FED. RD. DIV. NO.	STATE PROJECT NO.		SHEET NO.
6	C 3256-2-93		1
STATE	STATE DIST. NO.	COUNTY	
TEXAS	HOU	HARRIS	
CONT.	SECT.	JOB	HIGHWAY NO.
3256	02	093	SL 8

INDEX OF SHEETS

SEE SHEET 2 FOR INDEX OF SHEETS

STATE HIGHWAY IMPROVEMENT
STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO. C 3256-2-93
CSJ 3256-02-093

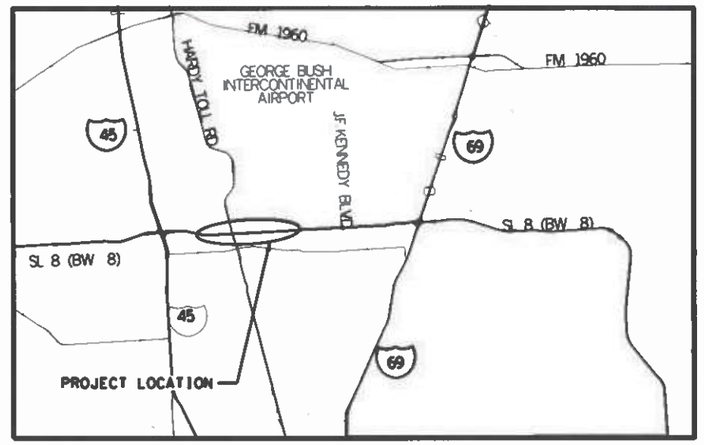
HARRIS COUNTY

SL 8 (BELTWAY 8)

PROJECT LENGTH 2.319 MI

LIMITS: WEST OF HARDY TOLL RD TO EAST OF ALDINE WESTFIELD RD.

FOR THE RECONSTRUCTION OF SL 8
AND
EB / WB FRONTAGE ROADS

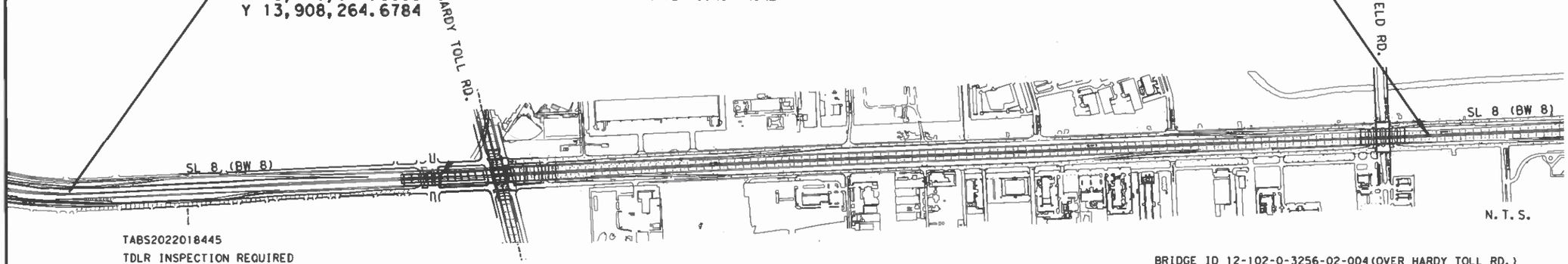


VICINITY MAP
N. T. S.

BEGIN PROJECT
STA. 1699+87.00 (SL 8)
REF M 720+1.058
MP 2.185
X= 3,110,977.8993
Y 13,908,264.6784

EQUATIONS: NONE
RAILROAD CROSSINGS: NONE
EXCEPTIONS: NONE

END PROJECT
STA. 1822+31.45 (SL 8)
REF 722+1.850
MP 4.504
X= 3,123,211.5232
Y= 13,908,777.9862



N. T. S.

TABS2022018445
TDLR INSPECTION REQUIRED

BRIDGE ID 12-102-0-3256-02-004(OVER HARDY TOLL RD.)

ALL BEARINGS AND COORDINATE ARE BASED ON THE TEXAS COORDINATE SYSTEM SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM OF (NAD)83, (2011 ADJUSTMENT), EPOCH 2010.00.

ALL DISTANCES AND COORDINATES SHOWN ARE SURFACE AND MAY BE CONVERTED TO A GRID BY DIVIDING BY A COMBINED ADJUSTMENT FACTOR OF 1.00013.

COORDINATES WERE DERIVED FROM STATIC OBSERVATIONS USING CORS STATIONS TXCN, TXLM AND TXRS.

ALL ELEVATIONS SHOWN ARE BASED ON NAVID 88 USING GEOID 12A AND WERE ESTABLISHED BY DIGITAL DIFFERENTIAL LEVELING.

PROJECT CONTROL POINTS WERE ESTABLISHED BY USING TXDOT LEVEL 2 AND 3 GPS SPECIFICATIONS.

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

REGISTERD ACCESSIBILITY SPECIALIST (RAS)
INSPECTION REQUIRED
TLDR NO, TABS202218445

SL 8 (AT HARDY TOLL ROAD)
URBAN FUNCTIONAL CLASSIFICATION: FREEWAY

DESIGN SPEED = 65 MPH
TRUCKS 6.2%

A.D.T. (2022) = 79,212 EB
A.D.T. (2042) = 109,678 EB

A.D.T. (2022) = 81,056 WB
A.D.T. (2042) = 112,231 WB

ALDINE WESTFIELD RD 35 MPH SOUTH OF SL 8
ALDINE WESTFIELD RD 45 MPH NORTH OF SL 8

EB FRTG. RD. SL 8 (AT CHAPLIN STREET)
URBAN FUNCTIONAL CLASSIFICATION: URBAN
PRINCIPAL ARTERIAL

DESIGN SPEED = 50 MPH
TRUCKS 5%

A.D.T. (2022) = 26,950 EB
A.D.T. (2042) = 37,300 EB

WB FRTG. RD. SL 8 (EAST OF CHAPLIN STREET)
URBAN FUNCTIONAL CLASSIFICATION: URBAN
PRINCIPAL ARTERIAL

DESIGN SPEED = 45 MPH
TRUCKS 5%

A.D.T. (2022) = 21,800 WB
A.D.T. (2042) = 30,250 WB

Texas Department of Transportation

RECOMMENDED FOR LETTING: March 20, 2023

AREA ENGINEER

APPROVED FOR LETTING: 3/30/2023

DocuSigned by:
James Koch, P.E.
FOR DISTRICT ENGINEER
8A2ACFA468C24CC...

COUNTY HARRIS CSJ. 325602093
HWY. NO. SL 8 LETTING DATE 06-2023
DATE ACCEPTED

DATE:$DATE$
$FILE$

INDEX OF SHEETS

* THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE, HAVE BEEN ISSUED BY ME AND ARE APPLICABLE TO THE PROJECT.

DANIEL THOMPSON PE 08/23/2018

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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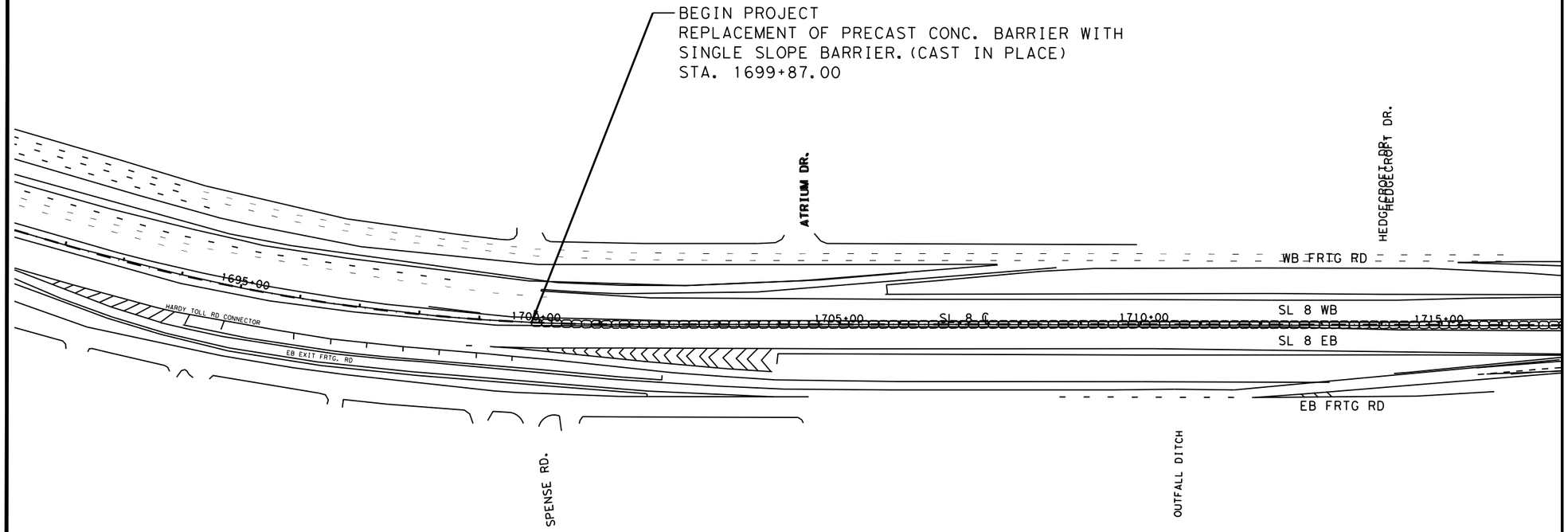
Texas Department of Transportation

SL 8
INDEX OF SHEETS

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			2
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:$DATE$
$FILEL$

XXXX



N

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 10" FAST TRACK
- 8" CRCP
- 13" CRCP
- 2" ASB
- SINGLE SLOPE CONC. BARRIER

STATE OF TEXAS
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122541
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SL 8

PROJECT LAYOUT

SCALE: 1" = 200' HORZ

SHEET 1 OF 6

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			3
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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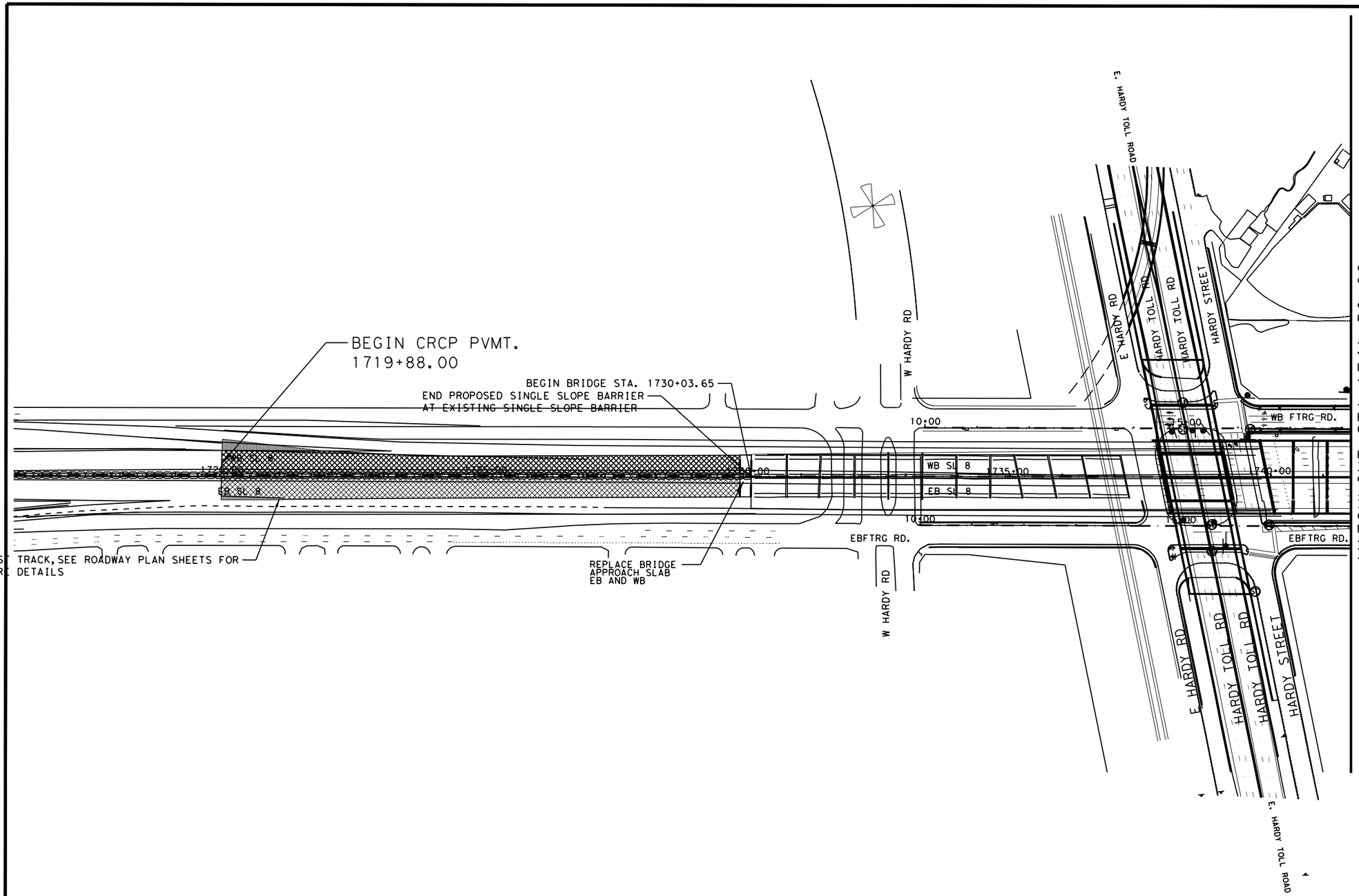

N

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PROJECT LAYOUT

SCALE: 1" = 200' HORZ

SHEET 2 OF 6

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			4
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

MATCH LINE STA. 1741+50.00

MATCH LINE STA. 1766+50.00

GREENDALE DR

TALLSHADOW RD

BEGIN PROPOSED CRCP PVMT.

END PROPOSED CRCP PVMT.

WB FTRG RD.

EB FTRG RD.

WB SL 8

EB SL 8

BELTWAY 8

20+00 25+00 30+00 35+00 40+00

1740+00 1745+00 1750+00 1755+00 1760+00 1765+00

SEE ROADWAY PLAN SHEETS FOR MORE DETAILS

BEGIN REPLACEMENT
OF PRECAST CONC. BARRIER WITH
SINGLE SLOPE BARRIER. (CAST IN PLACE)
(BEGIN AT EXIST. PRECACT BARRIER)

N

LEGEND

- EXIST TRAFFIC LANE
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- 13" CRCP
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SHEET 3 OF 6

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			5
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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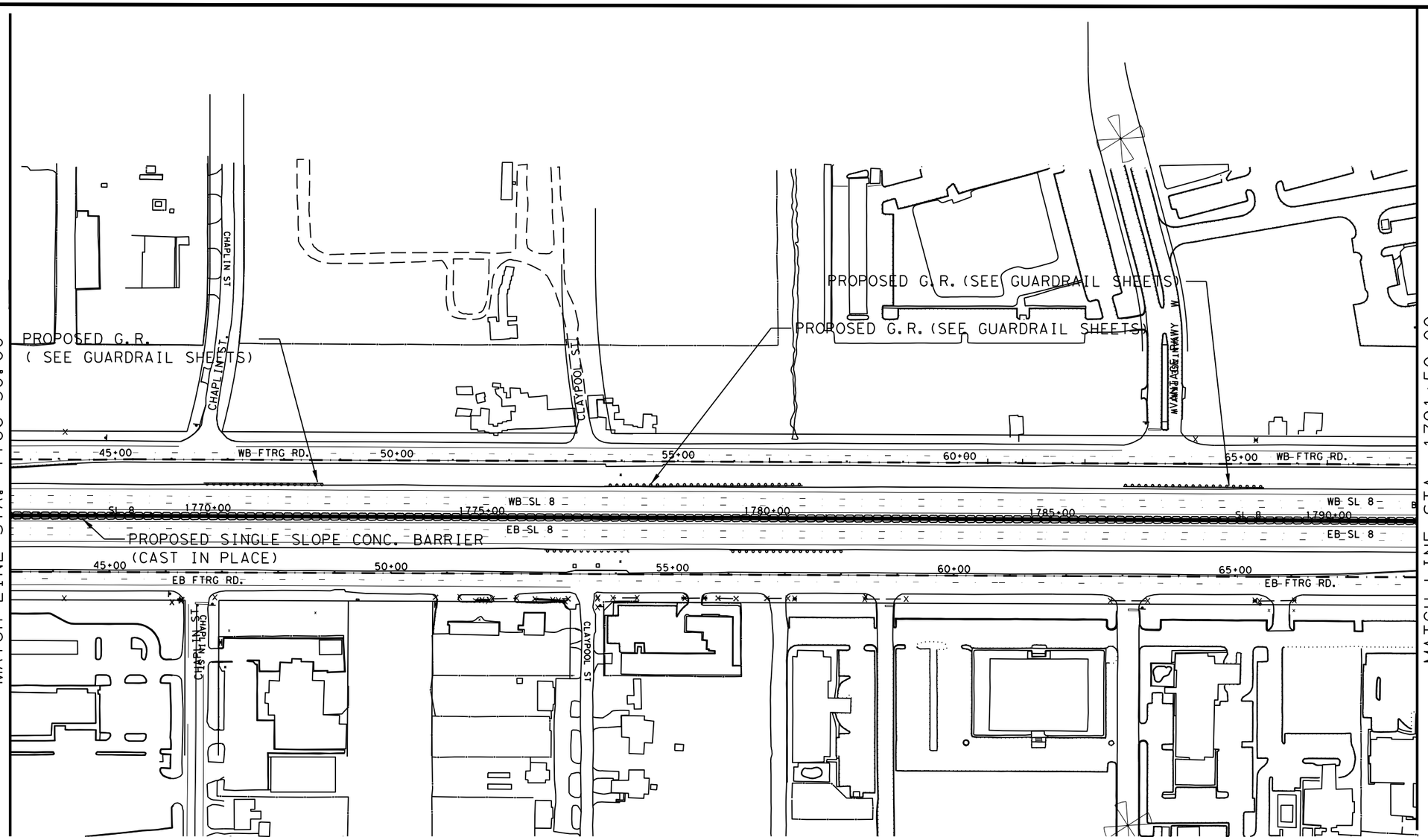

N

LEGEND

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- PROP TRAFFIC LANE
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- 13" CRCP
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PROJECT LAYOUT

SCALE: 1" = 200' HORZ

SHEET 4 OF 6

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			6
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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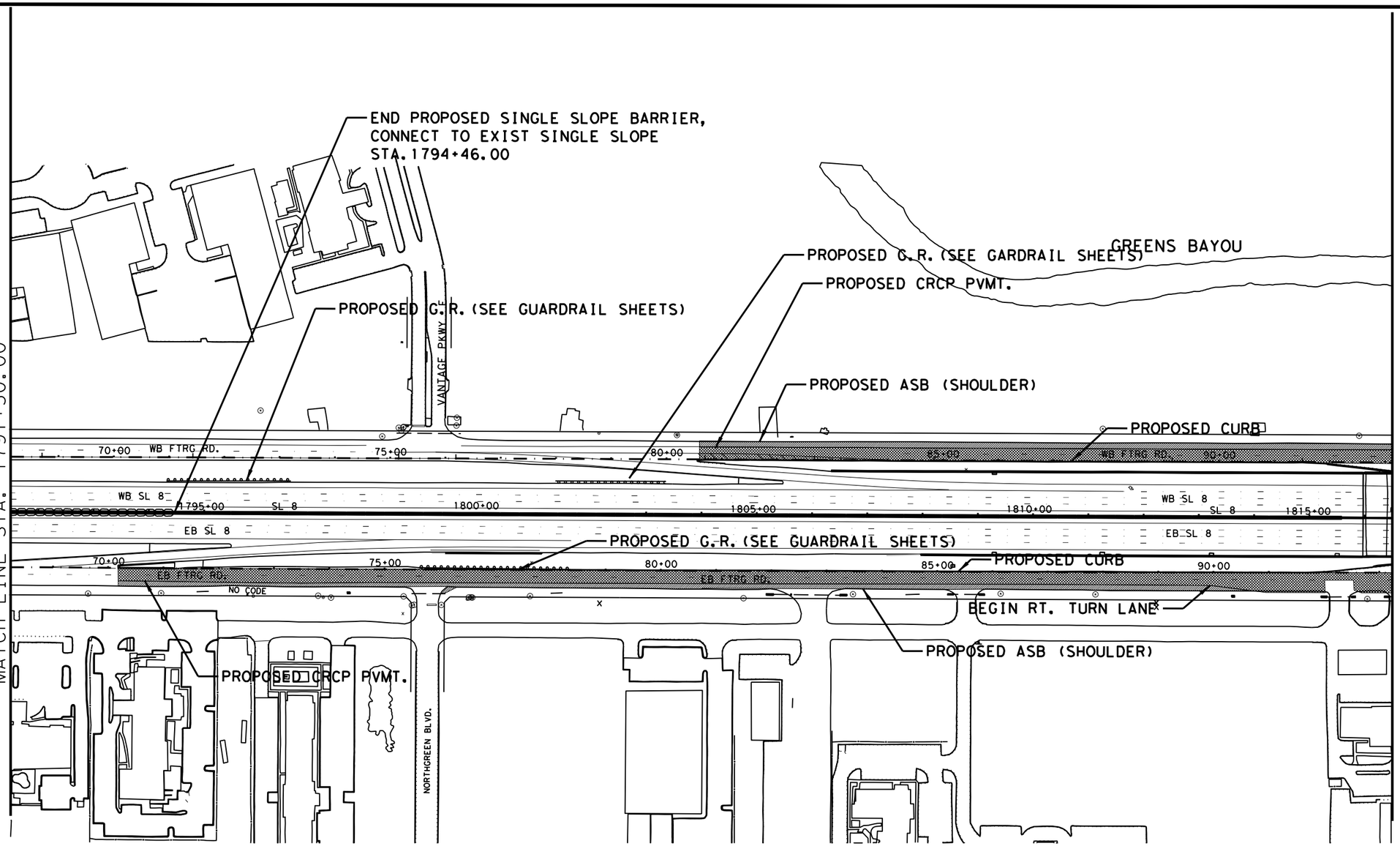

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PROJECT LAYOUT

SCALE: 1" = 200' HORZ

SHEET 5 OF 6

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			7
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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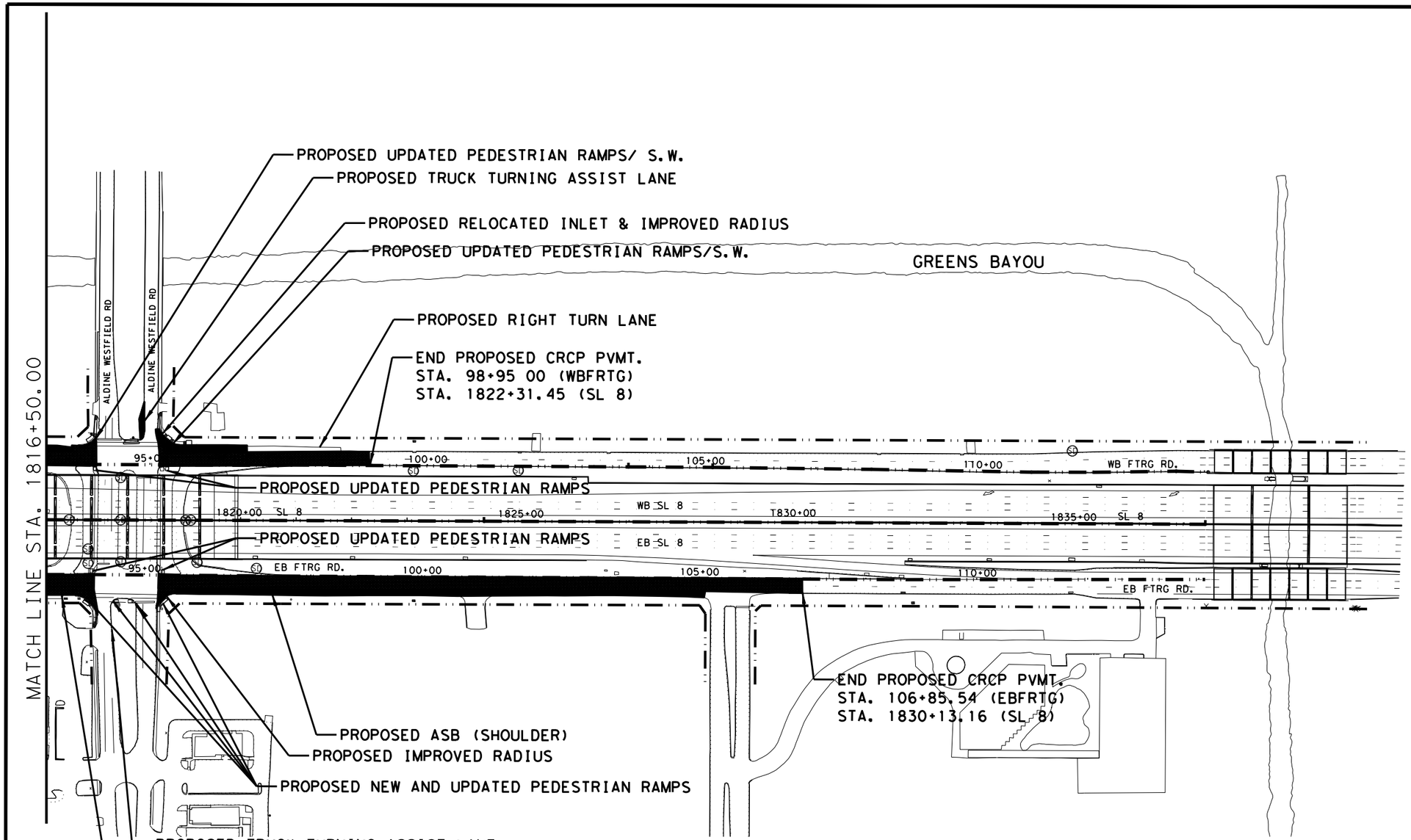

N

LEGEND

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- PROP TRAFFIC LANE
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SL 8

PROJECT LAYOUT

SCALE: 1" = 200' HORZ

SHEET 6 OF 6

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			8
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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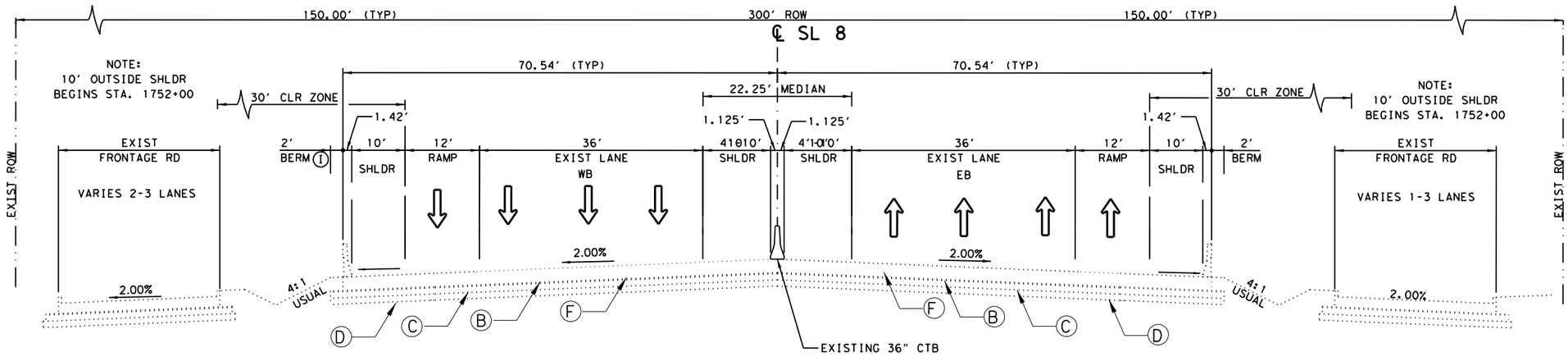


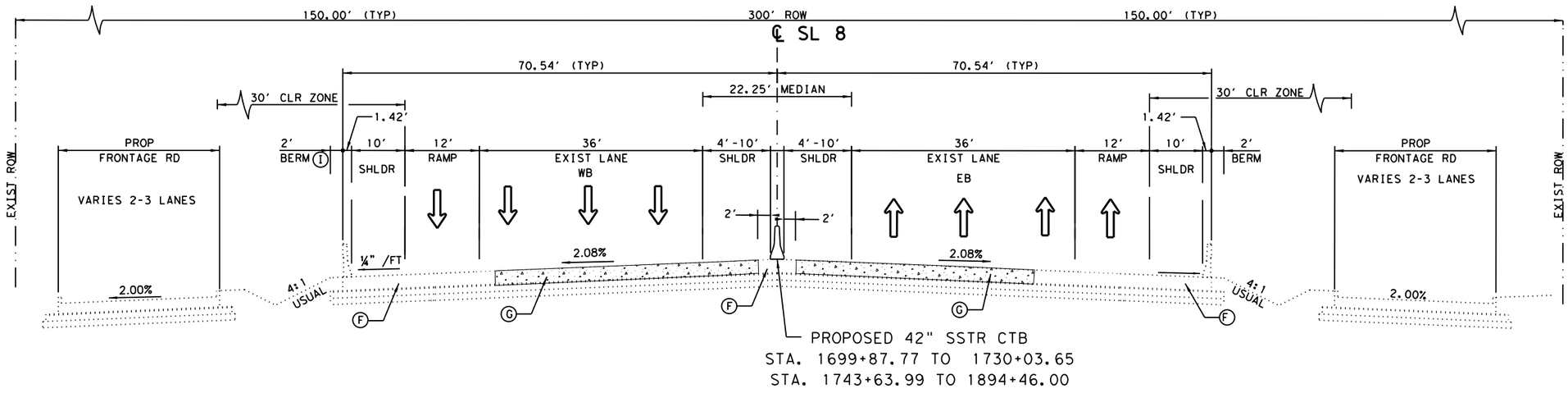
SL 8 EXISTING

STA. 1719+88.00 TO STA.1729+82.37

STA. 1734+88.94 TO STA.1753+27.34

NOTE: INSIDE SHOULDER WIDTH VARIES AT BRIDGE PIER FOR HARDY TOLL RD.

NOTE: INSIDE SHOULDER WIDTH VARIES AT BRIDGE PIER FOR HARDY TOLL RD.



SL 8 PROPOSED

STA. 1719+88.00 TO STA.1729+82.37

STA. 1734+88.94 TO STA.1753+27.34

DATE:3/15/2023
$FILEL$

LEGEND AND SYMBOLS

- (A) EXIST. 8" JRCP
- (B) 1" ASPH (BOND BREAKER)
- (C) 6" CEM STAB. BASE
- (D) 6" LIME TREATED SUB-BASE
- (E) EXIST. 8" CRCP
- (F) EXIST. 13" CRCP
- (G) PROPOSED 13" CRCP
- (H) PROPOSED 8" CRCP
- (I) 6" MONO CURB
- (L) 4" RIPRAP
- (M) EXIST. 2" ACP
- (N) TYPE II CURB MONO
- (O) 6" SLOTTED CURB
- (P) PROP. 2" ASPH TYPE D
- (Q) PROP. FAST TRACK 9"
- PROP TRAFFIC LANE
- EXIST TRAFFIC LANE

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SL 8

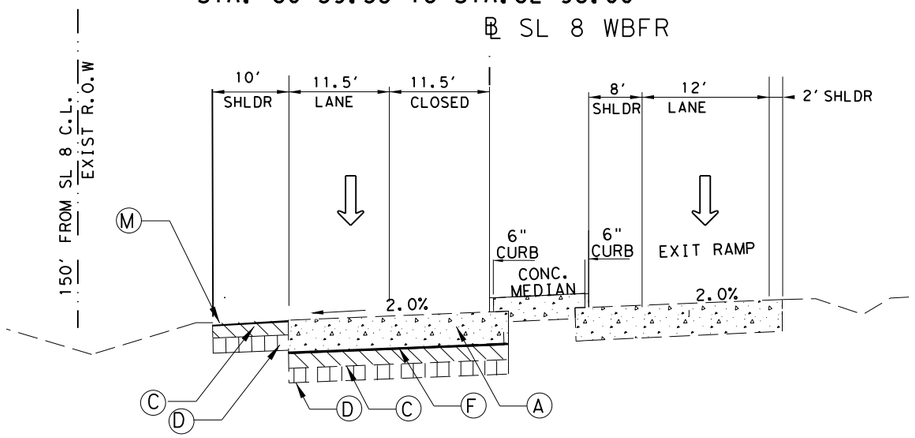
TYPICALS

SCALE: 1" = 20' HORZ

SHEET 2 OF 3

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			9
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

EXISTING WB FRTG. RD.
STA. 80+59.53 TO STA.82+98.00



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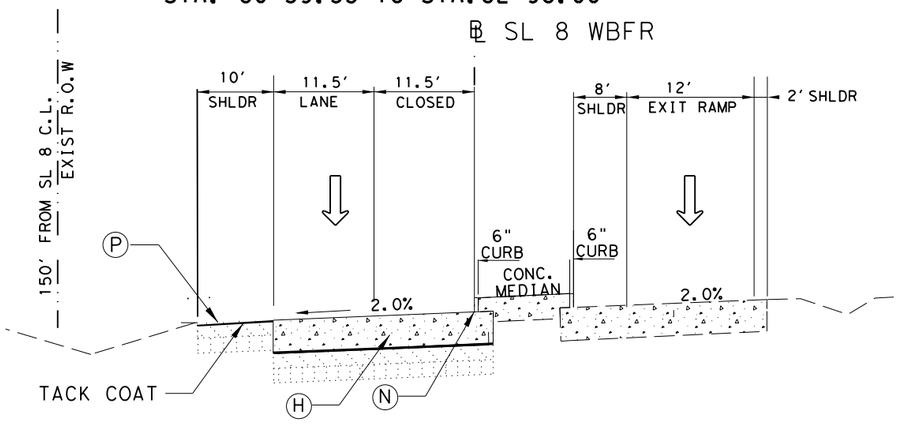
STA. 80+59.53 TO STA.82+98.00



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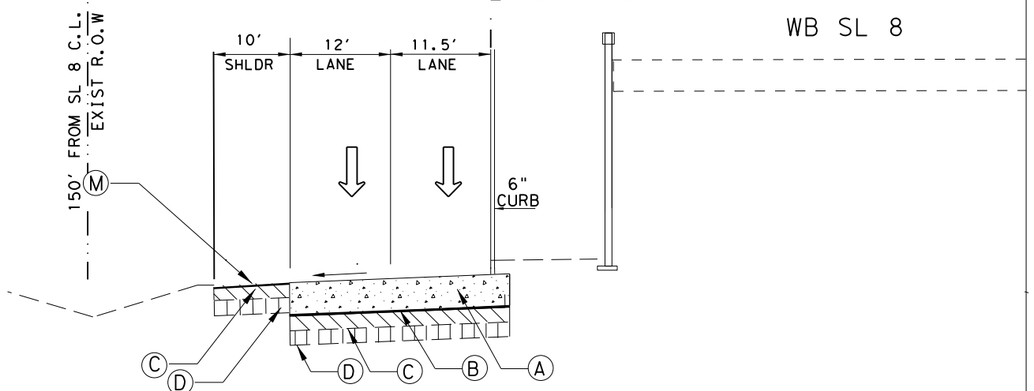
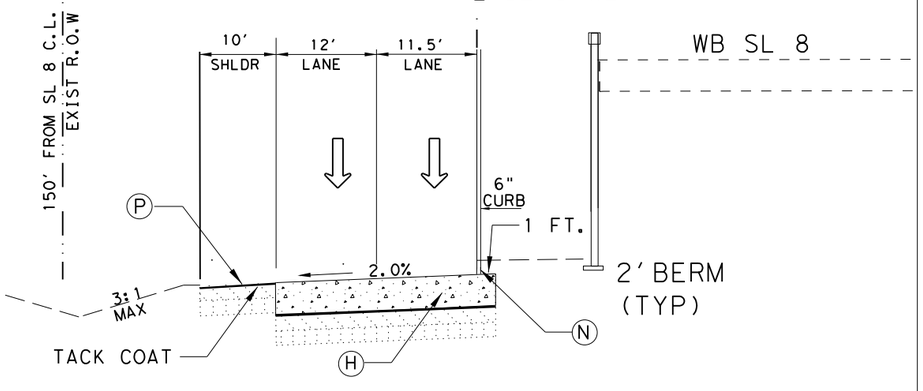
STA. 82+98.00 TO STA.91+92.00



PROPOSED WB FRTG. RD.
STA. 82+98.00 TO STA.91+92.00



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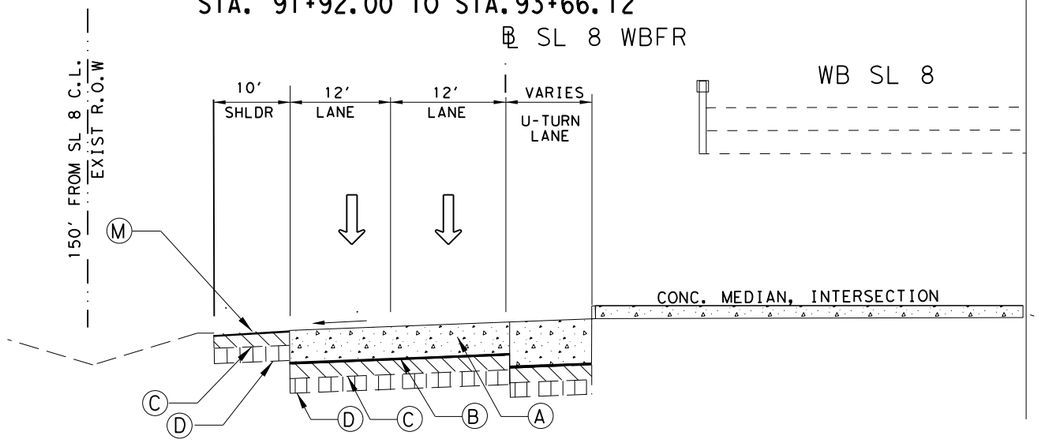
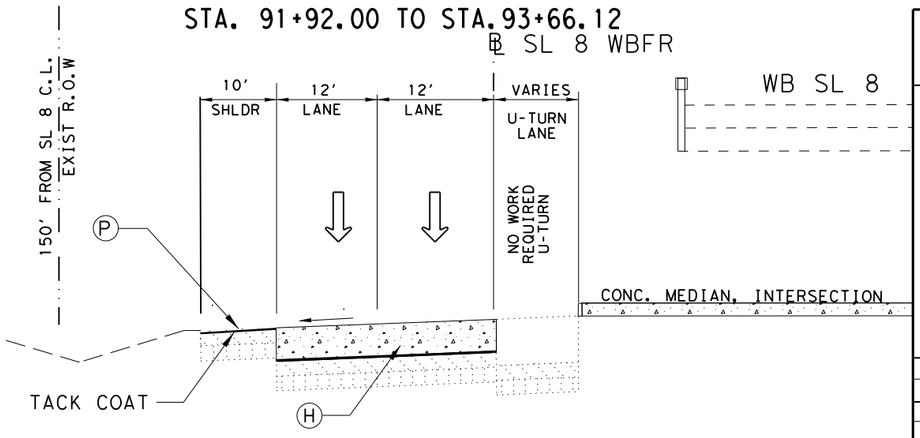
STA. 91+92.00 TO STA.93+66.12



PROPOSED WB FRTG. RD.
STA. 91+92.00 TO STA.93+66.12



LEGEND AND SYMBOLS

- Ⓐ EXIST. 8" JRCP
- Ⓑ 1" ASPH (BOND BREAKER)
- Ⓒ 6" CEM STAB. BASE
- Ⓓ 6" LIME TREATED SUB-BASE
- Ⓔ EXIST. 8" CRCP
- Ⓕ EXIST. 13" CRCP
- Ⓖ PROPOSED 13" CRCP
- Ⓗ PROPOSED 8" CRCP
- Ⓘ 6" MONO CURB
- Ⓛ 4" RIPRAP
- Ⓜ EXIST. 2" ACP
- Ⓝ TYPE II CURB MONO
- Ⓞ 6" SLOTTED CURB
- Ⓟ PROP. 2" ASPH TYPE D
- Ⓠ PROP. FAST TRACK 9"

➡ PROP TRAFFIC LANE

⇨ EXIST TRAFFIC LANE

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8

WB FRTG. TYPICAL SECTIONS

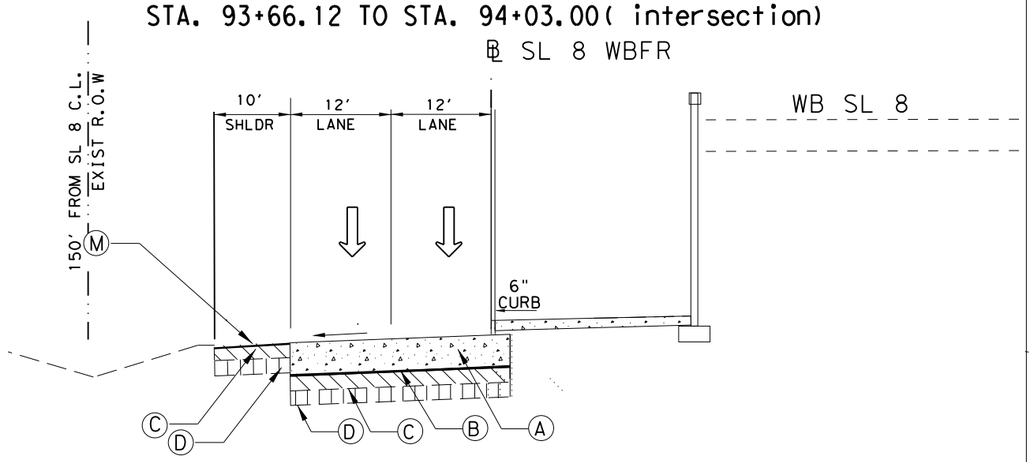
SCALE: 1" = 20' HORZ

SHEET 1 OF 2

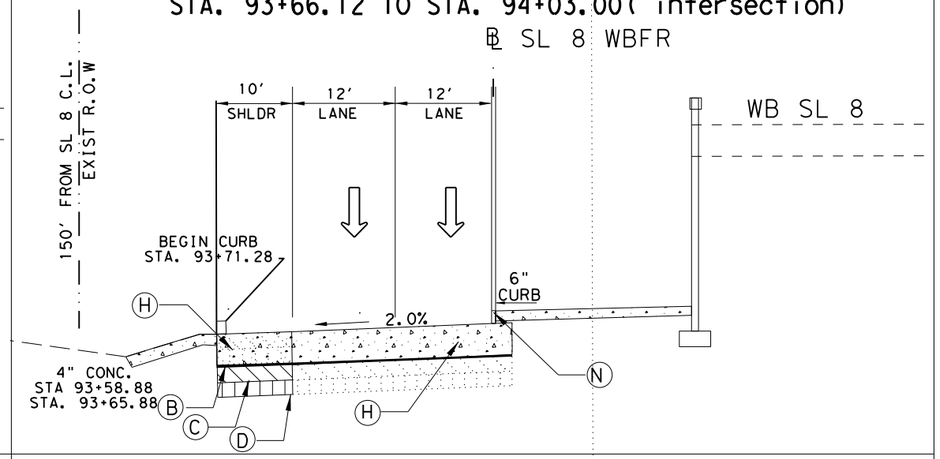
FED.RD. DIV.NO.	PROJECT NO.		SHEET
6			10
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
$FILEL$

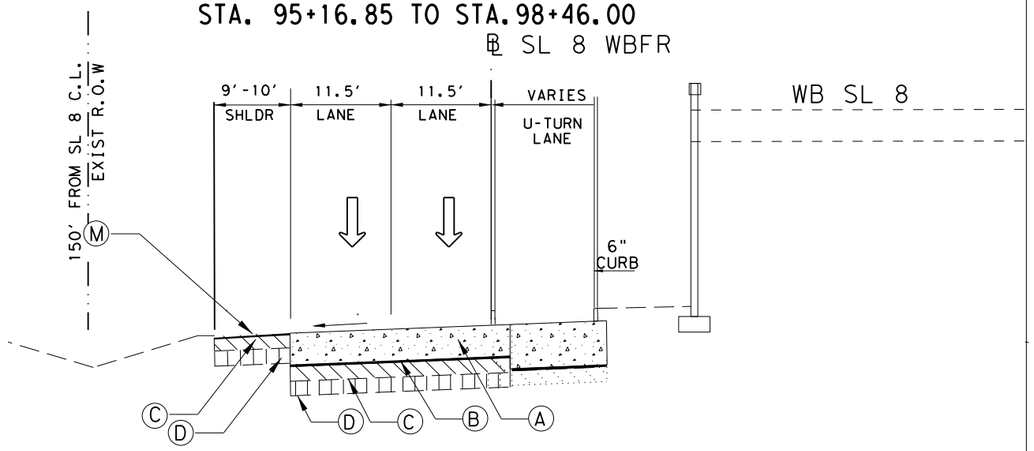
EXISTING WB FRTG. RD.
STA. 93+66.12 TO STA. 94+03.00(intersection)



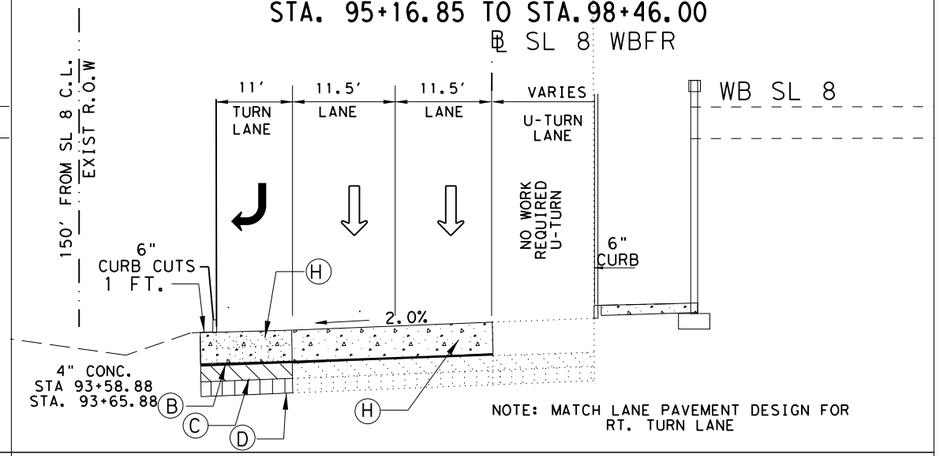
PROPOSED WB FRTG. RD.
STA. 93+66.12 TO STA. 94+03.00(intersection)



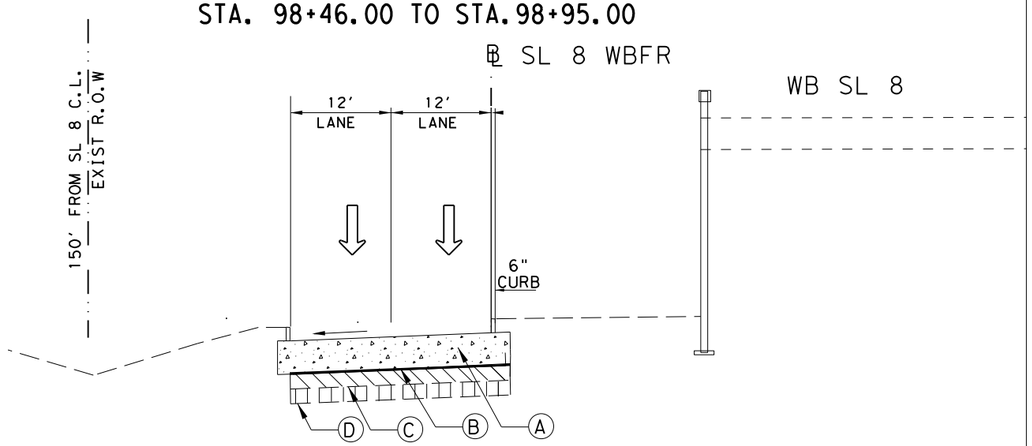
EXISTING WB FRTG. RD.
STA. 95+16.85 TO STA.98+46.00



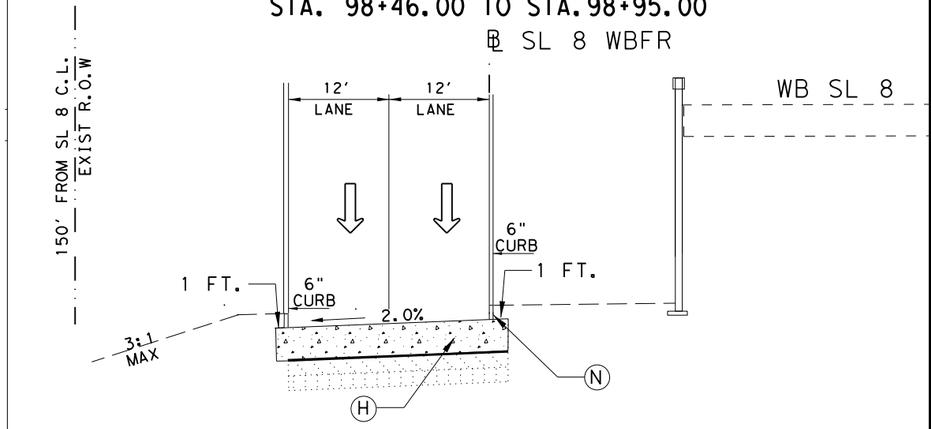
PROPOSED WB FRTG. RD.
STA. 95+16.85 TO STA.98+46.00



EXISTING WB FRTG. RD.
STA. 98+46.00 TO STA.98+95.00



PROPOSED WB FRTG. RD.
STA. 98+46.00 TO STA.98+95.00



DATE: 3/15/2023
$FILEL$

LEGEND AND SYMBOLS

- Ⓐ EXIST. 8" JRCP
- Ⓑ 1" ASPH (BOND BREAKER)
- Ⓒ 6" CEM STAB. BASE
- Ⓓ 6" LIME TREATED SUB-BASE
- Ⓔ EXIST. 8" CRCP
- Ⓕ EXIST. 13" CRCP
- Ⓖ PROPOSED 13" CRCP
- Ⓗ PROPOSED 8" CRCP
- Ⓘ 6" MONO CURB
- Ⓛ 4" RIPRAP
- Ⓜ EXIST. 2" ACP
- Ⓝ TYPE II CURB MONO
- Ⓞ 6" SLOTTED CURB
- Ⓟ PROP. 2" ASPH TYPE D
- Ⓠ PROP. FAST TRACK 9"
- ➡ PROP TRAFFIC LANE
- ⇨ EXIST TRAFFIC LANE

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Texas Department of Transportation

SL 8

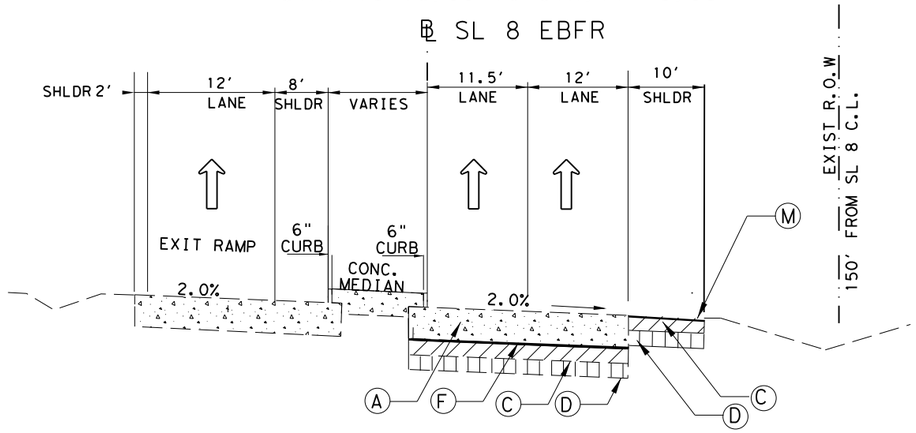
WB FRTG. TYPICAL SECTIONS

SCALE: 1" = 20' HORZ

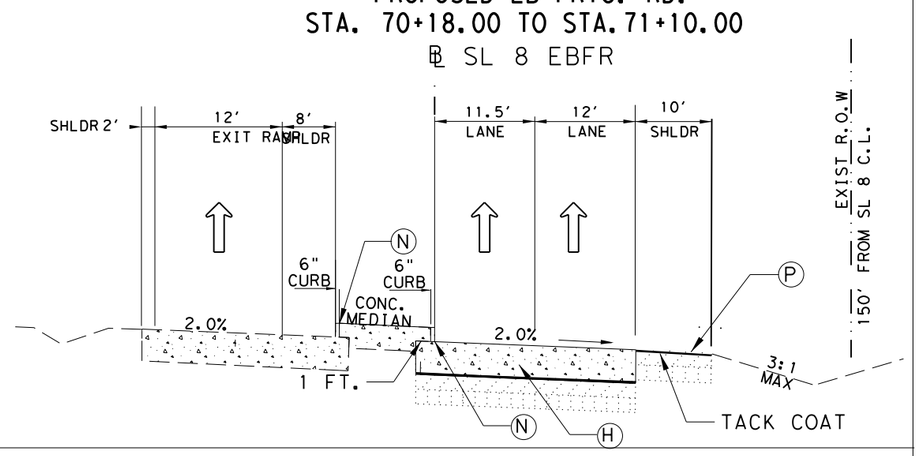
SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			11
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

EXISTING EB FRTG. RD.
STA. 70+18.00 TO STA. 71+10.00



PROPOSED EB FRTG. RD.
STA. 70+18.00 TO STA. 71+10.00



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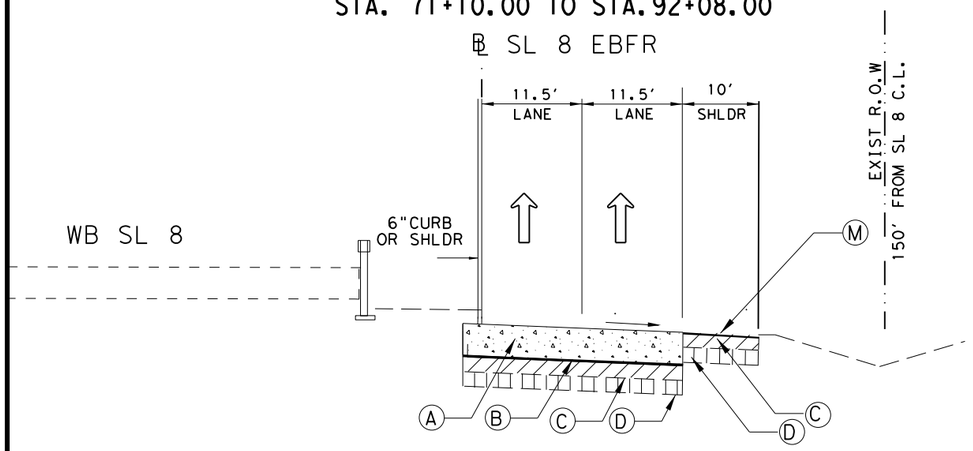

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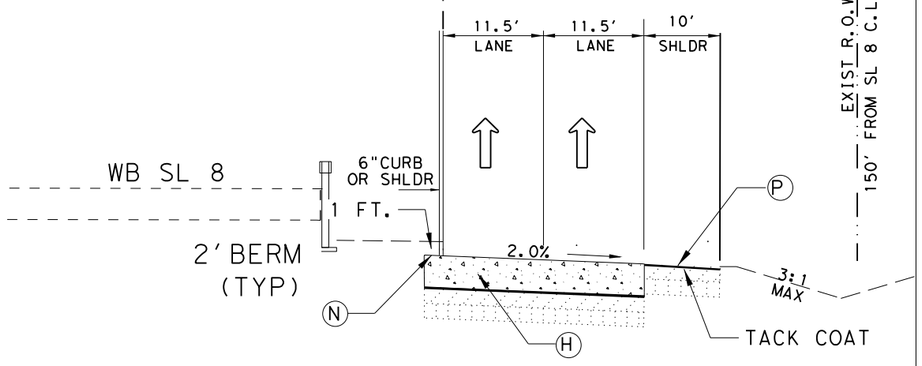

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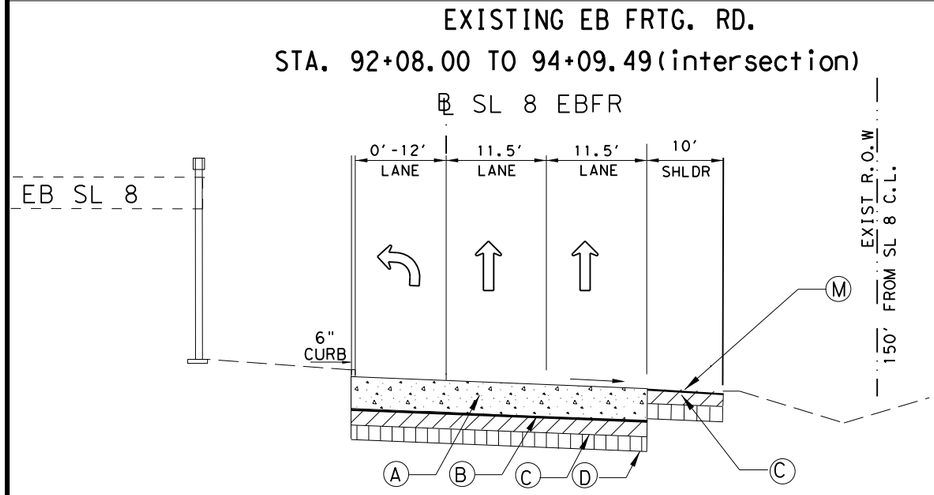
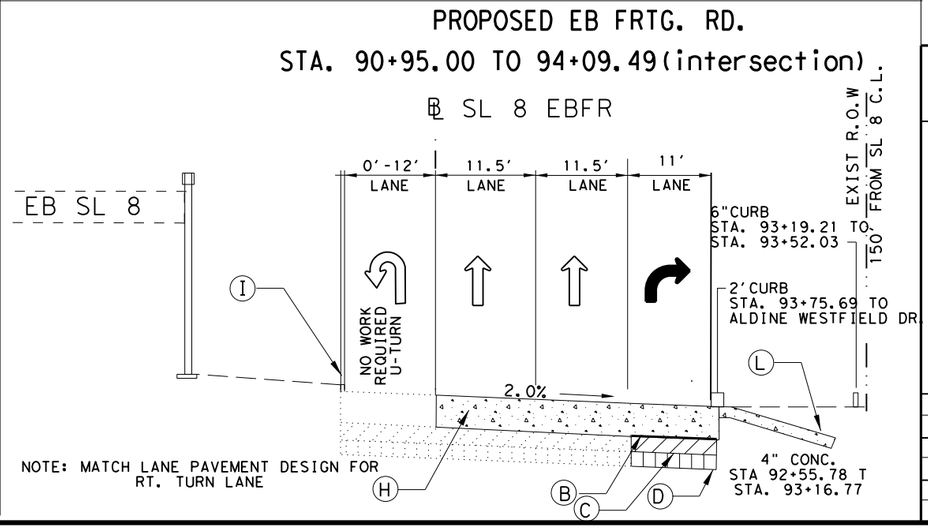
STA. 92+08.00 TO 94+09.49(intersection)



PROPOSED EB FRTG. RD.
STA. 90+95.00 TO 94+09.49(intersection)



NOTE: MATCH LANE PAVEMENT DESIGN FOR RT. TURN LANE

DATE: $DATE$
$FILEL$

LEGEND AND SYMBOLS

- Ⓐ EXIST. 8" JRCP
- Ⓑ 1" ASPH (BOND BREAKER)
- Ⓒ 6" CEM STAB. BASE
- Ⓓ 6" LIME TREATED SUB-BASE
- Ⓔ EXIST. 8" CRCP
- Ⓕ EXIST. 13" CRCP
- Ⓖ PROPOSED 13" CRCP
- Ⓗ PROPOSED 8" CRCP
- Ⓘ 6" MONO CURB
- Ⓛ 4" RIPRAP
- Ⓜ EXIST. 2" ACP
- Ⓝ TYPE II CURB MONO
- Ⓞ 6" SLOTTED CURB
- Ⓟ PROP. 2" ASPH TYPE D
- Ⓠ PROP. FAST TRACK 9"
- ➡ PROP TRAFFIC LANE
- ⇨ EXIST TRAFFIC LANE

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by Daniel Duke Thompson, P.E. 122541 on 03/15 , 2023 . Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

Texas Department of Transportation

SL 8

EB FRTG. TYPICAL SECTIONS

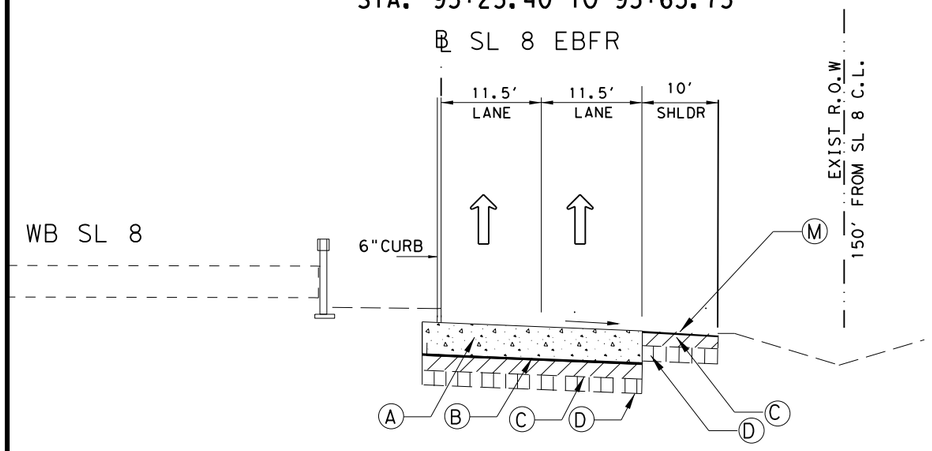
SCALE: 1" = 20' HORZ

SHEET 1 OF 2

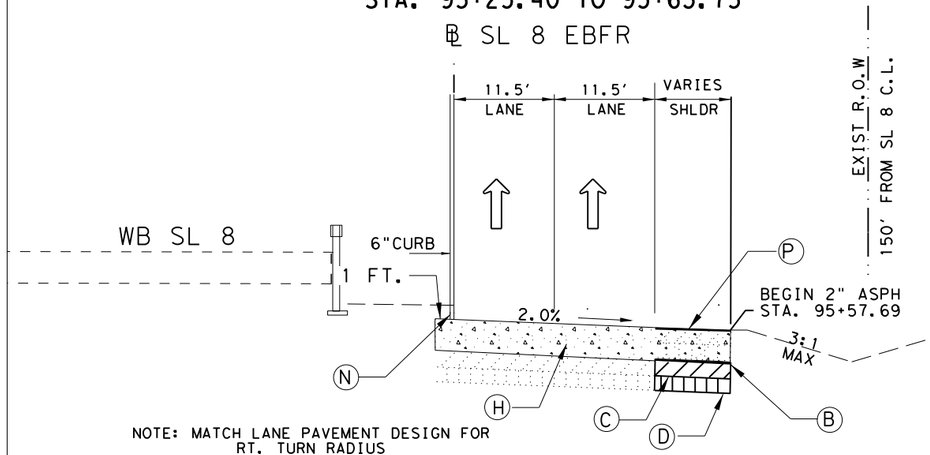
FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		12

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

EXISTING EB FRTG. RD.
STA. 95+25.40 TO 95+63.75

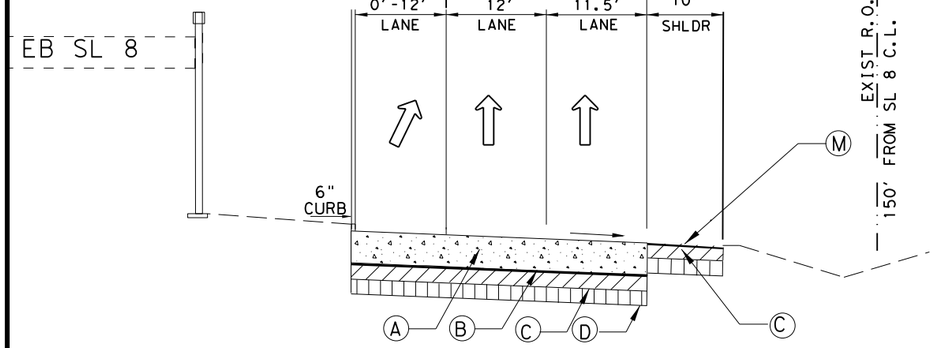


PROPOSED EB FRTG. RD.
STA. 95+25.40 TO 95+63.75

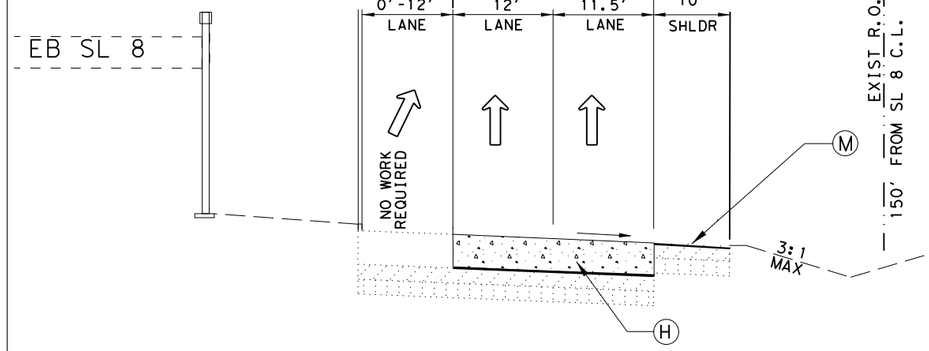


NOTE: MATCH LANE PAVEMENT DESIGN FOR RT. TURN RADIUS

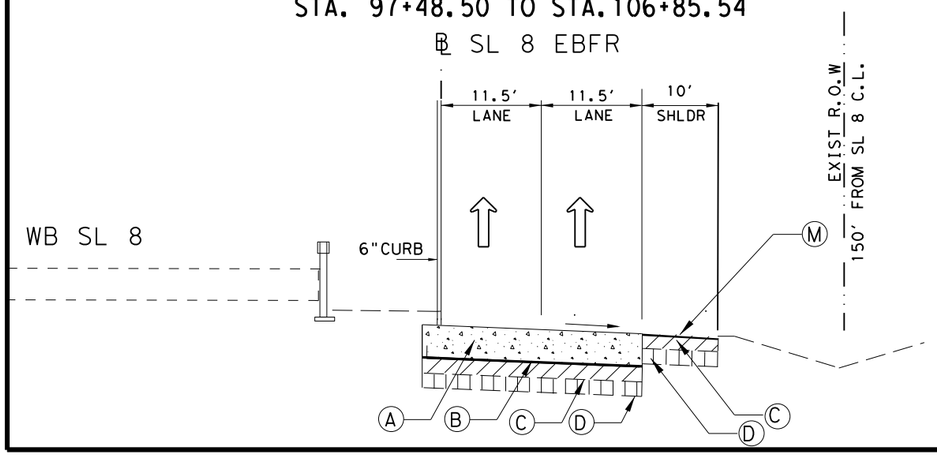
EXISTING EB FRTG. RD.
STA. 95+63.40 TO STA. 97+48.50



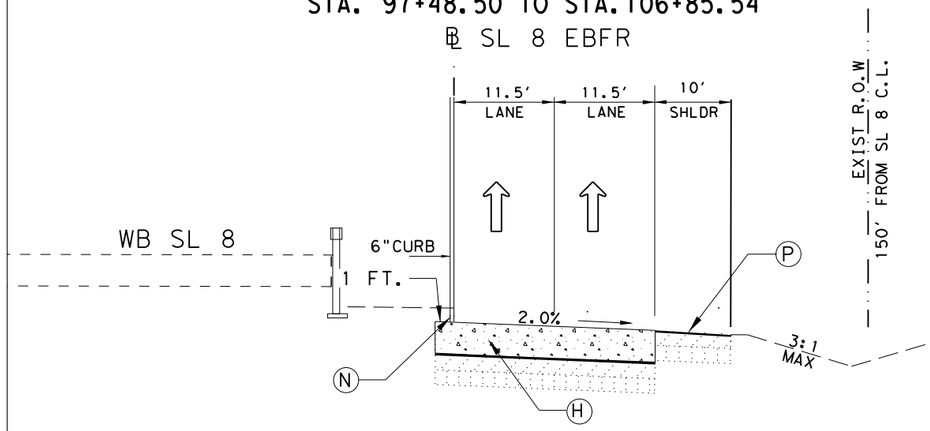
PROPOSED EB FRTG. RD.
STA. 95+63.40 TO STA. 97+48.50



EXISTING EB FRTG. RD.
STA. 97+48.50 TO STA. 106+85.54



PROPOSED EB FRTG. RD.
STA. 97+48.50 TO STA. 106+85.54



DATE: $DATE$
$FILEL$

DATE: $DATE$
$FILEL$

LEGEND AND SYMBOLS

- (A) EXIST. 8" JRCP
- (B) 1" ASPH (BOND BREAKER)
- (C) 6" CEM STAB. BASE
- (D) 6" LIME TREATED SUB-BASE
- (E) EXIST. 8" CRCP
- (F) EXIST. 13" CRCP
- (G) PROPOSED 13" CRCP
- (H) PROPOSED 8" CRCP
- (I) 6" MONO CURB
- (L) 4" RIPRAP
- (M) EXIST. 2" ACP
- (N) TYPE II CURB MONO
- (O) 6" SLOTTED CURB
- (P) PROP. 2" ASPH TYPE D
- (Q) PROP. FAST TRACK 9"
- ➡ PROP TRAFFIC LANE
- ⇨ EXIST TRAFFIC LANE

STATE OF TEXAS
DANIEL DUKE THOMPSON
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LICENSED PROFESSIONAL ENGINEER

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Texas Department of Transportation

SL 8

EB FRTG. TYPICAL SECTIONS

SCALE: 1" = 20' HORZ

SHEET 2 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			13
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

General Notes:

General:

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

(Phillip A. Garlin, Phillip.Garlin@txdot.gov)
(Roger Lopez, Roger.Lopez@txdot.gov)

Submit any questions about this project via the Letting Pre-Bid Q&A web page, located at:

https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors

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

All relevant project documentation, including Contract Time Determinations and cross-sections will continue to be provided on the following FTP site:

Index of /pub/txdot-info/Pre-Letting Responses/Houston District (state.tx.us) or

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

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

Superelevate the curves to match the existing surface.

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

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

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

Grade street intersections and median openings for surface drainage.

If a foundation is to be placed where a riprap surface or an asphalt concrete surface presently

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

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

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

Stencil the National Bridge Inventory (NBI) number on each existing bridge shown on these plans. The NBI number is shown above the title block for each bridge layout.

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.

General: Site Management

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

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

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

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

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

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

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

General: Utilities

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

If the Contractor damages or causes damage (breaks, leaks, nicks, dents, gouges, etc.) to the utility, contact the utility facility owner or operator immediately.

Be aware that an operational Computerized Transportation Management System (CTMS) exists within the limits of this project and that the system must remain operational throughout construction. If the Contractor damages or causes damage to this system, repair such damage within 8 hours of occurrence at no cost to the Department. In the event of system damage, notify the Director of Traffic Management Systems at 713-881-3283 within one hour of occurrence. Failure of the Contractor to repair damage to the main fiber optic cable and CCTV cable trunk lines, which convey all corridor information to TranStar, will result in the Contractor being billed for the full cost of emergency repairs.

At least 72 hours before starting work, make arrangements for locating existing Department-owned above ground and underground fiber optic, communications, power, illumination, and traffic signal cabling and conduit. Do this by calling the Department's Houston District Traffic Signal Operations Office at 713-802-5662, or by e-mailing the Department's Houston District Traffic Signal Operations Office at HOU-LocateRequest@txdot.gov, to schedule marking of underground lines on the ground. Use caution if working in these areas to avoid damaging or interfering with existing facilities.

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

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

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

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

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

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

Item 5: Control of Work

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

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

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

Submit shop drawings electronically for the fabrication of items as documented in Table 1 or Table 2 below. Information and requirements for electronic submittals can be viewed in the "Guide to Electronic Shop Drawing Submittal" which can be accessed through the following

web link, ftp://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/e_submit_guide.pdf. References to 11 in. x 17 in. sheets in individual specifications for structural items imply electronic CAD sheets.

Table 1

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

Spec Item No.'s	Product	Submittal Required	Approval Required (Y/N)	Contractor/ Fabricator P.E. Seal Required	Reviewing Party	Shop or Working Drawing (Note 1)
7.16.1&.2	Construction Load Analyses	Y	Y	Y	B	WD
400	Excavation and Backfill for Structures (cofferdams)	Y	N	Y	A	WD
403	Temporary Special Shoring	Y	N	Y	C	WD
420	Formwork/Falsework	Y	N	Y	A	WD
423	Retaining Walls, (calcs req'd.)	Y	Y	Y	C	SD
425	Optional Design Calculations (Prstrs Bms)	Y	Y	Y	B	SD
425	Prestr Concr Sheet Piling	Y	Y	N	B	SD
425	Prestr Concr Beams	Y	Y	N	B	SD
425	Prestr Concr Bent	Y	Y	N	B	SD
426	Post Tension Details	Y	Y	N	B	SD
434	Elastomeric Bearing Pads (All)	Y	Y	N	B	SD
441	Bridge Protective Assembly	Y	Y	N	B	SD
441	Misc Steel (various steel assemblies)	Y	Y	N	B	SD
441	Steel Pedestals (bridge raising)	Y	Y	N	B	SD
441	Steel Bearings	Y	Y	N	B	SD
441	Steel Bent	Y	Y	N	B	SD
441	Steel Diaphragms	Y	Y	N	B	SD
441	Steel Finger Joint	Y	Y	N	B	SD
441	Steel Plate Girder	Y	Y	N	B	SD
441	Steel Tub-Girders	Y	Y	N	B	SD
441	Erection Plans, including Falsework	Y	N	Y	A	WD
449	Sign Structure Anchor Bolts	Y	Y	N	T	SD
450	Railing	Y	Y	N	A	SD
462	Concrete Box Culvert	Y	Y	N	C	SD
462	Concrete Box Culvert (Alternate Designs Only,calcs reqd.)	Y	Y	Y	B	SD
464	Reinforced Concrete Pipe (Jack and Bore only; ONLY when requested)	Y	Y	Y	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets	Y	Y	N	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets (Alternate Designs Only, calcs req'd.)	Y	Y	Y	B	SD
466	Pre-cast Headwalls and Wingwalls	Y	Y	N	A	SD
467	Pre-cast Safety End Treatments	Y	Y	N	A	SD
495	Raising Existing Structure (calcs reqd.)	Y	Y	Y	B	SD
610	Roadway Illumination Supports (Non-Standard only, calcs reqd.)	Y	Y	Y	BRG	SD
613	High Mast Illumination Poles (Non-standard only, calcs reqd.)	Y	Y	Y	BRG	SD
627	Treated Timber Poles	Y	Y	N	T	SD
644	Special Non-Standard Supports (Bridge Mounts, Barrier Mounts, Etc.)	Y	Y	Y	T	SD
647	Large Roadside Sign Supports	Y	Y	Y	T	SD
650	Cantilever Sign Structure Supports - Alternate Design Calcs.	Y	Y	Y	T	SD
650	Sign Structures	Y	Y	N	T	SD
680	Installation of Highway Traffic Signals	Y	Y	N	T	SD
682	Vehicle and Pedestrian Signal Heads	Y	Y	N	T	SD
684	Traffic Signal Cables	Y	Y	N	T	SD
685	Roadside Flashing Beacon Assemblies	Y	Y	N	T	SD
686	Traffic Signal Pole Assemblies (Steel) (Non-Standard only)	Y	Y	Y	T	SD
687	Pedestal Pole Assemblies	Y	Y	N	T	SD
688	Detectors	Y	Y	N	A	SD
784	Repairing Steel Bridge Members	Y	Y	Y	B	WD
SS	Prestr Concr Crown Span	Y	Y	N	B	SD
SS	Sound Barrier Walls	Y	Y	Y	A	SD
SS	Camera Poles	Y	Y	Y	TMS	SD
SS	Pedestrian Bridge (Calcs req'd.)	Y	Y	Y	B	SD
SS	Screw-In Type Anchor Foundations	Y	Y	N	T	SD
SS	Fiber Optic/Communication Cable	Y	Y	N	TMS	SD
SS	Spread Spectrum Radios for Signals	Y	Y	N	T	SD
SS	VIVDS System for Signals	Y	Y	N	T	SD
SS	CTMS Equipment	Y	Y	N	TMS	SD

Notes:

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

Key to Reviewing Party

A - Area Office

Area Office	Email Address
North Harris Area Office	HOU-NHAShpDrwgs@txdot.gov

B - Houston Bridge Engineer

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

BRG - Austin Bridge Division

Bridge Design (Austin TxDOT)	BRG_ShopPlanReview@txdot.gov

C - Construction Office

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

T - Traffic Engineer

Traffic Operations	HOU-TrfShpDrwgs@txdot.gov

TMS – Traffic Management System

County: Harris

Highway: SL 8 **Control:** 3256-02-093

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

"When a precast or cast-in-place concrete element is included in the plans, a precast concrete alternate may be submitted in accordance with "Standard Operating Procedure for Alternate Precast Proposal Submission" found online at https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor."

Item 7: Legal Relations and Responsibilities

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

Contractor PSLs for construction support activities on or off the ROW. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the ROW to the Engineer (to the appropriate MS4 operator when on an off-state system route) and to the local government that operates a separate storm drain system.

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.

This project is on a hurricane evacuation route. Provide at the pre-construction meeting a written plan outlining procedures to suspend work, secure the job site, and safely handle traffic through and across the project in the event of a hurricane evacuation.

During the hurricane season (June 1 through November 30), do not close any travel lanes except when the Contractor can demonstrate that he/she can provide labor, equipment, material, a work plan, and quality of work to satisfactorily return all lanes to an open, all-weather travel surface within 3 days of receiving written or verbal notice but no later than 3 days before the predicted hurricane landfall. Construction of temporary lanes to an all-weather surface will be paid for in accordance with Article 9.7, "Payment for Extra Work and Force Account Method."

In addition to lane closures, cease work 3 days before the predicted hurricane landfall on or near the roadway that adversely impacts the flow of traffic and reduces the capacity of the highway during an evacuation. Vehicles of the Contractor, subcontractors, or material suppliers will not be allowed to enter or exit the traffic stream, including those for the purpose of material hauling and delivery, and mobilization or demobilization of equipment. When directed, this prohibition will include a reasonable time period for the evacuees to return to their point of origin.

Roadway closures during the following key dates and special events are prohibited:

March 3-20, 2024 – *Houston Livestock Show and Rodeo*

Item 8: Prosecution and Progress

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

Working days will be computed and charged based on a 6-*day* workweek in accordance with Section 8.3.3.2.2.

The maximum number of days the time charges on this contract may be suspended due to contractor mobilization, and material fabrication/accumulation or processing delays is 90 days. The Engineer and the Contractor may mutually agree, in writing, to decrease this maximum number of days.

The Lane Closure Assessment Fee is $ 2,000.00 for Mainlane & $500.00 for Frontage Road. This fee applies to the Contractor for closures or obstructions that overlap into restricted hour traffic for each hour or portion thereof, per lane, regardless of the length of lane closure or obstruction. For Restricted Hours subject to Lane Assessment Fee refer to the Item, "Barricades, Signs, and Traffic Handling." The time increment for the Lane Closure Assessment fee for this project is one hour.

Item 100: Preparing Right of Way

Obtain a City of Houston plumbing permit and a demolishing permit or removing permit before demolishing or removing existing houses or commercial buildings.

Clean existing ditches under fill sections of undesirable materials including grass, muck, and trash. Perform this work in accordance with the Construction section of the Item, "Preparing Right of Way." This work is subsidiary to this bid Item.

The Item, "Preparing Right of Way" will be measured for payment only in those designated areas shown on the plans. Preparing right of way necessary to perform construction that is outside designated areas is subsidiary to this bid Item.

Remove abandoned utilities that are in conflict with the new utilities, at no expense to the Department.

Reestablish and maintain right of way stakes after completing the right of way preparation activities and until the new utilities are in place.

Remove and assume ownership of the existing ground mounted signs within the limits of roadway construction unless otherwise noted or directed. This work is subsidiary to the Item, "Preparing Right of Way."

Item 104: Removing Concrete

Removing concrete curb is paid as a separate bid item if the existing pavement on which it rests is not removed at the same time.

Item 110: Excavation

If manipulating the excavated material requires moving the same material more than once to accomplish the desired results, the excavation is measured and paid for only once regardless of the manipulation required.

Transition the ditch grades and channel bottom widths at structure locations. Use only approved channel excavation in the embankment.

The total excavation quantity shown on the plans includes the quantity for excavating to 2 ft. behind the back of the proposed curb.

Excavate, strip, and stockpile the top 6 in. of existing topsoil only at locations shown in the plans. The salvaged quantity is shown in the plans. Reuse the topsoil under the Item, "Topsoil" including measurement and payment.

Item 132: Embankment

If salvaged base is used for the embankment material, break it into small pieces to achieve the required density and to facilitate placing in the embankment. Obtain approval of the material before placing in the embankment.

Furnish Type C material with a maximum Liquid Limit (LL) of 65, a minimum Plasticity Index (PI) of 5, and composed of suitable earth material such as loam, clay, or other materials that form a suitable embankment.

The embankment material used on the project which has a Liquid Limit exceeding 45 will be tested for Liquid Limits at the rate of one test per 20,000 cu. yd. or per total quantity less than 20,000 cu. yd., unless otherwise directed. Only use material that passes the above tests.

For unpaved areas, provide a finished grade with the top 4 in. capable of sustaining vegetation. Use fertile soil that is easily cultivated, free from objectionable material and highly resistant to erosion. Topsoil work is paid under the Item, "Topsoil."

Furnish material with a maximum Liquid Limit (LL) of 65.

Item 134: Backfilling Pavement Edges

Quantity by station includes both sides of the roadway.

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

For Permeable Friction Courses (PFC), the backfill material chosen must meet the requirements of Department Test Method Tex-246-F.

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 150: Blading

Blade the shoulders in accordance with this Item and as directed.

Perform blading for ditch grading to ensure proper drainage between the existing and proposed ditches.

If using native soil for reshaping the shoulders, no separate payment for materials will be made.

Item 162: Sodding for Erosion Control
Item 164: Seeding for Erosion Control
Item 166: Fertilizer
Item 168: Vegetative Watering

Refer to the "Fertilizer, Seed, Sod, Straw, Compost, and Water" plan sheet for material specifications, application rates, and for watering requirements.

Item 354: Planing and Texturing Pavement

Stockpile the material at The Department's Maintenance yard located at 59/69 Jacinto River location, as directed by *Reginald Phipps* at *(281) 319-6400*.

Item 360: Concrete Pavement

Where the pavement curb is left off for a later tie, provide the dowels or the tie bars as indicated on the paving detail sheets. The dowel bars and tie bars are subsidiary to the various bid items.

Repair portions of the concrete pavement surfaces that are damaged while in a plastic state before that area receives permanent pavement markings and opens to traffic. Perform repairs that are structurally equivalent to and cosmetically uniform with the adjacent undamaged areas. Do not repair by grouting onto the surface.

On pavement widening, hand finishing in place of the longitudinal float will be permitted.

Where existing pavement is widened with new pavement, place the new pavement a minimum of 2 ft. wide.

Equip the batching plants to proportion by weight, aggregates and bulk cement, using approved proportioning devices and approved automatic scales.

For mono curb, the curb height transitions will be paid at the contract unit price of the larger curb height in the transition. The 2.5-in. laydown curbs for driveways will be paid at the unit price bid for the Item, "Conc Curb (Mono) (Ty II)."

High-early strength cement may be used for frontage road and city street intersection construction.

Do not use limestone dust of fracture as fine aggregate.

If the concrete design requires greater than 5.5 sacks of cementitious material per cubic yard, obtain written approval. If placing concrete pavement mixes from April 1 to October 31, inclusive, use Mix Design Option 1 as specified in Section 421.4.2.6.1.

Perform saw cutting as shown on the plans in accordance with Section 360.4.10, "Sawing Joints." This saw cutting is subsidiary to this bid Item.

The pay limits for concrete pavements with traffic rails extends to the outside edge or back of the traffic rail.

Complete the entire Fast Track Concrete construction process, from the time the Fast Track Work Area is closed to traffic, to the time the Fast Track Work Area is opened to traffic. The Fast Track operation includes, but is not limited to, traffic control, existing pavement and

subgrade removal, preparation of subgrade, placement of steel, placement of Fast Track concrete pavement, cure time, striping, etc. Perform work in the Fast Track Work Area in an expeditious manner, within the allowable time period for any area shown below:

Fast Track Work Area	Allowable Duration
1. <Chaplin Street WB Frtg, *weekend*	1 day maximum
2. <Scottish Inn EB Frgt, *week*	1 day maximum

Failure to perform any Fast Track Work Area construction within the above time frames will be cause for the Engineer to require the Contractor to shut down all other construction operations to ensure all resources are directed toward the completion of the Fast Track operation. This shutdown will remain in force until the Fast Track operation is complete. Such a shutdown will not warrant additional time, time suspension, or any additional costs to the Department.

Unless otherwise directed in writing, provide Class HES concrete with a minimum average flexural strength of 425 psi or a minimum average compressive strength of 3,000 psi in 16 hours.

When directed in writing, open the pavement to traffic before the minimum requirements have been attained.

When needed, place and remove forms in accordance with Section 360.4.5, except do not remove forms until at least 6 hours after concrete has been placed. The time for the form removal may be extended with the direction of the Engineer if weather or other conditions make it advisable.

Sprinkling and rolling, required for the compaction of the rough subgrade in advance of fine-grading are subsidiary to this Item. Maintenance of a moist condition of the subgrade in advance of fine-grading and concrete is subsidiary work, as provided above.

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.

The approach pavement is paid for under the Item, "Concrete Pavement."

Item 400: Excavation and Backfill for Structures

Plugging existing pipe culverts is subsidiary to the various bid items.

If Recycled Cement Treatment (Type D) is included in the plans, the following additional requirements apply:

1. Use only approved sand, crushed concrete, or salvaged base free from deleterious matter, as aggregate for cement-stabilized backfill.
2. Provide crushed concrete or salvaged base backfill material in accordance with the Item, "Cement Treatment (Plant-Mixed)(Type D)" (base or crushed concrete), except the recycled Type D material must not contain Reclaimed Asphalt Pavement (RAP).
3. For backfill material below the spring line of pipes, use cement-stabilized sand rather than Recycled Type D backfill material.
4. For the cement-stabilized sand backfill, use a minimum of 7 percent of hydraulic cement based on the dry weight of backfill material. The cement content for the crushed concrete and salvaged base is specified in the Item, "Cement Treatment (Plant-Mixed) (Type D)."
5. Place and compact the stabilized backfill material using a gradation that provides a dense mass without segregating and is impervious to passing of water.

Item 464: Reinforced Concrete Pipe

Concrete collars are subsidiary to the various bid items except for those specified on the plans for stage construction, which are paid for under the Item, "Concrete Substructures" as "Cl C Conc (Collar)."

Rubber gaskets are required for concrete pipe joints except for connections of safety end treatments, driveway culverts, and joints between the existing pipes and extensions.

If performing the work under the Item, "Jacking, Boring, or Tunneling Pipe or Box," use tongue and groove pipe instead of rubber gaskets at these locations.

Open, install, and backfill each section, or a portion of a section, in the same day at locations requiring pipe culverts under existing roadways.

Place the pipe drains across existing roadways half at a time to allow passage of traffic. No trenches may remain open overnight.

Known locations of existing stub-outs are shown on the plans, but these stub-outs may be in a different position or condition. Delays, inconveniences, or additional work required will not be a basis for additional compensation.

Provide leave-outs or holes in the proposed storm drain structures and pipes for drainage during interim construction. This work is subsidiary to the various bid items.

The flowline elevations of side road structures are based on the proposed ditches. Field-verify these elevations and adjust them as necessary to meet the field conditions. Before placing these structures, prepare and submit for approval, the data (revised elevation, alignment, length, etc.) for the adjusted structures.

Item 465: Junction Boxes, Manholes, and Inlets

If required on the plans, build manholes and inlets to stage 1 construction, cover with temporary pavement, and complete in a later phase of construction. This temporary covering and pavement are subsidiary to the various bid items.

Construct manholes and inlets in graded areas, first to an elevation at least 4 in. above the top of the highest entering pipe and cover with a wooden cover. Complete the construction of such manholes and inlets to the finished elevation when completing the grading work for such manholes and inlets. Adjust the final elevation, if required, since this elevation is approximate.

Construct manholes and inlets in paved areas to an elevation so their temporary wooden covers are flush with the surface of the base material.

Do not leave excavations or trenches open overnight.

Items 496: Removing Structures

Assume ownership and remove from the project site, items salvaged from the existing bridge decks and steel beams.

Do not permit debris resulting from the structure removal or construction activities to enter a natural or manmade waterway such as drainage channels, rivers, streams, bays, etc. Remove debris which falls into such waterways. This work is subsidiary to the Item, "Removing Structures."

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."

Erect temporary signs when exit ramps are closed or moved to new locations during construction.

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

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

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

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

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

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

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

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

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

One Lane Closures (Mainlane)

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Mondays	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Tuesday	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Wednesday	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Thursday	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Friday	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Saturdays	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Sundays *	No work on Sunday	N/A	No work on Sunday

One- & Two-Lane Closures (Frontage Road)

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Mondays	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Tuesday	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Wednesday	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Thursday	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Friday	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Saturdays	9:00 AM - 3:00 PM	12:00 AM - 5:00 AM 7:00 PM - 11:59 PM	5:00 AM - 9:00 AM 3:00 PM - 7:00 PM
Sundays *	No work on Sunday	N/A	No work on Sunday

One Lane Closures (Ramps)

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Mondays Thru Saturdays	12:00 AM - 12:00 PM	N/A	N/A
Sundays	No work on Sunday	N/A	No work on Sunday

* Sundays and Holidays as approved by the Engineer

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.

A minimum of 7 days in advance of any total closure, notify the Houston District Public Information Office of which roadways, ramps, intersections, or lanes will be closed, the dates they will remain closed, and when they will be opened again to traffic.

A minimum of 7 days in advance of any total closure, place a portable changeable message (PCM) sign at the location of each total closure which informs the traveling public of the details of the closure. Alternately, if the Traffic Control Plan provides a positive barrier at the location,a non-trailer mounted static message board sign behind the positive barrier may be used in place of a PCM.

Minimize the number of working days for street closures. The following table lists the maximum number of working days allowed for each street closure. The closure period for each intersection occurs only during the phase when constructing that street, unless otherwise directed. Reopen the street within the number of working days allowed; otherwise the Engineer

may cease construction activities not affiliated with reopening the closed street, until it fully reopens to the traveling public. Time charges will not be suspended nor increased to compensate for this occurrence.

STREET NAME	Number of Working Days Allowed for Closures
NORTHGREEN BLVD	*2*

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

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

Before closing any City of Houston sidewalk, one or more city street lanes, or entire city streets during construction, obtain a permit to do so from the City. Obtain the required permit in person at the City of Houston Permit Office, or apply online at http://www.gims.houstontx.gov.

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

Item 506: Temporary Erosion, Sedimentation and Environmental Controls

A Storm Water Pollution Prevention Plan (SWP3) is required. Since the disturbed area is more than 5 acres, a "Notice of Intent" (NOI) is also 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.

Before starting construction, review with the Engineer the SWP3 used for temporary erosion control as outlined on the plans. Before construction, place the temporary erosion and sedimentation control features as shown on the SWP3.

Schedule the seeding or sodding work as soon as possible. The project schedule provides for a vegetation management plan.

After completing earthwork operations, restore and reseed the disturbed areas in accordance with the Department's specifications for permanent or temporary erosion control.

Implement temporary and permanent erosion control measures to comply with the National Pollution Discharge Elimination System (NPDES) general permit under the Clean Water Act.

Before starting grading operations and during the project duration, place the temporary or permanent erosion control measures to prevent sediment from leaving the right of way.

Item 512: Portable Traffic Barrier

Transport Low Profile Concrete Barriers (LPCB) used for traffic handling from the Department's stockpile located on the north side of IH 610 at Long Drive.

Where required by the Engineer, provide anchor pins for Type 2 Low Profile Concrete Barriers (LPCB) as shown on the current LPCB standard. Anchor pins are subsidiary to the Low Profile Concrete Barrier.

Transport Standard Height Portable Traffic Barriers (including J-J Hook and Safety Shape) used for traffic handling from the Department's stockpile located on the south side of IH 610 at Cedar Crest Blvd. (located across IH 610 from Long Drive).

Use only the J-J Hook type connection between barriers.

After completing the project, return Low Profile Concrete Barriers (LPCB) used for traffic handling, to the Department's stockpile located on the north side of IH 610 at Long Drive. After completing the project, return the associated LPCB connecting hardware to the area office or as directed.

After completing the project, return Standard Height Portable Traffic Barriers (including J-J Hook and Single Slope) used for traffic handling, to the Department's stockpile located on the south side of at IH 610 at Cedar Crest Blvd. (located across IH 610 from Long Drive). After completing the project, return the associated Single Slope barrier connecting hardware to the area office or as directed.

After completing the project, Standard Height Safety Shape Portable Traffic Barriers used for traffic handling and the associated connecting hardware will become the property of the Contractor.

If placing the portable traffic barrier on pre-stressed concrete box beams with exposed

reinforcing steel, protect the reinforcing steel by supporting the portable traffic barrier on 4 in. by 4 in. timbers. Place the timbers transversely and space them on 4 ft. centers. The cost of the labor and materials to perform this work are subsidiary to the Item, "Portable Traffic Barrier."

Item 514: Permanent Concrete Traffic Barrier

Add a 3/4-in. longitudinal chamfer to the Single Slope Concrete Barrier (SSCB) railing. Provide a continuous chamfer typically located 6 in. above the final grade. The cost of this is subsidiary to the Item, "Permanent Concrete Traffic Barrier."

Item 529: Concrete Curb, Gutter, and Combined Curb and Gutter
Item 530: Intersections, Driveways, and Turnouts
Item 531: Sidewalks

An air-entraining admixture is not required.

For concrete curbs, use Grade 7 aggregate conforming to Section 421.2.6 of the Item, "Hydraulic Cement Concrete."

For driveways and turnouts, coarse aggregate Grade No. 3 through No. 8 conforming to the gradation requirements specified in the Item, "Hydraulic Cement Concrete" will be permitted.

For reinforcing steel in sidewalks and pedestrian ramps, use No. 4 bars at a maximum 18 in. spacing center-to-center in both directions.

Item 540: Metal Beam Guard Fence

Painting the timber posts is not required.

Use timber posts for galvanized steel metal beam guard fence, except for anchorage at turned down ends.

Furnish and install wood blocks between the rail elements and the timber posts as detailed on the plans. These block-outs are subsidiary to this bid Item.

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

Painting the timber posts is not required.

Use timber posts for galvanized steel metal beam guard fence, except for anchorage at turned down ends.

Furnish and install wood blocks between the rail elements and the timber posts as detailed on the plans. These block-outs are subsidiary to this bid Item.

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 545: Crash Cushion Attenuators

After completing the project, return remaining unused crash cushion attenuators units to the Area Office Maintenance yard or as directed, at no cost to the Department.

A MASH compliant crash cushion attenuator is required for every temporary and permanent installation.

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 Continuously Reinforced Concrete Pavement (CRCP) mainlanes and direct connectors, use

Surface Test Type B and Pay Adjustment Schedule 2. For ramps use Surface Test Type A.

For concrete or asphalt curb and gutter sections or frontage roads, use Surface Test Type B and Pay Adjustment Schedule 2 except for the outside lane. Use Surface Test Type B and Pay Adjustment Schedule 3 for the outside lane.

Item 644: Small Roadside Sign Assemblies

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

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

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

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

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."

Item 662: Work Zone Pavement Markings
Item 666: Reflectorized Pavement Markings
Item 668: Prefabricated Pavement Markings
Item 6038: Multipolymer Pavement Markings (MPM)

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

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

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

For roadways with asphalt surfaces to be striped with work zone or permanent thermoplastic markings, the Contractor has the option to apply paint and beads markings for a maximum 30-day period until placing the thermoplastic markings, or until starting the succeeding phase of work on the striped area. Maintain the paint and beads markings, at no expense to the Department, until placing the thermoplastic markings or starting the succeeding phase of work on the striped area. The work zone markings, whether paint and beads or thermoplastic, are paid under the Item, "Work Zone Pavement Markings" and the markings are paid for only once for the given phase of construction.

If 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.

Place the pedestrian crosswalk pavement markings only after the pedestrian signals and push buttons are installed and operating.

Item 672: Raised Pavement Markers

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

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

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

Item 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 687: Pedestal Pole Assemblies

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 688: Pedestrian Detectors and Vehicle Loop Detectors

Provide pedestrian push buttons a minimum of 2 in. diameter in the smallest dimension.

Install a rubber grommet or bushing between the push button assembly and the signal pole to protect the conductors.

Provide a black tube loop detector wire as specified in the "International Municipal Signal Association, Inc." (IMSA) Specifications.

At intersections where a minimum of 10 ft. spacing between adjacent accessible pedestrian signal units is not possible, provide each accessible pedestrian pushbutton with the following features: a pushbutton locator tone, a tactile arrow, a speech walk message for the walking

person indication and a speech pushbutton information message.

Provide pedestrian push buttons a minimum of 2 in. diameter in the smallest dimension.

Install a rubber grommet or bushing between the push button assembly and the signal pole to protect the conductors.

If the loop sealant supplied by the Contractor is not on the Department's pre-qualified product list, before applying the sealant provide a 5-gal. container of loop sealant for testing.

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.
In addition to the shadow vehicles with TMAs/TAs that are specified as being required on the TCP layout sheets for this project, provide additional shadow vehicles with TMAs/TAs as shown on the TCP Standard sheets. 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 7114: Water Filled Barrier

Furnishing and installing water filled barriers including filling the barrier with water, move and reset in the project site and return after use to North Harris Area Office located at 16803 Eastex Freeway, Humble, TX 77396 are incidental to Item 7114.

Basis of Estimate

Item	Description	Limit and Rate	Unit
150	Blading	1 Hr. / Station	HR
3077	Superpave Mixtures Asphalt Aggregate	100 Lb. / Sq. Yd.-In. 8 % by weight 92 % by weight	TON

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

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 3256-02-093 **DISTRICT** Houston **COUNTY** Harris
HIGHWAY SL 8

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**3256-02-093**			
		PROJECT ID		**A00117093**			
		COUNTY		**Harris**			
		HIGHWAY		**SL 8**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6001	PREPARING ROW	AC	1.000		1.000	
	104-6001	REMOVING CONC (PAV)	SY	29,856.000		29,856.000	
	104-6011	REMOVING CONC (MEDIANS)	SY	149.000		149.000	
	104-6028	REMOVING CONC (MISC)	SY	15.500		15.500	
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	80.000		80.000	
	104-6042	REMOVING CONC (MOVABLE BARRIER)	LF	8,098.000		8,098.000	
	104-6054	REMOVING CONCRETE(MOW STRIP)	LF	925.000		925.000	
	104-6067	REMOVING CONC (SAWCUT)	LF	4,420.000		4,420.000	
	105-6035	REMOVING STAB BASE & ASPH PAV (0-2")	SY	731.000		731.000	
	110-6001	EXCAVATION (ROADWAY)	CY	1,650.000		1,650.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	1,235.000		1,235.000	
	150-6003	BLADING	LF	5,055.000		5,055.000	
	160-6004	FURNISHING AND PLACING TOPSOIL (6")	SY	2,815.000		2,815.000	
	162-6002	BLOCK SODDING	SY	10,522.000		10,522.000	
	166-6001	FERTILIZER	AC	2.100		2.100	
	168-6001	VEGETATIVE WATERING	MG	250.400		250.400	
	192-6015	LANDSCAPE EDGE	LF	132.000		132.000	
	354-6146	PLANE ASPH CONC PAV (1.5'-2")	SY	4,556.000		4,556.000	
	360-6043	CONC PVMT (CONT REINF)(FAST TRK)(13")	SY	862.000		862.000	
	360-6048	CONC PVMT (CONT REINF) (FAST TRK) (9")	SY	324.000		324.000	
	361-6002	FULL - DEPTH REPAIR CRCP (8")	SY	14,958.000		14,958.000	
	361-6007	FULL - DEPTH REPAIR CRCP (13")	SY	16,053.000		16,053.000	
	400-6001	STRUCT EXCAV	CY	38.000		38.000	
	400-6005	CEM STABIL BKFL	CY	44.000		44.000	
	400-6009	CEMENT STAB BACKFILL (INLET OR MH)	CY	25.000		25.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	10.000		10.000	
	420-6054	CL C CONC (HEADWALL)	CY	1.000		1.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	2.000		2.000	
	432-6006	RIPRAP (CONC)(CL B)	CY	2.000		2.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY	44.000		44.000	
	450-6048	RAIL (HANDRAIL)(TY B)	LF	10.000		10.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	90.000		90.000	
	465-6167	INLET (COMPL)(TY AD)	EA	2.000		2.000	
	465-6175	INLET (COMPL)(CURB)(TY C)	EA	1.000		1.000	
	496-6002	REMOV STR (INLET)	EA	1.000		1.000	
	496-6004	REMOV STR (SET)	EA	4.000		4.000	
	496-6006	REMOV STR (HEADWALL)	EA	1.000		1.000	

TxDOTCONNECT

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Report Created On: Mar 12, 2023 3:23:48 PM

DISTRICT	COUNTY	CCSJ	SHEET
Houston	Harris	3256-02-093	

SL 8

E&Q SHEET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			26
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
$FILEL$

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 3256-02-093 **DISTRICT** Houston **COUNTY** Harris
HIGHWAY SL 8

				CONTROL SECTION JOB		TOTAL EST.	TOTAL FINAL
				PROJECT ID			
				COUNTY			
				HIGHWAY			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	496-6007	REMOV STR (PIPE)	LF	48.000		48.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	9.000		9.000	
	506-6034	CONSTRUCTION PERIMETER FENCE	LF	150.000		150.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	4,160.000		4,160.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	4,160.000		4,160.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	248.000		248.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	248.000		248.000	
	512-6013	PORT CTB (DES SOURCE)(SGL SLP)(TY 1)	LF	5,140.000		5,140.000	
	512-6021	PORT CTB (DES SOURCE)(LOW PROF)(TY 1)	LF	4,770.000		4,770.000	
	512-6022	PORT CTB (DES SOURCE)(LOW PROF)(TY 2)	LF	80.000		80.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	3,020.000		3,020.000	
	512-6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	8,850.000		8,850.000	
	512-6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	80.000		80.000	
	512-6037	PORT CTB (STKPL)(SGL SLP)(TY 1)	LF	5,140.000		5,140.000	
	512-6045	PORT CTB (STKPL)(LOW PROF)(TY 1)	LF	4,778.000		4,778.000	
	512-6046	PORT CTB (STKPL)(LOW PROF)(TY 2)	LF	80.000		80.000	
	514-6001	PERM CTB (SGL SLOPE) (TY 1) (42)	LF	8,100.000		8,100.000	
	514-6002	PERM CTB (SGL SLOPE) (TY 2) (42)	LF	24.000		24.000	
	514-6035	PERM CTB (TRAN SSCB TO CTB) (MOD)	LF	24.000		24.000	
	528-6006	REMOVE AND RELAY PAVERS	SY	30.000		30.000	
	529-6005	CONC CURB (MONO) (TY II)	LF	4,775.000		4,775.000	
	529-6012	CONC CURB (SLOTTED)	LF	197.000		197.000	
	529-6036	CONCRETE CURB (SPECIAL)	LF	121.000		121.000	
	531-6001	CONC SIDEWALKS (4")	SY	105.000		105.000	
	531-6004	CURB RAMPS (TY 1)	EA	2.000		2.000	
	531-6008	CURB RAMPS (TY 5)	EA	4.000		4.000	
	531-6010	CURB RAMPS (TY 7)	EA	13.000		13.000	
	531-6016	CURB RAMPS (TY 21)	EA	1.000		1.000	
	536-6002	CONC MEDIAN	SY	135.000		135.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	750.000		750.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	4.000		4.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	750.000		750.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	4.000		4.000	
	542-6003	REMOVE DOWNSTREAM ANCHOR TERMINAL	EA	4.000		4.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4.000		4.000	
	545-6002	CRASH CUSH ATTEN (DES SOURCE)	EA	2.000		2.000	

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SL 8

E&Q
SHEET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			FV
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:$DATE$
$FILEL$

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 3256-02-093 **DISTRICT** Houston **COUNTY** Harris
HIGHWAY SL 8

				CONTROL SECTION JOB		TOTAL EST.	TOTAL FINAL
				PROJECT ID			
				COUNTY			
				HIGHWAY			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL		
	496-6007	REMOV STR (PIPE)	LF	48.000		48.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	9.000		9.000	
	506-6034	CONSTRUCTION PERIMETER FENCE	LF	150.000		150.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	4,160.000		4,160.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	4,160.000		4,160.000	
	506-6042	BIODEG EROSN CONT LOGS (INSTL) (18")	LF	248.000		248.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	248.000		248.000	
	512-6013	PORT CTB (DES SOURCE)(SGL SLP)(TY 1)	LF	5,140.000		5,140.000	
	512-6021	PORT CTB (DES SOURCE)(LOW PROF)(TY 1)	LF	4,770.000		4,770.000	
	512-6022	PORT CTB (DES SOURCE)(LOW PROF)(TY 2)	LF	80.000		80.000	
	512-6025	PORT CTB (MOVE)(SGL SLP)(TY 1)	LF	3,020.000		3,020.000	
	512-6033	PORT CTB (MOVE)(LOW PROF)(TY 1)	LF	8,850.000		8,850.000	
	512-6034	PORT CTB (MOVE)(LOW PROF)(TY 2)	LF	80.000		80.000	
	512-6037	PORT CTB (STKPL)(SGL SLP)(TY 1)	LF	5,140.000		5,140.000	
	512-6045	PORT CTB (STKPL)(LOW PROF)(TY 1)	LF	4,778.000		4,778.000	
	512-6046	PORT CTB (STKPL)(LOW PROF)(TY 2)	LF	80.000		80.000	
	514-6001	PERM CTB (SGL SLOPE) (TY 1) (42)	LF	8,100.000		8,100.000	
	514-6002	PERM CTB (SGL SLOPE) (TY 2) (42)	LF	24.000		24.000	
	514-6035	PERM CTB (TRAN SSCB TO CTB) (MOD)	LF	24.000		24.000	
	528-6006	REMOVE AND RELAY PAVERS	SY	30.000		30.000	
	529-6005	CONC CURB (MONO) (TY II)	LF	4,775.000		4,775.000	
	529-6012	CONC CURB (SLOTTED)	LF	197.000		197.000	
	529-6036	CONCRETE CURB (SPECIAL)	LF	121.000		121.000	
	531-6001	CONC SIDEWALKS (4")	SY	105.000		105.000	
	531-6004	CURB RAMPS (TY 1)	EA	2.000		2.000	
	531-6008	CURB RAMPS (TY 5)	EA	4.000		4.000	
	531-6010	CURB RAMPS (TY 7)	EA	13.000		13.000	
	531-6016	CURB RAMPS (TY 21)	EA	1.000		1.000	
	536-6002	CONC MEDIAN	SY	135.000		135.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF	750.000		750.000	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA	4.000		4.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF	750.000		750.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA	4.000		4.000	
	542-6003	REMOVE DOWNSTREAM ANCHOR TERMINAL	EA	4.000		4.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA	4.000		4.000	
	545-6002	CRASH CUSH ATTEN (DES SOURCE)	EA	2.000		2.000	

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SL 8

E&Q
SHEET

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			FV
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:$DATE$
$FILEL$

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 3256-02-093 **DISTRICT** Houston **COUNTY** Harris
HIGHWAY SL 8

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**3256-02-093**			
		PROJECT ID		**A00117093**			
		COUNTY		**Harris**			
		HIGHWAY		**SL 8**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	545-6003	CRASH CUSH ATTEN (MOVE & RESET)	EA	1.000		1.000	
	545-6004	CRASH CUSH ATTEN (STKPL)	EA	2.000		2.000	
	644-6009	IN SM RD SN SUP&AM TY10BWG(1)SB(P)	EA	14.000		14.000	
	644-6075	RELOCATE SM RD SN SUP&AM(SIGN ONLY)	EA	2.000		2.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA	14.000		14.000	
	658-6064	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	EA	20.000		20.000	
	658-6104	INSTL OM ASSM (OM-3R)(WFLX)SRF)SRF	EA	3.000		3.000	
	662-6063	WK ZN PAV MRK REMOV (W)4"(SLD)	LF	27,000.000		27,000.000	
	662-6095	WK ZN PAV MRK REMOV (Y)4"(SLD)	LF	17,390.000		17,390.000	
	666-6039	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	LF	2,400.000		2,400.000	
	666-6225	PAVEMENT SEALER 6"	LF	20,775.000		20,775.000	
	666-6226	PAVEMENT SEALER 8"	LF	2,913.000		2,913.000	
	666-6228	PAVEMENT SEALER 12"	LF	1,220.000		1,220.000	
	666-6230	PAVEMENT SEALER 24"	LF	288.000		288.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	10.000		10.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	7.000		7.000	
	666-6234	PAVEMENT SEALER (DBL ARROW)	EA	2.000		2.000	
	668-6019	PREFAB PAV MRK TY B (W)(ARROW)	EA	10.000		10.000	
	668-6020	PREFAB PAV MRK TY B (W)(DBL ARROW)	EA	2.000		2.000	
	668-6027	PREFAB PAV MRK TY B (W)(WORD)	EA	7.000		7.000	
	672-6006	REFL PAV MRKR TY I-A	EA	14.000		14.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	240.000		240.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	36,189.000		36,189.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	4,008.000		4,008.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF	2,002.000		2,002.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	288.000		288.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	10.000		10.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	1.000		1.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	6.000		6.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF	19,835.000		19,835.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF	3,969.000		3,969.000	
	678-6006	PAV SURF PREP FOR MRK (12")	LF	1,296.000		1,296.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF	288.000		288.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA	10.000		10.000	
	678-6010	PAV SURF PREP FOR MRK (DBL ARROW)	EA	2.000		2.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA	9.000		9.000	
	678-6033	PAV SURF PREP FOR MRK (RPM)	EA	241.000		241.000	

TxDOTCONNECT

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DISTRICT	COUNTY	CCSJ	SHEET
Houston	Harris	3256-02-093	

SL 8

E&Q
SHEET

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		28

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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SL 8 WK ZN

LOCATION	506 6034	502 6001	512 6013	512 6021	512 6022	512 6025	512 6033	512 6034	512 6037	512 6045	512 6046	545 6002	545 6003	545 6004	662 6063	662 6095
	CONSTRUCTION PERIMETER FENCE	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORT CTB (DES SOURCE)(SGL SLP)(TY 1)	PORT CTB (DES SOURCE)(LOW PROF)(TY 1)	PORT CTB (DES SOURCE)(LOW PROF)(TY 2)	PORT CTB (MOVE)(SGL SLP)(TY 1)	PORT CTB (MOVE)(LOW PROF)(TY 1)	PORT CTB (MOVE)(LOW PROF)(TY 2)	PORT CTB (STKPL)(SGL SLP)(TY 1)	PORT CTB (STKPL)(LOW PROF)(TY 1)	PORT CTB (STKPL)(LOW PROF)(TY 2)	CRASH CUSH ATTEN (DES SOURCE)	CRASH CUSH ATTEN (MOVE & RESET)	CRASH CUSH ATTEN (STKPL)	WK ZN PAV MRK REMOV (W)4"(SLD)	WK ZN PAV MRK REMOV (Y)4"(SLD)
	LF	MO	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	LF
WB SL 8 1 OF 7		1													580	290
WB SL 8 2 OF 7			1080												2600	1200
WB SL 8 3 OF 7			1200												2400	1200
WB SL 8 4 OF 7			1200												2400	1200
WB SL 8 5 OF 7			1200	50						50		1			2400	1200
WB SL 8 6 OF 7			460	520						520		1			2400	1200
WB SL 8 7 OF 7															2240	1020
EB SL 8 1 OF 5		1							2120							400
EB SL 8 2 OF 5						800			800				1	2	580	290
EB SL 8 3 OF 5						1200			1200						1600	1200
EB SL 8 4 OF 5						1020			1020						2600	1200
EB SL 8 5 OF 5															760	380
SL 8 TOTAL	0	2	5140	570	0	3020	0	0	5140	570	0	2	1	2	20560	10780

SL 8 WK ZN

LOCATION	662 6095	677 6002	677 6003	677 6005	677 6008	6001 6002	6185 6005	6185 6002	7114 6001
	WK ZN PAV MRK REMOV (Y)4"(SLD)	ELIM EXT PAV MRK & MRKS (6")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (12")	ELIM EXT PAV MRK & MRKS (ARROW)	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)	TMA (STATIONARY)	WATER FILLED BARRIER (350)(TL-3)
	LF	LF	LF	LF	EA	EA	DAY	DAY	LF
WB SL 8 1 OF 7	290	900				15	4	7	
WB SL 8 2 OF 7	1200	1680							
WB SL 8 3 OF 7	1200	1680							
WB SL 8 4 OF 7	1200	1680	400	300	2	2			
WB SL 8 5 OF 7	1200	2160							
WB SL 8 6 OF 7	1200	2160							320
WB SL 8 7 OF 7	1020	2160							
EB SL 8 1 OF 5	400						4	7	
EB SL 8 2 OF 5	290								
EB SL 8 3 OF 5	1200	1440							
EB SL 8 4 OF 5	1200	2160	400	300	2	2			
EB SL 8 5 OF 5	380								
SL 8 TOTAL	10780	16020	800	600	4	19	8	14	320

DATE:3/15/2023
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Texas Department of Transportation

SL 8

SUMMARY OF WK ZN. SL 8 QUANTITIES

SHEET 1 OF 3

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		30

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

EB FRTG RD WK ZONE

LOCATION	506 6034	502 6001	512 6013	512 6021	512 6022	512 6025	512 6033	512 6034	512 6037	512 6045	512 6046	545 6002	545 6003	545 6004	662 6063
	CONSTRUCTION PERIMETER FENCE	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORT CTB (DES SOURCE)(SGL SLP)(TY 1)	PORT CTB (DES SOURCE)(LOW PROF)(TY 1)	PORT CTB (DES SOURCE)(LOW PROF)(TY 2)	PORT CTB (MOVE)(SGL SLP)(TY 1)	PORT CTB (MOVE)(LOW PROF)(TY 1)	PORT CTB (MOVE)(LOW PROF)(TY 2)	PORT CTB (STKPL)(SGL SLP)(TY 1)	PORT CTB (STKPL)(LOW PROF)(TY 1)	PORT CTB (STKPL)(LOW PROF)(TY 2)	CRASH CUSH ATTEN (DES SOURCE)	CRASH CUSH ATTEN (MOVE & RESET)	CRASH CUSH ATTEN (STKPL)	WK ZN PAV MRK REMOV (W)4"(SLD)
	LF	MO	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF
EB PHASE 1		1													
EB FRTG RD 1 of 8				500	20										460
EB FRTG RD 2 of 8				600											600
EB FRTG RD 3 of 8				520	20										520
EB FRTG RD 4 of 8				600											600
EB FRTG RD 5 of 8	100			520	20										540
EB FRTG RD 6 of 8				520	20										480
EB FRTG RD 7 of 8				600											600
EB FRTG RD 8 of 8				240											240
EB FRTG RD PHASE 1A				100											100
EB PHASE 2		1													
EB FRTG RD 1 of 8							440	20							
EB FRTG RD 2 of 8							600								
EB FRTG RD 3 of 8							600								
EB FRTG RD 4 of 8							600								
EB FRTG RD 5 of 8							600								
EB FRTG RD 6 of 8							460	20							
EB FRTG RD 7 of 8							600								
EB FRTG RD 8 of 8							240								
EB FRTG RD TOTAL	100	2	0	4200	80	0	4140	40	0	0	0	0	0	0	4140

EB FRTG RD WK ZONE

LOCATION	662 6095	677 6002	677 6003	677 6005	677 6008	6001 6002	6185 6005	6185 6002	7114 6001
	WK ZN PAV MRK REMOV (Y)4"(SLD)	ELIM EXT PAV MRK & MRKS (6")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (12")	ELIM EXT PAV MRK & MRKS (ARROW)	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)	TMA (STATIONARY)	WATER FILLED BARRIER (350)(TL-3)
	LF	LF	LF	LF	EA	EA	DAY	DAY	LF
EB PHASE 1							2	6	
EB FRTG RD 1 of 8									
EB FRTG RD 2 of 8									
EB FRTG RD 3 of 8									
EB FRTG RD 4 of 8									
EB FRTG RD 5 of 8									
EB FRTG RD 6 of 8									
EB FRTG RD 7 of 8									
EB FRTG RD 8 of 8									
EB FRTG RD PHASE 1A									
EB PHASE 2							2	5	
EB FRTG RD 1 of 8	460								
EB FRTG RD 2 of 8	600								
EB FRTG RD 3 of 8	600								
EB FRTG RD 4 of 8	600								
EB FRTG RD 5 of 8	600								
EB FRTG RD 6 of 8	480								
EB FRTG RD 7 of 8	600								
EB FRTG RD 8 of 8	240							2	
EB FRTG RD TOTAL	4180	0	0	0	0	0	4	13	0

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Texas Department of Transportation

SL 8

SUMMARY OF WK ZN EB FRTG RD. QUANTITIES

SHEET 2 OF 3

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		31

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

WB FRTG RD WK ZN.

LOCATION	506 6034	502 6001	512 6013	512 6021	512 6022	512 6025	512 6033	512 6034	512 6037	512 6045	512 6046	545 6002	545 6003	545 6004	662 6063	662 6095
	CONSTRUCTION PERIMETER FENCE	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORT CTB (DES SOURCE)(SGL SLP)(TY 1)	PORT CTB (DES SOURCE)(LOW PROF)(TY 1)	PORT CTB (DES SOURCE)(LOW PROF)(TY 2)	PORT CTB (MOVE)(SGL SLP)(TY 1)	PORT CTB (MOVE)(LOW PROF)(TY 1)	PORT CTB (MOVE)(LOW PROF)(TY 2)	PORT CTB (STKPL)(SGL SLP)(TY 1)	PORT CTB (STKPL)(LOW PROF)(TY 1)	PORT CTB (STKPL)(LOW PROF)(TY 2)	CRASH CUSH ATTEN (DES SOURCE)	CRASH CUSH ATTEN (MOVE & RESET)	CRASH CUSH ATTEN (STKPL)	WK ZN PAV MRK REMOV (W)4"(SLD)	WK ZN PAV MRK REMOV (Y)4"(SLD)
	LF	MO	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	LF	LF
WB PHASE 1		1.5														
WB FRTG RD 1 of 5							400								400	
WB FRTG RD 2 of 5							600								600	
WB FRTG RD 3 of 5	50						490								490	
WB FRTG RD 4 of 5							600								600	
WB FRTG RD 5 of 5							210			500					210	
WB FRTG RD PHASE 1A							120	20		600						120
										520	20					
WB PHASE 2		1.5								600						
WB FRTG RD 1 of 5							410			520	20					410
WB FRTG RD 2 of 5							600			520						600
WB FRTG RD 3 of 5							480			600	20					480
WB FRTG RD 4 of 5							600			240	20					600
WB FRTG RD 5 of 5							200	20		100						220
WB FRTG RD TOTAL	50	3	0	0	0	0	4710	40	0	4200	80	0	0	0	2300	2430
GRAND TOTAL WK ZN	150	9	5140	4770	80	3020	8850	80	5140	4770	80	2	1	2	27000	17390

WB FRTG RD WK ZN.

LOCATION	677 6002	677 6003	677 6005	677 6008	6001 6002	6185 6005	6185 6002	7114 6001
	ELIM EXT PAV MRK & MRKS (6")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (12")	ELIM EXT PAV MRK & MRKS (ARROW)	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (MOBILE OPERATION)	TMA (STATIONARY)	WATER FILLED BARRIER (350)(TL-3)
	LF	LF	LF	EA	EA	DAY	DAY	LF
WB PHASE 1						2	6	
WB FRTG RD 1 of 5								
WB FRTG RD 2 of 5								
WB FRTG RD 3 of 5								
WB FRTG RD 4 of 5								
WB FRTG RD 5 of 5								
WB FRTG RD PHASE 1A								
WB PHASE 2						2	5	
WB FRTG RD 1 of 5								
WB FRTG RD 2 of 5								
WB FRTG RD 3 of 5								
WB FRTG RD 4 of 5								
WB FRTG RD 5 of 5								
WB FRTG RD TOTAL	0	0	0	0	0	4	11	0
GRAND TOTAL WK ZN	16020	800	600	4	19	16	38	320

SL 8

SUMMARY OF WK ZN
WB FRTG RD
QUANTITIES

SHEET 3 OF 3

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		32

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

PAVEMENT MARKINGS

LOCATION	666 6039	666 6225	666 6226	666 6228	666 6230	666 6231	666 6232	666 6234	668 6019	668 6020	668 6027	672 6006	672 6010	677 6002	677 6003	677 6005	677 6007	677 6008
	REFL PAV MRK TY I (W)12"(LNDP)(100MIL)	PAVEMENT SEALER 6"	PAVEMENT SEALER 8"	PAVEMENT SEALER 12"	PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	PAVEMENT SEALER (DBL ARROW)	PREFAB PAV MRK TY B (W)(ARROW)	PREFAB PAV MRK TY B (W)(DBL ARROW)	PREFAB PAV MRK TY B (W)(WORD)	REFL PAV MRKR TY I-A	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK & MRKS (6")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (12")	ELIM EXT PAV MRK & MRKS (24")	ELIM EXT PAV MRK & MRKS (ARROW)
	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF	LF	LF	EA
SL 8 EB	1200	7485		353		2	2		2		2		60	6879	250	527		3
SL 8 WB	1200	6879	600	450		2	2		2		2		60	6879	600	458		2
EB FRTG RD 1 OF 7		900	280										8	900	280			
EB FRTG RD 2 OF 7		830											7	830				
EB FRTG RD 3 OF 7		900											8	900				
EB FRTG RD 4 OF 7		900											7	900				
EB FRTG RD 5 OF 7		514	392	104	138	1	1	1	1	1	1		8	514	377	104	138	1
EB FRTG RD 6 OF 7		900											8	900				
EB FRTG RD 7 OF 7		212											5	212				
WB FRTG RD 1 OF 6		100	690										20	100	750			
WB FRTG RD 2 OF 6		160	540	200								14	15	160	540	200		
WB FRTG RD 3 OF 6		300											8	300				
WB FRTG RD 4 OF 6		180	411	113	150	5	2	1	5	1	2		11	180	411	113	150	
WB FRTG RD 5 OF 6		395											12	395				
WB FRTG RD 6. OF 6		120											3	120				
PROJECT TOTALS	2400	20775	2913	1220	288	10	7	2	10	2	7	14	240	20169	3208	1402	288	6

PAVEMENT MARKINGS

LOCATION	677 6009	677 6012	678 6002	678 6004	678 6006	678 6008	678 6009	678 6010	678 6016	678 6033	6038 6004	6038 6005	6038 6006	6038 6007	6038 6011
	ELIM EXT PAV MRK & MRKS (DBL ARROW)	ELIM EXT PAV MRK & MRKS (WORD)	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (12")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (DBL ARROW)	PAV SURF PREP FOR MRK (WORD)	PAV SURF PREP FOR MRK (RPM)	MULTIPOLYMER PAV MRK (W)(6")(SLD)	MULTIPOLYMER PAV MRK (W)(6")(BRK)	MULTIPOLYMER PAV MRK (W)(6")(DOT)	MULTIPOLYMER PAV MRK (W)(8")(SLD)	MULTIPOLYMER PAV MRK (W)(12")(SLD)
	EA	EA	LF	LF	LF	LF	EA	EA	EA	EA	LF	LF	LF	LF	LF
SL 8 EB		3	6879	600	458		2		2	60	2400	1200		600	
SL 8 WB		2	6879	600	458		2		2	60	2400	1200	279	600	
EB FRTG RD 1 OF 7			900	280						8	600	300		280	
EB FRTG RD 2 OF 7			830							7	530	300			
EB FRTG RD 3 OF 7			900							8	600	300			
EB FRTG RD 4 OF 7			900							7	600	300			
EB FRTG RD 5 OF 7	1	1	200	377	104	138	1	1	1	8	314	200		320	74
EB FRTG RD 6 OF 7			900								600	300			
EB FRTG RD 7 OF 7			212								32	180			
WB FRTG RD 1 OF 6			100	750						20		100		750	
WB FRTG RD 2 OF 6			160	540	200					29	120	40		160	
WB FRTG RD 3 OF 6			280	411						8		280			
WB FRTG RD 4 OF 6			180	411	76	150	5	1	4	11		160		411	76
WB FRTG RD 5 OF 6			395							12	95	300			
WB FRTG RD 6. OF 6			120							3		120			
PROJECT TOTALS	1	6	19835	8969	1296	288	10	2	9	241	8291	5280	279	3121	150

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Texas Department of Transportation

SUMMARY OF PAVEMENT QUANTITIES

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		33

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

PAVEMENT MARKINGS

LOCATION	6038 6012	6038 6013	6038 6017	6038 6020	6038 6021	6038 6024
	MULTIPOLYMER PAV MRK <W><12"><LNDP>	MULTIPOLYMER PAV MRK <W><24"><SLD>	MULTIPOLYMER PAV MRK <Y><6"><SLD>	MULTIPOLYMER PAV MRK <Y><8"><SLD>	MULTIPOLYMER PAV MRK <Y><12"><SLD>	MULTIPOLYMER PAV MRK <BLK><6"><BRK>
	LF	LF	LF	LF	LF	LF
SL 8 EB	2400		2400			2300
SL 8 WB	2400		2400			1200
EB FRTG RD 1 OF 7						
EB FRTG RD 2 OF 7						
EB FRTG RD 3 OF 7						
EB FRTG RD 4 OF 7						
EB FRTG RD 5 OF 7		130		57	30	
EB FRTG RD 6 OF 7						
EB FRTG RD 7 OF 7						
WB FRTG RD 1 OF 6						
WB FRTG RD 2 OF 6				380	200	
WB FRTG RD 3 OF 6						
WB FRTG RD 4 OF 6		150		68	113	
WB FRTG RD 5 OF 6						
WB FRTG RD 6. OF 6						
PROJECT TOTALS	4800	280	4800	505	343	3500

SIGNING

LOCATION	644 6001	644 6075	644 6076
	IN SM RD SN SUP&AM TY10BWG<1>SA<P>	RELOCATE SM RD SN SUP&AM<SIGN ONLY>	REMOVE SM RD SN SUP&AM
	EA	EA	EA
WB FRG RD	9	1	8
EB FRTG RD	5	1	5
PROJECT TOTALS	14	2	13

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Texas Department of Transportation

SUMMARY OF SIGNING AND PAVEMENT QUANTITIES

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			34
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

ROADWAY

LOCATION	100 6001	110 6001	132 6006	160 6004	360 6048	360 6043	361 6002	361 6007	432 6001	432 6045	450 6048	514 6019	514 6002	514 6035	529 6005	529 6012	529 6036	531 6001	531 6004	531 6008	531 6010
	PREPARING ROW	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL)(DENS CONT)(TY C)	FURNISHING AND PLACING TOPSOIL (6")	CONC PVMT (CONT REINF) (FAST TRK) (9")	CONC PVMT (CONT REINF)(FAST TRK)(13")	FULL - DEPTH REPAIR CRCP (8")	FULL - DEPTH REPAIR CRCP (13")	RIPRAP (CONC)(4 IN)	RIPRAP (MOW STRIP)(4 IN)	RAIL (HANDRAIL)(TY B)	PERM CTB(SGL SLOPE)(TY 1)(42)(HP C)	PERM CTB (SGL SLOPE) (TY 2) (42)	PERM CTB (TRAN SSCB TO CTB) (MOD)	CONC CURB (MONO) (TY II)	CONC CURB (SLOTTED)	CONCRETE CURB (SPECIAL)	CONC SIDEWALKS (4")	CURB RAMPS (TY 1)	CURB RAMPS (TY 5)	CURB RAMPS (TY 7)
	AC	CY	CY	SY	SY	SY	SY	SY	CY	CY	LF	LF	LF	LF	LF	LF	LF	SY	EA	EA	EA
SL 8 EB	1					236		8251				4050	12	12							
SL 8 WB						626		7802		33		4050	12	12							
EB FRTG 1 OF 6		100	75	200			1314								551						
EB FRTG 2 OF 8		200	150	300	170		1509			11					505						
EB FRTG 3 OF 8		200	150	300			1576								600						
EB FRTG 4 OF 8		200	150	300	123		1776								600						
EB FRTG 5 OF 8		150	125	225	31		1591				10				241	34	76	41		2	7
EB FRTG 6 OF 8		200	150	300			1604								600						
EB FRTG 7 OF 8		100	75	115			588								212						
FRTG RD																					
WB FRTG 1 OF 4		75	50	200			1057								511						
WB FRTG 2 OF 4		100	75	300			1525		2						600						
WB FRTG 3 OF 4		250	185	375			1664								355	93	45	64	2	2	6
WB FRTG 4 OF 4		75	50	200			755									70					
PROJECT TOTALS	1	1650	1235	2815	324	862	14958	16053	2	44	10	8100	24	24	4775	197	121	105	2	4	13

ROADWAY

LOCATION	531 6008	531 6010	531 6016	536 6002	540 6001	540 6016	544 6001	658 6064	658 6104	687 6002	688 6001	688 6003	3077 6042	7257 6002
	CURB RAMPS (TY 5)	CURB RAMPS (TY 7)	CURB RAMPS (TY 21)	CONC MEDIAN	MTL W-BEAM GD FEN (TIM POST)	DOWNSTREAM ANCHOR TERMINAL SECTION	GUARDRAIL END TREATMENT (INSTALL)	INSTL DEL ASSM (D-SY)SZ 1(BRF)GF2	INSTL OM ASSM (OM-3R)(WFLX) SRF)SRF	PEDESTRIAN PUSH BUTTON POLE	PED DETECT PUSH BUTTON (APS)	PED DETECTOR CONTROLLER UNIT	SP MIXES SP-D SAC-A PG64-22	PERM CONC TRAFF BARRIER REPLACE
	EA	EA	EA	SY	LF	EA	EA	EA	EA	EA	EA	EA	TON	LF
SL 8 EB														15
SL 8 WB					525	3	3	15						
EB FRTG 1 OF 6				75									508	
EB FRTG 2 OF 8					225	1	1	5					512	
EB FRTG 3 OF 8													586	
EB FRTG 4 OF 8									1				594	
EB FRTG 5 OF 8	2	7								6	6	6	336	
EB FRTG 6 OF 8													623	
EB FRTG 7 OF 8													73	
FRTG RD														
WB FRTG 1 OF 4				60					2				424	
WB FRTG 2 OF 4													622	
WB FRTG 3 OF 4	2	6	1							6	6	6	35	
WB FRTG 4 OF 4														
PROJECT TOTALS	4	13	1	135	750	4	4	20	3	12	12	12	4313	15

DATE:3/15/2023
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SL 8

SUMMARY OF ROADWAY QUANTITIES

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		35

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

LANDSCAPED

LOCATION	150 6003	162 6002	166 6001	168 6001	192 6015	432 6006	528 6006	760 6001
	BLADING	BLOCK SODDING	FERTILIZER	VEGETATIVE WATERING	LANDSCAPE EDGE	RIPRAP (CONC)(CLB)	REMOVE AND RELAY PAVERS	DITCH CLEANING AND RESHAPING (FOOT)
	LF	SY	AC	MG	LF	CY	SY	LF
EB FRTG RD 1	460	850	0.18	21.00				EB FRTG RD
EB FRTG RD 2	525	1019	0.21	25.00				EB FRTG RD
EB FRTG RD 3	415	825	0.17	20.00				EB FRTG RD
EB FRTG RD 4	530	1098	0.21	25.00				EB FRTG RD
EB FRTG RD 5	310	1120	0.20	25.00	132	2	30	250
EB FRTG RD 6	550	961	0.19	23.00				EB FRTG RD
EB FRTG RD 7	20	76	0.02	2.40				EB FRTG RD
WB FRTG RD 1	250	433	0.09	10.00				WB FRTG RD
WB FRTG RD 2	600	1045	0.21	24.00				WB FRTG RD
WB FRTG RD 3	600	1045	0.21	25.00				WB FRTG RD
WB FRTG RD 4	420	1245	0.25	31.00				WB FRTG RD
WB FRTG RD 5	375	805	0.16	19.00				WB FRTG RD
PROJECT TOTALS	5055	10522	2.1	250.40	132.00	2	30	250

EROSION

LOCATION	506 6038	506 6039	506 6042	506 6043
	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (18")	BIODEG EROSN CONT LOGS (REMOVE)
	LF	LF	LF	LF
EB FRTG RD 1 OF 7	250	250	24	24
EB FRTG RD 2 OF 7	600	600	32	32
EB FRTG RD 3 OF 7	600	600	32	32
EB FRTG RD 4 OF 7	600	600	32	32
EB FRTG RD 5 OF 7	150	150	16	16
EB FRTG RD 6 OF 7	600	600	24	24
EB FRTG RD 7 OF 7	220	220		
WB FRTG RD 1 OF 5	170	170	16	16
WB FRTG RD 2 OF 5	600	600	24	24
WB FRTG RD 3 OF 5	140	140	32	32
WB FRTG RD 4 OF 5	230	230	16	16
PROJECT TOTALS	4160	4160	248	248.0

DATE:3/15/2023
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Texas Department of Transportation

SL 8

SUMMARY OF LANDSCAPED, EROSION QUANTITIES

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		36

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DRAINAGE

	400 6001	400 6005	400 6009	402 6001	420 6054	464 6005	465 6167	465 6175	496 6004	496 6006	467 6007
	STRUCT EXCAV	CEM STABIL BKFL	CEMENT STAB BACKFILL (INLET OR MH)	TRENCH EXCAVATION PROTECTION	CL C CONC (HEADWALL)	RC PIPE (CL III)(24 IN)	INLET (COMPL)(TY AD)	INLET (COMPL)(CURB)(TY C)	REMOV STR (SET)	REMOV STR (HEADWALL)	SET (TY I) (24 IN) (6:1) (C)
	CY	CY	CY	LF	CY	LF	EA	EA	EA	EA	EA
LDINE WESTFIELD & EBFRTG R	28	4	11	10		8		1			
STA. 90+39 EBFRTG RD.	5				1					1	
STA 92+77.00 EB FRTG RD.		29	7			60	1		2		1
STA 93+70.30 EB FRTG RD.	5	11	7			22	1		2		
PROJECT TOTALS	38	44	25	10	1	90	2	1	4	1	1

SL 8

SUMMARY OF DRAINAGE QUANTITIES

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			37
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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DEMOLITION

LOCATION	104 6001	104 6011	104 6028	104 6036	104 6042	104 6054	104 6067	105 6035	354 6146	496 6006	496 6007	542 6001	542 6002	542 6003
	REMOVING CONC (PAV)	REMOVING CONC (MEDIANS)	REMOVING CONC (MISC)	REMOVING CONC (SIDEWALK OR RAMP)	REMOVING CONC (MOVABLE BARRIER)	REMOVING CONCRETE(MOW STRIP)	REMOVING CONC (SAWCUT)	REMOVING STAB BASE & ASPH PAV (0-2")	PLANE ASPH CONC PAV (1.5"-2")	REMOV STR (HEADWALL)	REMOV STR (PIPE)	REMOVE METAL BEAM GUARD FENCE	REMOVE TERMINAL ANCHOR SECTION	REMOVE DOWNSTREAM ANCHOR TERMINAL
	SY	SY	SY	SY	LF	LF	LF	SY	SY	EA	LF	LF	EA	EA
PHASE 1														
WB SL 8 1 OF 2	4473													
WB SL 8 2 OF 2	3374													
PHASE 1														
EB SL 8 1 OF 2	4454													
EB SL 8 2 OF 2	3230													
SL 8 TRAFFIC BARRIER					8098									
SL 8 GUARDFENCE						675						750	4	4
PHASE 1														
EB FRTG RD 1 OF 7	641								388					
EB FRTG RD 2 OF 7	815								533		24			
EB FRTG RD 3 OF 7	766								586		24			
EB FRTG RD 4 OF 7	685							239	389	1				
EB FRTG RD 5 OF 7	700		15.5	28			154	132	301					
EB FRTG RD 6 OF 7	780								625					
EB FRTG RD 7 OF 7	760								68					
PHASE 2														
EB FRTG RD 1 OF 7	612	91							130					
EB FRTG RD 2 OF 7	807					250	502		45					
EB FRTG RD 3 OF 7	807						600							
EB FRTG RD 4 OF 7	807						600							
EB FRTG RD 5 OF 7	507			8			189							
EB FRTG RD 6 OF 7	836						600							
EB FRTG RD 7 OF 7	300						210							
PHASE 1														
WB FRTG RD 1 OF 4	511								470					
WB FRTG RD 2 OF 4	720								689					
WB FRTG RD 3 OF 4	721			44			127	167	332					
WB FRTG RD 4 OF 4	301							193						
PHASE 2														
WB FRTG RD 1 OF 4	516	58					511							
WB FRTG RD 2 OF 4	808						600							
WB FRTG RD 3 OF 4	700						176							
WB FRTG RD 4 OF 4	225						151							
PROJECT TOTALS	29856	149	15.5	80	8098	925	4420	731	4556	1	48	750	4	4

SL 8

SUMMARY OF DEMOLITION QUANTITIES

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			37A
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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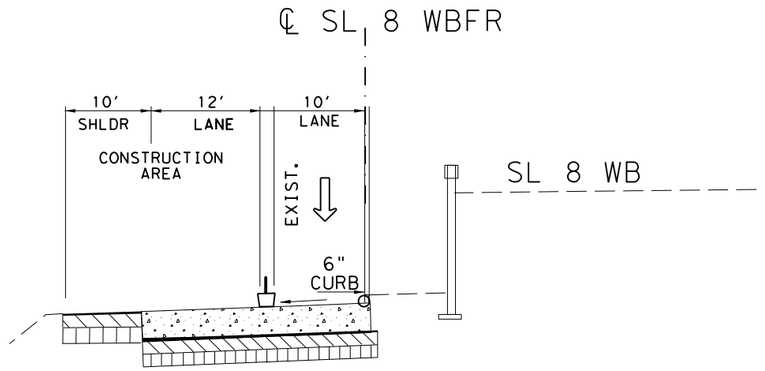
PHASE 1 WB FRTG RD. STA.80+59.53 TO STA.105+10.00

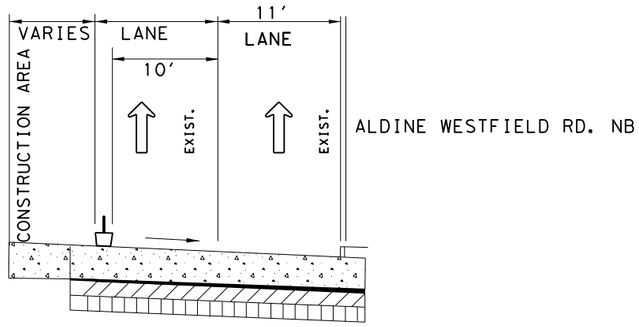
CONSTRUCT FULL DEPTH REPLACEMENT ON FRTG LANES.
CONSTRUCT RIGHT TURN LANE AT ALDINE WESTFIEL RD.
REMOVE/ INSTALL INLET AT ALDINE WESTFIELD INTERSECTION.
REPLACE 2" EXISTING ASPHULT ON SHOULDER.



1 LANE CLOSURE

PHASE 1A WB FRTG RD. (ALDINE WESTFIELD RD)

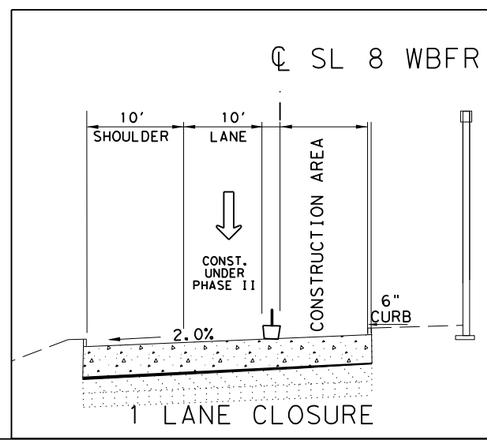
CONSTRUCT INSIDE LANE AND CURB ALONG ALDINE WESTFIELD RD. (TURING ASSIST LANE)



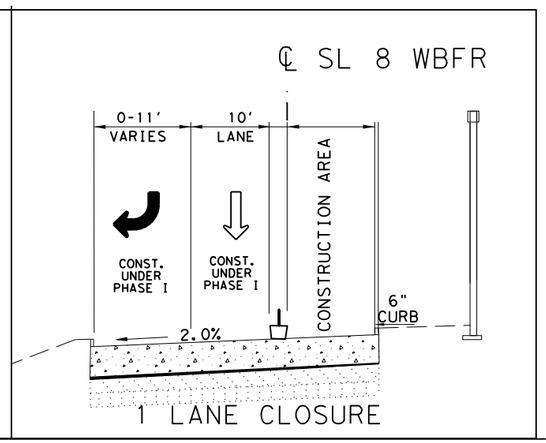
1 LANE CLOSURE

PHASE 2 WB FRTG RD. STA.80+59.53 TO STA.105+10.00

CONSTRUCT FULL DEPTH REPLACEMENT ON INSIDE FRTG LANE, AND CURB.



1 LANE CLOSURE



1 LANE CLOSURE

DATE: 3/15/2023
$FILEL$

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD

TCP
NARRATIVE

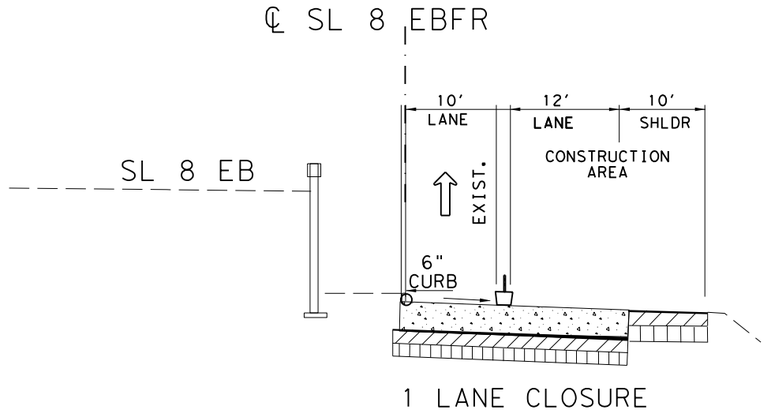
SHEET 1 OF 4

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		38

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

PHASE 1 EB FRTG RD. STA.64+18.00 TO STA.106+85.54

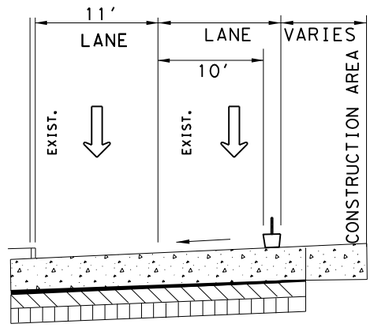
CONSTRUCT FULL DEPTH REPLACEMENT ON FRTG LANES.
CONSTRUCT RIGHT TURN LANE AT ALDINE WESTFIEL RD.
REMOVE/ INSTALL INLET AT ALDINE WESTFIELD INTERSECTION.
REPLACE 2" EXISTING ASPHULT ON SHOULDER.



1 LANE CLOSURE

PHASE 1A EB FRTG RD. (ALDINE WESTFIELD RD)

CONSTRUCT INSIDE LANE AND CURB ALONG ALDINE WESTFIELD RD. (TURING ASSIST LANE)

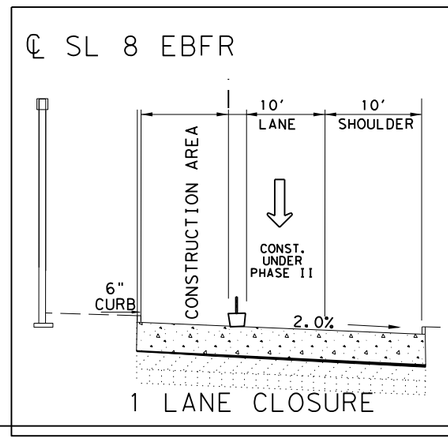


1 LANE CLOSURE

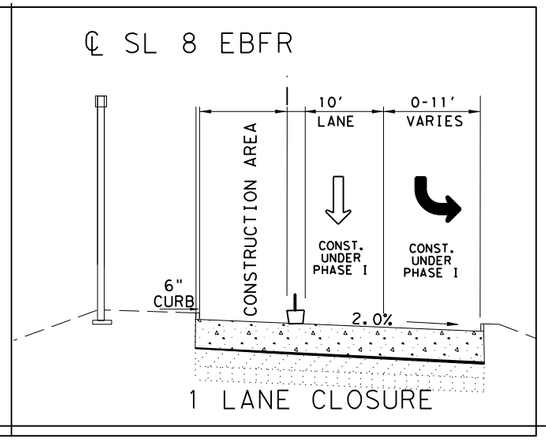
ALDINE WESTFIELD RD. NB

PHASE 1 EB FRTG RD. STA.64+18.00 TO STA.106+85.54

CONSTRUCT FULL DEPTH REPLACEMENT ON INSIDE FRTG LANE, AND CURB.



1 LANE CLOSURE



1 LANE CLOSURE

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD

TCP
NARRATIVE

SHEET 2 OF 4

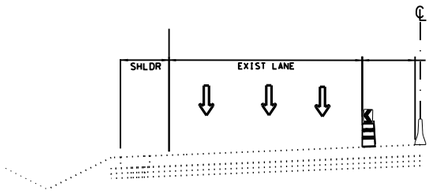
FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			39
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

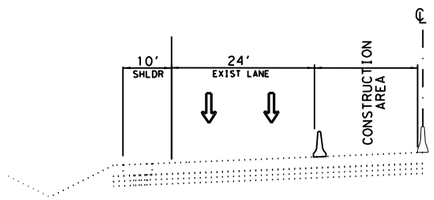
PHASE 1 WB SL 8.

FULL DEPTH PAVEMENT REPLACEMENT WITH CRCP.

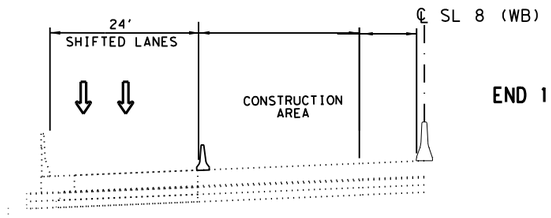
1. INSTALL ADVANCE WARNING SIGNS, PORT CB TY 1, AND TMA'S.
2. CLOSE INSIDE LANE ALONG SL 8.
3. SHIFT TRAFFIC TO OUTSIDE SHOULDER.



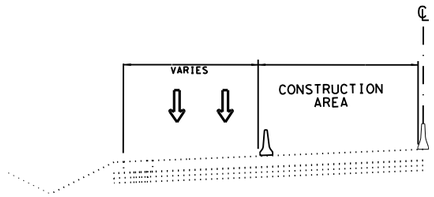
BEGIN 1 LANE CLOSURE



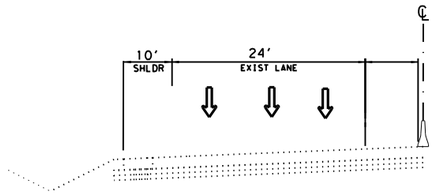
END LANE CLOSURE BEGIN LANE SHIFT



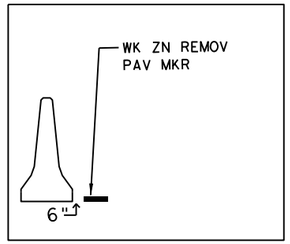
END 1 LANE SHIFT



BEGIN 1 LANE SHIFT



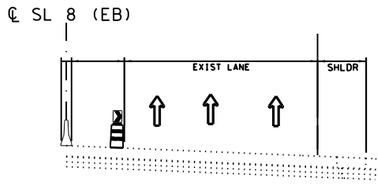
BACK TO EXISTING



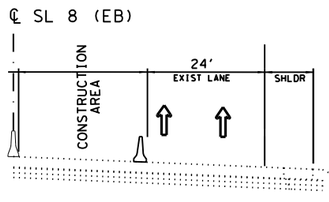
PHASE 1 EB SL 8.

FULL DEPTH PAVEMENT REPLACEMENT WITH CRCP.

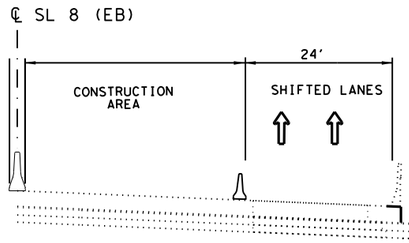
1. INSTALL ADVANCE WARNING SIGNS, PORT CB TY 1, AND TMA'S.
2. CLOSE INSIDE LANE ALONG SL 8.
3. SHIFT TRAFFIC TO OUTSIDE SHOULDER.



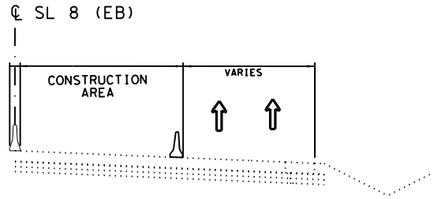
BEGIN 1 LANE CLOSURE



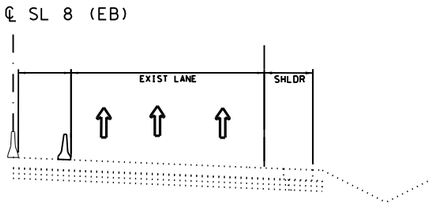
END LANE CLOSURE BEGIN LANE SHIFT



END 1 LANE SHIFT



BEGIN 1 LANE SHIFT



BACK TO EXISTING

DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8

TCP NARRATIVE

SHEET 3 OF 4

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		40

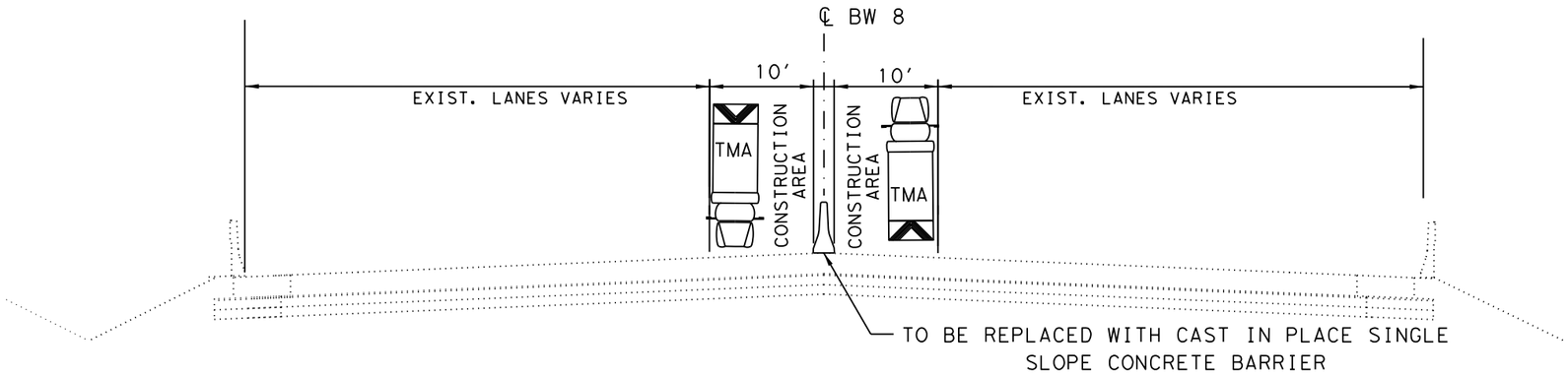
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

PHASE 2 SL 8.

REPLACE PRECAST CONC. BARRIES WITH SINGLE SLOPE CONC. BARRIER.

1. INSTALL ADVANCE WARNING SIGNS, PORT CB TY 1 EB AND WB SL 8.
2. PLACE PORT CB BARRIER ON INSIDE SHOULDER EB AND WB SL 8.



