PROJECT NO.			
C 495-4-76, ETC.			
CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		1

INDEX OF SHEETS

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SUPPLEMENTAL INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

PROJECT NO. C 495-4-76, ETC.

IH 20
SMITH COUNTY

FUNCTIONAL CLASS: INTERSTATE
A.D.T. (2020): = 38,914
A.D.T. (2040) = 77,828
DESIGN SPEED IH 20: 70 MPH
DESIGN SPEED RAMPS: 50 MPH

NET LENGTH OF PROJECT= 22,344.96 FEET = 4.232 MILE

LIMITS: FROM VAN ZANDT C/L, E
TO: SH 110

FOR THE CONSTRUCTION OF OVERLAY
CONSISTING OF TBPFC SURFACE, ACP SURFACE, PLANING,
SHOULDER TEXTURING AND PAVEMENT MARKINGS.

FINAL PLANS

DATE CONTRACT LETTING: _____

DATE CONTRACTOR BEGAN WORK: _____

DATE WORK COMPLETED & ACCEPTED: _____

CONTRACTOR: _____

USED ____ OF ____ ALLOTTED DAYS _____

FINAL CONTRACT COST : $ _____

FINAL AS BUILT PLANS

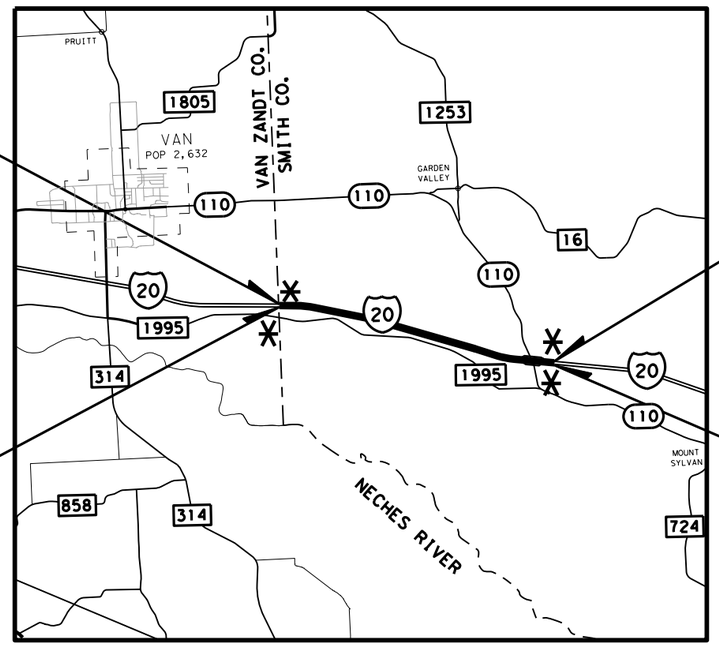
THE CONSTRUCTION WAS PERFORMED UNDER MY SUPERVISION
IN ACCORDANCE WITH THE PLANS AND CONTRACT

_____ _____

DATE AREA ENGINEER

IH 20, WBL
BEGIN PROJECT
CSJ: 0495-04-076
STA: 1+13
REF. MRK: 543+0.851

IH 20, EBL
BEGIN PROJECT
CSJ: 0495-04-077
STA: 1+13
REF. MRK: 543+0.836



IH 20, WBL
END PROJECT
CSJ: 0495-04-076
STA: 250+00
REF. MRK: 548+0.083

IH 20, EBL
END PROJECT
CSJ: 0495-04-077
STA: 250+22
REF. MRK: 548+0.145

* SIGN IN ACCORDANCE WITH THE STANDARD BC SHEETS AND PART 6 OF THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: SPECIAL LABOR PROVISIONS FOR STATE PROJECTS (000-008)

EXCEPTIONS: NONE
EQUATIONS: NONE
RAILROAD CROSSINGS: NONE
NOT TO SCALE

Texas Department of Transportation

SUBMITTED FOR LETTING: 12/1/2021

DocuSigned by: Gilbert Arteaga BF88CB5DCDAE4E8...
DISTRICT DESIGN ENGINEER

APPROVED FOR LETTING: 12/2/2021

DocuSigned by: Vernon M. Webb 6149184A8C65461...
DISTRICT ENGINEER

DATE: 11/10/2021 7:53:00 AM
FILE: c:\txdot\pw_online\txdot3\mark.driskell\d0432361\IH20_COMB_GEN_TITLE.dgn

CK:
DW:
CK:
DN:

GENERAL

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	SUPPLEMENTAL INDEX OF SHEETS
3 - 12	TYPICAL SECTIONS
13, 13A-13H	GENERAL NOTES
14, 14A	ESTIMATE AND QUANTITY SHEET
15 - 23	QUANTITY SUMMARY SHEETS

TRAFFIC CONTROL PLAN

SHEET NO.	DESCRIPTION
24	CONSTRUCTION SEQUENCE
25	TREATMENT FOR VARIOUS EDGE CONDITIONS

SHEET NO.	STANDARDS
26 - 37	BC(1)-21 THRU BC(12)-21
38	TCP (1-2)-18
39 - 40	TCP (3-2)-13, TCP (3-3)-14
41	TCP (6-1)-12 (MOD)
42	TCP (6-2)-12 (MOD)
43	TCP (6-3)-12 (MOD)
44	TCP(7-1)-13
45	TCP(S-5)-08
46	WZ (STPM)-13
47	WZ (UL)-13

ROADWAY DETAILS

SHEET NO.	DESCRIPTION
48 - 62	PROJECT LAYOUTS
63 - 64	MISCELLANEOUS DETAILS

BRIDGE ITEMS

SHEET NO.	DESCRIPTION
65	CLEAN & SEALING EXISTING BRIDGE JOINTS (PAN GIRDER BRIDGES)

TRAFFIC ITEMS

SHEET NO.	STANDARDS
66 - 67	FPM(1)-12 & FPM(2)-12
68 - 70	PM(1)-20 THRU PM(3)-20
71	RS(1)-13

ENVIRONMENTAL ISSUES

SHEET NO.	DESCRIPTION
72 - 73	IH 20, ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)
74 - 75	IH 20, STORMWATER POLLUTION PREVENTION PLAN (SW3P)
76	CONCRETE WASHOUT DETAIL

SHEET NO.	STANDARDS
77	EC(1)-16

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER

Gilbert Arteaga 12/01/2021

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

IH 20
SUPPLEMENTAL INDEX OF SHEETS

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		2

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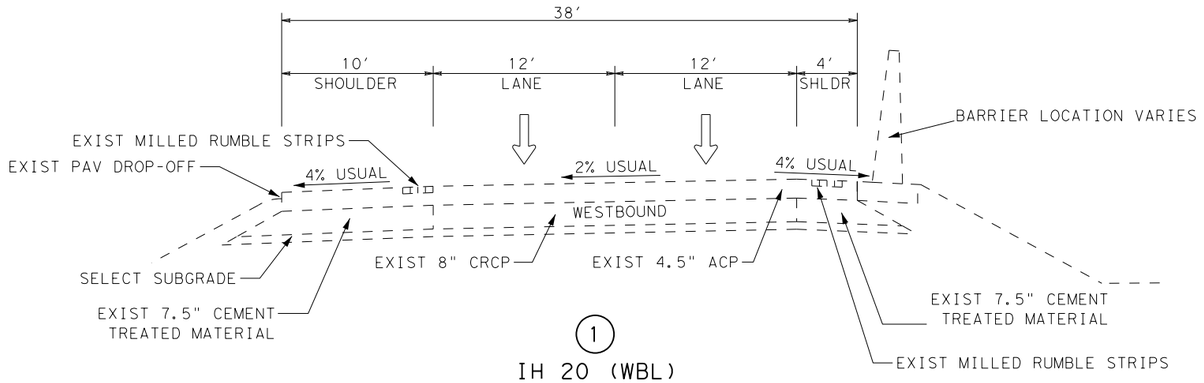


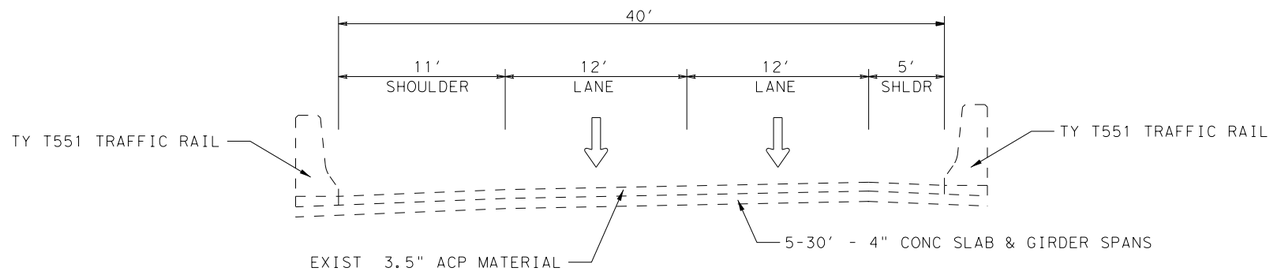
1

IH 20 (WBL)
EXISTING TYPICAL SECTION

STA 1+13 TO STA 83+48
STA 85+14 TO STA 250+00

0 5 10

SCALE: 1" = 10′



2

IH 20 (WBL)
CANEY CREEK BRIDGE
EXISTING TYPICAL SECTION

STA 83+48 TO STA 85+14

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

IH 20
(WBL)
TYPICAL SECTIONS

Texas Department of Transportation

SHEET 1 OF 10

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		3

DATE: 10/27/2021 11:33:28 AM
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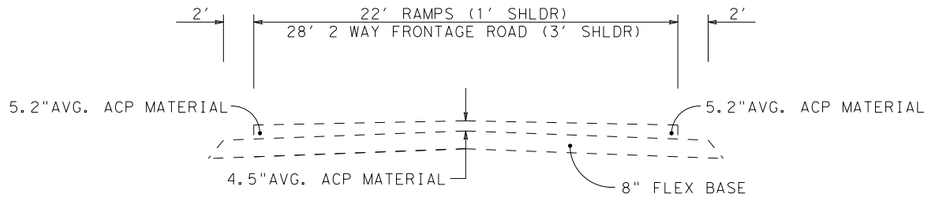

3

IH 20 (WBL)
RAMPS / FRONTAGE ROAD
EXISTING TYPICAL SECTION
(SH 110) STA 2000+00 TO STA 2021+95

0 5 10
SCALE: 1" = 10'

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

IH 20
(WBL)
TYPICAL SECTIONS

Texas Department of Transportation
SHEET 2 OF 10

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		4

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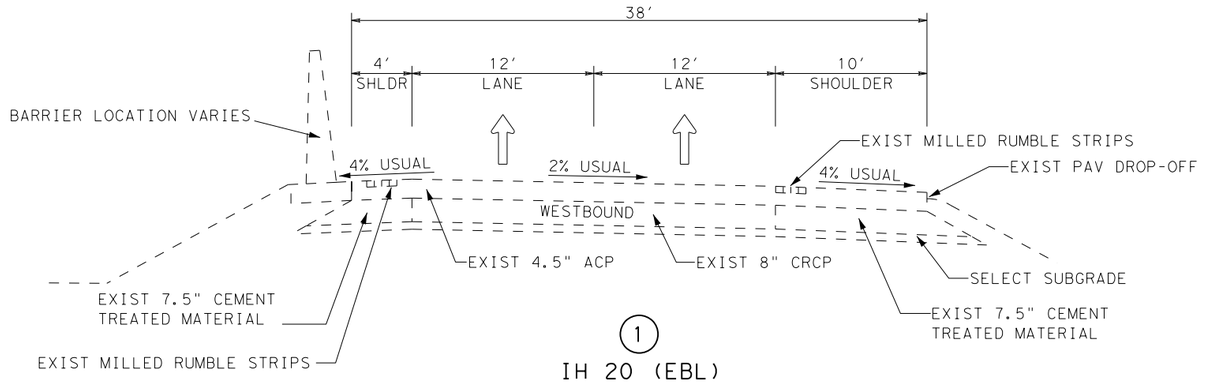
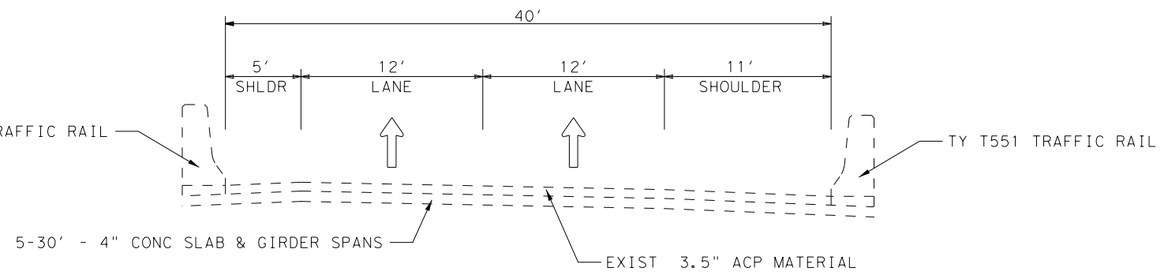


1

IH 20 (EBL)
EXISTING TYPICAL SECTION

STA 1+13 TO STA 83+31
STA 84+97 TO STA 250+22



2

IH 20 (EBL)
CANEY CREEK BRIDGE
EXISTING TYPICAL SECTION

STA 83+31 TO STA 84+97

0 5 10

SCALE: 1" = 10'

STATE OF TEXAS
GILBERT ARTEAGA
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LICENSED
PROFESSIONAL ENGINEER
12/01/2021

IH 20
(EBL)
TYPICAL SECTIONS

Texas Department of Transportation

SHEET 3 OF 10

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		5

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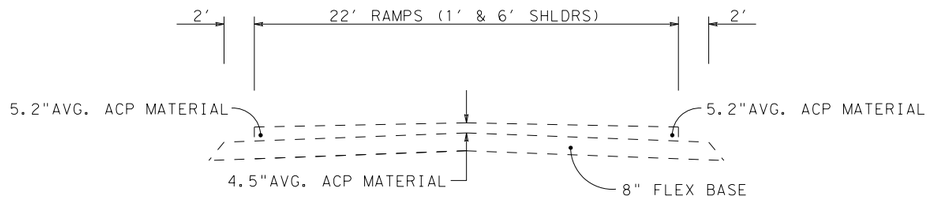

3

IH 20 (EBL)
RAMPS
EXISTING TYPICAL SECTION
(CR 426) RAMPS A3 & A4
(SH 110) RAMPS B3 & B4

0 5 10
SCALE: 1" = 10'

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

IH 20
(EBL)
TYPICAL SECTIONS

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		6

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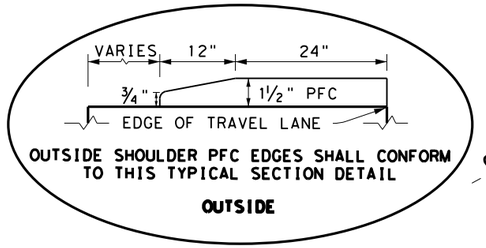
CK:
DW:
CK:
DN:

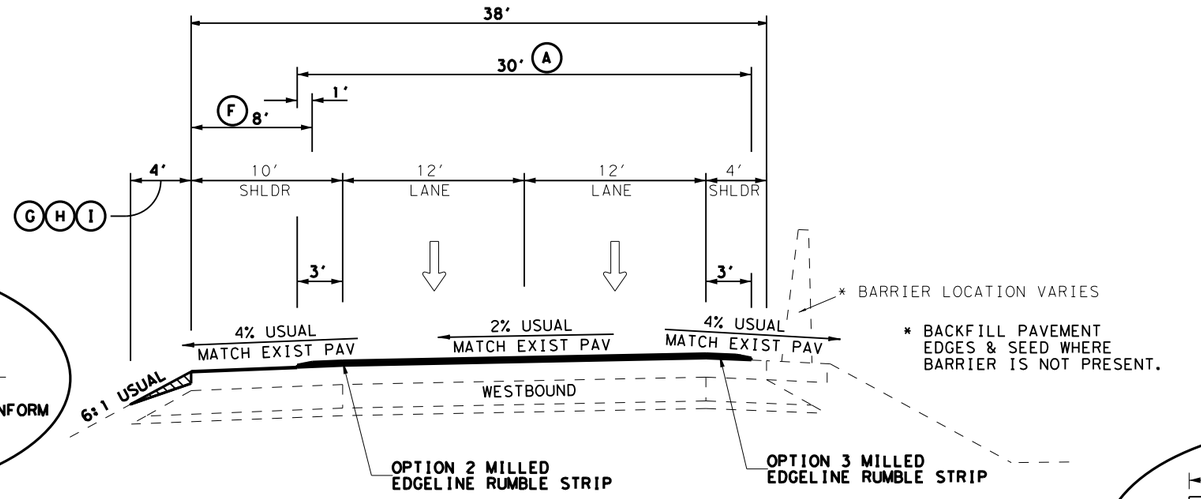
LEGEND

- (A) PROPOSED 1.5" TBPFC, MEMBRANE UNDERSEAL
- (B) PROPOSED PLANE ASPH CONC PAV (1.5")
- (C) PROPOSED PLANE ASPH CONC PAV (0"-1.5")
- (D) PROPOSED PLANE ASPH CONC PAV (2")
- (E) PROPOSED 2" TY C SUPERPAVE SAC-A (PG 70-22), MEMBRANE UNDERSEAL
- (F) PROPOSED FRICTIONAL ASPH SURF PRESERV TRTMT
- (G) PROPOSED BACKFILL TY A. TXDOT WILL PROVIDE RAP MILLINGS FOR BACKFILL TY A.
- (H) PROPOSED EMULSION
- (I) PROPOSED BONDED FIBER MATRIX
- (J) PROPOSED 1.5" TY D SUPERPAVE (PG 70-22), MEMBRANE UNDERSEAL

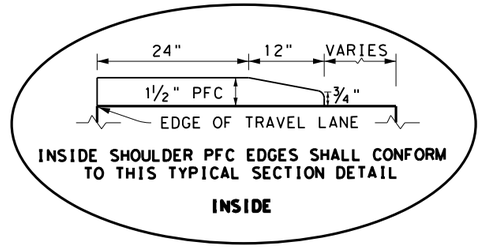


OUTSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

OUTSIDE



* BACKFILL PAVEMENT EDGES & SEED WHERE BARRIER IS NOT PRESENT.



INSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

INSIDE

0 5 10

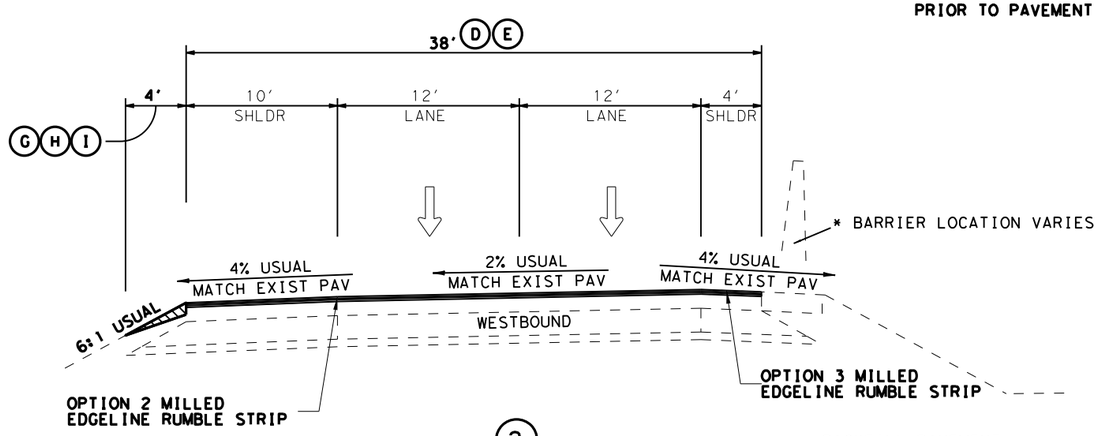
SCALE: 1" = 10'

(1)

IH 20 (WBL)
PROPOSED TYPICAL SECTION

STA 1+13 TO STA 26+50
STA 33+50 TO STA 81+98
STA 86+64 TO STA 129+50
STA 136+50 TO STA 225+75
STA 232+75 TO STA 250+00

NOTE:
- MATCH EXISTING ROADWAY CROSS-SLOPES.
- OVERLAY ALL PLANED AREAS BY THE END OF EACH DAY.
- FIELD VERIFY EXISTING PAVEMENT MARKINGS FOR RAMPS/FRONTAGE RD. PRIOR TO PAVEMENT OPERATIONS.



* BACKFILL PAVEMENT EDGES & SEED WHERE BARRIER IS NOT PRESENT.

(2)

IH 20 (WBL)
PROPOSED TYPICAL SECTION

STA 26+50 TO STA 33+50
STA 129+50 TO STA 136+50
STA 225+75 TO STA 232+75

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER

Gilbert Arteaga
12/01/2021

IH 20
(WBL)
TYPICAL SECTIONS

Texas Department of Transportation

SHEET 5 OF 10

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		7

DATE: 10/27/2021 11:33:33 AM
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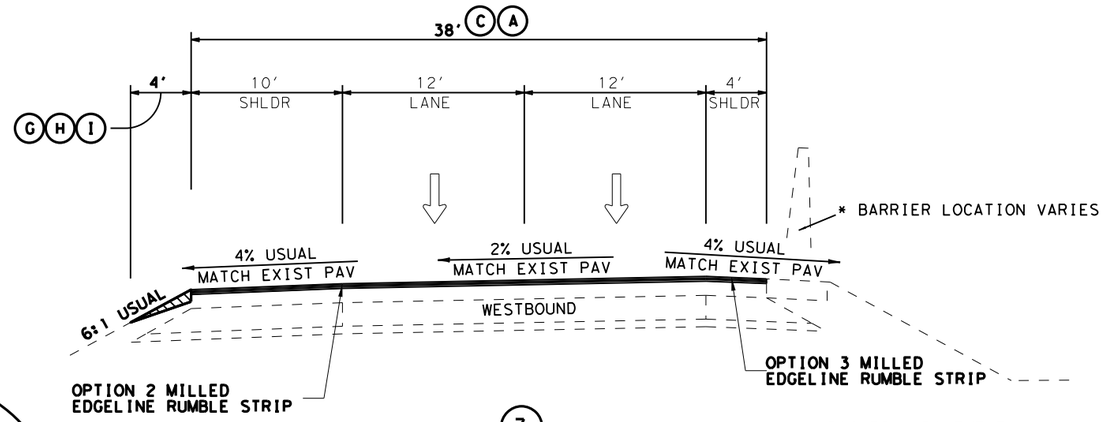
LEGEND

- (A) PROPOSED 1.5" TBPFC, MEMBRANE UNDERSEAL
- (B) PROPOSED PLANE ASPH CONC PAV (1.5")
- (C) PROPOSED PLANE ASPH CONC PAV (0"-1.5")
- (D) PROPOSED PLANE ASPH CONC PAV (2")
- (E) PROPOSED 2" TY C SUPERPAVE SAC-A (PG 70-22), MEMBRANE UNDERSEAL
- (F) PROPOSED FRICTIONAL ASPH SURF PRESERV TRTMT
- (G) PROPOSED BACKFILL TY A. TXDOT WILL PROVIDE RAP MILLINGS FOR BACKFILL TY A.
- (H) PROPOSED EMULSION
- (I) PROPOSED BONDED FIBER MATRIX
- (J) PROPOSED 1.5" TY D SUPERPAVE (PG 70-22), MEMBRANE UNDERSEAL

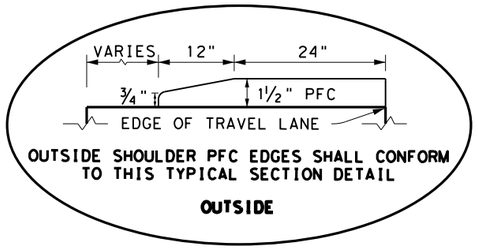


(3)

IH 20 (WBL)
PROPOSED TYPICAL SECTION

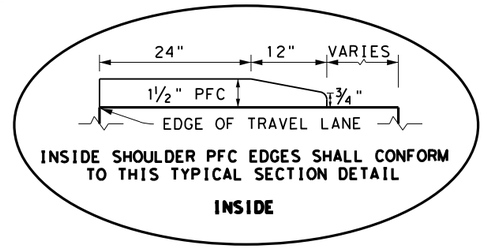
STA 81+98 TO STA 83+48
STA 85+14 TO STA 86+64

* BACKFILL PAVEMENT EDGES & SEED WHERE BARRIER IS NOT PRESENT.



OUTSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

OUTSIDE



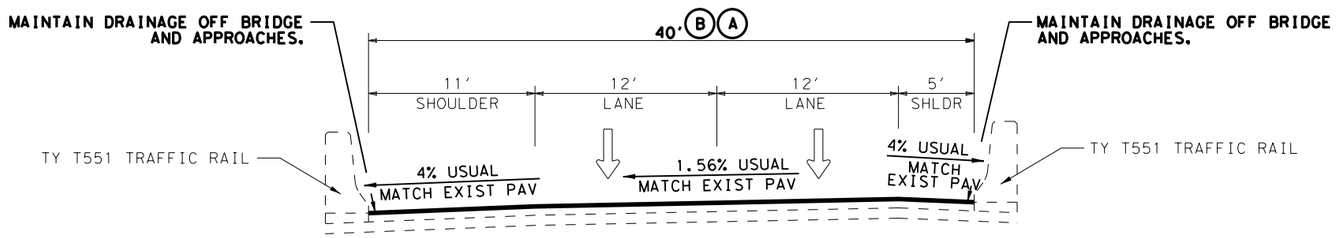
INSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

INSIDE

0 5 10

SCALE: 1" = 10'

NOTE:
- MATCH EXISTING ROADWAY CROSS-SLOPES.
- OVERLAY ALL PLANED AREAS BY THE END OF EACH DAY.
- FIELD VERIFY EXISTING PAVEMENT MARKINGS FOR RAMPS/FRONTAGE RD. PRIOR TO PAVEMENT OPERATIONS.



(4)

IH 20 (WBL)
CANEY CREEK BRIDGE
PROPOSED TYPICAL SECTION

STA 83+48 TO STA 85+14

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER

Gilbert Arteaga 12/01/2021

IH 20 (WBL) TYPICAL SECTIONS

SHEET 6 OF 10

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		8

DATE: 10/27/2021 11:33:37 AM
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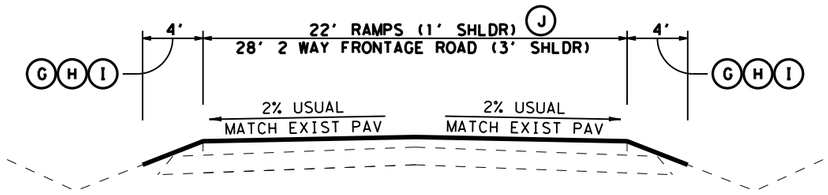
LEGEND

- (A) PROPOSED 1.5" TBPFC, MEMBRANE UNDERSEAL
- (B) PROPOSED PLANE ASPH CONC PAV (1.5")
- (C) PROPOSED PLANE ASPH CONC PAV (0"-1.5")
- (D) PROPOSED PLANE ASPH CONC PAV (2")
- (E) PROPOSED 2" TY C SUPERPAVE SAC-A (PG 70-22), MEMBRANE UNDERSEAL
- (F) PROPOSED FRICTIONAL ASPH SURF PRESERV TRTMT
- (G) PROPOSED BACKFILL TY A. TXDOT WILL PROVIDE RAP MILLINGS FOR BACKFILL TY A.
- (H) PROPOSED EMULSION
- (I) PROPOSED BONDED FIBER MATRIX
- (J) PROPOSED 1.5" TY D SUPERPAVE (PG 70-22), MEMBRANE UNDERSEAL



0 5 10

SCALE: 1" = 10'

(5)

IH 20 (WBL)
RAMPS / FRONTAGE ROAD
PROPOSED TYPICAL SECTION
(SH 110) STA 2000+00 TO STA 2021+95

NOTE:
* MATCH EXISTING ROADWAY CROSS-SLOPES.
* OVERLAY ALL PLANED AREAS BY THE END OF EACH DAY.
* FIELD VERIFY EXISTING PAVEMENT MARKINGS FOR RAMPS/FRONTAGE RD. PRIOR TO PAVEMENT OPERATIONS.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
Gilbert Arteaga
12/01/2021

IH 20
(WBL)
TYPICAL SECTIONS

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		9

DATE: 10/27/2021 11:33:41 AM
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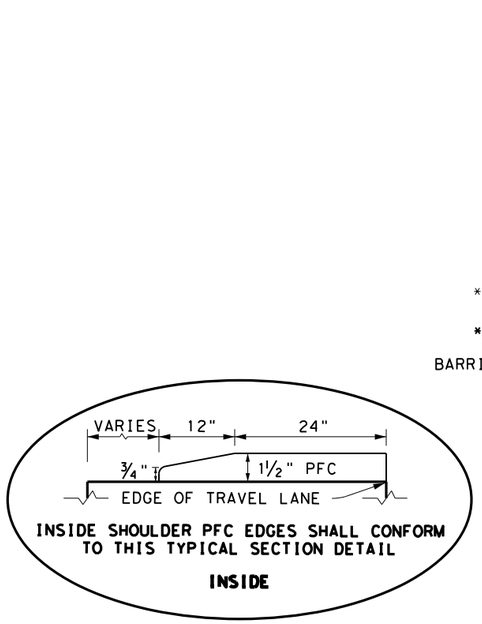
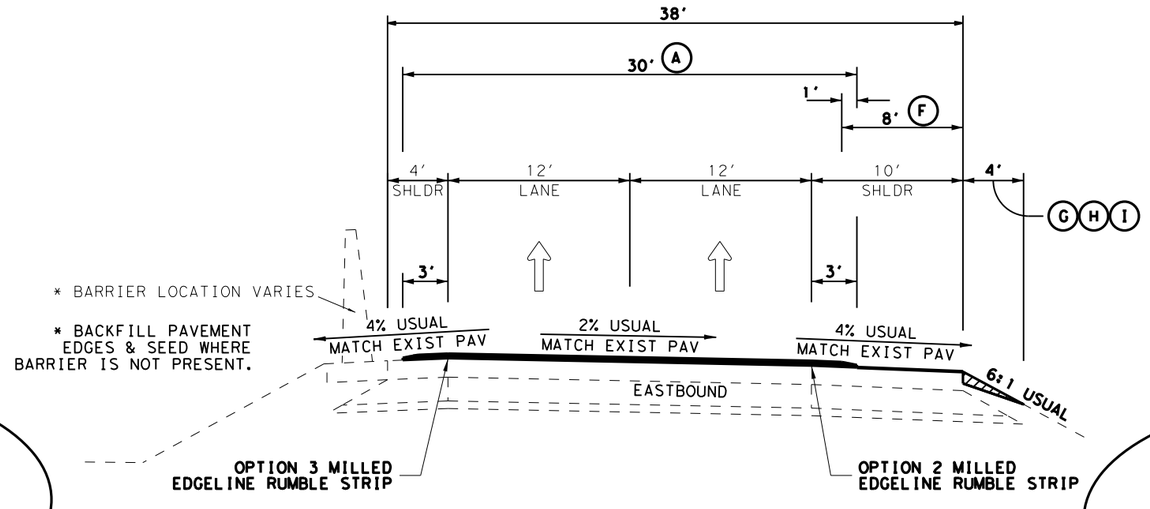
LEGEND

- (A) PROPOSED 1.5" TBPFC, MEMBRANE UNDERSEAL
- (B) PROPOSED PLANE ASPH CONC PAV (1.5")
- (C) PROPOSED PLANE ASPH CONC PAV (0"-1.5")
- (D) PROPOSED PLANE ASPH CONC PAV (2")
- (E) PROPOSED 2" TY C SUPERPAVE SAC-A (PG 70-22), MEMBRANE UNDERSEAL
- (F) PROPOSED FRICTIONAL ASPH SURF PRESERV TRTMT
- (G) PROPOSED BACKFILL TY A. TXDOT WILL PROVIDE RAP MILLINGS FOR BACKFILL TY A.
- (H) PROPOSED EMULSION
- (I) PROPOSED BONDED FIBER MATRIX
- (J) PROPOSED 1.5" TY D SUPERPAVE (PG 70-22), MEMBRANE UNDERSEAL



INSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

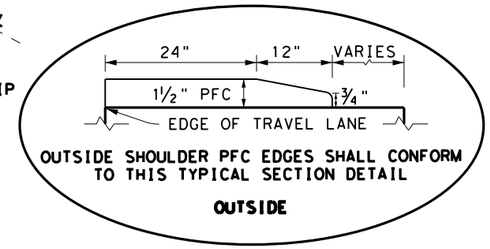
INSIDE



(1)

IH 20 (EBL)
PROPOSED TYPICAL SECTION

STA 1+13 TO STA 26+41
STA 33+41 TO STA 81+81
STA 86+47 TO STA 129+31
STA 136+31 TO STA 225+97
STA 232+97 TO STA 250+22

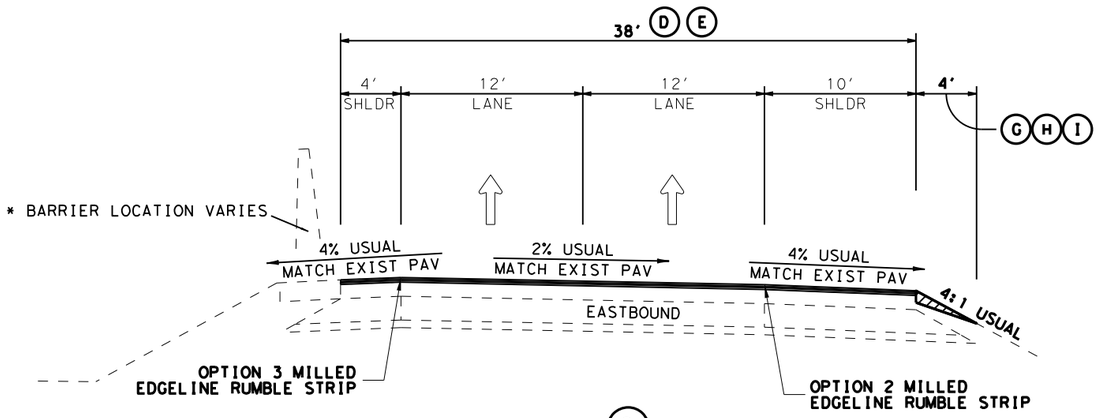


OUTSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

OUTSIDE

0 5 10

SCALE: 1" = 10'



* BACKFILL PAVEMENT EDGES & SEED WHERE BARRIER IS NOT PRESENT.

(2)

IH 20 (EBL)
PROPOSED TYPICAL SECTION

STA 26+41 TO STA 33+41
STA 129+31 TO STA 136+31
STA 225+97 TO STA 232+97

NOTE:
* MATCH EXISTING ROADWAY CROSS-SLOPES.
* OVERLAY ALL PLANED AREAS BY THE END OF EACH DAY.
* FIELD VERIFY EXISTING PAVEMENT MARKINGS FOR RAMPS. PRIOR TO PAVEMENT OPERATIONS.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED PROFESSIONAL ENGINEER
12/01/2021

IH 20 (EBL) TYPICAL SECTIONS

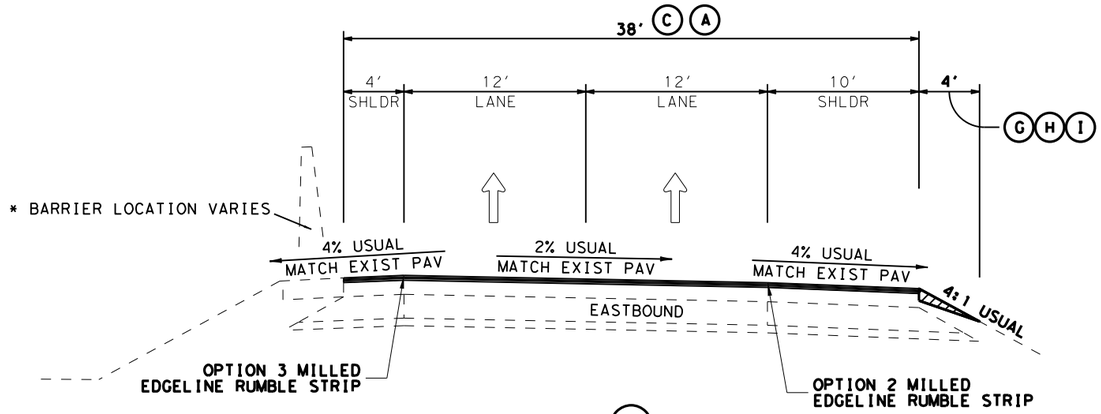
SHEET 8 OF 10

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		10

DATE: 10/27/2021 11:33:45 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432361\IH20_COMB_GEN_TYP_.dgn

LEGEND

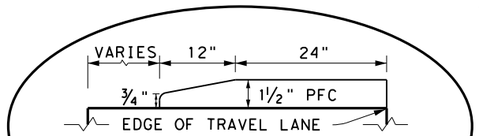
- (A) PROPOSED 1.5" TBPFC, MEMBRANE UNDERSEAL
- (B) PROPOSED PLANE ASPH CONC PAV (1.5")
- (C) PROPOSED PLANE ASPH CONC PAV (0"-1.5")
- (D) PROPOSED PLANE ASPH CONC PAV (2")
- (E) PROPOSED 2" TY C SUPERPAVE SAC-A (PG 70-22), MEMBRANE UNDERSEAL
- (F) PROPOSED FRICTIONAL ASPH SURF PRESERV TRTMT
- (G) PROPOSED BACKFILL TY A. TXDOT WILL PROVIDE RAP MILLINGS FOR BACKFILL TY A.
- (H) PROPOSED EMULSION
- (I) PROPOSED BONDED FIBER MATRIX
- (J) PROPOSED 1.5" TY D SUPERPAVE (PG 70-22), MEMBRANE UNDERSEAL



* BACKFILL PAVEMENT EDGES & SEED WHERE BARRIER IS NOT PRESENT.

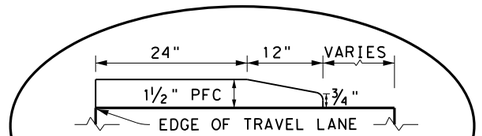
(3)

IH 20 (EBL)
PROPOSED TYPICAL SECTION
STA 81+81 TO STA 83+31
STA 84+97 TO STA 86+47



INSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

INSIDE

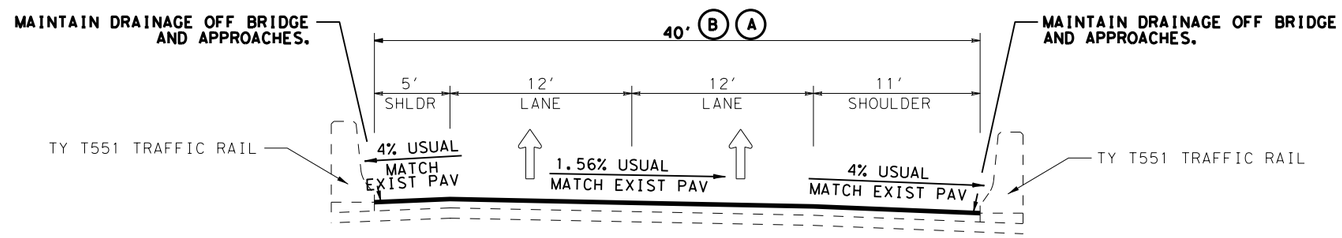


OUTSIDE SHOULDER PFC EDGES SHALL CONFORM TO THIS TYPICAL SECTION DETAIL

OUTSIDE

0 5 10

SCALE: 1" = 10'



(4)

IH 20 (EBL)
CANEY CREEK BRIDGE
PROPOSED TYPICAL SECTION
STA 83+31 TO STA 84+97

NOTE:
- MATCH EXISTING ROADWAY CROSS-SLOPES.
- OVERLAY ALL PLANED AREAS BY THE END OF EACH DAY.
- FIELD VERIFY EXISTING PAVEMENT MARKINGS FOR RAMPS. PRIOR TO PAVEMENT OPERATIONS.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

IH 20 (EBL) TYPICAL SECTIONS

SHEET 9 OF 10

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		11

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LEGEND

- (A) PROPOSED 1.5" TBPFC, MEMBRANE UNDERSEAL
- (B) PROPOSED PLANE ASPH CONC PAV (1.5")
- (C) PROPOSED PLANE ASPH CONC PAV (0"-1.5")
- (D) PROPOSED PLANE ASPH CONC PAV (2")
- (E) PROPOSED 2" TY C SUPERPAVE SAC-A (PG 70-22), MEMBRANE UNDERSEAL
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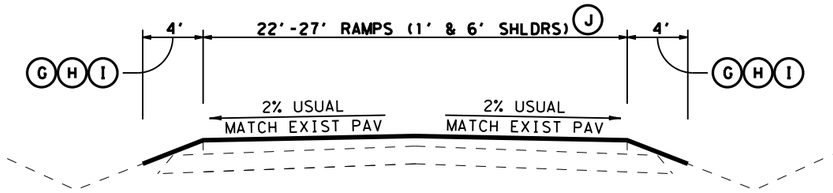
- (I) PROPOSED BONDED FIBER MATRIX
- (J) PROPOSED 1.5" TY D SUPERPAVE (PG 70-22), MEMBRANE UNDERSEAL



0 5 10

SCALE: 1" = 10'

5

IH 20 (EBL)
RAMPS
PROPOSED TYPICAL SECTION
(CR 426) RAMPS A3 & A4
(SH 110) RAMPS B3 & B4

NOTE:
* MATCH EXISTING ROADWAY CROSS-SLOPES.
* OVERLAY ALL PLANED AREAS BY THE END OF EACH DAY.
* FIELD VERIFY EXISTING PAVEMENT MARKINGS FOR RAMPS. PRIOR TO PAVEMENT OPERATIONS.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
Gilbert Arteaga
12/01/2021

IH 20
(EBL)
TYPICAL SECTIONS

Texas Department of Transportation

SHEET 10 OF 10

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		12

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GENERAL NOTES:

GENERAL.

Contractor questions on this project are to be addressed to the following individuals:

Paul Schneider Paul.Schneider@txdot.gov

Travis Singleton Travis.Singleton@txdot.gov

Contractor questions will be accepted through email, phone, and in person by the above individuals.

All Contractor questions will be reviewed by the Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following Address:

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

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

For this Contract, the following standard sheets have been modified:

TCP (6-1)-12(MOD), TCP (6-2)-12(MOD), TCP (6-3)-12(MOD)

All stockpiles within TxDOT right of way, must not exceed 12 ft. in height and must have 3:1 slopes unless otherwise directed. Place stockpiles in a manner that will be outside the horizontal clear zone, will not obstruct traffic or sight distance, and will not interfere with roadway drainage.

Do not haul with loaded scrapers on the surfaced areas of any highway except as approved.

Remove all vegetation from pavement edges, intersections, and driveways prior to planing operations, seal coat, or ACP operations. This work will not be paid for directly, but will be subsidiary to the bid items of the Contract.

ATTN: Provide a 20-ft. length per 1-in. depth temporary taper at all transverse joints in the travel lane before opening to traffic. This work will not be paid for directly, but will be subsidiary to the bid items of the Contract.

Project Number: **Sheet 13**

County: Smith **Control:** 0495-04-076, Etc.

Highway: IH 20

Provide all-weather surface for temporary ingress and egress to adjacent property, as directed. Materials, labor, equipment and incidentals necessary to provide temporary ingress and egress will not be paid for directly, but will be subsidiary to various bid items.

PROJECT MOWING

Mow the highway right of way in the project limits a maximum of 2 cycles per year, as directed. Mowing will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Provide approved mowing equipment capable of mowing on slopes without unduly marring finished slope surfaces or damaging existing growth. The minimum cutting width should not be less than 5 ft. unless otherwise approved.

Mow all areas of existing vegetation and vegetation placed during the project, as directed. The mowing height should be 5 in. unless otherwise directed. Repair portions of sod or grass which are damaged during mowing operations in an acceptable manner.

Mow as close as possible to all fixed objects, exercising extreme care not to damage trees, plants, shrubs, signs, delineators or other appurtenances which are part of the facility. Hand trim around such objects, unless otherwise specified.

Use safety chains or other manufacturer's safety devices to prevent injury to people or damage to property caused by flying debris propelled out from under rotary mowers. Chains should be a minimum size of 5/16 in. and links spaced side by side around the front, sides and rear of mower. When mowing at the specified cutting height, the chains should be long enough to drag the ground. If at any time it is determined that mowing or trimming equipment is defective to the point that it may affect the quality of work or create unsafe conditions, then immediately repair or replace the equipment.

LITTER PICKUP

Remove litter from the right of way in the project limits a maximum of 3 cycles per year as directed. Litter pickup will not be measured or paid for directly, but will be subsidiary to pertinent Items.

Equipment used for litter pickup must be approved.

