DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NUMBER		HIGHWAY NO.
SB	6	CM 2022(004)		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	DALLAS	DALLAS	1
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

FINAL PLANS

NAME OF CONTRACTOR: ____________________

DATE OF LETTING: ____________________

DATE WORK BEGAN: ____________________

DATE WORK COMPLETED: ____________________

DATE WORK ACCEPTED: ____________________

SUMMARY OF CHANGE ORDERS:

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL AID

CM 2022(004)

CSJ: 0092-02-125

IH 45

DALLAS COUNTY

LIMITS: AT DOWDY FERRY

DESIGN SPEEDS = 45 MPH FRONTAGE ROAD
= 30 MPH CROSS STREETS

FUNCTIONAL CLASSIFICATION = INTERSTATE

ADT = IH 45 FR: 8,188 (2021)
11,337 (2041)

DOWDY FERRY RD: 4,537 (2021)
6,282 (2041)

NOTE:

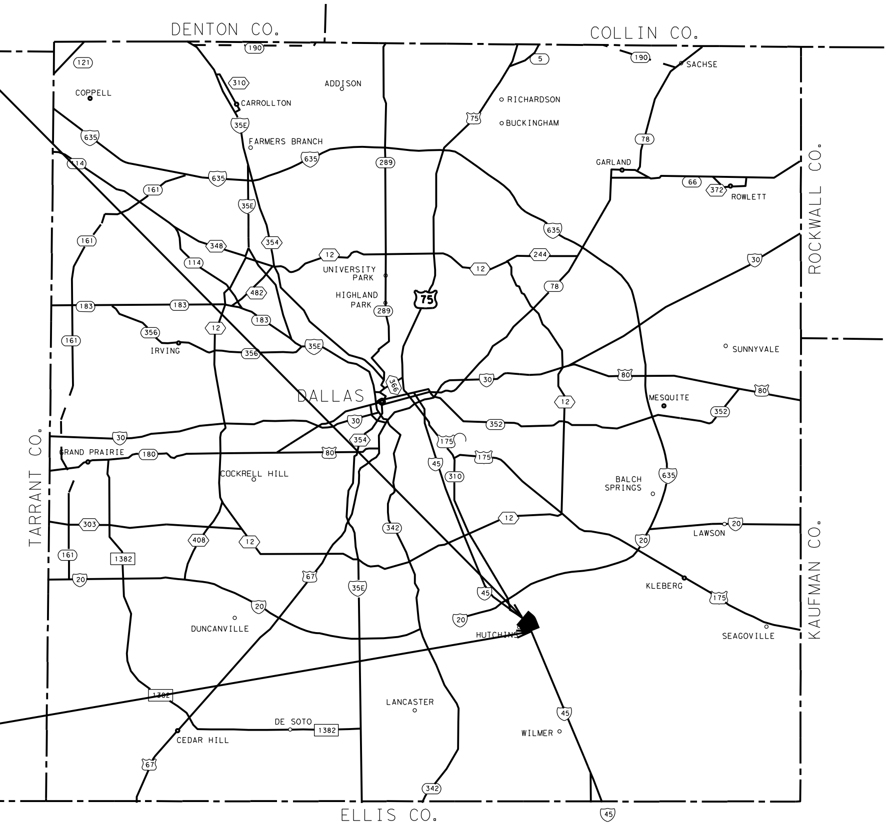
SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014, AND THE CONTRACT PROVISIONS LISTED AND DATED AS FOLLOWS SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, MAY 1, 2012)

TOTAL LENGTH OF PROJECT =

ROADWAY	= 3,637.90 FT.	=	0.689	MI.
BRIDGE	= 240.00 FT.	=	0.045	MI.
TOTAL	= 3,877.90 FT.	=	0.734	MI.

FOR THE CONSTRUCTION OF INTERSECTION AND OPERATIONAL IMPROVEMENTS.
CONSISTING OF CONSTRUCTING INTERSECTION IMPROVEMENTS, INCLUDING TEXAS U-TURN AND TURN LANES.

END PROJECT
CSJ 0092-02-125
STA 10082+83
TRM 275+0.083



DALLAS COUNTY

DALLAS DISTRICT

BEGIN PROJECT
CSJ 0092-02-125
STA 1635+00.00
TRM 274+0.571

EQUATIONS: IH45-1655+09.92 BK TO 10064+15.02 FWD = 840,905.10 FT
SOUTH FRONTAGE ROAD-1655+46.42 BK TO 10065+24.57 FWD = 840,978.15 FT
NORTH FRONTAGE ROAD-1658+25.28 BK TO 10066+56.86 FWD = 840,831.58 FT

EXCEPTIONS: NONE

RAILROAD CROSSINGS: NONE

WORK WAS COMPLETED ACCORDING TO THE PLANS AND CONTRACT.

________________, P.E.
Signature of Registrant & Date

TEXAS DEPARTMENT OF TRANSPORTATION

SUBMITTED FOR LETTING 6/23/2021
solomonbayou, P.E.
DESIGN ENGINEER

RECOMMENDED FOR LETTING 6/23/2021
DocuSigned by:
________________, P.E.
DIRECTOR OF TRANSPORTATION PLANNING & DEVELOPMENT

RECOMMENDED FOR LETTING 6/23/2021
DocuSigned by:
________________, P.E.
FOR THE AREA ENGINEER

APPROVED FOR LETTING 6/24/2021
DocuSigned by:
________________, P.E.
DISTRICT ENGINEER

DATE:

INDEX OF SHEETS

STATE OF TEXAS
NAPAT INTHARASOMBAT
102136
LICENSED PROFESSIONAL ENGINEER

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

DocuSigned by:
Napat Intharasombat P.E. 6/23/2021
35F6ACE8F8E3466... & Date

STATE OF TEXAS
MARK ANTHONY ABOSO
112638
LICENSED PROFESSIONAL ENGINEER

& THE STANDARD SHEETS SPECIFICALLY IDENTIFIED ABOVE HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING

DocuSigned by:
Mark A Abosso P.E. 6/23/2021
007CE6FA41AE48C... & Date

STATE OF TEXAS
KEVIN Y. BROSAM
138369
LICENSED PROFESSIONAL ENGINEER

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

Signatur
DocuSigned by:
Kevin Brosam P.E. 6/23/2021
929CA83771E145D... & Date

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED PROFESSIONAL ENGINEER

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

solomonbayou , P.E. 6/23/2021
Signature of Registrant & Date

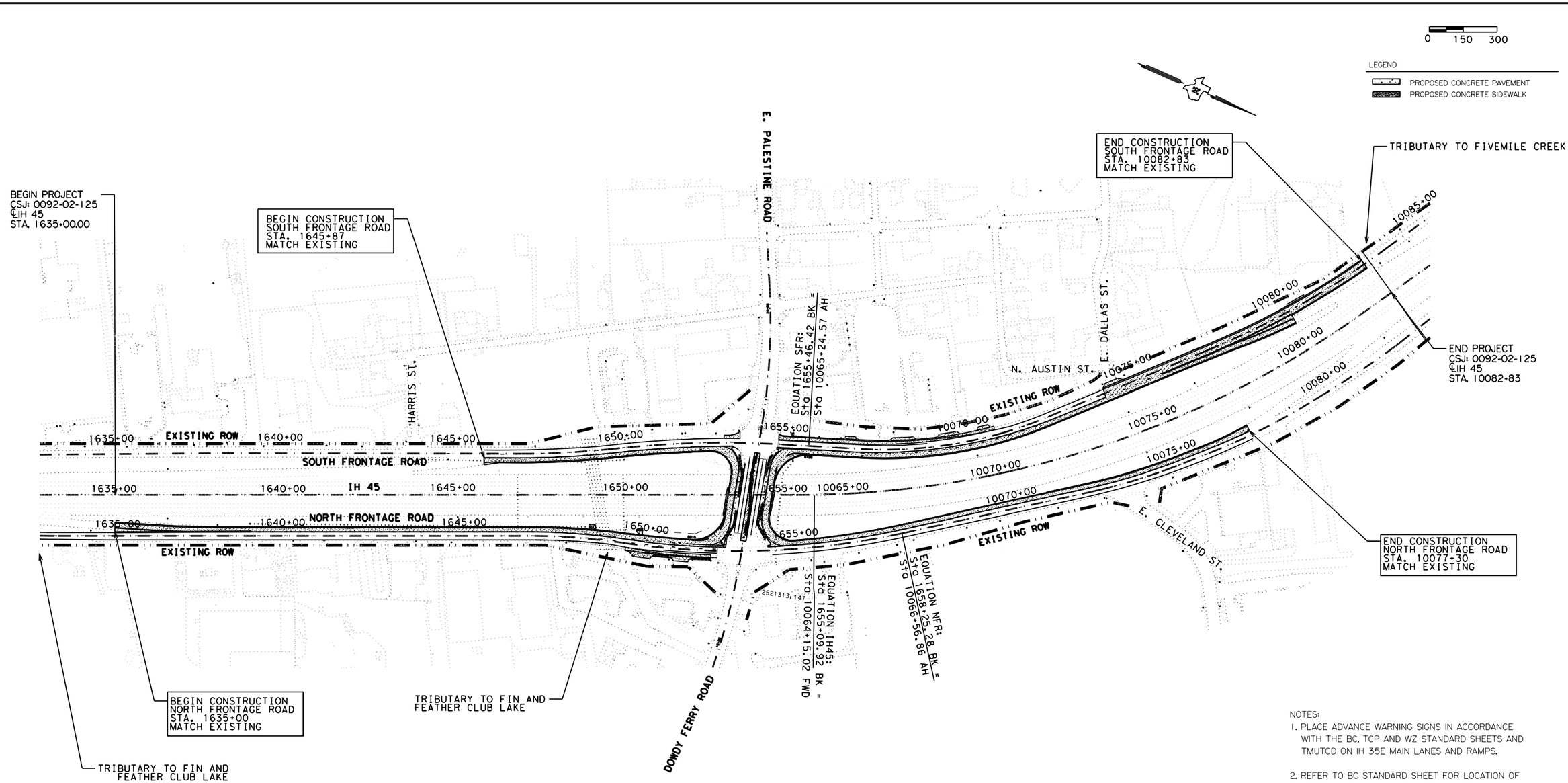
Texas Department of Transportation

IH 45

INDEX OF SHEETS

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SB	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SB	TEXAS	18	DALLAS	
CHECK	CONTROL	SECTION	JOB	
DN	0092	02	125	2
CHECK				
AM				



NOTES:

1. PLACE ADVANCE WARNING SIGNS IN ACCORDANCE WITH THE BC, TCP AND WZ STANDARD SHEETS AND TMUTCD ON IH 35E MAIN LANES AND RAMPS.
2. REFER TO BC STANDARD SHEET FOR LOCATION OF SIGNS.

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 7/13/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

PROJECT LAYOUT

SCALE: 1"=300' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	3
CHECK NP	CONTROL	SECTION	JOB	
	0092	02	125	

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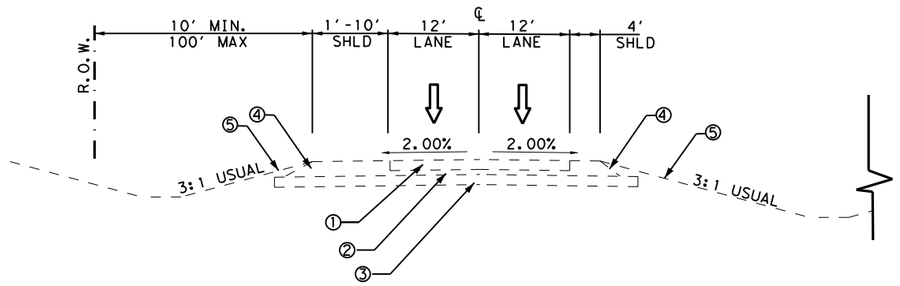
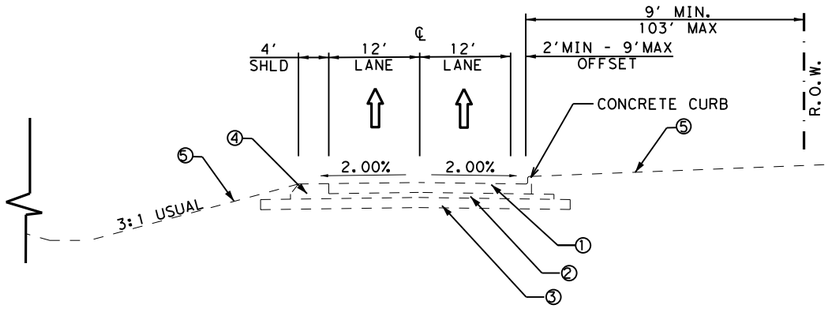


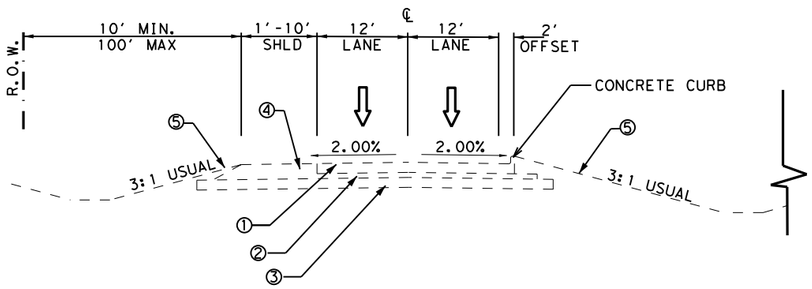
EXISTING TYPICAL SECTION
I.H. 45 S.B. FRONTAGE RD
1645+87 TO 1652+00
10066+00 TO 10074+22



EXISTING TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1635+00 TO 1651+00

LEGEND

① 8" CPCD
② 4" HMAC
③ 6" LIME TREATED SUBGRADE (7%)
④ VARIABLE DEPTH ASPHALT
⑤ TOPSOIL



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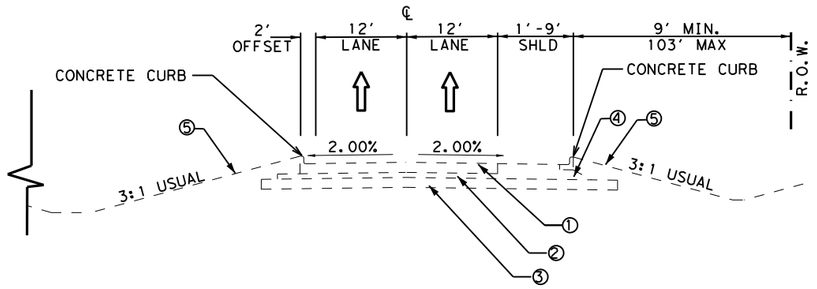
I.H. 45 S.B. FRONTAGE RD
1652+00 TO 1653+00
10065+24.57 TO 10066+00



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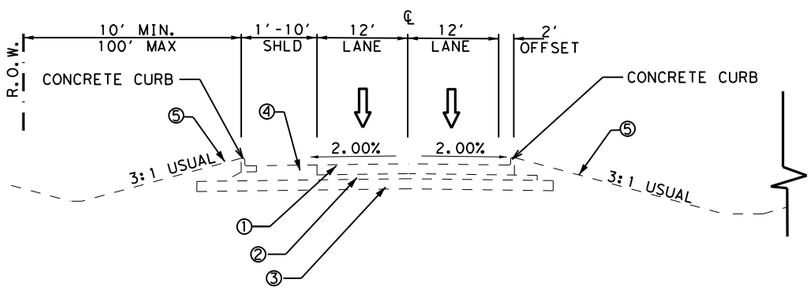
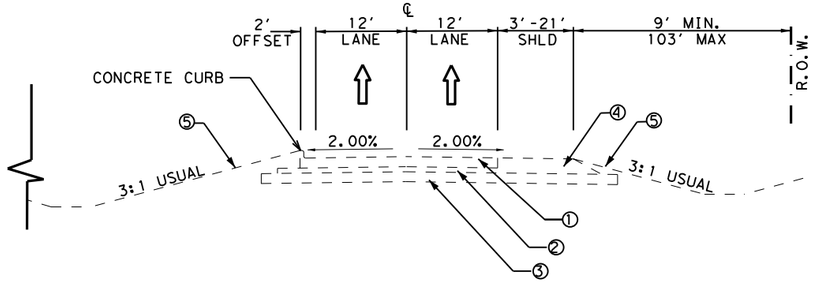
I.H. 45 N.B. FRONTAGE RD
1651+00 TO 1656+00



EXISTING TYPICAL SECTION
I.H. 45 S.B. FRONTAGE RD
1653+00 TO 1653+43
1654+57 TO 1655+00



EXISTING TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1656+00 TO 1658+25.28
10066+55.86 TO 10074+22

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

TYPICAL SECTIONS

SHEET 1 OF 5

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	
CHECK	CONTROL	SECTION	JOB	4
CHECK	0092	02	125	

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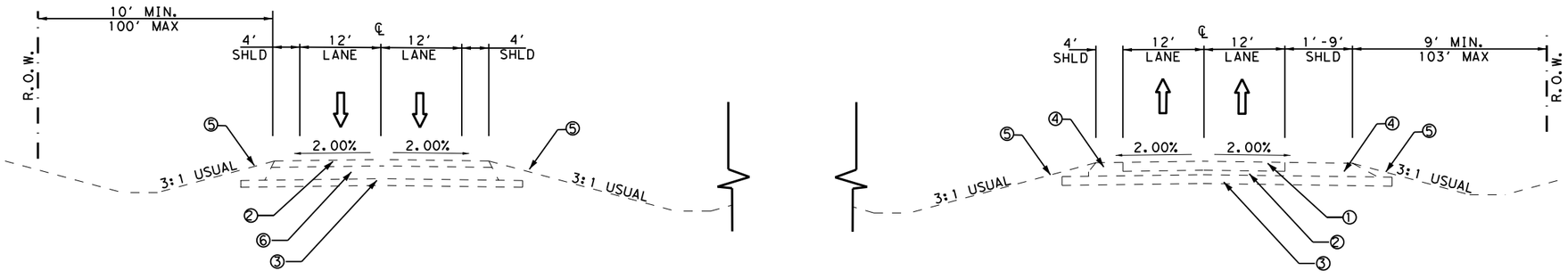
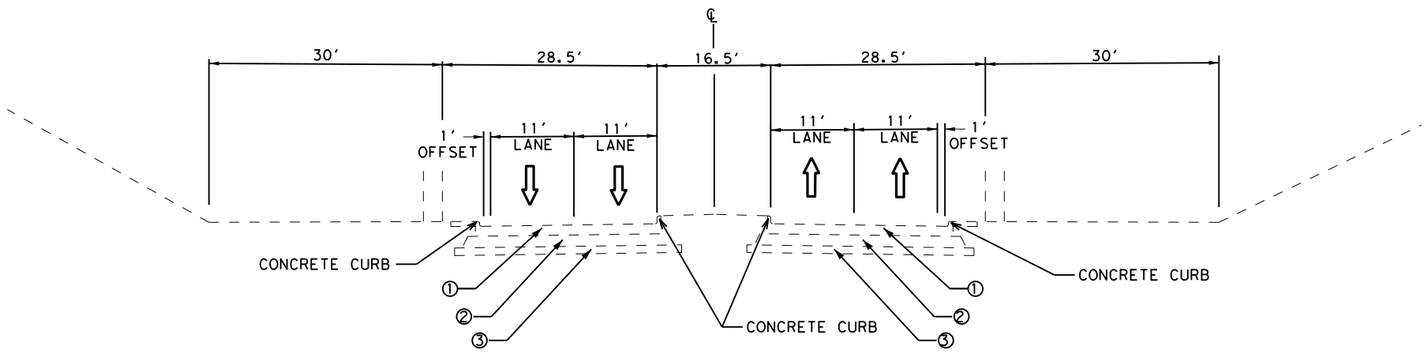


EXISTING TYPICAL SECTION
I.H. 45 S.B. FRONTAGE RD
10074+22 TO 10082+83

EXISTING TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
10074+22 TO 10082+83



EXISTING TYPICAL SECTION
DOWDY FERRY RD
13+10 TO 15+71

LEGEND

1. 8" CPCD
2. 4" HMAC
3. 6" LIME TREATED SUBGRADE (7%)
4. VARIABLE DEPTH ASPHALT
5. TOPSOIL
6. 9" FLEX BASE

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

TYPICAL SECTIONS

SHEET 2 OF 5

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	5
CHECK	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

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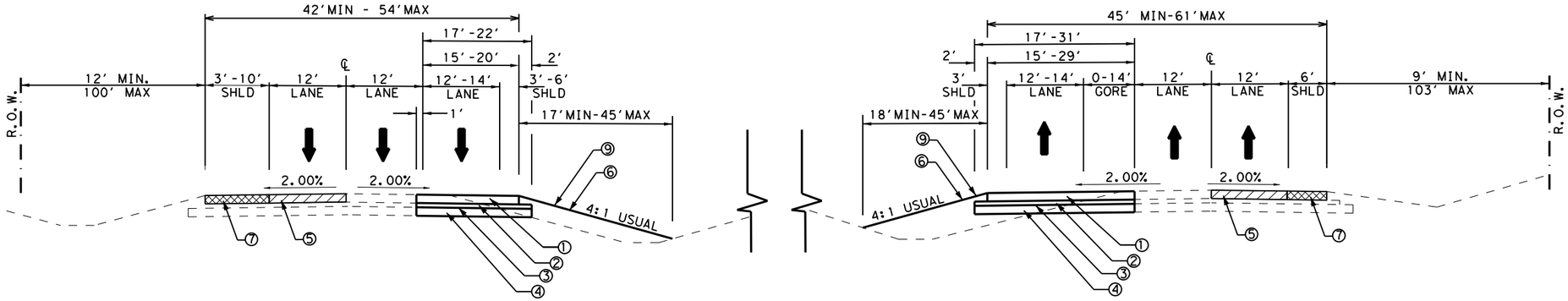
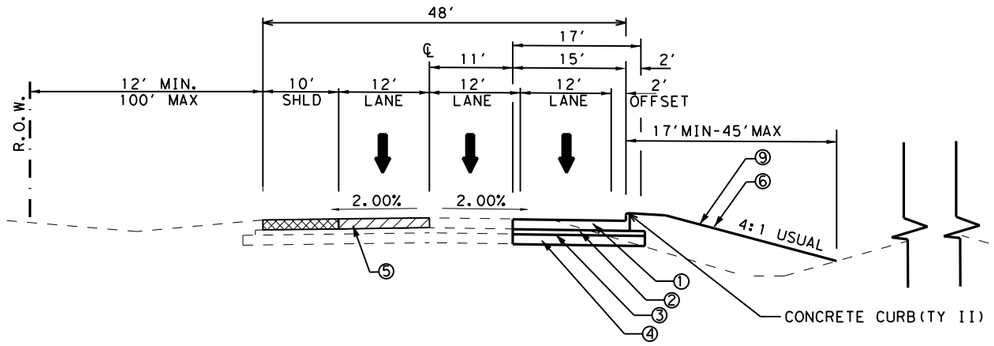
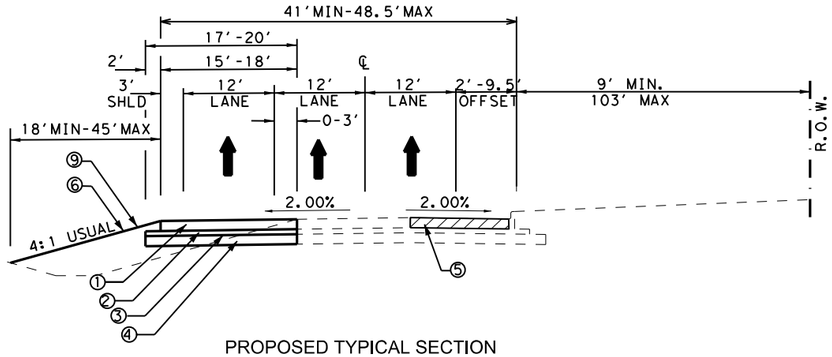


PROPOSED TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
1645+87 TO 1652+00
10070+80 TO 10074+25

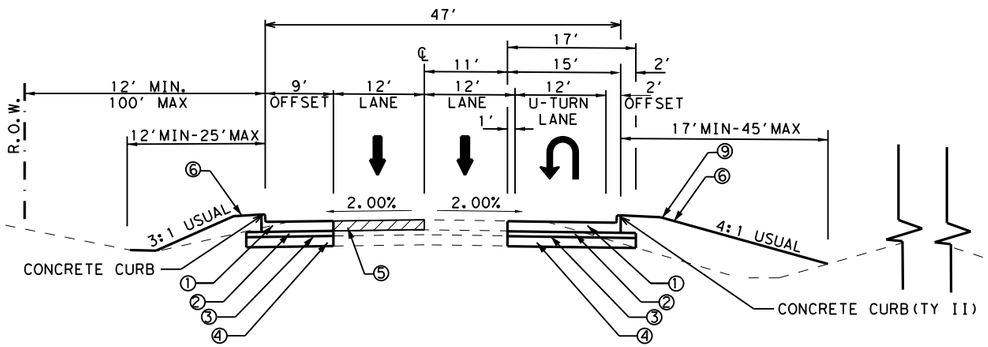
PROPOSED TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1635+00 TO 1637+81



PROPOSED TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
1652+00 TO 1652+96

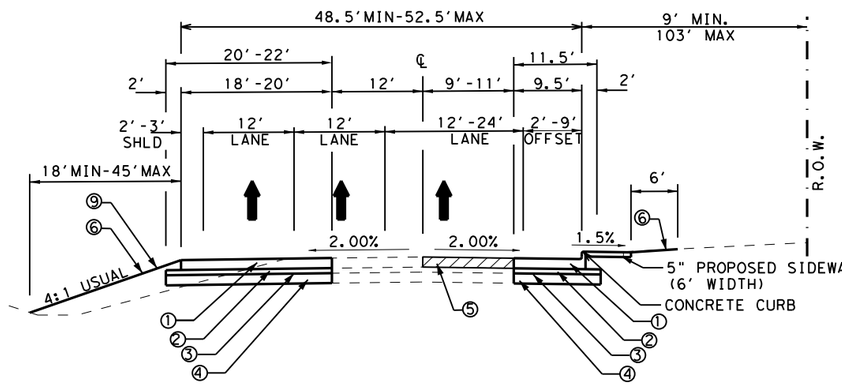


PROPOSED TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1637+81 TO 1650+07



PROPOSED TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
1652+96 TO 1653+43

OMIT DOWDY FERRY ROAD FROM STA. 1653+43 TO STA. 1654+57



PROPOSED TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1650+07 TO 1650+59

LEGEND

① 8" CONC PVMT (JOINTED- CPCD)
② 4" SUPERPAVE (SP-B PG64-22)
③ EMULS ASPH (PRIME)(MS-2 OR SS-1)
④ 6" LIME TREATED EXISTING SUBGRADE (7%)
⑤ FULL - DEPTH REPAIR CPCD (8")
⑥ COMPOST MANUF. TOPSOIL (4")W/ BLOCK SOD
⑦ FLEXIBLE PAVEMENT STRUCTURE REPAIR (12")
⑧ 4" CONCRETE RIPRAP
⑨ TEMPORARY SEEDING/BLOCK SOD

NOTES:

1. FULL DEPTH REPAIR CPCD LOCATIONS TO BE LOCATED AND VERIFIED BY THE ENGINEER.

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/22/21
Signature of Registrant & Date

Texas Department of Transportation
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IH 45

TYPICAL SECTIONS

SHEET 3 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	6
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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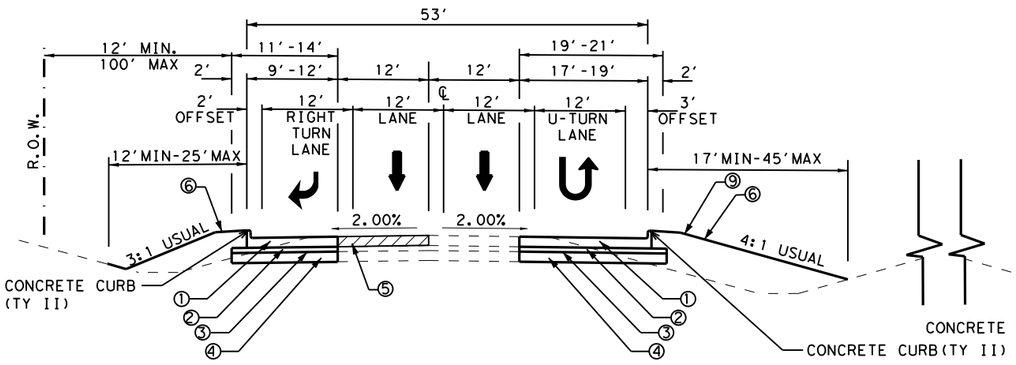
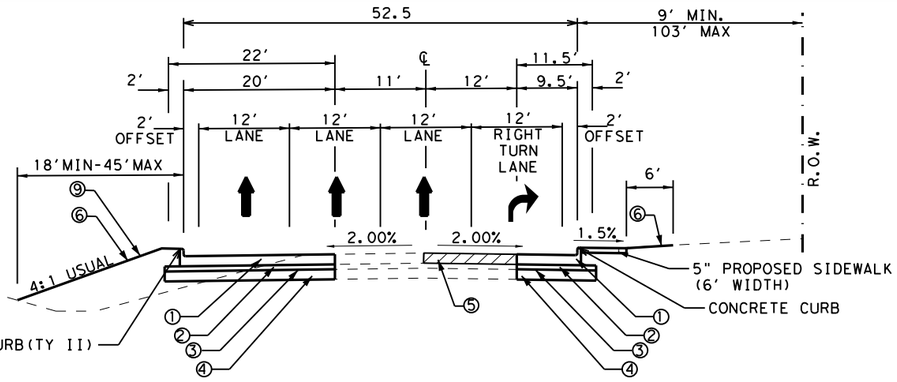


PROPOSED TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
1654+57 TO 1655+46.42
10065+24.57 TO 10066+00



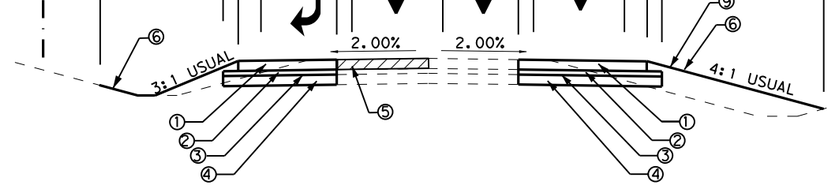
PROPOSED TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1650+59 TO 1652+58

LEGEND

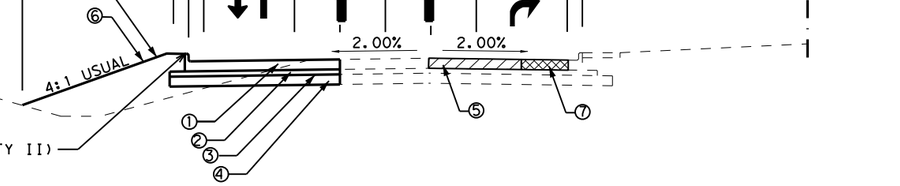
1. 8" CONC PVMT (JOINTED- CPCD)
2. 4" SUPERPAVE (SP-B PG64-22)
3. EMULS ASPH (PRIME)(MS-2 OR SS-1)
4. 6" LIME TREATED EXISTING SUBGRADE (7%)
5. FULL - DEPTH REPAIR CPCD (8")
6. COMPOST MANUF. TOPSOIL (4")W/ BLOCK SOD
7. FLEXIBLE PAVEMENT STRUCTURE REPAIR (12")
8. 4" CONCRETE RIPRAP
9. TEMPORARY SEEDING/BLOCK SOD

NOTES:

1. FULL DEPTH REPAIR CPCD LOCATIONS TO BE LOCATED AND VERIFIED BY THE ENGINEER.

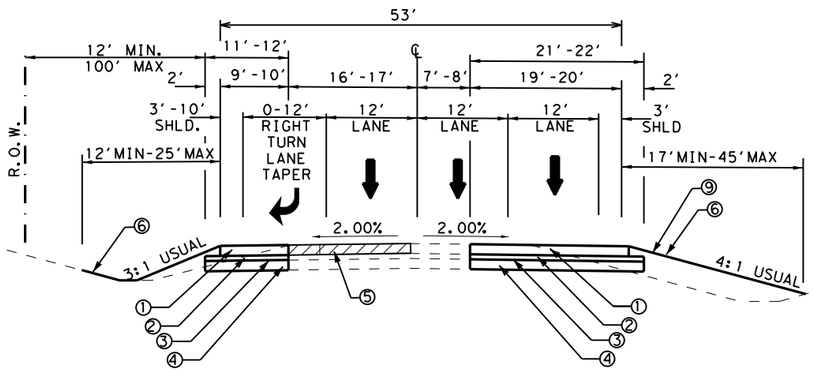


PROPOSED TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
10066+00 TO 10069+00



PROPOSED TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1652+58 TO 1653+03

OMIT DOWDY FERRY ROAD FROM STA. 1653+03 TO STA. 1654+26



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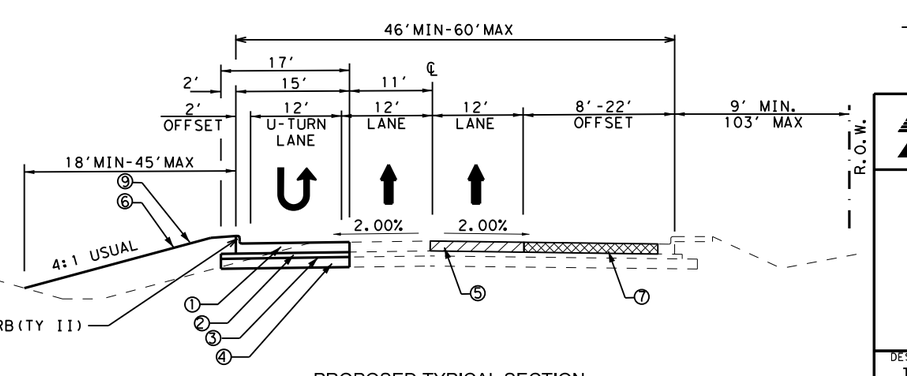
I.H. 45 SB FRONTAGE RD
10069+00 TO 10070+80



PROPOSED TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1654+26 TO 1658+25.28
10066+56.86 TO 10068+15

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/22/21
Signature of Registrant & Date

Texas Department of Transportation
© 2021

IH 45

TYPICAL SECTIONS

SHEET 4 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	7
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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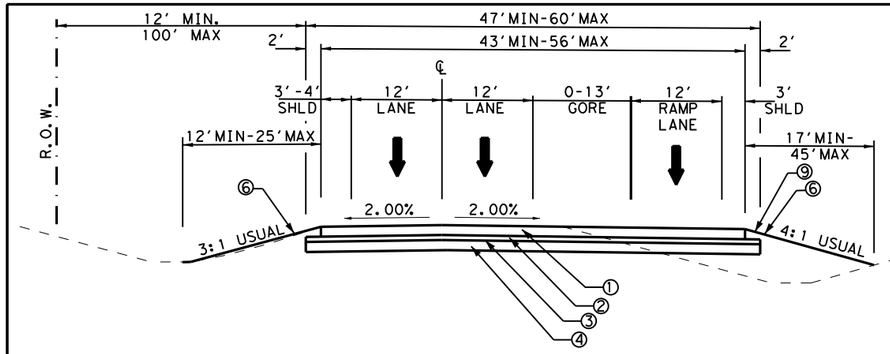
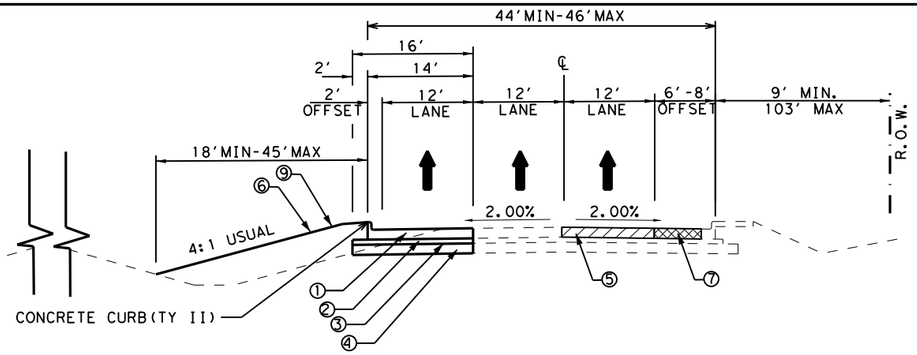


PROPOSED TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
10074+25 TO 10080+20



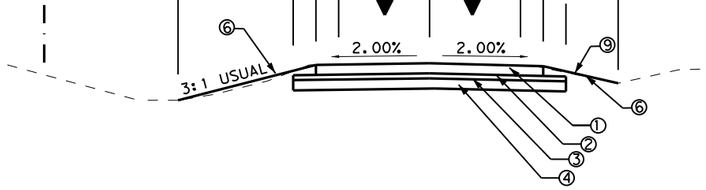
PROPOSED TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
10068+15 TO 10071+00

LEGEND

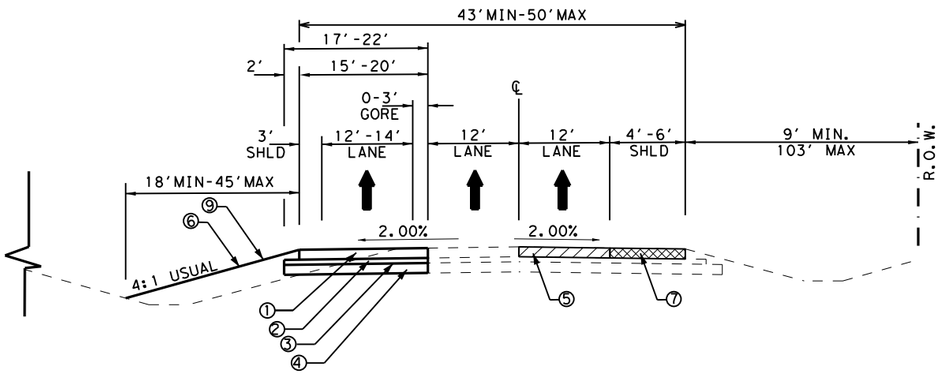
1. 8" CONC PVMT (JOINTED- CPCD)
2. 4" SUPERPAVE (SP-B PG64-22)
3. EMULS ASPH (PRIME)(MS-2 OR SS-1)
4. 6" LIME TREATED EXISTING SUBGRADE (7%)
5. FULL - DEPTH REPAIR CPCD (8")
6. COMPOST MANUF. TOPSOIL (4")W/ BLOCK SOD
7. FLEXIBLE PAVEMENT STRUCTURE REPAIR (12")
8. 4" CONCRETE RIPRAP
9. TEMPORARY SEEDING/BLOCK SOD

NOTES:

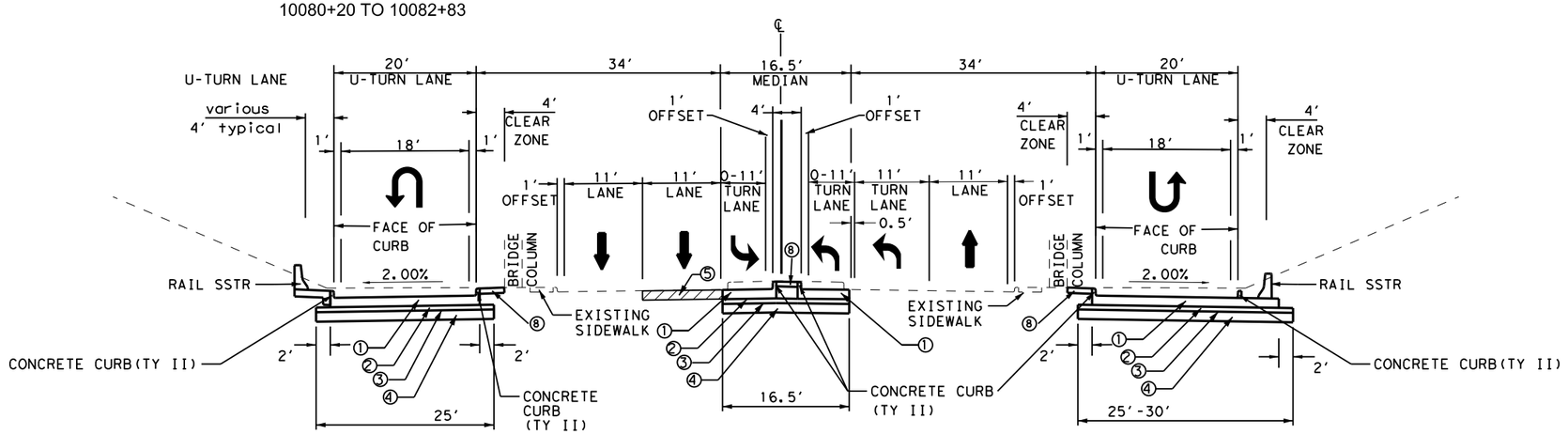
1. FULL DEPTH REPAIR CPCD LOCATIONS TO BE LOCATED AND VERIFIED BY THE ENGINEER.



PROPOSED TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
10080+20 TO 10082+83



PROPOSED TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
10071+00 TO 10077+30



PROPOSED TYPICAL SECTION
DOWDY FERRY RD
13+10 TO 15+71

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/22/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

TYPICAL SECTIONS

SHEET 5 OF 5

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	8
CHECK	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

DATE: 6/22/2021 TIME: 1:39:12 PM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450704\TYPICAL SECTION.dgn

SPECIFICATION DATA

Table 1: Soil Constants Requirements				
Item	Description	Plasticity Index		Note
		Max	Min	
132	EMBANKMENT (FINAL)(DC)(TY C)	40	8	1

Note 1: Material excavated from the project must meet the PI requirements when used in the top 10 feet of embankment that supports the pavement structure or other locations shown in the plans. Do not use shale and obtain approval to incorporate shaley clay produced by the construction project.

Table 2: Basis of Estimate for Permanent Construction					
Item	Description	Thickness	Rate		Quantity
162	Block Sod	N/A	See Specifications		17,902 SY
166 *	Fertilizer (12-6-6)	N/A	500	Lbs./Ac	0.92 Ton
168	Vegetative Watering (Warm)**	N/A	12	MG/Ac/Day	2,663 MG
260 260 260	Hydrated Lime (slurry) Commercial Lime Slurry Quick Lime (slurry)	6”		7% by wt.	289 Ton
314	*EMULS ASPH (PRIME)(MS-2 OR SS-1)*	N/A	0.20	Gal/SY	3,661 Gal
3077	SUPERPAVE MIXTURES SP-B PG64-22	4”	110	Lbs./SY/In	4,027 Ton
*For contractor’s information only **Use Summer rate for calculation, adjust for actual field conditions/temperatures as necessary. See Vegetation Establishment Plan Sheet for estimated daily rates.					
Note: (1) Asphalt weight based on 110 Lbs./SY/In (2) Subgrade weight based on 1.35 Ton/CY (dry-compacted) (3) Item 314 Residual Asphalt 0.20 Gal/SY					

Table 3: Basis of Estimate for Temporary Erosion Control Items				
Item	Description	Rate		Quantity
164	Drill Seeding (Temp) (Warm or Cool)	See Specifications		17,902 SY
166*	Fertilizer (12-6-6)	500	Lb/Ac	0.92 Ton
168	Vegetative Watering (Warm)**	12	MG/Ac/Day	2,663 MG
*For Contractor’s Information Only. **Use Summer rate for calculation, adjust for Actual Field Conditions/Temperatures as Necessary. See Vegetation Establishment Sheet for estimated daily rates.				

GENERAL

The construction, operation and maintenance of the proposed project will be consistent with the state implementation plan as prepared by the Texas Commission on Environmental Quality.

The disturbed area for this project, as shown on the plans is 8.46 acres. However, the Total Disturbed Area (TDA) will establish the required authorization for storm water discharges. The TDA of this project will be determined by the sum of the disturbed area in all project locations in the contract, and all disturbed area on all Project-Specific Locations (PSL) located in the project limits and/or within 1 mile of the project limits. The department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction site as shown on the plans, according to the TDA of the project. The contractor will obtain any required authorization from the TCEQ for the discharge of storm water from any PSL for construction support activities on or off of the project row according to the TDA of the project. When the TDA for the project exceeds 1 acre, provide a copy of the appropriate application of permit (NOI, or Construction Site Notice) to the engineer, for any PSL located in the project limits or within 1 mile of the project limits. Follow the directives and adhere to all requirements set forth in the TCEQ, Texas Pollution Discharge Elimination System, Construction General Permit (TPDES, CGP).

This project required permits with environmental resources agencies, as outlined in the plan set Environmental Permints, Issues and Commitments (EPIC) sheet. There is a high probability that an environmentally sensitive area could be encountered on the contractor designated Project-Specific Locations (PSL) for this project (haul roads, equipment staging areas, borrow pits, disposal sites, field offices, storage areas, parking areas, etc.). Item 7.6 “Project-Specific Locations”, provides a listing of regulatory agencies that may need to be contacted regarding this project.

Leave all right of way areas undisturbed until actual construction is to be performed in said areas.

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

Amanda Moser: Amanda.Moser@Txdot.gov
Nathan Petter: Nathan.Petter@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.

Paper copies of cross-sections may be produced by using the provided .pdf file located on the above FTP Website at the bidders' expense and at copying companies. This data is for non-construction purposes only and it is the responsibility of the prospective bidder to validate the enclosed data with appropriate plans, specifications and estimate for the project(s).

The following standard detail sheets have been modified : TRF (MOD)

Item 5:
Underground utilities owned by the Texas Department of Transportation may be present within the Right-Of-Way on this project. For signal, illumination, surveillance, and communications & control maintained by TxDOT, call the TxDOT Traffic Signal Office (214-320-6682) for locates a minimum of 48 hours in advance of excavation. For irrigation systems, call TxDOT Landscape Office (214-320-6205) for locates a minimum of 48 hours in advance of excavation. If city or town owned irrigation facilities are present, call the appropriate department of the local city or town a minimum of 48 hours in advance of excavation. The Contractor is liable for all damages when utilities are damaged due to Contractor's negligence including, but not limited to, repair or replacement at the Contractor's expense.

For the project to be deemed complete, permanently stabilize all unpaved disturbed areas of the project with a vegetative cover at a minimum of 70% density for the control of erosion.

Place construction stakes/station markings at intervals of no more than 100 feet or as directed by the Engineer. Place stakes and markings so as not to interfere with normal construction operations.

Item 7:
Repair or replace any structures and utilities that might have been damaged by negligence or a failure to have utility locates performed.

Perform all electrical work in accordance with the National Electrical Code and Texas Department of Transportation Specifications.

Consult with appropriate electric company representatives according to their respective area to coordinate electrical services installations.

Holiday restrictions – the engineer may decide that no lane closures or construction operations shall be allowed during the restricted periods listed in the following holiday schedule. TxDOT

has the right to lengthen, shorten, or otherwise modify these restricted periods as actual, or expected, traffic conditions may warrant. Working days will not be charged for these restricted periods. No additional compensation will be allowed for these closures (i.e., overhead, delays, stand-by, barricades or any other associated cost impacts).

- New Year's Eve and Day (noon on December 31 thru 10:00 pm January 1)
- Easter Holiday weekend (noon on Friday thru 10:00 pm Sunday)
- Memorial Day weekend (noon on Friday thru 10:00pm Monday)
- Independence Day (noon on July 3 thru 10:00 pm on July 5)
- Labor Day weekend (noon on Friday thru 10:00 pm Monday)
- Thanksgiving Holiday (noon on Wednesday thru 10:00 pm Sunday)
- Christmas Holiday (noon on December 23 thru 10:00 pm December 26)

No significant traffic generator events identified.

Item 8:
This Project will be a Standard Wokweek in accordance with Article 8.3.1.4.

Meet weekly with the engineer to notify him or her of planned work for the upcoming week.

Critical Path Method (CPM) schedule in P6 format will be required for this project. Submit baseline schedule and obtain approval prior to beginning construction. The Estimate will be held if monthly schedule update is not submitted.

Per Special Provision 008-006, the contractor will be awarded an incentive as shown in table 8-1 for each day of early completion of each milestone. Further, the contractor will be assessed a disincentive for failing to meet each milestones specified in Table 8-1.

Table 8-1

	Milestone Begin and End Conditions	Milestone Duration	Type	Maximum # of days for early completion incentive	Daily Incentive and Disincentive Rate ($/day)
1.	Milestone begins on the first day of the complete closure of the IH 45 North Bound exit ramp for the construction of the connection between the ramp and north bound frontage road widening. The milestone end when the ramp is reopened to traffic.	31 Calendar days	Incentive/Disincentive	7 Calendar days	$2,100

Item 100:
Remove the existing roadway small signs, delineators and object markers as shown on the plans, or as directed, during construction within the right of way. Small sign, delineator and object marker removals are subsidiary to this Item.

The limits of preparing right of way will be measured from Sta. 1635+00 to Sta. 10082+82.83 along the centerline of construction.

Item 104:
In those areas where the pavement is not to be overlaid, provide a smooth surface after the curb removal. Planing or grinding is considered an acceptable method at these locations. Measurement and payment is in accordance with this item.

Sawing of concrete is not paid for directly, but is considered subsidiary to this item.

Item 110:
Excavated shale is not an acceptable material for embankment.

Item 110 and 132:
Scarify and loosen the excavated areas, unpaved surface areas, except rock, to a depth of at least 8 inches and compact in accordance with the specifications.

Excavation and embankment for driveways, sleeper slabs, alleys and intersections will not be paid for directly, but will be considered subsidiary to these items.

Items 132:
Excavated material from the project site has not been determined to be suitable for embankment. The bidder assumes all risk for the use of excavated materials for embankment and is expected to meet all material requirements for embankment regardless of the source.

Perform Tex-106-E (Plasticity Index) by an approved laboratory on excavated soils from sources outside right of way when used in roadway embankment. Provide the test results at no expense to the department. The engineer will sample and test soils produced by the construction project for specification requirements or material sources specified in the plans.

Earth embankment Type C, is mainly composed of material other than shale. Furnish material that is free from vegetation or other objectionable material and that conforms to the requirements of Table 1 (Sheet A). If necessary, treat material with lime slurry in accordance with Item 260, “Lime Treatment (Road-Mixed)” in order to meet these requirements. Use Tex-121-E, figure 1, page 4 to calculate the amount of lime required. When lime treated subgrade is specified, 3000 PPM is the maximum allowed sulfate content in the top 3 feet when material comes from borrow source. Follow recommendations of 260.4.4 for mixing and mellowing. The engineer will test material placed or excavated to a depth of one foot below and laterally to one foot outside the proposed treatment limit. Lime treatment of this material will not be paid for directly, but will be considered subsidiary to this item.

Item 134:
Start backfilling pavement edges as soon as possible after the surface course is started.

Backfill and compact the pavement edges to produce a smooth surface adjacent to the pavement with no vertical edges.

Use Type “A” or “B” material to backfill pavement edges as shown in plans. Type “A” or “B” material shall consist of suitable material that when compacted will support the pavement edge. Rap is considered suitable Type “A” or “B” material.

Blade the existing vegetation into a neat wind-row prior to overlay. After placing Ty A or Ty B backfill and placing seeding, the material from the wind-row shall be replaced on the completed slopes. Emulsion shall be placed at a 50/50 solution of water to emulsion over disturbed area. Emulsion rate=0.15 Gal/SY residual. This work, materials and equipment shall be subsidiary to Item 134.

Item 160:
Sequence construction operations to salvage topsoil from one location and spread on areas ready to receive topsoil. Keep stockpiling of topsoil to a minimum.

Use fertile clay or loam from the project site not more than six inches below natural grade as topsoil.

Item 161:
Provide tickets representing quantity of compost delivered to site.

Item 260:
Furnish and distribute MS-2 smoothly and evenly at the rate of 0.20 gallons per square yard to cure lime, as directed.

Provide Hydrated Lime (slurry) or Commercial Lime Slurry or Quick Lime (slurry) and apply lime by slurry placement method.

Item 301:
Provide liquid antistripping agents unless otherwise directed. Add the minimum dosage determined by the manufacturer or higher dosage determined by design requirement and try subsequent trials at 0.25% increments.

Item 305:
Saw existing asphalt along neat lines where portions are to be left in place temporarily or permanently. Sawing is not paid for directly, but is subsidiary to this item.

Take possession of recycled asphalt pavement from the project and recycle the material.

Properly dispose of unsalvageable material at your own expense.

Item 314:
Apply MS-2 or SS-1 as a prime, dilute the asphalt with base finish water, distribute in successive applications, and work into the top 1/4” of flex base. Residual asphalt 0.20 Gal/SY.

Item 320:
Use a self-propelled wheel mounted MTV capable of receiving mix from the haul trucks, separate from the paver. It shall have a minimum storage capacity of approximately 25 tons. It shall be equipped with a pivoting discharge conveyor and shall completely and thoroughly remix the material prior to placement. The effectiveness of the MTV’s remixing ability is subject to the approval of the Engineer. In addition, the paver shall have a surge storage insert with a minimum capacity of 20 tons.

The use of windrow pick-up equipment is allowed except on the first course of roadway material placed over the subgrade.

Item 360:
Provide dowel support assemblies in concrete pavement constructed of No. 1/0 (0.306" diameter) wire in the main vertical members. Rigidly support the dowels in parallel positions and weld them on one end to the support frame. Provide weld attachments alternately on opposite ends of successive dowels. The support assembly is subject to approval.

Use of multiple piece tiebars will be required. Provide chairs for multiple piece tiebars, threaded connectors or other adequate devices, used in concrete paving, or tie them to the pavement reinforcing steel. If approved by the engineer for specific areas, in lieu of multiple piece tiebars, drill holes into the pavement and grout straight tiebars in place with epoxy. Use a non-impact, rotary core drill to prevent damage to the pavement unless otherwise directed. Clean the drill holes and then completely fill with epoxy before inserting the tiebar. Do not bend the tiebars or insert them into plastic concrete without the approval of the engineer.
Provide curbs monolithically constructed with the concrete pavement. If continuous monolithic curb has to be temporarily omitted for any reason, provide dowelled curbs in the proposed areas, as detailed in the plans, and apply an approved epoxy resin to the pavement to receive the curb as directed. This work and materials will not be paid for directly, but is considered subsidiary to this item.

If asphalt curing is used, cure the concrete pavement with MS-2.

Stockpile the concrete aggregates at the plant site.

Provide pavement widening joints, as detailed in the plans, at all locations where concrete pavement is placed adjacent to existing concrete pavement. Installation of these joints is not paid for directly, but is considered subsidiary to this item.

Payment for furnishing and installing the pre-molded expansion joint material between the retaining walls and concrete pavement is not paid for directly, but is considered subsidiary to this item.

Provide a curing machine equipped with rubber tires, or other acceptable arrangement, so that the machine will span the pavement and monolithic curb.

Curb transition is paid for as Type II curb.

The installation of curb openings is not paid for directly, but is considered subsidiary to this item.

Place construction, sawed and contraction joints in accordance with the pavement detail sheet and as directed. Joint locations, other than as shown on the plans, are subject to approval.

Pavement leave outs are required on this project as necessary to provide for traffic at driveways and side streets as shown in the plans or as directed. The cost of providing these leaveouts, including the construction of a suitable crossover connection at each site, is not paid for directly but is considered subsidiary to this item.

If a traveling form paver is used, provide one equipped with an electronically operated horizontal control device.

Use "mechanical steel placing equipment” at the discretion of the engineer.

Supply the Engineer with a list of certified personnel and copies of their current ACI certificates before beginning production and when personnel changes are made. Supply hard copies of calibration reports for testing equipment when required by the Engineer.

If more than 30% of an area in any 1000-Ft section of roadway requires grinding, action will be taken by the Contractor to make that 1000-Ft full width section uniform without changing ride quality, compromising quality of pavement and decreasing skid resistance. Approved blasting method or other method approved by the Engineer will be performed at the Contractor’s expense.

Item 361:
Provide Class HES concrete designed to attain a minimum average flexural strength of 255 psi or a minimum average compressive strength of 1,800 psi within the allowed lane closure times.

All permanent pavement markings which are removed during the removal of the existing concrete pavement are to be replaced as directed by the Engineer. These pavement markings will not be paid for directly, but will be considered subsidiary to this bid item.

Tining will be required as described in Item 360.4.8.3 unless otherwise directed by the Engineer. Surface Test Type A utilizing a 10’ straight edge as described under Item 585 will be required unless otherwise directed by the Engineer.

Item 400:
Structural Excavation is not paid for directly but is considered subsidiary to pertinent Items.

When placing concrete storm drain pipe on slopes of greater than 10 percent, provide cement stabilized backfill to a depth shown on the plans.

Item 416:
Provide a formed smooth finish for all portions of drill shafts extending above proposed ground. Include cost for this work in the unit bid price for this item.

Illumination pole foundations will be paid for once regardless of extra work caused by obstructions.

Concrete removal required for installation of drilled shafts will be subsidiary to Item 416.

Item 421:
Furnish mix designs to the Engineer in a format compatible to the latest version of the Department's Construction Management System (SiteManager). Mix Design templates will be provided by the Engineer.

Provide sulfate resistant concrete for all drilled shafts.

Item 440:
Fiber Reinforced Concrete (FRC) can be used as a substitute for Non-Structural Class Reinforced Concrete in Mow-Strip and Rip Rap Items as approved. FRC may also be used for other Non-Structural Class Reinforced Concrete Items as approved.

Item 449:
Use Thomas & Betts Kopr-Shield, MG Chemicals #846, MG Chemicals #8463, NYOGEL #756G, Pro-Shield #7308, Cho-Lube #4220, or other approved electrically conducting lubricant compound.

Item 464:
The concrete collars and the connections of pipes to existing or proposed concrete boxes or pipe will not be paid for directly but will be considered subsidiary to the various bid items.

At locations where storm drains dead-end, plug with a concrete plug of a thickness equal to 1 ½ inches per foot of diameter of pipe with a minimum thickness of 3 inches. The cost of the plugs shall be included in the unit price bid per foot of the various storm drain pipes.

Item 465:
All manholes, junction boxes and inlets will require inverts unless otherwise directed.

Item 479:
Accept ownership of inlet grates and manhole covers and properly dispose of them outside the limits of the right of way in accordance with federal, state and local regulations.

Submit a plan detailing proposed methods of handling phased construction at manholes and water valves.

Payment for the phase construction will be considered subsidiary to this item.

Item 496:
Concrete pavement removed as a result of removing the inlets will not be paid for directly but will be considered as subsidiary to Item 496.

Inlet grates and manhole covers become the property of the contractor for disposal.

Item 500:
Material On Hand (MOH) will not be used in calculating partial payments for Mobilization.

Item 502:
The Contractor Force Account "Safety Contingency" that has been established for this project is intended to be utilized for work zone enhancements, to improve the effectiveness of the Traffic Control Plan, that could not be foreseen in the project planning and design stage. These enhancements will be mutually agreed upon by the Engineer and the Contractor's Responsible Person based on weekly or more frequent traffic management reviews on the project. The Engineer may choose to use existing bid items if it does not slow the implementation of enhancement.

Access will be provided to all business and residences at all times. Where turning radii are limited during phased construction at intersections, provide all weather surfaces such as RAP or base in turning movements to accommodate and to protect the traffic from edge drop-offs. Materials, labor, maintenance and removal for these temporary accesses and radii will not be paid for directly but will be considered subsidiary to the various bid items.

Provide written proposed lane closure information by 1:00 pm on the business day prior to the proposed closures. Do not close lanes when this requirement is not met.

When excavation is required next to a pavement lane carrying traffic and the widening is not completed by the end of the work day, backfill against the edge of the pavement with at least a 3:1 slope using an acceptable material to support vehicular traffic. Carefully remove and dispose of this material when work resumes. Backfilling pavement edges, and the materials required for the work will be subsidiary to this item.

Place barricades and signs in locations that do not obstruct the sight distance of drivers entering the highway from driveways or side streets.

Provide rectangular shape (CW12-2P) Temporary Clearance Signs on all bridges where the existing vertical clearance has changed. Install Signs to the satisfaction of the Engineer prior to opening to traffic. Plywood sign blanks will have minimum dimensions of 84" X 12". Work performed and materials are subsidiary to this item.

Do not commence work on the road before sunrise. Do not operate or park any equipment/machinery closer than 30 feet from the traveled roadway after sunset unless authorized by the engineer.

When moving unlicensed equipment on or across any pavement or public highways, protect the pavement from all damage using an acceptable method.

As approved by the Engineer, provide uniformed off duty police officers and squad cars during ramp closures or other situations that indicate a need for additional traffic control to protect the traveling public or the construction workforce. Provide documentation such as payroll, log sheets with signatures and badge number, or invoices from the government entity providing the officers for reimbursement. Complete the weekly 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. Reimbursement will not be made for coordination fees charged by any party.

Item 506:
Take all practicable precautions to prevent debris from being discharged into the Waters of Texas or a designated wetland. Install Best Management Practices before demolition begins and maintain them during the demolition. Remove any debris or construction material that escapes containment devices and are discharged into the restricted areas, before the next rain event or within 24 hours of the discharge.

If temporary construction stream crossings are allowed under a Nationwide Permit, submit in writing for approval the type and location of each temporary stream crossing. Use temporary bridges, timber mats, or other structurally sound and non-eroding material for temporary stream crossings. A temporary culvert crossing will consist of storm sewer pipes and 4- to 8-inch nominal size rock. Temporary stream crossings must not cause more than minimal changes to the hydraulic flow characteristics of the stream, increase flooding, or cause more than minimal degradation of water quality. Remove the temporary stream crossings in their entirety and return the affected areas to their pre-existing elevation. All work and materials use for temporary construction stream crossings will not be paid for directly but are subsidiary to pertinent Items.

Provide SW3P Signs. Obtain from the Engineer a copy of the project's completed TPDES Storm Water Program Construction Site Notice and Contractor Site Notice. Laminate the sheets and bond with adhesive to 36" X 36" plywood sign blanks. Ensure the sheets remain dry. Apply Type C Blue reflective sheeting as the background and add the text "SW3P" in 5" white lettering, centered at the top. Attach the signs to approved temporary mounts and locate at each of the project limits just inside the right of way line at a readable height or as directed by the Engineer. If the sign cannot be placed outside the clear zone, it must adhere to the TMUTCD. SW3P signs, maintenance, and reposting (for replacement or as needed to ensure readability) will be subsidiary to Item 502.

Concrete Washouts are required per the CGP. The Concrete Washout Area(s) structural controls must consist of temporary berms, temporary shallow pits, and/or temporary storage tanks to prevent contaminated runoff and must be lined as to prevent contamination of underlying soil. Ensure pits properly maintained including removal of concrete as not to allow over flow. The location(s) of washout area will be approved by the Engineer. When washout pits are no longer needed, they will be removed and area will be restored to original condition. This work, materials and labor will not be measured or paid for directly but will be subsidiary to Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls."

Item 508:
Testing of materials used in the construction of a temporary detour may be waived when approved by the Engineer

Item 529:
Provide grooved joints at 10-foot intervals and ¾ inch expansion joint material for doweled curb at the same locations as on the existing pavement.

For Curb and Gutter sections, provide grooved joints at 10-foot intervals and ¾ inch expansion joint material at a maximum of 50-foot centers and at all radius points and inlets.

Curb and Gutter transitions will be paid for by the foot at the unit price for the corresponding curb or curb and gutter section.

Saw joints at the same location as on the existing pavement.

Item 530:
Provide Class "HES" concrete for concrete intersections and driveways listed or shown on the plans.

Item 531:
Joint sealant is required when shown in the plans. This work will not be paid for directly but will be considered subsidiary to this Item.

Item 536:
Use Class "B" concrete for concrete medians and directional islands.

Item 585:
Use Surface Test Type A on all intersections and driveways.

Use Surface Test Type B pay adjustment schedule 3 on the service roads.

Item 610:
Contact the Trafic Siganl Shop at (213)319-6432 for assistance with locates.

Use 480 volt electronic LED drivers for luminaires on this project

Make every effort to keep the jobsite lit for duration of the project. Do not de-energize existing lighting before new lighting is operational without prior approval.

Existing illumination circuits may be located within or adjacent to the project limits. Either verify with the Engineer or supply a video survey to the Engineer of all the lighting in and adjacent to the project limits before beginning work. Ensure that all assemblies operational at the beginning of construction are operational at the completion of the project. This work will be done at the contractor's expense.

Item 618:
The location of conduits and ground boxes are diagrammatic only and may be shifted to accommodate field conditions as directed.

Secure permission and approval from the proper authority prior to cutting into or removing any sidewalks or curbs for installation of this Item.

Structurally mount junction boxes as shown on the plans.

Place conduit under existing pavement by an approved boring method. Do not place boring pits closer than 2 feet from the edge of the pavement unless otherwise directed. Do not use water jetting. When conduits are bored, do not exceed 18 inches in the vertical and horizontal tolerances as measured from the intended target point.

Do not use a pneumatically driven device for punching holes beneath the pavement (commonly known as a "missile").

Furnish and install a non-metallic mule tape in conduit runs in excess of 50 feet. Also furnish and install non-metallic mule tape in conduit installed for future use and cap using standard weather-tight conduit caps, as approved. Furnish Garvin # PT-1250-3K, ComStar PUL 1250P3K, Ideal Part No. 31-315 or equal as approved by the Engineer. This work will not be paid for directly, but is subsidiary to this Item.

Use a colored cleaner-primer on all PVC to PVC joints before application of PVC cement.

Seal all conduit ends with a permanently soft, non-toxic duct seal. Use a duct seal that does not adversely affect other plastic materials or corrode metals.

Existing conduit is proposed for reuse in this project. Conduit prep will be paid for under Item 6027 as directed by the Engineer.

When using existing conduit, ensure that all conduits have bushings and are cleaned of mud and debris. This work will not be paid for directly, but is subsidiary to this Item.

Item 620:
The equipment grounding conductor shall be identified by a continuous green colored jacket insulation or bare wire. Grounded conductors (Neutral) shall be identified by a continuous white colored jacket. Ungrounded conductors (Hot) in a 120/240v or 240/480v system shall be identified by each pole or leg. For 240-volt branch circuit fed from 120/240 source and 480-volt branch circuit fed from 240/480 source, ensure one leg is identified by a continuous black colored jacket and the other leg by a continuous red colored jacket.

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holder as shown on the Texas Department of Transportation (TxDOT) - Construction Division's (CST) materials producers list. Category is "Roadway Illumination and Electrical Supplies." Fuse holder is shown on list under Items 610 & 620. Provide 10 amp time delay fuses.

Item 624:
Slack conductors required by Standard Sheet ED(3)-14 will be subsidiary to Item 624.

Concrete removal required for installation of ground boxes will be subsidiary to Item 624.

Items 644:
Provide two (2) sets of shop drawings for signs. The shop drawings shall conform to the details shown on the plans. The shop drawings shall show the details of the panels, wind beams, stiffeners, joint backing plates, splices, fasteners, brackets, and sign support connections. The shop drawings shall show letter types and sizes, interline spacing and message arrangements.

Affix a sign identification decal to the back of all signs in accordance with Item 643.

Prior to taking elevations to determine lengths for fabrication of sign posts and/or sign support towers, obtain verification of all proposed locations.

All sign mounts shall have a clamp base system for all small roadside sign assemblies.

A 3 inch strip of red reflective sheeting shall be placed on all Do Not Enter sign assemblies. This sheeting shall be placed directly below the Do Not Enter sign for the entire length of the sign post facing wrong way traffic. This work will be considered subsidiary to Item 644.

Item 662 and 672:
Black adhesive will be used on asphalt pavements and white adhesive will be used on concrete pavements.

Item 677:
A water blasting method approved by the Engineer will be the only method allowed for the removal of permanent and temporary pavement markings except on a sealcoat surface. A 2 foot wide sealcoat will be required on sealcoat surfaces to eliminate permanent and temporary pavement markings.

Item 682:
Install signal head attachments so that the wiring to each signal head passes from the mast arm through the attachment hardware to the signal head. Do not leave cable or wiring exposed.

Provide signal head attachments that allow for adjustment about the horizontal and vertical axis.

Provide aluminum pedestrian and vehicle signal heads in the following color: Federal Yellow #13538 of Federal Standard 595. Provide non-painted aluminum tubing. Provide back plates, louvers, and the inside of visors with a flat black finish. Provide aluminum vented back plates for all traffic signal heads.

Turn down signal heads or cover with burlap or other material, as approved, until traffic signal is placed in operation.

Mount signal heads level and plumb and aim as directed.

Item 684:
Provide stranded 14 AWG Type A signal cables for LED signal heads and stranded 12 AWG Type C cables for APS units.

Provide a separate multi-conductor signal cable (14 AWG) inside pedestal poles and signal poles from the terminal strip to each signal head as shown on the plans.

Identify each cable as shown on the plans (cable 1, etc.) with permanent marking labels (Panduit Type PLM standard single marker tie, Thomas&Betts Type 548M, or equal) at each ground box, pole base, and controller.

Item 3077:
Use aggregate that meets the Surface Aggregate Classification (SAC) requirement of Class B.

Superpave Mixtures used as concrete pavement underlayment is deemed as “Exempt Production”.

Provide PG binder 64-22 in Type SP-B mixture.

Item 6155
Radar cable will be supplied by the Texas Dept. of Transportation for the contractor to install

Item 6185:
The total number of truck mounted attenuators (TMAs) or trailer attenuators (TAs) required when utilizing the traffic control standards are shown in the tables below.

TCP 2 Series	Scenario	Required TMA/TA
(2-5)-18 / (2-6)-18	All	1

TCP 3 Series	Scenario			Required TMA/TA
(3-2)-13	All			3
(3-3)-14	A	B	D	2
	C			3
(3-4)-13	All			1, unless working inside a twltl, then 2.

TCP 6 Series	Scenario		Required TMA/TA	
(6-4)-12	A	B	1	2

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/TAs needed for the project. Additional TMAs/TAs used that are not specified in the plans in which the contractor expects compensation will require prior approval from the Engineer.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0092-02-125 **DISTRICT** Dallas **COUNTY** Dallas
HIGHWAY IH 45

			CONTROL SECTION JOB		**0092-02-125**	TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00058765**		
			COUNTY		**Dallas**		
			HIGHWAY		**IH 45**		
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	38.780		38.780	
	104-6001	REMOVING CONC (PAV)	SY	1,068.000		1,068.000	
	104-6009	REMOVING CONC (RIPRAP)	SY	5.000		5.000	
	104-6011	REMOVING CONC (MEDIANS)	SY	481.000		481.000	
	104-6015	REMOVING CONC (SIDEWALKS)	SY	267.000		267.000	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	499.000		499.000	
	104-6021	REMOVING CONC (CURB)	LF	620.000		620.000	
	104-6024	REMOVING CONC (RETAINING WALLS)	SY	158.000		158.000	
	104-6032	REMOVING CONC (WHEELCHAIR RAMP)	SY	1.000		1.000	
	104-6044	REMOVING CONC (FLUME)	SY	10.000		10.000	
	110-6001	EXCAVATION (ROADWAY)	CY	5,411.000		5,411.000	
	132-6006	EMBANKMENT (FINAL)(DENS CONT)(TY C)	CY	5,207.000		5,207.000	
	134-6004	BACKFILL (TY A OR B)	STA	59.400		59.400	
	152-6001	ROAD GRADER WORK (ORD COMP)	STA	59.400		59.400	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY	17,902.000		17,902.000	
	162-6002	BLOCK SODDING	SY	17,902.000		17,902.000	
	164-6051	DRILL SEED (TEMP)(WARM OR COOL)	SY	17,902.000		17,902.000	
	168-6001	VEGETATIVE WATERING	MG	5,326.000		5,326.000	
	216-6001	PROOF ROLLING	HR	26.000		26.000	
	260-6006	LIME TRT (EXST MATL) (6")	SY	18,303.000		18,303.000	
	260-6016	LIME (HYD, COM, OR QK(SLURRY))	TON	289.000		289.000	
	305-6049	SLV, HAUL & STKPL RCL APH PV(8" TO 14")	SY	6,744.000		6,744.000	
	314-6021	EMULS ASPH (PRIME)(MS-2 OR SS-1)	GAL	3,661.000		3,661.000	
	351-6008	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	SY	385.000		385.000	
	360-6018	CONC PVMT (JOINTED - CPCD) (8")	SY	16,097.000		16,097.000	
	360-6024	CONC PVMT (JOINTED - CPCD) (14")	SY	71.000		71.000	
	361-6033	FULL - DEPTH REPAIR CPCD (8")	SY	1,340.000		1,340.000	
	402-6001	TRENCH EXCAVATION PROTECTION	LF	265.000		265.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	60.000		60.000	
	420-6066	CL C CONC (RAIL FOUNDATION)	CY	7.000		7.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	10.500		10.500	
	432-6006	RIPRAP (CONC)(CL B)	CY	2.100		2.100	
	432-6044	RIPRAP (CONC)(FLUME)	CY	101.000		101.000	
	450-6023	RAIL (TY SSTR)	LF	196.000		196.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	118.000		118.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	194.000		194.000	
	465-6147	INLET(COMPL)(PSL)(SFG)(4FTX4FT-4FTX4FT)	EA	1.000		1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0092-02-125 **DISTRICT** Dallas **COUNTY** Dallas
HIGHWAY IH 45

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0092-02-125**			
		PROJECT ID		**A00058765**			
		COUNTY		**Dallas**			
		HIGHWAY		**IH 45**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	465-6203	INLET (COMPL)(CURB)(TY 1)	EA	2.000		2.000	
	465-6208	INLET (COMPL)(CURB&GRATE)(TY I)	EA	1.000		1.000	
	465-6268	INLET (COMPL) (EXT)(TY I)	EA	2.000		2.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA	2.000		2.000	
	479-6002	ADJUSTING INLETS	EA	1.000		1.000	
	496-6002	REMOV STR (INLET)	EA	1.000		1.000	
	496-6004	REMOV STR (SET)	EA	2.000		2.000	
	496-6016	REMOV STR (PIPE)	EA	4.000		4.000	
	500-6001	MOBILIZATION	LS	1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000		8.000	
	506-6001	ROCK FILTER DAMS (INSTALL) (TY 1)	LF	111.000		111.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF	111.000		111.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY	466.800		466.800	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY	466.800		466.800	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF	105.000		105.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF	105.000		105.000	
	506-6041	BIODEG EROSN CONT LOGS (INSTL) (12")	LF	2,919.000		2,919.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	2,919.000		2,919.000	
	508-6001	CONSTRUCTING DETOURS	SY	324.000		324.000	
	529-6005	CONC CURB (MONO) (TY II)	LF	3,070.000		3,070.000	
	530-6004	DRIVEWAYS (CONC)	SY	478.000		478.000	
	531-6001	CONC SIDEWALKS (4")	SY	206.000		206.000	
	531-6004	CURB RAMPS (TY 1)	EA	1.000		1.000	
	536-6002	CONC MEDIAN	SY	102.000		102.000	
	560-6011	MAILBOX INSTALL-S (TWW-POST) TY 4	EA	10.000		10.000	
	610-6004	RELOCATE RD IL ASM (TRANS-BASE)	EA	6.000		6.000	
	610-6104	IN RD IL (U/P) (TY 1) (150W EQ) LED	EA	6.000		6.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF	1,300.000		1,300.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	156.000		156.000	
	618-6029	CONDT (PVC) (SCH 40) (3")	LF	25.000		25.000	
	618-6033	CONDT (PVC) (SCH 40) (4")	LF	372.000		372.000	
	618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF	368.000		368.000	
	618-6064	CONDT (RM) (1")	LF	208.000		208.000	
	620-6007	ELEC CONDR (NO.8) BARE	LF	347.000		347.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF	3,206.000		3,206.000	
	620-6009	ELEC CONDR (NO.6) BARE	LF	1,221.000		1,221.000	
	620-6011	ELEC CONDR (NO.4) BARE	LF	2,388.000		2,388.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0092-02-125 **DISTRICT** Dallas **COUNTY** Dallas
HIGHWAY IH 45

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0092-02-125**			
		PROJECT ID		**A00058765**			
		COUNTY		**Dallas**			
		HIGHWAY		**IH 45**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	620-6012	ELEC CONDR (NO.4) INSULATED	LF	4,776.000		4,776.000	
	621-6002	TRAY CABLE (3 CONDR) (12 AWG)	LF	2,651.000		2,651.000	
	624-6008	GROUND BOX TY C (162911)W/APRON	EA	2.000		2.000	
	624-6028	REMOVE GROUND BOX	EA	1.000		1.000	
	628-6002	REMOVE ELECTRICAL SERVICES	EA	1.000		1.000	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	15.000		15.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	32.000		32.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA	35.000		35.000	
	644-6005	IN SM RD SN SUP&AM TY10BWG(1)SA(T-2EXT)	EA	1.000		1.000	
	644-6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA	2.000		2.000	
	644-6064	IN BRIDGE MNT CLEARANCE SGN ASSM(TY N)	EA	2.000		2.000	
	647-6003	REMOVE LRSA	EA	1.000		1.000	
	658-6047	INSTL OM ASSM (OM-2Y)(WC)GND	EA	8.000		8.000	
	662-6001	WK ZN PAV MRK NON-REMOV (W)4"(BRK)	LF	400.000		400.000	
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	5,500.000		5,500.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	5,000.000		5,000.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	1,290.000		1,290.000	
	662-6110	WK ZN PAV MRK SHT TERM (TAB)TY Y	EA	400.000		400.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	3,754.000		3,754.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	155.000		155.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	13.000		13.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	13.000		13.000	
	666-6224	PAVEMENT SEALER 4"	LF	19,343.000		19,343.000	
	666-6226	PAVEMENT SEALER 8"	LF	3,754.000		3,754.000	
	666-6230	PAVEMENT SEALER 24"	LF	155.000		155.000	
	666-6231	PAVEMENT SEALER (ARROW)	EA	13.000		13.000	
	666-6232	PAVEMENT SEALER (WORD)	EA	13.000		13.000	
	666-6300	RE PM W/RET REQ TY I (W)4"(BRK)(100MIL)	LF	3,150.000		3,150.000	
	666-6303	RE PM W/RET REQ TY I (W)4"(SLD)(100MIL)	LF	8,279.000		8,279.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	7,914.000		7,914.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	202.000		202.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	7,759.000		7,759.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	1,097.000		1,097.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	155.000		155.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	2.000		2.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	2.000		2.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	8.000		8.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0092-02-125 **DISTRICT** Dallas **COUNTY** Dallas
HIGHWAY IH 45

						TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0092-02-125**			
		PROJECT ID		**A00058765**			
		COUNTY		**Dallas**			
		HIGHWAY		**IH 45**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	7.000		7.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	12.000		12.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4.000		4.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	12.000		12.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4.000		4.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	14.000		14.000	
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA	1.000		1.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	257.000		257.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	2,454.000		2,454.000	
	684-6038	TRF SIG CBL (TY A)(14 AWG)(12 CONDR)	LF	1,796.000		1,796.000	
	684-6079	TRF SIG CBL (TY C)(12 AWG)(2 CONDR)	LF	3,627.000		3,627.000	
	690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA	14.000		14.000	
	3077-6003	SP MIXESSP-BSAC-B PG64-22	TON	4,027.000		4,027.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	4.000		4.000	
	6027-6003	CONDUIT (PREPARE)	LF	1,763.000		1,763.000	
	6027-6008	GROUND BOX (PREPARE)	EA	10.000		10.000	
	6155-6002	RADAR COMMUNICATION CABLE	LF	2,583.000		2,583.000	
	6185-6002	TMA (STATIONARY)	DAY	132.000		132.000	
	6185-6003	TMA (MOBILE OPERATION)	HR	70.000		70.000	
	16	MATERIAL FURNISHED BY THE STATE (PARTICIPATING)	LS	1.000		1.000	
	18	LAW ENFORCEMENT: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000		1.000	
		SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	

SUMMARY OF REMOVAL ITEMS

LOCATION	104 6001	104 6009	104 6011	104 6015	104 6017	104 6021	104 6024	104 6032	305 6049
	REMOVING CONC (PAV)	REMOVING CONC (RIPRAP)	REMOVING CONC (MEDIANS)	REMOVING CONC (SIDEWALKS)	REMOVING CONC (DRIVEWAYS)	REMOVING CONC (CURB)	REMOVING CONC (RETAINING WALLS)	REMOVING CONC (WHEELCHAIR RAMP)	SLV, HAUL & STKPL RCL APH PV (8" TO 14")
	SY	SY	SY	SY	SY	LF	SY	SY	SY
NORTH BOUND FRONTAGE ROAD	889			44	150	234		1	1,873
SOUTH BOUND FRONTAGE ROAD	179	5			349	286			4,871
DOWDY FERRY ROAD			481			100			
U-TURN NORTH				81			100		
U-TURN SOUTH				142			58		
PROJECT TOTALS	1068	5	481	267	499	620	158	1	6744

SUMMARY OF RAIL ITEMS

LOCATION	450 6023	420 6066
	RAIL (TY SSTR)	CL C CONC (RAIL FOUNDATION)
	LF	CY
NORTH RAIL	113	7
SOUTH RAIL	83	
PROJECT TOTALS	196	7

SUMMARY OF ROADWAY ITEMS

LOCATION	110 6001	132 6006	134 6004	152 6001	216 6001	260 6006	260 6016	314 6021	351 6008	360 6018	360 6024	361 6033	432 6001	508 6001	529 6005	531 6001	531 6004	536 6002	658 6047	6001 6002	6185 6002	6185 6003	3077 6003
	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY C)	BACKFILL (TY A OR B)	ROAD GRADER WORK (ORD COMP)	PROOF ROLLING	LIME TRT (EXST MATL) (6")	LIME (HYD, COM, OR QK(SLURRY))	EMULS ASPH (PRIME) (MS-2 OR SS-1)	FLEXIBLE PAVEMENT STRUCTURE REPAIR (12")	CONC PVMT (JOINTED - CPCD) (8")	CONC PVMT (JOINTED - CPCD) (14")	FULL - DEPTH REPAIR CPCD (8")	RIPRAP (CONC) (4 IN)	CONSTRUCTING DETOURS	CONC CURB (MONO) (TY II)	CONC SIDEWALKS (4")	CURB RAMPS (TY 1)	CONC MEDIAN	INSTL OM ASSM (OM-2Y) (WC)GND	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)	SP MIXES SP-B SAC-B PG64-22
	CY	CY	STA	STA	HR	SY	TON	GAL	SY	SY	SY	SY	CY	SY	LF	SY	EA	SY	EA	EA	DAY	HR	TON
NORTH BOUND FRONTAGE ROAD	2,096	2,072	32.9	32.9	10	7,606	120	1,521	335	6,671		685			1110		1		4	1	132	70	1,673
SOUTH BOUND FRONTAGE ROAD	2,760	2,997	21.3	21.3	10	8,459	133	1,692	50	7,419		455		324	370				4	1			1,861
DOWDY FERRY ROAD					2	378	6	76		378		200			100	206		102		2			83
U-TURN NORTH	345	88	2.6	2.6	2	1066	17	213		945	32		4		745								235
U-TURN SOUTH	210	50	2.6	2.6	2	794	13	159		684	39				745								175
PROJECT TOTALS	5,411	5,207	59.4	59.4	26	18,303	289	3,661	385	16,097	71	1,340	4	324	3,070	206	1	102	8	4	132	70	4,027

SUMMARY OF DRAINAGE ITEMS

LOCATION	104 6044	402 6001	432 6001	432 6044	464 6003	464 6005	465 6147	465 6203	465 6208	465 6268	467 6395	479 6002	496 6002	496 6004	496 6016
	REMOVING CONC (FLUME)	TRNECH EXCAVATION PROTECTION	RIPRAP (CONC) (4 IN)	RIPRAP (CONC) (FLUME)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	INLET (COMPL) (PSL) (SFG) (4FTX4FT-4FTX4FT)	INLET (COMPL) (CURB) (TY I)	INLET (COMPL) (CURB&GRATE) (TY I)	INLET (COMPL) (EXT) (TY I)	SET (TY II) (24 IN) (RCP) (6: 1) (P)	ADJUSTING INLETS	REMOV STR (INLET)	REMOV STR (SET)	REMOV STR (PIPE)
	SY	LF	CY	CY	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA
NBFR															
STA. 1650+00.00			3.5												
LINE L2-1 (STA. 1650+33.78)			3			32					1				
STA. 1654+64.93				20											
LINE L5-2 (STA. 1655+26.25)		58				72	1						1		
DOWDY FERRY														1	
LINE L3-1 (STA. 13+76.83)	5	92				90			1		1				
LINE L4-1 (STA. 13+89.67)	5	33			59			1							
														1	
U-TURN NORTH															
LINE L5-1 (STA. 1+71.57)		82		81	59			1		2					4
STA. 0+50.30 OFF 18.93 LT												1			
PROJECT TOTALS	10	265	6.5	101	118	194	1	2	1	2	2	1	1	2	4

IH 45

QUANTITY SUMMARY

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	
CHECK	CONTROL	SECTION	JOB	11
CHECK	0092	02	125	

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	662 6001	662 6004	662 6034	662 6109	662 6110	666 6036	666 6048	666 6054	666 6078	666 6224	666 6226	666 6230	666 6231	666 6232	666 6300	666 6303	666 6315	672 6010	677 6001	677 6003	677 6007	677 6008	677 6012
	WK ZN PAV MRK NON-REMOV (W)4" (BRK)	WK ZN PAV MRK NON-REMOV (W)4" (SLD)	WK ZN PAV MRK NON-REMOV (Y)4" (SLD)	WK ZN PAV MRK SHT TERM (TAB)TY W	WK ZN PAV MRK SHT TERM (TAB)TY Y	REFL PAV MRK TY I (W)8" (SLD) (100MIL)	REFL PAV MRK TY I (W)24" (SLD) (100MIL)	REFL PAV MRK TY I (W) (ARROW) (100MIL)	REFL PAV MRK TY I (W) (WORD) (100MIL)	PAVEMENT SEALER 4"	PAVEMENT SEALER 8"	PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	RE PM W/RET REQ TY I (W)4" (BRK) (100MIL)	RE PM W/RET REQ TY I (W)4" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)	REFL PAV MRKR TY II-C-R	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (24")	ELIM EXT PAV MRK & MRKS (ARROW)	ELIM EXT PAV MRK & MRKS (WORD)
	LF	LF	LF	EA	EA	LF	LF	EA	EA	LF	LF	LF	EA	EA	LF	LF	LF	EA	LF	LF	LF	EA	EA
NORTH FRONTAGE ROAD	200	2,000	2,000	530	200	1,281	38	4	4	9,181	1,281	38	4	4	1,600	3,810	3,771	92	4,260	82	38		
SOUTH FRONTAGE ROAD	200	2,500	2,500	660	200	1,567	45	5	5	7,244	1,567	45	5	5	1,550	2,787	2,907	78	2999	515	45		
DOWDY FERRY ROAD		1,000	500	100		906	72	4	4	1,446	906	72	4	4		946	500	32	500	500	72	2	2
U-TURN NORTH										736						368	368						
U-TURN SOUTH										736						368	368						
PROJECT TOTALS	400	5,500	5,000	1,290	400	3,754	155	13	13	19,343	3,754	155	13	13	3,150	8,279	7,914	202	7,759	1,097	155	2	2

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	100 6002	161 6017	162 6002	164 6051	168 6001	506 6001	506 6011	506 6020	506 6024	506 6038 *	506 6039 *	506 6041 *	506 6043 *
	PREPARING ROW	COMPOST MANUF TOPSOIL (4")	BLOCK SODDING	DRILL SEEDING TEMP (WARM OR COOL)	VEGETATIVE WATERING	ROCK FILTER DAMS (INSTALL) (TY 1)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)	BIODEG EROSN CONT LOGS (INSTL) (12")	BIODEG EROSN CONT LOGS (REMOVE)
	STA	SY	SY	SY	MG	LF	LF	SY	SY	LF	LF	LF	LF
NORTH FRONTAGE ROAD	38.78	7,835	7,835	7,835	2,331	60	60	233.4	233.4	100	100	990	990
SOUTH FRONTAGE ROAD		10,067	10,067	10,067	2,995	51	51	233.4	233.4			1,790	1,790
DOWDY FERRY ROAD													
U-TURN NORTH													
U-TURN SOUTH													
PERIODIC REPLACEMNET OF PERISHABLE										5	5	139	139
PROJECT TOTALS	38.78	17,902	17,902	17,902	5,326	111	111	466.8	466.8	105	105	2,919	2,919

* QUANTITIES HAVE BEEN INCREASED BY 5% TO ACCOUNT FOR REPLACEMENTS NEEDED DUE TO NORMAL WEAR OR DIFFERING SITE CONDITIONS

SUMMARY OF DRIVEWAY ITEMS

LOCATION	530 6004	560 6011
	DRIVEWAYS (CONC)	MAILBOX INSTALL-S (TWW-POST) TY 4
	SY	EA
NFR		8
1650+63	106	
1651+72	91	
SFR		2
1655+00		
10065+46	31	
10068+06	62	
10069+38	62	
10070+48	34	
10074+52	58	
10080+47	34	
PROJECT TOTALS	478	10

SUMMARY OF SIGNING ITEMS

LOCATION	644 6001	644 6004	644 6005	644 6036	644 6064	647 6003
	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TY10BWG(1)SA(T-2EXT)	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	IN BRIDGE MNT CLEARANCE SGN ASSM(TY N)	REMOVE LRSA
	EA	EA	EA	EA	EA	EA
SHEET 1 OF 5	1	1				
SHEET 2 OF 5	1	2				
SHEET 3 OF 5	22	19		1	2	1
SHEET 4 OF 5	5	11	1	1		
SHEET 5 OF 5	3	2				
PROJECT TOTALS	32	35	1	2	2	1

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IH 45

QUANTITY SUMMARY

SHEET 2 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	
CHECK	CONTROL	SECTION	JOB	12
CHECK	0092	02	125	

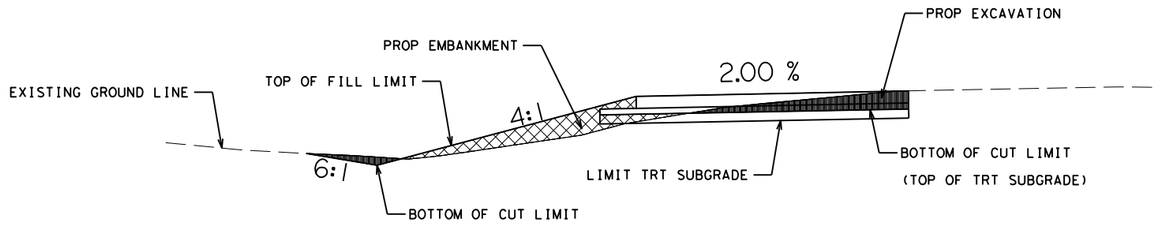
DATE: 6/25/2021 TIME: 8:43:56 AM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450702\Summary Sheets.dgn

IH45 NBFR	110 6001 EXCAVATION		132 6006 EMBK (F)(DC)(TY C)	
	AREA (SY)	VOLUME (CY)	AREA (SY)	VOLUME (CY)
1635+00	28.8	0	28.3	0
1636+00	22.3	94	23	95
1637+00	19.4	77	20.3	80
1638+00	13.4	60	15.3	66
1639+00	12.6	48	14.2	55
1640+00	8.2	38	14.2	53
1641+00	6.7	27	14.2	53
1642+00	7.5	26	14.2	53
1643+00	7.5	28	14.2	53
1644+00	8.6	30	14.2	53
1645+00	6.9	29	14.2	53
1646+00	9.1	30	14.2	53
1647+00	9.0	34	14.2	53
1648+00	9	33	14.9	54
1649+00	9	33	16.1	57
1650+00	9.5	34	17.2	62
1650+07	18.8	4	25.9	6
1651+00	81.0	172	29.8	96
1652+00	63.7	268	32.1	115
1652+25	90.8	71	34.9	31
1652+59.35	47.5	88	52.7	56
1652+93.37	5.4	33	5.5	37
Dowdy Ferry				
1654+26.82	4.3	24	4.5	25
1654+50	10.1	6	16.3	9
1655+00	18.6	26	15.3	29
1655+50	20.2	36	15.4	28
1656+00	22.1	40	15.4	29
1656+63.88	18.9	48	15.4	36
1657+00	20.2	27	15.4	21
1658+00	18.6	72	15.4	57
1658+11.54	17.9	7	15.4	7
10067+00	16.5	36	15.4	32
10068+00	14.5	57	15.5	57
10069+00	12.6	50	14.7	56
10070+00	15.8	52	14.5	54
10071+00	15.3	58	13.7	52
10072+00	13.6	54	14.2	52
10073+00	13.9	51	14.2	53
10074+00	12.4	49	14.2	53
10075+00	10.3	42	14.2	53
10076+00	9.4	36	14.3	53
10077+00	16.9	49	18.3	60
10077+30.17	18.2	19	20.2	22
NBFR TOTAL		2096		2072

IH45 SBFR	110 6001 EXCAVATION		132 6006 EMBK (F)(DC)(TY C)	
	AREA (SY)	VOLUME (CY)	AREA (SY)	VOLUME (CY)
1645+87.35	23.4	0	21.4	0
1646+00	20.8	10	19.7	10
1647+00	14.1	64	14.4	63
1648+00	13.2	50	15.8	56
1649+00	18.4	59	13.2	54
1650+00	14.5	61	14.9	52
1650+88	19.3	55	14.6	48
1651+00	19	8	14.5	7
1651+82	20.0	60	15.2	45
1652+00	15.2	12	15.7	10
1652+96	65.5	143	35	90
1653+00	73.6	10	39	6
1653+43	20.8	76	21	48
Dowdy Ferry				
1654+57.21	26.9	100	26.4	100
1655+00	35.1	49	45.4	57
10065+25	28.2	54	30.5	65
10066+00	29.0	80	30.5	85
10067+00	30.3	109	33.5	119
10068+00	23.7	100	34.2	125
10069+00	16.0	74	31	121
10070+00	14.3	56	30.2	113
10070+30	23.2	21	30	34
10071+00	6.3	38	20	65
10072+00	8	26	18.1	71
10073+00	6.1	26	16.3	64
10074+00	7.1	24	16.3	60
10074+25	42.7	23	45	28
10075+00	38.7	113	45.3	125
10076+00	37.3	141	45.4	168
10077+00	43.8	150	44.7	167
10078+00	52.6	178	47.9	171
10079+00	61.8	212	53.4	188
10080+00	57.1	220	58.7	208
10080+21	53.3	42	58.7	45
10080+50	28.1	45	32	49
10081+00	30.2	54	32.7	60
10082+00	33.2	117	33.3	122
10082+81	33.7	100	32.4	98
SFR TOTAL		2760		2997

U-TURN NORTH	110 6001 EXCAVATION		132 6006 EMBK (F)(DC)(TY C)	
	AREA (SY)	VOLUME (CY)	AREA (SY)	VOLUME (CY)
0+46.42	23	0	30	0
0+50.00	26	3	19	3
0+62.41	42	16	16	8
0+75.00	68	26	0	4
1+00.00	89	73	0	0
1+25.00	38	59	0	0
1+30.79	33	8	0	0
1+50.00	31	23	9	3
1+71.38	32	25	4	5
1+75.00	32	4	3	0
2+00.00	36	31	3	3
2+25.00	26	29	6	4
2+50.00	26	24	9	7
2+75.00	1	13	30	18
3+00.00	4	2	9	18
3+25.00	11	7	20	13
3+30.82	7	2	0	2
U-TURN NORTH TOTAL		345		88

U-TURN SOUTH	110 6001 EXCAVATION		132 6006 EMBK (F)(DC)(TY C)	
	AREA (SY)	VOLUME (CY)	AREA (SY)	VOLUME (CY)
0+46.18	0	0	0	0
0+75.00	16	0	3	0
1+00.00	15	14	2	2
1+25.00	13	13	3	2
1+50.00	23	17	5	4
1+75.00	16	18	10	7
2+00.00	8	11	20	14
2+25.00	8	7	6	12
2+50.00	12	9	6	6
2+75.00	38	23	1	3
3+00.00	63	47	0	0
3+19.54	77	51	0	0
U-TURN SOUTH TOTAL		210		50



EARTHWORK TYPICAL SECTION

NOTES:
FOR CONTRACTOR'S INFORMATION ONLY.
THE EARTH WORK QUANTIITES ARE SHOWN IN THE SUMMARY OF ROADWAY ITEMS.

Texas Department of Transportation

IH 45

QUANTITY SUMMARY
(EARTHWORK)

SHEET 3 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	SEE TITLE SHEET		IH 45
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	13
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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SIGNAL SUMMARY

BID ITEM	DESCRIPTION	UNIT	QUANTITIES
618-6029	CONDT (PVC) (SCH 40) (3")	LF	25
618-6033	CONDT (PVC) (SCH 40) (4")	LF	372
618-6034	CONDT (PVC) (SCH 40) (4") (BORE)	LF	368
**620-6008	ELEC CONDR (NO.8) INSULATED	LF	2512
620-6009	ELEC CONDR (NO.6) BARE	LF	1221
621-6002	TRAY CABLE (3 CONDR) (12 AWG)	LF	2651
**624-6008	GROUND BOX TY C (162911) W/APRON	EA	1
624-6028	REMOVE GROUND BOX	EA	1
636-6007	REPLACE EXISTING ALUMINUM SIGNS (TY A)	SF	15
682-6001	VEH SIG SEC (12")LED (GRN)	EA	8
682-6002	VEH SIG SEC (12")LED (GRN ARW)	EA	7
682-6003	VEH SIG SEC (12")LED (YEL)	EA	12
682-6004	VEH SIG SEC (12")LED (YEL ARW)	EA	4
682-6005	VEH SIG SEC (12")LED (RED)	EA	12
682-6006	VEH SIG SEC (12")LED (RED ARW)	EA	4
682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	14
682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA	1
684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	257
684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	2454
684-6038	TRF SIG CBL (TY A)(14 AWG)(12 CONDR)	LF	1796
684-6079	TRF SIG CBL(TY C)(12 AWG)(2 CONDR)	LF	3627
690-6024	REMOVAL OF SIGNAL HEAD ASSM	EA	14
**6027-6003	CONDUIT (PREPARE)	LF	692
**6027-6008	GROUND BOX (PREPARE)	EA	9
*6155-6002	RADAR COMMUNICATION CABLE	LF	2583

ILLUMINATION SUMMARY

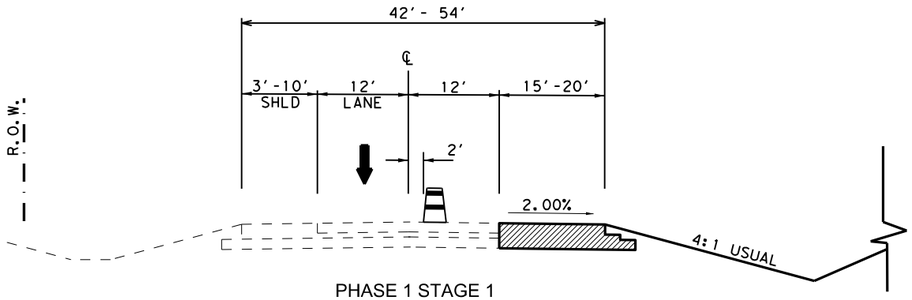
BID ITEM	DESCRIPTION	UNIT	QUANTITIES
416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	60
432-6006	RIPRAP (CONC)(CL B)	CY	2.1
610-6004	RELOCATE RD IL ASM (TRANS-BASE)	EA	6
610-6104	IN RD IL (U/P) (TY 1) (150W EQ) LED	EA	6
618-6023	CONDT (PVC) (SCH 40) (2")	LF	1300
618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF	156
618-6064	CONDT (RM) (1")	LF	208
620-6007	ELEC CONDR (NO.8) BARE	LF	347
**620-6008	ELEC CONDR (NO.8) INSULATED	LF	694
620-6011	ELEC CONDR (NO.4) BARE	LF	2388
620-6012	ELEC CONDR (NO.4) INSULATED	LF	4776
**624-6008	GROUND BOX TY C (162911) W/APRON	EA	1
628-6002	REMOVE ELECTRICAL SERVICE	EA	1
**6027-6003	CONDUIT (PREPARE)	EA	1071
**6027-6008	GROUND BOX (PREPARE)	EA	1

* RADAR CABLE TO BE SUPPLIED BY TXDOT AND INSTALLED BY CONTRACTOR
** BID ITEMS ARE SHOWN IN MULTIPLE SUMMARY BOXES

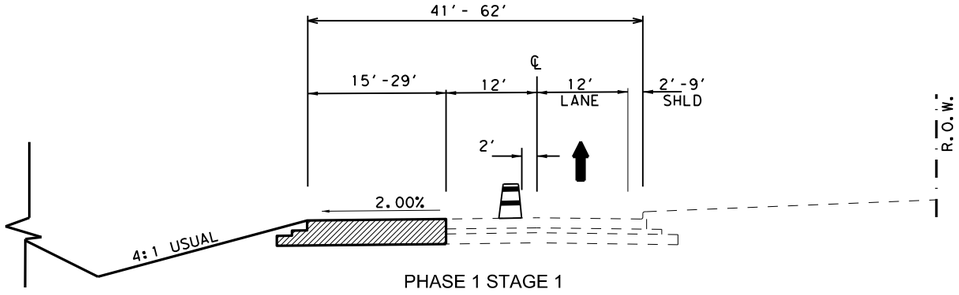
IH 45 AT DOWDY FERRY RD
TRAFFIC SIGNAL
AND
ILLUMINATION
SUMMARY

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
KYB	6	SEE TITLE SHEET		IH 45
GRAPHICS KYB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK LDL	TEXAS	DALLAS	DALLAS	14
CHECK APM	CONTROL	SECTION	JOB	
	0092	02	125	



PHASE 1 STAGE 1
TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
1645+87 TO 1653+23.22
10064+31.01 TO 10074+25
10080+20 TO 10082+75



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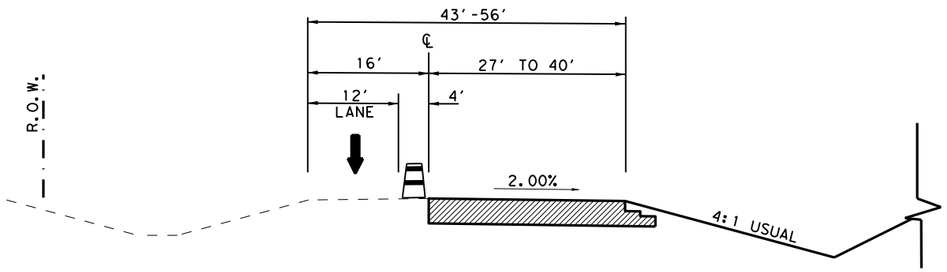
TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1640+00 TO 1653+01.77
10062+58.79 TO 10077+30



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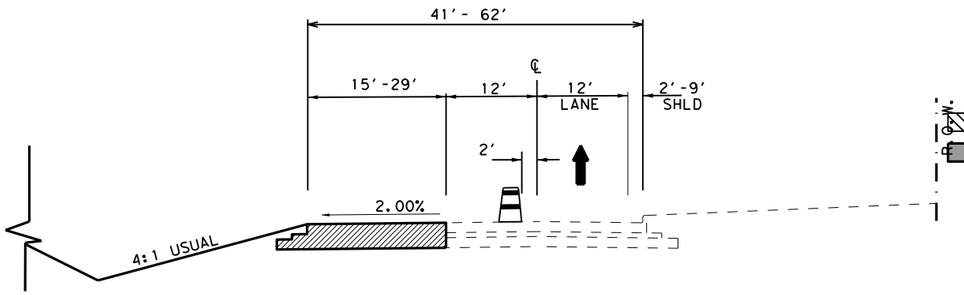
TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
10074+25 TO 10080+20



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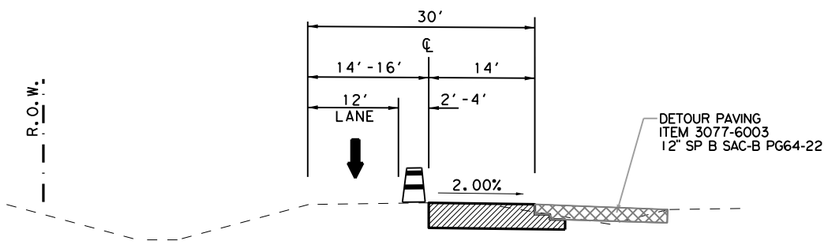
TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1635+00 TO 1640+00.00



PHASE 1 STAGE 1
TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
10080+20 TO 10082+75

LEGEND

NEW CONSTRUCTION THIS PHASE

NEW CONSTRUCTION PREVIOUS PHASE

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 7/13/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

TRAFFIC CONTROL PLAN TYPICAL SECTIONS

SHEET 1 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	15
CHECK	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

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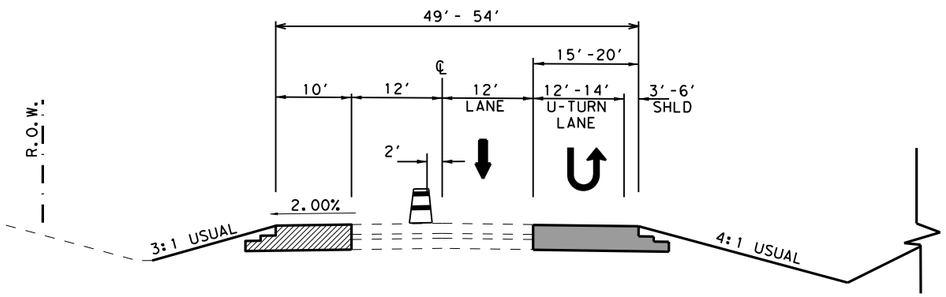
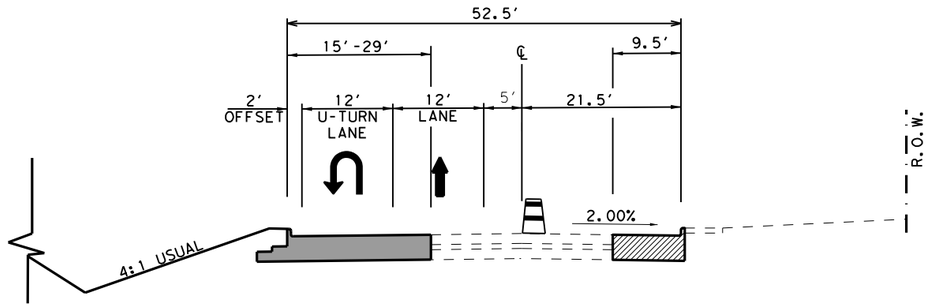


PHASE 2 STAGE 1
TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
1652+95 TO 1653+43
10064+35.15 TO 10070+80



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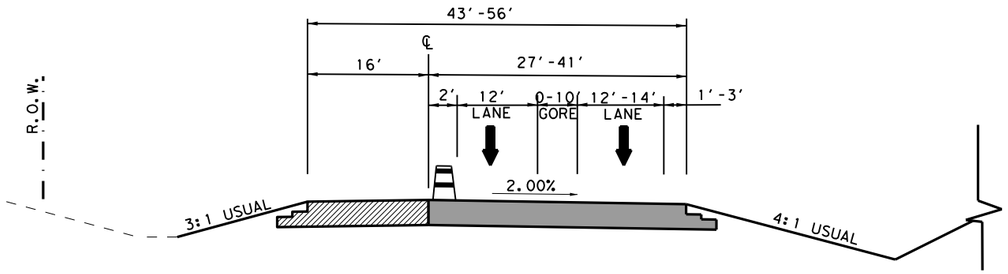
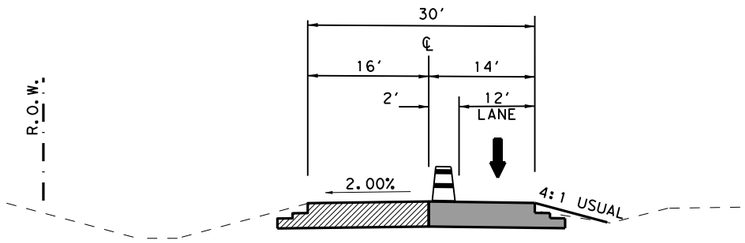
TYPICAL SECTION
I.H. 45 N.B. FRONTAGE RD
1650+07 TO 1652+60



PHASE 1 STAGE 2
TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
10074+25 TO 10080+20



PHASE 2 STAGE 1
TYPICAL SECTION
I.H. 45 SB FRONTAGE RD
10080+20 TO 10082+75

LEGEND

NEW CONSTRUCTION THIS PHASE

NEW CONSTRUCTION PREVIOUS PHASE

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou, P.E. 7/9/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

TRAFFIC CONTROL PLAN TYPICAL SECTIONS

SHEET 2 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	16
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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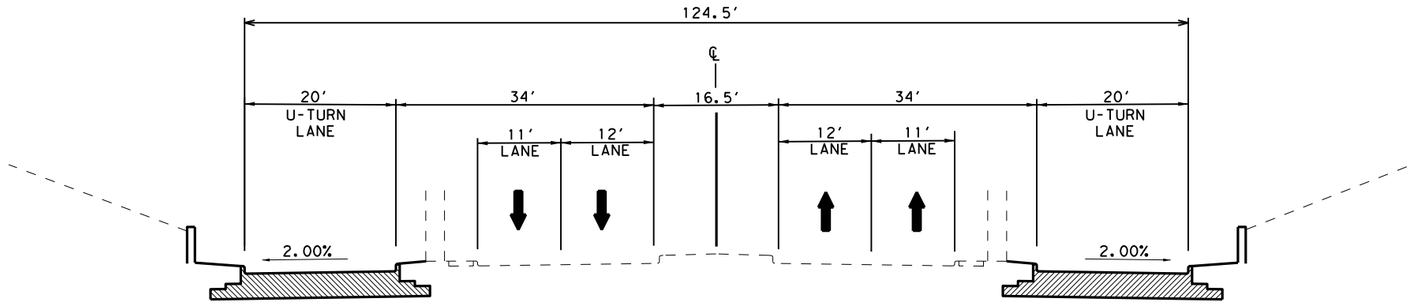
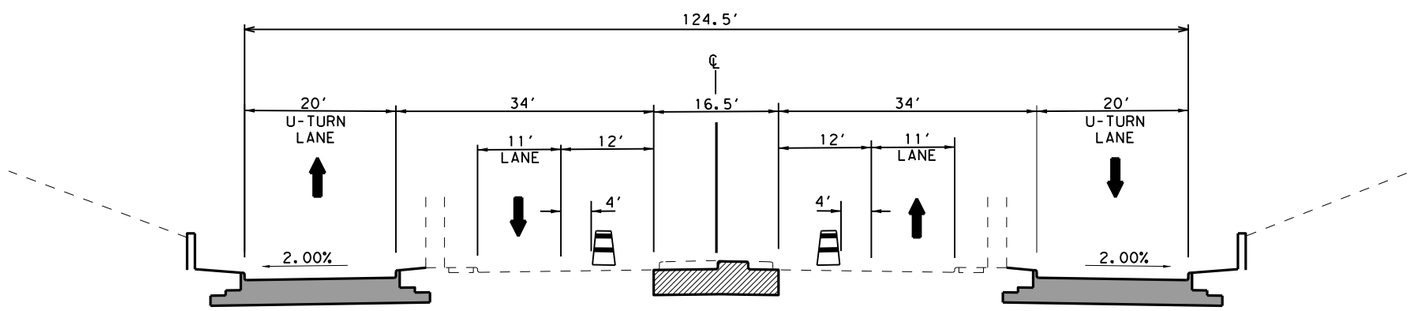


PHASE 1 STAGE 1
TYPICAL SECTION
DOWDY FERRY RD
13+10 TO 15+71



PHASE 1 STAGE 2
TYPICAL SECTION
DOWDY FERRY RD
13+10 TO 15+71

LEGEND

NEW CONSTRUCTION THIS PHASE

NEW CONSTRUCTION PREVIOUS PHASE

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

TRAFFIC CONTROL PLAN TYPICAL SECTIONS

SHEET 3 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	17
CHECK	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

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GENERAL NOTES:

1. INSTALL BARRICADES AND ADVANCED WARNING SIGNS PER BC STANDARD, TCP STANDARDS WORK ZONE STANDARDS AND/OR AS DIRECTED BY THE ENGINEER.
2. INSTALL STORM WATER POLLUTION PREVENTION (SW3P) DEVICES PRIOR TO INITIATING SOIL DISTURBANCE ACTIVITIES IN THEIR CONTROL AREA. TEMPORARY SW3P EROSION CONTROL MEASURES SHALL ONLY BE PLACED IN AREAS WHERE SOIL DISTURBANCE IS EXPECTED TO OCCUR WITHIN TWO WEEKS. TEMPORARY SW3P EROSION CONTROL MEASURES SHALL BE REMOVED IN EACH AREA WITHIN TWO WEEKS OF VEGETATION ESTABLISHMENT OR AS APPROVED BY THE ENGINEER.
3. SUBMIT A DETAILED SCHEDULE OF WORK TO THE PROJECT ENGINEER FOR APPROVAL PRIOR TO THE BEGINNING OF CONSTRUCTION WHICH GENERALLY CONFORMS TO THE SEQUENCE SHOWN ON THE TCP SEQUENCE OF WORK (SEE BELOW).
4. SUBMIT ANY REQUEST TO ALTER SEQUENCE OF OPERATION OF TRAFFIC CONTROL PLANS TO THE ENGINEER FOR WRITTEN APPROVAL PRIOR TO BEGIN OF CONSTRUCTION. ADDITIONAL COST OR TIME IS AT THE EXPENSE OF THE CONTRACTOR.
5. MAINTAIN TEMPORARY SIGNS WITHIN THE PROJECT LIMITS AND COVER OR REMOVE ANY EXISTING SIGN OR PAVEMENT MARKING THAT CONFLICTS WITH TCP TO AVOID CONFUSION FOR THE TRAVELING PUBLIC. TEMPORARY SIGNING SHALL BE PLACED AS NEEDED DURING ALL PHASES. PAYMENT FOR THIS WORK SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES.
6. THE COMPLETE CLOSURE OF ANY ROADWAY REQUIRES THE APPROVAL OF THE ENGINEER.
7. MAINTAIN TEMPORARY DRAINAGE THROUGHOUT ALL PHASES OF CONSTRUCTION. THIS WORK WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.
8. PROVIDE ACCESS TO PRIVATE PROPERTY AT ALL TIMES. MATERIALS, MAINTENANCE, AND LABOR IS SUBSIDIARY.
9. THE SIGNS, BARRICADES, OR OTHER WARNING DEVICES SHOWN SHALL BE CONSIDERED MINIMUM AND ADDITIONAL SIGNS, BARRICADES, OR WARNING DEVICES DEEMED NECESSARY BY THE ENGINEER OR DICTATED BY FIELD CONDITIONS SHALL BE PROVIDED ACCORDING TO ALL APPLICABLE STANDARDS. ADDITIONAL SIGNS OR BARRICADES WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO THE BID ITEM “BARRICADES, SIGNS, AND TRAFFIC HANDLING.

PHASE 1 TCP NARRATIVE:

PHASE 1 STAGE 1

1. PLACE TRAFFIC CONTROL DEVICES AND ALLOW TRAFFIC TO REMAIN ON EXISTING RIGHT LANE AND CLOSE LEFT LANE ON NB AND SB SERVICE ROAD ON IH 45.
2. SAWCUT EXISTING CURB AND CONSTRUCT PERMANENT PAVEMENT WIDENING ON THE WEST SIDE OF THE NBFR FROM STA 1640+00 TO 1653+01.77 AND 10062+58.79 TO 10077+30.
3. SAWCUT EXISTING CURB AND CONSTRUCT PERMANENT PAVEMENT WIDENING ON THE EAST SIDE OF THE SBFR FROM STA 1645+87 TO 1653+23.22, STA 10064+31.01 TO 10074+25, STA 10080+20 TO STA 1082+75, AND CONSTRUCT 12" SP B SAC- B PG 64-22 DETOUR FROM STA 10080+20 TO STA 10082+75.
4. CONSTRUCT PERMANENT PAVEMENT OF THE U-TURN LANES ON BOTH SIDES OF DOWDY FERRY ROAD.
5. MAINTAIN PEDESTRIAN TRAFFIC THROUGHOUT ALL PHASES OF CONSTRUCTION. THIS WORK WILL BE SUBSIDIARY TO SIDWALK BID ITEMS.

PHASE 1 STAGE 2

1. ADJUST TRAFFIC CONTROL DEVICES AND ALLOW TRAFFIC TO MOVE TO THE RIGHT LANE AND CLOSE RIGHT LANE ON NB AND SB SERVICE ROAD ON IH 45.
2. CONSTRUCT PERMANENT PAVEMENT ON THE WEST SIDE OF THE NBFR FROM STA 1635+00 TO 1640+00.
3. CONSTRUCT PERMANENT PAVEMENT ON THE EAST SIDE OF THE SBFR FROM STA 10074+25 TO 10080+20.

PHASE 2 STAGE 1

1. ADJUST TRAFFIC CONTROL DEVICES AND ALLOW TRAFFIC TO MOVE TO THE LEFT LANE AND CLOSE RIGHT LANE ON NB AND SB SERVICE ROAD ON IH 45.
2. CONSTRUCT PERMANENT PAVEMENT ON THE EAST SIDE OF THE NBFR FROM STA 1650+07 TO 1652+60.
3. CONSTRUCT PERMANENT PAVEMENT ON THE WEST SIDE OF THE SBFR FROM STA 1652+95 TO 1653+43, 1064+35.15 TO 10070+80, AND 10074+25 TO 10082+75.
4. REMOVE EXISTING MEDIAN AND CONSTRUCT PERMANENT MEDIAN ALONG DOWDY FERRY ROAD.
5. REVEGETATE DISTURBED SOILS , INSTALL SIGNS, AND APPLY PERMANENT PAVEMENT MARKINGS.
6. REMOVE SW3P MEASURES ONCE APPROVED BY ENGINEER AND DO FINAL PROJECT CLEANUP.

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IH 45

TCP NARRATIVE

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	18
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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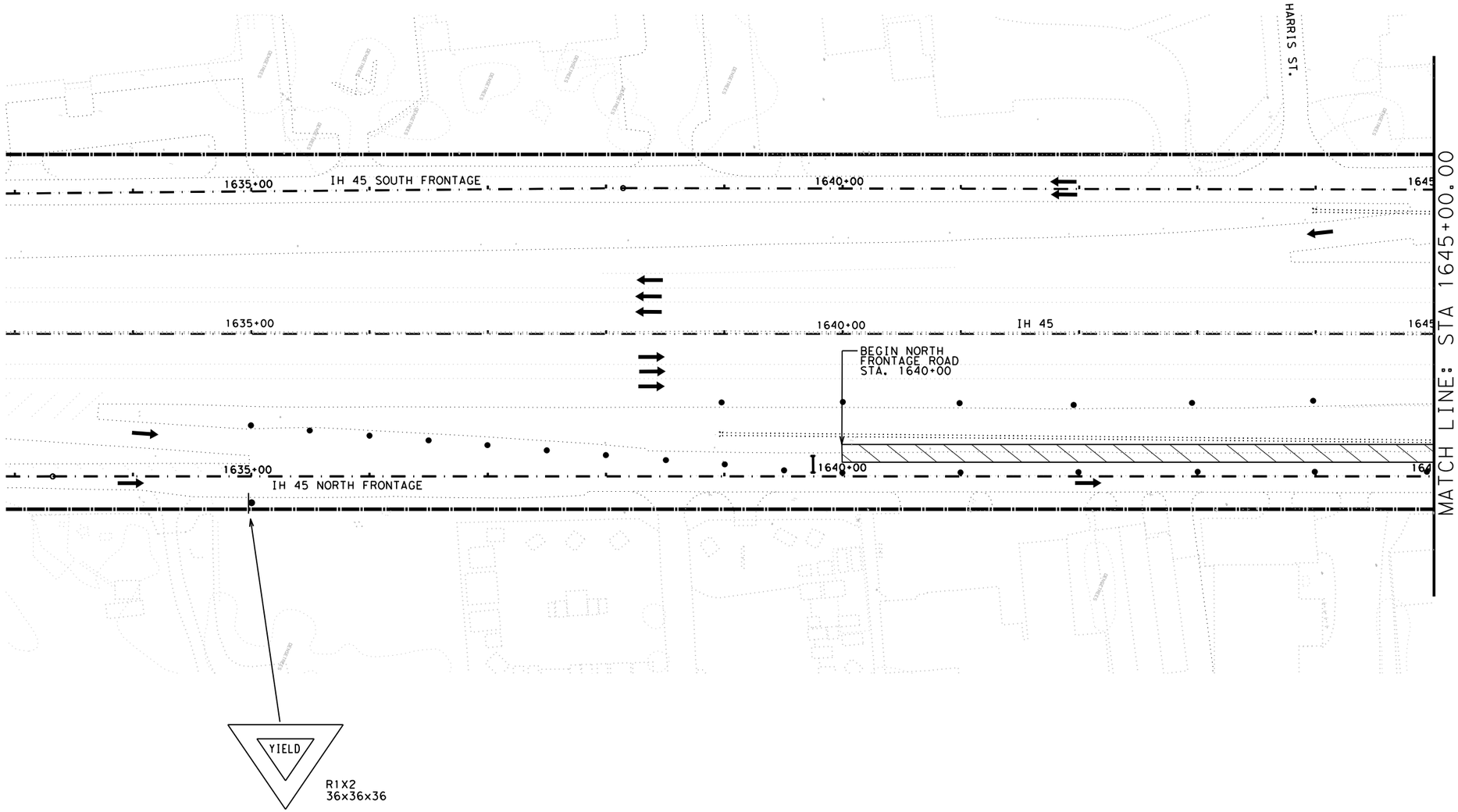

0 50 100

LEGEND

- SIGN POST
- TYPE III BARRICADE
- CHANNELIZATION DRUMS
- TRAFFIC ARROWS
- PROPOSED CONSTRUCTION THIS PHASE
- PROPOSED CONSTRUCTION PREVIOUS PHASE

SEE STANDARD TCP(2-5)-18 FOR SIGNING AND LOCATIONS ON THE FRONTAGE ROAD.

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TRAFFIC CONTROL PLAN PHASE 1 STAGE 1

SCALE: 1"=100' SHEET 1 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	19
DN	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

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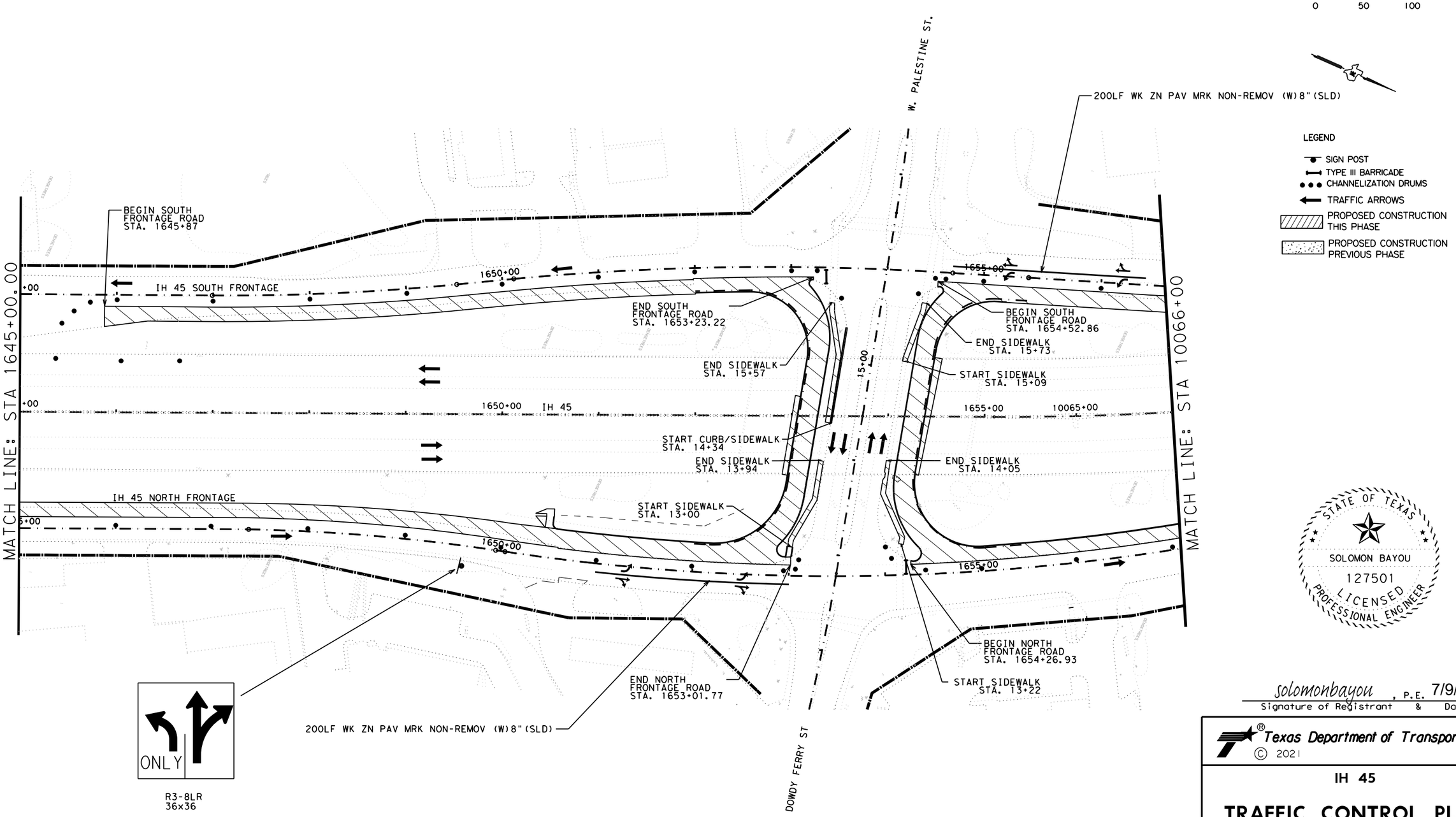

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TRAFFIC CONTROL PLAN PHASE 1 STAGE 1

SCALE: 1"=100' SHEET 2 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	20
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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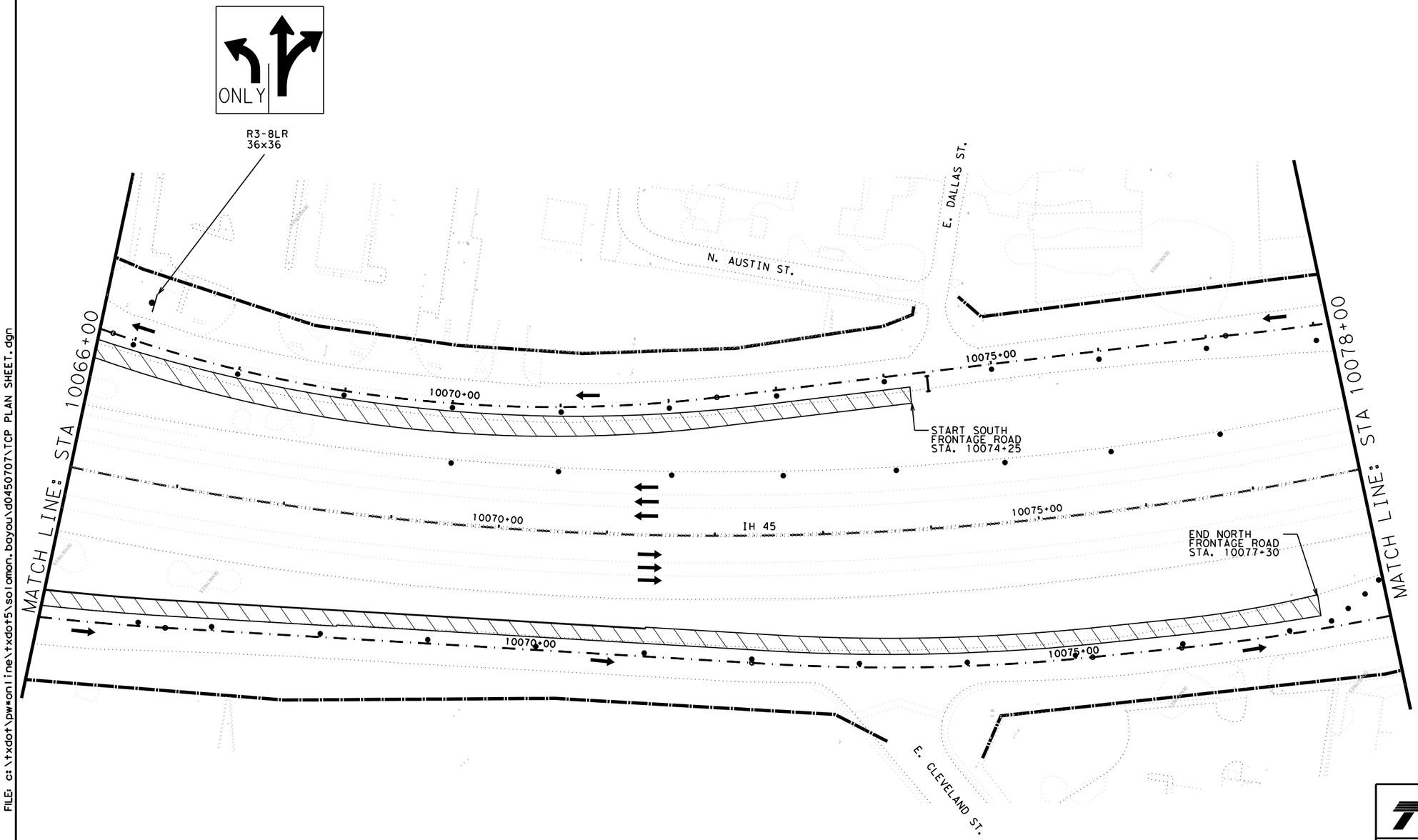

0 50 100

LEGEND

- SIGN POST
- TYPE III BARRICADE
- CHANNELIZATION DRUMS
- TRAFFIC ARROWS
- PROPOSED CONSTRUCTION THIS PHASE
- PROPOSED CONSTRUCTION PREVIOUS PHASE

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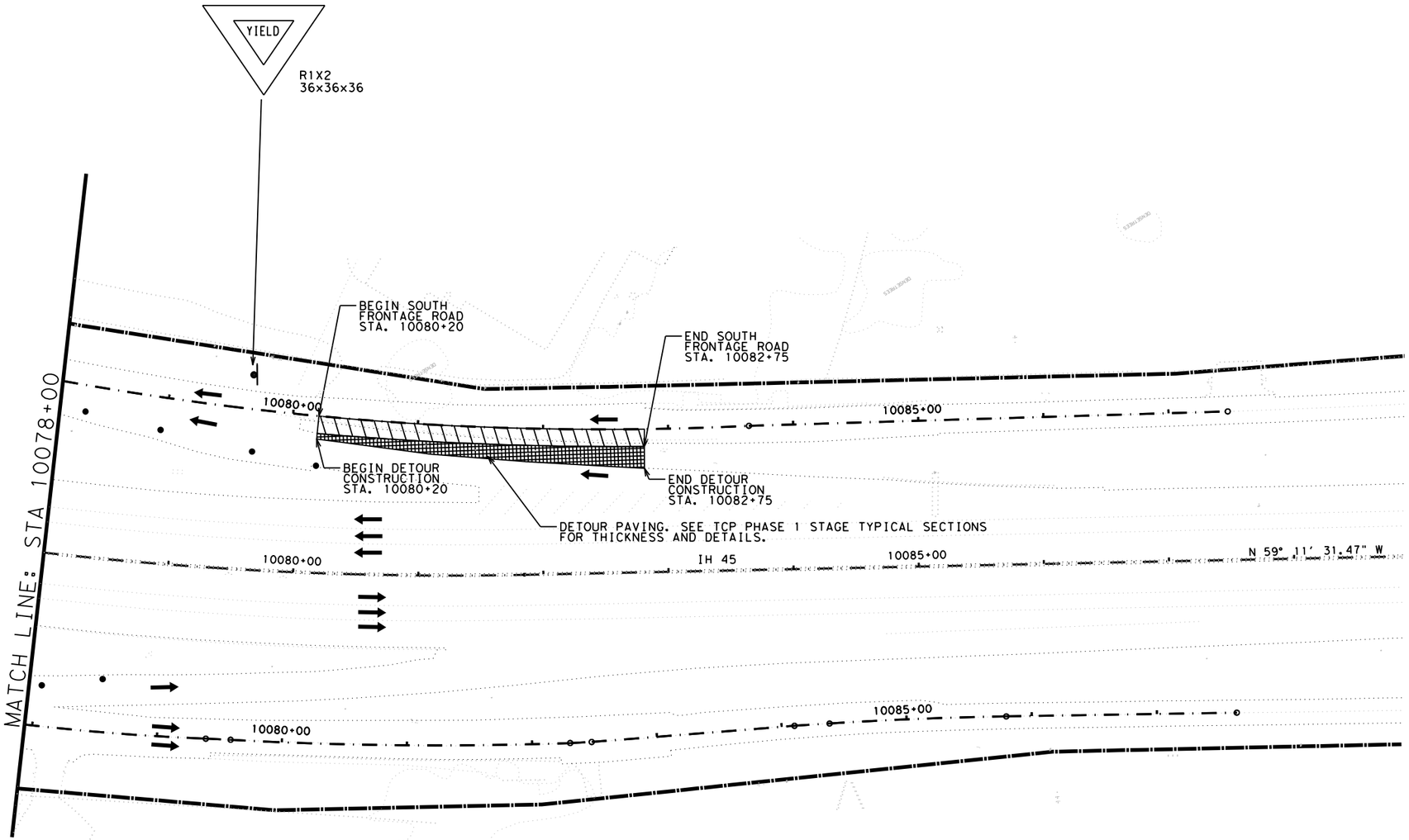
TRAFFIC CONTROL PLAN PHASE 1 STAGE 1

SCALE: 1"=100' SHEET 3 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	21
DN	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

DATE: 6/23/2021 TIME: 2:57:47 PM FILE: c:\txdot\pw\online\txdot5\solomon.bayou\d0450707\TCP PLAN SHEET.dgn

SEE STANDARD TCP(2-5)-18 FOR SIGNING AND LOCATIONS ON THE FRONTAGE ROAD.



0 50 100

LEGEND

- SIGN POST
- TYPE III BARRICADE
- CHANNELIZATION DRUMS
- TRAFFIC ARROWS
- PROPOSED CONSTRUCTION THIS PHASE
- PROPOSED CONSTRUCTION PREVIOUS PHASE
- DETOUR CONSTRUCTION THIS PHASE

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TRAFFIC CONTROL PLAN PHASE 1 STAGE 1

SCALE: 1"=100' SHEET 4 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	22
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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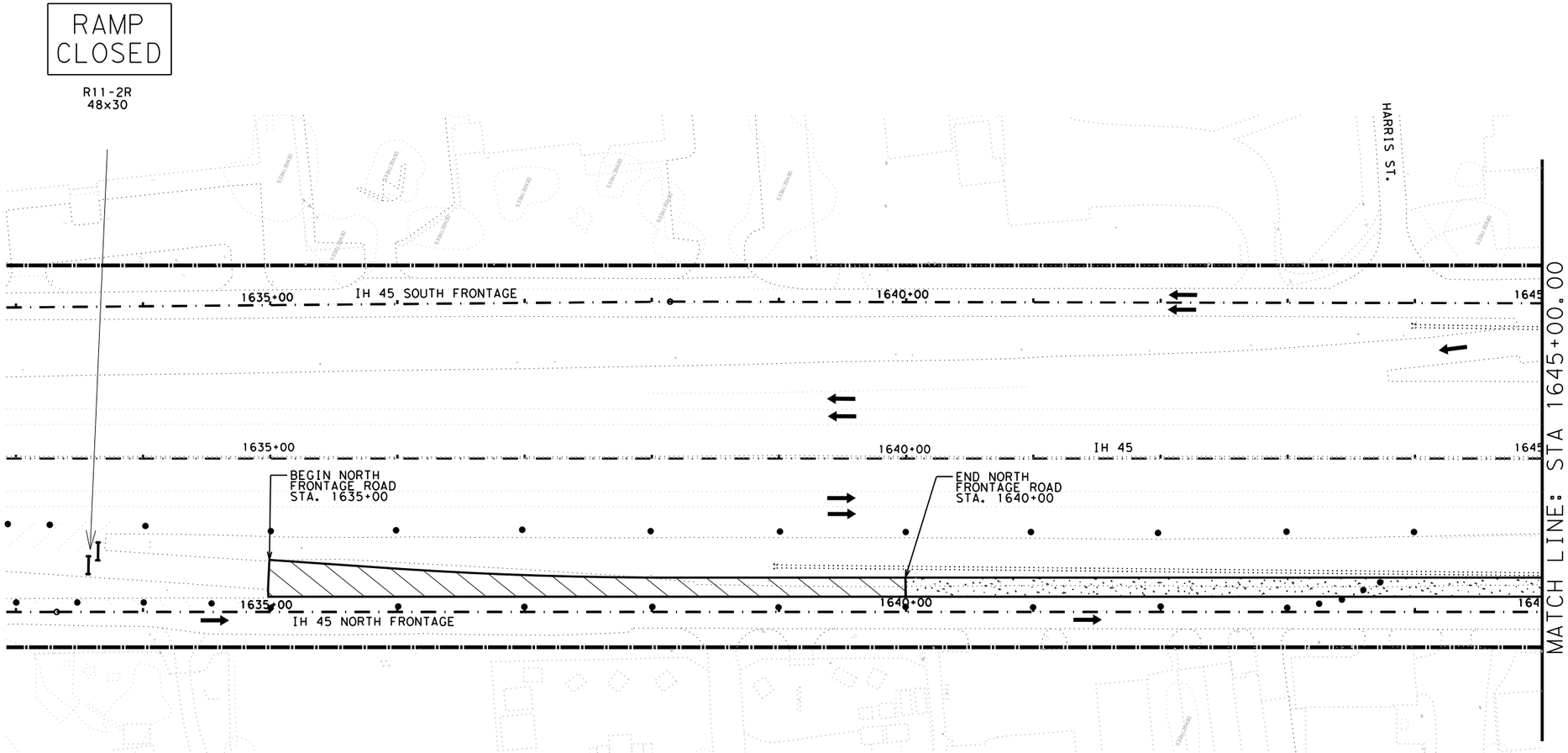

0 50 100

LEGEND

- SIGN POST
- TYPE III BARRICADE
- CHANNELIZATION DRUMS
- TRAFFIC ARROWS
- PROPOSED CONSTRUCTION THIS PHASE
- PROPOSED CONSTRUCTION PREVIOUS PHASE

SEE RAMP DETOUR LAYOUT SHEETS FOR RAMP CLOSER

SEE STANDARD TCP(2-5)-18 FOR SIGNING AND LOCATIONS ON THE FRONTAGE ROAD.