STA. 1699+87.00 TO STA. 1730+03.65 (BEG. OF HARDY TOLL RD.)
STA. 1743+63.99 (END OF HARDY TOLL RD.) TO STA. 1894+46.00

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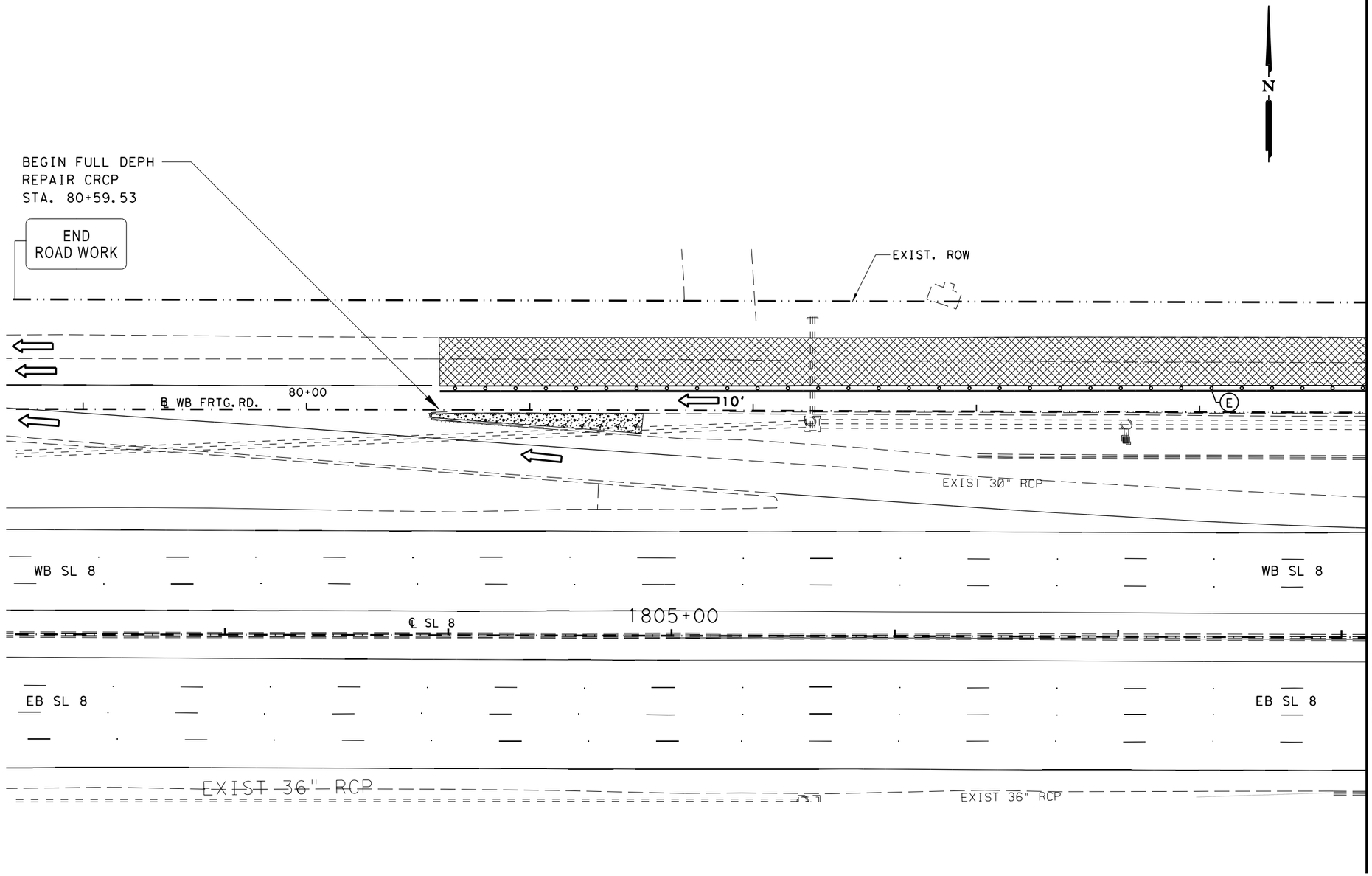
SL 8

TCP NARRATIVE

SHEET 4 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			41
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

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SL 8
WB FRONTAGE ROAD

TCP

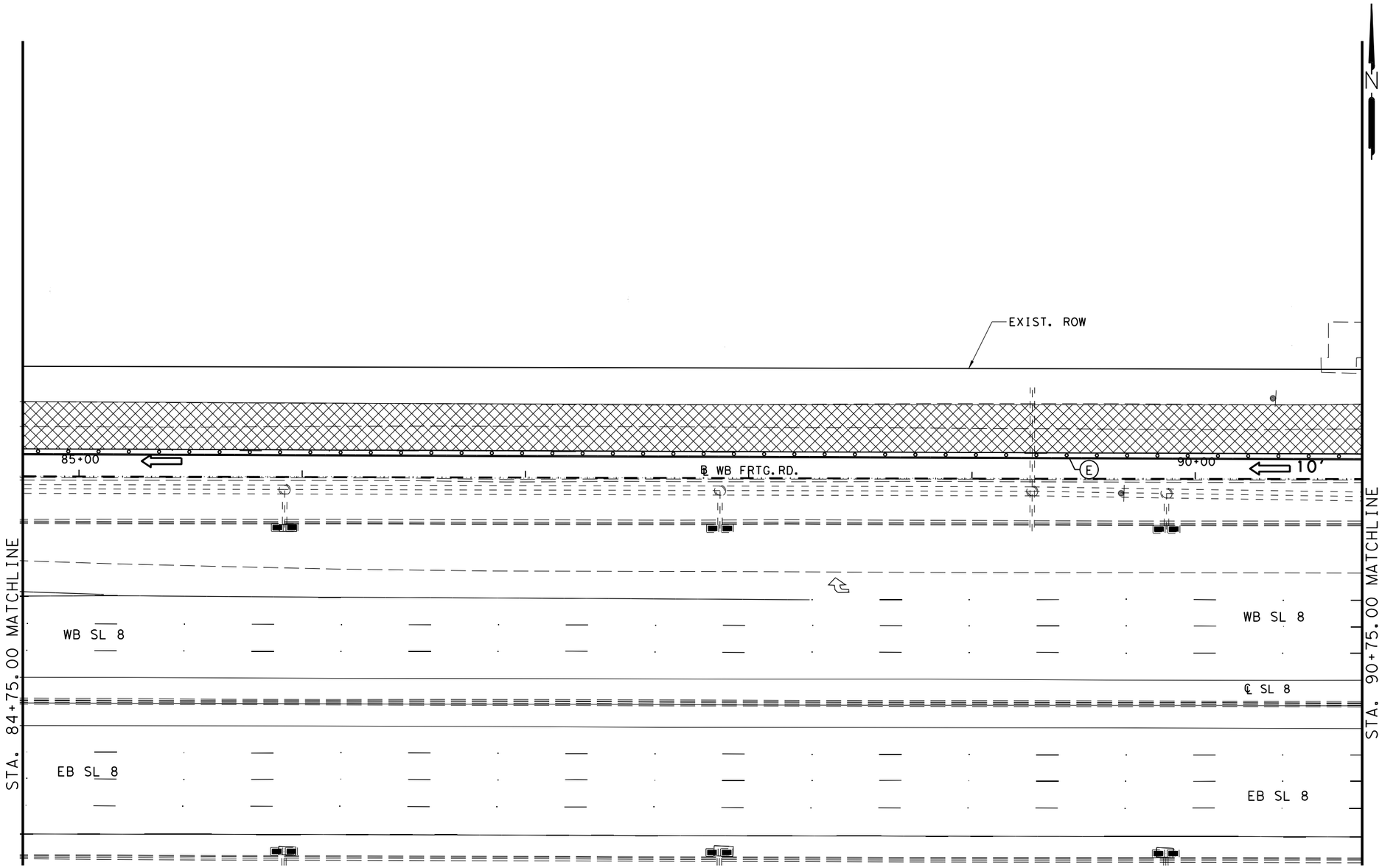
PHASE 1

SCALE: 1" = 50' HORZ

SHEET 1 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			42
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
DANIEL DUKE THOMPSON
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SL 8
WB FRONTAGE ROAD

TCP

PHASE 1

SCALE: 1" = 50' HORZ

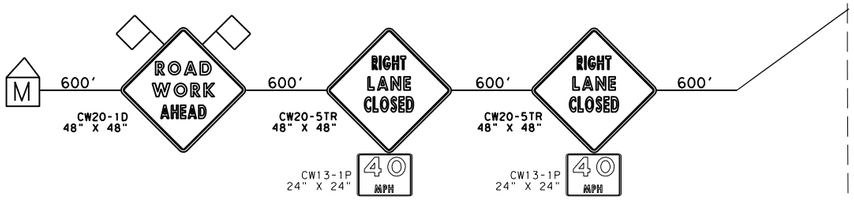
SHEET 2 OF 5

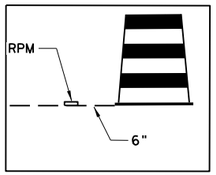
FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		43

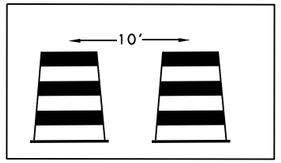
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

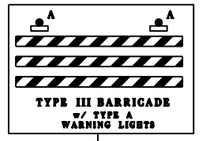
DATE: 3/15/2023
$FILEL$

SEE TCP (1-4)-18 STD. DWG FOR MORE DETAILS









N

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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SL 8
WB FRONTAGE ROAD

TCP

PHASE 1

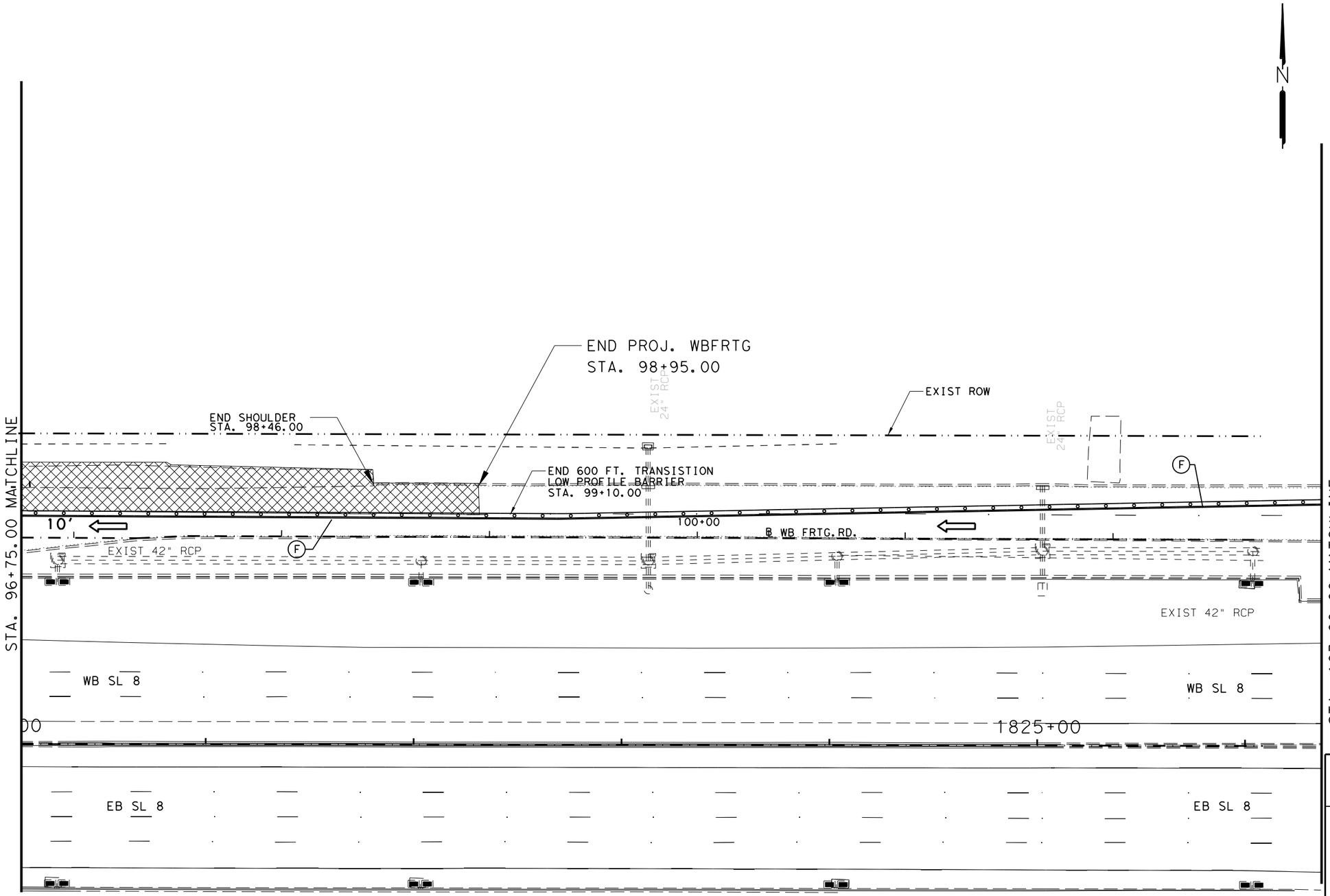
SCALE: 1" = 50' HORZ

SHEET 3 OF 5

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		44

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



N

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M — PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- A — WK ZN PAV MKR REMOV (Y) 8" SLD
- B — WK ZN PAV MKR REMOV (W) 8" SLD
- C — REFL PAV MRKR TY II-A-A
- D — REFL PAV MRKR TY II-C-R
- E — WK ZN PAV MRK REMOV (W)(4")(SLD)
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- G — WK ZN PAV MRK REMOV (Y)(4")(SLD)
- H1 — MULTIPOLYMER PAV MRK W(6")(BRK)
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- J — MULTIPOLYMER PAV MRK Y(6")(SLD)
- K — MULTIPOLYMER PAV MRK W(6")(SLD)
- L — MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD

TCP
PHASE 1

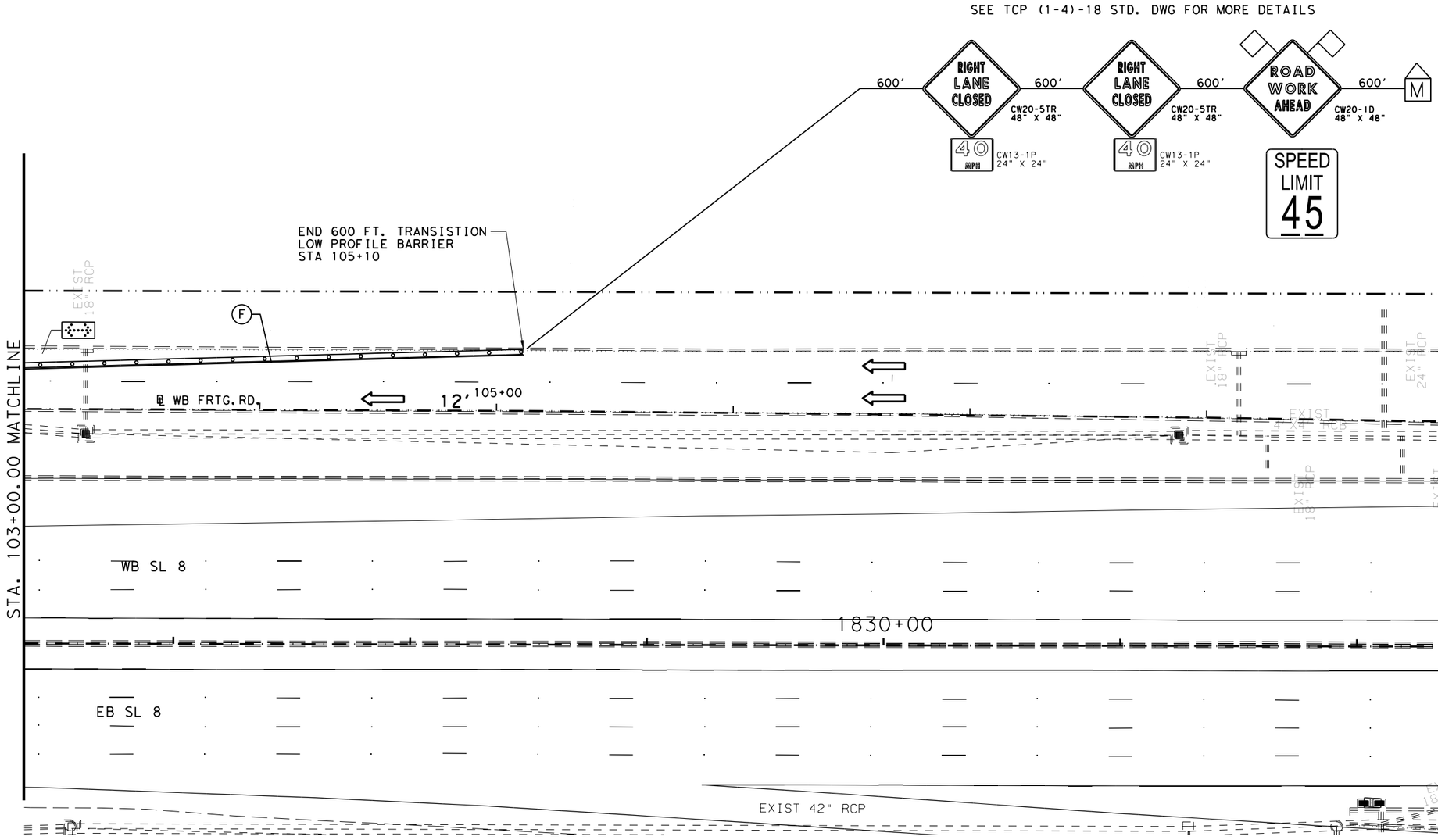
SCALE: 1" = 50' HORZ

SHEET 4 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			45
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

SEE TCP (1-4)-18 STD. DWG FOR MORE DETAILS



LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M — PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- A — WK ZN PAV MKR REMOV (Y) 8" SLD
- B — WK ZN PAV MKR REMOV (W) 8" SLD
- C — REFL PAV MRKR TY II-A-A
- D — REFL PAV MRKR TY II-C-R
- E — WK ZN PAV MRK REMOV (W)(4")(SLD)
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- H1 — MULTIPOLYMER PAV MRK W(6")(BRK)
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SL 8
WB FRONTAGE ROAD

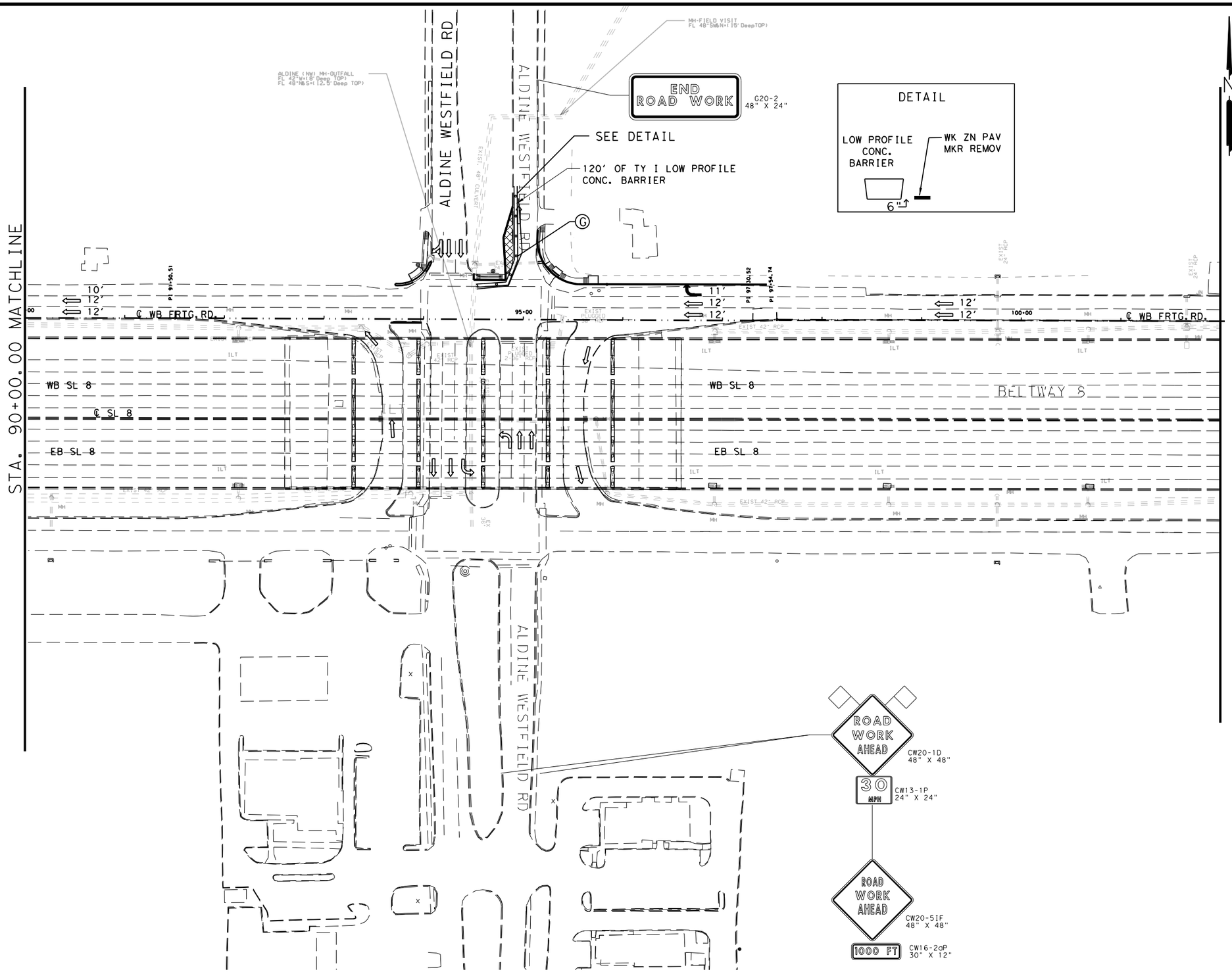
TCP
PHASE 1

SCALE: 1" = 50' HORZ

SHEET 5 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			46
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M — PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- A — WK ZN PAV MKR REMOV (Y) 8" SLD
- B — WK ZN PAV MKR REMOV (W) 8" SLD
- C — REFL PAV MRKR TY II-A-A
- D — REFL PAV MRKR TY II-C-R
- E — WK ZN PAV MRK REMOV (W)(4")(SLD)
- F — WK ZN PAV MRK REMOV (W)(4")(BRK)
- G — WK ZN PAV MRK REMOV (Y)(4")(SLD)
- H1 — MULTIPOLYMER PAV MRK W(6")(BRK)
- H2 — MULTIPOLYMER PAV MRK B(6")(BRK)
- J — MULTIPOLYMER PAV MRK Y(6")(SLD)
- K — MULTIPOLYMER PAV MRK W(6")(SLD)
- L — MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD

TCP
PHASE 1A

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		47

STATE	DIST	COUNTY
TEXAS	HOU	HARRIS

CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

END
ROAD WORK

EXIST. ROW

10'

10'

G

℄ WB FRTG. RD.

80+00

EXIST 30" RCP

WB SL 8

WB SL 8

℄ SL 8

1805+00

EB SL 8

EB SL 8

EXIST 36" RCP

EXIST 36" RCP

STA. 84+75.00 MATCHLINE

N

LEGEND

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- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
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- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
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SL 8
WB FRONTAGE ROAD

TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 1 OF 5

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			48
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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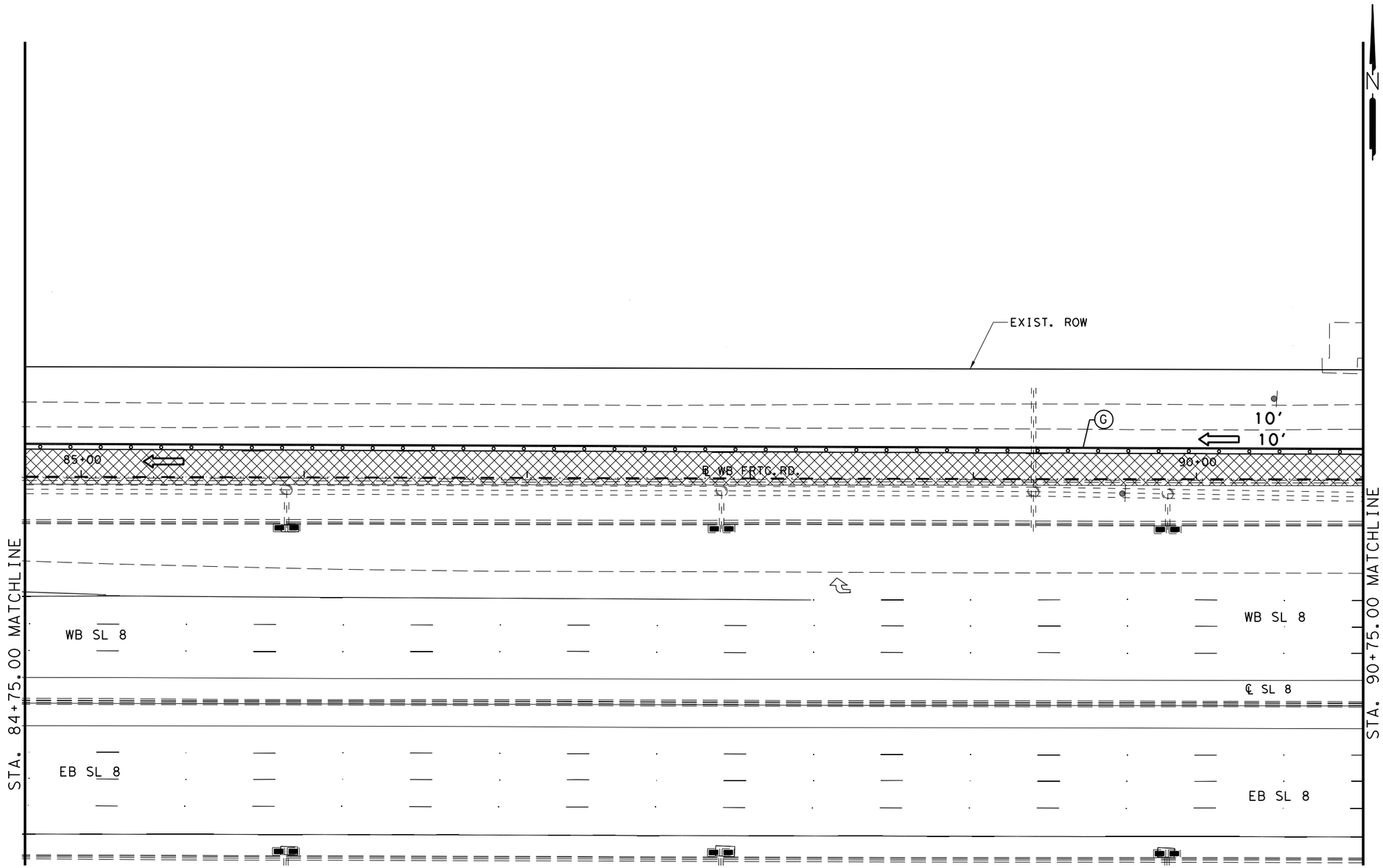

LEGEND

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- EXISTING TRAFFIC
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SL 8
WB FRONTAGE ROAD

TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 2 OF 5

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		49

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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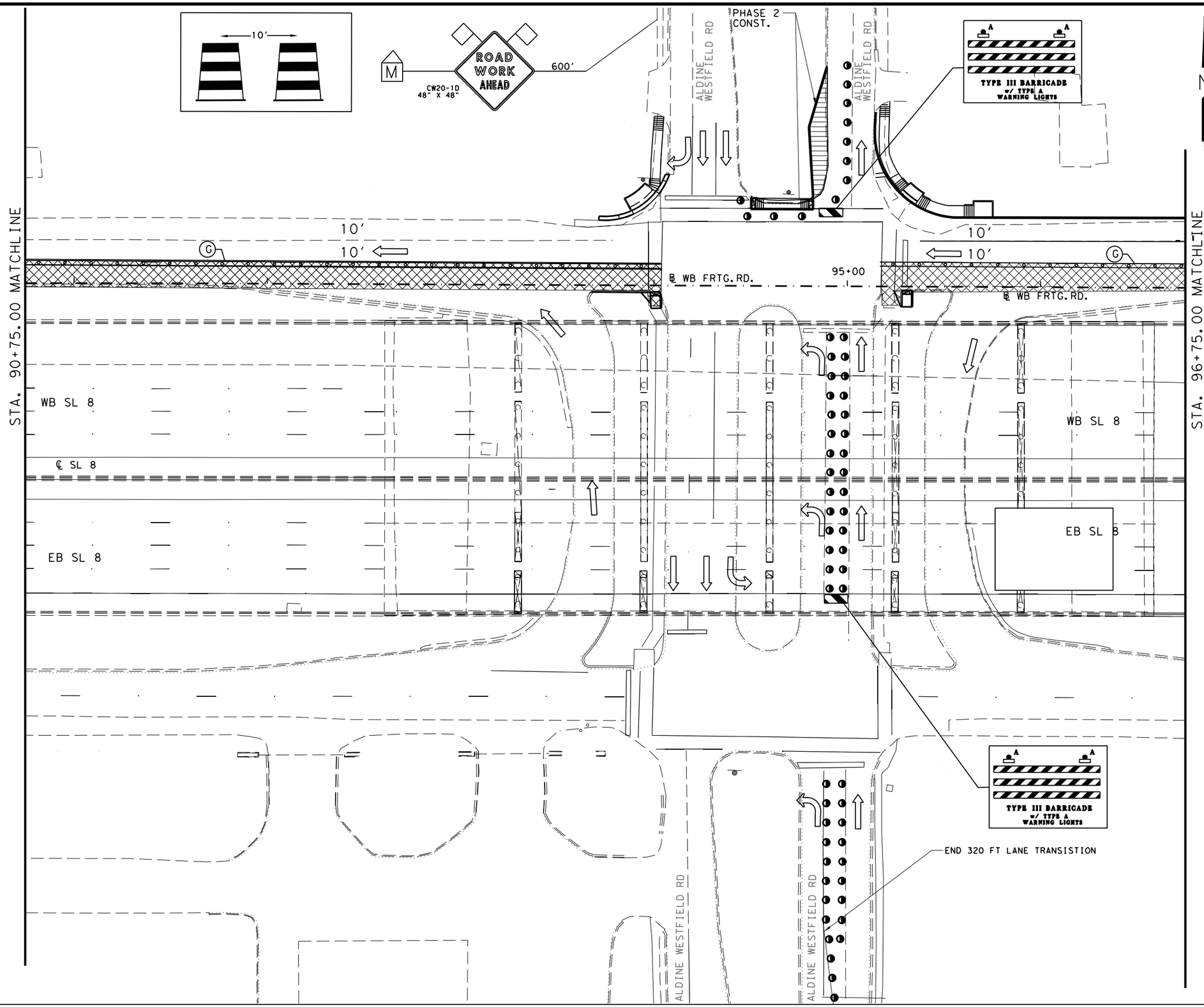

LEGEND

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SL 8
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TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 3 OF 5

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		50

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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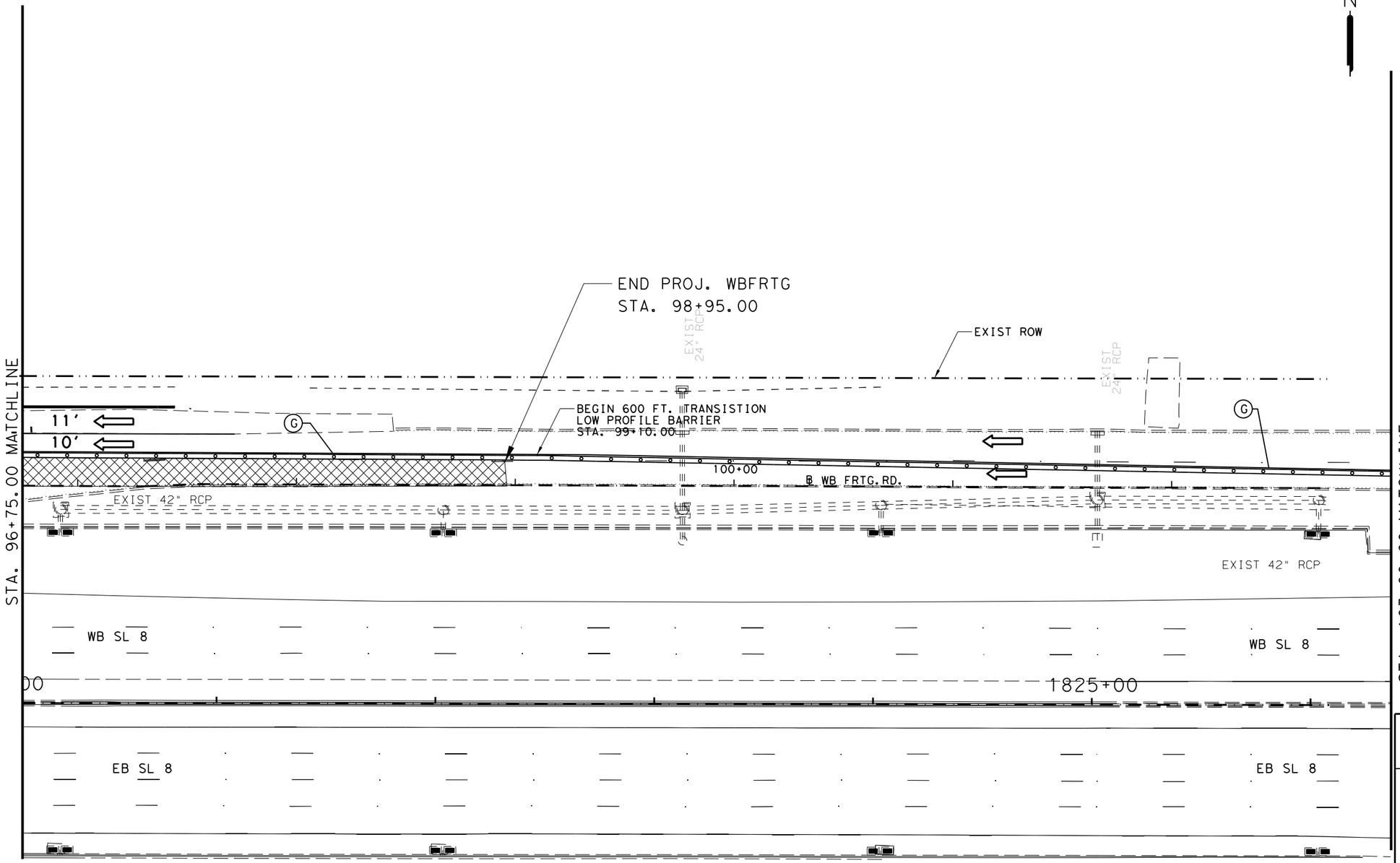

N

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
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SL 8
WB FRONTAGE ROAD

TCP
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 4 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			51
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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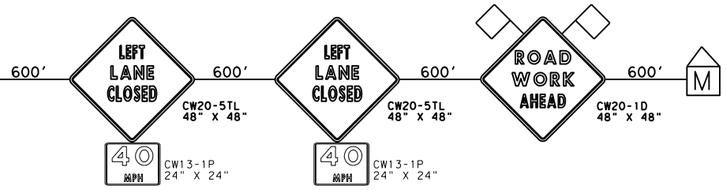
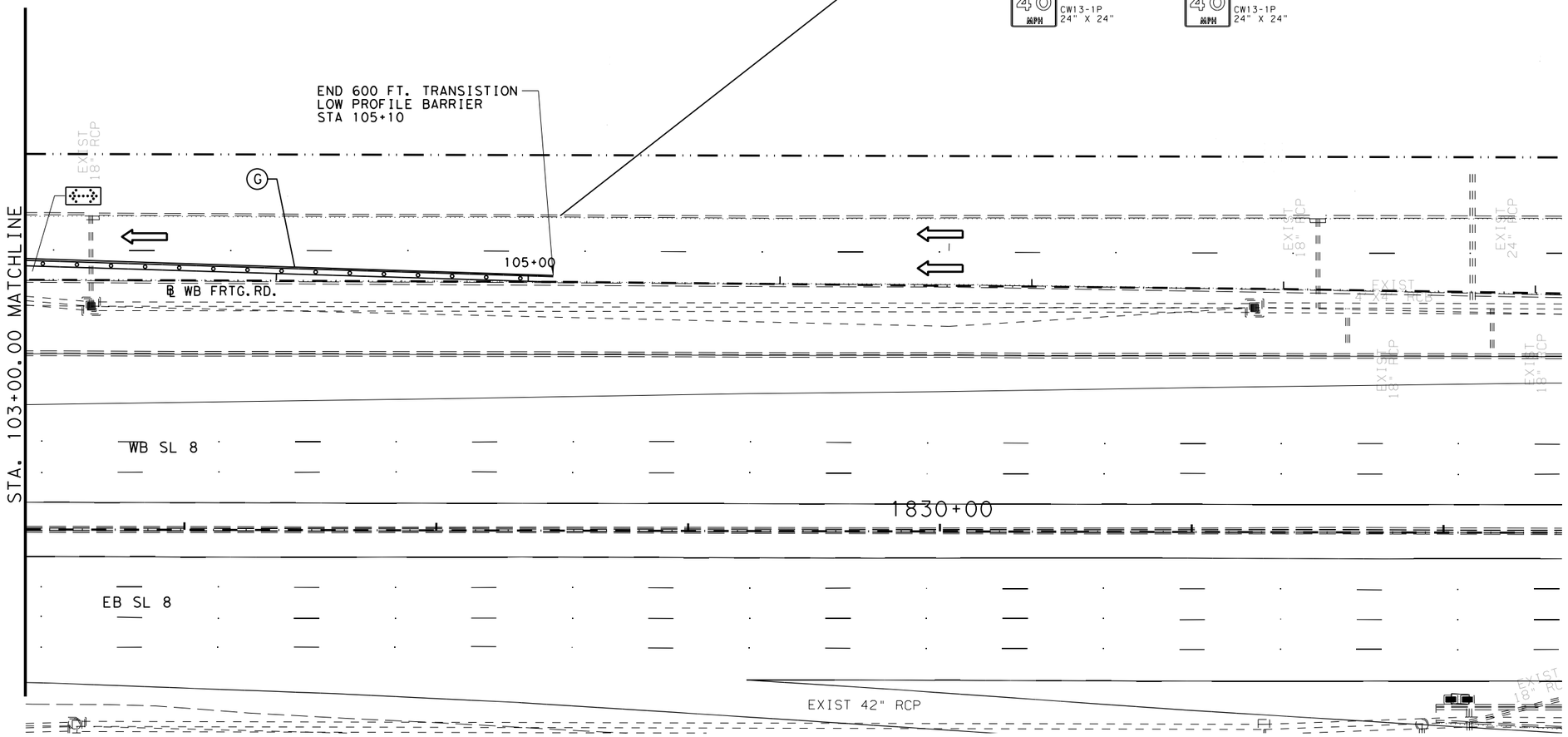
SEE TCP (1-4)-18 STD. DWG FOR MORE DETAILS





N

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SL 8
WB FRONTAGE ROAD

TCP
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 5 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			52
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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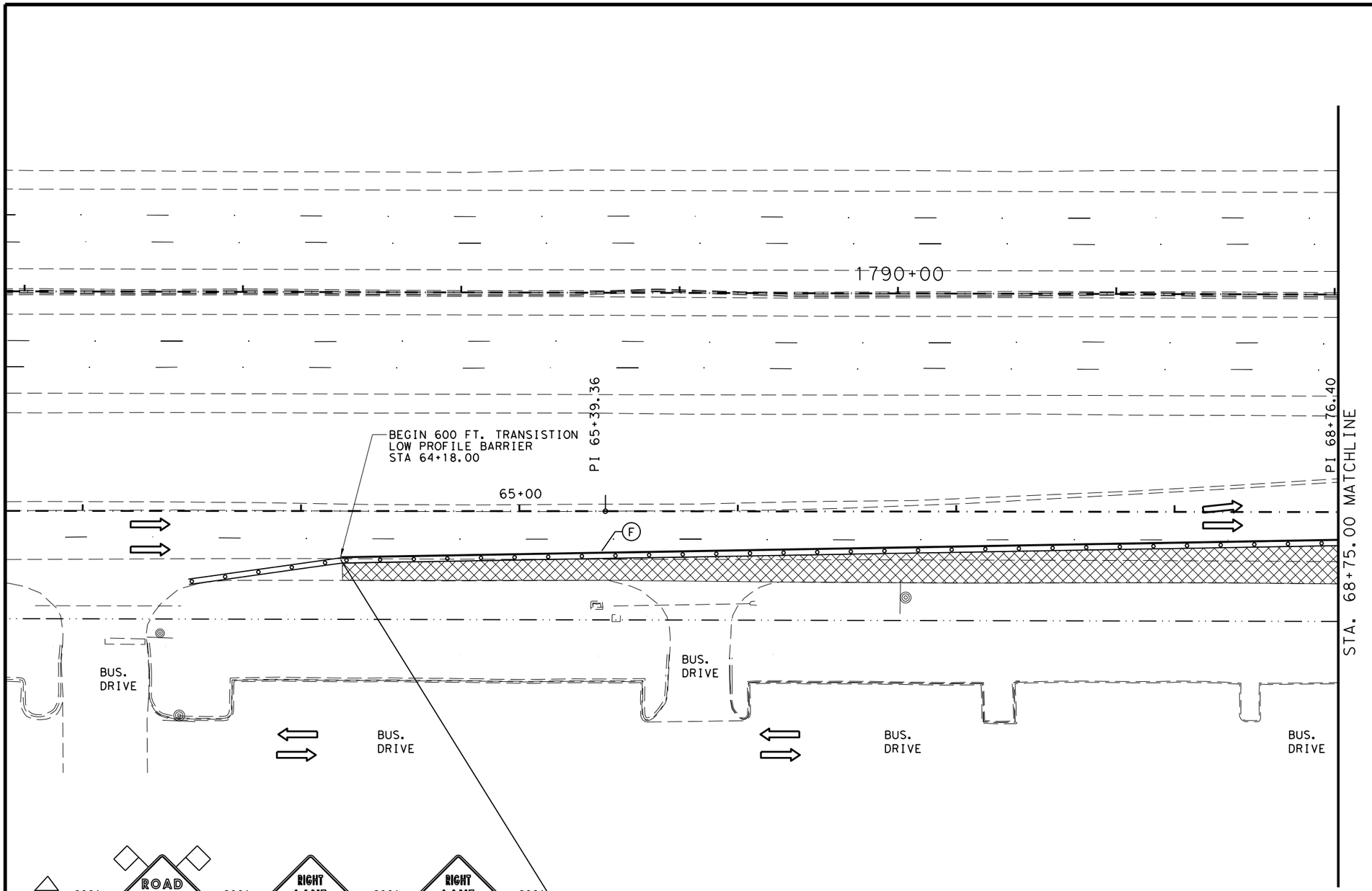

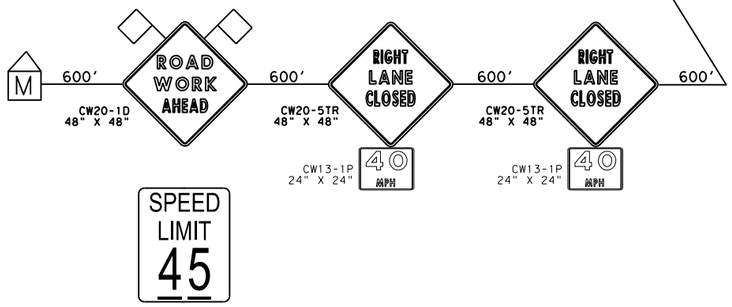

LEGEND

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SL 8
EB FRONTAGE ROAD

TCP

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 1 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			53
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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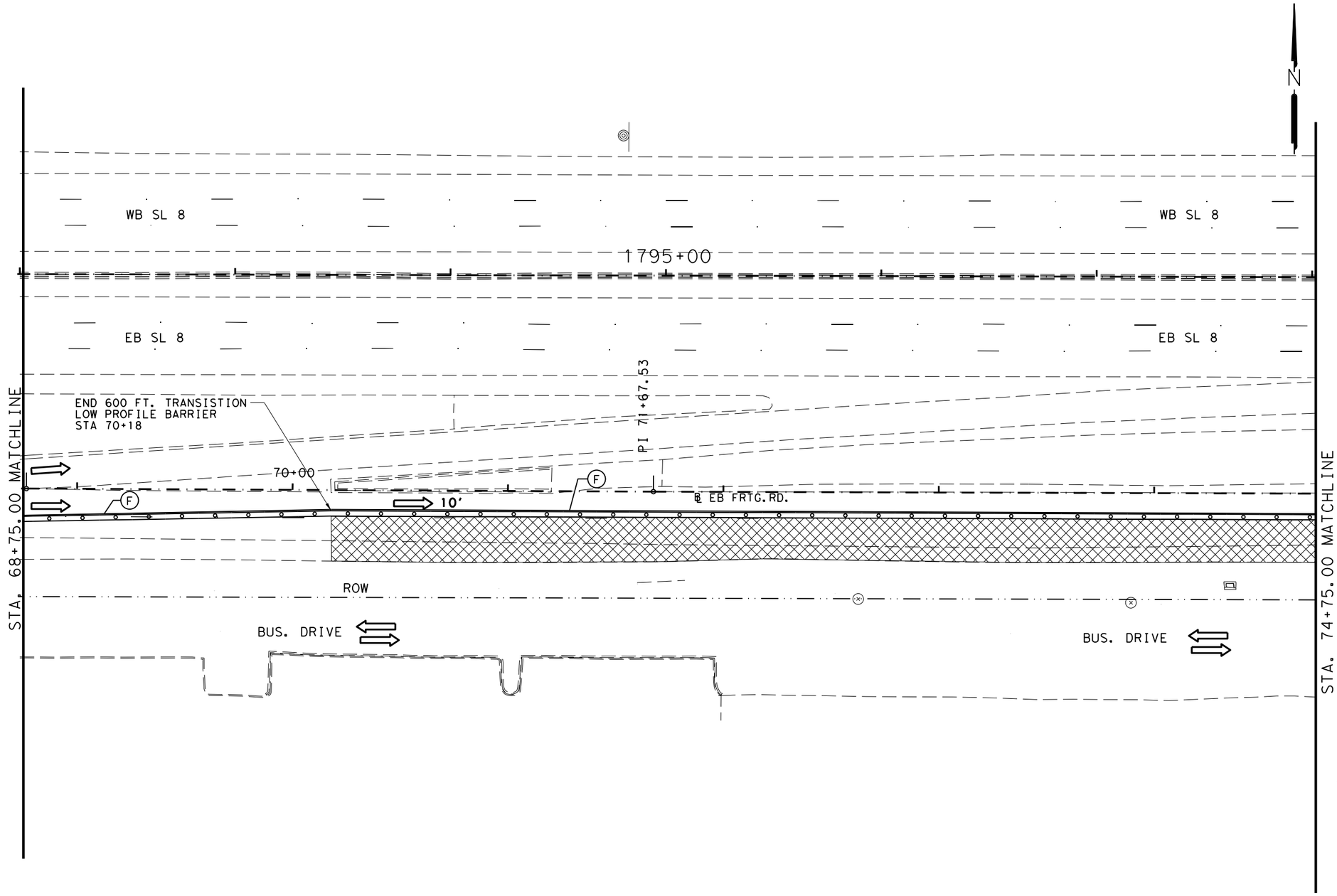

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SL 8
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TCP

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 2 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			54
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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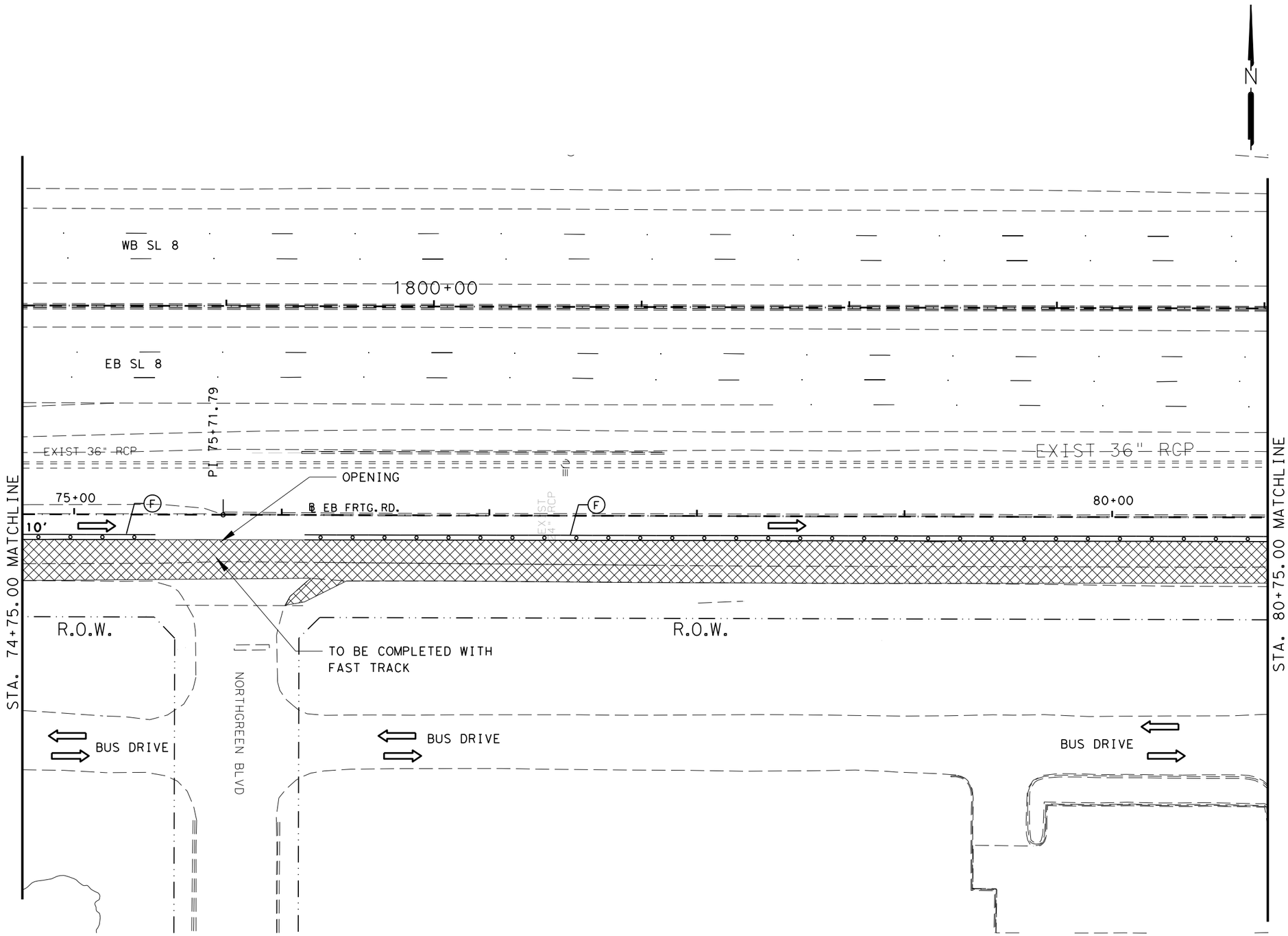

LEGEND

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TCP

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 3 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			55
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

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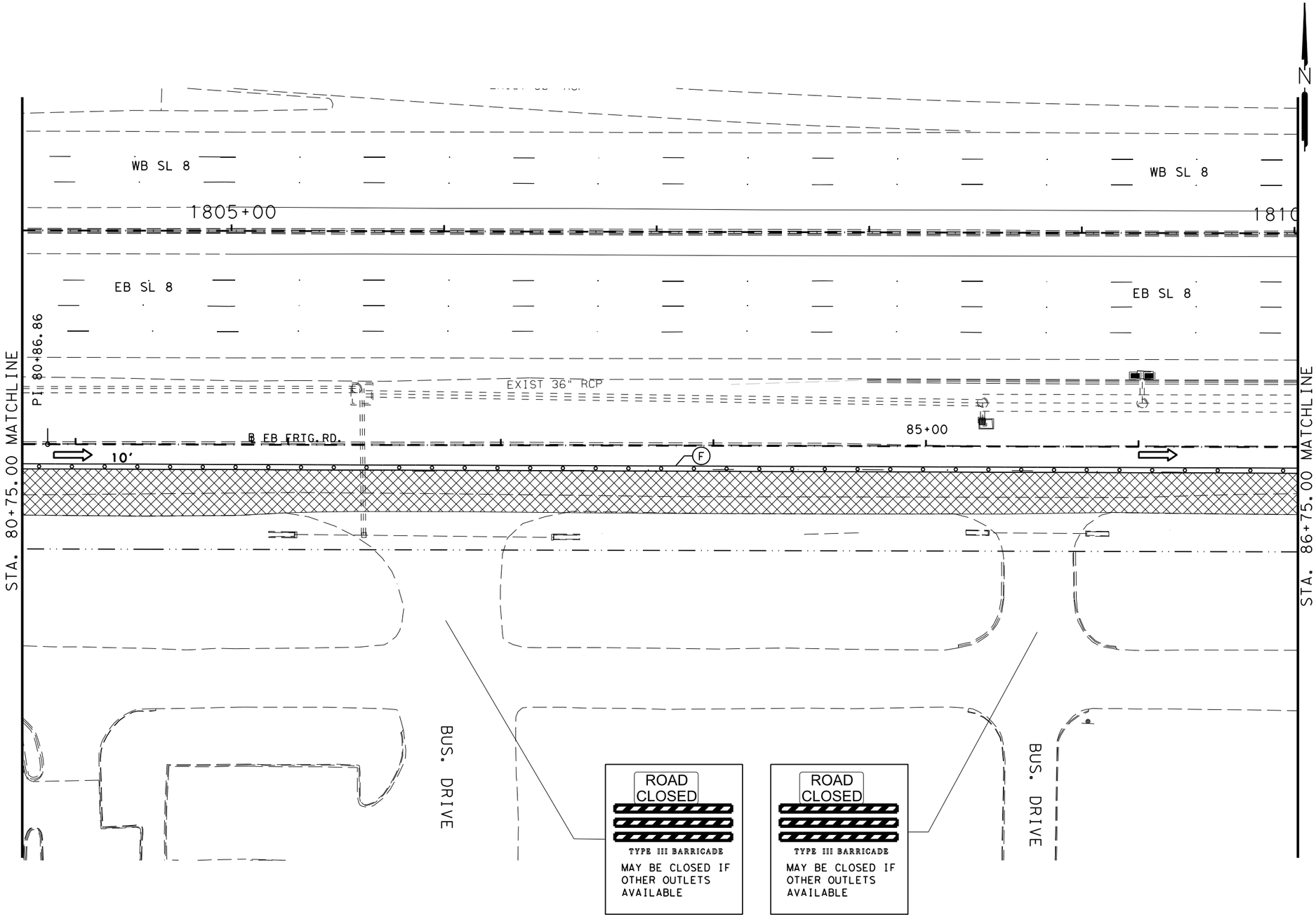

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PHASE 1

SCALE: 1" = 50' HORZ

SHEET 4 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			56
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

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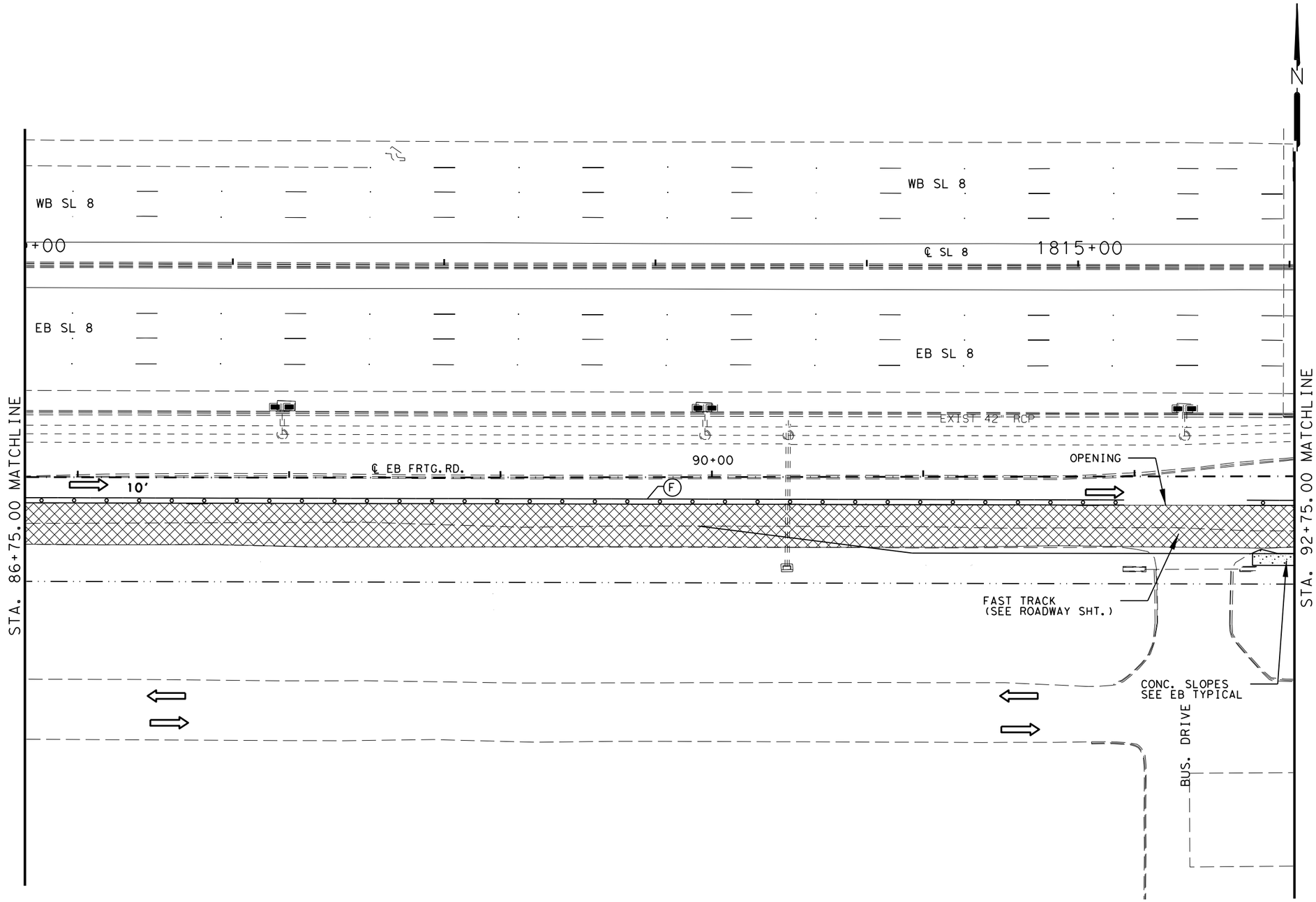

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- J — MULTIPOLYMER PAV MRK Y(6")(SLD)
- K — MULTIPOLYMER PAV MRK W(6")(SLD)
- L — MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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SL 8
EB FRONTAGE ROAD

TCP
PHASE 1

SCALE: 1" = 50' HORZ

SHEET 5 OF 8

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		57

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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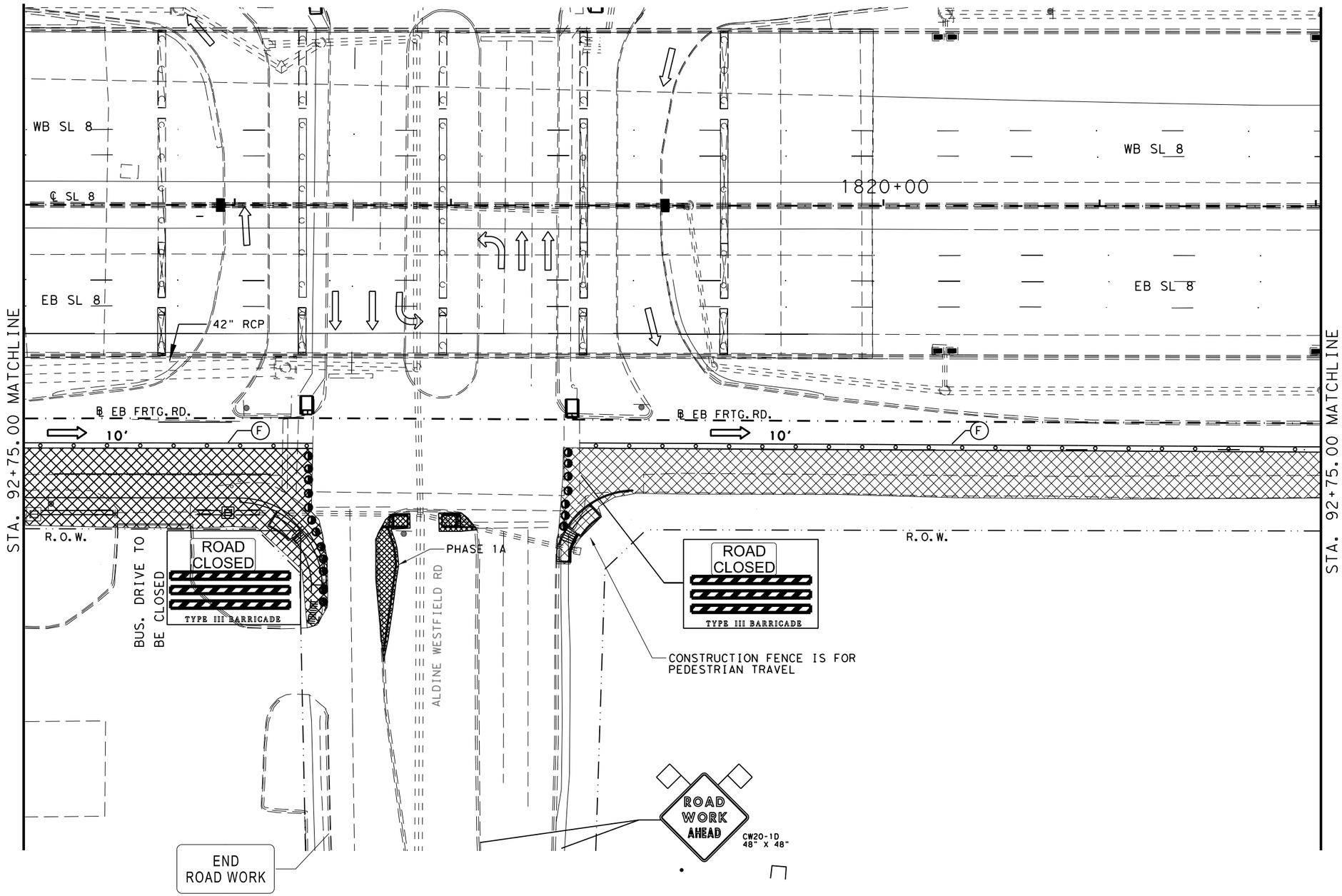

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LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M — PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- A — WK ZN PAV MKR REMOV (Y) 8" SLD
- B — WK ZN PAV MKR REMOV (W) 8" SLD
- C — REFL PAV MRKR TY II-A-A
- D — REFL PAV MRKR TY II-C-R
- E — WK ZN PAV MRK REMOV (W)(4")(SLD)
- F — WK ZN PAV MRK REMOV (W)(4")(BRK)
- G — WK ZN PAV MRK REMOV (Y)(4")(SLD)
- H1 — MULTIPOLYMER PAV MRK W(6")(BRK)
- H2 — MULTIPOLYMER PAV MRK B(6")(BRK)
- J — MULTIPOLYMER PAV MRK Y(6")(SLD)
- K — MULTIPOLYMER PAV MRK W(6")(SLD)
- L — MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 6 OF 8

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		58

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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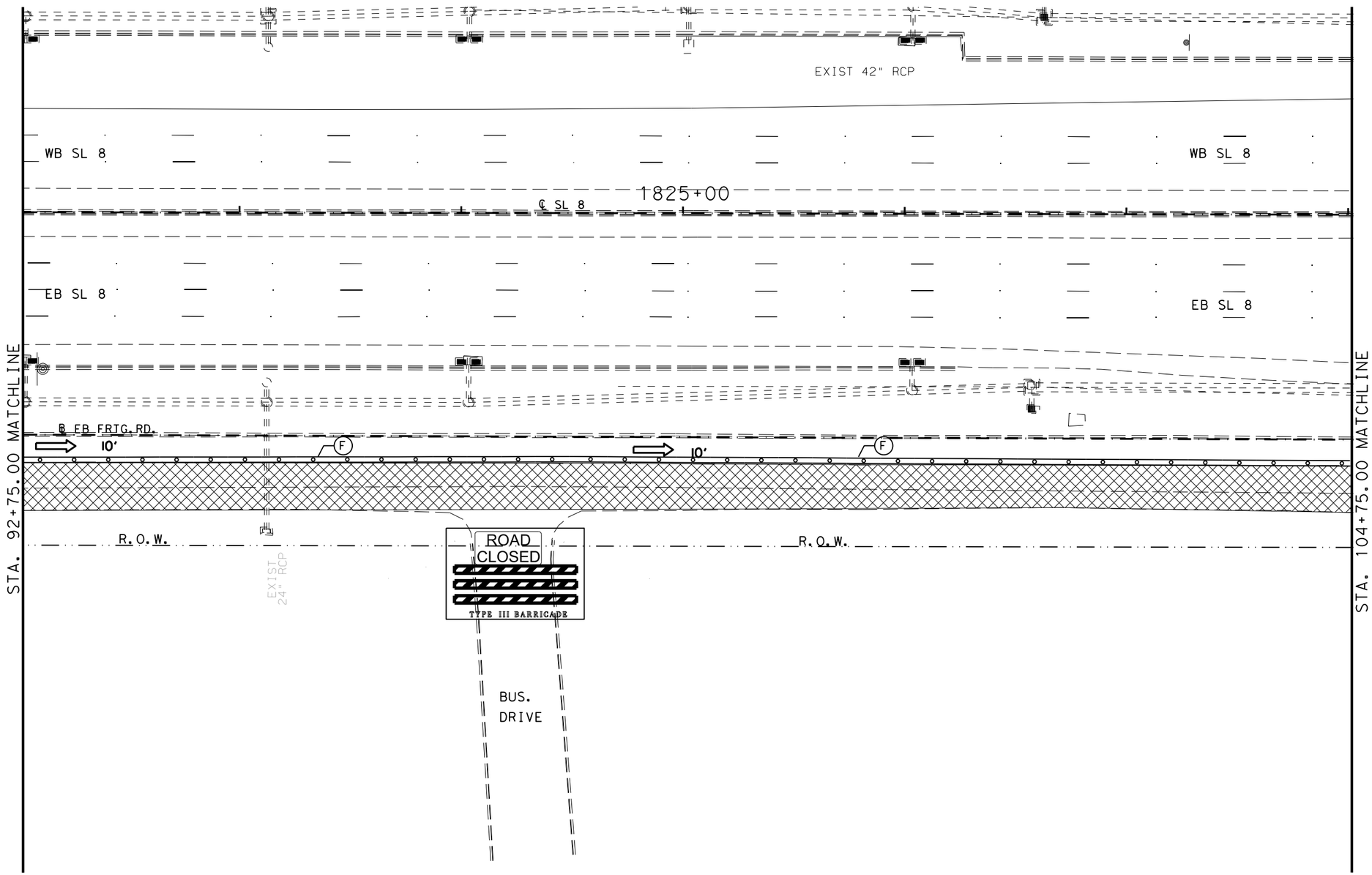

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LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 7 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			59
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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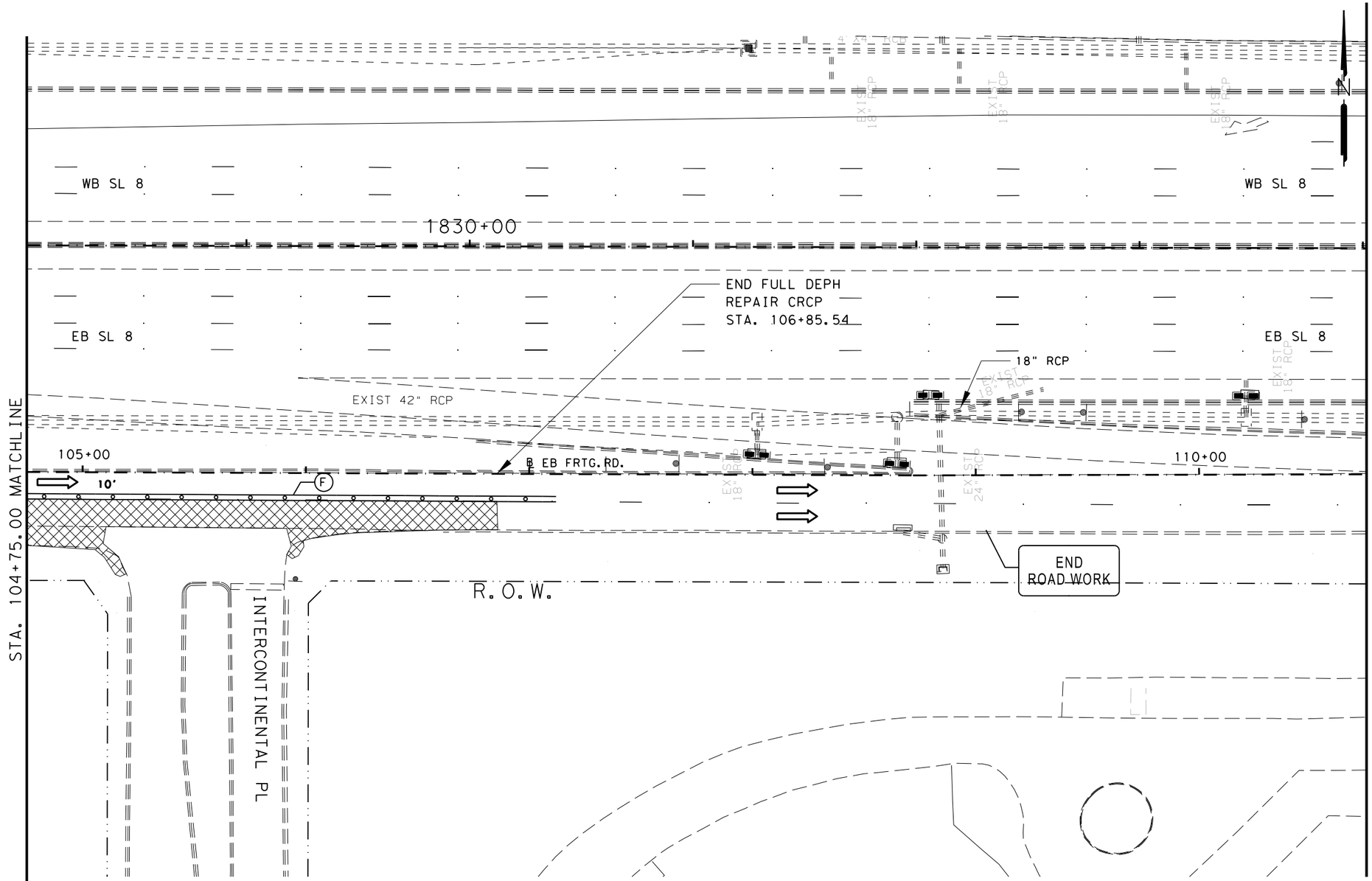

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP
PHASE 1

SCALE: 1" = 50' HORZ

SHEET 8 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			60
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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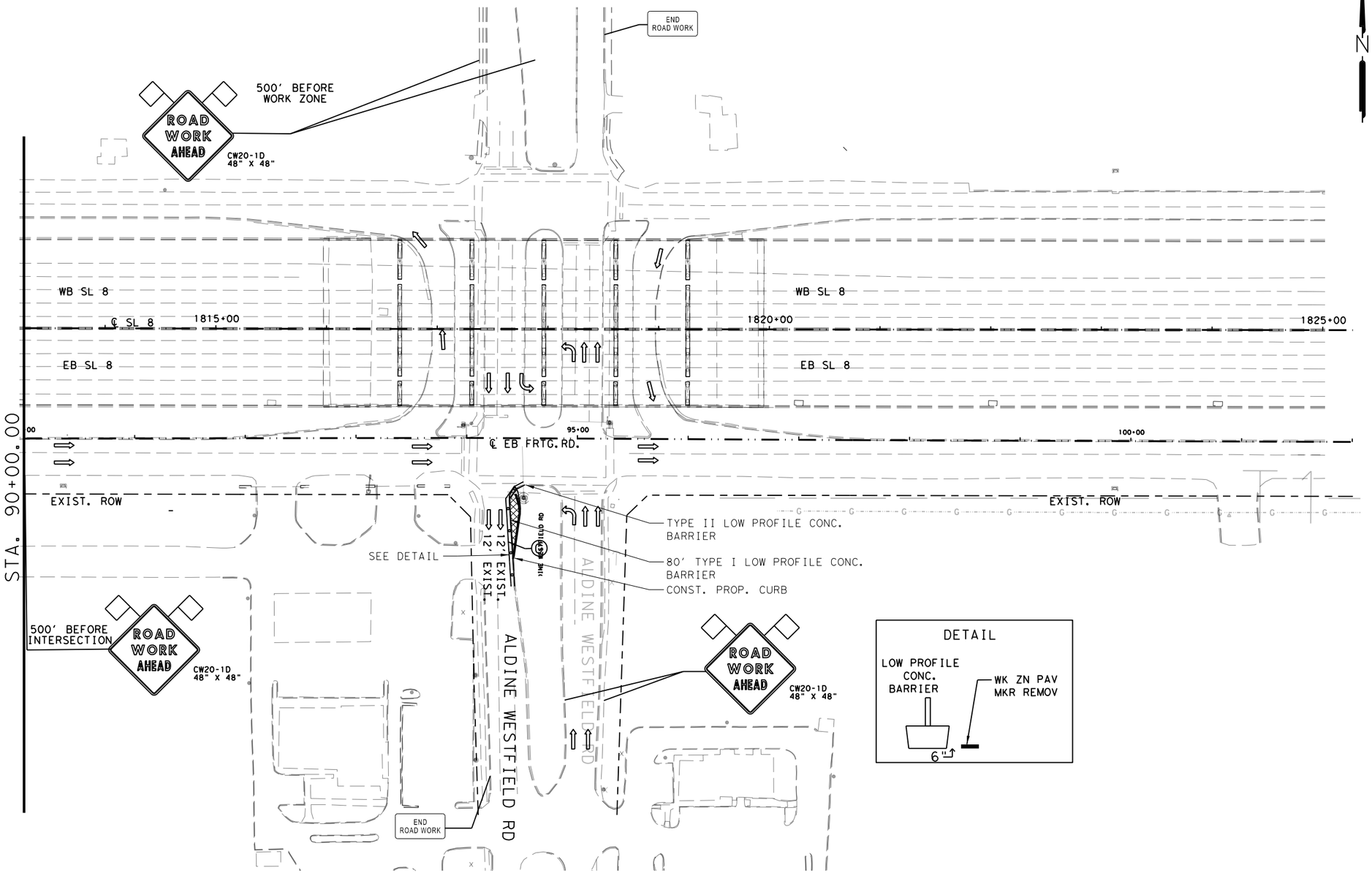

DETAIL

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP
PHASE 1A

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			61
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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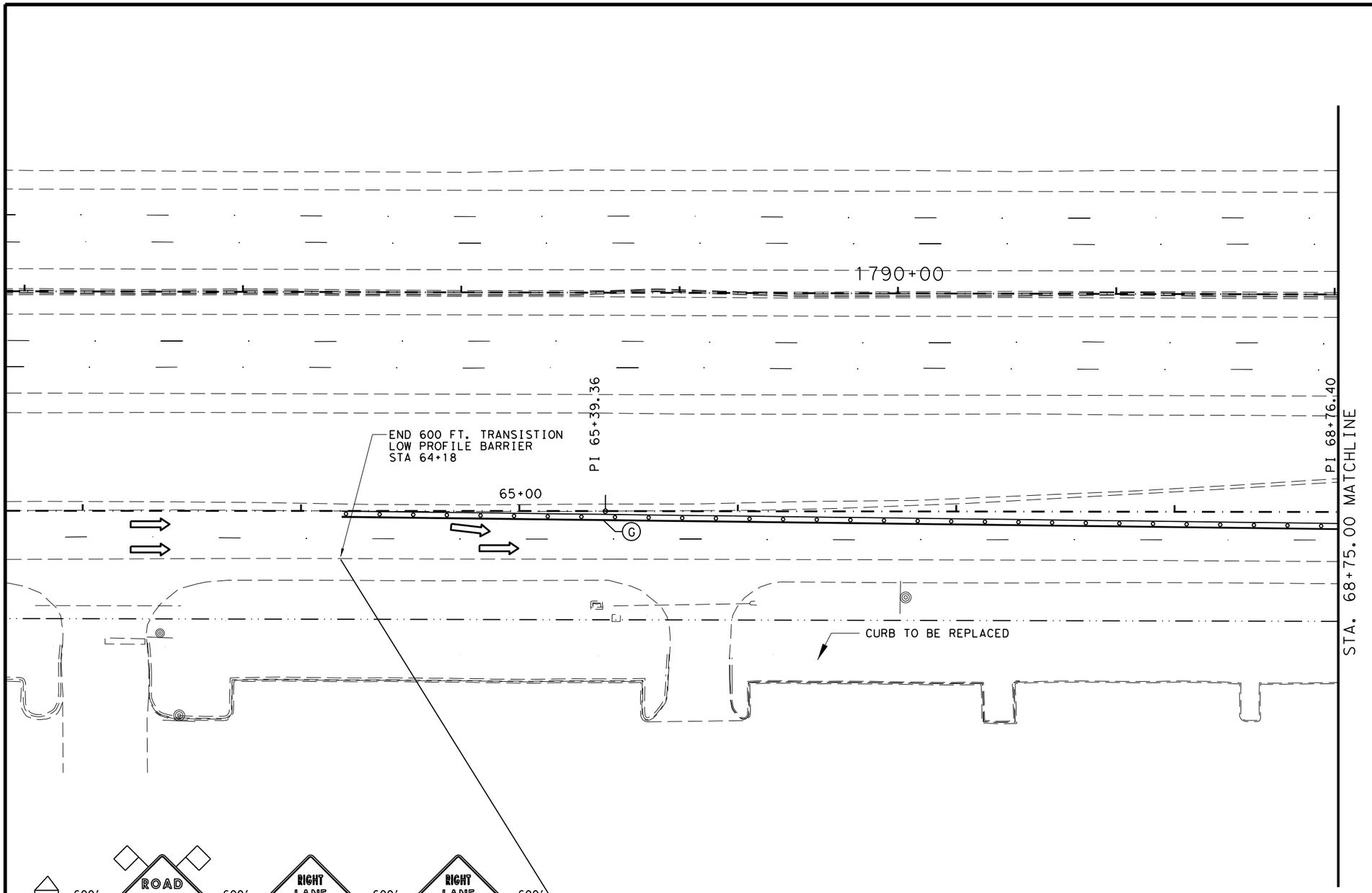

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M — PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 1 OF 8

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		62

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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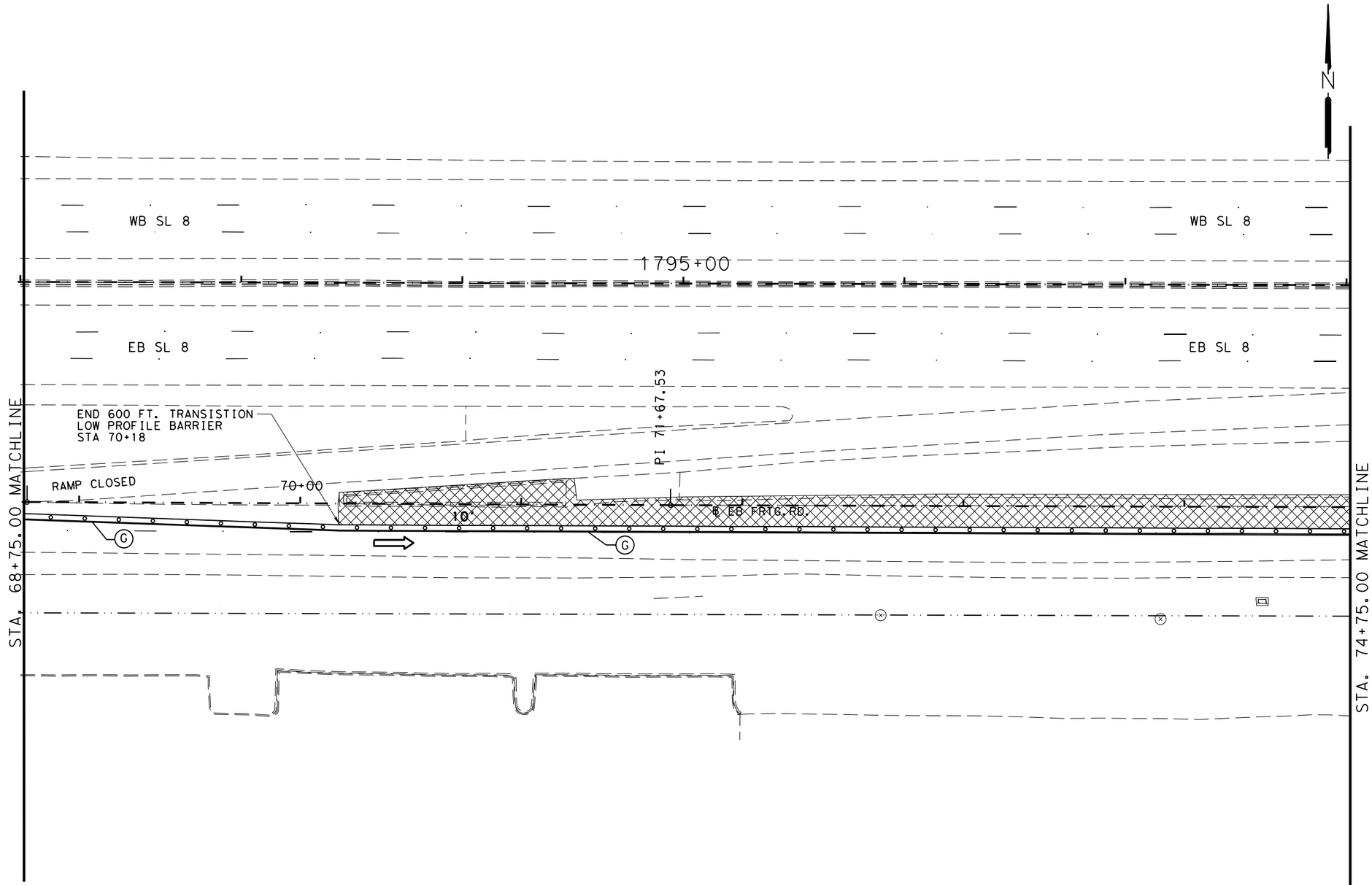

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
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EB FRONTAGE ROAD

TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 2 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			63
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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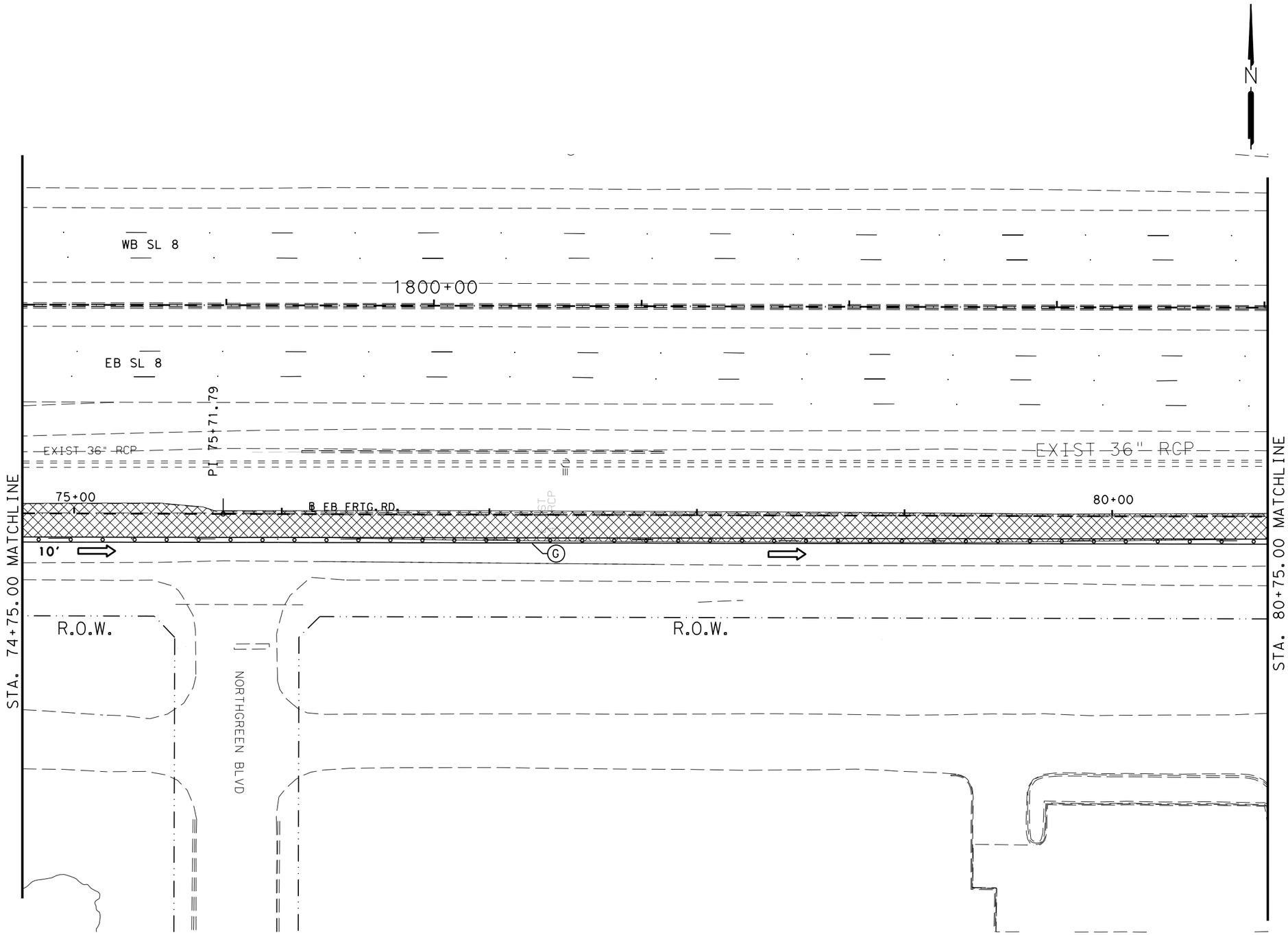

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 3 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			64
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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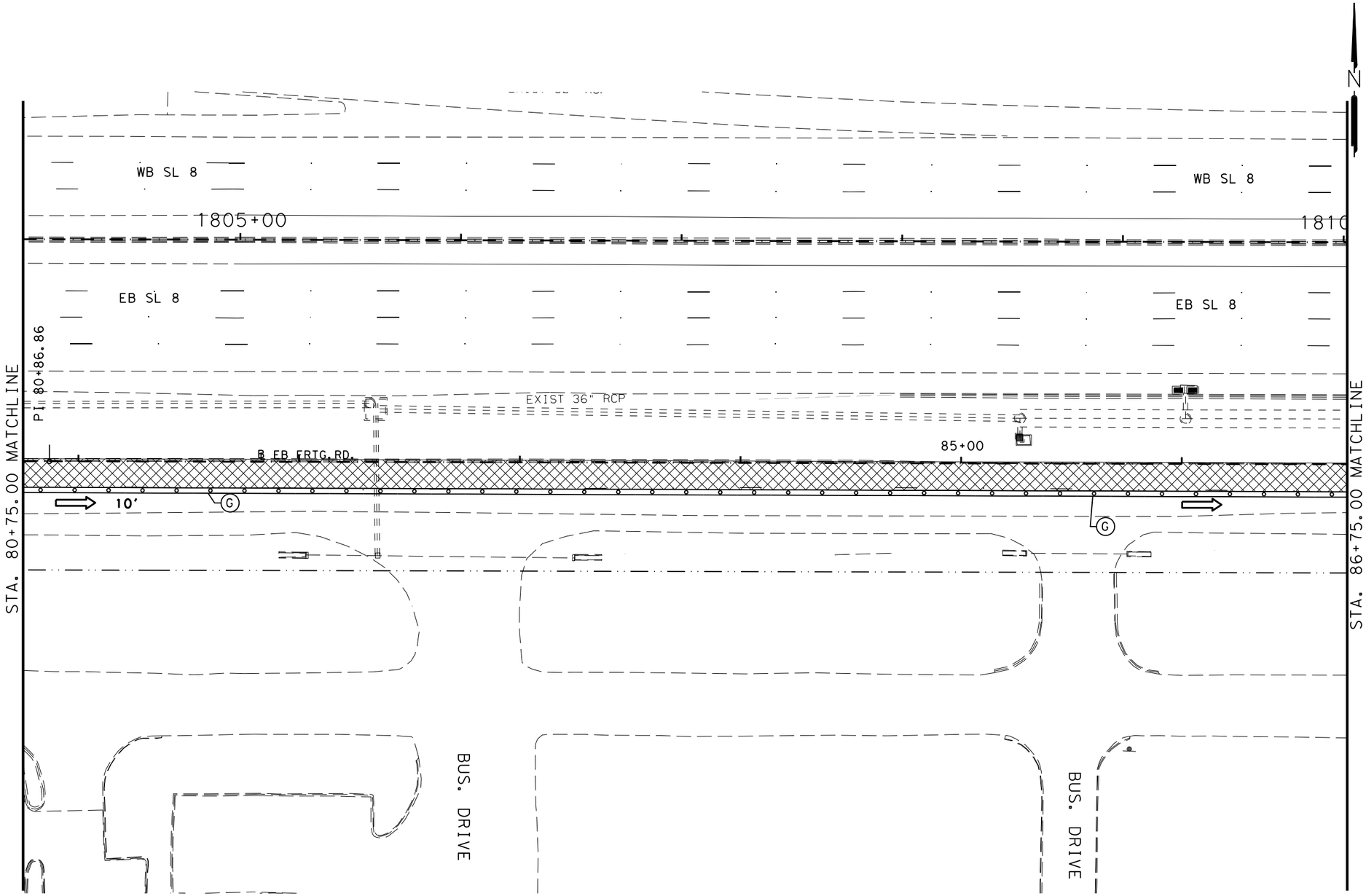

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 4 OF 8

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		65

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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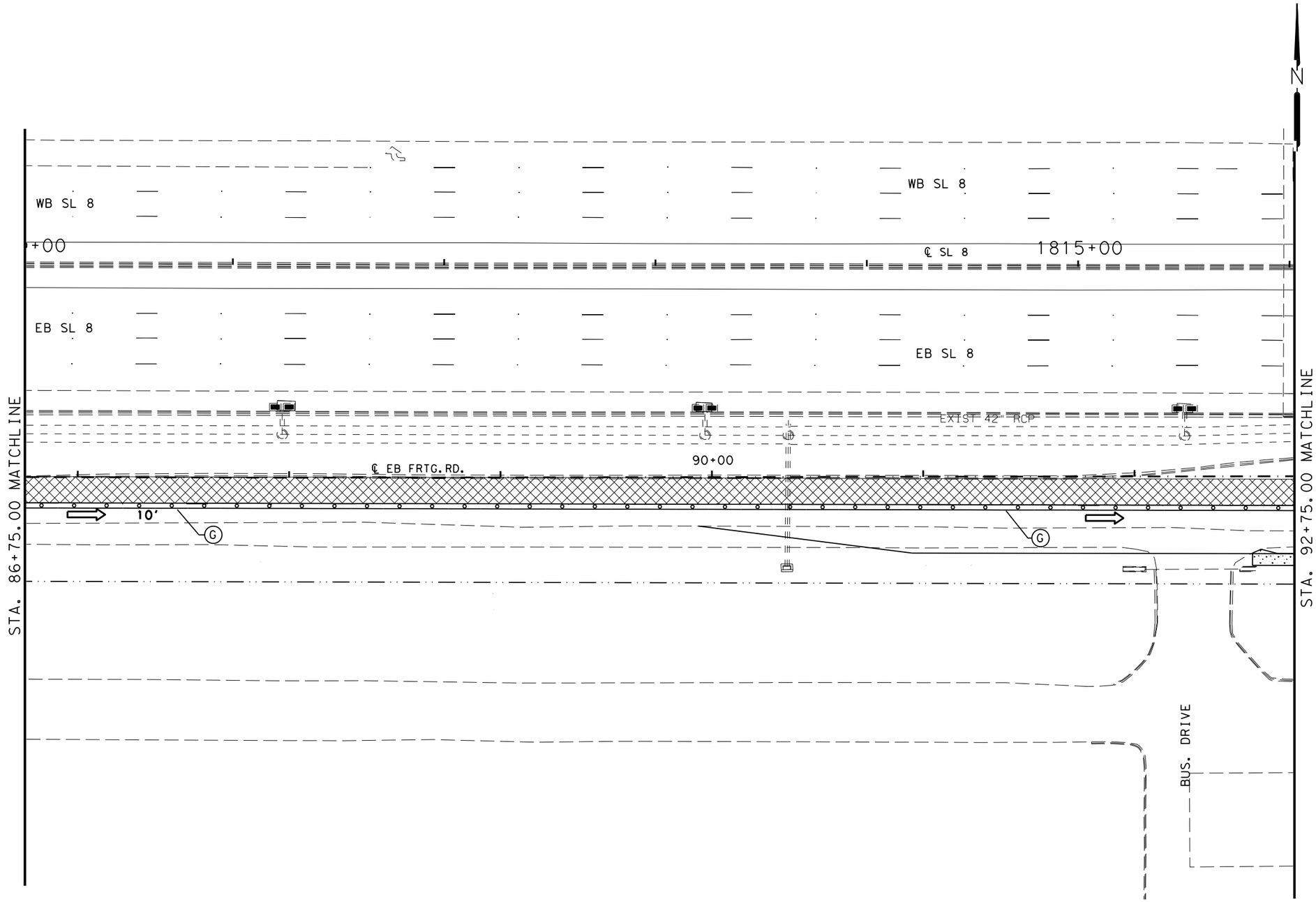

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 5 OF 8

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		66

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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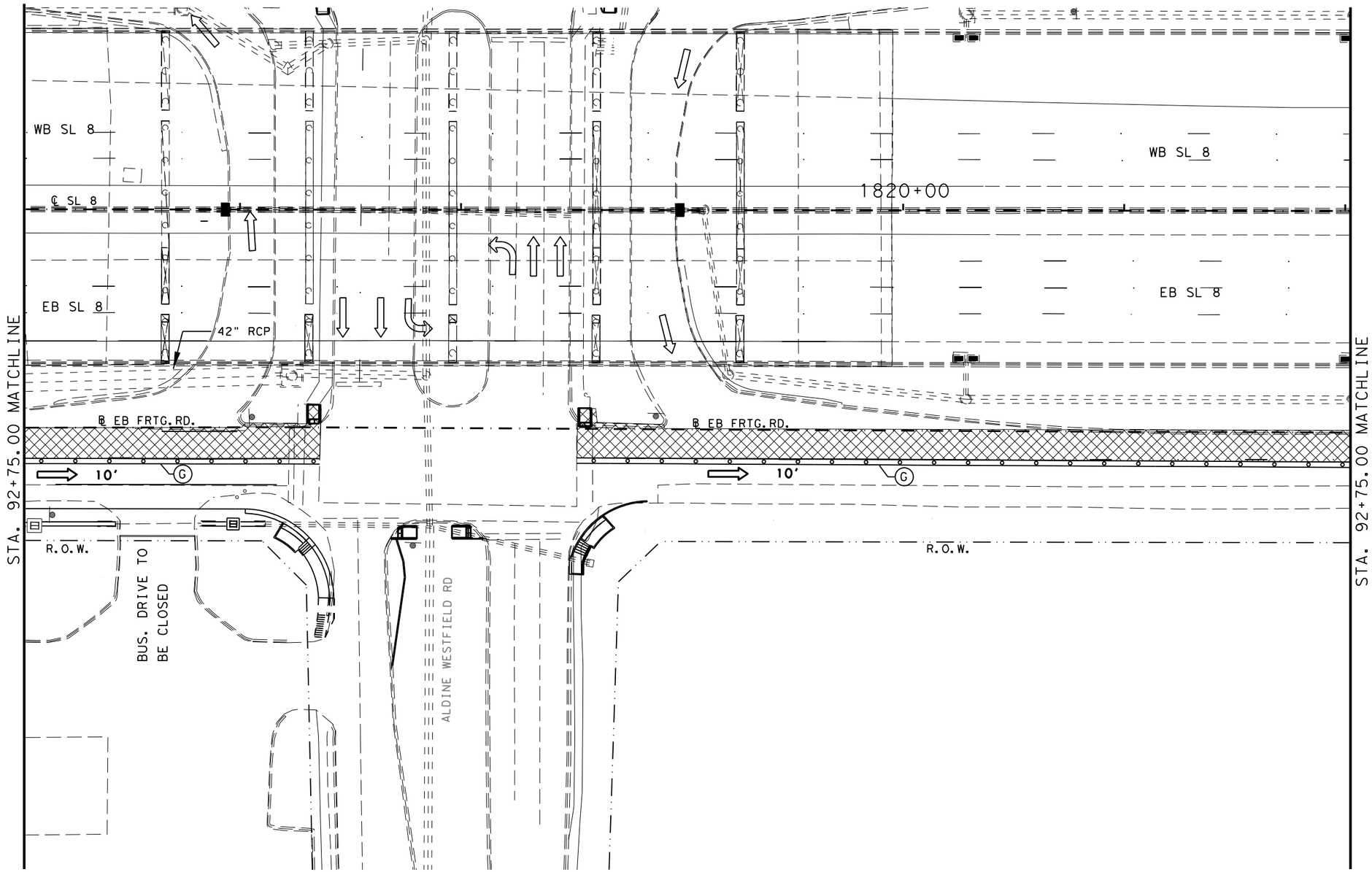

N

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- A WK ZN PAV MKR REMOV (Y) 8" SLD
- B WK ZN PAV MKR REMOV (W) 8" SLD
- C REFL PAV MRKR TY II-A-A
- D REFL PAV MRKR TY II-C-R
- E WK ZN PAV MRK REMOV (W)(4")(SLD)
- F WK ZN PAV MRK REMOV (W)(4")(BRK)
- G WK ZN PAV MRK REMOV (Y)(4")(SLD)
- H1 MULTIPOLYMER PAV MRK W(6")(BRK)
- H2 MULTIPOLYMER PAV MRK B(6")(BRK)
- J MULTIPOLYMER PAV MRK Y(6")(SLD)
- K MULTIPOLYMER PAV MRK W(6")(SLD)
- L MULTIPOLYMER PAV MRK W(6")(DOT)

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SL 8
EB FRONTAGE ROAD

TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 6 OF 8

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		67

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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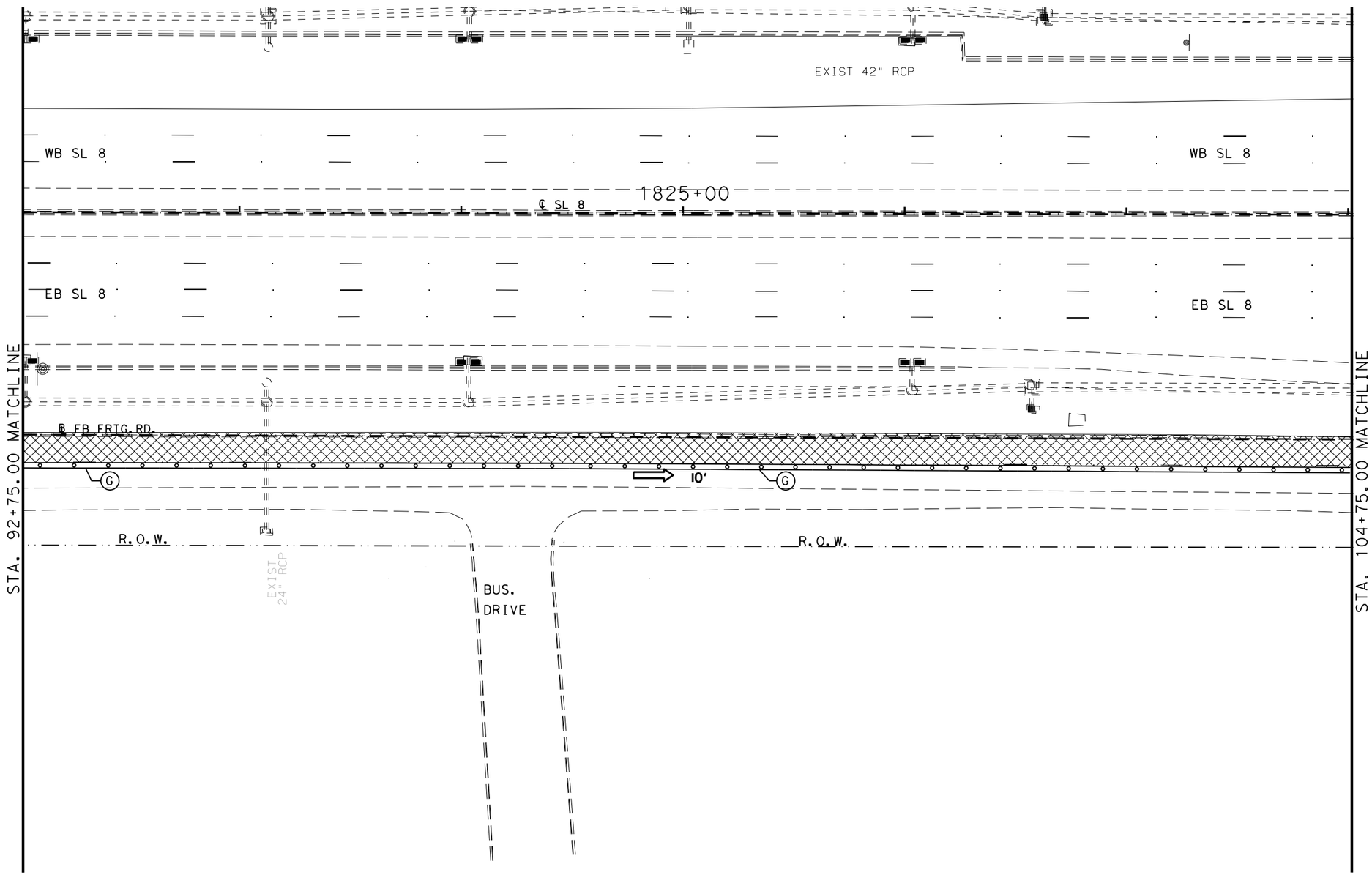

N

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
- (H1) MULTIPOLYMER PAV MRK W(6")(BRK)
- (H2) MULTIPOLYMER PAV MRK B(6")(BRK)
- (J) MULTIPOLYMER PAV MRK Y(6")(SLD)
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
EB FRONTAGE ROAD

TCP

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 7 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			68
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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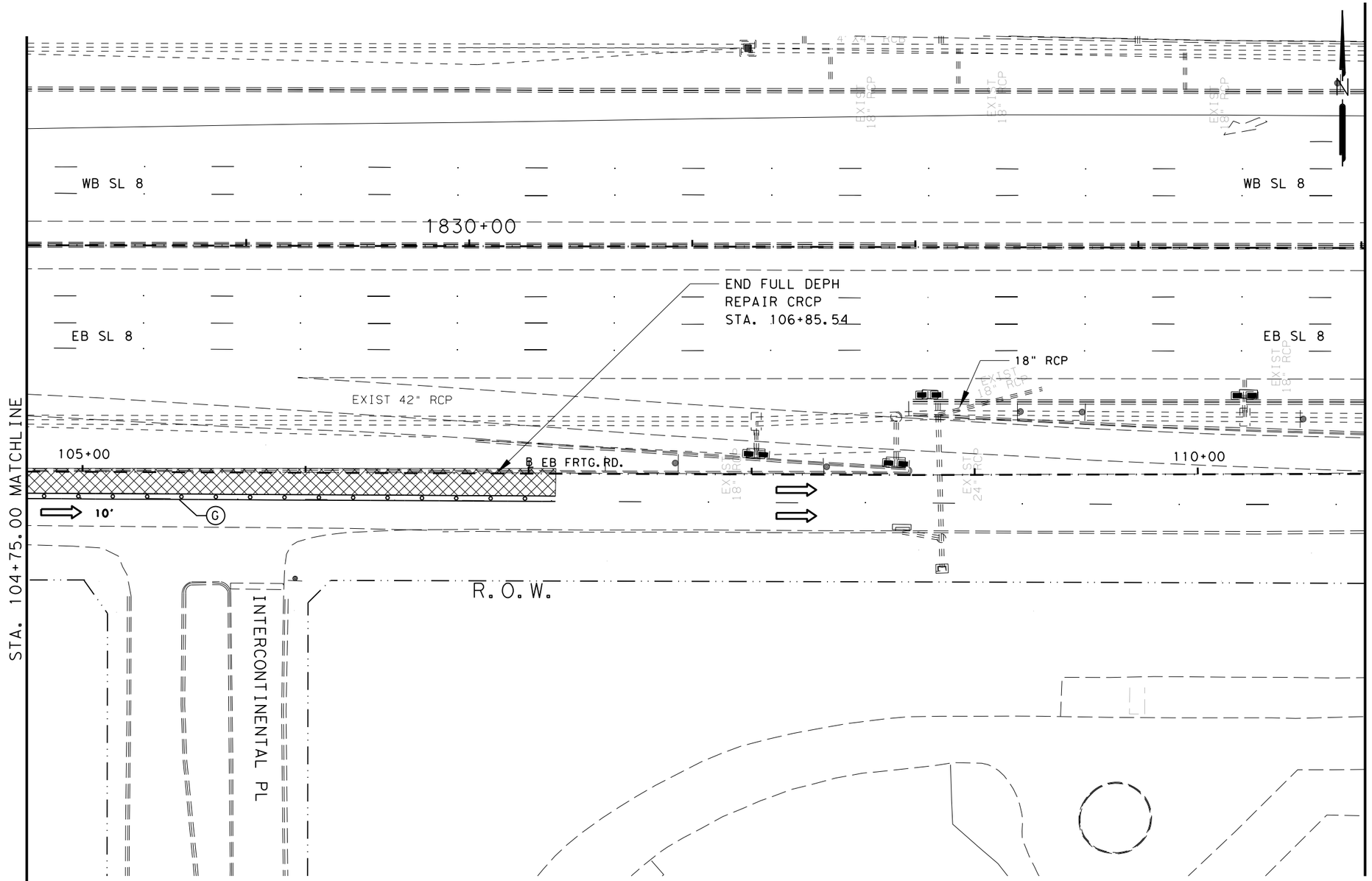

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M — PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- A — WK ZN PAV MKR REMOV (Y) 8" SLD
- B — WK ZN PAV MKR REMOV (W) 8" SLD
- C — REFL PAV MRKR TY II-A-A
- D — REFL PAV MRKR TY II-C-R
- E — WK ZN PAV MRK REMOV (W)(4")(SLD)
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Texas Department of Transportation

SL 8
EB FRONTAGE ROAD

TCP
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 8 OF 8

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			69
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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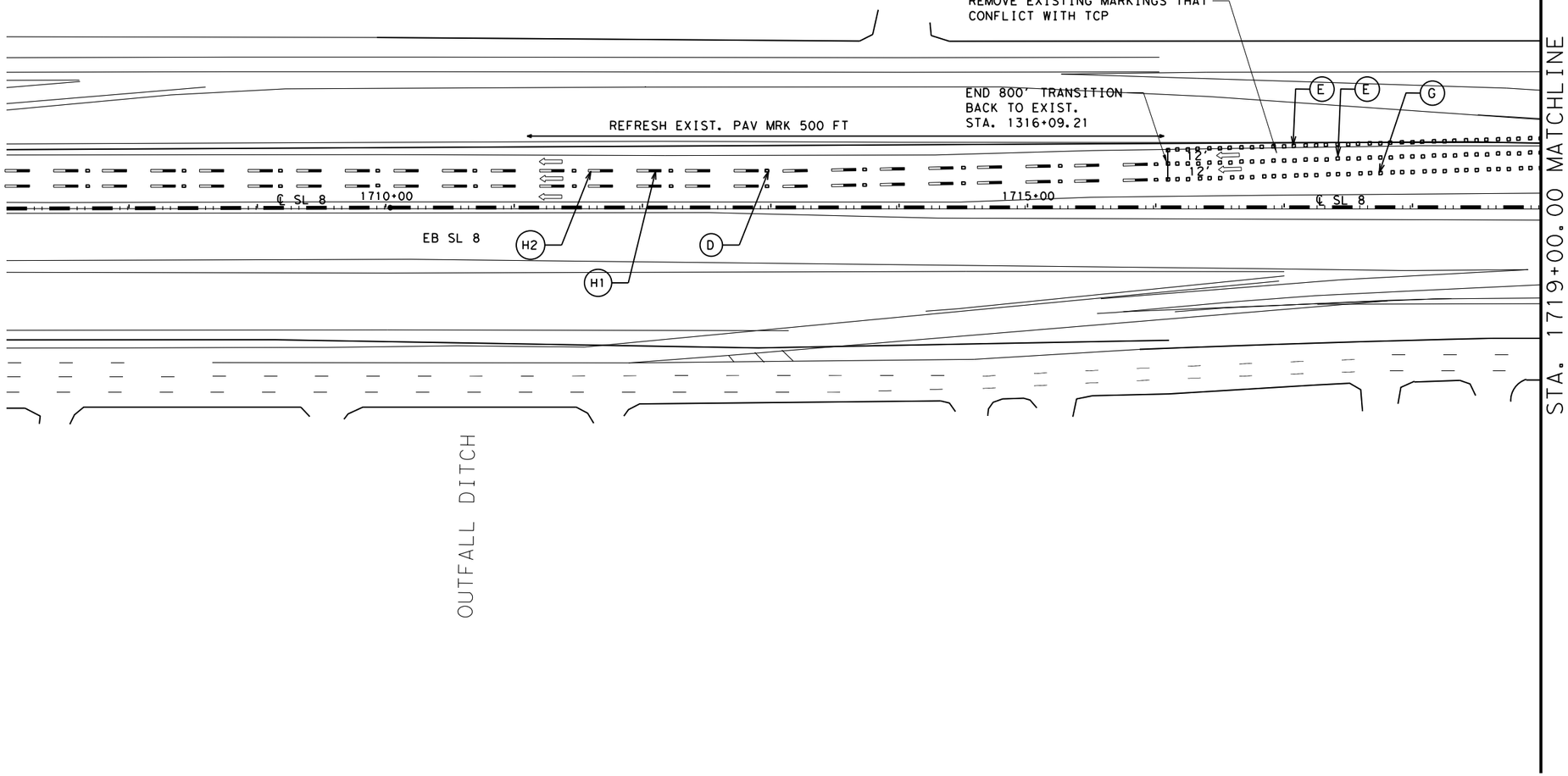

LEGEND

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- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
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SL 8

WB TCP

PHASE 1

SCALE: 1" = 100' HORZ

SHEET 1 OF 7

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		70

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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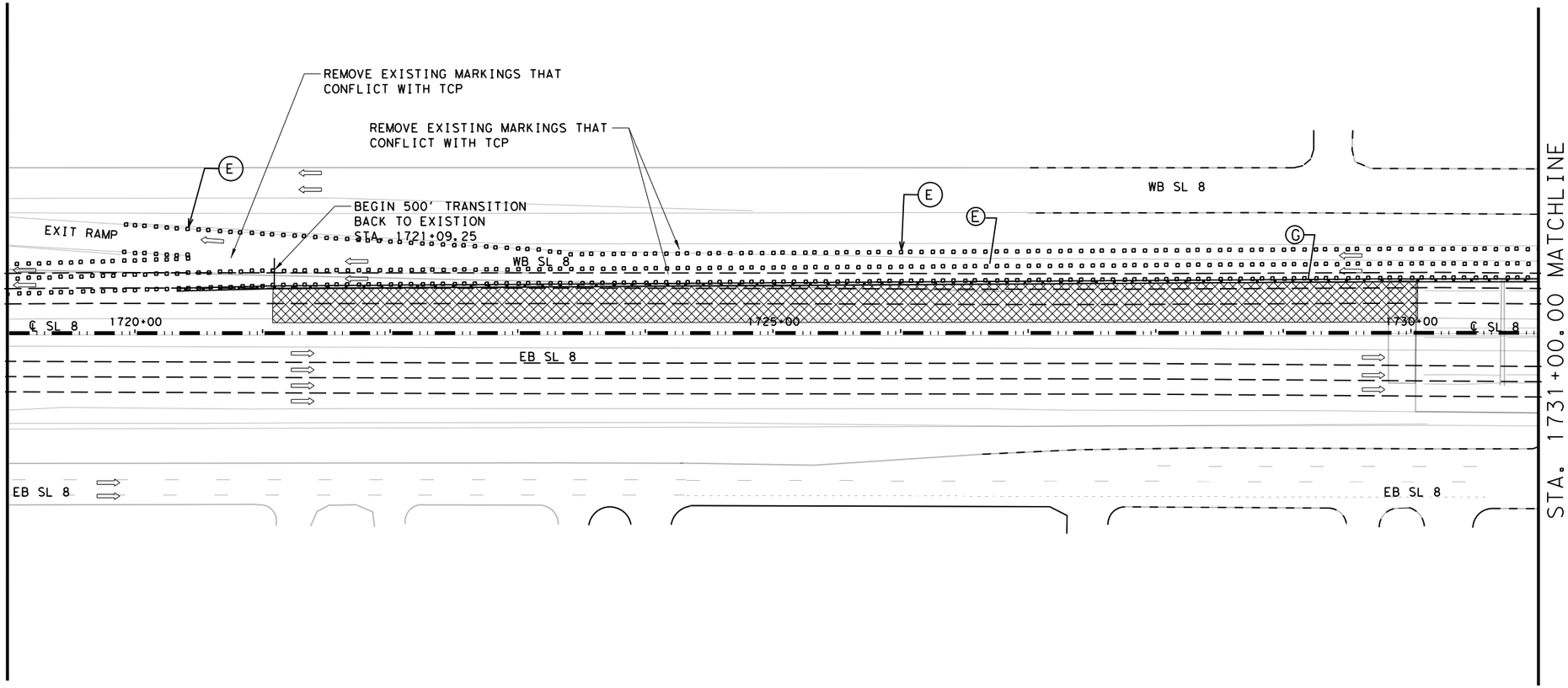

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LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
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WB TCP

PHASE 1

SCALE: 1" = 100' HORZ

SHEET 2 OF 7

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		71

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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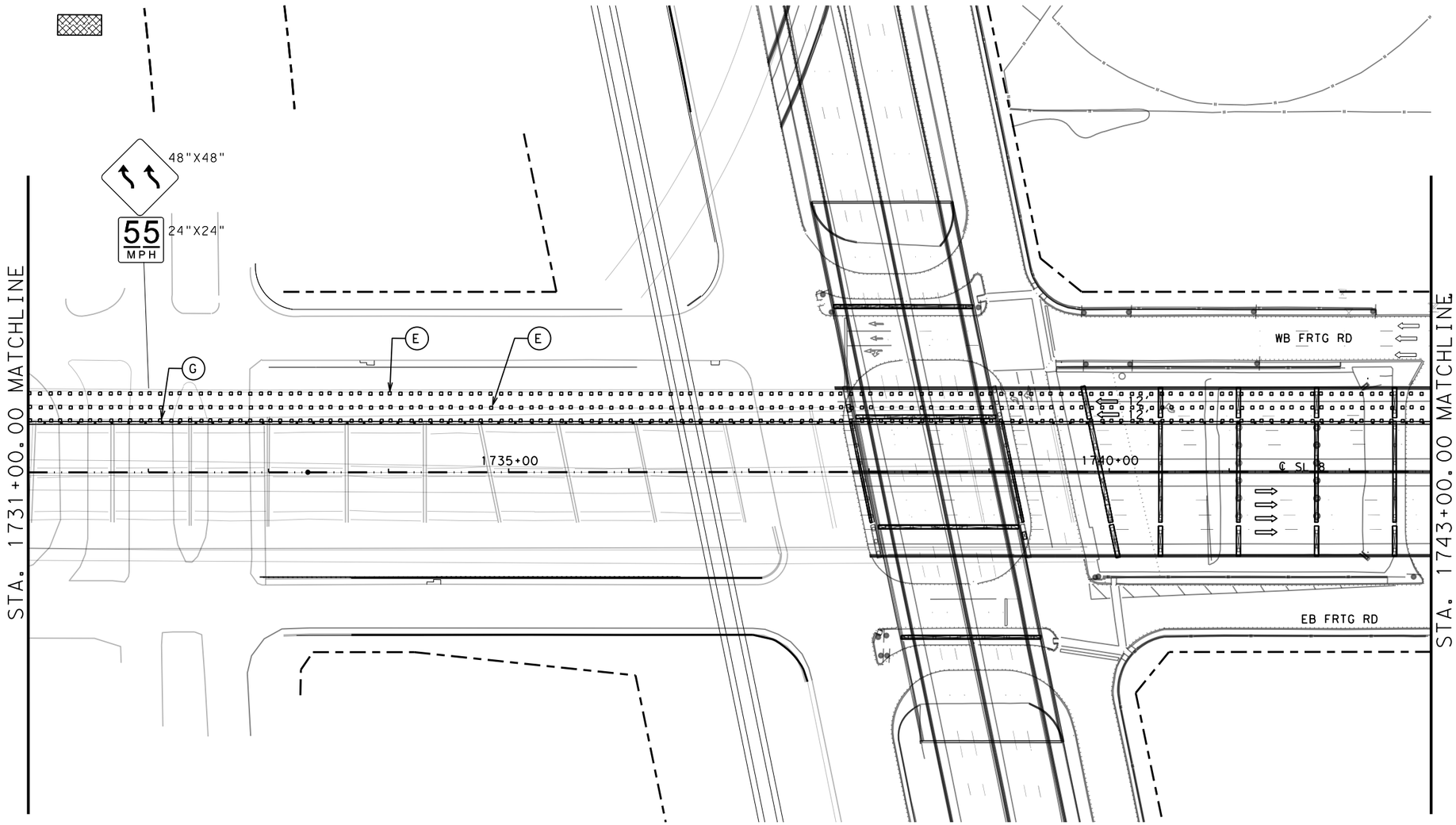

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
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PHASE 1

SCALE: 1" = 100' HORZ

SHEET 3 OF 7

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		72

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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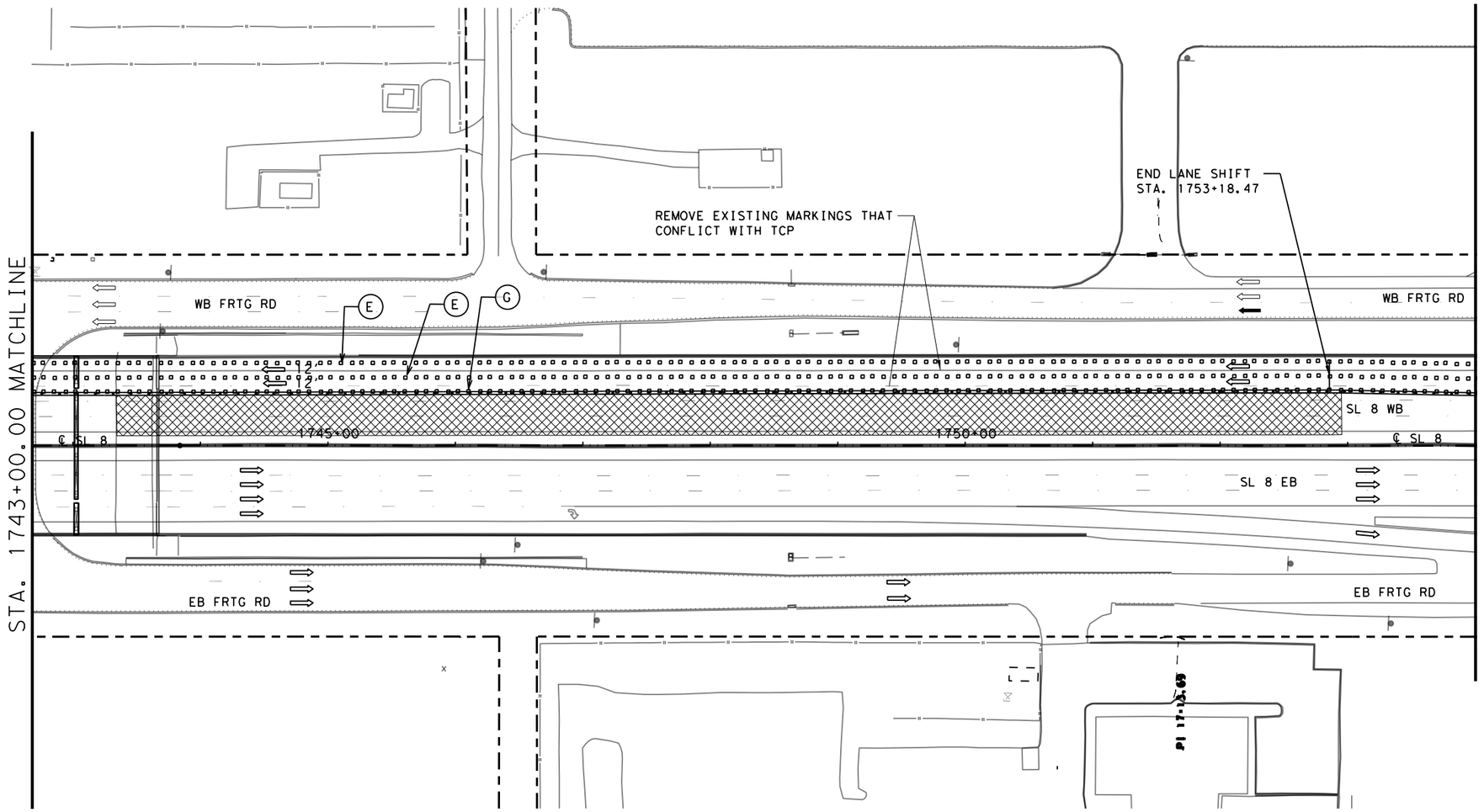

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
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PHASE 1

SCALE: 1" = 100' HORZ

SHEET 4 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			73
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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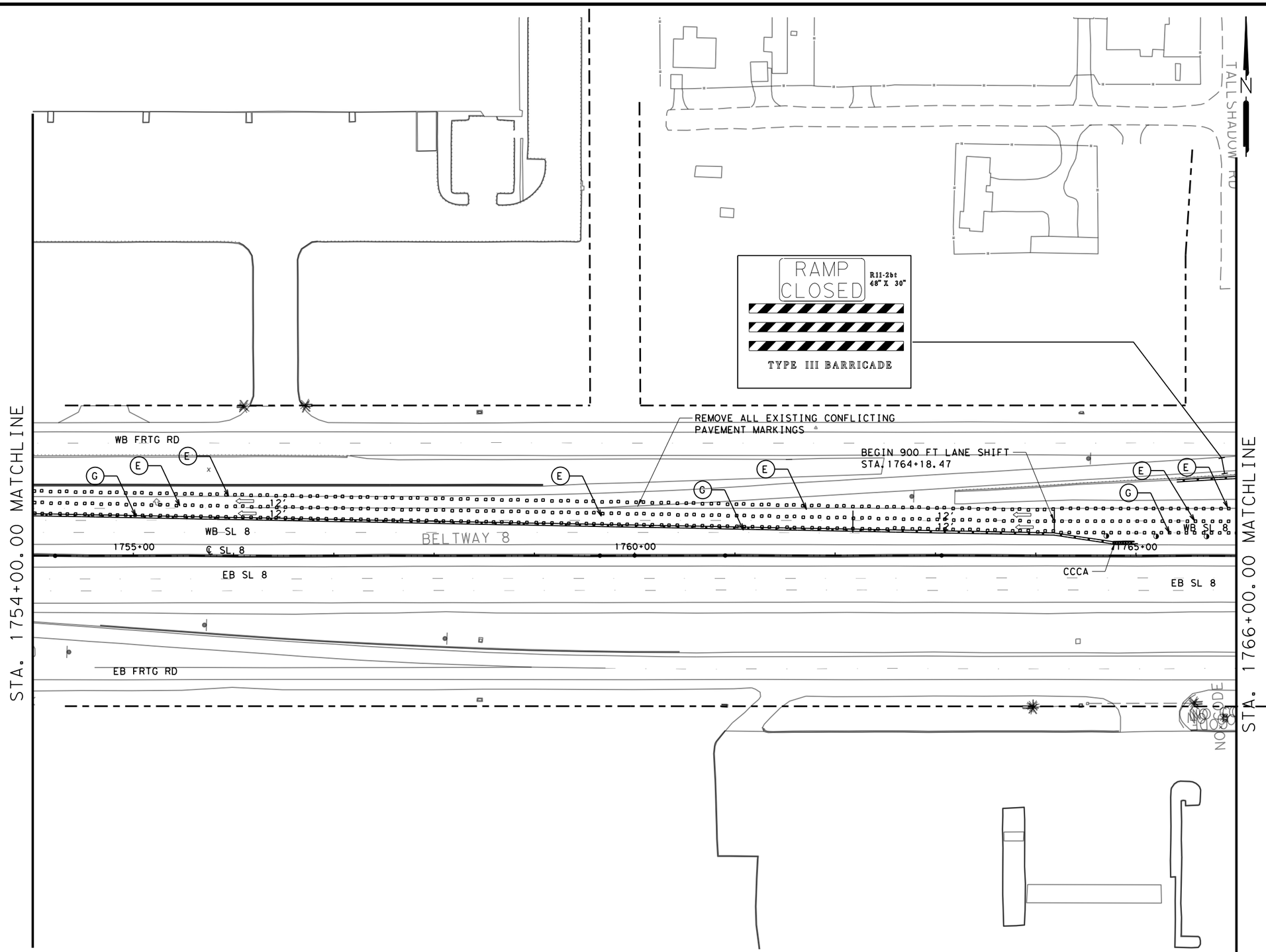

LEGEND

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SL 8

WB TCP

PHASE 1

SCALE: 1" = 100' HORZ

SHEET 5 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			74
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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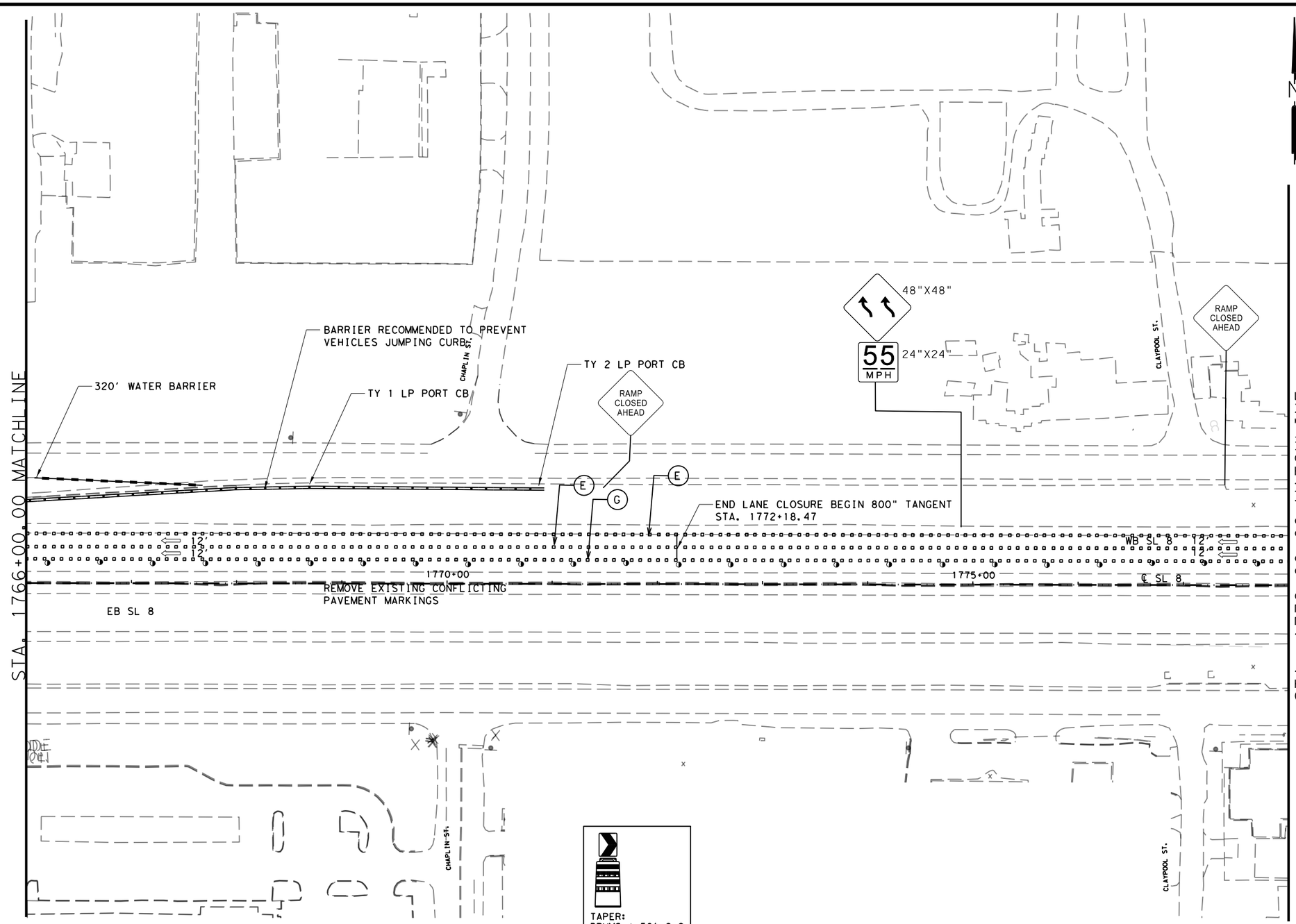

LEGEND

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SL 8

WB TCP

PHASE 1

SCALE: 1" = 100' HORZ

SHEET 6 OF 7

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		75

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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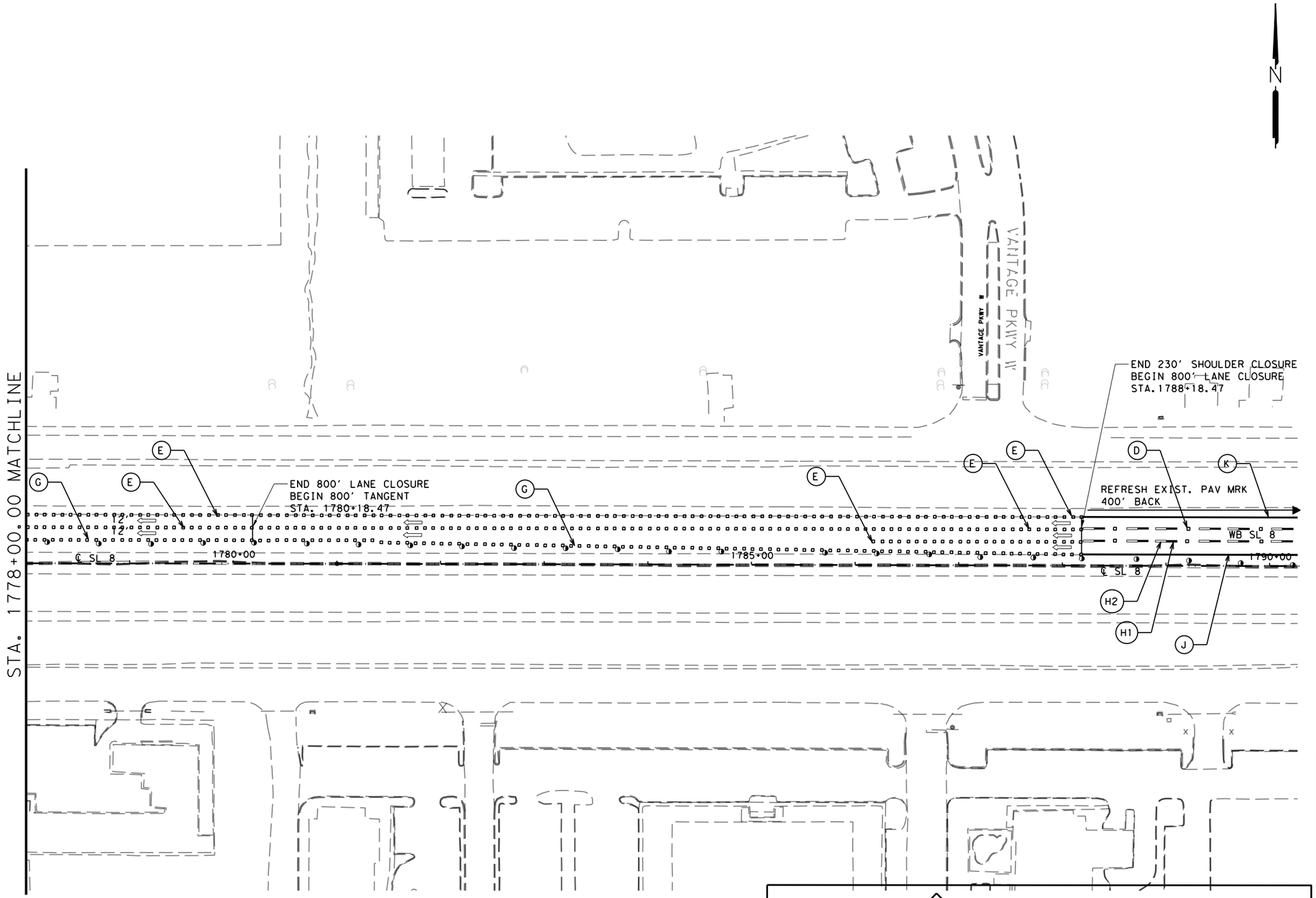

LEGEND

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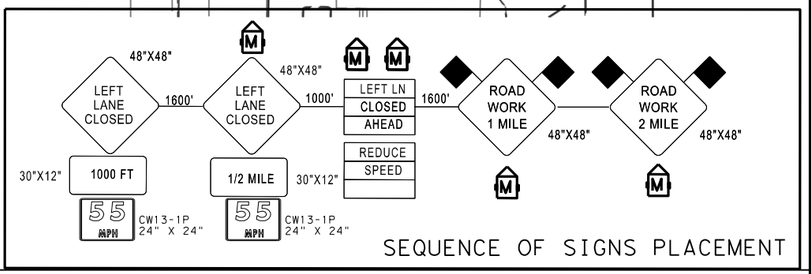
- (K) MULTIPOLYMER PAV MRK W(6")(SLD)
- (L) MULTIPOLYMER PAV MRK W(6")(DOT)

TAPER:
DRUMS @ 50' C-C
WITH CHEVRON ON
EVERY OTHER DRUM



SEQUENCE OF SIGNS PLACEMENT

STATE OF TEXAS
DANIEL DUKE THOMPSON
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LICENSED PROFESSIONAL ENGINEER

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SL 8

WB TCP

PHASE 1

SCALE: 1" = 100' HORZ

SHEET 7 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			76
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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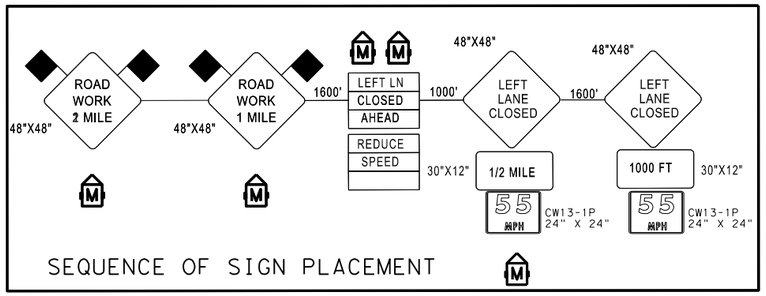
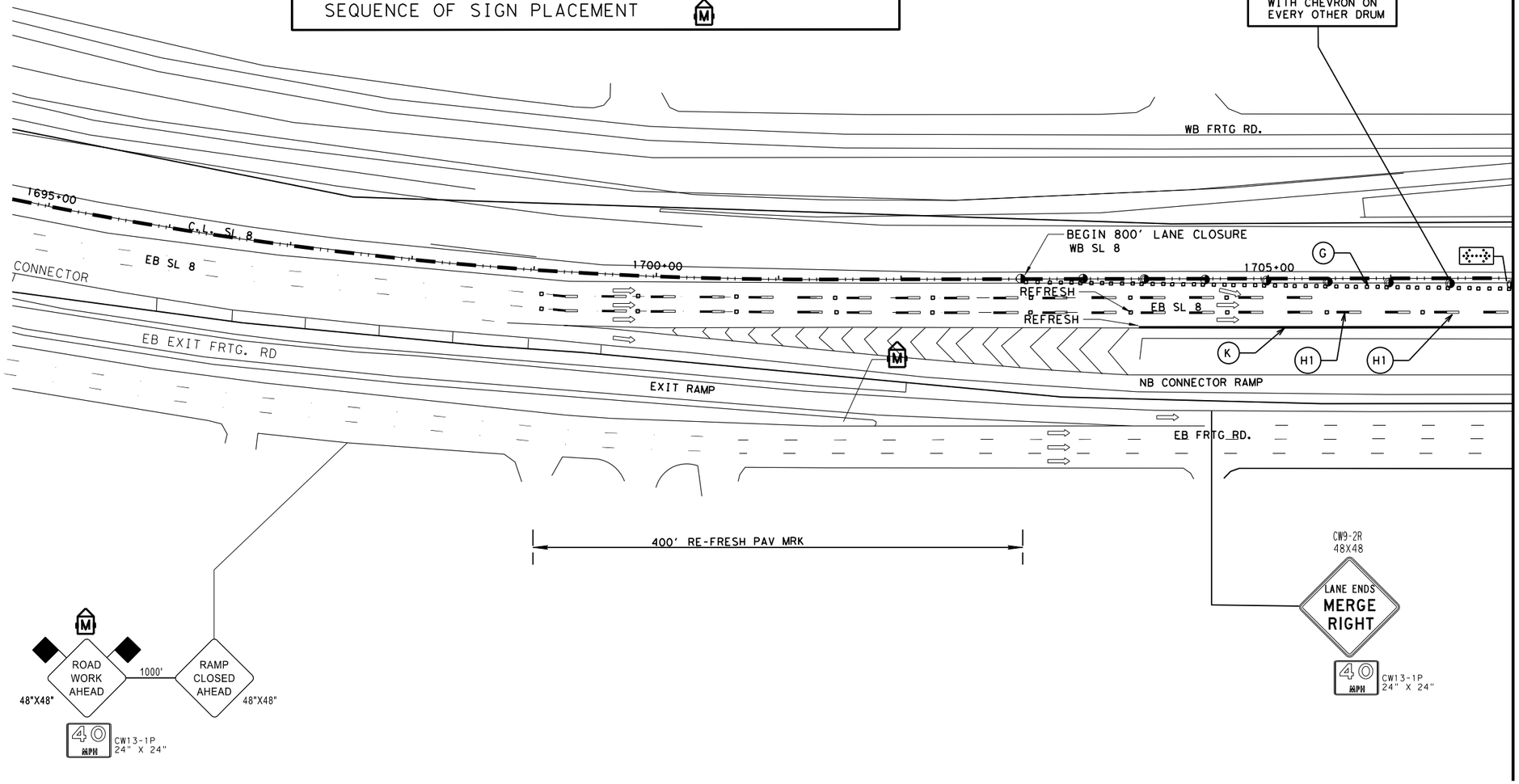


SEQUENCE OF SIGN PLACEMENT



LEGEND

- PROP WORK ZONE
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- PROPOSED TRAFFIC
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SL 8

EB TCP

PHASE 1

SCALE: 1" = 100' HORZ

SHEET 1 OF 5

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		78

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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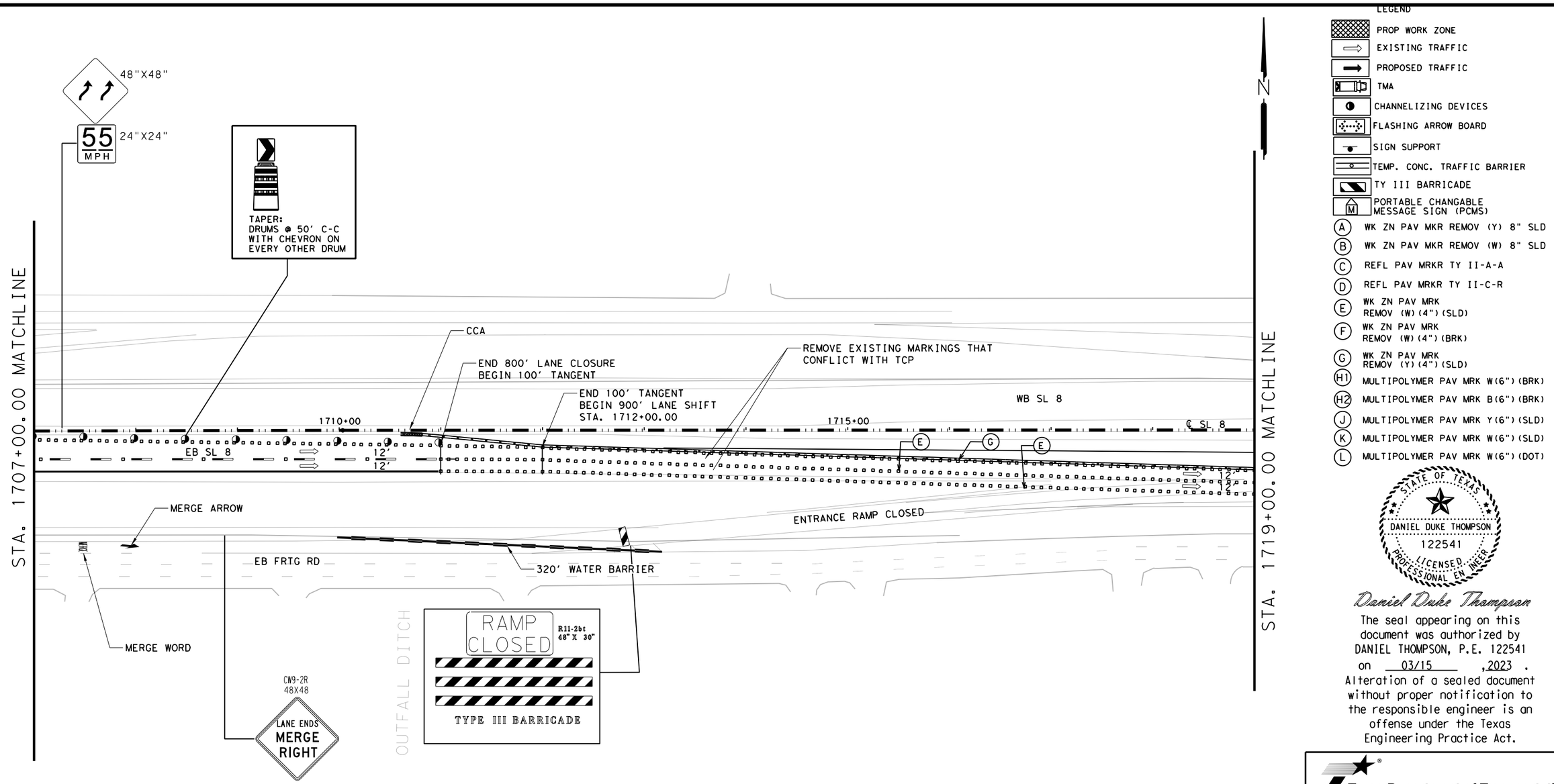

LEGEND

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PHASE 1

SCALE: 1" = 100' HORZ

SHEET 2 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			79
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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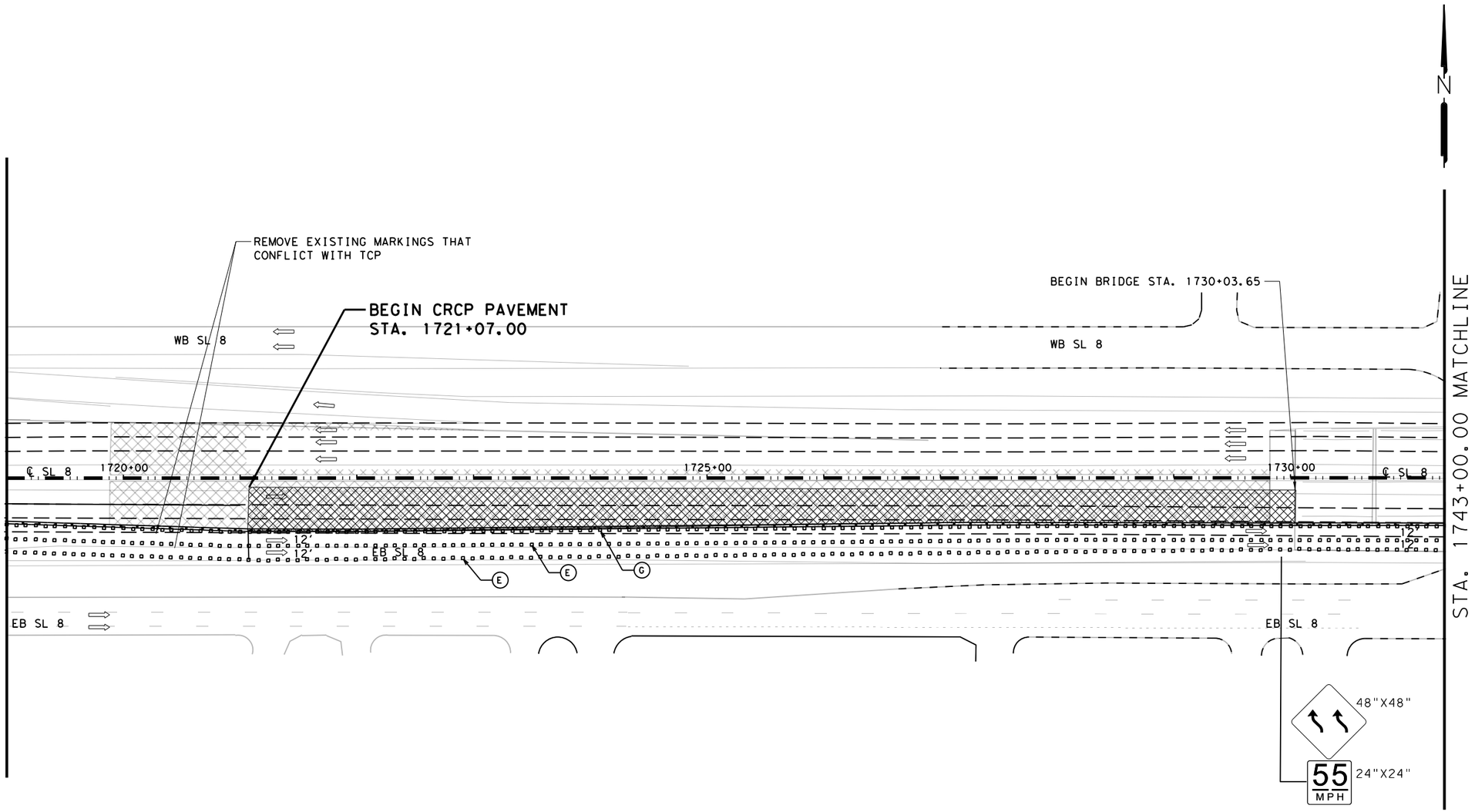

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- M — PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- A — WK ZN PAV MKR REMOV (Y) 8" SLD
- B — WK ZN PAV MKR REMOV (W) 8" SLD
- C — REFL PAV MRKR TY II-A-A
- D — REFL PAV MRKR TY II-C-R
- E — WK ZN PAV MRK REMOV (W)(4")(SLD)
- F — WK ZN PAV MRK REMOV (W)(4")(BRK)
- G — WK ZN PAV MRK REMOV (Y)(4")(SLD)
- H1 — MULTIPOLYMER PAV MRK W(6")(BRK)
- H2 — MULTIPOLYMER PAV MRK B(6")(BRK)
- J — MULTIPOLYMER PAV MRK Y(6")(SLD)
- K — MULTIPOLYMER PAV MRK W(6")(SLD)
- L — MULTIPOLYMER PAV MRK W(6")(DOT)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8

EB TCP

PHASE 1

SCALE: 1" = 100' HORZ

SHEET 3 OF 5

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		80

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

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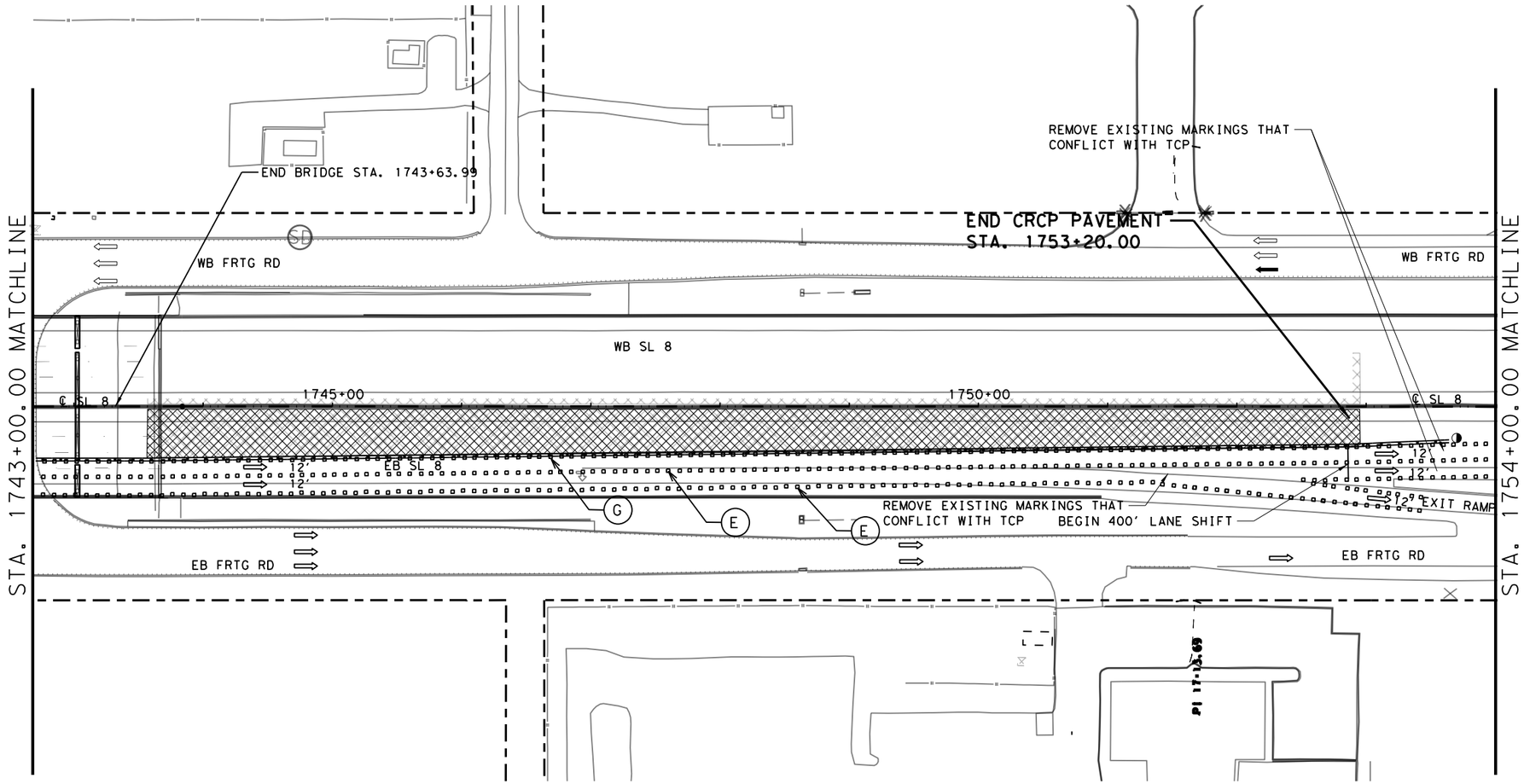

LEGEND

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- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
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- B — WK ZN PAV MKR REMOV (W) 8" SLD
- C — REFL PAV MRKR TY II-A-A
- D — REFL PAV MRKR TY II-C-R
- E — WK ZN PAV MRK REMOV (W)(4")(SLD)
- F — WK ZN PAV MRK REMOV (W)(4")(BRK)
- G — WK ZN PAV MRK REMOV (Y)(4")(SLD)
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PHASE 1

SCALE: 1" = 100' HORZ

SHEET 4 OF 5

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			81
STATE	DIST	COUNTY	
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CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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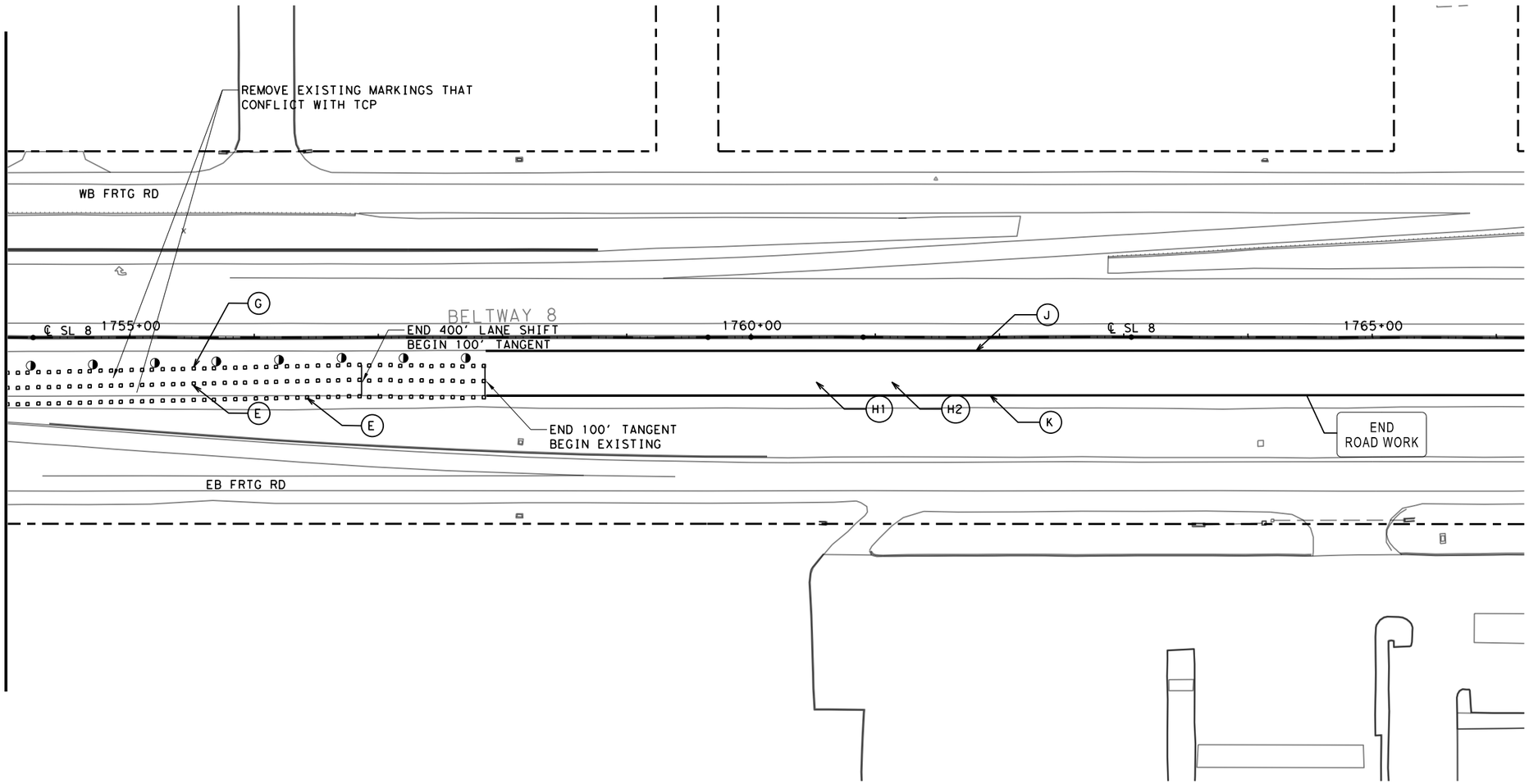

LEGEND

- PROP WORK ZONE
- EXISTING TRAFFIC
- PROPOSED TRAFFIC
- TMA
- CHANNELIZING DEVICES
- FLASHING ARROW BOARD
- SIGN SUPPORT
- TEMP. CONC. TRAFFIC BARRIER
- TY III BARRICADE
- (M) PORTABLE CHANGABLE MESSAGE SIGN (PCMS)
- (A) WK ZN PAV MKR REMOV (Y) 8" SLD
- (B) WK ZN PAV MKR REMOV (W) 8" SLD
- (C) REFL PAV MRKR TY II-A-A
- (D) REFL PAV MRKR TY II-C-R
- (E) WK ZN PAV MRK REMOV (W)(4")(SLD)
- (F) WK ZN PAV MRK REMOV (W)(4")(BRK)
- (G) WK ZN PAV MRK REMOV (Y)(4")(SLD)
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PHASE 1

SCALE: 1" = 100' HORZ

SHEET 5 OF 5

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		82

STATE	DIST	COUNTY	
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CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

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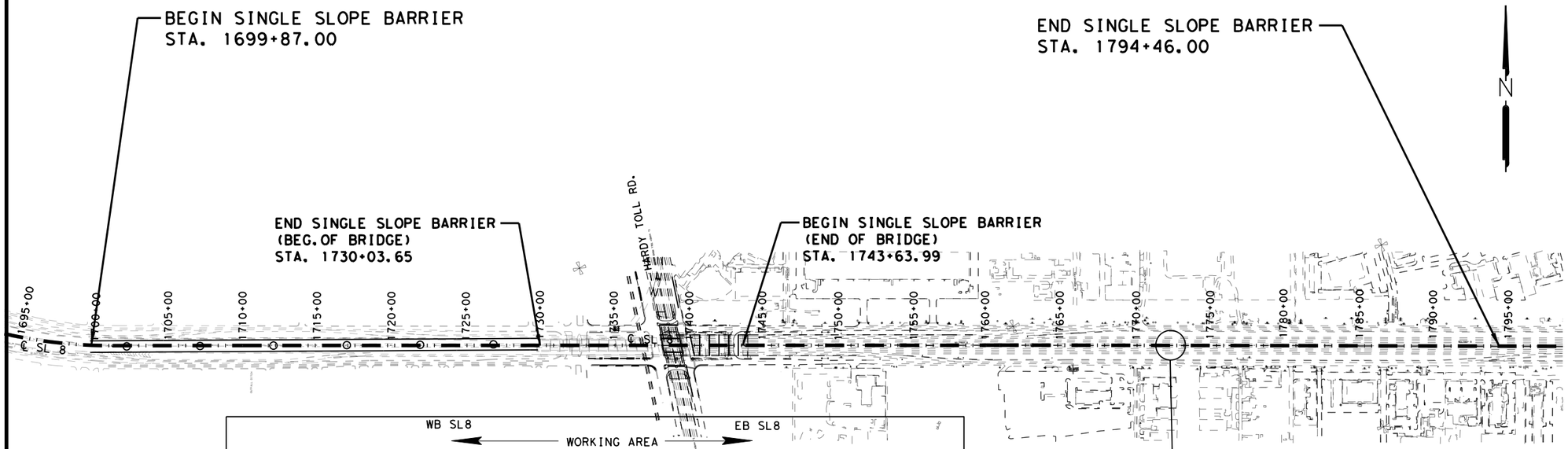

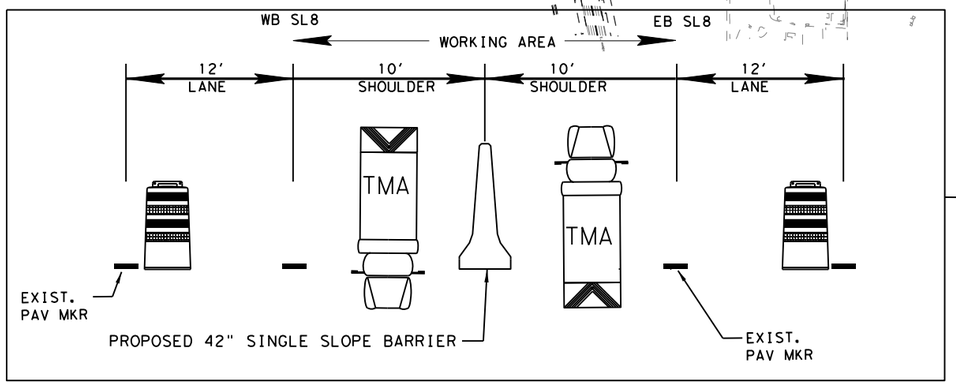

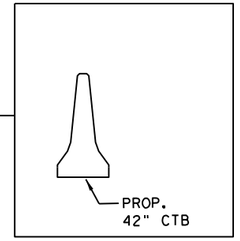

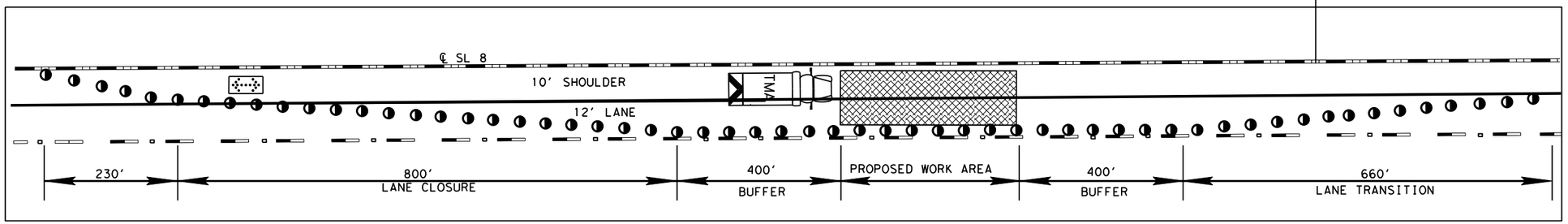

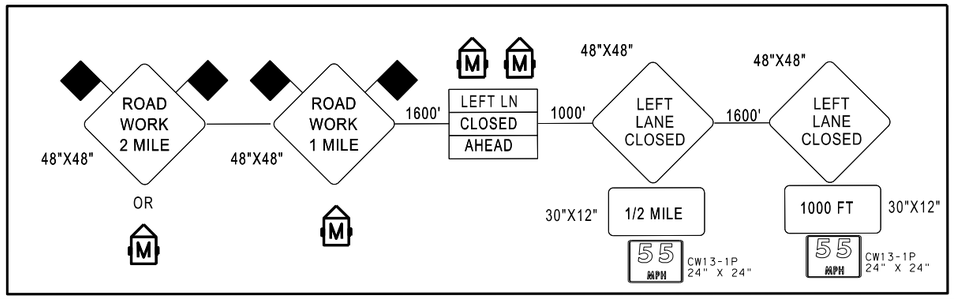

LEGEND

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TCP

CTB PHASE

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			83
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

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BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

SHEET 1 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	84
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	HOU	HARRIS		84
5-10 5-21				

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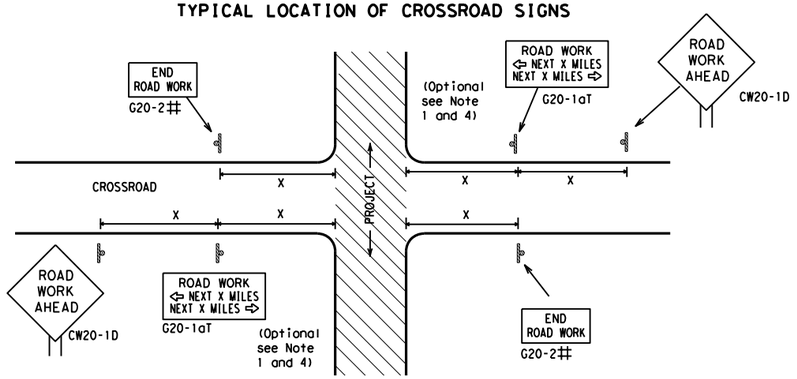
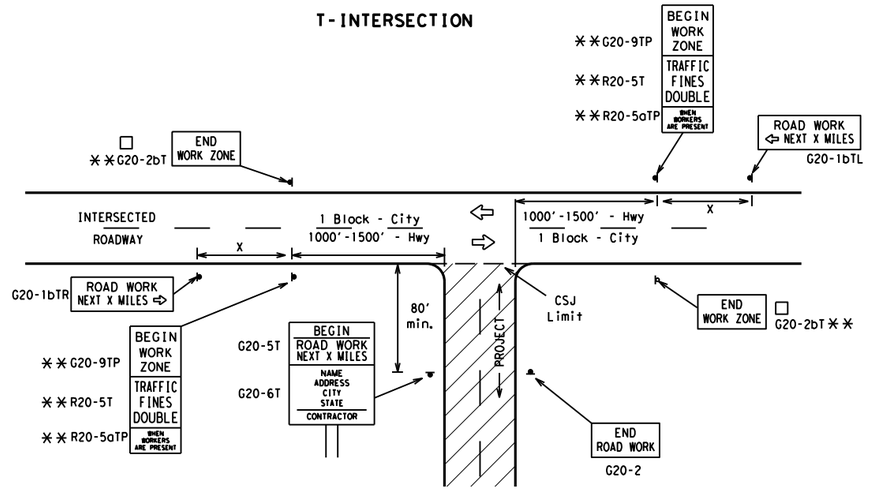
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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]

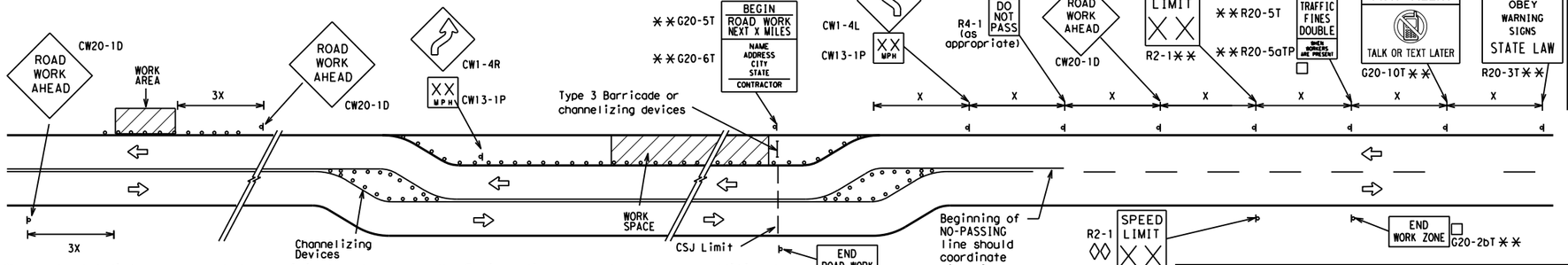
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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.