Collect and properly dispose of all litter deposited by construction operations or the traveling public from within the right of way as directed. This includes cans, bottles, paper, plastic items, metal scraps, lumber, etc. Do not dump or stockpile collected litter on Department property.

ITEM 4. SCOPE OF WORK

Upon completion of the work and before final acceptance, remove all foreign material, stains, and marks from concrete surfaces. Sandblast clean concrete surfaces as directed. Clean existing concrete structures that are marked or stained by the Contractor's operations. This work will not be paid for directly, but will be subsidiary to the bid items of the Contract.

During final clean up, remove all foreign material that has accumulated at bridge abutments and bent caps as approved. All work and equipment involved in the removal of this material is subsidiary to the bid items of the Contract.

Preserve the integrity of all right of way monuments within project limits. Right of way monuments damaged or destroyed during construction must be replaced by a registered professional land surveyor (RPLS), at the Contractor's expense.

ITEM 5. CONTROL OF THE WORK

If utility lines need adjustments during construction operations, modify operations and continue the work in a manner that will allow others to make the utility adjustments. Additional working time may be allowed for delays caused by these utility adjustments.

Maintain and re-establish the centerline stations throughout each project as required for each phase of work.

Restrict movement of construction equipment and haul trucks to paved surfaces. Do not cross the median with equipment and haul trucks unless specifically authorized. Use entrance and exit ramps to enter and exit the freeway mainlanes.

ITEM 7. LEGAL RELATIONS AND RESPONSIBILITIES

Maintain positive drainage for permanent and temporary work for the duration of the project. The Contractor will be responsible for any items associated with the temporary or interim drainage and all related maintenance. This work will be subsidiary to various bid items.

The total disturbed area for this project is 7.97 acres. The disturbed area in this project and the Contractor Project Specific Locations (PSL's) within 1 mile of the project limits for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any Contractor PSL for construction support activities on or off the ROW. When the total area disturbed for all projects in the Contract and PSLs within 1 mile of the project limits exceed 5 acres, before disturbance, provide a copy of the

Project Number: **Sheet 13A**

County: Smith **Control:** 0495-04-076, Etc.

Highway: IH 20

Contractor NOI for PSLs on the ROW and within 1 mile of the project limits to the Engineer and to any local government that operates a Municipal Separate Storm Sewer System (MSSS).

No significant traffic generator events identified.

ITEM 8. PROSECUTION AND PROGRESS

The hours that one lane can be closed are Monday through Thursday nights 8 P.M. to 5 A.M. and Sunday night 9 P.M. to 5 A.M.

A lane closure that exceeds the lane restrictions defined in Item 8 is subject to a fee of $500 per 15 minutes.

On IH 20, only one lane, shoulder and ramp in one direction is allowed to be closed at a time.

Limit lane closures on IH 20 to 2.5 miles unless otherwise directed.

Prepare the progress schedule as a bar chart.

ITEM 9. MEASUREMENT & PAYMENT

In accordance with Article 9.1., "Measurement of Quantities," furnish the tare and maximum gross weights as well as the volume capacity of all vehicles, trucks, truck-tractors, trailers, semi-trailers, or combination of such vehicles used to deliver materials for this Contract. Also, furnish calculations supporting these weights and capacities. Provide all measurements required for pay a minimum of 2 days before the trucks are used.

ITEM 134. BACKFILLING PAVEMENT EDGES

TxDOT will provide Recycled Asphalt Pavement (RAP) for the TY A backfill as shown on the plans. Obtain the backfill material from the Tyler Area Office located at 15986 SH 155 South, Tyler, Tx. 75703. Provide a work plan including equipment and schedule to the Engineer a minimum of one (1) week prior to use of the material.

Provide daily haul tickets stating the truck number and measurements in (CY) cubic yards.

Compact the backfill adjacent to the pavement edge with a pneumatic roller or other approved equipment. This rolling will not be paid for directly, but will be subsidiary to Item 134.

ITEM 164. SEEDING FOR EROSION CONTROL

The rates, types of seed, asphalt, and locations for the straw mulch and broadcast seed items will be determined if temporary erosion control is needed.

Mow tall vegetation prior to placement of erosion control measures in order to provide optimal growing conditions. This work will not be paid for directly, but will be subsidiary to the bid items of the Contract.

The season and seed mixture for "Broadcast Seeding (Temporary Erosion Control) (Cool Season)" and "Broadcast Seeding (Temporary Erosion Control) (Warm Season)" is specified below:

Cool Season - September 1 thru November 30
Warm Season - May 15 thru August 31

Permanent Planting Mixture	
Species and Rates	
(lb. PLS/ac.)	
(Season: February 1 to May 15)	
Green Sprangletop	0.5
Bermudagrass	5.0
Weeping Lovegrass (Ermelo)	0.5
Sand Lovegrass	0.5
Lance-Leaf Coreopsis	1.0
(Season: September 1 to February 1)	
Bermuda (unhulled)	12
Crimson Clover	10

Project Number: **Sheet 13B**

County: Smith **Control:** 0495-04-076, Etc.

Highway: IH 20

Temporary Seeding for Erosion Control	
Warm Season	
(Season: May 15 to August 31)	
Bermudagrass	10
Foxtail Millet	30
Cool Season	
(Season: September 1 to November 30)	
Tall Fescue	4.5
Oats	24
Wheat	34

Place topsoil before temporary seeding unless otherwise directed.

Do not use Bahiagrass.

Use additional temporary seeding if permanent seeding is placed outside the optimum growing season shown for this Item as directed.

Use crimping as the tacking method for hay or straw mulch.

Provide a Bonded Fiber Matrix that meets the current requirements of the Approved Products List for Item 169, "Soil Retention Blanket, Class 1, Type D, Spray Type Blanket," for both permanent and temporary seeding. Install according to manufacturer's recommendations based on a slope steeper than 3:1 with sandy soils. This Item will be paid for under Item 164.

ITEM 166. FERTILIZER

Place fertilizer at the rate of 1 lb. per 9 sq. yd. on areas prepared for seeding.

ITEM 168. VEGETATIVE WATERING

Apply water to all newly placed sod or seeded areas the same day of installation. Maintain the sod or seeded areas in a sufficiently watered condition. Do not allow sod or seeded areas to dry out so that water stress is evident.

ITEM 314. EMULSIFIED ASPHALT TREATMENT

Before application, dilute the emulsion with water up to a maximum dilution of 50% at a distribution rate of 0.30 gal. per sq. yd.

ITEM 320. EQUIPMENT FOR ASPHALT CONCRETE PAVEMENT

Provide either a material transfer vehicle or material transfer paver for the surface course of this project. The material transfer vehicle must be self-propelled, wheel mounted and capable of receiving material from haul trucks separate from the paver. The 20-ton minimum capacity hopper must be equipped with a pivoting discharge conveyor and must have a means of remixing the asphaltic material before placement. The material transfer paver, if supplied, must consist of a mobile, self-propelled asphalt paver incorporating an integral mix loadout elevator (conveyor) having a minimum rated capacity of 750 ton per hour. The conveyor system must have a means of remixing the asphaltic concrete material before discharging into the paver hopper and must be equipped with either a truck dump hopper attachment or a minimum 20-ton capacity surge hopper. If a material transfer paver utilizing the truck dumper hopper attachment is used, the haul trucks must stop a minimum of 1 foot into the truck. In addition, paving will not be allowed to begin until the paver has reached its full storage capacity.

ITEM 348. THIN BONDED FRICTION COURSES

Cease production of mixture if the asphalt content from any sublot drops below 6%. Resume production following tests showing appropriate adjustments have been made to the satisfaction of the Engineer.

Provide Class A coarse aggregate for the PFC as listed in the Department's Bituminous Rated Source Quality Catalog (BRSQC).

Warm Mix Asphalt (WMA) is not allowed.

The use of Reclaimed Asphalt Pavement (RAP) and Recycled Asphalt Shingles (RAS) is not allowed.

Project Number: **Sheet 13C**

County: Smith **Control:** 0495-04-076, Etc.

Highway: IH 20

Provide PFC-C aggregate in accordance with Item 342.

ITEM 351. FLEXIBLE PAVEMENT STRUCTURE REPAIR

Replace the unstable pavement structure with 6 in. of asphaltic concrete pavement base (Super Pave SP-C PG70-22 Binder), unless otherwise directed. The Engineer will determine the exact locations and limits of pavement repair in the field prior to beginning this Item of work.

No substitutions allowed.

Apply a tack coat with a rate of 0.10 gal/sy of residual asphalt between each layer of ACP pavement unless otherwise directed.

Furnish planing equipment to remove existing material in accordance with Item 354, as directed. The planing equipment will be subsidiary to Item 351.

ITEM 354. PLANING AND TEXTURING PAVEMENT

Use a front-end loader or other suitable equipment at the stockpile site to properly stockpile the planed material as required.

ATTN: Vary planing locations to meet field conditions as directed. Begin and end planing at a sawed or planed vertical joint to provide a smooth transition to existing pavement. Provide a 20-ft. length per 1-in. depth temporary taper at all transverse joints in the travel lane before opening to traffic.

Before opening planed areas to traffic, bevel vertical or near vertical longitudinal faces in the pavement surface.

Overlay all planed areas by the end of each day unless otherwise approved.

If unsuitable weather or other unexpected conditions do not allow planed areas to be overlaid, provide and maintain warning signs for overnight lane closures in accordance with the traffic control plan sheets until overlay operations are complete.

Retain all RAP generated from this project.

Prime area where the underlying flexible base is exposed during the planing operation using an approved asphalt. The Engineer will determine the rate. Patch area as necessary with an approved ACP material. Perform this work at the end of the day's operation as directed. This work will not be paid for directly, but will be subsidiary to Item 354.

ITEM 502. BARRICADES, SIGNS, AND TRAFFIC HANDLING

The traffic control plan for this Contract consists of: the installation and maintenance of warning signs and other traffic control devices shown on the plans; specification data, which may be included in the general notes; applicable provisions of the Texas Manual on Uniform Traffic Control Devices (TMUTCD); traffic control plan sheets included on the plans; standard BC sheets; Compliant Work Zone Traffic Control Device List, and Item 502 of the standard specifications.

Use ground-mounted sign mounts with two posts for all temporary work zone signs unless otherwise directed.

Inspect and correct deficiencies each day throughout the duration of the Contract. In accordance with Article 502.4., "Payment," no payment will be made for the month if the Contractor fails to provide or properly maintain signs and devices in compliance with Contract requirements. Temporary warning signs that are visible when conditions do not apply will be considered improper maintenance of signs.

Provide at least one employee on call nights and weekends (or any other time that work is not in progress) for maintenance of signs and traffic control devices. This employee must have an address and telephone number near the project, as approved. Notify the Engineer in writing of the name, address, and telephone number of this employee. The Engineer will furnish this information to local law enforcement officials.

In addition to providing a Contractor's Responsible Person and a phone number for emergency contact, have an employee available to respond on the project for emergencies and for taking corrective measures within 30 minutes.

Sign all roads intersecting the project in accordance with current BC standards.

Refer to the traffic control plan sheets for traffic handling through the work area. Contractor may vary the signing arrangement and spacing as necessary to fit field conditions; however, any proposed changes in the traffic control plan must be approved before implementation.

When the sequence of work is shown on the plans, the Contractor may submit an alternate proposal for approval. Submit in writing all proposed variations and revisions.

High-visibility safety apparel is required for workers in accordance with the General Notes on current BC standards.

Place and maintain signs, channelizing devices, and flaggers to direct and route traffic at any location and for any period of time as may be required or directed.

Project Number: **Sheet 13D**

County: Smith **Control:** 0495-04-076, Etc.

Highway: IH 20

When operations require a lane closure, provide cones, vertical panels, drums, signs, flaggers, and flashing arrow panels as necessary to route traffic around the closed lane as shown on the plans and as directed. Lane closures will be limited to one specific lane as directed.

Unless otherwise approved, lane closures for minor or major construction operations will not be allowed on Good Friday, Easter weekend, Memorial Day, Memorial Day weekend, July 4th, Labor Day, Labor Day weekend, Thanksgiving Day thru Sunday, Christmas Eve, Christmas Day, New Year's Eve, New Year's Day, or on any other high traffic days or holidays as determined.

Maintain existing roadside signs within this project's limits during this Contract. In order to accommodate the grading or other operations, temporarily relocate these signs in accordance with the TMUTCD as directed. Use ground-mounted sign mounts with two posts for all relocated signs unless otherwise directed. This work will not be paid for directly, but will be subsidiary to Item 502.

Provide truck-mounted attenuators (TMA) as shown on the appropriate traffic control plan sheets. Provide a letter certifying that all TMA used on this project meet NCHRP 350 or AASHTO Manual for Assessing Safety Hardware (MASH) requirements.

Regulate all construction activities and equipment to minimize inconvenience to the traveling public. At points where it is necessary for trucks to stop, load, or unload, provide warning signs and flaggers to protect the traveling public.

The pavement must be entirely open to traffic each day. Remove or clearly barricade all material stockpiles, equipment left overnight, or any obstruction within 30 ft. of a travelway as approved.

The Contractor Force Account "Safety Contingency" is intended to be used for work zone enhancements that could not be foreseen in the project planning and design stage for the purpose of improving the effectiveness of the Traffic Control Plan. 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.

Provide flaggers at county roads, commercial driveways, and other intersecting roadways deemed necessary by the Engineer to maintain control of the work zone during one-lane two-way operations. Provide communication radios to each flagger in the work zone and the pilot vehicle operator.

Lane closures will not be allowed Friday thru Sunday of Canton's First Monday Weekend.

Lane closures will not be allowed on IH 20 after 5 A.M. on Fridays or before 9 P.M. on Sundays.

For nighttime work, submit written notification to the Engineer for approval of the type of lighting to be used during construction.

Provide Balloon Lighting for nighttime construction work. Follow manufacturer's operational guidelines. Work lights must be portable and include LED lighting to diffuse glare and reduce shadows and provide 360 degrees of light. Balloon lighting is subsidiary to Item 502.

Submit a drawing showing the proposed lighting, traffic control, and protection devices during night work. Do not direct the lighting into the eyes of motorists. Provide lighting that is adequate to satisfactorily perform the required work.

Furnish and install work zone/reduce speed ahead and work zone/speed limit signs in accordance with current BC standards at locations as established by the Engineer. Signs must be ground-mounted.

Provide work zone speed limit signs that meet sizing requirements in accordance with Table 2B-1 of the TMUTCD.

Refer to the traffic control details for surfacing operations shown on the plans. Install signs as required by this standard or plan sheet. Keep signs in place until after completion of the surface course operation and until placement of the standard pavement markings. Place standard pavement markings within 7 days of surface treatment application. The placement of acceptable permanent pavement markings and the completion of the final cleanup will be considered a part of the surface course operation. These signs are in addition to the signs and barricades that may be required on standard BC sheets. Short-term stationary/short duration portable signs will be required during the removal of the temporary pavement markings.

Prior to beginning work, the Contractor and Engineer must agree on the allowable length of lane closure.

Provide 3 electronic Portable Changeable Message Sign (PCMS) units adjacent to the mainlanes in advance of each lane closure. PCMS units must be in accordance with Section 6F.60 of the TMUTCD, applicable standards and special provisions. Depending on conditions, message boards may have to be relocated during daily operations. Messages will be in accordance with current BC standards. When not in use, remove PCMS units from the right of way. Measurement and payment for the PCMS noted above will be in accordance with Item 6001. The term "operational" is defined as displaying a message in direct support of current project operations as approved and directed by the Engineer.

Place Type 3 barricades and road closed signs as shown on current BC standards across the closed roadway or the new location at each road, street, closed bridge, and along the closed roadway or new location at 3/4-mi. intervals.

Project Number: **Sheet 13E**

County: Smith **Control:** 0495-04-076, Etc.

Highway: IH 20

Restrict movement of construction equipment and haul trucks to all paved surfaces. Do not allow construction equipment and haul trucks to cross the median unless specifically authorized. Use entrance and exit ramps for ingress and egress to the mainlanes.

The use of Law Enforcement Officers (LEOs) will be required for this project. Before the preconstruction meeting, coordinate with local agencies to be prepared for staffing needs.

Provide uniformed LEOs with marked vehicles during work zone activities. The officer in marked vehicle will be located as approved to monitor or direct traffic during the closure. The Engineer will approve the method used to direct traffic at signalized intersections. Additional officers and vehicles may be provided when directed.

Complete the daily tracking form provided by the Department and submit invoices that agree with the tracking form for payment at the end of each month approved services were provided. Minimums, scheduling fees, etc. will not be paid; TxDOT will consider paying cancellation fees on a case by case basis.

All law enforcement personnel used in work zone traffic control must be trained for performing duties in work zones and are required to take "Safe and Effective Use of Law Enforcement Personnel in Work Zones" (Course #133119) which can be found online at the following site: www.nhi.fhwa.dot.gov.

Certificates of completion should be available to all who finish the course. These should be kept by the officers to verify completion when reporting to the work site.

Provide the Engineer 72-hour notice of lane or ramp closures to provide advance notice to the traveling public by way of media and for any dynamic message sign programing. Place Portable Changeable Message Signs (PCMS) at locations as directed a minimum of 3 days in advance of entrance ramp closures on the affected crossroad. These signs are to remain in place during the ramp closures.

Place reduced regulatory speed zones signs (R2-1)(48x60)/G20-5aP(36x24) on ground-mounted sign supports with two (2) posts at one-mile intervals.

Place reduced regulatory speed zone signs one week prior to beginning work for each current work zone area. Once all work is complete, move the work zone speed limit signs to flow with the work zones throughout the project limits. At the end of each workday place a cover over the reduced regulatory speed zone signs and uncover the existing regulatory speed limit signs. Covers for signs will be approved prior to installation.

In areas where concrete barrier wall restricts the use of placing short-term/short duration sign supports, use MBC Coil-Flex Series Median Barrier Clamp produced by Eastern Metal of

Elmira, Inc., 1430 Sullivan Street, Elmira, NY 14901, (800)-USA-SIGN, www.usa-sign.com or approved equal.

All work required by these general notes, except as provided for by Item 502, will not be paid for directly, but will be subsidiary to Item 502 unless otherwise shown on the plans.

ITEM 506. TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS

Remove dirt, silt, rocks, debris, and other foreign matter that accumulates in all structures due to project erosion and Contractor's operations. Keep stream channels open at all times. This work will not be paid for directly, but will be subsidiary to this Item.

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

Provide the following Items for the SWP3 for this Contract as directed on a force account basis:

Temporary sediment control fence, seeding for erosion control, earthwork for erosion control, and vegetative watering.

The total disturbed area for this project is 7.97 acres. The disturbed area in this project, all project locations in the Contract, and Contractor project specific locations (PSLs) within 1 mile of the project limits for the Contract, will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. Obtain any required authorization from the TCEQ for any Contractor PSLs for the construction support activities on or off right of way. When the total area disturbed for all projects in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, before disturbance, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer (to the appropriate MS4 operator when on an off-State system route).

The Engineer will provide copies of documents to meet TxDOT's posting requirements. Laminate, post, and maintain these documents at the project limits and at major roadways intersecting the project as directed. Post required Contractor documents in the same manner and location. This work will be subsidiary to Item 506.

Project Number: **Sheet 13F**

County: Smith **Control:** 0495-04-076, Etc.

Highway: IH 20

ITEM 533. MILLED RUMBLE STRIPS

Rumble strip placement will be Option 2 for the outside shoulder and will be Option 3 for the inside shoulders in accordance with RS(1)-13.

Provide one-lane two-way traffic control on two-lane roadways unless otherwise approved.

Provide traffic control for roadways with other lane configurations as directed.

Provide a sweeper that meets the requirements of Section 354.2.3.

ITEM 585. RIDE QUALITY FOR PAVEMENT SURFACES

Use Surface Test Type B pay adjustment schedule 3 to evaluate ride quality of the travel lanes in accordance with Item 585, "Ride Quality for Pavement Surfaces."

ITEM 658. DELINEATOR AND OBJECT MARKER ASSEMBLIES

Accept ownership of unsalvageable delineator and object marker assemblies and remove from the right of way.

ITEM 662. WORK ZONE PAVEMENT MARKINGS

Do not use foil backed pavement markings as removable work zone pavement markings. Removable work zone pavement markings must be pliant polymer detour grade (removable) material or other markings that can be obliterated or removed to the satisfaction of the Engineer.

Use tape for short-term removable pavement markings on hot mix & PFC surfacing applications.

Tabs may be used before surface treatment application.

ITEM 666. RETROREFLECTORIZED PAVEMENT MARKINGS

Use the spray method for application of the thermoplastic compound for lane lines, barrier lines, edge lines and channelizing lines.

Do not begin work before 9 P.M. on Sunday. No work before 8 P.M. or after 5 A.M. Monday through Thursday nights unless otherwise approved. In other areas, the Engineer will approve and direct the time of work.

Extrude hot to the pavement surface thermoplastic compound for arrows, stop lines, yield triangles, transverse lines, crosswalk lines, words and symbols.

For lengths greater than 300-ft, provide guide markings that will not leave a permanent mark on the roadway. Have the guide marking material and equipment used for placement approved prior to use. Provide adequate notification for approval of the guide markings prior to placement of the permanent pavement markings.

Provide a crew experienced in the work of installing pilot guideline markings and in the necessary traffic control. Supply all the equipment, personnel, traffic control, and materials necessary for the placement of pilot guideline markings as directed. All work will be in conformance with Part 6 of the TMUTCD.

The Engineer will establish beginning and ending points of no passing zones.

Correct deficiencies in the alignment of pavement markings at Contractor's expense, as directed. Use a strip seal with aggregate and asphalt types and rates as directed to eliminate the deficient pavement markings.

ITEM 672. RAISED PAVEMENT MARKERS

Provide dispensing equipment such that the bituminous material can be directly applied from the melting pot to the pavement surface without secondary handling. Dispensing material from the melting pot into a separate container and then to the pavement surface will not be permitted. Intermittent agitation of the bituminous material will be by a method approved by the Engineer to ensure even heat distribution and must be such that the adhesive is agitated at approved and consistent intervals.

ITEM 3028. FRICTIONAL ASPHALTIC SURFACE PRESERVATION TREATMENT

Place surface treatments between May 1 and August 31 unless otherwise directed.

ITEM 3077. SUPERPAVE MIXTURES

Provide a facility at the asphalt concrete pavement plant for use by the Engineer as a laboratory. This is an existing requirement of Item 6, Article 5, "Plant Inspection and Testing," of the Standard Specifications. Provide a facility meeting the requirements of Item 504. At a minimum meet the requirements of 504.2.2.4, "Ty D Structure (Asphalt Mix Control Laboratory)" and 504.2.2.4.1, "Asphalt Content by Ignition Method." In addition, provide the following: At least one exterior door opening with a 48-in. minimum width. If steps are required to gain access to the facility's 48-in. door, provide a landing dock with minimum dimensions of 60 in. wide by 60 in. deep. The strong floor and landing of the facility should support the weight of all equipment and personnel providing a stable, essentially zero deflection during testing operations, acceptable

Project Number: **Sheet 13G**

County: Smith **Control:** 0495-04-076, Etc.

Highway: IH 20

to the Engineer. This facility will be required of all projects with plant produced asphalt concrete pavement.

No direct payment will be made for Engineer field labs. All construction, maintenance, utilities, custodial services, security, and permits necessary to establish and maintain readiness of this facility is the responsibility of the Contractor. This building/facility is required by the standard specifications and is considered a standard part of any asphalt concrete pavement plant producing materials for Department projects.

Furnish a Superpave Gyratory Compactor calibrated in accordance with Tex-241-F for molding production samples. The Superpave Gyratory Compactor will not be paid for directly, but will be subsidiary to the asphalt concrete pavement Items of work.

When using crushed gravel as a coarse aggregate for ACP, use 1% lime as an antistripping agent.

Provide coarse aggregate for the final surface course from the same source or blended sources unless otherwise directed.

Give the State inspector at the spreading and finishing machine one weight ticket for each load of material. When directed, weigh asphaltic concrete loads on public scales to ensure the proper weight of material.

For materials paid for by the ton, provide a summary spreadsheet in accordance with Article 520.2, "Equipment."

Provide Class A coarse aggregate for the surface as listed in the Department's *Bituminous Rated Source Quality Catalog* (BRSQC).

Use an electrical impedance (non-nuclear) measurement gauge to determine mat segregation and joint density for Part V and Part VIII of test procedure Tex-207-F. Do not use nuclear density gauges or thin lift gauges for segregation or joint density determinations. Data reporting for mat segregation and joint density must be performed on Department templates.

All RAP used on this project must be fractionated. If an existing mix design is submitted for use as Warm Mix Asphalt (WMA), then a new trial batch with passing Hamburg Wheel test results is required.

Apply a tack coat with a rate of 0.10 gal/sy of residual asphalt between each layer of ACP pavement unless otherwise directed.

On Table 1, under 3077.2.1.3, the Sand equivalent, % Min is voided and not replaced. The minimum percent for the sand equivalent must be 45 for the combined aggregate.

ITEM 6001. PORTABLE CHANGEABLE MESSAGE SIGN

Provide 3 electronic Portable Changeable Message Sign (PCMS) units adjacent to the mainlanes in advance of each lane closure. PCMS units must be in accordance with Section 6F.60 of the TMUTCD, applicable standards and special provisions. Depending on conditions, one or all message boards may have to be relocated during operations. Messages will be in accordance with current BC standards. When not in use, remove PCMS units from the right of way. Measurement and payment for the PCMS noted above will be in accordance with Item 6001. The term “operational” is defined as displaying a message in direct support of current project operations as approved and directed by the Engineer.

Provide a non-erodible, stable surface to place the Portable Changeable Message Sign (PCMS) units adjacent to the roadway as directed. Payment for this surface is incidental to Item 6001.

ITEM 6185. TRUCK MOUNTED ATTENUATOR (TMA)

Shadow vehicles with truck mounted attenuator (TMA) are required on the traffic control plan and TCP standards for this project. The Contractor will be responsible for determining if one or more of these traffic control operations will be ongoing at the same time to determine the total number of TMAs needed for the project. Additional truck mounted attenuators (TMAs) may be required as deemed necessary by the Engineer.

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 2 additional shadow vehicles with TMA for TCP (6 - 1)-12 (MOD) thru TCP (6 - 3)-12 (MOD) as detailed on General Note 4 of this standard sheet. Therefore, three (3) total shadow vehicles with TMA will be required for this type of work. The Contractor will be responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

CONTROLLING PROJECT ID 0495-04-076 **DISTRICT** Tyler **COUNTY** Smith
HIGHWAY IH 20

				0495-04-076		0495-04-077		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB							
		PROJECT ID							
		COUNTY		**Smith**		**Smith**			
		HIGHWAY		**IH 20**		**IH 20**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL		
	134-6001	BACKFILL (TY A)	STA	217.000		151.000		368.000	
	134-6006	BACKFILL (TY A)	LF	6,857.000		12,892.000		19,749.000	
	164-6001	BROADCAST SEED (PERM) (RURAL) (SANDY)	SY	20,812.000		14,996.000		35,808.000	
	164-6054	BOND FBR MTRX SEED (PERM)(RURAL)(SAND)	SY	41,625.000		29,992.000		71,617.000	
	164-6055	BONDED FBR MTRX SEED (TEMP)(WARM)	SY	20,812.000		14,996.000		35,808.000	
	164-6056	BONDED FBR MTRX SEED (TEMP)(COOL)	SY	20,812.000		14,996.000		35,808.000	
	168-6001	VEGETATIVE WATERING	MG	1,145.000		825.000		1,970.000	
	348-6001	TBPFC (MEMBRANE)	GAL	28,291.000		29,206.000		57,497.000	
	348-6002	TBPFC (ASPHALT)(PG 76-22)	TON	392.000		404.000		796.000	
	348-6012	TBPFC (AGGREGATE) (SAC-A)	TON	6,137.000		6,335.000		12,472.000	
	351-6002	FLEXIBLE PAVEMENT STRUCTURE REPAIR(6")	SY	1,200.000		10,000.000		11,200.000	
	351-6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	SY			10,000.000		10,000.000	
	354-6041	PLANE ASPH CONC PAV (1.5")	SY	738.000		738.000		1,476.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	8,868.000		8,868.000		17,736.000	
	354-6051	PLANE ASPH CONC PAV (0" TO 1 1/2")	SY	14,684.000		13,749.000		28,433.000	
	438-6002	CLEANING AND SEALING EXIST JOINTS(CL3)	LF	258.000		258.000		516.000	
	500-6001	MOBILIZATION	LS	1.000				1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	6.000				6.000	
	533-6001	RUMBLE STRIPS (SHOULDER)	LF	44,348.000		44,730.000		89,078.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	376.000		335.000		711.000	
	662-6112	WK ZN PAV MRK SHT TERM RMV (W)(4")	LF	8,380.000		8,420.000		16,800.000	
	662-6113	WK ZN PAV MRK SHT TERM RMV (Y)(4")	LF	8,912.000		6,309.000		15,221.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	3,760.000		3,350.000		7,110.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	58.000		92.000		150.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	4,907.000		6,050.000		10,957.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	6,222.000		6,227.000		12,449.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	25,467.000		24,909.000		50,376.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	14,721.000		3,130.000		17,851.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	24,887.000		24,909.000		49,796.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA			1.000		1.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)	EA			1.000		1.000	
	672-6006	REFL PAV MRKR TY I-A	EA	54.000				54.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	50.000				50.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	530.000		479.000		1,009.000	
	3002-6001	MEMBRANE UNDERSEAL	GAL	4,792.000		3,539.000		8,331.000	
	3028-6002	FRICTIONAL ASPH SURF PRESERV TRTMT	SY	17,999.000		18,190.000		36,189.000	
	3077-6022	SP MIXESSP-CSAC-A PG70-22	TON	975.000		975.000		1,950.000	

ESTIMATE AND QUANTITY SHEET

DISTRICT	COUNTY	CCSJ	SHEET
Tyler	Smith	0495-04-076	14

CONTROLLING PROJECT ID 0495-04-076 **DISTRICT** Tyler **COUNTY** Smith
HIGHWAY IH 20

			CONTROL SECTION JOB		**0495-04-076**		**0495-04-077**		TOTAL EST.	TOTAL FINAL
			PROJECT ID							
			COUNTY		**Smith**		**Smith**			
			HIGHWAY		**IH 20**		**IH 20**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL		
	3077-6052	SP MIXESSP-DSAC-A PG70-22		TON	1,245.000		728.000		1,973.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN		DAY	3.000		2.000		5.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN		EA	7.000		7.000		14.000	
	6185-6002	TMA (STATIONARY)		DAY	50.000		47.000		97.000	
	6185-6005	TMA (MOBILE OPERATION)		DAY	15.000		15.000		30.000	
	08	LAW ENFORCEMENT		LS	1.000				1.000	
		SAFETY CONTINGENCY (NON-PART)		LS	1.000				1.000	
		EROSION CONTROL MAINTENANCE (NON-PART)		LS	1.000				1.000	

ESTIMATE AND QUANTITY SHEET

DISTRICT	COUNTY	CCSJ	SHEET
Tyler	Smith	0495-04-076	14A

CK:
DW:
CK:
DN:

BASIS OF ESTIMATE

	ITEM	DESCRIPTION	RATE	CSJ 0495-04-076 AMOUNT	CSJ 0495-04-077 AMOUNT	UNIT	CSJ 0495-04-076 QUANTITY	CSJ 0495-04-077 QUANTITY	PROJECT TOTAL	PAY UNIT
[1]	166	FERTILIZER	1 LB/9 SY	104,061	74,980	SY	5.78	4.17	9.95	TON
	168	VEGETATIVE WATERING	11 GAL/SY	104,061	74,980	SY	1145	825	1,970	MG
[2]	314	EMULS ASPH (EROSN CONT)(CSS-1)	0.15 GAL/SY	41,625	19,202	SY	6244	2880	9,124	GAL
[3]	3028	FRICTIONAL ASPH SURF PRESERV TRTMT (FIRST PASS)	2.5 LB/SY	17,999	18,190	SY	44	46	90	TON
[3]	3028	FRICTIONAL ASPH SURF PRESERV TRTMT (SECOND PASS)	2.5 LB/SY	17,999	18,190	SY				
	3077	SP MIXES SP-D SAC-A PG70-22 (1.5 IN)	165 LB/SY	15,090	8,826	SY	1,245	728	1,973	TON
	3077	SP MIXES SP-C SAC-A PG70-22 (2 IN)	220 LB/SY	8,868	8,868	SY	975	975	1,950	TON
	3002	MEMBRANE UNDERSEAL	0.2 GAL/SY	23,958	17,694	SY	4792	3539	8,331	GAL
	348	TBPFC (MEMBRANE)	0.325 GAL/SY	87,049	89,864	SY	28291	29206	57,497	GAL
	348	TBPFC (ASPHALT) (PG 76-22)	9 LB/SY	87,049	89,864	SY	392	404	796	TON
	348	TBPFC (AGGREGATE) (SAC-A)	141 LB/SY	87,049	89,864	SY	6137	6335	12,472	TON
	500	MOBILIZATION							1	LS
	502	BARRICADES, SIGNS AND TRAFFIC HANDLING					3	3	6	MO

[1] CONTRACTOR INFORMATION ONLY. SUBSIDIARY TO ITEM 164.
[2] CONTRACTOR INFORMATION ONLY. SUBSIDIARY TO ITEM 134.
[3] CONTRACTOR INFORMATION ONLY.

FLEXIBLE BASE REPAIR SUMMARY

LOCATION		ITEM 351	
FROM	TO	[1] FLEX PAV STR REPAIR (6")	[1] FLEX PAV STR REPAIR (4")
STA	STA	SY	SY
CSJ 0495-04-076 (WBL)			
1+13	250+00	1,200	
CSJ 0495-04-077 (EBL)			
1+13	250+22	10,000	10,000
CSJ 0495-04-077 (WBL) SUB TOTAL		1,200	
CSJ 0495-04-077 (EBL) SUB TOTAL		10,000	10,000
PROJECT TOTAL		11,200	10,000

[1] USE AS DIRECTED.

PORTABLE CHANGEABLE MESSAGE SIGN SUMMARY

SIGN	LOCATION	ITEM 6001	
		PORTABLE CHANGEABLE MESSAGE SIGN	PORTABLE CHANGEABLE MESSAGE SIGN
		EA	DAYS
CSJ 0495-04-076 (WBL)			
IH 20	TCP SETUP	3	
CROSS ROADS	TO BE LOCATED AS DIRECTED	4	3
CSJ 0495-04-077 (EBL)			
IH 20	TCP SETUP	3	
CR 246	TO BE LOCATED AS DIRECTED	2	1
SH 110	TO BE LOCATED AS DIRECTED	2	1
CSJ 0495-04-076 (WBL) SUB TOTAL		7	3
CSJ 0495-04-077 (EBL) SUB TOTAL		7	2
PROJECT TOTAL		14	5

TRUCK MOUNTED ATTENUATOR SUMMARY

WORK PHASE	NUMBER OF TRUCKS	ITEM 6185	
		TMA (STATIONARY)	TMA (MOBILE)
		DAYS	DAYS
CSJ 0495-04-076 (WBL)	1	50	15
CSJ 0495-04-077 (EBL)	1	47	15
CSJ 0495-04-076 (WBL) SUB TOTAL		50	15
CSJ 0495-04-077 (EBL) SUB TOTAL		47	15
PROJECT TOTAL		97	30

IH 20 (WBL & EBL) QUANTITY SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		15

DATE: 11/22/2021 4:32:45 PM
FILE: c:\txdot\pw_online\txdot3\mark.driskell\d0432361\IH20_COMB_GEN_SUM.dgn

PLANING SUMMARY (1 OF 2)

LOCATION		LENGTH	ITEM 354						REMARKS
FROM	TO		PLANE ASPH CONC PAV 0" TO 1.5"		PLANE ASPH CONC PAV 1.5"		PLANE ASPH CONC PAV 2"		
STA	STA	FT	WIDTH (FT)	SY	WIDTH (FT)	SY	WIDTH (FT)	SY	
CSJ 0495-04-076 (WBL)									
1+13	2+63	150	38	633					MAIN LANES / SHLDR
20+00	21+50	150	18	300					CR 426 ENTRANCE RAMP
17+80	21+50	370	12	493					CR 426 ENTRANCE RAMP / GORE (SEE MISC DETAILS)
25+00	26+50	150	38	633					MAIN LANES / SHLDR (UNDER CR 426 BRIDGE)
26+50	33+50	700					38	2,956	MAIN LANES / SHLDR (UNDER CR 426 BRIDGE)
33+50	35+00	150	38	633					MAIN LANES / SHLDR (UNDER CR 426 BRIDGE)
41+25	43+20	195	10	217					CR 426 EXIT RAMP / GORE (SEE MISC DETAILS)
41+25	42+75	150	24	400					CR 426 EXIT RAMP
81+98	83+48	150	38	633					CANEY CREEK BRIDGE
83+48	85+14	166			40	738			CANEY CREEK BRIDGE
85+14	86+64	150	38	633					CANEY CREEK BRIDGE
106+71	108+21	150	22	367					WEIGH-STATION ENTRANCE RAMP
104+35	108+21	386	7	300					WEIGH-STATION ENTRANCE (GORE)
121+00	124+15	315	10	350					WEIGH-STATION EXIT (GORE)
121+00	122+50	150	22	367					WEIGH-STATION EXIT RAMP
128+00	129+50	150	38	633					MAIN LANES / SHLDR (UNDER CR 424 BRIDGE)
129+50	136+50	700					38	2,956	MAIN LANES / SHLDR (UNDER CR 424 BRIDGE)
136+50	138+00	150	38	633					MAIN LANES / SHLDR (UNDER CR 424 BRIDGE)
219+50	221+00	150	22	367					SH 110 ENTRANCE RAMP
218+50	221+00	250	11	306					SH 110 ENTRANCE RAMP (GORE)
224+25	225+75	150	38	633					MAIN LANES / SHLDR (UNDER SH 110 BRIDGE)
225+75	232+75	700					38	2,956	MAIN LANES / SHLDR (UNDER SH 110 BRIDGE)
232+75	234+25	150	38	633					MAIN LANES / SHLDR (UNDER SH 110 BRIDGE)
242+62	246+00	338	13	488					SH 110 EXIT RAMP (GORE)
242+62	244+12	150	22	367					SH 110 EXIT RAMP
248+50	250+00	150	38	633					MAIN LANES / SHLDR (END PROJECT)
CR 426 RAMPS / FRONTAGE ROADS									
1000+00	1027+12	150	22	367					CR 426 ENTRANCE RAMP / FRONTAGE ROAD @ YIELD SIGN
CR 426 RAMPS		150	50	833					CR 426 ENTRANCE RAMP / FRONTAGE ROAD @ STOP SIGN
CR 426 RAMPS		150	50	833					CR 426 EXIT RAMP / FRONTAGE ROAD @ STOP SIGN
CR 426 RAMPS		150	20	333					CR 426 EXIT RAMP / FRONTAGE ROAD @ YIELD SIGN
SH 110 RAMPS / FRONTAGE ROADS									
2000+00	2021+95	150	50	833					SH 110 RAMPS / FRONTAGE @ STOP SIGN
SH 110 RAMPS		150	50	833					SH 110 RAMPS / FRONTAGE @ STOP SIGN
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL				**14,684**		**738**		**8,868**	

IH 20
(WBL & EBL)
QUANTITY
SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		16

PLANING SUMMARY (2 OF 2)

LOCATION		LENGTH	ITEM 354						REMARKS
FROM	TO		PLANE ASPH CONC PAV 0" TO 1.5"		PLANE ASPH CONC PAV 1.5"		PLANE ASPH CONC PAV 2"		
STA	STA	FT	WIDTH (FT)	SY	WIDTH (FT)	SY	WIDTH (FT)	SY	
CSJ 0495-04-077 (EBL)									
1+13	2+63	150	38	633					MAIN LANES / SHLDR (BEGIN PROJECT)
22+27	23+77	150	18	300					CR 426 EXIT RAMP
20+68	23+77	309	14 AVG	481					CR 426 EXIT RAMP / GORE (SEE MISC DETAILS)
24+91	26+41	150	38	633					MAIN LANES / SHLDR (UNDER CR 426 BRIDGE)
26+41	33+41	700					38	2,956	MAIN LANES / SHLDR (UNDER CR 426 BRIDGE)
33+41	34+91	150	38	633					MAIN LANES / SHLDR (UNDER CR 426 BRIDGE)
37+59	40+84	325	12 AVG	433					CR 426 ENTRANCE RAMP / GORE (SEE MISC DETAILS)
37+59	39+09	150	24	400					CR 426 ENTRANCE RAMP
81+81	83+31	150	38	633					CANEY CREEK BRIDGE
83+31	84+97	166			40	738			CANEY CREEK BRIDGE
84+97	86+47	150	38	633					CANEY CREEK BRIDGE
100+43	101+93	150	22	367					WEIGH-STATION EXIT RAMP
98+64	101+93	329	13 AVG	475					WEIGH-STATION EXIT (GORE)
114+53	118+29	376	13 AVG	543					WEIGH-STATION ENTRANCE (GORE)
114+53	116+03	150	22	367					WEIGH-STATION ENTRANCE RAMP
127+81	129+31	150	38	633					MAIN LANES / SHLDR (UNDER CR 424 BRIDGE)
129+31	136+31	700					38	2,956	MAIN LANES / SHLDR (UNDER CR 424 BRIDGE)
136+31	137+81	150	38	633					MAIN LANES / SHLDR (UNDER CR 424 BRIDGE)
219+79	221+29	150	22	367					SH 110 EXIT RAMP
218+34	221+29	295	16 AVG	524					SH 110 EXIT RAMP (GORE)
224+47	225+97	150	38	633					MAIN LANES / SHLDR (UNDER SH 110 BRIDGE)
225+97	232+97	700					38	2,956	MAIN LANES / SHLDR (UNDER SH 110 BRIDGE)
232+97	234+47	150	38	633					MAIN LANES / SHLDR (UNDER SH 110 BRIDGE)
239+29	242+15	286	13	413					SH 110 ENTRANCE RAMP (GORE)
239+29	240+79	150	22	367					SH 110 ENTRANCE RAMP
248+72	250+22	150	38	633					MAIN LANES / SHLDR (END PROJECT)
CR 426 RAMP A3		150	32 AVG	533					CR 426 EXIT RAMP
CR 426 RAMP A4		150	38 AVG	633					CR 426 ENTRANCE RAMP
SH 110 RAMP B3		150	38 AVG	633					SH 110 EXIT RAMP
SH 110 RAMP B4		150	35 AVG	583					SH 110 ENTRANCE RAMP
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL				**14,684**		**738**		**8,868**	
CSJ 0495-04-077 (EBL) (2 OF 2) SUB TOTAL				**13,749**		**738**		**8,868**	
PROJECT TOTAL				**28,433**		**1,476**		**17,736**	

IH 20
(WBL & EBL)
QUANTITY
SUMMARY

Texas Department of Transportation

SHEET 3 OF 9

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		17

TABULATION OF SURFACE AREAS SUMMARY (1 OF 2)

LOCATION						ITEM 348		ITEM 3002	ITEM 3028	ITEM 3077		REMARKS
FROM	TO	LENGTH	PROPOSED SUPERPAVE WIDTH	PROPOSED OYNX SHOULDER WIDTH	PROPOSED PFC WIDTH	[1] THIN BONDED PERMEABLE FRICTION COURSE 1.5"	[1] THIN BONDED PERMEABLE FRICTION COURSE (MEMBRANE)	[1] MEMBRANE UNDERSEAL	[2] FRICTIONAL ASPH SURF PRESERV TRTMT	[1] SP MIXES SP-D SAC-A PG70-22 1.5"	[1] SP MIXES SP-C SAC-A PG70-22 2"	
STA	STA	FT	FT	FT	FT	SY	SY	SY	SY	SY	SY	
CSJ 0495-04-076 (WBL)												
1+13	11+50	1,037		8	30	3,457	3,457		922			MAIN LANES / SHLDR
11+50	21+50	1,000			27	3,000	3,000					MAIN LANES / SHLDR @ CR 426 ENTRANCE RAMP
10+00	21+50	1,150			20	2,556	2,556					CR 426 ENTRANCE RAMP
17+80	21+50	370		12 AVG					493			CR 426 ENTRANCE RAMP (GORE)
21+50	26+50	500		8	30	1,667	1,667		444			MAIN LANES / SHLDR
26+50	33+50	700	38					2,956			2,956	MAIN LANES / SHLDR (UNDER CR 426 BRIDGE)
33+50	41+25	775		8	30	2,583	2,583		689			MAIN LANES / SHLDR
41+25	43+20	195		8 AVG					173			CR 426 EXIT RAMP (GORE)
41+25	45+50	425			24	1,133	1,133					CR 426 EXIT RAMP
41+25	45+50	425			27	1,275	1,275					MAIN LANES / SHLDR @ CR 426 EXIT RAMP
45+50	81+98	3,648		8	30	12,160	12,160		3,243			MAIN LANES / SHLDR
81+98	83+48	150			38	633	633					MAIN LANES / SHLDR
83+48	85+14	166			40	738	738					CANEY CREEK BRIDGE
85+14	86+64	150			38	633	633					MAIN LANES / SHLDR
86+64	99+00	1,236		8	30	4,120	4,120		1,099			MAIN LANES / SHLDR
99+00	108+21	921			24	2,456	2,456					WEIGH-STATION ENTRANCE RAMP
104+35	108+21	386		8 AVG					343			WEIGH-STATION ENTRANCE RAMP (GORE)
99+00	108+21	921			27	2,763	2,763					MAIN LANES / SHLDR @ WEIGH-STATION ENTRANCE RAMP
108+21	121+00	1,279		8	30	4,263	4,263		1,137			MAIN LANES / SHLDR
121+00	124+15	315		10 AVG					350			WEIGH-STATION EXIT RAMP (GORE)
121+00	127+00	600			28	1,867	1,867					WEIGH-STATION EXIT RAMP
121+00	127+00	600			27	1,800	1,800					MAIN LANES / SHLDR @ WEIGH-STATION EXIT RAMP
127+00	129+50	250		8	30	833	833		222			MAIN LANES / SHLDR
129+50	136+50	700	38					2,956			2,956	MAIN LANES / SHLDR (UNDER CR 424 BRIDGE)
136+50	211+50	7,500		8	30	25,000	25,000		6,667			MAIN LANES / SHLDR
211+50	221+00	950			24	2,533	2,533					SH 110 ENTRANCE RAMP
218+50	221+00	250		11 AVG					306			SH 110 ENTRANCE RAMP (GORE)
211+50	221+00	950			27	2,850	2,850					MAIN LANES / SHLDR @ SH 110 ENTRANCE RAMP
221+00	225+75	475		8	30	1,583	1,583		422			MAIN LANES / SHLDR
225+75	232+75	700	38					2,956			2,956	MAIN LANES / SHLDR (UNDER SH 110 BRIDGE)
232+75	242+62	987		8	30	3,290	3,290		877			MAIN LANES / SHLDR
242+62	246+00	338		13 AVG					488			SH 110 EXIT RAMP (GORE)
242+62	248+60	598			24	1,595	1,595					SH 110 EXIT RAMP
242+62	248+60	598			27	1,794	1,794					MAIN LANES / SHLDR @ SH 110 EXIT RAMP
248+60	250+00	140		8	30	467	467		124			MAIN LANES / SHLDR (END PROJECT)
CR 426 RAMPS												
1000+00	1027+12	2,712	28 AVG					8,437		8,437		CR 426 RAMPS
CR 426 FRONTAGE ROADS		300	24					800		800		CR 426 FRONTAGE ROAD
SH 110 RAMPS / FRONTAGE ROADS												
2000+00	2021+95	2,195	24					5,853		5,853		SH 110 RAMPS / FRONTAGE ROADS
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL						**87,049**	**87,049**	**23,958**	**17,999**	**15,090**	**8,868**	

[1] QUANTITIES INCLUDED IN BASIS OF ESTIMATE.
[2] ITEM 3028 IS PAID BY THE SURFACE (SY) AS SHOWN.
PLACE ITEM 3028 TO THE RATE SHOWN IN THE BASIS OF ESTIMATE. THIS IS FOR CONTRACTOR INFORMATION ONLY.
ITEM 3028 TO BE PLACED ON THE OUTSIDE SHOULDERS AND GORE AREAS GREATER THAN 8' IN WIDTH.