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TRAFFIC CONTROL PLAN PHASE 1 STAGE 2

SCALE: 1"=100' SHEET 1 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	23
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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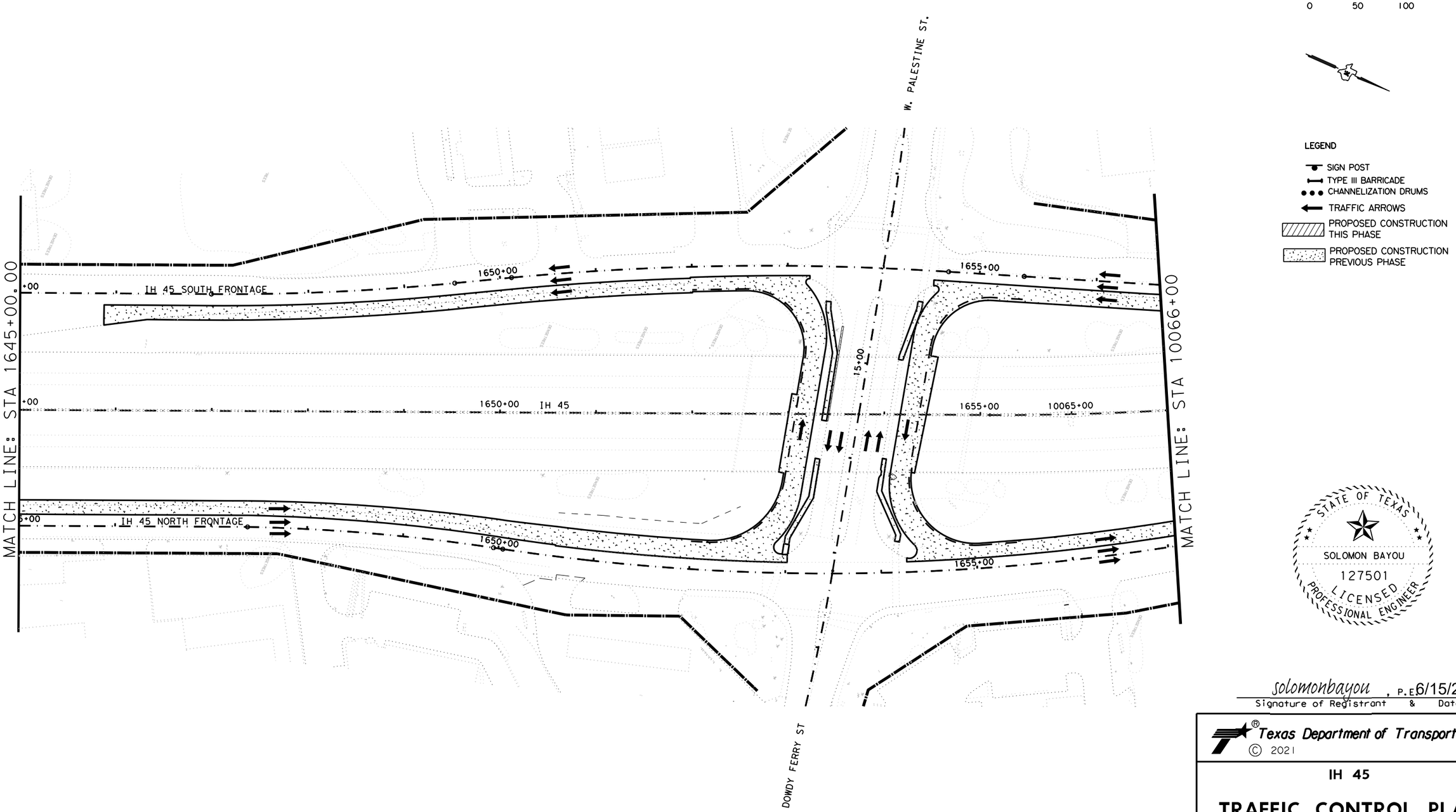

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TRAFFIC CONTROL PLAN PHASE 1 STAGE 2

SCALE: 1"=100' SHEET 2 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	24
CHECK	CONTROL	SECTION	JOB	
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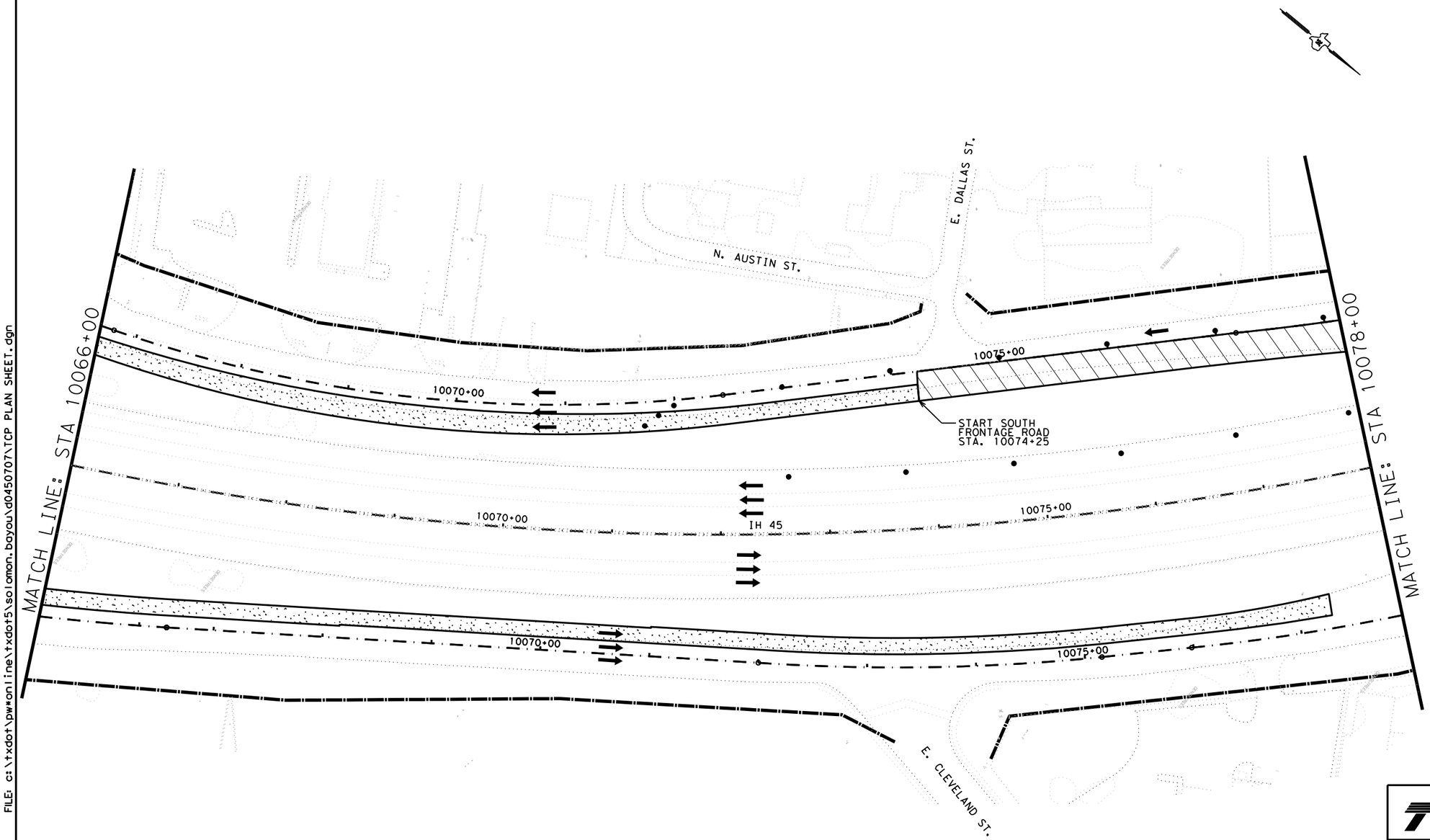

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TRAFFIC CONTROL PLAN
PHASE 1 STAGE 2

SCALE: 1"=100' SHEET 3 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	25
CHECK	CONTROL	SECTION	JOB	
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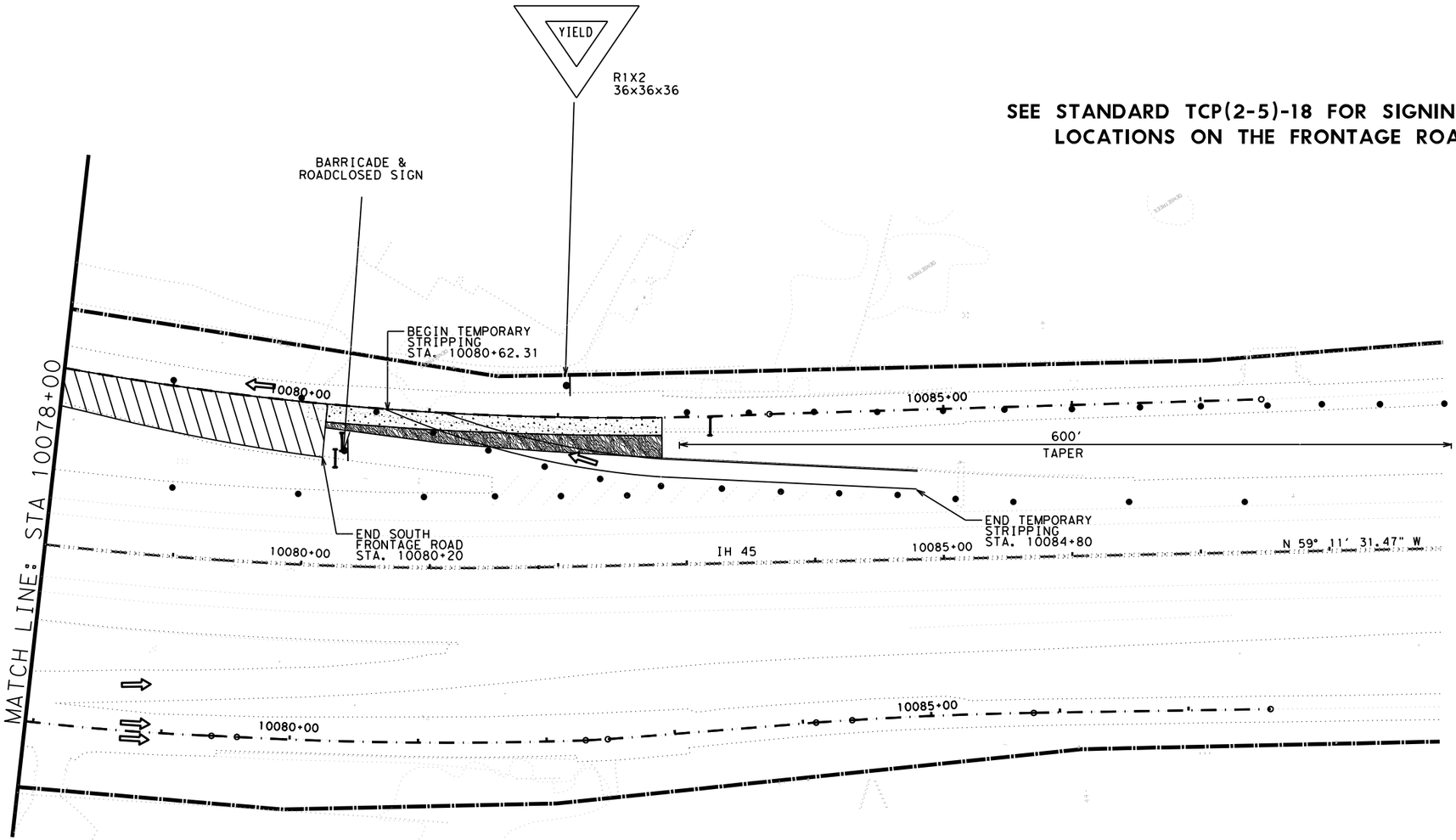
SEE STANDARD TCP(2-5)-18 FOR SIGNING AND LOCATIONS ON THE FRONTAGE ROAD.



LEGEND

- SIGN POST
- TYPE III BARRICADE
- CHANNELIZATION DRUMS
- TRAFFIC ARROWS
- PROPOSED CONSTRUCTION THIS PHASE
- PROPOSED CONSTRUCTION PREVIOUS PHASE
- PROPOSED DETOUR CONSTRUCTION PREVIOUS PHASE

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TRAFFIC CONTROL PLAN
PHASE 1 STAGE 2

SCALE: 1"=100' SHEET 4 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	26
CHECK	CONTROL	SECTION	JOB	
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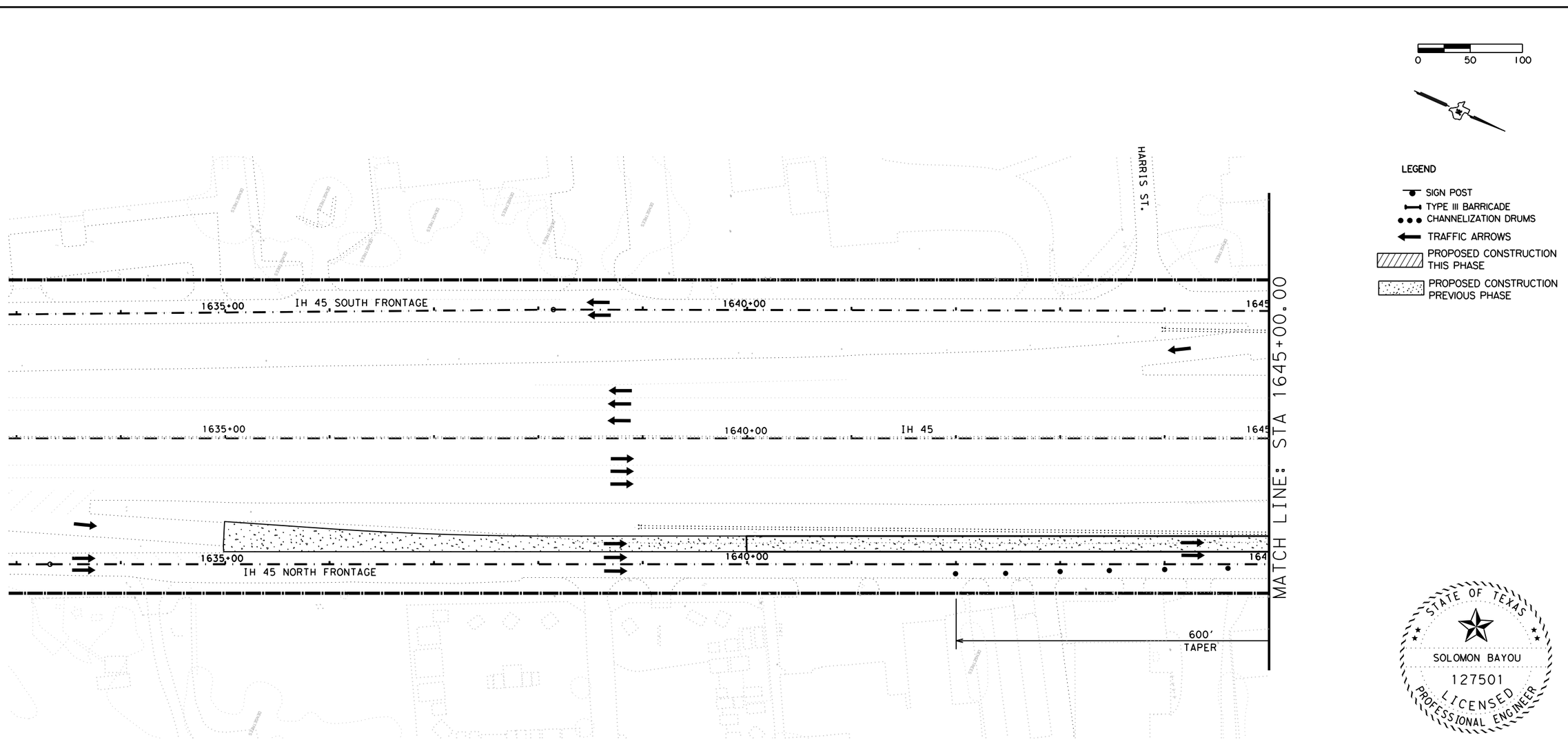

SEE STANDARD TCP(2-5)-18 FOR SIGNING AND LOCATIONS ON THE FRONTAGE ROAD.

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TRAFFIC CONTROL PLAN
PHASE 2 STAGE 1

SCALE: 1"=100' SHEET 1 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	27
DN	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

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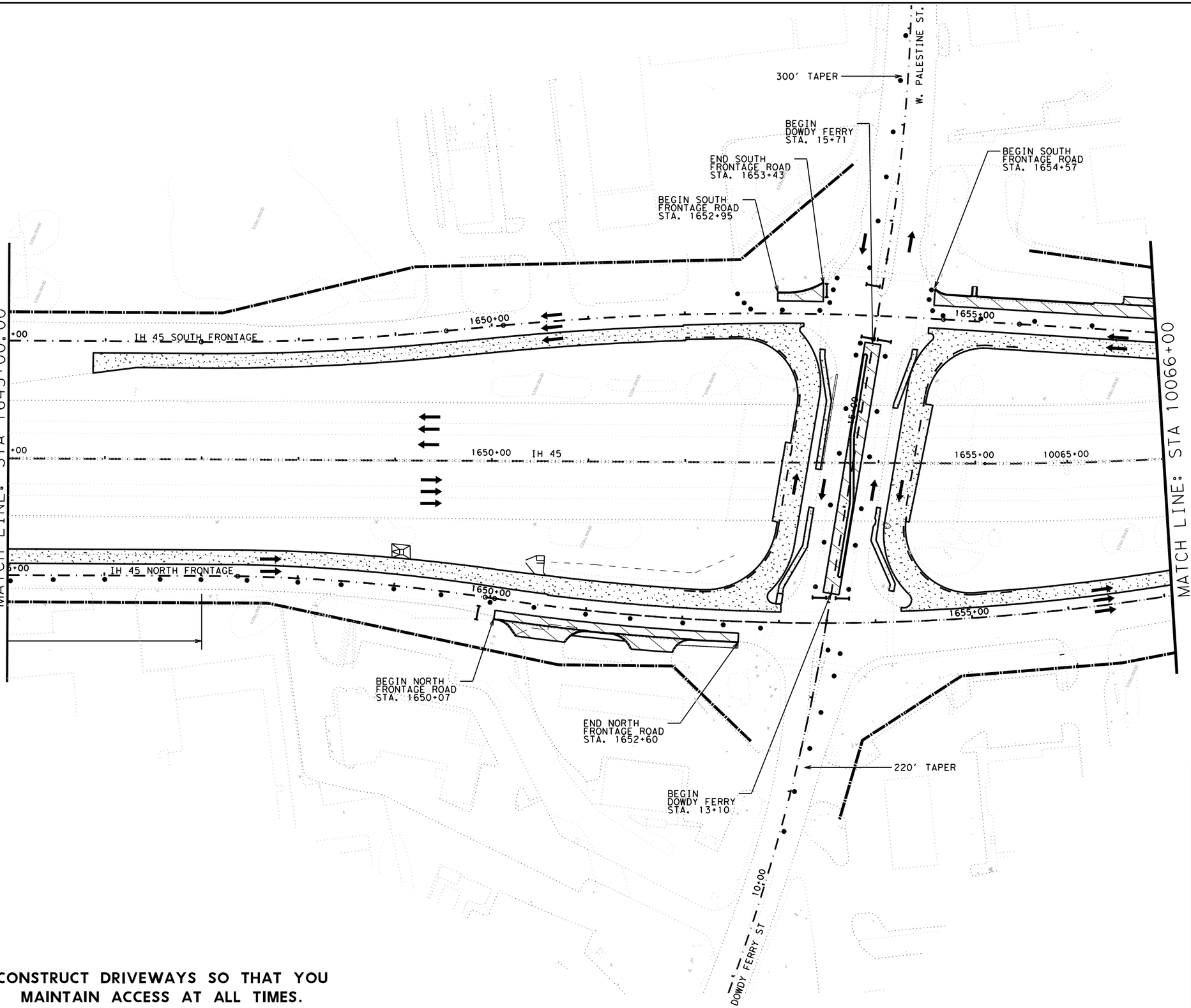

CONSTRUCT DRIVEWAYS SO THAT YOU MAINTAIN ACCESS AT ALL TIMES.

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TRAFFIC CONTROL PLAN
PHASE 2 STAGE 1

SCALE: 1"=100' SHEET 2 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	28
CHECK	CONTROL	SECTION	JOB	
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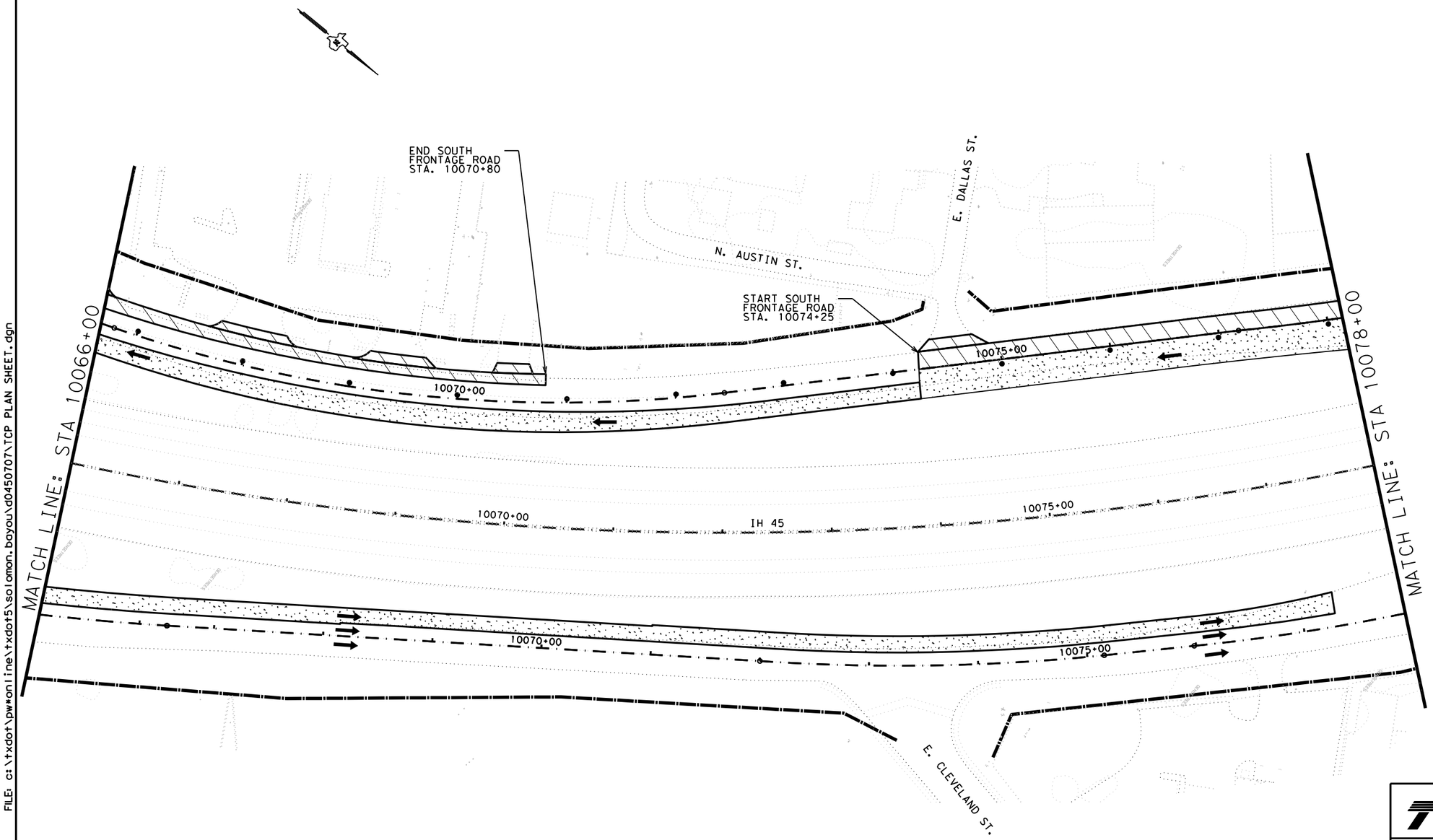

0 50 100

LEGEND

- SIGN POST
- TYPE III BARRICADE
- CHANNELIZATION DRUMS
- TRAFFIC ARROWS
- PROPOSED CONSTRUCTION THIS PHASE
- PROPOSED CONSTRUCTION PREVIOUS PHASE

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TRAFFIC CONTROL PLAN

PHASE 2 STAGE 1

SCALE: 1"=100' SHEET 3 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	29
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/15/2021 TIME: 8:44:54 AM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450707\TCP PLAN SHEET.dgn

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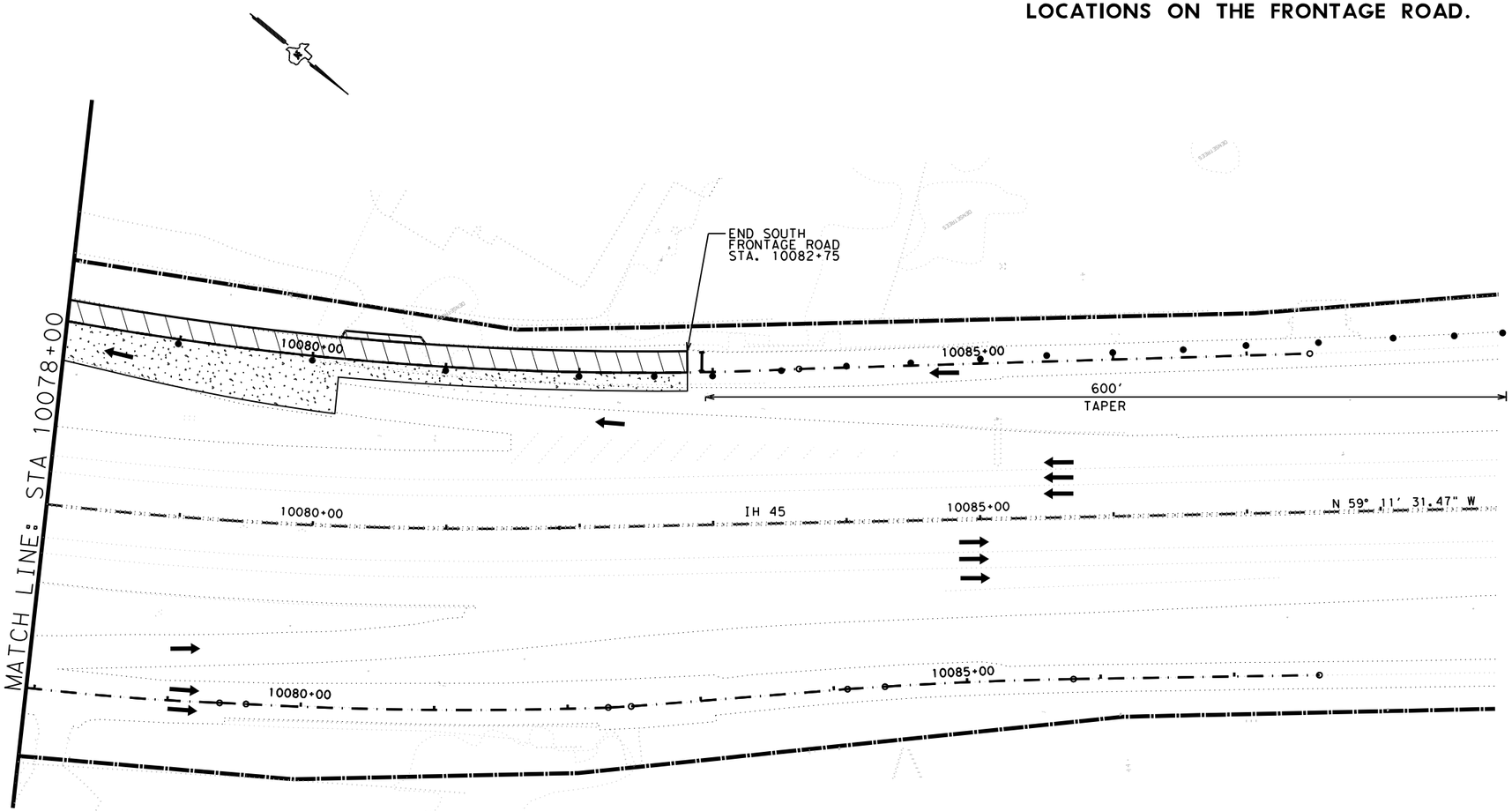
SEE STANDARD TCP(2-5)-18 FOR SIGNING AND LOCATIONS ON THE FRONTAGE ROAD.



LEGEND

- SIGN POST
- TYPE III BARRICADE
- CHANNELIZATION DRUMS
- TRAFFIC ARROWS
- PROPOSED CONSTRUCTION THIS PHASE
- PROPOSED CONSTRUCTION PREVIOUS PHASE

CONSTRUCT DRIVEWAYS SO THAT YOU MAINTAINING ACCESS AT ALL TIMES.

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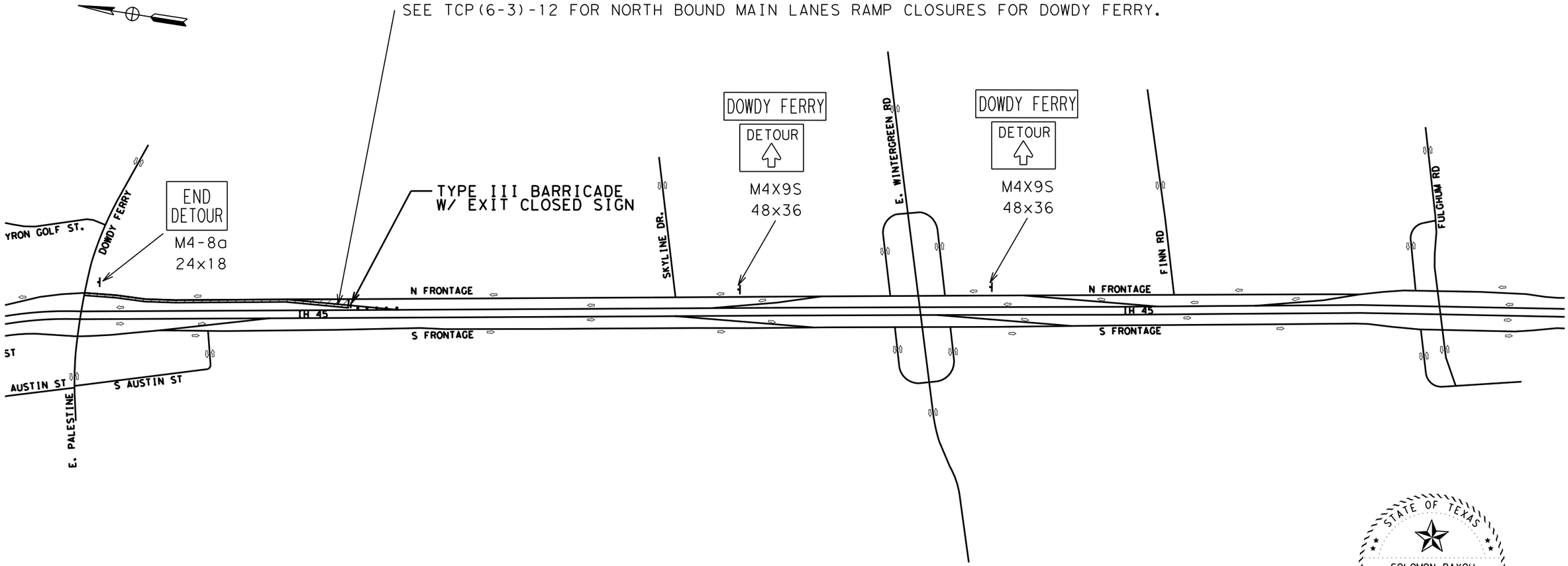
TRAFFIC CONTROL PLAN
PHASE 2 STAGE 1

SCALE: 1"=100' SHEET 4 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	30
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/15/2021 TIME: 8:44:56 AM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450707\TCP PLAN SHEET.dgn

SEE TCP(6-3)-12 FOR NORTH BOUND MAIN LANES RAMP CLOSURES FOR DOWDY FERRY.



LEGEND

- SIGN POST
- TYPE III BARRICADE
- CHANNELIZATION DEVICES
- TRAFFIC ARROWS
- CONSTRUCTION

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TRAFFIC CONTROL PLAN
RAMP DETOUR LAYOUT

SHEET 2 OF 2

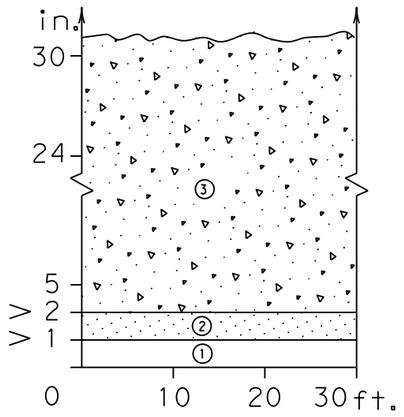
DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	32
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/14/2021 TIME: 7:54:28 AM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450707\RAMP DETOUR LAYOUT.dgn

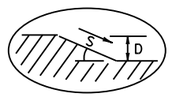
DATE:
FILE:

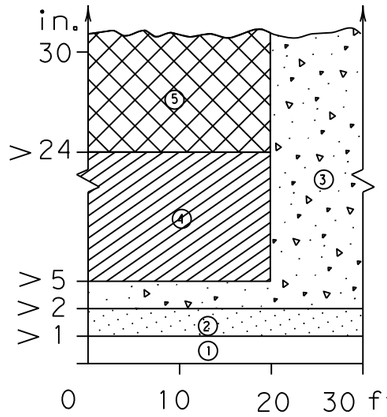
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

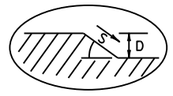


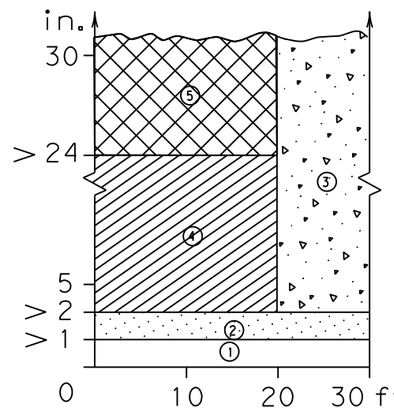
Edge Condition I
S = (3:1) (or flatter)



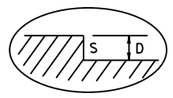


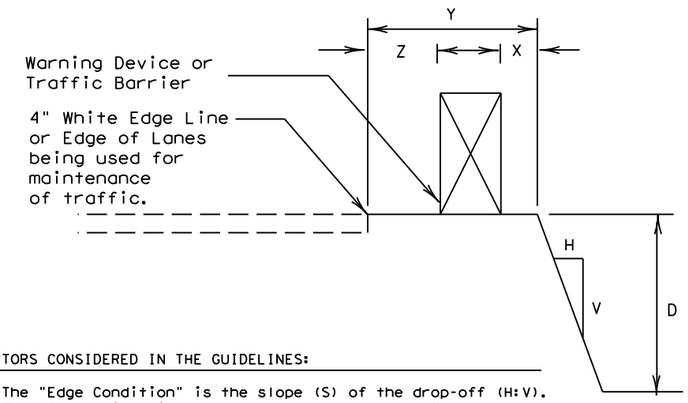
Edge Condition II
S = ((2.99):1) to (1:1)





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:

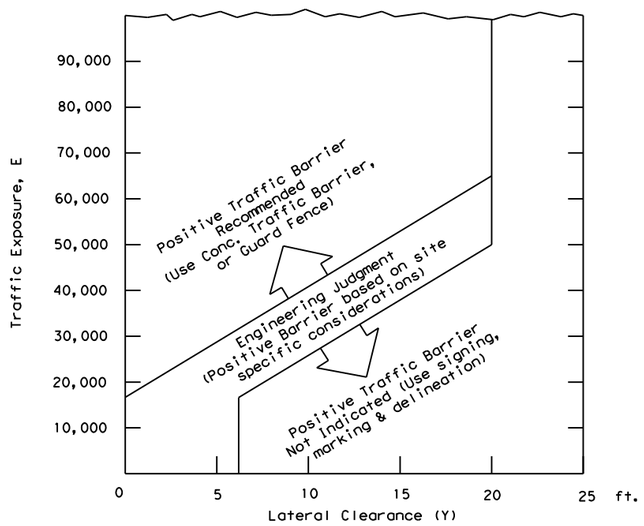
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

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.

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation
Traffic Operations Division

TREATMENT FOR VARIOUS EDGE CONDITIONS

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

REVISIONS
03-01
08-01 correct typos

CONT	SECT	JOB	HIGHWAY
0092	02	125	IH 45
DIST	COUNTY		SHEET NO.
18	DALLAS		33

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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. As shown on BC(2), the OBEY WARNING SIGNS STATE LAW sign, STAY ALERT TALK OR TEXT LATER (see Sign Detail G20-10T) and the WORK ZONE TRAFFIC FINES DOUBLE sign with plaque shall be erected in advance of the CSJ limits. However, the TRAFFIC FINES DOUBLE sign will not be required on projects consisting solely of mobile operation work, such as striping or milling edgeline rumble strips. The BEGIN ROAD WORK NEXT X MILES, CONTRACTOR and END ROAD WORK signs shall be erected at or near the CSJ limits.

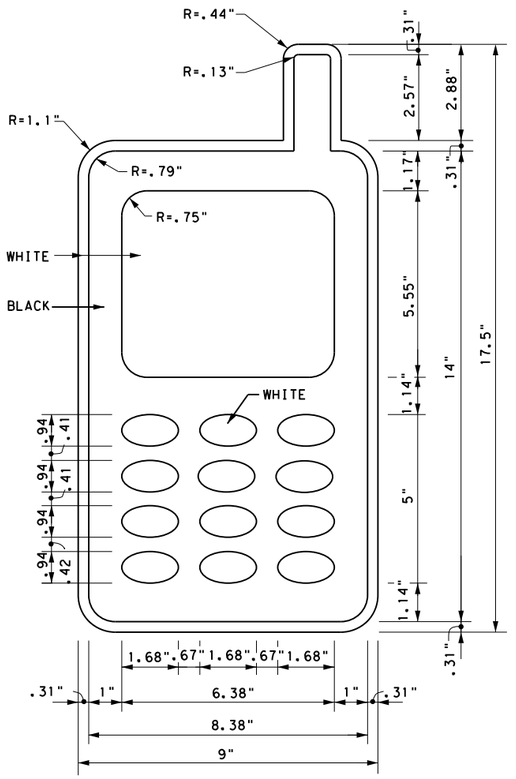
11. Except for devices required by Note 10, traffic control devices should be in place only while work is actually in progress or a definite need exists.

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 APPAREL 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.



3.0" Radius, 1.25" Border, 0.75" Indent, Black on Yellow;
[STAY ALERT] Font: D
3.0" Radius, 1.25" Border, 0.75" Indent, Black on Orange;
[TALK OR TEXT LATER] Font: C specified length;

SIGN DETAIL (G20-10T)

Only pre-qualified products shall be used. The "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found on-line at the web address given below or by contacting:

Texas Department of Transportation
Traffic Operations Division - TE
Phone (512) 416-3118

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

Texas Department of Transportation | Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-14

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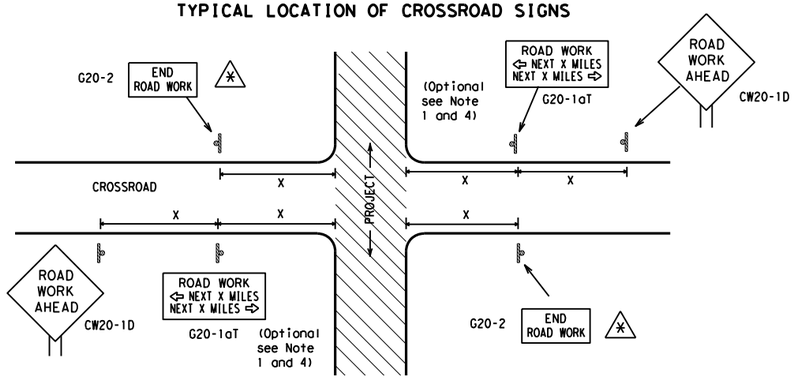
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
4-03 5-10 8-14 9-07 7-13	DIST	COUNTY		SHEET NO.
	18	DALLAS		34

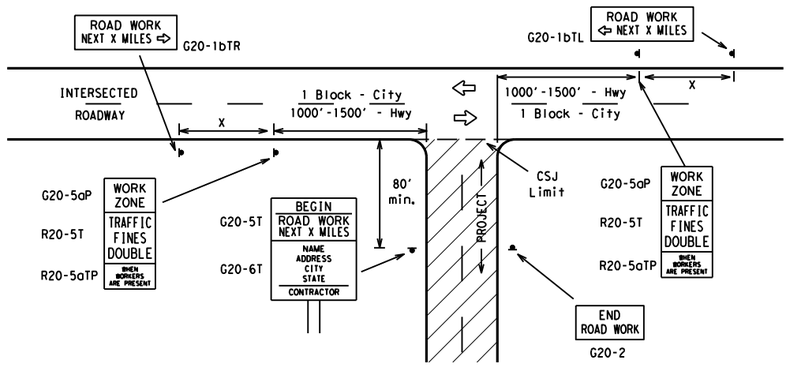
TYPICAL LOCATION OF CROSSROAD SIGNS



✱ 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. 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			SPACING	
Sign Number or Series	Conventional Road	Expressway/ Freeway	Posted Speed	Sign Spacing "X" △
			MPH	Feet (Apprx.)
CW20[4] CW21 CW22 CW23 CW25	48" x 48"	48" x 48"	30	120
			35	160
			40	240
			45	320
CW1, CW2, CW7, CW8, CW9, CW11, CW14	36" x 36"	48" x 48"	50	400
			55	500[2]
			60	600[2]
CW3, CW4, CW5, CW6, CW8-3, CW10, CW12	48" x 48"	48" x 48"	65	700[2]
			70	800[2]
			75	900[2]
			80	1000[2]
			✱	✱ [3]

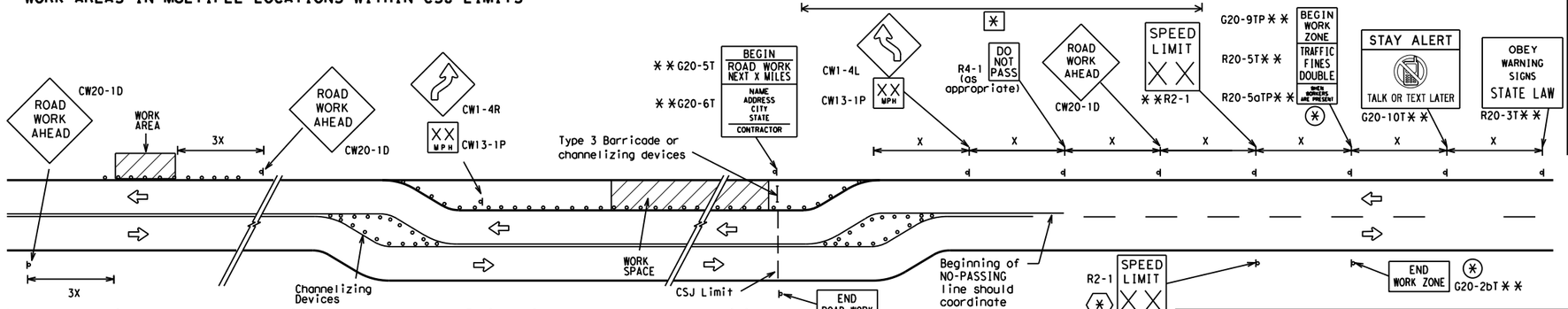
✱ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

△ 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. See Note 2 under "Typical Location of Crossroad Signs".
5. Only diamond shaped warning sign sizes are indicated.
6. See sign size listing in "TMUTCD", Sign Appendix or the "Standard Highway Sign Designs for Texas" manual for complete list of available sign design sizes.

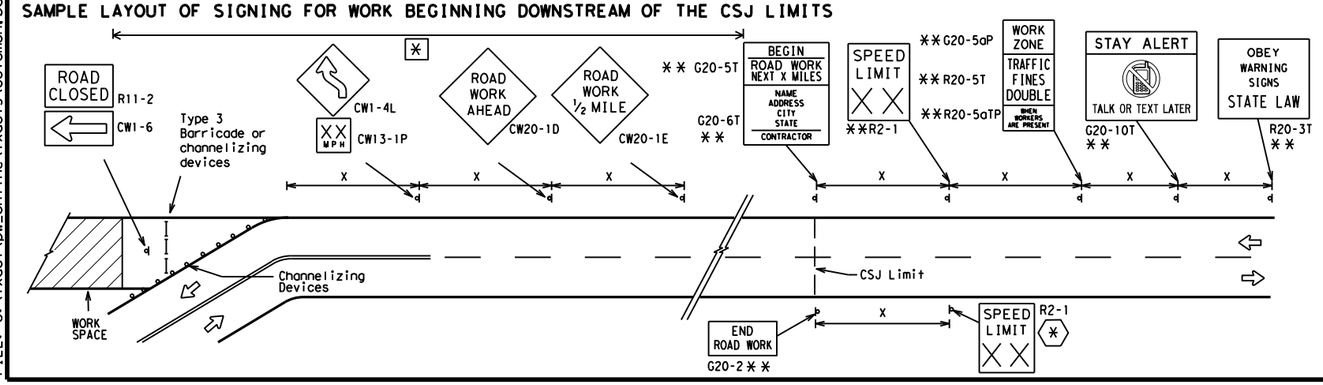
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS



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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS

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



NOTES

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

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

✱✱ Required CSJ Limit signing. See Note 10 on BC(1). TRAFFIC FINES DOUBLE signs will not be required on projects consisting solely of mobile operations work.

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

(✱) Contractor will install a regulatory speed limit sign at the end of the work zone.

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-14

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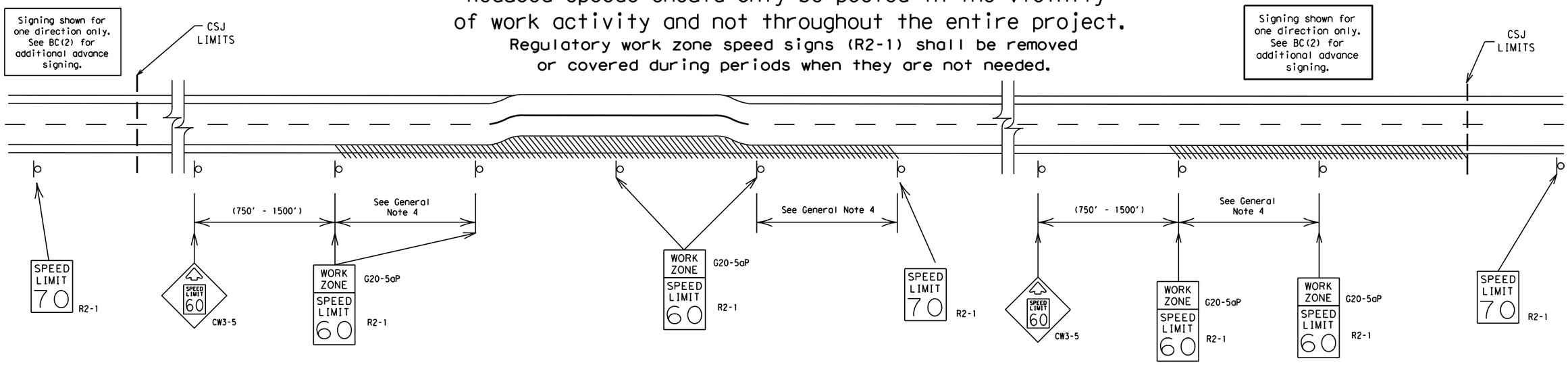
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	18	DALLAS		35

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 travelled 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 Operations Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

BC(3)-14

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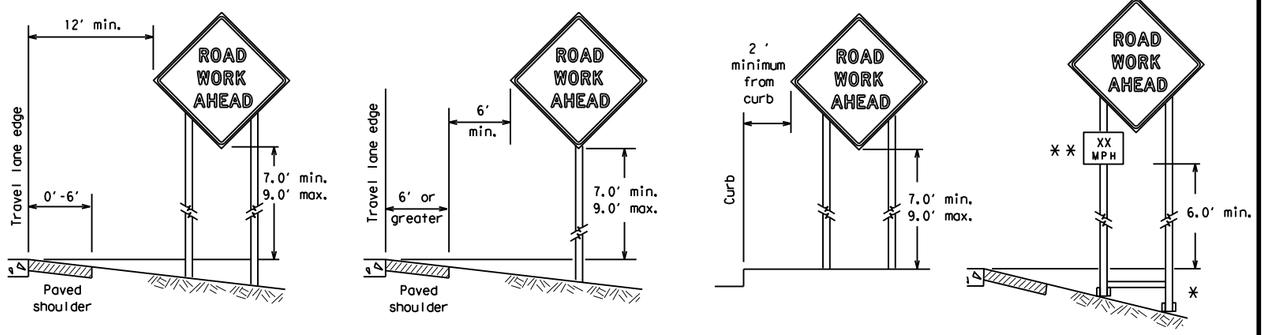
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		36

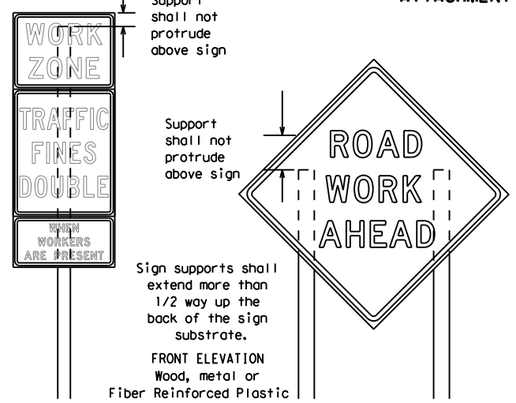
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

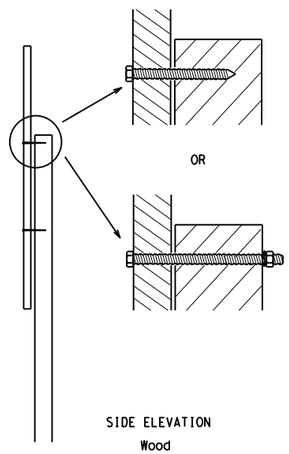


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

** 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





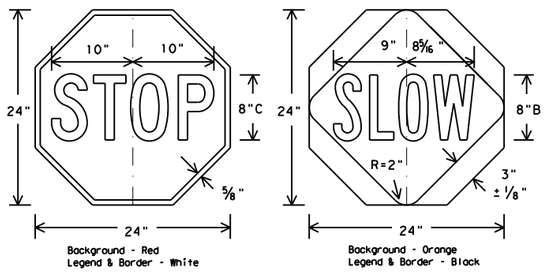
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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" as detailed below.
2. When used at night, the STOP/SLOW paddle shall be retroreflectorized.
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.



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, 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.
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 sheets or the CWZTCD. The signs shall meet the required mounting heights shown on the BC Sheets or the SMD Standards 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). 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 Operations Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		37

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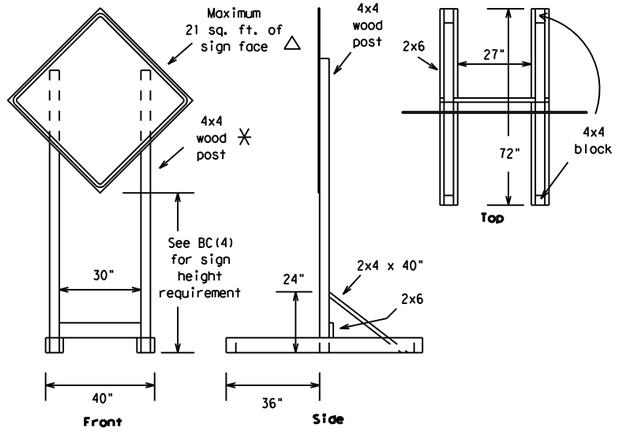
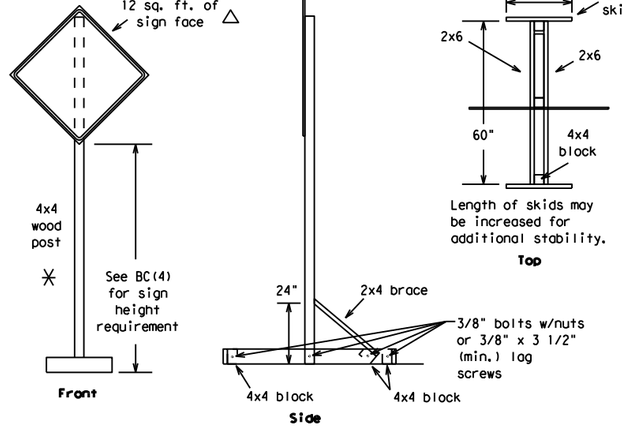
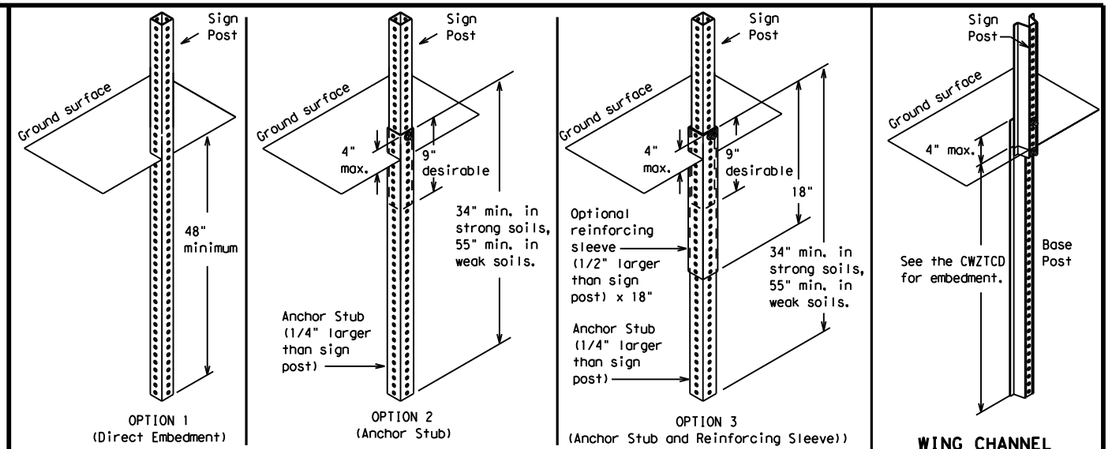




SKID MOUNTED WOOD SIGN SUPPORTS

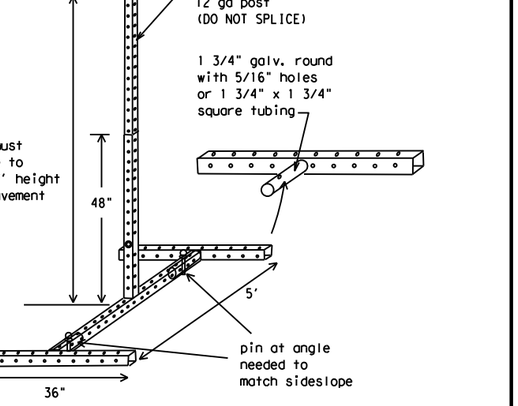
LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS □

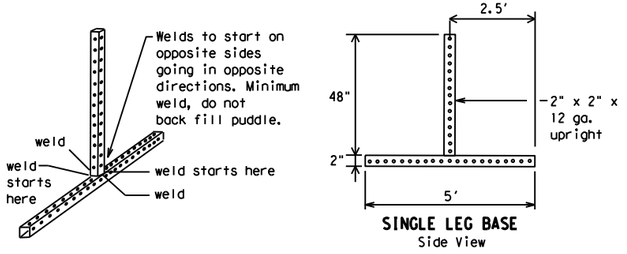


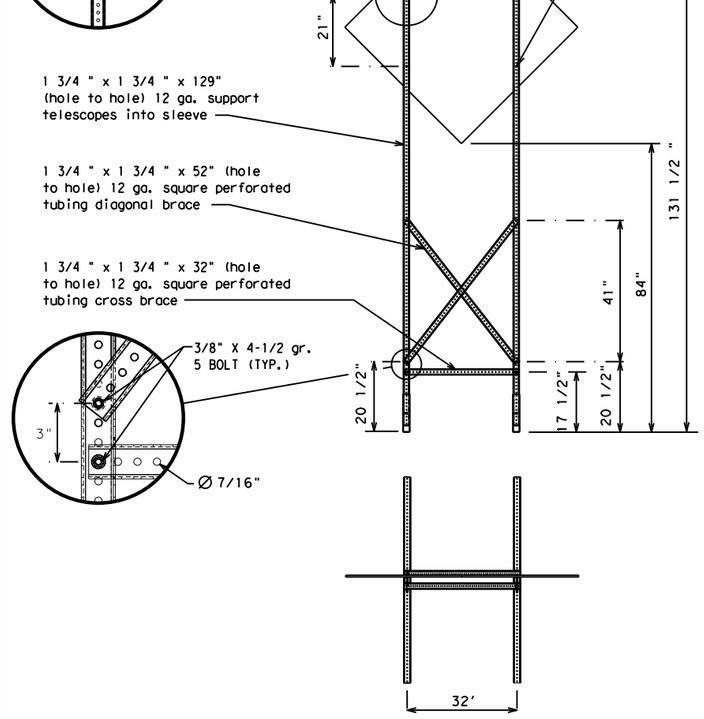
PERFORATED SQUARE METAL TUBING

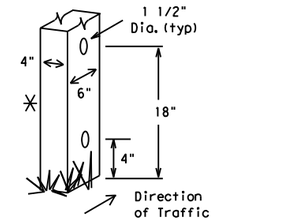
GROUND MOUNTED SIGN SUPPORTS

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.



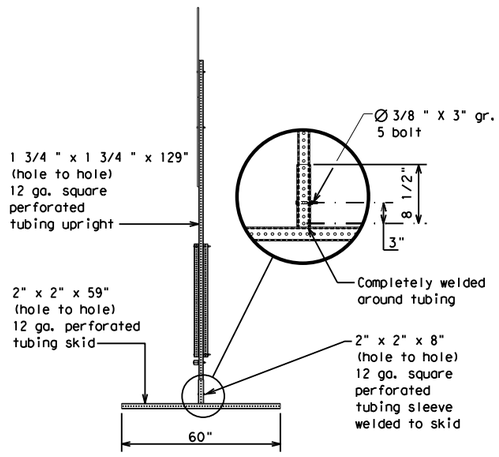






Nominal Post Size	Number of Posts	Maximum Sq. feet of Sign Face	Minimum Soil Embedment	Drilled Hole(s) Required
4 x 4	1	12	36"	NO
4 x 4	2	21	36"	NO
4 x 6	1	21	36"	YES
4 x 6	2	36	36"	YES

WOOD POST SYSTEM FOR GROUND MOUNTED SIGN SUPPORTS



WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

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SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-14

FILE: bc-14.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	18	DALLAS		38

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

** 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 Operations Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-14

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9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	18	DALLAS		39

100

DATE: 6/13/2021 5:46:03 AM
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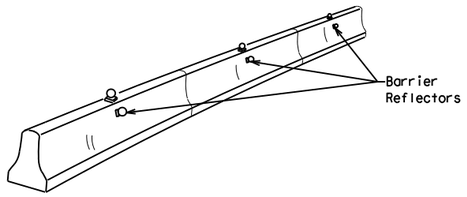
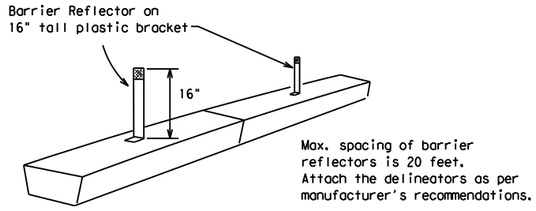
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost of the reflectors shall be considered subsidiary to Item 512.

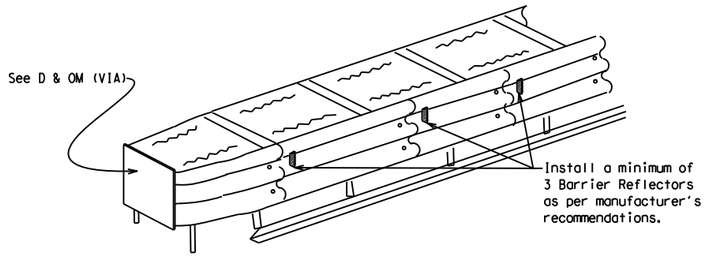


CONCRETE TRAFFIC BARRIER (CTB)

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



LOW PROFILE CONCRETE BARRIER (LPCB)

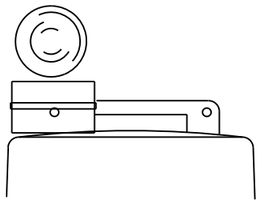


DELINEATION OF END TREATMENTS

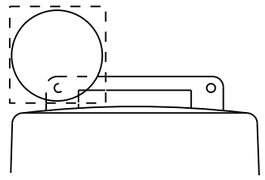
END TREATMENTS FOR CTB'S USED IN WORK ZONES

End treatments used on CTB's in work zones shall meet crashworthy standards as defined in the National Cooperative Highway Research Report 350. 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

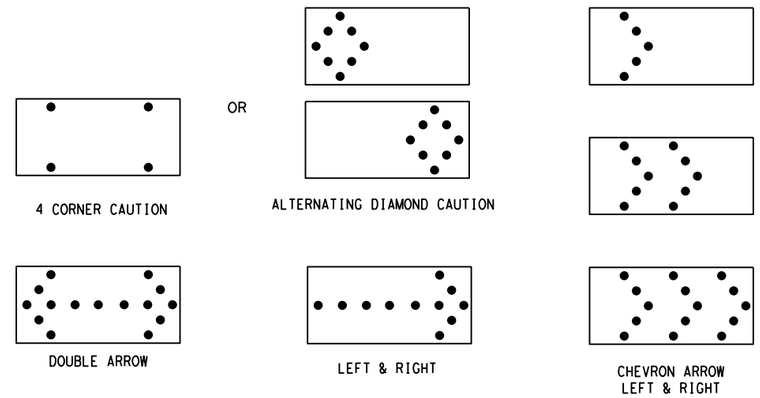
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing 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 National Cooperative Highway Research Report No. 350 (NCHRP 350) or 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 Operations Division Standard

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

BC(7)-14

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	18	DALLAS		40

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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:

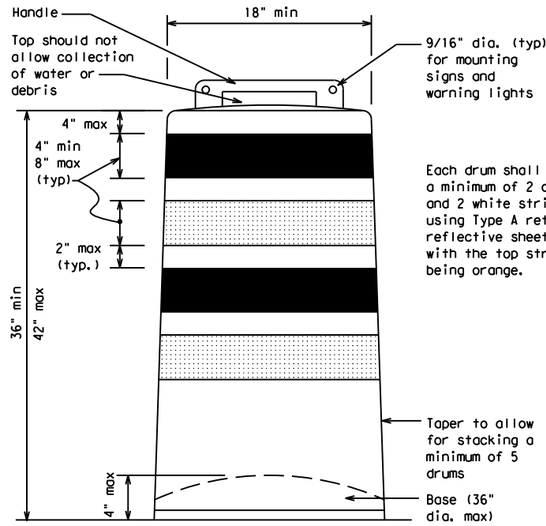
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

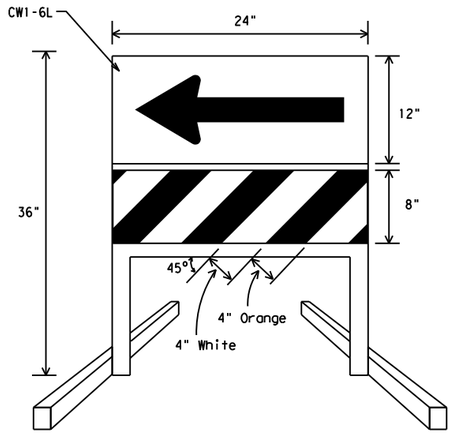
RETROREFLECTIVE SHEETING

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 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

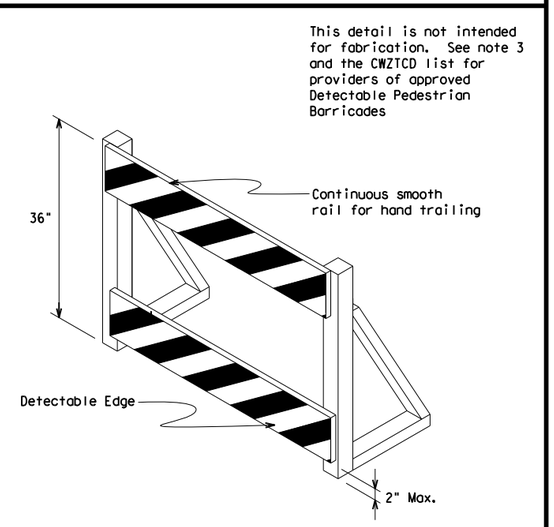
1. Unballasted bases shall be large enough to hold up to 50 lbs. of sand. This base, when filled with the ballast material, should weigh between 35 lbs (minimum) and 50 lbs (maximum). The ballast may be sand in one to three sandbags separate from the base, sand in a sand-filled plastic base, or other 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.





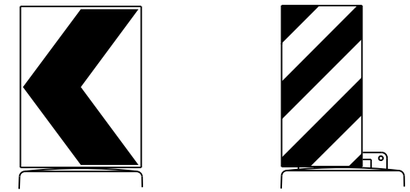
DIRECTION INDICATOR BARRICADE

1. The Direction Indicator Barricade may be used in tapers, transitions, and other areas where specific directional guidance to drivers is necessary.
2. If used, the Direction Indicator Barricade should be used in series to direct the driver through the transition and into the intended travel lane.
3. The Direction Indicator Barricade shall consist of One-Direction Large Arrow (CW1-6) sign in the size shown with a black arrow on a background of Type B_{FL} or Type C_{FL} Orange retroreflective sheeting above a rail with Type A retroreflective sheeting in alternating 4" white and orange stripes sloping downward at an angle of 45 degrees in the direction road users are to pass. Sheeting types shall be as per DMS 8300.
4. Double arrows on the Direction Indicator Barricade will not be allowed.
5. Approved manufacturers are shown on the CWZTCD List. Ballast shall be as approved by the manufacturers instructions.



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.
2. Where pedestrians with visual disabilities normally use the closed sidewalk, a device that is detectable by a person with a visual disability traveling with the aid of a long cane shall be placed across the full width of the closed sidewalk.
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 for Buildings and Facilities (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 may 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 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.

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Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-14

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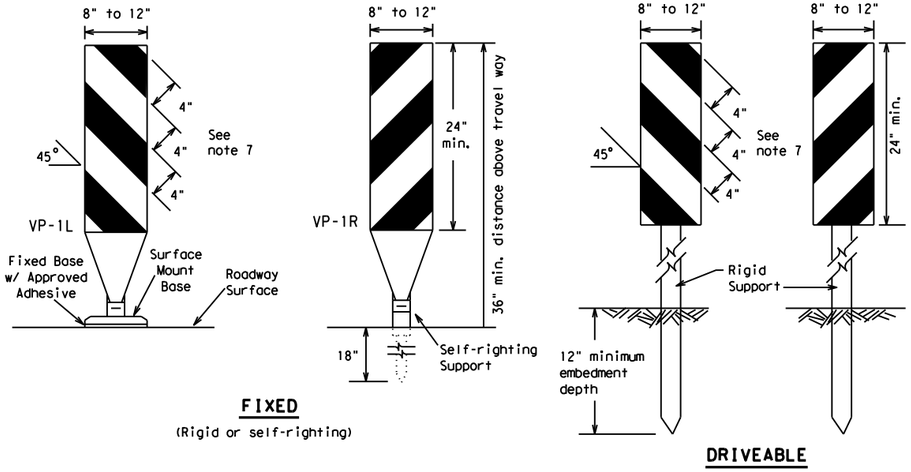
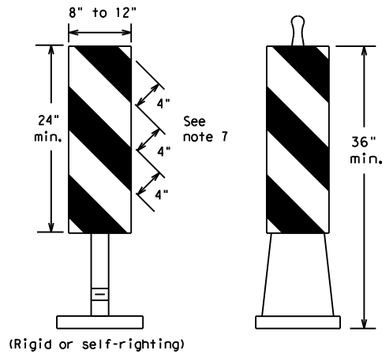


FIXED
(Rigid or self-righting)

DRIVEABLE

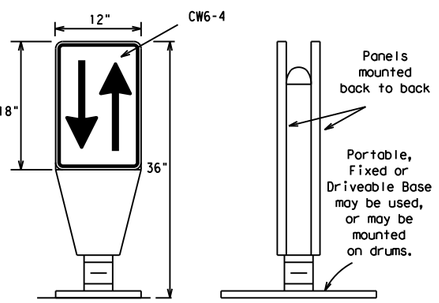


(Rigid or self-righting)

PORTABLE

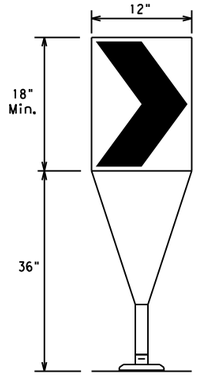
VERTICAL PANELS (VPs)

1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is required. The Engineer/Inspector shall refer to the Roadway Design Manual Appendix B "Treatment of Pavement Drop-offs in Work Zones" for additional guidelines on the use of 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 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.



OPPOSING TRAFFIC LANE DIVIDERS (OTLD)

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.



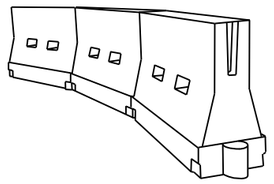
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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) placed 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 NCHRP 350 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

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-14

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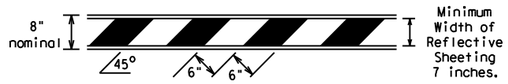
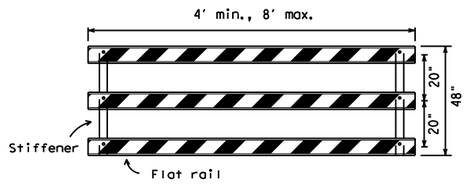
TYPE 3 BARRICADES

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 conforming to Departmental Material Specification DMS-8300 unless otherwise noted.

Barricades shall NOT be used as a sign support.



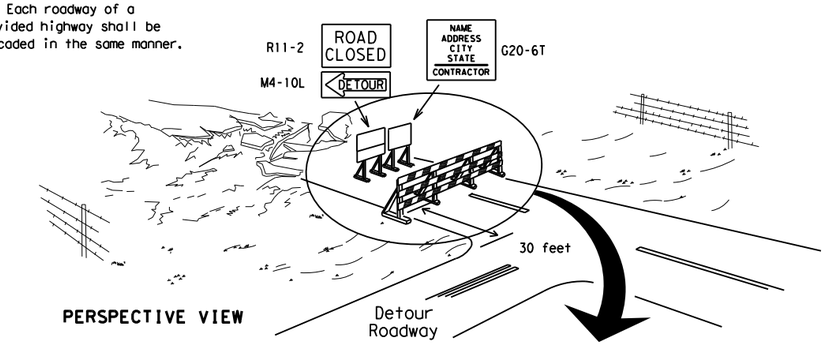
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

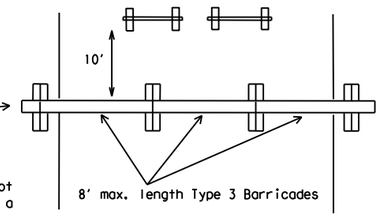
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

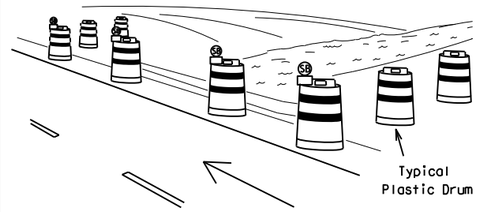
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

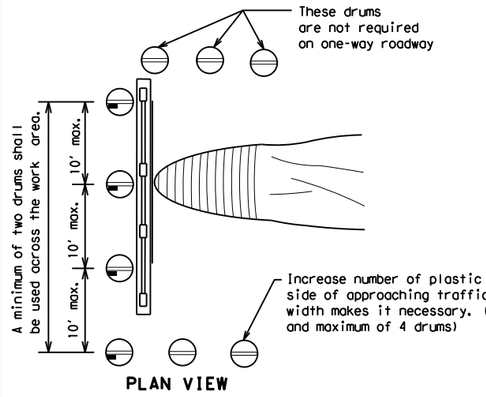
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

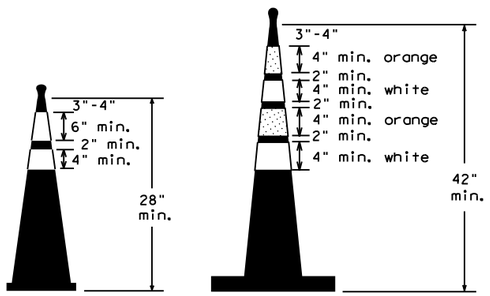
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

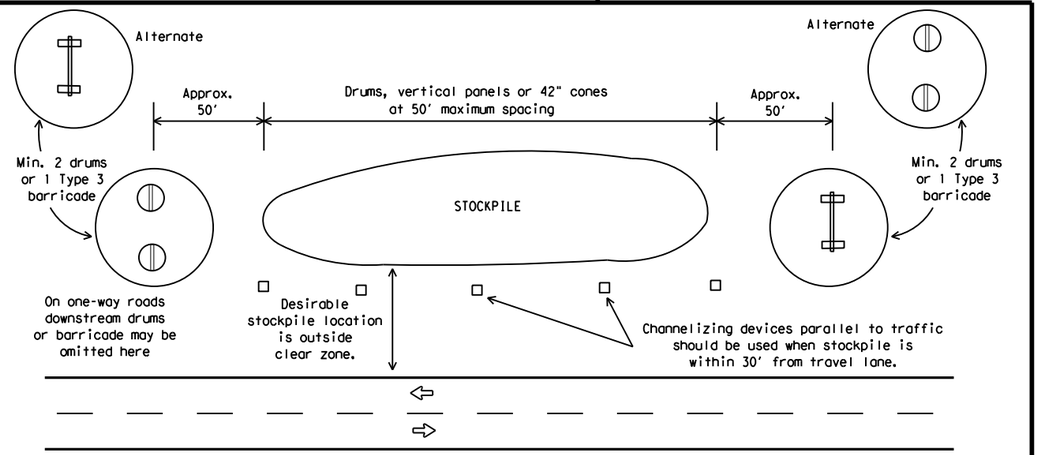
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

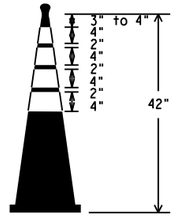
42" 2-piece cones shall have a minimum weight of 30 lbs. including base.

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 used at night 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.
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

THIS DEVICE SHALL NOT BE USED ON PROJECTS LET AFTER MARCH 2014.



EDGELINE CHANNELIZER

1. This device is intended only for use in place of a vertical panel to channelize traffic by indicating the edge of the travel lane. It is not intended to be used in transitions or tapers.
2. This device shall not be used to separate lanes of traffic (opposing or otherwise) or warn of objects.
3. This device is based on a 42 inch, two-piece cone with an alternate striping pattern: four 4 inch retroreflective bands, with an approximate 2 inch gap between bands. The color of the band should correspond to the color of the edgeline (yellow for left edgeline, white for right edgeline) for which the device is substituted or for which it supplements. The reflectorized bands shall be retroreflective Type A conforming to Departmental Material Specification DMS-8300, unless otherwise noted.
4. The base must weigh a minimum of 30 lbs.

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13	18	DALLAS		43

104

DATE: 6/13/2021 5:46:14 AM
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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.

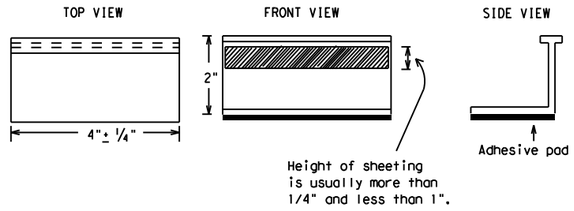
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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 Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-14

FILE: bc-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
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2-98 9-07	DIST	COUNTY		SHEET NO.
1-02 7-13	18	DALLAS		44
11-02 8-14				

105

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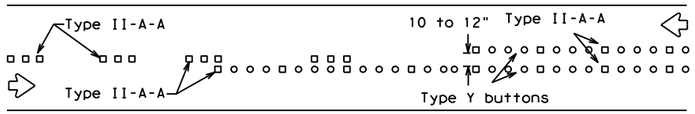
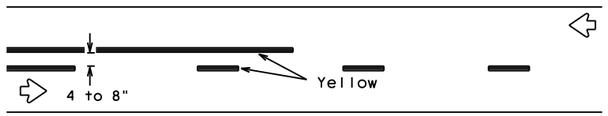
PAVEMENT MARKING PATTERNS

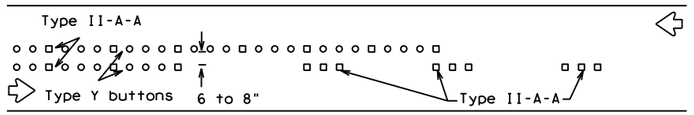
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



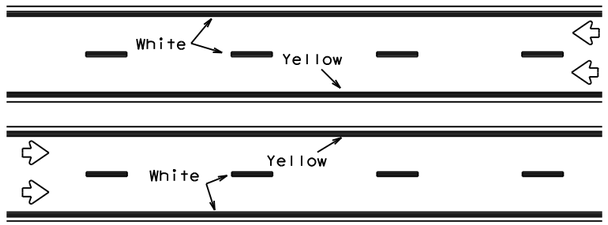
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



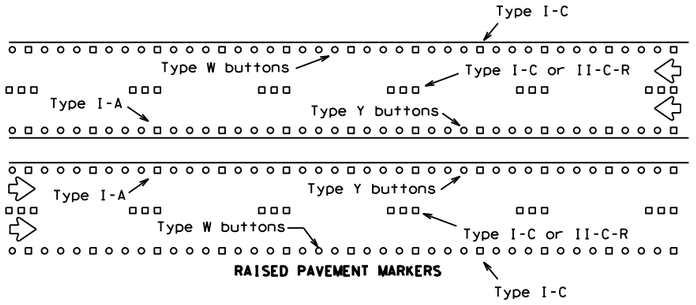
RAISED PAVEMENT MARKERS - PATTERN B

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

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



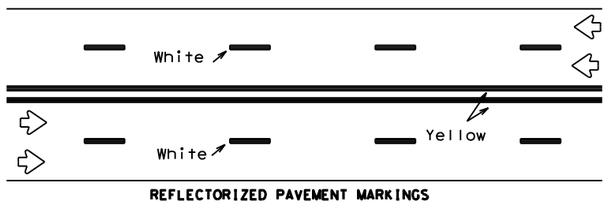
REFLECTORIZED PAVEMENT MARKINGS



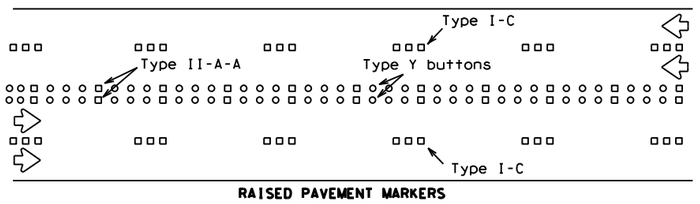
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



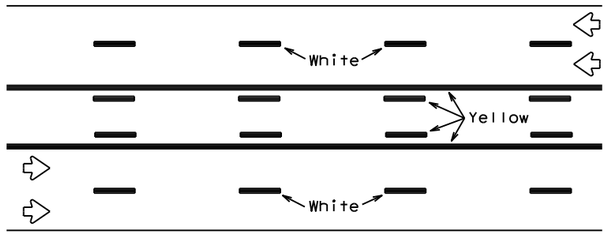
REFLECTORIZED PAVEMENT MARKINGS



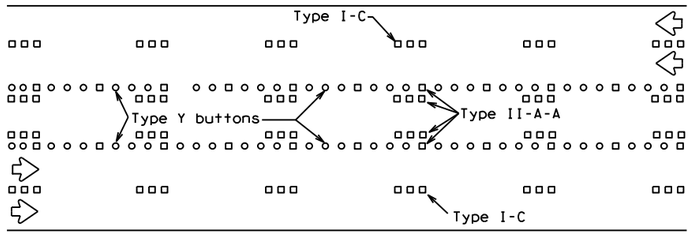
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

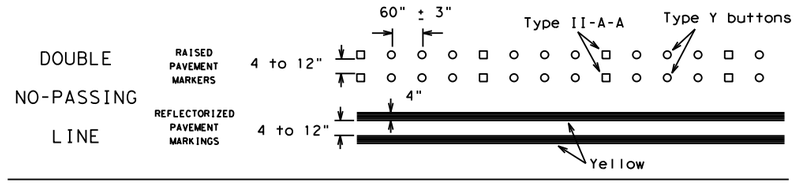
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

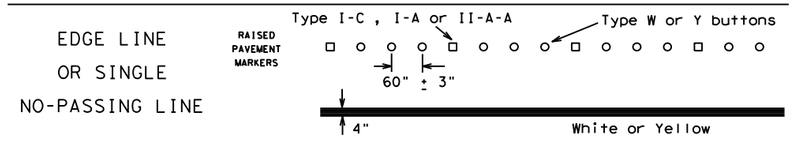
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

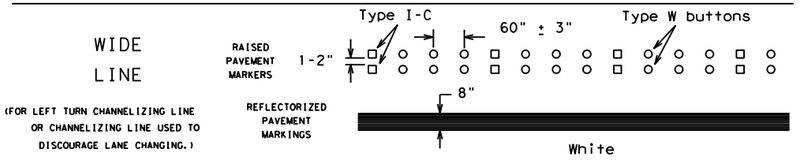


EDGE LINE OR SINGLE NO-PASSING LINE



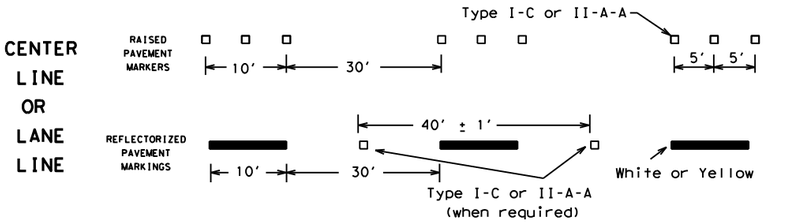
WIDE LINE

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

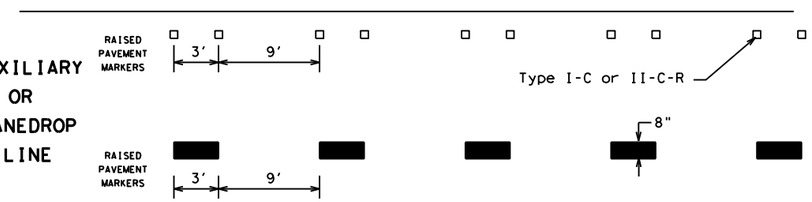


BROKEN LINES

CENTER LINE OR LANE LINE

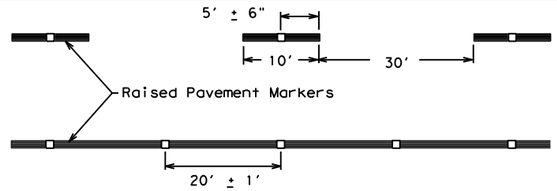


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Operations Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-14

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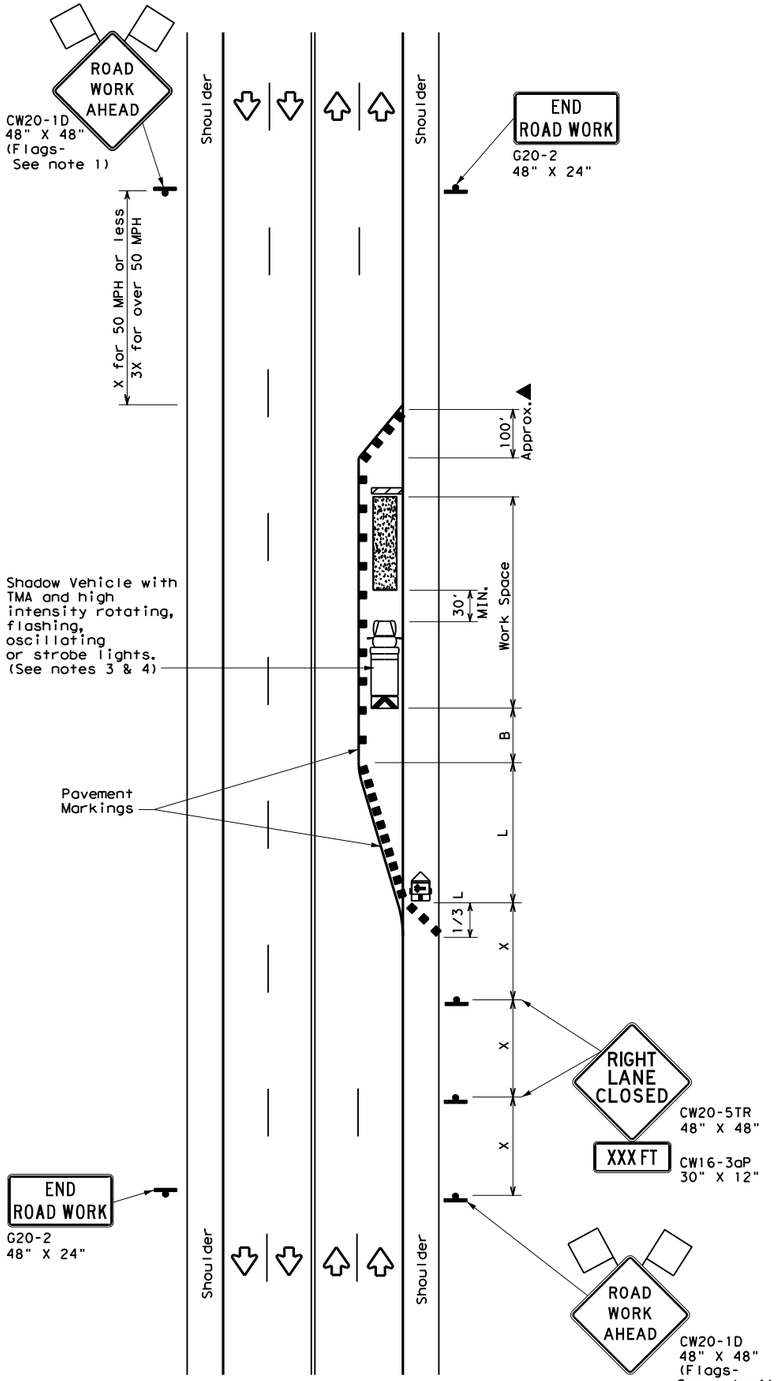
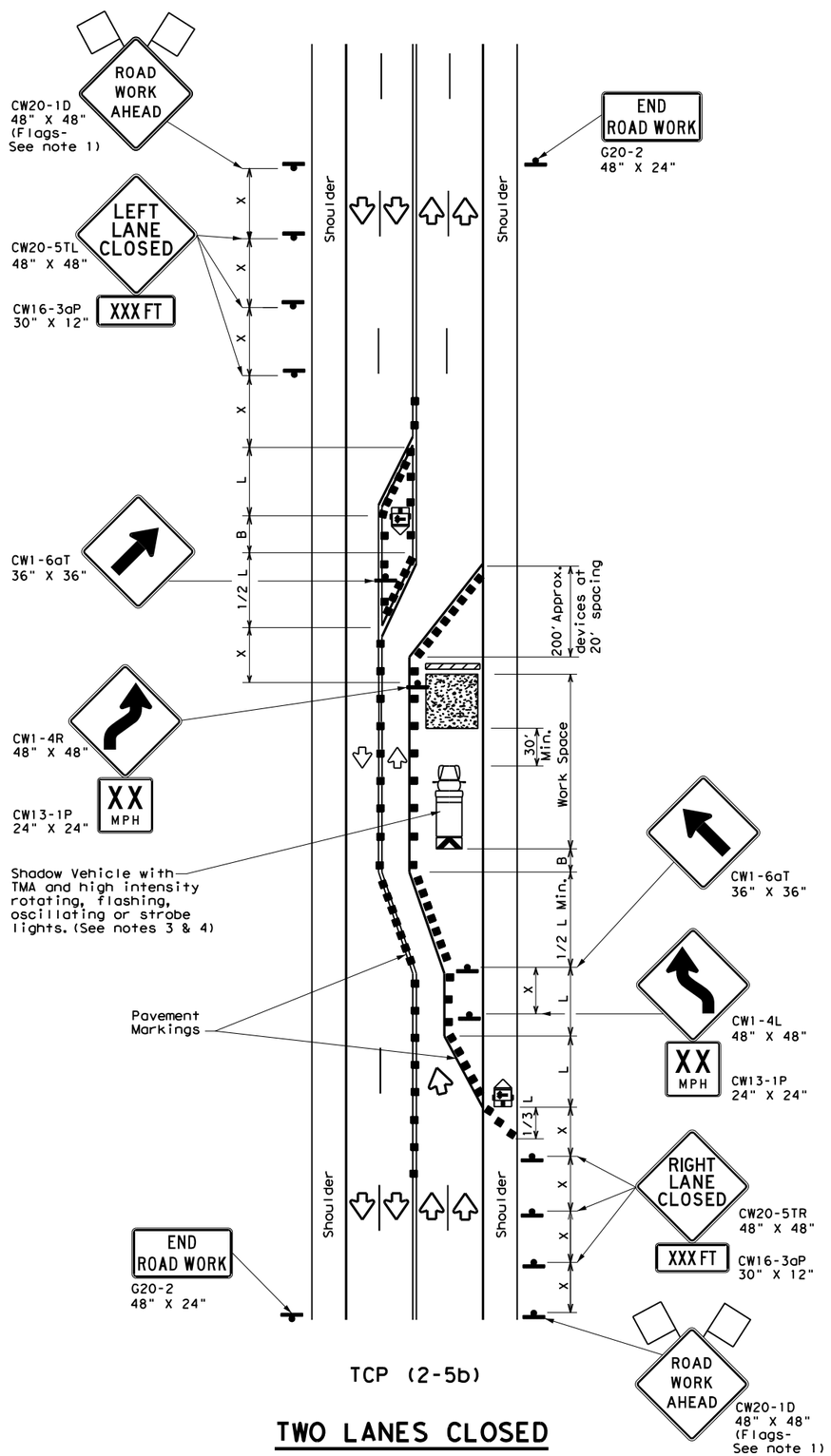
2-98 7-13	18	DALLAS		45
11-02 8-14				



TCP (2-5a)

ONE LANE CLOSED



TCP (2-5b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-5a)

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

TCP (2-5b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LONG TERM LANE CLOSURES MULTILANE CONVENTIONAL RDS.

TCP(2-5)-18

FILE: tcp2-5-18.dgn	DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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1-97 3-03	DIST	COUNTY		SHEET NO.
4-98 2-18	18	DALLAS		46

165

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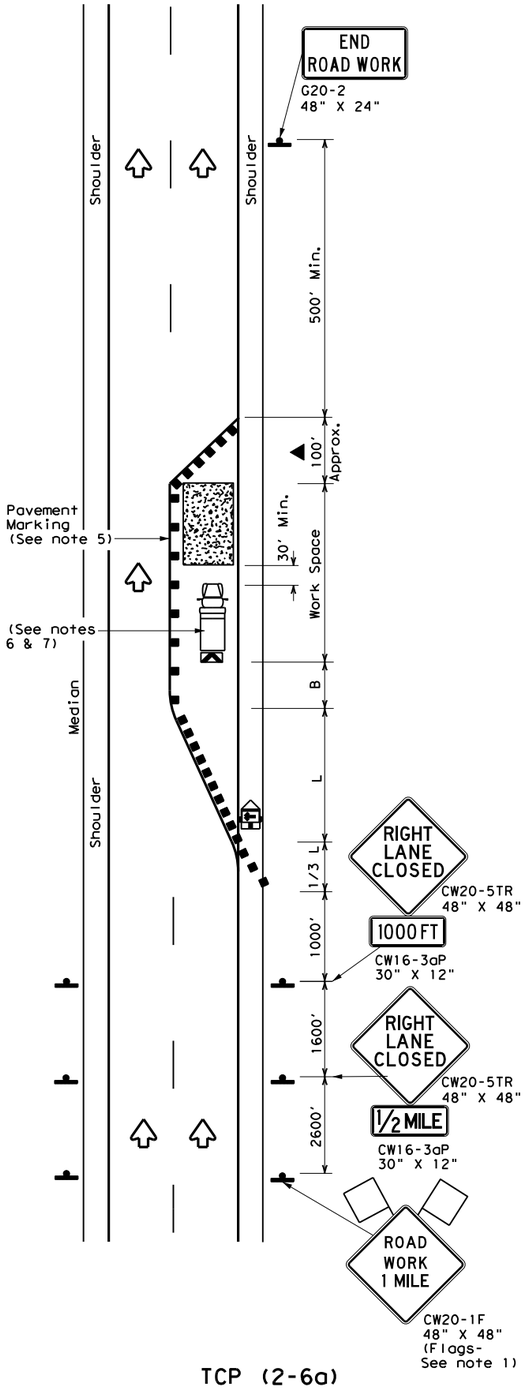
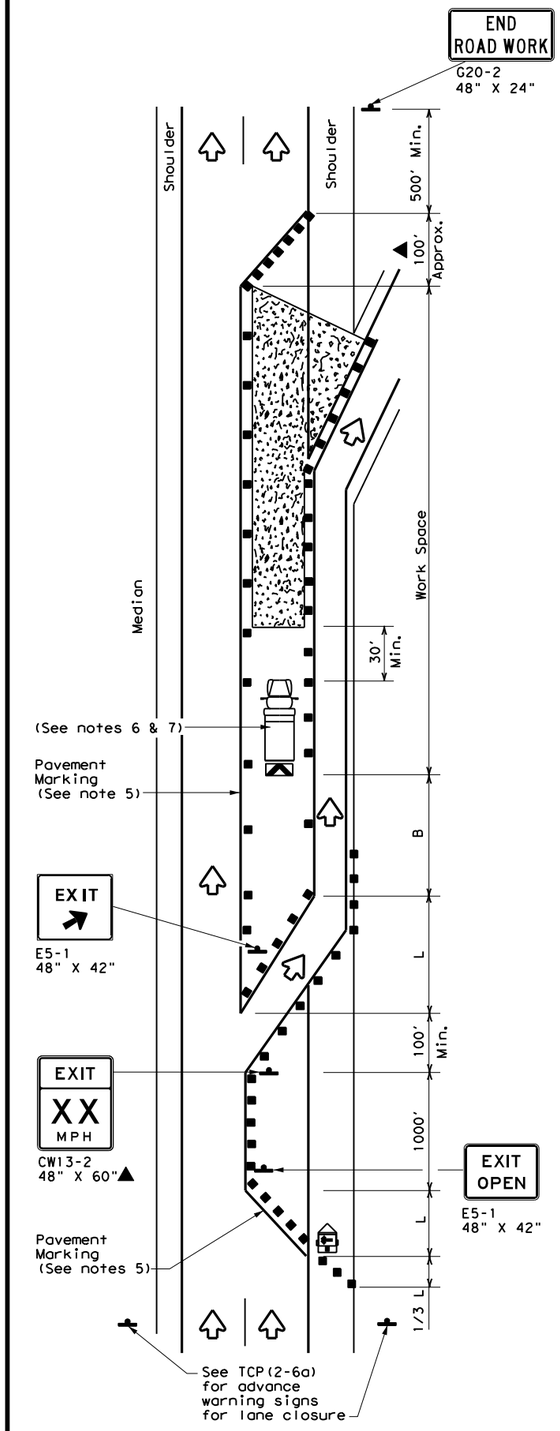


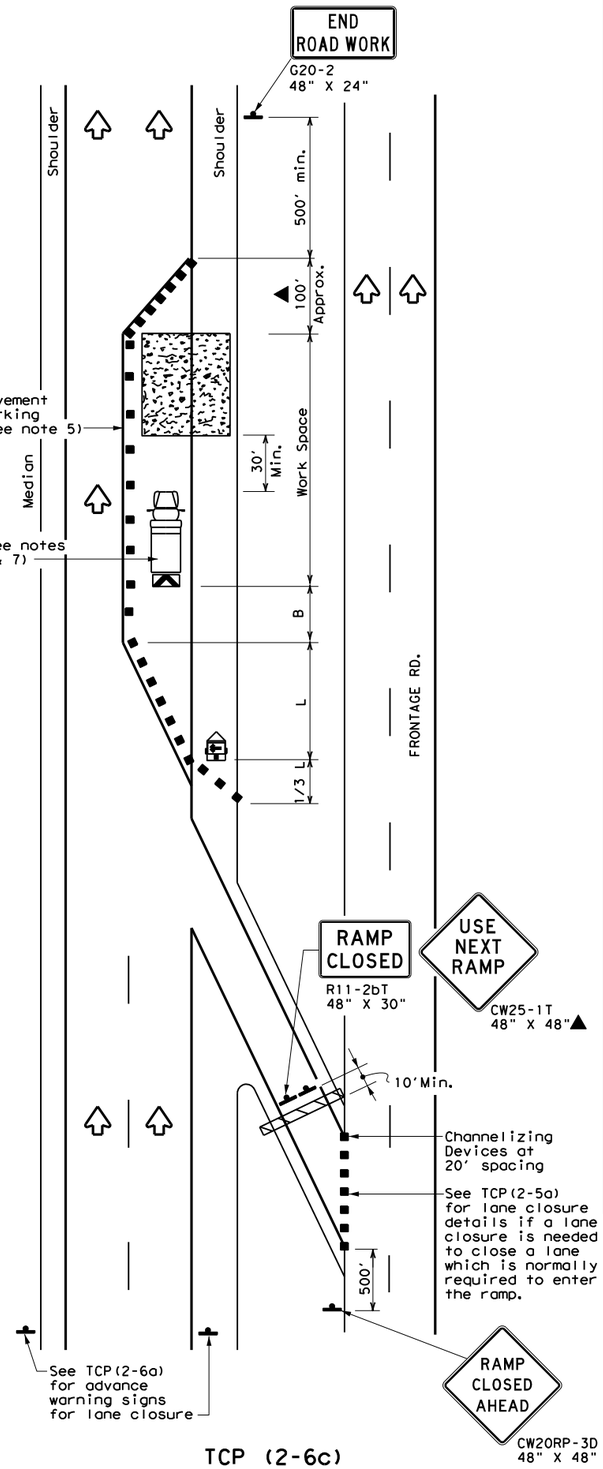
TCP (2-6a)

ONE LANE CLOSURE



TCP (2-6b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (2-6c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. Channelizing devices used to close lanes may be supplemented with the Chevron Alignment Sign placed on every other channelizing device. Chevrons may be attached to plastic drums as per BC Standards.
4. Channelizing devices used along the work space or along tangent sections may be supplemented with vertical panels (VP) placed on everyother channelizing device. If night time conditions make it difficult to see at least two VPs, the VPs may be placed on each channelizing device.
5. The placement of pavement markings may be omitted on Intermediate-term stationary work zones with the approval of the Engineer.
6. Shadow Vehicle with TMA and high intensity rotating, flashing,oscillating or strobe lights. Shadow Vehicle with TMA and high intensity rotating, flashing, oscillating or strobe lights. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned in each closed lane, on the shoulder or off the paved surface, next to those shown in order to protect a wider work space.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON DIVIDED HIGHWAYS

TCP(2-6)-18

FILE: tcp2-6-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 2-12 1-97 2-18	0092	02	125	IH 45
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	18	DALLAS		47

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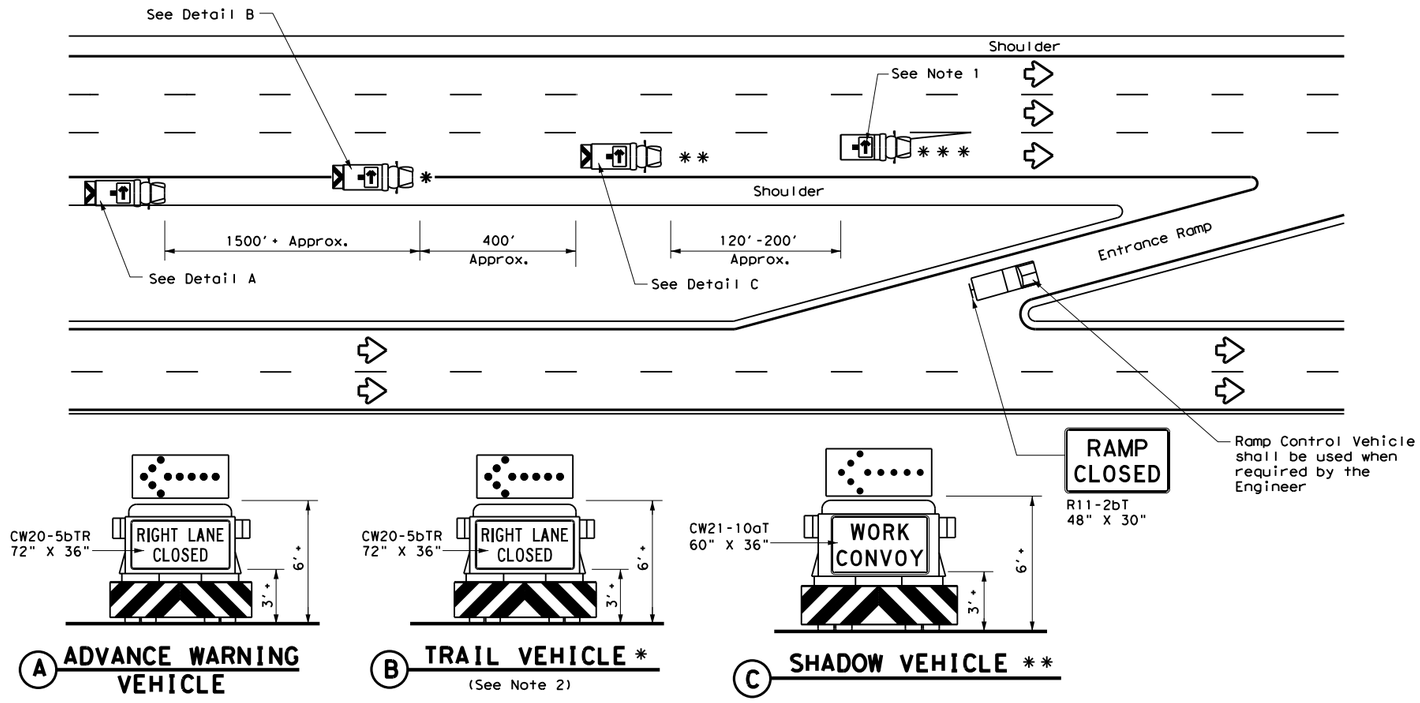
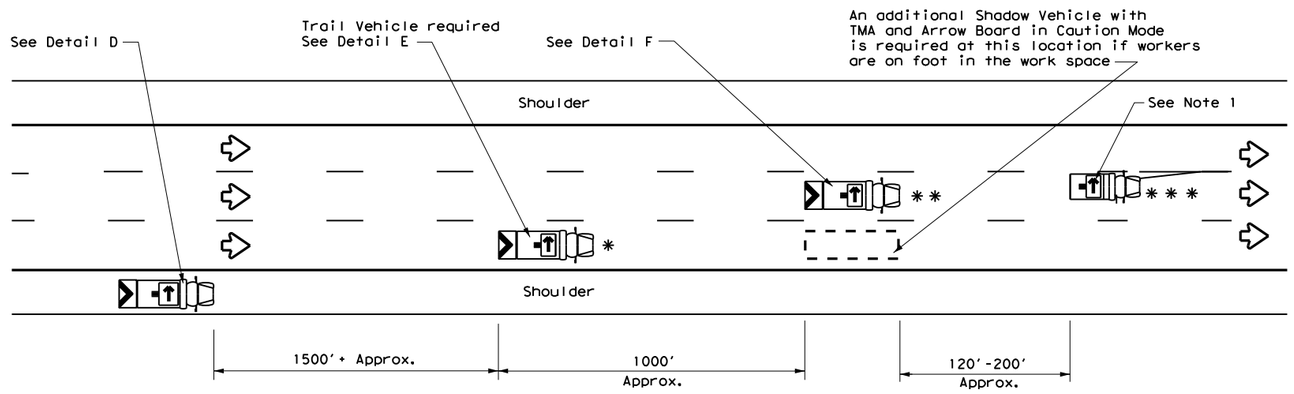


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



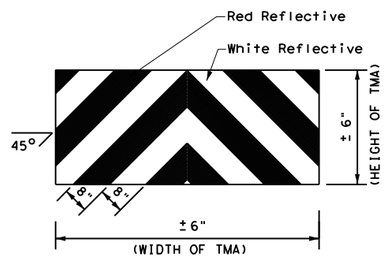
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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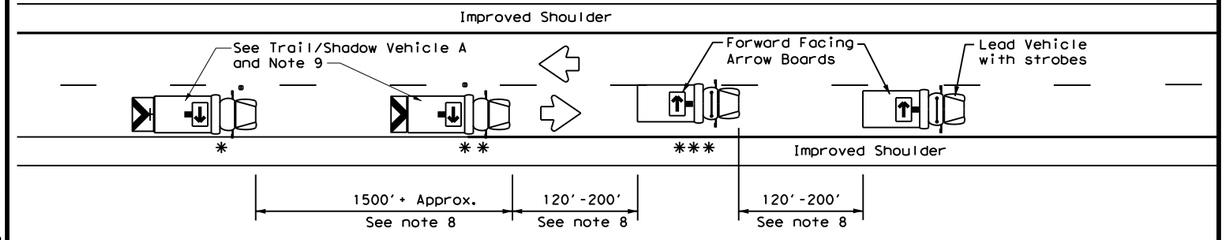
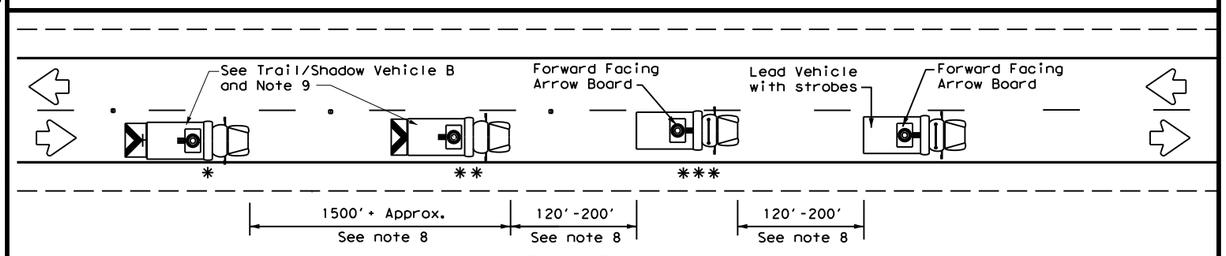
8-95 7-13	18	DALLAS		48
1-97				

176



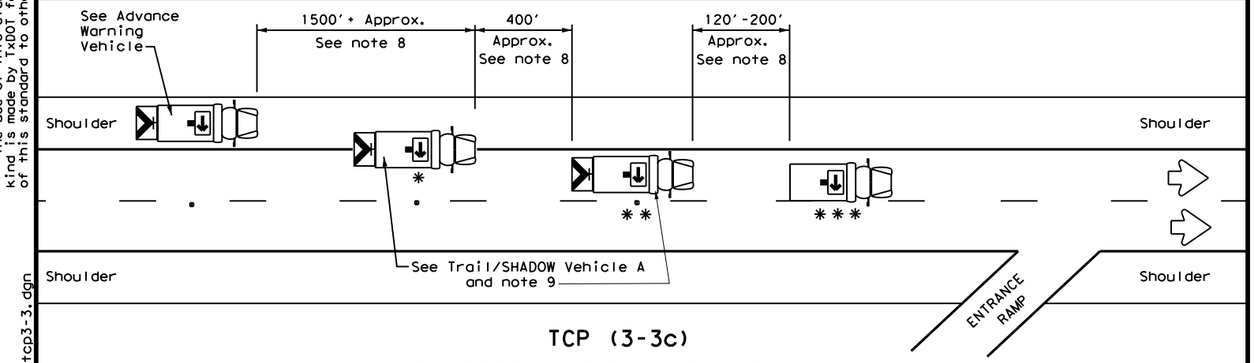
TCP (3-3a)

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



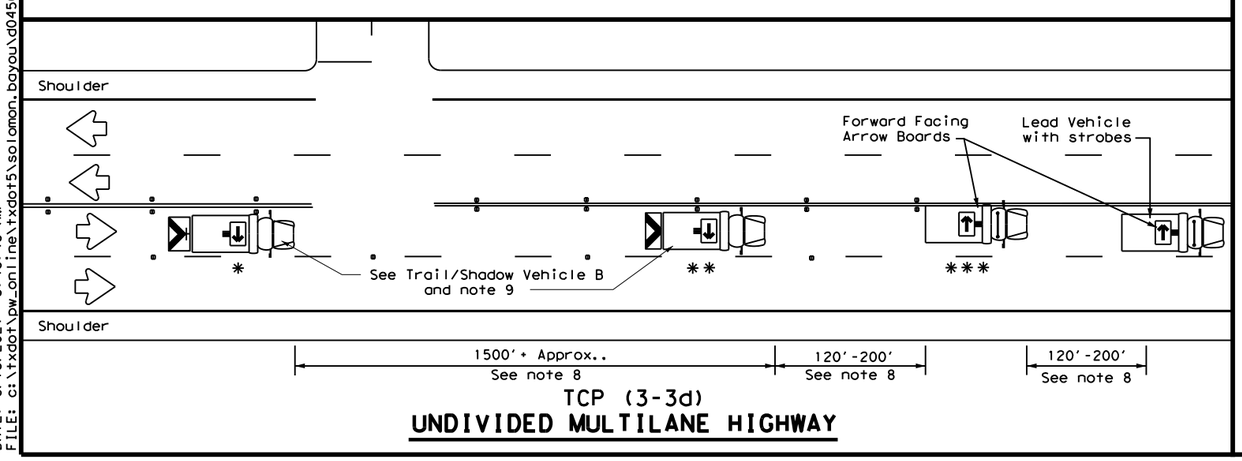
TCP (3-3b)

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



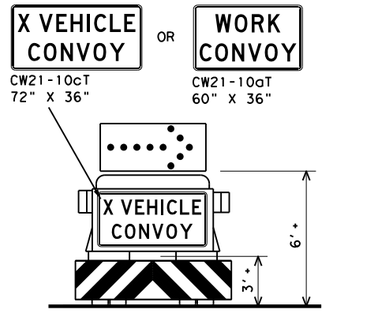
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



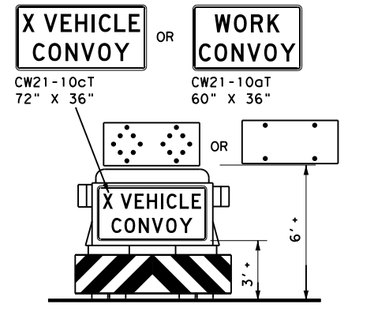
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



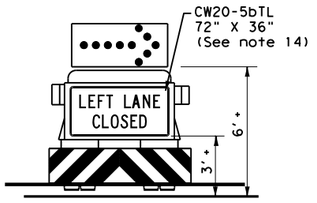
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

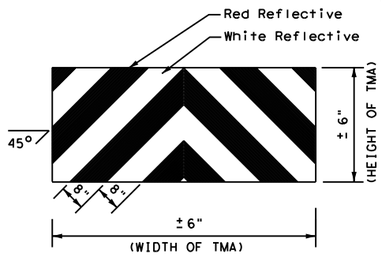


TRAIL/SHADOW VEHICLE B

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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REVISIONS	0092	02	125	IH 45
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	18	DALLAS		49
1-97 7-14				

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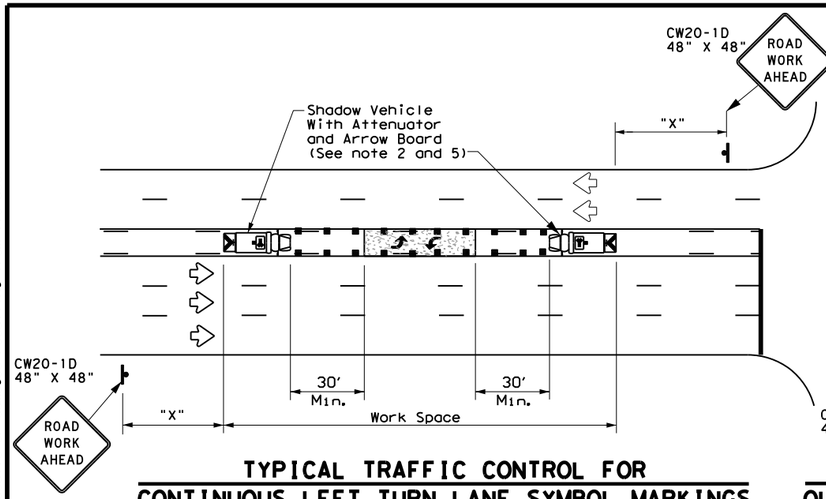
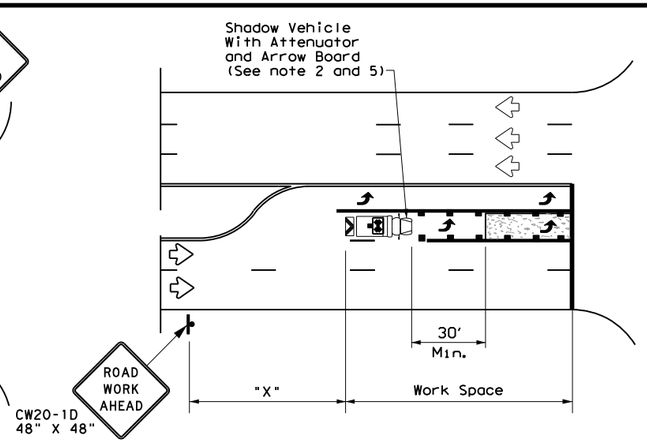
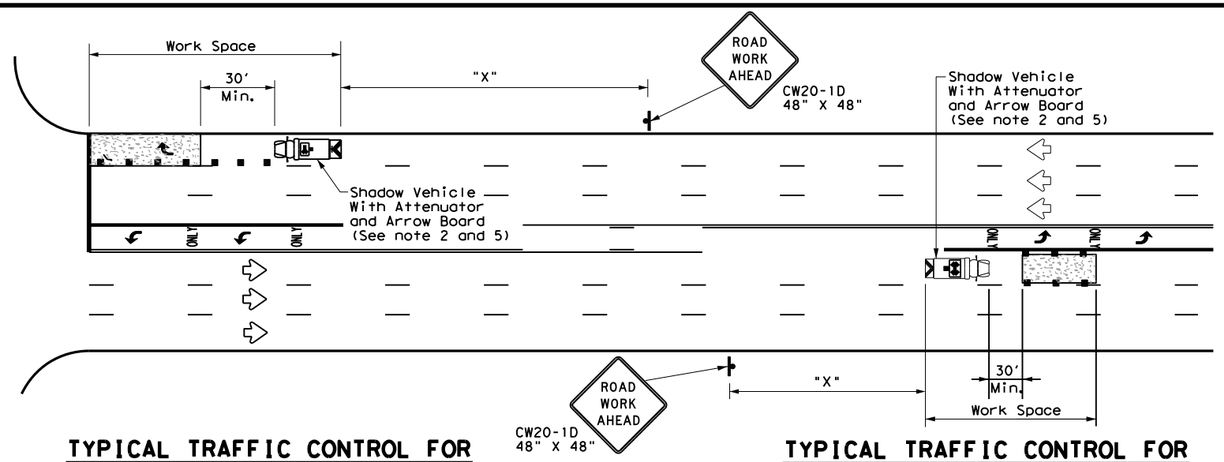


TYPICAL TRAFFIC CONTROL FOR
CONTINUOUS LEFT TURN LANE SYMBOL MARKINGS

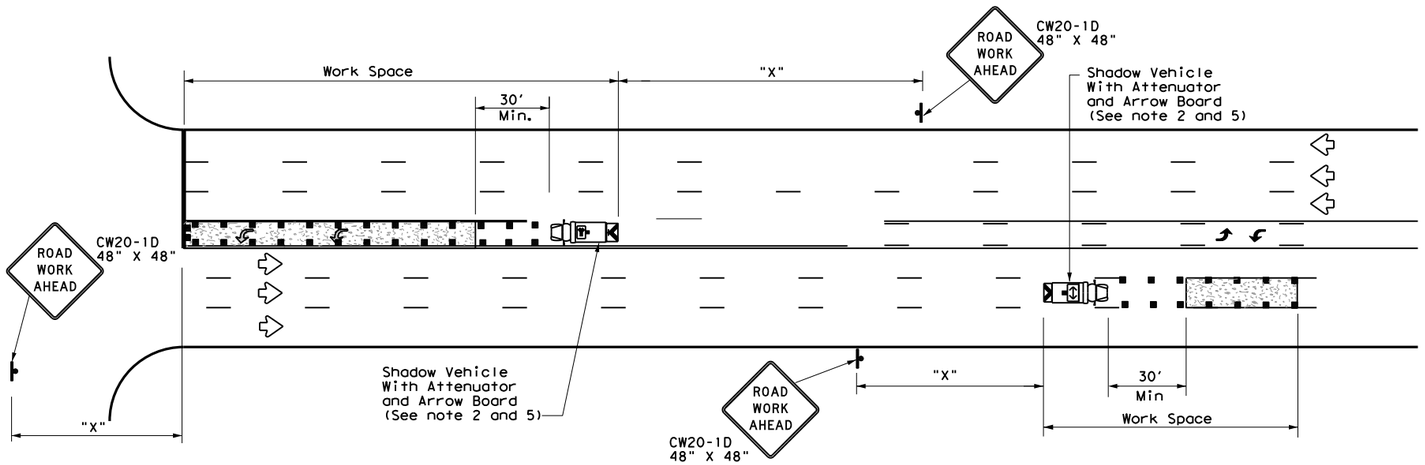


TYPICAL TRAFFIC CONTROL FOR
OUTSIDE DUAL LEFT TURN LANE SYMBOL MARKINGS



TYPICAL TRAFFIC CONTROL FOR
OUTSIDE LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
INSIDE LANE MARKINGS



TYPICAL TRAFFIC CONTROL FOR
LEFT TURN LANE MARKINGS

TYPICAL TRAFFIC CONTROL FOR
CENTER LANE MARKINGS

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

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

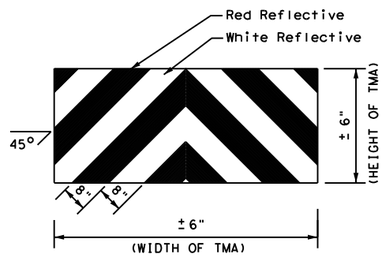
* Conventional Roads Only

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

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

GENERAL NOTES

1. This traffic control plan is for use on conventional roads posted at 45 mph or less and is intended for mobile operations that move continuously or intermittently (stopping up to approximately 15 minutes) such as short-line striping and in-lane rumble strips. When activities are anticipated to take longer amounts of time or traffic conditions warrant, a short duration or short-term stationary traffic control plan should be used.
2. A Truck Mounted Attenuator shall be used on Shadow Vehicle. Striping on the back panel of all truck mounted attenuators shall be 8" red and white reflective sheeting placed in an inverted "V" design. Reflective sheeting shall meet or exceed the reflectivity and color requirements of departmental material specification DMS-8300, Type A.
3. All traffic control devices shall be in accordance with the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD), latest edition.
4. The use of yellow rotating beacons or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the drivers side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
5. Flashing arrow board shall be used on Shadow Vehicle. Flashing arrow board shall be Type B or Type C as per BC Standards. The arrow board operation shall be controlled from inside the truck.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS FOR ISOLATED WORK AREAS UNDIVIDED HIGHWAYS

TCP(3-4)-13

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©TxDOT July, 2013	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	18	DALLAS		50

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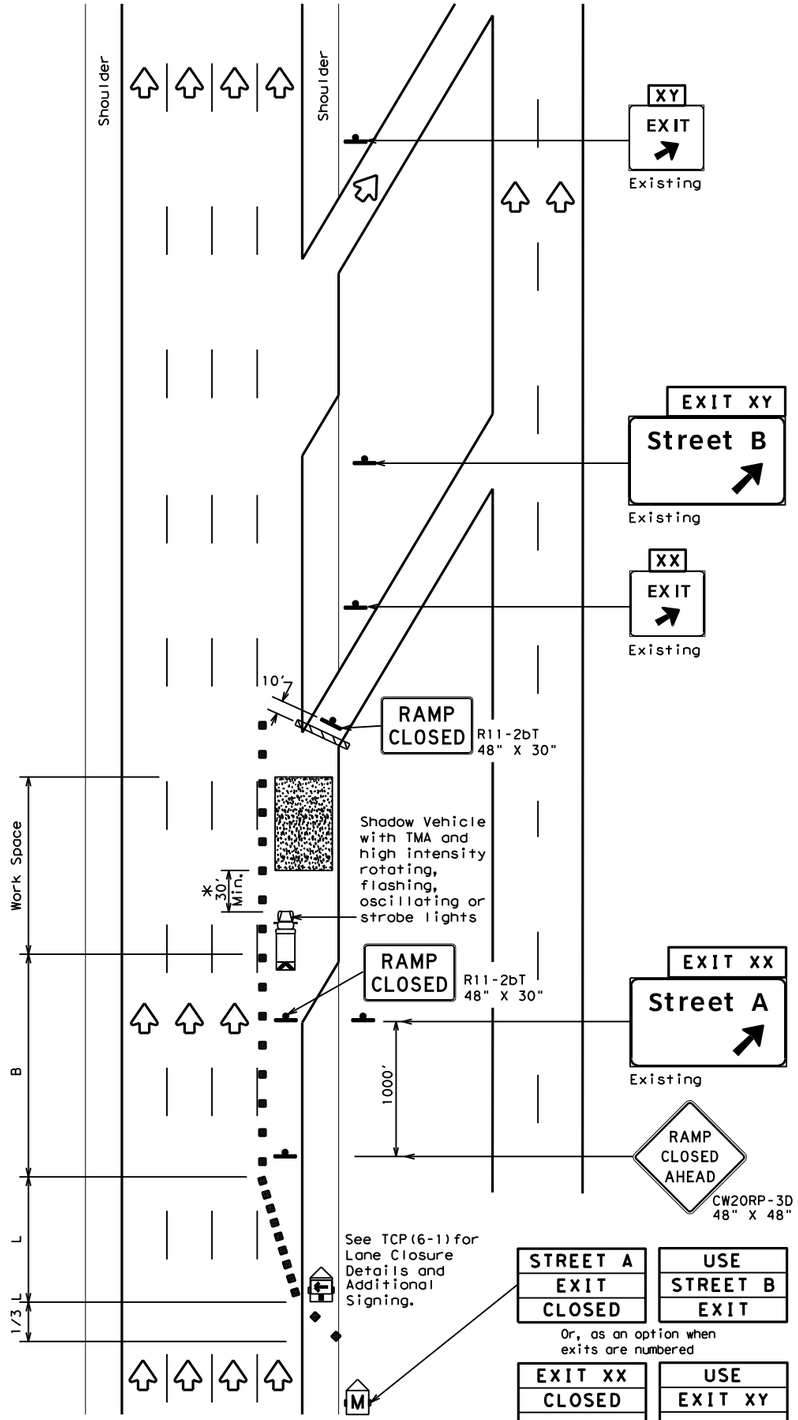
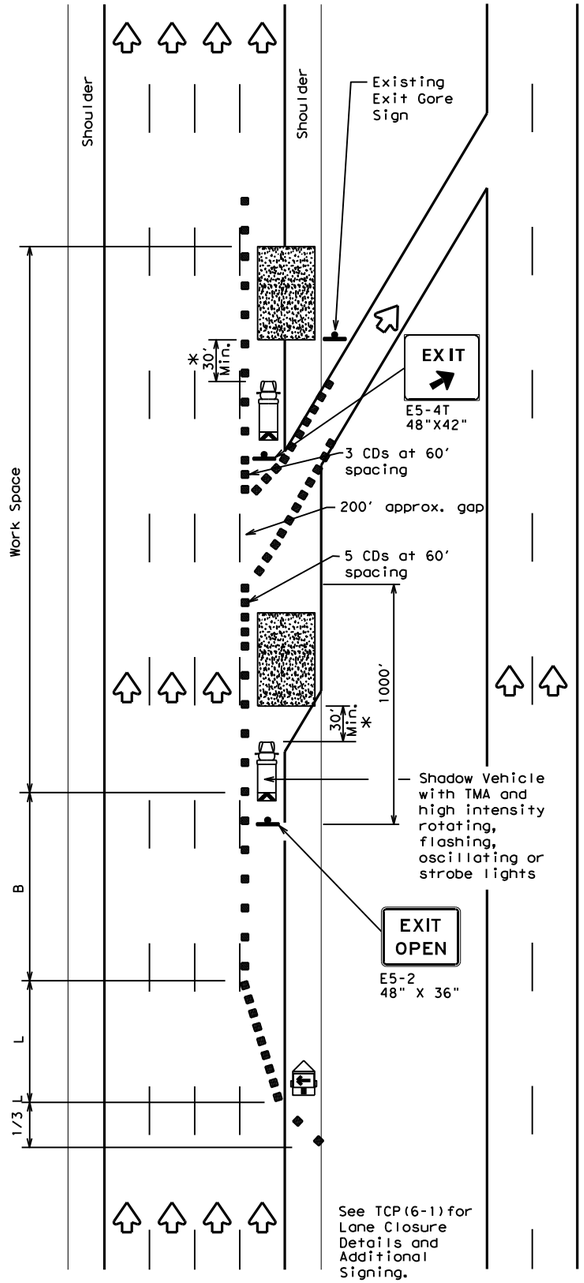


TCP (6-4a)

EXIT RAMP CLOSED
TRAFFIC EXITS PAST CLOSED RAMP



TCP (6-4b)

EXIT RAMP OPEN

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

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

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

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

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN
WORK AREA AT EXIT RAMP

TCP(6-4)-12

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©TxDOT Feburary 1994	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
1-97 8-98	DIST	COUNTY		SHEET NO.
4-98 8-12	18	DALLAS		51

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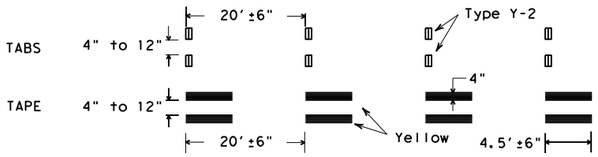
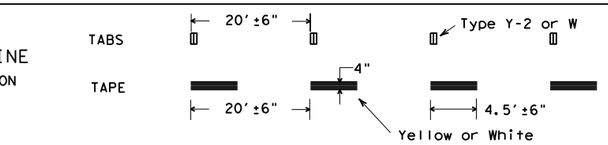
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

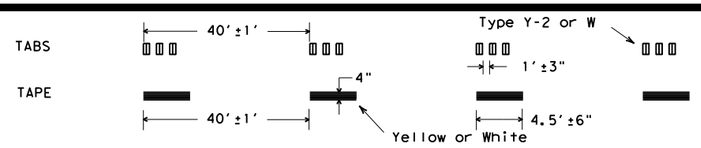


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



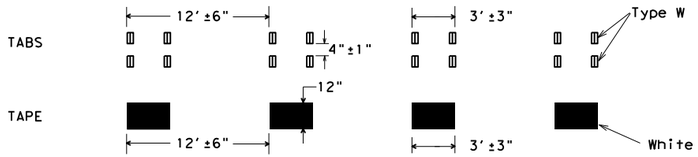
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

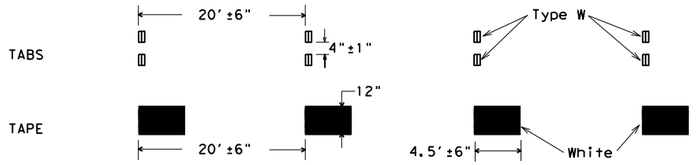


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



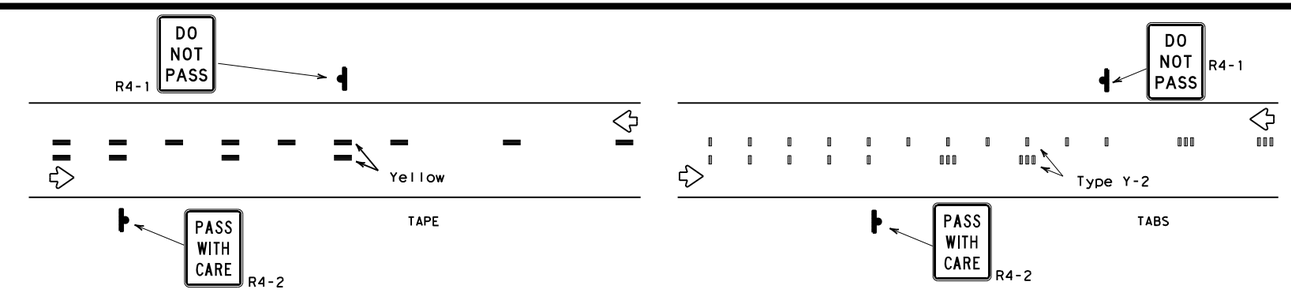
NOTES:

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.

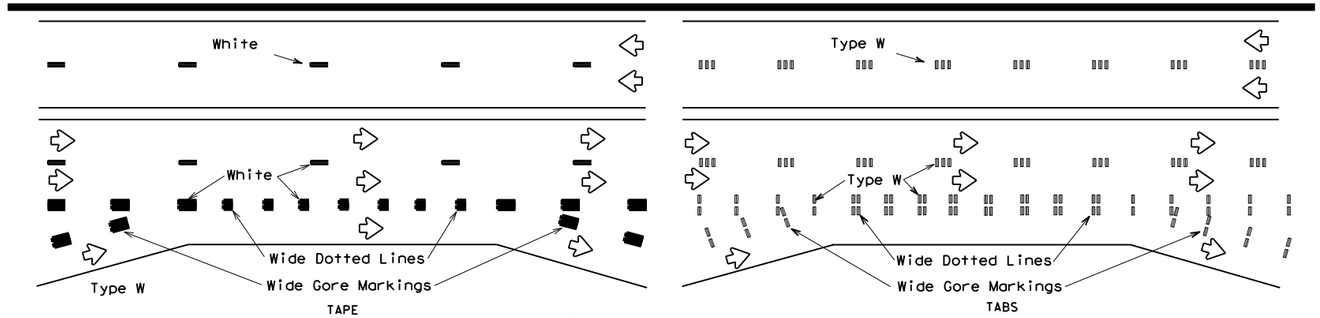
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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.