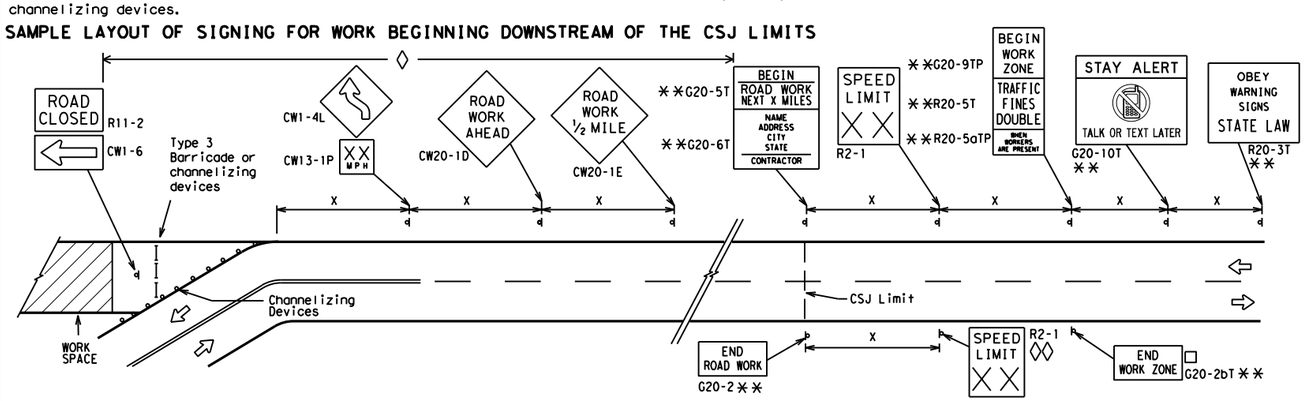
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

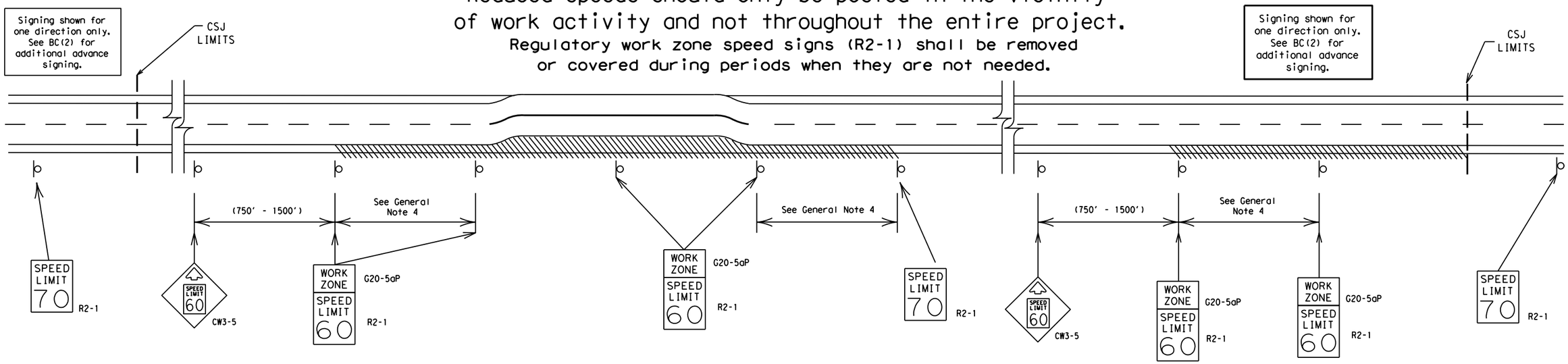
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	85
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	HARRIS		85

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.

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

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REVISIONS	3256	02	093	86
9-07 8-14	DIST	COUNTY		SHEET NO.
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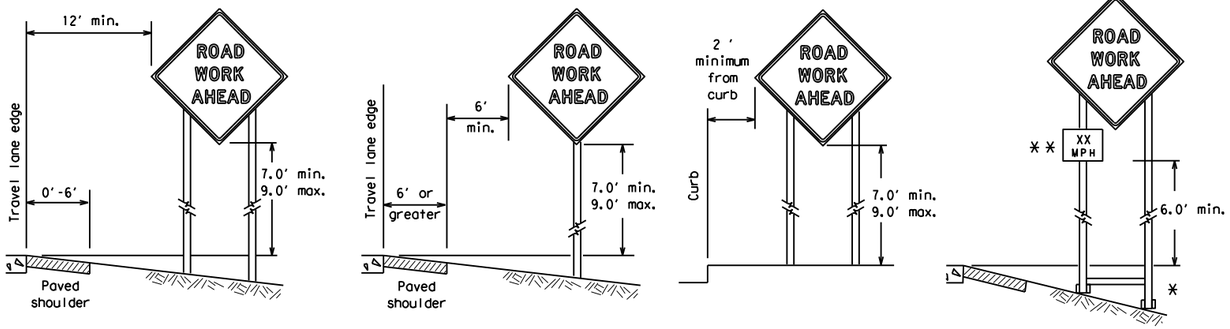
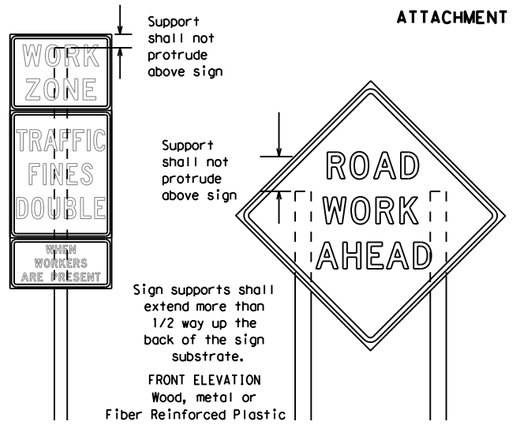
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

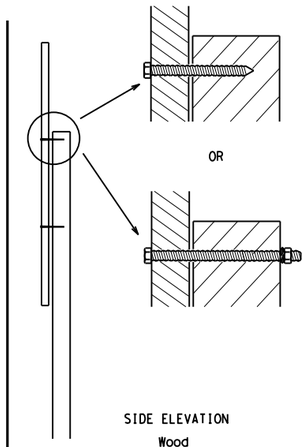


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





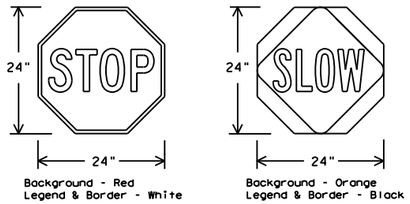
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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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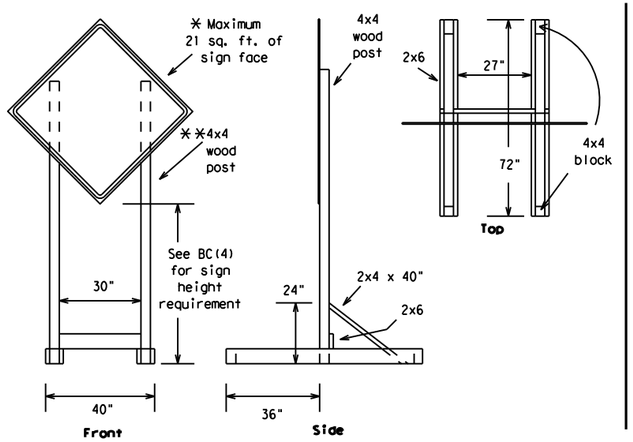
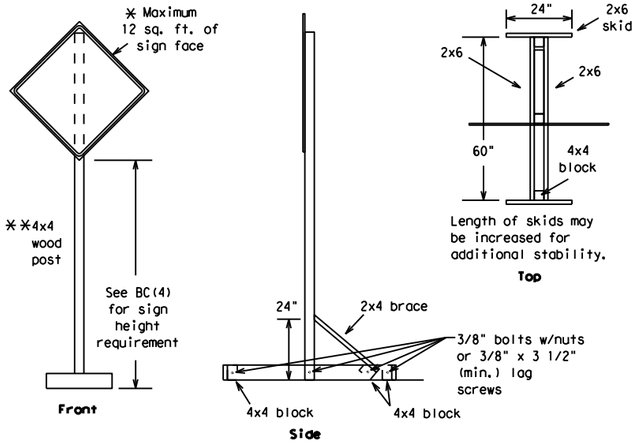
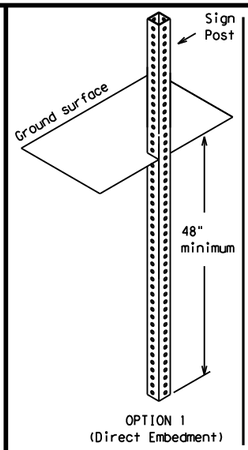
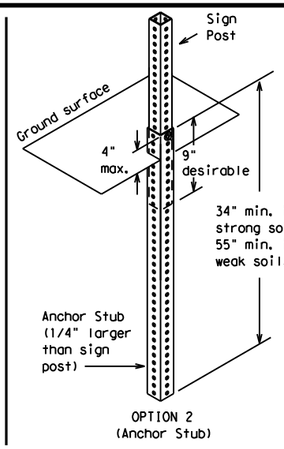


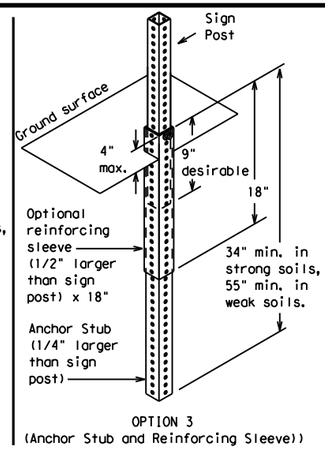


SKID MOUNTED WOOD SIGN SUPPORTS

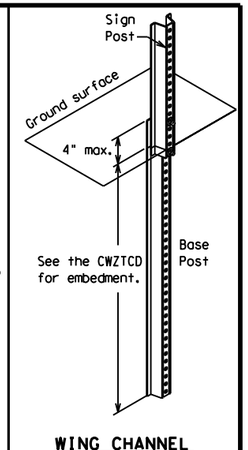
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







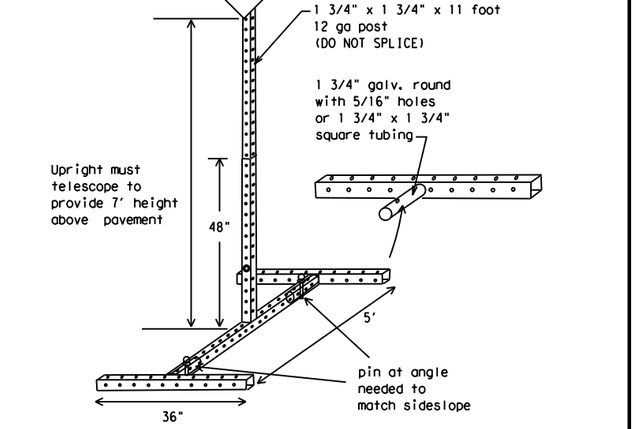
PERFORATED SQUARE METAL TUBING

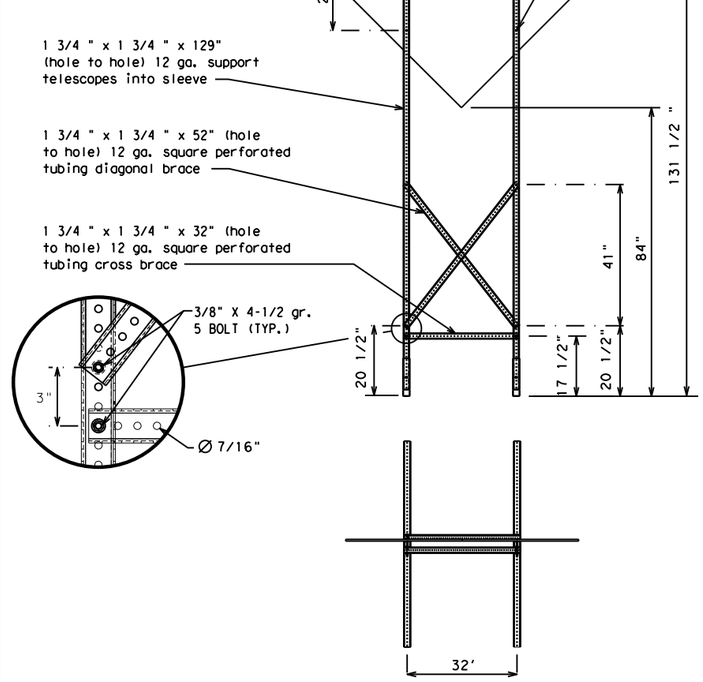


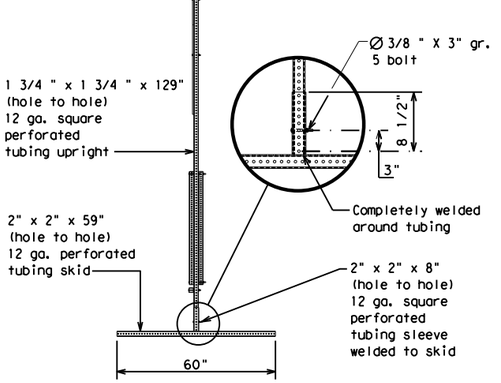
WING CHANNEL
Lap-splice/base bolted anchor

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.

SHEET 5 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List		Other Condition List	
FREEWAY CLOSED X MILE	FRONTAGE ROAD CLOSED	ROADWORK XXX FT	ROAD REPAIRS XXXX FT
ROAD CLOSED AT SH XXX	SHOULDER CLOSED XXX FT	FLAGGER XXXX FT	LANE NARROWS XXXX FT
ROAD CLSD AT FM XXXX	RIGHT LN CLOSED XXX FT	RIGHT LN NARROWS XXXX FT	TWO-WAY TRAFFIC XX MILE
RIGHT X LANES CLOSED	RIGHT X LANES OPEN	MERGING TRAFFIC XXXX FT	CONST TRAFFIC XXX FT
CENTER LANE CLOSED	DAYTIME LANE CLOSURES	LOOSE GRAVEL XXXX FT	UNEVEN LANES XXXX FT
NIGHT LANE CLOSURES	I-XX SOUTH EXIT CLOSED	DETOUR X MILE	ROUGH ROAD XXXX FT
VARIOUS LANES CLOSED	EXIT XXX CLOSED X MILE	ROADWORK PAST SH XXXX	ROADWORK NEXT FRI-SUN
EXIT CLOSED	RIGHT LN TO BE CLOSED	BUMP XXXX FT	US XXX EXIT X MILES
MALL DRIVEWAY CLOSED	X LANES CLOSED TUE - FRI	TRAFFIC SIGNAL XXXX FT	LANES SHIFT *
XXXXXXXX BLVD CLOSED			

* 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		Location List	Warning List	** Advance Notice List
MERGE RIGHT	FORM X LINES RIGHT	AT FM XXXX	SPEED LIMIT XX MPH	TUE-FRI XX AM- X PM
DETOUR NEXT X EXITS	USE XXXXX RD EXIT	BEFORE RAILROAD CROSSING	MAXIMUM SPEED XX MPH	APR XX-XX X PM-X AM
USE EXIT XXX	USE EXIT I-XX NORTH	NEXT X MILES	MINIMUM SPEED XX MPH	BEGINS MONDAY
STAY ON US XXX SOUTH	USE I-XX E TO I-XX N	PAST US XXX EXIT	ADVISORY SPEED XX MPH	BEGINS MAY XX
TRUCKS USE US XXX N	WATCH FOR TRUCKS	XXXXXXX TO XXXXXXX	RIGHT LANE EXIT	MAY X-X XX PM - XX AM
WATCH FOR TRUCKS	EXPECT DELAYS	US XXX TO FM XXXX	USE CAUTION	NEXT FRI-SUN
EXPECT DELAYS	PREPARE TO STOP		DRIVE SAFELY	XX AM TO XX PM
REDUCE SPEED XXX FT	END SHOULDER USE		DRIVE WITH CARE	NEXT TUE AUG XX
USE OTHER ROUTES	WATCH FOR WORKERS			TONIGHT XX PM- XX AM
STAY IN LANE *				

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	BC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	HARRIS		89

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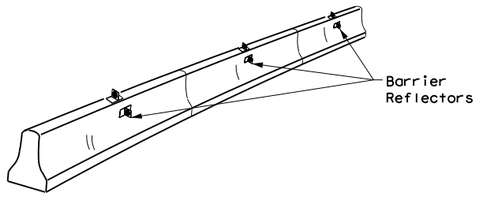
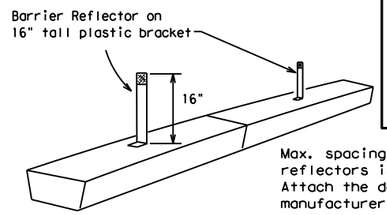
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



CONCRETE TRAFFIC BARRIER (CTB)

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

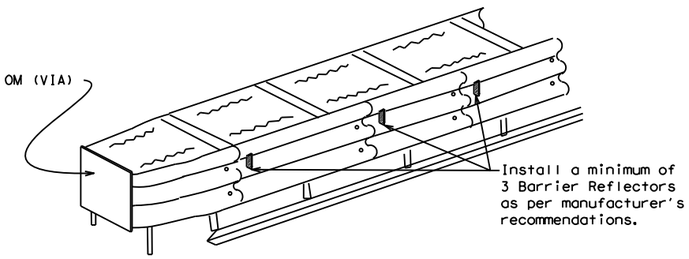


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

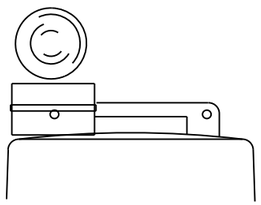


DELINEATION OF END TREATMENTS

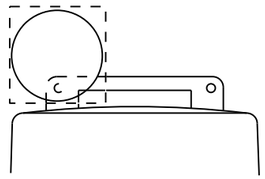
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

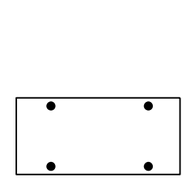
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

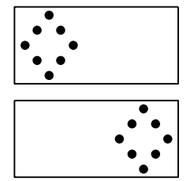
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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

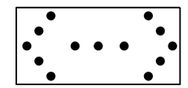


4 CORNER CAUTION

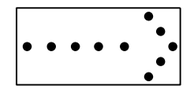
OR



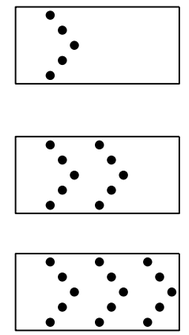
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



RIGHT/LEFT ARROW
(right arrow shown; left is similar)



RIGHT/LEFT SEQUENTIAL CHEVRON
(right chevron shown; left is similar)

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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	90
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	HARRIS		90

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	12	HARRIS		89

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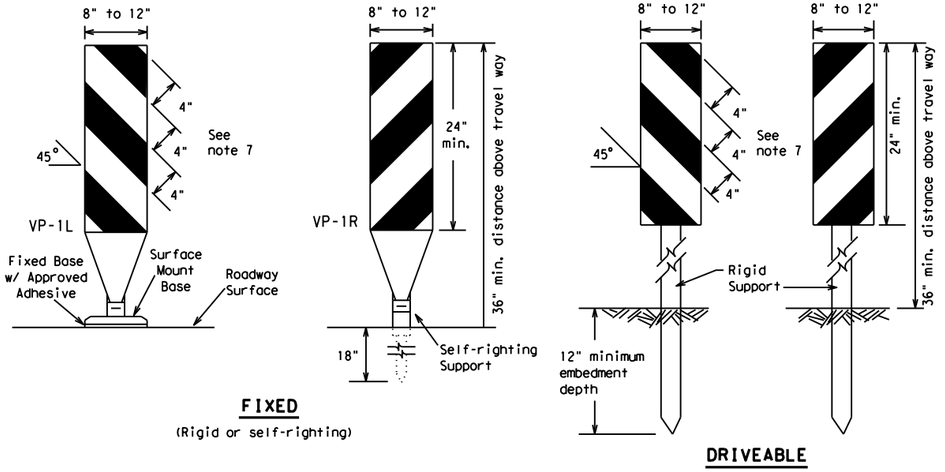
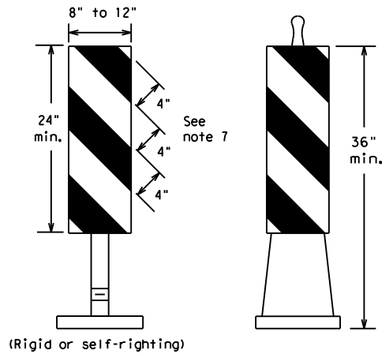


FIXED
(Rigid or self-righting)

DRIVEABLE

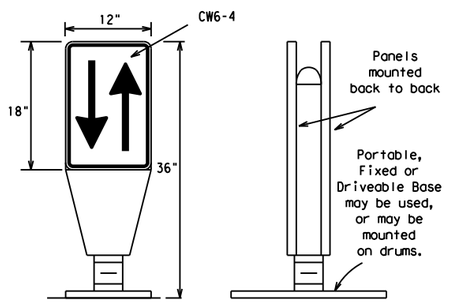


(Rigid or self-righting)

PORTABLE

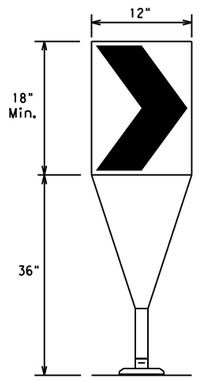
VERTICAL PANELS (VPs)

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



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



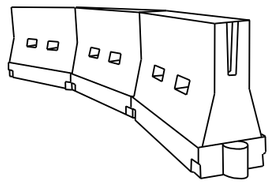
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	3256	02	093	104
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7-13 5-21	HOU	HARRIS		92

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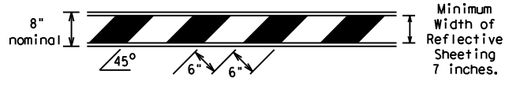
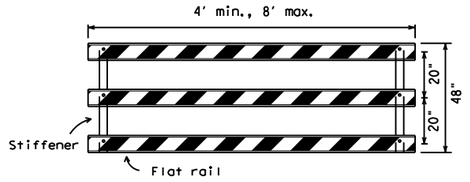
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



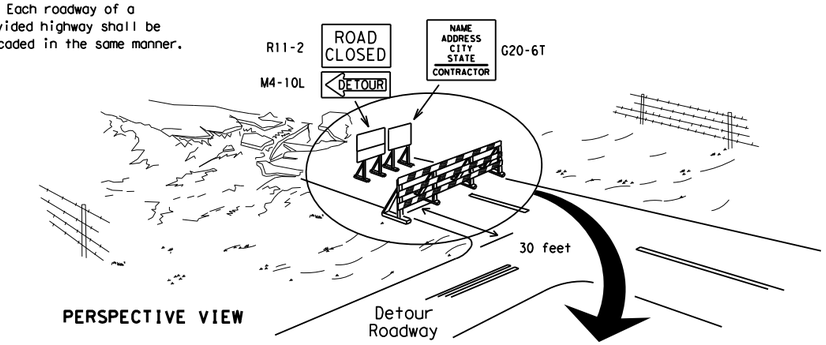
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

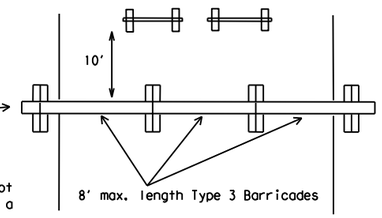
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

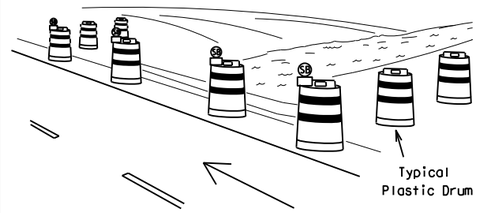
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

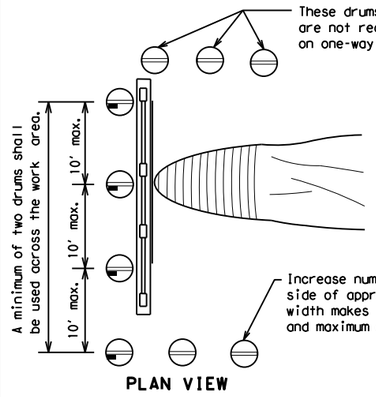
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

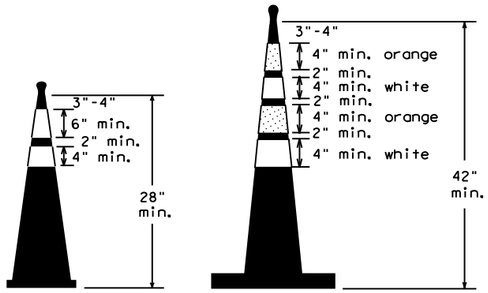
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



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

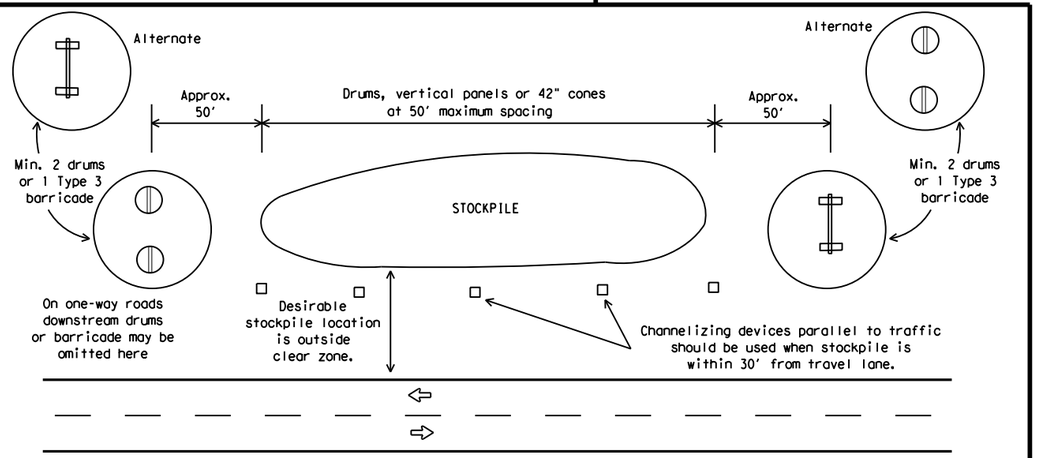
PLAN VIEW

CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	HARRIS		93

104

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

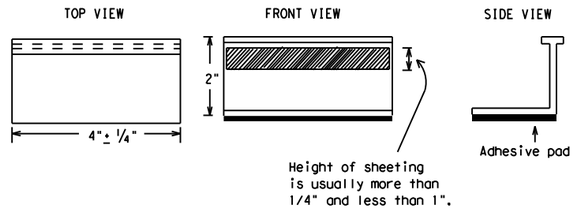
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	12	HARRIS		94
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105

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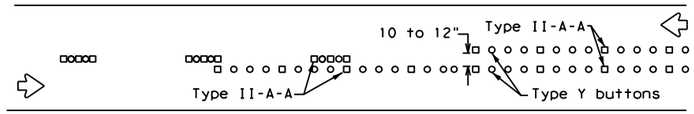
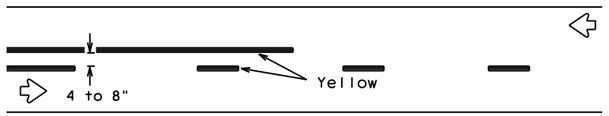
PAVEMENT MARKING PATTERNS

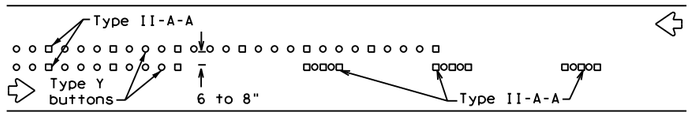
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



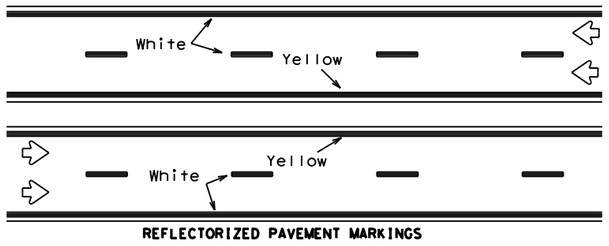
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



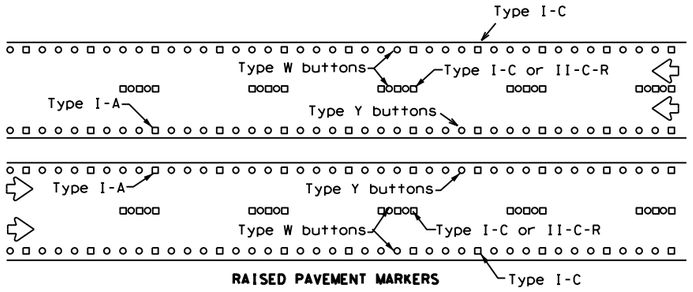
RAISED PAVEMENT MARKERS - PATTERN B

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

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



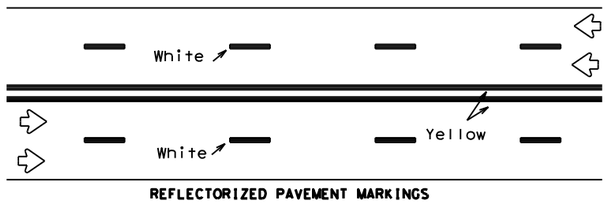
REFLECTORIZED PAVEMENT MARKINGS



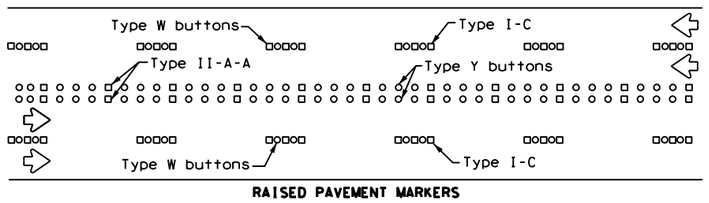
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



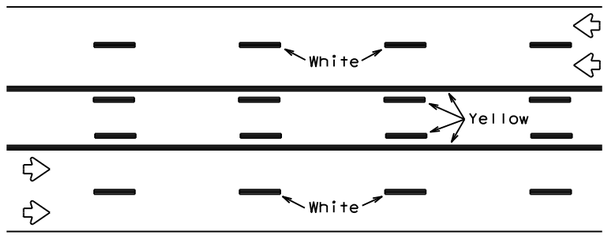
REFLECTORIZED PAVEMENT MARKINGS



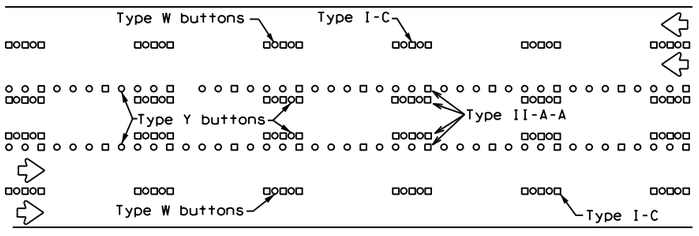
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

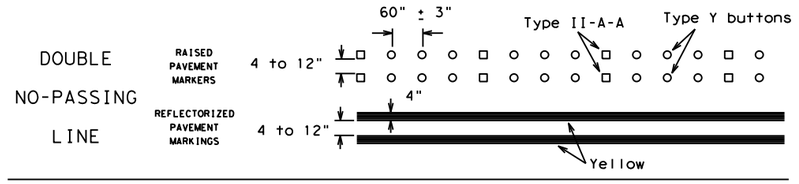
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

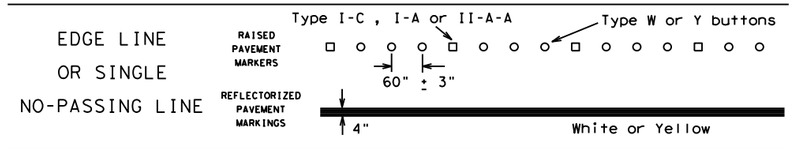
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

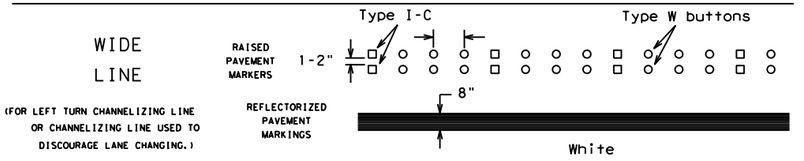


EDGE LINE OR SINGLE NO-PASSING LINE



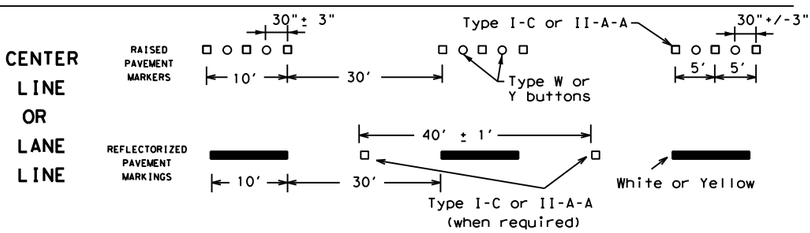
WIDE LINE

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

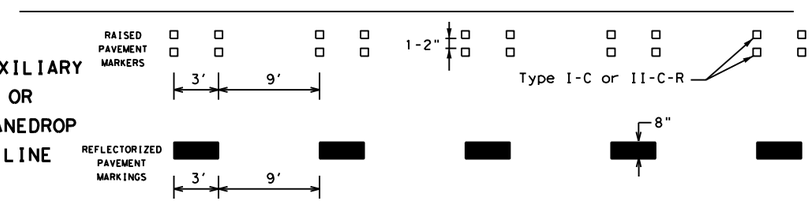


BROKEN LINES

CENTER LINE OR LANE LINE

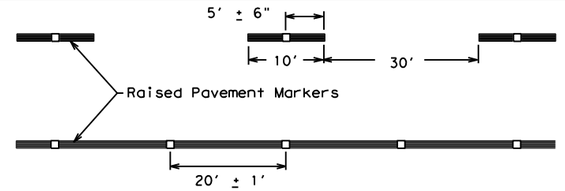


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

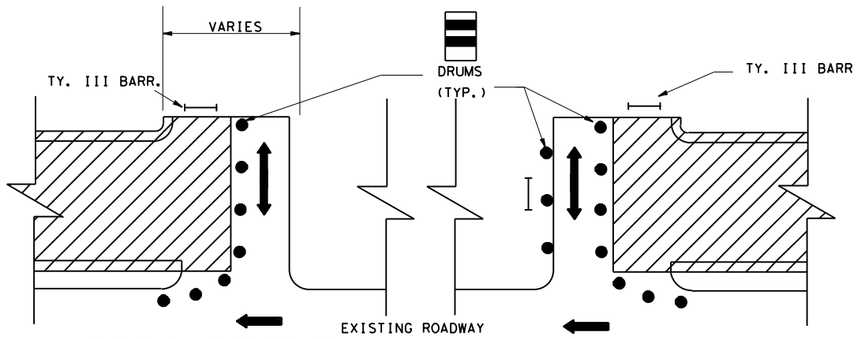
BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	C	S	J	BI
	DIST	COUNTY		SHEET NO.
	DST	CTY		95

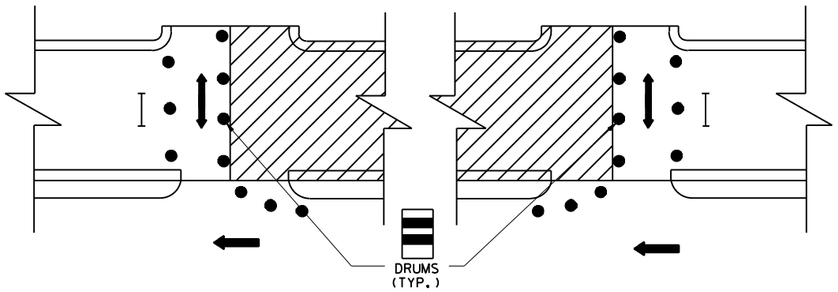
106

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

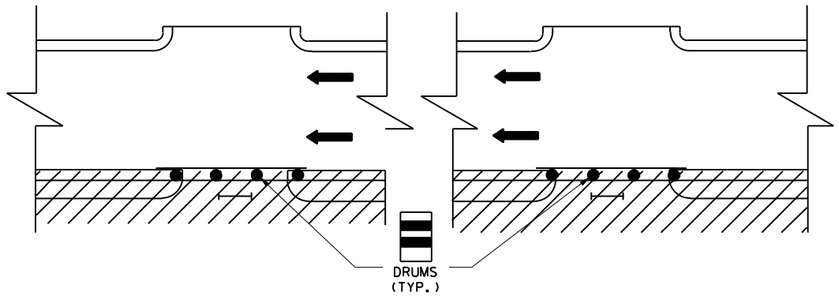


1) WITH TRAFFIC ON EXISTING
BUILD ONE-HALF OF DRIVE.

2) BUILD OTHER HALF OF DRIVE



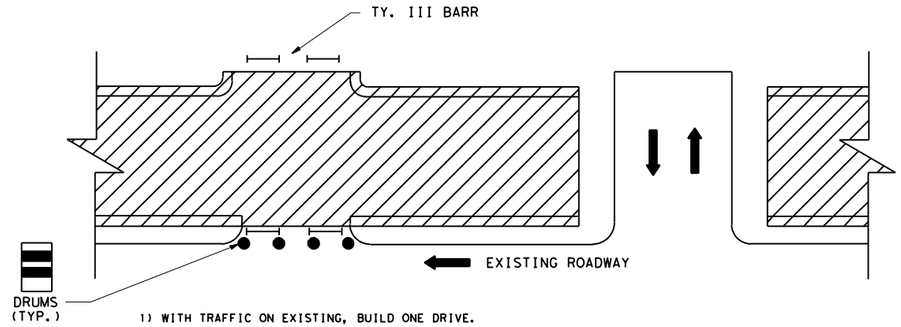
2) BUILD OTHER HALF OF DRIVE



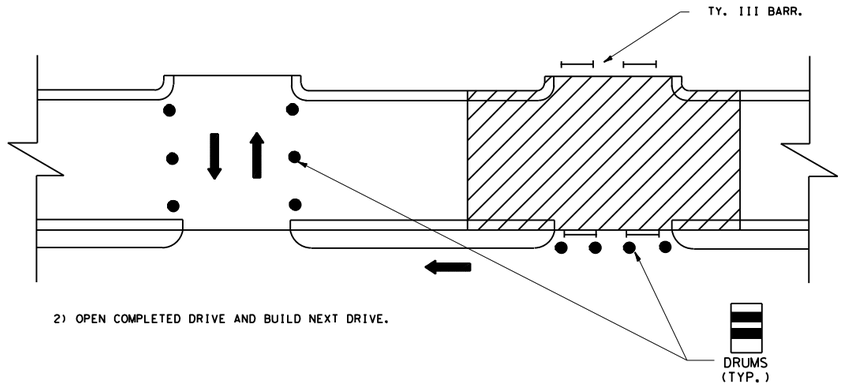
3) OPEN DRIVE

4) AFTER TRAFFIC MOVES TO NEW ROADWAY,
BUILD REMAINING CURB.

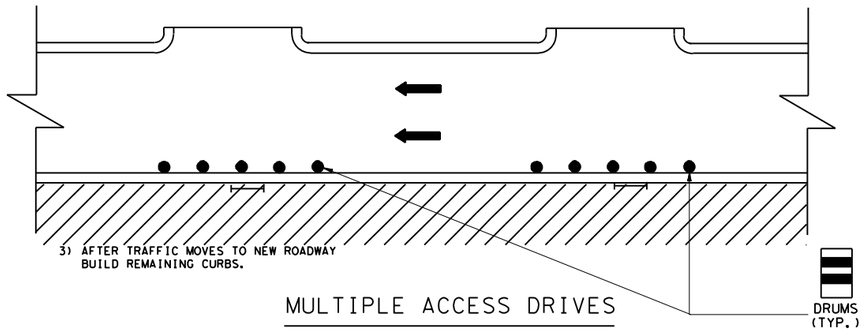
SINGLE ACCESS DRIVES



1) WITH TRAFFIC ON EXISTING, BUILD ONE DRIVE.



2) OPEN COMPLETED DRIVE AND BUILD NEXT DRIVE.



3) AFTER TRAFFIC MOVES TO NEW ROADWAY
BUILD REMAINING CURBS.

MULTIPLE ACCESS DRIVES

Texas Department of Transportation
Houston District

CONSTRUCTION SEQUENCE FOR MISCELLANEOUS DRIVES

CSMD TC8010-2020

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2020	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6		98
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HARRIS	3256	02	093	SL8

STD H-29

DATE: 3/15/2023 4:16:02 AM
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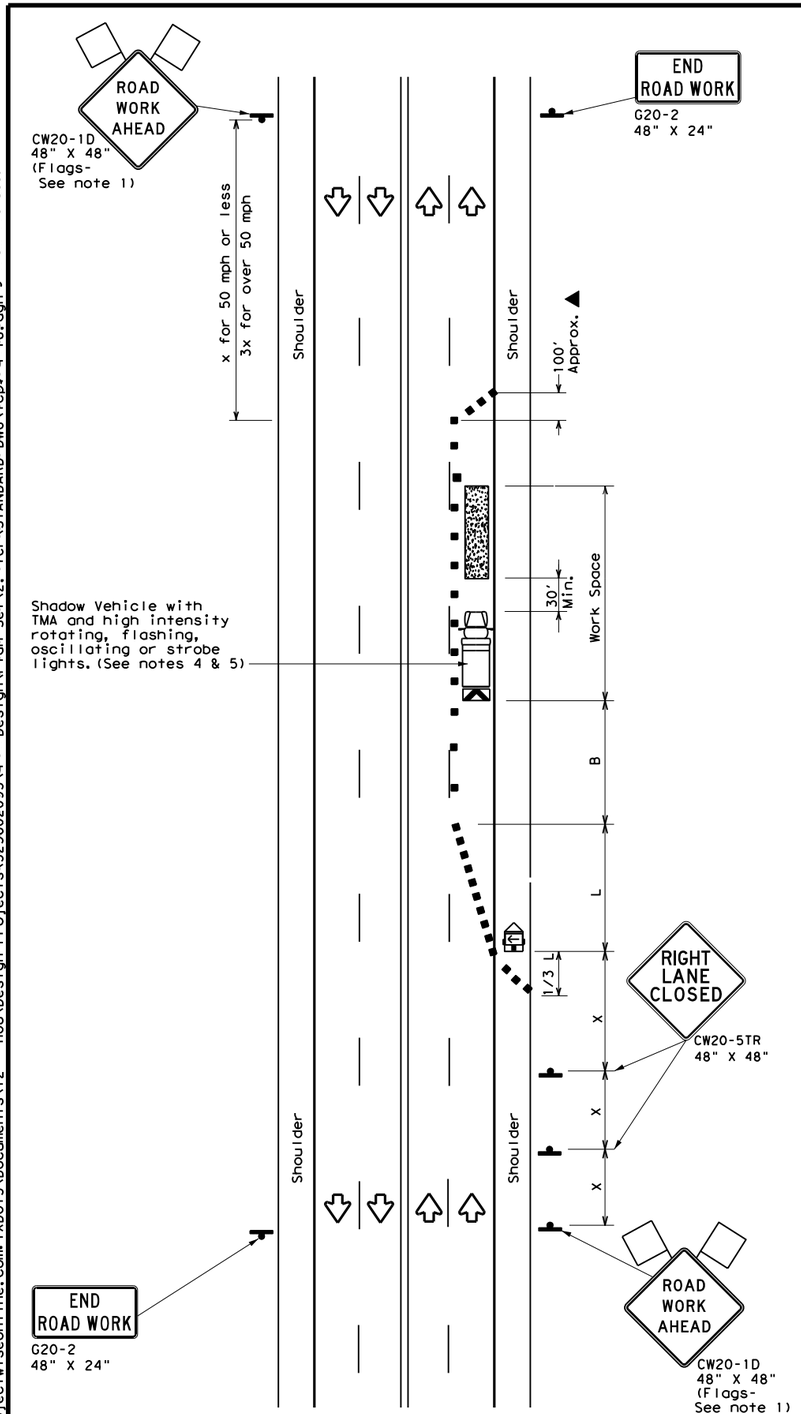
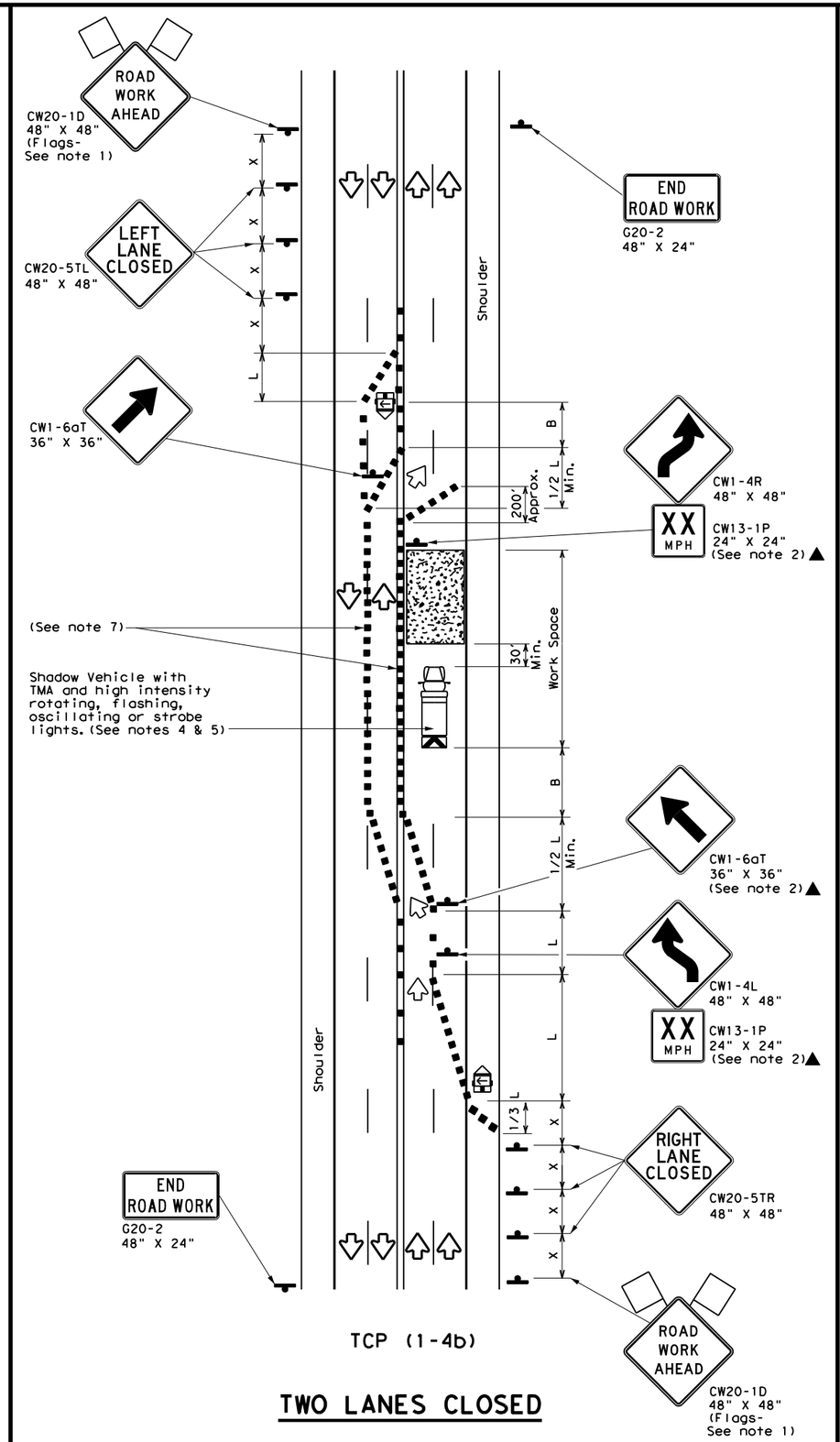


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

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 CW20-1D "ROAD WORK AHEAD" sign may be repeated if the visibility of the work zone is less than 1500 feet.
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.

TCP (1-4a)

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

TCP (1-4b)

7. 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 1/2S where S is the speed in mph. This tighter device spacing is intended for the areas 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(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12				
1-97 2-18	HOU	HARRIS		99

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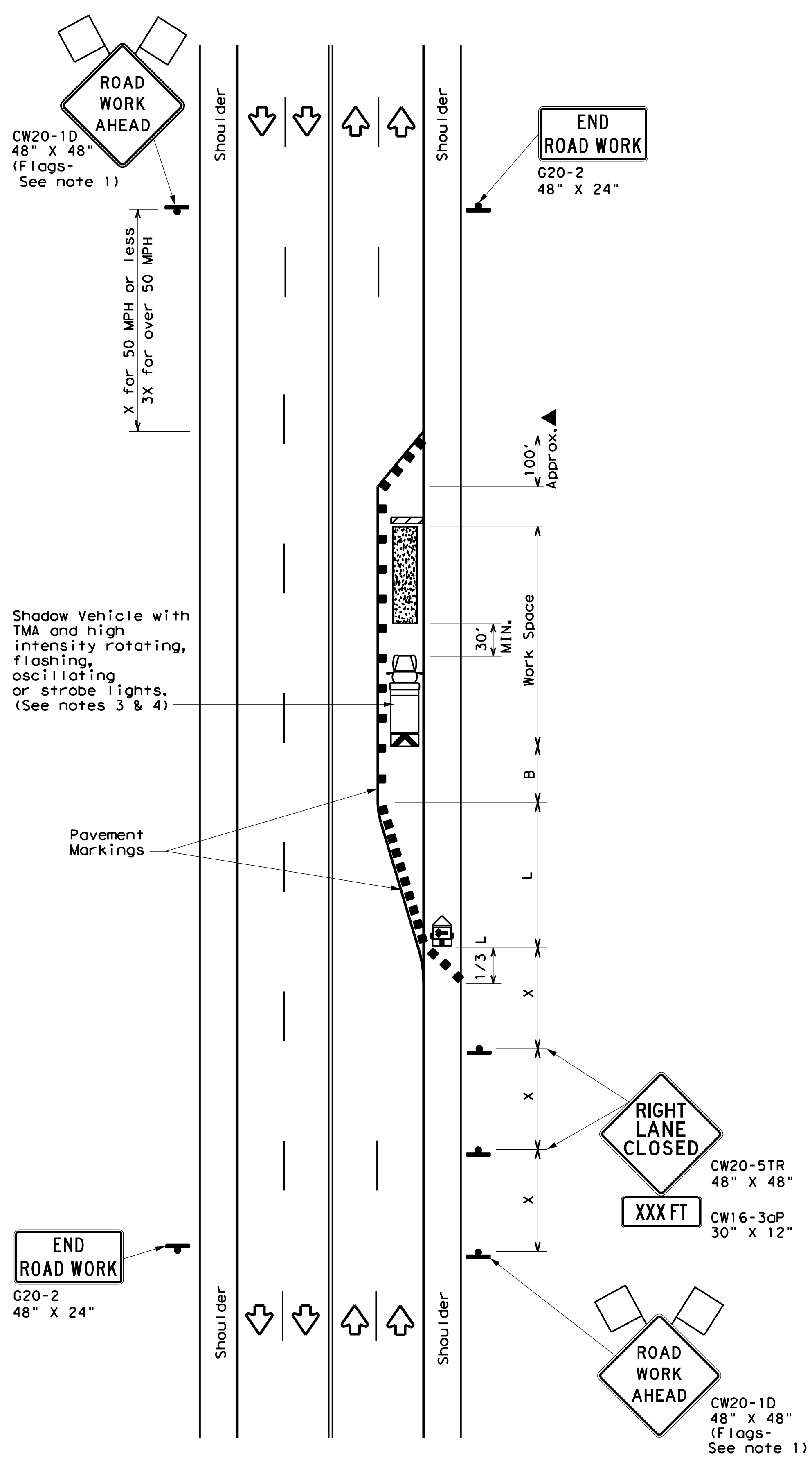
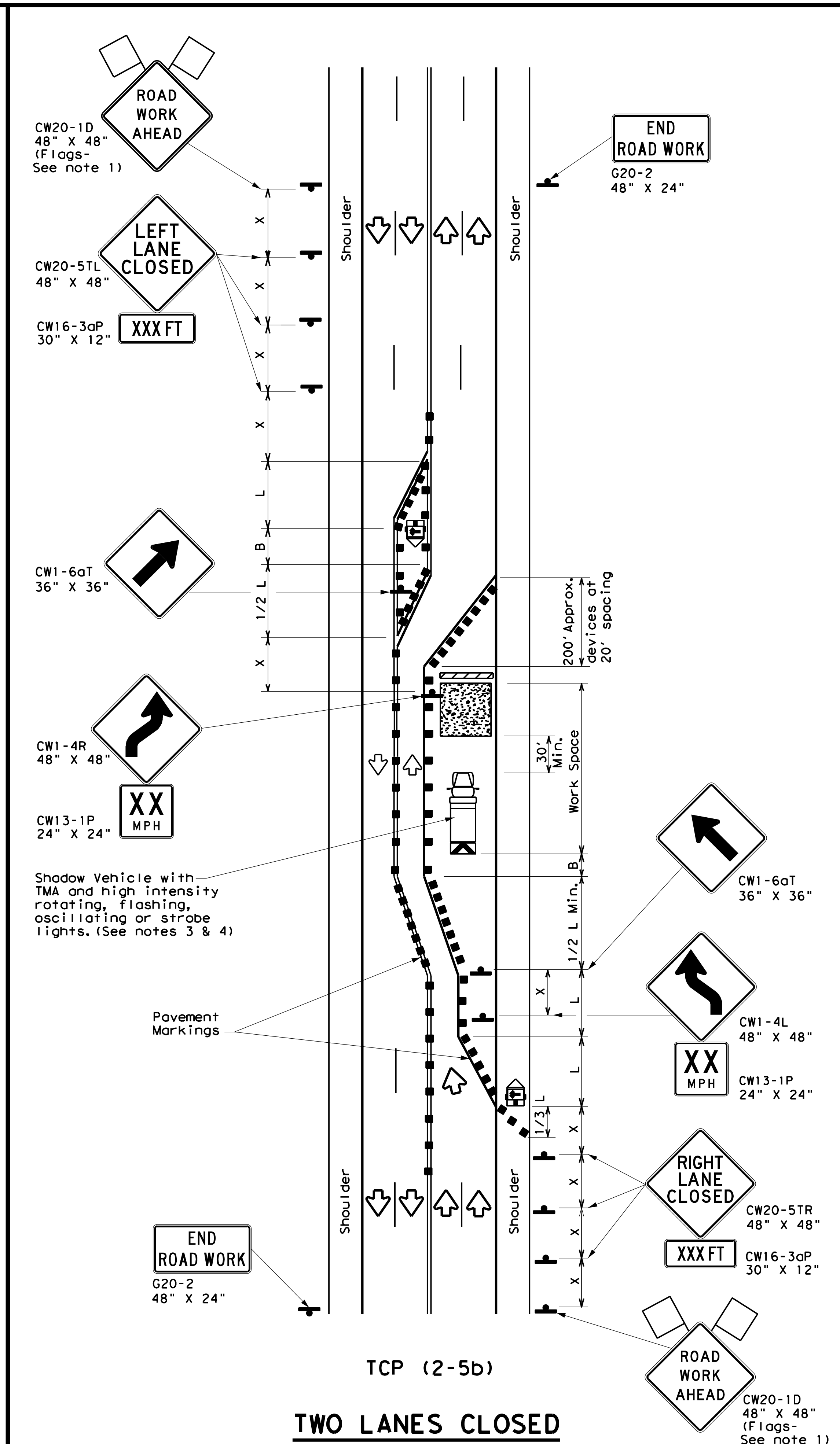


TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

LEGEND

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

Posted Speed *	Formula	Minimum Desirable Taper Lengths ** 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. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew eposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substitutued for the Shadow Vehicle and TMA.
4. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.
5. The downstream taper is optional. When used, it should be 100 feet approximately per lane, with channelizing devices spaced at 20 feet.

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 2-12, 1-97 3-03, 4-98 2-18	3256	02	093	SL 8
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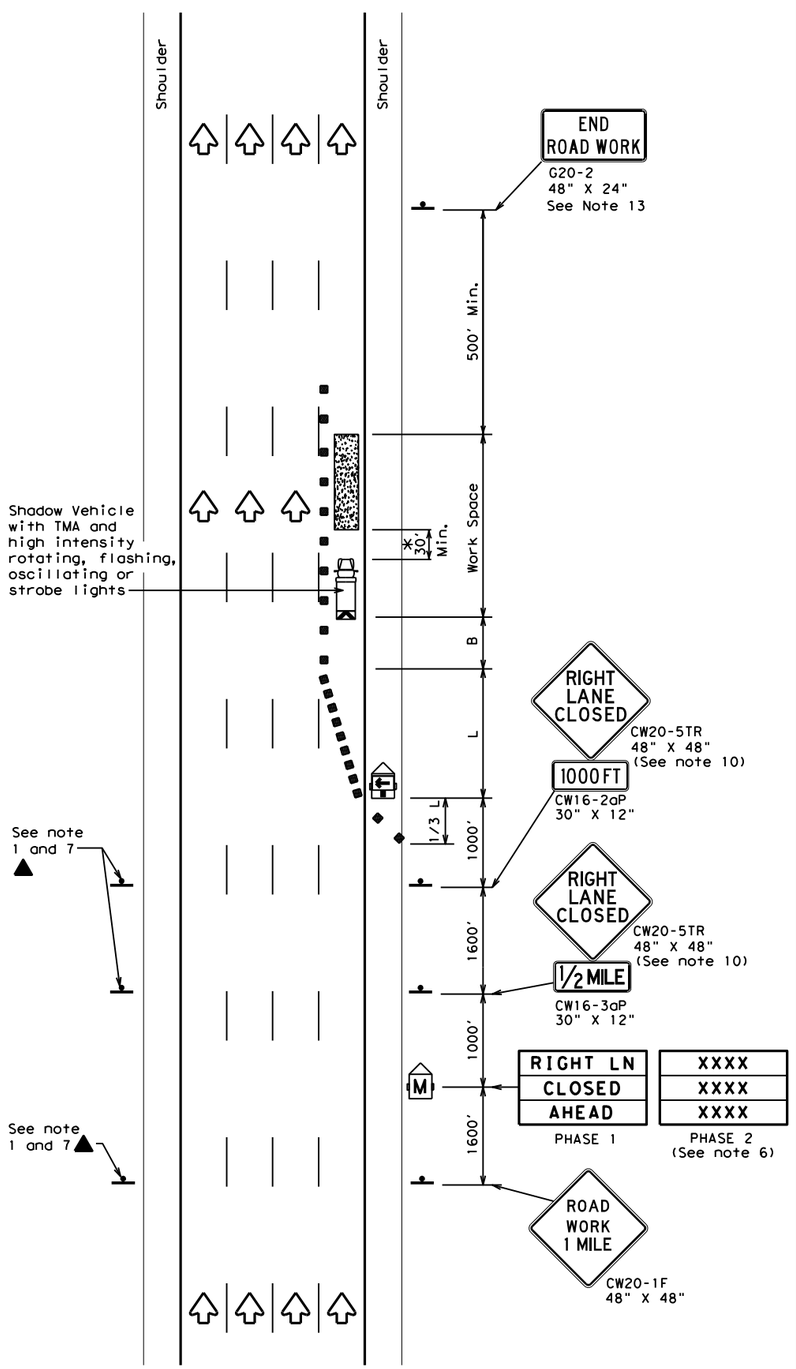
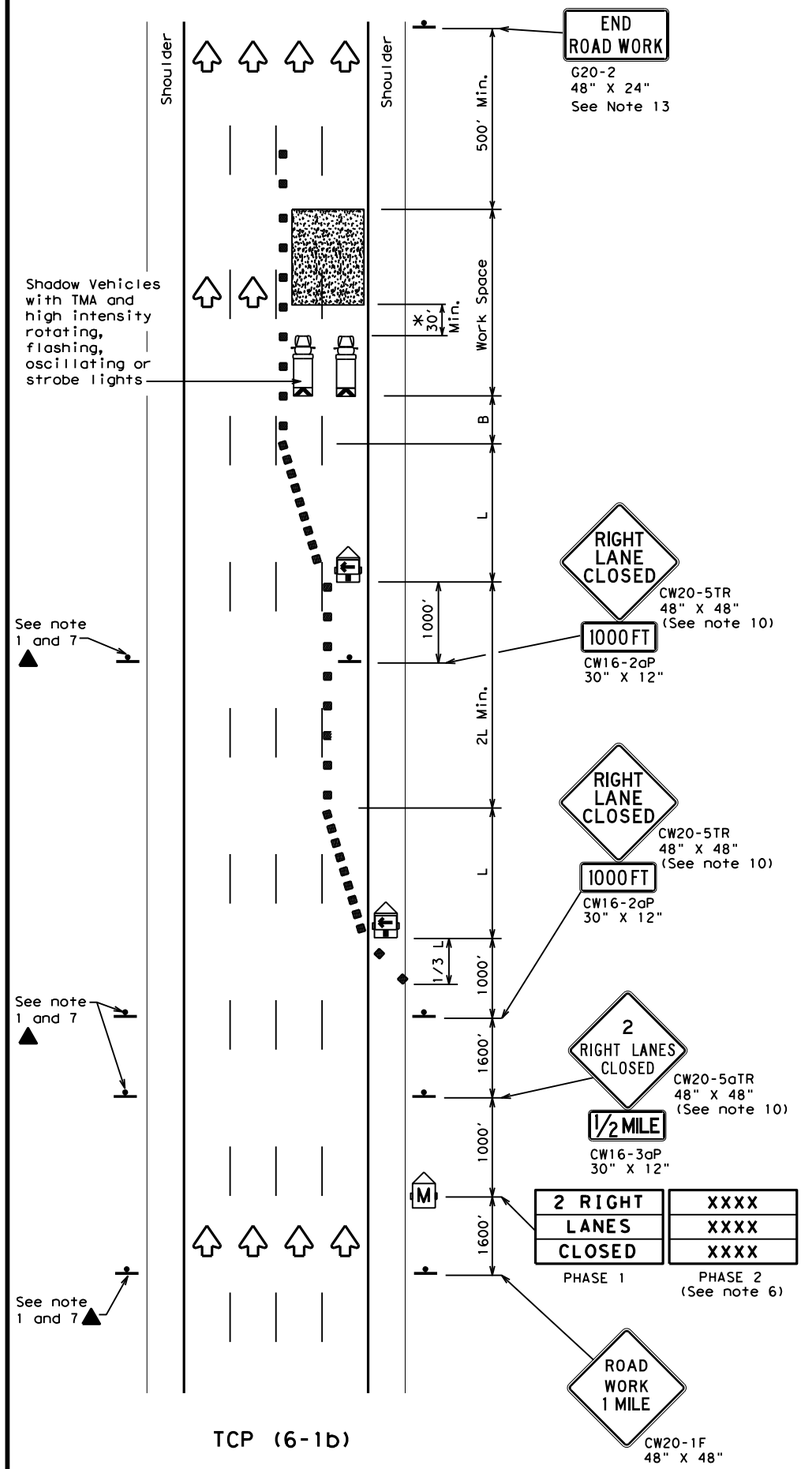


TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE



TCP (6-1b)

TYPICAL FREEWAY TWO LANE CLOSURE

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

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

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

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

GENERAL NOTES

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12

FILE: tcp6-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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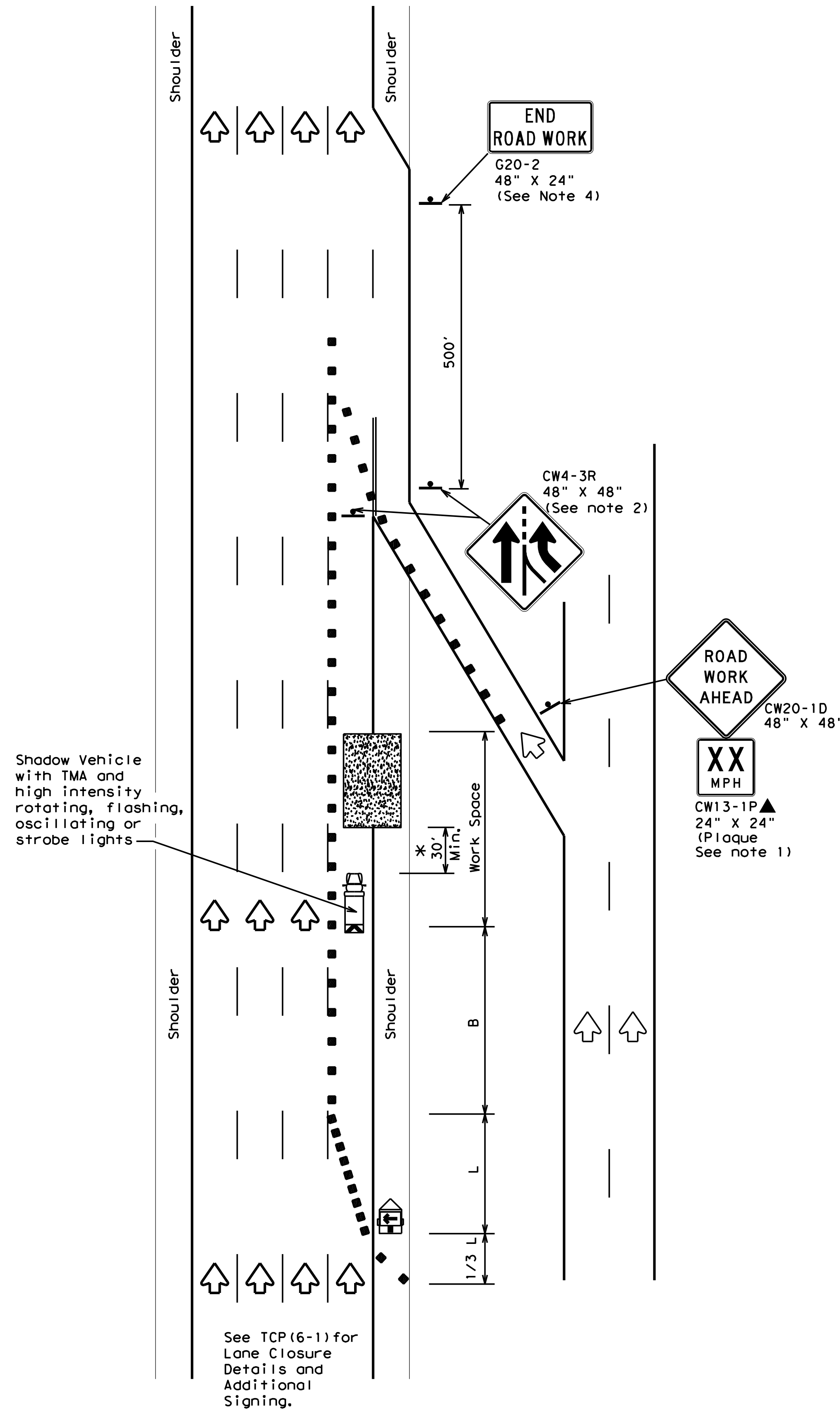
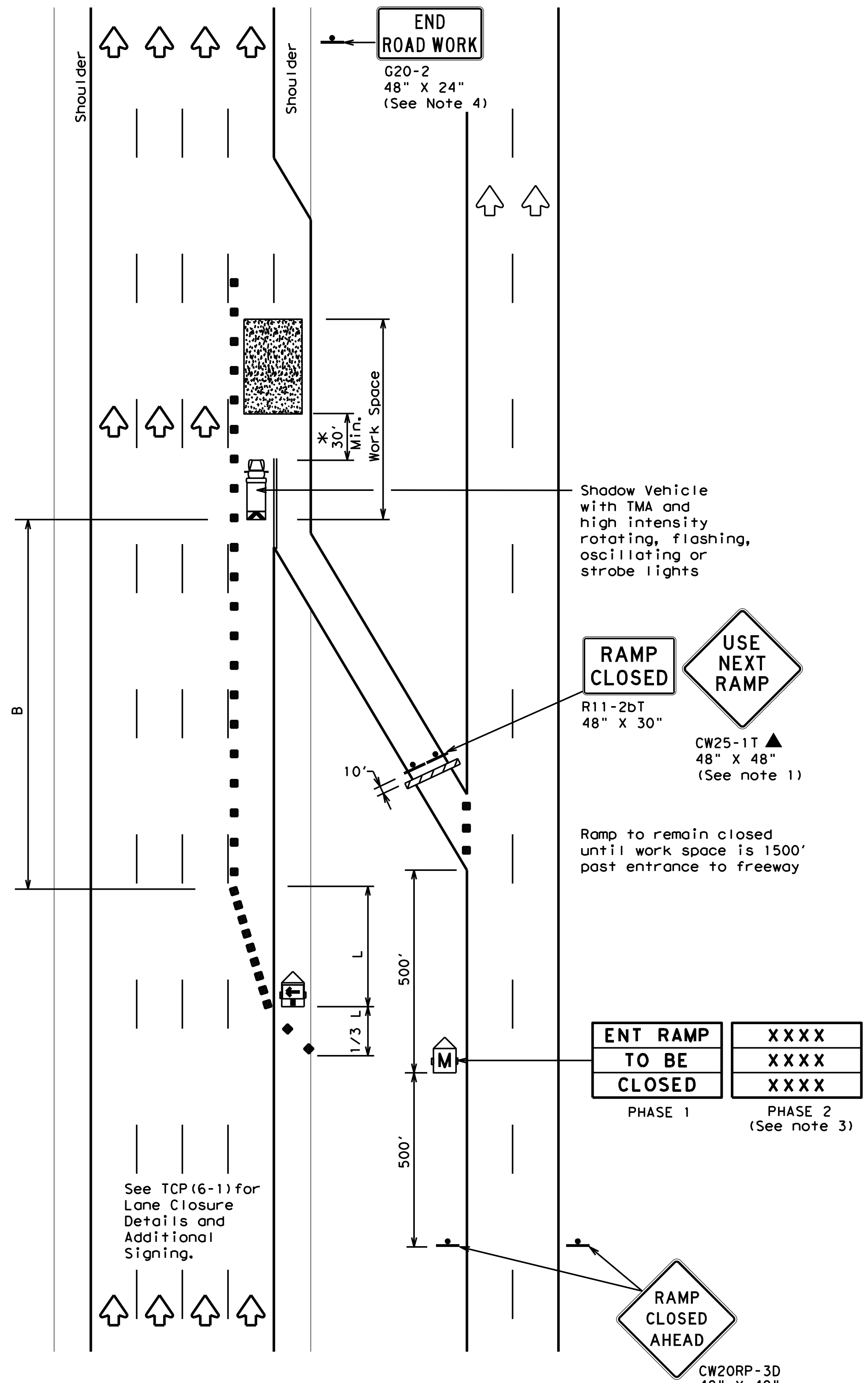
8-12	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		101



TCP (6-2a)

ENTRANCE RAMP OPEN
WORK WITHIN 500' OF RAMP



TCP (6-2b)

ENTRANCE RAMP CLOSED

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. ADDED LANE Symbol (CW4-3) sign may be omitted when sign between ramp and mainlane can be seen from both roadways.
3. See "Advance Notice List" on BC(6) for recommended date and time formatting options for PCMS Phase 2 message.
4. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

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

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT		
©TxDOT February 1994	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3256	02	093		SL 8	
1-97 8-98	DIST		COUNTY		SHEET NO.	
4-98 8-12	HOU		HARRIS		102	

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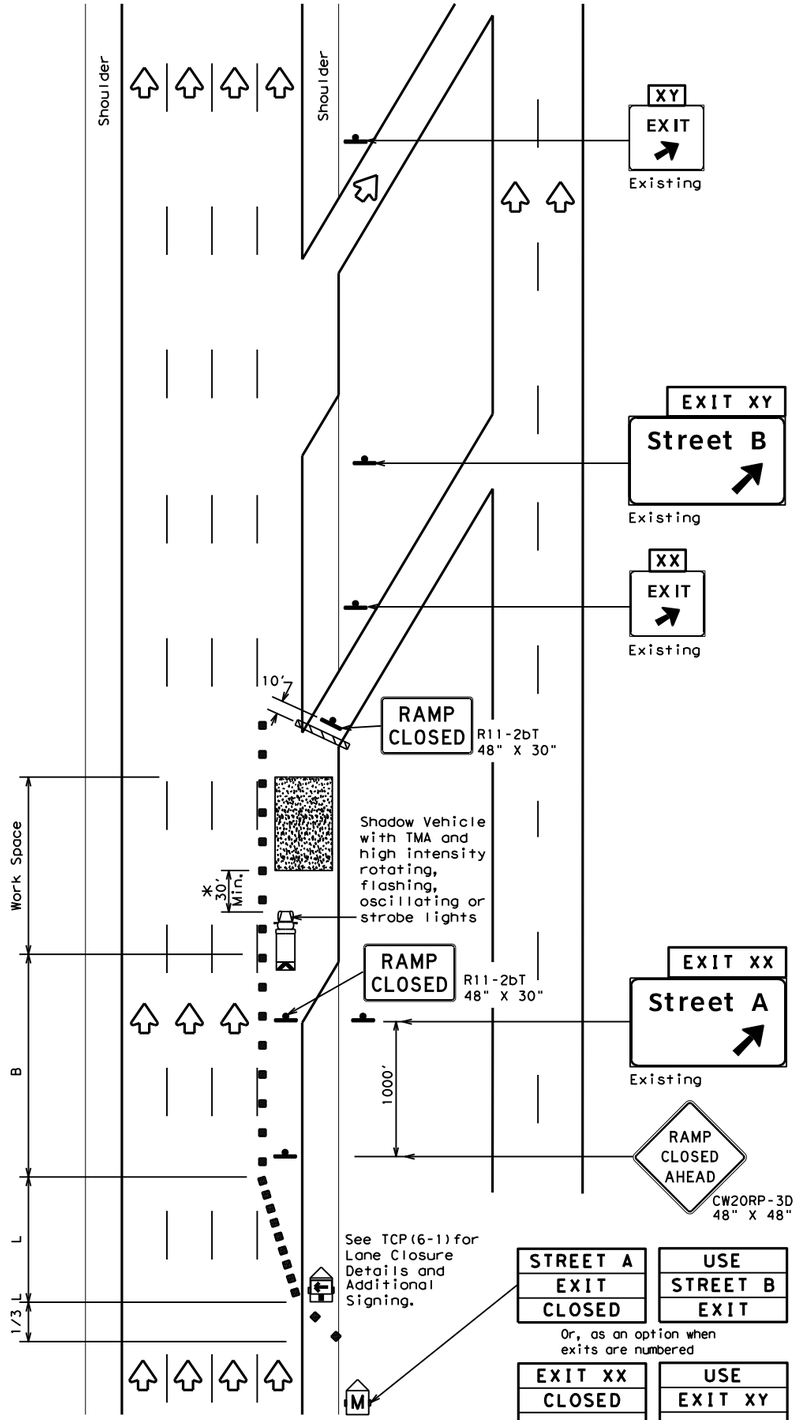
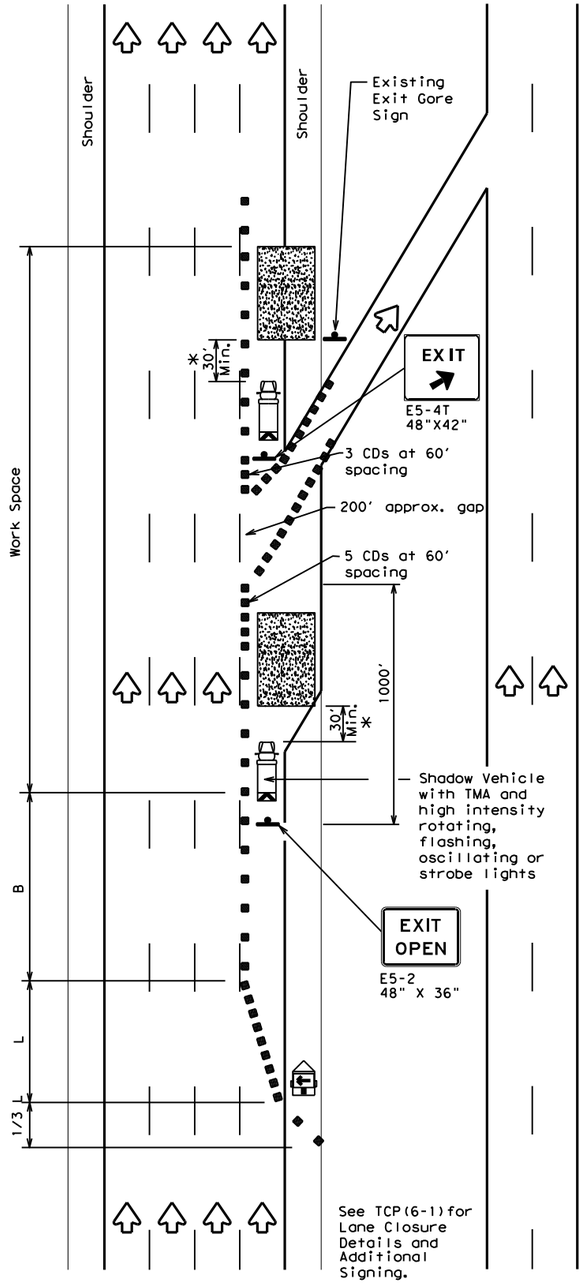


TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. See BC Standards for sign details.

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

Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

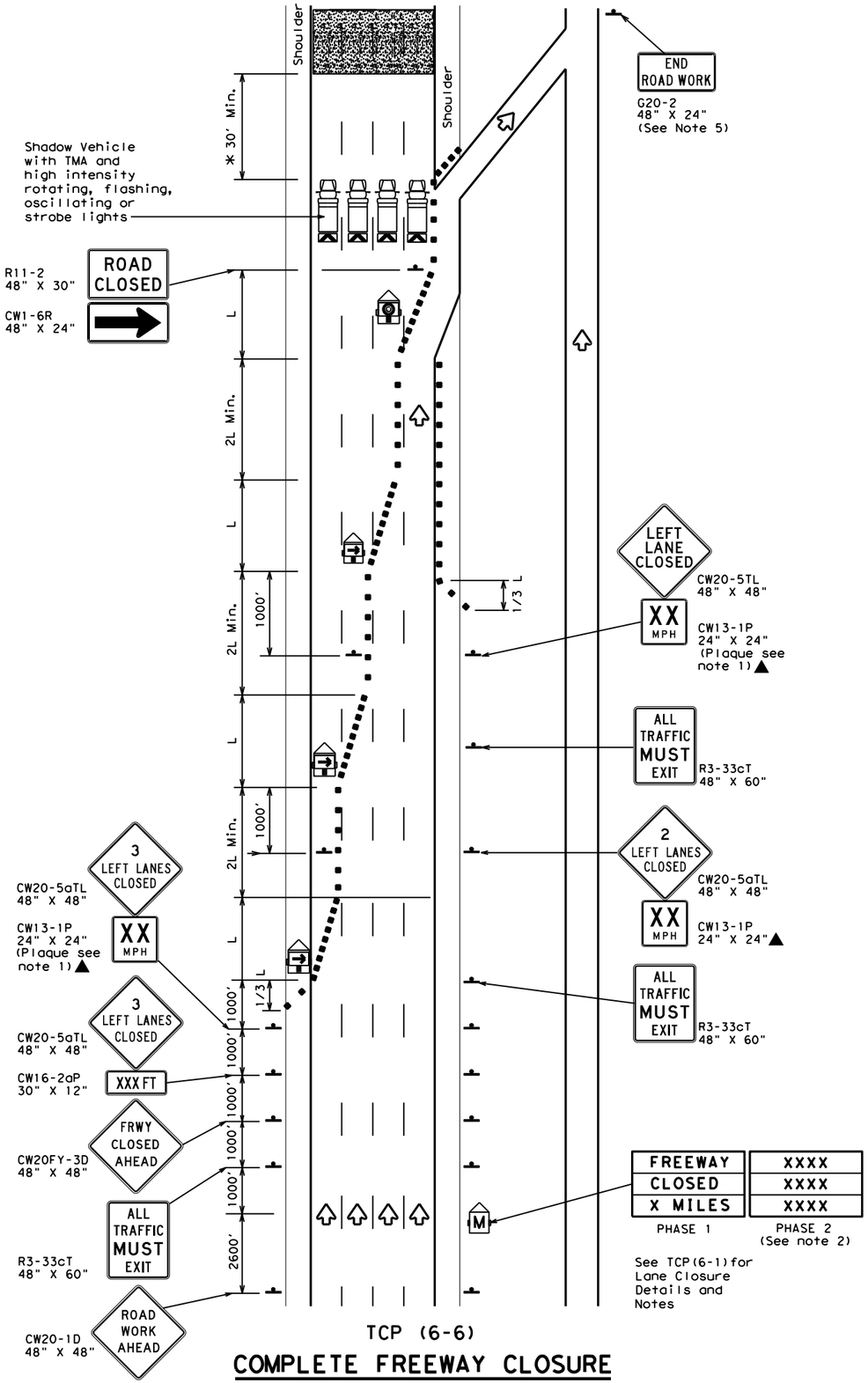
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

FILE: tcp6-4.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	HOU	HARRIS		102A

DATE: 3/15/2023 4:16:27 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\STANDARDS DWG\tcp6-6.dgn



TCP (6-6)

COMPLETE FREEWAY CLOSURE

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

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

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

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

GENERAL NOTES

1. All traffic control devices illustrated are REQUIRED. Devices denoted with the triangle symbol may be omitted when stated elsewhere in the plans.
2. Phase 2 of the PCMS message should include appropriate information formatted as shown on BC(6), such as "MERGE RIGHT," recommended speed, delay, exit information, or other specific warnings.
3. Where queuing is anticipated beyond signing shown, additional PCMS signs, other warning signs, devices or Law Enforcement Officers should be available to warn approaching high speed traffic of the end of the queue, as directed by the Engineer.
4. Entrance ramps located from the advance warning area to the exit ramp should be closed whenever possible.
5. The END ROAD WORK (G20-2) sign may be omitted when it conflicts with G20-2 signs already in place on the project.

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

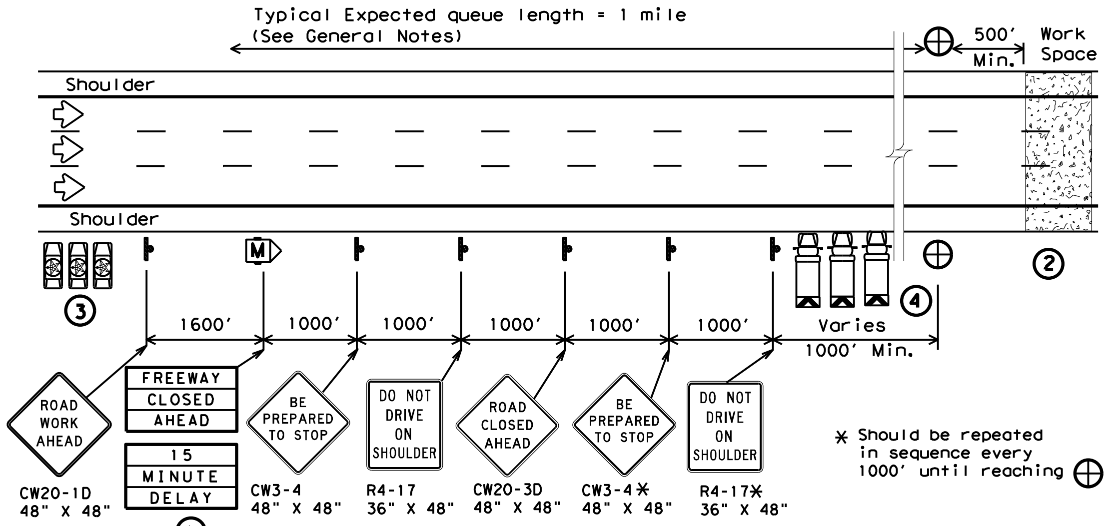
Additional requirements for lane closures and advance signing shall be as shown on TCP (6-1) or as directed by the Engineer.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY CLOSURE

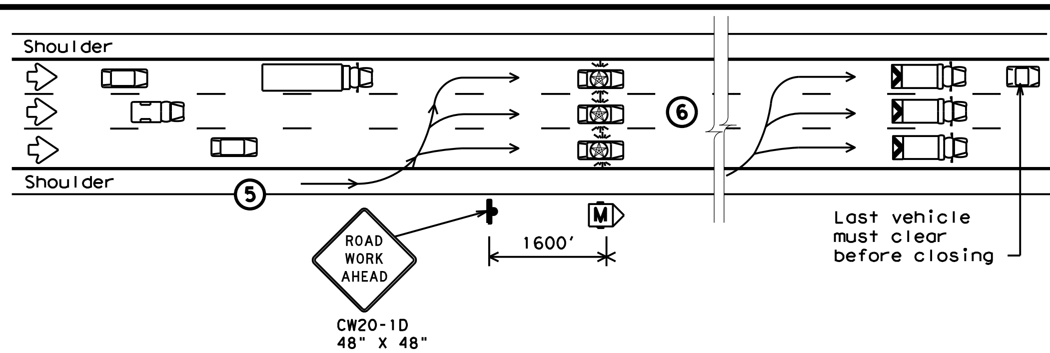
TCP(6-6)-12

FILE: tcp6-6.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	HOU	HARRIS		102B



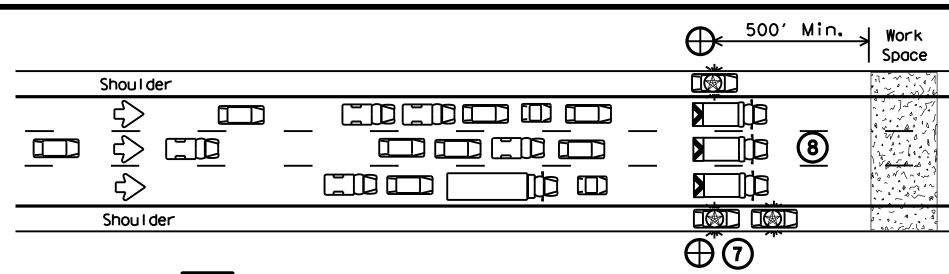
1 STARTING POSITION

1. Traffic control devices should be installed or located near their intended position prior to beginning temporary roadway closure sequence. Duplicate signs should be erected on the median side of the roadway when median width permits. Warning signs should not be placed on the paved shoulders that will be used by the WARNING LEOV, or where movement of the LEOVs or barrier vehicles will be impeded.
2. Prior to beginning the roadway closure sequence, all equipment, materials, personnel, and other items necessary to complete the work should be gathered near the work area. Entrance ramps located in the area where a queue is expected to build should be closed.
3. There should be one LEOV for every lane to be controlled, plus a minimum of one to warn traffic approaching a queue. An additional lead law enforcement officer is desirable to remain with the Engineer's or Contractor's point of contact (POC) during the operation in order to improve communication with all LEOVs involved.
4. One barrier vehicle with a Truck Mounted Attenuator and amber or blue and amber high intensity flashing/oscillating/strobe lighting shall be used for each lane to be closed.



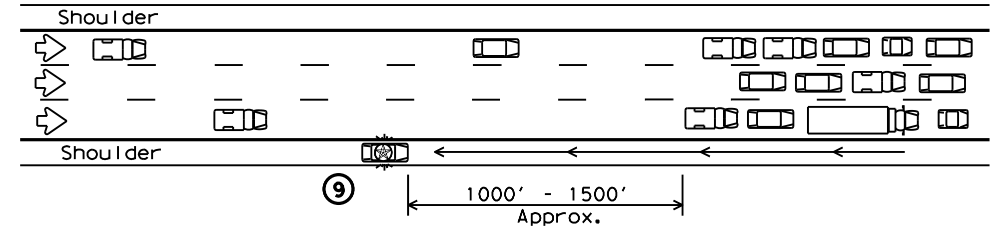
2 REDUCING SPEED OPERATION

5. Starting position of the LEOVs should be in advance of the most distant warning signs.
6. Once the LEOVs have achieved an abreast blocking formation while traveling toward the CP, emergency lights and headlights should be turned "ON". The LEOVs should maintain formation, not allow traffic to pass, and begin to decelerate. The LEOVs should continue to decelerate, giving the barrier vehicles opportunity to be staged upstream of the work space after traffic has cleared. The LEOVs should then continue to decelerate slowly until bringing traffic to a stop near the barrier vehicles.



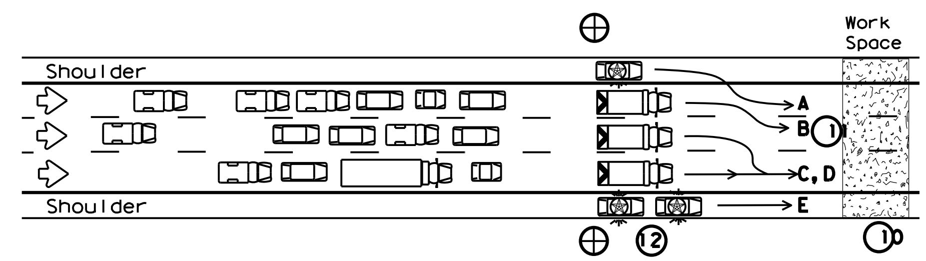
3 ALL TRAFFIC STOPPED AT CP

7. Once traffic is stopped the LEOVs should park on the shoulders with emergency lighting "ON" in order to provide law enforcement presence at the closure and keep shoulders blocked ahead of the work space. They should stay in radio contact with the WARNING LEOV.
8. The barrier vehicles should be parked, one in each lane, the parking brake set, with the high visibility flashing/oscillating/strobe lighting "ON," and the transmission in gear.



4 WARNING THE TRAFFIC QUEUE

9. The WARNING LEOV should proceed to the right shoulder of the roadway, with emergency lights on approximately 1000' in advance of the traffic queue (stopped traffic) as the queue develops. When determined that limited sight distance situations (crest of hills, sharp roadway curvature, etc.) may occur to motorists approaching the queue, the WARNING LEOV may proceed 1/4 mile or more in advance of the queue.



5 RELEASING STOPPED TRAFFIC

10. All equipment, materials, personnel, and other items should be removed from the roadway and maintain an adequate clear zone.
11. When the roadway is clear for traffic, the LEOV should proceed forward from the left shoulder followed by the barrier vehicles, from left to right, as shown alphabetically in the plan view.
12. The LEOV or LEOVs on the right shoulder may remain on the shoulder until satisfied that traffic is moving satisfactorily before merging or proceeding.
13. LEOVs and barrier vehicles should re-group at their respective starting positions if necessary.

LEGEND			
■ ■	Channelizing Devices	⊕	Control Position (CP)
(M)	Portable Changeable Message Sign (PCMS)		Barrier Vehicle with Truck Mounted Attenuator
	Law Enforcement Officer's Vehicle (LEOV)	⇦	Traffic Flow

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

GENERAL NOTES

1. All traffic control devices shall conform with the latest edition of the Texas Manual on Uniform Traffic Control Devices (TMUTCD). Additional guidelines for traffic control devices may be found in the TMUTCD. Signs conflicting with the roadway closure sequence should be completely removed or covered. Additional traffic control devices may be required for closure of access roads, cross streets, exit and entrance ramps as directed by the Engineer.
2. Law enforcement officers and all workers involved should review and understand all procedures before the roadway closure sequence begins. Pre-work meetings may be held for this purpose. Local emergency services and media should have advance notification of roadway closure, expected dates and approximate times of closures.
3. Law enforcement officers shall be in uniform and have jurisdiction in the locale of the work area. An additional WARNING Law Enforcement Officer's Vehicle (LEOV) may be used on the median side of the roadway where median shoulder width permits (See sequence #9).
4. The roadway closure should be during off-peak hours, as shown in the plans, or as directed by the Engineer.
5. Work should be limited to approximately 15 minutes maximum duration unless otherwise directed by the Engineer based on existing roadway conditions. If the work is not complete within 15 minutes, or if the end of the traffic queue extends past the most distant advance warning signs, the work area should be cleared of all equipment, materials, personnel, and other items, and the roadway reopened. When the queue has dissipated and the traffic flow appears normal the roadway closure sequence may be repeated.
6. For traffic volumes greater than 1000 Passenger Cars Per Hour Per Lane (PCPHPL), or for roadway closures that exceed 15 minutes, see details elsewhere in the plan.
7. If traffic queues beyond the advance warning signs during one road closure sequence, the advance warning should be extended prior to repeating the road closure sequence. When possible, PCMS signs should be located in advance of the last available exit prior to the closure to allow motorists the choice of an alternate route.

THIS PLAN IS INTENDED TO BE USED AT LOCATIONS/TIMES WHEN TRAFFIC VOLUMES ARE LESS THAN 1000 PASSENGER CARS PER HOUR PER LANE.

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN SHORT DURATION FREEWAY CLOSURE SEQUENCE

TCP(6-7)-12

FILE: tcp6-7.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT 3256	SECT 02	JOB 093	HIGHWAY SL 8
REVISIONS 1-97 8-12 4-98	DIST HOU	COUNTY HARRIS		SHEET NO. 102C

207

DATE: 3/15/2023 4:16:32 AM
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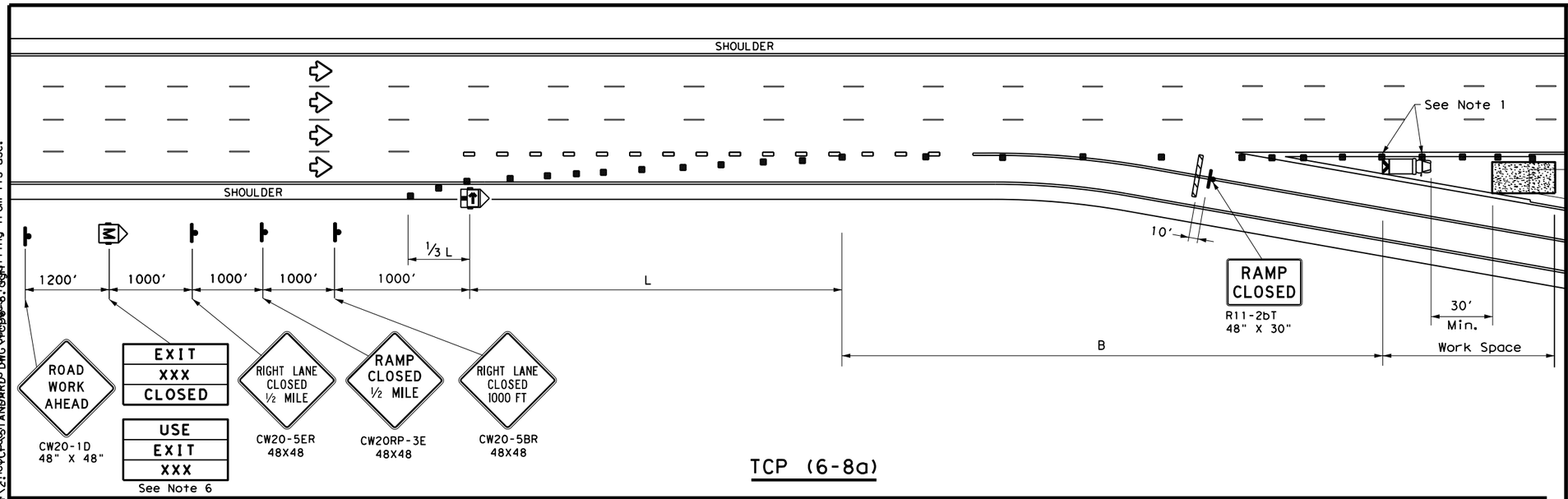
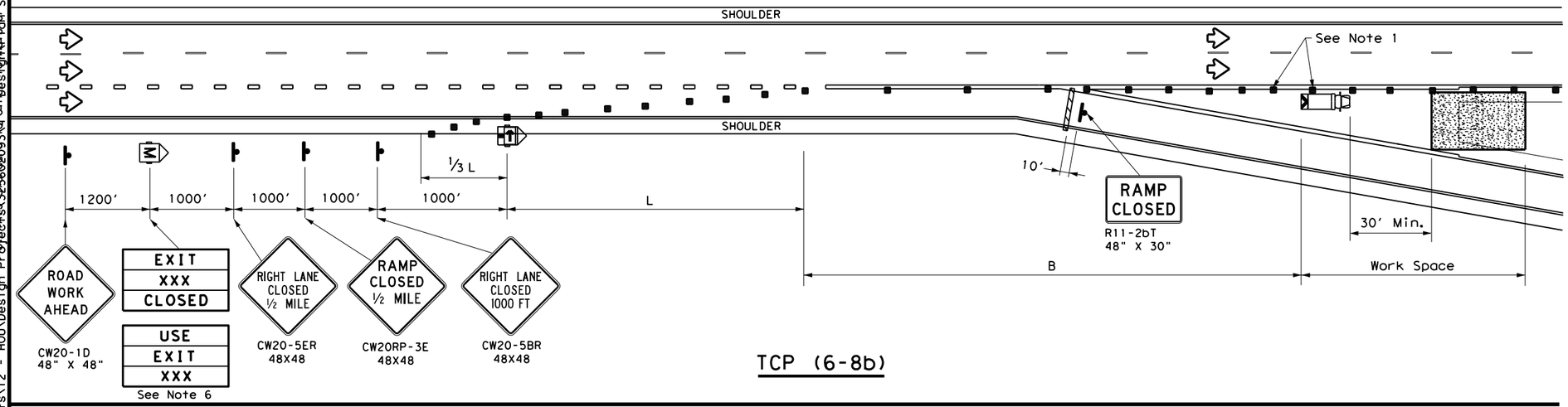
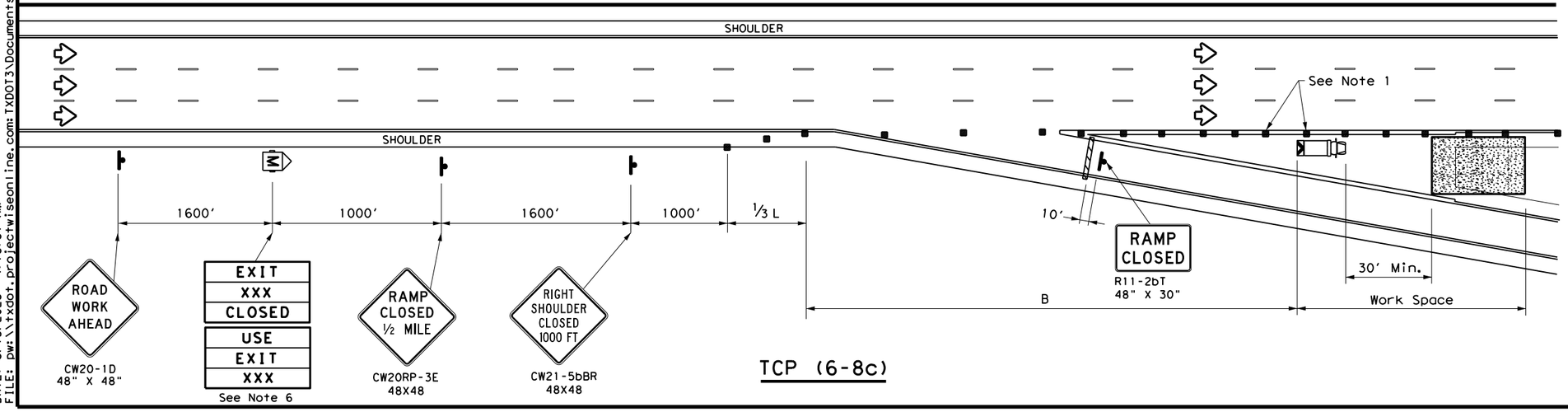


TCP (6-8a)



TCP (6-8b)



TCP (6-8c)

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Place channelizing devices in the gore at 20' spacing.
2. See the Standard Highway Sign Design for Texas (SHSD) for sign details.
3. The PCMS may be omitted when a permanent DMS sign is available in an appropriate location to display a similar message as called for on the PCMS.
4. When it is determined that a through lane should be closed in addition to the exit ramp, refer to TCP(6-4) for traffic control details.
5. Truck mounted attenuator is required.
6. The PCMS may be omitted if replaced with a "RAMP CLOSED" AHEAD (CW20RP-3D) Sign.
7. Roadway ADT should be greater than 10,000.

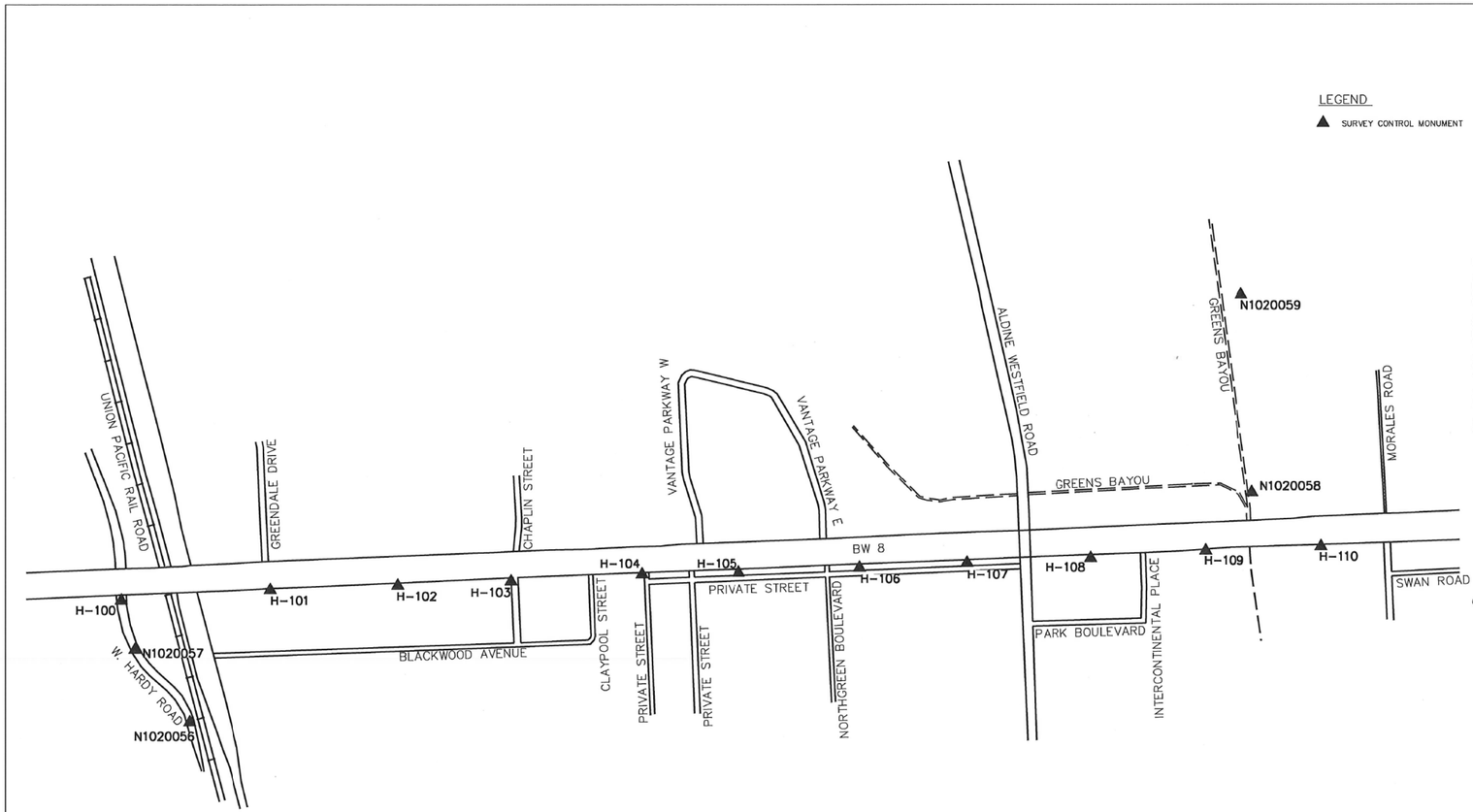
Texas Department of Transportation

Traffic Operations Division Standard

WORK IN EXIT GORE FOR ADT GREATER THAN 10,000

TCP(6-8)-14

FILE: tcp6-8.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		102D



NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM (NAD) 83 (2011 ADJUSTMENT), EPOCH 2010.00.

2. ALL COORDINATES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00013. UNITS US SURVEY FEET.

3. COORDINATES WERE DERIVED FROM STATIC OBSERVATIONS USING CORS STATIONS TXCN, TXLM AND TXRS.

4. ALL ELEVATIONS SHOWN ARE BASED ON NAVD 88 USING GEOID 12A AND WERE ESTABLISHED BY DIGITAL DIFFERENTIAL LEVELING.

5. PROJECT CONTROL POINTS WERE ESTABLISHED USING TXDOT LEVEL 2 AND 3 GPS SPECIFICATIONS.

STATE OF TEXAS
REGISTERED
ROBERT M. ANGUIANO
6347
PROFESSIONAL
LAND SURVEYOR

01-11-19

THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND AND UNDER MY SUPERVISION.

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

SURVEY CONTROL MONUMENTS

POINT NO.	NORTHING	EASTING	DISK ELEV.	NG ELEV.	DESCRIPTION
N1020056	13,907,088.10	3,114,902.31	78.55'	78.95'	3-1/4" TXDOT ALUMINUM DISK SET IN CONCRETE
N1020057	13,907,768.06	3,114,366.96	76.05'	76.47'	3-1/4" TXDOT ALUMINUM DISK SET IN CONCRETE
N1020058	13,909,239.44	3,124,691.18	69.75'	70.18'	3-1/4" TXDOT ALUMINUM DISK SET IN CONCRETE
N1020059	13,911,095.33	3,124,791.69	70.86'	71.32'	3-1/4" TXDOT ALUMINUM DISK SET IN CONCRETE
H-100	13,908,228.94	3,114,258.76	76.45'	76.97'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-101	13,908,326.97	3,115,671.04	74.18'	74.65'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-102	13,908,369.74	3,116,863.35	73.67'	74.23'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-103	13,908,408.96	3,117,929.05	74.44'	75.03'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-104	13,908,474.08	3,119,159.77	73.87'	74.32'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-105	13,908,490.73	3,120,068.04	75.32'	75.82'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-106	13,908,535.28	3,121,204.32	74.16'	74.67'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-107	13,908,581.28	3,122,210.71	71.66'	72.28'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-108	13,908,624.83	3,123,370.93	68.70'	69.26'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-109	13,908,692.45	3,124,450.66	70.14'	70.74'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD
H-110	13,908,732.72	3,125,540.49	68.48'	69.01'	3-1/4" TXDOT ALUMINUM DISK ATOP 5/8" DIAMETER IRON ROD

SURVEY CONTROL MONUMENT INVERSE TABLE

FROM POINT	TO POINT	BEARING	DISTANCE
N1020056	N1020057	N37°09'31"W	853.19'
N1020056	H-100	N29°25'40"W	1,309.84'
N1020057	H-100	N15°32'44"W	478.38'
N1020058	N1020059	N03°04'07"W	1,858.55'
H-103	H-104	N86°58'15"E	1,232.45'
H-104	H-105	N88°56'60"E	908.42'
H-105	H-106	N87°45'17"E	1,137.15'
H-106	H-107	N87°22'59"E	1,007.44'
H-107	H-108	N87°51'01"E	1,161.04'
H-108	H-109	N86°24'59"E	1,081.85'
H-109	H-110	N87°53'03"E	1,090.58'

U.S. SURVEY FEET

SURVEY CONTROL LAYOUT

VICKREY & ASSOCIATES, INC.
CONSULTING ENGINEERS
CIVIL · ENVIRONMENTAL · SURVEY
12940 Country Parkway
San Antonio, TX 78216
Telephone: (210) 349-3271
TBPLS #10004100

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
6	TEXAS				BW 8
STATE DIST. NO.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
HOU	HARRIS	3256	02	093	

SL 8

SURVEY
HOR/VER CONTROL

SHEET 1 OF 3

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			103
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: $DATE$
$FILEL$

N1020056
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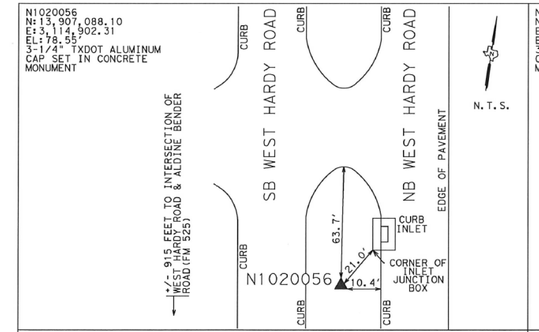
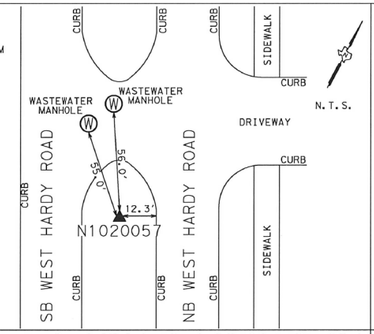
EL:78.55'
3-1/4" TXDOT ALUMINUM
CAP SET IN CONCRETE
MONUMENT



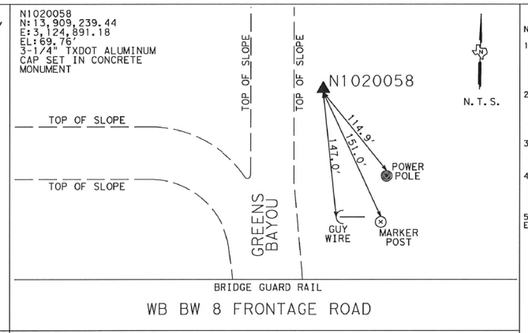
N1020056 is located on a grass median +/- 915 feet northwest of the intersection of West Hardy Road and Aldine Bender Road (FM 525), being +/- 63.7 feet south of the north nose of the grass median, +/- 21.0 feet southwest of the southwest corner of a curb inlet junction box, and +/- 10.4 feet west of the back of curb for the east side of the grass median.

N1020057
N:13,907,768.06
E:3,114,586.96
EL:76.05'
3-1/4" TXDOT ALUMINUM
CAP SET IN CONCRETE
MONUMENT



N1020057 is located on a grass median +/- 545 feet southeast of the intersection of West Hardy Road and EB BW 8 Frontage Road, being +/- 55.0 feet southeast of a wastewater manhole, +/- 56.0 feet southeast of a wastewater manhole, and +/-12.3 feet west of the back of curb for the east side of the grass median.

N1020058
N:13,909,239.44
E:3,124,891.18
EL:69.76'
3-1/4" TXDOT ALUMINUM
CAP SET IN CONCRETE
MONUMENT



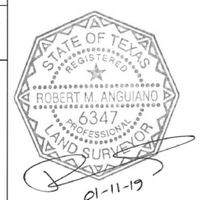
N1020058 is located on the east bank of Greens Bayou +/- 255 feet north of the face of bridge, being +/-114.9 feet northwest of a power pole, +/- 151.0 feet northwest of a marker post, and +/- 147.0 feet northwest of a guy wire.

NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM (NAD) 83 (2011 ADJUSTMENT), EPOCH 2010.00.
2. ALL COORDINATES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00013. UNITS US SURVEY FEET.
3. COORDINATES WERE DERIVED FROM STATIC OBSERVATIONS USING CORS STATIONS TXCN, TXLM AND TXRS.
4. ALL ELEVATIONS SHOWN ARE BASED ON NAVD 88 USING GEOID 12A AND WERE ESTABLISHED BY DIGITAL DIFFERENTIAL LEVELING.
5. PROJECT CONTROL POINTS WERE ESTABLISHED USING TXDOT LEVEL 2 AND 3 GPS SPECIFICATIONS.

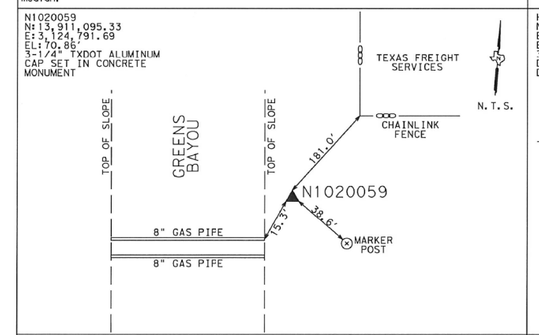
LEGEND

▲ SURVEY CONTROL MONUMENT



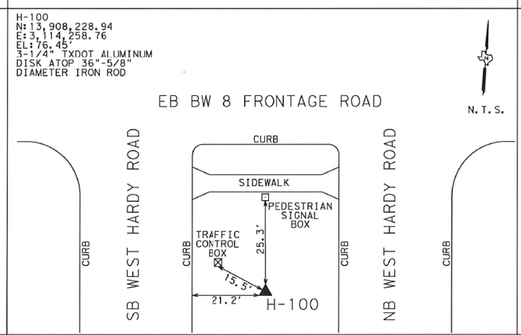
THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND AND UNDER MY SUPERVISION.

N1020059
N:13,911,095.33
E:3,124,791.69
EL:70.86'
3-1/4" TXDOT ALUMINUM
CAP SET IN CONCRETE
MONUMENT



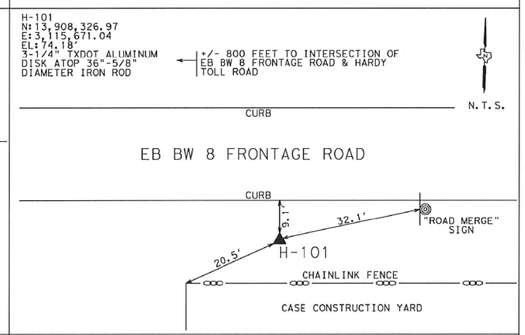
N1020059 is located on the east bank of Greens Bayou +/- 2,115 feet north of the face of bridge, being +/-181.0 feet southwest of the corner of a chainlink fence, +/- 38.6 feet northwest of a marker post, and +/- 15.3 feet northeast of the east end of an exposed 8 inch gas pipe.

H-100
N:13,908,228.94
E:3,114,258.76
EL:76.45'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



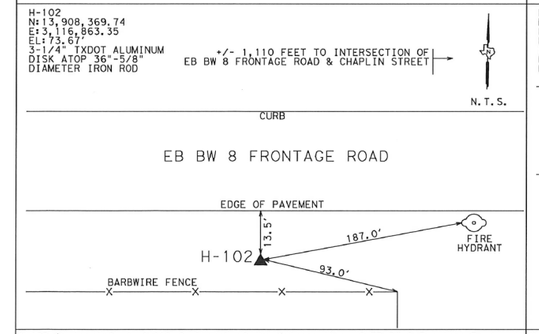
H-100 is located on a grass median on the south side of EB BW 8 Frontage Road, being +/- 21.2 feet east of the back of curb for the west side of the grass median, +/- 15.5 feet southeast of traffic control box, and +/- 25.3 south of a pedestrian signal box.

H-101
N:13,908,326.97
E:3,115,671.04
EL:74.18'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



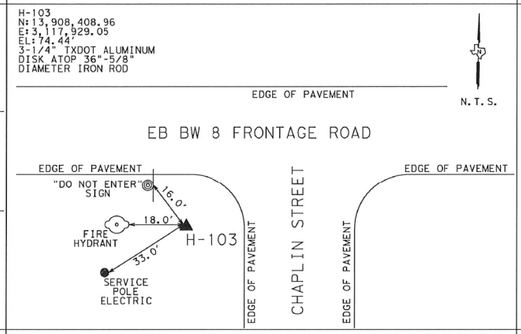
H-101 is located +/- 800 feet east of the intersection of Hardy Toll Road and EB BW 8 Frontage Road, being +/- 32.1 feet southwest of a "Road Merge" sign, +/- 20.5 feet northeast of the northwest corner of a chainlink fence, and +/- 9.1 feet south of the back of curb for the south side of EB BW 8 Frontage Road.

H-102
N:13,908,369.74
E:3,116,863.35
EL:73.67'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



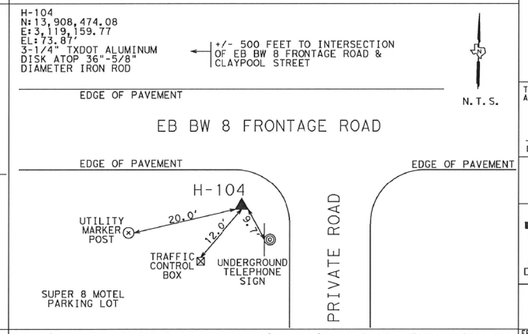
H-102 is located +/- 1,110 feet west of the intersection of EB BW 8 Frontage Road and Chaplin Street, being +/- 187.0 feet southwest of a fire hydrant, +/- 93.0 feet northwest of the northeast corner of a barbwire fence, and +/- 13.5 feet south of the edge of pavement on the south side of EB BW 8 Frontage Road.

H-103
N:13,908,408.96
E:3,117,929.05
EL:74.44'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



H-103 is located +/- 40 feet west of the intersection of EB BW 8 Frontage Road and Chaplin Street, being +/- 33.0 feet northeast of a service pole electric, +/- 18.0 feet east of a fire hydrant, and 16.0' feet southeast of a "Do Not Enter" sign.

H-104
N:13,908,474.08
E:3,119,159.77
EL:73.81'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



H-104 is located +/- 500 feet east of the intersection of EB BW 8 Frontage Road and Claypool Street, being +/- 9.7 feet northwest of a "Underground Telephone" sign, +/- 12.0 feet northeast of a traffic control box, and 20.0' feet northeast of a utility marker post.

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

DESIGN ENGINEER DATE

2019
Texas Department of Transportation

VICKREY & ASSOCIATES, INC.
CONSULTING ENGINEERS
CIVIL • ENVIRONMENTAL • SURVEY
12940 Country Parkway
San Antonio, TX 78216
Telephone: (210) 349-3271
TBPLS #10004100

BW 8
HORIZONTAL & VERTICAL CONTROL SHEET

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
6	TEXAS				BW 8
DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
HOU	HARRIS	3256	02	093	

SL 8

SURVEY
HOR/VER CONTROL

SHEET 2 OF 3

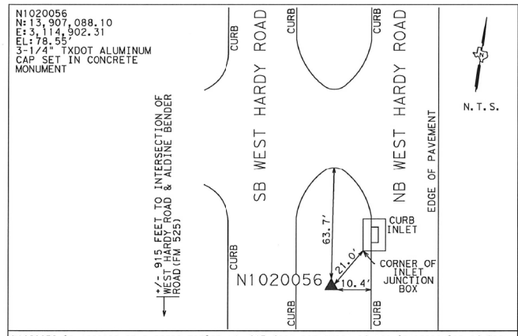
FED. RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		104

STATE	DIST	COUNTY
TEXAS	HOU	HARRIS

CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

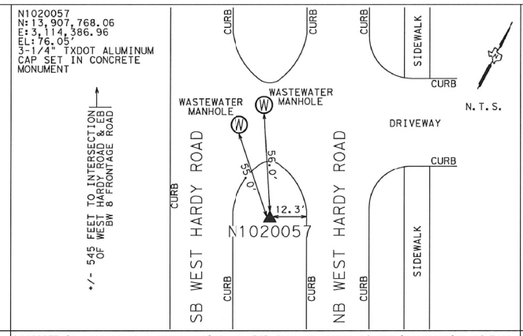
DATE:$DATE$
$FILEL$

N1020056
N:13,907,088.10
E:3,114,902.31
EL:78.55'
3-1/4" TXDOT ALUMINUM
CAP SET IN CONCRETE
MONUMENT



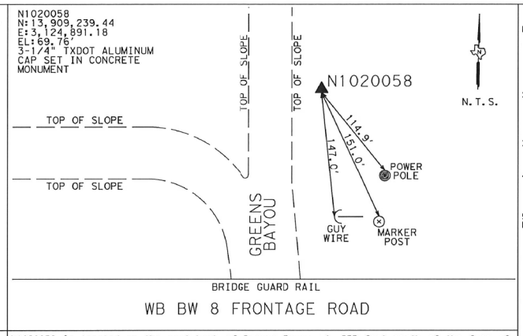
N1020056 is located on a grass median +/- 915 feet northwest of the intersection of West Hardy Road and Aldine Bender Road (FM 525), being +/- 63.7 feet south of the north nose of the grass median, +/- 21.0 feet southwest of the southwest corner of a curb inlet junction box, and +/- 10.4 feet west of the back of curb for the east side of the grass median.

N1020057
N:13,907,768.06
E:3,114,386.96
EL:76.05'
3-1/4" TXDOT ALUMINUM
CAP SET IN CONCRETE
MONUMENT



N1020057 is located on a grass median +/- 545 feet southeast of the intersection of West Hardy Road and EB BW 8 Frontage Road, being +/- 55.0 feet southeast of a wastewater manhole, and +/-12.3 feet west of the back of curb for the east side of the grass median.

N1020058
N:13,909,239.44
E:3,124,891.18
EL:69.76'
3-1/4" TXDOT ALUMINUM
CAP SET IN CONCRETE
MONUMENT



N1020058 is located on the east bank of Greens Bayou +/- 255 feet north of the face of bridge, being +/-114.9 feet northwest of a power pole, +/- 151.0 feet northwest of a marker post, and +/- 147.0 feet northwest of a guy wire.

NOTES:

1. ALL COORDINATES AND BEARINGS SHOWN ARE BASED ON TEXAS COORDINATE SYSTEM, SOUTH CENTRAL ZONE, NORTH AMERICAN DATUM (NAD) 83 (2011 ADJUSTMENT), EPOCH 2010.00.
2. ALL COORDINATES AND DISTANCES SHOWN ARE SURFACE VALUES AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00013. UNITS US SURVEY FEET.
3. COORDINATES WERE DERIVED FROM STATIC OBSERVATIONS USING CORS STATIONS TXCN, TXLM AND TXRS.
4. ALL ELEVATIONS SHOWN ARE BASED ON NAVD 88 USING GEOID 12A AND WERE ESTABLISHED BY DIGITAL DIFFERENTIAL LEVELING.
5. PROJECT CONTROL POINTS WERE ESTABLISHED USING TXDOT LEVEL 2 AND 3 GPS SPECIFICATIONS.

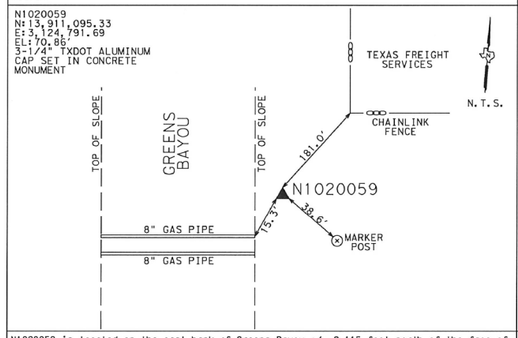
LEGEND

▲ SURVEY CONTROL MONUMENT

STATE OF TEXAS
REGISTERED
ROBERT M. ANGUIANO JR.
6347
PROFESSIONAL
LAND SURVEYOR
01-11-19

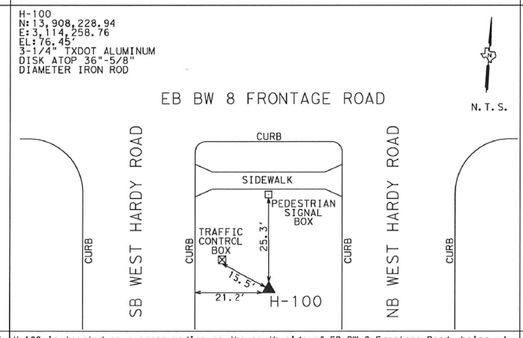
THE CONTROL POINTS SHOWN HEREIN WERE DETERMINED BY A SURVEY MADE ON THE GROUND AND UNDER MY SUPERVISION.

N1020059
N:13,911,095.33
E:3,124,791.69
EL:70.86'
3-1/4" TXDOT ALUMINUM
CAP SET IN CONCRETE
MONUMENT



N1020059 is located on the east bank of Greens Bayou +/- 2,115 feet north of the face of bridge, being +/-181.0 feet southwest of the corner of a chainlink fence, +/- 38.6 feet northwest of a marker post, and +/- 15.3 feet northeast of the east end of an exposed 8 inch gas pipe.

H-100
N:13,908,228.94
E:3,114,258.76
EL:76.45'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



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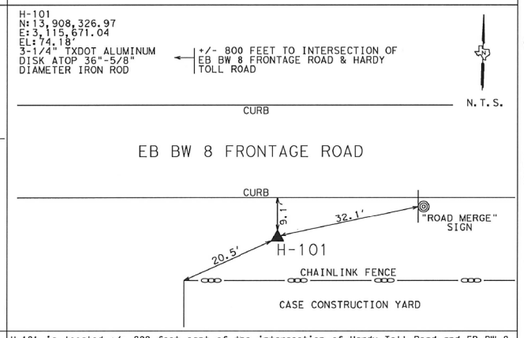
H-101
N:13,908,326.97
E:3,115,671.04
EL:74.18'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



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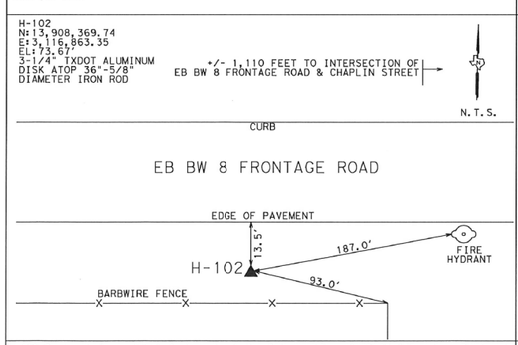
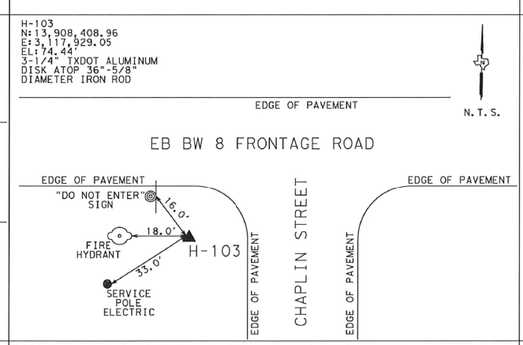
EL:73.67'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



H-102 is located +/- 1,110 feet west of the intersection of EB BW 8 Frontage Road and Chaplin Street, being +/- 187.0 feet southwest of a fire hydrant, +/- 93.0 feet northwest of the northeast corner of a barbwire fence, and +/- 13.5 feet south of the edge of pavement on the south side of EB BW 8 Frontage Road.

H-103
N:13,908,408.96
E:3,117,929.05
EL:74.44'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



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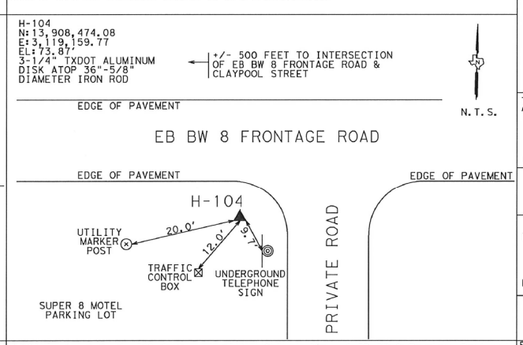
H-104
N:13,908,474.08
E:3,119,159.77
EL:73.87'
3-1/4" TXDOT ALUMINUM
DISK ATOP 36"-5/8"
DIAMETER IRON ROD



H-104 is located +/- 500 feet east of the intersection of EB BW 8 Frontage Road and Claypool Street, being +/- 9.7 feet northwest of a "Underground Telephone" sign, +/- 12.0 feet northeast of a traffic control box, and 20.0' feet northeast of a utility marker post.