IH 20
(WBL & EBL)
QUANTITY
SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		18

CK:
DW:
CK:
DN:

TABULATION OF SURFACE AREAS SUMMARY (2 OF 2)

LOCATION						ITEM 348		ITEM 3002	ITEM 3028	ITEM 3077		REMARKS
FROM	TO	LENGTH	PROPOSED SUPERPAVE WIDTH	PROPOSED OYNX SHOULDER WIDTH	PROPOSED PFC WIDTH	[1] THIN BONDED PERMEABLE FRICTION COURSE 1.5"	[1] THIN BONDED PERMEABLE FRICTION COURSE (MEMBRANE)	[1] MEMBRANE UNDERSEAL	[2] FRICTIONAL ASPH SURF PRESERV TRTMT	[1] SP MIXES SP-D SAC-A PG70-22 1.5"	[1] SP MIXES SP-C SAC-A PG70-22 2"	
STA	STA	FT	FT	FT	FT	SY	SY	SY	SY	SY	SY	
CSJ 0495-04-077 (EBL)												
1+13	17+00	1,587		8	30	5,290	5,290		1,411			MAIN LANES / SHLDR (BEGIN PROJECT)
17+00	23+77	677			27	2,031	2,031					MAIN LANES / SHLDR @ CR 426 EXIT RAMP
10+00	23+77	1,377			20	3,060	3,060					CR 426 EXIT RAMP
20+68	23+77	309		14 AVG					481			CR 426 EXIT RAMP (GORE)
23+77	26+41	264		8	30	880	880		235			MAIN LANES / SHLDR
26+41	33+41	700	38					2,956			2,956	MAIN LANES / SHLDR (UNDER CR 426 BRIDGE)
33+41	37+59	418		8	30	1,393	1,393		372			MAIN LANES / SHLDR
37+59	40+84	325		12 AVG					433			CR 426 ENTRANCE RAMP (GORE)
37+59	47+50	991			24	2,643	2,643					CR 426 ENTRANCE RAMP
37+59	47+50	991			27	2,973	2,973					MAIN LANES / SHLDR @ CR 426 ENTRANCE RAMP
47+50	81+81	3,431		8	30	11,437	11,437		3,050			MAIN LANES / SHLDR
81+81	83+31	150			38	633	633					CANEY CREEK BRIDGE
83+31	84+97	166			40	738	738					CANEY CREEK BRIDGE
84+97	86+47	150			38	633	633					CANEY CREEK BRIDGE
86+47	96+00	953		8	30	3,177	3,177		847			MAIN LANES / SHLDR
96+00	101+93	593			24	1,581	1,581					WEIGH-STATION EXIT RAMP
98+64	101+93	329		13 AVG					475			WEIGH-STATION EXIT RAMP (GORE)
96+00	101+93	593			27	1,779	1,779					MAIN LANES / SHLDR @ WEIGH-STATION EXIT RAMP
101+93	114+53	1,260		8	30	4,200	4,200		1,120			MAIN LANES / SHLDR
114+53	118+29	376		13 AVG					543			WEIGHT-STATION ENTRANCE RAMP (GORE)
114+53	126+00	1,147			28	3,568	3,568					WEIGHT- STATION ENTRANCE RAMP
114+53	126+00	1,147			27	3,441	3,441					MAIN LANES / SHLDR @ WEIGH-STATION ENTRANCE RAMP
126+00	129+31	331		8	30	1,103	1,103		294			MAIN LANES / SHLDR
129+31	136+31	700	38					2,956			2,956	MAIN LANES / SHLDR (UNDER CR 424 BRIDGE)
136+31	214+00	7,769		8	30	25,897	25,897		6,906			MAIN LANES / SHLDR
214+00	221+29	729			24	1,944	1,944					SH 110 EXIT RAMP
218+34	221+29	295		16 AVG					524			SH 110 EXIT RAMP (GORE)
214+00	221+29	729			27	2,187	2,187					MAIN LANES / SHLDR @ SH 110 EXIT RAMP
221+29	225+97	468		8	30	1,560	1,560		416			MAIN LANES / SHLDR
225+97	232+97	700	38					2,956			2,956	MAIN LANES / SHLDR (UNDER SH 110 BRIDGE)
232+97	239+29	632		8	30	2,107	2,107		562			MAIN LANES / SHLDR
239+29	242+15	286		13 AVG					413			SH 110 ENTRANCE RAMP (GORE)
239+29	249+00	971			24	2,589	2,589					SH 110 ENTRANCE RAMP
239+29	248+00	871			27	2,613	2,613					MAIN LANES / SHLDR @ SH 110 ENTRANCE RAMP
249+00	250+22	122		8	30	407	407		108			MAIN LANES / SHLDR (END PROJECT)
CR 426 RAMP A3		772	24 AVG					2,059		2,059		CR 426 EXIT RAMP
CR 426 RAMP A4		730	27 AVG					2,190		2,190		CR 426 ENTRANCE RAMP
SH 110 RAMP B3		945	22 AVG					2,310		2,310		SH 110 EXIT RAMP
SH 110 RAMP B4		850	24 AVG					2,267		2,267		SH 110 ENTRANCE RAMP
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL						**87,049**	**87,049**	**23,958**	**17,999**	**15,090**	**8,868**	
CSJ 0495-04-077 (EBL) (2 OF 2) SUB TOTAL						**89,864**	**89,864**	**17,694**	**18,190**	**8,826**	**8,868**	
PROJECT TOTAL						**176,913**	**176,913**	**41,652**	**36,189**	**23,916**	**17,736**	

[1] QUANTITIES INCLUDED IN BASIS OF ESTIMATE.
[2] ITEM 3028 IS PAID BY THE SURFACE (SY) AS SHOWN.
PLACE ITEM 3028 TO THE RATE SHOWN IN THE BASIS OF ESTIMATE. THIS IS FOR CONTRACTOR INFORMATION ONLY.
ITEM 3028 TO BE PLACED ON THE OUTSIDE SHOULDERS AND GORE AREAS GREATER THAN 8' IN WIDTH.

IH 20
(WBL & EBL)
QUANTITY SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		19

DATE: 10/27/2021 11:34:14 AM
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VEGETATION SUMMARY (1 OF 2)

LOCATION		ITEM 164				ITEM 166	ITEM 168
FROM	TO	BONDED FBR MTRX SEED (PERM) (RURAL) (SAND)	BONDED FBR MTRX SEED (TEMP)(WARM)	BONDED FBR MTRX SEED (TEMP)(COOL)	BROADCAST SEED (PERM) (RURAL) (SANDY)	[1] FERTILIZER	[1] VEGETATIVE WATERING
STA	STA	SY	SY	SY	SY	SY	SY
CSJ 0495-04-076 (WBL)							
1+13	30+50	5,221	2,611	2,611	2,611	13,054	13,054
30+50	41+25	478	239	239	239	1,195	1,195
46+00	83+48	1,667	833	833	833	4,166	4,166
85+14	223+70	24,633	12,316	12,316	12,316	61,581	61,581
223+70	242+62	841	420	420	420	2,101	2,101
248+60	250+00	62	31	31	31	155	155
CR 426 RAMPS / FRONTAGE ROAD		4,821	2,411	2,411	2,411	12,054	12,054
SH 110 RAMPS / FRONTAGE ROADS		3,902	1,951	1,951	1,951	9,755	9,755
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL		**41,625**	**20,812**	**20,812**	**20,812**	**104,061**	**104,061**

[1] INFORMATION ONLY, INCLUDED IN BASIS OF ESTIMATE

VEGETATION SUMMARY (2 OF 2)

LOCATION		ITEM 164				ITEM 166	ITEM 168
FROM	TO	BONDED FBR MTRX SEED (PERM) (RURAL) (SAND)	BONDED FBR MTRX SEED (TEMP)(WARM)	BONDED FBR MTRX SEED (TEMP)(COOL)	BROADCAST SEED (PERM) (RURAL) (SANDY)	[1] FERTILIZER	[1] VEGETATIVE WATERING
STA	STA	SY	SY	SY	SY	SY	SY
CSJ 0495-04-077 (EBL)							
1+13	30+50	1,305	653	653	653	3,264	3,264
30+50	83+31	9,388	4,694	4,694	4,694	23,470	23,470
84+97	178+00	4,135	2,067	2,067	2,067	10,336	10,336
178+00	223+70	8,124	4,062	4,062	4,062	20,310	20,310
223+70	250+22	1,179	589	589	589	2,946	2,946
CR 426 RAMPS / FRONTAGE ROAD		2,670	1,335	1,335	1,335	6,675	6,675
SH 110 RAMPS / FRONTAGE ROADS		3,191	1,596	1,596	1,596	7,979	7,979
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL		**41,625**	**20,812**	**20,812**	**20,812**	**104,061**	**104,061**
CSJ 0495-04-077 (EBL) (2 OF 2) SUB TOTAL		**29,992**	**14,996**	**14,996**	**14,996**	**74,980**	**74,980**
PROJECT TOTAL		**71,617**	**35,808**	**35,808**	**35,808**	**179,041**	**179,041**

[1] INFORMATION ONLY, INCLUDED IN BASIS OF ESTIMATE

IH 20
(WBL & EBL)
QUANTITY
SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		20

DATE: 11/22/2021 4:32:46 PM
FILE: c:\txdot\pw_online\txdot3\mark.driskell\d0432361\IH20_COMB_GEN_SUM.dgn

GRADING SUMMARY (1 OF 2)

LOCATION		ITEM 134		ITEM 314
FROM	TO	[1] BACKFILL (TY A)	[1] BACKFILL (TY A)	[2] [3] EMUL ASPH (EROSN CONT) (CSS-1)
STA	STA	STA	LF	SY
CSJ 0495-04-076 (WBL)				
1+13	30+50	29.37		5,221
30+50	41+25		1,075	478
46+00	83+50		3,750	1,667
85+14	223+70	138.56		24,633
223+70	242+62		1,892	841
248+60	250+00		140	62
CR 426 RAMPS / FRONTAGE ROAD		27.12		4,821
SH 110 RAMPS / FRONTAGE ROADS		21.95		3,902
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL		**217.00**	**6,857**	**41,625**

[1] TXDOT WILL PROVIDE RAP MILLINGS FOR BACKFILL TY A.
[2] FOR INFORMATION ONLY.
[3] SEE BASIS OF ESTIMATE FOR RATE.

BRIDGE SUMMARY

LOCATION	ITEM 438
	CLEANING & SEALING EXIST JOINTS (CL3)
	LF
CSJ 0495-04-076 (WBL) CANEY CREEK BRIDGE	
NBI# 10-212-0-0495-04-045 FROM 83+48 TO 85+14	258
CSJ 0495-04-077 (EBL) CANEY CREEK BRIDGE	
NBI# 10-212-0-0495-04-046 FROM 83+31 TO 84+97	258
CSJ 0495-04-076 (WBL) SUB TOTAL	**258**
CSJ 0495-04-077 (EBL) SUB TOTAL	**258**
PROJECT TOTAL	**516**

GRADING SUMMARY (2 OF 2)

LOCATION		ITEM 134		ITEM 314
FROM	TO	[1] BACKFILL (TY A)	[1] BACKFILL (TY A)	[2] [3] EMUL ASPH (EROSN CONT) (CSS-1)
STA	STA	STA	LF	SY
CSJ 0495-04-077 (EBL)				
1+13	29+50		2,837	1,263
30+00	83+48	53.48		4,767
85+14	133+35		4,821	2,149
133+35	165+47		3,212	1,431
165+47	230+00	64.53		5,752
230+00	250+22		2,022	901
CR 426 RAMP A3		7.73		688
CR 426 RAMP A4		7.31		651
SH 110 RAMP B3		9.45		842
SH 110 RAMP B4		8.50		758
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL		**217.00**	**6,857**	**41,625**
CSJ 0495-04-077 (EBL) (2 OF 2) SUB TOTAL		**151.00**	**12,892**	**19,202**
PROJECT TOTAL		**368.00**	**19,749**	**60,827**

[1] TXDOT WILL PROVIDE RAP MILLINGS FOR BACKFILL TY A.
[2] FOR INFORMATION ONLY.
[3] SEE BASIS OF ESTIMATE FOR RATE.

WORK ZONE PAVEMENT MARKINGS SUMMARY

WORK PHASE	ITEM 662		
	WK ZN PAV MRK SHT TERM RMV (W) 4"	WK ZN PAV MRK SHT TERM RMV (Y) 4"	[1] WK ZN PAV MRK SHT TERM TAB TY W
	LF	LF	EA
CSJ 0495-04-076 (WBL)	8,380	8,912	376
CSJ 0495-04-077 (EBL)	8,420	6,309	335
CSJ 0495-04-076 (WBL) SUB TOTAL	**8,380**	**8,912**	**376**
CSJ 0495-04-077 (EBL) SUB TOTAL	**8,420**	**6,309**	**335**
PROJECT TOTAL	**16,800**	**15,221**	**711**

NOTE: MULTIPLE MOVE-INS WILL BE REQUIRED TO MAINTAIN ADEQUATE STRIPING.
[1] WHITE TABS TO BE USED ON GORE AREAS ONLY.

IH 20 (WBL & EBL) QUANTITY SUMMARY

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		21

PERMANENT PAVEMENT MARKINGS SUMMARY (1 OF 2)

LOCATION		ITEM 533	ITEM 666							ITEM 668		ITEM 672			REMARKS
FROM	TO	RUMBLE STRIPS (SHLD)	REFL PAV MRK TY I (W)8" (SLD) (100MIL)	REFL PAV MRK TY I (W)24" (SLD) (100MIL)	RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)	RE PM W/RET REQ TY I (W)6" (BRK) (100MIL)	RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y)6" (SLD) (100MIL)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (DBL ARROW)	REFL PAV MRKR TY II-C-R	REFL PAV MRKR TY I-A	REFL PAV MRKR TY II-A-A	
STA	STA	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	
CSJ 0495-04-076 (WBL)															
IH 20 MAIN LANES						6,222						312			LANE LINE
IH 20 MAIN LANES							24,887		24,887						EDGE LINE
IH 20 MAIN LANES/RAMPS			3,760									188			GORE
1+13	11+50	1,037													LT
21+50	41+25	1,975													LT
46+00	82+98	3,698													LT
1+13	82+98	8,185													RT
85+64	250+00	16,436													RT
85+64	99+00	1,336													LT
108+21	121+00	1,279													LT
128+50	209+50	8,100													LT
221+00	242+62	2,162													LT
248+60	250+00	140													LT
CR 426 ENTR RAMP/FRONTAGE RD (GORE)							380					20			GORE
CR 426 EXIT RAMP/FRONTAGE RD (GORE)							200					10			GORE
CR 426 RAMPS / FRONTAGE ROADS								5,424					8	34	LANE LINE
CR 426 RAMPS / FRONTAGE ROADS					2,712			2,712							EDGE LINE
CR 426 RAMPS / FRONTAGE ROADS				42											STOP
SH 110 RAMPS & FRONTAGE RD								4,390					46	16	LANE LINE
SH 110 RAMPS & FRONTAGE RD					2,195			2,195							EDGE LINE
SH 110 RAMPS & FRONTAGE RD				16											STOP BAR
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL		**44,348**	**3,760**	**58**	**4,907**	**6,222**	**25,467**	**14,721**	**24,887**	**0**	**0**	**530**	**54**	**50**	

NOTE: MULTIPLE MOVE-INS WILL BE REQUIRED TO MAINTAIN ADEQUATE STRIPING.

IH 20
(WBL & EBL)
QUANTITY
SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		22

PERMANENT PAVEMENT MARKINGS SUMMARY (2 OF 2)

LOCATION		ITEM 533	ITEM 666							ITEM 668		ITEM 672			REMARKS
FROM	TO	RUMBLE STRIPS (SHLD)	REFL PAV MRK TY I (W)8" (SLD) (100MIL)	REFL PAV MRK TY I (W)24" (SLD) (100MIL)	RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)	RE PM W/RET REQ TY I (W)6" (BRK) (100MIL)	RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y)6" (SLD) (100MIL)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (DBL ARROW)	REFL PAV MRKR TY II-C-R	REFL PAV MRKR TY I-A	REFL PAV MRKR TY II-A-A	
STA	STA	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	
CSJ 0495-04-076 (EBL)															
IH 20 MAIN LANES						6,227						311			LANE LINE
IH 20 MAIN LANES							24,909		24,909						EDGE LINE
IH 20 MAIN LANES/RAMPS			3,290									165			GORE
1+13	17+00	1,587													RT
26+41	37+60	1,119													RT
46+50	82+81	3,631													RT
1+13	82+81	8,168													LT
85+47	250+22	16,475													LT
85+47	95+50	1,003													RT
102+00	114+50	1,250													RT
118+25	214+50	9,625													RT
221+30	239+30	1,800													RT
249+50	250+22	72													RT
CR 426 RAMPS / FRONTAGE ROADS					3,010			1,430							EDGE LINE
CR 426 RAMPS / FRONTAGE ROADS				42											STOP
SH 110 RAMPS & FRONTAGE RD			60									3			LANE LINE
SH 110 RAMPS & FRONTAGE RD					3,040			1,700		1	1				EDGE LINE
SH 110 RAMPS & FRONTAGE RD				50											STOP BAR
CSJ 0495-04-076 (WBL) (1 OF 2) SUB TOTAL		**44,348**	**3,760**	**58**	**4,907**	**6,222**	**25,467**	**14,721**	**24,887**	**0**	**0**	**530**	**54**	**50**	
CSJ 0495-04-077 (EBL) (2 OF 2) SUB TOTAL		**44,730**	**3,350**	**92**	**6,050**	**6,227**	**24,909**	**3,130**	**24,909**	**1**	**1**	**479**	**0**	**0**	
PROJECT TOTAL		**89,078**	**7,110**	**150**	**10,957**	**12,449**	**50,376**	**17,851**	**49,796**	**1**	**1**	**1,009**	**54**	**50**	

NOTE: MULTIPLE MOVE-INS WILL BE REQUIRED TO MAINTAIN ADEQUATE STRIPING.

IH 20
(WBL & EBL)
QUANTITY
SUMMARY

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		23

CK:
DW:
CK:
DN:

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CK:
DW:
CK:
DN:

CONSTRUCTION SEQUENCE

1. INSTALL PROJECT SIGNS.
2. DURING LANE CLOSURES AND PRIOR TO MILLING OPERATIONS, THE CONTRACTOR SHALL MARK EXISTING BRIDGE JOINT LOCATIONS.
3. PLACE BACKFILL TY "A", AS SHOWN IN THE PLANS.
4. ONCE BACKFILL PAVEMENT EDGES ARE COMPLETED, PLACE PERMANENT SEEDING AND EMULSION PRIOR TO ACP OPERATIONS.
5. PERFORM PAVEMENT REPAIR AT LOCATIONS, AS DIRECTED.
6. PLACE FRICTIONAL ASPHALT PRESERVATION TREATMENT.
7. BEGIN ACP OPERATIONS, AS SHOWN IN THE PLANS. PLANE NO MORE THAN WHAT CAN BE INLAID BY THE END OF EACH NIGHT. WZ REMOVABLE PAVEMENT MARKINGS WILL BE PLACED NIGHTLY.
8. SHOULDER UP WITH APPROVED MATERIAL OR AS DIRECTED EACH NIGHT.
9. PLACE MILLED RUMBLE STRIPS.
10. PLACE PERMANENT PAVEMENT MARKINGS.
11. PERFORM FINAL CLEANUP AND REMOVE PROJECT SIGNS.

NOTES:

THIS PROJECT WILL BE CONSTRUCTED DURING THE NIGHT. ALL WORK OPERATIONS SHALL BE DONE BETWEEN THE HOURS OF 8:00 PM AND 5:00 AM, UNLESS OTHERWISE APPROVED.

DO NOT WORK ON BOTH SIDES OF THE ROAD AT THE SAME TIME.

MILLING OPERATIONS:
DURING NON WORKING HOURS, AND WHEN A LANE CLOSURE IS NOT IN PLACE, NO EDGE DROP OFFS GREATER THAN 2" WILL BE ALLOWED.
TAPER SECTIONS SHALL BE FILLED IN ON THE SAME DAY PERFORMED.

USE APPROVED WZ DRUMS FOR CHANNELIZING DEVICES.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER

Gilbert Arteaga 12/01/2021

IH 20 CONSTRUCTION SEQUENCE

Texas Department of Transportation

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		24

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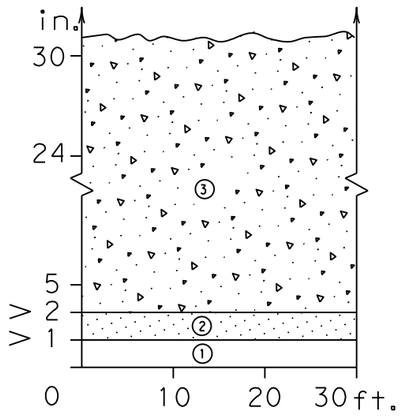
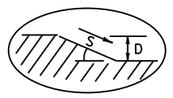
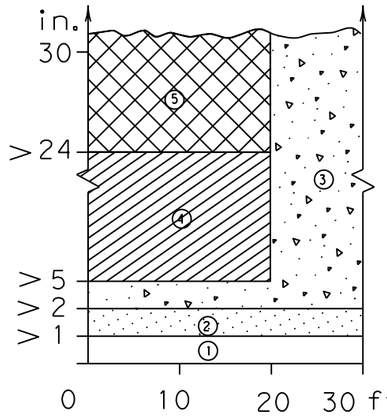
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

Edge Height (D) in Inches versus Lateral Clearance (Y) in Feet

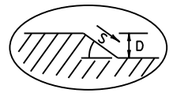


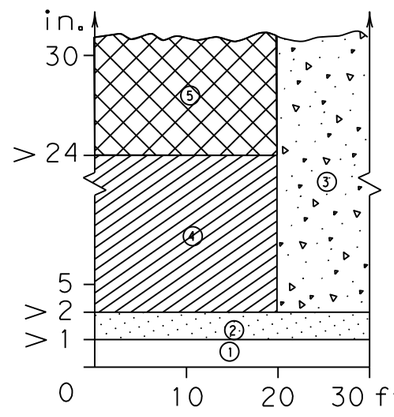
Edge Condition I
S = (3:1) (or flatter)



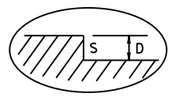


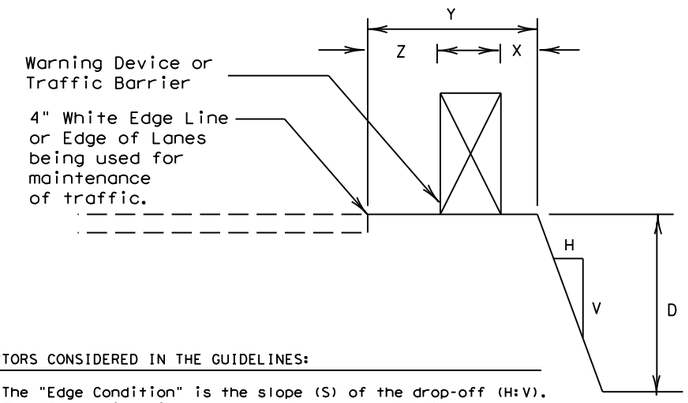
Edge Condition II
S = ((2.99):1) to (1:1)





Edge Condition III
S is steeper than (1:1)





FACTORS CONSIDERED IN THE GUIDELINES:

1. The "Edge Condition" is the slope (S) of the drop-off (H:V). The "Edge Height is the depth of the drop-off "D".

2. Distance "X" is to be the maximum practical under job conditions. Two feet minimum for high speed conditions. Distance "Y" is the lateral clearance from edge of travel lane to edge of dropoff. Distance "Z" does not have a minimum.

3. In addition to the factors considered in the guidelines, each construction zone drop-off situation should be analyzed individually, taking into account other variables, such as: traffic mix, posted speed in the construction zone, horizontal curvature, and the practicality of the treatment options.

4. The conditions for indicating the use of positive or protective barriers are given by Zone-5 and Figure-1. Traffic barriers are primarily applicable for high speed conditions. Urban areas with speeds of 30 mph or less may have a lesser need for signing, delineation, and barriers. Right-angled edges, however, with "D" greater than 2 inches and located within a lateral offset of 6 feet, may indicate a higher level of treatment.

5. If the distance "Y" must be less than 3 feet, the use of a positive barrier may not be feasible. In such a case, consider either: 1) narrowing the lanes to a desired 11 to 12 feet or 10 foot minimum (see CW20-8 sign), or 2) provide an edge slope such as Edge Condition I.

Zone	Treatment Types Guidelines:
①	No treatment.
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a "Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW 8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge fill may be provided to change the edge slope to that of the preferable Edge Condition I.
⑤	Check indications (Figure-1) for positive barrier. Where positive barrier is not indicated, the treatment shown above for Zone- 4 may be used after consideration of other applicable factors.

Edge Condition Notes:

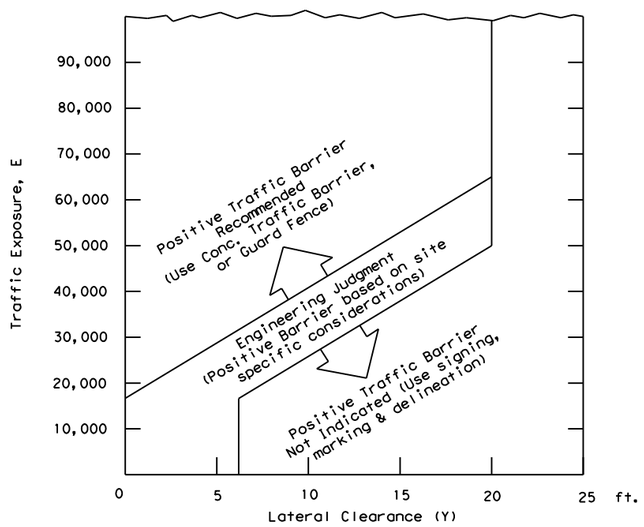
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

2. Edge Condition II: Most vehicles are able to traverse an edge condition with a slope between (2.99 to 1) and (1to 1) so long as "D" does not exceed 5 inches. Under-carriage drag on most automobiles will occur when "D" exceeds 6 inches. As "D" exeeds 24 inches, the possibility for rollover is greater in most vehicles.

3. Edge Condition III: When slopes are greater than (1 to 1) and where "D" is greater than 2 inches, a more difficult control factor may exist for some vehicles, if not properly treated. For example, where "D" is greater than 2 inches and up to 24 inches different types of vehicles may experience different steering control at different edge heights. Automobiles might experience more steering control differential when "D" is greater than 2 inches and up to 5 inches. Trucks, particularly those with high loads, have more steering control differen-tial when "D" is greater than 5 inches and up to 24 inches. When "D" exceeds 24 inches, the possibility of rollover is greater for most vehicles.

4. Milling or overlay operations that result in Edge Condition III should not be in place without appropriate warning treatments, and these conditions should not be left in place for extended periods of time.

FIGURE-1: CONDITIONS INDICATING USE OF POSITIVE BARRIER FOR ZONE 5 (▨)



1 E = ADT x T
Where ADT is that portion of the average daily traffic volume traveling within 20 feet (generally two adjacent lanes) of the edge dropoff condition; and, T is the dura-tion time in years of the dropoff condition.

2 Figure-1 provides a practical approach to the use of positive barriers for the protection of vehicles from pavement drop-offs. Other factors, such as the presence of heavy machinery, construction workers, or the mix and volume of traffic may make the use of positive barriers appropriate, even when the edge condition alone may not justify the use of a barrier.

3 An approved end treatment should be provided for any positive barrier end located within a lateral offset of 20 feet from the edge of the travel lane.

These guidelines apply to temporary traffic control areas or work zones where continuous pavement edges or drop-offs exists parallel and adjacent to a lane used by traffic. The edge conditions may be present between shoulders and travel lanes, between adjacent or opposing travel lanes, or at intermediate points across the width of the paved surface. Due to the variability in construction operations, tolerances in the variables may be allowed by the engineer. These guidelines do not apply to short term operations. These guidelines do not constitute a rigid standard or policy; rather, they are guidance to be used in conjunction with engineering judgement. These guidelines may be updated on the Design Division's on-line manuals.

Engineer's Seal

Date 12/01/2021

Texas Department of Transportation
Traffic Operations Division

TREATMENT FOR VARIOUS EDGE CONDITIONS

© TxDOT August 2000	DN: TXDOT		CK: TXDOT	DW: TXDOT	CK: TXDOT
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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	0495	04	076, ETC	IH 20
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	TYL	SMITH		26
5-10 5-21				

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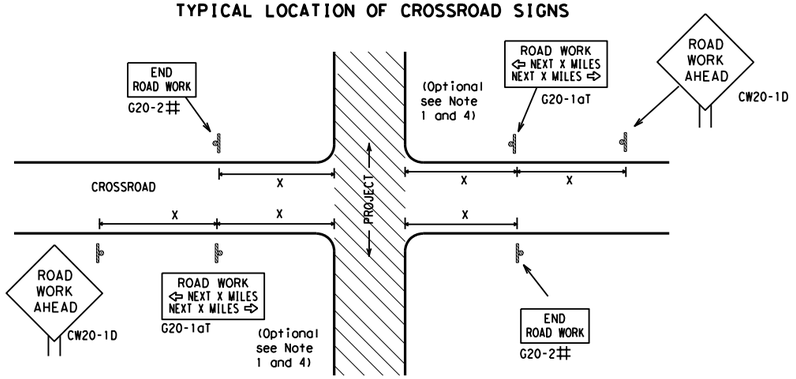
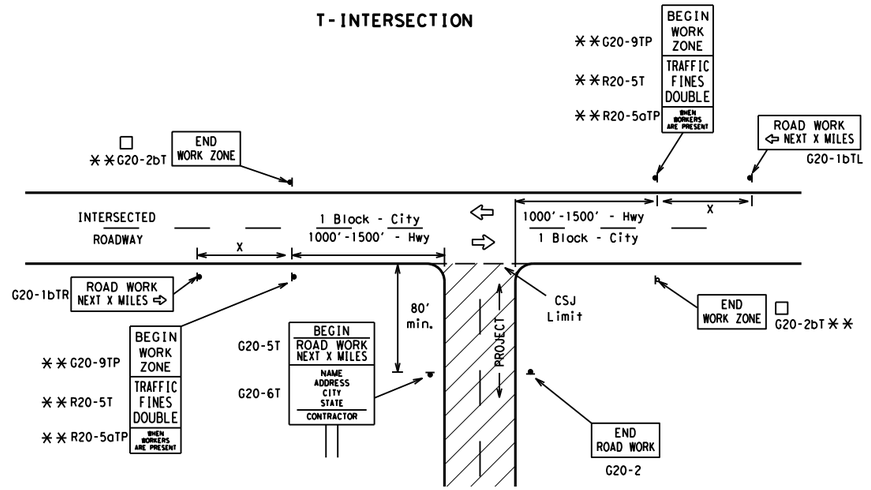
TYPICAL LOCATION OF CROSSROAD SIGNS



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]

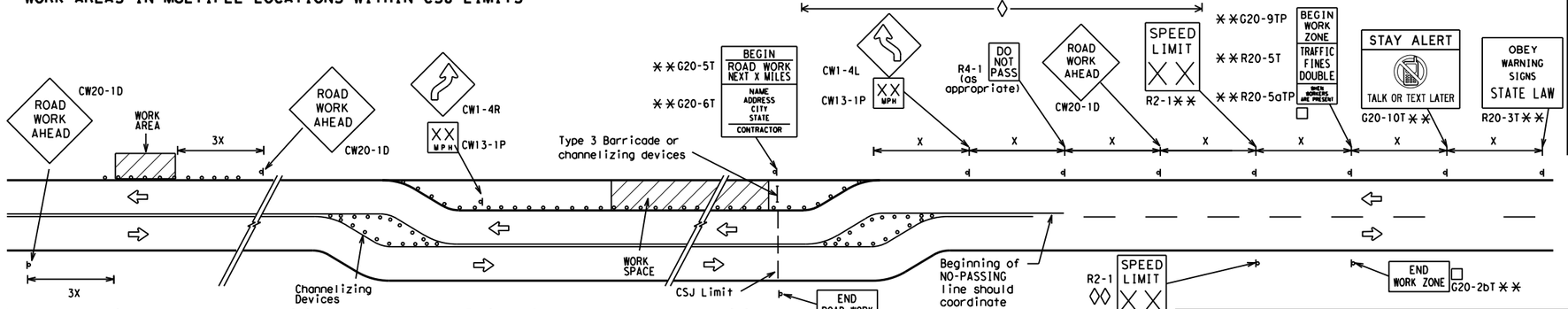
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

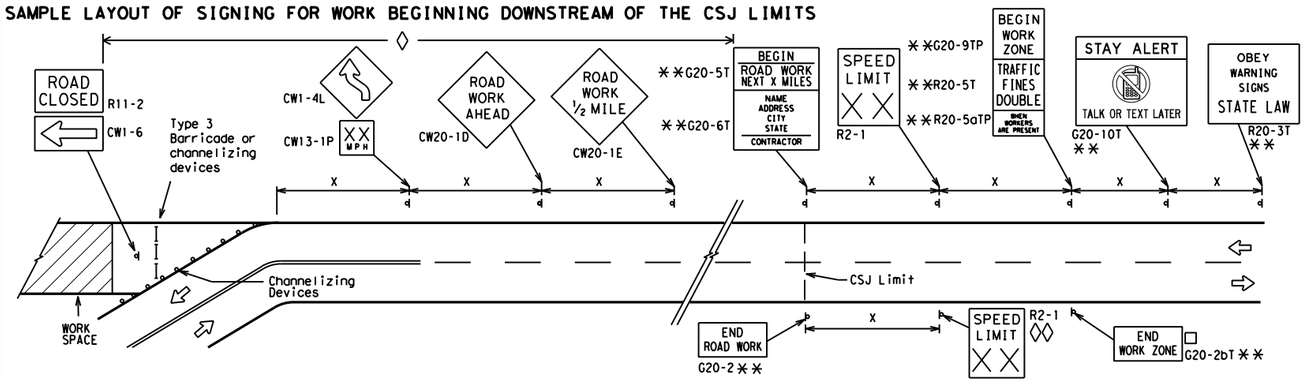
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may 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 DOWNSTREAM OF THE CSJ LIMITS



SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT 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.

SHEET 2 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

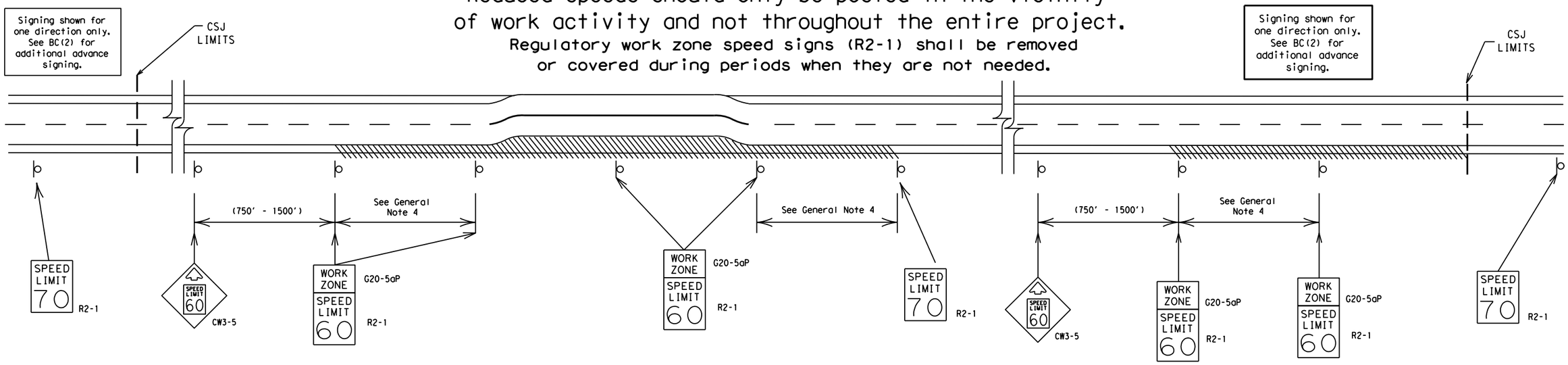
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0495	04	076, ETC	IH 20
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	SMITH		27

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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SHEET 3 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0495	04	076, ETC	IH 20
9-07 8-14	DIST	COUNTY		SHEET NO.
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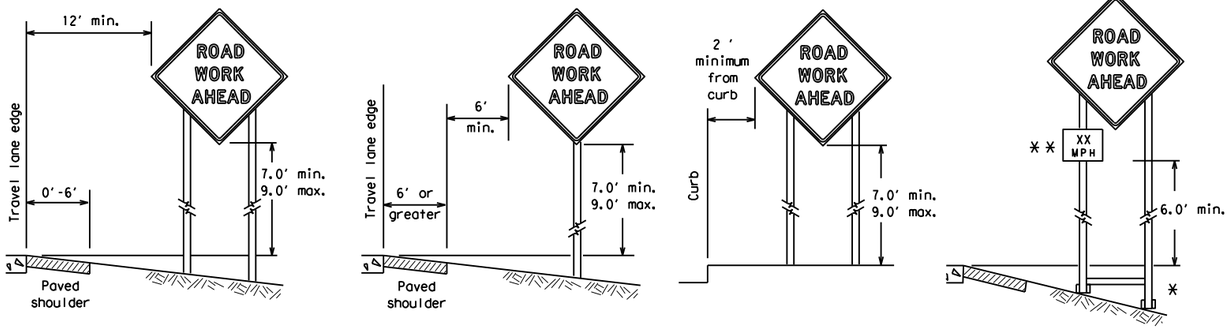
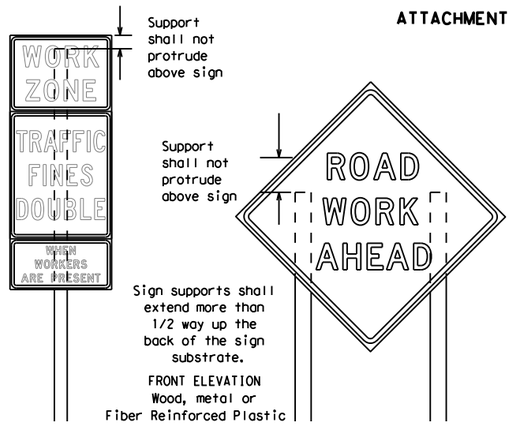
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

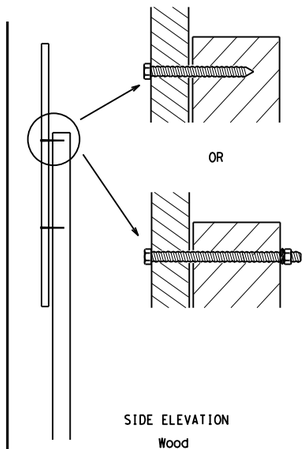


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





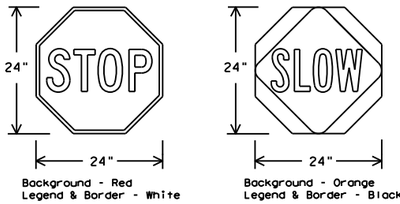
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	SMITH		29

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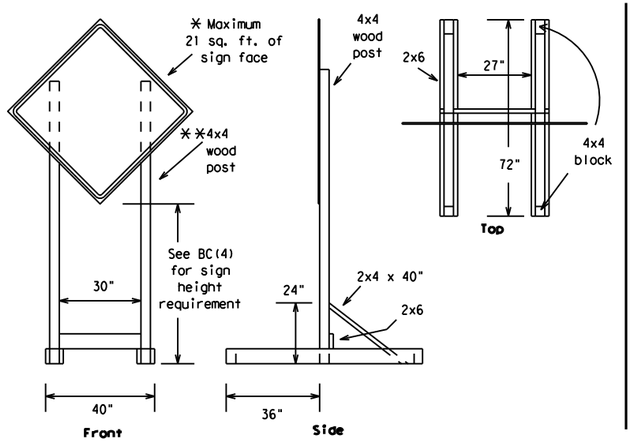
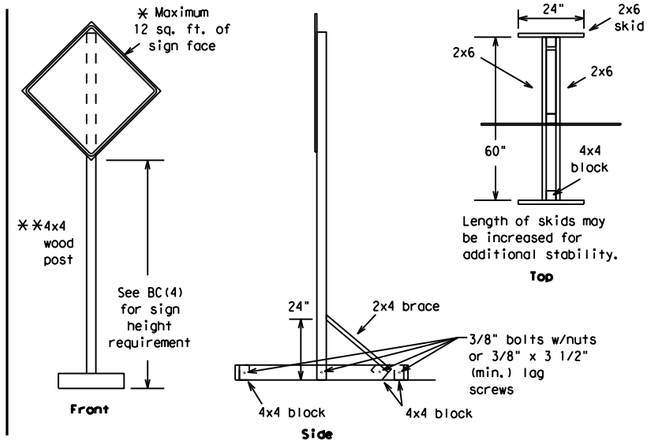
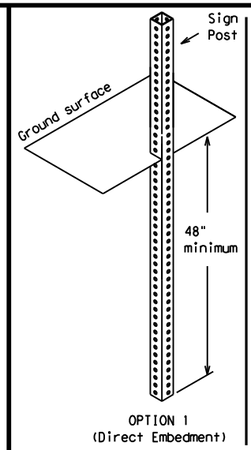
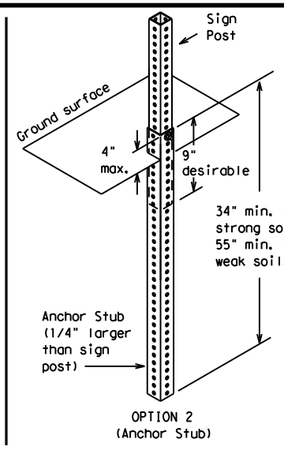


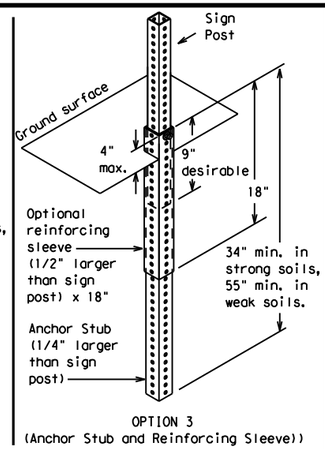


SKID MOUNTED WOOD SIGN SUPPORTS

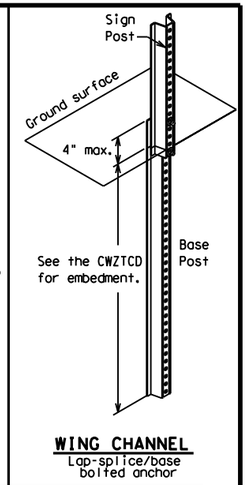
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS







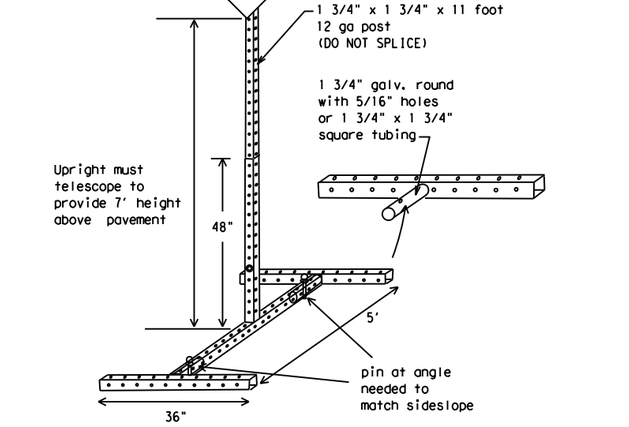
PERFORATED SQUARE METAL TUBING

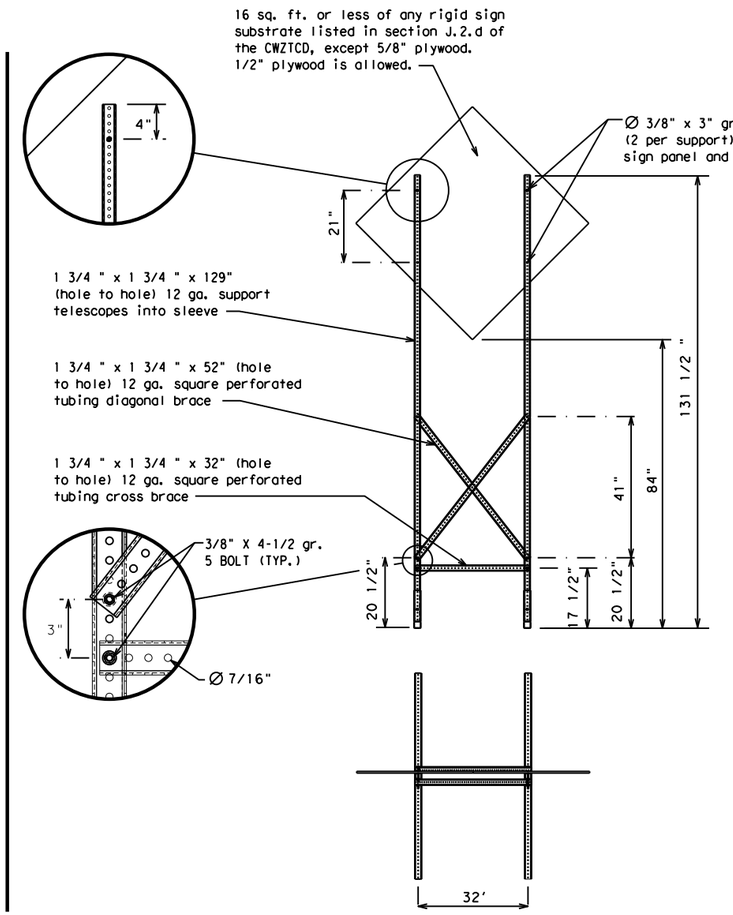


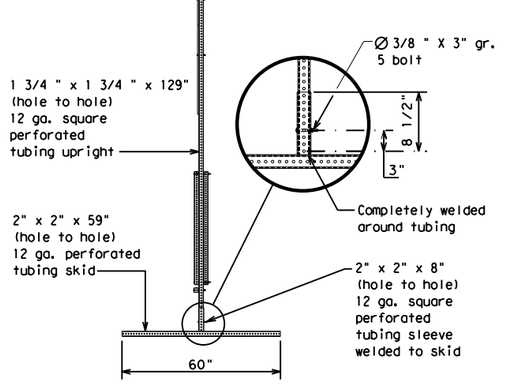
WING CHANNEL
Lap-splice/base bolted anchor

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.