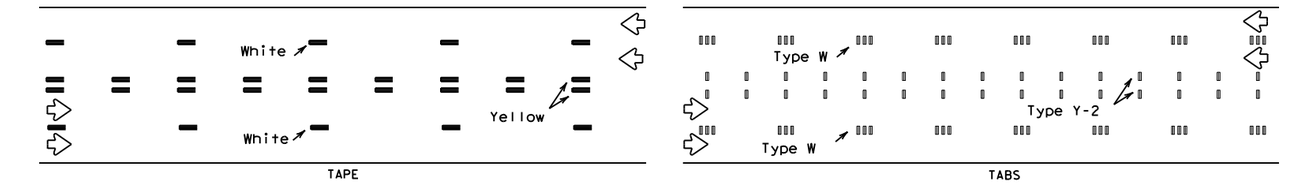
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



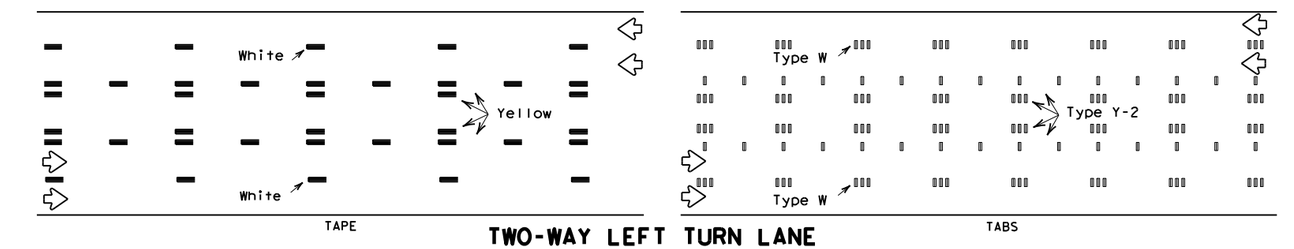
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



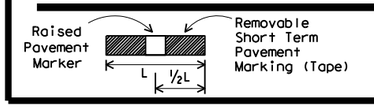
LANE LINES FOR DIVIDED HIGHWAY



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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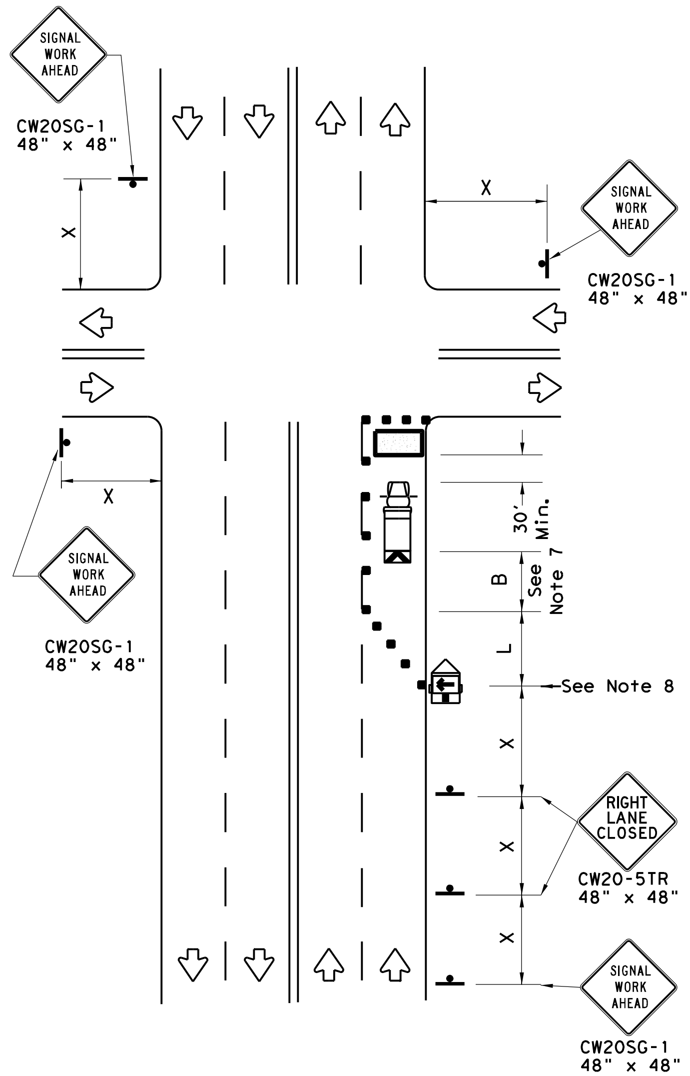
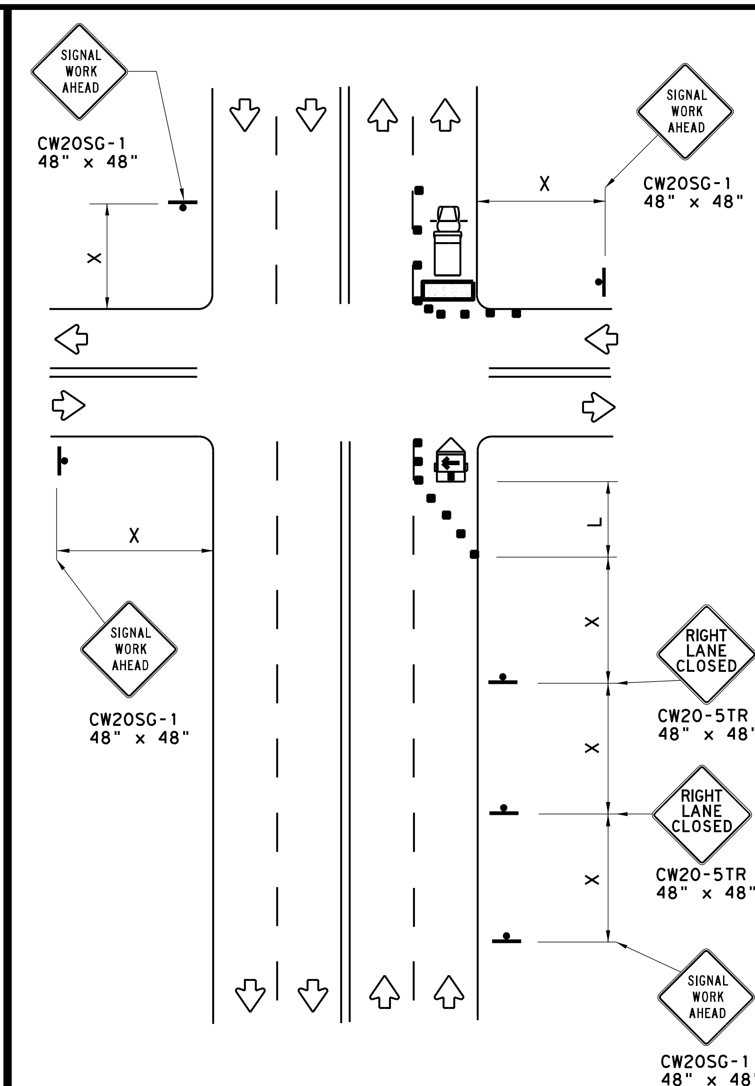
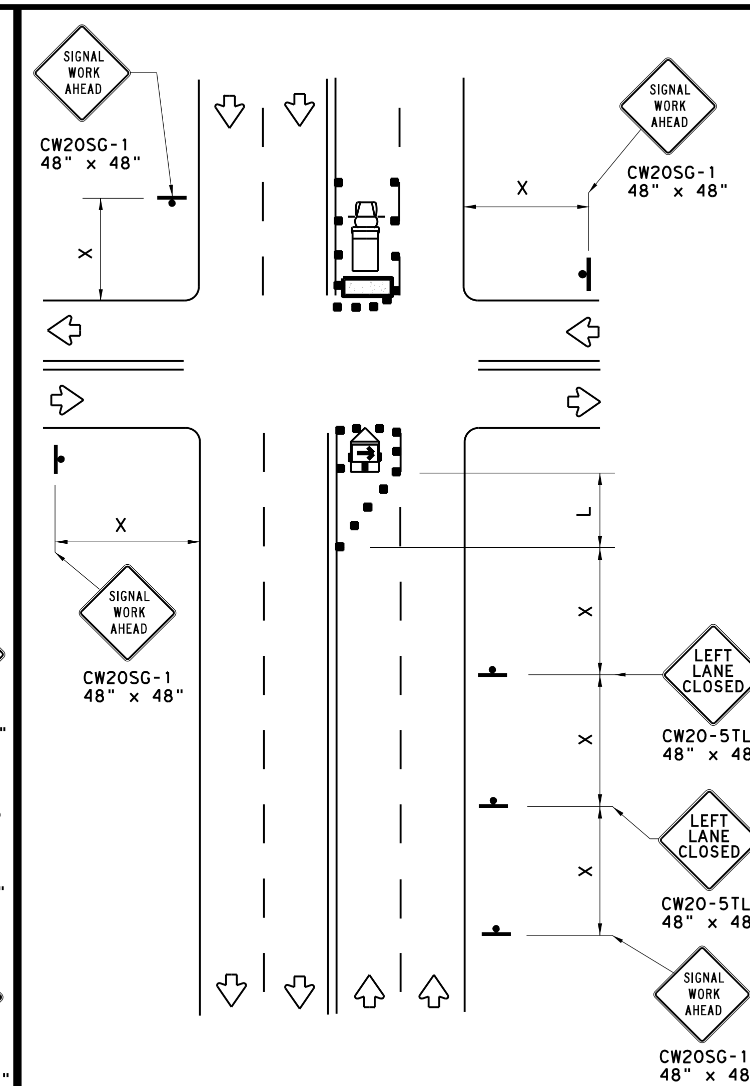
3-03		18	DALLAS		52
7-13					



NEAR SIDE LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE
SHORT DURATION OR SHORT TERM STATIONARY

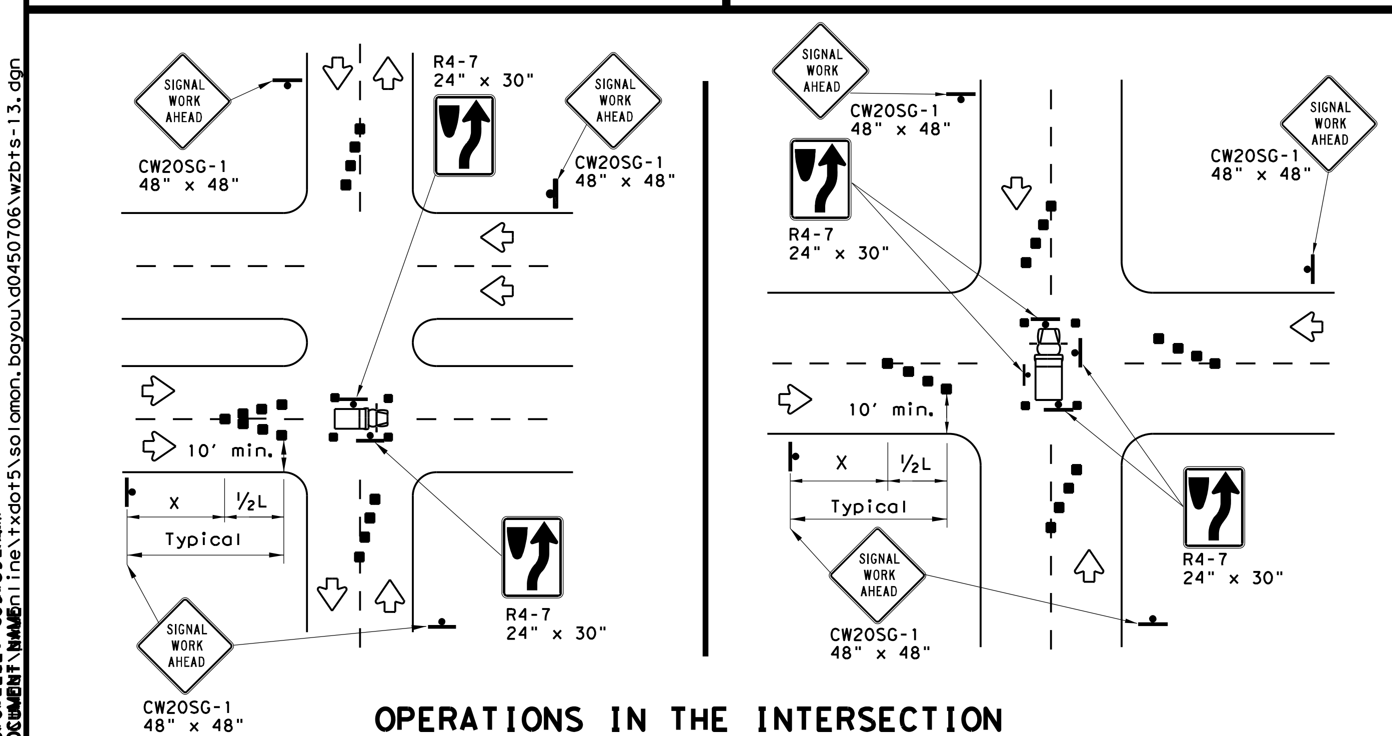
LEGEND

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

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

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

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



OPERATIONS IN THE INTERSECTION
SHORT DURATION

GENERAL NOTES

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

SHEET 1 OF 2

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
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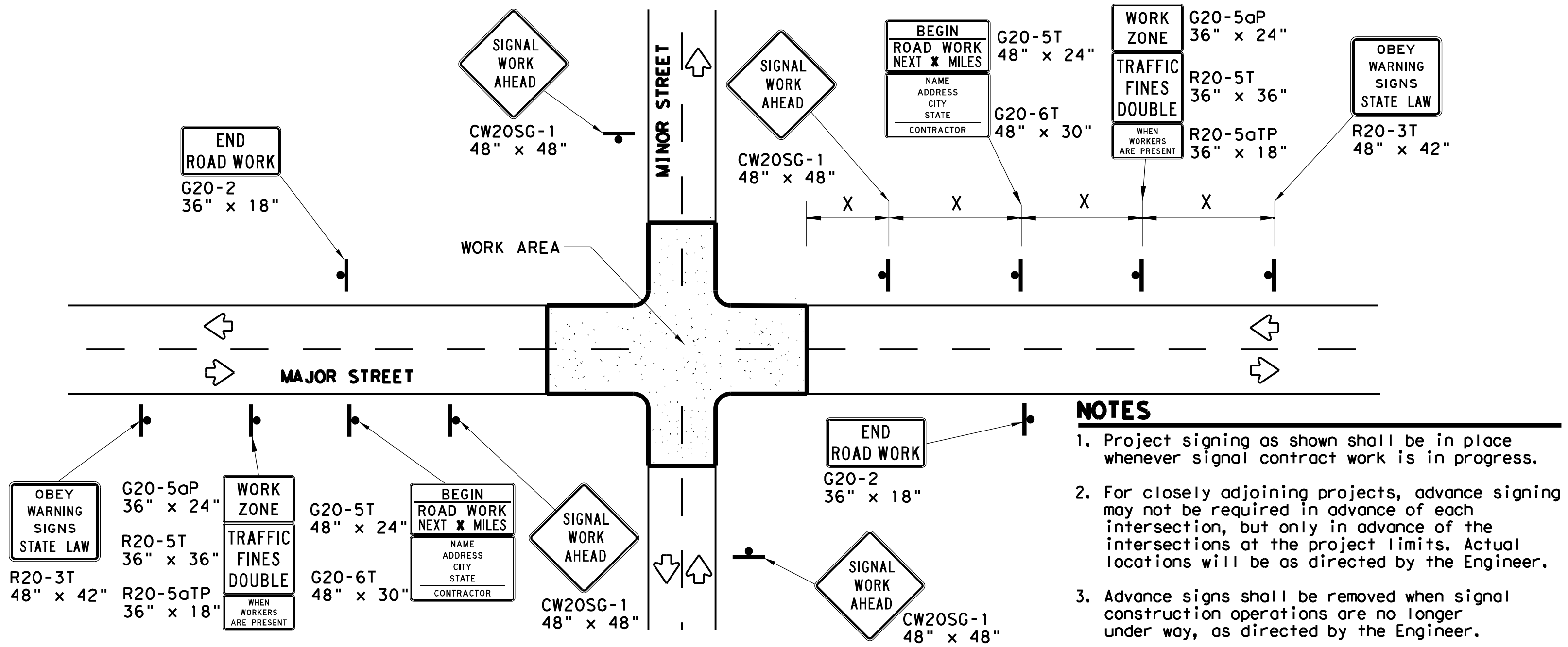
114



TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

REMOVING OR COVERING

1. When sign messages may be confusing or do not apply, the signs shall be removed or completely covered, unless otherwise approved by the Engineer.
2. When signs are covered, the material used shall be opaque, such as heavy mil black plastic, or other materials which will cover the entire sign face and maintain their opaque properties under automobile headlights at night without damaging the sign sheeting. Burlap, or heavy materials such as plywood or aluminum shall not be used to cover signs.
3. Duct tape or other adhesive material shall NOT be affixed to a sign face.
4. Signs and anchor stubs shall be removed and holes back filled upon completion of the work.

REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

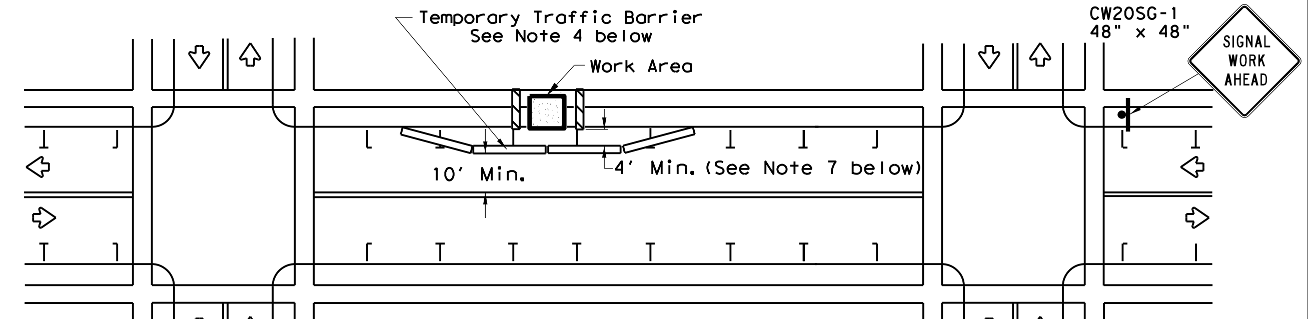
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
(symbol)	Sign
(symbol)	Channelizing Devices
(symbol)	Type 3 Barricade

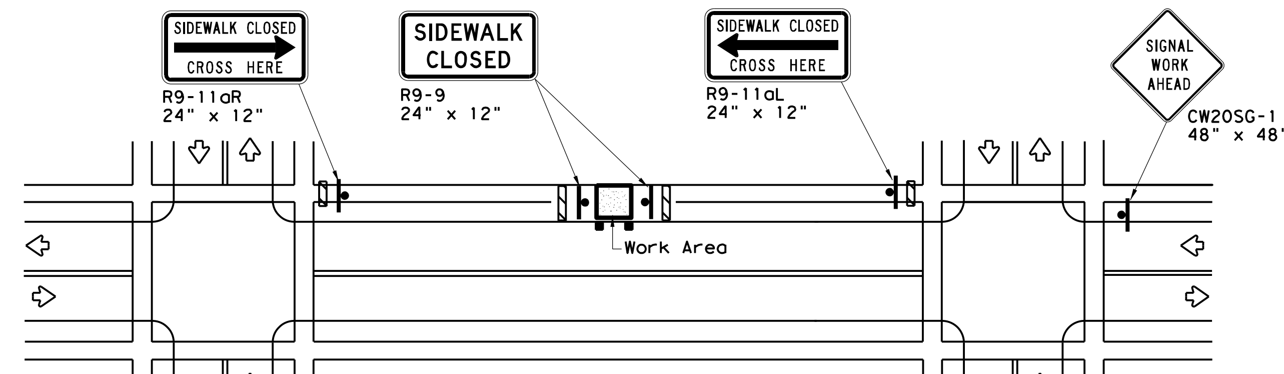
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

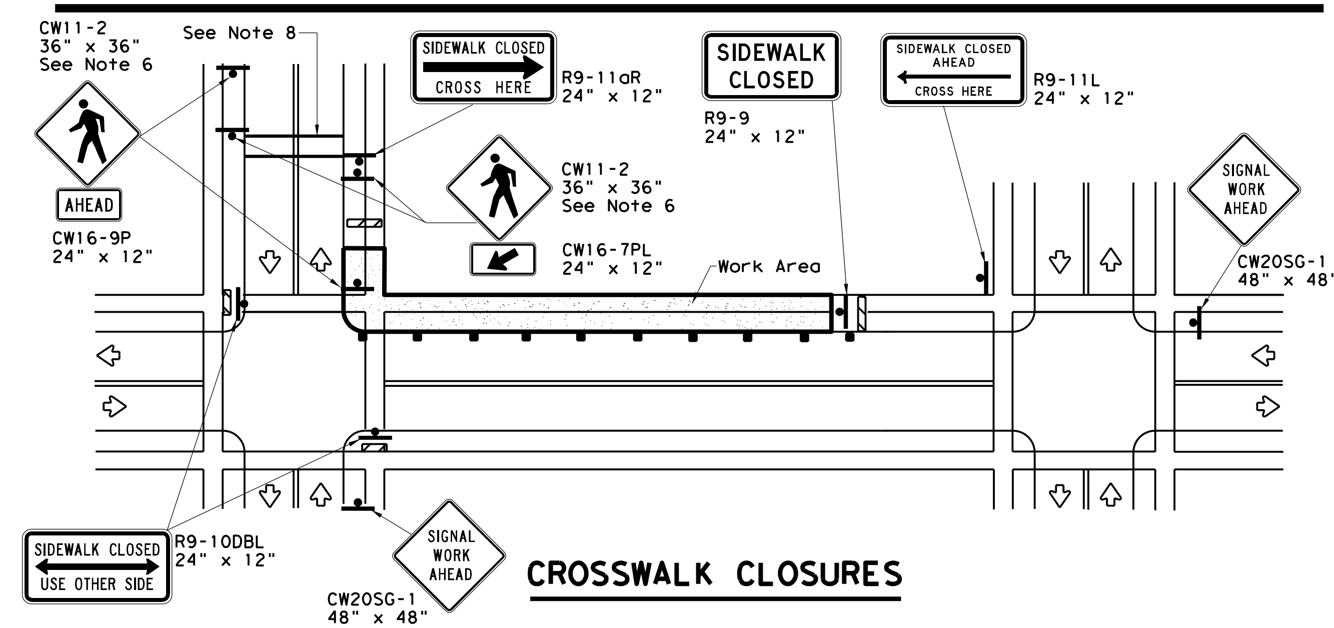
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

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

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

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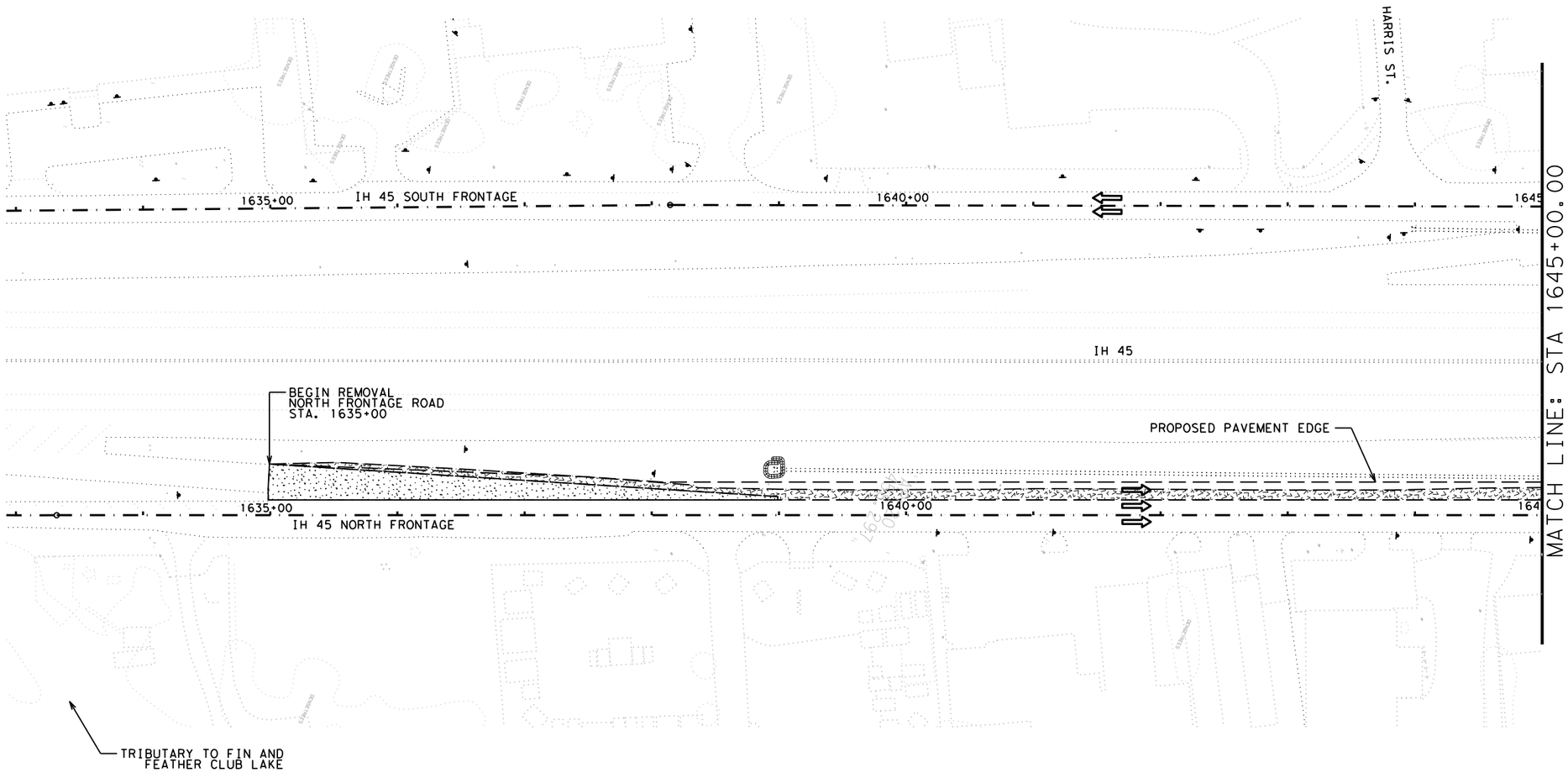

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LEGEND:

- EXISTING CONCRETE PAVEMENT REMOVAL
- EXISTING ASPHALT PAVEMENT REMOVAL
- EXISTING CONCRETE DRIVEWAY REMOVAL
- EXISTING CONCRETE MEDIAN REMOVAL
- EXISTING CONCRETE SIDEWALK REMOVAL
- EXISTING CONCRETE RETAINING WALL REMOVAL
- EXISTING CONCRETE RIPRAP REMOVAL

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45
REMOVAL SITE LAYOUTS

SHEET 1 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
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GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
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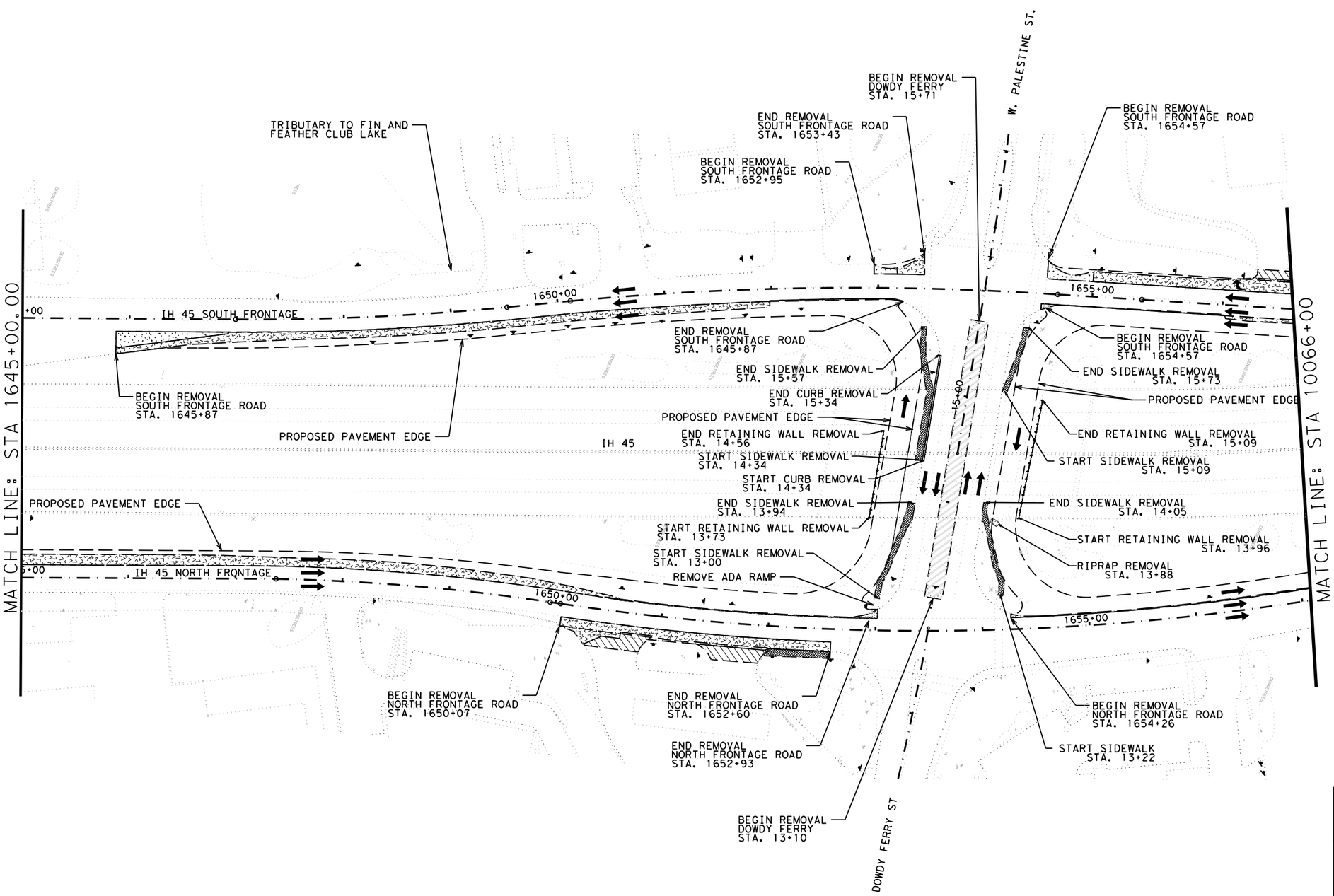

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

REMOVAL SITE LAYOUTS

SHEET 2 OF 4

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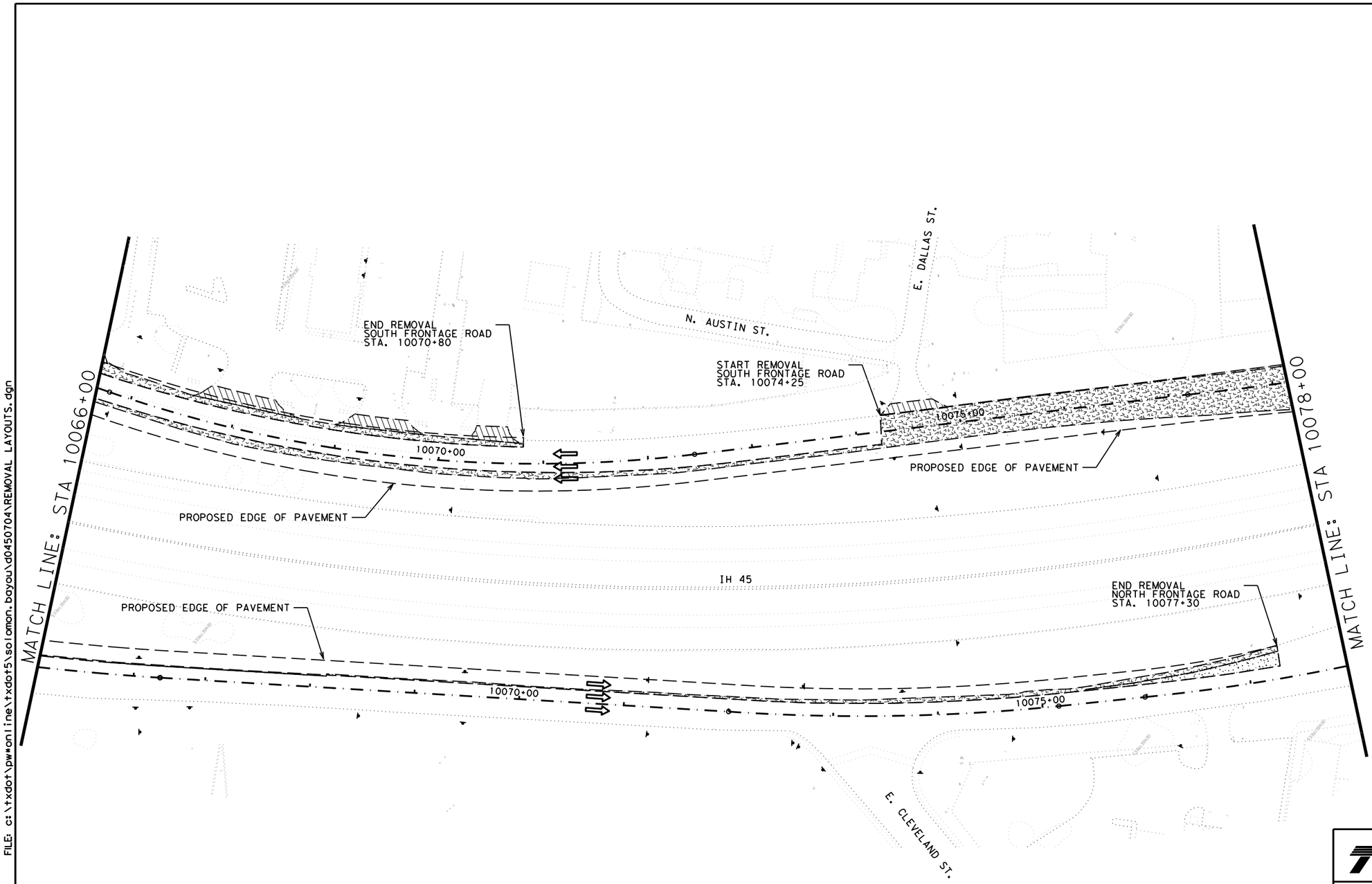

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

REMOVAL SITE LAYOUTS

SCALE: 1"=100' SHEET 3 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
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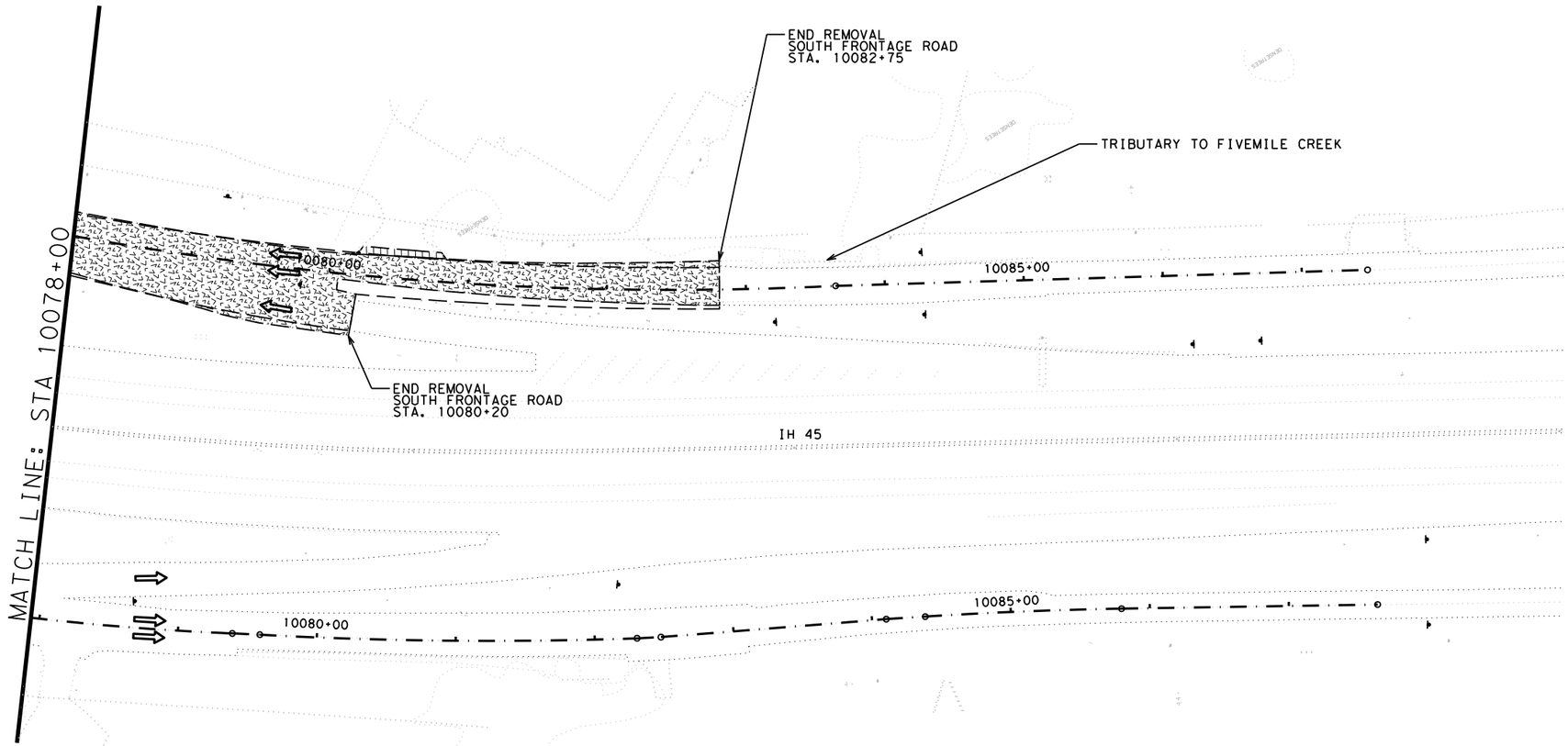

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LEGEND:

- EXISTING CONCRETE PAVEMENT REMOVAL
- EXISTING ASPHALT PAVEMENT REMOVAL
- EXISTING CONCRETE DRIVEWAY REMOVAL
- EXISTING CONCRETE MEDIAN REMOVAL
- EXISTING CONCRETE SIDEWALK REMOVAL
- EXISTING CONCRETE RETAINING WALL REMOVAL
- EXISTING CONCRETE RIPRAP REMOVAL

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

REMOVAL SITE LAYOUTS

SCALE: 1"=100' SHEET 4 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	58
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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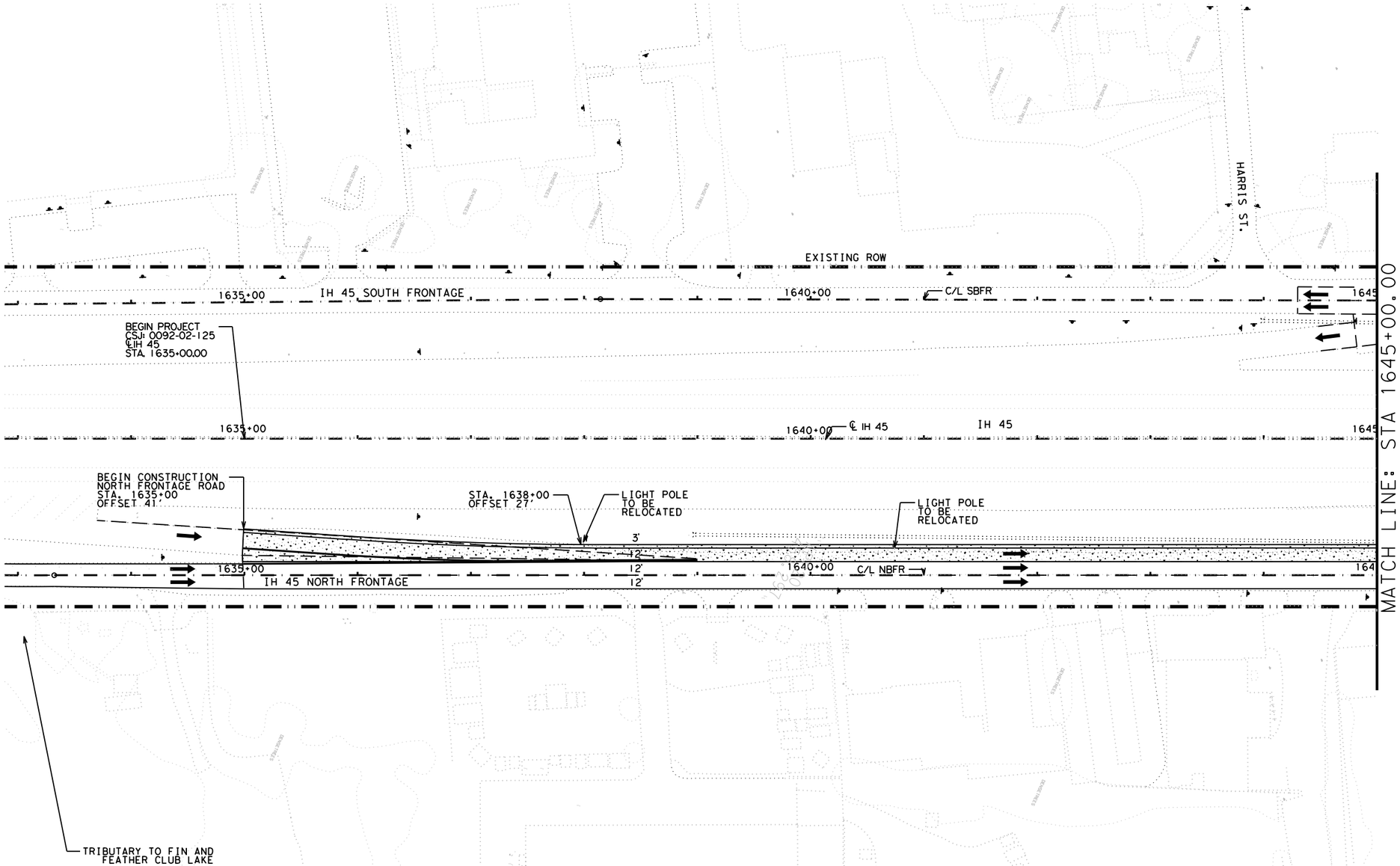

00 50 100

LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- DIRECTION OF TRAFFIC FLOW

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

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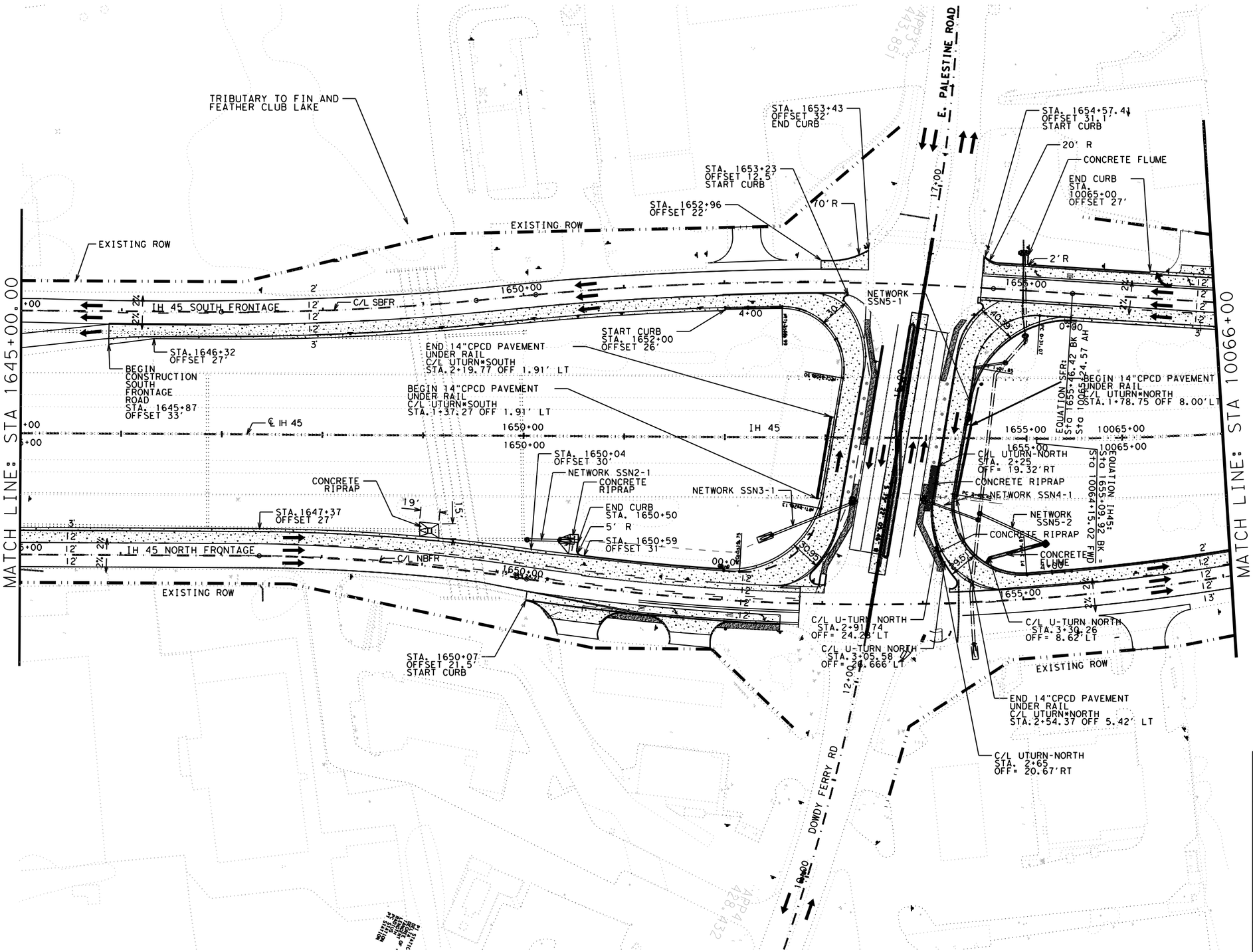
IH 45

PLAN LAYOUT

SCALE: 1"=100' SHEET 1 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	59
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/25/2021 TIME: 1:23:58 PM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450704\PLAN SHEETS.dgn



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solomonbayou , P.E. 7/15/21
Signature of Registrant & Date

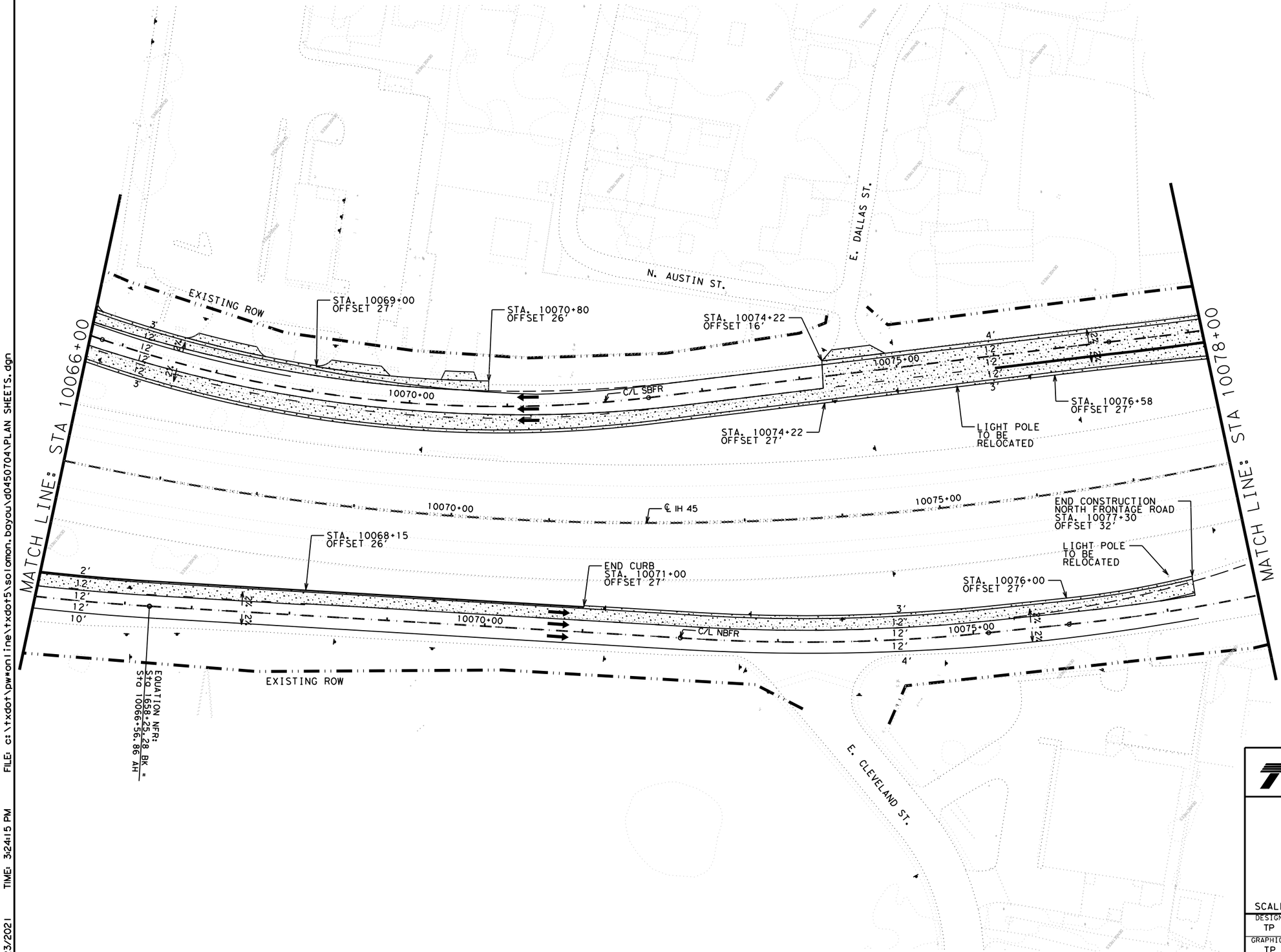
Texas Department of Transportation

IH 45

PLAN LAYOUT

SCALE: 1"=100' SHEET 2 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	60
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	



STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation
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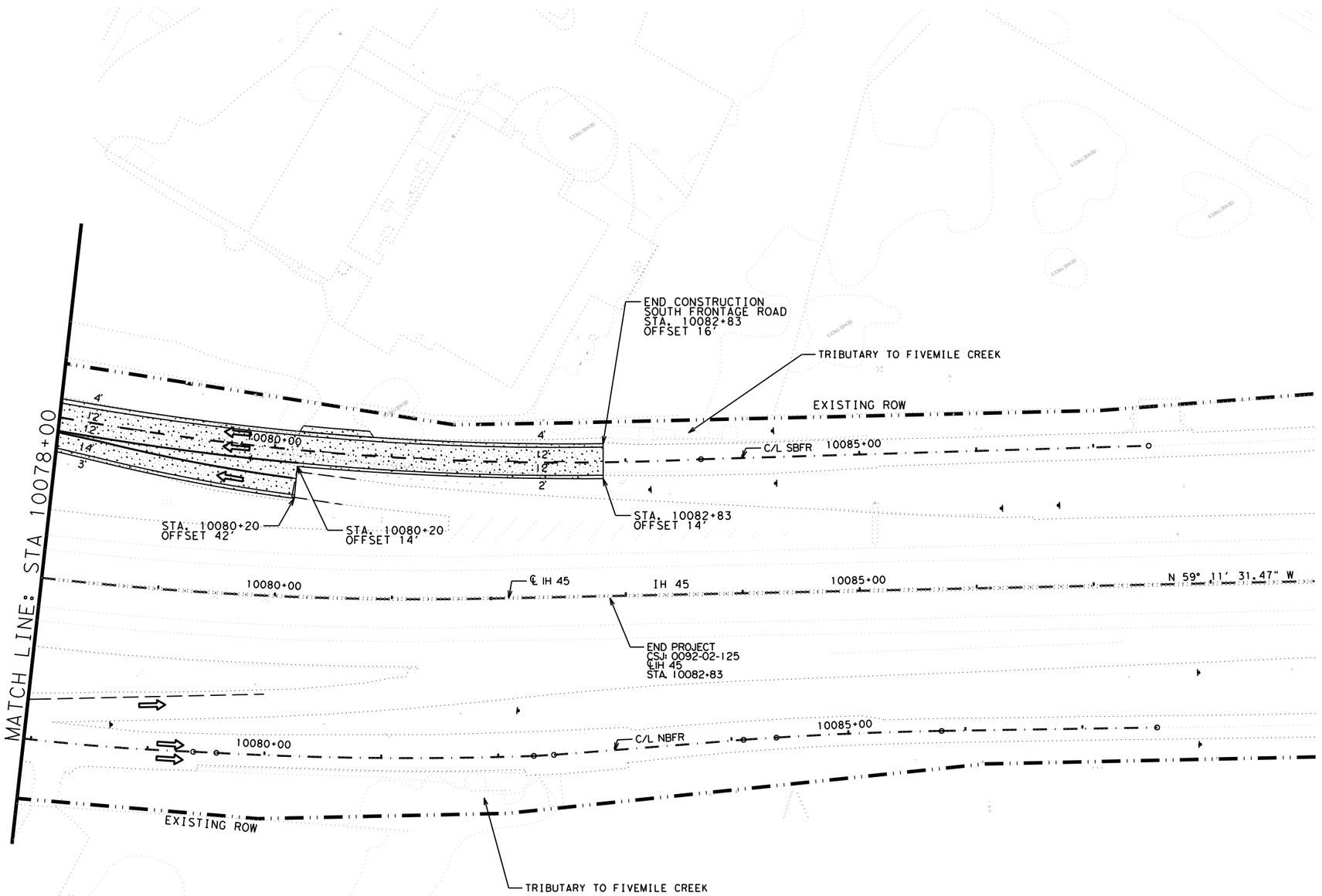
IH 45

PLAN LAYOUT

SCALE: 1"=100' SHEET 3 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	61
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/23/2021 TIME: 3:24:15 PM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450704\PLAN SHEETS.dgn



STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

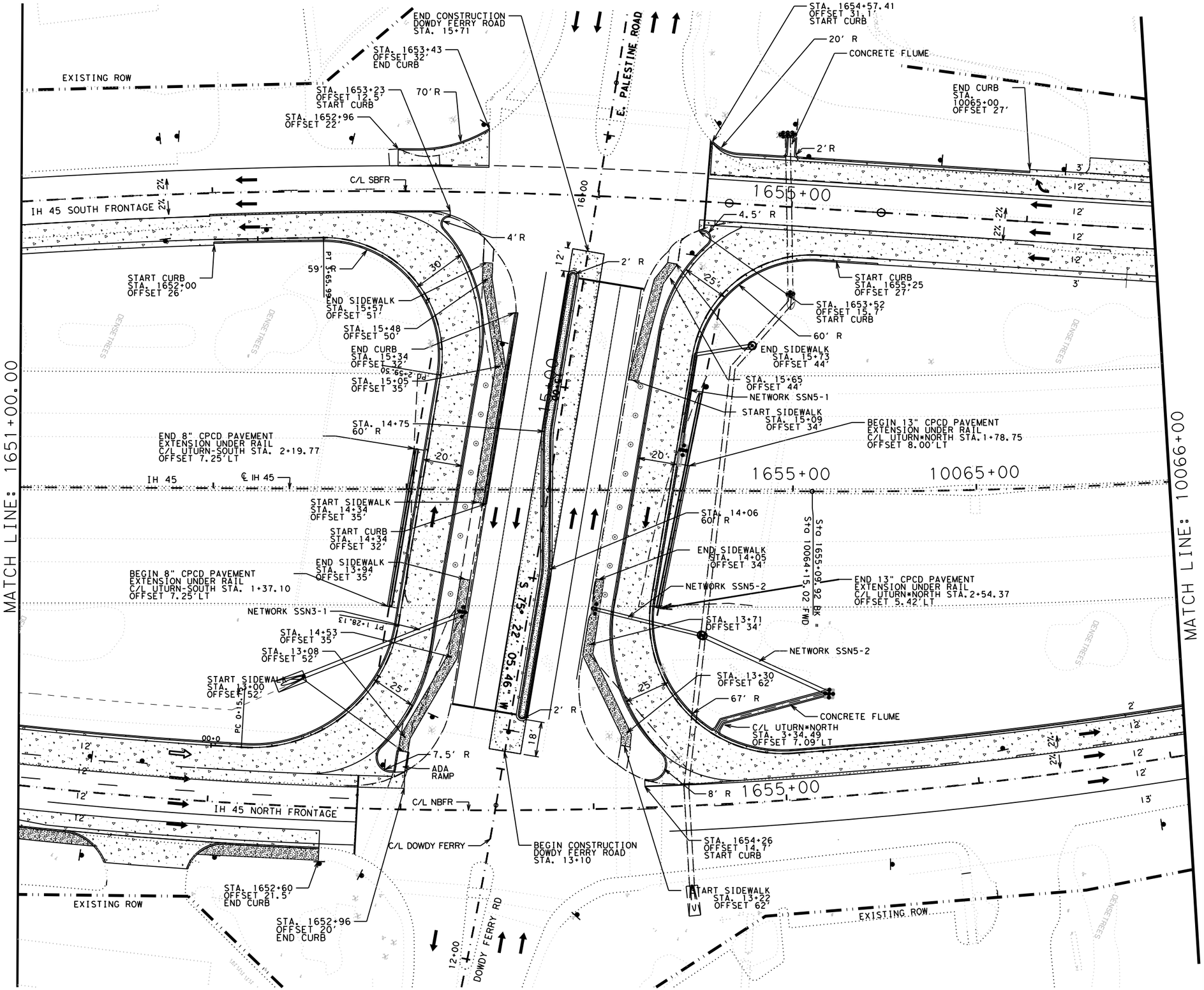
IH 45

PLAN LAYOUT

SCALE: 1"=100'

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	62
CHECK	CONTROL	SECTION	JOB	
DN	0092	02	125	
CHECK				

DATE: 6/23/2021 TIME: 3:24:20 PM FILE: c:\txdot\pw\online\txdot5\solomon.bayou\d0450704\PLAN SHEETS.dgn



solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation
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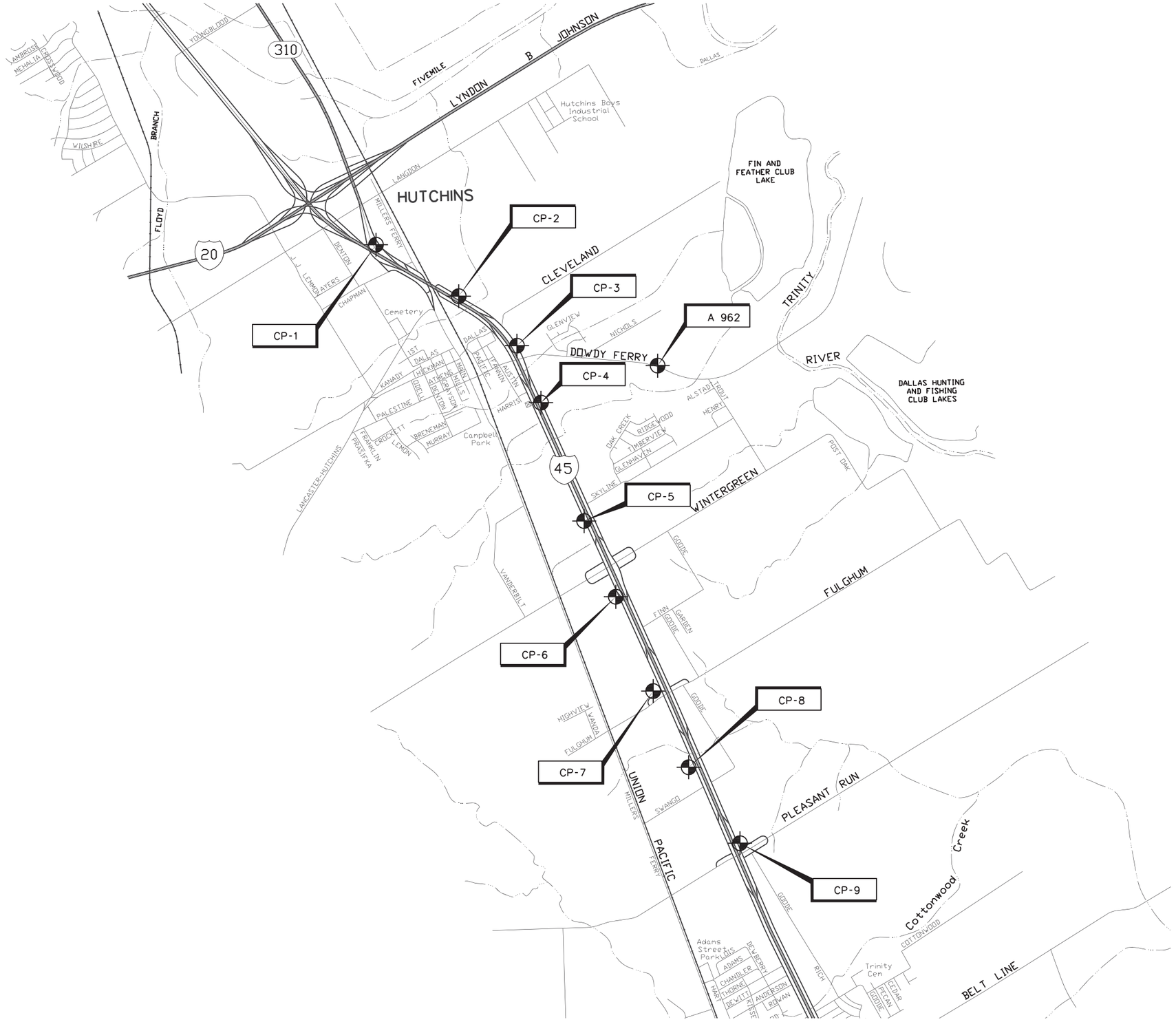
IH 45

PLAN LAYOUT

SCALE: 1"=50' SHEET 5 OF 5

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	63
CHECK	CONTROL	SECTION	JOB	
DN	0092	02	125	
CHECK				

DATE: 6/23/2021 TIME: 3:24:23 PM FILE: c:\txdot\pw\online\txdot5\solomon.bayou\d0450704\PLAN SHEETS.dgn



NOTES:

ALL COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE 4202, NAD83 (2011 ADJ) EPOCH 2010.00 GEOID 12A DETERMINED BY GPS OBSERVATIONS CALCULATED FROM DALLAS CORS ARP (PID-DF8984), FORT WORTH WAAS 1 CORS ARP (PID-DF4385), AND COLLIN COUNTY CORS ARP (PID-DF8982). ALL DISTANCES AND COORDINATES ARE SURFACE WITH A GRID TO GROUND SCALE FACTOR OF 1.0001365060.

PROJECT BENCHMARK:

NGS MONUMENT DESIGNATION: A 962
PID CS1467 (NAVD88): 3-1/2 BRONZE DISK SET ON TOP OF A CONCRETE MONUMENT ABOUT 4 INCHES ABOVE THE GROUND STAMPED A 962 1946 LOCATED ABOUT 0.10 MILES SOUTH ALONG THE TEXAS AND NEW ORLEANS RAILROAD FROM THE STATION AT HUTCHINS, THENCE 1.0 MILE EASTERLY ALONG DOWDY FERRY ROAD; APPROXIMATELY 33 FEET AND 1.5 FEET HIGHER THAN THE CENTER LINE OF THE ROAD, 12 FEET EAST OF THE EAST END OF A WIRE GATE, 1 FOOT NORTH OF THE RIGHT OF WAY FENCE, 1 FOOT WEST OF A 4X4 MARKER POST; APPROXIMATELY 305 FEET EAST THE CENTERLINE OF BEARD STREET, APPROXIMATELY 645 FEET EAST OF THE CENTERLINE OF MICHAEL STREET, AND 18 FEET NORTH OF THE NORTH EDGE OF PAVEMENT TO DOWDY FERRY ROAD:

NORTH:	6,924,494.593	(MEASURED)
EAST:	2,524,510.681	(MEASURED)
ELEV:	442.45'	(PUBLISHED)

STATE OF TEXAS
REGISTERED
ELLIOTT PAT BUSBY
5561
PROFESSIONAL
LAND SURVEYOR

8/12/19
ELLIOTT PAT BUSBY
RPLS NO. 5561
DATE

NO.	REVISIONS	BY	DATE

Texas Department of Transportation

SURVEY CONTROL

SHEET 1 OF 6

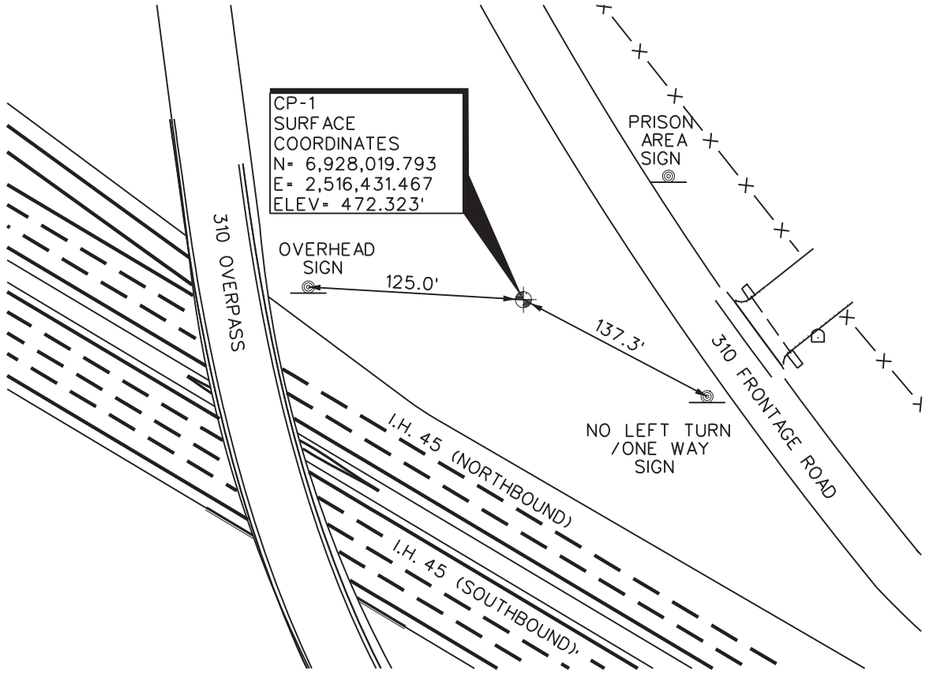
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		64
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH 45

8/10/2019
...\WFXP2203 Control.dgn

CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-1".

SKETCH
(NOT TO SCALE)



CONTROL POINT CP-1

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-1" LOCATED IN THE EAST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 0.4 MILES SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 125 FEET EAST OF AN OVERHEAD SIGN AND 137.3 FEET NORTHWEST OF A NO LEFT TURN/ONE WAY SIGN.

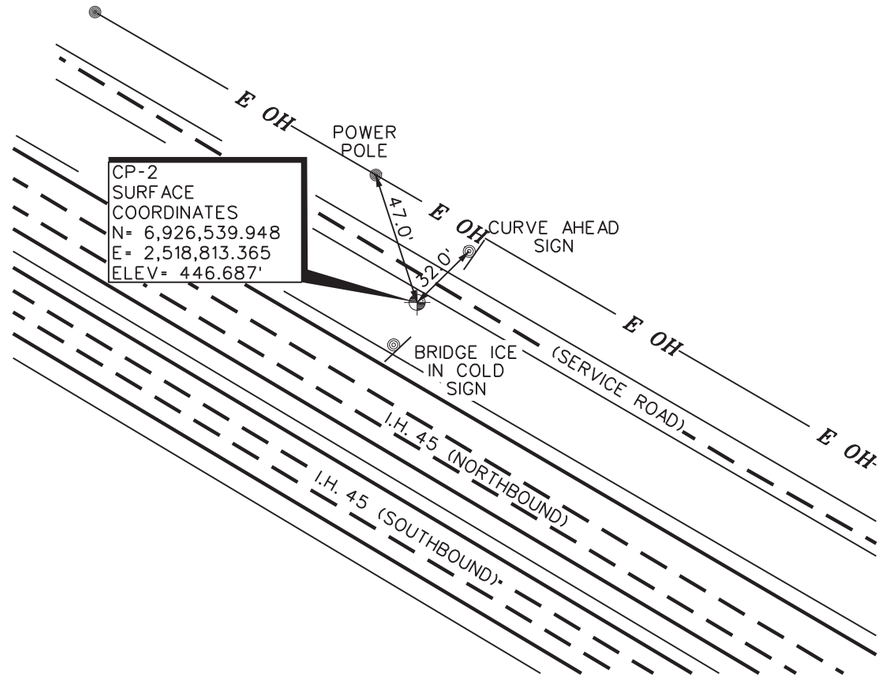
US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,927,074.206
GRID EASTING:	2,516,088.006
SURFACE NORTHING:	6,928,019.793
SURFACE EASTING:	2,516,431.467
NAVD88 ELEVATION:	472.323

CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-2".

SKETCH
(NOT TO SCALE)



CONTROL POINT CP-2

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-2" LOCATED IN THE EAST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 1.0 MILE SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 47.0 FEET SOUTHEAST OF A POWER POLE AND 32.0 FEET SOUTHWEST OF A CURVE AHEAD SIGN.

US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,925,594.563
GRID EASTING:	2,518,469.579
SURFACE NORTHING:	6,926,539.948
SURFACE EASTING:	2,518,813.365
NAVD88 ELEVATION:	446.687

NOTES:

ALL COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE 4202, NAD83 (2011 ADJ) EPOCH 2010.00 GEOID 12A DETERMINED BY GPS OBSERVATIONS CALCULATED FROM DALLAS CORS ARP (PID-DF8984), FORT WORTH WAAS 1 CORS ARP (PID-DF4385), AND COLLIN COUNTY CORS ARP (PID-DF8982). ALL DISTANCES AND COORDINATES ARE SURFACE WITH A GRID TO GROUND SCALE FACTOR OF 1.0001365060.

PROJECT BENCHMARK:

NGS MONUMENT DESIGNATION: A 962
PID CS1467 (NAVD88): 3-1/2 BRONZE DISK SET ON TOP OF A CONCRETE MONUMENT ABOUT 4 INCHES ABOVE THE GROUND STAMPED A 962 1946 LOCATED ABOUT 0.10 MILES SOUTH ALONG THE TEXAS AND NEW ORLEANS RAILROAD FROM THE STATION AT HUTCHINS, THENCE 1.0 MILE EASTERLY ALONG DOWDY FERRY ROAD; APPROXIMATELY 33 FEET AND 1.5 FEET HIGHER THAN THE CENTER LINE OF THE ROAD, 12 FEET EAST OF THE EAST END OF A WIRE GATE, 1 FOOT NORTH OF THE RIGHT OF WAY FENCE, 1 FOOT WEST OF A 4X4 MARKER POST; APPROXIMATELY 305 FEET EAST THE CENTERLINE OF BEARD STREET, APPROXIMATELY 645 FEET EAST OF THE CENTERLINE OF MICHAEL STREET, AND 18 FEET NORTH OF THE NORTH EDGE OF PAVEMENT TO DOWDY FERRY ROAD:

NORTH:	6,924,494.593	(MEASURED)
EAST:	2,524,510.681	(MEASURED)
ELEV:	442.45'	(PUBLISHED)

8/12/19
ELLIOTT PAT BUSBY DATE
RPLS NO. 5561

NO.	REVISIONS	BY	DATE

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Texas Department of Transportation

SURVEY CONTROL

SHEET 2 OF 6

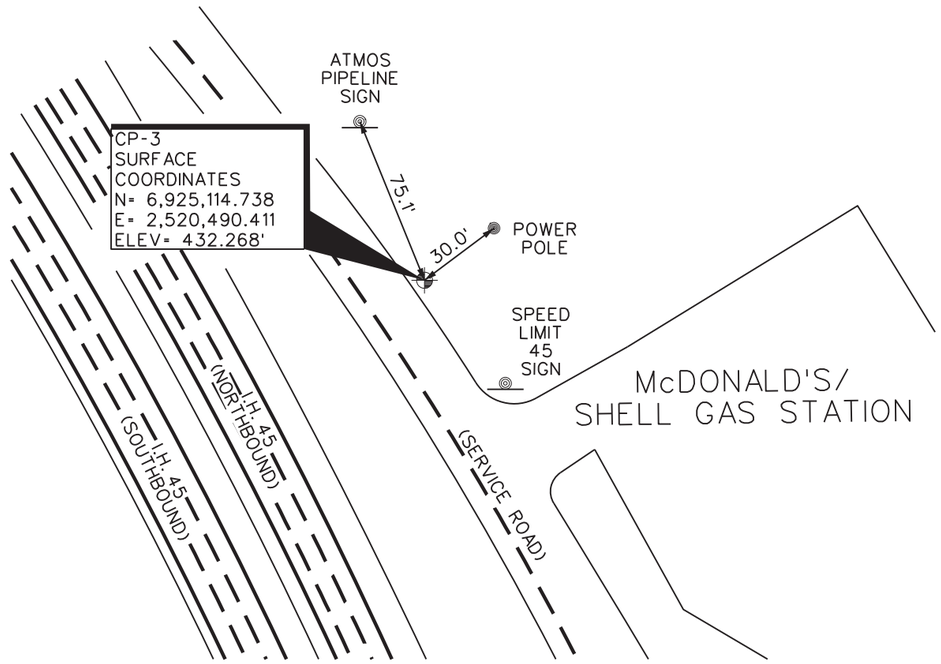
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		65
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH 45

8/10/2019
...\WFXP2203 Control.dgn

CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-3".

SKETCH
(NOT TO SCALE)



CONTROL POINT CP-3

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-3" LOCATED IN THE EAST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 1.3 MILES SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 30.0 FEET SOUTHWEST OF A POWER POLE AND 75.1 FEET SOUTHEAST OF A ATMOS PIPELINE SIGN.

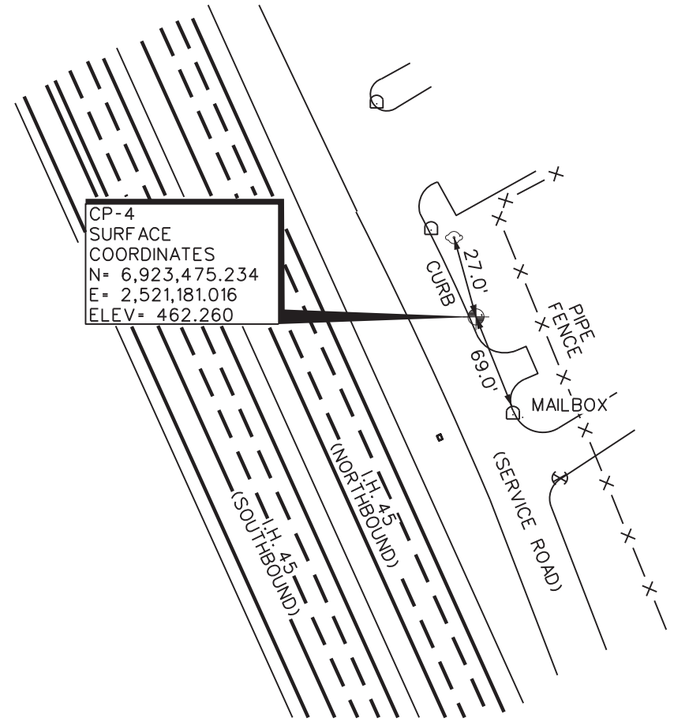
US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,924,169.547
GRID EASTING:	2,520,146.396
SURFACE NORTHING:	6,925,114.738
SURFACE EASTING:	2,520,490.411
NAVD88 ELEVATION:	432.268

CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-4".

SKETCH
(NOT TO SCALE)



CONTROL POINT CP-4

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-4" LOCATED IN THE EAST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 1.7 MILES SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 27.0 FEET SOUTHEAST OF A FIRE HYDRANT AND 69.0 FEET NORTHWEST OF A MAILBOX.

US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,922,530.267
GRID EASTING:	2,520,836.907
SURFACE NORTHING:	6,923,475.234
SURFACE EASTING:	2,521,181.016
NAVD88 ELEVATION:	462.260

NOTES:

ALL COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE 4202, NAD83 (2011 ADJ) EPOCH 2010.00 GEOID 12A DETERMINED BY GPS OBSERVATIONS CALCULATED FROM DALLAS CORS ARP (PID-DF8984), FORT WORTH WAAS 1 CORS ARP (PID-DF4385), AND COLLIN COUNTY CORS ARP (PID-DF8982). ALL DISTANCES AND COORDINATES ARE SURFACE WITH A GRID TO GROUND SCALE FACTOR OF 1.0001365060.

PROJECT BENCHMARK:

NGS MONUMENT DESIGNATION: A 962
PID CS1467 (NAVD88): 3-1/2 BRONZE DISK SET ON TOP OF A CONCRETE MONUMENT ABOUT 4 INCHES ABOVE THE GROUND STAMPED A 962 1946 LOCATED ABOUT 0.10 MILES SOUTH ALONG THE TEXAS AND NEW ORLEANS RAILROAD FROM THE STATION AT HUTCHINS, THENCE 1.0 MILE EASTERLY ALONG DOWDY FERRY ROAD; APPROXIMATELY 33 FEET AND 1.5 FEET HIGHER THAN THE CENTER LINE OF THE ROAD, 12 FEET EAST OF THE EAST END OF A WIRE GATE, 1 FOOT NORTH OF THE RIGHT OF WAY FENCE, 1 FOOT WEST OF A 4X4 MARKER POST; APPROXIMATELY 305 FEET EAST THE CENTERLINE OF BEARD STREET, APPROXIMATELY 645 FEET EAST OF THE CENTERLINE OF MICHAEL STREET, AND 18 FEET NORTH OF THE NORTH EDGE OF PAVEMENT TO DOWDY FERRY ROAD:

NORTH:	6,924,494.593	(MEASURED)
EAST:	2,524,510.681	(MEASURED)
ELEV:	442.45'	(PUBLISHED)

8/12/19
ELLIOTT PAT BUSBY DATE
RPLS NO. 5561

NO.	REVISIONS	BY	DATE

Texas Department of Transportation

SURVEY CONTROL

SHEET 3 OF 6

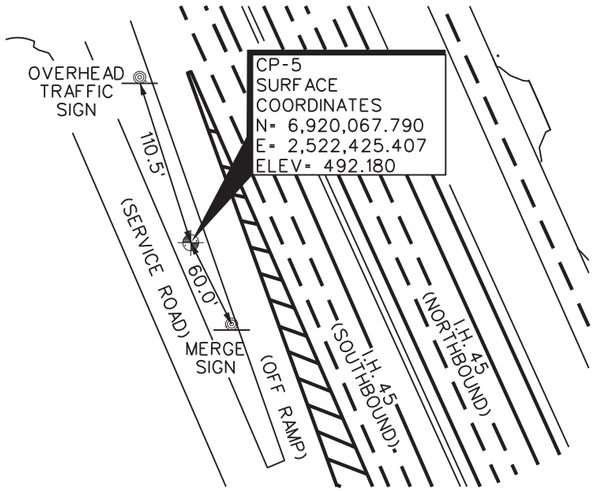
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		66
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH 45

8/10/2019
...\WFXP2203 Control.dgn

CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-5".

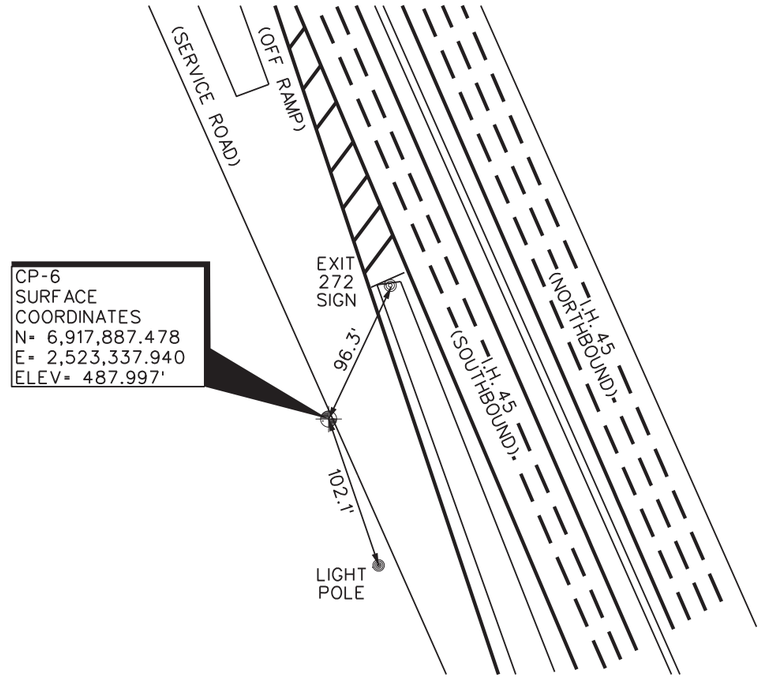
SKETCH
(NOT TO SCALE)



CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-6".

SKETCH
(NOT TO SCALE)



NOTES:

ALL COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE 4202, NAD83 (2011 ADJ) EPOCH 2010.00 GEOID 12A DETERMINED BY GPS OBSERVATIONS CALCULATED FROM DALLAS CORS ARP (PID-DF8984), FORT WORTH WAAS 1 CORS ARP (PID-DF4385), AND COLLIN COUNTY CORS ARP (PID-DF8982). ALL DISTANCES AND COORDINATES ARE SURFACE WITH A GRID TO GROUND SCALE FACTOR OF 1.0001365060.

PROJECT BENCHMARK:

NGS MONUMENT DESIGNATION: A 962
PID CS1467 (NAVD88): 3-1/2 BRONZE DISK SET ON TOP OF A CONCRETE MONUMENT ABOUT 4 INCHES ABOVE THE GROUND STAMPED A 962 1946 LOCATED ABOUT 0.10 MILES SOUTH ALONG THE TEXAS AND NEW ORLEANS RAILROAD FROM THE STATION AT HUTCHINS, THENCE 1.0 MILE EASTERLY ALONG DOWDY FERRY ROAD; APPROXIMATELY 33 FEET AND 1.5 FEET HIGHER THAN THE CENTER LINE OF THE ROAD, 12 FEET EAST OF THE EAST END OF A WIRE GATE, 1 FOOT NORTH OF THE RIGHT OF WAY FENCE, 1 FOOT WEST OF A 4X4 MARKER POST; APPROXIMATELY 305 FEET EAST THE CENTERLINE OF BEARD STREET, APPROXIMATELY 645 FEET EAST OF THE CENTERLINE OF MICHAEL STREET, AND 18 FEET NORTH OF THE NORTH EDGE OF PAVEMENT TO DOWDY FERRY ROAD:

NORTH:	6,924,494.593	(MEASURED)
EAST:	2,524,510.681	(MEASURED)
ELEV:	442.45'	(PUBLISHED)

8/12/19
ELLIOTT PAT BUSBY DATE
RPLS NO. 5561

NO.	REVISIONS	BY	DATE

CONTROL POINT CP-5

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-5" LOCATED IN THE WEST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 2.4 MILES SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 110.5 FEET SOUTHEAST OF A OVERHEAD TRAFFIC SIGN AND 60.0 FEET NORTHWEST OF A MERGE TRAFFIC SIGN.

US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,919,123.288
GRID EASTING:	2,522,081.128
SURFACE NORTHING:	6,920,067.790
SURFACE EASTING:	2,522,425.407
NAVD88 ELEVATION:	492.180

CONTROL POINT CP-6

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-6" LOCATED IN THE WEST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 2.8 MILES SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 96.3 FEET SOUTHWEST OF A EXIT 272 SIGN AND 102.1 FEET NORTHWEST OF A LIGHT POLE.

US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,916,943.274
GRID EASTING:	2,522,993.536
SURFACE NORTHING:	6,917,887.478
SURFACE EASTING:	2,523,337.940
NAVD88 ELEVATION:	487.997

Texas Department of Transportation

SURVEY CONTROL

SHEET 4 OF 6

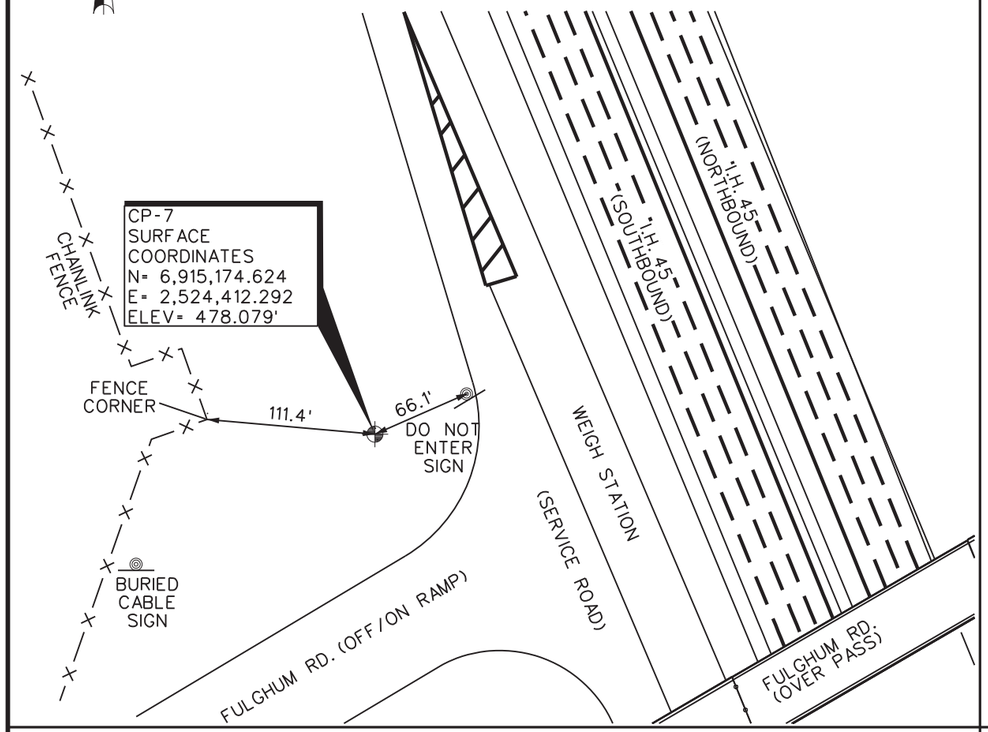
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		67
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH 45

8/10/2019
...\WFXP2203 Control.dgn

CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-7".

SKETCH
(NOT TO SCALE)



CONTROL POINT CP-7

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-7" LOCATED IN THE WEST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 3.4 MILES SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 111.4 FEET SOUTHEAST OF A FENCE POST AND 66.1 FEET SOUTHWEST OF A DO NOT ENTER SIGN.

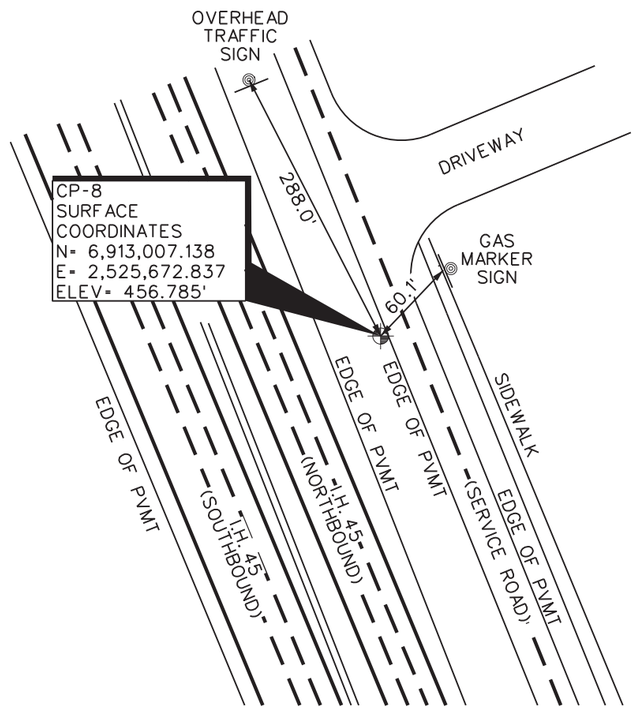
US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,914,230.790
GRID EASTING:	2,524,067.742
SURFACE NORTHING:	6,915,174.624
SURFACE EASTING:	2,524,412.292
NAVD88 ELEVATION:	478.079

CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-8".

SKETCH
(NOT TO SCALE)



CONTROL POINT CP-8

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-8" LOCATED IN THE EAST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 3.8 MILES SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 288.0 FEET SOUTHEAST OF A OVERHEAD TRAFFIC SIGN AND 60.1 FEET SOUTHWEST OF A GAS MARKER SIGN.

US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,912,063.600
GRID EASTING:	2,525,328.115
SURFACE NORTHING:	6,913,007.138
SURFACE EASTING:	2,525,672.837
NAVD88 ELEVATION:	456.785

NOTES:

ALL COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE 4202, NAD83 (2011 ADJ) EPOCH 2010.00 GEOID 12A DETERMINED BY GPS OBSERVATIONS CALCULATED FROM DALLAS CORS ARP (PID-DF8984), FORT WORTH WAAS 1 CORS ARP (PID-DF4385), AND COLLIN COUNTY CORS ARP (PID-DF8982). ALL DISTANCES AND COORDINATES ARE SURFACE WITH A GRID TO GROUND SCALE FACTOR OF 1.0001365060.

PROJECT BENCHMARK:

NGS MONUMENT DESIGNATION: A 962
PID CS1467 (NAVD88): 3-1/2 BRONZE DISK SET ON TOP OF A CONCRETE MONUMENT ABOUT 4 INCHES ABOVE THE GROUND STAMPED A 962 1946 LOCATED ABOUT 0.10 MILES SOUTH ALONG THE TEXAS AND NEW ORLEANS RAILROAD FROM THE STATION AT HUTCHINS, THENCE 1.0 MILE EASTERLY ALONG DOWDY FERRY ROAD; APPROXIMATELY 33 FEET AND 1.5 FEET HIGHER THAN THE CENTER LINE OF THE ROAD, 12 FEET EAST OF THE EAST END OF A WIRE GATE, 1 FOOT NORTH OF THE RIGHT OF WAY FENCE, 1 FOOT WEST OF A 4X4 MARKER POST; APPROXIMATELY 305 FEET EAST THE CENTERLINE OF BEARD STREET, APPROXIMATELY 645 FEET EAST OF THE CENTERLINE OF MICHAEL STREET, AND 18 FEET NORTH OF THE NORTH EDGE OF PAVEMENT TO DOWDY FERRY ROAD:

NORTH:	6,924,494.593	(MEASURED)
EAST:	2,524,510.681	(MEASURED)
ELEV:	442.45'	(PUBLISHED)

STATE OF TEXAS
REGISTERED
ELLIOTT PAT BUSBY
5561
PROFESSIONAL
LAND SURVEYOR

8/12/19

ELLIOTT PAT BUSBY
RPLS NO. 5561

DATE

NO.	REVISIONS	BY	DATE

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Texas Department of Transportation

SURVEY CONTROL

SHEET 5 OF 6

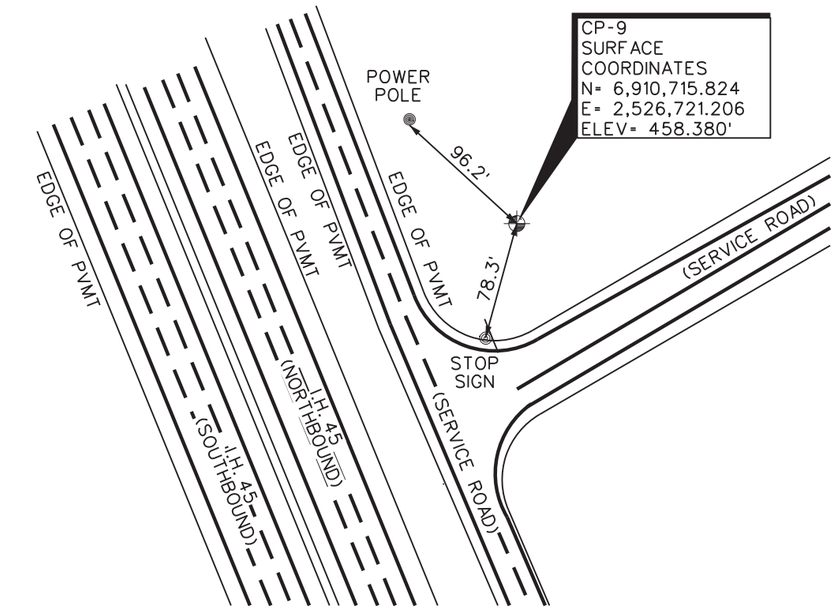
FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		68
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH 45

8/10/2019
...\WFXP2203 Control.dgn

CONTROL MONUMENT DESCRIPTION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-9".

SKETCH
(NOT TO SCALE)



CONTROL POINT CP-9

APPROXIMATE LOCATION:

A 3 1/2" ALUMINUM DISK SET IN CONCRETE STAMPED "CP-9" LOCATED IN THE EAST RIGHT-OF-WAY OF INTERSTATE HIGHWAY 45, APPROXIMATELY 4.4 MILES SOUTH OF INTERSTATE HIGHWAY 20, AND BEING 96.2 FEET SOUTHEAST OF A POWER POLE AND 78.3 FEET NORTHEAST OF A STOP SIGN.

US SURVEY FEET
TEXAS NORTH CENTRAL ZONE 4202
NORTH AMERICAN DATUM OF 1983 (NAD83)
GEOID 12A MODEL
DATE SET: JULY 15, 2019
DALLAS COUNTY SCALE FACTOR: 1.0001365060

GRID NORTHING:	6,909,772.599
GRID EASTING:	2,526,376.340
SURFACE NORTHING:	6,910,715.824
SURFACE EASTING:	2,526,721.206
NAVD88 ELEVATION:	458.380

NOTES:

ALL COORDINATES ARE BASED ON THE TEXAS COORDINATE SYSTEM, NORTH CENTRAL ZONE 4202, NAD83 (2011 ADJ) EPOCH 2010.00 GEOID 12A DETERMINED BY GPS OBSERVATIONS CALCULATED FROM DALLAS CORS ARP (PID-DF8984), FORT WORTH WAAS 1 CORS ARP (PID-DF4385), AND COLLIN COUNTY CORS ARP (PID-DF8982). ALL DISTANCES AND COORDINATES ARE SURFACE WITH A GRID TO GROUND SCALE FACTOR OF 1.0001365060.

PROJECT BENCHMARK:

NGS MONUMENT DESIGNATION: A 962
PID CS1467 (NAVD88): 3-1/2 BRONZE DISK SET ON TOP OF A CONCRETE MONUMENT ABOUT 4 INCHES ABOVE THE GROUND STAMPED A 962 1946 LOCATED ABOUT 0.10 MILES SOUTH ALONG THE TEXAS AND NEW ORLEANS RAILROAD FROM THE STATION AT HUTCHINS, THENCE 1.0 MILE EASTERLY ALONG DOWDY FERRY ROAD; APPROXIMATELY 33 FEET AND 1.5 FEET HIGHER THAN THE CENTER LINE OF THE ROAD, 12 FEET EAST OF THE EAST END OF A WIRE GATE, 1 FOOT NORTH OF THE RIGHT OF WAY FENCE, 1 FOOT WEST OF A 4X4 MARKER POST; APPROXIMATELY 305 FEET EAST THE CENTERLINE OF BEARD STREET, APPROXIMATELY 645 FEET EAST OF THE CENTERLINE OF MICHAEL STREET, AND 18 FEET NORTH OF THE NORTH EDGE OF PAVEMENT TO DOWDY FERRY ROAD:

NORTH:	6,924,494.593	(MEASURED)
EAST:	2,524,510.681	(MEASURED)
ELEV:	442.45'	(PUBLISHED)

STATE OF TEXAS
REGISTERED
ELLIOTT PAT BUSBY
5561
PROFESSIONAL
LAND SURVEYOR

8/12/19
ELLIOTT PAT BUSBY
RPLS NO. 5561
DATE

NO.	REVISIONS	BY	DATE

Texas Department of Transportation

SURVEY CONTROL

SHEET 6 OF 6

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		69
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH 45

8/10/2019
...\WFXP2203 Control.dgn

EXISTING ALIGNMENT "IH45"

Point 100 N 6,921,778.4316 E 2,521,777.5551 Sta 1621+67.26

Course from 100 to PC 45MAIN11 N 23° 47' 49.33" W Dist 3,342.6580

Curve Data

Curve 45MAIN11
P.I. Station 1655+09.92 N 6,924,836.8996 E 2,520,428.7990
Delta = 0° 00' 00.14" (LT)
Degree = 2° 00' 00.00"
Tangent = 0.0010
Length = 0.0020
Radius = 2,864.7890
External = 0.0000
Long Chord = 0.0020
Mid. Ord. = 0.0000
P.C. Station 1655+09.92 N 6,924,836.8987 E 2,520,428.7994
P.T. Station 1655+09.92 N 6,924,836.9005 E 2,520,428.7986
C.C. N 6,923,680.9622 E 2,517,807.5732
Back = N 23° 47' 49.33" W
Ahead = N 23° 47' 49.47" W
Chord Bear = N 23° 47' 49.43" W

Equation: Sta 1655+09.92 (BK) = Sta 10064+15.02 (AH)
End Region 1

Begin Region 2

Curve Data

Curve 45MAIN12
P.I. Station 10073+29.15 N 6,925,673.3142 E 2,520,059.9472
Delta = 35° 23' 42.00" (LT)
Degree = 2° 00' 00.00"
Tangent = 914.1330
Length = 1,769.7500
Radius = 2,864.7890
External = 142.3118
Long Chord = 1,741.7429
Mid. Ord. = 135.5769
P.C. Station 10064+15.02 N 6,924,836.9005 E 2,520,428.7986
P.T. Station 10081+84.77 N 6,926,141.4981 E 2,519,274.8084
C.C. N 6,923,680.9622 E 2,517,807.5732
Back = N 23° 47' 49.47" W
Ahead = N 59° 11' 31.47" W
Chord Bear = N 41° 29' 40.47" W

Course from PT 45MAIN12 to 101 N 59° 11' 31.47" W Dist 1,264.5347

Point 101 N 6,926,789.1443 E 2,518,188.7134 Sta 10094+49.30

EXISTING ALIGNMENT "DOWDY ROAD"

Point 7000 N 6,924,761.4222 E 2,521,915.9430 Sta 0+00.00

Course from 7000 to PC DOWDY1 N 84° 17' 45.10" W Dist 517.9478

Curve Data

Curve DOWDY1
P.I. Station 9+03.55 N 6,924,851.2279 E 2,521,016.8636
Delta = 20° 20' 09.44" (LT)
Degree = 2° 39' 53.71"
Tangent = 385.6057
Length = 763.0982
Radius = 2,150.0000
External = 34.3058
Long Chord = 759.0990
Mid. Ord. = 33.7670
P.C. Station 5+17.95 N 6,924,812.9019 E 2,521,400.5599
P.T. Station 12+81.05 N 6,924,753.8213 E 2,520,643.7635
C.C. N 6,922,673.5479 E 2,521,186.8679
Back = N 84° 17' 45.10" W
Ahead = S 75° 22' 05.46" W
Chord Bear = S 85° 32' 10.18" W

Course from PT DOWDY1 to 7001 S 75° 22' 05.46" W Dist 165.2567

Point 7001 N 6,924,712.0764 E 2,520,483.8662 Sta 14+46.30

Course from 7001 to PC DOWDY2 S 75° 22' 05.46" W Dist 213.5771

Curve Data

Curve DOWDY2
P.I. Station 18+62.15 N 6,924,607.0293 E 2,520,081.5006
Delta = 12° 09' 13.32" (LT)
Degree = 3° 00' 56.04"
Tangent = 202.2750
Length = 403.0320
Radius = 1,900.0000
External = 10.7368
Long Chord = 402.2768
Mid. Ord. = 10.6765
P.C. Station 16+59.88 N 6,924,658.1254 E 2,520,277.2156
P.T. Station 20+62.91 N 6,924,515.8737 E 2,519,900.9297
C.C. N 6,922,819.7442 E 2,520,757.1683
Back = S 75° 22' 05.46" W
Ahead = S 63° 12' 52.14" W
Chord Bear = S 69° 17' 28.80" W

Course from PT DOWDY2 to 7002 S 63° 12' 52.14" W Dist 162.3404

Point 7002 N 6,924,442.7147 E 2,519,756.0085 Sta 22+25.25

EXISTING ALIGNMENT "SOUTH FRONTAGE ROAD"

Point 17001 N 6,923,235.7805 E 2,521,000.1723 Sta 1638+14.41

Course from 17001 to PC 45SOUTHFRT1 N 23° 41' 15.06" W Dist 884.5485

Curve Data

Curve 45SOUTHFRT1
P.I. Station 1648+25.93 N 6,924,162.0800 E 2,520,593.7960
Delta = 5° 58' 55.74" (LT)
Degree = 2° 21' 28.26"
Tangent = 126.9713
Length = 253.7119
Radius = 2,430.0000
External = 3.3150
Long Chord = 253.5967
Mid. Ord. = 3.3104
P.C. Station 1646+98.96 N 6,924,045.8060 E 2,520,644.8065
P.T. Station 1649+52.67 N 6,924,272.4046 E 2,520,530.9453
C.C. N 6,923,069.5577 E 2,518,419.5336
Back = N 23° 41' 15.06" W
Ahead = N 29° 40' 10.80" W
Chord Bear = N 26° 40' 42.93" W

Course from PT 45SOUTHFRT1 to PC 45SOUTHFRT2 N 29° 40' 10.80" W Dist 59.4111

Curve Data

Curve 45SOUTHFRT2
P.I. Station 1652+40.32 N 6,924,522.8303 E 2,520,389.4316
Delta = 9° 06' 47.45" (RT)
Degree = 2° 00' 02.44"
Tangent = 228.2335
Length = 455.5043
Radius = 2,863.8165
External = 9.0802
Long Chord = 455.0243
Mid. Ord. = 9.0515
P.C. Station 1650+12.08 N 6,924,324.0265 E 2,520,501.5369
P.T. Station 1654+67.59 N 6,924,736.8804 E 2,520,310.2289
C.C. N 6,925,730.6957 E 2,522,996.0763
Back = N 29° 25' 07.05" W
Ahead = N 20° 18' 19.60" W
Chord Bear = N 24° 51' 43.32" W

Course from PT 45SOUTHFRT2 to 17002 N 20° 33' 23.35" W Dist 78.6779

Point 17002 N 6,924,810.5486 E 2,520,282.6027 Sta 1655+46.27

Course from 17002 to 16000 N 20° 33' 23.35" W Dist 0.1547

Equation: Sta 1655+46.42 (BK) = Sta 10065+24.57 (AH)
End Region 1

Begin Region 2

Point 16000 N 6,924,810.6935 E 2,520,282.5484 Sta 10065+24.57

Course from 16000 to PC 45SOUTHFRT3 N 20° 33' 23.35" W Dist 154.0853

Curve Data

Curve 45SOUTHFRT3
P.I. Station 10069+66.62 N 6,925,224.5968 E 2,520,127.3310
Delta = 25° 56' 45.63" (LT)
Degree = 4° 35' 01.18"
Tangent = 287.9649
Length = 566.0541
Radius = 1,250.0000
External = 32.7407
Long Chord = 561.2298
Mid. Ord. = 31.9051
P.C. Station 10066+78.66 N 6,924,954.9676 E 2,520,228.4443
P.T. Station 10072+44.71 N 6,925,422.8097 E 2,519,918.4400
C.C. N 6,924,516.0543 E 2,519,058.0362
Back = N 20° 33' 23.35" W
Ahead = N 46° 30' 08.98" W
Chord Bear = N 33° 31' 46.16" W

Course from PT 45SOUTHFRT3 to PC 45SOUTHFRT4 N 46° 30' 08.98" W Dist 473.7020

Curve Data

Curve 45SOUTHFRT4
P.I. Station 10080+43.46 N 6,925,976.9608 E 2,519,343.2332
Delta = 15° 20' 41.95" (LT)
Degree = 2° 22' 28.70"
Tangent = 325.0468
Length = 646.2031
Radius = 2,412.8214
External = 21.7961
Long Chord = 644.2735
Mid. Ord. = 21.6010
P.C. Station 10077+18.41 N 6,925,748.8697 E 2,519,574.8145
P.T. Station 10083+64.61 N 6,926,135.6370 E 2,519,059.5481
C.C. N 6,924,029.8429 E 2,517,881.6950
Back = N 45° 26' 06.08" W
Ahead = N 60° 46' 48.02" W
Chord Bear = N 53° 06' 27.05" W

Course from PT 45SOUTHFRT4 to 17003 N 59° 42' 45.12" W Dist 382.7999

Point 17003 N 6,926,328.6978 E 2,518,728.9981 Sta 10087+47.41

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation
© 2021

IH 45
HORIZONTAL GEOMETRY DATA SHEETS

SHEET 1 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	70
CHECK	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

DATE: 6/14/2021 TIME: 8:27:37 AM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450704HOR.dgn

EXISTING ALIGNMENT "NORTH FRONTAGE ROAD"

Curve Data

Curve 45NORTHFRT1
P.I. Station 1630+24.70 N 6,922,609.9310 E 2,521,538.0677
Delta = 0° 22' 20.69" (RT)
Degree = 0° 45' 14.01"
Tangent = 24.6995
Length = 49.3989
Radius = 7,600.0000
External = 0.0401
Long Chord = 49.3988
Mid. Ord. = 0.0401
P.C. Station 1630+00.00 N 6,922,587.2404 E 2,521,547.8249
P.T. Station 1630+49.40 N 6,922,632.6846 E 2,521,528.4582
C.C. N 6,925,589.5034 E 2,528,529.6883
Back = N 23° 16' 05.28" W
Ahead = N 22° 53' 44.59" W
Chord Bear = N 23° 04' 54.93" W

Course from PT 45NORTHFRT1 to PC 45NORTHFRT2 N 22° 53' 44.59" W Dist 233.4753

Curve Data

Curve 45NORTHFRT2
P.I. Station 1633+07.50 N 6,922,870.4474 E 2,521,428.0442
Delta = 1° 28' 40.42" (LT)
Degree = 3° 00' 04.86"
Tangent = 24.6218
Length = 49.2410
Radius = 1,909.0000
External = 0.1588
Long Chord = 49.2396
Mid. Ord. = 0.1588
P.C. Station 1632+82.87 N 6,922,847.7654 E 2,521,437.6235
P.T. Station 1633+32.12 N 6,922,892.8748 E 2,521,417.8831
C.C. N 6,922,105.0592 E 2,519,679.0250
Back = N 22° 53' 44.59" W
Ahead = N 24° 22' 25.00" W
Chord Bear = N 23° 38' 04.80" W

Course from PT 45NORTHFRT2 to PC 45NORTHFRT3 N 23° 47' 56.81" W Dist 1,405.8424

Curve Data

Curve 45NORTHFRT3
P.I. Station 1648+66.64 N 6,924,297.6783 E 2,520,800.4354
Delta = 7° 21' 45.39" (RT)
Degree = 2° 51' 53.24"
Tangent = 128.6789
Length = 257.0035
Radius = 2,000.0000
External = 4.1353
Long Chord = 256.8267
Mid. Ord. = 4.1268
P.C. Station 1647+37.96 N 6,924,179.1727 E 2,520,850.5819
P.T. Station 1649+94.96 N 6,924,421.6330 E 2,520,765.8887
C.C. N 6,924,958.5780 E 2,522,692.4634
Back = N 22° 56' 09.60" W
Ahead = N 15° 34' 24.21" W
Chord Bear = N 19° 15' 16.90" W

Course from PT 45NORTHFRT3 to PC 45NORTHFRT41 N 15° 34' 24.21" W Dist 9.8307

Curve Data

Curve 45NORTHFRT41
P.I. Station 1654+19.47 N 6,924,830.5600 E 2,520,651.9189
Delta = 20° 30' 32.36" (LT)
Degree = 2° 29' 58.59"
Tangent = 414.6813
Length = 820.4883
Radius = 2,292.1909
External = 37.2081
Long Chord = 816.1150
Mid. Ord. = 36.6138
P.C. Station 1650+04.79 N 6,924,431.1028 E 2,520,763.2494
P.T. Station 1658+25.28 N 6,925,165.6935 E 2,520,407.6932
C.C. N 6,923,815.7126 E 2,518,555.2110
Back = N 15° 34' 24.21" W
Ahead = N 36° 04' 56.57" W
Chord Bear = N 25° 49' 40.39" W

Equation: Sta 1658+25.28 (BK) = Sta 10066+56.86 (AH) End Region 1
Begin Region 2

Curve Data

Curve 45NORTHFRT42
P.I. Station 10066+56.86 N 6,925,165.6940 E 2,520,407.6929
Delta = 0° 00' 00.11" (LT)
Degree = 2° 29' 58.59"
Tangent = 0.0006
Length = 0.0012
Radius = 2,292.1909
External = 0.0000
Long Chord = 0.0012
Mid. Ord. = 0.0000
P.C. Station 10066+56.86 N 6,925,165.6935 E 2,520,407.6932
P.T. Station 10066+56.86 N 6,925,165.6944 E 2,520,407.6925
C.C. N 6,923,815.7126 E 2,518,555.2110
Back = N 36° 04' 56.57" W
Ahead = N 36° 04' 56.68" W
Chord Bear = N 36° 04' 56.62" W

Course from PT 45NORTHFRT42 to PC 45NORTHFRT5 N 36° 11' 23.11" W Dist 543.3678

Curve Data

Curve 45NORTHFRT5
P.I. Station 10073+58.30 N 6,925,732.6198 E 2,519,994.6445
Delta = 9° 44' 07.65" (LT)
Degree = 3° 05' 12.63"
Tangent = 158.0733
Length = 315.3856
Radius = 1,856.1287
External = 6.7188
Long Chord = 315.0063
Mid. Ord. = 6.6946
P.C. Station 10072+00.23 N 6,925,604.2281 E 2,520,086.8548
P.T. Station 10075+15.61 N 6,925,843.5698 E 2,519,882.0511
C.C. N 6,924,521.4757 E 2,518,579.2537
Back = N 35° 41' 08.65" W
Ahead = N 45° 25' 16.30" W
Chord Bear = N 40° 33' 12.48" W

Course from PT 45NORTHFRT5 to PC 45NORTHFRT6 N 45° 32' 14.31" W Dist 82.7900

Curve Data

Curve 45NORTHFRT6
P.I. Station 10077+69.24 N 6,926,021.4828 E 2,519,701.2894
Delta = 10° 19' 03.62" (LT)
Degree = 3° 01' 40.38"
Tangent = 170.8395
Length = 340.7552
Radius = 1,892.2709
External = 7.6963
Long Chord = 340.2950
Mid. Ord. = 7.6651
P.C. Station 10075+98.40 N 6,925,901.5596 E 2,519,822.9634
P.T. Station 10079+39.16 N 6,926,117.6744 E 2,519,560.1040
C.C. N 6,924,553.8614 E 2,518,494.6566
Back = N 45° 24' 54.66" W
Ahead = N 55° 43' 58.28" W
Chord Bear = N 50° 34' 26.47" W

Course from PT 45NORTHFRT6 to PC 45NORTHFRT7 N 55° 24' 40.31" W Dist 19.8203

Curve Data

Curve 45NORTHFRT7
P.I. Station 10080+94.80 N 6,926,207.1217 E 2,519,432.7368
Delta = 5° 11' 04.09" (LT)
Degree = 1° 54' 35.65"
Tangent = 135.8187
Length = 271.4519
Radius = 2,999.9309
External = 3.0729
Long Chord = 271.3594
Mid. Ord. = 3.0698
P.C. Station 10079+58.98 N 6,926,128.9260 E 2,519,543.7870
P.T. Station 10082+30.43 N 6,926,274.9626 E 2,519,315.0749
C.C. N 6,923,676.0745 E 2,517,816.6203
Back = N 54° 50' 55.84" W
Ahead = N 60° 01' 59.94" W
Chord Bear = N 57° 26' 27.89" W

Course from PT 45NORTHFRT7 to PC 45NORTHFRT8 N 60° 47' 58.83" W Dist 17.2315

Curve Data

Curve 45NORTHFRT8
P.I. Station 10083+28.94 N 6,926,320.9499 E 2,519,227.9680
Delta = 0° 11' 47.19" (LT)
Degree = 0° 07' 15.06"
Tangent = 81.2753
Length = 162.5505
Radius = 47,410.8048
External = 0.0697
Long Chord = 162.5504
Mid. Ord. = 0.0697
P.C. Station 10082+47.66 N 6,926,283.3693 E 2,519,300.0331
P.T. Station 10084+10.21 N 6,926,358.2832 E 2,519,155.7745
C.C. N 6,884,245.2244 E 2,497,377.9257
Back = N 62° 27' 31.68" W
Ahead = N 62° 39' 18.87" W
Chord Bear = N 62° 33' 25.28" W

Course from PT 45NORTHFRT8 to PC 45NORTHFRT9 N 61° 41' 37.96" W Dist 28.1248

Curve Data

Curve 45NORTHFRT9
P.I. Station 10085+09.01 N 6,926,405.1315 E 2,519,068.7900
Delta = 2° 46' 57.39" (RT)
Degree = 1° 58' 08.50"
Tangent = 70.6733
Length = 141.3188
Radius = 2,909.8500
External = 0.8581
Long Chord = 141.3049
Mid. Ord. = 0.8579
P.C. Station 10084+38.34 N 6,926,371.6195 E 2,519,131.0126
P.T. Station 10085+79.66 N 6,926,441.6247 E 2,519,008.2676
C.C. N 6,928,933.5291 E 2,520,510.8119
Back = N 61° 41' 37.96" W
Ahead = N 58° 54' 40.58" W
Chord Bear = N 60° 18' 09.27" W

Course from PT 45NORTHFRT9 to 501 N 58° 54' 40.58" W Dist 184.2155

Point 501 N 6,926,536.7471 E 2,518,850.5112 Sta 10087+63.87

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 08/5/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45
HORIZONTAL GEOMETRY DATA SHEETS

SHEET 2 OF 3

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	71
CHECK	CONTROL	SECTION	JOB	
CHECK	0092	02	125	

DATE: 6/14/2021 TIME: 8:27:38 AM FILE: c:\txdot\pw*online\txdot5\solomon.bayou\d0450704\HORIZONTAL GEOMETRY DATA SHEET.dgn

PROPOSED ALIGNMENT "U-TURN NORTH"

Point 700 N 6,924,818.9758 E 2,520,305.0745 Sta 0+00.00

Course from 700 to PC UTURN_NORTH1 S 20° 33' 23.35" E Dist 31.0662

Curve Data

Curve UTURN_NORTH1
P.I. Station 0+86.79 N 6,924,737.7141 E 2,520,335.5484
Delta = 83° 53' 39.32" (LT)
Degree = 92° 24' 45.17"
Tangent = 55.7215
Length = 90.7823
Radius = 62.0000
External = 21.3600
Long Chord = 82.8871
Mid. Ord. = 15.8868
P.C. Station 0+31.07 N 6,924,789.8876 E 2,520,315.9828
P.T. Station 1+21.85 N 6,924,751.6192 E 2,520,389.5070
C.C. N 6,924,811.6577 E 2,520,374.0351
Back = S 20° 33' 23.35" E
Ahead = N 75° 32' 57.34" E
Chord Bear = S 62° 30' 13.01" E

Course from PT UTURN_NORTH1 to PC UTURN_NORTH2 N 75° 32' 57.34" E Dist 127.5849

Curve Data

Curve UTURN_NORTH2
P.I. Station 3+38.01 N 6,924,805.5613 E 2,520,598.8278
Delta = 104° 09' 45.04" (LT)
Degree = 83° 02' 14.50"
Tangent = 88.5746
Length = 125.4405
Radius = 69.0000
External = 43.2785
Long Chord = 108.8659
Mid. Ord. = 26.5965
P.C. Station 2+49.43 N 6,924,783.4577 E 2,520,513.0555
P.T. Station 3+74.87 N 6,924,883.3185 E 2,520,556.4099
C.C. N 6,924,850.2747 E 2,520,495.8367
Back = N 75° 32' 57.34" E
Ahead = N 28° 36' 47.70" W
Chord Bear = N 23° 28' 04.82" E

Course from PT UTURN_NORTH2 to 701 N 28° 36' 47.70" W Dist 44.7503

Point 701 N 6,924,922.6036 E 2,520,534.9792 Sta 4+19.62

PROPOSED ALIGNMENT "U-TURN SOUTH"

Point 850 N 6,924,606.5517 E 2,520,675.7313 Sta 0+00.00

Course from 850 to PC UTURN_SOUTH1 N 20° 41' 11.70" W Dist 15.7511

Curve Data

Curve UTURN_SOUTH1
P.I. Station 0+84.62 N 6,924,685.9856 E 2,520,646.5639
Delta = 83° 37' 02.67" (LT)
Degree = 74° 24' 27.32"
Tangent = 68.8693
Length = 112.3775
Radius = 77.0026
External = 26.3046
Long Chord = 102.6669
Mid. Ord. = 19.6068
P.C. Station 0+15.75 N 6,924,621.2873 E 2,520,670.1671
P.T. Station 1+28.13 N 6,924,669.7211 E 2,520,579.6427
C.C. N 6,924,594.8967 E 2,520,597.8281
Back = N 20° 02' 34.50" W
Ahead = S 76° 20' 22.83" W
Chord Bear = N 61° 51' 05.84" W

Course from PT UTURN_SOUTH1 to PC UTURN_SOUTH2 S 75° 30' 30.99" W Dist 131.3742

Curve Data

Curve UTURN_SOUTH2
P.I. Station 3+32.23 N 6,924,618.6486 E 2,520,382.0377
Delta = 100° 01' 16.01" (LT)
Degree = 93° 55' 39.03"
Tangent = 72.7242
Length = 106.4876
Radius = 61.0000
External = 33.9200
Long Chord = 93.4719
Mid. Ord. = 21.7986
P.C. Station 2+59.50 N 6,924,636.8467 E 2,520,452.4482
P.T. Station 3+65.99 N 6,924,552.4790 E 2,520,412.2103
C.C. N 6,924,577.7874 E 2,520,467.7125
Back = S 75° 30' 30.99" W
Ahead = S 24° 30' 45.02" E
Chord Bear = S 25° 29' 52.99" W

Course from PT UTURN_SOUTH2 to 851 S 25° 05' 08.73" E Dist 56.8246

Point 851 N 6,924,501.0144 E 2,520,436.3025 Sta 4+22.82

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

Solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

HORIZONTAL GEOMETRY DATA SHEETS

SHEET 3 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	72
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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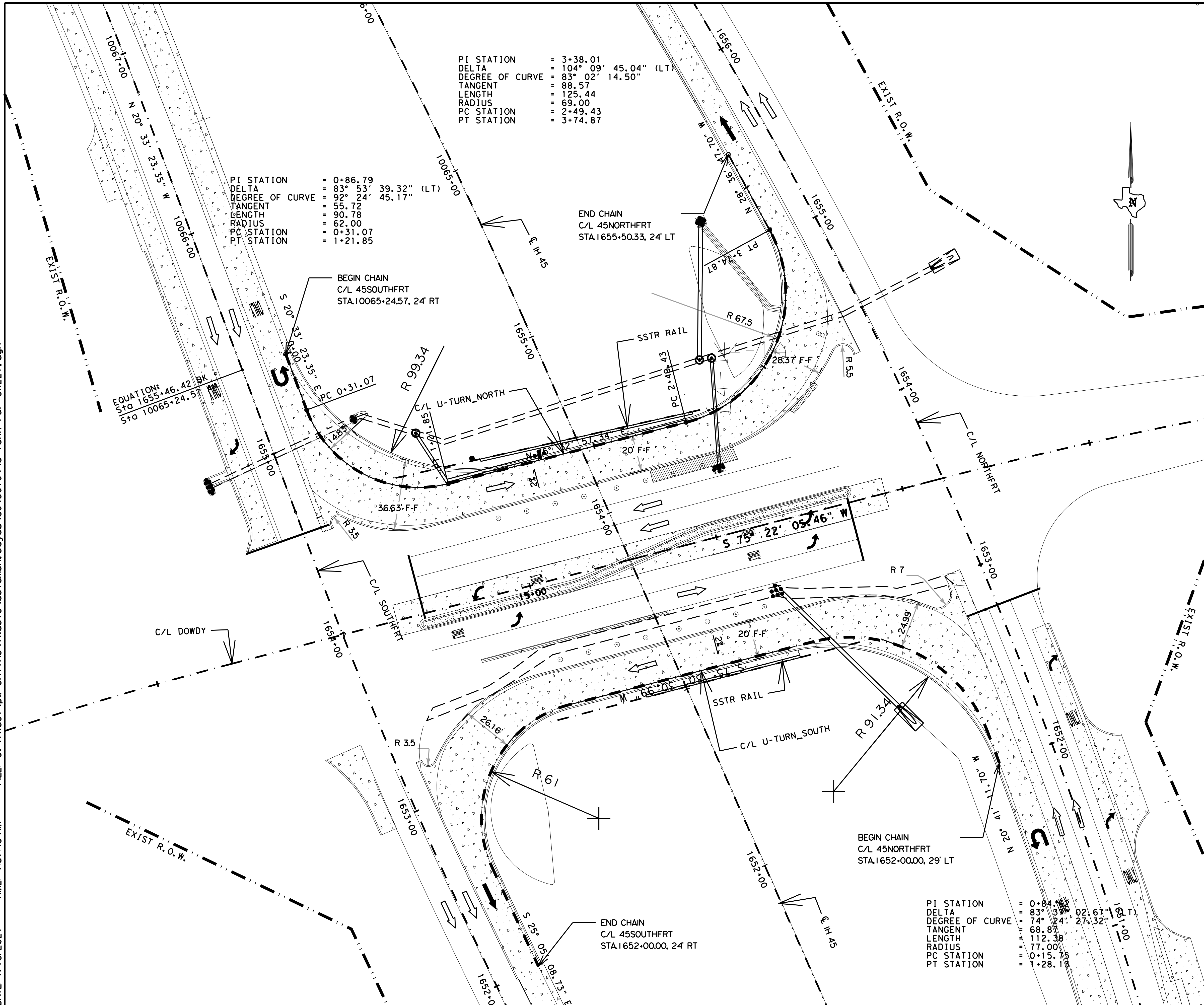

0 25 50

LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- DIRECTION OF TRAFFIC FLOW

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 7/13/21
Signature of Registrant & Date

Texas Department of Transportation
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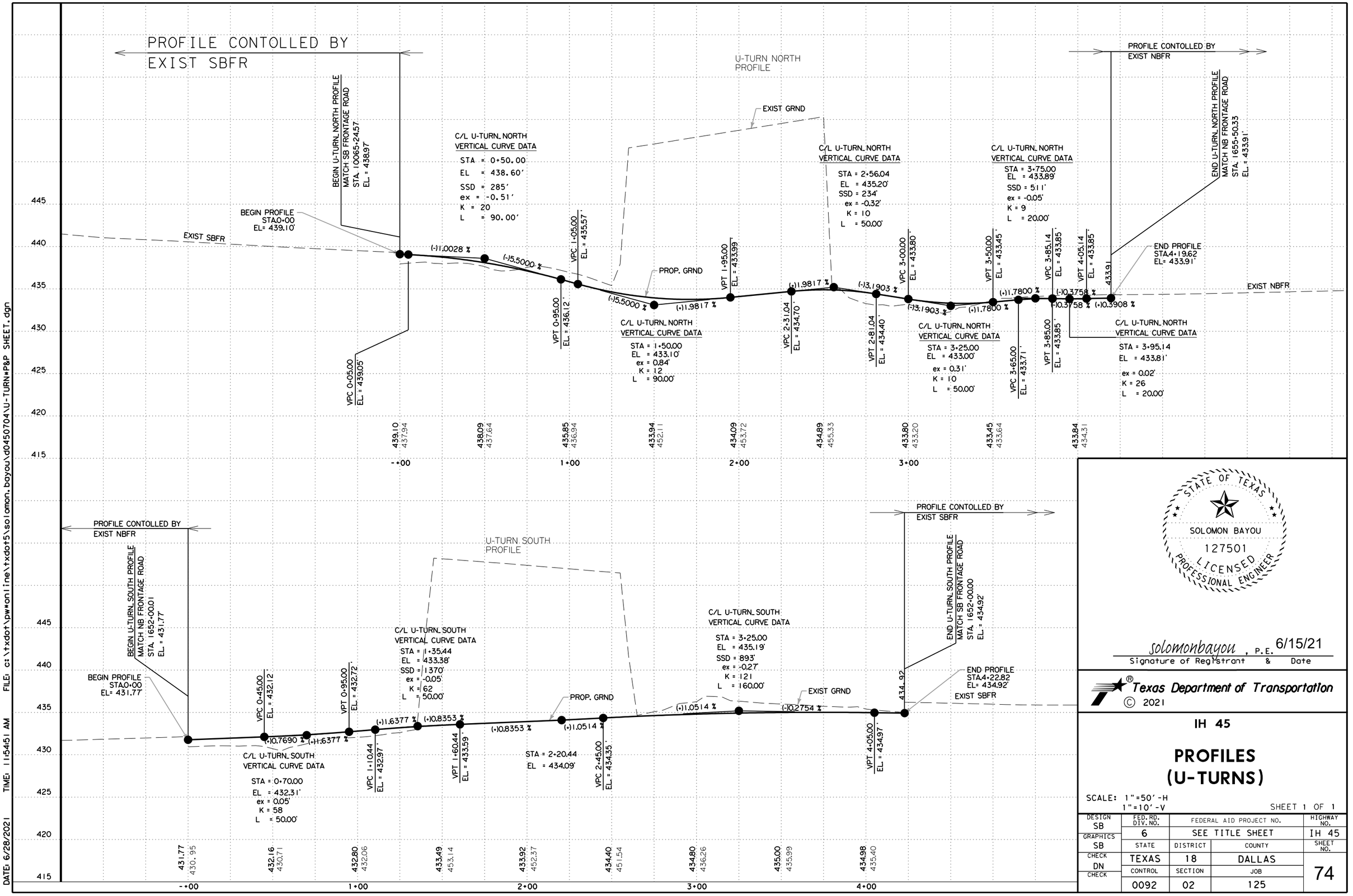
IH 45

PLAN VIEW
(U-TURNS)

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SB	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SB	TEXAS	18	DALLAS	73
CHECK	CONTROL	SECTION	JOB	
DN	0092	02	125	
CHECK				



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TIME: 11:54:51 AM
DATE: 6/28/2021

STATE OF TEXAS
SOLOMON BAYOU
127501
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solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation
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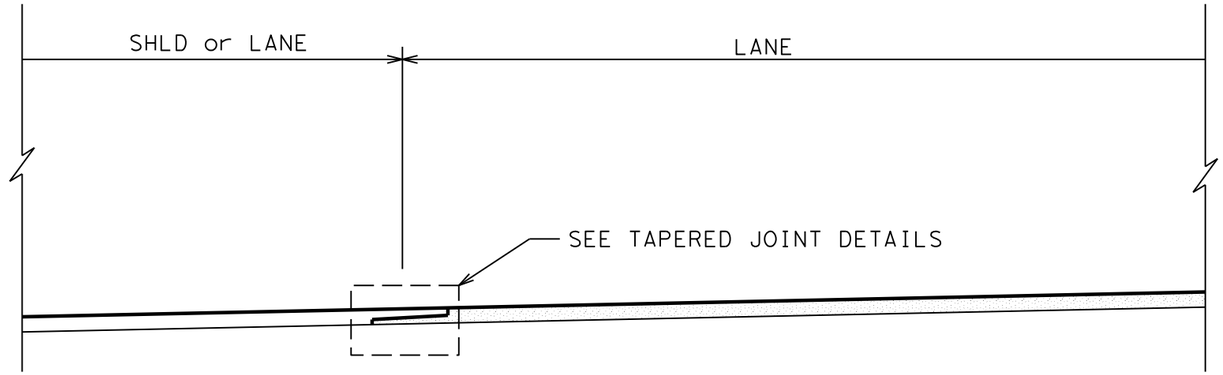
IH 45

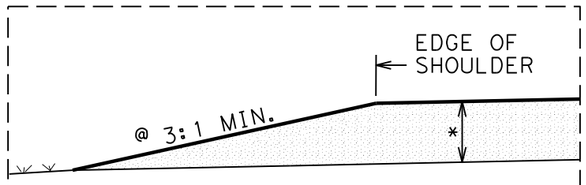
PROFILES (U-TURNS)

SCALE: 1"=50'-H
1"=10'-V

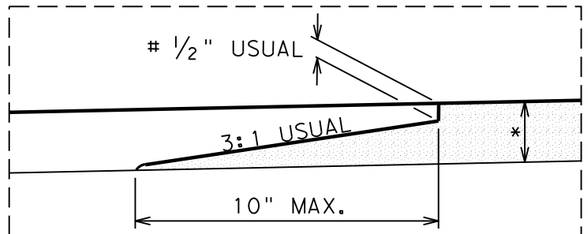
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SB	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SB	TEXAS	18	DALLAS	74
CHECK	CONTROL	SECTION	JOB	
DN	0092	02	125	
CHECK				

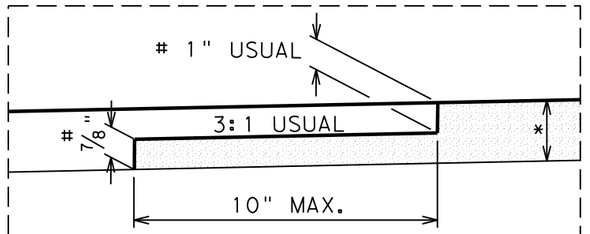




TAPERED OUTSIDE EDGE DETAIL



TAPERED JOINT DETAIL 1.5" TO 4" LIFTS



TAPERED JOINT DETAIL OVER 4" LIFTS

@ IF BACKFILLED SLOPE IS LESS THAN 3:1, COVER WEDGE WITH APPROVED BACKFILL.

* SEE TYPICAL SECTION FOR DEPTH AND TYPE OF HMA.
# NOTCH DEPTH SHALL NOT BE LESS THAN NOMINAL AGGREGATE SIZE.

NOTES:

1. THE ABOVE DETAILS SHALL BE CONSTRUCTED BY TAPERING THE BITUMINOUS MAT. THE TAPERED PORTION SHALL EXTEND BEYOND THE NORMAL LANE WIDTH AND BE LAID MONOLITHICALLY WITH ADJOINING MAT. THE TAPERED PORTION OF THE MAT SHALL BE CONSTRUCTED BY THE USE OF AN APPROVED STRIKE-OFF DEVICE THAT WILL PROVIDE A UNIFORM SLOPE AND WILL NOT RESTRICT THE MAIN SCREED. CLEAN WEDGE PRIOR TO PLACEMENT OF TACK COAT. TACK COAT SHALL BE APPLIED UNIFORMLY TO THE IN-PLACE TAPER WITH A DISTRIBUTOR BEFORE THE ADJACENT MAT IS PLACED. FINAL DENSITY REQUIREMENTS FOR THE ENTIRE PAVEMENT, INCLUDING THE TAPER AREA, WILL REMAIN UNCHANGED. COMPACTION OF THE INITIAL TAPER SECTION WILL BE REQUIRED AS NEAR TO FINAL DENSITY AS POSSIBLE. ROLL ADJACENT MAT FROM HOT SIDE TO COLD.

2. THE TYPE OF DEVICE TO PRODUCE ABOVE REFERENCED DETAILS SHALL PROVIDE INITIAL COMPACTION EQUIVALENT TO LAYDOWN MACHINE, WITH FINAL DENSITY ADHERING TO NOTE 1, AND BE APPROVED BY THE ENGINEER.

3. HOT MIX MATERIAL AND PLACEMENT SHALL BE PAID FOR UNDER THE PERTINENT ITEM. ANY ADDITIONAL SURFACE PREPARATION, TACK COAT, TACK COAT PLACEMENT, EQUIPMENT, LABOR, TOOLS AND INCIDENTALS TO PRODUCE TAPERED EDGE AND JOINTS AS DESCRIBED ABOVE SHALL BE CONSIDERED SUBSIDIARY TO THE HOT MIX ITEM.

4. THE TAPERED JOINT DETAIL IS NOT INTENDED FOR USE ON 2 WAY 2 LANE ROADBED CENTERLINE WITH LESS THAN 22' OVERALL WIDTH.

HOT MIX EDGE AND LONGITUDINAL JOINT DETAILS DALLAS DISTRICT STANDARD

LJD(1-1)-07

FED. RD. DIV. NO.	PROJECT NUMBER		SHEET NUMBER
18	(SEE TITLE SHEET)		75
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NUMBER
0092	02	125	IH 45

REVISED ON 9/10/08

DATE: 6/14/2021
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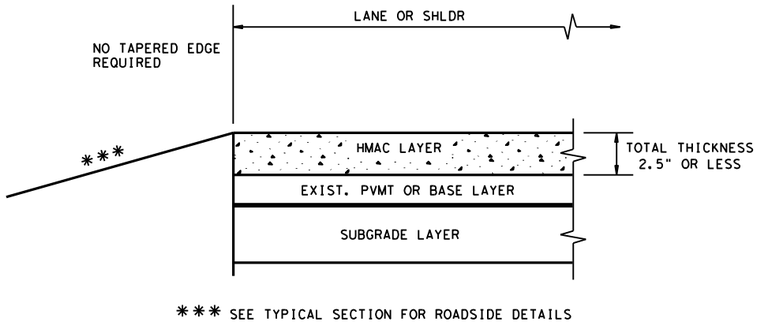
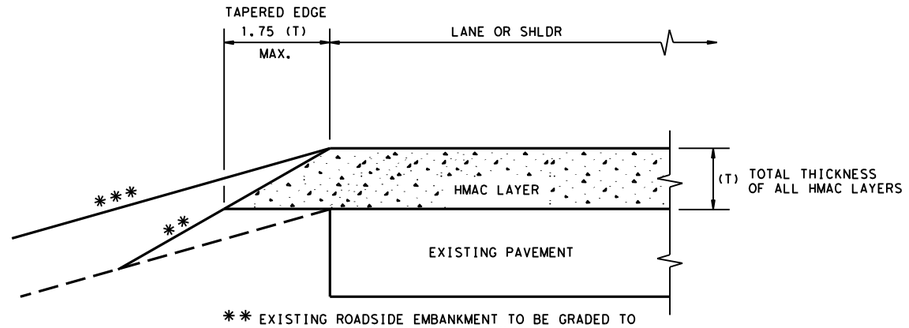


*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

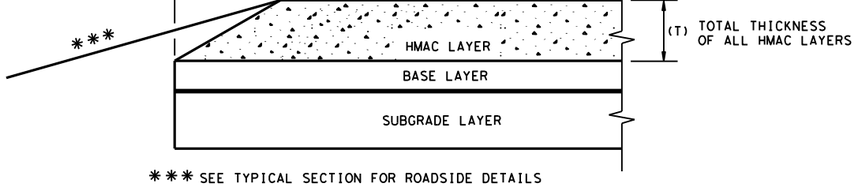
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** EXISTING ROADSIDE EMBANKMENT TO BE GRADED TO PRODUCE A SMOOTH LEVEL SURFACE FOR PLACEMENT OF TAPERED EDGE. THIS WORK IS SUBSIDIARY TO THE VARIOUS BID ITEMS.

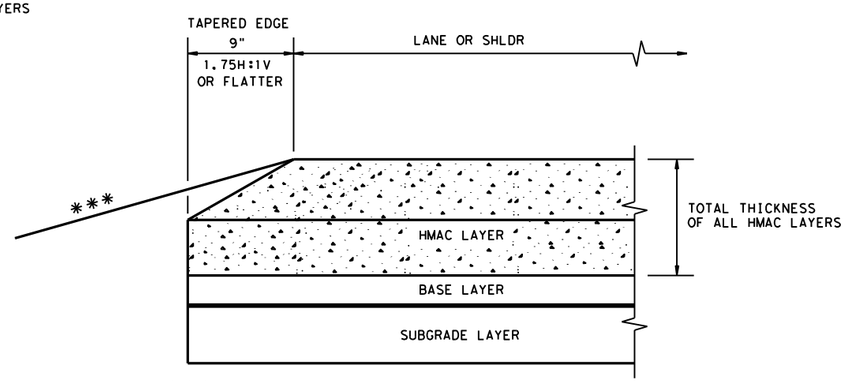
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 2
OVERLAY OF EXISTING PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 3
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 2.5" TO 5"



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

CONDITION - 4
NEW OR RECONSTRUCTED PAVEMENT HMAC THICKNESS 5" OR GREATER

(NOT TO SCALE)

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, A VERTICAL EDGE IS PERMISSIBLE FOR HMAC PLACED GREATER THAN 5" BELOW THE EDGE OF PAVEMENT AND FOR THICKNESS OF HMAC LESS THAN 2.5".
2. FOR FURTHER INFORMATION REGARDING THE ROADSIDE AND PAVEMENT DETAILS, SEE TYPICAL SECTIONS.
3. PAYMENT FOR TAPERED EDGE WILL BE IN ACCORDANCE WITH APPLICABLE ITEMS IN THE CONTRACT.
4. THE SLOPE OF THE TAPERED EDGE SHALL BE 1.75H:1V OR FLATTER.
5. THE TAPERED EDGE SHALL BE PRODUCED BY USE OF A SCREED ATTACHMENT CAPABLE OF PRODUCING A SMOOTH COMPACTED SURFACE. ADDITIONAL COMPACTING EFFORT BEHIND THE SCREED IS NOT REQUIRED.

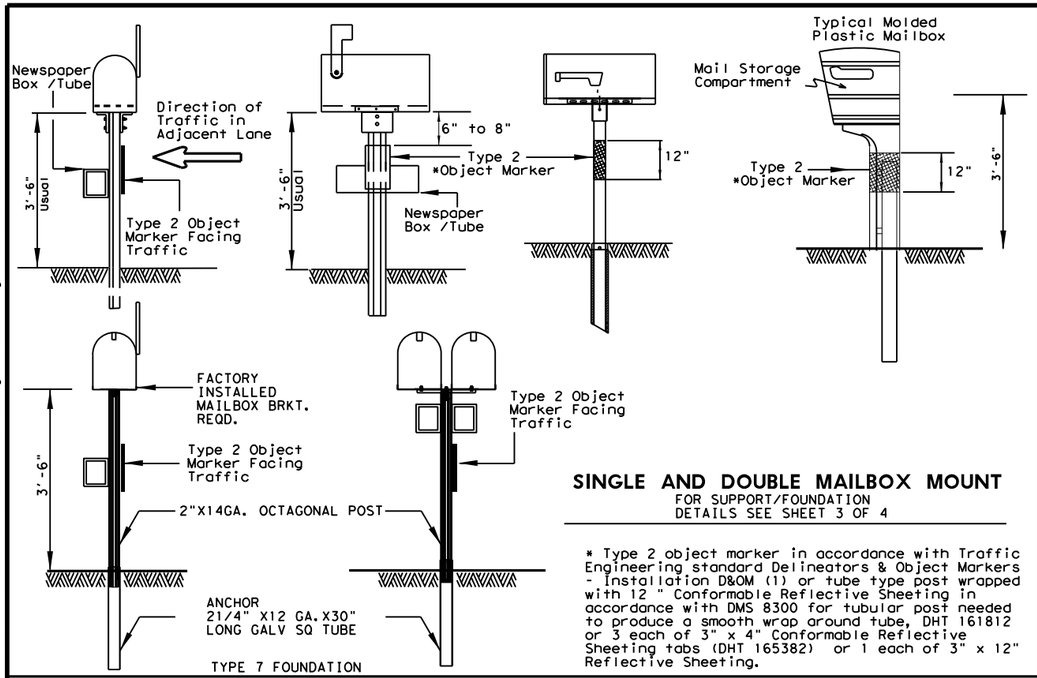
Texas Department of Transportation

Design Division Standard

TAPERED EDGE DETAILS HMAC PAVEMENT

TE(HMAC)-11

FILE: tehmac11.dgn	DN: TxDOT	CK: RL	DW: KB	CK:
© TxDOT January 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		76



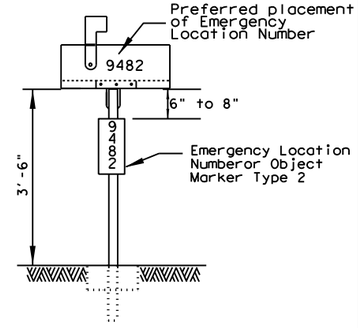
SINGLE AND DOUBLE MAILBOX MOUNT

FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4

* Type 2 object marker in accordance with Traffic Engineering standard Delineators & Object Markers - Installation D&OM (1) or tube type post wrapped with 12 " Conformable Reflective Sheeting in accordance with DMS 8300 for tubular post needed to produce a smooth wrap around tube, DHT 161812 or 3 each of 3" x 4" Conformable Reflective Sheeting tabs (DHT 165382) or 1 each of 3" x 12" Reflective Sheeting.

Note: Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Pedestrian Facilities Curb ramps standard *PED-XX for pedestrian facilities.

*PED-XX: XX is the standard year for example PED- 12 , PED-13,etc.