THE SURVEY CONTROL INFORMATION HAS BEEN ACCEPTED AND INCORPORATED INTO THIS PS&E

DESIGN ENGINEER DATE

2019
Texas Department of Transportation

VICKREY & ASSOCIATES, INC.
CONSULTING ENGINEERS
CIVIL • ENVIRONMENTAL • SURVEY
12940 Country Parkway
San Antonio, TX 78216
Telephone: (210) 349-3271
TBPLS #10004100

BW 8
HORIZONTAL & YERTICAL CONTROL SHEET

FED. RD. DIV. NO.	STATE	FEDERAL AID PROJECT NO.			HIGHWAY NO.
6	TEXAS				BW 8
DIST.	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
HOU	HARRIS	3256	02	093	

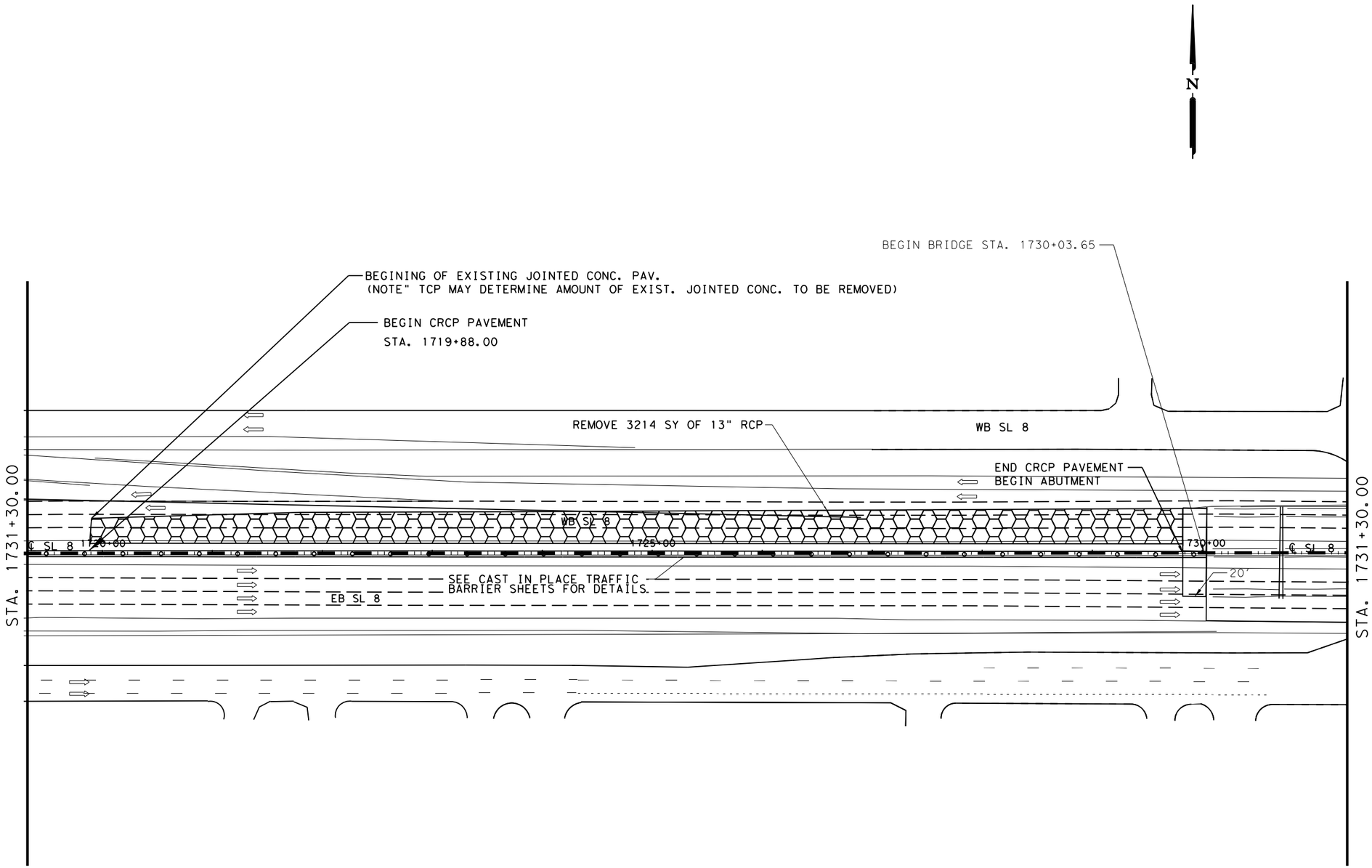
SL 8

SURVEY
HOR/VER CONTROL

SHEET 3 OF 3

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			105
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:$DATE$
$FILEL$



NOTE: LINE UP PROPOSED JOINTS WITH OUTSIDE JOINTS

LEGEND

1. REMOVE CONC PVMT. (361-6002)
2. PLANE ASPH CONC. 0"-4" 354-6023
3. REMOVE CONC PVMT. (361-6007)
4. REMOVE CURB (104-6021)
5. REMOVE GUARDRAIL (542-6001)
6. REMOVE SIDEWALK (104-6036)
7. REMOVAL CONC. BARRIER 104 6042

NOTE: RAP TO BECOME PROPERTY OF TxDOT, SEE ITEM 354 IN NOTES FOR LOCATION AND CONTACT.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by Daniel Duke Thompson, P.E. 122541
03/15 2023

Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

Daniel Thompson 09/22/202

Texas Department of Transportation

WB SL 8

DEMOLITION PLAN

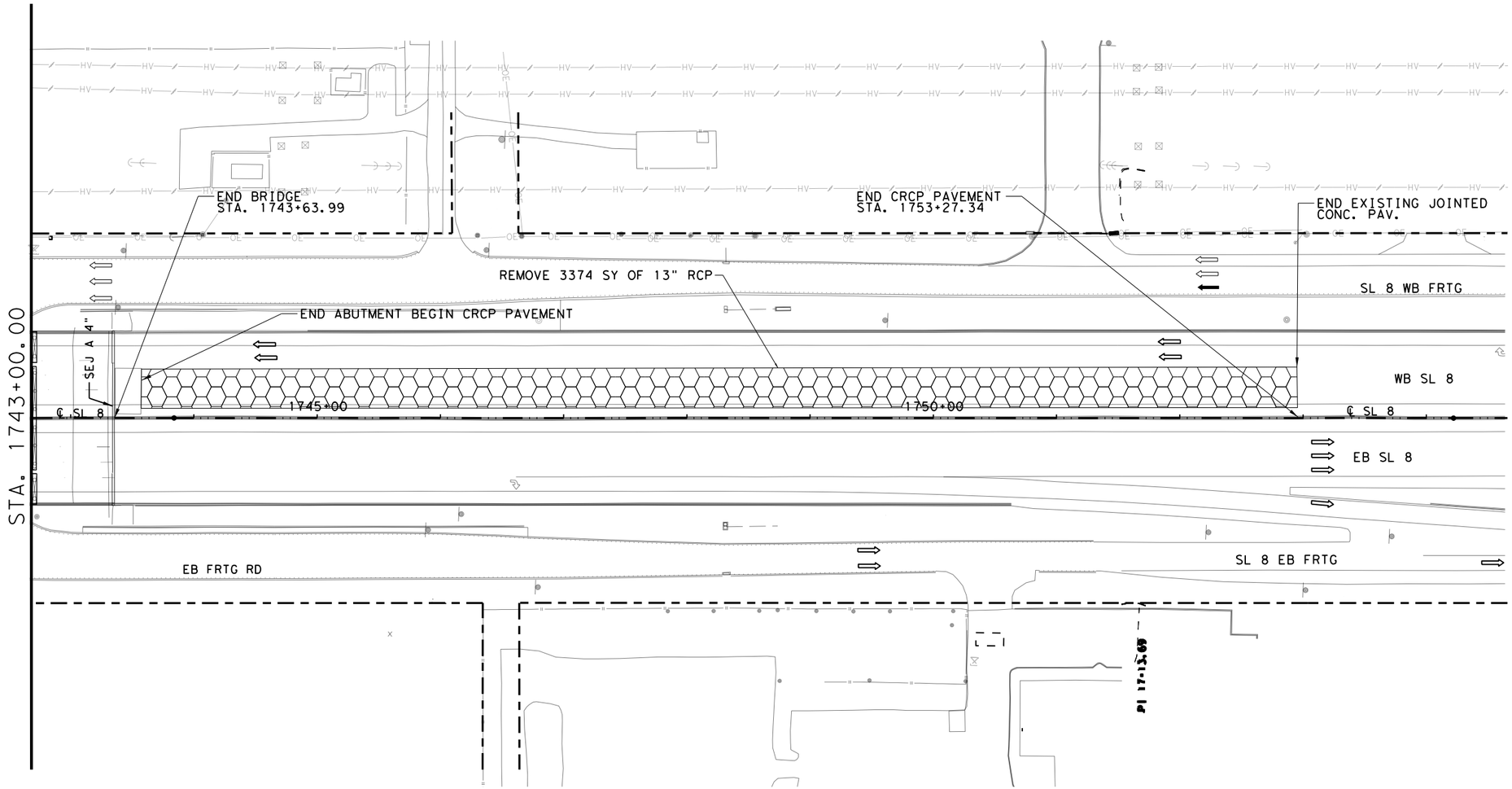
PHASE 1

SCALE: 1" = 100' HORZ

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			106
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/31/2023
$FILEL$



NOTE" LINE UP PROPOSED JOINTS WITH OUTSIDE JOINTS

BRIDGE ID 12-102-0-3256-02-004

LEGEND

1. REMOVE CONC PVMT. (361-6002)
2. PLANE ASPH CONC. 0"-4" 354-6023
3. REMOVE CONC PVMT. (361-6007)
4. REMOVE CURB (104-6021)
5. REMOVE GUARDRAIL (542-6001)
6. REMOVE SIDEWALK (104-6036)
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STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

WB SL 8
DEMOLITION PLAN
PHASE 1

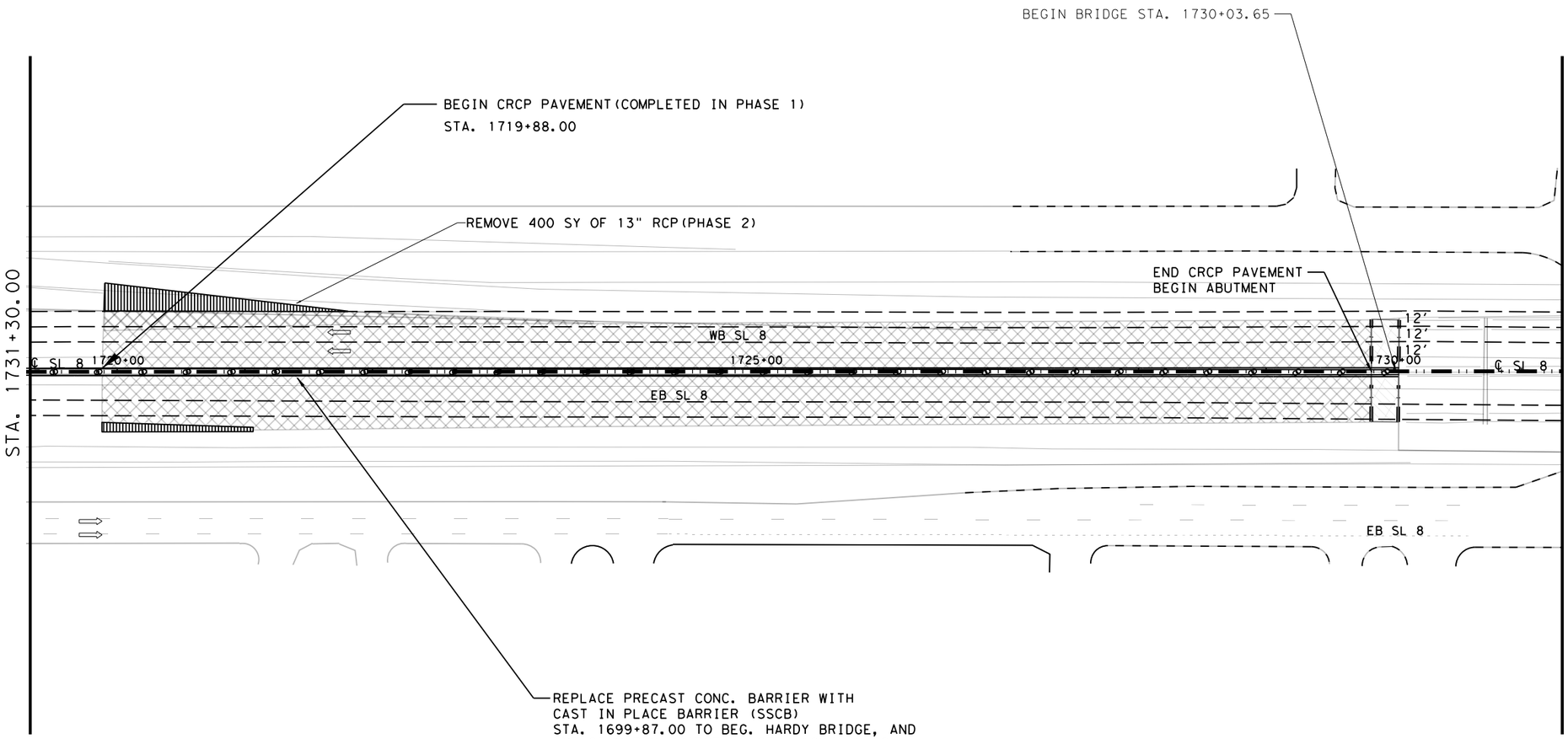
SCALE: 1" = 100' HORZ

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			107
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

BEGIN 42" SINGLE SLOPE BARRIER
STA. 1699+87.00



LEGEND

1. REMOVE CONC PVMT. (361-6002)
2. PLANE ASPH CONC. 0"-4" 354-6023
3. REMOVE CONC PVMT. (361-6007)
4. REMOVE CURB (104-6021)
5. REMOVE GUARDRAIL (542-6001)
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STATE OF TEXAS
DANIEL DUKE THOMPSON
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Texas Department of Transportation

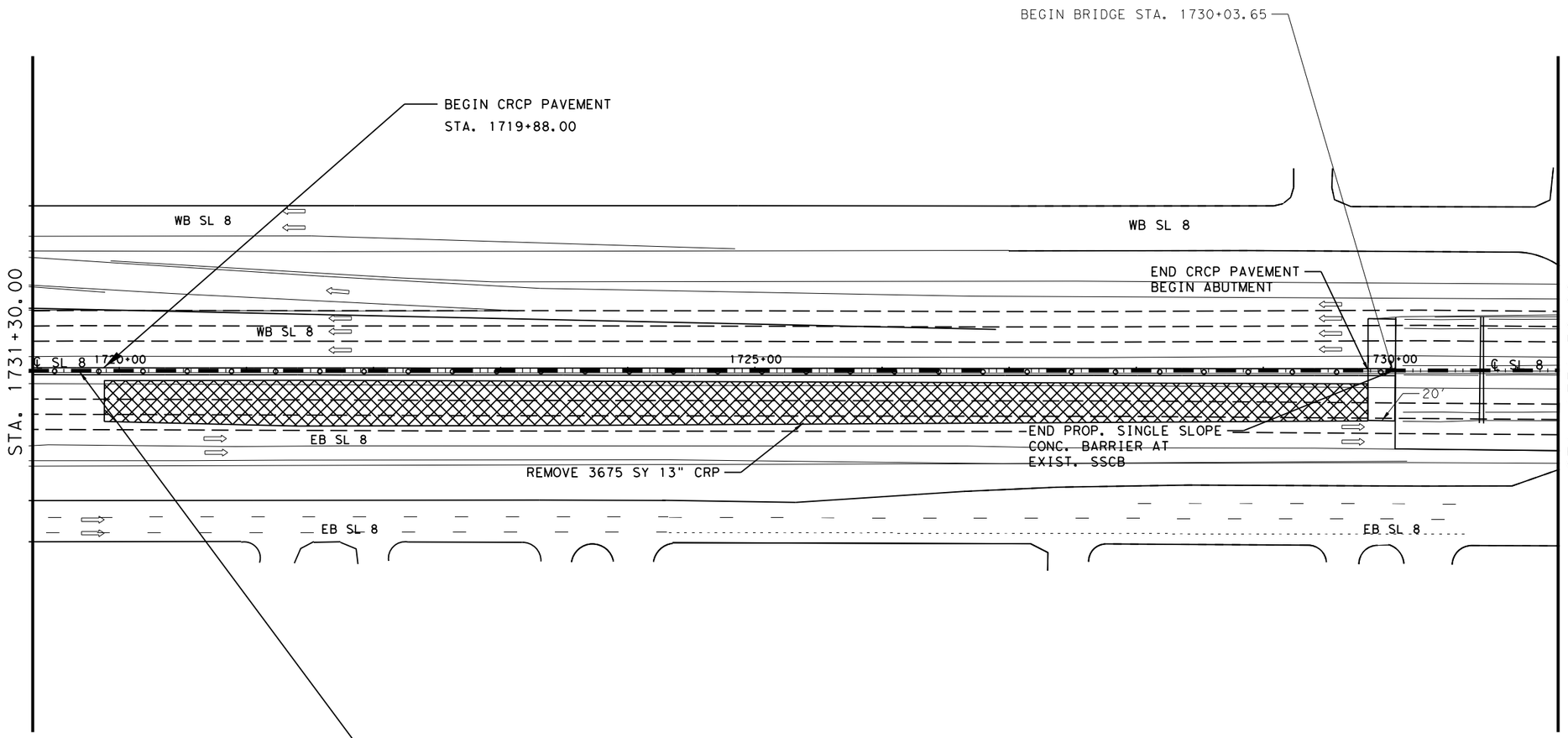
WB SL 8
DEMOLITION PLAN
PHASE 2

SCALE: 1" = 100' HORZ

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			108
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



LEGEND

1. REMOVE CONC PVMT. (361-6002)
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3. REMOVE CONC PVMT. (361-6007)
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STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

EB SL 8

DEMOLITION PLAN

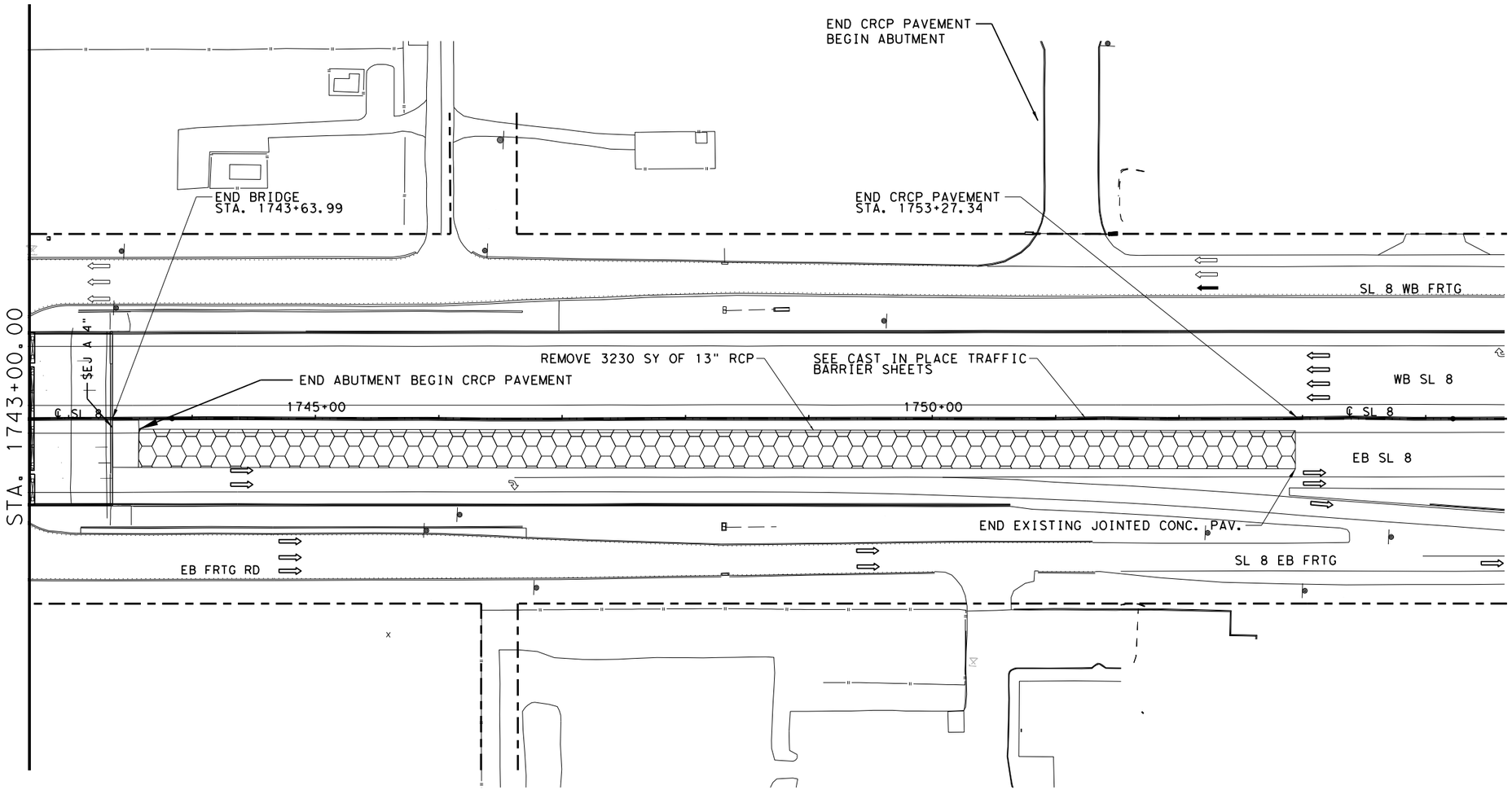
PHASE 1

SCALE: 1" = 100' HORZ

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			109
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



NOTE" LINE UP PROPOSED JOINTS WITH OUTSIDE JOINTS

LEGEND

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5. REMOVE GUARDRAIL (542-6001)
6. REMOVE SIDEWALK (104-6036)
7. REMOVAL CONC. BARRIER 104 6042

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STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

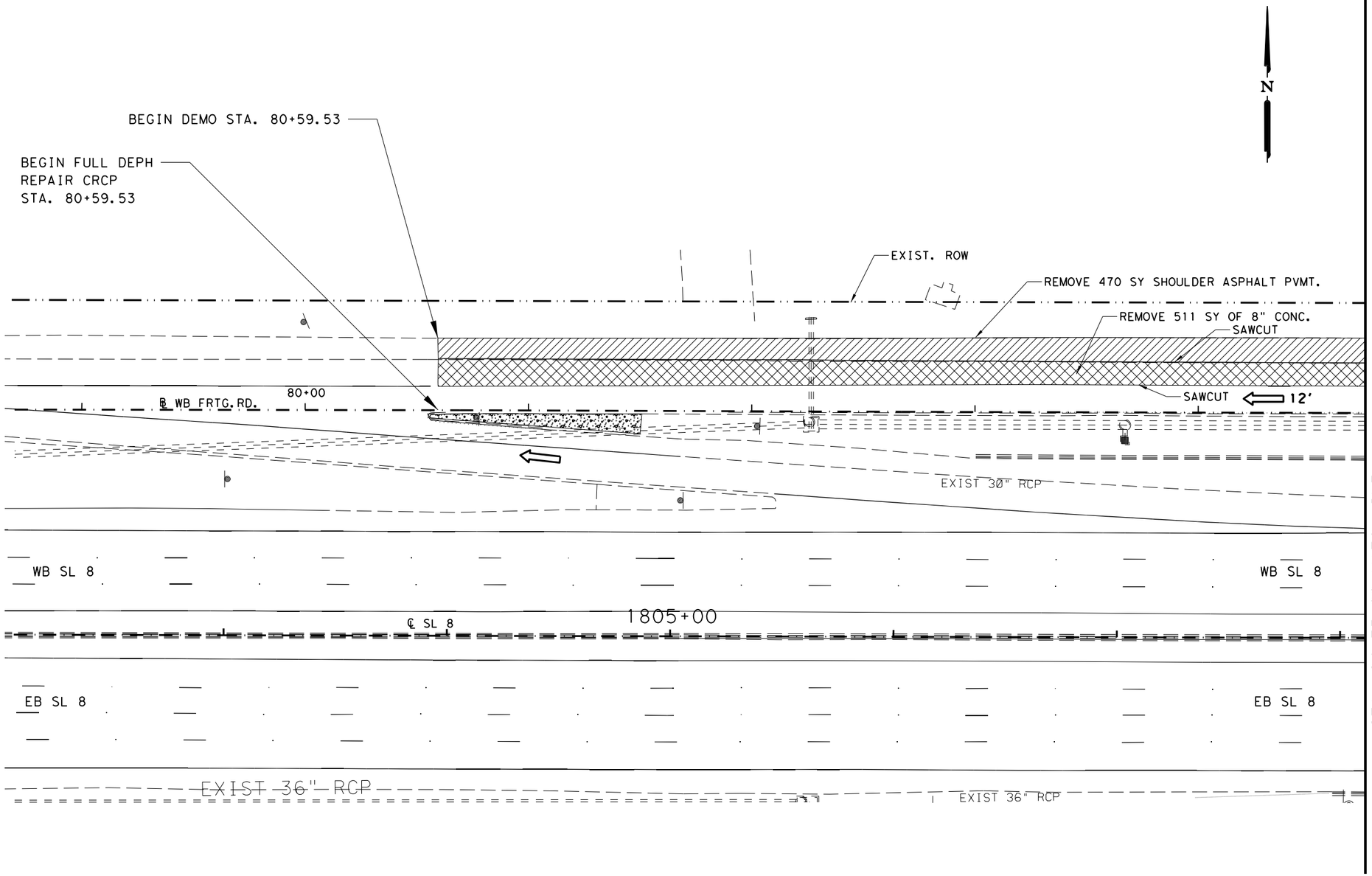
EB SL 8
DEMOLITION PLAN
PHASE 1

SCALE: 1" = 100' HORZ

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			110
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



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6. REMOVE SIDEWALK (104-6036)
7. REMOVAL CONC. BARRIER 104 6042

NOTE: RAP TO BECOME PROPERTY OF TxDOT, SEE ITEM 354 IN NOTES FOR LOCATION AND CONTACT.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD
DEMOLITION PLAN
PHASE 1

SCALE: 1" = 50' HORZ

SHEET 1 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			111
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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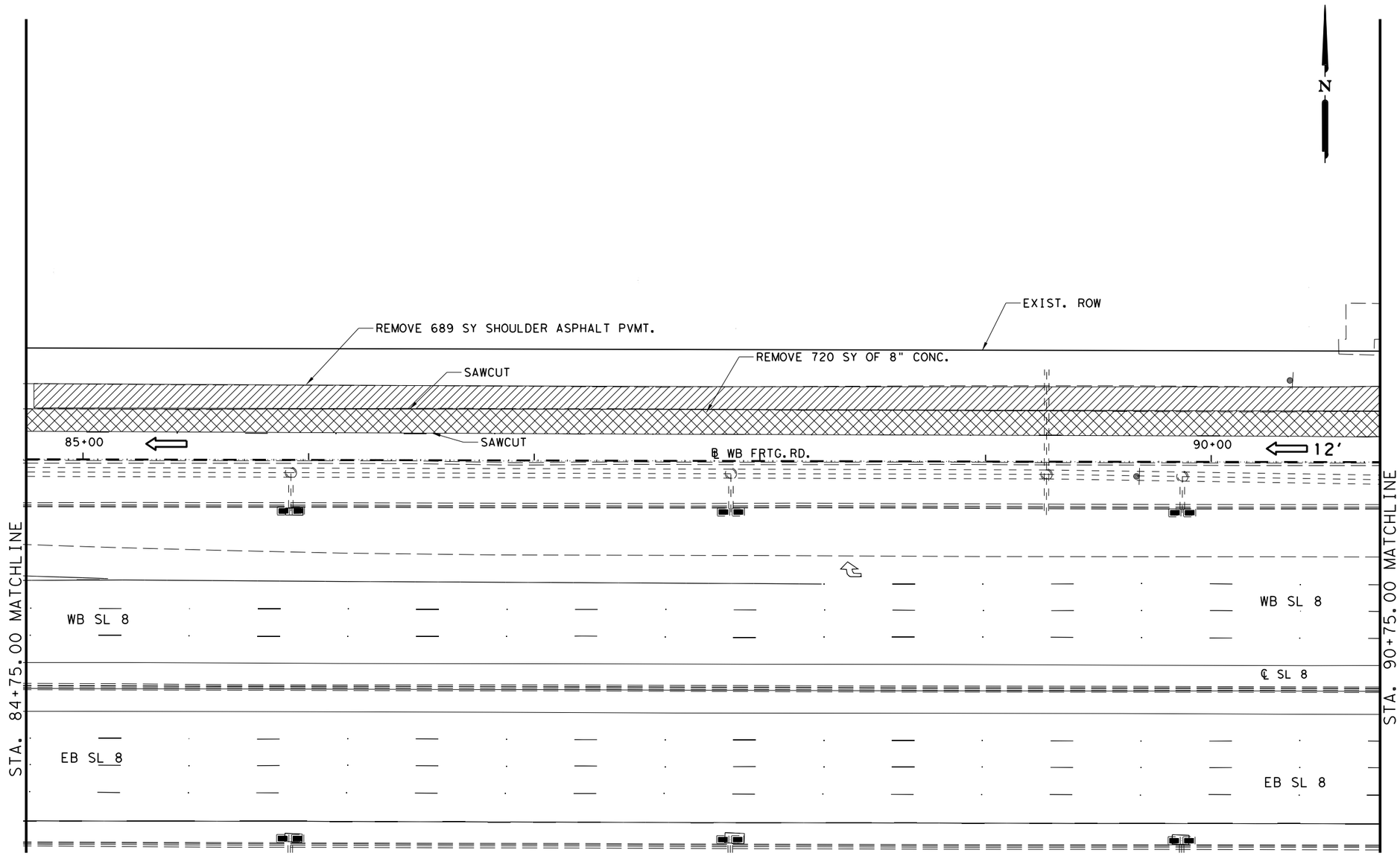

LEGEND

1. REMOVE CONC PVMT. (361-6002)
2. PLANE ASPH CONC. 0"-4" 354-6023
3. REMOVE CONC PVMT. (361-6007)
4. REMOVE CURB (104-6021)
5. REMOVE GUARDRAIL (542-6001)
6. REMOVE SIDEWALK (104-6036)
7. REMOVAL CONC. BARRIER 104 6042

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SL 8
WB FRONTAGE ROAD
DEMOLITION PLAN
PHASE 1

SCALE: 1" = 50' HORZ

SHEET 2 OF 4

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		112

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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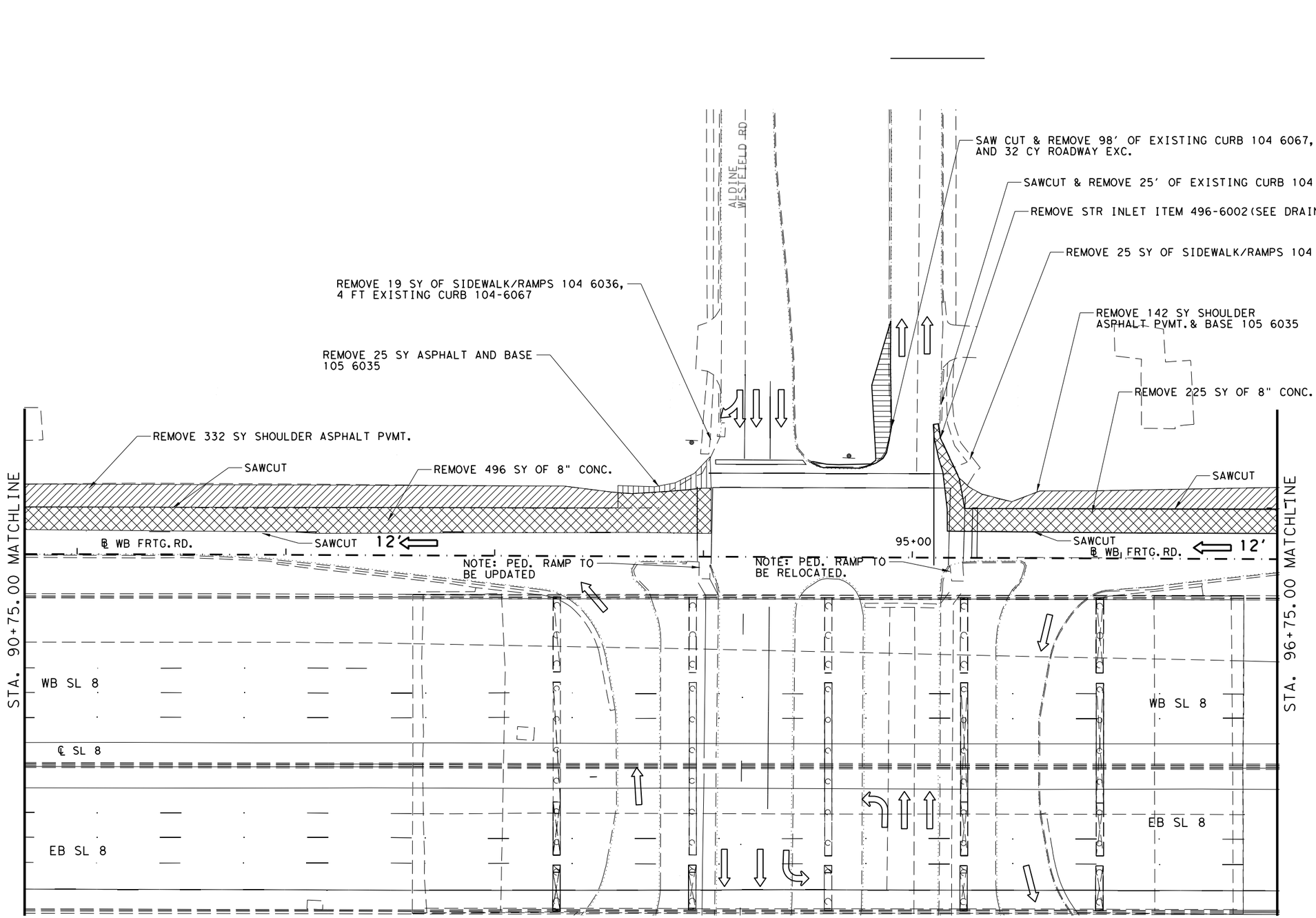

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SL 8 WB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 3 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			113
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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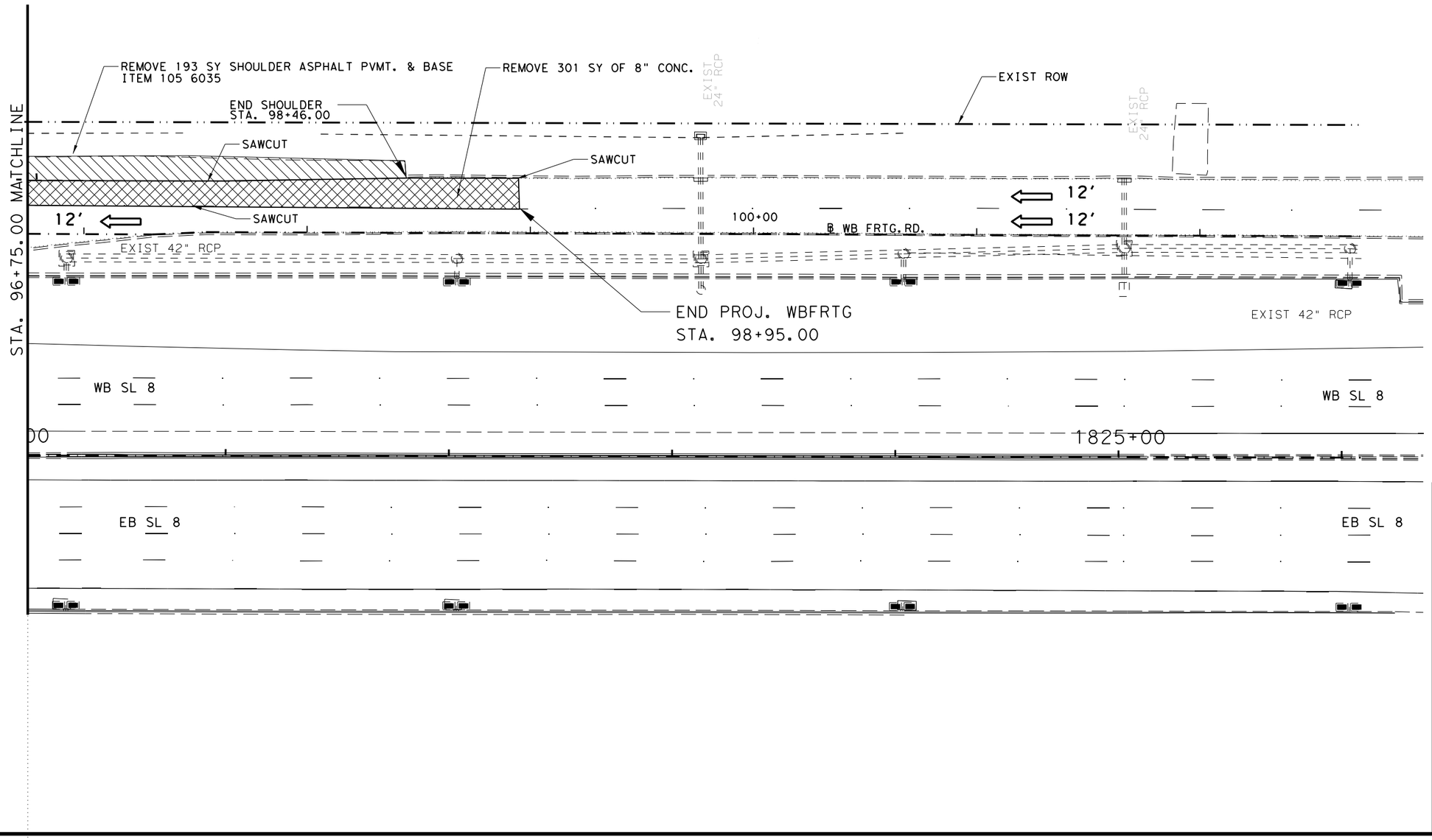

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SL 8
WB FRONTAGE ROAD

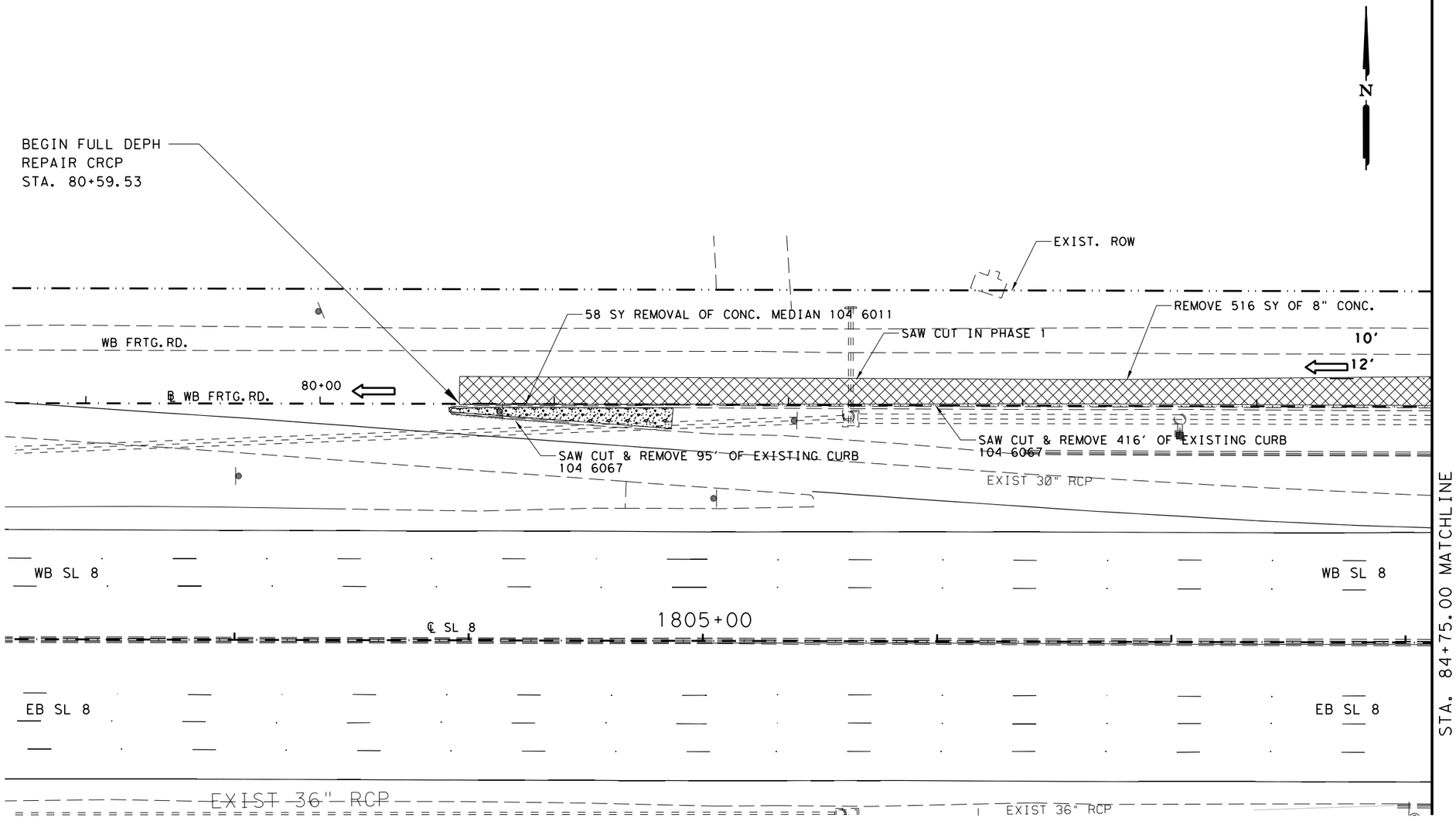
DEMOLITION PHASE 1

SCALE: 1" = 50' HORZ

SHEET 4 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			114
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



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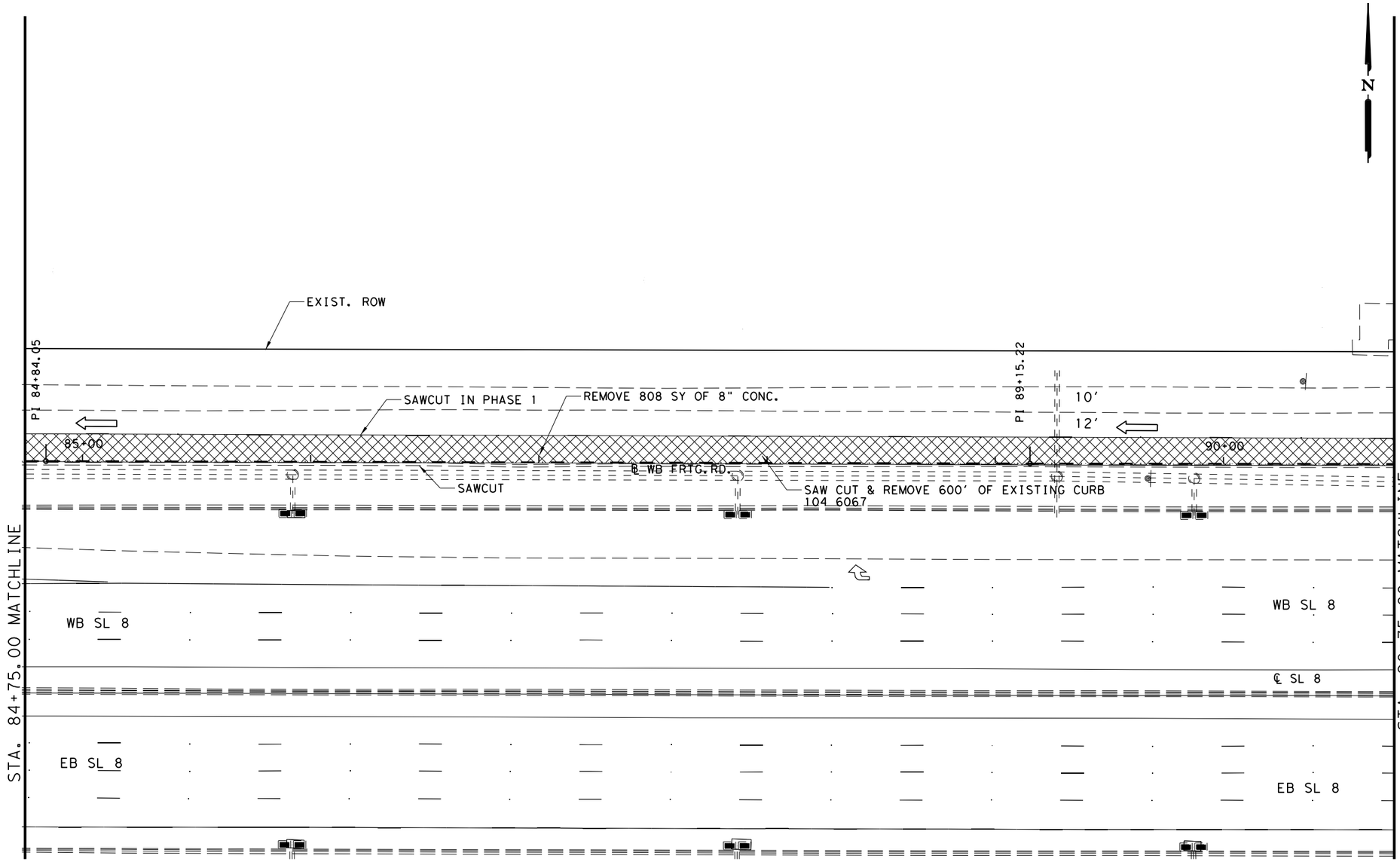
SL 8
WB FRONTAGE ROAD
DEMOLITION PLAN
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 1 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			115
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



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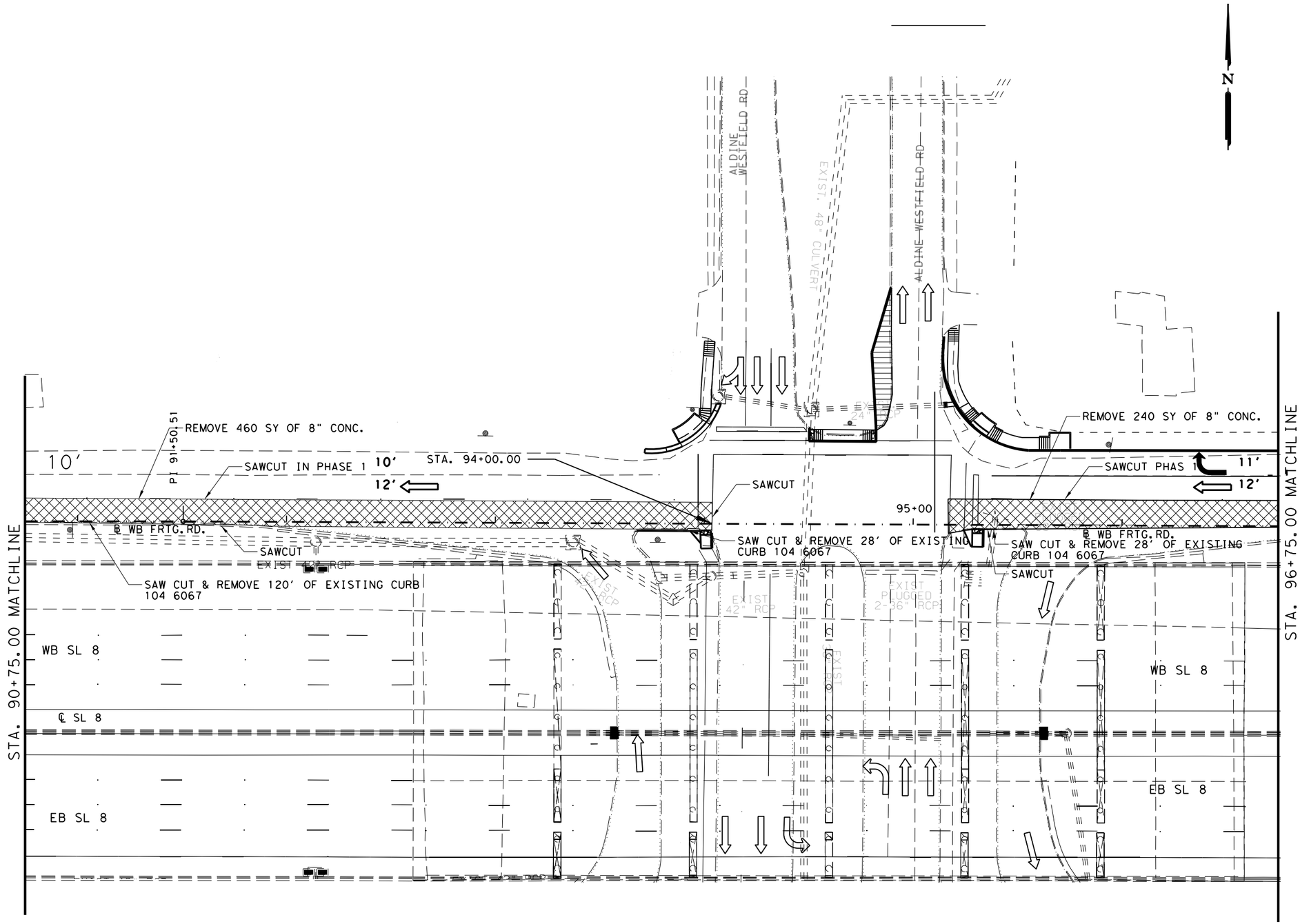
SL 8
WB FRONTAGE ROAD
DEMOLITION
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 2 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			116
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



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SL 8
WB FRONTAGE ROAD
DEMOLITION
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 3 OF 4

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		117

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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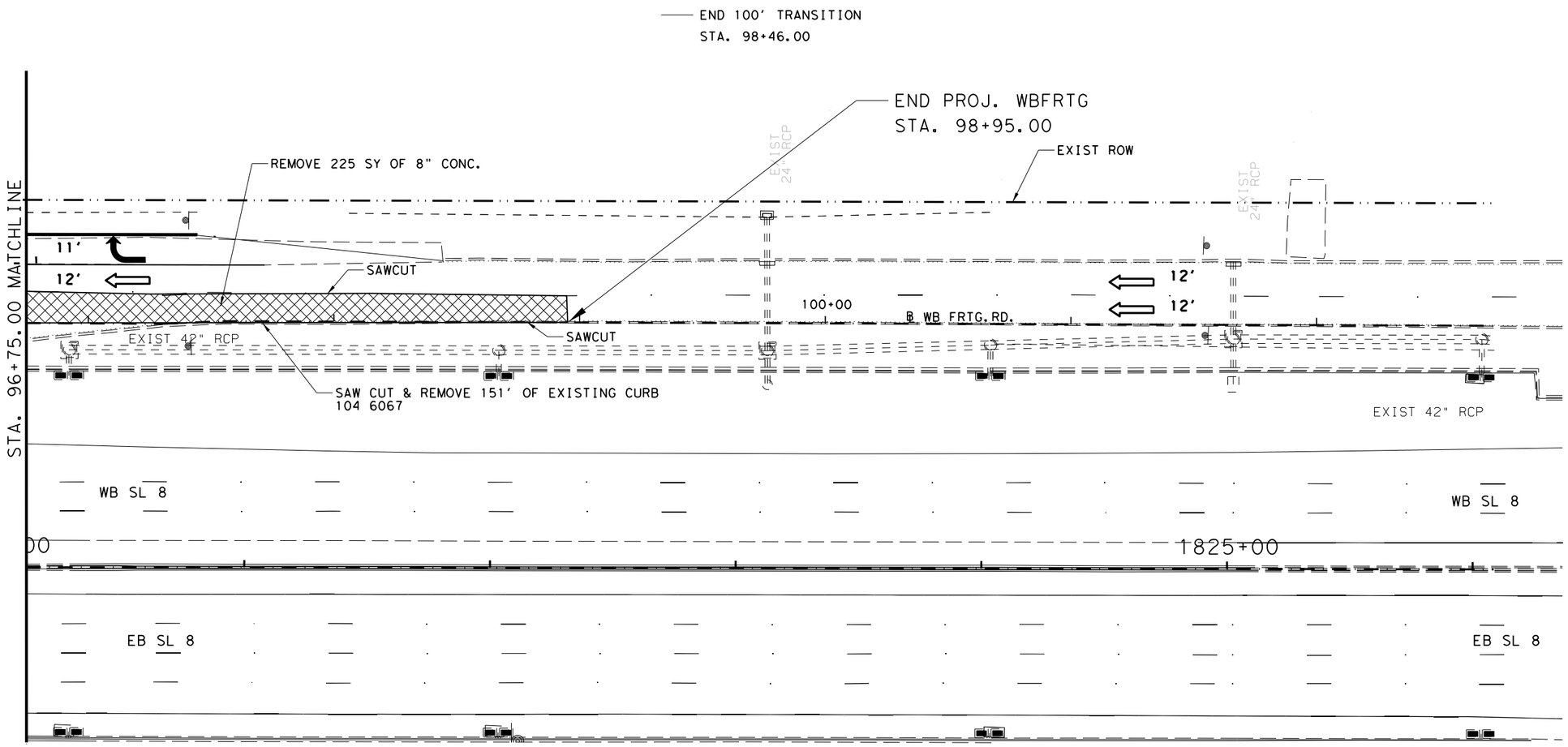

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SL 8
WB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 4 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			118
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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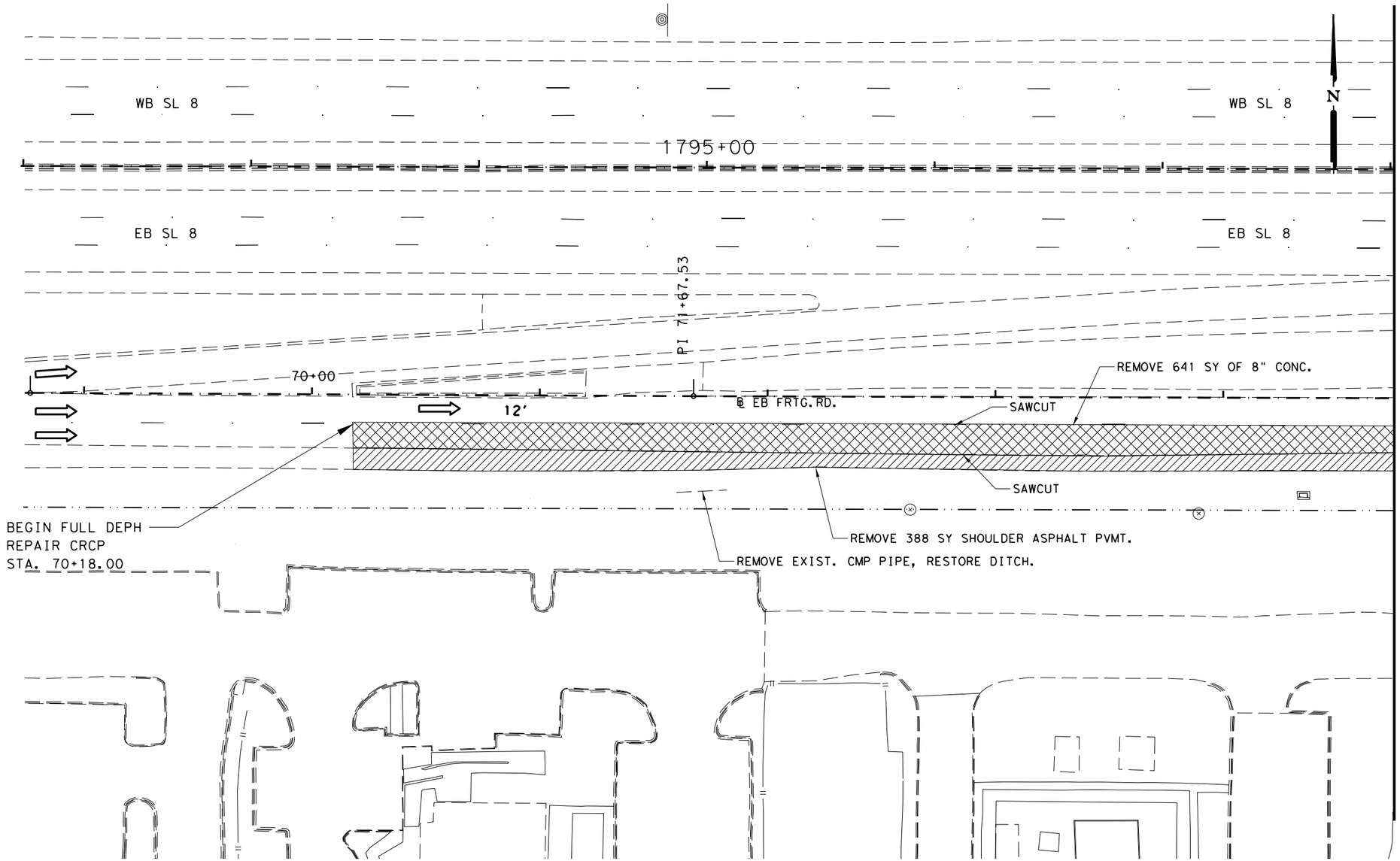

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SL 8

EB FRTG RD DEMOLITION PLAN

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 1 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			119
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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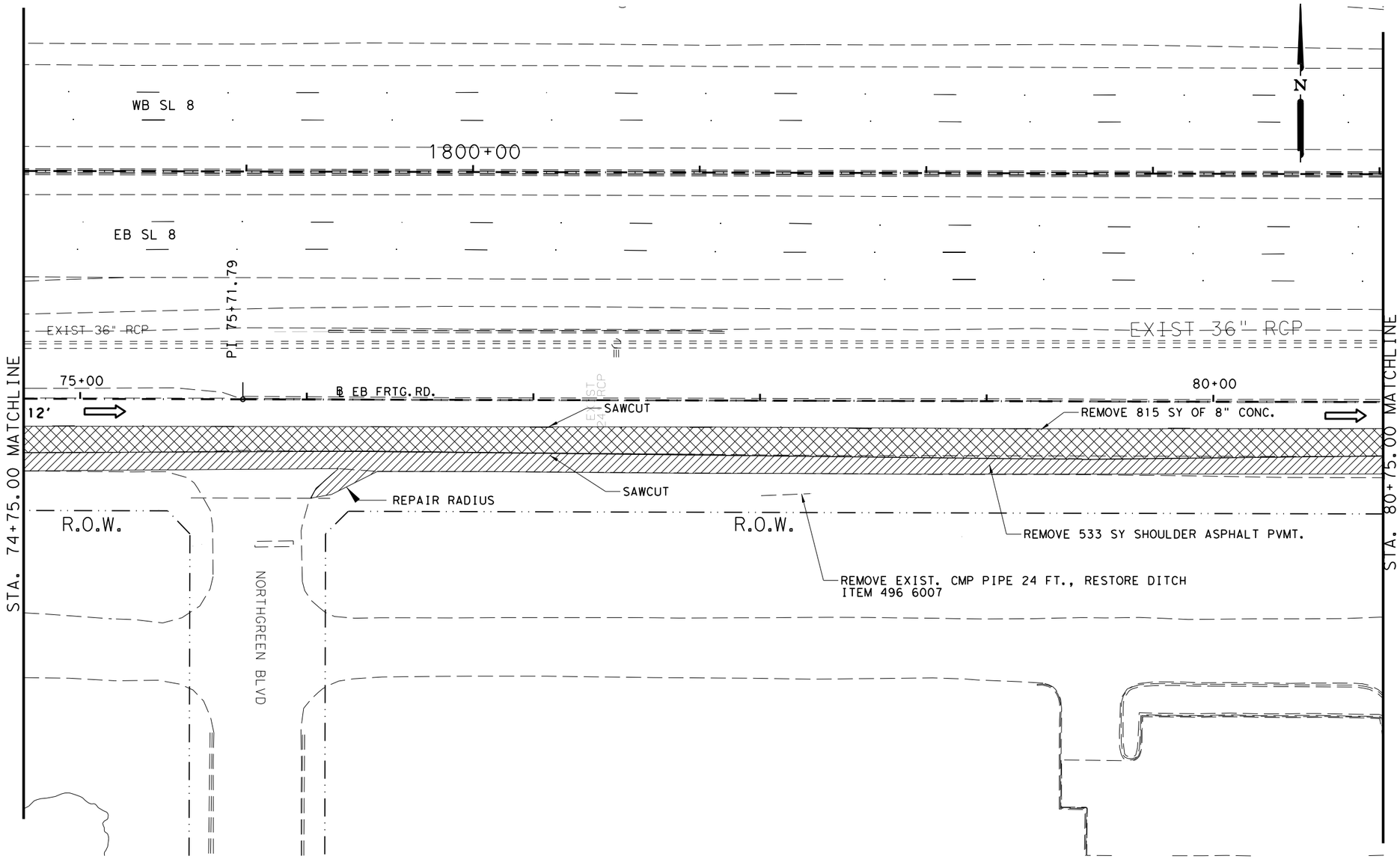

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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 2 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			120
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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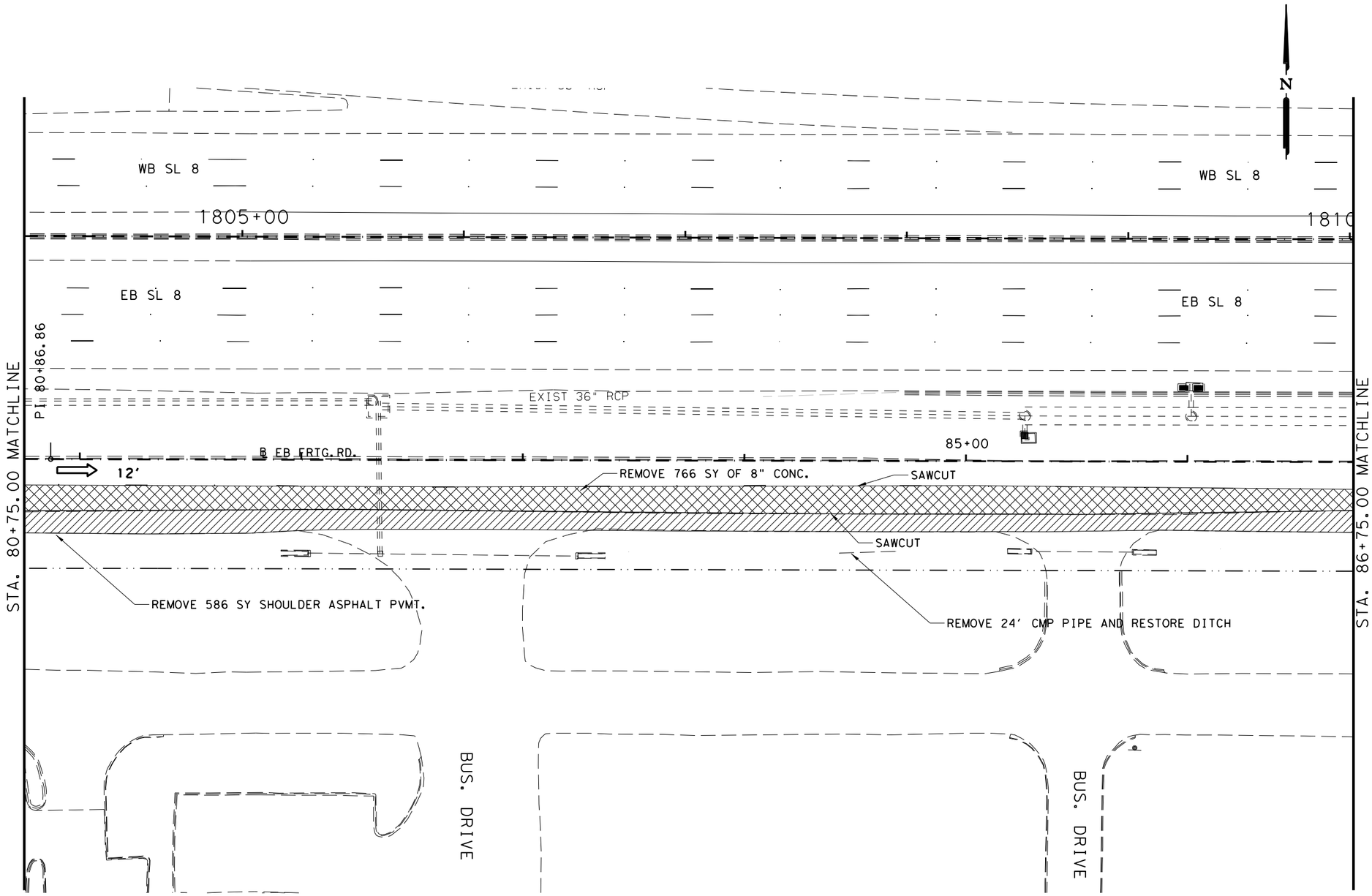

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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 3 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			121
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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STA. 94+00.00

(2

N

WB SL 8

WB SL 8

+00

℄ SL 8

1815+00

EB SL 8

EB SL 8

EXIST 42" RCP

STA. 86+75.00 MATCHLINE

STA. 92+75.00 MATCHLINE

℄ EB FRTG. RD.

90+00

12'

SAWCUT

REMOVE 685 SY OF 8" CONC.

SAWCUT

SAWCUT

PROPOSED RT.
TURN LANE
STA. ~~89+94.50~~

REMOVE 389 SY SHOULDER ASPHALT PVMT.

HEADWALL TO BE
REPLACED
REMOVE 496 6006

REMOVE 239 SY SHOULDER ASPHALT PVMT.& BASE
ITEM 105 6035

CONC. SLOPES
SEE EB TYPICAL

BUS. DRIVE

LEGEND

1. REMOVE CONC PVMT. (361-6002)
2. PLANE ASPH CONC. 0"-4" 354-6023
3. REMOVE CONC PVMT. (361-6007)
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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 4 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			122
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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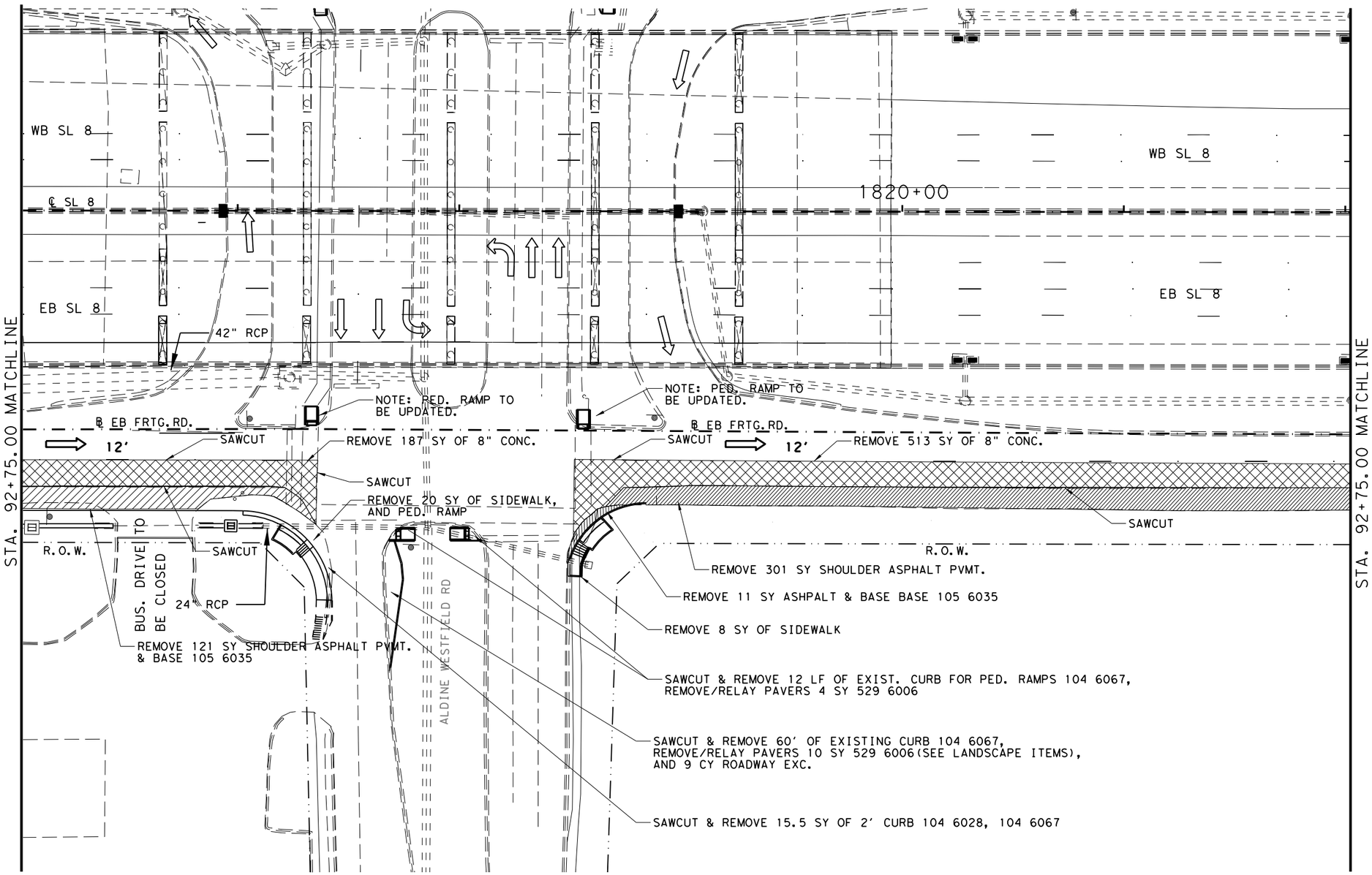

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EB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 1

SCALE: 1" = 50' HORZ

SHEET 5 OF 7

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			123
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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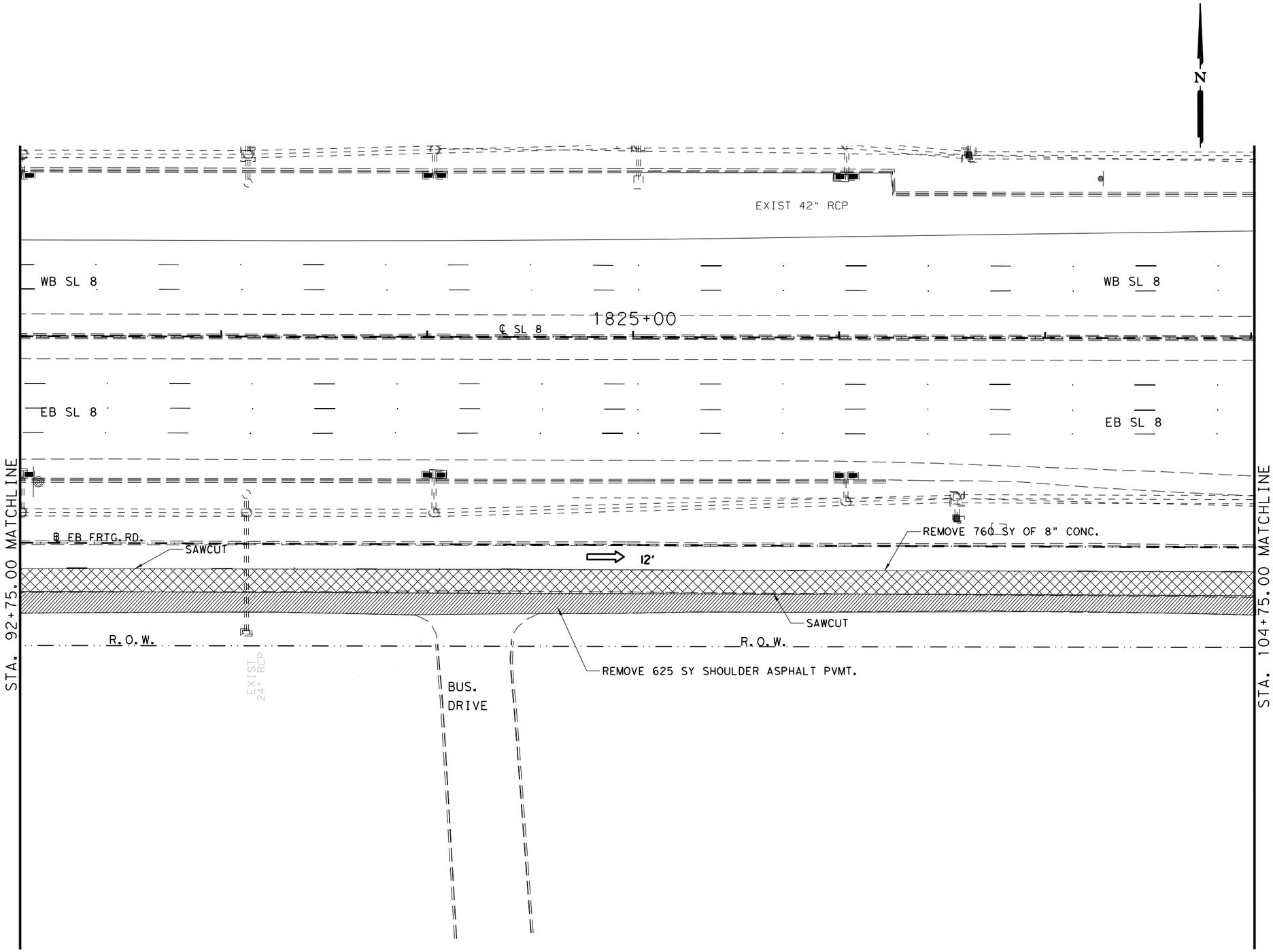

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SL 8
EB FRONTAGE ROAD
DEMOLITION PLAN
PHASE 1

SCALE: 1" = 50' HORZ

SHEET 6 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			124
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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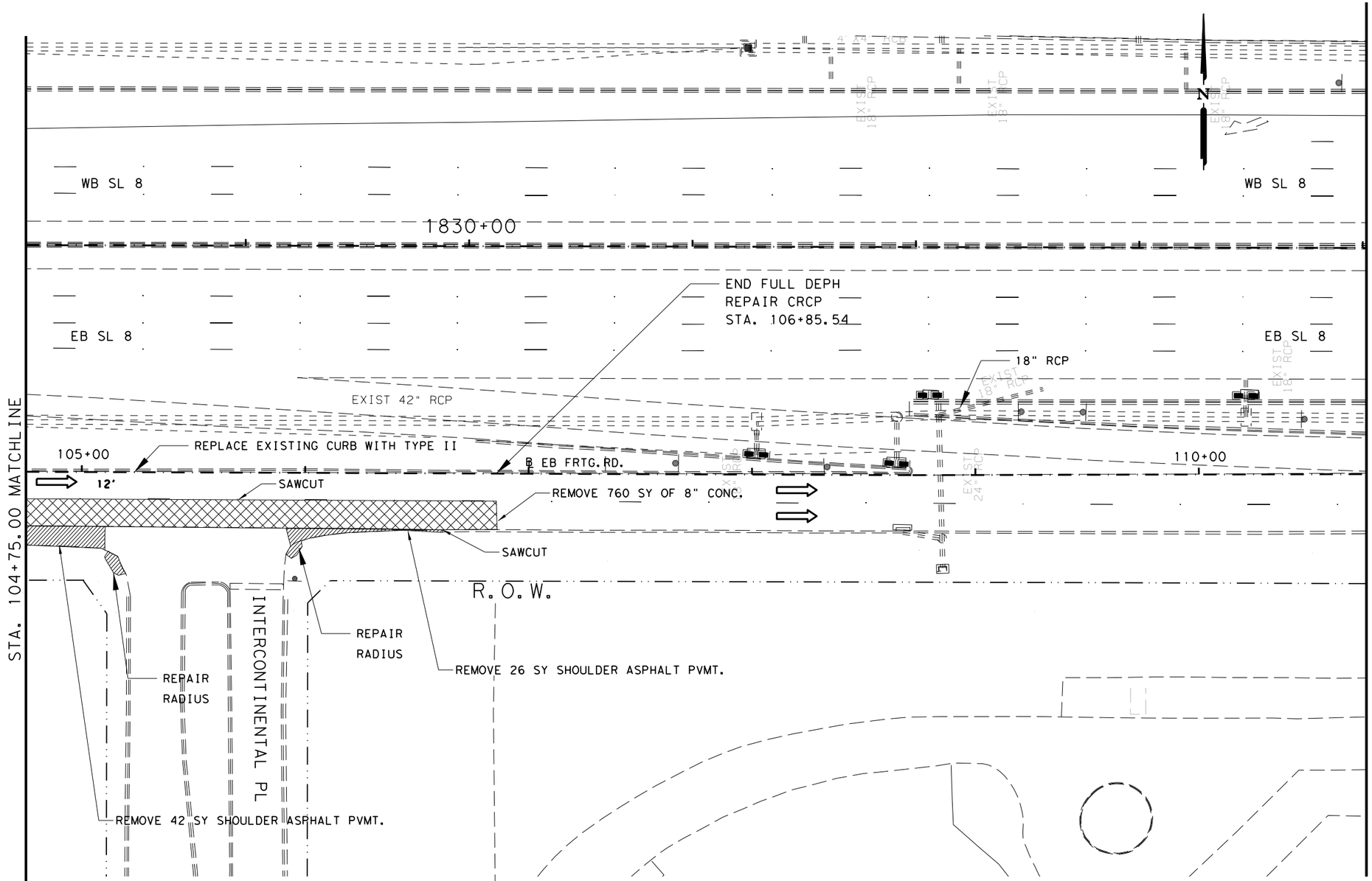

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SL 8
EB FRONTAGE ROAD
DEMOLITION PLAN
PHASE 1

SCALE: 1" = 50' HORZ

SHEET 7 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			125
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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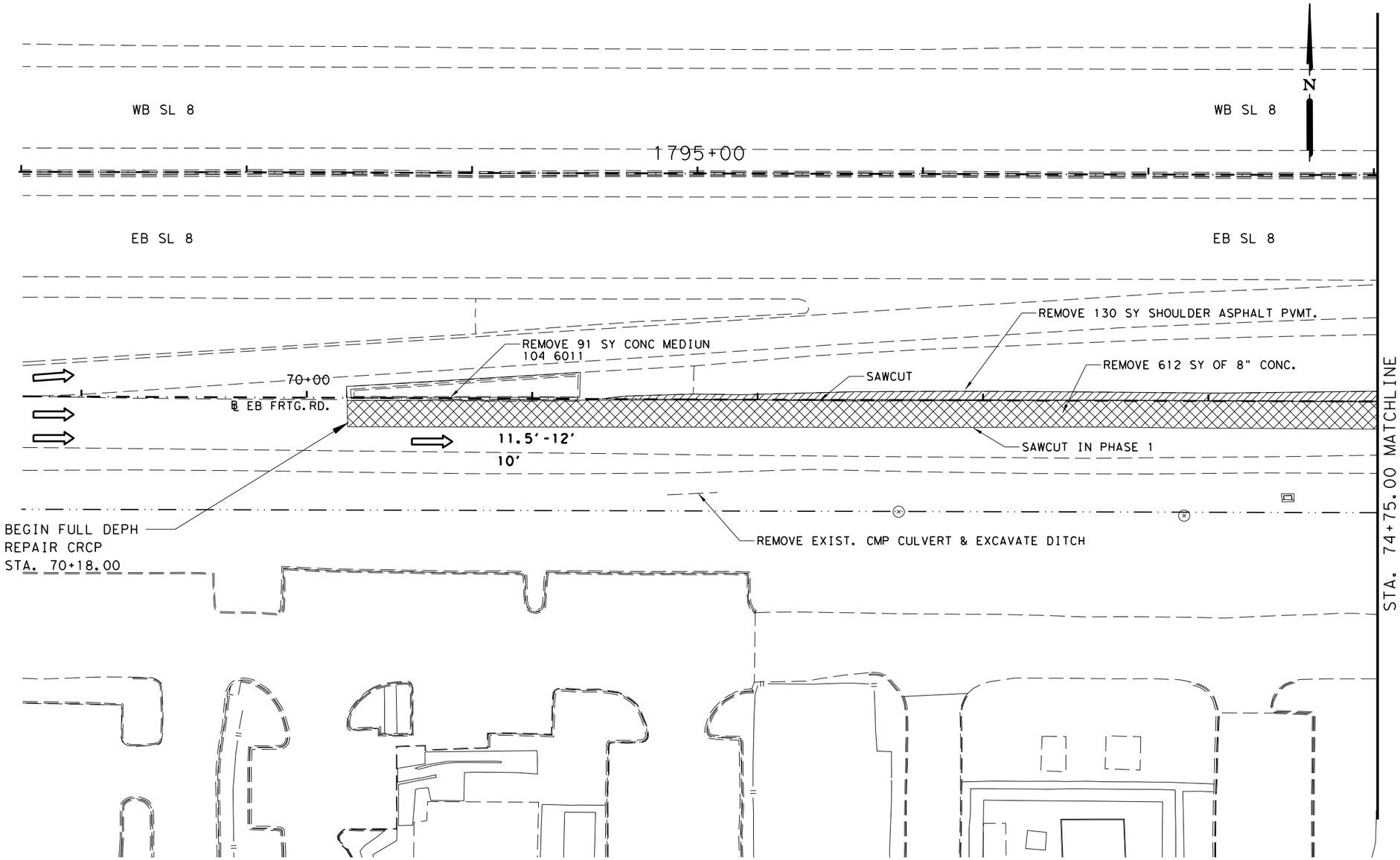

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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 1 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			126
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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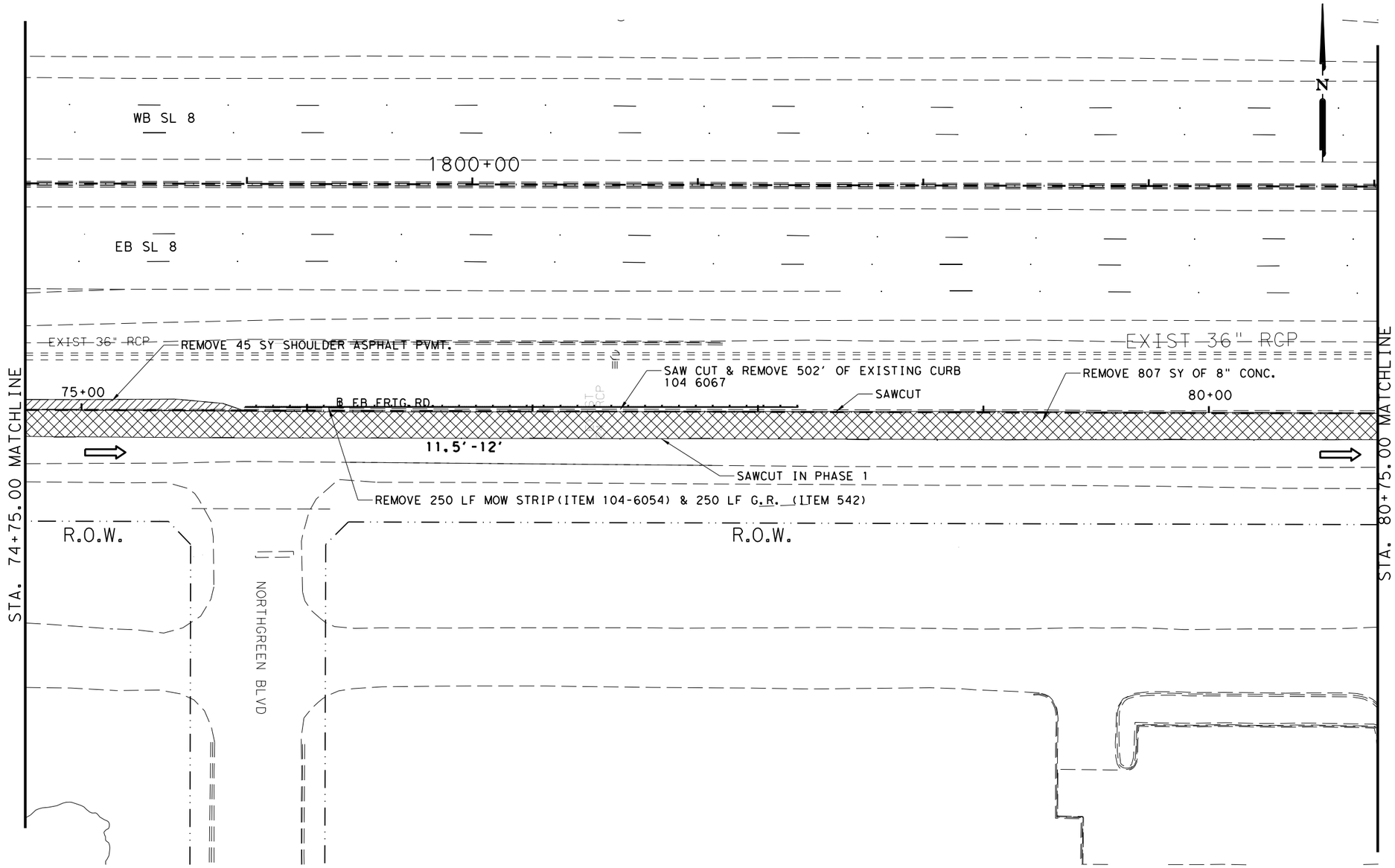

LEGEND

1. REMOVE CONC PVMT. (361-6002)
2. PLANE ASPH CONC. 0"-4" 354-6023
3. REMOVE CONC PVMT. (361-6007)
4. REMOVE CURB (104-6021)
5. REMOVE GUARDRAIL (542-6001)
6. REMOVE SIDEWALK (104-6036)
7. REMOVAL CONC. BARRIER 104 6042

NOTE: RAP TO BECOME PROPERTY OF TxDOT, SEE ITEM 354 IN NOTES FOR LOCATION AND CONTACT.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 2

SCALE: 1" = 50' HORZ

SHEET 2 OF 7

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			127
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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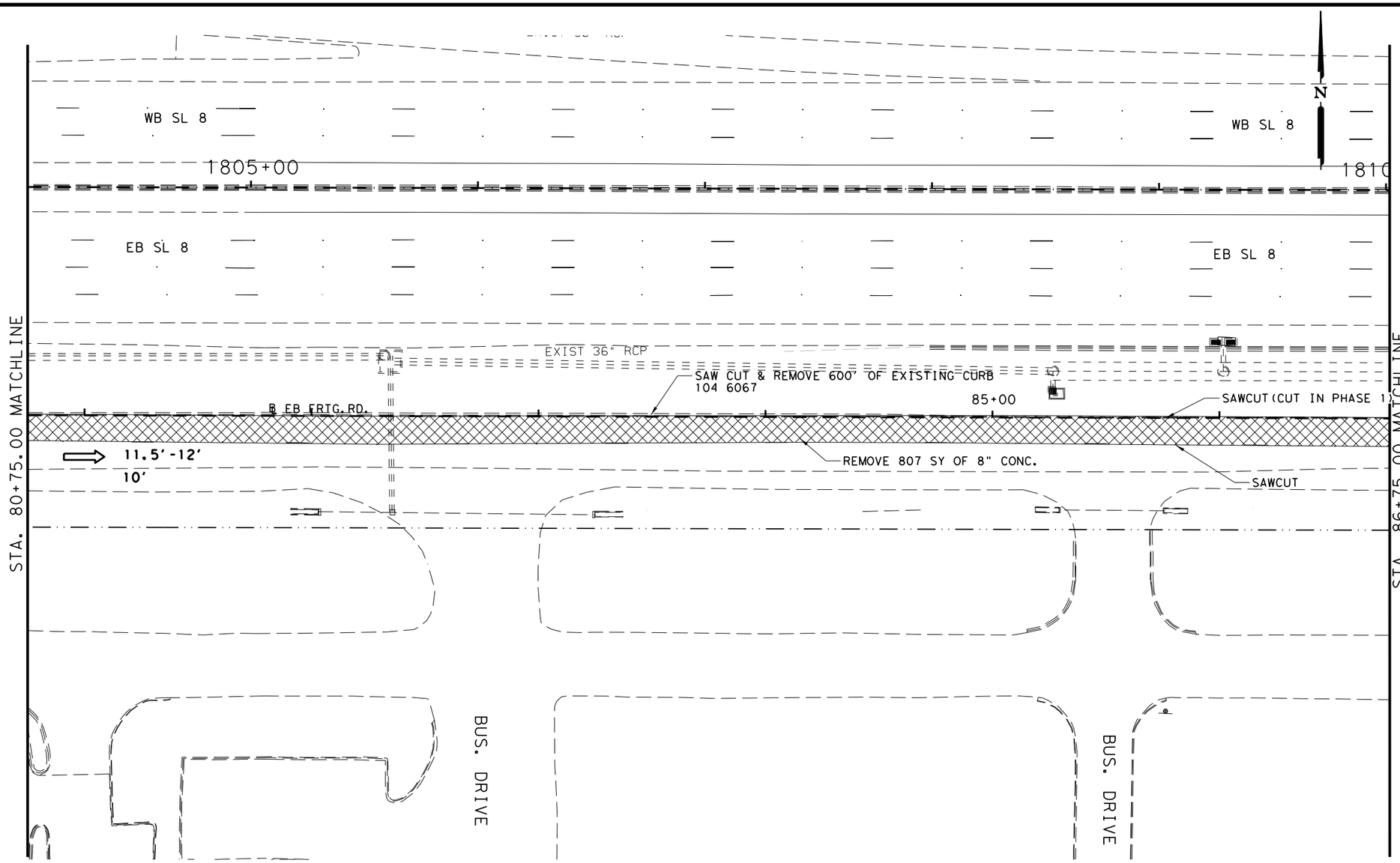

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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

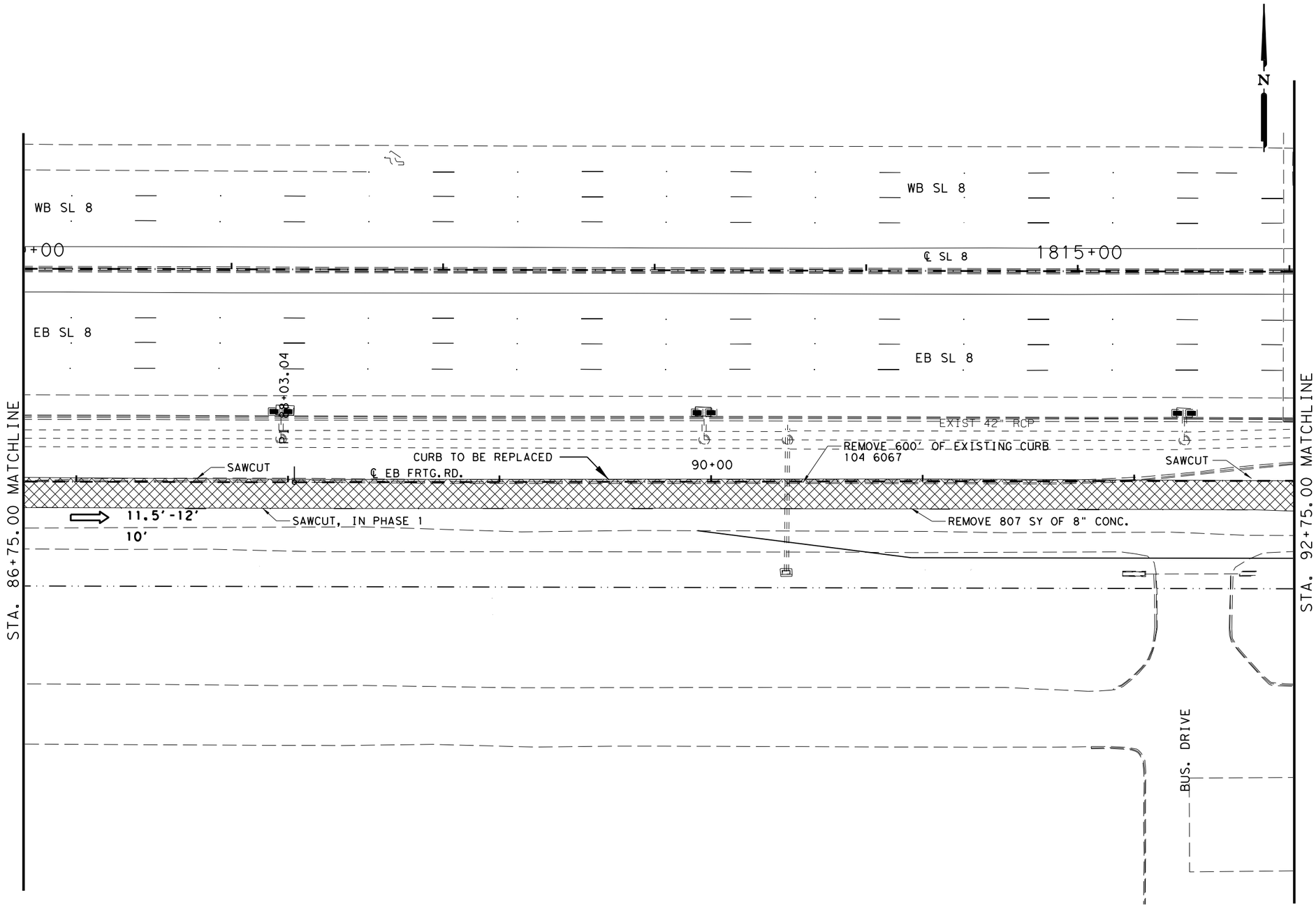
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 3 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			128
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



LEGEND

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3. REMOVE CONC PVMT. (361-6007)
4. REMOVE CURB (104-6021)
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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

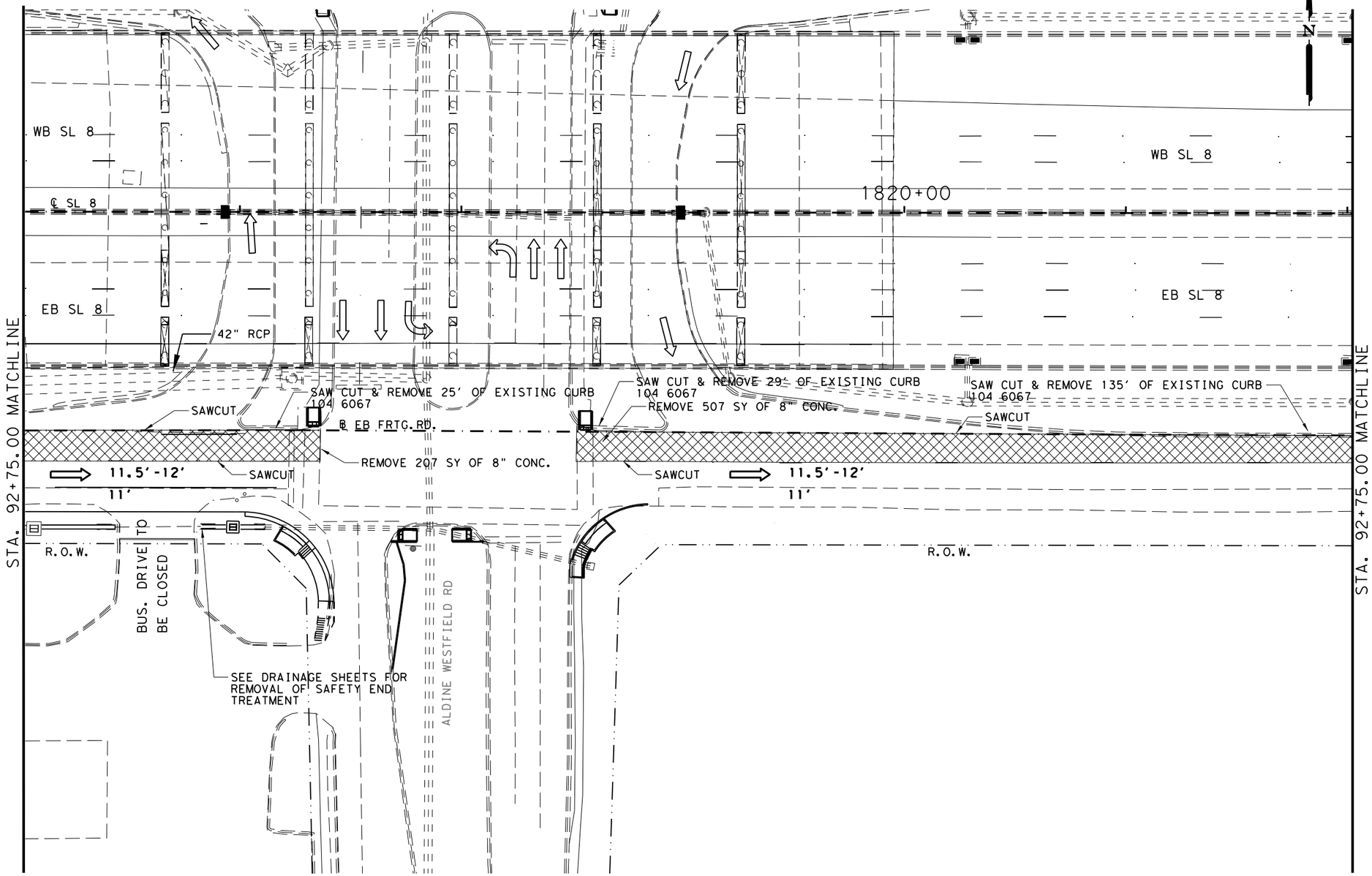
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 4 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			129
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

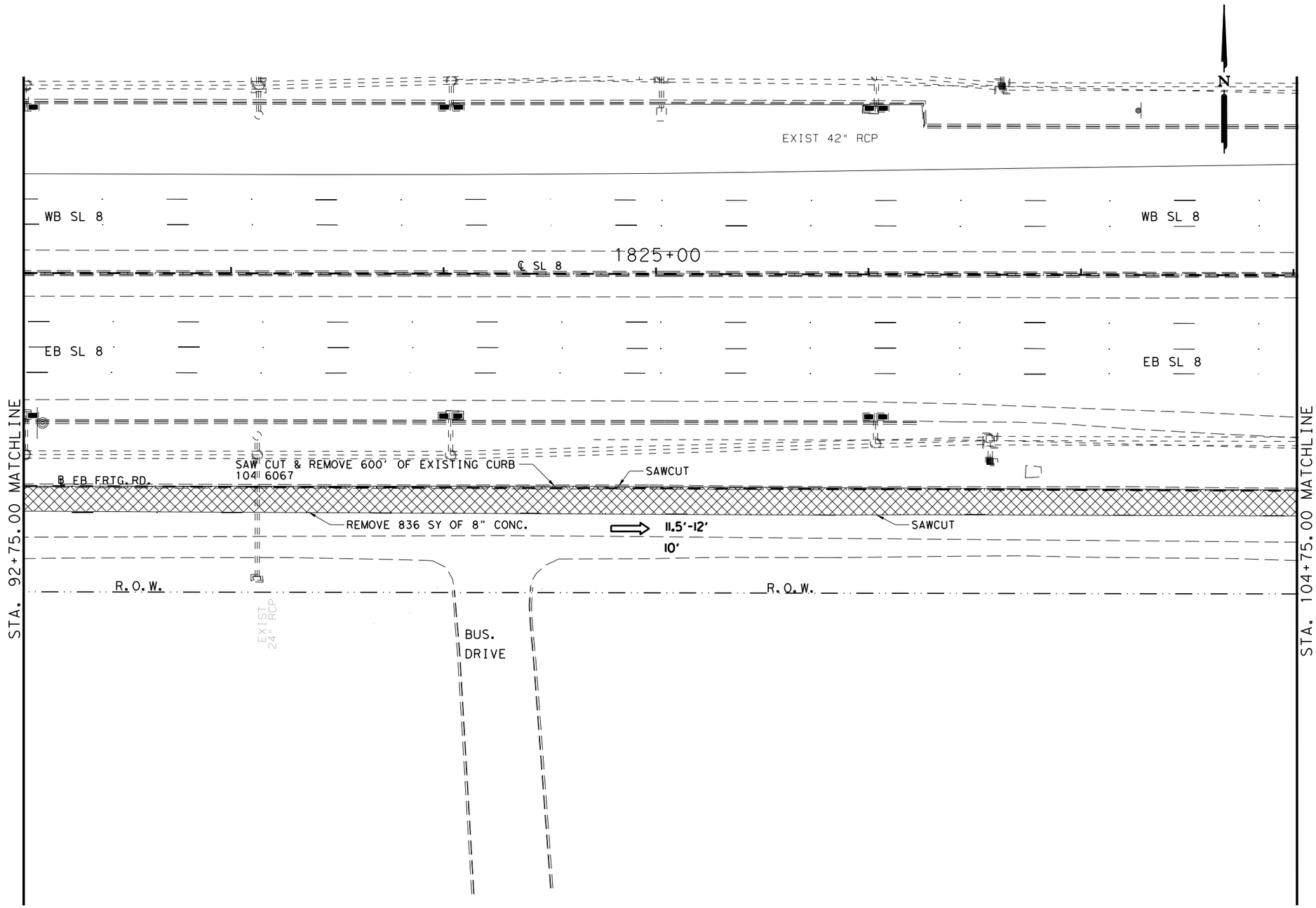
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 5 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			130
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

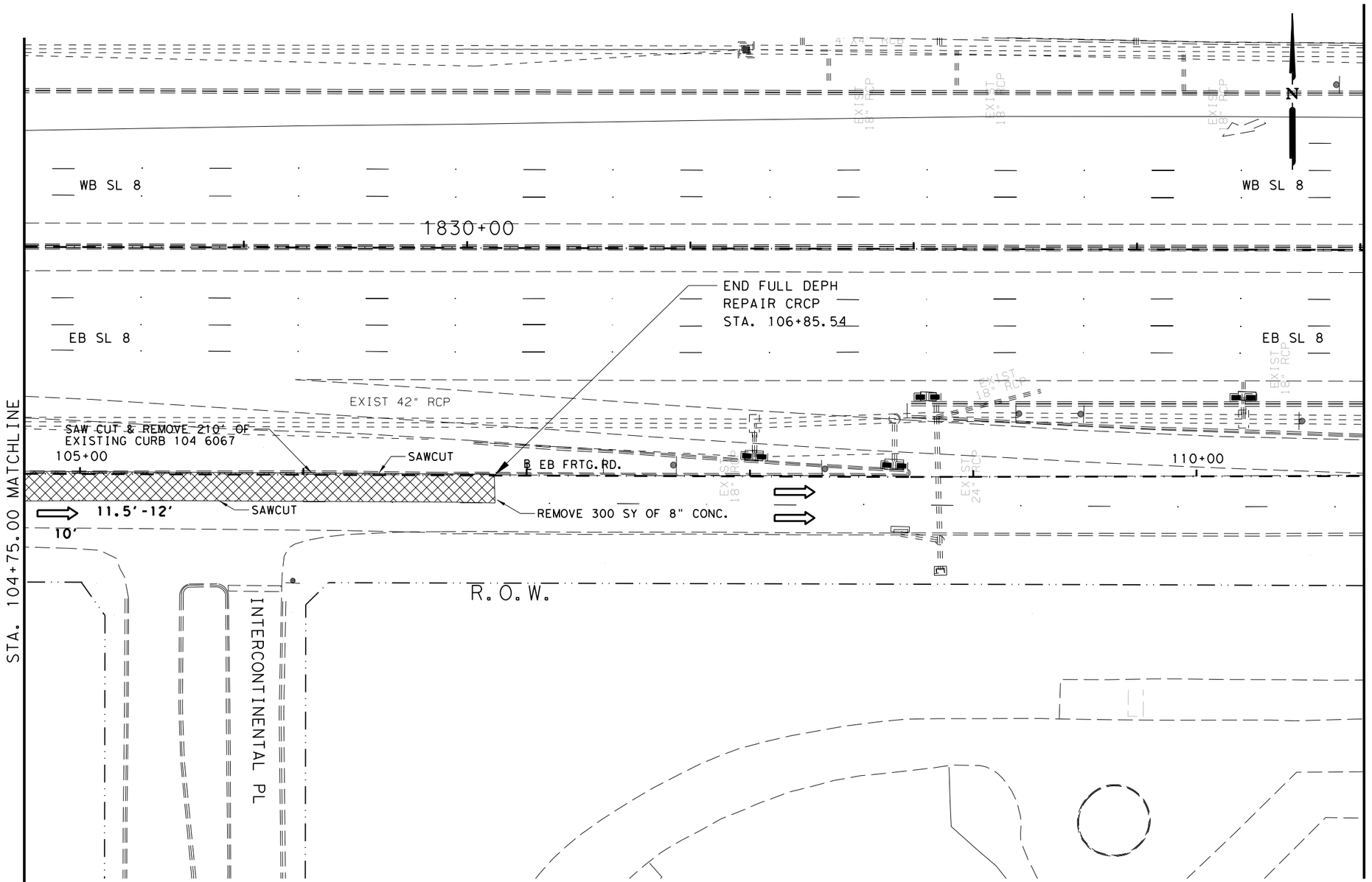
PHASE 2

SCALE: 1" = 50' HORZ

SHEET 6 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			131
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: $DATE$
$FILEL$



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SL 8
EB FRONTAGE ROAD

DEMOLITION PLAN

PHASE 2

SCALE: 1" = 50' HORZ

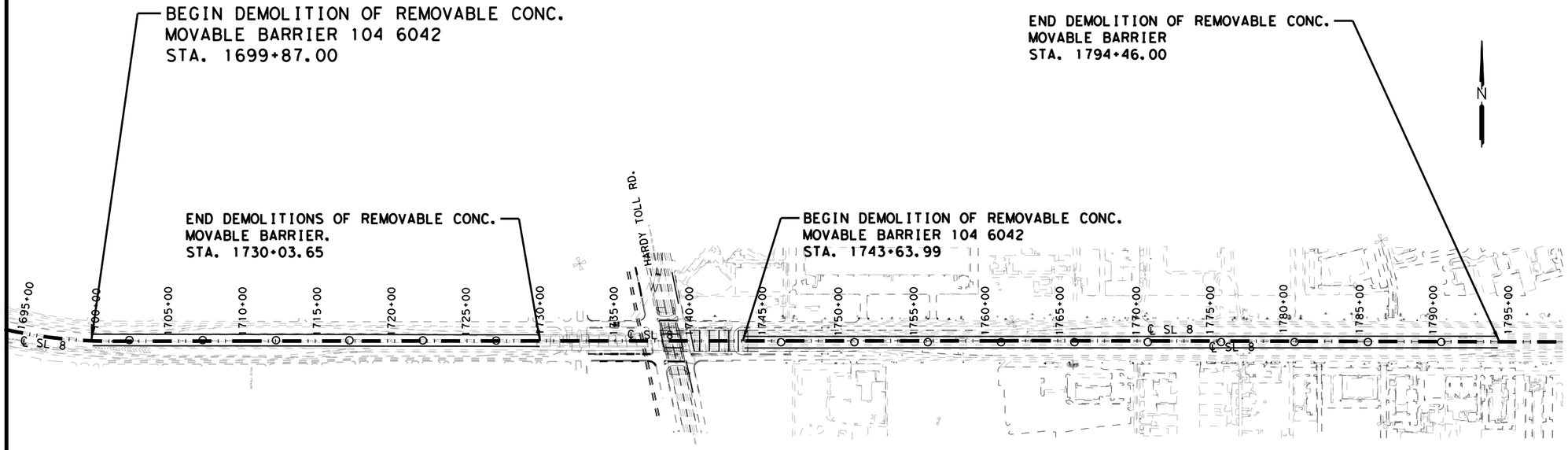
SHEET 7 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			132
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

LEGEND

SINGLE SLOPE 42" CONC. BARRIER
514 6001 TYPE I



STATE OF TEXAS
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Texas Department of Transportation

SL 8

DEMOLITION PLAN CAST IN PLACE TRAFFIC BARRIER

SCALE: 1" = 800' HORZ

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			133
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

EB FRTG ROAD

Chain EBFRTG

Point EBFRTG1	N 13,908,314.2671 E	3,114,318.6177 Sta	10+00.00
Course from EBFRTG1 to EBFRTG3 N 87° 37′ 26.31" E Dist 298.5217			
Point EBFRTG3	N 13,908,326.6431 E	3,114,616.8828 Sta	12+98.52
Course from EBFRTG3 to EBFRTG5 N 87° 41′ 15.71" E Dist 120.0153			
Point EBFRTG5	N 13,908,331.4852 E	3,114,736.8004 Sta	14+18.54
Course from EBFRTG5 to EBFRTG7 N 87° 29′ 35.35" E Dist 244.9915			
Point EBFRTG7	N 13,908,342.2009 E	3,114,981.5575 Sta	16+63.53
Course from EBFRTG7 to EBFRTG9 N 87° 35′ 53.00" E Dist 266.7782			
Point EBFRTG9	N 13,908,353.3814 E	3,115,248.1013 Sta	19+30.31
Course from EBFRTG9 to EBFRTG11 N 87° 34′ 02.33" E Dist 121.2261			
Point EBFRTG11	N 13,908,358.5269 E	3,115,369.2181 Sta	20+51.53
Course from EBFRTG11 to EBFRTG13 N 87° 34′ 02.33" E Dist 251.7977			
Point EBFRTG13	N 13,908,369.2147 E	3,115,620.7889 Sta	23+03.33
Course from EBFRTG13 to EBFRTG15 N 89° 39′ 20.19" E Dist 230.6604			
Point EBFRTG15	N 13,908,370.6011 E	3,115,851.4452 Sta	25+33.99
Course from EBFRTG15 to EBFRTG17 N 87° 01′ 28.70" E Dist 301.5325			
Point EBFRTG17	N 13,908,386.2526 E	3,116,152.5712 Sta	28+35.52
Course from EBFRTG17 to EBFRTG19 N 87° 30′ 02.31" E Dist 207.4730			
Point EBFRTG19	N 13,908,395.3001 E	3,116,359.8468 Sta	30+43.00
Course from EBFRTG19 to EBFRTG21 N 87° 34′ 50.03" E Dist 660.1955			
Point EBFRTG21	N 13,908,423.1700 E	3,117,019.4538 Sta	37+03.19
Course from EBFRTG21 to EBFRTG23 N 87° 18′ 51.13" E Dist 228.6404			
Point EBFRTG23	N 13,908,433.8838 E	3,117,247.8430 Sta	39+31.83
Course from EBFRTG23 to EBFRTG25 N 87° 35′ 00.64" E Dist 390.0348			
Point EBFRTG25	N 13,908,450.3289 E	3,117,637.5310 Sta	43+21.87
Course from EBFRTG25 to EBFRTG27 N 87° 39′ 25.52" E Dist 715.2077			
Point EBFRTG27	N 13,908,479.5667 E	3,118,352.1408 Sta	50+37.07
Course from EBFRTG27 to EBFRTG29 N 87° 39′ 25.52" E Dist 389.4027			
Point EBFRTG29	N 13,908,495.4855 E	3,118,741.2180 Sta	54+26.48
Course from EBFRTG29 to EBFRTG31 N 87° 42′ 40.66" E Dist 348.6310			
Point EBFRTG31	N 13,908,509.4080 E	3,119,089.5709 Sta	57+75.11
Course from EBFRTG31 to EBFRTG33 N 87° 40′ 18.79" E Dist 430.1879			
Point EBFRTG33	N 13,908,526.8832 E	3,119,519.4037 Sta	62+05.30
Course from EBFRTG33 to EBFRTG35 N 87° 35′ 02.98" E Dist 334.0683			
Point EBFRTG35	N 13,908,540.9648 E	3,119,853.1751 Sta	65+39.36
Course from EBFRTG35 to EBFRTG37 N 87° 36′ 16.89" E Dist 337.0309			
Point EBFRTG37	N 13,908,555.0506 E	3,120,189.9115 Sta	68+76.40
Course from EBFRTG37 to EBFRTG39 N 87° 49′ 14.70" E Dist 291.1294			
Point EBFRTG39	N 13,908,566.1210 E	3,120,480.8303 Sta	71+67.53
Course from EBFRTG39 to EBFRTG41 N 87° 42′ 38.96" E Dist 404.2681			
Point EBFRTG41	N 13,908,582.2687 E	3,120,884.7758 Sta	75+71.79
Course from EBFRTG41 to EBFRTG43 N 87° 41′ 08.78" E Dist 515.0623			
Point EBFRTG43	N 13,908,603.0669 E	3,121,399.4181 Sta	80+86.86
Course from EBFRTG43 to EBFRTG45 N 87° 40′ 21.07" E Dist 716.1852			
Point EBFRTG45	N 13,908,632.1519 E	3,122,115.0124 Sta	88+03.04
Course from EBFRTG45 to EBFRTG47 N 87° 27′ 33.78" E Dist 596.2740			
Point EBFRTG47	N 13,908,658.5833 E	3,122,710.7003 Sta	93+99.31
Course from EBFRTG47 to EBFRTG49 N 87° 51′ 22.10" E Dist 349.6549			
Point EBFRTG49	N 13,908,671.6634 E	3,123,060.1104 Sta	97+48.97
Course from EBFRTG49 to EBFRTG51 N 87° 45′ 41.18" E Dist 1,122.9306			
Point EBFRTG51	N 13,908,715.5254 E	3,124,182.1841 Sta	108+71.90
Course from EBFRTG51 to EBFRTG52 N 87° 24′ 29.66" E Dist 539.6688			
Point EBFRTG52	N 13,908,739.9289 E	3,124,721.3009 Sta	114+11.57

Ending chain EBFRTG description

WB FRTG ROAD

CHAIN WBFRTG

Point WBFRTG1	N 13,908,501.6866 E	3,114,320.4491 Sta	10+00.00
Course from WBFRTG1 to WBFRTG3 N 87° 40′ 48.09" E Dist 359.5488			
Point WBFRTG3	N 13,908,516.2412 E	3,114,679.7032 Sta	13+59.55
Course from WBFRTG3 to WBFRTG5 N 87° 25′ 38.91" E Dist 260.6704			
Point WBFRTG5	N 13,908,527.9411 E	3,114,940.1109 Sta	16+20.22
Course from WBFRTG5 to WBFRTG7 N 87° 21′ 40.38" E Dist 302.4672			
Point WBFRTG7	N 13,908,541.8664 E	3,115,242.2574 Sta	19+22.69
Course from WBFRTG7 to WBFRTG9 N 87° 55′ 45.53" E Dist 70.3624			
Point WBFRTG9	N 13,908,544.4088 E	3,115,312.5739 Sta	19+93.05
Course from WBFRTG9 to WBFRTG11 N 87° 29′ 07.90" E Dist 304.2666			
Point WBFRTG11	N 13,908,557.7575 E	3,115,616.5476 Sta	22+97.32
Course from WBFRTG11 to WBFRTG13 N 85° 15′ 29.57" E Dist 169.9712			
Point WBFRTG13	N 13,908,571.8082 E	3,115,785.9370 Sta	24+67.29
Course from WBFRTG13 to WBFRTG15 N 85° 50′ 35.53" E Dist 57.5996			
Point WBFRTG15	N 13,908,575.9834 E	3,115,843.3851 Sta	25+24.89
Course from WBFRTG15 to WBFRTG17 N 87° 42′ 44.82" E Dist 56.3177			
Point WBFRTG17	N 13,908,578.2313 E	3,115,899.6579 Sta	25+81.20
Course from WBFRTG17 to WBFRTG19 N 87° 42′ 44.81" E Dist 454.6206			
Point WBFRTG19	N 13,908,596.3774 E	3,116,353.9162 Sta	30+35.82
Course from WBFRTG19 to WBFRTG21 N 87° 41′ 17.26" E Dist 309.0233			
Point WBFRTG21	N 13,908,608.8430 E	3,116,662.6880 Sta	33+44.85
Course from WBFRTG21 to WBFRTG23 N 87° 05′ 52.56" E Dist 51.0964			
Point WBFRTG23	N 13,908,611.4300 E	3,116,713.7188 Sta	33+95.94
Course from WBFRTG23 to WBFRTG25 N 87° 32′ 55.59" E Dist 688.3643			
Point WBFRTG25	N 13,908,640.8706 E	3,117,401.4533 Sta	40+84.31
Course from WBFRTG25 to WBFRTG27 N 87° 43′ 03.99" E Dist 377.8945			
Point WBFRTG27	N 13,908,655.9190 E	3,117,779.0480 Sta	44+62.20
Course from WBFRTG27 to WBFRTG29 N 86° 43′ 36.32" E Dist 69.3371			
Point WBFRTG29	N 13,908,659.8780 E	3,117,848.2720 Sta	45+31.54
Course from WBFRTG29 to WBFRTG31 N 87° 40′ 14.64" E Dist 1,131.1745			
Point WBFRTG31	N 13,908,705.8514 E	3,118,978.5118 Sta	56+62.71
Course from WBFRTG31 to WBFRTG33 N 87° 41′ 21.81" E Dist 387.6938			
Point WBFRTG33	N 13,908,721.4819 E	3,119,365.8905 Sta	60+50.41
Point WBFRTG35	N 13,908,721.4819 E	3,119,365.8905 Sta	60+50.41
Course from WBFRTG35 to WBFRTG37 N 87° 35′ 28.06" E Dist 61.6761			
Point WBFRTG37	N 13,908,724.0742 E	3,119,427.5121 Sta	61+12.08
Course from WBFRTG37 to WBFRTG39 N 87° 41′ 37.19" E Dist 111.1232			
Point WBFRTG39	N 13,908,728.5461 E	3,119,538.5452 Sta	62+23.21
Course from WBFRTG39 to WBFRTG41 N 87° 40′ 47.64" E Dist 184.9885			
Point WBFRTG41	N 13,908,736.0348 E	3,119,723.3821 Sta	64+08.20
Course from WBFRTG41 to WBFRTG43 N 87° 36′ 31.10" E Dist 245.3025			
Point WBFRTG43	N 13,908,746.2701 E	3,119,968.4710 Sta	66+53.50
Course from WBFRTG43 to WBFRTG45 N 87° 44′ 17.41" E Dist 216.5618			
Point WBFRTG45	N 13,908,754.8169 E	3,120,184.8640 Sta	68+70.06
Course from WBFRTG45 to WBFRTG47 N 87° 38′ 03.08" E Dist 272.8113			
Point WBFRTG47	N 13,908,766.0784 E	3,120,457.4428 Sta	71+42.87
Course from WBFRTG47 to WBFRTG49 N 87° 43′ 24.58" E Dist 372.4550			
Point WBFRTG49	N 13,908,780.8731 E	3,120,829.6038 Sta	75+15.33
Course from WBFRTG49 to WBFRTG51 N 87° 26′ 21.22" E Dist 103.5050			
Point WBFRTG51	N 13,908,785.4976 E	3,120,933.0055 Sta	76+18.83
Course from WBFRTG51 to WBFRTG53 N 87° 37′ 34.73" E Dist 450.4688			
Point WBFRTG53	N 13,908,804.1546 E	3,121,383.0878 Sta	80+69.30
Course from WBFRTG53 to WBFRTG55 N 87° 44′ 31.28" E Dist 197.9403			
Point WBFRTG55	N 13,908,811.9532 E	3,121,580.8744 Sta	82+67.24
Course from WBFRTG55 to WBFRTG57 N 87° 42′ 31.77" E Dist 216.8049			
Point WBFRTG57	N 13,908,820.6206 E	3,121,797.5060 Sta	84+84.05
Course from WBFRTG57 to WBFRTG59 N 87° 40′ 39.38" E Dist 431.1692			
Point WBFRTG59	N 13,908,838.0926 E	3,122,228.3210 Sta	89+15.22
Course from WBFRTG59 to WBFRTG61 N 87° 36′ 32.21" E Dist 235.2983			
Point WBFRTG61	N 13,908,847.9092 E	3,122,463.4144 Sta	91+50.51
Course from WBFRTG61 to WBFRTG63 N 87° 47′ 40.82" E Dist 580.0101			
Point WBFRTG63	N 13,908,870.2284 E	3,123,042.9950 Sta	97+30.52
Course from WBFRTG63 to WBFRTG65 N 85° 12′ 54.46" E Dist 24.2118			
Point WBFRTG65	N 13,908,872.2480 E	3,123,067.1224 Sta	97+54.74
Course from WBFRTG65 to WBFRTG67 N 87° 44′ 55.50" E Dist 607.4258			
Point WBFRTG67	N 13,908,896.1087 E	3,123,674.0794 Sta	103+62.16
Course from WBFRTG67 to WBFRTG69 N 87° 47′ 06.99" E Dist 151.6321			
Point WBFRTG69	N 13,908,901.9685 E	3,123,825.5982 Sta	105+13.79
Course from WBFRTG69 to WBFRTG71 N 88° 06′ 29.93" E Dist 286.2400			
Point WBFRTG71	N 13,908,911.4173 E	3,124,111.6822 Sta	108+00.03
Course from WBFRTG71 to WBFRTG73 N 88° 26′ 37.47" E Dist 288.5327			
Point WBFRTG73	N 13,908,919.2534 E	3,124,400.1085 Sta	110+88.57
Course from WBFRTG73 to WBFRTG75 N 87° 29′ 49.85" E Dist 110.8102			
Point WBFRTG75	N 13,908,924.0923 E	3,124,510.8130 Sta	111+99.38
Course from WBFRTG75 to WBFRTG77 N 86° 44′ 29.23" E Dist 149.9577			
Point WBFRTG77	N 13,908,932.6162 E	3,124,660.5282 Sta	113+49.33
Course from WBFRTG77 to WBFRTG78 N 89° 01′ 10.83" E Dist 57.6616			
Point WBFRTG78	N 13,908,933.6027 E	3,124,718.1814 Sta	114+07.00

Ending chain WBFRTG description

STATE OF TEXAS
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122541
LICENSED
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Texas Department of Transportation

SL 8

ALIGNMENT DATA

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		134

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
$FILEL$

SL 8

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<*       1   DESCRIBE CHAIN SL8

Chain SL8 contains:
 SL81 CUR SL8_3 SL86 SL88 SL810 SL812 SL814 SL816 SL818 SL820 SL822 SL824 SL826-
 SL828 SL829

Beginning chain SL8 description
Feature: Road_Centerline
================================================================================

Point SL81            N  13,908,666.8008 E   3,108,935.4907 Sta    1679+00.00

Course from SL81 to PC SL8_3 S 76° 16′ 55.86" E Dist 1,301.7082

                                  Curve Data
                                 *----------*
Curve SL8_3
P.I.  Station          1696+70.51  N     13,908,246.9422  E      3,110,655.4952
Delta          =      16° 17′ 22.43" (LT)
Degree         =       1° 44′ 57.01"
Tangent        =             468.7992
Length         =             931.2744
Radius         =           3,275.6000
External       =              33.3769
Long Chord     =             928.1411
Mid. Ord.      =              33.0402
P.C.  Station          1692+01.71  N     13,908,358.1134  E      3,110,200.0683
P.T.  Station          1701+32.98  N     13,908,267.9774  E      3,111,123.8222
C.C.                               N     13,911,540.2783  E      3,110,976.8449
Back         = S  76° 16′ 55.86" E
Ahead        = N  87° 25′ 41.72" E
Chord Bear   = S  84° 25′ 37.07" E