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	SMITH		30

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

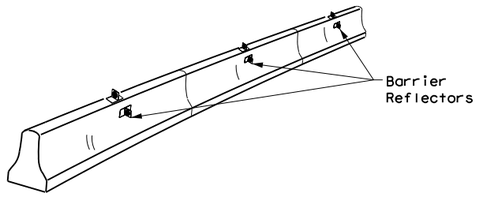
Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

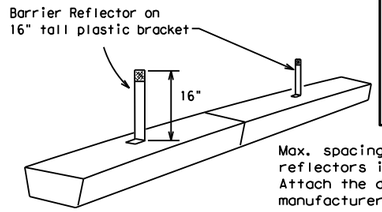
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0495	04	076, ETC	IH 20
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	SMITH		31

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



CONCRETE TRAFFIC BARRIER (CTB)

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

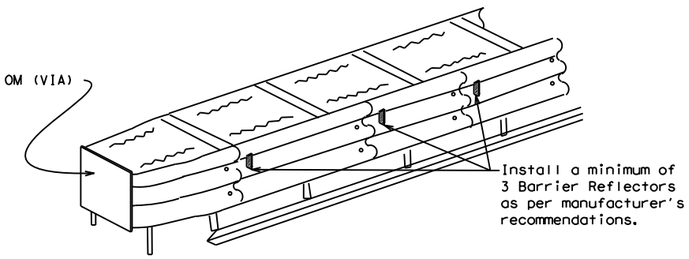


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

LOW PROFILE CONCRETE BARRIER (LPCB)

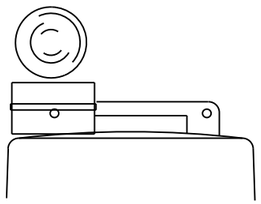


DELINEATION OF END TREATMENTS

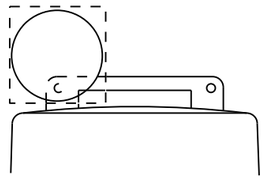
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

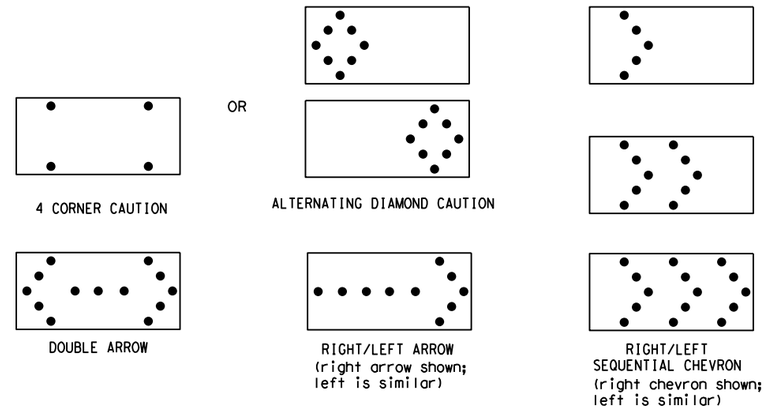
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

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	0495	04	076, ETC	IH 20
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	TYL	SMITH		32

101

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

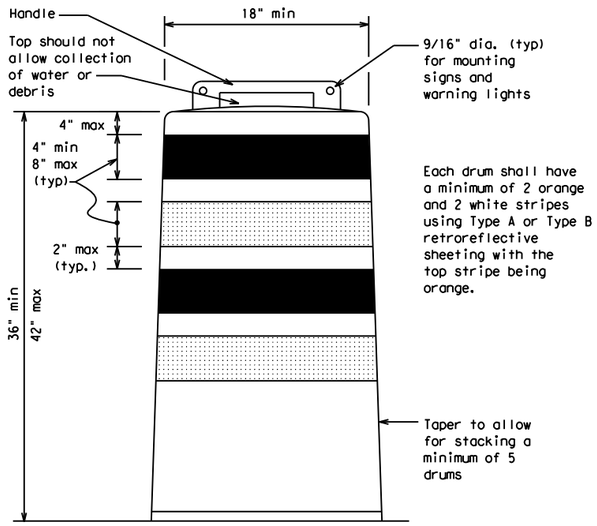
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

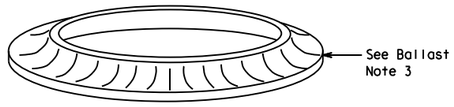
RETROREFLECTIVE SHEETING

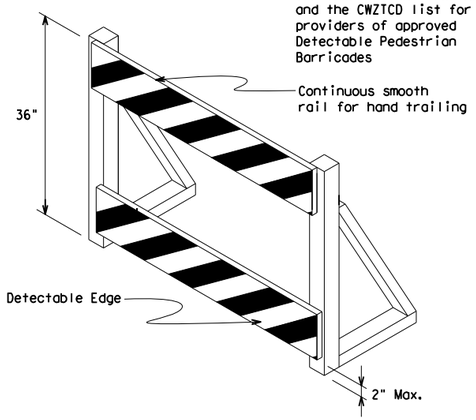
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

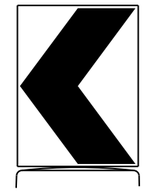




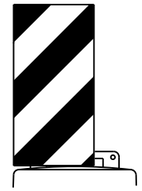


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0495	04	076, ETC	IH 20
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	TYL	SMITH		33
7-13				

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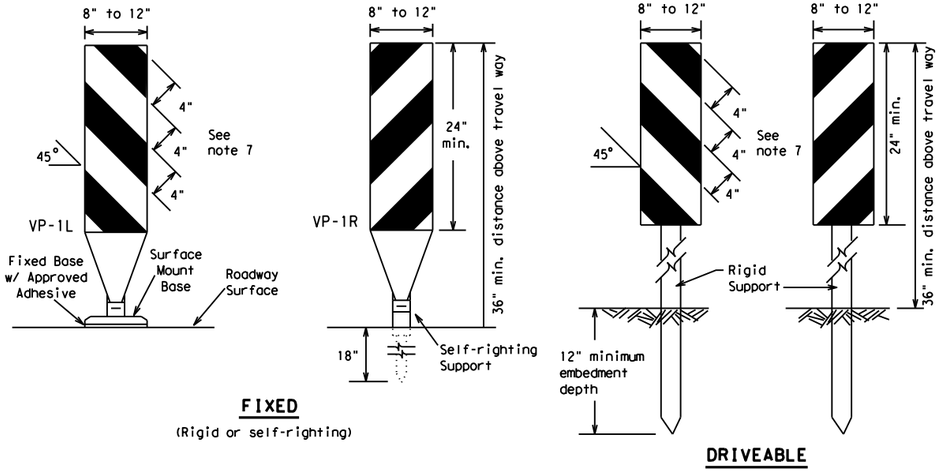
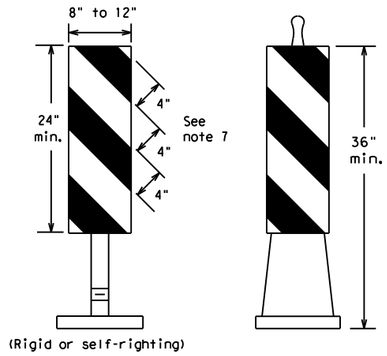


FIXED
(Rigid or self-righting)

DRIVEABLE

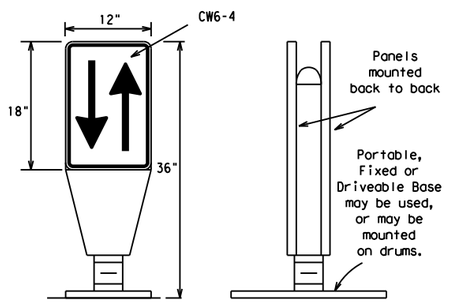


(Rigid or self-righting)

PORTABLE

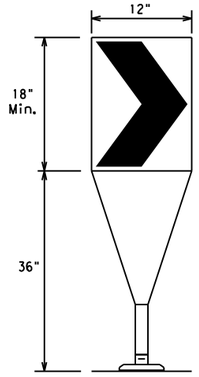
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is 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.

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



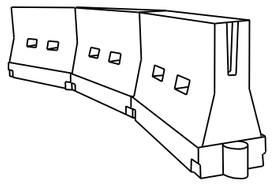
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0495	04	076, ETC	IH 20
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7-13 5-21	TYL	SMITH		34

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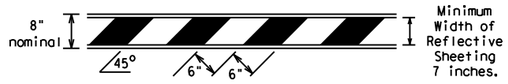
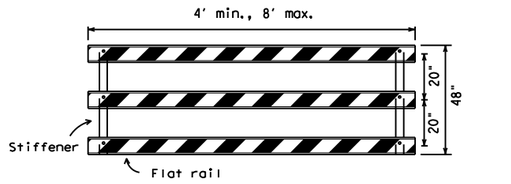
TYPE 3 BARRICADES

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.



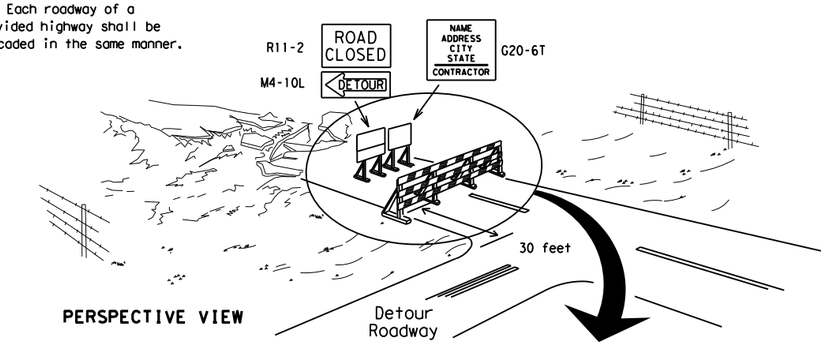
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

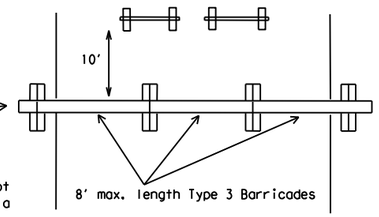
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

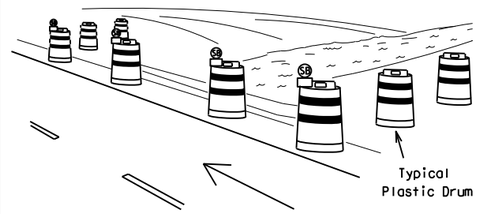
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

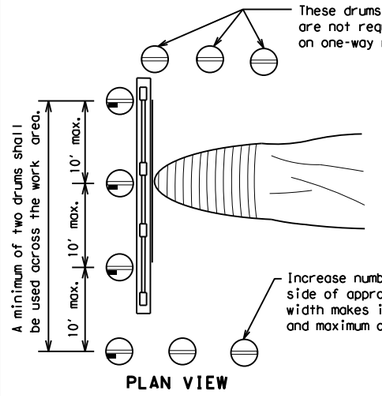
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

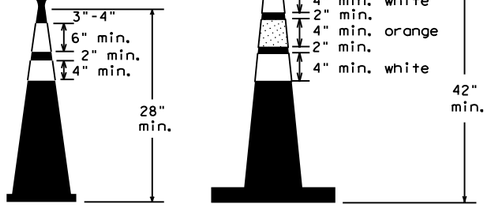
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



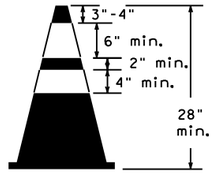
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

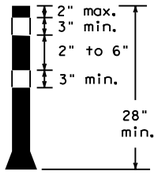
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

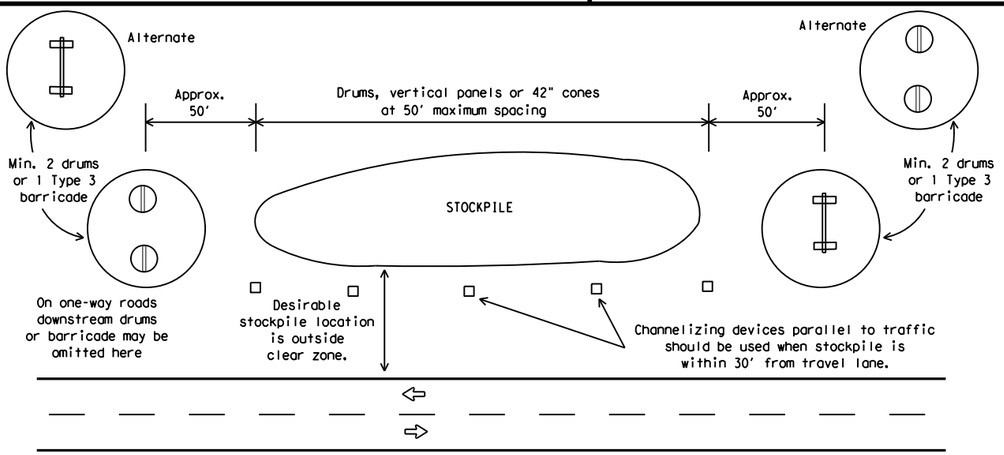


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

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7-13 5-21	TYL	SMITH		35

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

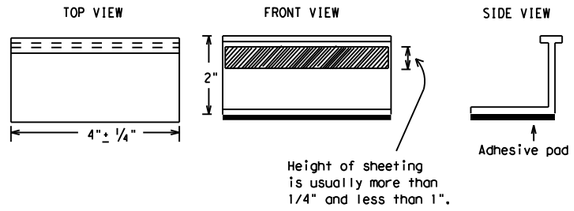
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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1-02 7-13	TYL	SMITH		36
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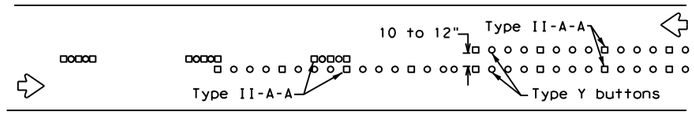
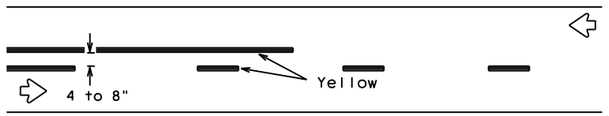
PAVEMENT MARKING PATTERNS

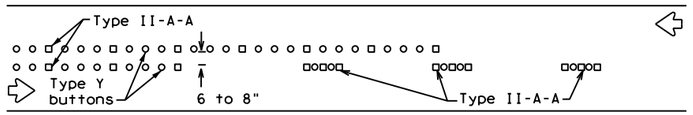
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



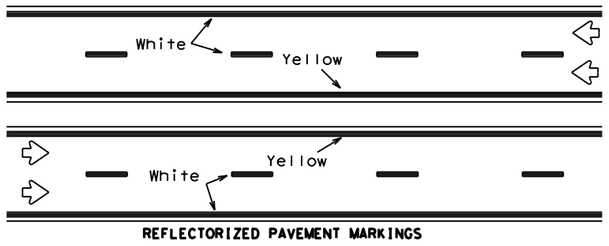
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



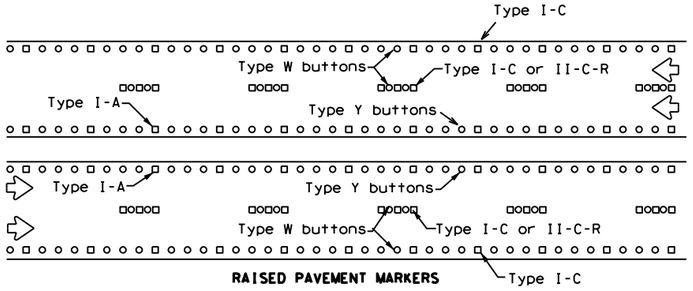
RAISED PAVEMENT MARKERS - PATTERN B

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



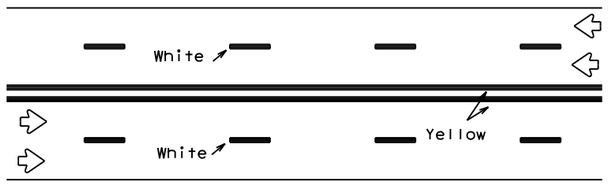
REFLECTORIZED PAVEMENT MARKINGS



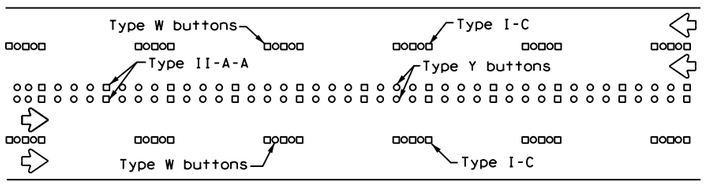
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



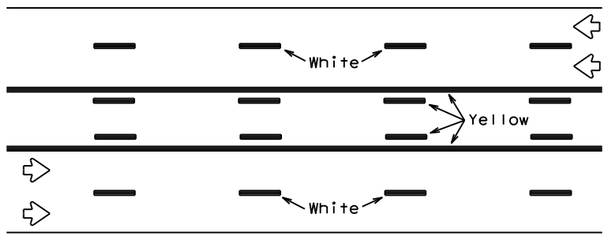
REFLECTORIZED PAVEMENT MARKINGS



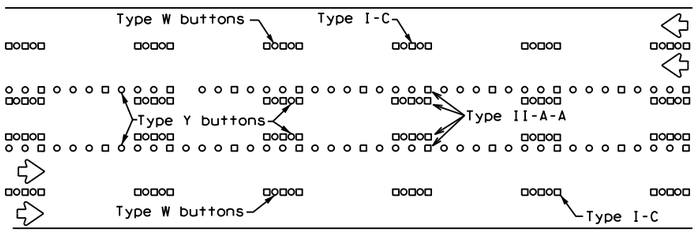
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS

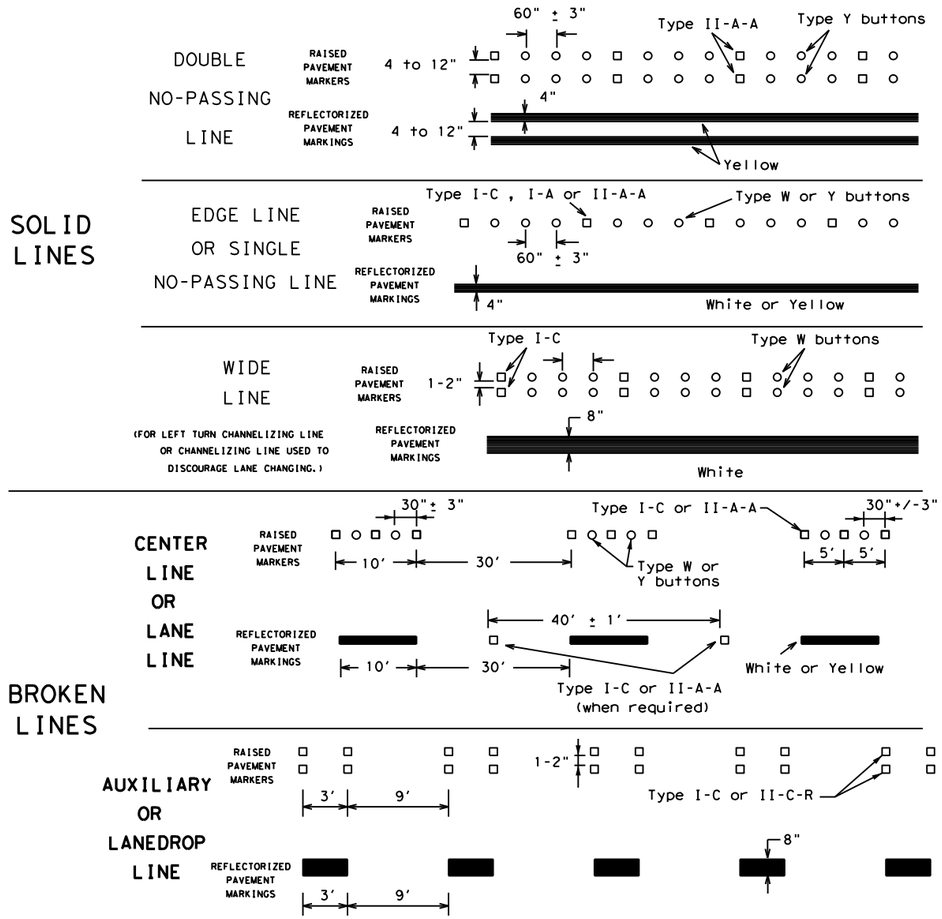


RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

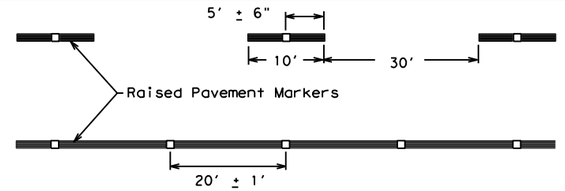
TWO-WAY LEFT TURN LANE

STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS



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	0495	04	076, ETC	IH 20
	DIST	COUNTY		SHEET NO.
	TYL	SMITH		37

DATE: 10/27/2021 11:35:41 AM
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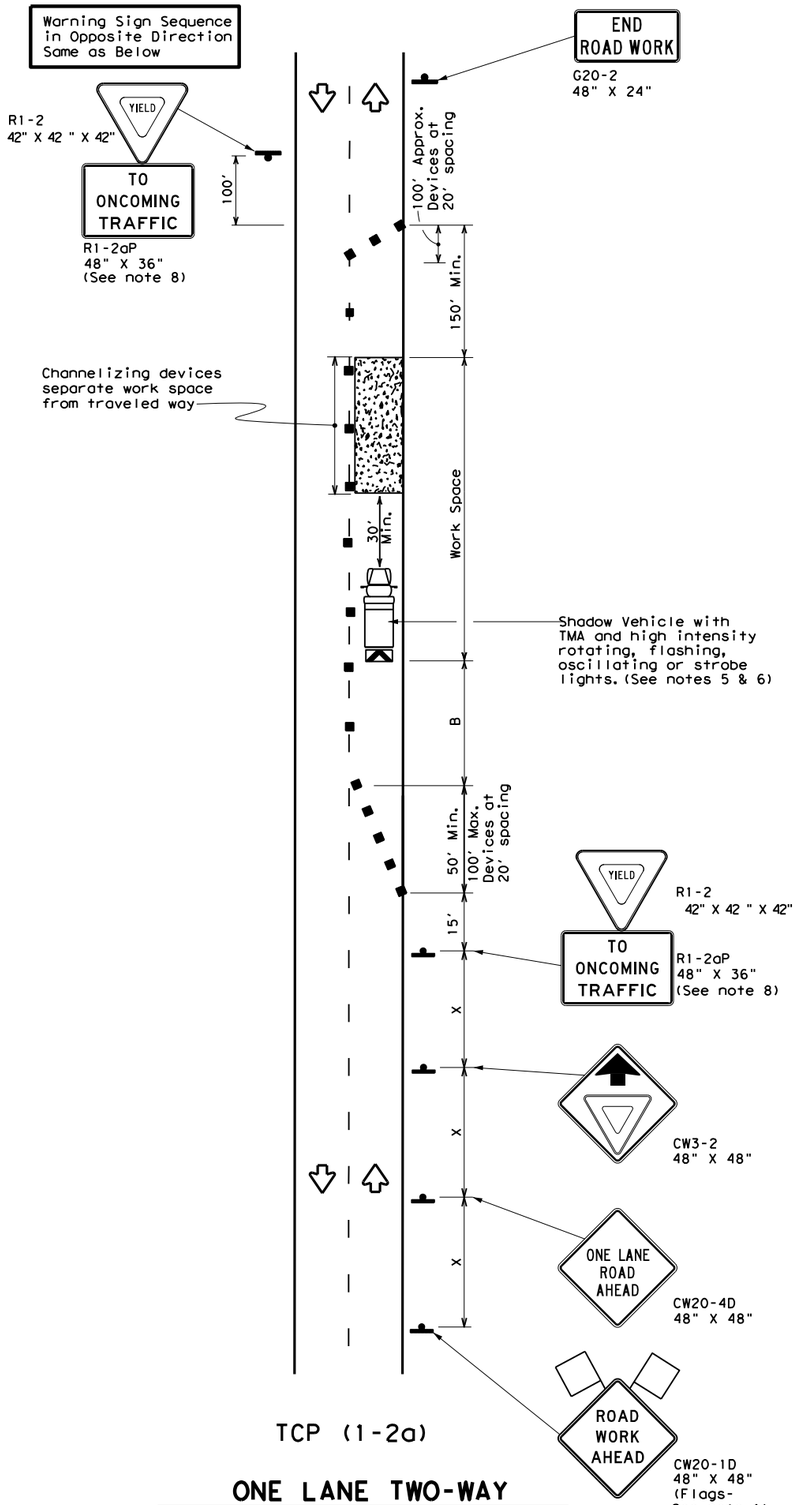
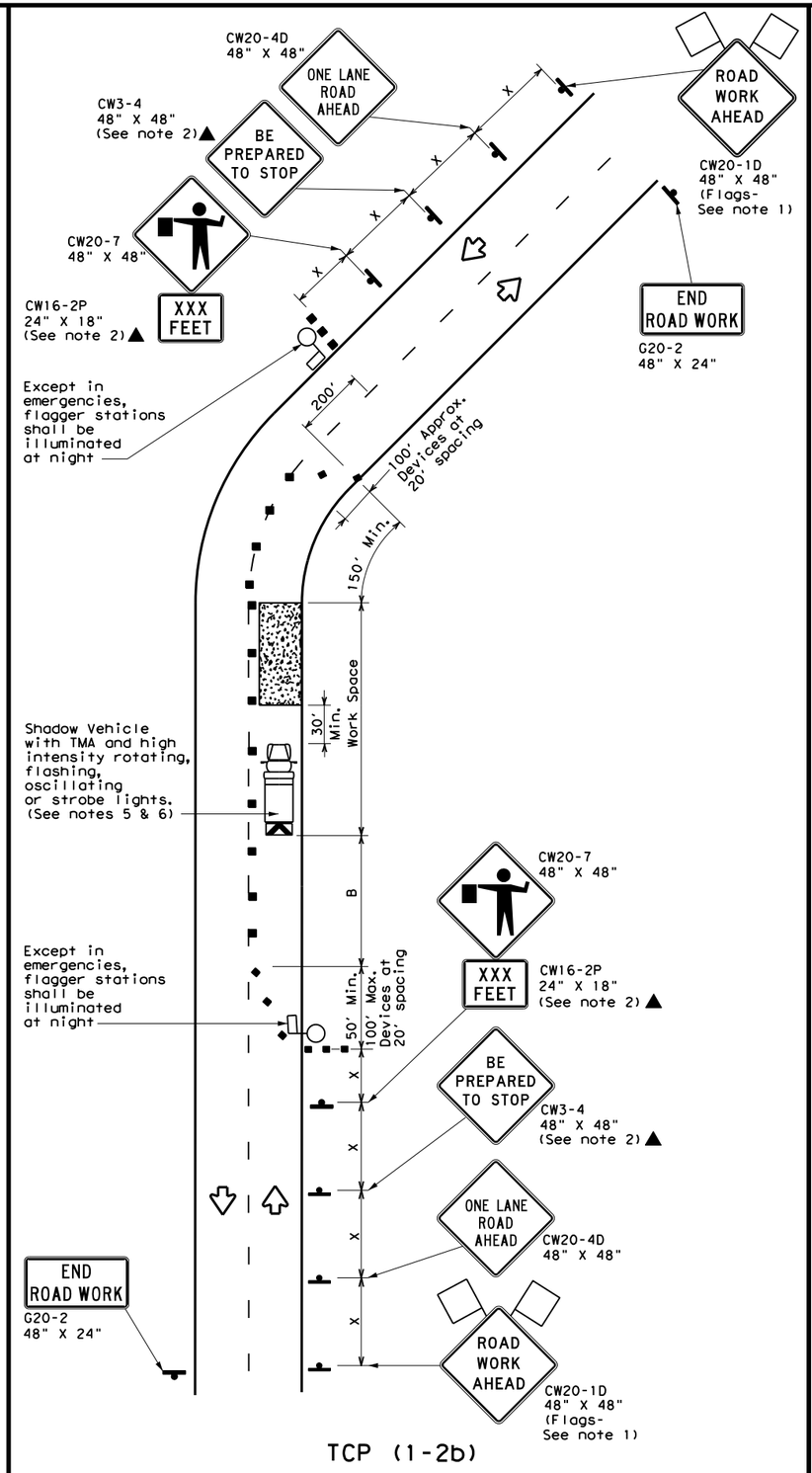


TCP (1-2a)

ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See note 7)



TCP (1-2b)

ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

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

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

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

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

GENERAL NOTES

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

TCP (1-2a)

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

TCP (1-2b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
ONE-LANE TWO-WAY
TRAFFIC CONTROL

TCP(1-2)-18

FILE: tcp1-2-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-90 4-98 2-94 2-12 1-97 2-18	0495	04	076, ETC	IH 20
	DIST	COUNTY		SHEET NO.
	TYL	SMITH		38

DATE: 10/27/2021 11:35:45 AM
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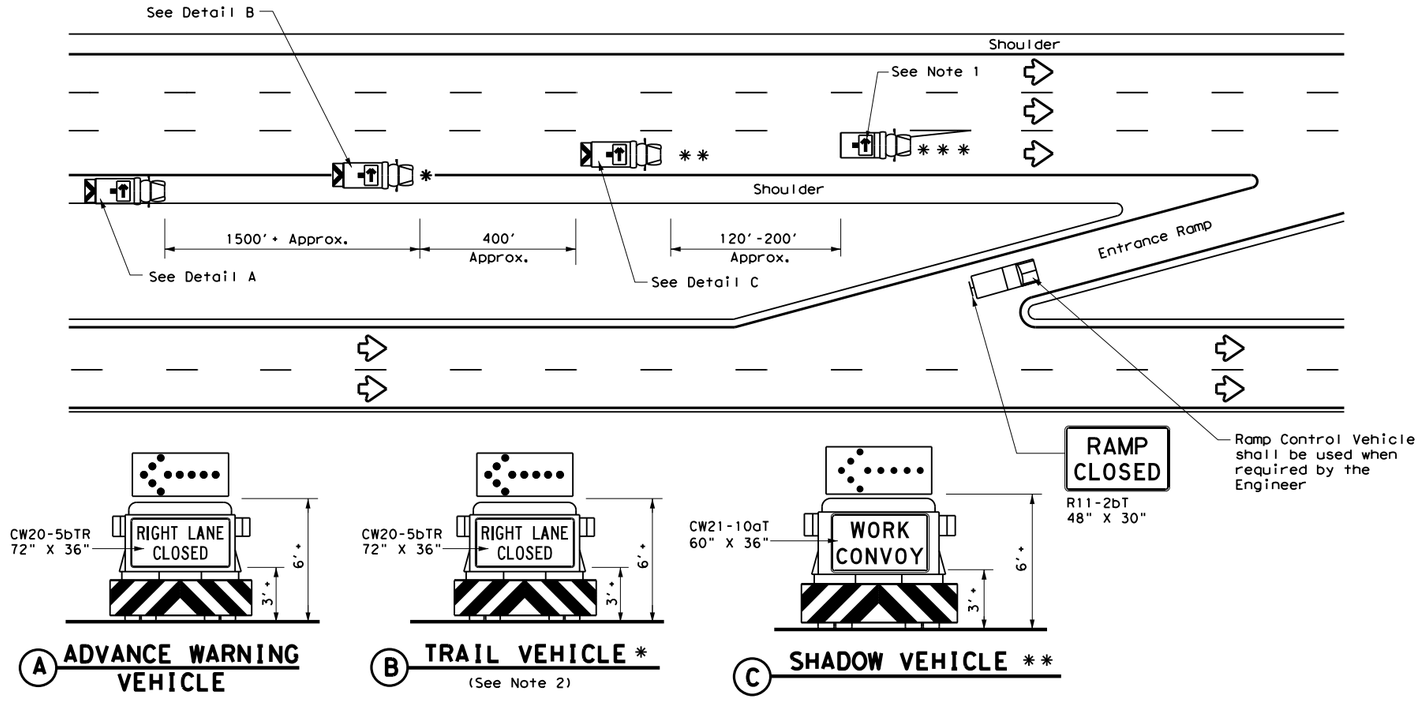
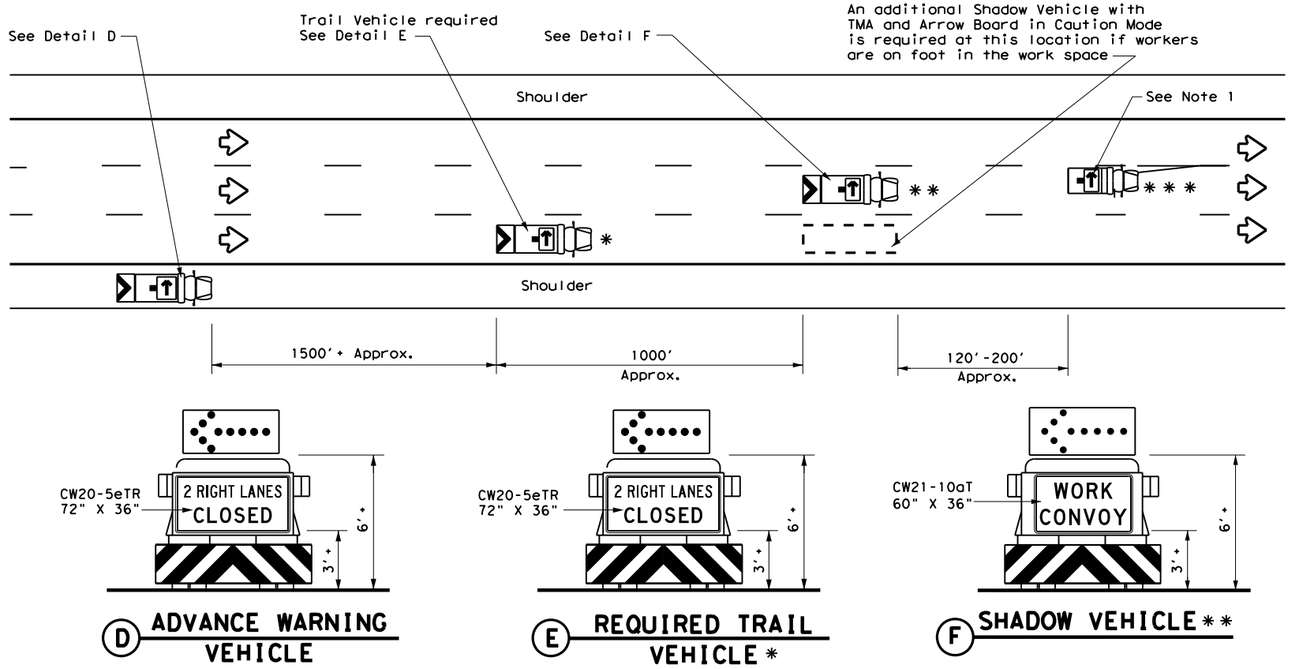


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



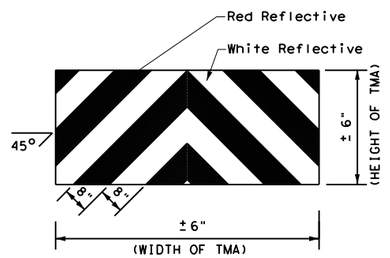
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

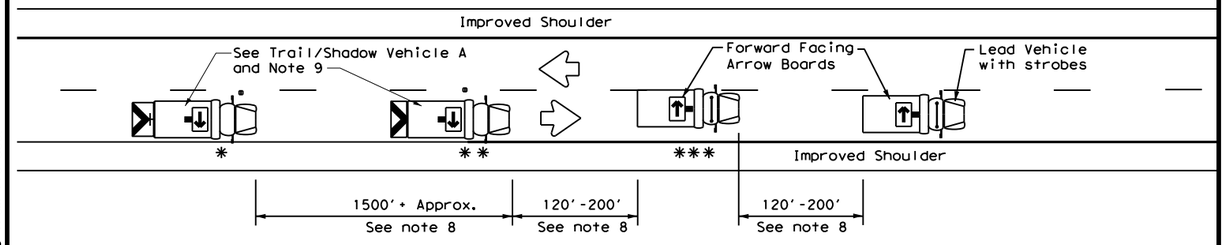
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

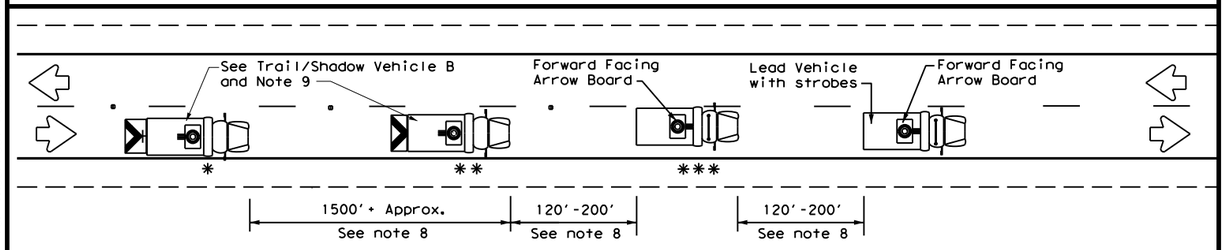
FILE: tcp3-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0495	04	076, ETC	IH 20
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	TYL	SMITH		39
1-97				

176



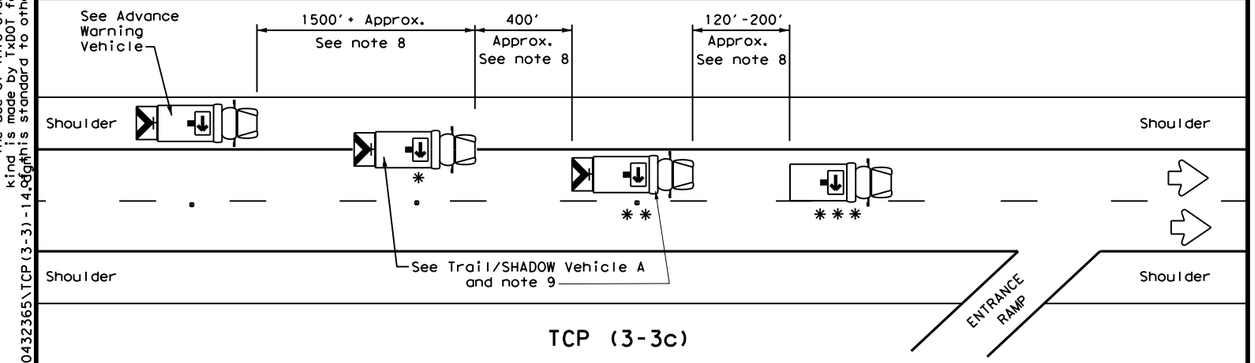
TCP (3-3a)

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



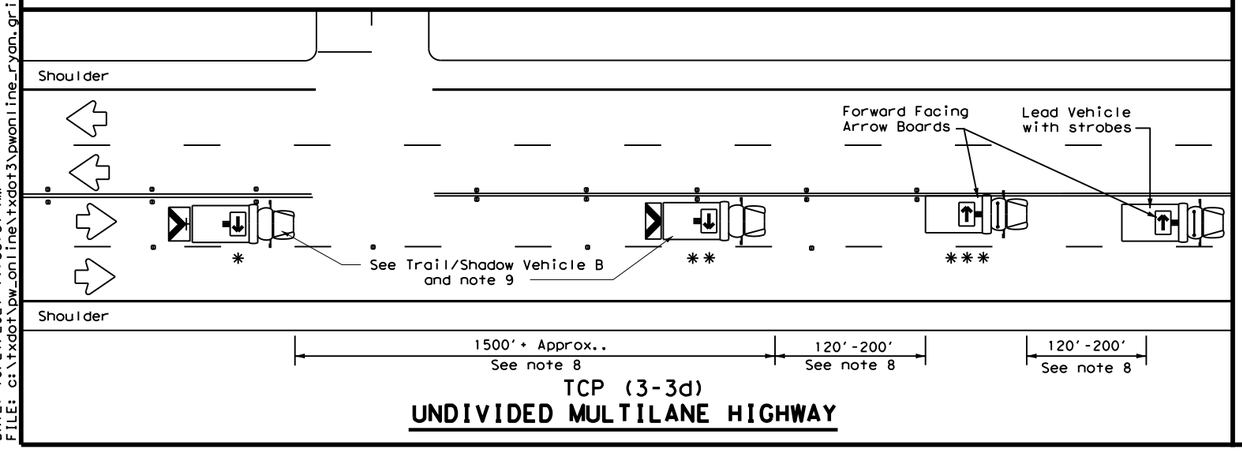
TCP (3-3b)