PLACEMENT OF EMERGENCY LOCATION NUMBER

Location Number shall be placed on: 1. A yellow, type A plate with class 1 flat surface reflective sheeting in accordance with DMS 8600. The color of numbers shall be black. or 2: A green or blue plate with white numbers attached to post beside the object marker. Other contrasting color configuration, as approved , may be used. (Use Same type plate as used for the type 2 Object Marker. Recommended sign size is 6" by 15")

MAILBOX SIZES

TYPICAL MAILBOX SIZE				LIGHT WEIGHT MATERIAL	
				SHEET METAL	**PLASTIC
SIZE	LENGTH (INCHES)	WIDTH (INCHES)	HEIGHT (INCHES)	MAXIMUM WEIGHT (POUNDS)	
SMALL	19 1/2	6	7	5	5
MEDIUM	22 1/2	8	11 1/2	7	7
LARGE	23 1/2*	11 1/2*	13 1/2*	10	10

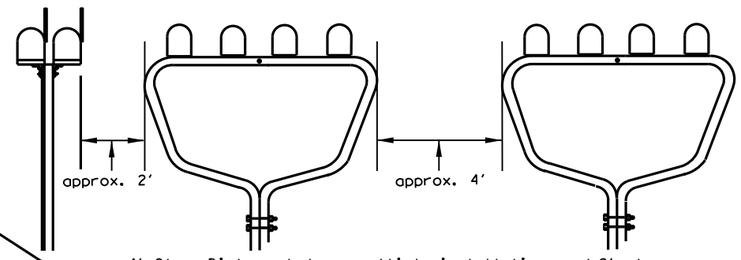
* Maximum allowed dimensions for mailbox
** Excluding Molded Plastic on 4 X 4 Post

LOCKABLE ARCHITECTURAL MAILBOX SIZE (INCHES)					
VIEW	TOP	BOTTOM	FRONT SIDE	BACK SIDE	WEIGHT (POUNDS)
SIDE	18	15	18.3	15	22.4
BACK	11 1/2	11 1/2		15	

SEE TOP RIGHT CORNER OF SHEET 2 OF 4

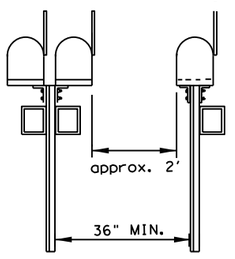
Mailboxes shall be made of light weight sheet metal or light weight plastic. Lockable architectural mailboxes shall meet the requirements of the above table.

Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.



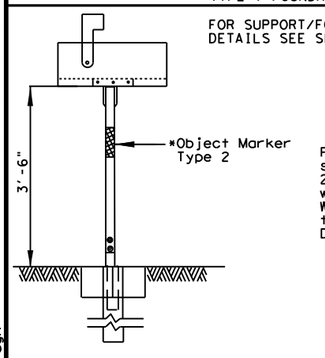
4' Clear Distance between multiple installations and 2' clearance between double or single installations and the multiple installation. DHT #'s 164116 or 149339.

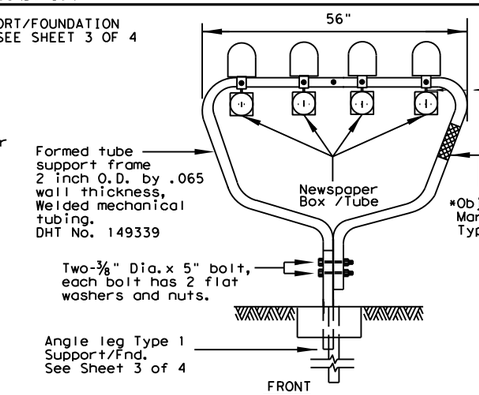
MULTIPLE MAILBOX PLACEMENT

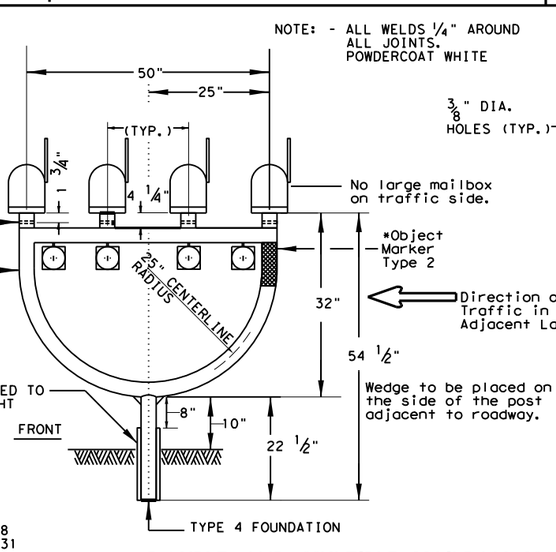


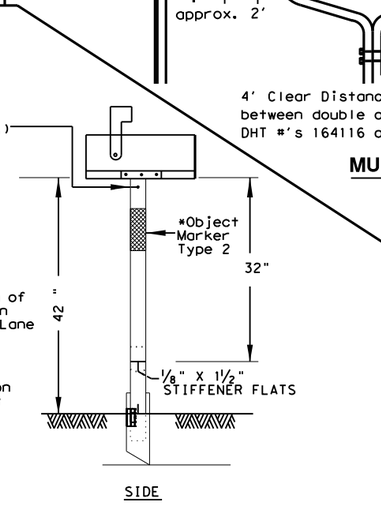
Clear Distance between single or double mounted posts. (Normally when 3 or more mailboxes are in one location, a multiple support is used).

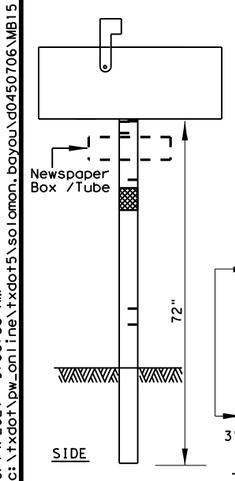
SINGLE & DOUBLE MAILBOX PLACEMENT

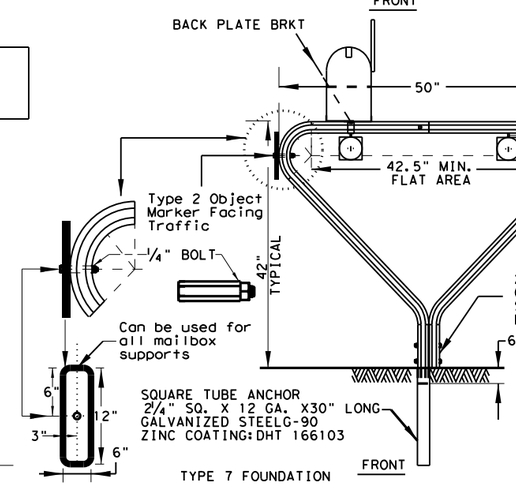












DOUBLE AND MULTIPLE MAILBOX MOUNT

FOR SUPPORT/FOUNDATION DETAILS SEE SHEET 3 OF 4
FOR DHT NUMBERS SEE SHEET 4 OF 4

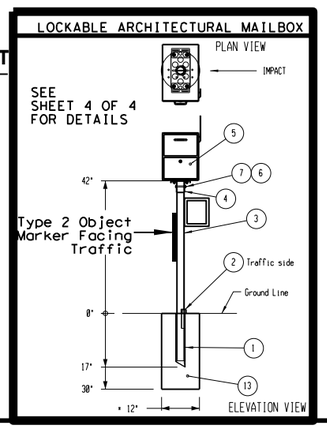
MULTIPLE MAILBOX MOUNT

INDEX OF MAILBOX DETAIL SHEETS

NEWSPAPER RECEPTACLE

A light weight receptacle for newspaper delivery can be attached to mailbox posts as shown on this page if the receptacle:

- Does not touch the mailbox.
- Does not present a hazard to traffic or delivery of the mail.
- Does not extend beyond the front of the mailbox.
- Does not display advertising, except the publication title.
- Newspaper receptacles on separate supports are prohibited.



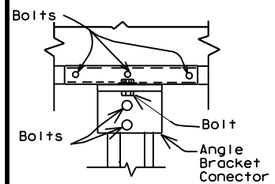
SHEET 1 OF 4

Texas Department of Transportation — Maintenance Division Standard

MAILBOX MOUNTING AND SPACING

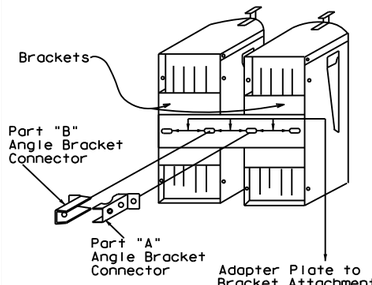
MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK: JEO	DW:	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS: Added additional newspaper receptacle for double mailbox support	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		77



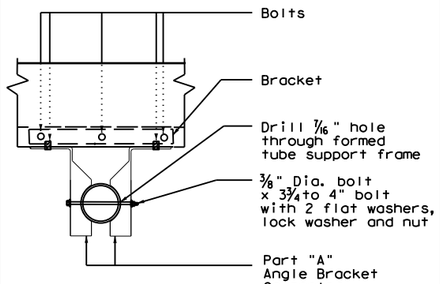
For bolt sizes see details below for "SMALL MAILBOX" and "MEDIUM AND LARGE MAILBOXES"

SINGLE MAILBOX

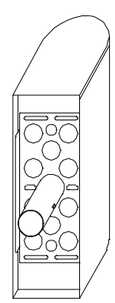


(Not permitted for Large Mailboxes)

DOUBLE MAILBOX

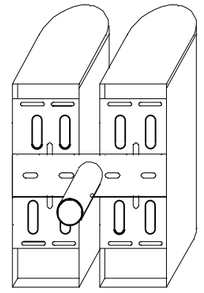


MULTIPLE MAILBOX



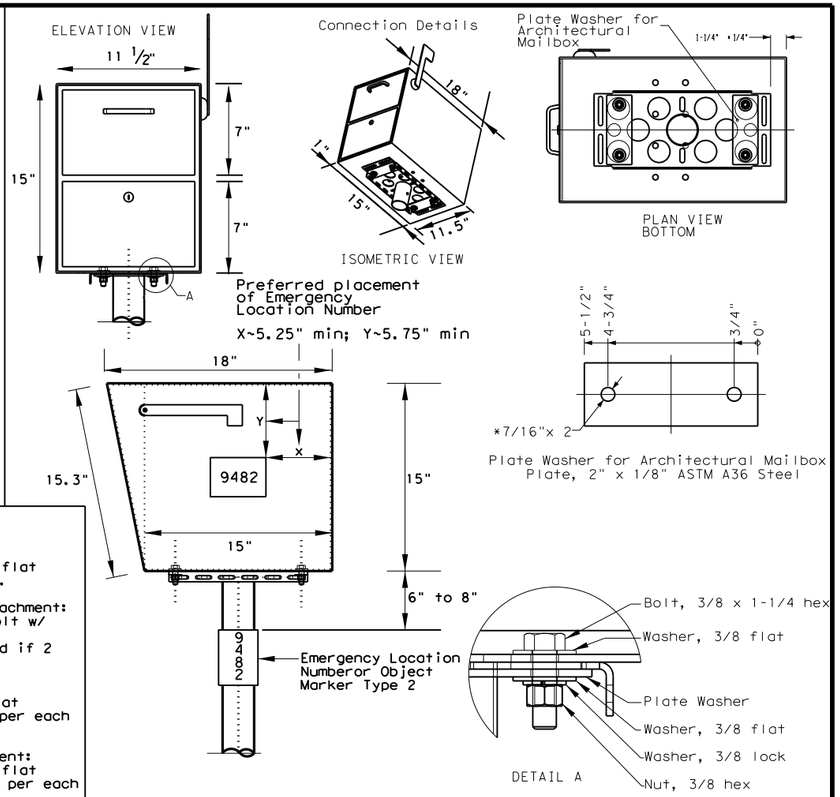
To be used with 2⅜" OD RR or thinwall Steel posts.

WELDED SINGLE MAILBOXBRACKET

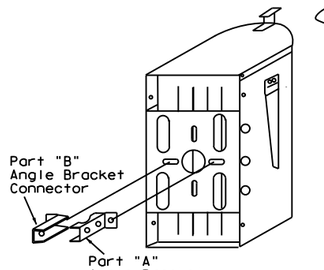


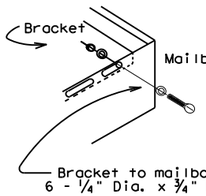
To be used with thinwall Steel posts. Not to be used with RR posts.

WELDED DOUBLE MAILBOX BRACKET WITHADAPTER PLATE



LOCKABLE ARCHITECTURAL MAILBOX CONNECTION DETAILS



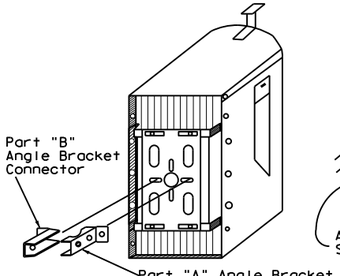


Bracket to mailbox attachment: 6 - ¼" Dia. x ¾" bolt w/ 2 flat washers and nut per each bolt.

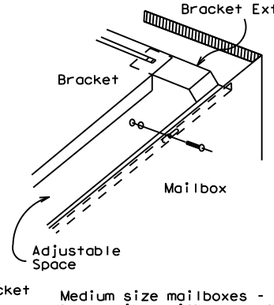
Angle to bracket attachment: 2 - ⅜" Dia. x ¾" bolt with 2 flat washers, lock washer and nut per each bolt.

Angle to 2 - ⅜" Dia. x 2½" bolt with 2 flat washers, lock washer and nut per each bolt.

SMALL MAILBOX



Use both Parts "A" and "B" Angle Bracket Connectors for Winged Channel Posts



Bracket to mailbox attachment: 6 - ¼" Dia. x ¾" bolt w/2 flat washers and nut per each bolt.

Bracket to bracket extension attachment: 2 - ¼" Dia. x ¾" carriage bolt w/ flat washer, lock washer and nut per bolt (4 bolts required if 2 bracket extensions are used).

Angle to bracket attachment: 2 - ⅜" Dia. x ¾" bolt w/2 flat washers, lock washer and nut per each bolt.

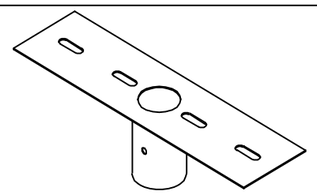
Angle to mailbox support attachment: 2 - ⅜" Dia. x 2½" bolt w/2 flat washers, lock washer, and nut per each bolt.

Medium size mailboxes - one extension bracket
Large size mailboxes - two extension brackets

MEDIUM AND LARGE MAILBOXES

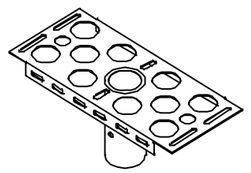
GENERAL NOTES

1. Connecting hardware detailed on this sheet is for the hardware that the Department stocks at the Regional Warehouses. This hardware is available to the contractor only when so stated elsewhere in the plans or specification.
2. Hardware for mounting mailboxes to the support/foundation furnished by industry should be used when shown on the Maintenance Divisions "Approved Products List." Only mailbox hardware that have been crash tested in accordance with NCHRP Report 350, will be on the approved list.
3. Hardware furnished by industry shall be erected in accordance with the manufacturer's recommendation.
4. Bracket and bracket extension shall be constructed of 14 gauge galvanized steel sheet metal.
5. The angles, brackets and adapter plates shall be constructed of 12 gauge galvanized steel sheet metal.
6. Items with evidence of damage to the galvanized coating or wet storage stains (white rust) will not be accepted.



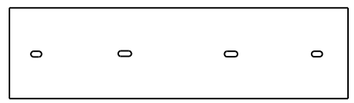
DHT 162323

For use with galvanized thinwall steel posts DHT # 143426 or powder-coated thinwall steel post DHT # 162911.



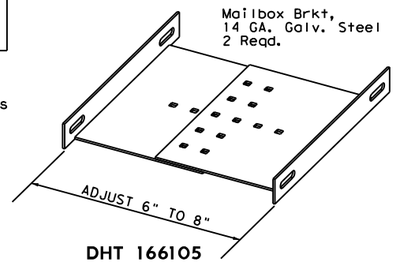
DHT 161443

For use with RCR post DHT # 161442 or galvanized thinwall steel post DHT # 143426 or powder-coated thinwall steel post. DHT # 162911.

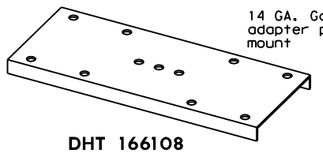


DHT #3789

Used for mounting two Mailboxes on the same post.

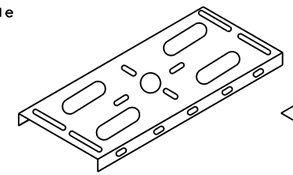


DHT 166105



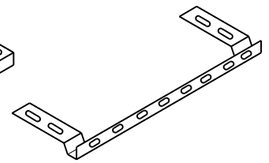
14 GA. Galv. Steel adapter plate for double mount

DHT 166108



DHT 148939

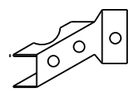
Mailbox Bracket



DHT 148938

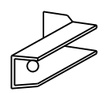
Used for extending 6" wide bracket to attach larger mailboxes.

Bracket Extension



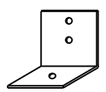
DHT 159489

Part "A" Angle Bracket Connector



DHT 159490

Part "B" Angle Bracket Connector



DHT 2917

Angle Bracket For Temporary Mailbox

HARDWARE AT TXDOT REGIONAL WAREHOUSES

Brackets and adapter plate shown in this section should be available to the Contractor when stated elsewhere in plans or specifications.

See Table of Applicable DHT Numbers on sheet 4 of 4 for DHT description and unit of measure.

SHEET 2 OF 4

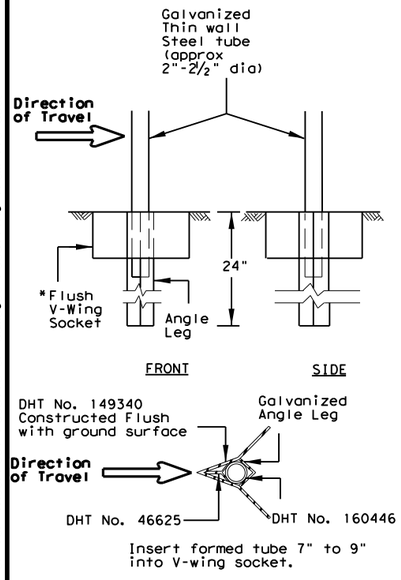
Texas Department of Transportation

Maintenance Division Standard

MAILBOX BRACKET CONNECTING DETAILS

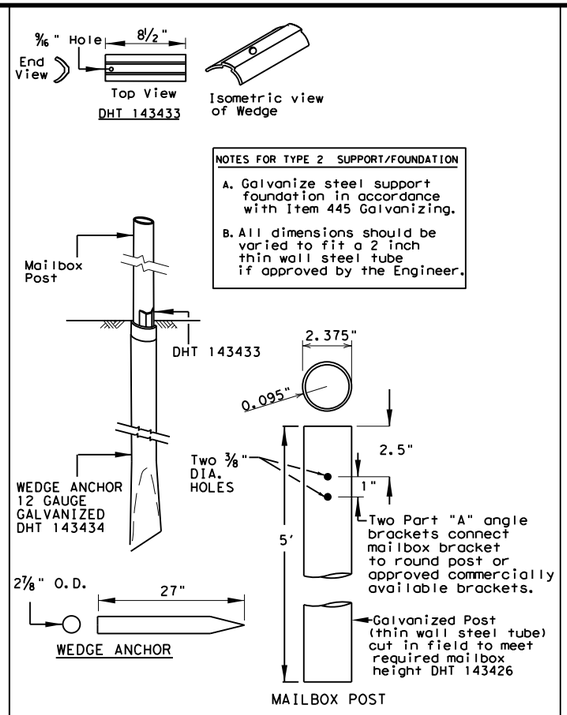
MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK:	DW: JEO	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS ADDED DHT 163730	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		78



TYPE 1 SUPPORT/FOUNDATION

THIN WALL STEEL TUBE w/ V-LOC ANCHORAGE



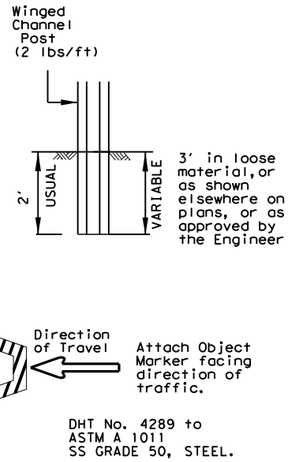
NOTES FOR TYPE 2 SUPPORT/FOUNDATION

A. Galvanize steel support foundation in accordance with Item 445 Galvanizing.

B. All dimensions should be varied to fit a 2 inch thin wall steel tube if approved by the Engineer.

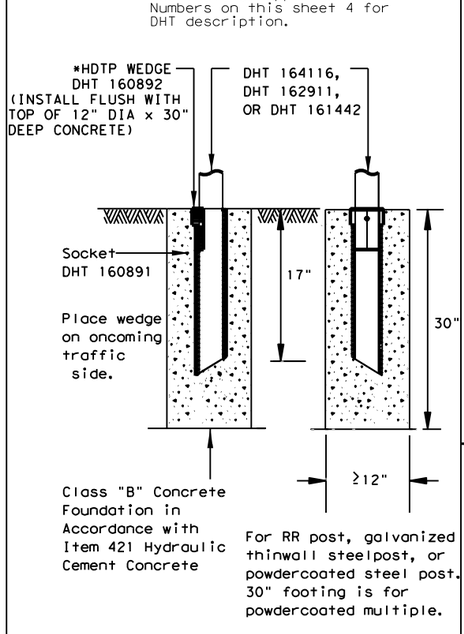
TYPE 2 SUPPORT/FOUNDATION

THIN WALL STEEL TUBE w/ WEDGE ANCHOR SYSTEM



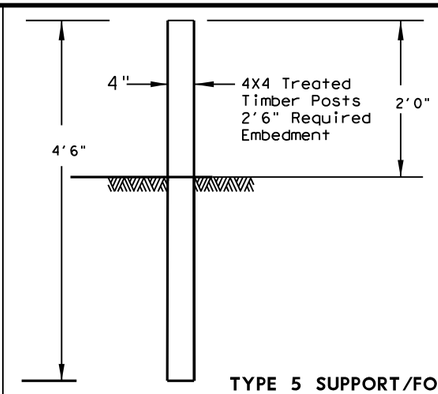
TYPE 3 SUPPORT/FOUNDATION

WINGED CHANNEL POST



TYPE 4 SUPPORT/FOUNDATION

FOR WHITECOATED STEEL POST, MULTIPLE POST, AND RECYCLED RUBBER.

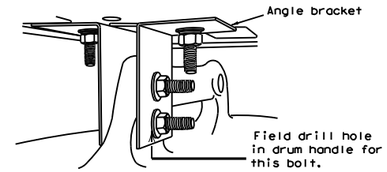


TYPE 5 SUPPORT/FOUNDATION

FOR ONE PIECE MOLDED PLASTIC MAILBOX

ONE PIECE MOLDED PLASTIC MAILBOXES

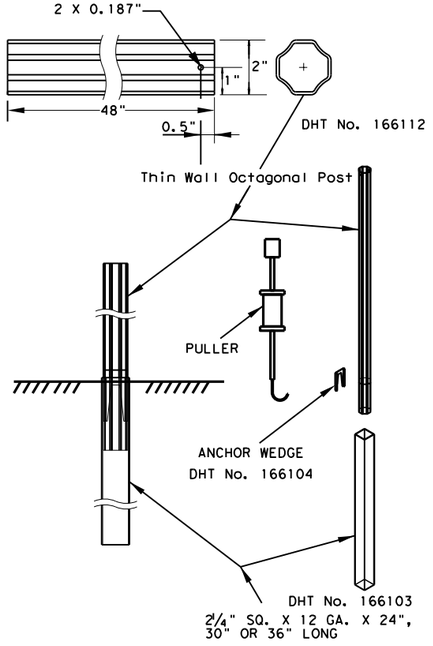
Molded Plastic Mailboxes shall be installed on 4"x4" treated timber posts only. The use of steel pipe or structural tubing in place of timber post is prohibited.



Placed on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

TYPE 6 TEMPORARY MAILBOX SUPPORT

CONNECTION DETAIL



TYPE 7 MAILBOX SUPPORT/FOUNDATION

CONNECTION DETAIL

GENERAL NOTES

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. type 1, 2, 3, 4 or 7 supports or foundation can be used for single or double mailbox installations. The RCR post should be used only for a single installation with a small mailbox. The Type 5 support/foundation is used for the single molded plastic mailbox. The Type 4 support/foundation is used for the 2.375" O.D. RR post, thin wall steel post, and white multiple mailbox post.
4. The Type 1 or type 7 support/foundation can be used for a multiple mailbox mount.
5. The Type 4 support should be used with thin wall steel pipe for the medium, large and double mailbox installations.
6. Use a concrete footing as shown or when directed. Concrete footing will be required when soils do not hold the support/foundations in a stable condition.

MB-(X) ASSM TY (XXX) (X) (XX) (OPTIONAL)

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- SP = Single Plastic

Type of Post
- WC = Winged Channel Post
- RR = Recycled Rubber
- TWW = Thin Walled White Tubing
- TWG = Thin Walled Galvanized Tubing
- TIM = Timber

Type of Foundation
- Ty 1 = V-Loc
- Ty 2 = Wedge Anchor Steel System
- Ty 3 = Winged Channel post
- Ty 4 = Wedge Anchor Plastic System
- Ty 5 = 4 X 4 Post
- Ty 7 = Wedge Anchor

Type of Bracket
- AB = Angle Bracket.
- TB = 2.375" Tube Bracket

DOUBLE AND LARGE MAILBOXES MUST BE ON STEEL POST.

*HDTP: High density thermoplastic polyesters

SHEET 3 OF 4

Texas Department of Transportation — Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB-15(1)

FILE: MB14(1).DGN	DN: JEO	CK:	DW: JEO	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		79

LOCKABLE ARCHITECTURAL MAILBOX

SINGLE-MOUNT INSTALLATION PARTS			
#	PART NAME	PART/DHT #	QTY
1	SOCKET, TYPE 4 FOUNDATION	160891	1
2	WEDGE FOR TYPE 4 FOUNDATION	160892	1
3	THIN-WALL WHITE STEEL TUBE 2.375 OD	162911	1
4	BRACKET FOR ATTACHING MAILBOX	161443	1
5	ARCHITECTURAL MAILBOX	SEE NOTE	1
6	NUT, 5/16" HEX	NUT, 5/16" HEX	1
7	BOLT, 5/16 X 3 HEX	GRADE 5	1
8	PLATE WASHER FOR ARCHITECTURAL MAILBOX	SEE SEE SHEET 2	2
9	WASHER, 3/8 FLAT		8
10	WASHER, 3/8 LOCK		4
11	NUT, 3/8 HEX		4
12	BOLT, 3/8 X 1-1/4 HEX	GRADE 5	4
13	CONCRETE, CLASS B (2000 PSI)		1

LOCKABLE ARCHITECTURAL MAILBOX DETAILS

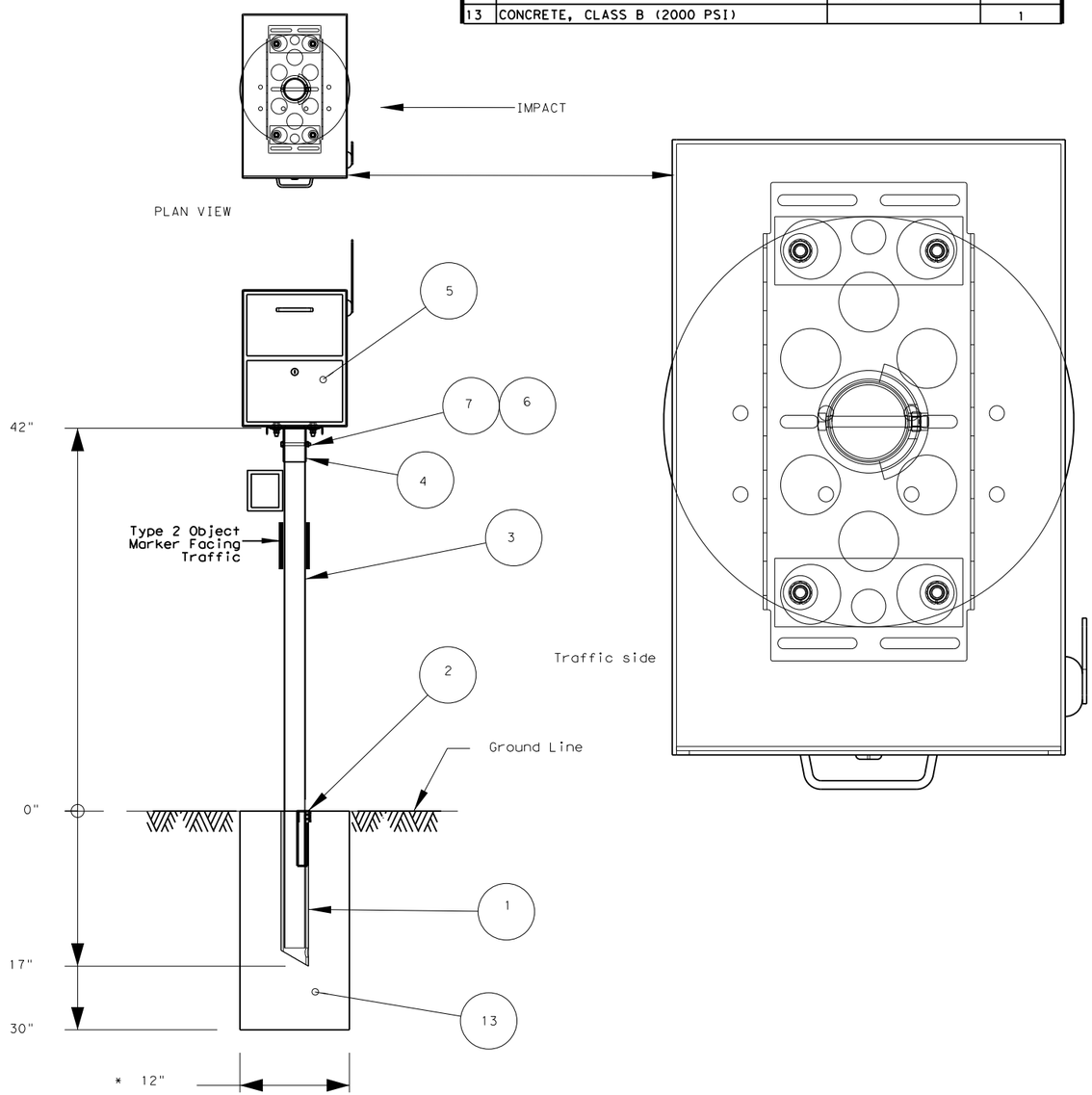


TABLE OF APPLICABLE DHT NUMBERS	
DHT NUMBER	DESCRIPTION
	FOUNDATIONS
46625	WEDGE FOR V-WING SOCKET FOR TYPE 1 FOUNDATION
149340	V-WING SOCKET FOR TYPE 1 FOUNDATION
143433	WEDGE FOR TYPE 2 FOUNDATION
143434	ANCHOR FOR TYPE 2 FOUNDATION
166103	ANCHOR FOR TYPE 7 FOUNDATION
160891	SOCKET FOR TYPE 4 FOUNDATION
160892	WEDGE FOR TYPE 4 FOUNDATION
166104	WEDGE FOR TYPE 7 FOUNDATION
	POSTS
4289	WINGED CHANNEL MAILBOX POST
149339	MULTIPLE MAILBOX POST (GALVANIZED TUBING)
164116	MULTIPLE MAILBOX POST (WHITE COATED)
166114	MULTIPLE MAILBOX POST (WHITE COATED OCTAGONAL)
166153	MULTIPLE MAILBOX POST (GALVANIZED OCTAGONAL)
161442	RECYCLED RUBBER POST. FOR SMALL MAILBOX ONLY
143426	THIN-WALL GALVANIZED STEEL TUBE 2.375" OUTER DIAMETER
162911	THINWALL WHITE STEEL TUBE 2.375" OUTER DIAMETER
166152	SINGLE OR DOUBLE THIN-WALL MAILBOX POST GALVANIZED 2" OCTAGONAL
166112	SINGLE OR DOUBLE THIN-WALL MAILBOX POST WHITECOATED 2" OCTAGONAL
	REFLECTIVE SHEETING
161812	REFLECTIVE SHEETING FOR EMERGENCY LOCATION NUMBER PANEL
	CONNECTING HARDWARE
2917	ANGLE BRACKET USED FOR TEMPORARY MAILBOX SUPPORT
166105	BRACKET FOR SINGLE MOUNTING OF MAILBOXES (MOUNTING KIT)
3789	PLATE FOR DOUBLE MOUNTING OF MAILBOXES
166108	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES (MOUNTING KIT)
166111	BRACKET FOR MULTIPLE MOUNTING OF MAILBOXES (MOUNTING KIT)
148939	BRACKET FOR ATTACHING SMALL OR MEDIUM SIZE MAIL BOX
148938	EXTENDER TO BRACKET FOR ATTACHING LARGE MAILBOX
159489	ANGLE BRACKET PART A
159490	ANGLE BRACKET PART B
162323	BRACKET FOR DOUBLE MOUNTING OF MAILBOXES ON THINWALL STEEL POST, GALVANIZED OR POWDERCOATED.
161443	BRACKET FOR ATTACHING MAILBOX TO RECYCLED RUBBER POST AND TO MULTIPLE WHITE MAILBOX POST
158358	CASTING (NEWSPAPER RECEPTACLE BRACKET)
163731	U-BOLT (NEWSPAPER RECEPTACLE BRACKET)
160698	BOLT;HEX HEAD, GALV;3/8"DIA X 3/4"L HD, W/2-FLAT WASHERS
163750	BOLT;HEX HEAD, GALV;3/8" X 1-1/2, 16 NC, W/WASHERS
160701	BOLT;HEX HEAD, GALV;3/8"DIA X 2-1/2"L, HD, W/2-FLAT WASHERS
163730	BOLT;HEX HEAD, GALV;3/8" X 3-1/2", NC, W/NUT, 2 FLAT WASHERS
160699	BOLT;HEX HEAD, GALV;3/8"DIA X 3-3/4"L HD, W/2-FLAT WASHERS
160700	BOLT;HEX HEAD, GALV;3/8"DIA X 4"L HD, W/2-FLAT WASHERS

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Texas Department of Transportation — Maintenance Division Standard

DHT NUMBERS TABLE

MB-15(1)

FILE:MB14(1).DGN	DN:	CK:	DW:	CK:
©TxDOT APRIL 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		80

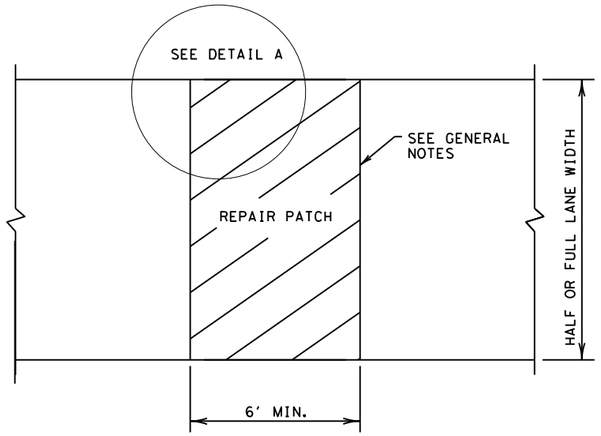
DATE: 6/14/2021
FILE: c:\txdot\pw_online\txdot5\solomon.bayou\d0450706\repcp14.dgn

TABLE NO.1 STEEL BAR SIZE AND SPACING						
TYPE PAVEMENT	SLAB THICKNESS AND BAR SIZE		LONGITUDINAL*		TRANSVERSE*	
			REGULAR BARS	TIEBARS	BARS	TIEBARS
	T (IN.)	BAR SIZE	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)	SPACING (IN.)
CRCP	6.0	#5	7.5	7.5	24	24
	6.5		7.0	7.0		
	7.0		6.5	6.5		
	7.5		6.0	6.0		
	8.0	#6	9.0	9.0	24	24
	8.5		8.5	8.5		
	9.0		8.0	8.0		
	9.5		7.5	7.5		
	10.0		7.0	7.0		
	10.5		6.75	6.75		
	11.0		6.5	6.5		
	11.5		6.25	6.25		
	≥12.0		6.0	6.0		
JRCP	<8.0	#5	24.0	12.0	24	24
	≥8.0	#6	24.0	12.0	24	24
CPCD	<8.0	#5	NONE	12.0	NONE	24
	≥8.0	#6	NONE	12.0	NONE	24

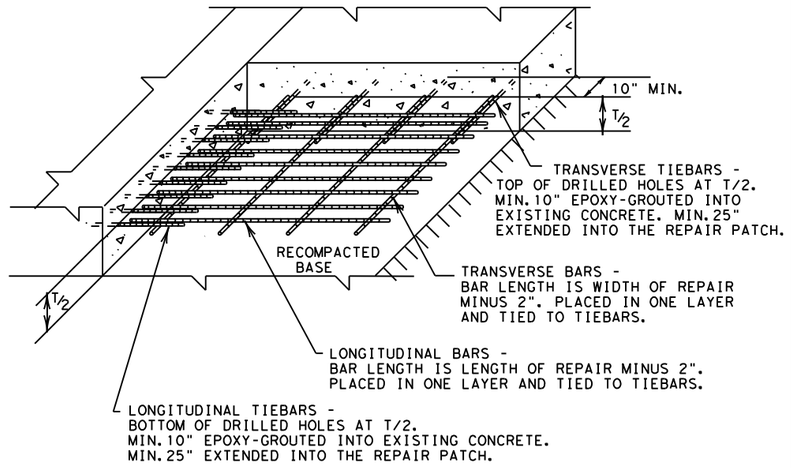
* USE 12" SPACING AS FIRST AND LAST SPACING AT END OR SIDE FOR ALL BARS.

GENERAL NOTES

1. ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
2. MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
3. FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
4. AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
5. ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
6. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
7. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



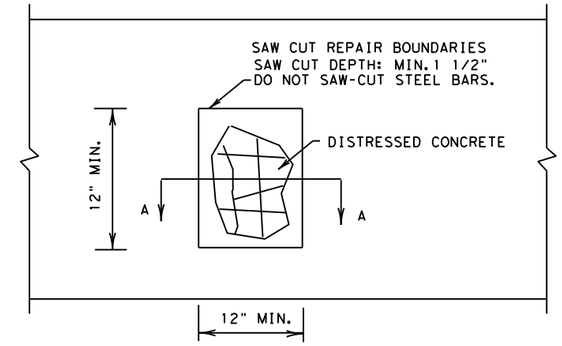
PLAN VIEW



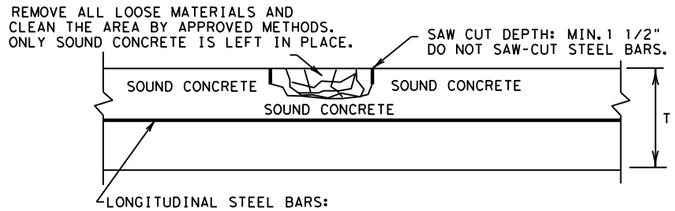
DETAIL A
GROUTED TIEBARS & REINFORCEMENT

GENERAL NOTES

1. ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
2. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
3. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



PLAN VIEW



LONGITUDINAL STEEL BARS:

*REPAIR AREAS MAY BE ADJUSTED AFTER REMOVING DISTRESSED CONCRETE. SWITCH THE HALF-DEPTH REPAIR TO FULL-DEPTH REPAIR IF EXPOSED EXISTING LONGITUDINAL BARS ARE DEFICIENT, AS APPROVED. COMPENSATION WILL BE MADE FOR UNEXPECTED VOLUMES OF REPAIR AREAS OR CHANGES IN SCOPE OF WORK.

*INCREASE THE REPAIR AREA AND PERFORM A FULL-DEPTH REPAIR AS DIRECTED IF LONGITUDINAL STEEL BARS WERE DAMAGED BY THE REMOVAL OPERATIONS. NO ADDITIONAL COMPENSATION WILL BE MADE.

SECTION A-A

HALF-DEPTH REPAIR

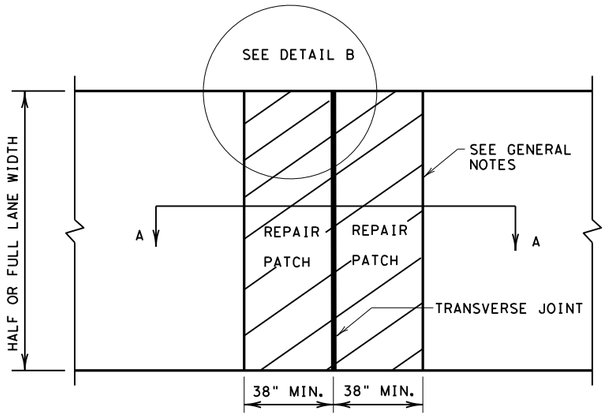
FULL-DEPTH REPAIR OF CRCP, JRCP, AND CPCD

Texas Department of Transportation | Design Division Standard

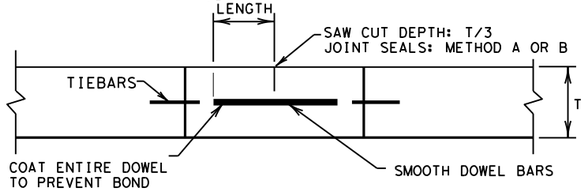
REPAIR OF CONCRETE PAVEMENT

REPCP-14

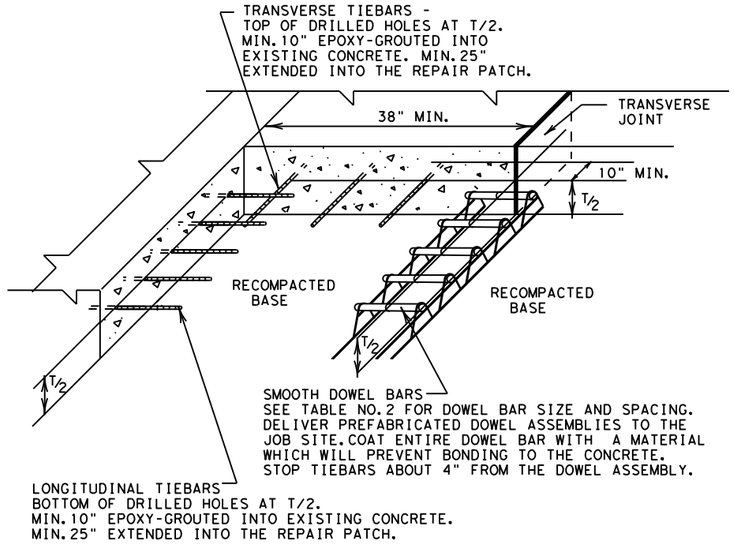
FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
© TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		81



PLAN VIEW



SECTION A-A



DETAIL B
GROUTED TIEBARS & DOWELS

GENERAL NOTES

1. ITEM 361, "REPAIR OF CONCRETE PAVEMENT" SHALL GOVERN FOR THIS WORK.
2. MULTIPLE PIECE TIEBARS SHALL BE USED WHEN THE REPAIR AREA MUST BE PLACED IN TWO STAGES DUE TO SEQUENCE OF CONSTRUCTION.
3. FULL DEPTH SAW CUTS SHALL BE MADE AROUND THE PERIMETER OF THE AREA TO BE REPAIRED. THE CUT SHALL BE MADE AT A RIGHT ANGLE TO THE PAVEMENT EDGE AND TO THE CENTER LINE OF THE PAVEMENT.
4. AT LEAST ONE LONGITUDINAL FULL DEPTH SAW CUT SHALL BE AT AN EXISTING LONGITUDINAL JOINT.
5. ADDITIONAL SAW CUTS MAY BE REQUIRED WITHIN THE AREA OF THE REPAIR TO FACILITATE REMOVAL OF THE CONCRETE OR TO ALLEVIATE BINDING OF THE FULL DEPTH SAW CUT AT THE REPAIR EDGE.
6. THE SAW CUTS WHICH EXTEND OUTSIDE THE AREA OF THE REPAIR WILL BE CLEANED AND FILLED WITH A CEMENTITIOUS GROUT APPROVED BY THE ENGINEER.
7. EXISTING LONGITUDINAL AND TRANSVERSE JOINTS REMOVED DUE TO REPAIR OPERATION SHOULD BE RESTORED IN ACCORDANCE WITH STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."
8. DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.

TABLE NO. 2 DOWELS (SMOOTH BARS)			
PAVEMENT THICKNESS (INCHES)	SIZE AND DIA.	LENGTH (IN.)	SPACING (IN.)
<10	#8 (1 IN.)	18.0	12.0
≥10	#10 (1 1/4 IN.)		

REPAIR OF TRANSVERSE JOINT OF CPCD

SHEET 2 OF 2

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REPAIR OF CONCRETE PAVEMENT

REPCP-14

FILE: repcp14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
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REVISIONS	0092	02	125	IH 45
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DATE: 6/14/2021
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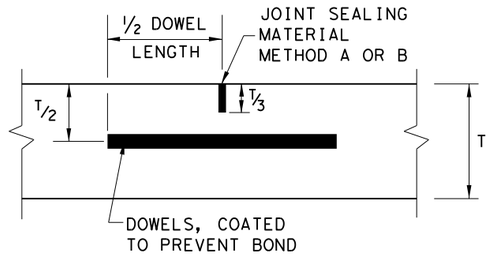
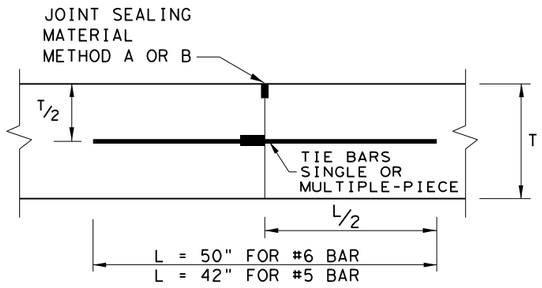
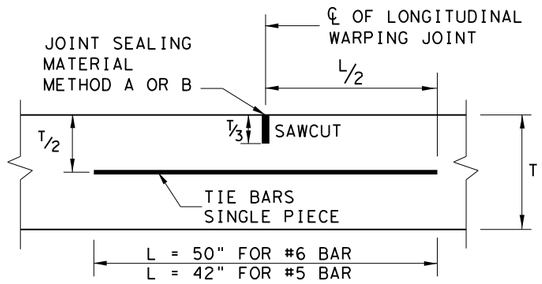


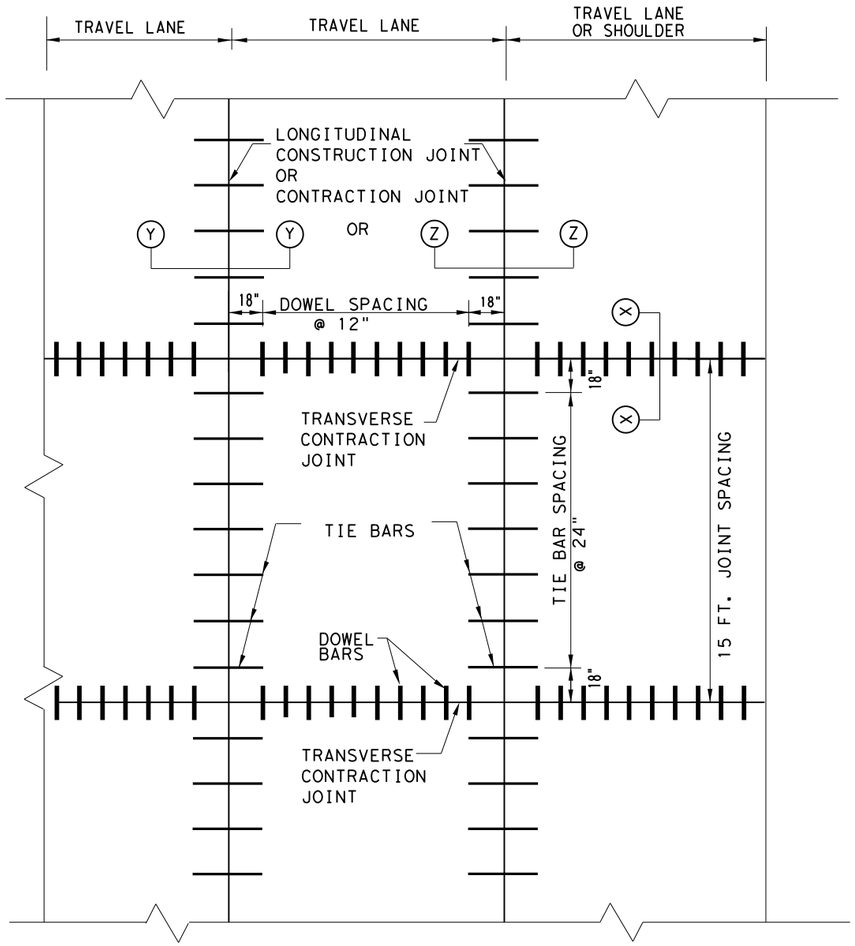
TRANSVERSE CONTRACTION JOINT
SECTION X-X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y-Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z-Z



TYPICAL PAVEMENT LAYOUT
PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT ARE NOT COVERED BY THIS STANDARD.
2. FOR FURTHER INFORMATION REGARDING THE PLACEMENT OF CONCRETE AND LOAD TRANSFER DEVICES REFER TO THE GOVERNING SPECIFICATION FOR "CONCRETE PAVEMENT".
3. THE SPACING BETWEEN TRANSVERSE CONTRACTION JOINTS SHALL BE 15 FT. UNLESS OTHERWISE SHOWN IN THE PLANS.
4. TRANSVERSE CONSTRUCTION JOINTS MAY BE FORMED BY USE OF METAL OR WOOD FORMS EQUAL IN DEPTH TO THE DEPTH OF PAVEMENT, OR BY METHODS APPROVED BY THE ENGINEER.
5. USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL THE FORMED JOINTS.
6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
7. THE JOINT BETWEEN OUTSIDE LANE AND SHOULDER SHALL BE A LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z) UNLESS OTHERWISE SHOWN IN THE PLANS. THE SAW CUT DEPTH FOR THE LONGITUDIANL CONTRACTION JOINT (SECTION Z-Z) SHALL BE ONE THIRD OF THE SLABTHICKNESS (T/3).
8. WHEN TYING CONCRETE GUTTER AT A LONGITUDINAL JOINT, THE TIE BAR LENGTH OR POSITION MAY BE ADJUSTED. PROVIDE 3 IN. OF CONCRETE COVER FROM THE BACK OF GUTTER TO THE END OF TIE BAR.
9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN. 10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
10. WHEN AN MONOLITHIIC CURB IS SPECIFIED, THE JOINT IN THE CURB SHALL COINCIDE WITH PAVEMENT JOINTS AND MAY BE FORMED BY ANY MEANS APPROVED BY THE ENGINEER.
11. DOWEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1/4 IN. HORIZONTALLY AND VERTICALLY UNLESS OTHERWISE SPECIFIED. WHERE DOWEL BAR BASKETS ARE USED, REMOVE THE SHIPPING WIRES.
12. THE DETAIL FOR JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."

TABLE NO. 1 DOWELS (SMOOTH BARS)		
SLAB THICKNESS T (IN.)	BAR DIA. AND LENGTH	AVERAGE SPACING (IN.)
6 to 7.5	1" X 18"	12
8 to 10	1 1/4" X 18"	12
>= 10.5	1 1/2" X 18"	12

TABLE NO. 2 TIE BARS (DEFORMED BARS)		
SLAB THICKNESS T (IN.)	BAR SIZE	AVERAGE SPACING (IN.)
6 to 7.5	#5	24
>= 8	#6	24

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CONCRETE PAVEMENT DETAILS
CONTRACTION DESIGN
T-6 to 12 INCHES

CPCD-14

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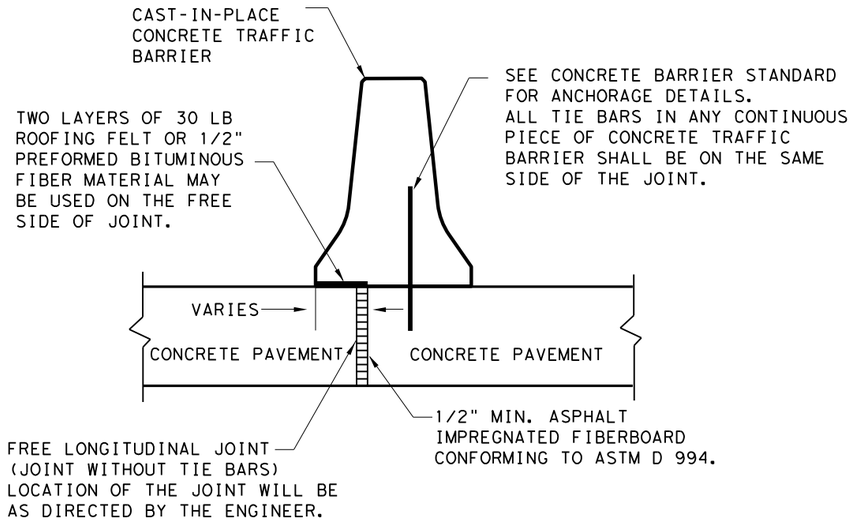
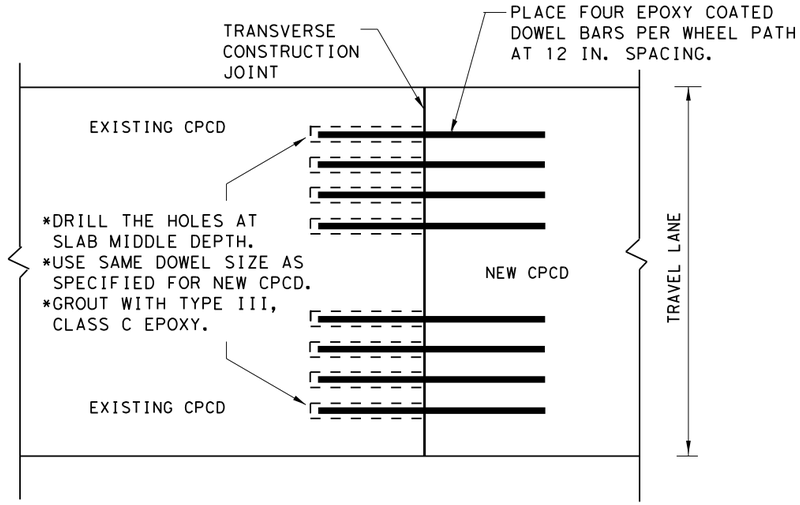


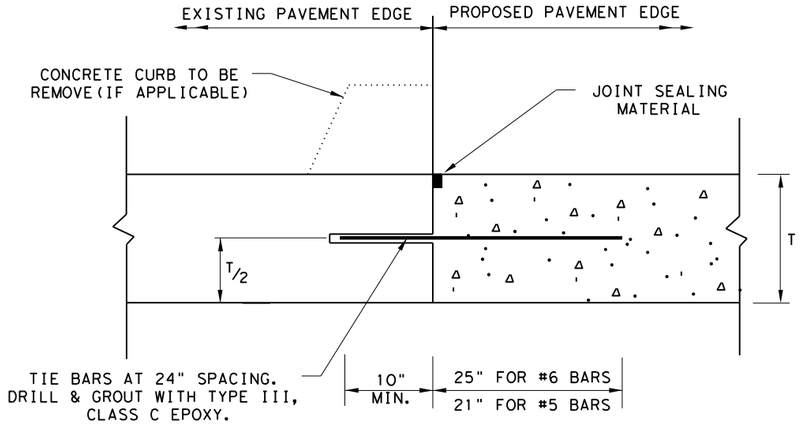
FREE LONGITUDINAL JOINT DETAIL



TRANSVERSE JOINT DETAIL

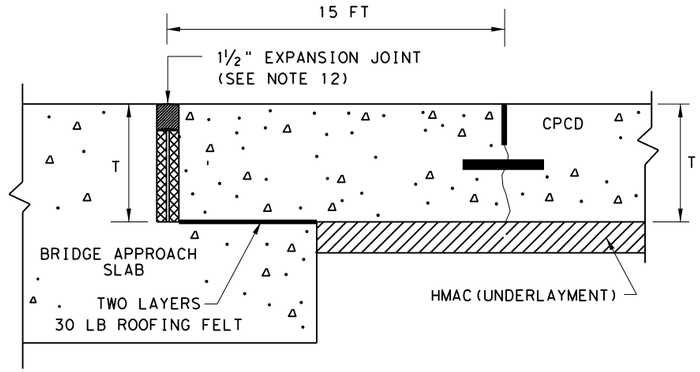
EXISTING CPCD TO NEW CPCD

PLAN VIEW (NOT TO SCALE)



1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIREMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 BARS FOR 8" AND THICKER SLABS, USE #5 BARS FOR LESS THAN 8" THICK SLABS.
3. THE TRANSVERSE JOINTS OF PROPOSED PAVEMENT SHALL COINCIDE WITH EXISTING PAVEMENT JOINTS UNLESS OTHERWISE SHOWN ON THE PLANS.

LONGITUDINAL WIDENING JOINT DETAIL



TRANSVERSE EXPANSION JOINT DETAIL

AT BRIDGE APPROACH

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

CONCRETE PAVEMENT DETAILS
CONTRACTION DESIGN
T-6 to 12 INCHES

CPCD-14

FILE: cpcd14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
©TxDOT: DECEMBER 2014	CONT	SECT	JOB	HIGHWAY
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	18	DALLAS		84

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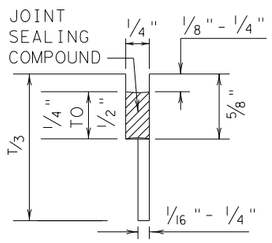
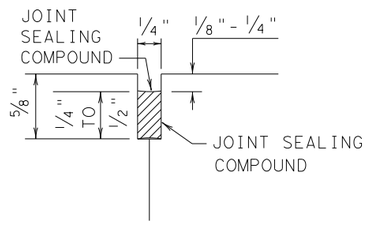
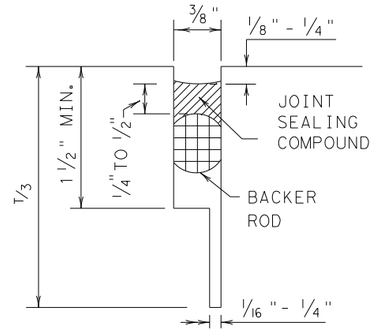
METHOD B: JOINT SEALING COMPOUND



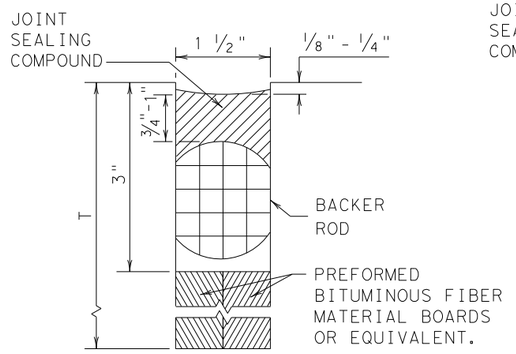
LONGITUDINAL SAWED CONTRACTION JOINT



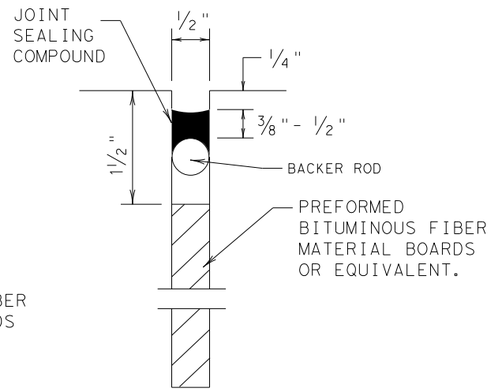
LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT

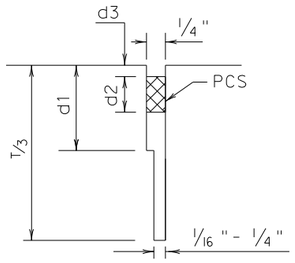


TRANSVERSE FORMED EXPANSION JOINT



FORMED ISOLATION JOINT

METHOD A: PREFORMED COMPRESSION SEALS (PCS)(DMS-6310 CLASS 6)



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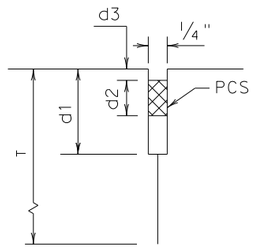
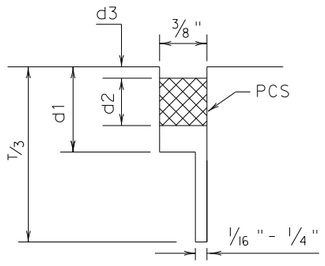
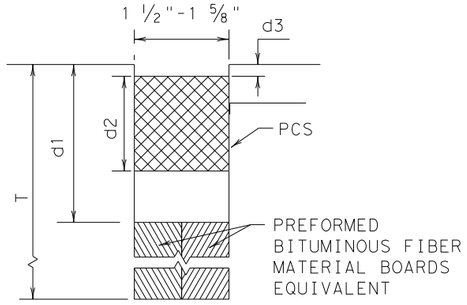


LONGITUDINAL CONSTRUCTION JOINT



TRANSVERSE SAWED CONTRACTION JOINT



TRANSVERSE FORMED EXPANSION JOINT

GENERAL NOTES

1. UNLESS OTHERWISE SHOWN IN THE PLANS, EITHER METHOD "A" OR METHOD "B" MAY BE USED.
2. THE LOCATION OF JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS.
3. THE JOINT RESERVOIR FOR SEALANT OR PCS SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR THE LONGITUDINAL AND TRANSVERSE CONSTRUCTION JOINTS AND THE SAWED JOINTS.
4. DIMENSIONS d1, d2, AND d3 SHOWN IN METHOD A SHALL BE IN ACCORDANCE WITH THE PREFORMED COMPRESSION SEAL MANUFACTURER'S RECOMMENDATION.
5. REFER TO DMS-6310 "JOINT SEALANTS AND FILLERS" FOR THE CLASSIFICATIONS.
6. FOR SAWED LONGITUDINAL JOINT, LONGITUDINAL OR TRANSVERSE CONSTRUCTION JOINT, USE JOINT SEALANT CLASS 5 OR 8 UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED.
7. FOR TRANSVERSE SAWED CONTRACTION, TRANSVERSE FORMED EXPANSION JOINT, AND ISOLATION JOINT USE JOINT SEALANT CLASS 5 OR 8 AT NEW JOINTS. USE JOINT SEALANT CLASS 4,5,7,OR 8 FOR MAINTAINING EXISTING JOINTS.
8. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS" OR ITEM 713 "CLEANING AND SEALING JOINTS AND CRACKS (CONCRETE PAVEMENT)".
9. ISOLATION JOINTS ACCOMMODATE HORIZONTAL AND VERTICAL MOVEMENTS THAT OCCUR BETWEEN A PAVEMENT AND A STRUCTURE. ISOLATION JOINTS MAY BE USED FOR BRIDGE ABUTMENTS, INTERSECTIONS, CURB AND GUTTER, OLD AND NEW PAVEMENTS, OR AROUND DRAINAGE INLETS, MANHOLES, FOOTINGS AND LIGHTING STRUCTURES.

Texas Department of Transportation

Design Division Standard

CONCRETE PAVING DETAILS

JOINT SEALS

JS-14

FILE: js14.dgn	DN: TxDOT	DN: HC	DW: HC	CK: AN
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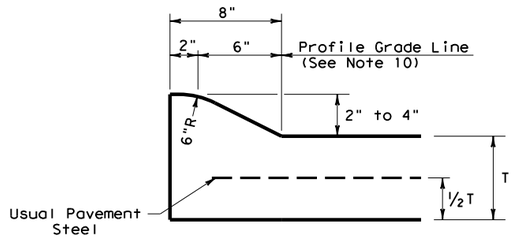
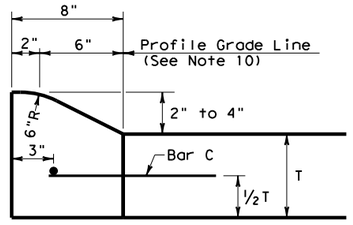


TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



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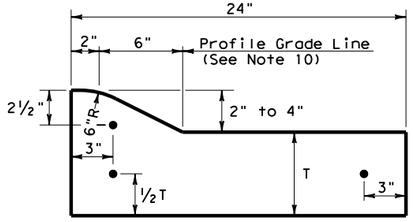
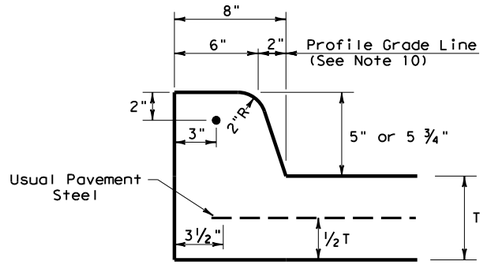
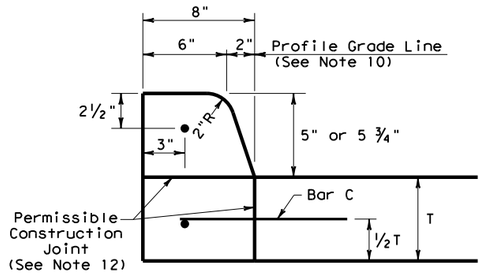


TYPE I CURB AND GUTTER
2" - 4" HEIGHT



TYPE II CURB (MONOLITHIC)
5" - 5 ¾" HEIGHT



TYPE II CURB
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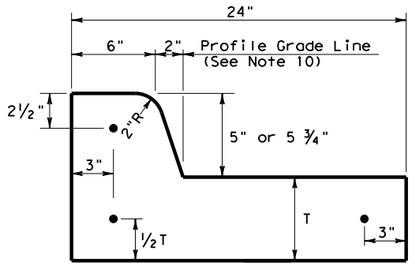
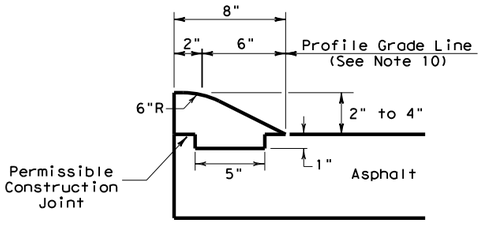
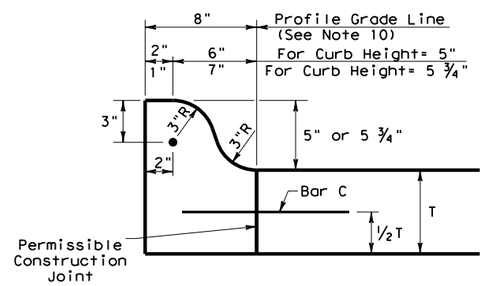


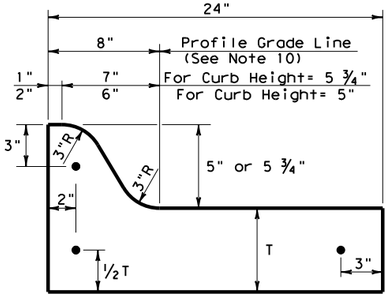
TYPE II CURB AND GUTTER
5" - 5 ¾" HEIGHT



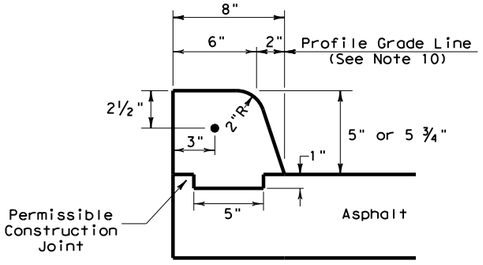
TYPE III CURB (KEYED)
2" - 4" HEIGHT



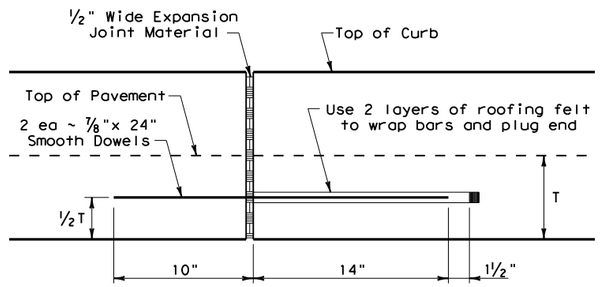
TYPE IIa CURB
5" - 5 ¾" HEIGHT



TYPE IIa CURB AND GUTTER
5" - 5 ¾" HEIGHT

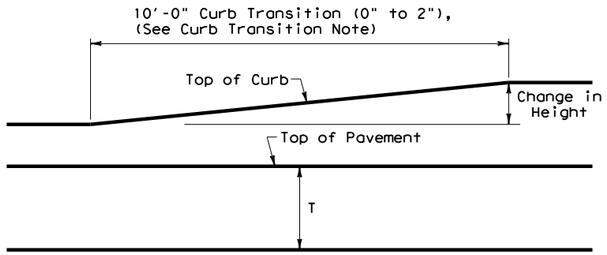


TYPE IV CURB (KEYED)
5" - 5 ¾" HEIGHT



EXPANSION JOINT DETAIL

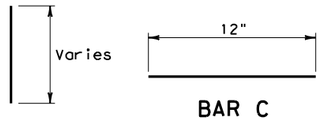
CURB TRANSITION NOTE:
Field conditions may require a longer or shorter transition, and shall be shown elsewhere in the plans, or as directed by the Engineer.



CURB TRANSITION
Note: To be paid for as Highest Curb

GENERAL NOTES

1. All materials and construction shall be in accordance with Item 529, "Concrete Curb, Gutter, and Combined Curb and Gutter."
2. Concrete shall be Class A.
3. When reinforcing bars are used, they shall be No.4 unless otherwise shown. The use of fiber reinforced concrete in lieu of reinforcing steel is acceptable. Use fibers meeting the requirements of DMS 4550, "Fibers for Concrete," and dose fibers in accordance with Material Producers List (MPL) "Fibers for Class A and B Concrete Applications."
4. Round exposed sharp edges with a rounding tool, to a minimum radius of ¼ inch.
5. All existing curbs and driveways to be removed shall be sawed or removed at existing joints.
6. Where concrete curb is to be placed on existing concrete pavement, Bar B may be drilled and the grouted in place, or may be inserted into fresh concrete.
7. Expansion and contraction joints shall be constructed to match pavement joints in all curbs and curb and gutter adjacent to jointed concrete pavement. Where placement of curb or curb and gutter is not adjacent to concrete pavement, expansion joints shall be provided at structures, curb returns at streets, and at locations directed by The Engineer.
8. Vertical and horizontal dowel bars and transverse reinforcing bars shall be placed at four feet C~C.
9. Dimension 'T' shown is the thickness of concrete pavement. When curb is installed adjacent to flexible pavement dimension 'T' is 8" maximum.
10. Usual profile grade line. Refer to typical sections and plan-profile sheets for exact locations.
11. One-half inch expansion joint material shall be provided where curb or curb and gutter is adjacent to sidewalk or riprap.
12. When horizontal permissible construction joints are used, the longitudinal pavement steel shall be placed in accordance with pavement details shown elsewhere in the plans. Reinforcing steel for curb section shall then conform to that required for concrete curb.
13. Bar B used as needed to support curb reinforcing steel during concrete placement.



BAR B

BAR C

Texas Department of Transportation

Design Division Standard

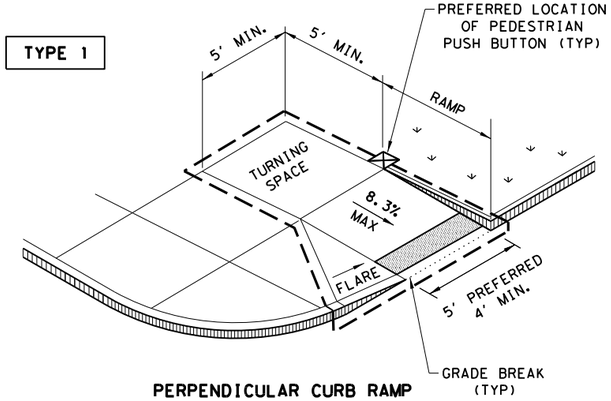
CONCRETE CURB AND CURB AND GUTTER

CCCG-21

FILE: cccg21.dgn	DN: TXDOT	CK: AN	DW: SS	CK: KM
© TxDOT: FEBRUARY 2021 REVISIONS	CONT	SECT	JOB	HIGHWAY
	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		86

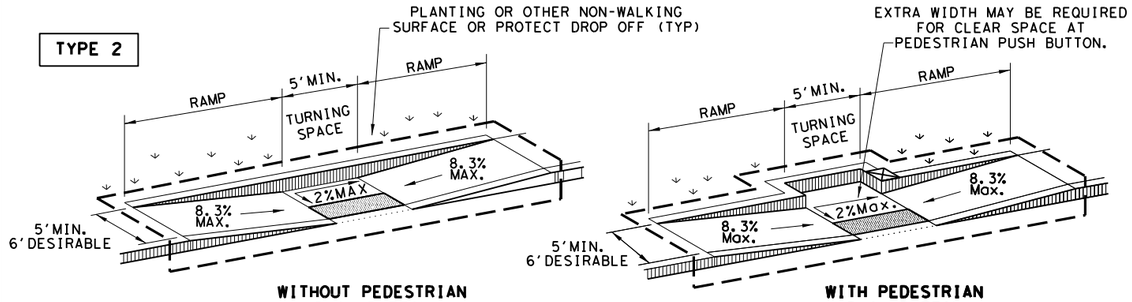
DATE: 6/14/2021
FILE: c:\txdot\pw_online\txdot5\solomon.bayou\d0450706\ped18.dgn

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

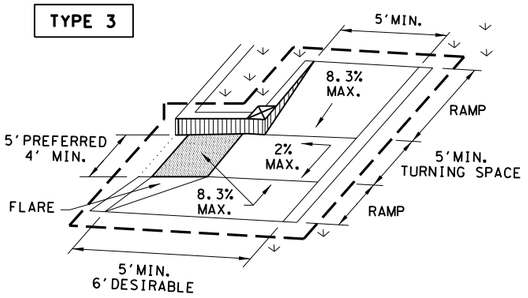


WITHOUT PEDESTRIAN PUSH BUTTON

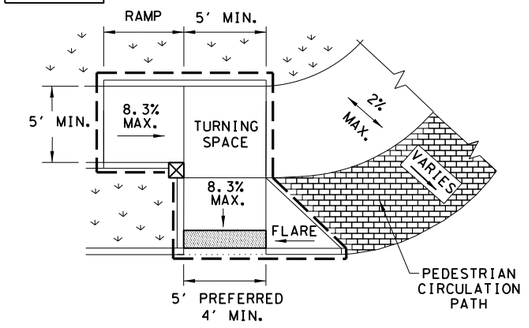
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

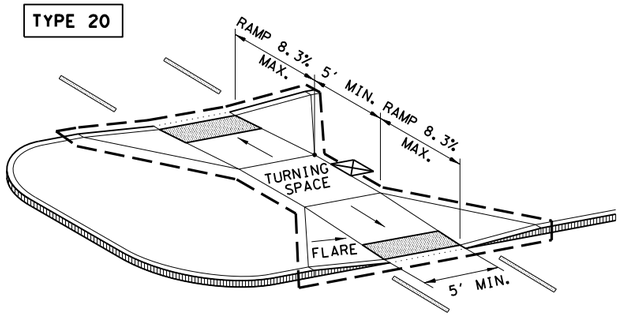


TYPE 6



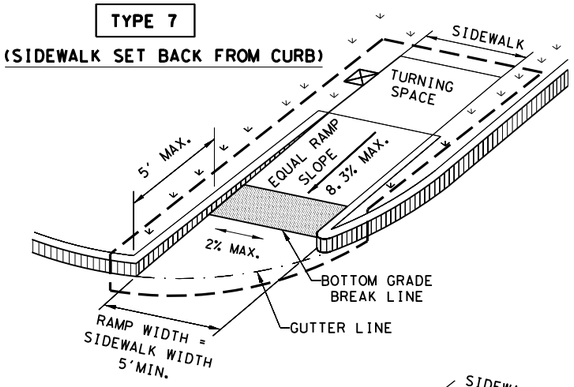
COMBINATION CURB RAMPS

TYPE 20

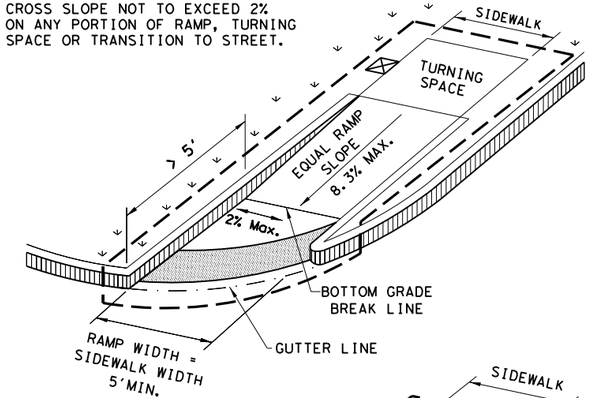


CURB RAMPS AT MEDIAN ISLANDS

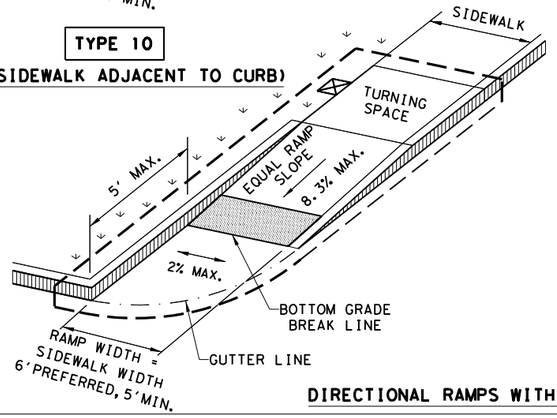
TYPE 7
(SIDEWALK SET BACK FROM CURB)



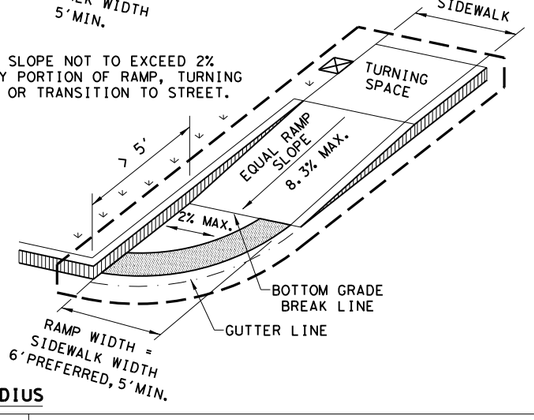
CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



TYPE 10
(SIDEWALK ADJACENT TO CURB)

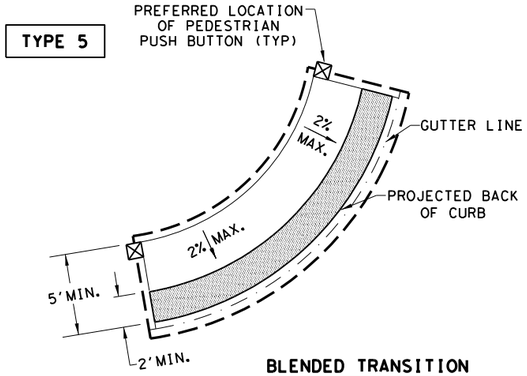


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

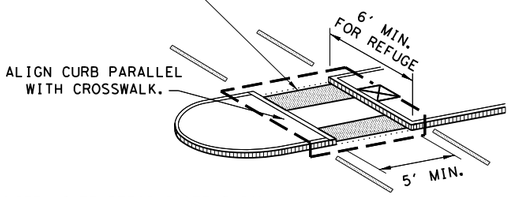
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

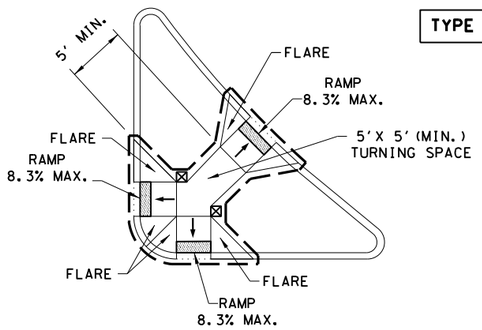
INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.

TYPE 21



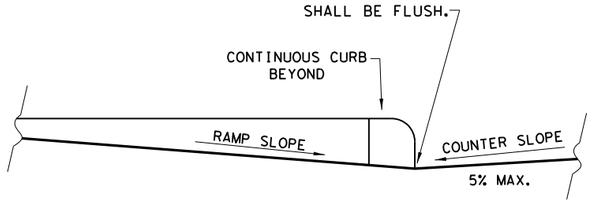
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS

BOTTOM GRADE BREAK OF CURB RAMP WILL NORMALLY BE AT GUTTER LINE. SURFACE SLOPES AT GRADE BREAKS SHALL BE FLUSH.



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

SEE GENERAL NOTES ON SHEET 2 OF 4 FOR MORE INFORMATION.

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	18	DALLAS		87

DATE: 6/14/2021
FILE: c:\txdot\pw_online\txdot5\solomon.boyou\d0450706\ped18.dgn

GENERAL NOTES

CURB RAMPS

1. Install a curb ramp or blended transition at each pedestrian street crossing.
2. All slopes shown are maximum allowable. Cross slopes of 1.5% and lesser running should be used. Adjust curb ramp length or grade of approach sidewalks as directed.
3. Maximum allowable cross slope on sidewalk and curb ramp surfaces is 2%.
4. The minimum sidewalk width is 5'. Where the sidewalk is adjacent to the back of curb, a 6' sidewalk width is desirable. Where a 5' sidewalk cannot be provided due to site constraints, sidewalk width may be reduced to 4' for short distances. 5'x 5' passing areas at intervals not to exceed 200' are required.
5. Turning Spaces shall be 5'x 5' minimum. Cross slope shall be maximum 2%.
6. Clear space at the bottom of curb ramps shall be a minimum of 4'x 4' wholly contained within the crosswalk and wholly outside the parallel vehicular travel path.
7. Provide flared sides where the pedestrian circulation path crosses the curb ramp. Flared sides shall be sloped at 10% maximum, measured parallel to the curb. Returned curbs may be used only where pedestrians would not normally walk across the ramp, either because the adjacent surface is planted, substantially obstructed, or otherwise protected.
8. Additional information on curb ramp location, design, light reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicalble standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

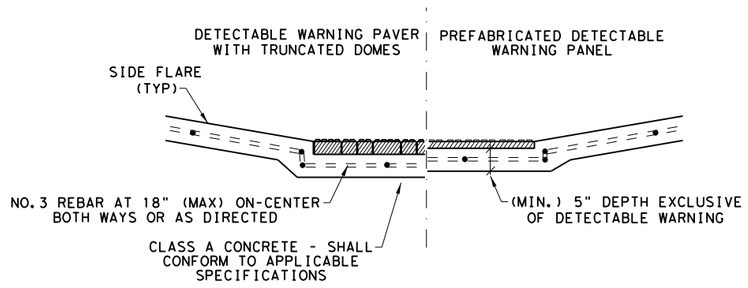
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

DETECTABLE WARNING PAVERS (IF USED)

25. Furnish detectable warning paver units meeting all requirements of ASTM C-936, C-33. Lay in a two by two unit basket weave pattern or as directed.
26. Lay full-size units first followed by closure units consisting of at least 25 percent (25%) of a full unit. Cut detectable warning paver units using a power saw.

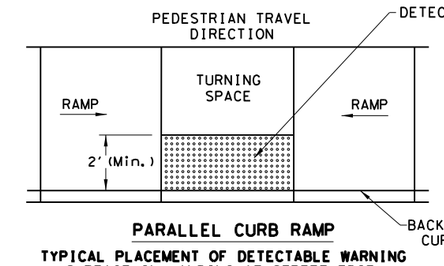
SIDEWALKS

27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items so as not to obstruct the pedestrian access route or clear ground space.
29. Street grades and cross slopes shall be as shown elsewhere in the plans.
30. Changes in level greater than 1/4 inch are not permitted.
31. The least possible grade should be used to maximize accessibility. The running slope of sidewalks and crosswalks within the public right of way may follow the grade of the parallel roadway. Where a continuous grade greater than five percent (5%) must be provided, handrails may be desirable to improve accessibility. Handrails may also be needed to protect pedestrians from potentially hazardous conditions. If provided, handrails shall comply with PROWAG R409.
32. Handrail extensions shall not protrude into the usable landing area or into intersecting pedestrian routes.
33. Driveways and turnouts shall be constructed and paid for in accordance with Item "Intersections, Driveways and Turnouts". Sidewalks shall be constructed and paid for in accordance with Item, "Sidewalks".
34. Sidewalk details are shown elsewhere in the plans.

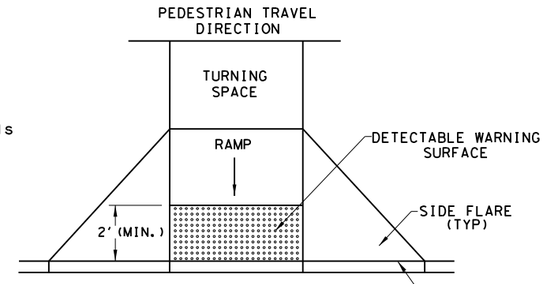


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

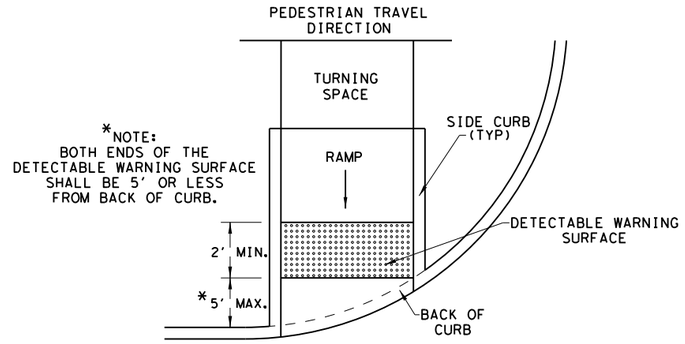
DETECTABLE WARNING SURFACE DETAILS



PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

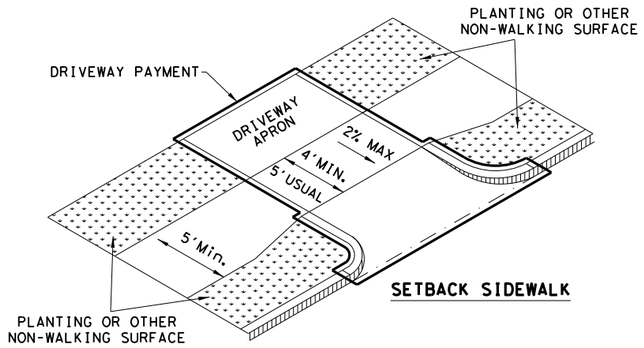
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

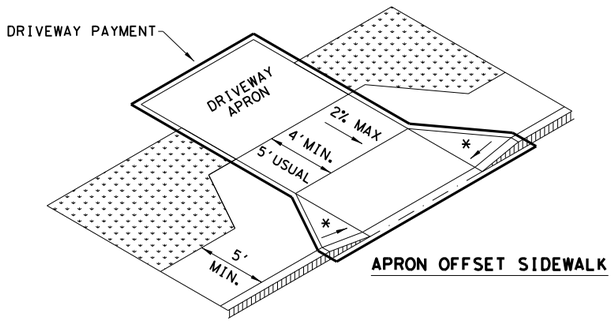
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0092	02	125		IH 45
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY			SHEET NO.
	18	DALLAS			88

DATE: 6/14/2021
FILE: c:\txdot\pw_online\txdot5\solomon.boyou\d0450706\ped18.dgn

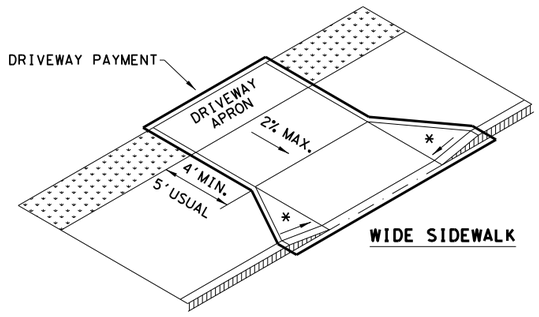
SIDEWALK TREATMENT AT DRIVEWAYS



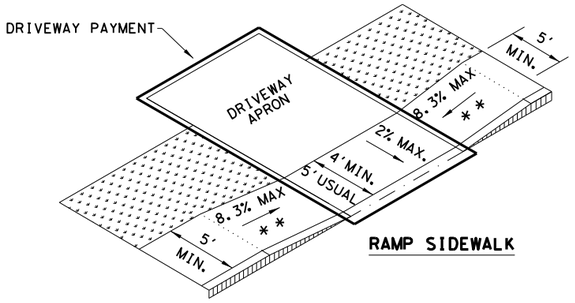
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

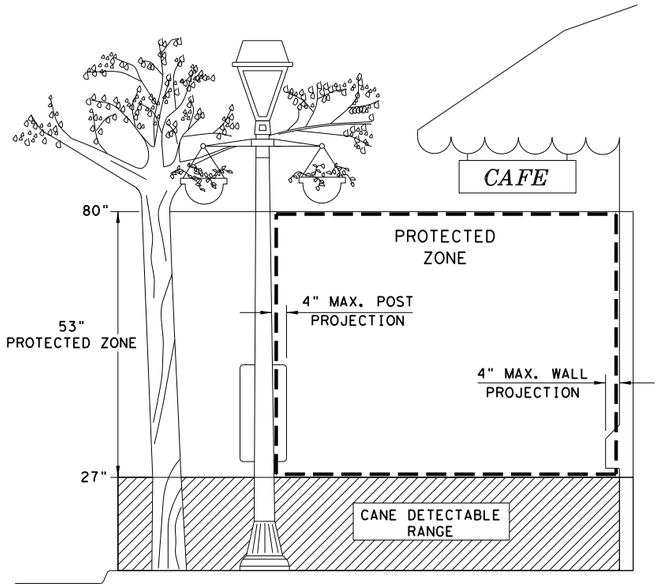


RAMP SIDEWALK

NOTES:

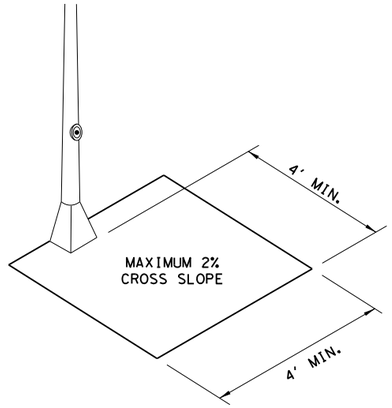
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

* * IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%. HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

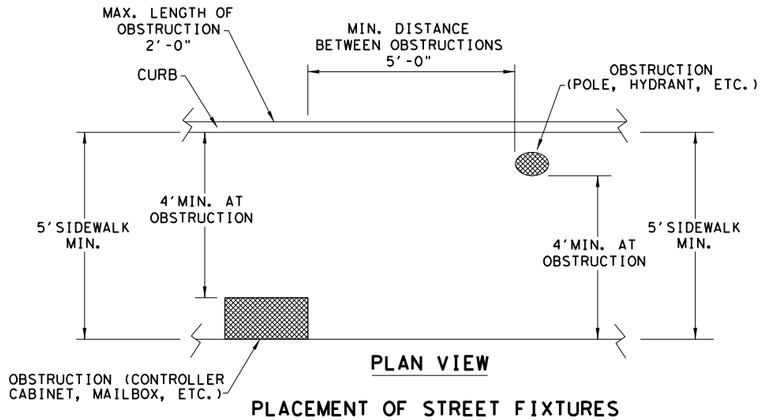


PROTECTED ZONE

NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



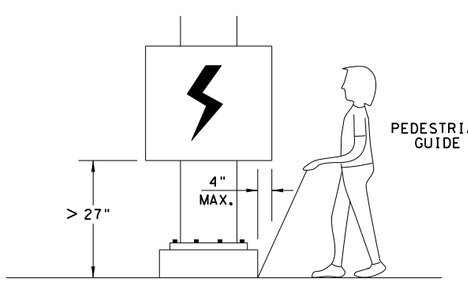
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



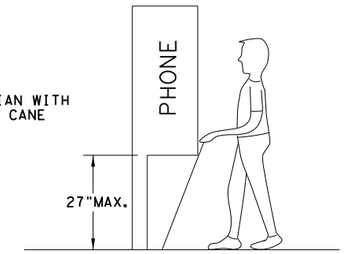
PLAN VIEW

PLACEMENT OF STREET FIXTURES

NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



WHEN AN OBSTRUCTION OF A HEIGHT GREATER THAN 27" FROM THE SURFACE WOULD CREATE A PROTRUSION OF MORE THAN 4" INTO THE PEDESTRIAN CIRCULATION AREA, CONSTRUCT ADDITIONAL CURB OR FOUNDATION AT THE BOTTOM TO PROVIDE A MAXIMUM 4" OVERHANG.



PROTRUDING OBJECTS OF A HEIGHT ≤ 27" ARE DETECTABLE BY CANE AND DO NOT REQUIRE ADDITIONAL TREATMENT.

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

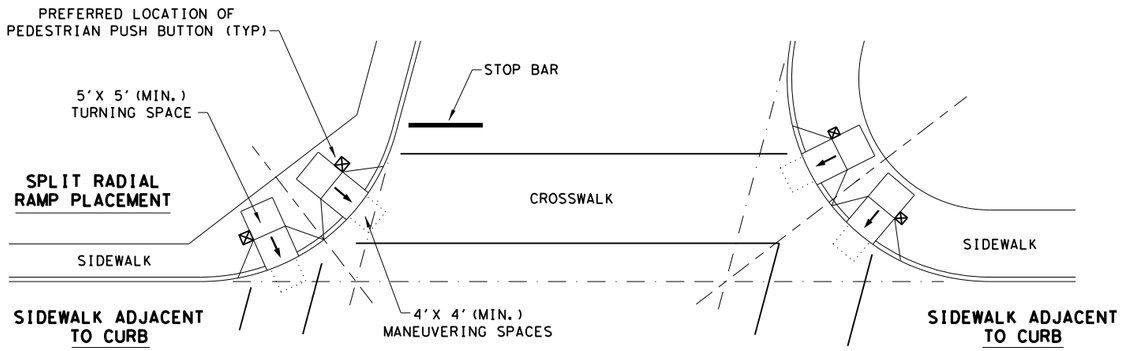
PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0092	02	125		IH 45
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY			SHEET NO.
	18	DALLAS			89

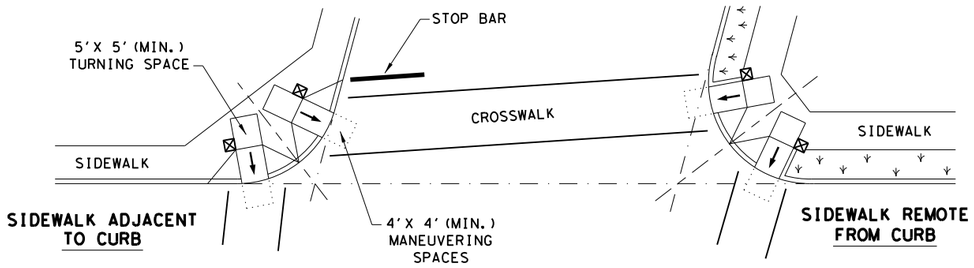
DATE: 6/14/2021
FILE: c:\txdot\pw_online\txdot5\solomon.bayou\d0450706\ped18.dgn

TYPICAL CROSSING LAYOUTS

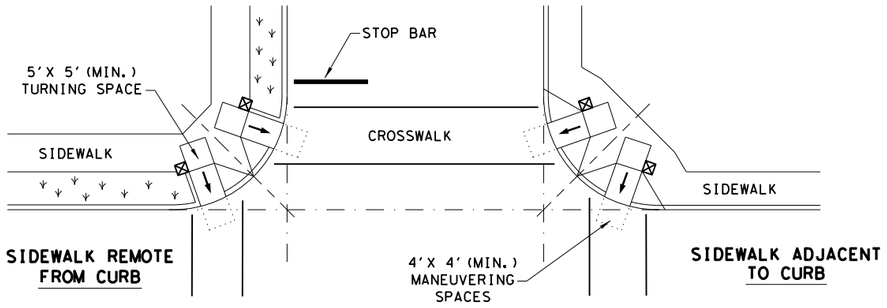
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



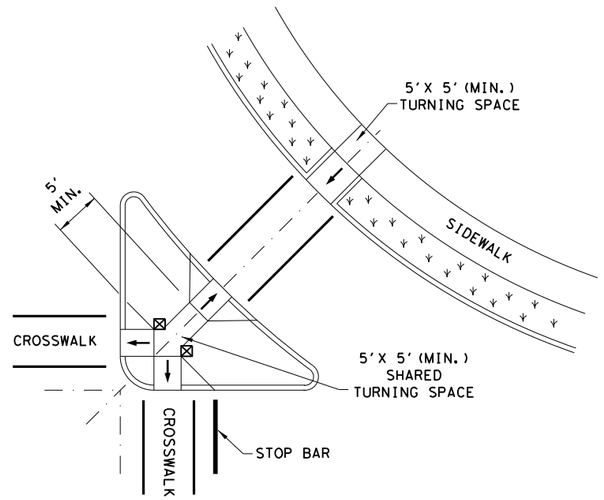
SKEWED INTERSECTION WITH "LARGE" RADIUS



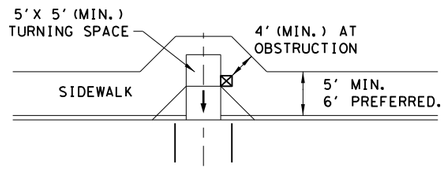
SKEWED INTERSECTION WITH "SMALL" RADIUS

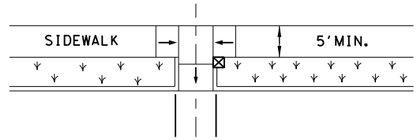


NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND





MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON (IF APPLICABLE). ☒

DENOTES PLANTING OR NON-WALKING SURFACE NOT PART OF PEDESTRIAN CIRCULATION PATH.

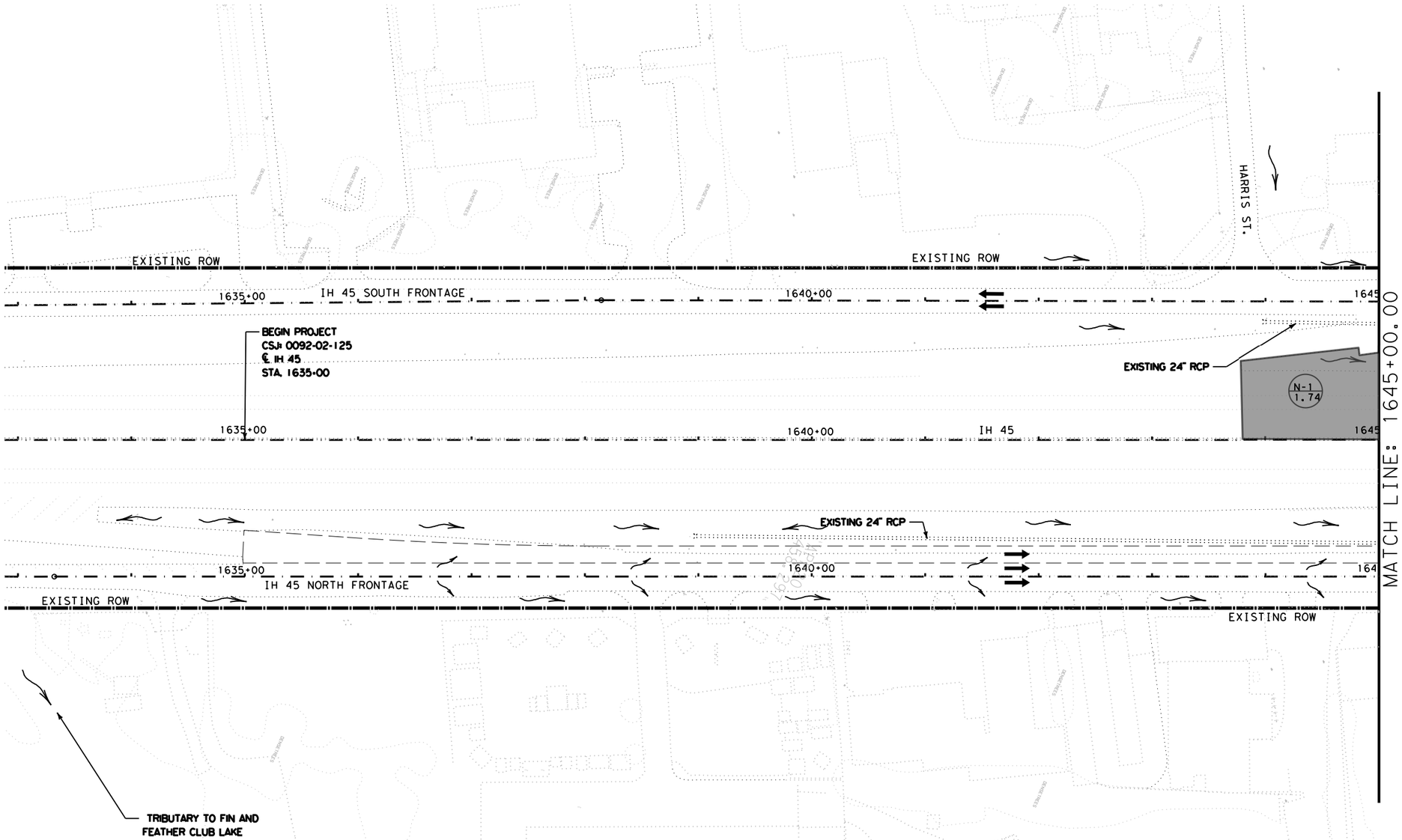
SHEET 4 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	18	DALLAS		90



STATE OF TEXAS
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PROFESSIONAL ENGINEER

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IH 45

DRAINAGE AREA MAP

SCALE: 1"=100' SHEET 1 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	91
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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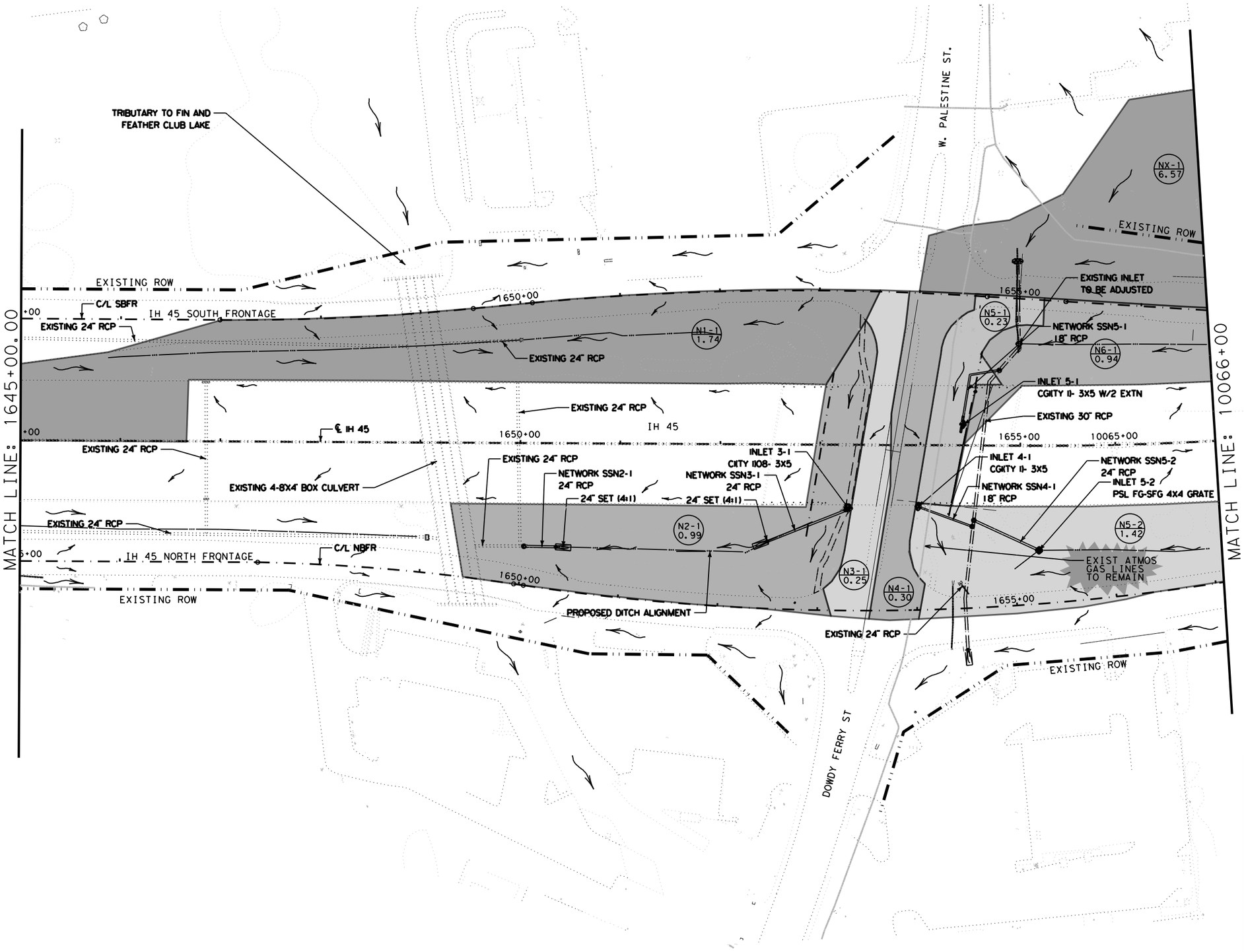

LEGEND

XX — DRAINAGE AREA NUMBER
XX.X — DRAINAGE AREA (ACRE)
DRAINAGE AREA BOUNDARY

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DRAINAGE AREA MAP

SCALE: 1"=100' SHEET 2 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	92
CHECK	CONTROL	SECTION	JOB	
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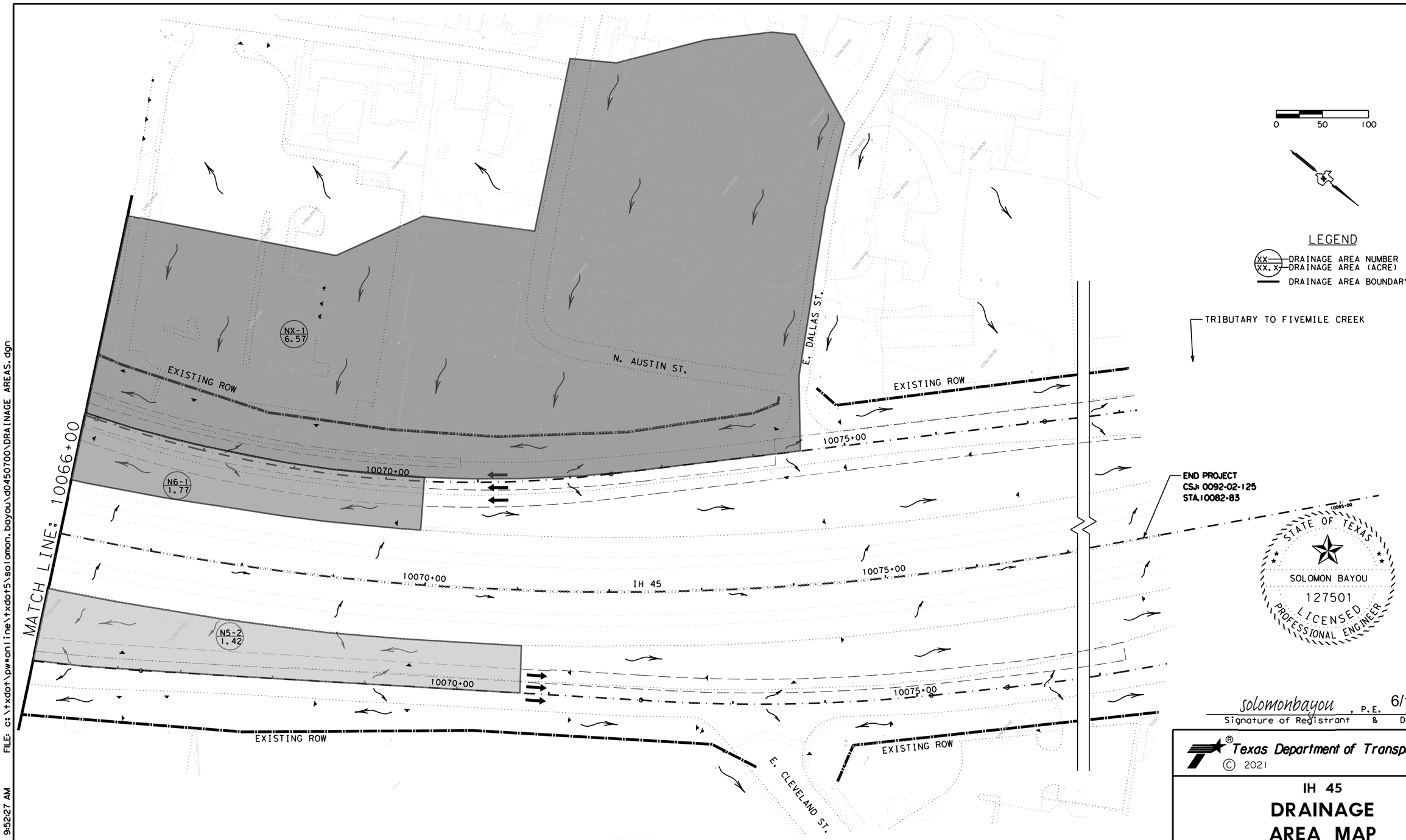

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IH 45
DRAINAGE AREA MAP

SCALE: 1"=100' SHEET 3 OF 3

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	93
CHECK	CONTROL	SECTION	JOB	
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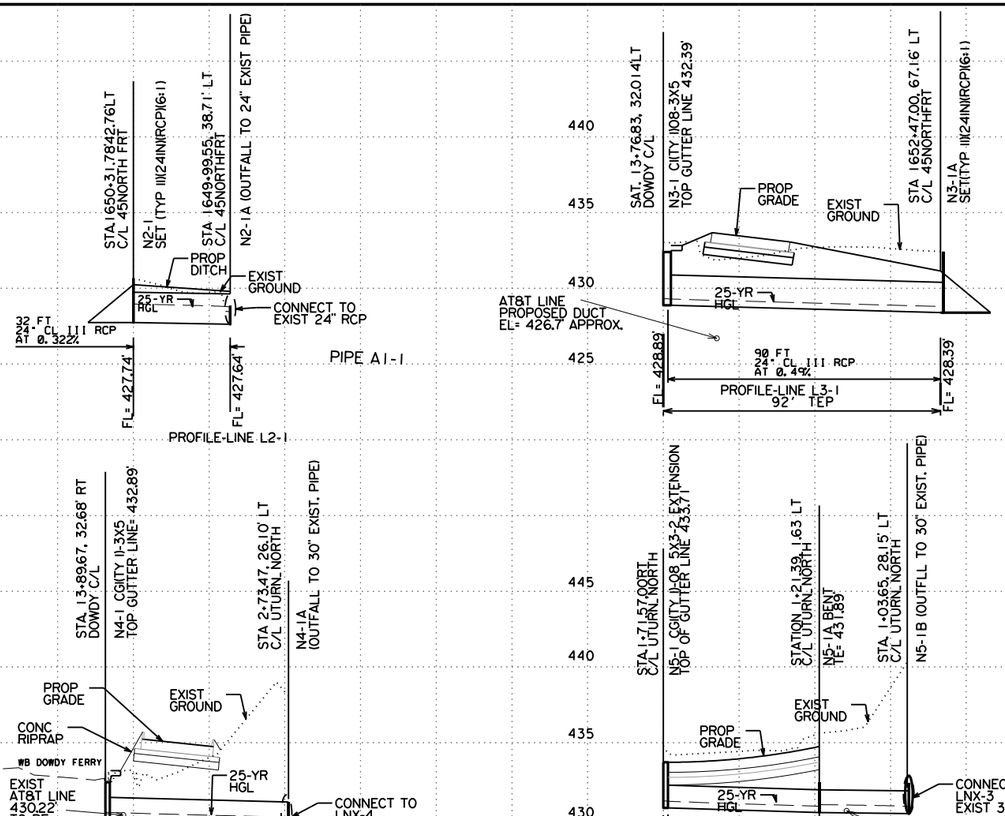

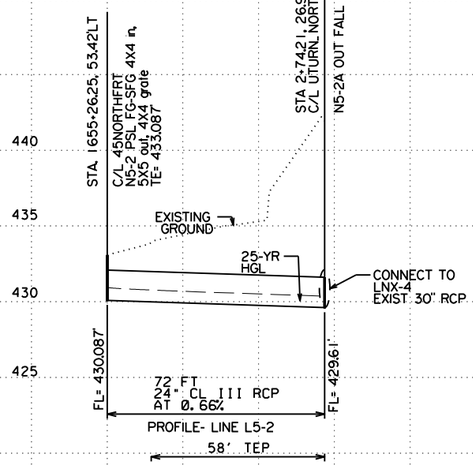

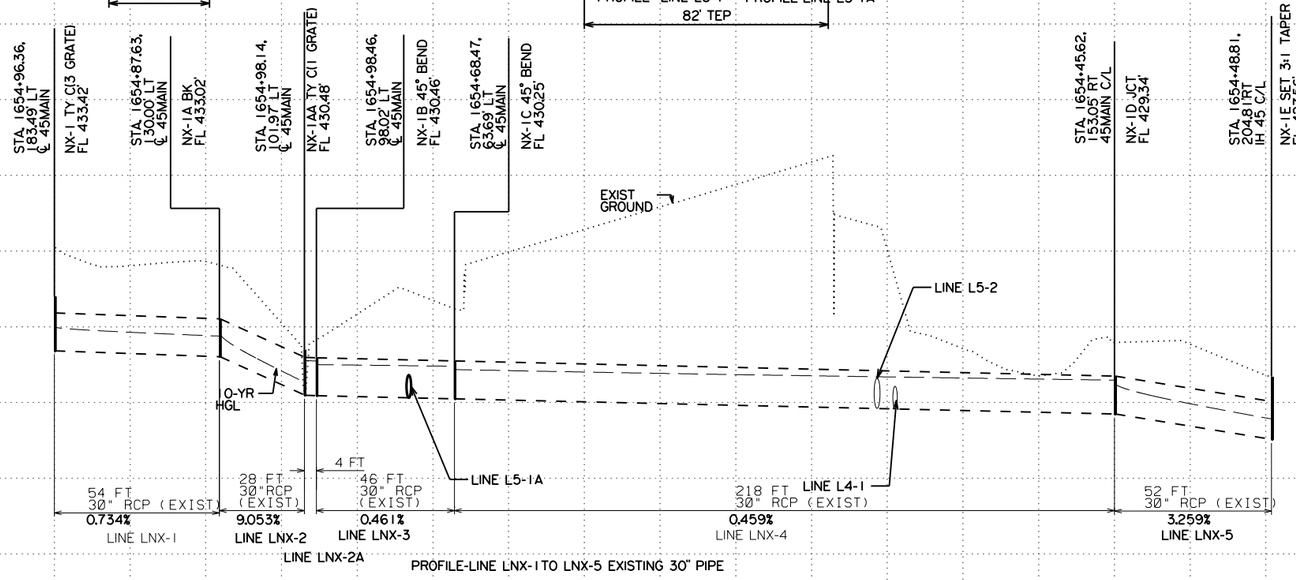

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IH 45

STORM SEWER PROFILES

SCALE: 1"=50'-H
1"=10'-V

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SB	6	SEE TITLE SHEET		IH 45
GRAPHICS SB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	94
CHECK NP	CONTROL	SECTION	JOB	
	0092	02	125	

INLET COMPUTATIONS

SYSTEM NAME	Inlet ID	Drainage Area ID	Inlet Station	PGL Name	Inlet Offset		Inlet Type	Profile Type	Comp X-Sect Spread	CURB HEIGHT	INLET DEPRESSION	INLET DEPRESSION WIDTH	Inlet Length Actual	CURB OR GRATE INLET ON GRADE			
					(ft)									Inlet Length Required	Long Slope	Comp Ponded Width	Comp Ponded Depth
									(%)	(ft)	(ft)	(ft)	(ft)	(ft)	(%)	(ft)	(ft)
SSN3-1	N3-1	N3-1	13+76.83	DOWDY	32.01	LT	Curb	Sag	0.32	0.5	0.25	1.5	5			0.63	0.2
SSN4-1	N4-1	N4-1	13+89.67	DOWDY	32.68	RT	Curb and Grate	Sag	0.15	0.5	0.25	1.5	5			2.03	0.3
SSN5-1	N5-1	N5-1	1+71.45	UTURN_NORTH	1.34	LT	Curb	Sag	1.91	0.25	0.25	3	15			0.05	0.1
SSN5-2	N5-2	N5-2	1655+26.25	45NORTHFRT	53.42	LT	Grate	Sag	0.01							61.12	0.38
SSNX-1	NX-1 (EXIST)	NX-1	1654+96.33	45MAIN	184.49	LT	Grate	Sag	0.03							34.41	0.91
	NX-1AA (EXIST)	n/a	1655+22.00	45NORTHFRT	260.98	LT	Grate	Sag	0.03							20.7	0.53

INLET COMPUTATIONS CONT.

CURB OR GRATE INLET IN SAG				GRATE INLET			ALLOWABLE HEAD	COMPUTED HEAD	Total Discharge	Capacity	By Pass Flow	By Pass Flow into Node	n
Ponded Width Left	Ponded Width Right	Long Slope Left	Long Slope Right	No. of Grates	Grate Length	Grate Width							
(ft)	(ft)	(%)	(%)		(ft)	(ft)	(ft)	(ft)	(cfs)	(cfs)	(cfs)	(cfs)	
2.19	2.903	2	2	1			0.5	0.20	1.63	6.26			0.01
2.36	3.118	2	2	1	4.96	1.39	0.5	0.30	1.96	10.48			0.01
2.11	2.809	2	2	1			0.5	0.10	1.50	16.59			0.01
40.24	9.796	0.62	1.12	1	4.17	4.17	1	0.38	6.00	22.02			0.03
#N/A	#N/A	#N/A	#N/A	1			1	0.91	21.31	24.42			0.01
#N/A	#N/A	#N/A	#N/A	1			1	0.53	5.32	11.99			0.02

RUNOFF COMPUTATIONS

SYSTEM NAME	AREA ID	Acres-Drained						Time of Conc					
		Total	Grass	Steep Grass	Single Family	Pav.		Total	Actual	Design	Freq.	I	Q
		Area	C = 0.35	C=0.70	C	C = 0.90	C Value	CA	(min)	(min)	(yr)	(in/hr)	(cfs)
		(acre)	(acre)	(acre)	(acre)	(acre)	(Comp.)						
SSN2-1	N2-1	0.99		0.46		0.53	0.81	0.80	8.00	10.00	25	8.48	6.78
SSN3-1	N3-1	0.25				0.25	0.90	0.23	3.00	10.00	25	8.48	1.91
SSN4-1	N4-1	0.30				0.30	0.90	0.27	3.00	10.00	25	8.48	2.29
SSN5-1	N5-1	0.23				0.22	0.90	0.21	3.00	10.00	25	8.48	1.76
SSN5-2	N5-2	1.42	0.82			0.60	0.90	1.28	3.00	10.00	25	8.48	1.68
SSNX-1	N6-1	0.94		0.57		0.37	0.78	0.73	10.00	10.00	10	7.26	5.31
	NX-1	6.57			0.88	0.64	0.52	3.42	14.00	14.00	10	6.25	21.31

PIPE COMPUTATIONS

System Name	Line ID	Upstream Node	Downstream Node	Size	Actual Length (ft)	Hydraulic Length (ft)	Manning's n Value	Slope (%)	Invert Upstream (ft)	Invert Downstream (ft)	Discharge (cfs)	Capacity (cfs)	Uniform Depth (ft)	Uniform Velocity (ft/s)	Actual Downtream Velocity (ft/s)	Actual Upstream Velocity (ft/s)	Actual Downtream Depth (ft)	Actual Upstream Depth (ft)	HGL Downstream	HGL Upstream	Freq (yr)	Tc (min)
SSN2-1	L2-1	N2-1	N2-1A	24 Inch Dia. Circular	32	32	0.01	0.32	427.74	427.64	9.91	14.96	1.26	4.75	5.44	3.49	1.13	1.7	428.76	429.44	25	
SSN3-1	L3-1	N3-1	N3-1A	24 Inch Dia. Circular	90	92.5	0.01	0.54	428.89	428.39	1.63	19.38	0.41	3.56	3.56	2.07	0.41	0.6	428.8	429.49	25	3
SSN4-1	L4-1	N4-1	N4-1A	18 Inch Dia. Circular	58.98	60.48	0.01	0.51	429.89	429.58	1.96	8.76	0.5	3.79	3.79	2.31	0.5	0.73	430.08	430.62	25	3
SSN5-1	L5-1	N5-1	N5-1A	18 Inch Dia. Circular	50.06	51.56	0.01	0.62	430.71	430.39	1.5	9.64	0.42	3.77	3.76	2.15	0.42	0.63	430.81	431.34	25	3
	L5-2	N5-2	N5-2A	24 Inch Dia. Circular	71.81	71.81	0.01	0.66	430.09	429.61	6	21.49	0.75	5.56	5.53	2.91	0.75	1.25	430.36	431.33	25	10
SSN5-2	L5-1A	N5-1A	N5-1B	18 Inch Dia. Circular	29.48	29.48	0.01	0.24	430.39	430.32	1.5	5.96	0.53	2.7	3.27	2.16	0.46	0.62	430.78	431.01	25	3.23
SSNX-1	LNX-1(EXIST)	NX-1	NX-1A	30 Inch Dia. Circular	54.48	54.48	0.01	0.73	433.42	433.02	21.31	40.96	1.34	7.96	7.75	4.38	1.37	2.43	434.39	435.85	10	14
	LNX-2(EXIST)	NX-1A	NX-1AA	30 Inch Dia. Circular	28.06	28.06	0.01	9.05	433.02	430.48	21.31	143.82	0.67	19.93	14.53	6.41	0.85	1.6	431.33	434.62	10	14.11
	LNX-3(EXIST)	NX-1B	NX-1C	30 Inch Dia. Circular	45.58	45.58	0.01	0.46	430.46	430.25	26.53	32.44	1.83	6.88	5.91	5.63	2.15	2.29	432.4	432.75	10	14.15
	LNX-4(EXIST)	NX-1C	NX-1D	30 Inch Dia. Circular	217.95	217.95	0.01	0.46	430.25	429.25	27.94	32.38	1.91	6.96	6.05	6.23	2.23	2.15	431.48	432.4	10	14.26
	LNX-5(EXIST)	NX-1D	NX-1E	30 Inch Dia. Circular	51.86	51.86	0.01	3.26	429.25	427.56	35.54	86.29	1.17	15.85	13.15	7.69	1.35	2.23	428.91	431.48	10	14.78
	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	#REF±	10	#REF±

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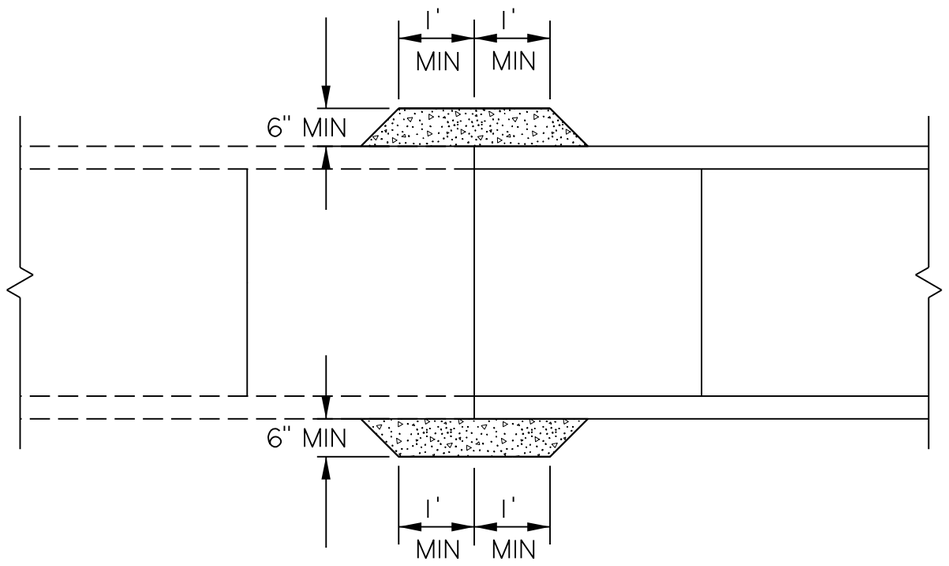
STORM SEWER HYDRAULIC COMPUTATIONS

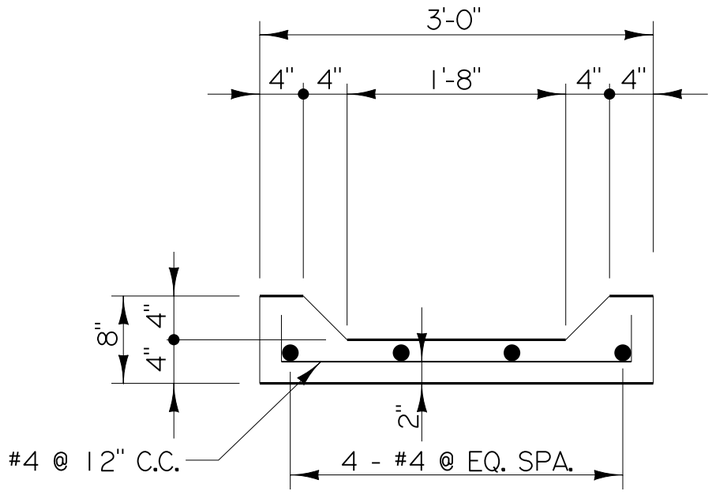
SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SB	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
SB	TEXAS	18	DALLAS	95
CHECK	CONTROL	SECTION	JOB	
DN	0092	02	125	
CHECK				



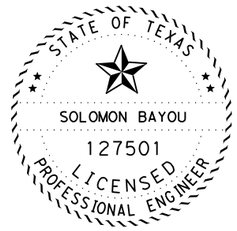
PIPE CONNECTION DETAIL

DETAIL FOR CONNECTION BETWEEN NEW AND
EXISTING PIPE FOR CULVERT EXTENSIONS



FLUME DETAIL

NTS



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DRAINAGE DETAILS

SCALE: 1"=100' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SB	6	SEE TITLE SHEET		IH 45
GRAPHICS SB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	96
DN	CONTROL	SECTION	JOB	
CHECK NP	0092	02	125	

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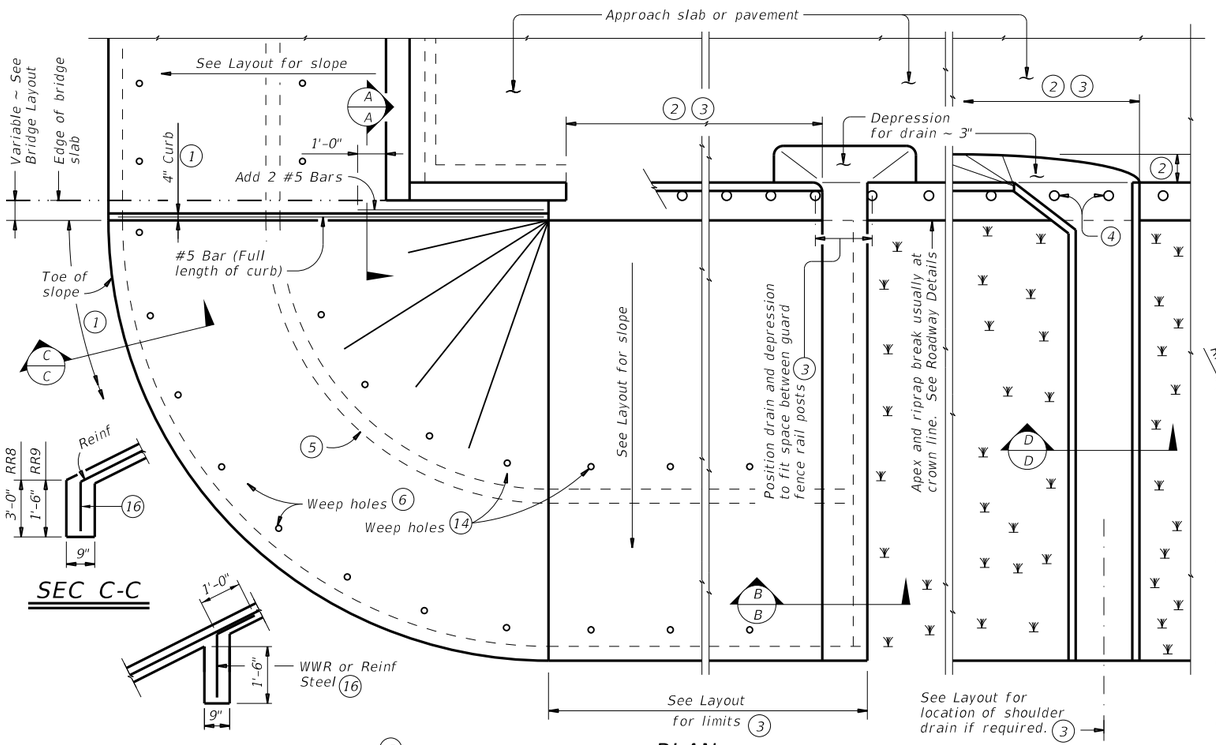
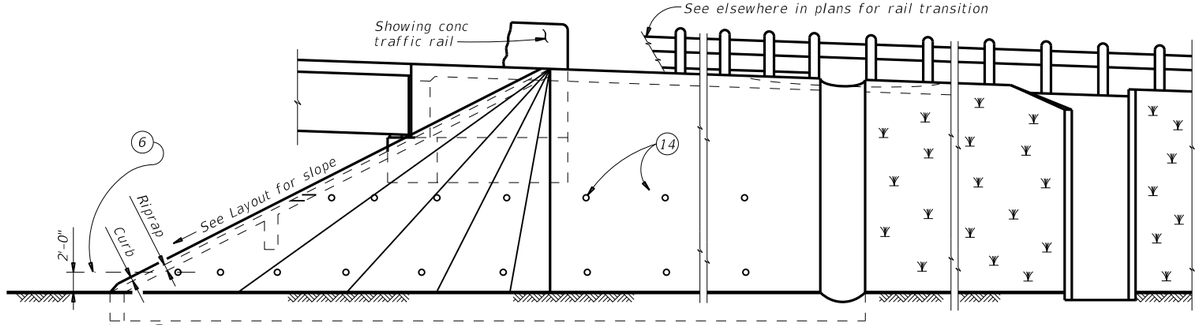


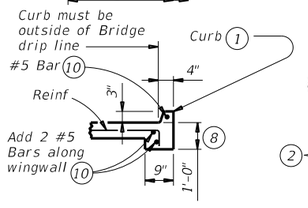
PLAN

SEC C-C

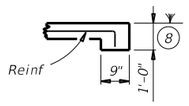
INTERMEDIATE TOEWALL (5)



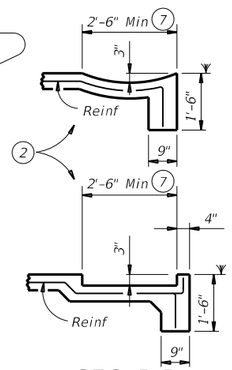
ELEVATION



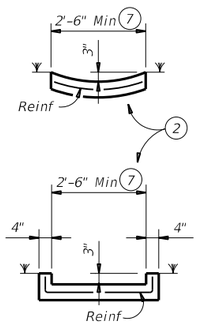
SEC A-A



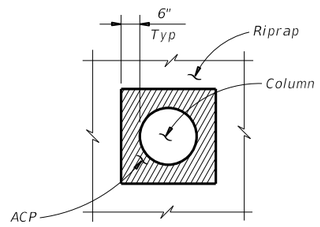
SEC B-B
(No drain)



SEC B-B
(Shoulder drain integral with riprap)

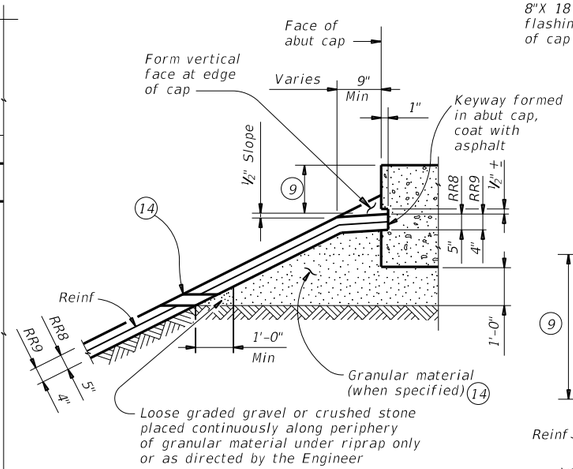


SEC D-D
(Shoulder drain)

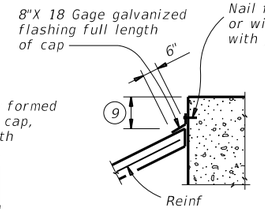


Riprap blockout to be filled with ACP. (Subsidiary to riprap)

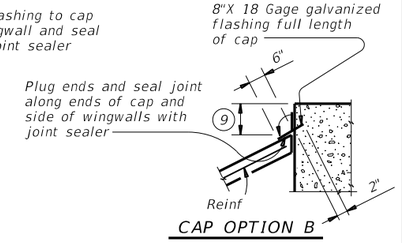
RIPRAP DETAIL AT COLUMNS
(As directed by the Engineer)



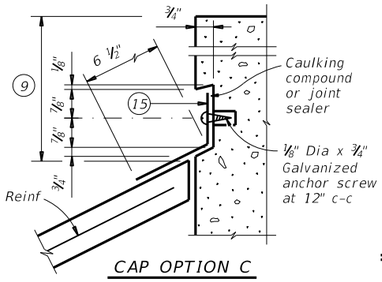
SHOWING KEYWAY OPTION



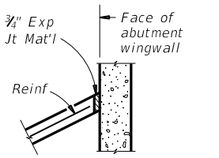
CAP OPTION A



CAP OPTION B

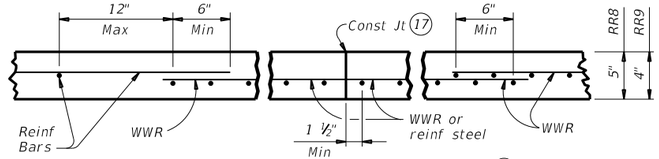


CAP OPTION C



SECT THRU RIPRAP AT WINGWALL (12)

SECTIONS THRU RIPRAP AT CAP (11)



REINFORCEMENT DETAILS (13)

See General Notes for optional synthetic fiber reinforcement.

(1) When riprap is shown extended around header on layout, extend slab and toewall as shown and eliminate 4" curb.

(2) Limits and configuration of drains and depressions are as shown elsewhere in plans or as directed by the Engineer.

(3) Location of shoulder drain must consider limitations imposed by rail transition. Do not locate shoulder drains at expansion joints between approach slab and concrete pavement.

(4) See details elsewhere in plans for installation of guard fence posts through concrete riprap.

(5) Provide intermediate toewall only when designated elsewhere in the plans or included in the specifications.

(6) Provide lower level of 2" Dia weep holes at 10' c-c backed by 1 CF packet of gravel and galvanized hardware cloth at all locations unless directed by the Engineer to eliminate.

(7) Use wider or other drain configurations if shown elsewhere in plans or if directed by the Engineer.

(8) Wall extension may be reduced or modified if approved by the Engineer. Increase wall extension to 1'-6" whenever the optional intermediate toewall is called for in the plans.

(9) Top of cap to top of riprap dimension varies as directed by the Engineer. Should be 9" Min for beam/slab type bridges and 1'-6" for slab span, box beam, or slab beam bridges.

(10) #5 bars shown are required even when synthetic fiber reinforcing option is selected.

(11) Provide sealing option for joint between the face of cap and riprap as designated by the Engineer or as shown elsewhere on plans.

(12) Flashing (shown in Cap Option A) may be used at wingwall in addition to Exp Jt Mat'l if shown on plans or directed by the Engineer.

(13) Provide #3 reinforcing bars at 18" Spa c-c. Provide Welded Wire Reinforcement (WWR) as 6x6-D2.9xD2.9 or D3xD3. Combinations of WWR and reinforcing bars may be used if both are permitted. Use lap splices of a minimum 6 inches, measured from the transverse wire of WWR, and the ends of reinforcing bars.

(14) If granular material is specified, provide upper level of 2" Dia weep holes at 10' c-c backed by galvanized hardware cloth.

(15) 8" x 18 Gage Galv Sheet Metal

(16) Provide WWR or #3 bars, with 1'-0" extension into slope.

(17) WWR or reinforcing steel is continuous through riprap construction joints. Provide WWR or reinforcing steel that extends 1'-1" minimum into adjacent riprap on each side of construction joint even if synthetic reinforcing fiber is utilized.

FOR CONTRACTOR'S INFORMATION ONLY:
5" of RR8 = 0.015 CY/SF
4" of RR9 = 0.012 CY/SF
#3 Reinf at 18" c-c = 0.501 Lbs/SF
6x6-D3xD3 = 0.408 Lbs/SF

GENERAL NOTES:

Provide Class "B" concrete (f'c = 2,000 psi) unless noted elsewhere in plans.

Provide Grade 60 reinforcing steel.

Provide deformed welded wire reinforcement (WWR) meeting ASTM A1064, unless otherwise shown.

Provide reinforcing bars, deformed WWR, or any suitable combination of both types for riprap reinforcing, unless specified elsewhere in the plans.

Optionally synthetic fibers may be used if approved by the Engineer. Provide synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) in lieu of steel reinforcing in riprap concrete.

Install construction joints or grooved joints extending the full slant slope height at intervals of approximately 20 feet unless otherwise directed by the Engineer.

Hardware cloth, loose grade stone behind weep holes, flashing, or other sealing material are subsidiary to the bid item "Riprap".

See Layout for limits of riprap.

RR8 is to be used on stream crossings.

RR9 is to be used on other embankments.