Course from PT SL8_3 to SL86 N 87° 25′ 41.72" E Dist 870.5145

Point SL86            N  13,908,307.0377 E   3,111,993.4600 Sta    1710+03.50

Course from SL86 to SL88 N 87° 31′ 25.95" E Dist 2,329.2753

Point SL88            N  13,908,407.6696 E   3,114,320.5604 Sta    1733+32.77

Course from SL88 to SL810 N 87° 30′ 38.01" E Dist 1,051.1042

Point SL810           N  13,908,453.3246 E   3,115,370.6726 Sta    1743+83.88

Course from SL810 to SL812 N 87° 32′ 51.95" E Dist 1,038.1943

Point SL812           N  13,908,497.7453 E   3,116,407.9162 Sta    1754+22.07

Course from SL812 to SL814 N 87° 31′ 05.26" E Dist 543.3170

Point SL814           N  13,908,521.2727 E   3,116,950.7236 Sta    1759+65.39

Course from SL814 to SL816 N 87° 21′ 21.85" E Dist 34.6243

Point SL816           N  13,908,522.8699 E   3,116,985.3110 Sta    1760+00.01

Course from SL816 to SL818 N 87° 32′ 34.20" E Dist 90.3307

Point SL818           N  13,908,526.7426 E   3,117,075.5587 Sta    1760+90.34

Course from SL818 to SL820 N 87° 31′ 38.96" E Dist 215.7891

Point SL820           N  13,908,536.0518 E   3,117,291.1469 Sta    1763+06.13

Course from SL820 to SL822 N 87° 38′ 19.35" E Dist 1,793.8721

Point SL822           N  13,908,609.9605 E   3,119,083.4958 Sta    1781+00.00

Course from SL822 to SL824 N 87° 40′ 52.53" E Dist 2,199.9910

Point SL824           N  13,908,698.9691 E   3,121,281.6855 Sta    1803+00.00

Course from SL824 to SL826 N 87° 40′ 31.76" E Dist 1,256.8303

Point SL826           N  13,908,749.9452 E   3,122,537.4816 Sta    1815+56.83

Course from SL826 to SL828 N 87° 37′ 04.04" E Dist 881.8066

Point SL828           N  13,908,786.5978 E   3,123,418.5261 Sta    1824+38.63

Course from SL828 to SL829 N 87° 39′ 53.40" E Dist 1,299.6935

Point SL829           N  13,908,839.5539 E   3,124,717.1403 Sta    1837+38.33

================================================================================
Ending chain SL8 description
```

STATE OF TEXAS
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122541
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Daniel Duke Thompson

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Texas Department of Transportation

SL 8

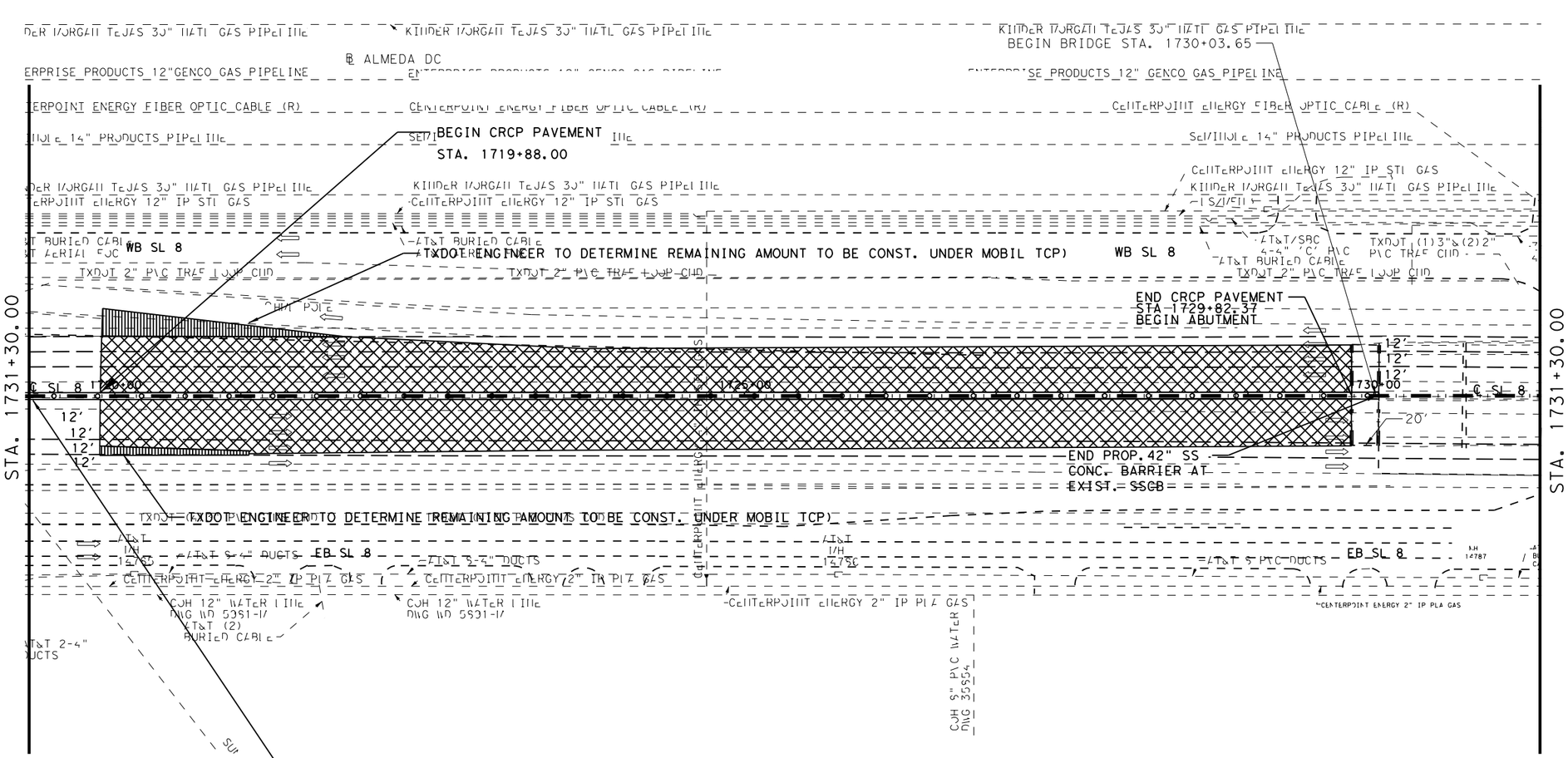
SL 8
ALIGNMENT DATA

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			135
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
$FILEL$

BEGIN 42" SINGLE SLOPE BARRIER
STA. 1699+87.00



NOTE: LINE UP PROPOSED JOINTS WITH OUTSIDE JOINTS

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 13" CRCP
- SINGLE SLOPE 42" CONC. BARRIER
- 13" FAST TRACK

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BRIDGE ID 12-102-0-3256-02-004

Texas Department of Transportation

SL 8

ROADWAY PLAN

SCALE: 1" = 100' HORZ

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			136
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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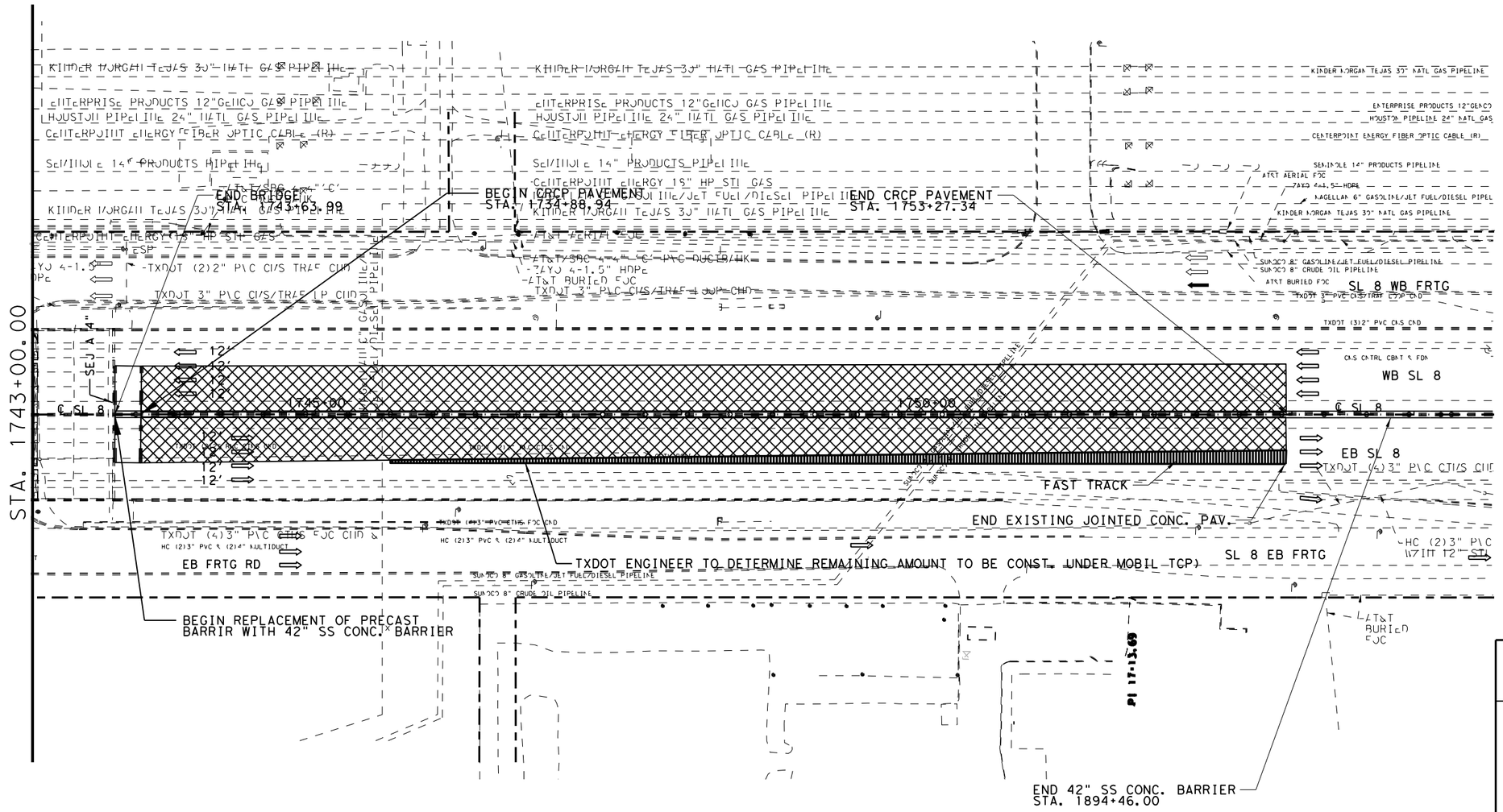

NOTE" LINE UP PROPOSED JOINTS WITH OUTSIDE JOINTS

BRIDGE ID 12-102-0-3256-02-004

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 13" CRCP
- SINGLE SLOPE 42" CONC. BARRIER
- 13" FAST TRACK

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Texas Department of Transportation

SL 8

ROADWAY PLAN

SCALE: 1" = 100' HORZ

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			137
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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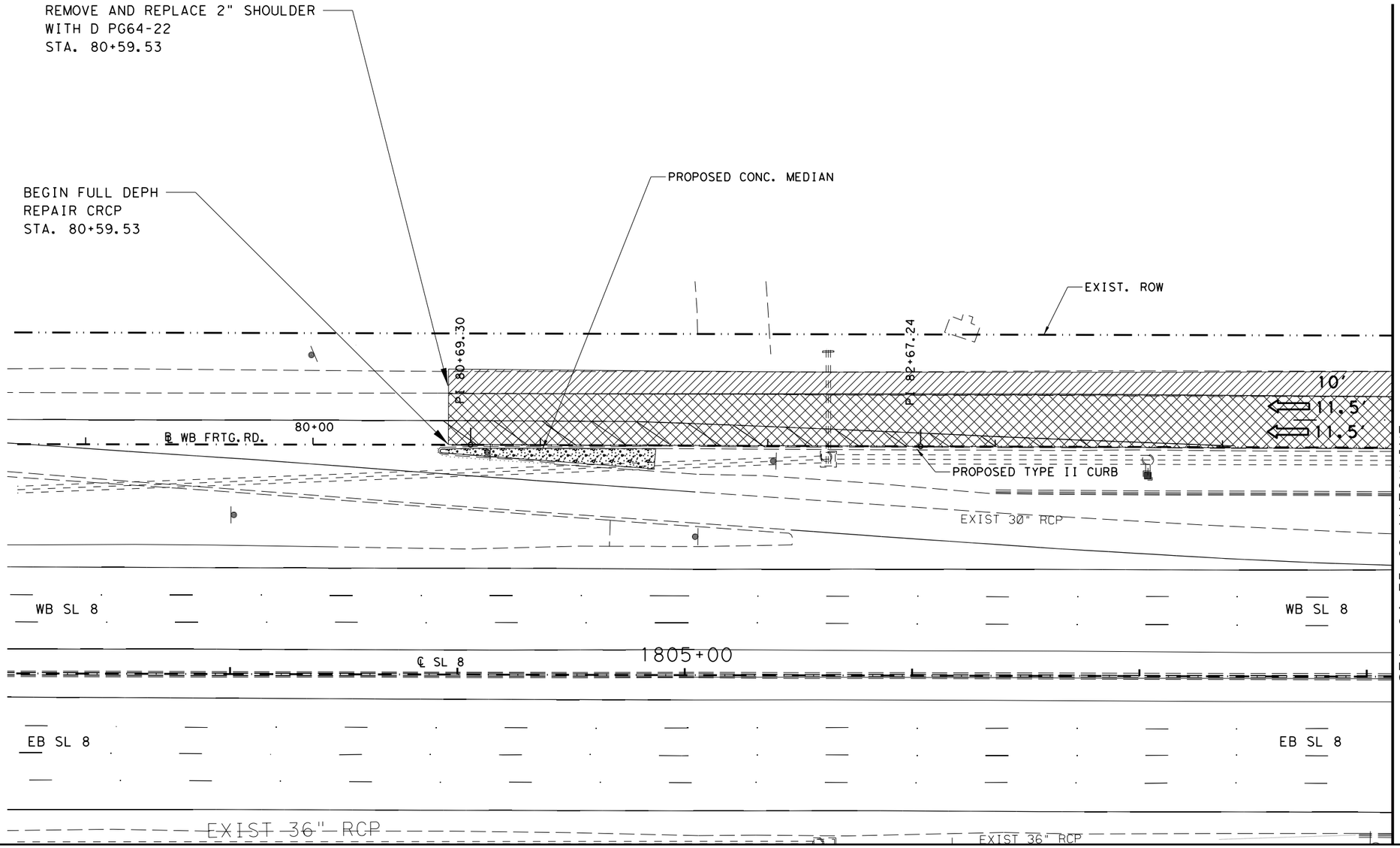

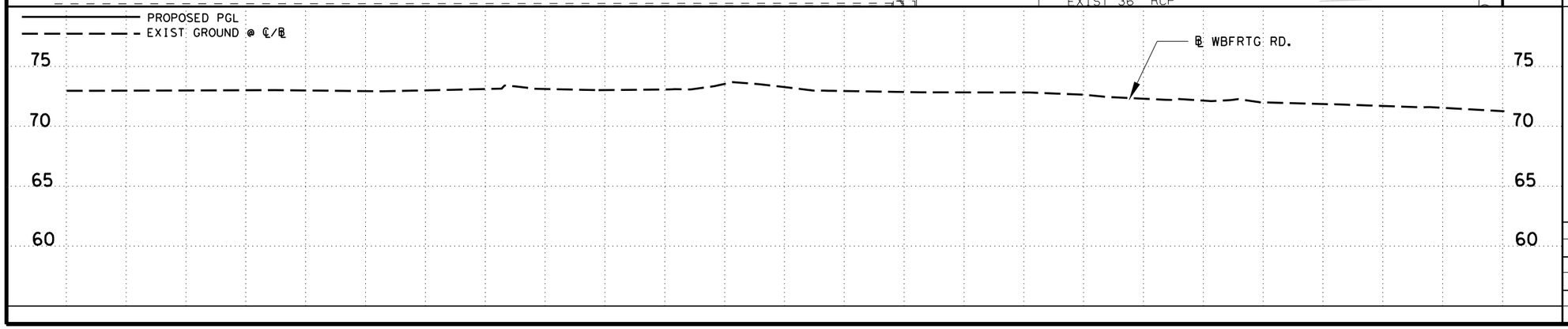

N

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 9" FAST TRACK (RT. TURN LANE)
- 2" SP-D PG64-22 (SHOULDER)
- 8"CRCP (FRTG. RD.)
- 4" CONC. SLOPES

NOTES:

1. PRIOR TO CONSTRUCTION, CONTRACTOR WILL FIELD VERIFY ELEVATIONS AT BEGIN AND END OF PROPOSED FRONTAGE ROADS SO THAT ANY DISCREPANCIES WITH EXISTING SURVEY CAN TO BE ADDRESSED WITH THE ENGINEER AS SOON AS POSSIBLE.
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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 1 OF 4

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		138

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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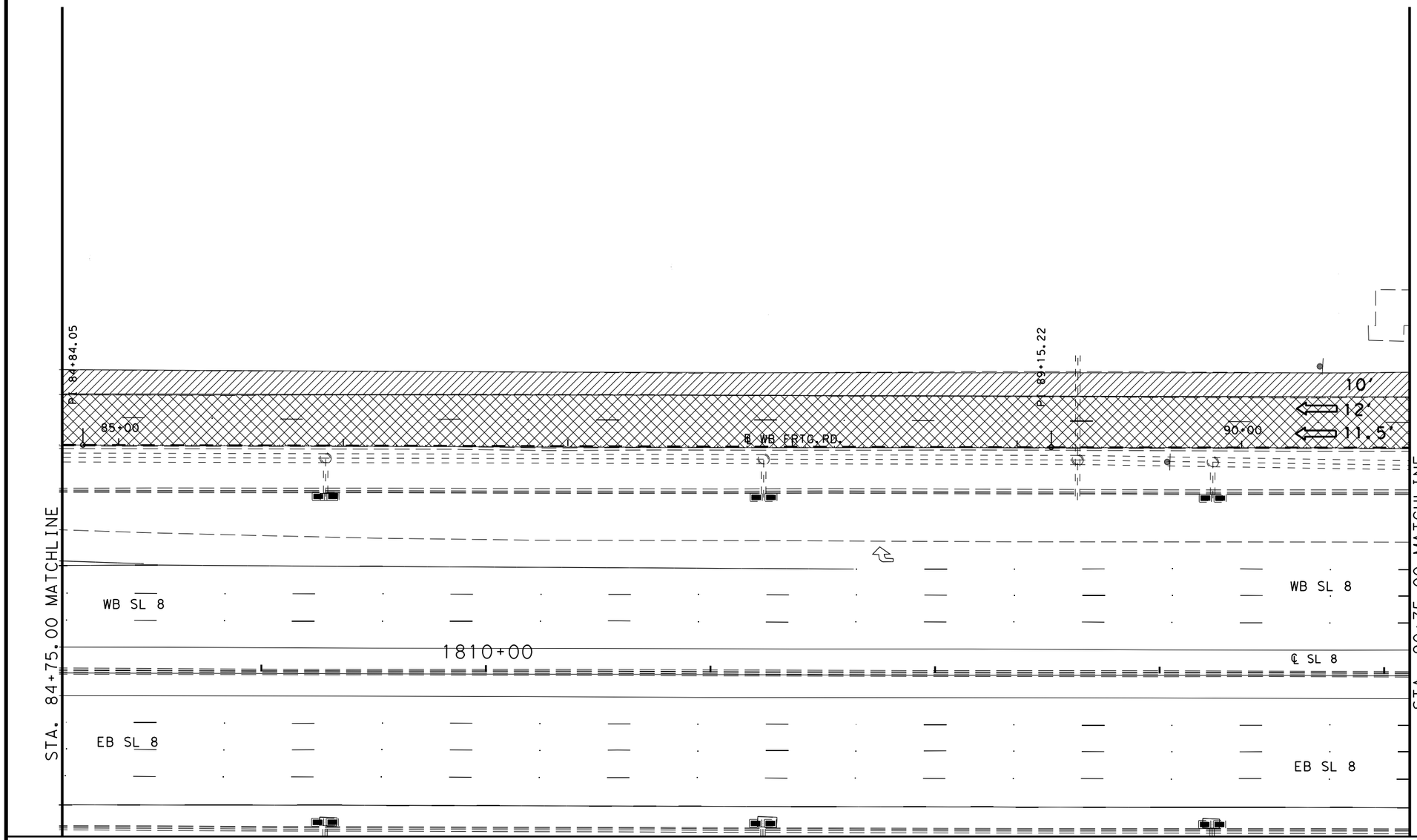

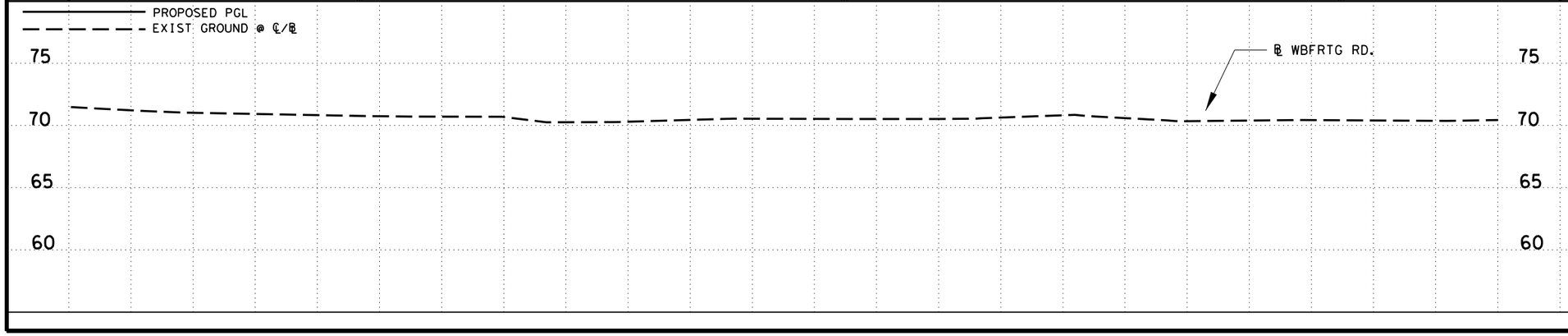

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 9" FAST TRACK (RT. TURN LANE)
- 2" SP-D PG64-22 (SHOULDER)
- 8"CRCP (FRTG. RD.)
- 4" CONC. SLOPES

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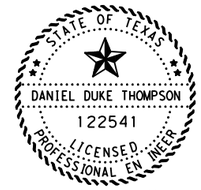

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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 2 OF 4

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		139

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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NO.	STATION / OFFSET
(1)	93+71.45, 35.73 LT.
(2)	94+03.00
(3)	94+00.43, 48.63 LT.
(4)	94+52.31, 44.57 LT.
(5)	94+80.14, 82.36 LT.
(6)	94+89.07, 111.05 LT.
(7)	95+13.62 81.65 LT
(8)	95+16.85
(9)	95+55.10 35.56 LT
(10)	95+65.13
(11)	95+27.41

SEE PRDESTRAIN RAMP SHEETS FOR MORE DETAILS ON RAMPS

(6) END INSIDE TYPE II CURB
(5) INSIDE TYPE II CURB
STA. 94+81.18 ℄ WBFRTG OFFSET 46.44' R=2'
END AT EXISTING
(4) BEGIN RELOCATED TYPE II CURB
(2) END 2' CURB 35.2 RADIUS
(3) SEE PEDESTRIAN RAMP SHEETS FOR MORE DETAILS
(1) BEGIN 2' CURB 35.2 RADIUS
10' WIDE 4" RIPRAP SLOPES TO BOTTOM OF DITCH FOR DRAINAGE
48" RCP
ALDINE WESTFIELD RD
EXIST. 48" CULVERT
BEGIN TYPE II CURB
(7) BEGIN 44' RADIUS
SEE DRAINAGE DETAIL SHEET
(11) END CURB BEGIN RAMP
(9) END 44' TYPE II CURB RADIUS
(10) SEE PEDESTRAIN SHEETS FOR MORE DETAILS.
STA. 95+81.40 BEGIN CURB OUTLETS 10' SPACING
UTILITY ENTRANCE
PROPOSED RT. TURN LANE
24" RCP
STA. 91+50.51
STA. 94+00.00
95+00
10'
12'
11'
11.5'
℄ WB FRTG.RD.
(2)
(8)
EXIST 42" RCP
EXIST PLUGGED 2-36" RCP
STA. 90+75.00 MATCHLINE
STA. 96+75.00 MATCHLINE
WB SL 8
℄ SL 8
EB SL 8

N

LEGEND

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PROPOSED PGL
EXIST GROUND @ ℄/℄
℄ WBFRTG RD.
70
65
60
91+00
92+00
93+00
94+00
95+00
96+00

STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER

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Texas Department of Transportation

SL 8 WB FRONTAGE ROAD

PLAN AND PROFILE

SHEET 3 OF 4

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			140
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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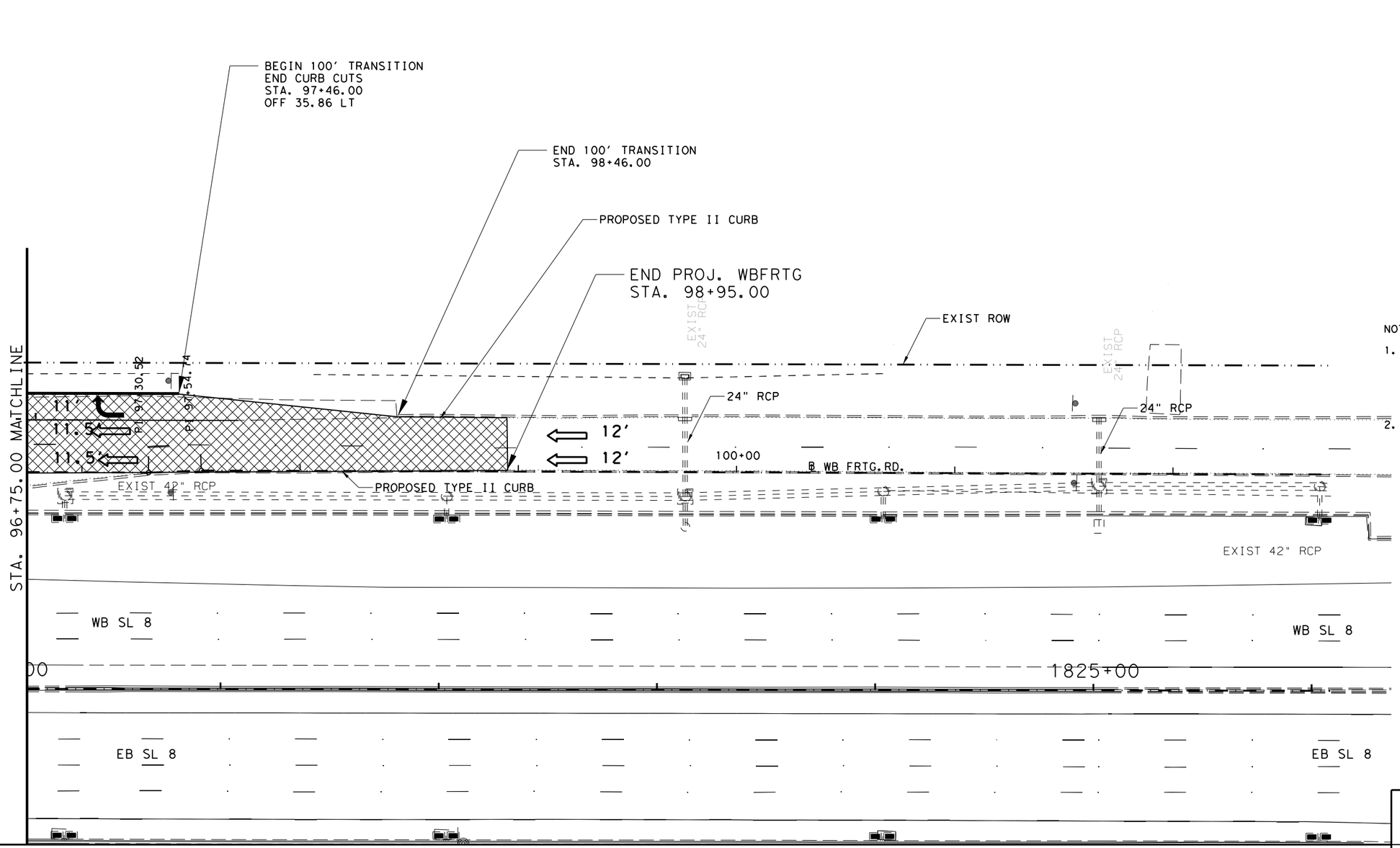

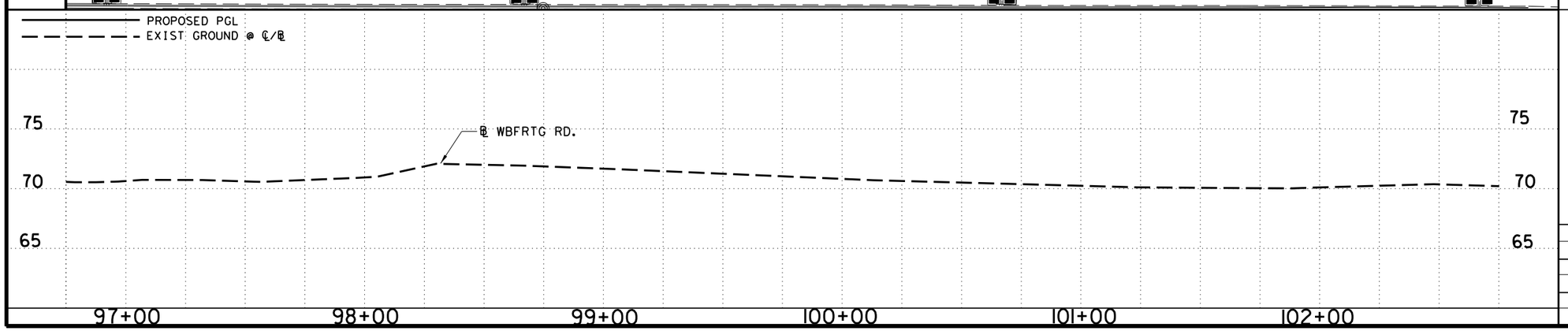

N

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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 4 OF 4

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			141
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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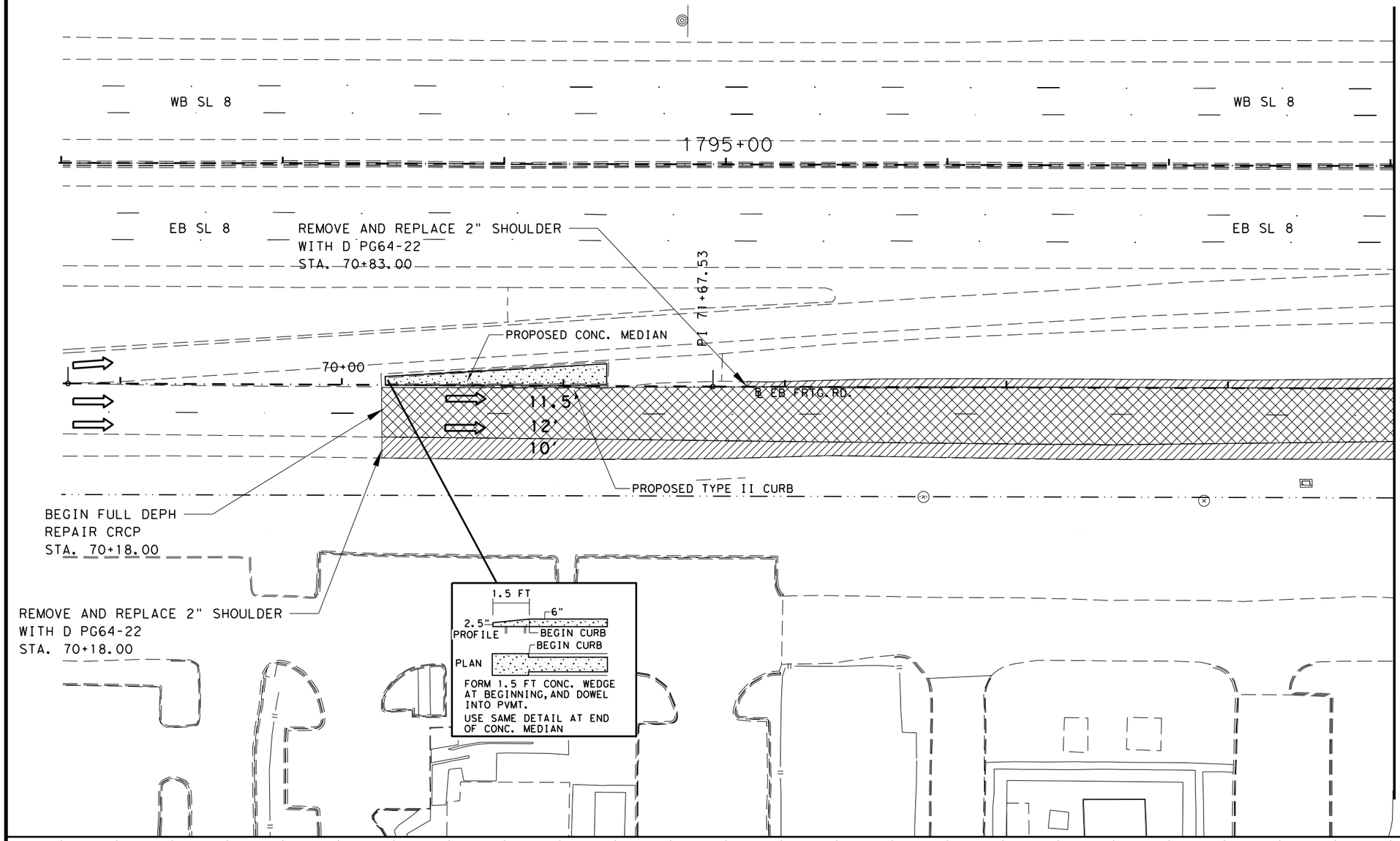

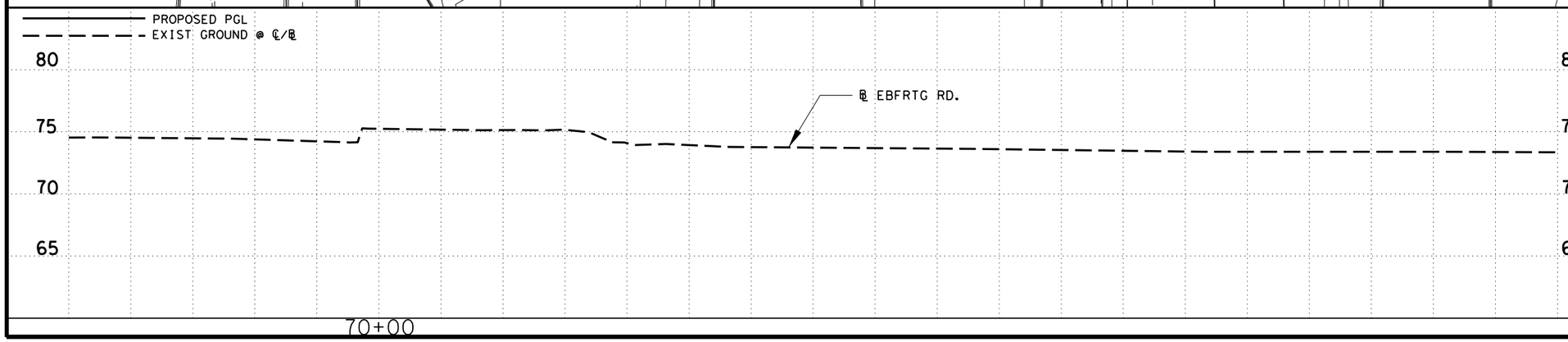

N

LEGEND

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- PROP TRAFFIC LANE
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SL 8
EB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 1 OF 7

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			142
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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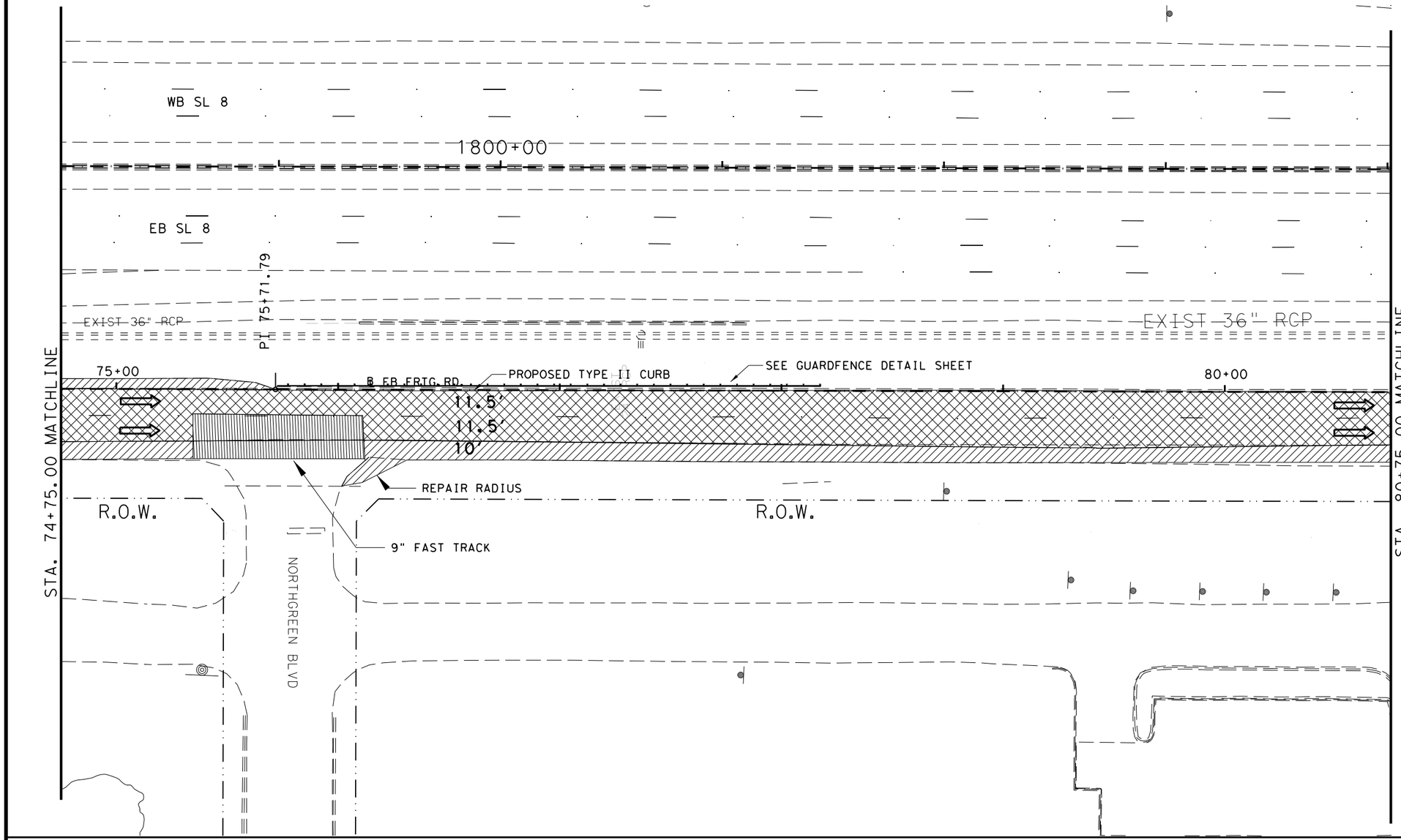

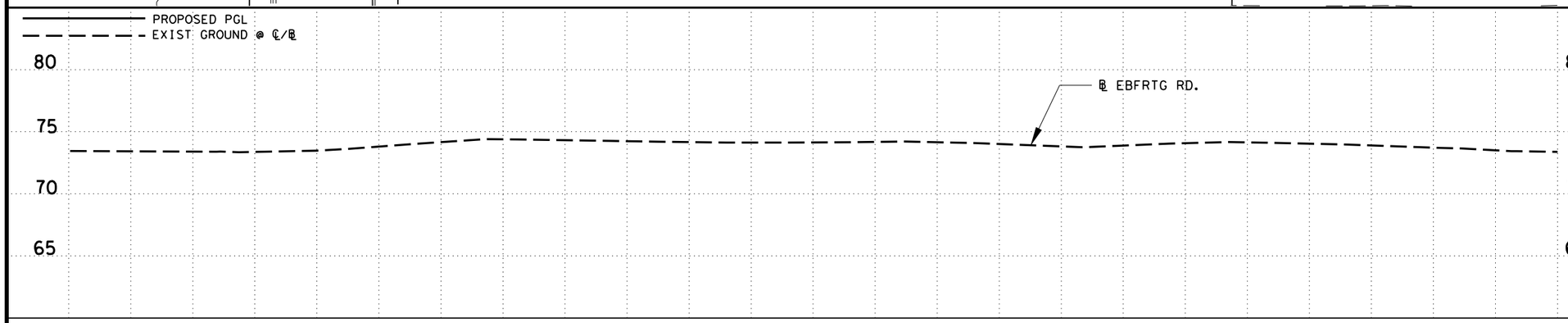

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LEGEND

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SL 8
EB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 2 OF 7

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		143

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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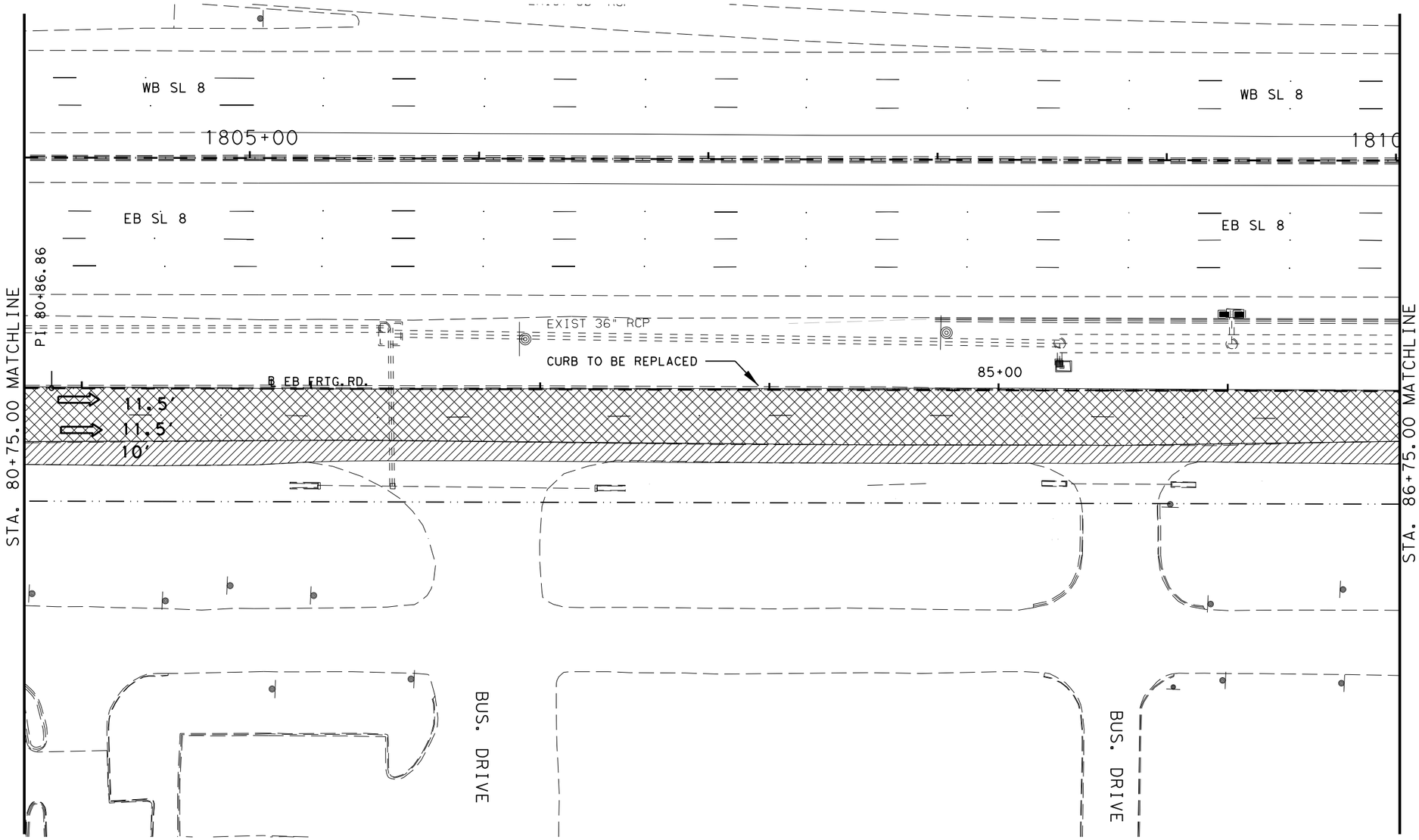

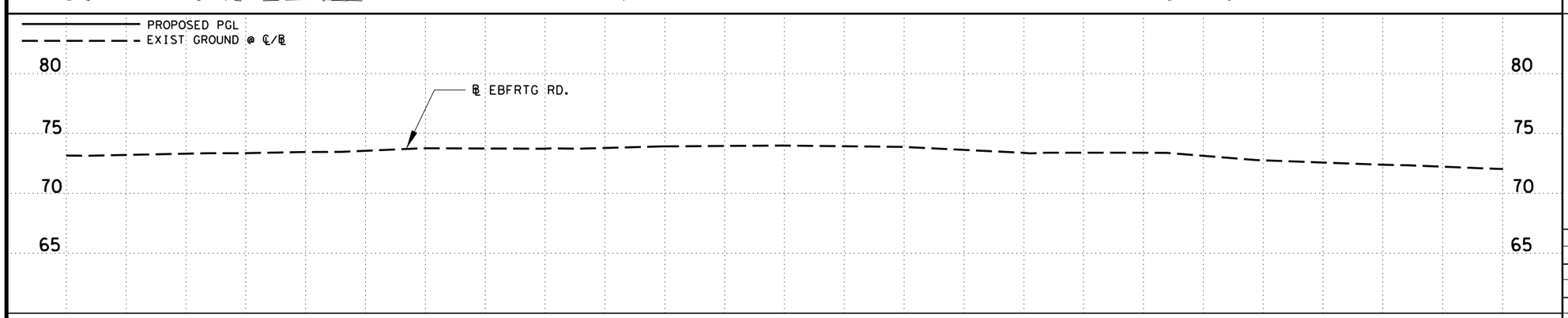

LEGEND

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- EXSIT. ROW
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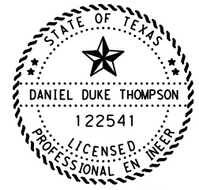

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SL 8
EB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 3 OF 7

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		144

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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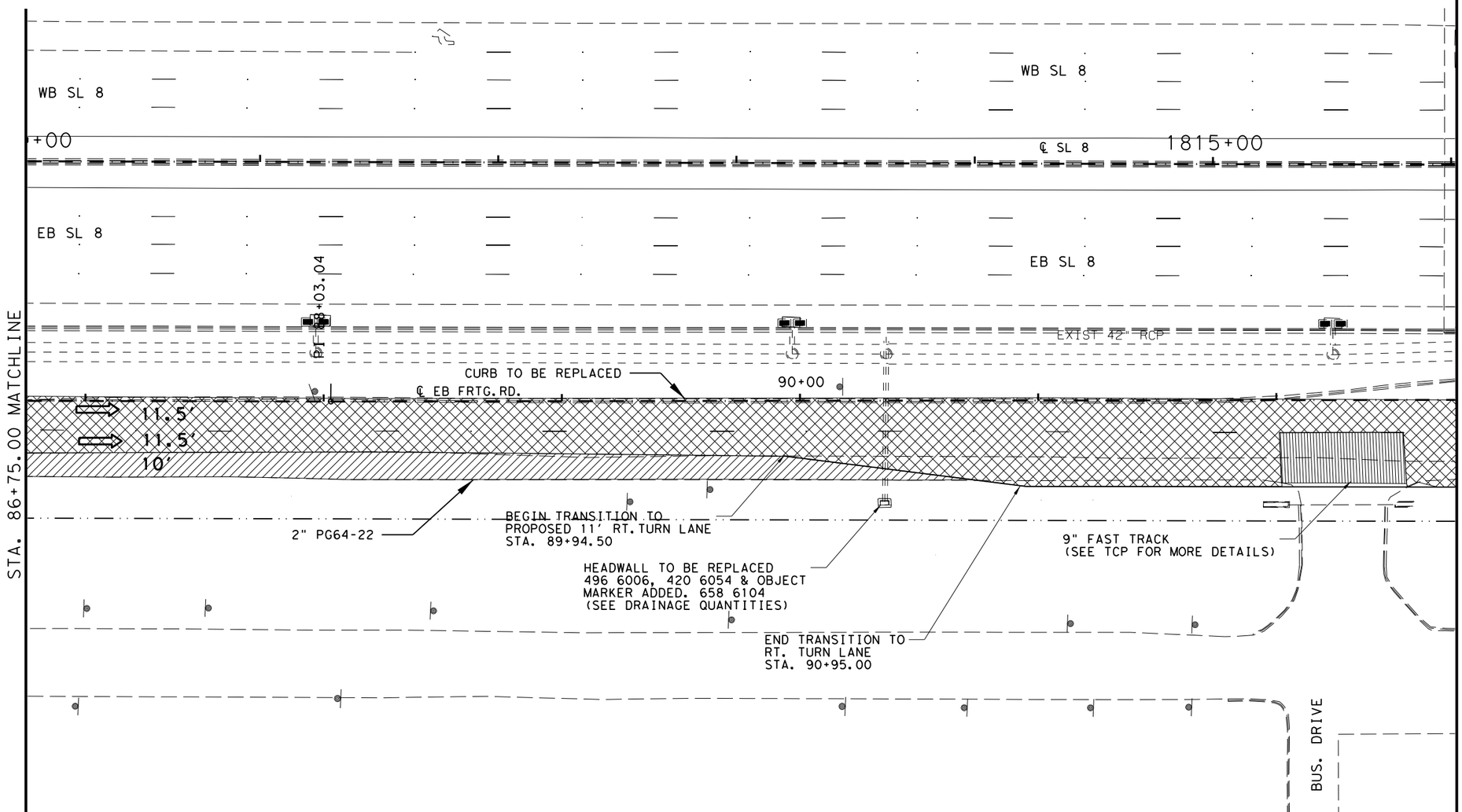

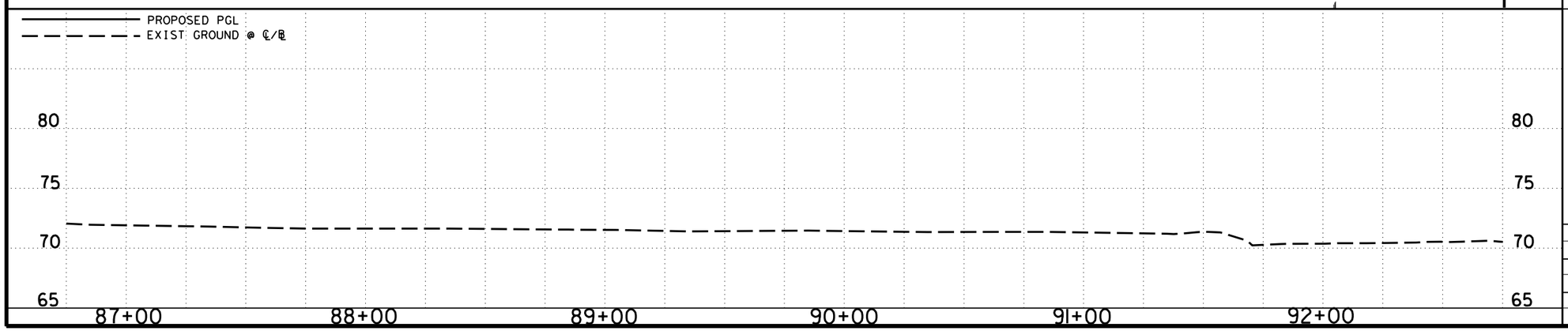

N

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 9" FAST TRACK (RT. TURN LANE)
- 2" SP-D PG64-22 (SHOULDER)
- 8"CRCP (FRTG. RD.)
- 4" CONC. SLOPES

NOTES:

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2. ALL DIMENSIONS ARE TO THE TOE OF RAIL OR FACE OF CURB UNLESS OTHERWISE NOTED.

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
EB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 4 OF 7

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			145
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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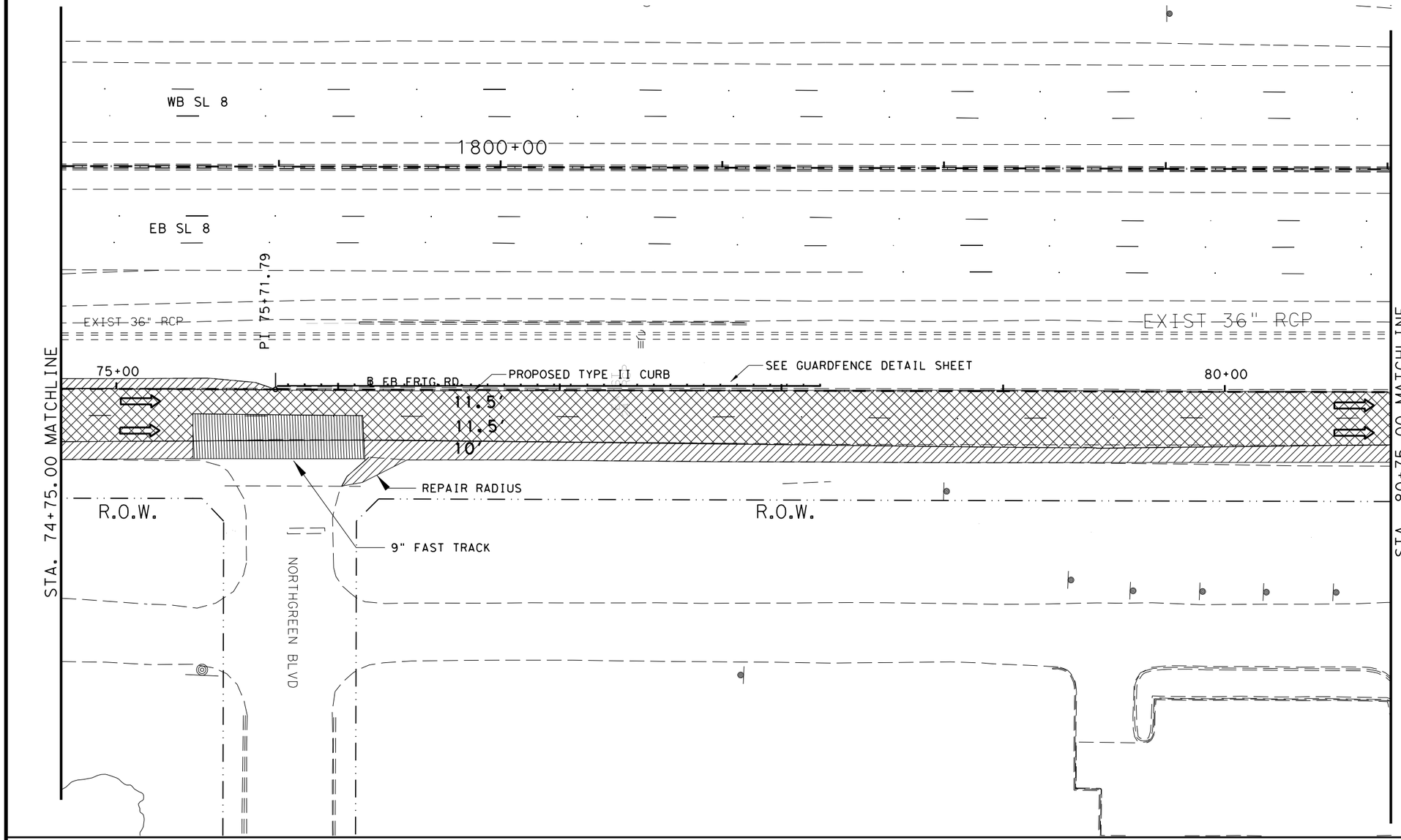

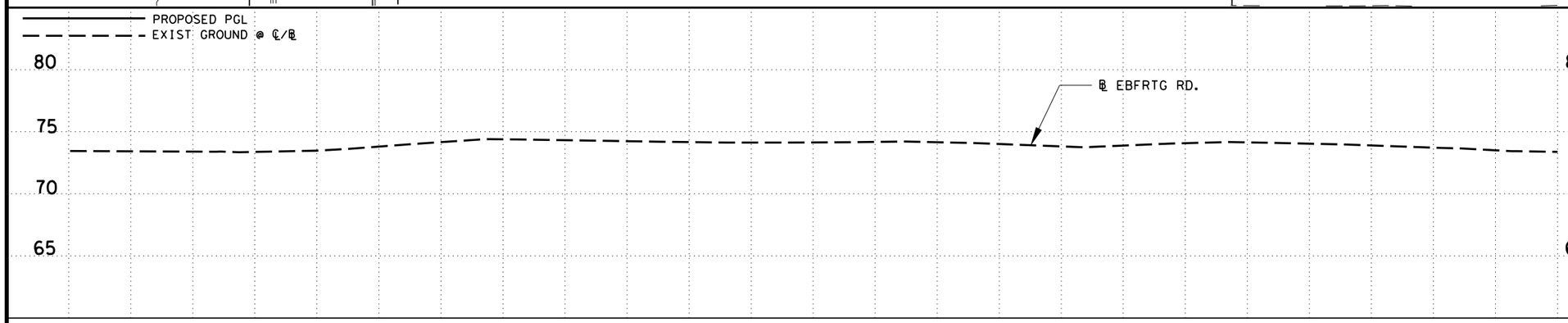

N

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 9" FAST TRACK (RT. TURN LANE)
- 2" SP-D PG64-22 (SHOULDER)
- 8"CRCP (FRTG. RD.)
- 4" CONC. SLOPES

NOTES:

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SL 8
EB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 2 OF 7

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		143

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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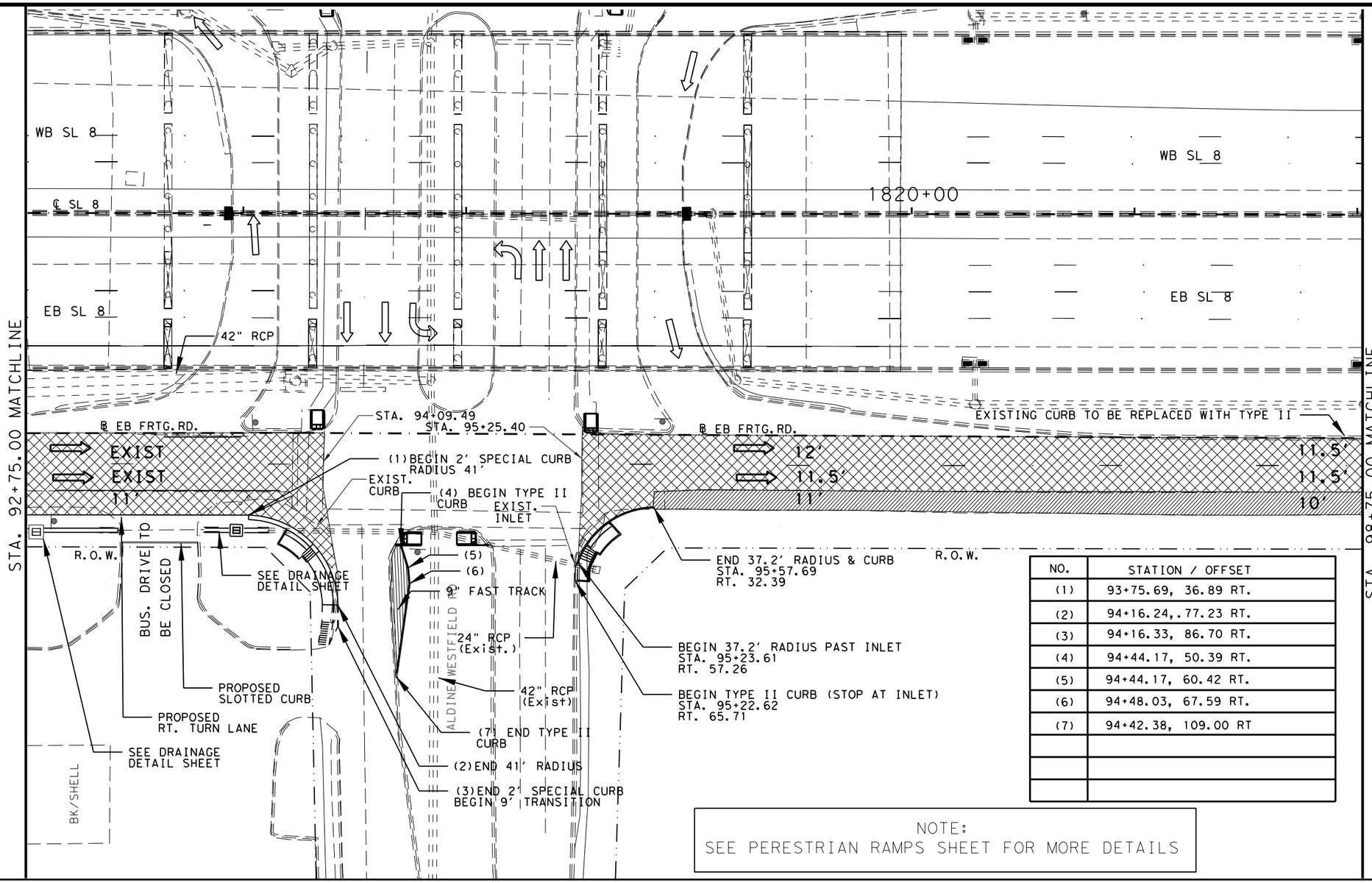
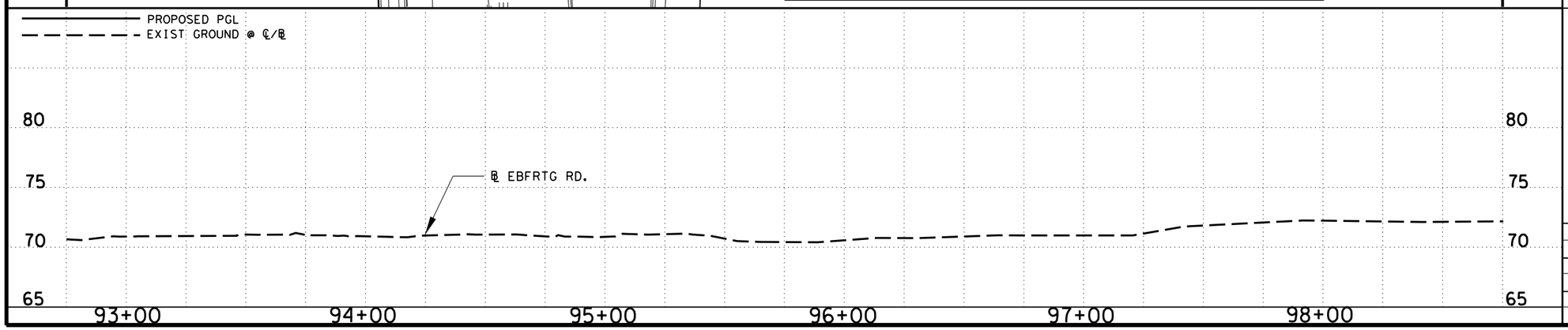


NO.	STATION / OFFSET
(1)	93+75.69, 36.89 RT.
(2)	94+16.24,.77.23 RT.
(3)	94+16.33, 86.70 RT.
(4)	94+44.17, 50.39 RT.
(5)	94+44.17, 60.42 RT.
(6)	94+48.03, 67.59 RT.
(7)	94+42.38, 109.00 RT

NOTE:
SEE PERESTRIAN RAMPS SHEET FOR MORE DETAILS



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LEGEND

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- PROP TRAFFIC LANE
- EXSIT. ROW
- 9" FAST TRACK (RT. TURN LANE)
- 2" SP-D PG64-22 (SHOULDER)
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NOTES:

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SL 8
EB FRONTAGE ROAD
PLAN AND PROFILE

5 OF 7

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		146

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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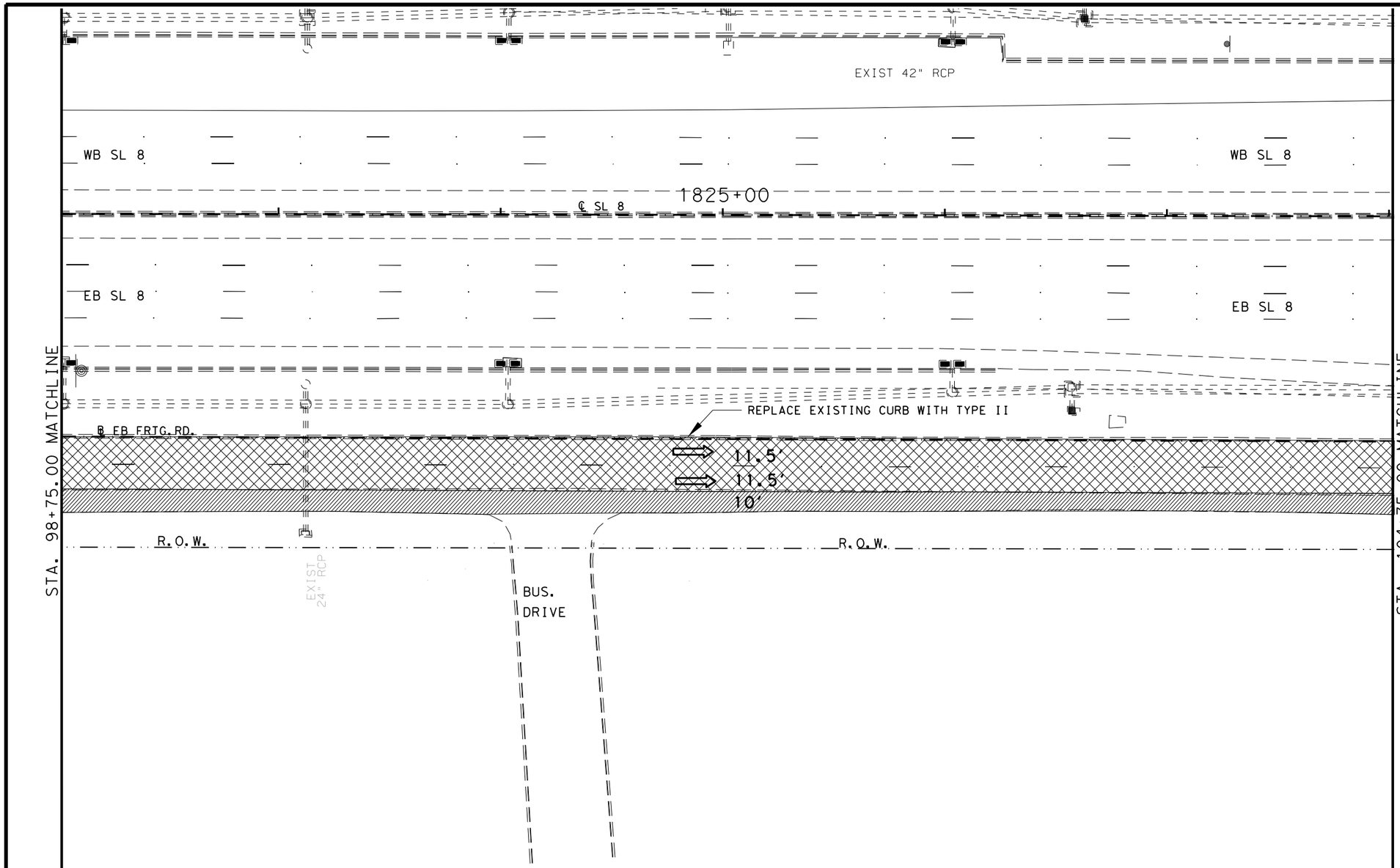

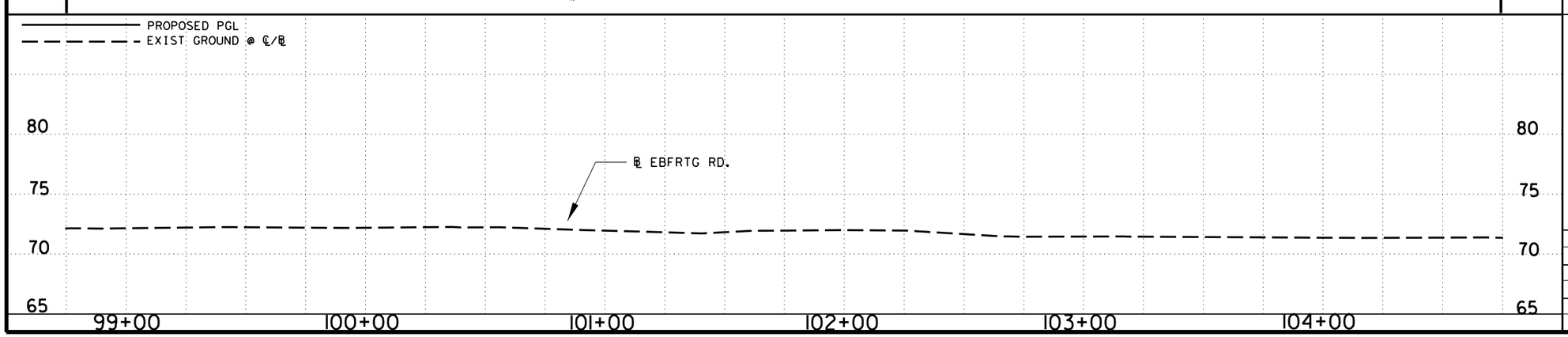

N

LEGEND

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- PROP TRAFFIC LANE
- EXSIT. ROW
- 9" FAST TRACK (RT. TURN LANE)
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- 8"CRCP (FRTG. RD.)
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SL 8
EB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 6 OF 7

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			147
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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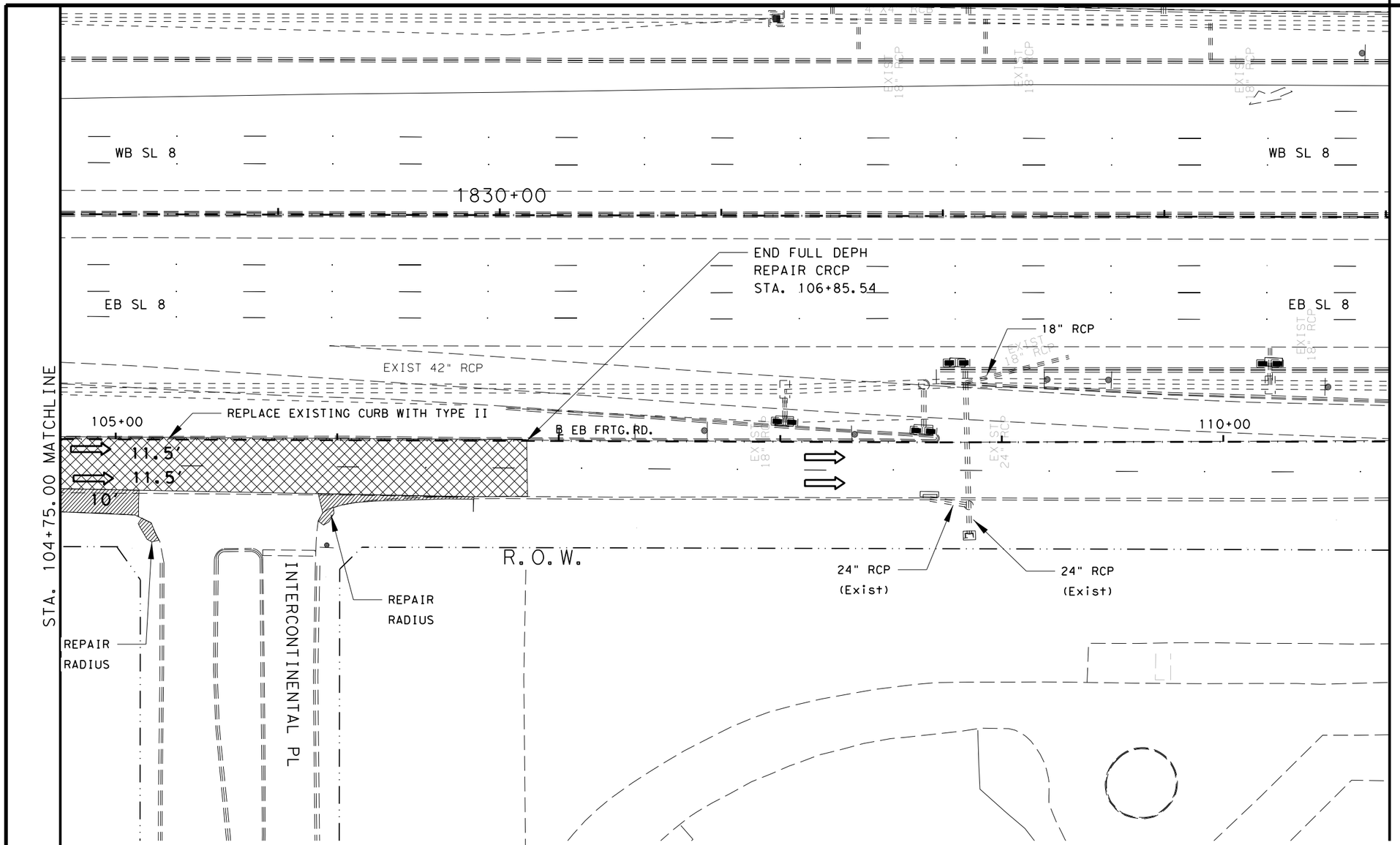

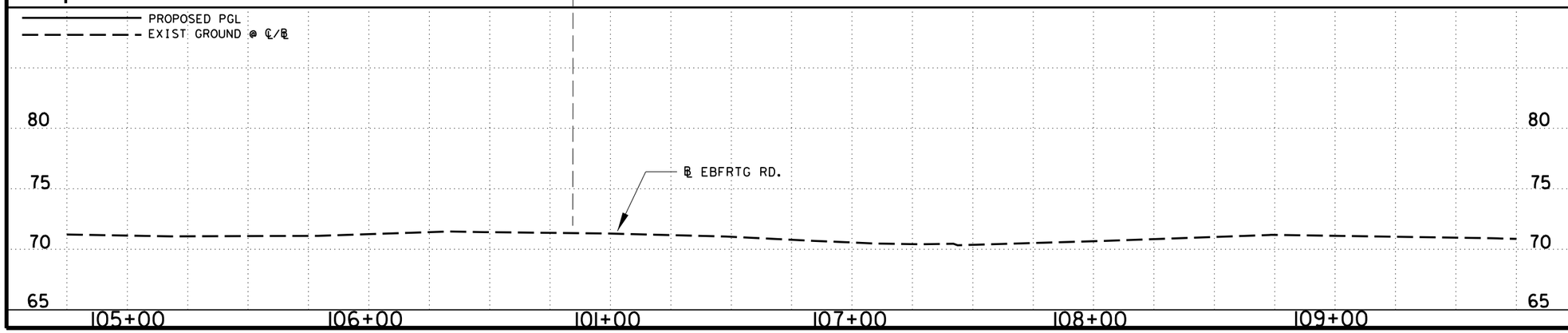

DATE: 3/15/2023
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N

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 9" FAST TRACK (RT. TURN LANE)
- 2" SP-D PG64-22 (SHOULDER)
- 8"CRCP (FRTG. RD.)
- 4" CONC. SLOPES

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SL 8
EB FRONTAGE ROAD
PLAN AND PROFILE

SHEET 7 OF 7

SCALE: 1" = 50' HORZ
1" = 5' VERT

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			148
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

EB SL 8

EXIST. PEDESTRIAN POLE

PROPOSED PEDESTRIAN POLE

UPDATE RAMP

TYPE 7 RAMP

EXIST. SIGNAL POLE

REMOVE, REPLACE RAMP

PROP. PEDESTRIAN POLE

TYPE 7 RAMP

EB FRTG RD.

EB FRTG RD.

N

DETECTABLE WARNING SURFACE

PEDESTRIAN POLE ITEM 687 6002

EXIST. ROW

2'X 13'

TYPE 5 RAMP

PEDESTRIAN POLE

1.0%

5' LANDING

TYPE 7 RAMP

5' S.W.

TYPE 7 RAMP

EXIST. ROW

ALDINE WESTFIELD RD

TYPE 7 RAMP

RELOCATE ELETRICAL BOX

TYPE 7 RAMP

RELOCATE SIGN

EXIST. POLE

INE WESTFIELD RD

2'X 13.5'

TYPE 5 RAMP

PEDESTRIAN POLE

5' LANDING

1.0% SLOPE

TYPE 7 RAMP

EXIST. INLET

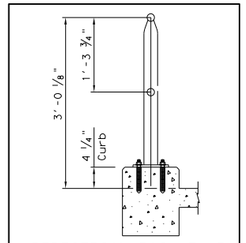
10' OF PEDESTRIAN RAIL 450 6048

5' S.W.

ALDINE WESTFIELD RD

EXIST. S.W.

EXIST. ROW



PEDESTRIAN RAIL TY B

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SL 8
EB FRONTAGE ROAD

PEDESTRIAN RAMPS

SCALE: 1' = 20'

SHEET 1 OF 2

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			149
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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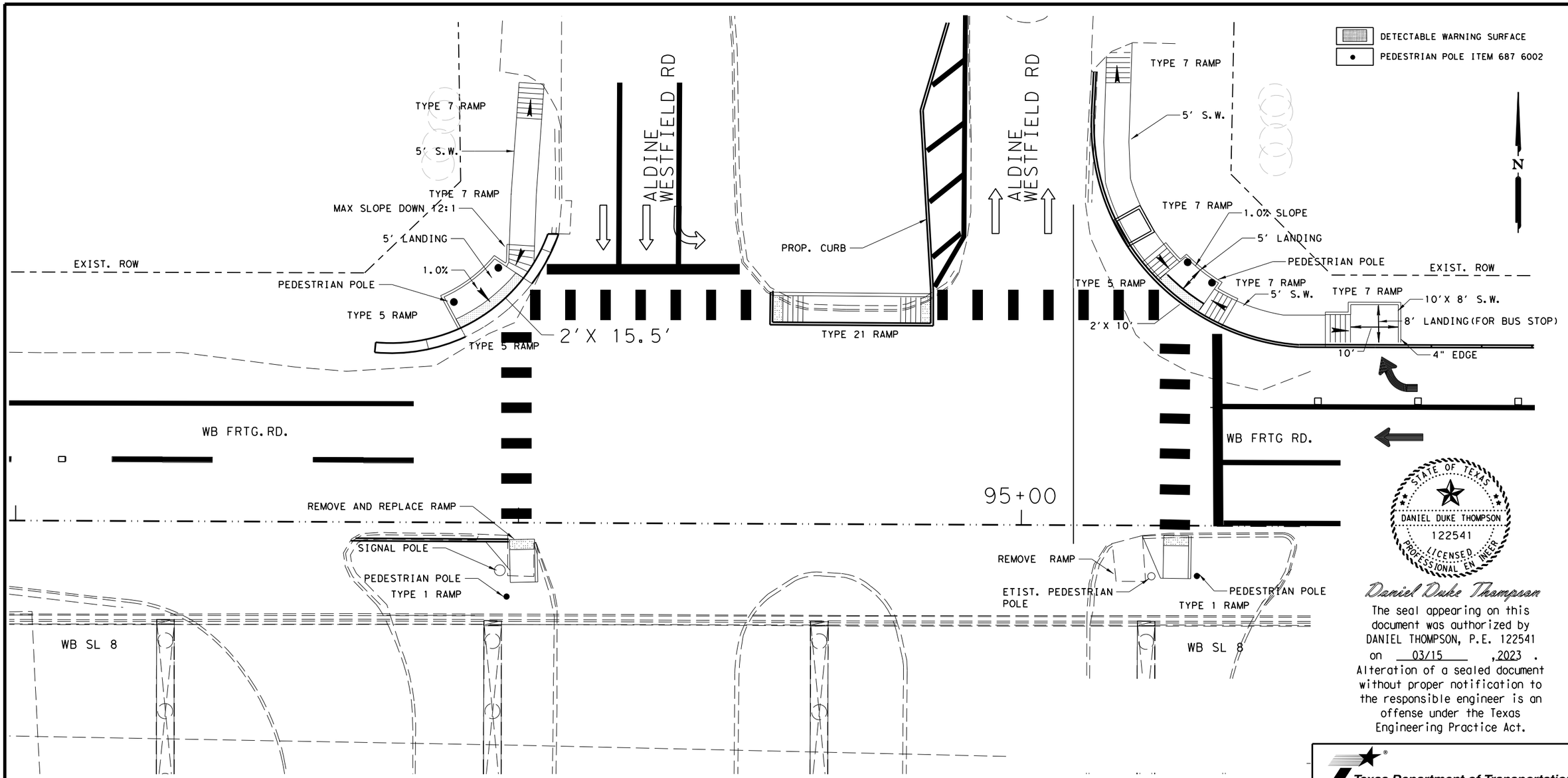

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SL 8
WB FRONTAGE ROAD

PEDESTRIAN RAMPS

SCALE: 1' = 20'

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		150

STATE	DIST	COUNTY
TEXAS	HOU	HARRIS

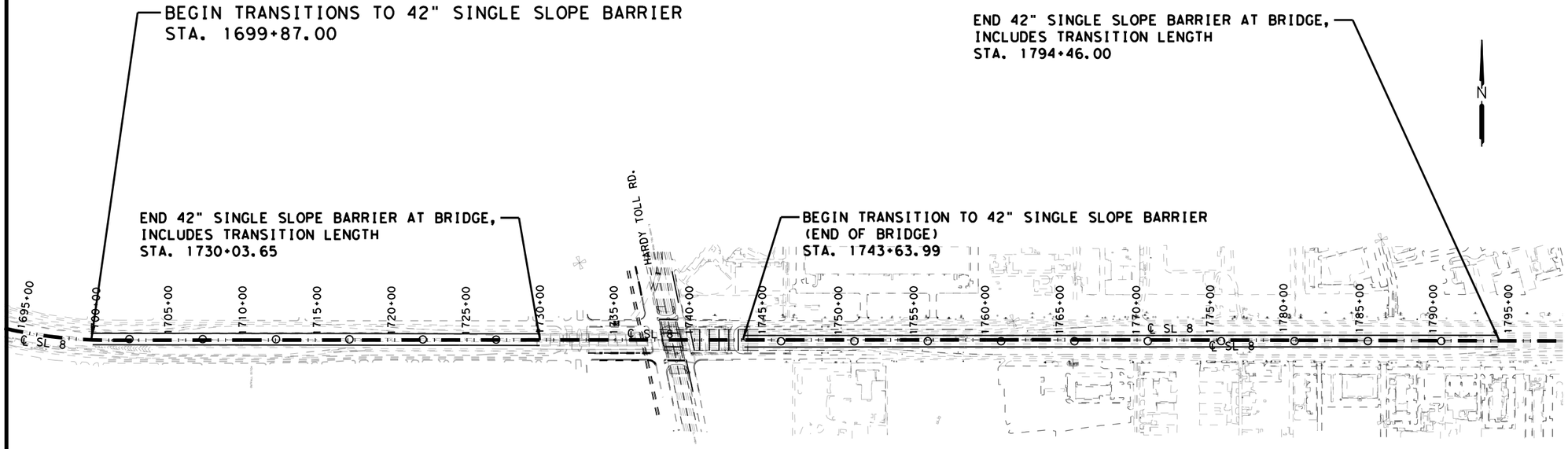
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

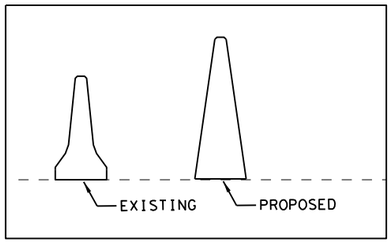
DATE: 3/15/2023
$FILE$

FOR THE REPLACEMENT OF 36" PRECAST MOVABLE BARRIER WITH 42" CAST -IN -PLACE CONC. SS BARRIER.

LEGEND

SINGLE SLOPE 42" CONC. BARRIER
514 6001 TYPE I





TRANSITION IN BARRIER HEIGHT SHALL NOT EXCEED 2" PER 30 FT.
TRANSITION DISTANCE TO BE DETERMINE BY ENGINEER

SEE STANDARD DRAWING SSCB(2)-HOU

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SL 8

CAST IN PLACE TRAFFIC BARRIER

SCALE: 1" = 800' HORZ

SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			151
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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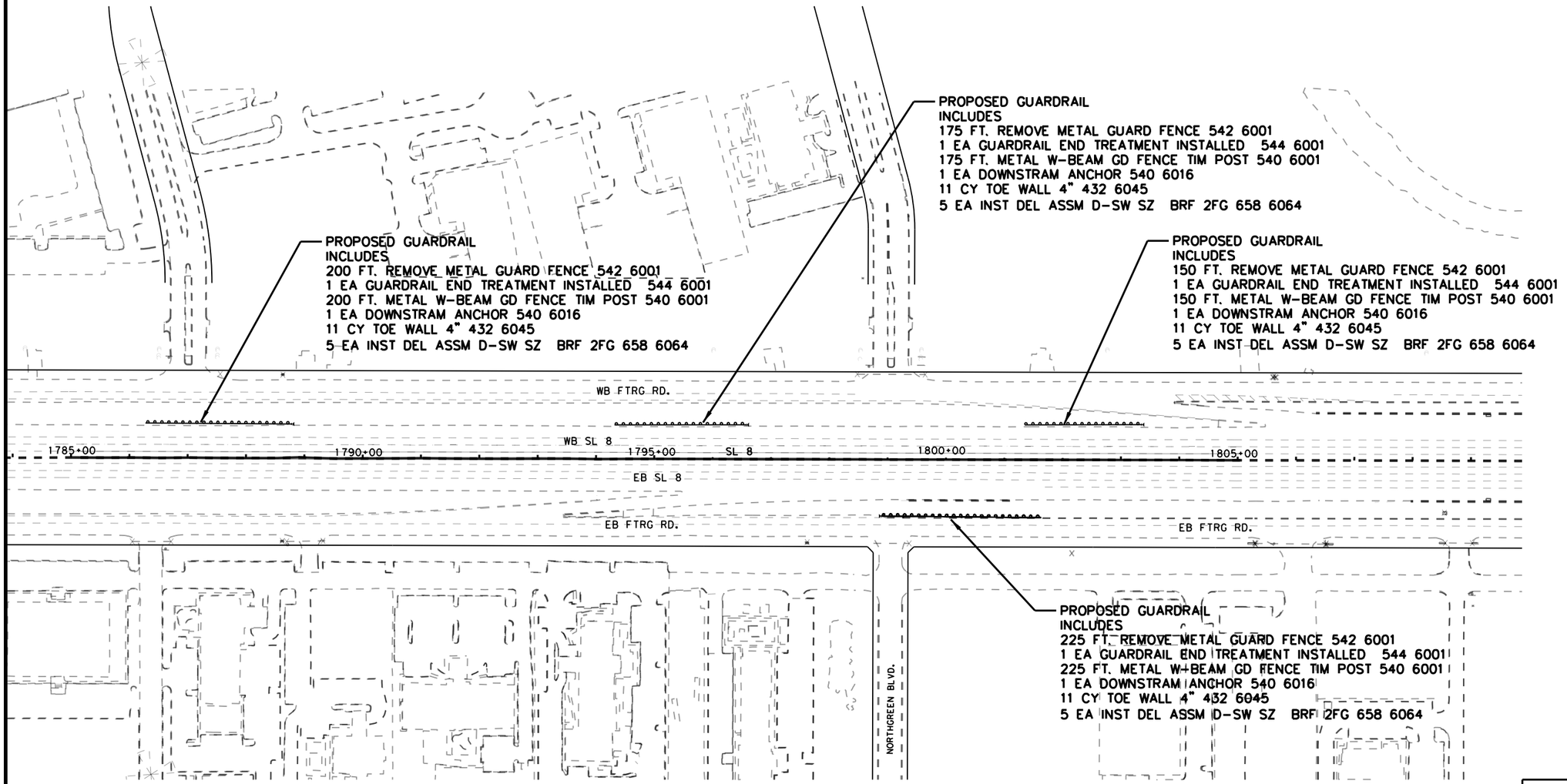

N

LEGEND

GUARDRAIL

NOTE: PROPOSED GUARDFENCE ALONG SL 8 TO BE INSTALLED 2 FT BACK FROM PREVIOUS LOCATION FOR FUTURE TCP OF FOUR LANES.

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SL 8

GUARDFENCE DETAIL SHEET

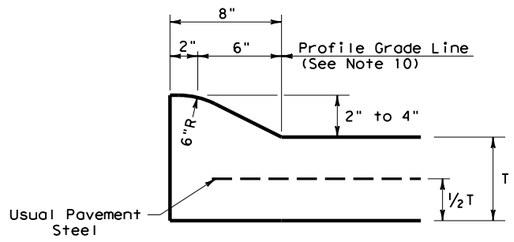
SCALE: 1" = 200' HORZ

SHEET 1 OF 1

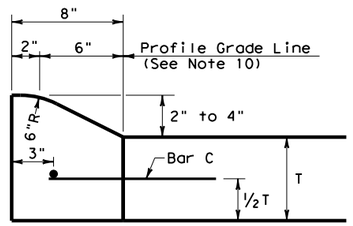
FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			152
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

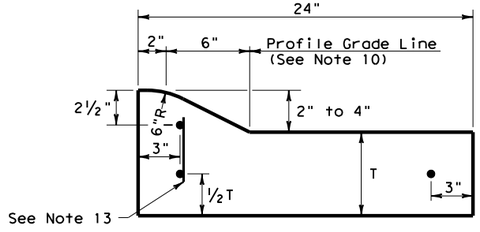
DATE:
FILE:



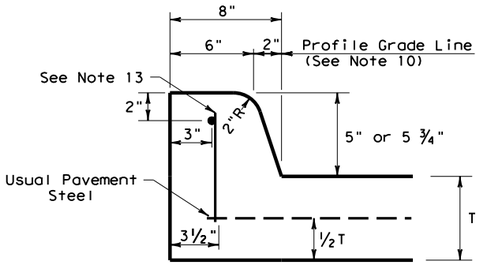
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



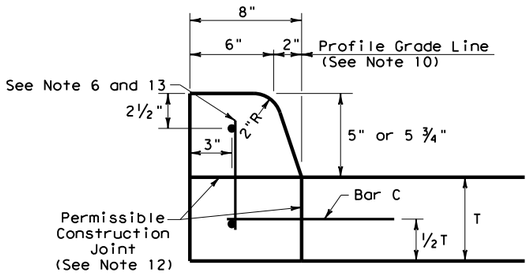
TYPE I CURB
2" - 4" HEIGHT



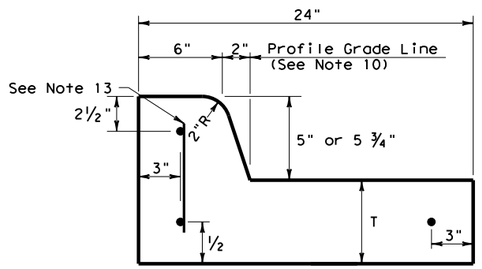
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



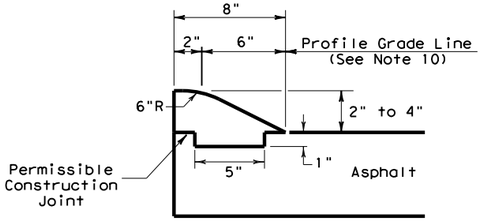
TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



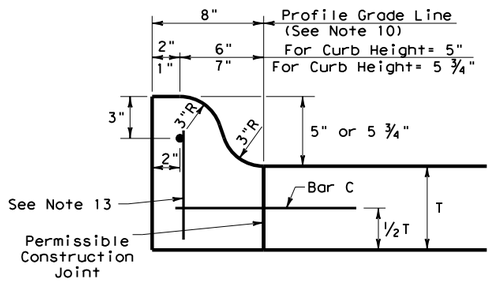
TYPE II CURB
5" - 5 ¾" HEIGHT



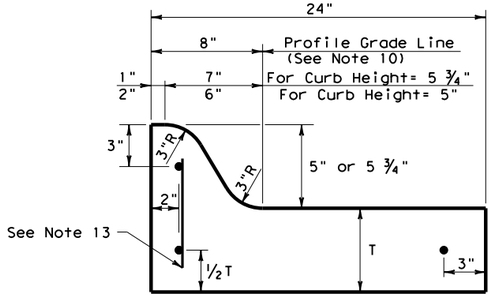
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



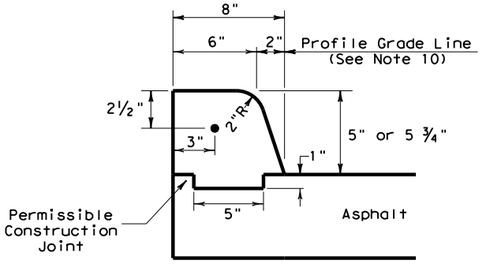
TYPE III CURB (KEYED)
2" - 4" HEIGHT



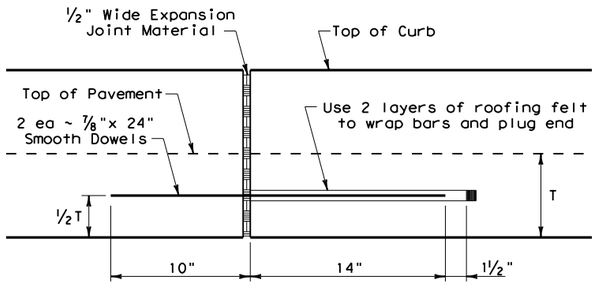
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

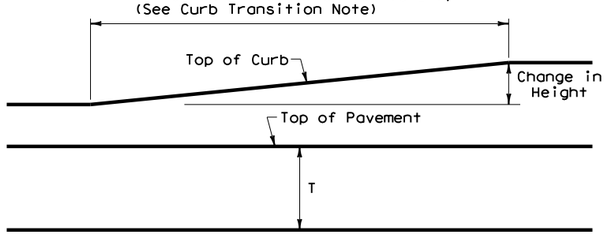


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

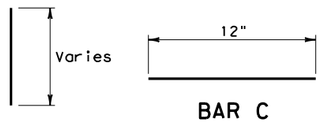
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B placement as needed (typically at four ft. C-C) to support curb reinforcing steel during concrete placement.



BAR B

BAR C

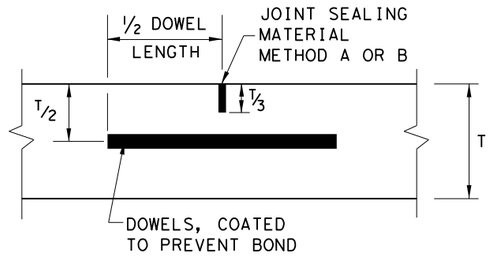
Texas Department of Transportation

Design Division Standard

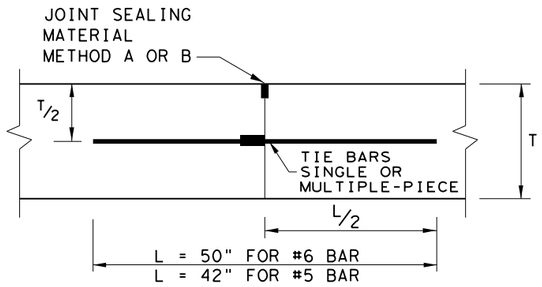
CONCRETE CURB AND CURB AND GUTTER

CCCG-22

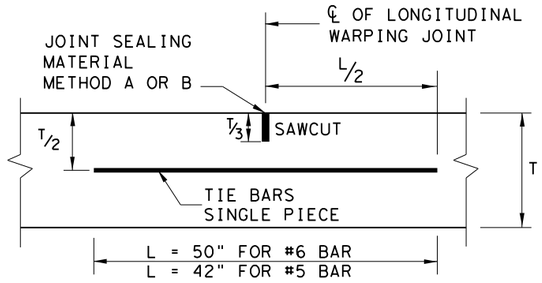
FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: CS	CK: KM
© TxDOT: JUNE 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	12	HARRIS		153



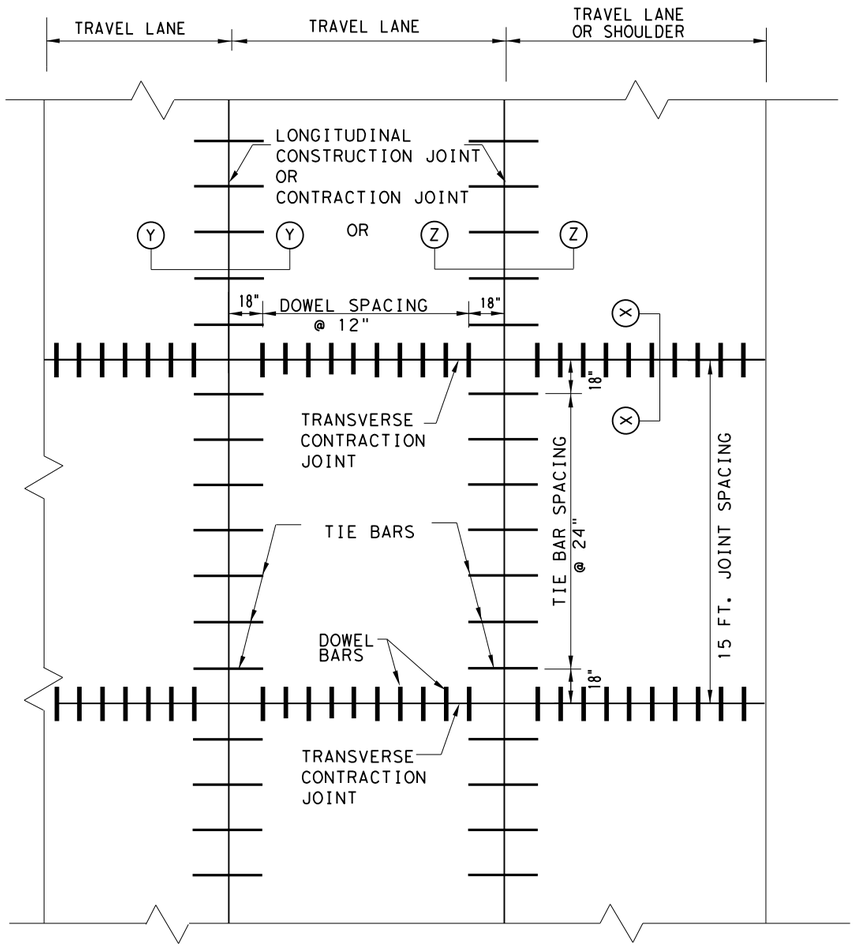
TRANSVERSE CONTRACTION JOINT
SECTION X-X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y-Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z-Z



TYPICAL PAVEMENT LAYOUT
PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
2. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND LOAD TRANSFER DEVICES REFER TO THE GOVERNING SPECIFICATION FOR "CONCRETE PAVEMENT".
3. THE SPACING BETWEEN TRANSVERSE CONTRACTION JOINTS SHALL BE 15 FT. UNLESS OTHERWISE SHOWN IN THE PLANS.
4. TRANSVERSE CONSTRUCTION JOINTS MAY BE FORMED BY USE OF METAL OR WOOD FORMS EQUAL IN DEPTH TO THE DEPTH OF PAVEMENT, OR BY METHODS APPROVED BY THE ENGINEER.
5. USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL THE FORMED JOINTS.
6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
7. THE JOINT BETWEEN OUTSIDE LANE AND SHOULDER SHALL BE A LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) UNLESS OTHERWISE SHOWN IN THE PLANS. THE SAW CUT DEPTH FOR THE LONGITUDIANL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLABTHICKNESS (T/3).
8. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
10. WHEN AN MONOLITHIIC CURB IS SPECIFIED, THE JOINT IN THE CURB SHALL COINCIDE WITH PAVEMENT JOINTS AND MAY BE FORMED BY ANY MEANS APPROVED BY THE ENGINEER.
11. DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.
12. THE DETAIL FOR JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."

TABLE NO. 1 DOWELS (SMOOTH BARS)		
SLAB THICKNESS T (IN.)	BAR DIA. AND LENGTH	AVERAGE SPACING (IN.)
6 to 7.5	1" X 18"	12
8 to 10	1 1/4" X 18"	12
>= 10.5	1 1/2" X 18"	12

TABLE NO. 2 TIE BARS (DEFORMED BARS)		
SLAB THICKNESS T (IN.)	BAR SIZE	AVERAGE SPACING (IN.)
6 to 7.5	#5	24
>= 8	#6	24

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SHEET 1 OF 2

Texas Department of Transportation | Design Division Standard

CONCRETE PAVEMENT DETAILS
CONTRACTION DESIGN
T-6 to 12 INCHES

CPCD-14

FILE: cpcd14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		154

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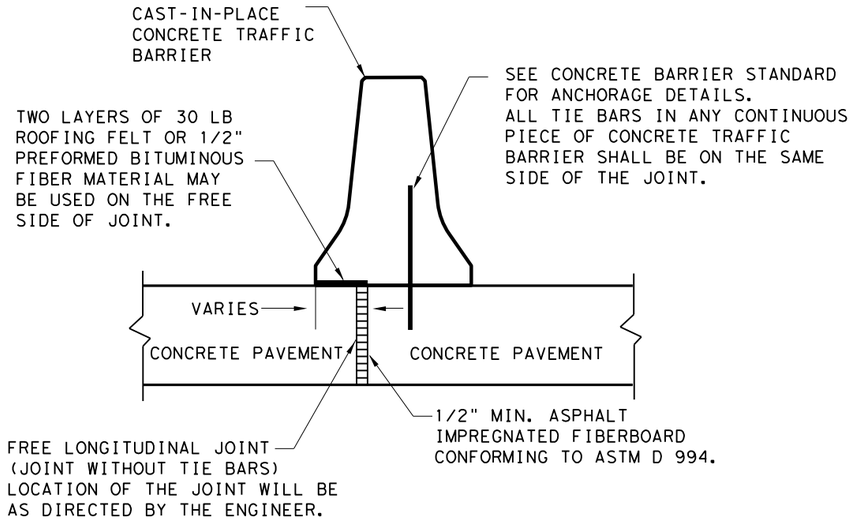
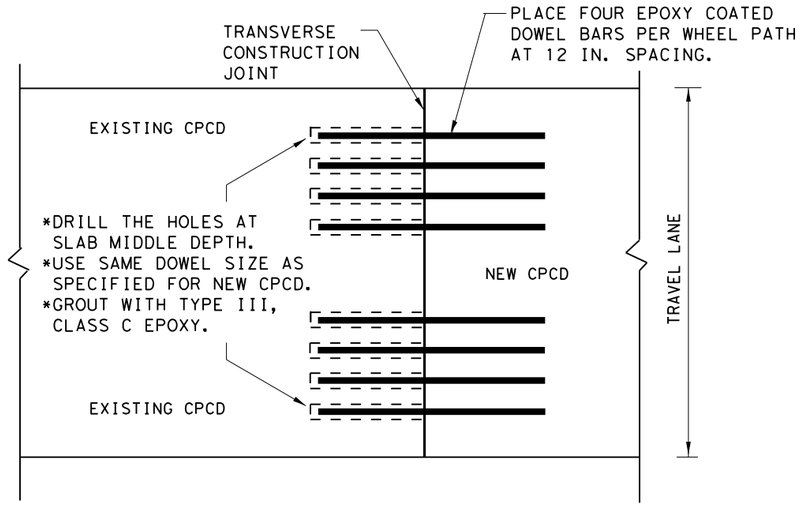
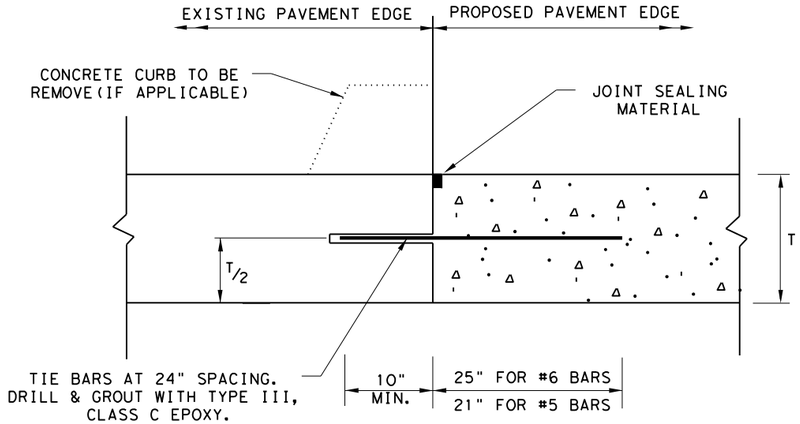


FREE LONGITUDINAL JOINT DETAIL

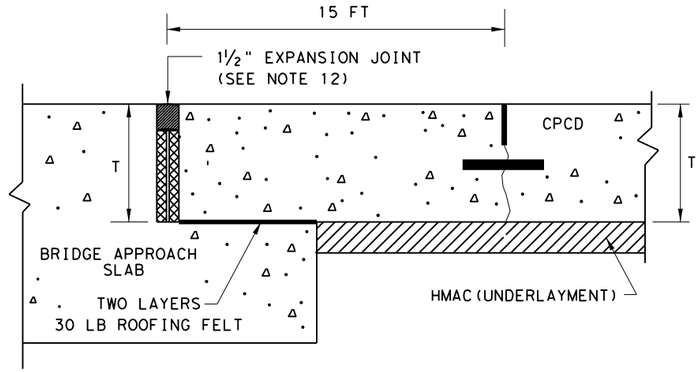


TRANSVERSE JOINT DETAIL
EXISTING CPCD TO NEW CPCD
PLAN VIEW (NOT TO SCALE)



1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 BARS FOR 8" AND THICKER SLABS, USE #5 BARS FOR LESS THAN 8" THICK SLABS.
3. THE TRANSVERSE JOINTS OF PROPOSED PAVEMENT SHALL COINCIDE WITH EXISTING PAVEMENT JOINTS UNLESS OTHERWISE SHOWN ON THE PLANS.

LONGITUDINAL WIDENING JOINT DETAIL



TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH

SHEET 2 OF 2

Texas Department of Transportation — Design Division Standard

CONCRETE PAVEMENT DETAILS
CONTRACTION DESIGN
T-6 to 12 INCHES

CPCD-14

FILE: cpcd14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
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	HOU	HARRIS		155

DATE: 3/15/2023
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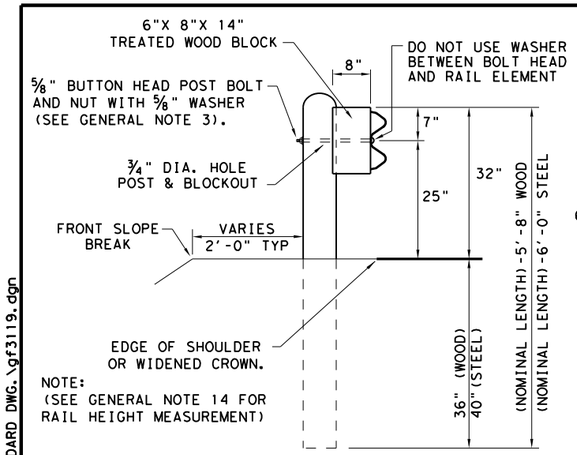
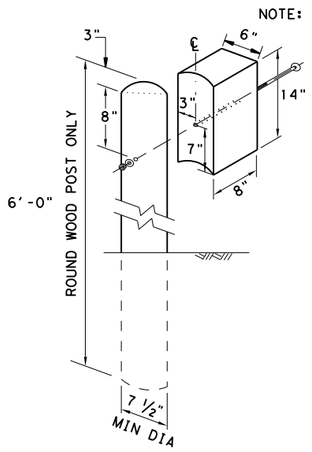
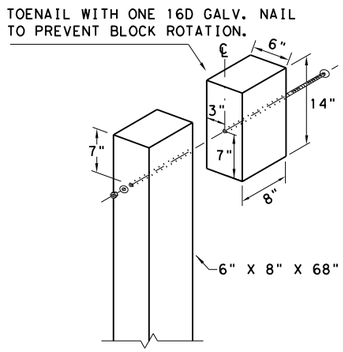


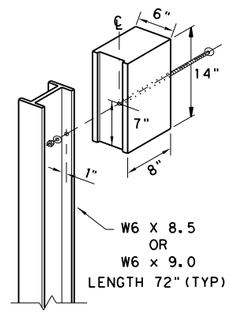
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

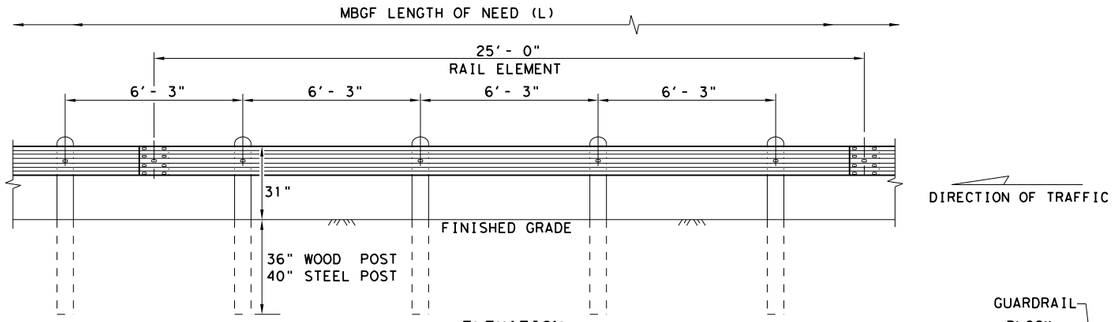


WOOD BLOCK TO RECTANGULAR WOOD POST



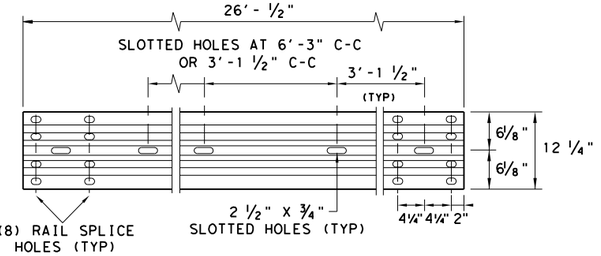
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



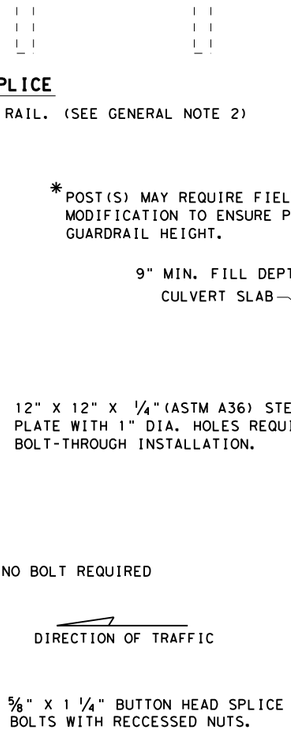
ELEVATION
MID-SPAN RAIL SPLICE

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



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

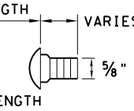
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.



MID-SPAN RAIL SPLICE DETAIL

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

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



BUTTON HEAD BOLT

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

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	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		156

DATE: 3/15/2023
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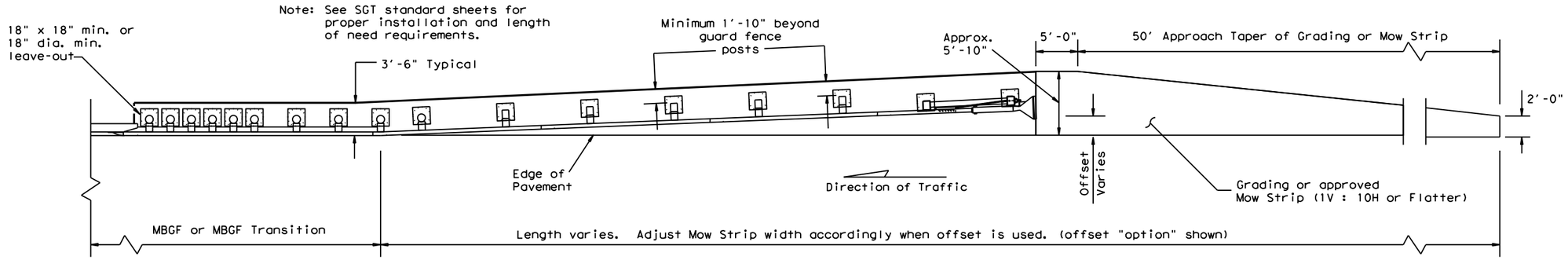
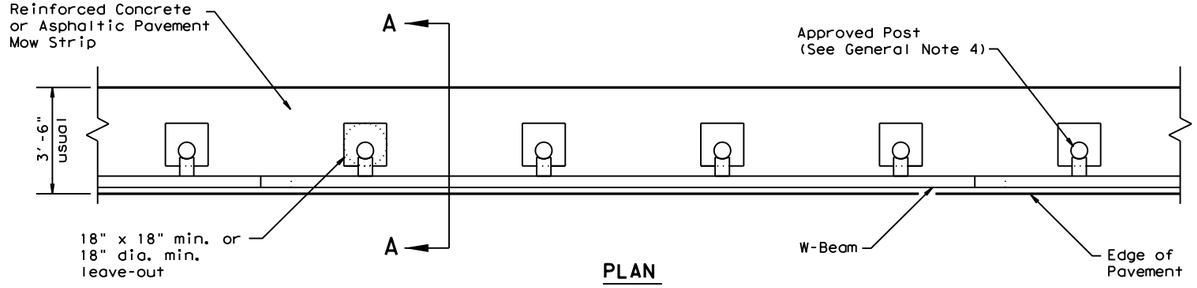
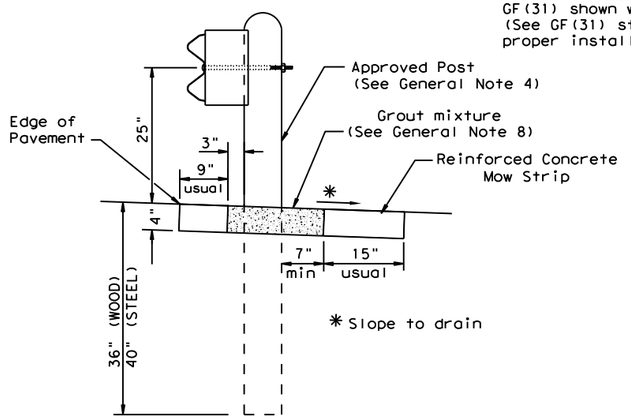


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



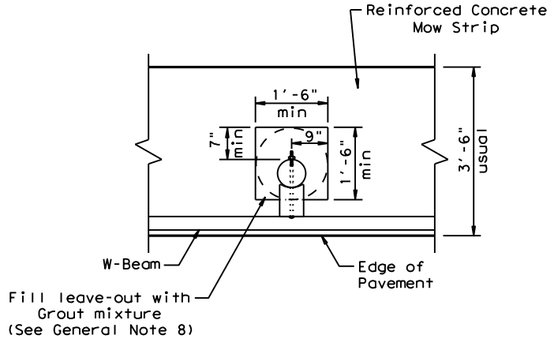
PLAN

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



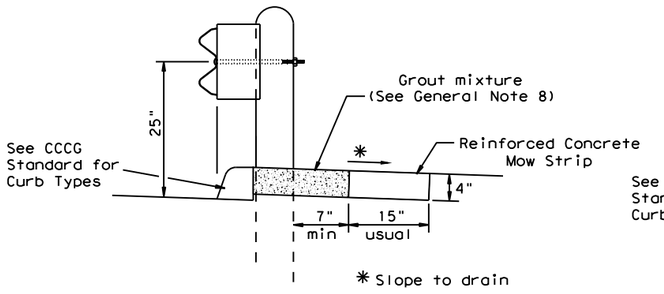
SECTION A-A

Typical



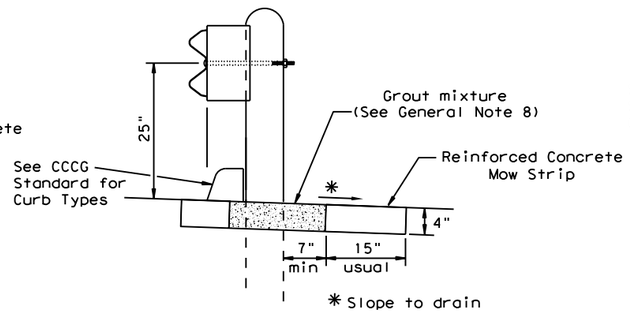
MOW STRIP DETAIL

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



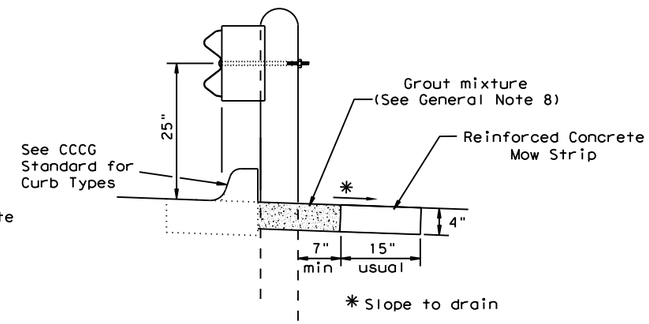
CURB OPTION (1)

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
GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
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REVISIONS	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		157

DATE:
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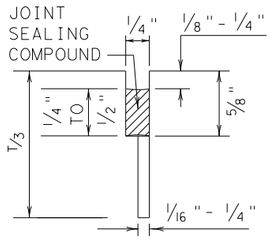
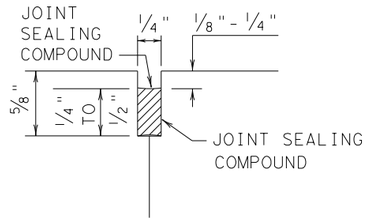
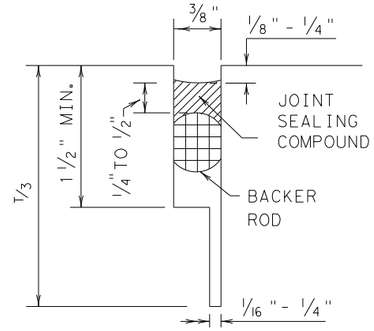
METHOD B: JOINT SEALING COMPOUND



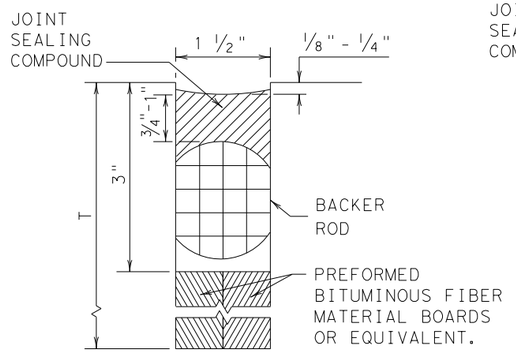
LONGITUDINAL SAWED CONTRACTION JOINT



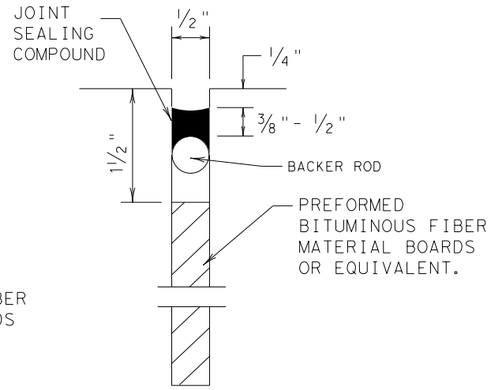
LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT

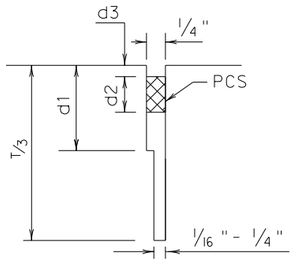


TRANSVERSE FORMED EXPANSION JOINT

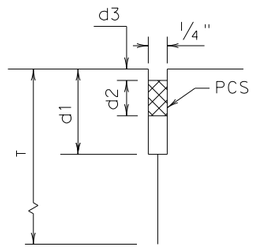


FORMED ISOLATION JOINT

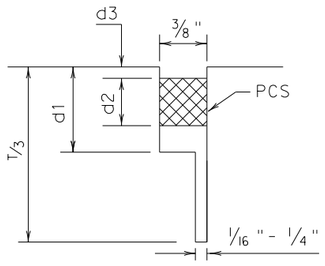
METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



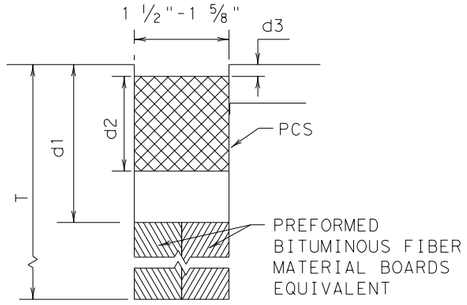
LONGITUDINAL SAWED CONTRACTION JOINT



LONGITUDINAL CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT



TRANSVERSE FORMED EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation

Design Division Standard

CONCRETE PAVING DETAILS

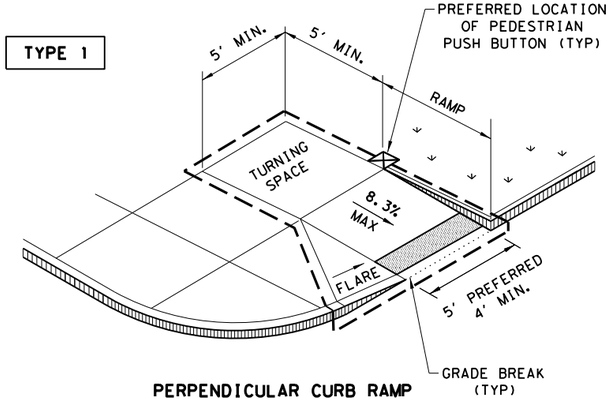
JOINT SEALS

JS-14

FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	12	HARRIS		158

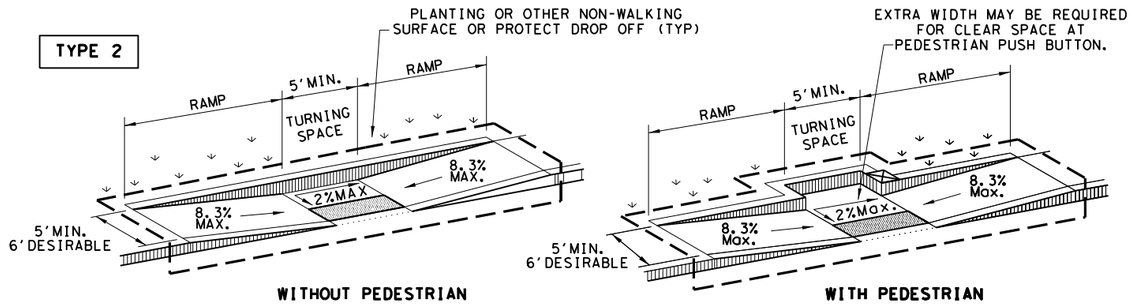
DATE: 3/15/2023
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\325602093\4 - Design\Plan Set\3. Roadway\STANDARD DWG. \ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

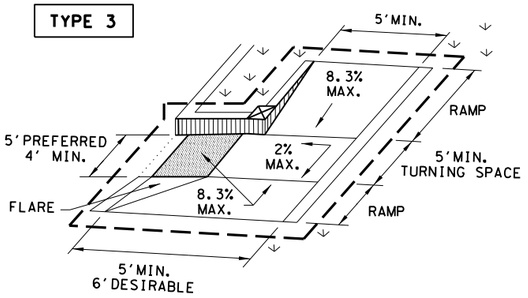


WITHOUT PEDESTRIAN PUSH BUTTON

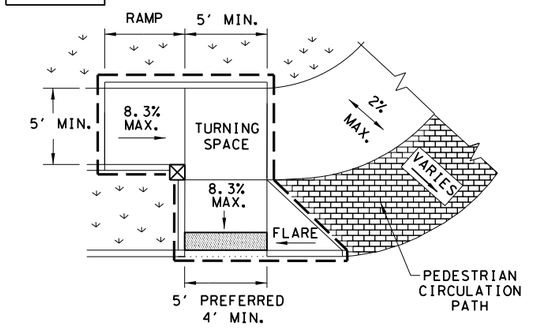
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

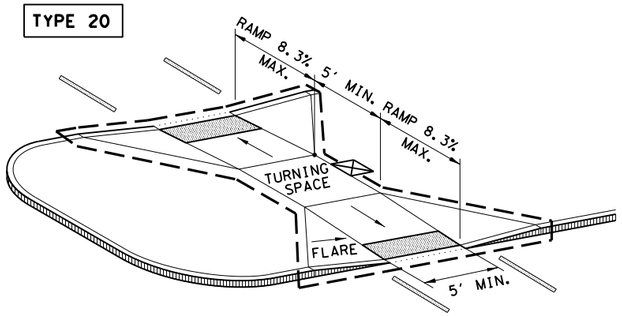


TYPE 6



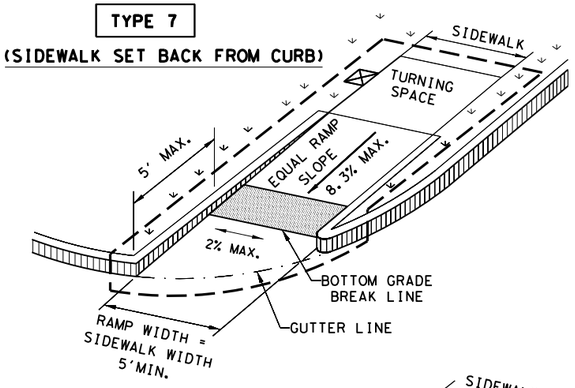
COMBINATION CURB RAMPS

TYPE 20

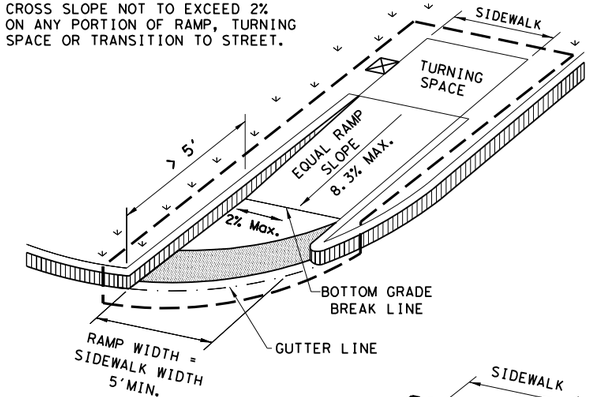


CURB RAMPS AT MEDIAN ISLANDS

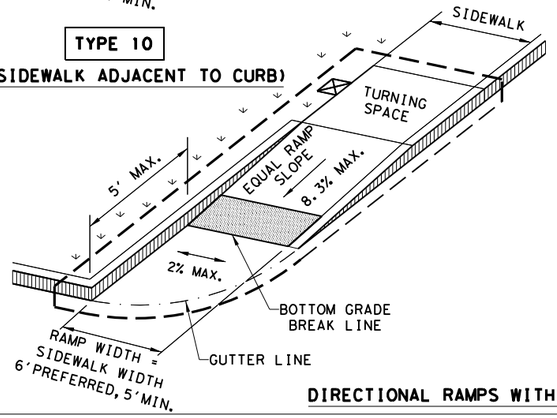
TYPE 7
(SIDEWALK SET BACK FROM CURB)



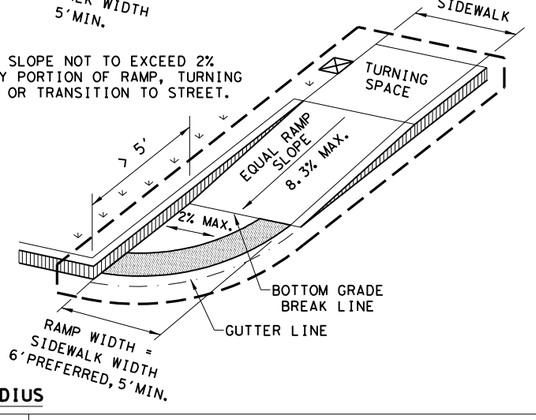
CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



TYPE 10
(SIDEWALK ADJACENT TO CURB)

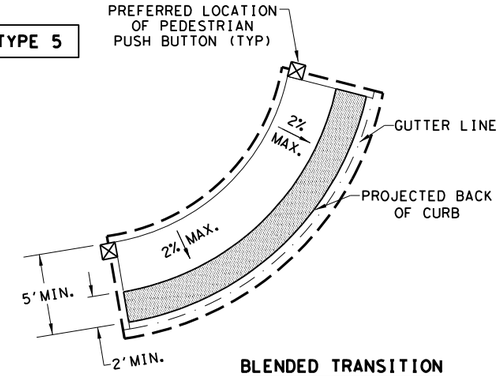


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

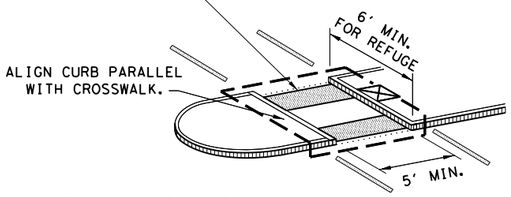
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

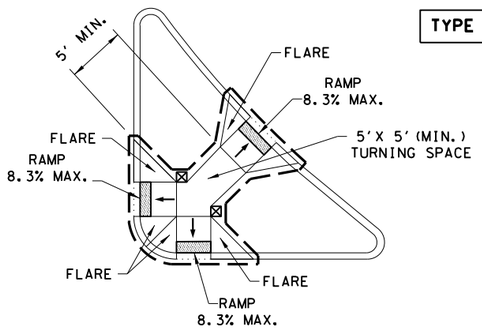
INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.

TYPE 21



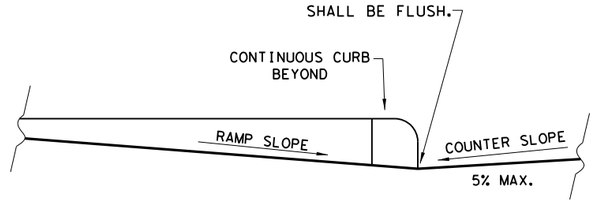
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		159

DATE: 3/15/2023
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\325602093\4 - Design\Plan Set\3. Roadway\STANDARD DWG. \ped18.dgn

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

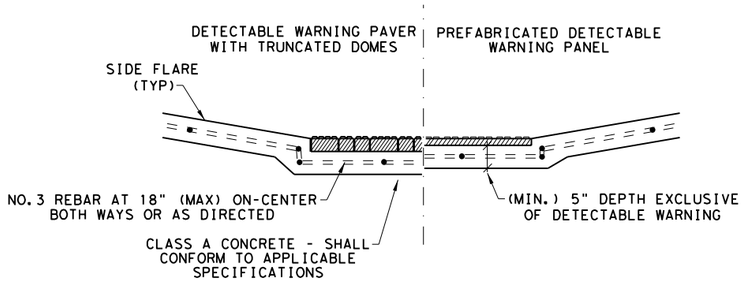
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

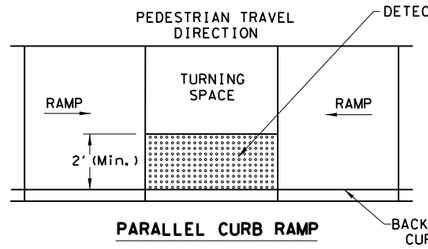
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.



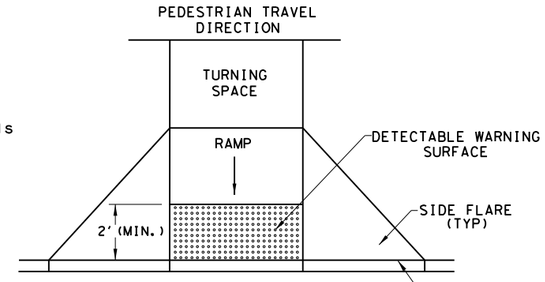
SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

DETECTABLE WARNING SURFACE DETAILS



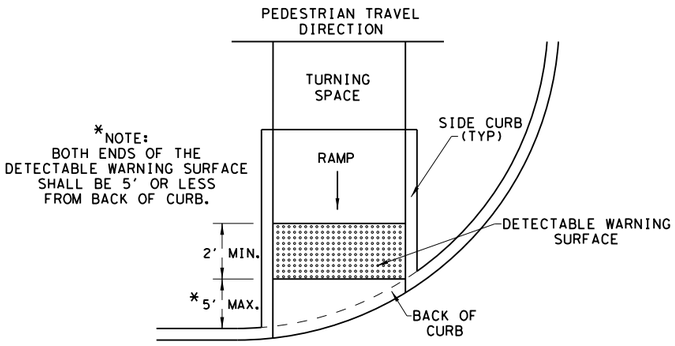
PARALLEL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

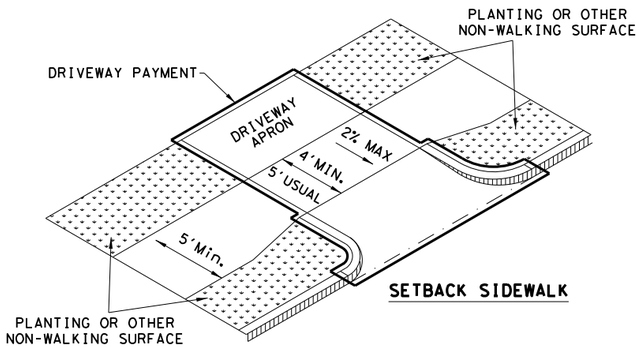
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

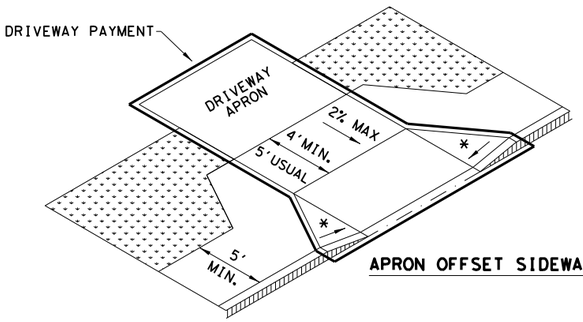
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	3256	02	093		SL 8
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	HOU	HARRIS			160

DATE: 3/15/2023
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\325602093\4 - Design\Plan Set\3. Roadway\STANDARD DWG. \ped18.dgn

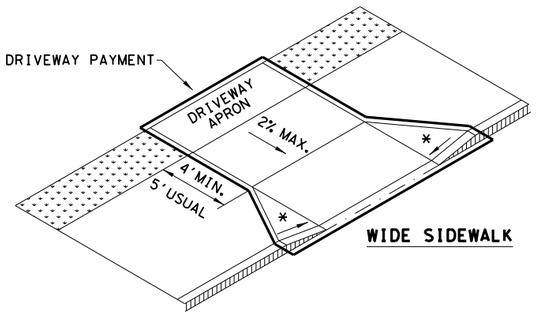
SIDEWALK TREATMENT AT DRIVEWAYS



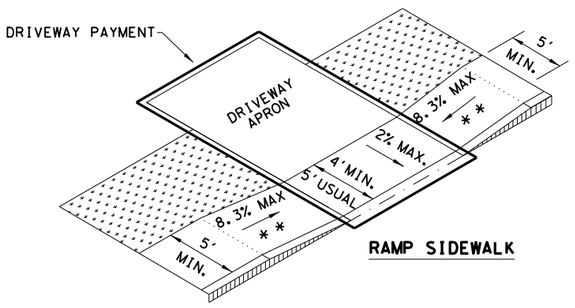
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

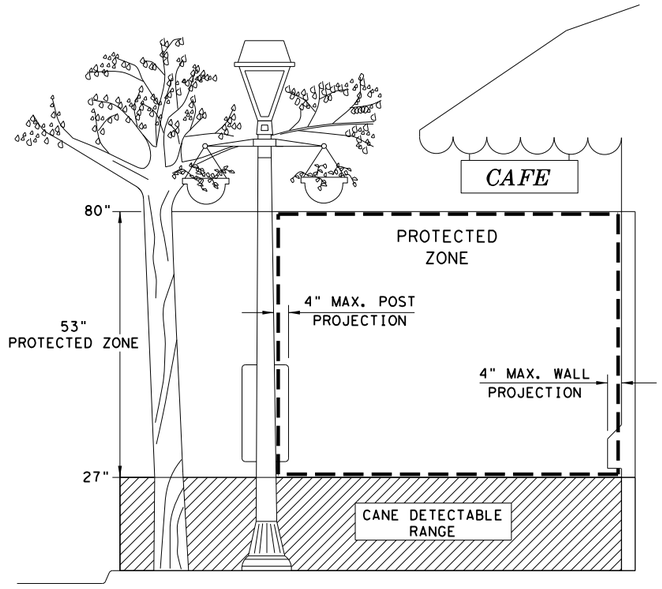


RAMP SIDEWALK

NOTES:

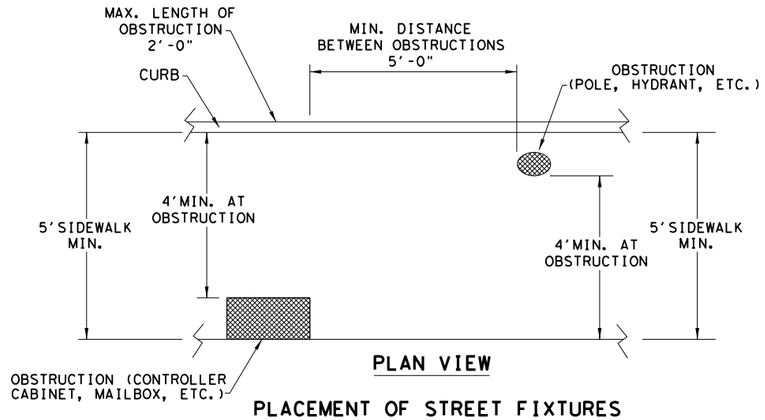
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.



PROTECTED ZONE

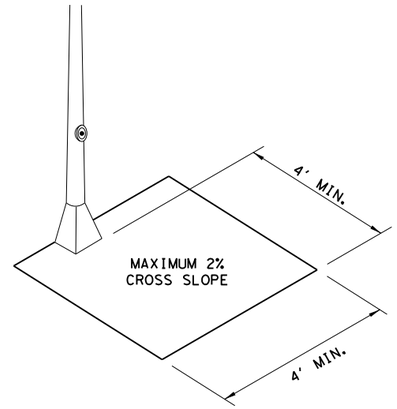
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



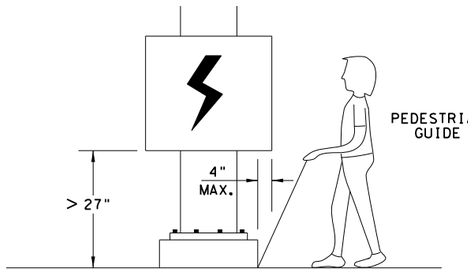
PLAN VIEW

PLACEMENT OF STREET FIXTURES

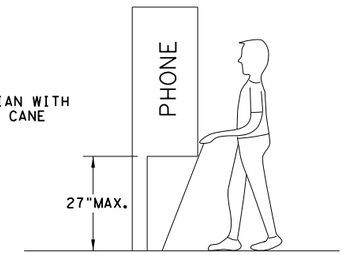
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

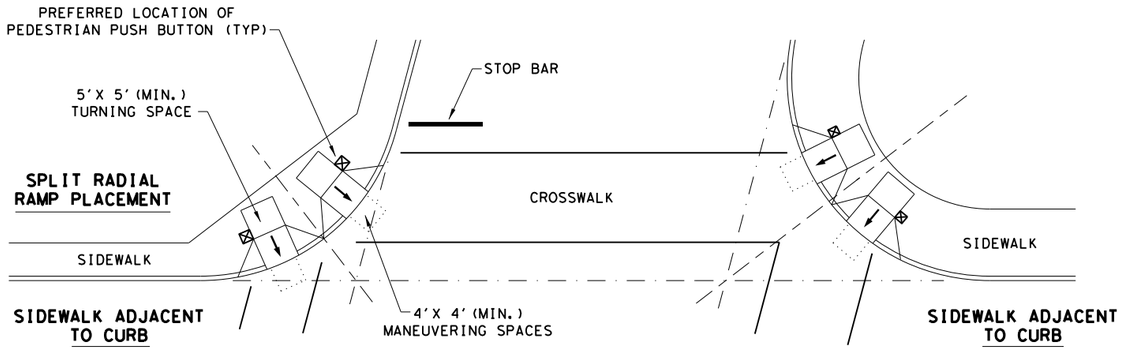
PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	3256	02	093		SL 8
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST		COUNTY		SHEET NO.
	HOU		HARRIS		161

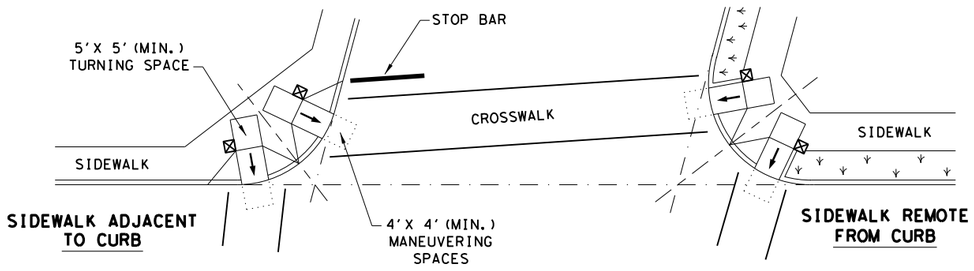
DATE: 3/15/2023
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\3256020931\4 - Design\Plan Set\3. Roadway\STANDARD DWG. \ped18.dgn

TYPICAL CROSSING LAYOUTS

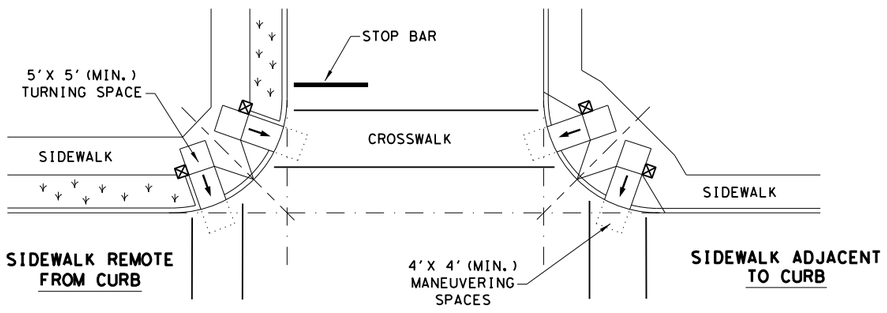
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



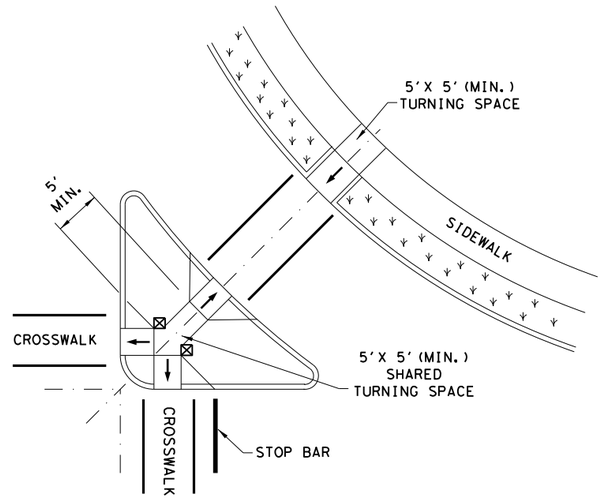
SKEWED INTERSECTION WITH "LARGE" RADIUS



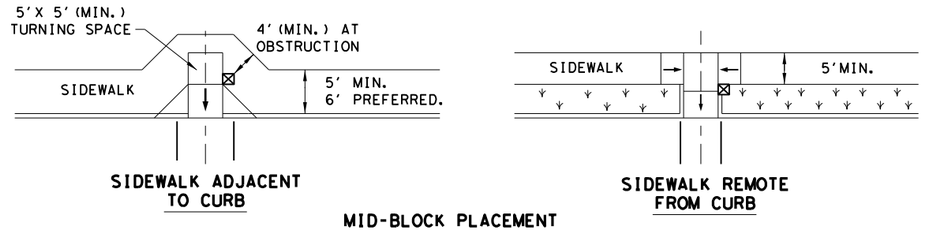
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

SHEET 4 OF 4

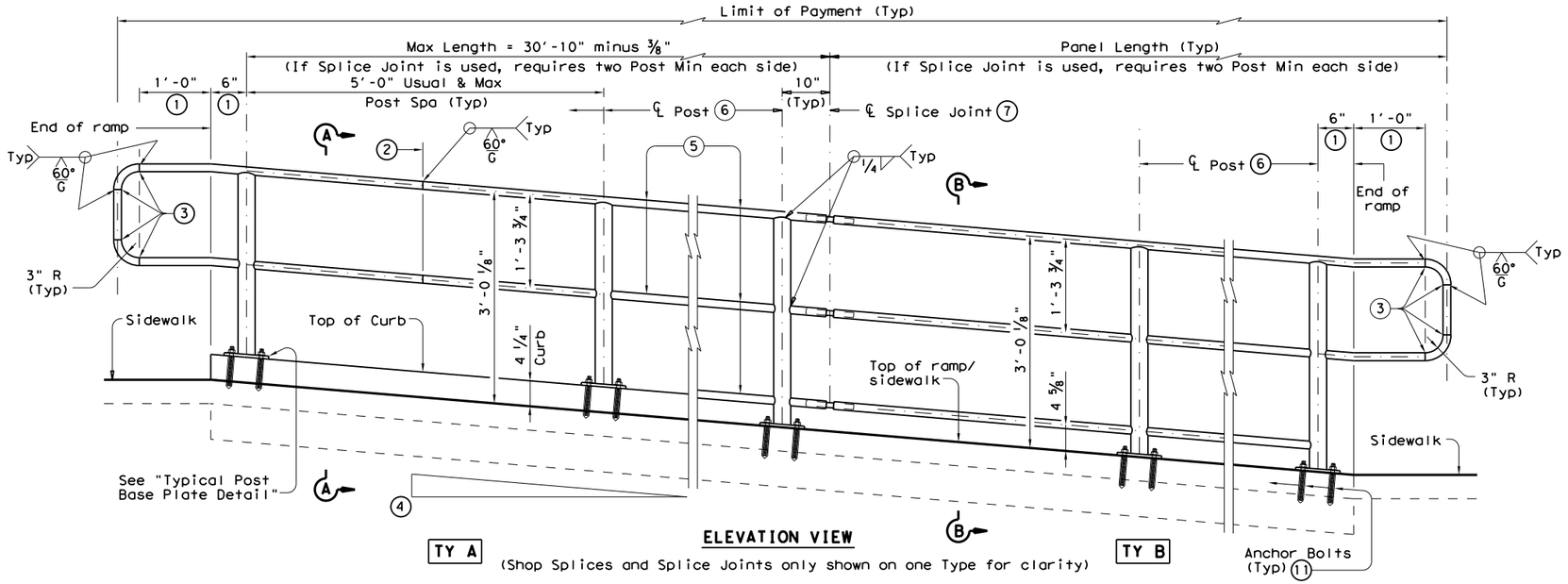
Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

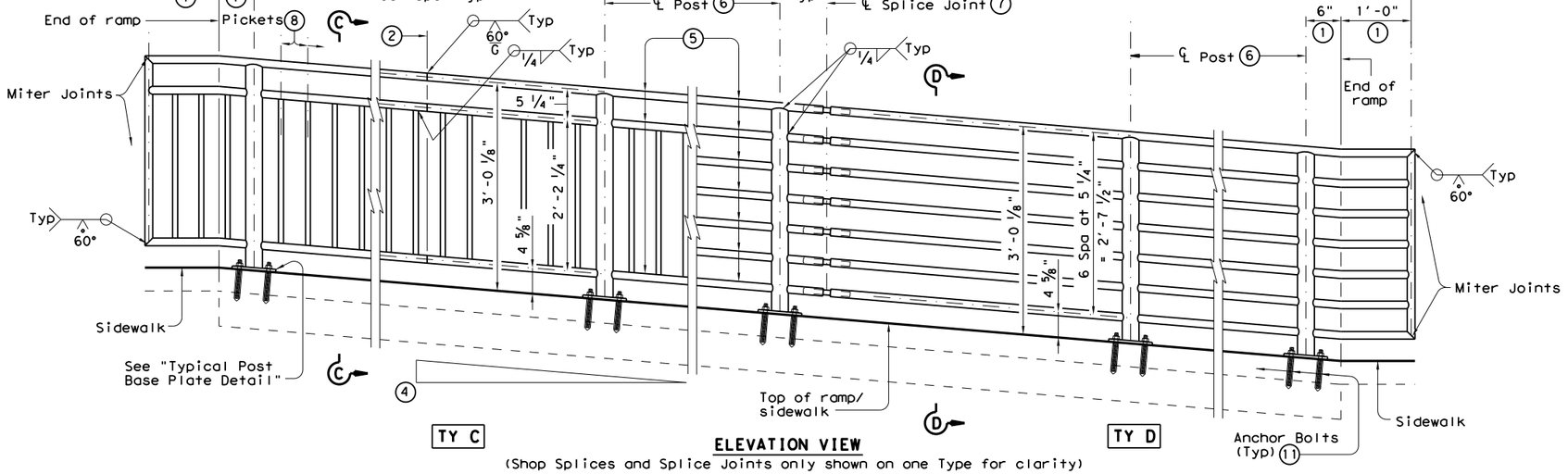
PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		162

DATE: 3/15/2023
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\325602093\4 - Design\Plan Set\3. Roadway\STANDARD DWG. \prd13.dgn

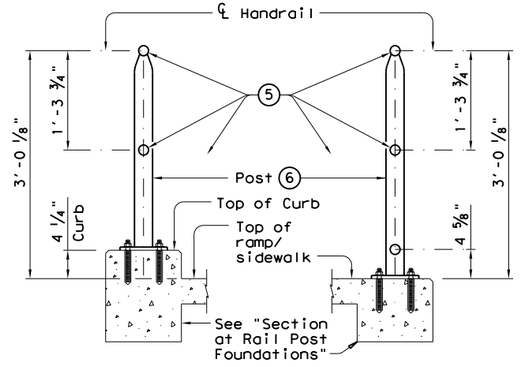


ELEVATION VIEW
(Shop Splices and Splice Joints only shown on one Type for clarity)



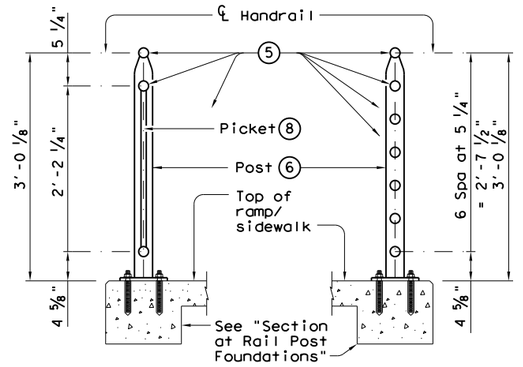
ELEVATION VIEW
(Shop Splices and Splice Joints only shown on one Type for clarity)

RECOMMENDED USAGE (9) (10)	
Dropoff Height/ Condition	Recommended Rail Options
< 30" dropoff	TY A, TY B, TY C, or TY D
≥ 30" dropoff, or along Bike Path	TY E or TY F



SECTION A-A
(Showing Handrail **TY A**)

SECTION B-B
(Showing Handrail **TY B**)



SECTION C-C
(Showing Handrail **TY C**)

SECTION D-D
(Showing Handrail **TY D**)

1. Parallel to ground.
2. One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
3. Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
5. 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
7. See "Handrail Fabrication Details" for Splice Joints.
8. ℄ ⅝" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
9. When needed for accessibility (grade > 5 percent) or as needed for pedestrian safety.
10. Not to be used on bridges.
11. See "General Notes" for anchor bolt information.

SHEET 1 OF 3

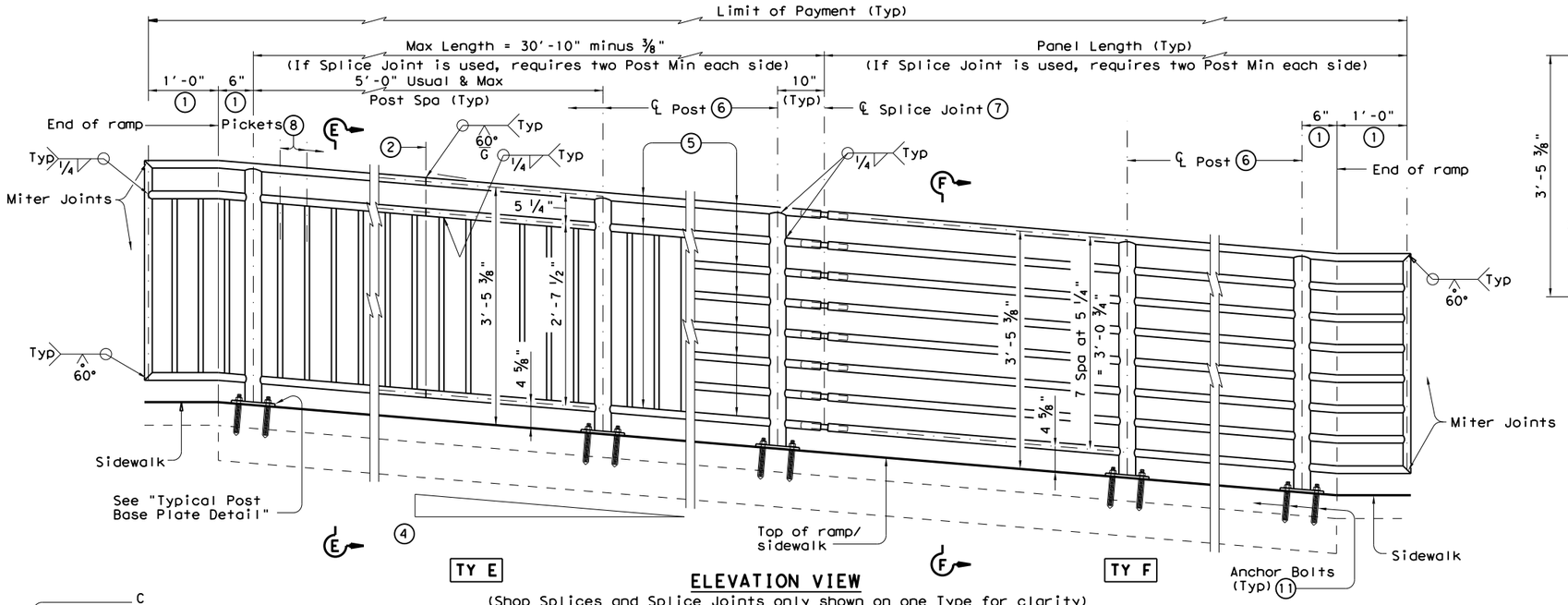
Texas Department of Transportation — Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

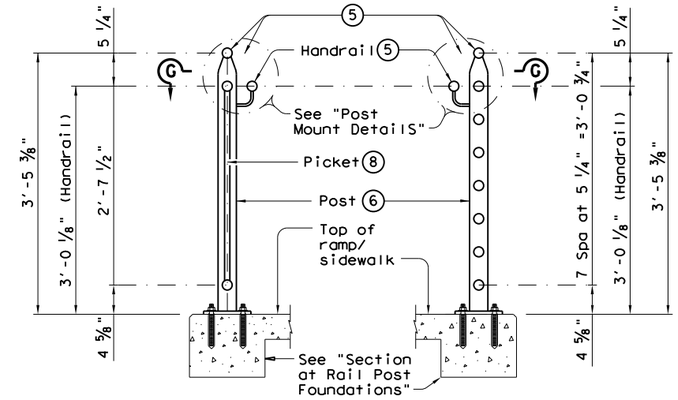
PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
© TxDOT Decmeber 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		163

DATE: 3/15/2023
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\3256020934 - Design\Plan Set\3. Roadway\STANDARD DWG. \prd13.dgn

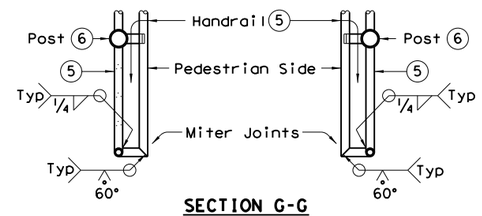


ELEVATION VIEW
(Shop Splices and Splice Joints only shown on one Type for clarity)

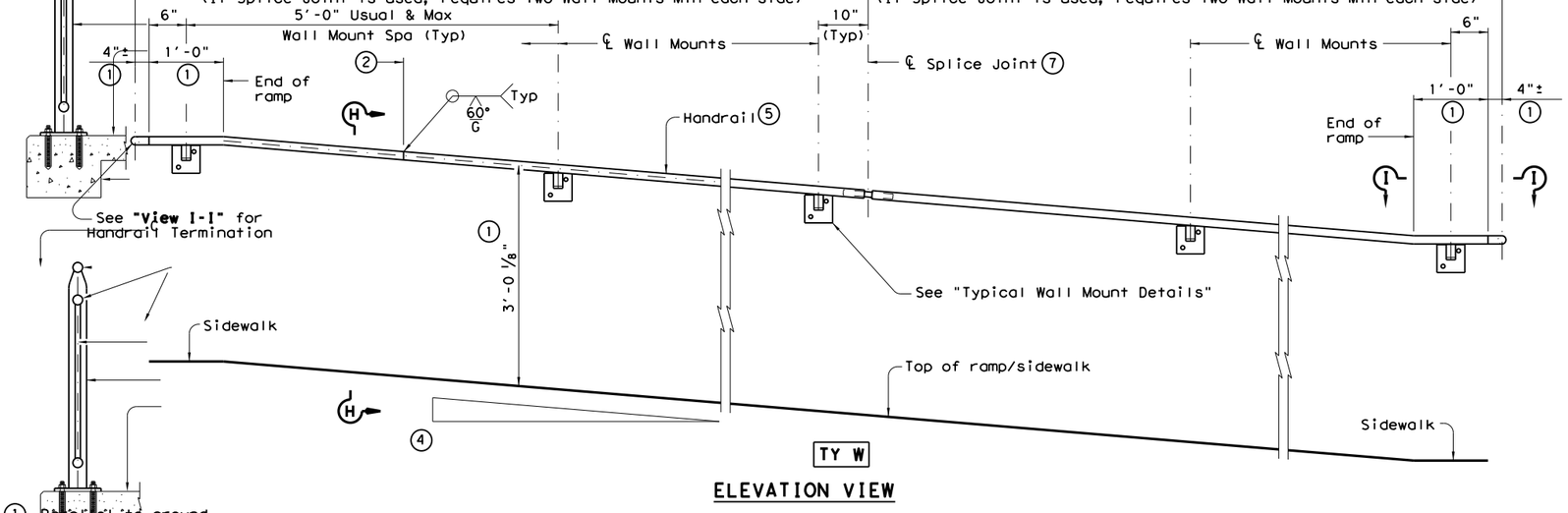


SECTION E-E
(Showing Handrail **TY E**)

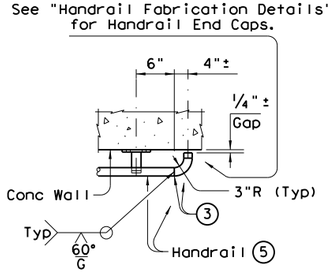
SECTION F-F
(Showing Handrail **TY F**)



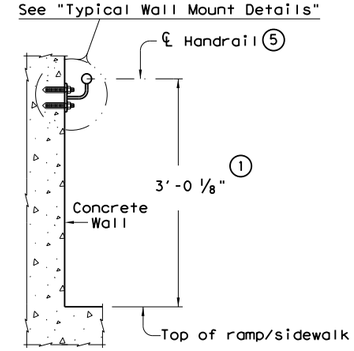
SECTION G-G
(Showing Handrail Termination)



ELEVATION VIEW



VIEW I-I
(Showing Handrail Termination)



SECTION H-H
(Showing Handrail **TY W**)

1. Parallel to ground.
2. One shop splice per panel is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
3. Shop splice is permitted with minimum 85 percent penetration. The weld may be square groove or single vee groove. Grind smooth.
4. See Ramp Details located elsewhere in plans for ramp slope and dimensions. Maximum ramp slope will not exceed 8.3 percent. Level landing required for each 30" rise if grade exceeds 5 percent.
5. 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp / sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.
6. 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). See "Post Mount Detail" for crimping and trimming post to fit Dia. of top rail. Provide holes as needed in post for galvanizing drainage and venting. Plumb all posts.
7. See "Handrail Fabrication Details" for Splice Joints.
8. ℄ ⅝" Dia. Round Bar equal spacing at 4 ½" Max. Plumb all pickets.
11. See "General Notes" for anchor bolt information.

Texas Department of Transportation — Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS REVISED MAY, 2013 (VP)	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		164

DATE: 3/15/2023
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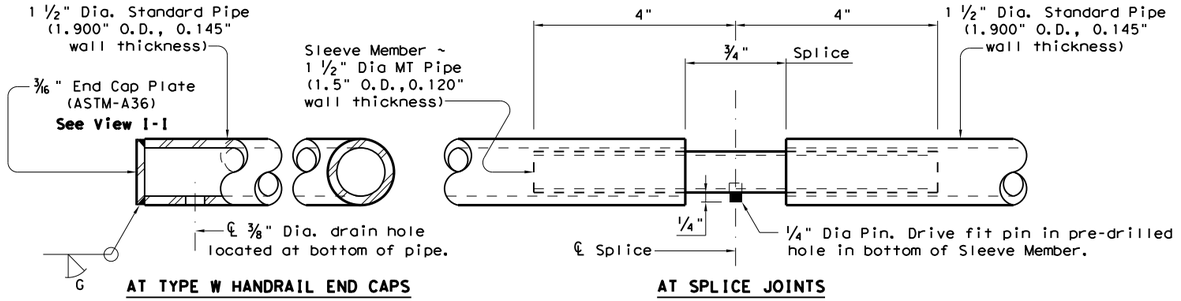
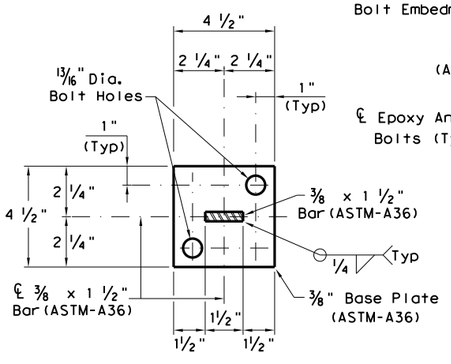


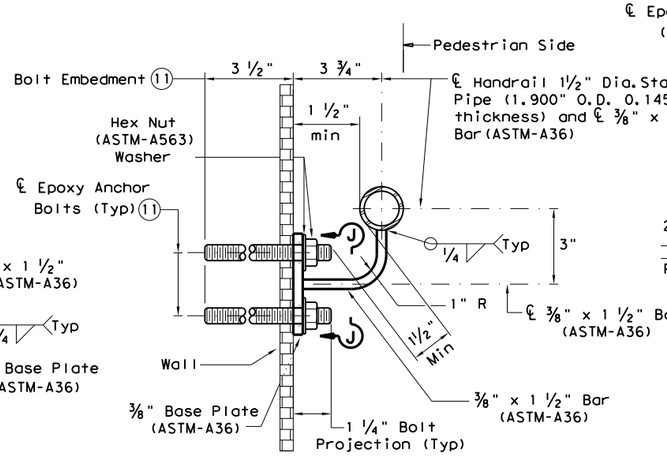
AT TYPE W HANDRAIL END CAPS

AT SPLICE JOINTS

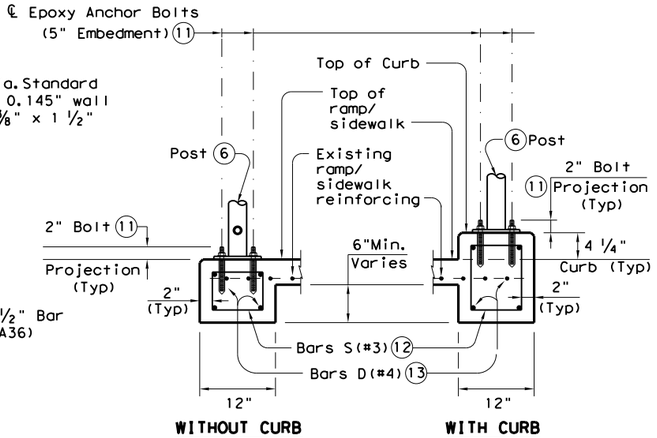
HANDRAIL FABRICATION DETAILS



SECTION J-J
(Anchor Bolts not shown for clarity)



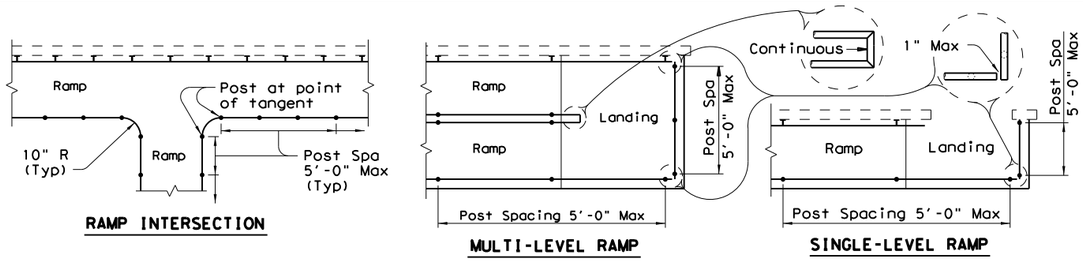
SECTION AT WALL MOUNT



WITHOUT CURB

WITH CURB

SECTION AT RAIL POST FOUNDATIONS



PLAN SHOWING RAIL AT RAMP CONDITIONS

TYPICAL WALL MOUNT DETAILS

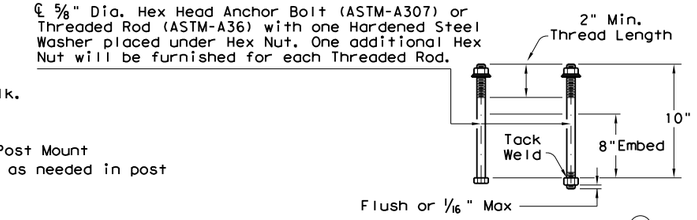
(5) 1 ½" Dia. Standard Pipe (1.900" O.D., 0.145" wall thickness). Parallel to ramp/sidewalk. Provide holes as needed in 1 ½" Dia. pipe for galvanizing drainage and venting.

(6) 2 ½" Dia. Standard Pipe (2.875" O.D., 0.203" wall thickness). Plumb all posts. See "Post Mount Detail" for crimping and trimming post to fit the diamenter of top rail. Provide holes as needed in post for galvanizing drainage and venting.

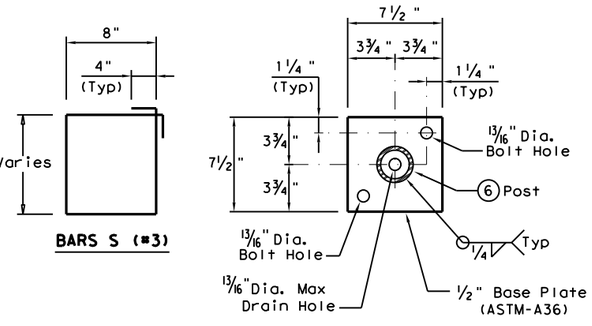
(11) See "General Notes" for anchor bolt information.

(12) Bars S(#3) spaced at 12" Max (Spaced 3" from outside edge of overall length of Ramp/Sidewalk).

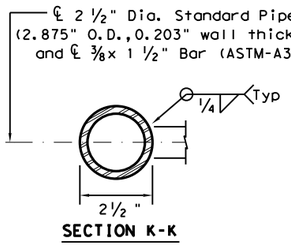
(13) Provide 1 ½" end cover to Bars D(#4) from outside edge of overall length of Ramp/Sidewalk.



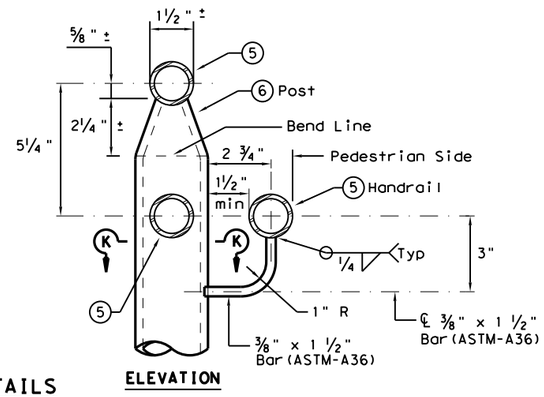
CAST-IN-PLACE ANCHOR BOLT OPTIONS
(Used for Post Base Plate only)



TYPICAL POST BASE PLATE DETAIL



SECTION K-K



ELEVATION

POST MOUNT DETAILS

GENERAL NOTES

Designed according to ADAAG, Texas Accessibility Standards, Uniform Building Code, and AASHTO LRFD Specifications.

Handrail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Pipe will conform to ASTM-A53 Grade B or A500 Grade B. Steel plates and steel bars will conform to ASTM-A36. Mechanical tubing (MT) will conform to ASTM A513 Grade 1015 or higher. Galvanize all steel components except reinforcing steel unless noted otherwise.

Concrete for foundations will be in accordance with Item 531 "Sidewalks". All reinforcing steel must be Grade 60. Bar laps, where required, will be as follows: Uncoated ~ #4 = 1'-5" Epoxy coated ~ #4 = 2'-1"

When the plans require painted steel, follow the requirements for painting galvanized steel in Item 446, "Cleaning and Painting Steel". Sleeve Members will receive galvanization and only get field painted after installation unless directed otherwise by Engineer.

Epoxy Anchor bolts for wall mount and post base plate will be ⅝" Dia. ASTM A36 threaded rods with one hex nut and one hardened steel washer at each bolt. ⅝" Dia. threaded rod embedment depth for wall mounts is 3 ½" and embedment depth for post base plate is 5".

Embed threaded rods into concrete with a Type III (Class C) epoxy meeting the requirements of DMS-6100, "Epoxies and Adhesives". Mix and dispense adhesive with the manufacturer's static mixing nozzle/dual cartridge system. Core drill holes (percussion drilling not permitted).

At the contractor's option the post base plate anchor bolts may be cast with the Ramp/Sidewalk (See Cast-in-Place Anchor Bolt Options).

Optional cast-in-place anchor bolts will be ⅝" Dia ASTM A307 Grade A bolts (or A36 threaded rods with one tack welded hex nut each) with one hex nut and one hardened steel washer at each bolt. Embedment depth of cast-in-place bolt will be 8" for post base plate.

Handrails and any wall or other surface adjacent to them will be free of any sharp or abrasive elements.

Submit shop drawings to the Engineer unless otherwise noted. For curved handrail applications, fabricate the handrail to the curve if radius is less than 600 ft. Shop drawings are required when rail is fabricated to the curve.

For all handrails, erection drawings will be submitted to the Engineer for approval to ensure proper installation.

Drawings will show handrail mount locations with bolts setting, spacing, ramp slope, and/or splice joint locations, and handrail lengths with identification showing where each handrail goes on the layout.

Payment for concrete sidewalks or curb ramps will be paid for in accordance with Item 531 "Sidewalks".

Payment for all items shown is to be included in unit price bid in accordance with Item 450 "Railing" of the type specified.

All exposed edges will be rounded or chamfered to approximately ⅛" by grinding.

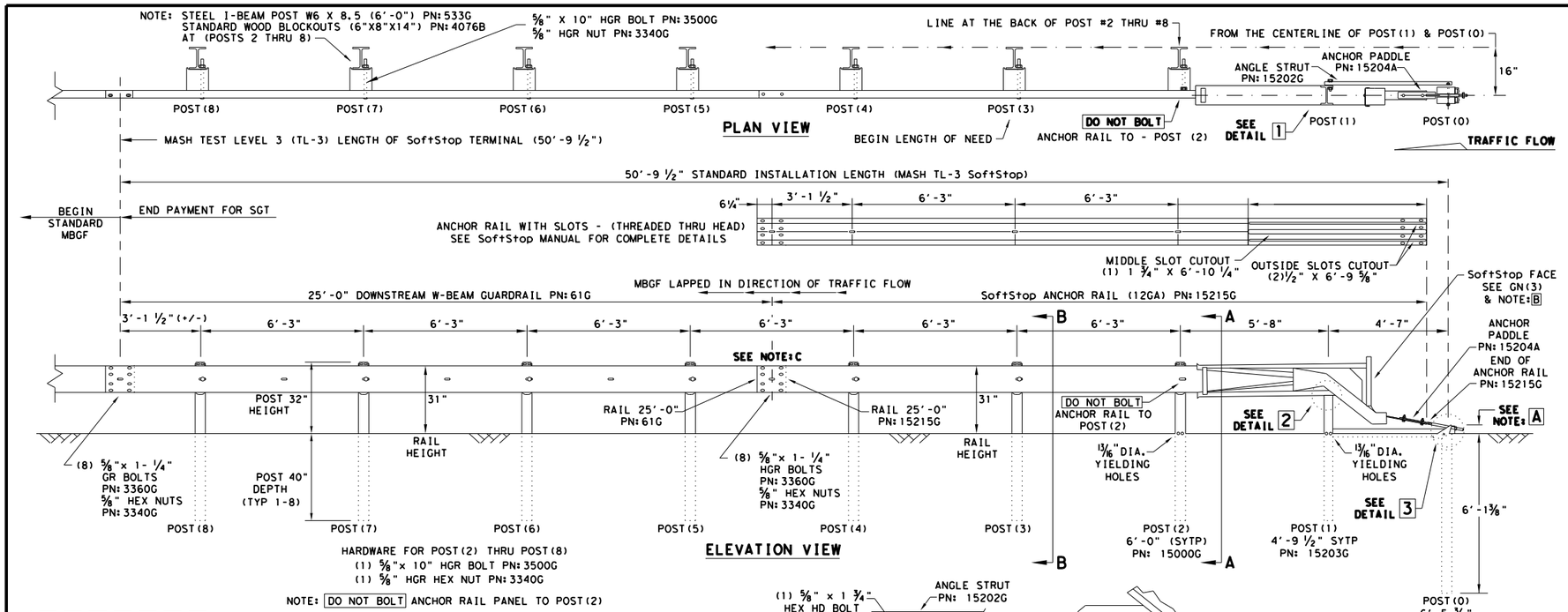
Texas Department of Transportation

Design Division Standard

PEDESTRIAN HANDRAIL DETAILS

PRD-13

FILE: prd13.dgn	DN: TxDOT	CK: AM	DW: JTR	CK: CGL
©TxDOT December 2006	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
REVISED MAY, 2013 (VP)	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		165



GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE:A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-3/4" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE:B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE:C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 7/8")
15203G	1	POST #1 - (SYTP) (4'- 9 1/2")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 1/2" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (1/2" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	3/4" x 2 1/2" HEX BOLT A325
3701G	4	3/4" ROUND WASHER F436
3704G	2	3/4" HEAVY HEX NUT A563 GR.DH
3360G	16	5/8" x 1 1/4" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	5/8" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	5/8" x 10" HGR POST BOLT A307
3391G	1	5/8" x 1 3/4" HEX HD BOLT A325
4489G	1	5/8" x 9" HEX HD BOLT A325
4372G	4	5/8" WASHER F436
105285G	2	5/8" x 2 1/2" HEX HD BOLT GR-5
105286G	1	5/8" x 1 1/2" HEX HD BOLT GR-5
3240G	6	5/8" ROUND WASHER (WIDE)
3245G	3	5/8" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE:B

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3
SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP		
©TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3256	02	093		SL 8	
	DIST	COUNTY			SHEET NO.	
	HOU	HARRIS			166	

DATE:
FILE:

DATE: 3/15/2023
FILE: dw: \\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\MAX-TENSION\sgt11s3118.dgn

(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6)
INNER SIDE SLIDER
(ISS) PANEL FOR RAIL 3

FIELD-SIDE
(RAIL 3)

NOTE:
RECESSED HEX NUTS FACING
TRAFFIC-SIDE **SEE DETAIL (C)**

REFERENCE LINE USED TO INSTALL
LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED
7-⅝" FROM REFERENCE LINE

POST 9 POST 8 POST 7 POST 6 POST 5 POST 4 POST 3 POST 2

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

RAIL 4 RAIL 3 RAIL 2 RAIL 1

CABLES

ITEM (5)
TRAFFIC SIDE SLIDER
(TSS) PANEL FOR RAIL 2

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE
OF RAIL 2 WITH THE PANEL ARROWS
POINTING TOWARDS THE HEAD.

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

PLAN VIEW

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 2

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

ITEM (25)
MAX-TENSION HEAD
SEE DETAIL (A)

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

BEGIN LENGTH OF NEED

INSTALLATION LENGTH 55'- ½"

49'-8 ⅝"

6'-3" 6'-3" 6'-3" 6'- ¾" 6'-3" 6'-3" 6'-3" 37 ½" 5'-3 ⅜"

RAIL
HEIGHT
31"

ARROWS

ITEM (13) RAIL 4 ITEM (13) RAIL 3 ITEM (13) RAIL 2 ITEM (13) RAIL 1

DETAIL (D)

RAIL
HEIGHT
31"

HEAD
HEIGHT

DETAIL (B)

32-¼"

68-⅛"

FINISHED
GRADE

CABLES

FINISHED
GRADE

ITEM (10)
CABLE
ASSEMBLY

ITEM (2)
GROUNDSTRUT

POST 9 POST 8 POST 7 POST 6 POST 5 POST 4 POST 3 POST 2 POST 1

ITEM (4)
I-BEAM
W6 X 9

NO BLOCKOUT
AT (POST 1)

SOIL
ANCHOR POST
ITEM (1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

A

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

INSTALL THE TSS AND RSS
WITH THE ARROWS POINTING
TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE

DETAIL (D)

HEAD
HEIGHT
32-¼"

TOP OF POST

31-⅞"

FINISHED
GRADE

40-⅛"

68-⅛"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

ITEM (11)
LINE POSTS
2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN),