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



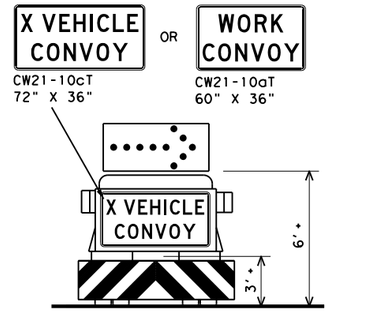
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



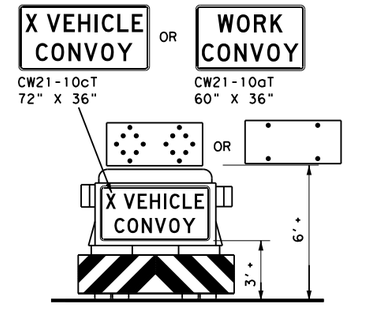
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



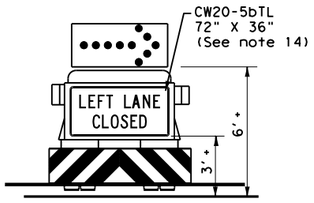
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

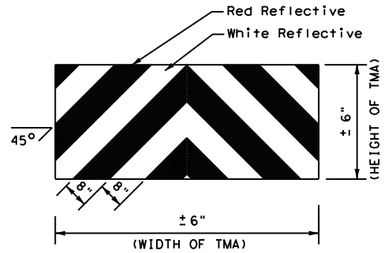


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

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

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	TYL	SMITH		40
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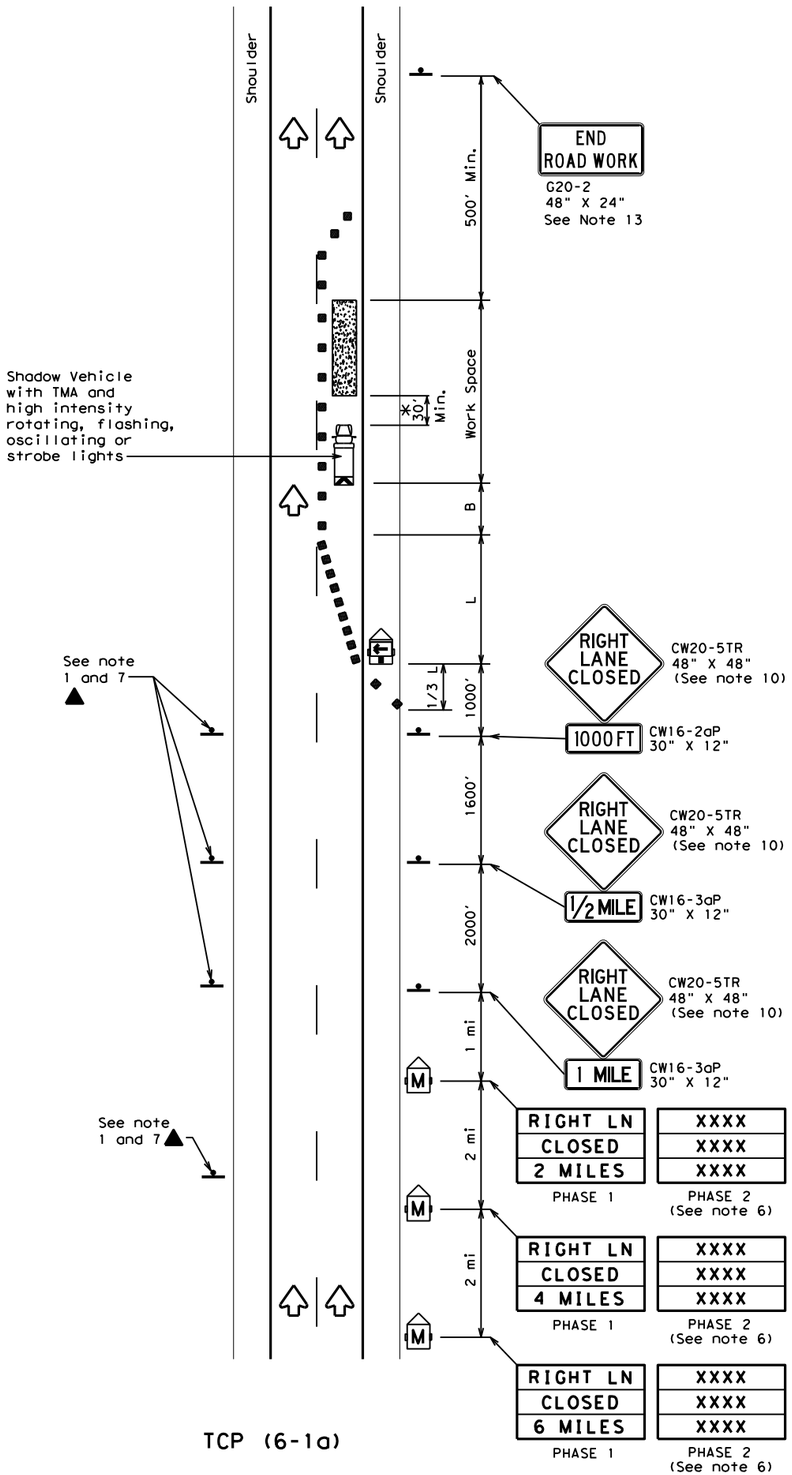

TCP (6-1a)

TYPICAL FREEWAY ONE LANE CLOSURE

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.
14. PCMS boards shall be in operation before lane is 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 "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
	✓	✓	✓	

* 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.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN FREEWAY LANE CLOSURES

TCP(6-1)-12(MOD)

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©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-12 9-16-16	0495	04	076, ETC	IH 20
	DIST	COUNTY		SHEET NO.
	TYL	SMITH		41

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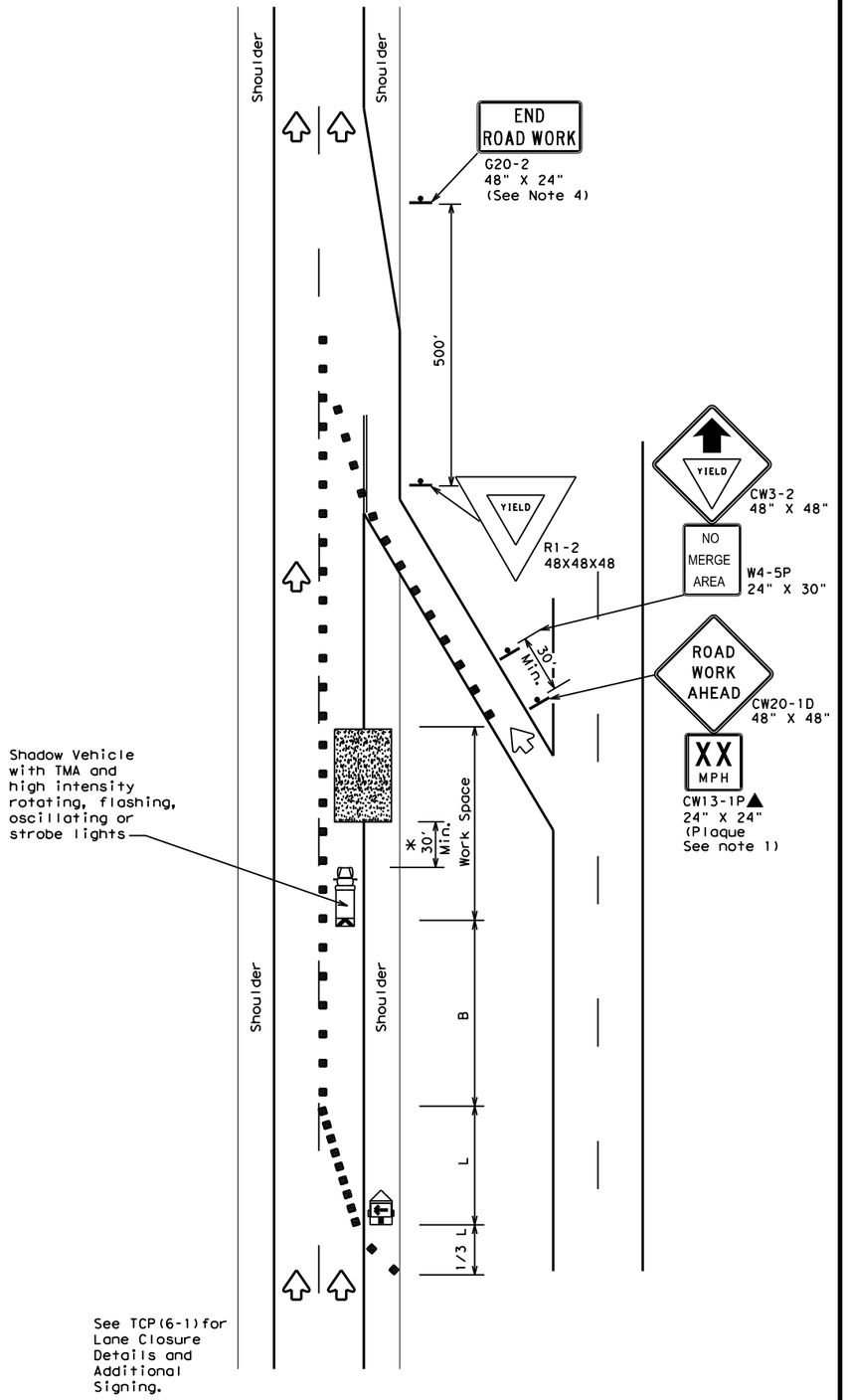
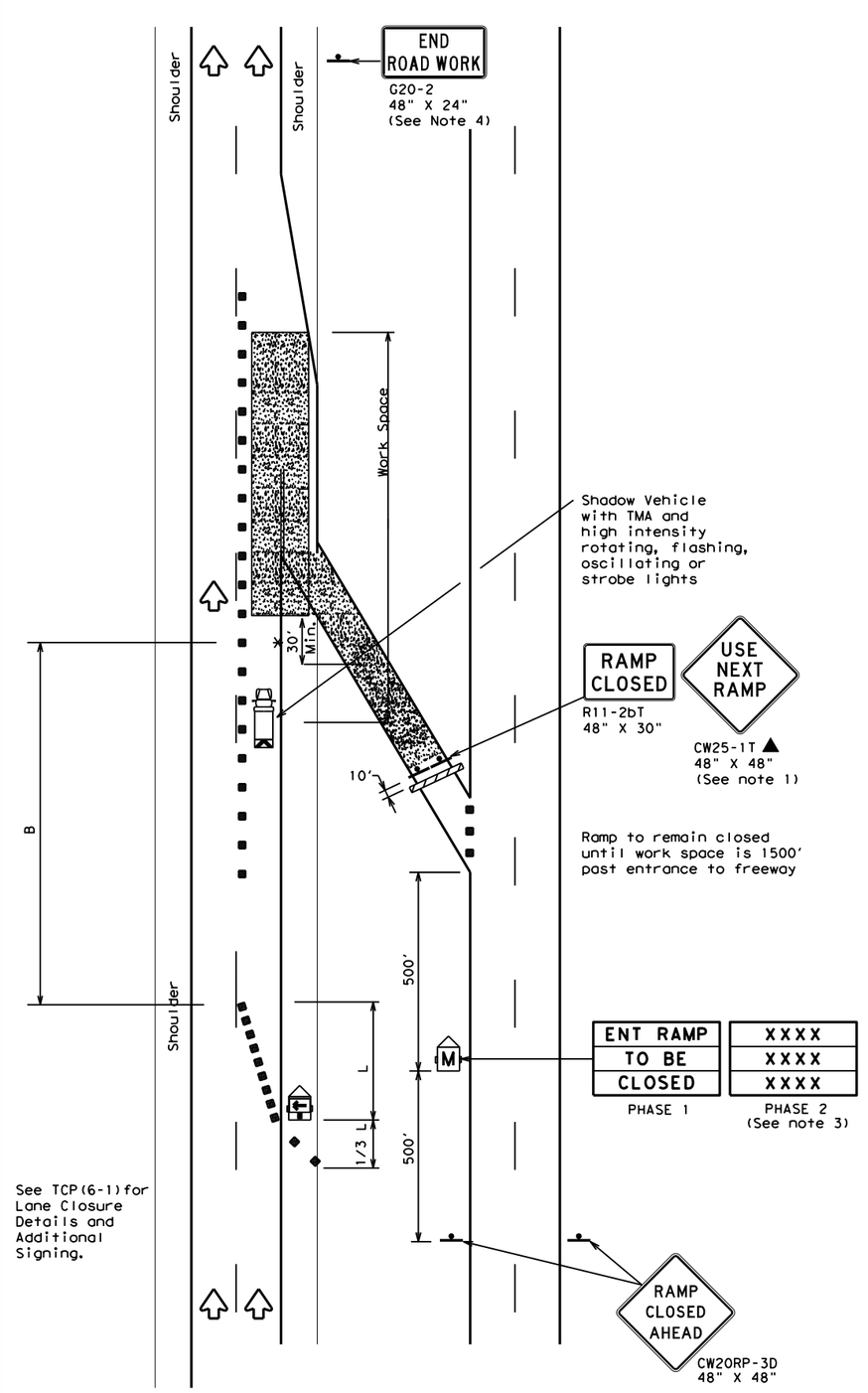


TCP (6-2a)

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	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. OMITTED
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.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA NEAR RAMP

TCP(6-2)-12(MOD)

FILE: tcp6-2.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0495	04	076, ETC	IH 20
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	TYL	SMITH		42

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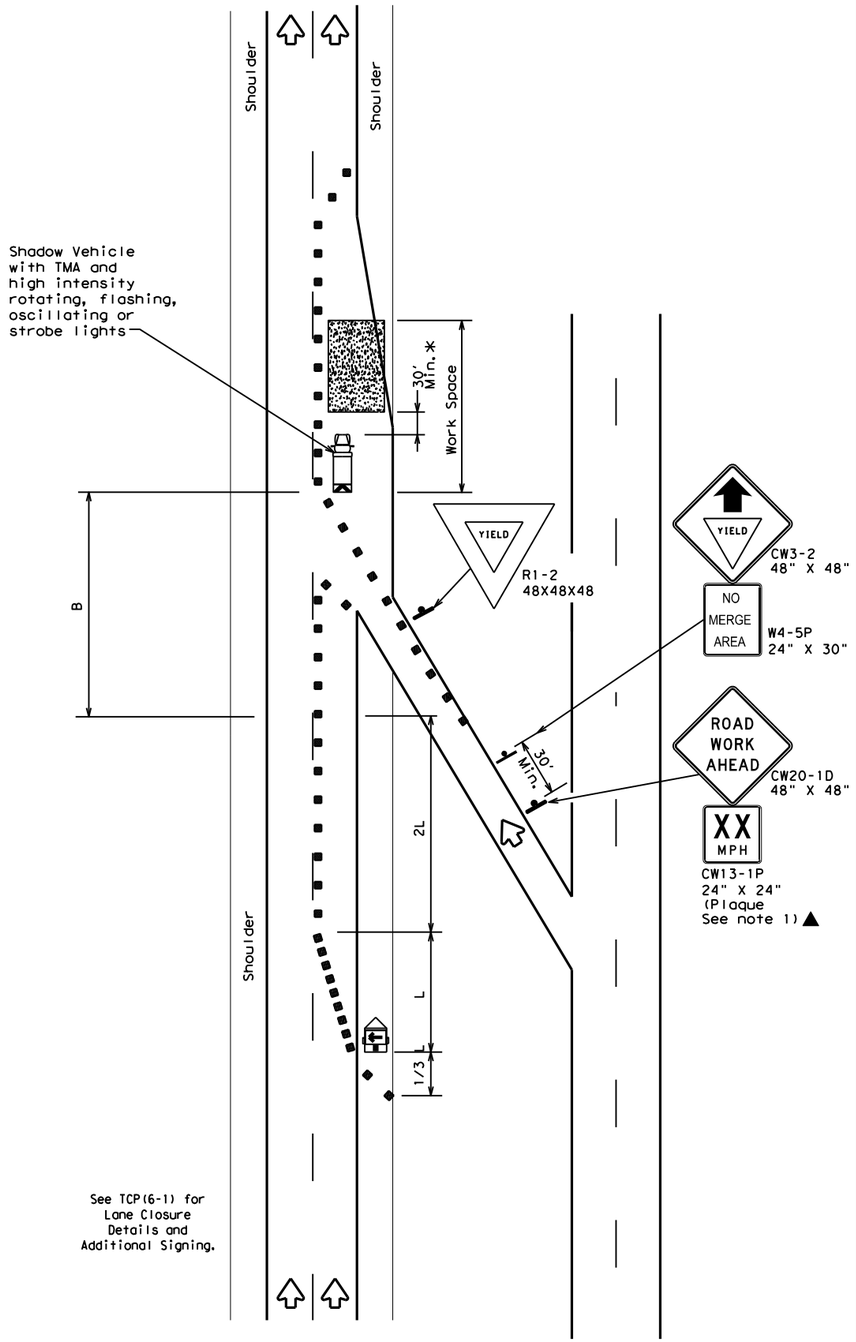
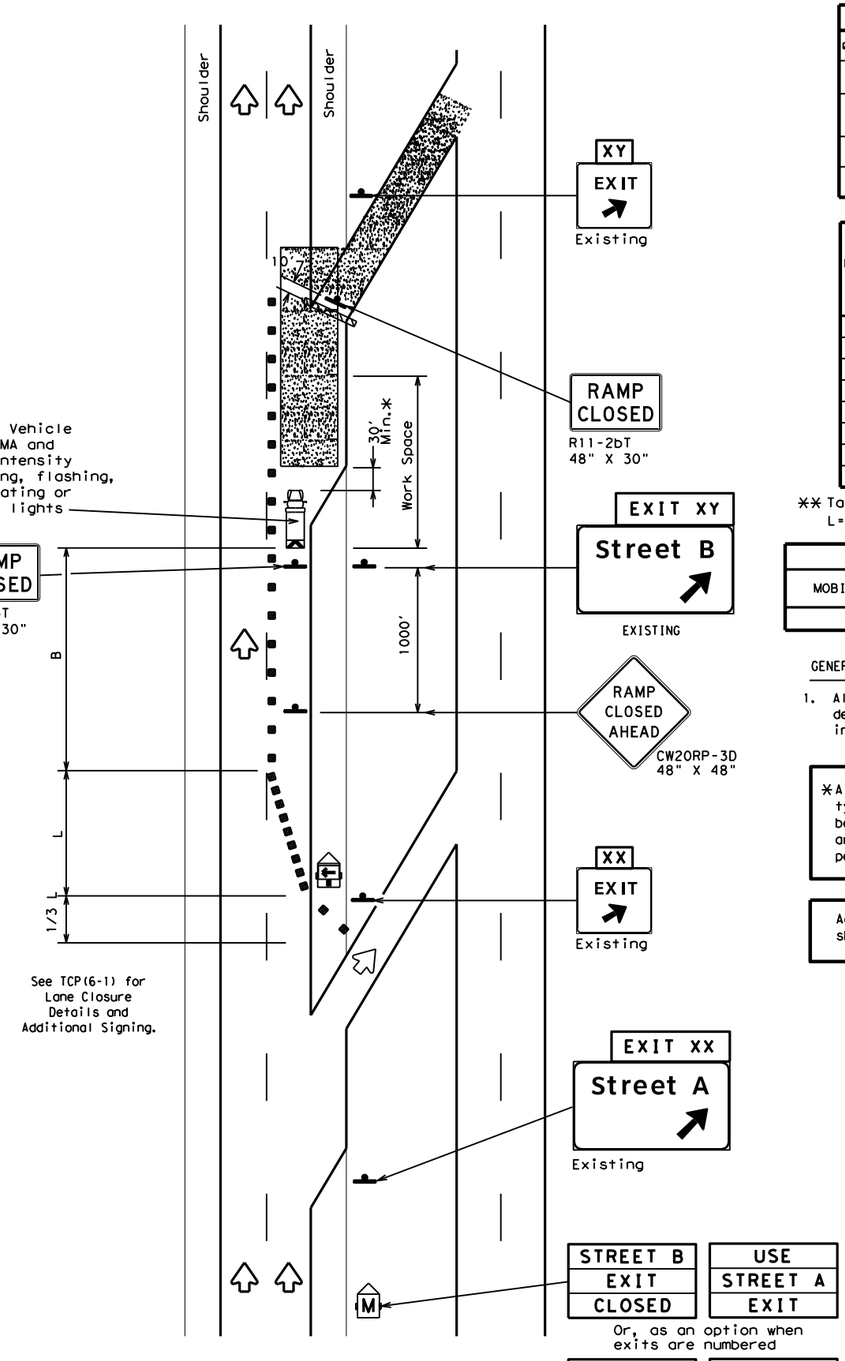


TCP (6-3a)

ENTRANCE RAMP OPEN



TCP (6-3b)

EXIT RAMP CLOSED
TRAFFIC EXITS PRIOR TO CLOSED RAMP

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.

*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.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA BEYOND RAMP

TCP(6-3)-12(MOD)

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©TxDOT February 1994	CONT	SECT	JOB	HIGHWAY
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1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	TYL	SMITH		43

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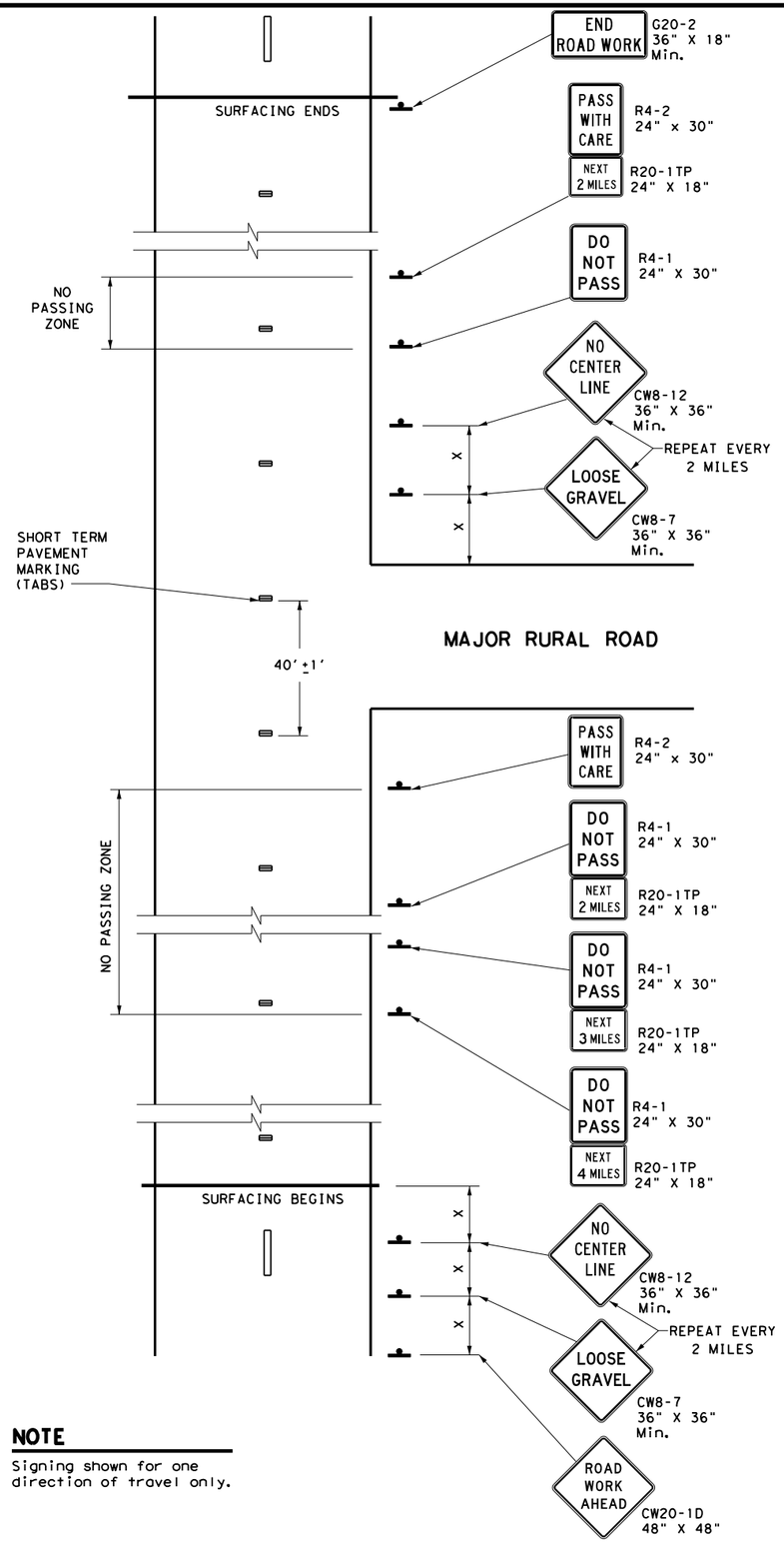
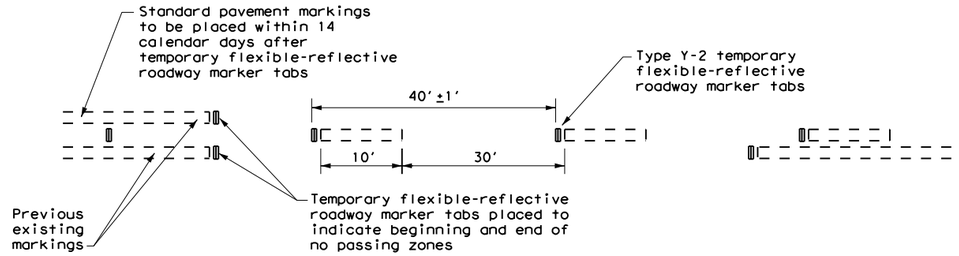


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13

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©TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
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4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	TYL	SMITH		44

210

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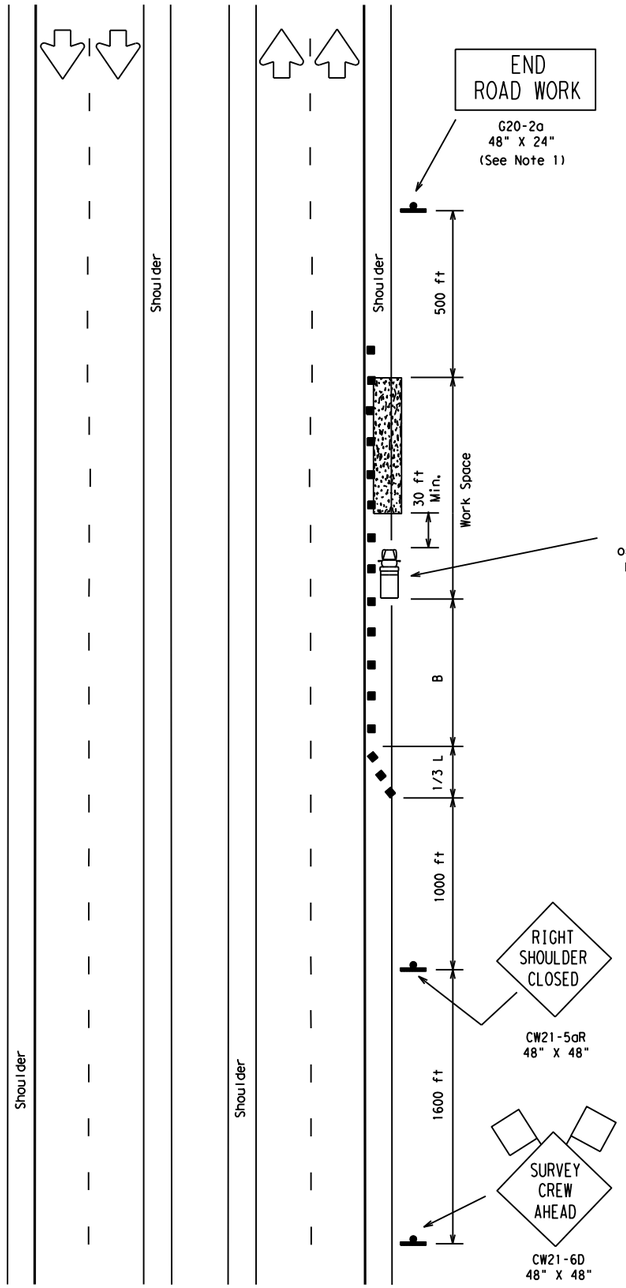
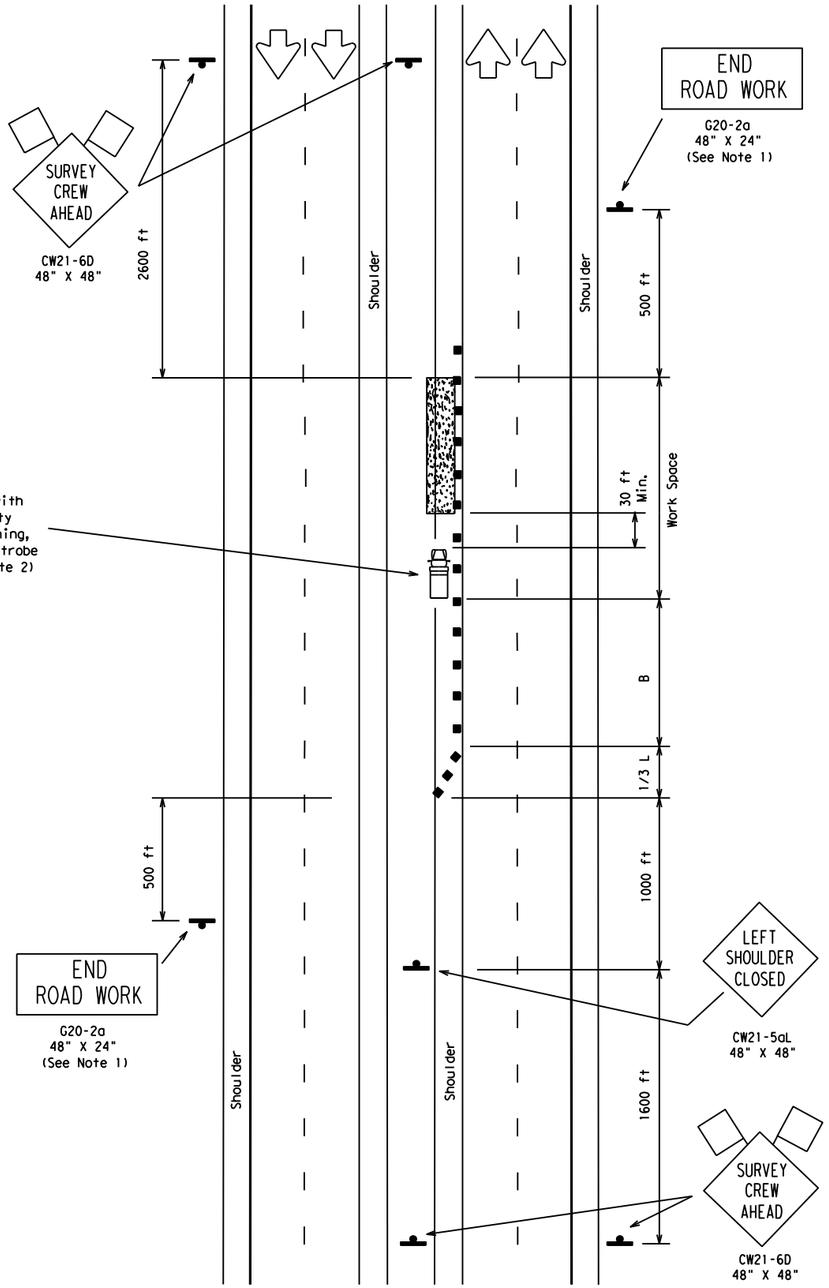


TCP (S-5a)
WORK ON RIGHT SHOULDER
OF DIVIDED ROADWAYS



TCP (S-5b)
WORK ON MEDIAN SHOULDER
OF DIVIDED ROADWAYS

WHENEVER POSSIBLE, SURVEY PARTIES SHOULD AVOID, BY THE USE OF OFFSET LINES, ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

LEGEND

Type III Barricade ■ ■ Channelizing Devices Flag
Heavy Work Vehicle Truck Mounted Attenuator (TMA)
Trailer Mounted Flashing Arrow Panel
Portable Changeable Message Sign (PCMS)
Flagger Sign Post

Posted Speed ✳	Formula	Minimum Desirable Taper Lengths ✳✳ 10' Offset	11' Offset	12' Offset	Suggested Maximum Spacing of Device On a Taper	On a Tangent	Min. Sign Spacing "X" Distance	Longitudinal Buffer Space "B"
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	90'
35		205'	225'	245'	35'	70'-90'	160'	120'
40		265'	295'	320'	40'	80'-100'	240'	155'
45	L=WS	450'	495'	540'	45'	90'-110'	320'	195'
50		500'	550'	600'	50'	100'-125'	400'	240'
55		550'	605'	660'	55'	110'-140'	500'	295'
60		600'	660'	720'	60'	120'-150'	600'	350'
65		650'	715'	780'	65'	130'-165'	700'	410'
70		700'	770'	840'	70'	140'-175'	800'	475'
75		750'	825'	900'	75'	150'-185'	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
	✓	✓		

DEFINITIONS:
SHORT DURATION - work that occupies a location up to 1 hour.
SHORT TERM STATIONARY - daytime work that occupies a location for more than 1 hour within a single daylight period.

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be omitted for short duration (less than 1 hour) work.
2. For short duration work, the Shadow Vehicle with TMA may be replaced by another Work Vehicle with high intensity rotating, flashing or strobe lights.
3. Shadow Vehicles with a TMA are desirable when workers or equipment are in the work space. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Shadow Vehicle.
4. If shoulders are not present, the 1/3L shoulder taper is to be omitted and four channelizing devices shall be placed in front of the arrow panel, perpendicular to traffic.
5. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" signs.
6. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-5)-08

REVISIONS

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

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20

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TYL	SMITH	45

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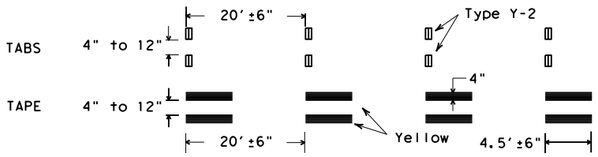
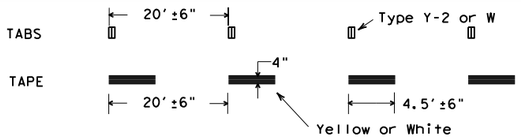
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

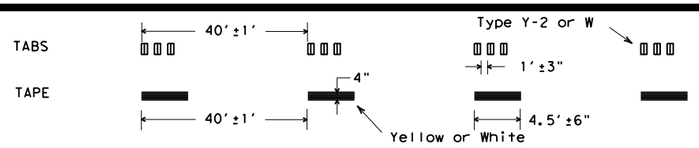


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



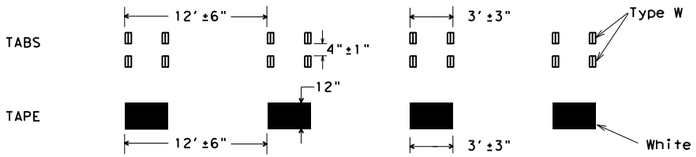
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

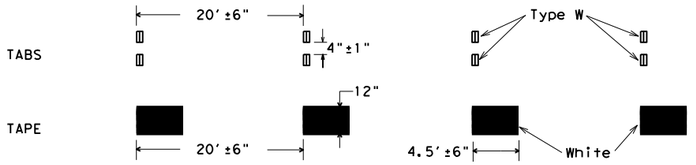


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



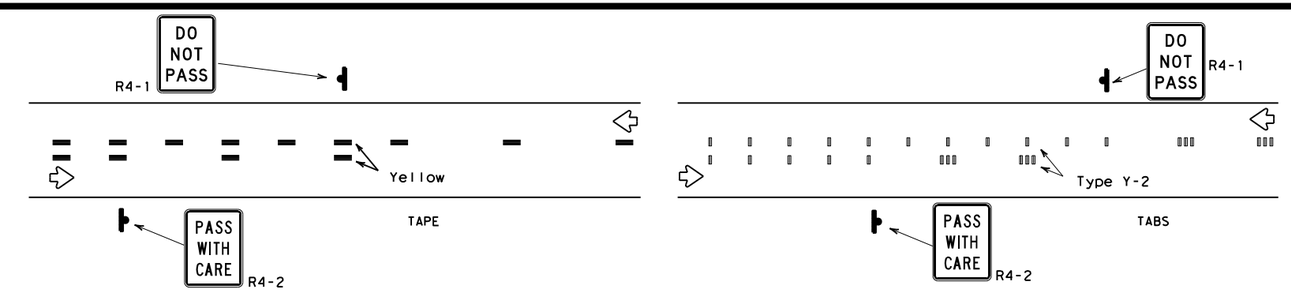
NOTES:

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

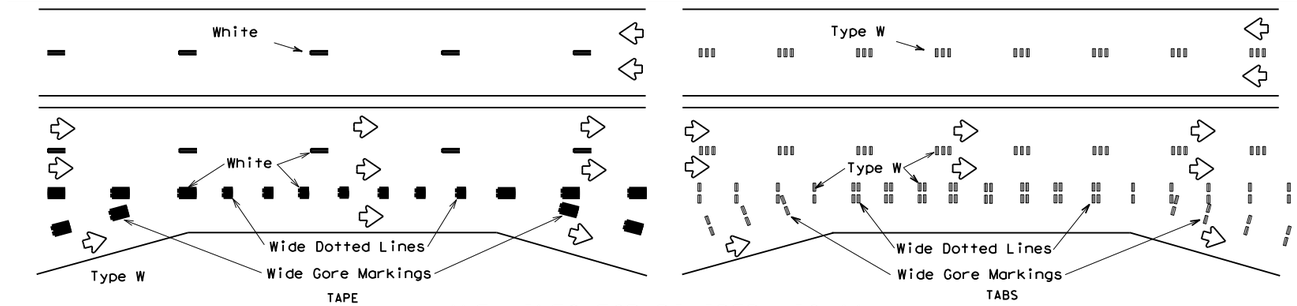
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

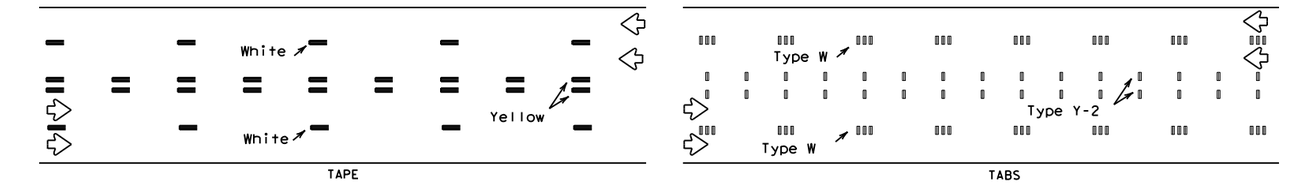
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



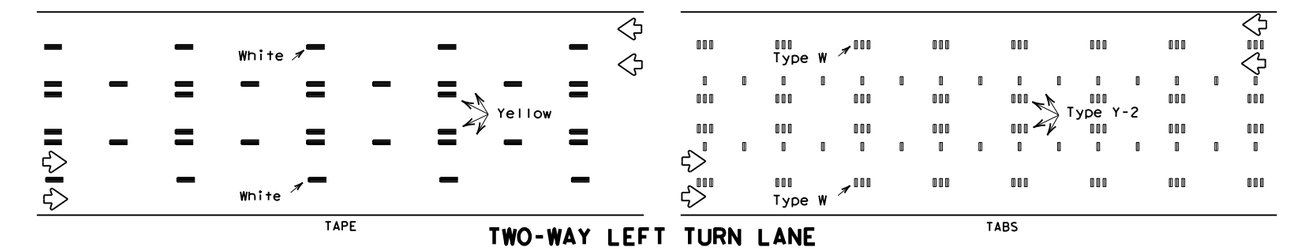
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



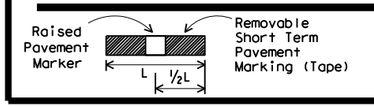
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:
   http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

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3-03		TYL	SMITH		46
7-13					

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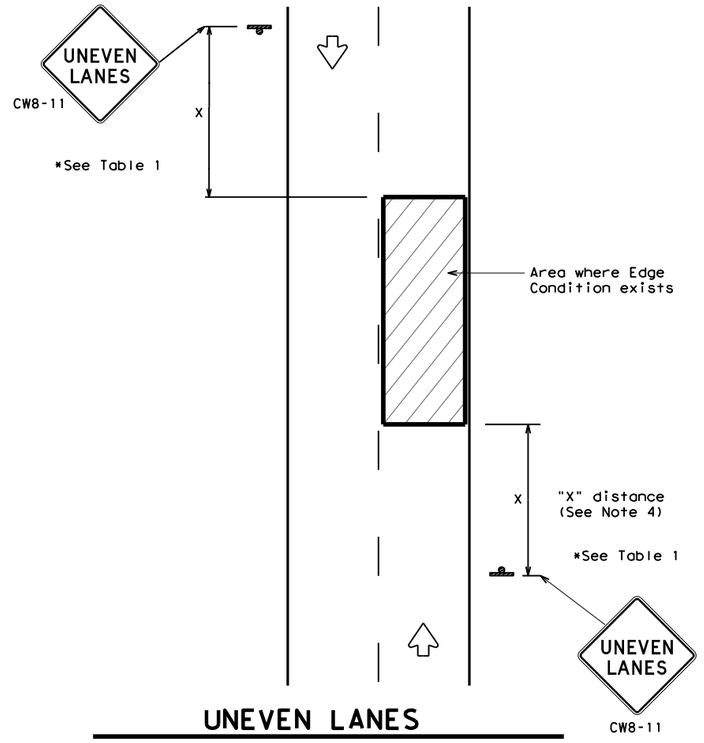
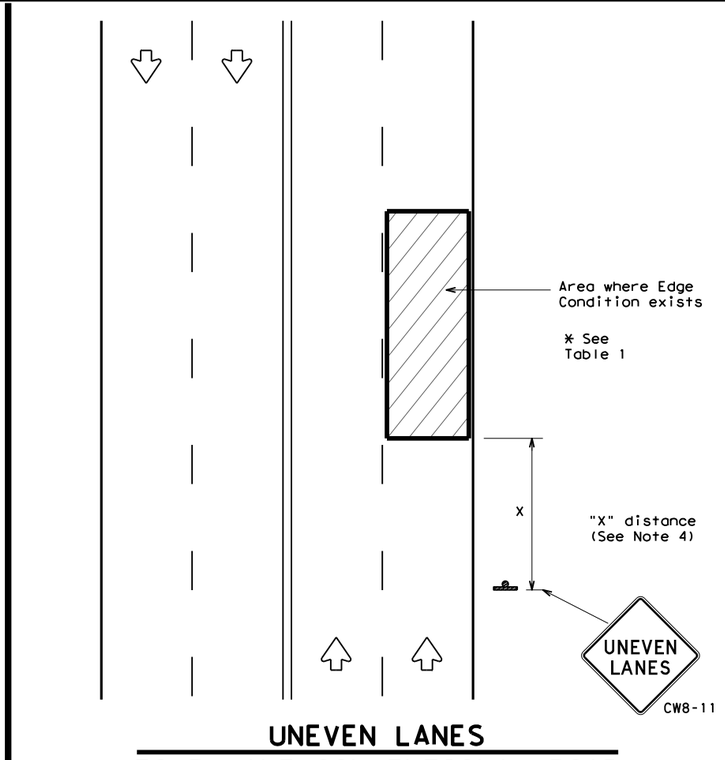
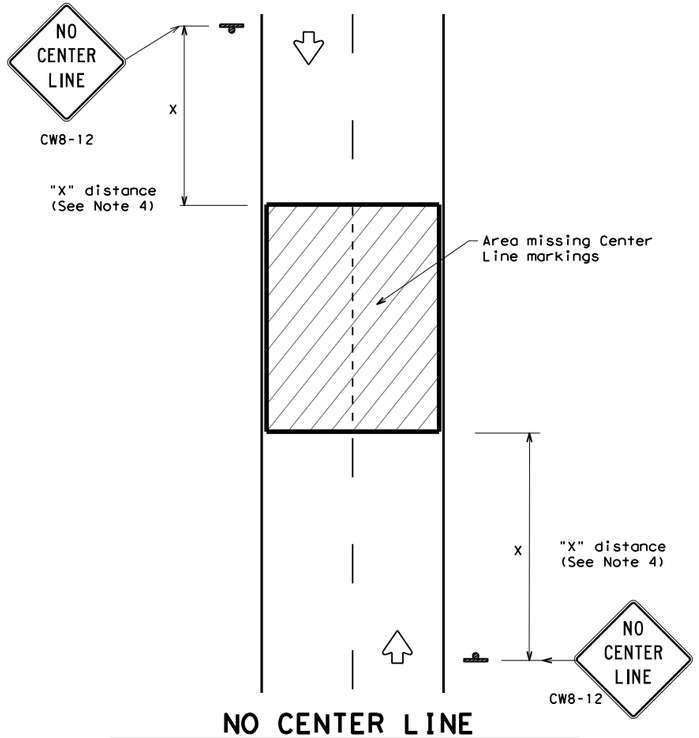