Texas Department of Transportation

Bridge Division Standard

CONCRETE RIPRAP AND SHOULDER DRAINS
EMBANKMENTS AT BRIDGE ENDS (TYPES RR8 & RR9)

CRR

FILE: crrstde1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		97

DATE: 6/14/2021 11:43:16 AM
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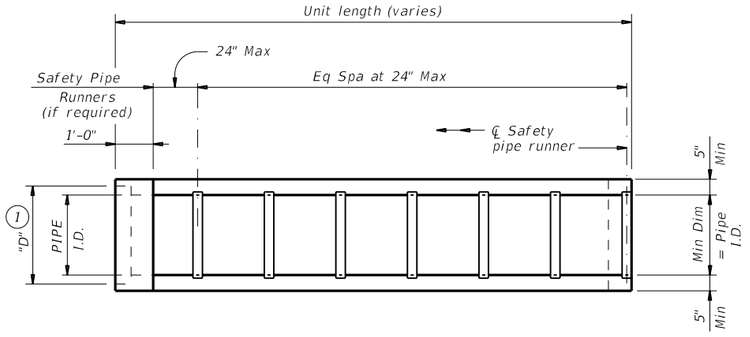
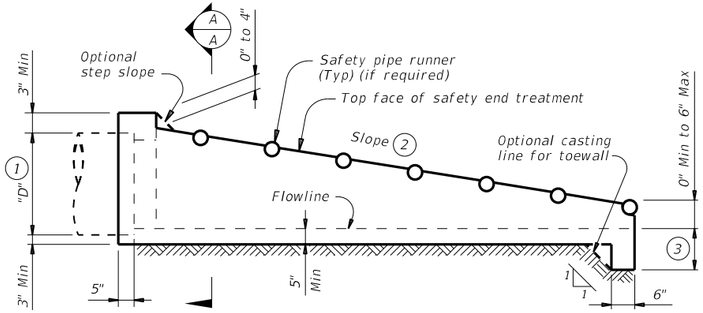


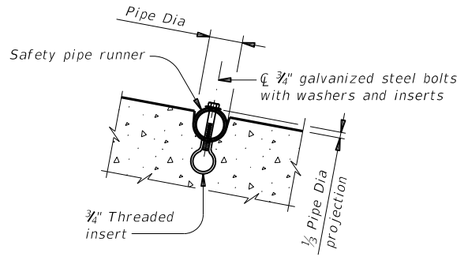
PLAN

(Showing bell end connection.)



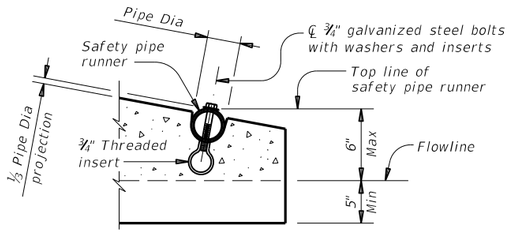
LONGITUDINAL ELEVATION

(Showing bell end connection.)

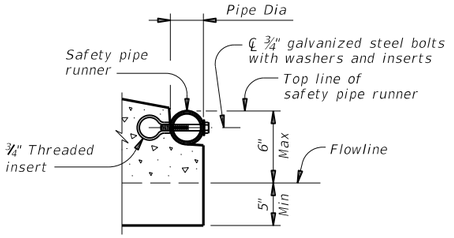


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



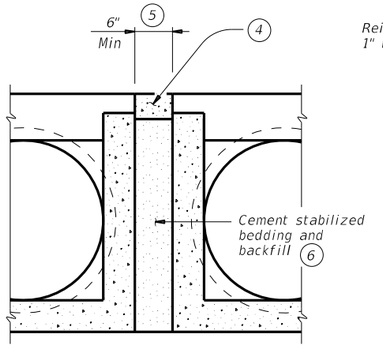
OPTION A



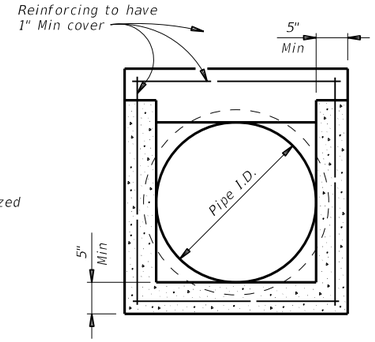
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

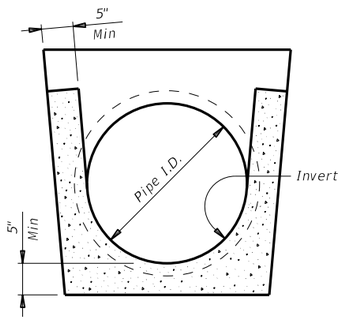
(If required)



MULTIPLE PIPE INSTALLATION

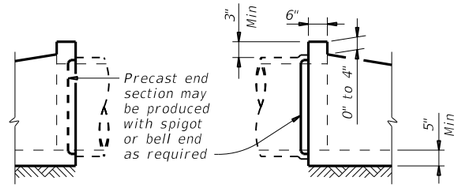


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment.)

REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (7)	"D" (1)	Slope	Min Length	Pipe Runners Required		Required Pipe Runner Size		
						Single Pipe	Multiple Pipe	Nominal Dia.	O.D.	I.D.
12"	2"	1.15"	17.00"	6:1	4' – 9"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
15"	2 ¼"	1.30"	20.50"	6:1	6' – 5"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
18"	2 ½"	1.60"	24.00"	6:1	8' – 0"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
24"	3"	1.95"	31.00"	6:1	11' – 3"	No	Yes, for > 2 pipes	3" STD	3.500"	3.068"
30"	3 ½"	2.65"	38.50"	6:1	14' – 8"	No	Yes	4" STD	4.500"	4.026"
36"	4"	2.75"	45.50"	6:1	17' – 11"	Yes	Yes	4" STD	4.500"	4.026"
42"	4 ½"	N/A	52.50"	6:1	21' – 2"	Yes	Yes	4" STD	4.500"	4.026"

(1) Dimension "D" is based on reinforced concrete pipe (RCP) meeting the requirements of ASTM C-76, Class III, (RCP Wall "B" thickness). Adjust "D" for any other wall thickness used. For thermoplastic pipe (TP) take into account the annular space requirements for grouted connections.

(2) Slope as shown elsewhere in the plans. Slope of 6:1 or flatter is required for vehicle safety.

(3) Toewall to be used only when dimension is shown elsewhere in the plans.

(4) Fill the top 4" of void between precast end treatments with concrete riprap. Concrete riprap is considered subsidiary to the Item 467, "Safety End Treatment".

(5) Adjust clear distance between pipes to provide for the minimum distance between safety end treatments.

(6) Provide cement stabilized bedding and backfill in accordance with the Item 400, "Excavation and Backfill for Structures". Bedding and backfill is considered subsidiary to the Item 467, "Safety End Treatment". When concrete riprap is specified around the safety end treatment, backfill as directed by Engineer.

(7) Thermoplastic pipe wall thickness may vary. Adjust accordingly. Thermoplastic pipe requires the safety end treatments to have a bell end for grouted connections.

GENERAL NOTES:

Precast safety end treatment for reinforced concrete pipe (RCP), and thermoplastic pipe (TP) may be used for TYPE II end treatment as specified in Item "Safety End Treatment".

When precast safety end treatment is used as a Contractor's alternate to mitered RCP, riprap will not be required unless noted otherwise on the plans.

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Manufacture this product in accordance with Item 467, "Safety End Treatment" except as noted below :

A. Provide minimum reinforcing of #4 at 6" (Grade 40) or #4 at 9" (Grade 60) each way or 6"x6" – D12 x D12 or 5"x5" – D10 x D10 welded wire reinforcement (WWR).

B. For precast (steel formed) sections, provide Class "C" concrete (f'c = 3,600 psi).

At the option and expense of the Contractor the next larger size of safety end treatment may be furnished; as long as the "D" dimension cast is that of the required size of pipe.

Pipe runners are designed for a traversing load of 10,000 Lbs at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Provide pipe runners meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Galvanize all steel components except reinforcing steel after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

Connect RCP using the Optional Joint for RCP detail shown or in accordance with Item 464, "Reinforced Concrete Pipe". Connect TP by grouting. See PBGC standard for grouted connections with TP and precast safety end treatment.

Texas Department of Transportation

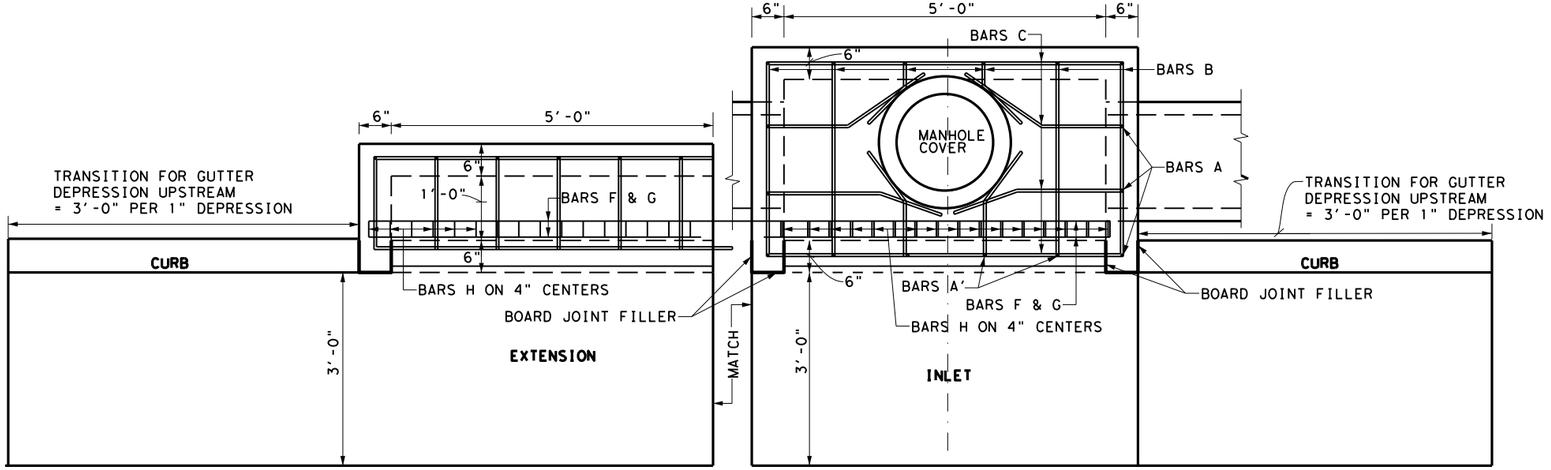
Bridge Division Standard

PRECAST SAFETY END TREATMENT

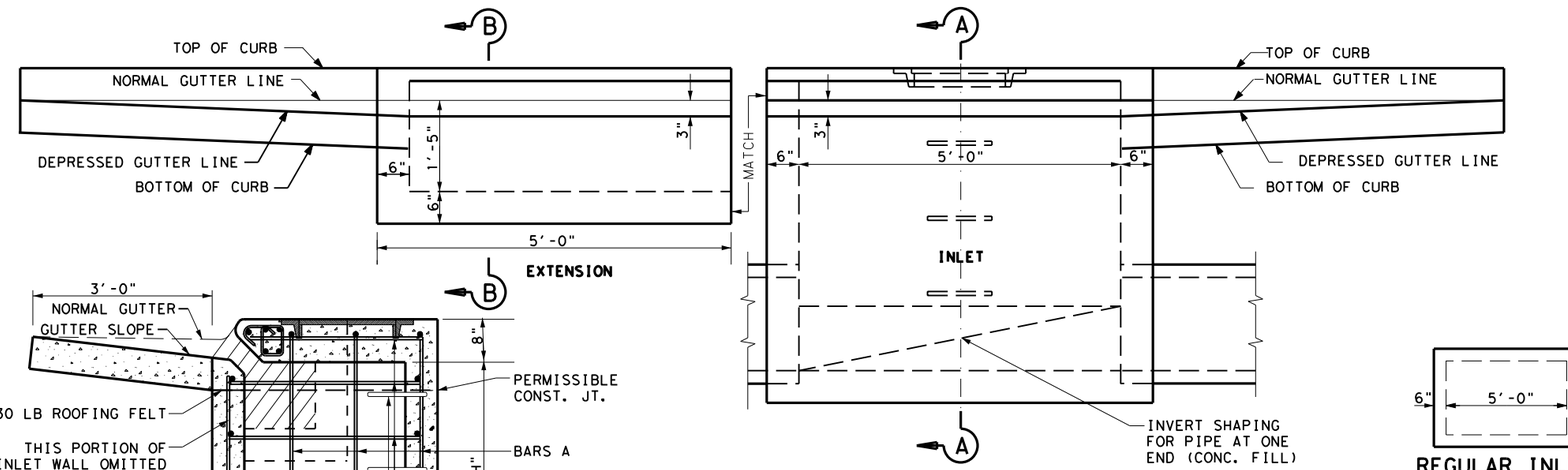
TYPE II ~ PARALLEL DRAINAGE

PSET-SP

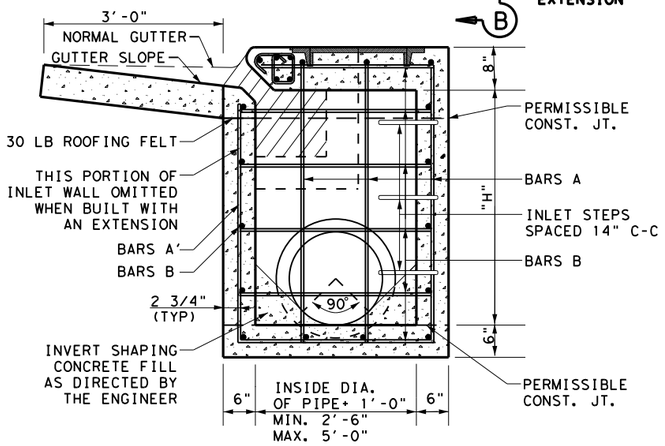
FILE: psetspss-20.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		98



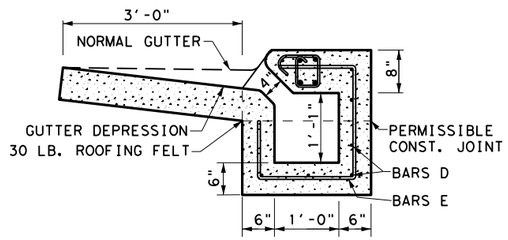
PLAN VIEW



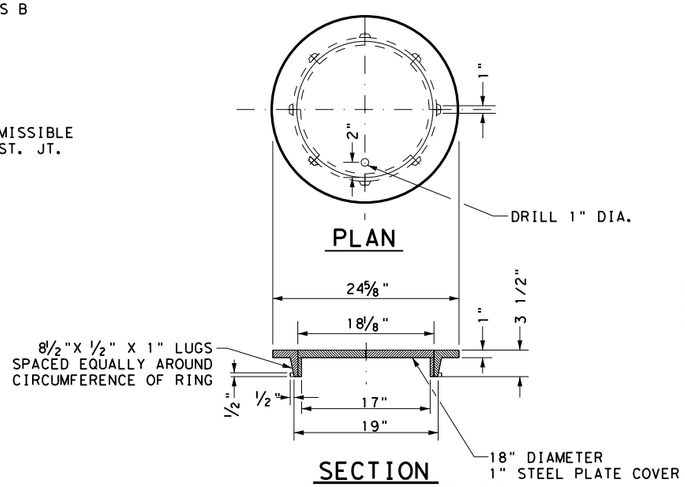
ELEVATION VIEW



SECTION A-A



SECTION B-B

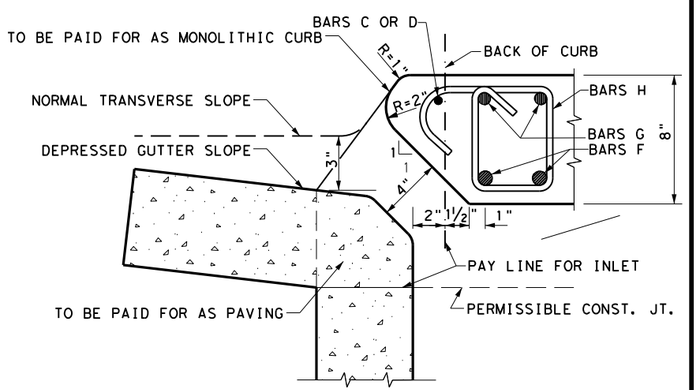


PLAN

SECTION

18" C.I. MANHOLE RING & STEEL PLATE COVER TY. A

NOTE: DIMENSIONS FOR CURB SECTIONS VARY ACCORDING TO LIMITS OF PROPOSED CURB TYPES.



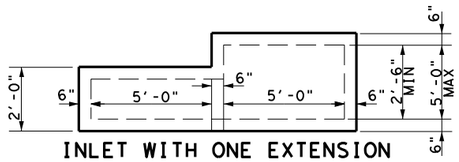
THROAT DETAIL

GENERAL NOTES:

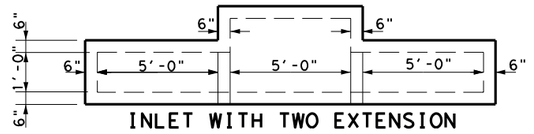
1. ALL CONCRETE SHALL BE CLASS A. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
2. CAST IRON STEPS, SPACED 14" AND LOCATED AS DIRECTED BY THE ENGINEER, SHALL BE PROVIDED AND INSTALLED IN ALL INLETS WHERE THE DEPTH "H" EXCEEDS 4'-0".
3. PAYMENT OF CURB INLETS AND EXTENSIONS THERETO AS SHOWN ON PLANS WILL BE MADE AT THE UNIT PRICE BID FOR "INLET (COMPLETE) (TYPE I)", "INLET EXTENSION".
4. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTERS OF BARS.
5. SEE SHEET NO. 2 OF 2 FOR INLET SUMMARY OF CONCRETE AND REINFORCING STEEL.

SHEET 1 OF 2

REGULAR INLET



INLET WITH ONE EXTENSION



INLET WITH TWO EXTENSION

PLAN OF INLET AND EXTENSIONS

REVISED ON 9/10/08

NOT TO SCALE

Texas Department of Transportation
Dallas District

CURB INLET TYPE I

CI(TY I)-08

FILE: CI(TY I)-08	DN: TxDOT	CK: TxDOT	DW:	CK:
© TxDOT	DISTRICT	FEDERAL AID PROJECT		SHEET
	DAL	SEE TITLE SHEET		99
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	DALLAS	0092	02	125	IH 45

LEVELS DISPLAYED
1

REINFORCING STEEL AND CONCRETE IN TYPE I - 5FT. INLETS

INLET SIZE		STEEL																										TOTALS	
		BARS A				BARS A'				BARS B				BARS C				BARS F				BARS G				BARS H				Reinf. Steel	CL A Conc
H	W	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	LBS	*C.Y.
3.0	2.5	12	4	3'-10"	31	4	4	2'-6"	7	18	4	3'-2"	38	13	4	5'-8"	49	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	194	1.64
3.5	2.5	12	4	4'-4"	35	4	4	3'-0"	8	18	4	3'-2"	38	13	4	5'-8"	49	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	199	1.80
4.0	2.5	12	4	4'-10"	39	4	4	3'-6"	9	20	4	3'-2"	42	15	4	5'-8"	57	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	216	1.96
4.5	2.5	12	4	5'-4"	43	4	4	4'-0"	11	20	4	3'-2"	42	15	4	5'-8"	57	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	222	2.11
5.0	2.5	12	4	5'-10"	47	4	4	4'-6"	12	22	4	3'-2"	47	17	4	5'-8"	64	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	239	2.27
5.5	2.5	12	4	6'-4"	51	4	4	5'-0"	13	22	4	3'-2"	47	17	4	5'-8"	64	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	244	2.42
6.0	2.5	12	4	6'-10"	55	4	4	5'-6"	15	24	4	3'-2"	51	19	4	5'-8"	72	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	262	2.59
6.5	2.5	12	4	7'-4"	59	4	4	6'-0"	16	24	4	3'-2"	51	19	4	5'-8"	72	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	267	2.74
8.0	2.5	12	4	8'-10"	71	4	4	7'-6"	20	28	4	3'-2"	59	23	4	5'-8"	87	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	306	3.22
8.5	2.5	12	4	9'-4"	75	4	4	8'-0"	21	28	4	3'-2"	59	23	4	5'-8"	87	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	311	3.37
10.0	2.5	12	4	10'-10"	87	4	4	9'-6"	25	32	4	3'-2"	68	27	4	5'-8"	102	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	351	3.84
10.5	2.5	12	4	11'-4"	91	4	4	10'-0"	27	32	4	3'-2"	68	27	4	5'-8"	102	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	357	4.00
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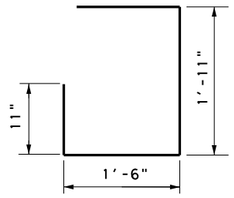
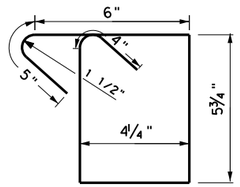
5.5	3.5	14	4	6'-4"	59	4	4	5'-0"	13	22	4	4'-2"	61	19	4	5'-8"	72	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	274	2.89
7.5	4.0	16	4	8'-4"	89	4	4	7'-0"	19	26	4	4'-8"	81	25	4	5'-8"	95	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	353	3.87
10.0	5.0	18	4	10'-10"	130	4	4	9'-6"	25	32	4	5'-8"	121	33	4	5'-8"	125	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	470	5.42
7.5	5.0	18	4	8'-4"	100	4	4	7'-0"	19	26	4	5'-8"	96	29	4	5'-8"	110	2	7	5'-8"	23	2	6	9'-8"	29	18	3	2'-7"	17	394	4.09

*Does not include invert shaping

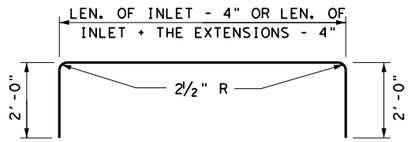
NOTE: On inlets with entensions, Bars F & G shall run continuous the inlet and extensions. Where two or more extensions are together, Bars D shall run continuous the the



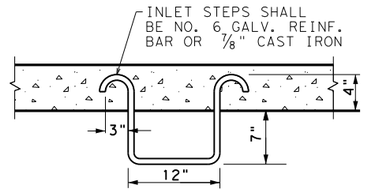
BARS E



BARS H



BARS G



DETAIL OF INLET STEPS

CONCRETE TO BE DEDUCTED FOR PIPES	
Pipe Size	Conc. C.Y.
15"	0.04
18"	0.05
21"	0.07
24"	0.09
27"	0.11
30"	0.14
33"	0.17
36"	0.19
42"	0.26
48"	0.34
54"	0.43

NOTE:

WHERE TWO OR MORE EXTENSIONS ARE TOGETHER, BARS "D" SHALL RUN CONTINUOUS THRU THE EXTENSIONS.
* DOES NOT INCLUDE QUANTITY FOR INVERT SHAPING.

REINFORCING STEEL AND CONCRETE IN EXTENSIONS

5'-0" EXTN. NO.	BARS D				BARS E				BARS F				BARS G				BARS H				Reinf. Steel	CL A Conc.
	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	NO.	SIZE	*LENGTH	WEIGHT	NO.	SIZE	*LENGTH	WEIGHT	NO.	SIZE	LENGTH	WEIGHT	LBS	C.Y.
1	8	4	5'-8"	30	6	4	5'-4"	21	2	7	5'-6"	23	2	6	5'-6"	17	16	3	2'-7"	6	97	1.64
2	8	4	11'-2"	60	12	4	5'-4"	43	2	7	11'-0"	45	2	6	11'-0"	33	33	3	2'-7"	32	213	1.80
3	Reinf. Steel is as shown for 1 Extension and as shown for 2 Extensions																					

** Length is to be added to the length as shown in the above table for Typ. I - 5'-0" Inlets*

GENERAL NOTES:

REINFORCING STEEL AND CONCRETE TABLRS SHOWN ABOVE ARE FOR INFORMATION ONLY

THESE TABLES ARE TO BE USED WITH INLET TYPE I, WITH 3" & 5" NORMAL CURB HEIGHT AND 8" CONCRETE PAVEMENT.

REVISED ON 9/10/08

NOT TO SCALE

LEVELS DISPLAYED
1

Texas Department of Transportation
Dallas District

CURB INLET TYPE I

CI(TY I)-08

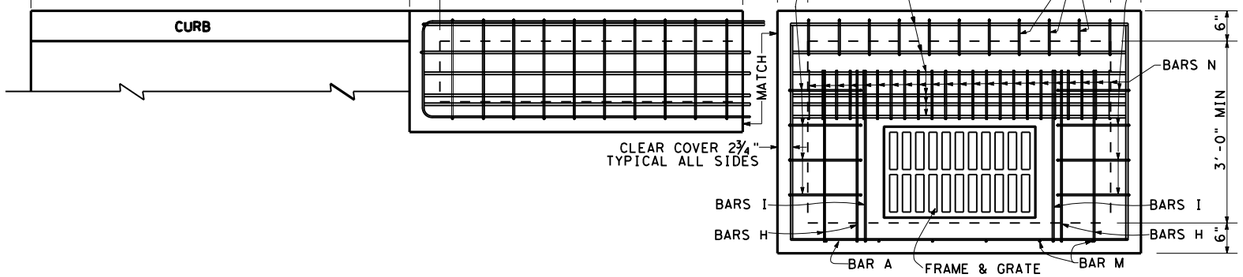
FILE: CI(TY I)-08	DN: TxDOT	CK: TxDOT	DW:	CK:
© TxDOT	DISTRICT	FEDERAL AID PROJECT		SHEET
	DAL	SEE TITLE SHEET		100
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	DALLAS	0092	02	125	IH 45

cgityi.dgn

LEVELS DISPLAYED

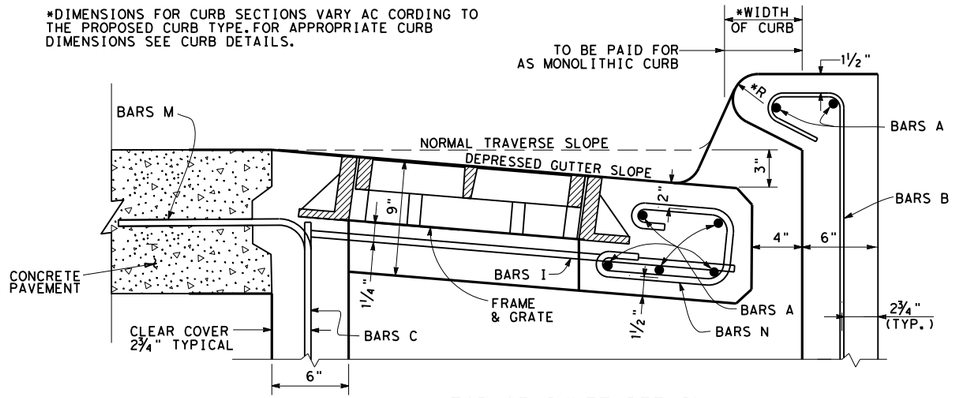
1

TRANSITION FOR GUTTER DEPRESSION UPSTREAM = 3'-0" PER 1" DEPRESSION

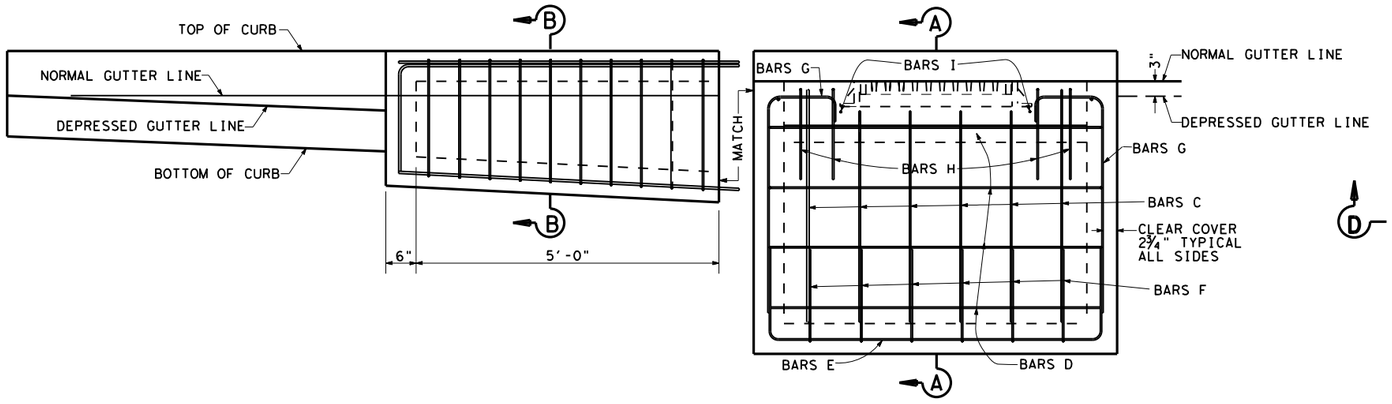


PLAN VIEW

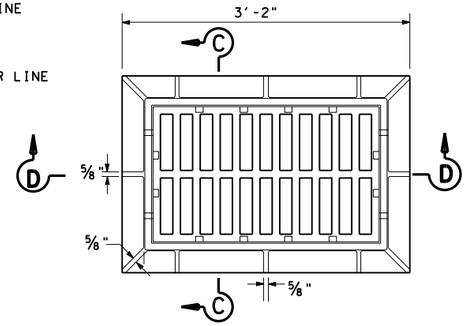
*DIMENSIONS FOR CURB SECTIONS VARY AC CORDING TO THE PROPOSED CURB TYPE. FOR APPROPRIATE CURB DIMENSIONS SEE CURB DETAILS.



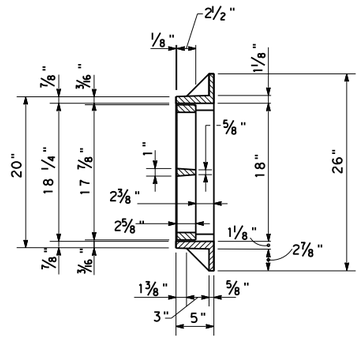
TOP OF INLET DETAIL



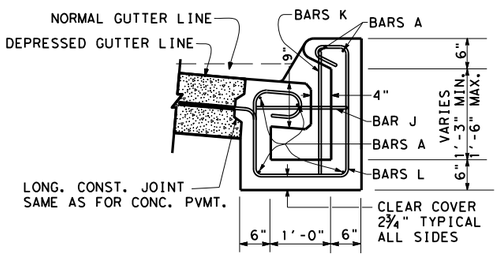
ELEVATION VIEW



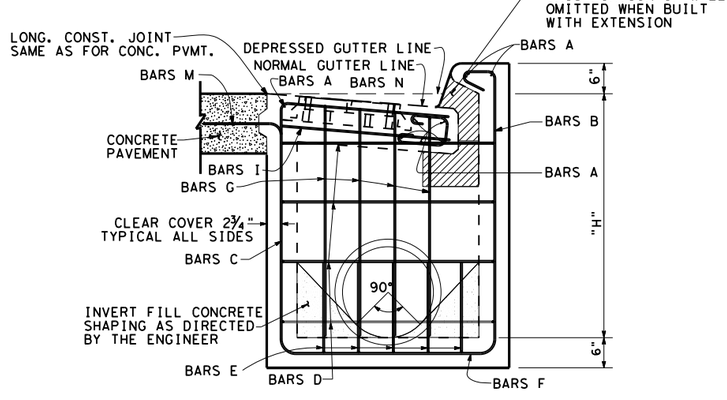
PLAN



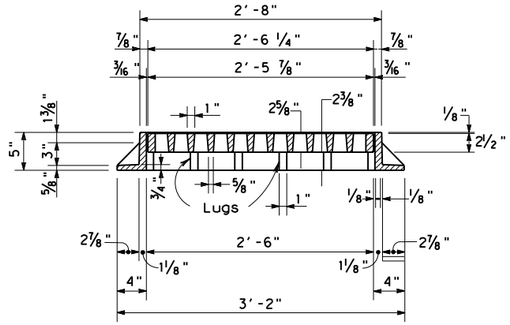
SECTION C-C



SECTION B-B



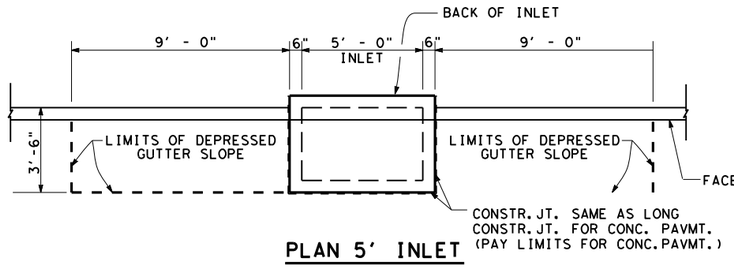
SECTION A-A



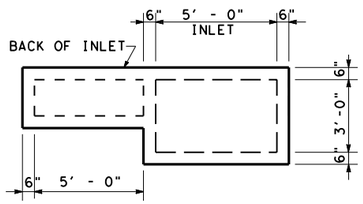
SECTION D-D

FRAME & GRATE TYPE "A"

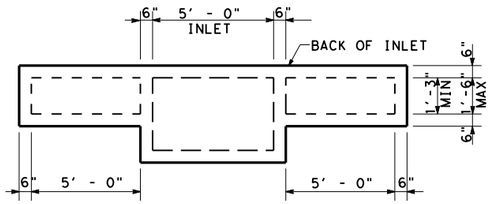
NOTE:
FRAME AND GRATE TO BE OF GRAY CAST IRON CONFORMING TO A.S.T.M. SPEC. A-48 FOR CLASS NO. 30 CAST IRON



PLAN 5' INLET



PLAN 10' INLET



PLAN 15' INLET

REVISED ON 9/10/08
NOT TO SCALE

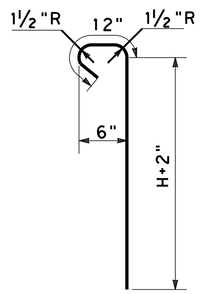
SHEET 1 OF 2

Texas Department of Transportation
Dallas District

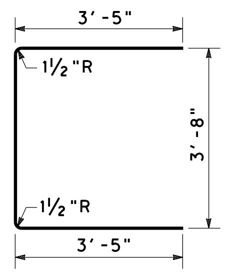
CURB & GRATE INLET TYPE I

CGI(TY I)-08

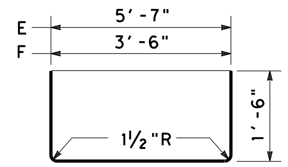
FILE: CGI(TY I)-08	DN: TxDOT	CK: TxDOT	DW:	CK:
© TxDOT	DISTRICT	FEDERAL AID PROJECT		SHEET
	DAL	SEE TITLE SHEET		101
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	DALLAS	0092	02	125	IH 45



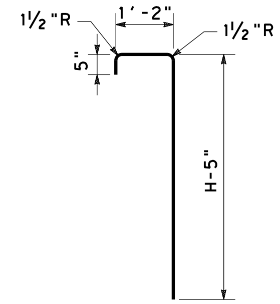
BAR "B"



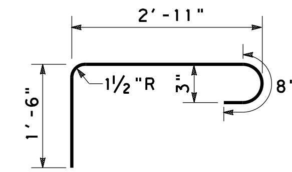
BAR "D"



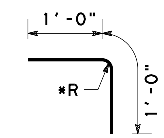
BARS "E" & "F"



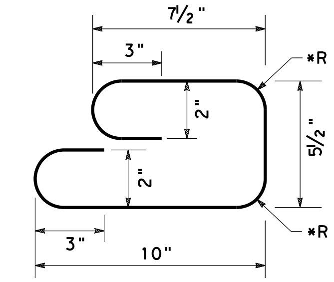
BAR "G"



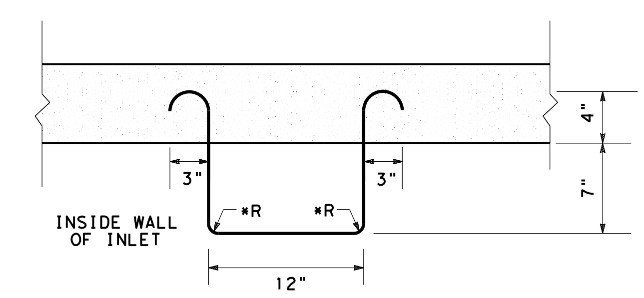
BAR "H"



BAR "M"



BAR "N"



DETAIL OF INLET STEP
INLET STEP SHALL BE NO. 6 GALVANIZED REINFORCING BAR

* MINIMUM INSIDE DIAMETER OF BAR BENDS AS PRE TABLE 4 OF ITEM 440

INLET REINFORCING STEEL AND CONCRETE

INLET SIZE		BAR "A"					BAR "B"					BAR "C" *				
HEIGHT FT.	WIDTH FT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.
2.5	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	2'-4"	17	6	4	10"C.C.	2'-4"	9
3.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	2'-10"	21	6	4	10"C.C.	2'-10"	11
3.5	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	3'-4"	24	6	4	10"C.C.	3'-4"	13
4.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	3'-10"	28	6	4	10"C.C.	3'-10"	15
4.5	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	4'-4"	32	6	4	10"C.C.	4'-4"	17
5.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	4'-10"	36	6	4	10"C.C.	4'-10"	19
5.5	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	5'-4"	39	6	4	10"C.C.	5'-4"	21
6.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	5'-10"	43	6	4	10"C.C.	5'-10"	23
7.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	6'-10"	50	6	4	10"C.C.	6'-10"	27
8.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	6'-10"	58	6	4	10"C.C.	6'-10"	31
9.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	6'-10"	65	6	4	10"C.C.	6'-10"	35
10.0	3.0	8	6	AS SHN	5'-6"	66	11	4	6"C.C.	6'-10"	72	6	4	10"C.C.	6'-10"	39

INLET SIZE		BAR "D"					BAR "E"					BAR "F"				
HEIGHT FT.	WIDTH FT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.
2.5	3.0	4	4	12"C.C.	10'-6"	28	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
3.0	3.0	6	4	12"C.C.	10'-6"	42	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
3.5	3.0	6	4	12"C.C.	10'-6"	42	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
4.0	3.0	8	4	12"C.C.	10'-6"	56	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
4.5	3.0	8	4	12"C.C.	10'-6"	56	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
5.0	3.0	10	4	12"C.C.	10'-6"	70	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
5.5	3.0	10	4	12"C.C.	10'-6"	70	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
6.0	3.0	12	4	12"C.C.	10'-6"	84	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
7.0	3.0	14	4	12"C.C.	10'-6"	98	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
8.0	3.0	14	4	12"C.C.	10'-6"	98	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
9.0	3.0	14	4	12"C.C.	10'-6"	98	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24
10.0	3.0	14	4	12"C.C.	10'-6"	98	5	4	7"C.C.	8'-0"	27	6	4	10"C.C.	6'-0"	24

INLET SIZE		BAR "G"					BAR "H"				
HEIGHT FT.	WIDTH FT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.
2.5	3.0	8	4	7"C.C.	3'-8"	20	4	4	AS SHN	4'-11"	13
3.0	3.0	8	4	7"C.C.	4'-2"	22	4	4	AS SHN	4'-11"	13
3.5	3.0	8	4	7"C.C.	4'-8"	25	4	4	AS SHN	4'-11"	13
4.0	3.0	8	4	7"C.C.	5'-2"	28	4	4	AS SHN	4'-11"	13
4.5	3.0	8	4	7"C.C.	5'-8"	30	4	4	AS SHN	4'-11"	13
5.0	3.0	8	4	7"C.C.	6'-2"	33	4	4	AS SHN	4'-11"	13
5.5	3.0	8	4	7"C.C.	6'-8"	36	4	4	AS SHN	4'-11"	13
6.0	3.0	8	4	7"C.C.	7'-2"	38	4	4	AS SHN	4'-11"	13
7.0	3.0	8	4	7"C.C.	8'-2"	44	4	4	AS SHN	4'-11"	13
8.0	3.0	8	4	7"C.C.	8'-2"	49	4	4	AS SHN	4'-11"	13
9.0	3.0	8	4	7"C.C.	8'-2"	54	4	4	AS SHN	4'-11"	13
10.0	3.0	8	4	7"C.C.	8'-2"	60	4	4	AS SHN	4'-11"	13

* REDUCE BAR LENGTH AS NECESSARY TO PROVIDE CLEARANCE UNDER GRATE

INLET REINFORCING STEEL AND CONCRETE (CONT.)

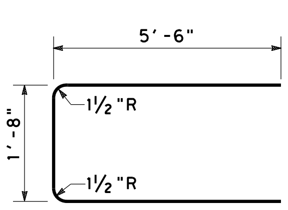
INLET SIZE		BAR "I"					BAR "M"					BAR "N"					TOTALS	
HEIGHT FT.	WIDTH FT.	NO.	SZ.	SPACING	LENGTH	WT.	NO.	SZ.	SPACIN	LENGTH	WT.	NO.	SZ.	SPACING	LENGTH	WT.	STEEL LBS.	CONC. C.Y.
2.5	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	236	1.63
3.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	258	1.80
3.5	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	266	1.96
4.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	289	2.13
4.5	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	297	2.29
5.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	320	2.46
5.5	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	328	2.62
6.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	350	2.79
7.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	381	3.12
8.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	398	3.45
9.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	414	3.78
10.0	3.0	2	4	AS SHN	2'-9"	4	7	4	24"C.C.	2'-0"	9	21	3	3"C.C.	2'-5"	19	431	4.11

CONCRETE TO BE DEDUCTED FOR ONE PIPE

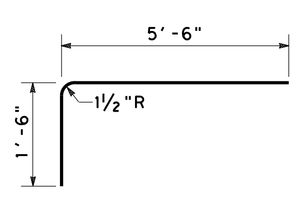
PIPE DIA.	CONC. C.Y.
15"	0.04
18"	0.05
21"	0.07
24"	0.09
27"	0.11
30"	0.14
36"	0.20

GENERAL NOTES:

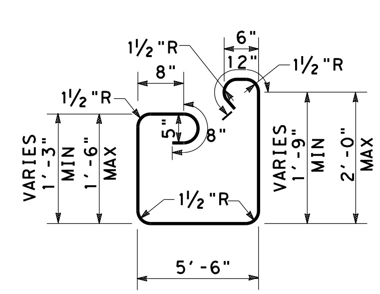
1. ALL CONCRETE SHALL BE CLASS "A".
2. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
3. INLET STEPS SPACED 14" C.C. AND LOCATED AND DIRECTED BY THE ENGINEER, SHALL BE PROVIDED AND INSTALLED IN ALL INLETS WHERE THE DEPTH EXCEEDS 5'-0".
4. DIMENSIONS RELATING TO REINFORCING STEEL ARE TO THE CENTER OF THE BARS.
5. TOTAL QUANTITIES SHOWN FOR CONCRETE AND REINFORCING STEEL ARE APPROXIMATE AND ARE PLACED HEREON FOR INFORMATIONAL PURPOSES ONLY.



BAR "J"



BAR "K"



BAR "L"

INLET REINFORCING STEEL AND CONCRETE FOR ONE 5' EXTENSION

BAR	NO.	SIZE	SPACING	LENGTH	WT.
A	6	6	AS SHN	5'-6"	50
J	1	4	AS SHN	12'-8"	8
K	1	4	AS SHN	7'-4"	5
L	10	4	6"C.C.	6'-7"TO 7'-1"	46
M	4	4	24"C.C.	1'-11"	5
TOTAL REINFORCING STEEL (LBS.)					114
TOTAL CONCRETE (C.Y.)					0.64

REVISED ON 9/10/08
NOT TO SCALE

SHEET 2 OF 2

Texas Department of Transportation
Dallas District

CURB & GRATE INLET TYPE I

CGI(TY I)-08

FILE: CGI(TY I)-08	DN: TxDOT	CK: TxDOT	DW:	CK:
© TxDOT	DISTRICT	FEDERAL AID PROJECT		SHEET
	DAL	SEE TITLE SHEET		102
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	DALLAS	0092	02	125	IH 45

LEVELS DISPLAYED
1

DATE: DATE/20UE 11:43:30 AM
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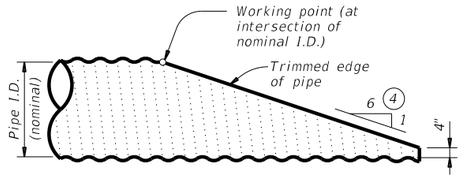
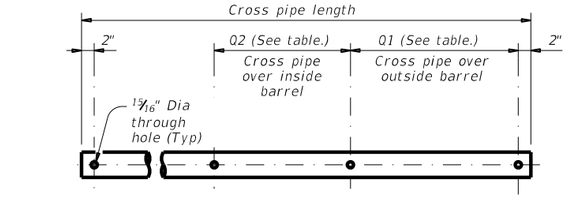


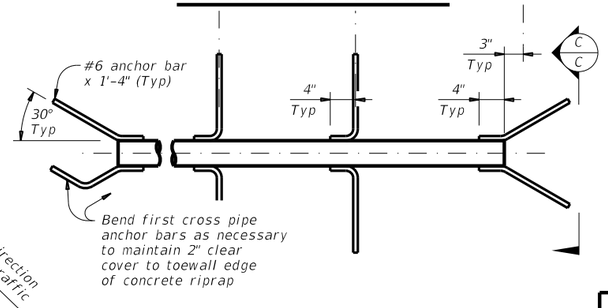
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

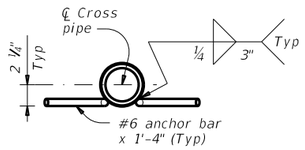
(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)



PIPE WITH BOLTED ANCHOR

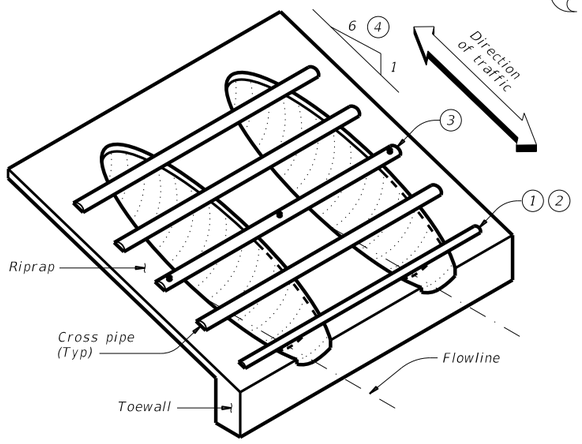


PIPE WITH ANCHOR BARS

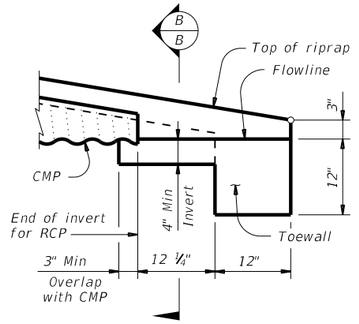


SECTION C-C

CROSS PIPE DETAILS

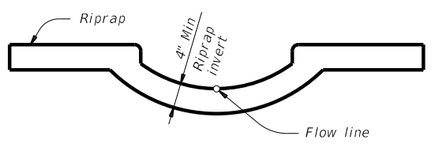


ISOMETRIC VIEW OF TYPICAL INSTALLATION



DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



SECTION B-B

(Cross pipes not shown for clarity.)

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

Synthetic fibers listed on the "Fibers for Concrete" Material Producer List (MPL) may be used in lieu of steel reinforcing in riprap concrete unless noted otherwise.

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

Galvanize all steel components, except concrete reinforcing, after fabrication. Repair galvanizing damaged during transport or construction in accordance with the specifications.

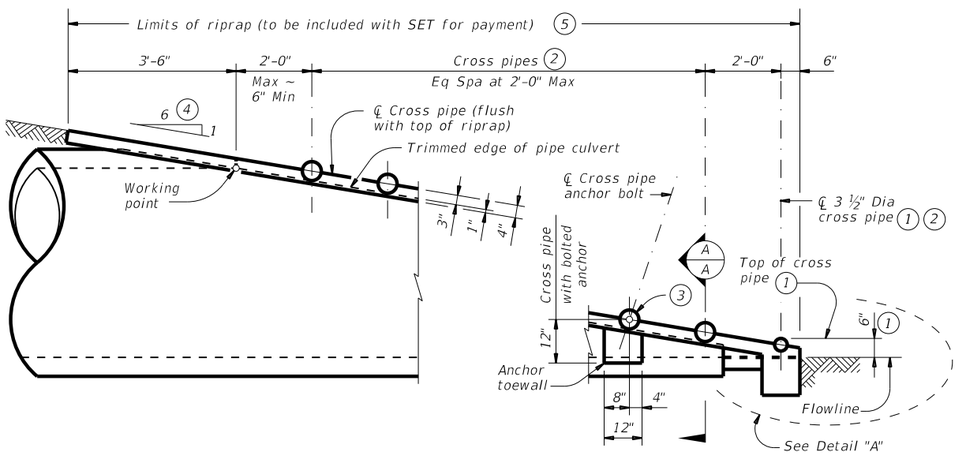
GENERAL NOTES:

Cross pipes are designed for a traversing load of 10,000 pounds at yield as recommended by Research Report 280-2F, "Safety Treatment of Roadside Parallel-Drainage Structures", Texas Transportation Institute, March 1981.

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

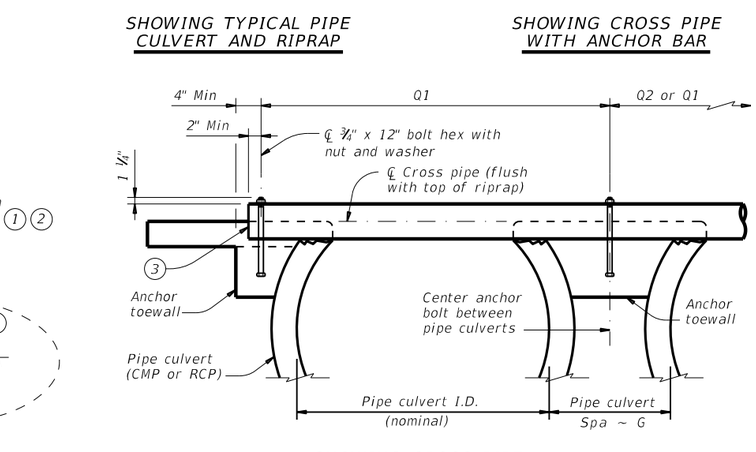
Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.



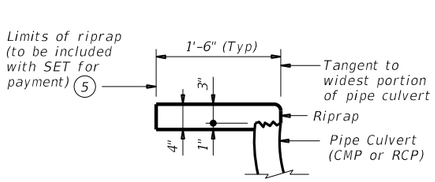
SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)

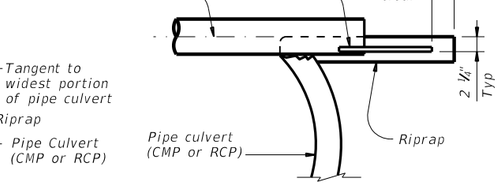


SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A



SHOWING TYPICAL PIPE CULVERT AND RIPRAP



SHOWING CROSS PIPE WITH ANCHOR BAR

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 72" DIA PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

SETP-PD

FILE: setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		103

DATE: 11:43:36 AM
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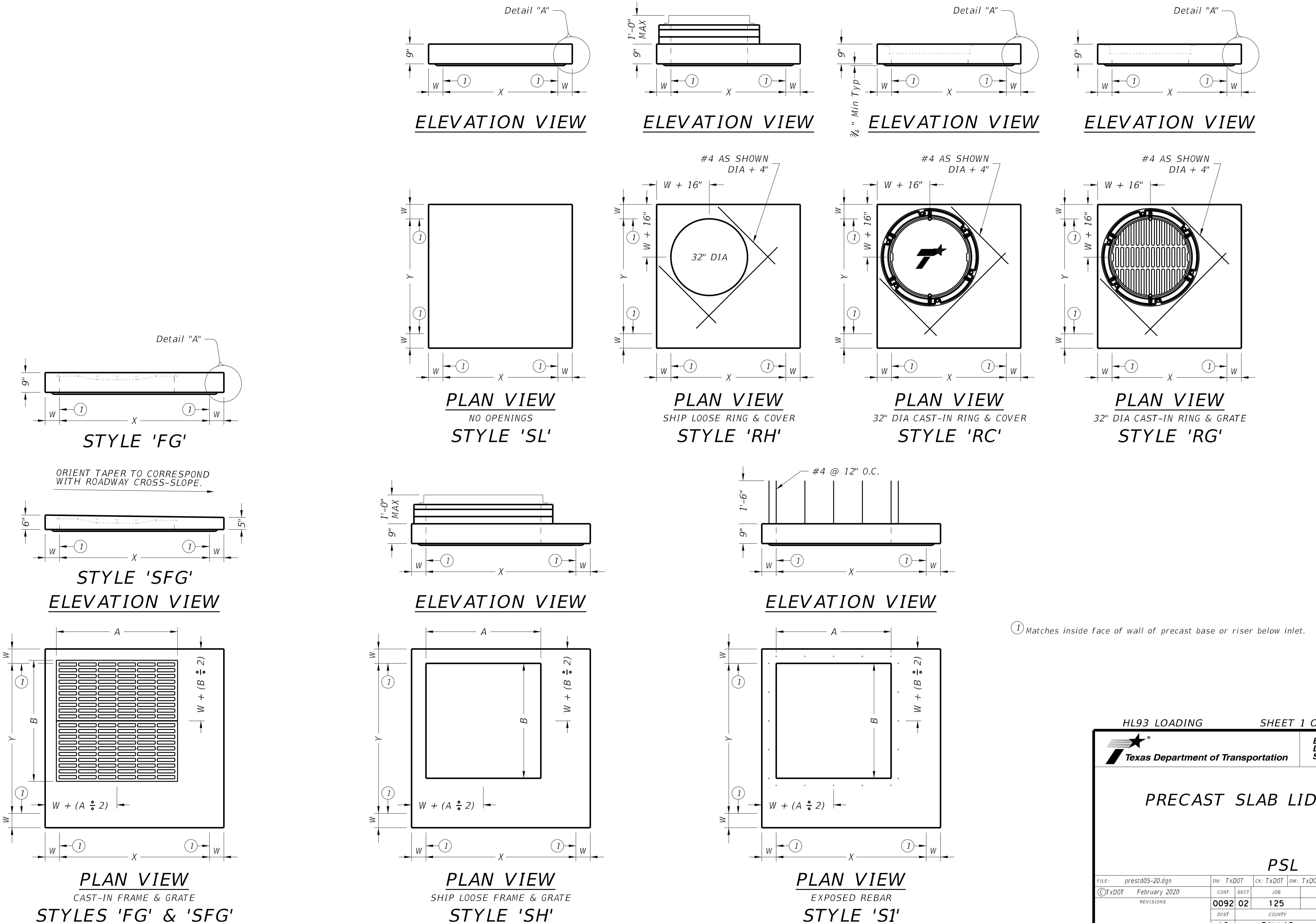


(1) Matches inside face of wall of precast base or riser below inlet.

HL93 LOADING

SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

PRECAST SLAB LID

PSL

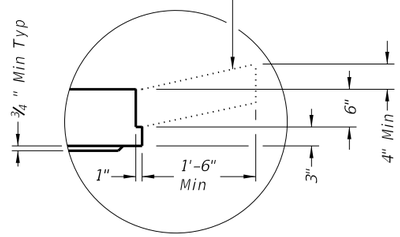
FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST		COUNTY	SHEET NO.
	18		DALLAS	104

DATE: DATE/TIME 11:43:38 AM
FILE: DOCUMENT NAME\online\txdot5\solomon.bayou\d0450706\prestd05-20.dgn

Style	Size (X x Y)	W (2)	A x B (nominal)	Short Span Reinf Steel Area	Long Span Reinf Steel Area
SL	3'x3'	6"	n/a	0.37 in²/ft	0.37 in²/ft
RH,RC,RG,SH,S1,FG	3'x3'	6"	3'x3' or 32" Dia	0.37 in²/ft	0.37 in²/ft
SFG	3'x3'	6"	3'x3'	0.32 in²/ft	0.32 in²/ft
SL	4'x4'	6"	n/a	0.34 in²/ft	0.34 in²/ft
RH,RC,RG,SH,S1,FG	4'x4'	6"	3'x3' or 32" Dia	0.41 in²/ft	0.41 in²/ft
SH,S1,FG	4'x4'	6"	4'x4'	0.41 in²/ft	0.41 in²/ft
SFG	4'x4'	6"	4'x4'	0.32 in²/ft	0.32 in²/ft
SL	3'x5'	6"	n/a	0.39 in²/ft	0.39 in²/ft
RH,RC,RG,SH,S1,FG	3'x5'	6"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	3'x5'	6"	3'x5'	0.48 in²/ft	0.48 in²/ft
SFG	3'x5'	6"	3'x5'	0.32 in²/ft	0.32 in²/ft
SL	4'x5'	6"	n/a	0.42 in²/ft	0.42 in²/ft
RH,RC,RG,SH,S1,FG	4'x5'	6"	3'x3' or 32" Dia	0.42 in²/ft	0.42 in²/ft
SH,S1,FG	4'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	4'x5'	6"	3'x5'	0.66 in²/ft	0.66 in²/ft
SL	5'x5'	6"	n/a	0.36 in²/ft	0.36 in²/ft
RH,RC,RG,SH,S1,FG	5'x5'	6"	3'x3' or 32" Dia	0.43 in²/ft	0.43 in²/ft
SH,S1,FG	5'x5'	6"	4'x4'	0.63 in²/ft	0.63 in²/ft
SH,S1,FG	5'x5'	6"	3'x5'	0.63 in²/ft	0.63 in²/ft
SL	5'x6'	6"/8"	n/a	0.48 in²/ft	0.48 in²/ft
RH,RC,RG,SH,S1,FG	5'x6'	6"/8"	3'x3' or 32" Dia	0.48 in²/ft	0.48 in²/ft
SH,S1,FG	5'x6'	6"/8"	4'x4'	0.60 in²/ft	0.60 in²/ft
SH,S1,FG	5'x6'	6"/8"	3'x5'	0.60 in²/ft	0.60 in²/ft
SL	6'x6'	6"/8"	n/a	0.43 in²/ft	0.43 in²/ft
RH,RC,RG,SH,S1,FG	6'x6'	6"/8"	3'x3' or 32" Dia	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	4'x4'	0.56 in²/ft	0.56 in²/ft
SH,S1,FG	6'x6'	6"/8"	3'x5'	0.59 in²/ft	0.59 in²/ft
SL	8'x8'	8"/10"	n/a	0.45 in²/ft	0.45 in²/ft
RH,RC,RG,SH,S1,FG	8'x8'	8"/10"	3'x3' or 32" Dia	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	4'x4'	0.45 in²/ft	0.45 in²/ft
SH,S1,FG	8'x8'	8"/10"	3'x5'	0.45 in²/ft	0.45 in²/ft

(2) See sheet PDD for corresponding wall thickness (W) of base unit or riser.

Construct cast-in-place reinforced concrete apron, when shown elsewhere in plans. Use Class "A" concrete. Apron is subsidiary to PSL. Apron is 1'-6" Min width around precast zone drain.



DETAIL "A"

(Reinforcing not shown for clarity)

When an apron is to be cast around PSL, use detail above to create an apron ledge on all 4 sides.

FABRICATION NOTES:

1. Locate penetration (Style 'RH'), ring and cover (Style 'RC'), ring and grate (Style 'RG'), and frame and grate (Style 'FG') in a corner. Only one penetration is allowed per slab lid.
2. Provide Class "H" concrete in accordance with Item 421 and having a minimum compressive strength of 5,000 psi.
3. Provide Grade 60 reinforcing steel or equivalent area of WWR.
4. Provide clear cover of ¾" to reinforcing from lower outside shoulder of slab for structural reinforcement, and 2" from top of slab for shrinkage and temperature reinforcement. Place short span reinforcing closest to surface.
5. Slabs with a thickness of 8" or greater require shrinkage and temperature reinforcing. Provide steel area = 0.11 in²/ft each way.
6. No substitution is allowed for diagonal #4 bars around openings.
7. Design tongue and groove joints for full closure on both shoulders. Minimum spigot depth is ¾".
8. Provide lifting devices in conformance with Manufacturer's recommendations.

INSTALLATION NOTES:

1. Precast slab lids are intended for direct traffic and may be placed in roadway.
2. Seal tongue and groove joints with preformed or bulk mastic in conformance with Manufacturer's recommendations. Tongue and groove joints may be grouted no more than 1" between each section, or ½ the joint depth, whichever is greater.
3. Do not grout rubber gasket joints without Manufacturer's recommendation.
4. Initial installation of grade adjustment rings for Styles 'RH' and 'SH' is limited to 1'-0" Max as shown.
5. Grade adjustment rings for Styles 'RH' and 'SH' may be increased to 2'-0" Max when future construction affects final grade of structure. Make adjustments greater than 2'-0" with additional risers. Adjustments can be made up to Max depth shown on sheet PDD. Structure must be evaluated if Max depth will be exceeded.
6. Orient long dimension of grate slots perpendicular to traffic, unless noted otherwise on plans

GENERAL NOTES:

1. Designed according to ASTM C913.
2. Payment for lid is per Item 465, "Junction Boxes, Manholes, and Inlets" by type, style, size, and opening size (when applicable).

Cover dimensions are clear dimensions, unless noted otherwise.

Texas Department of Transportation

Bridge Division Standard

PRECAST SLAB LID

PSL

FILE: prestd05-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		105

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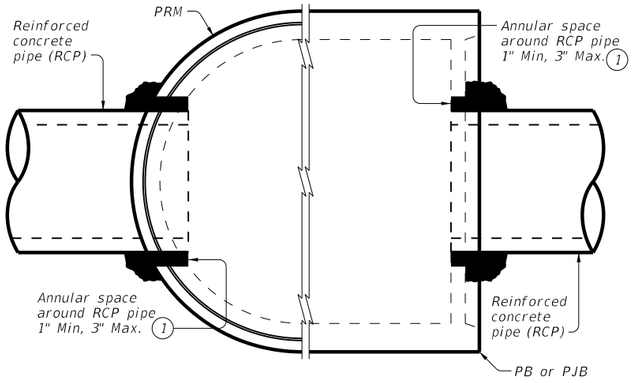
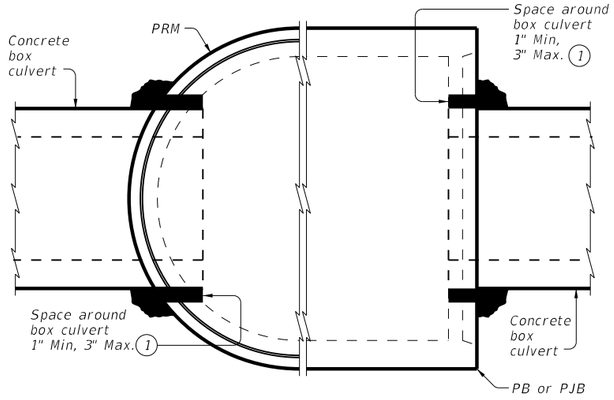


PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

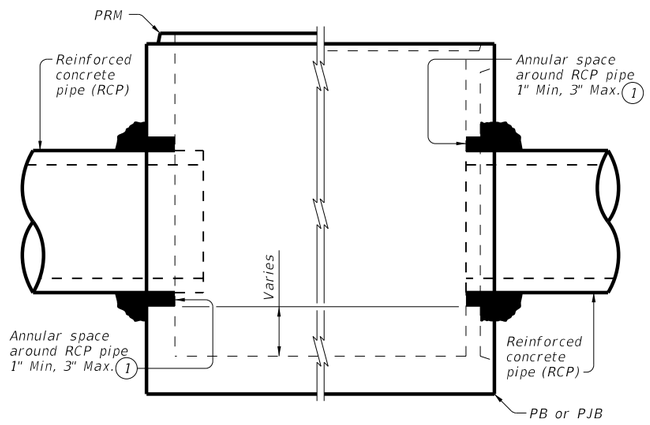
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

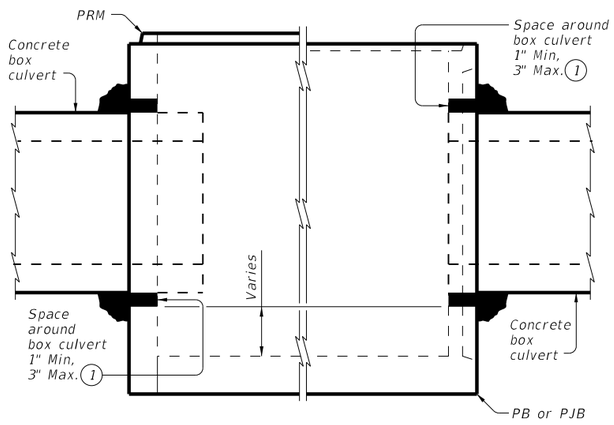
TYPICAL HALF PLAN



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

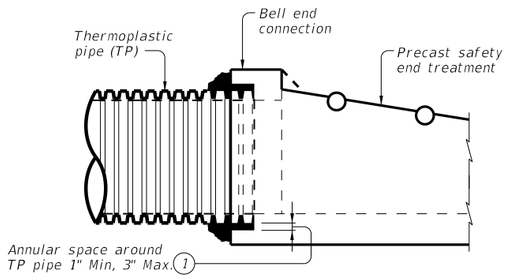
TYPICAL HALF ELEVATION



PRECAST ROUND MANHOLE (PRM) WITH THROUGH-HOLE

PRECAST BASE (PB) OR PRECAST JUNCTION BOX (PJB) WITH THIN-WALL KNOCK-OUT

TYPICAL HALF ELEVATION



TYPICAL PARTIAL ELEVATION OF PRECAST SAFETY END TREATMENTS

Showing square PSET for parallel drainage, cross drainage shown similar.

(1) Completely fill the void between the precast structure and the connecting pipe or box with cementitious grouts and mortars in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

CONSTRUCTION NOTES:

Do not grout rubber gasket joints without Manufacturer's recommendations.

Do not use bricks, masonry blocks, native stone, or similar materials in conjunction with grouted connections when filling void spaces around pipes or box culverts.

MATERIAL NOTES:

Provide grouted connections in accordance with DMS-4675 "Cementitious Grouts and Mortars for Miscellaneous Application".

GENERAL NOTES:

See applicable standards for notes and details not shown:
- Precast Base (PB)
- Precast Junction Box (PJB)
- Precast Round Manhole (PRM)
- Precast Safety End Treatments C/D Square (PSET-SC)
- Precast Safety End Treatments P/D Square (PSET-SP)

Provide Concrete Box Culverts in accordance with Item 462 "Concrete Box Culverts and Drains".

Provide Reinforced Concrete Pipe (RCP) in accordance with Item 464 "Reinforced Concrete Pipe".

Provide Thermoplastic Pipe (TP) in accordance with Special Specification Thermoplastic Pipe.

Payment for grouted connections is considered subsidiary to other bid Items.

Texas Department of Transportation

Bridge Division Standard

PIPE AND BOX GROUTED CONNECTIONS FOR PRECAST STRUCTURES

PBGC

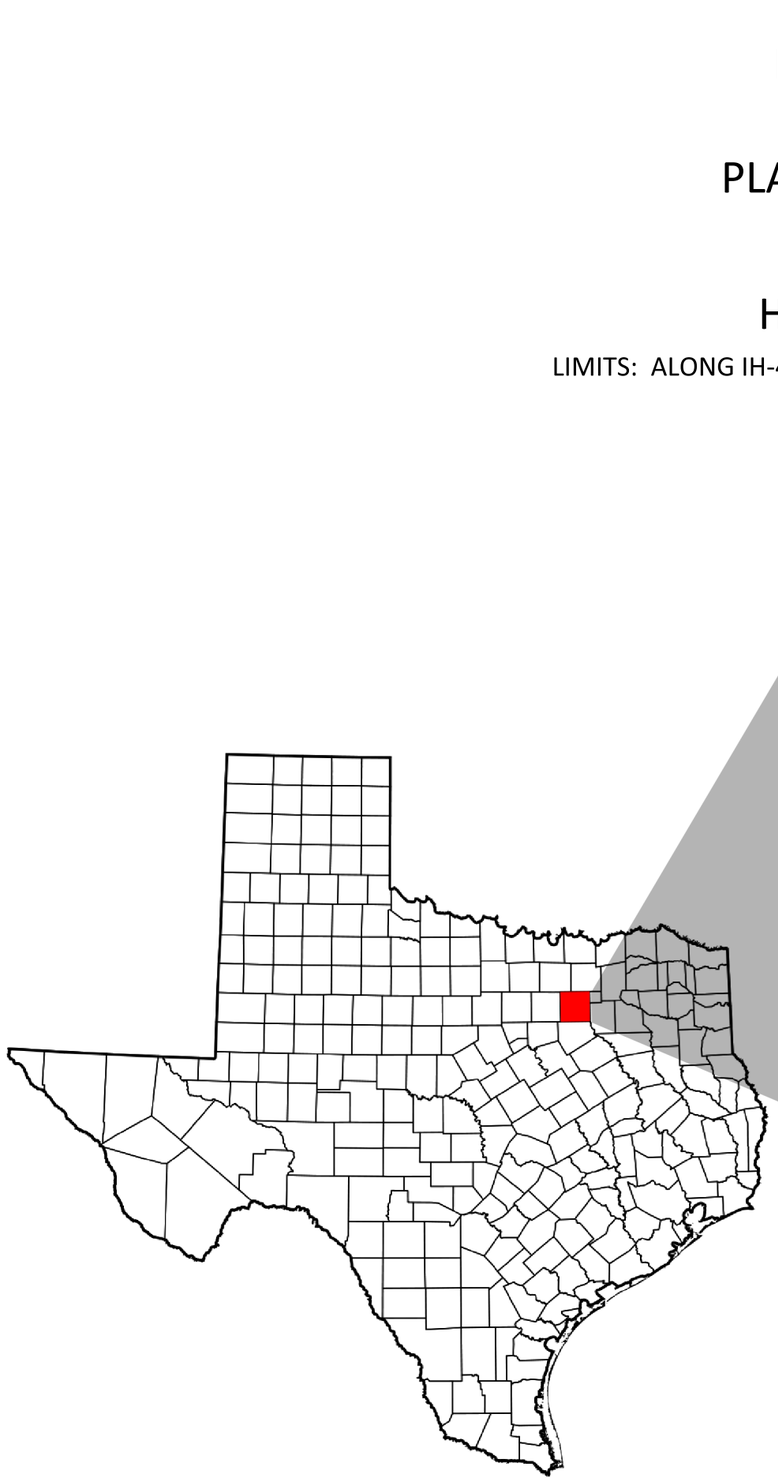
FILE: pbgcstd1-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		106

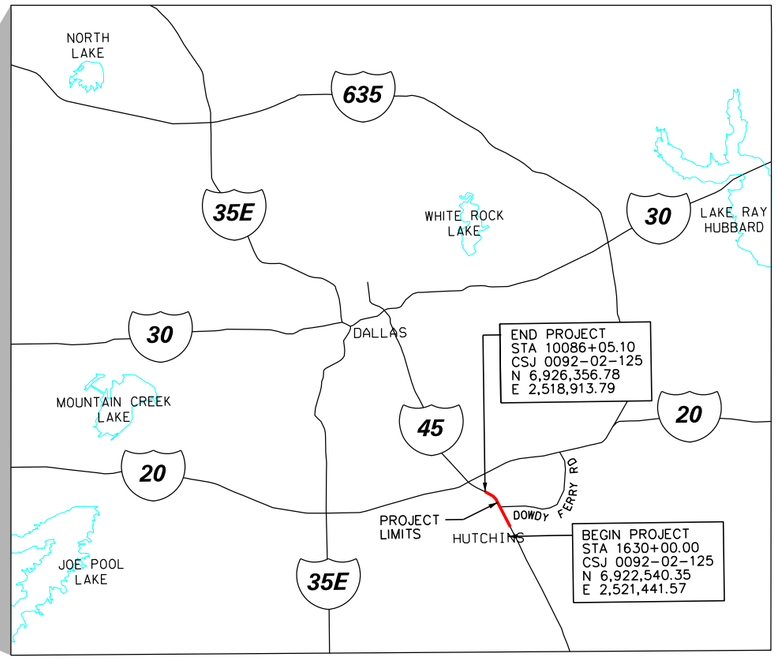
STATE OF TEXAS

DEPARTMENT OF TRANSPORTATION

PLANS OF EXISTING SUBSURFACE UTILITIES
QUALITY LEVEL B
DALLAS COUNTY
HIGHWAY : IH-45 AT DOWDY FERRY RD

LIMITS: ALONG IH-45 - 2,200' NORTH AND 2,500' SOUTH OF IH-45-DOWDY FERRY RD INTERSECTION
CSJ: 0092-02-125





LOCATION MAP
N.T.S.

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
06/25/21

ARS ENGINEERS, INC.

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		107
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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6/30/2021 10:14:32 AM P:\30118066.06 IH 45 at Dowdy Ferry\DGN\SHEETS\IH-45 DF COVER SHT.dgn

SUE LEGEND

OH	OVERHEAD (SEE OH LEGEND)
E1	ONCOR
E2	TXDOT
TS1	TXDOT
G1	ATMOS GAS
UDUCT1	AT&T DUCT
FOC1	AT&T FIBER
FOC2	CENTURYLINK
FOC3	UNITE PRIVATE NETWORKS
T1	AT&T TELEPHONE
T2	CHARTER COMMUNICATIONS/TIME WARNER
CATV1	CHARTER COMMUNICATIONS/TIME WARNER
STM1	CITY OF HUTCHINS - STORM
WW1	CITY OF HUTCHINS - WASTEWATER
W1	CITY OF HUTCHINS - WATER

OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

- TRANSMISSION TOWER
- CELL TOWER
- POWER POLE
- POWER POLE WITH LIGHT
- POWER MANHOLE
- PULL/TRANSFORMER BOX
- ELECTRIC METER
- UG ELECTRIC MARKER
- LIGHT POLE
- TRAFFIC SIGNAL POLE
- TRAFFIC SIGNAL CONTROL BOX
- SIGNAL PEDESTAL
- TELEPHONE HAND HOLE
- TELEPHONE PEDESTAL
- TELEPHONE MANHOLE
- CATV PEDESTAL
- UG TELEPHONE MARKER
- UG FIBER MARKER
- GAS MANHOLE
- GAS METER
- GAS APPURTENANCE
- UG GAS MARKER
- GAS VENT
- GAS TEST VALVE
- WATER VALVE
- FIRE HYDRANT
- WATER METER
- WATER MANHOLE
- WASTEWATER MANHOLE
- WASTEWATER CLEANOUT
- UG WASTEWATER MARKER
- STORM SEWER MANHOLE
- IRRIGATION EQUIPMENT
- SITE SIGN
- CONTROL POINT
- CONTINUATION MARK

QUALITY LEGEND

QUALITY LEVEL "D":
INFORMATION DERIVED FROM EXISTING RECORDS AND/OR ORAL RECOLLECTIONS.

QUALITY LEVEL "C":
INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION.

QUALITY LEVEL "B":
INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES (AKA DESIGNATING).

QUALITY LEVEL "A":
PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT (AKA LOCATING).

NOTES:

STORM SEWER DATA NOT SHOWN. UNABLE TO CORRELATE APPLICABLE UTILITY RECORDS TO CURRENT TOPOGRAPHIC DATA.

SHEET INDEX

TOTAL LINEAR FEET		
SUE QUALITY LEVEL	QUANTITY	
LEVEL A	Ø	EA
LEVEL B	39689	LF
LEVEL C	31495	LF
LEVEL D	26585	LF

DATUM:
THE UNIT OF MEASURE IS THE U.S. SURVEY FOOT.
ALL COORDINATES AND DISTANCES ARE SURFACE VALUES AND CAN BE CONVERTED TO GRID VALUES BY DIVIDING BY THE PROJECT SURFACE ADJUSTMENT FACTOR OF 1.000136506.

CONTROL POINTS:
1. CP-1
NORTHING: 6,928,019.79 EASTING: 2,516,431.47 ELEV.: 472.323'
2. CP-2
NORTHING: 6,926,539.95 EASTING: 2,518,813.37 ELEV.: 466.69'
3. CP-3
NORTHING: 6,925,114.74 EASTING: 2,520,490.41 ELEV.: 432.27'
4. CP-4
NORTHING: 6,923,475.23 EASTING: 2,521,181.02 ELEV.: 462.26'
5. CP-5
NORTHING: 6,920,067.57 EASTING: 2,522,425.41 ELEV.: 492.18'
6. CP-6
NORTHING: 6,917,887.48 EASTING: 2,523,337.94 ELEV.: 487.99'
7. CP-7
NORTHING: 6,915,174.62 EASTING: 2,524,412.29 ELEV.: 478.08'

•SURVEY CONTROL SET BY TXDOT.

UTILITY CONTACT INFORMATION:

UTILITY TYPE	OWNER	CONTACT	PHONE	EMAIL
Communications	Charter Communications	Chad Whidden	817-298-3528	Chad.Whidden@charter.com
Communications	AT&T	Gary Tilory	817-338-6202	gt1219@att.com
Communications	CenturyLink	Jordan Adams	918-547-0817	jordanadams@centurylink.com
Gas	Atmos	Edie Lopez	214-714-7552	Edie.Lopez@atmosenergy.com
Communications	Sprint	James Stuart	972-791-8556	james.stuart@sprint.com
Electric	Oncor	Distribution GIS		DistributionGIS@oncor.com
Electric	Oncor Transmission	Michael Holloway	817-253-9679	Michael.Holloway@oncor.com
Communications	Unite Private Networks	Griselle Gonzalez	469-475-9328	Griselle.Gonzalez@upnfiber.com
W, WW, Storm	City of Hutchins	Charles Brewer	214-862-4136	cbrewer@cityofhutchins.org

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
06/25/21

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
LEGEND AND UTILITY CONTACT LIST

SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		108
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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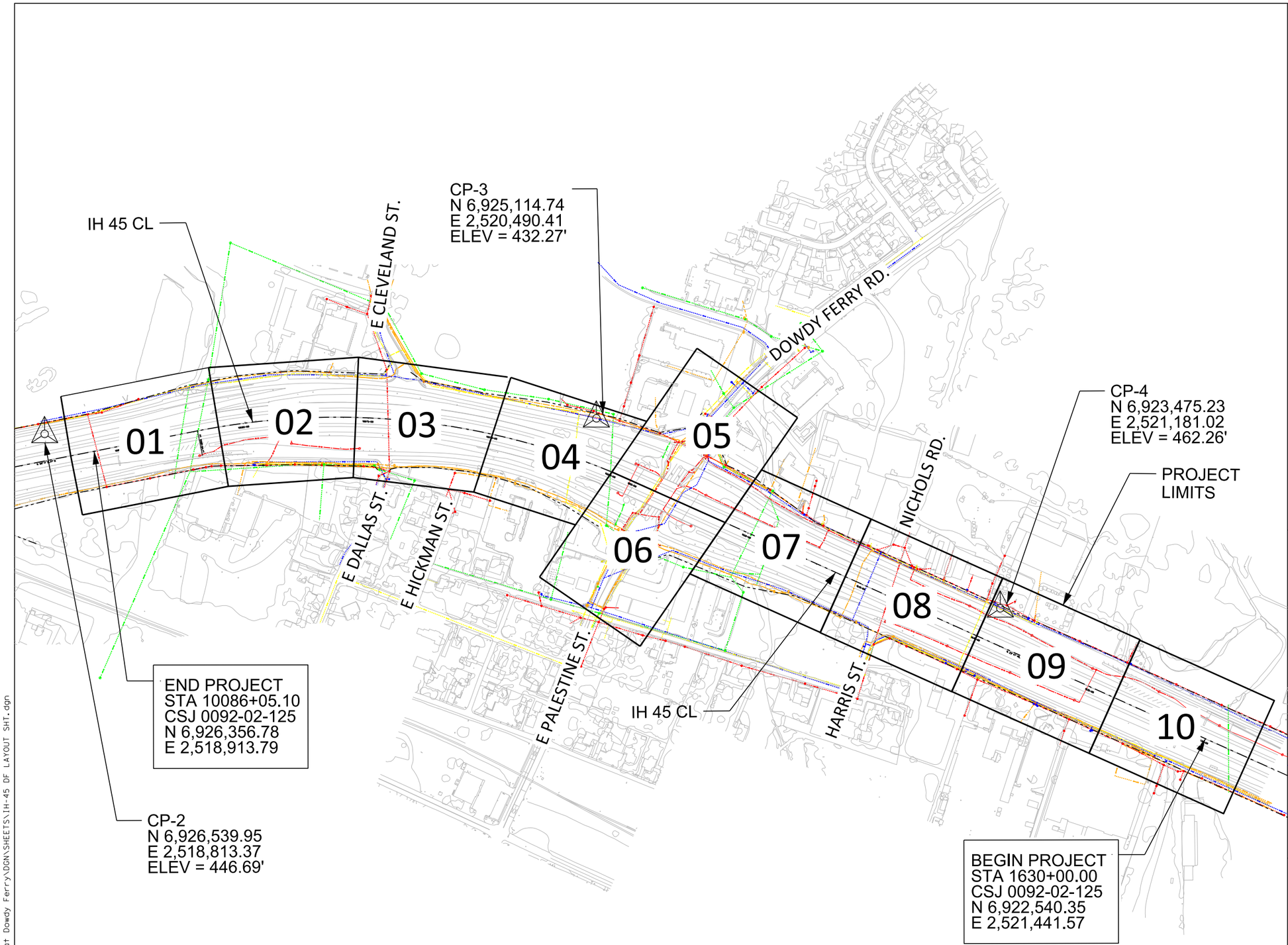

SCALE: 1"=200' (22x34)

0 50 100 150 200

0 200 400 600 800

SCALE: 1"=400' (11x17)

T1 (B)

T1 (C)

T1 (D)

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
06/25/21

NO.	DATE	REVISION	APPROV.

Texas Department of Transportation

IH-45 AT DOWDY FERRY SHEET LAYOUT

SHEET 1 OF 1

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		109
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

6/30/2021 10:14:35 AM P:\30118066.06 IH 45 at Dowdy Ferry\DGN\SHEETS\IH-45 DF LAYOUT SHT.dgn

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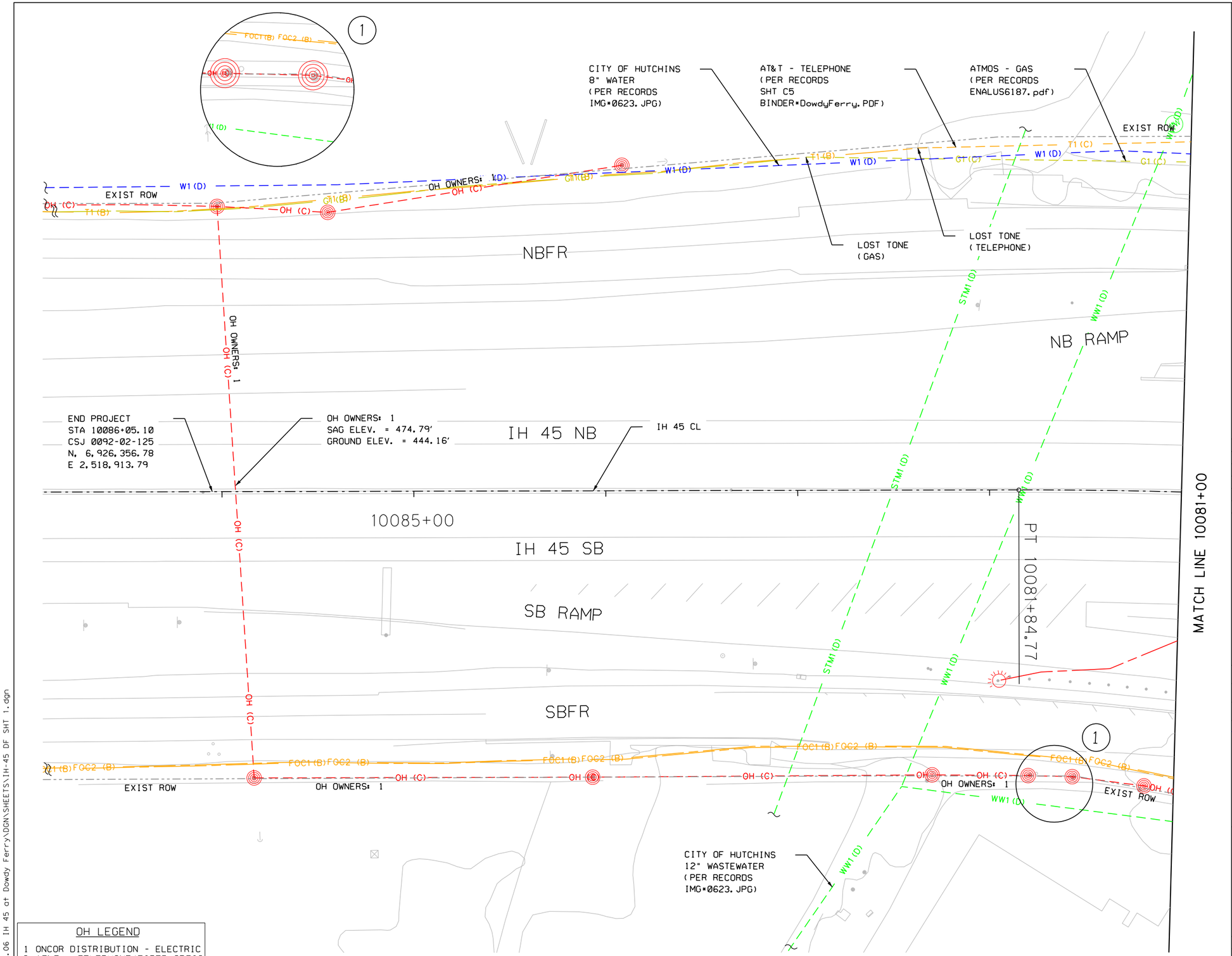

OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

*ALL SUE CONDUCTED PRIOR TO 11-23-2020

SCALE: 1"=25' (22x34)

0 25 50

0 25 50 75 100

SCALE: 1"=50' (11x17)

N

SHEET INDEX

QUALITY LEGEND

- QUALITY LEVEL "A"
- T1 (B) — QUALITY LEVEL "B"
- T1 (C) — QUALITY LEVEL "C"
- T1 (D) — QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY	
LEVEL A	0	EA
LEVEL B	2336	LF
LEVEL C	1950	LF
LEVEL D	3417	LF

STATE OF TEXAS
ANEIL M. SANDHU
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PROFESSIONAL ENGINEER
06/25/21

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ARS ENGINEERS, INC.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 1 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		110
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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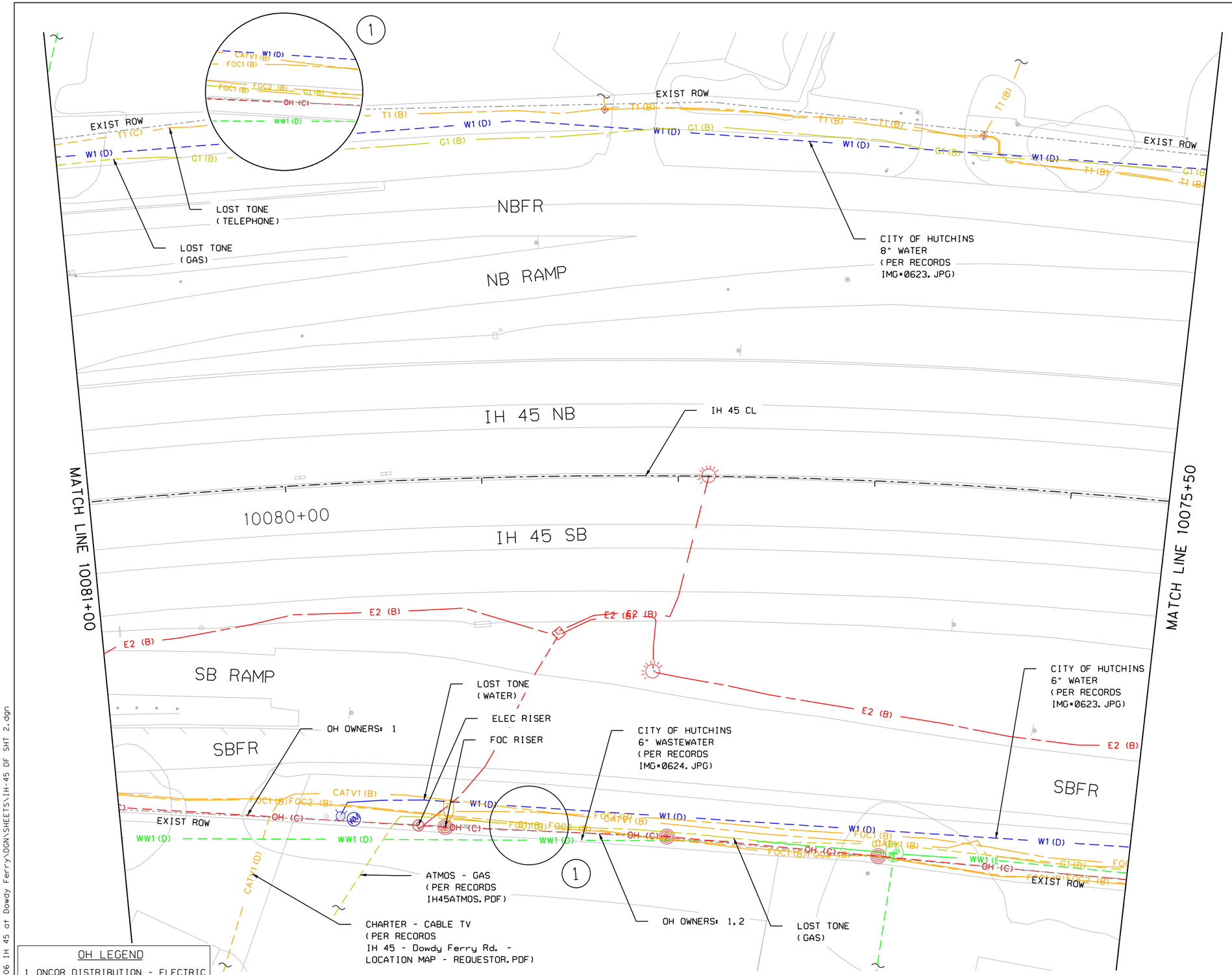
6/30/2021 10:14:36 AM P:\30118066.06 IH 45 at Dowdy Ferry\DGN\SHEETS\IH-45 DF SHT 1.dgn



OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

*ALL SUE CONDUCTED PRIOR TO 11-23-2020

SCALE: 1"=25' (22x34)

0 25 50

0 25 50 75 100

SCALE: 1"=50' (11x17)

N

SHEET INDEX

QUALITY LEGEND

- QUALITY LEVEL "A"
- T1 (B) — QUALITY LEVEL "B"
- T1 (C) — QUALITY LEVEL "C"
- T1 (D) — QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY	
LEVEL A	0	EA
LEVEL B	4387	LF
LEVEL C	1438	LF
LEVEL D	2859	LF

STATE OF TEXAS
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06/25/21

NO.	DATE	REVISION	APPROV.

ARS ENGINEERS, INC.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 2 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		111
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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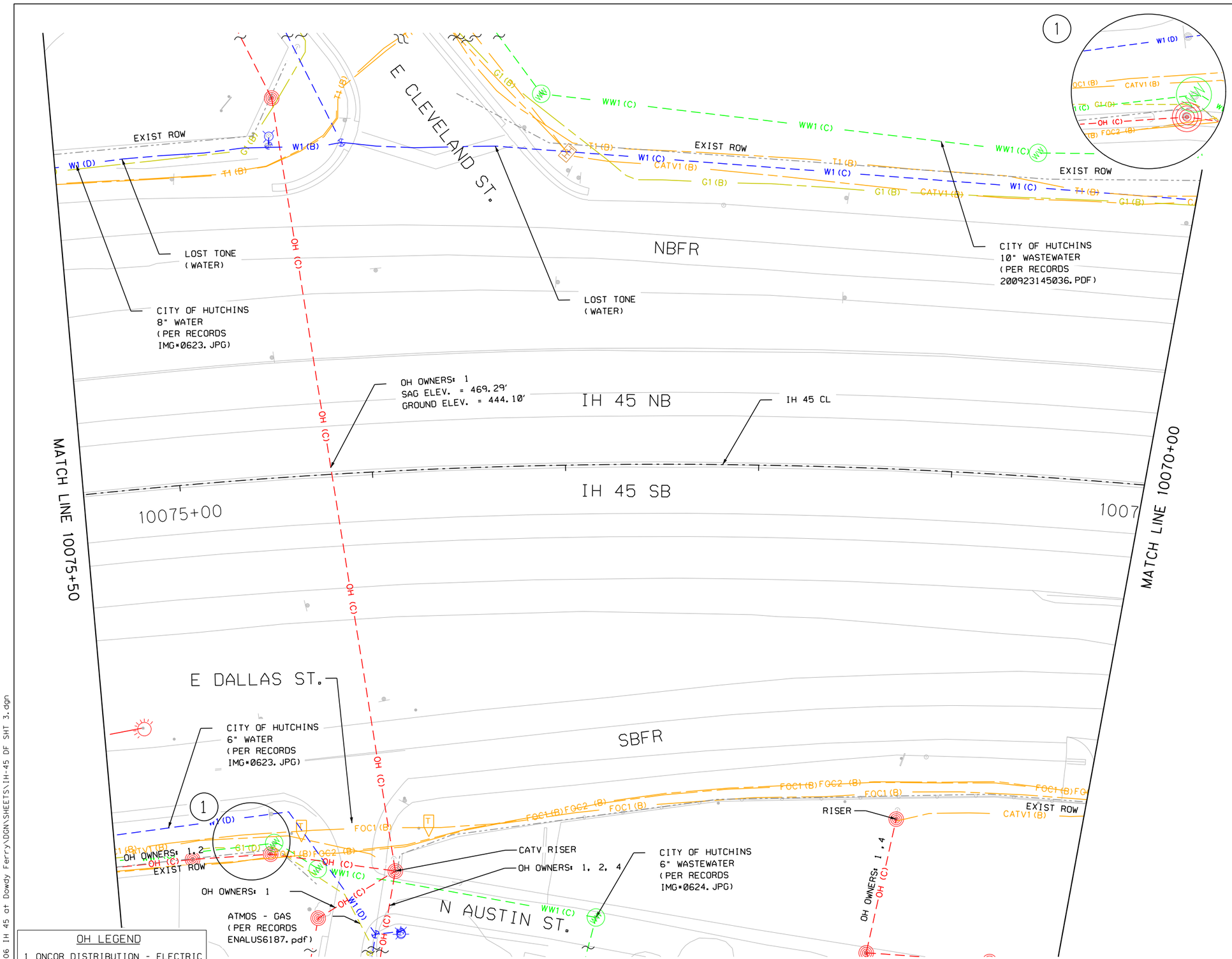
6/30/2021 10:14:37 AM P:\30118066.06 IH 45 at Dowdy Ferry\DGN\SHEETS\IH-45 DF SHT 2.dgn



SCALE: 1"=25' (22x34)

0 25 50

0 25 50 75 100

SCALE: 1"=50' (11x17)

SHEET INDEX

QUALITY LEGEND

	QUALITY LEVEL "A"
T1 (B)	QUALITY LEVEL "B"
T1 (C)	QUALITY LEVEL "C"
T1 (D)	QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY	
LEVEL A	0	EA
LEVEL B	5100	LF
LEVEL C	4146	LF
LEVEL D	2582	LF

STATE OF TEXAS
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06/25/21

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Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 3 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		112
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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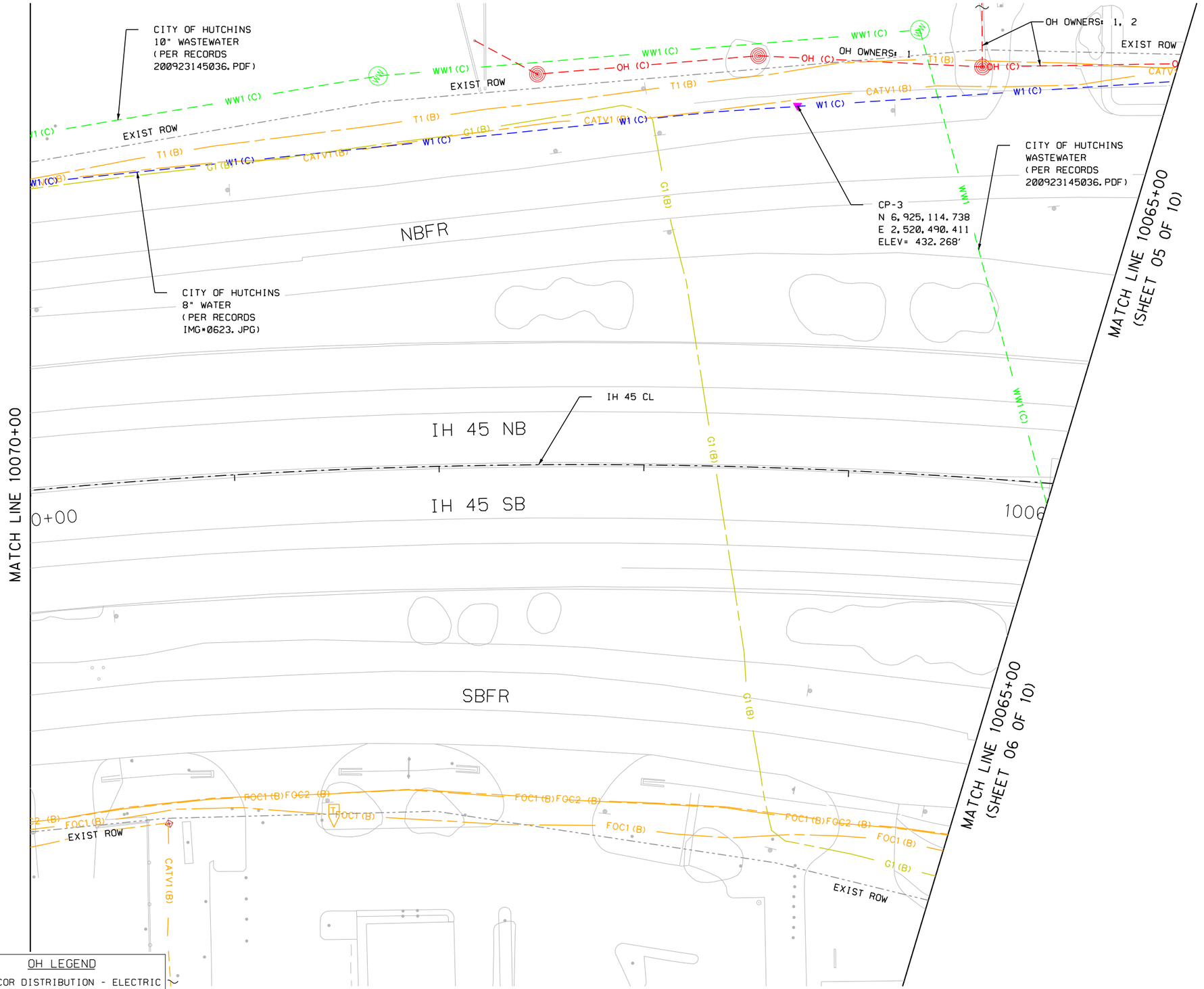

OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

*ALL SUE CONDUCTED PRIOR TO 11-23-2020

SCALE: 1"=25' (22x34)

0 25 50

0 25 50 75 100

SCALE: 1"=50' (11x17)

N

SHEET INDEX

QUALITY LEGEND

- QUALITY LEVEL "A"
- T1 (B) — QUALITY LEVEL "B"
- T1 (C) — QUALITY LEVEL "C"
- T1 (D) — QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY
LEVEL A	0 EA
LEVEL B	3342 LF
LEVEL C	2533 LF
LEVEL D	1417 LF

STATE OF TEXAS
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06/25/21

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IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 4 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		113
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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6/30/2021 10:14:38 AM P:\30118066.06 IH 45 at Dowdy Ferry\DGN\SHEETS\IH-45 DF SHT 4.dgn

MATCH LINE 10065+00 (SHEET 04 OF 10)

STATION EQUATION
STA 10065+84.98 =
STA 1654+90.08

1655+00

NBFR

IH 45 NB

MATCH LINE IH45 CENTERLINE
(SHEET 06 OF 10)

OH OWNERS: 1, 2

RISER

AT&T - TELEPHONE
(PER RECORDS
SHT D6
BINDER*DowdyFerry.PDF)

EXIST ROW

CITY OF HUTCHINS
8" WATER
(PER RECORDS
IMG*0623.JPG)

AT&T - TELEPHONE
(PER RECORDS
SHT D6
BINDER*DowdyFerry.PDF)

ELEC RISER

OH OWNERS: 1
SAG ELEV. = 449.04'
GROUND ELEV. = 430.58'

DOWDY FERRY RD.

RISERS

ATMOS - GAS
(PER RECORDS
IH45ATMOS.PDF)

END OF LINE
PER RECORDS

CITY OF HUTCHINS
6" WASTEWATER
(PER RECORDS
200923145036.PDF)

OH OWNERS: 1, 2, 4

CITY OF HUTCHINS
12" WASTEWATER
(PER RECORDS
200923145036.PDF)

ELEC RISER

CITY OF HUTCHINS
6" WATER
(PER RECORDS
IMG*0623.JPG)

OH OWNERS: 1, 2

MATCH LINE 1651+00 (SHEET 07 OF 10)

OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

*ALL SUE CONDUCTED PRIOR TO
11-23-2020

SCALE: 1"=25' (22x34)

0 25 50

SCALE: 1"=50' (11x17)

0 25 50 75 100

N

SHEET INDEX

QUALITY LEGEND

T1 (B)	QUALITY LEVEL "A"
T1 (B)	QUALITY LEVEL "B"
T1 (C)	QUALITY LEVEL "C"
T1 (D)	QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY	
LEVEL A	0	EA
LEVEL B	4272	LF
LEVEL C	3828	LF
LEVEL D	3783	LF

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
06/25/21

NO.	DATE	REVISION	APPROV.

ARS ENGINEERS, INC.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 5 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		114
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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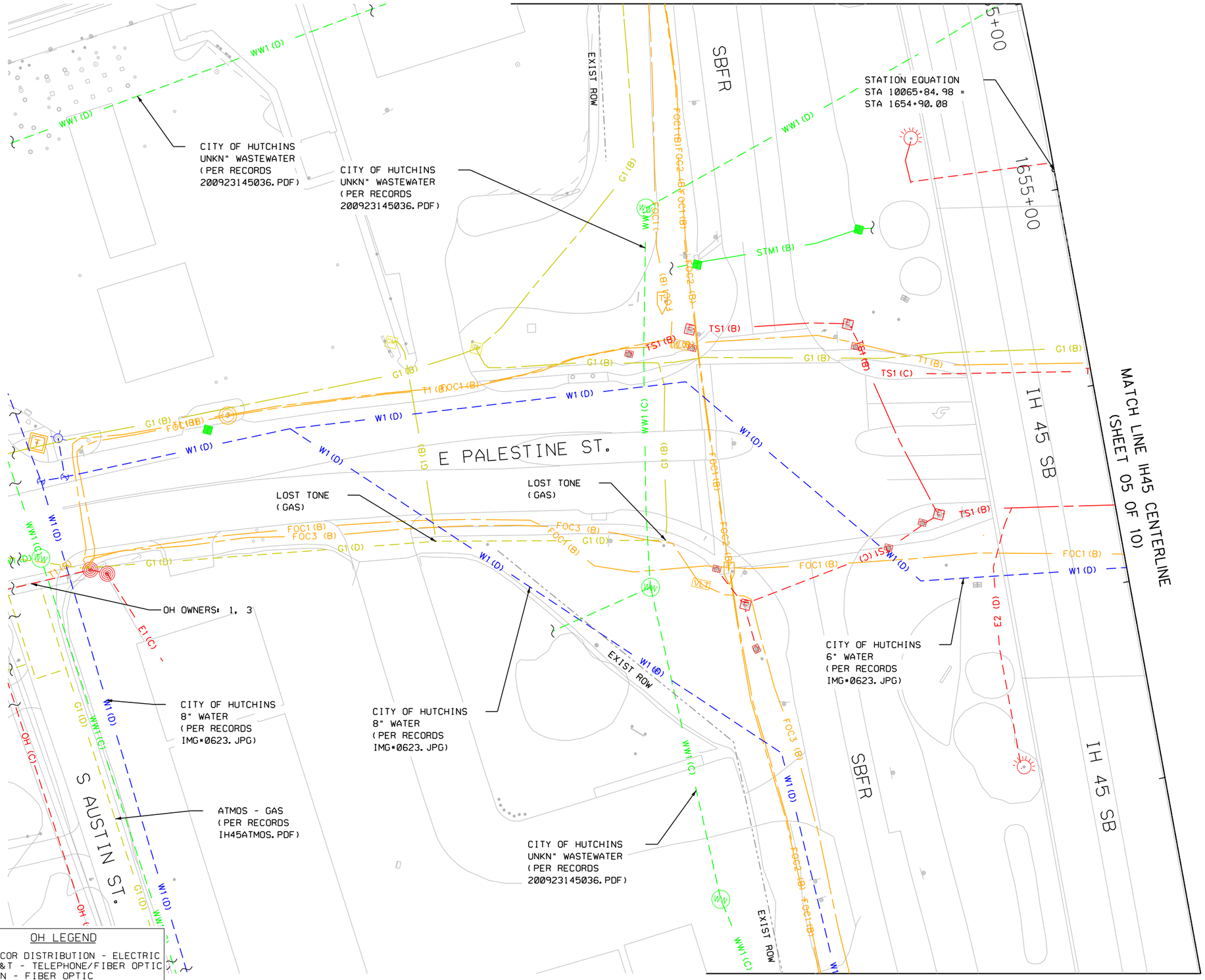
6/30/2021 10:14:39 AM P:\30118066.06 IH 45 at Dowdy Ferry\DGN\SHEETS\IH-45 OF SHT 5.dgn

MATCH LINE 10065+00 (SHEET 04 OF 10)



MATCH LINE 1651+00 (SHEET 07 OF 10)

OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

*ALL SUE CONDUCTED PRIOR TO 11-23-2020

SCALE: 1"=25' (22x34)

0 25 50

0 25 50 75 100

SCALE: 1"=50' (11x17)

~N~

SHEET INDEX

QUALITY LEGEND

	QUALITY LEVEL "A"
T1 (B)	QUALITY LEVEL "B"
T1 (C)	QUALITY LEVEL "C"
T1 (D)	QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY
LEVEL A	0 EA
LEVEL B	4608 LF
LEVEL C	2432 LF
LEVEL D	4038 LF

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
06/25/21

NO.	DATE	REVISION	APPROV.

ARS ENGINEERS, INC.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 6 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		115
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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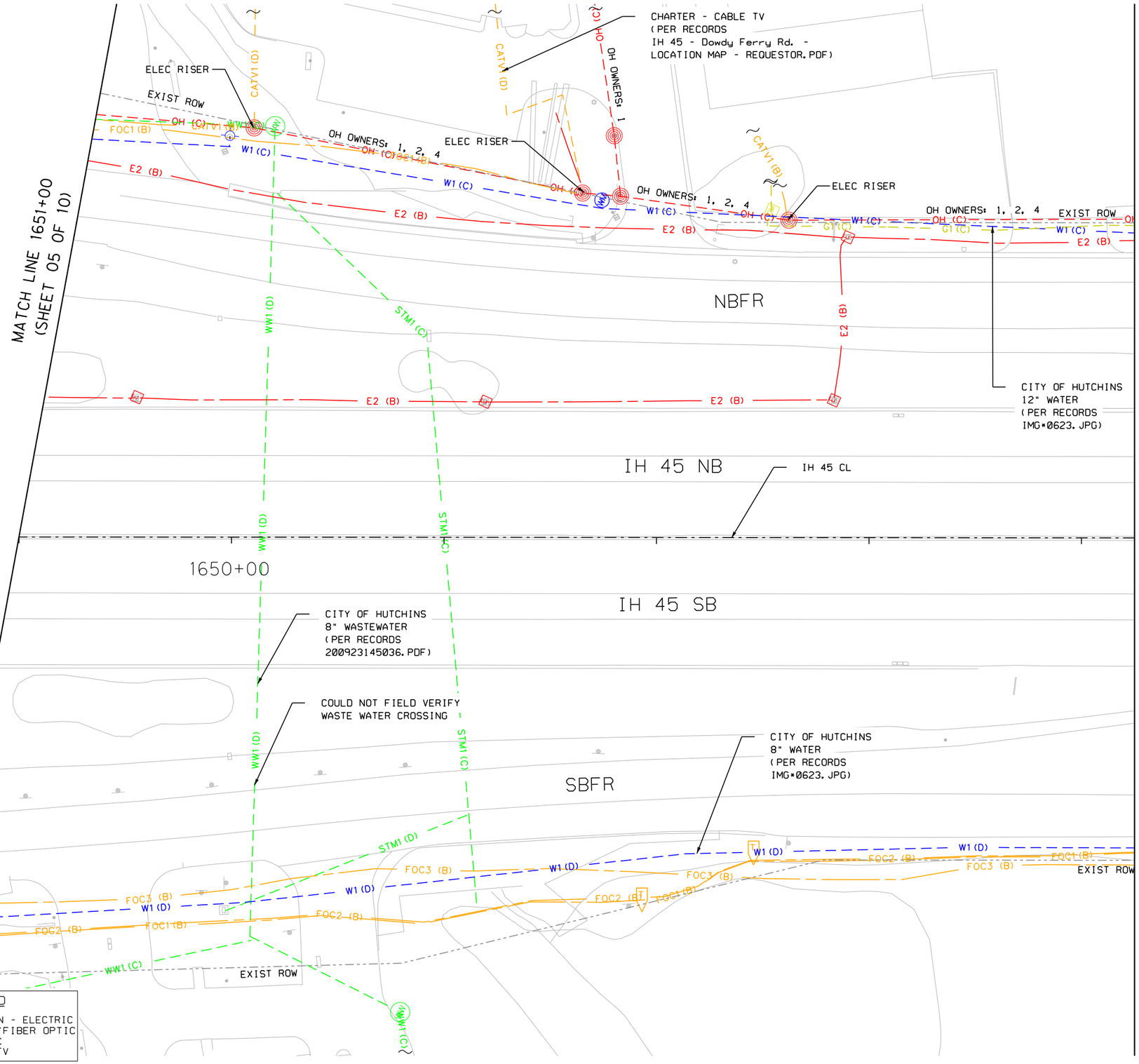
6/30/2021 10:14:39 AM P:\30118066.06 IH 45 at Dowdy Ferry\DGN\SHEETS\IH-45 DF SHT 6.dgn



SCALE: 1"=25' (22x34)

0 25 50

SCALE: 1"=50' (11x17)

0 25 50 75 100

N

SHEET INDEX

QUALITY LEGEND

- QUALITY LEVEL "A"
- T1 (B) — QUALITY LEVEL "B"
- T1 (C) — QUALITY LEVEL "C"
- T1 (D) — QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY
LEVEL A	0 EA
LEVEL B	3014 LF
LEVEL C	3322 LF
LEVEL D	2740 LF

STATE OF TEXAS
ANEIL M. SANDHU
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06/25/21

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ARS ENGINEERS, INC.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 7 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		116
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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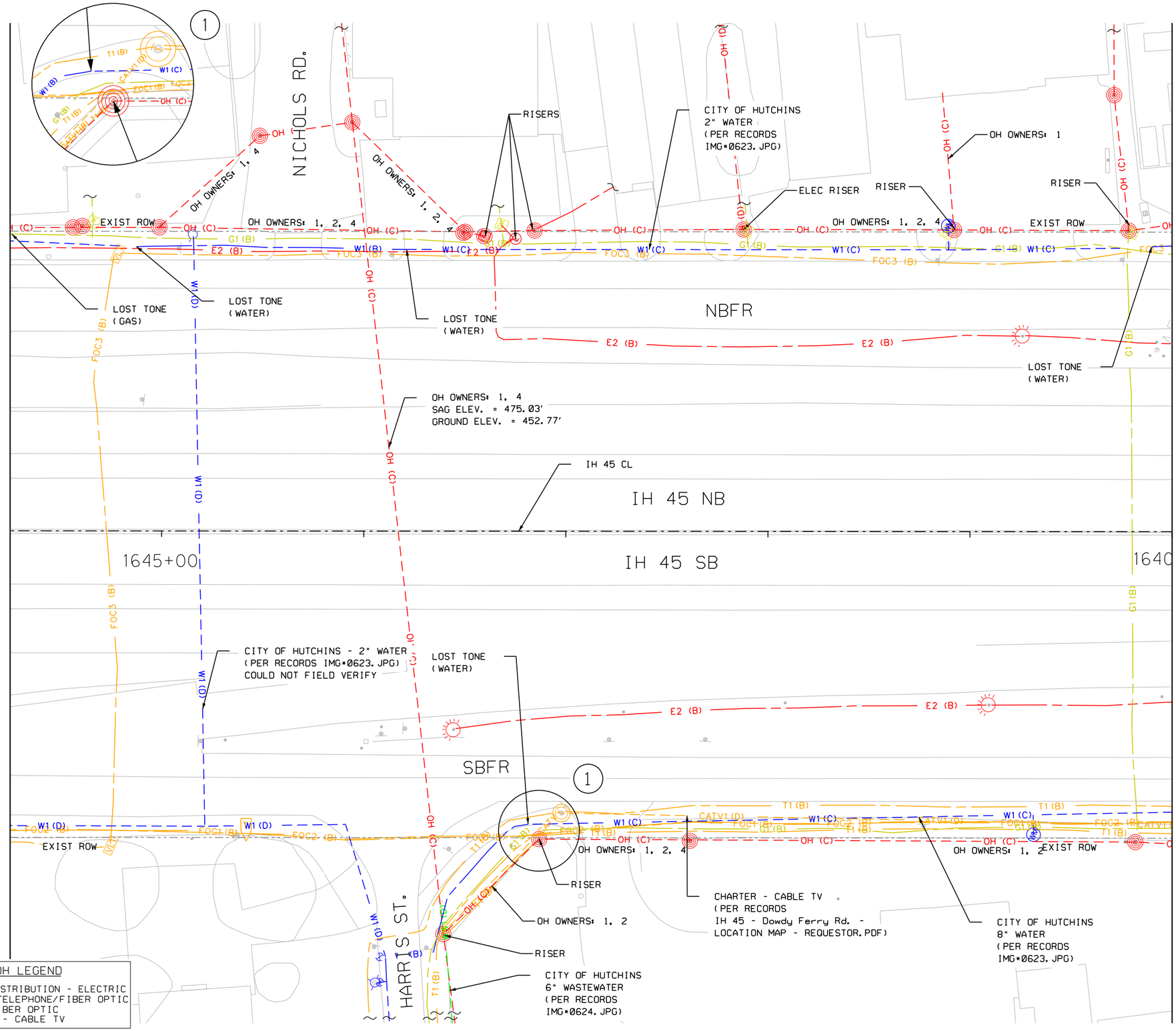

OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

*ALL SUE CONDUCTED PRIOR TO 11-23-2020

SCALE: 1"=25' (22x34)

0 25 50

SCALE: 1"=50' (11x17)

0 25 50 75 100

N

SHEET INDEX

QUALITY LEGEND

- QUALITY LEVEL "A"
- T1 (B) — QUALITY LEVEL "B"
- T1 (C) — QUALITY LEVEL "C"
- T1 (D) — QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY
LEVEL A	0 EA
LEVEL B	5974 LF
LEVEL C	3205 LF
LEVEL D	2025 LF

STATE OF TEXAS
ANEIL M. SANDHU
114532
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06/25/21

NO.	DATE	REVISION	APPROV.

ARS ENGINEERS, INC.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 8 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		117
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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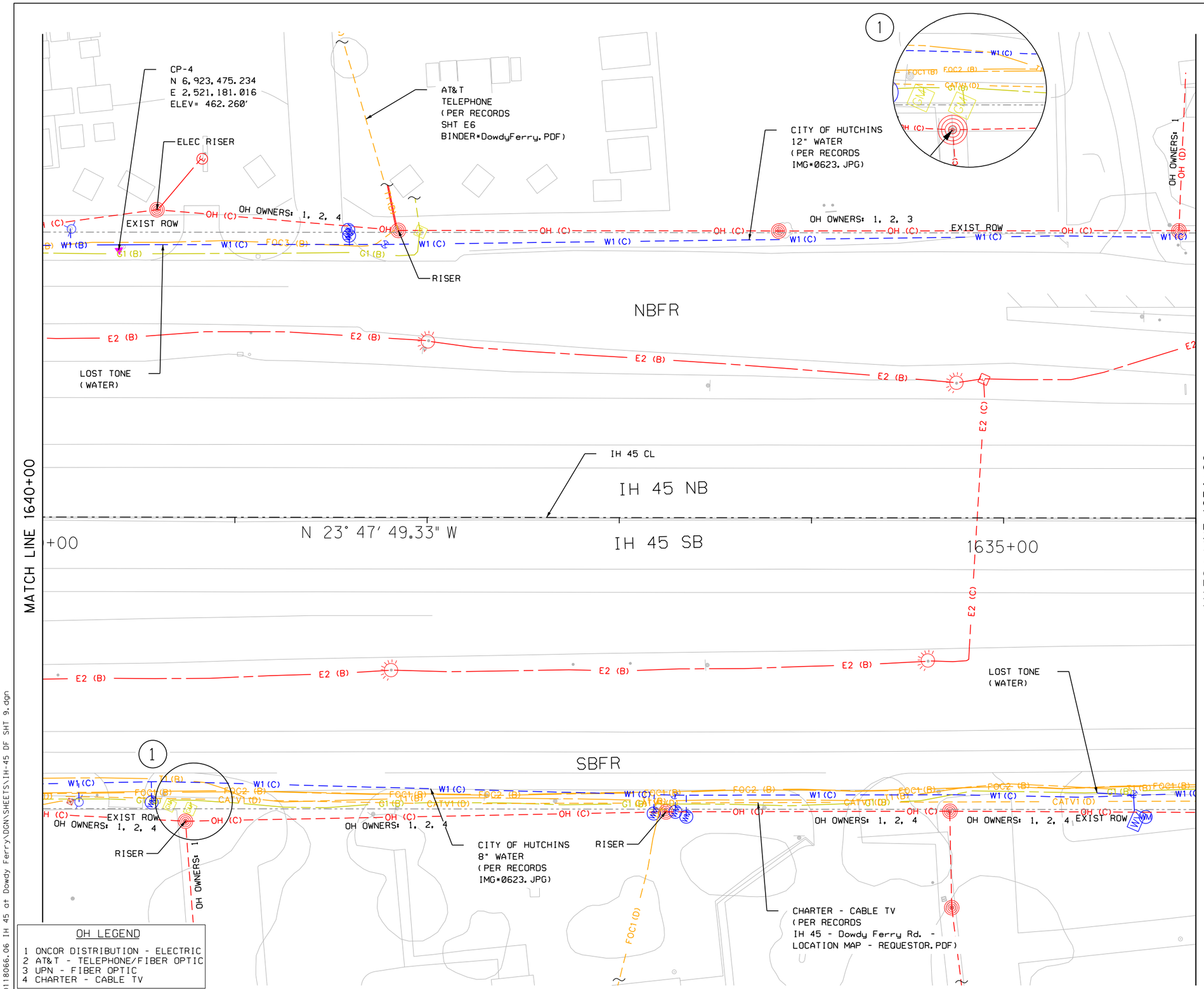

OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

*ALL SUE CONDUCTED PRIOR TO 11-23-2020

SCALE: 1"=25' (22x34)

0 25 50

0 25 50 75 100

SCALE: 1"=50' (11x17)

SHEET INDEX

QUALITY LEGEND

- T1 (B) — QUALITY LEVEL "A"
- T1 (B) — QUALITY LEVEL "B"
- T1 (C) — QUALITY LEVEL "C"
- T1 (D) — QUALITY LEVEL "D"

TOTAL LINEAR FEET

SUE QUALITY LEVEL	QUANTITY	
LEVEL A	0	EA
LEVEL B	4115	LF
LEVEL C	2729	LF
LEVEL D	1023	LF

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
06/25/21

NO.	DATE	REVISION	APPROV.

ARS ENGINEERS, INC.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 9 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		118
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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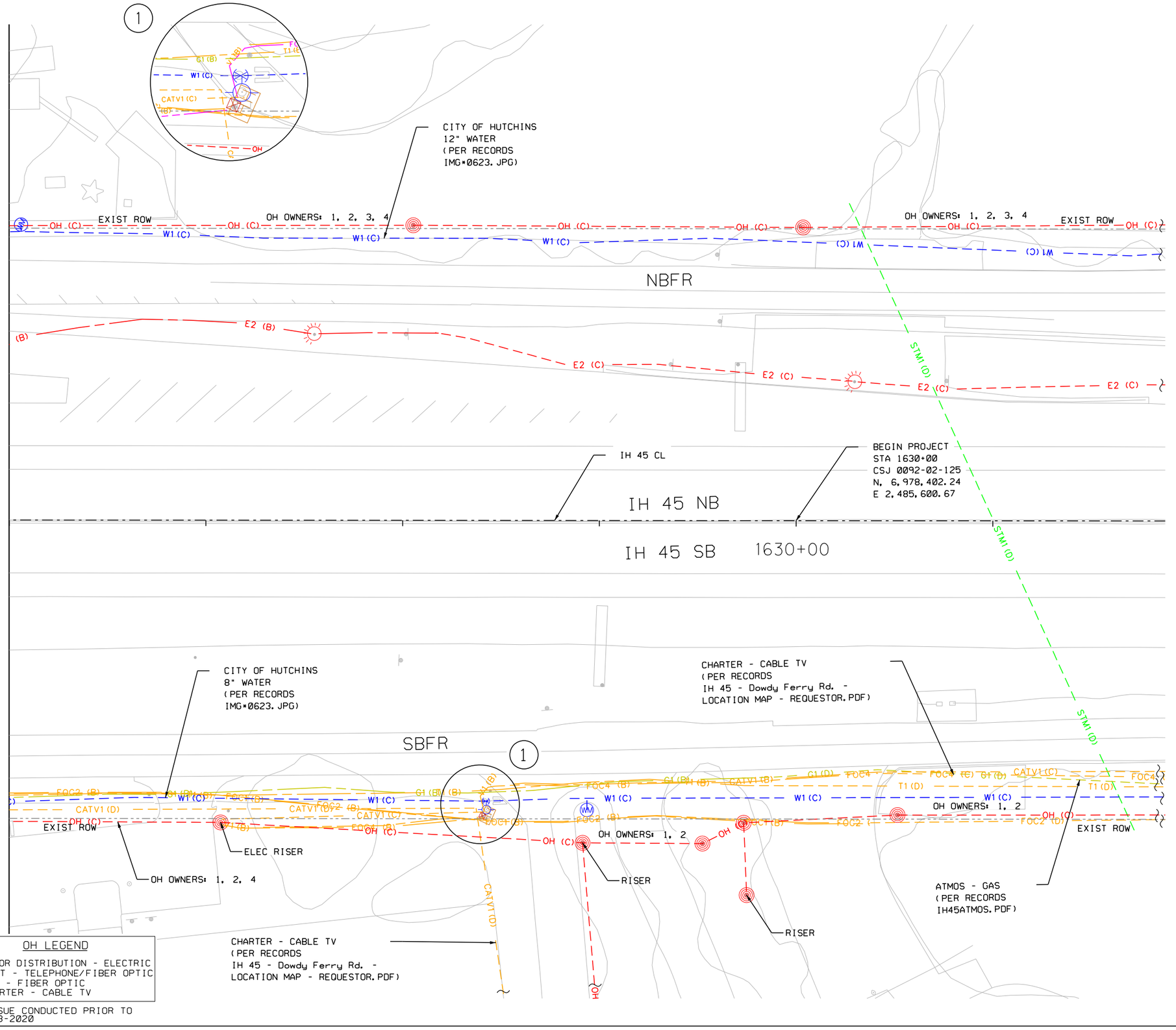

OH LEGEND

1 ONCOR DISTRIBUTION - ELECTRIC
2 AT&T - TELEPHONE/FIBER OPTIC
3 UPN - FIBER OPTIC
4 CHARTER - CABLE TV

*ALL SUE CONDUCTED PRIOR TO 11-23-2020

SCALE: 1"=25' (22x34)

0 25 50

0 25 50 75 100

SCALE: 1"=50' (11x17)

SHEET INDEX

QUALITY LEGEND

	QUALITY LEVEL "A"
T1 (B)	QUALITY LEVEL "B"
T1 (C)	QUALITY LEVEL "C"
T1 (D)	QUALITY LEVEL "D"

TOTAL LINEAR FEET		
SUE QUALITY LEVEL	QUANTITY	
LEVEL A	0	EA
LEVEL B	2539	LF
LEVEL C	5910	LF
LEVEL D	2700	LF

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
06/25/21

NO.	DATE	REVISION	APPROV.

ARS ENGINEERS, INC.

Texas Department of Transportation

IH-45
AT DOWDY FERRY
EXISTING UTILITY MAP

SHEET 10 OF 10

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	SEE TITLE SHEET		119
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	HIGHWAY NO.
0092	02	125	IH-45

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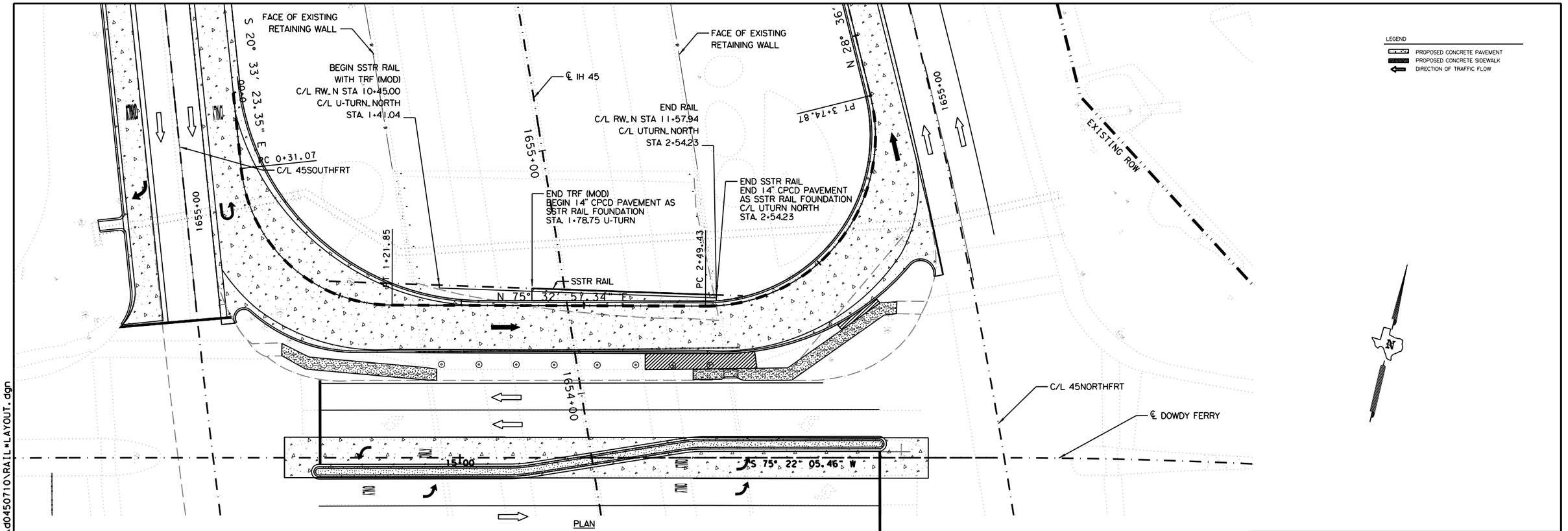

SOLOMON BAYOU
127501
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

solomonbayou , P.E. 7/15/21
Signature of Registrant & Date

Texas Department of Transportation
© 2021

IH 45

RAIL N LAYOUT

SCALE: 1"=40'-H
1"=5'-V

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SB	6	SEE TITLE SHEET		IH 45
GRAPHICS SB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK TEXAS	18	DALLAS		120
CHECK DN	CONTROL	SECTION	JOB	
	0092	02	125	

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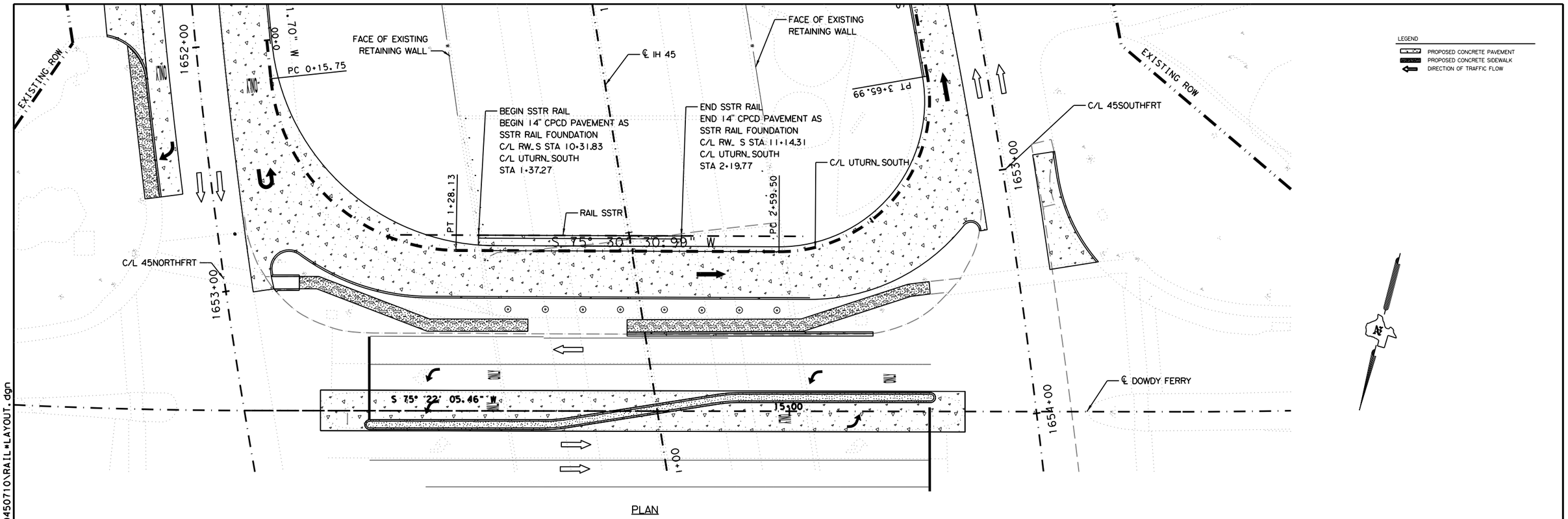
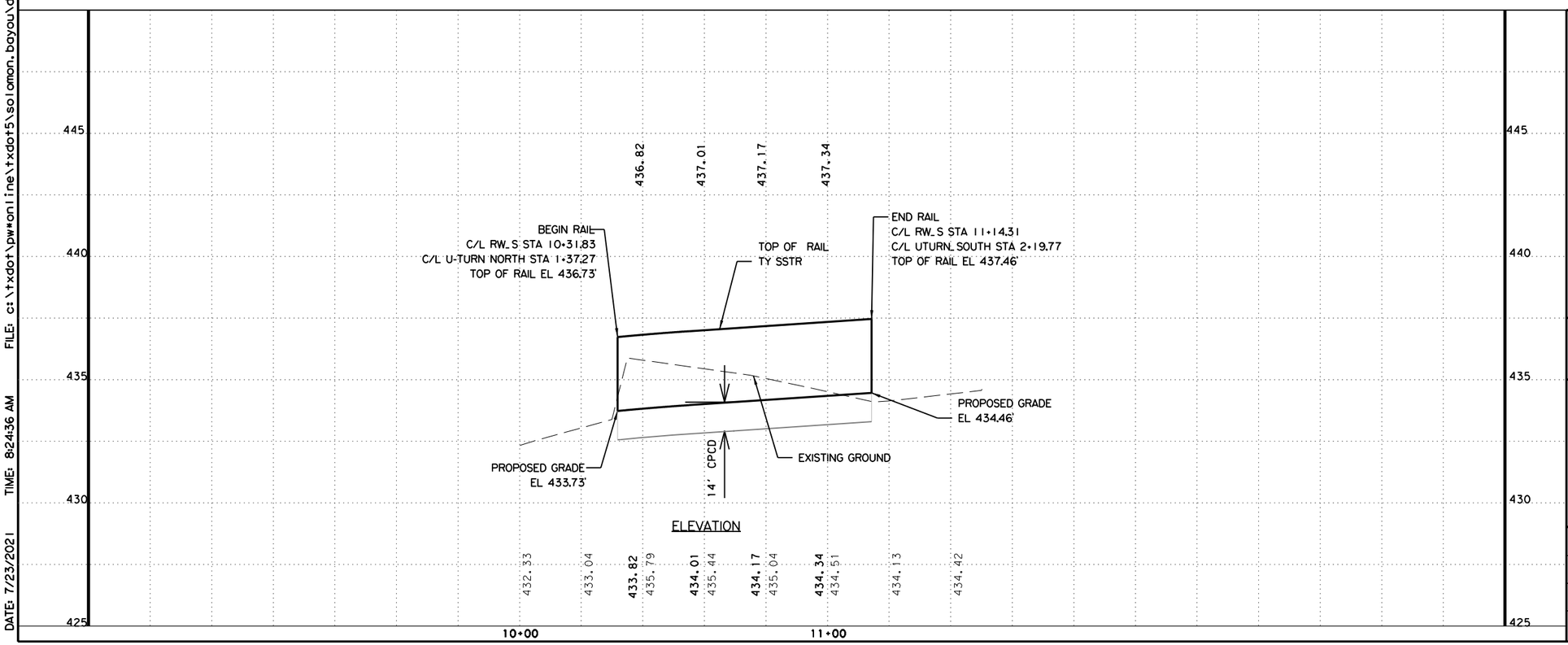
DATE: 7/23/2021



PLAN



ELEVATION

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TIME: 8:24:36 AM
DATE: 7/23/2021

SOLOMON BAYOU
127501
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

solomonbayou , P.E. 7/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

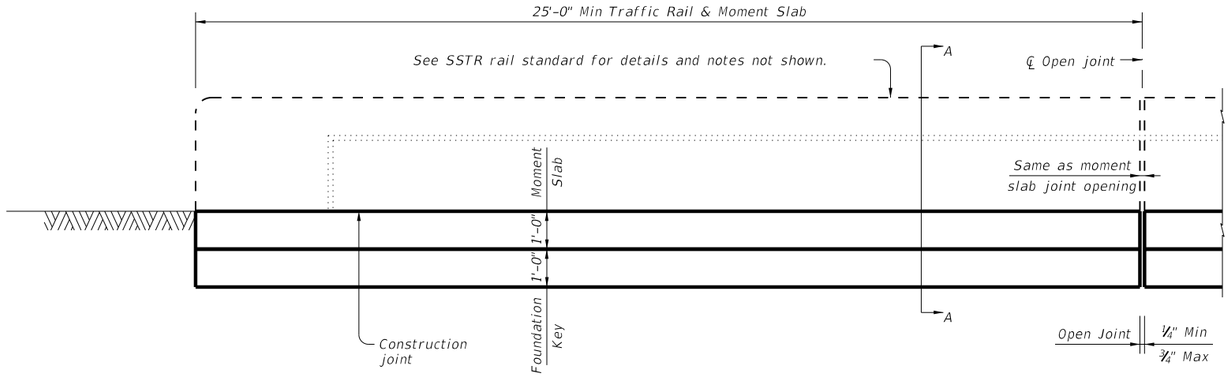
RAIL S LAYOUT

SCALE: 1"=40'-H
1"=5'-V

SHEET 1 OF 1

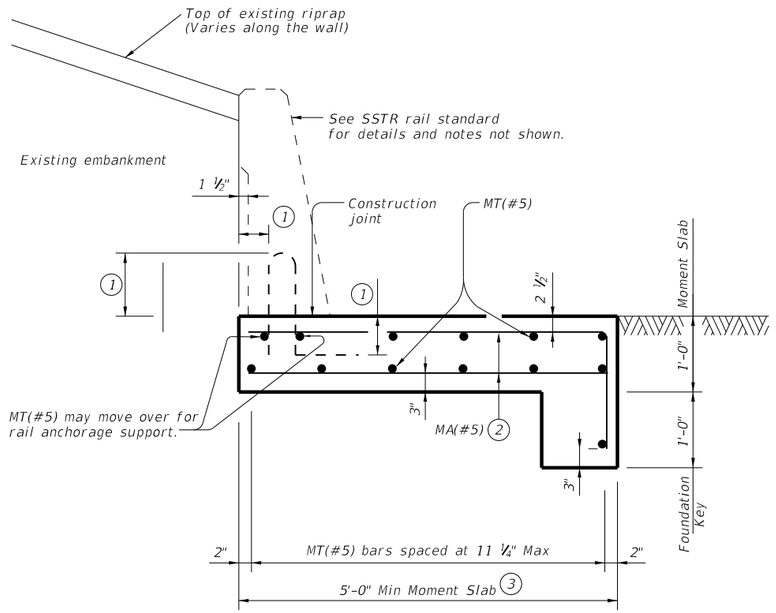
DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
SB	6	SEE TITLE SHEET		IH 45
GRAPHICS SB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	121
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE:
FILE:



ROADWAY ELEVATION OF TRAFFIC RAIL ON MOMENT SLAB (TRF-MS)

(Reinforcing not shown for clarity.)