TO BE INSTALLED AT SAME DEPTH
AS LINE POSTS.)

SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9

SECTION VIEW A-A

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

NOTE:
INSTALL ⅝" RECESSED HEX
NUTS ON TRAFFIC SIDE.

ITEM (24)
ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

* ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

NOTE:
USE THE MASH APPROVED
X-TENSION CABLE ASSEMBLY.

7 ⅝"

2 ⅛"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25'GUARD FENCE PANELS

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX.
RAIL OFFSET

APPROACH GRADING
(1V:10H OR FLATTER)
SEE PRODUCT ASSEMBLY MANUAL
FOR ADDITIONAL GUIDANCE.

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT
USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

MAX-TENSION END TERMINAL
MASH - TL-3
SGT(11S)31-18

FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		167

DATE: 3/15/2023
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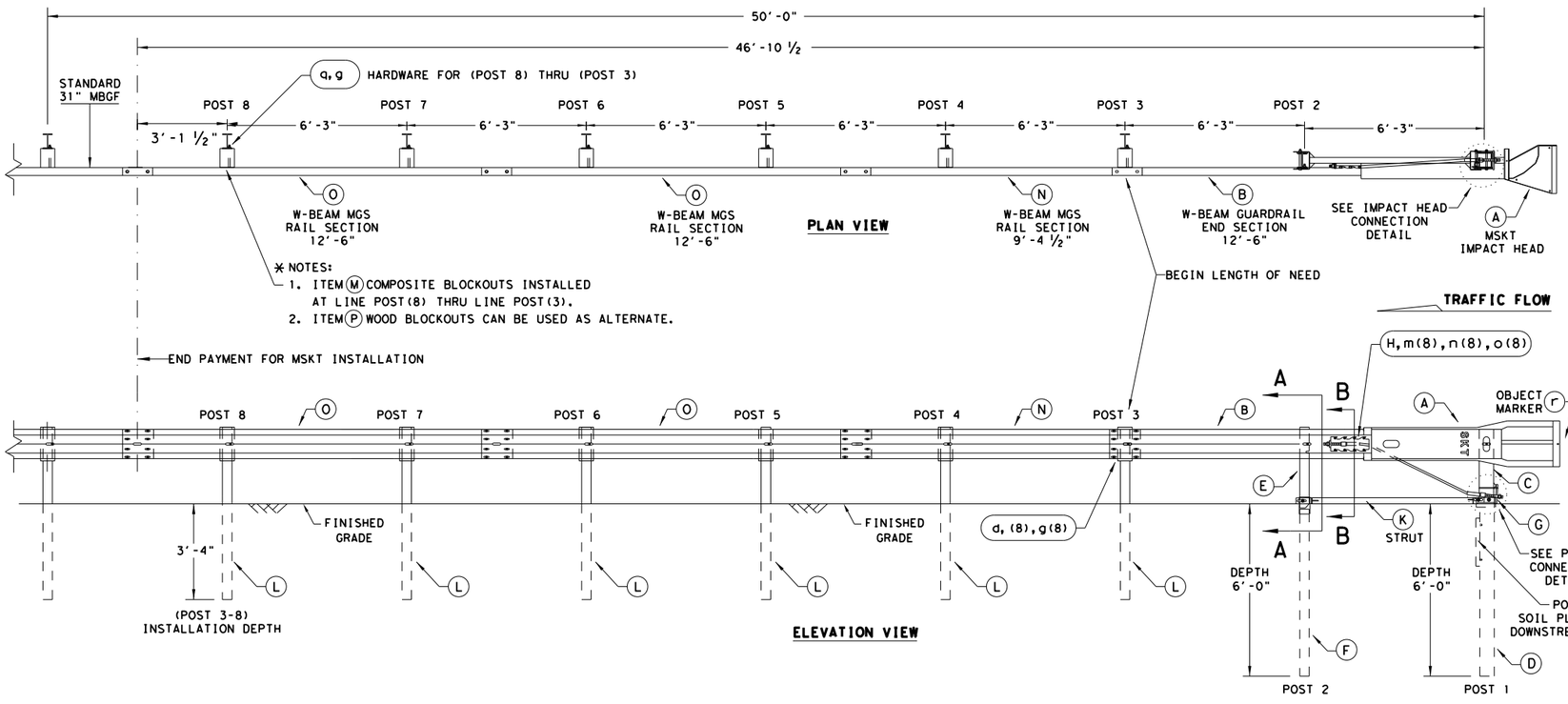
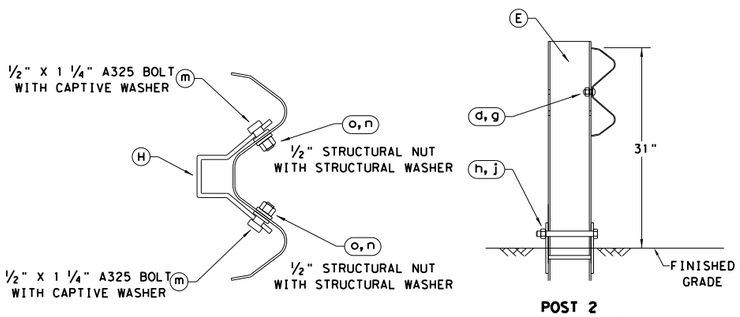
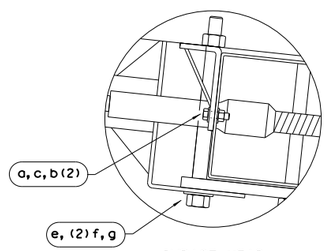
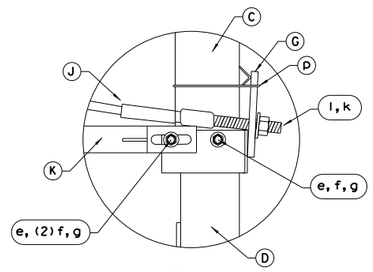


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.







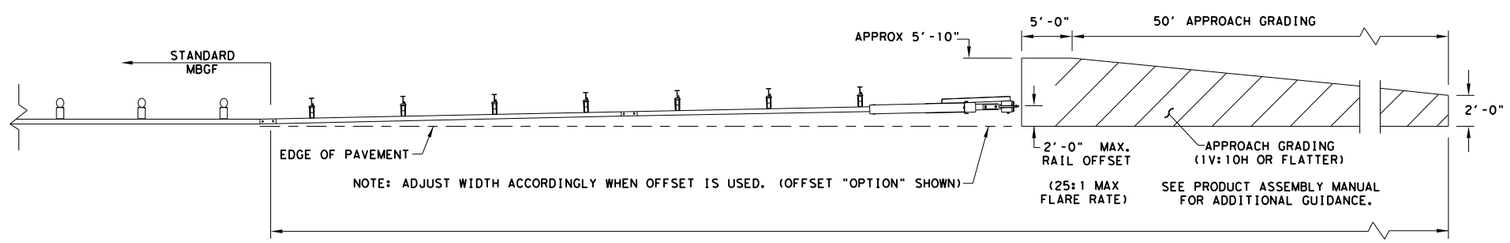
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	5/16" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 5/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL	
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS	3256	02	093	SL 8	
	DIST	COUNTY		SHEET NO.	
	HOU	HARRIS		168	

DATE:
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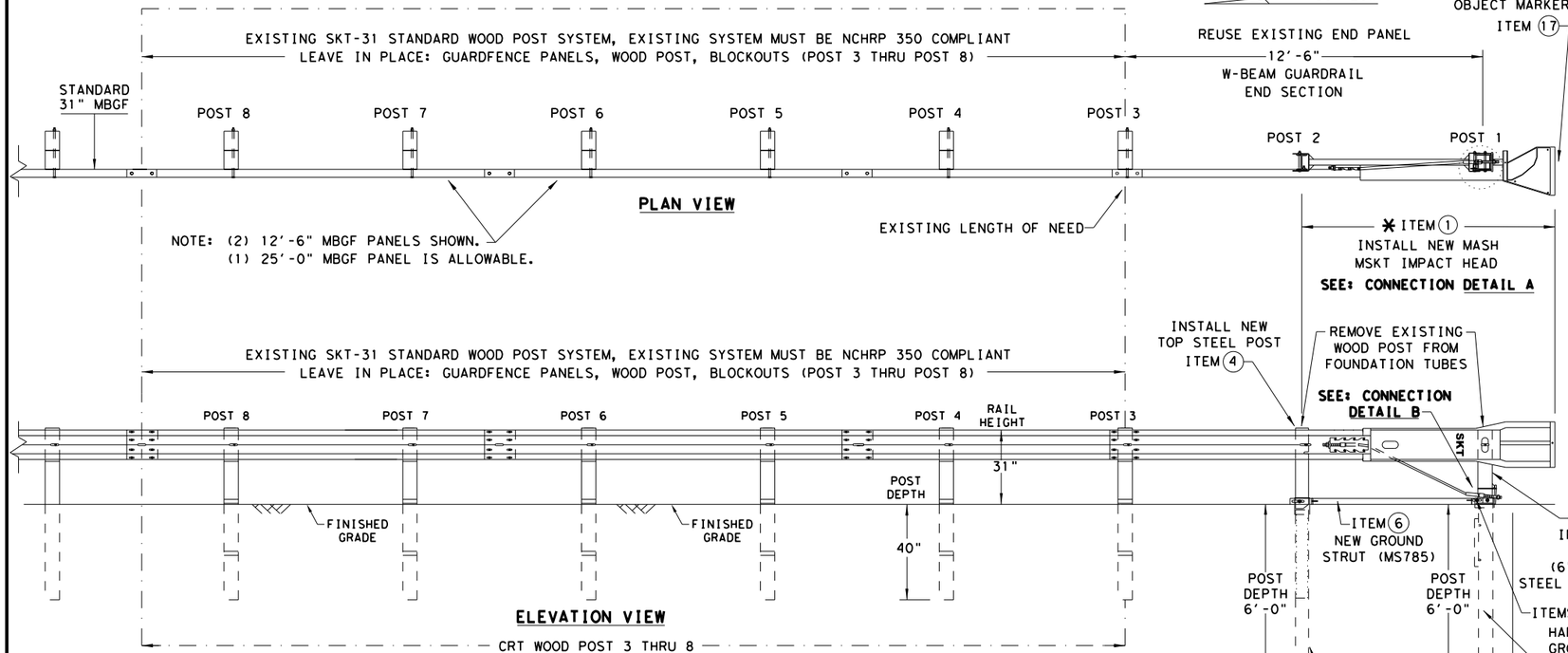


** NOTE: EXTRA SOIL COMPACTION WILL BE NEEDED AROUND NEW (POSTS 1 & 2) DUE TO THE REMOVAL OF THE STEEL FOUNDATION TUBES.

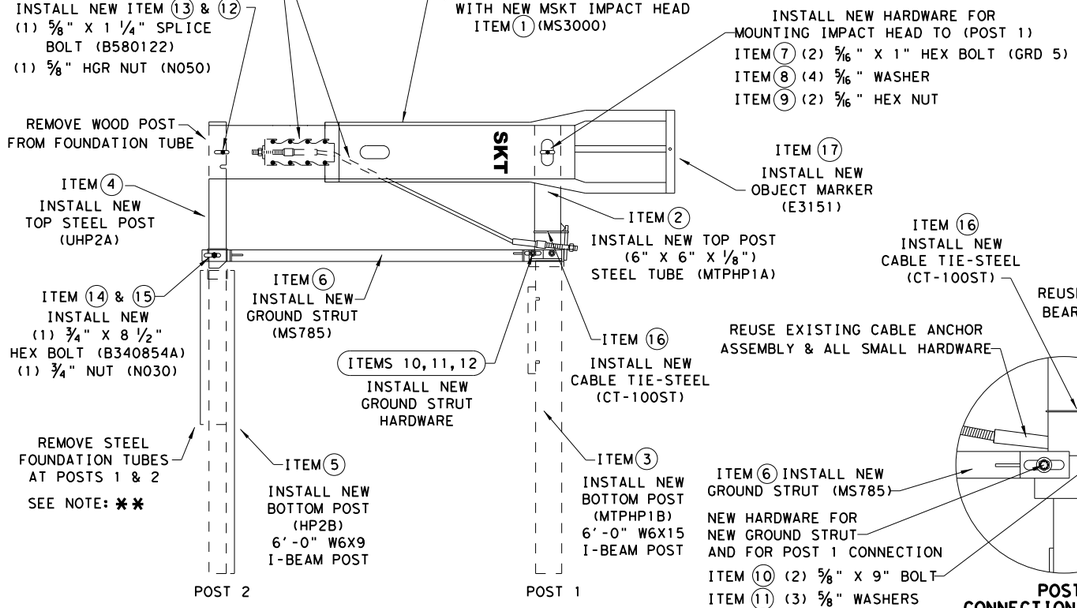
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. THE EXISTING SKT 31" STANDARD WOOD POST SYSTEM MUST BE THOROUGHLY INSPECTED, AND DETERMINED TO BE INTACT, AND FREE OF ANY DAMAGE OR DEFECTS BEFORE RETROFITTING. THIS INSPECTION INCLUDES COMPLETING THE MSKT RETROFIT INSPECTION CHECKLIST FOR THE EXISTING SKT 31" WOOD POST NCHRP 350 SYSTEM. ALL EXISTING, AND REUSABLE PARTS MUST BE FREE OF ANY DAMAGE FOR A MASH COMPLIANT RETROFIT.
9. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
10. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
11. SPECIAL DRIVING CAP TO BE USED WHEN DRIVING (LOWER POSTS 1 & 2) TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEMS	QTY	MAIN SYSTEM COMPONENTS	PART NUMBERS
1	1	MSKT IMPACT HEAD	MS3000
2	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
3	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
4	1	POST 2 - ASSEMBLY TOP	UHP2A
5	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
6	1	GROUND STRUT	MS785
7	2	5/16" X 1" HEX BOLT (GRD 5)	B516014A
8	4	5/16" WASHERS	W0516
9	2	5/16" HEX NUT	N0516
10	2	5/8" X 9" HEX BOLT (GRD A449)	B580904A
11	3	5/8" WASHERS	W050
12	3	5/8" H.G.R NUT	N050
13	1	5/8" X 1 1/4" SPLICE BOLT	B580122
14	1	3/4" X 8 1/2" HEX BOLT (GRD 5)	B340854A
15	1	3/4" HEX NUT	N030
16	1	CABLE TIE-STEEL	CT-100ST
* 17	1	OBJECT MARKER 18" X 18"	E3151

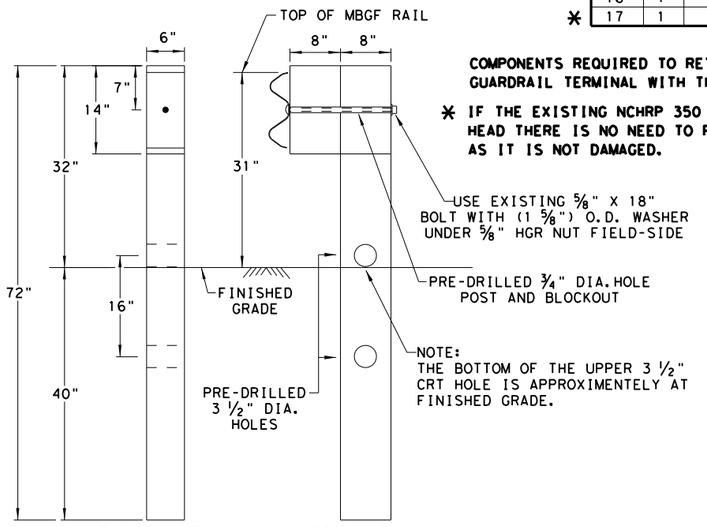
COMPONENTS REQUIRED TO RETROFIT: EXISTING 31" WOOD POST (NCHRP 350 SKT) GUARDRAIL TERMINAL WITH THE NEW 31" (MASH COMPLIANT MSKT IMPACT HEAD).

*** IF THE EXISTING NCHRP 350 (31" WOOD POST SKT) ALREADY HAS THE MSKT IMPACT HEAD THERE IS NO NEED TO REPLACE THE IMPACT HEAD OR OBJECT MARKER AS LONG AS IT IS NOT DAMAGED.**



CONNECTION DETAIL A
IMPACT HEAD (POST 1 & POST 2)

POST 1
CONNECTION DETAIL B



FRONT VIEW **SIDE VIEW**
EXISTING WOOD POSTS 3-8
CONTROLLED RELEASE TERMINAL (CRT)

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE EXISTING; SKT END TERMINAL RETROFITED TO THE MSKT MASH COMPLIANT TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

RETROFIT STANDARD SKT 31" WOOD POST SYSTEM TO MASH MSKT

SGT(14W)31-18

FILE: sgt14w3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL	
©TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
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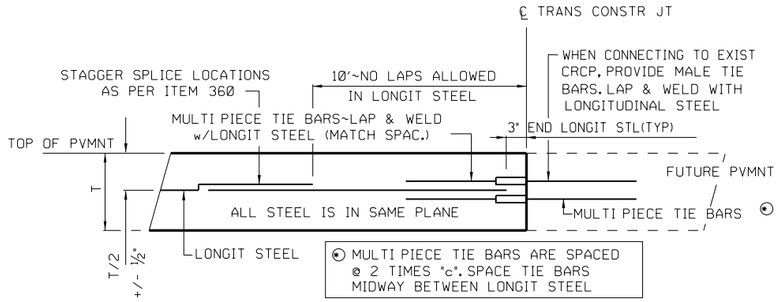
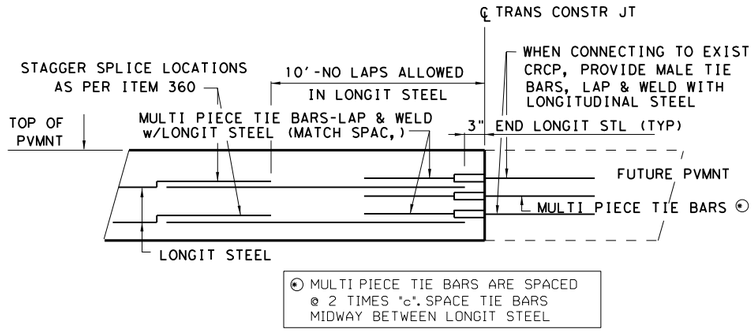


SECTION - SINGLE STEEL MAT

AT END OF PROJECT OR TEMPORARY END OF PAVEMENT



SECTION - DOUBLE STEEL MAT

AT END OF PROJECT OR TEMPORARY END OF PAVEMENT

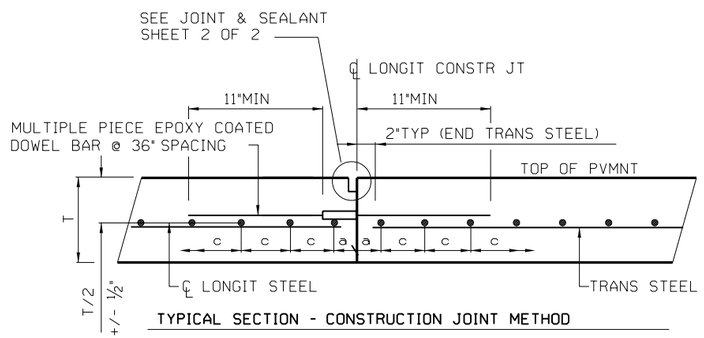
GENERAL NOTES

1. DETAILS FOR 7.0 IN. TO 13.0 IN. THICK CONCRETE PAVEMENT ARE SHOWN ON STANDARD CRCP(1)-17. DETAILS FOR 14 IN. TO 15 IN. THICK CONCRETE PAVEMENT ARE SHOWN ON STANDARD CRCP(2)-17.
2. DOWELS AND TIE BARS - DOWELS ARE ONE INCH MINIMUM DIAMETER. ENSURE DOWELS ARE FREE OF GREASE AND ARE EPOXY COATED. DO NOT SHEAR CUT DOWELS DURING FABRICATION. PROVIDE TIE BARS PER ITEM 360. FURNISH MULTI PIECE TIE BARS AND DOWELS WITH STOP COUPLINGS AND WITH THREADS ON THE BARS.
3. USE CHAIRS OF SUFFICIENT STRUCTURAL QUALITY AND NUMBER TO SUPPORT THE MAT TO THE VERTICAL TOLERANCES. CHAIRS WILL BE APPROVED BY THE ENGINEER AND DO NOT REQUIRE GALVANIZING.
4. MECHANICALLY PLACING REINFORCING STEEL IS NOT ALLOWED. NO BARS, DOWELS OR TIE BARS MAY BE VIBRATED INTO POSITION.
5. WHERE DIFFERENT THICKNESS PAVEMENTS MEET, TRANSITION THE THINNER SECTION TO THE THICKER SECTION OVER A DISTANCE OF 20 FT. PLACE REINFORCING STEEL WITHIN THE TRANSITION THE SAME AS IN THE THICKER PAVEMENT.
6. PERFORM WELDING PER ITEM 448. FURNISH WELDABLE REBAR PER ITEM 440.

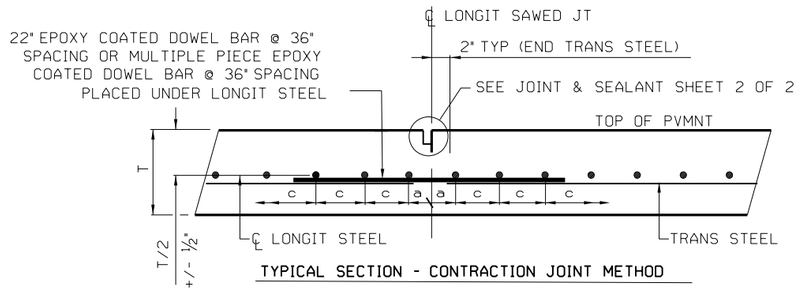
LONGITUDINAL DOWEL JOINT DETAILS

LOCATE WHERE SHOWN IN THE PLANS OR AS APPROVED. CONTRACTOR MAY USE EITHER METHOD

SINGLE STEEL MAT

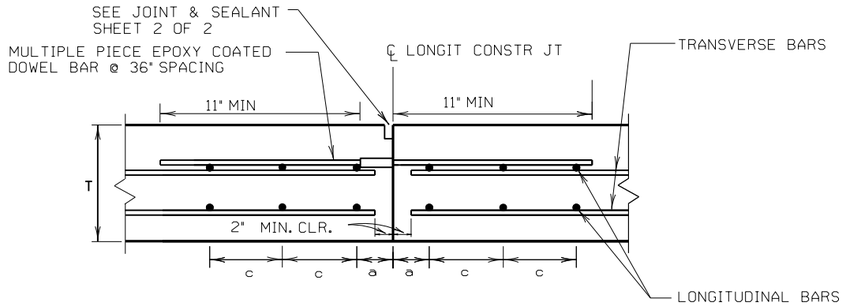


TYPICAL SECTION - CONSTRUCTION JOINT METHOD

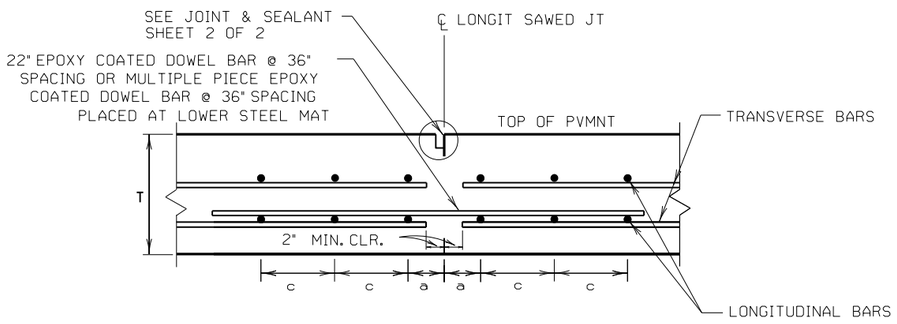


TYPICAL SECTION - CONTRACTION JOINT METHOD

DOUBLE STEEL MAT



TYPICAL SECTION - CONSTRUCTION JOINT METHOD



TYPICAL SECTION - CONTRACTION JOINT METHOD

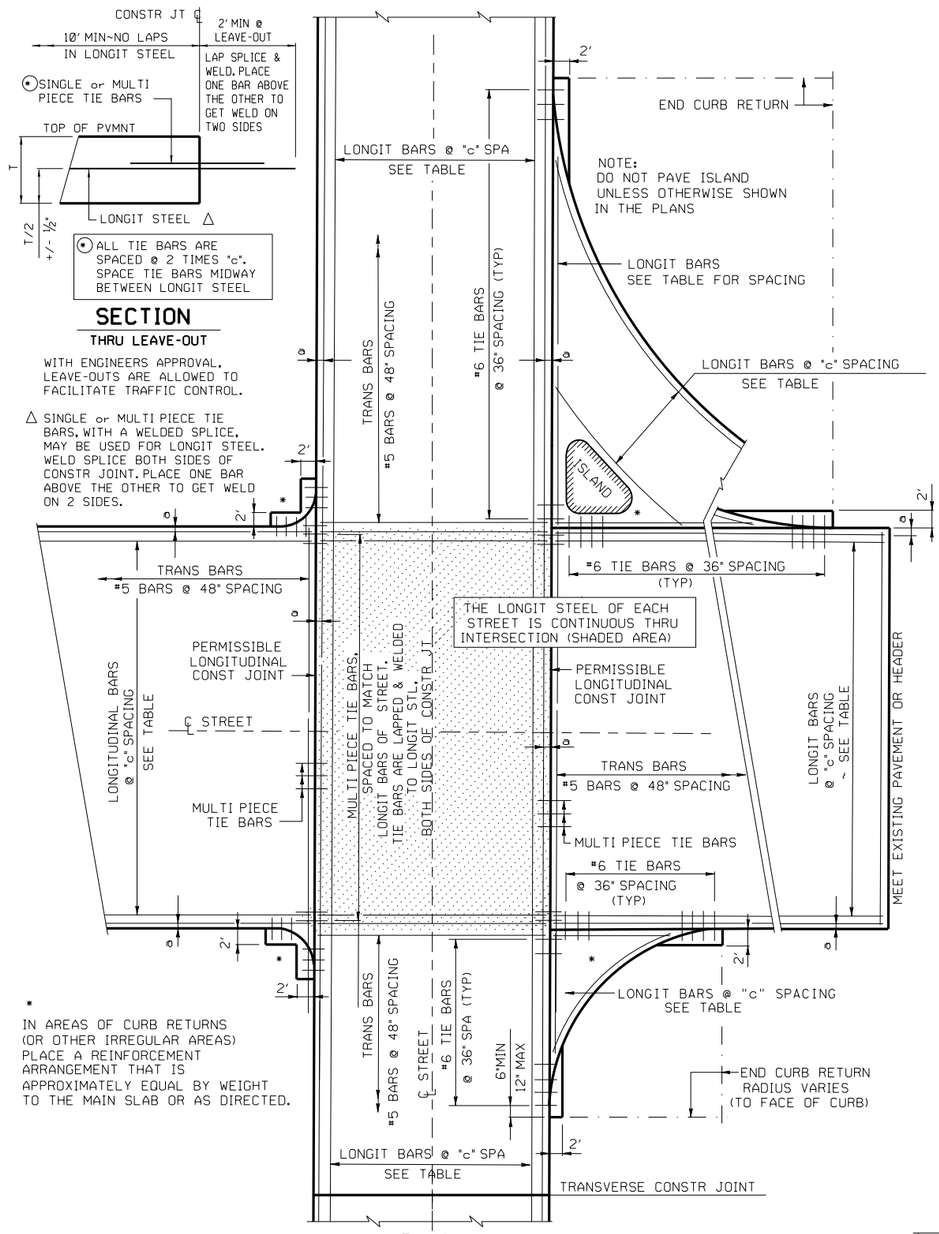
Texas Department of Transportation
Houston District

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT HOUSTON SUPPLEMENT CRCP-HS

DN: - CK: - DW: - CK: -

REVISIONS
4/12 CHANGED CTE FROM 6.0 TO 5.0
8/14 UPDATE TO REFERENCE CRCP-13 STND.
2/15 REVISED GENERAL NOTES, MINOR CORRECTIONS.
4/17 REVISED NOTE #3 OF GENERAL NOTES, MINOR CORRECTIONS.

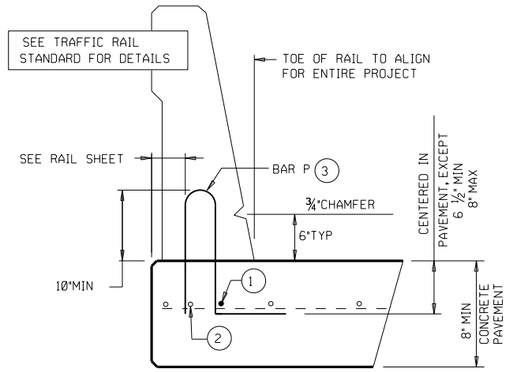
DISTRICT	PROJECT NO.			SHEET
HOU				170
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
HARRIS	3256	02	093	SL8



PLAN

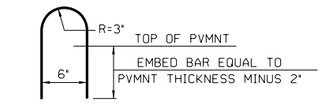
SHOWING TYPICAL CONCRETE PAVEMENT INTERSECTION

1. AS AN AID IN SUPPORTING REINFORCEMENT, ADDITIONAL LONGITUDINAL BARS MAY BE USED IN THE SLAB WITH THE APPROVAL OF THE ENGINEER. FURNISH SUCH BARS AT NO EXPENSE TO THE DEPARTMENT.
2. LONGITUDINAL SLAB BAR MAY BE ADJUSTED LATERALLY 3" +/- TO TIE REINFORCING.
3. ANCHORAGE BAR SHOWN IS FOR AN SSTR OR T551 RAIL. SEE RAILING DETAIL SHEET FOR SPACING OF BAR P. FOR OTHER RAIL TYPES SEE RAILING DETAIL SHEET.

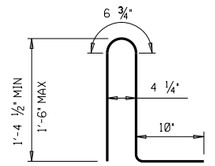


RAIL DETAIL

FOR ADDITIONAL DETAILS, SEE RAIL STANDARD SHEET.
THE MINIMUM LENGTH OF A CONCRETE RAILING PANEL IS FIVE FEET.

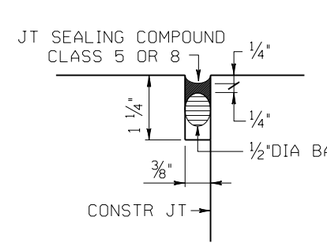


BAR A (#3)

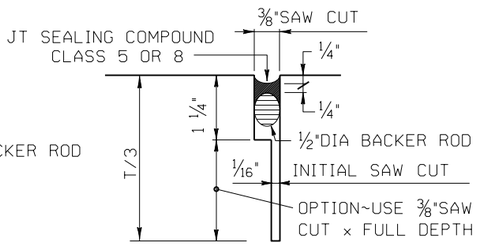


BAR P (#5)

RAIL ANCHOR INSTALLED IN PAVEMENT (3)

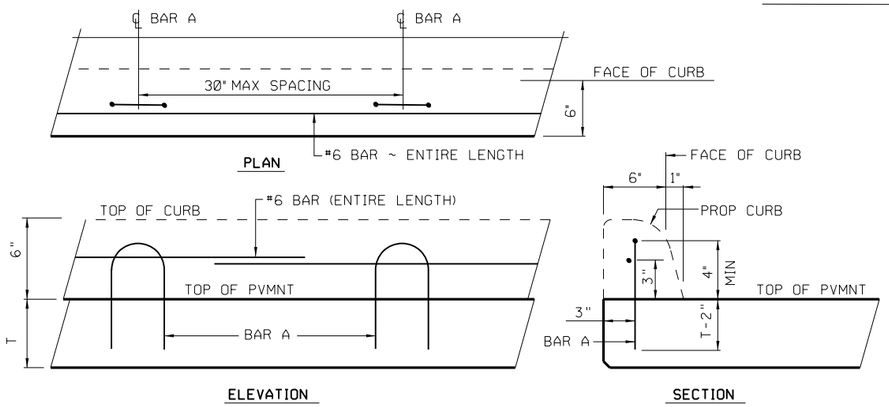


DETAIL 1 ~ CONSTR JOINT



DETAIL 2 ~ SAWED JOINT

JOINT AND SEALANT DETAILS



CURB DETAIL

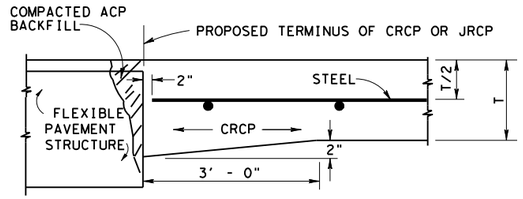
SEE CC & DID STANDARD

Texas Department of Transportation
Houston District

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT HOUSTON SUPPLEMENT CRCP-HS

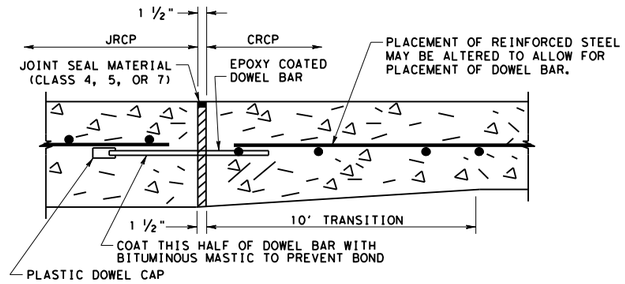
DN: -	CK: -	DW: -	CK: -	
DISTRICT	PROJECT NO.			SHEET
HOU				170A
COUNTY	CONTROL	SECTION	JOB	HIGHWAY
HARRIS	3256	02	093	SL8

REVISIONS
4/12 CHANGED CTE FROM 6.0 TO 5.0 (ON SHEET 1)
2/15 MINOR CORRECTIONS.



NOTE:
ADDITIONAL CONCRETE FOR THICKENED EDGE IS SUBSIDIARY TO VARIOUS BID ITEMS. BACKFILL DISTURBED MATERIAL IN THE FLEXIBLE PAVEMENT WITH ACP. THIS ACP IS SUBSIDIARY TO VARIOUS BID ITEMS.

JUNCTURE A & B - CRCP OR JRCP WITH FLEXIBLE TYPE PAVEMENT STRUCTURE

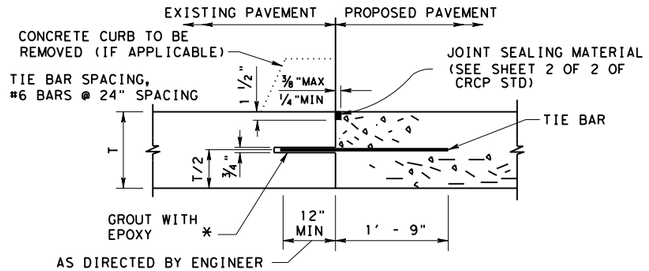


FOR DETAILS NOT SHOWN, SEE TRANSVERSE EXPANSION JOINT DETAILS ELSEWHERE IN PLANS.

DETAIL "B" - DOWEL ASSEMBLY AT EXPANSION JOINT

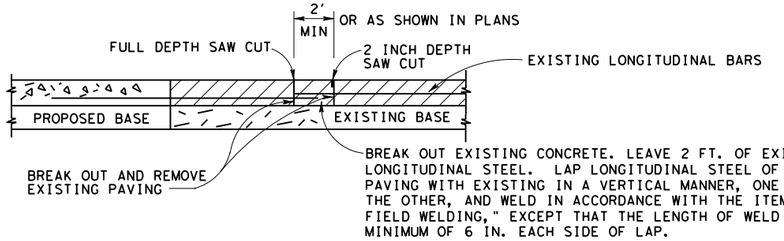
DOWEL BAR DATA			
SLAB THICKNESS(T)	6"-7.5"	8"-10"	10.5"-15"
DOWEL SIZE	1"	1 ¼"	1 ½"
DOWEL LENGTH	18"	20"	22"
DOWEL BAR SPACING	12"	12"	12"

TABLE A - DOWEL BAR DATA



JUNCTURE D - TYPICAL CONNECTION TO EXISTING CONCRETE

*FOR EPOXY TYPE SEE ITEM 361.



JUNCTURE F - "BREAK BACK" CONCRETE CRCP WITH CRCP OR JRCP WITH JRCP

GENERAL NOTES

1. FOR FURTHER INFORMATION REGARDING PLACING CONCRETE AND REINFORCEMENT, REFER TO THE GOVERNING SPECIFICATION FOR CONCRETE PAVEMENT.
2. THE DESIGN REQUIREMENTS FOR THE PAVEMENT STRUCTURE, I.E. BAR SPACING, BAR SIZE LAP REQUIREMENTS, ETC., ARE SHOWN ON THE APPROPRIATE PAVEMENT DESIGN DETAIL.
3. SLEEPER SLAB AND ADDITIONAL REINFORCING REQUIRED ON THIS DRAWING ARE INCIDENTAL TO THE VARIOUS BID ITEMS.
4. USE THE SIZE, SPACING, AND LENGTH OF DOWEL BARS SHOWN IN TABLE "A".
5. WHERE THERE WILL BE A JUNCTURE AND ADDITIONAL JRCP PAVING WILL BE PLACED AT A FUTURE DATE, MULTIPLE PIECE DOWEL BARS WILL BE PERMITTED AT THE JUNCTURE. PROVIDE MULTIPLE PIECE DOWEL BAR ASSEMBLIES WITH A MINIMUM ULTIMATE TENSILE STRENGTH OF 60.0 KIPS AND THAT HAVE SMOOTH EPOXY COATED BARS. ENSURE THE MULTIPLE PIECE DOWEL BAR ASSEMBLIES HAVE STOP TYPE COUPLINGS AND HAVE HAVE ROLLED THREADS ON THE BARS. DISMANTLE THE BAR AND FIT THE COUPLING PORTION USED IN CONSTRUCTION, WITH A PLASTIC CAP. FURNISH THE REMAINING PORTION OF THE BAR TO THE ENGINEER.
6. WHERE THE PAVING IS CRCP AND A RAMP COMPOSED OF A FLEXIBLE PAVEMENT WILL BE USED AT THE JUNCTURE UNTIL FUTURE PAVING IS CONSTRUCTED, MULTIPLE PIECE TIE BARS MAY BE USED IF PERMITTED BY THE ENGINEER. IF USED, ENSURE THE MULTIPLE PIECE TIE BAR ASSEMBLIES HAVE STOP TYPE COUPLINGS AND ROLLED THREADS ON THE BARS. FURNISH MULTIPLE PIECE TIE BAR ASSEMBLIES THAT DEVELOP A MINIMUM ULTIMATE TENSILE STRENGTH EQUAL TO 1.25 TIMES THE YIELD STRENGTH OF THE TRANSVERSE BARS BEING JOINED. FOR TIE BARS, USE DEFORMED REINFORCING BARS. TIE BAR ASSEMBLIES MADE FROM STEELS OTHER THAN ASTM GRADE 60 AND WITH DEFORMATIONS OTHER THAN ASTM STD. MAY BE USED PROVIDED THEY PROVE SATISFACTORY TO THE ENGINEER AND ARE IN EVERY RESPECT THE EQUAL TO THE ASSEMBLIES SPECIFIED. LABORATORY TESTING OF THE PROPOSED ASSEMBLIES, AT THE CONTRACTOR'S EXPENSE, MAY BE REQUIRED. LAP AND WELD ONE PORTION OF THE TIE BAR ASSEMBLY TO EACH LONGITUDINAL BAR IN ACCORDANCE WITH THE ITEM "STRUCTURAL FIELD WELDING "AND THE OTHER PORTION INTO THE COUPLING PRIOR TO PAVING. ENSURE MULTIPLE PIECE TIE BAR LENGTHS CONFORM TO THE TIE BAR LENGTHS SHOWN ELSEWHERE IN THE PLANS. ADDITIONAL "SHEAR STEEL" WILL ALSO BE REQUIRED AND MAY BE USED WITH MULTIPLE PIECE ASSEMBLIES AS PREVIOUSLY DESCRIBED. USE ADDITIONAL STEEL BARS OF EQUAL DIAMETER AT A SPACING DOUBLE THAT OF THE LONGITUDINAL STEEL AND ENSURE THE LENGTH IS 66 TIMES THE TIE BAR DIAMETER.
7. DO NOT SHEAR CUT DOWEL BARS.
8. ENSURE DOWEL BAR EPOXY COATING CONFORMS TO ARTICLE 440.2.7., "EPOXY COATING".
9. REPLACE ANY BENT LONGITUDINAL REINFORCING. IF THERE IS NOT SUFFICIENT EXPOSED REINFORCING TO PROVIDE A MINIMUM OF A 33 TIMES BAR DIAMETER LAP, REMOVE THE EXISTING PAVEMENT AND SUFFICIENTLY EXPOSE THE EXISTING REINFORCING TO PROVIDE A 33 TIMES BAR DIAMETER LAP. REPLACE ANY SHEAR BARS THAT ARE DISTURBED, BY DRILLING AND GROUTING AS REQUIRED BY NOTE 12 BELOW. PERFORM THIS CORRECTIVE ACTION AT NO EXPENSE TO THE DEPARTMENT.
10. TIE BARS AND DOWEL BARS OMITTED, LOST, OR DAMAGED SHALL BE REPAIRED BY DRILLING AND EPOXY GROUTING AT NO EXPENSE TO THE DEPARTMENT.
11. JUNCTURES A & B ARE ONLY SUITABLE FOR MINOR STREETS WITH LOW TRAFFIC VOLUMES.
12. FURNISH ADDITIONAL SHEAR BARS (DIAMETER "D") OF THE SAME SIZE AS LONGITUDINAL BARS AND SPACE THEM MIDWAY BETWEEN ALTERNATE LONGITUDINAL BARS ALONG THE TRANSVERSE CONSTRUCTION JOINT FORMED AT THE LEAVE-OUT.

LEGEND

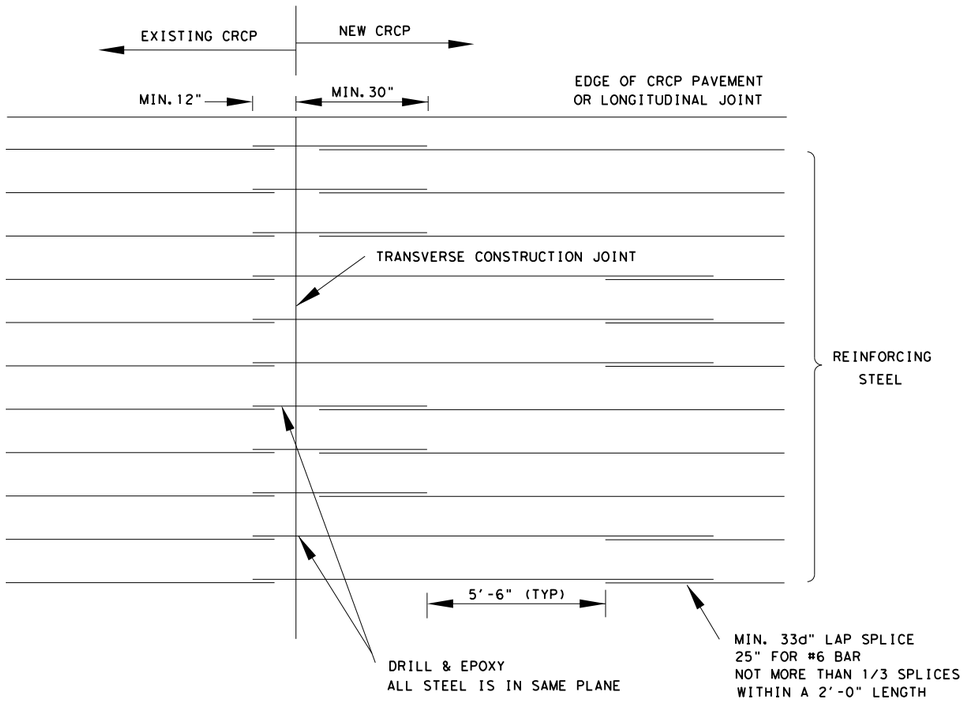
ACP - ASPHALT CONCRETE PAVEMENT
CRCP - CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
JRCP - JOINTED REINFORCED CONCRETE PAVEMENT
T - THICKNESS

Texas Department of Transportation
Houston District

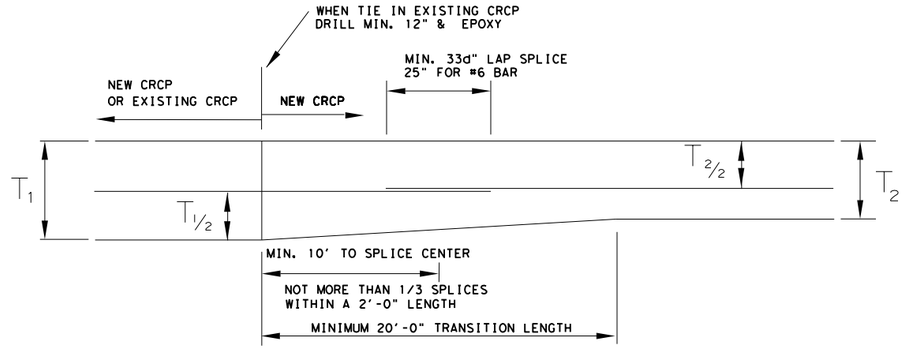
CONCRETE PAVEMENT JUNCTURES

CPJ

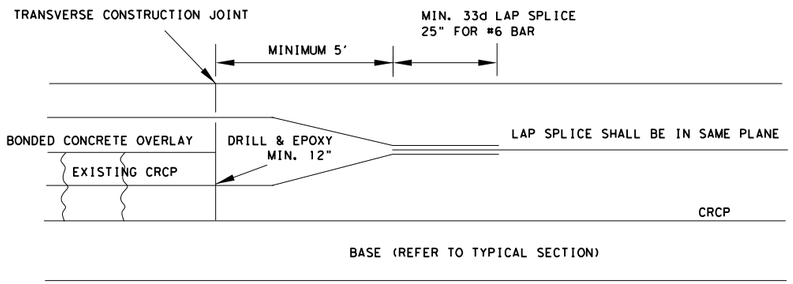
FILE: STDB-5.dgn	DN:	CK:	DW:	CK:	
©TxDOT DEC. 2009	DIST	FED REG	PROJECT NO.		SHEET
REVISIONS 5/05 2004 SPECS REVISED 4/2008 2/15 2014 SPECS	HOU	6			171
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	HARRIS		3256	02	093	SL 8



EXISTING CRCP TO NEW CRCP

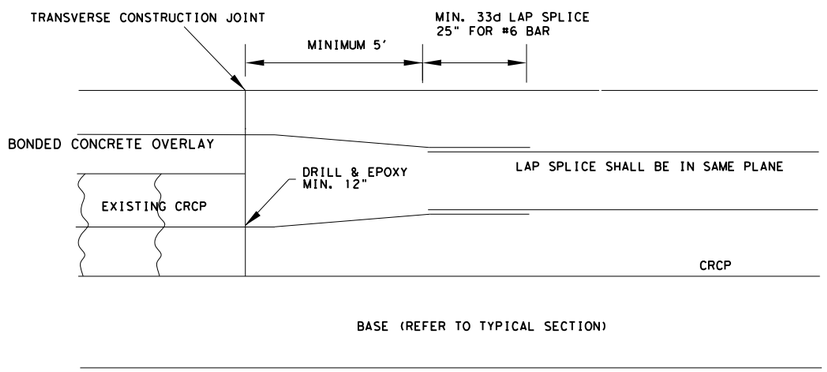


CRCP THICKNESS TRANSITION



CRCP BONDED OVERLAY TO CRCP TRANSITION

(ONE LAYER STEEL)



CRCP BONDED OVERLAY TO CRCP TRANSITION

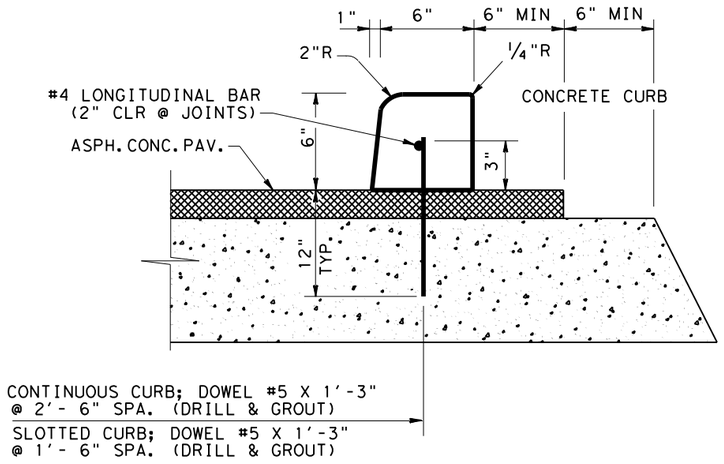
(TWO LAYER STEEL)

Texas Department of Transportation
Houston District

CONCRETE PAVEMENT JUNCTURES

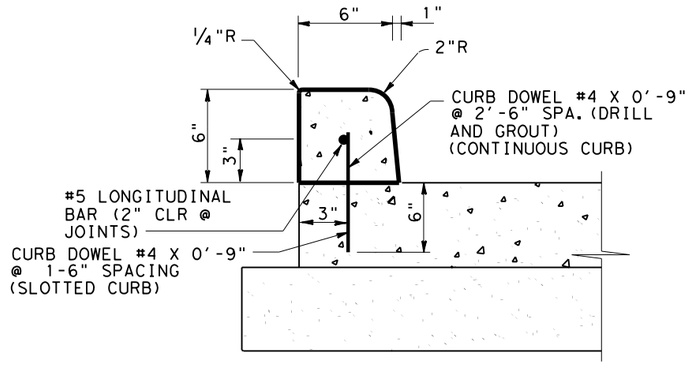
CPJ

FILE: STDB-5.dgn	DN:	CK:	DW:	CK:		
© TxDOT DEC. 2009	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS 5/05 2004 SPECS REVISED 4/2008 2/15 2014 SPECS	HOU	6				172
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	HARRIS		3256	02	093	SL 8



SHOWN ON EXISTING OR PROPOSED ACP PAVEMENT

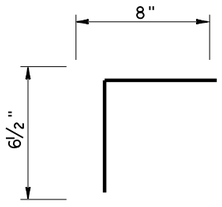
(PAY ITEM 529-6011) - FOR CONTINUOUS



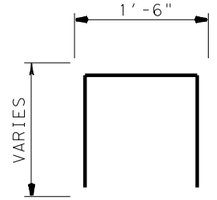
SHOWN ON EXISTING OR PROPOSED CONCRETE PAVEMENT

(PAY ITEM 529-6011) - FOR CONTINUOUS

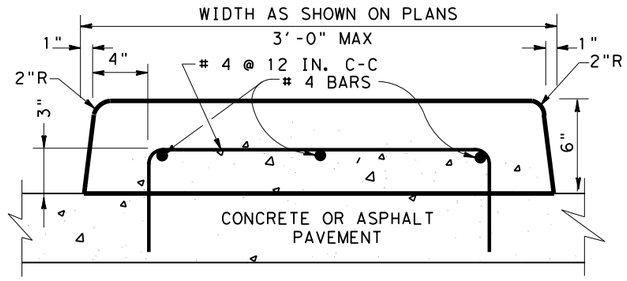
CONCRETE CURB (DOWEL) (6 IN.)



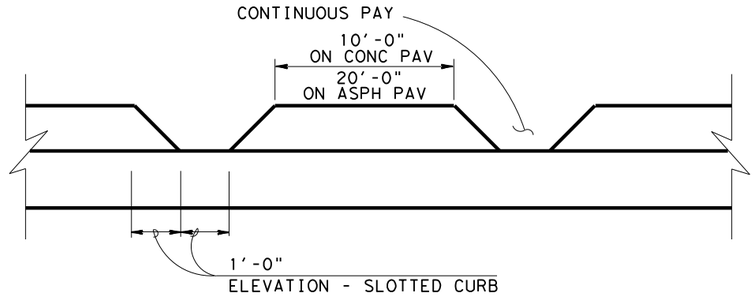
BAR K
#4



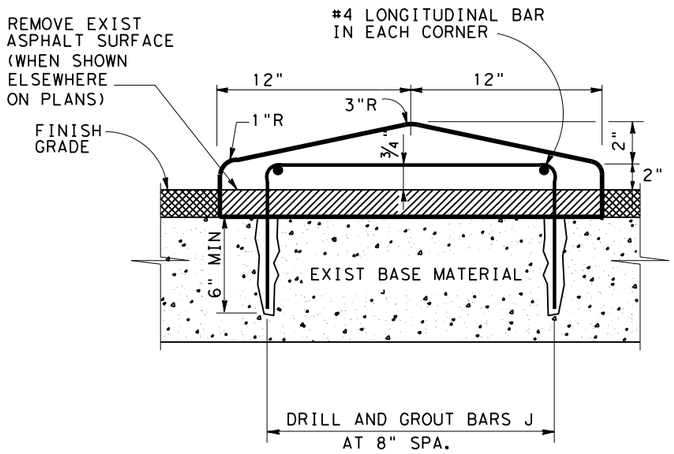
BAR J
#4



ITEM 536-6001 CONCRETE MEDIAN
SEE NOTE 2

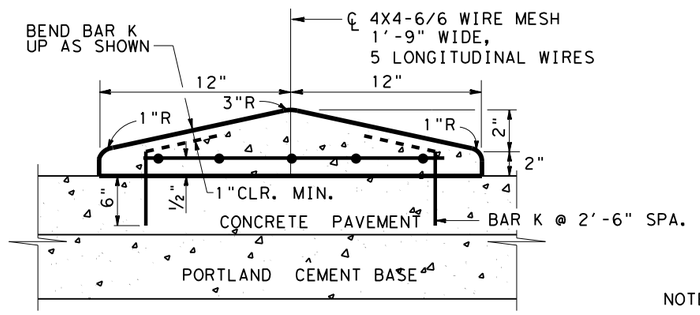


ITEM 529-6012 CONCRETE CURB (SLOTTED) - ON CONC.
ITEM 529-6009 CONC CURB (DOWEL)(SLOTTED) - ON ASPH.



SHOWN ON EXISTING ACP PAVEMENT

SEE NOTE 2 - ITEM 536-6003 CONC DIRECTIONAL ISLAND



SHOWN ON EXISTING OR PROPOSED CONCRETE PAVEMENT

SEE NOTE 2 - ITEM 536-6003 CONC DIRECTIONAL ISLAND

NOTES:

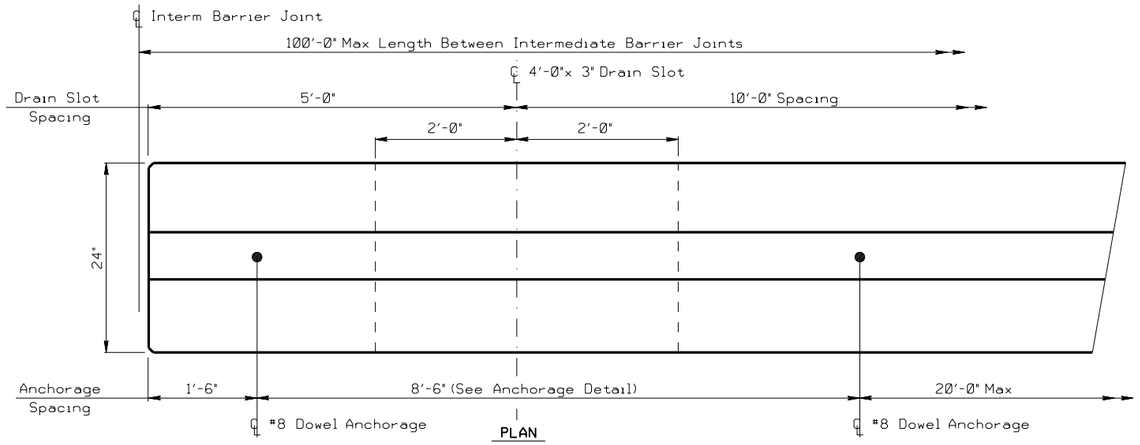
1. DRILL AND GROUT BARS SHOWN AS PER ITEM 420.4.7.10, 6" EMBEDMENT, MINIMUM ON CONC.
2. INSTALL A 2 INCH DRAINAGE OPENING AT 10 FT C-C WHEN CURB/ISLAND IS NOT ON TOP OF CROSS SECTION. (LOCATED ON A 2 OR 3 PERCENT TRANSVERSE GRADE, OR SUPERELEVATION.)

CONCRETE DIRECTIONAL ISLAND

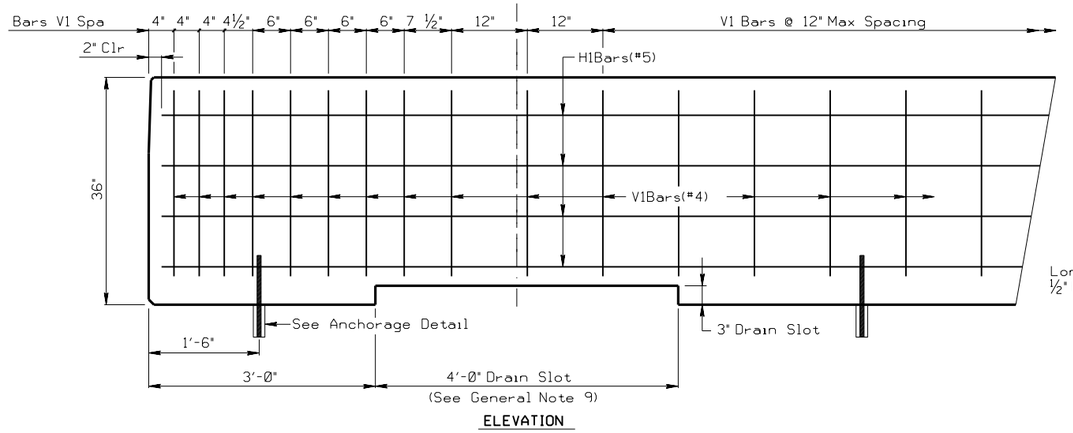
Texas Department of Transportation
Houston District

CONCRETE CURB AND DIRECTIONAL ISLAND DETAILS CC & DID

FILE: STDB-9.dgn	DN:	CK:	DW:	CK:
©TxDOT 2014	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6		173
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HARRIS	3256	02	093	SL8



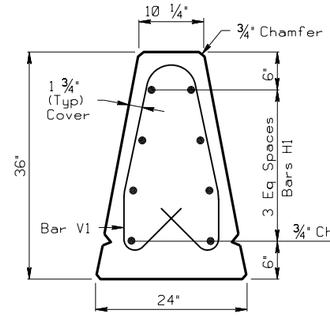
PLAN



ELEVATION

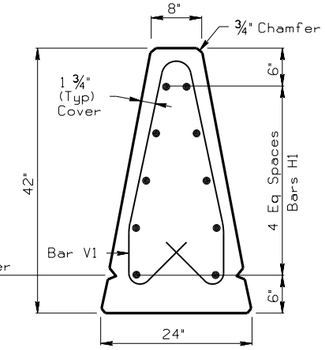
CAST-IN-PLACE SINGLE SLOPE CONCRETE BARRIER

36" Barrier Shown ~ 42" Barrier Similar



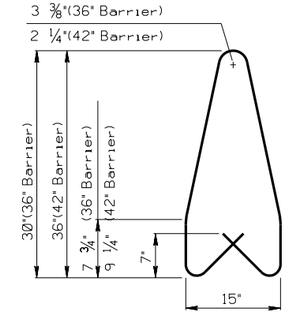
TYPICAL SECTION

36" BARRIER HEIGHT



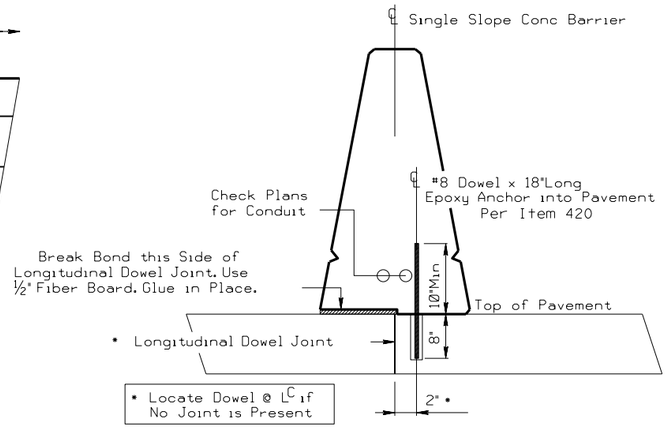
TYPICAL SECTION

42" BARRIER HEIGHT



BARS V1(#4)

REINFORCING DETAIL

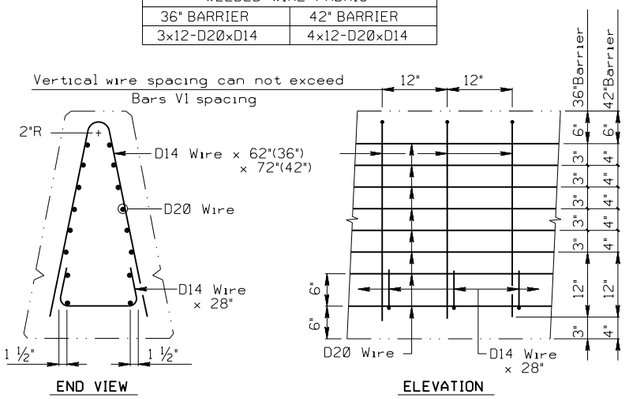


ANCHORAGE AND JOINT DETAIL

GENERAL NOTES:

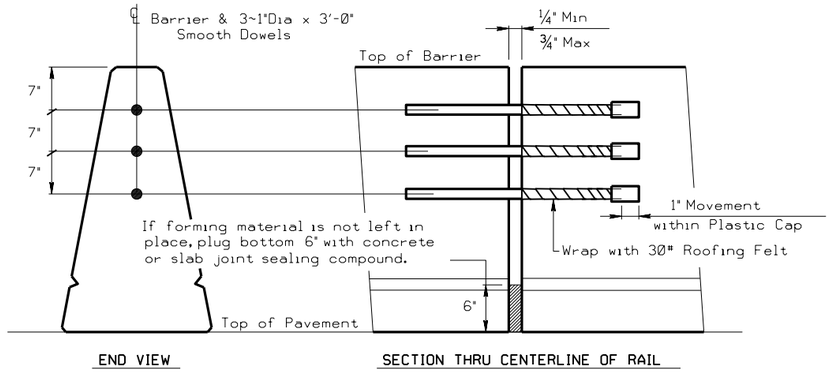
1) Precast barrier is not allowed. Cast-in place barrier may be slip formed. Additional reinforcement may be tack welded to the upper two-thirds of the reinforcing cage to provide bracing.
2) All concrete will be Class C.
3) All reinforcing steel will be Grade 60, unless otherwise specified. All welded rebar is ASTM A706.
4) Chamfer all edges ¾ inch.
5) The minimum bar splice length is 24 times the bar diameter.
6) Welded wire fabric may be used as an option to conventional reinforcement. All wire is 60 ksi yield strength.
7) Transitions to barrier height, as needed, will be determined by the Engineer. Changes in barrier height should not normally exceed 2 inches per 30 feet. Vertical steel will be uniformly transitioned throughout the variation in barrier height as directed by the Engineer.
8) Installation of anchorage dowels are not paid for directly. Installation is incidental to barrier bid items.
9) Drain slots may be used where shown elsewhere on the plans or as directed by the Engineer.

WELDED WIRE FABRIC	
36" BARRIER	42" BARRIER
3x12-D20xD14	4x12-D20xD14



END VIEW ELEVATION

WELDED WIRE FABRIC (OPTIONAL REINFORCING)



END VIEW SECTION THRU CENTERLINE OF RAIL

INTERMEDIATE BARRIER JOINT DETAIL

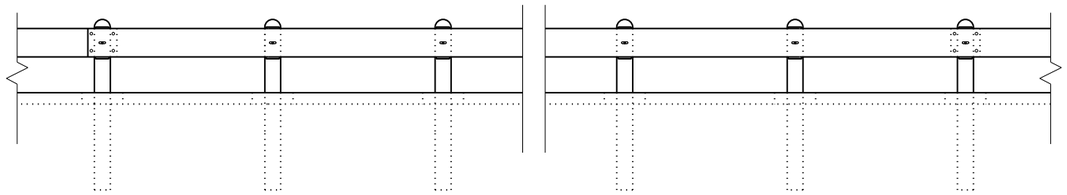
R = Radius
Dia = Diameter

Texas Department of Transportation
Houston District (Roadway)

SINGLE SLOPE CONCRETE BARRIER
TYPE 2
(CAST-IN-PLACE)

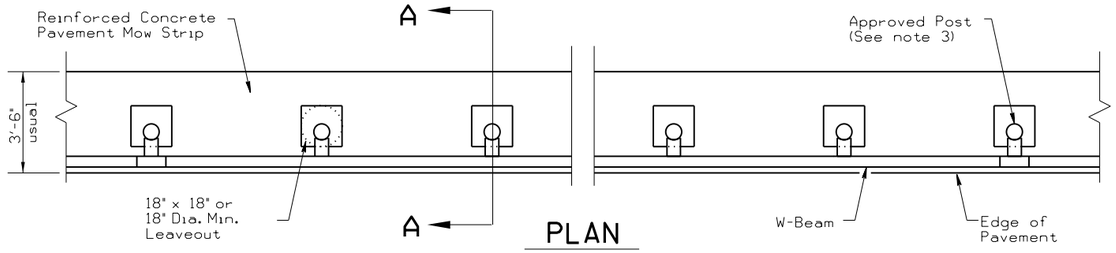
SSCB(2)-HOU

FILE: STDC4.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
©TxDOT AUG. 2005	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 3/2015 2014 SPECS	HOU	6		174
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HARRIS	3256	02	093	SL8

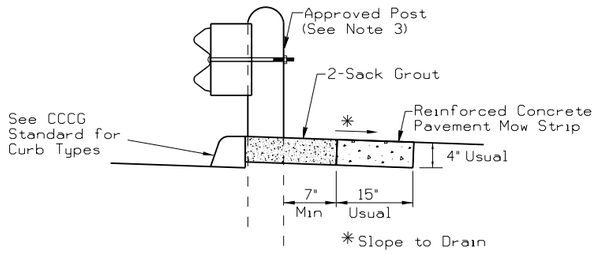


ELEVATION

TRAFFIC

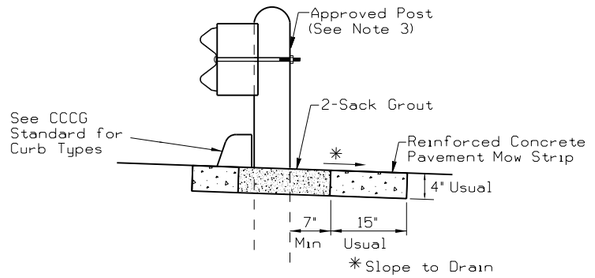


PLAN



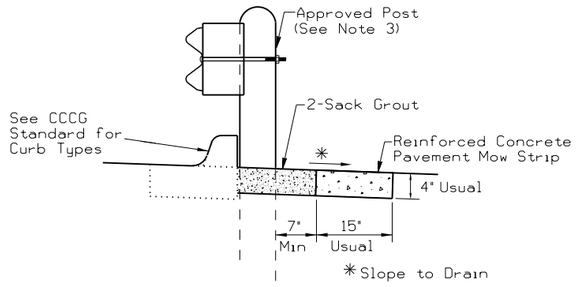
CURB OPTION (1)

Shown at Curbed Location

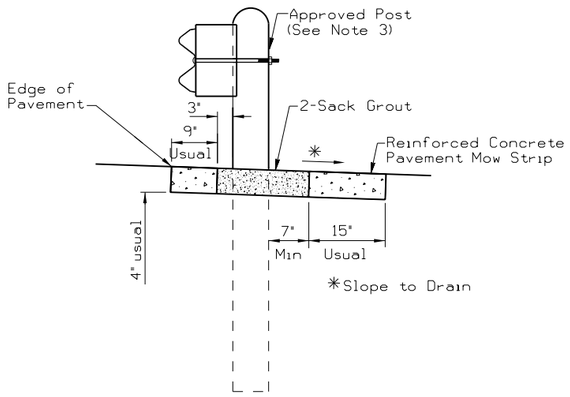


CURB OPTION (2)

Curb Shown on Top of Mow Strip

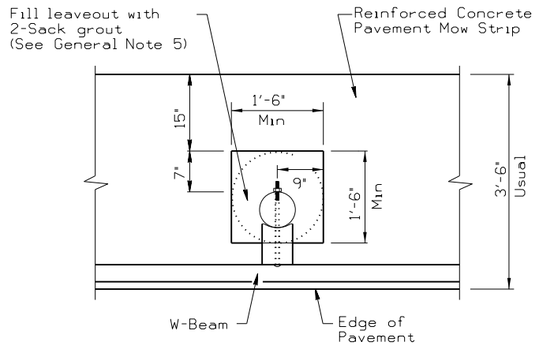


CURB OPTION (3)



SECTION A-A

Typical



MOW STRIP DETAIL

Reinforced Concrete Pavement
Mow Strip with 18" x 18"or 18"
dia. minimum leaveout.

GENERAL NOTES

1. Place concrete riprap mow strips at all Metal Beam Guard Fence locations, and in accordance with Item 432, "Riprap". Use Class B Concrete, reinforced with No. 3 bars spaced at 18 in. centers each direction and 2 in. below the surface.
2. Provide a minimum of 7 in. leave out behind the post. Do not place concrete in the leave out.
3. The type of approved post is shown elsewhere on the plans. See the applicable standard sheets for additional details and information.
4. Other curb placement options may be used. Curbs are not considered part of the mow strip and are paid for under other pertinent bid items.
5. Fill the leave outs with no more than a 2-sack grout mixture and place in accordance with Section 421.2.7, ""Mortar and Grout." Payment for furnishing and placing the grout mixture is subsidiary to the Item 432, "RIPRAP."
6. Place the mow strip the entire length of the guard fence plus any Terminal Anchor Section (TAS) or Single Guardrail Terminal (SGT) to 2 ft. beyond the face of the object marker at the end of the SGT. Do not allow concrete to adhere to the ground line strut shown on the SGT standard sheet.

Texas Department of Transportation
Houston District

MOW STRIP

MS

FILE:	DN:	CK:	DW:	CK:	
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REVISIONS	HOU	6			175
03/15 2014 SPECS	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	HARRIS		3256	02	093	SL8

STDE5.DGN

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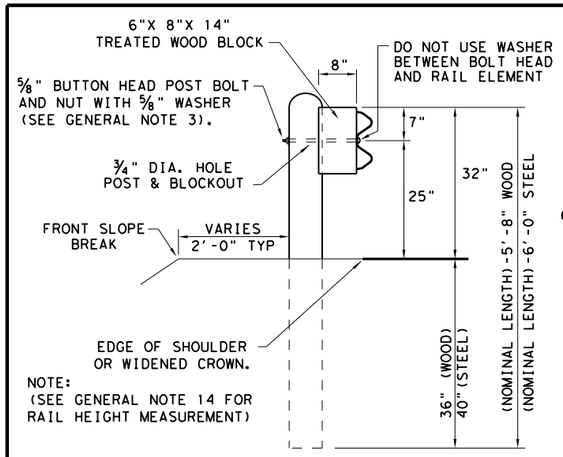
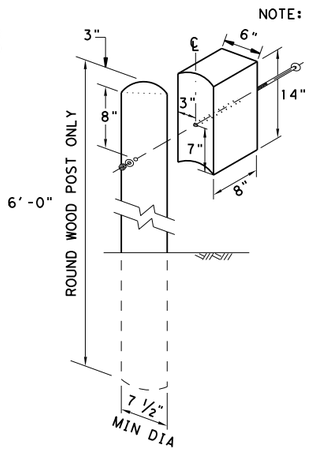
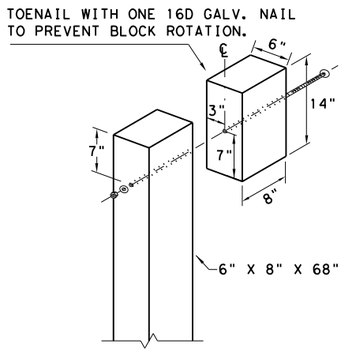


TYPICAL POST PLACEMENT

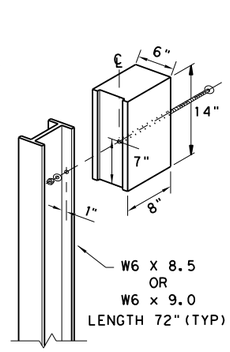


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

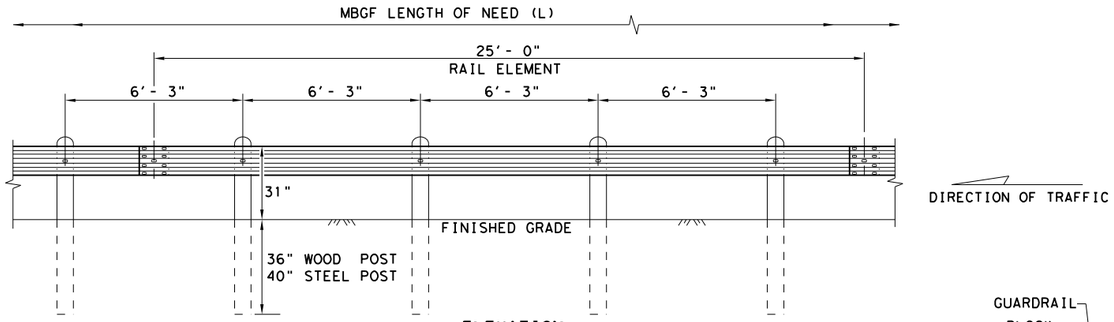


WOOD BLOCK TO RECTANGULAR WOOD POST



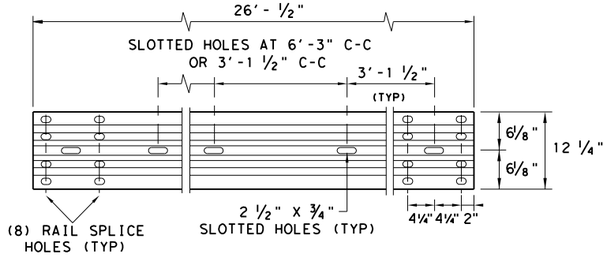
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



ELEVATION
MID-SPAN RAIL SPLICE

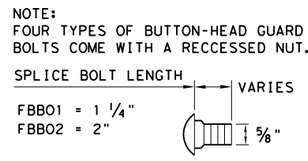
SHOWING A 25'- 0" SECTION OF W-BEAM RAIL. (SEE GENERAL NOTE 2)



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

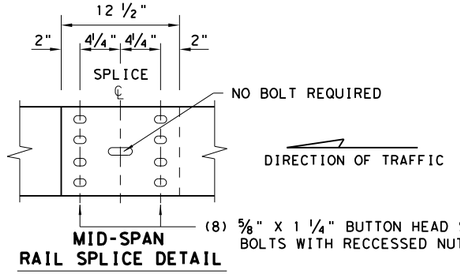
NOTES: SEE GENERAL NOTE 2 FOR ALLOWABLE RAIL TYPES.
SEE RAIL SPLICE DETAIL FOR REQUIRED HARDWARE.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



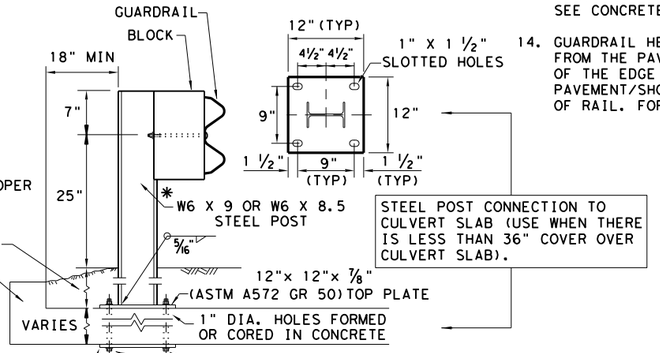
BUTTON HEAD BOLT

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				
	DIST	COUNTY		SHEET NO.
				176

DATE:
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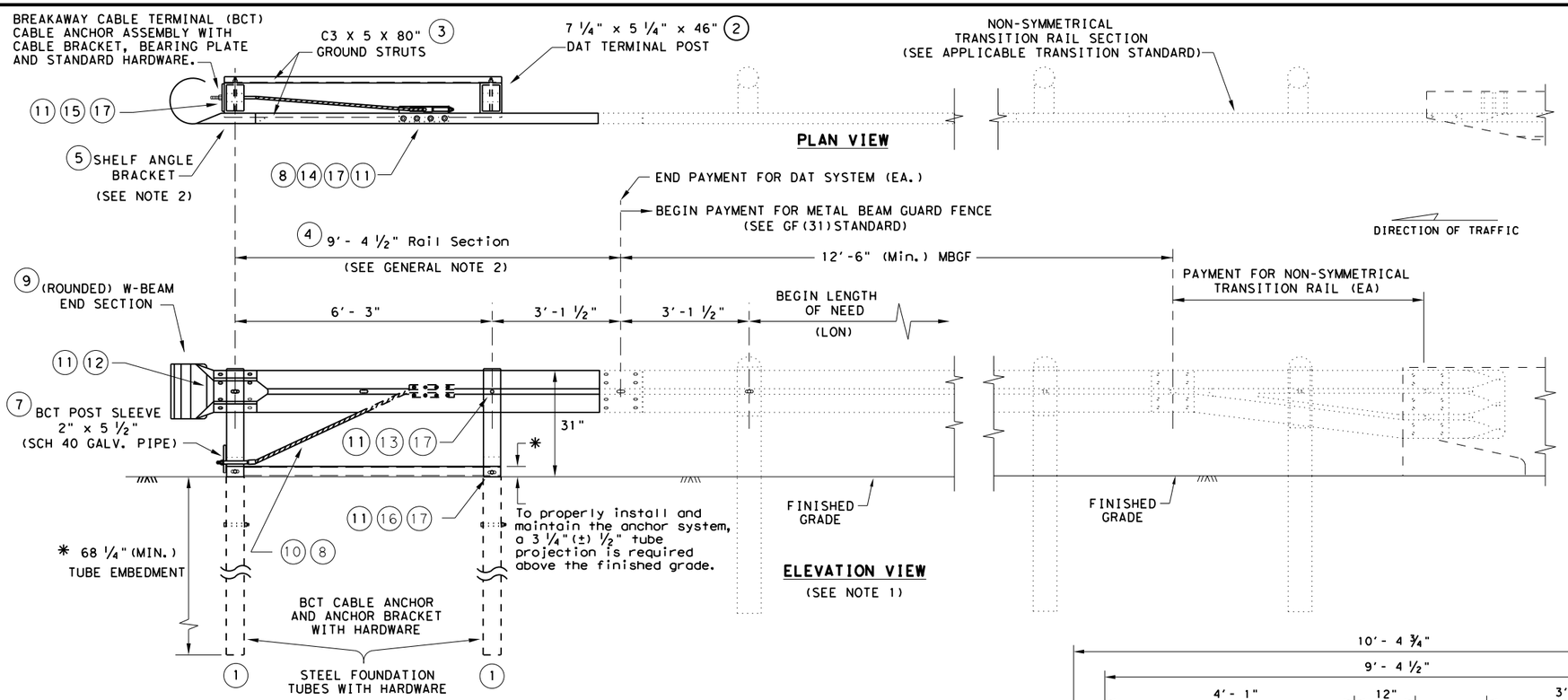


DOWNSTREAM ANCHOR TERMINAL (DAT)

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

GENERAL NOTES

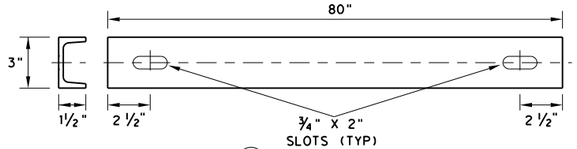
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN 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

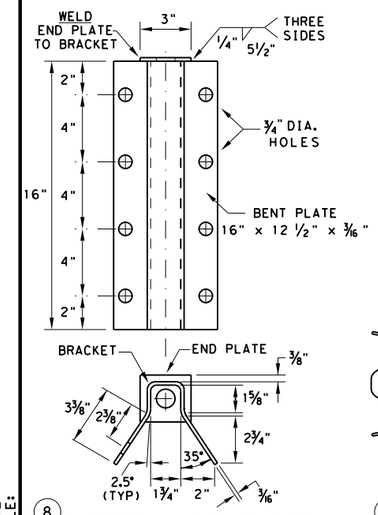
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

#	(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

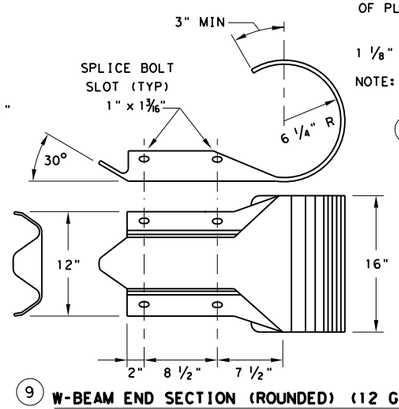
(4) TERMINAL RAIL ELEMENT FOR DAT



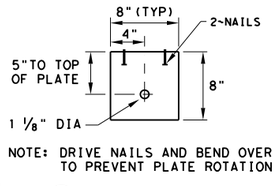
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

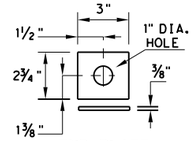


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

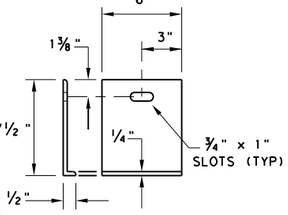


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

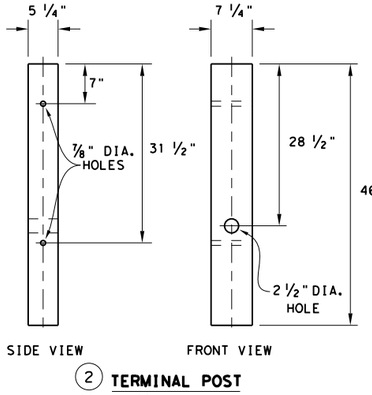
(6) BEARING PLATE
8"x 8"x 5/8" R



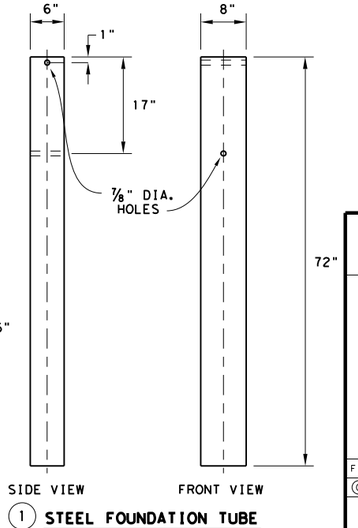
END PLATE



(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
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				177

DATE:
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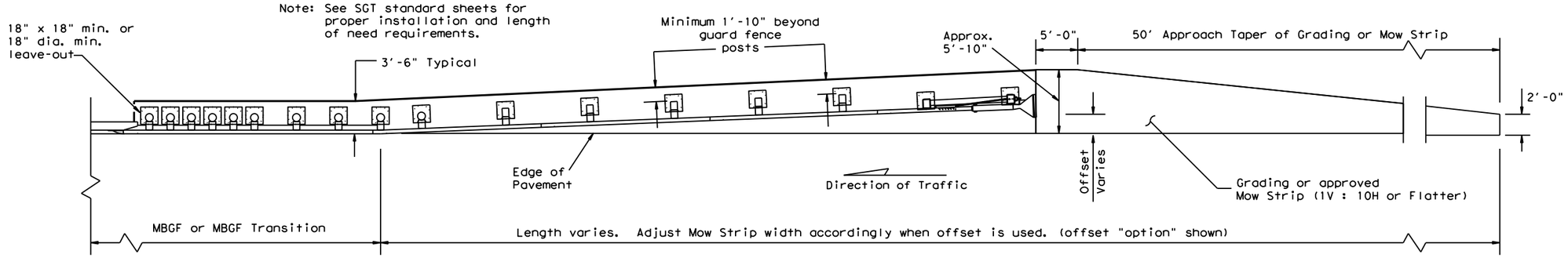
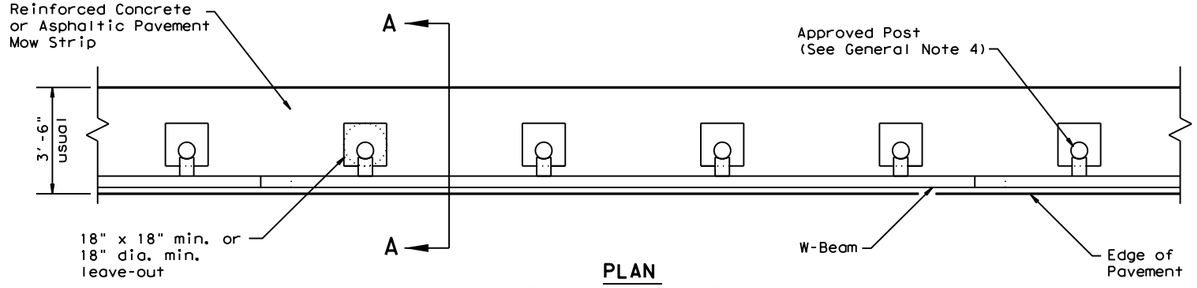
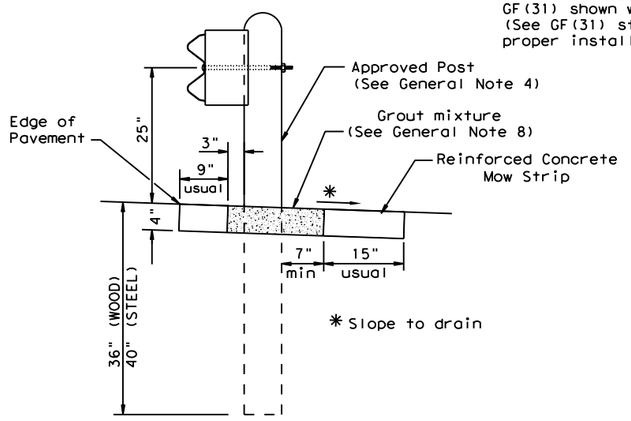


GRADING AND MOW STRIP AT GUARDRAIL END TREATMENTS



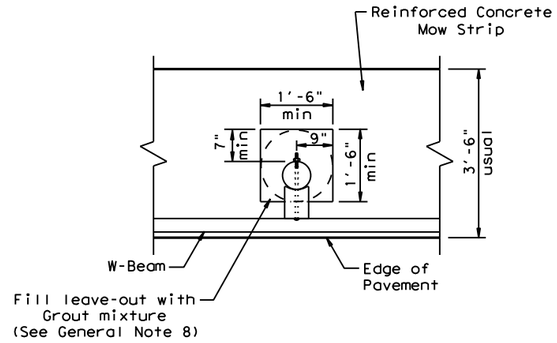
PLAN

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



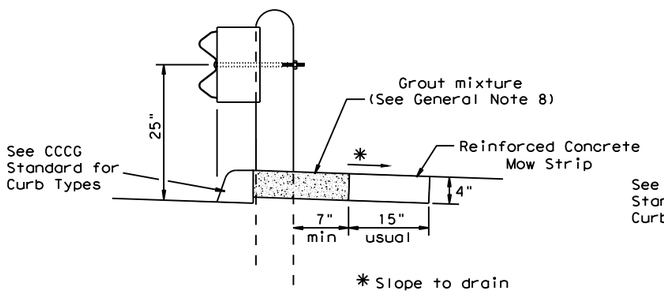
SECTION A-A

Typical



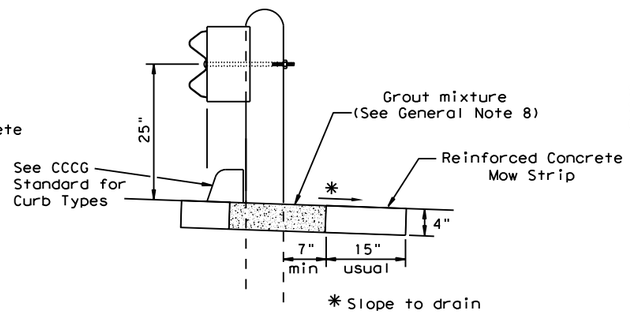
MOW STRIP DETAIL

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



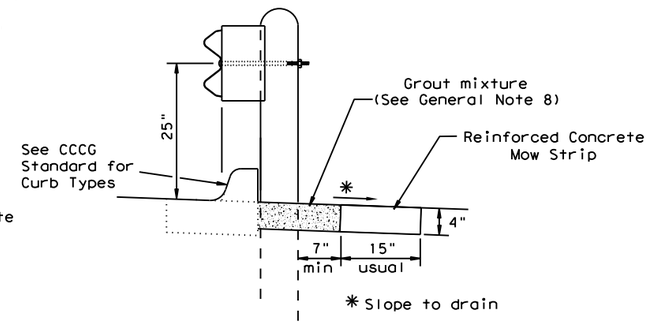
CURB OPTION (1)

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

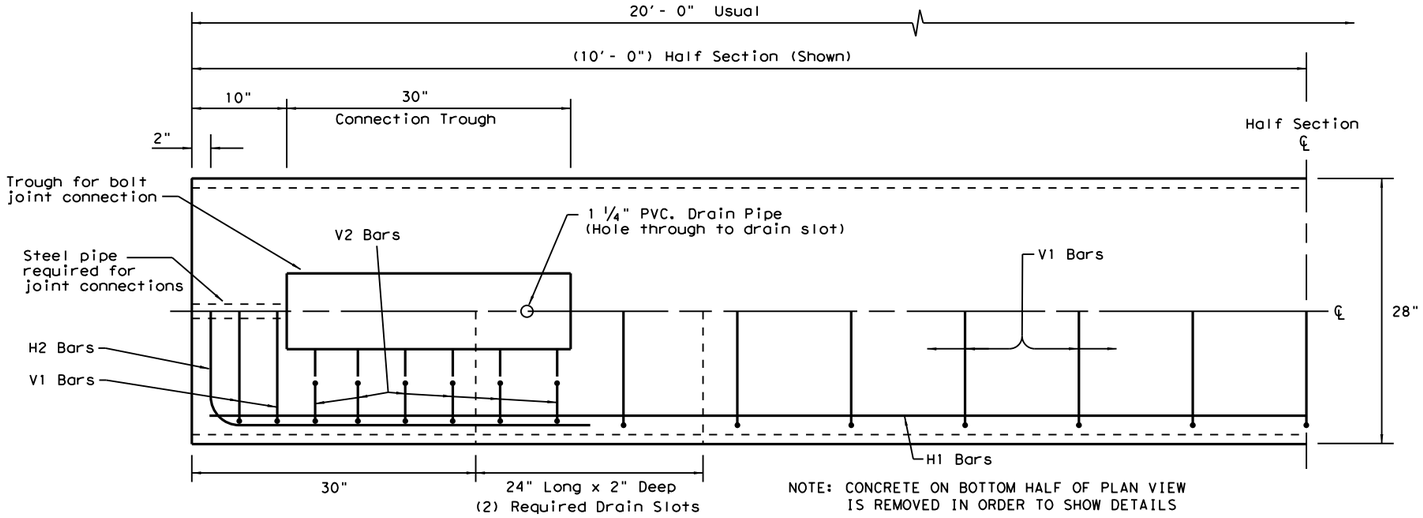
Design Division Standard

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

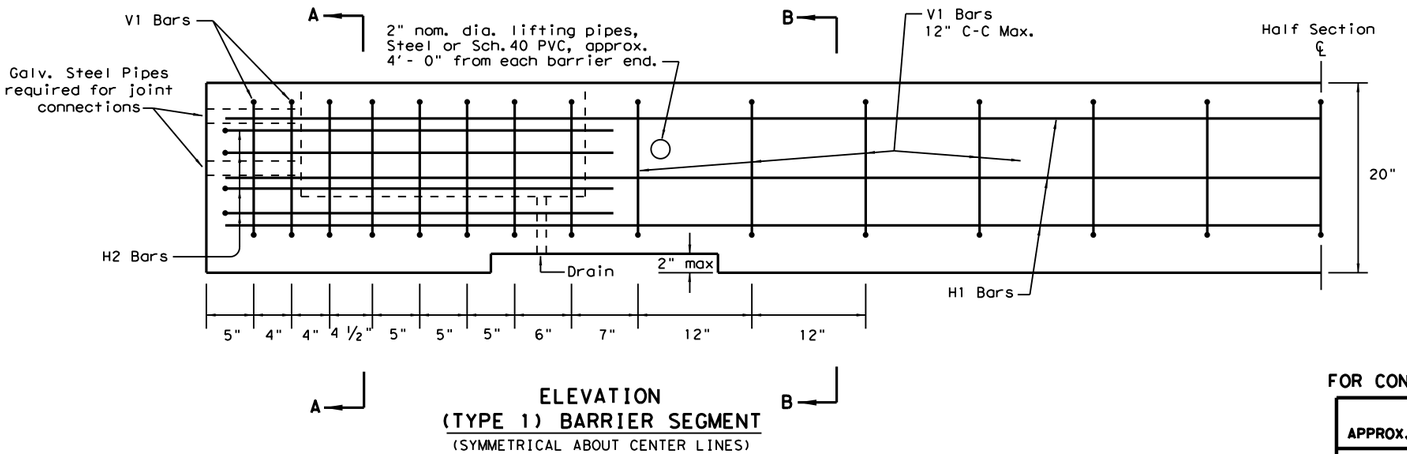
GF(31)MS-19

FILE: gf31ms19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY	
REVISIONS					
	DIST	COUNTY		SHEET NO.	
				178	

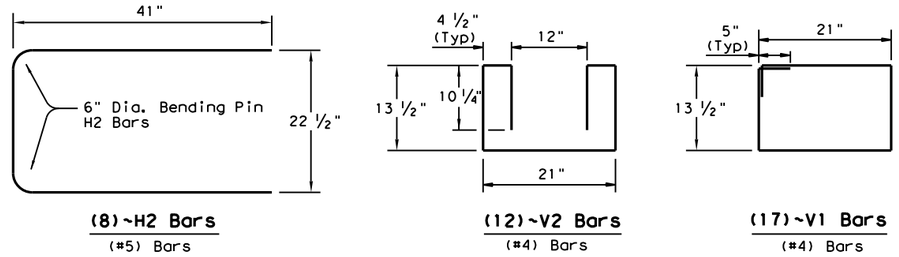
DATE: 3/15/2023
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\325602093\4 - Design\Plan Set\2. TCP\STANDARD DWGV\pcb13.dgn



PLAN
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)



ELEVATION
(TYPE 1) BARRIER SEGMENT
(SYMMETRICAL ABOUT CENTER LINES)



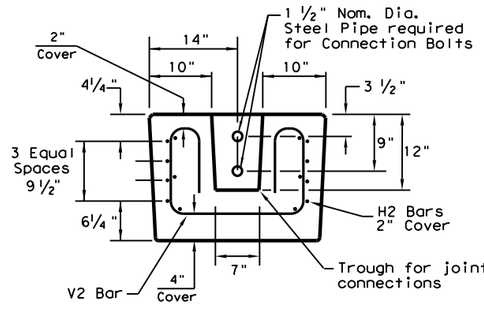
(8)~H2 Bars (#5) Bars

(12)~V2 Bars (#4) Bars

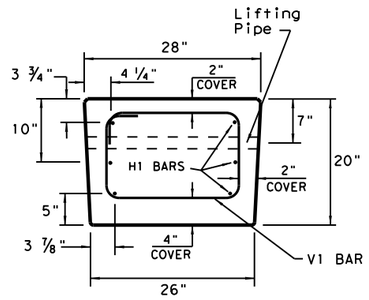
(17)~V1 Bars (#4) Bars

REINFORCING STEEL DETAILS
TYPE 1 - BARRIER SEGMENT

Note: Use 2" Dia. Bending Pin, unless otherwise shown



SECTION A-A



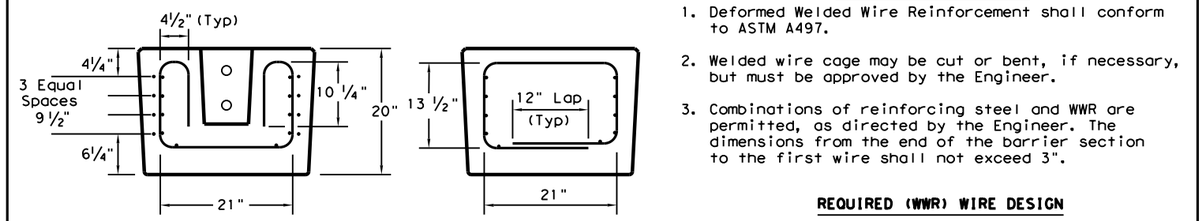
SECTION B-B

GENERAL NOTES

1. Low Profile Concrete Barrier (LPCB), is approved for use in temporary work zone locations, where the posted speed is 45 mph, or less.
2. Concrete shall be Class H for precast barrier with a minimum compressive strength of 3,600 psi.
3. Where used, rebar reinforcement shall be Grade 60 and conform to ASTM A615.
4. Precast LPCB barrier length shall be 20 ft.
5. All barrier edges shall have ¾" chamfer or a tooled radius.
6. Joint connection hardware shall be in accordance with Item 449, "Anchor Bolts." and is considered subsidiary.
7. Steel pipe required for joint connection bolts shall be galvanized in accordance with Item 445, "Galvanizing."
8. Welded wire reinforcement (WWR) may be used in lieu of conventional reinforcement for Type 1 barrier, and shall meet the requirements shown.

FOR CONTRACTORS INFORMATION ONLY

(TYPE 1) APPROX. QUANTITIES 20 FT. SECTION		
CONCRETE	CY	2.6
REINFORCING STEEL	LBS	330
TOTAL BARRIER WT.	LBS	11000



SECTION A-A SECTION B-B

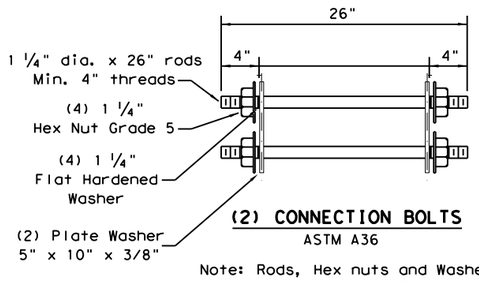
(WWR) GENERAL NOTES

1. Deformed Welded Wire Reinforcement shall conform to ASTM A497.
2. Welded wire cage may be cut or bent, if necessary, but must be approved by the Engineer.
3. Combinations of reinforcing steel and WWR are permitted, as directed by the Engineer. The dimensions from the end of the barrier section to the first wire shall not exceed 3".

REQUIRED (WWR) WIRE DESIGN

8 ~ (D31) Horizontal Wires (Equally spaced)
10 ~ (D20) Horizontal Wires (Equally spaced)
29 ~ (D20) Vertical Wires (Spaced as shown in Elevation View)

WELDED WIRE REINFORCEMENT (WWR)- OPTIONAL REINFORCING



(2) CONNECTION BOLTS ASTM A36

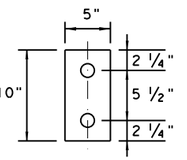


PLATE WASHER 5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

SHEET 1 OF 2

Texas Department of Transportation — Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 1)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
©TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		178A

DATE: 3/15/2023
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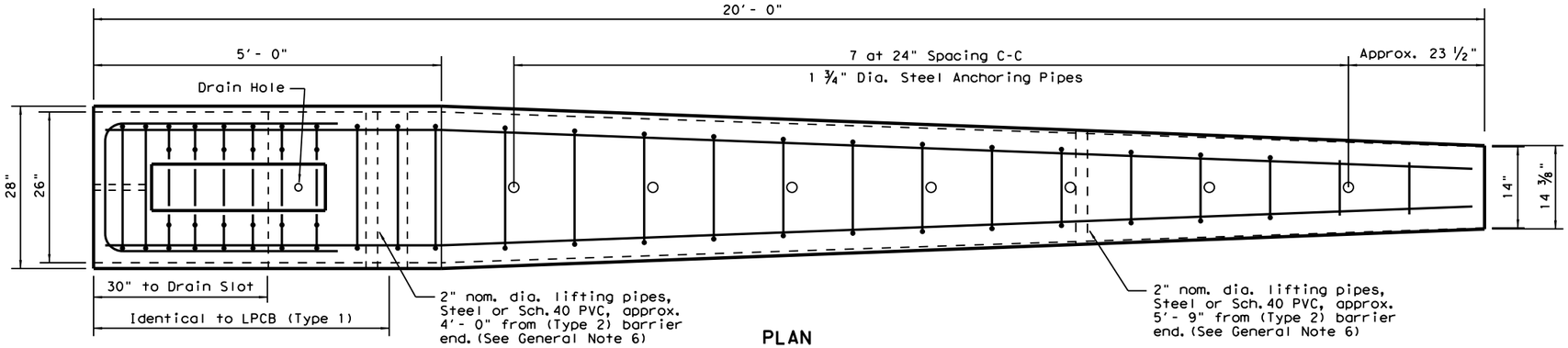
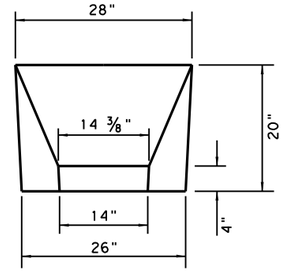
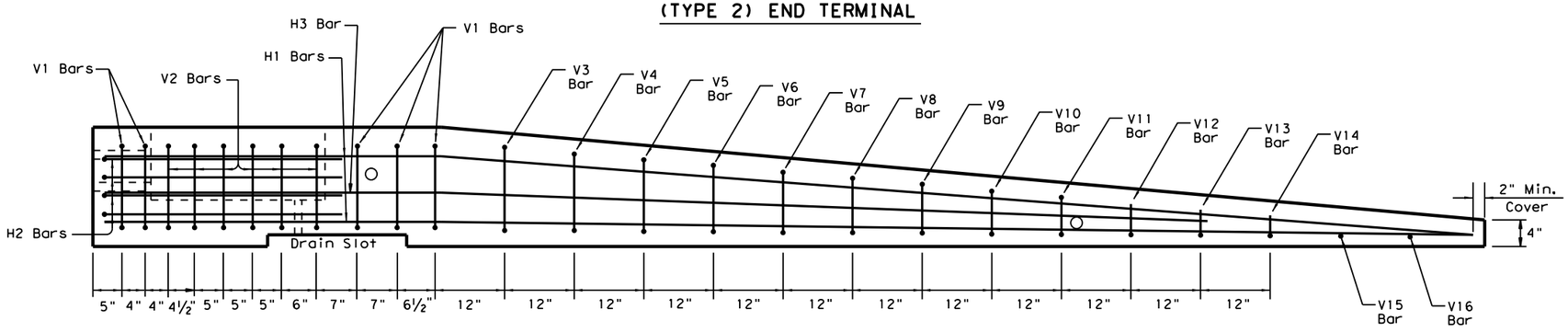


PLAN
(TYPE 2) END TERMINAL

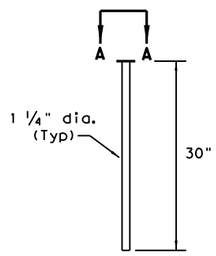


APPROACH VIEW

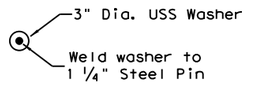


ELEVATION
(TYPE 2) END TERMINAL

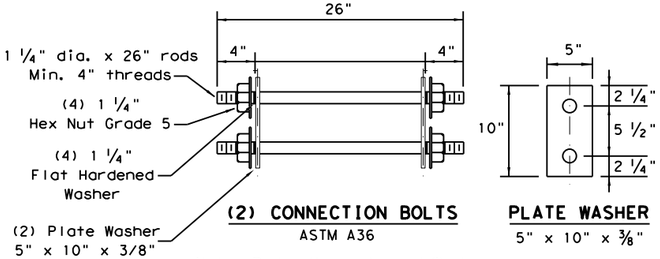
Note:
Anchoring pipes not shown in Elevation View



(7) Anchor Pins
ASTM A36 Steel (See Note 3)



Section A-A
(Head of Anchoring Pin)



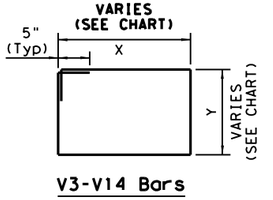
(2) CONNECTION BOLTS
ASTM A36

PLATE WASHER
5" x 10" x ⅜"

Note: Rods, Hex nuts and Washers shall be Galvanized.

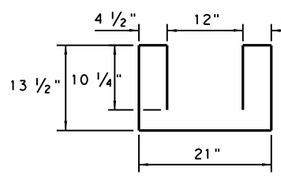
TYPE 2 - NOTES

1. Welded wire reinforcment (WWR) is "not" an option for Type 2 Barrier.
2. Type 2 Barrier shall be used as an end treatment for the Type 1 barrier segments, when applicable.
3. The end treatment can be used without the anchor pins in locations that can accommodate approximately 4 ft. of lateral displacement of the end treatment. The use of non-pinned end treatment does not affect the performance or the deflection of the Low-Profile barrier system.
4. The anchor pins are all the same length and are to be driven flush with the top of the (Type 2) barrier surface.
5. The bends in the H3 and H1 bars are slight, no formal bend is necessary.
6. The Type 2 barrier segment must be lifted from the rear first, to prevent cracking of sloped section.
7. See LPCB sheet 1 for additional information.

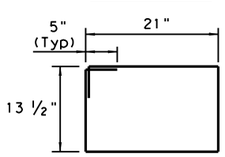


V3-V14 Bars

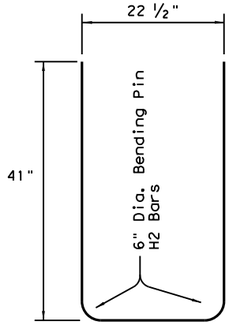
BAR(#4)	X (IN.)	Y (IN.)
V3 BAR	20 ¼	14 ½
V4 BAR	19 ½	13 ½
V5 BAR	18 ½	12 ¼
V6 BAR	17 ½	11 ¼
V7 BAR	17	10 ¼
V8 BAR	16 ¼	9
V9 BAR	15 ½	8
V10 BAR	14 ½	7
V11 BAR	13 ¾	6



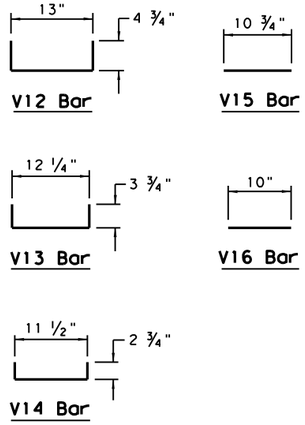
(6)~V2 Bars



(5)~V1 Bars



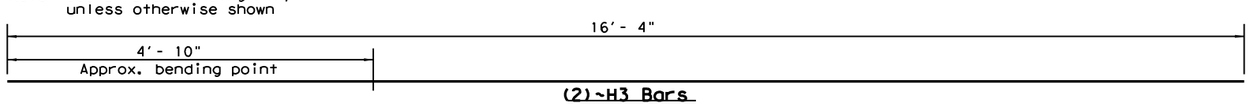
(4)~H2 Bars
(#5) Bars



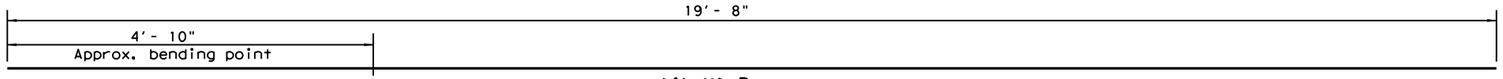
Note: All V Bars are (#4)

REINFORCING STEEL DETAILS
TYPE 2 - END TERMINAL

Note: Use 2" Dia. Bending Pin, unless otherwise shown



(2)~H3 Bars
(#5) Bar



Note: Bends on H1 and H3 bars are slight and do not require formal bends.

(4)~H1 Bars
(#5) Bar

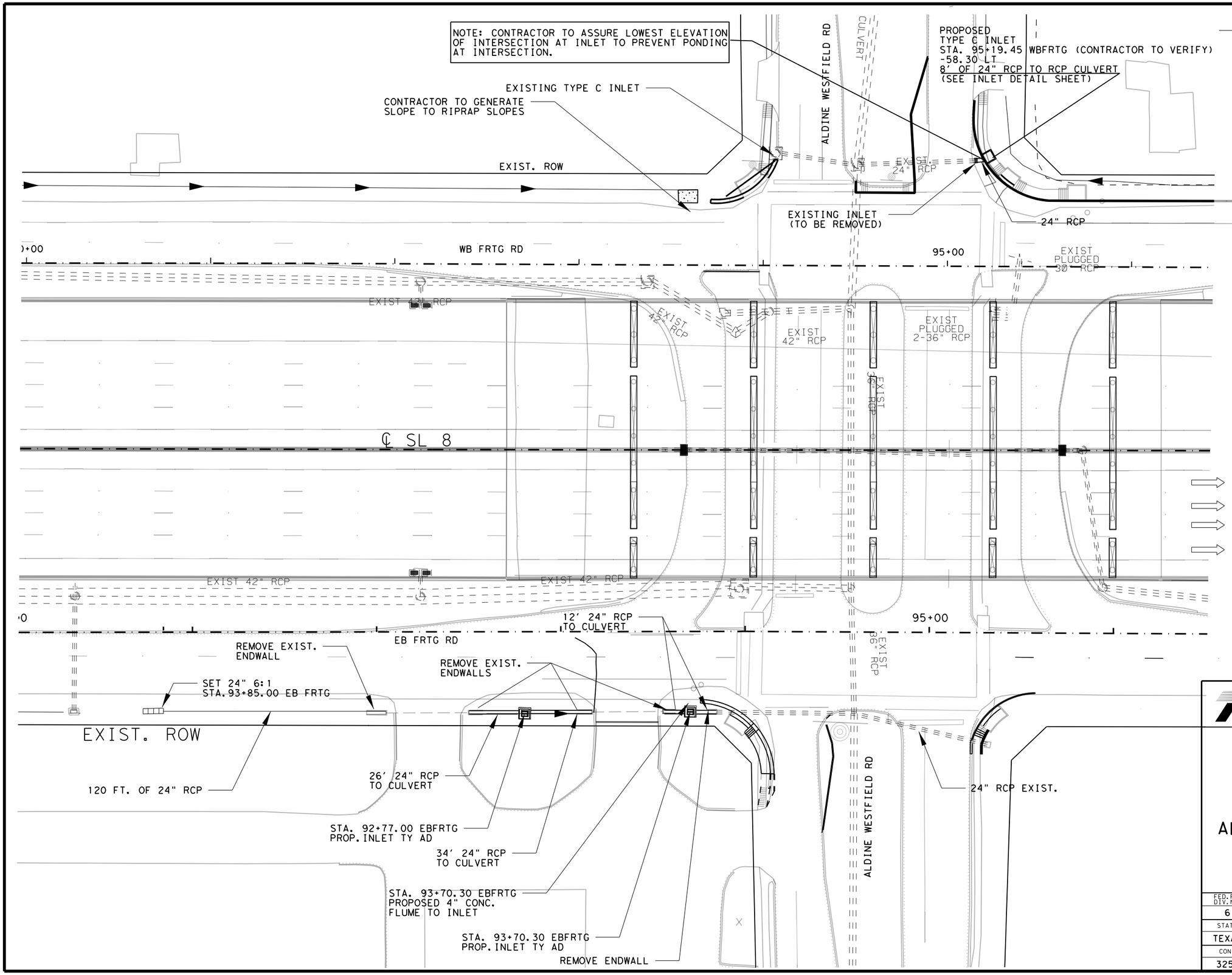
FOR CONTRACTORS INFORMATION ONLY

(TYPE 2) APPROX. QUANTITIES	20 FT. SECTION	
CONCRETE	CY	1.65
REINFORCING STEEL	LBS	240
TOTAL BARRIER WT.	LBS	7000

Texas Department of Transportation — Design Division Standard

LOW PROFILE CONCRETE BARRIER
PRECAST BARRIER (TYPE 2)
LPCB-13

FILE: lpcb13.dgn	DN: TxDOT	CK: AM	DW: VP	CK:
© TxDOT December 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		178B



STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by Daniel Duke Thompson, P.E. 122541 on 03/15 , 2023 .

Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

Texas Department of Transportation

EXIST. ROW
SL 8
PROPOSED DRAINAGE AT ALDINE WESTFIELD RD.

SCALE: 1" = 50' HORZ

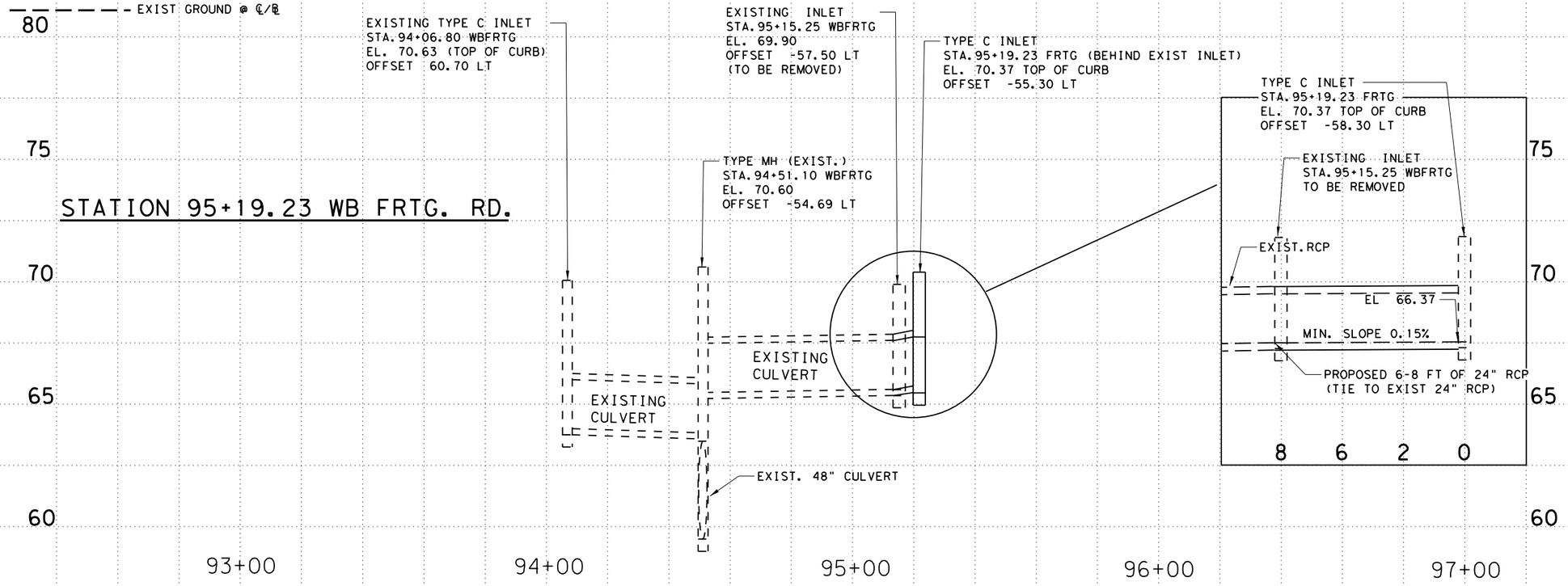
SHEET 1 OF 1

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			179
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: $DATE$
$FILE$

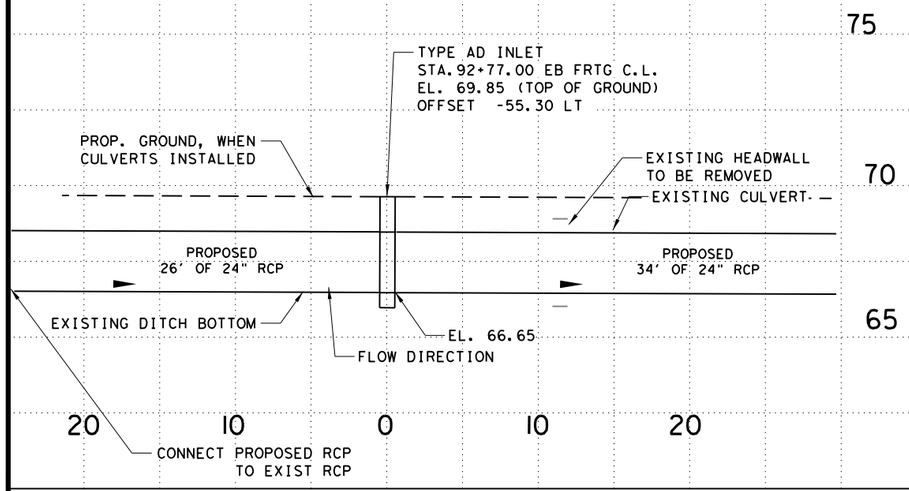
PROPOSED PGL
EXIST GROUND @ ℄/℞

STATION 95+19.23 WB FRTG. RD.



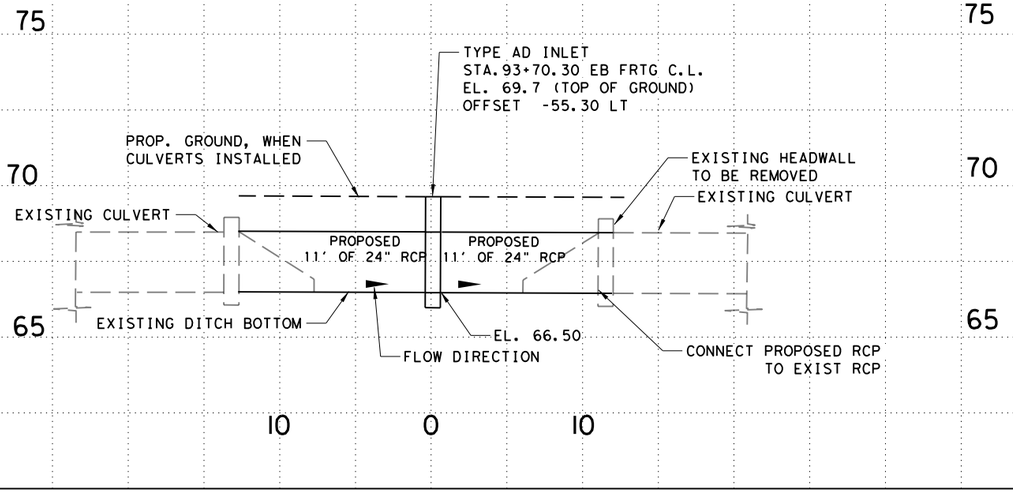
PROPOSED PGL
EXIST GROUND @ ℄/℞

STATION 92+77.00 EB FRTG. RD.



STATION 93+70.30 EB FRTG. RD.

NOTE: INLET MAY NEED SIDE OPENINGS, FOR TOP OF GROUND RUN OFF.



N

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- EXSIT. ROW
- 8" CRCP
- 2" ASB

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8

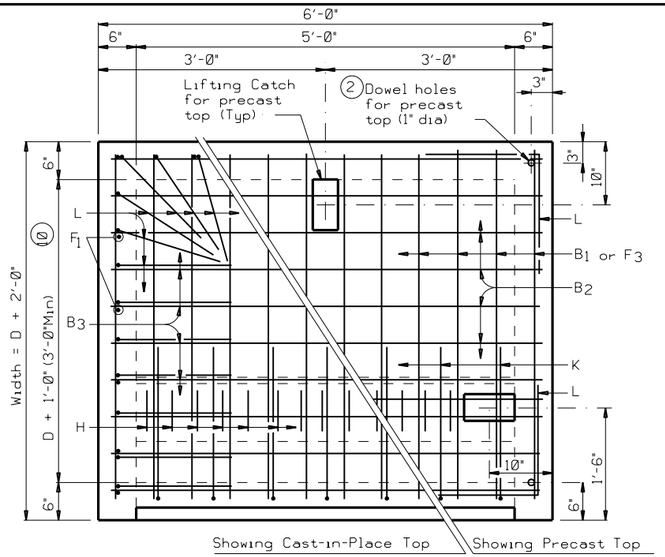
DRAINAGE DETAILS

SCALE: 1" = 100' HORZ
1" = 10' VERT

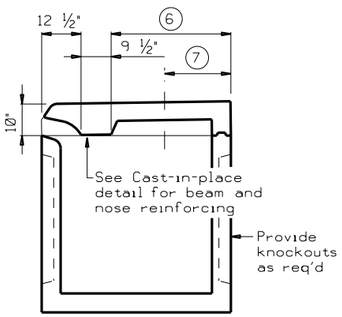
SHEET 1 OF 1

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			180
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

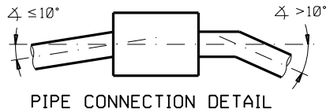


PLAN



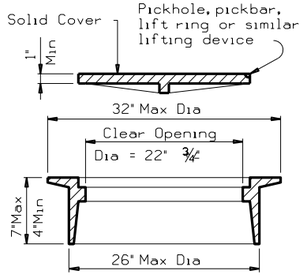
PREFABRICATED INLET

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



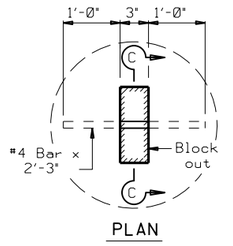
PIPE CONNECTION DETAIL

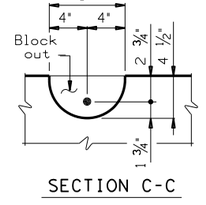
Connecting pipes should enter within 10° of normal to inlet wall. If necessary, pipe elbow or curved approach alignment should be used to stay within this limit.



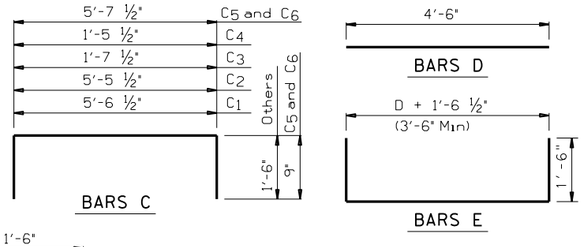
RING AND COVER DETAILS

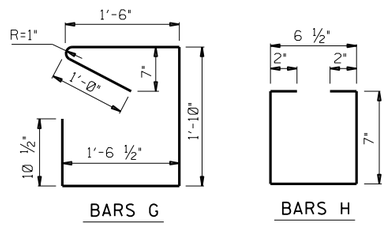
EJIW No V-1814 or Neenah No R5900-FTX





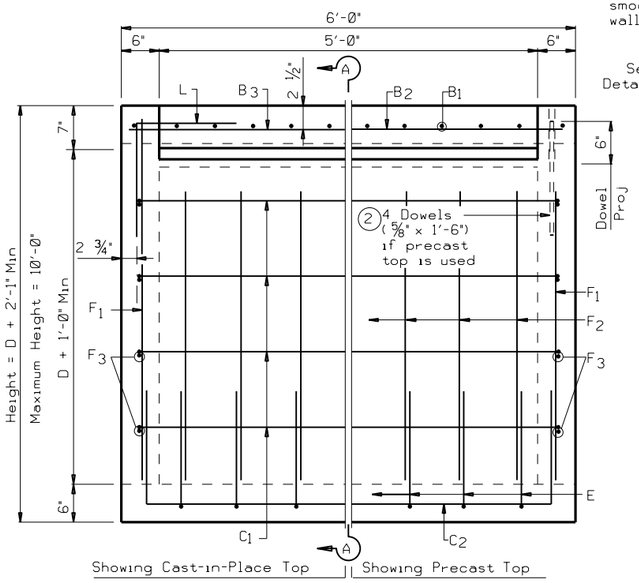
LIFTING CATCH





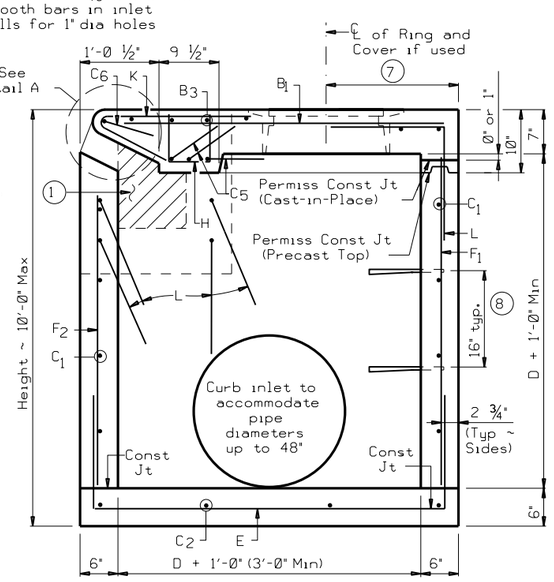
(9) As shown

REINF STEEL		
Bar	Size	Spacing
B1	#4	6"
B2	#5	6"
B3	#4	6"
C1-2	#4	12"
C3-4	#4	(9)
C5	#6	(9)
C6	#4	(9)
D	#4	(9)
E	#4	12"
F1-3	#4	12"
G	#4	6"
H	#3	4"
K	#4	9"
L	#4	6"



ELEVATION

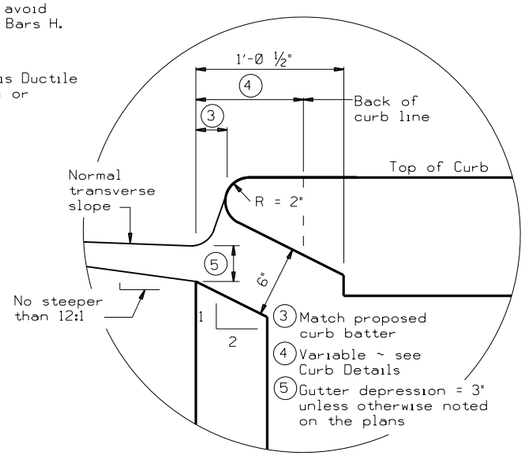
(2) If precast top is used, provide 4 ~ ⅝" dia x 1'-6" smooth bars in inlet walls for 1" dia holes



SECTION A-A

(7) 1'-6" Min, 1'-9" Max Adjust placement of Ring and Cover as necessary to avoid conflict with Bars H.

(8) Ladder rung is Ductile Iron, Aluminum or Cast Iron.



DETAIL A

GENERAL NOTES:

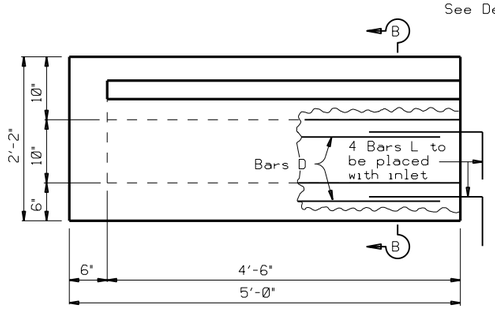
No alternate designs nor alternate details shall be permitted for precast or cast in place inlets.

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 are required for Precast Inlets.

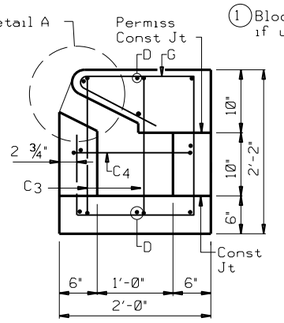
In areas of conflict between reinforcing steel, blockouts, pipes, anchor bolts or other reinforcing steel, the reinforcement shall be bent or adjusted to clear as directed by the Engineer.

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.

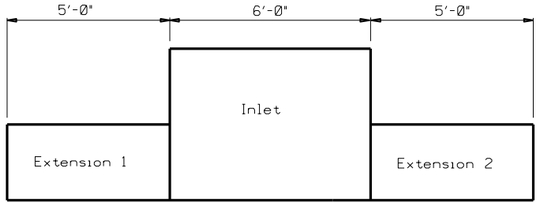


EXTENSION ELEVATION

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



SECTION B-B



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.

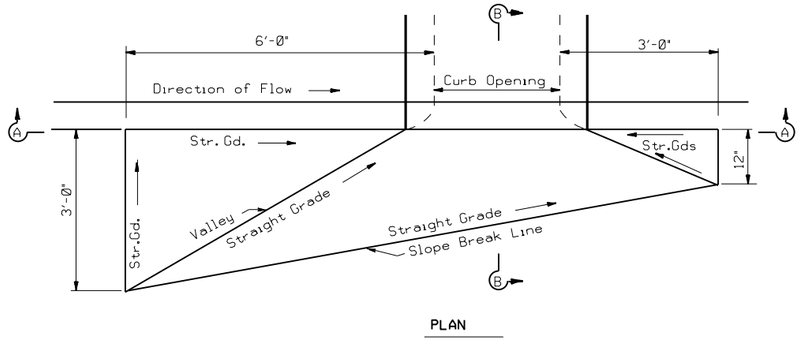
D = Diameter
R = Radius

Texas Department of Transportation
Houston District

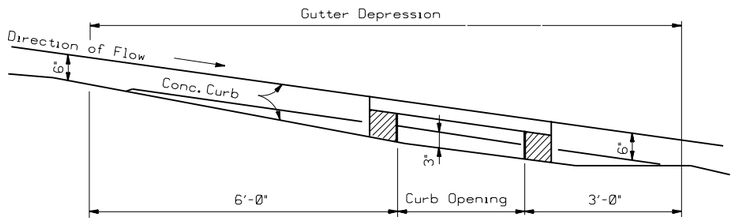
CURB INLET TYPE C
(WITH OR WITHOUT EXTENSION)

HIL-C

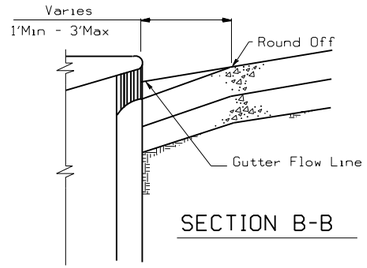
FILE: STDD1.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STD:	
© TxDOT Feb 2010	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS 2/2010 Added note concerning opening on the back of inlet. 10/2014 Removed Note 10	HOUS	6				181
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	HARRIS		3256	02	093	SL 8



PLAN

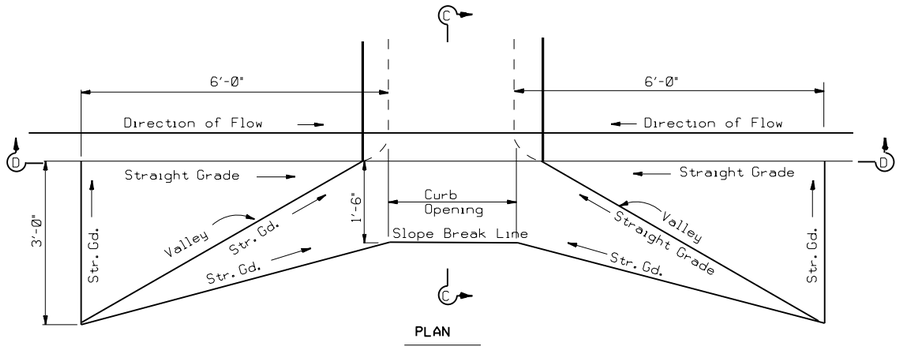


SECTION A-A

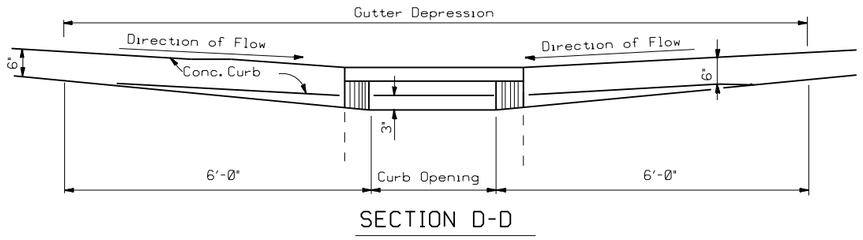


SECTION B-B

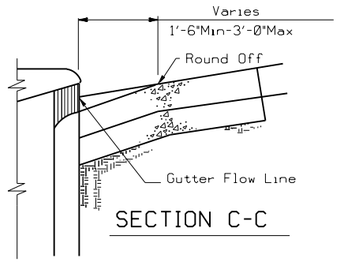
CURB INLET ON GRADE



PLAN



SECTION D-D



SECTION C-C

CURB INLET AT SAG

GENERAL NOTES:

Base Course under Concrete Pavement shall be full depth and shall conform to surface depression details.

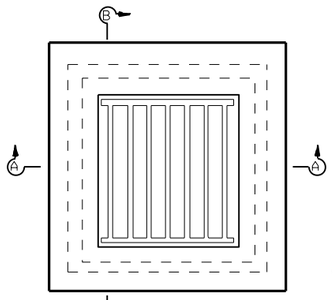
Texas Department of Transportation
Houston District

GUTTER DEPRESSION DETAILS FOR CURB INLETS

GD

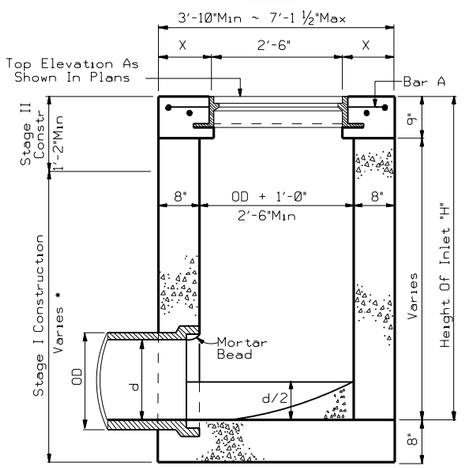
FILE: STDD12.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STD:	
© TxDOT Mar 2004	DIST	FED REG	PROJECT NO.			SHEET
REVISIONS	HOUS	6				182
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	HARRIS		3256	02	093	SL8

STDD12.DGN

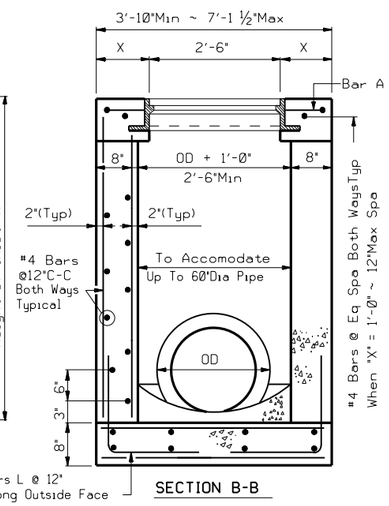


• But Not Less Than Six Inches Over Highest Entering Pipe.

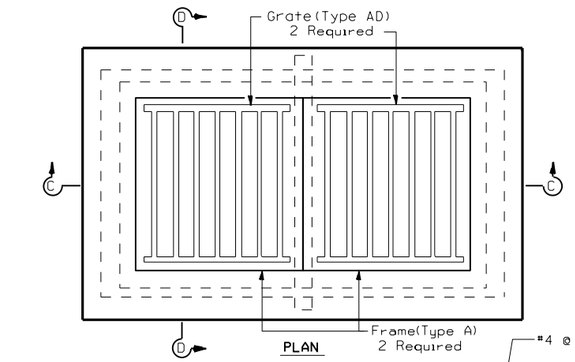
X = 8" Min to 3'-9" Max



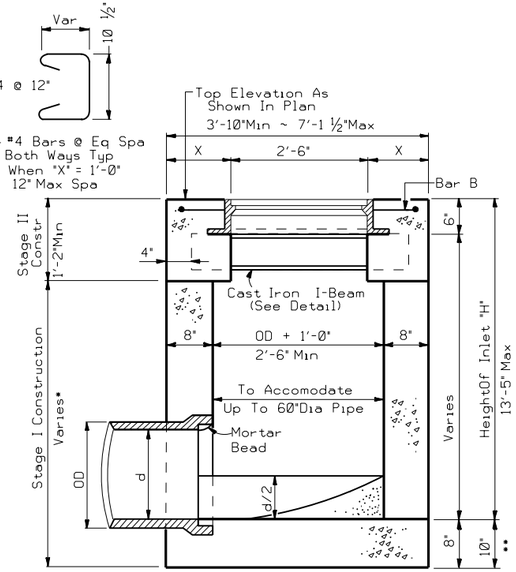
SECTION A-A



SECTION B-B



SECTION C-C



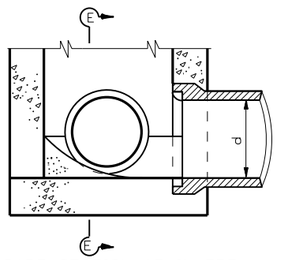
SECTION D-D

• But Not Less Than Six Inches Over Highest Entering Pipe.

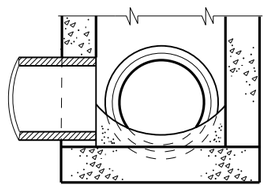
•• For Pipe Diameters 66" And Greater

INLET TYPE AD

INLET TYPE AAD

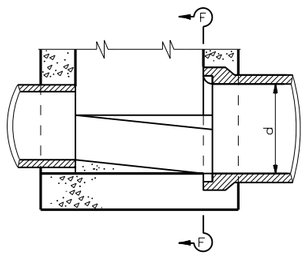


PART SECTION AT INVERT

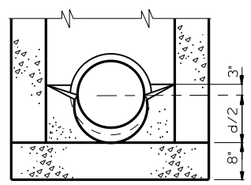


SECTION E-E

Showing Shaping Of Invert, Pipe Entering From Adjacent Sides

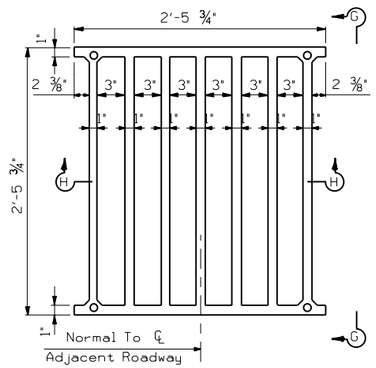


PART SECTION AT INVERT



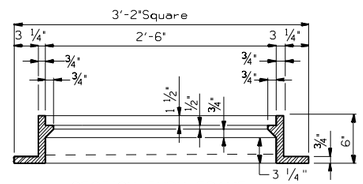
SECTION F-F

Showing Shaping Of Invert, Pipe Entering From Opposite Sides

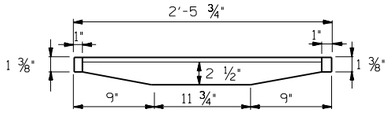


PLAN

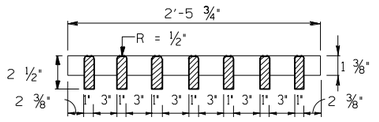
Provide 4 ~ Stainless Steel Hex Head Bolts per Grate



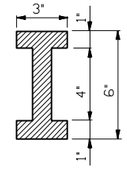
SECTION THRU FRAME



ELEVATION G-G



SECTION H-H



SECTION OF CAST IRON I-BEAM

FRAME AND GRATE

Type AD ~ Neenah No.3418 or EJIW No.V-4880-2
Type AAD ~ Neenah No.3418-2 or EJIW No.V-4881-2

d = Diameter
R = Radius

GENERAL NOTES:

Type AD Inlet contains a single frame with grate. Type AAD Inlet contains a double frame and double grate with an I-beam.

Frame and Grates may be gray cast iron.

The Furnishing And Installation Of Cast Iron I-Beams Shall Be Considered Incidental To Inlet (Compl) (Ty AAD) Or Inlet (Stage II) (Ty AAD) As The Case May Be.

Where Size Of Pipes Passing Thru Inlet Exceeds 30", Increase Inside Width To Diameter Of Pipe Plus 1'-0" (OD + 1'-0")

Cast Iron Manhole Steps (See Manhole Details) Spaced At 16" Centers And Located On Wall Specified By The Engineer Shall Be Provided And Installed Where "D" Exceeds 5'-0".

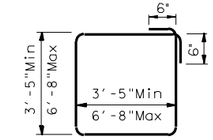
See Standard or Detail Sheet For Excavation and Backfill Diagrams.

Type AD & AAD Inlets Shall Be Built To Stage I And Finished After All Grading Operations Are Substantially Completed.

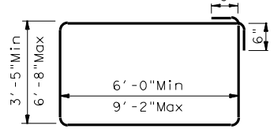
Shop Drawings Will Be Required For Precast Construction Of Inlets.

Upon installation of the grates the threads of the bolts shall be coated with thread lock type adhesive (Lockite or equal). Reapply thread lock adhesive each time grates are removed.

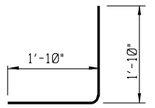
Bolted grates and frames are a matched set, do not unbolt without "Match Marking" so that grates and frames are re-installed as originally built.



BAR A (#4)



BAR B (#4)



BAR L (#4)

NOT FOR TRAFFIC LOADS

Texas Department of Transportation
Houston District

INLETS TYPE AD & AAD

HIL-AD/AAD

FILE: STDD5.DGN	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT	STD:	
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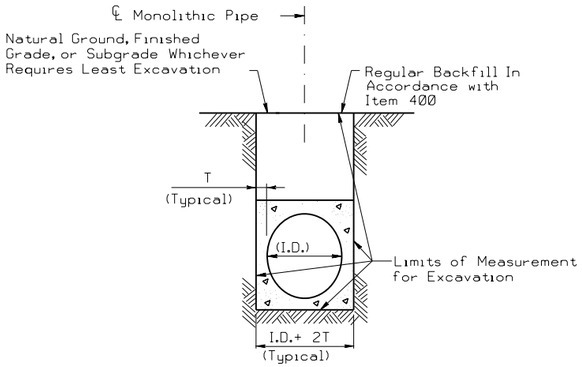
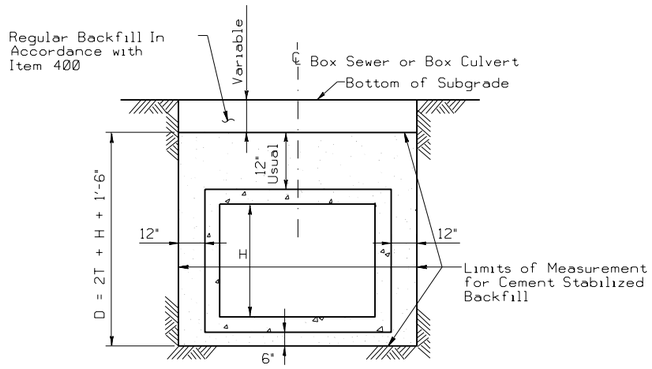
REVISIONS	HOUS	6				183
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	HARRIS		3256	02	093	SL8

STDD5.DGN



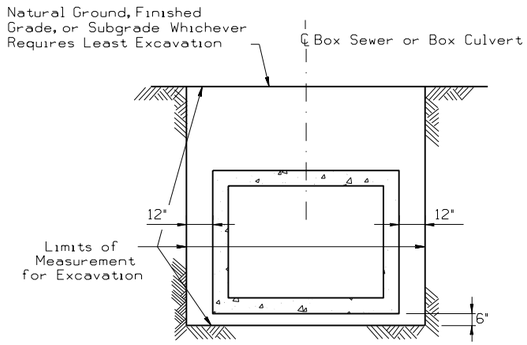
EXCAVATION DETAIL

MONOLITHIC PIPE
IN A PAVED OR GRADED AREA



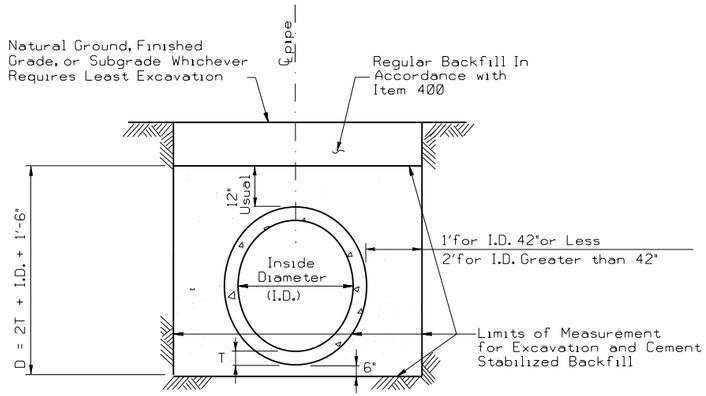
BACKFILL DETAIL

BOX CULVERTS
IN A GRADED OR PAVED AREA
INCLUDING DETOURS *



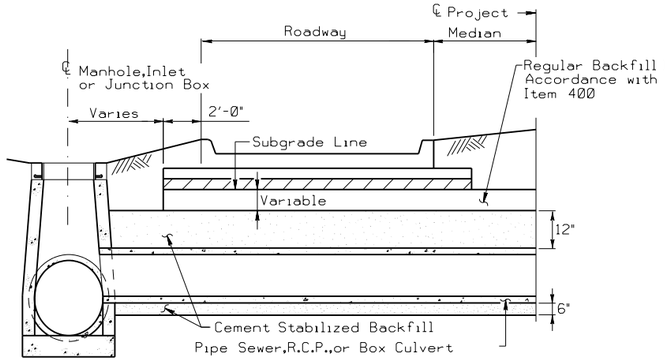
EXCAVATION DETAIL

BOX CULVERTS
IN A GRADED AREA



EXCAVATION & BACKFILL DETAIL

REINFORCED CONCRETE PIPE
IN A GRADED OR PAVED AREA
INCLUDING DETOURS



BACKFILL DETAIL

AT MANHOLE, INLET OR JUNCTION BOX

D = Depth
H = Height
T = Thickness
R = Radius
Dia = Diameter

REINFORCED CONCRETE PIPE

EXCAVATION AND BACKFILL QUANTITIES

PIPE DIA. IN.	T FT.	CULVERT OR SEWER EXCAVATION IN A PAVED OR GRADED AREA C.Y.PER L.F.PER FT.OF DEPTH	CEMENT STABILIZED BACKFILL IN A PAVED OR GRADED AREA C.Y.PER L.F. OF PIPE
18	0.19	0.144	0.383
24	0.23	0.165	0.478
30	0.29	0.188	0.586
36	0.33	0.210	0.692
42	0.38	0.231	0.808
48	0.42	0.327	1.394
54	0.46	0.349	1.560
60	0.50	0.370	1.731
66	0.54	0.392	1.907
72	0.58	0.414	2.088
78	0.62	0.435	2.275
84	0.67	0.457	2.474

MONOLITHIC PIPE

EXCAVATION QUANTITIES

PIPE DIA. IN.	T FT.	EXCAVATION C.Y.PER L.F.PER FT.OF DEPTH
36	0.417	0.142
42	0.458	0.164
48	0.458	0.182
54	0.500	0.204
60	0.583	0.228
66	0.583	0.247
72	0.625	0.269
78	0.625	0.287
84	0.625	0.306

NOTE:

Cement stabilized backfill may be omitted in private driveways as indicated elsewhere in the plans.

Rubber gaskets shall be required for all joints on proposed cross drainage, pipe culverts and proposed storm sewer systems, unless otherwise shown in the plans.

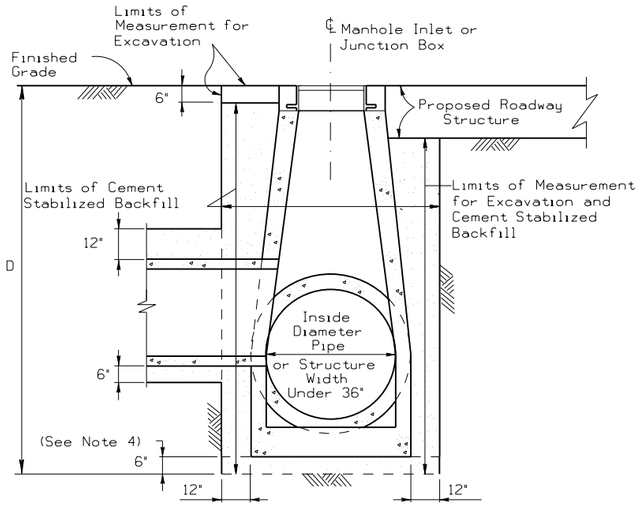
* Backfill with cement stabilized material will be required for all structures under detours unless noted otherwise in the General Notes.

Texas Department of Transportation
Houston District

EXCAVATION AND BACKFILL DIAGRAMS

E&BD

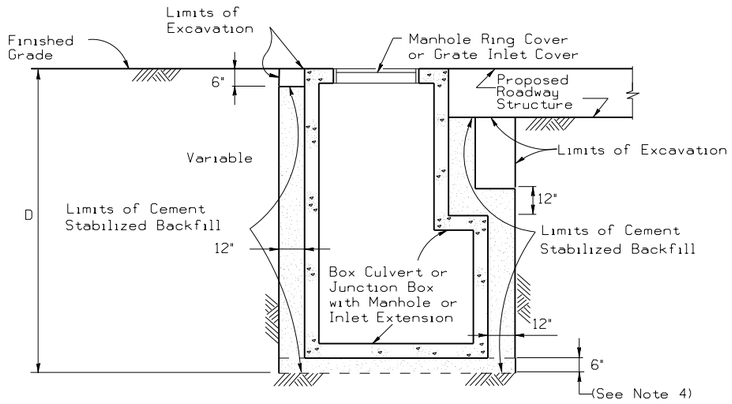
FILE: STDE1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
© TxDOT FEB 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REVISED 11/05 REVISED 2/2010 Added note to Table 1,Sht 2 of 2. REVISED 6/12 REVISED 9/14	HOUSTON	6		184
	COUNTY		CONTROL SECT JOB	HIGHWAY
	HARRIS		3256 02 093	SL8



EXCAVATION AND BACKFILL DETAIL

MANHOLES SMALLER THAN 36 IN.
IN A PAVED OR GRADED AREAS

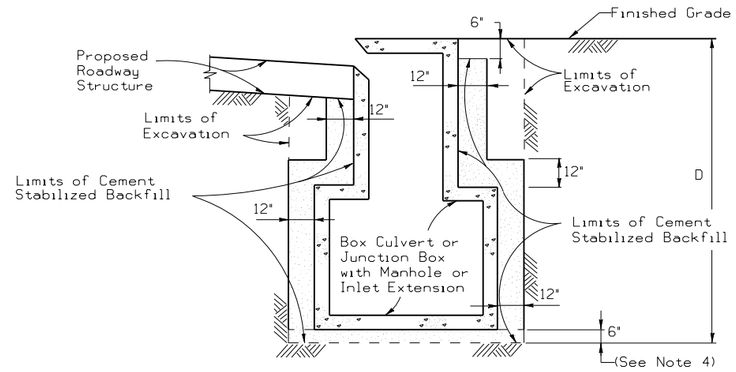
N.T.S.



EXCAVATION AND BACKFILL DETAIL

JUNCTION BOXES IN A
PAVED OR GRADED AREA

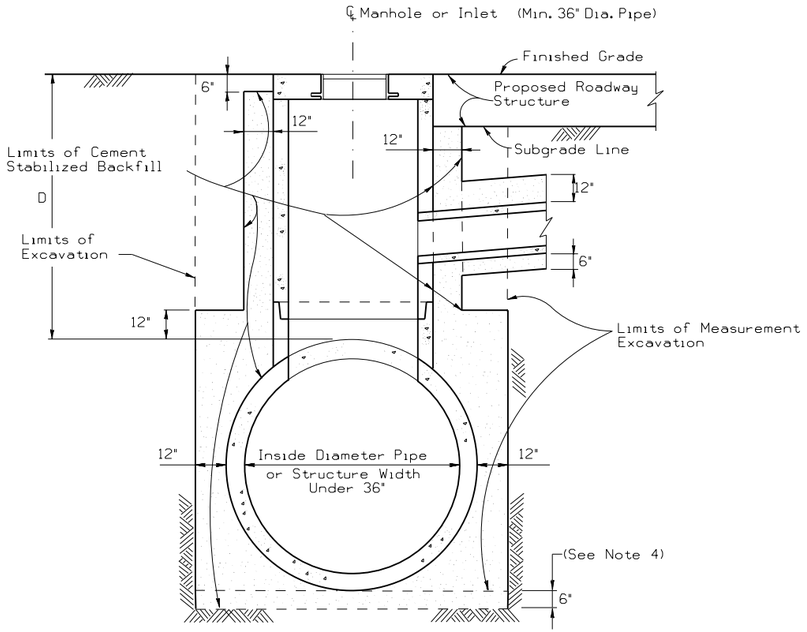
N.T.S.



EXCAVATION AND BACKFILL DETAIL

INLET EXTENSIONS ON A BOX CULVERT
IN A PAVED OR GRADED AREA

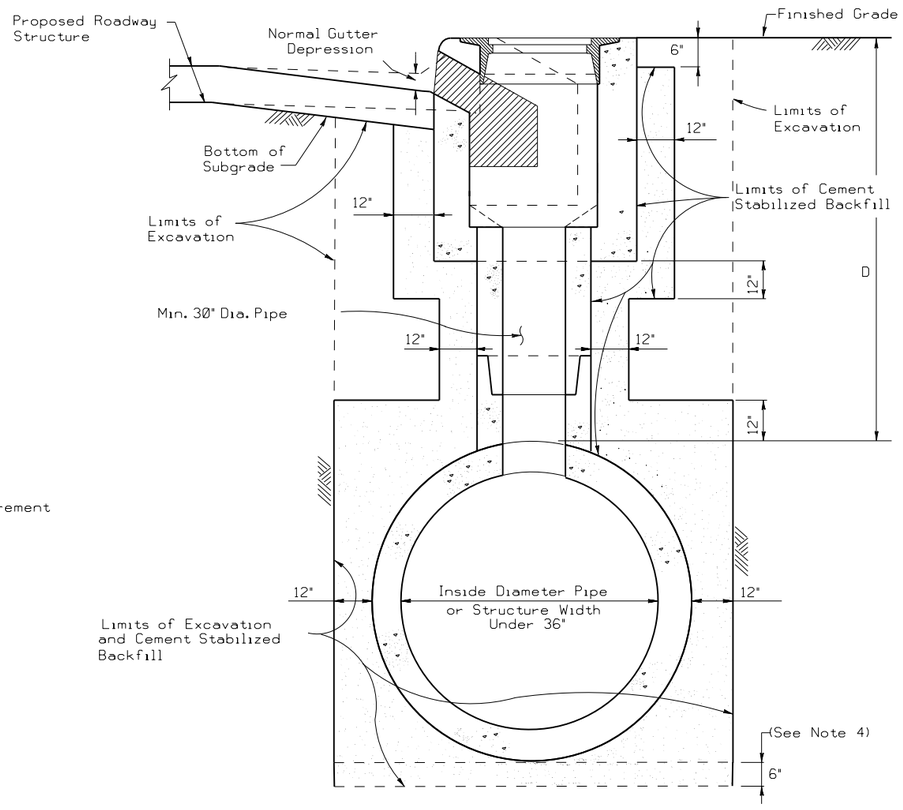
N.T.S.



EXCAVATION AND BACKFILL DETAIL

MANHOLES 36 IN. AND GREATER
IN A PAVED OR GRADED AREA

N.T.S.



EXCAVATION AND BACKFILL DETAIL

CURB INLETS IN A PAVED OR GRADED AREA

N.T.S.

D = Depth
H = Height
T = Thickness
R = Radius
Dia = Diameter

TABLE 1

SCHEDULE FOR PAY QUANTITIES OF CEMENT STABILIZED BACKFILL (SEE NOTE 1)

MANHOLE OR INLET DEPTH (D) IN FEET	CEMENT STABILIZED BACKFILL IN CUBIC YARDS
0 through 5	5.75
> 5 through 10	8.25
greater than 10	12.75

TO BE PAID UNDER ITEM 400-6009 CEMENT STABILIZED BACKFILL (INLET OR MANHOLE)

NOTES:

1. The Contractor is paid a fixed estimated amount for cement stabilized backfill based on depth (D) and Table. 1.
2. Proposed roadway structure includes pavement, base and any subgrade.
3. For backfill of intersecting pipes and box culverts, see "Excavation and Backfill Diagram for Pipes and Box Culverts."
4. 6" cement stabilized backfill will be required only for precast units.

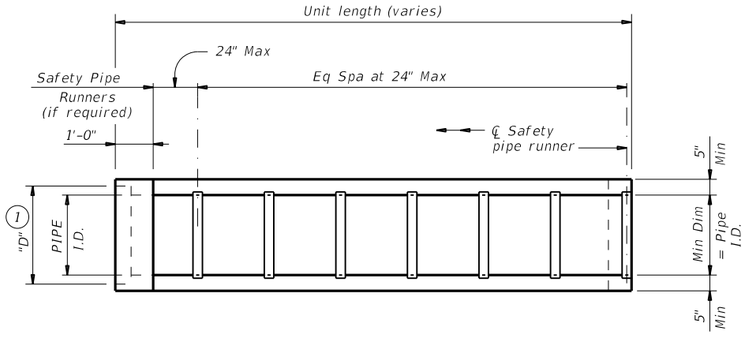
Texas Department of Transportation
Houston District

EXCAVATION AND BACKFILL DIAGRAMS

E&BD

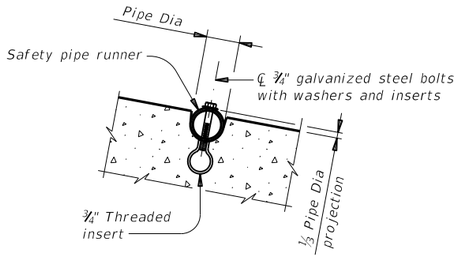
FILE: STDE1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
© TxDOT FEB 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REVISED 2/2010 Added note to Table 1. REVISED 6/12 REVISED 9/14 REVISED 3/15	HOUSTON	6		185
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HARRIS	3256	02	093	SL8

DATE:
FILE:



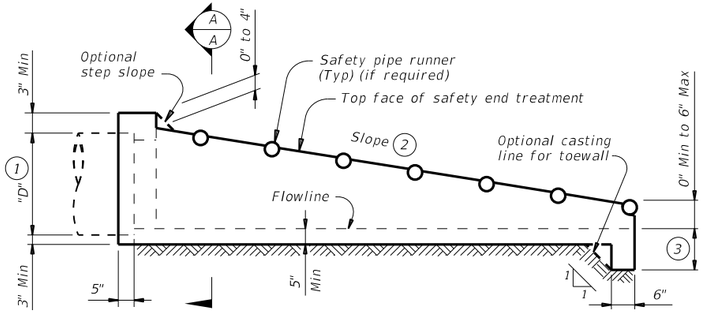
PLAN

(Showing bell end connection.)



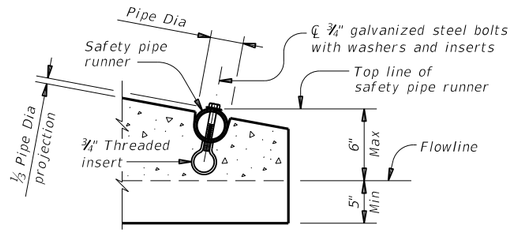
INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

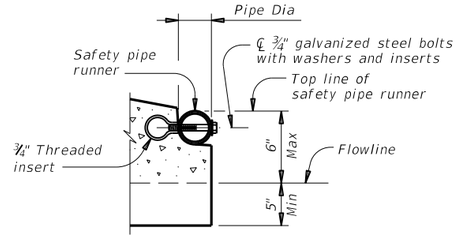


LONGITUDINAL ELEVATION

(Showing bell end connection.)



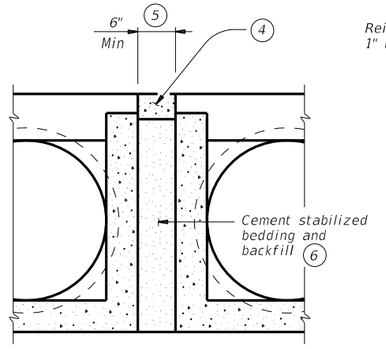
OPTION A



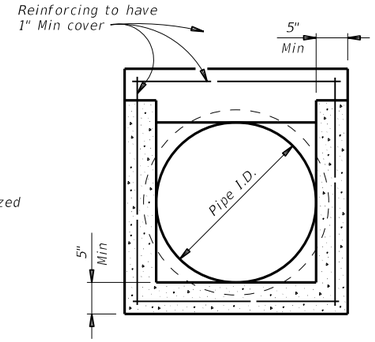
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

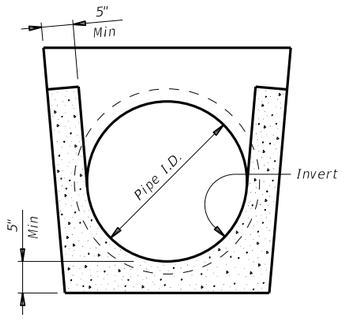
(If required)



MULTIPLE PIPE INSTALLATION

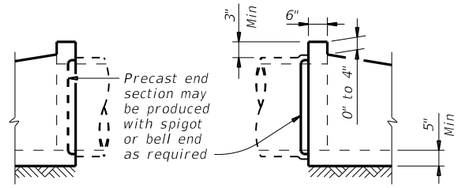


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' – 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	1.30"	20.50"	6:1	6' – 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' – 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' – 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' – 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' – 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	2.7"	52.50"	6:1	21' – 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" – D12 x D12 or 5"x5" – D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See Pipe and Box Grouted Connections (PBGC) standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

FILE: psetspss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	12	HARRIS		185A

HOUSTON PIPELINE 24" NATL GAS PIPELINE

KINDER MORGAN TEJAS 30" NATL GAS PIPELINE

ENTERPRISE PRODUCTS 12"GENCO GAS PIPELINE

SEMINOLE 14" PRODUCTS PIPELINE

KINDER MORGAN TEJAS 30" NATL GAS PIPELINE

HOUSTON PIPELINE 24

KINDER MORGAN TEJAS

ENTERPRISE PRODUCTS

SEMINOLE 14" PRODUC

KINDER MORGAN TEJAS

N

JN

DETECT AMP
CBNT & FDN

TXDOT (1)2"&(2)3"
PVC TRAF LOOP CND

WBFRTG. RD.

80+00

TXDOT (2)2" PVC TRAF LOOP CND

TXDOT (2)2" PVC TRA

ILT

MH

FOL

EXIST 30" RCP

POLE
2" PVC
OOP CND

TXDOT 2" PVC TRAF LOOP CND

℄ SL 8

1805+00

CBNT & FDN
XDOT 2" PVC TRAF LOOP CND

MH

EXIST 36" RCP

EXIST 36" RCP

STA. 84+75.00 MATCHLINE

LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

DATE:3/15/2023
$FILEL$

Texas Department of Transportation

SL 8

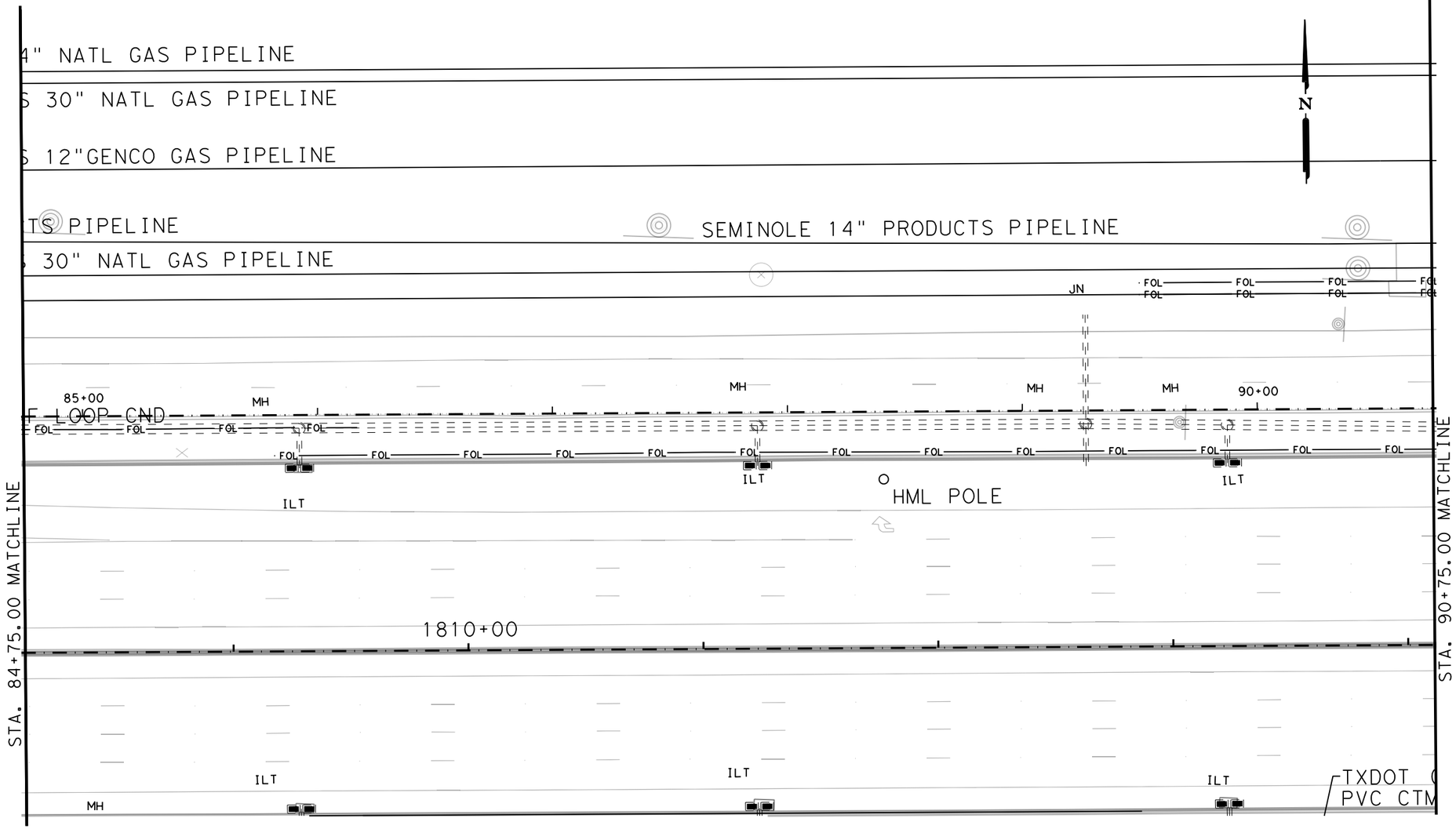
WB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 1 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			186
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8



LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

Texas Department of Transportation

SL 8

WB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 2 OF 4

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			187
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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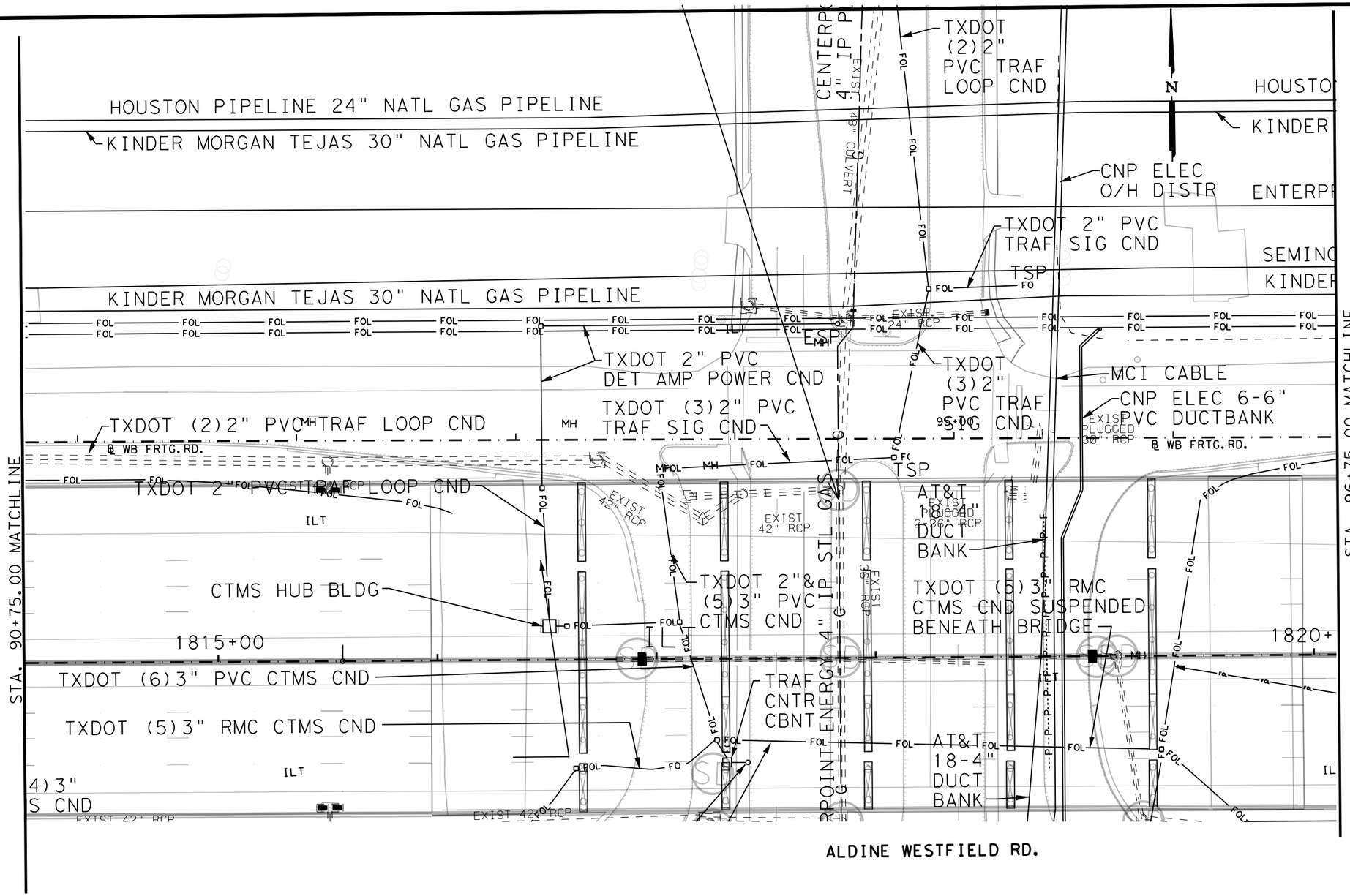


LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

Texas Department of Transportation

SL 8

WB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 3 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			188
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

N PIPELINE 24" NATL GAS PIPELINE

MORGAN TEJAS 30" NATL GAS PIPELINE

I (11' FROM EOP)

HCTRA FIBER

RISE PRODUCTS 12"GENCO GAS PIPELINE

TURYLINK

LEENATURPRODUCTS PIPELINE

R MORGAN TEJAS 30" NATL GAS PIPELINE

STA. 96+75.00 MATCHLINE

EXIST 24" RCP

EXIST 24" RCP

JN

℄ WB FRTG.RD.

TXDOT 3" PVC CMS/TRAF LOOP CND

TXDOT 2" PVC CMS/TRAF LOOP CND

℄ WB FRTG.RD.

MH

EXIST 42" RCP

ILT

HML POLE O

EXIST 42" RCP

SL 8

00

1825+00

TXDOT 3" PVC
CMS/TRAF LOOP CND

EXIT SIGN

LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

DATE: 3/15/2023
$FILEL$

Texas Department of Transportation

SL 8

WB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 4 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			189
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

TWAY 8

℄ SL 8

1795+00

N

MCI

FOL

TXDOT (4)3" PVC CTMS CND

(4)3" PVC CTMS CND

3" PVC & (2)4" MULTIDUCT

MH

JN

TXDOT

70+00

EBFRTG. RD.

HC (2)3" PVC & (2)4" MULTIDUCT
W/IN 12" STL CASING

ZAYO 4-1.5" HDPE

16-4" AT&T/SBC DUCTS

EXIST 24" RCP

DETECT AMP
CBNT & FDN

HC (2)
TXDOT (
FTM LOC
ZA
ESP
CE

GASOLINE/JET FUEL/DIESEL PIPELINE

SUNOCO 12" GASOLINE/JET FUEL/DIESEL PIPELINE

AT&T
MH
9654

STA. 74+75.00 MATCHLINE

LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

DATE: 3/15/2023
$FILEL$

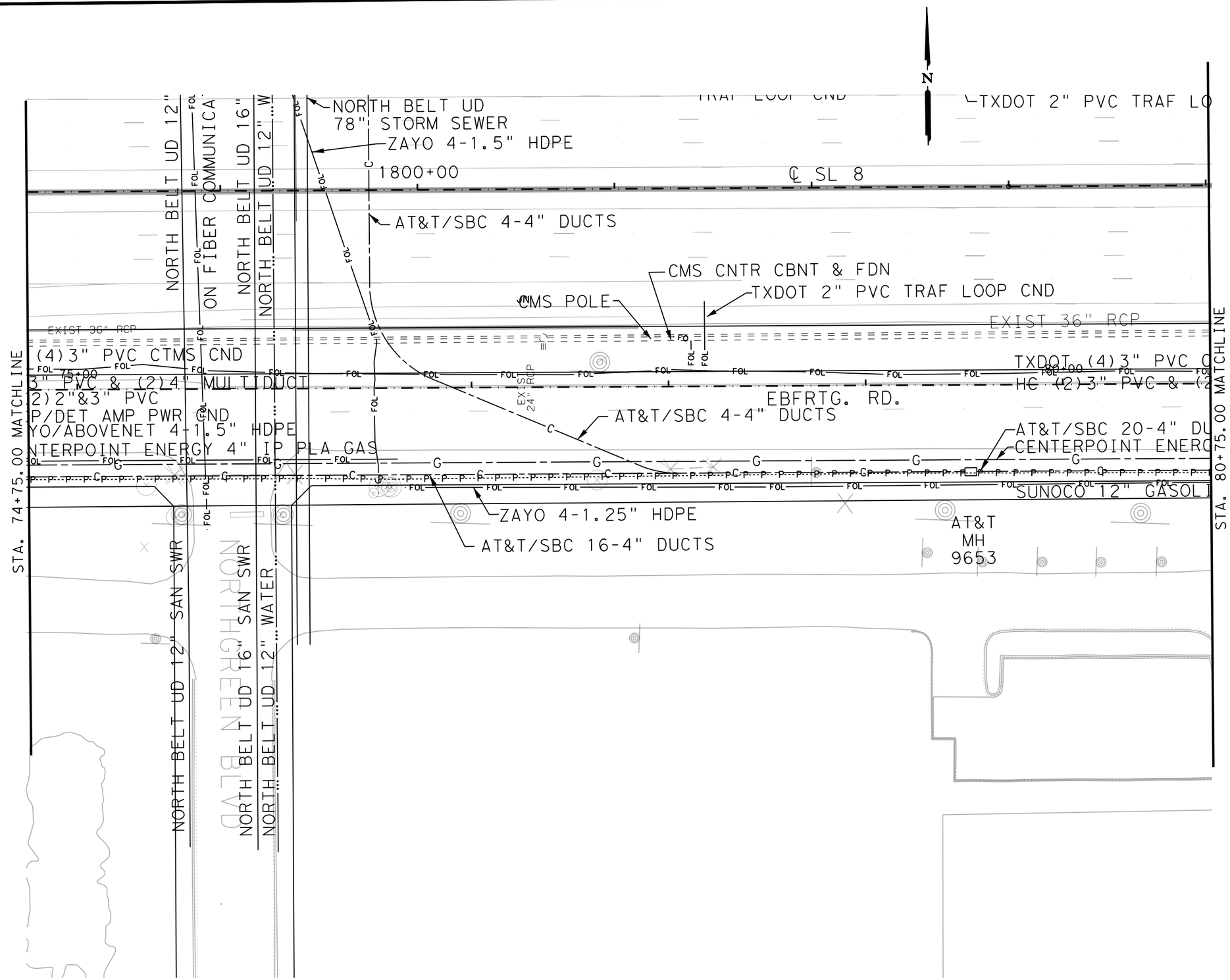
Texas Department of Transportation

SL 8
EB FRONTAGE RD.
EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 1 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			190
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8



LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

Texas Department of Transportation

SL 8

EB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 2 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			191
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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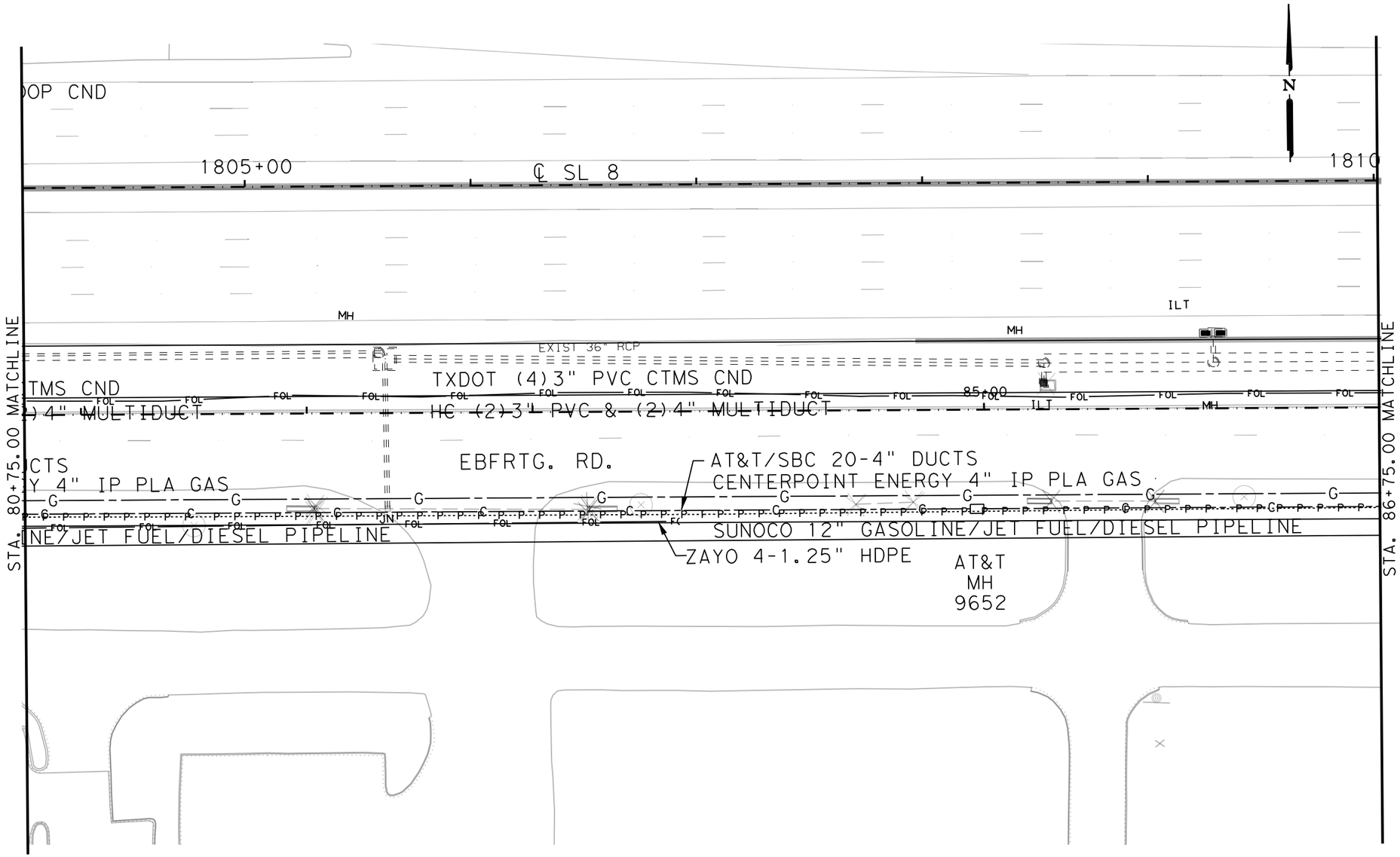


LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

Texas Department of Transportation

SL 8

EB FRONTAGE RD.

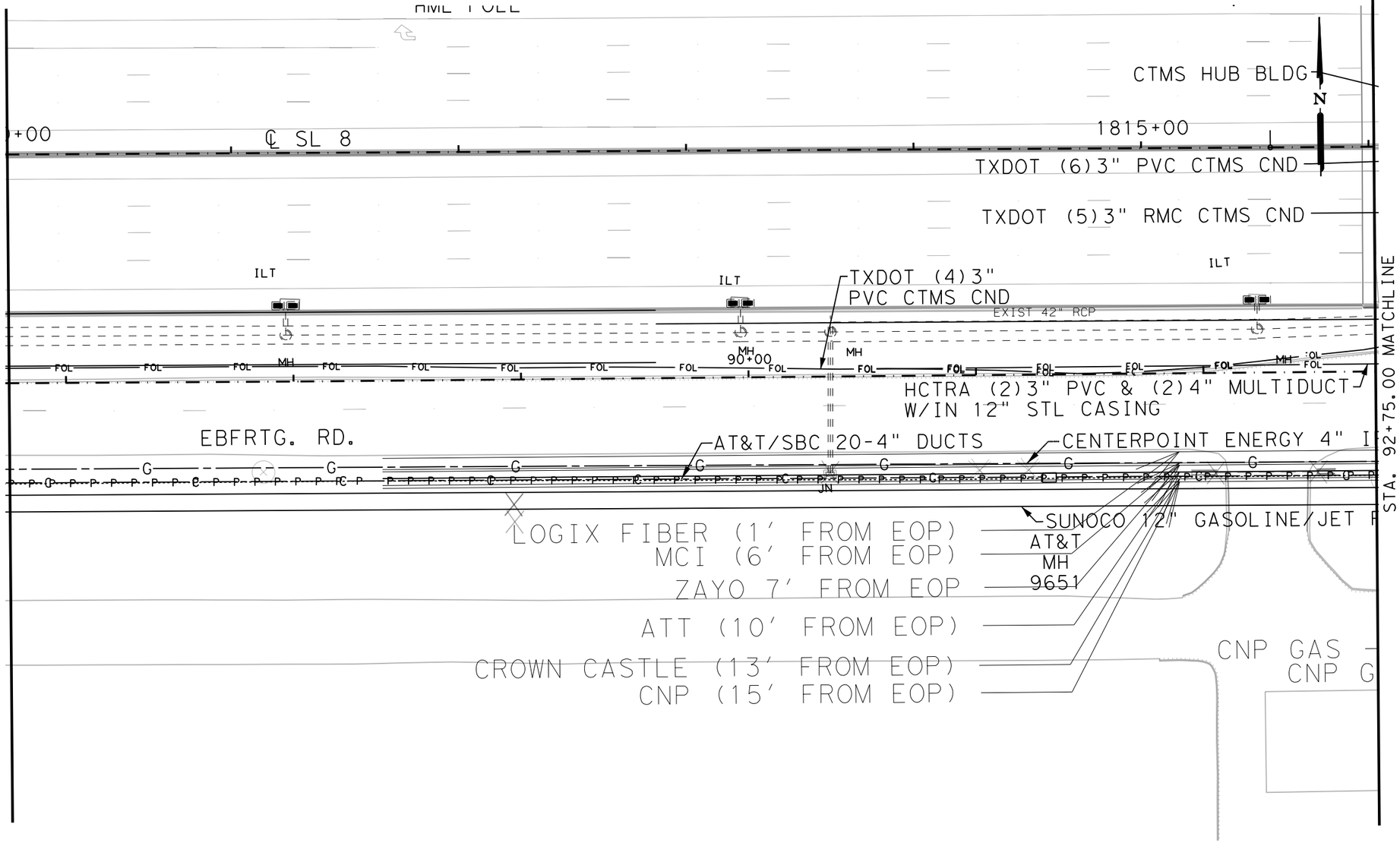
EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 3 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			192
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

Texas Department of Transportation

SL 8

EB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 4 OF 7

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			193
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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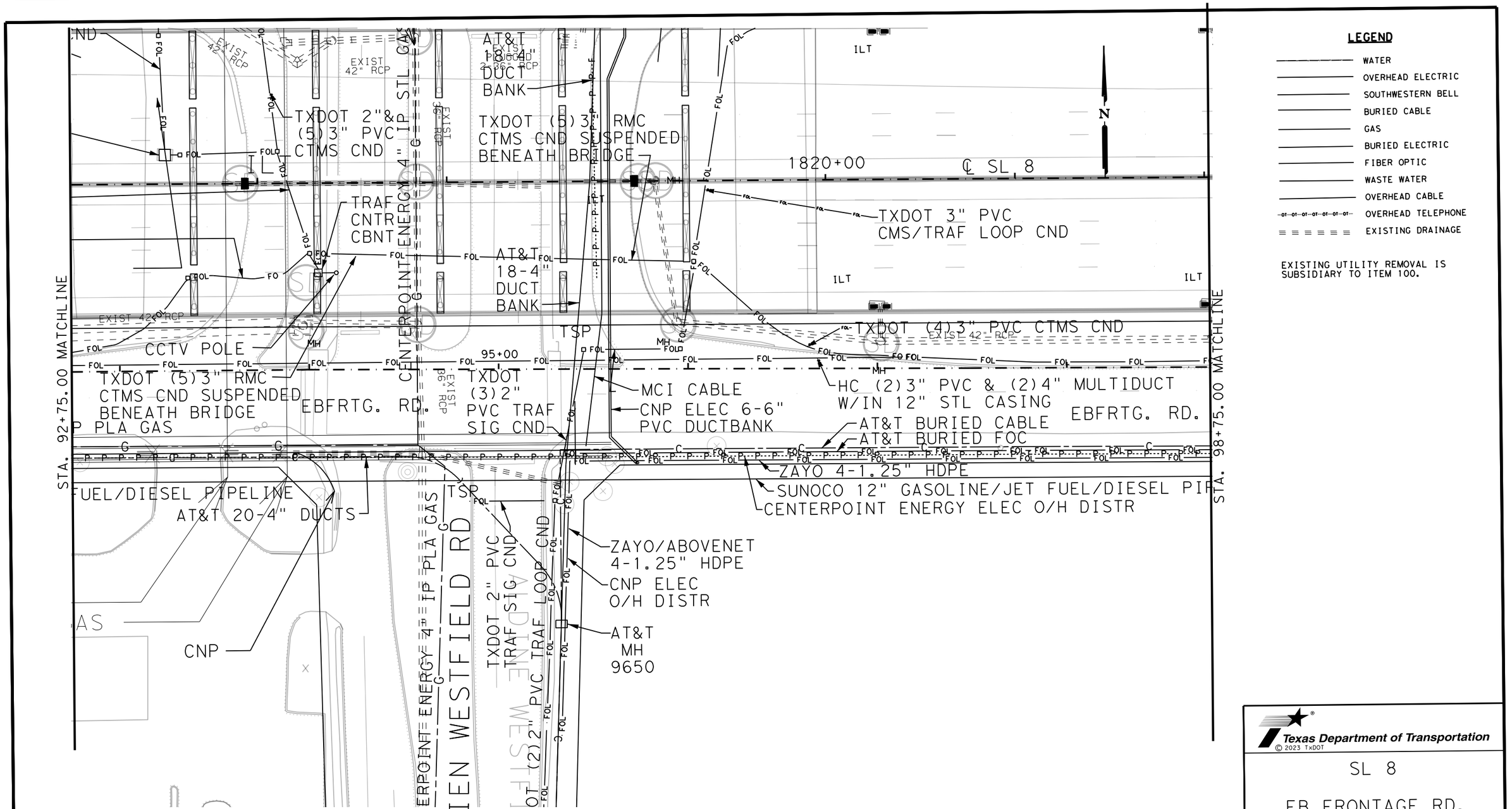


DATE: 3/15/2023
$FILEL$

Texas Department of Transportation

SL 8

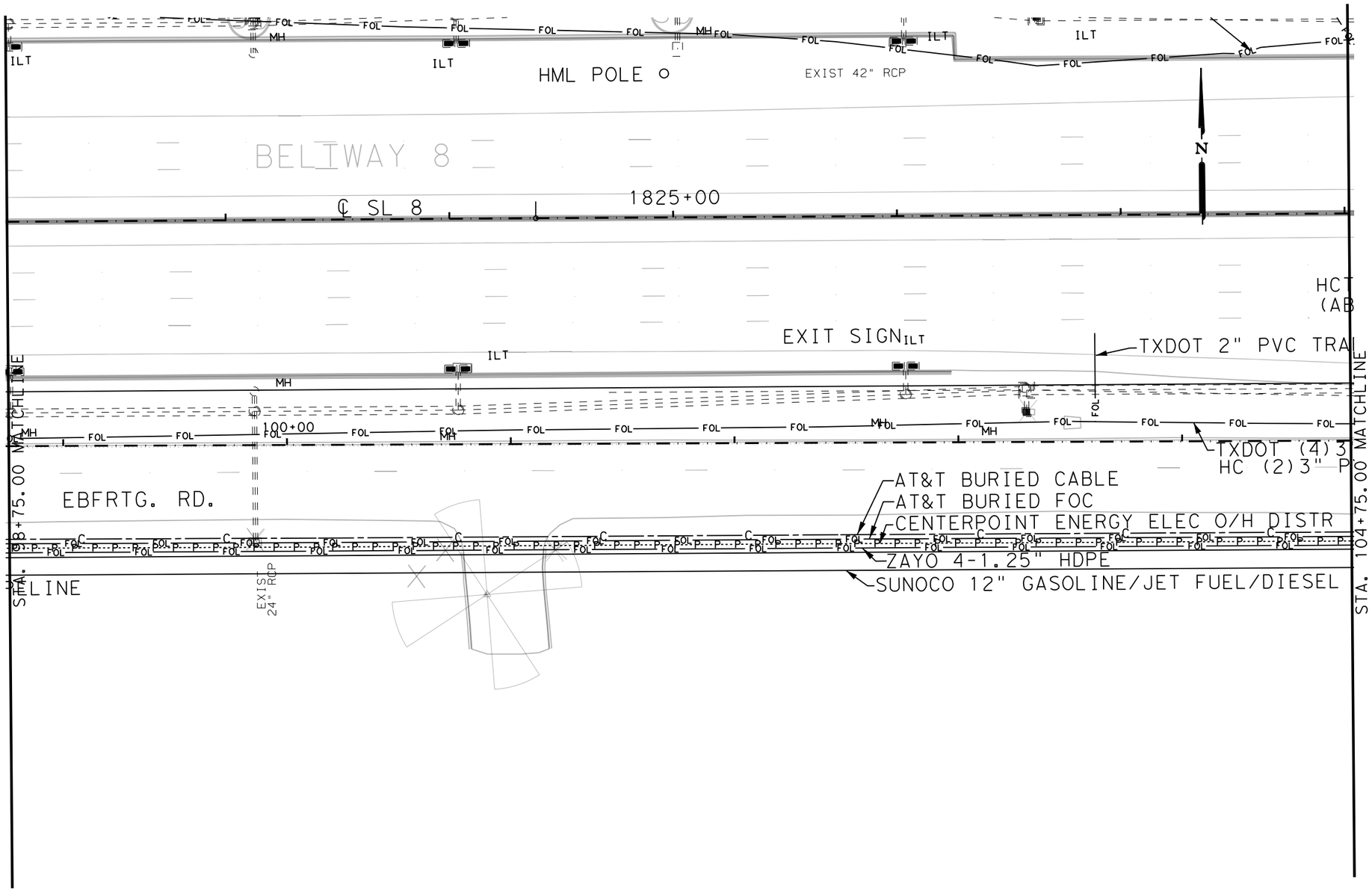
EB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 5 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			194
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8



LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

DATE: 3/15/2023
$FILEL$

Texas Department of Transportation

SL 8

EB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 6 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			195
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

N

SL 8

1830+00

SL 8

TRA CONDUIT
BANDONED)

F LOOP CND

EXIST 42" RCP

105+00

PVC CTMS CND &
VC & (2)4" MULTIDUCT

EBFRTG. RD.

STA. 104+75.00 MATCHLINE

PIPELINE

ILT-N14

ST-N14B

EXIST 18" RCP

ST-N14A

EXIST 18" RCP

TXDOT 2" PVC CMS/TRAF LOOP CND

ST-N14C

EXIST 18" RCP

MH-S17-1

ILT-S17A

MH-S17-2

ILT-S17

ILT-S18

EXIST 18" RCP

EXIST 18" RCP

ILT-S19A

MH-S18A

110+00

EXIST 18" RCP

EXIST 24" RCP

TXDOT (4)3" PVC CTMS CND &
HC (2)3" PVC & (2)4" MULTIDUCT

JUNCTION

MH-S19A

AT&T BURIED CABLE
AT&T BURIED FOC

ZAYO 4-1.25" HDPE

SUNOCO 12" GASOLINE/JET FUEL/DIESEL PIPELINE

CENTERPOINT ENERGY ELEC O/H DISTR

LEGEND

- WATER
- OVERHEAD ELECTRIC
- SOUTHWESTERN BELL
- BURIED CABLE
- GAS
- BURIED ELECTRIC
- FIBER OPTIC
- WASTE WATER
- OVERHEAD CABLE
- OVERHEAD TELEPHONE
- EXISTING DRAINAGE

EXISTING UTILITY REMOVAL IS SUBSIDIARY TO ITEM 100.

DATE: 3/15/2023
$FILEL$

Texas Department of Transportation

SL 8

EB FRONTAGE RD.

EXISTING UTILITIES

SCALE: 1" = 50' HORZ

SHEET 7 OF 7

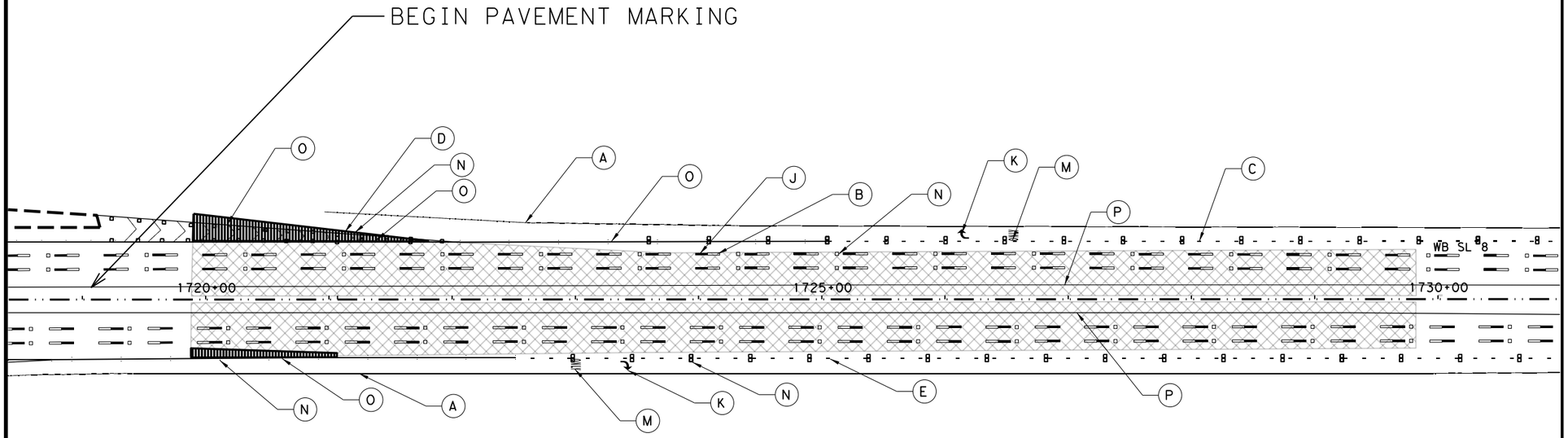
FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			196
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

N



STA. 1731+00.00 MATCHLINE

Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

The seal appearing on this document was authorized by DANIEL THOMPSON, P.E. 122541 on 03/15 ,2023 .
Alteration of a sealed document without proper notification to the responsible engineer is an offense under the Texas Engineering Practice Act.

Texas Department of Transportation

SL 8

PAVEMENT & SIGNS LAYOUT

SCALE: 1" = 50' HORZ

SHEET 1 OF 2

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			197
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

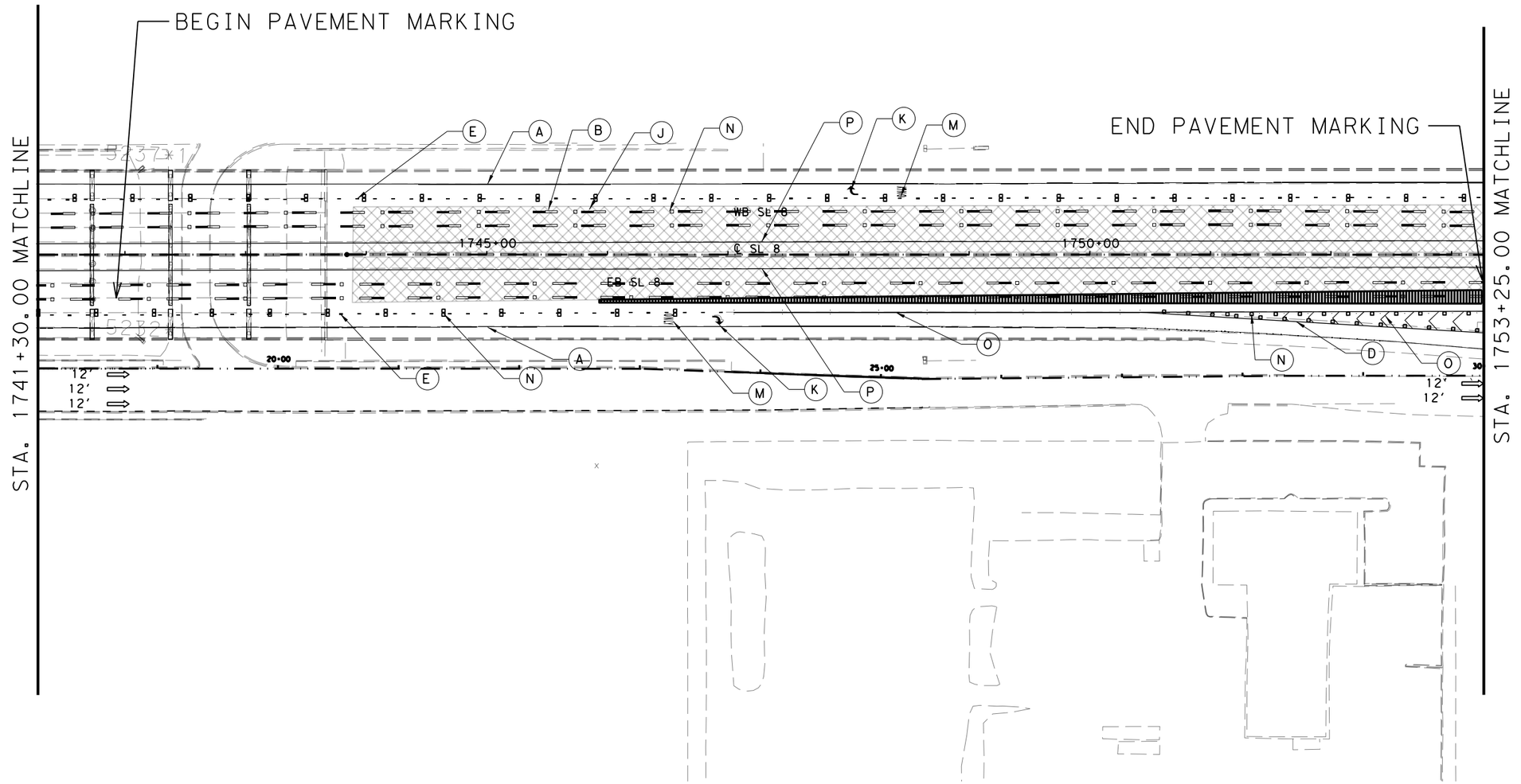
DATE: 3/15/2023
$FILEL$

LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

N



Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8

PAVEMENT & SIGNS LAYOUT

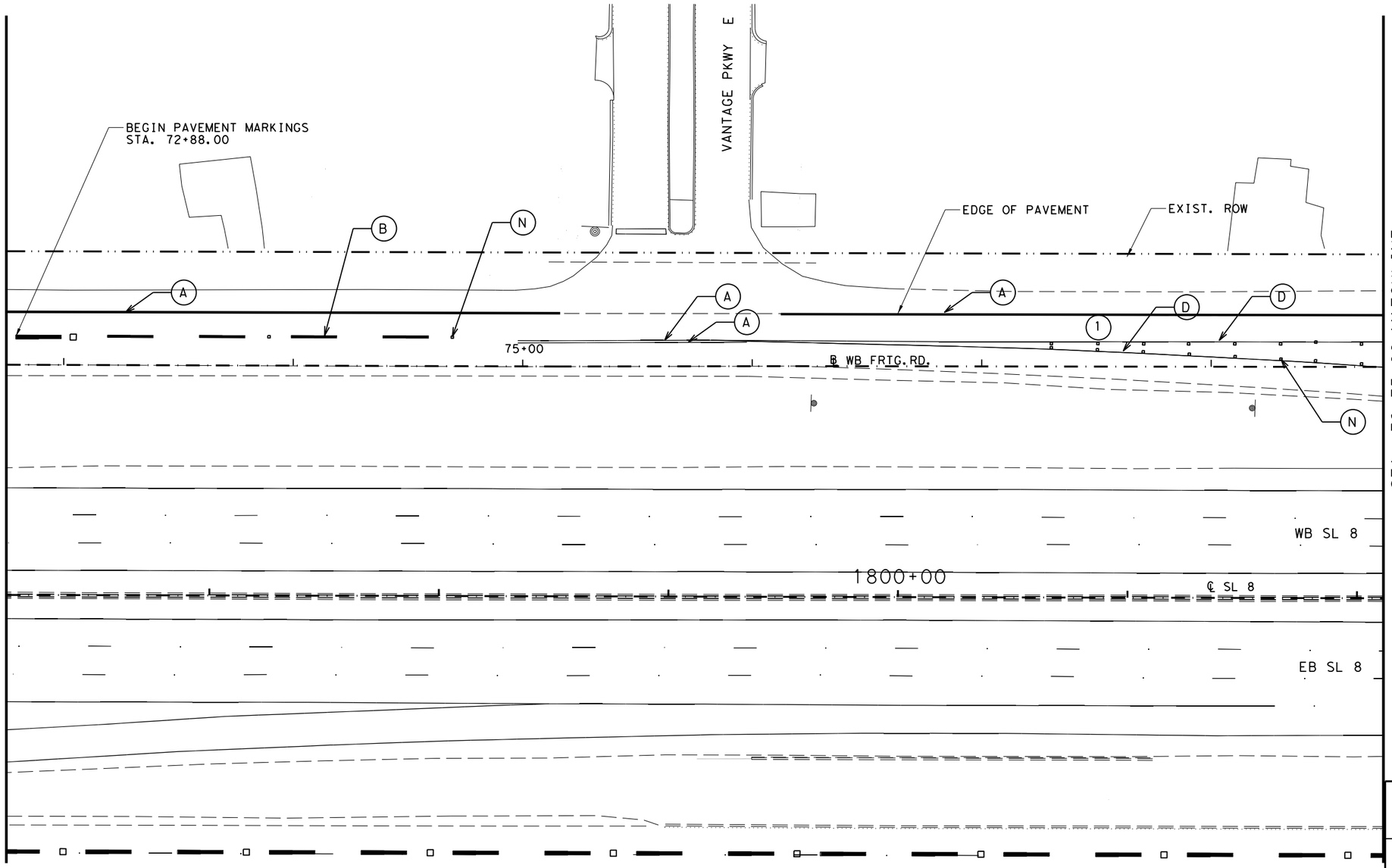
SCALE: 1" = 50' HORZ

SHEET 2 OF 2

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		198

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
$FILEL$



A MULTIPOLYMER PAV MRK (W)(6")(SLD)
B MULTIPOLYMER PAV MRK (W)(6")(BRK)
C MULTIPOLYMER PAV MRK (W)(6")(DOT)
D MULTIPOLYMER PAV MRK (W)(8")(SLD)
E MULTIPOLYMER PAV MRK (W)(12")(LNDP)
F MULTIPOLYMER PAV MRK (W)(24")(SLD)
G REFL PAV MRKR TY I-A

H MULTIPOLYMER PAV MRK (Y)(8")(SLD)
I MULTIPOLYMER PAV MRK (Y)(12")(SLD)
J MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
K PREFAB PAV MRK TY B (W)(ARROW)
L PREFAB PAV MRK TY B (W)(DBL ARROW)
M PREFAB PAV MRK TY B (W)(WORD)
N REFL PAV MRKR TY II-CR
O MULTIPOLYMER PAV MRK (W)(12")(SLD)
P MULTIPOLYMER PAV MRK (Y)(6")(SLD)

DATE: 3/15/2023
$FILEL$

STATE OF TEXAS
DANIEL DUKE THOMPSON
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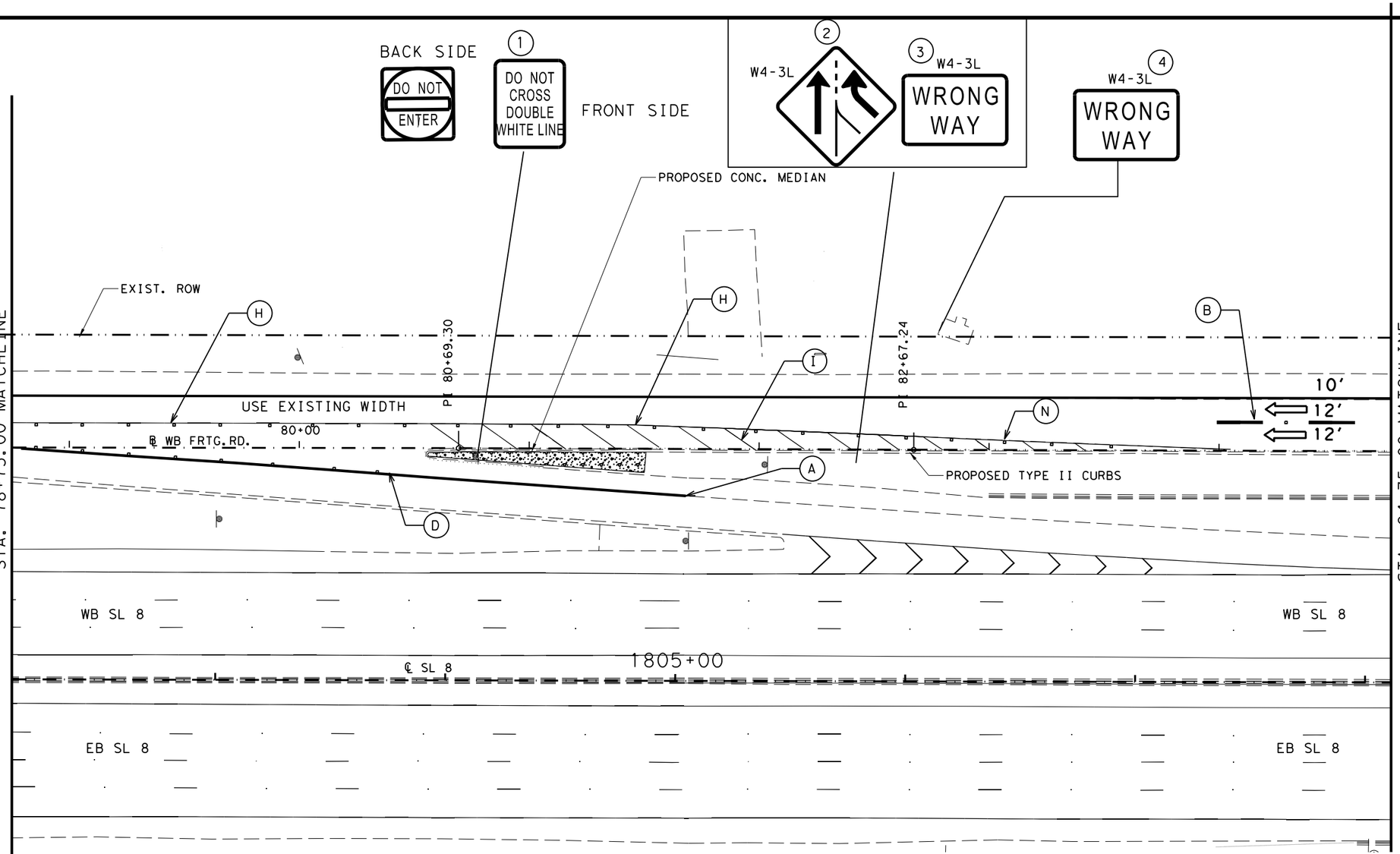
SL 8
WB FRONTAGE ROAD

SIGN & PAVEMENT MARKING LAYOUT

SHEET 1 OF 6

SCALE: 1" = 50' HORZ

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			199
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8



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A MULTIPOLYMER PAV MRK (W)(6")(SLD)
B MULTIPOLYMER PAV MRK (W)(6")(BRK)
C MULTIPOLYMER PAV MRK (W)(6")(DOT)
D MULTIPOLYMER PAV MRK (W)(8")(SLD)
E MULTIPOLYMER PAV MRK (W)(12")(LNDP)
F MULTIPOLYMER PAV MRK (W)(24")(SLD)
G REFL PAV MRKR TY I-A

H MULTIPOLYMER PAV MRK (Y)(8")(SLD)
I MULTIPOLYMER PAV MRK (Y)(12")(SLD)
J MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
K PREFAB PAV MRK TY B (W)(ARROW)
L PREFAB PAV MRK TY B (W)(DBL ARROW)
M PREFAB PAV MRK TY B (W)(WORD)
N REFL PAV MRKR TY II-CR
O MULTIPOLYMER PAV MRK (W)(12")(SLD)
P MULTIPOLYMER PAV MRK (Y)(6")(SLD)

Texas Department of Transportation

SL 8
WB FRONTAGE ROAD

SIGN & PAVEMENT MARKING LAYOUT

SHEET 2 OF 6

SCALE: 1" = 50' HORZ

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		200

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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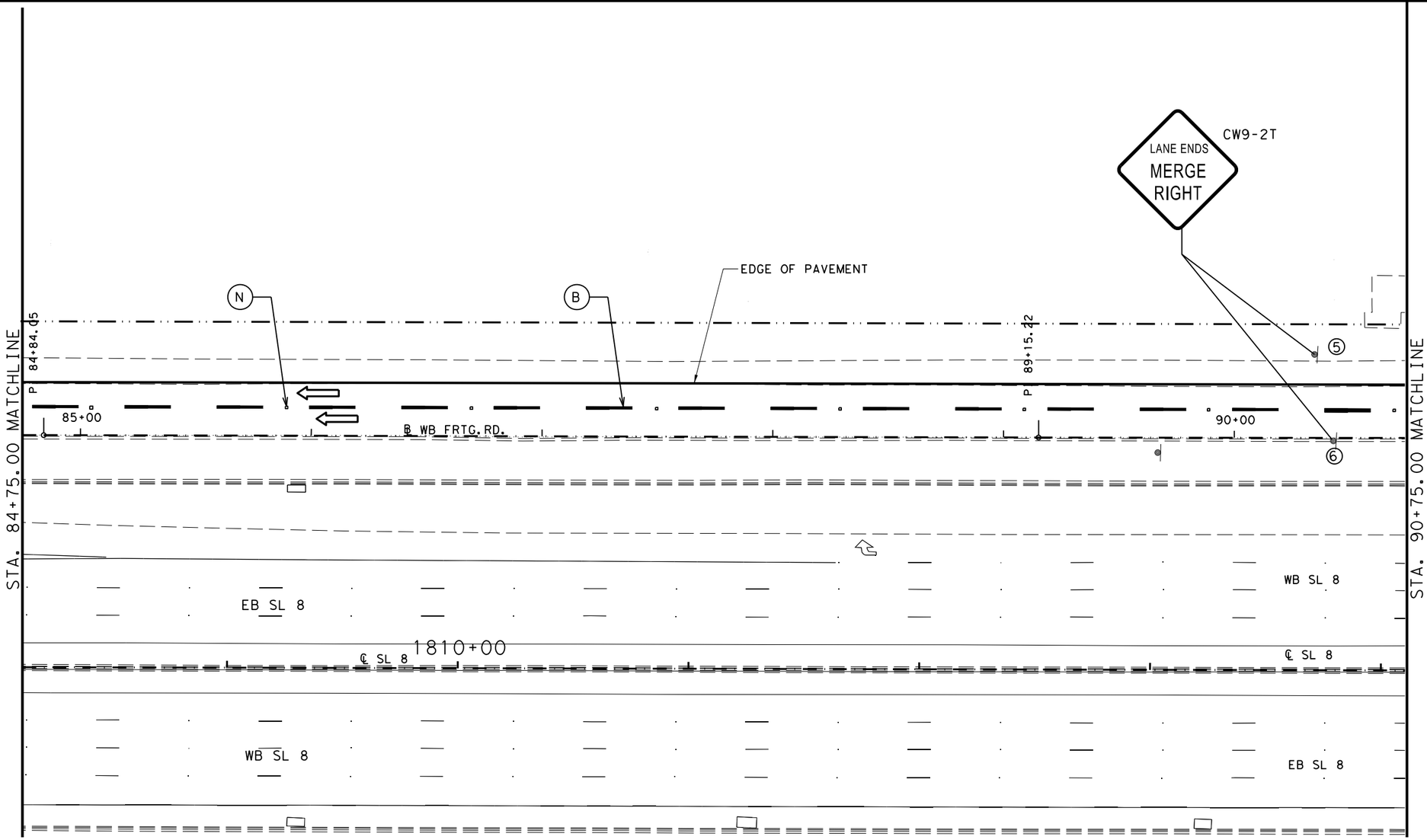

A MULTIPOLYMER PAV MRK (W)(6")(SLD)
B MULTIPOLYMER PAV MRK (W)(6")(BRK)
C MULTIPOLYMER PAV MRK (W)(6")(DOT)
D MULTIPOLYMER PAV MRK (W)(8")(SLD)
E MULTIPOLYMER PAV MRK (W)(12")(LNDP)
F MULTIPOLYMER PAV MRK (W)(24")(SLD)
G REFL PAV MRKR TY I-A

H MULTIPOLYMER PAV MRK (Y)(8")(SLD)
I MULTIPOLYMER PAV MRK (Y)(12")(SLD)
J MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
K PREFAB PAV MRK TY B (W)(ARROW)
L PREFAB PAV MRK TY B (W)(DBL ARROW)
M PREFAB PAV MRK TY B (W)(WORD)
N REFL PAV MRKR TY II-CR
O MULTIPOLYMER PAV MRK (W)(12")(SLD)
P MULTIPOLYMER PAV MRK (Y)(6")(SLD)

DATE:3/15/2023
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STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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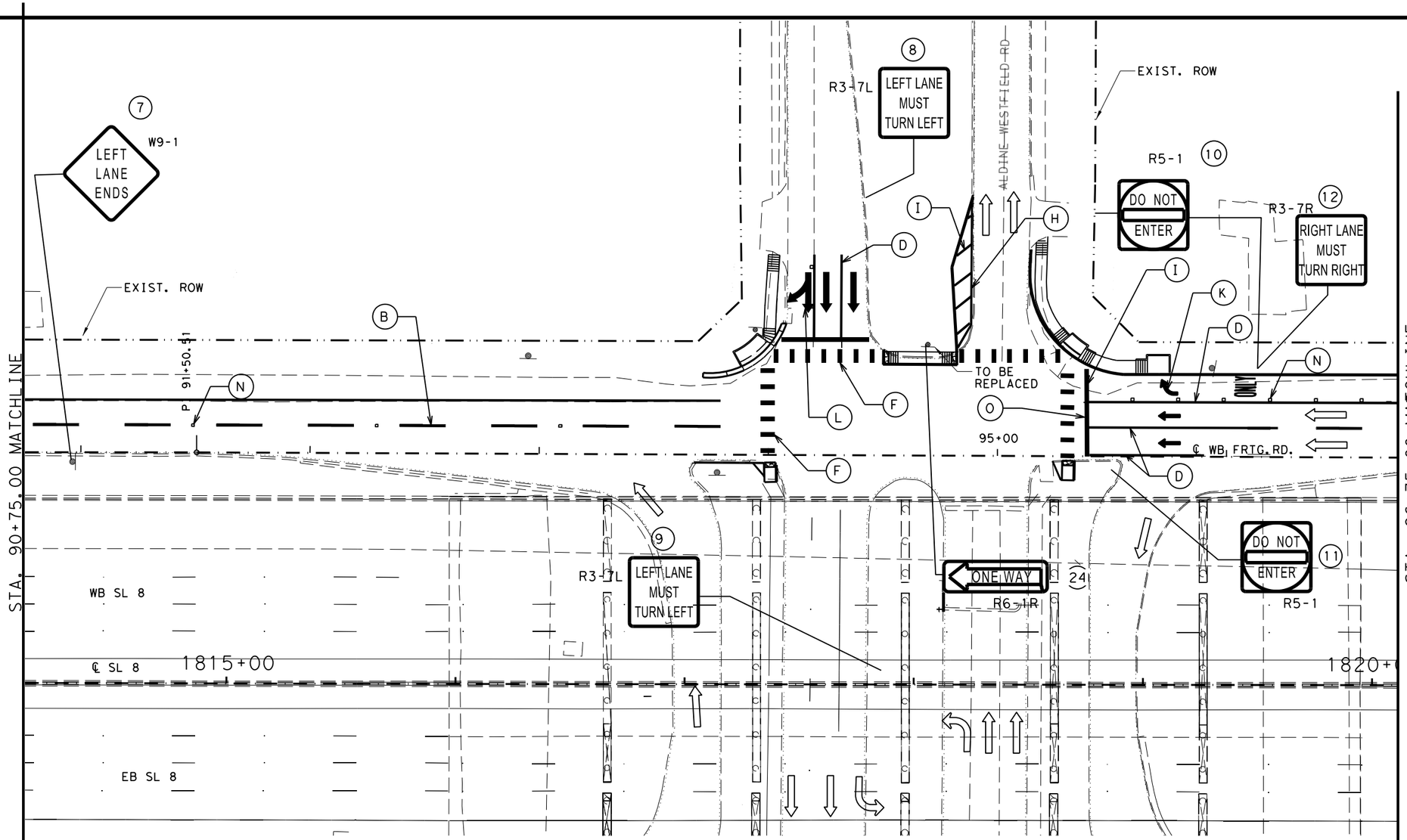
SL 8
WB FRONTAGE ROAD

SIGN & PAVEMENT MARKING LAYOUT

SHEET 3 OF 6

SCALE: 1" = 50' HORZ

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			201
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8



SHEET 1 OF 4

A MULTIPOLYMER PAV MRK (W)(6")(SLD)
B MULTIPOLYMER PAV MRK (W)(6")(BRK)
C MULTIPOLYMER PAV MRK (W)(6")(DOT)
D MULTIPOLYMER PAV MRK (W)(8")(SLD)
E MULTIPOLYMER PAV MRK (W)(12")(LNDP)
F MULTIPOLYMER PAV MRK (W)(24")(SLD)
G REFL PAV MRKR TY I-A
H MULTIPOLYMER PAV MRK (Y)(8")(SLD)
I MULTIPOLYMER PAV MRK (Y)(12")(SLD)
J MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
K PREFAB PAV MRK TY B (W)(ARROW)
L PREFAB PAV MRK TY B (W)(DBL ARROW)
M PREFAB PAV MRK TY B (W)(WORD)
N REFL PAV MRKR TY II-CR
O MULTIPOLYMER PAV MRK (W)(12")(SLD)
P MULTIPOLYMER PAV MRK (Y)(6")(SLD)

DATE:3/15/2023
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SL 8
WB FRONTAGE ROAD

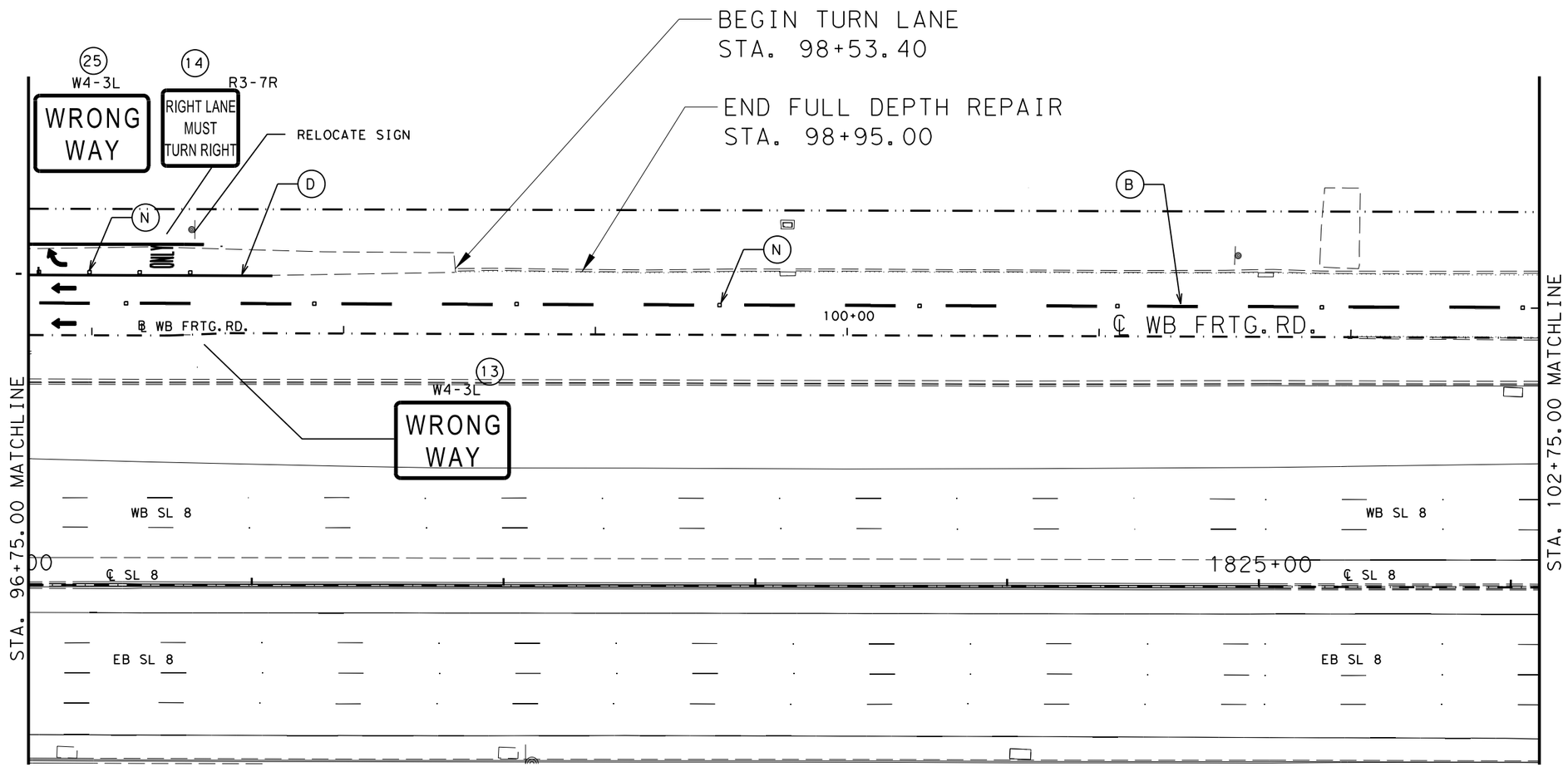
SIGN & PAVEMENT MARKING LAYOUT

SHEET 4 OF 6

SCALE: 1" = 50' HORZ

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			202
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

EXISTING TRAFFIC
PROPOSED TRAFFIC



A MULTIPOLYMER PAV MRK (W)(6")(SLD)
B MULTIPOLYMER PAV MRK (W)(6")(BRK)
C MULTIPOLYMER PAV MRK (W)(6")(DOT)
D MULTIPOLYMER PAV MRK (W)(8")(SLD)
E MULTIPOLYMER PAV MRK (W)(12")(LNDP)
F MULTIPOLYMER PAV MRK (W)(24")(SLD)
G REFL PAV MRKR TY I-A

H MULTIPOLYMER PAV MRK (Y)(8")(SLD)
I MULTIPOLYMER PAV MRK (Y)(12")(SLD)
J MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
K PREFAB PAV MRK TY B (W)(ARROW)
L PREFAB PAV MRK TY B (W)(DBL ARROW)
M PREFAB PAV MRK TY B (W)(WORD)
N REFL PAV MRKR TY II-CR
O MULTIPOLYMER PAV MRK (W)(12")(SLD)
P MULTIPOLYMER PAV MRK (Y)(6")(SLD)

DATE:3/15/2023
$FILEL$

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SL 8
WB FRONTAGE ROAD

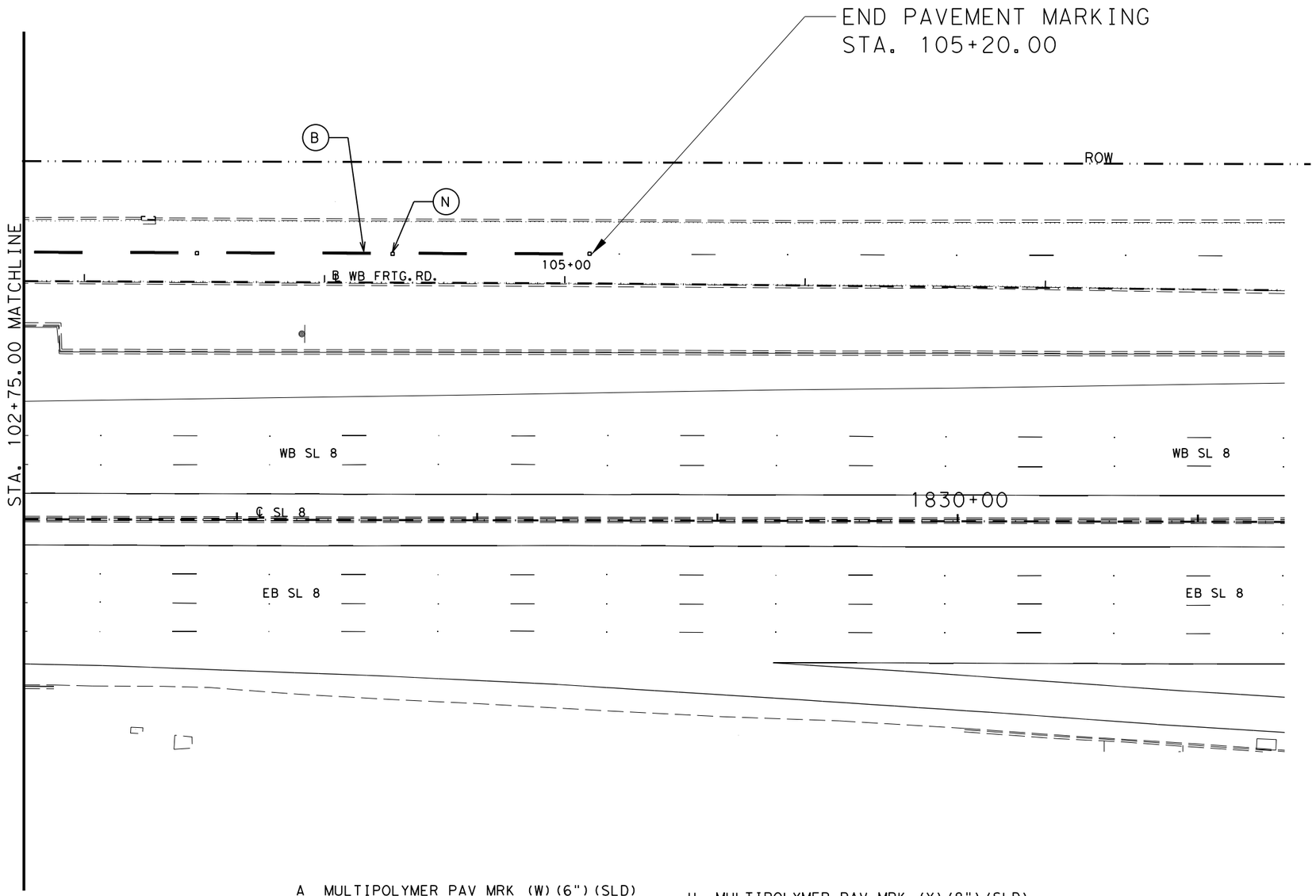
SIGN & PAVEMENT MARKING LAYOUT

SHEET 5 OF 6

SCALE: 1" = 50' HORZ

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			203
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

EXISTING TRAFFIC
PROPOSED TRAFFIC



A MULTIPOLYMER PAV MRK (W)(6")(SLD)
B MULTIPOLYMER PAV MRK (W)(6")(BRK)
C MULTIPOLYMER PAV MRK (W)(6")(DOT)
D MULTIPOLYMER PAV MRK (W)(8")(SLD)
E MULTIPOLYMER PAV MRK (W)(12")(LNDP)
F MULTIPOLYMER PAV MRK (W)(24")(SLD)
G REFL PAV MRKR TY I-A

H MULTIPOLYMER PAV MRK (Y)(8")(SLD)
I MULTIPOLYMER PAV MRK (Y)(12")(SLD)
J MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
K PREFAB PAV MRK TY B (W)(ARROW)
L PREFAB PAV MRK TY B (W)(DBL ARROW)
M PREFAB PAV MRK TY B (W)(WORD)
N REFL PAV MRKR TY II-CR
O MULTIPOLYMER PAV MRK (W)(12")(SLD)
P MULTIPOLYMER PAV MRK (Y)(6")(SLD)

DATE: 3/15/2023
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DANIEL DUKE THOMPSON
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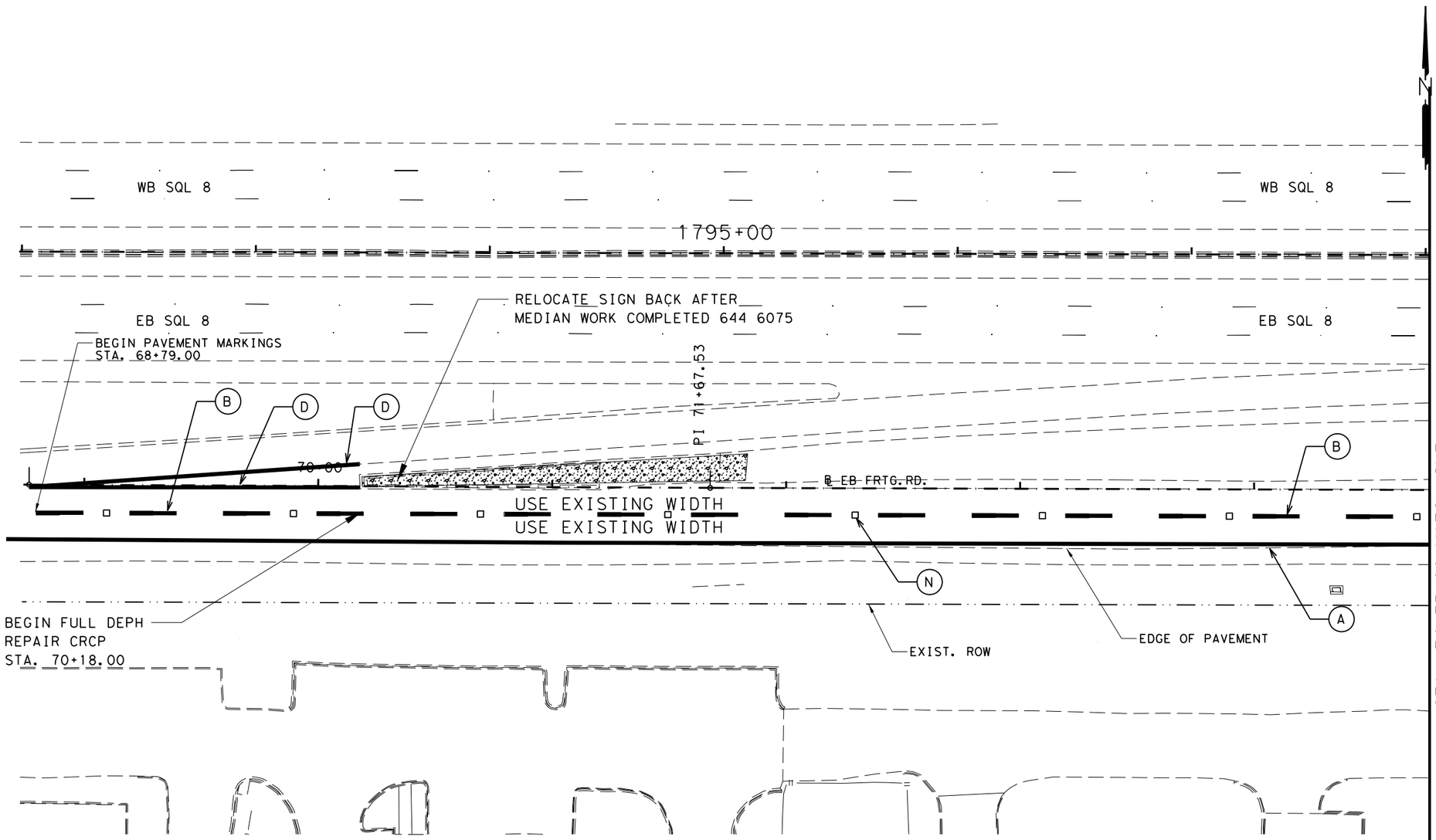
SL 8
WB FRONTAGE ROAD

SIGN & PAVEMENT MARKING LAYOUT

SHEET 6 OF 6

SCALE: 1" = 50' HORZ

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			204
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8



LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

STATE OF TEXAS
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SL 8
EB FRONTAGE ROAD

PAVEMENT & SIGNS LAYOUT

SCALE: 1" = 50' HORZ

SHEET 1 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			205
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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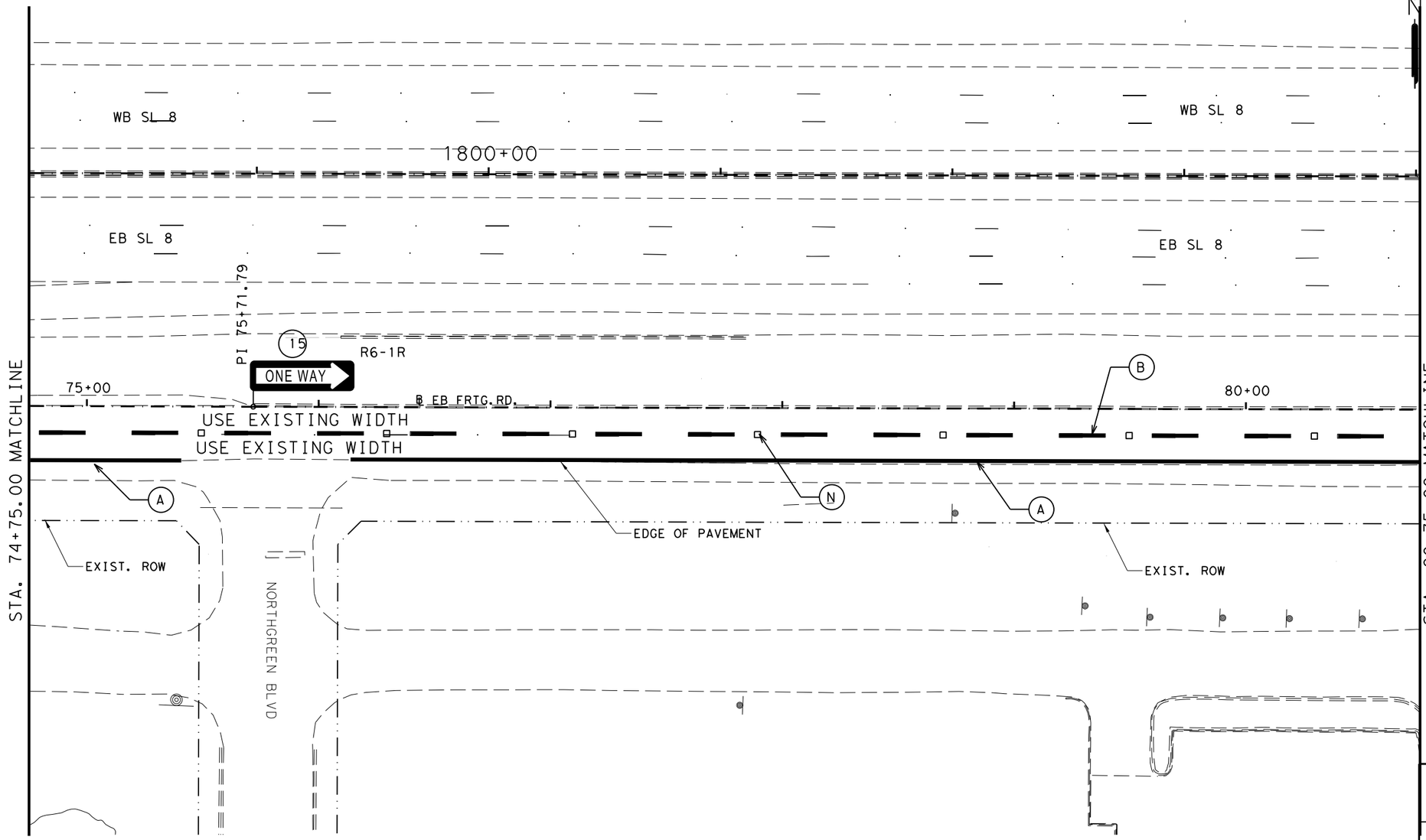

LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

STA. 74+75.00

STA. 80+75.00

Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

SHEET 1 OF 7

DATE:3/15/2023
$FILEL$

STATE OF TEXAS
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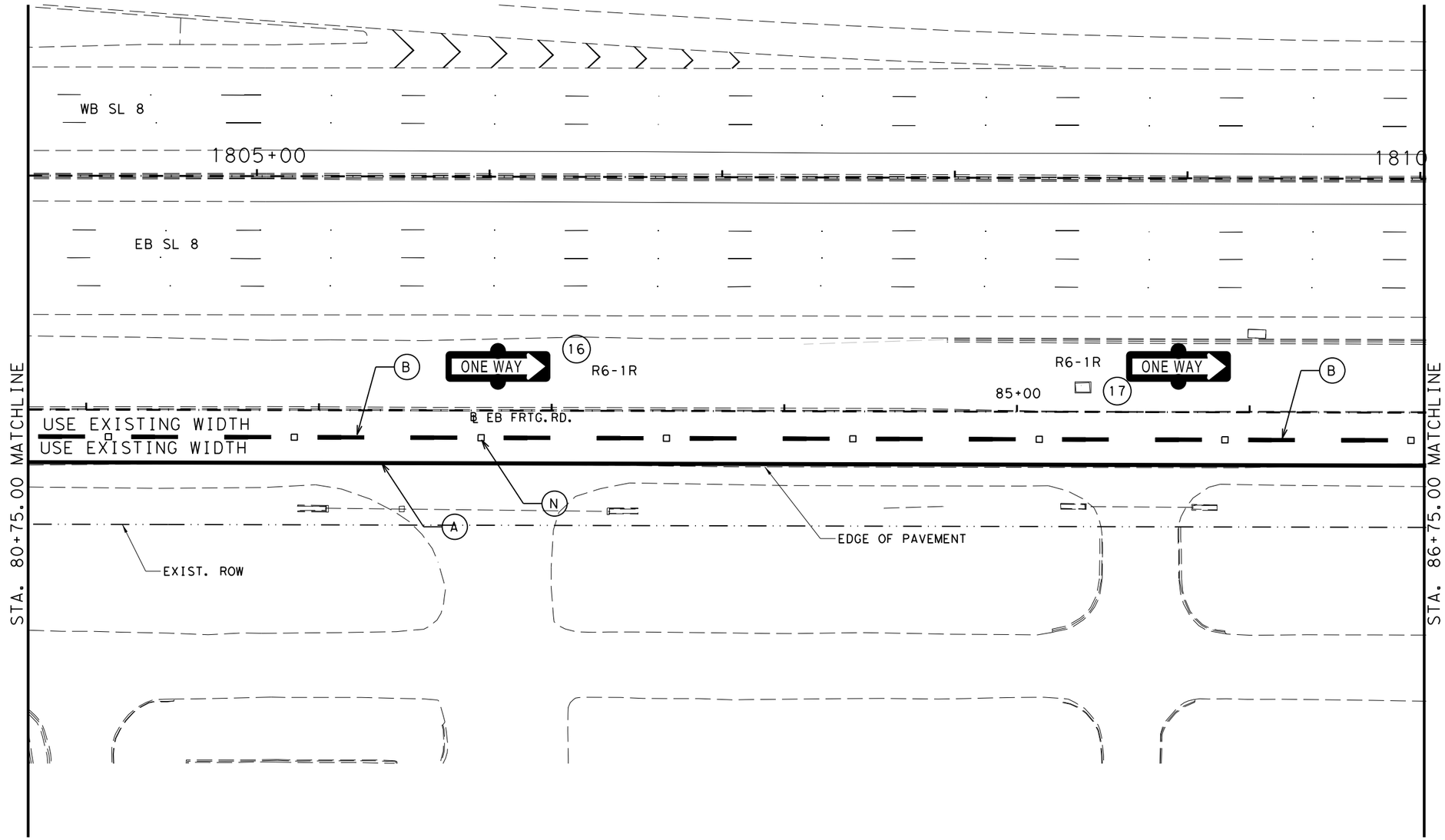
SL 8
EB FRONTAGE ROAD

PAVEMENT & SIGNS LAYOUT

SCALE: 1" = 50' HORZ

SHEET 2 OF 7

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			206
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8



LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

N

Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

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SL 8
EB FRONTAGE ROAD

PAVEMENT & SIGNS LAYOUT

SCALE: 1" = 50' HORZ

SHEET 3 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			207
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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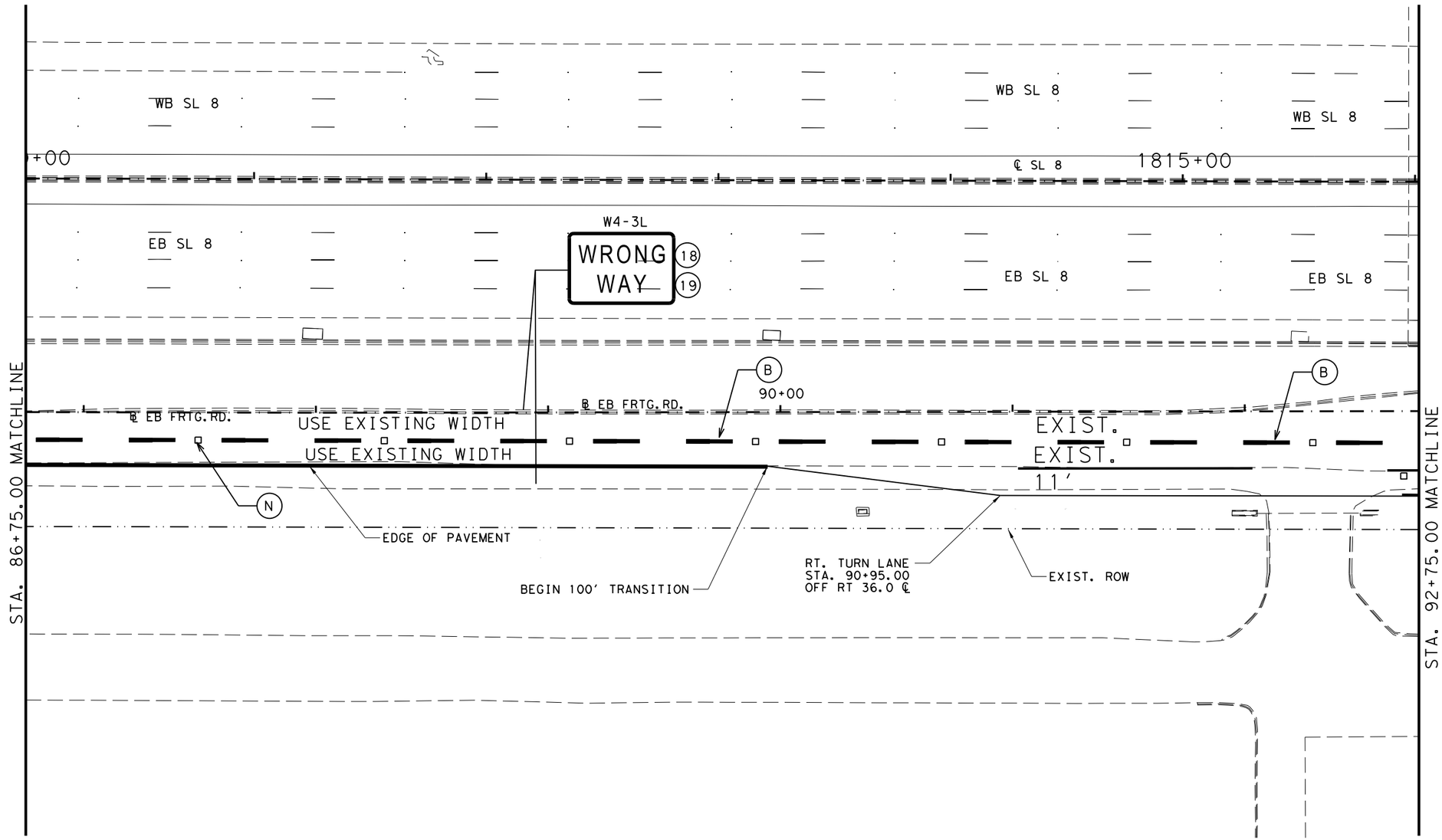
LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

N



Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

SHEET NOTES

STATE OF TEXAS
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SL 8
EB FRONTAGE ROAD

PAVEMENT & SIGNS LAYOUT

SCALE: 1" = 50' HORZ

SHEET 4 OF 7

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			208
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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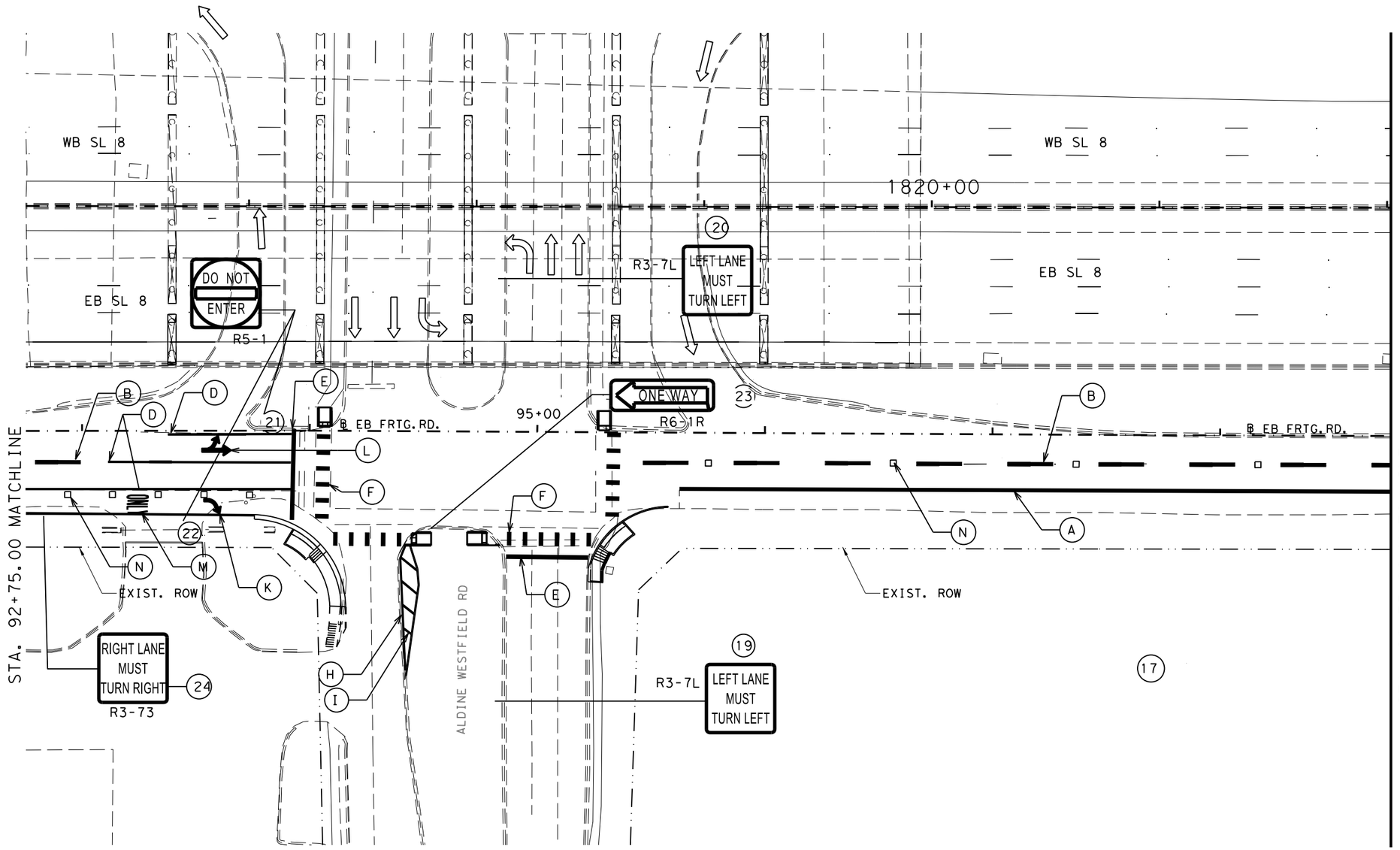

LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

N

Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8
EB FRONTAGE ROAD

PAVEMENT & SIGNS LAYOUT

SCALE: 1" = 50' HORZ

SHEET 5 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			209
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

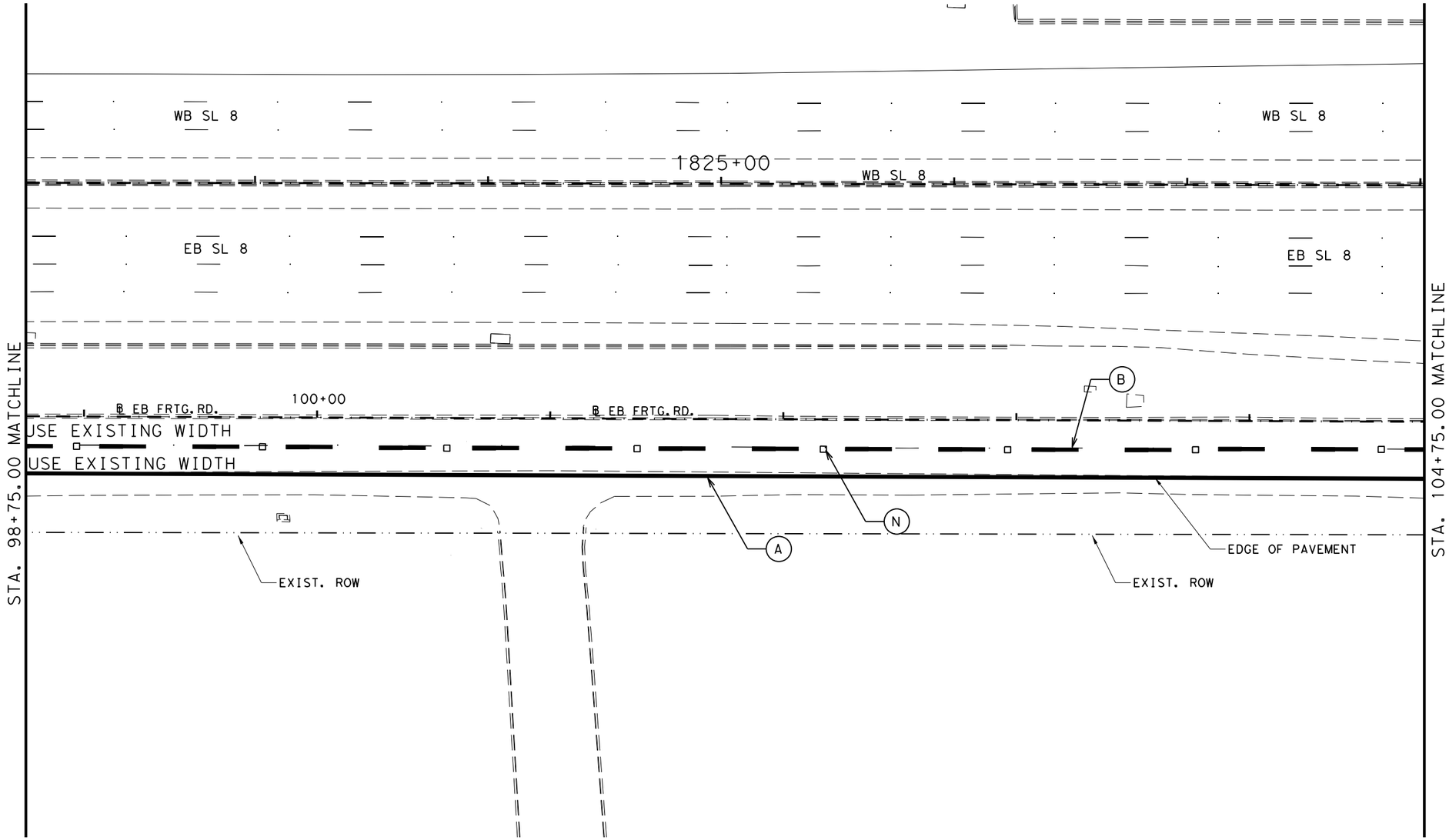
DATE: 3/15/2023
$FILEL$

LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

N



Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

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Texas Department of Transportation

SL 8
EB FRONTAGE ROAD

PAVEMENT & SIGNS LAYOUT

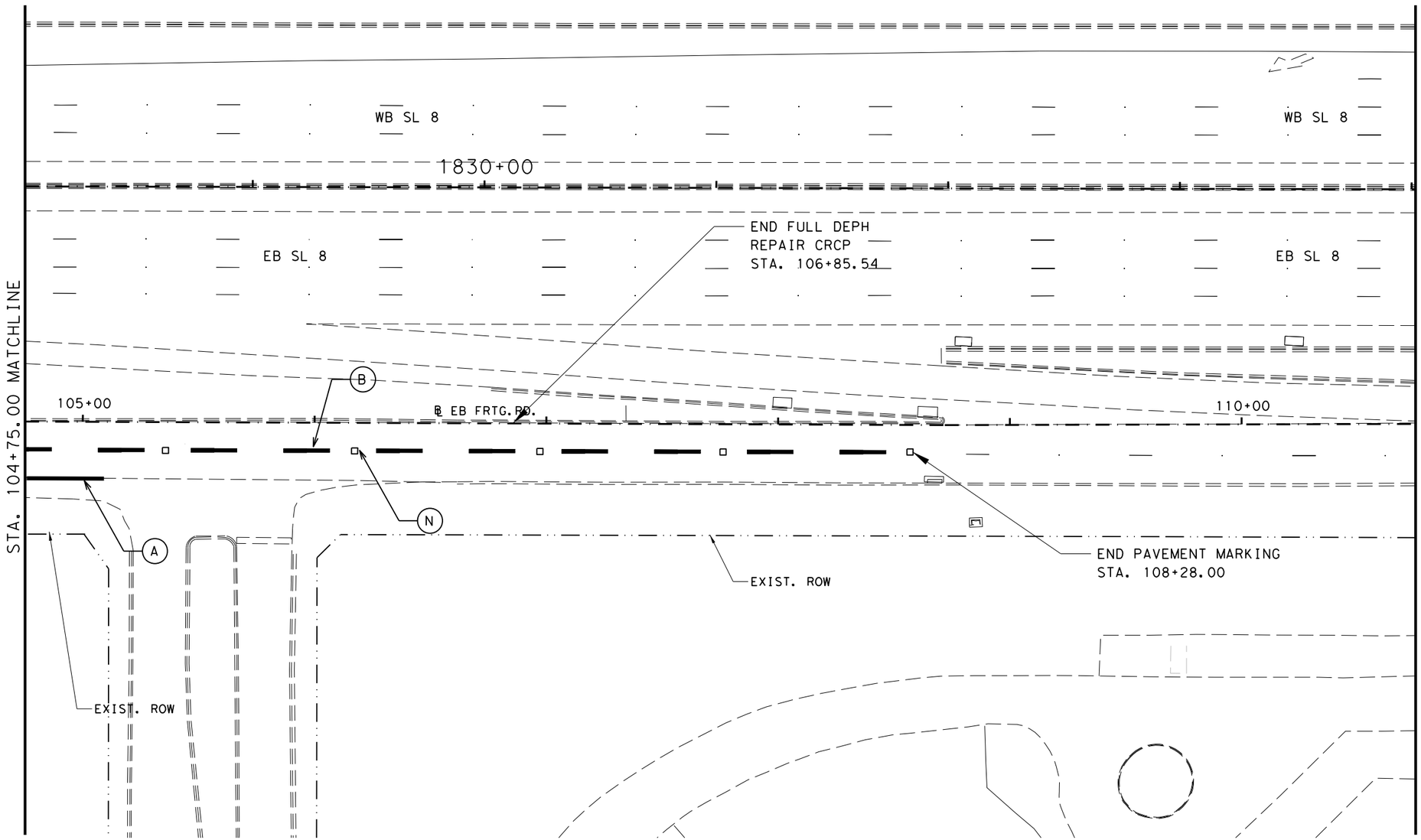
SCALE: 1" = 50' HORZ

SHEET 6 OF 7

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		210

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



LEGEND

EXISTING TRAFFIC

PROPOSED TRAFFIC

N

Ⓐ MULTIPOLYMER PAV MRK (W)(6")(SLD)
Ⓑ MULTIPOLYMER PAV MRK (W)(6")(BRK)
Ⓒ MULTIPOLYMER PAV MRK (W)(6")(DOT)
Ⓓ MULTIPOLYMER PAV MRK (W)(8")(SLD)
Ⓔ MULTIPOLYMER PAV MRK (W)(12")(LNDP)
Ⓕ MULTIPOLYMER PAV MRK (W)(24")(SLD)
Ⓖ REFL PAV MRKR TY I-A
Ⓗ MULTIPOLYMER PAV MRK (Y)(8")(SLD)
Ⓘ MULTIPOLYMER PAV MRK (Y)(12")(SLD)
Ⓙ MULTIPOLYMER PAV MRK (BLK)(6")(BRK)
Ⓚ PREFAB PAV MRK TY B (W)(ARROW)
Ⓛ PREFAB PAV MRK TY B (W)(DBL ARROW)
Ⓜ PREFAB PAV MRK TY B (W)(WORD)
Ⓝ REFL PAV MRKR TY II-CR
Ⓞ MULTIPOLYMER PAV MRK (W)(12")(SLD)
Ⓟ MULTIPOLYMER PAV MRK (Y)(6")(SLD)

STATE OF TEXAS
DANIEL DUKE THOMPSON
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Texas Department of Transportation

SL 8
EB FRONTAGE ROAD

PAVEMENT & SIGNS LAYOUT

SCALE: 1" = 50' HORZ

SHEET 7 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			211
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
$FILEL$

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE TY N TY S
FRTG												
WB 4	12	R3-7R	RIGHT LANE MUST TURN RIGHT									
WB 5	14											
FRTG												
		R4-3bT	DO NOT CROSS DOUBLE WHITE LINE — FRONT SIDE	36" X 36"	X							
				36" X 36"	X							
WB 2	1,2		DO NOT ENTER — BACK SIDE									
		R5-1		36" X 36"	X		10BWG	4	SA	U		
				36" X 36"	X							
FRTG												
WB 5	13,25	W4-3L	WRONG WAY	36" X 24"	X		10BWG	6	SA	P		
WB 2	3,4			36" X 24"	X							
EB 4	18,19			36" X 24"	X							
WB 4	7	W9-1	LEFT LANE ENDS	36" X 36"	X		10BWG	1	SA	P		
FRTG												
WB 2	2	W4-3L		36" X 36"	X		10BWG	1	SA	P		
				36" X 36"	X		10BWG	1	SA	P		
FRTG												
EB 2	15											
EB 3	16,17	R6-1R	ONE WAY									
EB 4												
FRTG												
WB 3	5,6	W4-3L	LANE ENDS MERGE RIGHT	36" X 36"	X		10BWG	2	SA	P		
FRTG												
EB 5	23	R6-1L	ONE WAY	36" X 12"	X		10BWG	2	SA	P		
WB 4	24											
WB 4	8	R3-7L	RIGHT LANE MUST TURN RIGHT	36" X 36"	X		10BWG		SA	P		
WB 4	9											
EB 4	24											
WB 4	10,11	R5-1	DO NOT ENTER	36" X 36"	X		10BWG		SA	P		
EB 5	21,22											

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

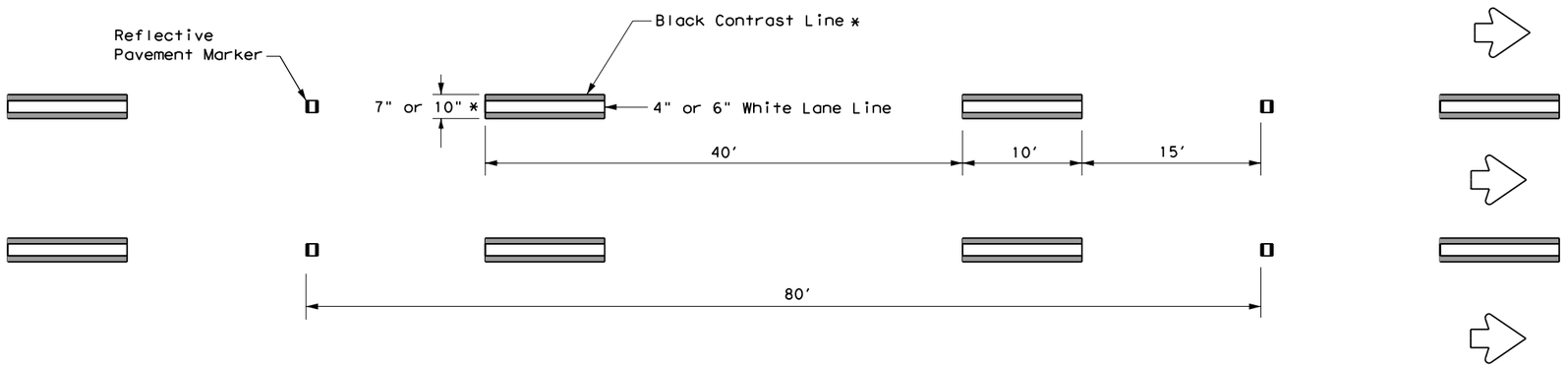
SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	3256	02	093	SL 8
4-16 8-16	DIST	COUNTY		SHEET NO.
	12	HOUSTON		211A

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

DATE: 3/15/2023 4:53:46 AM
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\Standards\CPM(1)-14.dgn



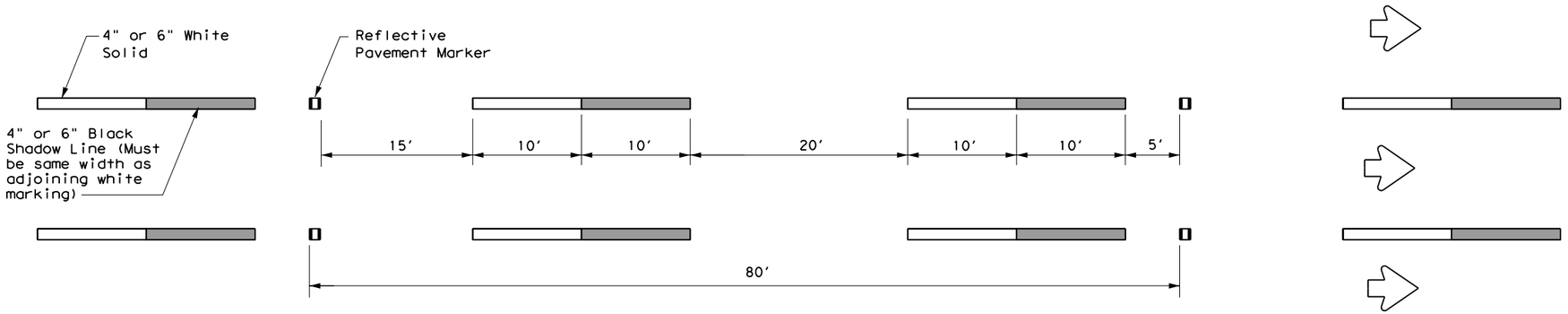
CONTRAST LANE LINE DESIGN

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

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	3256	02	093	SL 8
	DIST	COUNTY		SHEET NO.
	HOU	HARRIS		212

22N

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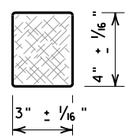
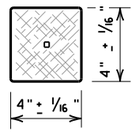
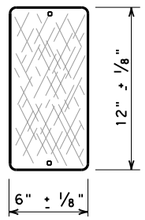
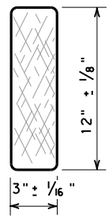
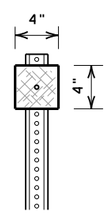
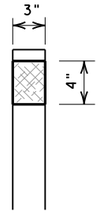
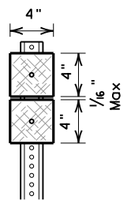
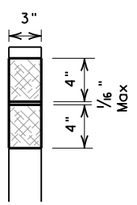
DATE:
FILE:

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

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

DELINEATORS

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

D & OM DESCRIPTIVE CODES

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

NUMBER OF REFLECTORS
S = Single
D = Double

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

REFLECTOR UNIT SIZE
1 or 2

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

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

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

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

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

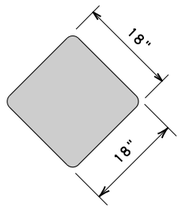
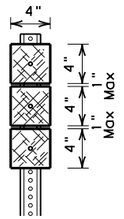
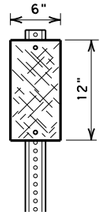
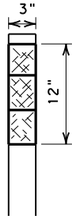
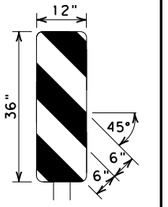
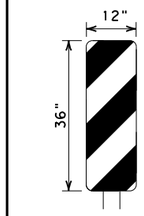
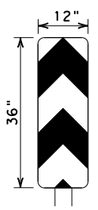
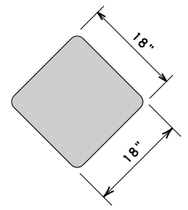
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

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

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

DIRECTION
If Required
BI = Bi-Directional

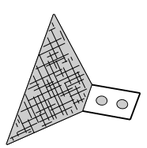
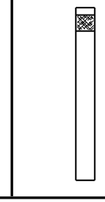
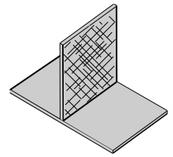
OBJECT MARKERS

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

DEPARTMENTAL MATERIAL SPECIFICATIONS

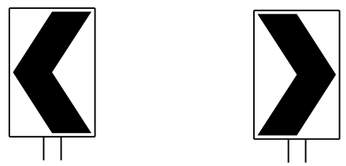
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



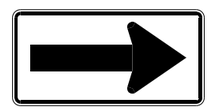
W1-8

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

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

ONE DIRECTION LARGE ARROW

DEVICE



W1-6

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

NOTE:

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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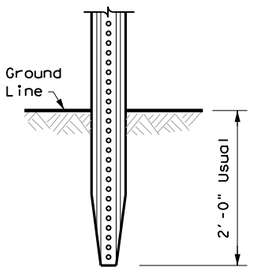
REVISIONS	3205	02	093	SL 8
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	12	HARRIS		213

20A

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

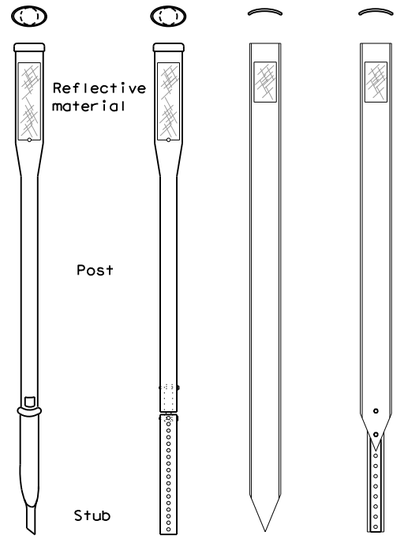


NOTES

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

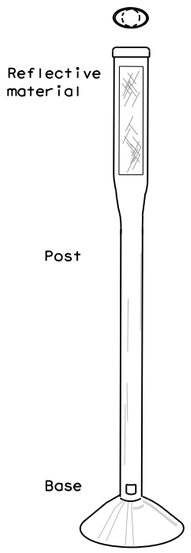
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



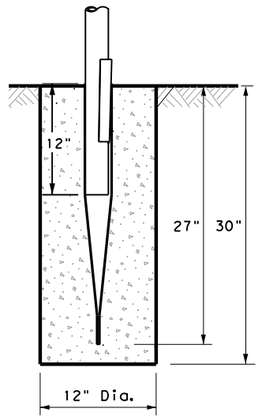
SURFACE MOUNT

NOTES

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

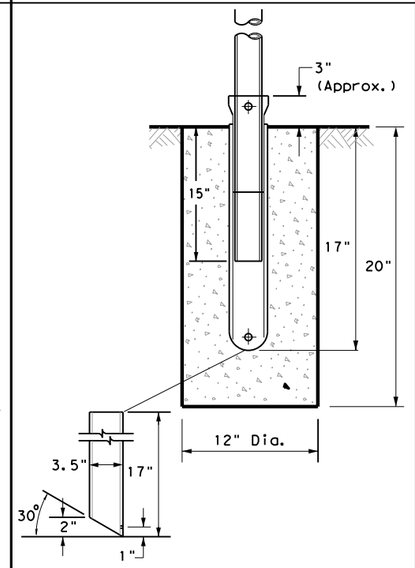
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

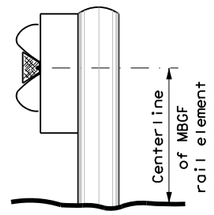
NOTE

1. Install per manufacturer's recommendations.

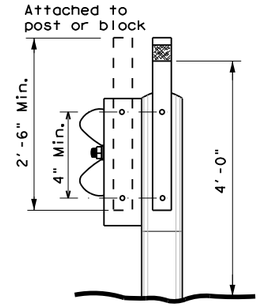
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

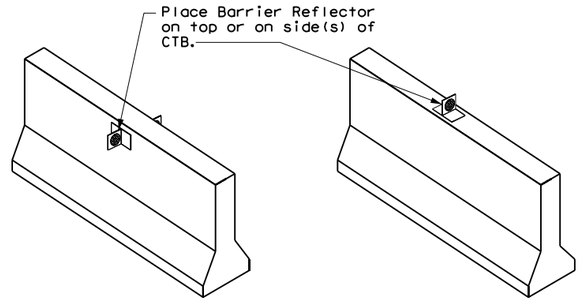
GF1



GF2



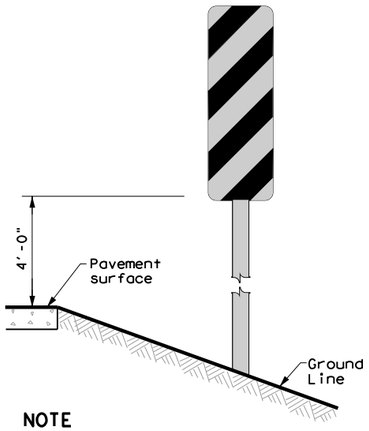
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

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

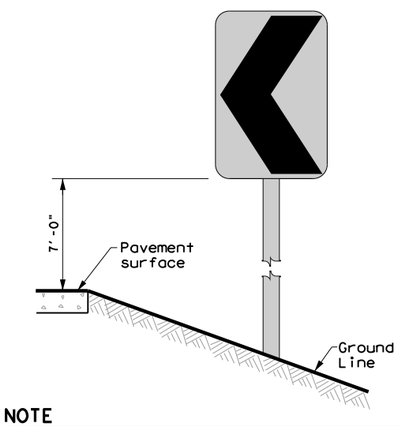
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

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

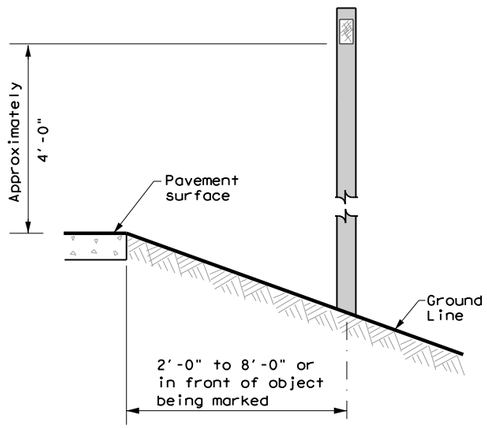
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

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

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
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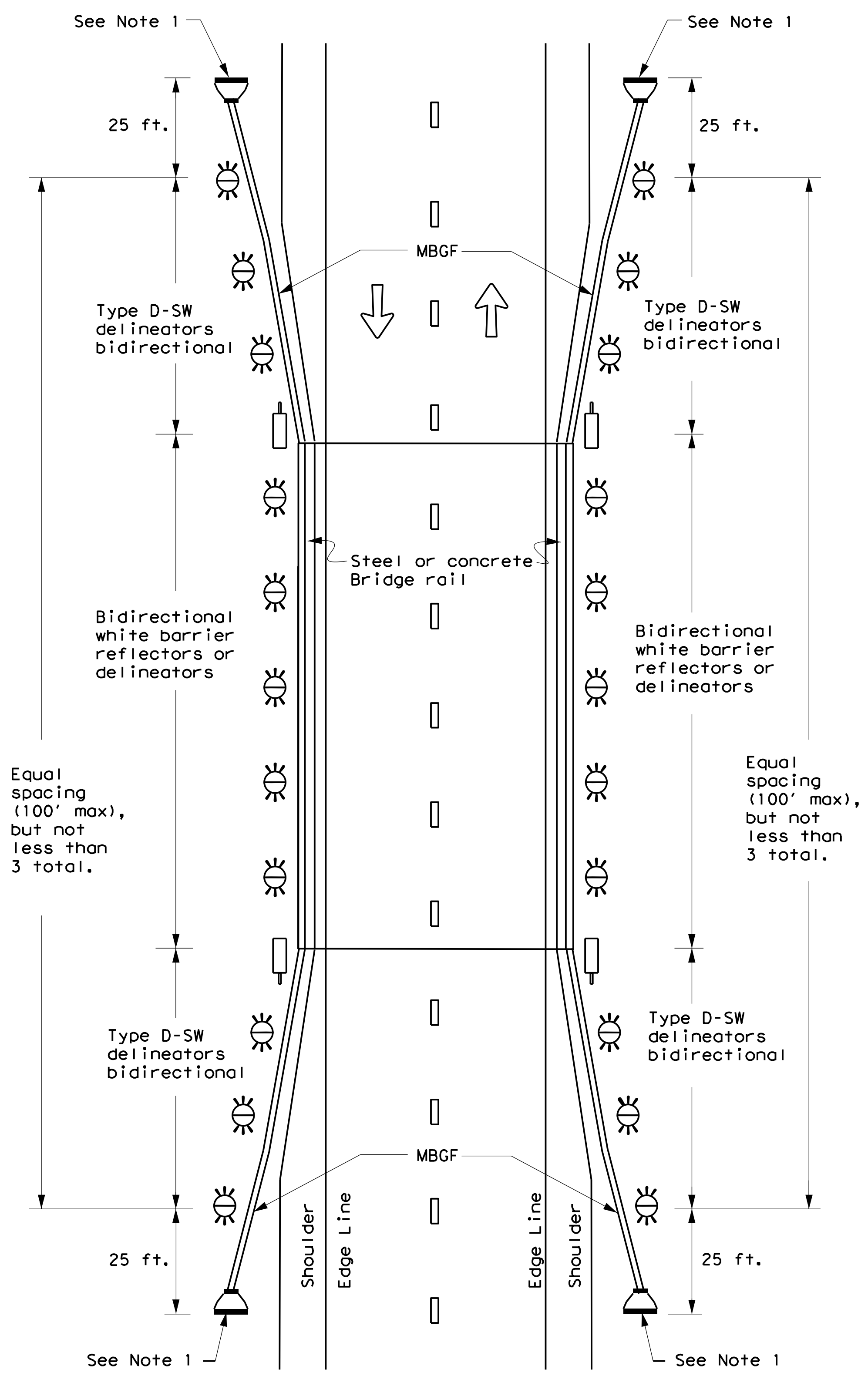
4-10 7-20	12	HARRIS		214

20B

DATE:
FILE:

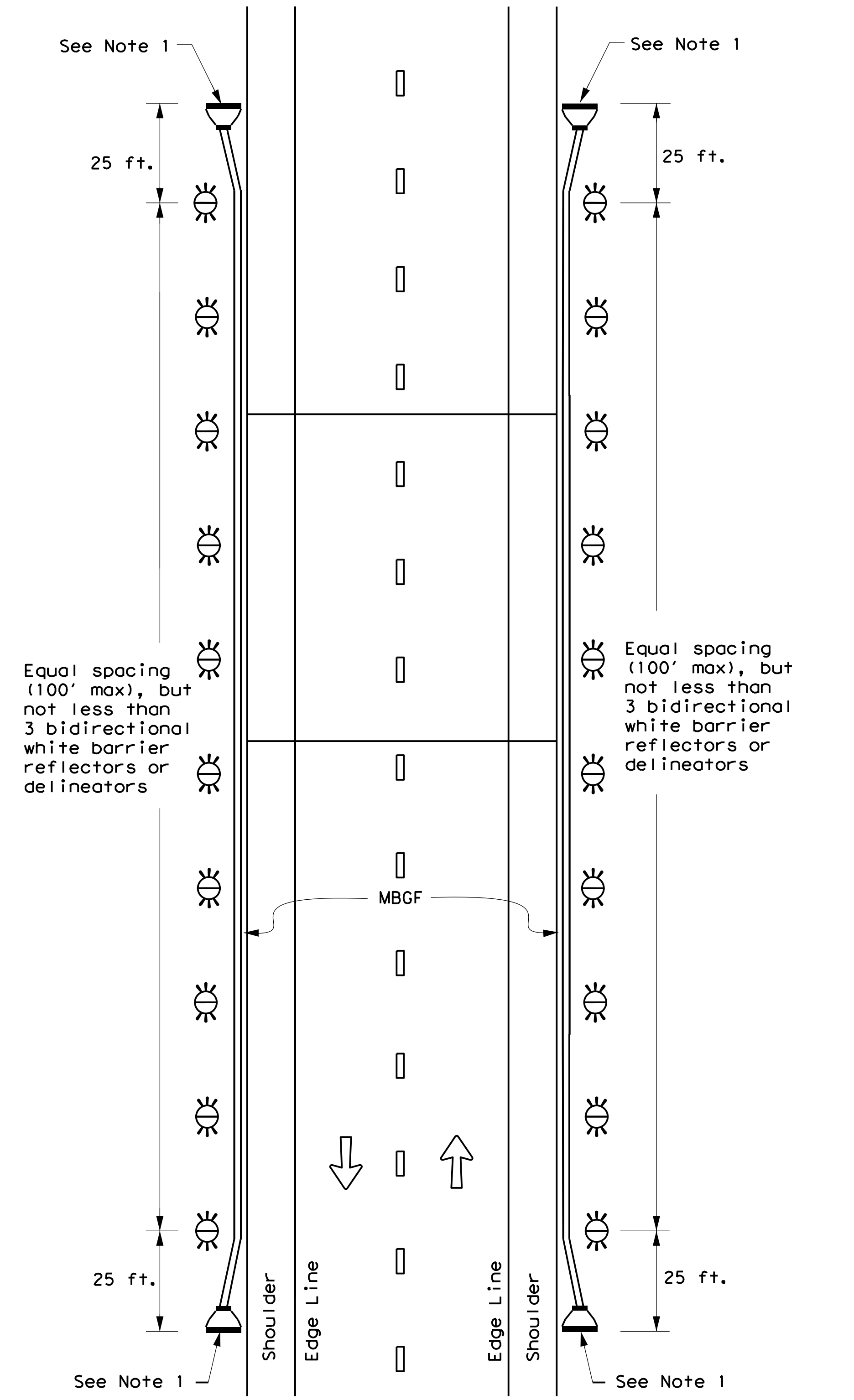
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

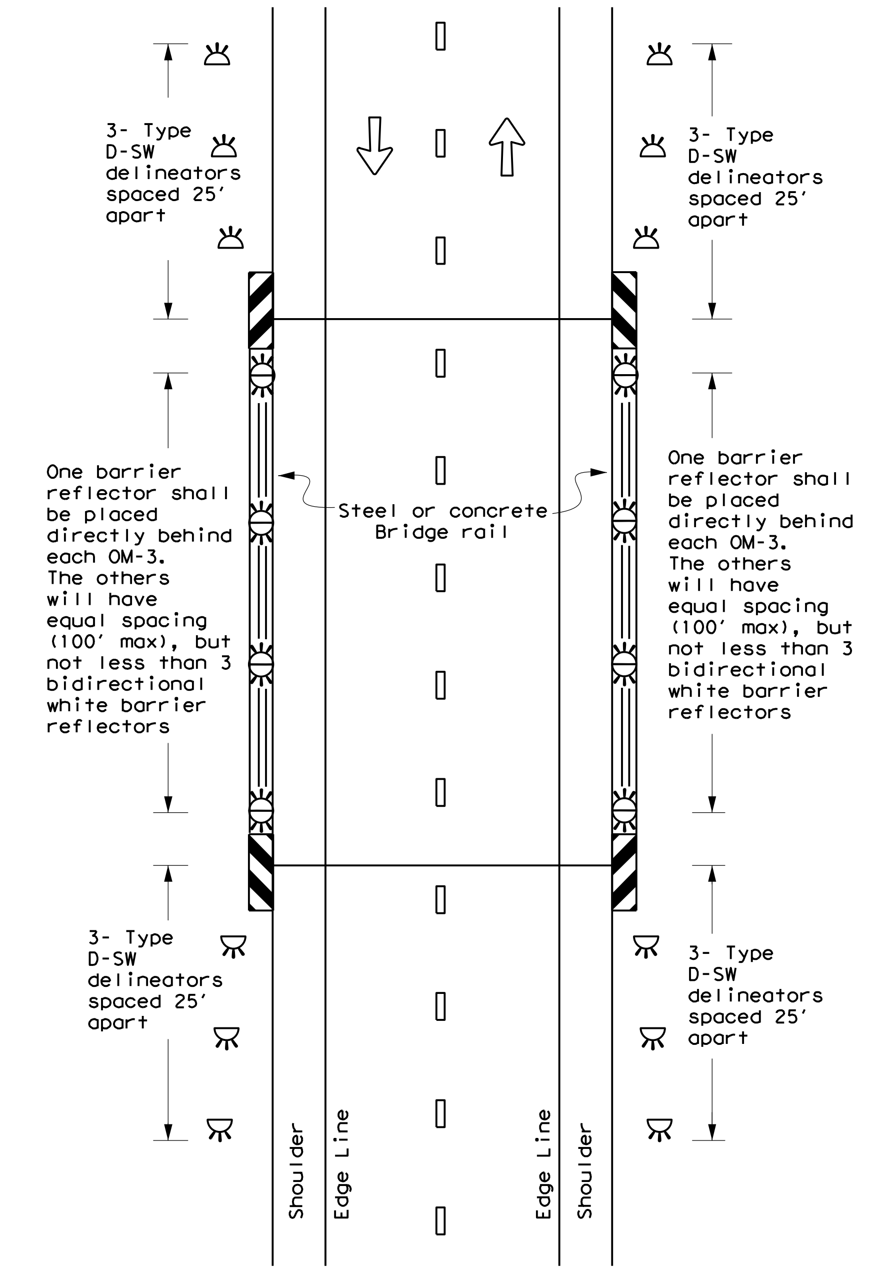
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(5)-20

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20E

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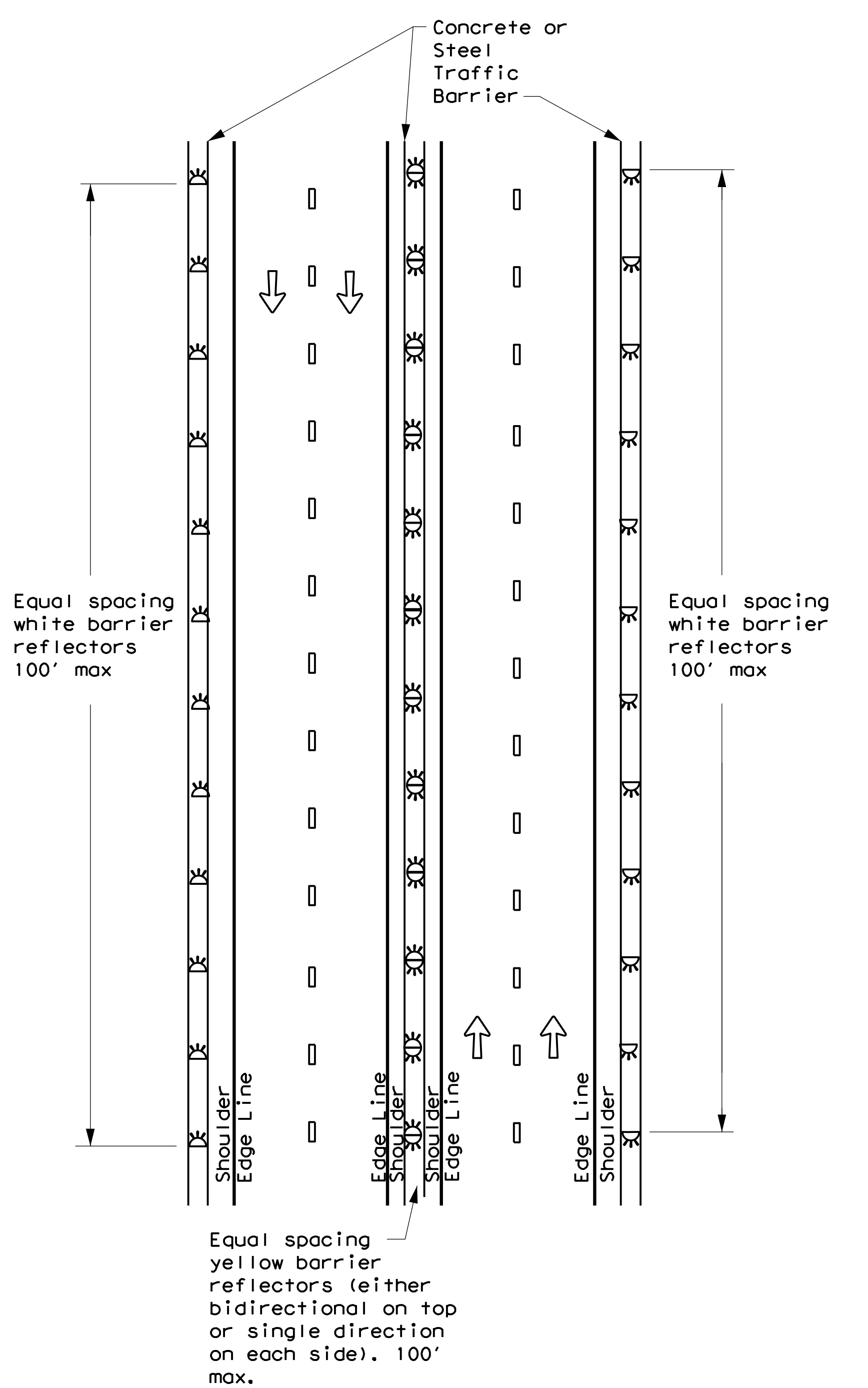
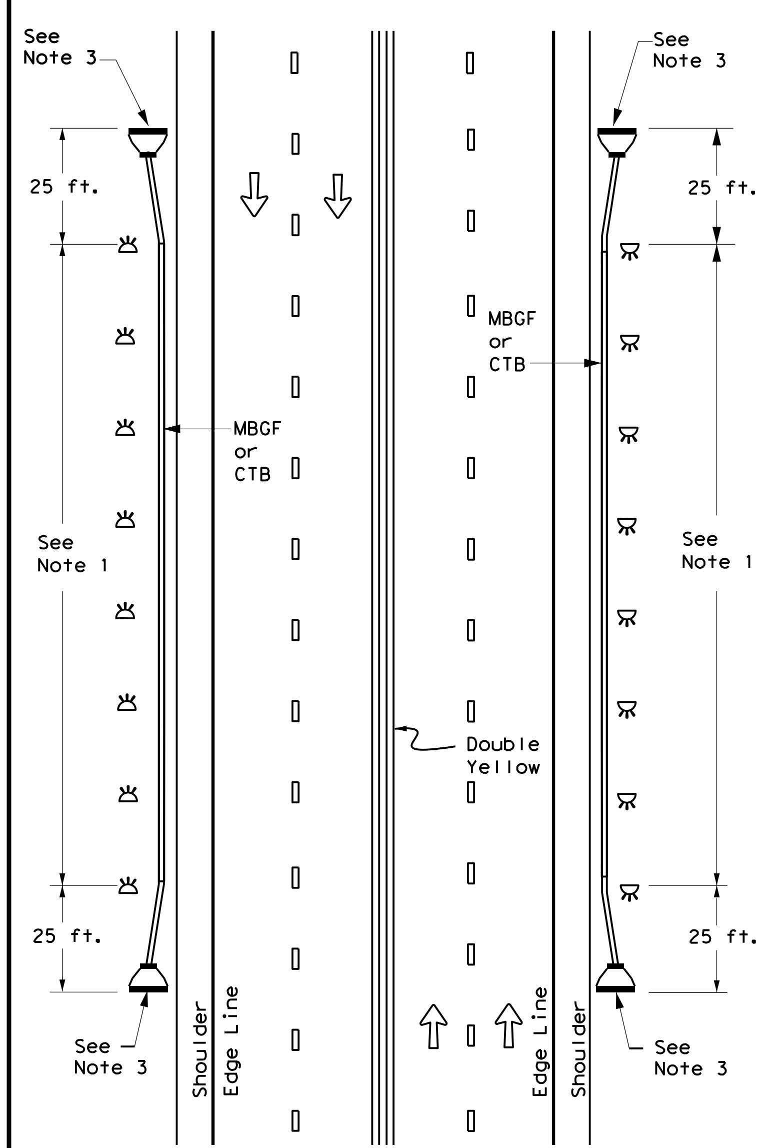
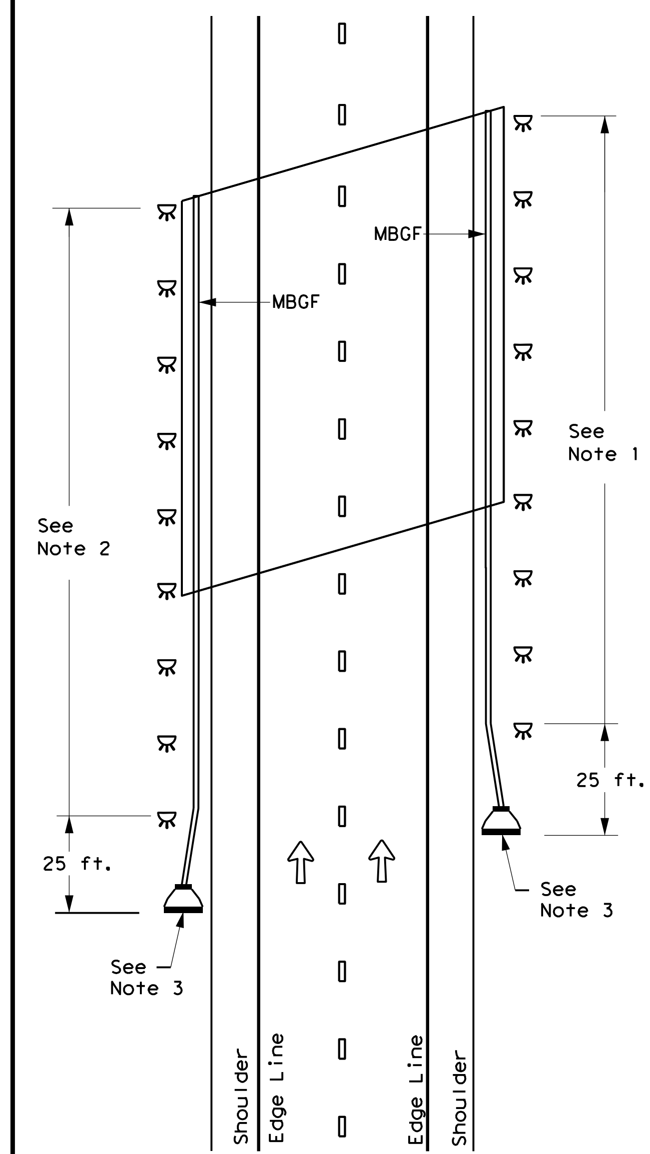
CONTINUOUS CONCRETE OR STEEL BARRIER



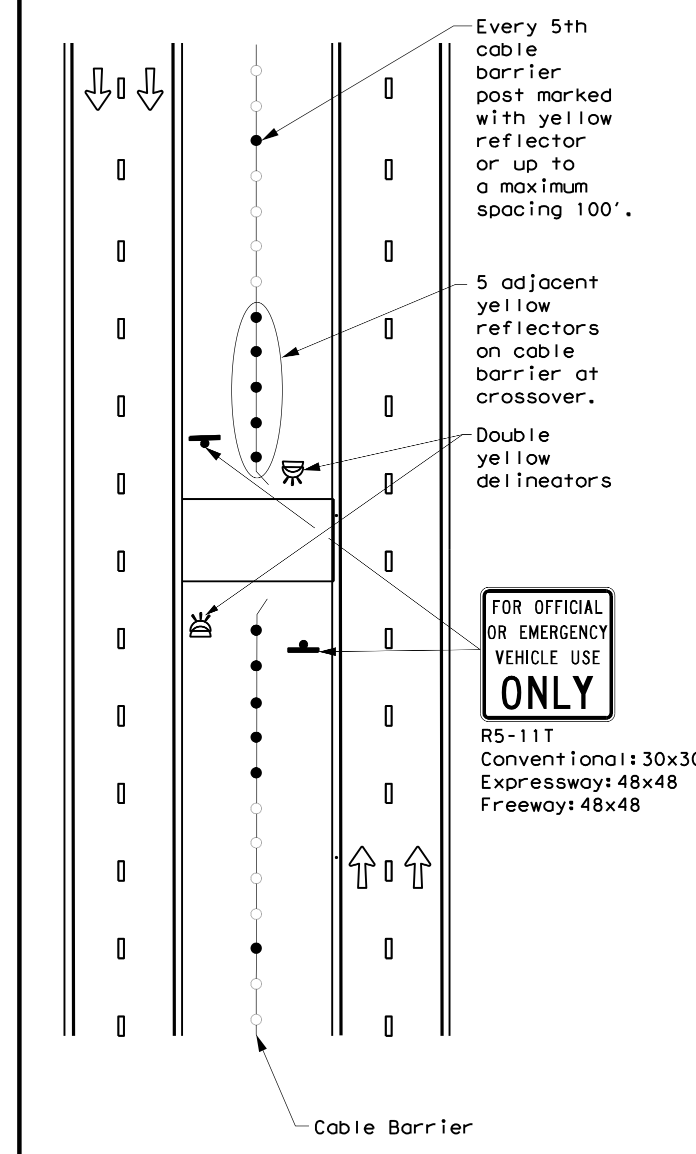
MULTI-LANE UNDIVIDED, TWO-WAY ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



DIVIDED ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



EMERGENCY CROSSOVER



NOTES

1. Equal spacing (100′ max), but not less than 3 single directional white barrier reflectors or delineators. On Continuos Barrier, equal spacing (100′ max.)

2. Equal spacing (100′ max), but not less than 3 single directional yellow barrier reflectors or delineators.

3. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

D & OM(6)-20

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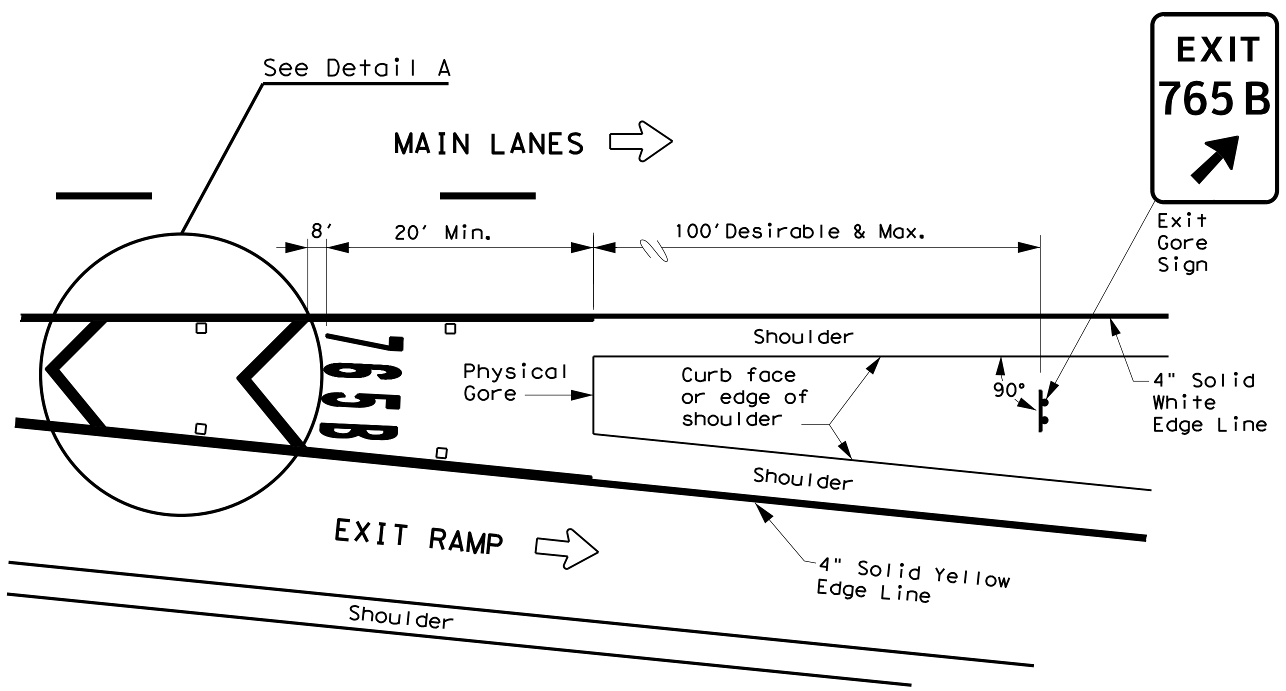
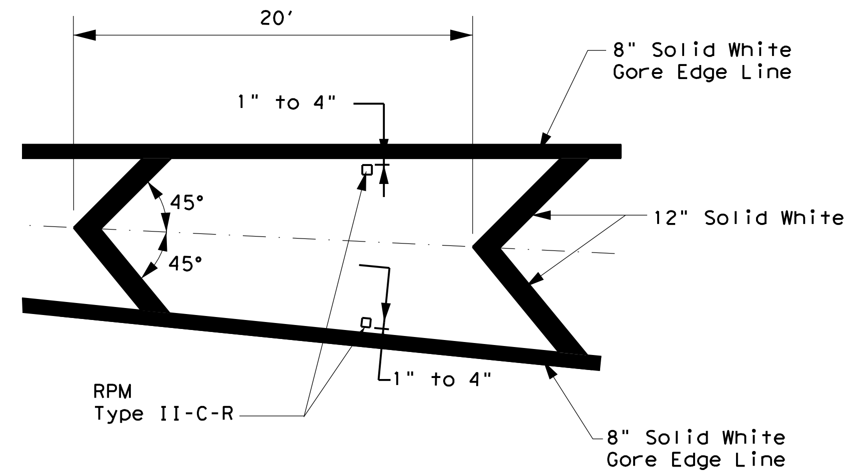
EXIT NUMBER PAVEMENT MARKING NOTES

1. Minimum 8 foot white markings should be used, unless otherwise noted.
2. Spacing between letters and numbers should be approximately 4 inches.
3. Pavement markings are to be located as specified elsewhere in the plans.
4. All pavement marking materials shall meet the required Departmental Material Specifications or as specified in these plans.
5. Numbers and Letters details can be found in the Standard Highway Design for Texas (SHSD) Chapter 12 at http://www.txdot.gov



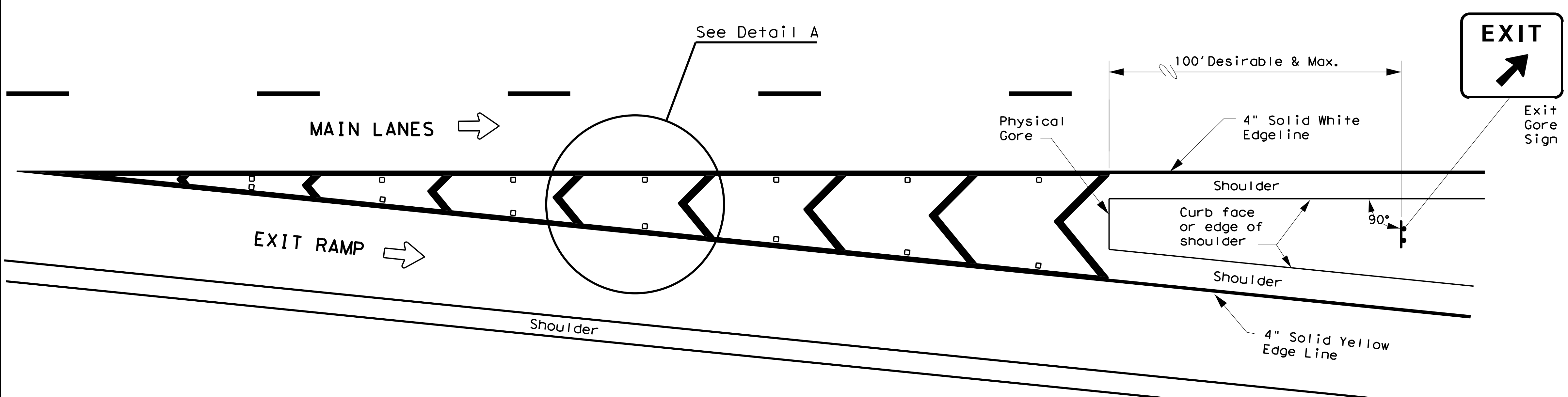
MARKINGS WITH EXIT NUMBER



NOTES

1. Raised pavement markers shall be centered between chevron or gore lines.
2. For more information, see Reflectorized Raised Pavement Marker Detail.

DETAIL A

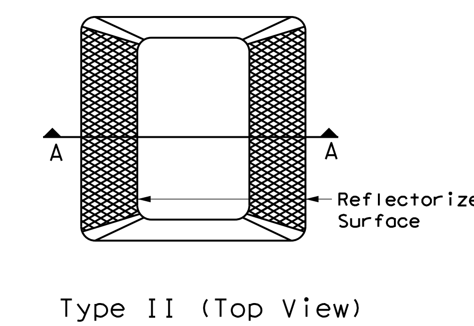


MARKINGS WITHOUT EXIT NUMBER

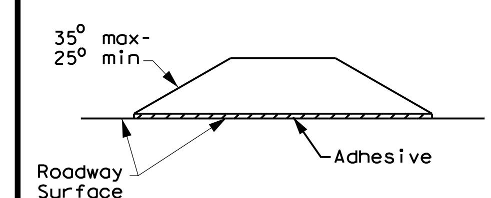
MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

LEGEND	
⇦	Traffic flow
▫	Reflectorized Raised Markers (RPM) Type II-C-R



Type II (Top View)



SECTION A

REFLECTORIZED RAISED PAVEMENT MARKER (RPM)

Texas Department of Transportation

Traffic Safety Division Standard

EXIT GORE PAVEMENT MARKINGS

FPM(5)-19

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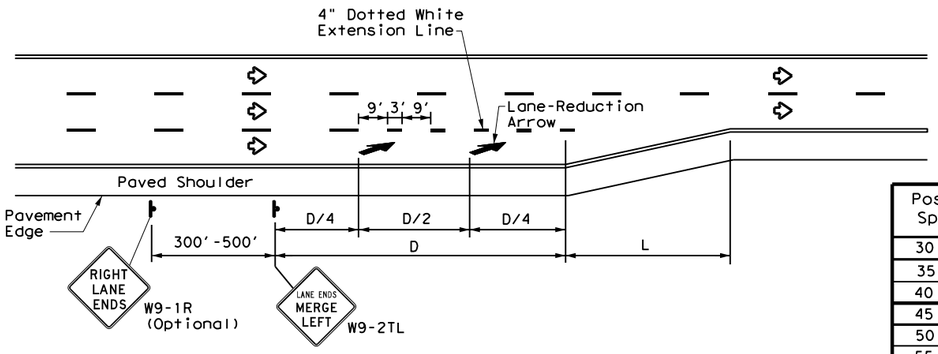
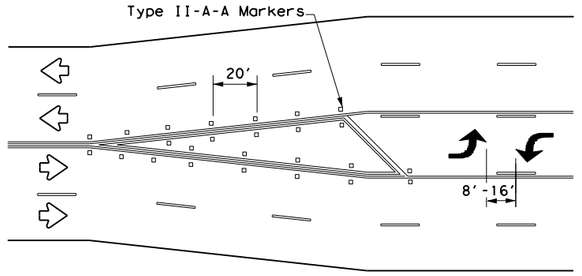


LANE REDUCTION

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

NOTES

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



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

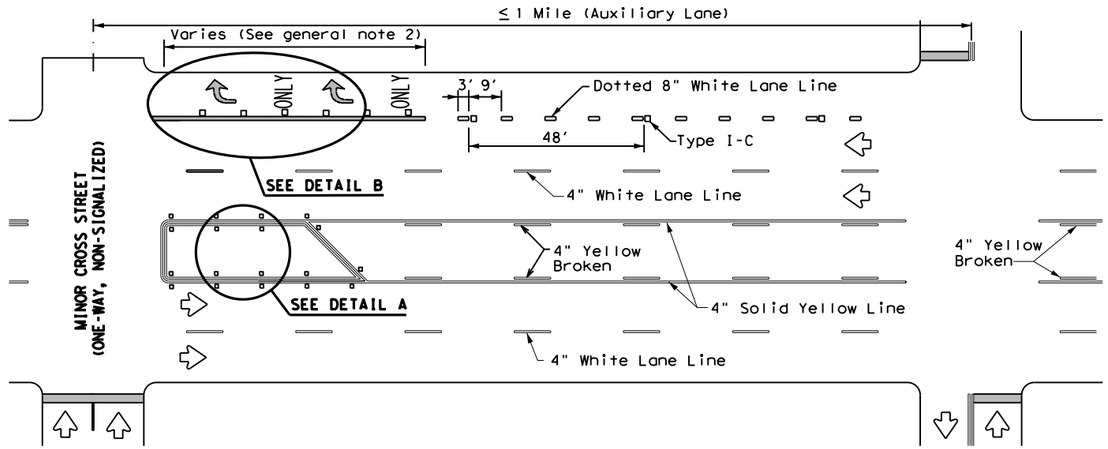
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

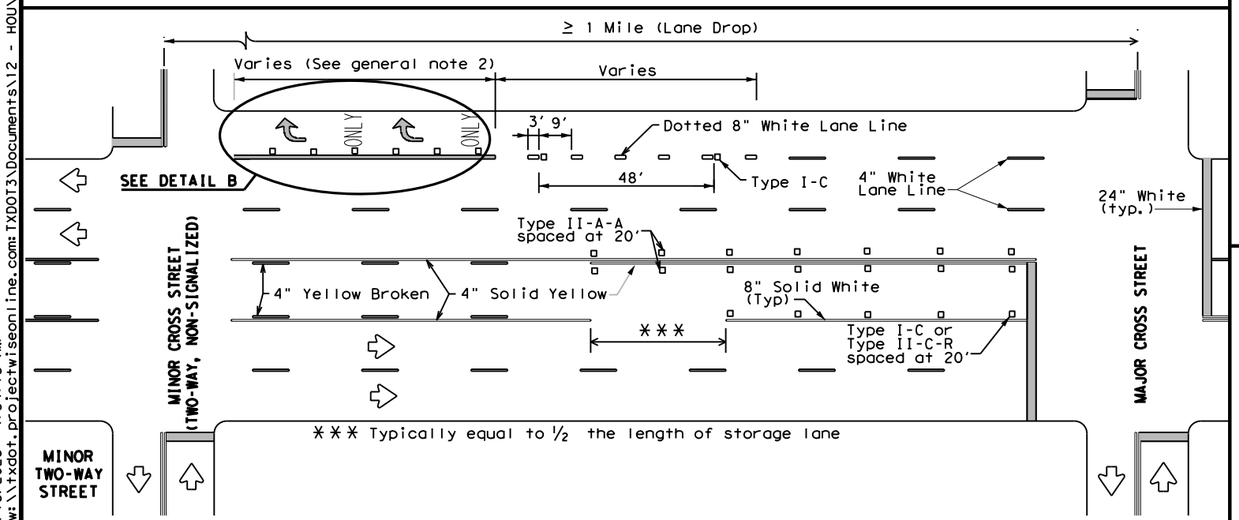
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

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

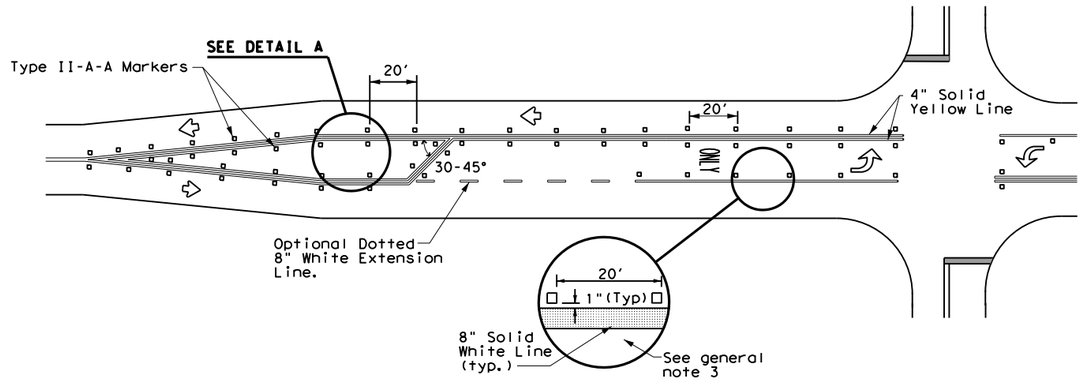
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



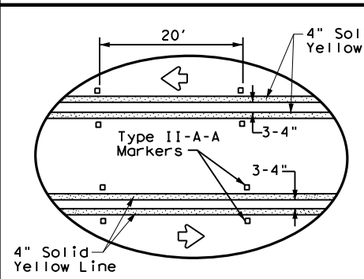
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



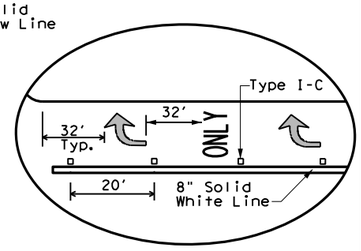
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS PM(3)-20

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3-03 6-20				

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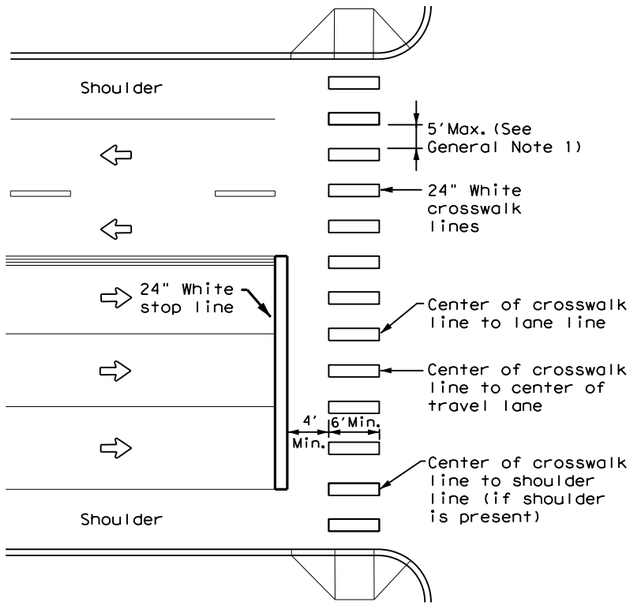


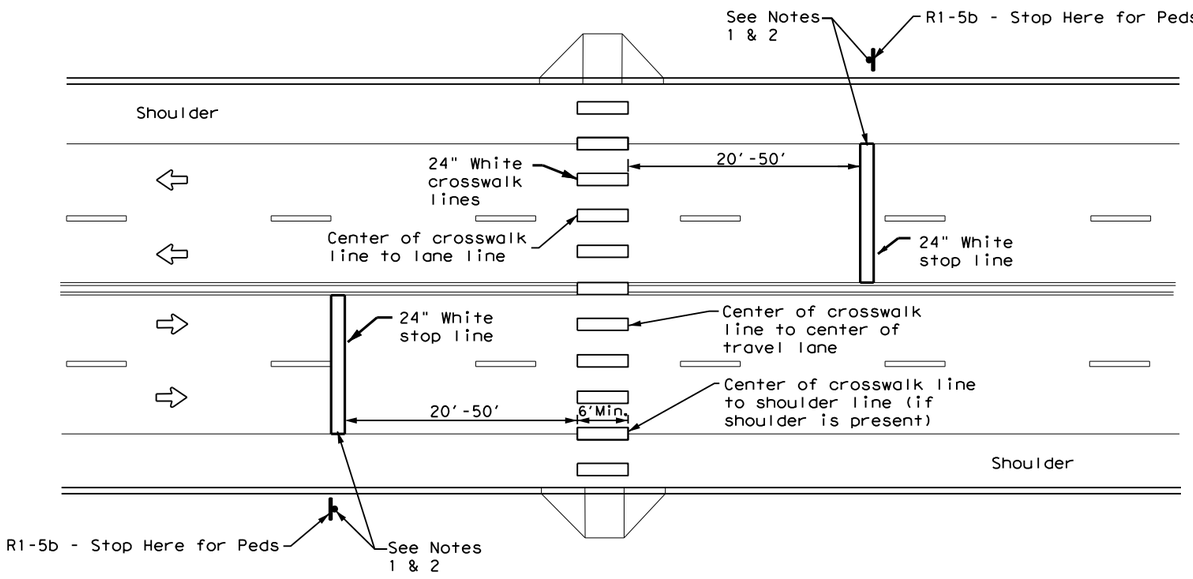
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

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

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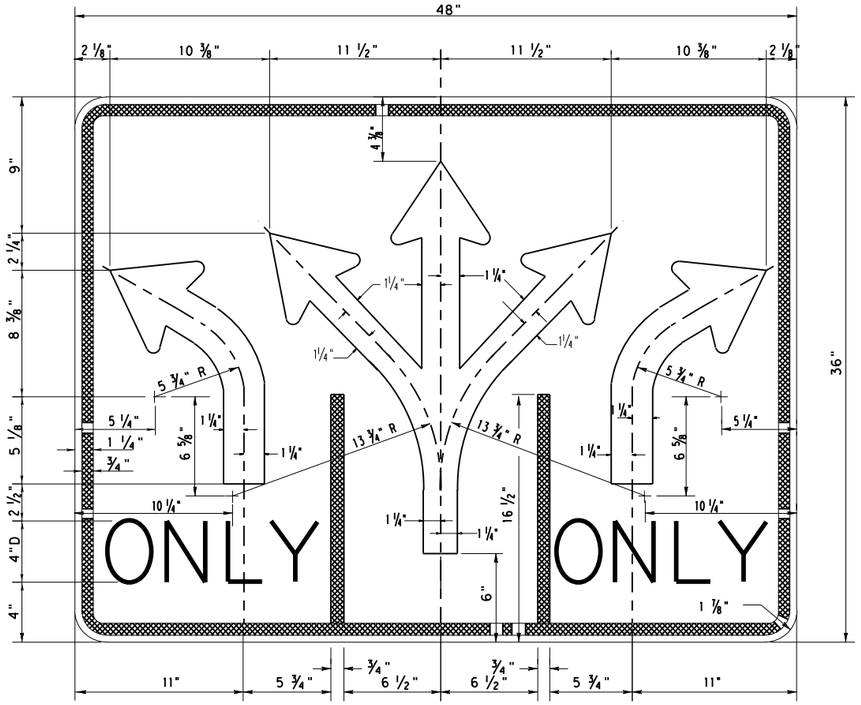
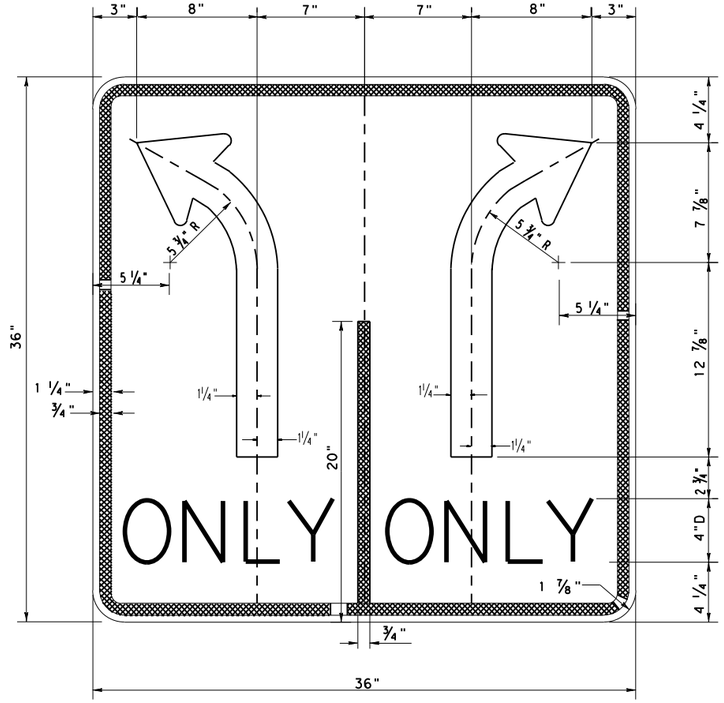
	12	HARRIS		219

22D



R3-8B



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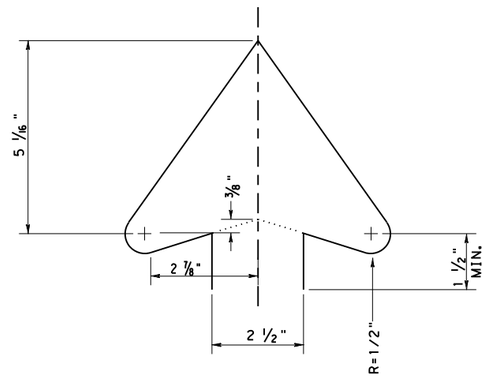
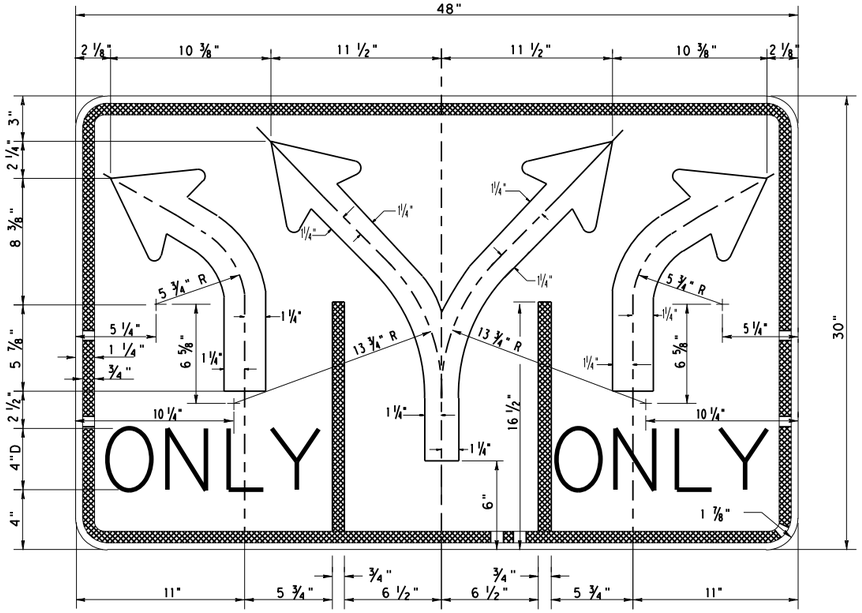


TYPICAL
ARROWHEAD DETAIL



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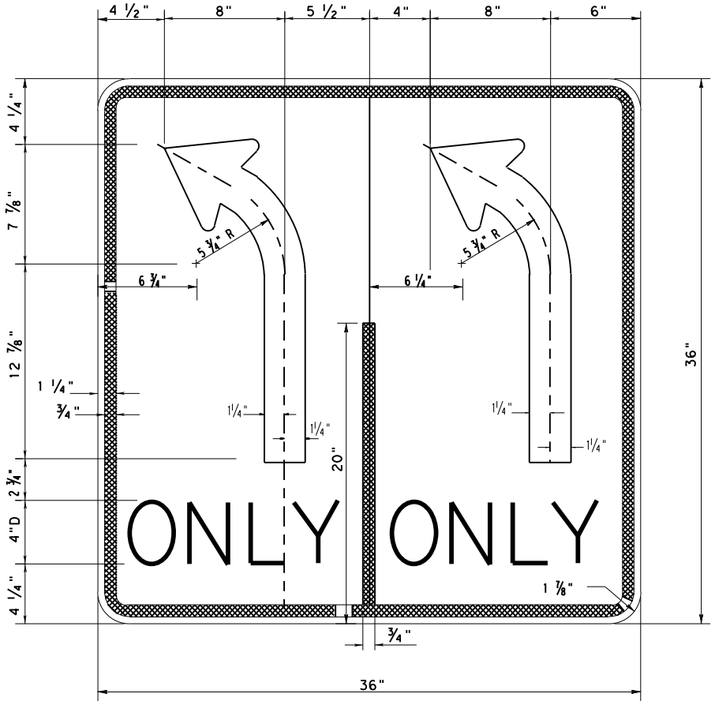


R3-8LT

LETTERS - BLACK
SYMBOLS - BLACK
BORDERS - BLACK
BACKGROUND- WHITE REFLECTIVE

For Department Material Specifications and General Notes see "TSR Series" Standard.

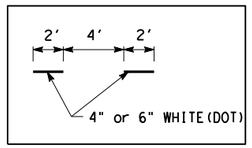
Texas Department of Transportation
Houston District

REGULATORY SIGNS (LANE USE CONTROL)

R(LUC-1)-04

FILE:	DN:	CK:	DW:	CK:
© TxDOT 1998	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6		220
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HARRIS	3256	02	093	SL8

STD N-15



DETAIL "A"

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

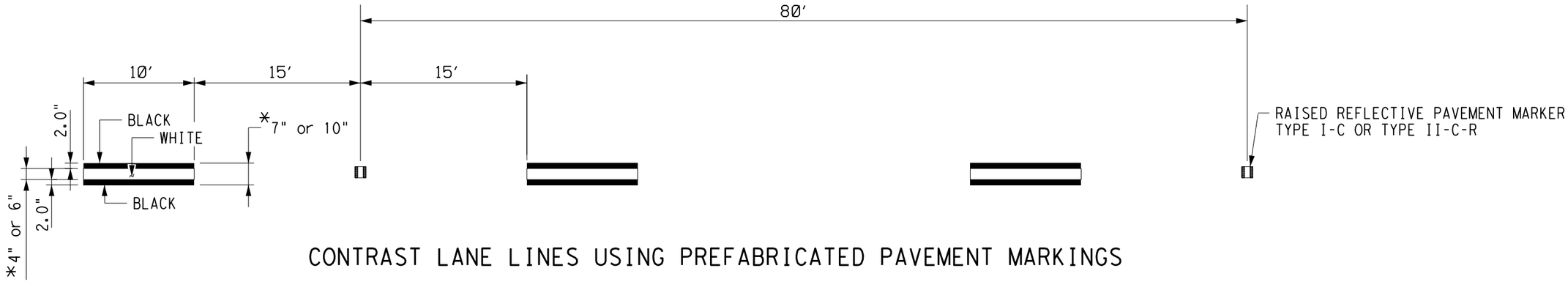
TYPICAL PLACEMENT OF DOTTED EXTENSION AT INTERSECTIONS

Texas Department of Transportation
Houston District

PAVEMENT MARKINGS
(DOTTED EXTENSION DETAILS)

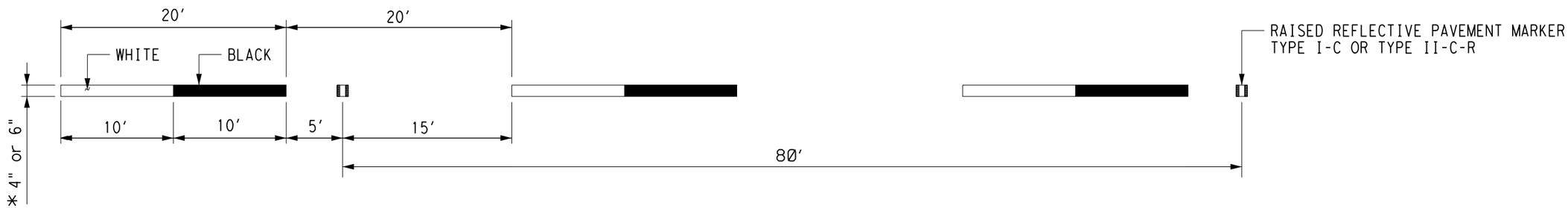
PM(DOT)-11

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 4/2010 4/2011	HOU	6		222
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HARRIS	3256	02	093	SL8



CONTRAST LANE LINES USING PREFABRICATED PAVEMENT MARKINGS

DIRECTION OF TRAFFIC



CONTRAST LANE LINES USING LIQUID APPLICATIONS
(MULTIPOLYMER, THERMOPLASTIC, ETC.)

* AS SHOWN ON THE PLANS.

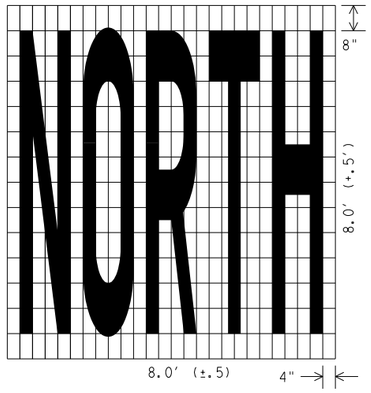
Texas Department of Transportation
Houston District

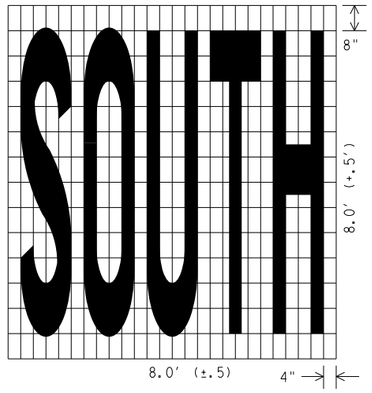
PAVEMENT MARKINGS
(CONTRAST LANE LINES)

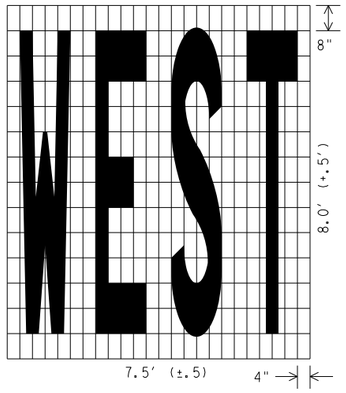
PM(CLL)-14

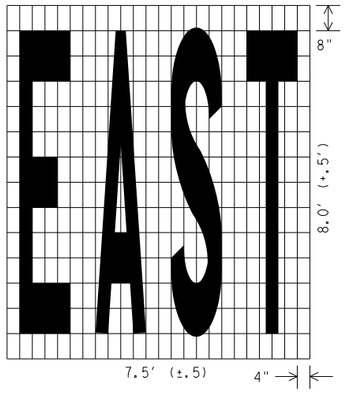
FILE:	DN:	CK:	DW:	CK:
© TxDOT 2003	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 01-10-06 02-12-08 10-2019 9" to 10"	HOU	6		223
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	HARRIS	3256	02 093	SL8

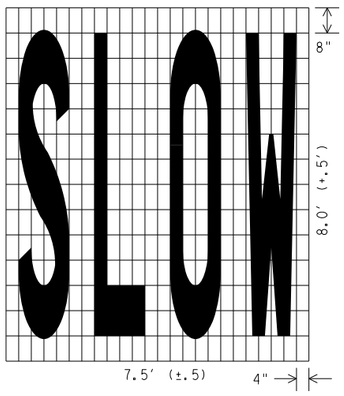
STD N-30

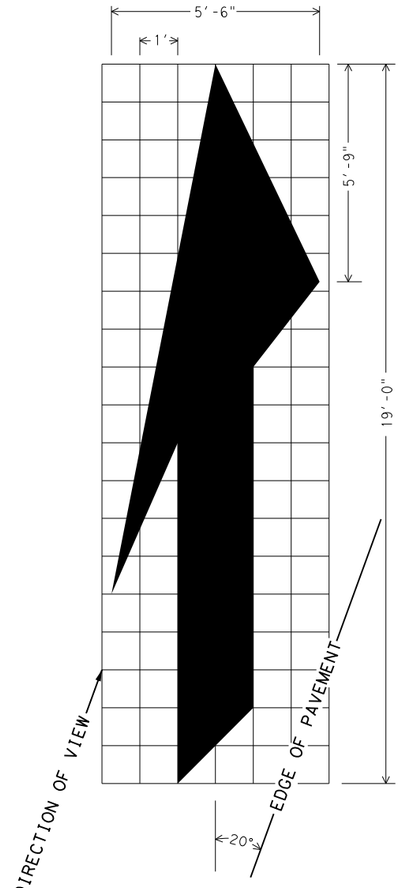






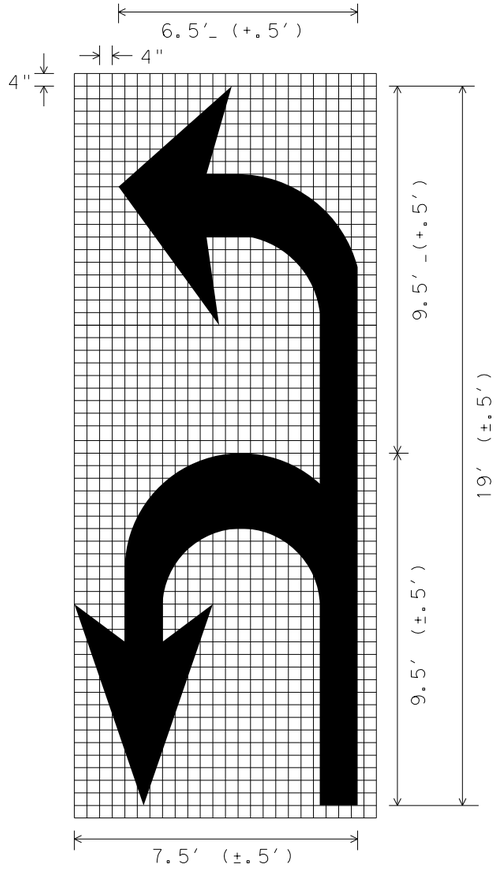




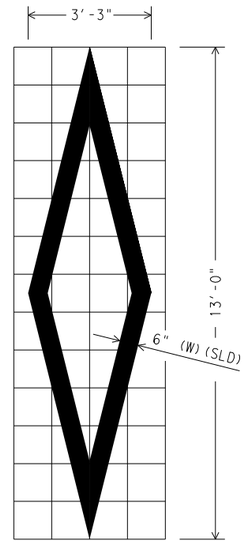


ISOMETRIC ARROW

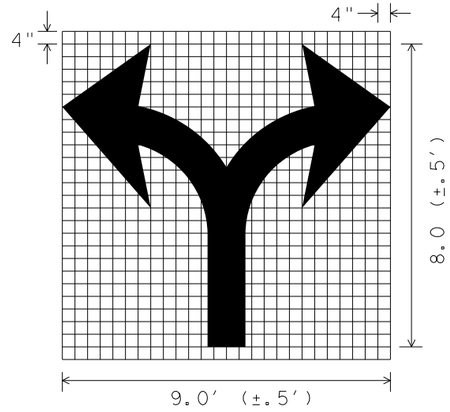
12 INCH GRID
AREA = 42 SQ. FT.
RIGHT LANE DROP ARROW
(FOR LEFT LANE, USE MIRROR IMAGE)



U-L ARROW



DIAMOND SYMBOL



SCALE 1/4" = 1′

Texas Department of Transportation
Houston District

PAVEMENT MARKINGS (WORDS, ARROWS & SYMBOLS)

PM(WAS)-07

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2007	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 03-19-07	HOU	6		224
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	HARRIS	3256	02	093	SL8

STD-N31

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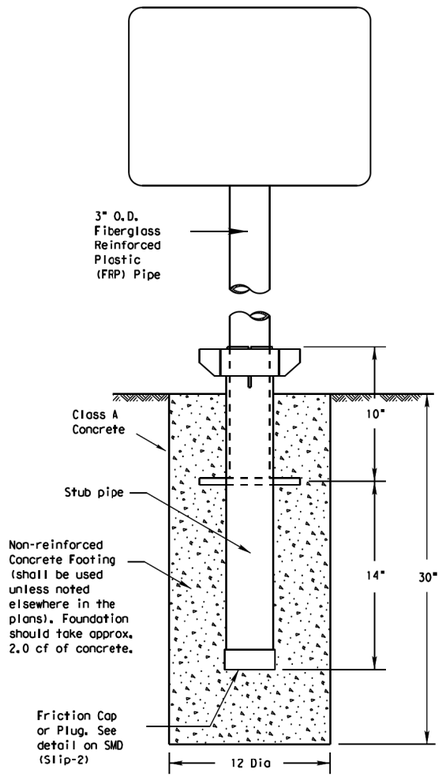
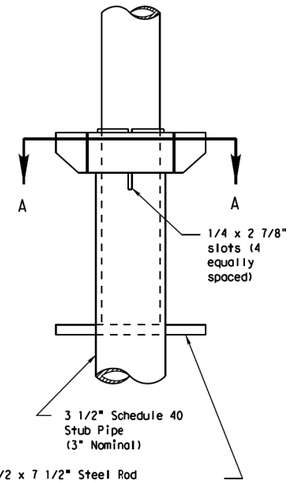
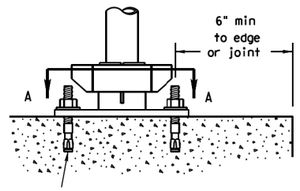
DATE: $DATE$ $TIME$
FILE: $FILE$

Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



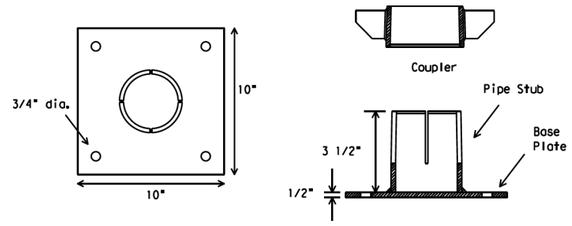
SM RD SGN ASSM TY FRP(X)UA(P)





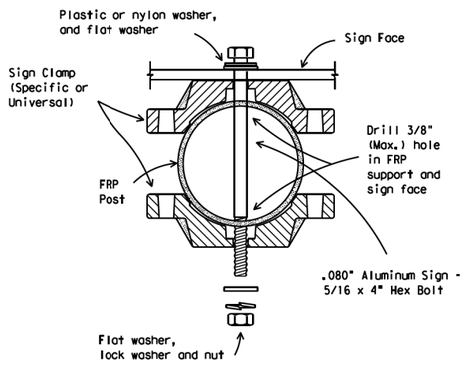
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

BOLT-DOWN DETAILS

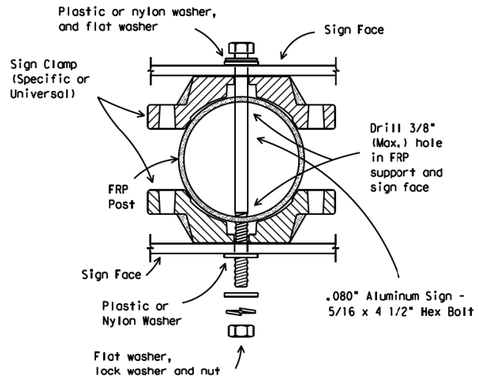


SM RD SGN ASSM TY FRP(X)UB(P)

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

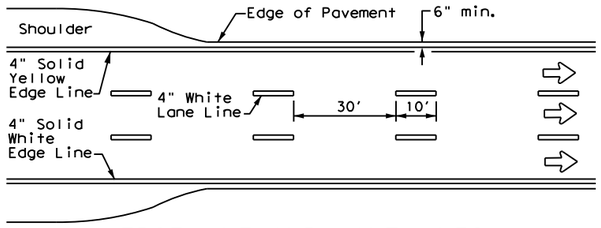
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

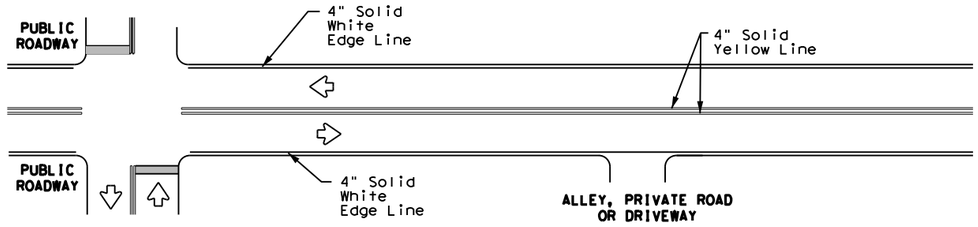
SMD(FRP)-08

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

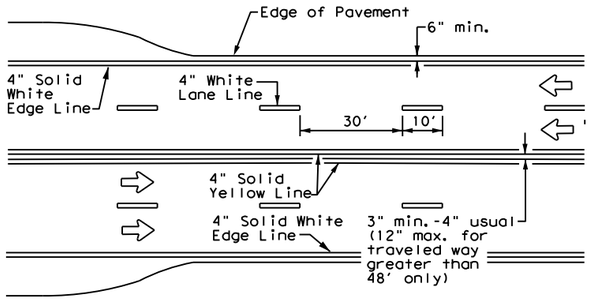
REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	3256	02	093	SL 8
©TxDOT July 2002 REVISIONS	DIST	COUNTY		SHEET NO.
9-08	12	HARRIS		225F



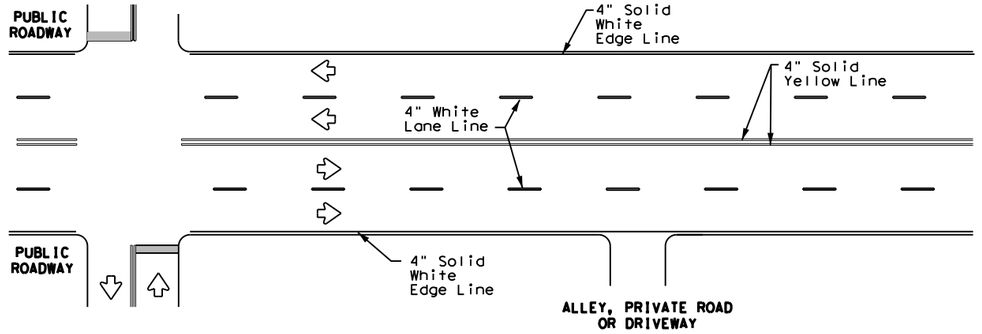
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



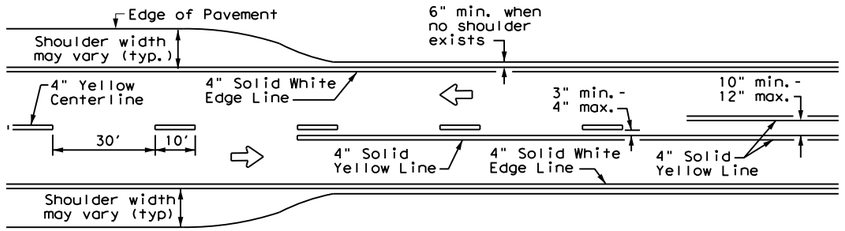
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



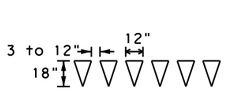
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



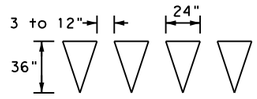
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

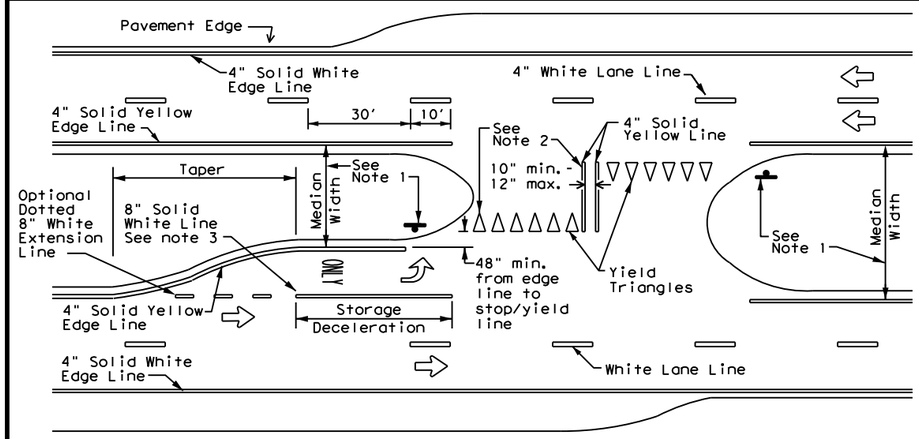


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTE:

1. Irrespective of shoulder, use 6in width lines (edge lines).
2. Use 4 in. width lines (edge and lane lines) when lane width is 10 ft. or less; and 6 in. width lines when lane width is greater than 10 ft.

NOTES

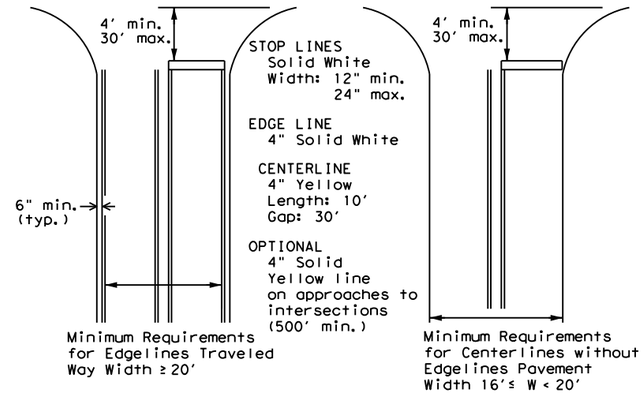
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation
HOUSTON DISTRICT STANDARD

TYPICAL STANDARD PAVEMENT MARKINGS

PM-20

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

REVISIONS: 8-95 2-12; 5-00 8-16; 8-00 7-20; 3-03

CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DIST	COUNTY	SHEET NO.
12	HARRIS	225

DATE:
FILE:

STD N-5a

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

9-08	REVISIONS	12	HARRIS	225A

3256 02	093		SL 8

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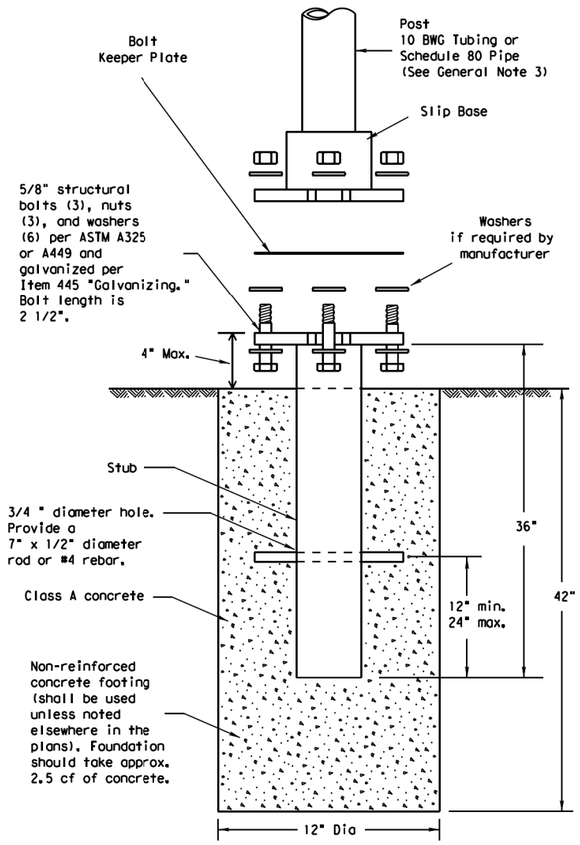
DATE: $DATE$ $TIME$
FILE: $FILE$

DATE:
FILE:

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

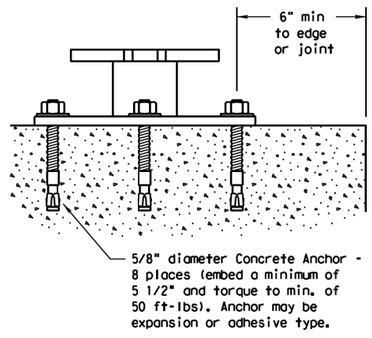
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

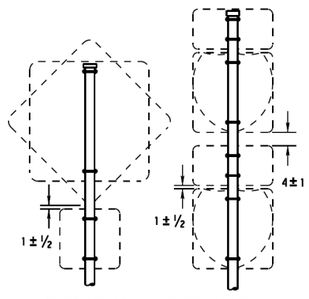
SMD(SLIP-1)-08

REVISIONS
9-08

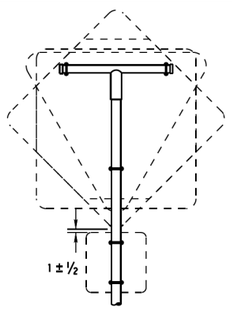
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

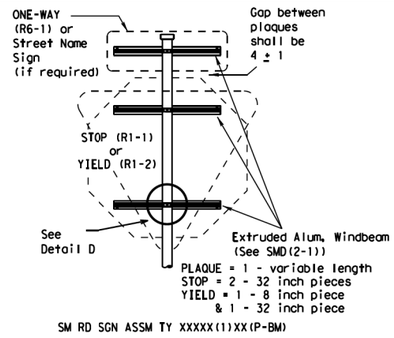
DIST	COUNTY	SHEET NO.
12	HARRIS	225B



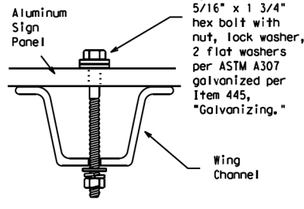
SM RD SGN ASSM TY XXXXX(1)XX(P)



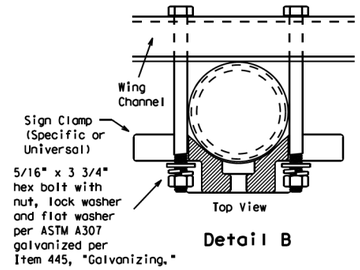
SM RD SGN ASSM TY XXXXX(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



Detail A



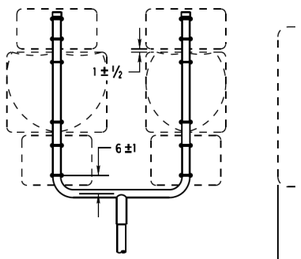
Detail B

GENERAL NOTES:

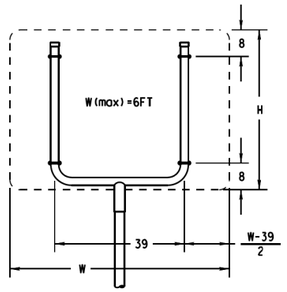
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

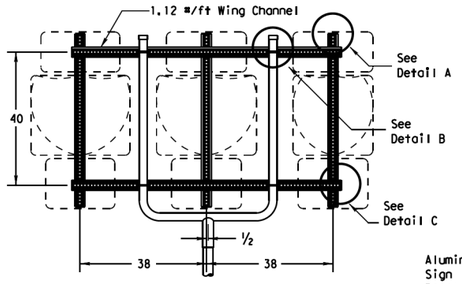
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



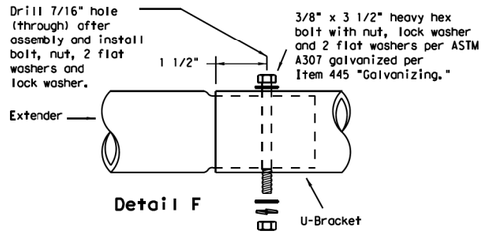
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

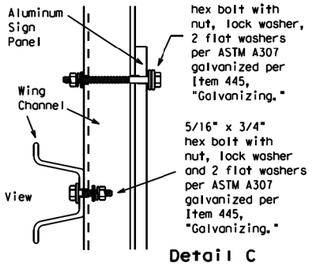


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

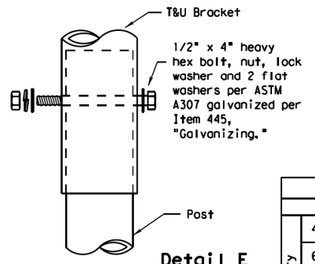


Detail F

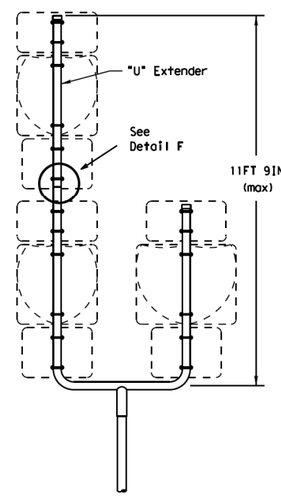
Splices shall only be allowed behind the sign substrate.



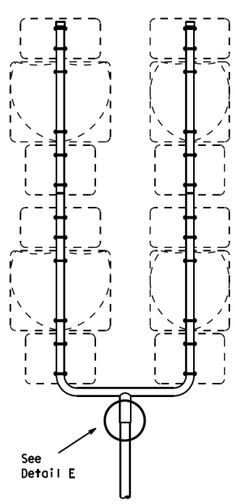
Detail C



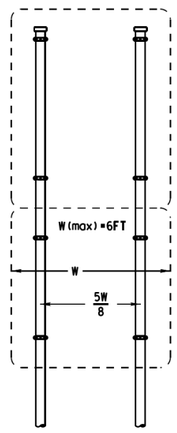
Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)

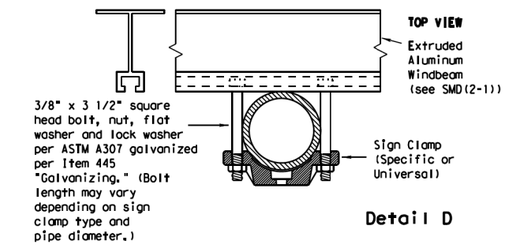


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

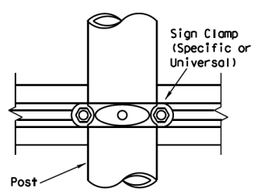


SM RD SGN ASSYM TY XXXXX(2)XX(P)

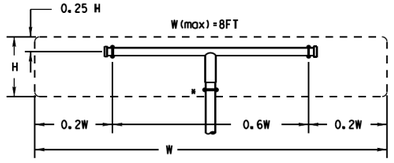
SIDE VIEW



Detail D



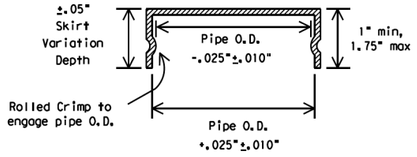
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-Inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
©TxDOT July 2002 REVISIONS	3256	02	093	SL 8
9-08	DIST	COUNTY		SHEET NO.
26C	12	HARRIS		225C

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

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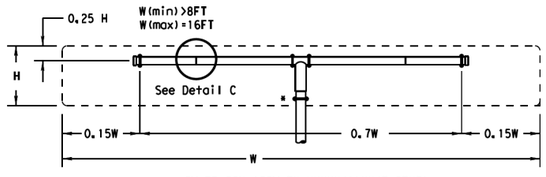
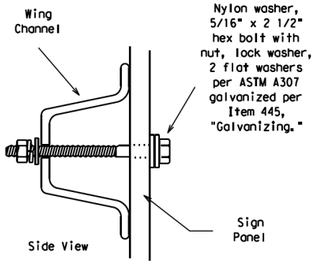
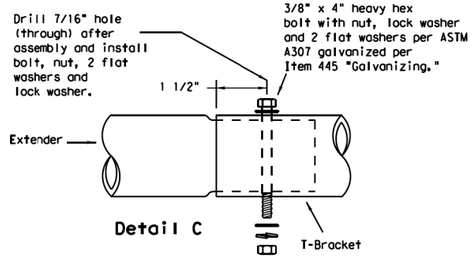
DATE: $DATE$ $TIME$
FILE: $FILE$



SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



Detail B



Detail C

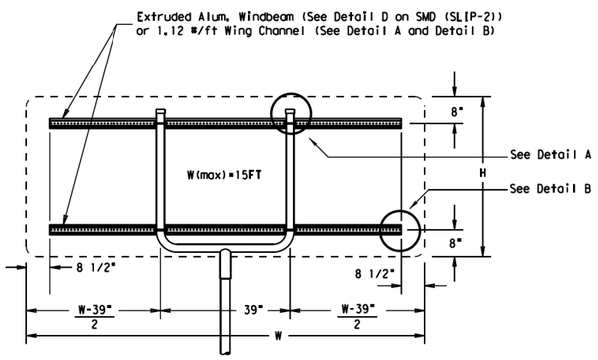
Splices shall only be allowed behind the sign substrate.

GENERAL NOTES:

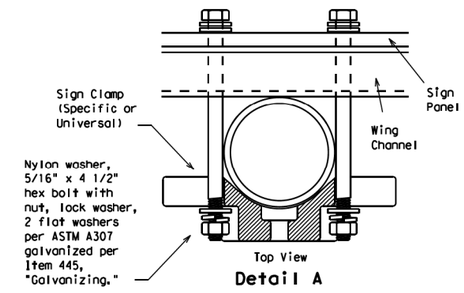
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

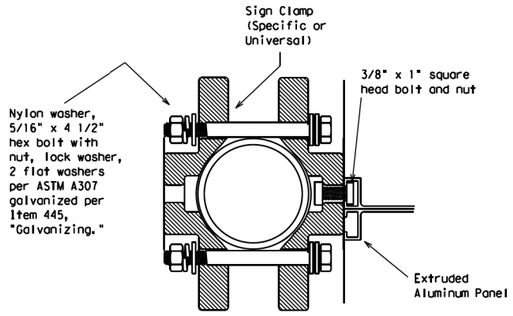
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.



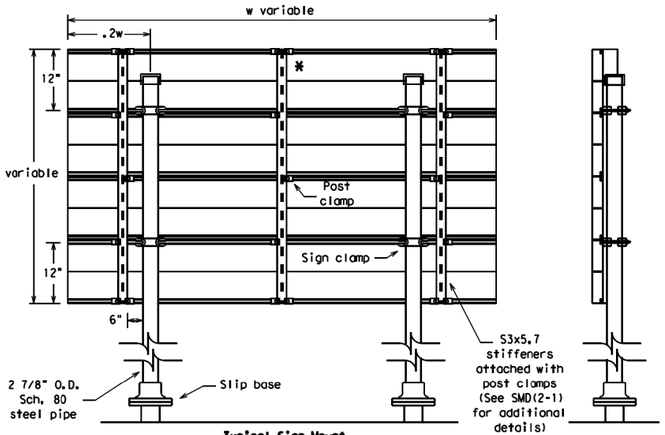
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



Detail A



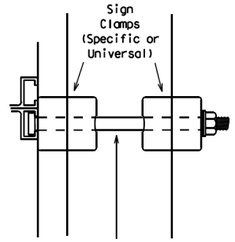
Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



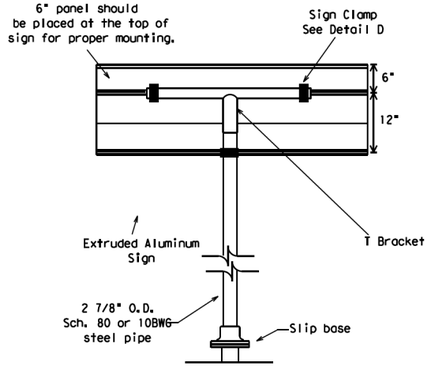
Typical Sign Mount

SM RD SGN ASSM TY S80(2)XX(P-EXAL)

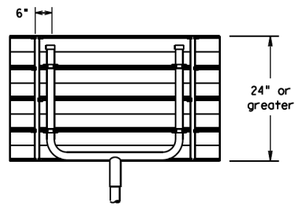
* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.



Detail E



Extruded Aluminum Sign With T Bracket



Use Extruded Alum. Windbeam as stiffeners See SMD (2-1) for additional details

See Detail E for clamp installation

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS
9-08

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9-08

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8
DIST	COUNTY		SHEET NO.
12	HARRIS		225D

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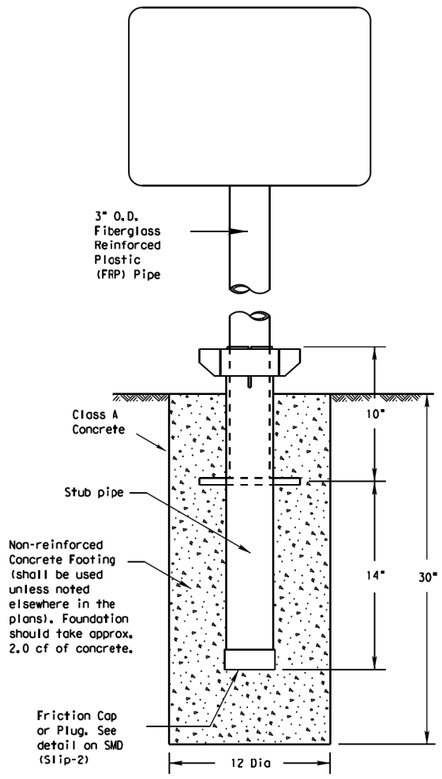
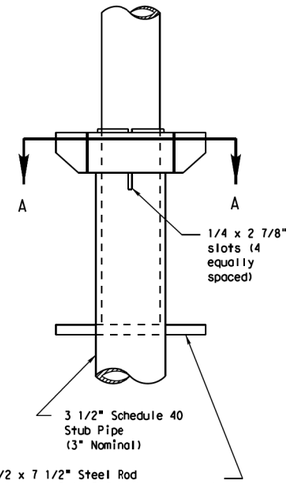
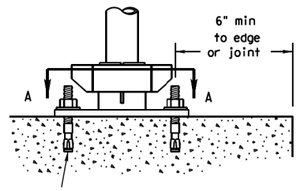
DATE: $DATE$ $TIME$
FILE: $FILE$

Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



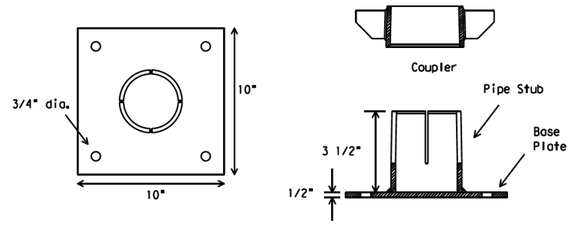
SM RD SGN ASSM TY FRP(X)UA(P)





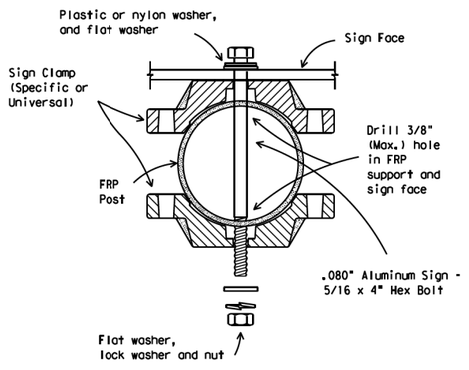
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

BOLT-DOWN DETAILS

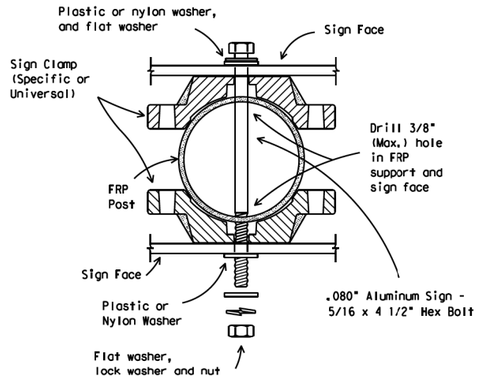


SM RD SGN ASSM TY FRP(X)UB(P)

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD(FRP)-08

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	3256	02	093	SL 8
©TxDOT July 2002 REVISIONS	DIST	COUNTY		SHEET NO.
9-08	12	HARRIS		225F

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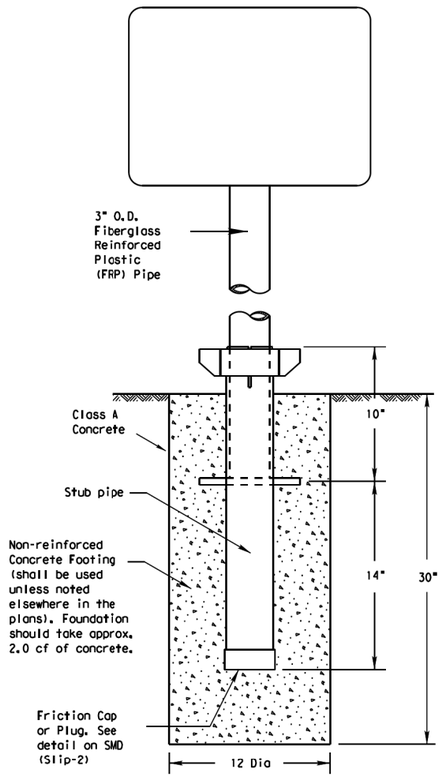
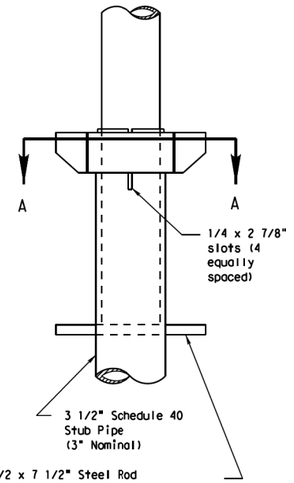
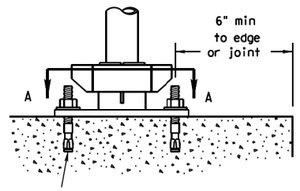
DATE: $DATE$ $TIME$
FILE: $FILE$

Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post



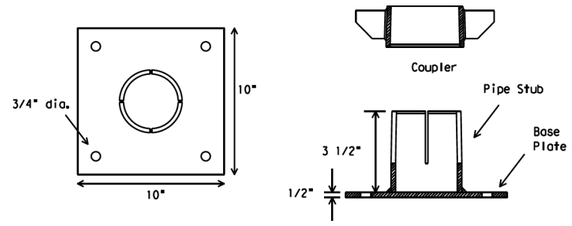
SM RD SGN ASSM TY FRP(X)UA(P)





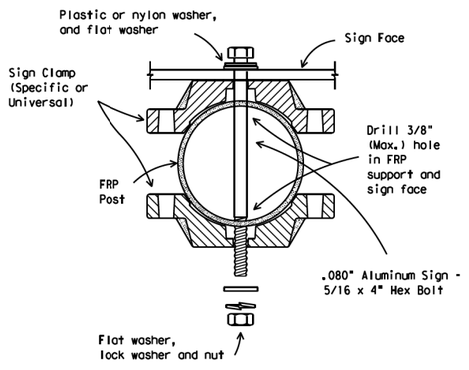
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

BOLT-DOWN DETAILS

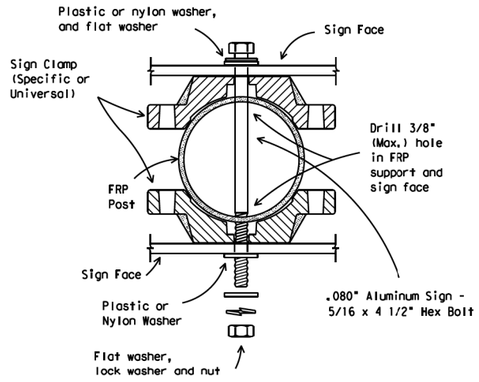


SM RD SGN ASSM TY FRP(X)UB(P)

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
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FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
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UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

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2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD(FRP)-08

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	3256	02	093	SL 8
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9-08	12	HARRIS		225F

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

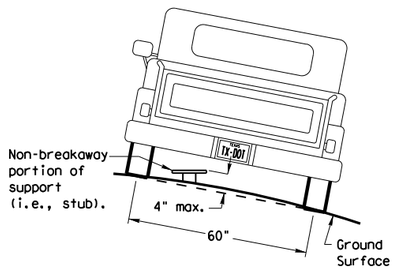
Anchor Type

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

Sign Mounting Designation

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

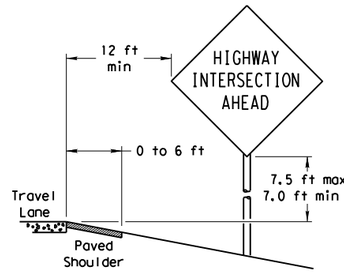
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

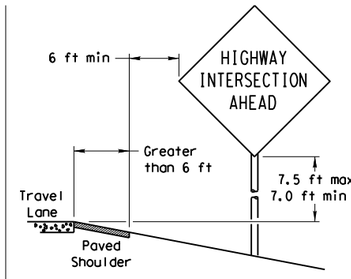
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

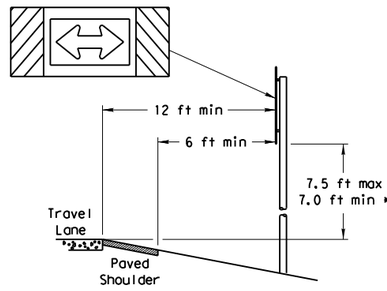
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



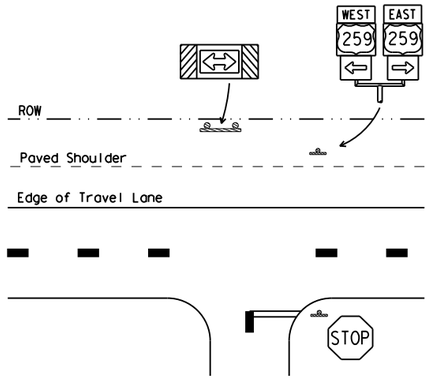
GREATER THAN 6 FT. WIDE

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

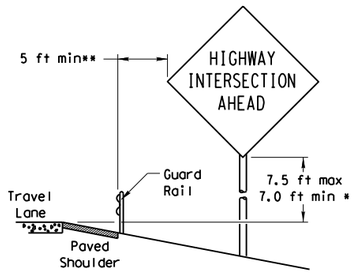
T-INTERSECTION



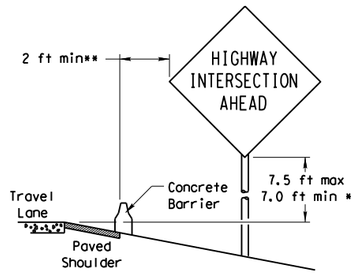
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



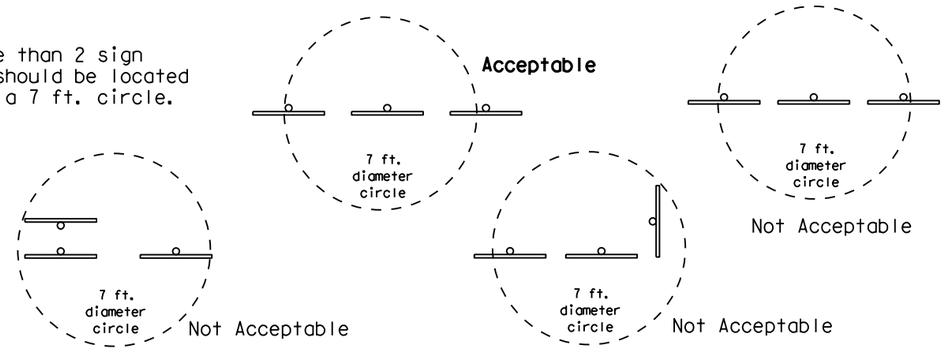
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

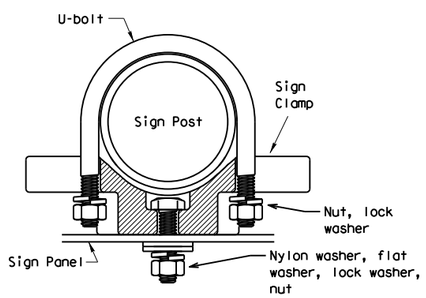
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

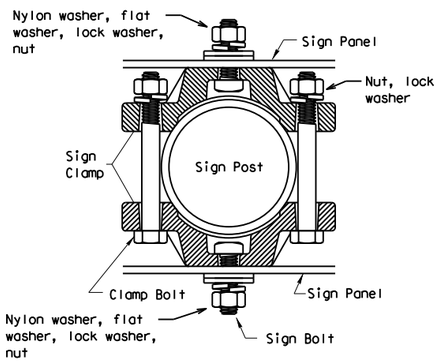


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

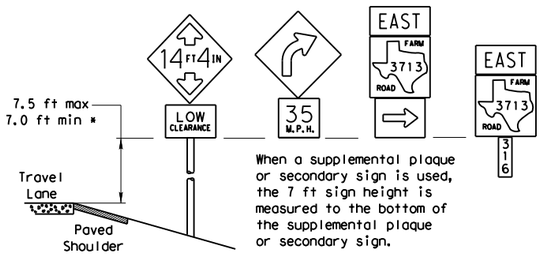
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



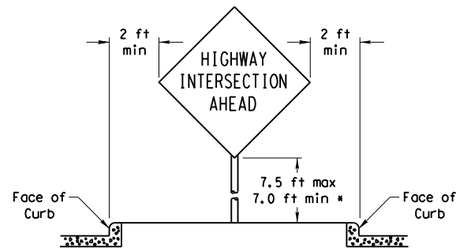
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



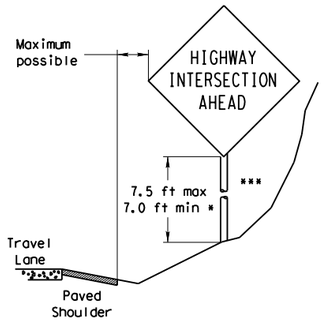
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

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

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

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

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

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

Texas Department of Transportation
Traffic Operations Division

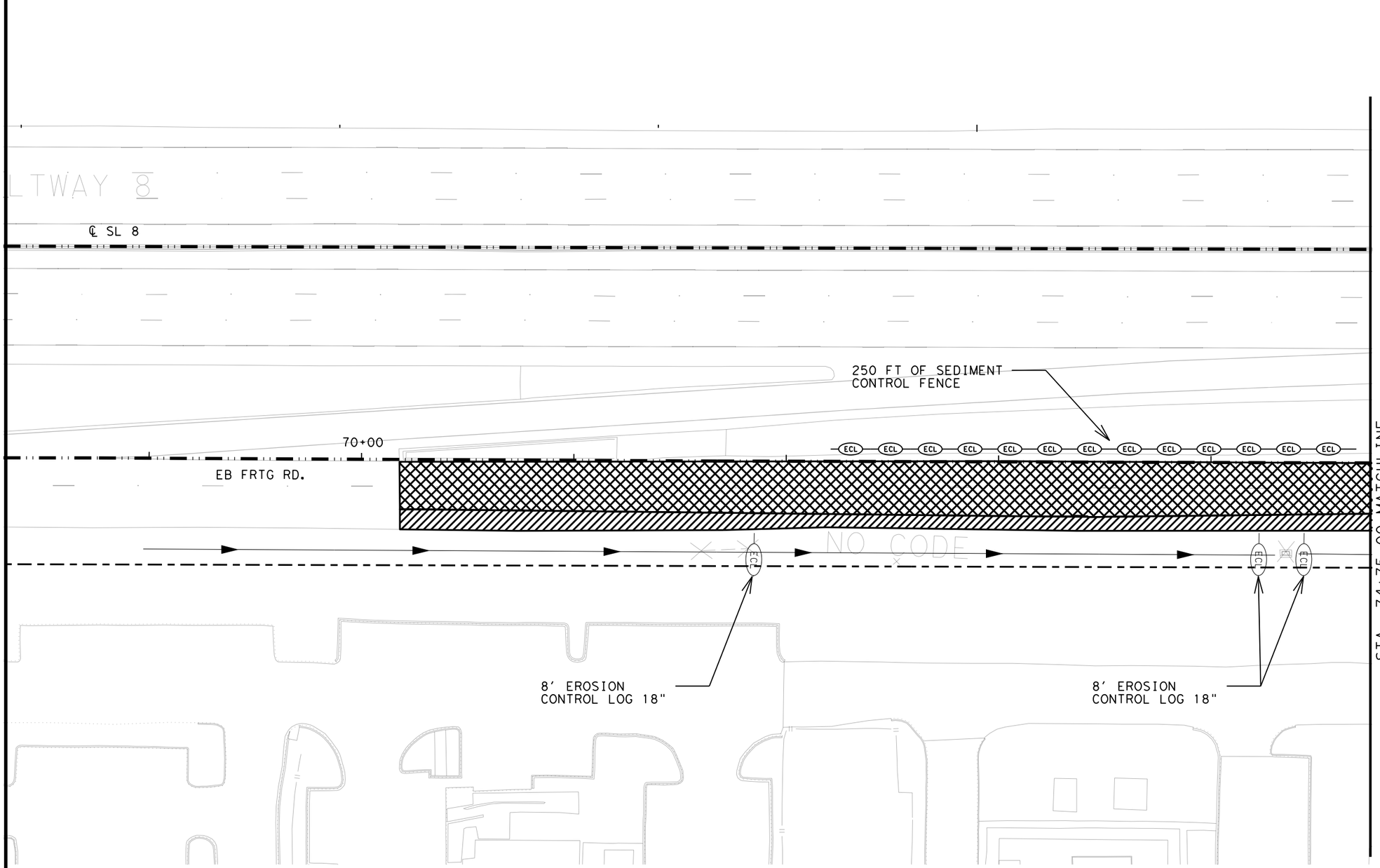
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
C	S	J	HWY
DIST	COUNTY		SHEET NO.
DST	CTY		225G

9-08 REVISIONS

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



LEGEND

- WATER FLOW
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG

N

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED
PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8

EB FRTG RD STORMWATER POLLUTION PREVENTION PLAN (SWP3)

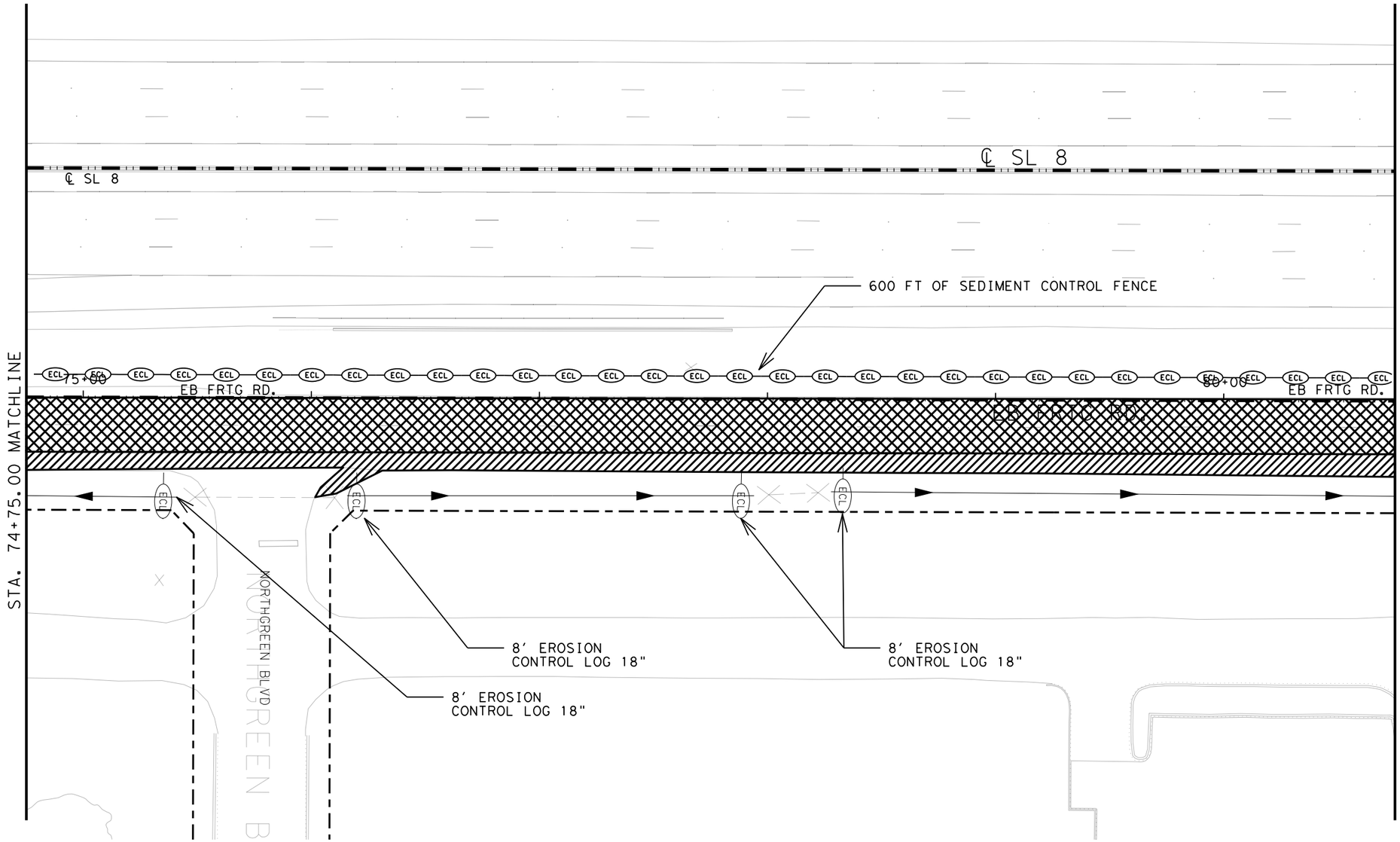
SCALE: 1" = 50' HORZ

SHEET 1 OF 7

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		226

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



LEGEND

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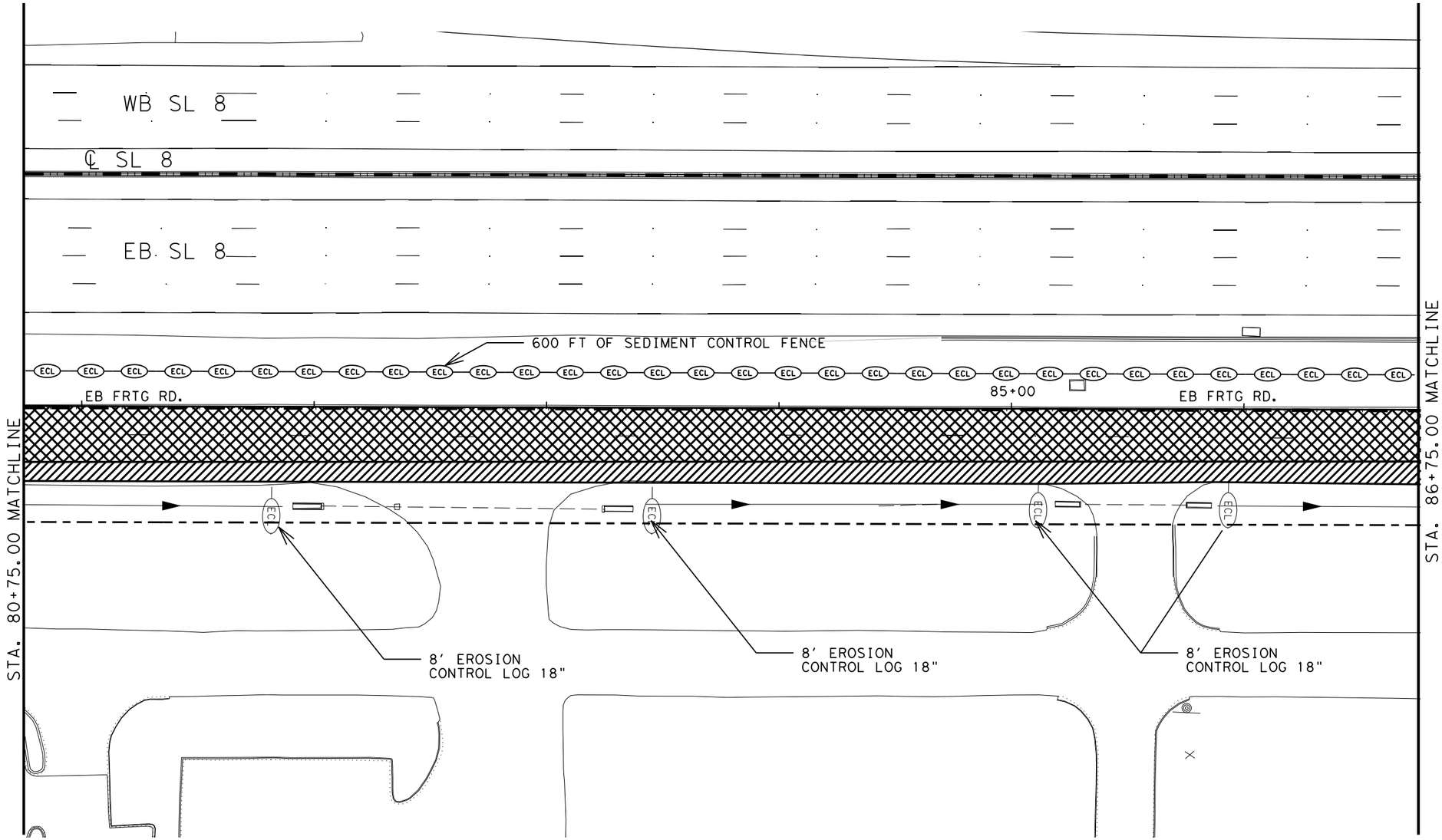
SL 8
EB FRTG RD STORMWATER POLLUTION PREVENTION PLAN (SWP3)

SCALE: 1" = 50' HORZ

SHEET 2 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			227
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
$FILEL$



LEGEND

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SL 8
EB FRTG RD STORMWATER POLLUTION PREVENTION PLAN (SWP3)

SCALE: 1" = 50' HORZ

SHEET 3 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			228
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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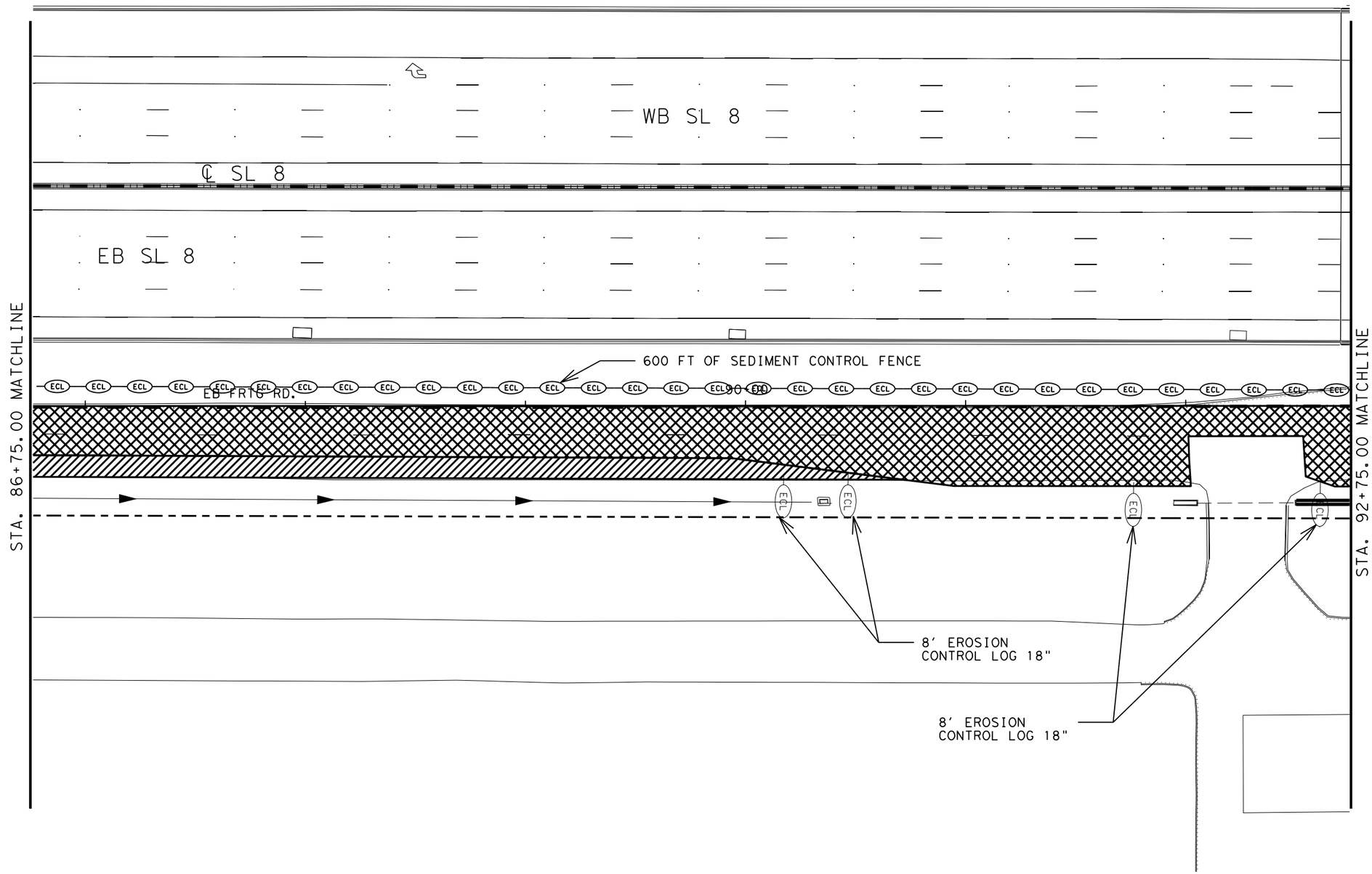

LEGEND

- WATER FLOW
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DANIEL DUKE THOMPSON
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SL 8

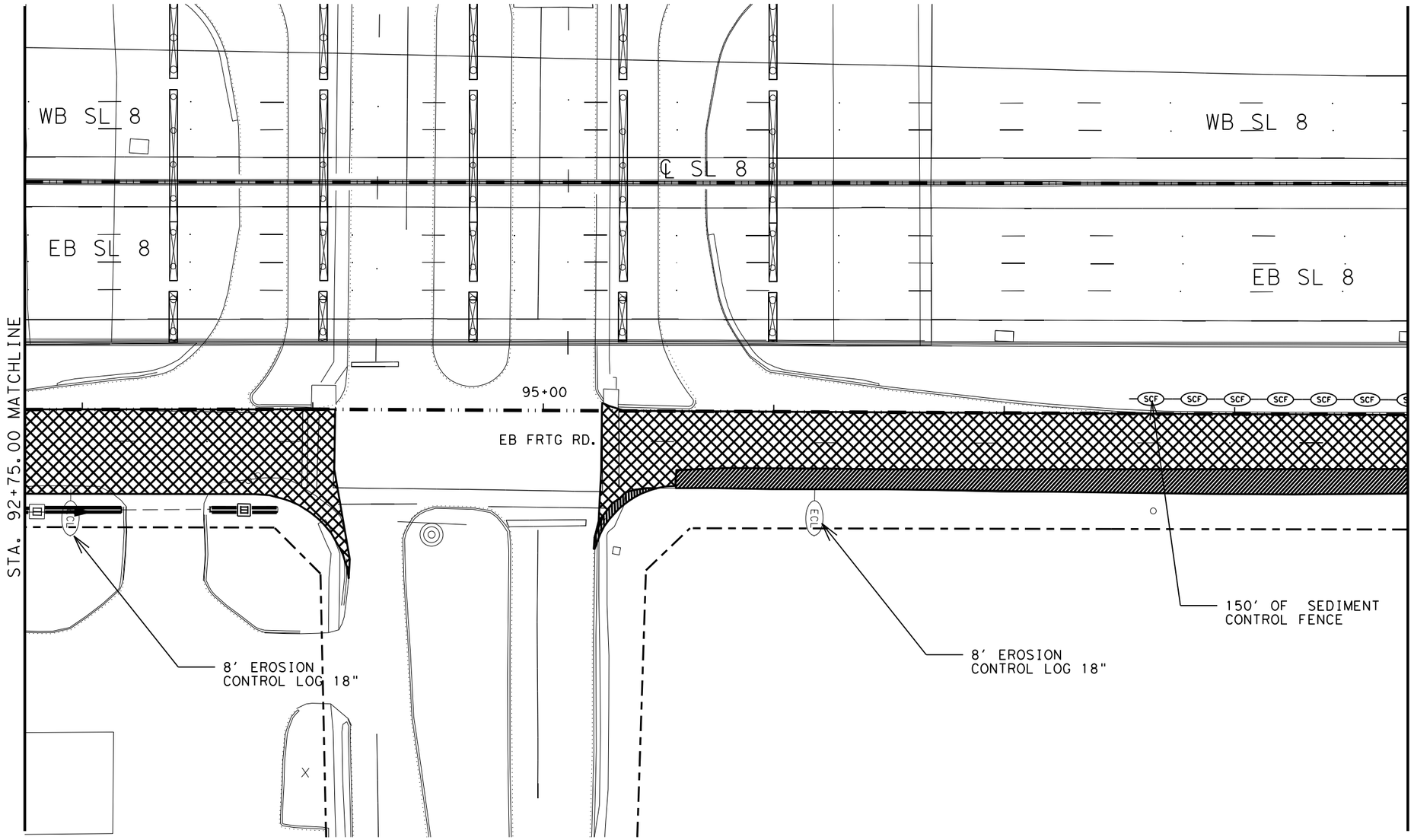
EB FRTG RD STORMWATER POLLUTION PREVENTION PLAN (SWP3)

SCALE: 1" = 50' HORZ

SHEET 4 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			229
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
$FILEL$



N

LEGEND

- WATER FLOW
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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Texas Department of Transportation

SL 8

EB FRTG RD STORMWATER POLLUTION PREVENTION PLAN (SWP3)

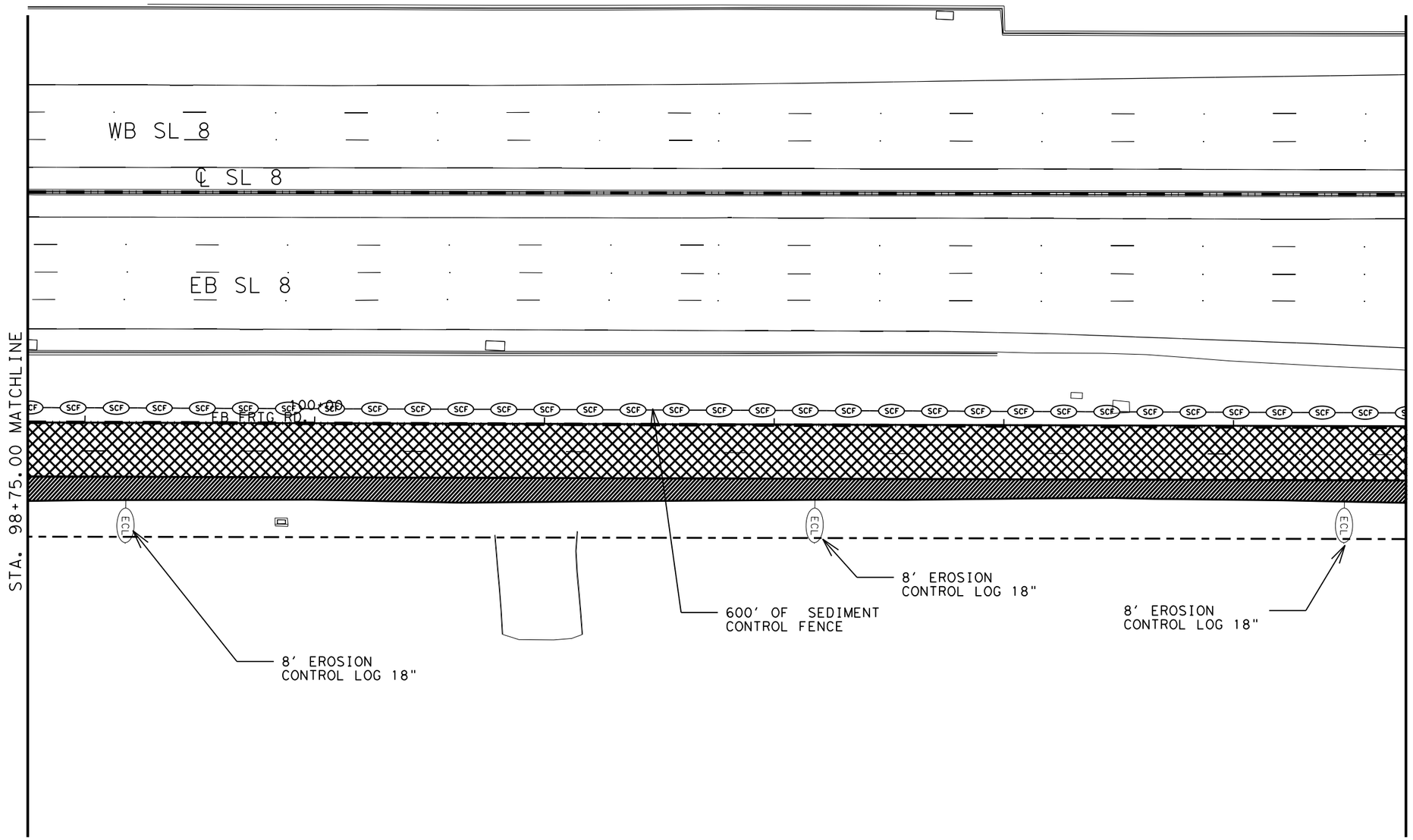
SCALE: 1" = 50' HORZ

SHEET 5 OF 7

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		230

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$



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- WATER FLOW
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SL 8

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SCALE: 1" = 50' HORZ

SHEET 6 OF 7

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		231

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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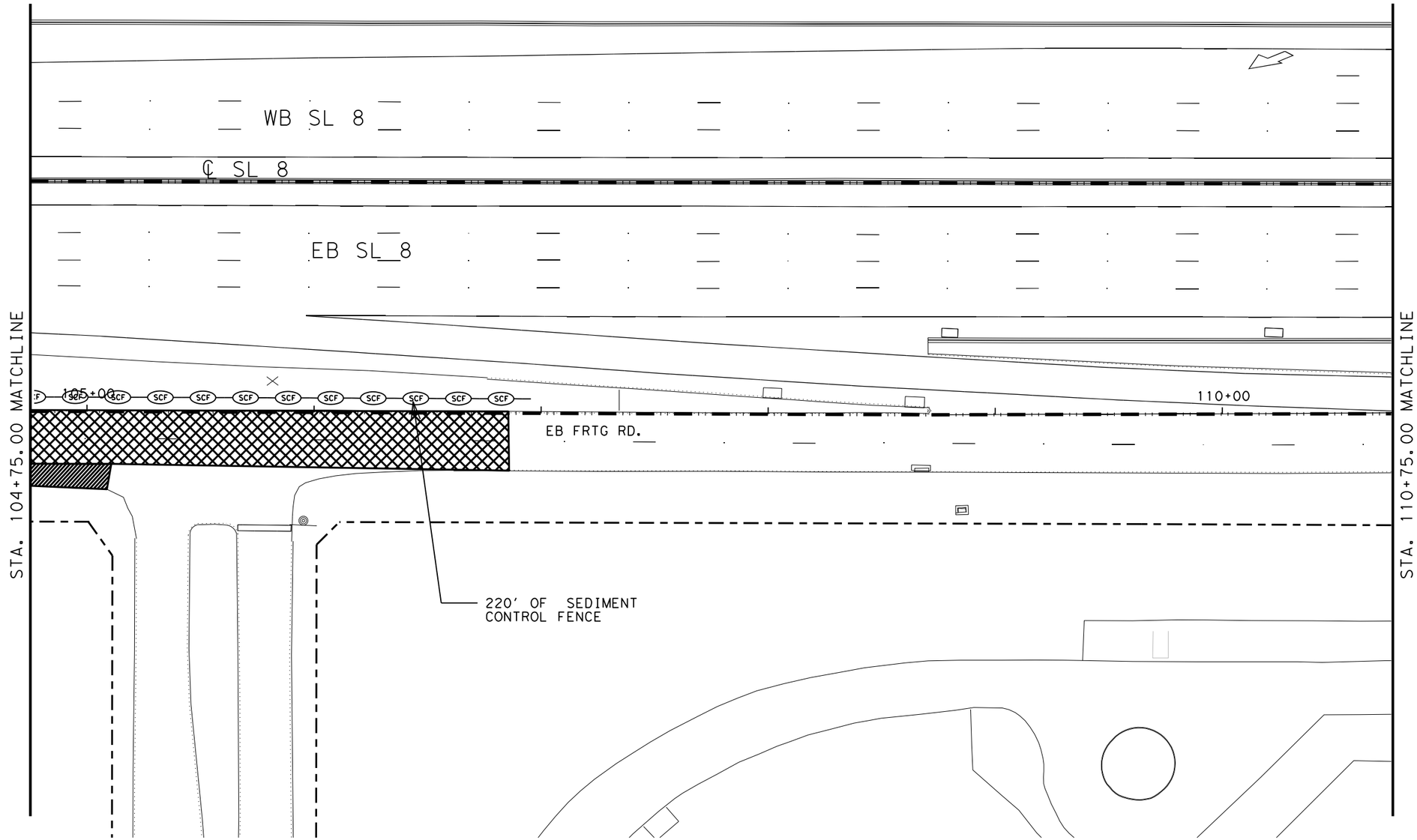

N

LEGEND

- WATER FLOW
- SCF — SEDIMENT CONTROL FENCE
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SL 8

EB FRTG RD STORMWATER POLLUTION PREVENTION PLAN (SWP3)

SCALE: 1" = 50' HORZ

SHEET 7 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			232
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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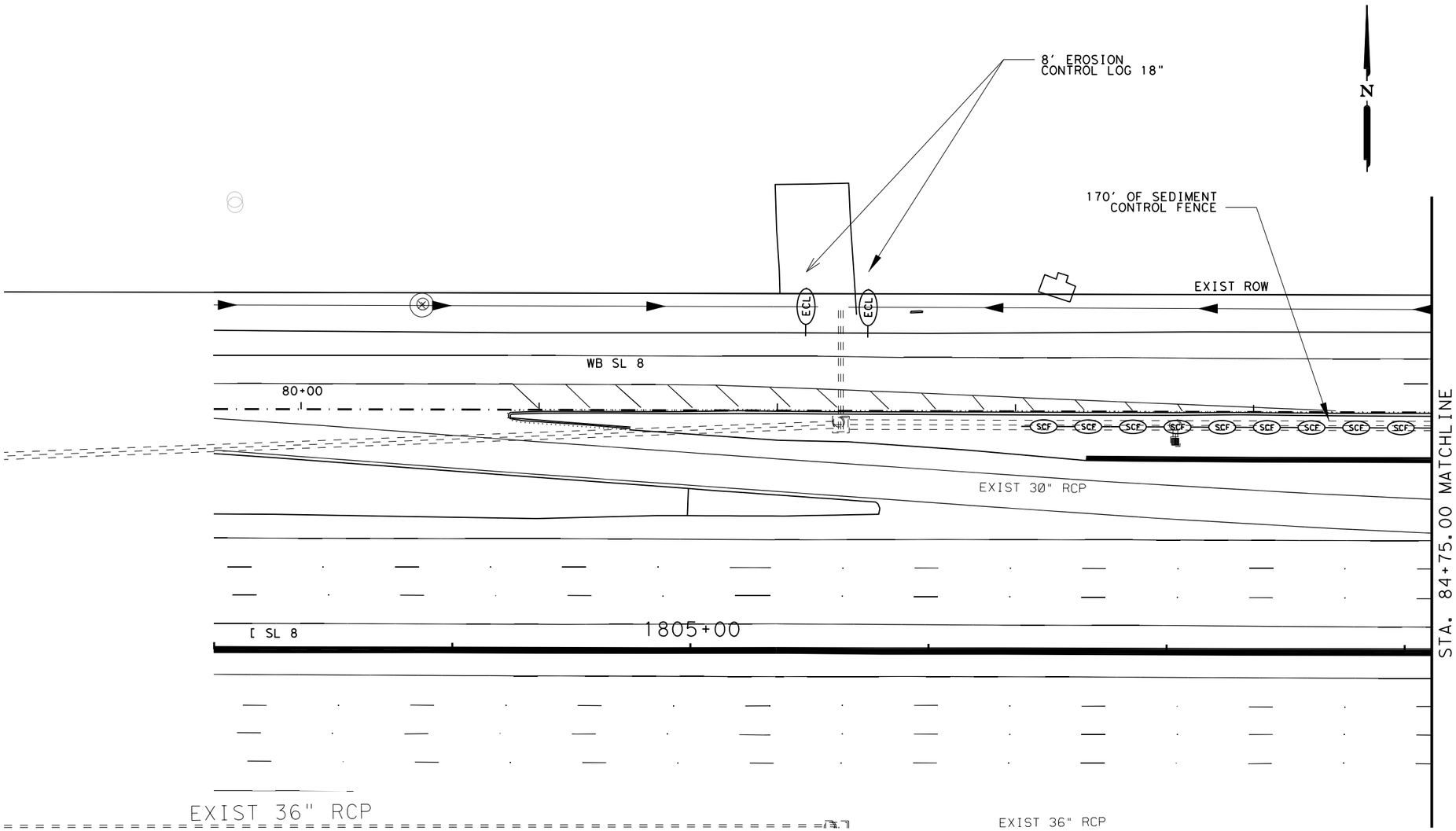

LEGEND

- WATER FLOW
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG

N

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SL 8

WB FRTG RD

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

SCALE: 1" = 50' HORZ

SHEET 1 OF 4

FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
6		233

STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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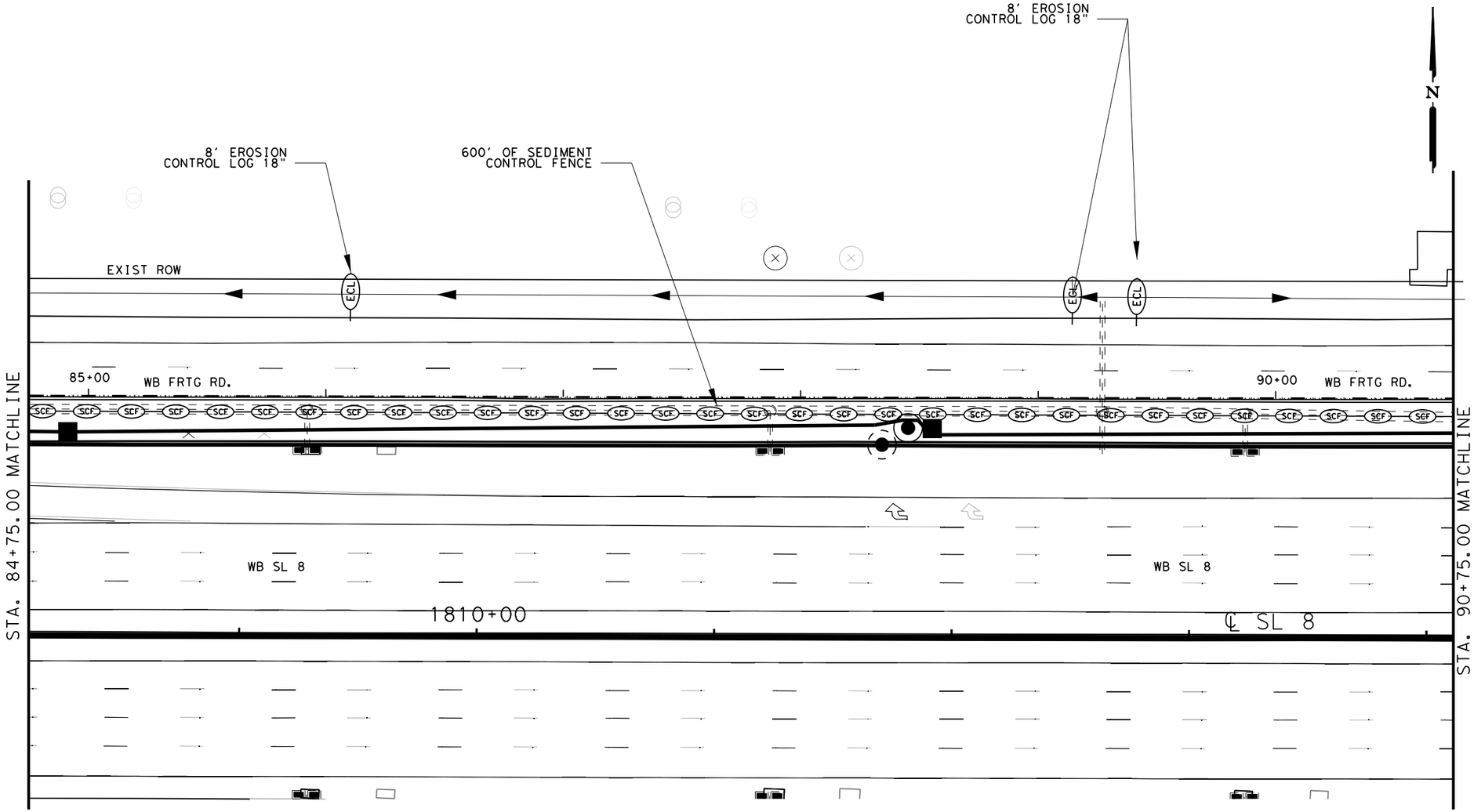

LEGEND

- WATER FLOW
- SCF — SEDIMENT CONTROL FENCE
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SL 8

WB FRTG. RD

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

SCALE: 1" = 50' HORZ

SHEET 2 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			234
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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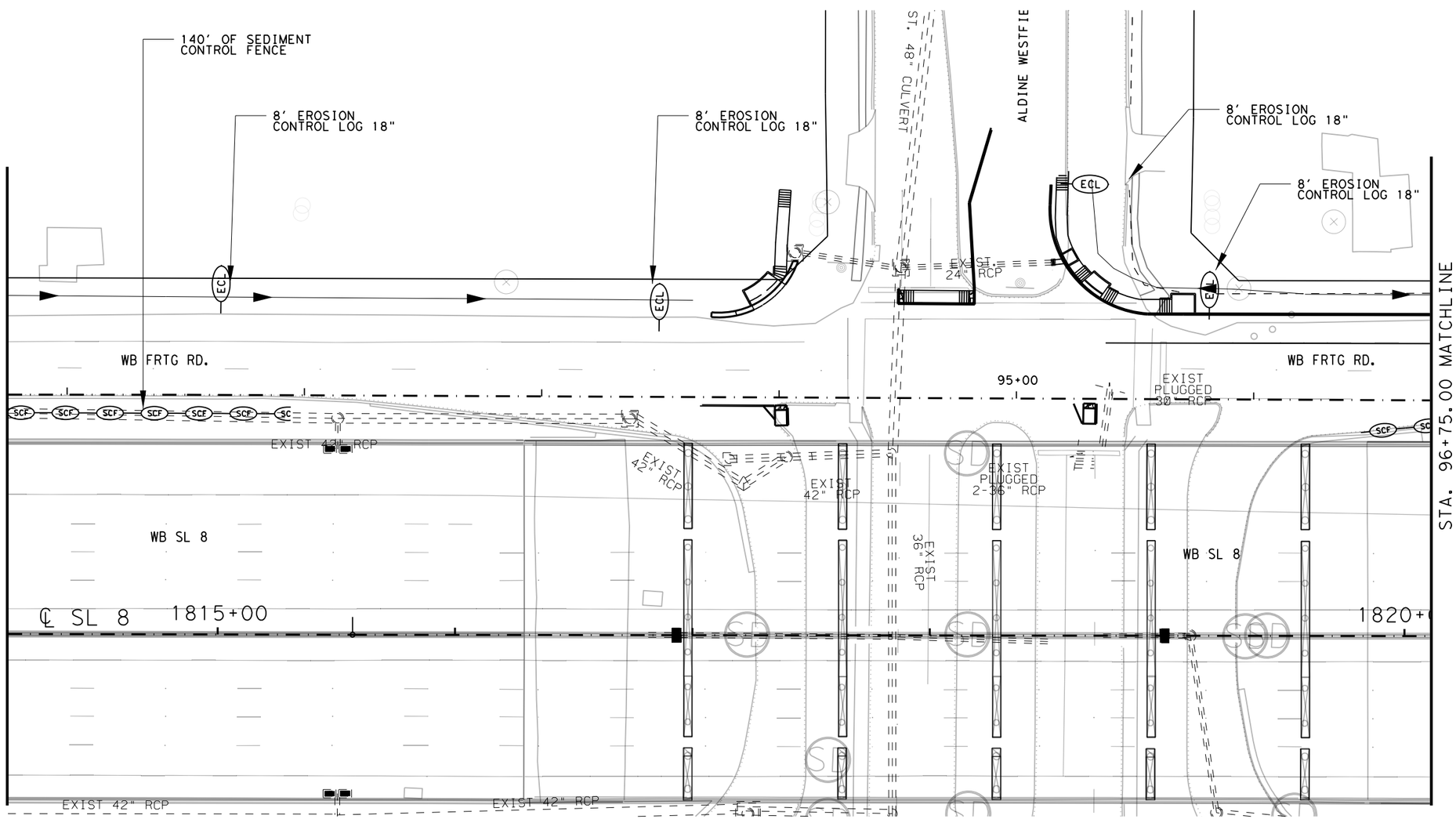

LEGEND

- WATER FLOW
- SCF — SEDIMENT CONTROL FENCE
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WB FRTG. RD

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SCALE: 1" = 50' HORZ

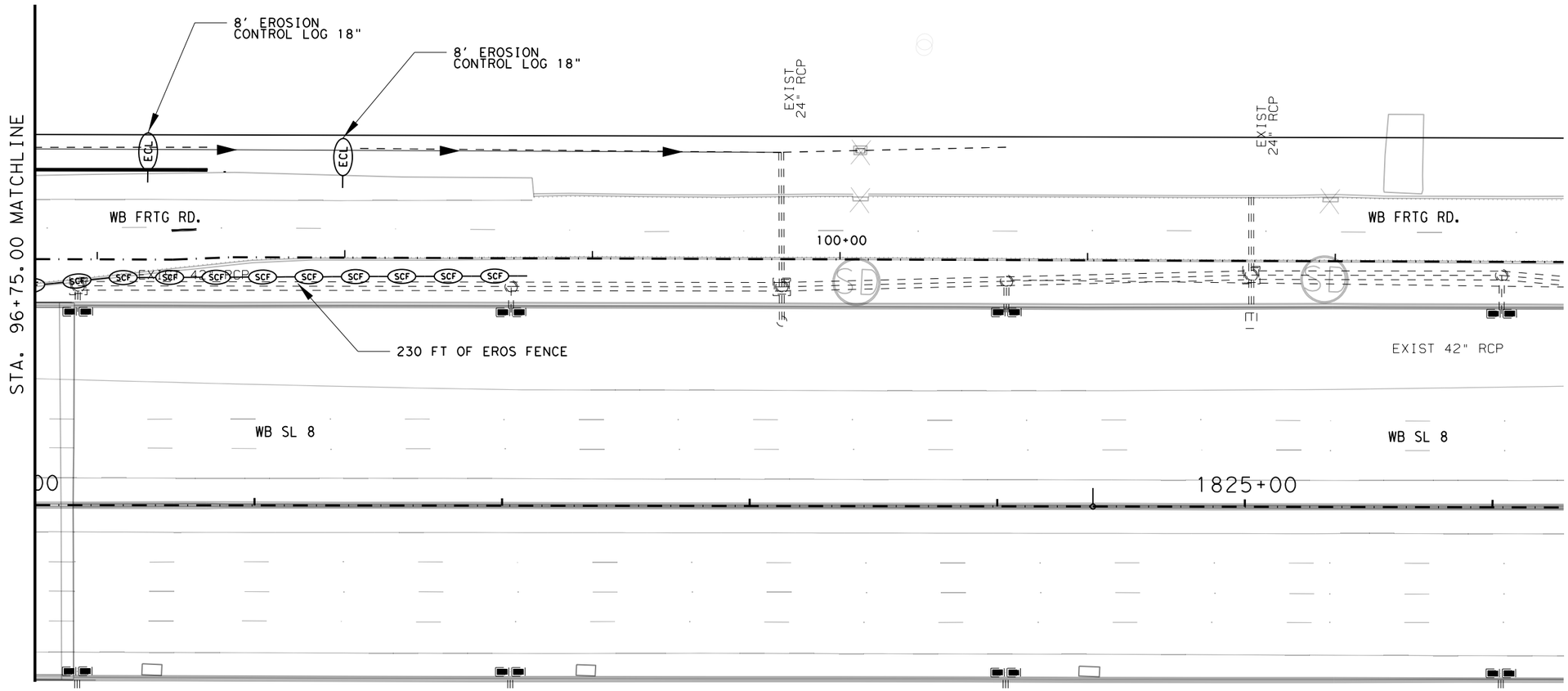
SHEET 3 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			235
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

LEGEND

- WATER FLOW
- SCF — SEDIMENT CONTROL FENCE
- ECL — EROSION CONTROL LOG



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SL 8

WB FRTG. RD

STORMWATER POLLUTION PREVENTION PLAN (SWP3)

SCALE: 1" = 50' HORZ

SHEET 4 OF 4

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			236
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

SITE DESCRIPTION

PROJECT LIMITS: SL 8 (BELTWAY 8)
EAST OF HARDY TOLL RD TO EAST OF ALDINE WESTFIELD RD.

PROJECT DESCRIPTION: FOR THE RECONSTRUCTION OF SL 8 AND EB /WB FRONTAGE ROADS.

MAJOR SOIL DISTURBING ACTIVITIES:

PHASE I EB FRTG RD.
EXCAVATE FOR NEW 13' INSIDE LANE.
RELOCATE AREA DRAINS BETWEEN FRTG RD AND MAINLANES(SL 8).
PLACE MAN HOLES ON EXISTING INLETS, AND RE- GRADE MEDIAN DITCH TO NEW INLETS.

PHASE II EB FRTG RD.
RE GRADE OUTSIDE DITCHES TO DRAIN TO EXISTING CULVERTS.
INSTALL AREA DRAIN AND CULVERTS AT EB FRTG RD. AND ALDINE WESTFIELD RD.

PHASE I WB FRTG RD.
EXCAVATE FOR NEW 13' INSIDE LANE.
RELOCATE AREA DRAINS BETWEEN FRTG RD AND MAINLANES(SL 8).
PLACE MAN HOLES ON EXISTING INLETS, AND RE-GRADE MEDIAN DITCH TO NEW INLETS.

PHASE II WB FRTG RD.
RE-GRADE OUTSIDE DITCHES TO DRAIN TO EXISTING CULVERTS.
RELOCATE INLET AND REMOVE EXISTING INLET AT WBFRTG RD. AND ALDINE WESTFIELD RD.

TOTAL PROJECT AREA: 27 ACRES

TOTAL AREA TO BE DISTURBED: 12 ACRES

WEIGHTED RUNOFF COEFFICIENT:
(AFTER CONSTRUCTION): C=0.63

EXISTING CONDITION OF SOIL & VEGETATIVE
COVER AND % OF EXISTING VEGETATIVE COVER:

EXISTING VEGETAVE HAS GOOD COVER OVER 99% OF PROJECT
SANDY CLAY SOIL

NAME OF RECEIVING WATERS: (GREENS BAYOU (P100-00-00)

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

- [X] TEMPORARY SEEDING
- [X] PERMANENT PLANTING, SODDING, OR SEEDING
- [ ] MULCHING
- [ ] SOIL RETENTION BLANKET
- [ ] BUFFER ZONES
- [ ] PRESERVATION OF NATURAL RESOURCES

OTHER:

STRUCTURAL PRACTICES:

- [X] SILT FENCES
- [ ] HAY BALES
- [ ] ROCK BERMS
- [ ] DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- [ ] DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- [ ] DIVERSION DIKE AND SWALE COMBINATIONS
- [ ] PIPE SLOPE DRAINS
- [ ] PAVED FLUMES
- [ ] ROCK BEDDING AT CONSTRUCTION EXIT
- [ ] TIMBER MATTING AT CONSTRUCTION EXIT
- [ ] CHANNEL LINERS
- [ ] SEDIMENT TRAPS
- [ ] SEDIMENT BASINS
- [ ] STORM INLET SEDIMENT TRAP
- [ ] STONE OUTLET STRUCTURES
- [X] CURBS AND GUTTERS
- [X] STORM SEWERS
- [ ] VELOCITY CONTROL DEVICES
- [X] EROSION CONTROL LOGS

OTHER:

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES:

PHASE I WB & EB FRTG RD.
SET UP SILT FENCE AROUND PROPOSED AREA DRAINS.
SET UP EROSION CONTROL LOGS IN PROPOSED DITCHES TO PROPOSED INLETS.

PHASE 2 WB & EB FRTG RD.
SET UP EROSION CONTROL LOGS IN EXISTING DITCHES TO CAPTURE SEDIMENT.

STORM WATER MANAGEMENT:

STORM WATER WILL BE CONTAINED FOR SEDIMENT REMOVAL BY UTILIZING SILT FENCE AND EROSION CONTROL LOGS.

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
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Texas Department of Transportation
Houston District

TxDOT STORM WATER POLLUTION PREVENTION PLAN

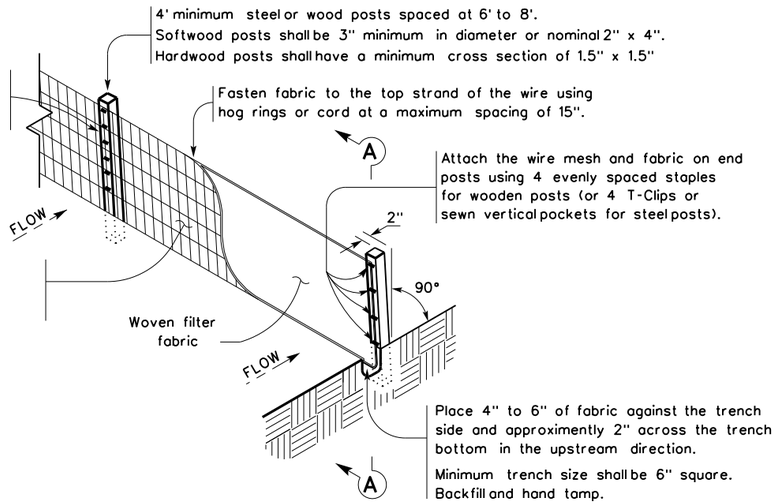
SWP3

FILE: STDG1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
©TxDOT JANUARY 2007	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6		237
9/2010 INSPECTION NOTE	COUNTY		CONTROL	SECT	JOB	HIGHWAY
9/2013 INSPECTION NOTE	HARRIS		3256	02	093	SL 8
11/2013 SW3P TO SWP3						
03/2015 2014 SPECS						

STD G-1

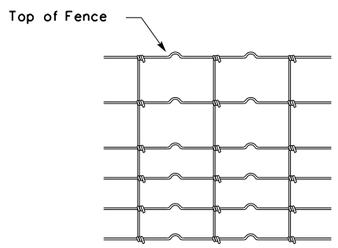
Connect the ends of the successive reinforcement sheets or rolls a minimum of 6 times with hog rings.

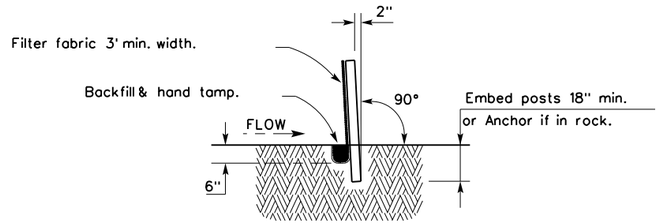
Galvanized welded wire mesh (W.W.M.) (12.5 GA. SWG Min.) with a maximum opening size of 2"x 4"or Woven Mesh (W.M.)(See woven mesh option detail)



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

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

SEDIMENT CONTROL FENCE USAGE GUIDELINES

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

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

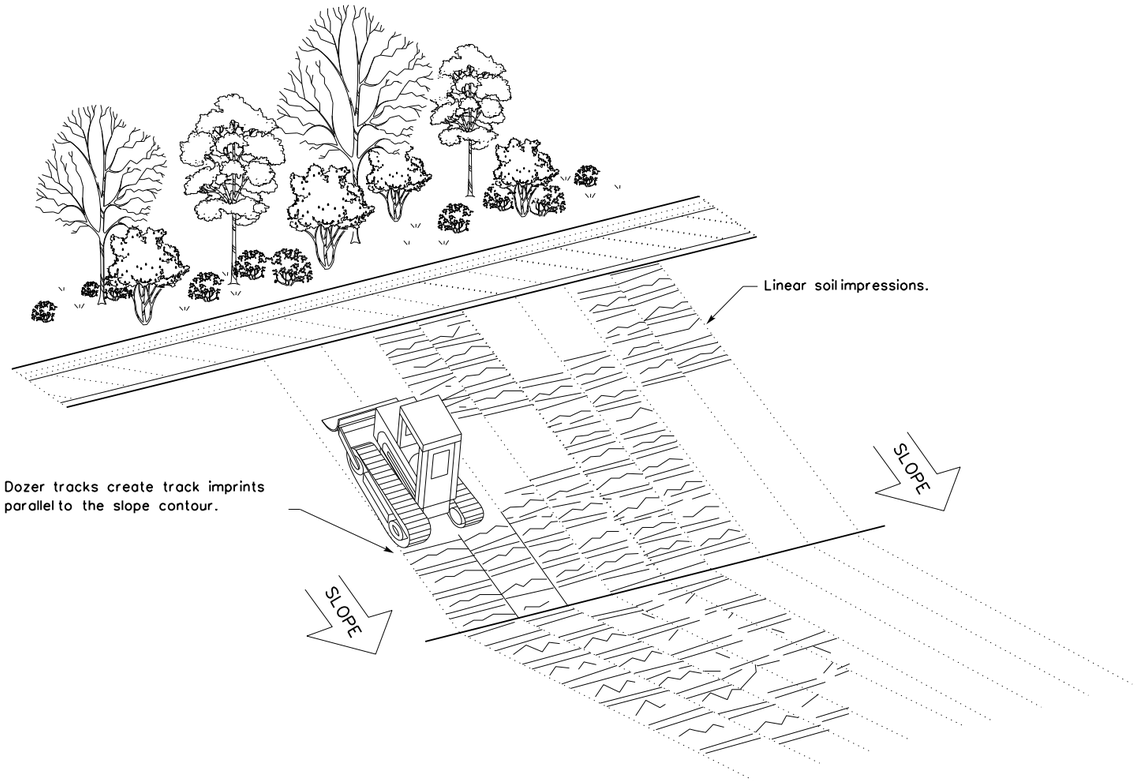
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

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



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

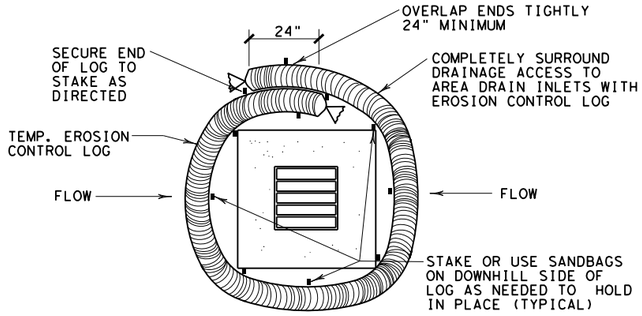
FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS		
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY		
REVISIONS	3256	02	093	SL 8		
	DIST	COUNTY		SHEET NO.		
	HOU	HARRIS		238		

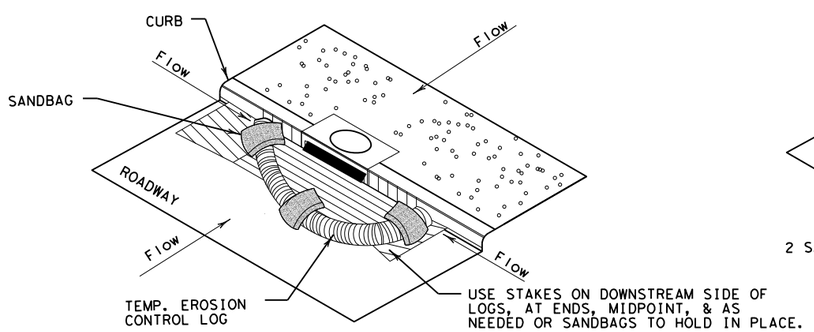
30/5/2023
pltd:txdot.projectwiseonline.com:TXDOT3\Documents\12 - HOU\Design Projects\325602093\4 - Design\Plan Set\9, Environmental\EROSION STANDARD DWG\ec116.dgn

DATE:
FILE:



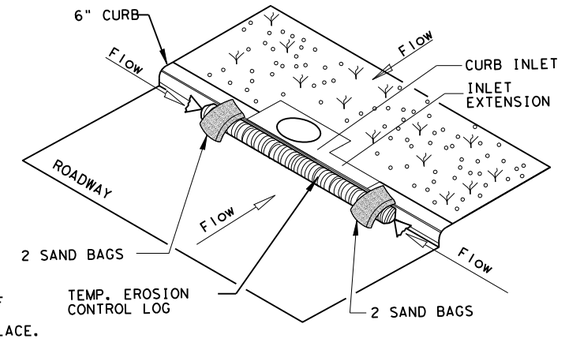
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

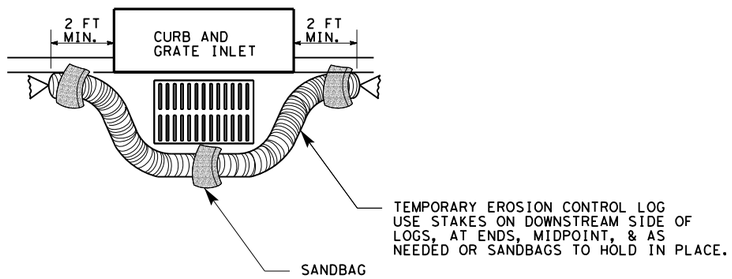
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

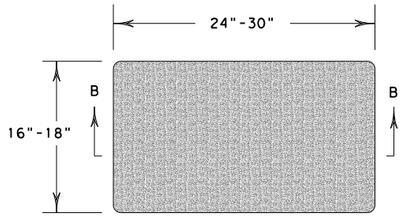
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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

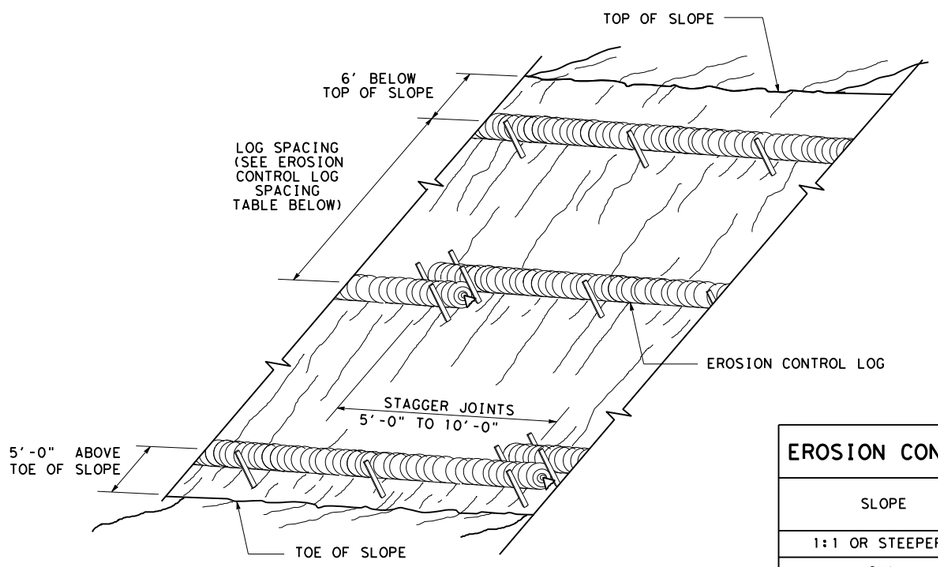
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

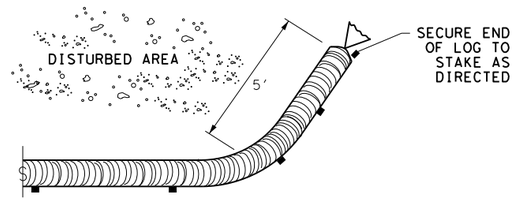
FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3256	02	093		SL 8	
	DIST	COUNTY			SHEET NO.	
	HOU	HARRIS			241	

DATE:
FILE:



EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

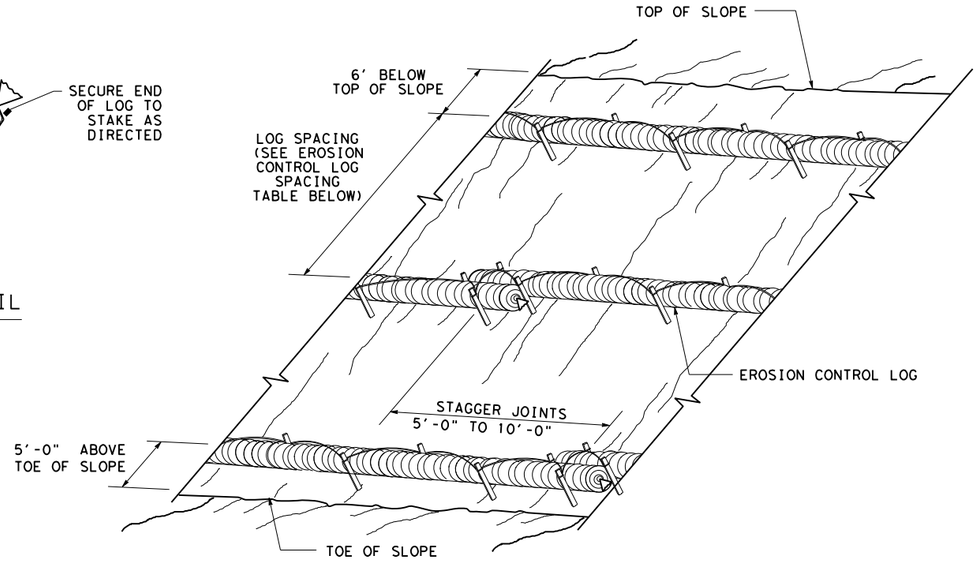
CL-SST



END SECTION RAP DETAIL

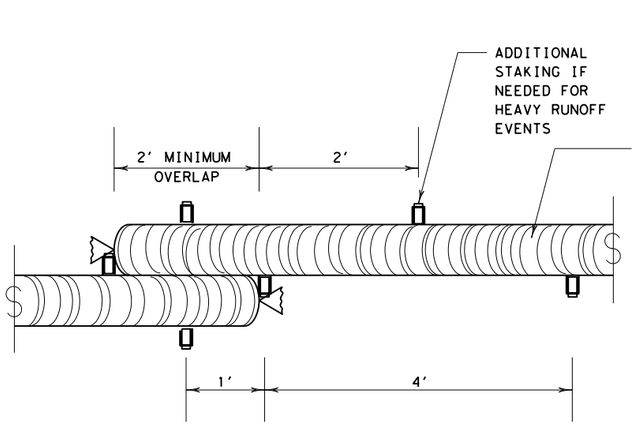
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

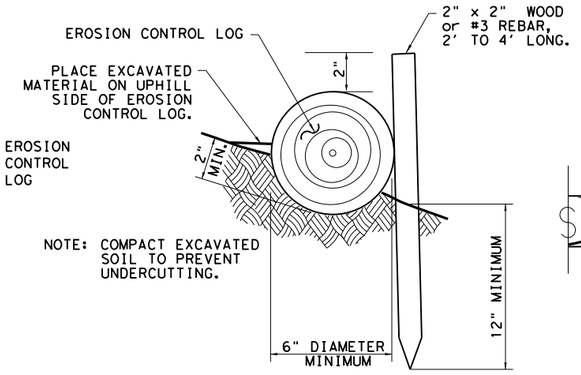
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

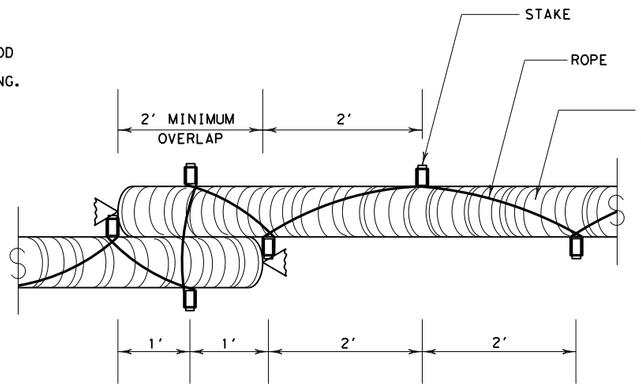


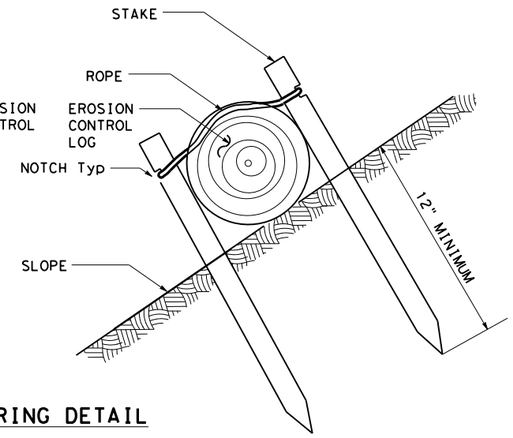


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

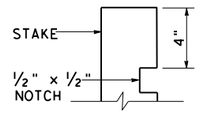
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

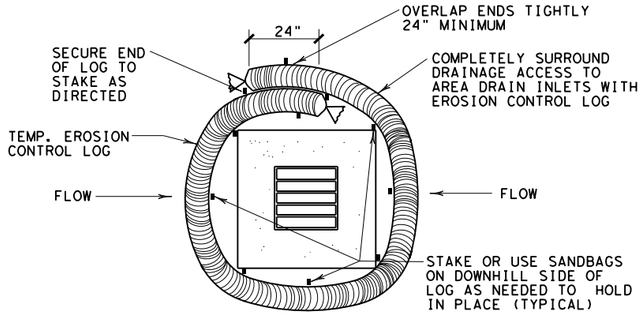
Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

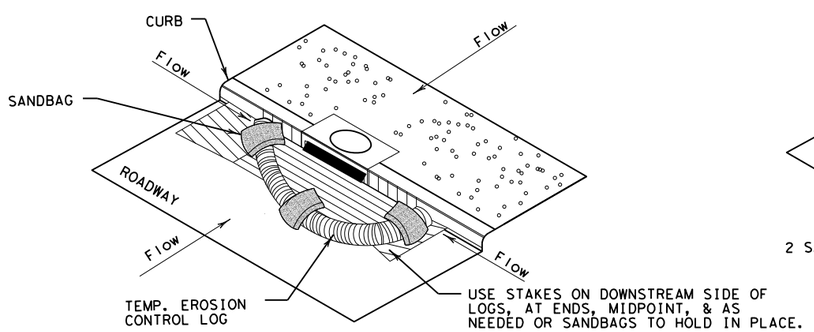
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3256	02	093		SL 8	
	DIST	COUNTY			SHEET NO.	
	HOU	HARRIS			240	

DATE:
FILE:



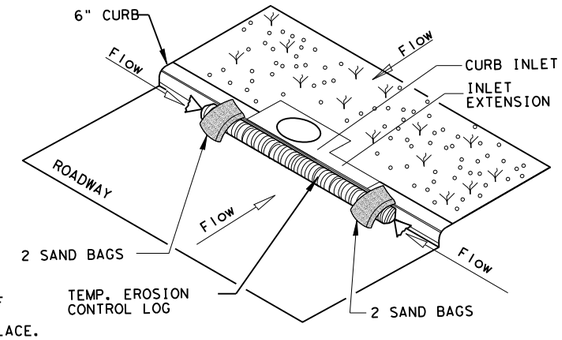
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

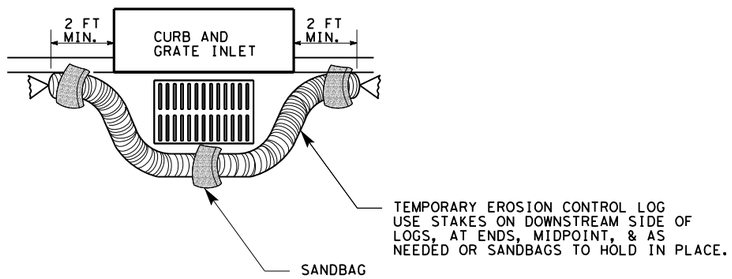
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

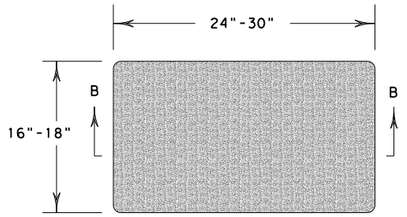
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



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

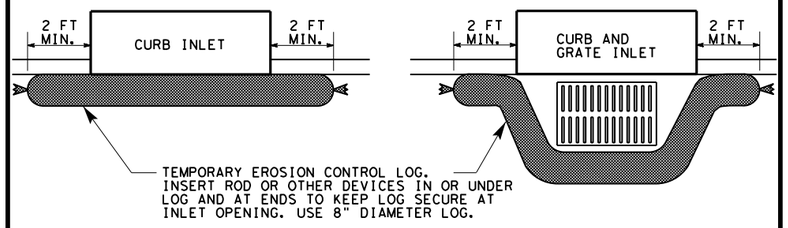
EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM	DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	3256	02	093		SL 8	
	DIST	COUNTY			SHEET NO.	
	HOU	HARRIS			241	

CURB INLETS
8" DIAMETER LOGS

ITEM 506-6040 BIODEG EROSN CONT LOGS (INSTL) (8")



MATERIAL REQUIREMENTS

FILL:

Use 100% shredded mulch or other non-compost biodegradable material as fill for logs. No compost or fines.

DO NOT USE MATERIAL WHICH PROHIBITS WATER INFILTRATION.

LOG MESH:
Use mesh with 1/4" openings or larger. Mesh must allow water infiltration but also hold fill material in place.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

A sediment trap (erosion control log) may be used to filter sediment out of runoff draining from an unstabilized area.

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).

Sediment traps should be placed in the following locations:
1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way

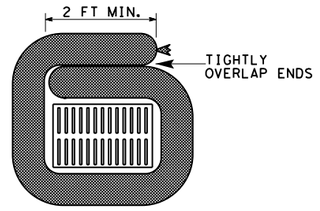
The trap should be cleaned when the capacity has been reduced by 1/2 or the sediment has accumulated to a depth of 1', whichever is less.

REQUIRED ITEMS:

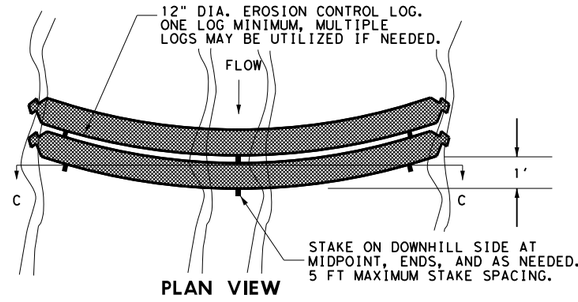
- ITEM 506-6040 BIODEG EROSN CONT LOGS (INSTL) (8") LF
- ITEM 506-6041 BIODEG EROSN CONT LOGS (INSTL) (12") LF
- ITEM 506-6043 BIODEG EROSN CONT LOGS (REMOVE) LF

DROP INLETS AND OTHER LOCATIONS
12" DIAMETER LOGS

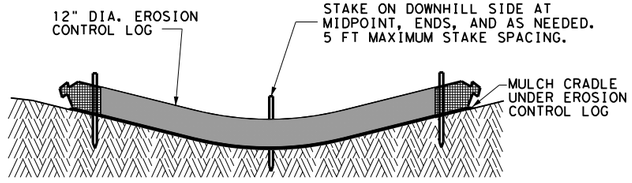
ITEM 506-6041 BIODEG EROSN CONT LOGS (INSTL)(12")



DROP INLETS

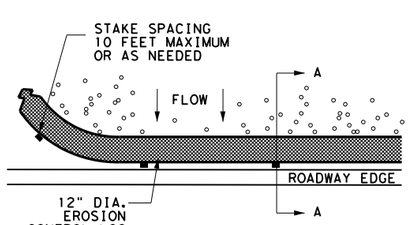


PLAN VIEW

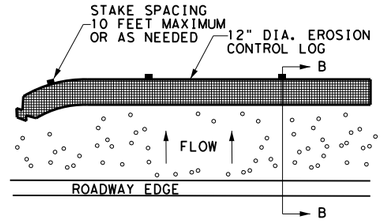


SECTION C-C

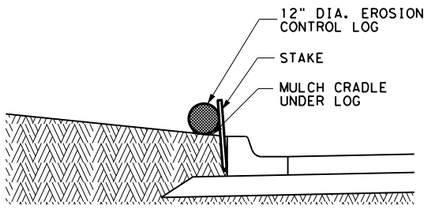
DRAINAGE SWALE OR DITCH



PLAN VIEW

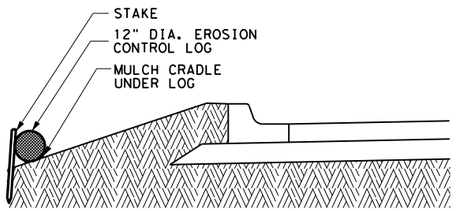


PLAN VIEW



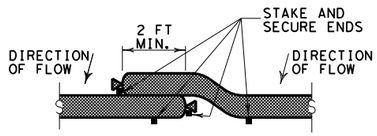
SECTION A-A

SLOPE TO ROADWAY EDGE

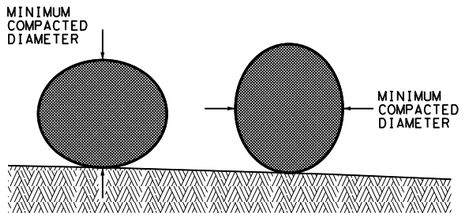


SECTION B-B

SLOPE AWAY FROM ROADWAY EDGE



END OF LOG OVERLAP



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

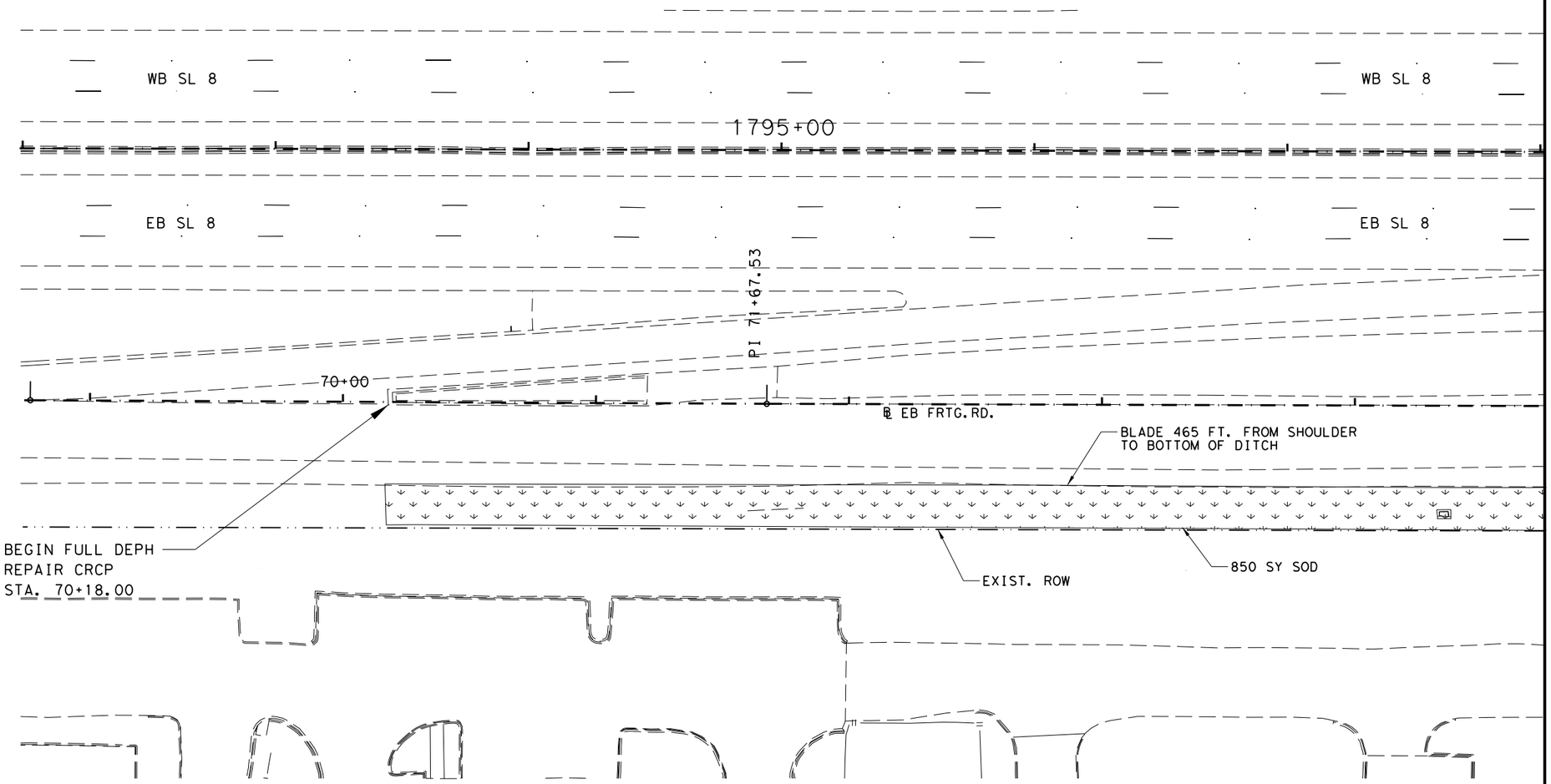
Texas Department of Transportation
Houston District

EROSION CONTROL LOG

ECL-12

FILE: STDG4a.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot					
©TxDOT 2014	DISTRICT	FED REG	PROJECT NUMBER					SHEET	
REVISIONS 3/15 MINOR CORRECTIONS	HOU	6						242	
	COUNTY				CONTROL	SECT	JOB	HIGHWAY	
	HARRIS				3256	02	093	SL 8	

STD G-4A



LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
- CONC. EDGE (432 6003 CY)
- SOD

STATE OF TEXAS
DANIEL DUKE THOMPSON
122541
LICENSED PROFESSIONAL ENGINEER

Daniel Duke Thompson

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SL 8
EB FRONTAGE ROAD

LANDSCAPING

SHEET 1 OF 7

SCALE: 1" = 50'

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			243
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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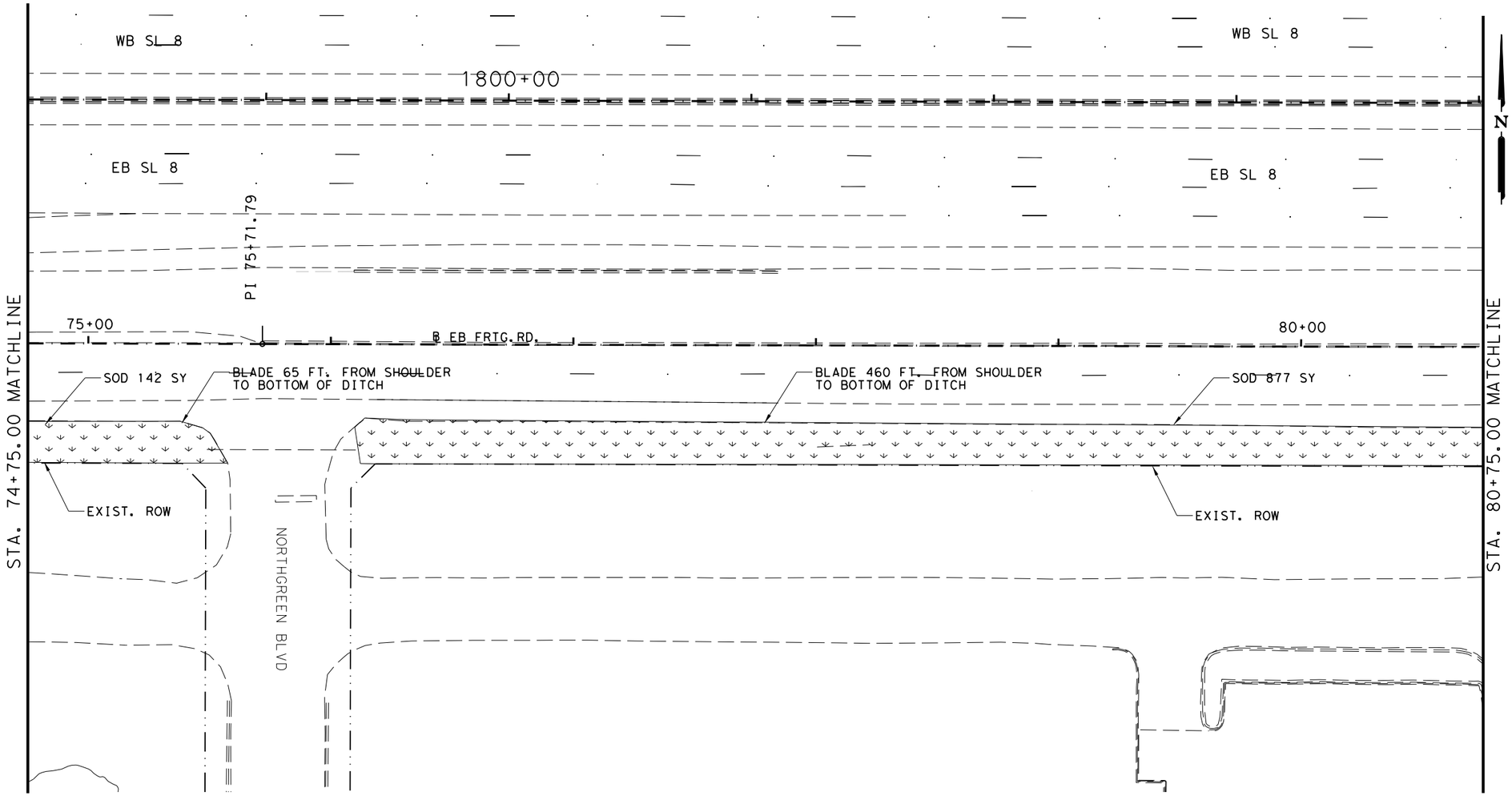

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
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- SOD

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SHEET 1 OF x

DATE: 3/15/2023
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SHEET x OF x

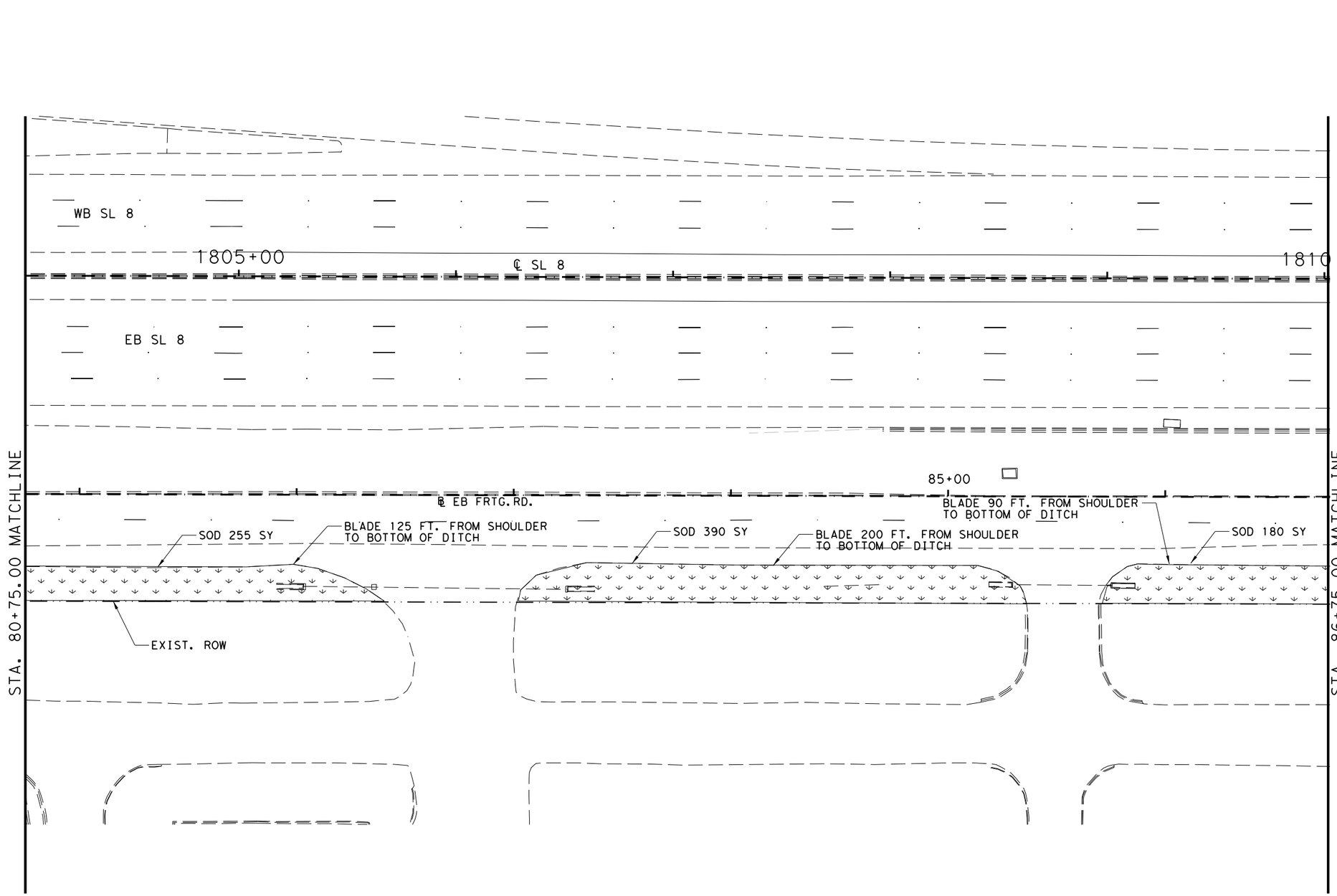
SL 8
EB FRONTAGE ROAD

LANDSCAPING

SHEET 2 OF 7

SCALE: 1" = 50'

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			244
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8



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LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
- CONC. EDGE (432 6003 CY)
- SOD

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LANDSCAPING

SHEET 3 OF 7

SCALE: 1" = 50'

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			245
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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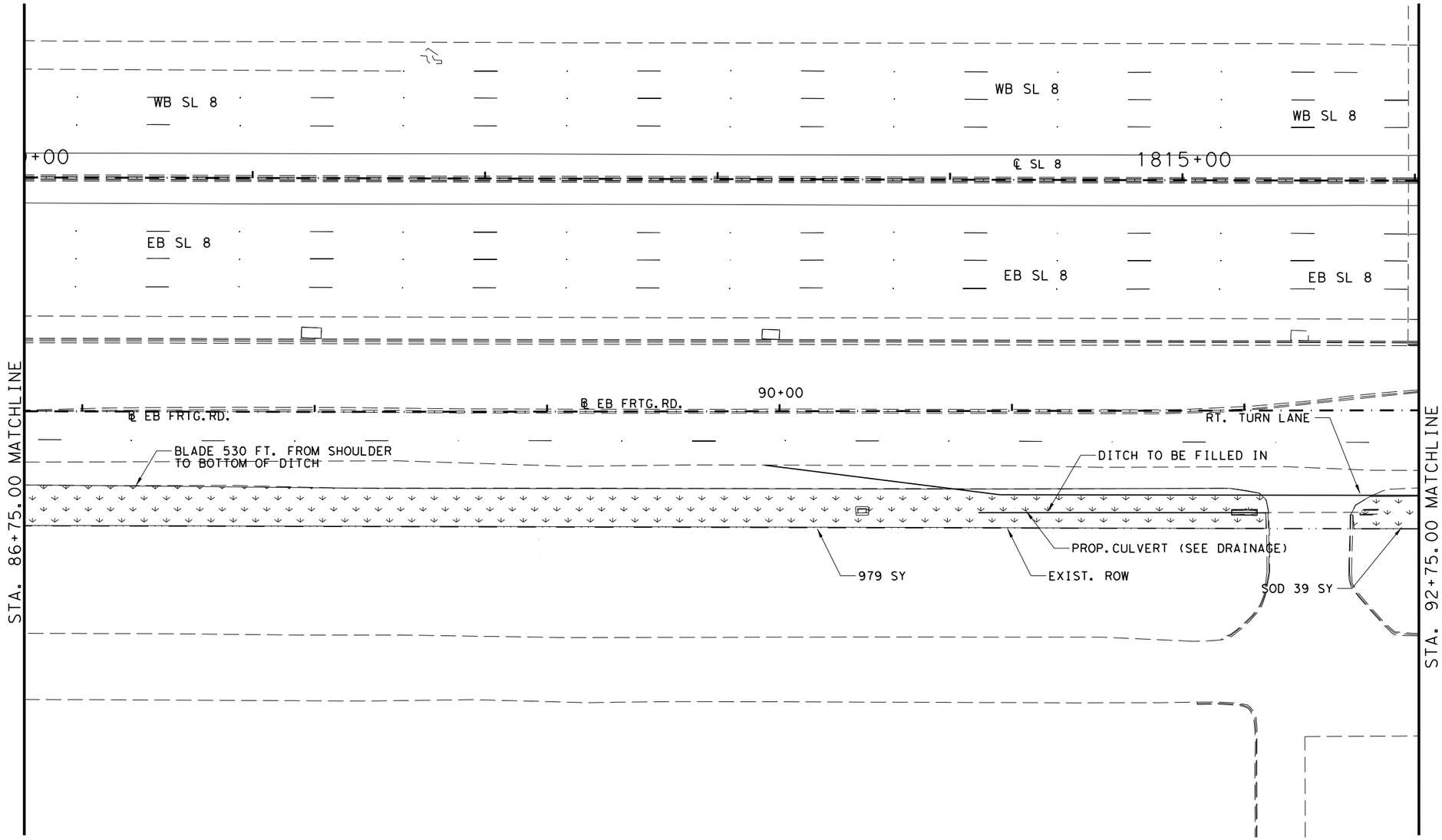

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
- CONC. EDGE (432 6003 CY)
- SOD

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EB FRONTAGE ROAD

LANDSCAPING

SHEET 4 OF 7

SCALE: 1" = 50'

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			246
STATE	DIST	COUNTY	
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3256	02	093	SL 8

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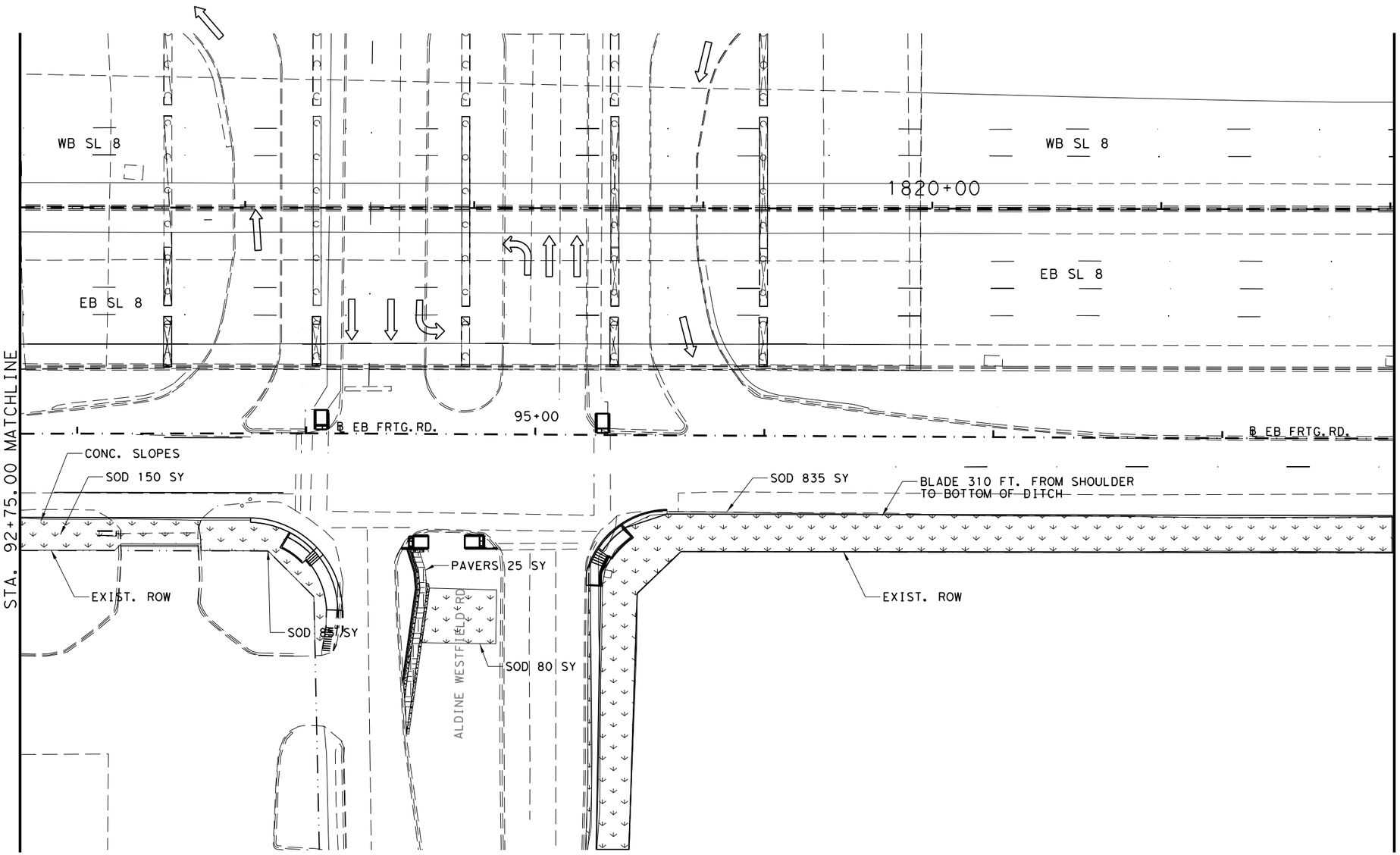

N

LEGEND

EXIST TRAFFIC LANE

PROP TRAFFIC LANE

CONC. EDGE (432 6003 CY)

STATE OF TEXAS
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SL 8
EB FRONTAGE ROAD

LANDSCAPING

SCALE: 1" = 50'

SHEET 5 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			247
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE:3/15/2023
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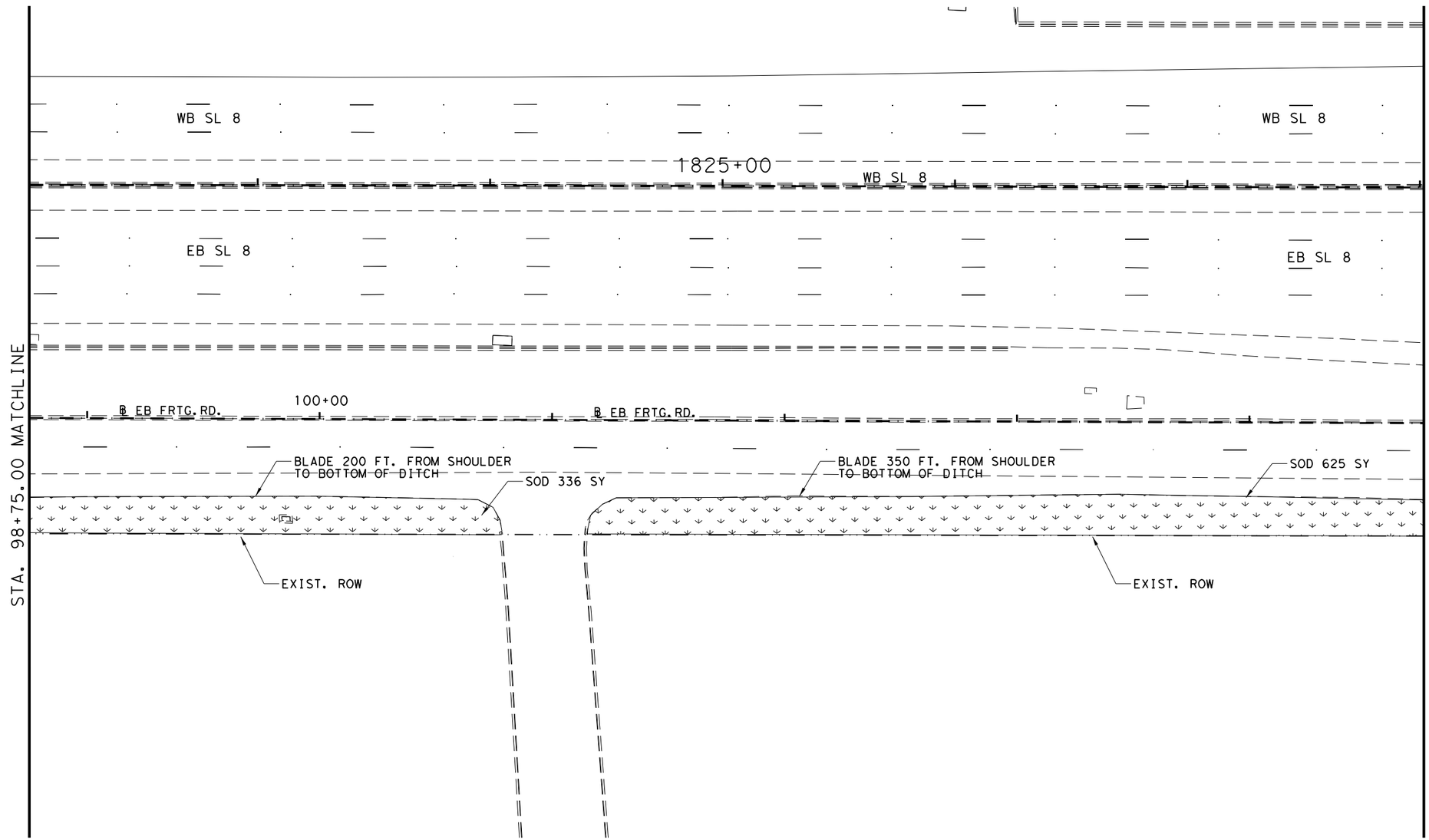

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LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
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SL 8
EB FRONTAGE ROAD

LANDSCAPING

SCALE: 1" = 50'

SHEET 6 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			248
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

SHEET X OF X

DATE: 3/15/2023
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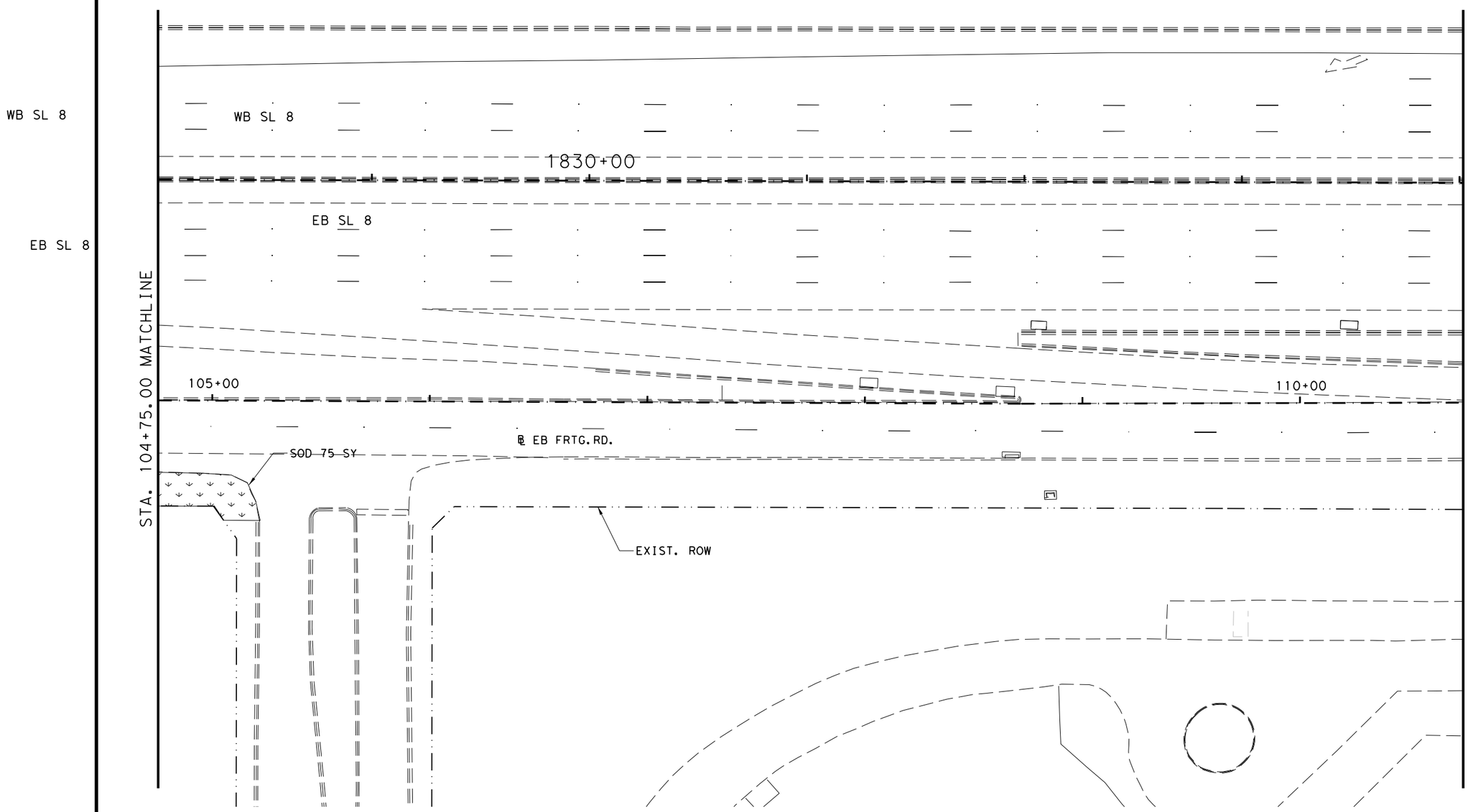

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LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
- CONC. EDGE (432 6003 CY)
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STATE OF TEXAS
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SL 8
EB FRONTAGE ROAD

LANDSCAPING

SCALE: 1" = 50'

SHEET 7 OF 7

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			249
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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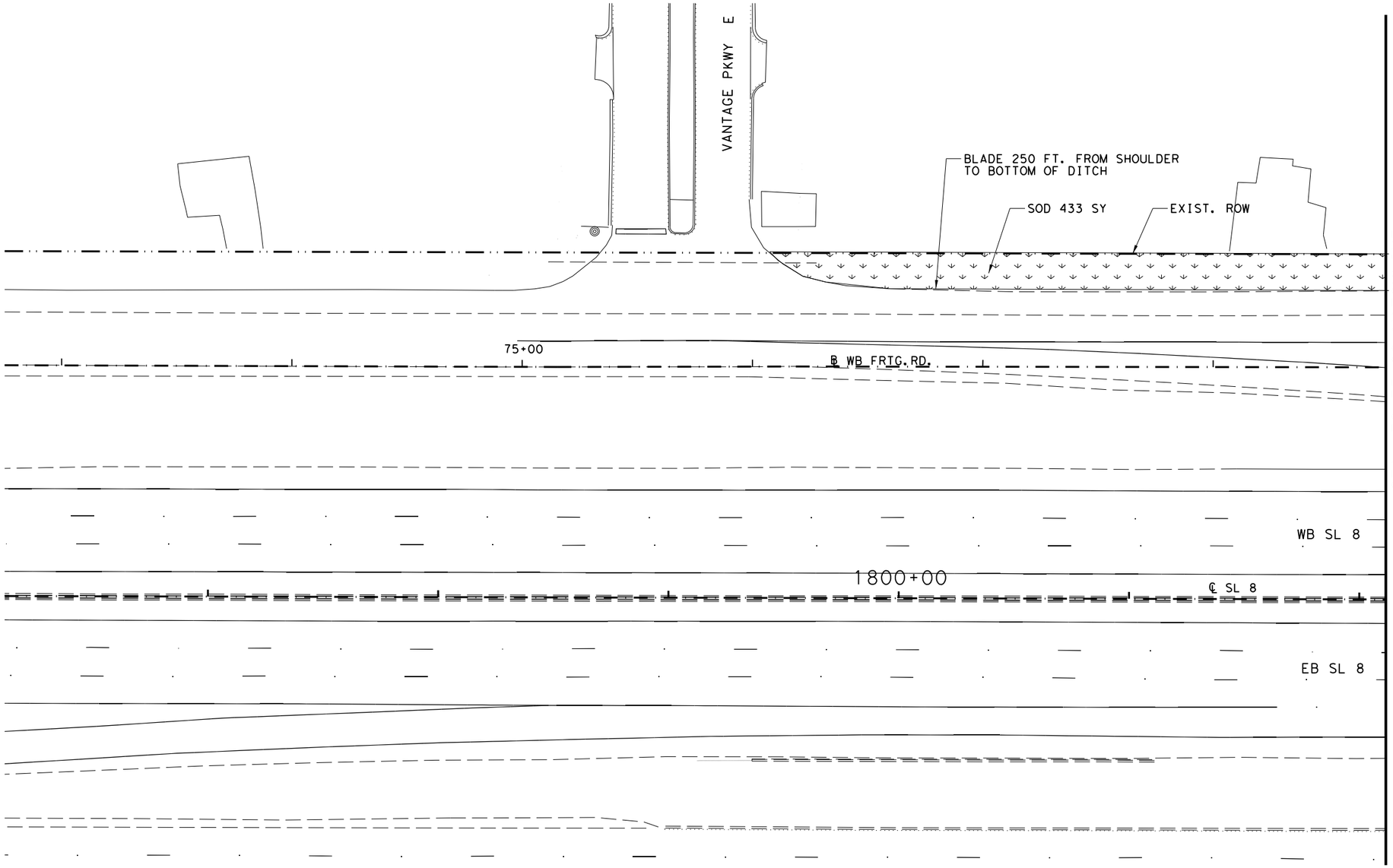

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
- CONC. EDGE (432 6003 CY)
- SOD

STATE OF TEXAS
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SL 8
WB FRONTAGE ROAD

LANDSCAPING

SCALE: 1" = 50'

SHEET 1 OF 5

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			250
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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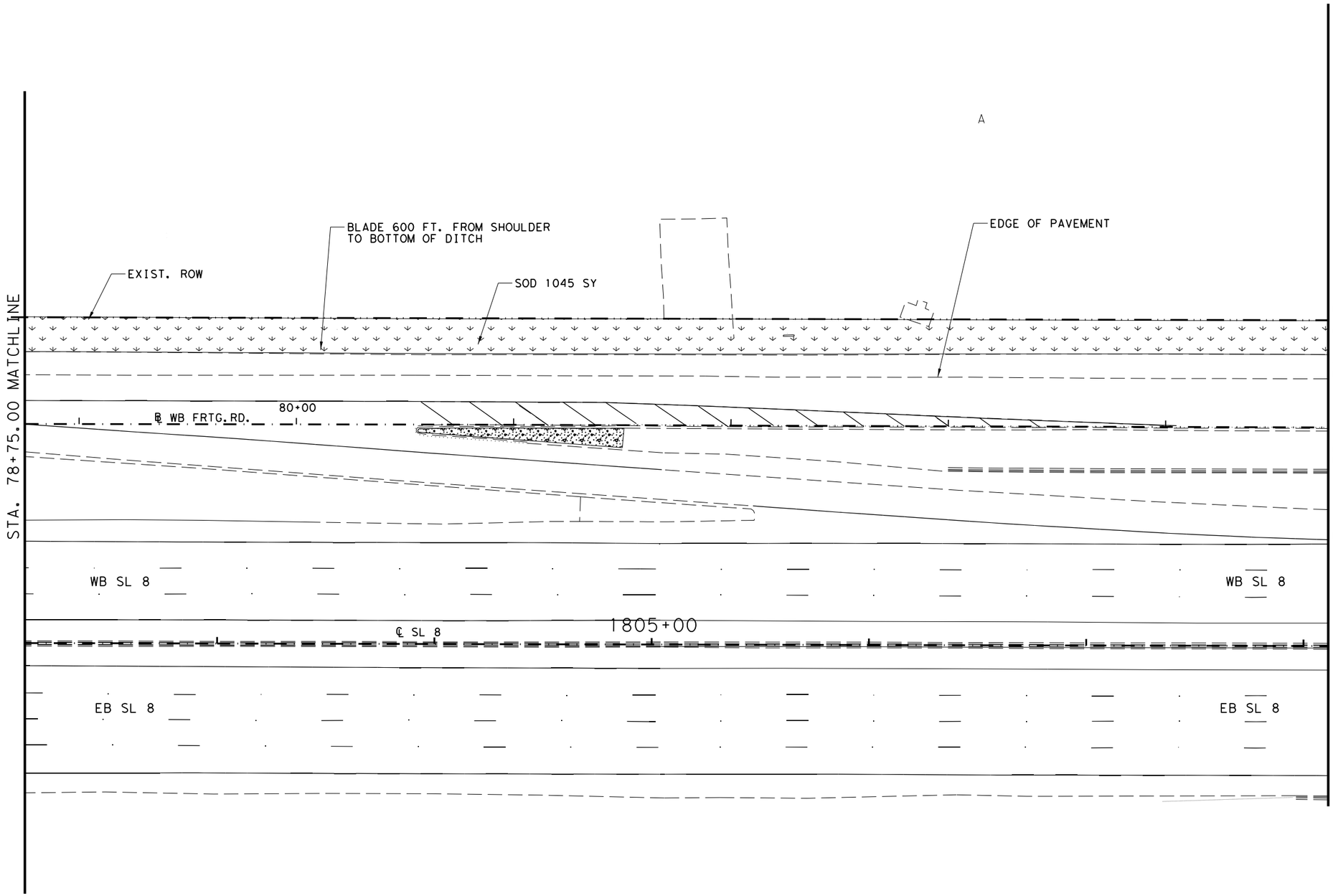

N

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
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STATE OF TEXAS
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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD

LANDSCAPING

SCALE: 1" = 50'

SHEET 2 OF 5

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			251
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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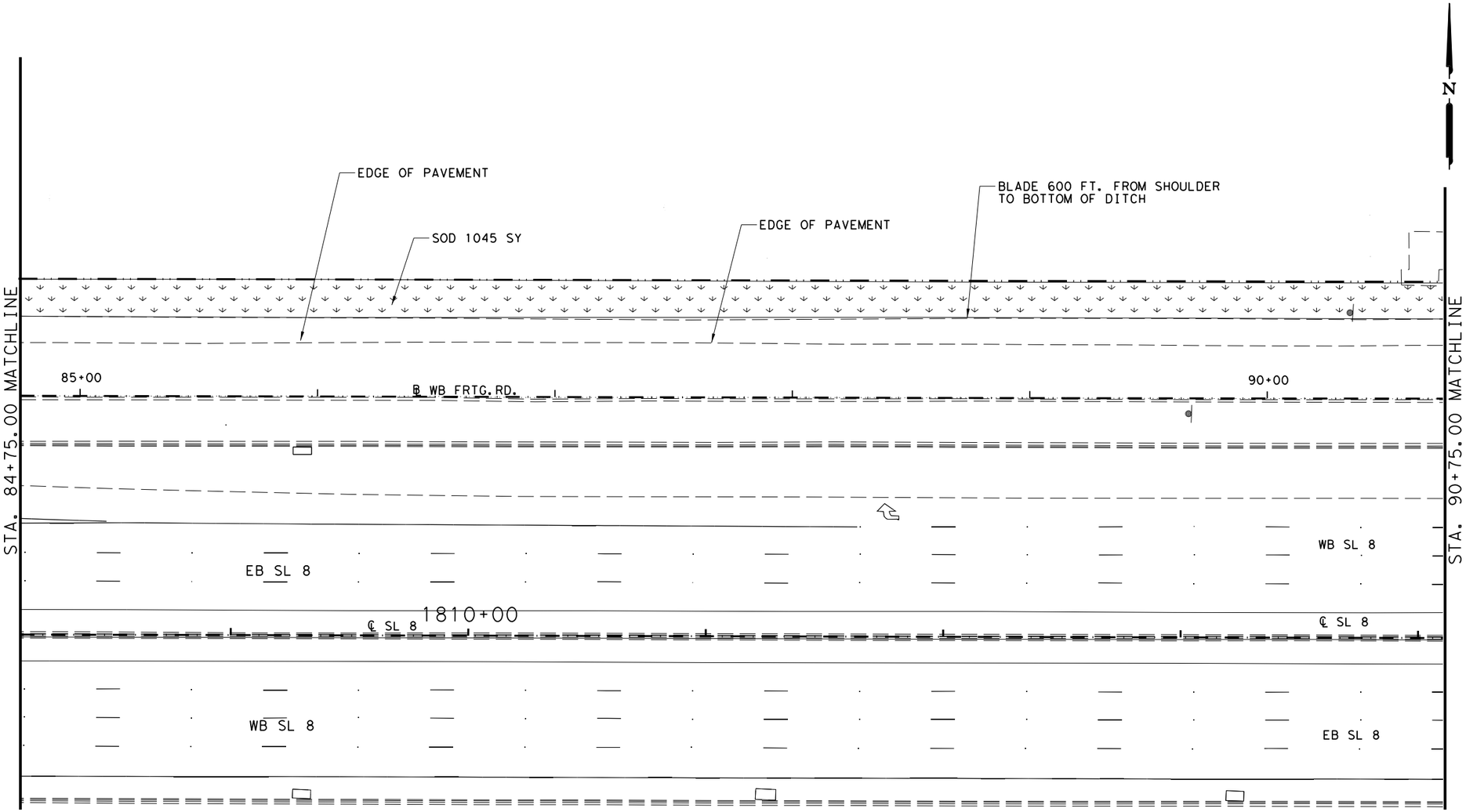

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LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
- CONC. EDGE (432 6003 CY)
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STATE OF TEXAS
DANIEL DUKE THOMPSON
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Texas Department of Transportation

SL 8
WB FRONTAGE ROAD

LANDSCAPING

SCALE: 1" = 50'

SHEET 3 OF 5

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			252
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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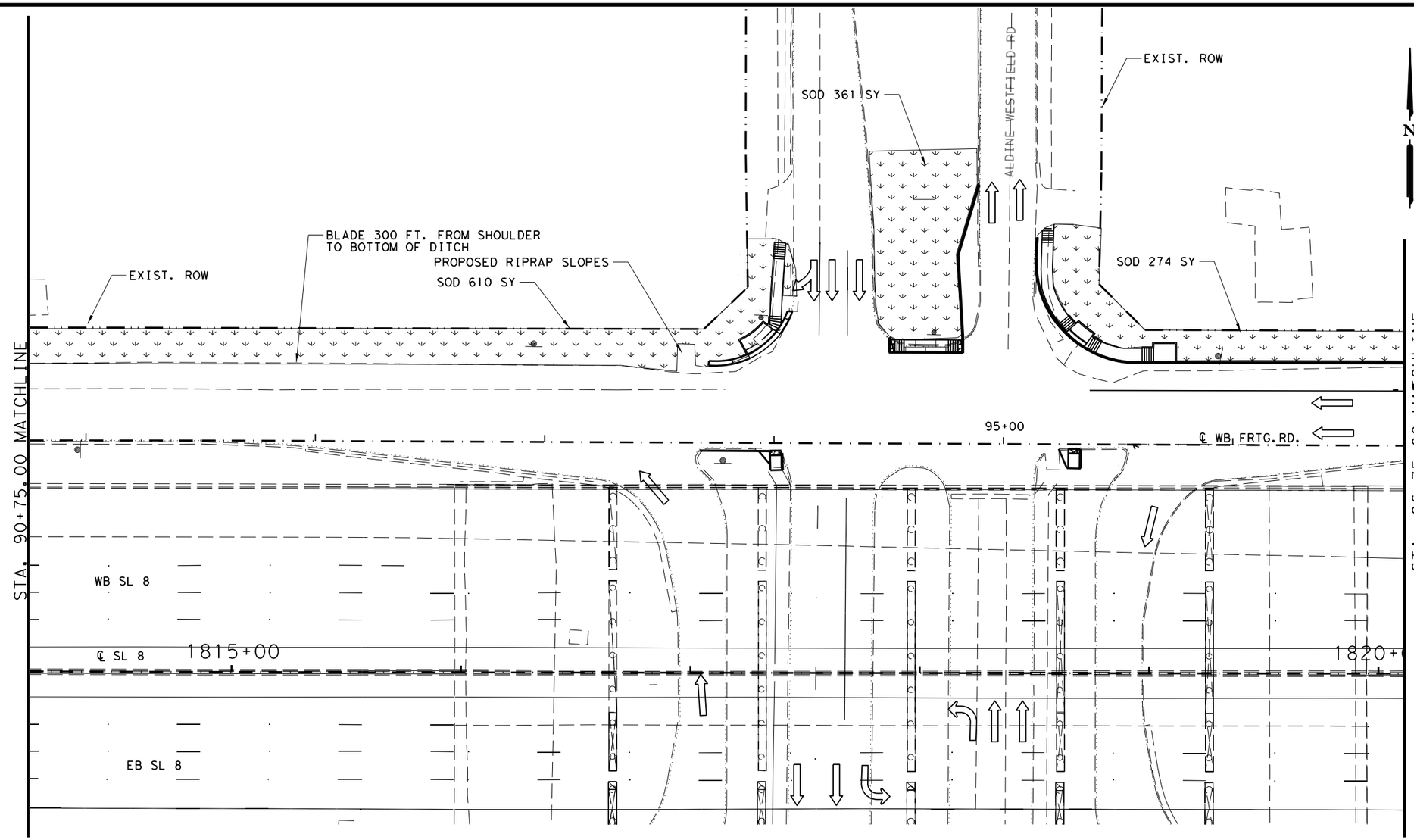

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
- CONC. EDGE (432 6003 CY)
- SOD

STATE OF TEXAS
DANIEL DUKE THOMPSON
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SL 8
WB FRONTAGE ROAD
LANDSCAPING

SHEET 4 OF 5

SCALE: 1" = 50' HORZ

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6			253
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
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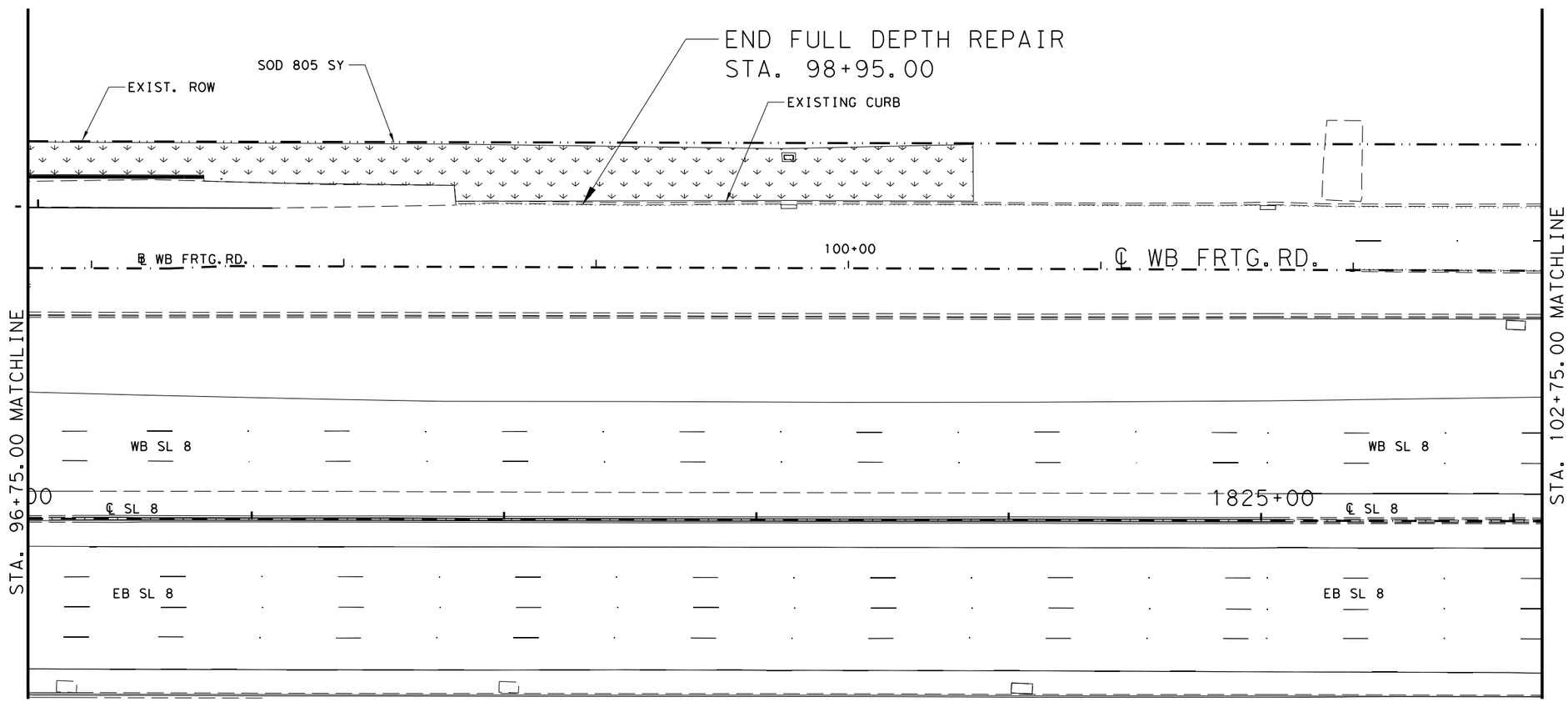

N

LEGEND

- EXIST TRAFFIC LANE
- PROP TRAFFIC LANE
- LANDSCAPE PAVERS (528 6004 SY)
- CONC. EDGE (432 6003 CY)
- SOD

STATE OF TEXAS
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SL 8
WB FRONTAGE ROAD

LANDSCAPING

SHEET 5 OF 5

SCALE: 1" = 50' HORZ

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6			254
STATE	DIST	COUNTY	
TEXAS	HOU	HARRIS	
CONT	SECT	JOB	HIGHWAY
3256	02	093	SL 8

DATE: 3/15/2023
$FILEL$

TYPE OF WORK — ITEMS AND REQUIREMENTS FOR EACH TYPE OF WORK

SODDING	PERMANENT SEEDING	TEMPORARY SEEDING	Reference Item 161, 162, 164, 166, 168 of the Texas Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges 2014 for specifications, dimensions, volumes and measurements that are not shown. Use latest Houston District, Special Provisions for those items indicated.		
	✓		**161-6017 COMPOST MANUF TOPSOIL (BIP)(4") SY**	APPLICATION RATE Item 161.2.1. Compost Manufactured Topsoil (CMT)	Item 161.2. Materials. Submit quality control (QC) documentation to the Engineer. Compost producer's STA certification must be dated to meet STA requirements (certification must be within 30 or 90 days per STA requirements). Lab analysis performed by an STA-certified lab must be dated within 30 days before delivery of the compost.
✓			**162-6002 BLOCK SODDING SY**	GRASS SPECIES Item 162.2. Materials. Common Bermuda (Cynodon Dactylon)	Item 162.2.1. Block Sod. Use block palletized or roll type sod. **REMOVE PLASTIC BACKING FROM ROLL TYPE SOD.** Place sod within 48 hours of delivery to site. No exceptions. Place sod with joints alternating on each row to prevent continuous joint lines. Peg sod as needed with wood pegs to hold sod in place. Pegging sod is subsidiary to Item 162.
	✓		**164-6066 DRILL SEEDING(PERM)(WARM OR COOL) SY** Item 164.1. Description Provide and install seeding as shown on District Standard	PLANTING MONTH / SEED MIX March, April, May, June, July, August, September, October: Hulled - Bermudagrass (Cynodon dactylon) - 40.0 lbs PLS/acre Foxtail Millet (Setaria italica) - 34.0 lbs PLS/acre Green Sprangletop (Leptochloa dubia) - 4.0 lbs PLS/acre Sideoats Grama (Bouteloua curtipendula) - 3.2 lbs PLS/acre Little Bluestem (Schizachyrium scoparium) - 1.4 lbs PLS/acre November, December, January, February, Unhulled - Bermudagrass (Cynodon dactylon) - 40.0 lbs PLS/acre Oats (Avena sativa) - 72.0 lbs PLS/acre Green Sprangletop (Leptochloa dubia) - 4.0 lbs PLS/acre Sideoats Grama (Bouteloua curtipendula) - 3.2 lbs PLS/acre Little Bluestem (Schizachyrium scoparium) - 1.4 lbs PLS/acre	PLS (Pure Live Seed) Provide documentation of PLS requirements per Item 164.2.1. CONSTRUCTION. Cultivate the area to a depth of 4 inches before placing the seed unless otherwise directed. When performing permanent seeding after an established temporary seeding, cultivate the seedbed to a depth of 4 inches or mow the area before placement of the permanent seed. Plant the seed and place the straw or hay mulch after the area has been completed to lines and grades as shown on the plans. Drill Seeding. Plant seed or seed mixture uniformly over the area shown on the plans at a depth of 1/4 to 1/3 inch using a cultipacker(turfgrass) type seeder. Plant seed along the contour of the slopes. Use broadcast seeding method where site conditions prevent drill seeding method. Broadcast Seeding. Distribute the dry seed or dry seed mixture uniformly over the areas shown on the plans using hand or mechanical distribution on top of soil.
	✓		**164-6052 BROADCAST SEED(PERM)(SPECIAL MIX) SY** Item 164.1. Description Provide and install seeding as shown on District Standard		
		✓	**164-6051 DRILL SEED(TEMP)(WARM OR COOL) SY** Item 164.1. Description Provide and install seeding as shown on District Standard	PLANTING MONTH / SEED MIX March, April, May, June, July, August, September, October: Foxtail Millet (Setaria italica) - 34.0 lbs PLS/acre November, December, January, February, Oats (Avena sativa - 72.0 lbs PLS/acre	
		✓	**164-6009 BROADCAST SEED(TEMP)(WARM) SY** Item 164.1. Description Provide and install seeding as shown on District Standard		
	✓	✓	**162-6003 STRAW OR HAY MULCH SY**	APPLICATION RATE Immediately after planting the seed or seed mixture, apply straw or hay mulch uniformly over the seeded area. Apply straw or hay mulch at 2 tons per acre. Use tacking agent with straw or hay mulch as described on this sheet.	Use straw or hay mulch in conformance with Article 162.2.5, "Mulch." Use biodegradable tacking agents only applied at a rate in accordance with manufacturer's recommendations. Use the following products or an approved equal(see note this sheet): Conweb/Contac Guar Gum, Profile Products Corporation, (307) 655-9565, Ramtec/Procol/Viscol Guar Gum, Ramtec Corporation, (800) 366-1180
✓	✓	✓	**166-6001 FERTILIZER AC** Item 166.2. Materials Use fertilizer as shown on District Standard	APPLICATION RATE Deliver and evenly distribute fertilizer at a rate of 4000 lbs/acre.	Use a **NON-CHEMICAL** fertilizer which meets all the following criteria: (1) BRAND NAME must be registered with the Texas State Chemist as a commercial fertilizer. (2) Meets USEPA guidelines for unrestricted use. (3) Derived from biological sources such as, but not limited to: sewage sludge, manures, vegetation, etc. (4) In granular form and essentially dust free. Submit proof of registration and nutrient source to Engineer. Use the following products or an approved equal(see note this sheet): Sigma, SIGMA AgriScience, 281-851-6749 Sustanite-standard grade, Automation Nation, Inc., 713-675-4999 Milorganite, MMSD, 800-287-9645 Agricultural Organic P/L, Ag Org, INC., 713-523-4396
✓	✓	✓	**168-6001 VEGETATIVE WATERING MG**	APPLICATION RATE Item 168.3 Construction. 6000 gallons/acre per working day x 20 consecutive working days = 120,000 gallons total/acre	Begin watering immediately after installation of seed or sod. Replace, fertilize, and water any seed or sod in poor condition due to the failure to apply the specified amount of water within the time allowed at no expense to the Department.

SEQUENCE OF WORK

BLOCK SOD	PERMANENT SEEDING	TEMPORARY SEEDING
1. FERTILIZER 2. CULTIVATE SOIL (ITEM 162.3) 3. SOD 4. VEGETATIVE WATERING	1. FERTILIZER 2. COMPOST MANUFACTURED TOPSOIL 3. CULTIVATE SOIL (ITEMS 164.3 AND 161.3.1) 4. PERMANENT SEEDING 5. STRAW OR HAY MULCH 6. VEGETATIVE WATERING	1. FERTILIZER 2. CULTIVATE SOIL (PER ITEM 164.3) 3. TEMPORARY SEEDING 4. STRAW OR HAY MULCH 5. VEGETATIVE WATERING

Texas Department of Transportation

HOUSTON DISTRICT

FERTILIZER, SEED, SOD, STRAW, COMPOST, AND WATER

SHEET 1 OF 1

REVISIONS	FILE:	FED DIV	STATE	PROJECT NUMBER			SHEET
10/2014 UPDATED TO 2014 SPECS 3/2015 MINOR CORRECTIONS	OCT 2014	6	TEXAS				255
	ORIGINAL:	DIST	COUNTY	CONTROL	SECT	JOB	HIGHWAY
		12	HARRIS	3256	02	093	SL 8

STD K-1

GENERAL PAVER NOTES:

1. Reference Item 528, Colored Textured Concrete and Landscape Pavers, of the Texas Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges 2014 for specifications, dimensions, volumes and measurements not shown. NOTE: Item 528 references several ASTM standard specifications required as part of this Item.
2. Locate and stake all underground conduits and utilities associated with but not limited to: CTMS, CTMS power supply, lighting, signal wires and detectors, gas, electrical, telephone, fiber optics, etc.
3. Locate and stake existing ground boxes, inlets, culverts, manholes, etc. within the project area with a 4' wooden stake, painted orange. Maintain the stakes in place for duration of construction period of the contract. Remove stakes when directed by Engineer.
4. Repair and/or replacement of any damaged underground conduits or utilities, structures, pavement, riprap, equipment, materials, slopes, vegetation, surfaces, etc. at no expense to the Department.

MATERIALS:

1. Use "Class B" concrete for concrete edge for pavers shown in detail. Concrete edge is paid for separately under Item 432-6003 RIPRAP(CONC)(6 IN) CY.
2. Use portland cement treated base which meets the requirements of Item 276, Strength L. Portland cement treated base is subsidiary to Item 528.
3. Use bedding sand described in Item 528.2.2.2. Bedding sand is subsidiary to Item 528.
4. Use paver unit type and color type as shown. Submit sample units for approval by Engineer prior to construction with manufacturer's information certifying that paver units:
   a. Meet the requirements of Item 528.2.2.1. Pavers. including:
      1) Portland cements conform to ASTM C 150
      2) Fly ash conforms to ASTM C 618
      3) Aggregates conform to ASTM C 33 - 07
      4) Color pigments conform to ASTM C 979
   b. Are manufactured so all grey cement products are produced with a concrete mix design that contains a pigment loading that represents, by weight, 3% of the total cementitious weight of the batch. White cement products will contain sufficient pigment to achieve the specified color. Pigment dispensing will be accomplished by automated equipment designed to meter pigment granules accurately to the concrete mixer within +/- 1/2 ounce per 10 pounds of pigment.
   c. Are manufactured using accelerating plasticizer and an efflorescence reducer. Follow manufacturer's application rates, but in no case dose admixture less than 8 ounces per 100 pounds of cementitious material.
   d. Are manufactured by a standard process on equipment capable of creating a four color blend with a full range of colors to occur on each pallet.
5. Use joint sand described in Item 528.2.2.3. Joint sand is subsidiary to ITEM 528.

SUBMITTALS

1. The following submittals are required to ensure conformance with specifications:

	SUBMITTALS RECEIVED FROM CONTRACTOR? YES	NO
a. Certification from the manufacturer stating that the pavers have been tested and meet all the requirements of ASTM C 936.		
b. Mix design, including information indicating percentage of fly ash to be used as cementitious material = less than or equal to 20%.		
c. Current mill certificate from cement supplier for grey cement. Meets all requirements of ASTM C 150.		
d. Current mill certificate from cement supplier for white cement. Meets requirements of ASTM C 150.		
e. Material certification information for fly ash. Meets requirements of ASTM C 618.		
f. Current quality test reports and gradation results of stockpiles from aggregate supplier for sand and gravel products.		
g. Pigment suppliers information.		
h. Complete technical data for admixtures including information relating to percentage of total cementitious material in mix design.		
i. Technical data and specifications for equipment used in dispensing pigment to mixing equipment.		

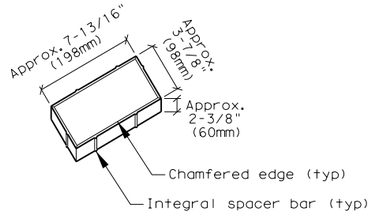
FOR ENGINEER'S USE TO ENSURE ALL SUBMITTALS ARE RECEIVED

CONSTRUCTION METHODS:

1. Provide a minimum 10'X10' (100SF) mock-up adjacent to existing display located at TxDOT District Headquarters, 7600 Washington Ave. Remove mock-up as directed by Engineer.
2. Locate and stake all items and/or limits of landscape pavers and related work in the field. Receive approval from Engineer prior to continuing.
3. Item 528.3.2.2, receive approval from Engineer before covering base material.
4. Maintain a straight joint line orientation both directions in pattern with no deviation more than 1/8 inch in a ten foot horizontal dimension.
5. Maintain vertical elevation of paver units with no surface elevation deviation greater than 3/8 inch under a ten foot straight edge.
6. Item 528.3.2.5, complete a minimum of two sweepings of joint sand, complete additional sweepings to fill the joints to the approval of the Engineer. Leave surplus sand on the surface during construction period. Sweep and clean all excess joint sand, soil, foreign material, and/or stains from pavers as directed by Engineer.
7. Immediately remove and replace paver units damaged during installation.

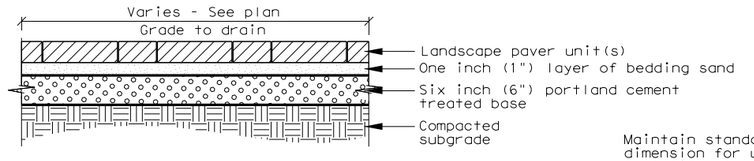
PAVER UNIT

"Holland Stone"
as manufactured by
IPC Building Products, Sugar Land, Tx,
or
approved equal

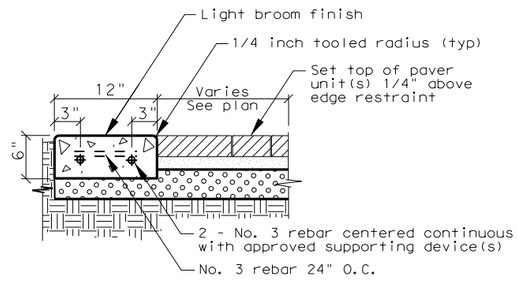


PAVER COLOR

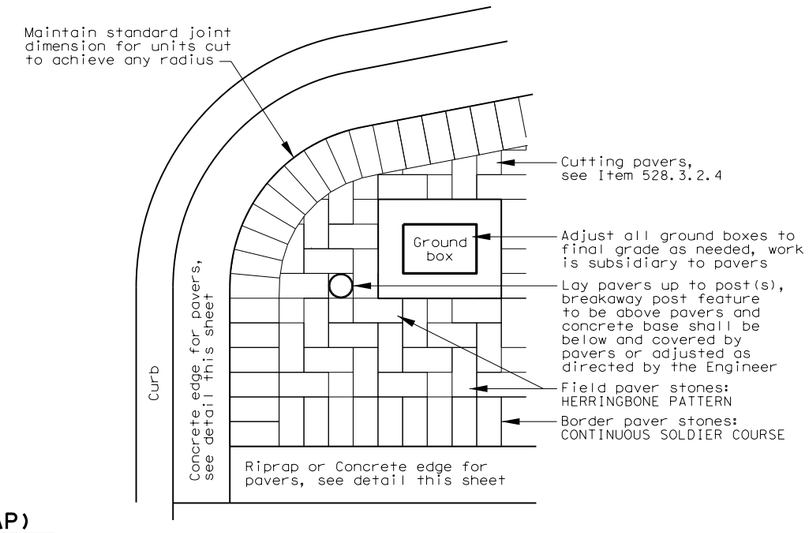
IPC Building Products "TxDOT HOUSTON DISTRICT GRP II BLEND"
or
approved equal
Color mix includes Houston District approved:
Green, charcoal, bronze and tan.
(Border stones and field stones are to be same color blend)



PAVERS ON PORTLAND CEMENT TREATED BASE

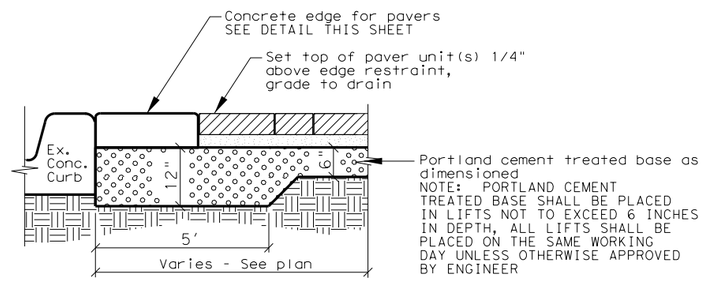


CONCRETE EDGE FOR PAVERS (CL B RIPRAP)



PAVER PATTERN LAYOUT

Install In Herringbone Pattern With
Soldier Course Along Perimeter As Shown



PORTLAND CEMENT TREATED BASE UNDER PAVERS AT EXISTING CONCRETE CURB

REQUIRED ITEMS:

- Item 432-6003 RIPRAP(CONC)(6 IN) CY
- Item 528-6004 LANDSCAPE PAVERS SY

APPROVED EQUAL NOTE:

Reference to manufacturer's trade name or product is for the purpose of identificatin only, Contractor is permitted to furnish like materials of other manufacturers provided they are of equal quality and comply with specifications for this project. All materials for consideration as an "approved equal" must be submitted to the Engineer at the preconstruction meeting. Consideration for late submittals will only be for any materials, shown in plans, which become unavailable as required.

Texas Department of Transportation

HOUSTON DISTRICT

LANDSCAPE PAVERS

SHEET 1 OF 1

Details not to scale

FILE:	FED DIV	STATE	PROJECT NUMBER			SHEET
	6	TEXAS				256
REVISED: OCT 2014 for 2014 specs	DIST	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	12	HARRIS	3256	02	093	SL 8

STD K-2