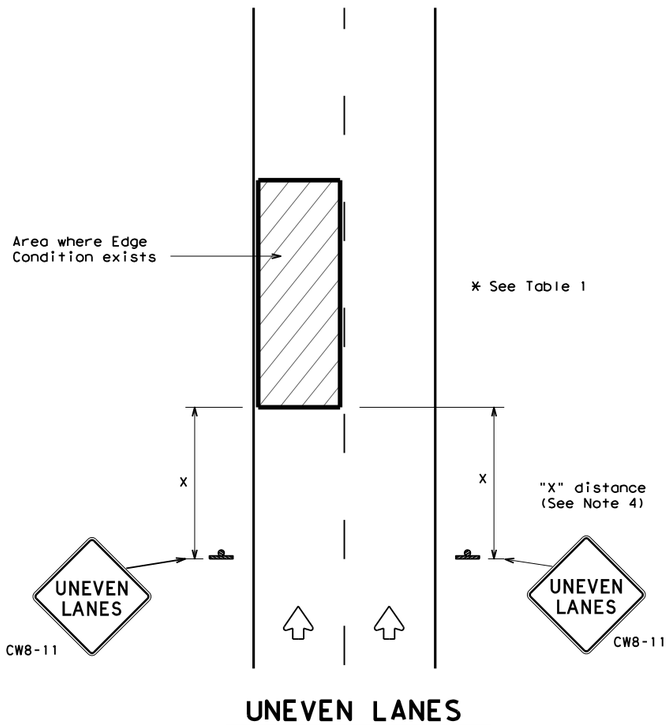
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

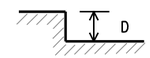
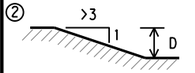
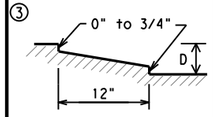
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

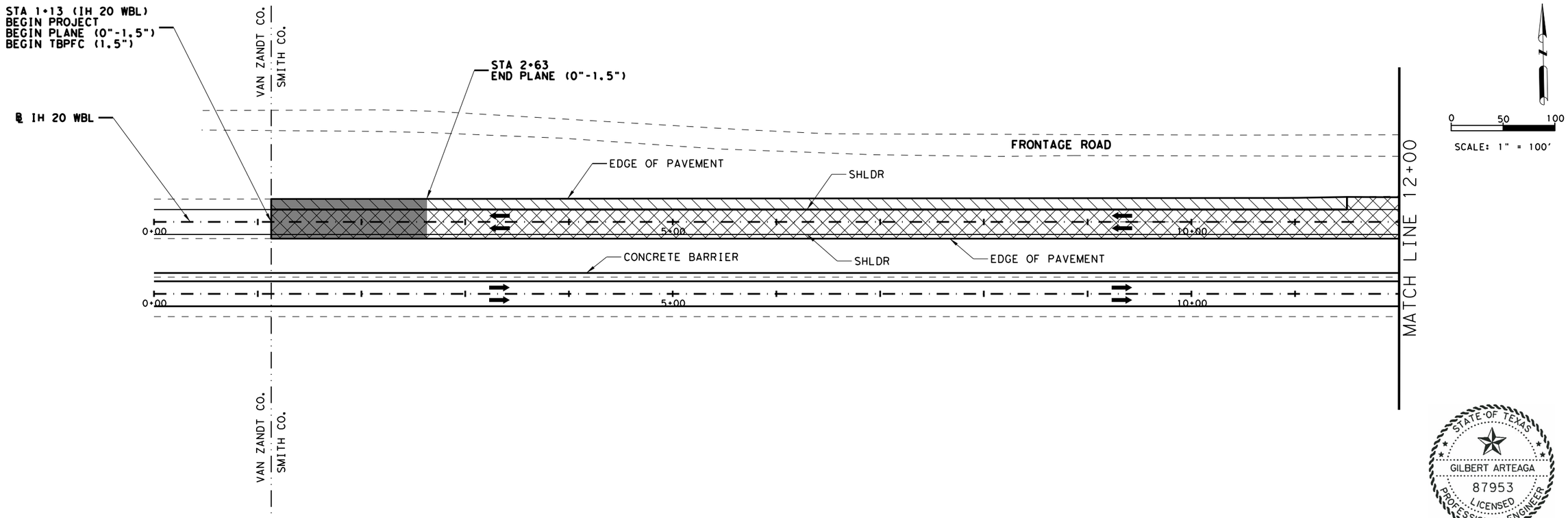
SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE:	wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS		0495	04	076, ETC	IH 20
8-95 2-98 7-13		DIST	COUNTY		SHEET NO.
1-97 3-03		TYL	SMITH		47

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER

12/01/2021

IH 20
(WBL)
PROJECT LAYOUT

Texas Department of Transportation

SHEET 1 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		48

DATE: 10/27/2021 11:36:55 AM
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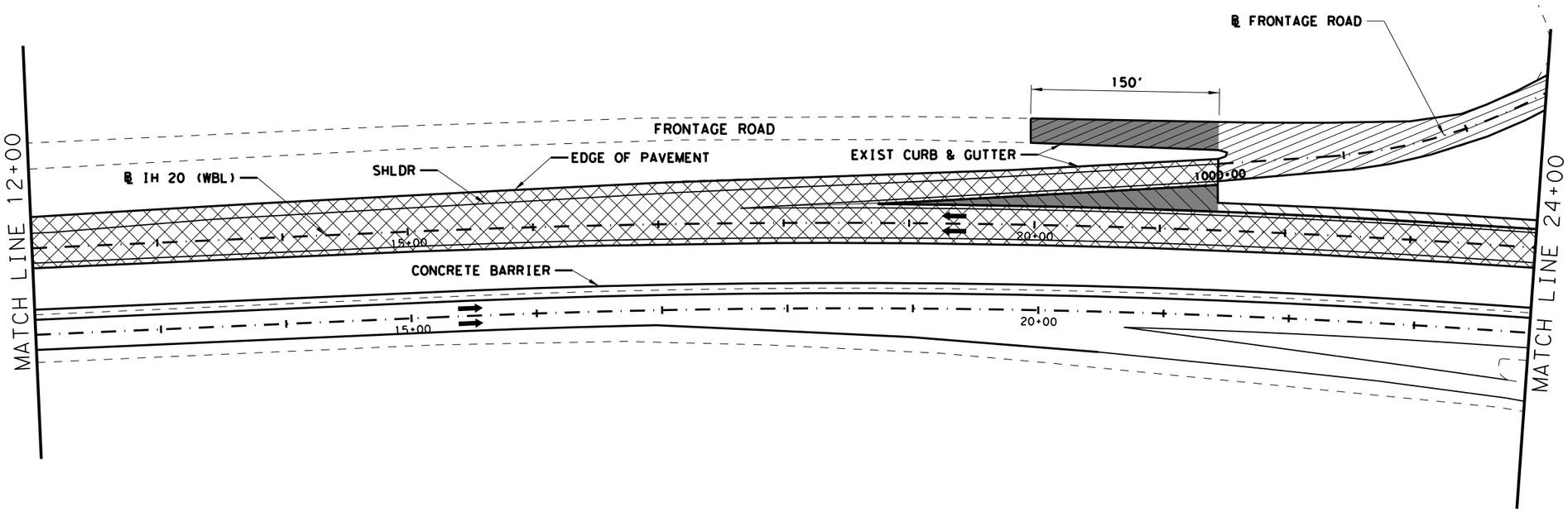
CK:
DW:
CK:
DN:

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



N

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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Gilbert Arteaga
12/01/2021

IH 20
(WBL)
PROJECT LAYOUT

Texas Department of Transportation

SHEET 2 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		49

DATE: 10/27/2021 11:37:02 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432363\IH20_COMB_WBL_PLAN_02.dgn

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING

PLANE (0"-1.5")

PLANE (0"-1.5")

℄ FRONTAGE ROAD

1005+00

1015+00

CR 426 (WILLOW BRANCH RD)

STA 26+50
END TBPFC (1.5")
END PLANE (0"-1.5")
BEGIN SUPERPAVE (2")

STA 25+00
BEGIN PLANE (0"-1.5")

℄ IH 20 (WBL)

SHLDR

STA 33+50
END SUPERPAVE (2")
BEGIN TBPFC (1.5")
BEGIN PLANE (0"-1.5")

EDGE OF PAVEMENT

STA 35+00
END PLANE (0"-1.5")

MATCH LINE 24+00

MATCH LINE 36+00

25+00

30+00

35+00

CONCRETE BARRIER

CONCRETE BARRIER

CONCRETE BARRIER

0 50 100

SCALE: 1" = 100'

IH 20
(WBL)
PROJECT LAYOUT

STATE OF TEXAS
GILBERT ARTEAGA
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PROFESSIONAL ENGINEER

Gilbert Arteaga 12/01/2021

Texas Department of Transportation

SHEET 3 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		50

DATE: 10/27/2021 11:37:07 AM
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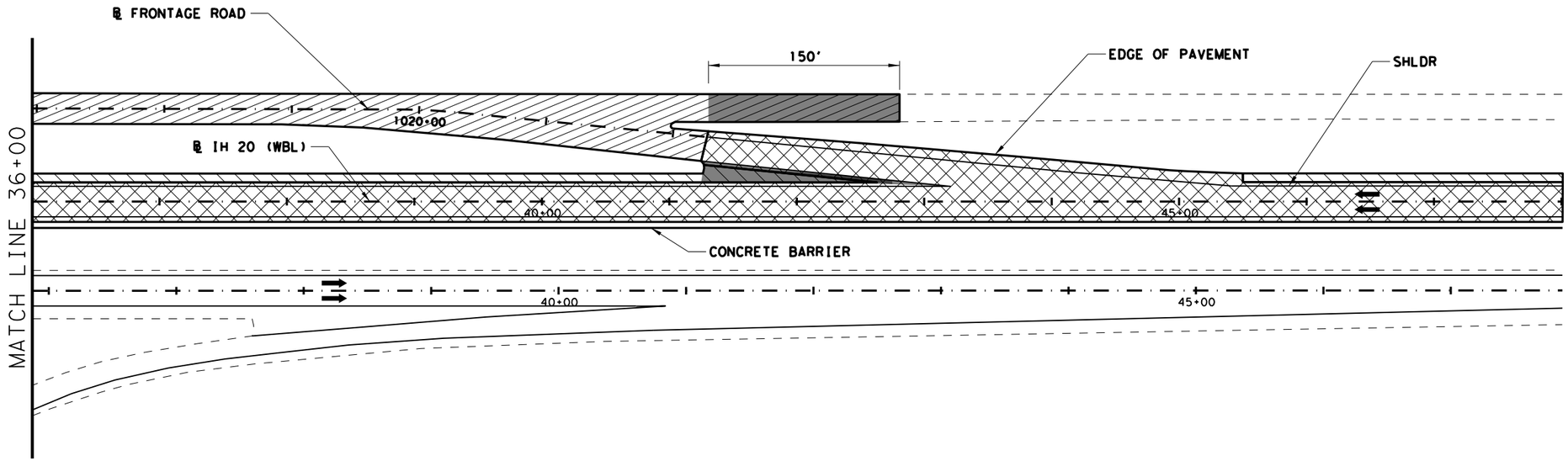
CK:
DW:
CK:
DN:

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
GILBERT ARTEAGA
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Gilbert Arteaga 12/01/2021

IH 20 (WBL) PROJECT LAYOUT

Texas Department of Transportation

SHEET 4 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		51

DATE: 10/27/2021 11:37:13 AM
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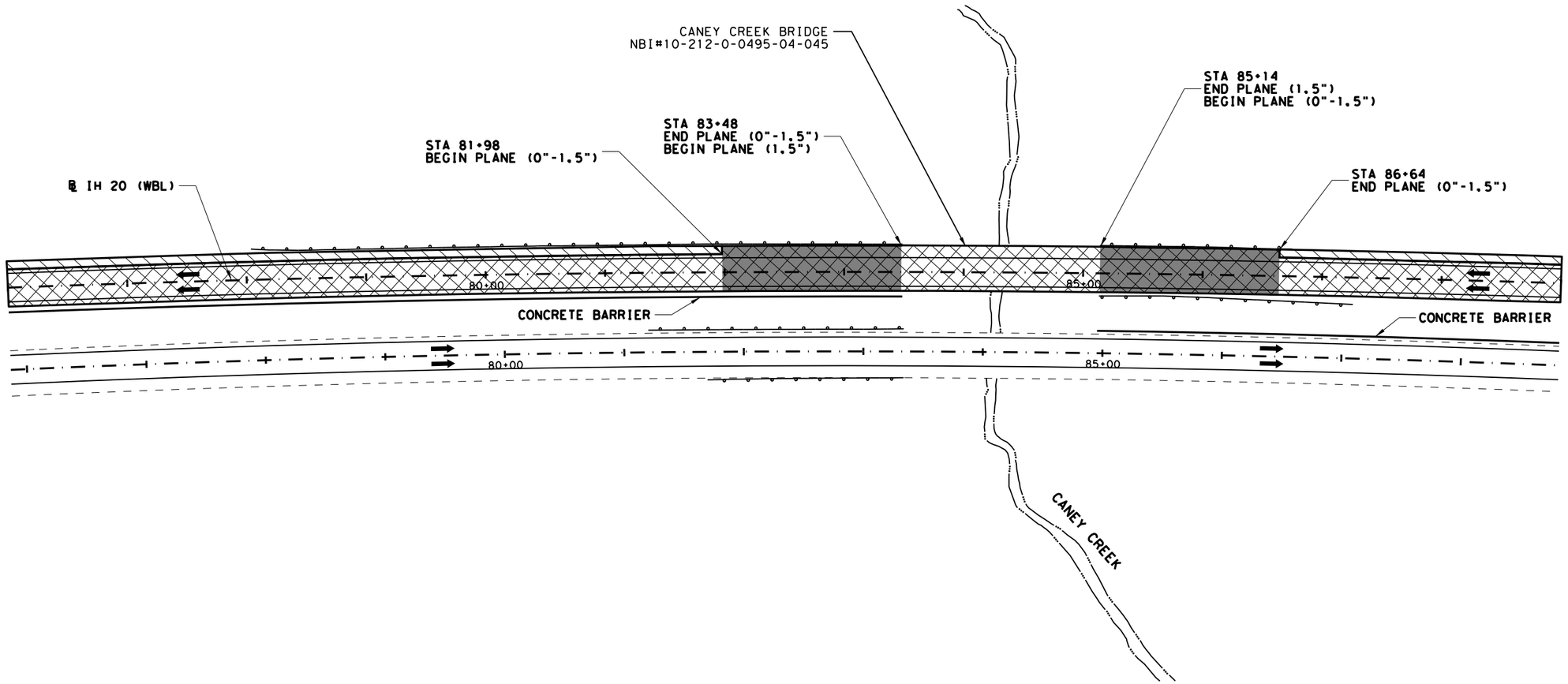
PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

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Gilbert Arteaga 12/01/2021

IH 20
(WBL)
PROJECT LAYOUT

Texas Department of Transportation

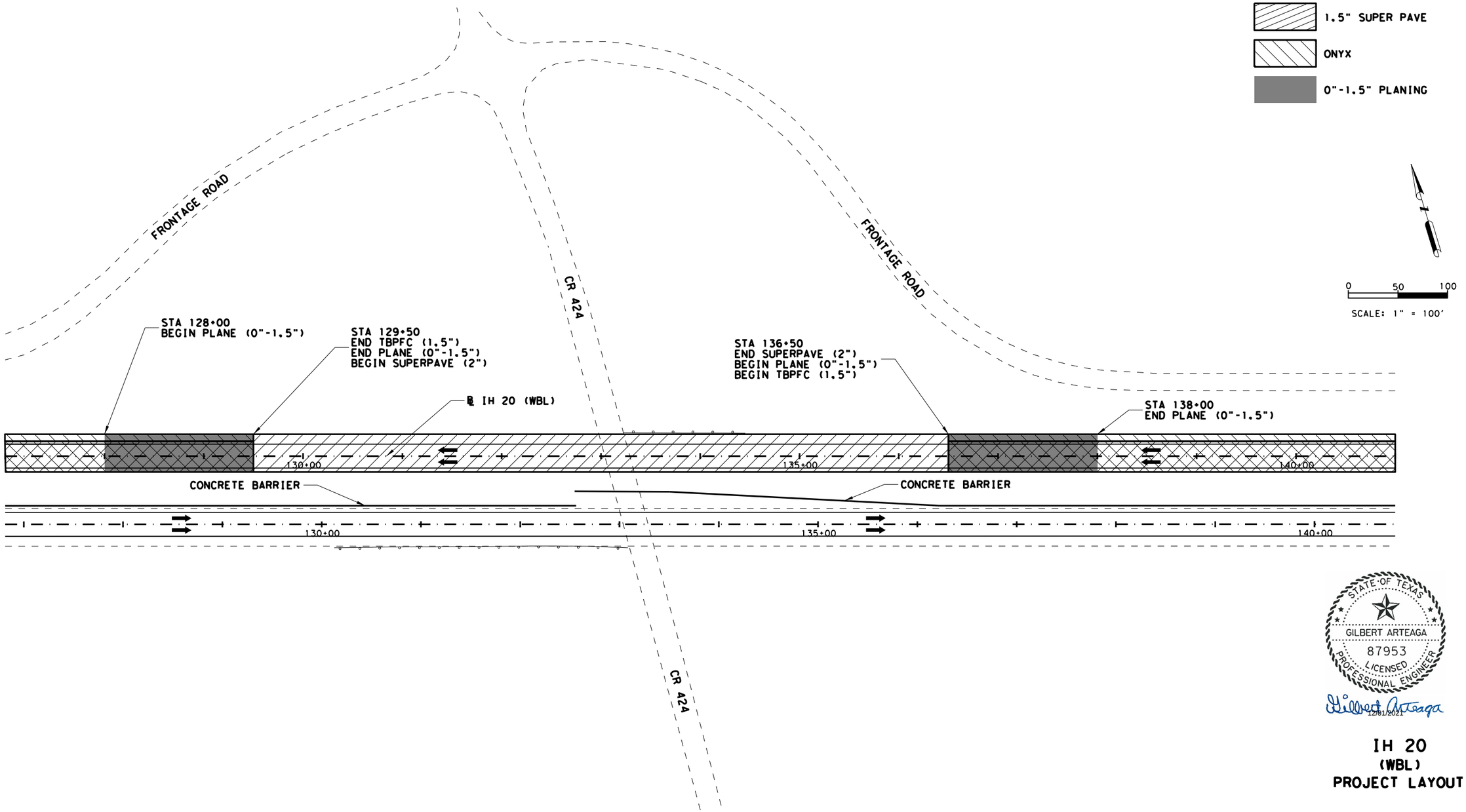
SHEET 5 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		52

DATE: 10/27/2021 11:37:20 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432363\IH20_COMB_WBL_PLAN_05.dgn

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

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IH 20
(WBL)
PROJECT LAYOUT

Texas Department of Transportation

SHEET 6 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		53

DATE: 10/27/2021 11:37:27 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432363\IH20_COMB_WBL_PLAN_06.dgn

CK:
DW:
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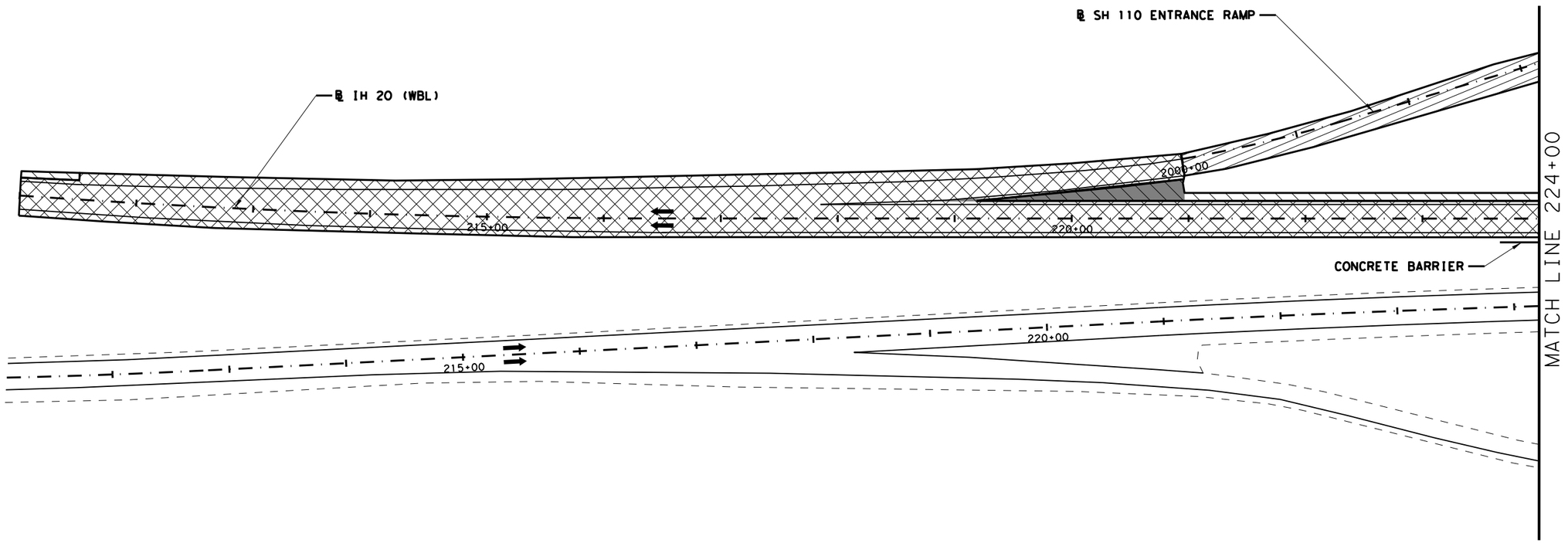
DN:

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



N

0 50 100

SCALE: 1" = 100'

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12/01/2021

IH 20
(WBL)
PROJECT LAYOUT

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SHEET 7 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		54

DATE: 10/27/2021 11:37:32 AM
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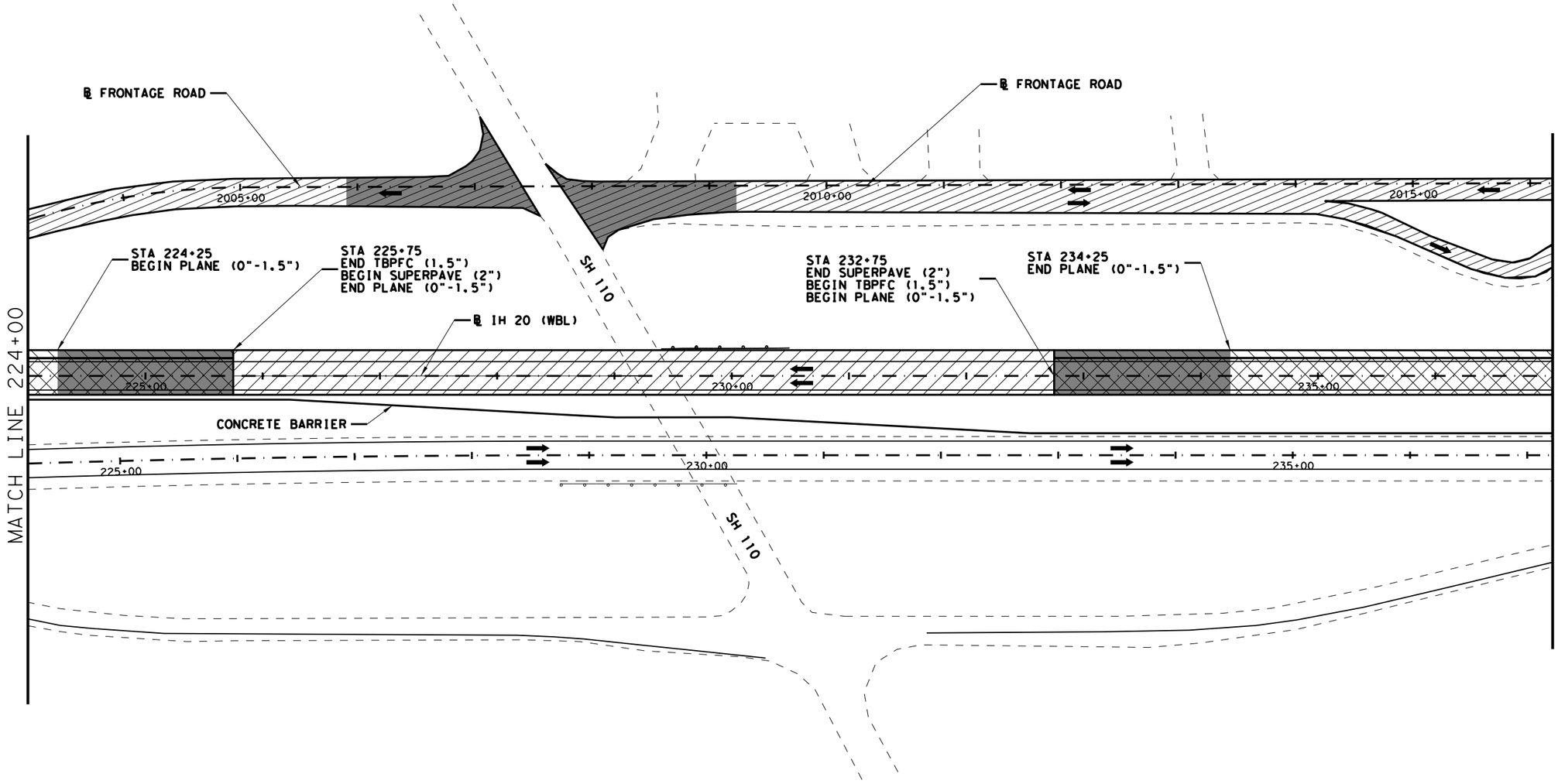
PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

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PROJECT LAYOUT

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SHEET 8 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		55

DATE: 10/27/2021 11:37:37 AM
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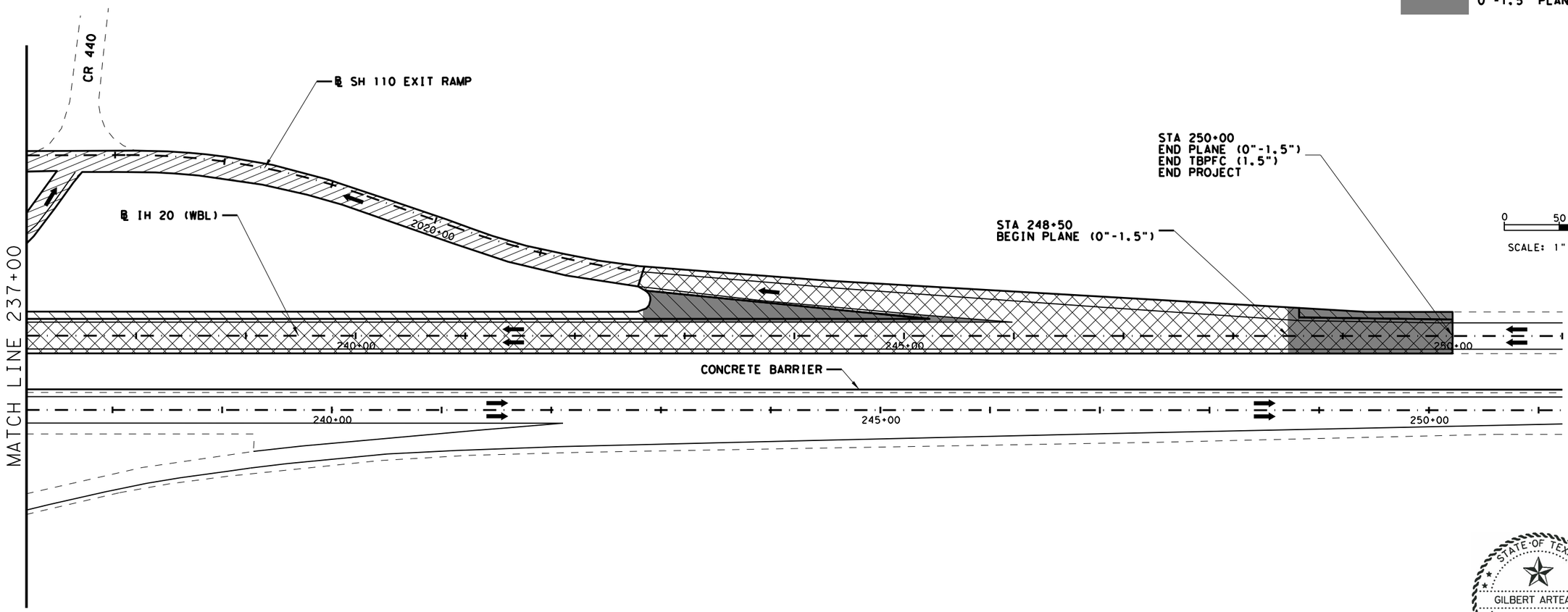
PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

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12/01/2021

IH 20
(WBL)
PROJECT LAYOUT

Texas Department of Transportation

SHEET 9 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		56

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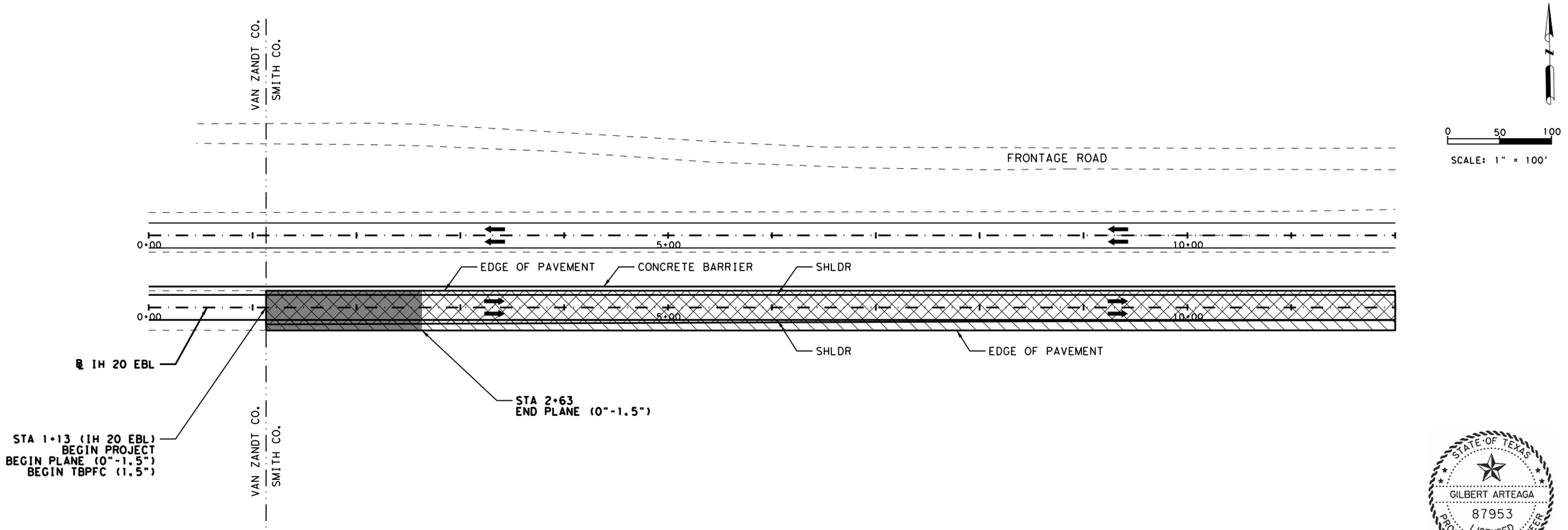
CK:
DW:
CK:
DN:

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



N

0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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12/01/2021

IH 20 (EBL) PROJECT LAYOUT

Texas Department of Transportation

SHEET 10 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		57

DATE: 10/27/2021 11:37:52 AM
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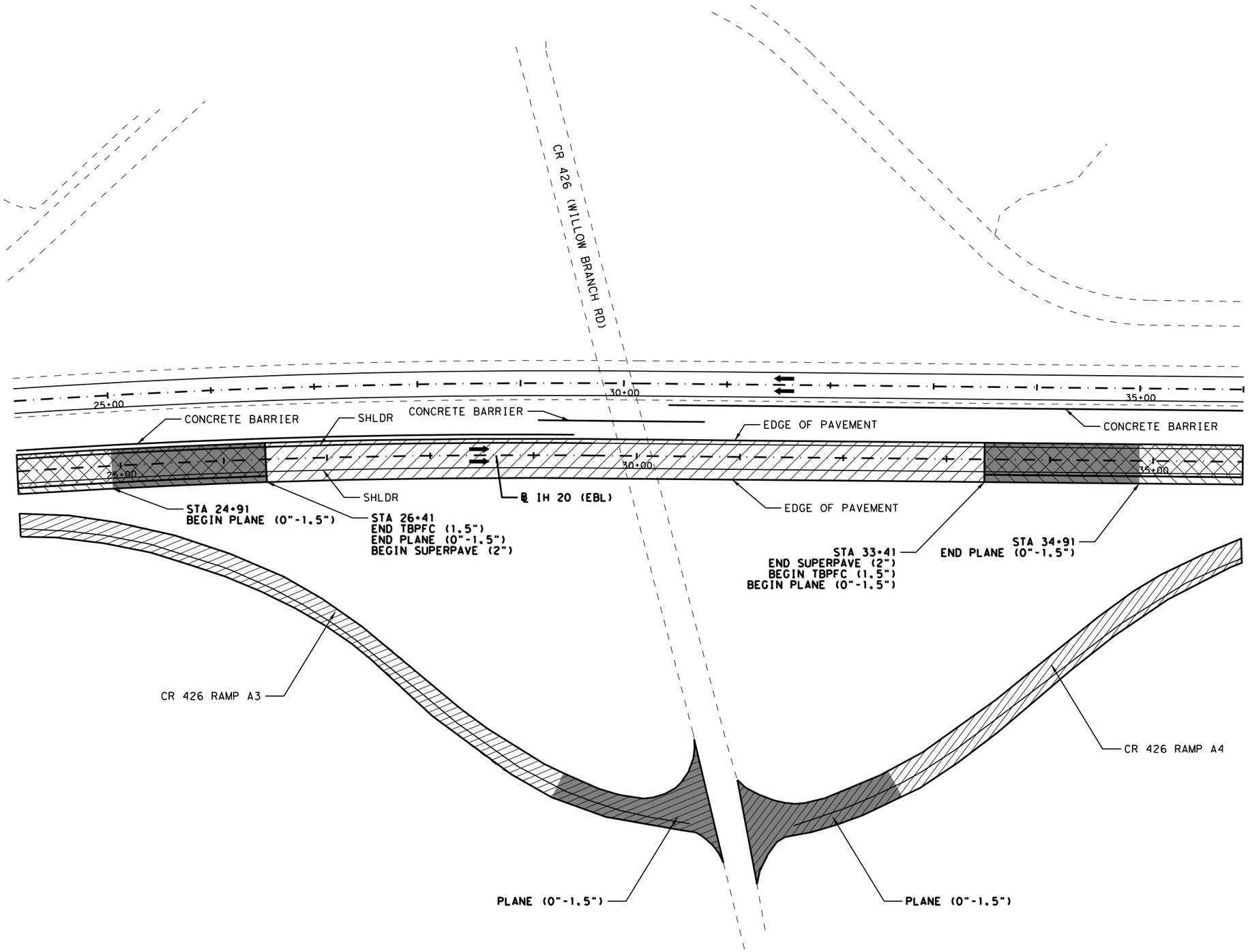
CK:
DW:
CK:
DN:

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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Gilbert Arteaga
12/01/2021

IH 20 (EBL) PROJECT LAYOUT

Texas Department of Transportation

SHEET 11 OF 15

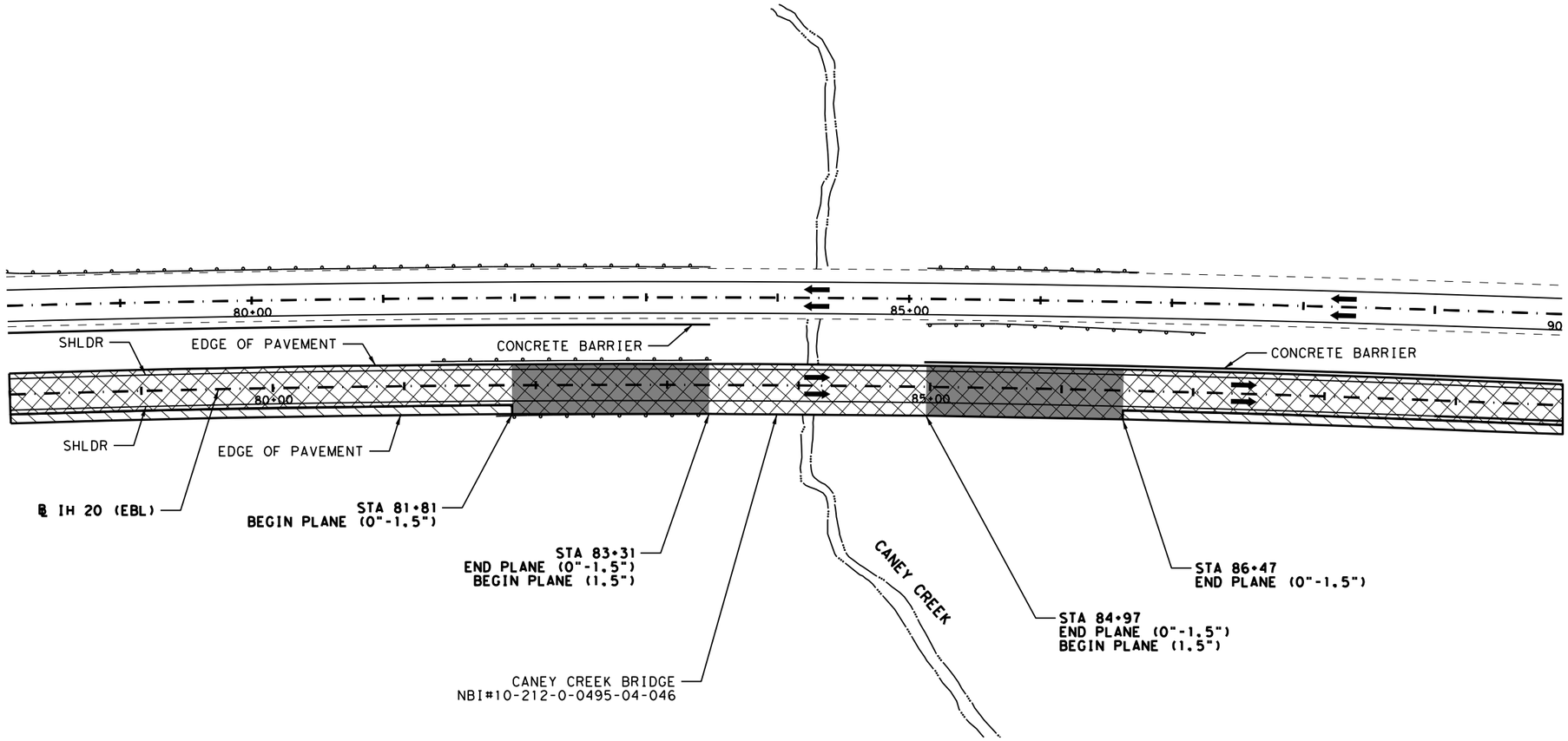
CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		58

DATE: 10/27/2021 11:38:00 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432363\IH20_COMB_EBL_PLAN_03.dgn

CK:
DW:
CK:
DN:

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
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87953
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12/01/2021

IH 20 (EBL) PROJECT LAYOUT

Texas Department of Transportation

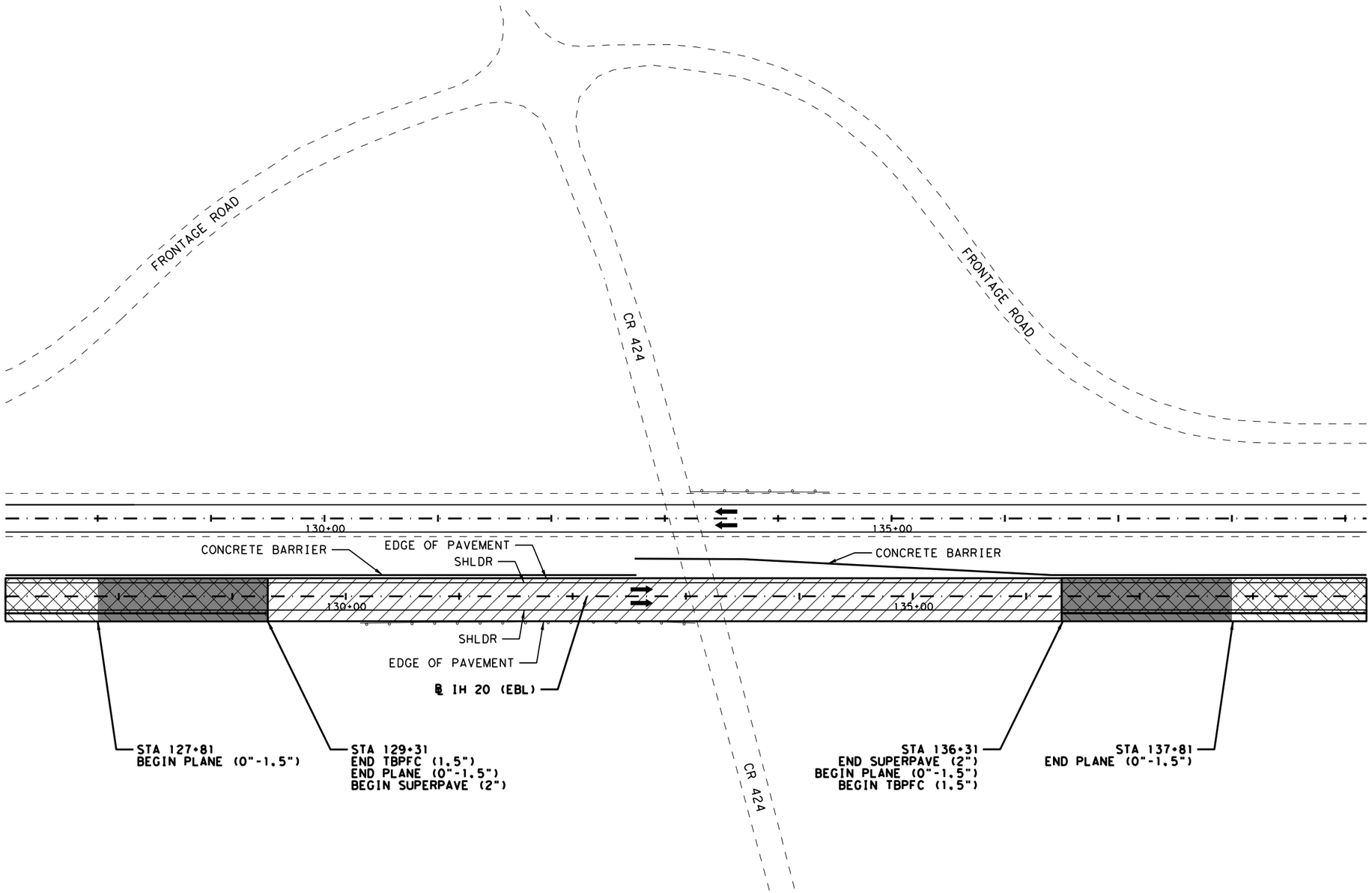
SHEET 12 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		59

DATE: 10/27/2021 11:38:12 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432363\IH20_COMB_EBL_PLAN_05.dgn

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
GILBERT ARTEAGA
87953
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PROFESSIONAL ENGINEER

12/01/2021

IH 20 (EBL) PROJECT LAYOUT

Texas Department of Transportation

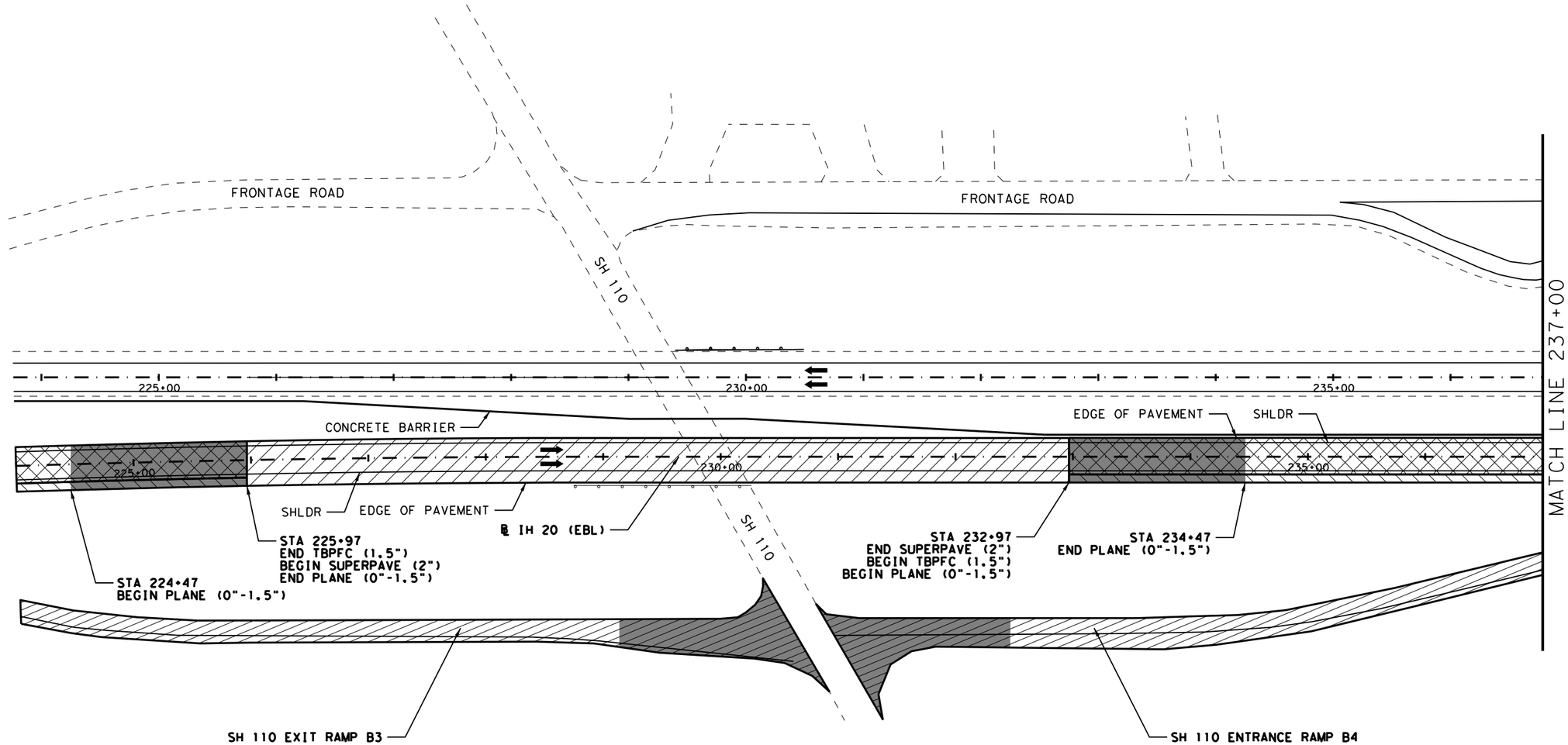
SHEET 13 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		60

DATE: 10/27/2021 11:38:20 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432363\IH20_COMB_EBL_PLAN_06.dgn

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER

12/01/2021

IH 20 (EBL) PROJECT LAYOUT

Texas Department of Transportation

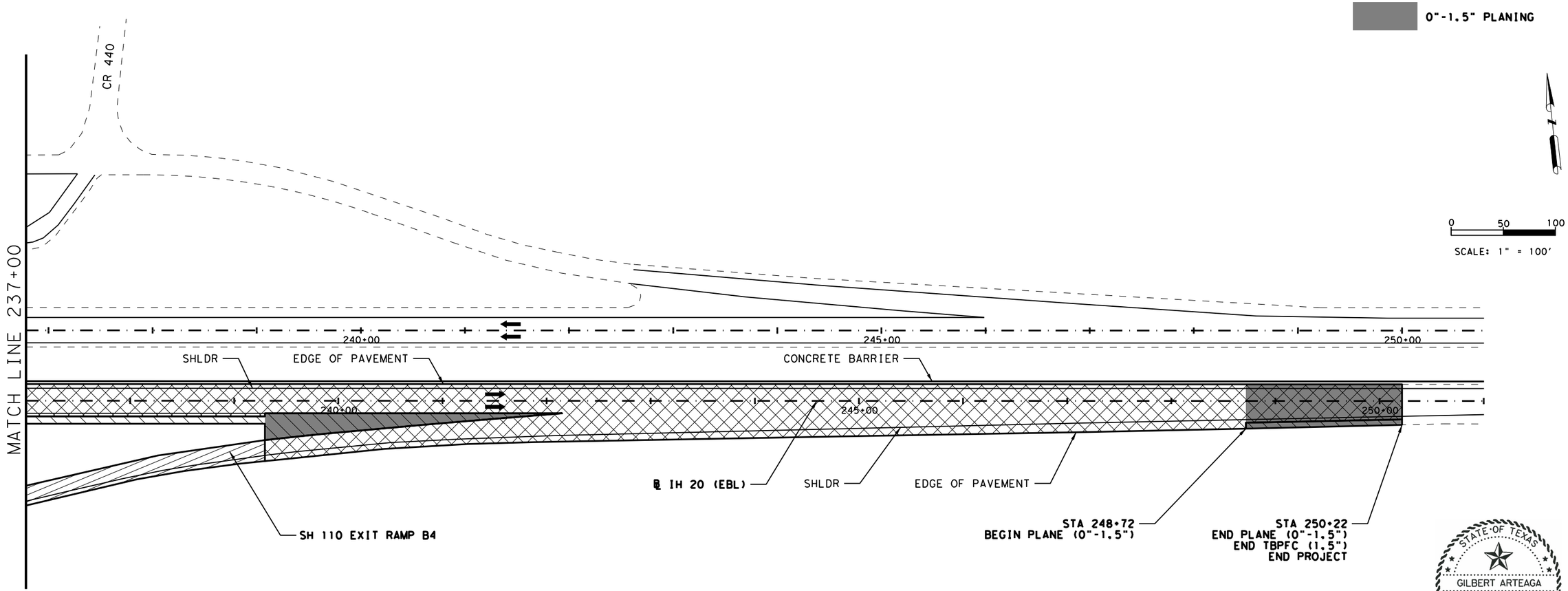
SHEET 14 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		61

DATE: 10/27/2021 11:38:28 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432363\IH20_COMB_EBL_PLAN_08.dgn

PLAN LEGEND

- 1.5" TBPFC
- 2" PLANING/ 2" SUPER PAVE
- 1.5" SUPER PAVE
- ONYX
- 0"-1.5" PLANING



0 50 100

SCALE: 1" = 100'

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER

12/01/2021

IH 20 (EBL) PROJECT LAYOUT

Texas Department of Transportation

SHEET 15 OF 15

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		62

DATE: 10/27/2021 11:38:36 AM
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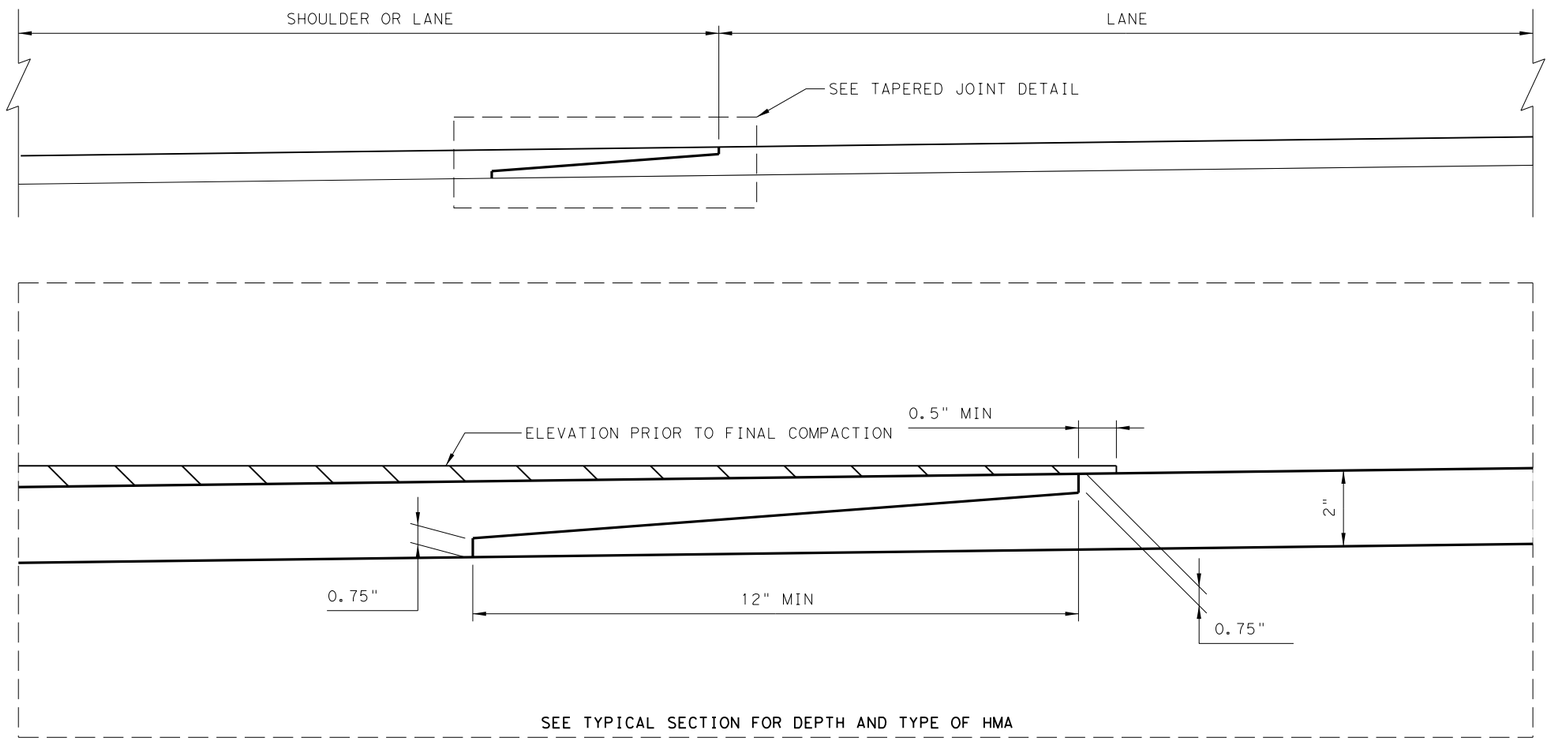

TAPERED JOINT DETAIL

NOTES:
EXTEND THE TAPERED PORTION OF THE MAT BEYOND THE NORMAL LANE WIDTH.
CONSTRUCT THE TAPERED PORTION OF THE MAT USING AN APPROVED STRIKE-OFF DEVICE THAT WILL PROVIDE A UNIFORM SLOPE AND WILL NOT RESTRICT THE MAIN SCREED.
APPLY TACK COAT TO THE IN-PLACE TAPER BEFORE THE ADJACENT MAT IS PLACED.
FINAL DENSITY REQUIREMENTS FOR THE ENTIRE PAVEMENT, INCLUDING THE TAPER AREA, WILL NOT CHANGE.
COMPACTION OF THE INITIAL TAPER SECTION WILL BE REQUIRED TO BE AS NEAR TO FINAL DENSITY AS POSSIBLE.
USE A SMALL STATIC ROLLER (APPROXIMATELY 200 LBS) LOCATED IMMEDIATELY BEHIND THE PAVER FOR PRE-COMPACTION OF THE NOTCHED WEDGE JOINT.

(NOT TO SCALE)

STATE OF TEXAS
GILBERT ARTEAGA
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LICENSED
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12/01/2021

IH 20 MISCELLANEOUS DETAILS

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		63

DATE: 10/27/2021 11:38:43 AM
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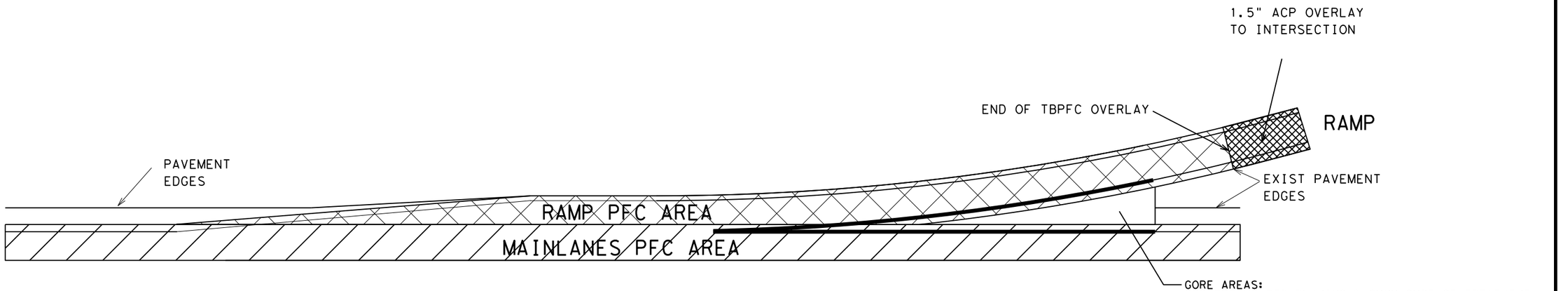

TYPICAL LIMITS OF TBPFC OVERLAY AT RAMPS (WBL & EBL)

END OF PFC OVERLAY SHALL BE
ADJUSTED IN THE FIELD TO ALLOW
POSITIVE PAVEMENT DRAINAGE

(NOT TO SCALE)

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER

Gilbert Arteaga
12/01/2021

IH 20
MISCELLANEOUS
DETAILS

Texas Department of Transportation

SHEET 2 OF 2

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		64

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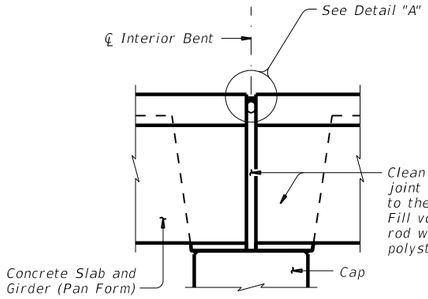
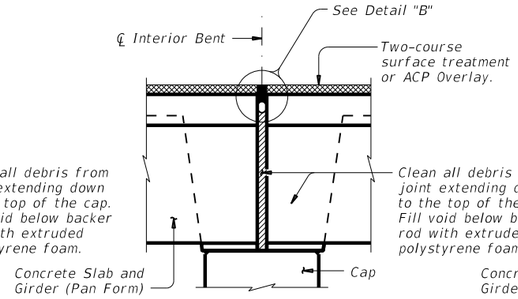
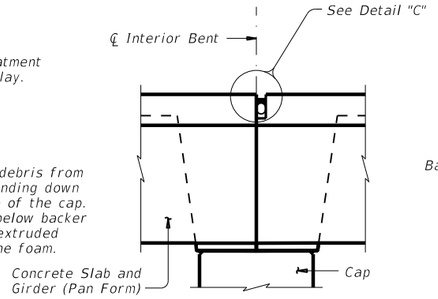


JOINT WITH SILICONE SEAL
(used without ACP Overlay)

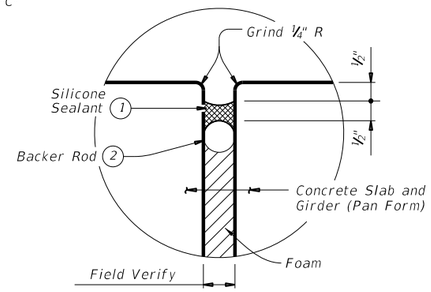


JOINT WITH HOT POURED RUBBER SEAL
(used with ACP Overlay)

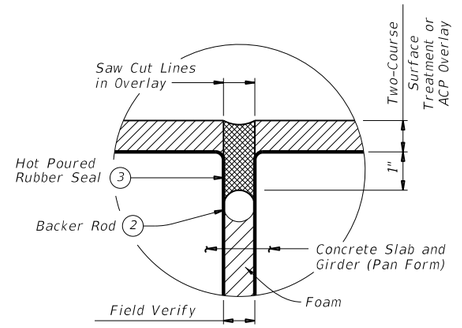


FIXED JOINT

EXISTING CONCRETE SLAB & GIRDER JOINT REPAIR

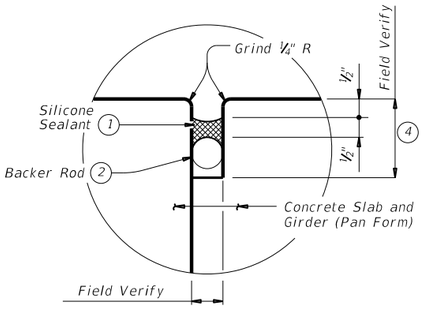


DETAIL "A"



DETAIL "B"

1. Use Class 7 silicone sealant. Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."
2. Backer rod must be 25% larger than joint opening and must be compatible with the sealant.
3. Use Class 3 hot poured rubber seal. Prepare joint and seal in accordance with Item 438 "Cleaning and Sealing Joints."
4. Backer rod may be omitted if existing joint depth is less than 1½".



DETAIL "C"

PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE GIRDER JOINT WITH SILICONE SEAL:

1) Clean joint opening of all old expansion materials/devices, dirt, and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints." Clean joint out full depth of the joint.
2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
3) Place backer rod into joint opening 1" below the top of concrete. The backer rod must be 25% larger than the joint opening. Fill void below backer rod with extruded polystyrene foam.
4) Seal the joint opening with a Class 7 Silicone. Recess seal ½" below top of concrete in travel lanes and ⅛" below top of concrete in shoulders.

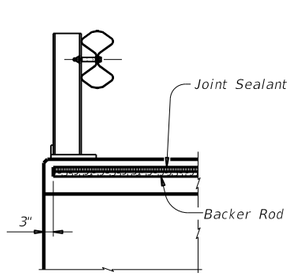
PROCEDURE FOR CLEANING AND SEALING EXISTING CONCRETE GIRDER JOINT WITH HOT POURED RUBBER SEAL:

1) Saw cut through the asphalt at the centerline of joint. Make multiple saw cuts to create a ½" minimum joint opening or match the existing joint opening. Clean joint opening of all old expansion materials/devices, bituminous materials, dirt, grease and all other deleterious materials in accordance with Item 438, "Cleaning and Sealing Joints."
2) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
3) Place backer rod into joint opening 1" below the top of concrete. Backer rod must be compatible with the hot poured rubber sealant and rated for a minimum of 400°F. The backer rod must be 25% larger than the joint opening. Fill void below backer rod with extruded polystyrene foam.
4) Seal the joint opening with a Class 3, "Hot Poured Rubber." Seal flush to the top of the asphaltic concrete pavement.

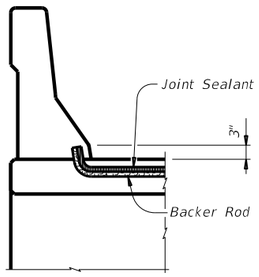
PROCEDURE FOR CLEANING AND SEALING EXISTING FIXED JOINTS:

1) Remove existing seal and debris from recess.
2) Abrasive blast clean existing surfaces where silicone seal is to be placed.
3) Obtain approval of cleaned joint prior to proceeding with joint sealing operation.
4) Place backer rod into joint opening 1" below the top of concrete. The backer rod must be 25% larger than the joint opening.
5) Seal the joint opening with a Class 7 Silicone. Recess seal ½" below top of concrete in travel lanes and ⅛" below top of concrete in shoulders.

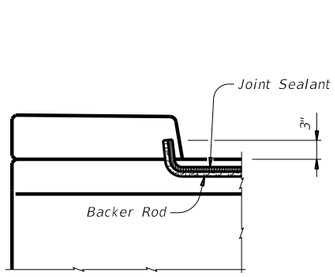
NOTE:
DURING LANE CLOSURES AND PRIOR TO MILLING OPERATIONS, THE CONTRACTOR SHALL MARK BRIDGE JOINT LOCATIONS.



SHOWN AT STEEL RAIL



SHOWN AT BARRIER RAIL



SHOWN AT CURB

JOINT SEALANT TERMINATION DETAILS

GENERAL NOTES

Cleaning existing joint opening (full depth) of all debris, providing and placing backer rod, saw-cutting asphalt overlay, and sealing joint is paid for by Item 438, "Cleaning and Sealing Joints" and measured by the linear foot.

Obtain approval for all tools, equipment, materials and techniques proposed for use to prepare the joint.

For Class 3 Hot Poured Rubber Seal, provide backer rod compatible with the hot poured rubber sealant and rated for a minimum of 400°F.

Provide Class 3 sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in asphalt overlay.

Provide Class 7 silicone sealant in accordance with DMS-6310, "Joint Sealants and Fillers" for joints in concrete.

Extend sealant up into rail or curb 3 inches on low side or sides of deck. If the Class 7 Sealant cannot be effectively placed in the vertical position, a Class 4 Sealant compatible with the Class 7 sealant is allowed for the extension of the seal into the curb or rail. Prepare surfaces where sealant is to be placed in accordance with manufacturer's specifications.

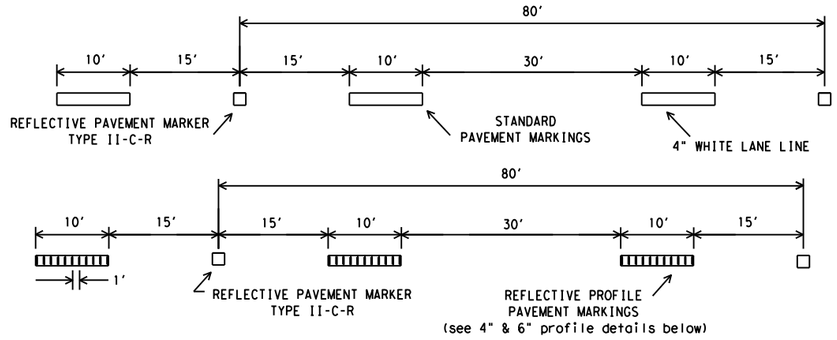
DATE:
FILE:

Texas Department of Transportation

Bridge Division

CLEANING AND SEALING EXISTING BRIDGE JOINTS
(PAN GIRDER BRIDGES)

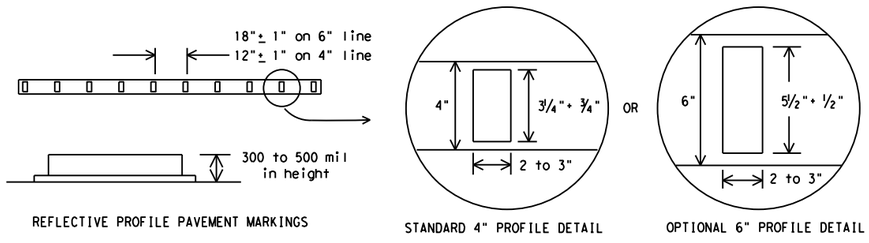
FILE: cleansealjts pangirder.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT OCTOBER 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0495	04	076, ETC	IH 20
	DIST	COUNTY		SHEET NO.
	TYL	SMITH		65



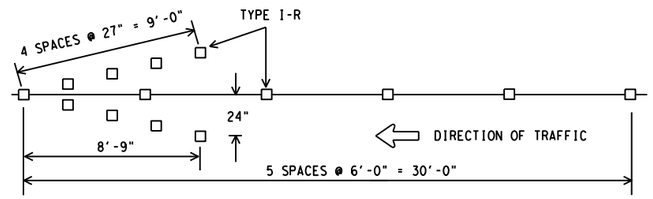
PAVEMENT MARKERS (REFL) TYPE II-C-R SHALL BE SPACED ON 80' CENTERS WITH THE CLEAR FACE TOWARD NORMAL TRAFFIC AND THE RED FACE TOWARD WRONG WAY TRAFFIC.

TRAFFIC LANE LINES PAVEMENT MARKING DETAILS

EDGELINES SHOULD TYPICALLY BE 4" WIDE AND THE MATERIALS SHALL BE AS SPECIFIED IN THE PLANS.
IF RAISED PROFILE PAVEMENT MARKINGS ARE USED SEE DETAILS BELOW.



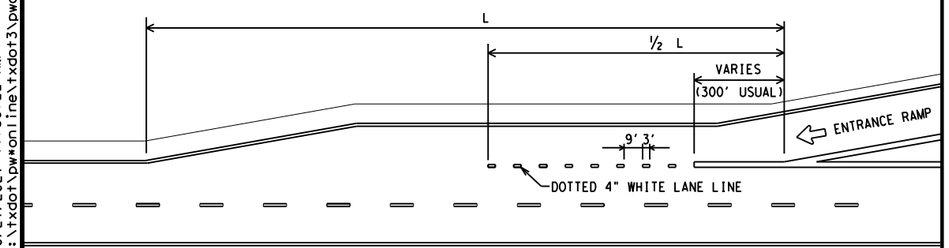
EDGELINE PAVEMENT MARKINGS



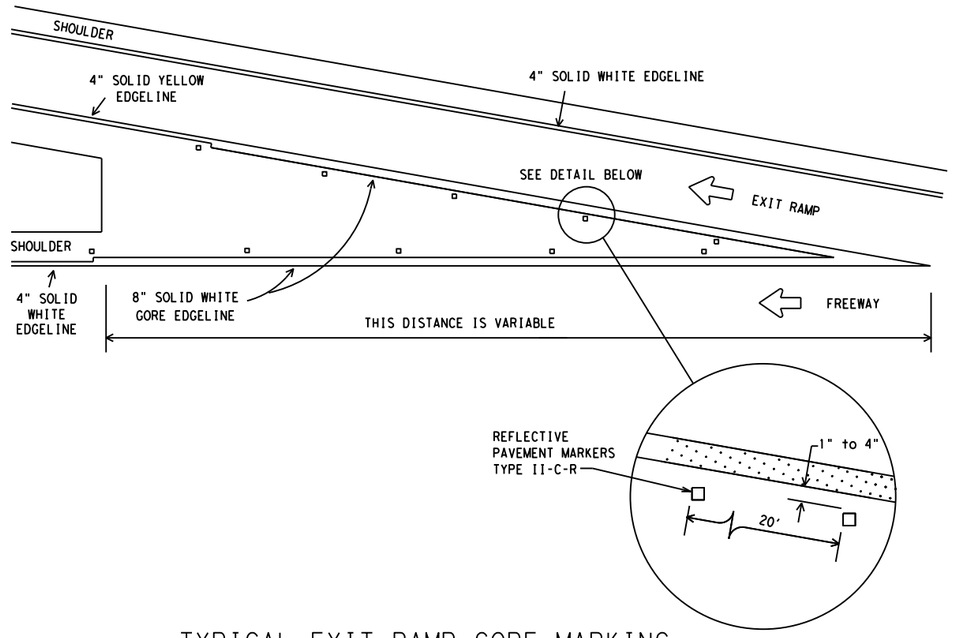
ALL RAISED MARKERS IN THE WRONG WAY ARROW SHALL BE TYPE I-R REFLECTORIZED PAVEMENT MARKERS WITH THE REFLECTORIZED SURFACE FACING THE WRONG WAY TRAFFIC. TYPE II-C-R SHALL NOT BE USED.

REFLECTORIZED WRONG WAY ARROWS, NOT TO EXCEED TWO, MAY BE PLACED ON EXIT RAMPS.
LOCATION OF THE ARROWS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.

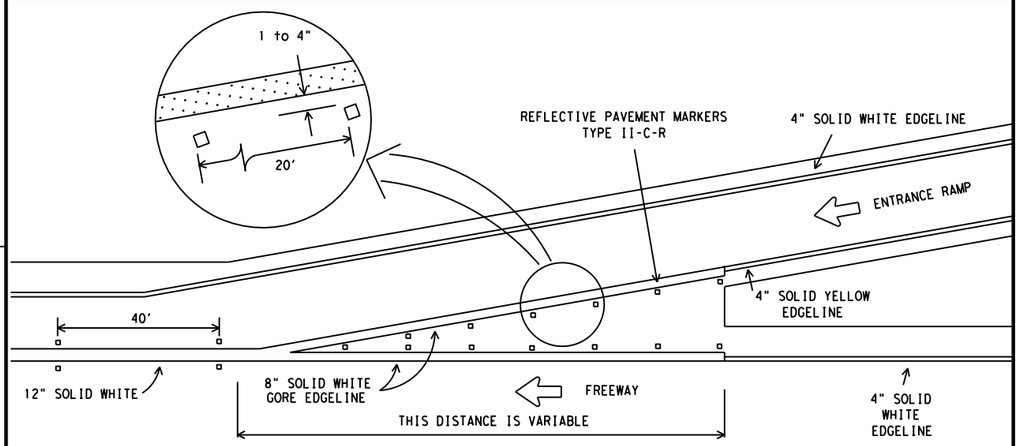
WRONG WAY ARROW DETAIL



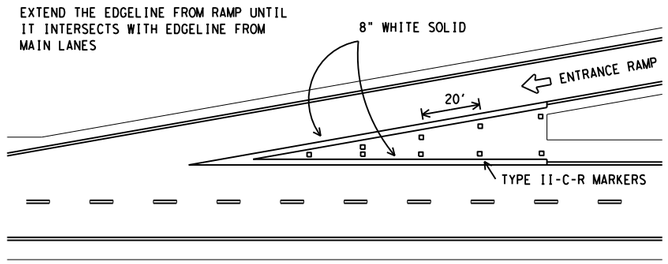
PARALLEL ACCELERATION LANE



TYPICAL EXIT RAMP GORE MARKING



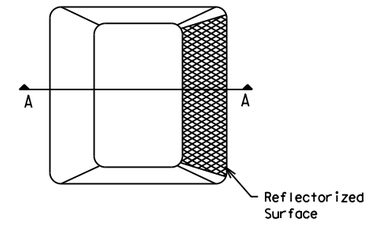
TYPICAL ENTRANCE RAMP GORE MARKING



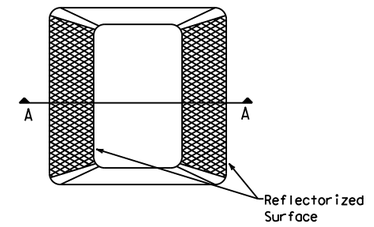
TAPERED ACCELERATION LANE

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

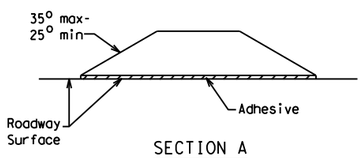
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS WITH RAISED PAVEMENT MARKERS

FPM(1)-12

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

REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10	0495	04	076, ETC	IH 20
5-00	2-12	DIST	COUNTY		SHEET NO.
8-00		TYL	SMITH		66
2-08					

23A

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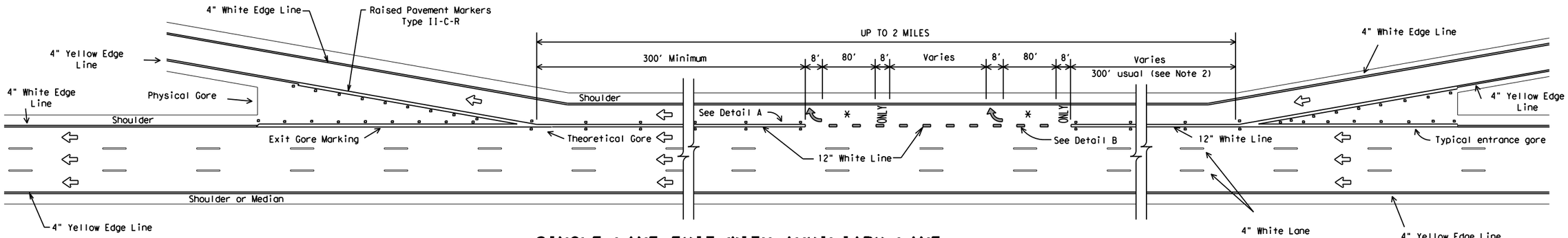
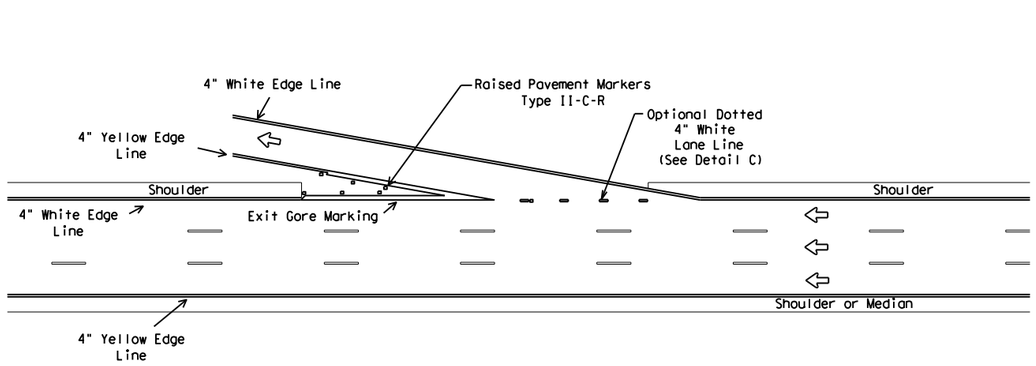
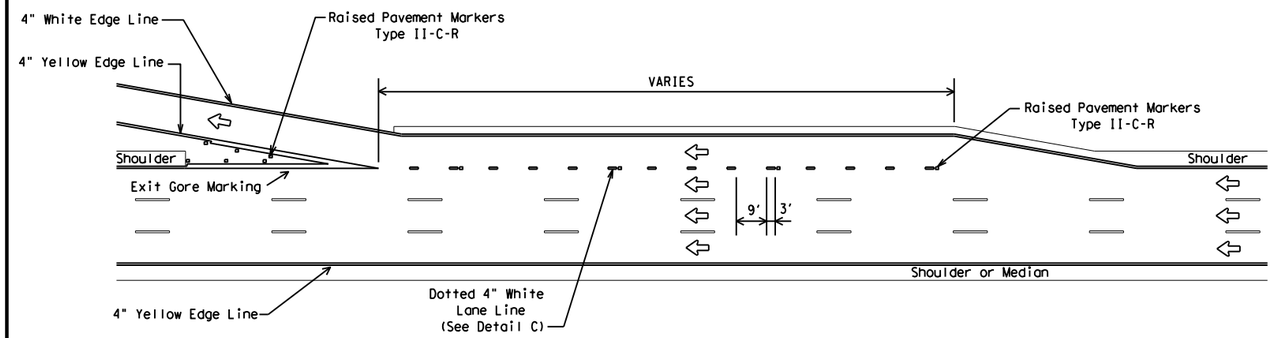


SINGLE LANE EXIT WITH AUXILIARY LANE

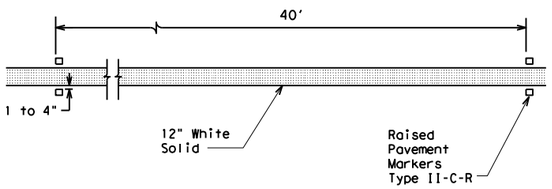
(See Note 2)



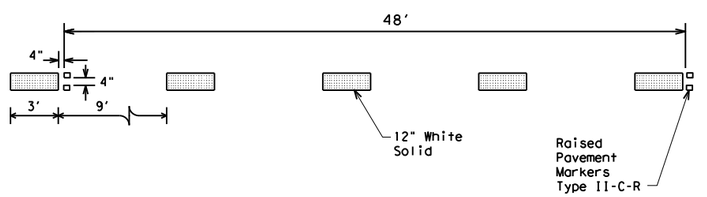
TAPERED DECELERATION LANE



PARALLEL DECELERATION LANE

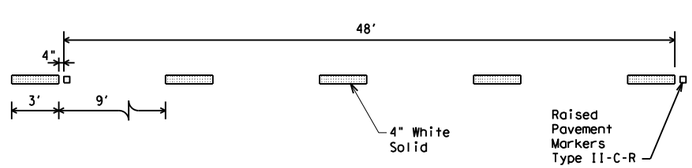


DETAIL A



DETAIL B

Wide (12") Dotted Lane Line (See Note 3)



DETAIL C

Normal (4") Dotted Lane Line (See Note 4)

GENERAL NOTES

1. Pavement markings shall be white except as otherwise noted.
2. Length of 12" white line may vary depending on location.
3. Wide (12") Dotted Lane Line (See Detail B) is used to separate a through lane from a lane drop at normal exit ramp and from an auxiliary lane between an entrance and exit ramp.
4. Normal (4") Dotted Lane Line (See Detail C) is used at parallel acceleration and deceleration lanes.

LEGEND	
⇦	Denotes direction of traffic.
↱	Pavement marking arrows (white)
✳	Arrow markings are optional, however "ONLY" is required if arrow is used

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

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

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD FREEWAY PAVEMENT MARKINGS ENTRANCE AND EXIT RAMPS

FPM(2)-12

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

REVISIONS
4-92 2-10
8-95 2-12
5-00
8-00

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20

DIST	COUNTY	SHEET NO.
TYL	SMITH	67

23B

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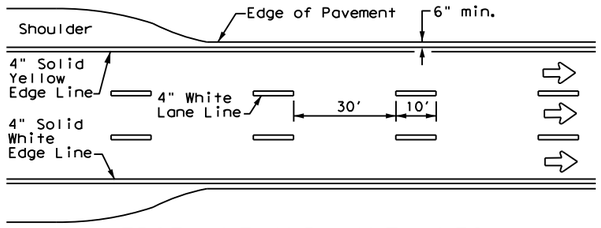
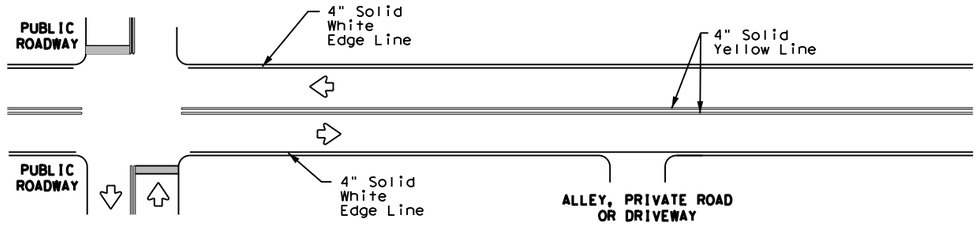
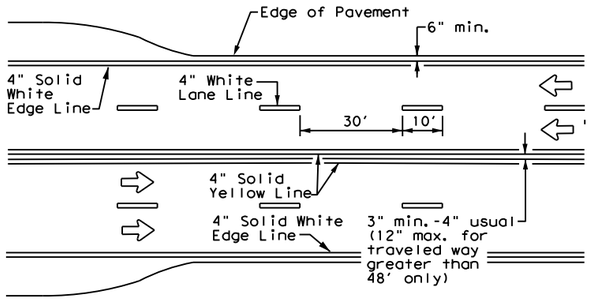


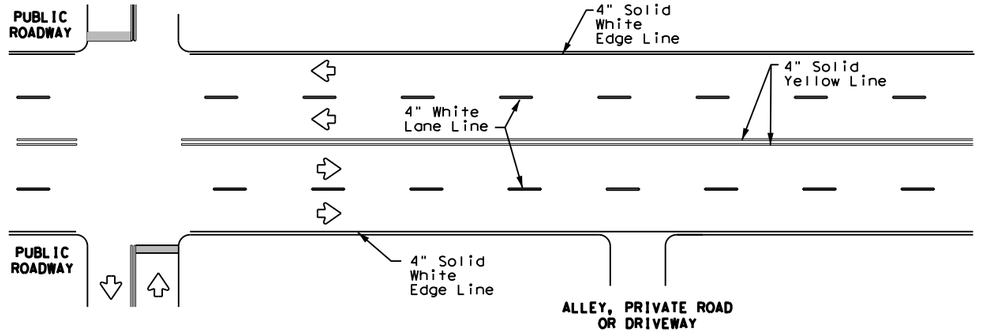
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



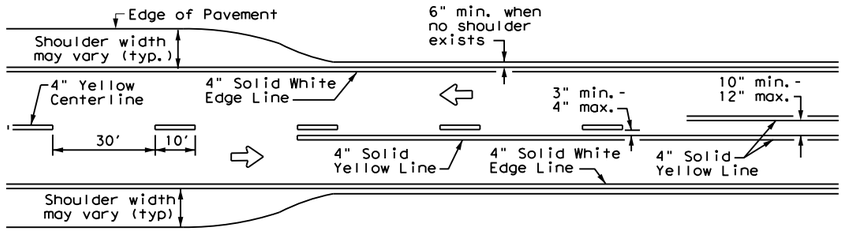
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



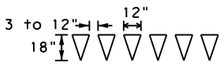
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



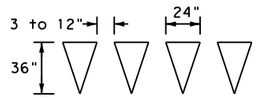
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

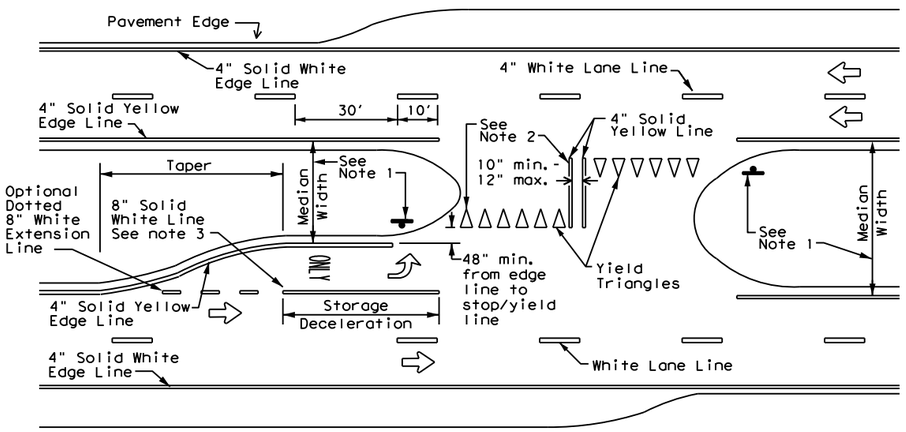


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.

2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.

3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

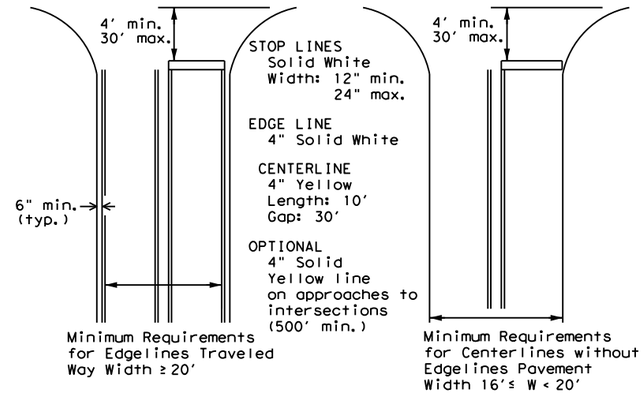
GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.

2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

FILE: pm1-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0495	04	076, ETC	IH 20
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	TYL	SMITH		68

22A

DATE: 10/27/2021 11:39:34 AM
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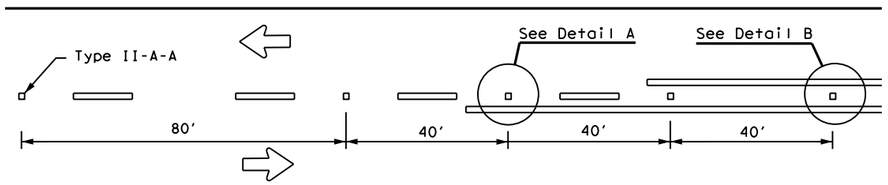
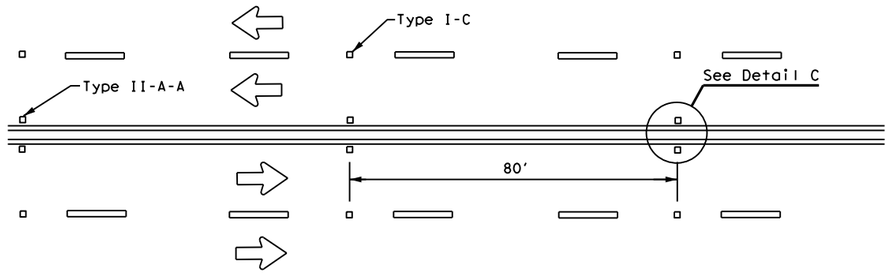
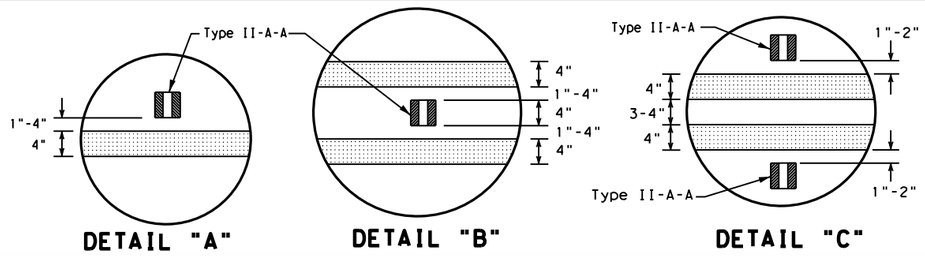
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



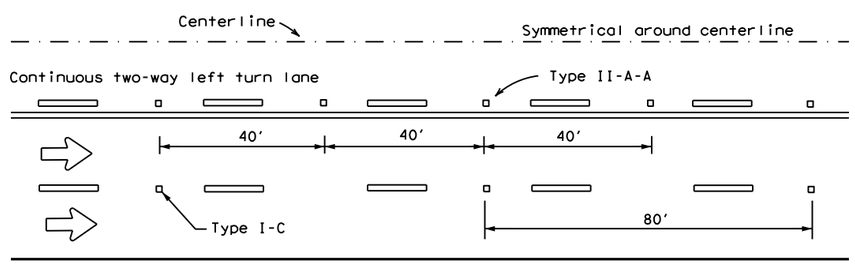
CENTERLINE FOR ALL TWO LANE ROADWAYS



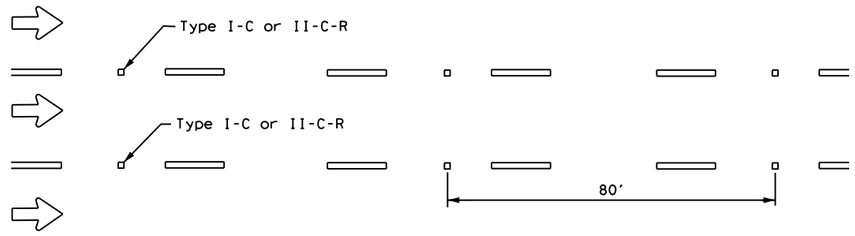
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" **DETAIL "B"** **DETAIL "C"**

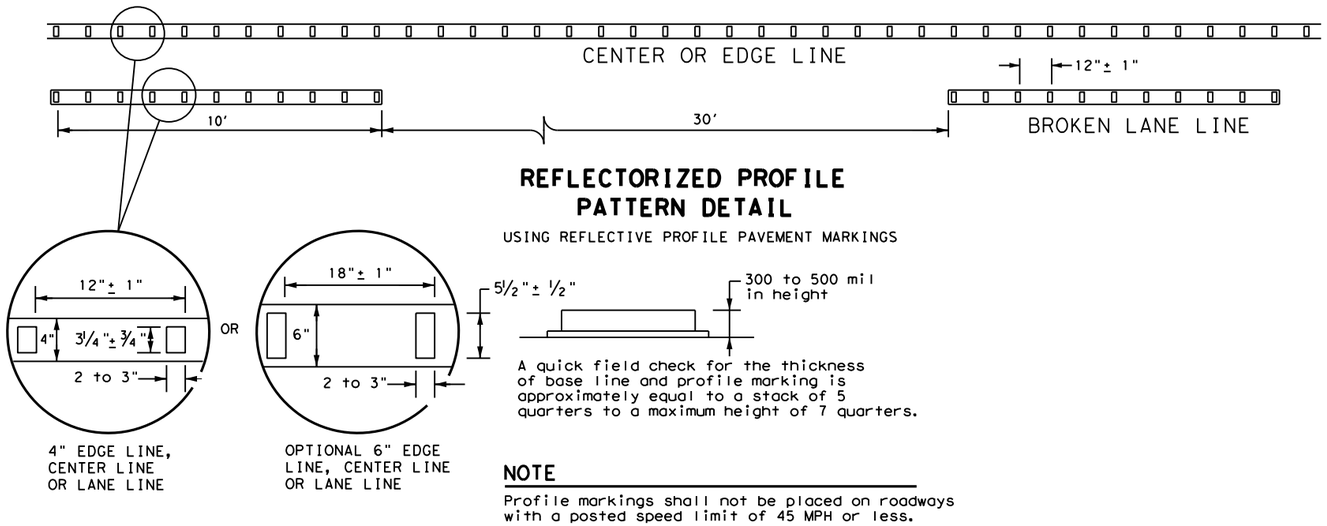


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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

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



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

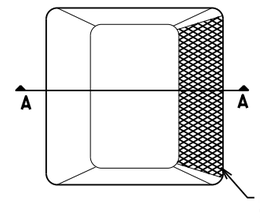
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

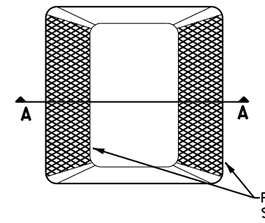
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

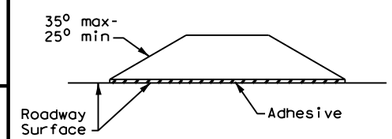
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	0495	04	076, ETC	IH 20
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8-00 6-20	TYL	SMITH		69

22B

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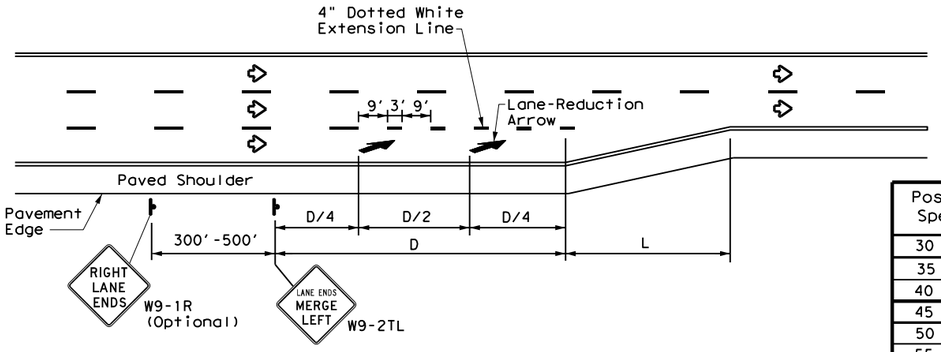
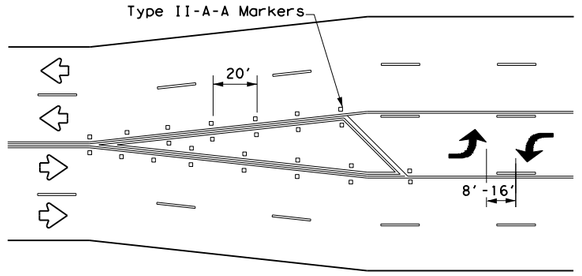


LANE REDUCTION

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.

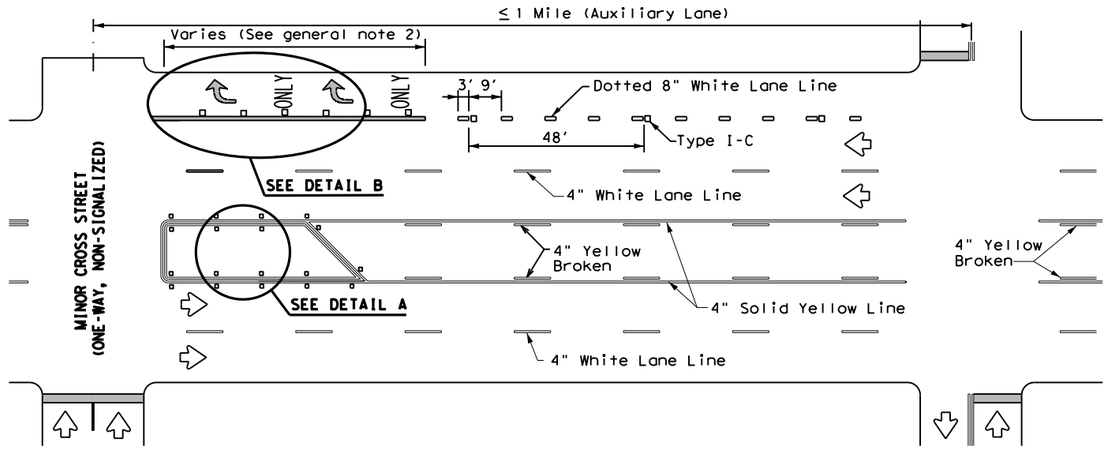
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

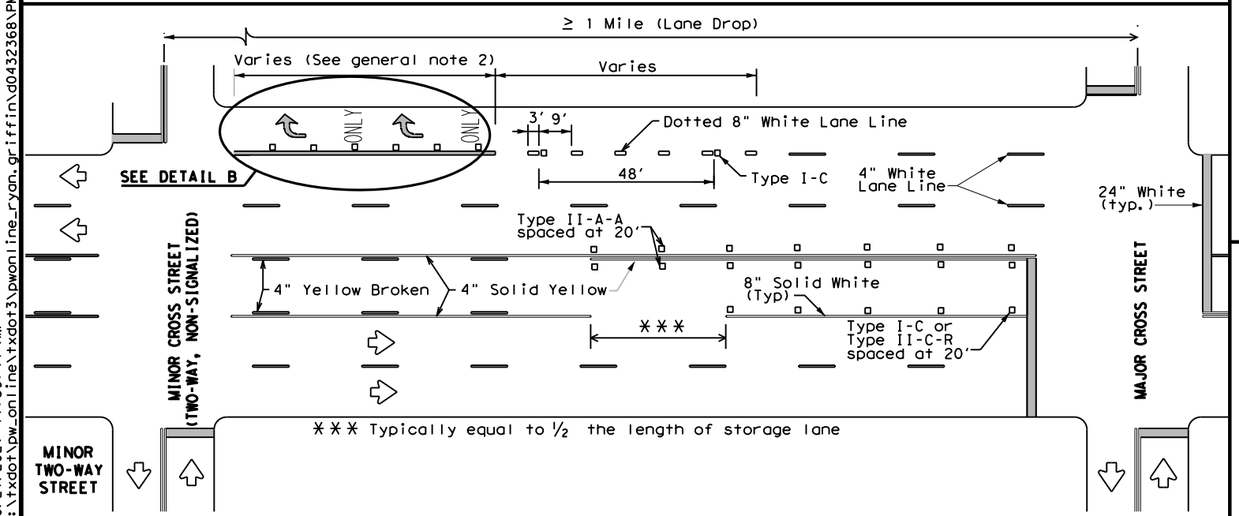
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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

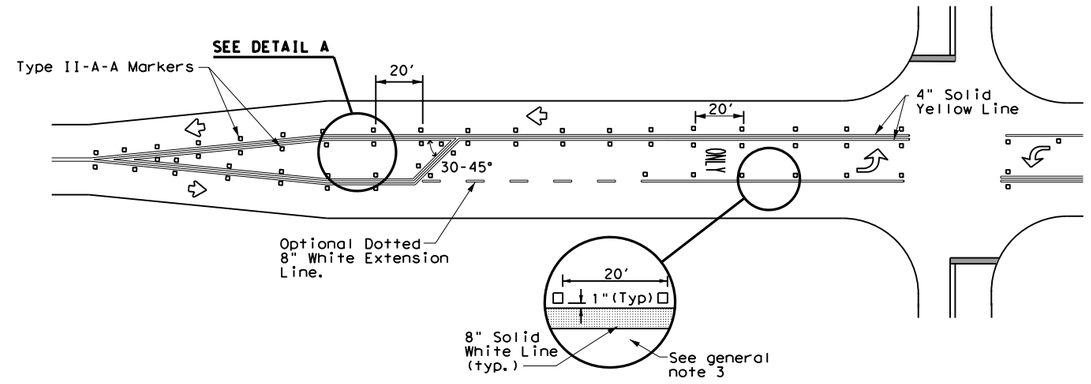
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



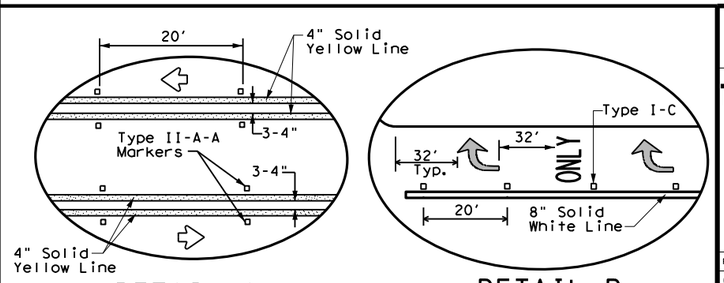
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



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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© TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
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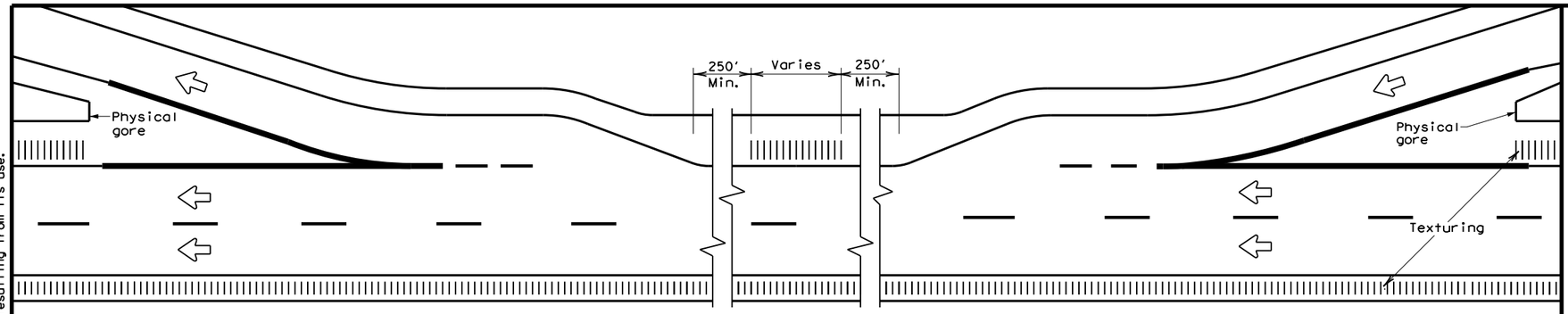
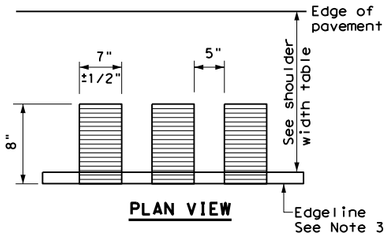
8-00 2-12	TYL	SMITH		70
3-03 6-20				

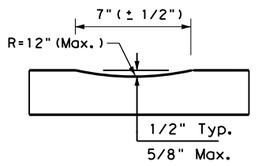
220



TYPICAL RUMBLE STRIP PLACEMENT AT EXIT AND ENTRANCE RAMPS

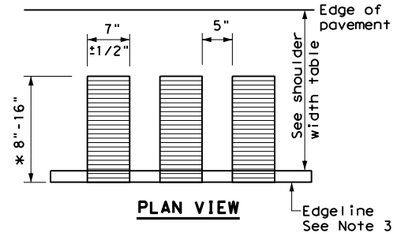


PLAN VIEW



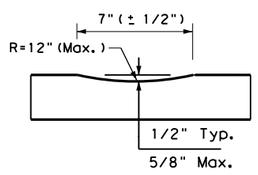
PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



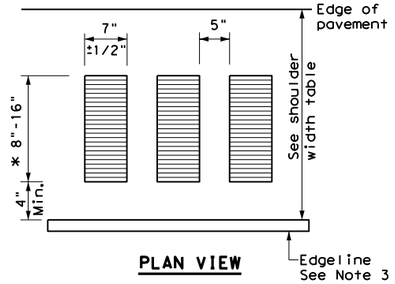
PLAN VIEW

* This distance may vary based on width of shoulder



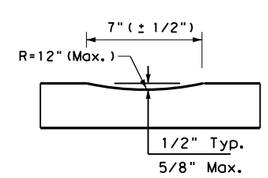
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS
(Rumble Stripes)



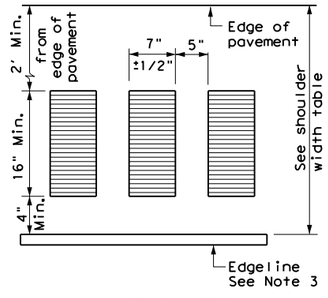
PLAN VIEW

* This distance may vary based on width of shoulder

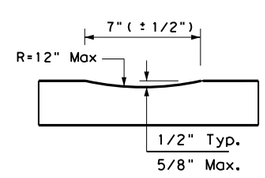


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)



PLAN VIEW



PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS
(Rumble Strips)

GENERAL NOTES

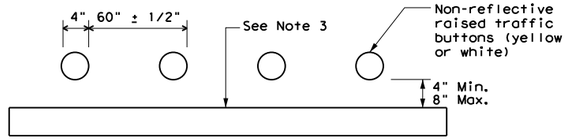
1. Rumble strips and profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
2. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall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

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

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

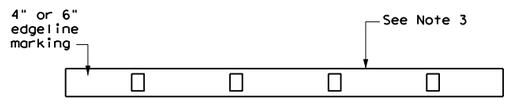
WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

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



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

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

Texas Department of Transportation

Traffic Operations Division Standard

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

FILE: rs(1)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2006	CONT	SECT	JOB	HIGHWAY
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	TYL	SMITH		71

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I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. Comply with SW3P as stated in the plans.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

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

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. Contractor to adhere to specifications listed above in IV.

2.

3.

4.

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

☐ No Action Required ☒ Required Action

Action No.

1. Follow Migratory Bird Treaty Act guidelines as listed below.

2.

3.

4.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

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

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

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

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

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

☐ Yes ☒ No

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

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC (WBL)

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0495	04	076, ETC	IH 20
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	TYL	SMITH		72

DATE: 10/27/2021
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0432369\IH20_COMB_ENV_EPIC_02.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. Comply with SW3P as stated in the plans.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000

2. Comply with the SW3P and revise when necessary to control pollution or required by the Engineer.

3. Post Construction Site Notice (CSN) with SW3P information on or near the site, accessible to the public and TCEQ, EPA or other inspectors.

4. When Contractor project specific locations (PSL's) increase disturbed soil area to 5 acres or more, submit NOI to TCEQ and the Engineer.

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

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

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

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

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

Refer to TxDOT Standard Specifications in the event historical issues or archeological artifacts are found during construction. Upon discovery of archeological artifacts (bones, burnt rock, flint, pottery, etc.) cease work in the immediate area and contact the Engineer immediately.

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☐ No Action Required ☒ Required Action

Action No.

1. Contractor to adhere to specifications listed above in IV.

2.

3.

4.

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

☐ No Action Required ☒ Required Action

Action No.

1. Follow Migratory Bird Treaty Act guidelines as listed below.

2.

3.

4.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

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

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

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

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* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

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

Are the results of the asbestos inspection positive (is asbestos present)?

☐ Yes ☐ No

If "Yes", then TxDOT must retain a DSHS licensed asbestos consultant to assist with the notification, develop abatement/mitigation procedures, and perform management activities as necessary. The notification form to DSHS must be postmarked at least 15 working days prior to scheduled demolition.

If "No", then TxDOT is still required to notify DSHS 15 working days prior to any scheduled demolition.

In either case, the Contractor is responsible for providing the date(s) for abatement activities and/or demolition with careful coordination between the Engineer and asbestos consultant in order to minimize construction delays and subsequent claims.

Any other evidence indicating possible hazardous materials or contamination discovered on site. Hazardous Materials or Contamination Issues Specific to this Project:

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

Texas Department of Transportation — Design Division Standard

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC (EBL)

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR	
	CONT	SECT	JOB	HIGHWAY	
REVISIONS 12-12-2011 (DS) 05-07-14 ADDED NOTE SECTION IV. 01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	0495	04	076, ETC	IH 20	
	DIST	COUNTY		SHEET NO.	
	TYL	SMITH		73	

FILE: c:\txdot\pw*online\txdot3\pwonline*ryan.griffin\d0432369\IH 20*COMB*ENV* SW3P*01.dgn
DATE: 10/27/2021 11:40:14 AM

A. GENERAL SITE DATA

1. PROJECT LIMITS:
IH 20, (WBL) FROM: VAN ZANDT COUNTY LINE, EAST TO SH 110.
PROJECT LENGTH = 24,887 FT. = 4.713 MILES
PROJECT LOCATION:
FROM: FROM VAN ZANDT COUNTY LINE/SMITH COUNTY LINE, EAST
TO: SH 110.
PROJECT COORDINATES:
BEGIN LATITUDE: 32.4995172, BEGIN LONGITUDE: -95.5935070
END LATITUDE: 32.4837125, END LONGITUDE: -95.5236386

2. PROJECT SITE MAPS:
* PROJECT LOCATION MAP: **TITLE SHEET**
* DRAINAGE PATTERNS: **NA**
* SLOPES ANTICIPATED AFTER MAJOR GRADINGS OR AREAS OF SOIL DISTURBANCE: **PROPOSED TYPICAL SECTIONS**
* LOCATION OF EROSION AND SEDIMENT CONTROLS: **NA**
* SURFACE WATERS AND DISCHARGE LOCATIONS: **NA**
* PROJECT SPECIFIC LOCATIONS: TO BE SPECIFIED BY THE PROJECT FIELD OFFICE DURING CONSTRUCTION AND LOCATED IN THE PROJECT SW3P FILE. REFERENCE ITEM #10 BELOW

3. PROJECT DESCRIPTION: **RESURFACE ROADWAY WITH HOT MIX.**

4. MAJOR SOIL DISTURBING ACTIVITIES: **BACKFILL PAVEMENT EDGES**

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: **EXISTING ROW IS APPROX 90% GOOD GRASS COVER.**

6. TOTAL PROJECT AREA: **158 ACRES**

7. TOTAL AREA TO BE DISTURBED: **4 ACRES**

8. WEIGHTED RUNOFF COEFFICIENT
BEFORE CONSTRUCTION: **0.42**
AFTER CONSTRUCTION: **0.42**

9. NAME OF RECEIVING WATERS: (SEGMENT NUMBER OF RECEIVING WATERS)
THE RECEIVING WATER FOR THIS PROJECT IS CANEY CREEK, WHICH FLOWS INTO THE NECHES RIVER, SEGMENT 0606.

10. PROJECT SW3P FILE: FOR PROJECTS DISTURBING ONE ACRE OR MORE, TXDOT WILL MAINTAIN AN SW3P FILE WITH ALL PERTINENT ENVIRONMENTAL DOCUMENTS, CORRESPONDENCE, ETC. AT THE PROJECT FIELD OFFICE. IF NO FIELD OFFICE IS AVAILABLE THEN THE SW3P FILE SHALL BE KEPT IN THE INSPECTOR'S TRUCK.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES:

___ TEMPORARY SEEDING
_X_ PERMANENT PLANTING, SODDING, OR SEEDING
___ MULCHING
___ SOIL RETENTION BLANKET
___ BUFFER ZONES
_X_ PRESERVATION OF NATURAL RESOURCES

OTHER:

2. STRUCTURAL PRACTICES:

_X_ SILT FENCES
___ ROCK FILTER DAMS
___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
___ DIVERSION DIKE AND SWALE COMBINATIONS
___ PIPE SLOPE DRAINS
___ PAVED FLUMES
___ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ SEDIMENT BASINS
___ STORM INLET SEDIMENT TRAP
___ STONE OUTLET STRUCTURES
___ CURBS AND GUTTERS
___ STORM SEWERS
___ VELOCITY CONTROL DEVICES

OTHER:

3. STORM WATER MANAGEMENT:

STORM WATER DRAINAGE WILL BE PROVIDED BY **DITCHES**

THIS SYSTEM WILL CARRY THE DRAINAGE WITHIN THE RIGHT-OF-WAY TO
VARIOUS LOCATIONS THROUGH THE PROJECT

4. STORM WATER MANAGEMENT ACTIVITIES: (SEQUENCE OF CONSTRUCTION)

1. BACKFILL PAVEMENT EDGES. CONTAIN SEDIMENT WITH EXISTING VEGETATION.

2. MILL & INLAY 1.5" OF PFC SURFACE.

5. NON-STORM WATER DISCHARGES:
FILTER NON-STORM WATER DISCHARGES, OR HOLD RETENTION BASINS, BEFORE BEING ALLOWED TO MIX WITH STORM WATER. THESE DISCHARGES CONSIST OF NON-POLLUTED GROUND WATER, SPRING WATER, FOUNDATION AND/OR FOOTING DRAIN WATER; AND WATER USED FOR DUST CONTROL, PAVEMENT WASHING AND VEHICLE WASHWATER CONTAINING NO DETERGENTS.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:
MAINTENANCE WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.

2. INSPECTION:
INSPECTION WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.

3. WASTE MATERIALS:
ALL WASTE MATERIALS WILL BE COLLECTED, STORED AND DISPOSED OF IN A LIDDED DUMPSTER IN A LEGAL AND PROPER MANNER. NO CONSTRUCTION WASTE MATERIAL WILL BE BURIED ON SITE.

4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS. PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR MUST BE CONTACTED IMMEDIATELY.

5. SANITARY WASTE:
ALL SANITARY WASTE WILL BE COLLECTED FROM THE PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATION BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

OFFSITE VEHICLE TRACKING:

___ HAUL ROADS DAMPENED FOR DUST CONTROL
_X_ LOADED HAUL TRUCKS TO BE COVERED WITH TARPAULIN
_X_ EXCESS DIRT ON ROAD REMOVED DAILY
_X_ STABILIZED CONSTRUCTION ENTRANCE

OTHER:

REMARKS: DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL SEDIMENT FROM ENTERING RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WATERBODY OR STREAMBED.

CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED TO MINIMIZE THE RUNOFF OF POLLUTANTS.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
Gilbert Arteaga
12/01/2021

IH 20, (WBL) STORM WATER POLLUTION PREVENTION PLAN (SW3P)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		74

A. GENERAL SITE DATA

1. PROJECT LIMITS:
IH 20, (EBL) FROM: VAN ZANDT C/L, E TO SH 110, EBL.
PROJECT LENGTH = 22,746.24 FT. = 4.308 MILES
PROJECT LOCATION:
FROM: FROM VAN ZANDT COUNTY LINE/SMITH COUNTY LINE, EAST
TO: SH 110.
PROJECT COORDINATES:
BEGIN LATITUDE: 32.4995299, BEGIN LONGITUDE: -95.5937527
END LATITUDE: 32.4836109, END LONGITUDE: -95.5225800

2. PROJECT SITE MAPS:
* PROJECT LOCATION MAP: **TITLE SHEET**
* DRAINAGE PATTERNS: **NA**
* SLOPES ANTICIPATED AFTER MAJOR GRADINGS OR AREAS OF SOIL DISTURBANCE: **PROPOSED TYPICAL SECTIONS**
* LOCATION OF EROSION AND SEDIMENT CONTROLS: **NA**
* SURFACE WATERS AND DISCHARGE LOCATIONS: **NA**
* PROJECT SPECIFIC LOCATIONS: TO BE SPECIFIED BY THE PROJECT FIELD OFFICE DURING CONSTRUCTION AND LOCATED IN THE PROJECT SW3P FILE. REFERENCE ITEM #10 BELOW

3. PROJECT DESCRIPTION: **OVERLAY OF AN EXISTING FACILITY CONSISTING OF TBPFC SURFACE, ACP SURFACE, PLANING, SHOULDER TEXTURING AND PAVEMENT MARKINGS.**

4. MAJOR SOIL DISTURBING ACTIVITIES: **BACKFILL PAVEMENT EDGES**

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER: **EXISTING ROW IS APPROX 90% GOOD GRASS COVER.**

6. TOTAL PROJECT AREA: **80 ACRES**

7. TOTAL AREA TO BE DISTURBED: **3.97 ACRES**

8. WEIGHTED RUNOFF COEFFICIENT
BEFORE CONSTRUCTION: **0.42**
AFTER CONSTRUCTION: **0.42**

9. NAME OF RECEIVING WATERS: (SEGMENT NUMBER OF RECEIVING WATERS)
THE RECEIVING WATER FOR THIS PROJECT IS CANEY CREEK, WHICH FLOWS INTO THE NECHES RIVER, SEGMENT 0606.

10. PROJECT SW3P FILE: FOR PROJECTS DISTURBING ONE ACRE OR MORE, TXDOT WILL MAINTAIN AN SW3P FILE WITH ALL PERTINENT ENVIRONMENTAL DOCUMENTS, CORRESPONDENCE, ETC. AT THE PROJECT FIELD OFFICE. IF NO FIELD OFFICE IS AVAILABLE THEN THE SW3P FILE SHALL BE KEPT IN THE INSPECTOR'S TRUCK.

B. EROSION AND SEDIMENT CONTROLS

1. SOIL STABILIZATION PRACTICES:

___ TEMPORARY SEEDING
_X_ PERMANENT PLANTING, SODDING, OR SEEDING
___ MULCHING
___ SOIL RETENTION BLANKET
___ BUFFER ZONES
_X_ PRESERVATION OF NATURAL RESOURCES

OTHER:

2. STRUCTURAL PRACTICES:

_X_ SILT FENCES
___ ROCK FILTER DAMS
___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
___ DIVERSION DIKE AND SWALE COMBINATIONS
___ PIPE SLOPE DRAINS
___ PAVED FLUMES
___ ROCK BEDDING AT CONSTRUCTION EXIT
___ TIMBER MATTING AT CONSTRUCTION EXIT
___ CHANNEL LINERS
___ SEDIMENT TRAPS
___ SEDIMENT BASINS
___ STORM INLET SEDIMENT TRAP
___ STONE OUTLET STRUCTURES
___ CURBS AND GUTTERS
___ STORM SEWERS
___ VELOCITY CONTROL DEVICES

OTHER:

3. STORM WATER MANAGEMENT:

STORM WATER DRAINAGE WILL BE PROVIDED BY **DITCHES**

THIS SYSTEM WILL CARRY THE DRAINAGE WITHIN THE RIGHT-OF-WAY TO
VARIOUS LOCATIONS THROUGH THE PROJECT

4. STORM WATER MANAGEMENT ACTIVITIES: (SEQUENCE OF CONSTRUCTION)

1. BACKFILL PAVEMENT EDGES. CONTAIN SEDIMENT WITH EXISTING VEGETATION.

2. MILL & INLAY 1.5" OF PFC SURFACE.

5. NON-STORM WATER DISCHARGES:
FILTER NON-STORM WATER DISCHARGES, OR HOLD RETENTION BASINS, BEFORE BEING ALLOWED TO MIX WITH STORM WATER. THESE DISCHARGES CONSIST OF NON-POLLUTED GROUND WATER, SPRING WATER, FOUNDATION AND/OR FOOTING DRAIN WATER; AND WATER USED FOR DUST CONTROL, PAVEMENT WASHING AND VEHICLE WASHWATER CONTAINING NO DETERGENTS.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:
MAINTENANCE WILL BE PERFORMED AS INDICATED ON FIELD INSPECTION AND MAINTENANCE REPORT FORM 2118.

2. INSPECTION:
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3. WASTE MATERIALS:
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4. HAZARDOUS WASTE (INCLUDING SPILL REPORTING):
AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS. PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS, THE SPILL COORDINATOR MUST BE CONTACTED IMMEDIATELY.

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_X_ EXCESS DIRT ON ROAD REMOVED DAILY
_X_ STABILIZED CONSTRUCTION ENTRANCE

OTHER:

REMARKS: DISPOSAL AREAS, STOCKPILES AND HAUL ROADS SHALL BE CONSTRUCTED IN A MANNER THAT WILL MINIMIZE AND CONTROL SEDIMENT FROM ENTERING RECEIVING WATERS. DISPOSAL AREAS SHALL NOT BE LOCATED IN ANY WATERBODY OR STREAMBED.

CONSTRUCTION STAGING AREAS AND VEHICLE MAINTENANCE AREAS SHALL BE CONSTRUCTED TO MINIMIZE THE RUNOFF OF POLLUTANTS.

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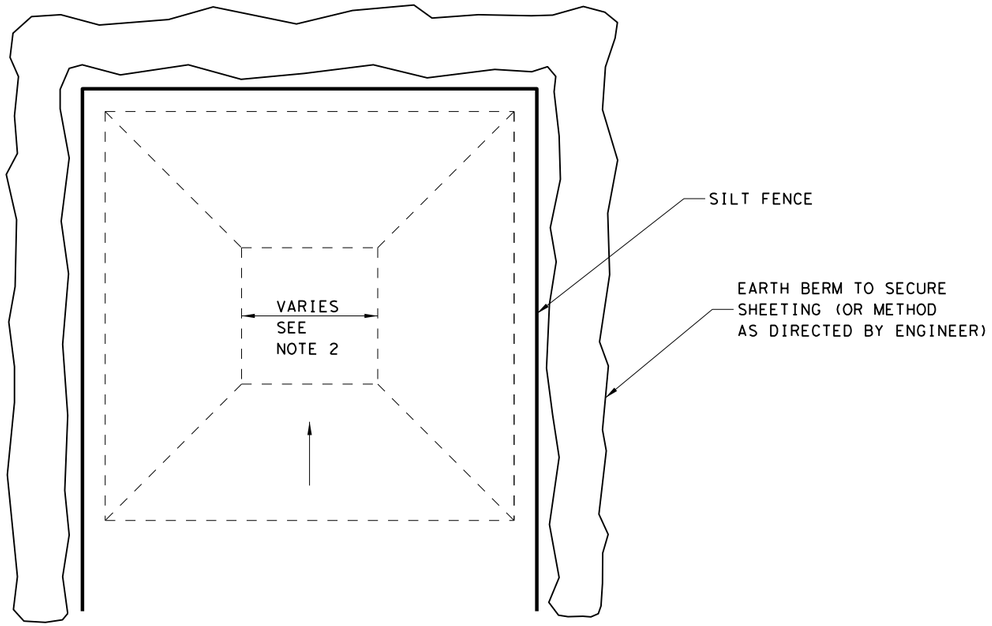
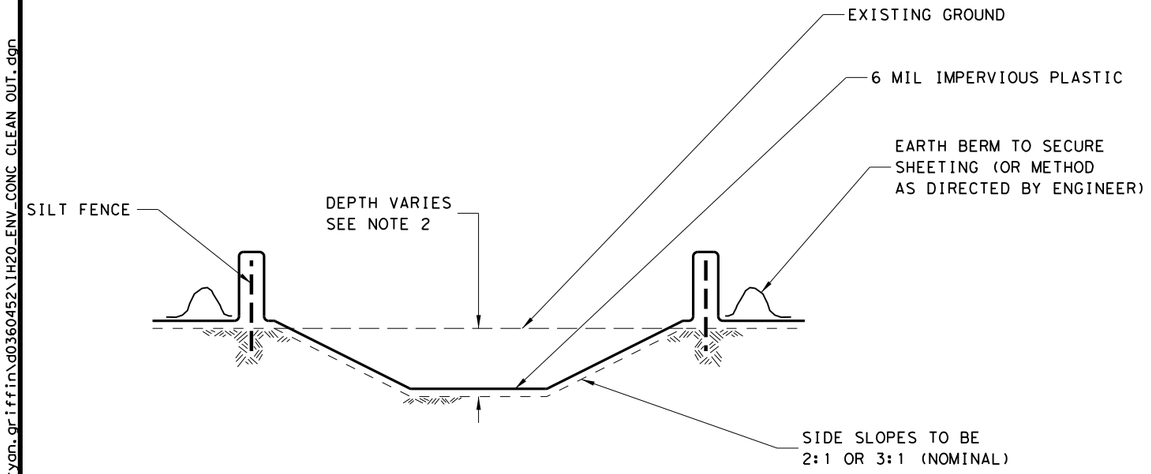
IH 20, (EBL) STORM WATER POLLUTION PREVENTION PLAN (SW3P)

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		75





CONCRETE WASHOUT AREA

NOT TO SCALE
(SEE NOTE 2)

NOTES

1. CONCRETE WASHOUT AREA(S) SHALL BE INSTALLED PRIOR TO CONCRETE PLACEMENT ON SITE. THE CONCRETE WASHOUT AREA SHALL BE ENTIRELY SELF-CONTAINED.

2. THE CONTRACTOR SHALL SUBMIT THE DESIGN, LOCATION AND SIZING OF OF THE CONCRETE WASHOUT AREA(S) WITH THE PROJECT'S EROSION AND SEDIMENTATION CONTROL PLAN AND SHALL BE APPROVED BY THE ENGINEER.

LOCATION: WASHOUT AREA(S) ARE TO BE LOCATED AT LEAST 50 FEET FROM ANY STREAM, WETLAND, STORM DRAINS, OR OTHER SENSITIVE RESOURCE. THE FLOOD CONTINGENCY PLAN MUST ADDRESS THE CONCRETE WASHOUT IF THE WASHOUT IS TO BE LOCATED WITHIN THE FLOODPLAN.

SIZE: THE WASHOUT MUST HAVE SUFFICIENT VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS INCLUDING, BUT NOT LIMITED TO, OPERATIONS ASSOCIATED WITH GROUT AND MORTAR.

3. SURFACE DISCHARGE IS UNACCEPTABLE, THERFORE EARTH BERM OR OTHER CONTROL MEASURES, AS APPROVED BY THE ENGINEER, SHOULD BE USED AROUND THE PERIMETER OF THE CONCRETE WASHOUT AREA FOR CONTAINMENT.

4. SIGNS SHOULD BE PLACED AT THE CONSTRUCTION ENTRANCE, AT THE CONCRETE AREA(S) AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS. WASHOUT AREA(S) SHOULD BE FLAGGED WITH SAFETY FENCING OR OTHER APPROVED METHOD.

5. CONCRETE WASH-OUT AREAS SHALL BE LINED WITH IMPERVIOUS PLASTIC WITH A MINIMUM THICKNESS OF 6 MILS AND BE REPLACED IF DAMAGED DURING CLEAN-OUT OF HARDENED CONCRETE FROM THE WASH-OUT AREA.

6. WASHOUT AREA(S) ARE TO BE INSPECTED AT LEAST ONCE A WEEK FOR STRUCTURAL INTEGRITY, ADEQUATE HOLDING CAPACITY AND CHECKED FOR LEAKS, TEARS, OR OVERFLOWS. (AS DIRECTED BY THE CONSTRUCTION SITE ENVIRONMENTAL INSPECTION REPORT) WASHOUT AREA(S) SHOULD BE CHECKED AFTER HEAVY RAINS.

7. HARDENED CONCRETE WASTE SHOULD BE REMOVED AND DISPOSED OF WHEN THE WASTE HAS ACCUMULATED TO HALF OF THE CONCRETE WASHOUT'S HEIGHT. THE WASTE CAN BE STORED AT AN UPLAND LOCATION, AS APPROVED BY THE ENGINEER. ALL CONCRETE WASTE SHALL BE DISPOSED OF IN A MANNER CONSISTENT WITH ALL APPLICABLE LAWS, REGULATIONS, AND GUIDELINES.

8. PAYMENT FOR THIS ITEM IS TO BE INCLUDED UNDER THE GENERAL COST OF THE WORK FOR THE PROJECT, INCLUDING SITE RESTORATION.

STATE OF TEXAS
GILBERT ARTEAGA
87953
LICENSED
PROFESSIONAL ENGINEER
12/01/2021

IH 20, (WBL) CONCRETE WASHOUT DETAIL

Texas Department of Transportation

SHEET 1 OF 1

CONT	SECT	JOB	HIGHWAY
0495	04	076, ETC	IH 20
DIST	COUNTY		SHEET NO.
TYL	SMITH		76

DATE: 10/27/2021 11:40:30 AM
FILE: c:\txdot\pw_online\txdot3\pwonline_ryan.griffin\d0360452\IH20_ENV_CONC CLEAN OUT.dgn

DATE:
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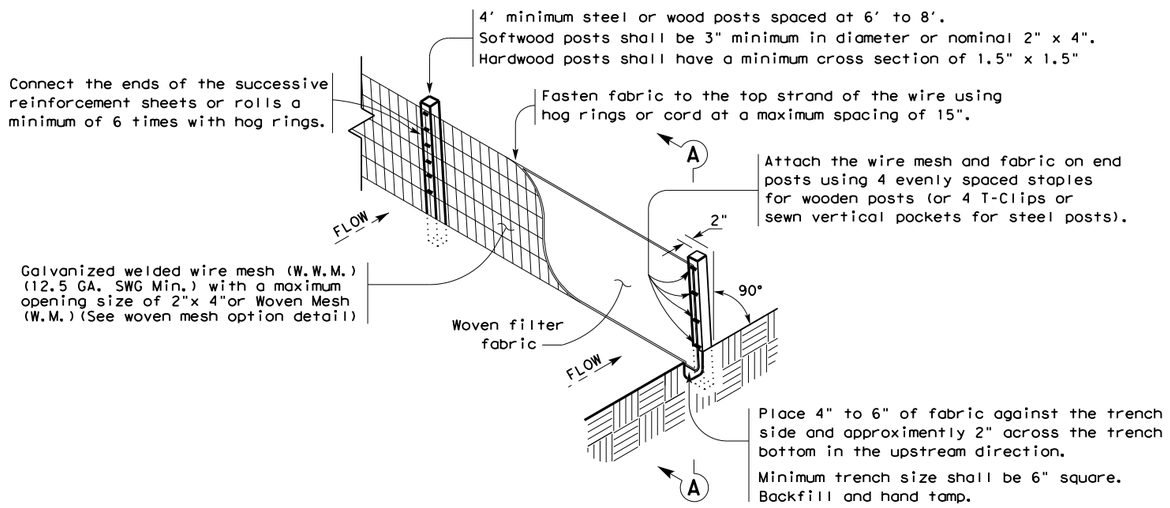
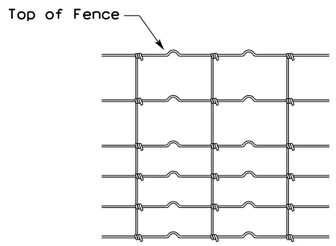
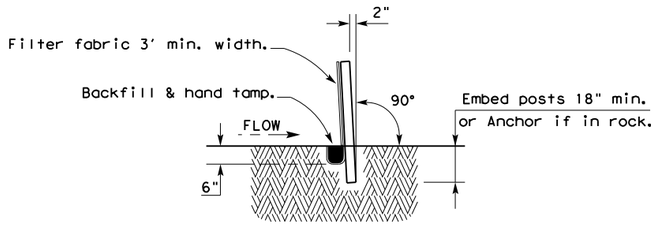


TEMPORARY SEDIMENT CONTROL FENCE

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.

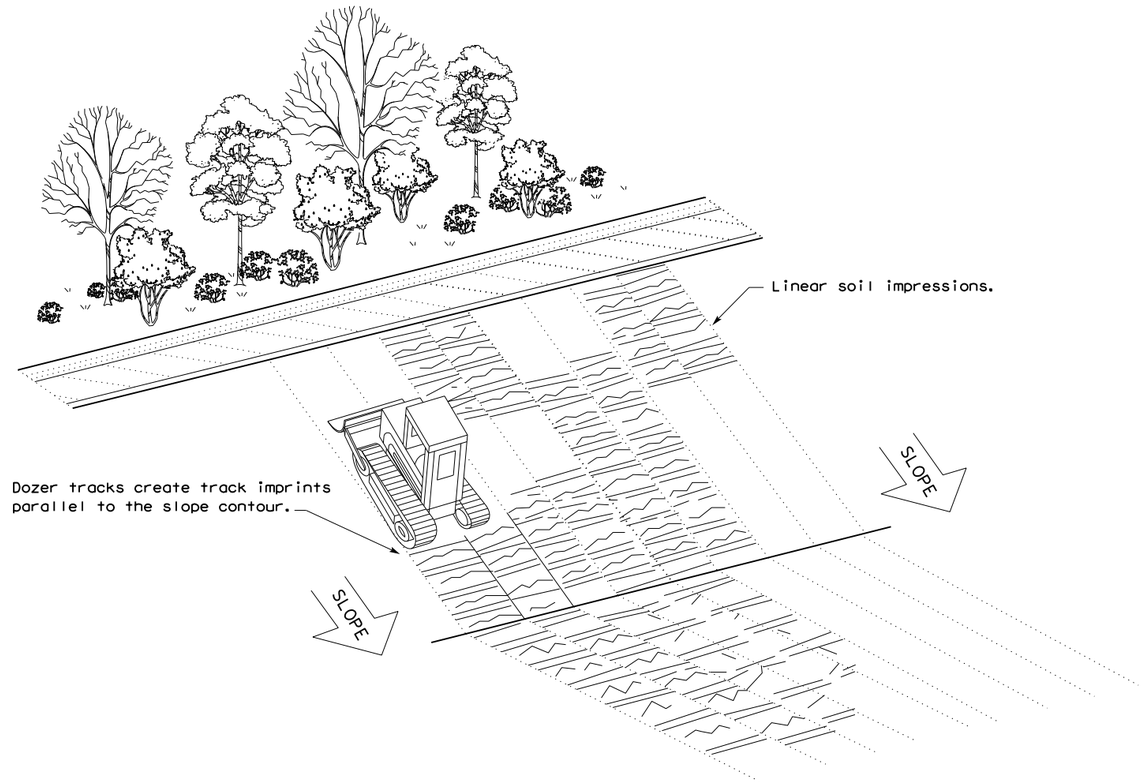
LEGEND

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	0495	04	076, ETC			IH 20	
	DIST	COUNTY				SHEET NO.	
	TYL	SMITH				77	