SECTION A-A
SSTR RAIL ON MOMENT SLAB (TRF-MS)

12/17/2020 Sheet modified to remove grade beam option and add shear key to a moment slab

1. See applicable bridge rail standard.
2. MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).
3. Approximate moment slab concrete = 0.23 CY/LF and reinforcement = 25.1 LB/LF.

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) open joints with rail open joints maintaining no less than minimum rail length.
Provide moment slab (TRF-MS) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.
Provide Grade 60 reinforcing steel.
Epoxy coat or galvanize all reinforcing steel if required elsewhere.

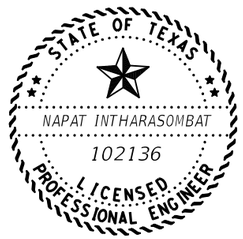
Provide bar laps, where required, as follows:
Uncoated or galvanized ~ #5 = 2'-4"
Epoxy coated ~ #5 = 3'-6"

Use of these details will result in a moment slab (TRF-MS) that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

GENERAL NOTES:

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.
See appropriate rail standard for details and notes not shown.
This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.
Payment for moment slab (TRF-MS) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.
The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.
Excavation will be subsidiary to other Items.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bar dimensions shown are out-to-out of bar.



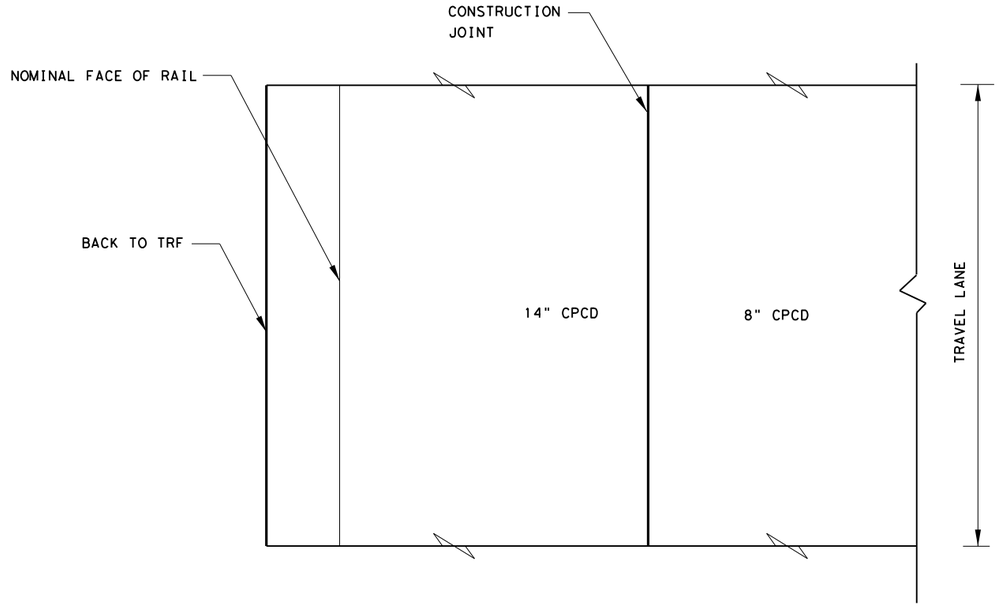
06/16/2021

Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL FOUNDATIONS
FOR MASH TL-2, TL-3 & TL-4 BRIDGE RAILS
TRF (MOD)

FILE: rista027-20.dgn	DN: TxDOT	CK: TAR	DW: JTR	CK: TAR
©TxDOT September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS 07-20: Added moment slab with rail foundation lengths.	0092	02	125	IH-45
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS		122



TRANSVERSE JOINT DETAIL

14" CPCD TO 8" CPCD

(PLAN VIEW (NOT TO SCALE)

① *See applicable bridge rail standard.*

② *MA(#5) space longitudinally along moment slab at 12" Max. (Spaced 2 ½" longitudinally from outside edge of moment slab).*

Approximate moment slab concrete = 0.19 CY/LF and reinforcement = 22.4 LB/LF.

CONSTRUCTION NOTES:

Align moment slab (TRF-MS) open joints with rail open joints maintaining no less than minimum rail length. Provide moment slab (TRF-MS) with open joints at no greater than 100' spacing unless otherwise shown on the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if required elsewhere.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #5 = 2'-4"

Epoxy coated ~ #5 = 3'-6"

GENERAL NOTES:

Use of these details will result in a moment slab (TRF-MS) foundation that is acceptable for traffic rails which are MASH TL-2, TL-3, or TL-4 compliant.

See elsewhere in the plans for selected options between moment slab (TRF-MS).

The foundation design resistance is based on the current AASHTO bridge railing requirements with the assumption of fair to good soil support conditions. Poor soil conditions will require suitably deeper and/or wider foundations.

See appropriate rail standard for details and notes not shown.

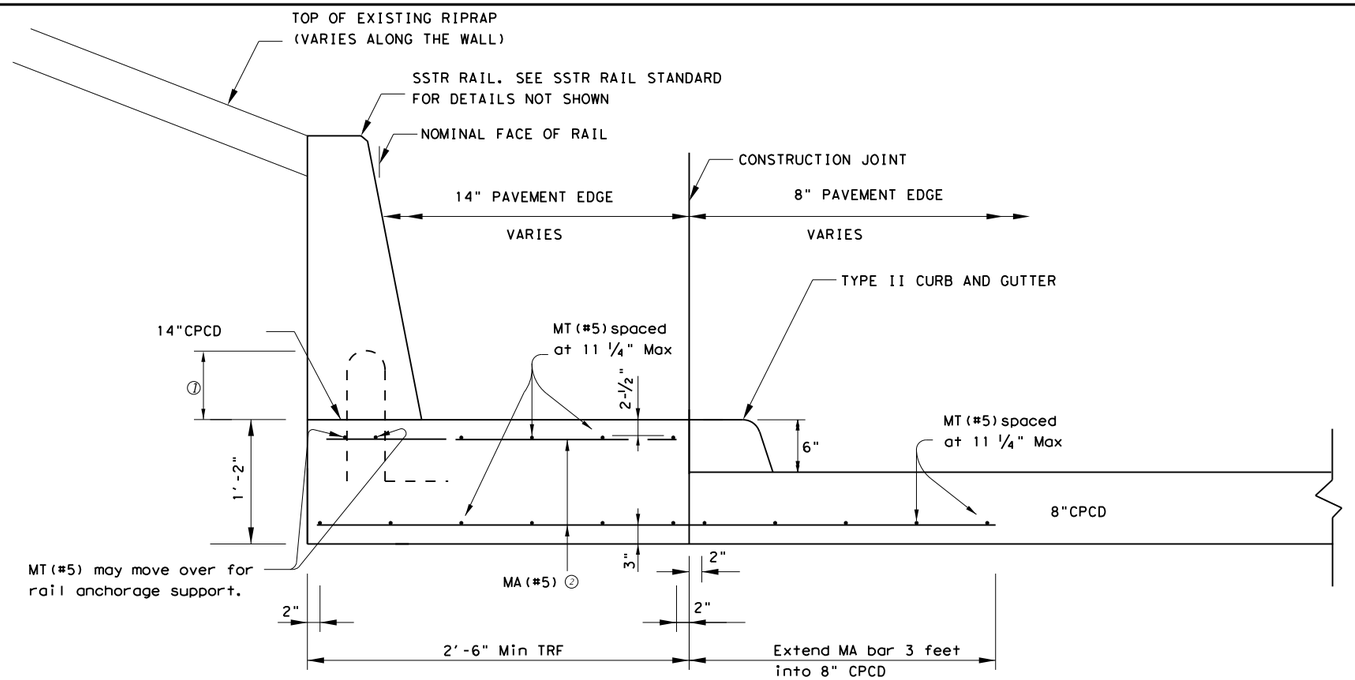
This detail is intended for use as a guide to unusual railing anchorage situations but may be included in the plans, modified as necessary to apply to specific installations required on the project.

Payment for moment slab (TRF-MS) will be by Class "C" concrete or Class "C" (HPC) concrete for rail foundations.

The associated bridge railing will be paid for by the linear foot which includes the concrete and reinforcement.

Excavation will be subsidiary to other Items.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.



TRAFFIC RAIL ON MOMENT SLAB (TRF-MS) LONGITUDINAL JOINT DETAIL

(PROFILE VIEW (NOT TO SCALE)

STATE OF TEXAS
NAPAT INTHARASOMBAT
102136
LICENSED
PROFESSIONAL ENGINEER

07/26/2021

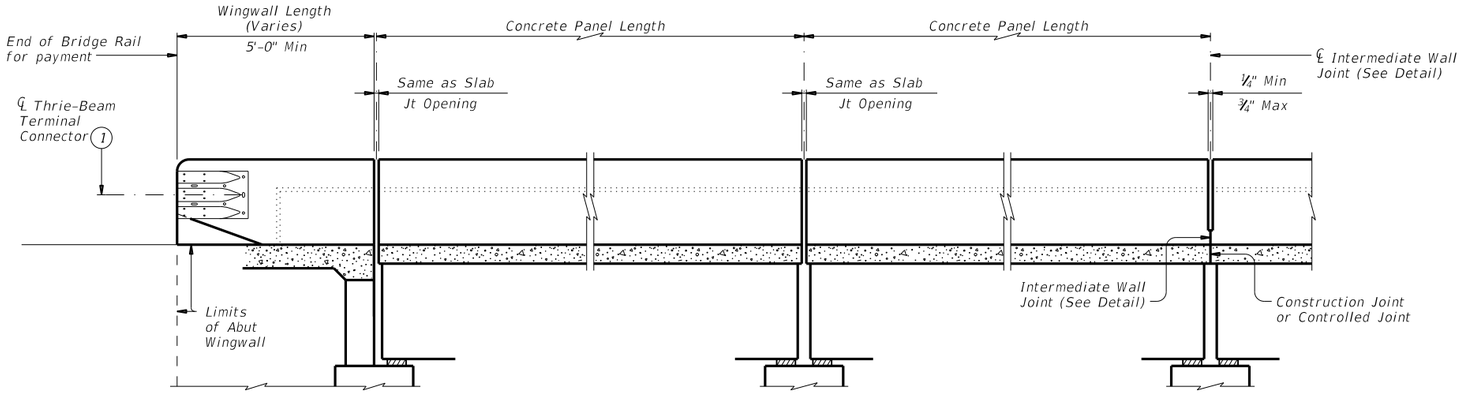
Texas Department of Transportation

Dallas District Bridge

TRAFFIC RAIL FOUNDATION

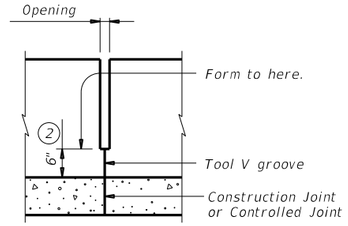
FILE: ..SEE PATH..		DN: NI		CK: NI	DW: NI		CK: NI
©TxDOT 2021		CONT	SECT	JOB		HIGHWAY	
REVISIONS		0092	02	125		IH-45	
		DIST	COUNTY				SHEET NO.
		DAL	DALLAS				122A

DATE:
FILE:



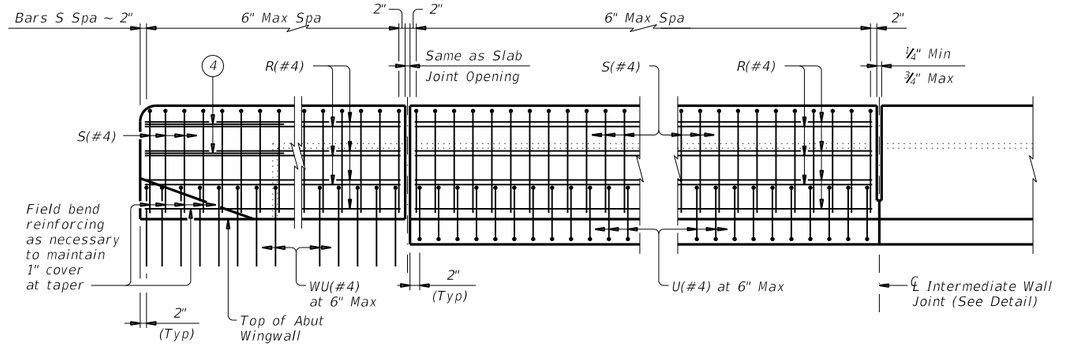
AT ABUTMENTS | AT BENTS WITH SLAB EXP JOINTS | AT BENTS WITHOUT SLAB EXP JOINTS

ROADWAY ELEVATION OF RAIL

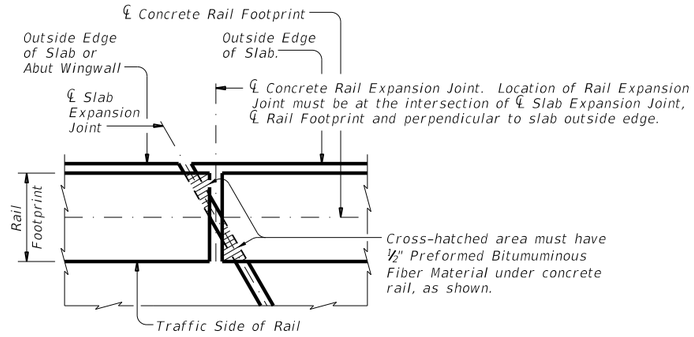


INTERMEDIATE WALL JOINT DETAIL

Provide at all interior bents without slab expansion joints.



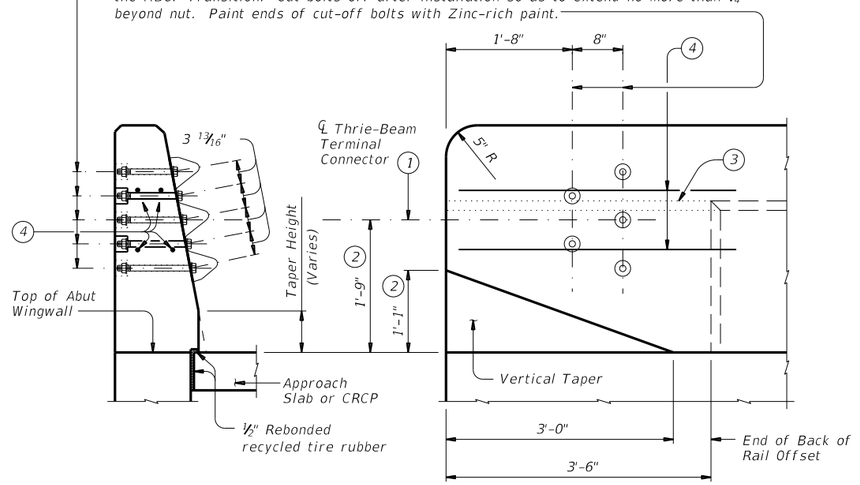
ELEVATION SHOWING TYPICAL REINFORCING PLACEMENT



PLAN OF RAIL AT EXPANSION JOINTS

Example showing Slab Expansion Joints without breakbacks.

℄ 5 ~ 1" Dia holes and 2 ½" Dia x 2" deep recesses. Form or core holes and recesses. Percussion drilling is not permitted. Adjust placement of reinforcing steel as necessary to avoid bolt holes and recesses. Bolt recesses are only required when pedestrian sidewalks are adjacent to back of rail. Tighten the 5 Terminal Connection Bolts in a well distributed pattern so to prevent damage or distortion of the Thrie-Beam Connection and the MBGF Transition. Cut bolts off after installation so as to extend no more than ¾" beyond nut. Paint ends of cut-off bolts with Zinc-rich paint.



SECTION | ELEVATION

TERMINAL CONNECTION DETAILS

(1) Terminal Connectors and associated hardware are to be paid for under the Item "Metal Beam Guard Fence". Attach Metal Beam Guard Fence Transitions to the bridge rail and extend along the embankment unless otherwise shown in the plans.

(2) Increase 2" for structures with Overlay.

(3) Back of rail offset may, with Engineer's approval, be continued to the end of the railing.

(4) Place 4 additional Bars R(#4) 3'-8" in length inside Bars S(#4) and centered 2'-0" from end of rail when Terminal Connections are required.

Texas Department of Transportation

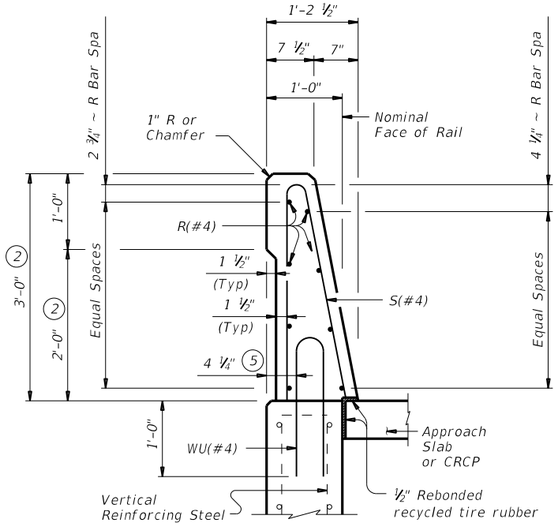
Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

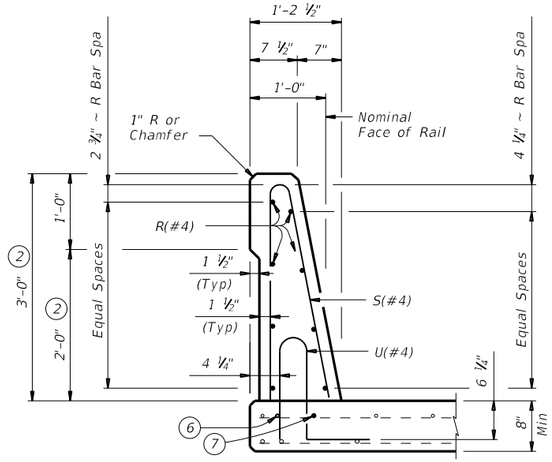
TYPE SSTR

FILE:	rlstd014-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT	September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS		0092	02	125	IH-45
		DIST	COUNTY		SHEET NO.
		DAL	DALLAS		123

DATE:
FILE:

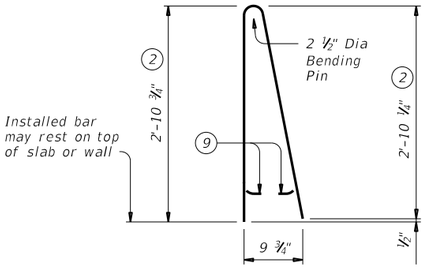


ON ABUTMENT WINGWALLS OR CIP RETAINING WALLS

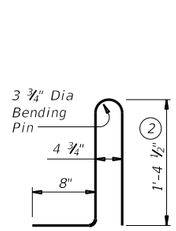


ON BRIDGE SLAB

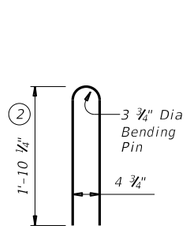
SECTIONS THRU RAIL



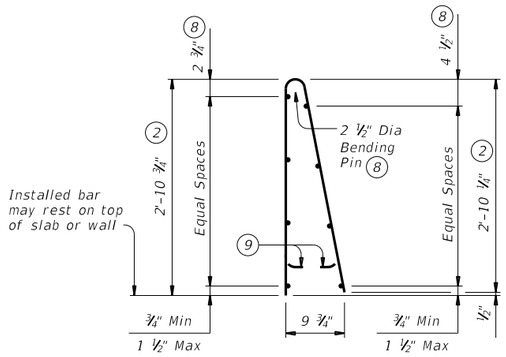
BARS S (#4)



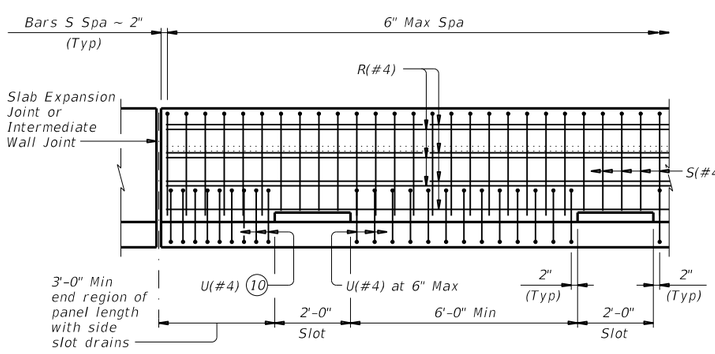
BARS U (#4)



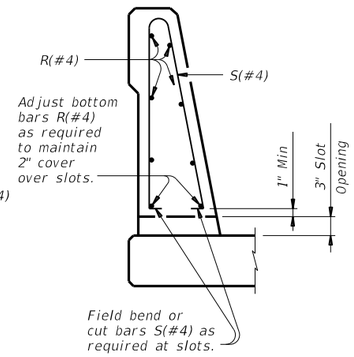
BARS WU (#4)



OPTIONAL WELDED WIRE REINFORCEMENT (WWR)



OPTIONAL SIDE SLOT DRAIN DETAIL



SECTION THRU OPTIONAL SIDE SLOT DRAIN

Note: Side Slot Drains may be used where shown elsewhere on the plans or as directed by the Engineer. Drains should not be placed over railroad tracks, lower roadways, or sidewalks. When this rail is used as a separator between a roadway surface and a sidewalk surface, side drain slots will not be permitted.

DESCRIPTION	LONGITUDINAL WIRES	VERTICAL WIRES
Minimum (Cumulative Total) Wire Area	1.067 Sq In.	0.267 Sq In. per Ft
	No. of Wires	Spacing
Minimum	8	4"
Maximum	10	8"
Maximum Wire Size Differential	The smaller wire must have an area of 40% or more of the larger wire.	

(2) Increase 2" for structures with Overlay.

(5) 5 ¼" when vertical reinforcing has closer clear cover over horizontal reinforcing in abutment wingwalls or retaining walls on traffic side of wall.

(6) As an aid in supporting reinforcement, additional longitudinal bars may be used in the slab with the approval of the Engineer. Such bars must be furnished at the Contractor's expense.

(7) Top longitudinal slab bar may be adjusted laterally 3" plus or minus to tie reinforcing.

(8) No longitudinal wires may be within upper bend.

(9) Bend or cut as required to clear drain slots.

(10) Space U(#4) bars at 4" Max when end region of panel length is less than 6'-0" to side slot drain. Space U(#4) bars at 6" Max when end region of panel length is 6'-0" and greator to side slot drain.

CONSTRUCTION NOTES:

This railing may be constructed by the slipform process when approved by the Engineer, with equipment approved by the Engineer. Provide sensor control for both line and grade. Tack welding to provide bracing for slipform operations is acceptable. Welding may be performed at a minimum spacing of 3 ft between the cage and the anchorage. It is permissible to weld to bars U, WU and S at any location on the cage. If increased bracing is needed, provide additional anchorage devices and weld in the upper two thirds of the cage. Paint welded areas on epoxy coated and/or galvanized reinforcing with an organic zinc rich paint in accordance with Item 445 "Galvanizing".

If rail is slipformed, apply an heavy epoxy bead 1" behind toe of traffic side of rail to concrete deck just prior to slip forming. Provide a ⅜" width x ¼" tall heavy epoxy bead with Type III, Class C or a Type V epoxy.

The back of railing must be vertical unless otherwise shown in the plans or approved by the Engineer.

MATERIAL NOTES:

Provide Class "C" concrete. Provide Class "C" (HPC) if required elsewhere.

Provide Grade 60 reinforcing steel.

Epoxy coat or galvanize all reinforcing steel if slab bars are epoxy coated or galvanized.

Deformed Welded Wire Reinforcement (WWR) (ASTM A1064) of equal size and spacing may be substituted for Bars U and WU unless noted otherwise. Deformed WWR (ASTM A1064) may be substituted for Bars R and S, as shown. Combinations of reinforcing steel and WWR or configurations of WWR other than shown are permitted if conditions in the table are satisfied. Provide the same laps as required for reinforcing bars.

Provide bar laps, where required, as follows:

Uncoated or galvanized ~ #4 = 1'-7"

Epoxy coated ~ #4 = 2'-5"

GENERAL NOTES:

This rail has been successfully evaluated by full-scale crash test to meet MASH TL-4 criteria. This rail can be used for speeds of 50 mph and greater when a TL-3 rated guard fence transition is used. When a TL-2 rated guard fence transition is used, this rail can only be used for speeds of 45 mph and less.

Do not use this railing on bridges with expansion joints providing more than 5" movement.

Rail anchorage details shown on this standard may require modification for select structure types. See appropriate details elsewhere in plans for these modifications.

Shop drawings will not be required for this rail.

Average weight of railing with no overlay is 376 plf.

Cover dimensions are clear dimensions, unless noted otherwise.

Reinforcing bar dimensions shown are out-to-out of bar.

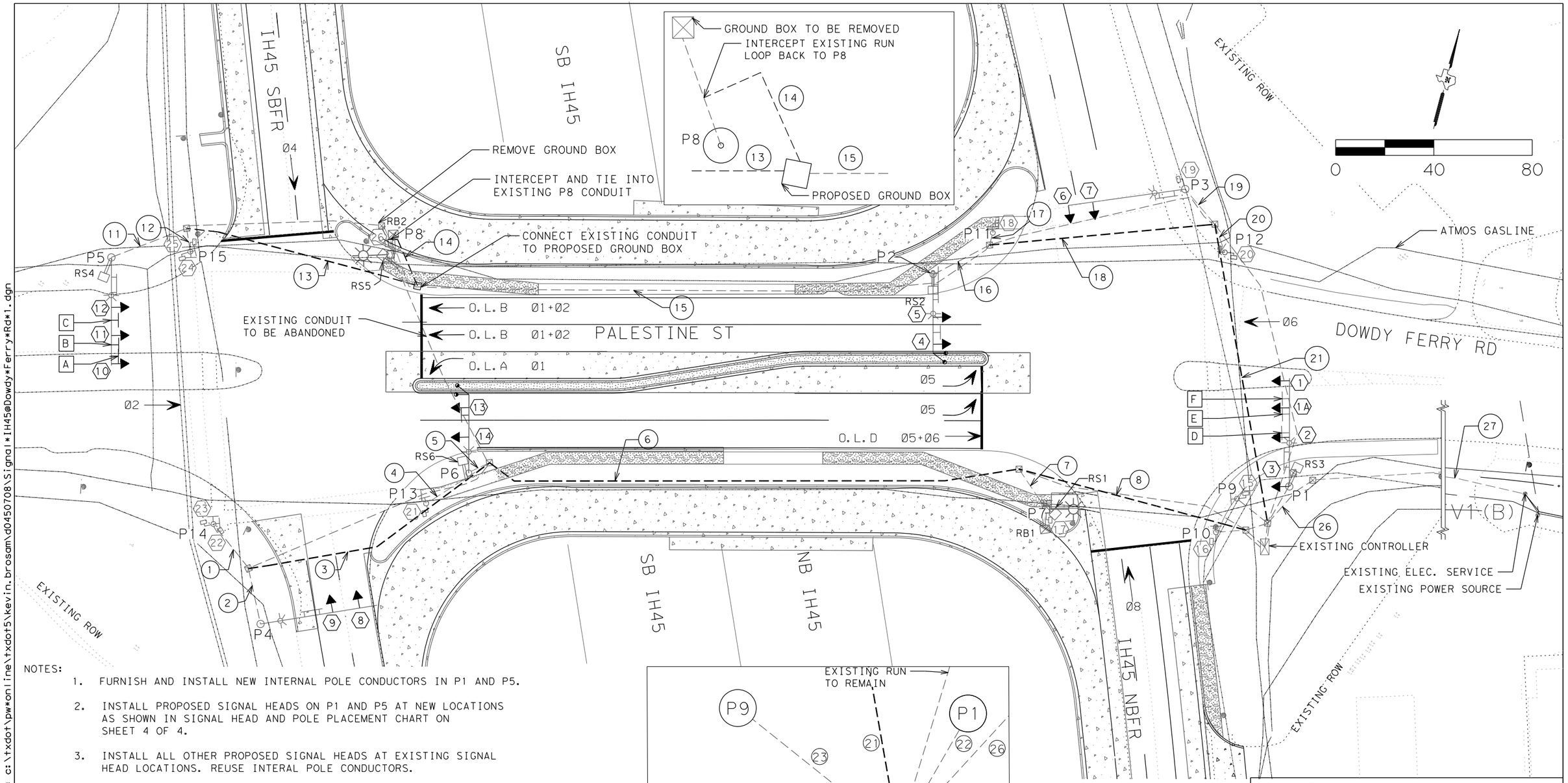
Texas Department of Transportation

Bridge Division Standard

TRAFFIC RAIL SINGLE SLOPE

TYPE SSTR

FILE:	rlstd014-19.dgn	DN: TxDOT	CK: TxDOT	DW: JTR	CK: TxDOT
©TxDOT	September 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS		0092	02	125	IH-45
		DIST	COUNTY		SHEET NO.
		DAL	DALLAS		124

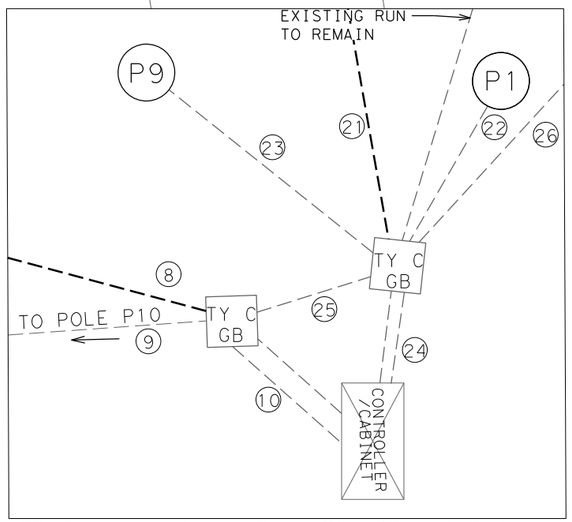


NOTES:

1. FURNISH AND INSTALL NEW INTERNAL POLE CONDUCTORS IN P1 AND P5.
2. INSTALL PROPOSED SIGNAL HEADS ON P1 AND P5 AT NEW LOCATIONS AS SHOWN IN SIGNAL HEAD AND POLE PLACEMENT CHART ON SHEET 4 OF 4.
3. INSTALL ALL OTHER PROPOSED SIGNAL HEADS AT EXISTING SIGNAL HEAD LOCATIONS. REUSE INTERAL POLE CONDUCTORS.
4. REMOVE EXISTING CONDUCTORS FROM EXISTING RUNS, EXCEPT THOSE USED BY POLE P1, P9, P10 AND THE ELECTRICAL SERVICE RUNS 26 AND 27. INSTALL NEW CONDUCTORS TO REMAINING POLES, SERVICE AND CONTROLLER. SEE CONDUIT RUN CHART FOR MORE INFORMATION.
5. ALL BORES WILL BE A MIMIMUM OF 3' BELOW TOP OF PAVEMENT.

LEGEND

- EXISTING MAST ARM SIGNAL WITH HEAD NUMBERS, STREET NAME SIGN, SIGN NUMBER AND LED LUMINAIRE.
- EXISTING PEDESTRIAN POLE, SIGNAL HEAD AND APS SIGN
- RS1 EXISTING PRESENCE RADAR
- RB1 EXISTING SETBACK RADAR
- EXISTING GROUND BOX
- EXISTING CONDUIT RUN
- PROPOSED CONDUIT RUN
- CONDUIT RUN NUMBER
- PROPOSED TYPE C GROUND BOX
- TOMAR SENSOR (DUAL CHANNEL)



CONDUIT RUN DETAILS AT CONTROLLER/CABINET
NOT TO SCALE

STATE OF TEXAS
KEVIN Y. BROSAM
138369
LICENSED PROFESSIONAL ENGINEER

Kevin Brosam, P.E. 6/16/21
Signature of Registrant & Date

Texas Department of Transportation
© 2021

IH 45 AT DOWDY FERRY RD TRAFFIC SIGNAL PLAN

1" = 40' SHEET 1 OF 4

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
KYB	6	SEE TITLE SHEET		IH 45
GRAPHICS KYB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK LDL	TEXAS	DALLAS	DALLAS	125
CHECK APM	CONTROL 0092	SECTION 02	JOB 125	

RUN NO.	CONDUIT RUNS															RUN NO.
	2" PVC SCHD 40 (LF)	3" PVC SCHD 40 (LF)	4" PVC SCHD 40 (LF)	4" PVC SCHD 40 BORED (LF)	CONDUCTORS			SIGNAL CABLE			PRESENSE RADAR CABLE (EA) *	ADVANCE RADAR CABLE (EA) *	3 CNDR 12 AWG TRAY CABLE (ILSN) (EA)	TOMAR CABLE (EA) **	TOTAL LENGTH OF RUN (LF)	
					NO. 4 XHHW (EA)	NO. 6 BARE (EA)	NO. 8 XHHW (EA)	TY-A, 14 AWG 7 CNDR CABLE (EA)	TY-A, 14 AWG 12 CNDR CABLE (EA)	TY-C, 12 AWG 2 CNDR CABLE (EA)						
1	-	23(E)	-	-		1		1		2					23(E)	1
2	-	23(E)	-	-		1	2		1				1		23(E)	2
3	-	-	65	45		1	2	1	1	2			1		110	3
4	-	31(E)	-	-		1		1		1					31(E)	4
5	-	9(E)	-	-		1	4		1		1		1	1	9(E)	5
6	-	-	218	-		1	2	2	2	3	1		2	1	218	6
7	-	20(E)	-	-		1	4	1		1	1	1			20(E)	7
8	-	-	21	75		1	2	3	2	4	2	1	2	1	96	8
9	-	12(E)	-	-		1(E)		1(E)		1(E)					12(E)	9
10	-	-	2-10(E)	-		2(E)		1(E) 3	2	1(E) 4	2	1		1	10(E)	10
11	-	33(E)	-	-		1	2		1		1		1		33(E)	11
12	-	10(E)	-	-		1		1		2					10(E)	12
13	-	-	30	68		1	2	1	1	2	1		1		98	13
14	-	25-7(E)	-	-		1	4	1		1	1	1			31	14
15	-	238(E)	-	-		1	2	2	1	3	2	1	1		238(E)	15
16	-	26(E)	-	-		1	4		1		1		1	1	26(E)	16
17	-	5(E)	-	-		1		1		1					5(E)	17
18	-	-	11	81		1	2	3	2	4	3	1	2	1	92	18
19	19(E)	-	-	-		1	4		1	1			1		19(E)	19
20	12(E)	-	-	-		1		1		1					12(E)	20
21	-	-	27	99		1	2	4	3	6	3	1	3	1	126	21
22	-	-	18(E)	-		1(E)	2(E)		1(E)		1(E)		1(E)		18(E)	22
23	16(E)	-	-	-		1(E)		1(E)		1(E)					16(E)	23
24	-	-	2-10(E)	-	2(E)	2(E)		1(E) 4	1(E) 3	1(E) 6	1(E) 3	1		1	10(E)	24
25	-	10(E)	-	-		1(E)	2						2		10(E)	25
26	-	26(E)	-	-	2(E)	1(E)	4(E)						1(E) 5		26(E)	26
27	-	121(E)	-	-	2(E)	1(E)	4(E)						1(E) 5		121(E)	27
TOTAL		25	372	368		1221	2512	2391	1796	3577	1808	624	2501	587		

NOTE: (E)-DENOTES EXISTING TO REMAIN

*RADAR CABLE TO BE SUPPLIED BY TXDOT AND INSTALLED BY CONTRACTOR. CONTACT DALLAS DISTRICT SIGNAL SHOP TO COORDINATE CONTRACTOR PICK UP OF MATERIAL.

**TOMAR CABLE TO BE PROVIDED BY CITY OF HUTCHINS CONTACT RYAN WOOLEVER OF THE HUTCHINS FIRE DEPT. AT 214-293-2581 INSTALLATION WILL BE SUBSIDIARY TO ITEM 684

GROUND BOX SUMMARY		
ITEM	DESCRIPTION	TOTAL (EA)
0624 6008	GROUND BOX TY C (162911)W/APRON	1
0624 6028	REMOVE GROUND BOX	1
6027 6008	GROUND BOX (PREPARE)	9

STATE OF TEXAS
KEVIN Y. BROSAM
138369
LICENSED
PROFESSIONAL ENGINEER

Kevin Brosam, P.E. 6/16/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45 AT DOWDY FERRY RD TRAFFIC SIGNAL PLAN

SHEET 2 OF 4

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
KYB	6	(SEE TITLE SHEET)		IH 45
GRAPHICS KYB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK LDL	TEXAS	DALLAS	DALLAS	126
CHECK APM	CONTROL	SECTION	JOB	
	0092	02	125	

CABLE TERMINATION CHART*

CNDR. COLOR	CABLE 1 FR. P1 TO CNTRL. 12 CNDR.	**CABLE 2 FR. P2 TO CNTRL. 12 CNDR.	**CABLE 3 FR. P3 TO CNTRL. 12 CNDR.	**CABLE 4 FR. P4 TO CNTRL. 12 CNDR.	CABLE 5 FR. P5 TO CNTRL. 12 CNDR.	**CABLE 6 FR. P6 TO CNTRL. 12 CNDR.	**CABLE 7 FR. P7 TO CNTRL. 7 CNDR.	**CABLE 8 FR. P8 TO CNTRL. 7 CNDR.	**CABLE 9 FR. P9 TO CNTRL. 7 CNDR.	**CABLE 10 FR. P10 TO CNTRL. 7 CNDR.	**CABLE 11 FR. P11 TO CNTRL. 7 CNDR.	**CABLE 12 FR. P12 TO CNTRL. 7 CNDR.	**CABLE 13 FR. P13 TO CNTRL. 7 CNDR.	**CABLE 14 FR. P14 TO CNTRL. 7 CNDR.	**CABLE 15 FR. P15 TO CNTRL. 7 CNDR.
BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
WHITE	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON	SIG. COMMON
RED	SH 2, 3 O.L.D R	SH 4, 5 Ø6 R	SH 6, 7 Ø8 R	SH 8, 9 Ø4 R	SH 11, 12 O.L.B R	SH 13, 14 Ø2 R	SH 17 Ø6 DW	SH 26 Ø2 DW	SH 15 Ø8 DW	SH 16 Ø6 DW	SH 18 Ø6 DW	SH 20 Ø8 DW	SH 21 Ø2 DW	SH 22 Ø2 DW	SH 24 Ø4 DW
GREEN	SH 2, 3 O.L.D G/ ⓖ	SH 4, 5 Ø6 G/ ⓖ	SH 6, 7 Ø8 G	SH 8, 9 Ø4 G	SH 11, 12 O.L.B G/ ⓖ	SH 13, 14 Ø2 G/ ⓖ	SH 17 Ø6 W	SH 26 Ø2 W	SH 15 Ø8 W	SH 16 Ø6 W	SH 18 Ø6 W	SH 20 Ø8 W	SH 21 Ø2 W	SH 22 Ø2 W	SH 24 Ø4 W
ORANGE	SH 2, 3 O.L.D Y	SH 4, 5 Ø6 Y	SH 6, 7 Ø8 Y	SH 8, 9 Ø4 Y	SH 11, 12 O.L.B Y	SH 13, 14 Ø2 Y	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE
BLUE	SH 1, 1A Ø5 ~~<R~~	SPARE	SPARE	SPARE	SH 10 O.L.A ~~<R~~	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 23 Ø4 DW	SH 25 Ø2 DW
WHITE/ BLACK	SH 1, 1A Ø5 ~~<Y~~	SPARE	SPARE	SPARE	SH 10 O.L.A ~~<Y~~	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE	SH 23 Ø4 W	SH 25 Ø2 W
RED/ BLACK	SPARE	SPARE	SH 19 Ø6 DW	SPARE	SH 10 O.L.A ~~<FY~~	SPARE									
GREEN/ BLACK	SH 1, 1A Ø5 ~~<G~~	SPARE	SH 19 Ø6 W	SPARE	SH 10 Ø1 ~~<G~~	SPARE									
ORANGE/ BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE									
BLUE/ BLACK	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE									
BLACK/ WHITE	SPARE	SPARE	SPARE	SPARE	SPARE	SPARE									

*APS PUSH BUTTON COMMON AND PED PHASE CALL ARE ON TYPE C 12 AWG 2 CONDUCTOR CABLE.
**THIS INFORMATION IS FOR CONTRACTORS INFORMATION ONLY--EXISTING CONDUCTORS TO REMAIN

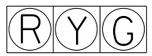
VEHICLE AND PEDESTRIAN SIGNAL HEADS

POLE #	SIG. HEAD NO.	SIG. HEAD TYPE	BACK PLATE VENTED(12") 3 SEC (EA)	BACK PLATE VENTED(12") 5 SEC (EA)	SUMMARY OF SIGNAL SECTION(LED)(EA) VEHICLE R	Y	G	~~<R~~	~~<Y~~	~~<G~~/ ⓖ	PEDESTRIAN (COUNT DOWN)
P1	1	H3LT	1					1	1	1	
	1A	H3LT	1					1	1	1	
	2	H3	1		1	1	1				
	3	V3T	1		1	1				1	
P2	4	H3T	1		1	1				1	
	5	H3	1		1	1	1				
P3	6	H3	1		1	1	1				
	7	H3	1		1	1	1				
P4	8	H3	1		1	1	1				
	9	H3	1		1	1	1				
P5	10	H5FLT		1				2	2	1	
	11	H3	1		1	1	1				
P6	12	H3T	1		1	1				1	
	13	H3T	1		1	1				1	
P9	14	H3	1		1	1	1				
P10	15	152A									
P7	16	152A									
P11	17	152A									
P3	18	152A									
P12	19	152A									
P13	20	152A									
P14	21	152A									
	22	143C									
	23										
P15	24	143C									
	25										
P8	26	152A									
TOTAL (EA)			14	1	12	12	8	4	4	7	0

152A S.H. 15, 16, 17, 18, 19, 20, 21, 26

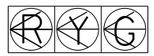
143C S.H. 22, 23, 24, 25

H3



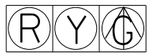
S.H. 2, 5, 6, 7, 8, 9, 11, 14

H3LT



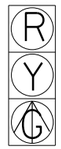
S.H. 1, 1A

H3T



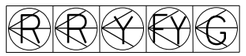
S.H. 4, 12, 13

V3T



S.H. 3

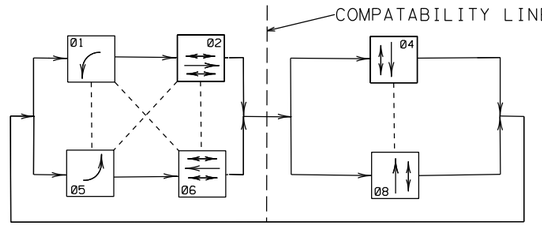
H5FLT



S.H. 10

REMOVE EXISTING VEHICLE SIGNAL HEADS AND INSTALL NEW VEHICLE SIGNAL HEADS AS INDICATED. REMOVED SIGNAL HEADS ARE TO BE DELIVERED TO THE DALLAS DISTRICT SIGNAL SHOP, CONTACT TO COORDINATE CONTRACTOR DELIVERY.

PEDESTRIAN SIGNAL HEADS ARE EXISTING TO REMAIN



PHASE SEQUENCE

Ø1 IS A PROTECTED PERMISSIVE LEFT TURN
Ø5 IS A PROTECTED LEFT TURN.
O.L.A = Ø1(RA, YA, FYA)
O.L.B = Ø1+Ø2
O.L.D = Ø5+Ø6

STATE OF TEXAS
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IH 45 AT DOWDY FERRY RD TRAFFIC SIGNAL PLAN

SHEET 3 OF 4

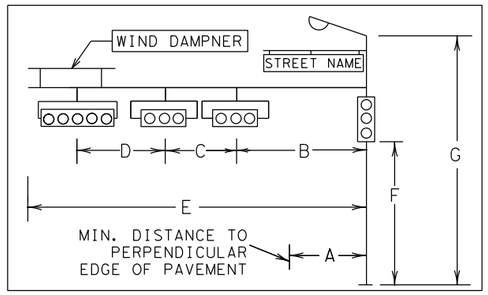
DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
KYB	6	(SEE TITLE SHEET)		IH 45
GRAPHICS KYB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK LDL	TEXAS	DALLAS	DALLAS	127
CHECK APM	CONTROL 0092	SECTION 02	JOB 125	

DATE: 5/11/2021 TIME: 3:45:57 PM FILE: c:\txdot\pw*online\txdot5\kevin.brosam\d0450708\Signal*IH45@Dowdy*Ferry*Rd*2.dgn

SIGNAL HEAD & POLE PLACEMENT

POLE NUMBER	A (LF)	B (LF)	C (LF)	D (LF)	E (LF)	F (LF)	G (LF)	LUM (EA)	CABLE INSIDE POLES: SIGNAL CABLE TY-A 14 AWG 5 CNDR (LF)	TY-A 14 AWG 7 CNDR (LF)	TY-C 12 AWG 2 CNDR (LF)	APS UNIT (EA)	LUMINAIRE NO.12 AWG (LF)	RADAR CABLE PRESENCE (LF)	RADAR CABLE SETBACK (LF)	3 CNDR TRAY/12 AWG CABLE (LF)	TOMAR CABLE (LF) ***
P-1	19.3	20	12	11	44	10	30	1(E)	167	-	-	-	90(E)	17(E)	-	30(E)	-
P-2	9	17	11	-	32		30	1(E)	83(E)	-	-	-	90(E)	17	-	30	51
P-3	8	38	10	-	48		30	1(E)	126(E)	-	5	1(E)	90(E)	-	-	30	-
P-4	18.5	30	11	-	48		30	1(E)	109(E)	-	-	-	90(E)	-	-	30	-
P-5	12	20	12	12	44		30	1(E)	90	63	-	-	90(E)	17	-	30	-
P-6	8.8	14	12	-	32		30	1(E)	78(E)	-	-	-	90(E)	17	-	30	51
P-7	-	ILLUMINATION POLES					30	1(E)	10(E)	-	5	1(E)		20	30	-	-
P-8	-						30	1(E)	10(E)	-	5	1(E)		20	30	-	-
P-9	N/A	-	-	-	-		12	-	10(E)	-	5(E)	1(E)	-	-	-	-	-
P-10	N/A	-	-	-	-		12	-	10(E)	-	5(E)	1(E)	-	-	-	-	-
P-11	N/A	-	-	-	-		12	-	10(E)	-	5	1(E)	-	-	-	-	-
P-12	N/A	-	-	-	-		12	-	10(E)	-	5	1(E)	-	-	-	-	-
P-13	N/A	-	-	-	-		12	-	10(E)	-	5	1(E)	-	-	-	-	-
P-14	N/A	-	-	-	-		12	-	20(E)	-	10	2(E)	-	-	-	-	-
P-15	N/A	-	-	-	-		12	-	20(E)	-	10	2(E)	-	-	-	-	-
TOTAL								**0**	**257**	**63**	**50**	**0**	**0**	**91**	**60**	**150**	**102*** **

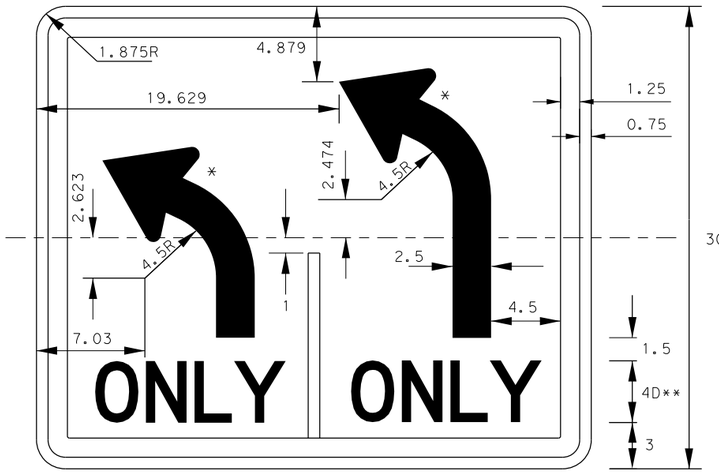
***TOMAR CABLE WILL BE FURNISHED BY CITY OF HUTCHINS, CONTRACTOR WILL BE RESPONSIBLE FOR INSTALLATION



A R10-17T
36" X 42"
P5 EXISTING
**RELOCATE AS NEEDED

B R3-8LS
36" X 30"
P5 EXISTING
TO BE REMOVED

C R6-2L
30" X 36"
P5 EXISTING
**RELOCATE AS NEEDED



R3-8LL
36" X 30"
P1
TO BE INSTALLED

RADAR DETECTION ZONE*		
RADAR #	HEIGHT OF RADAR	RADAR DETECT ZONE
RS1 ON ILLUMINATION POLE P7	20'	PHASE 8 AT STOP BAR
RS2 ON SIGNAL POLE P2	17'	PHASES 5 & O.L. D AT STOP BAR
RS3 ON SIGNAL POLE P1	17'	PHASE 6 AT STOP BAR
RS4 ON SIGNAL POLE P5	17'	PHASE 2 AT STOP BAR
RS5 ON ILLUMINATION POLE P8	20'	PHASE 4 AT STOP BAR
RS6 ON SIGNAL POLE P6	17'	PHASES 1 & O.L. B AT STOP BAR
RB1 ON ILLUMINATION POLE P7	30'	PHASE 8 TO 600' FROM SENSOR
RB2 ON ILLUMINATION POLE P8	30'	PHASE 4 TO 600' FROM SENSOR

*FOR CONTRACTOR INFORMATION ONLY

D R6-2L
30" X 36"
P1 EXISTING
**RELOCATE AS NEEDED

E R3-8LS
36" X 30"
P1 EXISTING
TO BE REMOVED

F R10-17T
36" X 42"
P1 EXISTING
TO BE REMOVED

E R3-8LL
36" X 30"
P1
REPLACE R3-8LS

** RELOCATION OF THE SIGNS WILL BE SUBSIDIARY TO ITEM 682

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IH 45 AT DOWDY FERRY RD
TRAFFIC SIGNAL PLAN

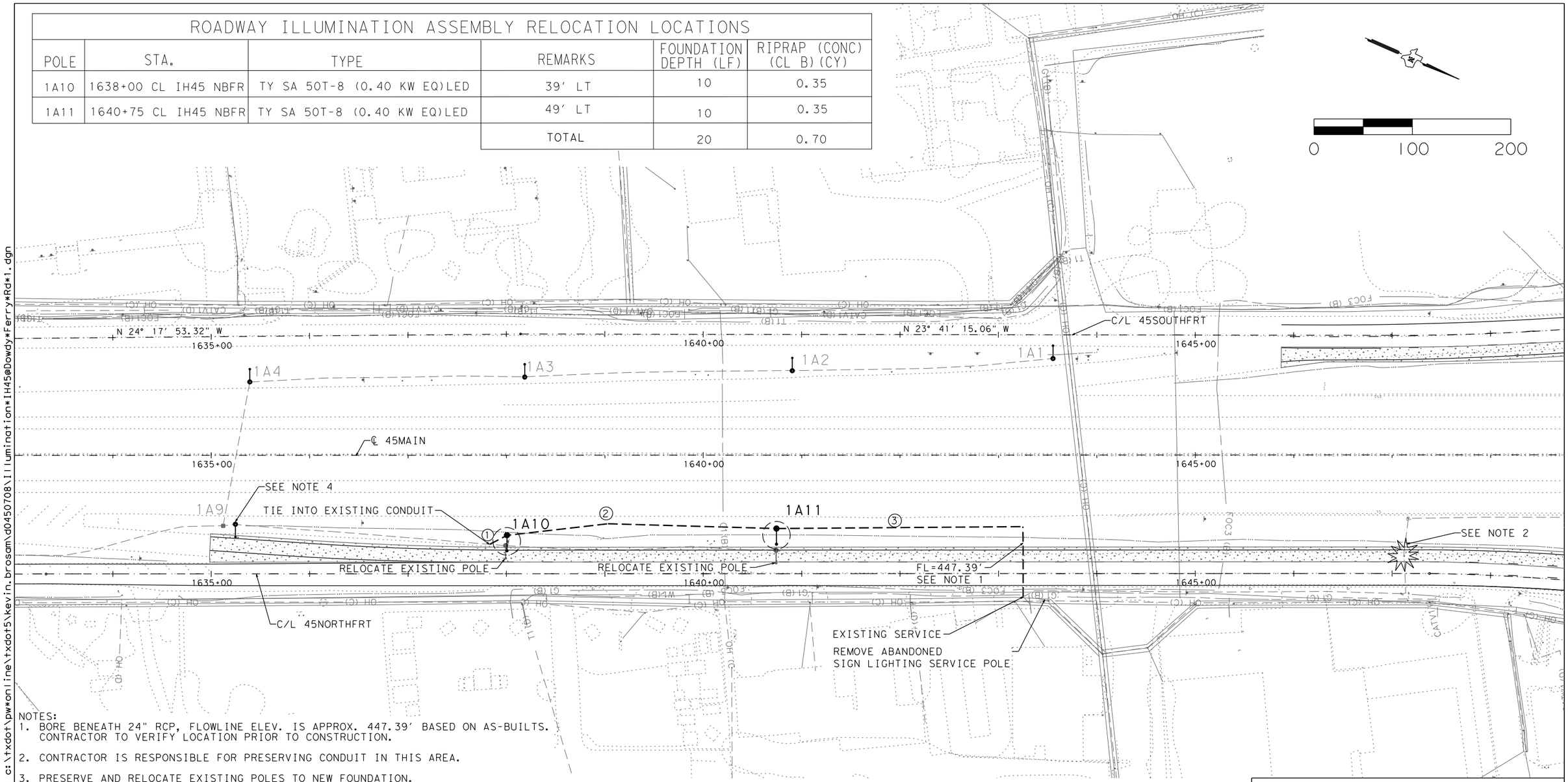
SHEET 4 OF 4

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
KYB	6	(SEE TITLE SHEET)		IH 45
GRAPHICS KYB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK LDL	TEXAS	DALLAS	DALLAS	128
CHECK APM	CONTROL 0092	SECTION 02	JOB 125	

DATE: 5/11/2021 TIME: 3:47:00 PM FILE: c:\txdot\pw*online\txdot5\kevin.brosam\d0450708\Signal*IH45@Dowdy*Ferry*Rd*2.dgn

ROADWAY ILLUMINATION ASSEMBLY RELOCATION LOCATIONS

POLE	STA.	TYPE	REMARKS	FOUNDATION DEPTH (LF)	RIPRAP (CONC) (CL B)(CY)
1A10	1638+00 CL IH45 NBFR	TY SA 50T-8 (0.40 KW EQ)LED	39' LT	10	0.35
1A11	1640+75 CL IH45 NBFR	TY SA 50T-8 (0.40 KW EQ)LED	49' LT	10	0.35
			TOTAL	20	0.70



NOTES:
1. BORE BENEATH 24" RCP, FLOWLINE ELEV. IS APPROX. 447.39' BASED ON AS-BUILTS. CONTRACTOR TO VERIFY LOCATION PRIOR TO CONSTRUCTION.
2. CONTRACTOR IS RESPONSIBLE FOR PRESERVING CONDUIT IN THIS AREA.
3. PRESERVE AND RELOCATE EXISTING POLES TO NEW FOUNDATION.
4. DISCONNECT CNDRS. AT 1A9 AND SERVICE AND REMOVE. TIE INTO EXISTING CONDUIT AND PULL NEW CNDRS THROUGH. CONNECT CNDRS AT 1A9 AND RELOCATED 1A10 AND 1A11 THEN CONNECT TO SERVICE.
5. ALL BORES WILL BE A MINIMUM OF 3' BELOW TOP OF PAVEMENT.

CONDUIT RUNS

RUNS	GROUND LENGTH (FEET)	CONDUCTOR NO. AND LENGTH (FEET)	CONDUIT (FEET)		
	#4 BARE	#4 XHHW	2" PVC EXISTING	2" PVC SCH 40	2" PVC (BORED)
1	280	2-280	260	20	
2	275	2-275		275	
3	327	2-327		251	76
TOT	882	1764	260	546	76

ROADWAY ILLUMINATION ASSEMBLIES SUMMARY

ITEM	DESCRIPTION	UNIT	QTY.
610 6004	RELOCATE RD IL ASM (TRANS-BASE)	EA	2

LEGEND

- EXISTING CONDUIT
- PROPOSED CONDUIT
- (8) CONDUIT RUN NUMBER
- 1B6 EXISTING ILLUMINATION POLE TO REMAIN
- EXISTING ILLUMINATION POLE TO RELOCATE
- EXISTING GROUND BOX
- 1B6 RELOCATED RDWY ILL ASSEMBLY (TY SA 50T-8)(400W EQ)(LED)

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IH 45 AT DOWDY FERRY RD ILLUMINATION PLAN

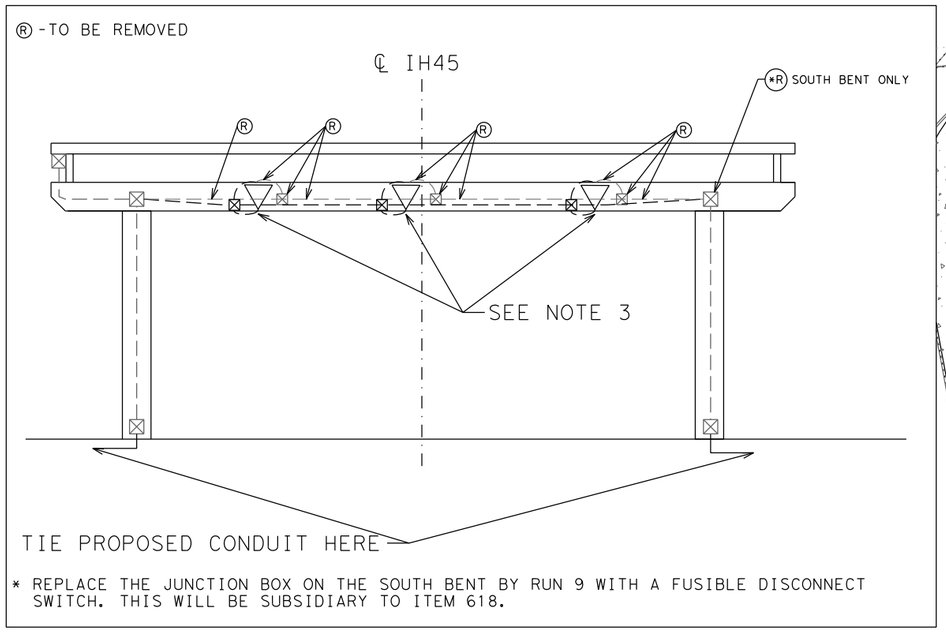
1" = 100' SHEET 1 OF 3

DESIGN	FED. RD. DIV. NO.	PROJECT NO.		HIGHWAY NO.
KYB	6	SEE TITLE SHEET		IH 45
GRAPHICS: KYB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK: LDL	TEXAS	DALLAS	DALLAS	129
CHECK: APM	CONTROL	SECTION	JOB	
	0092	02	125	

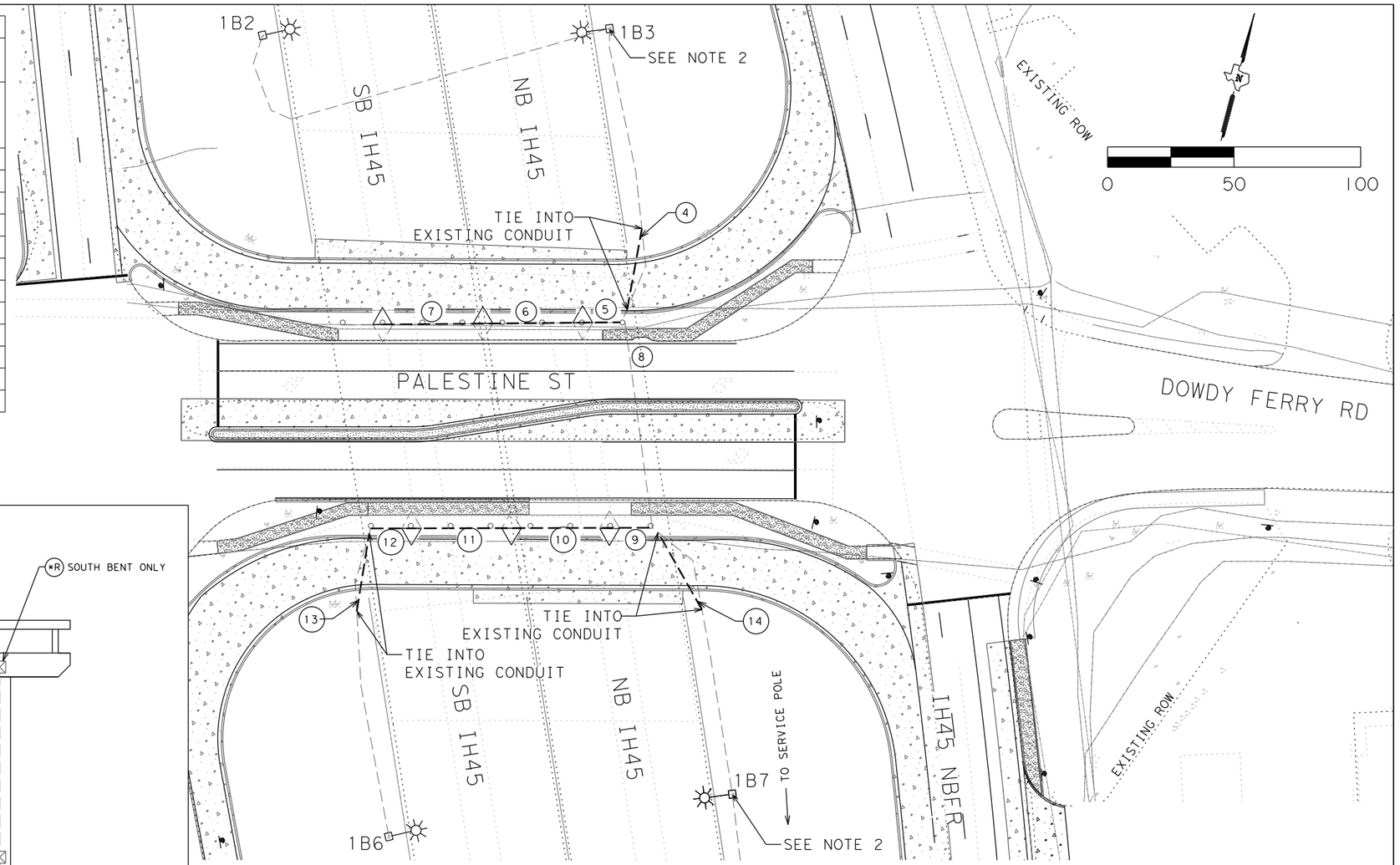
FILE: c:\txdot\pw*online\txdot5\kevin.brosam\d0450708\Illumination*IH45@Dowdy*Ferry*Rd*1.dgn
TIME: 12:11:16 PM
DATE: 5/12/2021

RUN NO.	CONDUIT TYPE			WIRE SIZE AND TYPE			
				CONDUCTORS			
	2" PVC & RM EXISTING (LF)	2" PVC SCHD 40 PROPOSED (LF)	1" RM PROPOSED (LF)	NO. 4 BARE (LF)	NO. 4 XHHW (LF)	NO. 8 BARE (LF)	NO. 8 XHHW (LF)
4	101	33		134	2-134		
5			16			16	2-16
6			40			40	2-40
7			40			40	2-40
8	93			93	2-93		
9			16			16	2-16
10			40			40	2-40
11			40			40	2-40
12			16			16	2-16
13	108	31				139	2-139
14	92	35		127	2-127		
TOTAL (LF)	394	99	208	354	708	347	694

ILLUMINATION SUMMARY			
BID CODE	DESCRIPTION	UNIT	QUANTITY
0610 6104	IN RD IL (U/P)(TY 1)(150W EQ)LED	EA	6



* REPLACE THE JUNCTION BOX ON THE SOUTH BENT BY RUN 9 WITH A FUSIBLE DISCONNECT SWITCH. THIS WILL BE SUBSIDIARY TO ITEM 618.



LEGEND

1B6	EXISTING ILLUMINATION POLE TO REMAIN
△	EXISTING UNDERPASS LIGHT TO REMAIN
△	PROPOSED UNDERPASS
————	EXISTING CONDUIT
– – – –	PROPOSED CONDUIT
⑧	CONDUIT RUN NUMBER

NOTES:

1. THE EXISTING ELECTRICAL SERVICE IS APPROXIMATELY 950′ SOUTH OF DOWDY FERRY RD; ADJACENT TO NB FRONTAGE ROAD.
2. DISCONNECT AND REMOVE CONDUCTORS STARTING AT 1B3 TO 1B7. SPLICE INTO EXISTING CONDUCTORS AT 1B3, CONNECT EXISTING, PROPOSED UNDERPASS LIGHTING AND 1B6. SPLICE INTO EXISTING CONDUCTORS AT 1B7.
3. REMOVE EXISTING UNDERPASS LIGHTING JUNCTION BOXES AND CONDUIT. TIE EXISTING OVERPASS LIGHTING INTO PROPOSED CONDUIT. FLEXIBLE CONDUIT REQUIRED TO TIE UNDERPASS LIGHTING INTO PROPOSED CONDUIT WILL BE CONSIDERED SUBSIDIARY TO ITEM 610.
4. ALL BORES WILL BE A MINIMUM OF 3′ BELOW TOP OF PAVEMENT.

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IH 45 AT DOWDY FERRY RD
ILLUMINATION PLAN

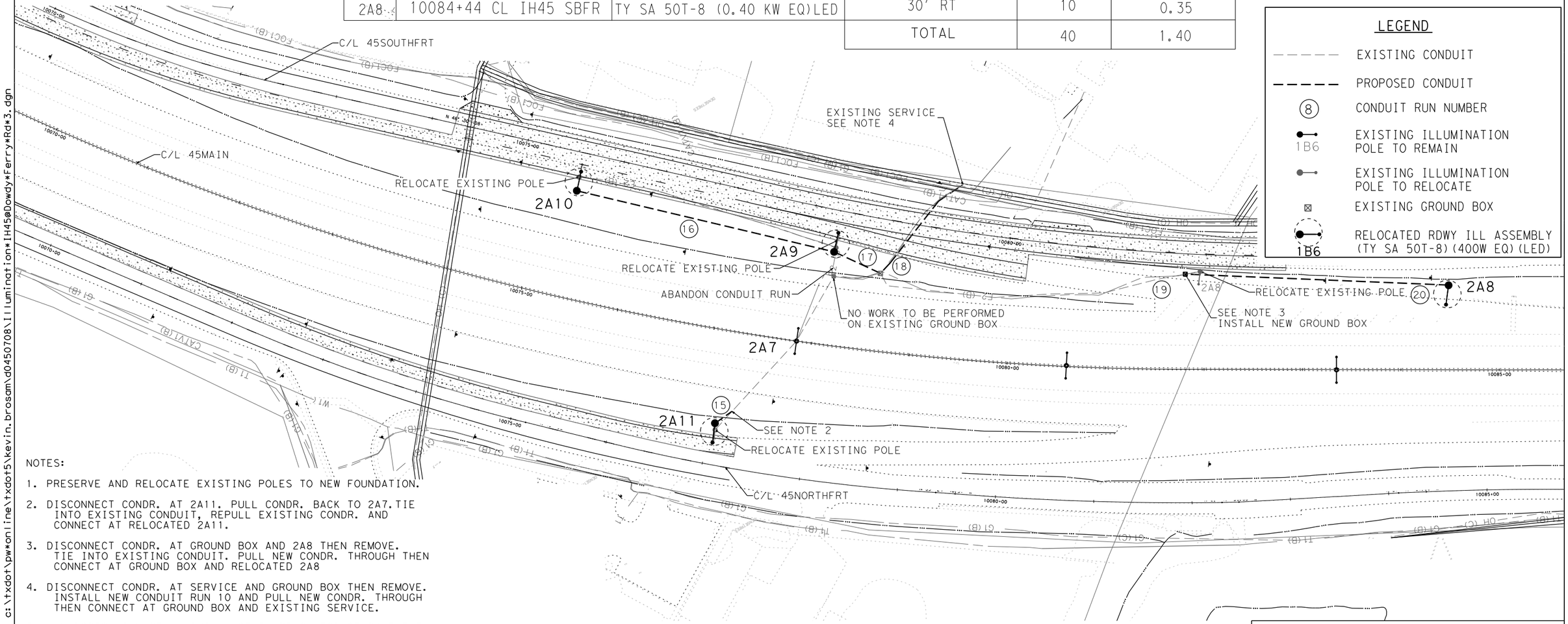
1" = 50′ SHEET 2 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
KYB	6	SEE TITLE SHEET		IH 45
GRAPHICS KYB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK LDL	TEXAS	DALLAS	DALLAS	130
CHECK APM	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 5/14/2021 TIME: 9:12:55 AM FILE: c:\txdot\pw*online\txdot5\kevin.brosam\d0450708\Illumination*IH45@Dowdy*Ferry*Rd*2.dgn

ROADWAY ILLUMINATION ASSEMBLY RELOCATION LOCATIONS

POLE	STA.	TYPE	REMARKS	FOUNDATION DEPTH (LF)	RIPRAP (CONC) (CL B)(CY)
2A11	10077+05 CL IH45 NBFR	TY SA 50T-8 (0.40 KW EQ)LED	42' LT	10	0.35
2A10	10075+58 CL IH45 SBFR	TY SA 50T-8 (0.40 KW EQ)LED	40' RT	10	0.35
2A9	10078+25 CL IH45 SBFR	TY SA 50T-8 (0.40 KW EQ)LED	44' RT	10	0.35
2A8	10084+44 CL IH45 SBFR	TY SA 50T-8 (0.40 KW EQ)LED	30' RT	10	0.35
			TOTAL	40	1.40



0 100 200

LEGEND

- EXISTING CONDUIT
- PROPOSED CONDUIT
- (8) CONDUIT RUN NUMBER
- 1B6 EXISTING ILLUMINATION POLE TO REMAIN
- EXISTING ILLUMINATION POLE TO RELOCATE
- EXISTING GROUND BOX
- 1B6 RELOCATED RDWY ILL ASSEMBLY (TY SA 50T-8)(400W EQ)(LED)

NOTES:

1. PRESERVE AND RELOCATE EXISTING POLES TO NEW FOUNDATION.
2. DISCONNECT CONDR. AT 2A11. PULL CONDR. BACK TO 2A7.TIE INTO EXISTING CONDUIT, REPULL EXISTING CONDR. AND CONNECT AT RELOCATED 2A11.
3. DISCONNECT CONDR. AT GROUND BOX AND 2A8 THEN REMOVE. TIE INTO EXISTING CONDUIT. PULL NEW CONDR. THROUGH THEN CONNECT AT GROUND BOX AND RELOCATED 2A8
4. DISCONNECT CONDR. AT SERVICE AND GROUND BOX THEN REMOVE. INSTALL NEW CONDUIT RUN 10 AND PULL NEW CONDR. THROUGH THEN CONNECT AT GROUND BOX AND EXISTING SERVICE.
5. ALL BORES WILL BE A MINIMUM OF 3' BELOW TOP OF PAVEMENT.

CONDUIT RUNS

RUNS	GROUND LENGTH (FEET)	CONDUCTOR NO. AND LENGTH (FEET)	CONDUIT (FEET)		
	#4 BARE	#4 XHHW	2" PVC EXISTING	2" PVC SCH 40	2" PVC (BORED)
15	119	2-119	97	22	
16	269	2-269		269	
17	52	2-52		52	
18	124	2-124		44	80
19	320	2-320	320		
20	268	2-268		268	
TOT	1152	2304	417	655	80

ROADWAY ILLUMINATION ASSEMBLIES SUMMARY

ITEM	DESCRIPTION	UNIT	QTY.
610 6004	RELOCATE RD IL ASM (TRANS-BASE)	EA	4

GROUND BOX SUMMARY

ITEM	DESCRIPTION	TOTAL (EA)
624 6008	GROUND BOX TY C (162911)W/APRON	1
6027 6008	GROUND BOX (PREPARE)	1

STATE OF TEXAS
KEVIN Y. BROSAM
138369
LICENSED
PROFESSIONAL ENGINEER

Kevin Brosam, P.E. 6/16/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45 AT DOWDY FERRY RD ILLUMINATION PLAN

1" = 100' SHEET 3 OF 3

DESIGN	FED.RD. DIV.NO.	PROJECT NO.		HIGHWAY NO.
KYB	6	SEE TITLE SHEET		IH 45
GRAPHICS KYB	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK LDL	TEXAS	DALLAS	DALLAS	131
CHECK APM	CONTROL	SECTION	JOB	
	0092	02	125	

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GENERAL NOTES FOR ALL ELECTRICAL WORK

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

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

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

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

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

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

CONDUIT

A. MATERIALS

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

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

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

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

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

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

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

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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		DIST	COUNTY		SHEET NO.
		DALLAS	DALLAS		132

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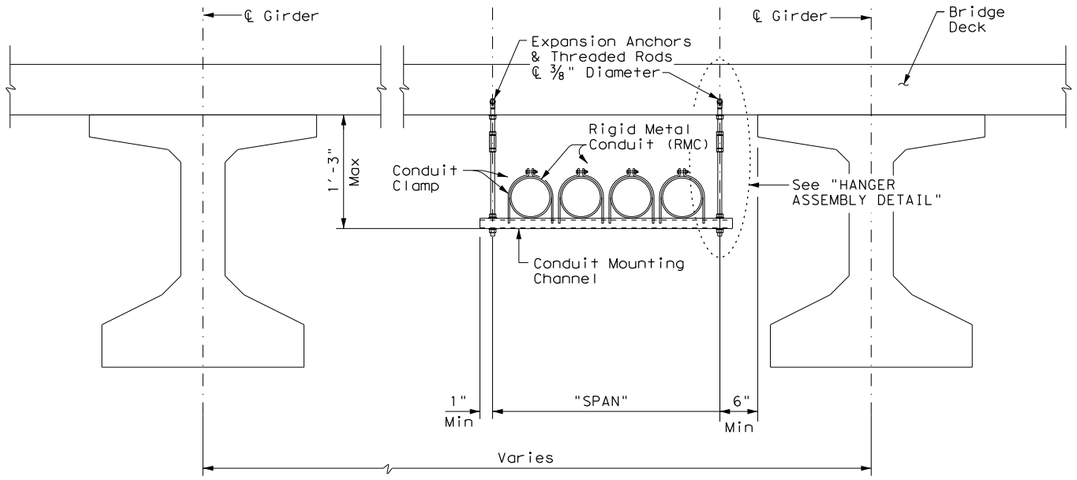
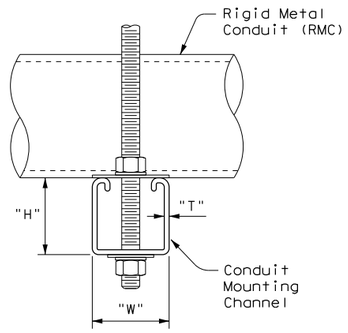
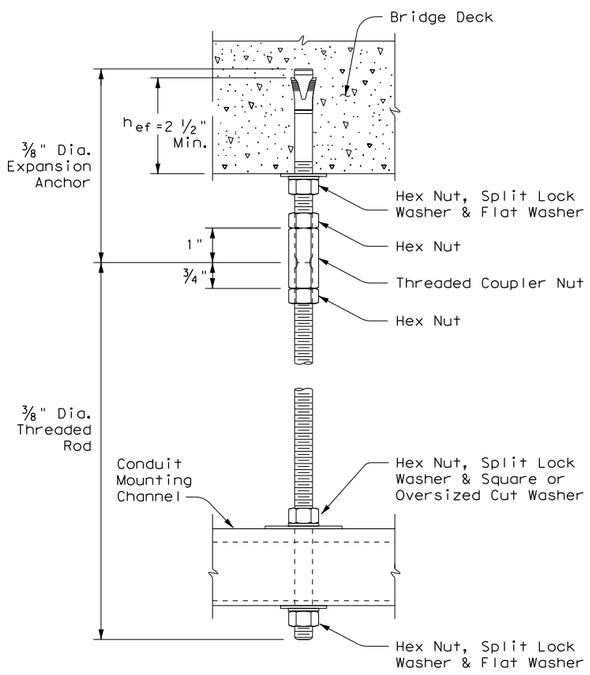


CONDUIT HANGING DETAIL

CONDUIT MOUNTING CHANNEL		
"SPAN"	"W" x "H"	"T"
less than 2'	1 5/8" x 1 3/8"	12 Ga.
2'-0" to 2'-6"	1 5/8" x 1 5/8"	12 Ga.
>2'-6" to 3'-0"	1 5/8" x 2 7/16"	12 Ga.

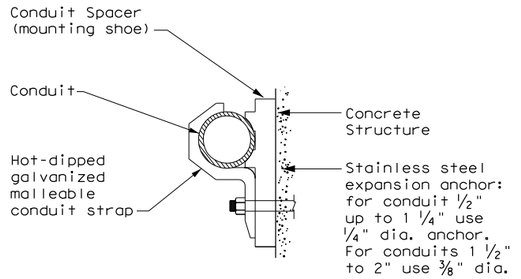
Channels with round or short slotted hole patterns are allowed, if the load carrying capacity is not reduced by more than 15%.

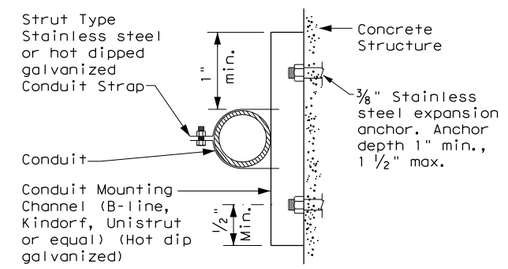




HANGER ASSEMBLY DETAIL

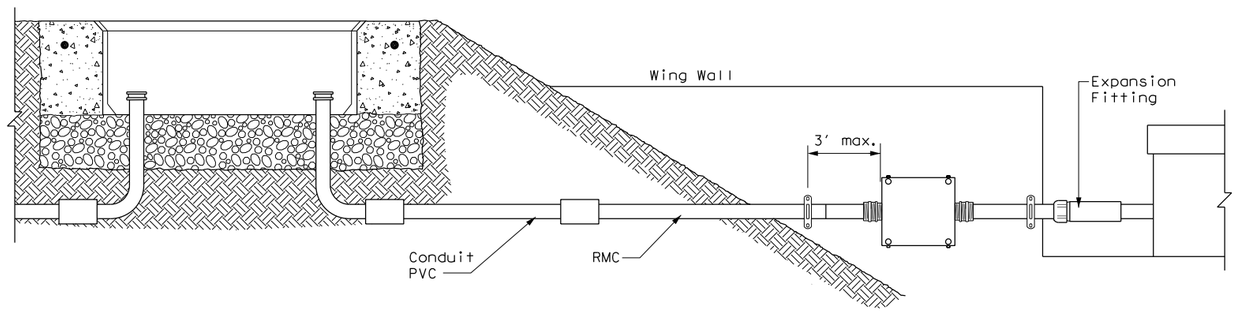
ELECTRIC CONDUIT TO BRIDGE DECK ATTACHMENT





CONDUIT MOUNTING OPTIONS

Attachment to concrete surfaces
See ED(1)B.2



TYPICAL CONDUIT ENTRY TO BRIDGE STRUCTURE DETAIL

EXPANSION ANCHOR NOTES FOR BRIDGE DECK ATTACHMENT

1. Use torque controlled mechanical expansion anchors that are approved for use in cracked concrete by the International Code Council, Evaluation Service (ICC-ES). The chosen anchor product shall have a designated ICC-ES Evaluation Report number, and its approval status shall be maintained on the ICC-ES website under Division 031600 for Concrete Anchors.

2. Unless otherwise approved by the Engineer: do not use adhesive anchors; do not use expansion anchors that are not included in the ICC-ES approval list; and do not use expansion anchors that are only approved for use in uncracked concrete.

3. Use anchors manufactured with stainless steel expansion wedges. Anchors manufactured with carbon steel expansion wedges are not allowed. Anchor bodies can be either zinc-plated carbon steel or stainless steel. For application in marine environment, both the anchor body and expansion wedge shall be stainless steel.

4. Install anchors as shown on the plans and in accordance with the anchor manufacturer's published installation instructions. Arrange a field demonstration test to evaluate the procedures and tools. The test shall be witnessed and approved by the Engineer prior to furnishing anchors on the structure.

5. Prior to hole drilling, use rebar locator to ensure clearing of existing deck strands or reinforcement. Install anchors to ensure a minimum effective embedment depth, (h_{ef}), as shown. Increase (h_{ef})as needed to ensure sufficient thread length for proper torqueing and tightening of anchors.

6. Use anchors of minimum 1600 Lbs tensile capacity (minimum of steel, concrete breakout, and concrete pullout strengths as determined by ACI 318 Appendix D) at the required minimum embedment depth (h_{ef}). No lateral loads shall be introduced after conduit installation.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
CONDUIT SUPPORTS

ED(2)-14

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REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DALLAS	DALLAS		133

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

C. TEMPORARY WIRING

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

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

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

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

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

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

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

B. CONSTRUCTION METHODS

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

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

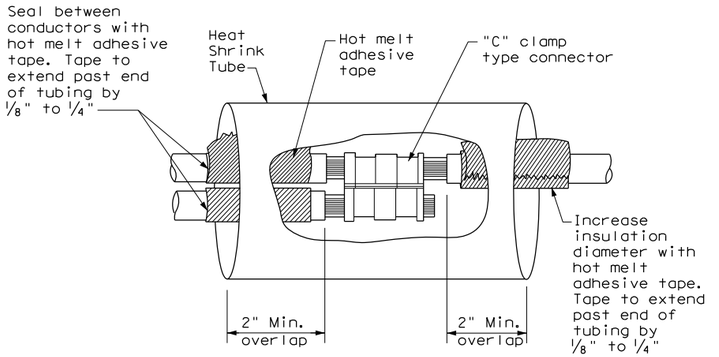
3. Install ground rods so the imprinted part number is at the upper end of the rod.

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

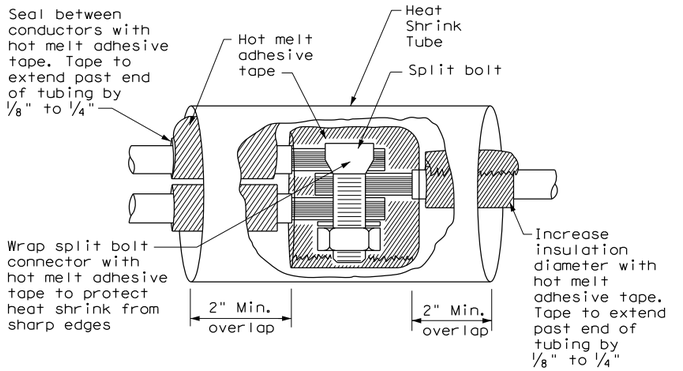
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

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

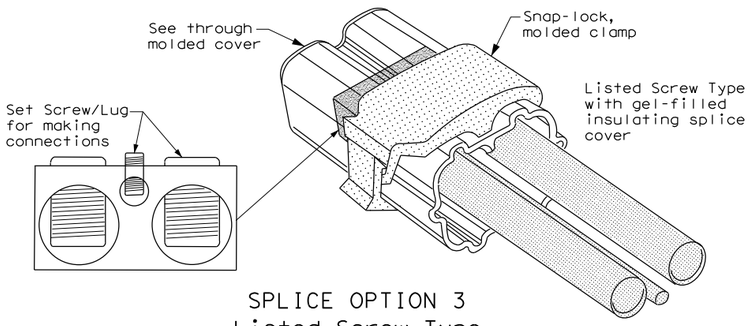
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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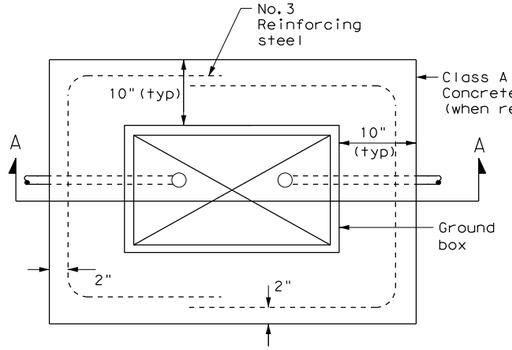
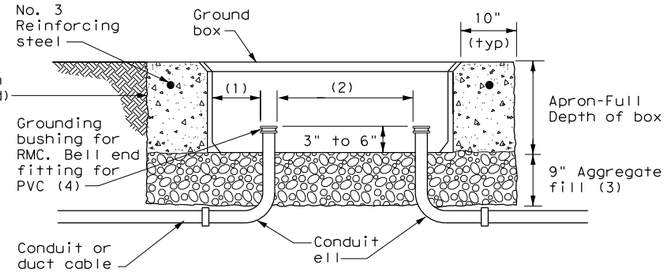


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

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

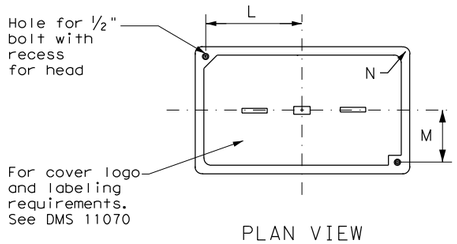
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

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

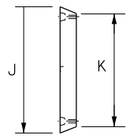
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

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

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



PLAN VIEW



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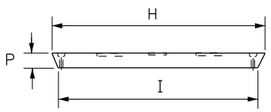


SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

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

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

ED(4)-14

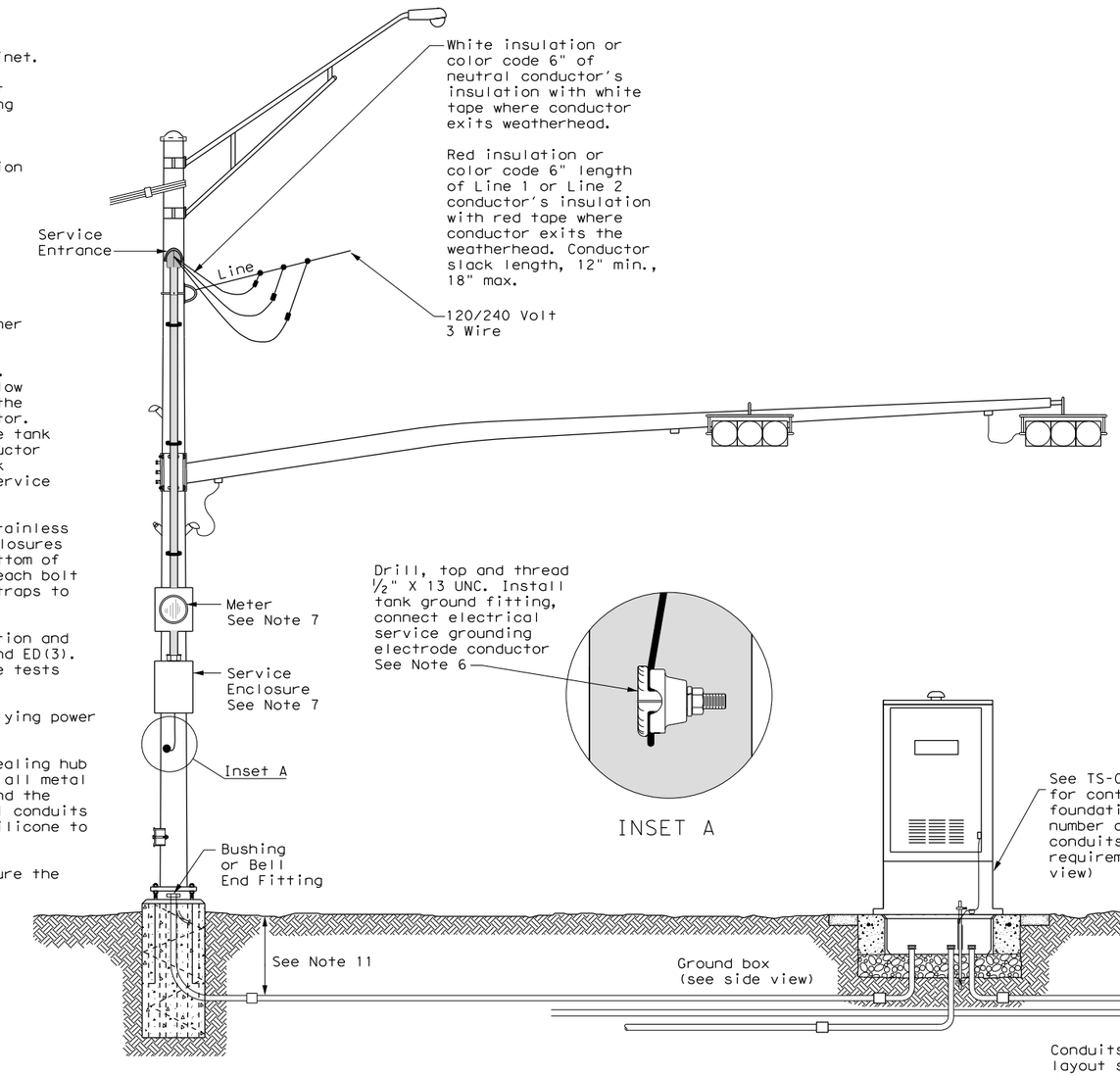
FILE: ed4-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DALLAS	DALLAS		135

71D

DATE:
FILE:

TRAFFIC SIGNAL NOTES

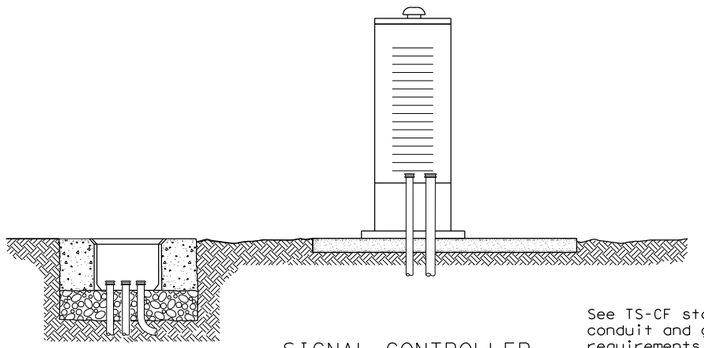
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL POLE WITH SERVICE

Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

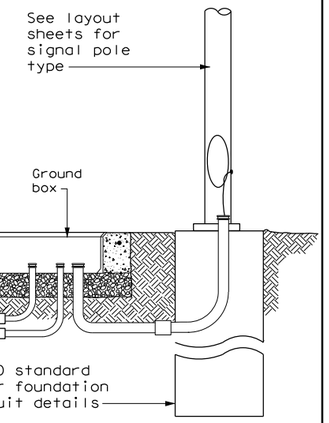
INSET A



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

SIGNAL CONTROLLER FRONT VIEW



SIGNAL POLE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS
ED(8)-14

FILE: ed8-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DALLAS	DALLAS		136

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ROADWAY ILLUMINATION ASSEMBLY NOTES

1. Details apply to roadway lighting installations bid or referenced under Item 610, "Roadway Illumination Assemblies." Provide, furnish, and install all other materials not shown on the plans which may be necessary for complete and proper construction. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the State such warranties or guarantees.

2. The locations of poles and fixtures may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC),TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA),and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association, Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection.

4. Provide Roadway Illumination Light Fixtures as per TxDOT Departmental Material Specification (DMS) 11010, Item 610, and as shown on the Material Producers List (MPL) for Roadway Illumination and Electrical Supplies.

5. Fabricate steel roadway illumination poles in accordance with Roadway Illumination Poles (RIP) standards and Item 610. Poles fabricated according to RIP standards do not require shop drawing submittals.

   a. Alternate designs to RIP standards or the use of aluminum to fabricate poles will require the submission of shop drawings electronically. For instructions on submitting shop drawings electronically see "Guide to Electronic Shop Drawing Submittal" on the TxDOT web site.

   b. Limitations on use of the RIP standard: The RIP standard details were developed for installations in locations where the 3-second gust basic maximum wind speed is 110 mph, and where the elevation of the base of the pole is less than (i.e. not more than) 25' above the elevation of the surrounding terrain, in accordance with the "AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals," 6th Edition (2013) of the AASHTO Design Specifications. For poles to be installed in regions where the maximum basic wind speed exceeds 110 mph or to be mounted more than 25' above the surrounding terrain, provide poles meeting the following requirements:

      i. Submittals. Following the electronic shop drawing submittal process (see Guide to Electronic Shop Drawing Submittal on the TxDOT web site), submit to the Engineer for approval fabrication drawings and calculations for the poles, sealed by a Texas licensed professional engineer (P.E.).

      ii. Luminaire Structural Support Requirements. Provide light poles, arms, and anchor bolt assemblies with a 25 year design life to safely resist dead loads, ice loads and the required basic wind speeds at the location of installation in accordance with the 6th edition (2013) of the AASHTO Design Specifications. For transformer base poles, include transformer base and connecting hardware in calculations and shop drawing submittals. Structurally test all transformer bases to resist the theoretical plastic moment capacity of the pole. Submit certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished with the shop drawings. Show breakaway base model number, manufacturer's name, and logo on shop drawings. Include on manufacturer's shop drawings the ASTM designations for all materials to be used.

6. For both transformer and shoe-base type illumination poles, provide and install double-pole breakaway fuse holders as specified by DMS-11040. Breakaway fuse holders are listed on the MPL for Roadway Illumination and Electrical Supplies under Items 610 & 620. Provide 10 amp time delay fuses for breakaway connectors in light poles, or inside the light fixture for underpass luminaires. In each pole, connect luminaires to the breakaway connector with continuous stranded 12 AWG copper conductors as listed on the MPL. Bond all equipment grounding conductors together and to the ground lug in the transformer base or hand hole.

7. Tighten anchor bolts for shoe base, concrete traffic barrier base, and bridge mount roadway illumination poles, in accordance with Item 449.

8. Install T-Base with following procedure:

   a. Anchor Bolt Tightening.

      i. Coat the threads of the anchor bolts with electrically conductive lubricant.

      ii. Place the T-base over the anchor bolts. Foundation must be level and flat. The maximum permissible gap under any one corner of the t-base is 1/8" before nuts are tightened.

      iii. Coat the bearing surfaces of the nuts and washers with electrically conductive lubricant. Install (1) 1/2" hold down washer, (1) lock washer, and (1) nut on each anchor bolt. Turn the nuts onto the bolts so that each is hand-tight against the washer.

      iv. Using a torque wrench, tighten each nut to 150 ft-lb. Uniform contact is required between the foundation and the T-base in the corner regions of the T-base, and all corner gaps must be closed after applying torque. If a gap still exists after torquing to 150 ft-lbs, continue torquing each bolt incrementally until gap is closed or maximum allowable torque of 250 ft. pound is reached, whichever comes first. If 250 ft-lbs is not enough to close the gap the foundation must be leveled. Gaps along the straight sides of the T-bases and the foundation are permissible. Ensure that no high point of contact occurs between the straight sides of the T-base and the foundation.

      v. Check top of T-base for level. If not level then foundation must be leveled.

   b. Top Bolt Procedure

      i. Erect pole over T-base with crane. Coat bolts, nuts, washers, and lock washers with electrically conductive lubricant.

      ii. Install bolts and 1/2" connecting washers from the inside of the T-base, thread up through the pole base. Install flat washers, lock washers and nuts snug tight according to Item 447, "Structural Bolting."

      iii. Tighten each nut to 150 ft-lb. using a torque wrench.

   c. Level and Plumb

      i. Ensure pole is plumb and mast arm is perpendicular to the roadway according to plans to within 5 degrees.

9. Construct luminaire pole foundations in accordance with Item 416, "Drilled Shaft Foundations," and TxDOT standard sheet RID(2).

10. Provide and install underpass luminaires in accordance with Item 610, DMS-11010, and TxDOT standard sheet RID(3). Typical luminaire size for underpass luminaires is 150W HPS or 150W EQ LED.

11. Mount luminaires on arms level as shown by the luminaire level indicator.

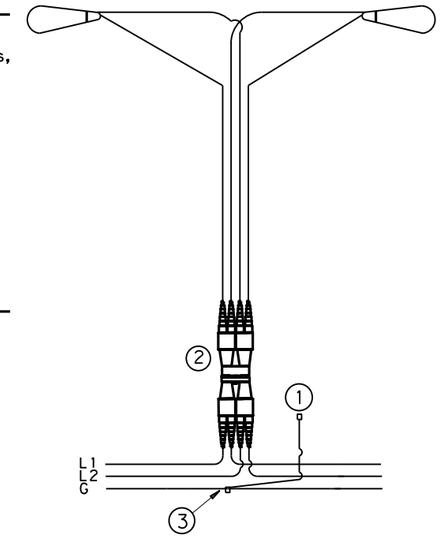
12. Orient luminaires perpendicular to the roadway intended to be lit unless otherwise shown on the plans.

Wiring Diagram Notes:

(1) Use 1/2 in.-13 UNC threaded, copper or tin-plated copper, pole bonding connector, sized appropriately for conductors, bonded to T-base, or use ground lug in handhole as available.

(2) Use pre-qualified two-pole breakaway connectors for all luminaire pole installations. For luminaires fed by a circuit with a neutral conductor, use double pole breakaway connectors with the neutral side unfused and marked white.

(3) Split Bolt or other connector.



L1,L2 = Hot Conductors
G = Grounding Conductor

TYPICAL WIRING DIAGRAM

LUMINAIRES SERVED AT 480V ON 240/480 VOLT SERVICE OR LUMINAIRES SERVED AT 240V FOR 120/240 VOLT SERVICE.

Decorative LED Lighting Notes:

1. LED Drivers in Remote Outdoor enclosures (for drivers that do not include an enclosure as part of a factory assembly):

   a. Provide NEMA 3R outdoor enclosure or as approved.

   b. Install enclosure at least 12" above ground or other horizontal surface. Mount vertically or on ceiling, and avoid direct sun where possible.

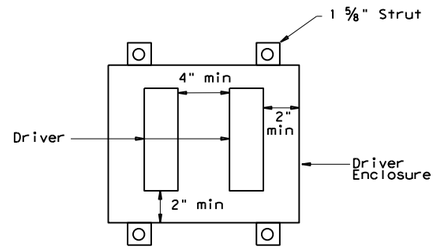
   c. Install drivers with at least 2 inches of space from enclosure walls.

   d. For multiple drivers in an enclosure, provide at least 4 inches side to side and 1 inch end to end from other drivers or electronic equipment

   e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.

   f. Provide remote drivers with a maximum of 100 watts

   g. Provide drivers with documentation of 100,000 hr lifetime at Tcase of 65C or higher.



Driver Spacing In Remote Enclosure

Texas Department of Transportation — Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

RID(1)-20

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12-20	DAL	DALLAS		137

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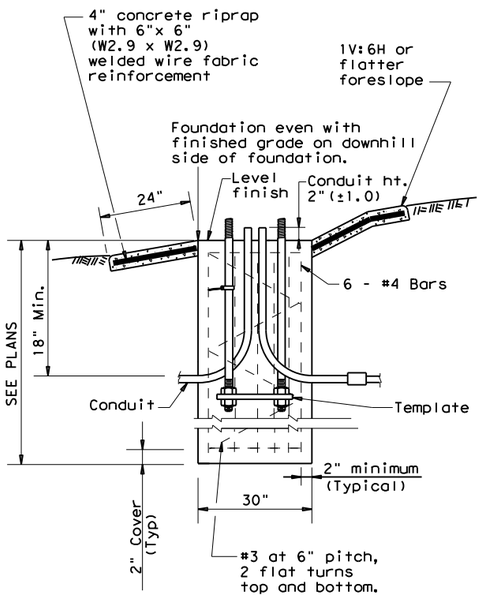
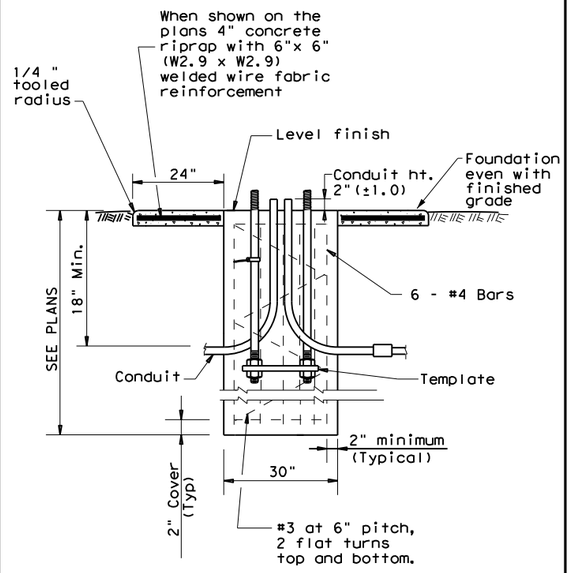


SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1

ANCHOR BOLTS

POLE MOUNTING HEIGHT	BOLT CIRCLE		ANCHOR BOLT SIZE
	Shoe Base	T-Base	
<40 ft.	13 in.	14 in.	1in. x 30in.
40-50 ft.	15 in.	17 ¼in.	1 ¼in. x 30in.

TABLE 2

RECOMMENDED FOUNDATION LENGTHS
(See note 1)

MOUNTING HEIGHT	TEXAS CONE PENETROMETER N Blows/ft		
	10	15	40
≤20 ft.	6′	6′	6′
>20 ft. to 30 ft.	8′	6′	6′
>30 ft. to 40 ft.	8′	8′	6′
>40 ft. to 50 ft.	10′	8′	6′

TABLE 3

PAY QUANTITY OF RIPRAP PER FOUNDATION (Install only when shown on the plans)

Foundation Diameter	RIPRAP DIAMETER	RIPRAP (CONC) (CL B)
30 in.	78 in.	0.35 CY

GENERAL NOTES:

1. "Recommended Foundation Lengths" table is for information purposes only. Foundation lengths shall be as shown on the plans, or as directed by the Engineer. Foundations will be paid for under Item 416, "Drilled Shaft Foundations," unless otherwise shown on the plans.
2. Erect roadway illumination assembly poles plumb and true. Form and level the top 6" of the foundation so the pole will be plumb. Use leveling nuts to plumb shoe base poles. Do not use shims or leveling nuts under transformer bases. Do not grout between baseplate and the foundation.
3. Ensure Class 2A and 2B fit for anchor bolts and nuts. Tap and chase nuts after galvanizing. Anchor bolt body with rolled threads need not be full size.
4. Use appropriate class of concrete as specified in Items 416 and 432. Concrete for riprap may be upgraded to Class C at no extra cost to the Department.
5. Place riprap around the foundation when called for elsewhere in the plans. Riprap will be paid for under Item 432.
6. Locate breakaway roadway illumination assemblies as shown in the placement table, unless otherwise dimensioned on the plans. Protect non-breakaway illumination assemblies from vehicular impact (i.e. 2.5 ft. behind guard rail or mounted on traffic barrier), or located outside the clear zone, except that 2.5 ft. from curb face is minimum desired for light poles on city streets, 45 mph or less. See Roadway Design Manual for further information.
7. Use 4 hold down and 4 connecting washers on transformer base poles as recommended by the manufacturer and supplied with base.
8. Install a minimum of 2 conduits in each foundation. See lighting layout sheets for locations of foundations with more than 2 conduits. Cap unused conduits in foundations on both ends.
9. Conduit location in foundations is critical for breakaway devices. Place conduits 2 in. apart on centerline as shown.
10. Bond anchor bolt to rebar cage with #6 bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. The bonded steel in the foundation creates a concrete encased grounding electrode which replaces the ground rod.
11. Grade earthwork around T-base foundations even with the finished grade as shown in Section A-A to ensure proper function of the breakaway device. Use riprap on T-base foundations that are located on sloped grades, and as shown on the plans for level grades.

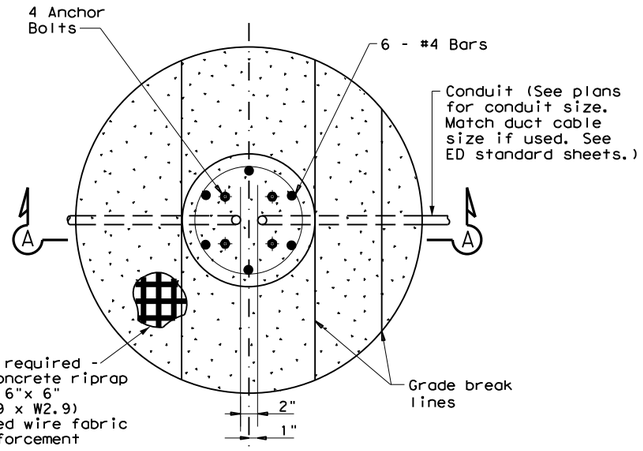
TABLE 4

BREAKAWAY POLE PLACEMENT (See note 6)

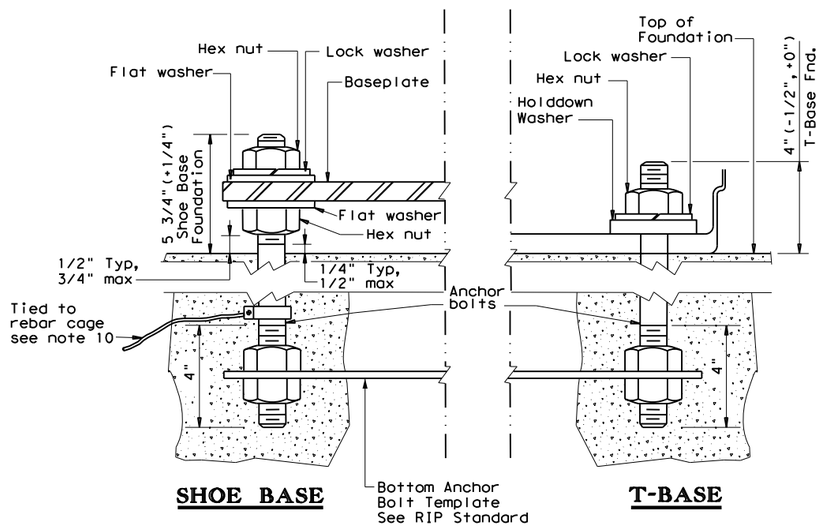
ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 ft. desirable) from lane edge

* or as close to ROW line as is practical

** provide 2/5 of the luminaire mounting height behind the pole for "falling area" to prevent encroachment on the other travel lanes. See design guidelines.



FOUNDATION DETAIL



SHOE BASE T-BASE

ANCHOR BOLT DETAIL

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(RDWY ILLUM FOUNDATIONS)
RID(2)-20

FILE: rid2-20.dgn	DN:	CK:	DW:	CK:
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	DAL	DALLAS		138

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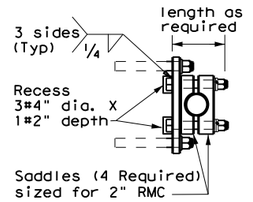
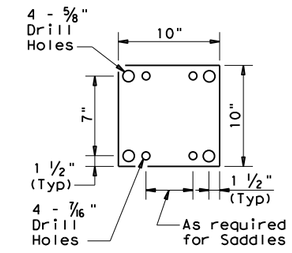
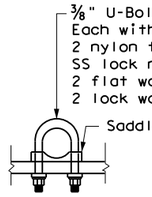


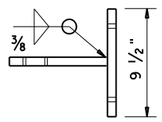
SECTION A-A



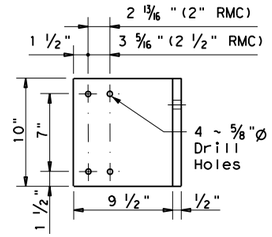
MOUNTING PLATE
(ASTM A-36 or better)



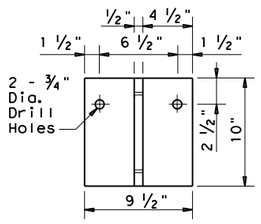
CLAMP DETAIL
(2 Req'd)



PLAN VIEW

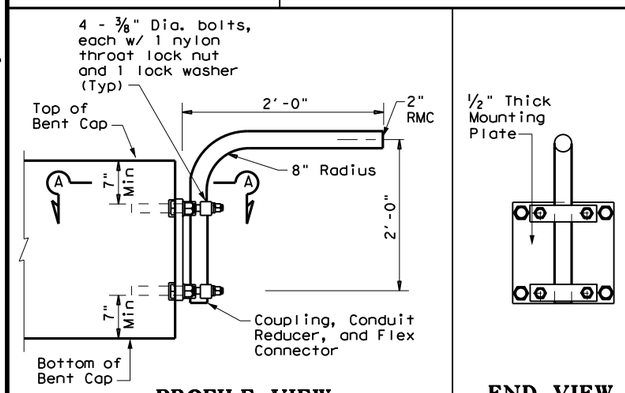


FRONT



SIDE

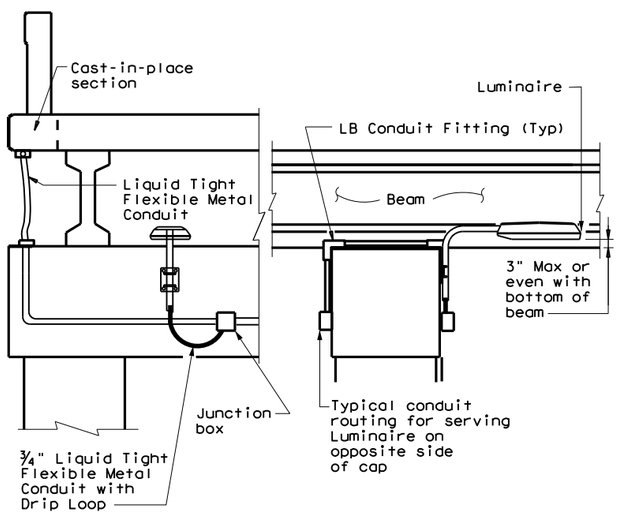
BRACKET DETAIL
Make from 1/2" plate (ASTM A-36 or better)



PROFILE VIEW
Or as Required
(See Note A.3)

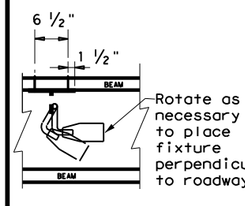
END VIEW

UNDERPASS LIGHTING ARM



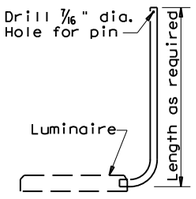
IN RD IL AM (U/P)(TY 1)
If bridge has pre-cast panels under deck, run circuit under deck edge.

UNDERPASS LIGHTING TYPE 1

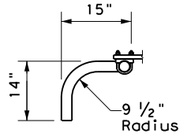


PLAN VIEW

FIXTURE ORIENTATION

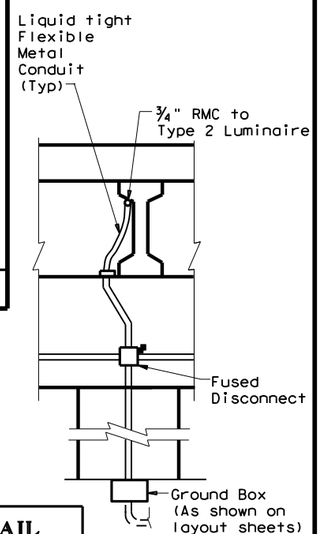


SIDE



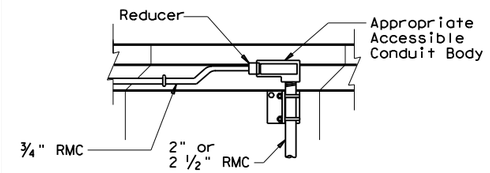
PLAN VIEW

ARM DETAIL



3 - No. 12 XHHW in 3/4" RMC for Branch Circuit runs from fused disconnect to underpass Luminaires

CONDUIT DETAIL



CONDUIT CONNECTION PROFILE

FRONT
(Beam height greater than 54")

FRONT
(Beam height equal to or less than 54")

IN RD IL AM (U/P)(TY 2)

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET

TABLE 5

LOCATION OF UNDERPASS LIGHT MOUNTING BRACKET TABLE

SPAN LENGTH	MINIMUM DISTANCE
≤ 50'	10'-0"
50' - 70'	15'-0"
70' - 90'	20'-0"
> 90'	25'-0"

UNDERPASS LIGHTING TYPE 2

GENERAL NOTES:

A. ALL 150 watt HPS and 150 watt equivalent LED Luminaires

1. Luminaire locations, conduit and conductor sizes and routing are typical and diagrammatic only. See project layout sheets for specific details.
2. Conduit will be paid for under Item 618, "Conduit" and conductors will be paid for under Item 620, "Electrical Conductors," unless otherwise shown on the plans.
3. Adjust conduit in saddles to place fixture height and orientation as required. See fixture orientation detail and plans. Where practicable, place luminaires so the bottom of luminaire is above the bottom of the beam, maximum of 3 in. (See detail UNDERPASS LIGHTING ARM TYPE 2)
4. Except as noted, galvanize all structural steel and exposed bolts, nuts, and washers in accordance with Item 445 "Galvanizing".
5. Fabrication of brackets and support arms will not be paid for directly but is subsidiary to Item 610, "Roadway Illumination Assemblies."
6. Install a heavy duty NEMA 3R fused disconnect or breaker enclosure rated at 30 amps and 480 volts to switch underpass luminaires as shown on plans, with at least one per bridge circuit. Install 20 amp time-delay fuses or inverse-time circuit breakers. Mount disconnect or breaker enclosure 10 ft.(min) above grade on columns or bent caps as approved by the Department. Modify disconnect to allow padlocking in the "ON" and "OFF" positions. Padlocks and disconnect switches or circuit breakers for underpass fixtures will not be paid for directly but are subsidiary to the various bid items of the contract.
7. Conduit on columns, caps, and slab is shown surface mounted. For new columns and caps, embed PVC conduit in concrete. Bond and ground metal junction boxes and conduit.

B. TYPE 1

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) for Type 1 arm shaft.
2. Use 3/8 in. stainless steel bolt or stud non-epoxy type expansion anchors for concrete for Type 1 mounting. Except as noted, provide an allowable 2650 lbs minimum pull-out force (after consideration of adjustment factors for edge distance and bolt spacing) for each anchor. Install each anchor to the embedment depth recommended by the manufacturer.
3. Attach conduit to plate with 4 saddles, four - 3/8 in. diameter bolts, nylon throat lock nuts, and lock washers.

C. TYPE 2

1. Provide 2 in. rigid metal conduit (2.375" O.D., 0.146" wall) or provide a combination of 2 1/2 in. (2.875" O.D., 0.193" wall) and 2 in. (2.375" O.D., 0.146" wall) rigid metal conduits with a reducing bushing as beam height stipulated for Type 2 arm shaft. Field cutting and threading will be permitted. Paint cut and threaded areas with zinc rich paint after conduit is connected to adjacent fitting.
2. Connecting conduit may be strapped to tapered section only of precast beams as shown. Anchor as approved by the Engineer. Maximum anchor depth is 1 in.
3. Indiscriminate drilling into precast concrete beams may result in reduced beam strength. Use drilling location and method as directed by the Engineer. See Location of Underpass Lighting Mounting Bracket detail. The locations shown in the table are such that reinforcing strands will not be damaged.

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS
(UNDERPASS LIGHT FIXTURES)

RID(3)-20

FILE:	rid3-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS		0092	03	125	IH 45
2-14		DIST	COUNTY		SHEET NO.
7-17		DAL	DALLAS		139
12-20					

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DATE:
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SHIPPING PARTS LIST - POLES AND LUMINAIRE ARMS

Nominal Mounting Ht. (ft)	Shoe Base Designation				Quantity	T-Base Designation				Quantity	CSB/SSCB Mounted Designation				Quantity
	Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire		Pole	A1	A2	Luminaire	
20	(Type SA 20 S - 4)			(150W EQ) LED		(Type SA 20 T - 4)			(150W EQ) LED						
	(Type SA 20 S - 4 - 4)			(150W EQ) LED		(Type SA 20 T - 4 - 4)			(150W EQ) LED						
30	(Type SA 30 S - 4)			(250W EQ) LED		(Type SA 30 T - 4)			(250W EQ) LED		(Type SP 28 S - 4)			(250W EQ) LED	
	(Type SA 30 S - 4 - 4)			(250W EQ) LED		(Type SA 30 T - 4 - 4)			(250W EQ) LED		(Type SP 28 S - 4 - 4)			(250W EQ) LED	
	(Type SA 30 S - 8)			(250W EQ) LED		(Type SA 30 T - 8)			(250W EQ) LED		(Type SP 28 S - 8)			(250W EQ) LED	
	(Type SA 30 S - 8 - 8)			(250W EQ) LED		(Type SA 30 T - 8 - 8)			(250W EQ) LED		(Type SP 28 S - 8 - 8)			(250W EQ) LED	
40	(Type SA 40 S - 4)			(250W EQ) LED		(Type SA 40 T - 4)			(250W EQ) LED		(Type SP 38 S - 4)			(250W EQ) LED	
	(Type SA 40 S - 4 - 4)			(250W EQ) LED		(Type SA 40 T - 4 - 4)			(250W EQ) LED		(Type SP 38 S - 4 - 4)			(250W EQ) LED	
	(Type SA 40 S - 8)			(250W EQ) LED		(Type SA 40 T - 8)			(250W EQ) LED		(Type SP 38 S - 8)			(250W EQ) LED	
	(Type SA 40 S - 8 - 8)			(250W EQ) LED		(Type SA 40 T - 8 - 8)			(250W EQ) LED		(Type SP 38 S - 8 - 8)			(250W EQ) LED	
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	(Type SA 40 S - 10 - 10)			(250W EQ) LED		(Type SA 40 T - 10 - 10)			(250W EQ) LED		(Type SP 38 S - 10 - 10)			(250W EQ) LED	
	(Type SA 40 S - 12)			(250W EQ) LED		(Type SA 40 T - 12)			(250W EQ) LED		(Type SP 38 S - 12)			(250W EQ) LED	
	(Type SA 40 S - 12 - 12)			(250W EQ) LED		(Type SA 40 T - 12 - 12)			(250W EQ) LED		(Type SP 38 S - 12 - 12)			(250W EQ) LED	
50	(Type SA 50 S - 4)			(400W EQ) LED		(Type SA 50 T - 4)			(400W EQ) LED		(Type SP 48 S - 4)			(400W EQ) LED	
	(Type SA 50 S - 4 - 4)			(400W EQ) LED		(Type SA 50 T - 4 - 4)			(400W EQ) LED		(Type SP 48 S - 4 - 4)			(400W EQ) LED	
	(Type SA 50 S - 8)			(400W EQ) LED		(Type SA 50 T - 8)			(400W EQ) LED		(Type SP 48 S - 8)			(400W EQ) LED	
	(Type SA 50 S - 8 - 8)			(400W EQ) LED		(Type SA 50 T - 8 - 8)			(400W EQ) LED		(Type SP 48 S - 8 - 8)			(400W EQ) LED	
	(Type SA 50 S - 10)			(400W EQ) LED		(Type SA 50 T - 10)			(400W EQ) LED		(Type SP 48 S - 10)			(400W EQ) LED	
	(Type SA 50 S - 10 - 10)			(400W EQ) LED		(Type SA 50 T - 10 - 10)			(400W EQ) LED		(Type SP 48 S - 10 - 10)			(400W EQ) LED	
	(Type SA 50 S - 12)			(400W EQ) LED		(Type SA 50 T - 12)			(400W EQ) LED		(Type SP 48 S - 12)			(400W EQ) LED	
	(Type SA 50 S - 12 - 12)			(400W EQ) LED		(Type SA 50 T - 12 - 12)			(400W EQ) LED		(Type SP 48 S - 12 - 12)			(400W EQ) LED	

OTHER Designation				Quantity
Pole	A1	A2	Luminaire	

GENERAL NOTES:

1. All work, materials and services not shown on the plans which may be necessary for complete and proper construction shall be performed, furnished and installed by the Contractor. Faulty fabrication or poor workmanship in any material, equipment or installation will be considered justification for rejection. Where manufacturers provide warranties or guarantees as a customary trade practice, furnish to the Department such warranties or guarantees.

2. The location of poles and fixtures are diagrammatic only and may be shifted by the Engineer to accommodate local conditions. Install or remove poles and luminaires located near overhead electrical lines using established industry and utility safety practices and in accordance with laws governing such work. Consult with the appropriate utility company prior to beginning such work.

3. Standard Steel Pole Designs. Steel poles fabricated in accordance with the details and dimensions shown herein, shall be considered standard designs. Submission of shop drawings and design calculations for standard designs is not required.

4. Optional Steel Pole Designs. Multi-sided steel poles may be allowed as optional designs, if steel poles are permitted or required, pending approval by the Department as outlined below.

   a. Shop Drawings. Optional designs require submission of shop drawings and design calculations bearing the seal of an engineer licensed in the State of Texas, in accordance with Item 441, "Steel Structures." The Department may elect to pre-approve some shop drawings for optionally designed poles. Submission of shop drawings and design calculations is not required for structures fabricated in accordance with the details of shop drawings on the pre-approved list maintained by the TxDOT Traffic Operations Division. Any deviation from the pre-approved shop drawings will require submission of shop drawings of the complete assembly and design calculations as described above.
   b. Structural Support Design for Luminaires. Lighting support structures shall be designed for a 25 year design life in accordance with the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto. All poles shall be designed for 110 mph 3-second gust wind speeds. The Gust Factor, G, and Wind Importance Factor, Ir, shall be applied as per the AASHTO Specifications assuming a 25-year design life. The design wind pressure for hurricane wind velocities greater than 100 mph shall not be less than the design wind pressure using 100 mph with the non-hurricane Wind Importance Factor, Ir, value. For transformer base poles, fabricator shall include transformer base and connecting hardware in design calculations and shop drawing submittals. All transformer bases shall have been structurally tested to resist the theoretical plastic moment capacity of the pole. Certification of the plastic moment load test and FHWA breakaway requirement test of the model of base being furnished shall be submitted with the shop drawings. Shop drawings shall show breakaway base model number, and manufacturer's name and logo. Manufacturer's shop drawings shall include the ASTM designations for all materials to be used.
   c. Mast Arm Attachments. All poles and attachments shall be structurally designed to support two 12-foot mast arms and luminaires. Poles shall be supplied with mast arm combinations as shown in the plans. All mast arms shall be designed for a 60-pound luminaire having an effective projected area of 1.6 square feet.
   d. Anchor Bolt Assembly. Anchor bolt assemblies for optionally designed poles shall be the same as those shown herein.

5. Aluminum Pole Designs. Aluminum pole designs may be allowed, if aluminum poles are permitted or required, pending approval by the Department as outlined below.

   a. Meet all of the requirements stated above for optional steel pole designs and the following:
      1. Aluminum poles shall be fabricated in accordance with "Structural Welding Code-Aluminum" AWS D1.2.
      2. Aluminum pole designs shall use the same anchor bolt assembly and be subject to the same geometric restraints and other requirements for steel poles specified herein.
      3. Aluminum poles shall be equipped with vibration mitigation devices, as approved by the engineer.
      4. Pole components shall be constructed using the following material:
         Shaft: ASTM B221 or B241 Alloy 6063-T6, ASTM B209 Alloy 5086-H34, ASTM B221 Alloy 6005-T5.
         Base Flange: ASTM B26 Alloy 356.0-T6 or ASTM B108 Alloy 356.0-T6 (Yield strength test required).
         Mast Arm Fitting: ASTM B209 Alloy 6061-T6 or ASTM B221 Alloy 6005-T5.
         Mast Arms: ASTM B241 Alloy 6061-T6 or Alloy 6063-T6.
         Pole Cap: ASTM B209 Alloy 5086-H32 or ASTM B108 or B26 Alloy 356.0-T6.
         Bolts: Stainless Steel AISI 300 series. Bolts threading into aluminum threads shall be treated with anti-seize compound, Never-Seez Compound, Permatex 133K or equal.

6. Special Designs. Poles with architectural treatments shall meet the requirements shown elsewhere in the plans.

7. Luminaire Mounting Height. Actual luminaire mounting height shall be the nominal mounting height given on RIP(2) for all pole-arm combinations except for poles with 4 ft. luminaire arms, which shall be 3'-0" lower than the nominal height, unless otherwise shown or directed.

EXPLANATION OF ROADWAY ILLUMINATION ASSEMBLY DESIGNATIONS

(TYPE SA 50 T - X - X) (400W EQ) LED

- SA: Pole and mast arm may be steel or aluminum.
- ST: Pole and mast arm must be steel.
- AL: Pole and mast arm must be aluminum.
- SP: Special (ovalized) steel or aluminum pole for installing on CSB or SSCB. See standard sheet CSB (4), or SSCB (4).

Two numerical digits denote nominal mounting height in feet.

Next letter denotes type of base, (S-Shoe Base, T-Transformer Base, or B-Bridge/Ret.Wall Mount)

First number denotes length of mast arm in feet.

Use of second mast arm is indicated by second dashed number which denotes length in feet.

Luminaire rating in watts (i.e. 400W). Equivalent wattage LED fixtures will include EQ (i.e. 400W EQ)

Last letters indicate light source (S - High Pressure Sodium; LED - LED luminaire)

SHEET 1 OF 4

Texas Department of Transportation

Traffic Safety Division Standard

ROADWAY ILLUMINATION POLES

RIP(1)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
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REVISIONS	0092	02	125	IH 45
7-17	DIST	COUNTY		SHEET NO.
12-19	DALLAS	DALLAS		140

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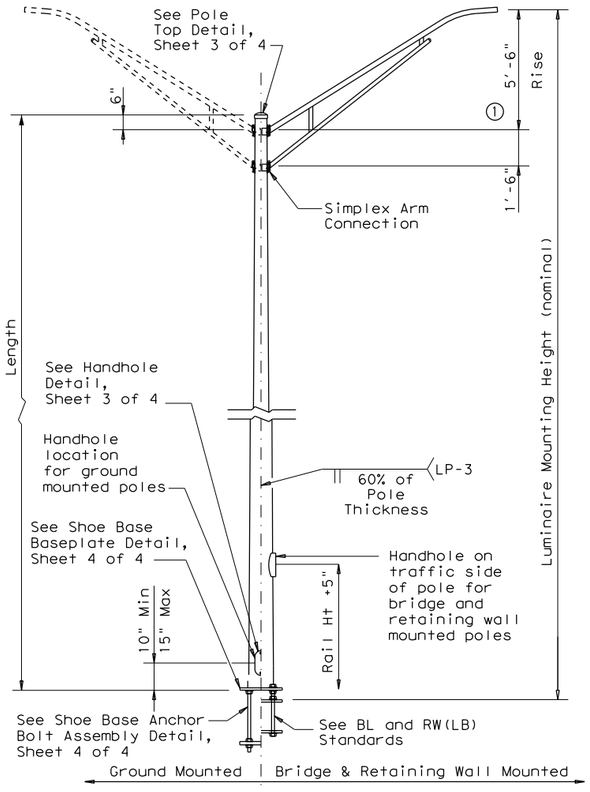
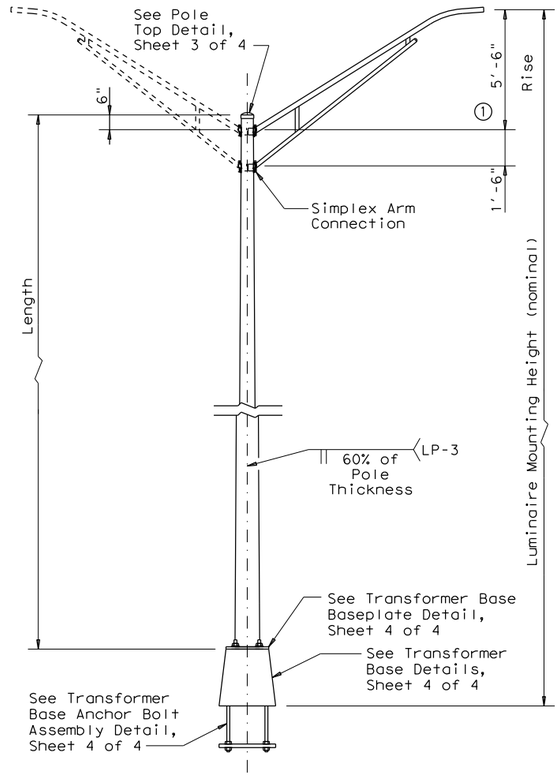


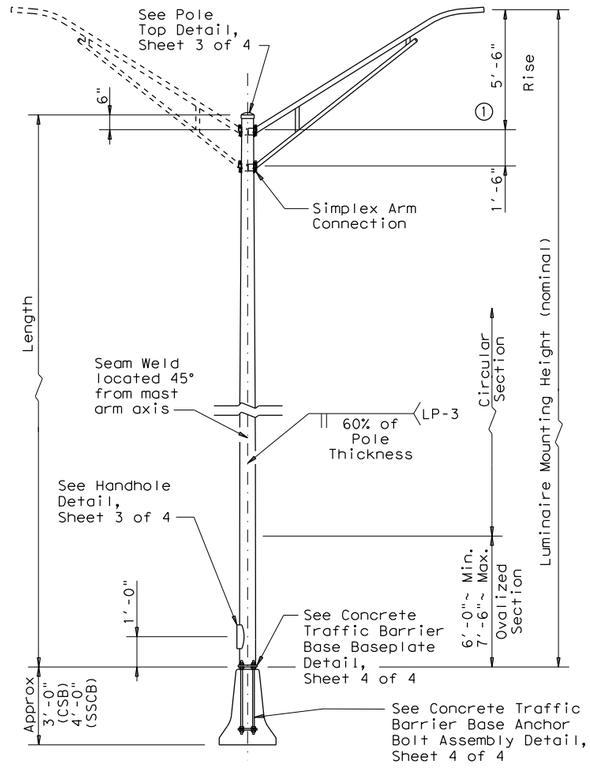
SHOE BASE POLE

SHOE BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	4.90	15.00	0.1196	7.1
30.00	7.50	4.00	25.00	0.1196	13.2
31.00-39.00	8.00	4.36-3.24	26.00-34.00	0.1196	20.7
40.00	8.50	3.60	35.00	0.1196	20.7
50.00	10.50	4.20	45.00	0.1196	30.3



TRANSFORMER BASE POLE

TRANSFORMER BASE POLE					
Luminaire Mounting Height (Nominal) (ft)	Base Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)
20.00	7.00	5.11	13.50	0.1196	7.1
30.00	7.50	4.21	23.50	0.1196	13.2
31.00-39.00	8.00	4.57-3.45	24.50-32.50	0.1196	20.7
40.00	8.50	3.81	33.50	0.1196	20.7
50.00	10.00	3.91	43.50	0.1196	30.3



CONCRETE TRAFFIC BARRIER BASE POLE

CONCRETE TRAFFIC BARRIER BASE POLE (CSB/SSCB)						
Luminaire Mounting Height (Nominal) (ft)	Base ② Diameter (in)	Top Diameter (in)	Length (ft)	Pole Thickness (in)	Design Moment (K-ft)	
					About ℄ of Rail	Perp. to Rail
28.00	9.00	5.78	23.00	0.1196	10.3	13.2
38.00	9.00	4.38	33.00	0.1196	16.6	20.8
48.00	10.50	4.48	43.00	0.1345	25.1	30.5

MATERIAL DATA		
COMPONENT	ASTM DESIGNATION	MIN. YIELD (ksi)
Pole Shaft (0.14"/ft. Taper)	A572 Gr 50, A595 Gr A, A1011 HSLAS Gr 50 Cl 2 ③, or A1008 HSLAS Gr 50 Cl 2	50
Base Plate and Handhole Frame	A572 Gr.50, or A36	36
T-Base Connecting Bolts	F3125 Gr A325	92
Anchor Bolts	F1554 Gr 55, A193-B7 or A321	55 105
Anchor Bolt Templates	A36	36
Heavy Hex (H.H.) Nuts	A194 Gr 2H, or A563 Gr DH	
Flat Washers	F436	

NOTES:

① 2'-6" rise for 4 ft. luminaire arms.

② Before ovalized as shown on Concrete Traffic Barrier Base Baseplate details, Sheet 4 of 4.

③ A1011 SS Gr 50 may be used instead of HSLAS, provided the material meets the elongation requirements for HSLAS.

POLE ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Shaft length	+1"
I.D. of outside piece of slip fitting pieces	+1/8", -1/16"
O.D. of inside piece of slip fitting pieces	+1/32", -1/8"
Shaft diameter: other	+3/16"
Out of "round"	1/4"
Straightness of shaft	±1/4" in 10 ft
Twist in multi-sided shaft	4° in 50 ft
Perpendicular to baseplate	1/8" in 24"
Pole centered on baseplate	±1/4"
Location of Attachments	±1/4"
Bolt hole spacing	±1/16"

GENERAL NOTES:

1. Designs conform to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals , 6th Edition (2013) and Interim Revisions thereto. Design 3-Second Gust Wind Speed equals 110 mph with a 1.14 gust factor. A wind importance factor of 0.80 is applied to adjust the wind speed to a 25 year recurrence interval. Design moments listed in tables assume base of pole is 25' above natural ground level.
2. Structures are designed to support two 12' luminaire mast arms and luminaires. Mast arms are designed to support a 60-pound luminaire having an effective projected area of 1.6 square feet.
3. Fabrication shall be in accordance with the Specifications and with the details, dimensions, and weld procedures shown herein. Do not submit shop drawings for roadway illumination pole assemblies fabricated in accordance with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Materials, fabrication tolerances, and shipping practices shall meet the requirements of these sheets and the Specifications. In the absence of specified fabrication tolerances, dimensions shall be within the tolerances generally obtainable in normal fabrication practice.
4. For mounting heights between values shown in the tables, use base diameter and thickness values for the larger height.
5. Unless otherwise noted, all steel parts shall be galvanized in accordance with Item 445, "Galvanizing."
6. Steel poles shall be fabricated in accordance with Item 441, "Steel Structures." Longitudinal seam welds for pole sections shall have 60% minimum penetration. All welding shall be in accordance with AWS D1.1, Structural Welding Code-Steel.
7. Two-section poles joined by circumferential welds will not be permitted, unless otherwise shown on the plans. Poles may be fabricated in two sections and field-assembled by the lap-joint method. The two sections shall telescope together with a lap length of not less than 1-1/2 times the shaft diameter at the lap joint.
8. Alternate material equal to or better than material specified may be substituted with the approval of the Engineer.
9. Lubricate and tighten anchor bolts, when erecting shoe base poles and concrete traffic barrier base poles, in accordance with Item 449, "Anchor Bolts."
10. All poles, except Transformer Base Poles, shall have hand holes with reinforcing frames and covers. For ground mounted shoe base poles, hand holes shall be placed 90 degrees to mast arm unless otherwise noted on the plans. For poles mounted on a concrete traffic barrier with one luminaire arm, hand holes shall be located 180 degrees from luminaire arm. For poles mounted on a concrete traffic barrier with two luminaire arms, all hand holes shall be on the same side of the barrier. For poles mounted on a bridge lighting bracket or a retaining wall lighting bracket, hand hole shall be on traffic side of the pole, at a height that will clear the barrier.
11. The finished pole shall have a smooth, uniform finish free of pits, blisters, or other defects. Scratched, chipped, and other damaged galvanized areas on poles and mast arms shall be repaired in accordance with Item 445, "Galvanizing."
12. Pole length is based on a 5'-6" luminaire arm rise. 4 ft. luminaire arms have a 2'-6" rise. A pole with 4 ft. luminaire arms will have an actual mounting height 3'-0" less than the nominal mounting height. Increasing the pole length to meet the nominal mounting height is allowed, but unnecessary unless otherwise directed by the engineer.
13. Erect transformer base poles in accordance with sheet RID(1).

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ROADWAY ILLUMINATION POLES

RIP(2)-19

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12-19	DALLAS	DALLAS		141

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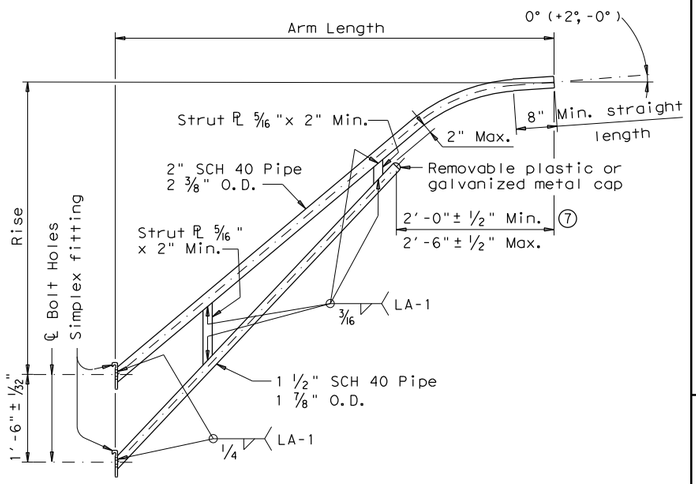
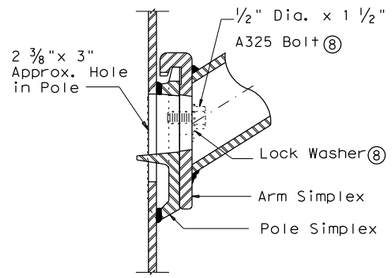


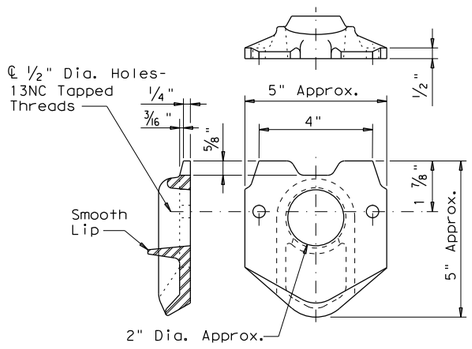
LUMINAIRE ARM

LUMINAIRE ARM DIMENSIONS		
Nominal Arm Length	Arm Length	Rise
4'-0"	3'-6"	2'-6"
6'-0"	5'-6"	5'-6"
8'-0"	7'-6"	5'-6"
10'-0"	9'-6"	5'-6"
12'-0"	11'-6"	5'-6"

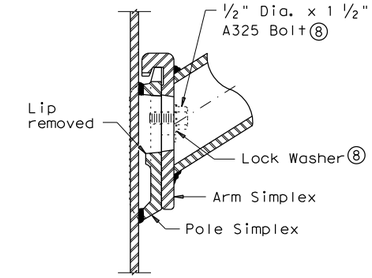
ARM ASSEMBLY FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Arm Length	±1"
Arm Rise	±1"
Deviation from flat	1/8" in 12"
Spacing between holes	±1/32"



UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

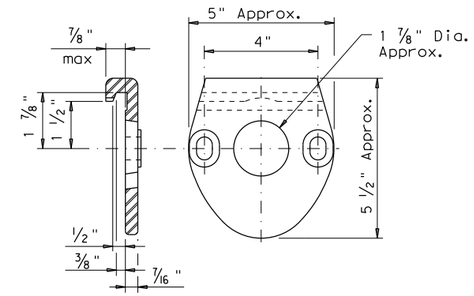


POLE SIMPLEX DETAIL ⑨



LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SECTION B-B



ARM SIMPLEX DETAIL ⑨

NOTES:

④ Any of the materials listed for plates may be used where the drawings do not specify a particular ASTM designation.

⑤ A576 must be suitable for forging and also meet minimum tensile strength of 65 ksi, minimum yield of 35 ksi, and elongation in 2 inches of 22 percent.

⑥ A572, A1008 HSLAS-F, and A1011 HSLAS-F materials may have higher yield strengths but shall not have less elongation than the grade indicated.

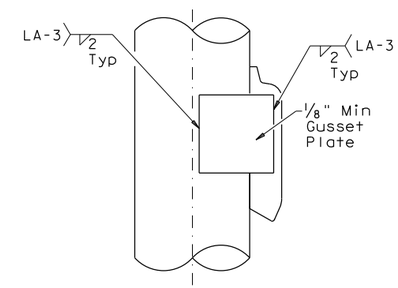
⑦ Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

⑧ Each pole simplex fitting shall be supplied with 2 bolts and 2 lock washers of the size specified. The bolts and lock washers shall be secured to the pole with the other hardware items called for in the plans.

⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.

⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted



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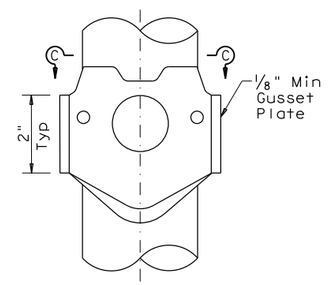
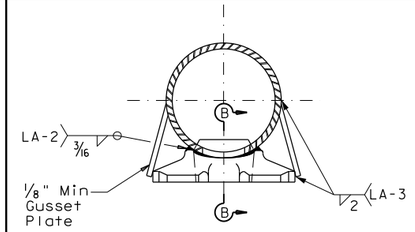
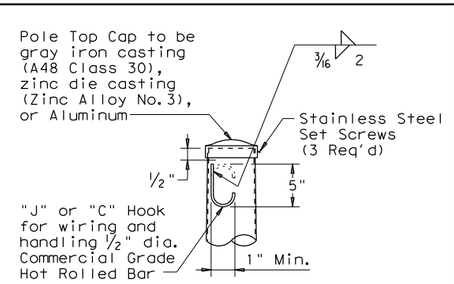


ELEVATION

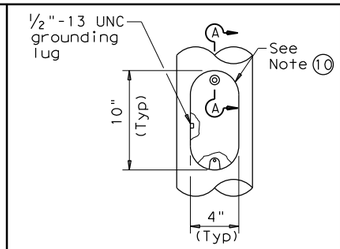


SECTION C-C

SIMPLEX ATTACHMENT DETAIL



POLE TOP



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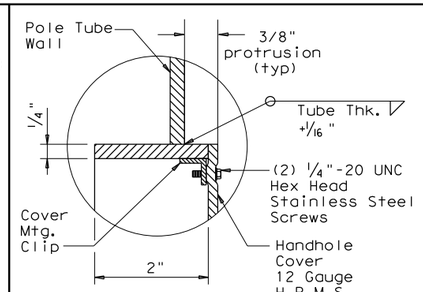


SECTION A-A

HANDHOLE

Texas Department of Transportation

Traffic Safety Division Standard

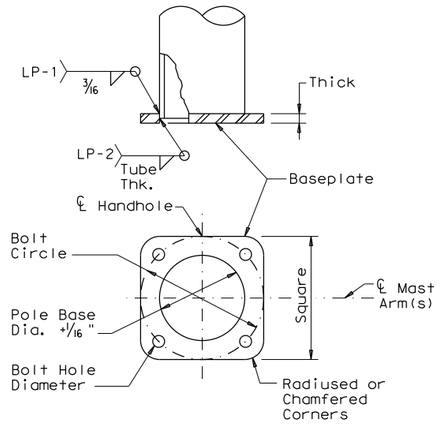
ROADWAY ILLUMINATION POLES

RIP(3)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
7-17	DIST	COUNTY		SHEET NO.
12-19	DALLAS	DALLAS		142

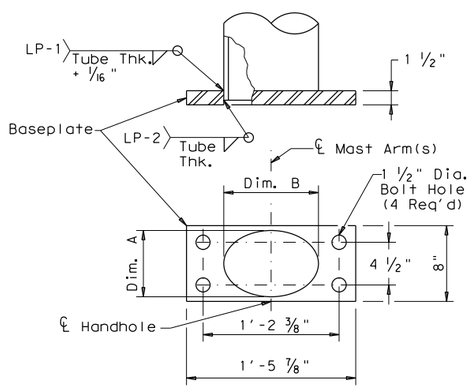
73C

DATE:
FILE:



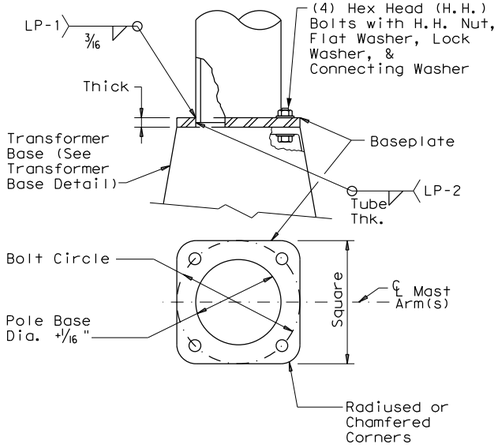
SHOE BASE BASEPLATE

SHOE BASE BASEPLATE TABLE				
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	BOLT HOLE DIAMETER
20′ - 39′	13"	13"	1 1/4"	1 1/4"
40′	15"	15"	1 1/4"	1 1/2"
50′	15"	15"	1 1/2"	1 1/2"



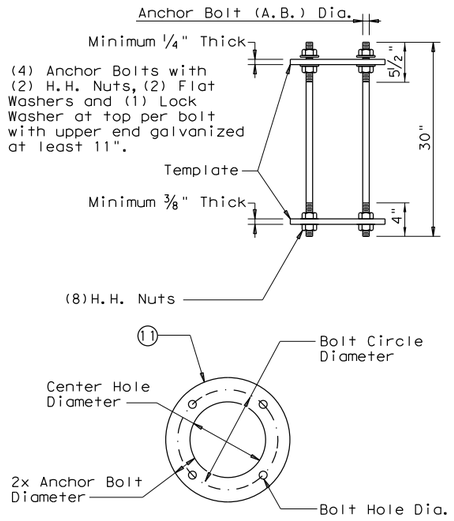
CONCRETE TRAFFIC BARRIER BASE BASEPLATE

CONCRETE TRAFFIC BARRIER BASE BASEPLATE TABLE			
MOUNTING HEIGHTS (nominal)	POLE DIA.(12)	DIM. A	DIM. B
28′ - 38′	9"	7"± 1/4"	10"± 1/4"
48′	10 1/2"	7"± 1/4"	13"± 1/4"



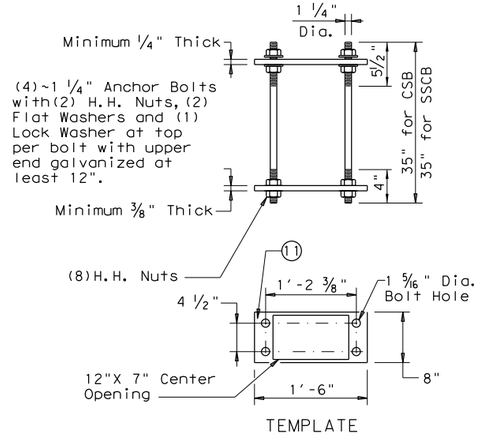
TRANSFORMER BASE BASEPLATE

TRANSFORMER BASE BASEPLATE TABLE						
MOUNTING HEIGHTS (nominal)	BOLT CIRCLE	SQUARE	THICK	CONNECTING BOLT DIA.	BOLT HOLE DIAMETER	TRANSFOMER BASE TYPE
20′ - 39′	13"	13"	1 1/4"	1"	1 1/4"	A
40′	15"	15"	1 1/4"	1 1/4"	1 1/2"	B
50′	15"	15"	1 1/2"	1 1/4"	1 1/2"	B



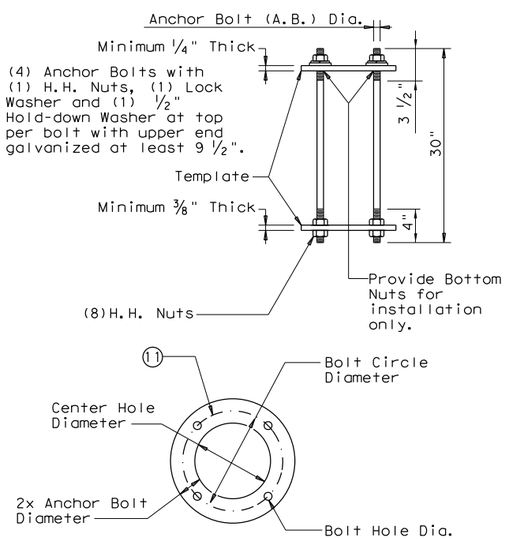
SHOE BASE ANCHOR BOLT ASSEMBLY

SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′-39′	1"	13"	11"	1 1/16"
40′-50′	1 1/4"	15"	12 1/2"	1 5/16"



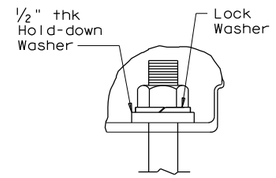
CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

TRANSFORMER BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20′ - 39′	1"	14"	12"	1 1/16"
40′ - 50′	1 1/4"	17 1/4"	14 3/4"	1 5/16"

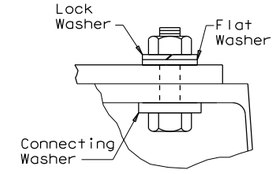


TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

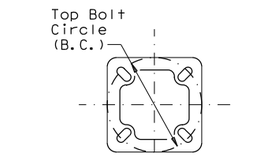
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



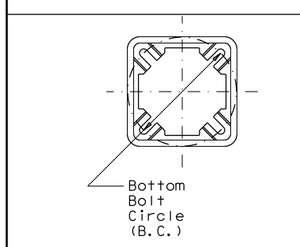
DETAIL A



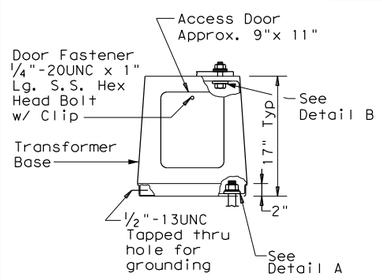
DETAIL B



TOP PLAN



BOTTOM PLAN



ELEVATION

TRANSFORMER BASE DETAILS

GENERAL NOTES:

1. For mounting heights between those shown in the table, use the values in the table for the larger mounting height.
2. All breakaway bases shall meet the breakaway requirements of the AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition (2013) and Interim Revisions thereto, and shall have been tested by FHWA-approved methods. All bases shall have been structurally tested to resist 150% of the design moment.
3. Transformer bases shall be cast from aluminum, ASTM B108 or B26 Alloy 356.0-T6, or other material approved by the Engineer. Four Hex Head (H.H.) bolts with four H.H. nuts, four lock washers, four flat washers, and connecting and hold-down washers as recommended by the manufacturer, galvanized to ASTM A153 Class C or D, or B695 Class 50, shall be provided with each transformer base for connecting the pole. Bolts shall be ASTM A325 or approved equal. Nuts shall be ASTM A563 grade DH galvanized.
4. Bases shall be stamped, incised or by other approved permanent means, marked to show fabricator's name or logo, and model number. Such information shall be placed in a readily seen location, inside or outside the base, but shall not be placed on the door.
5. Doors for transformer bases shall be made of plastic, fiberglass or other non-metallic material approved by the Engineer and shall be attached with stainless steel screws or bolts. Transformer bases shall be cleaned by grit blast cleaning after heat treatment. Certification by the manufacturer of heat treatment shall be furnished with transformer bases. The certification shall show the metal alloy and temper and that the base meets those requirements, chemical and physical. The certification shall also show the material ASTM specification. Transformer bases shall be cast with a removable tab bar for material testing. Some bars may have been removed by the manufacturer for testing.

NOTES:

(11) Anchor Bolt Templates do not need to be galvanized.

(12) Pole diameter before ovalized.

ANCHOR BOLT FABRICATION TOLERANCES TABLE	
DIMENSION	TOLERANCE
Length	± 1/2"
Threaded length	± 1/2"
Galvanized length (if required)	- 1/4"

Texas Department of Transportation

Traffic Safety Division Standard

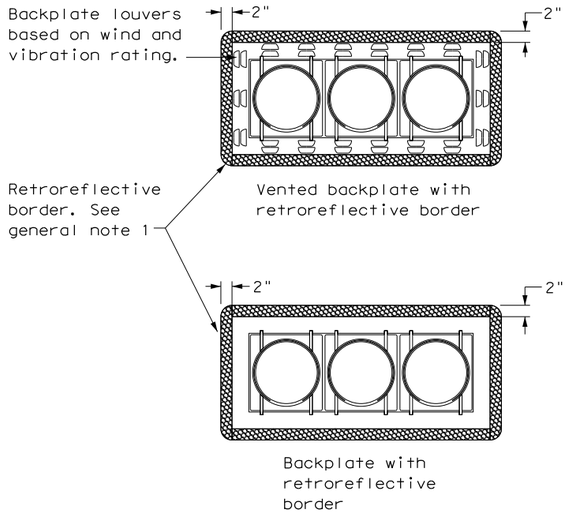
ROADWAY ILLUMINATION POLES

RIP(4)-19

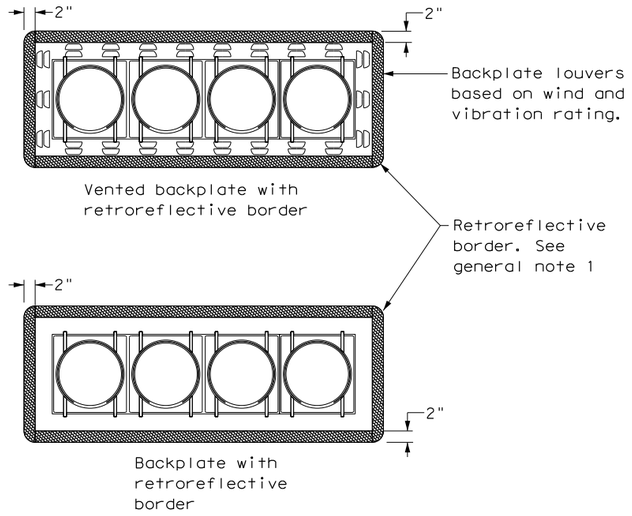
FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS 7-17 12-19	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DALLAS	DALLAS		143

73D

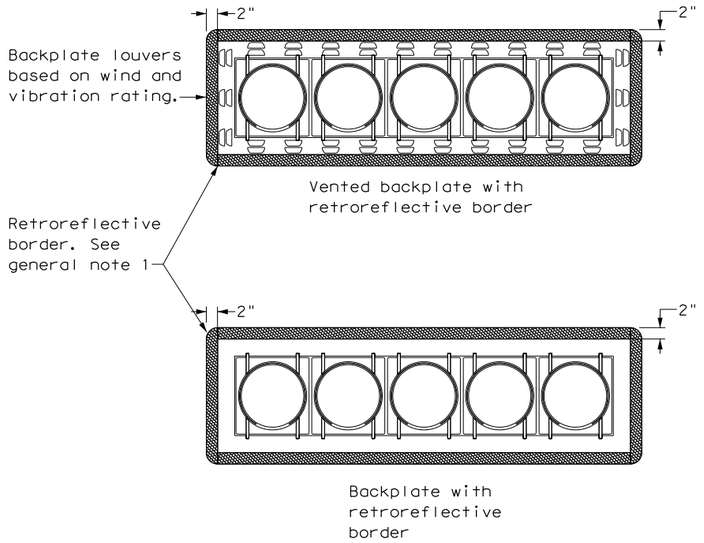
DATE:
FILE:



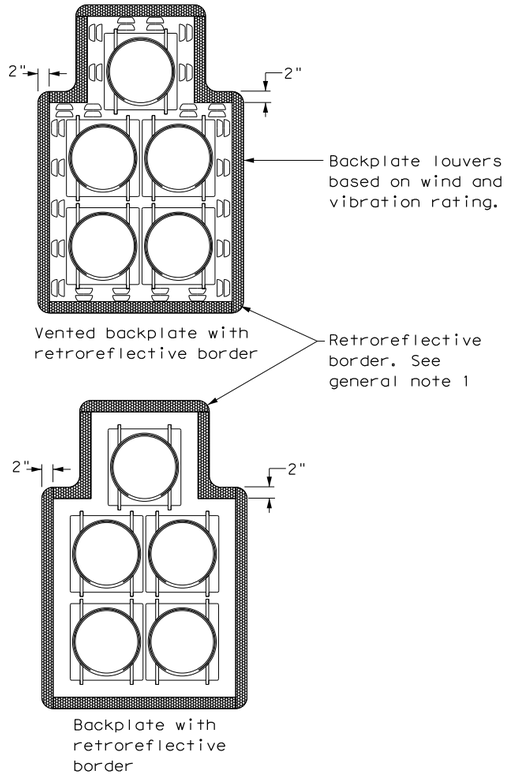
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



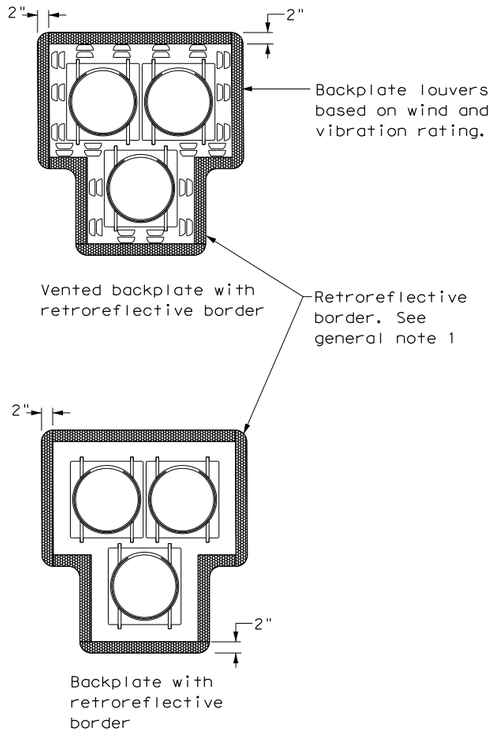
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

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

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

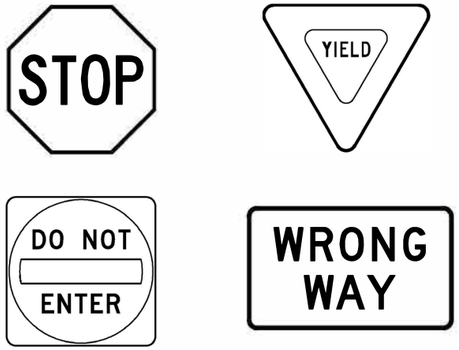
TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DALLAS	DALLAS		144

DATE:
FILE:

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

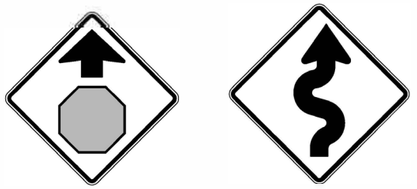
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

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

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
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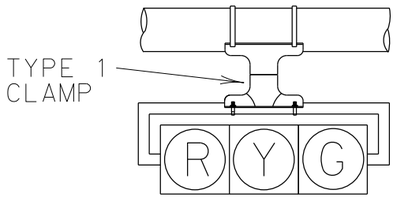
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	DALLAS	DALLAS		145



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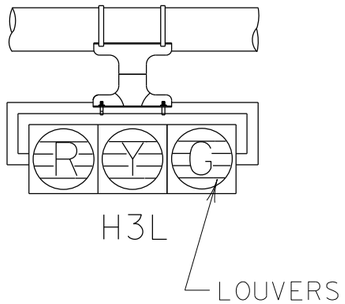

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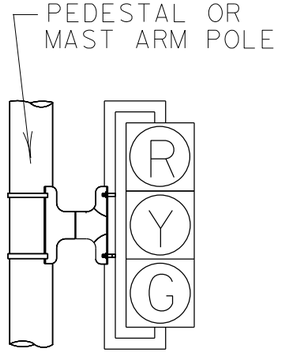
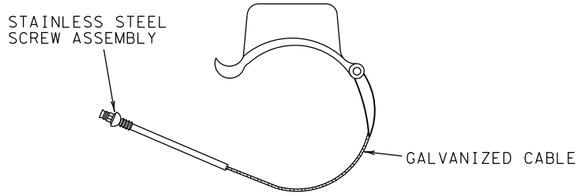
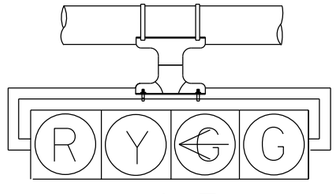


V3



TYPE 1 AND 2 CLAMPS



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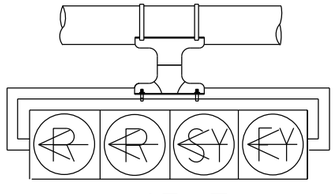

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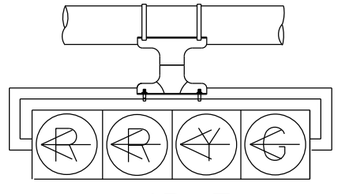

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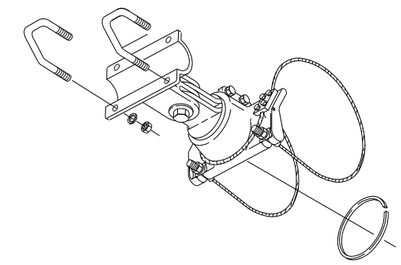
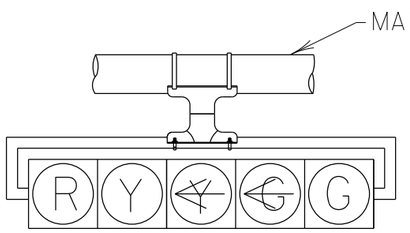


TYPE 2 CLAMP KIT

SHALL BE INSTALLED WHEN ROTATION ABOUT
THE HORIZONTAL AND VERTICAL AXES ARE NEEDED.



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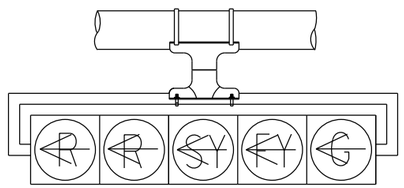

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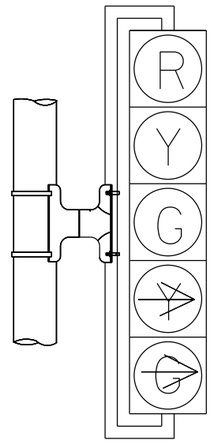


V5RT

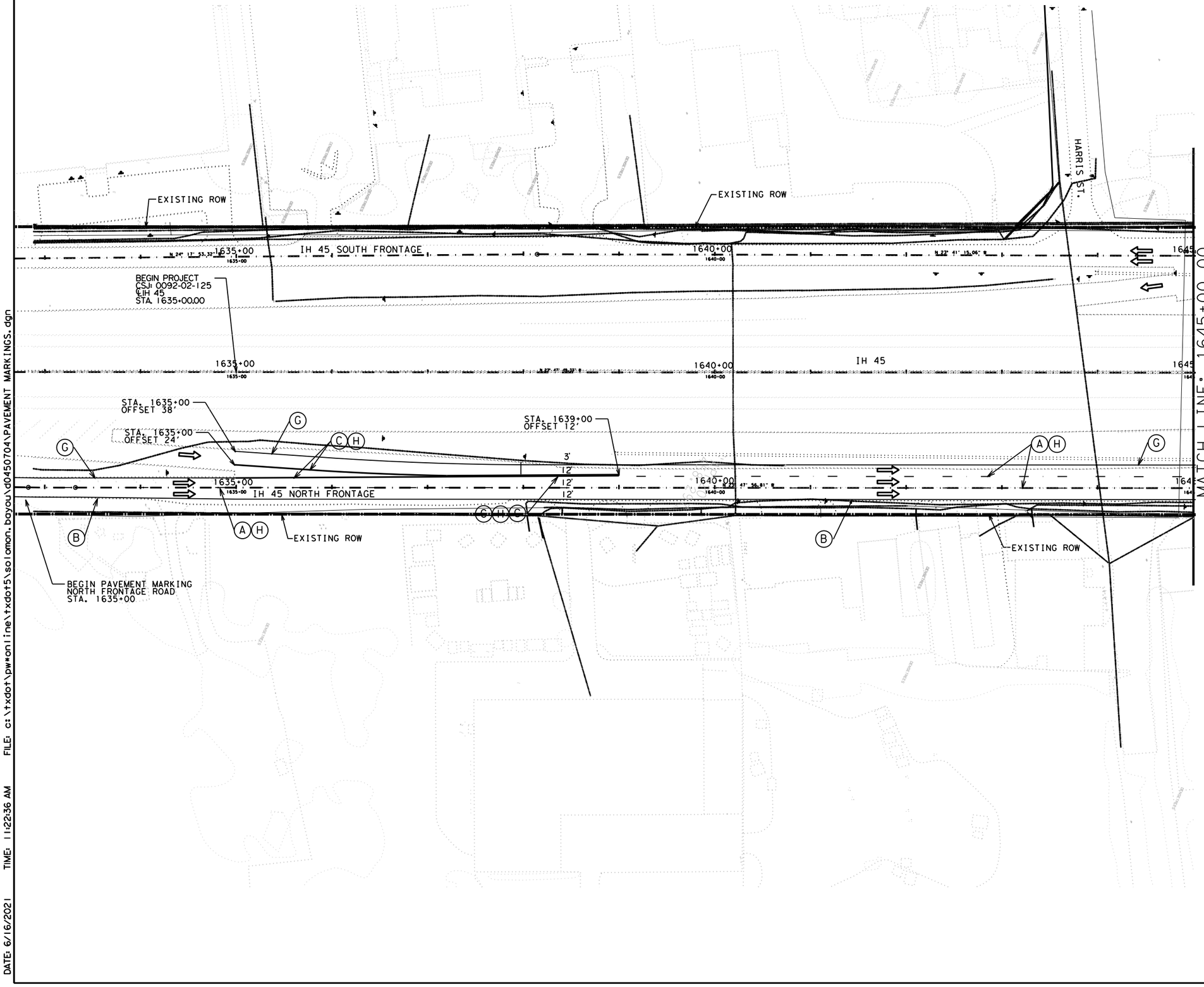
NOTES:

1. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH TYPE 1 CLAMP AND APPROPRIATE TUBING.
2. ALL POLE MOUNTED VEHICLE HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
3. THE SIGNAL HEADS SHOWN ARE NOT MEANT TO REFLECT ALL POSSIBLE SIGNAL HEADS, BUT ARE REPRESENTATIVE OF SIGNAL HEADS COMMONLY IN USE. SEE THE TRAFFIC SIGNAL LAYOUT FOR REQUIRED SIGNAL HEADS, AND THE NUMBER AND ORIENTATION OF LOUVERS.

DALLAS DISTRICT STANDARD

FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		146
STATE	STATE DIST.	COUNTY	
TEXAS	DALLAS	DALLAS	
CONT.	SECT.	JOB	HIGHWAY NO.
0092	02	125	IH 45

TRAFFIC SIGNAL HEAD DETAILS (DAL)



(A) REFL PAV MRK TY I (W) 4" (BRK) (100MIL)
(B) REFL PAV MRK TY I (W) 4" (SLD) (100MIL)
(C) REFL PAV MRK TY I (W) 8" (SLD) (100MIL)
(D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
(E) REFL PAV MRK TY I (ARROW) (100MIL)
(F) REFL PAV MRK TY I (WORD) (100MIL)
(G) REFL PAV MRK TY I (Y) 4" (SLD) (100MIL)
(H) REFL PAV MRKR TY II-C-R

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

PAVEMENT MARKINGS LAYOUT

SCALE: 1"=100' SHEET 1 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	147
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

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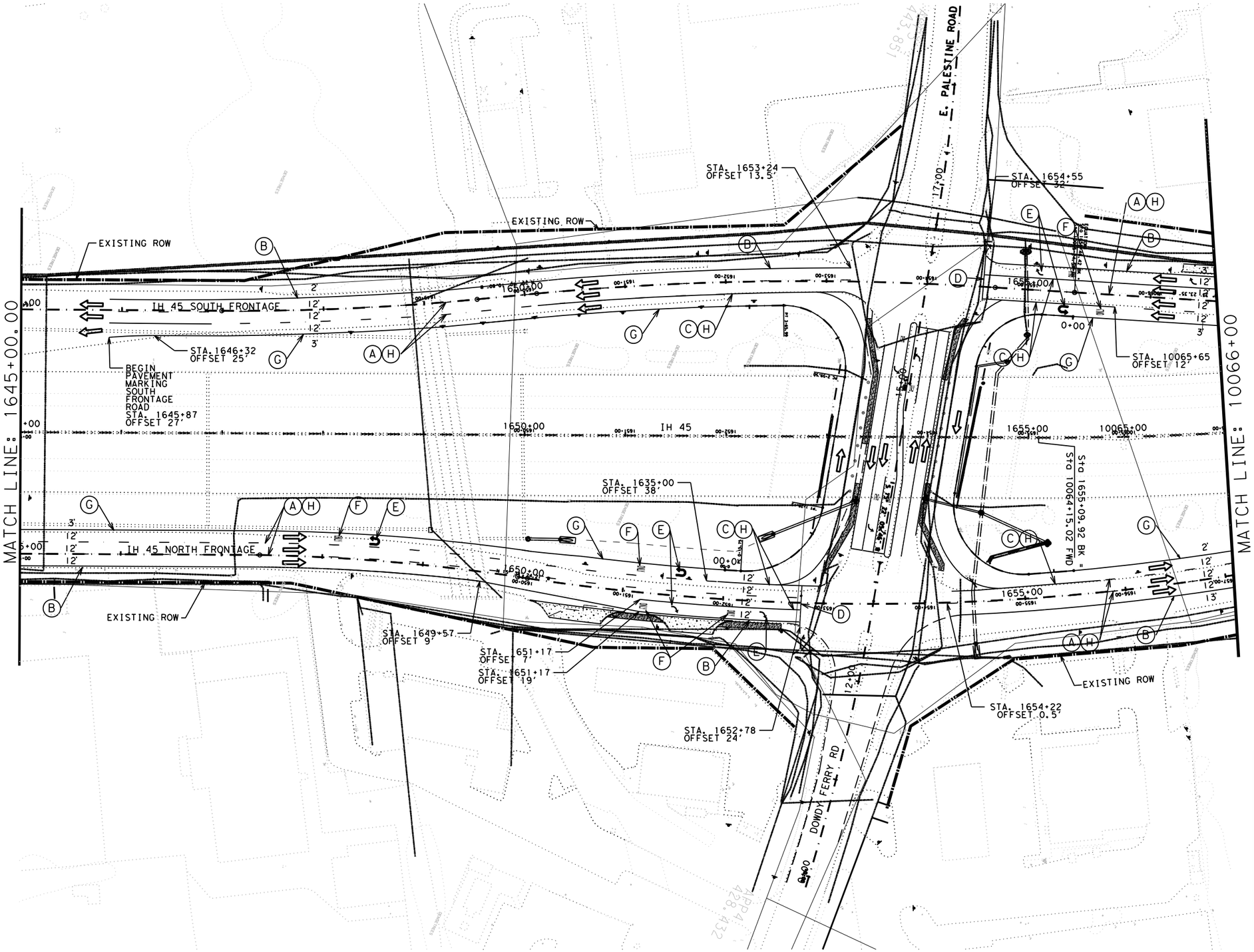


0 50 100

- (A) REFL PAV MRK TY I (W) 4" (BRK) (100MIL)
- (B) REFL PAV MRK TY I (W) 4" (SLD) (100MIL)
- (C) REFL PAV MRK TY I (W) 8" (SLD) (100MIL)
- (D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
- (E) REFL PAV MRK TY I (ARROW) (100MIL)
- (F) REFL PAV MRK TY I (WORD) (100MIL)
- (G) REFL PAV MRK TY I (Y) 4" (SLD) (100MIL)
- (H) REFL PAV MRKR TY II-C-R

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

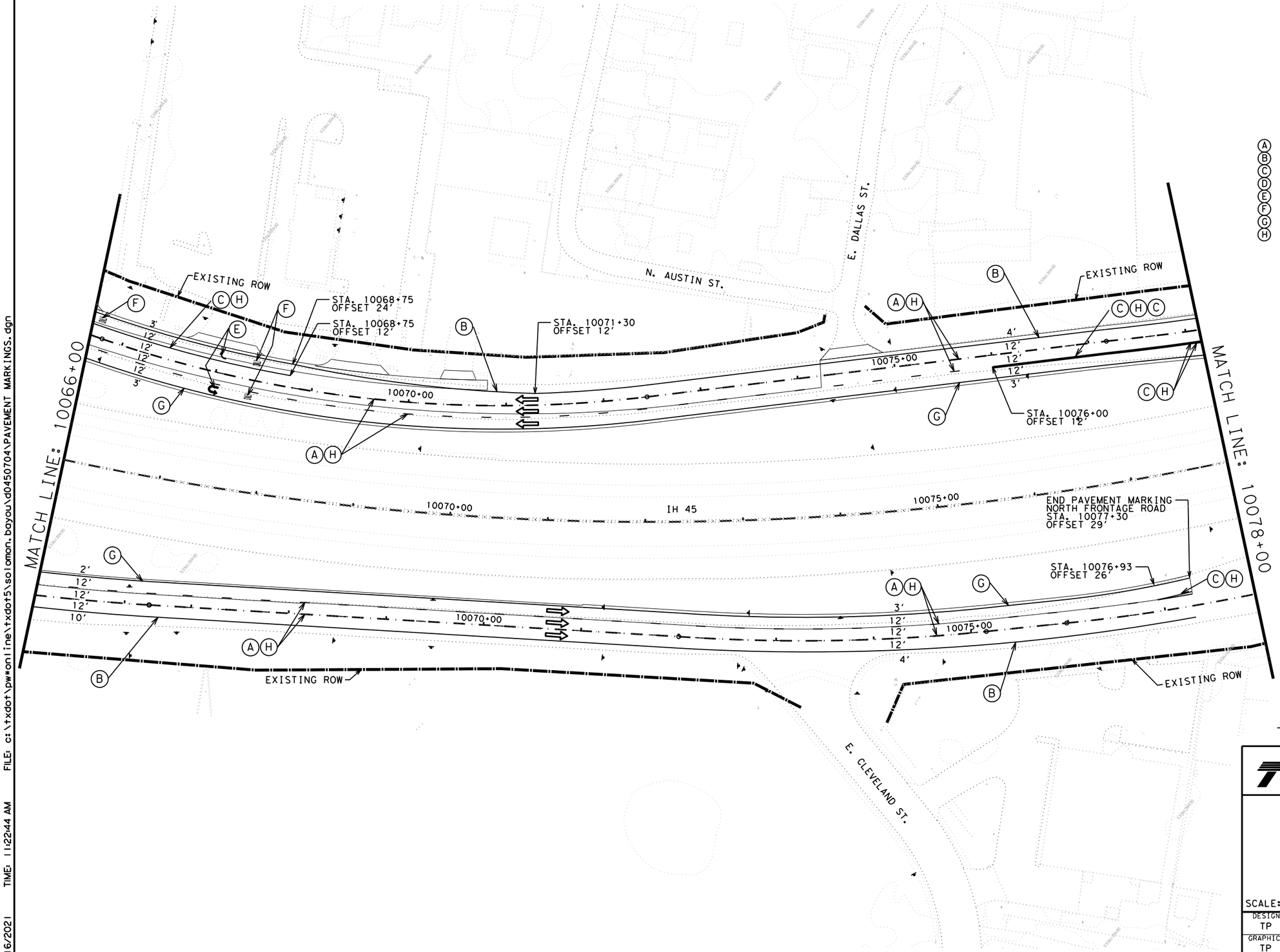
IH 45

PAVEMENT MARKINGS LAYOUT

SCALE: 1"=100' SHEET 2 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	148
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/16/2021 TIME: 11:22:40 AM FILE: c:\txdot\pw*online\txdot5\solomon_bayou\d0450704\PAVEMENT MARKINGS.dgn



(A) REFL PAV MRK TY I (W) 4" (BRK) (100MIL)
(B) REFL PAV MRK TY I (W) 4" (SLD) (100MIL)
(C) REFL PAV MRK TY I (W) 8" (SLD) (100MIL)
(D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
(E) REFL PAV MRK TY I (ARROW) (100MIL)
(F) REFL PAV MRK TY I (WORD) (100MIL)
(G) REFL PAV MRK TY I (Y) 4" (SLD) (100MIL)
(H) REFL PAV MRKR TY II-C-R

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

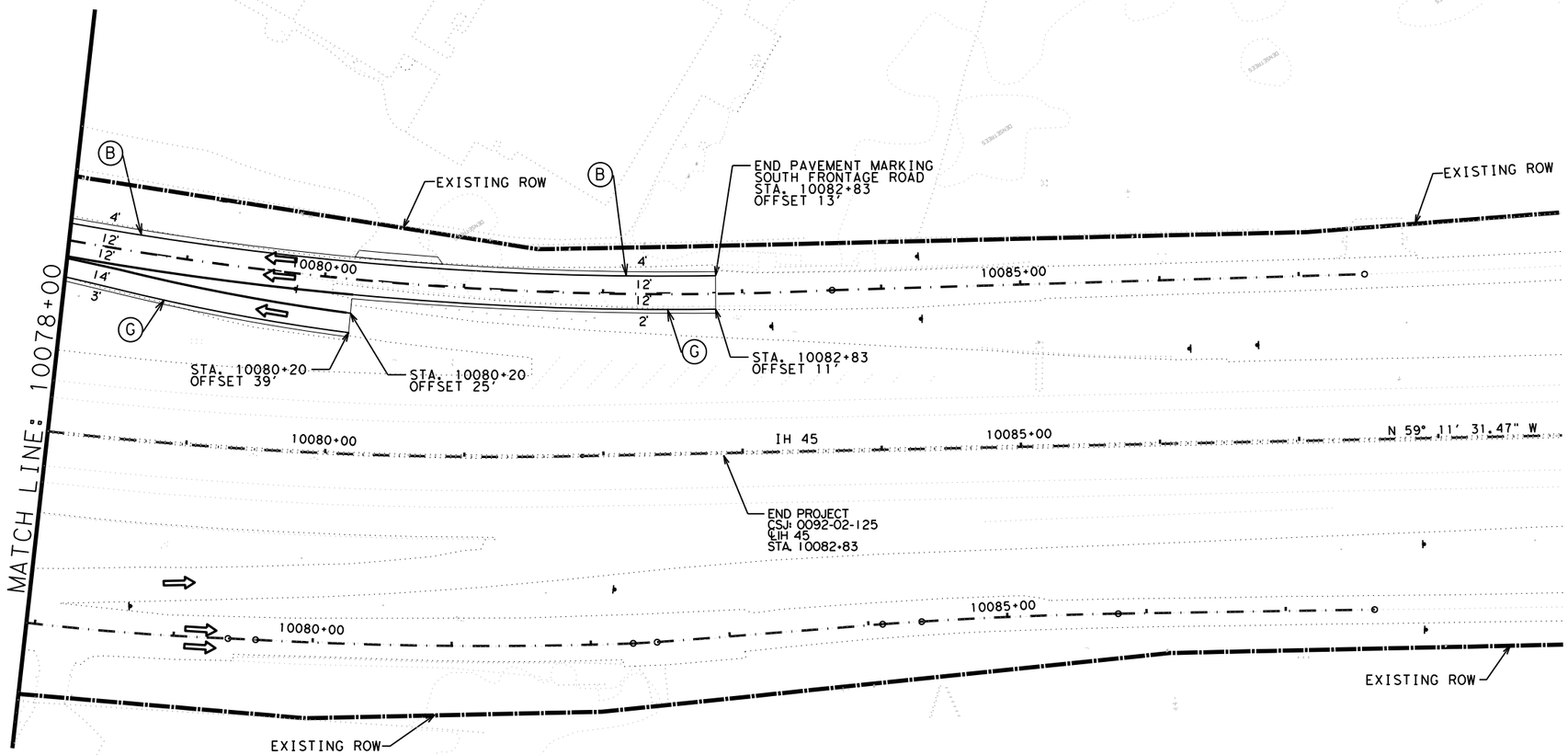
IH 45
PAVEMENT MARKINGS LAYOUT

SCALE: 1"=100'

SHEET 3 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	149
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/16/2021 TIME: 11:22:44 AM FILE: c:\txdot\pw*online\txdot5\solomon_bayou\d0450704\PAVEMENT MARKINGS.dgn



0 50 100

(A) REFL PAV MRK TY I (W) 4" (BRK) (100MIL)
(B) REFL PAV MRK TY I (W) 4" (SLD) (100MIL)
(C) REFL PAV MRK TY I (W) 8" (SLD) (100MIL)
(D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
(E) REFL PAV MRK TY I (ARROW) (100MIL)
(F) REFL PAV MRK TY I (WORD) (100MIL)
(G) REFL PAV MRK TY I (Y) 4" (SLD) (100MIL)
(H) REFL PAV MRKR TY II-C-R

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

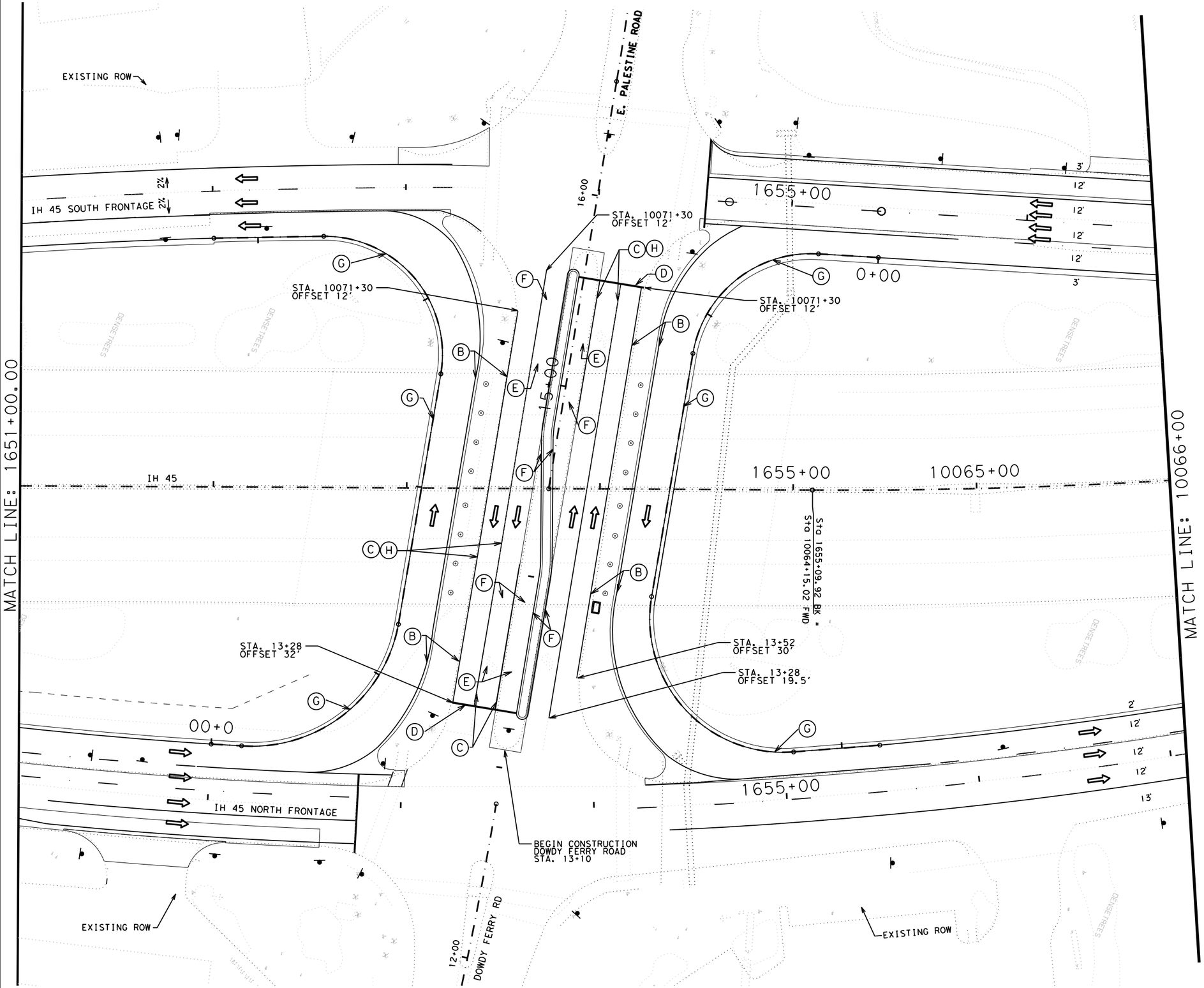
IH 45

PAVEMENT MARKINGS LAYOUT

SCALE: 1"=100' SHEET 4 OF 5

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	150
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/16/2021 TIME: 11:22:46 AM FILE: c:\txdot\pw*online1\txdot5\solomon.bayou\d0450704\PAVEMENT MARKINGS.dgn



0 50 100

(A) REFL PAV MRK TY I (W) 4" (BRK) (100MIL)
(B) REFL PAV MRK TY I (W) 4" (SLD) (100MIL)
(C) REFL PAV MRK TY I (W) 8" (SLD) (100MIL)
(D) REFL PAV MRK TY I (W) 24" (SLD) (100MIL)
(E) REFL PAV MRK TY I (ARROW) (100MIL)
(F) REFL PAV MRK TY I (WORD) (100MIL)
(G) REFL PAV MRK TY I (Y) 4" (SLD) (100MIL)
(H) REFL PAV MRKR TY II-C-R

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

PAVEMENT MARKINGS LAYOUT

SCALE: 1"=50' SHEET 5 OF 5

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	18	DALLAS	151
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

DATE: 6/16/2021 TIME: 11:47:43 AM FILE: c:\txdot\pw\online\txdot5\solomon.bayou\d0450704\PAVEMENT MARKINGS.dgn

DATE: DATE TIME
FILE: DOCUMENT NAME

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE (FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80)	POSTS (1 or 2)	ANCHOR TYPE (UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic)	MOUNTING DESIGNATION: PREFABRICATED (P = "Plain", T = "T", U = "U")	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext; BM = Extruded Wind Beam; WC = 1.12 #/ft Wing Channel; EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE S
1	1	W4-3L		36"x 36"	X		10BWG	1 MOUNT	SA BACK TO BACK	T			
		R5-1a		48"x 36"	X								
1	2	W4-3L		36"x 36"	X		10BWG	1	SA	P			
2	1	R4-3bT		36"x 36"	X		10BWG	1 MOUNT	SA BACK TO BACK	T			
		R5-1		48"X 48"	X								
2	2	R4-3bT		36"x 36"	X		10BWG	1 MOUNT	SA BACK TO BACK	T			
		R5-1		48"X 48"	X								
2	3	R4-3bT		36"x 36"	X		10BWG	1	SA	P			
3	1	R8-3aTL		24"x 30"	X		10BWG	1	SA	P			
3	2	R6-1R		54"x 18"	X		10BWG	1	SA	T			
		R3-2		36"X 36"	X								
3	3	R8-3a		24"x 30"	X		10BWG	1	SA	P			

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS SHEET 1 OF 8

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0092	02	125	IH 45
		DIST	COUNTY		SHEET NO.
		DAL	DALLAS		152

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE: FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80	POSTS: 1 or 2	ANCHOR TYPE: UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic	MOUNTING DESIGNATION: PREFABRICATED: P = "Plain", T = "T", U = "U"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext, BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE S
3	4	R6-1R	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R3-2		36"X 36"	X								
3	5	R8-3a	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	6	R2-1	SPEED LIMIT 45	30"x 36"	X		10BWG	1	SA	P			
3	6	R6-1R	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R3-2		36"X 36"	X								
3	8	R8-3a	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	9	R1-2	YIELD	48"x 48"x 48"	X		10BWG	1	SA	T			
3	10	R6-1L	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R6-1R	ONE WAY	54"x 18"	X								
3	11	R8-3aTDBL	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	12	R8-3aTDBL	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	13	R8-3aTR	NO PARKING	24"x 30"	X		10BWG	1	SA	P			

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

DATE: DATE TIME
FILE: DOCUMENT NAME

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS		153

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	TYPE S
3	14	R3-5L	ONLY	30"x 36"	X		10BWG	1	SA	P			
3	15	R5-1	DO NOT ENTER	48"x 48"	X		10BWG	1	SA	T			
3	16	R5-1	DO NOT ENTER	48"x 48"	X		10BWG	1	SA	T			
3	17	R3-5R	ONLY	30"x 36"	X		10BWG	1	SA	P			
3	18	R8-3aTR	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	19	R8-3aTDBL	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	20	R8-3aTL	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	21	R3-8UT	ONLY	30"x 36"	X		10BWG	1	SA	P			
3	22	R6-1L	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R6-1R	ONE WAY	54"x 18"	X								
3	23	R3-8UT	ONLY	30"x 36"	X		10BWG	1	SA	P			
3	24	D1-2	⇦ Palestine St Dowdy Ferry Rd ⇨	126"x 30"	X		S80	1	SA	U	BM		
3	25	R6-1R	ONE WAY	54"x 18"	X		10BWG	1	SA	T			

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

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NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 3 OF 8

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS		154

T8

DATE: DATE TIME
FILE: DOCUMENT NAME

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE: FRP = Fiberglass, TWT = Thin-Wall, 10BWG = 10 BWG, S80 = Sch 80	POSTS: 1 or 2	ANCHOR TYPE: UA=Universal Conc, UB=Universal Bolt, SA=Slipbase-Conc, SB=Slipbase-Bolt, WS=Wedge Steel, WP=Wedge Plastic	MOUNTING DESIGNATION: PREFABRICATED: P = "Plain", T = "T", U = "U"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext, BM = Extruded Wind Beam, WC = 1.12 #/ft Wing Channel, EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE S
3	26	R6-1R	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
3	27	R6-1R	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
3	28	R3-8UT	ONLY	30"x 36"	X		10BWG	1	SA	P			
3	29	R8-3a	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	30	R5-1a	WRONG WAY	48"x 36"	X		10BWG	1	SA	T			
3	31	R5-1a	WRONG WAY	48"x 36"	X		10BWG	1	SA	T			
3	32	R8-3a	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
3	33	R3-5R	ONLY	30"x 36"	X		10BWG	1	SA	P			
3	34	R5-1	DO NOT ENTER	48"x 48"	X		10BWG	1	SA	T			
3	35	R5-1	DO NOT ENTER	48"x 48"	X		10BWG	1	SA	T			
3	36	R6-1L	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R6-1R	ONE WAY	54"x 18"	X								
3	37	R6-1L	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R6-1R	ONE WAY	54"x 18"	X								

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 4 OF 8

FILE:	sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS		0092	02	125	IH 45
		DIST	COUNTY		SHEET NO.
		DAL	DALLAS		155

DATE: DATE TIME
FILE: DOCUMENT NAME

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	MOUNTING DESIGNATION 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE S
3	38	R8-3aTL	NO PARKING ⇦	24"x 30"	X		10BWG	1	SA	P			
3	39	R3-8 LL	ONLY ONLY	30"x 36"	X		10BWG	1	SA	P			
3	40	R8-3aTDBL	NO PARKING ⇔	24"x 30"	X		10BWG	1	SA	P			
3	41	R6-1R	ONE WAY ⇨	54"x 18"	X		10BWG	1	SA	T			
3	42	R1-2	YIELD	48"x 48"x 48"	X		10BWG	1	SA	T			
3	43	W12-2a	XX FT X IN	84"x 24"	X				MOUNT ON BRIDGE			N	
3	44	W12-2a	XX FT X IN	84"x 24"	X				MOUNT ON BRIDGE			N	
4	1	R5-1a	WRONG WAY	48"x 36"	X		10BWG	1	SA	T			
4	2	R5-1a	WRONG WAY	48"x 36"	X		10BWG	1	SA	T			
4	3	D1-2	⇦ Dowdy Ferry Rd Palestine St ⇨	126"x 30"	X		S80	1	SA	U	BM		
4	4	R1-1	STOP	36"x 36"	X		10BWG	1	SA	P			
4	5	R3-8UT	ONLY	30"x 36"	X		10BWG	1	SA	P			

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 5 OF 8

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS		156

T8

DATE: DATE TIME
FILE: DOCUMENT NAME

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE S
4	6	R6-1R	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R1-1	STOP	36"x 36"	X								
4	7	R6-1R	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R3-2		36"X 36"	X								
4	8	R5-1	DO NOT ENTER	48"x 48"	X		10BWG	1	SA	T			
4	9	R5-1	DO NOT ENTER	48"x 48"	X		10BWG	1	SA	T			
4	10	R2-1	SPEED LIMIT 45	30"x 36"	X		10BWG	1	SA	P			
4	11	R8-3aTDBL	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
4	12	R8-3aTDBL	NO PARKING	24"x 30"	X		10BWG	1	SA	P			
4	13	R5-1a	WRONG WAY	48"x 36"	X		10BWG	1	SA	T			
4	14	R5-1a	WRONG WAY	48"x 36"	X		10BWG	1	SA	T			
4	15	D1-1	Cleveland Rd ⇨	108"x 18"	X		10BWG	1	SA	T	2EXT		

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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NOTE:

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2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

DATE: DATE TIME
FILE: DOCUMENT NAME

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS SHEET 6 OF 8

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS		157

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DATE: DATE TIME
FILE: DOCUMENT NAME

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	 1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	 TYPE S
4	16	R5-1	DO NOT ENTER	48"x 48"	X		10BWG	1	SA	T			
4	17	R5-1	DO NOT ENTER	48"x 48"	X		10BWG	1	SA	T			
4	18	R6-1R	ONE WAY	54"x 18"	X		10BWG	1	SA	T			
		R3-2		36"X 36"	X								
5	1	R4-3bT	DO NOT CROSS DOUBLE WHITE LINE	36"x 36"	X		10BWG	1	SA	P			
5	2	R4-3bT	DO NOT CROSS DOUBLE WHITE LINE	36"x 36"	X		10BWG	1	SA	T			
		R5-1	DO NOT ENTER	48"X 48"	X			MOUNT	BACK TO BACK				
5	3	R4-3bT	DO NOT CROSS DOUBLE WHITE LINE	36"x 36"	X		10BWG	1	SA	T			
		R5-1	DO NOT ENTER	48"X 48"	X			MOUNT	BACK TO BACK				
5	4	W4-3L		36"x 36"	X		10BWG	1	SA	P			

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

SHEET 7 OF 8

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS		158

18

SUMMARY OF SMALL SIGNS

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

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	POST TYPE FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	POSTS 1 or 2	ANCHOR TYPE UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	MOUNTING DESIGNATION PREFABRICATED P = "Plain" T = "T" U = "U"	1EXT or 2EXT = # of Ext BM = Extruded Wind Beam WC = 1.12 #/ft Wing Channel EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TYPE N	TYPE S
5	5	W12-2	15'-0"	36"x 36"	X		10BWG	1	SA	P			

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DATE: DATE TIME
FILE: DOCUMENT NAME

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

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http://www.txdot.gov/

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2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS

SOSS

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	DAL	DALLAS		159

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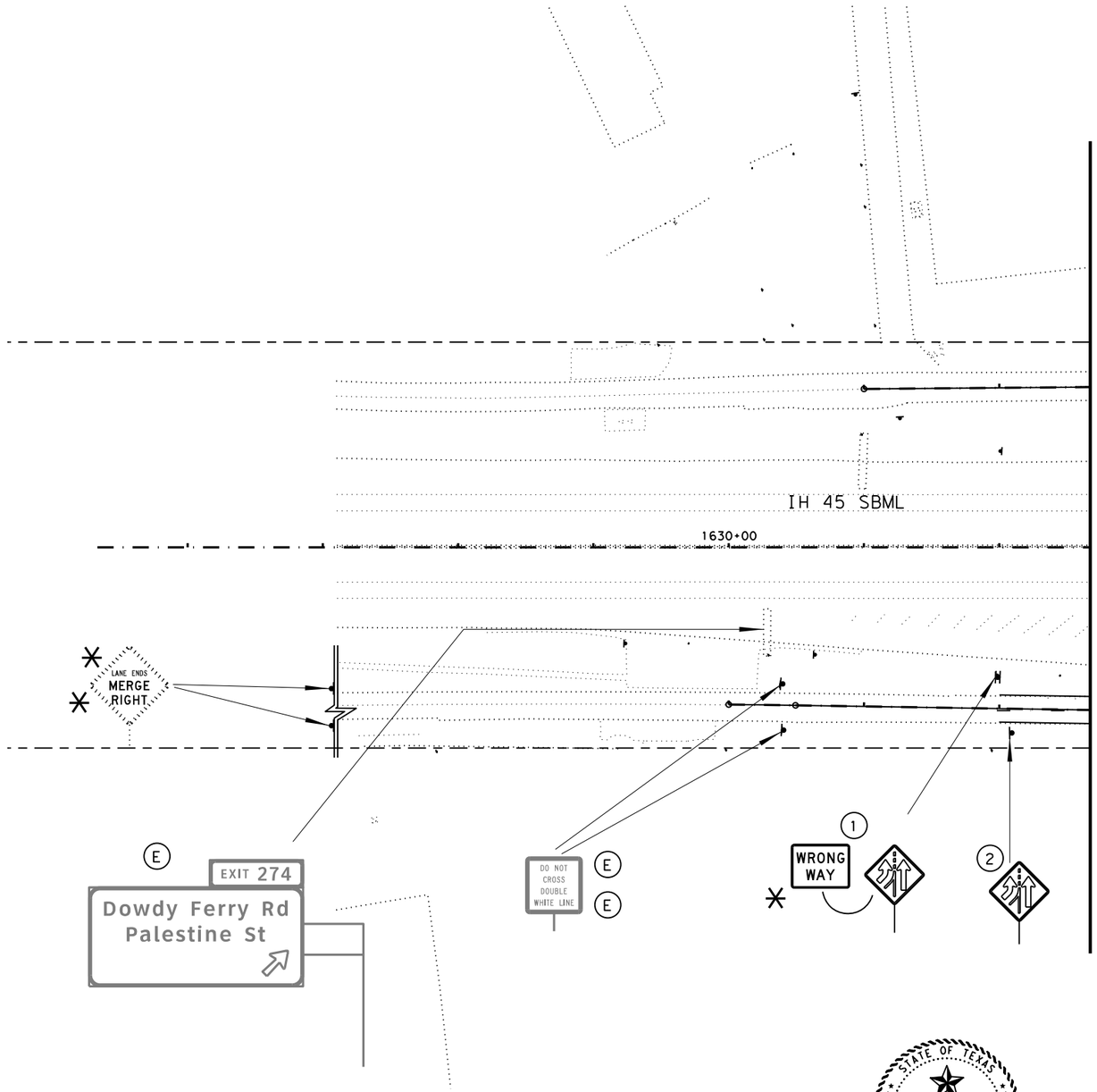

SIGNING LEGEND

- (E) EXISTING SIGN TO REMAIN
- (1) SIGN TO BE INSTALLED
- RSP-1 REPLACE SMALL SIGN PANEL
- RSA-1 REMOVE SMALL SIGN ASSEMBLY
- RLA-1 REMOVE LARGE GROUND ASSEMBLY
- * SIGN REMOVAL SUBSIDIARY TO PREP ROW

* REMOVAL ITEMS THIS SHEET

____ (EA) LARGE SIGNS ASSEMBLY

Removal Quantities are Approximate and Contractor Will be Paid For Actual Work Performed

STATE OF TEXAS
MARK A. ABOSO
112638
LICENSED
PROFESSIONAL ENGINEER

Mark A Aboso ,P.E. 06/15/2021
Signature of Registrant Date

Texas Department of Transportation

SIGNING LAYOUT

SCALE: 1"=100' SHEET 1 OF 6

DESIGN/CK	FED.RD. DIV.NO.	FEDERAL-AID PROJECT NUMBER		HIGHWAY NO.
MAA	6	SEE TITLE SHEET		IH 45
CHECK BLS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK BA	TEXAS	DALLAS	DALLAS	160
CHECK FRC	CONTROL	SECTION	JOB	
	0092	02	125	

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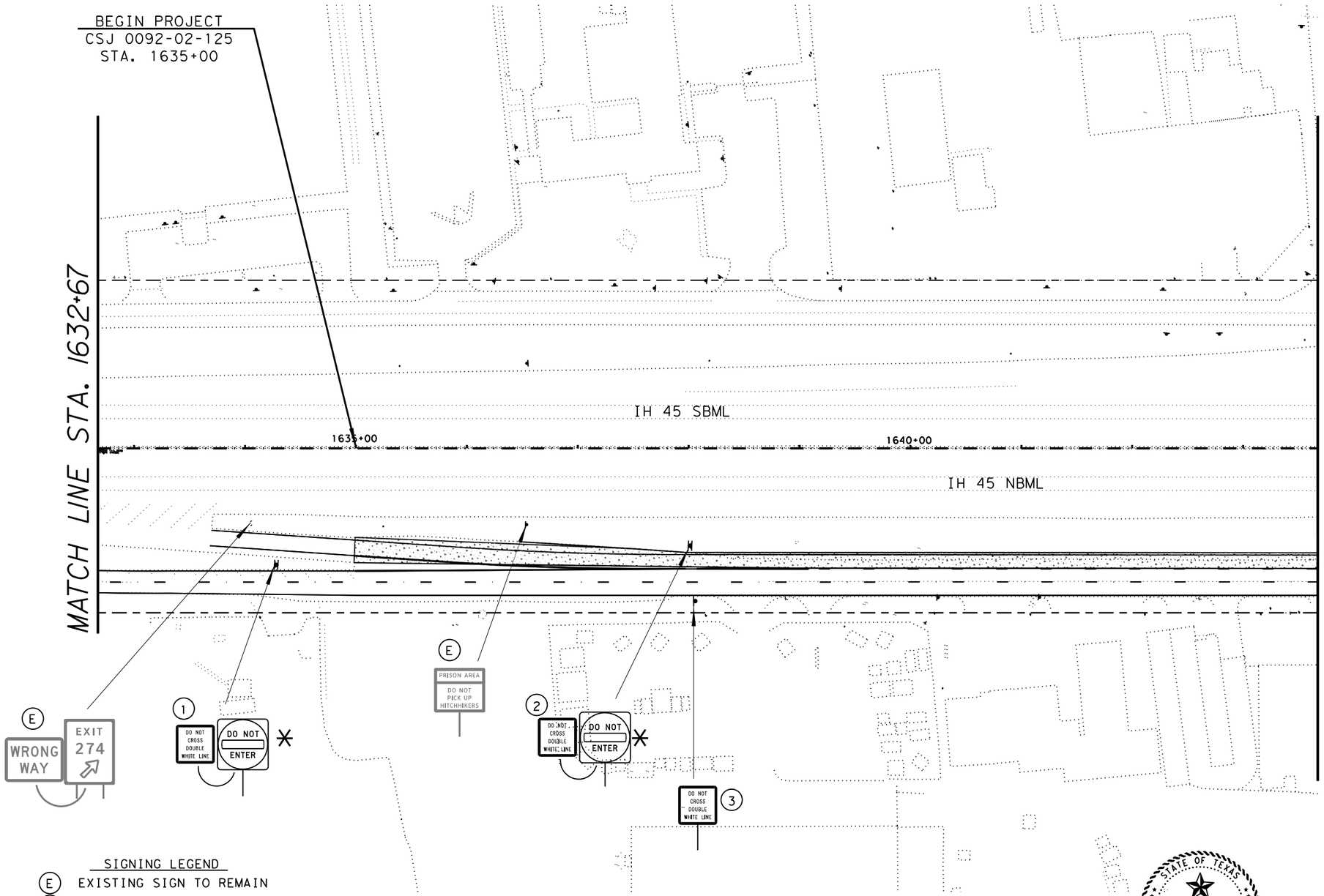

0 50 100
(FEET)

SIGNING LEGEND

- (E) EXISTING SIGN TO REMAIN
- (1) SIGN TO BE INSTALLED
- (RSP-1) REPLACE SMALL SIGN PANEL
- [RSA-1] REMOVE SMALL SIGN ASSEMBLY
- [RLA-1] REMOVE LARGE GROUND ASSEMBLY
- ✳ SIGN REMOVAL SUBSIDIARY TO PREP ROW

* REMOVAL ITEMS THIS SHEET

(EA) LARGE SIGNS ASSEMBLY

Removal Quantities are Approximate and Contractor Will be Paid For Actual Work Performed

STATE OF TEXAS
MARK A. ABOSO
112638
LICENSED PROFESSIONAL ENGINEER

Mark A Aboso ,P.E. 06/15/2021
Signature of Registrant Date

Texas Department of Transportation

SIGNING LAYOUT

SCALE: 1"=100' SHEET 2 OF 6

DESIGN/CK	FED.RD. DIV.NO.	FEDERAL-AID PROJECT NUMBER		HIGHWAY NO.
MAA	6	SEE TITLE SHEET		IH 45
CHECK BLS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK BA	TEXAS	DALLAS	DALLAS	161
CHECK FRC	CONTROL	SECTION	JOB	
	0092	02	125	

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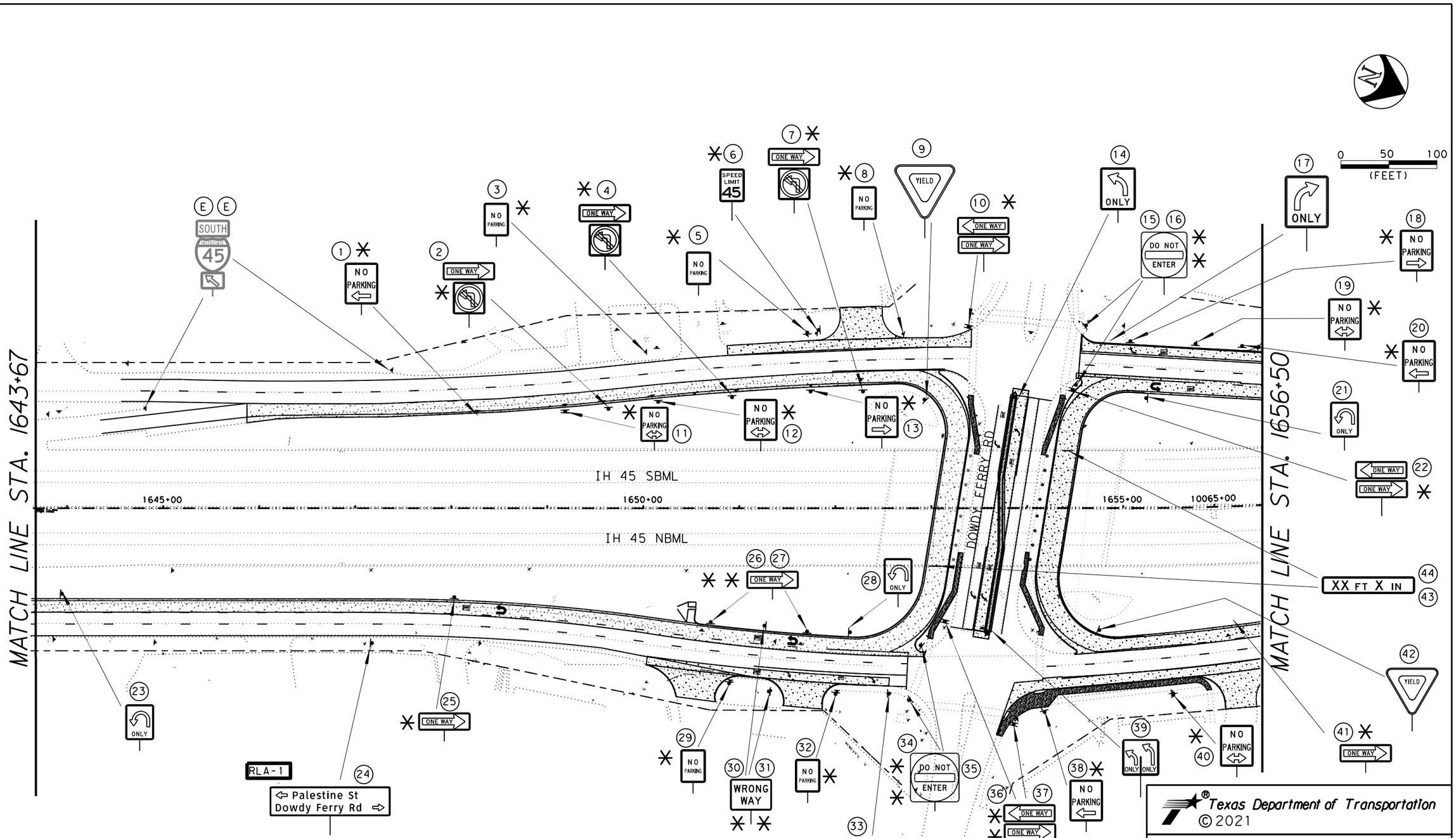

SIGNING LEGEND

- (E) EXISTING SIGN TO REMAIN
- (1) SIGN TO BE INSTALLED
- (RSP-1) REPLACE SMALL SIGN PANEL
- [RSA-1] REMOVE SMALL SIGN ASSEMBLY
- [RLA-1] REMOVE LARGE GROUND ASSEMBLY
- ✳ SIGN REMOVAL SUBSIDIARY TO PREP ROW

* REMOVAL ITEMS THIS SHEET

1 (EA) LARGE SIGNS ASSEMBLY

Removal Quantities are Approximate and Contractor Will be Paid For Actual Work Performed

STATE OF TEXAS
MARK A. ABOSO
112638
LICENSED PROFESSIONAL ENGINEER

Mark A Aboso ,P.E. 06/15/2021
Signature of Registrant Date

SIGNING LAYOUT

SCALE: 1"=100' SHEET 3 OF 6

DESIGN/CK	FED.RD. DIV.NO.	FEDERAL-AID PROJECT NUMBER		HIGHWAY NO.
MAA	6	SEE TITLE SHEET		IH 45
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
BLS	TEXAS	DALLAS	DALLAS	162
CHECK	CONTROL	SECTION	JOB	
BA	0092	02	125	
CHECK				
FRC				

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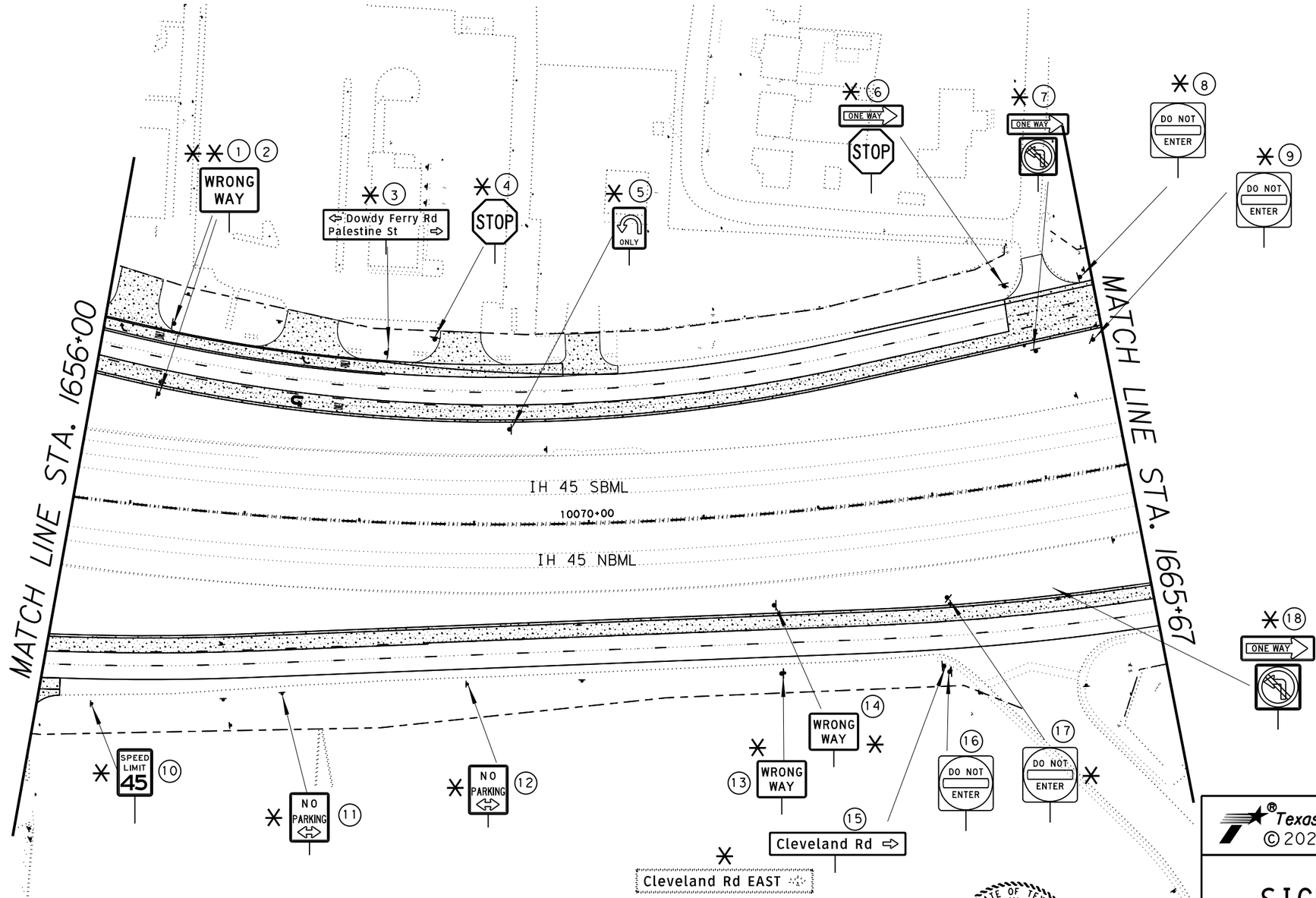

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(FEET)

SIGNING LEGEND

- (E) EXISTING SIGN TO REMAIN
- (1) SIGN TO BE INSTALLED
- (RSP-1) REPLACE SMALL SIGN PANEL
- [RSA-1] REMOVE SMALL SIGN ASSEMBLY
- [RLA-1] REMOVE LARGE GROUND ASSEMBLY
- ✳ SIGN REMOVAL SUBSIDIARY TO PREP ROW

* REMOVAL ITEMS THIS SHEET

____ (EA) LARGE SIGNS ASSEMBLY

Removal Quantities are Approximate and Contractor Will be Paid For Actual Work Performed

STATE OF TEXAS
MARK A. ABOSO
112638
LICENSED PROFESSIONAL ENGINEER

Mark A Aboso ,P.E. 06/15/2021
Signature of Registrant Date

Texas Department of Transportation

SIGNING LAYOUT

SCALE: 1"=100' SHEET 4 OF 6

DESIGN/CK	FED.RD. DIV.NO.	FEDERAL-AID PROJECT NUMBER		HIGHWAY NO.
MAA	6	SEE TITLE SHEET		IH 45
CHECK BLS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK BA	TEXAS	DALLAS	DALLAS	163
CHECK FRC	CONTROL	SECTION	JOB	
	0092	02	125	

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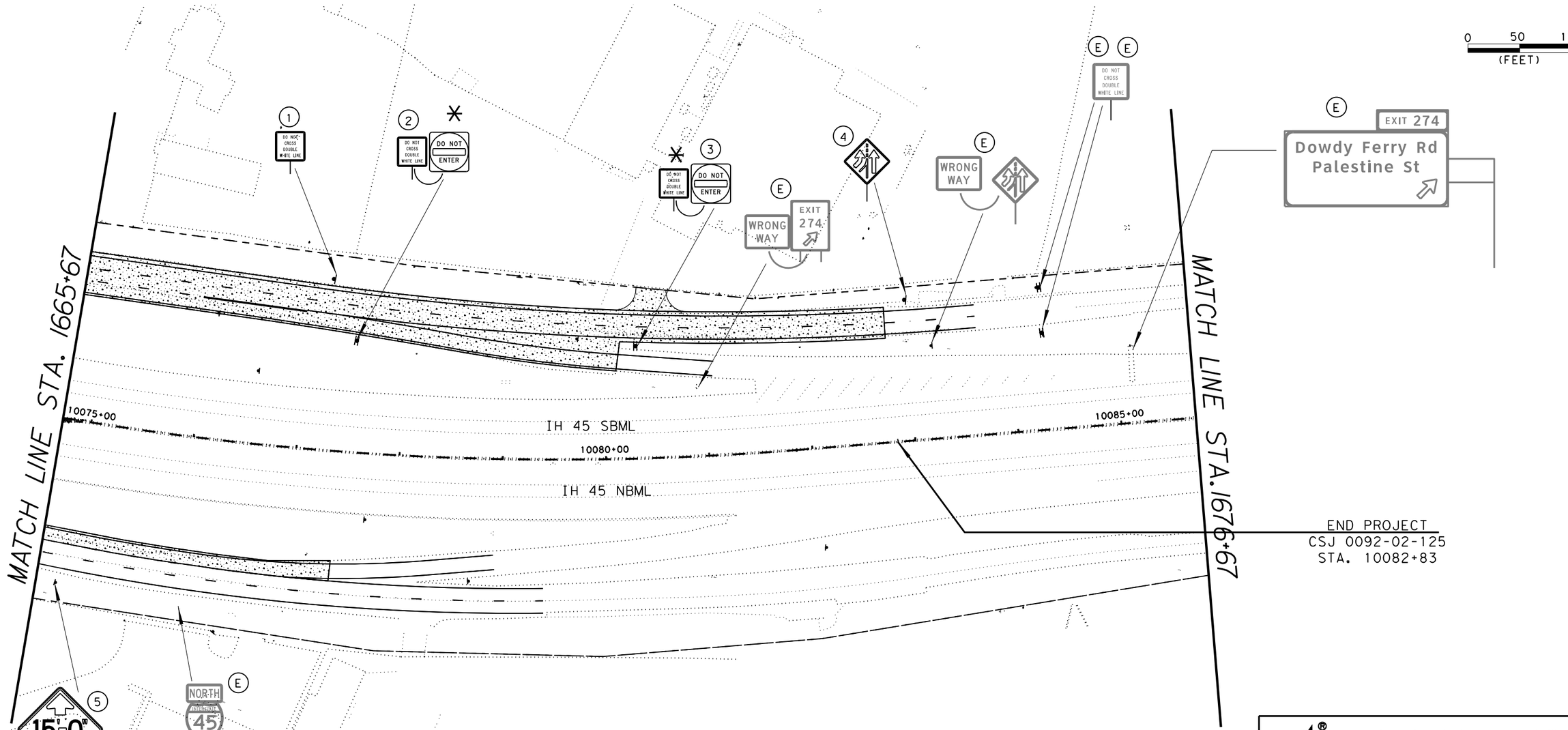

SIGNING LEGEND

- (E) EXISTING SIGN TO REMAIN
- (1) SIGN TO BE INSTALLED
- (RSP-1) REPLACE SMALL SIGN PANEL
- [RSA-1] REMOVE SMALL SIGN ASSEMBLY
- [RLA-1] REMOVE LARGE GROUND ASSEMBLY
- ✳ SIGN REMOVAL SUBSIDIARY TO PREP ROW

* REMOVAL ITEMS THIS SHEET

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STATE OF TEXAS
MARK A. ABOSO
112638
LICENSED PROFESSIONAL ENGINEER

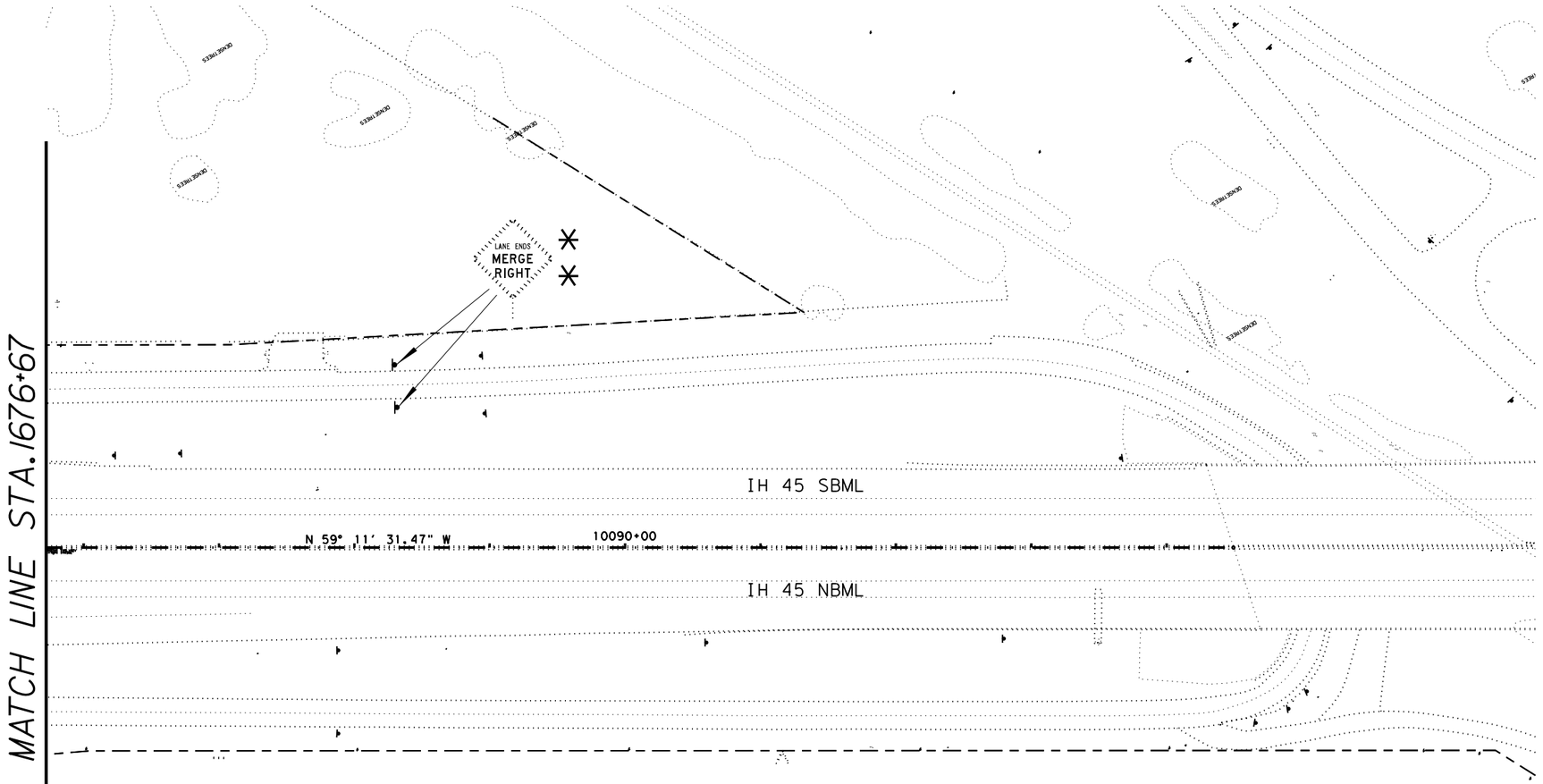
Mark A Aboso ,P.E. 06/15/2021
Signature of Registrant Date

SIGNING LAYOUT

SCALE: 1"=100' SHEET 5 OF 6

DESIGN/CK	FED.RD. DIV.NO.	FEDERAL-AID PROJECT NUMBER		HIGHWAY NO.
MAA	6	SEE TITLE SHEET		IH 45
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
BLS	TEXAS	DALLAS	DALLAS	
CHECK	CONTROL	SECTION	JOB	164
BA	0092	02	125	
CHECK				
FRC				

$DATE$ $TIME$



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(FEET)

SIGNING LEGEND

(E)	EXISTING SIGN TO REMAIN
(1)	SIGN TO BE INSTALLED
RSP-1	REPLACE SMALL SIGN PANEL
RSA-1	REMOVE SMALL SIGN ASSEMBLY
RLA-1	REMOVE LARGE GROUND ASSEMBLY
*	SIGN REMOVAL SUBSIDIARY TO PREP ROW

* REMOVAL ITEMS THIS SHEET

____ (EA) LARGE SIGNS ASSEMBLY

Removal Quantities are Approximate and Contractor Will be Paid For Actual Work Performed

STATE OF TEXAS
MARK A. ABOSO
112638
LICENSED PROFESSIONAL ENGINEER

Signature of Registrant ,P.E. 06/15/2021 Date

Texas Department of Transportation

SIGNING LAYOUT

SCALE: 1"=100' SHEET 6 OF 6

DESIGN/CK	FED. RD. DIV. NO.	FEDERAL-AID PROJECT NUMBER		HIGHWAY NO.
MAA	6	SEE TITLE SHEET		IH 45
CHECK BLS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK BA	TEXAS	DALLAS	DALLAS	165
CHECK FRC	CONTROL	SECTION	JOB	
	0092	02	125	

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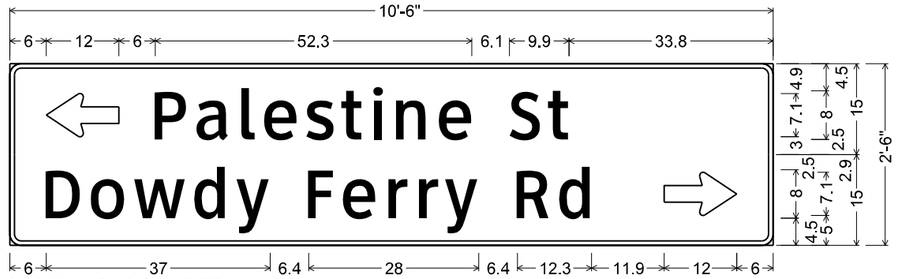
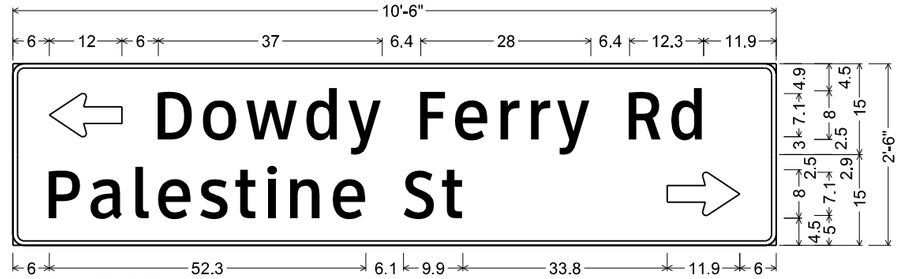


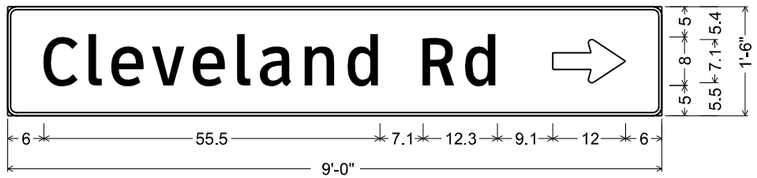
Identifier : D1-2 8in LT-RT;
1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 12.0" X 7.1" 180°; [Palestine St] ClearviewHwy-3-W;
1.9" Radius, 0.8" Border, White on Green;
[Dowdy Ferry Rd] ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0°;

SHEET 3 SIGN 24



Identifier : D1-2 8in LT-RT;
1.9" Radius, 0.8" Border, White on Green;
Standard Arrow Custom 12.0" X 7.1" 180°; [Dowdy Ferry Rd] ClearviewHwy-3-W;
1.9" Radius, 0.8" Border, White on Green;
[Palestine St] ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0°;

SHEET 4 SIGN 3



D1-1 8in RT;
1.5" Radius, 0.5" Border, White on, Green;
"Cleveland Rd", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0';

SHEET 4 SIGN 15

STATE OF TEXAS
MARK A. ABOSO
112638
LICENSED PROFESSIONAL ENGINEER

Mark A Aboso ,P.E. 06/15/2021
Signature of Registrant Date

Texas Department of Transportation

GUIDE SIGN DETAILS

SCALE: NTS SHEET 1 OF 1

DESIGN/CK	FED.RD. DIV.NO.	FEDERAL-AID PROJECT NUMBER		HIGHWAY NO.
MAA	6	SEE TITLE SHEET		IH 45
CHECK BLS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK BA	TEXAS	DALLAS	DALLAS	166
CHECK FRC	CONTROL 0092	SECTION 02	JOB 125	

6/15/2021 10:35:15 AM

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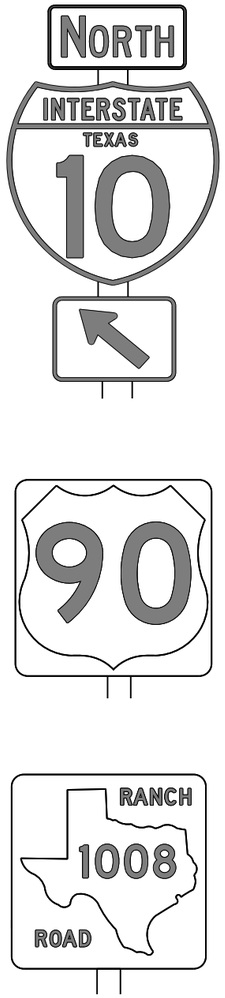
DATE: DATE/TIME 11:37:15 AM
FILE: DGN NAME c:\online\txdot5\solomon.bayou\d0450706\tsr3-13.dgn

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

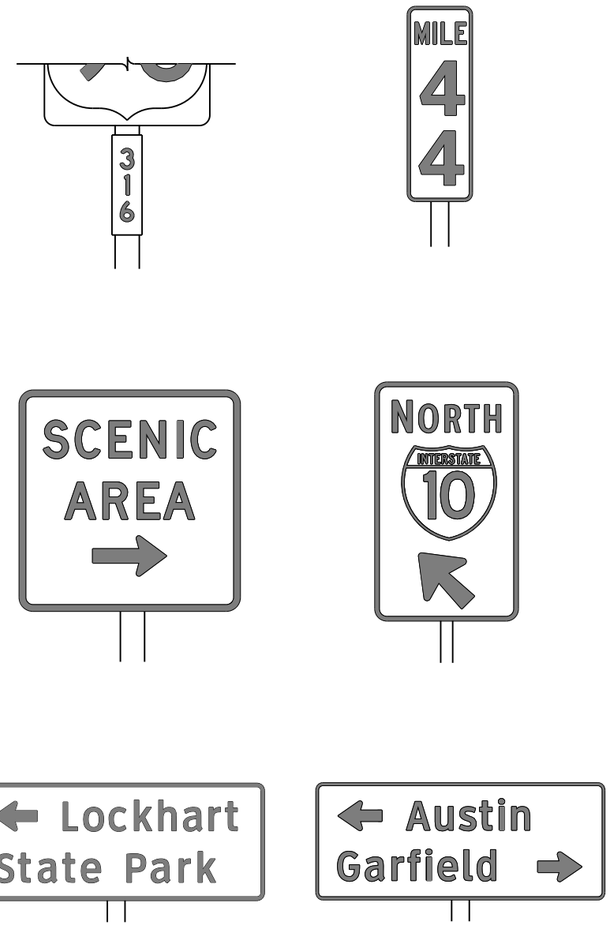
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

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

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

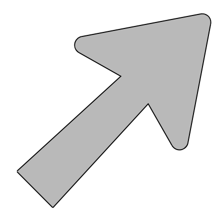
TYPICAL SIGN REQUIREMENTS

TSR(3)-13

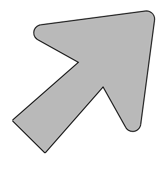
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	18	DALLAS		167

ARROW DETAILS

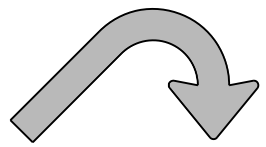
for Large Ground-Mounted and Overhead Guide Signs



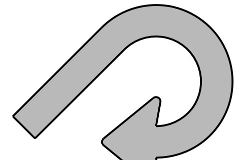
Type A



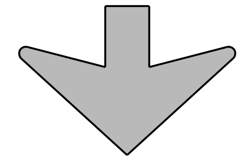
Type B



E-3



E-4



Down Arrow

TYPE	LETTER SIZE	USE
A-1	10.67" U/L and 10" Caps	Single Lane Exits
A-2	13.33" U/L and 12" Caps	
A-3	16" & 20" U/L	
B-1	10.67" U/L and 10" Caps	Multiple Lane Exits
B-2	13.33" U/L and 12" Caps	
B-3	16" & 20" U/L	

CODE	USED ON SIGN NO.
E-3	E5-1aT
E-4	E5-1bT

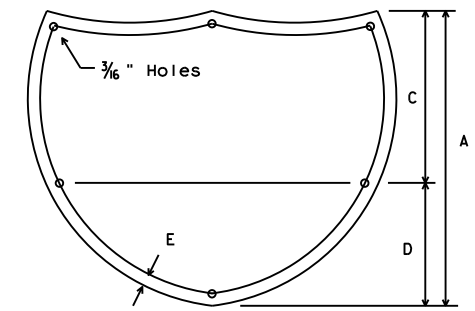
NOTE

Arrow dimensions are shown in the "Standard Highway Sign Designs for Texas" manual.

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

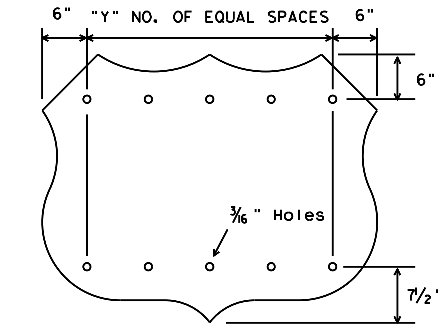
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)



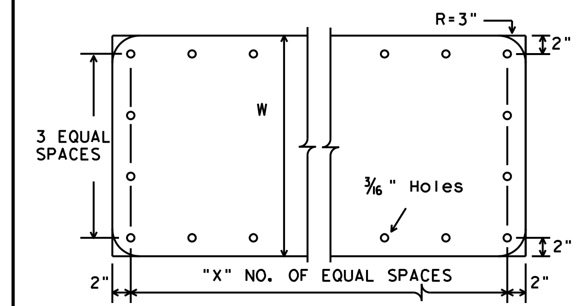
INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4



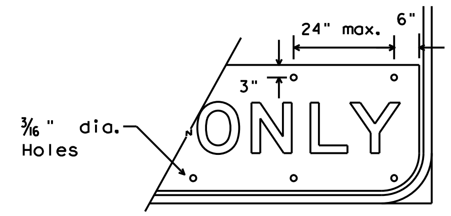
U.S. ROUTE MARKERS

Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



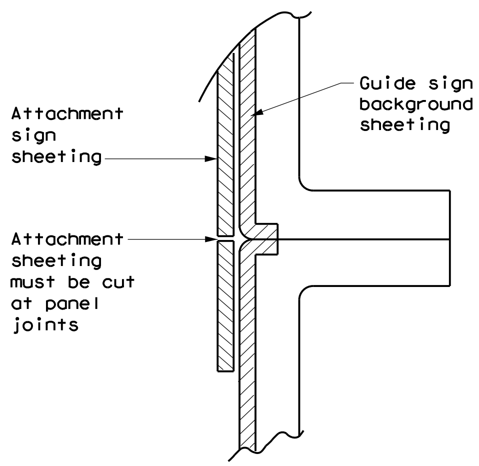
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

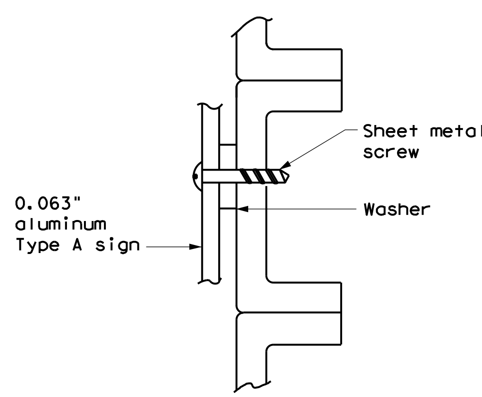


EXIT ONLY PANEL

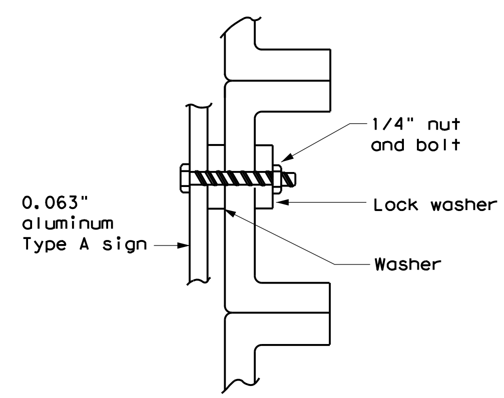
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



DIRECT APPLIED ATTACHMENT



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

NOTE:

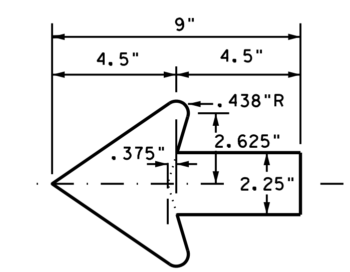
1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".

NOTE:

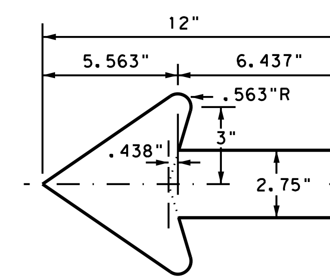
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

ARROW DETAILS

for Destination Signs (Type D)



Standard arrow to be used with 6 inch letters.



Standard arrow to be used with 8 inch letters.

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(5)-13

FILE: tsr5-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
12-03 7-13 9-08	DIST		COUNTY	SHEET NO.
	18		DALLAS	168

DATE: 11:37:21 AM
FILE: ...online\txdot5\solomon.bayou\d0450706\tsr5-13.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

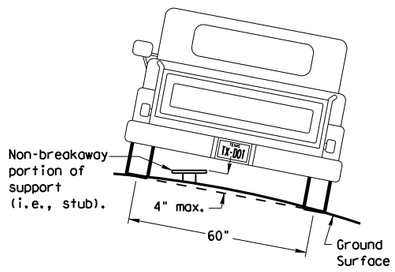
Anchor Type

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

Sign Mounting Designation

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

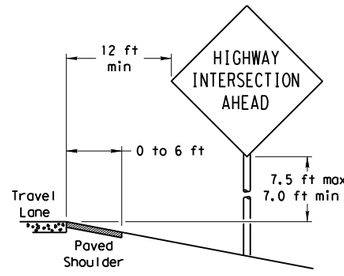
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

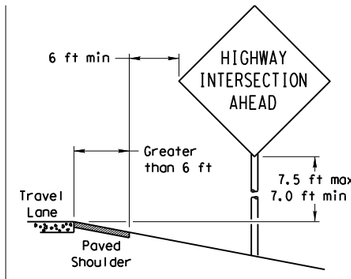
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

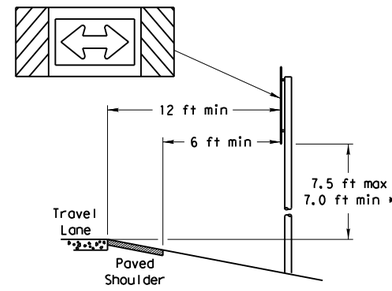
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



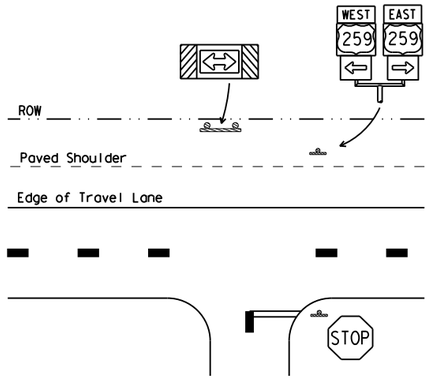
GREATER THAN 6 FT. WIDE

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

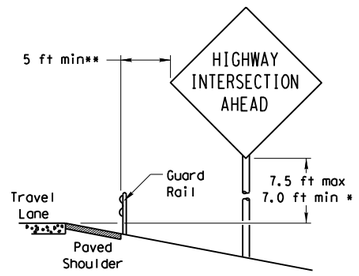
T-INTERSECTION



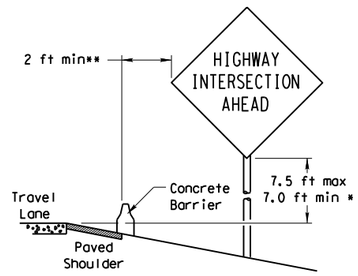
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



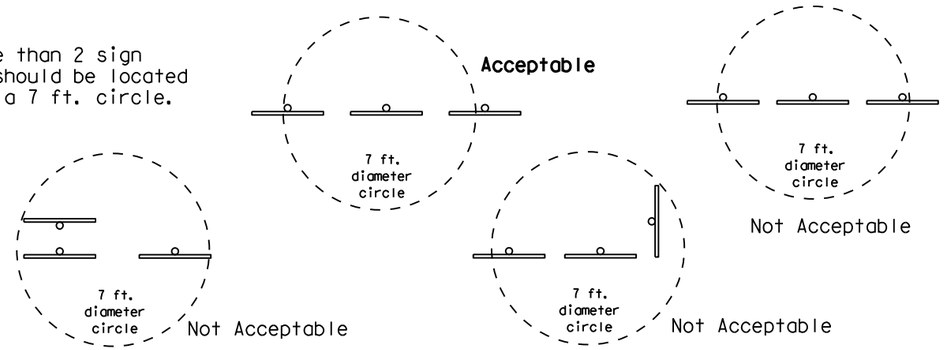
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

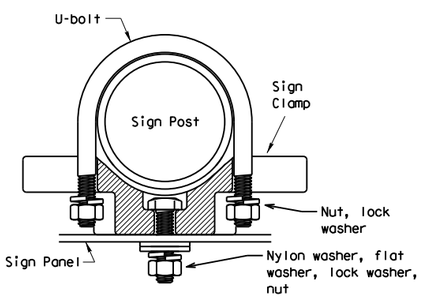
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

No more than 2 sign posts should be located within a 7 ft. circle.

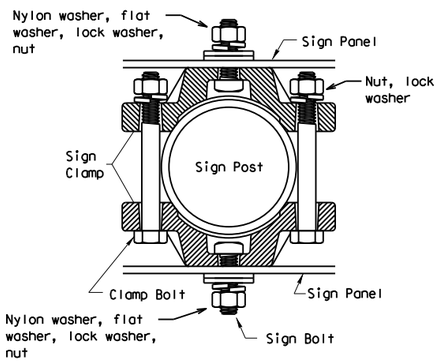


TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



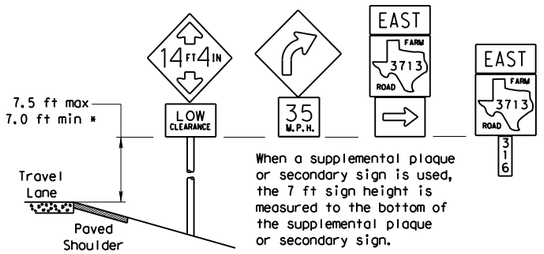
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

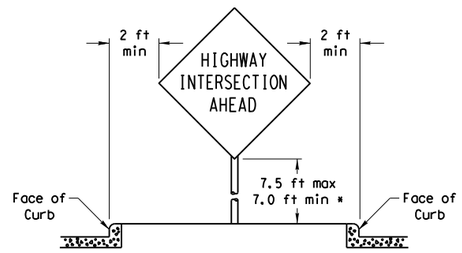
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



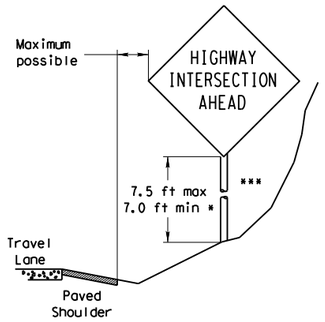
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

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

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

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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

9-08 REVISIONS

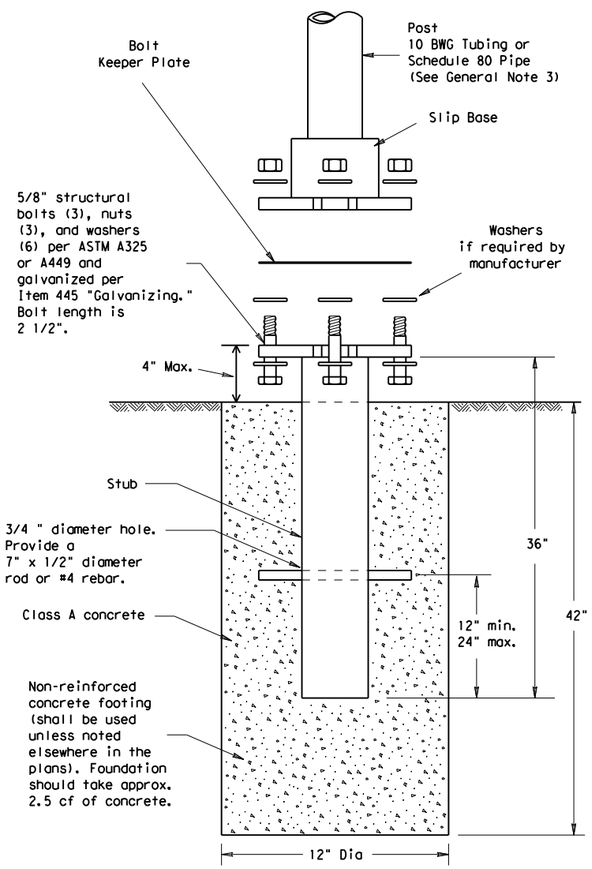
CONT	SECT	JOB	HIGHWAY
0092	02	125	IH 45
DIST	COUNTY		SHEET NO.
18	DALLAS		169

26A

DATE: 6/15/2021 11:37:28 AM
FILE: c:\txdot\pw\online\txdot5\solomon.bayou\d0450706\smdgen.dgn

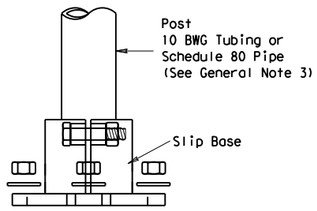
DATE: 6/15/2021 11:37:35 AM
FILE: c:\txdot\pw\online\txdot5\solomon.bayou\d0450706\SMD (slip-1) -08 dal.dgn

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS

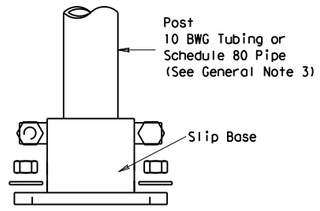


SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

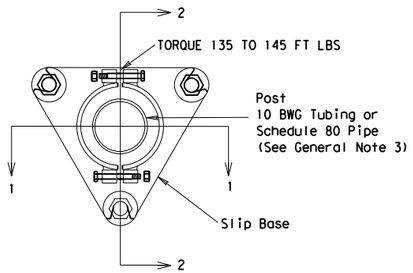
NOTE
The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.



SIDE VIEW 1-1



SIDE VIEW 2-2



TOP VIEW

DETAIL A

GENERAL NOTES:

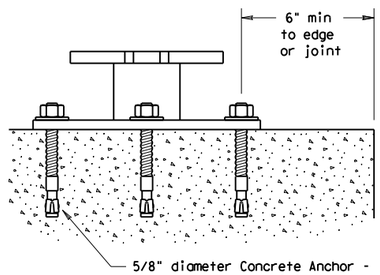
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is:
   http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

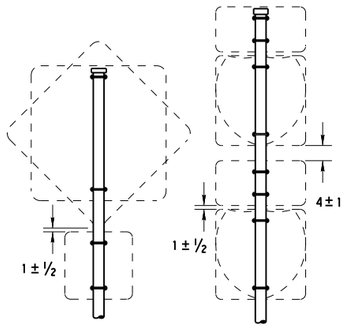
ADDED DETAIL A FOR CLAMP BASE
10-2010

Texas Department of Transportation
Dallas District Standard

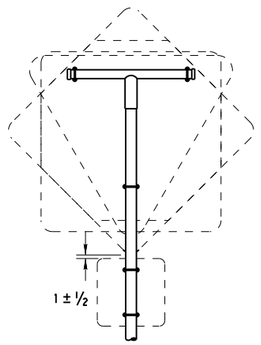
SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08(DAL)

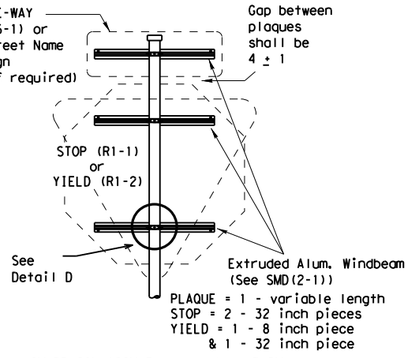
©TxDOT July 2002	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
12-10 (DISTRICT) ADDED CLAMP BASE DETAIL FOR SLIP BASE INSTALLATION	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		170



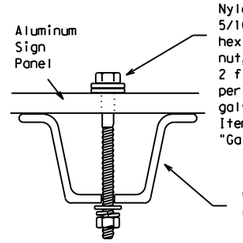
SM RD SGN ASSM TY XXXXX(1)XX(P)



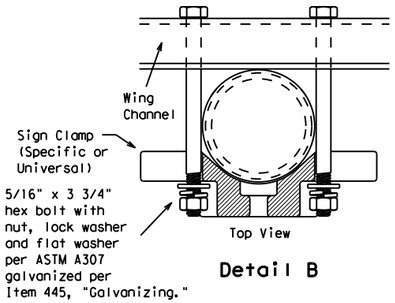
SM RD SGN ASSM TY XXXXX(1)XX(T)



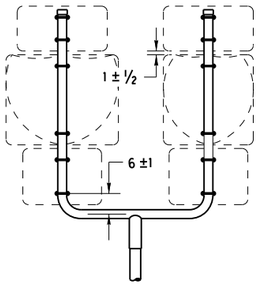
SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



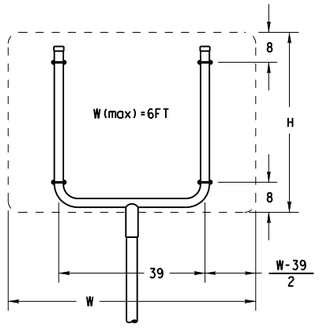
Detail A



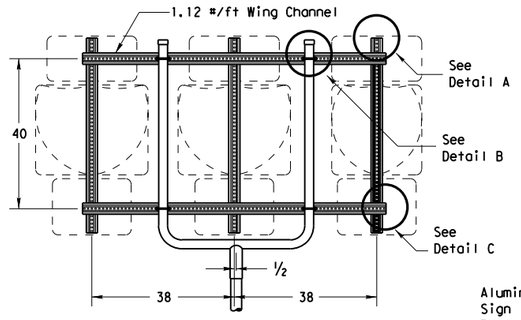
Detail B



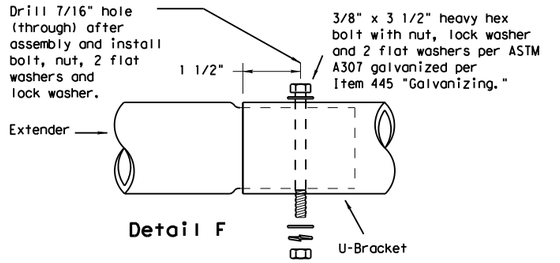
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U)

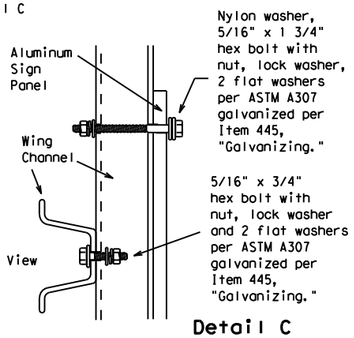


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

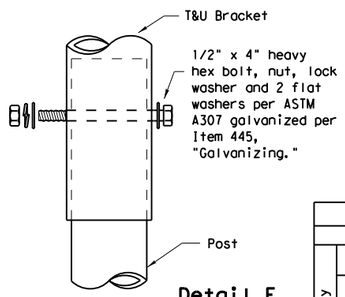


Detail F

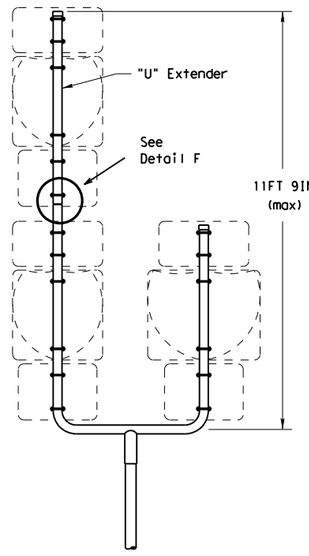
Splices shall only be allowed behind the sign substrate.



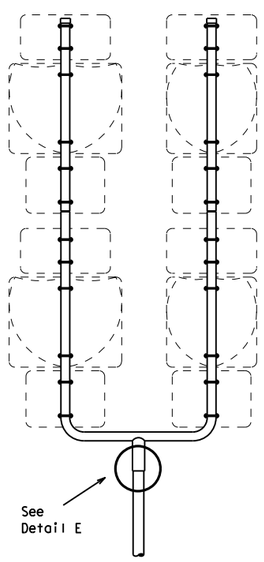
Detail C



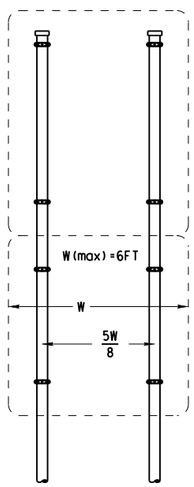
Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)

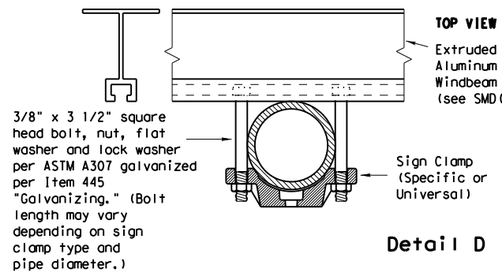


SM RD SGN ASSM TY S80(1)XX(U-2EXT)

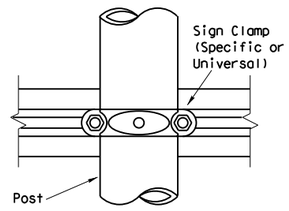


SM RD SGN ASSYM TY XXXXX(2)XX(P)

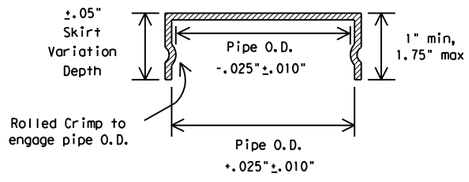
SIDE VIEW



Detail D



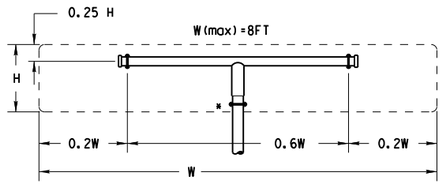
FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

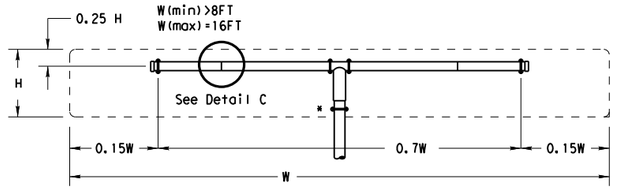
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0092	02	125	IH 45

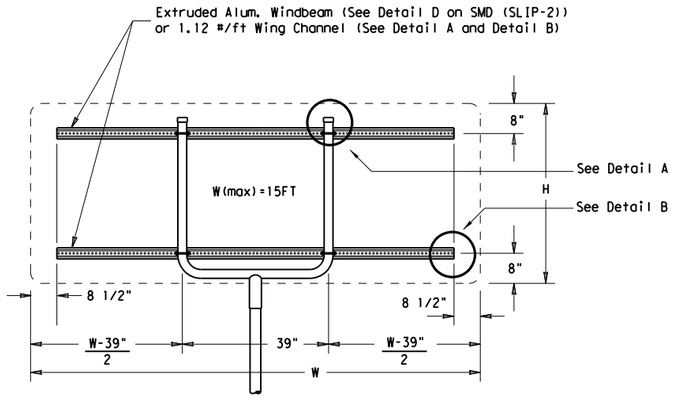
DIST	COUNTY	SHEET NO.
18	DALLAS	171

DATE: 6/15/2021 11:37:40 AM
FILE: c:\txdot\pw*online\txdot5\solomon.boyou\d0450706\smds2.dgn

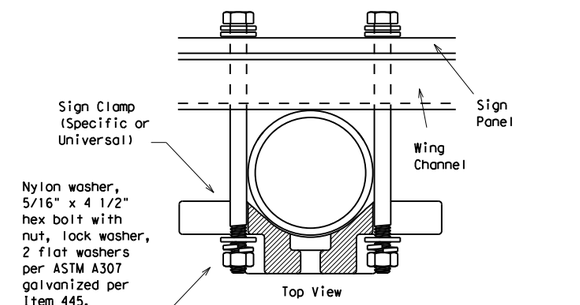
DATE: 6/15/2021 11:37:50 AM
FILE: c:\txdot\pwonline\txdot5\solomon_bayou\d0450706\smds3.dgn



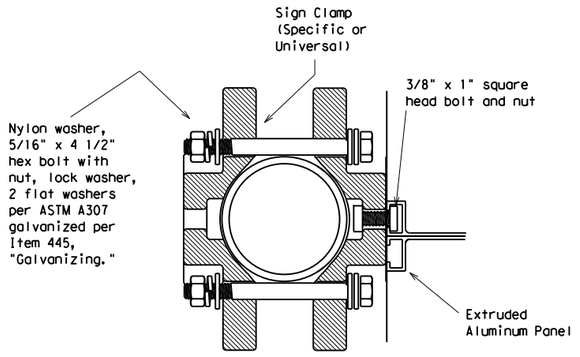
SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



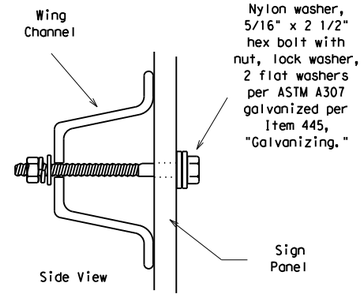
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



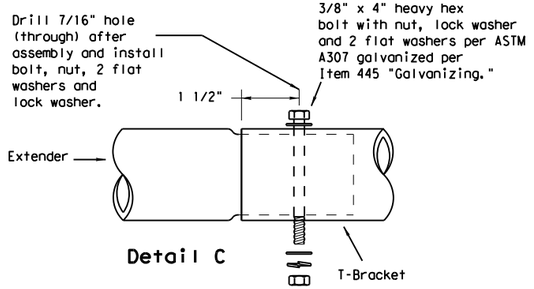
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

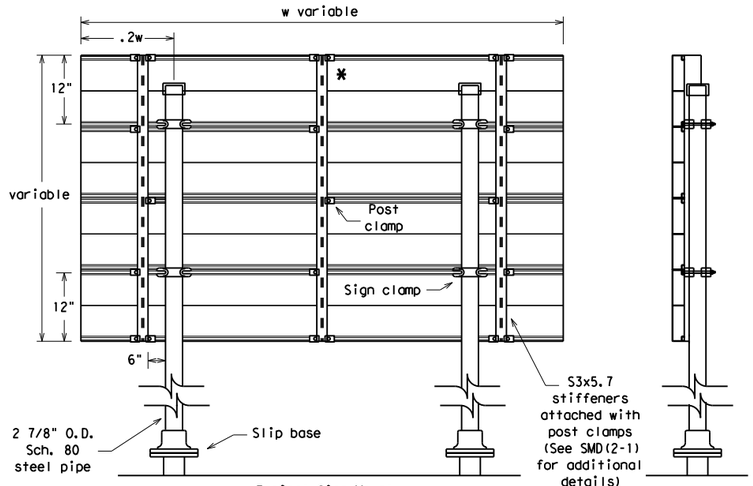


Detail B



Detail C

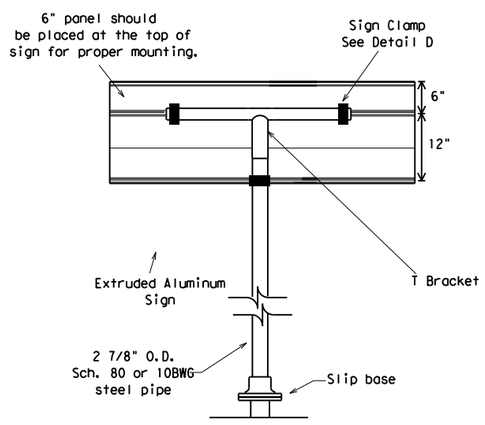
Splices shall only be allowed behind the sign substrate.



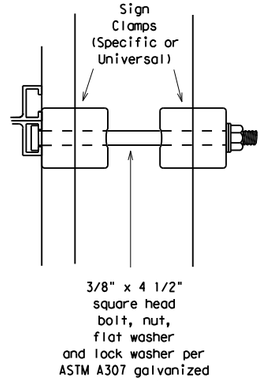
Typical Sign Mount

SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

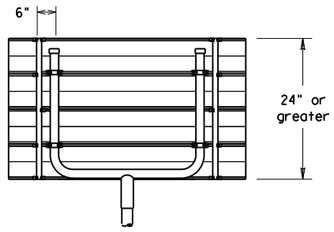


Extruded Aluminum Sign
With T Bracket



3/8" x 4 1/2"
square head
bolt, nut,
flat washer
and lock washer per
ASTM A307 galvanized
per Item 445,
"Galvanizing."

Detail E



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

GENERAL NOTES:

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

1. See table above.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT

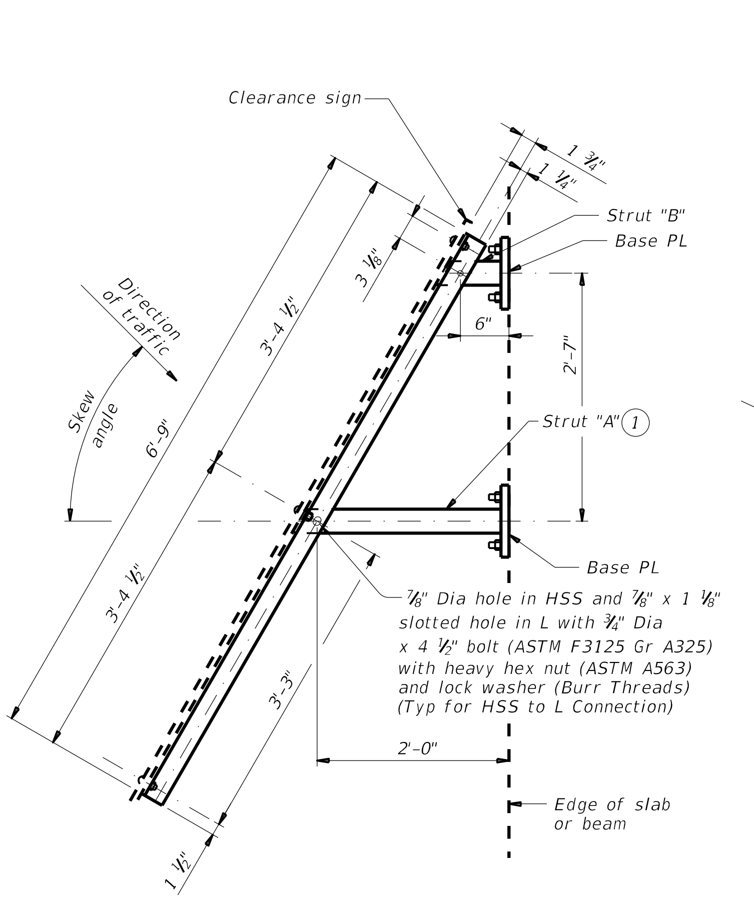
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

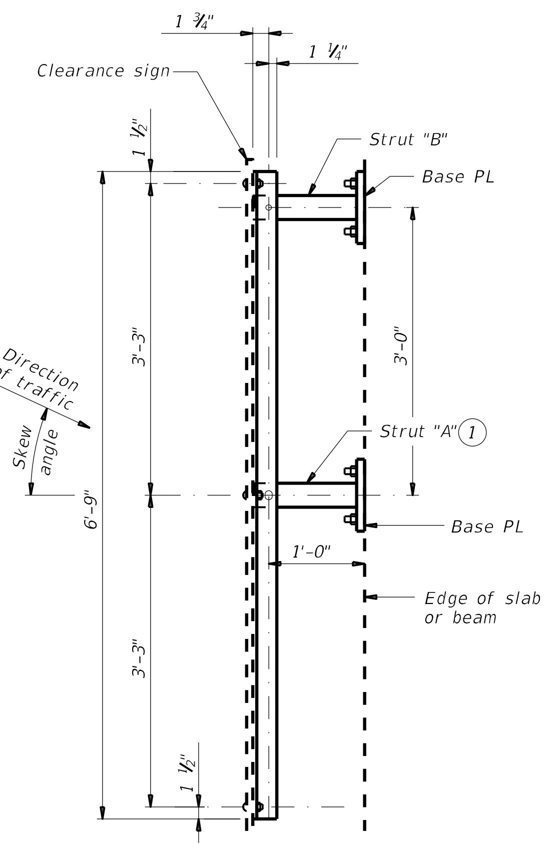
SMD(SLIP-3)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		172



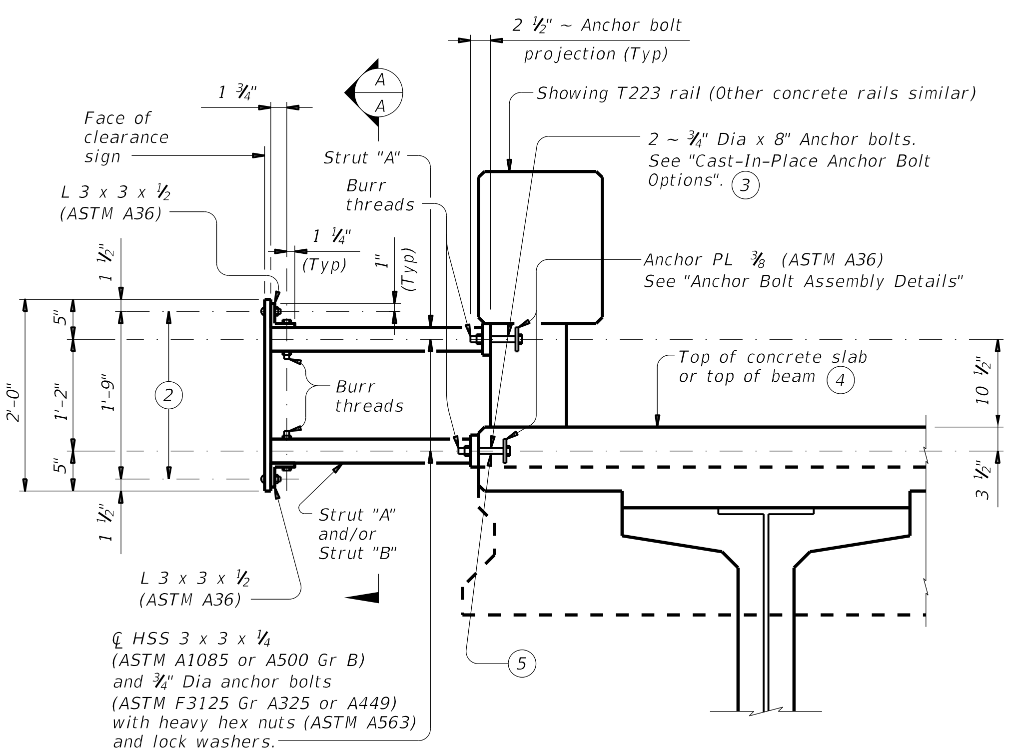
PLAN OF TYPE S MOUNT

(Used for skews over 30°)

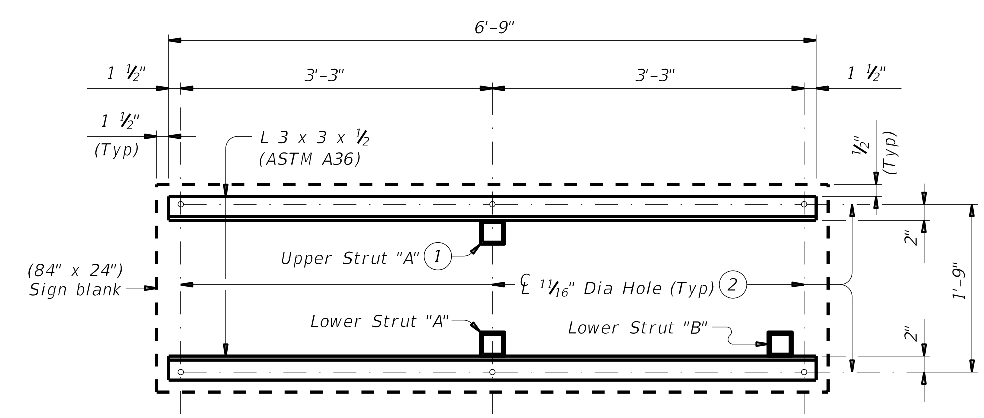


PLAN OF TYPE N MOUNT

(Used for 0° to 30° skews)



SECTION



SECTION A-A

1. Locate centerline of Strut A no closer than 12" from a vertical concrete edge.
2. ℄ 5/8" Dia x 2" Hexagon socket button head cap screws (ASTM A574) with hex nuts. Attach hex nuts to L 3 x 3 x 1/2 by tack welding in two places. Threads must have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.
3. At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are 3/4" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".
4. For decked slab beams topped with a 2 course surface treatment and ACP overlay.
5. Anchor bolts to be cast into decked slab beams topped with a 2 course surface treatment or ACP overlay. Anchor bolts with heavy hex nuts, regular lock washers, hardened washers and anchor plate that is embedded in the beam will be provided by the beam Fabricator.

CONSTRUCTION NOTES:

Install the vertical face of clearance sign plumb unless otherwise approved by the Engineer.

Test adhesive anchors in accordance with Item 450.3.3, "Tests". Test 1 anchor per bridge mounted clearance sign installed. Perform corrective measures to provide adequate capacity if any of the tests do not meet the required test load. Repair damage from testing as directed.

MATERIAL NOTES:

Galvanize all steel components after fabrication unless otherwise noted.

GENERAL NOTES:

This standard provides details to mount a vertical clearance sign (84" x 24") to bridges. Rail Types T631, T631LS, PR11, PR22 and PR3 are not accommodated.

The Engineer will furnish the clearance to be shown on the sign.

See Bridge Layout for sign location and mounting type (Type N or S).

Cost of furnishing, installing, relocating or removing a clearance sign, including structural steel for sign mount, is included in unit price bid for Item 644, "Small Roadside Sign Assemblies".

One Sign Blank (84" x 24") is 14 SF.

Average steel weight for one complete Type N Mount is 219 Lb.

Average steel weight for one complete Type S Mount is 233 Lb.

Texas Department of Transportation — Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST		COUNTY	SHEET NO.
	18		DALLAS	173

DATE: 6/23/2020 10:36:25 AM
FILE: pw:\\txdot-pw.bentley.com:txdot-pw-01\Documents\Online\txdot5\solomon.bayou\d0450706\bmcsste1-19.dgn

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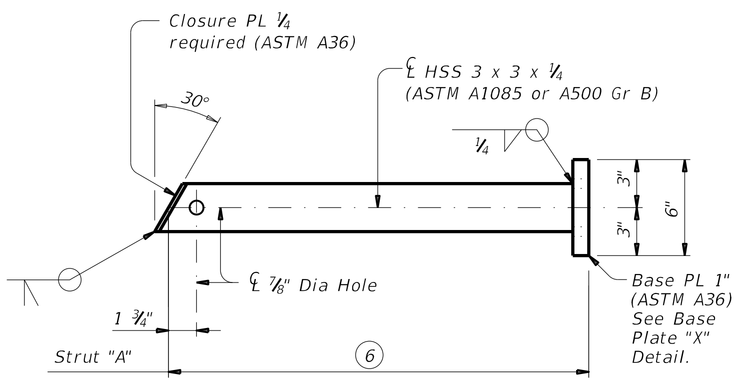
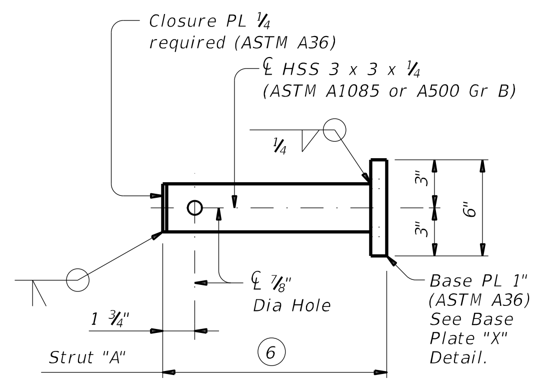
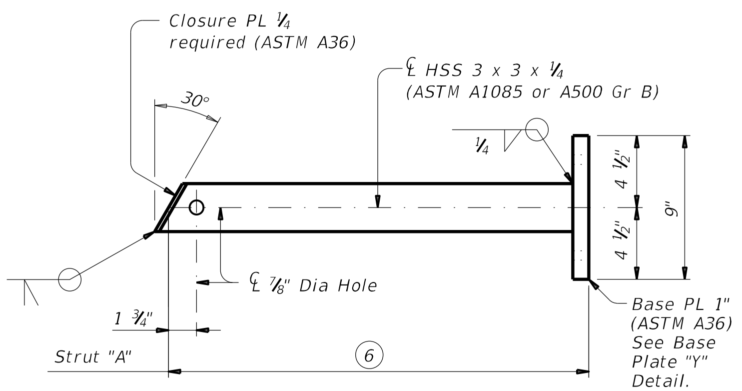


FOR T411 AND
C411 RAIL TYPES



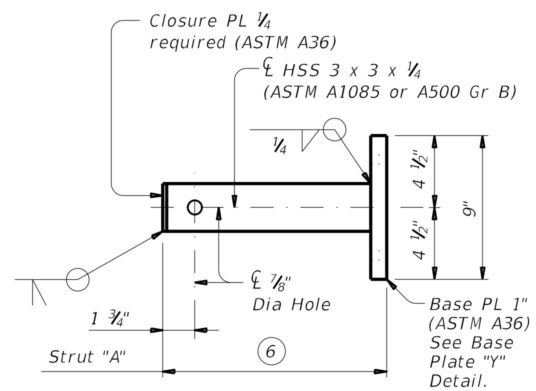
FOR T411 AND
C411 RAIL TYPES



FOR T221, C221, T222, T223, C223,
T401, T402, C402, T551, T552,
T80HT, T80SS AND SSTR RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

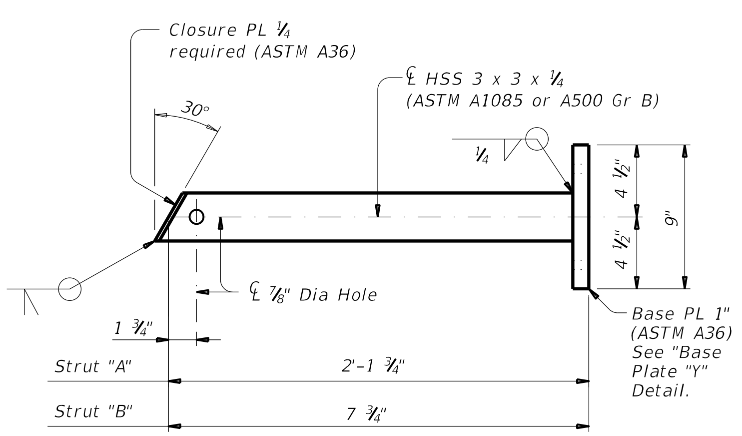
(Used for skews over 30°)



FOR T221, C221, T222, T223, C223,
T401, T402, C402, T551, T552,
T80HT, T80SS AND SSTR RAIL TYPES

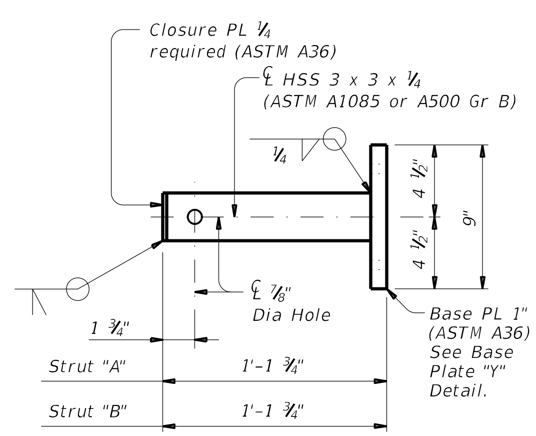
UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



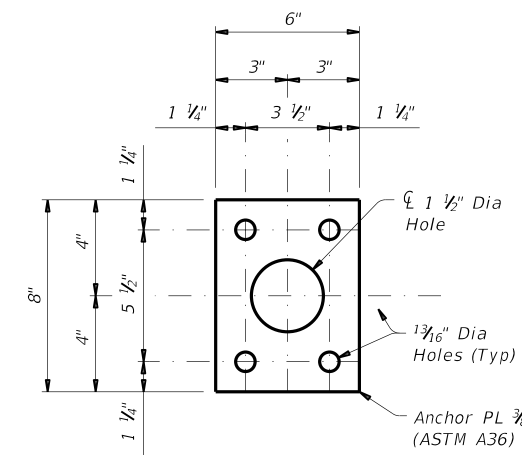
LOWER STRUT DETAILS FOR (TYPE S MOUNT)

(Used for skews over 30°)

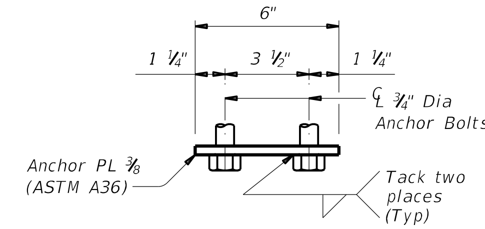


LOWER STRUT DETAILS FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)



PLAN OF ANCHOR PLATE



ELEVATION

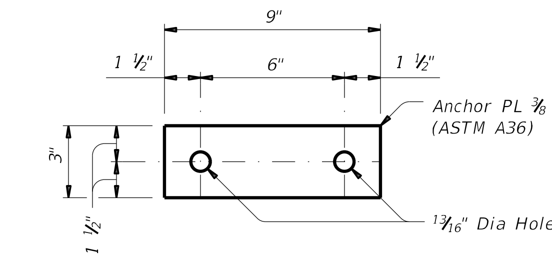
ANCHOR BOLT ASSEMBLY DETAILS (3)

(Used on Base Plate "X" with T411 and C411 rail types.)

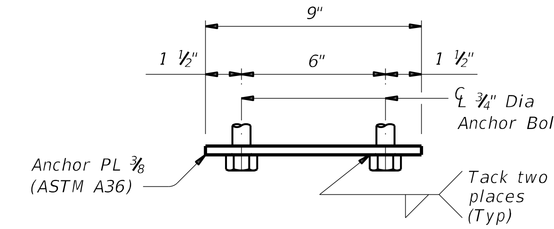
(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(6) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

(7) Hole required to drain zinc from base plate during galvanizing.



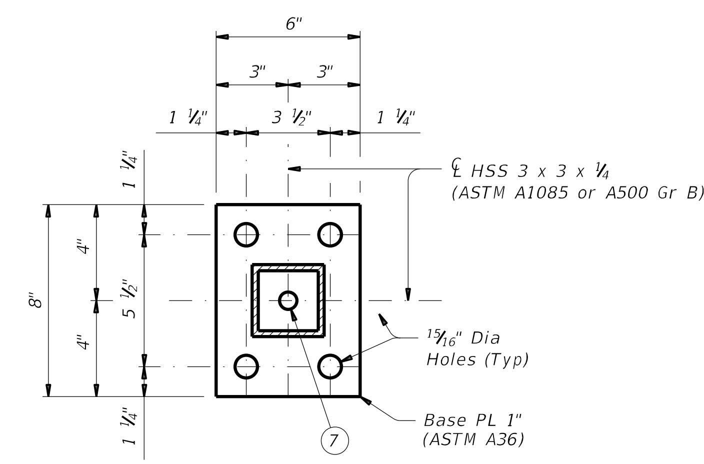
PLAN OF ANCHOR PLATE



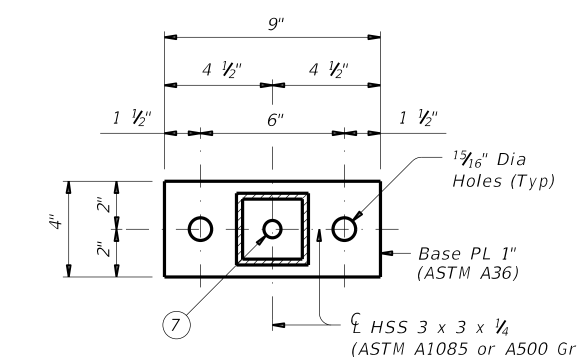
ELEVATION

ANCHOR BOLT ASSEMBLY DETAILS (3)

(Used on Base Plate "Y" and with T1F, T2P, C2P, T1W, C1W, T66 and C66 rail types.)

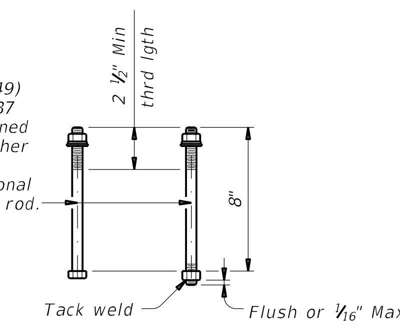


BASE PLATE "X" DETAIL



BASE PLATE "Y" DETAIL

℄ ¾" Dia heavy hex head anchor bolt (ASTM F3125 Gr A325 or A449) or threaded rod (ASTM A193 Gr B7 or F1554 Gr 105) with one hardened washer and one regular lock washer placed under heavy hex nut (ASTM A563). Furnish one additional heavy hex nut for each threaded rod.



CAST-IN-PLACE ANCHOR BOLT OPTIONS (3)

SHEET 2 OF 3

Texas Department of Transportation | Bridge Division Standard

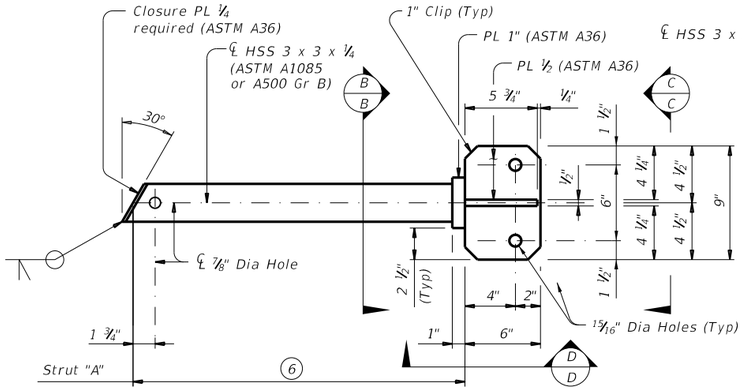
BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST		COUNTY	SHEET NO.
	18		DALLAS	174

DATE: 6/23/2020 10:36:25 AM
FILE: DOCUMENT\NAME pw:\\txdot-pw.bentley.com:txdot-pw-01\Documents\...\online\txdot5\solomon.bayou\d0450706\bmcsste1-19.dgn

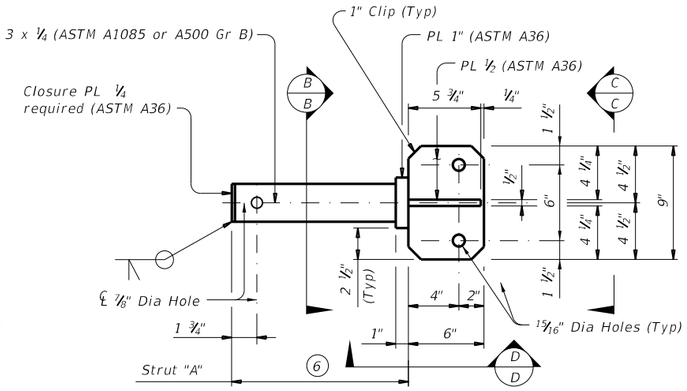
DATE: 6/23/2020 10:35:25 AM
FILE: bmcsste1-19.dgn



FOR T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE S MOUNT)

(Used for skews over 30°)



FOR T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL TYPES

UPPER STRUT DETAIL FOR (TYPE N MOUNT)

(Used for 0° to 30° skews)

(2) ℄ ⅞" Dia x 2" Hexagon socket button head cap screws (ASTM A574) with hex nuts. Attach hex nuts to L 3 x 3 x ½ by tack welding in two places. Threads must have Class 3A fit tolerance in accordance ASME B1.1. Six screws required.

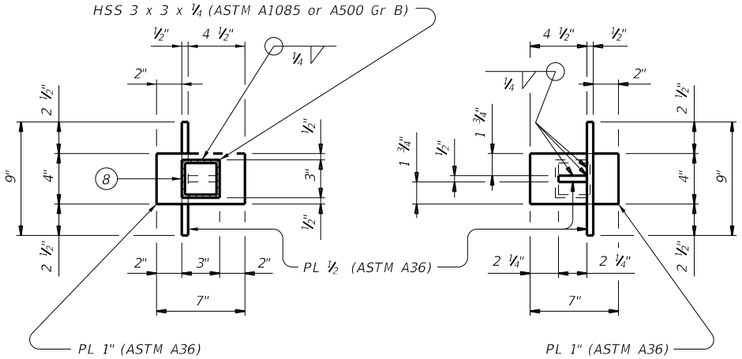
(3) At the Contractor's option fully threaded adhesive anchors may be use instead of cast-in-place anchor bolts. Expansion anchors are not allowed. Provide adhesive anchors that are ¾" Dia ASTM A193 Gr B7 or F1554 Gr 105 fully threaded rods with one hardened steel washer (ASTM F436) and one regular lock washer placed under heavy hex nut (ASTM A563). Embed fully threaded rods using a Type III, Class C, D, E, or F anchor adhesive. Adhesive anchor embedment depth is 8". Anchor adhesive chosen must be able to achieve a factored bond strength in tension of 2.2 kips per anchor (edge distance and spacing must be accounted for). Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450, "Railing".

(4) For decked slab beams topped with a 2 course surface treatment and ACP overlay.

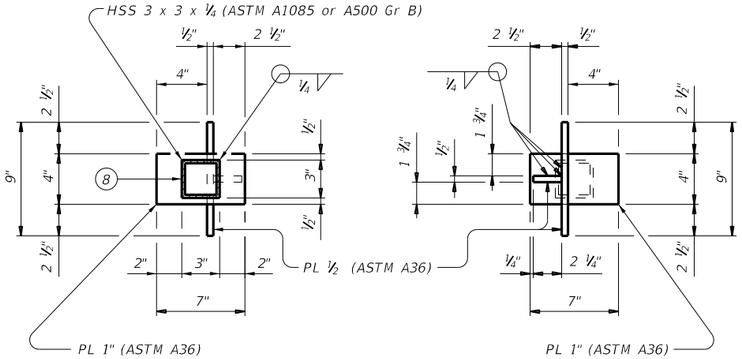
(6) Adjust length to accommodate edge of slab to back of rail for specific project conditions and to help plumb the vertical face of clearance sign.

(8) Hole required in bottom of HSS to drain zinc during galvanizing.

(9) 11" curb is for structures with 2" ACP overlay.



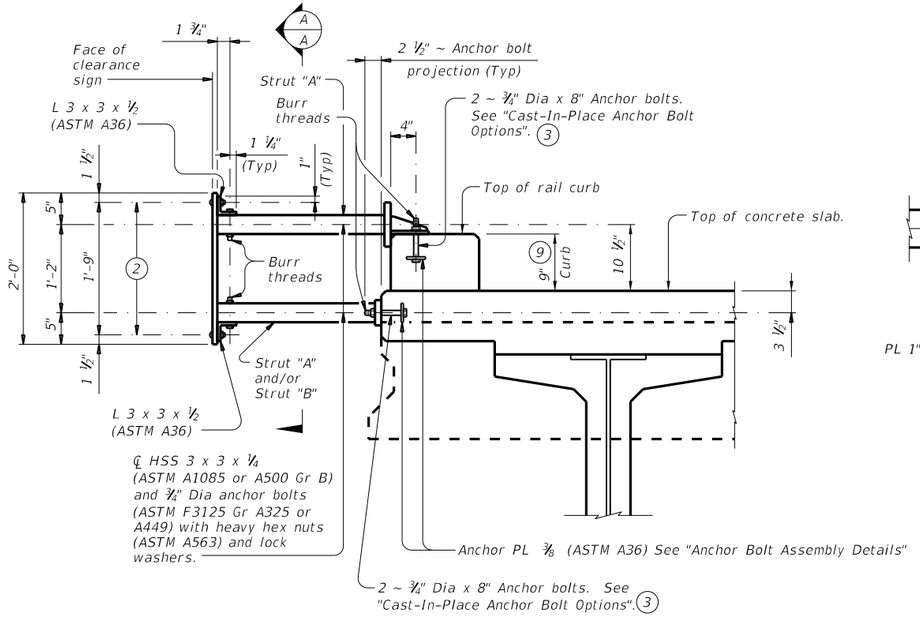
FOR 9" HIGH CURBS



FOR 11" HIGH CURBS

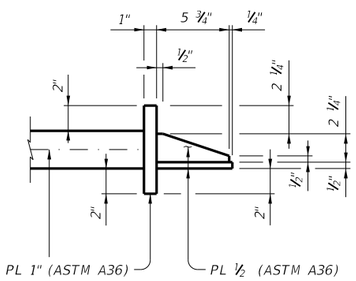
SECTION B-B

VIEW C-C

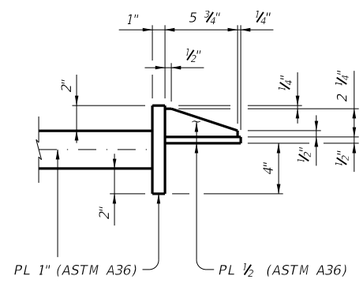


SECTION THRU T1F, T2P, C2P, T1W, C1W, T66 AND C66 RAIL CURB

Showing sign mount on a 9" high curb, 11" high curb similar.



FOR 9" HIGH CURBS



FOR 11" HIGH CURBS

VIEW D-D

SHEET 3 OF 3

Texas Department of Transportation

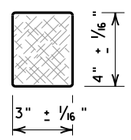
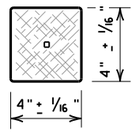
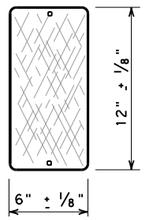
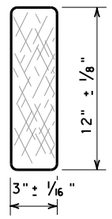
Bridge Division Standard

BRIDGE MOUNTED CLEARANCE SIGN ASSEMBLY

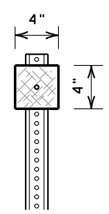
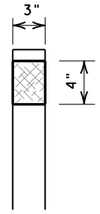
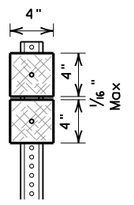
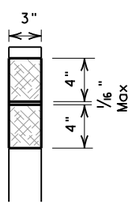
BMCS

FILE: bmcsste1-19.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		175

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flx). 2. Size 2 and 3 - For use on wing channel (wc) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE				
	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

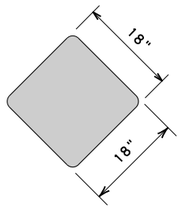
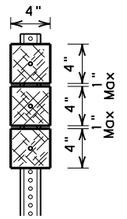
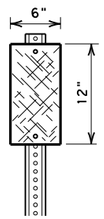
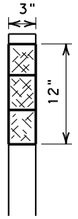
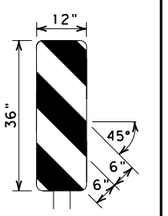
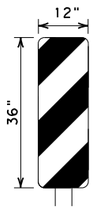
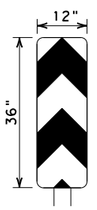
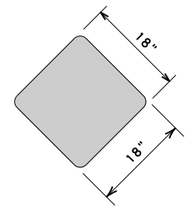
NUMBER OF REFLECTORS OR DIRECTION
X = 3-Size 2 reflector units (Type 2 only)
Y = 1-Size 3 reflector unit (Type 2 only)
Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

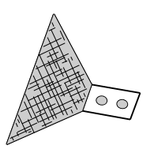
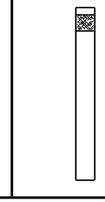
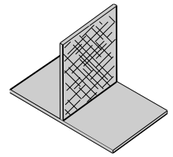
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE								
		3-Size 2 reflector units	1-Size 3 reflector unit	3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

DEPARTMENTAL MATERIAL SPECIFICATIONS

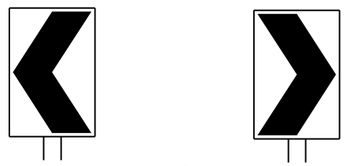
FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

DEVICE



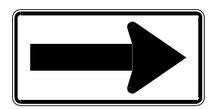
W1-8

SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	

NOTE
1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies).
2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).

ONE DIRECTION LARGE ARROW

DEVICE



W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:

Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION

D & OM(1)-20

FILE: dom1-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20	18	DALLAS		176

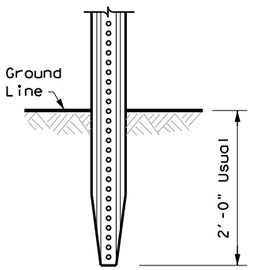
20A

DATE: 6/15/2021 11:53:08 AM
FILE: c:\txdot\pw_online\txdot5\solomon.bayou\d0450706\dom1-20.dgn

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

GND

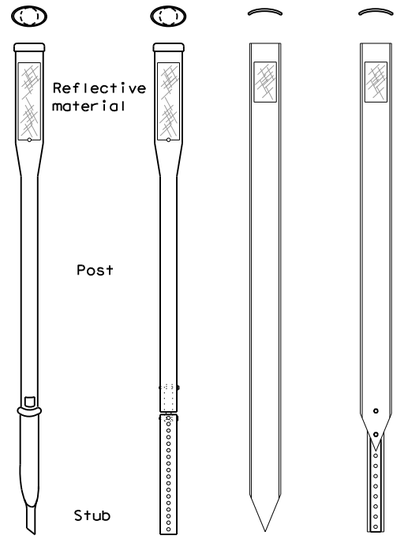


NOTES

1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

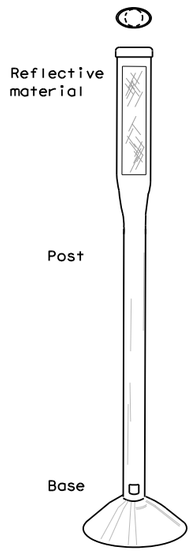
FLEXIBLE POSTS (YFLX, WFLX)

GND



EMBEDDED

SRF



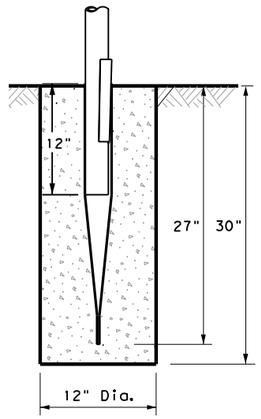
SURFACE MOUNT

NOTES

1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

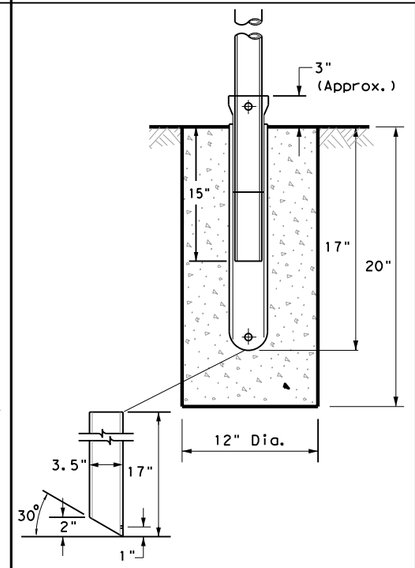
WEDGE ANCHOR SYSTEMS

WAS



STEEL

WAP



PLASTIC

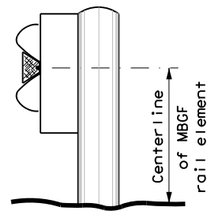
NOTE

1. Install per manufacturer's recommendations.

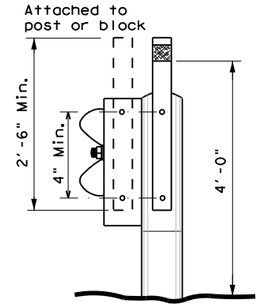
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

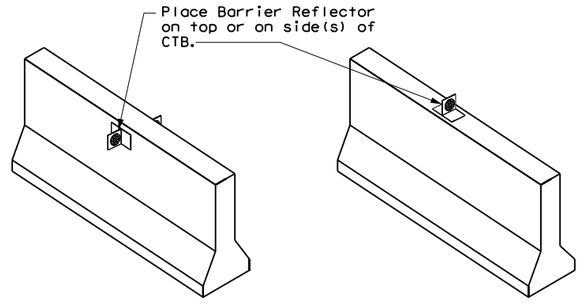
GF1



GF2



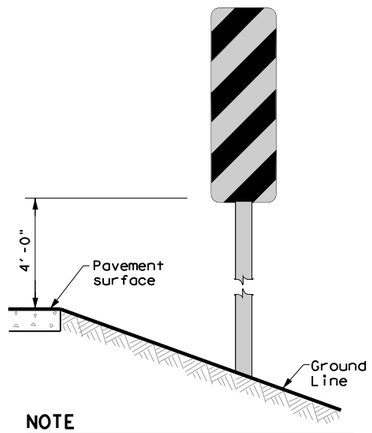
CONCRETE TRAFFIC BARRIER (CTB)



GENERAL NOTES

1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

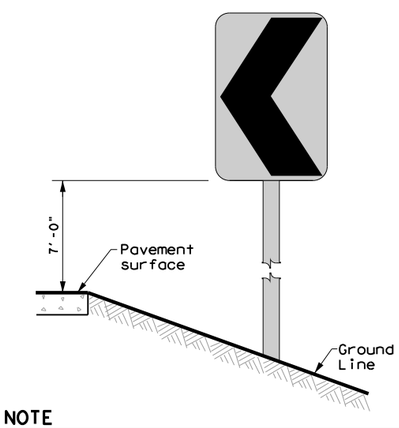
TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



NOTE

Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

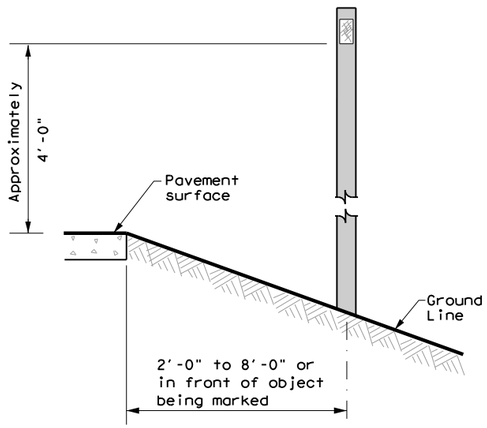
CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE

Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION

D & OM(2)-20

FILE: dom2-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
© TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
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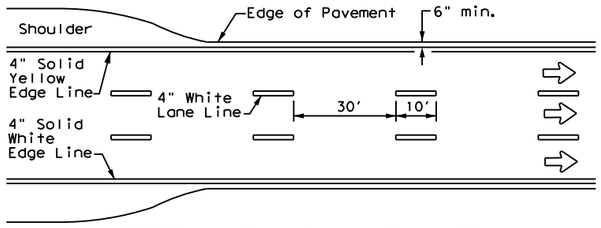
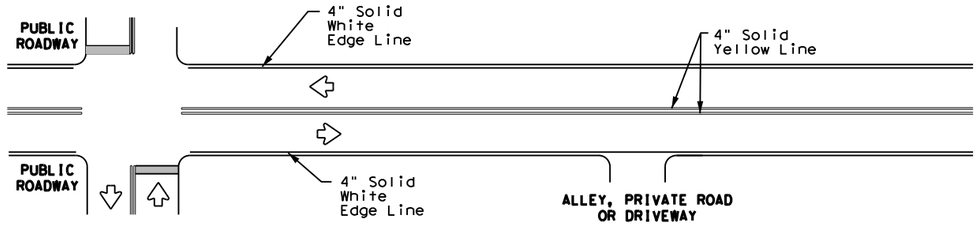
4-10 7-20	18	DALLAS		177

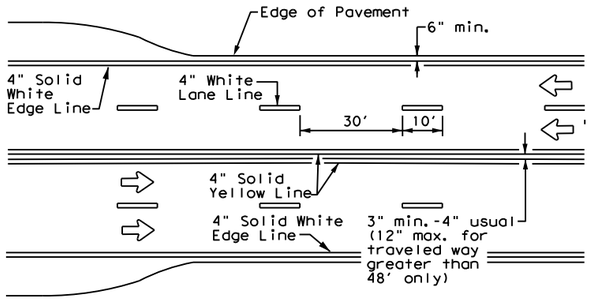
20B



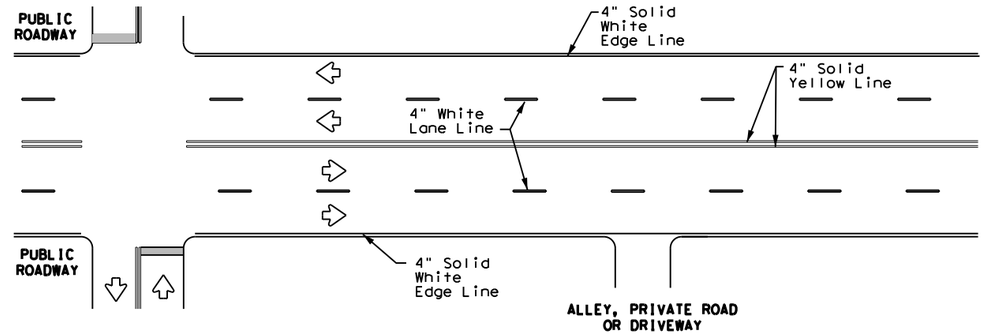
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



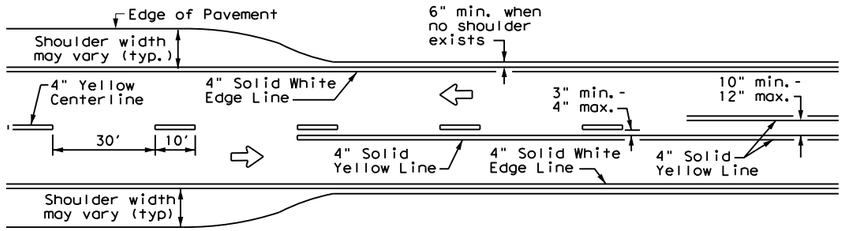
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



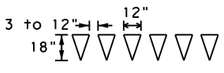
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



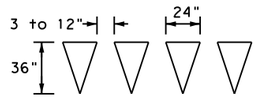
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

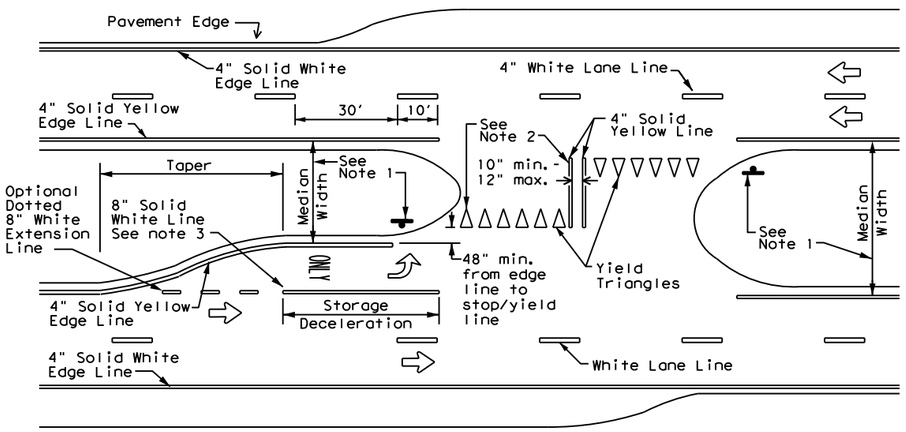


For posted speed on road being marked equal to or less than 40 MPH.



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.

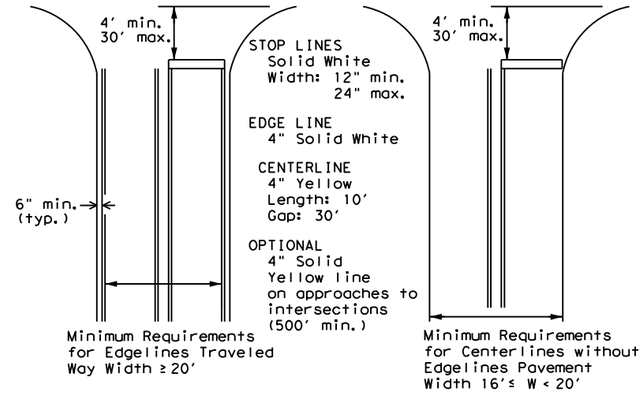
GENERAL NOTES

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	0092	02	125	IH 45
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8-00 6-20	18	DALLAS		178

22A

DATE: 6/15/2021 11:53:19 AM
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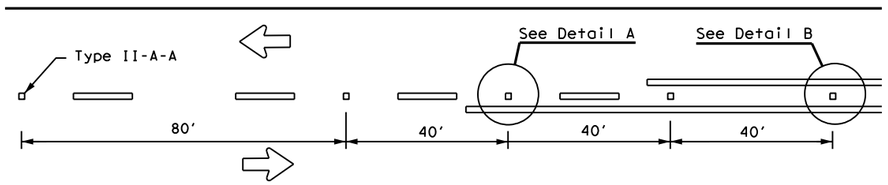
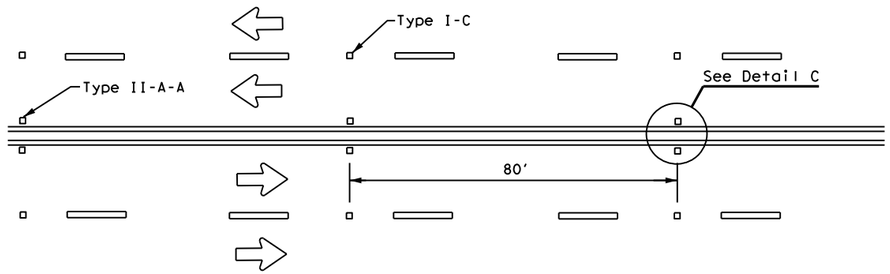
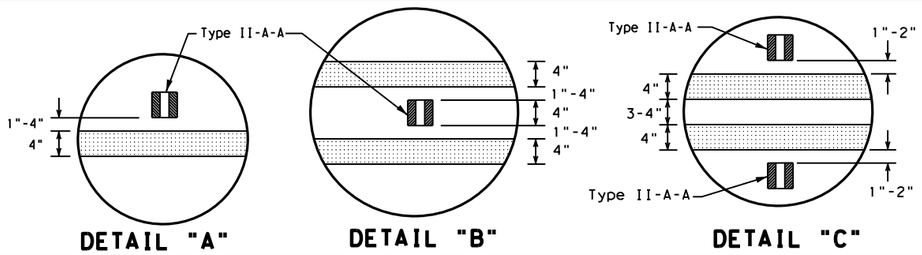
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



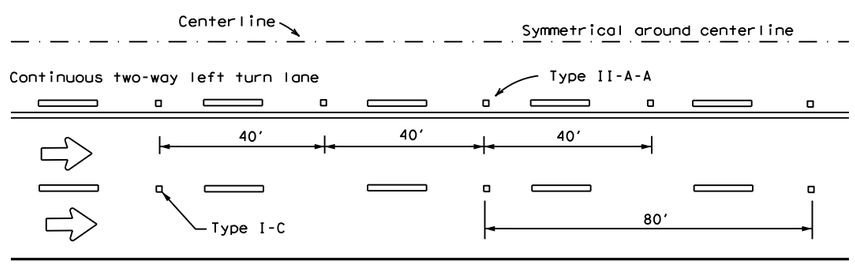
CENTERLINE FOR ALL TWO LANE ROADWAYS



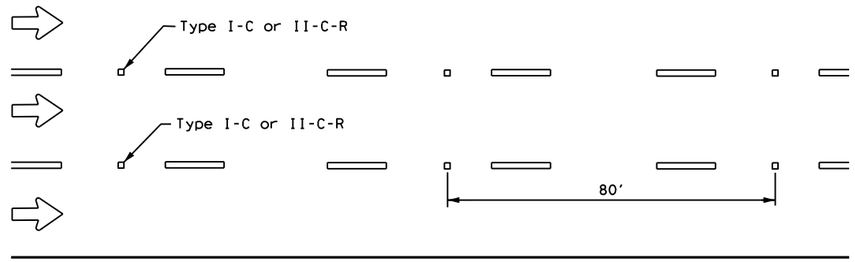
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



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

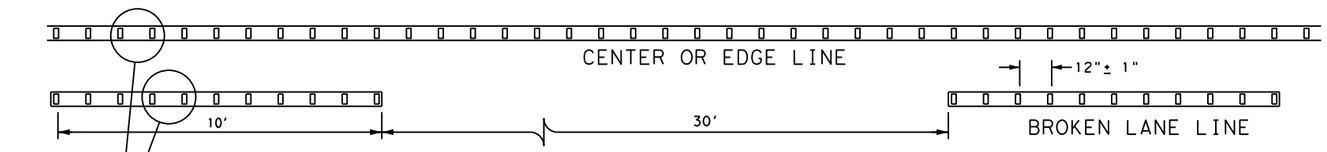


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



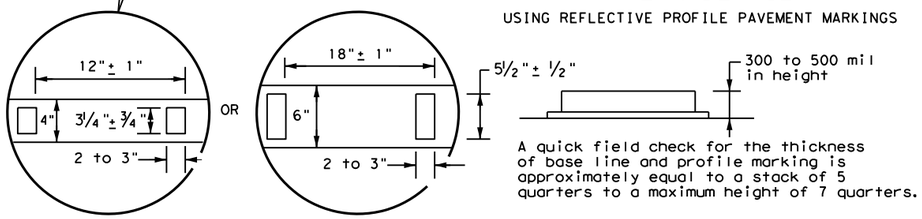
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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



4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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.

NOTE

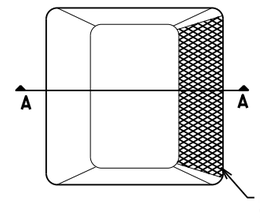
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

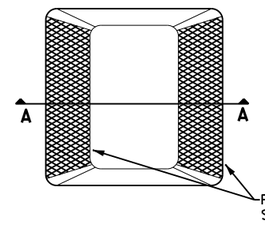
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

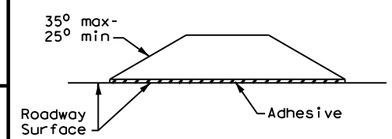
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



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

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©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	0092	02	125	IH 45
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	18	DALLAS		179

22B

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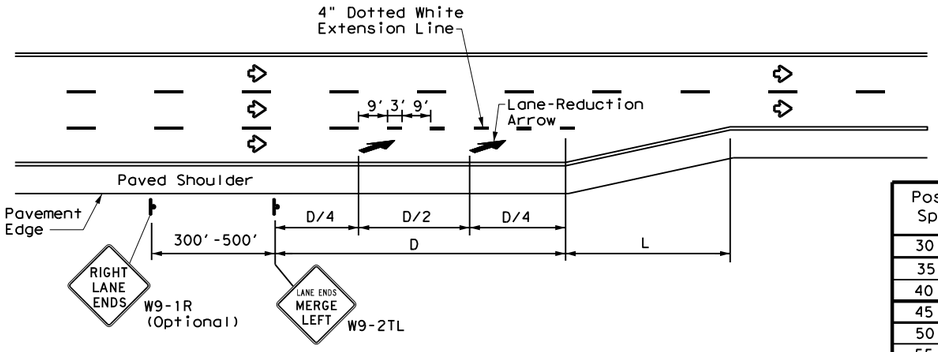
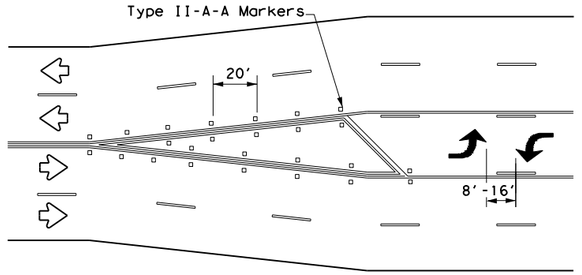


LANE REDUCTION

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.

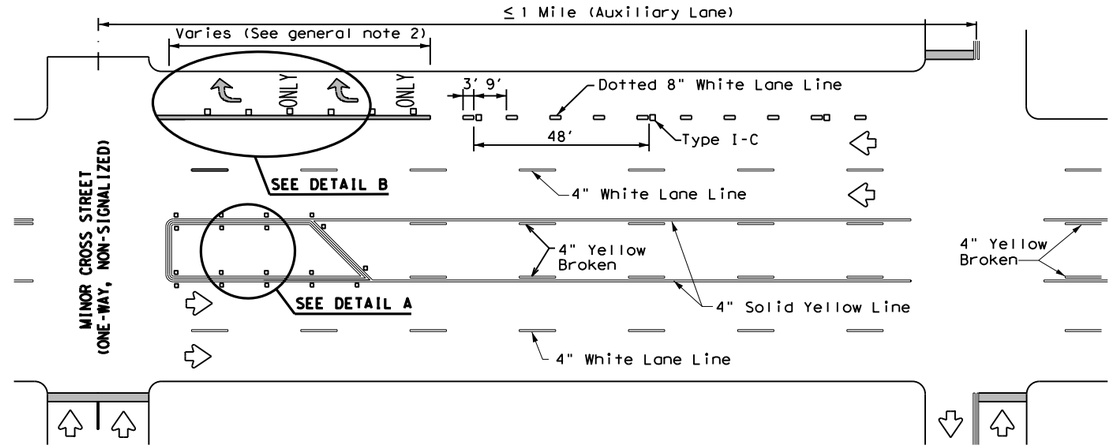
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

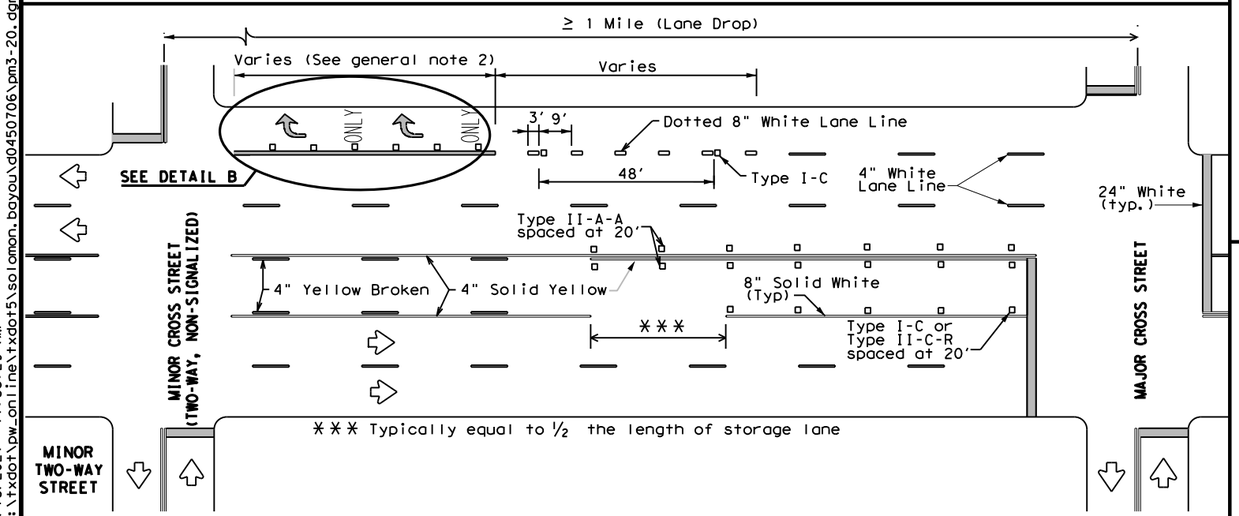
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

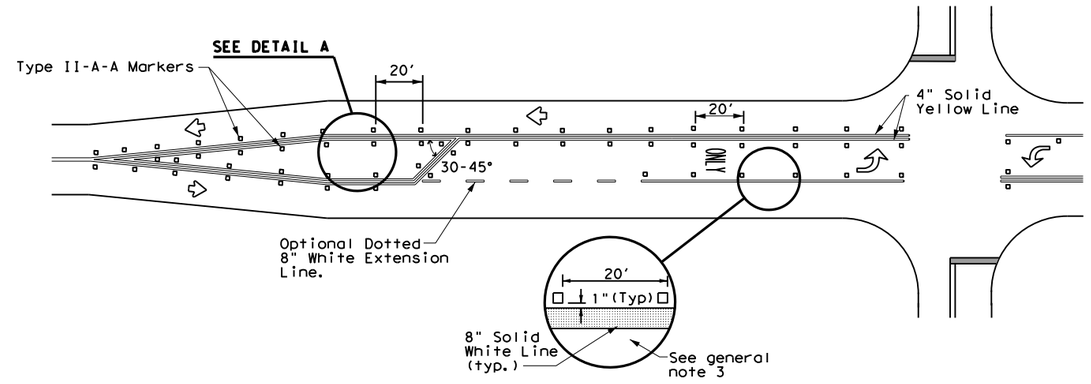
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



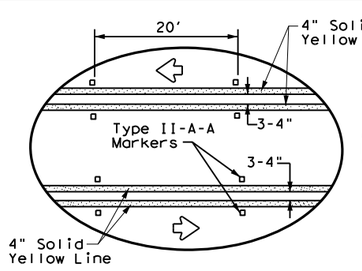
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



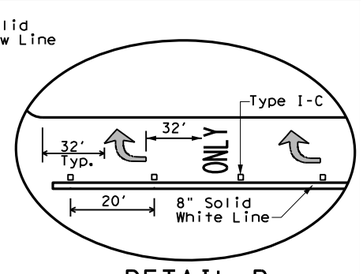
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



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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3-03 6-20				

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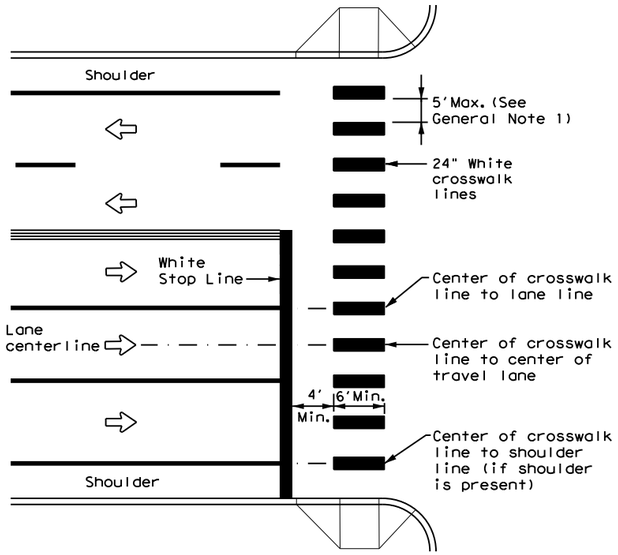


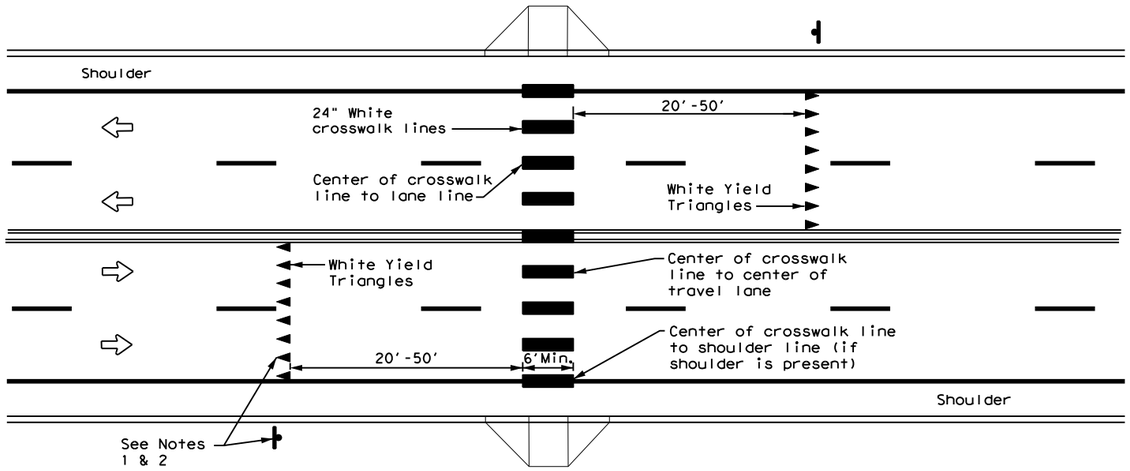
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

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

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES

1. Use yield triangles with "Yield Here to Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-20

FILE: pm4-20.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		181

22D

A. GENERAL SITE DATA

1. PROJECT LIMITS: *IH 45 AT DOWDY FERRY RD.*

Begin Project Coordinates : Latitude (N): 32.6432947 Longitude (W): --96.7047559
End Project Coordinates : Latitude (N): 32.6525617 Longitude (W): - -96.7106589

2. PROJECT SITE MAPS:

- *Project Location Map: The Title Sheet and Project Layout Sheet 3*
- *Drainage Patterns: Drainage Area Map Sheet 91-93*
- *Slopes Anticipated After Major Gradings or Areas of Soil Disturbance: Typical Sections Sheet 4-8*
- *Location of Erosion and Sediment Controls: SW3P Site Layouts Sheet 184-187*
- *Surface Waters and Discharge Locations: Drainage Area map Sheet 91-93*
- *Project Specific Location(s) (PSL): To be determined by the project Construction Personnel. Location(s) shown on SW3P Site Map (If PSL location(s) is within one mile of project) and information located in project SW3P Binder (Reference Item #10 below).*

3. PROJECT DESCRIPTION:
CONSTRUCT INTERSECTION IMPROVEMENT, INCLUDING TEXAS U-TURN AND TURN LANES

4. MAJOR SOIL DISTURBING ACTIVITIES:
INTERSECTION IMPROVEMENTS, CULVERT IMPROVEMENT, EXCAVATION, GRADING, ADD CONCRETE PAVEMENT, BACKFILL PAVEMENT, AND FINAL SURFACE PREPARATION FOR REVEGETATION.

5. EXISTING CONDITION OF SOIL & VEGETATIVE COVER AND % OF EXISTING VEGETATIVE COVER:
THE EXISTING SOIL CLASSIFIED AS MIX OF AUSTIN CLAY, EDDY CLAY LOAM, FRIO SILTY CLAY, LEWISVILLE SILTY CLAY, AND STEPHEN SILTY CLAY. THE EXISTING VEGETATION IS ABOUT 85-100% COVERED WITH VARIOUS GRASS, WITH SPARSE TRESS, AND SHRUBS. WHEN THE PROJECT IS COMPLETED IT WILL BE REVEGETATE WITH SOD.

6. TOTAL PROJECT AREA: *32.01* Acres

7. TOTAL AREA TO BE DISTURBED: *8.46* Acres *(26.42%)*

8. WEIGHTED RUNOFF COEFFICIENT

BEFORE CONSTRUCTION: *0.95*
AFTER CONSTRUCTION: *0.95*

9. NAME OF RECEIVING WATERS:

TRIBUTARY TO FIVEMILE CREEK (SEGMENT 0805D). (NO WATER QUALITY IMPAIREMENT). TWO TRIBUTARIES TO FIN AND FEATHER CLUB LAKE WHICH FLOW TO TRINITY RIVER (SEGMENT 0805). WATER QUALITY IN-MPAIRED BY BACTERIA IN WATER (RECREATION USE) AND BY DIOXIN AND PCB's IN EDIBLE TISSUE

10. PROJECT SW3P Binder:

A. For projects disturbing one to five acres, TxDOT will maintain a SW3P Binder at the project field office (If there is not a project field office, should be kept at the Area Office) which contains the following: Index Sheet, TCEQ Signature Authority, TxDOT's and Contractor's Small Construction Site Notice, SW3P Inspector Qualification Statements, EPIC Sheet, SW3P Sheet, Site Location Maps, Inspection and Maintenance Reports (Form 2118), Construction Stage Gate Checklist(s) (CSGC), Stored Material Lists specifying associated control measures and the Appendix which contains the TPDES Construction General Permit, TxDOT and Contractor MS4 Operator Notification(s) and the Construction PSL Permits per all applicable requirements.

B. For projects disturbing 5 acres or more, TxDOT will follow the actions listed in (10.A.) above with the addition of the following: TxDOT and Contractor Notice Of Intent (N.O.I.) and Fee Payment Form, TxDOT and Contractor Large Construction Site Notice (to be used instead of Small Site Notice), and TPDES Permit Coverage Notice.

C. For projects disturbing less than one acre, actions described in (10.A.) and (10.B.) above are not required. Acreage is calculated by adding Total Area To Be Disturbed Acres on project (See #7 above) and the PSL(s) acreage located within one mile of project.

B. EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

1.
- *T* TEMPORARY SEEDING
- ___ MULCHING (Hay or Straw)
- ___ BUFFER ZONES
- ___ PLANTING
- ___ SEEDING
- *P* SODDING
- *P* PRESERVATION OF NATURAL RESOURCES
- ___ FLEXIBLE CHANNEL LINER
- ___ RIGID CHANNEL LINER
- ___ SOIL RETENTION BLANKET
- *P* COMPOST MANUFACTURED TOPSOIL
- ___ VERTICAL TRACKING
- ___ OTHER: *NONE*

2. STRUCTURAL PRACTICES: (Select T = Temporary or P = Permanent, as applicable)

- *T* SILT FENCES
- *T* EROSION CONTROL LOGS
- ___ EROSION CONTROL COMPOST BERMS (Low Velocity)
- *T* ROCK FILTER DAMS
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER DIKES
- ___ DIVERSION, INTERCEPTOR, OR PERIMETER SWALES
- ___ DIVERSION DIKE AND SWALE COMBINATIONS
- ___ PIPE SLOPE DRAINS
- ___ PAVED FLUMES
- *T* 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: *(Specify Practice)*

NOTE: TOP OF BMP'S SHOULD NOT BE HIGHER THAN ROADWAY ELEVATION AS NOT TO FLOOD ROADWAY UNLESS PRIOR APPROVAL FROM ENGINEER IS OBTAINED.

3. STORM WATER MANAGEMENT:

A. STORM WATER DRAINAGE WILL BE PROVIDED BY DITCHES, INLETS, AND STORM WATER SYSTEMS WHICH CARRY DRAINAGE WITHIN THE R.O.W. TO THE LAWS WITHIN THE ROADWAY AND PROJECT SITE WHICH DRAINS TO NATURAL FACILITIES.

B. DO NOT STAGE PORTABLE SANITARY UNITS, CONCRETE WASHOUT PIT OR CHEMICAL STORAGE WITH 50 FEET UPGRADIENT OF A STORMWATER DRAINAGE FEATURE OR RECEIVING WATER WITHOUT APPROPRIATE STORMWATER QUALITY CONTROLS

4. STORM WATER MANAGEMENT ACTIVITIES: (Sequence of Construction)

1) FOR DETAIL CONSTRUCTION ACTIVITIES SEE TRAFFIC CONTROL PLAN PHASE NARRATIVE.

2) SEE CONSTRUCTION PROGRESS SCHEDULE FOR SHULDULE AND DURATIONS OF RELEVANT SOIL DISTURBANCEAND STABILIZATION ACTIVITIES.

3) TO THE EXTENT PARACTICABLE, PRESERVE EXISTING VEGETION, MAINTAIN A VEGETATIVE BUFFER ALONG RECEIVING WATERS, AND PHASE CONSTRUCTION ACTIVITIES TO MINIMIZE EXPOSURE OF DISTURBED SOILS.

4) AVOID STORING PORTABLE SANITARY UNITS, CONCRETE WASHOUTS OR CHEMICALS WITHIN 50 FEET UPGRADIENT OF A RECEIVING WATER OR DRAINAGE CONVEYANCE WITHOUT ADEQUATE POLLUTION CONTROLS.

5) PRIOR TO THE START OF CONSTRUCTION ACTIVITIES IN THEIR CONTROL AREA, INSTALL SW3P CONTROL DEVICES AS APPROPRIATE TO PROTECT ADJACENT AND DOWNSLOPLE STORMWATER FEATURES AND RECEIVING WATERS, AND ACTIVE ROADWAYS AND PEDESTRIAN FACILITIES. INSTALL IN ACCORDANCE WITH THE APPLICABLE STANDARDS, AS DIRECTED BY THE ENGINEER.

6) CAPTURE SAW-CUTTING DEBRIS AND SLURRY FOR PROPER DISPOSAL, AND PROTECT PROXIMAL DOWNGRADIENT STORMWATER DRAINAGE FEATURES.

7) WHERE WORK HAS TEMPORARILY CEASED IN A DISTURBED AREA (THAT WILL EXCEED 14 DAYS BEFORE NEXT SOIL DISTURBANCE ACTIVITY OR INITIATION OF FINAL STABILIZATION MEASURES), TEMPORARILY STABILIZE SOIL PER TXR15000, WITH VERTICAL TRACKING, TEMPORARY SEEDING AND/OR OTHER SOIL COVER, AND VELOCITY AND DOWNSLOPE PERIMETER CONTROLS, AS APPROPRIATE AND/OR AS DIRECTED BY ENGINEER.

8) RE-VEGETATE DISTURBED SOIL IN COMPLETED PROJECT AREAS AS SOON AS PRACTICABLE OR AS DIRECTED BY ENGINEER.

9) WHEN ALL CONSTRUCTION ACTIVITIES ARE COMPLETE AND THE SITE IS STABILIZED AND APPROVED BY THE PROJECT ENGINEER, REMOVE ALL TEMPORARY STORMWATER QUALITY CONTROL MEASURES.

5. NON-STORM WATER DISCHARGES:
Filter non-storm water discharges, or hold in retention basins, before being allowed to mix with storm water. These discharges consist of, but not limited to, non-polluted ground water, spring water, foundation or footing drain water, water used for dust control or pavement washing and vehicle washwater containing no detergents.

C. OTHER REQUIREMENTS & PRACTICES

1. MAINTENANCE:
Maintain all erosion and sediment controls in good working order. Perform any necessary cleaning/repairs/replacements at the earliest possible date prior to next rain event, but no later than 7 calendar days. Ensure the surrounding ground has dried sufficiently to prevent damage from equipment. "Too Wet" is the only reason for not adhering to timeframes described. When construction activities permanently or temporarily cease and are not expected to resume for 14 or more days on a disturbed portion of the site, stabilization measures must be initiated immediately.

2. INSPECTION:
A TxDOT Inspector will perform a regularly scheduled SW3P inspection every 7 calendar days. An Inspection and Maintenance Report, signed by the TxDOT Inspector and the Contractor, will be filed for each Inspection. Revise/clean/repair/replace each BMP control device in accordance with the current Field Inspection and Maintenance Report (Form 2118) and Item 1 (Maintenance) above.

3. WASTE MATERIALS:
On a daily basis, or as may be directed, collect all waste materials, trash and debris from the construction site and deposit into a metal dumpster having a secure cover and which meets all state and local city solid waste management requirements. Empty the dumpster as required by regulation, or as may be directed, at a local approved landfill site. Do not bury construction waste on the construction project site.

4. HAZARDOUS WASTE & SPILL REPORTING:
As a minimum, any products in the following categories are considered to be hazardous: Paints, Acids, Solvents, Fuels, Asphalt Products, Chemical Additives for Soil Stabilization, and Concrete Curing Compounds or Additives. When storing hazardous material on the project site, or at a Project Specific Location, take all practicable precaution to prevent and/or contain any spillage of these materials. In the event of a spill, contact the spill coordinator immediately.

5. SANITARY WASTE:
Use a licensed sanitary waste management contractor to collect all sanitary waste from portable units as may be required by local regulation, or as directed.

6. CONSTRUCTION VEHICLE TRACKING:
On a regular basis, or as may be directed, dampen haul roads for dust control and construct construction entrances/exits. Provide for a motorized broom or vacuum type sweeper to be available on a daily basis, or as may be directed, to remove sediment from paved roadways on project, abutting and traversing the project site.

7. MANAGEMENT PRACTICES:
A. Construct disposal areas, stockpiles, haul roads and PSL's in a manner that will minimize and control the amount of sediment that may enter receiving waters. Do not locate disposal areas in any wetland, waterbody or streambed.
B. Locate construction staging areas, vehicle maintenance and PSL's areas in a manner to minimize the runoff of pollutants.
C. When working in or near a wetland, install and maintain operating soil erosion and sediment controls at all times during construction and isolate the work from the wetland.
D. Clear all waterways as soon as practicable of temporary embankment, temporary bridges, matting, falsework, piling, debris or other obstructions placed during construction operations that are not a part of the finished work.
E. Procedures and/or practices should be taken to control dust.
F. Sediment to be removed from roadways daily or when work begins after weather events if construction activities have ceased due to weather event.

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED PROFESSIONAL ENGINEER

solomonbayou, P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

DALLAS DISTRICT ENVIRONMENTAL

STORM WATER POLLUTION PREVENTION PLAN (SW3P)

TEMPLATE REVISION DATE: 02/07/18

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
GRAPHICS TP	6	SEE TITLE SHEET		IH 45
CHECK	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	DALLAS	DALLAS	182
CHECK	CONTROL	SECTION	JOB	
	0092	02	125	

FILE NAME
DATE
DESIGNER

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

Notes To Designer:
1. Do not alter Sheet Design or Font style, size or weight - match text attributes.
2. If additional space is needed for a numbered section, fence and adjust sections up or down as needed for proportioning and readability but do not relocate from its relative position.
3. All areas should be addressed thoroughly and verify the necessary pay items are set up to support actions needed.

Filled Out: XX/XX/XXXX
Prepared by: Name/Section

I. STORMWATER POLLUTION PREVENTION PLAN-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 adjacent MS 4 Operator(s) that receive discharges from this project. They need to be notified prior to construction activities.
(Note: Leave blank only if no adjacent MS 4 Operator(s) are affected.)

1. City of Dallas Phase I MS4 contact Kevin Hurley

2.

☐ No Action Required ☒ Required Action

Action Number:

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. No equipment is allowed in any sream channel below the ordinary High Water Mark except on approved temporary stream crossings or drill pads.

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# 3(a)

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.

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 for applicable 401 General Conditions:
(Note: If CORP Permit not required, do not check boxes.)

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 Number:

1.

2.

3.

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 Number:

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Action Number:
1.

2.

3.

4.

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

Special Note: The Migratory Bird Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, young, feather or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. The contractor would remove all old migratory bird nests from any structure or trees where work would be done from October 1 to February 15. In addition, the contractor would be prepared to prevent migratory birds from building nest(s) between February 15 to October 1. In the event that migratory birds are encountered on-site during project construction, efforts to avoid adverse impacts on protected birds, active nests, eggs and/or young would be observed.

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 Corp 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 Safety Data Sheets (SDS) 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 SDS. In the event of a spill, take actions to mitigate the spill as indicated in the SDS, 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, canisters, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

Does the project involve any bridge class structure rehabilitation(s) or replacement(s) (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 Number:

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action Number:

1.

GENERAL NOTE:

Any change orders and/or deviations from the final design must be reported to the Engineer prior to commencement of construction activities, as additional environmental clearance may be required.

LAST REVISION: 1/15/15

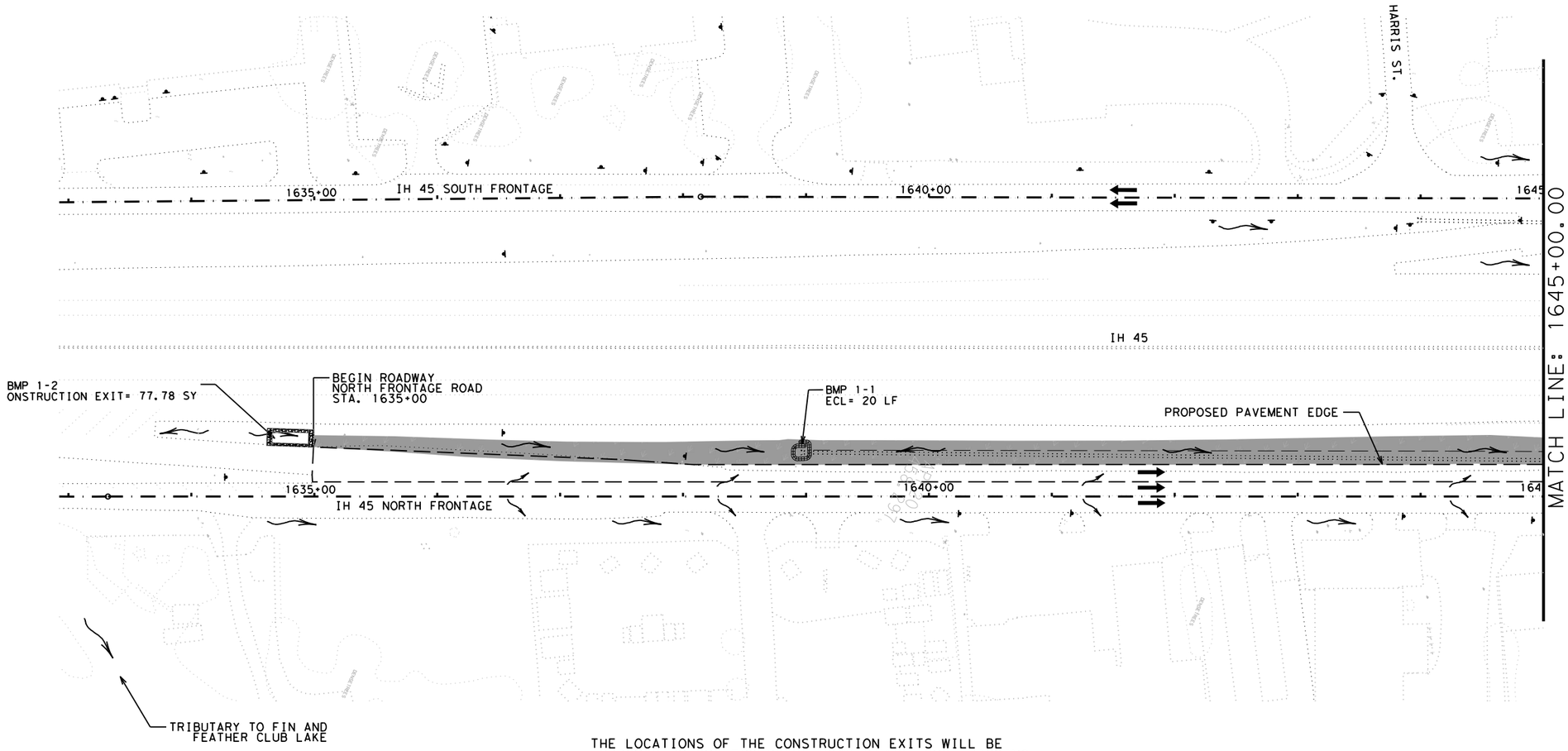
 Texas Department of Transportation
Dallas District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
6	SEE TITLE SHEET		IH 45
STATE	DISTRICT	COUNTY	
TEXAS	DALLAS	DALLAS	
CONTROL	SECTION	JOB	SHEET NO.
0092	02	125	183

DATE DISTURBED: _____

DATE STABILIZED: _____



0 50 100

LEGEND:

- WATER FLOW DIRECTION
- SCF — SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- ROCK FILTER DAM (TYPE 1)
- PROPOSED BLOCK SOD/TEMP SEEDING
- CONSTRUCTION EXIT

THE LOCATIONS OF THE CONSTRUCTION EXITS WILL BE APPROVED BY THE ENGINEER. TO MINIMIZE THE TRACKING OF SEDIMENT FROM AREAS OF DISTURBED SOIL AREA OF ACTIVE PAVEMENT THE ADVANCE PLANNING AND MAPPING OF THE CONSTRUCTION EXIST IS A PERMITTED REQUIREMENT.

TEMPORARY SEED (PER TYPICAL SECTION)	
DATE PLACED	
PERMANENT BLOCK SOD (PER TYPICAL SECTION)	
DATE PLACED	

	DATE INSTALLED	DATE REMOVED
BMP 1-1		
BMP 1-2		

NOTES:

1) BMPS SHALL NOT BE INSTALLED IN THEIR CONTROL AREA ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBING ACTIVITIES IN THAT AREA.
2) EXACT LOCATION OF ROCK FILTER DAM, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE TO BE DETERMINED BY THE ENGINEER IN THE FIELD.
3) CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION CONTROL DEVICES FROM PREVIOUS PHASE(S) THROUGHOUT DURATION OF PROJECT.
4) REMOVE SEDIMENT FROM BMP WHEN IT REDUCES BMP CAPACITY BY 40%. ALWAYS PROVIDE CONSISTENT DRAINAGE.
5) CONSTRUCTION ACCESS TO BE PLACED AT THE LOCATIONS APPROVED BY THE ENGINEER.
6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

SW3P SITE LAYOUTS

SCALE: 1"=100' SHEET 1 OF 4

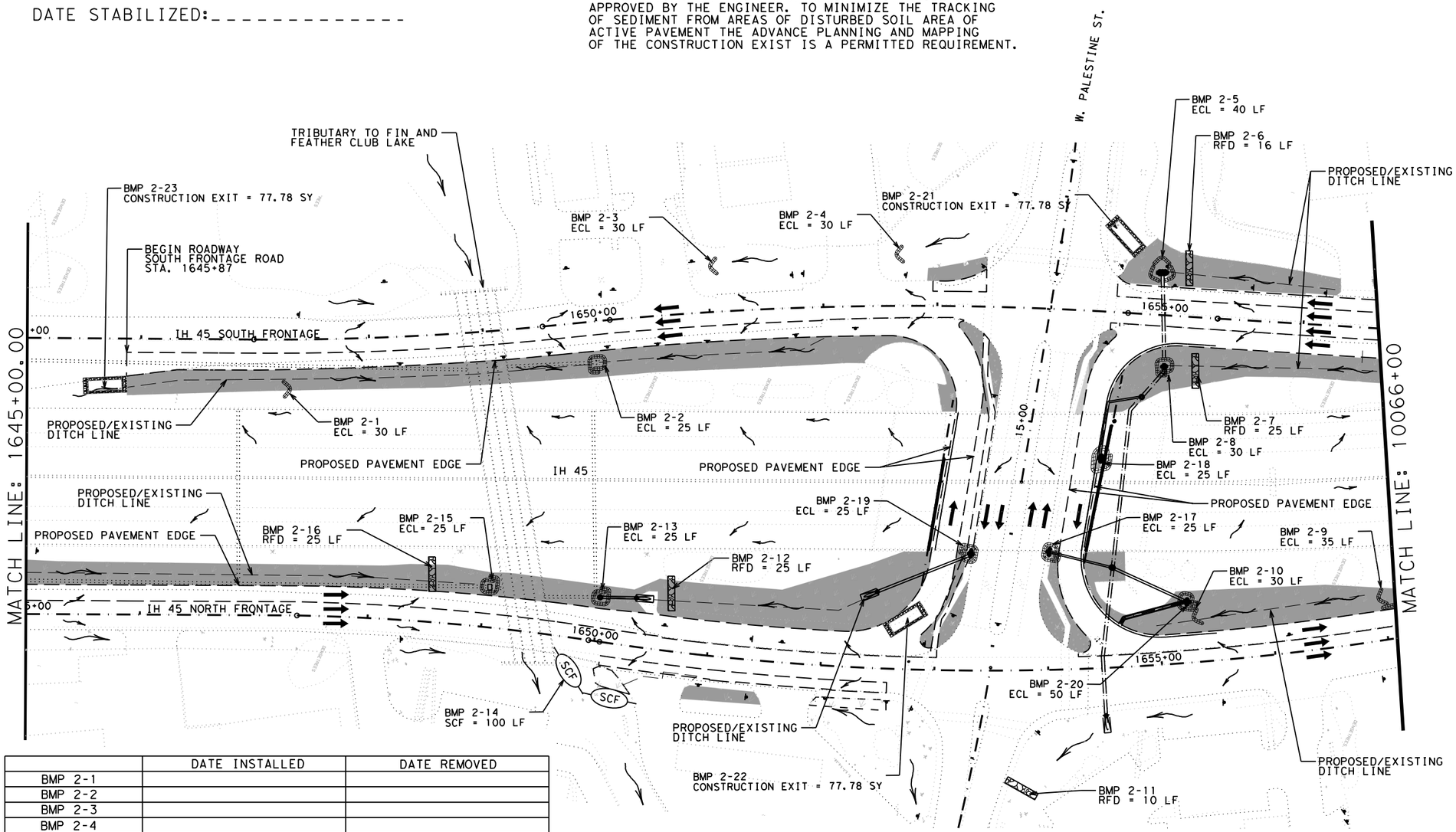
DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	184
CHECK	CONTROL	SECTION	JOB	
DN	0092	02	125	
CHECK				
NP				

DATE: 6/24/2021 TIME: 2:24:28 PM FILE: c:\txdot\pw\online\txdot5\solomon.bayou\d0450701\SW3P SITE LAYOUTS.dgn

DATE DISTURBED: _ _ _ _ _ _ _ _ _ _ _ _ _

DATE STABILIZED: _ _ _ _ _ _ _ _ _ _ _ _ _

THE LOCATIONS OF THE CONSTRUCTION EXITS WILL BE APPROVED BY THE ENGINEER. TO MINIMIZE THE TRACKING OF SEDIMENT FROM AREAS OF DISTURBED SOIL AREA OF ACTIVE PAVEMENT THE ADVANCE PLANNING AND MAPPING OF THE CONSTRUCTION EXIST IS A PERMITTED REQUIREMENT.



LEGEND:

- WATER FLOW DIRECTION
- SCF — SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- ROCK FILTER DAM (TYPE 1)
- PROPOSED BLOCK SOD/TEMP SEEDING
- CONSTRUCTION EXIT

	DATE INSTALLED	DATE REMOVED
BMP 2-1		
BMP 2-2		
BMP 2-3		
BMP 2-4		
BMP 2-5		
BMP 2-6		
BMP 2-7		
BMP 2-8		
BMP 2-9		
BMP 2-10		
BMP 2-11		
BMP 2-12		
BMP 2-13		
BMP 2-14		
BMP 2-15		
BMP 2-16		
BMP 2-17		
BMP 2-18		
BMP 2-19		
BMP 2-20		
BMP 2-21		
BMP 2-22		
BMP 2-23		

TEMPORARY SEED (PER TYPICAL SECTION)	
DATE PLACED	
PERMANENT BLOCK SOD (PER TYPICAL SECTION)	
DATE PLACED	

NOTES:

1) BMPS SHALL NOT BE INSTALLED IN THEIR CONTROL AREA ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBING ACTIVITIES IN THAT AREA.
2) EXACT LOCATION OF ROCK FILTER DAM, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE TO BE DETERMINED BY THE ENGINEER IN THE FIELD.
3) CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION CONTROL DEVICES FROM PREVIOUS PHASE(S) THROUGHOUT DURATION OF PROJECT.
4) REMOVE SEDIMENT FROM BMP WHEN IT REDUCES BMP CAPACITY BY 40%. ALWAYS PROVIDE CONSISTENT DRAINAGE.
5) CONSTRUCTION ACCESS TO BE PLACED AT THE LOCATIONS APPROVED BY THE ENGINEER.
6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

IH 45

SW3P SITE LAYOUTS

SCALE: 1"=100' SHEET 2 OF 4

DESIGN	FED. RD. DIV. NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
TP	TEXAS	18	DALLAS	185
CHECK	CONTROL	SECTION	JOB	
DN	0092	02	125	
CHECK				
NP				

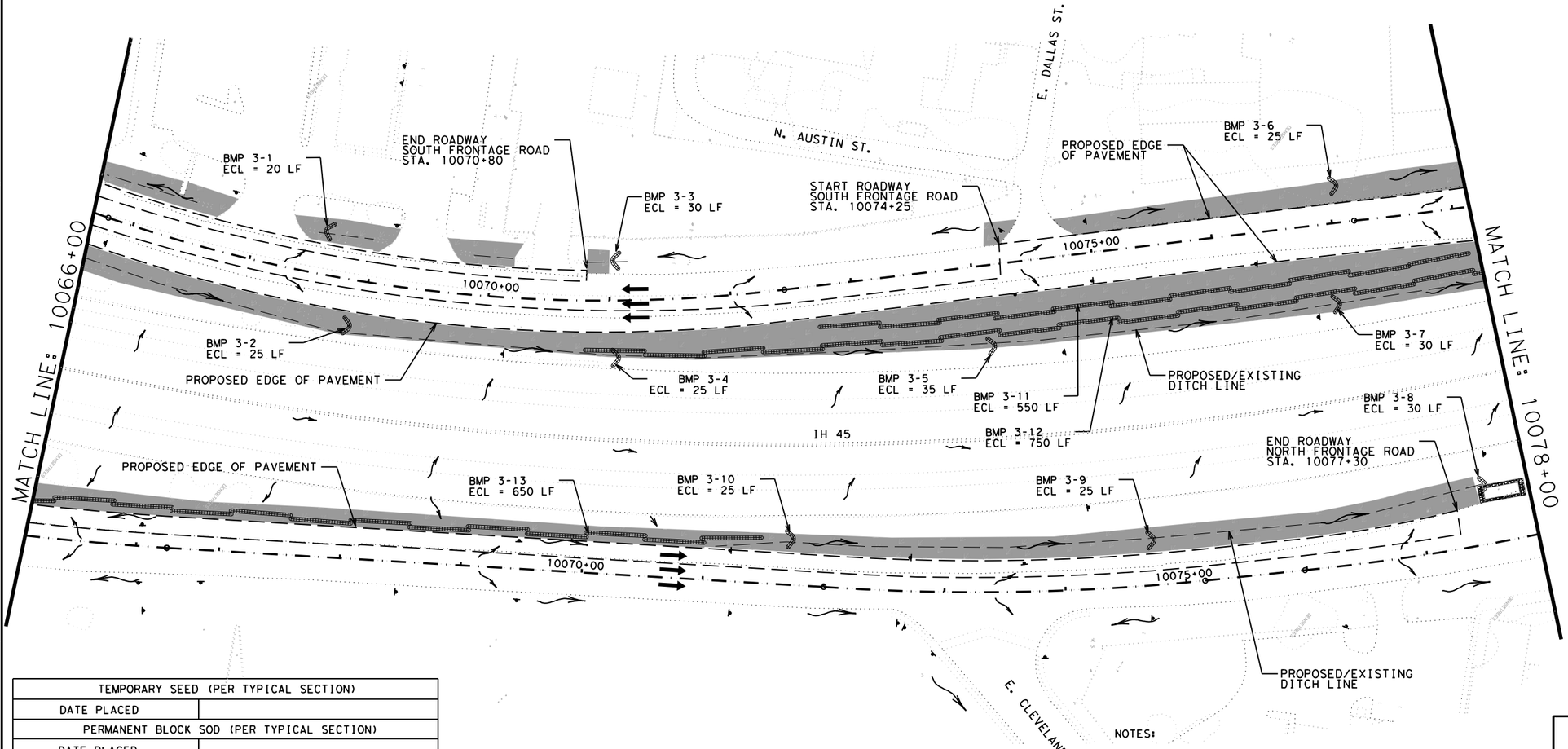
DATE: 6/24/2021 TIME: 2:24:31 PM FILE: c:\txdot\pw#online\txdot#5\solomon_bayou\d0450701\SW3P SITE LAYOUTS.dgn

DATE DISTURBED: _____

DATE STABILIZED: _____

THE LOCATIONS OF THE CONSTRUCTION EXITS WILL BE APPROVED BY THE ENGINEER. TO MINIMIZE THE TRACKING OF SEDIMENT FROM AREAS OF DISTURBED SOIL AREA OF ACTIVE PAVEMENT THE ADVANCE PLANNING AND MAPPING OF THE CONSTRUCTION EXIST IS A PERMITTED REQUIREMENT.

0 50 100



LEGEND:

- WATER FLOW DIRECTION
- SCF — SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- ROCK FILTER DAM (TYPE 1)
- PROPOSED BLOCK SOD/TEMP SEEDING
- CONSTRUCTION EXIT

TEMPORARY SEED (PER TYPICAL SECTION)	
DATE PLACED	
PERMANENT BLOCK SOD (PER TYPICAL SECTION)	
DATE PLACED	

	DATE INSTALLED	DATE REMOVED
BMP 3-1		
BMP 3-2		
BMP 3-3		
BMP 3-4		
BMP 3-5		
BMP 3-6		
BMP 3-7		
BMP 3-8		
BMP 3-9		
BMP 3-10		
BMP 3-11		
BMP 3-12		
BMP 3-13		

NOTES:

1) BMPS SHALL NOT BE INSTALLED IN THEIR CONTROL AREA ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBING ACTIVITIES IN THAT AREA.
2) EXACT LOCATION OF ROCK FILTER DAM, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE TO BE DETERMINED BY THE ENGINEER IN THE FIELD.
3) CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION CONTROL DEVICES FROM PREVIOUS PHASE(S) THROUGHOUT DURATION OF PROJECT.
4) REMOVE SEDIMENT FROM BMP WHEN IT REDUCES BMP CAPACITY BY 40%. ALWAYS PROVIDE CONSISTENT DRAINAGE.
5) CONSTRUCTION ACCESS TO BE PLACED AT THE LOCATIONS APPROVED BY THE ENGINEER.
6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

SW3P SITE LAYOUTS

SCALE: 1"=100' SHEET 3 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	186
CHECK NP	CONTROL	SECTION	JOB	
	0092	02	125	

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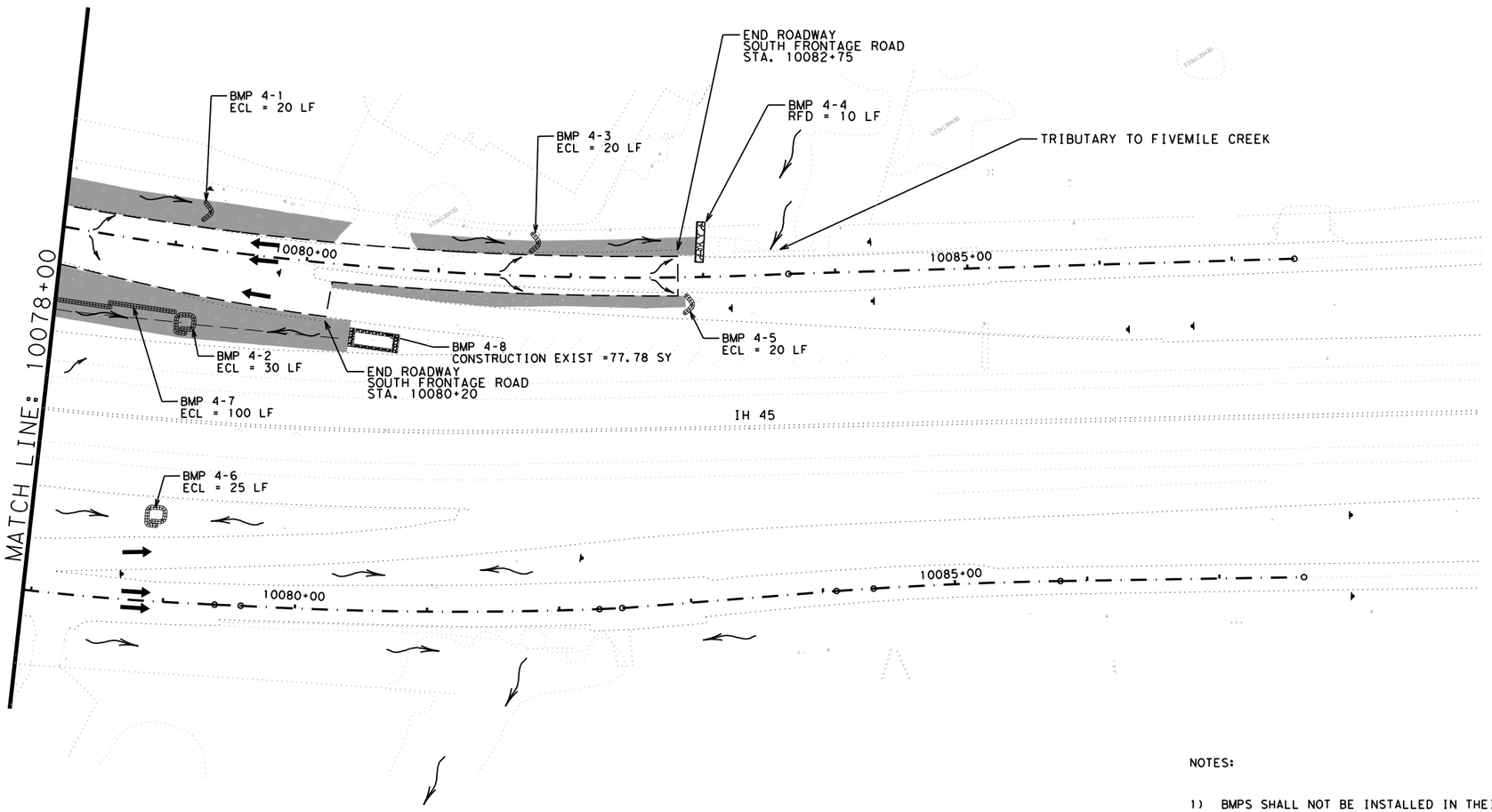
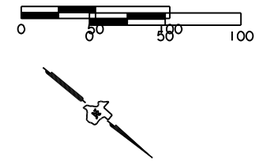
DATE: 6/24/2021 TIME: 2:24:34 PM

DATE DISTURBED: _____

DATE STABILIZED: _____

THE LOCATIONS OF THE CONSTRUCTION EXITS WILL BE APPROVED BY THE ENGINEER. TO MINIMIZE THE TRACKING OF SEDIMENT FROM AREAS OF DISTURBED SOIL AREA OF ACTIVE PAVEMENT THE ADVANCE PLANNING AND MAPPING OF THE CONSTRUCTION EXIST IS A PERMITTED REQUIREMENT.





LEGEND:

- WATER FLOW DIRECTION
- SCF — SEDIMENT CONTROL FENCE
- EROSION CONTROL LOG
- ROCK FILTER DAM (TYPE 1)
- PROPOSED BLOCK SOD/TEMP SEEDING
- CONSTRUCTION EXIT

TEMPORARY SEED (PER TYPICAL SECTION)	
DATE PLACED	
PERMANENT BLOCK SOD (PER TYPICAL SECTION)	
DATE PLACED	

	DATE INSTALLED	DATE REMOVED
BMP 4-1		
BMP 4-2		
BMP 4-3		
BMP 4-4		
BMP 4-5		
BMP 4-6		
BMP 4-7		
BMP 4-8		

NOTES:

1) BMPS SHALL NOT BE INSTALLED IN THEIR CONTROL AREA ANY SOONER THAN TWO WEEKS PRIOR TO SOIL DISTURBING ACTIVITIES IN THAT AREA.

2) EXACT LOCATION OF ROCK FILTER DAM, EROSION CONTROL LOGS AND SEDIMENT CONTROL FENCE TO BE DETERMINED BY THE ENGINEER IN THE FIELD.

3) CONTRACTOR IS RESPONSIBLE FOR MAINTAINING EROSION CONTROL DEVICES FROM PREVIOUS PHASE(S) THROUGHOUT DURATION OF PROJECT.

4) REMOVE SEDIMENT FROM BMP WHEN IT REDUCES BMP CAPACITY BY 40%. ALWAYS PROVIDE CONSISTENT DRAINAGE.

5) CONSTRUCTION ACCESS TO BE PLACED AT THE LOCATIONS APPROVED BY THE ENGINEER.

6) SEE DAILY WORK REPORTS FOR INITIAL STABILIZATION TIME FRAMES.

STATE OF TEXAS
SOLOMON BAYOU
127501
LICENSED
PROFESSIONAL ENGINEER

solomonbayou , P.E. 6/15/21
Signature of Registrant & Date

Texas Department of Transportation

IH 45

SW3P SITE LAYOUTS

SCALE: 1"=100' SHEET 4 OF 4

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
TP	6	SEE TITLE SHEET		IH 45
GRAPHICS TP	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK DN	TEXAS	18	DALLAS	187
CHECK NP	CONTROL	SECTION	JOB	
	0092	02	125	

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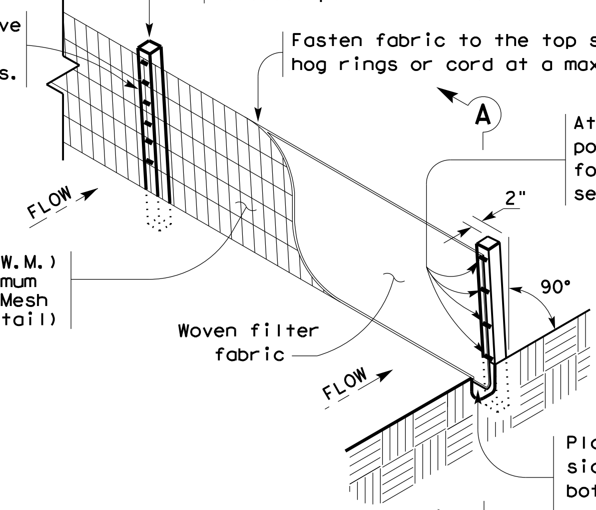
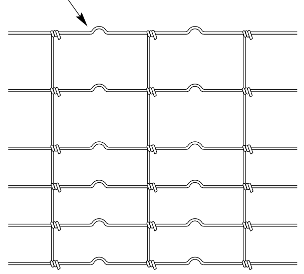


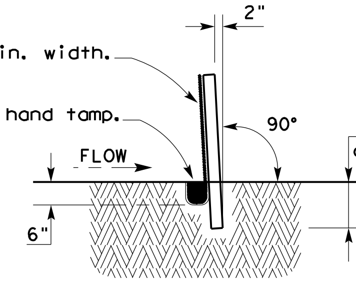
TEMPORARY SEDIMENT CONTROL FENCE

SCF



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.



SECTION A-A

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.

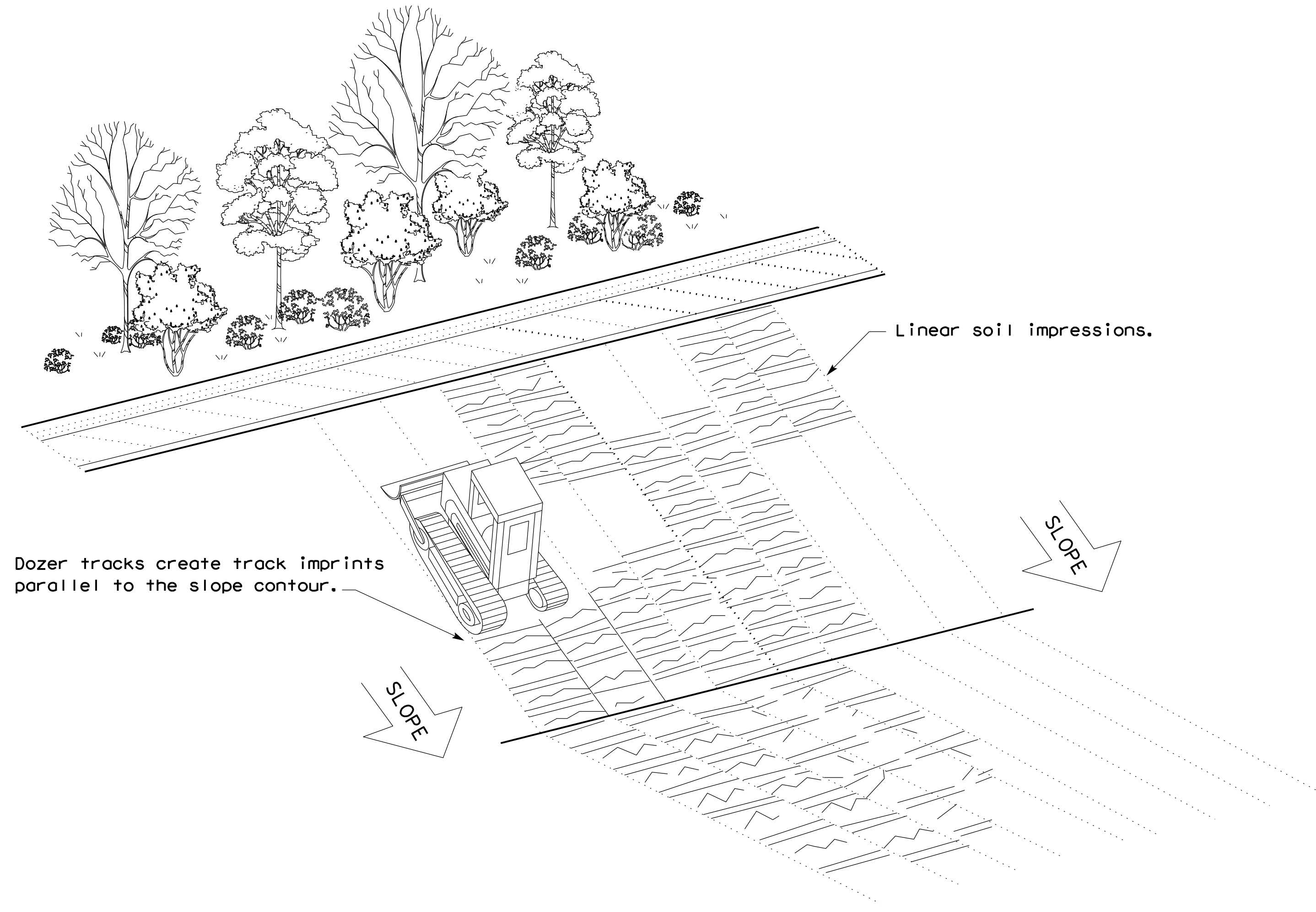
LEGEND

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	0092	02	125	IH 45
	DIST		COUNTY	SHEET NO.
	18		DALLAS	188

DATE: 6/15/2021
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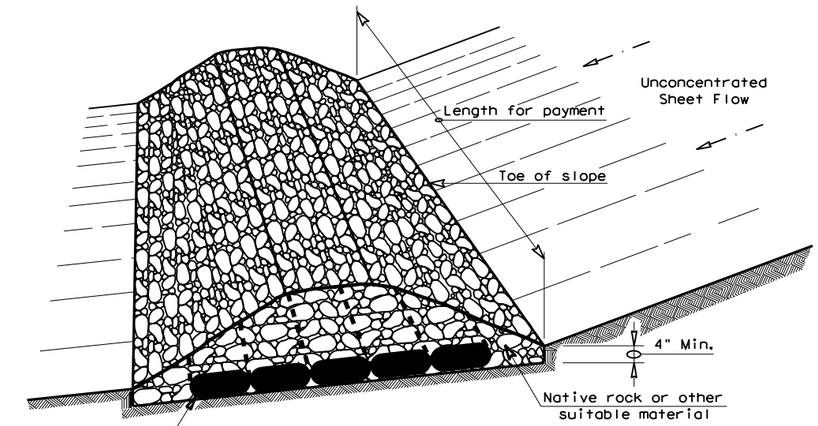
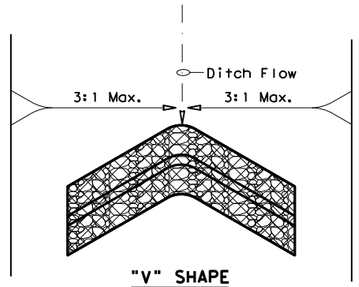
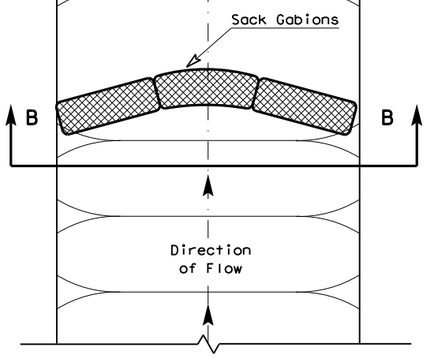


FILTER DAM AT TOE OF SLOPE

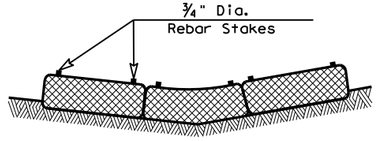
RFD1



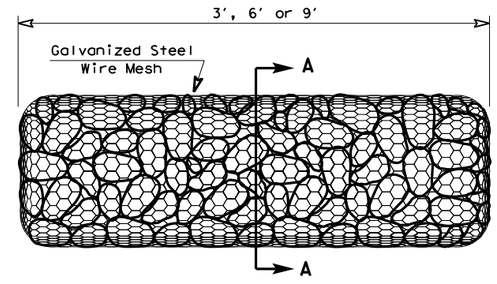
"V" SHAPE PLAN VIEW



PLAN VIEW

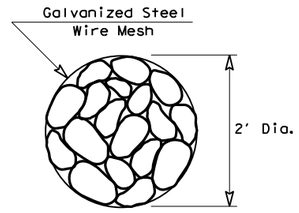


SECTION B-B

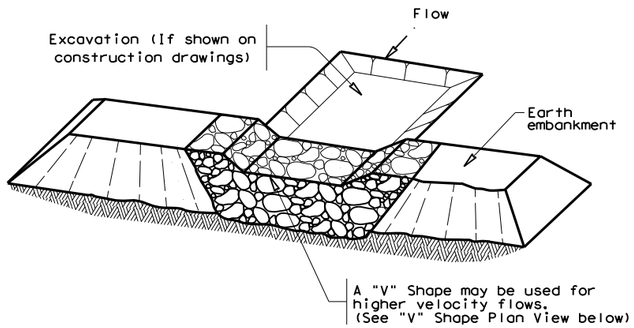


TYPE 4 (SACK GABIONS)

RFD4

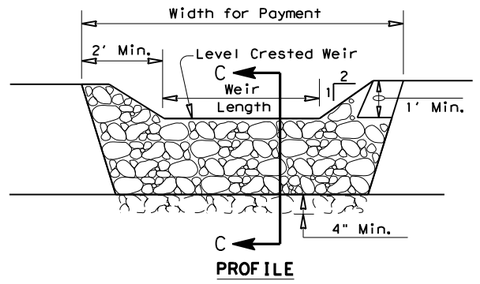


SECTION A-A

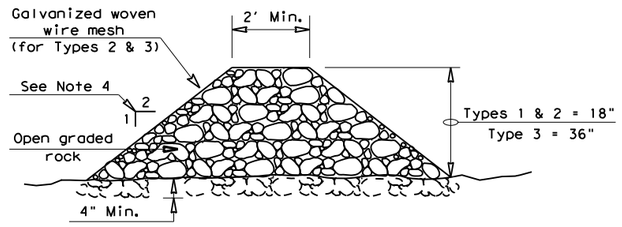


FILTER DAM AT SEDIMENT TRAP

RFD1 OR RFD2



PROFILE



SECTION C-C

ROCK FILTER DAM USAGE GUIDELINES

Rock Filter Dams should be constructed downstream from disturbed areas to intercept sediment from overland runoff and/or concentrated flow. The dams should be sized to filter a maximum flow through rate of 60 GPM/FT^2 of cross sectional area. A 2 year storm frequency may be used to calculate the flow rate.

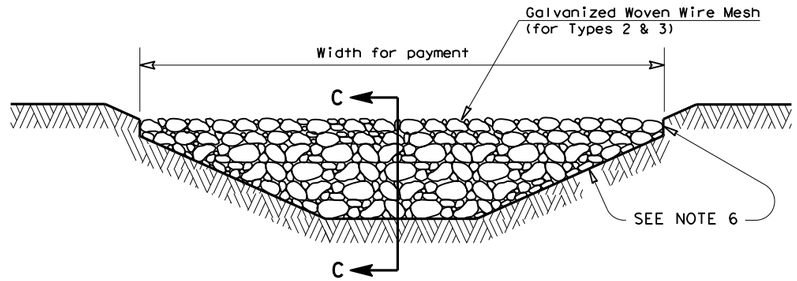
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity flows (approximently 8 Ft/Sec or more) in which aggregate wash out may occur. Sandbags may be used at the embedded foundation (4" deep min.) for better filtering efficiency of low flows if called for on the plans or directed by the Engineer.

Type 2 (18" high with wire mesh) (3" to 6" aggregate): Type 2 may be used in ditches and at dike or swale outlets.

Type 3 (36" high with wire mesh) (4" to 8" aggregate): Type 3 may be used in stream flow and should be secured to the stream bed.

Type 4 (Sack gabions) (3" to 6" aggregate): Type 4 May be used in ditches and smaller channels to form an erosion control dam.

Type 5: Provide rock filter dams as shown on plans.



FILTER DAM AT CHANNEL SECTIONS

RFD1 OR RFD2 OR RFD3

GENERAL NOTES

1. If shown on the plans or directed by the Engineer, filter dams should be placed near the toe of slopes where erosion is anticipated, upstream and/or downstream at drainage structures, and in roadway ditches and channels to collect sediment.
2. Materials (aggregate, wire mesh, sandbags, etc.) shall be as indicated by the specification for "Rock Filter Dams for Erosion and Sedimentation Control".
3. The rock filter dam dimensions shall be as indicated on the SW3P plans.
4. Side slopes should be 2:1 or flatter. Dams within the safety zone shall have sideslopes of 6:1 or flatter.
5. Maintain a minimum of 1' between top of rock filter dam weir and top of embankment for filter dams at sediment traps.
6. Filter dams should be embedded a minimum of 4" into existing ground.
7. The sediment trap for ponding of sediment laden runoff shall be of the dimensions shown on the plans.
8. Rock filter dam types 2 & 3 shall be secured with 20 gauge galvanized woven wire mesh with 1" diameter hexagonal openings. The aggregate shall be placed on the mesh to the height & slopes specified. The mesh shall be folded at the upstream side over the aggregate and tightly secured to itself on the downstream side using wire ties or hog rings. For in stream use, the mesh should be secured or staked to the stream bed prior to aggregate placement.
9. Sack Gabions should be staked down with ¾" dia. rebar stakes, and have a double-twisted hexagonal weave with a nominal mesh opening of 2 ½" x 3 ¼"
10. Flow outlet should be onto a stabilized area (vegetation, rock, etc.).
11. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

PLAN SHEET LEGEND

Type 1 Rock Filter Dam — RFD1
Type 2 Rock Filter Dam — RFD2
Type 3 Rock Filter Dam — RFD3
Type 4 Rock Filter Dam — RFD4

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		189

DATE: 6/15/2021
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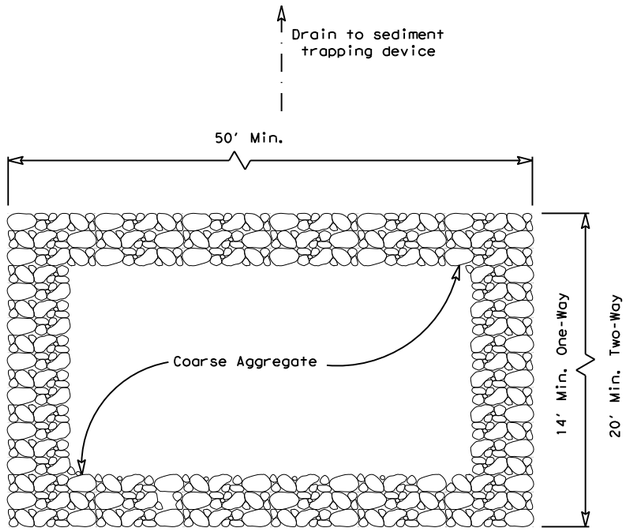
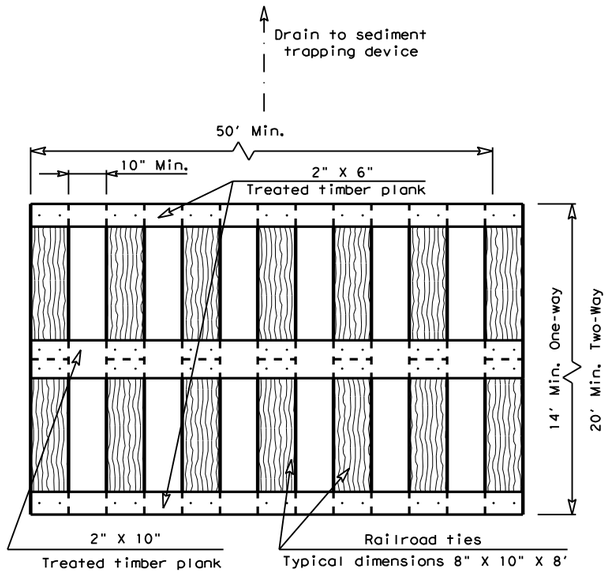


PLAN VIEW



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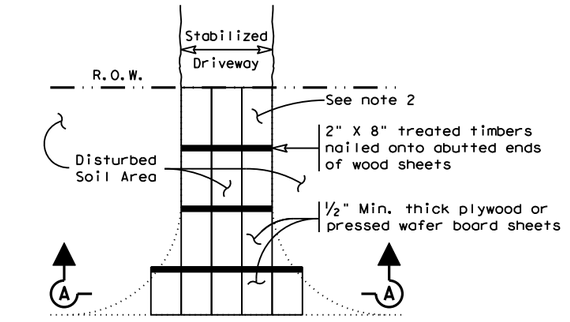

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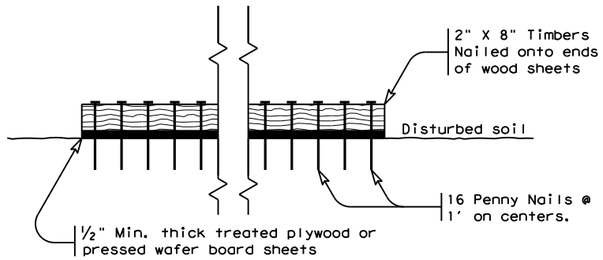
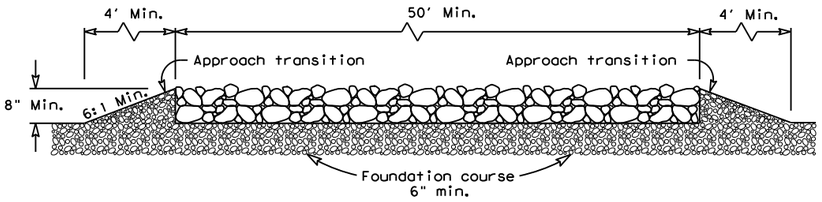


SECTION A-A

CONSTRUCTION EXIT (TYPE 3)

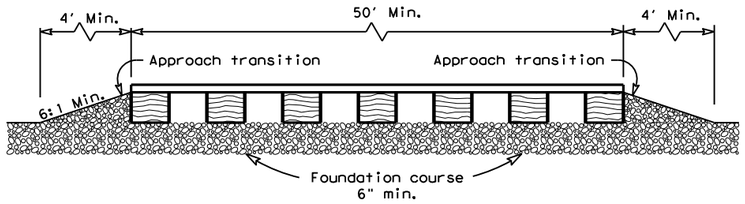
SHORT TERM



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK CONSTRUCTION (LONG TERM)



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 1)

1. The length of the type 1 construction exit shall be as indicated on the plans, but not less than 50'.
2. The coarse aggregate should be open graded with a size of 4" to 8".
3. The approach transitions should be no steeper than 6:1 and constructed as directed by the Engineer.
4. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other materialas approved by the Engineer.
5. The construction exit shall be graded to allow drainage to a sediment trapping device.
6. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
7. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

CONSTRUCTION EXITS

EC(3)-16

FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		190

DATE: 6/15/2021
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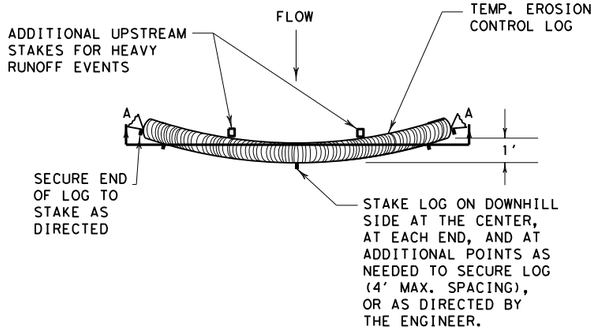
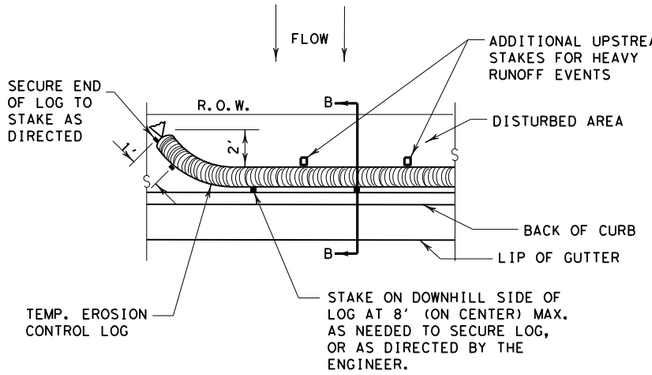


PLAN VIEW



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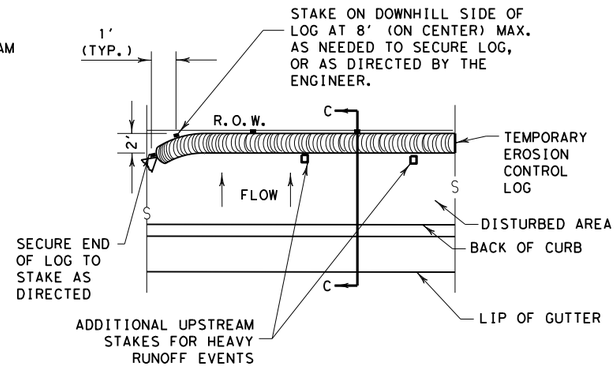

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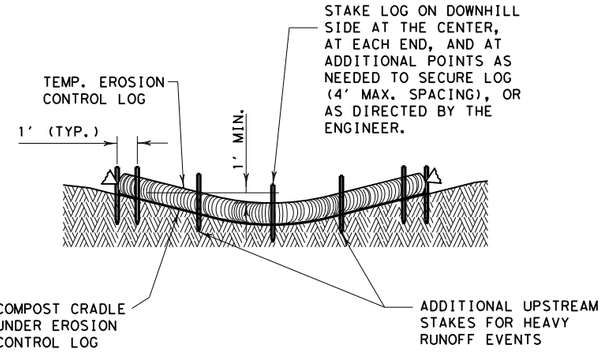
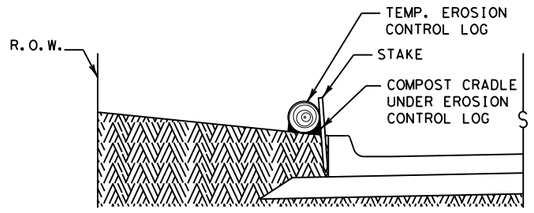


SECTION A-A

EROSION CONTROL LOG DAM

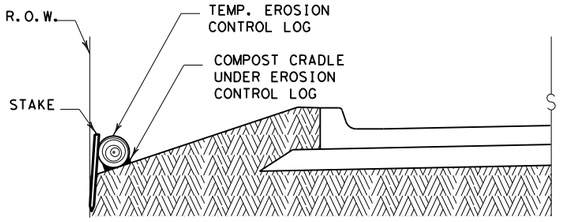
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

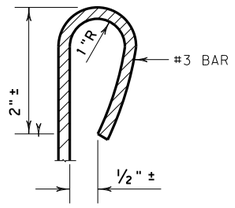
CL-BOC



SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW



REBAR STAKE DETAIL

LEGEND

- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

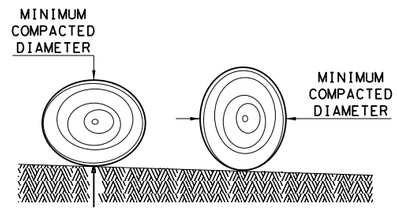
Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0092	02	125		IH 45		
	DIST	COUNTY			SHEET NO.		
	18	DALLAS			191		

DATE: 6/15/2021
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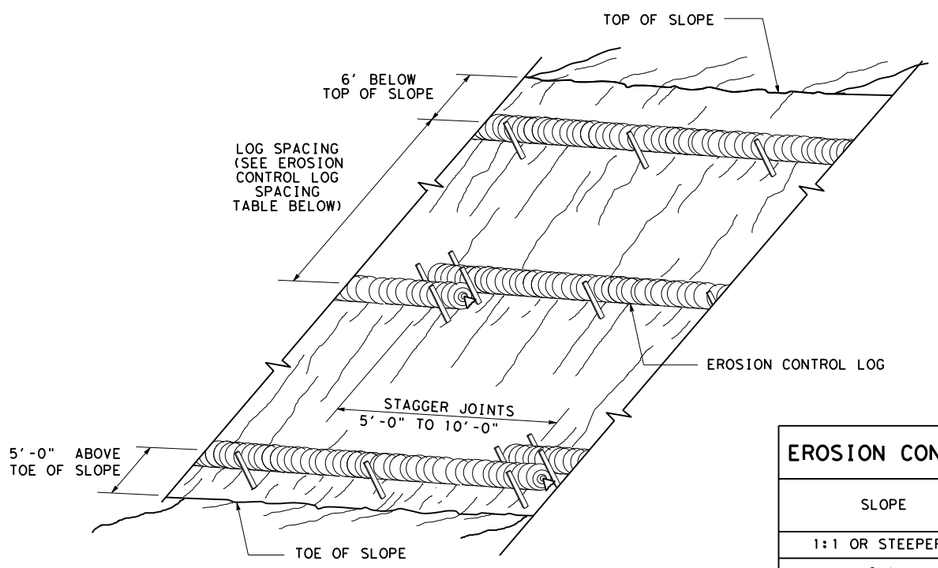
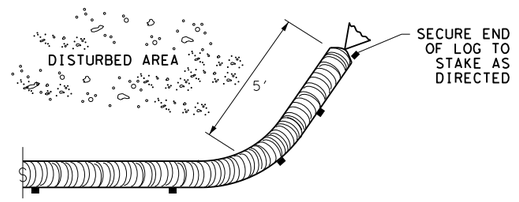


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

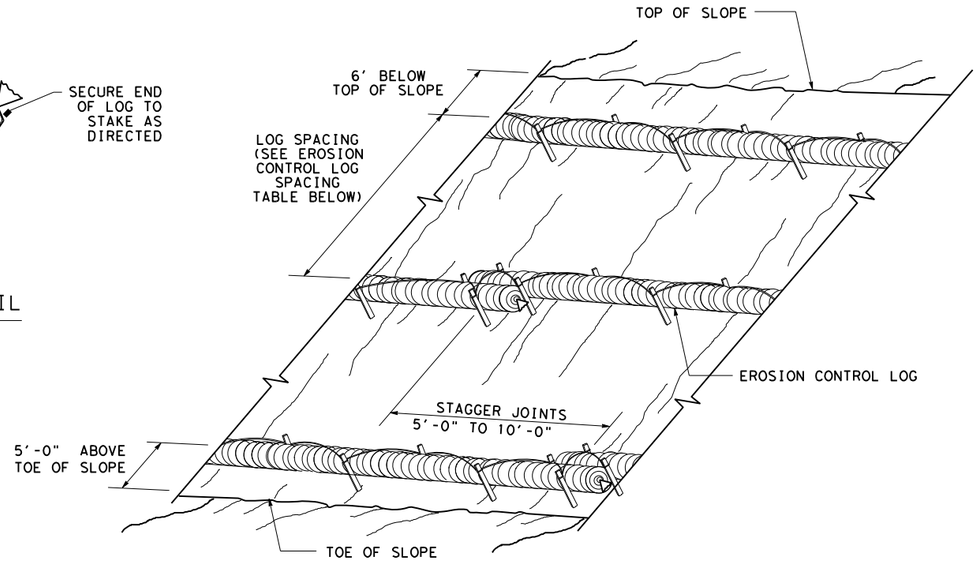
CL-SST



END SECTION RAP DETAIL

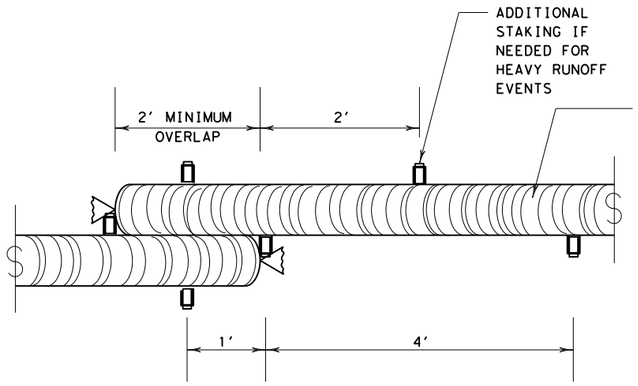
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5'	10'	15'	20'
2:1	10'	20'	30'	40'
3:1	15'	30'	45'	60'
4:1 OR FLATTER	20'	40'	60'	80'

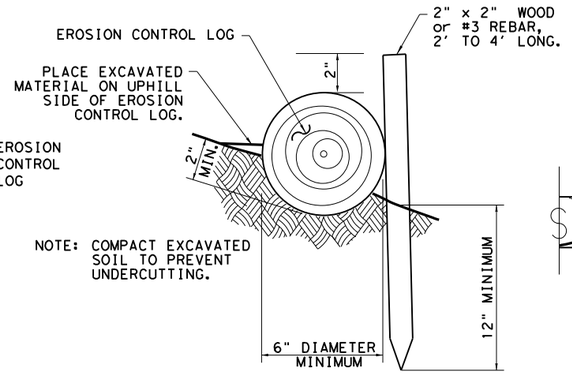
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

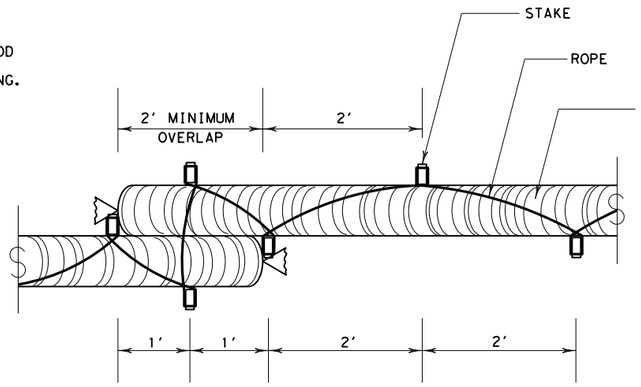


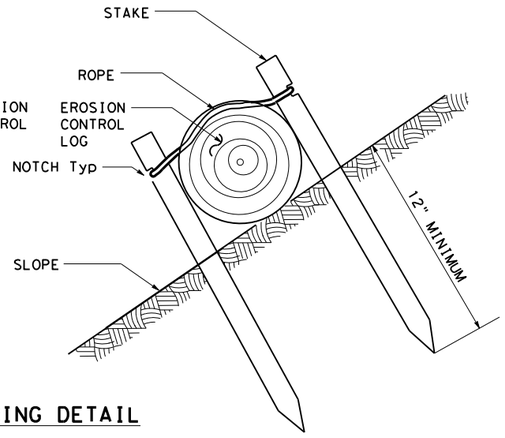


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

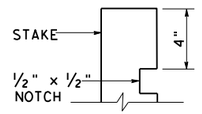
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES
EROSION CONTROL LOG
EC(9)-16

FILE: ec116	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS	
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0092	02	125	IH 45	
	DIST	COUNTY		SHEET NO.	
	18	DALLAS		192	

DATE: 6/15/2021
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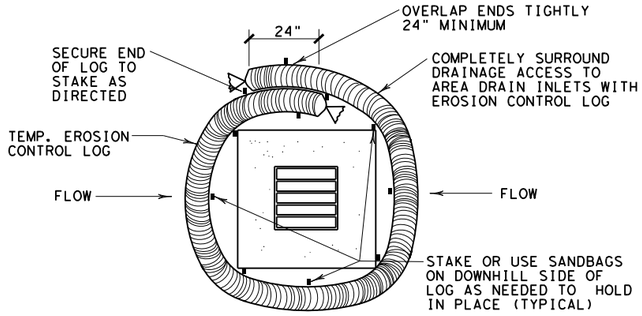
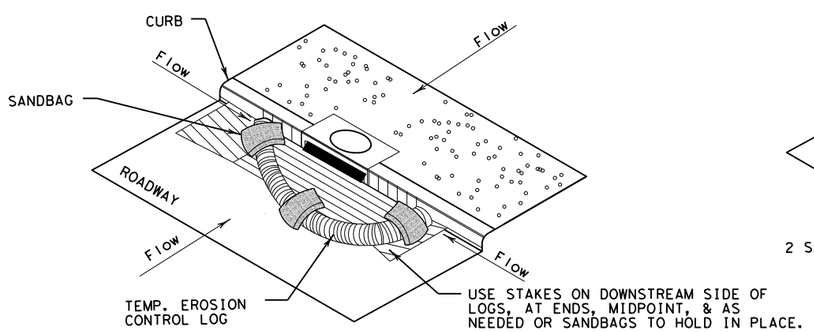


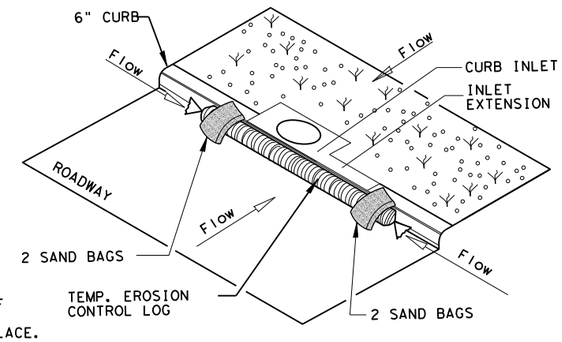
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

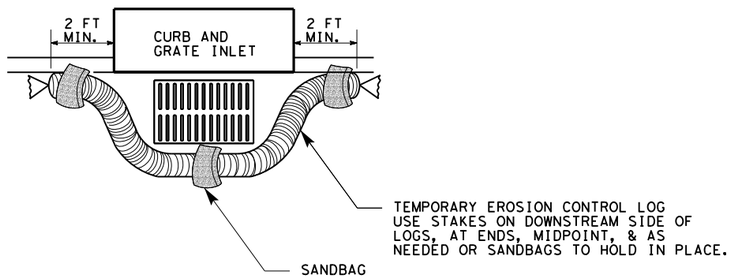
CL-CI



EROSION CONTROL LOG AT CURB INLET

CL-CI

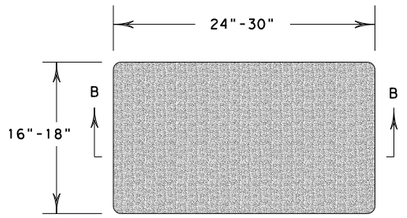
NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.



EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI

SECTION B-B



SANDBAG DETAIL

SHEET 3 OF 3

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT	CK: KM	DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0092	02	125	IH 45
	DIST	COUNTY		SHEET NO.
	18	DALLAS		193

USER ID

SURFACE PREPARATION ITEM 160* TOPSOIL SY / ITEM 161* COMPOST MANUF. TOPSOIL (BOS) (4") SY

SURFACE PREPARATION

Prepare planting area surface BEFORE placing Topsoil, Compost, Fertilizer, Seed and/or Sod.
Once project area has been completed to final lines, grade and compaction, remove objectionable materials from planting area surface and cultivate existing surface to a depth of 4 inches, unless otherwise specified or directed.

Refer to Items 160 and 161 of TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.

TOPSOIL NOTES:
1. When Topsoil is specified under Item 160, use suitable material salvaged from the project ROW in accordance with Item 160 specifications, and/or secure additional good material from approved sources.
2. Topsoil shall include only the top 6 inches of its native surface, and be easily cultivated, fertile, erosion-resistant and free of objectionable materials.
3. Topsoil obtained from sites outside of the ROW must come from approved sources and have a pH between 5.5 and 8.5 su.
4. Place Topsoil on pre-cultivated surface, spread to a uniform loose cover at thickness specified, and shape per plans. Water and roll the finished surface with a light roller or other suitable equipment per Item 160.3; do not over-compact.

COMPOST NOTES:
1. When Compost Manufactured Topsoil (4") is specified under Item 161, use compost meeting all requirements of Item 161.2 and Table 1. Provide quality control (QC) documentation and obtain Engineer approval prior to compost delivery.
2. Contractor shall provide tickets/invoices that document material type, quantity and placement for all compost delivered.
3. Additional topsoil may be required to be imported to achieve the compost/topsoil mix ratio. Topsoil must meet Item 160 specifications.

APPLICATION OF COMPOST MANUFACTURED TOPSOIL (4")

AFTER Surface Preparation, uniformly spread a 1-inch layer of compost on-grade with 3 inches topsoil over pre-cultivated planting area. (25% compost and 75% topsoil = 1" compost and 3" topsoil.)
Then mix compost and topsoil together by cultivating the compost into the topsoil (by till or disk) to a 4-inch (4") depth.
Roll the finished surface with a light corrugated drum; do not over-compact.

FERTILIZER ITEM 166* FERTILIZER AC

SOIL ANALYSIS FOR FERTILIZER APPLICATION RATE

Unless otherwise stated in the plans, Contractor shall perform at least one soil analysis on each project before fertilization, and submit results to Engineer with recommended fertilizer rates based on soil analysis.
Engineer may direct sample location(s). Soil analysis may be waived if both compost and sod are used on entire project.

FERTILIZER NOTES:
1. Refer to Item 166 of TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
2. Apply fertilizer BEFORE seeding, or AFTER placing sod.
3. Use fertilizer containing nitrogen (N), phosphoric acid (P) and potash (K) nutrients, unless otherwise specified. At least 50% of the Nitrogen component shall be a slow-release sulfur-coated urea as described in Item 166.3. Do not apply more than 60 lbs Nitrogen per acre without Engineer concurrence.
4. Deliver fertilizer in bags, clearly labeled to show contents, unless otherwise specified or approved prior to delivery. When non-bagged, loose fertilizer is approved, provide documentation for each load of material delivered, to validate authenticity of the material.
5. Apply fertilizer uniformly, as a dry, granular material, essentially dust-free, and do not mix with water for application as a slurry.
6. When both temporary and permanent seeding are specified for the same area, apply half of the required fertilizer before the temporary seeding operation and the other half before the permanent seeding operation.

SEEDING FOR EROSION CONTROL ITEM 164* DRILL SEEDING AC

RECOMMENDED PLANTING SEASON	PERMANENT RURAL SEED MIX ITEM 164 - DRILL SEEDING (PERM) (RURAL)(CLAY)		PERMANENT URBAN SEED MIX ITEM 164 - DRILL SEEDING (PERM) (URBAN)(CLAY)		TEMPORARY DRILL SEED MIX ITEM 164 - DRILL SEEDING (TEMP) (WARM OR COOL)	
		Pure Live Seed Rate**		Pure Live Seed Rate**		Pure Live Seed Rate**
WARM SEASON Mar.15th, April, May, June, July, August, Sept. 15th	Green Sprangletop (Van Horn)	- 1.0 lbs/AC	Green Sprangletop (Leptochloa dubia)	- 0.3 lbs/AC	Foxtail Millet (Setaria italica)	- 34 lbs/AC
	Sideoats Grama (Haskell)	- 1.0 lbs/AC	Sideoats Grama (El Reno)(Bouteloua curtipendula)	- 3.6 lbs/AC		
	Texas Grama (Atascosa)	- 1.0 lbs/AC	Buffalograss (Texoka)(Buchloe dactyloides)	- 1.6 lbs/AC		
	Hairy Grama (Chaparral)	- 0.4 lbs/AC	Bermudagrass (Cynodon dactylon)	- 2.4 lbs/AC		
	Shortspike Windmillgrass (Welder)	- 0.2 lbs/AC				
	Little Bluestem (OK Select)	- 0.8 lbs/AC				
	Purple Prairie Clover (Cuero)	- 0.6 lbs/AC				
	Engelmann Daisy (Eldorado)	- 0.75lbs/AC				
	Illinois Bundleflower	- 1.3 lbs/AC				
	Awnless Bushsunflower (Plateau)	- 0.2 lbs/AC				
COOL SEASON Sept 16th, Oct, Nov, Dec, Jan, Feb, Mar 14th						Pure Live Seed Rate**
					Tall Fescue (Festuca arundinaceae)	- 4.5 lbs/AC
					Western Wheatgrass (Agropyron smithii)	- 5.6 lbs/AC
					Red Winter Wheat (Triticum aestivum)	- 34 lbs/AC
					Cereal Rye	- 34 lbs/AC

SEEDING NOTES:
1. When seeding is specified under Item 164, refer to TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown. Materials and construction shall meet specifications.
2. Conduct seeding upon completion of each applicable construction stage (dependent upon planting season requirements), without compensation for additional move-ins.
3. Place seed AFTER preparing planting area surface. Refer to Surface Preparation detail this sheet, as well as Topsoil Item 160 and Compost Manufactured Topsoil Item 161 when specified. Apply fertilizer per Item 166 BEFORE seeding, per specifications and this sheet, to help drill the fertilizer into the soil.
4. When temporary grasses are well-established and more than 2 inches tall, mow planting area before seeding permanent grasses; mowing for this purpose will be subsidiary. When vegetation is not already well-established, cultivate planting area to a depth as described in Item 164.3, before temporary seeding and before permanent seeding.
5. Seed material must be appropriate to the location, soil type and season. Use the seed mix species and pure live seed rates designated in Tables 1-4 of the TxDOT 2014 Standard Specifications* for Item 164, unless otherwise specified.
6. All seed shall meet labeling, delivery, analysis, and testing requirements described in Item 164.2.1. Deliver seed in labeled, unopened bags or containers to Engineer prior to planting.
7. Uniformly plant seed over the designated planting area, along the contour of slopes, and drill seed to a depth as described in Item 164.3.4.
8. Hydroseeding may be allowed, when specified or Engineer concurs.
9. Implement and continue Vegetative Watering per the schedule, rate and volume specified under Item 168.

TXDOT REFERENCE MATERIALS:

- * "STANDARD SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES" 2014
- "A GUIDANCE TO ROADSIDE VEGETATION ESTABLISHMENT" 2004
- ONLINE TRAINING COURSE: MNT415 REVEGETATION DURING CONSTRUCTION
- DALLAS DISTRICT "VEGETATION ESTABLISHMENT GUIDELINES"

SODDING FOR EROSION CONTROL ITEM 162* BLOCK SOD (BERMUDA) SY

BLOCK OR ROLL SOD	COMMON NAME	BOTANICAL NAME
	Common Bermuda Grass	Cynodon dactylon

SODDING NOTES:
1. Refer to Item 162 of TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
2. Place sod between the average date of the last freeze in the Spring and 6 weeks before the average date of the first freeze in the Fall, per the Texas Almanac for the project area.
3. Place sod only AFTER soil surface preparation is complete as detailed in this sheet. Dry soil may require pre-watering.
4. Place all sod (blocks or rolls) within 24 hours of delivery to the site, and keep moist from the time it is dug up until it is planted. Sod with dried roots will not be accepted.
5. Place sod with joints alternating on each row to prevent all joints from lining up, and place blocks firmly against adjacent blocks. Roll, tamp and trim sod per Item 162.3.
6. Place fertilizer promptly AFTER sodding operation is complete in each area.
7. Water sod immediately following placement, and continue Vegetative Watering per Item 168.

VEGETATIVE WATERING FOR ESTABLISHING SEED AND SOD ITEM 168* VEGETATIVE WATERING MG

WATERING SCHEDULE

SEASON (Usual Months)	RATE	TIME SCHEDULE	TOTAL WATER ESTIMATE
SPRING & FALL (March, April, May, October)	7,000 gallons/acre per working day	Vegetative watering for seed shall begin on the day after rainfall described below and continue for 60 consecutive working days; vegetative watering for sod shall begin on the day the sod is placed and continue for a minimum of 15 consecutive working days.	420,000 gallons/acre (60 working days)
SUMMER (June, July, August, September)	12,000 gallons/acre per working day		720,000 gallons/acre (60 working days)
WINTER (November through February)	1,000 gallons/acre per working day	Vegetative watering for seed and/or sod shall begin on the day after placement for 15 consecutive working days	15,000 gallons/acre (15 working days)

Notes: Rate and frequency may be adjusted, with the approval of the Engineer, to meet site conditions (especially with sod).
For informational purposes only: 1,000 gallons equals 1 MG

VEGETATIVE WATERING NOTES:
1. Refer to Item 168 of TxDOT 2014 Standard Specifications* for specifications, dimensions, volumes, and measurements that have been modified or not shown in plans. Materials and construction shall meet all specifications.
2. Use clean water free of industrial waste and other substances harmful to vegetation growth, per Item 168.2.
3. Use Vegetative Watering to keep the seed bed moist during germination; not to provide initial watering. After drill seeding, postpone watering operations until site receives at least 1/2-inch of natural rainfall in a single day. Delay watering operations for warm season grasses until soil temperature exceeds 70 degrees F.
4. For sod, water immediately.
5. All water distribution equipment shall be furnished and operated to provide water at a uniform and controllable rate. Use a metering device on all watering equipment.
6. Evenly distribute water over entire area designated for seeding and/or sodding, using even spray patterns that do not disturb seed bed and/or dislodge seed from seed bed.
7. Do not water between the hours of 12:00 p.m. and 6:00 p.m. when daytime temperatures exceed 95 degrees F.
8. After initial establishment period, continue intermittent watering of newly established seed or sod at a rate of approximately 1-inch water/week, during summer months until end of contract.
9. If 1/4-inch or more of rainfall occurs on site on any given working day, no vegetative watering will be needed on that working day. (Note: 1/4-inch rain equals 7,000 gallons of water per acre.)
10. Should the Contractor fail to apply the specified amount of water within the time allowed, any seed or sod in poor condition shall be replaced, fertilized, and watered at Contractor's expense.

**Note: The amount of Pure Live Seed (PLS) in one pound of bulk seed is based on three factors: % Purity, % Germination, and % Dormant. Use the following formula to calculate PLS in bulk seed: PLS = % Purity X (% Germination + % Dormant) Ensure that the specified amount of pure live seed is placed.

ROADSIDE MOWING ITEM 730* PROJECT MAINTENANCE AC

MOWING NOTES:
1. During project construction, once seed is established, use mowing to promote permanent grasses by mowing any remaining temporary grasses.
2. Also mow established turf and ROW grasses in designated areas of project limits as specified or directed by Engineer.
3. Remove litter and debris prior to mowing.
4. Do not mow on wet ground when soil rutting can occur.
5. Hand-trim around obstructions and stormwater control devices as needed.
6. Maintain paved surfaces free of tracked soils and clipped vegetation.

SEQUENCE OF WORK:

- CULTIVATE SURFACE SOIL.
- PREPARE / PLACE TOPSOIL, OR
- PREPARE / PLACE COMPOST MANUFACTURED TOPSOIL.
- APPLY FERTILIZER AND THEN PLACE SEEDING, OR
- PLACE SOD AND THEN APPLY FERTILIZER.
- CONDUCT VEGETATIVE WATERING.
- CONDUCT ROADSIDE MOWING, AS DIRECTED.

Texas Department of Transportation

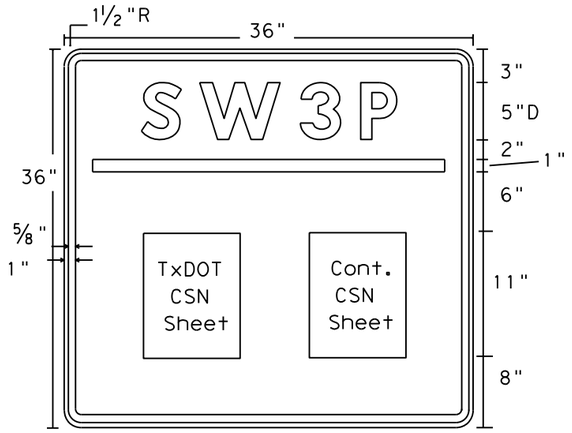
VEGETATION ESTABLISHMENT SHEET

(DALLAS DISTRICT)

TEMPLATE REVISION DATE: 02/21/19

DESIGN	FED.RD. DIV.NO.	FEDERAL AID PROJECT NO.		HIGHWAY NO.
CPB	6	(See Title Sheet)		IH 45
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
XXX	TEXAS	DALLAS	DALLAS	
CHECK	CONTROL	SECTION	JOB	194
XXX	0092	02	125	
CHECK				
XXX				

DATE



SW3P SIGN

TxDOT & Contractor Construction Site Note (CSN)

Sign Dimensions

36" X 36"

Letters - White
Numbers - White
Border - White
Background - Blue

GENERAL NOTES:

1. The alphabets and lateral spacing between letters and numerals shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways", (TMUTCD) latest edition, and the "Compliant Work Zone Traffic Control Devices List". Lateral spacing of text shall provide a balanced appearance. All materials shall conform to Department Specifications.
2. Legend and border may be applied by reverse screening process with transparent colored ink, cut-out white reflective sheeting applied to colored background or combination thereof. Background shall be reflective sheeting Type C.
3. CSN Sheets will be laminated and attached to the sign with an adhesive. Ensure sheets remain dry. (See Figure 1).
4. SW3P Signs should be placed just inside the ROW line at the project limits at a readable height. It may be placed perpendicular or parallel to ROW line. If the sign cannot be placed outside the clear zone, it will be mounted per TMUTCD requirements.
5. Final location of the signs will be as approved by the Engineer.

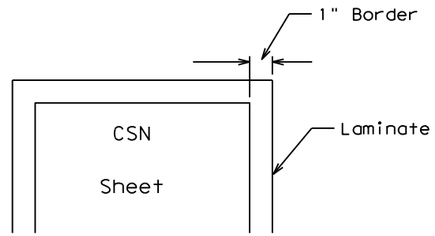
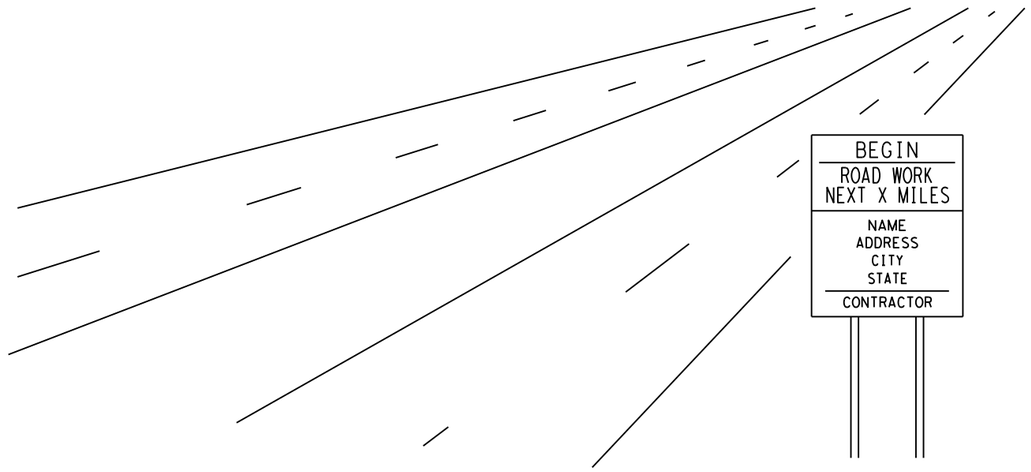
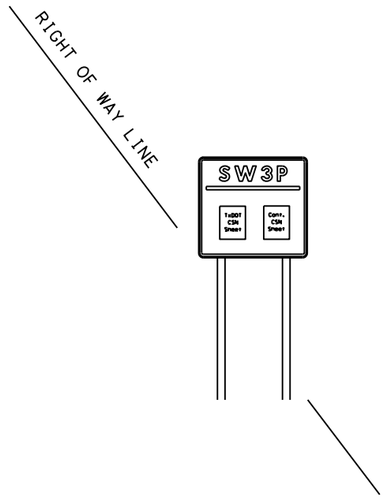


Figure 1





DEPARTMENT MATERIAL SPECIFICATIONS	
PLYWOOD SIGN BLANKS	DMS-7100
FLAT SURFACE REFLECTIVE SHEETING	DMS-8300
VINYL NON-REFLECTIVE DECAL SHEETING	DMS-8320

COLOR	USAGE	REFLECTIVE SHEETING OR OTHER MATERIAL
BLUE	BACKGROUND	TYPE C (FLUORESCENT PRISMATIC)
WHITE	LEGEND & BORDERS	VINYL NON-REFLECTIVE DECAL SHEETING

Texas Department of Transportation
DALLAS DISTRICT STANDARD

SW3P SIGN SHEET

FILE:	DN: TxDOT	CK:	DW:	CK:	
© TxDOT 2016	DISTRICT	FEDERAL AID PROJECT			SHEET
	18	SEE TITLE SHEET			195
REVISION DATE: 10-16-15	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	DALLAS		0092	02	125	IH 45

LEVELS DISPLAYED
PATH: