SEE SHEET 2 FOR INDEX OF SHEETS

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

FHWA TEXAS DIVISION	PROJECT NO.		SHEET NO.
	F 2022(381)		1
STATE	DISTRICT	COUNTY	
TEXAS	LFK	SHELBY	
CONTROL	SECTION	JOB	HIGHWAY NO.
0809	02	069	US 96

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

FEDERAL PROJECT NO. F 2022(381)

US 96
SHELBY COUNTY

FUNCTIONAL CLASS.: RURAL PRINCIPAL ARTERIAL

DESIGN SPEED = 40 MPH
ADT (2018) = 3300
ADT (2038) = 5400

FINAL PLANS

LETTING DATE: _____
DATE CONTRACTOR BEGAN WORK: _____
DATE WORK WAS COMPLETED: _____
DATE WORK WAS ACCEPTED: _____
FINAL CONTRACT COST: $ _____
CONTRACTOR: _____

CONSTRUCTION WORK ON THIS PROJECT WAS PERFORMED IN ACCORDANCE WITH PLANS, CONTRACT AND APPROVED CHANGE ORDERS.

_____ DATE _____

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., SUITE 1400 DALLAS, TEXAS 75202
Firm No. F-761

STATE OF TEXAS
DAVID A. NUFER
68818
LICENSED PROFESSIONAL ENGINEER

RECOMMENDED FOR LETTING: 9/28/2022

DAVID ALAN NUFER, PE
PROJECT MANAGER

NET LENGTH OF PROJECT = 26,040 FT. = 4.932 MI.

LIMITS: FROM 0.35 MILES S OF FM 417 TO SAN AUGUSTINE COUNTY LINE

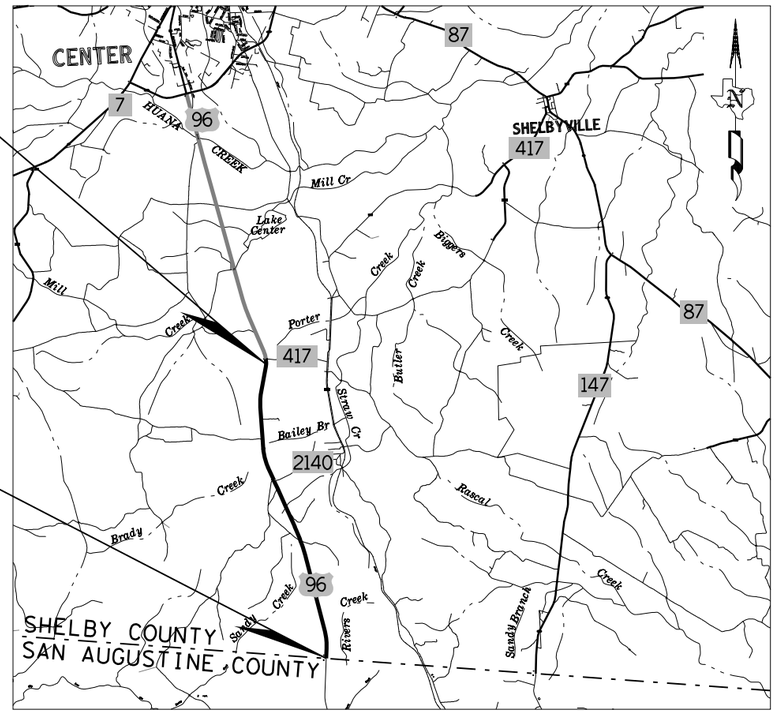
FOR THE CONSTRUCTION OF SUPER 2 HIGHWAY
CONSISTING OF ADD PASSING LANES AND OVERLAY EXISTING PAVEMENT

BEGIN PROJECT
CSJ: 0809-02-069
STA 2562+65
REF MRK = 334+0.077
LAT +31.69997000°
LONG -094.16342700°

PREVIOUS PROJECT TIE
PROJECT: NH 93(5) R
CSJ: 0809-03-048
TIE-IN STA 2563+91.68

END PROJECT
CSJ: 0809-02-069
STA 2302+25
REF MRK = 338+0.998
LAT +31.62697473°
LONG -094.15058702°

PREVIOUS PROJECT TIE
PROJECT: NH2013(514)
CSJ: 0809-03-038
TIE-IN STA 1905+86



NTS

"NO EXCEPTIONS, NO EQUATIONS, NO RAILROAD CROSSINGS"

BARRICADES AND WARNING SIGNS

PROVIDE AND ERECT BARRICADES AND WARNING SIGNS IN ACCORDANCE WITH THE BARRICADE & CONSTRUCTION STANDARDS, TCP STANDARDS, THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" AND AS DIRECTED.

RECOMMENDED FOR LETTING: 9/29/2022

DocuSigned by:
Jennifer H. Adams
CE1DDBE07C00426...
DISTRICT ADVANCE TRANSPORTATION PLANNING DIRECTOR

APPROVED FOR LETTING: 9/29/2022

DocuSigned by:
Kelly O. Morris, P.E.
F044211639424B4...
DISTRICT ENGINEER

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT: REQUIRED CONTRACT PROVISIONS FOR ALL FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, JULY 2022).

FILE: H:\proj\R306068.02 - TxDOT - 36-6\DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\01*GEN\6802C001.dgn
DATE: 9/28/2022 8:35:41 AM

	SHEET	DESCRIPTION
		GENERAL
	1	TITLE SHEET
	2	INDEX OF SHEETS
	3 - 8	PROJECT LAYOUT
	9 - 13	TYPICAL SECTIONS
	14,14A-14J	GENERAL NOTES
	15,15A-15B	ESTIMATE & QUANTITY SHEET
	16 - 29	QUANTITY SUMMARIES
	30 - 31	SUMMARY OF SMALL SIGNS
		TRAFFIC CONTROL PLAN
	32	TRAFFIC CONTROL PLAN SEQUENCE OF WORK
	33 - 34	TRAFFIC CONTROL PLAN TYPICAL SECTIONS
#	35 - 46	BC(1)-21 THRU BC(12)-21
#	47 - 48	TCP(2-1)-18 THRU TCP(2-2)-18
#	49	TCP(3-1)-13
#	50	TCP(3-3)-14
#	51	TCP(S-1)-08A
#	52	TCP(S-2)-08A
#	53	TCP(S-2c)-10
#	54	TCP(S-3)-08
#	55	WZ(STPM)-13
#	56	WZ(RS)-22
#	57	WZ(BRK)-13
		ROADWAY DETAILS
	58 - 63	SURVEY CONTROL INDEX SHEET
	64	HORIZONTAL ALIGNMENT DATA
	65 - 89	PLAN & PROFILE
	90	MISCELLANEOUS ROADWAY DETAILS
	91	MAILBOX TURNOUT DETAILS
	92	NON-MOW STRIP DETAILS
	93	DRIVEWAY & SIDE ROAD DETAILS
	94	DRIVEWAY & SIDE ROAD CUT & RESTORE PAVEMENT DETAILS
	94A	TREE REMOVAL AND TRIMMING DETAILS
#	95	GF(31)-19
#	96	SGT(11S)31-18
#	97	SGT(12S)31-18
#	98	SGT(15)31-20
#	99	TE(HMAC)-11
		DRAINAGE DETAILS
	100 - 101	DRAINAGE AREA MAP
	102 - 112	CULVERT LAYOUTS
	113	MISCELLANEOUS DRAINAGE DETAILS
##	114	CONCRETE RIPRAP DETAILS (LUFKIN DISTRICT STANDARD)
##	115	PSET-SC
##	116	PSET-SP
##	117	CH-PW-O
##	118	CH-PW-S

	SHEET	DESCRIPTION
		TRAFFIC ITEMS
	119 - 130	SIGNING & PAVEMENT MARKING LAYOUTS
	131	ILLUMINATION LAYOUT
	132	SIGN DETAILS
#	133 - 135	PM(1)-20 THRU PM(3)-20
#	136 - 138	TSR(3)-13 THRU TSR(5)-13
#	139	SMD(GEN)-08
#	140	SMD(SLIP-1)-08
#	141	SMD(SLIP-2)-08
#	142	SMD(SLIP-3)-08
#	143	SMD(TWT)-08
#	144	D & OM(1)-20
#	145	D & OM(3)-20
#	146	D & OM(4)-20
#	147	D & OM(5)-20
#	148	D & OM(VIA)-20
#	149	TS2(PL-1)-18
#	150	RS(3)-13
#	151	RS(4)-13
###	152	ED(1)-14
###	153 - 157	ED(3)-14 THRU ED(7)-14
###	158	RID(1)-20
###	159	RID(2)-20
###	160 - 163	RIP(1)-19 THRU RIP(4)-19
		ENVIRONMENTAL ISSUES
	164	TXDOT SWP3 INDEX
	165 - 166	EPIC
	167 - 178	SWP3 LAYOUT
	179	BLOCK SOD DETAILS
#	180	EC(1)-16
#	181	EC(2)-16
#	182	EC(3)-16
		MISCELLANEOUS ITEMS
#	183 - 186	MB(1)-21 THRU MB(4)-21

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

PE 9/28/2022

CHRISTIAN L. MOORMAN
TEXAS LICENSE NO.: 93828

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

PE 9/28/2022

ZACHARY D. STEINKUHLER
TEXAS LICENSE NO.: 122305

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

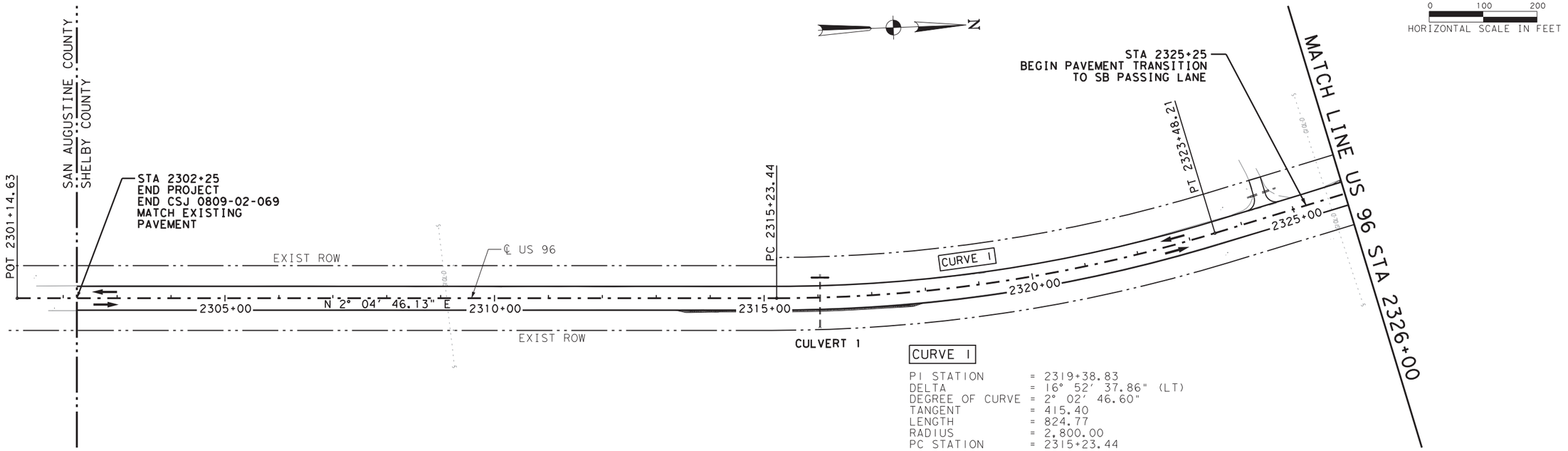
PE 9/28/2022

DAVID A. NUFER
TEXAS LICENSE NO.: 68818

INDEX OF SHEETS

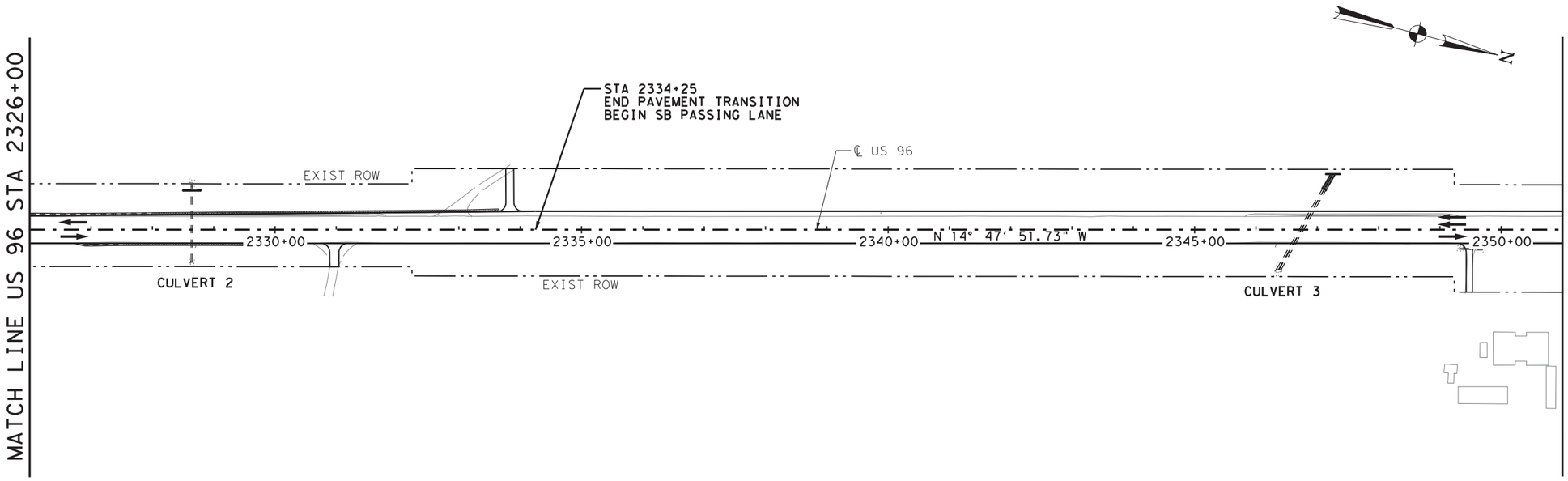
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		2



CURVE 1

PI STATION	= 2319+38.83
DELTA	= 16° 52' 37.86" (LT)
DEGREE OF CURVE	= 2° 02' 46.60"
TANGENT	= 415.40
LENGTH	= 824.77
RADIUS	= 2,800.00
PC STATION	= 2315+23.44
PT STATION	= 2323+48.21



STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

PROJECT LAYOUT

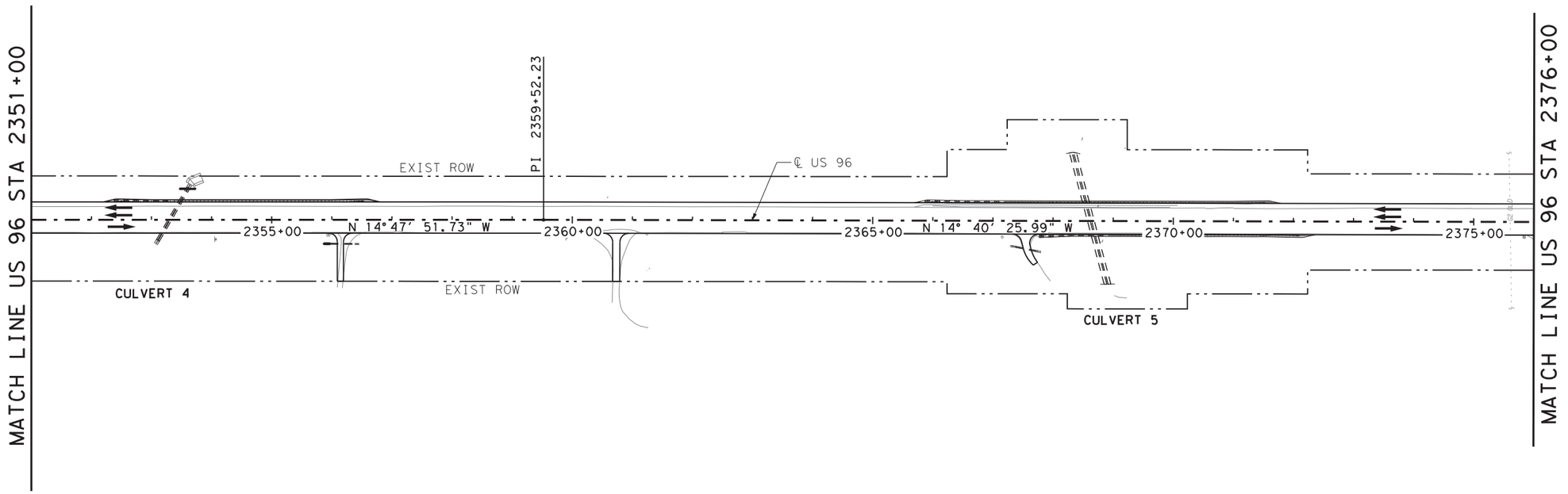
(END TO STA 2351+00)

(SHEET 1 OF 6)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		3

11/2/2021 3:29:54 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802TPL01.dgn



STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

PROJECT LAYOUT

(STA 2351+00 TO STA 2401+00)

(SHEET 2 OF 6)

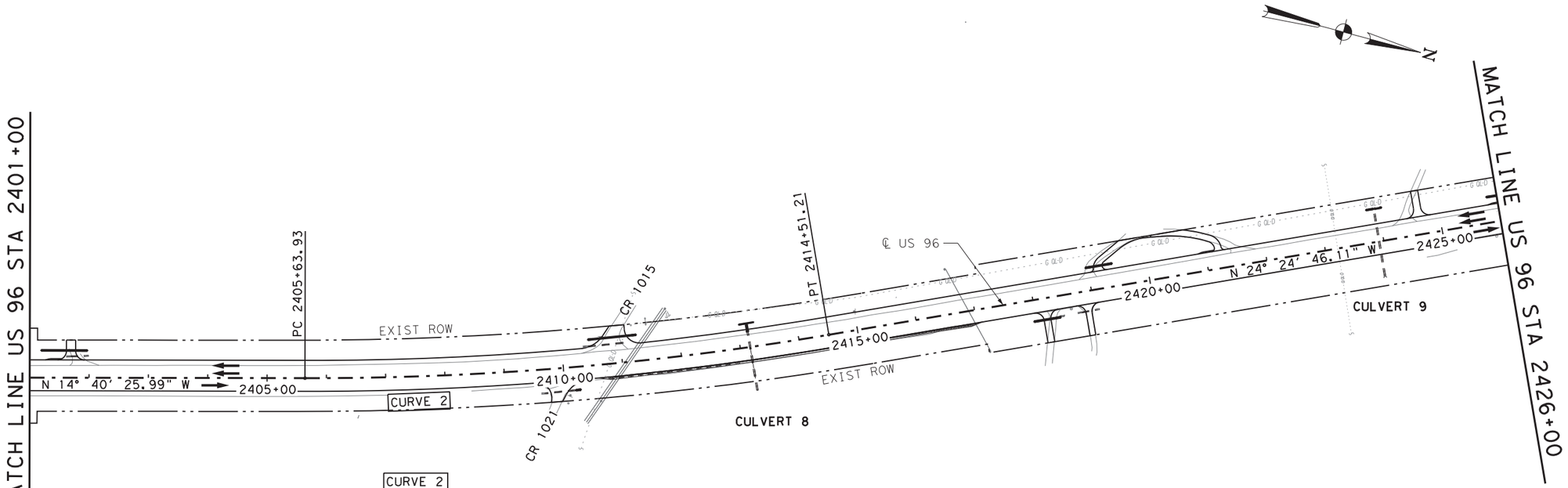
HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		4

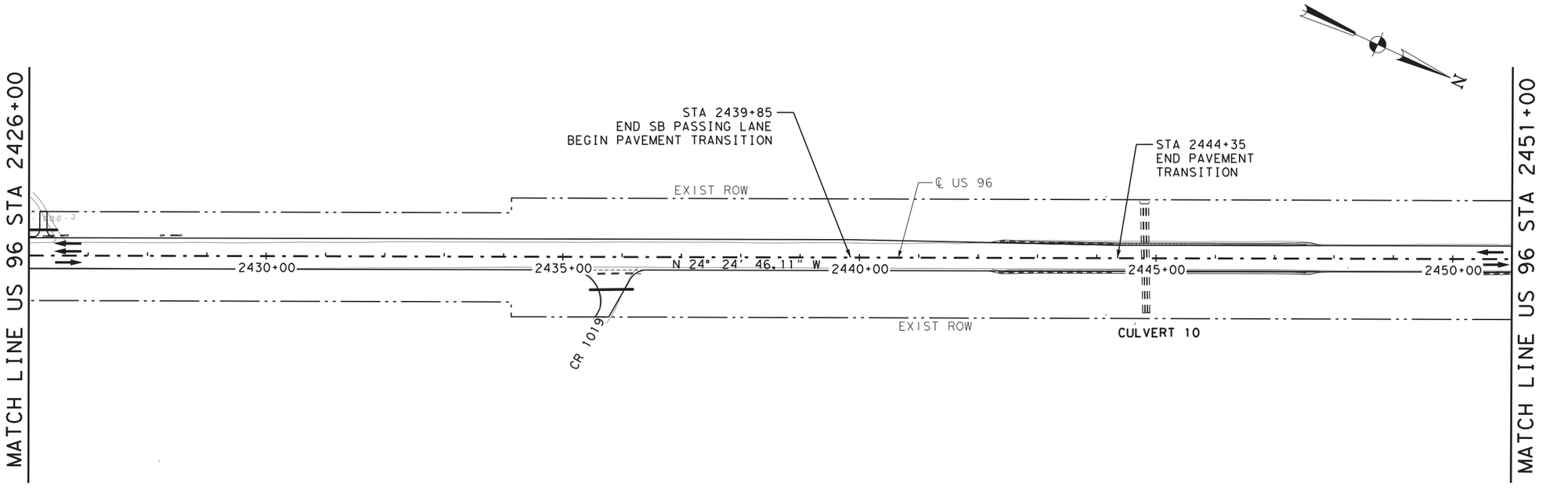
11/2/2021 3:29:54 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802TPL02.dgn



0 100 200
HORIZONTAL SCALE IN FEET

CURVE 2

PI STATION	= 2410+08.64
DELTA	= 9° 44' 20.12" (LT)
DEGREE OF CURVE	= 1° 05' 51.43"
TANGENT	= 444.71
LENGTH	= 887.28
RADIUS	= 5,220.00
PC STATION	= 2405+63.93
PT STATION	= 2414+51.21



STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

PROJECT LAYOUT

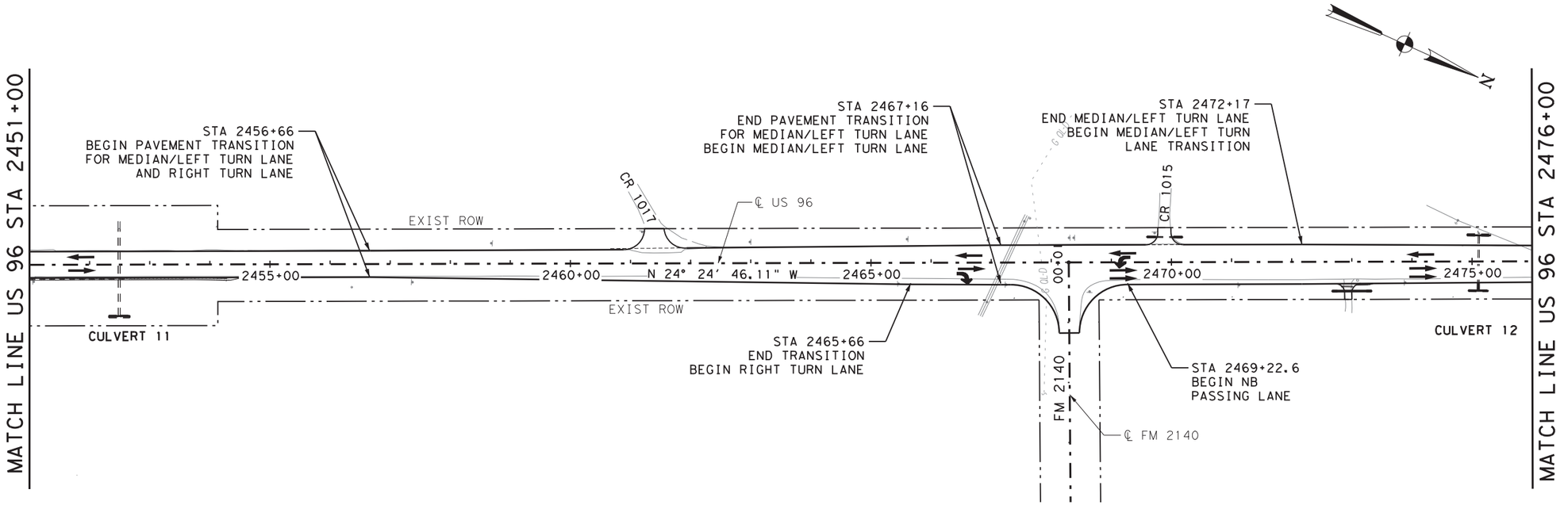
(STA 2401+00 TO STA 2451+00)

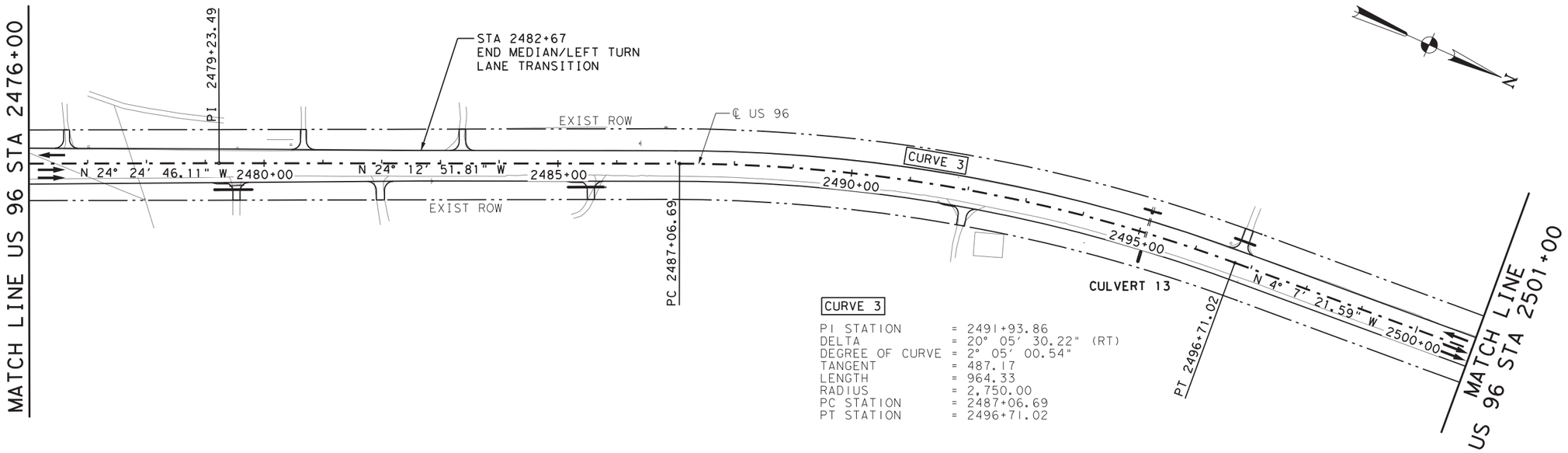
(SHEET 3 OF 6)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		5

11/2/2021 3:29:55 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\03*RDWY\6802TPL03.dgn





CURVE 3

PI STATION	=	2491+93.86
DELTA	=	20° 05' 30.22" (RT)
DEGREE OF CURVE	=	2° 05' 00.54"
TANGENT	=	487.17
LENGTH	=	964.33
RADIUS	=	2,750.00
PC STATION	=	2487+06.69
PT STATION	=	2496+71.02

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

PROJECT LAYOUT

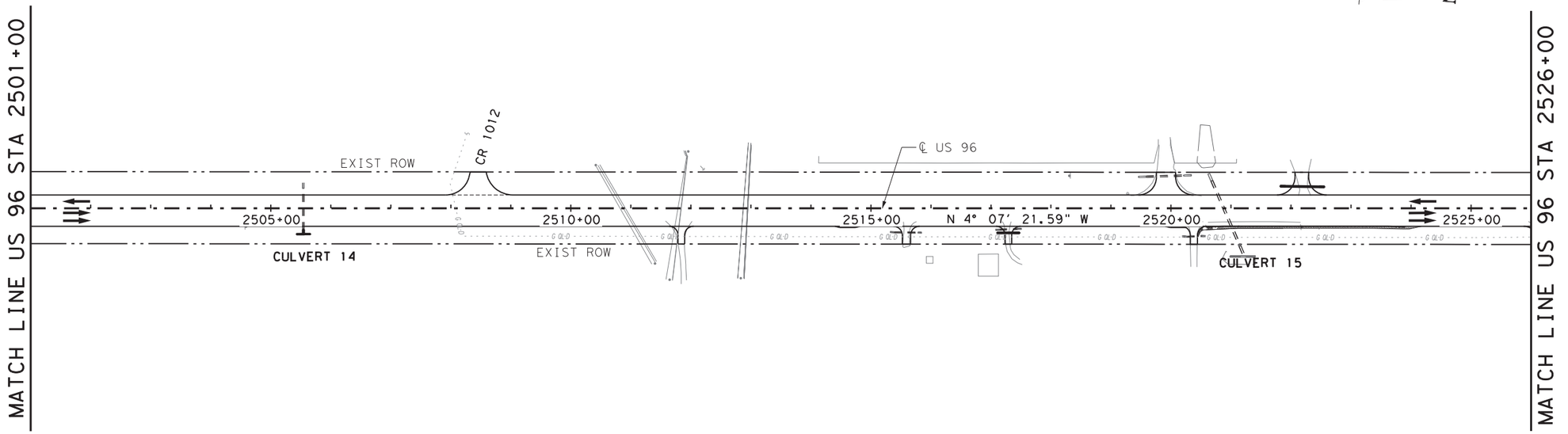
(STA 2451+00 TO STA 2501+00)

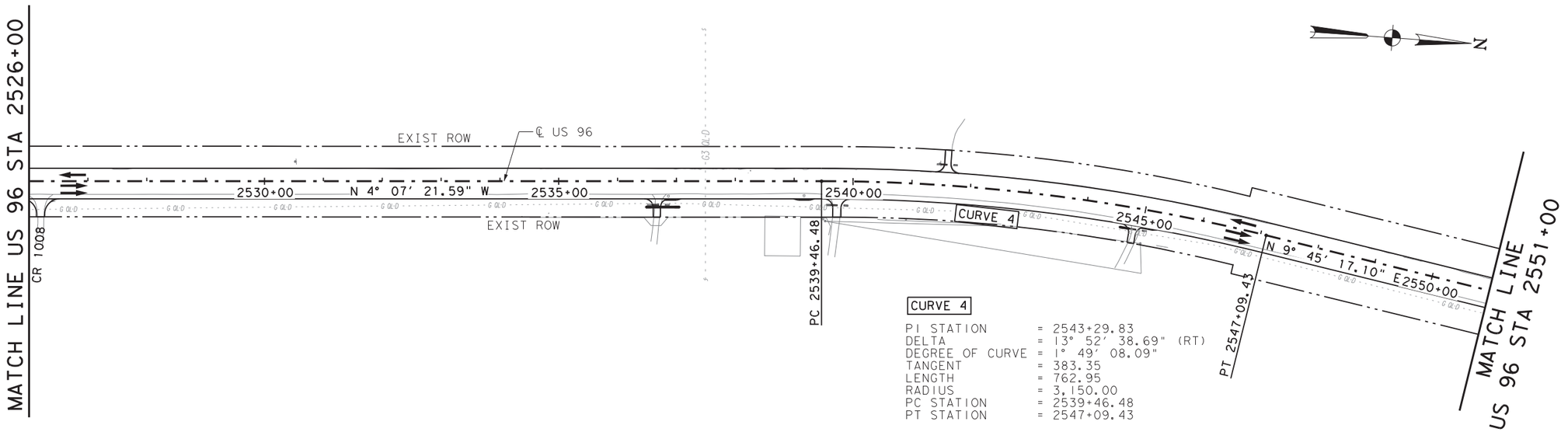
(SHEET 4 OF 6)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		6

11/2/2021 3:29:56 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\03*RDWY\6802TPL04.dgn





CURVE 4

PI STATION	= 2543+29.83
DELTA	= 13° 52' 38.69" (RT)
DEGREE OF CURVE	= 1° 49' 08.09"
TANGENT	= 383.35
LENGTH	= 762.95
RADIUS	= 3,150.00
PC STATION	= 2539+46.48
PT STATION	= 2547+09.43

0 100 200
HORIZONTAL SCALE IN FEET

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

PROJECT LAYOUT

(STA 2501+00 TO STA 2551+00)

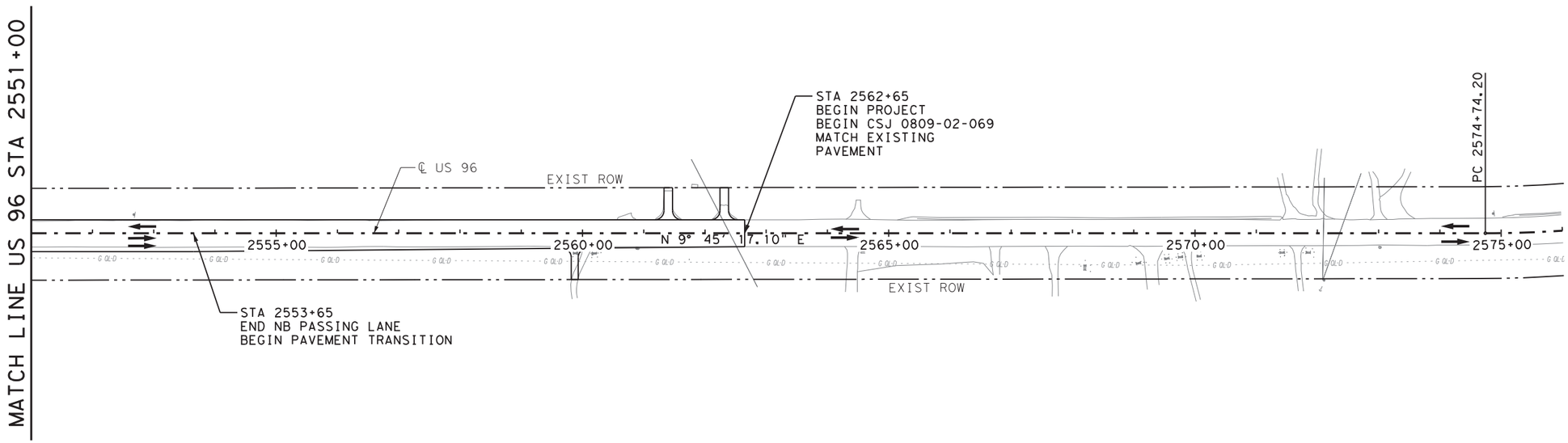
(SHEET 5 OF 6)

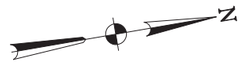
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		7

11/2/2021 3:29:56 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802TPL05.dgn





0 100 200
HORIZONTAL SCALE IN FEET

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

11/2/2021

PROJECT LAYOUT

(STA 2551+00 TO BEGIN)

(SHEET 6 OF 6)

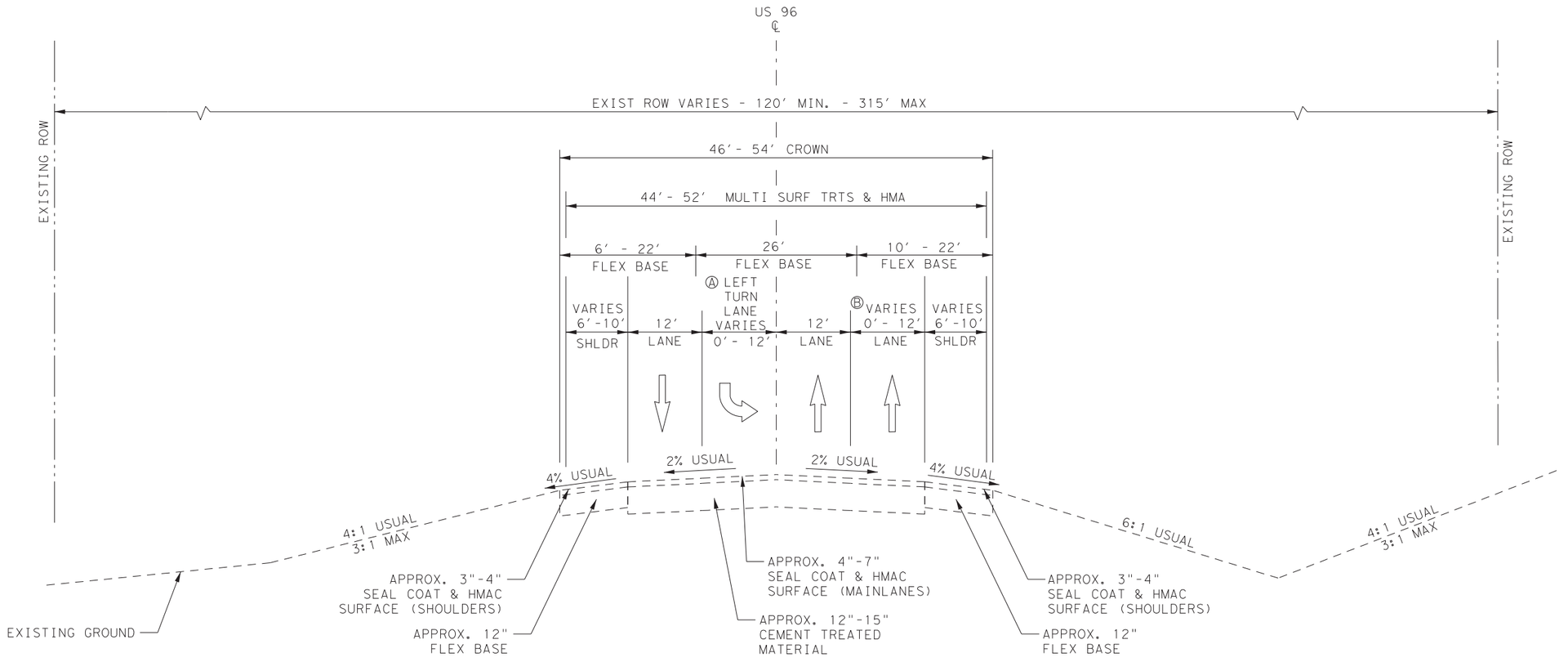
HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		8

11/2/2021 3:29:56 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802TPL06.dgn



EXISTING TYPICAL SECTION

STA 2302+25 TO STA 2386+67
STA 2408+06 TO STA 2462+63

Ⓑ STA 2386+67 TO STA 2408+06
Ⓐ STA 2462+63 TO STA 2562+65

SCALE: NTS

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

TYPICAL SECTIONS

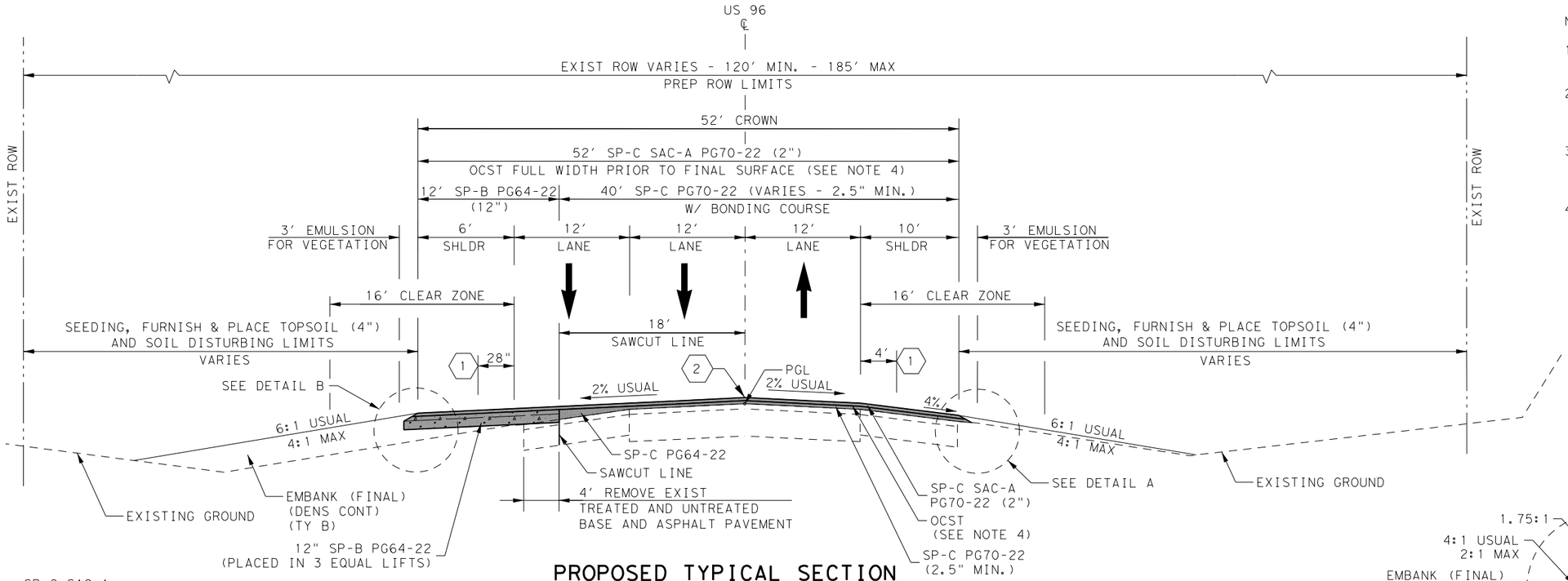
(SHEET 1 OF 5)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		9

11/2/2021 3:29:57 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802TYP01.dgn



PROPOSED TYPICAL SECTION

STA 2334+25 TO STA 2439+85

TRANSITION

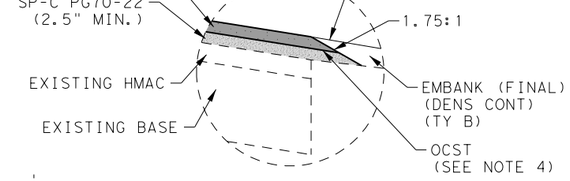
0'-12' LT: STA 2325+25 TO STA 2334+25 (PASSING LANE)
10'-6' LT: STA 2325+25 TO STA 2334+25 (SHOULDER)
12'-0' LT: STA 2439+85 TO STA 2444+35 (PASSING LANE)
6'-10' LT: STA 2439+85 TO STA 2444+35 (SHOULDER)

NOTES:

1. SEE ROADWAY PLAN & PROFILE SHEETS FOR SUPERELEVATION INFORMATION.
2. SEE TXDOT STANDARD DRAWING TE(HMAC)-11 FOR DETAILS NOT SHOWN HERE.
3. SEE PREP ROW DETAIL SHEET FOR TREE REMOVAL AND TRIMMING DETAILS. (SUBSIDIARY TO ITEM 100)
4. OCST:
   ASPHALT: (AC15P OR CRS-2P) (0.50 GAL/SY)
   AGGREGATE: (TY-PE, E, L OR PL GR 3) (1CY/120SY)
   COVERED PRIME: (ALT. BID)
   ASPHALT: RC 250 @ 0.25 GAL/SY
   AGGREGATE: GR 5 TY E OR L (1CY/140SY)

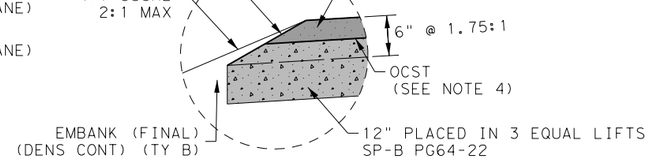
(1) EDGELINE RUMBLE STRIP SEE RS(4) FOR DETAILS NOT SHOWN HERE.

(2) MILLED CENTERLINE RUMBLE STRIPS SEE RS(3) FOR DETAILS NOT SHOWN HERE.



DETAIL A

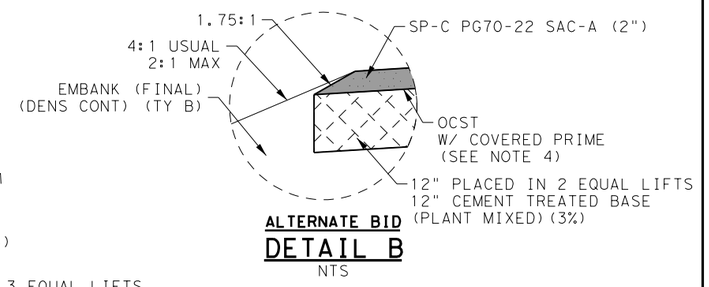
NTS



BASE BID

DETAIL B

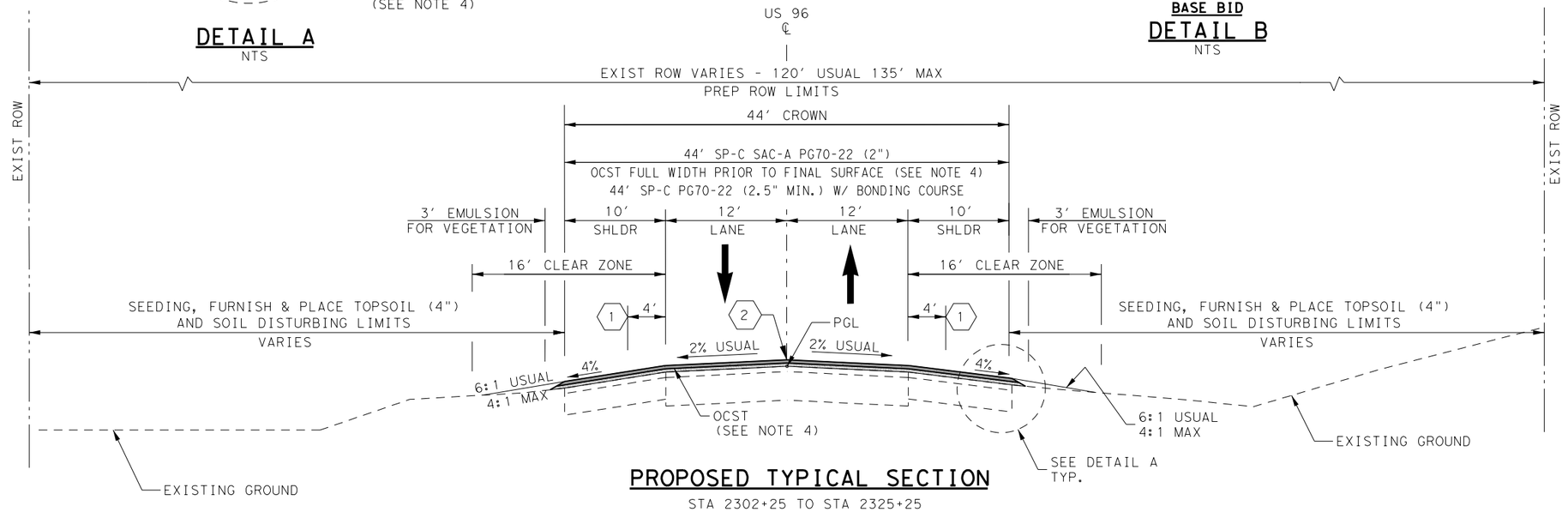
NTS



ALTERNATE BID

DETAIL B

NTS



PROPOSED TYPICAL SECTION

STA 2302+25 TO STA 2325+25
STA 2444+35 TO STA 2456+66

SCALE: NTS

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

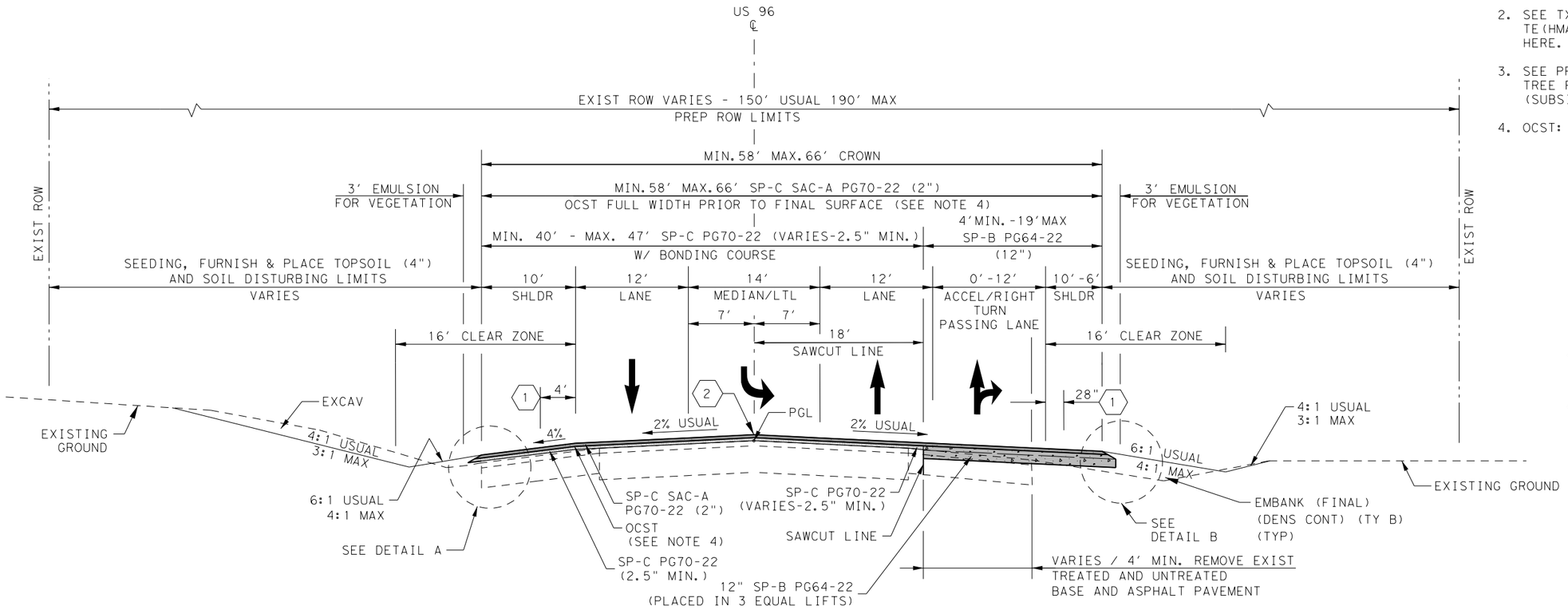
TYPICAL SECTIONS

(SHEET 2 OF 5)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		10

9/28/2022 8:45:21 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802TYP02.dgn



NOTES:

1. SEE ROADWAY PLAN & PROFILE SHEETS FOR SUPERELEVATION INFORMATION.
2. SEE TXDOT STANDARD DRAWING TE(HMAC)-11 FOR DETAILS NOT SHOWN HERE.
3. SEE PREP ROW DETAIL SHEET FOR TREE REMOVAL AND TRIMMING DETAILS. (SUBSIDIARY TO ITEM 100)
4. OCST:
   ASPHALT: (AC15P OR CRS-2P) (0.50 GAL/SY)
   AGGREGATE: (TY-PE, E, L OR PL GR 3) (1CY/120SY)
   COVERED PRIME: (ALT. BID)
   ASPHALT: RC 250 @ 0.25 GAL/SY
   AGGREGATE: GR 5 TY E OR L (1CY/140SY)

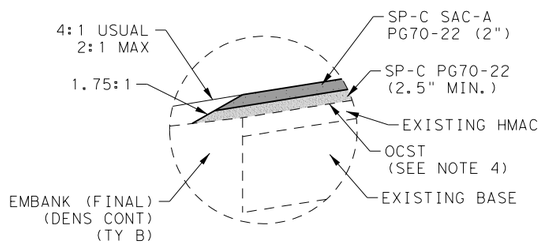
(1) EDGELINE RUMBLE STRIP SEE RS(4) FOR DETAILS NOT SHOWN HERE.

(2) MILLED CENTERLINE RUMBLE STRIPS SEE RS(3) FOR DETAILS NOT SHOWN HERE.

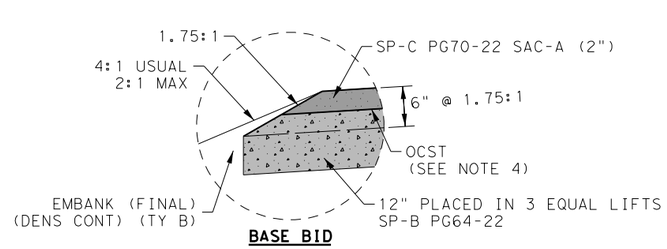
PROPOSED TYPICAL SECTION

STA 2467+16 TO STA 2472+17
TRANSITION

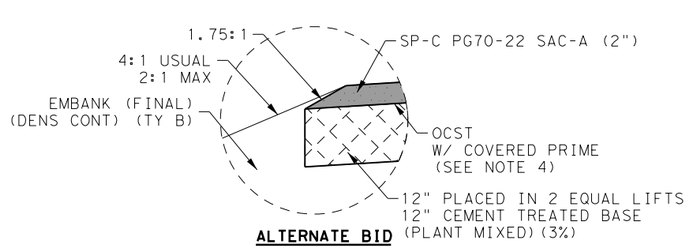
0'-14' ℄ : STA 2456+66 TO STA 2467+16 (MEDIAN/LTL)
0'-12' RT: STA 2456+66 TO STA 2465+66 (PASSING LANE)
10'-6' RT: STA 2456+66 TO STA 2465+66 (SHOULDER)
12' RT: STA 2465+66 TO STA 2467+16 (RIGHT TURN LANE)
14'-0' ℄ : STA 2472+17 TO STA 2482+67 (MEDIAN/LTL)



DETAIL A
NTS



BASE BID
DETAIL B
NTS



ALTERNATE BID
DETAIL B
NTS

SCALE: NTS

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

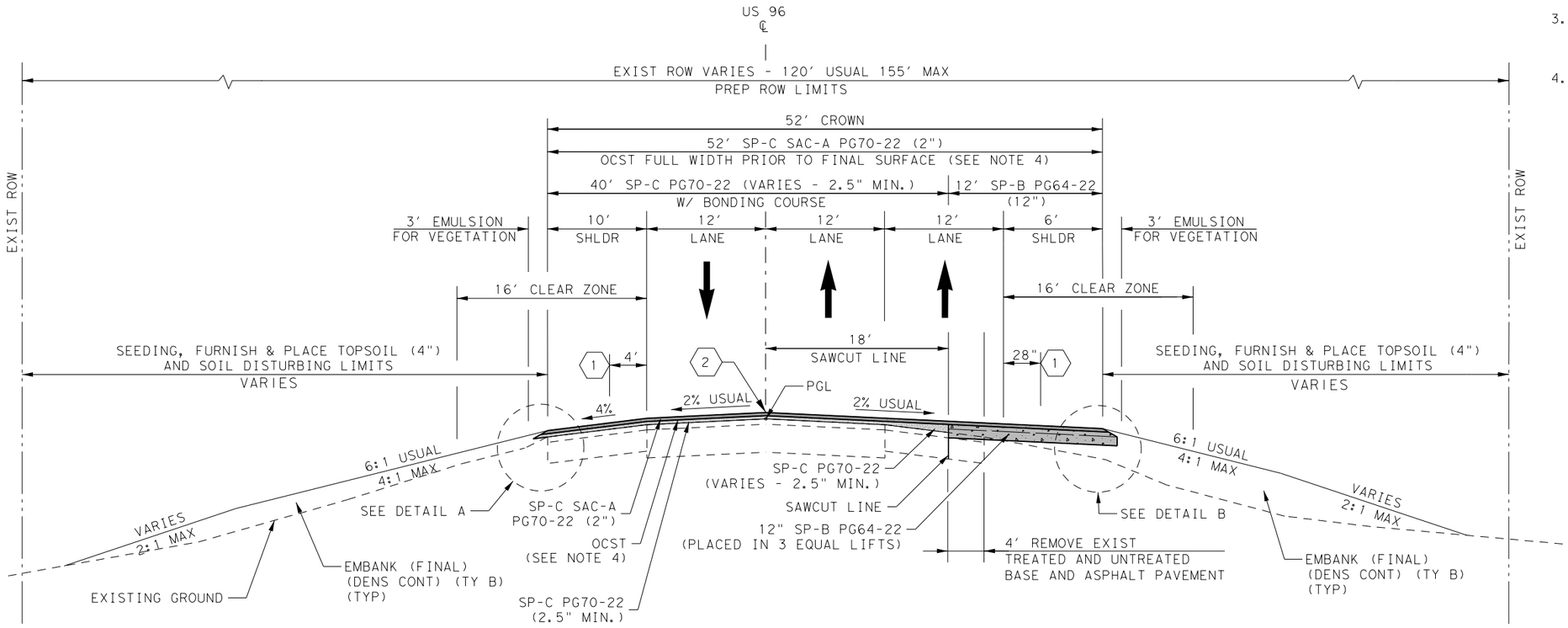
TYPICAL SECTIONS

(SHEET 3 OF 5)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		11

9/28/2022 8:45:22 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802TYP03.dgn



PROPOSED TYPICAL SECTION

STA 2482+67 TO STA 2553+65

TRANSITION

12'-0' RT: STA 2553+65 TO STA 2562+65
6'-10' RT: STA 2553+65 TO STA 2562+65

NOTES:

1. SEE ROADWAY PLAN & PROFILE SHEETS FOR SUPERELEVATION INFORMATION.
2. SEE TXDOT STANDARD DRAWING TE(HMAC)-11 FOR DETAILS NOT SHOWN HERE.
3. SEE PREP ROW DETAIL SHEET FOR TREE REMOVAL AND TRIMMING DETAILS. (SUBSIDIARY TO ITEM 100)
4. OCST:

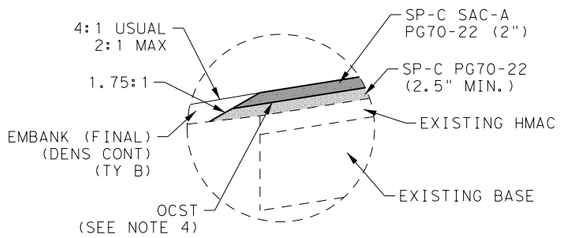
   ASPHALT: (AC15P OR CRS-2P) (0.50 GAL/SY)

   AGGREGATE: (TY-PE, E, L OR PL GR 3) (1CY/120SY)

   COVERED PRIME: (ALT. BID)
   ASPHALT: RC 250 @ 0.25 GAL/SY
   AGGREGATE: GR 5 TY E OR L (1CY/140SY)

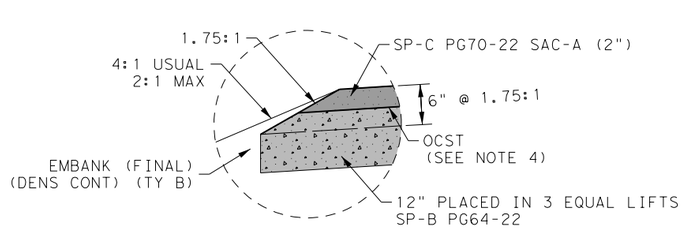
(1) EDGELINE RUMBLE STRIP SEE RS(4) FOR DETAILS NOT SHOWN HERE.

(2) MILLED CENTERLINE RUMBLE STRIPS SEE RS(3) FOR DETAILS NOT SHOWN HERE.



DETAIL A

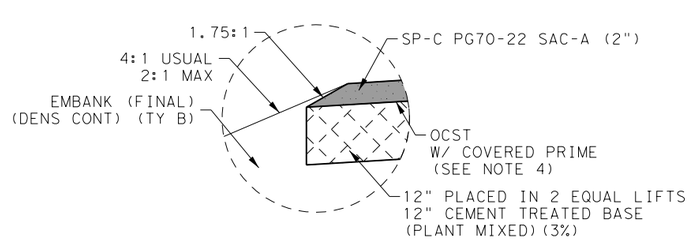
NTS



BASE BID

DETAIL B

NTS



ALTERNATE BID

DETAIL B

NTS

SCALE: NTS

CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

9/28/2022

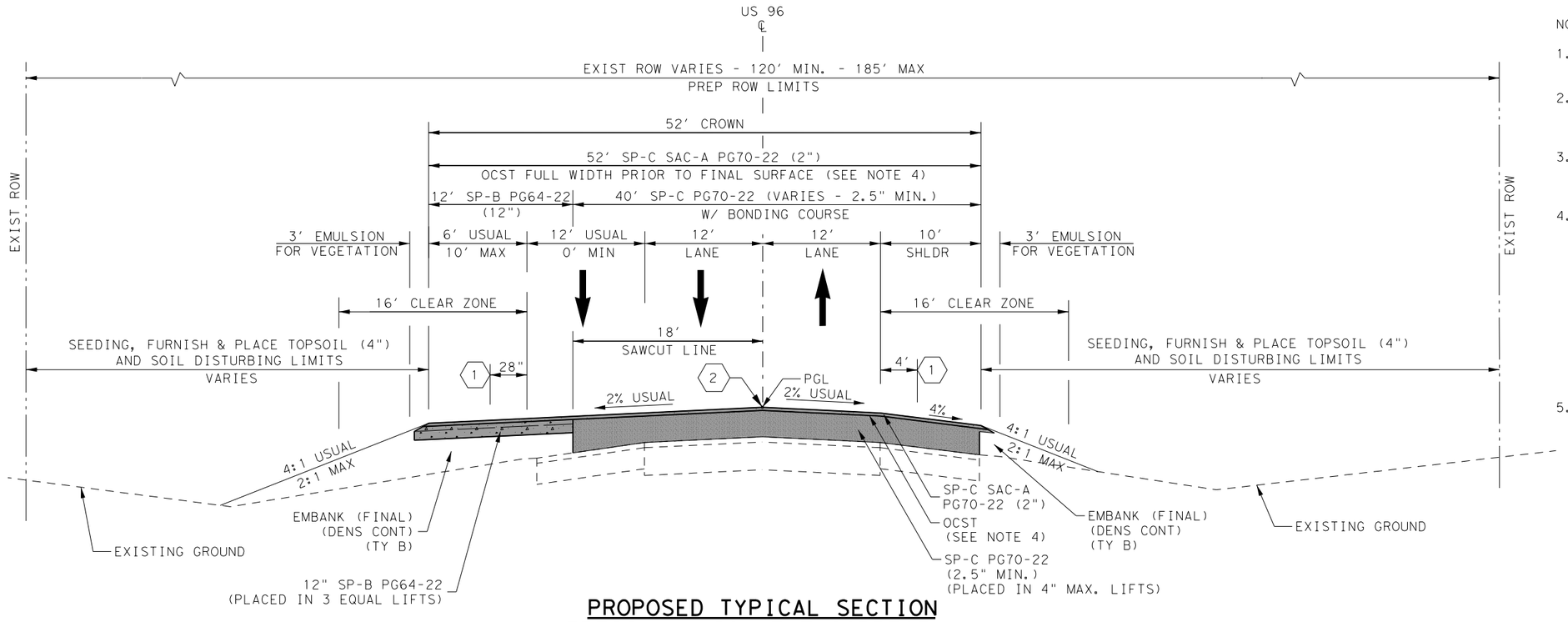
TYPICAL SECTIONS

(SHEET 4 OF 5)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		12

9/28/2022 8:45:22 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\IO CADD & BIM\IO.6 Microstation\IO.6.5 Sheets\03*RDWY\6802TYP04.dgn



PROPOSED TYPICAL SECTION
VERTICAL ALIGNMENT CORRECTION

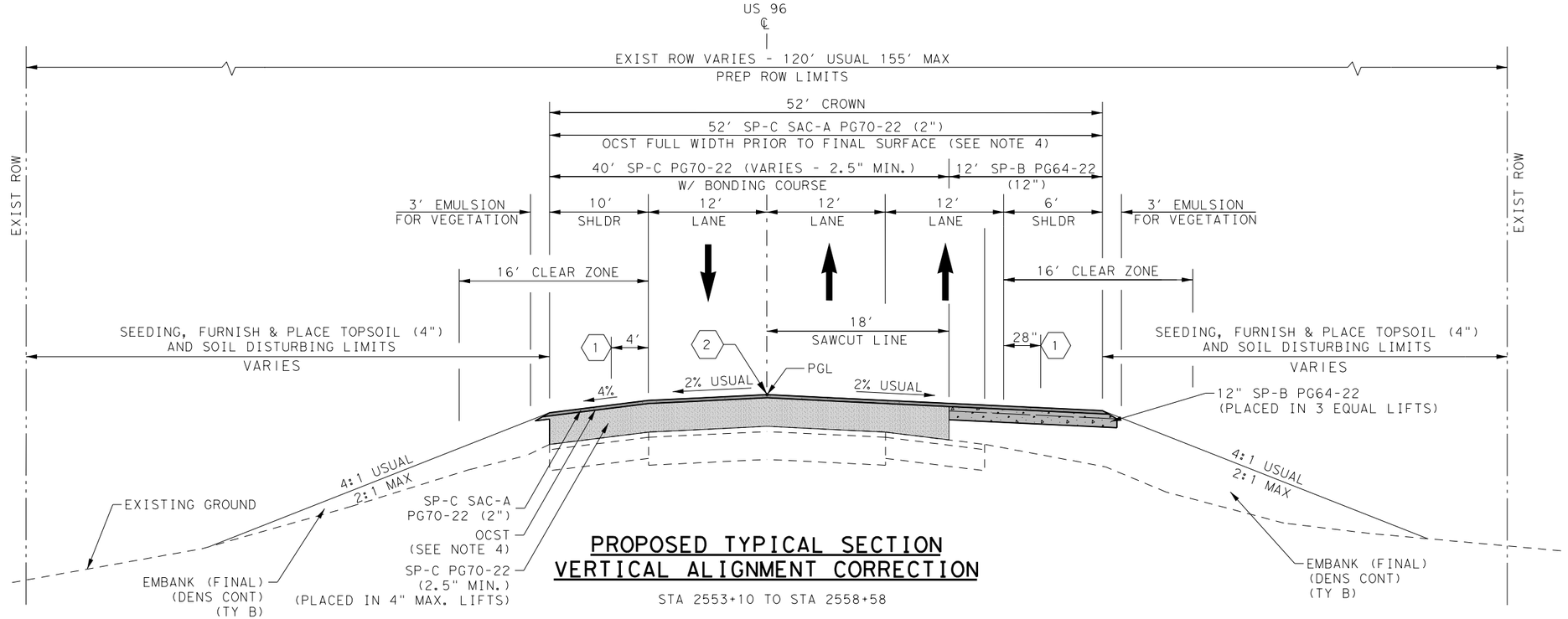
STA 2365+78 TO STA 2372+82
STA 2440+87 TO STA 2448+49

NOTES:

1. SEE ROADWAY PLAN & PROFILE SHEETS FOR SUPERELEVATION INFORMATION.
2. SEE TXDOT STANDARD DRAWING TE(HMAC)-11 FOR DETAILS NOT SHOWN HERE.
3. SEE PREP ROW DETAIL SHEET FOR TREE REMOVAL AND TRIMMING DETAILS. (SUBSIDIARY TO ITEM 100)
4. OCST:
   ASPHALT: (AC15P OR CRS-2P) (0.50 GAL/SY)
   AGGREGATE: (TY-PE, E, L OR PL GR 3) (1CY/120SY)
   COVERED PRIME: (ALT. BID)
   ASPHALT: RC 250 @ 0.25 GAL/SY
   AGGREGATE: GR 5 TY E OR L (1CY/140SY))
5. CONTRACTOR IS LIMITED TO WORK THAT CAN BE COMPLETED IN ONE WORKING DAY. NO OVERNIGHT LANE SHIFTS OR LANE CLOSURES. CONTRACTOR SHALL CONSTRUCT LEVEL UP FOR FULL ROADWAY WIDTH AND OPEN UP TO TRAFFIC FOR NON-WORKING TIMES.

(1) EDGELINE RUMBLE STRIP SEE RS(4) FOR DETAILS NOT SHOWN HERE.

(2) MILLED CENTERLINE RUMBLE STRIPS SEE RS(3) FOR DETAILS NOT SHOWN HERE.



PROPOSED TYPICAL SECTION
VERTICAL ALIGNMENT CORRECTION

STA 2553+10 TO STA 2558+58

SCALE: NTS

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

TYPICAL SECTIONS

(SHEET 5 OF 5)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		13

9/28/2022 8:45:23 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802TYP05.dgn

GENERAL NOTES:

Existing regulatory, warning and guide signs within project limits are to remain visible to the traveling public at all times. If a sign must be repositioned during construction operations, move and install the sign to an approved location. Use care when working near existing signs and repair or replace signs damaged by work operations. All work involved repositioning existing signs will be subsidiary to various bid items.

Furnish materials and make repairs to the existing roadway at any location damaged by construction operations. This work shall be done in an approved manner and will be subsidiary to various bid items.

Ensure drainage structures and outfall channels constructed on this project are free of silt and debris at the time of project acceptance. Final clean out work will be subsidiary to various bid items.

Maintain adequate surface drainage throughout the project limits during all phases of construction.

Provide suitable access at all times to adjacent businesses, private property and side roads.

When construction work necessitates the moving of mailboxes, temporarily relocate them as necessary to keep them clear of construction operations and convenient for the mail carrier. Mounts for temporarily relocating mailboxes shall conform to the Department's "Compliant Work Zone Traffic Control Device List" or the MB-15(1) Standard. Temporary relocation of mailboxes will be subsidiary to various bid items.

Remove dirt, silt, rocks, debris and other foreign matter that accumulates in structures due to the Contractor's operations as directed. Keep stream channels open at all times. This work will not be paid fo di ctly, but will be subsidiary to pertinent Items.

Contractor questions on this project are to be addressed to the following individual(s):
Randal Cooper, Area Engineer Randal.Cooper@txdot.gov
Cleo Blanton, Asst. Area Engineer Cleopha.Blanton@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.

The contractor's attention is directed to the EPIC sheet included in this plan set for Environmental Issues and Commitments.

Project Mowing

Mow the highway right of way within the project limits a maximum of 3 cycles per year as directed. Mowing will not be measured or paid for directly, but will be subsidiary to various bid items.

The equipment used for mowing shall consist of approved mowing units capable of mowing on slopes without marring finished slope surfaces or injuring existing growth. The minimum cutting width shall not be less than 5 ft., unless otherwise approved.
Mow all areas of existing vegetation and vegetation placed during the project as directed. The mowing height shall be 5 in. unless otherwise directed. Repair portions of sod or grass that are injured during mowing operations as directed.

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

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

Litter Pickup

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

The equipment used for litter pickup shall be approved.

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

For removal of large dead animals, contact nearest TxDOT maintenance section for disposal instructions. Do not bury animal carcasses on State property.

Item 5: Control of the Work

In the event utility lines needing unforeseen adjustments are encountered during construction operations, alter operations and continue to prosecute the contract in such a manner that will allow utility adjustments to be made by others. An extension of working time may be granted for any delays caused by the utility adjustments if deemed necessary.

Electronic files (pdf only) containing cross-sections will be available at the Area Engineer's office.

Precast Alternate Proposals.

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

Item 6: Control of Materials

To comply with the latest provisions of Build America, Buy America Act (BABA Act) of the Bipartisan Infrastructure Law, the contractor must submit a notarized original of the TxDOT Construction Material Buy America Certification Form for all items classified as construction materials. This form is not required for materials classified as a manufactured product.

Refer to the Buy America Material Classification Sheet for clarification on material categorization.

The Buy America Material Classification Sheet is located at the below link.

https://www.txdot.gov/business/resources/materials/buy-america-material-classification-sheet.html for clarification on material categorization.

Item 7: Legal Relations and Responsibilities

No significant traffic generator events identified.

This project has a soil disturbance of 5 acres or more.

The Department will be considered a primary operator for Operational Control Over Plans and Specifications as defined in TPDES GP TXR 150000 for construction activities in the right of way. The Department will post a large site notice, file a notice of intent (NOI), notice of change (NOC), if applicable, and a notice of termination (NOT) along with other requirements per TPDES GP TXR 150000 as the entity having operational control over plans and specifications fo wo k shown on the plans in the right of way.

The Contractor will be considered a primary operator for Day-to-Day Operational Control as defined in TPDES GP TXR 150000 for construction activities in the right of way. In addition to the Department's actions, the Contractor shall file a NOI, NOC, if applicable, and NOT and post a large site notice along with other requirements as the entity of having day-to-day operational control of the work shown on the plans in the right of way. This is in addition to the Contractor being responsible for TPDES GP TXR 150000 requirements for on- right of way and off- right of way PSL's. Adhere to all requirements of the SWP3 as shown on the plans.

Dispose of all vegetative matter and any other materials removed from State Right of Way in accordance with applicable environmental laws, rules, regulations and requirements.

Burning locations must be approved by the Engineer prior to beginning. Burning activities must be conducted in compliance with Texas Commission on Environmental Quality (TCEQ) regulations. Notify the Engineer when burning activities will take place.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), construction activities that may affect nests (i.e. tree removal, tree limbing, bridge work) shall be conducted outside of the nesting season (March 15

to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

Item 8: Prosecution and Progress

For this project, working days will be computed and charged in accordance with Item 8, Section 3.1.4 "Standard Workweek".

Submit monthly progress schedules no later than the 20th calendar day of the month. Failure to comply with this deadline may result in the Engineer withholding progress (monthly) payments.

Provide a Critical Path Method (CPM) Construction Schedule unless otherwise approved.

Item 100: Preparing Right of Way

The equipment used to trim limbs shall be approved. A boom axe will not be allowed.

For areas requiring Preparing ROW, remove all trees within the ROW and limbs overhanging within the ROW to a minimum of 60' vertically.

Item 105: Removing Treated and Untreated Base and Asphalt Pavement

Material removed by this operation will become the property of the Contractor.

Item 132: Embankment

Hauling materials with scrapers across or along existing roadways will not be permitted without written permission.

Drying of material deeper than 6 inches below subgrade elevations will not be permitted without written permission.

Grading required for shaping driveways and side road turnouts for pipe culverts at all access locations, will be subsidiary to various bid items.

All blading, rolling, and scraper work to construct and remove temporary slopes adjacent to pavement drop-offs, will be subsidiary to various bid items.

Compact embankment material used to reshape existing slopes to a density comparable with adjacent undisturbed material to the satisfaction of the Engineer.

Item 162: Sodding for Erosion Control

Provide Bermuda block sod unless St. Augustine is the prevailing grass cover at particular placement locations. Provide St. Augustine block sod at those locations.

Item 166: Fertilizer

Fertilize all seeded or sodded areas.

Item 168: Vegetative Watering

Equip water trucks with sprinkler systems capable of watering all of the entire seeded or sodded areas from the roadway.

Water all newly placed sodded or seeded areas at the time of installation. Thereafter, maintain the sodded or seeded areas in a well-watered condition, at no time allow the areas to dry to a condition where water stress is evident.

Item 169: Soil Retention Blankets

In areas designated for soil retention blankets (SRB) in the plans, furnish only spray-on products listed on the Approved Product List for Erosion Control Products based upon the Class and Type specified in the plans. Any substitution to spray-on products must be approved in writing, be listed on the Approved Product List for Erosion Control Products based upon Class and Type, and shall not contain UV degradable, photodegradable or polypropylene materials.

Item 247: Flexible Base

Provide flexible base with a minimum plasticity index of 2.

Provide flexible base material with a minimum Bar Linear Shrinkage of 2% as determined by Test Method Tex-107-E, Part II.

Stockpiling of base material will not be required if testing has been performed and the material has been approved at the source. Deliver approved specified materials to the project.

Compaction requirements for flexible base are ordinary compaction.

Item 276: Cement Treatment (Plant-Mixed)

Cure with a mixture of emulsified asphalt (MS-2 or SS-1) and water.

Cement treated material shall be placed in lifts no greater than *6* in.

No strength requirement is specified. The target cement content is *3* %.

Item 316: Seal Coat

Apply the covered prime weekly.

Open season for asphalt placement is from May 1 thru August 31. Do not place asphalt outside the open season without written approval.

The uniformity and rate of distribution of asphaltic material will be checked periodically during construction. Apply the seal coat in lane widths unless otherwise directed. Where extra width of surfacing has been provided in transitions and climbing lanes, seal the entire surface width.

Resurface county road turnouts and intersection areas as directed.

Place surface on driveways and other road turnouts prior to placing the final roadway surface.

Cease application of asphalt 2 hr. before sunset unless otherwise directed.

Cure th su fac t atment as directed prior to placement of the overlay.

Set string line or other approved control points at crossovers and acceleration lanes as required to define the desired section.

Cure the covered prime a minimum of 14 days prior to placement of the surface treatment.

Use precoated aggregate with AC-15P and use non-precoated aggregate with RC-250 and CRS-2P.

Furnish medium pneumatic tire rollers in accordance Item 210, "Rolling". Provide enough rollers to perform the work as directed.

Blade the existing paved shoulders prior to surface treatment operations to remove existing overgrowth. This work will be subsidiary to Item 316.

Item 354: Planing and Texturing Pavement

Complete planing operations in adjacent lanes and shoulders to the same point at the end of each day.

Blade the existing paved shoulders prior to planing operations to remove existing overgrowth. This work will be subsidiary to Item 354.

Cut the existing shoulder pavement to drain water away from planed travel lanes. This work will be subsidiary to various bid items.

Use an approved ski device to control longitudinal grade.

Where the underlying flexible base is exposed during the planing operation, prime exposed area with asphalt at the rate directed and patch with an approved HMA material at the end of the day's operation in which it occurs. Th s it ms of wo k will not be paid for directly but will be subsidiary to Item 354.

Item 400: Excavation and Backfill for Structures

When cutting an existing roadway open to traffic, complete all operations including structural excavation, laying pipe and backfilling within daylight hours the day they are initiated.

Replace excavated material deemed unsuitable for backfilling with material approved by the Engineer, paid for under the pertinent bid items or as extra work. This provision does not apply to excavated materials that are too wet and are replaced for the Contractor's convenience to expedite the work.

When excavation does not generate enough material to complete the backfill, additional material must be approved prior to use. Additional material will be subsidiary to various bid items.

Item 420: Concrete Substructures

Limit work on structures crossing the roadway to one side of the roadway at a time. No work shall begin on the opposite side of the roadway until backfilling of the initially extended portion of the structure is completed.

Item 421: Hydraulic Cement Concrete

The Engineer will provide curing facilities and strength testing equipment for acceptance testing at Nacogdoches Area Engineer Office, 918 Industrial Blvd, Nacogdoches, TX 75961.

Item 427: Surface Finishes for Concrete

Provide a rub finish for Surface Area I.

Provide the following surface finish for the listed elements: Ordinary surface finish for all concrete surfaces.

Item 432: Riprap

Stone Riprap (T pe R) shall have a minimum thickness of 12 in.

Stone riprap will require the placement of filter fabric prior to placement of stones.

Welded wire fabric will not be allowed for reinforcing concrete riprap. Reinforcing shall consist of No. 3 or 4 bars meeting the requirements of grade 60 reinforcing steel. Place bars on 12 in. centers in each direction, supported on reinforcing chairs.

Item 464: Reinforced Concrete Pipe

Lay each private entrance or side road pipe culvert to the line and grade as directed.

At locations where existing driveway pipes are to be removed and replaced, replace the top 6 in. of the existing driveway with material equal to or better than the existing driveway material. This work will be subsidiary to various bid items.

Limit work on pipe culverts crossing the road to one side of the roadway at a time. No work shall begin on the opposite side of the roadway until backfilling the first side of the pipe culvert being extended is complete.

When excavation does not generate enough material to complete the backfill, additional material must be approved prior to use.

Item 465: Junction Boxes, Manholes, and Inlets

All junction boxes, manholes, and inlets are to be precast unless otherwise shown on the plans or directed by the Engineer.

Item 466: Headwalls and Wingwalls

Provide cast-in-place headwalls and wingwalls.

Item 467: Safety End Treatment

Use Type II precast concrete units of the same style and design.

Provide 12 in. deep toewalls on Type II precast safety end treatments.

To improve drainage, grade existing ditch within ten feet of proposed safety end treatment. This work shall be subsidiary to Item 467.

When excavation does not generate enough material to complete the backfill, additional material must be approved prior to use. Additional material will be subsidiary to various bid items.

Check each location where safety end treatments are to be installed to verify pipe lengths shown will produce the desired slope. Extra pipe will be paid for, but removing and replacing safety end treatment units previously installed under this Contract will not be paid for.

Place safet end treatments along the same slope as the pipe.

Item 480: Cleaning Existing Culverts

Certain box culverts will require cleaning to remove silt and other debris. Waters carried by these box culverts have been determined to be waters of the United States and are under jurisdiction of the U.S. Army Corps of Engineers. Silt and other debris removal shall be immediately hauled to an upland location for dumping. Material will not be side cast into either the water channel or its banks. Removal of the sediment is limited to the minimum necessary to restore the waterway to its configuration when the structure was built. No work will be allowed

outside of the right-of-way. This work shall also be restricted to a distance of no more than 10 ft. from the end of the structure.

Item 496: Removing Structures

Place salvageable county road pipe at Right of Way line.

Item 502: Barricades, Signs, and Traffic Handling

Traffic Control Plan (TCP):

Ensure the Contractor's Responsible Person (CRP) or their alternate for Barricades, Signs and Traffic Handling is available at all times and able to receive instructions from the Engineer or authorized Department representative. The CRP shall be a person that is usually at the project site during normal working hours.

For protection of the traveling public, direct traffic through the work area using signs, flaggers and other devices. Required signs are shown in the plans on the Barricade and Construction Standards and Traffic Control Plan Sheets. The latest edition of the "Texas Manual on Uniform Traffic Control Devices" shall also be used as a guide for handling traffic on this project.

Use "Do Not Pass" (R4-1) signs to mark the beginnings of roadway sections where passing is prohibited and use "Pass With Care" (R4-2) signs to mark the beginnings of roadway sections where passing is permitted. Install signs at the time signing for project limits are erected. Sign placement shall be verified and approved.

This project requires speed reduction signs during construction. Fabricate, provide and maintain speed limit signs (XX mph) as shown on BC(3)-21 standards. Remove or cover regulatory (black and white) speed limit signs, when not applicable.
Furnishing, erecting, relocating and removing temporary speed zone signs is subsidiary to Item 502.

When pavement work begins, use flashing arrow panels and flaggers 24 hr. per day during inclement weather or as directed.

Install "No Center Line" (CW8-12) signs at 2-mile intervals. Install "Loose Gravel" (CW8-7) and "Next XX Miles" (CW7-3aP) signs as directed prior to the start of surface treatment operations.

In general, restrict construction work to single lane widths. Control traffic in accordance with standard drawings WZ(BTS-1) "Traffic Signal Installation Typical Details"; WZ(BTS-2) "Traffic Signal Installation Barricades and Signs"; and, Part VI of the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways". Unless otherwise approved, use an advance warning, flashing arrow panel in addition to the necessary signs, barricades, or other traffic control devices at the work area.

Restrict construction work to single lane widths with only minor disruptions in traffic flow. Lane closures shall conform to the Traffic Control Plan for lane closures as shown in the plans. No overnight closures will be permitted.

Limit lane closures for 2 lane roads to 1 mi. in length, unless otherwise approved.

Lane closure lengths can exclude the end tapers.

Plan the sequence of work to minimize the time lane closures are in place. Install lane closures only where construction operations are anticipated to start within 1 hr. and limited to the amount of lane that can be reached by the construction activity within 2 hr. unless otherwise approved.

Provide flashing arrow panels to supplement required signs and devices for lane closures.

Provide temporary rumble strips as shown on WZ(RS)-16.

Provide a pilot car to lead traffic through the work area. The pilot car will not be paid for directly, but will be subsidiary to various bid items.

Halt traffic during the time asphalt is being applied to the roadway. No vehicles will be allowed to pass the asphalt distributor during asphalt application.

Provide adequate flaggers to protect the traveling public when working on or near a roadway carrying traffic. All flaggers shall wear hardhats and reflective vests.

Install "Be Prepared to Stop" (CW3-4) and "Flagger Ahead" (CW20-7aD) signs when flaggers are present. Position the signs where good visibility and traffic control can be maintained.

Use a flashing arrow board in addition to the required signs to warn motorists of flaggers.

Use additional flaggers at roadway intersections to direct traffic entering the work area, when deemed necessary by the Engineer.

Open all traffic lanes to traffic at the close of work each day.

Install "Pavement Ends" (CW8-3) and "30 mph" (CW13-1P) signs where the paved surface of the road ends. Use flashing arrow panels to supplement these signs during nighttime hours.

Provide one high-intensity yellow, rotating dome-light on all equipment such as distributors, spreader boxes, lay-down machines, dump trucks, rollers, backhoes, road graders, loaders, etc. within the work zone. Mount lights high enough to be visible from all directions and operating when the equipment is in the work zone. On all other equipment such as automobiles, trailers, etc. use emergency flashers while within the work zone.

Install "Shoulder Drop-Off" (CW8-9aT) and “Uneven Lanes” (CW8-11) signs at one-half mile spacings as the hot mix asphalt is placed, unless otherwise directed. Maintain signs until the condition is eliminated.

Install vertical panels or drums at 100-ft. spacings where drop-offs or construction work occurs along edges of existing pavement. Unless otherwise authorized, these shall remain in place until final striping.

Install "Slow Down on Wet Road" (CW8-5aT), "Shoulder Drop-Off" (CW8-17), “Uneven Lanes” (CW8-11), “Bump” (CW8-1) and "Soft Shoulder" (CW8-4) signs during construction as directed.

Restrict construction operations so that no drop off along the edge of pavement will remain overnight.

All blading, rolling and scraper work to construct and remove temporary slopes adjacent to pavement drop-offs, will be considered subsidiary to various bid items.

Notify the Engineer prior to placing any materials or equipment on the right of way. Locate equipment, stockpiles or other materials not in use as far as possible from the driving lanes and in no case closer than 30 ft. unless otherwise authorized. Any equipment, stockpiles, or materials placed within 30 ft. of the driving lane must have adequate signs, barricades or other warning devices as approved. As a minimum place an 8 ft. wide TY III Barricade or barrels on the approach side of each site that is within 30 ft. of the driving lane. Use TY III Barricade or barrels for the site similarly on the departure side if the location is within 30 ft. of the opposing traffic lane.

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. 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.

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.

Texas Transportation Code 547.105 authorizes the use of warning lights to promote safety and provides an effective means of gaining the travelling public’s attention as they drive in areas where construction crews are present. In order to influence the public to move over when high risk construction activities are taking place, minimize the utilization of blue warning lights. These lights must be used only while performing work on or near the travel lanes or shoulder where the travelling public encounters construction crews that are not protected by a standard work zone set up such as a lane closure, shoulder closure, or one-way traffic control. Refrain from leaving the warning lights engaged while travelling from one work location to another or while parked on the right of way away from the pavement or a work zone.

Temporary stop lines as shown on TCP (2-2)-18 should be omitted.

Provide an illuminated flagger station when nighttime work is performed.

Install "Stay Alert" (G20-10T) and "OBEY" (R20-3T) signs at the beginning of the construction zone at “T” intersections as directed.

All workers on TxDOT right-of-way shall wear reflective clothing meeting ANSI Class II requirements during the day and ANSI Class III requirements during the night.

Item 504: Field Office and Laboratory

Provide a Type D Structure. Asphalt content will be determined by the ignition method.

Provide a lockable file cabinet, desk and chair in a contractor’s field office for TxDOT use.

Item 506: Temporary Erosion, Sedimentation, and Environmental Controls

Locations and types of BMPs may require adjustments prior to or after placement as directed by the Engineer. Adjustments should be made to ensure BMPs are working effectively and maintain compliance with the Construction General Permit. Notif the Engineer prior to making adjustments.

Place temporary sediment control fence at locations as directed.

Item 530: Intersections, Driveways, and Turnouts

Welded wire fabric will not be allowed for reinforcing concrete driveways. Use reinforcing steel consisting of No. 3 or 4 bars meeting the requirements of grade 60 reinforcing steel. Place bars on 12 in. centers in each direction, supported on reinforcing chairs.

Unless otherwise directed, install 1/2 in. pre-molded expansion joint material between existing concrete and new concrete.

Item 540: Metal Beam Guard Fence

Use round timber posts.

Use timber post on all metal beam guard fence installations except where steel posts are required.

Determine length of steel posts for low fill culvert post mounting in the field to insure proper metal beam guard fence height.

At the close of work each day, protect the ends of metal beam guard fence in an approved manner, so that no blunt ends are exposed to approaching traffic. Plastic drums will be required at these locations.

For existing non-mow strip to remain in place, backfill top 4” in an existing abandoned post hole with HMA and backfill below 4” with suitable earth material. This work will be subsidiary to Item 540.

The removal of existing HMA/Base to place MBGF posts is subsidiary to the various bid items.

Item 560: Mailbox Assemblies

Repair and, if necessary, replace mailboxes damaged by construction operations.

The number and type of mailbox assemblies shown in the plans are for estimating purposes; actual quantities may vary.

Use 1 size 3 reflector mounted on the upstream and downstream sides of the post as directed for single and double mailbox assemblies.

Use 1 st ip of 12”x6” reflective sheeting for multiple mailbox assemblies in lieu of the Type 2 object marker shown on the MB-15(1) Standard. Each strip shall be approximately 3 in. wide and spaced as directed. Use reflective sheeting conforming to DMS-8600.

Item 585: Ride Quality for Pavement Surfaces

Use Surface Test Type B pay adjustment schedule 2

Item 618: Conduit

When conduit is laid in a trench or bored, minimum depth to the top of the conduit shall be 3 ft. Where obstructions prevent laying conduit at this depth, place conduit at the maximum depth possible.

Where a trench for laying conduit is cut through pavement, surfaced shoulder, median or driveway, replace the base and surfacing with similar materials equal in appearance and quality to the original construction. Replacing base and surfacing will be subsidiary to Item 618.

Place conduit under existing pavement by boring unless otherwise directed. Pits for boring shall not be closer than 2 ft. from edge of pavement unless otherwise approved. Water jetting will not be permitted. At the close of work each day, cover all open pits and barricade for safety.

When boring is used for under-pavement conduit installations, maximum allowable overcut shall be 1 in. diameter.

Use of a pneumatically driven device for punching holes beneath pavement (commonly known as a "missile") will not be permitted on this project.

All underground conduit bends of 45° or more in PVC conduit systems, including bends into ground boxes, shall be made with rigid metal conduit. Where rigid metal conduit is exposed at any point and where rigid metal conduit extends into ground boxes, bond the metal conduit to the grounding conduction with grounding type bushings or by other approved UL listed grounding connectors. Rigid metal bends will not be paid for separately but will be incidental to the PVC conduit system.

The location of conduits is diagrammatic only and may be shifted to accommodate field conditions as directed.

Item 624: Ground Boxes

Location and estimated number of ground boxes are diagrammatic only. The location and number of ground boxes may vary to accommodate field conditions as directed.

Item 644: Small Roadside Sign Assemblies

Install adjacent signs with bottom edges at equal heights.

Sign placement shall be in accordance with the "Sign Crew Field Book" and 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. Stake all sign support locations for verification and approval.

Existing supports shall not be reused, and shall become the property of the Contractor.

Salvage all sign blanks to be removed and deliver the same day to TxDOT's facility at San Augustine County Maintenance Facility, 551 South El Camino Crossing (US 96 South), San Augustine, TX 75972.

Place relocated signs as close as feasible to existing signs, unless placement conflicts with the Sign Crew Field Book.

Prior to ordering signs, advisory speeds at horizontal curves shall be verified by the department.

Wrap red retroreflective tape (NGIP Code 801-49-87-1008) around the support post of all STOP, YIELD, and DO NOT ENTER signs. Tape shall be placed approximately 4 feet above the surface of the edge of the roadway adjacent to the sign and shall be wrapped to a height of 12

inches. The tape and the placement of the tape on the sign posts shall be subsidiary to the sign assembly.

Item 658: Delineator and Object Marker Assemblies

Install delineators on the departure side of the posts when mounting to metal beam guard fence and guardrail end treatments.

Item 662: Work Zone Pavement Markings

Place standard work zone pavement markings before traffic is routed over detours.

Install standard work zone pavement markings on the level-up course of the overlay.

Standard work zone pavement markings shall be paint and glass beads or thermoplastic.

Install short term pavement markings (removable) on the hot mix asphalt immediately following final rolling.

Install short term pavement markings (removable) on the finish course of the overlay immediately following final rolling, offset from lane lines so there will be no conflict with permanent stripes.
Place short term pavement markings on the level-up course of the hot mix asphalt and the existing pavement after planing.

Place short term pavement markings on the surface treatment and level-up course immediately following final rolling.

After placement of permanent striping on the finish course, remove all short term pavement markings.

Furnish Type II glass beads conforming to DMS-8290, "Glass Traffic Beads", for hot applied thermoplastic and traffic paint markings.

Item 666: Reflectorized Pavement Markings

Remove loose aggregate immediately prior to placing pavement markings.

Place reflectorized pavement markings no sooner than 3 days nor later than 14 days after placement of the surface treatment.

Type I markings must meet the minimum retroreflectivity values for edgeline markings, centerline or no passing barrier-line, and lane lines when measured any time after 3 days, but not later than 10 days after application.

Before construction operations begin, observe and mark existing passing/no passing zones. Passing/no passing zones shall be verified prior to placement of permanent pavement markings.

Use Type II pavement markings as a sealer for Type I pavement markings.

Place a minimum of 500 ft. of 4 in. double yellow no passing lines on the approach to all stop condition intersections for two lane roads unless otherwise shown in the plans or directed.

Item 672: Raised Pavement Markers

Place permanent raised pavement markers after permanent striping has been completed.

Item 3076: Dense-Graded Hot-Mix Asphalt

Trial batches may be required whenever the design has not been produced in the previous 12 months. Trial batches will be subsidiary to the bid item.
TX-203 Will be ran on the complete mix and a requires minimum of 45%

No Department-owned RAP is available.

Provide a tack that meets the requirements of Item 300, Table 3A or Table 10A, unless otherwise approved by the engineer.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough so that stopping between trucks is not ordinarily required. If, in the opinion of the Engineer, sporadic delivery of material is adversely affecting the HMA placement, the Engineer may require paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

Add h drated lime to all HMA mixtures at a minimum rate of 1.0% by weight of the total aggregate, except for those mixtures containing RAP and/or RAS. Mixtures that contain RAP

and/or RAS shall be designed at a rate of minimum 0.5 % of lime by weight and the test results will be evaluated by the engineer to determine if lime or a liquid anti-strip additive will be used. The hydrated lime shall meet the requirements of DMS-6350, “Lime and Lime Slurry”. The hydrated lime shall be added in accordance with the construction method in Item 301, “Asphalt Antistripping Agents”. This lime will be subsidiary to this item.

Cover each load of mixture with waterproof tarpaulins.

For HMA placements greater than 2 inches, construct longitudinal joints adjacent to travel ways with a maximum 1 inch vertical edge and an adjacent 3:1 maximum taper.

Along outside pavement edges construct a 3:1 maximum taper or backfill the same day as shown on the plans or as directed.

Remove and properly dispose of any piles of asphaltic concrete and all other debris left on the right of way daily.

Item 3077: Superpave Mixtures

No Department-owned RAP is available.

TX-203 Will be ran on the complete mix and a requires minimum of 45%

Add h drated lime to all HMA mixtures at a minimum rate of 1.0% by weight of the total aggregate, except for those mixtures containing RAP and/or RAS. Mixtures that contain RAP and/or RAS shall be designed at a minimum rate of 0.5 % of lime by weight and the test results will be evaluated by the engineer to determine if lime or a liquid anti-strip additive will be used. The hydrated lime shall meet the requirements of DMS-6350, "Lime and Lime Slurry". The hydrated lime shall be added in accordance with the construction method in Item 301, "Asphalt Antistripping Agents". This lime will be subsidiary to this item.

Trial batches may be required whenever the design has not been produced in the previous 12 months. Trial batches will be subsidiary to the bid item.

Provide a tack that meets the requirements of Item 300, Table 3A or Table 10A, unless otherwise approved by the engineer.

Cover each load of mixture with waterproof tarpaulins.

Operate the spreading and finishing machine at a uniform forward speed consistent with the plant production rate, hauling capability, and roller train capacity to result in a continuous operation. The speed shall be slow enough so that stopping between trucks is not ordinarily required. If, in the opinion of the Engineer, sporadic delivery of material is adversely affecting the HMA placement, the Engineer may require paving operations to cease until acceptable methods are employed to minimize starting and stopping of the paver.

A material transfer vehicle (MTV) will be required for all courses of HMA on this project. An MTV is defined as a self-propelled, wheel-mounted vehicle capable of receiving HMA from the haul trucks separate from the paver. The MTV shall have a minimum storage capacity of approximately 25 tons and shall be equipped with a pivoting discharge conveyor and a means of completely remixing the HMA prior to placement.

Remove and properly dispose of any piles of asphaltic concrete and all other debris left on the right of way daily.

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

Two (2) TMAs (stationary) will be required for this project. The contractor will be responsible for determining if multiple operations will be ongoing at the same time to determine the total numbe of TMAs needed for the project.

Three (3) TMAs will be required on all divided highways for mobile operations and two (2) TMAs will be required on all other roadways for each mobile operation. Quantities were estimated based on one mobile working operation, as per the number of working days. If multiple crews were utilized, additional TMAs will be required.

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0809-02-069 **DISTRICT** Lufkin **COUNTY** Shelby
HIGHWAY US 96

		CONTROL SECTION JOB		**0809-02-069**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00059671**			
		COUNTY		**Shelby**			
		HIGHWAY		**US 96**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	100-6002	PREPARING ROW	STA	260.400		260.400	
	104-6017	REMOVING CONC (DRIVEWAYS)	SY	105.000		105.000	
	105-6014	REMOVING STAB BASE & ASPH PAV (7"-12")	SY	11,958.000		11,958.000	
	110-6001	EXCAVATION (ROADWAY)	CY	4,936.000		4,936.000	
	132-6004	EMBANKMENT (FINAL)(DENS CONT)(TY B)	CY	16,268.000		16,268.000	
	161-6017	COMPOST MANUF TOPSOIL (4")	SY	252,757.000		252,757.000	
	162-6002	BLOCK SODDING	SY	1,280.000		1,280.000	
	164-6021	CELL FBR MLCH SEED(PERM)(RURAL)(SANDY)	SY	252,757.000		252,757.000	
	164-6029	CELL FBR MLCH SEED(TEMP)(WARM)	SY	126,380.000		126,380.000	
	164-6031	CELL FBR MLCH SEED(TEMP)(COOL)	SY	126,380.000		126,380.000	
	168-6001	VEGETATIVE WATERING	MG	10,135.000		10,135.000	
	169-6003	SOIL RETENTION BLANKETS (CL 1) (TY C)	SY	11,636.000		11,636.000	
	314-6010	EMULS ASPH (EROSN CONT)(SS-1)	GAL	5,208.000		5,208.000	
	316-6402	AGGR (TY-PE, E, L OR PL GR 3)	CY	1,260.000		1,260.000	
	316-6530	ASPH (AC-15P OR CRS-2P)	TON	640.000		640.000	
	351-6008	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	SY	700.000		700.000	
	400-6005	CEM STABIL BKFL	CY	2.000		2.000	
	403-6001	TEMPORARY SPL SHORING	SF	1,400.000		1,400.000	
	416-6029	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	16.000		16.000	
	420-6009	CL A CONC (COLLAR)	EA	3.000		3.000	
	432-6001	RIPRAP (CONC)(4 IN)	CY	1,433.000		1,433.000	
	432-6024	RIPRAP (STONE COMMON)(DRY)(12 IN)	CY	78.000		78.000	
	464-6003	RC PIPE (CL III)(18 IN)	LF	647.000		647.000	
	464-6005	RC PIPE (CL III)(24 IN)	LF	29.000		29.000	
	464-6007	RC PIPE (CL III)(30 IN)	LF	68.000		68.000	
	466-6095	HEADWALL (CH - PW - 0) (DIA= 18 IN)	EA	1.000		1.000	
	466-6097	HEADWALL (CH - PW - 0) (DIA= 24 IN)	EA	1.000		1.000	
	466-6099	HEADWALL (CH - PW - 0) (DIA= 30 IN)	EA	2.000		2.000	
	466-6100	HEADWALL (CH - PW - 0) (DIA= 33 IN)	EA	2.000		2.000	
	466-6101	HEADWALL (CH - PW - 0) (DIA= 36 IN)	EA	1.000		1.000	
	466-6102	HEADWALL (CH - PW - 0) (DIA= 42 IN)	EA	2.000		2.000	
	466-6104	HEADWALL (CH - PW - 0) (DIA= 54 IN)	EA	1.000		1.000	
	466-6107	HEADWALL (CH - PW - 0) (DIA= 72 IN)	EA	1.000		1.000	
	466-6132	HEADWALL (CH - PW - S) (DIA= 30 IN)	EA	1.000		1.000	
	466-6135	HEADWALL (CH - PW - S) (DIA= 42 IN)	EA	1.000		1.000	
	466-6138	HEADWALL (CH - PW - S) (DIA= 60 IN)	EA	1.000		1.000	
	467-6363	SET (TY II) (18 IN) (RCP) (6: 1) (P)	EA	33.000		33.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0809-02-069 **DISTRICT** Lufkin **COUNTY** Shelby
HIGHWAY US 96

			CONTROL SECTION JOB		**0809-02-069**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00059671**			
			COUNTY		**Shelby**			
			HIGHWAY		**US 96**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**		EST.	FINAL		
	467-6419	SET (TY II) (30 IN) (RCP) (4: 1) (C)	EA		1.000		1.000	
	480-6001	CLEAN EXIST CULVERTS	EA		4.000		4.000	
	496-6016	REMOV STR (PIPE)	EA		13.000		13.000	
	500-6001	MOBILIZATION	LS		1.000		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO		33.000		33.000	
	506-6002	ROCK FILTER DAMS (INSTALL) (TY 2)	LF		576.000		576.000	
	506-6011	ROCK FILTER DAMS (REMOVE)	LF		576.000		576.000	
	506-6020	CONSTRUCTION EXITS (INSTALL) (TY 1)	SY		312.000		312.000	
	506-6024	CONSTRUCTION EXITS (REMOVE)	SY		312.000		312.000	
	506-6038	TEMP SEDMT CONT FENCE (INSTALL)	LF		20,436.000		20,436.000	
	506-6039	TEMP SEDMT CONT FENCE (REMOVE)	LF		20,436.000		20,436.000	
	530-6002	INTERSECTIONS (ACP)	SY		608.000		608.000	
	530-6004	DRIVEWAYS (CONC)	SY		100.000		100.000	
	530-6005	DRIVEWAYS (ACP)	SY		4,661.000		4,661.000	
	530-6008	TURNOUTS (ACP)	SY		65.000		65.000	
	533-6001	RUMBLE STRIPS (SHOULDER)	LF		52,080.000		52,080.000	
	533-6002	RUMBLE STRIPS (CENTERLINE)	LF		26,040.000		26,040.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF		4,450.000		4,450.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF		3,725.000		3,725.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA		26.000		26.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA		28.000		28.000	
	560-6003	MAILBOX INSTALL-M (TWG-POST) TY 1	EA		1.000		1.000	
	560-6007	MAILBOX INSTALL-S (WC-POST) TY 3	EA		19.000		19.000	
	560-6008	MAILBOX INSTALL-D (WC-POST) TY 3	EA		6.000		6.000	
	610-6254	IN RD IL (TY ST) 40T-8 (250W EQ) LED	EA		2.000		2.000	
	618-6023	CONDT (PVC) (SCH 40) (2")	LF		179.000		179.000	
	618-6024	CONDT (PVC) (SCH 40) (2") (BORE)	LF		90.000		90.000	
	620-6007	ELEC CONDR (NO.8) BARE	LF		294.000		294.000	
	620-6008	ELEC CONDR (NO.8) INSULATED	LF		588.000		588.000	
	624-6008	GROUND BOX TY C (162911)W/APRON	EA		3.000		3.000	
	628-6009	ELC SRV TY A 120/240 060(NS)SS(E)SP(O)	EA		1.000		1.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA		3.000		3.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)	EA		1.000		1.000	
	644-6036	IN SM RD SN SUP&AM TYS80(1)SA(U-BM)	EA		1.000		1.000	
	644-6060	IN SM RD SN SUP&AM TYTWT(1)WS(P)	EA		43.000		43.000	
	644-6061	IN SM RD SN SUP&AM TYTWT(1)WS(T)	EA		1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA		40.000		40.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0809-02-069 **DISTRICT** Lufkin **COUNTY** Shelby
HIGHWAY US 96

		CONTROL SECTION JOB		**0809-02-069**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00059671**			
		COUNTY		**Shelby**			
		HIGHWAY		**US 96**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL		
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA	57.000		57.000	
	658-6109	INSTL OM ASSM (OM-2Z)(WFLX)SRF(BI)	EA	30.000		30.000	
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	52,080.000		52,080.000	
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF	300.000		300.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	52,080.000		52,080.000	
	662-6109	WK ZN PAV MRK SHT TERM (TAB)TY W	EA	5,212.000		5,212.000	
	662-6111	WK ZN PAV MRK SHT TERM (TAB)TY Y-2	EA	10,424.000		10,424.000	
	662-6112	WK ZN PAV MRK SHT TERM RMV (W)(4")	LF	104,460.000		104,460.000	
	662-6113	WK ZN PAV MRK SHT TERM RMV (Y)(4")	LF	104,160.000		104,160.000	
	666-6020	REFL PAV MRK TY I (W)6"(LNDP)(090MIL)	LF	3,313.000		3,313.000	
	666-6035	REFL PAV MRK TY I (W)8"(SLD)(090MIL)	LF	974.000		974.000	
	666-6305	RE PM W/RET REQ TY I (W)6"(BRK)(090MIL)	LF	4,120.000		4,120.000	
	666-6308	RE PM W/RET REQ TY I (W)6"(SLD)(090MIL)	LF	51,425.000		51,425.000	
	666-6320	RE PM W/RET REQ TY I (Y)6"(SLD)(090MIL)	LF	51,379.000		51,379.000	
	668-6076	PREFAB PAV MRK TY C (W) (24") (SLD)	LF	12.000		12.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)	EA	2.000		2.000	
	668-6083	PREFAB PAV MRK TY C (W) (LNDP ARROW)	EA	4.000		4.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)	EA	2.000		2.000	
	672-6007	REFL PAV MRKR TY I-C	EA	103.000		103.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	662.000		662.000	
	3076-6071	D-GR HMA TY-D PG 64-22 (EXEMPT)	TON	563.000		563.000	
	3077-6021	SP MIXESSP-CPG70-22	TON	35,585.000		35,585.000	
	3077-6022	SP MIXESSP-CSAC-A PG70-22	TON	16,539.000		16,539.000	
	3084-6001	BONDING COURSE	GAL	7,533.000		7,533.000	
	6001-6002	PORTABLE CHANGEABLE MESSAGE SIGN	EA	2.000		2.000	
	6185-6002	TMA (STATIONARY)	DAY	340.000		340.000	
	6185-6005	TMA (MOBILE OPERATION)	DAY	66.000		66.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000		1.000	
		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	
1A	276-6232	CEM TRT(PLNT MX) (CLN)(TYA)(GR1-2)(12")	SY	31,187.000		31,187.000	
	316-6060	ASPH (RC-250)	TON	37.000		37.000	
	316-6417	AGGR (TY E OR L GR 5)	CY	226.000		226.000	
1	3077-6001	SP MIXESSP-BPG64-22	TON	21,525.000		21,525.000	

SUMMARY OF TRAFFIC CONTROL QUANTITIES

ITEM NO.:			351	662							6001	6185	
	STATION TO STATION	LENGTH	FLEXIBLE PAVEMENT STRUCTURE REPAIR (12") (1)	WK ZN PAV MRK NON-REMOV (W) 4" (SLD)	WK ZN PAV MRK NON-REMOV (W) 8" (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-2	WK ZN PAV MRK SHT TERM RMV (W)(4")	WK ZN PAV MRK SHT TERM RMV (Y)(4")	PORTABLE CHANGEABLE MESSAGE SIGN (2)	TMA (STATIONARY)	TMA (MOBILE OPERATION)
		(FT)	SY	LF	LF	LF	EA	EA	LF	LF	EA	DAY	DAY
SB LANES	2302+25 TO 2562+65	26,040	350	26,040	150	26,040	1,303	2,606	26,190	26,040			
NB LANES	2302+25 TO 2562+65	26,040	350	26,040	150	26,040	1,303	2,606	26,190	26,040			
FINAL 2" LIFT	2302+25 TO 2562+65	26,040					2,606	5,212	52,080	52,080			
PROJECT TOTALS:			**700**	**52,080**	**300**	**52,080**	**5,212**	**10,424**	**104,460**	**104,160**	**2**	**340**	**66**

(1) LOCATIONS AS DIRECTED BY THE ENGINEER

(2) PORTABLE CHANGEABLE MESSAGE SIGNS SHALL BE PLACED AS DIRECTED BY THE ENGINEER, AND ARE TO REMAIN IN PLACE FOR DURATION OF THE PROJECT

FOR CONTRACTOR'S INFORMATION ONLY

SUBSIDIARY TO ITEM 351

ITEM NO.:		**LENGTH**	316		3076
			1 CST		
	STATION TO STATION		ASPH (AC-15P OR CRS-2P)	AGGR (TY-PE, E, L, OR PL GR 3)	D-GR HMA TY-B PG64-22
			(0.42 GAL/SY)	(1 CY /120SY)	(12")
		(FT)	GAL	CY	TON
SB LANES	2302+25 TO 2562+65	26,040	147	3	231
NB LANES	2302+25 TO 2562+65	26,040	147	3	231
CONTRACTOR INFORMATION TOTAL:			**294**	**6**	**462**

QUANTITY SUMMARIES

(SHEET 1 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		16

9/28/2022 8:48:15 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\0I*GEN\6802QUANT00I.dgn

SUMMARY OF PAVEMENT QUANTITIES

								ALTERNATE BID ITEMS									
						ITEM NO.:	100	105	276	316		316			3077			3084
STATION TO STATION	LENGTH	WIDTH	AREA	TRANSITION AVG. WIDTH	TRANSITION AREA	PREPARING ROW	REMOVING STAB BASE & ASPH PAV (7"-12")	* CEM TRT (PLNT MX) (CLN) (TYA) (GR1-2)	* ASPH (RC-250)	* AGGR (TY E OR L GR 5)	OCST + ASPH (AC-15P OR CRS-2P)	OCST ASPH (AC-15P OR CRS-2P)	OCST AGGR (TY-PE, E, L OR PL GR 3)	** SP MIXES SP-B PG64-22	SP MIXES SP-C SAC-A PG70-22	SP MIXES SP-C PG70-22	BONDING COURSE
								(12")		(1CY/140 SY)	(0.42 GAL/SY)		(1CY/120 SY)	(1320 LBS/SY)	(220 LBS/SY)	(275 LBS/SY)	(0.05 GAL/SY)
	FT	FT	SY	FT	SY	STA	SY	SY	TON	CY	GAL	TON	CY	TON	TON	TON	GAL
2302+25 TO 2325+25	2,300	44	11,319			23.0					4,786	48	95		1,250	2,960	570
2325+25 TO 2334+25	900			48	4,829	9.0	388	830	1	6	2,041	21	41	583	534	923	243
2334+25 TO 2439+85	10,560	52	61,352			105.6	5,234	14,417	16	103	25,912	262	515	9,955	6,775	15,947	3,085
2439+85 TO 2444+35	450			48	2,415	4.5	331	415	1	3	1,021	10	21	292	267	724	122
2444+35 TO 2456+66	1,231	44	6,058			12.3					2,562	26	51		669	2,314	305
2456+66 TO 2467+16	1,050			55	6,455	10.5	593	1,443	2	11	2,726	28	55	996	713	1,245	325
2467+16 TO 2472+17	501	77	4,299			5.0	1,156	1,684	2	13	1,813	18	36	1,139	475	523	216
2472+17 TO 2482+67	1,050			60	6,964	10.5	845	1,889	3	14	2,940	30	59	1,293	769	999	350
2482+67 TO 2553+65	7,098	52	41,227			71.0	2,974	9,675	11	70	17,412	176	346	6,680	4,553	8,218	2,073
2553+65 TO 2562+65	900			48	4,834	9.0	437	834	1	6	2,043	21	41	587	534	1,732	244
PROJECT TOTALS:						**260.4**	**11,958**	*** 31,187**	***37**	*** 226**	**+63,256**	**640**	**1,260**	**** 21,525**	**16,539**	**35,585**	**7,533**

* ALTERNATE BID ITEMS

** BASE BID ITEM TO BE REPLACED BY ALTERNATE BID ITEMS FOR ALTERNATE BID

\+ FOR CONTRACTOR'S INFORMATION ONLY

NOTE: MAXIMUM LIFT THICKNESS SHALL BE 4" IN AREAS FOR CORRECTING VERTICAL CURVES

QUANTITY SUMMARIES

(SHEET 2 OF 14)

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		17

SUMMARY OF MAILBOXES AND TURNOUTS

ITEM NO.:		530	560		
STATION	LT/RT	TURNOUTS (ACP)	MAILBOX INSTALL-M (TWG-POST) TY 1	MAILBOX INSTALL-S (WC-POST) TY 3	MAILBOX INSTALL-D (WC-POST) TY 3
		SY	EA	EA	EA
2401+47	LT	5		1	
2421+06	LT	5		1	
2426+02	LT	5		1	
2477+02	LT			1	
2480+43	LT			1	
2496+48	LT			1	
2519+33	LT			1	
2561+11	LT			1	
2562+54	LT			1	
2355+79	RT				1
2361+21	RT			1	
2367+14	RT				1
2375+78	RT				1
2392+47	RT			1	
2418+59	RT				1
2473+15	RT	5		1	
2479+32	RT	5		1	
2485+37	RT	5		1	
2491+76	RT	5		1	
2514+61	RT	8			1
2520+14	RT	6			1
2536+89	RT	5		1	
2539+17	RT	6		1	
2545+05	RT	5		1	
2559+70	RT			1	
2560+90	RT		1		
PROJECT TOTALS:		65	1	19	6

QUANTITY SUMMARIES

(SHEET 3 OF 14)

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		18

SUMMARY OF DRIVEWAY QUANTITIES

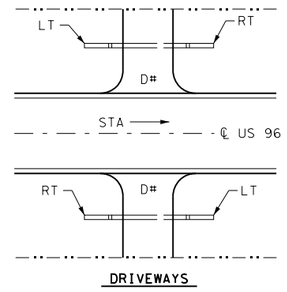
									ITEM NO.	ITEM 104	ITEM 162 (1)	ITEM 168	ITEM 464	ITEM 467 (2)	ITEM 496	ITEM 530		
													RC PIPE (CL III)			DRIVEWAYS		INTERSECTIONS
DRWY ID	STA	O/S	EXIST MAT'L	R C S	DESCRIPTION	AVG WIDTH (W)	LENGTH	RADIUS		REMOVING CONC (DRIVEWAYS)	BLOCK SODDING	VEGETATIVE WATERING	(18 IN)	SET (TY II) (18 IN) (RCP) (6:1) (P)	REMOV STR (PIPE)	(CONC)	(ACP)	(ACP)
																	6"	6"
																	660 LBS/SY	660 LBS/SY
										SY	SY	MG	LF	EA	EA	SY	SY	SY
1	2324+48	LT	ASPH	C	EXIST 24" X 44' RCP W/SET'S TO REMAIN	22	53	35\50									220	
2	2330+97	RT	ASPH	C	NO STRUCTURE	15	38	35									123	
3	2333+51	LT	ASPH	R	NO STRUCTURE	12	71	15									112	
4	2349+48	RT	CONC	R	EXIST 18" X 24' RCP W/SET'S TO REMAIN	10	79	15		105						100		
5	2356+14	RT	ASPH	R	EXIST 18" X 42' RCP W/SET'S TO REMAIN, INSTALL 1 SET	10	80	15			11	0.2		1			101	
6	2360+26	RT	ASPH	C	NO STRUCTURE	12	80	15									118	
7	2367+45	RT	ASPH	R	EXIST 18" X 40' RCP W/SET'S TO REMAIN	13	55	15									80	
8	2376+18	RT	ASPH	C	NO STRUCTURE	16	58	15									115	
9	2382+97	LT	ASPH	C	NO STRUCTURE	20	52	15\35									148	
10	2383+73	RT	GRAVEL	C	EXIST 18" X 24' RCP W/SET'S TO REMAIN	11	57	15									81	
11	2392+74	RT	ASPH	R	EXIST 24" X 30' RCP W/SET'S TO REMAIN	10	55	15									73	
12	2401+70	LT	ASPH	R	EXIST 18" X 24' RCP W/SET'S TO BE TO BE REMOVED & REPLACED WITH 18"X56' RCP & 2 SET'S	16	35	15			22	0.4	56	2			69	
13	2409+80	RT	ASPH	S	(CR 1021) EXIST 18" X 56' RCP W/ 1 SET TO REMAIN & INSTALL 1 SET	16	43	25			11			1			137	
14	2410+93	LT	ASPH	S	(CR 1015) EXIST 18" X 60' RCP W/1 SET TO BE REMOVED & REPLACED W/ 18" X 64' RCP & 2 SET'S	25	35	25			22	0.4	64	2	1		167	
15	2418+19	RT	ASPH	R	EXIST 18" X 24' RCP W/SET'S TO BE REMOVED AND REPLACED W/ 18" X 28' RCP & 2 SET'S	11	53	15			22	0.4	28	2	1		79	
16	2418+90	RT	ASPH	R	EXIST 18" X 24' RCP W/SET'S TO REMAIN	10	53	15									71	
17	2419+27	LT	ASPH	R	EXIST 18" RCP AND HEADWALL TO BE REMOVED AND REPLACED W/ 18"x48' RCP & 2 SET'S	11	70	15			22		48	2	1		159	
18	2420+89	LT	GRAVEL	R	NO STRUCTURE	11	79	15									193	
SHEET SUBTOTAL:										105	110	1.4	196	10	3	100	2046	0

NOTE: PAVEMENT STRUCTURE OF ALL INTERSECTIONS TO MATCH PROPOSED PAVEMENT STRUCTURE OF US 96

R - RESIDENTIAL DRIVEWAY
C - COMMERCIAL DRIVEWAY
S - SIDE ROAD

(1) WATER EST AT 10 GAL/SY FOR 2 APPLICATIONS.
(2) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

REQUIRED BLOCK SODDING AT EACH SET END	
CULVERT SIZE	SY
18"	11
24"	13



DRIVEWAYS

QUANTITY SUMMARIES

(SHEET 4 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		19

SUMMARY OF DRIVEWAY QUANTITIES (CONTINUED)

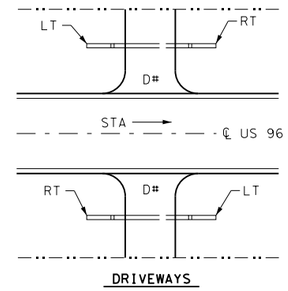
									ITEM NO.	ITEM 104	ITEM 162 (1)	ITEM 168	ITEM 464	ITEM 467 (2)	ITEM 496	ITEM 530		
																DRIVEWAYS		INTERSECTIONS
DRWY ID	STA	O/S	EXIST MAT'L	R C S	DESCRIPTION	AVG WIDTH (W)	LENGTH	RADIUS		REMOVING CONC (DRIVEWAYS)	BLOCK SODDING	VEGETATIVE WATERING	RC PIPE (CL III) (18 IN)	SET (TY II) (18 IN) (RCP) (6:1)(P)	REMOV STR (PIPE)	(CONC)	(ACP) 6" 660 LBS/SY	(ACP) 6" 660 LBS/SY
										SY	SY	MG	LF	EA	EA	SY	SY	SY
19	2424+68	LT	ASPH	R	NO STRUCTURE	12	46	15									70	
20	2426+22	LT	ASPH	R	EXIST 18" X 32' RCP W/SET'S TO BE REMOVED AND REPLACED W/ 18" X 48' RCP & 2 SET'S	12	46	30			22	0.4	48	2	1		70	
21	2435+27	RT	ASPH	S	(CR 1019) EXIST 18" X 90' RCP W/SET'S TO BE REMOVED & REPLACED W/ 18" X 56' RCP & 2 SET'S	20	79	30			22	0.4	56	2	1		400	
22	2461+15	LT	ASPH	S	(CR1017) NO STRUCTURE	55	32	75									170	
23	2468+29	RT	ASPH	S	(FM 2140) NO STRUCTURE			80										608
24	2469+88	LT	ASPH	S	(CR 1015) EXIST 18" X 30' RCP W/SET'S REMOVE SET'S AND EXTEND 6' EACH END & INSTALL 2 SET'S	22	28	20			22	0.4	12	2			100	
25	2472+94	RT	ASPH	R	EXIST 18"X18' PLASTIC PIPE TO BE REMOVED AND REPLACED W/ 18" X 48' RCP AND 2 SET'S	12	28	15			22	0.4	48	2	1		46	
26	2476+64	LT	GRAVEL	R	NO STRUCTURE	10	31	15									46	
27	2479+53	RT	ASPH	R	EXIST 18"X24' PLASTIC PIPE TO BE REMOVED AND REPLACED W/ 18" X 48' RCP & 2 SET'S	12	32	15			22	0.4	48	2	1		52	
28	2480+67	LT	ASPH	R	NO STRUCTURE	10	34	15									49	
29	2481+98	RT	GRAVEL	R	NO STRUCTURE	14	33	15									60	
30	2483+37	LT	GRAVEL	R	NO STRUCTURE	11	36	15									56	
31	2485+57	RT	GRAVEL	R	EXIST 18"X30' PLASTIC PIPE TO BE REMOVED AND REPLACED W/ 18" X 44' RCP & 2 SET'S	11	33	15			22	0.4	44	2	1		53	
32	2491+98	RT	ASPH	R	NO STRUCTURE	14	33	25\30									87	
33	2496+75	LT	GRAVEL	R	EXIST 18"X24' PLASTIC PIPE TO BE REMOVED AND REPLACED W/ 18" X 20' RCP & 2 SET'S	14	39	15			22	0.4	20	2	1		72	
34	2508+51	LT	ASPH	S	(CR 1012) NO STRUCTURE	26	39	45									203	
35	2511+84	RT	GRAVEL	R	NO STRUCTURE	11	31	15									47	
36	2515+59	RT	ASPH	R	EXIST 18" X 42' RCP W/SET'S TO REMAIN	14	31	15									58	
SHEET SUBTOTAL:										0	154	2.8	276	14	6	0	1639	608

NOTE: PAVEMENT STRUCTURE OF ALL INTERSECTIONS TO MATCH PROPOSED PAVEMENT STRUCTURE OF US 96

R - RESIDENTIAL DRIVEWAY
C - COMMERCIAL DRIVEWAY
S - SIDE ROAD

(1) WATER EST AT 10 GAL/SY FOR 2 APPLICATIONS.
(2) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

REQUIRED BLOCK SODDING AT EACH SET END	
CULVERT SIZE	SY
18"	11
24"	13



DRIVEWAYS

QUANTITY SUMMARIES

(SHEET 5 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		20

SUMMARY OF DRIVEWAY QUANTITIES (CONTINUED)

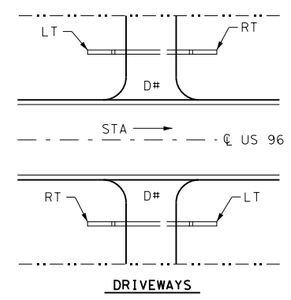
									ITEM NO.	ITEM 104	ITEM 162 (1)	ITEM 168	ITEM 464	ITEM 467 (2)	ITEM 496	ITEM 530		
																DRIVEWAYS		INTERSECTIONS
DRWY ID	STA	O/S	EXIST MAT'L	R C S	DESCRIPTION	AVG WIDTH (W)	LENGTH	RADIUS		REMOVING CONC (DRIVEWAYS)	BLOCK SODDING	VEGETATIVE WATERING	RC PIPE (CL III) (18 IN)	SET (TY II) (18 IN) (RCP) (6:1) (P)	REMOV STR (PIPE)	(CONC)	(ACP) 6" 660 LBS/SY	(ACP) 6" 660 LBS/SY
										SY	SY	MG	LF	EA	EA	SY	SY	SY
37	2517+29	RT	ASPH	R	EXIST 18" X 32' RCP W/SET'S TO BE REMOVED AND REPLACED W/ 18" X 20' RCP & 2 SET'S	11	31	15			22	0.4	20	2	1		48	
38	2519+92	LT	ASPH	C	EXIST 24" X 80' RCP W/SET'S TO REMAIN	32	38	30									178	
39	2520+38	RT	ASPH	R	EXIST 18" X 24' RCP W/SET'S TO REMAIN	12	32	15									51	
40	2522+18	LT	ASPH	C	EXIST 18" X 32' CMP TO BE REMOVED AND REPLACED W/ 18" X 56' RCP & 2 SET'S	33	38	30			22	0.4	56	2	1		139	
41	2526+15	RT	ASPH	S	(CR 1008) NO STRUCTURE	14	32	25									78	
42	2536+67	RT	GRAVEL	R	EXIST 18" X 24' RCP W/SET'S TO BE REOVED AND REPLACED W/ 18" X 40' RCP & 2 SET'S	11	32	15			22	0.4	40	2	1		52	
43	2539+73	RT	ASPH	C	EXIST 18" X 24' RCP W/SET'S TO REMAIN	14	32	15									60	
44	2541+59	LT	ASPH	R	EXIST 18" X 24' RCP W/SET'S TO REMAIN	11	38	15									58	
45	2544+84	RT	GRAVEL	R	EXIST 18" X 24' RCP W/SET'S REMOVE 1 SET AND EXTEND 8' & INSTALL 1 SET	11	32	15			11	0.2	8	1			50	
46	2559+87	RT	ASPH	R	EXIST 18" X 24' RCP W/SET'S TO BE REMOVED AND REPLACED W/ 18" X 40' RCP & 2 SET'S	11	49	15			22	0.4	40	2	1		76	
47	2561+40	LT	ASPH	R	NO STRUCTURE	14	53	15									93	
48	2562+31	LT	ASPH	R	NO STRUCTURE	14	53	15									93	
SHEET SUBTOTAL:										0	99	1.8	164	9	4	0	976	0
PROJECT TOTALS:										105	363	6.0	636	33	13	100	4661	608

NOTE: PAVEMENT STRUCTURE OF ALL INTERSECTIONS TO MATCH PROPOSED PAVEMENT STRUCTURE OF US 96

R - RESIDENTIAL DRIVEWAY
C - COMMERCIAL DRIVEWAY
S - SIDE ROAD

(1) WATER EST AT 10 GAL/SY FOR 2 APPLICATIONS.
(2) PROVIDE 12" DEEP TOEWALL FOR ALL SET'S.

REQUIRED BLOCK SODDING AT EACH SET END	
CULVERT SIZE	SY
18"	11
24"	13



DRIVEWAYS

QUANTITY SUMMARIES

(SHEET 6 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		21

SUMMARY OF CROSS DRAINAGE ITEMS

ITEM NO.		400	403	420	432	464			466			
CULVERT NO.	DESCRIPTION	CEM STABIL BKFL	TEMPORARY SPL SHORING	CL A CONC (COLLAR)	RIPRAP (STONE COMMON) (DRY)(12 IN)	RC PIPE (CL III) (18 IN)	RC PIPE (CL III) (24 IN)	RC PIPE (CL III) (30 IN)	HEADWALL (CH-PW-0) (DIA = 18 IN)	HEADWALL (CH-PW-0) (DIA = 24 IN)	HEADWALL (CH-PW-0) (DIA = 30 IN)	HEADWALL (CH-PW-0) (DIA = 33 IN)
		CY	SF	EA	CY	LF	LF	LF	EA	EA	EA	EA
1	STA 2316+04 EXIST 18" X 92' RCP TO REMAIN LT: REMOVE HEADWALL & INSTALL CH-PW-0 (33 IN) RT: NO CULVERT WORK				1.5							1
2	STA 2328+64 EXIST 24" X 124' RCP LT: REMOVE HEADWALL & 8'-24" RCP & INSTALL CH-PW-0 (42") RT: NO CULVERT WORK		310		5							
3	STA 2346+74 EXIST 2-30" X 145' RCP LT: REMOVE HEADWALL & 3'-30" RCP (N), 1'-30" RCP (S) LT: INSTALL 2-28'-30" RCP & CH-PW-S (30") RT: NO CULVERT WORK			1	10			56				
4	STA 2353+30 EXIST 2-24" X 101' RCP LT: REMOVE HEADWALLS & 1'-24" RCP (N), 3'-24" RCP (S), INSTALL CH-PW-S (42") RT: NO CULVERT WORK		250		10							
5	STA 2368+63 EXIST 2-48" X 227' RCP NO CULVERT WORK											
6	STA 2377+16 EXIST 18" X 114' RCP LT: REMOVE PSET, INSTALL 11'-18" RCP & CH-PW-0 (18") RT: REMOVE 12'-18" RCP & INSTALL CH-PW-0 (42")	1	200	1	3.5	11			1			
7	STA 2386+92 EXIST 2-24" X 179' RCP LT: REMOVE HEADWALL & INSTALL CH-PW-S (60") RT: NO CULVERT WORK											
8	STA 2413+16 EXIST 24" X 103' RCP LT: REMOVE HEADWALL & INSTALL 13'-24" RCP & CH-PW-0 (24") RT: NO CULVERT WORK	1		1			13			1		
9	STA 2423+92 EXIST 24" X 114' RCP LT: REMOVE HEADWALL & INSTALL CH-PW-0 (36") RT: NO CULVERT WORK											
10	STA 2444+82 EXIST 3-36" X 183' RCP NO CULVERT WORK											
11	STA 2452+49 EXIST 36" X 145' RCP LT: NO CULVERT WORK RT: REMOVE HEADWALL & INSTALL CH-PW-0 (72")		310		29							
12	STA 2475+11 EXIST 24" X 87' RCP LT: REMOVE PSET & 4'-24" RCP, INSTALL CH-PW-0 (54") RT: REMOVE PSET & INSTALL 8'-24" RCP & CH-PW-0 (33")		330		6		8					1
13	STA 2495+12 EXIST 30" X 69' RCP LT: REMOVE PSET & INSTALL 3'-30" RCP & CH-PW-0 (30") RT: REMOVE PSET & INSTALL 9'-30" RCP & PSET-SC (30")(4:1)				7			12			1	
14	STA 2505+54 EXIST 24" X 69' RCP LT: NO CULVERT WORK RT: REMOVE HEADWALL & INSTALL 8'-24" RCP & CH-PW-0 (30")				6		8				1	
15	STA 2520+88 EXIST 36" X 137' RCP NO CULVERT WORK											
PROJECT TOTALS:		**2**	**1,400**	**3**	**78**	**11**	**29**	**68**	**1**	**1**	**2**	**2**

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 25-YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. ADDITIONAL STUDIES ARE NOT REQUIRED. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

11/2/2021

QUANTITY SUMMARIES

(SHEET 7 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		22

11/2/2021 3:31:04 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\01*GEN\6802QUANT007.dgn

SUMMARY OF CROSS DRAINAGE ITEMS (CONTINUED)

ITEM NO.		466							467	480	496	
CULVERT NO.	DESCRIPTION	HEADWALL (CH-PW-0) (DIA = 36 IN)	HEADWALL (CH-PW-0) (DIA = 42 IN)	HEADWALL (CH-PW-0) (DIA = 54 IN)	HEADWALL (CH-PW-0) (DIA = 72 IN)	HEADWALL (CH-PW-S) (DIA = 30 IN)	HEADWALL (CH-PW-S) (DIA = 42 IN)	HEADWALL (CH-PW-S) (DIA = 60 IN)	SET (TY II) (30 IN) (RCP) (4:1)(C)	CLEAN EXIST CULVERTS	*REMOVE STR (HEADWALL)	*REMOVE STR (PIPE)
		EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF
1	STA 2316+04 EXIST 18" X 92' RCP TO REMAIN LT: REMOVE HEADWALL & INSTALL CH-PW-0 (33 IN) RT: NO CULVERT WORK										1	
2	STA 2328+64 EXIST 24" X 124' RCP LT: REMOVE HEADWALL & 8'-24" RCP & INSTALL CH-PW-0 (42") RT: NO CULVERT WORK		1								1	8
3	STA 2346+74 EXIST 2-30" X 145' RCP LT: REMOVE HEADWALL & 3'-30" RCP (N), 1'-30" RCP (S) LT: INSTALL 2-28'-30" RCP & CH-PW-S (30") RT: NO CULVERT WORK					1					1	4
4	STA 2353+30 EXIST 2-24" X 101' RCP LT: REMOVE HEADWALLS & 1'-24" RCP (N), 3'-24" RCP (S), INSTALL CH-PW-S (42") RT: NO CULVERT WORK						1				2	4
5	STA 2368+63 EXIST 2-48" X 227' RCP NO CULVERT WORK											
6	STA 2377+16 EXIST 18" X 114' RCP LT: REMOVE PSET, INSTALL 11'-18" RCP & CH-PW-0 (18") RT: REMOVE 12'-18" RCP & INSTALL CH-PW-0 (42")		1							1	1	12
7	STA 2386+92 EXIST 2-24" X 179' RCP LT: REMOVE HEADWALL & INSTALL CH-PW-S (60") RT: NO CULVERT WORK							1			1	
8	STA 2413+16 EXIST 24" X 103' RCP LT: REMOVE HEADWALL & INSTALL 13'-24" RCP & CH-PW-0 (24") RT: NO CULVERT WORK										1	
9	STA 2423+92 EXIST 24" X 114' RCP LT: REMOVE HEADWALL & INSTALL CH-PW-0 (36") RT: NO CULVERT WORK	1									1	
10	STA 2444+82 EXIST 3-36" X 183' RCP NO CULVERT WORK											
11	STA 2452+49 EXIST 36" X 145' RCP LT: NO CULVERT WORK RT: REMOVE HEADWALL & INSTALL CH-PW-0 (72")				1						1	
12	STA 2475+11 EXIST 24" X 87' RCP LT: REMOVE PSET & 4'-24" RCP, INSTALL CH-PW-0 (54") RT: REMOVE PSET & INSTALL 8'-24" RCP & CH-PW-0 (33")			1						1	2	4
13	STA 2495+12 EXIST 30" X 69' RCP LT: REMOVE PSET & INSTALL 3'-30" RCP & CH-PW-0 (30") RT: REMOVE PSET & INSTALL 9'-30" RCP & PSET-SC (30")(4:1)								1	1	2	
14	STA 2505+54 EXIST 24" X 69' RCP LT: NO CULVERT WORK RT: REMOVE HEADWALL & INSTALL 8'-24" RCP & CH-PW-0 (30")									1	1	
15	STA 2520+88 EXIST 36" X 137' RCP NO CULVERT WORK											
PROJECT TOTALS:		1	2	1	1	1	1	1	1	4	*15	*32

THE STRUCTURES ON THE PROJECT ARE OPERATING AT AN ESTIMATED MINIMUM 25-YEAR FREQUENCY. THE OPERATION OF THESE STRUCTURES WILL NOT BE SIGNIFICANTLY ALTERED BY THIS PROJECT. DUE CONSIDERATION HAS BEEN GIVEN TO THE EFFECTS OF HEADWATERS AND VELOCITIES ASSOCIATED WITH THE STRUCTURES. ADDITIONAL STUDIES ARE NOT REQUIRED. CAUTION TO BE USED WHEN WORKING OVER CULVERTS.

*REMOVAL OF STRUCTURES WILL BE SUBSIDIARY TO VARIOUS BID ITEMS. QUANTITIES FOR CONTRACTOR INFORMATION ONLY.

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

QUANTITY SUMMARIES

(SHEET 8 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		23

PAVEMENT MARKING SUMMARY

ITEM NO.:			533		666					668				672	
STATION TO STATION			# RUMBLE STRIPS (SHOULDER)	## RUMBLE STRIPS (CENTERLINE)	REFL PAV MRK TY I (W) 6" (LNDP) (90 MIL)	REFL PAV MRK TY I (W)8" (SLD) (90 MIL)	RE PM W/RET REQ TY I (W)6" (BRK) (90 MIL)	RE PM W/RET REQ TY I (W)6" (SLD) (90 MIL)	RE PM W/RET REQ TY I (Y)6" (SLD) (90 MIL)	PREFAB PAV MRK TY C (W) (24") (SLD)	PREFAB PAV MRK TY C (W) (ARROW)	PREFAB PAV MRK TY C (W) (LNDP ARROW)	PREFAB PAV MRK TY C (W) (WORD)	REFL PAV MRKR TY I-C	REFL PAV MRKR TY II-A-A
			LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA
2302+25	TO	2325+25	4,600	2,300				4,821	4,821						62
2325+25	TO	2334+25	1,800	900				1,800	1,800						25
2334+25	TO	2439+85	21,120	10,560	1,012		2,360	20,795	20,499			2		29	258
2439+85	TO	2444+35	900	450	390			900	900						13
2444+35	TO	2456+66	2,462	1,231				2,462	2,462						33
2456+66	TO	2467+16	2,100	1,050	900	150		2,014	2,100		1		1	9	28
2467+16	TO	2472+17	1,002	501		824		720	1,053	12	1		1	42	15
2472+17	TO	2482+67	2,100	1,050			260	2,100	2,100					4	28
2482+67	TO	2553+65	14,196	7,098	1,011		1,500	14,013	13,844			2		19	175
2553+65	TO	2562+65	1,800	900				1,800	1,800						25
PROJECT TOTALS:			**52,080**	**26,040**	**3,313**	**974**	**4,120**	**51,425**	**51,379**	**12**	**2**	**4**	**2**	**103**	**662**

EDGELINE RUMBLE STRIP OPTION 4

CENTERLINE RUMBLE STRIP OPTION 4

QUANTITY SUMMARIES

(SHEET 9 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		24

SUMMARY OF METAL BEAM GUARD FENCE ITEMS

ITEM NO.			432	540	542	544		3076
STATION TO STATION			RIPRAP (CONC) (4 IN)	MTL W-BEAM GD FEN (TIM POST)	REMOVE METAL BEAM GUARD FENCE	GUARDRAIL END TREATMENT (INSTALL)	GUARDRAIL END TREATMENT (REMOVE)	D-GR HMA TY-D PG64-22 (EXEMPT) (440 LBS/SY)
FROM	TO	LT / RT	CY	LF	LF	EA	EA	TON
2314+15	2317+15	RT	50	300	375	2	2	40
2326+60	2333+10	LT	213	650	450	2	2	68
2327+50	2329+25	RT	48	175	175	2	2	29
2345+50	2348+50	RT			200		2	
2346+25	2349+00	LT			175		2	
2353+00	2356+00	LT	84	300		2		40
2366+50	2371+00	LT	274	450	300	2	2	53
2368+31	2371+56	RT	280	325	250	2	2	41
2376+92	2378+42	RT		150	150	2	2	26
2387+72	2390+72	LT	108	300	300	2	2	40
2411+38	2416+38	RT	116	500	350	2	2	56
2442+98	2446+98	RT	184	400	425	2	2	49
2443+00	2447+00	LT	29	400	350	2	2	48
2451+00	2453+75	RT		275	175	2	2	38
2520+20		LT	5					
2521+12	2523+37	RT	42	225	50	2	2	35
PROJECT TOTALS:			1,433	4,450	3,725	26	28	563

DELINEATOR / OBJECT MARKER SUMMARY

ITEM NO.			658	
STATION TO STATION			INSTL DEL ASSM (D - SW) SZ 1 (BRF)GF2 (BI)	INSTL OM ASSM (OM-2Z)(WFLX) SRF (BI)
			EA	EA
2302+25	TO	2325+25	4	2
2325+25	TO	2334+25	11	2
2334+25	TO	2439+85	26	14
2439+85	TO	2444+35	3	
2444+35	TO	2456+66	9	4
2456+66	TO	2467+16		
2467+16	TO	2472+17		
2472+17	TO	2482+67		2
2482+67	TO	2553+65	4	6
2553+65	TO	2562+65		
PROJECT TOTALS:			57	30

QUANTITY SUMMARIES

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		25

SUMMARY OF SWP3 QUANTITIES

ITEM NO.:	161	162	164			168	169	314	506					
STATION TO STATION	COMPOST MANUF TOPSOIL (4")	BLOCK SODDING	CELL FBR MLCH SEED (PERM) (RURAL) (SANDY)	CELL FBR MLCH SEED (TEMP) (WARM)	CELL FBR MLCH SEED (TEMP) (COOL)	VEGETATIVE WATERING (1)	SOIL RETENTION BLANKETS (CL 1) (TY C)	EMULS ASPH (EROSN CONT) (SS-1) (0.30 GAL/SY)	ROCK FILTER DAMS (INSTALL) (TY 2)	ROCK FILTER DAMS (REMOVE)	CONSTRUCTION EXITS (INSTALL) (TY 1)	CONSTRUCTION EXITS (REMOVE)	TEMP SEDMT CONT FENCE (INSTALL)	TEMP SEDMT CONT FENCE (REMOVE)
	SY	SY	SY	SY	SY	MG	SY	GAL	LF	LF	SY	SY	LF	LF
2302+25 TO 2325+25	20,270	54	20,270	10,135	10,135	812	414	460	24	24	78	78	1,152	1,152
2325+25 TO 2334+25	7,016		7,016	3,508	3,508	281	960	180	24	24			1,617	1,617
2334+25 TO 2439+85	120,472	454	120,472	60,236	60,236	4,828	2,347	2,112	348	348			8,388	8,388
2439+85 TO 2444+35	7,356		7,356	3,678	3,678	294	1,720	90	12	12			659	659
2444+35 TO 2456+66	16,608	14	16,608	8,304	8,304	665	4,503	246	36	36	156	156	1,263	1,263
2456+66 TO 2467+16	7,399		7,399	3,700	3,700	296		210					516	516
2467+16 TO 2472+17	2,769	22	2,769	1,385	1,385	111		100					142	142
2472+17 TO 2482+67	6,654	100	6,654	3,327	3,327	268		210	24	24			1,137	1,137
2482+67 TO 2553+65	54,279	173	54,279	27,140	27,140	2,175	434	1,420	108	108			4,481	4,481
2553+65 TO 2562+65	9,934	100	9,934	4,967	4,967	399	1,258	180			78	78	1,081	1,081
PROJECT TOTALS:	252,757	917	252,757	126,380	126,380	10,129	11,636	5,208	576	576	312	312	20,436	20,436

(1) 10 GAL/SY FOR 2 APPLICATIONS

NOTE: LOCATIONS AND TYPES OF BMPS MAY REQUIRE ADJUSTMENTS PRIOR TO OR AFTER PLACEMENT AS DIRECTED BY THE ENGINEER. ADJUSTMENTS SHOULD BE MADE TO ENSURE BMPS ARE WORKING EFFECTIVELY AND MAINTAIN COMPLIANCE WITH THE CONSTRUCTION GENERAL PERMIT. NOTIFY THE ENGINEER PRIOR TO MAKING ADJUSTMENTS.

QUANTITY SUMMARIES

(SHEET 11 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		26

EARTHWORK QUANTITY SUMMARY

ITEM NO.:					110	132
STATION TO STATION			CUT AREA	FILL AREA	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY B)
			SF	SF	CY	CY
			6.6200	0.0000		
2302+25	TO	2303+00	0.0000	0.6746	9	
2303+00	TO	2304+00	0.0000	1.2497		4
2304+00	TO	2305+00	0.0000	0.9408		4
2305+00	TO	2306+00	0.0000	0.9244		3
2306+00	TO	2307+00	0.0000	0.7872		3
2307+00	TO	2308+00	3.5431	0.9380	7	3
2308+00	TO	2309+00	2.8950	0.9451	12	3
2309+00	TO	2310+00	0.1762	1.3657	6	4
2310+00	TO	2311+00	0.1307	0.8011		4
2311+00	TO	2312+00	0.0000	2.6769		6
2312+00	TO	2313+00	0.3695	2.2370		9
2313+00	TO	2314+00	0.0000	18.0985		38
2314+00	TO	2315+00	0.1741	23.3830		77
2315+00	TO	2316+00	0.0000	30.7631		100
2316+00	TO	2317+00	0.0000	31.1579		115
2317+00	TO	2318+00	0.2945	3.8880		65
2318+00	TO	2319+00	2.1656	1.7699	5	10
2319+00	TO	2320+00	3.3841	11.3154	10	24
2320+00	TO	2321+00	1.9163	10.2166	10	40
2321+00	TO	2322+00	1.9488	9.8275	7	37
2322+00	TO	2323+00	0.6162	18.6788	5	53
2323+00	TO	2324+00	0.9540	1.9117	3	38
2324+00	TO	2325+00	1.3549	17.5749	4	36
2325+00	TO	2326+00	1.6015	0.9181	5	34
2326+00	TO	2327+00	2.7363	70.7743	8	133
2327+00	TO	2328+00	3.0685	15.1400	11	159
2328+00	TO	2329+00	1.3871	53.7538	8	128
2329+00	TO	2330+00	2.7786	2.0684	8	103
2330+00	TO	2331+00	1.1510	6.1897	7	15
2331+00	TO	2332+00	1.0219	9.2502	4	29
2332+00	TO	2333+00	0.3484	7.6741	3	31
2333+00	TO	2334+00	1.4230	10.0426	3	33
2334+00	TO	2335+00	2.5196	5.1970	7	28
2335+00	TO	2336+00	17.2610	2.1057	37	14
2336+00	TO	2337+00	6.7279	6.5070	44	16
2337+00	TO	2338+00	3.4484	45.7385	19	97
2338+00	TO	2339+00	2.5920	49.1453	11	176
2339+00	TO	2340+00	7.3962	16.9251	18	122
2340+00	TO	2341+00	5.2905	11.6386	23	53
2341+00	TO	2342+00	33.6720	3.6238	72	28
2342+00	TO	2343+00	4.5344	17.3430	71	39
2343+00	TO	2344+00	4.0521	27.2485	16	83
2344+00	TO	2345+00	4.7425	12.4904	16	74
2345+00	TO	2346+00	3.9684	14.7311	16	50
2346+00	TO	2347+00	5.1315	18.3060	17	61
2347+00	TO	2348+00	6.9128	39.6863	22	107
2348+00	TO	2349+00	6.5481	44.9716	25	157
2349+00	TO	2350+00	14.6839	8.2132	39	98
2350+00	TO	2351+00	4.2754	7.2793	35	29
2351+00	TO	2352+00	1.9283	11.4431	11	35
2352+00	TO	2353+00	2.3520	17.1465	8	53
2353+00	TO	2354+00	1.8162	8.6335	8	48
2354+00	TO	2355+00	1.9976	8.5823	7	32
2355+00	TO	2356+00	2.1469	9.2856	8	33
2356+00	TO	2357+00	0.0000	20.3482	4	55
2357+00	TO	2358+00	6.6005	4.2968	12	46
2358+00	TO	2359+00	3.3243	6.0789	18	19
2359+00	TO	2360+00	5.1098	4.9746	16	20
2360+00	TO	2361+00	0.0000	14.1036	9	35
2361+00	TO	2362+00	3.2250	14.1493	6	52
SUBTOTAL:					730	3,001

EARTHWORK QUANTITY SUMMARY (CONT)

ITEM NO.					110	132
STATION TO STATION			CUT AREA	FILL AREA	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY B)
			SF	SF	CY	CY
2362+00	TO	2363+00	3.7213	20.1138	13	63
2363+00	TO	2364+00	2.3589	15.7253	11	66
2364+00	TO	2365+00	0.7149	14.7828	6	56
2365+00	TO	2366+00	3.7813	12.1218	8	50
2366+00	TO	2367+00	0.0000	84.7259	7	179
2367+00	TO	2368+00	0.0000	152.6370		440
2368+00	TO	2369+00	0.0000	150.8423		562
2369+00	TO	2370+00	0.0000	156.6291		569
2370+00	TO	2371+00	0.0000	51.6205		386
2371+00	TO	2372+00	0.5079	20.1878		133
2372+00	TO	2373+00	8.3691	7.1693	16	51
2373+00	TO	2374+00	4.5235	10.7571	24	33
2374+00	TO	2375+00	3.4270	7.3884	15	34
2375+00	TO	2376+00	11.6856	2.2498	28	18
2376+00	TO	2377+00	8.8243	6.9081	38	17
2377+00	TO	2378+00	15.8902	10.0394	46	31
2378+00	TO	2379+00	3.3021	13.0887	36	43
2379+00	TO	2380+00	20.6603	5.2598	44	34
2380+00	TO	2381+00	19.3673	2.3260	74	14
2381+00	TO	2382+00	14.3695	2.4891	62	9
2382+00	TO	2383+00	18.1985	0.8288	60	6
2383+00	TO	2384+00	6.8149	9.5880	46	19
2384+00	TO	2385+00	8.6747	10.4475	29	37
2385+00	TO	2386+00	2.5353	8.2059	21	35
2386+00	TO	2387+00	0.3391	60.9241	5	128
2387+00	TO	2388+00	3.6142	20.3393	7	150
2388+00	TO	2389+00	1.9779	8.0168	10	53
2389+00	TO	2390+00	3.9043	4.7625	11	24
2390+00	TO	2391+00	4.3164	6.1805	15	20
2391+00	TO	2392+00	0.1766	24.3664	8	57
2392+00	TO	2393+00	0.7217	21.1217	2	84
2393+00	TO	2394+00	0.8042	16.4660	3	70
2394+00	TO	2395+00	0.3473	22.6088	2	72
2395+00	TO	2396+00	0.4669	19.4962	2	78
2396+00	TO	2397+00	0.9332	10.3917	3	55
2397+00	TO	2398+00	8.2869	3.9736	17	27
2398+00	TO	2399+00	2.5828	9.2332	20	24
2399+00	TO	2400+00	8.9366	6.1807	21	29
2400+00	TO	2401+00	2.0289	9.1132	20	28
2401+00	TO	2402+00	0.0000	29.6608	4	72
2402+00	TO	2403+00	0.0000	45.1408		139
2403+00	TO	2404+00	4.4710	18.7856	8	118
2404+00	TO	2405+00	3.1697	37.4084	14	104
2405+00	TO	2406+00	5.5458	11.3249	16	90
2406+00	TO	2407+00	9.3606	5.4911	28	31
2407+00	TO	2408+00	18.4861	4.3484	52	18
2408+00	TO	2409+00	8.6002	6.2028	50	20
2409+00	TO	2410+00	5.9604	13.0696	27	36
2410+00	TO	2411+00	46.0724	5.0194	96	33
2411+00	TO	2412+00	7.2480	15.9477	99	39
2412+00	TO	2413+00	6.8027	13.3071	26	54
2413+00	TO	2414+00	6.6879	4.3548	25	33
2414+00	TO	2415+00	2.0747	4.9873	16	17
2415+00	TO	2416+00	1.9382	17.3300	7	41
2416+00	TO	2417+00	0.8844	12.8810	5	56
2417+00	TO	2418+00	2.6015	8.7101	6	40
2418+00	TO	2419+00	23.8648	0.2262	49	17
2419+00	TO	2420+00	24.9807	5.3537	90	10
2420+00	TO	2421+00	11.2039	2.5941	67	15
2421+00	TO	2422+00	5.0765	7.9849	30	20
2422+00	TO	2423+00	3.8645	2.7227	17	20
2423+00	TO	2424+00	2.9432	11.8470	13	27
SUBTOTAL:					1,475	4,834

QUANTITY SUMMARIES

(SHEET 12 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		27

EARTHWORK QUANTITY SUMMARY (CONT)

ITEM NO.					110	132
STATION TO STATION			CUT AREA	FILL AREA	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY B)
			SF	SF	CY	CY
2424+00	TO	2425+00	10.9779	4.1852	26	30
2425+00	TO	2426+00	12.4810	4.2369	43	16
2426+00	TO	2427+00	6.5203	9.0451	35	25
2427+00	TO	2428+00	8.4812	12.5494	28	40
2428+00	TO	2429+00	11.6351	8.5273	37	39
2429+00	TO	2430+00	8.9757	12.0017	38	38
2430+00	TO	2431+00	7.1266	11.5014	30	44
2431+00	TO	2432+00	7.0557	1.7249	26	24
2432+00	TO	2433+00	5.8679	19.9451	24	40
2433+00	TO	2434+00	5.7066	13.6460	21	62
2434+00	TO	2435+00	4.7116	10.4048	19	45
2435+00	TO	2436+00	28.2435	1.2404	61	22
2436+00	TO	2437+00	7.3355	6.8176	66	15
2437+00	TO	2438+00	5.4237	13.5398	24	38
2438+00	TO	2439+00	3.9873	19.7085	17	62
2439+00	TO	2440+00	6.4011	11.7124	19	58
2440+00	TO	2441+00	8.5145	1.2349	28	24
2441+00	TO	2442+00	3.8294	8.1564	23	17
2442+00	TO	2443+00	1.0001	27.3424	9	66
2443+00	TO	2444+00	0.0000	13.6191	2	76
2444+00	TO	2445+00	0.0000	62.3895		141
2445+00	TO	2446+00	0.0000	23.6466		159
2446+00	TO	2447+00	0.0000	24.1496		89
2447+00	TO	2448+00	1.8362	0.8991	3	46
2448+00	TO	2449+00	1.0110	1.7458	5	5
2449+00	TO	2450+00	0.0000	6.7478	2	16
2450+00	TO	2451+00	0.5774	6.4434		24
2451+00	TO	2452+00	0.4561	14.4921	2	39
2452+00	TO	2453+00	0.0000	108.9117		229
2453+00	TO	2454+00	0.0000	9.4294		219
2454+00	TO	2455+00	0.4827	13.3872		42
2455+00	TO	2456+00	0.0000	2.4210		29
2456+00	TO	2457+00	0.4824	0.2599		5
2457+00	TO	2458+00	1.4618	11.6214	4	22
2458+00	TO	2459+00	1.1620	10.0478	5	40
2459+00	TO	2460+00	1.4821	8.7603	5	35
2460+00	TO	2461+00	0.8633	11.3566	4	37
2461+00	TO	2462+00	1.9201	9.9838	5	40
2462+00	TO	2463+00	1.5737	30.9868	6	76
2463+00	TO	2464+00	1.5243	45.0505	6	141
2464+00	TO	2465+00	1.6961	21.5859	6	123
2465+00	TO	2466+00	1.8739	20.0069	7	77
2466+00	TO	2467+00	6.1158	6.3450	15	49
2467+00	TO	2468+00	16.0693	1.6945	41	15
2468+00	TO	2469+00	11.1538	0.9487	50	5
2469+00	TO	2470+00	16.7159	1.0978	52	4
2470+00	TO	2471+00	31.4788	0.1151	89	2
2471+00	TO	2472+00	32.5226	2.0155	119	4
2472+00	TO	2473+00	35.0050	0.0000	125	4
2473+00	TO	2474+00	7.3412	1.0230	78	2
2474+00	TO	2475+00	5.5918	6.9405	24	15
2475+00	TO	2476+00	5.8377	1.2263	21	15
2476+00	TO	2477+00	4.9487	2.1509	20	6
2477+00	TO	2478+00	3.8200	2.1049	16	8
2478+00	TO	2479+00	4.9228	11.3141	16	25
2479+00	TO	2480+00	2.5900	12.3566	14	44
2480+00	TO	2481+00	3.5702	8.2576	11	38
2481+00	TO	2482+00	47.8947	0.0000	95	15
2482+00	TO	2483+00	8.5279	2.9260	104	5
2483+00	TO	2484+00	4.5866	9.6254	24	23
2484+00	TO	2485+00	3.5414	22.0713	15	59
SUBTOTAL:					1,565	2,753

EARTHWORK QUANTITY SUMMARY (CONT)

ITEM NO.					110	132
STATION TO STATION			CUT AREA	FILL AREA	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY B)
			SF	SF	CY	CY
2485+00	TO	2486+00	3.9237	37.4168	14	110
2486+00	TO	2487+00	11.5358	23.9690	29	114
2487+00	TO	2488+00	14.1824	15.1250	48	72
2488+00	TO	2489+00	9.6110	12.4221	44	51
2489+00	TO	2490+00	7.5605	4.6826	32	32
2490+00	TO	2491+00	5.7011	6.5668	25	21
2491+00	TO	2492+00	8.4754	4.0055	26	20
2492+00	TO	2493+00	5.6700	0.0000	26	7
2493+00	TO	2494+00	5.2334	0.0000	20	
2494+00	TO	2495+00	2.5057	1.7101	14	3
2495+00	TO	2496+00	5.0953	0.0000	14	3
2496+00	TO	2497+00	2.6147	4.1404	14	8
2497+00	TO	2498+00	1.4379	4.5848	8	16
2498+00	TO	2499+00	3.3945	4.8206	9	17
2499+00	TO	2500+00	3.9467	4.1673	14	17
2500+00	TO	2501+00	2.6213	9.8587	12	26
2501+00	TO	2502+00	1.4437	10.7751	8	38
2502+00	TO	2503+00	1.5848	9.1532	6	37
2503+00	TO	2504+00	2.2935	12.4121	7	40
2504+00	TO	2505+00	1.1191	26.4230	6	72
2505+00	TO	2506+00	1.1664	29.8093	4	104
2506+00	TO	2507+00	0.2858	26.4304	3	104
2507+00	TO	2508+00	0.7915	3.5461	2	56
2508+00	TO	2509+00	1.3210	1.6718	4	10
2509+00	TO	2510+00	0.0000	4.4899	2	11
2510+00	TO	2511+00	1.4303	28.0786	3	60
2511+00	TO	2512+00	4.5729	2.1454	11	56
2512+00	TO	2513+00	1.1232	39.7044	11	77
2513+00	TO	2514+00	0.5148	40.8053	3	149
2514+00	TO	2515+00	1.2394	34.3035	3	139
2515+00	TO	2516+00	0.9676	40.4627	4	138
2516+00	TO	2517+00	2.0405	19.4877	6	111
2517+00	TO	2518+00	0.9875	15.0547	6	64
2518+00	TO	2519+00	1.6763	14.6302	5	55
2519+00	TO	2520+00	0.9037	30.9155	5	84
2520+00	TO	2521+00	2.1190	36.3360	6	125
2521+00	TO	2522+00	2.6012	40.5531	9	142
2522+00	TO	2523+00	2.3622	25.5899	9	122
2523+00	TO	2524+00	1.3022	26.9250	7	97
2524+00	TO	2525+00	0.7898	47.6319	4	138
2525+00	TO	2526+00	1.6530	41.3947	5	165
2526+00	TO	2527+00	0.3766	35.5010	4	142
2527+00	TO	2528+00	1.1385	20.7441	3	104
2528+00	TO	2529+00	0.2514	28.0210	3	90
2529+00	TO	2530+00	0.1407	26.1928		100
2530+00	TO	2531+00	3.1233	14.6969	6	76
2531+00	TO	2532+00	2.9884	8.0584	11	42
2532+00	TO	2533+00	3.2072	13.0396	11	39
2533+00	TO	2534+00	3.6835	12.2522	13	47
2534+00	TO	2535+00	5.4133	17.5120	17	55
2535+00	TO	2536+00	4.5506	27.3096	18	83
2536+00	TO	2537+00	5.2981	36.2102	18	118
2537+00	TO	2538+00	3.4335	37.5523	16	137
2538+00	TO	2539+00	10.0163	15.5153	25	98
2539+00	TO	2540+00	24.9919	9.5995	65	47
2540+00	TO	2541+00	10.5877	20.2803	66	55
2541+00	TO	2542+00	8.0000	9.1701	34	55
2542+00	TO	2543+00	6.4528	13.0008	27	41
2543+00	TO	2544+00	5.4144	0.0000	22	24
2544+00	TO	2545+00	7.5054	11.2643	24	21
2545+00	TO	2546+00	11.2147	12.7016	35	44
2546+00	TO	2547+00	6.9798	31.5097	34	82
SUBTOTAL:					940	4,211

EARTHWORK QUANTITY SUMMARY (CONT)

ITEM NO.					110	132
STATION TO STATION			CUT AREA	FILL AREA	EXCAVATION (ROADWAY)	EMBANKMENT (FINAL) (DENS CONT) (TY B)
			SF	SF	CY	CY
2547+00	TO	2548+00	4.7616	32.6975	22	119
2548+00	TO	2549+00	4.4885	23.7392	17	105
2549+00	TO	2550+00	4.1589	24.9389	16	90
2550+00	TO	2551+00	3.3711	20.5744	14	84
2551+00	TO	2552+00	4.2488	25.3014	14	85
2552+00	TO	2553+00	3.8924	28.3972	15	99
2553+00	TO	2554+00	1.0624	70.9546	9	184
2554+00	TO	2555+00	0.0000	76.4483	2	273
2555+00	TO	2556+00	0.0000	55.9284		245
2556+00	TO	2557+00	0.0000	8.7460		120
2557+00	TO	2558+00	5.1035	8.6018	9	32
2558+00	TO	2559+00	4.2133	4.2864	17	24
2559+00	TO	2560+00	15.6347	0.5273	37	9
2560+00	TO	2561+00	3.8420	0.0000	36	
2561+00	TO	2562+00	2.8978	0.0000	12	
2562+00	TO	2562+65	1.7817	0.0000	6	
SUBTOTAL:					226	1,469
PROJECT TOTAL:					4,936	16,268

QUANTITY SUMMARIES

(SHEET 13 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		28

SIGN SUMMARY

ITEM NO.	644					
STATION TO STATION	IN SM RD SN SUP&AM TYS80 (1)SA(T)	IN SM RD SN SUP&AM TY10BWG (1)SA(U)	IN SM RD SN SUP&AM TYS80 (1)SA(U-BM)	IN SM RD SN SUP&AM TYTWT (1)WS(P)	IN SM RD SN SUP&AM TYTWT (1)WS(T)	REMOVE SM RD SN SUP&AM
	EA	EA	EA	EA	EA	EA
2302+25 TO 2325+25	1			3	1	5
2334+25 TO 2439+85		1		12		9
2444+35 TO 2456+66				2		1
2456+66 TO 2467+16				8		7
2467+16 TO 2472+17		1	1	2		6
2472+17 TO 2482+67				4		2
2482+67 TO 2553+65		1		10		9
2553+65 TO 2562+65				2		1
PROJECT TOTALS:	**1**	**3**	**1**	**43**	**1**	**40**

SUMMARY OF ILLUMINATION QUANTITIES

ITEM NO.:	416	610	618		620		624	628
INTERSECTION	DRILL SHAFT (RDWY ILL POLE) (30 IN)	IN RD IL (TY ST) 40T-8 (250W EQ) LED	CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 40) (2") (BORE)	ELEC CONDR (NO. 8) BARE	ELEC CONDR (NO. 8) INSULATED	GROUND BOX TY C (162911) W/APRON	ELC SRV TY A 120/240 060(NS)SS (E)SP(O)
	LF	EA	LF	LF	LF	LF	EA	EA
FM 2140	16	2	179	90	294	588	3	1
PROJECT TOTALS:	**16**	**2**	**179**	**90**	**294**	**588**	**3**	**1**

QUANTITY SUMMARIES

(SHEET 14 OF 14)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		29

9/29/2022 2:28:41 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\01*GEN\6802QUANT016.dgn

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	MOUNTING DESIGNATION	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	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	TY N TY S
1 of 12	1	I-2dT	SAN AUGUSTINE COUNTY LINE	102 X 24	X		S80	1	SA	T		
	2	M1-4	U.S. HWY. ROUTE MARKER (96)	24 X 24	X		TWT	1	WS	P		
	3	I-2dT	SHELBY COUNTY LINE	54 X 24	X		TWT	1	WS	T		
	4	R2-1	SPEED LIMIT 75 MPH	30 X 36	X		TWT	1	WS	P		
	5	R2-1	SPEED LIMIT 75 MPH	30 X 36	X		TWT	1	WS	P		
3 of 12	6	W9-2TL	LANE ENDS MERGE LEFT	36 X 36	X		TWT	1	WS	P		
	7	W9-1R	RIGHT LANE ENDS	36 X 36	X		TWT	1	WS	P		
	8	M1-4	U.S. HWY. ROUTE MARKER (96)	24 X 24	X		TWT	1	WS	P		
		D10-7aT	REF MRKR 338	3 X 10	X							
		D10-7aT	REF MRKR 338	3 X 10	X							
	9	S3-1T	SCHOOL BUS STOP AHEAD	36 X 36	X		TWT	1	WS	P		
	10	D15-10T	PASSING LANE 2 MILES	54 X 42	X		10 BWG	1	SA	U		
4 of 12	11	S3-1T	SCHOOL BUS STOP AHEAD	36 X 36	X		TWT	1	WS	P		
5 of 12	12	R1-1	STOP	36 X 36	X		TWT	1	WS	P		
	13	D20-5T	COUNTY ROAD 1015 ⇦	24 X 42	X		TWT	1	WS	P		
		D20-5T	COUNTY ROAD 1021 ⇨	24 X 42	X							
	14	R1-1	STOP	36 X 36	X		TWT	1	WS	P		
6 of 12	15	D20-5T	COUNTY ROAD 1021 ⇦	24 X 42	X		TWT	1	WS	P		
		D20-5T	COUNTY ROAD 1015 ⇨	24 X 42	X							
	16	D20-1TR	COUNTY ROAD 1019 ⇨	24 X 24	X		TWT	1	WS	P		
7 of 12	17	R1-1	STOP	36 X 36	X		TWT	1	WS	P		
	18	R4-3	SLOWER TRAFFIC KEEP RIGHT	24 X 30	X		TWT	1	WS	P		
	19	M2-1	JUNCTION	21 X 15	X		TWT	1	WS	P		
		M1-6F	TEXAS FARM ROAD ROUTE MARKER (FM 2140)	24 X 24	X							
	20	D20-1TL	COUNTY ROAD 1017 ⇦	24 X 24	X		TWT	1	WS	P		
8 of 12	21	M1-4	U.S. HWY. ROUTE MARKER (96)	24 X 24	X		TWT	1	WS	P		
		D10-7aT	REF MRKR 336	3 X 10	X							
		D10-7aT	REF MRKR 336	3 X 10	X							
	22	R1-1	STOP	36 X 36	X		TWT	1	WS	P		
	23	R2-1	SPEED LIMIT 75 MPH	30 X 36	X		TWT	1	WS	P		
	24	M3-3	SOUTH	24 X 12	X		TWT	1	WS	P		
		M1-4	U.S. HWY. ROUTE MARKER (96)	24 X 24	X							
	25	D20-1TR	COUNTY ROAD (1017)(RT ARROW) ⇨	24 X 24	X		TWT	1	WS	P		
	26	D20-1TL	COUNTY ROAD (1017) (LT ARROW) ⇦	24 X 24	X		TWT	1	WS	P		
	27	D20-1TL	COUNTY ROAD (1015) (LT ARROW) ⇦	24 X 24	X		TWT	1	WS	P		
	28	W1-7T	CHEVRON/TWO-DIRECTION LARGE ARROW	96 X 36	X		S80	1	SA	U	BM	
	29	M1-4	U.S. HWY. ROUTE MARKER (96)	24 X 24	X		10 BWG	1	SA	U		
		M6-4	TWO-DIRECTION LARGE ARROW	21 X 15	X							
		M1-6F	TEXAS FARM ROAD ROUTE MARKER (FM 2140)	24 X 24	X							
		M6-1	DIRECTIONAL ARROW ⇦	21 X 15	X							
	30	R1-1	STOP	36 X 36	X		TWT	1	WS	P		
	31	D20-1TR	COUNTY ROAD (1015) (RT ARROW) ⇨	24 X 24	X		TWT	1	WS	P		
	32	M1-6F	TEXAS FARM ROAD ROUTE MARKER (FM 2140)	24 X 24	X		TWT	1	WS	P		
		M6-1	DIRECTIONAL ARROW ⇨	21 X 15	X							
	33	R1-1	STOP	36 X 36	X		TWT	1	WS	P		
		W4-4P	CROSS TRAFFIC DOES NOT STOP	24 X 12	X							
	34	R4-3	SLOWER TRAFFIC KEEP RIGHT	24 X 30	X		TWT	1	WS	P		
	35	M3-1	NORTH	24 X 12	X		TWT	1	WS	P		
		M1-4	U.S. HWY. ROUTE MARKER (96)	24 X 24	X							
9 of 12	36	M2-1	JUNCTION	21 X 15	X		TWT	1	WS	P		
		M1-6F	TEXAS FARM ROAD ROUTE MARKER (FM 2140)	24 X 24	X							
	37	R2-1	SPEED LIMIT 75 MPH	30 X 36	X		TWT	1	WS	P		
	38	W11-10	TRUCK	36 X 36	X		TWT	1	WS	P		
10 of 12	39	R1-1	STOP	36 X 36	X		TWT	1	WS	P		
	40	D20-1TL	COUNTY ROAD (1012) (LT ARROW) ⇦	24 X 24	X		TWT	1	WS	P		
	41	D20-1TR	COUNTY ROAD (1012) (RT ARROW) ⇨	24 X 24	X		TWT	1	WS	P		
	42	D20-1TR	COUNTY ROAD (1008) (RT ARROW) ⇨	24 X 24	X		TWT	1	WS	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 2)

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
C TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
4-16	DIST	COUNTY		SHEET NO.
8-16	LFK	SHELBY		30

18

9/28/2022 8:50:34 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08_TRAFF\sums16.dgn

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	POSTS	ANCHOR TYPE	MOUNTING DESIGNATION PREFABRICATED	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) TY = TYPE
							FRP = Fiberglass TWT = Thin-Wall 10BWG = 10 BWG S80 = Sch 80	1 or 2	UA=Universal Conc UB=Universal Bolt SA=Slipbase-Conc SB=Slipbase-Bolt WS=Wedge Steel WP=Wedge Plastic	P = "Plain" T = "T" U = "U"		TY N TY S
11 of 12	43	D20-1TL	COUNTY ROAD (1008) (LT ARROW) ⇦	24 X 24	X		TWT	1	WS	P		
	44	R1-1	STOP	36 X 36	X		TWT	1	WS	P		
	45	W9-1R	RIGHT LANE ENDS	36 X 36	X		TWT	1	WS	P		
	46	W9-2TL	LANE ENDS MERGE LEFT	36 X 36	X		TWT	1	WS	P		
12 of 12	47	D15-10T	PASSING LANE 2 MILES	54 X 42	X		10 BWG	1	SA	U		
	48	W11-10L	TRUCK	36 X 36	X		TWT	1	WS	P		
	49	M2-1	JUNCTION	21 X 15	X		TWT	1	WS	P		
		M1-6F	TEXAS FARM ROAD ROUTE MARKER (FM 417)	24 X 24	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 2 OF 2)

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
4-16	DIST	COUNTY		SHEET NO.
8-16	LFK	SHELBY		31

18

9/28/2022 8:50:34 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08_TRAFF\sums16.dgn

TCP SEQUENCE OF WORK

- PLACE ADVANCE WARNING SIGNS IN ACCORDANCE WITH APPLICABLE TRAFFIC CONTROL STANDARDS.
- INSTALL SWP3 FEATURES THROUGHOUT THE PROJECT AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER.
- PREPARE RIGHT OF WAY.
- EXTEND EXISTING CROSS CULVERTS.
- PROVIDE ACCESS TO SIDE ROADS AND DRIVEWAYS AT ALL TIMES.

- CONTRACTOR IS LIMITED TO WORK THAT CAN BE COMPLETED IN ONE WORKING DAY. NO OVERNIGHT LANE SHIFTS OR LANE CLOSURES. CONTRACTOR SHALL CONSTRUCT LEVEL UP FOR FULL ROADWAY WIDTH AND OPEN UP TO TRAFFIC FOR NON-WORKING TIMES. COMPLETE OPERATIONS IN ADJACENT LANES AND SHOULDERS TO THE SAME POINT AT THE END OF EACH DAY.
- SAWCUT EXISTING PAVEMENT, REMOVE OLD PAVEMENT, FILL AND CONSTRUCT PROPOSED WIDENING AND HMA LEVEL-UP COURSE UP TO THE FINAL 2" SURFACE COURSE.
- CONSTRUCT SIDE ROADS, MAILBOX TURNOUTS, DRIVEWAYS AND DRIVEWAY CULVERTS.
- PLACE ONE COURSE SURFACE TREATMENT.
- PLACE TEMPORARY WORK ZONE PAVEMENT MARKINGS

- PLACE FINAL FULL WIDTH 2" HMA OVERLAY.
- PLACE FINAL PAVEMENT MARKINGS, RUMBLE STRIPS AND SIGNS.
- PERFORM FINAL CLEANUP.

NOTE:
CONTRACTOR WILL SUBMIT SECONDARY CONTROL LEVEL LOOP ANALYSIS AND FINDINGS PRIOR TO CONSTRUCTION, CONTRACTOR AND TxDOT WILL RESOLVE ANY PRIMARY AND SECONDARY CONTROL DISCREPANCIES PRIOR TO CONSTRUCTION. PRIOR TO CONSTRUCTING PAVEMENT, FORMING CONCRETE IMPROVEMENTS OR ORDERING STRUCTURES, CONTRACTOR WILL IDENTIFY ELEVATION DIFFERENCES, REPORT TO TxDOT AND RESOLVE WITH TxDOT.

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

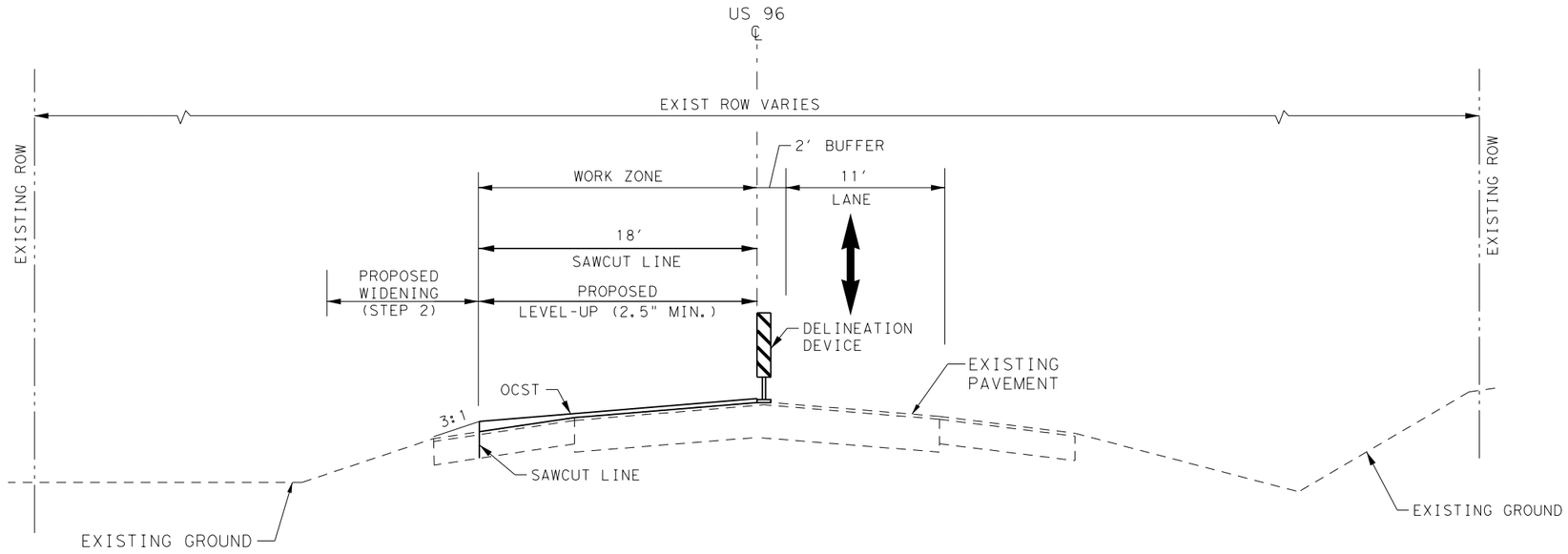
9/28/2022

TRAFFIC CONTROL PLAN SEQUENCE OF WORK

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		32

9/28/2022 8:51:43 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\02*TCP\6802TYP01*CSN01.dgn



LEGEND:

CONSTRUCTED PREVIOUSLY

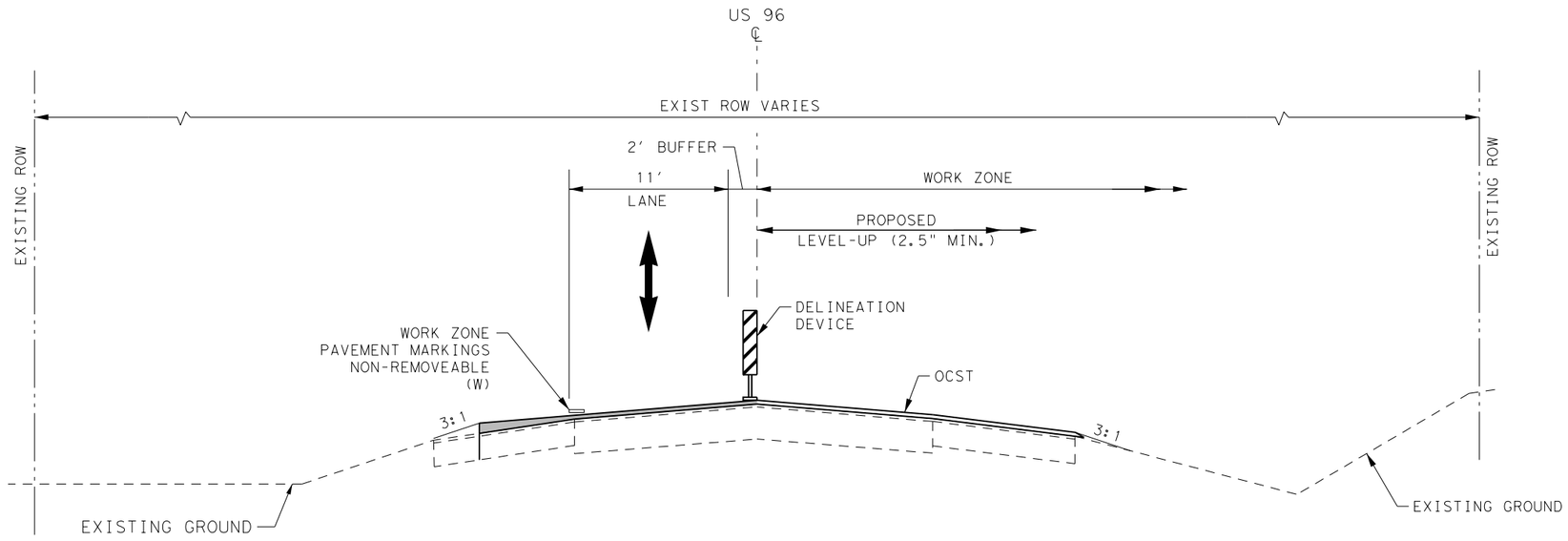
NOTES:

1. SB PASSING LANE CONSTRUCTION SHOWN. NORTHBOUND PASSING LANE WIDENING CONSTRUCTION SHALL BE AS MIRRORED ABOUT THE CENTERLINE.
2. MAINTAIN A 3:1 SAFETY SLOPE BETWEEN TRAVEL LANES AND CONSTRUCTION AREA.
3. PROVIDE ACCESS TO SIDE ROADS AND DRIVEWAYS AT ALL TIMES.
4. REFERENCE TXDOT STANDARD DRAWINGS TCP(2-1) & TCP(2-2) FOR MORE INFORMATION.

TYPICAL CONSTRUCTION SECTIONS

STEP 1: OVERLAY EXISTING PAVEMENT AND GRADE CHANGES

- CONTRACTOR CAN ONLY DO IN ONE DAY WHAT CAN BE DONE BOTH DIRECTIONS.
- CONSTRUCT HMA LEVEL-UP COURSE UP TO THE FINAL 2" SURFACE COURSE
- PLACE ONE COURSE SURFACE TREATMENT.
- PLACE TEMPORARY WORK ZONE PAVEMENT MARKINGS



0 5 10

SCALE: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

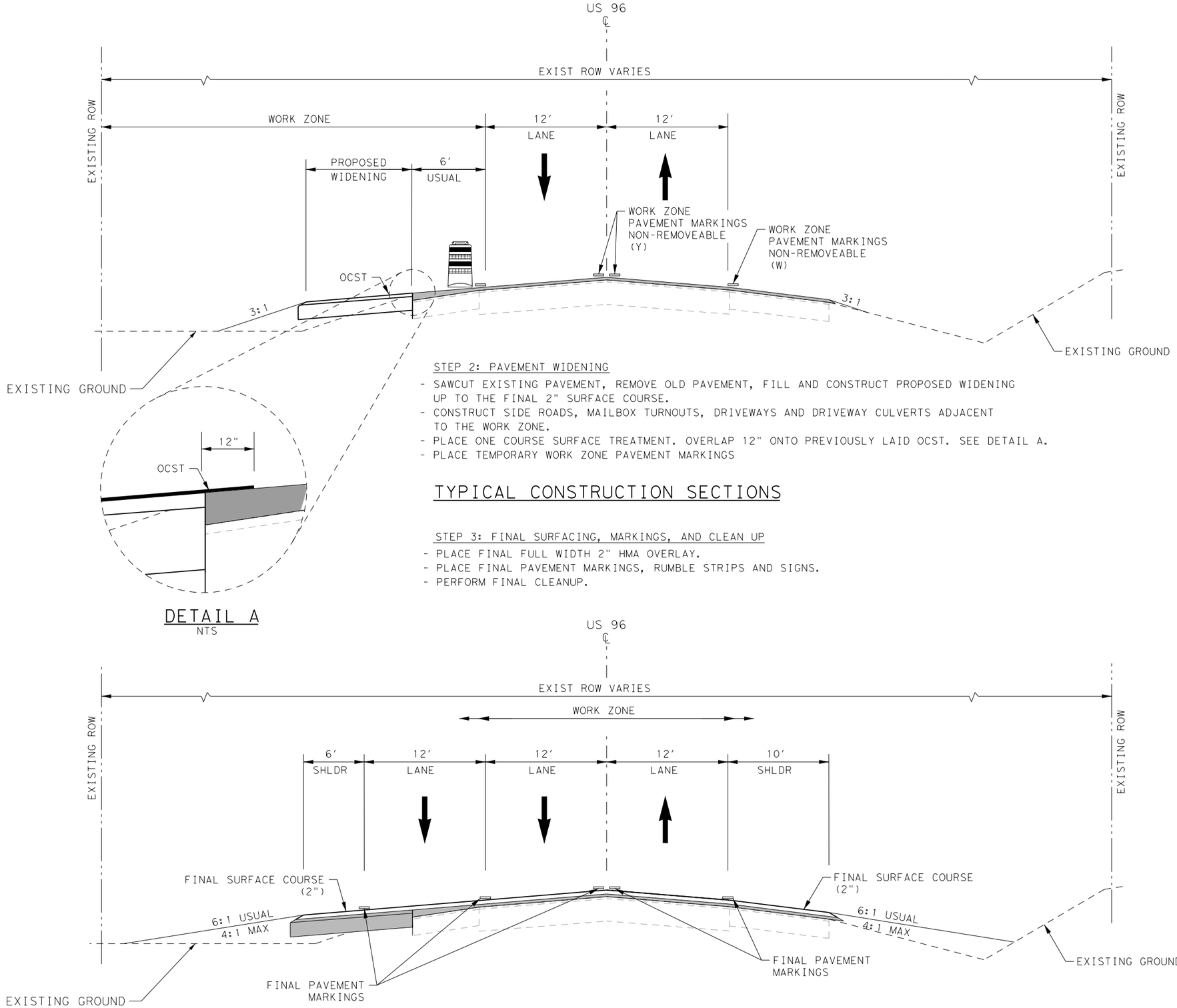
TRAFFIC CONTROL PLAN TYPICAL SECTIONS

(SHEET 1 OF 2)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		33

9/28/2022 8:51:44 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\02*TCP\6802TYP01*TCP.dgn



STEP 2: PAVEMENT WIDENING

- SAWCUT EXISTING PAVEMENT, REMOVE OLD PAVEMENT, FILL AND CONSTRUCT PROPOSED WIDENING UP TO THE FINAL 2" SURFACE COURSE.
- CONSTRUCT SIDE ROADS, MAILBOX TURNOUTS, DRIVEWAYS AND DRIVEWAY CULVERTS ADJACENT TO THE WORK ZONE.
- PLACE ONE COURSE SURFACE TREATMENT. OVERLAP 12" ONTO PREVIOUSLY LAID OCST. SEE DETAIL A.
- PLACE TEMPORARY WORK ZONE PAVEMENT MARKINGS

TYPICAL CONSTRUCTION SECTIONS

DETAIL A
NTS

STEP 3: FINAL SURFACING, MARKINGS, AND CLEAN UP

- PLACE FINAL FULL WIDTH 2" HMA OVERLAY.
- PLACE FINAL PAVEMENT MARKINGS, RUMBLE STRIPS AND SIGNS.
- PERFORM FINAL CLEANUP.

LEGEND:

CONSTRUCTED PREVIOUSLY

NOTES:

1. SB PASSING LANE CONSTRUCTION SHOWN. NORTHBOUND PASSING LANE WIDENING CONSTRUCTION SHALL BE AS MIRRORED ABOUT THE CENTERLINE.
2. MAINTAIN A 3:1 SAFETY SLOPE BETWEEN TRAVEL LANES AND CONSTRUCTION AREA.
3. PROVIDE ACCESS TO SIDE ROADS AND DRIVEWAYS AT ALL TIMES.
4. REFERENCE TXDOT STANDARD DRAWINGS TCP(2-1) & TCP(2-2) FOR MORE INFORMATION.
5. REFERENCE TXDOT STANDARD DRAWING TCP(3-1) & TCP(3-3) FOR FINAL PAVEMENT MARKINGS OPERATIONS.

0 5 10
SCALE: 1" = 10′

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

TRAFFIC CONTROL PLAN TYPICAL SECTIONS

(SHEET 2 OF 2)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		34

DATE: 11/2/2021 3:34:45 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\V10.6.5 Sheets\12_STANDARDS\01_TCP\bc-21.dgn

BARRICADE AND CONSTRUCTION (BC) STANDARD SHEETS GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

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

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

WORKER SAFETY NOTES:

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

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

COMPLIANT WORKZONE TRAFFIC CONTROL DEVICES

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

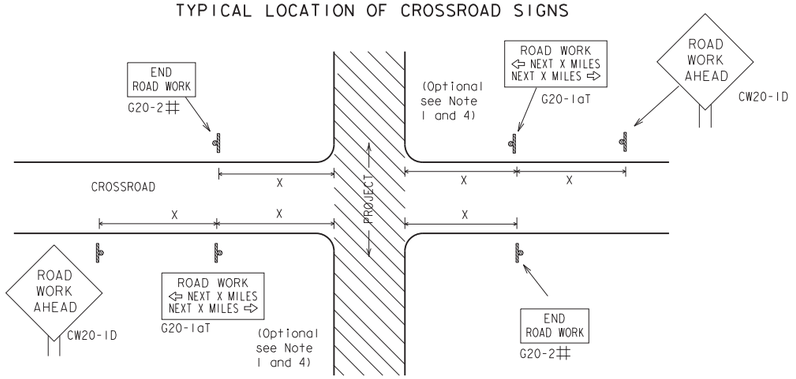
BARRICADE AND CONSTRUCTION GENERAL NOTES AND REQUIREMENTS

BC(1)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
4-03 7-13	DIST	COUNTY		SHEET NO.
9-07 8-14	LFK	SHELBY		35
5-10 5-21				

DATE: 11/2/2021 3:34:45 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS_OF_UCP\bc-21.dgn

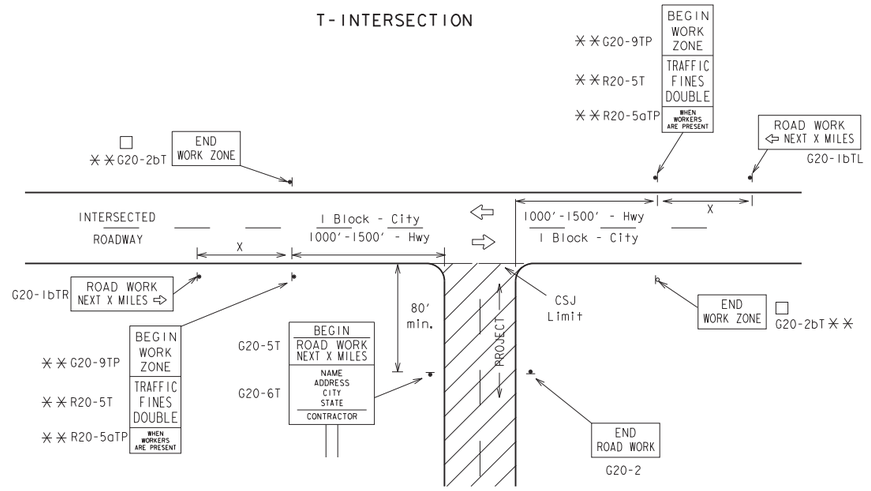
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

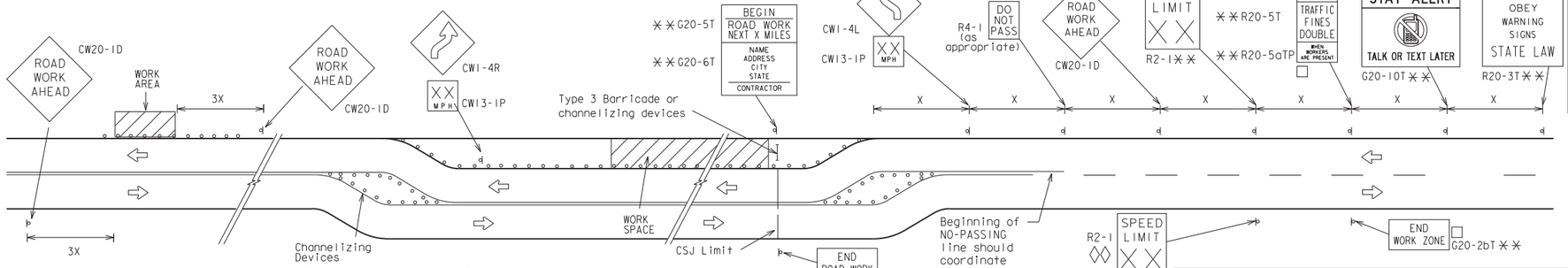
✳ For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

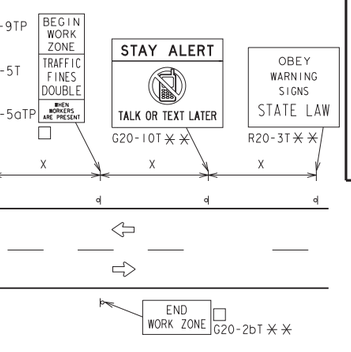
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

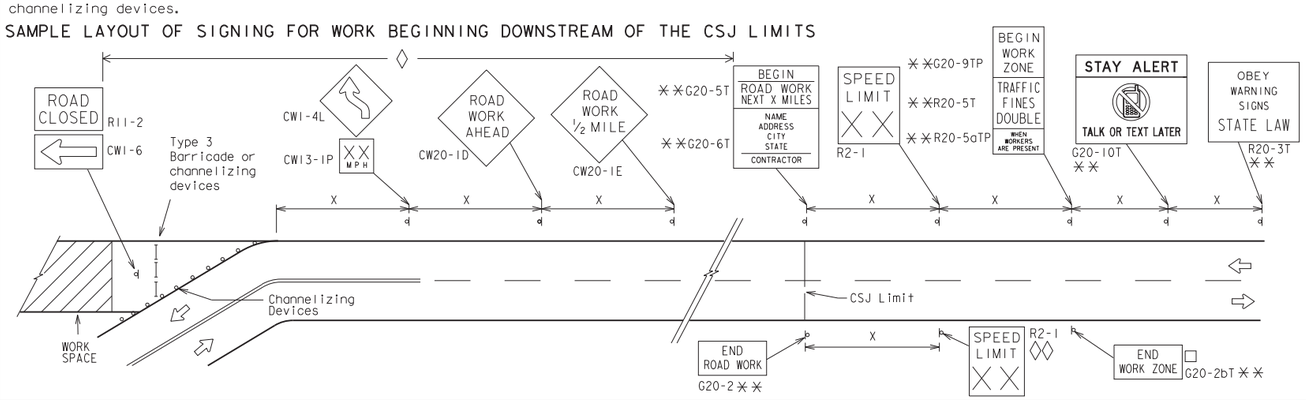


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SHELBY		36

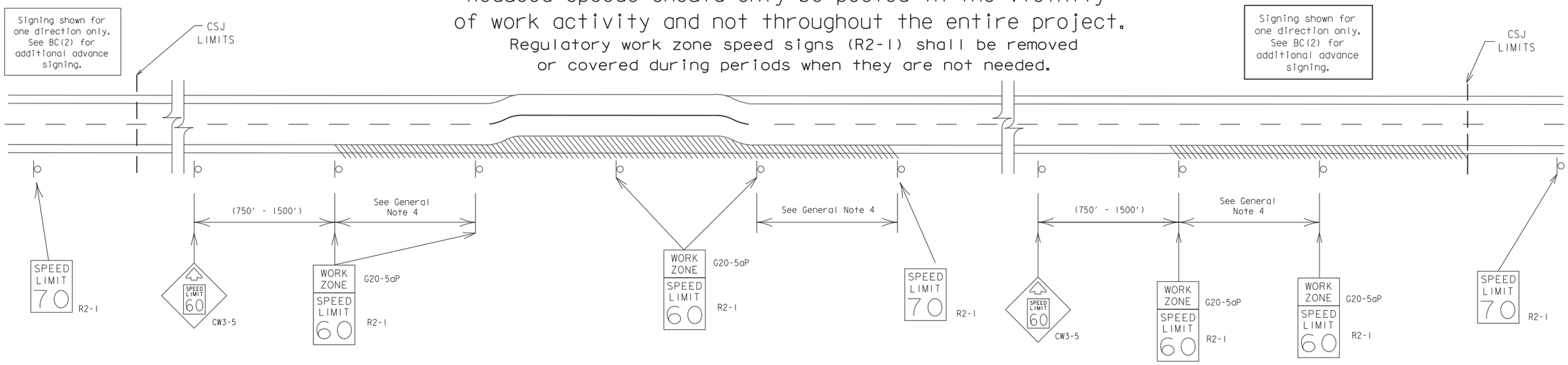
DATE: 11/2/2021 3:34:45 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Sheets\12_STANDARDS_OF_TCP\bc-21.dgn

TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

Work zone speed limits shall be regulatory, established in accordance with the "Procedures for Establishing Speed Zones," and approved by the Texas Transportation Commission, or by City Ordinance when within Incorporated City Limits.

Reduced speeds should only be posted in the vicinity of work activity and not throughout the entire project.

Regulatory work zone speed signs (R2-1) shall be removed or covered during periods when they are not needed.



GUIDANCE FOR USE:

LONG/INTERMEDIATE TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit should be included on the design of the traffic control plans when restricted geometrics with a lower design speed are present in the work zone and modification of the geometrics to a higher design speed is not feasible.

Long/Intermediate Term Work Zone Speed Limit signs, when approved as described above, should be posted and visible to the motorist when work activity is present. Work activity may also be defined as a change in the roadway that requires a reduced speed for motorists to safely negotiate the work area, including:

a) rough road or damaged pavement surface
b) substantial alteration of roadway geometrics (diversions)
c) construction detours
d) grade
e) width
f) other conditions readily apparent to the driver

As long as any of these conditions exist, the work zone speed limit signs should remain in place.

SHORT TERM WORK ZONE SPEED LIMITS

This type of work zone speed limit may be included on the design of the traffic control plans when workers or equipment are not behind concrete barrier, when work activity is within 10 feet of the traveled way or actually in the traveled way.

Short Term Work Zone Speed Limit signs should be posted and visible to the motorists only when work activity is present. When work activity is not present, signs shall be removed or covered.
(See Removing or Covering on BC(4)).

GENERAL NOTES

1. Regulatory work zone speed limits should be used only for sections of construction projects where speed control is of major importance.
2. Regulatory work zone speed limit signs shall be placed on supports at a 7 foot minimum mounting height.
3. Speed zone signs are illustrated for one direction of travel and are normally posted for each direction of travel.
4. Frequency of work zone speed limit signs should be:
   40 mph and greater 0.2 to 2 miles
   35 mph and less 0.2 to 1 mile
5. Regulatory speed limit signs shall have black legend and border on a white reflective background (See "Reflective Sheeting" on BC(4)).
6. Fabrication, erection and maintenance of the"ADVANCE SPEED LIMIT"(CW3-5)sign, "WORK ZONE"(G20-5aP) plaque and the "SPEED LIMIT"(R2-1)signs shall not be paid for directly, but shall be considered subsidiary to Item 502.
7. Turning signs from view, laying signs over or down will not be allowed, unless as otherwise noted under "REMOVING OR COVERING" on BC(4).
8. Techniques that may help reduce traffic speeds include but are not limited to:
   A. Law enforcement.
   B. Flagger stationed next to sign.
   C. Portable changeable message sign (PCMS).
   D. Low-power (drone) radar transmitter.
   E. Speed monitor trailers or signs.
9. Speeds shown on details above are for illustration only. Work Zone Speed Limits should only be posted as approved for each project.
10. For more specific guidance concerning the type of work, work zone conditions and factors impacting allowable regulatory construction speed zone reduction see TxDOT form #1204 in the TxDOT e-form system.

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION WORK ZONE SPEED LIMIT

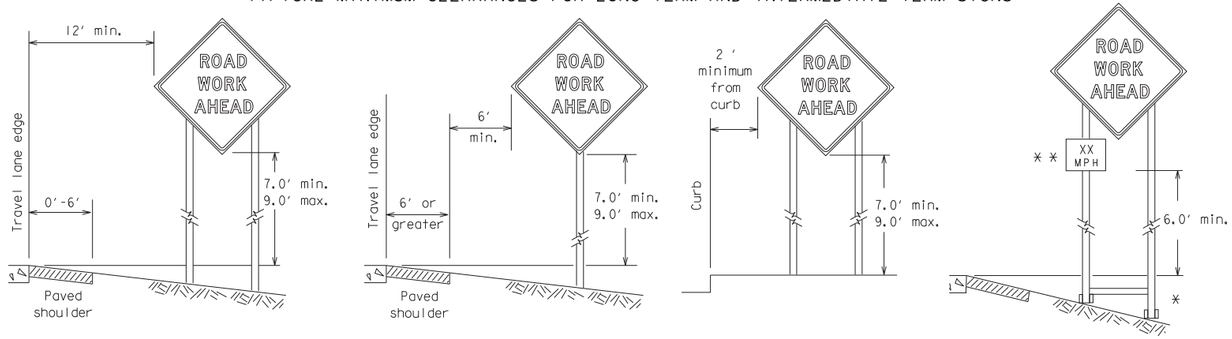
BC(3)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SHELBY		37

97

DATE: 11/2/2021 3:34:46 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\01_TCP\bc-21.dgn

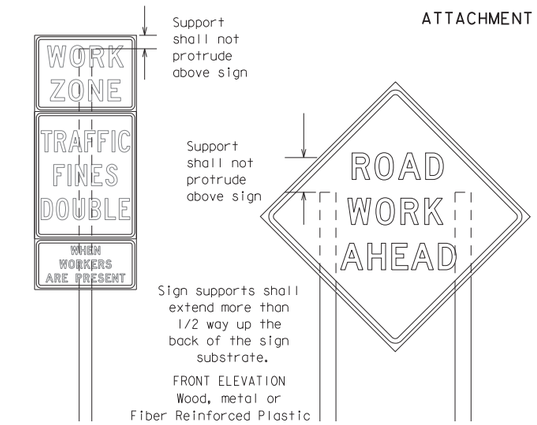
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

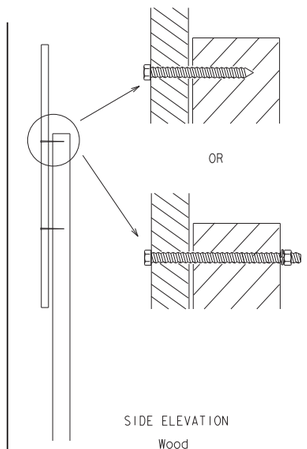


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





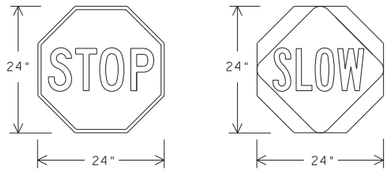
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

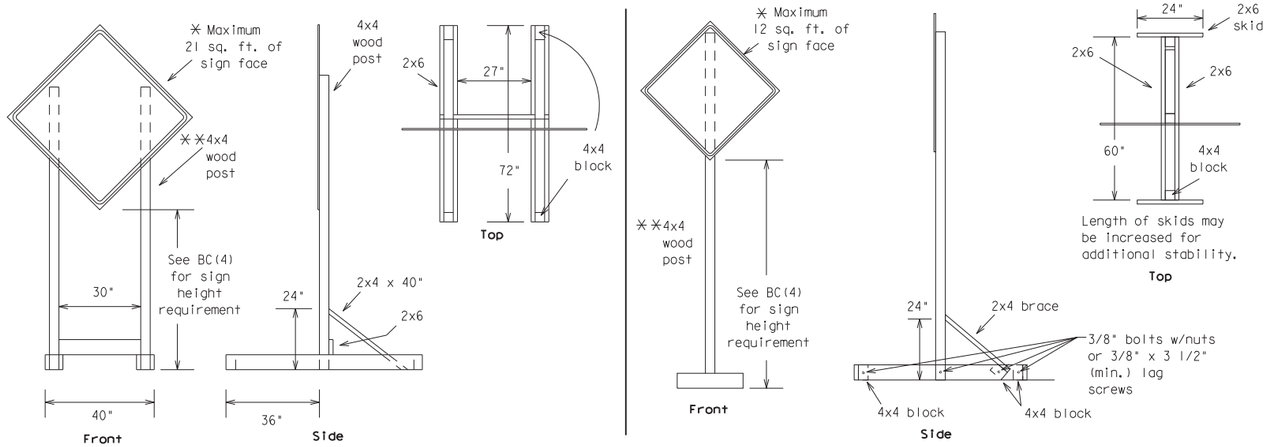
Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

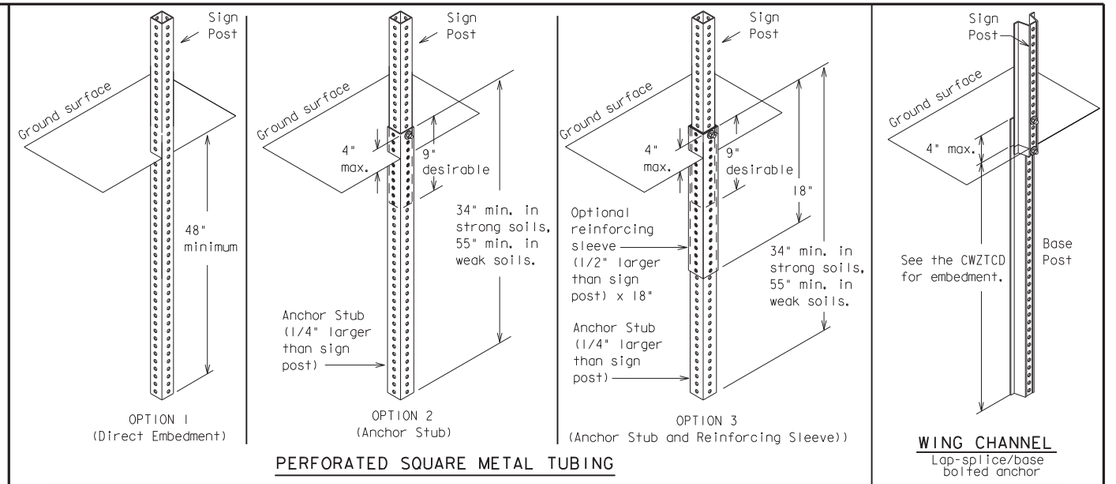
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SHELBY		38

DATE: 11/2/2021 3:34:46 PM
FILE: H:\proj\R30668.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\01_TCP\bc-21.dgn



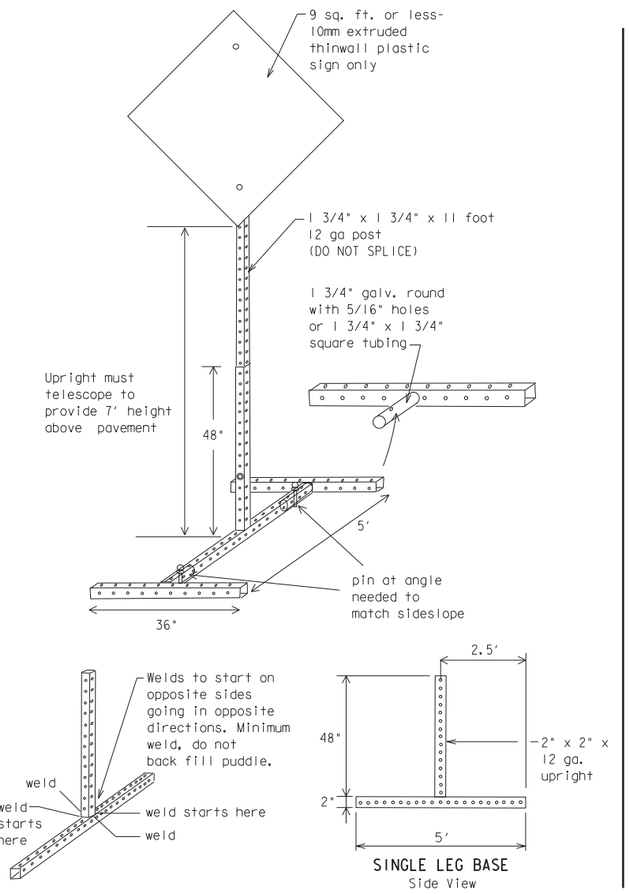
SKID MOUNTED WOOD SIGN SUPPORTS

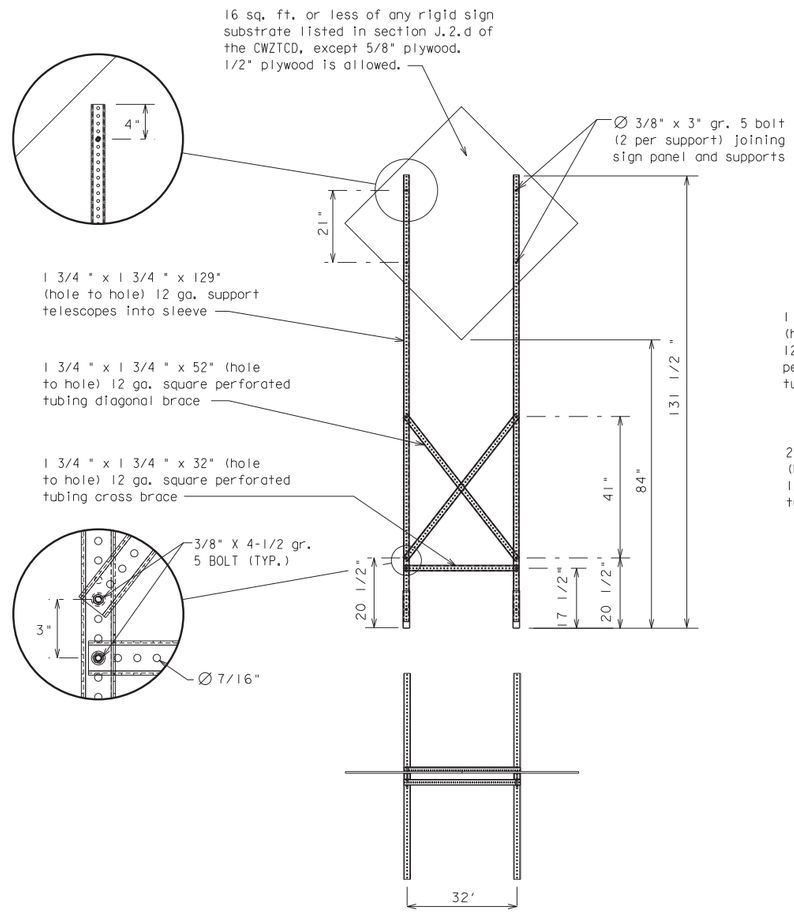
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

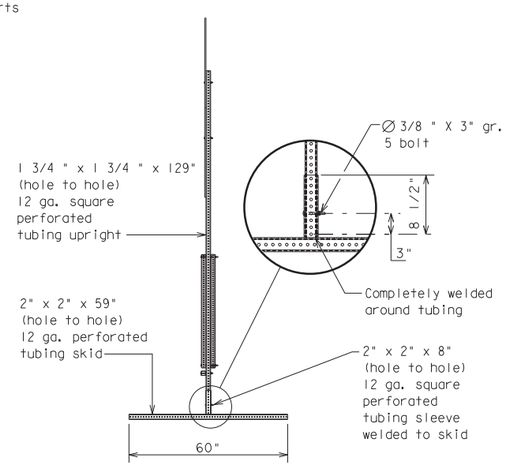


GROUND MOUNTED SIGN SUPPORTS

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







SKID MOUNTED PERFORATED SQUARE STEEL TUBING SIGN SUPPORTS

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

WEDGE ANCHORS

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

OTHER DESIGNS

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

GENERAL NOTES

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TYPICAL SIGN SUPPORT

BC(5)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SHELBY		39

DATE: 11/2/2021 3:34:46 PM
FILE: H:\Proj\N306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\01_TCP\bc-21.dgn

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

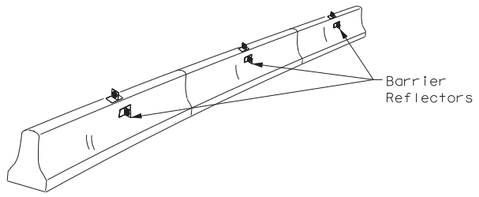
BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SHELBY		40

100

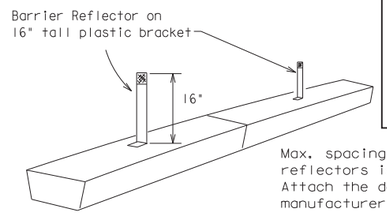
DATE: 11/2/2021 3:34:47 PM
FILE: H:\proj\N306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\01_TCP\bc-21.dgn

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



CONCRETE TRAFFIC BARRIER (CTB)

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

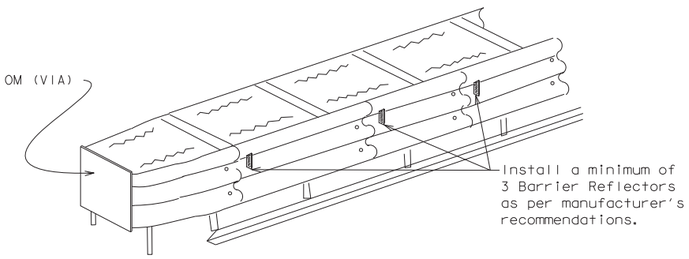


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

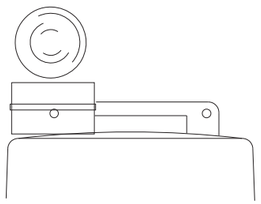


DELINEATION OF END TREATMENTS

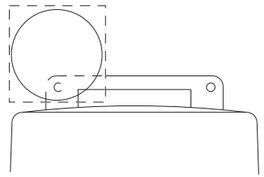
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

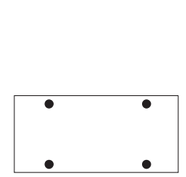
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

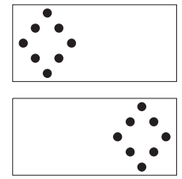
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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

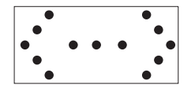


4 CORNER CAUTION

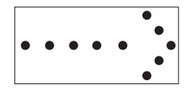
OR



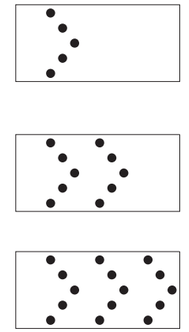
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



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



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

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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SHELBY		41

101

DATE: 11/2/2021 3:34:47 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\01_TCP\bc-21.dgn

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

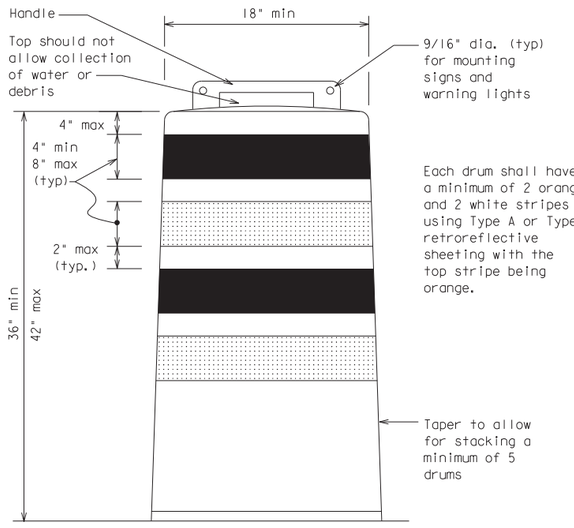
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

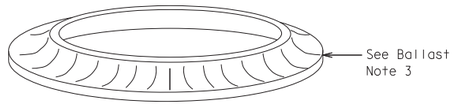
RETROREFLECTIVE SHEETING

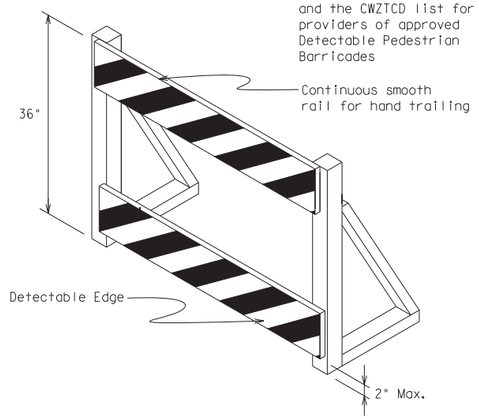
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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







DETECTABLE PEDESTRIAN BARRICADES

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

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

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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

.

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

Texas Department of Transportation | Traffic Safety Division Standard

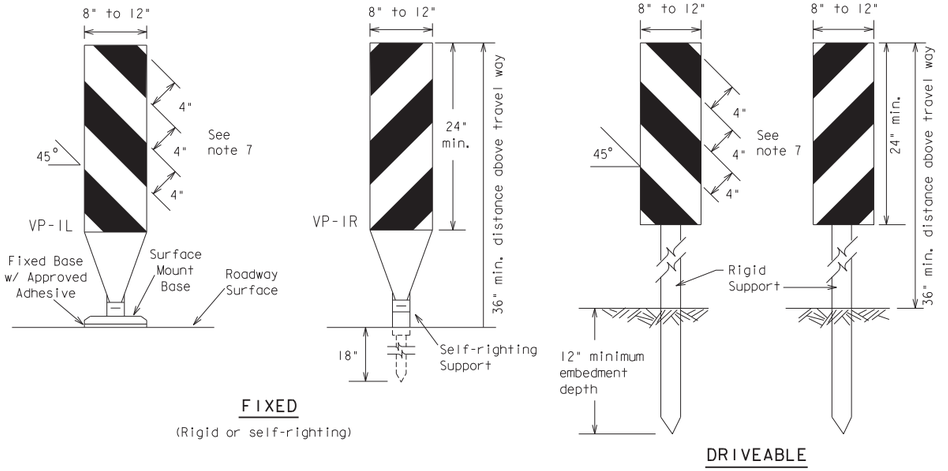
BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	LFK	SHELBY		42
7-13				

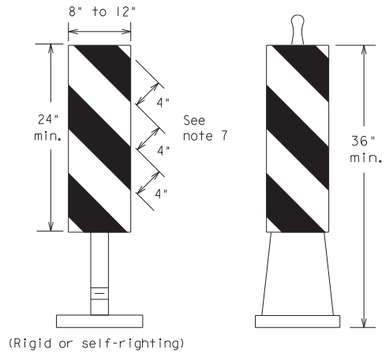
102

DATE: 11/2/2021 3:34:47 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\01_TCP\bc-21.dgn



FIXED
(Rigid or self-righting)

DRIVEABLE

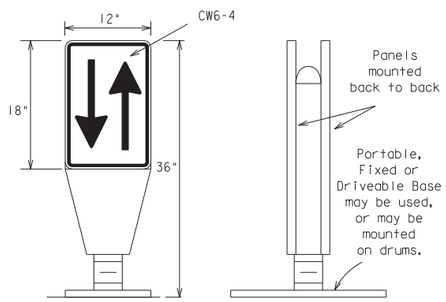


(Rigid or self-righting)

PORTABLE

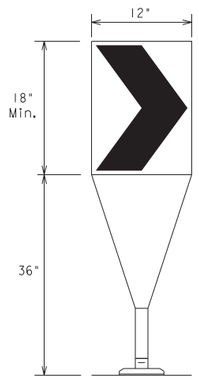
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



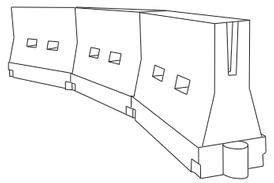
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SHELBY		43

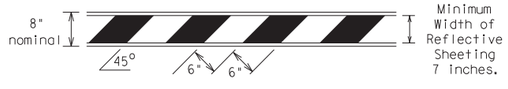
103

DATE: 11/2/2021 3:34:48 PM
FILE: H:\Proj\N306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\01_TCP\bc-21.dgn

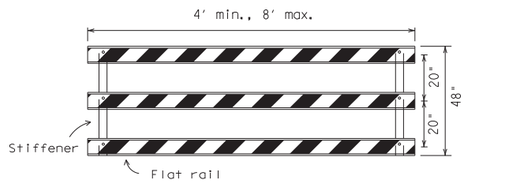
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



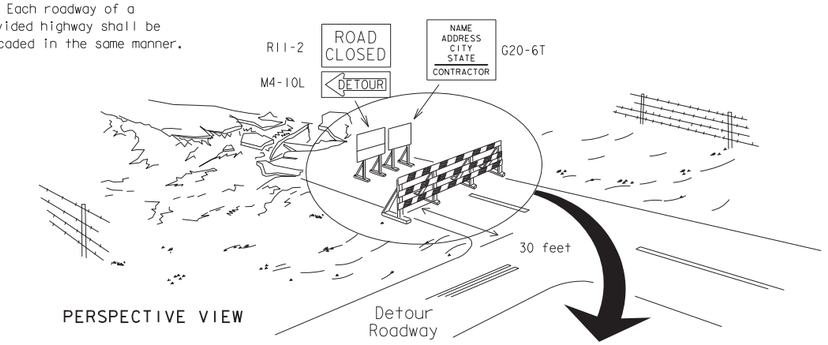
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

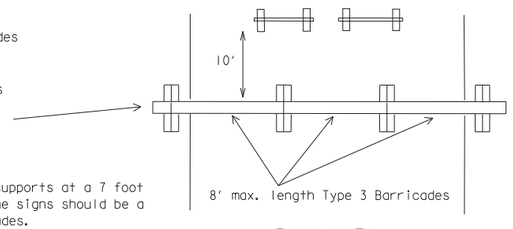
TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

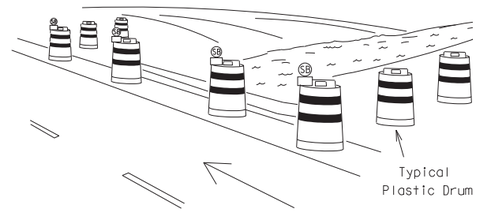
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

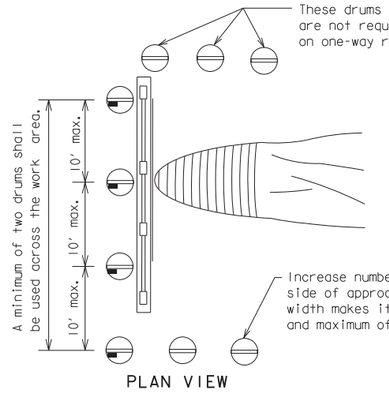
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

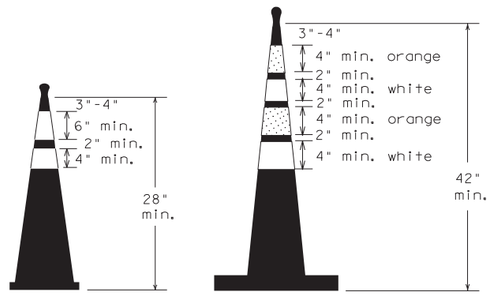
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

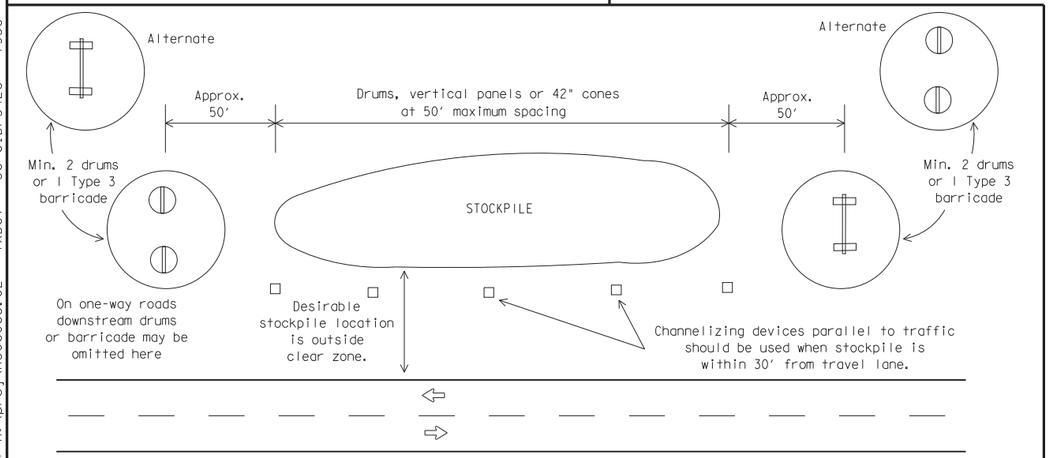
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

SHEET 10 OF 12

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	LFK	SHELBY		44

104

WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

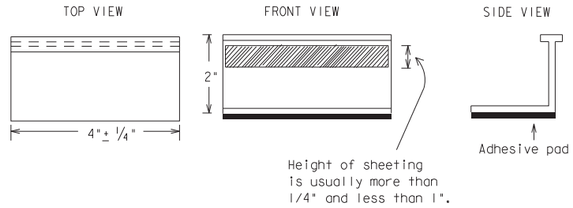
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation | Traffic Safety Division Standard

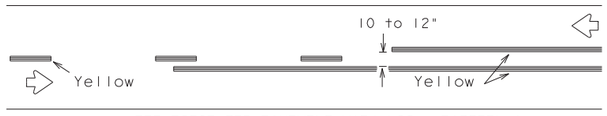
BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

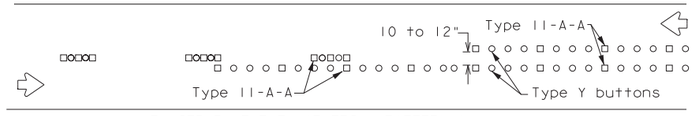
FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	LFK	SHELBY		45
11-02 8-14				

105

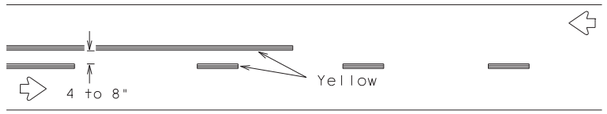
PAVEMENT MARKING PATTERNS



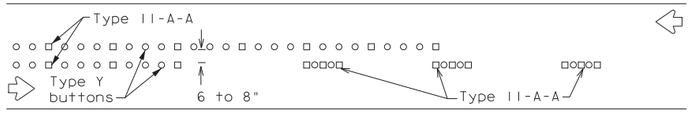
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



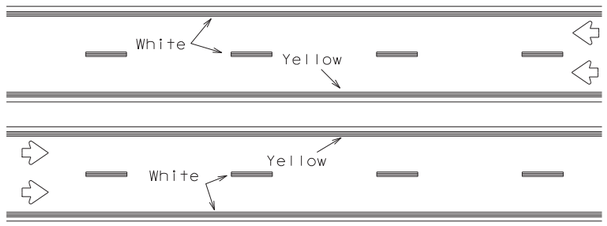
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



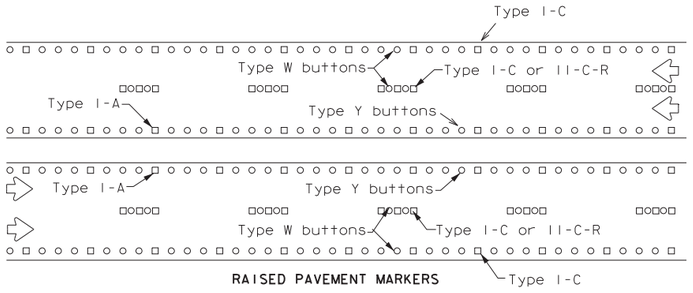
RAISED PAVEMENT MARKERS - PATTERN B

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

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



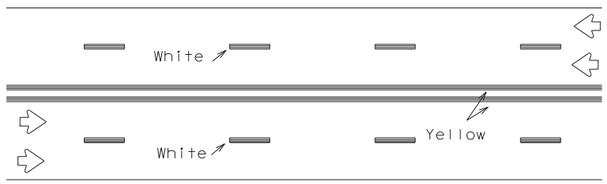
REFLECTORIZED PAVEMENT MARKINGS



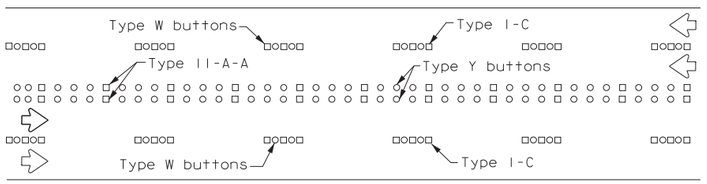
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



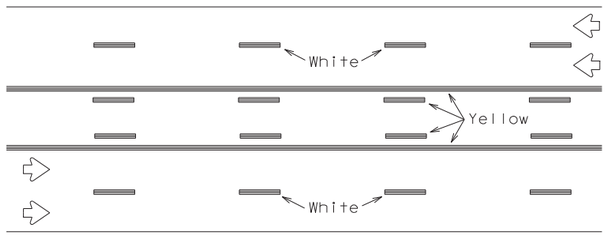
REFLECTORIZED PAVEMENT MARKINGS



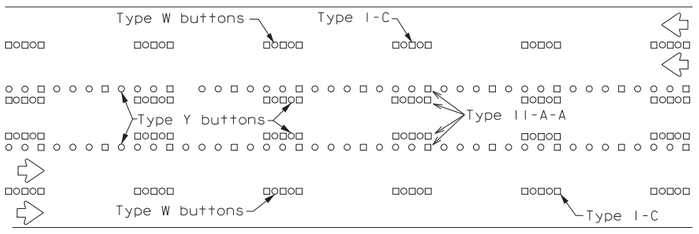
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

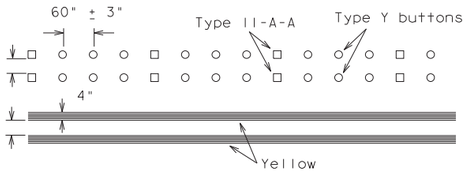
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

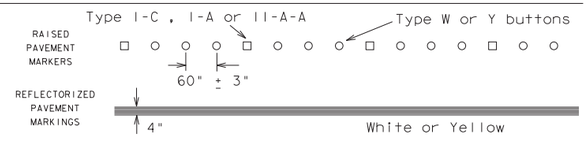
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

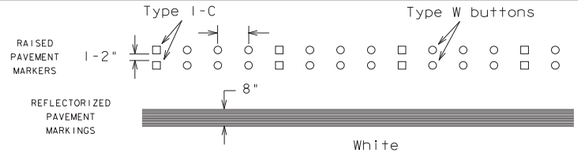


EDGE LINE OR SINGLE NO-PASSING LINE



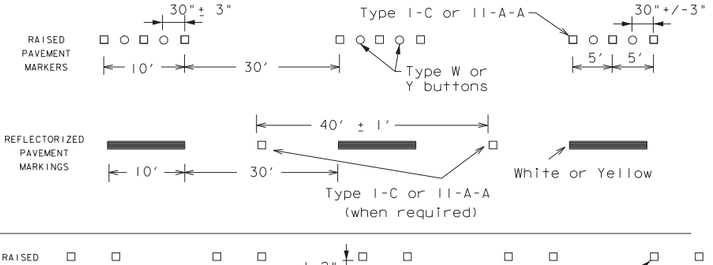
WIDE LINE

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

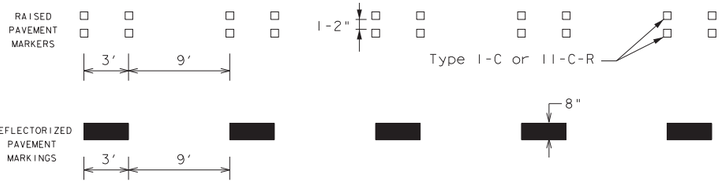


BROKEN LINES

CENTER LINE OR LANE LINE

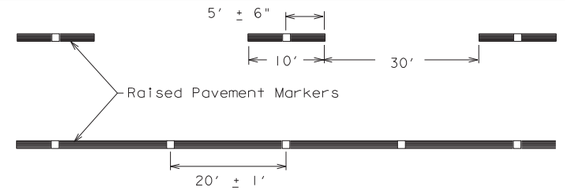


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

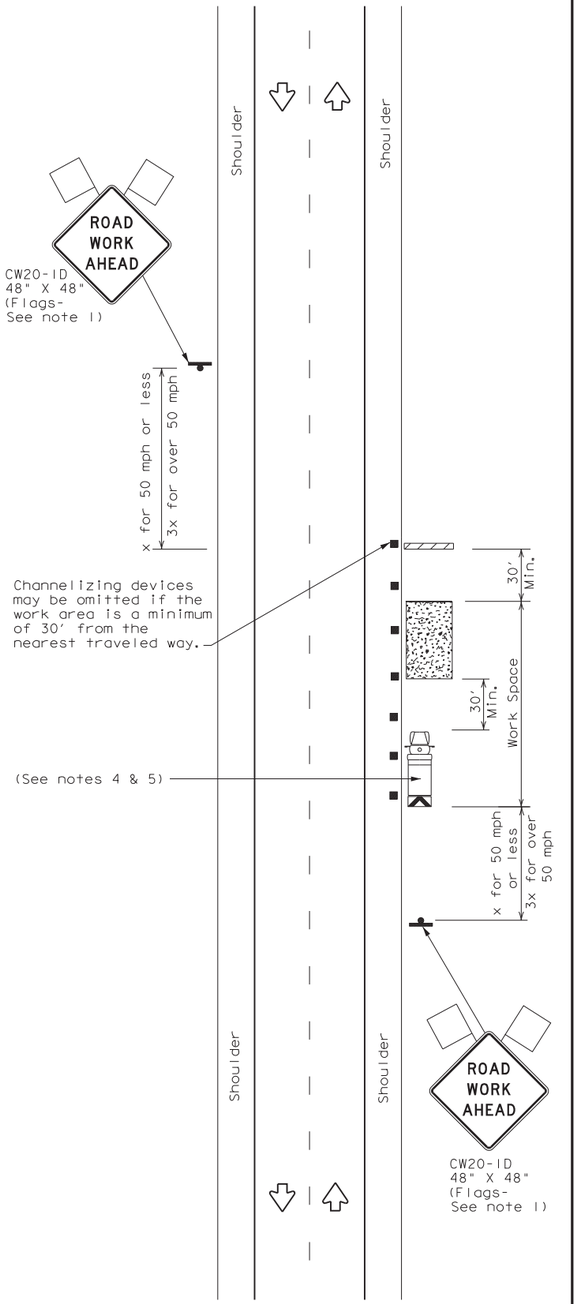
BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		46

106

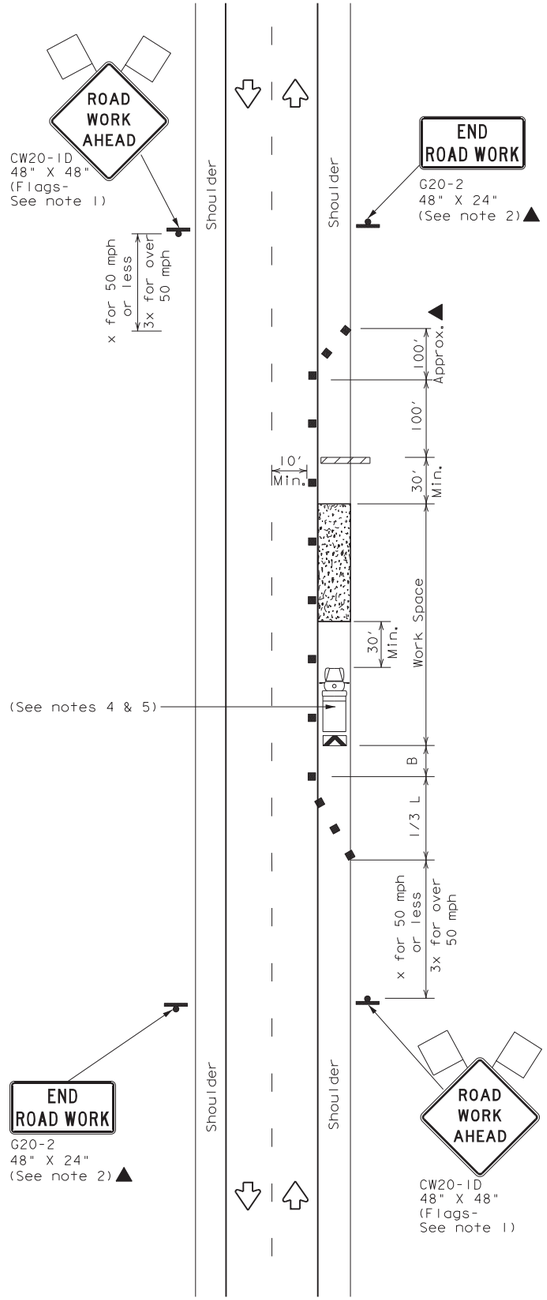
DATE: 11/2/2021 3:34:48 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\2_STANDARDS\01_TCP\bc-21.dgn

DATE: 11/2/2021 3:34:48 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\tcp2-1-18.dgn



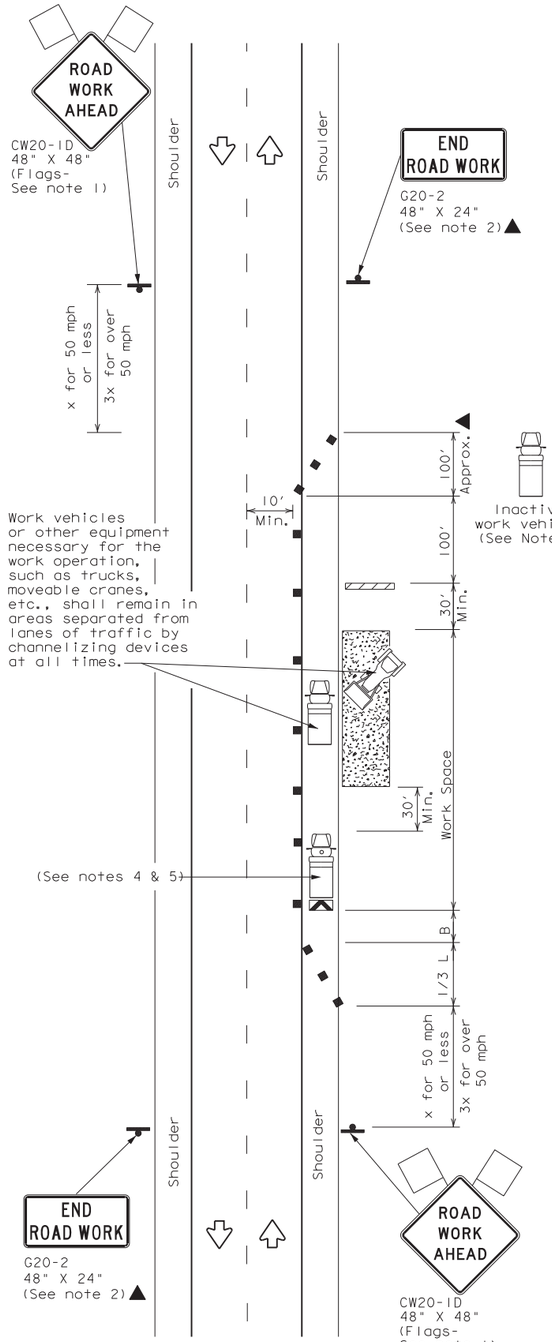
TCP (2-1a)

WORK SPACE NEAR SHOULDER
Conventional Roads



TCP (2-1b)

WORK SPACE ON SHOULDER
Conventional Roads



TCP (2-1c)

WORK VEHICLES ON SHOULDER
Conventional Roads

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

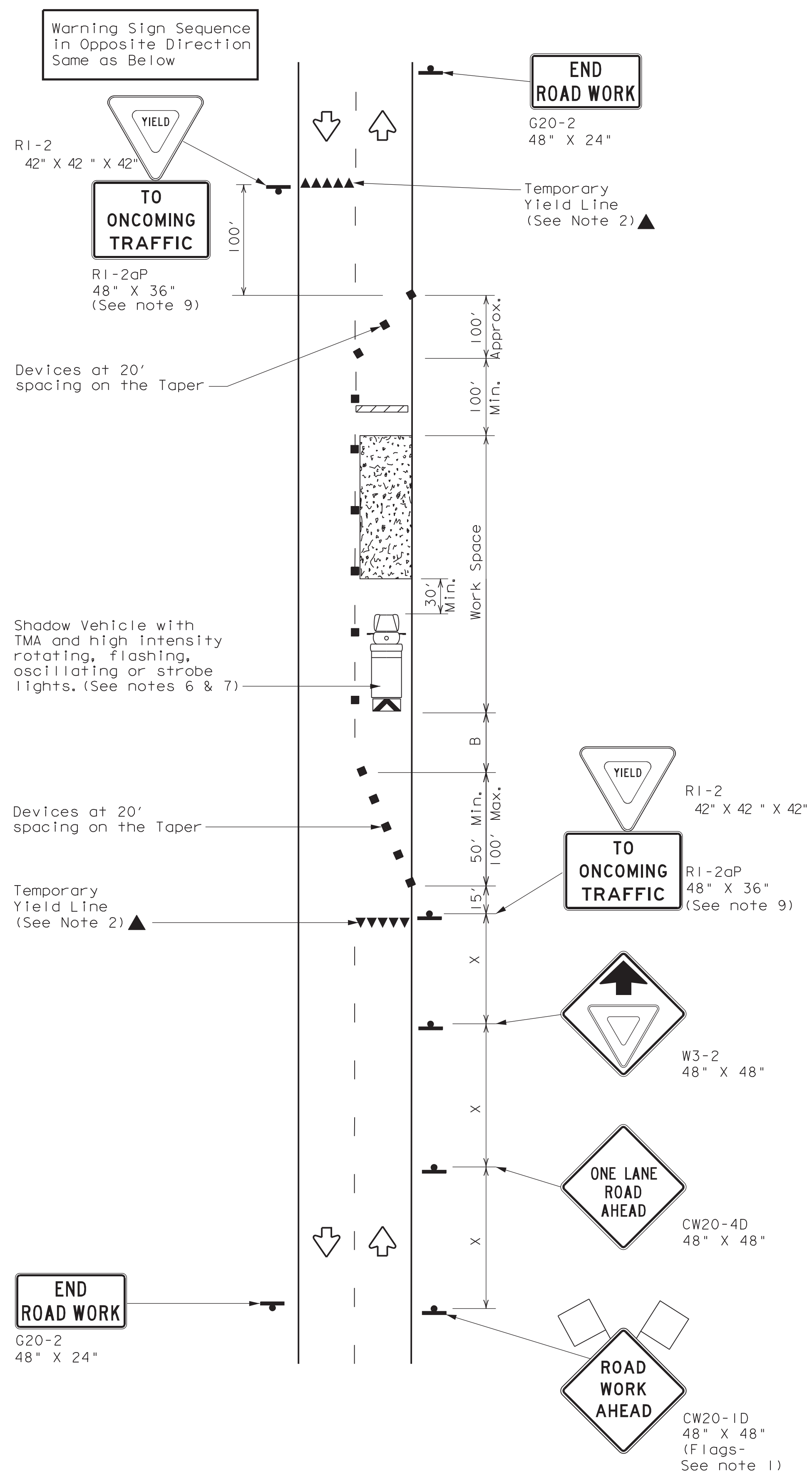
TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

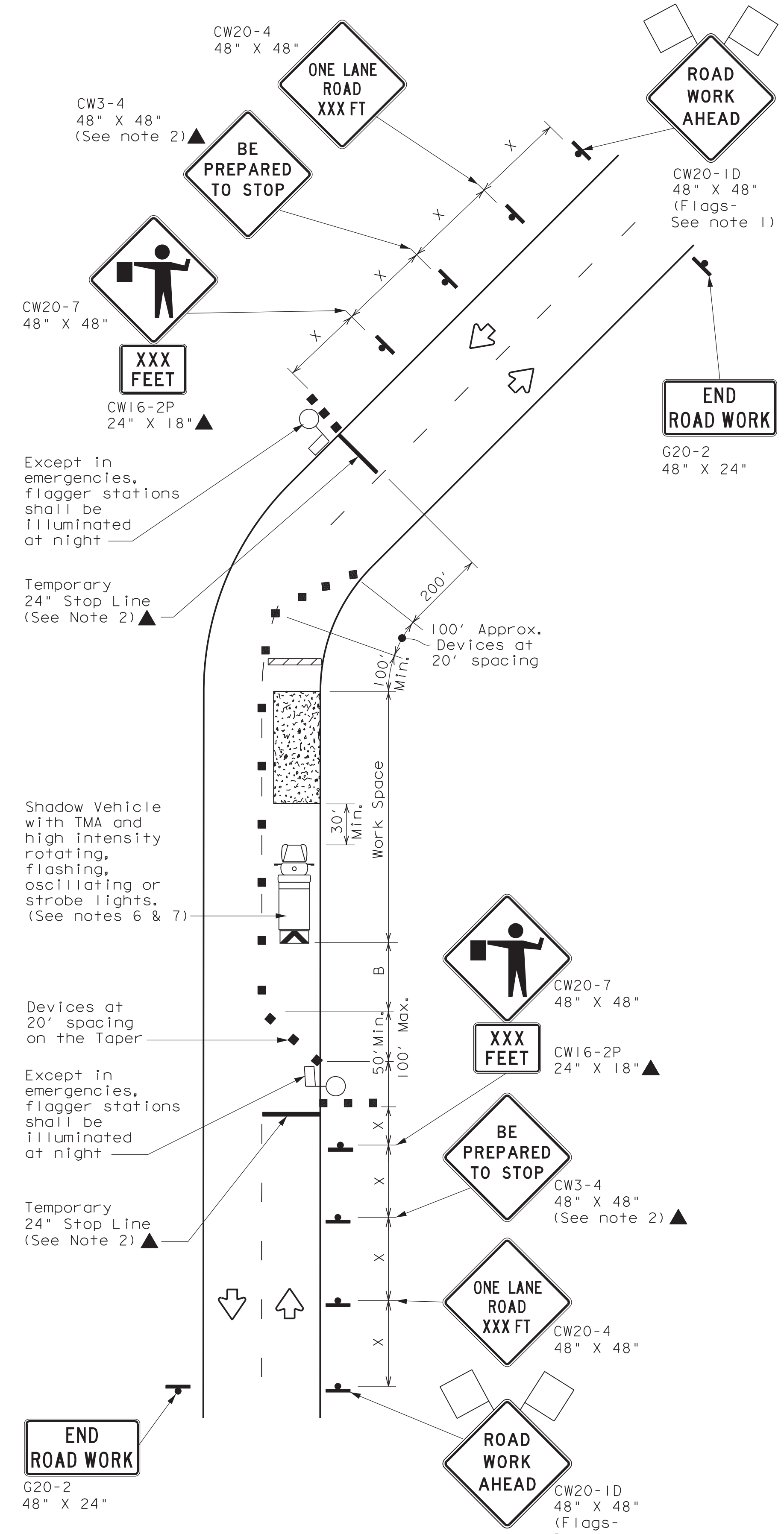
FILE: tcp2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	LFK	SHELBY		47
1-97 2-18				

161

DATE: 11/2/2021 3:34:49 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\



TCP (2-2a)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH YIELD SIGNS
(Less than 2000 ADT - See Note 9)



TCP (2-2b)
2-LANE ROADWAY WITHOUT PAVED SHOULDERS
ONE LANE TWO-WAY
CONTROL WITH FLAGGERS

LEGEND

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

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

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

TYPICAL USAGE

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

GENERAL NOTES

1. Flags attached to signs where shown, are REQUIRED.
2. All traffic control devices illustrated are REQUIRED, except those denoted with the triangle symbol may be omitted when stated elsewhere in the plans, or for routine maintenance work, when approved by the Engineer.
3. The CW3-4 "BE PREPARED TO STOP" sign may be installed after the CW20-4 "ONE LANE ROAD XXX FT" sign, but proper sign spacing shall be maintained.
4. Flaggers should use two-way radios or other methods of communication to control traffic.
5. Length of work space should be based on the ability of flaggers to communicate.
6. A Shadow Vehicle with a TMA should be used anytime it can be positioned 30 to 100 feet in advance of the area of crew exposure without adversely affecting the performance or quality of the work. If workers are no longer present but road or work conditions require the traffic control to remain in place, Type 3 Barricades or other channelizing devices may be substituted for the Shadow Vehicle and TMA.
7. Additional Shadow Vehicles with TMAs may be positioned off the paved surface, next to those shown in order to protect a wider work space.

TCP (2-2a)

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

TCP (2-2b)

10. Channelizing devices on the center line may be omitted when a pilot car is leading traffic and approved by the Engineer.
11. If the work space is located near a horizontal or vertical curve, the buffer distances should be increased in order to maintain stopping sight distance to the flagger and a queue of stopped vehicles. (See table above).
12. Flaggers should use 24" STOP/SLOW paddles to control traffic. Flags should be limited to emergency situtations.

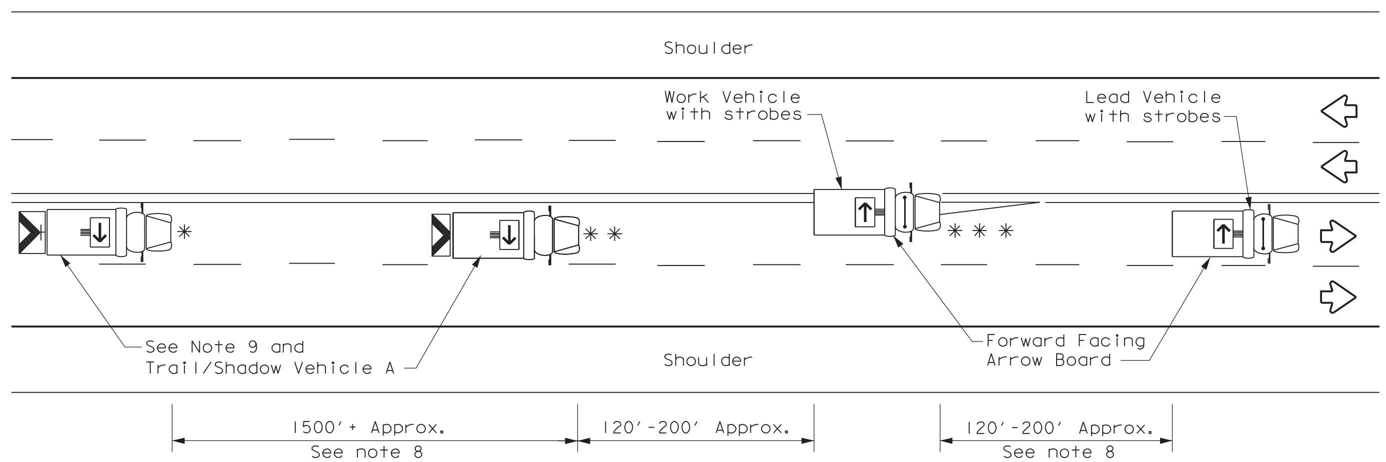
Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC CONTROL PLAN ONE-LANE TWO-WAY TRAFFIC CONTROL

TCP(2-2)-18

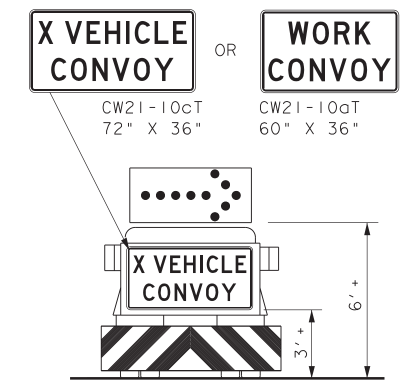
FILE: tcp2-2-18.dgn		DN:	CK:	DW:	CK:
©TxDOT December 1985	CONT	SECT	JOB		HIGHWAY
REVISIONS 8-95 3-03 1-97 2-12 4-98 2-18	0809	02	069		US 96
	DIST		COUNTY		SHEET NO.
	LFK		SHELBY		48

162



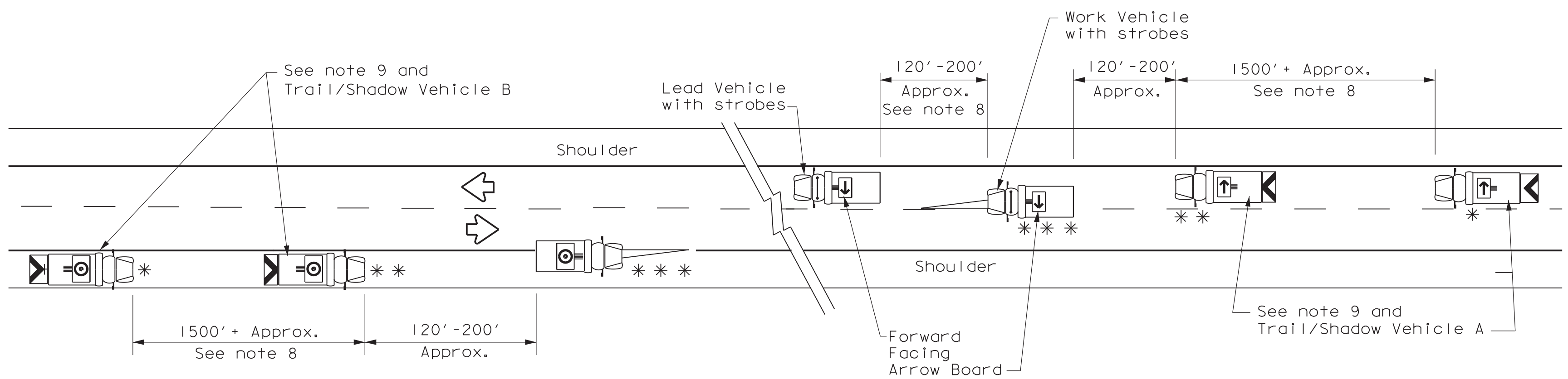
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

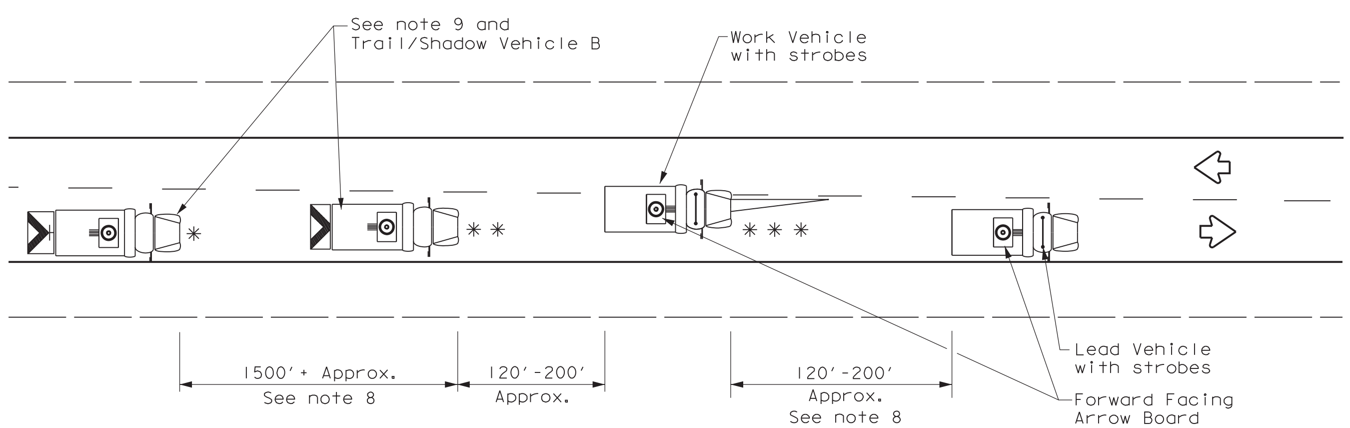


WORK ON SHOULDER

WORK ON TRAVEL LANE

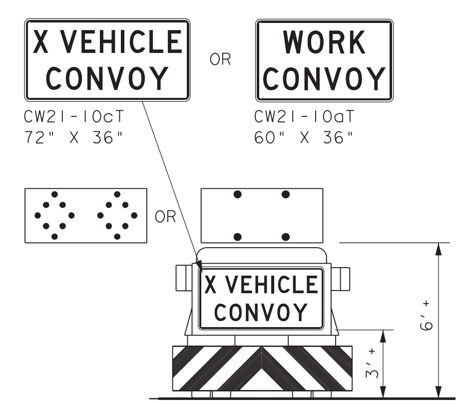
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in CAUTION display

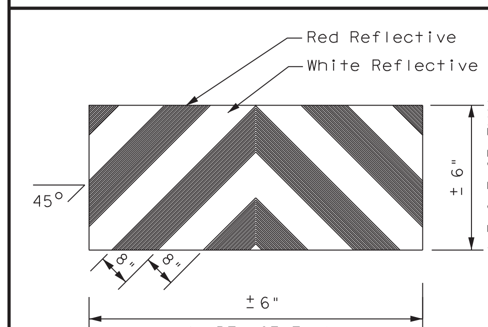
LEGEND

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

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

GENERAL NOTES

1. TRAIL, SHADOW, and LEAD vehicles shall be equipped with arrow boards as illustrated. When a LEAD vehicle is not used the WORK vehicle must be equipped with an arrow board. The Engineer will determine if the LEAD VEHICLE and/or TRAIL VEHICLE are required based on prevailing roadway conditions, traffic volume, and sight distance restrictions.
2. The use of amber high intensity rotating, flashing, oscillating, or strobe lights on vehicles are required. Blue high intensity rotating, flashing, oscillating or strobe lights when mounted on the driver's side of the vehicle may be operated simultaneously with the amber beacons or strobe lights.
3. The use of truck mounted attenuators (TMA) on the SHADOW VEHICLE and TRAIL VEHICLE are required.
4. Reflective sheeting on the rear of the TMA shall meet or exceed the reflectivity and color requirements of DEPARTMENTAL MATERIAL SPECIFICATION DMS 8300, Type A.
5. Flashing arrow boards shall be Type B or Type C as per the Barricade and Construction (BC) standards. The board shall be controlled from inside the vehicle.
6. Each vehicle shall have two-way radio communication capability.
7. When work convoys must change lanes, the TRAIL VEHICLE should change lanes first to shadow the other convoy vehicles.
8. Vehicle spacing between the TRAIL VEHICLE and the SHADOW VEHICLE will vary depending on sight distance restrictions. Motorists approaching the work convoy should be able to see the TRAIL VEHICLE in time to slow down and/or change lanes as they approach the TRAIL VEHICLE. Vehicle spacing between the WORK VEHICLE and SHADOW VEHICLE and vehicle spacing between WORK VEHICLE and LEAD VEHICLE may vary according to terrain, work activity and other factors.
9. "X VEHICLE CONVOY" (CW21-10cT) or "WORK CONVOY" (CW21-10aT) signs shall be used on TRAIL VEHICLES and SHADOW VEHICLES as shown. As an option 48" X 48" diamond shaped "WORK CONVOY"(CW21-10T) or "X VEHICLE CONVOY" (CW21-10bT) signs may be used where adequate mounting space exists. When used, the X VEHICLE CONVOY sign shall have the number of the convoy vehicles displayed on the sign in the number designation "X" location. The "X VEHICLE CONVOY" sign shall not be used on the SHADOW VEHICLE if a TRAIL VEHICLE is used.
10. On two-lane two-way roadways, the work and protection vehicles should pull over periodically to allow motor vehicle traffic to pass. If motorists are not allowed to pass the work convoy, a "DO NOT PASS" (R4-1) sign should be placed on the back of the rearmost protection vehicle.



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS UNDIVIDED HIGHWAYS

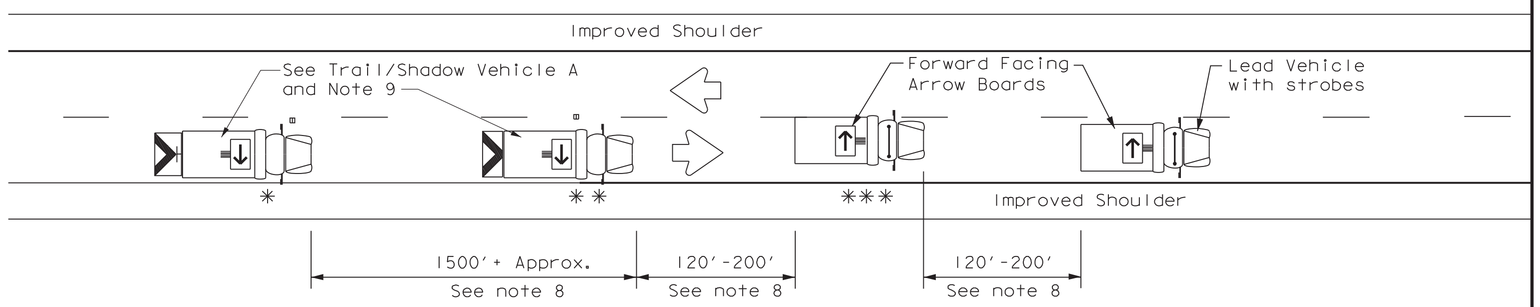
TCP(3-1)-13

FILE: tcp3-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT December 1985	CONT 0809	SECT 02	JOB 069	HIGHWAY US 96
REVISIONS 2-94 4-98 8-95 7-13 1-97	DIST LFK		COUNTY SHELBY	SHEET NO. 49

175

DATE: 11/2/2021 3:34:49 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\01 MicroStation\06 Sheets\12 STANDARDS\TCP\tcp3-1.dgn

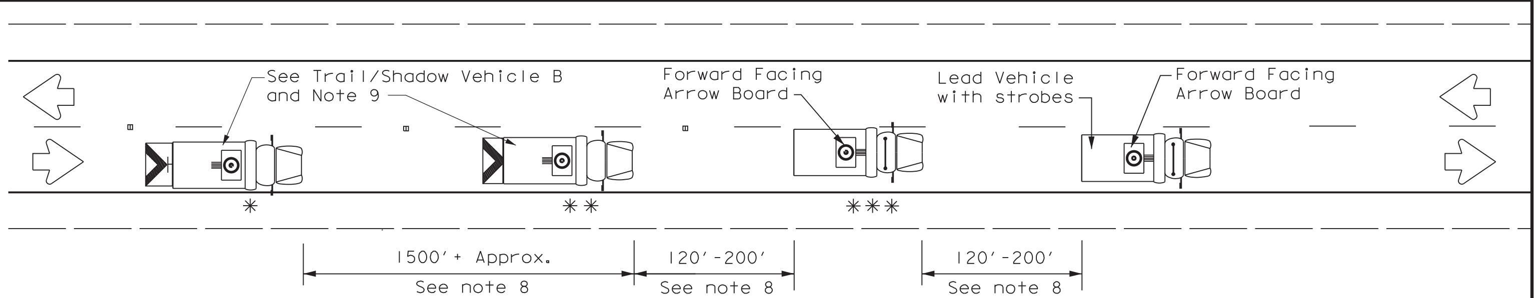
DATE: 11/2/2021 3:34:49 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\01_MicroStation\06_Sheets\12_STANDARDS\01_TCP\tcp3-3.dgn



TCP (3-3a)

TWO LANE HIGHWAY WITH PAVED SHOULDERS

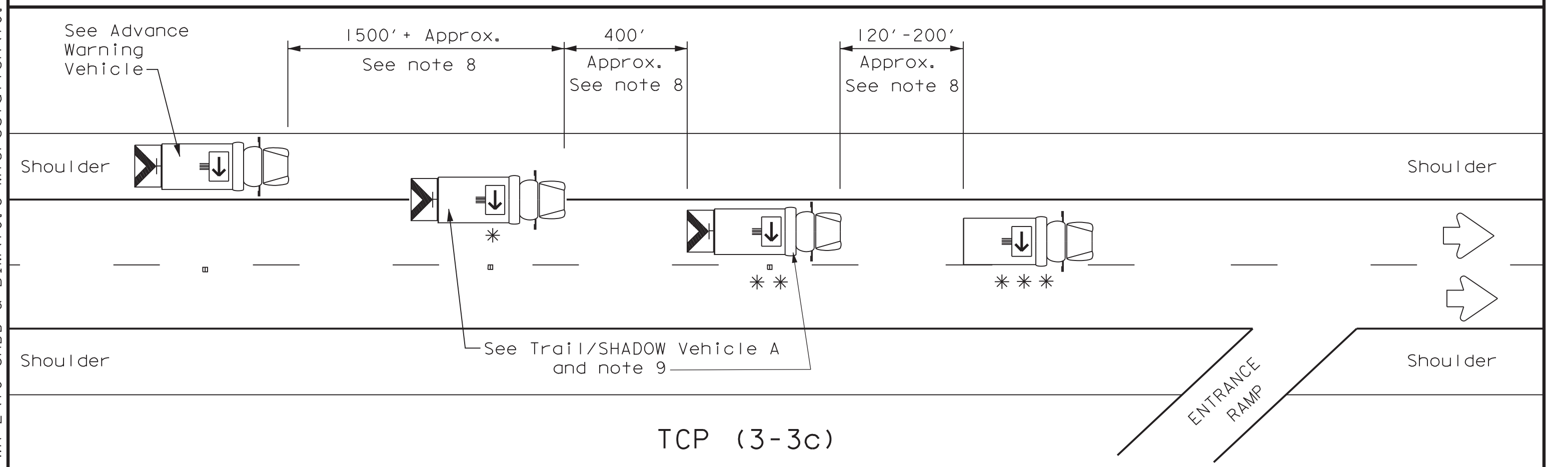
(WORK ON TRAVEL LANE)



TCP (3-3b)

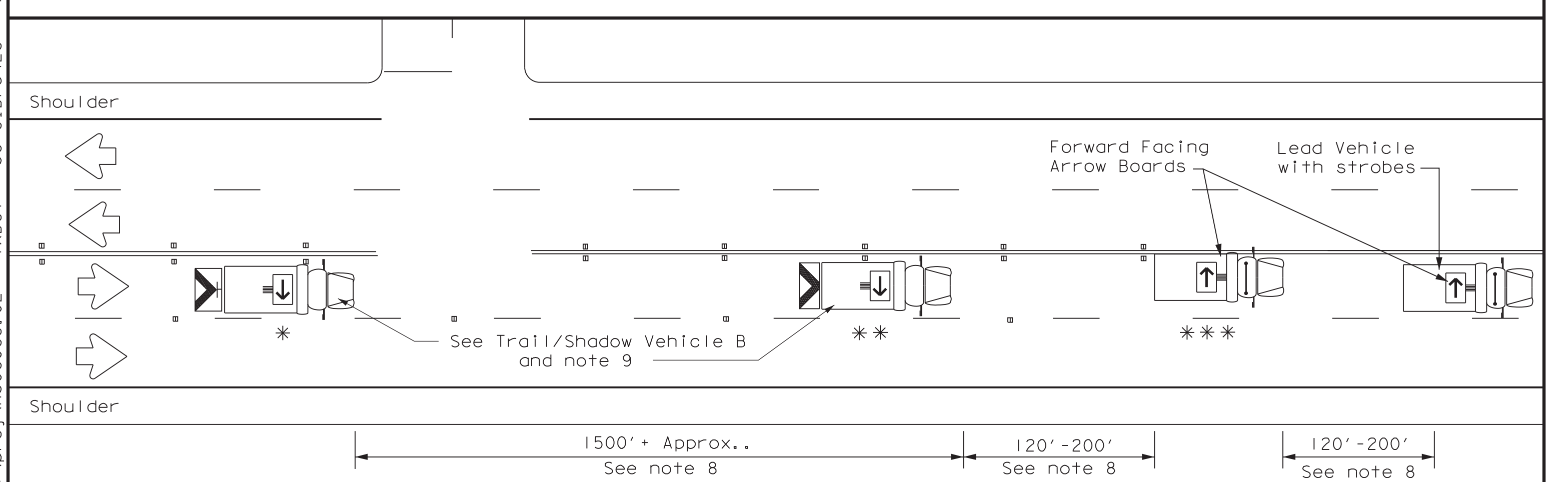
TWO LANE HIGHWAY WITHOUT PAVED SHOULDERS

(WORK ON TRAVEL LANE)



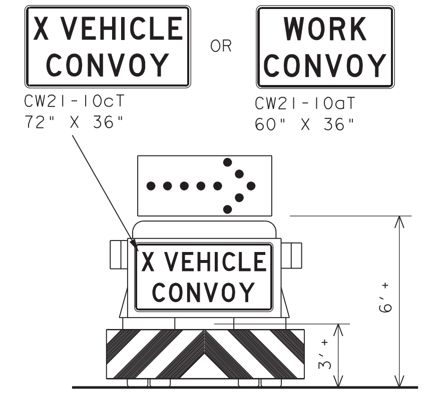
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



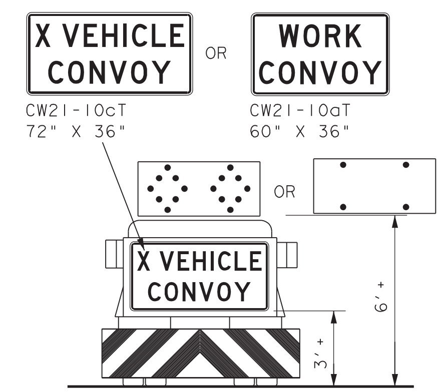
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



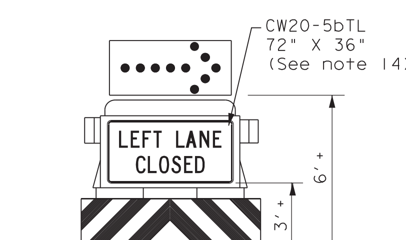
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

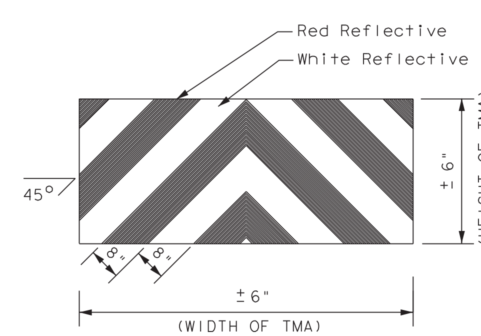


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

LEGEND

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

TYPICAL USAGE

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

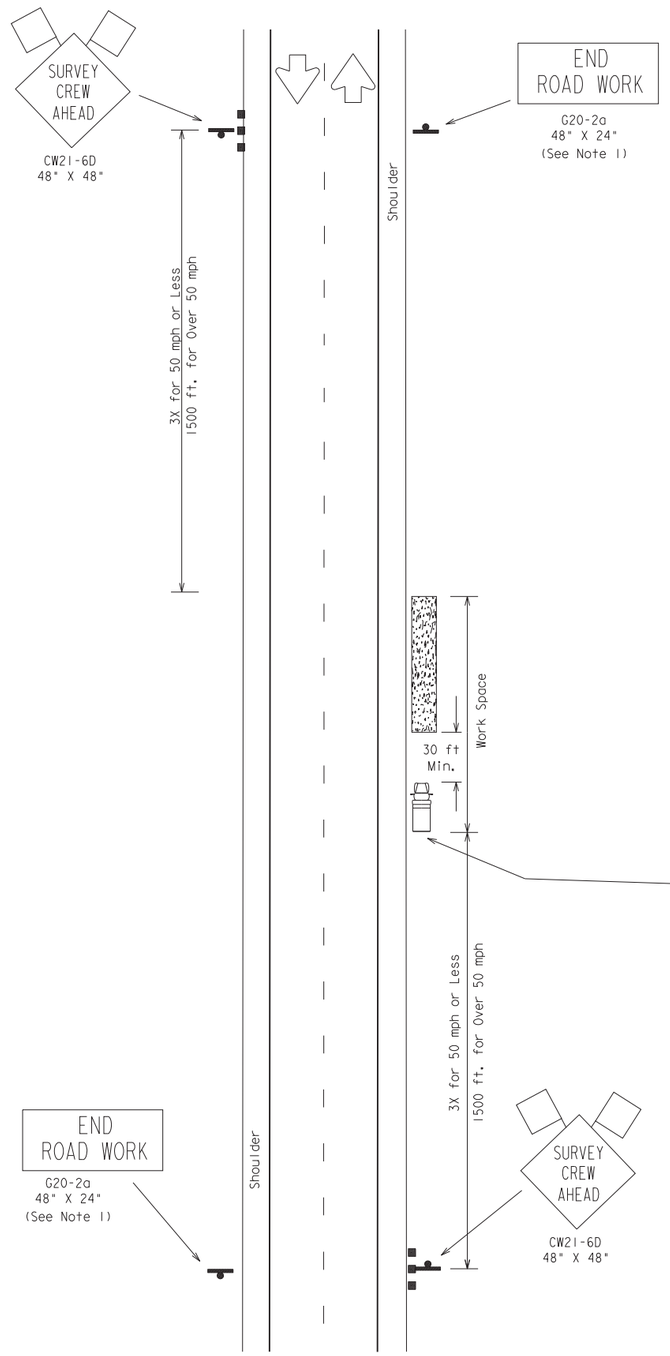
TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

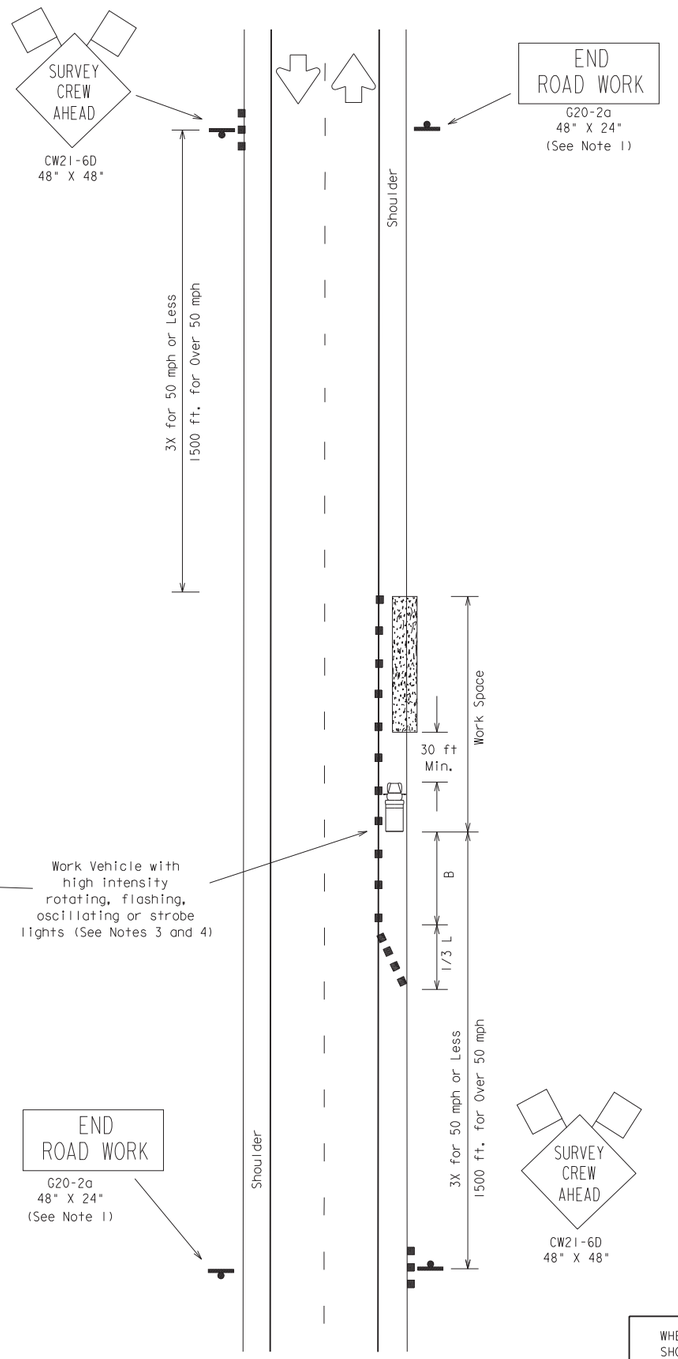
FILE: tcp3-3.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
2-94 4-98 8-95 7-13 1-97 7-14	DIST		COUNTY	SHEET NO.
	LFK		SHELBY	50

177

DATE: 11/2/2021 3:34:50 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\01*TCP\tcp1-1.dgn



TCP (S-1a)
WORK OFF SHOULDER OR PAVED SURFACE



TCP (S-1b)
WORK ON SHOULDER

LEGEND

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

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

* Conventional Roads Only

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

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

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

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Channelizing devices on the shoulder taper and tangent section may be omitted for short duration (less than 1 hour) work.
3. If line-of-sight requirements for surveying operations will preclude the placement of the Work Vehicle to protect workers, the channelizing devices mentioned in Note 2 are required.
4. ⚠1 A Shadow Vehicle with a Truck Mounted Attenuator and flashing warning lights/arrow panel in caution mode may be used in lieu of the Work Vehicle to protect the work space.
5. The CW20-1D "ROAD WORK AHEAD" sign may be substituted for the CW21-6D "SURVEY CREW AHEAD" sign.
6. This plan may also be used for shoulder work or off shoulder work for multilane undivided roadways.
7. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-1a)

8. Cones may be placed at edge of pavement adjacent to the work space to enhance safety.

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

8-18-08 Revision
⚠1 Corrected misspelling.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

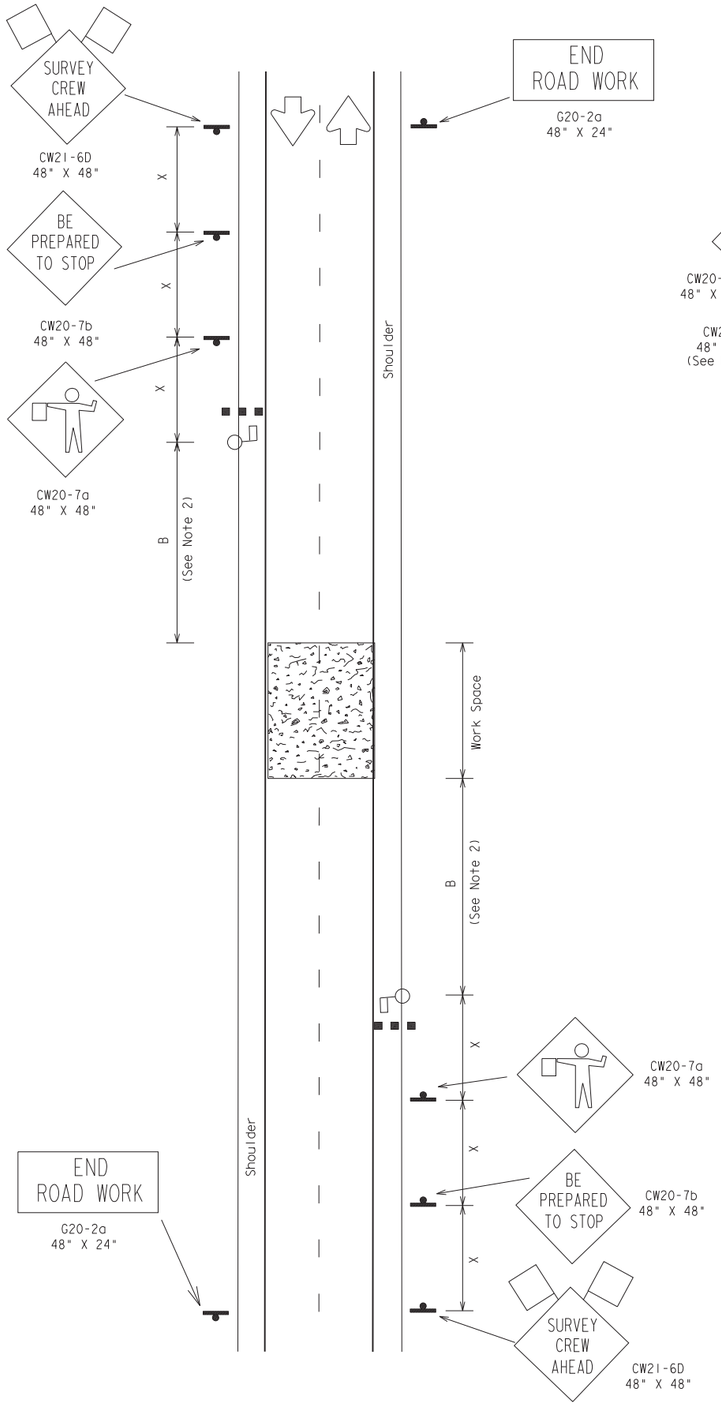
TCP(S-1)-08A

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

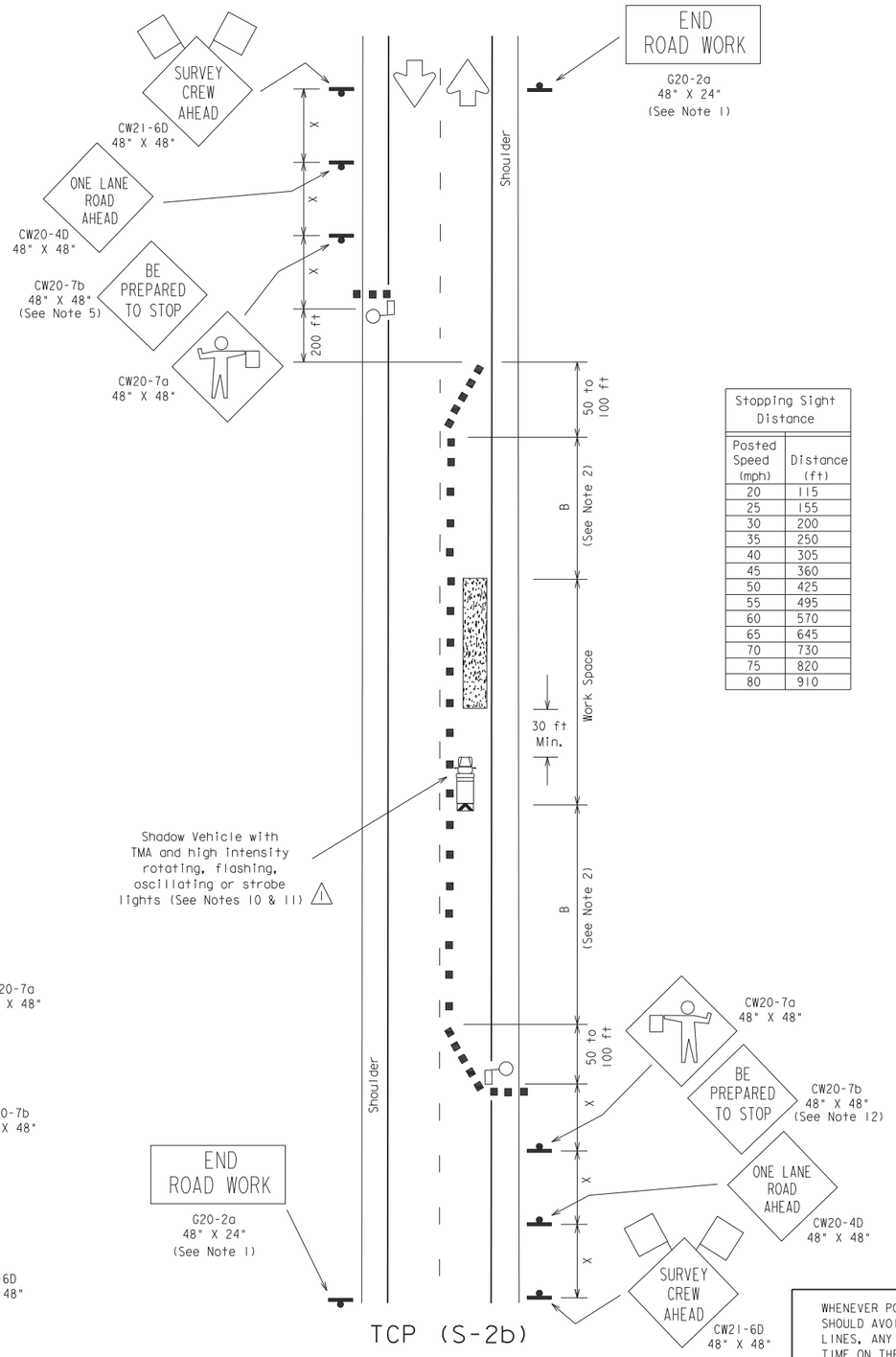
REVISIONS
8-08

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		51

DATE: 11/2/2021 3:34:50 PM
FILE: H:\proj\R30606B.02 - TxDOT - 36-6\DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\01*TCP\tcps2.dgn



TCP (S-2a)
ROAD CLOSED FOR LESS THAN 20 MINUTES -
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS



TCP (S-2b)
WORK IN ROADWAY
OFF PEAK TRAFFIC HOURS
WITH OR WITHOUT SHOULDERS

Stopping Sight Distance	
Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

LEGEND

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

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

* Conventional Roads Only

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

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

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

GENERAL NOTES:
1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Adequate Stopping Sight Distance (see Stopping Sight Distance table) should be maintained from approaching traffic to the flagger or a queue of stopped vehicles. The Buffer Space "B" should be extended around curves or other obstacles, when necessary, to have adequate Stopping Sight Distance to the flagger station.
3. Flaggers should use two-way radios or other means of communication while flagging.
4. The length of the work space should be based on the ability of the flaggers to communicate.
5. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" signs.
6. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads is desirable, but is not required when working less than 15 minutes in area of the side road, as determined by the Engineer.

TCP(S-2a)

7. Road closures shall be less than 20 minutes. Closures less than 5 minutes are desirable.
8. Sign spacing should be increased if traffic repeatedly queues past the CW20-7b "BE PREPARED TO STOP" sign.
9. The surveying instrument should not be located on the paved surface.

TCP (S-2B)

10. For short duration work the Shadow Vehicle with a TMA may be replaced by another Work Vehicle with high intensity rotating, flashing or strobe lights.
11. Shadow Vehicles with a TMA are desirable when workers or equipment are in the work space. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Shadow Vehicle.
12. The CW20-7b "BE PREPARED TO STOP" sign is optional. When used, it should be installed after the CW20-4D "ONE LANE ROAD AHEAD" sign.

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

8-18-08 Revision
1 Corrected referrence to notes.

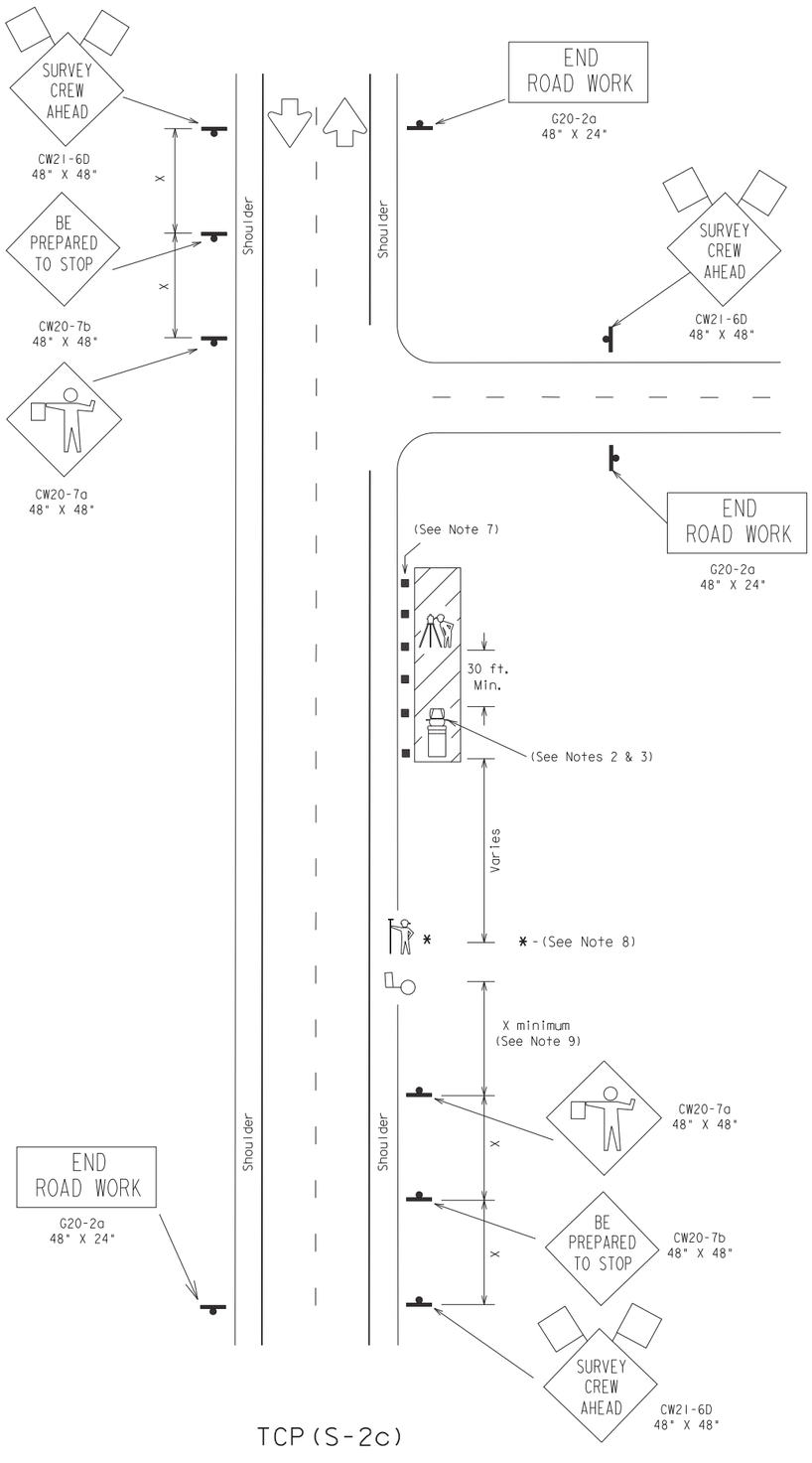
Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2)-08A

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
8-08	CONT	SECT	JOB	HIGHWAY
	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		52

DATE: 11/2/2021 3:34:50 PM
FILE: H:\Proj\VR306068.02 - TxDOT - 36-6\DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\2*STANDARDS\01*TCP\tcps2c.dgn



TCP(S-2c)

Stopping Sight Distance	
Posted Speed (mph)	Distance (ft)
20	115
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570
65	645
70	730
75	820
80	910

LEGEND

Type III Barricade ■ ■ Channelizing Devices Flag

Work Vehicle Truck Mounted Attenuator (TMA)

Flagger Sign Post Survey Rodman Instrument Person

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

* Conventional Roads Only

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

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

DEFINITIONS:

MOBILE - work that moves continously or intermittently (stopping up to approximately 15 minutes).

SHORT DURATION - work that occupies a location up to 1 hour.

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

GENERAL NOTES:

1. The G20-2a "END ROAD WORK" sign may be placed on the back of the CW21-6D "SURVEY CREW AHEAD" sign or may be omitted for short duration (less than 1 hour) work.
2. Work Vehicle with high intensity rotating, flashing, oscillating or strobe lights should be used to protect work space.
3. When approved by the engineer, Type III barricades or other channelizing devices may be substituted for the Heavy Work Vehicle.
4. CW20-1D "ROAD WORK AHEAD" signs may be substituted for CW21-6D "SURVEY CREW AHEAD" SIGNS.
5. The CW21-6D "SURVEY CREW AHEAD" sign for low volume intersecting side roads may be omitted when approved by the Engineer.
6. The Surveying instrument shall not be located on the paved surface.
7. Cones at edge of pavement adjacent to instrument person may be omitted when approved by the Engineer.
8. Rodman may only enter roadway when accompanied by flagger and as traffic allows.
9. The distance between the advance warning signs and the work should not exceed a two mile maximum.
10. Flaggers and Survey Crew should use two-way radios or other means of communication.
11. Survey Crew and Flaggers shall wear high-visibility apparel meeting the ANSI 107-2007 standard performance for Class 2 or Class 3 risk exposure.
12. Additional traffic control devices may be required to address local site conditions.
13. Stopping Sight Distance shall be maintained from approaching traffic to the flagger. See "Stopping Sight Distance" table.

SURVEY PARTIES SHOULD AVOID ANY UNNECCESSARY PERIODS OF TIME ON THE ROAD SURFACE.

This TCP is to cover two lane rural type roadways as determined by the Engineer. All other type roadways will be covered by other established Survey TCP'S.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

TCP(S-2c)-10

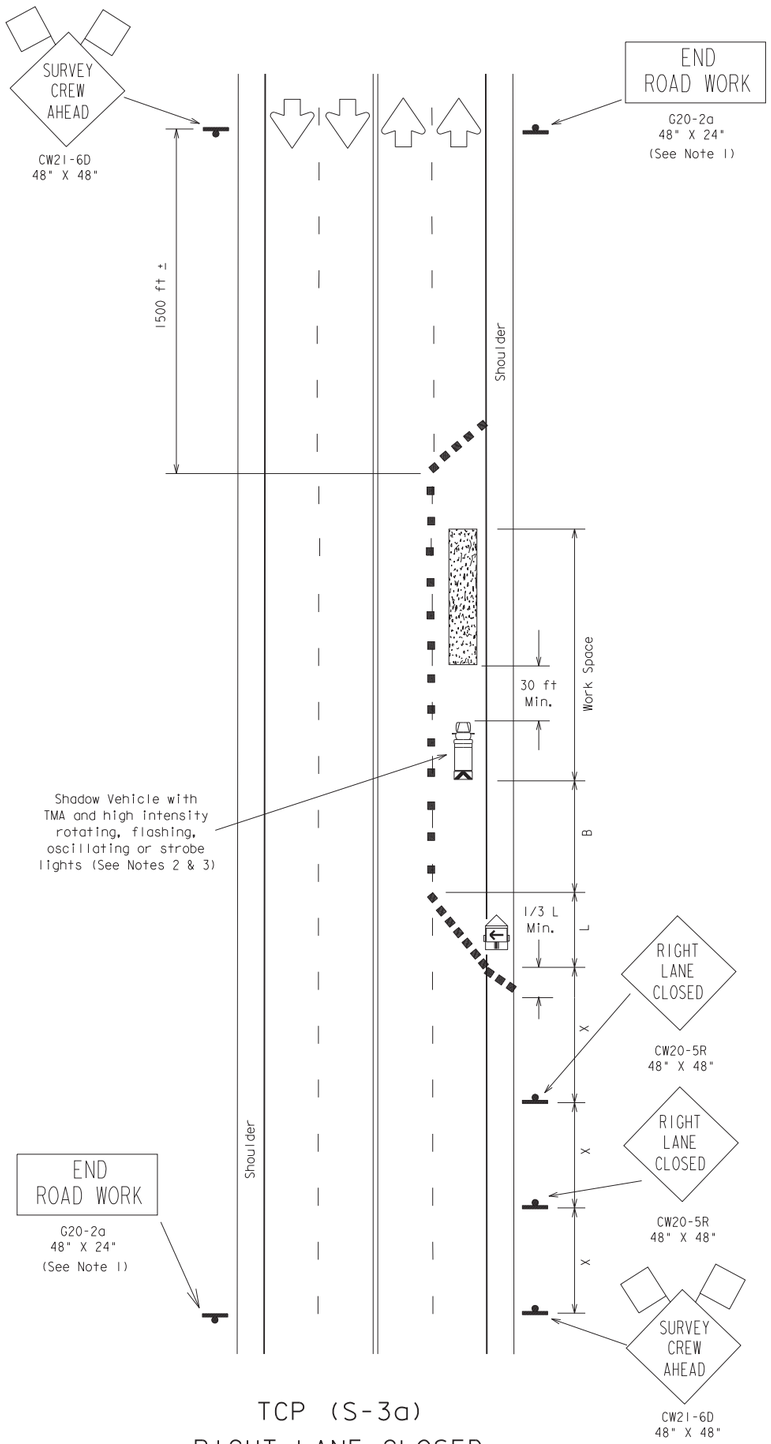
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS

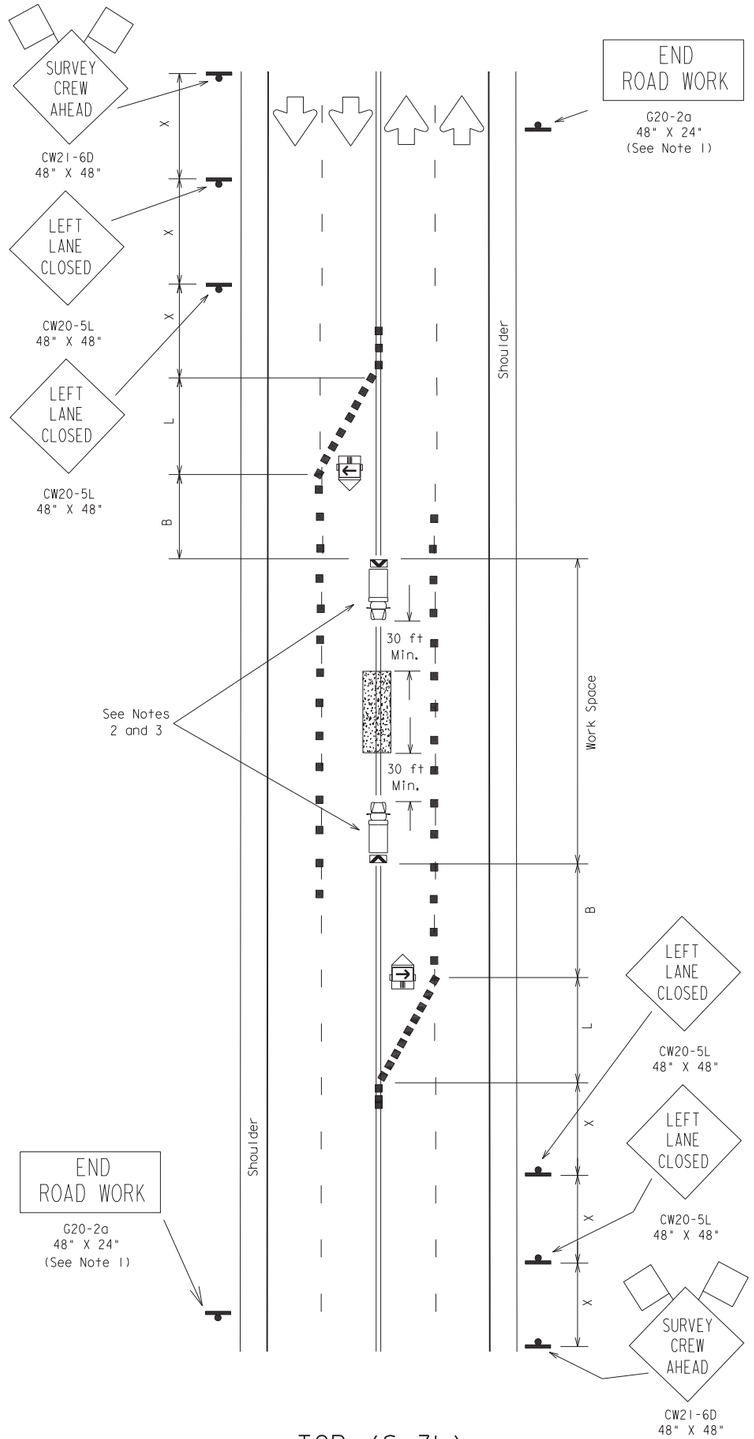
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		53

212A

DATE: 11/2/2021 3:34:51 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\01*TCP\tcps3.dgn



TCP (S-3a)
RIGHT LANE CLOSED
WITH OR WITHOUT SHOULDERS



TCP (S-3b)
WORK ON CENTERLINE

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

LEGEND

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

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

* Conventional Roads Only

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

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

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

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

TCP(S-3a)
6. If shoulders are not present, the 1/3L shoulder taper is to be omitted and four channelizing devices shall be placed in front of the arrow panel, perpendicular to traffic.

TCP(S-3b)
7. One CW20-5L "LEFT LANE CLOSED" sign in each direction may be omitted when the posted speed is less than 45mph and volume is less then 2000 ADT.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC CONTROL PLAN FOR SURVEYING OPERATIONS

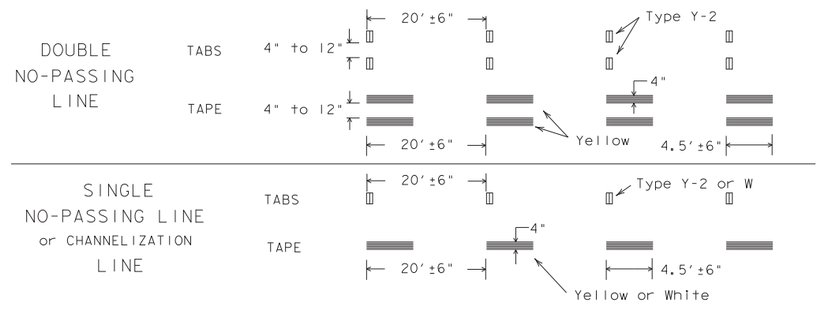
TCP(S-3)-08

REVISIONS

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

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		54

WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS



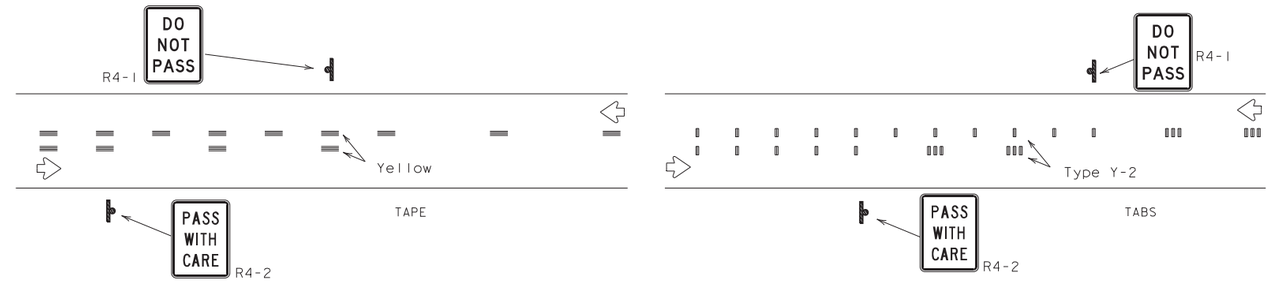
NOTES:

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

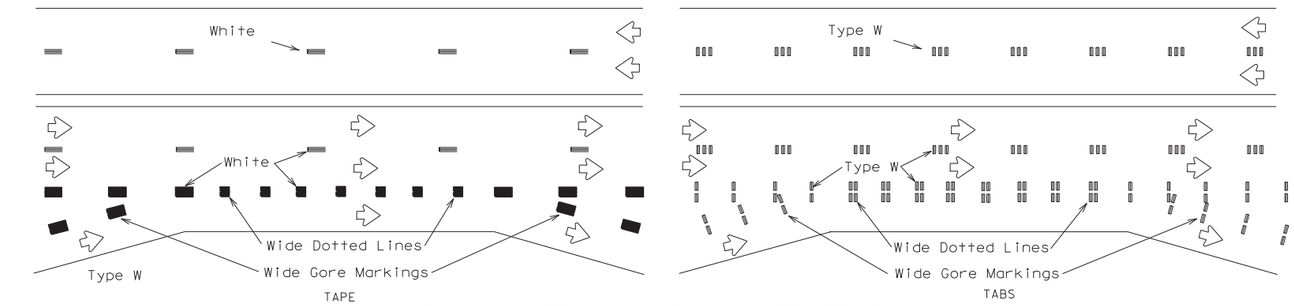
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

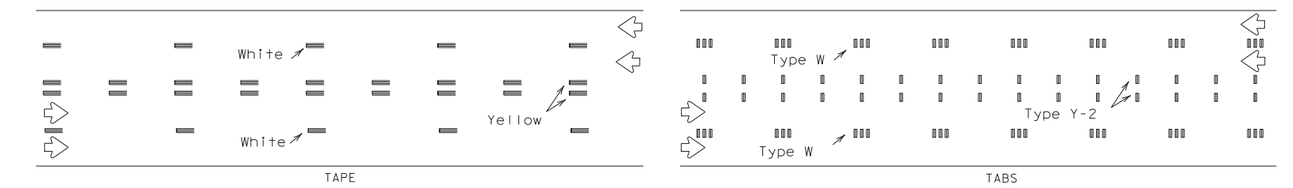
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



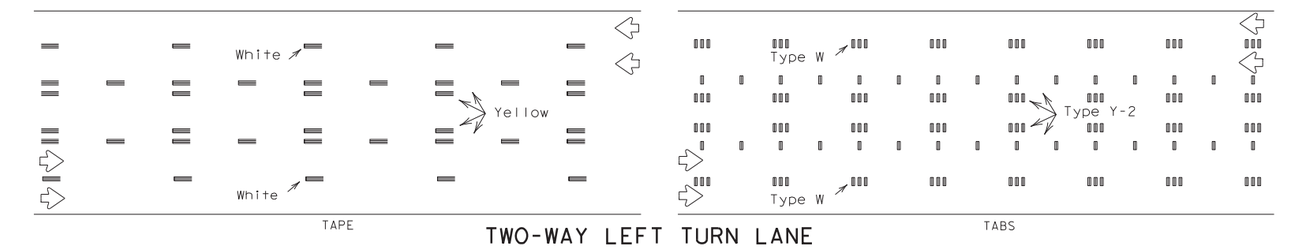
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



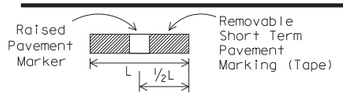
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

1. DMSs referenced above can be found along with embedded links to their respective MPLs at the following website:

http://www.txdot.gov/business/contractors_consultants/material_specifications/default.htm

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE: wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
1-97	DIST	COUNTY		SHEET NO.
3-03	LFK	SHELBY		55
7-13				

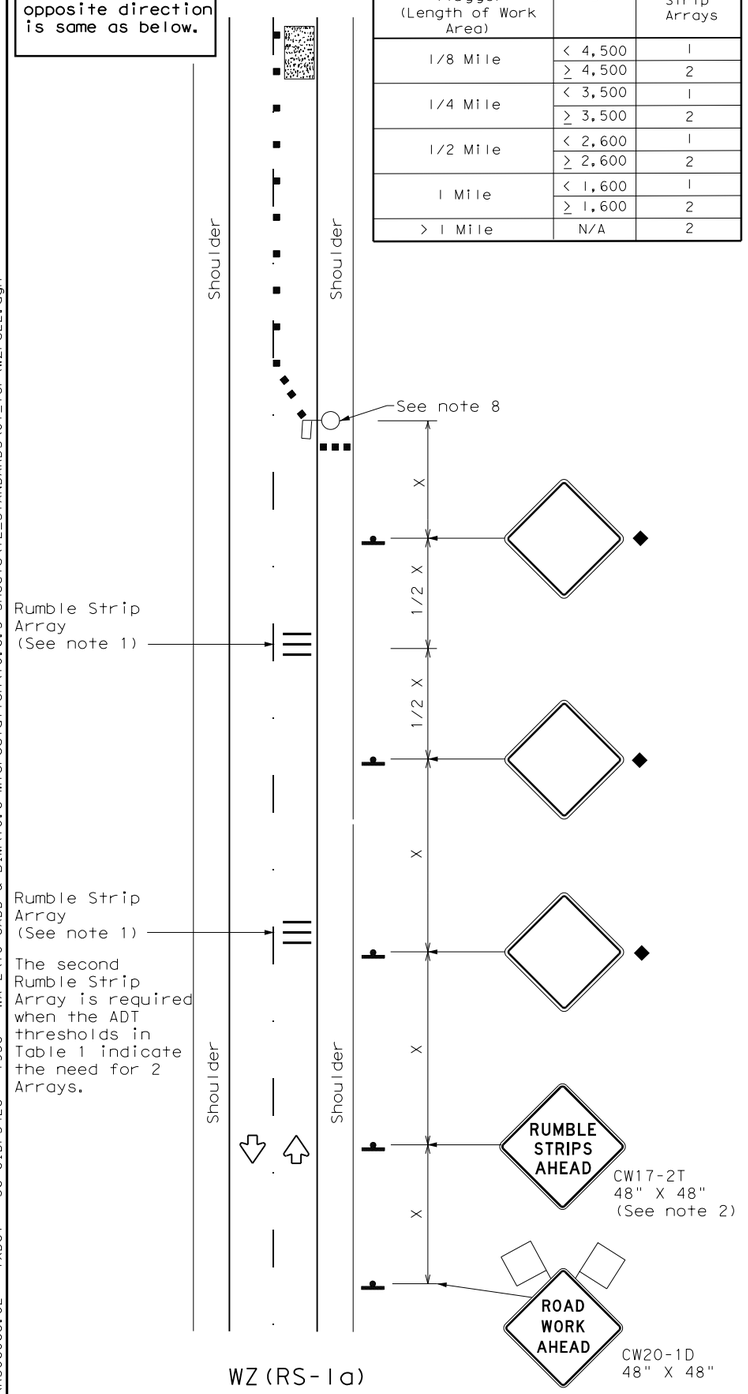
111

DATE: 11/2/2021 3:34:51 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\70 BIM\wzstpm-13.dgn

DATE: 9/28/2022 8:52:57 AM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\01_TCP\wzrs22.dgn

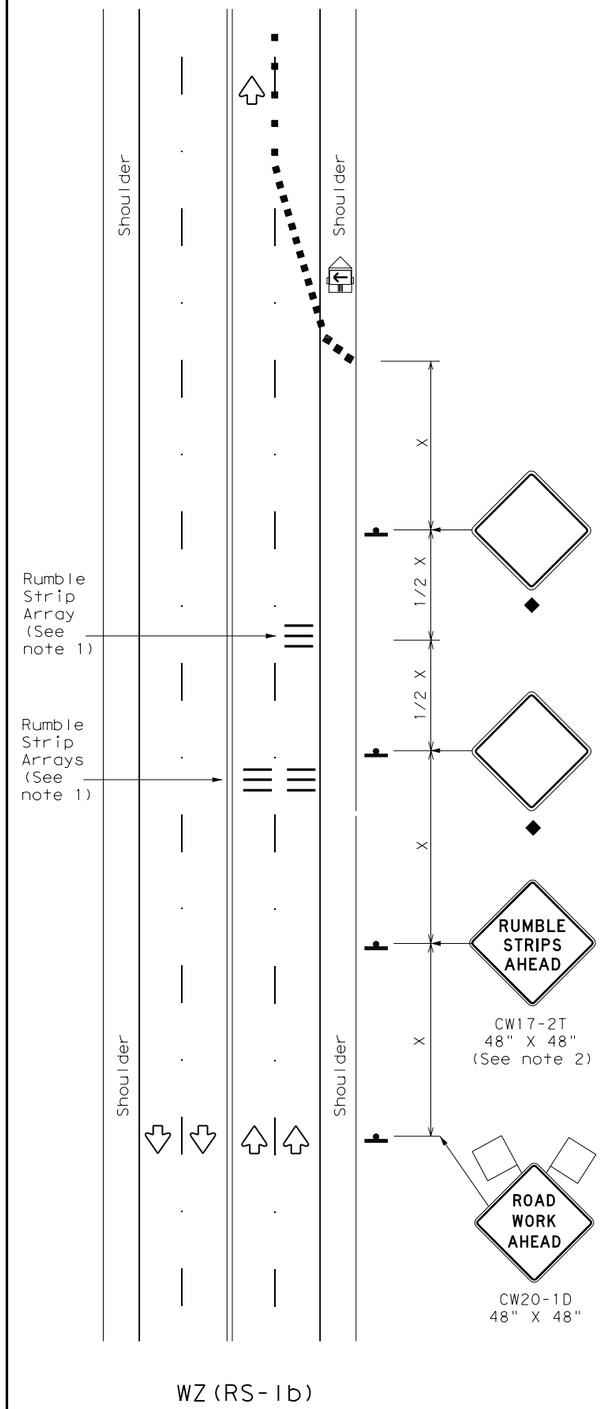
Warning sign and rumble strip sequence in opposite direction is same as below.

TABLE 1		
Flagger to Flagger (Length of Work Area)	ADT	# of Rumble Strip Arrays
1/8 Mile	< 4,500	1
	≥ 4,500	2
1/4 Mile	< 3,500	1
	≥ 3,500	2
1/2 Mile	< 2,600	1
	≥ 2,600	2
1 Mile	< 1,600	1
	≥ 1,600	2
> 1 Mile	N/A	2



WZ(RS-1a)

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION



WZ(RS-1b)

RUMBLE STRIPS FOR LANE CLOSURE ON CONVENTIONAL ROADWAY

GENERAL NOTES

1. Each Rumble Strip Array should consist of three rumble strips spaced center to center at the spacing shown in Table 2, placed transverse across the lane at locations shown.
2. The CW17-2T "RUMBLE STRIPS AHEAD" sign should be located after the CW20-1D "ROAD WORK AHEAD sign and spaced as shown. If traffic is observed to be queuing, or is expected to queue beyond the Rumble Strips, the CW17-2T sign and the first Rumble Strip Array may be located upstream of the CW20-1D sign as necessary to provide needed warning.
3. Temporary Rumble Strips will be considered subsidiary to Item 502, and shall be a product listed on the Compliant Work Zone Traffic Control Devices.
4. Remove Temporary Rumble Strips before removing the advanced warning signs.
5. Temporary Rumble Strips should not be used on horizontal curves, loose gravel, soft or bleeding asphalt, heavily rutted pavements or unpaved surfaces.
6. Temporary Rumble Strips shall be installed and maintained as per manufacturer's recommendations.
7. This standard sheet shall be used in conjunction with other appropriate TCP standard, TMUTCD typical application or project specific detail for the project.
8. The one-lane two-way application may utilize a flagger, an Automated Flagger Assistance Device (AFAD) or a Portable Traffic Signal (PTS).
9. Replace defective Temporary Rumble Strips as directed by the Engineer.
10. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment and written direction from the Engineer.

LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Panel	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
	✓	✓		

◆ Signs are for illustrative purposes only. Signs required may vary depending on the TCP, TMUTCD Typical Application, or project specific details for the project.

* For posted speeds in excess of 65 MPH, it is recommended that spacing is increased as speed limits increase. Increasing space between rumble strips will improve effectiveness.

TABLE 2	
Speed	Approximate distance between strips in an array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
= 60 MPH	20'
≥ 65 MPH	* 35' +

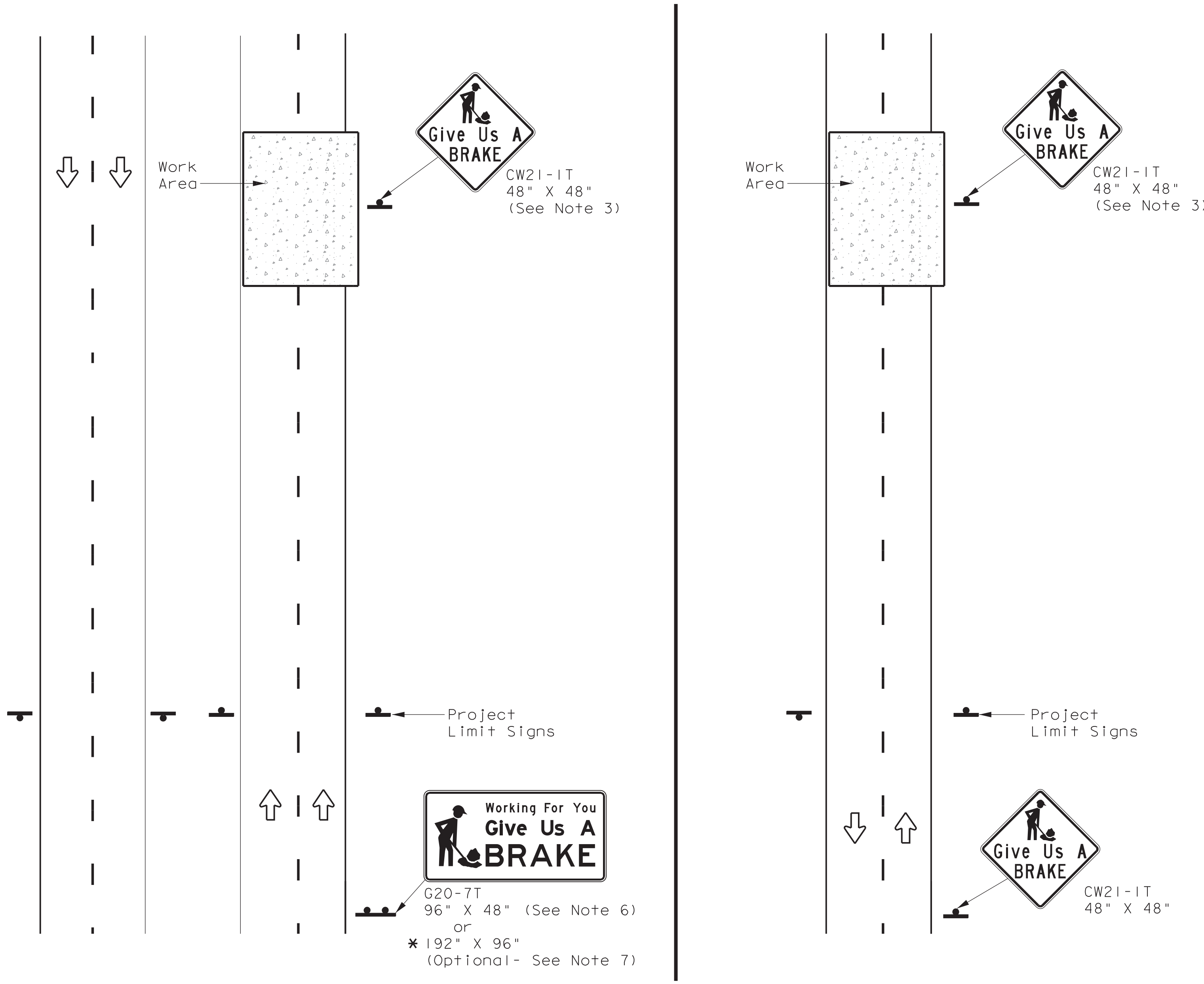
Texas Department of Transportation — Traffic Safety Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-22

FILE: wzrs22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-14 I-22 4-16	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		56

117



DIVIDED HIGHWAY

UNDIVIDED HIGHWAY

SIGNS ARE SHOWN FOR ONE DIRECTION OF TRAVEL

* When the optional larger WORKING FOR YOU GIVE US A BRAKE (G20-7T) 192" x 96" sign is required, the locations shall be noted elsewhere in the plans.

SUMMARY OF LARGE SIGNS

BACKGROUND COLOR	SIGN DESIGNATION	SIGN	SIGN DIMENSIONS	REFLECTIVE SHEETING	SQ FT	GALVANIZED STRUCTURAL STEEL Size	GALVANIZED STRUCTURAL STEEL (LF) ①	GALVANIZED STRUCTURAL STEEL (LF) ②	DRILLED SHAFT 24" DIA. (LF)
Orange	G20-7T	Working For You Give Us A BRAKE	96" X 48"	Type B_{FL} or C_{FL}	32	▲	▲	▲	▲
Orange	G20-7T	Working For You Give Us A BRAKE	192" X 96"	Type B_{FL} or C_{FL}	128	W8x18	16	17	12

▲ See Note 6 Below

LEGEND

Symbol	Meaning
(sign symbol)	Sign
(large sign symbol)	Large Sign
(arrow)	Traffic Flow

DEPARTMENTAL MATERIAL SPECIFICATIONS

PLYWOOD SIGN BLANKS	DMS-7100
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

1. See BC and SMD sheets for additional sign support details.
2. Sign locations shall be approved by the Engineer.
3. For projects more than two miles in length, Give Us a BRAKE signs should be repeated halfway through the project. The Give Us a Brake (CW21-1T) may be used for this purpose.
4. Work zone speed limits are sometimes used in conjunction with GIVE US A BRAKE signing. See BC(3) for location and spacing of construction speed zone signing when required.
5. Give Us a Brake (CW21-1T) signs and supports shall be considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."
6. The 96" X 48" Working For You Give Us A BRAKE (G20-7T) may use a 1/2" or 5/8" plywood substrate or 0.125" aluminum sheeting substrate and may be supported by two 4" x 6" wood posts with drilled holes for breakaway as per BC(5) and will be subsidiary to Item 502.
7. The Working For You Give Us A BRAKE (G20-7T) 192" X 96" sign shall be paid for under the following specification items:
   - Item 636 - Aluminum Signs
   - Item 647 - Large Roadside Sign Supports and Assemblies.
   - Item 416 - Drilled Shaft Foundations
8. All signs shall be constructed in accordance with the details found in the "Standard Highway Sign Designs for Texas," latest edition. Sign details not shown in this manual shall be shown in the plans or the Engineer shall provide a detail to the Contractor before the sign is manufactured.

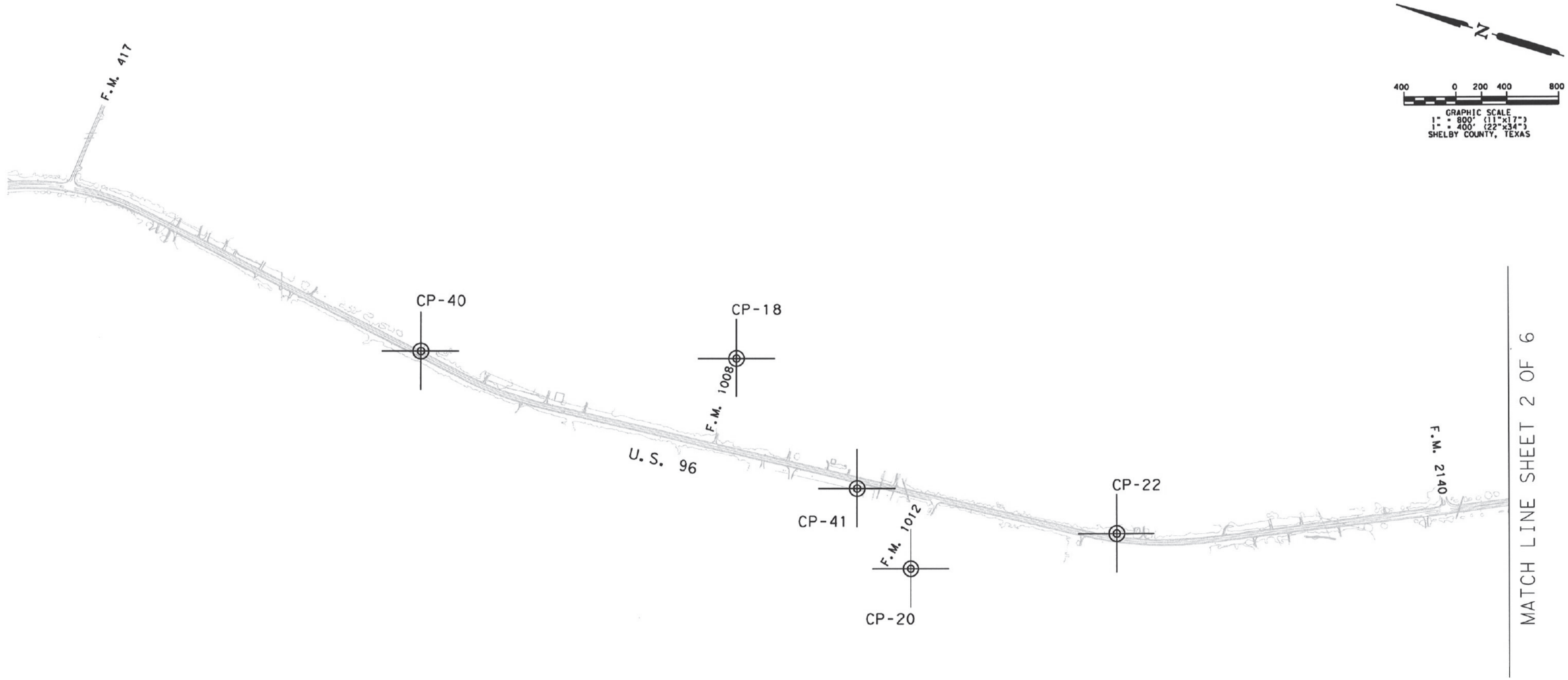
Texas Department of Transportation — Traffic Operations Division Standard

WORK ZONE "GIVE US A BRAKE" SIGNS

WZ(BRK)-13

FILE: wzbrk-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 1995	CONT 0809	SECT 02	JOB 069	HIGHWAY US 96
REVISIONS 6-96 5-98 7-13 8-96 3-03	DIST LFK		COUNTY SHELBY	SHEET NO. 57

116



HORIZONTAL AND VERTICAL CONTROL - SURFACE				
PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
18	10630670.85	4214912.76	473.27'	5/8"IR W/TXDOT ALUMINUM CAP
20	10628888.97	4213757.36	498.72'	5/8"IR W/TXDOT ALUMINUM CAP
22	10627443.46	4214491.84	448.78'	5/8"IR W/TXDOT ALUMINUM CAP
40	10633041.87	4214229.28	449.89'	TXDOT TYPE II MONUMENT STAMPED "2018"
41	10629478.91	4214223.99	482.34'	TXDOT TYPE II MONUMENT STAMPED "2018"

STATE OF TEXAS
REGISTERED
GORDON R. ANDERSON
6617
PROFESSIONAL LAND SURVEYOR
10 OCT 2018

NOTES:

1) ALL COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203). PROJECT COORDINATES ARE BASED ON GPS OBSERVATIONS UTILIZING TXDOT VRS. COORDINATES AND ELEVATIONS ARE BASED ON NAD83/93, NAVD88, GEOID 12A. ALL COORDINATES SHOWN HEREON ARE SURFACE, AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00003.
UNITS: US SURVEY FEET

2) A SITE CALIBRATION SHOULD BE PERFORMED WHILE UTILIZING THE CONTROL SHOWN HEREON

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER
Jan. 28, 2021

U.S. 96
FROM FM 417
TO THE SAN AUGUSTINE COUNTY LINE
CSJ NO. 0809-02-069

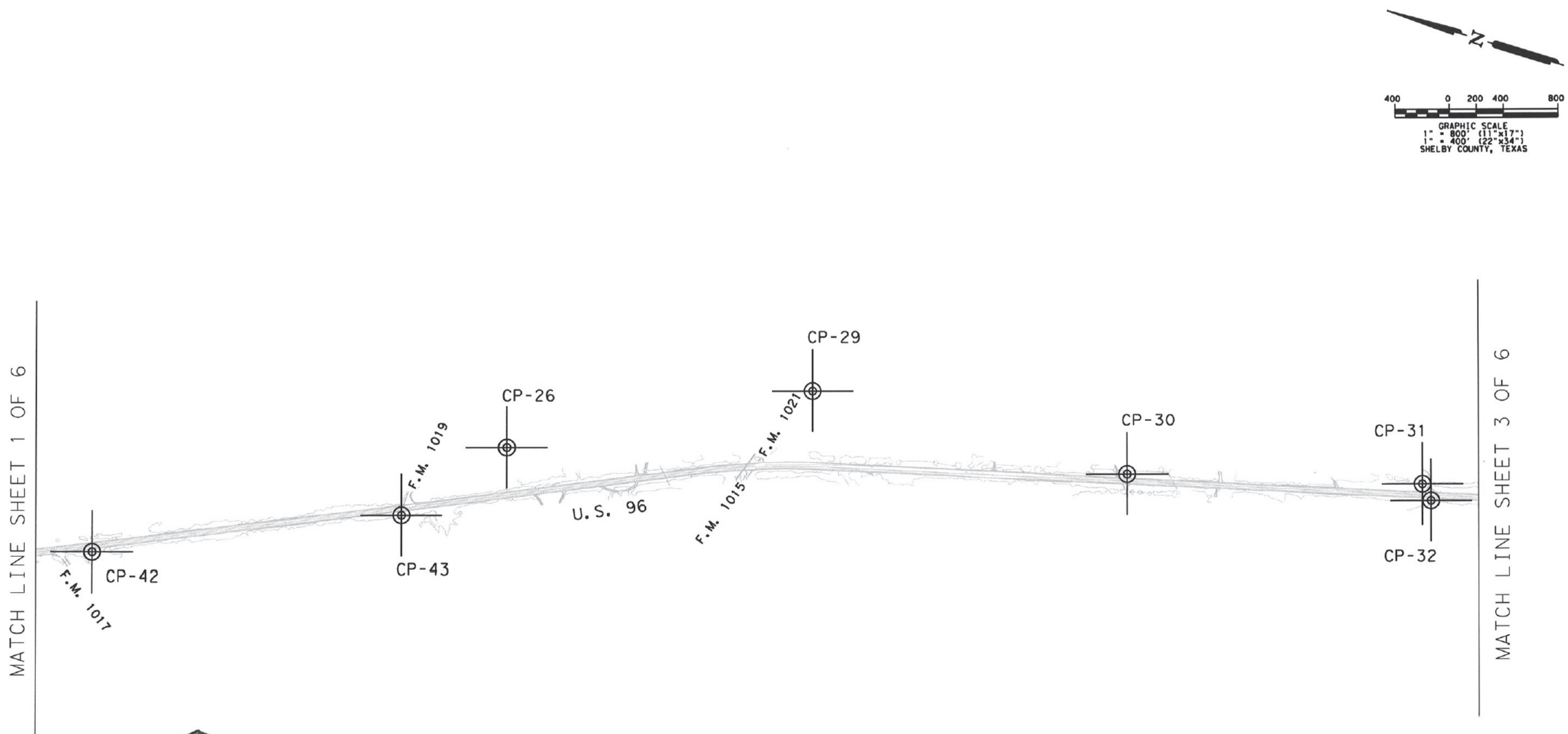
Survey Date: October 10, 2018

SAM
SURVEYING · AERIAL MAPPING · ENGINEERING
4801 Southwest Parkway
Building Two, Suite 100
Austin, Texas 78735
(512) 447-0575
Fax (512) 326-3029

Texas Department of Transportation
SHEET 1 OF 6

SURVEY CONTROL INDEX SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			58
STATE	DISTRICT	COUNTY	
TEXAS	11	SHELBY	
CONTROL	SECTION	JOB	HIGHWAY NO.
0809	02	069	US 96



HORIZONTAL AND VERTICAL CONTROL - SURFACE				
PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
26	10621542.67	4217397.02	456.47'	5/8"IR W/TXDOT ALUMINUM CAP
29	10619530.44	4218465.29	475.33'	5/8"IR W/TXDOT ALUMINUM CAP
30	10617138.00	4218570.58	428.79'	5/8"IR W/TXDOT ALUMINUM CAP
31	10615047.56	4219146.68	429.33'	5/8"IR W/TXDOT ALUMINUM CAP
32	10614950.10	4219049.71	417.83'	5/8"IR W/TXDOT ALUMINUM CAP
42	10624210.01	4215757.93	464.84'	TXDOT TYPE II MONUMENT STAMPED "2018"
43	10622130.81	4216692.73	461.54'	TXDOT TYPE II MONUMENT STAMPED "2018"

STATE OF TEXAS REGISTERED GORDON R. ANDERSON 6617 PROFESSIONAL LAND SURVEYOR

10 OCT 2018

NOTES:

1) ALL COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203). PROJECT COORDINATES ARE BASED ON GPS OBSERVATIONS UTILIZING TXDOT VRS. COORDINATES AND ELEVATIONS ARE BASED ON NAD83/93, NAVD88, GEOID 12A. ALL COORDINATES SHOWN HEREON ARE SURFACE, AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00003. UNITS: US SURVEY FEET

2) A SITE CALIBRATION SHOULD BE PERFORMED WHILE UTILIZING THE CONTROL SHOWN HEREON

STATE OF TEXAS CHRISTIAN L. MOORMAN 93828 LICENSED PROFESSIONAL ENGINEER

JAN. 28, 2021

U.S. 96
FROM FM 417
TO THE SAN AUGUSTINE COUNTY LINE
CSJ NO. 0809-02-069

Survey Date: October 10, 2018

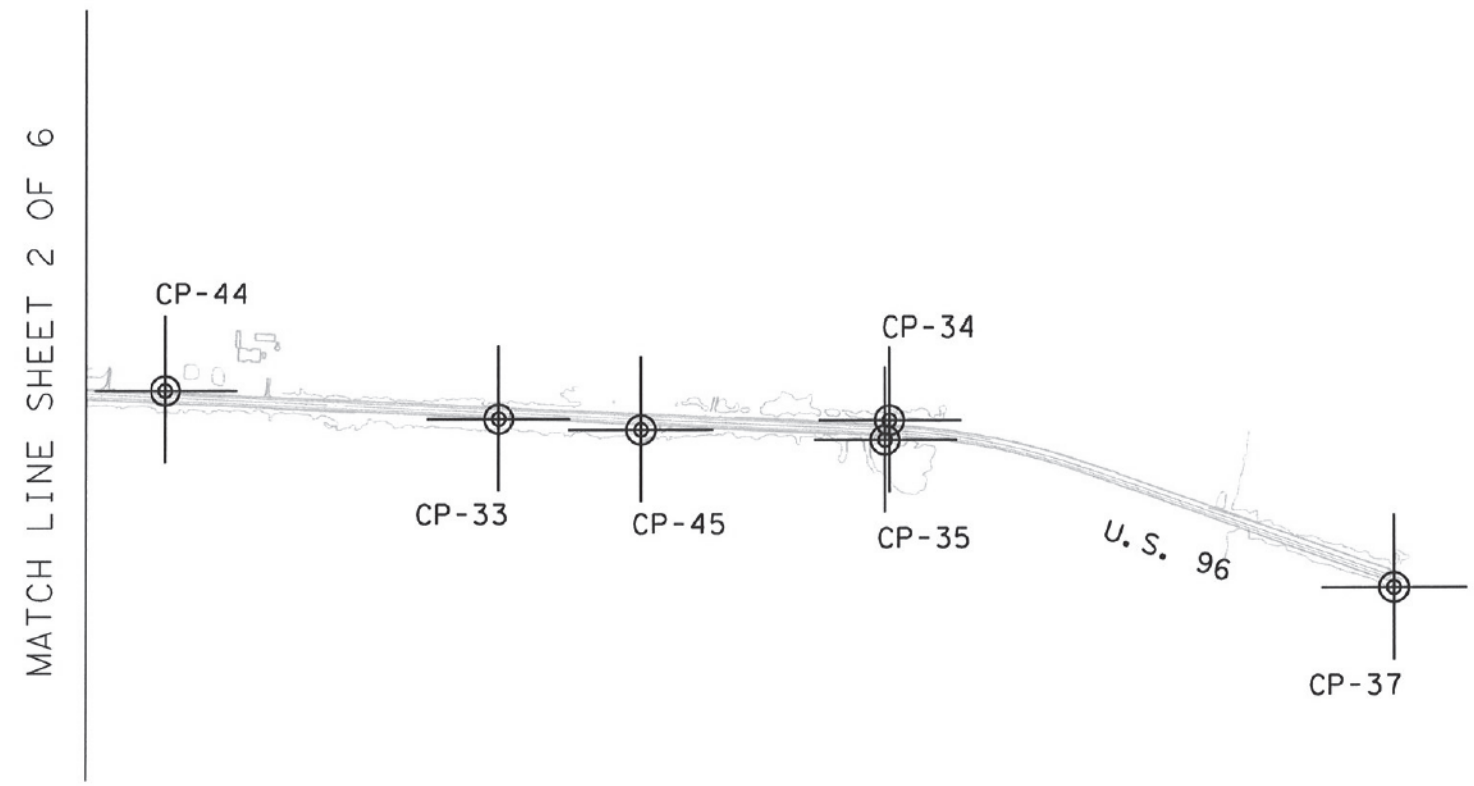
SAM SURVEYING · AERIAL MAPPING · ENGINEERING
4801 Southwest Parkway Building Two, Suite 100 Austin, Texas 78735 (512) 447-0575 Fax: (512) 326-3029

© 2021 Texas Department of Transportation

SHEET 2 OF 6

SURVEY CONTROL INDEX SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			59
STATE	DISTRICT	COUNTY	
TEXAS	11	SHELBY	
CONTROL	SECTION	JOB	HIGHWAY NO.
0809	02	069	US 96



400 0 200 400 800
GRAPHIC SCALE
1" = 800' (11"x17")
1" = 400' (22"x34")
SHELBY COUNTY, TEXAS

STATE OF TEXAS
REGISTERED
GORDON [illegible] DERSON
6617
PROFESSIONAL
LAND SURVEYOR

10 OCT 2018

HORIZONTAL AND VERTICAL CONTROL - SURFACE				
PNT	NORTHING	EASTING	ELEV.	DESCRIPTION
33	10612950.92	4219588.64	399.41'	5/8"IR W/TXDOT ALUMINUM CAP
34	10611394.44	4220070.74	447.43'	BERNSTIEN-ROD
35	10611388.09	4219986.68	446.85'	5/8"IR W/TXDOT ALUMINUM CAP
37	10609183.98	4220033.21	413.06'	5/8"IR W/TXDOT ALUMINUM CAP
44	10614306.57	4219287.34	401.82'	TXDOT TYPE II MONUMENT STAMPED "2018"
45	10612371.66	4219722.44	430.04'	TXDOT TYPE II MONUMENT STAMPED "2018"

NOTES:

1) ALL COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203). PROJECT COORDINATES ARE BASED ON GPS OBSERVATIONS UTILIZING TXDOT VRS. COORDINATES AND ELEVATIONS ARE BASED ON NAD83/93, NAVD88, GEOID 12A. ALL COORDINATES SHOWN HEREON ARE SURFACE, AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00003. UNITS: US SURVEY FEET

2) A SITE CALIBRATION SHOULD BE PERFORMED WHILE UTILIZING THE CONTROL SHOWN HEREON

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

Jan. 28, 2021

U.S. 96
FROM FM 417
TO THE SAN AUGUSTINE COUNTY LINE
CSJ NO. 0809-02-069

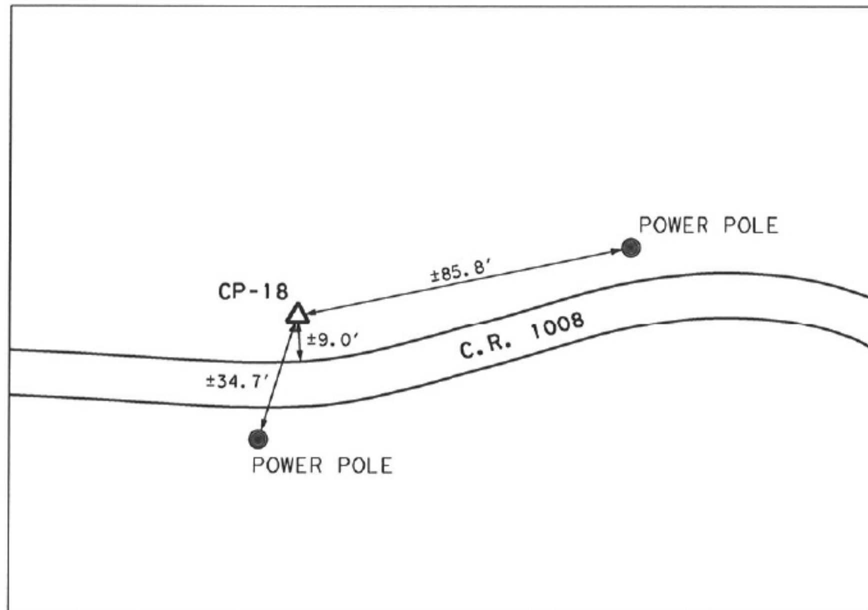
Survey Date: October 10, 2018

SAM
SURVEYING · AERIAL MAPPING · ENGINEERING
4801 Southwest Parkway
Building Two, Suite 100
Austin, Texas 78735
(512) 447-0575
Fax (512) 326-3029

Texas Department of Transportation
SHEET 3 OF 6

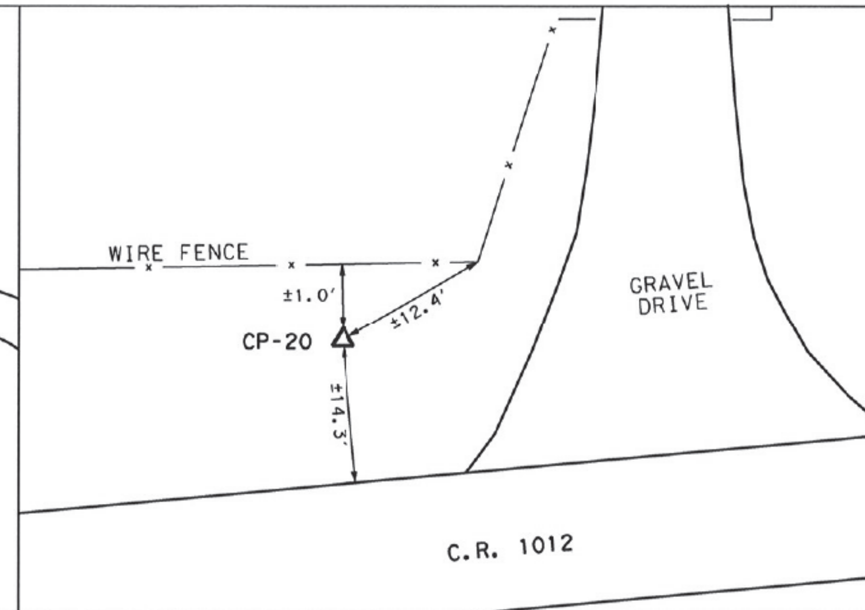
SURVEY CONTROL INDEX SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			60
STATE	DISTRICT	COUNTY	
TEXAS	11	SHELBY	
CONTROL	SECTION	JOB	HIGHWAY NO.
0809	02	069	US 96



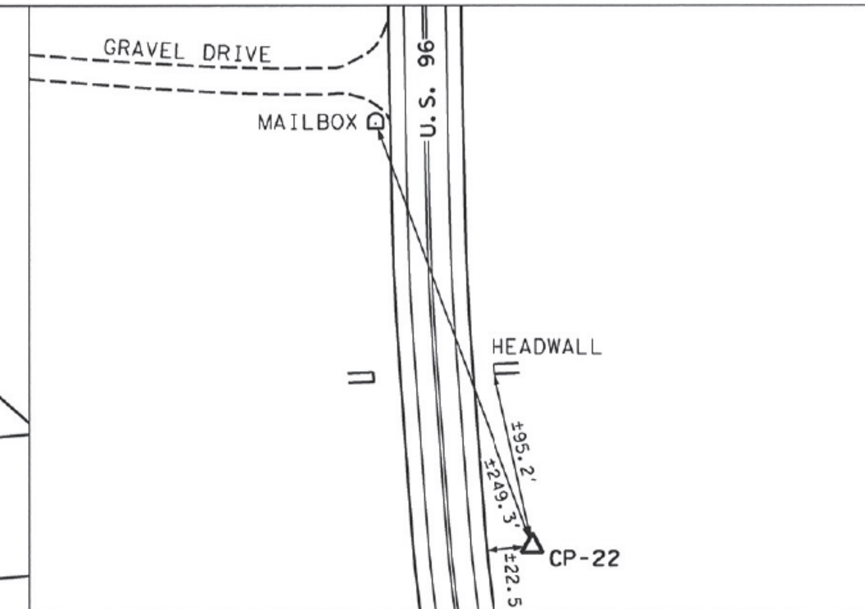
CP-18 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE NORTH RIGHT-OF-WAY OF C.R. 1008, APPROXIMATELY 705 FEET EAST OF THE INTERSECTION OF U.S. 96 AND C.R. 1008, LOCATED ±85.8 FEET WEST OF A POWER POLE, ±34.7 FEET NORTHEAST OF A POWER POLE, AND ±9.0 FEET NORTH OF THE C.R. 1008 EDGE PAVEMENT.

CP-18
N = 10630670.85
E = 4214912.76
ELEV. = 473.27'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP



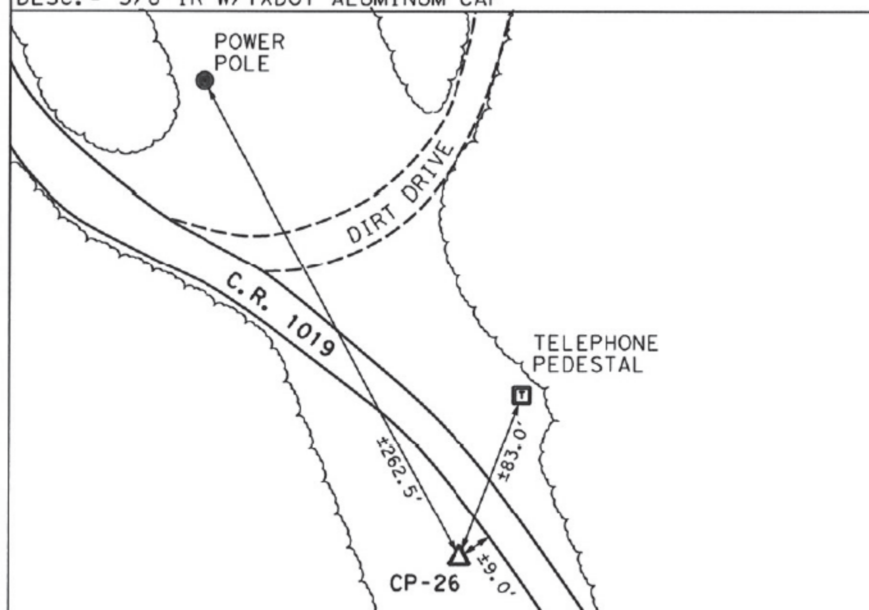
CP-20 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE NORTH RIGHT-OF-WAY OF C.R. 1012, APPROXIMATELY 550 FEET WEST OF THE INTERSECTION OF U.S. 96 AND C.R. 1012, LOCATED ±1.0 FEET SOUTH OF A WIRE FENCE, ±12.4 FEET SOUTHWEST OF A FENCE CORNER, AND ±14.3 FEET NORTH OF THE C.R. 1012 EDGE PAVEMENT.

CP-20
N = 10628888.97
E = 4213757.36
ELEV. = 498.72'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP



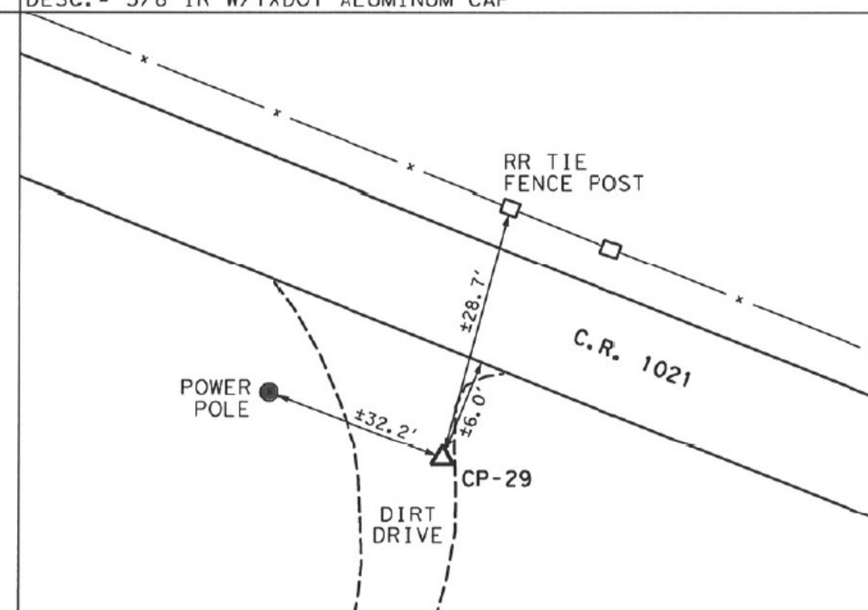
CP-22 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE EAST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 0.27 MILE SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1012, LOCATED ±22.5 FEET EAST OF THE U.S. 96 EDGE PAVEMENT, ±95.2 FEET SOUTH OF A HEADWALL, AND ±249.3 FEET SOUTH OF A MAILBOX.

CP-22
N = 10627443.46
E = 4214491.84
ELEV. = 448.78'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP



CP-26 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE SOUTH RIGHT-OF-WAY OF C.R. 1019, APPROXIMATELY 0.17 MILE SOUTHEAST OF THE INTERSECTION OF U.S. 96 AND C.R. 1019, LOCATED ±9.0 FEET WEST OF THE C.R. 1019 EDGE GRAVEL, ±83.0 FEET SOUTHWEST OF A TELEPHONE PEDESTAL, AND ±262.5 FEET SOUTHEAST OF A POWER POLE.

CP-26
N = 10621542.67
E = 4217397.02
ELEV. = 456.47'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP



CP-29 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE SOUTH RIGHT-OF-WAY OF C.R. 1021, APPROXIMATELY 0.12 MILE SOUTHEAST OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±6.0 FEET SOUTHWEST OF THE C.R. 1021 EDGE GRAVEL, ±32.2 FEET SOUTHEAST OF A POWER POLE, AND ±28.7 FEET SOUTHWEST OF A RR TIE FENCE POST.

CP-29
N = 10619530.44
E = 4218465.29
ELEV. = 475.33'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP

CP-30 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE EAST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 0.52 MILE SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±31.6 FEET EAST OF THE U.S. 96 EDGE PAVEMENT, ±25.2 FEET SOUTHWEST OF A WIRE FENCE, AND ±88.8 FEET SOUTHWEST OF AN ALUMINUM GATE.

CP-30
N = 10617138.00
E = 4218570.58
ELEV. = 428.79'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP

N

NOT TO SCALE

STATE OF TEXAS REGISTERED GORDON N. ANDERSON 6617 PROFESSIONAL LAND SURVEYOR

10 OCT 2018

Survey Date: October 10, 2018

SAM SURVEYING · AERIAL MAPPING · ENGINEERING
4801 Southwest Parkway Building Two, Suite 100 Austin, Texas 78735 (512) 447-0575 Fax: (512) 326-3029

 Texas Department of Transportation

SHEET 4 OF 6

SURVEY CONTROL INDEX SHEET

NOTES:

1) ALL COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203). PROJECT COORDINATES ARE BASED ON GPS OBSERVATIONS UTILIZING TXDOT VRS. COORDINATES AND ELEVATIONS ARE BASED ON NAD83/93, NAVD88, GEOID 12A. ALL COORDINATES SHOWN HEREON ARE SURFACE, AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00003. UNITS: US SURVEY FEET

2) A SITE CALIBRATION SHOULD BE PERFORMED WHILE UTILIZING THE CONTROL SHOWN HEREON

STATE OF TEXAS CHRISTIAN L. MOORMAN 93828 LICENSED PROFESSIONAL ENGINEER

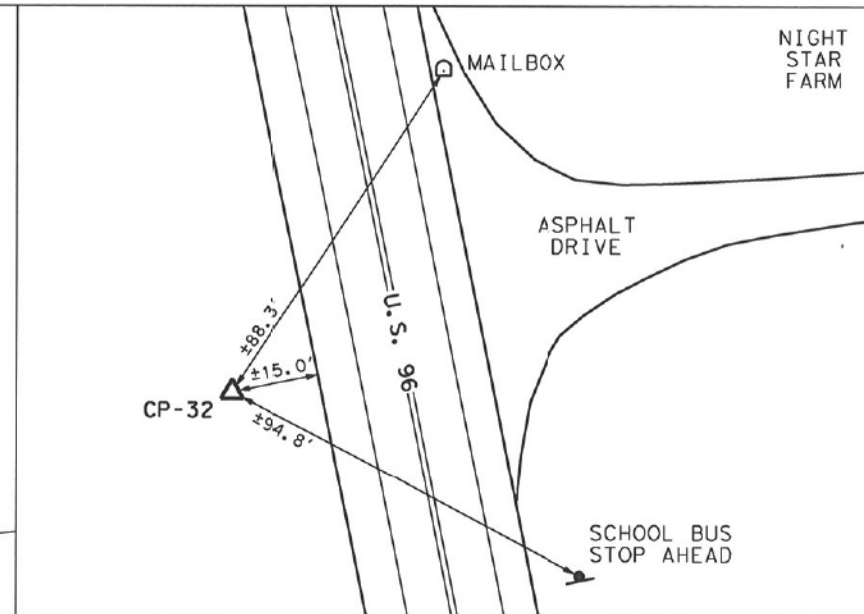
Jan. 28, 2021

U.S. 96
FROM FM 417
TO THE SAN AUGUSTINE COUNTY LINE
CSJ NO. 0809-02-069

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			61
STATE	DISTRICT	COUNTY	
TEXAS	11	SHELBY	
CONTROL	SECTION	JOB	HIGHWAY NO.
0809	02	069	US 96

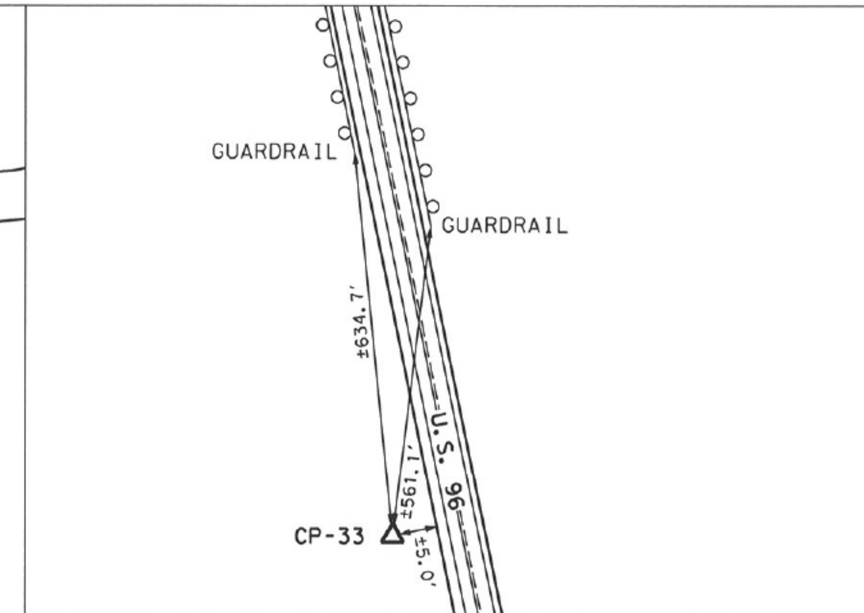
CP-31 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE EAST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 0.93 MILE SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±60.0 FEET EAST OF THE U.S. 96 EDGE PAVEMENT, ±15.6 FEET SOUTHWEST OF A WIRE FENCE, AND ±36.2 FEET NORTHWEST OF A WIRE FENCE CORNER.

CP-31
N = 10615047.56
E = 4219146.68
ELEV. = 429.33'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP



CP-32 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE WEST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 0.94 MILE SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±94.8 FEET NORTHWEST OF A SCHOOL BUS STOP AHEAD SIGN, ±15.0 FEET WEST OF THE U.S. 96 EDGE PAVEMENT, AND 88.3± FEET SOUTHWEST OF A MAILBOX.

CP-32
N = 10614950.10
E = 4219049.71
ELEV. = 417.83'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP

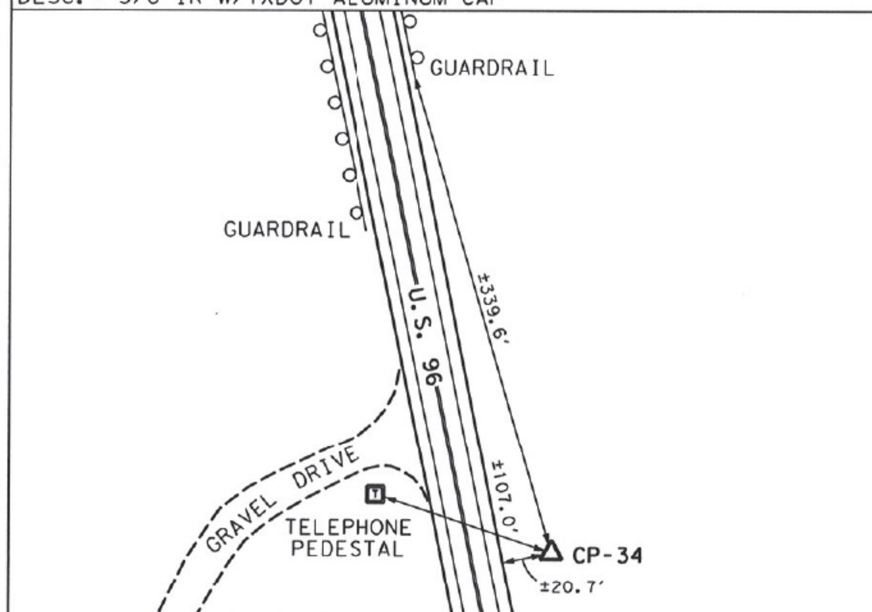


CP-33 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE WEST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 1.33 MILES SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±5.0 FEET WEST THE U.S. 96 EDGE PAVEMENT, ±634.7 FEET SOUTH OF A GUARDRAIL, AND 561.1± FEET SOUTHWEST OF A GUARDRAIL.

CP-33
N = 10612950.92
E = 4219588.64
ELEV. = 399.41'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP

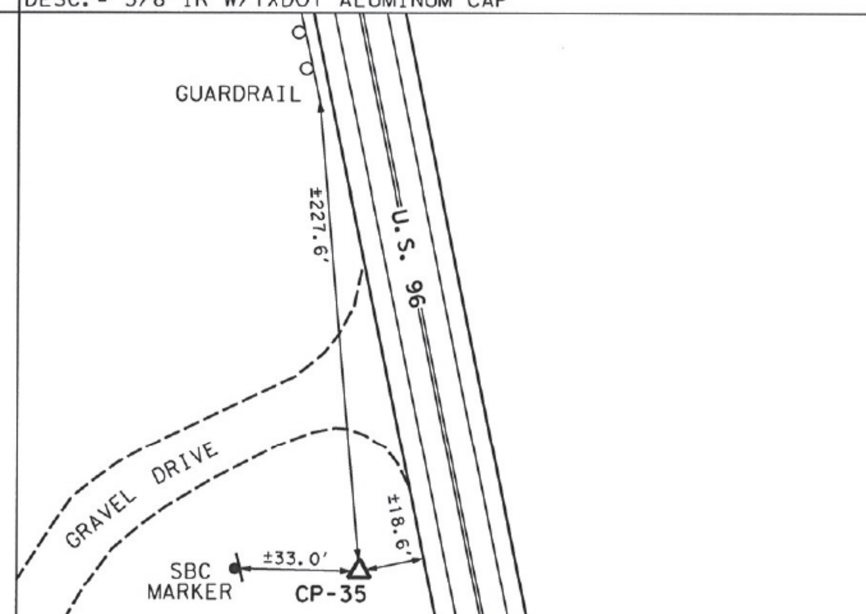
N

NOT TO SCALE



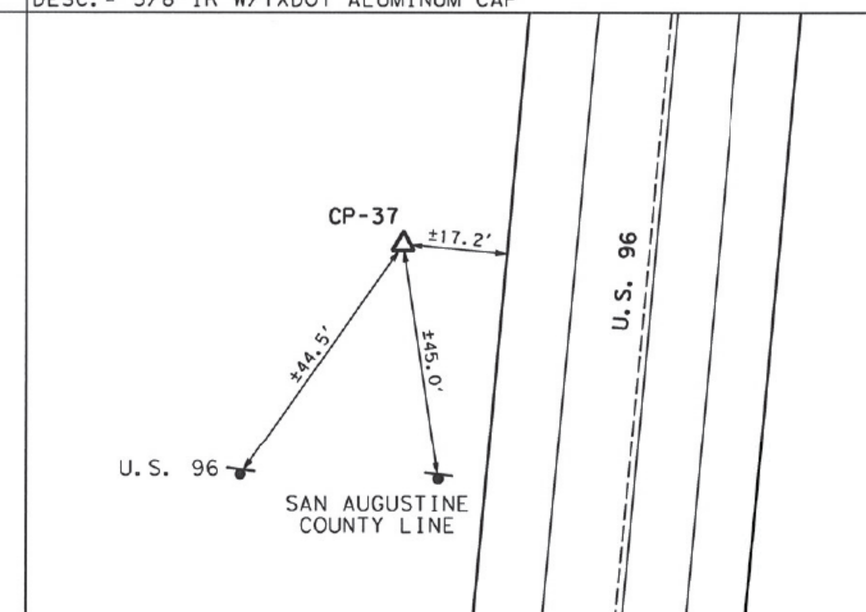
CP-34 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE EAST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 1.64 MILES SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±20.7 FEET EAST THE U.S. 96 EDGE PAVEMENT, ±339.6 FEET SOUTHEAST OF A GUARDRAIL, AND 107.0± FEET SOUTHEAST OF A TELEPHONE PEDESTAL.

CP-34
N = 10611394.44
E = 4220070.74
ELEV. = 447.43'
DESC. = BERNSTIEN-ROD



CP-35 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE WEST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 1.64 MILES SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±18.6 FEET WEST THE U.S. 96 EDGE PAVEMENT, ±227.6 FEET SOUTH OF A GUARDRAIL, AND 33.0± FEET EAST OF A SBC MARKER.

CP-35
N = 10611388.09
E = 4219986.68
ELEV. = 446.85'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP



CP-37 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE WEST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 2.06 MILES SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±17.2 FEET WEST THE U.S. 96 EDGE PAVEMENT, ±44.5 FEET NORTHEAST OF A U.S. 96 SIGN, AND 45.0± FEET NORTHWEST OF A SAN AUGUSTINE COUNTY LINE SIGN.

CP-37
N = 10609183.98
E = 4220033.21
ELEV. = 413.06'
DESC. = 5/8"IR W/TXDOT ALUMINUM CAP

STATE OF TEXAS
REGISTERED
GORDON N. ANDERSON
6617
PROFESSIONAL LAND SURVEYOR

18 OCT 2018

Survey Date: October 10, 2018

SAM
SURVEYING · AERIAL MAPPING · ENGINEERING
4801 Southwest Parkway Building Two, Suite 100 Austin, Texas 78735 (512) 447-0575 Fax: (512) 326-3029

 Texas Department of Transportation

SHEET 5 OF 6

SURVEY CONTROL INDEX SHEET

NOTES:

1) ALL COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203). PROJECT COORDINATES ARE BASED ON GPS OBSERVATIONS UTILIZING TXDOT VRS. COORDINATES AND ELEVATIONS ARE BASED ON NAD83/93, NAVD88, GEOID 12A. ALL COORDINATES SHOWN HEREON ARE SURFACE, AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00003. UNITS: US SURVEY FEET

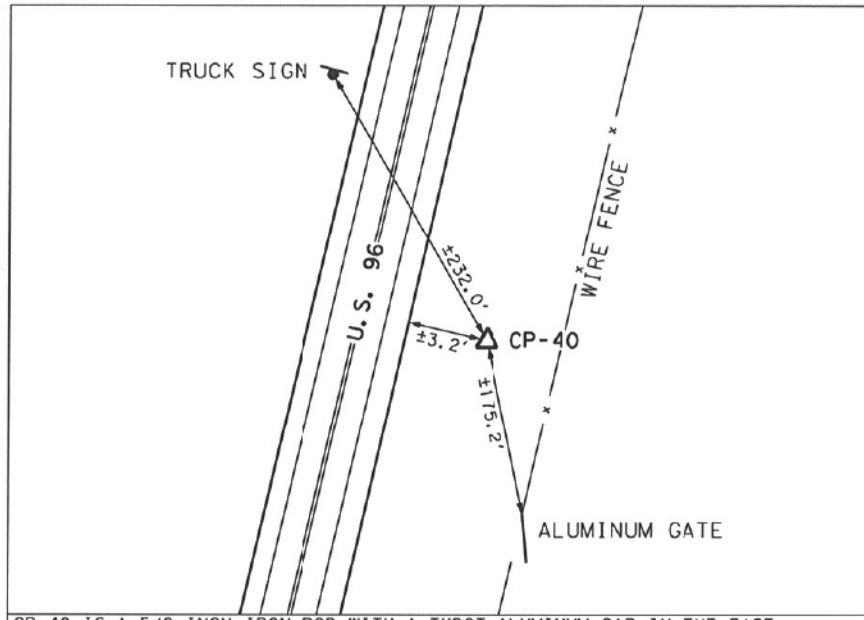
2) A SITE CALIBRATION SHOULD BE PERFORMED WHILE UTILIZING THE CONTROL SHOWN HEREON

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

JAN. 28, 2021

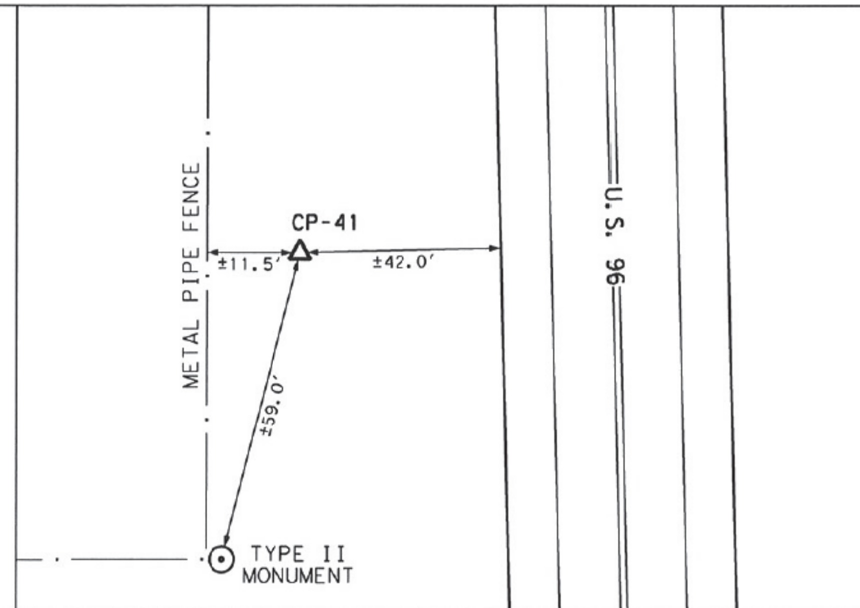
U.S. 96
FROM FM 417
TO THE SAN AUGUSTINE COUNTY LINE
CSJ NO. 0809-02-069

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			62
STATE	DISTRICT	COUNTY	
TEXAS	11	SHELBY	
CONTROL	SECTION	JOB	HIGHWAY NO.
0809	02	069	US 96



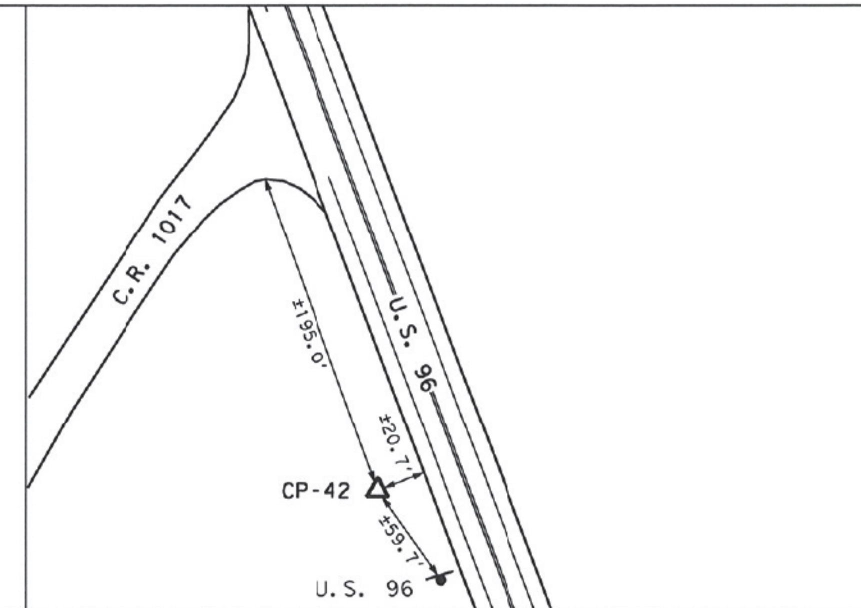
CP-40 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE EAST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 0.57 MILE SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 417, LOCATED ±3.2 FEET EAST THE U.S. 96 EDGE PAVEMENT, ±232.0 FEET SOUTHEAST OF A TRUCK SIGN, AND 175.2± FEET NORTHWEST OF AN ALUMINUM GATE.

CP-40
N = 10633041.87
E = 4214229.28
ELEV. = 449.89'
DESC. = TXDOT TYPE II MONUMENT STAMPED "2018"



CP-41 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE WEST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 0.22 MILE SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1008, LOCATED ±42.0 FEET WEST THE U.S. 96 EDGE PAVEMENT, ±232.0 FEET SOUTHEAST OF A TRUCK SIGN, AND 175.2± FEET NORTHWEST OF AN ALUMINUM GATE.

CP-41
N = 10629478.91
E = 4214223.99
ELEV. = 482.34'
DESC. = TXDOT TYPE II MONUMENT STAMPED "2018"

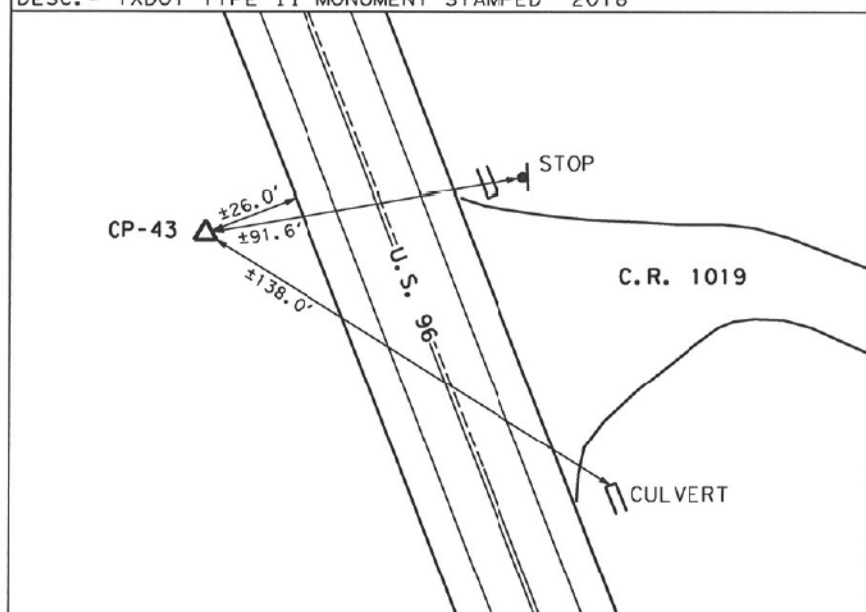


CP-42 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE WEST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 195 FEET SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1017, LOCATED ±20.7 FEET WEST THE U.S. 96 EDGE PAVEMENT, AND 59.7± FEET NORTHWEST OF A U.S. 96 SIGN.

CP-42
N = 10624210.01
E = 4215757.93
ELEV. = 464.84'
DESC. = TXDOT TYPE II MONUMENT STAMPED "2018"

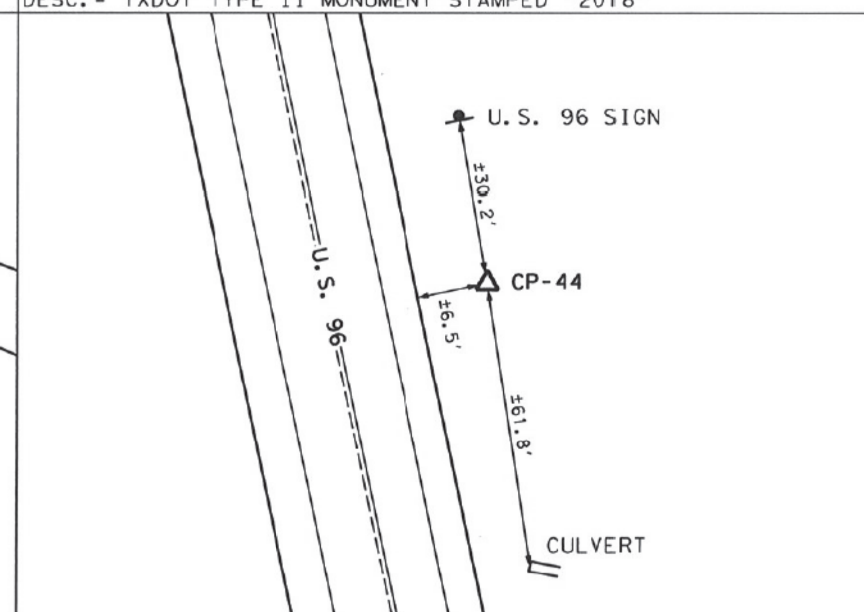
N

NOT TO SCALE



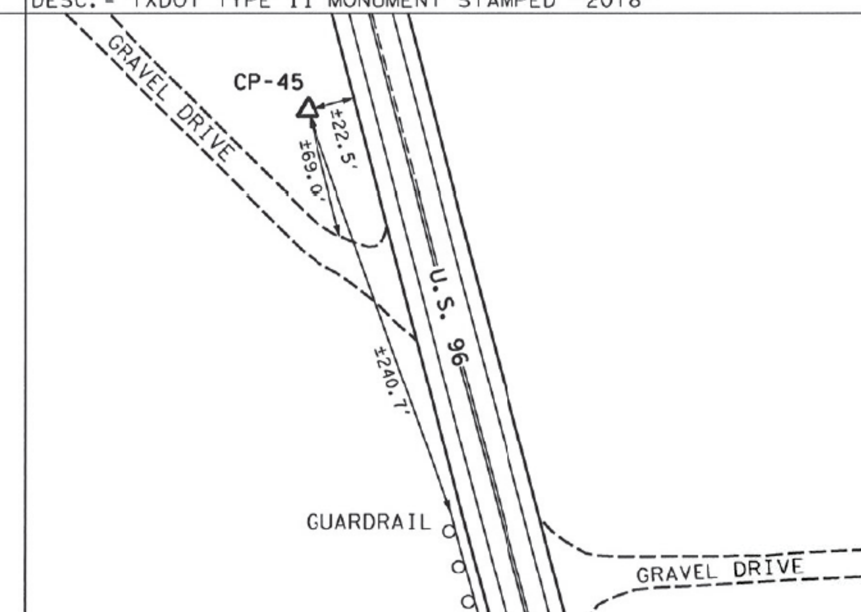
CP-43 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE WEST RIGHT-OF-WAY OF U.S. 96, AT THE INTERSECTION OF U.S. 96 AND C.R. 1019, LOCATED ±26.0 FEET WEST THE U.S. 96 EDGE PAVEMENT, ±91.6 FEET WEST OF A STOP SIGN, AND 138.0± FEET NORTHWEST OF A CULVERT.

CP-43
N = 10622130.81
E = 4216692.73
ELEV. = 461.54'
DESC. = TXDOT TYPE II MONUMENT STAMPED "2018"



CP-44 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE EAST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 1.07 MILES SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±6.5 FEET EAST THE U.S. 96 EDGE PAVEMENT, ±30.2 FEET SOUTH OF A U.S. 96 SIGN, AND 61.8± FEET NORTH OF A CULVERT.

CP-44
N = 10614306.57
E = 4219287.34
ELEV. = 401.82'
DESC. = TXDOT TYPE II MONUMENT STAMPED "2018"



CP-45 IS A 5/8 INCH IRON ROD WITH A TXDOT ALUMINUM CAP IN THE WEST RIGHT-OF-WAY OF U.S. 96, APPROXIMATELY 1.45 MILES SOUTH OF THE INTERSECTION OF U.S. 96 AND C.R. 1021, LOCATED ±22.5 FEET WEST THE U.S. 96 EDGE PAVEMENT, ±69.0 FEET NORTH OF A GRAVEL DRIVE, AND 240.7± FEET NORTH OF A GUARDRAIL.

CP-45
N = 10612371.66
E = 4219722.44
ELEV. = 430.04'
DESC. = TXDOT TYPE II MONUMENT STAMPED "2018"

STATE OF TEXAS
REGISTERED
GORDON N. ANDERSON
6617
PROFESSIONAL
LAND SURVEYOR

10 OCT 2018

Survey Date: October 10, 2018

SAM
SURVEYING AERIAL MAPPING ENGINEERING
4801 Southwest Parkway
Building Two, Suite 100
Austin, Texas 78735
(512) 447-0575
Fax: (512) 326-3029

NOTES:

1) ALL COORDINATES SHOWN HEREON ARE BASED ON THE TEXAS COORDINATE SYSTEM, CENTRAL ZONE (4203). PROJECT COORDINATES ARE BASED ON GPS OBSERVATIONS UTILIZING TXDOT VRS. COORDINATES AND ELEVATIONS ARE BASED ON NAD83/93, NAVD88, GEOID 12A. ALL COORDINATES SHOWN HEREON ARE SURFACE, AND MAY BE CONVERTED TO GRID BY DIVIDING BY THE SURFACE ADJUSTMENT FACTOR OF 1.00003. UNITS: US SURVEY FEET

2) A SITE CALIBRATION SHOULD BE PERFORMED WHILE UTILIZING THE CONTROL SHOWN HEREON

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

Jan. 28, 2021

U.S. 96
FROM FM 417
TO THE SAN AUGUSTINE COUNTY LINE
CSJ NO. 0809-02-069

© 2021
Texas Department of Transportation
SHEET 6 OF 6

SURVEY CONTROL INDEX SHEET

FHWA TEXAS DIVISION	FEDERAL AID PROJECT NO.		SHEET NO.
			63
STATE	DISTRICT	COUNTY	
TEXAS	11	SHELBY	
CONTROL	SECTION	JOB	HIGHWAY NO.
0809	02	069	US 96

US 96 CENTERLINE DATA

Beginning chain US96CL02 description
Feature: Horizontal Alignment 1

Point 134 N 10,609,147.5255 E 4,220,073.4123 Sta 2301+14.63

Course from 134 to PC US96CL02_3 N 2° 04′ 46.13" E Dist 1,408.8062

Curve Data

Curve 1
P.I. Station 2319+38.83 N 10,610,970.5257 E 4,220,139.6049
Delta = 16° 52′ 37.86" (LT)
Degree = 2° 02′ 46.60"
Tangent = 415.3953
Length = 824.7747
Radius = 2,800.0000
External = 30.6454
Long Chord = 821.7962
Mid. Ord. = 30.3136
P.C. Station 2315+23.44 N 10,610,555.4039 E 4,220,124.5320
P.T. Station 2323+48.21 N 10,611,372.1438 E 4,220,033.5101
C.C. N 10,610,657.0043 E 4,217,326.3759
Back = N 2° 04′ 46.13" E
Ahead = N 14° 47′ 51.73" W
Chord Bear = N 6° 21′ 32.80" W

Course from PT CURVE 1 to 135 N 14° 47′ 51.73" W Dist 3,604.0175

Point 135 N 10,614,856.6292 E 4,219,113.0188 Sta 2359+52.23

Course from 135 to PC CURVE 2 N 14° 40′ 25.99" W Dist 4,611.7003

Curve Data

Curve 2
P.I. Station 2410+08.64 N 10,619,748.1154 E 4,217,832.1440
Delta = 9° 44′ 20.12" (LT)
Degree = 1° 05′ 51.43"
Tangent = 444.7092
Length = 887.2760
Radius = 5,220.0000
External = 18.9089
Long Chord = 886.2082
Mid. Ord. = 18.8406
P.C. Station 2405+63.93 N 10,619,317.9111 E 4,217,944.7965
P.T. Station 2414+51.21 N 10,620,153.0637 E 4,217,648.3422
C.C. N 10,617,995.5960 E 4,212,895.0556
Back = N 14° 40′ 25.99" W
Ahead = N 24° 24′ 46.11" W
Chord Bear = N 19° 32′ 36.05" W

Course from PT CURVE 2 to 136 N 24° 24′ 46.11" W Dist 6,472.2791

Point 136 N 10,626,046.6647 E 4,214,973.2975 Sta 2479+23.49

Course from 136 to PC CURVE 3 N 24° 12′ 51.81" W Dist 783.2023

Curve Data

Curve 3
P.I. Station 2491+93.86 N 10,627,205.2653 E 4,214,452.2520
Delta = 20° 05′ 30.22" (RT)
Degree = 2° 05′ 00.54"
Tangent = 487.1692
Length = 964.3337
Radius = 2,750.0000
External = 42.8183
Long Chord = 959.4004
Mid. Ord. = 42.1618
P.C. Station 2487+06.69 N 10,626,760.9586 E 4,214,652.0655
P.T. Station 2496+71.02 N 10,627,691.1740 E 4,214,417.2284
C.C. N 10,627,888.8769 E 4,217,160.1126
Back = N 24° 12′ 51.81" W
Ahead = N 4° 07′ 21.59" W
Chord Bear = N 14° 10′ 06.70" W

Course from PT CURVE 3 to PC CURVE 4 N 4° 07′ 21.59" W Dist 4,275.4597

Curve Data

Curve 4
P.I. Station 2543+29.83 N 10,632,337.9300 E 4,214,082.2972
Delta = 13° 52′ 38.69" (RT)
Degree = 1° 49′ 08.09"
Tangent = 383.3513
Length = 762.9507
Radius = 3,150.0000
External = 23.2410
Long Chord = 761.0872
Mid. Ord. = 23.0707
P.C. Station 2539+46.48 N 10,631,955.5706 E 4,214,109.8571
P.T. Station 2547+09.43 N 10,632,715.7387 E 4,214,147.2489
C.C. N 10,632,182.0304 E 4,217,251.7062
Back = N 4° 07′ 21.59" W
Ahead = N 9° 45′ 17.10" E
Chord Bear = N 2° 48′ 57.76" E

Course from PT CURVE 4 to PC CURVE 5 N 9° 45′ 17.10" E Dist 2,764.7695

Ending chain US96CL02 description

FM 2140 CENTERLINE DATA

Beginning chain FM2140 description

Point 25 N 10,625,050.0145 E 4,215,425.6668 Sta 10+00.00

Course from 25 to PC 2140_01 N 65° 15′ 57.69" E Dist 1,028.3451

Curve Data

Curve 2140_01
P.I. Station 22+58.05 N 10,625,576.3877 E 4,216,568.2991
Delta = 12° 11′ 46.95" (LT)
Degree = 2° 39′ 53.71"
Tangent = 229.6999
Length = 457.6638
Radius = 2,150.0000
External = 12.2354
Long Chord = 456.8003
Mid. Ord. = 12.1662
P.C. Station 20+28.35 N 10,625,480.2799 E 4,216,359.6718
P.T. Station 24+86.01 N 10,625,714.4015 E 4,216,751.9135
C.C. N 10,627,433.0394 E 4,215,460.0995
Back = N 65° 15′ 57.69" E
Ahead = N 53° 04′ 10.74" E
Chord Bear = N 59° 10′ 04.22" E

Course from PT 2140_01 to 27 N 53° 04′ 10.74" E Dist 569.7575

Point 27 N 10,626,056.7367 E 4,217,207.3586 Sta 30+55.77

Ending chain FM2140 description

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

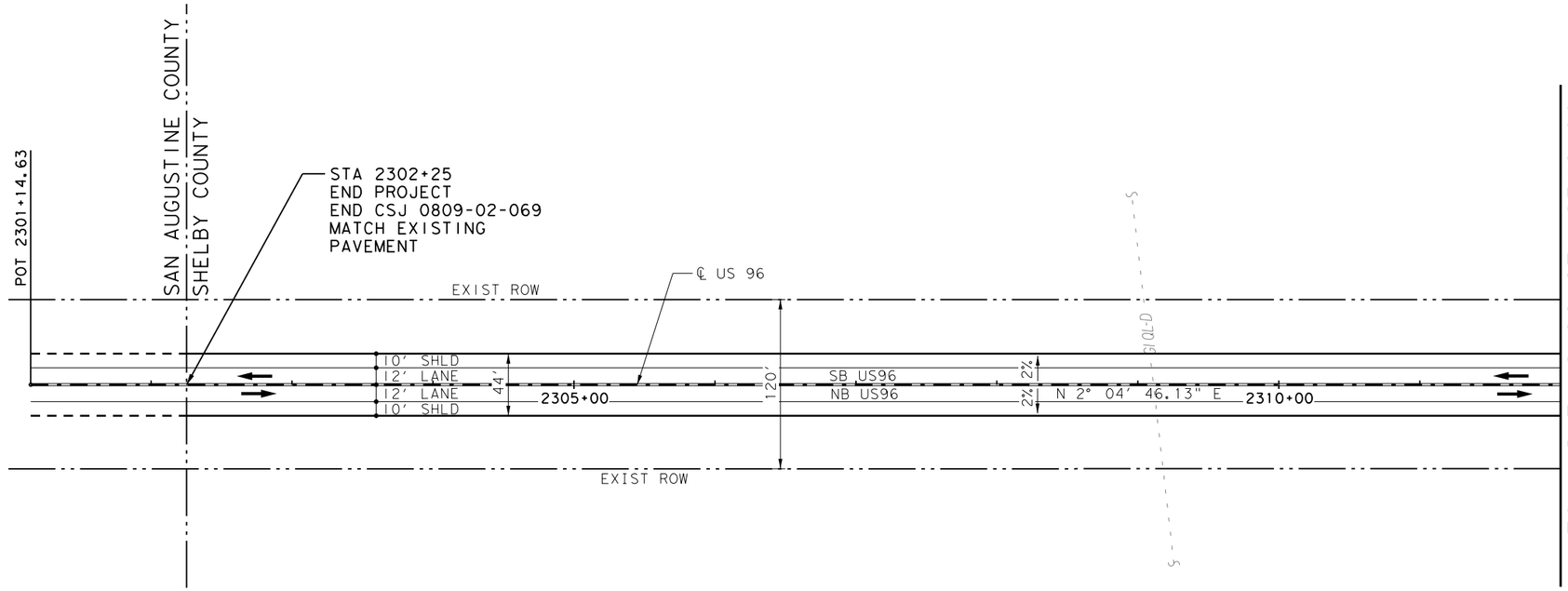
11/2/2021

HORIZONTAL ALIGNMENT DATA

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		64



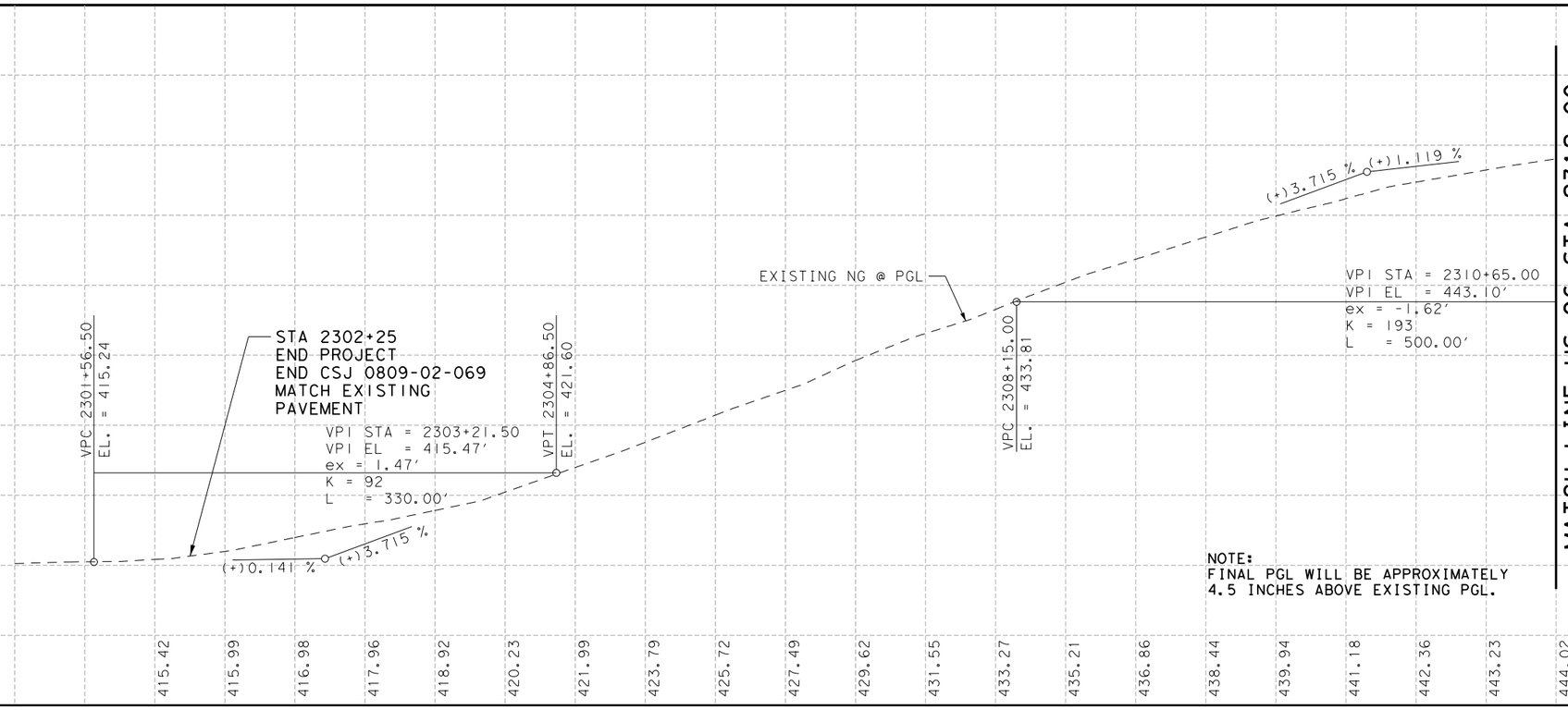
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



NOTE:
FINAL PGL WILL BE APPROXIMATELY 4.5 INCHES ABOVE EXISTING PGL.

SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

(END TO STA 2312+00)

(SHEET 1 OF 25)

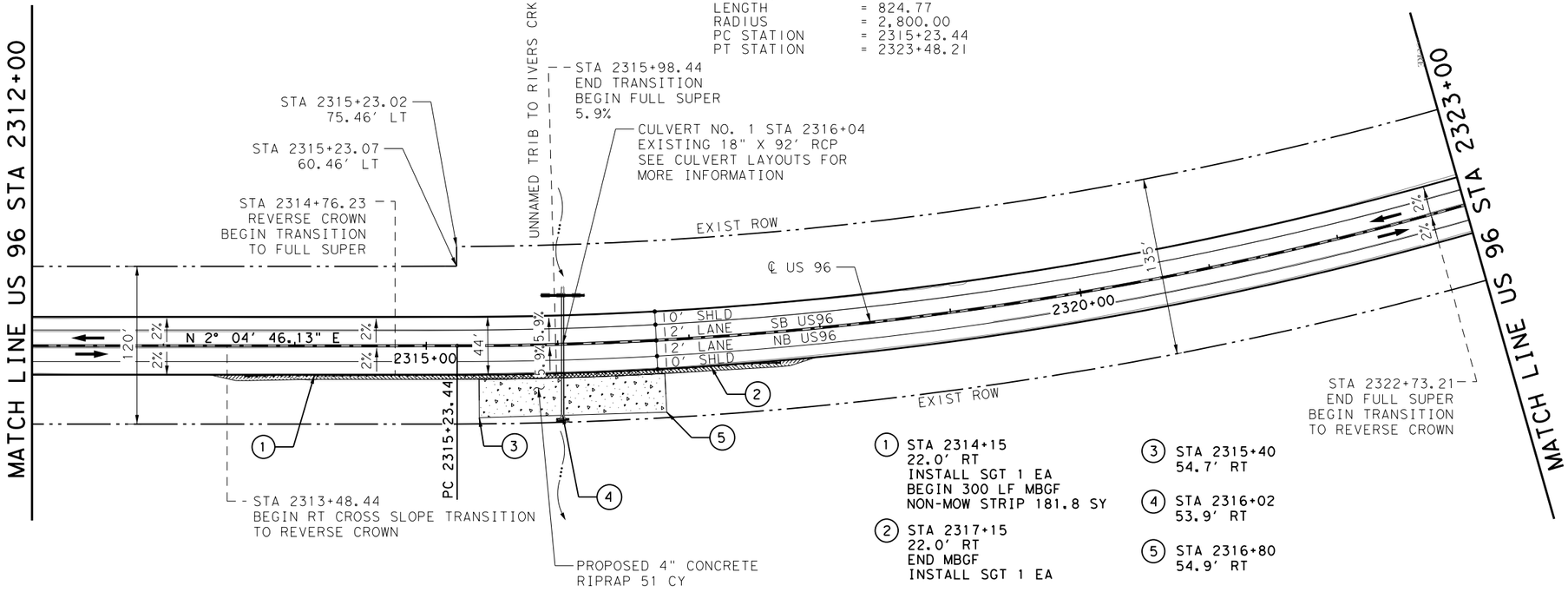
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		65

9/28/2022 9:08:43 AM
H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP01.dgn

CURVE 1

PI STATION = 2319+38.83
DELTA = 16° 52' 37.86" (LT)
DEGREE OF CURVE = 2° 02' 46.60"
TANGENT = 415.40
LENGTH = 824.77
RADIUS = 2,800.00
PC STATION = 2315+23.44
PT STATION = 2323+48.21



① STA 2314+15
22.0' RT
INSTALL SGT 1 EA
BEGIN 300 LF MBGF
NON-MOW STRIP 181.8 SY

② STA 2317+15
22.0' RT
END MBGF
INSTALL SGT 1 EA

③ STA 2315+40
54.7' RT

④ STA 2316+02
53.9' RT

⑤ STA 2316+80
54.9' RT

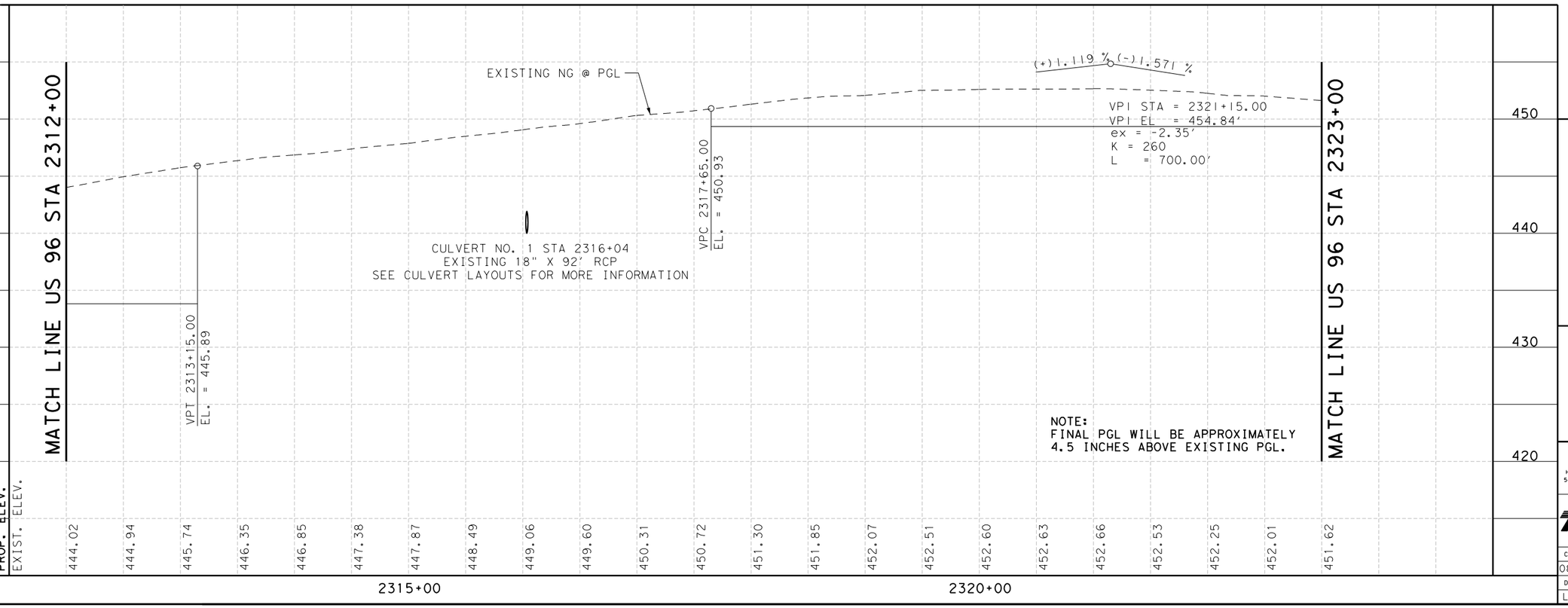
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

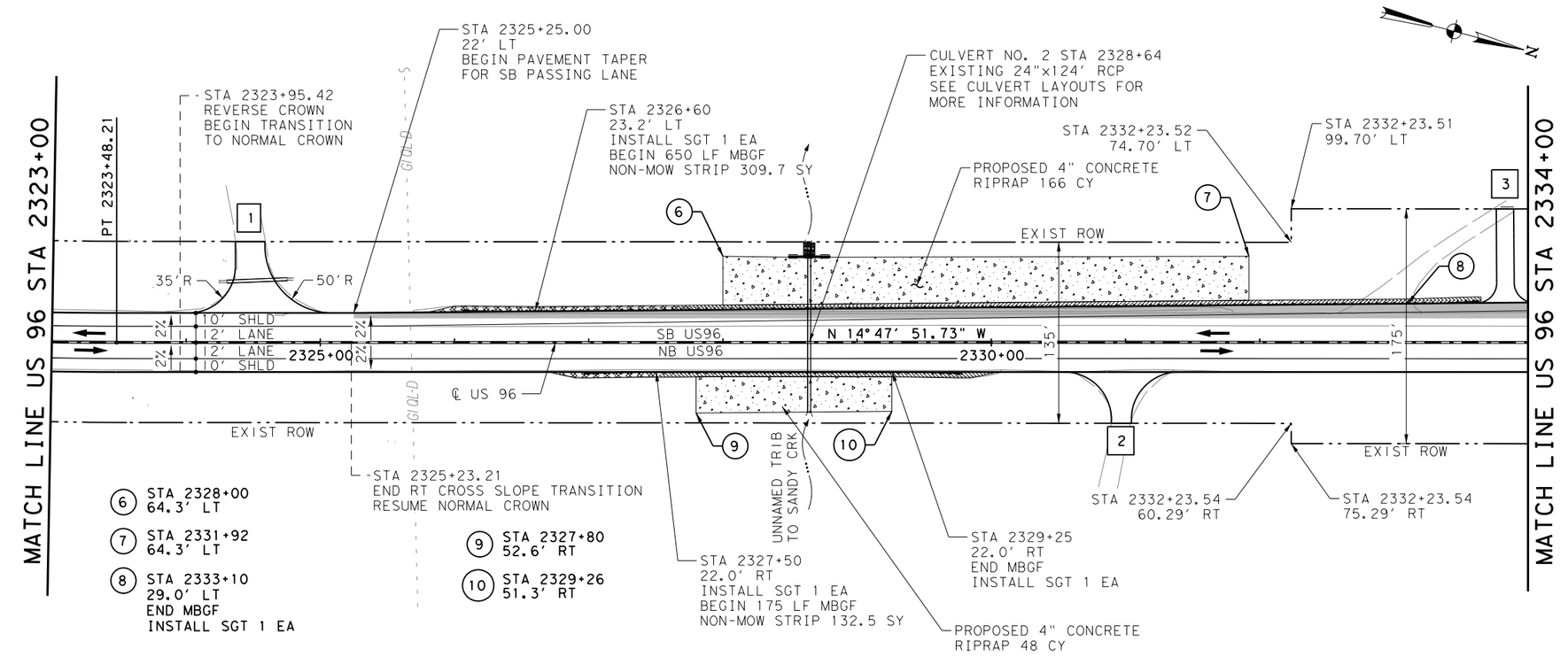
(STA 2312+00 TO STA 2323+00)

(SHEET 2 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

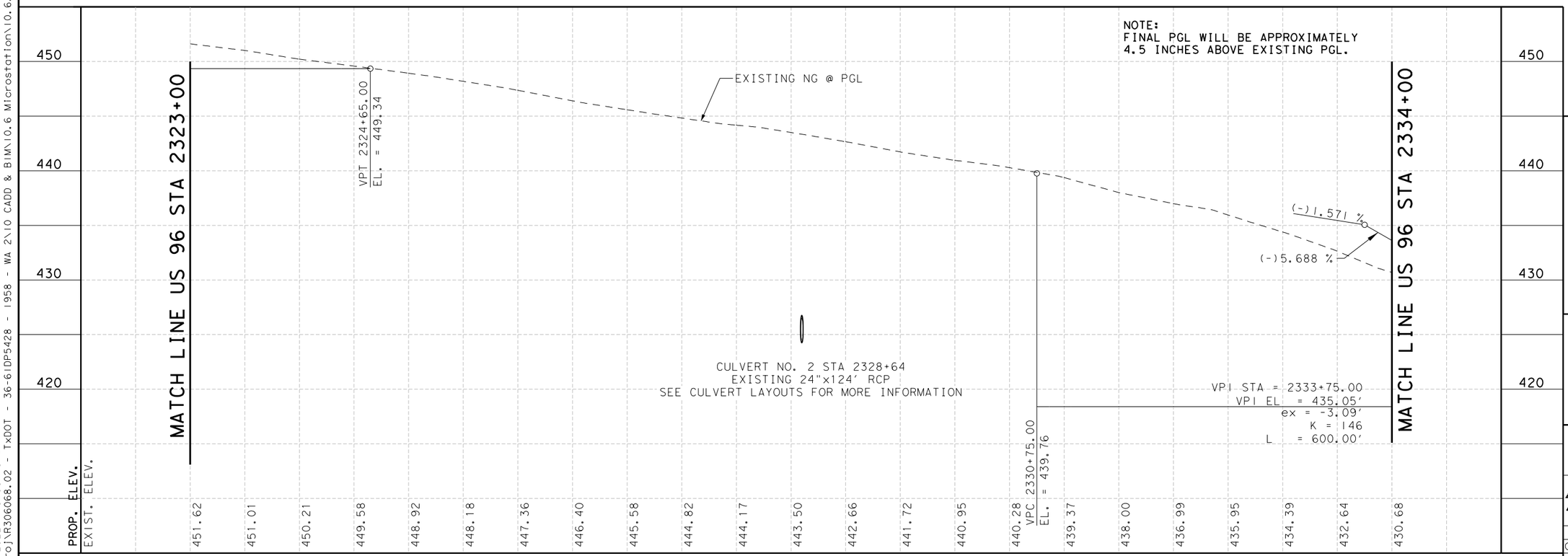
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		66

9/28/2022 9:08:44 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP02.dgn



NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

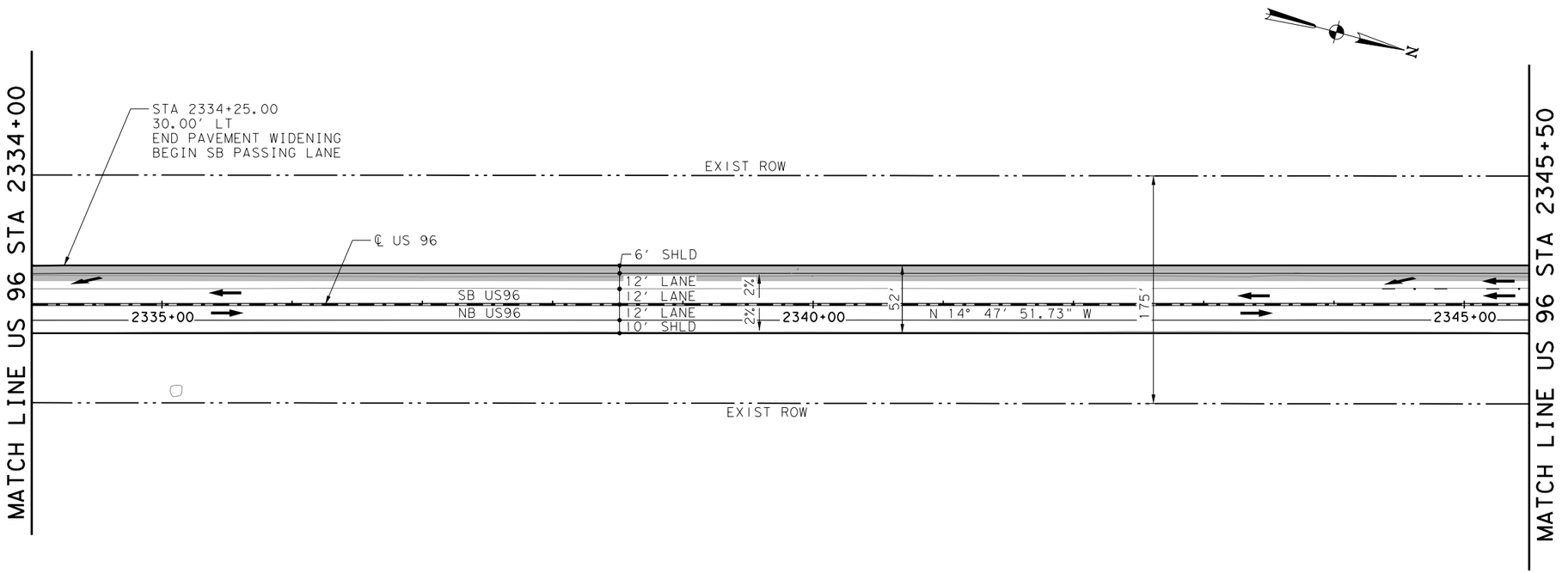
(STA 2323+00 TO STA 2334+00)

(SHEET 3 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		67

9/28/2022 9:08:45 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP03.dgn



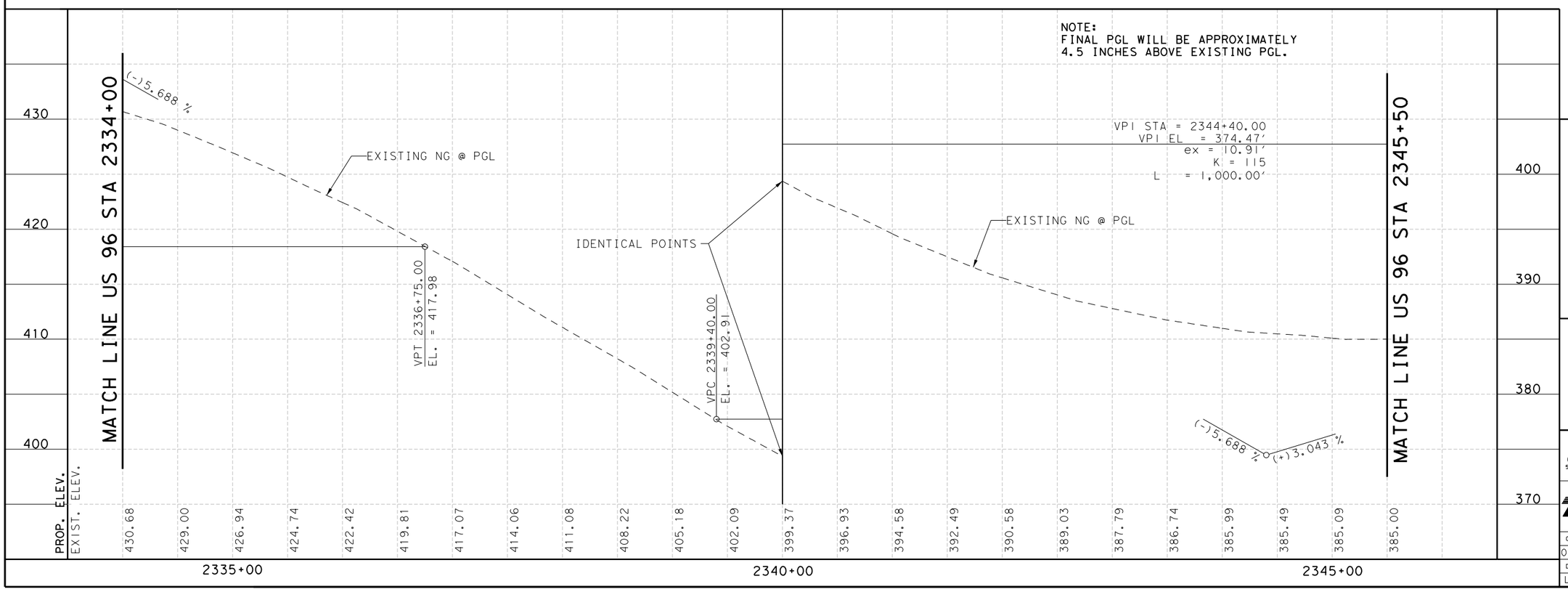
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

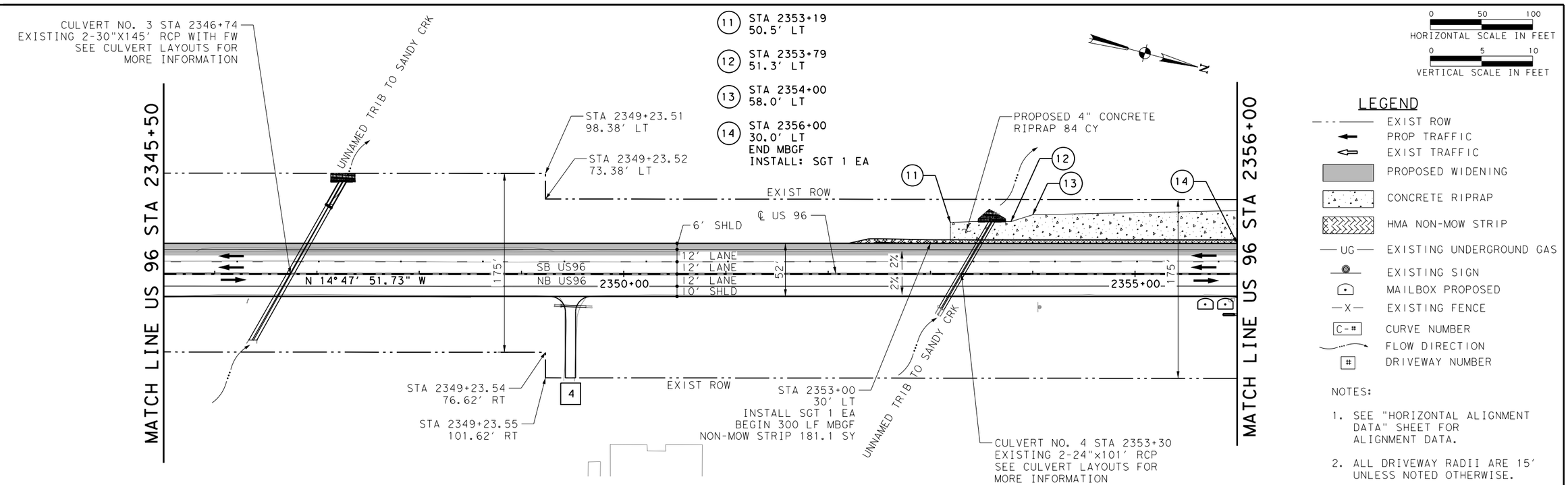
(STA 2334+00 TO STA 2345+50)

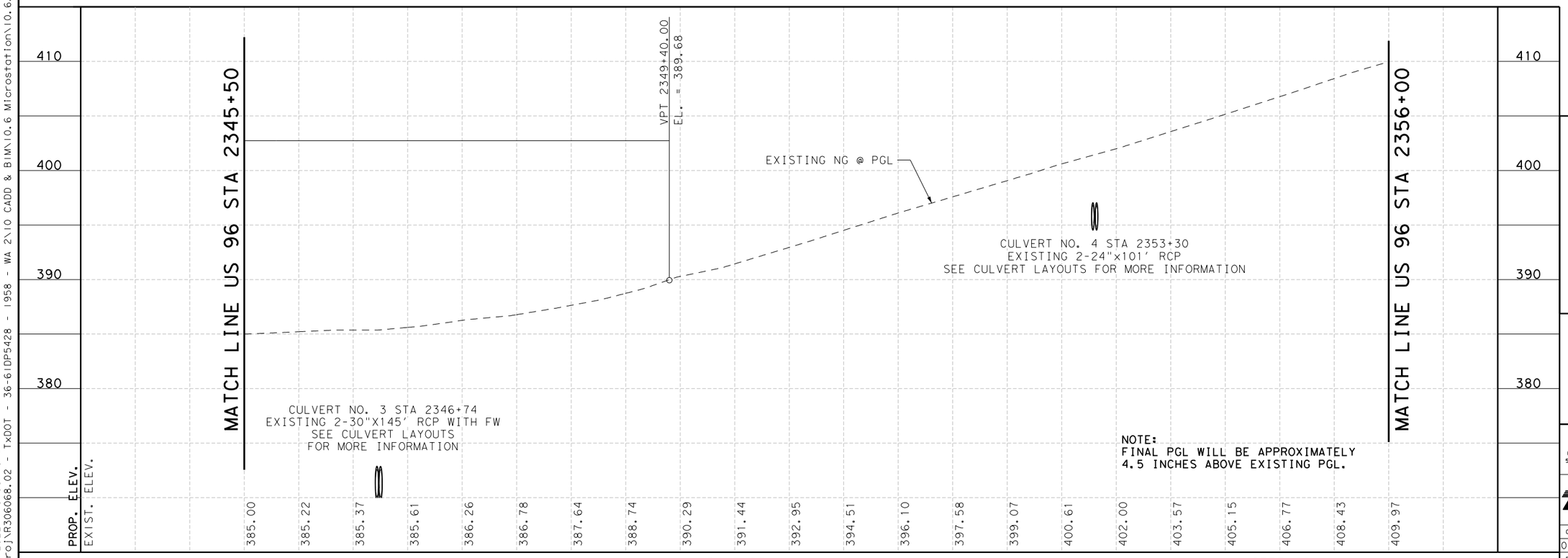
(SHEET 4 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		68

9/28/2022 9:08:45 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP04.dgn





SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

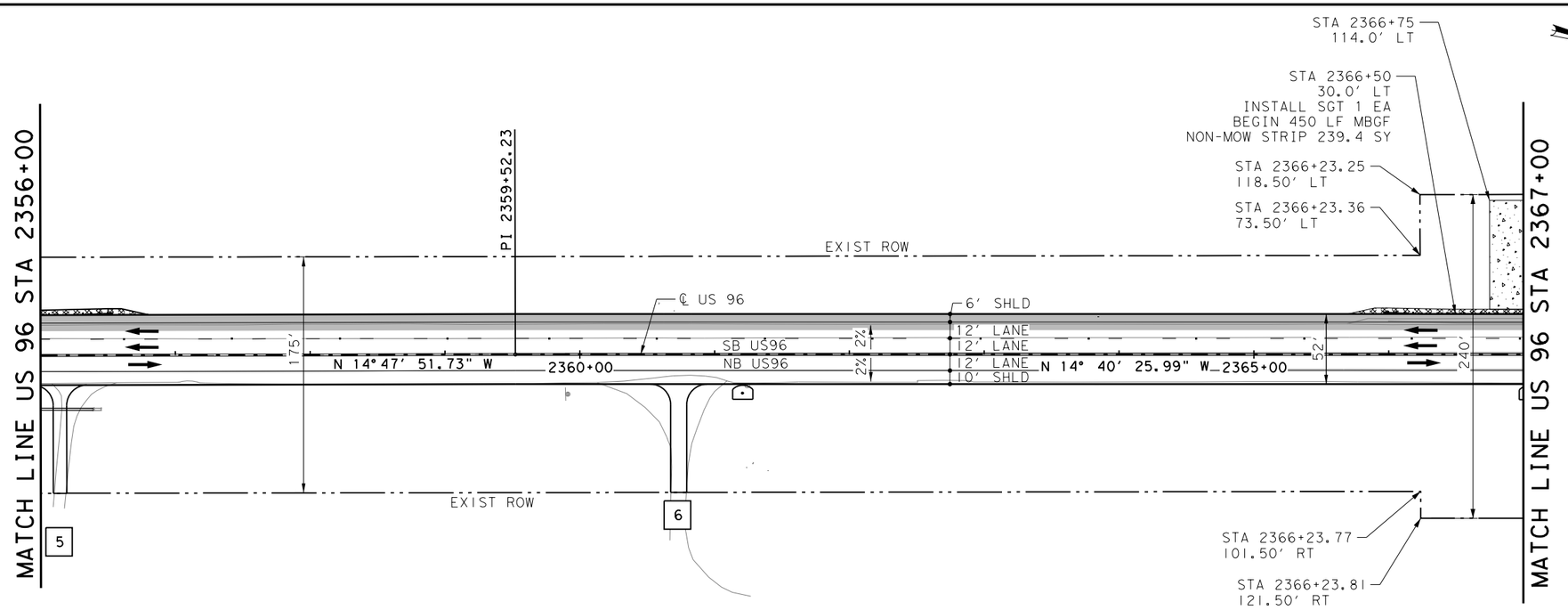
(STA 2345+50 TO STA 2356+00)

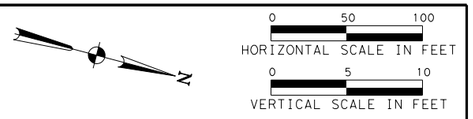
(SHEET 5 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		69

9/28/2022 9:08:46 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP05.dgn



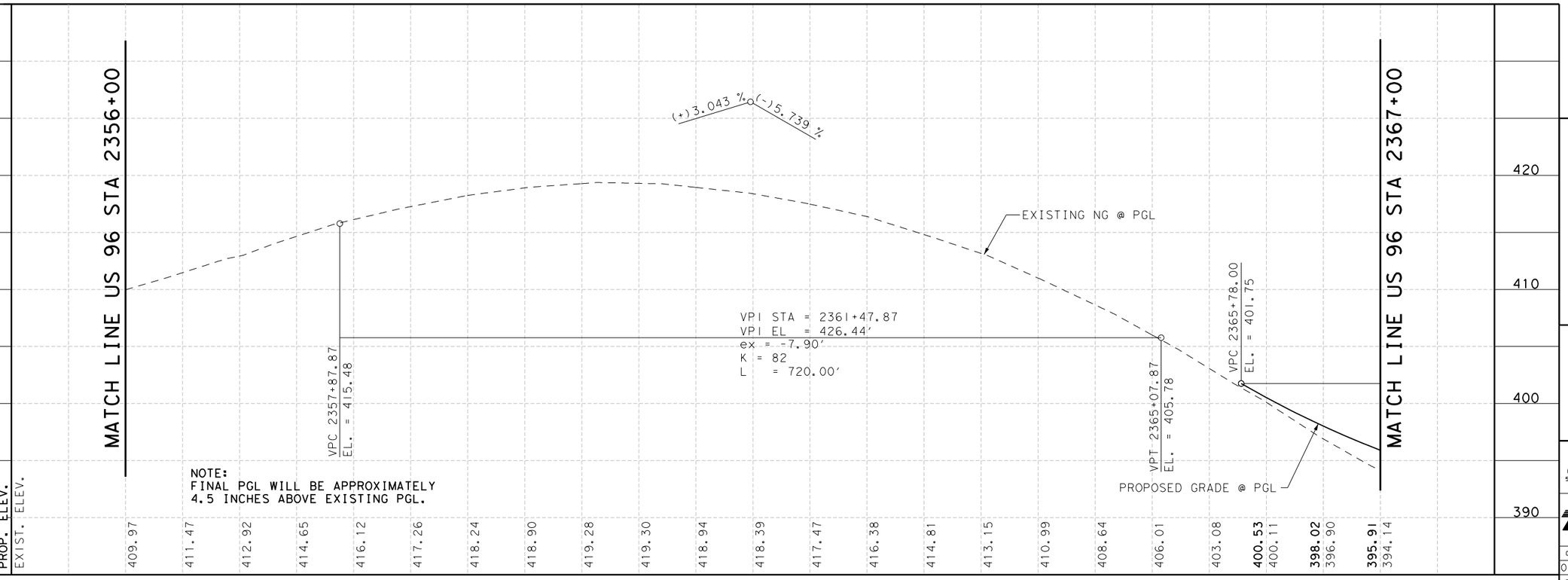


LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

(STA 2356+00 TO STA 2367+00)

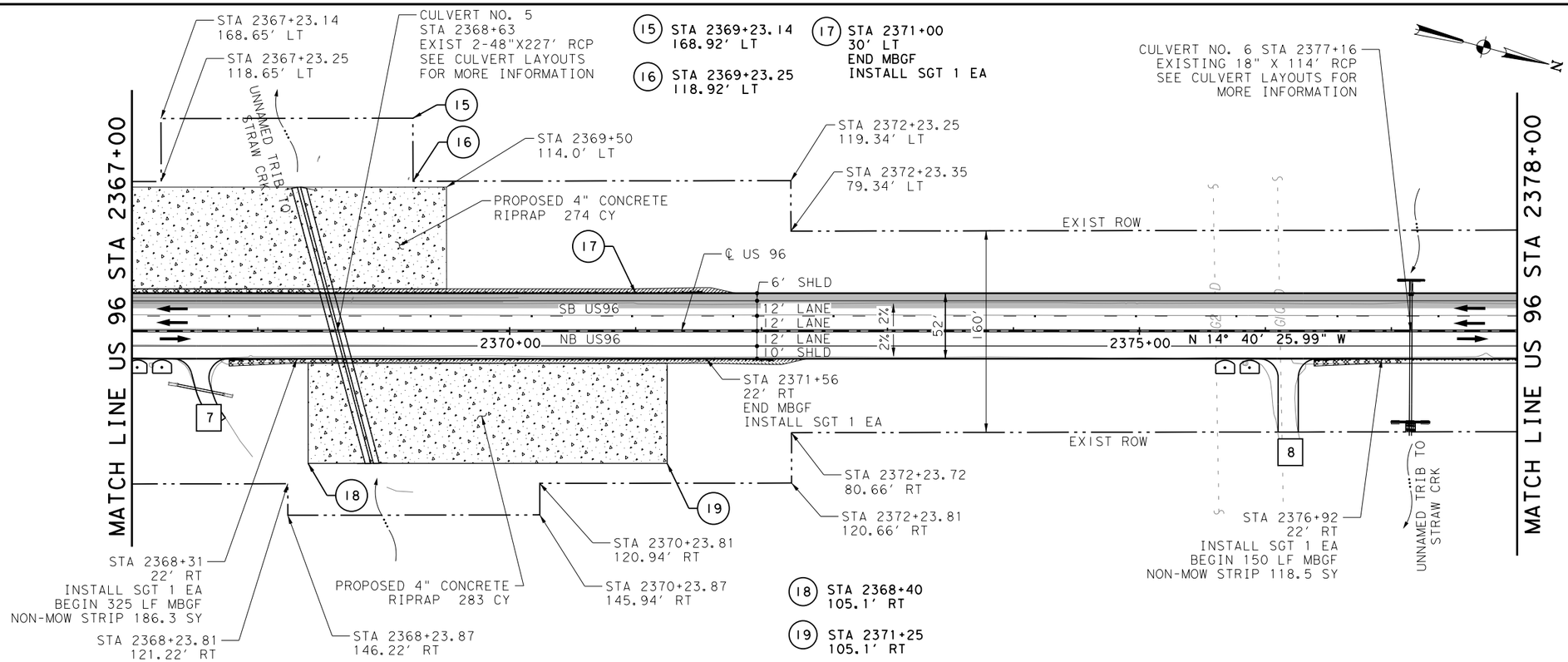
(SHEET 6 OF 25)

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		70

9/28/2022 9:08:47 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP06.dgn



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

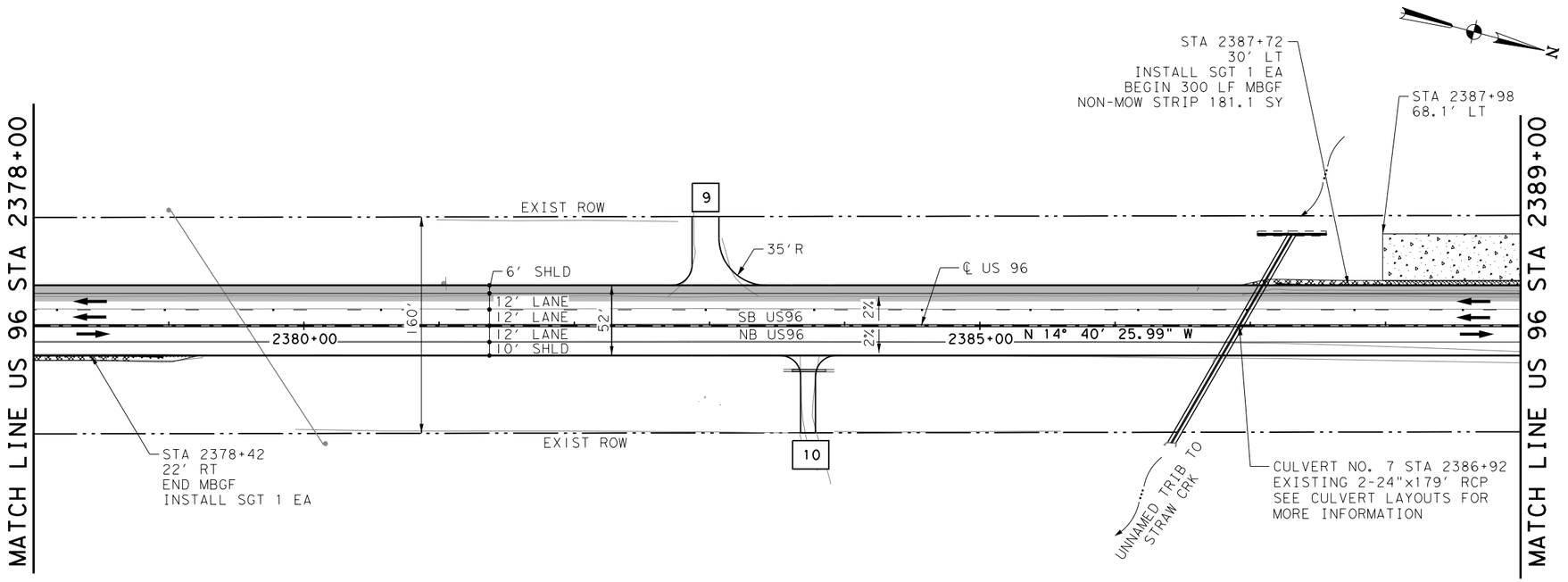
(STA 2367+00 TO STA 2378+00)

(SHEET 7 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		71

9/28/2022 9:08:47 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP07.dgn



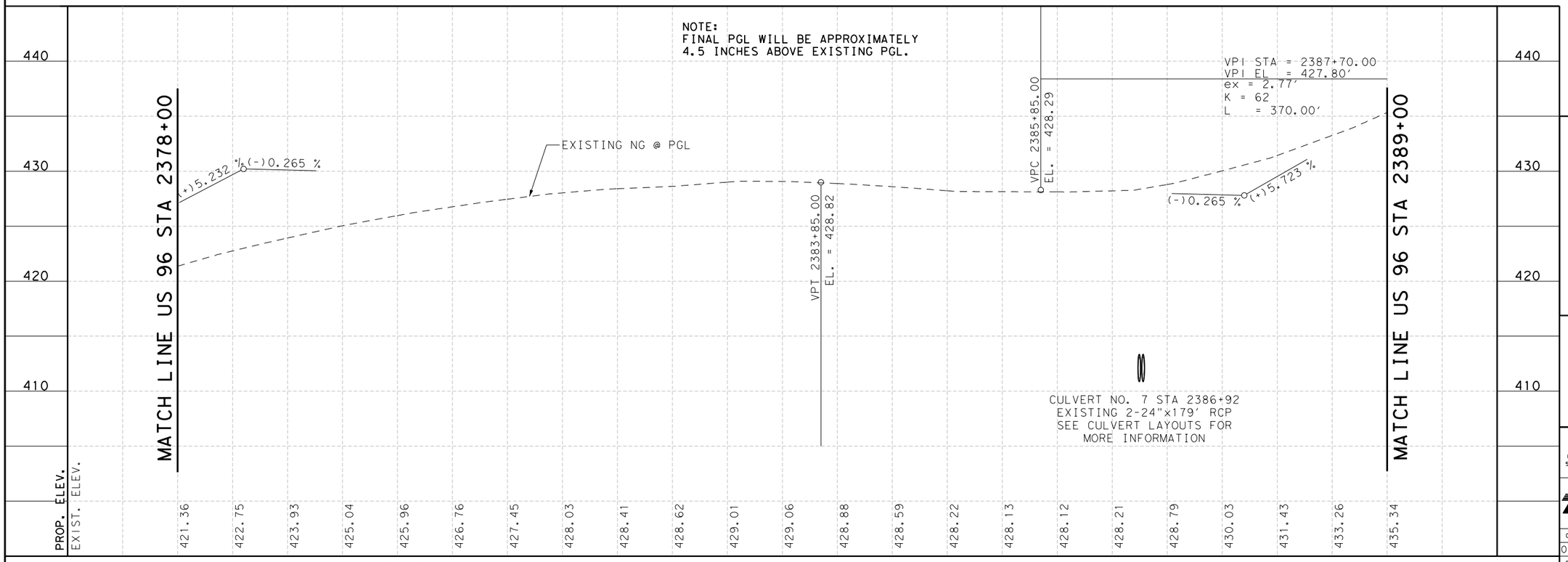
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

(STA 2378+00 TO STA 2389+00)

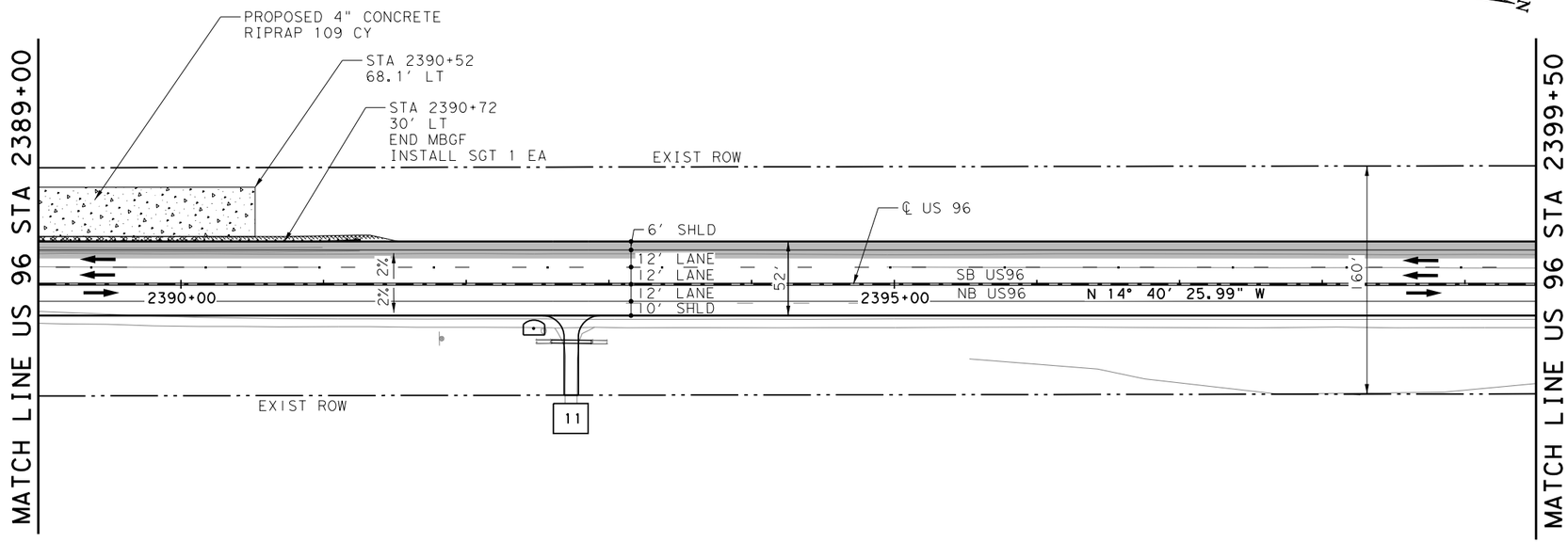
(SHEET 8 OF 25)

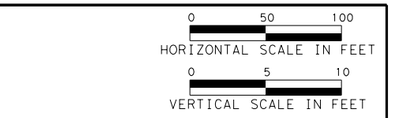
HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		72

9/28/2022 9:08:47 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP08.dgn



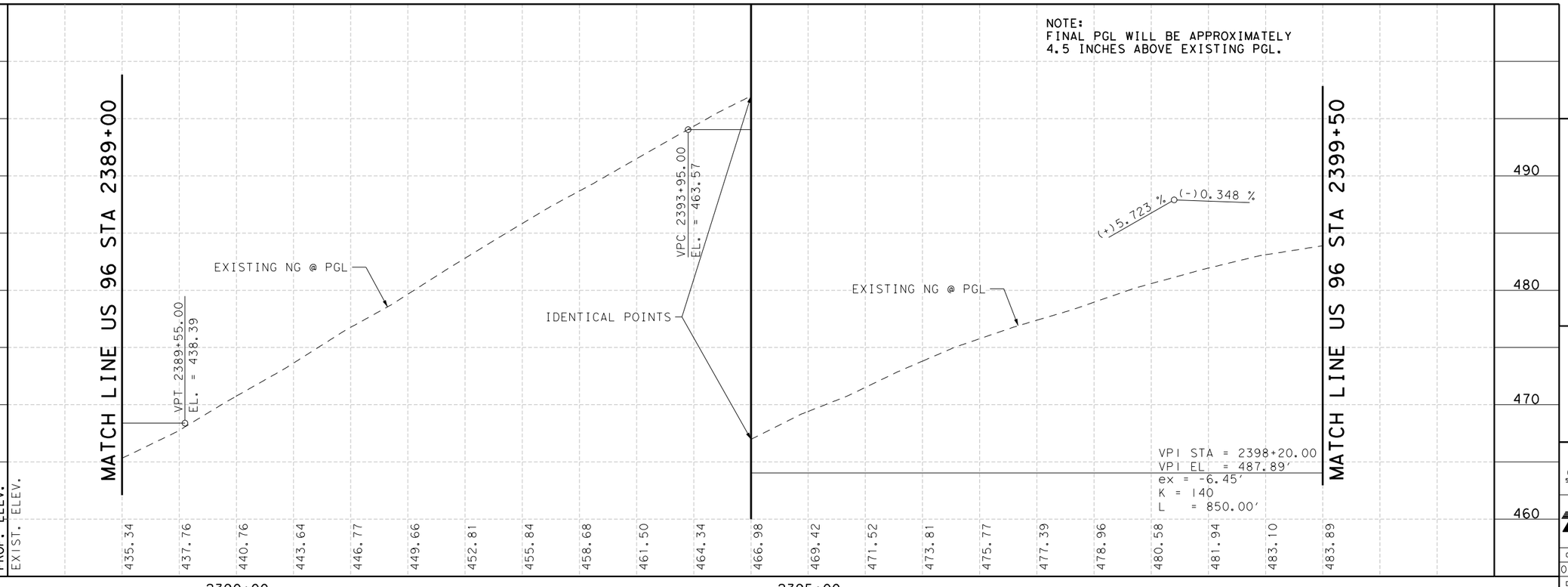


LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

(STA 2389+00 TO STA 2399+50)

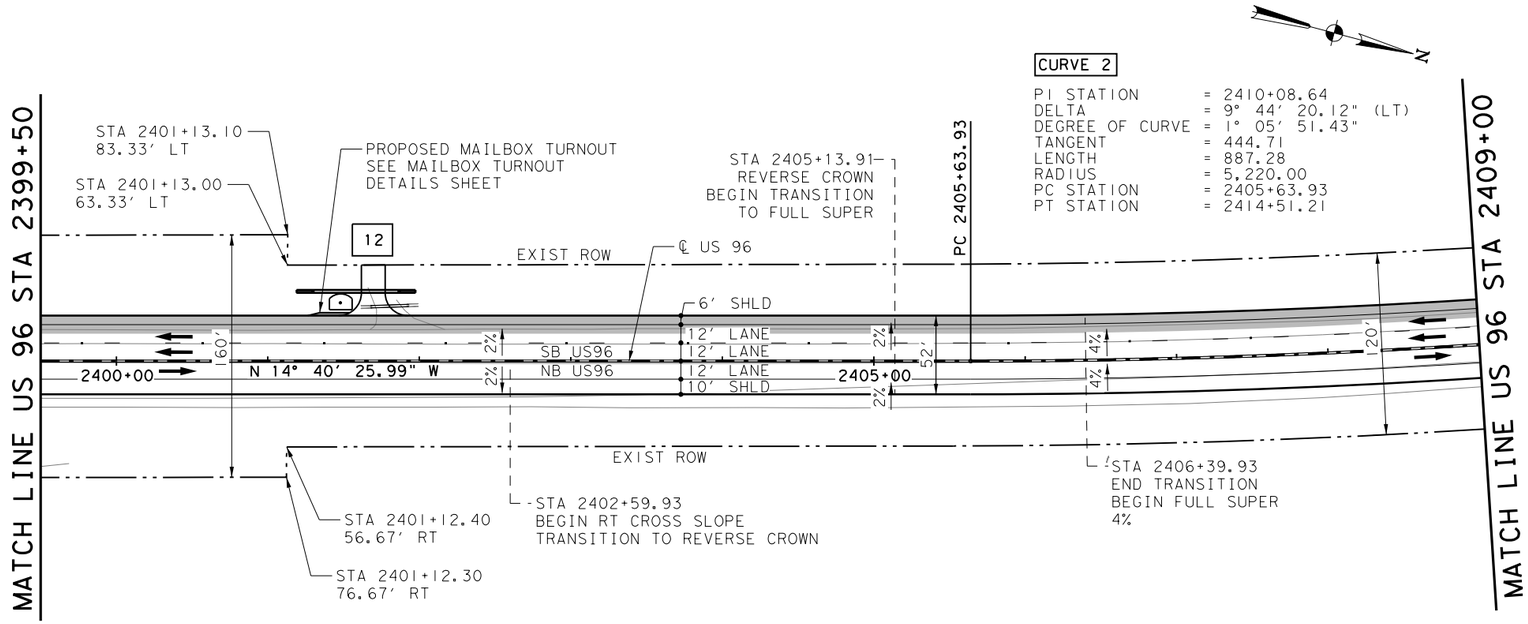
(SHEET 9 OF 25)

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		73

9/28/2022 9:08:48 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP09.dgn



CURVE 2

PI STATION	= 2410+08.64
DELTA	= 9° 44' 20.12" (LT)
DEGREE OF CURVE	= 1° 05' 51.43"
TANGENT	= 444.71
LENGTH	= 887.28
RADIUS	= 5,220.00
PC STATION	= 2405+63.93
PT STATION	= 2414+51.21

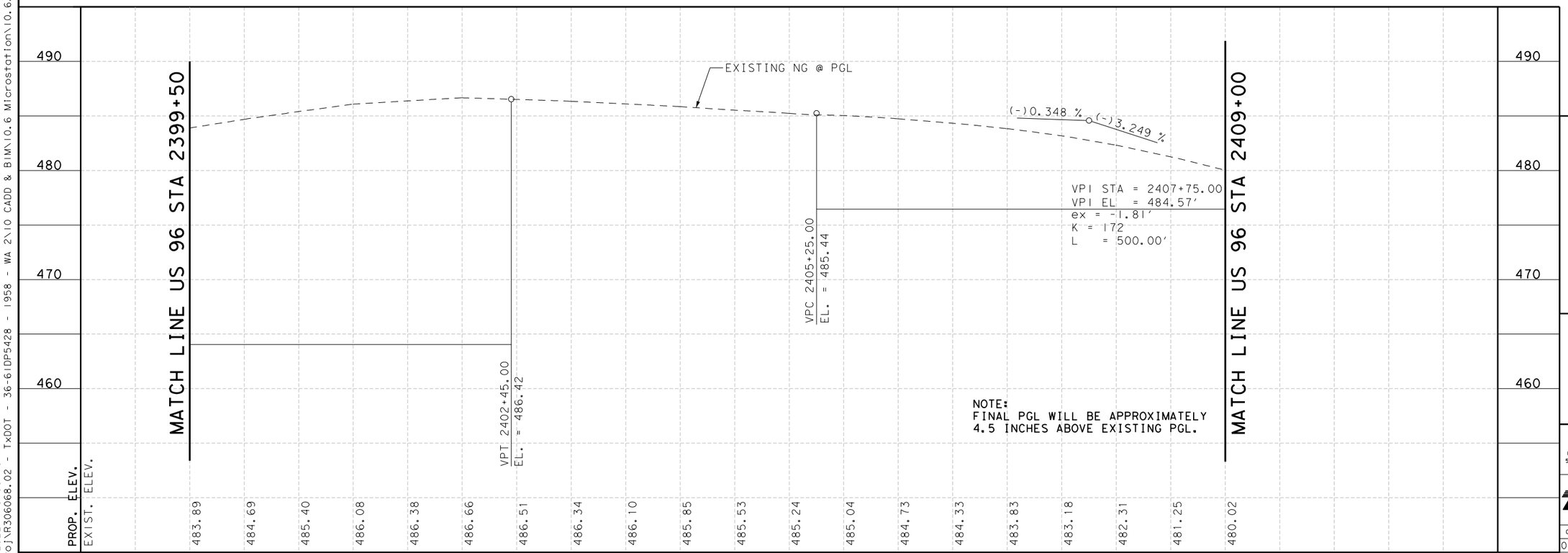
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

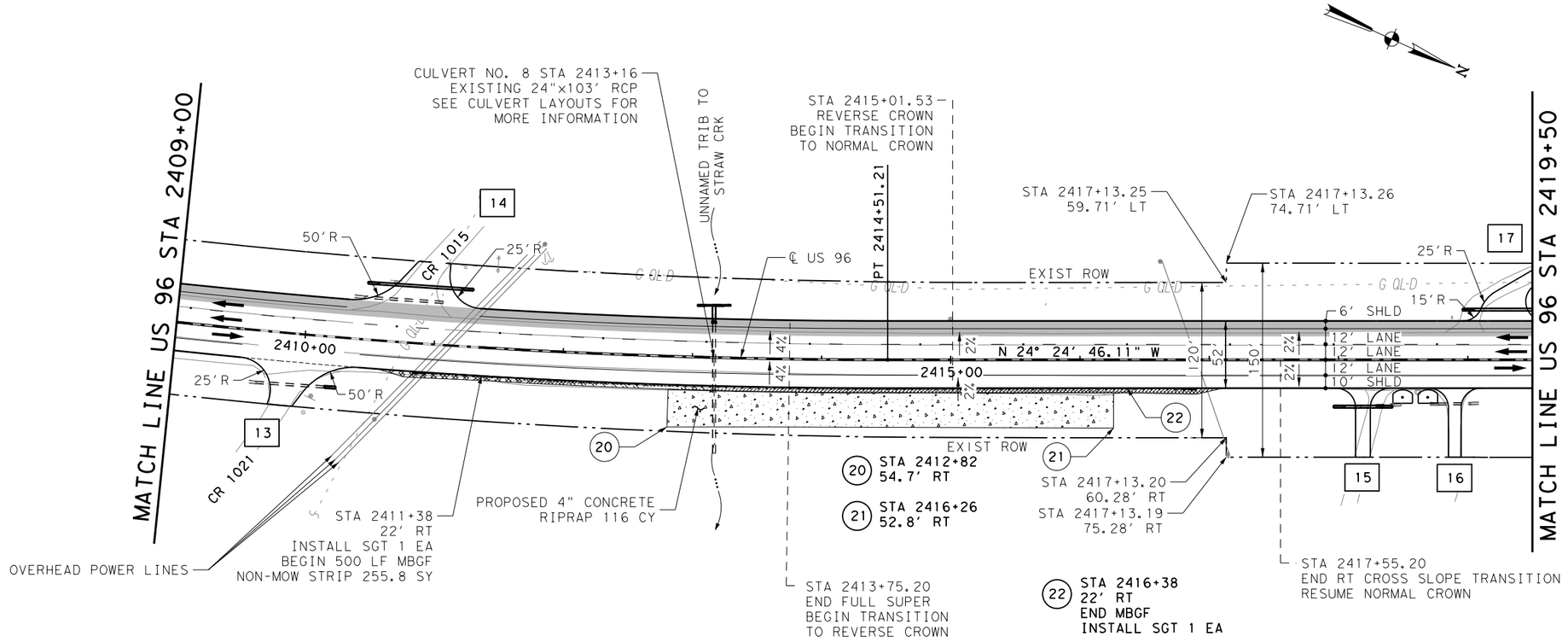
(STA 2399+50 TO STA 2409+00)

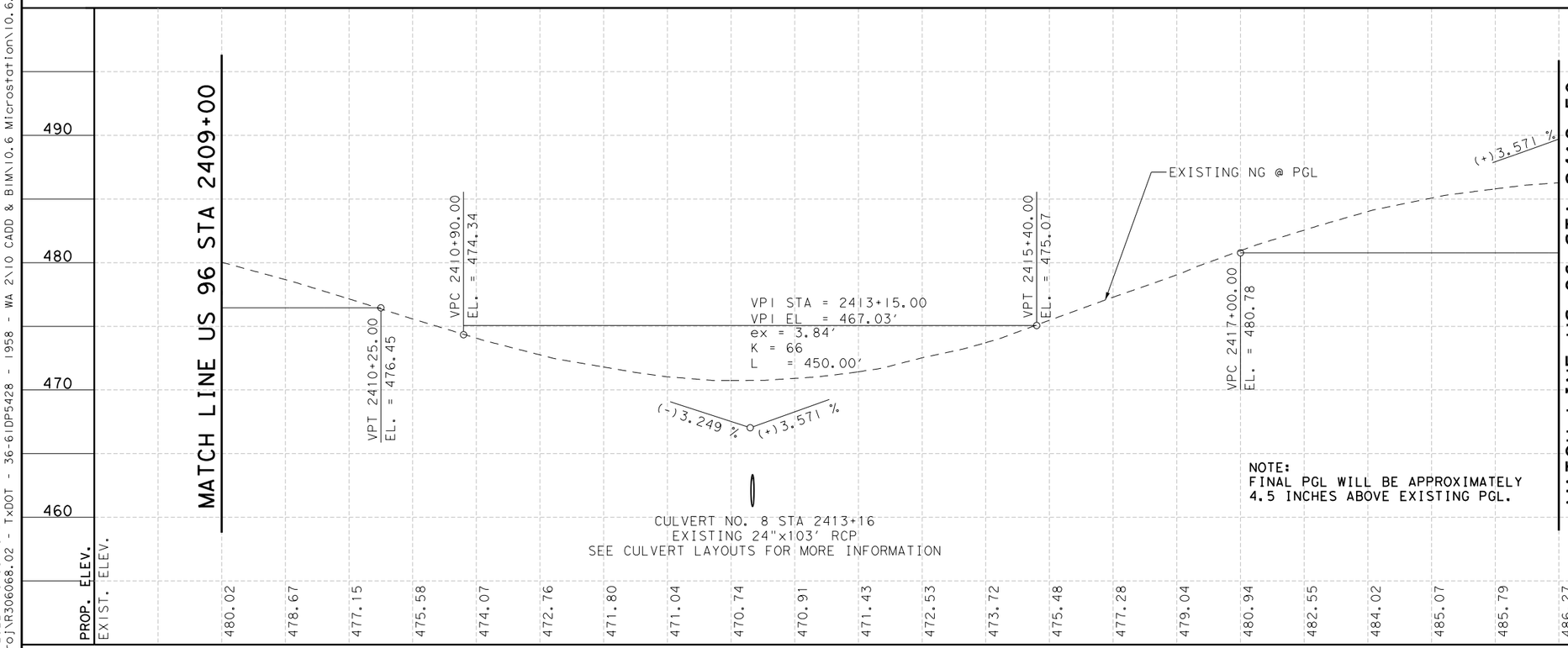
(SHEET 10 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		74

9/28/2022 9:08:48 AM
H:\proj\R306068.02 - TxDOT - 36-6\DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP10.dgn





0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.

SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

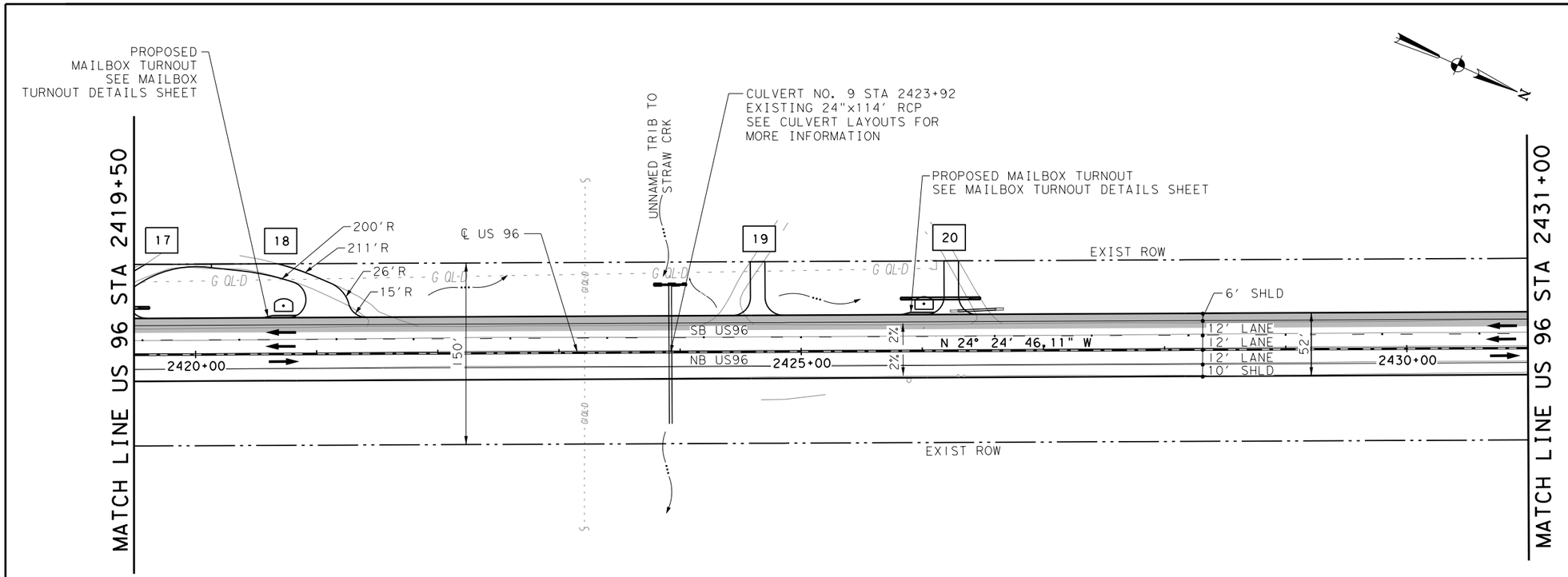
(STA 2409+00 TO STA 2419+50)

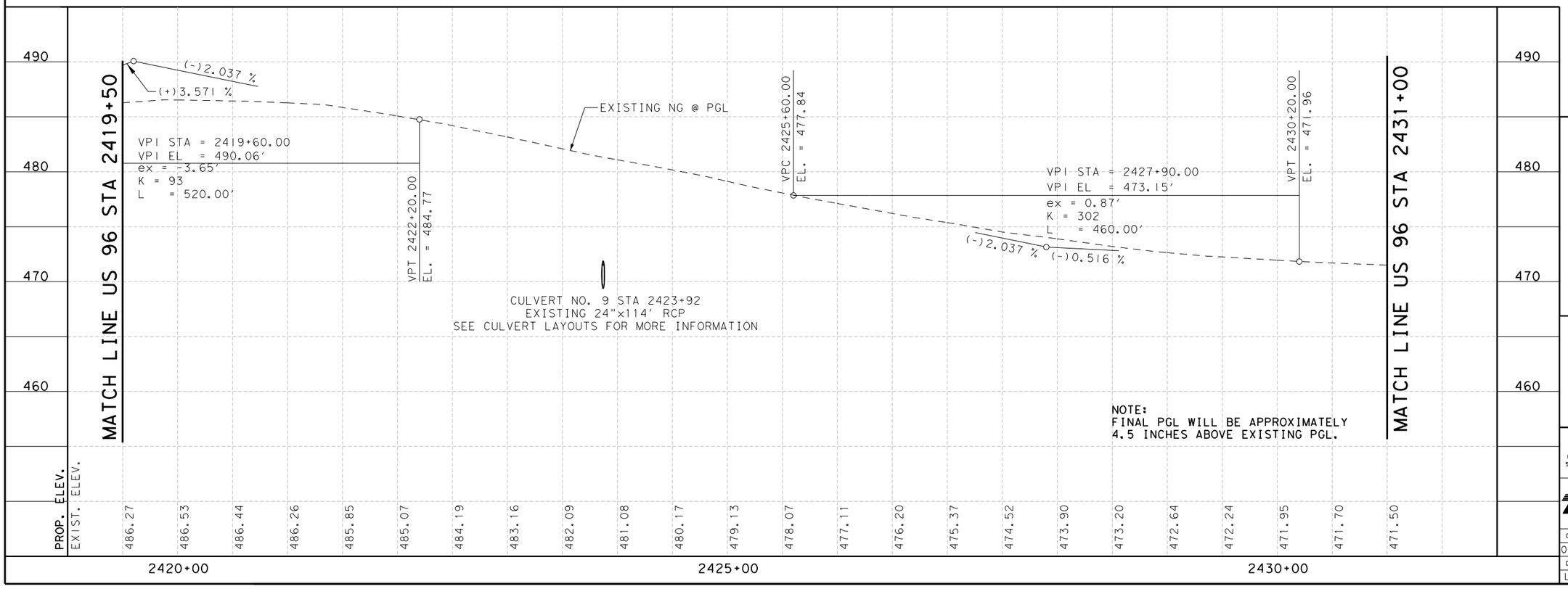
(SHEET 11 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		75

9/28/2022 9:08:48 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP11.dgn





0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.

SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

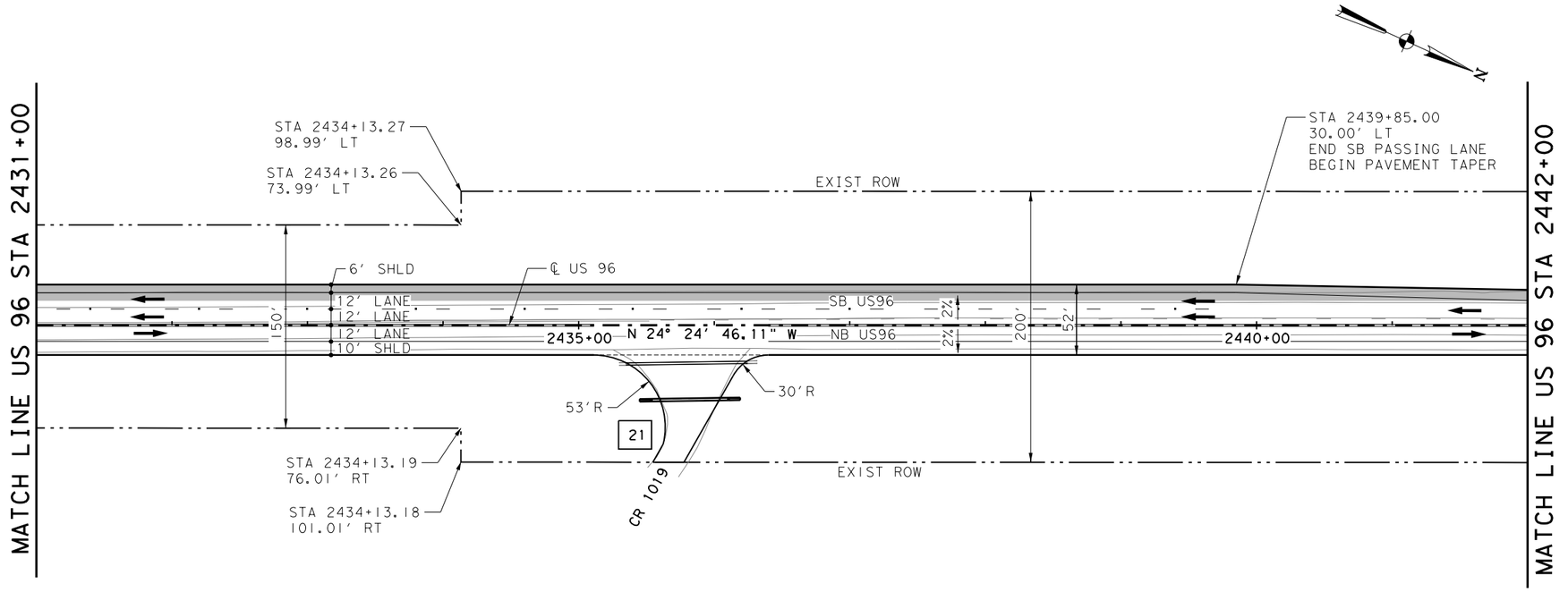
(STA 2419+50 TO STA 2431+00)

(SHEET 12 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		76

9/28/2022 9:08:49 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP12.dgn



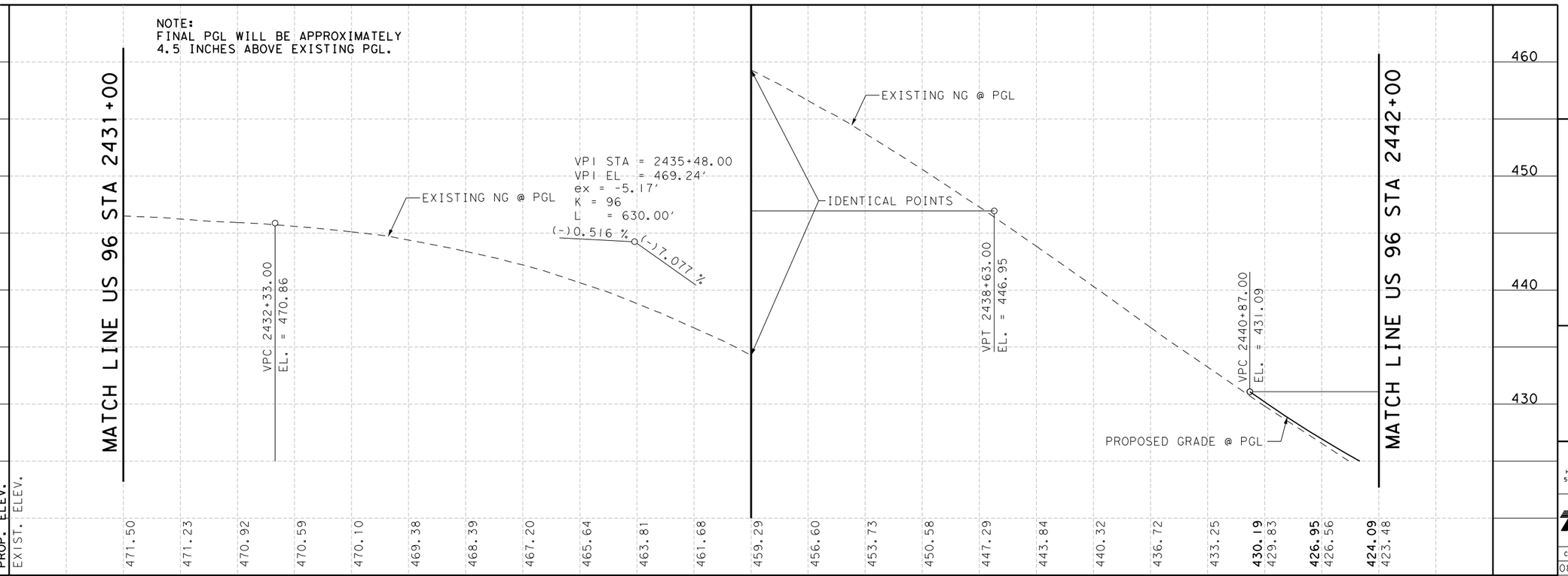
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

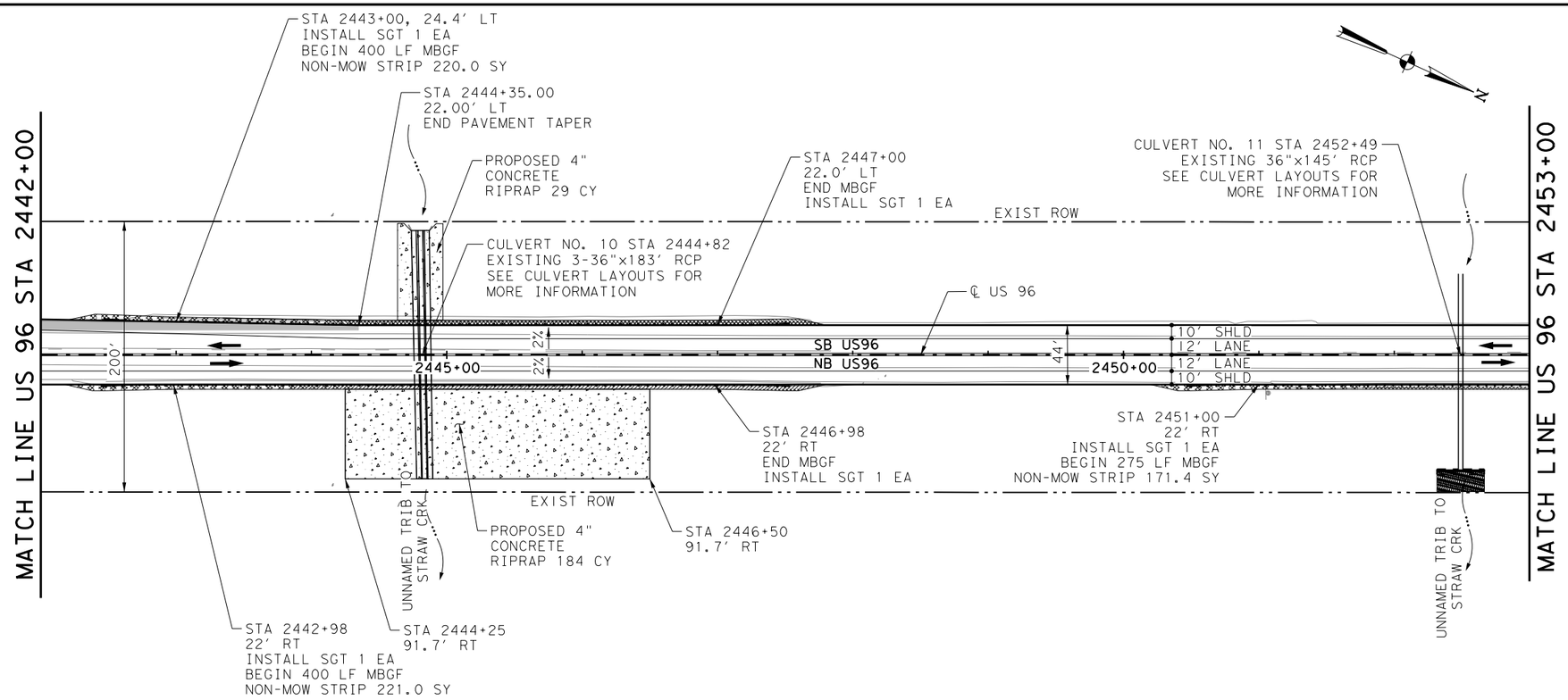
(STA 2431+00 TO STA 2442+00)

(SHEET 13 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		77

9/28/2022 9:08:49 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP13.dgn



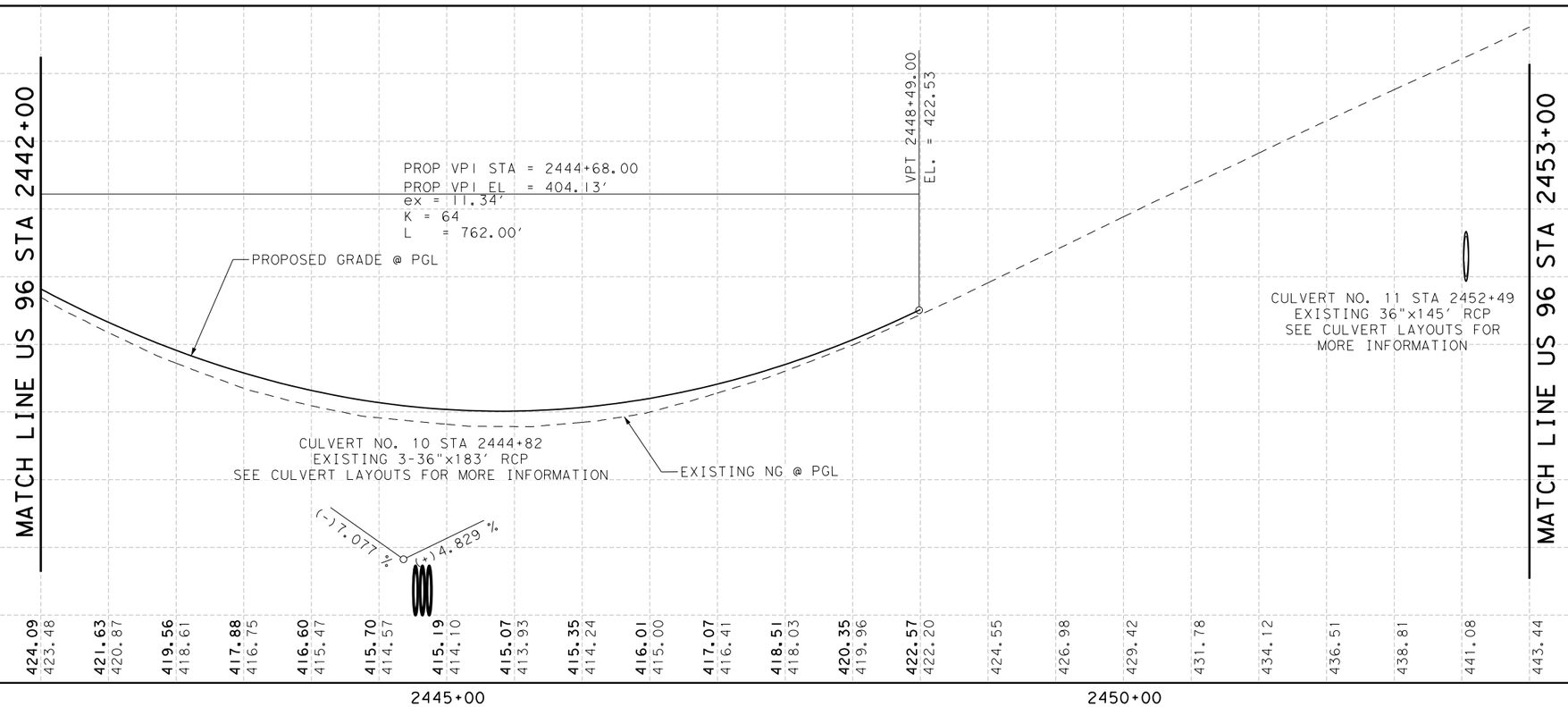
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

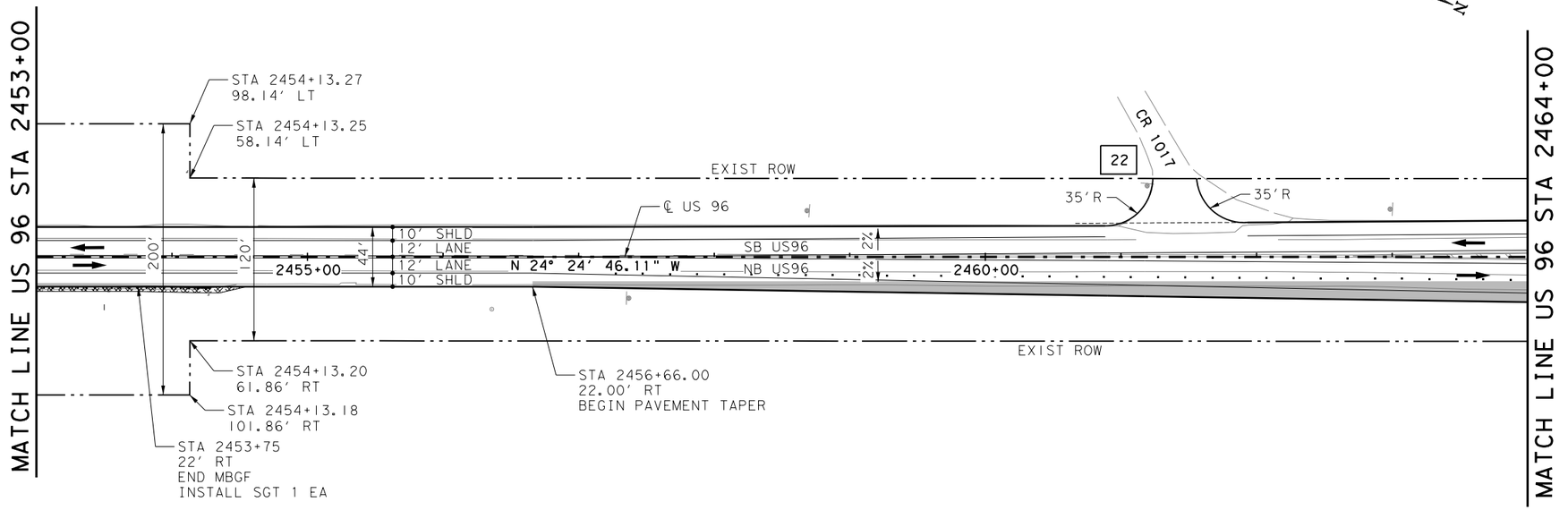
(STA 2442+00 TO STA 2453+00)

(SHEET 14 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		78

9/28/2022 9:08:50 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP14.dgn



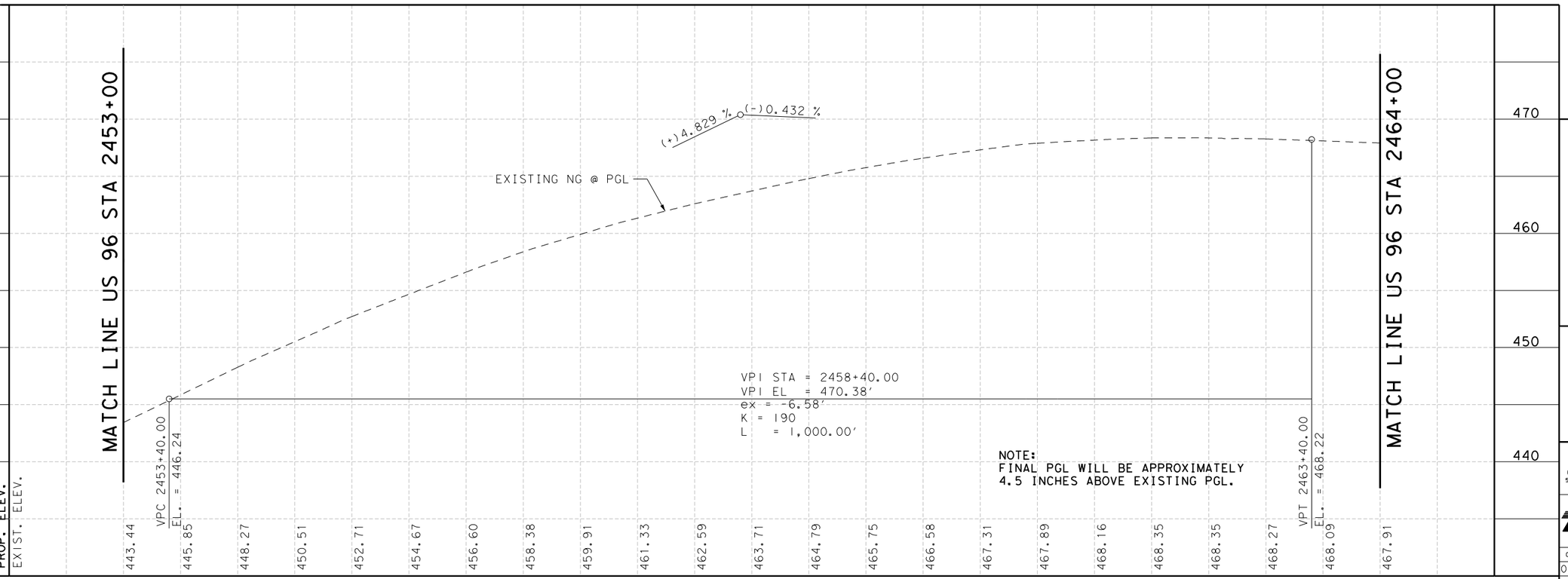
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

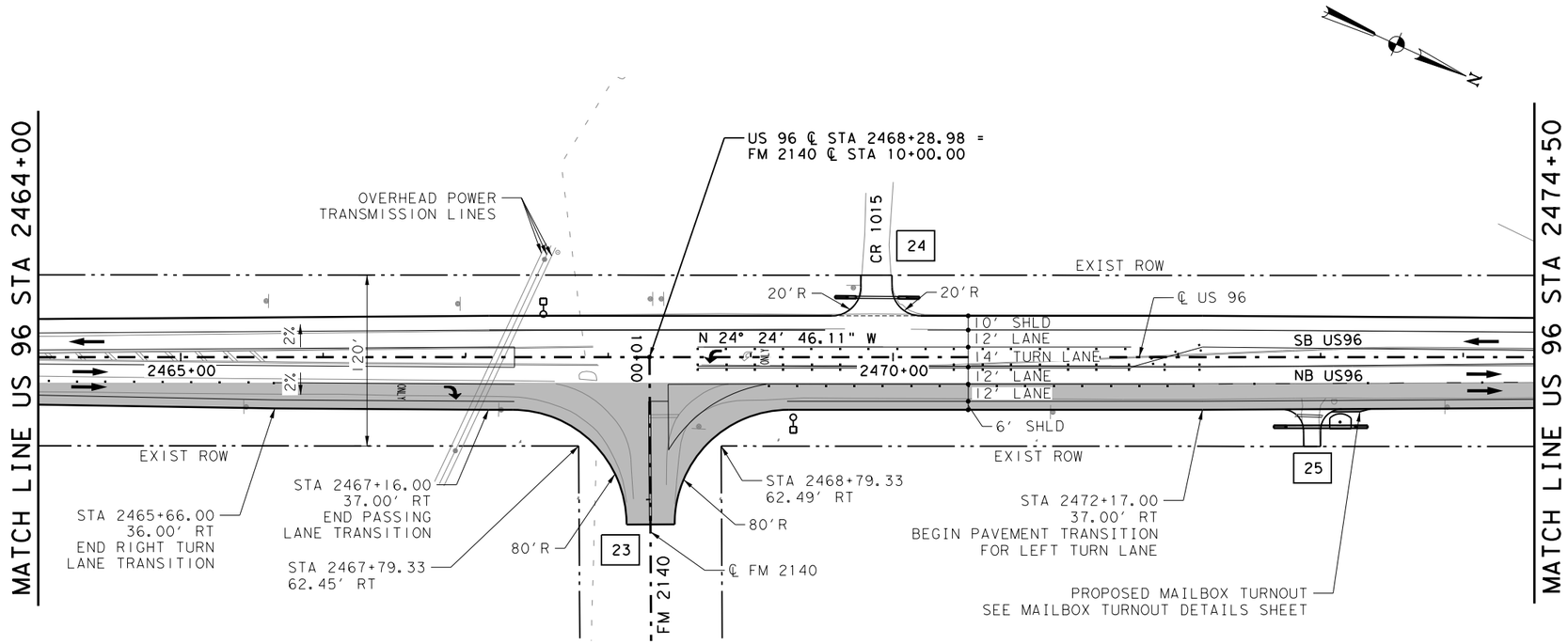
(STA 2453+00 TO STA 2464+00)

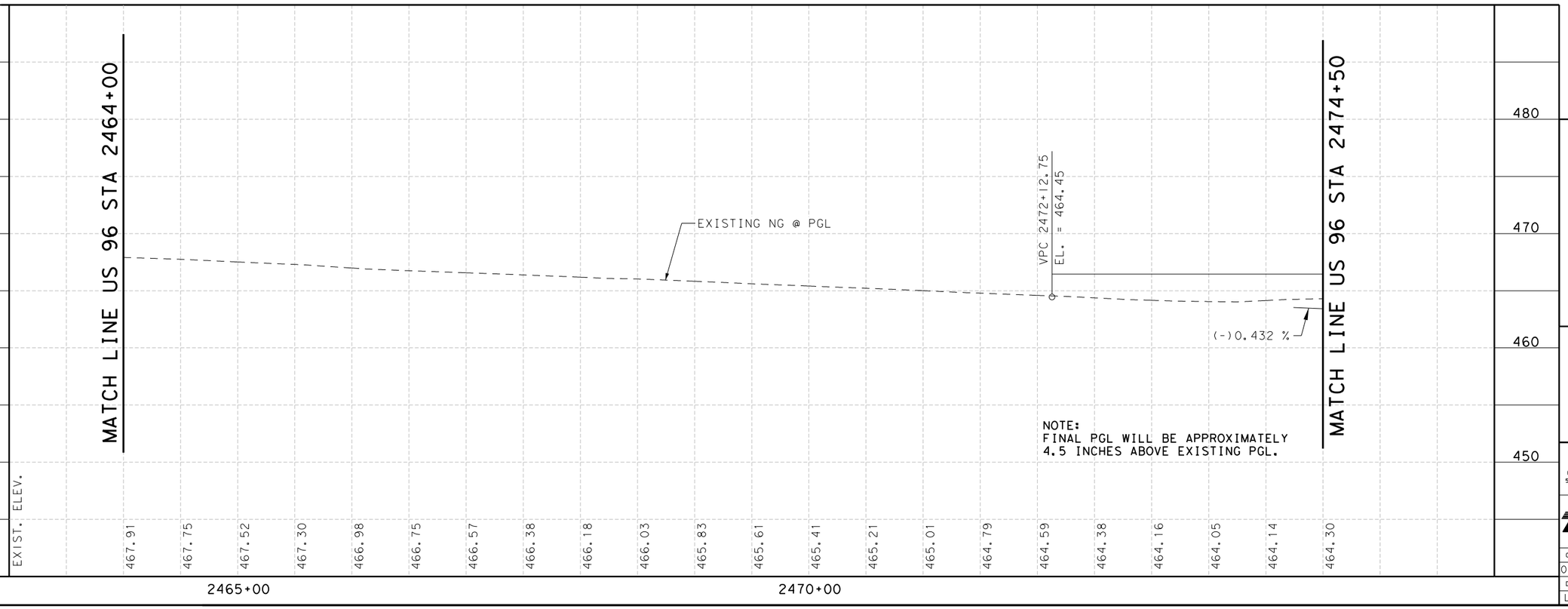
(SHEET 15 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		79

9/28/2022 9:08:50 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP15.dgn





0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.

SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

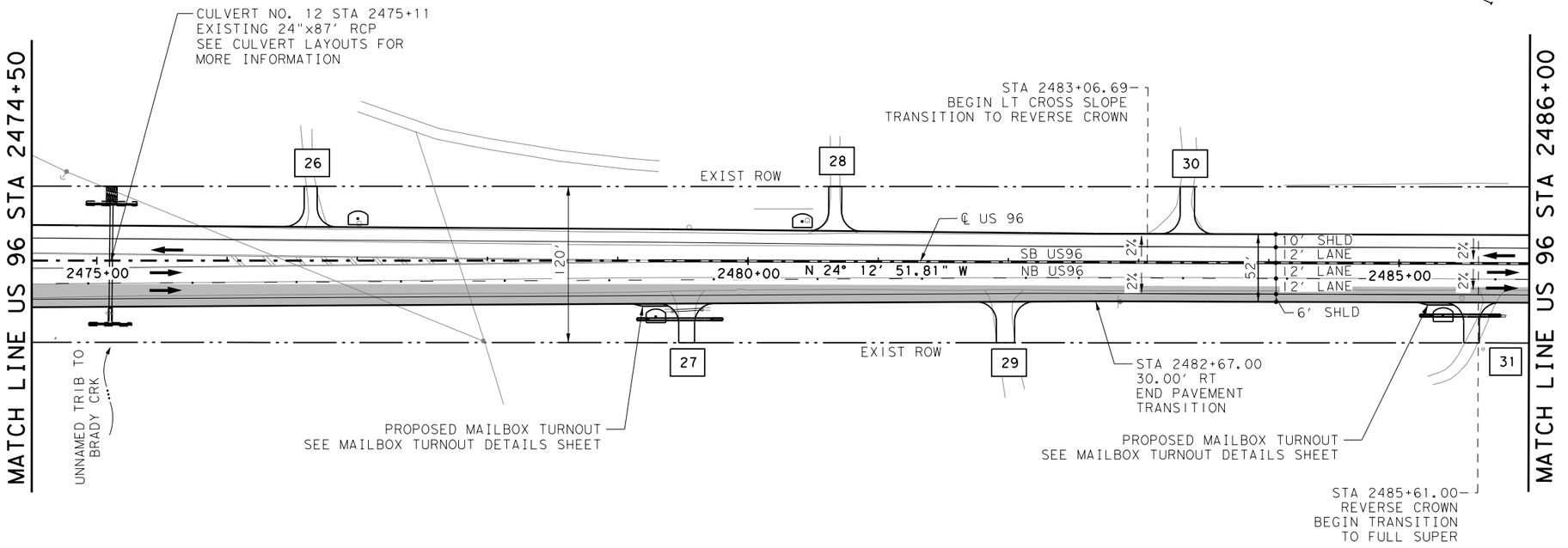
(STA 2464+00 TO STA 2474+50)

(SHEET 16 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		80

9/28/2022 9:08:50 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP16.dgn



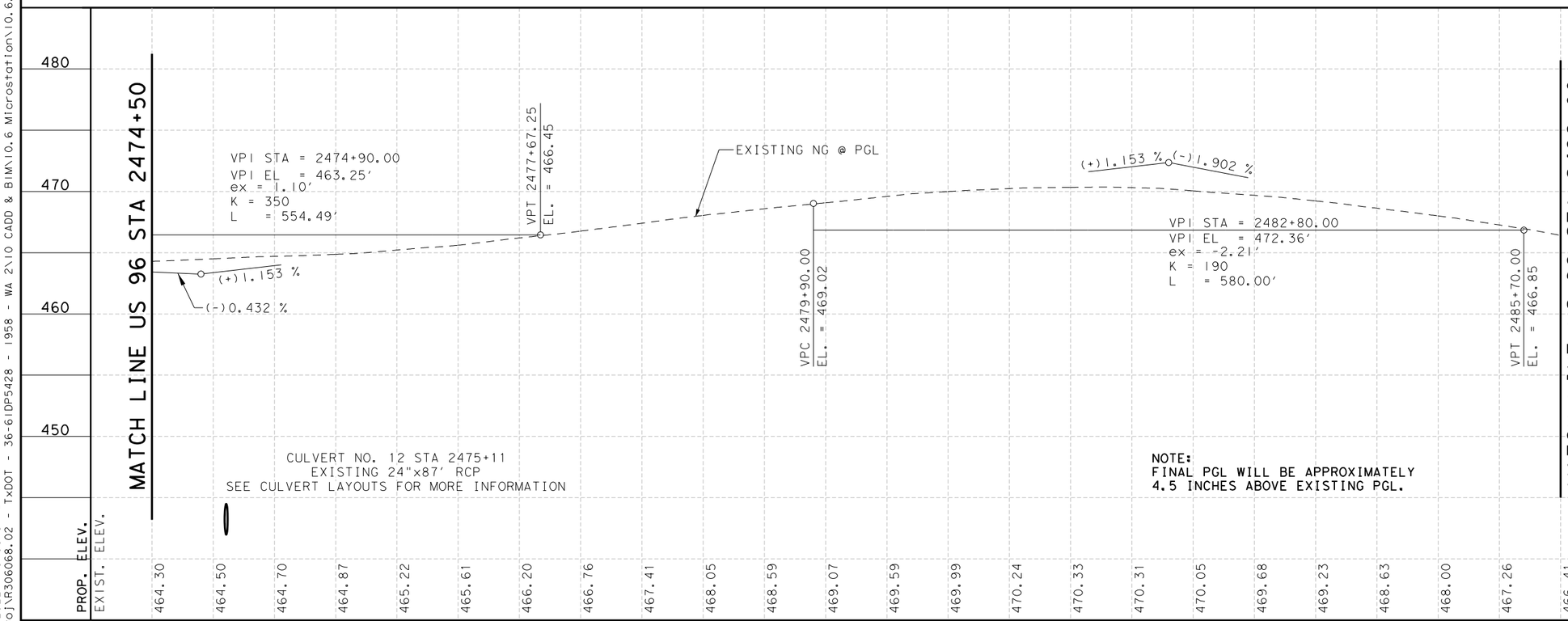
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

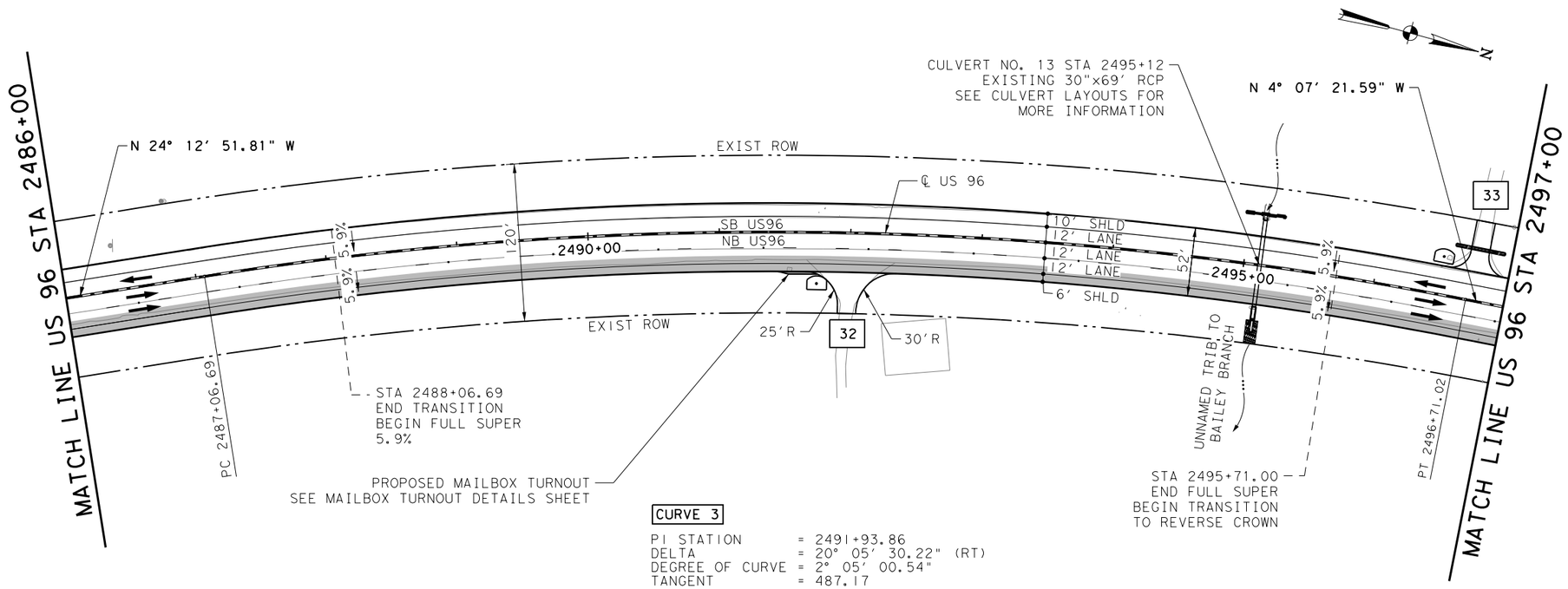
(STA 2474+50 TO STA 2486+00)

(SHEET 17 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		81

9/28/2022 9:08:51 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP17.dgn



CURVE 3

PI STATION	=	2491+93.86
DELTA	=	20° 05′ 30.22" (RT)
DEGREE OF CURVE	=	2° 05′ 00.54"
TANGENT	=	487.17
LENGTH	=	964.33
RADIUS	=	2,750.00
PC STATION	=	2487+06.69
PT STATION	=	2496+71.02

HORIZONTAL SCALE IN FEET: 0 50 100

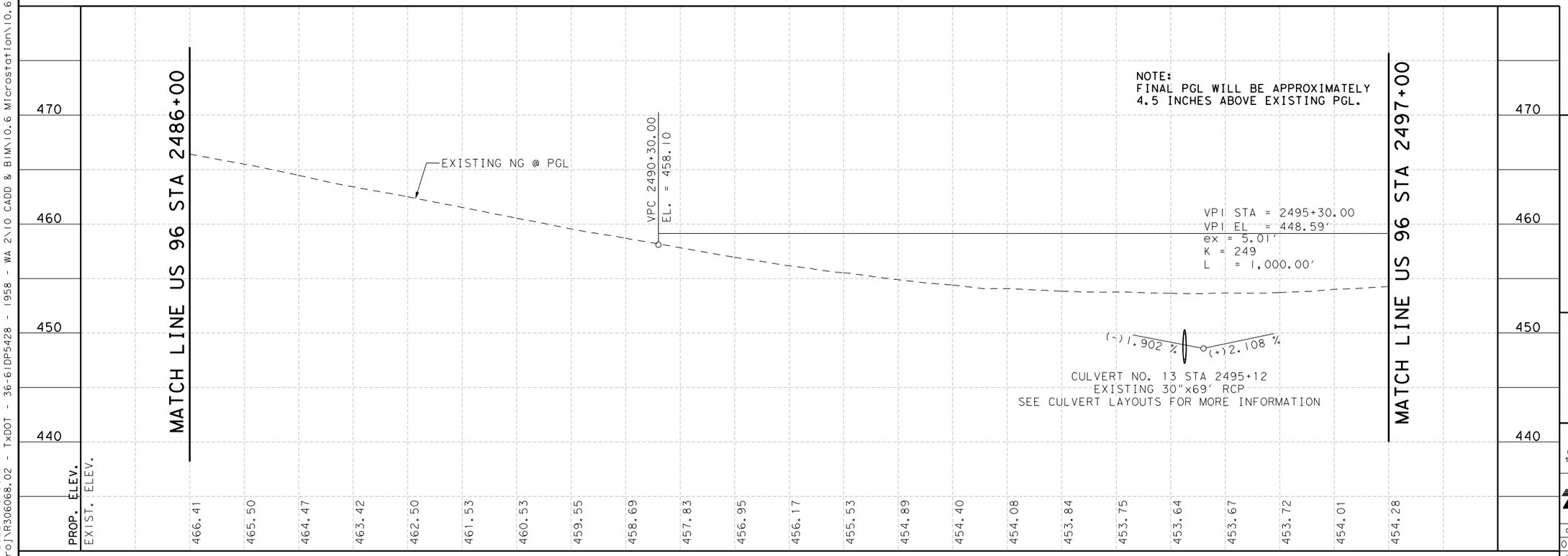
VERTICAL SCALE IN FEET: 0 5 10

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15′ UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100′
V: 1" = 10′

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

(STA 2486+00 TO STA 2497+00)

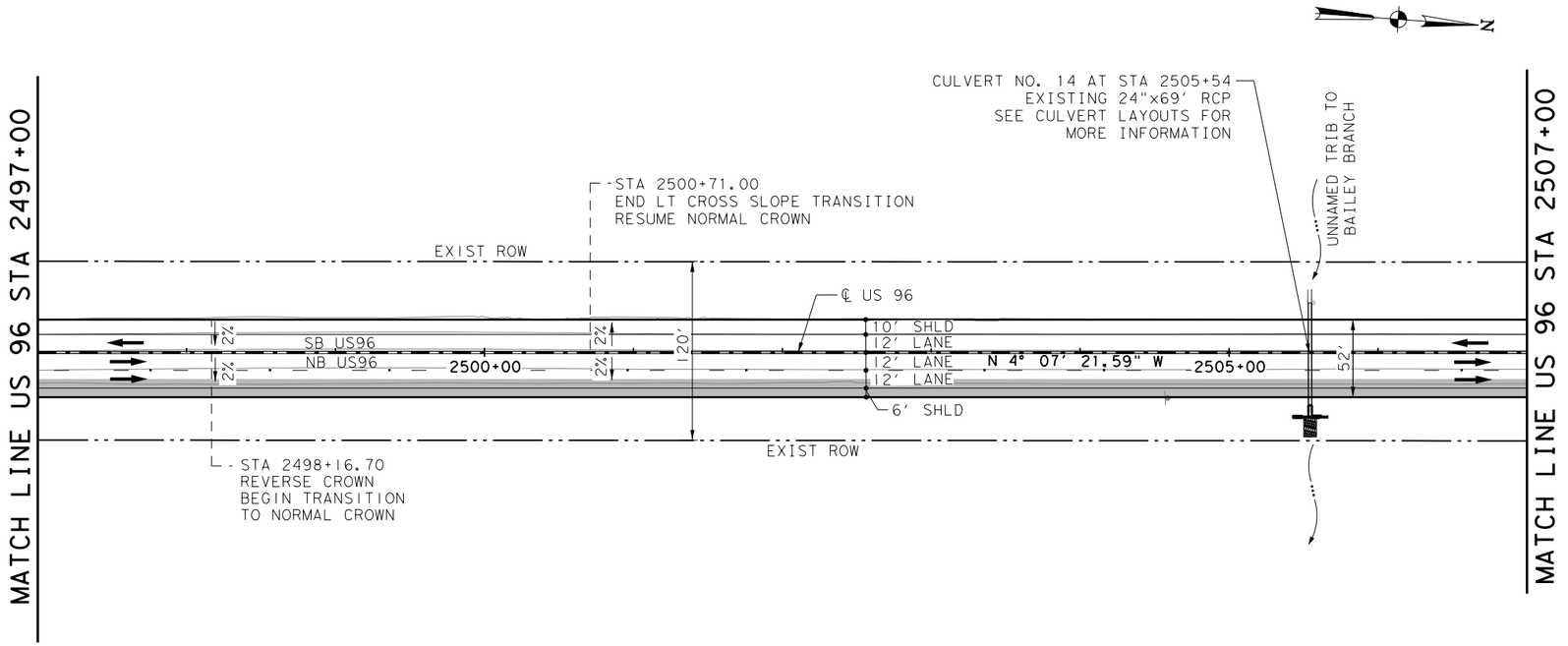
(SHEET 18 OF 25)

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		82

9/28/2022 9:08:51 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP18.dgn



0 50 100
HORIZONTAL SCALE IN FEET

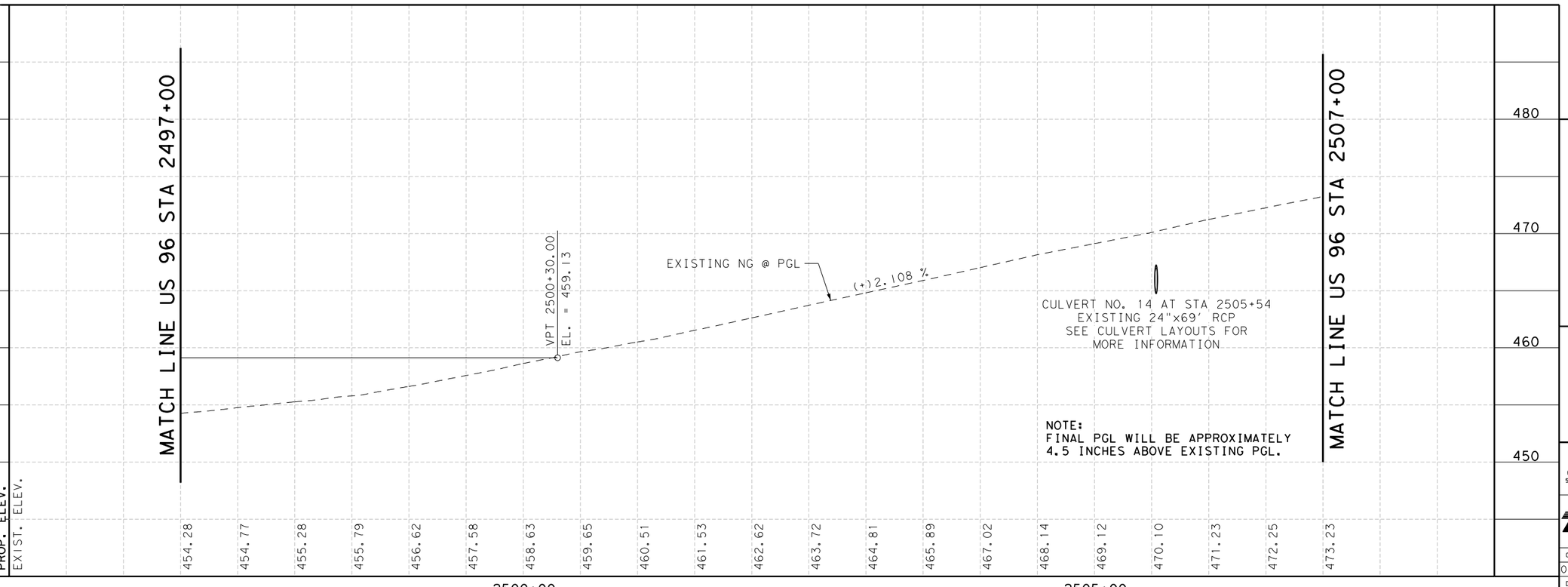
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

(STA 2497+00 TO STA 2507+00)

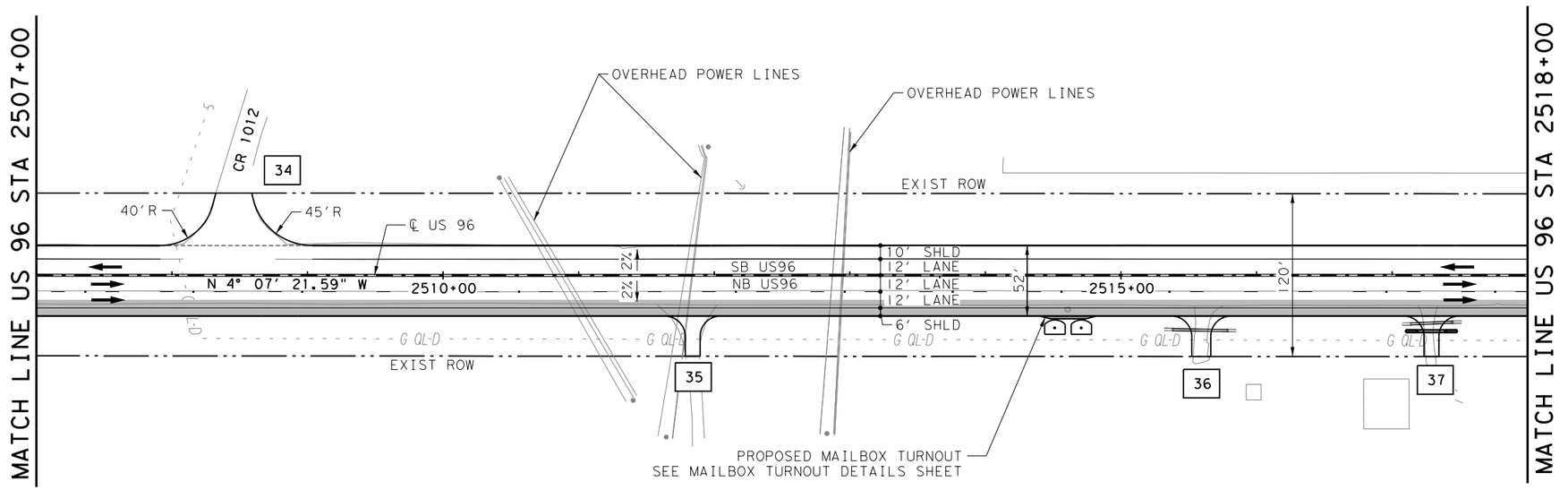
(SHEET 19 OF 25)

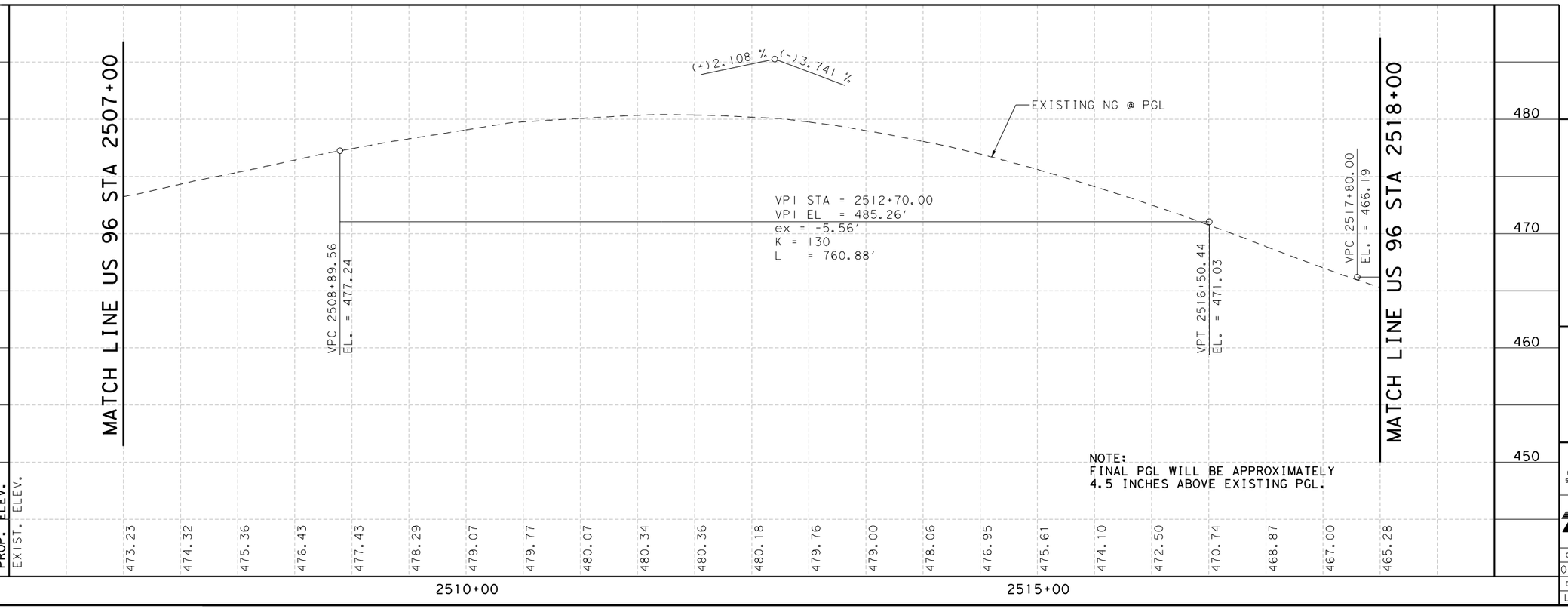
HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		83

9/28/2022 9:08:52 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP19.dgn





0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

N

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.

SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

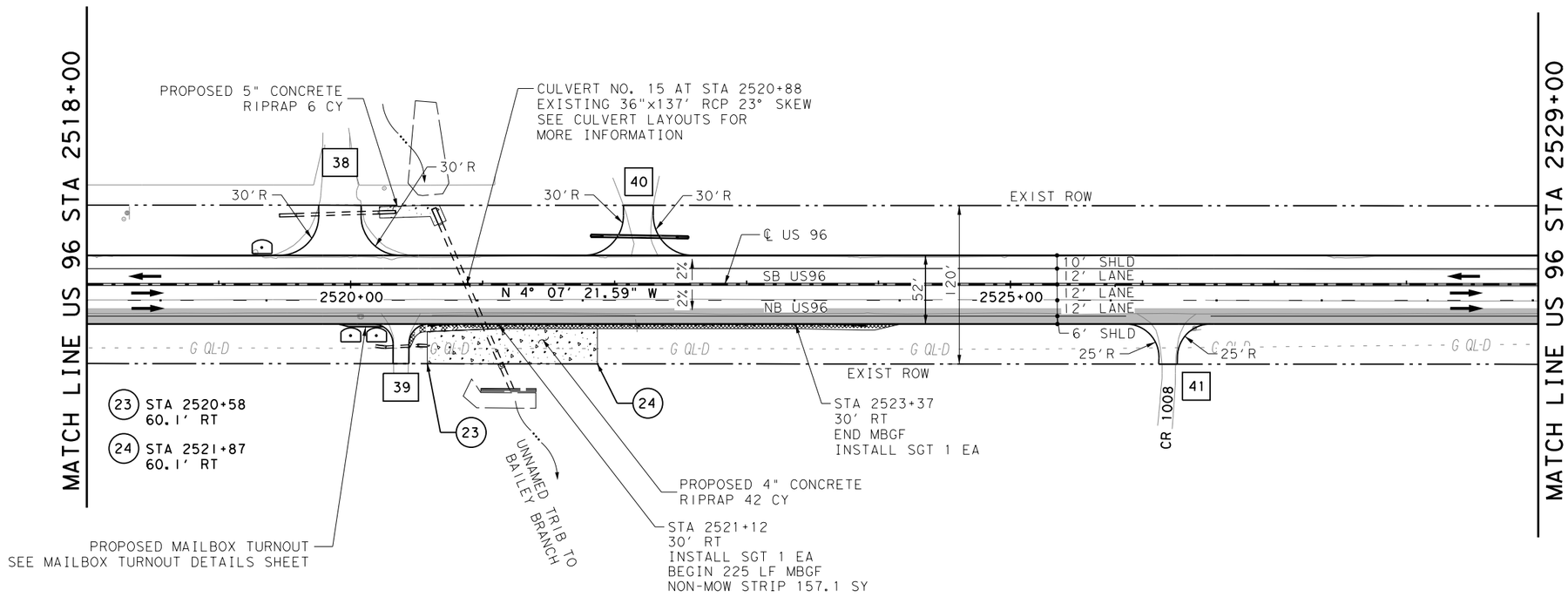
(STA 2507+00 TO STA 2518+00)

(SHEET 20 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		84

9/28/2022 9:08:52 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP20.dgn



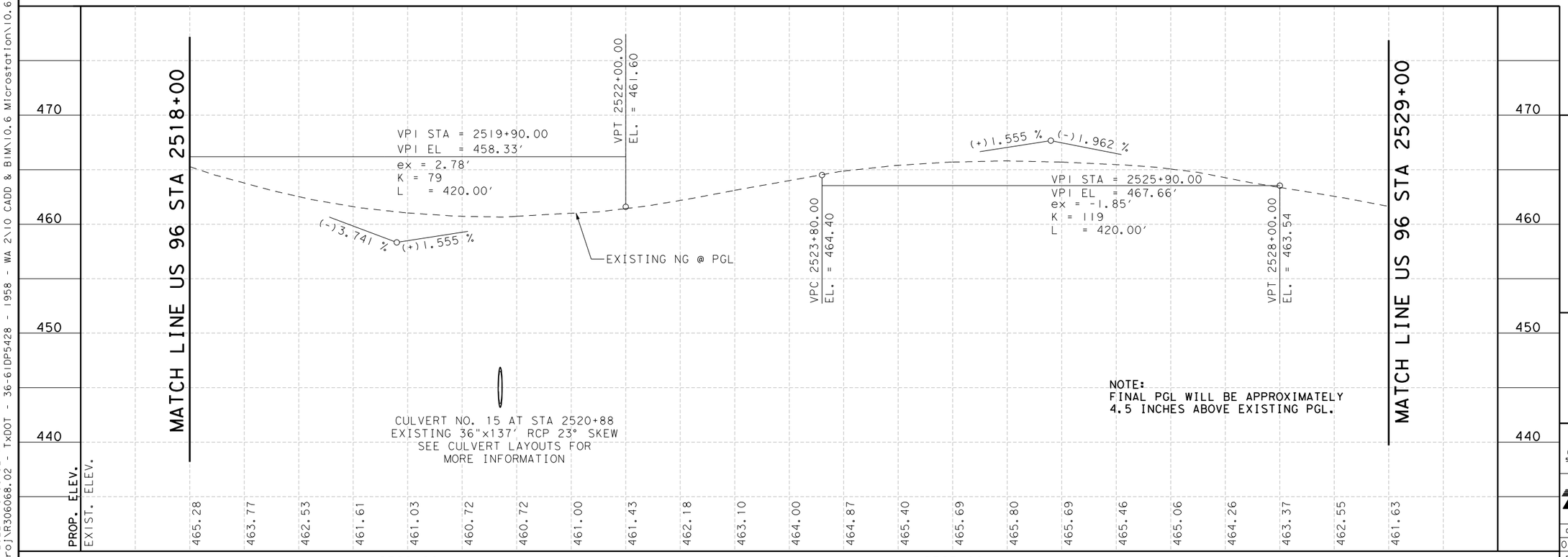
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

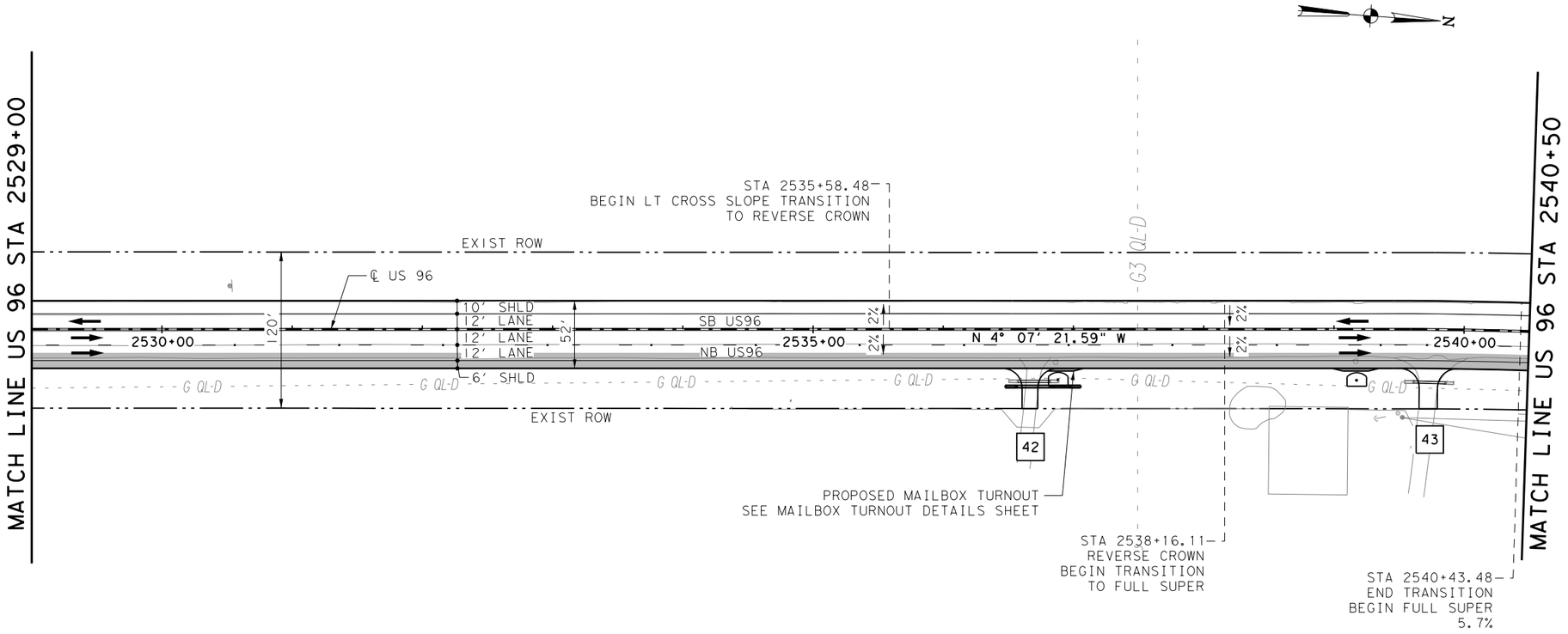
(STA 2518+00 TO STA 2529+00)

(SHEET 21 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		85

9/28/2022 9:08:52 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP21.dgn



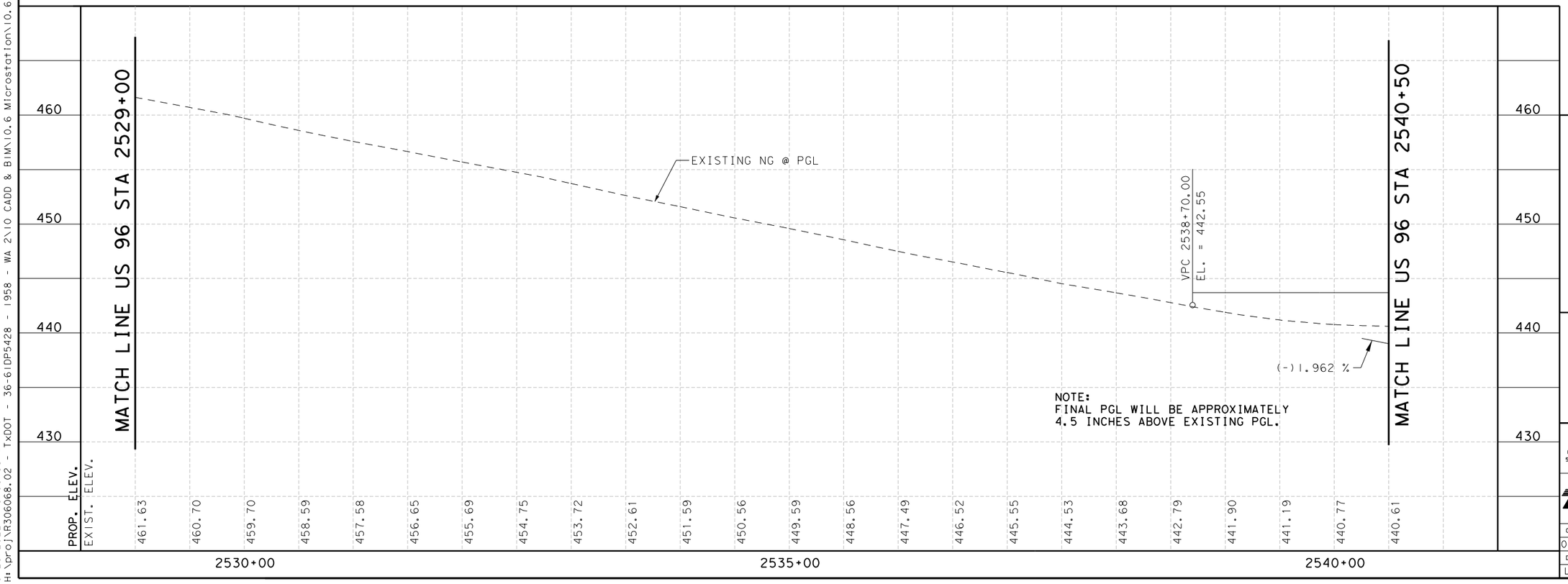
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

(STA 2529+00 TO STA 2540+50)

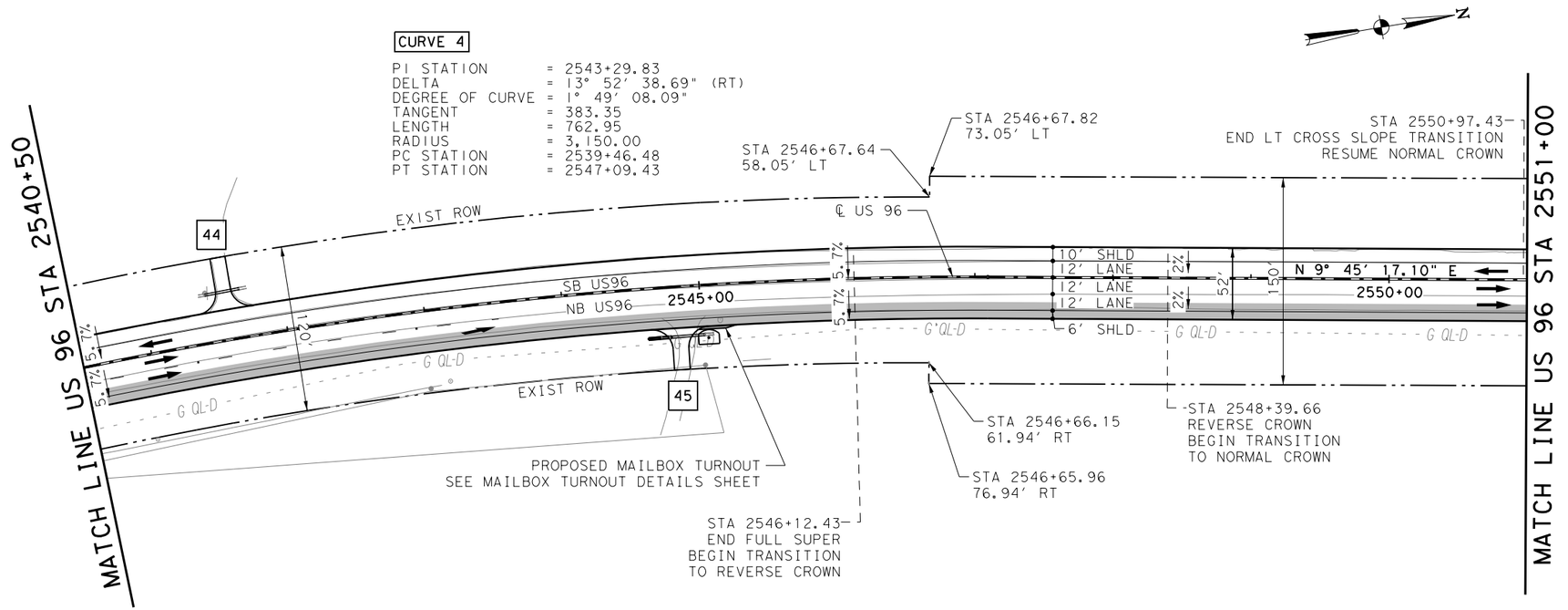
(SHEET 22 OF 25)

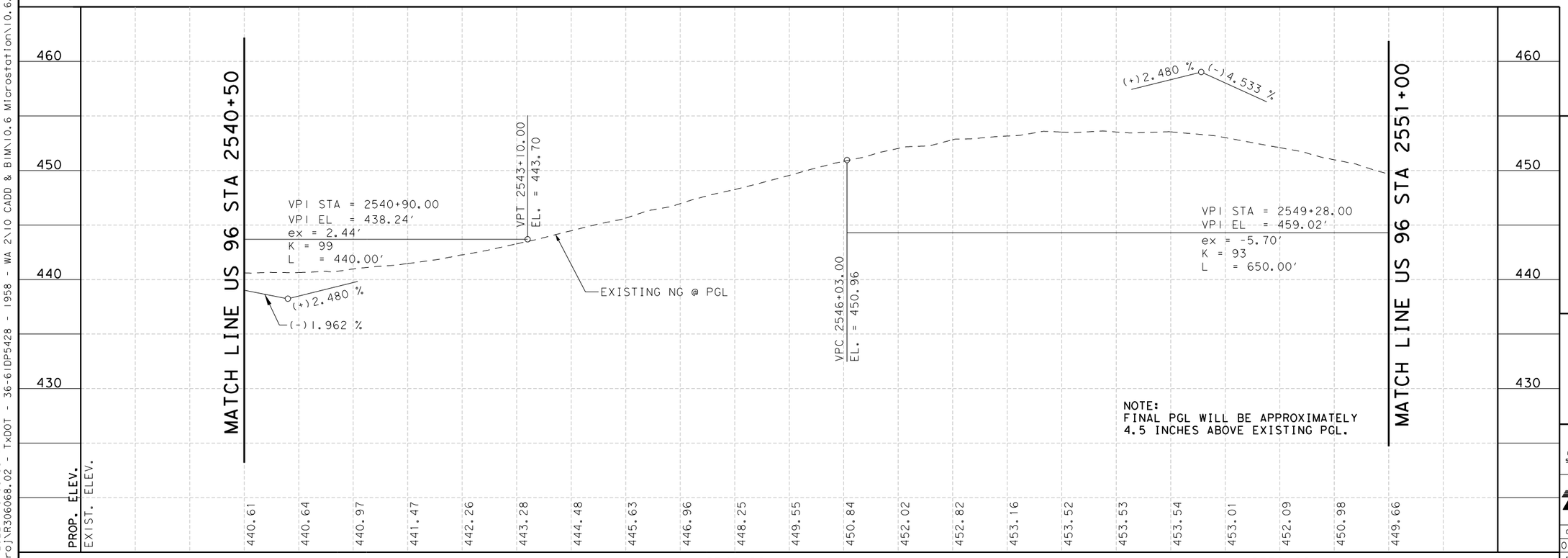
HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		86

9/28/2022 9:08:53 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP22.dgn





SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

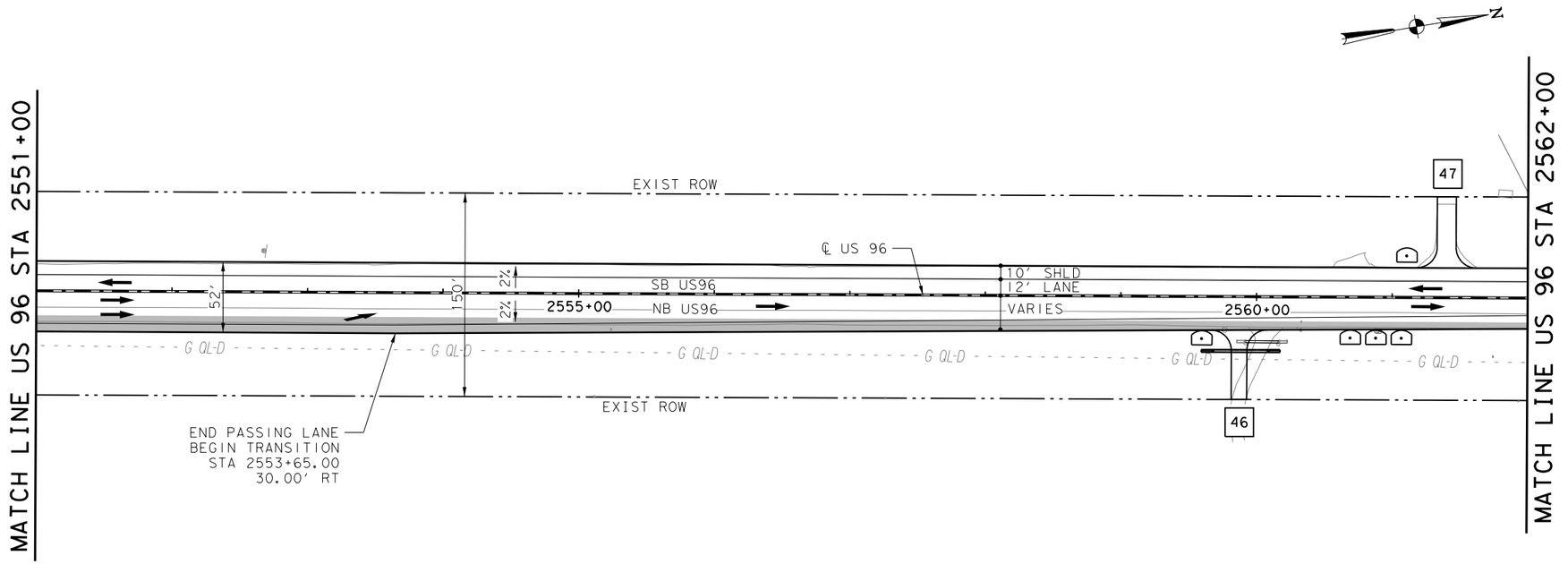
(STA 2540+50 TO STA 2551+00)

(SHEET 23 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		87

9/28/2022 9:08:53 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP23.dgn



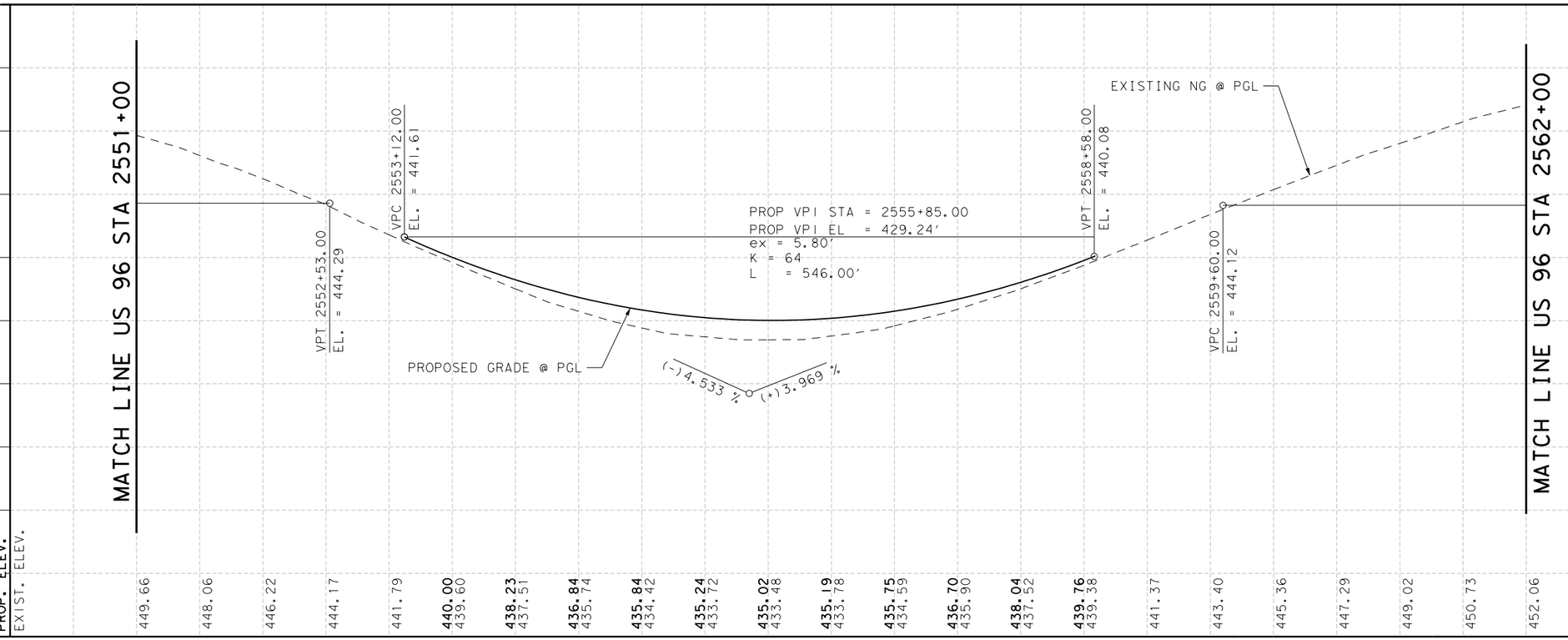
0 50 100
HORIZONTAL SCALE IN FEET
0 5 10
VERTICAL SCALE IN FEET

LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

(STA 2551+00 TO STA 2562+00)

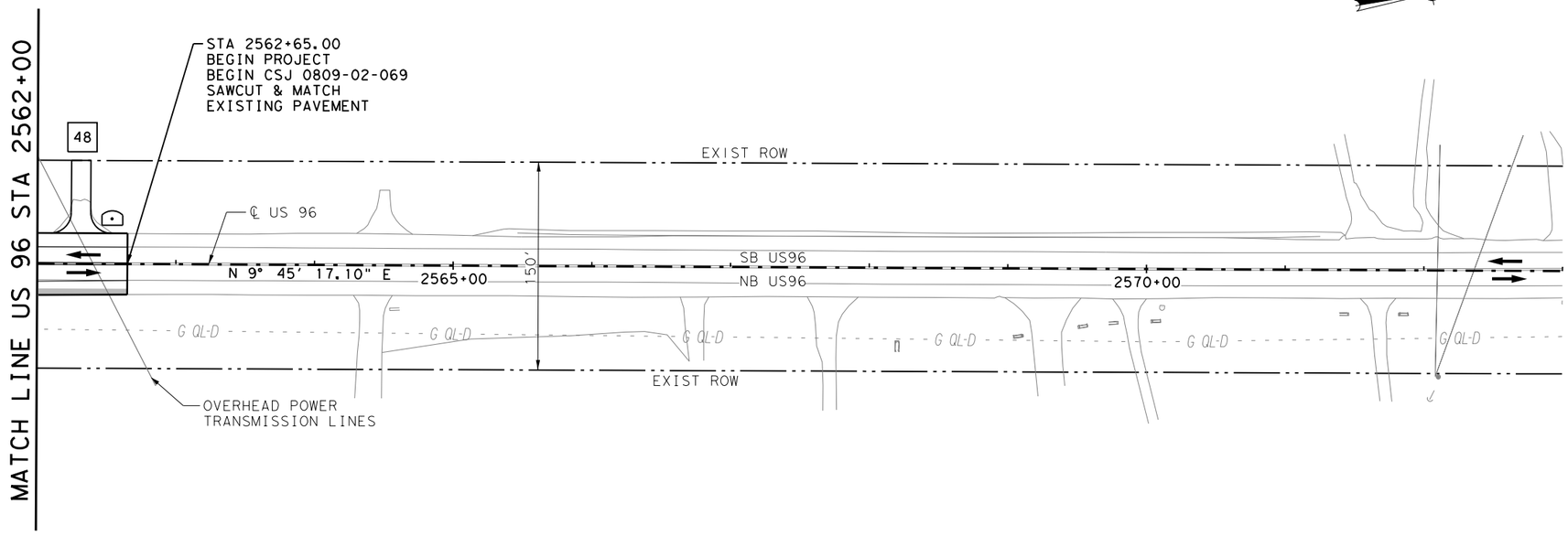
(SHEET 24 OF 25)

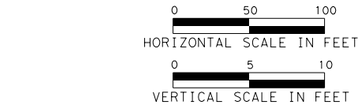
HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		88

9/28/2022 9:08:53 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP24.dgn



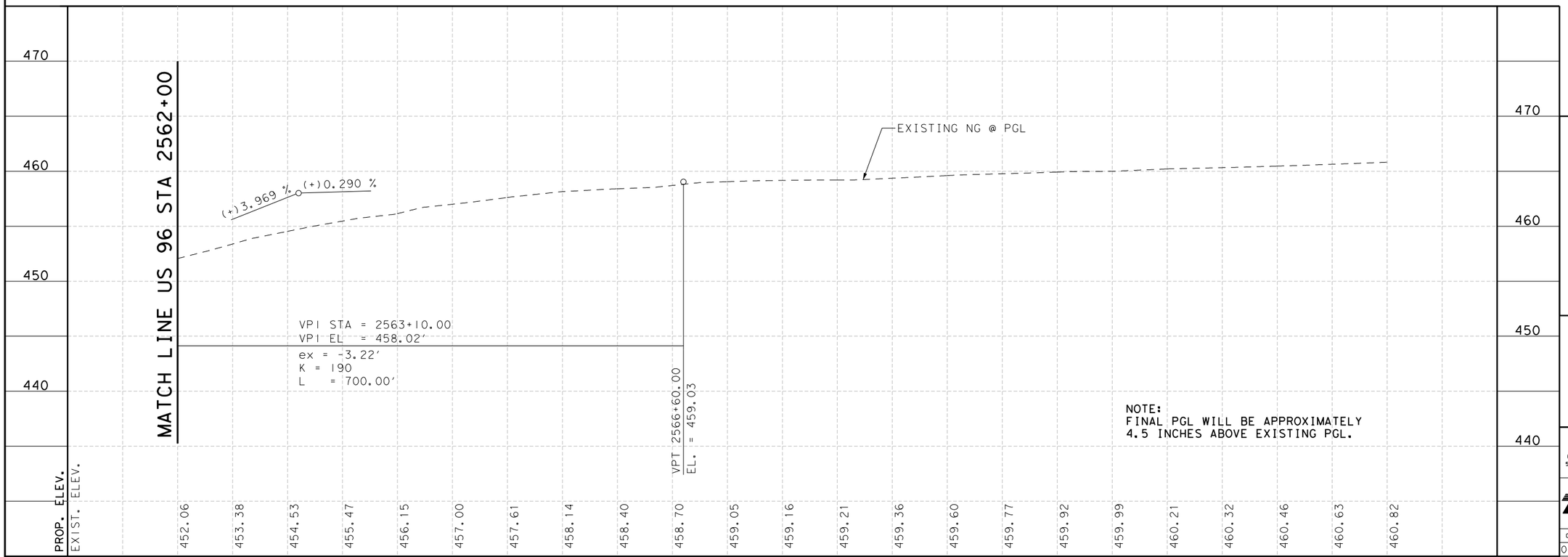


LEGEND

- EXIST ROW
- PROP TRAFFIC
- EXIST TRAFFIC
- PROPOSED WIDENING
- CONCRETE RIPRAP
- HMA NON-MOW STRIP
- UG — EXISTING UNDERGROUND GAS
- EXISTING SIGN
- MAILBOX PROPOSED
- —X— EXISTING FENCE
- C-# CURVE NUMBER
- FLOW DIRECTION
- # DRIVEWAY NUMBER

NOTES:

1. SEE "HORIZONTAL ALIGNMENT DATA" SHEET FOR ALIGNMENT DATA.
2. ALL DRIVEWAY RADII ARE 15' UNLESS NOTED OTHERWISE.



NOTE:
FINAL PGL WILL BE APPROXIMATELY 4.5 INCHES ABOVE EXISTING PGL.

SCALE H: 1" = 100'
V: 1" = 10'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

PLAN & PROFILE

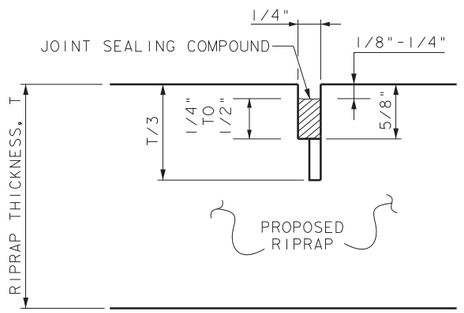
(STA 2562+00 TO BEGIN)

(SHEET 25 OF 25)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

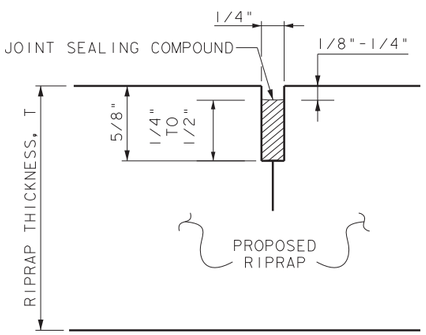
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		89

9/28/2022 9:08:54 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\6802PP25.dgn



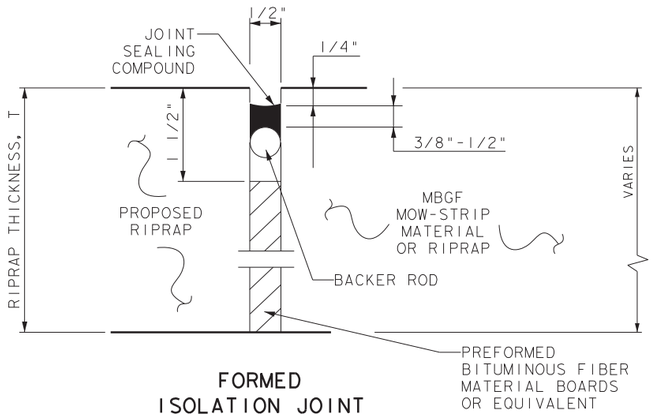
SAWED
CONTRACTION JOINT

NOT TO SCALE



CONSTRUCTION
CONTRACTION JOINT

NOT TO SCALE

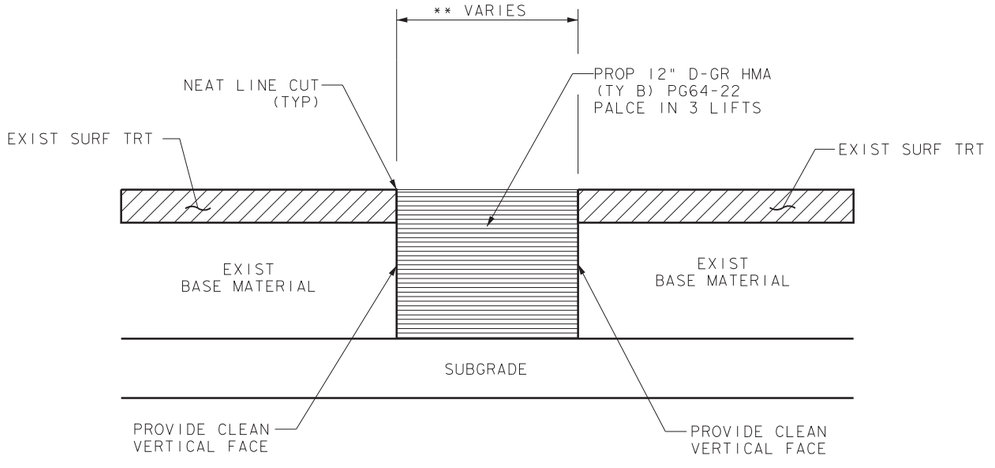


FORMED
ISOLATION JOINT

NOT TO SCALE

NOTES:

1. ISOLATION JOINT TO BE USED AT ALL LOCATIONS WHERE PROPOSED RIPRAP ABUTS TO PROPOSED MBGF MOW-STRIP MATERIAL AND AS DIRECTED BY THE ENGINEER.
2. THE LOCATION OF SAWED OR CONSTRUCTION JOINTS SHALL BE AS SHOWN ELSEWHERE IN THE PLANS OR AS DIRECTED BY THE ENGINEER.
3. THE JOINT RESERVOIR FOR SEALANT SHALL BE SAWED UNLESS OTHERWISE SHOWN ON THE PLANS FOR CONSTRUCTION AND SAWED JOINTS.
4. REFER TO DMS-6310 "JOINT SEALERS AND FILLERS" FOR THE CLASSIFICATIONS.
5. USE JOINT SEALANT CLASS 5 OR 8 FOR ALL JOINT TYPES UNLESS OTHERWISE SHOWN ON THE PLAN OR APPROVED BY THE ENGINEER.
6. THE JOINTS SHALL BE CLEANED IN ACCORDANCE WITH THE ITEM 438 "CLEANING AND SEALING JOINTS".
7. ALL LABOR AND MATERIALS ASSOCIATED WITH THE CONSTRUCTION OF THESE JOINTS WILL BE SUBSIDIARY TO THE APPLICABLE BID ITEMS.



ITEM 351 FULL DEPTH BASE REPAIR DETAIL

NOT TO SCALE
LOCATIONS AS DIRECTED
** MINIMUM DIMENSIONS 6' WIDTH X 15' LENGTH

NOTES:

1. ALL REPAIR AREAS SHALL BE DETERMINED AND MARKED IN THE FIELD BY THE ENGINEER PRIOR TO ANY REPAIR WORK TO BE PERFORMED. BASED ON ACTUAL WORK, FINAL QUANTITIES SHALL BE ADJUSTED AND PAID AS PER ITEM 351.

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

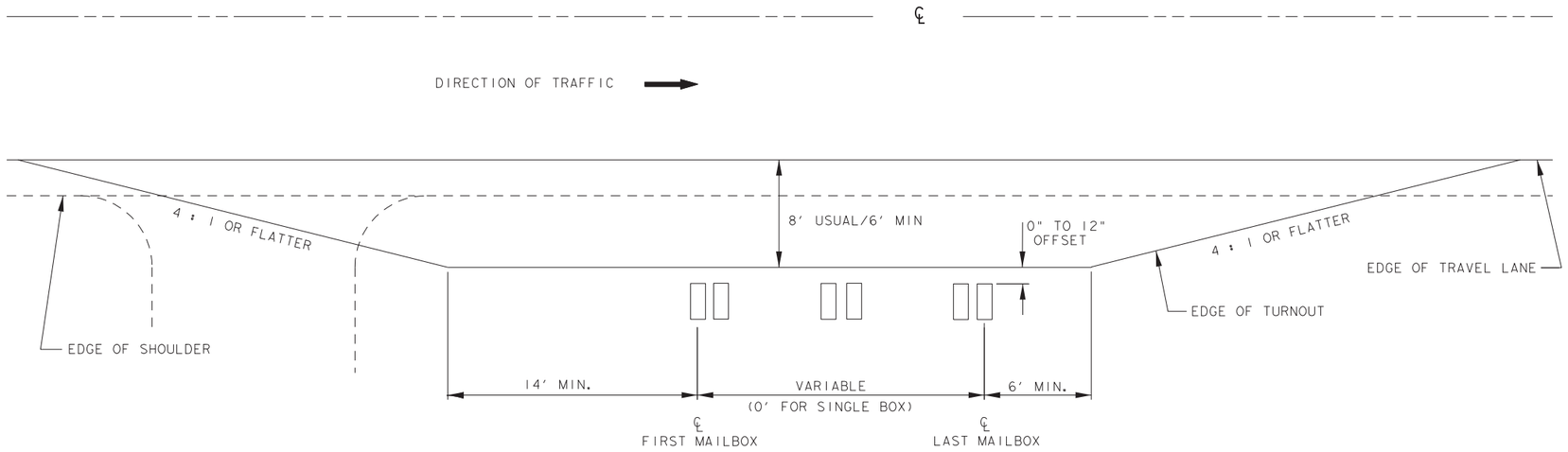
11/2/2021

MISCELLANEOUS ROADWAY DETAILS

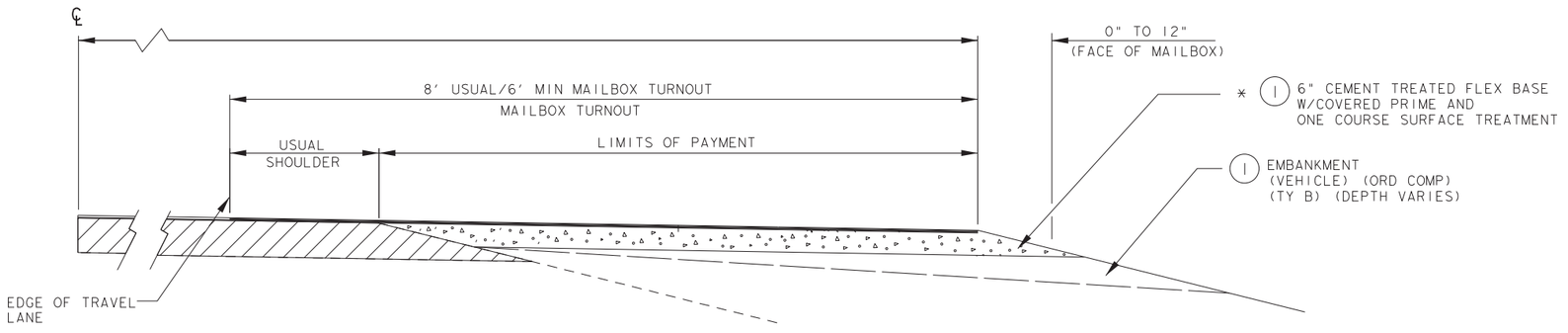
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		90

11/2/2021 3:36:33 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\03*RDWY\6802MISCELLANEOUS ROADWAY DETAILS.dgn



PLAN



TYPICAL SECTION

(1) SUBSIDIARY TO ITEM 530 (TURNOUTS)

* D-GR HMA TY-D PG64-22 (5") MAY BE USED AT THE OPTION OF THE CONTRACTOR IN LIEU OF CEMENT TREAT, FLEX BASE, COVERED PRIME AND SURFACE TREATMENT.
PLACE IN 2 LIFTS UNLESS OTHERWISE APPROVED.

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

NOT TO SCALE

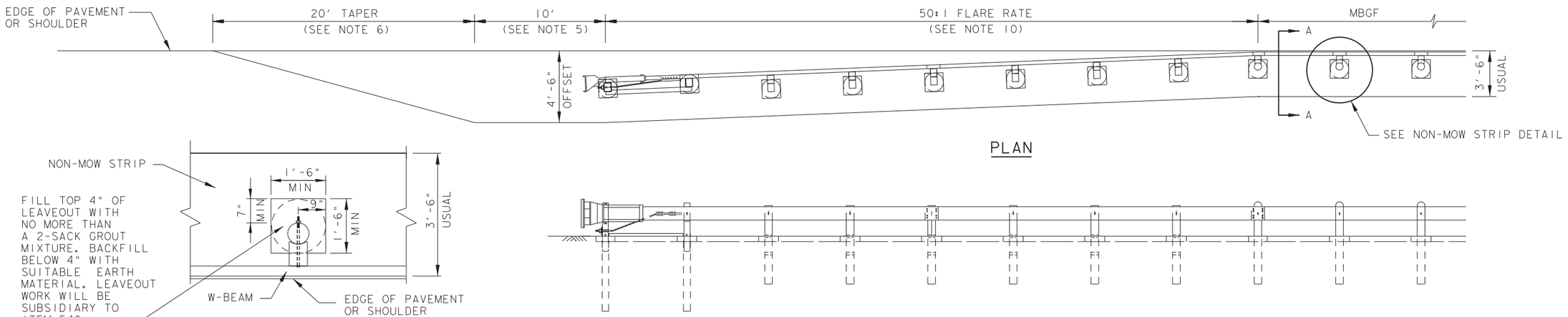
MAILBOX TURNOUT DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		91

11/2/2021 3:36:33 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\Mailbox Turnout Details.dgn

11/2/2021 3:36:34 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\I2*STANDARDS\O2*RDWY\NonMowStripDet*DistStnd.dgn

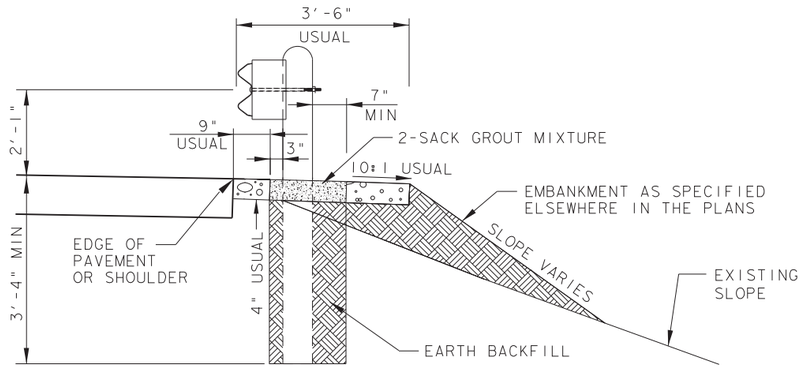


PLAN

ELEVATION

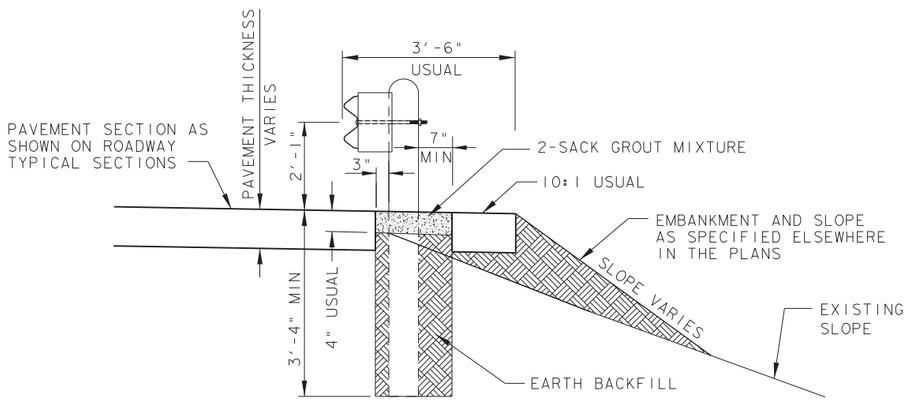
NON-MOW STRIP DETAIL

HOT MIX ASPHALTIC PAVEMENT NON-MOW STRIP
WITH I8"XI8" OR I8" DIA. MINIMUM LEAVEOUT



SECTION A-A

ASPHALTIC NON-MOW STRIP



OPTIONAL SECTION A-A

WIDEN PAVEMENT SECTION

GENERAL NOTES

1. NON-MOW STRIPS SHALL BE HOT MIX ASPHALTIC PAVEMENT UNLESS OTHERWISE SHOWN ON THE PLANS. HOT MIX ASPHALTIC PAVEMENT SHALL MEET THE REQUIREMENTS OF AND BE PLACED IN ACCORDANCE WITH THE PERTINENT BID ITEM AS SHOWN ON THE PLANS. OTHER MATERIALS MAY BE USED AS INDICATED ELSEWHERE IN THE PLANS. MATERIALS FOR THE OPTIONAL WIDENED PAVEMENT SECTION SHALL BE AS SHOWN IN THE ROADWAY TYPICAL SECTIONS.
2. THE TYPE OF APPROVED POST WILL BE SHOWN ELSEWHERE IN THE PLANS. SEE THE APPLICABLE STANDARD SHEETS FOR ADDITIONAL DETAILS AND INFORMATION.
3. THE LIMITS OF PAYMENT FOR HOT MIX ASPHALTIC PAVEMENT WILL INCLUDE LEAVEOUTS FOR POST.
4. THE LEAVEOUTS SHALL BE FILLED WITH NO MORE THAN A 2-SACK GROUT MIXTURE AND PLACED IN ACCORDANCE WITH SECTION 421.2.7, "MORTAR AND GROUT". PAYMENT FOR FURNISHING AND PLACING THE GROUT MIXTURE WILL BE CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.
5. THE NON-MOW STRIP SHALL BE EXTENDED FULL WIDTH FOR I0' IN ADVANCE OF THE GUARDRAIL END TREATMENT UNLESS OTHERWISE DIRECTED BY THE ENGINEER.
6. A 20' TAPER WILL BE USED IN ADVANCE OF GUARDRAIL UNLESS OTHERWISE SHOWN IN THE PLANS, OR DIRECTED BY THE ENGINEER.
7. EXACT LOCATION OF MBGF PLACEMENT WILL BE SHOWN ELSEWHERE IN THE PLANS TO MEET APPROPRIATE CLEAR ROADWAY WIDTH AND CLEAR ZONE REQUIREMENTS.
8. EXCAVATION REQUIRED TO CONSTRUCT NON-MOW STRIP WILL NOT BE MEASURED OR PAID FOR DIRECTLY BUT WILL BE SUBSIDIARY TO PERTINENT ITEMS.
9. THE FLARE RATE MAY BE DECREASED OR ELIMINATED IF DIRECTED BY THE ENGINEER.
10. WHEN THE EXISTING NON-MOW STRIP IS TO REMAIN IN PLACE, FILLING THE EXISTING POST HOLES WITH GROUT AND DIGGING NEW POST HOLES WILL BE SUBSIDIARY. THE TOP 4 INCHES OF A POST HOLE WITHIN AN EXISTING NON-MOW STRIP SHALL BE BACKFILLED WITH HMA. THIS WORK WILL NOT BE PAID FOR BUT WILL BE SUBSIDIARY TO ITEM 542.

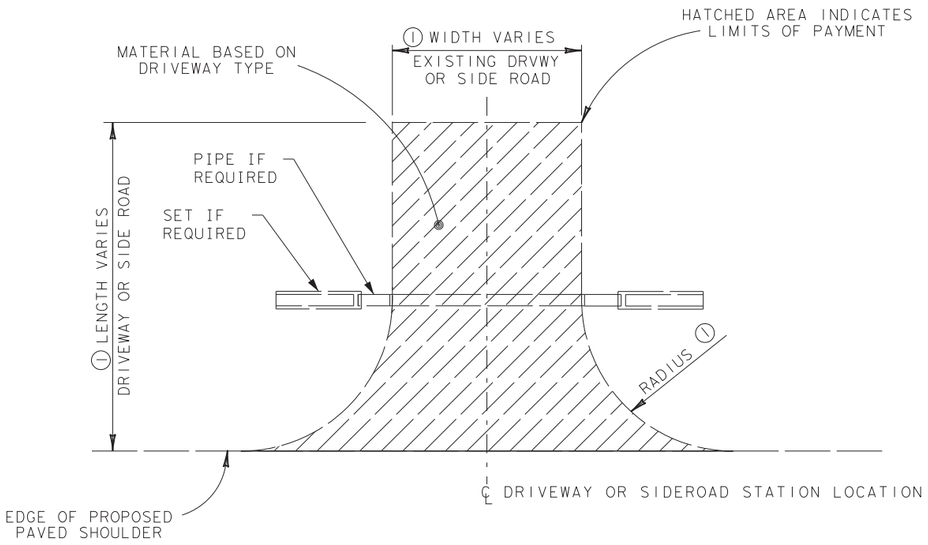
REVISED: 2-19-09
ADDED EDGE OF PAVEMENT OR SHOULDER LINE TO PLAN VIEW AND DETAIL.
REVISED: 7-16-10
CHANGED DEPTH OF NON-MOW STRIP FROM 5" TO 4".
REVISED: 12-30-11
REVISED HEIGHT OF W-BEAM ABOVE PAVEMENT SURFACE
REVISED: 9-29-16
REVISED SLOPE BEHIND POSTS; REMOVED SLOPE GENERAL NOTE
REVISED: 10-20-2016
MODIFIED TITLE BLOCK
REVISED: 04-07-2017
ADDED NOTE 10
REVISED: 07-10-2017
REVISED SLOPE BEHIND MBGF
REVISED: 02-02-2018
REVISED SPECIFICATION REFERENCE IN NOTE 4

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

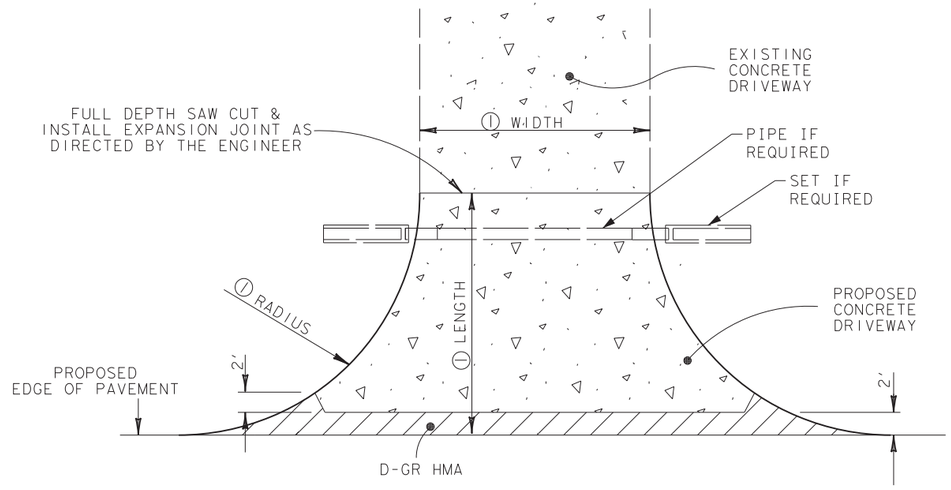
11/2/2021

NON-MOW STRIP DETAILS

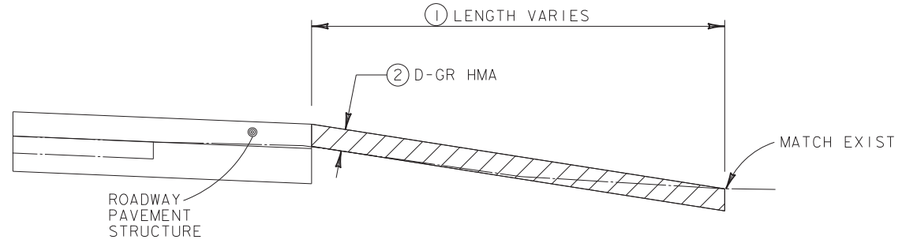
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		92



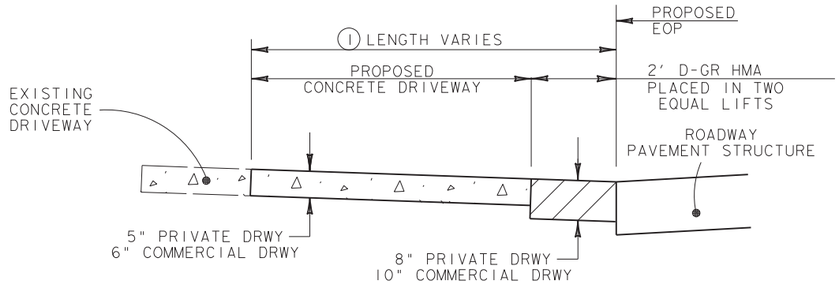
TYPICAL PLAN VIEW OF NON-CONC DRIVEWAYS



TYPICAL PLAN VIEW OF CONCRETE DRIVEWAYS



PROFILE OF ASPHALT DRIVEWAY



PROFILE OF CONCRETE DRIVEWAYS

GENERAL NOTES:

1. CONCRETE SURFACE - USE REINFORCING STEEL CONSISTING OF NO.3 OR 4 BARS MEETING THE REQUIREMENTS OF GRADE 60 REINFORCING STEEL. PLACE BARS ON 12 INCH CENTERS IN EACH DIRECTION, SUPPORTED ON REINFORCING CHAIRS.
2. CONCRETE SURFACE - WELDED WIRE FABRIC WILL NOT BE ALLOWED FOR REINFORCING.
3. CONCRETE SURFACE - UNLESS OTHERWISE DIRECTED, INSTALL 1/2 INCH PREMOLDED EXPANSION JOINT MATERIAL BETWEEN EXISTING CONCRETE AND NEW CONCRETE.
4. PREPARATION AND CONSTRUCTION OF DRIVEWAYS SHALL BE PAID FOR UNDER ITEM 530 DRIVEWAYS. NO ADDITIONAL PAYMENT WILL BE MADE FOR REMOVAL OF EXISTING GRAVEL AND DIRT DRIVEWAYS. THE NECESSARY EXCAVATION, GRADING, COMPACTION, HMA AND INCIDENTALS WILL BE CONSIDERED SUBSIDIARY TO ITEM 530.
5. D-GR HMA TYPE & RATE AS SHOWN ELSEWHERE IN PLANS. FOR D-GR HMA THICKER THAN 4", PLACE IN 2 LIFTS.
6. WHEN EXCAVATION DOES NOT GENERATE ENOUGH MATERIAL TO COMPLETE THE BACKFILL, ADDITIONAL MATERIAL MUST BE APPROVED PRIOR TO USE. ADDITIONAL MATERIAL WILL BE SUBSIDIARY TO VARIOUS BID ITEMS.

DETAIL NOTES:

① SEE SUMMARY ELSEWHERE IN PLANS FOR LENGTH, WIDTH AND RADIUS.

② THICKNESS SHOWN ELSEWHERE IN THE PLANS.

③ FULL DEPTH HMA MAY BE USED IN LIEU OF FLEX BASE, COVERED PRIME & ONE CST.

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

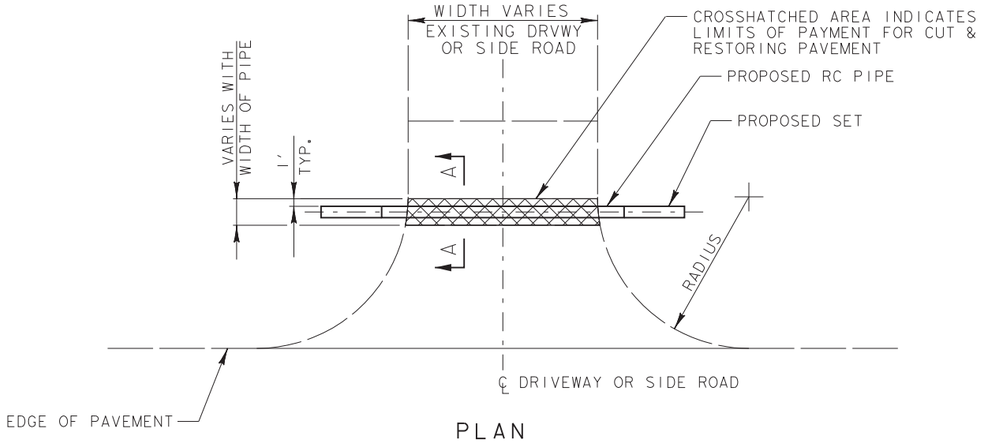
DRIVEWAY & SIDE ROAD DETAILS

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		93

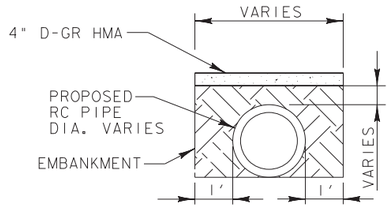
11/2/2021 3:36:34 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\03*RDWY\Driveway-SideRoad-Details-rebuild.dgn

11/2/2021 3:36:34 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\I2*STANDARDS\02*RDWY\DrwySIdrdCut&RePavDet*DistStnd.dgn



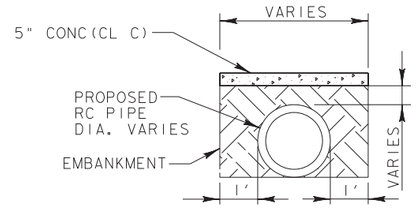
PLAN

DRIVEWAYS & SIDE ROADS



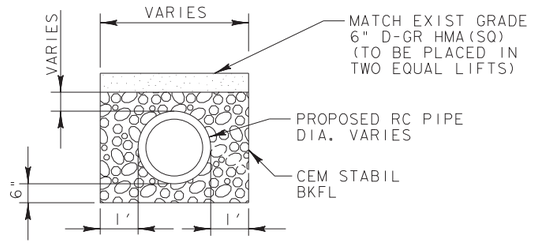
SECTION A-A

DRIVEWAYS (ASPH)
CUT & RESTORE PAV



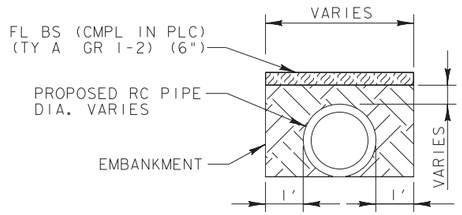
SECTION A-A

DRIVEWAYS (CONC)
CUT & RESTORE PAV



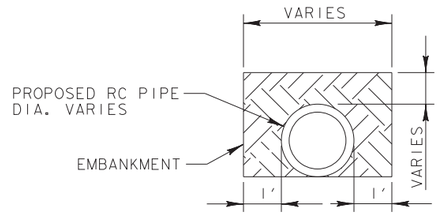
SECTION A-A

SIDE ROADS (ASPH)
CUT & RESTORE PAV
W/ CEM STABIL BKFL



SECTION A-A

DRIVEWAYS & SIDE ROADS
(GRAVEL)



SECTION A-A

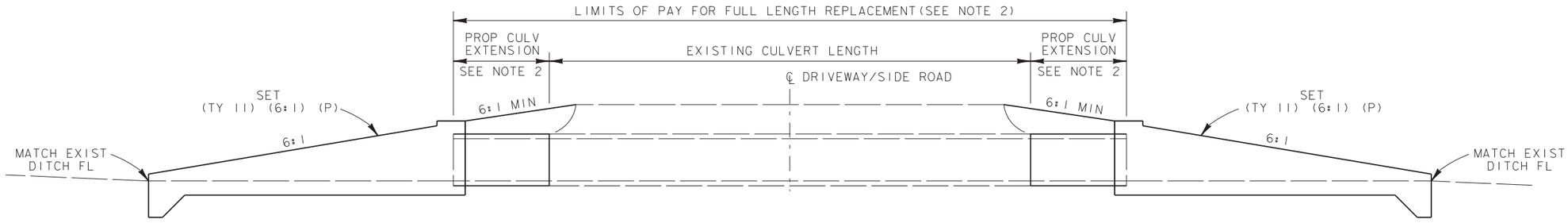
DRIVEWAYS & SIDE ROADS
(GRASS/DIRT)

CONCRETE DRIVEWAY NOTES:

1. USE REINFORCING STEEL CONSISTING OF NO.3 OR 4 BARS MEETING THE REQUIREMENTS OF GRADE 60 REINFORCING STEEL. PLACE BARS ON 12 INCH CENTERS IN EACH DIRECTION, SUPPORTED ON REINFORCING CHAIRS. INSTALL DOWELLS SIX INCHES INTO EXISTING CONCRETE USING EPOXY GROUT.
2. WELDED WIRE FABRIC WILL NOT BE ALLOWED FOR REINFORCING.
3. UNLESS OTHERWISE DIRECTED, INSTALL ½ INCH PREMOLDED EXPANSION JOINT MATERIAL BETWEEN EXISTING CONCRETE AND NEW CONCRETE.
4. UNLESS OTHERWISE DIRECTED, CUT & RESTORE CONCRETE DRIVEWAYS AND SIDEROADS AS SHOWN ABOVE OR TO THE NEAREST JOINT.

DRIVEWAY NOTES:

1. LIMITS OF STRUCTURAL EXCAVATION SHOULD BE DEFINED BY SAWCUTTING AT ASPHALT AND CONCRETE DRIVEWAYS. THIS WORK WILL BE CONSIDERED SUBSIDIARY TO ITEM 400.
2. D-GR HMA TYPE & RATE AS SHOWN ELSEWHERE IN THE PLANS.



CULVERT NOTES:

1. PLACE FULL LENGTH CULVERT REPLACEMENTS SYMMETRICAL ABOUT DRIVEWAY/SIDE ROAD CENTERLINE & AT THE SAME HORIZONTAL OFFSET AS THE ORIGINAL PIPE UNLESS OTHERWISE DIRECTED.
2. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONSTRUCT THE PROPOSED PARALLEL SETs IN SUCH A MANNER AS TO PROVIDE A MINIMUM SIDE SLOPE OF 6:I BETWEEN THE EDGE OF THE DRIVEWAY OR SIDE ROAD PAVEMENT AND THE TOP OF THE SET HEADWALL. ADDITIONAL PIPE NEEDED TO ACQUIRE 6:I MIN SLOPE WILL BE PAID FOR UNDER ITEM 464.

TYPICAL DETAIL
FOR EXTENDING OR REPLACING
PIPE CULVERTS AT DRIVEWAYS & SIDE ROADS

REVISED 12-17
ISSUED 04-09

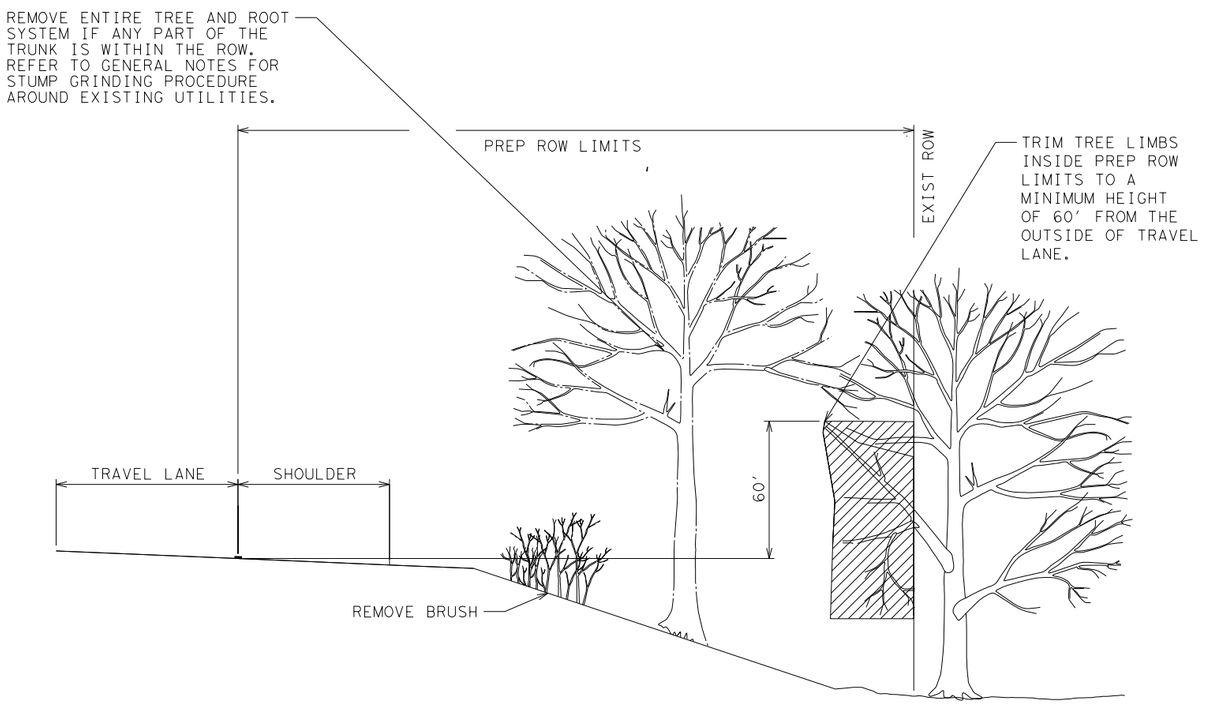
STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

DRIVEWAY & SIDE ROAD CUT & RESTORE PAVEMENT DETAILS

NOT TO SCALE

FED. NO. DIV. NO.	PROJECT NO.		SHEET NO.
6			94
STATE	DISTRICT	COUNTY	
TEXAS	LFK	SHELBY	
CONTROL	SECTION	JOB	HIGHWAY NO.
0809	02	069	US 96



TYPICAL REMOVAL AND TRIM DETAIL

US 96

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

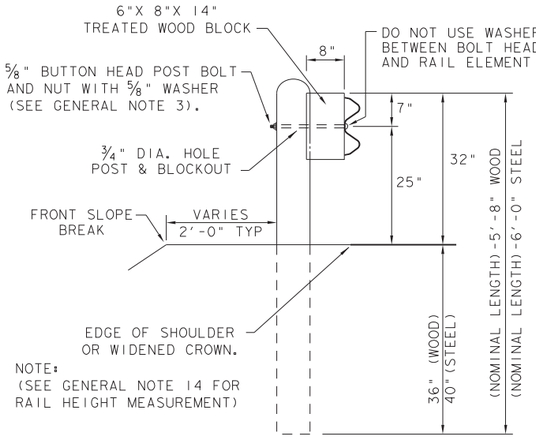
TREE REMOVAL AND TRIMMING DETAILS

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

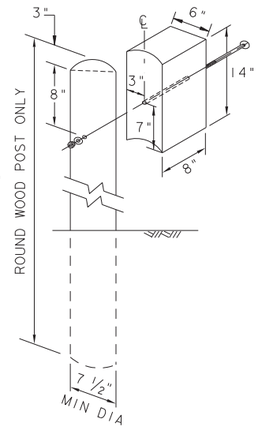
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		94A

9/28/2022 1:50:08 PM
H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\02*RDWY\TREE REMOVAL AND TRIMMING DETAILS.DGN

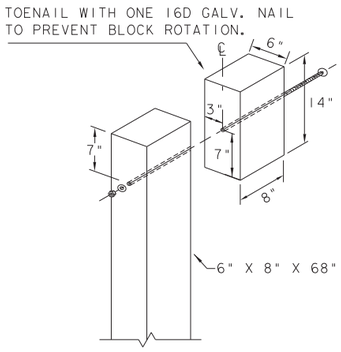
DATE: 11/2/2021
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\02_RDWY\gf3119.dgn



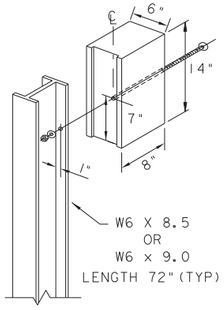
TYPICAL POST PLACEMENT



WOOD BLOCK TO ROUND WOOD POST

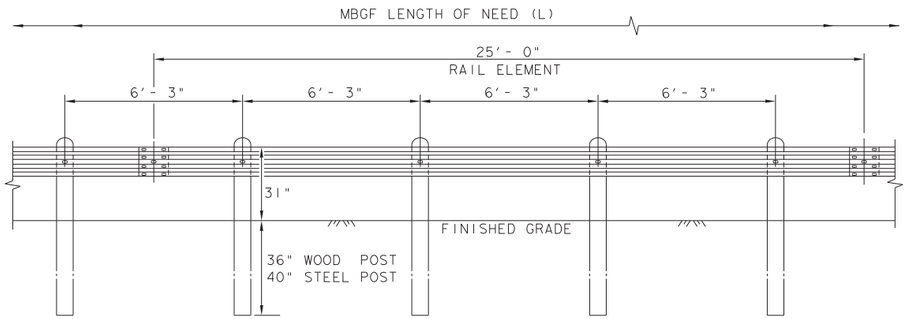


WOOD BLOCK TO RECTANGULAR WOOD POST



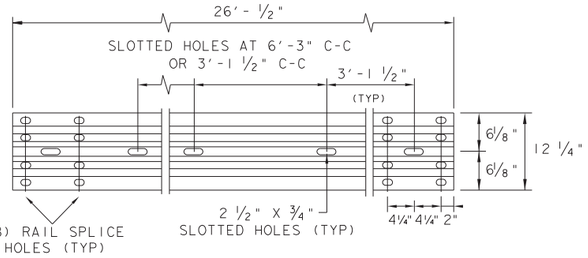
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



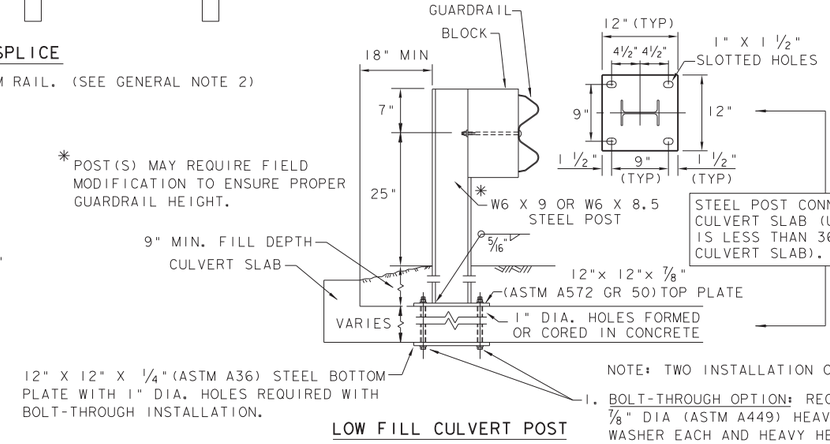
ELEVATION
MID-SPAN RAIL SPLICE

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



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

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

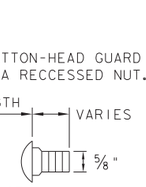
1. BOLT-THROUGH OPTION: REQUIRES A 6" MIN. SLAB THICKNESS. 7/8" DIA (ASTM A449) HEAVY HEX BOLTS WITH TWO HARDENED WASHER EACH AND HEAVY HEX NUTS.
   NOTE: BOLT LENGTH = SLAB PLUS 2 1/4" MIN.

2. EPOXY ANCHOR OPTION: THIS OPTION MAY ONLY BE USED IF THE CULVERT SLAB IS 9" MIN. THICK. THREADED ANCHOR RODS MUST BE 7/8" DIA. ASTM A449 OR A193 GRADE B7 WITH HEAVY HEX NUT, AND ONE HARDENED WASHER EACH. EMBED ANCHOR RODS 6" WITH HILTI HIT RE 500 EPOXY ADHESIVE. OTHER TYPE III CLASS C EPOXY ADHESIVES MEETING THE REQUIREMENTS OF DMS-6100, "EPOXIES AND ADHESIVES", MAY BE USED IF IT CAN BE DEMONSTRATED THAT THEY MEET OR EXCEED THE STRENGTH OF HILTI HIT RE 500 WITH THE SAME EMBEDMENT DEPTH AND THREADED ROD DIA. FOLLOW THE MANUFACTURER'S REQUIREMENTS FOR INSTALLING EPOXIED THREADED RODS. EXTEND RODS 1/4" MIN. BEYOND NUT.

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

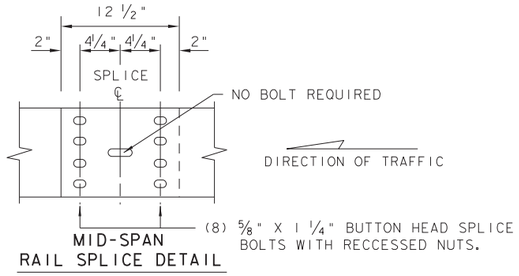
NOTE: TRANSISTIONS TO BRIDGE RAILS OR TRAFFIC BARRIERS.
SEE GF(31)TL3 TR STANDARD FOR HIGH-SPEED TL-3 TRANSITIONS.
SEE GF(31)TL2 TR STANDARD FOR LOW-SPEED TL-2 TRANSITIONS.

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.



BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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

GENERAL NOTES

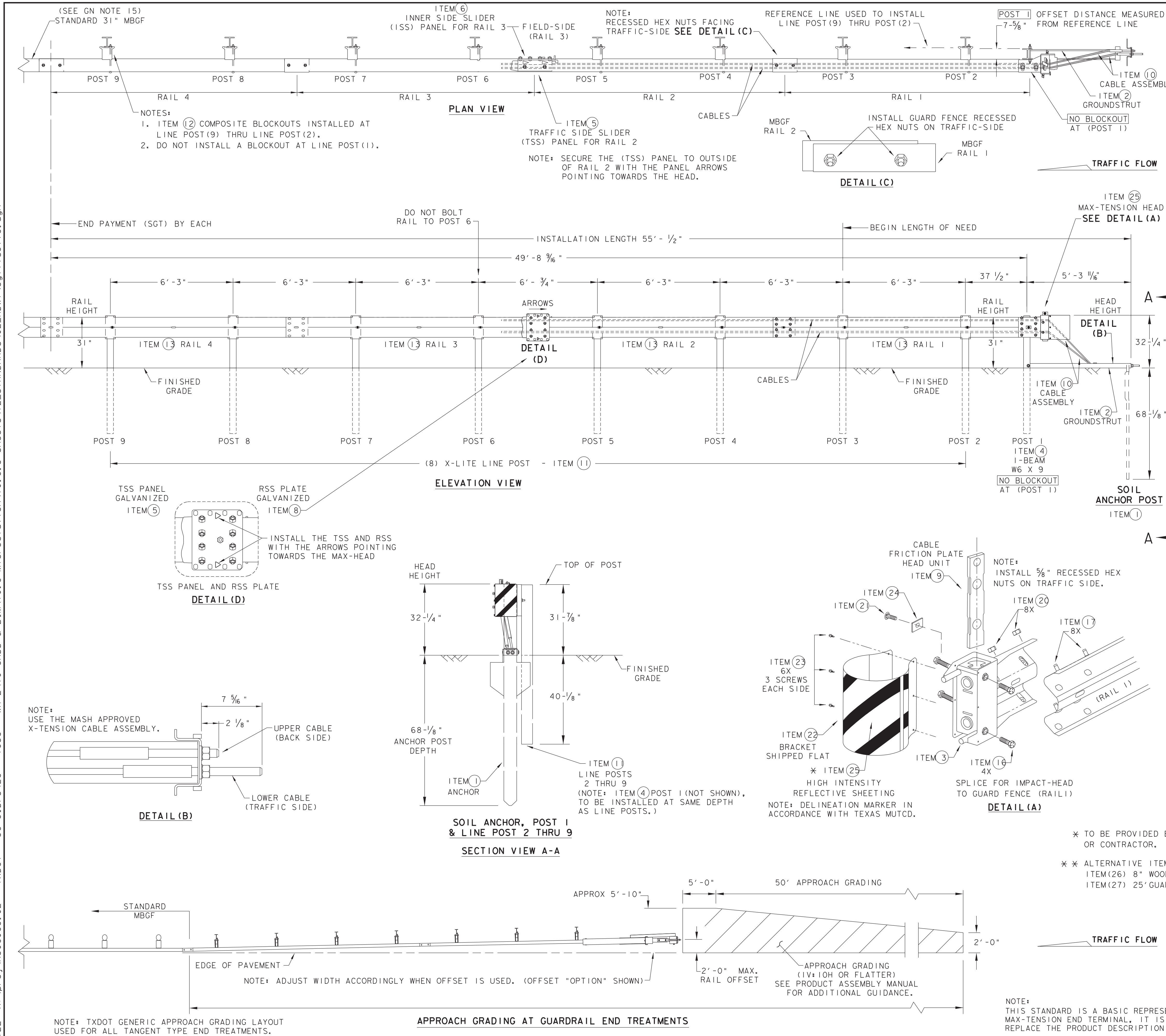
1. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST, OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. THE EXACT POSITION OF MBGF SHALL BE SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. STEEL POSTS TO BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING."
2. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS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

Texas Department of Transportation

Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT		CK: KM	DW: VP		CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0809	02	069		US 96	
	DIST	COUNTY			SHEET NO.	
	LFK	SHELBY			95	



GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

	ITEM#	PART NUMBER	DESCRIPTION	QTY
	1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
	2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
	3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
	4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
	5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
	6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
	7	BSI-1610066-00	TOOTH - GEOMET	1
	8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
	9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
	10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
	11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
	12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
	13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
	14	BSI-1102027-00	X-LITE SQUARE WASHER	1
	15	BSI-2001886	5/8" X 7" THREAD BOLT HH (GR.5)GEOMET	1
	16	BSI-2001885	3/4" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
	17	4001115	5/8" X 1 1/4" GUARD FENCE BOLTS (GR.2)MGAL	48
	18	2001840	5/8" X 10" GUARD FENCE BOLTS MGAL	8
	19	2001636	5/8" WASHER F436 STRUCTURAL MGAL	2
	20	4001116	5/8" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
	21	BSI-2001888	5/8" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
	22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
	23	BSI-2001887	1/4" X 3/4" SCREW SD HH 410SS	7
	24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
*	25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
* *	26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
* *	27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL, 8-SPACE, 12GA.	2
	28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

* * ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25' GUARD FENCE PANELS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE MAX-TENSION END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation — Design Division Standard

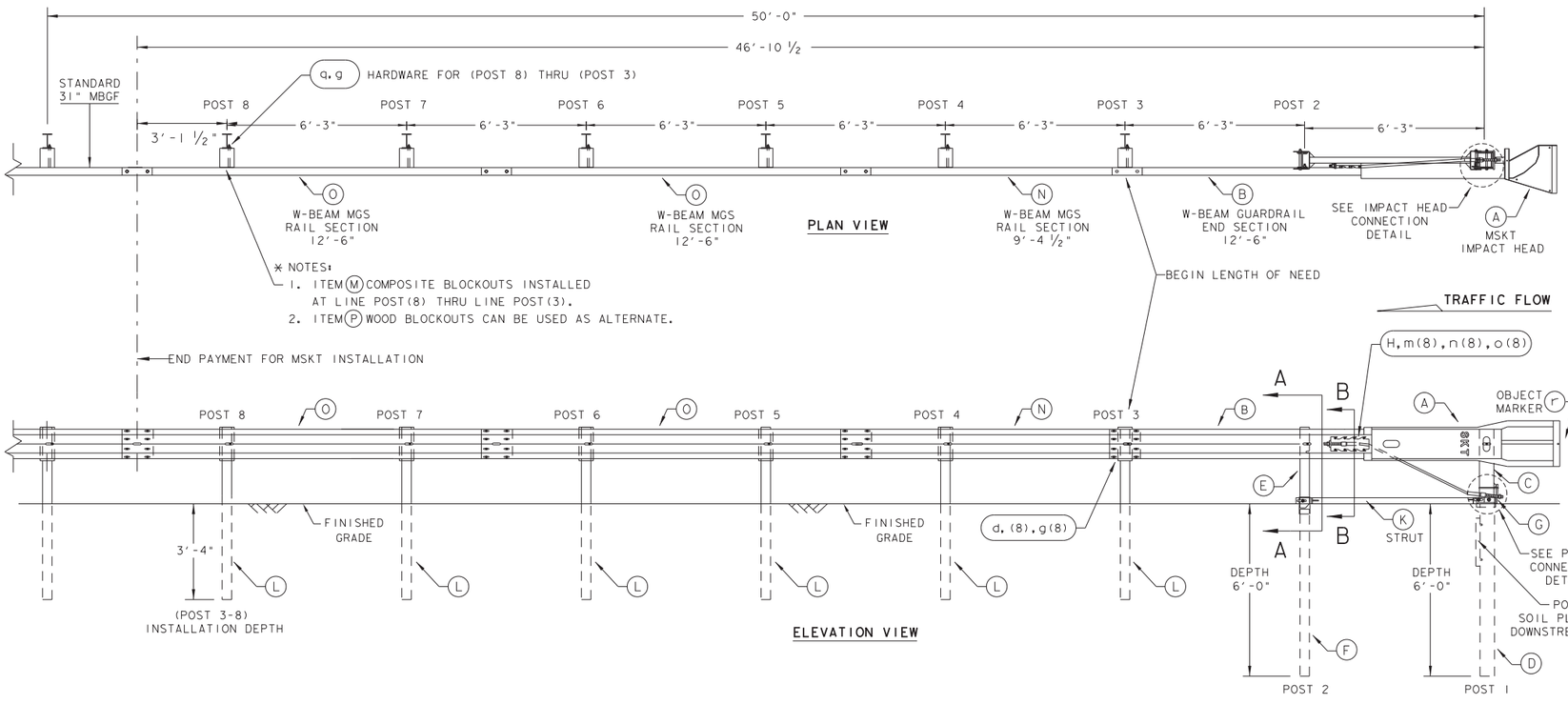
MAX-TENSION END TERMINAL
MASH - TL-3

SGT(11S)31-18

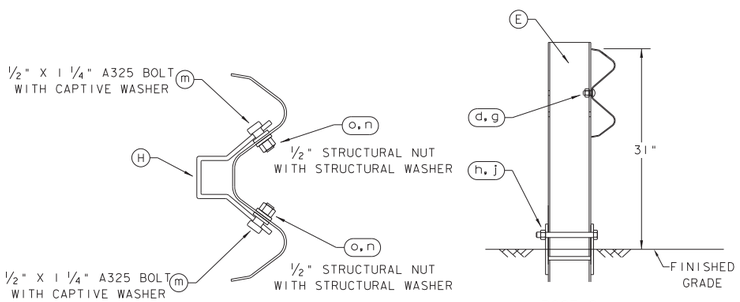
FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST		COUNTY	SHEET NO.
	LFK		SHELBY	96

DATE: 11/2/2021
FILE: H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\01 Mstn\06 Sheets\12 STANDARDS

DATE: 11/2/2021
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\02_RDWY\sgt12s3118.dgn

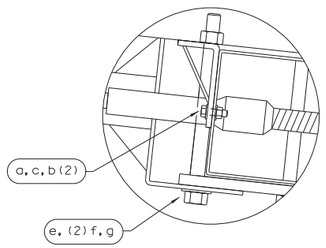


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.

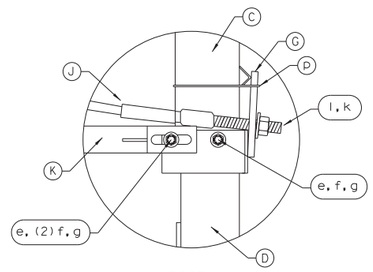


SECTION B-B
ANCHOR BRACKET

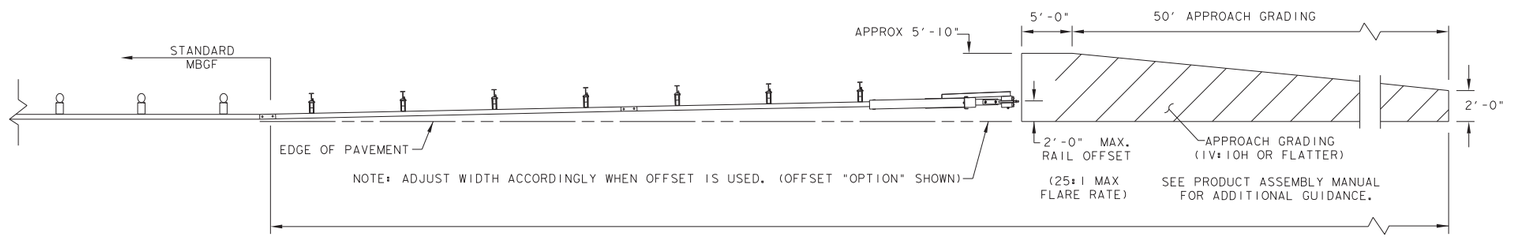
POST 2
SECTION A-A



IMPACT HEAD
CONNECTION DETAIL



POST 1
CONNECTION DETAIL



TRAFFIC FLOW

APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE: MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X 1/8" TUBE)	MTPHP1A
D	1	POST 1 - BOTTOM (6' W6X15)	MTPHP1B
E	1	POST 2 - ASSEMBLY TOP	UHP2A
F	1	POST 2 - ASSEMBLY BOTTOM (6' W6X9)	HP2B
G	1	BEARING PLATE	E750
H	1	CABLE ANCHOR BOX	S760
J	1	BCT CABLE ANCHOR ASSEMBLY	E770
K	1	GROUND STRUT	MS785
L	6	W6x9 OR W6x8.5 STEEL POST	P621
M	6	COMPOSITE BLOCKOUTS	CBSP-14
N	1	W-BEAM MGS RAIL SECTION (9'-4 1/2")	GI2025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	GI203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	GI209
SMALL HARDWARE			
a	2	5/16" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	5/16" WASHER	W0516
c	2	5/16" HEX NUT	N0516
d	25	5/8" Dia. x 1 1/4" SPLICE BOLT (POST 2)	B580122
e	2	5/8" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	5/8" WASHER	W050
g	33	5/8" Dia. H.G.R NUT	N050
h	1	3/4" Dia. x 8 1/2" HEX BOLT (GRD A449)	B340854A
j	1	3/4" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	1/2" x 1 1/4" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	1/2" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x 9/16" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	5/8" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. * *
* ITEM(P) 8" WOOD-BLOCKOUT
* * ITEM(Q) 25'GUARD FENCE PANEL

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL. IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

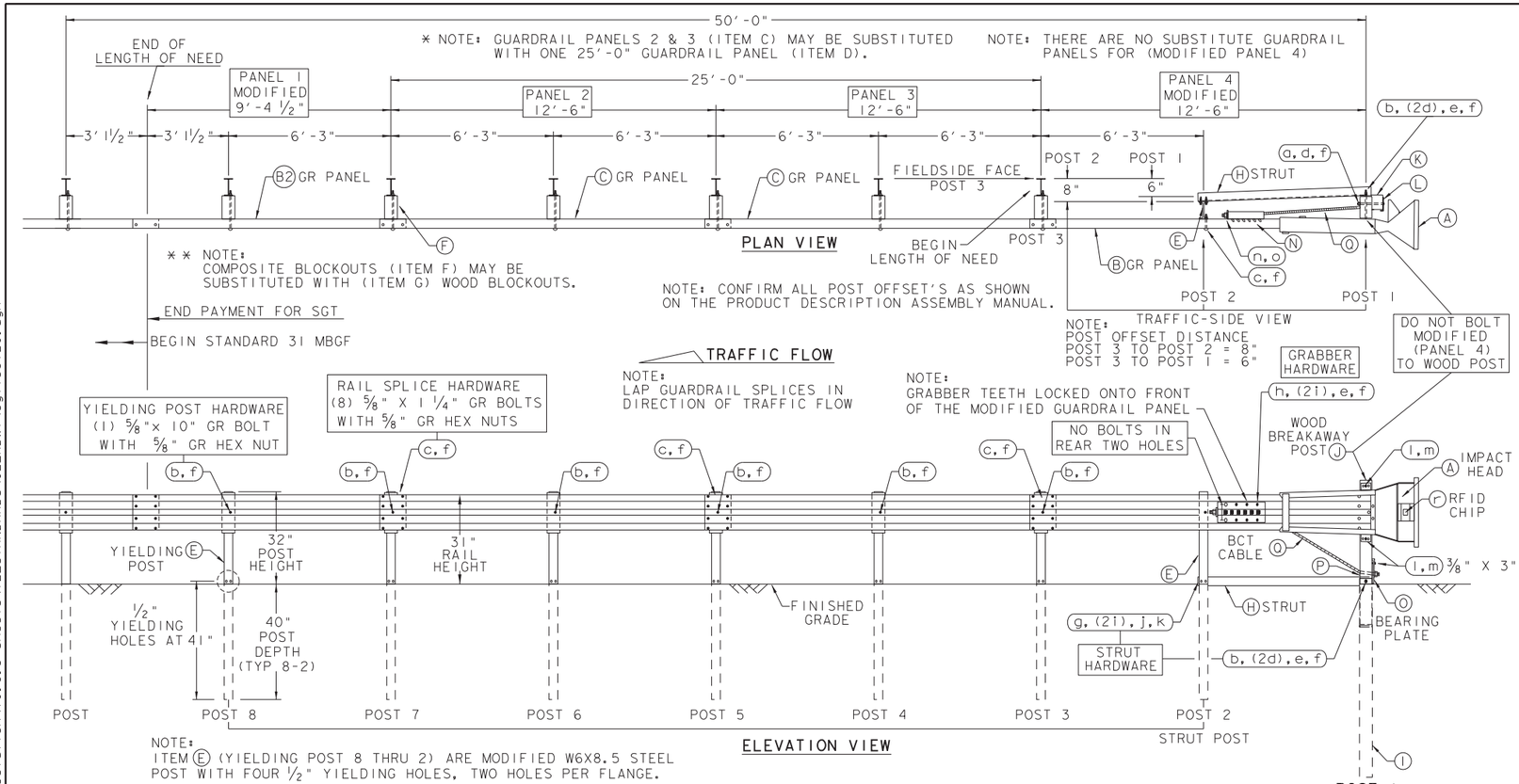
Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL
MSKT-MASH-TL-3
SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		97

DATE: 11/2/2021
FILE: H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\02_RDWY\sgt153120.dgn

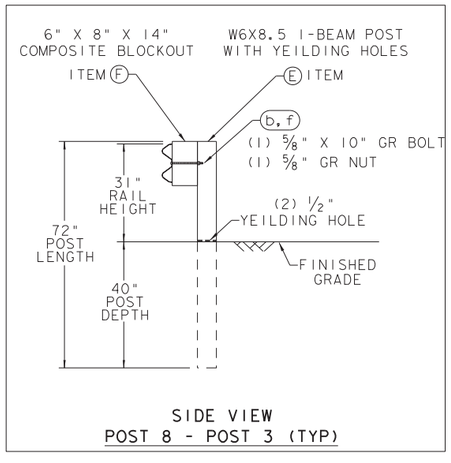


GENERAL NOTES

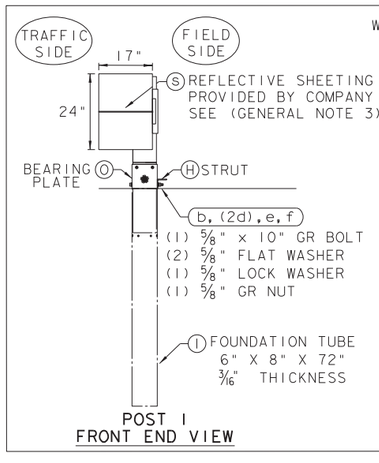
1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: SPIG INDUSTRY, INC. AT 1(267) 644-9510. 14675 INDUSTRIAL PARK RD; BRISTOL, VA 24202
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE MANUFACTURER'S; SGET END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL.
3. MANUFACTURER WILL APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" TO THE FACE PLATE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. THE OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. THE NOMINAL HEIGHT OF THE GUARDRAIL BEAM IS 31 INCHES WITH A TOLERANCE OF +/- ONE INCH.
5. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
6. (POST 2 THROUGH POST 8) ARE MODIFIED STEEL-YIELDING POSTS WITH YIELDING HOLES AT GROUND LEVEL. THERE ARE NO SUBSTITUTE POSTS.
7. POSTS SHALL NOT BE SET IN CONCRETE.
8. IF SOLID ROCK IS ENCOUNTERED FOR ANY OF THE POSTS IN THE SYSTEM, CONTACT THE MANUFACTURER FOR SPECIFIC INSTALLATION GUIDANCE.
9. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445,"GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
10. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS DMS-7210 REQUIREMENTS MAY BE SUBSTITUTED FOR AN APPROVED WOOD BLOCKOUT. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
11. THE ENTIRE SYSTEM MUST BE INSTALLED IN A STRAIGHT LINE WITHOUT ANY CURVE. HOWEVER, THE SYSTEM CAN BE OFFSET BY TWO FEET AS SHOWN ON THE APPROACH GRADING DETAIL TO HELP OFF-SET THE IMPACT HEAD FROM SHOULDER OF THE ROAD.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM #
A	1	SGET IMPACT HEAD	SIH1A
B	1	MODIFIED GUARDRAIL PANEL 12'-6" 12GA	126SPZGP
B2	1	MODIFIED GUARDRAIL PANEL 9'-4 1/2" 12GA	GP94
C	2	STANDARD GUARDRAIL PANEL 12'-6" 12GA	GP126
D	1	STANDARD GUARDRAIL PANEL 25'-0" 12GA	GP25
E	7	MODIFIED YIELDING I-BEAM POST W6x8.5	YP6MOD
F	6	COMPOSITE BLOCKOUT 6" X 8" X 14"	CBO8
G	6	WOOD BLOCKOUT 6" X 8" X 14"	WBO8
H	1	STRUT 3" X 3" X 80" x 1/4" A36 ANGLE	STR80
I	1	FOUNDATION TUBE 6" X 8" X 72" x 3/16"	FNDT6
J	1	WOOD BREAKAWAY POST 5 1/2" x 7 1/2" x 50"	WBRK50
K	1	WOOD STRIKE BLOCK	WSBLK14
L	1	STRIKE PLATE 1/4" A36 BENT PLATE	SPLT8
M	1	REINFORCEMENT PLATE 12 GA. GR55	REPLT17
N	1	GUARDRAIL GRABBER 2 1/2" X 2 1/2" X 16 1/2"	GGR17
O	1	BEARING PLATE 8" X 8 5/8" X 5/8" A36	BPLT8
P	1	PIPE SLEEVE 4 1/4" X 2 3/8" O.D. (2 1/8" I.D.)	PSLV4
Q	1	BCT CABLE 3/4" X 81" LENGTH	CBL81
		SMALL HARDWARE	
a	1	5/8" X 12" GUARDRAIL BOLT 307A HDG	12GRBLT
b	7	5/8" X 10" GUARDRAIL BOLT 307A HDG	10GRBLT
c	33	5/8" X 1 1/4" GR SPLICE BOLTS 307A HDG	1GRBLT
d	3	5/8" FLAT WASHER F436 A325 HDG	58FW436
e	1	5/8" LOCK WASHER HDG	58LW
f	39	5/8" GUARDRAIL HEX NUT HDG	58HN563
g	2	1/2" X 2" STRUT BOLT A325 HDG	2BLT
h	6	1/2" X 1 1/4" PLATE BOLT A325 HDG	125BLT
i	16	1/2" FLAT WASHER F436 A325 HDG	12FWF436
j	8	1/2" LOCK WASHER HDG	12LW
k	8	1/2" HEX NUT A563 HDG	12HN563
l	4	3/8" X 3" HEX LAG SCREW GR5 HDG	38LS
m	4	3/8" FLAT WASHER F436 A325 HDG	38FW844
n	2	1" FLAT WASHER F436 A325 HDG	1FWF436
o	2	1" HEX NUT A563DH HDG	1HN563
p	1	18" TO 24" LONG ZIP TIE RATED 175-200LB	ZPT18
q	1	1 1/2" X 4" SCH-40 PVC PIPE	PSPCR4
r	1	RFID CHIP RATED MIL-STD-810F	RFID810F
s	1	IMPACT HEAD REFLECTIVE SHEETING	RS30M

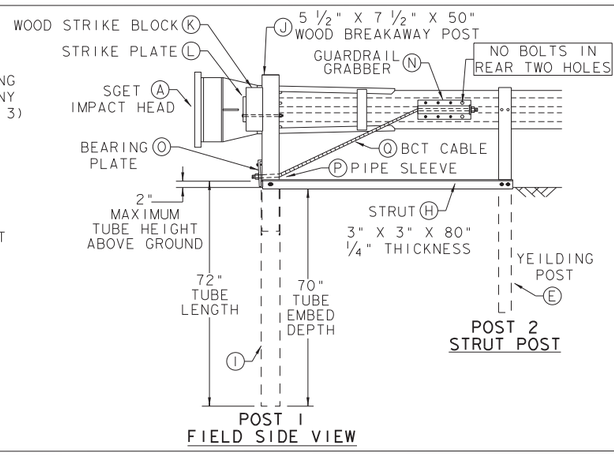
* ALTERNATIVE ITEMS
** NOTE: SEE PLAN VIEW



SIDE VIEW
POST 8 - POST 3 (TYP)

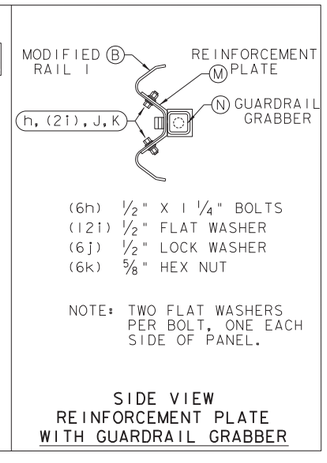


POST 1
FRONT END VIEW

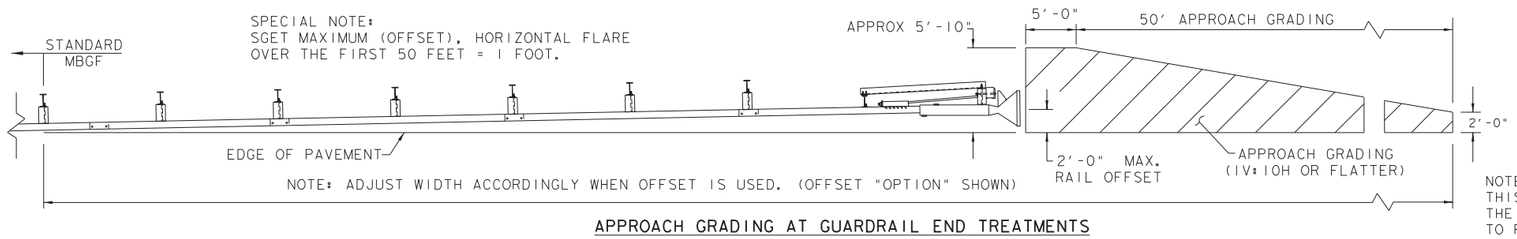


POST 1
FIELD SIDE VIEW

POST 2
STRUT POST



SIDE VIEW
REINFORCEMENT PLATE
WITH GUARDRAIL GRABBER



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SGET TERMINAL SYSTEM AND IS NOT INTENDED TO REPLACE THE MANUFACTURER'S ASSEMBLY MANUAL.

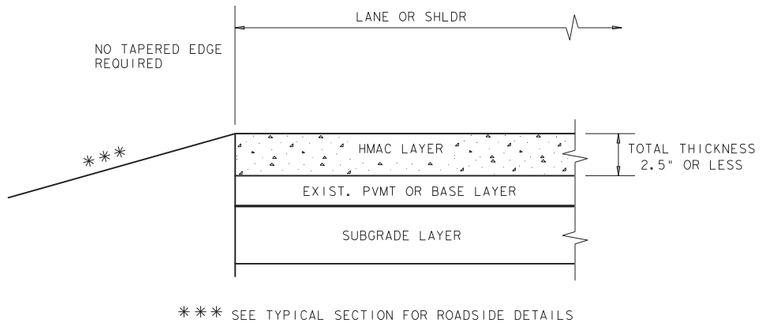
Texas Department of Transportation

Design Division Standard

SPIG INDUSTRY, LLC
SINGLE GUARDRAIL TERMINAL
SGET - TL-3 - MASH
SGT(15)31-20

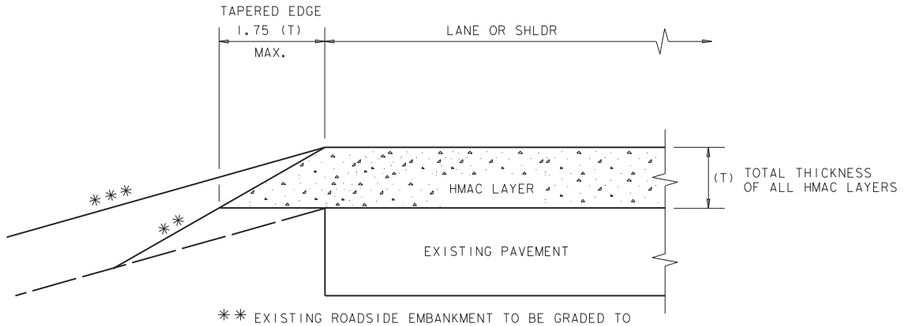
FILE: sgt153120.dgn	DN: TxDOT		CK: KM		DW: VP		CK: VP
©TxDOT: APRIL 2020	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0809	02	069		US 96		
	DIST	COUNTY			SHEET NO.		
	LFK	SHELBY			98		

DATE: 11/2/2021
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\02_RDWY\tehmac11.dgn



*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

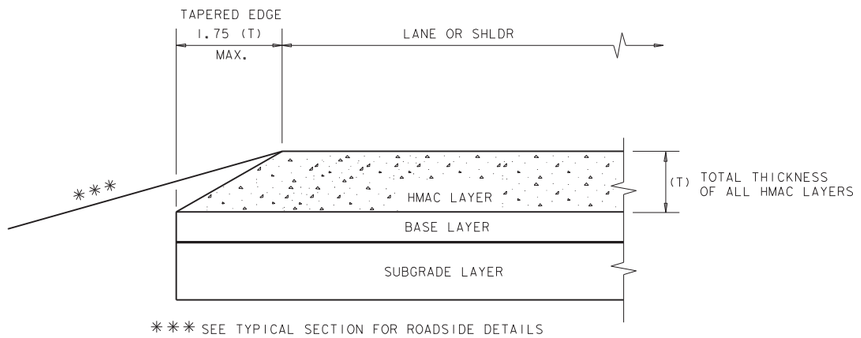
CONDITION - 1
THIN HMAC SURFACES OR HMAC OVERLAY WITH THICKNESS OF 2.5" OR LESS



** 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.

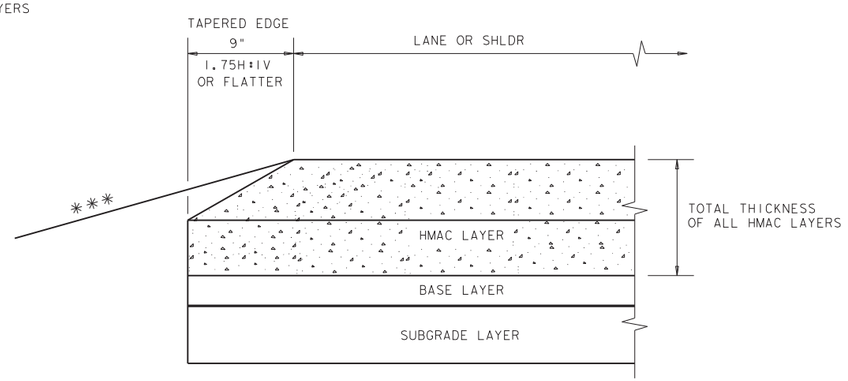
*** SEE TYPICAL SECTION FOR ROADSIDE DETAILS

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.

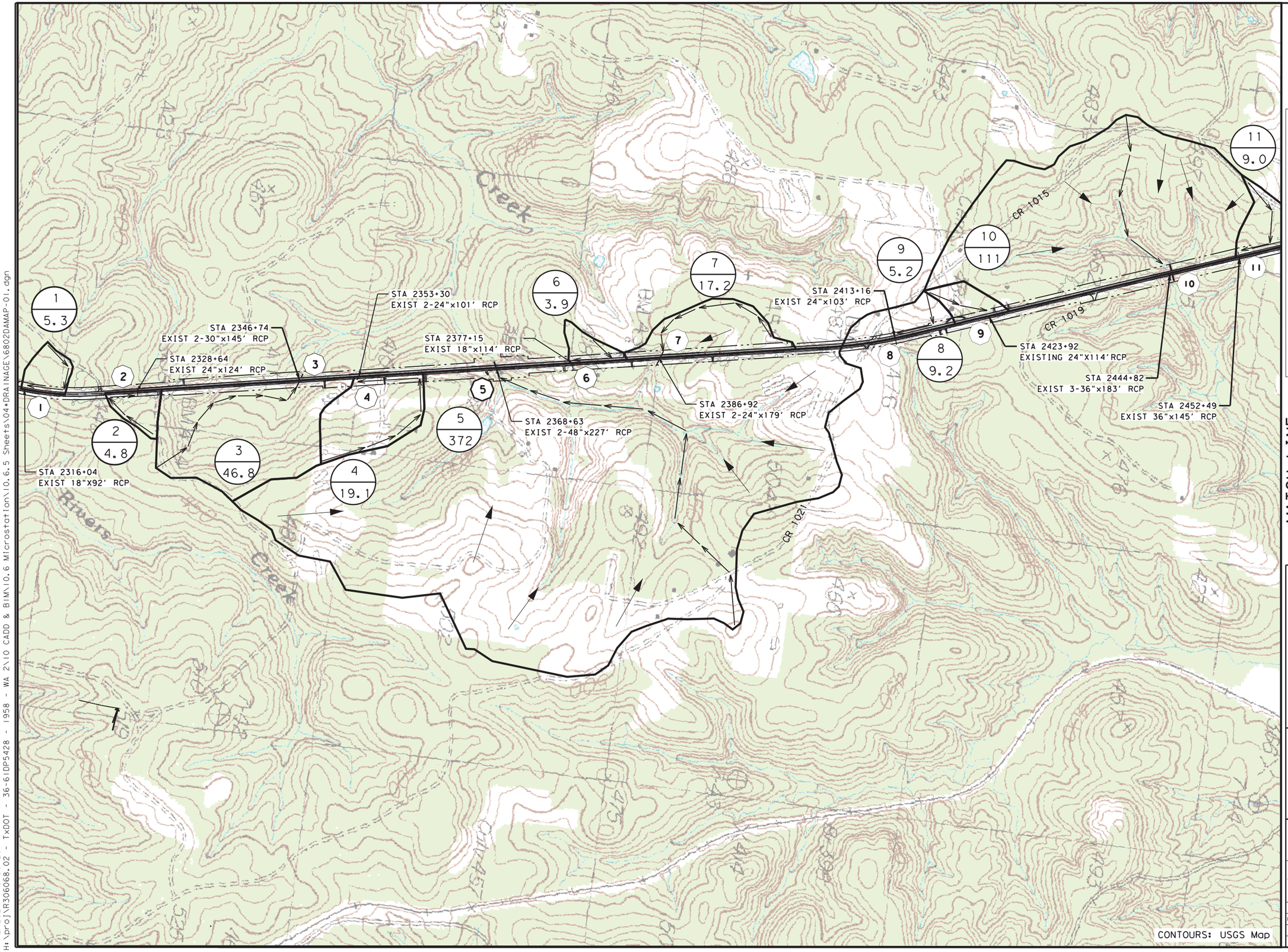
Texas Department of Transportation

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	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		99



N

0 500 1000

SCALE IN FEET

LEGEND

1 / 5.1 — DRAINAGE AREA (NUMBER/ACREAGE)

1 — DESIGN POINT

DRAINAGE AREA BOUNDARY

FLOW ARROWS

Tc PATH ARROWS

MATCH LINE

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

11/2/2021

DRAINAGE AREA MAP

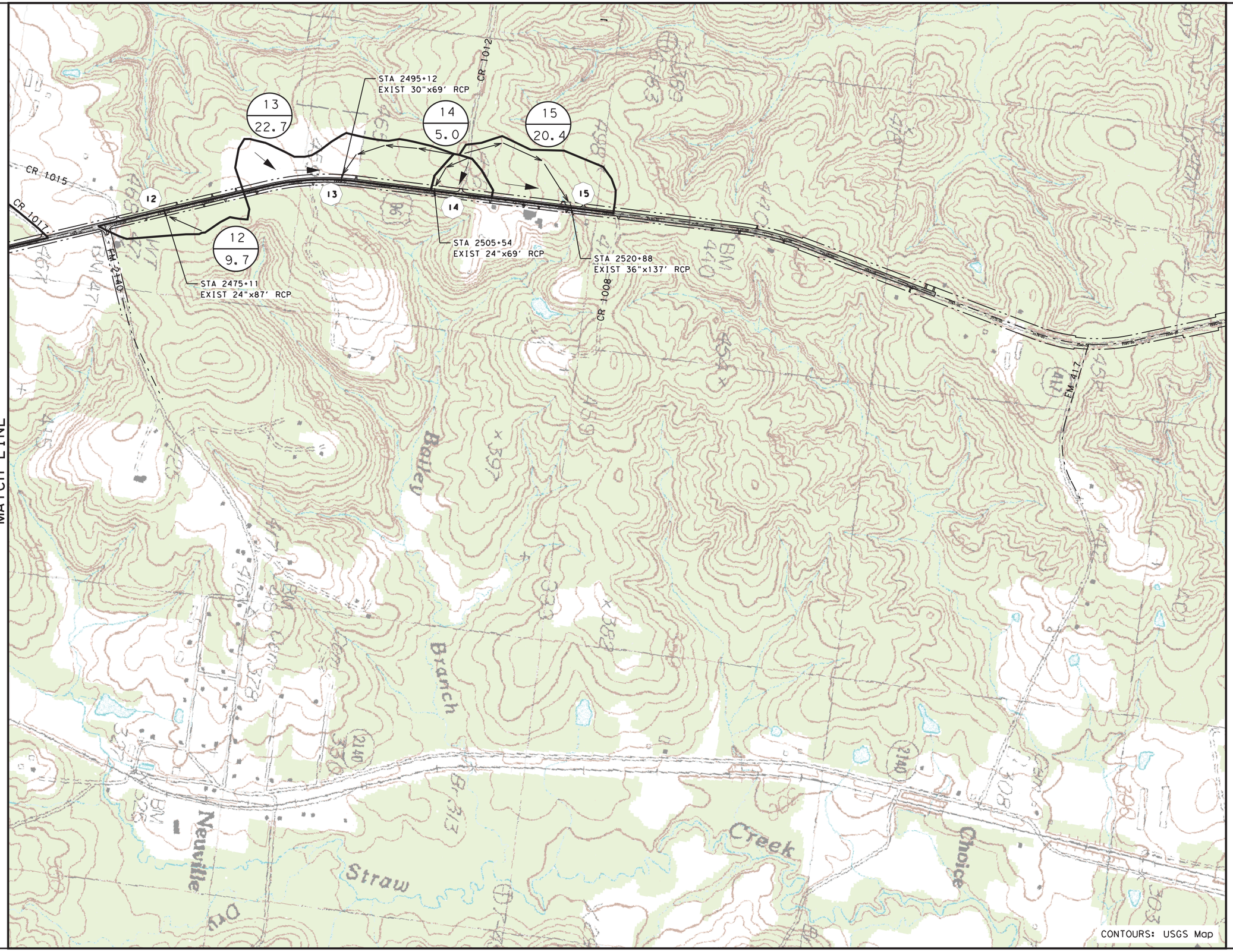
(SHEET 1 OF 2)

HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		100

11/2/2021 3:39:26 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802DAMAP-01.dgn



N

0 500 1000
SCALE IN FEET

LEGEND

- 1 / 5.1 — DRAINAGE AREA (NUMBER/ACREAGE)
- 1 — DESIGN POINT
- DRAINAGE AREA BOUNDARY
- FLOW ARROWS
- Tc PATH ARROWS

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

11/2/2021

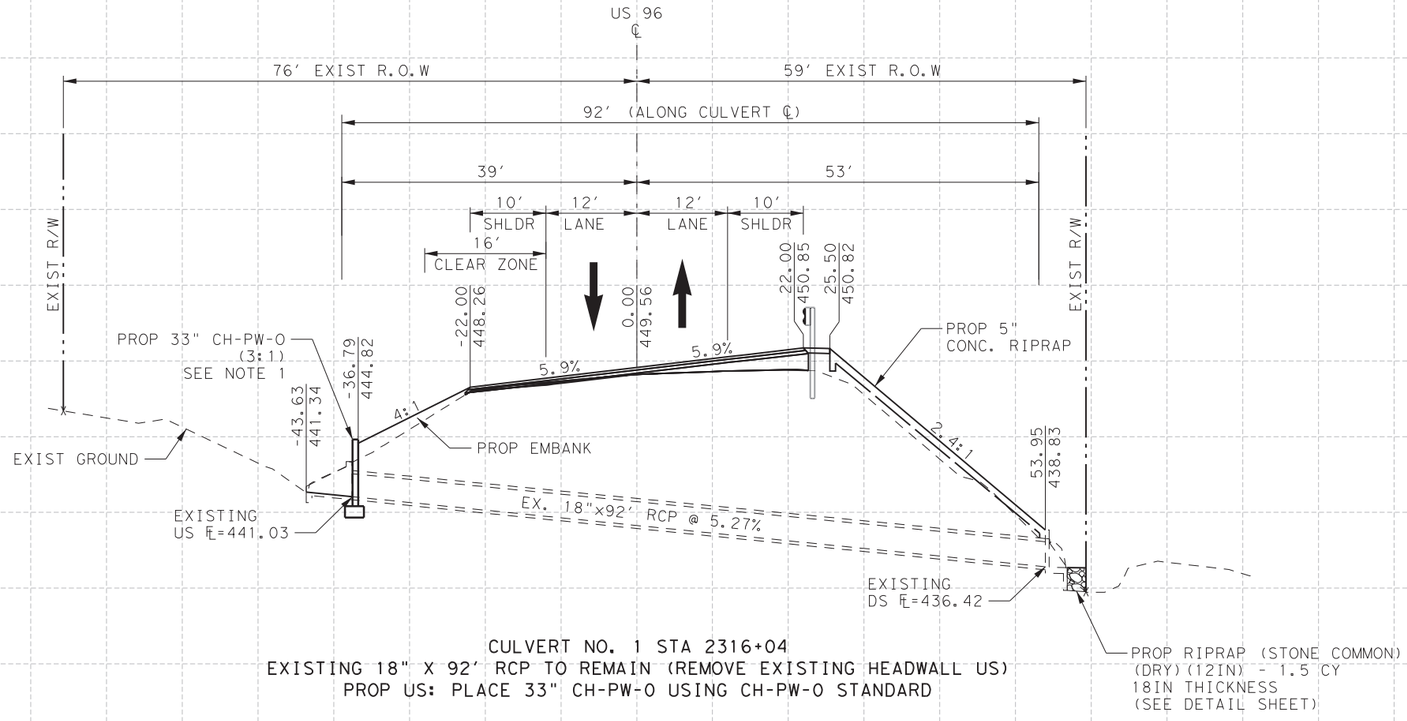
DRAINAGE AREA MAP

(SHEET 2 OF 2)

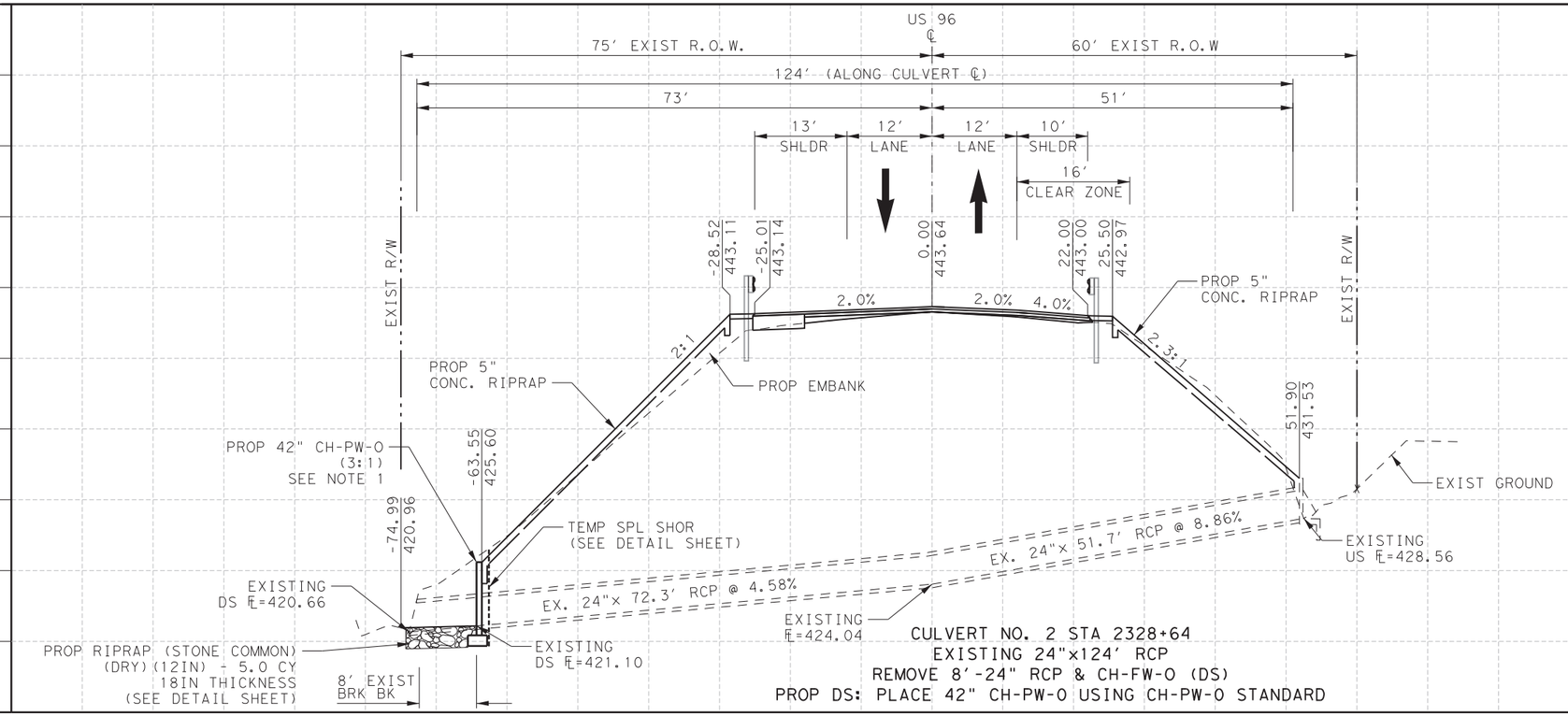
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		101

11/2/2021 3:39:28 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802DAMAP-02.dgn



CULVERT NO. 1 STA 2316+04
EXISTING 18" X 92′ RCP TO REMAIN (REMOVE EXISTING HEADWALL US)
PROP US: PLACE 33" CH-PW-O USING CH-PW-O STANDARD



CULVERT NO. 2 STA 2328+64
EXISTING 24"x124′ RCP
REMOVE 8′-24" RCP & CH-FW-O (DS)
PROP DS: PLACE 42" CH-PW-O USING CH-PW-O STANDARD

0 10 20
H: 1" = 20′

0 5 10
V: 1" = 10′

NOTES:

1. THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-O)(DIA=AS NOTED ON PLANS). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR THE SPECIFIED DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-O, EXCEPT FOR THE "K" DIMENSION (TOP OF PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.
2. SEE CONCRETE RIPRAP DETAILS FOR MORE INFORMATION.

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED
PROFESSIONAL ENGINEER

11/2/2021

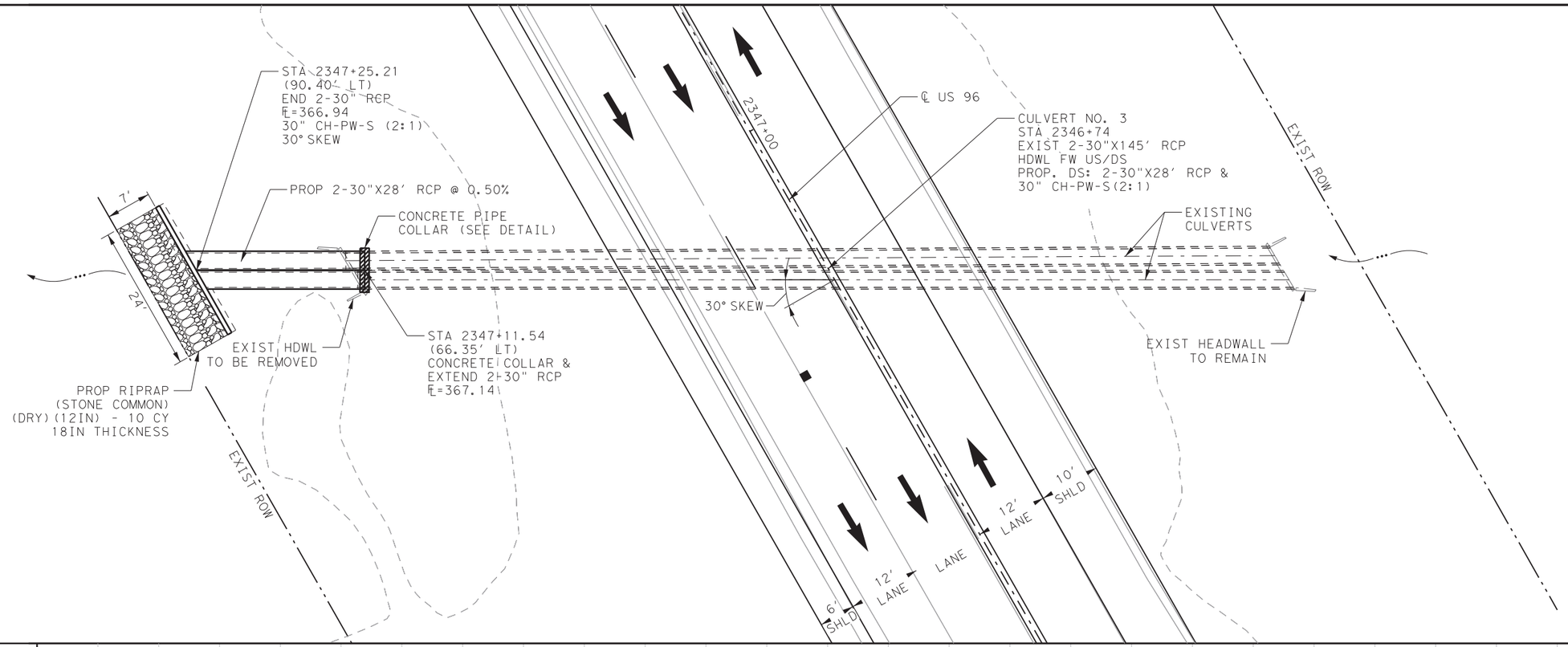
CULVERT LAYOUTS

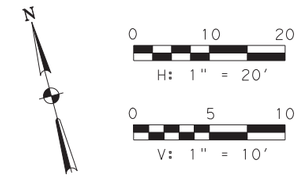
(SHEET 1 OF 11)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		102

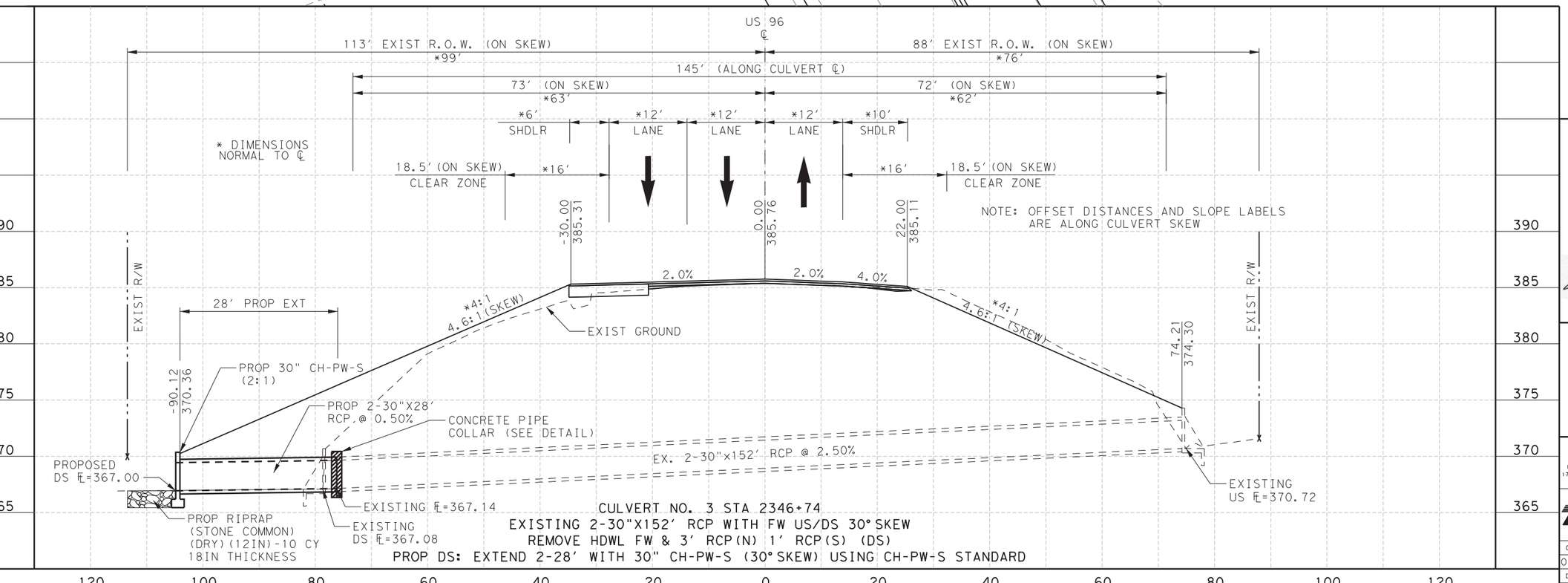
11/2/2021 3:39:28 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-01-02.dgn





NOTES:

1. WHEN EXTENDING CONCRETE STRUCTURES, THE CONTRACTOR IS RESPONSIBLE FOR THE CONNECTION TO THE EXISTING STRUCTURE. A CONCRETE COLLAR WILL BE USED AT THE LOCATIONS SHOWN IN THE PLANS, UNLESS AN ALTERNATIVE CONNECTION IS ACCEPTED BY TXDOT. THE EXTENSION LENGTH SHOWN IN THE PLANS WILL BE THE LIMITS OF MEASUREMENT FOR PAYMENT.



CULVERT NO. 3 STA 2346+74
EXISTING 2-30"X152' RCP WITH FW US/DS 30° SKEW
REMOVE HDWL FW & 3' RCP(N) 1' RCP(S) (DS)
PROP DS: EXTEND 2-28' WITH 30" CH-PW-S (30° SKEW) USING CH-PW-S STANDARD

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

11/2/2021

CULVERT LAYOUTS

(SHEET 2 OF 11)

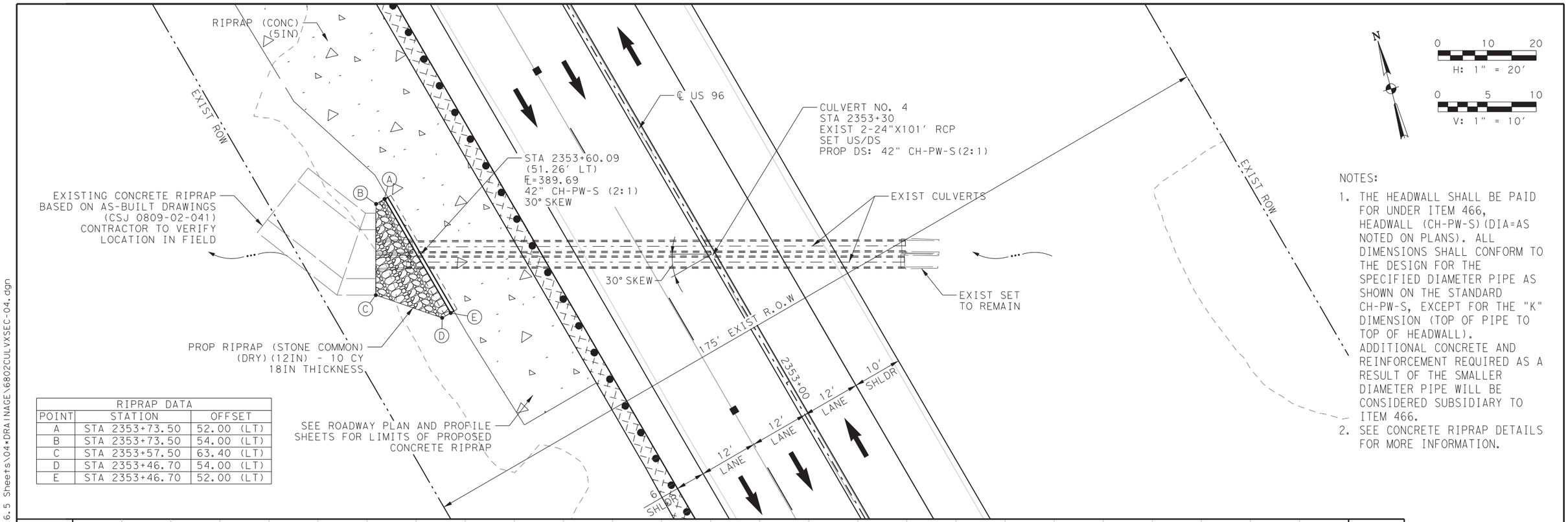
HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

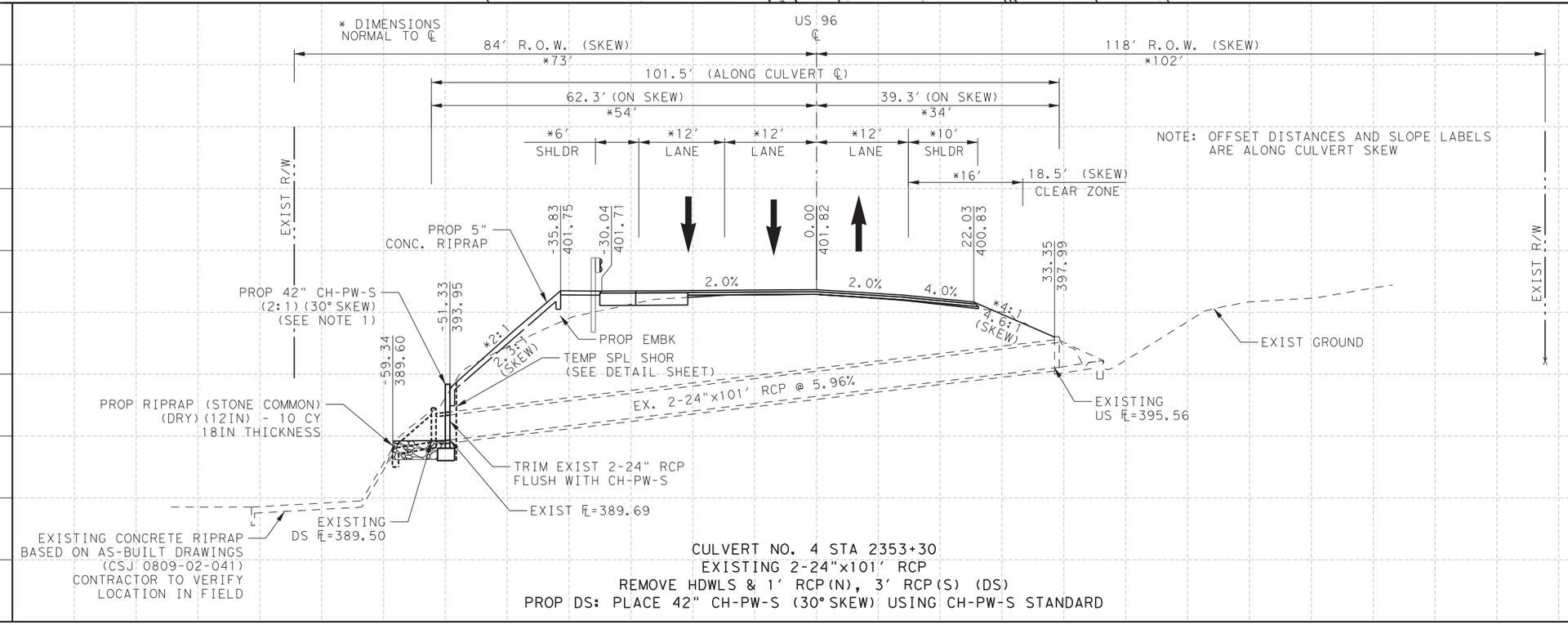
TEXAS DEPARTMENT OF TRANSPORTATION
©2021

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		103

11/2/2021 3:39:29 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-03.dgn



RIPRAP DATA		
POINT	STATION	OFFSET
A	STA 2353+73.50	52.00 (LT)
B	STA 2353+73.50	54.00 (LT)
C	STA 2353+57.50	63.40 (LT)
D	STA 2353+46.70	54.00 (LT)
E	STA 2353+46.70	52.00 (LT)



CULVERT NO. 4 STA 2353+30
EXISTING 2-24"x101' RCP
REMOVE HDWLS & 1' RCP(N), 3' RCP(S) (DS)
PROP DS: PLACE 42" CH-PW-S (30°SKEW) USING CH-PW-S STANDARD

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

11/2/2021

CULVERT LAYOUTS

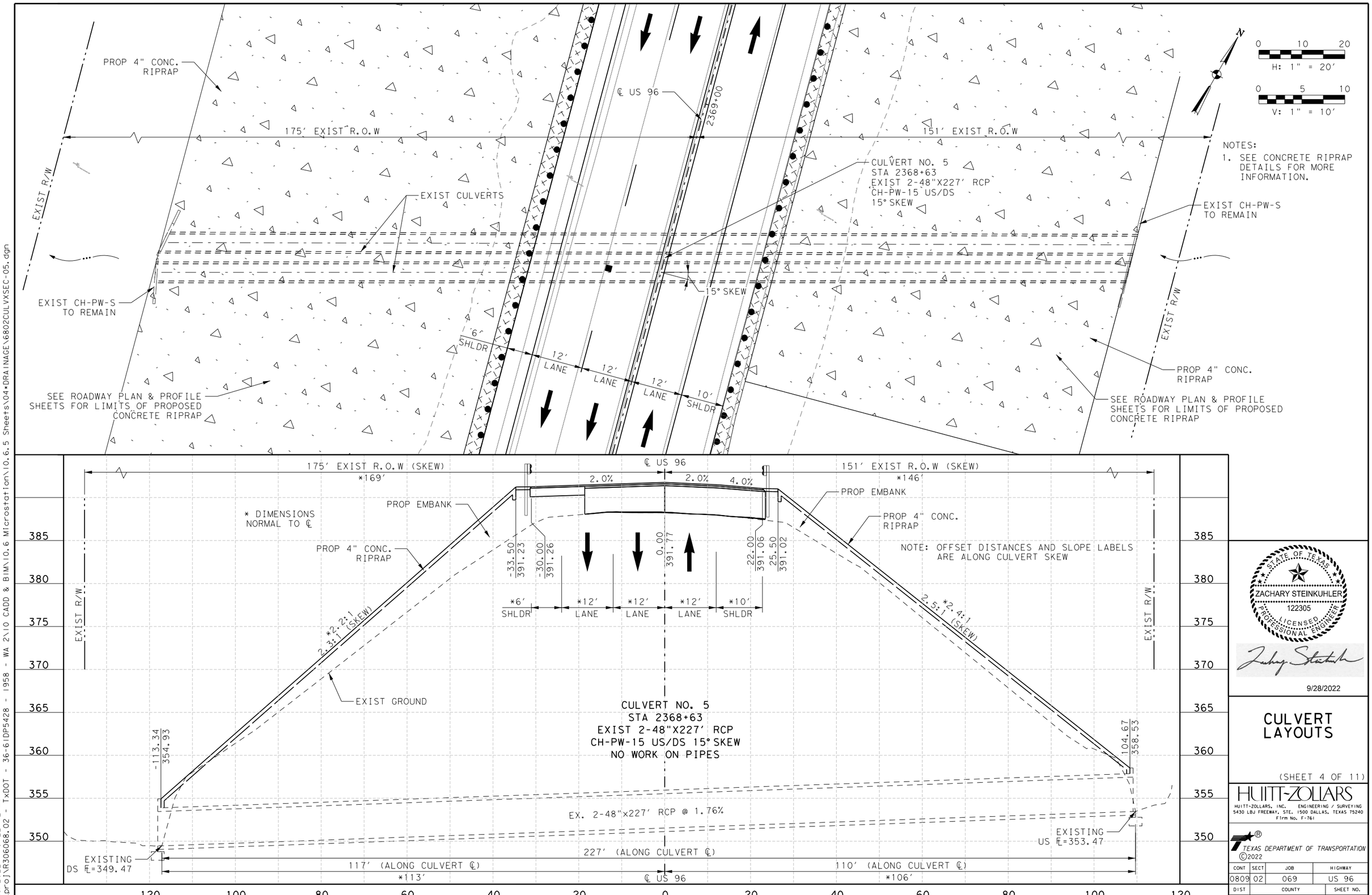
(SHEET 3 OF 11)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		104

11/2/2021 3:39:30 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-04.dgn



ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

9/28/2022

CULVERT LAYOUTS

(SHEET 4 OF 11)

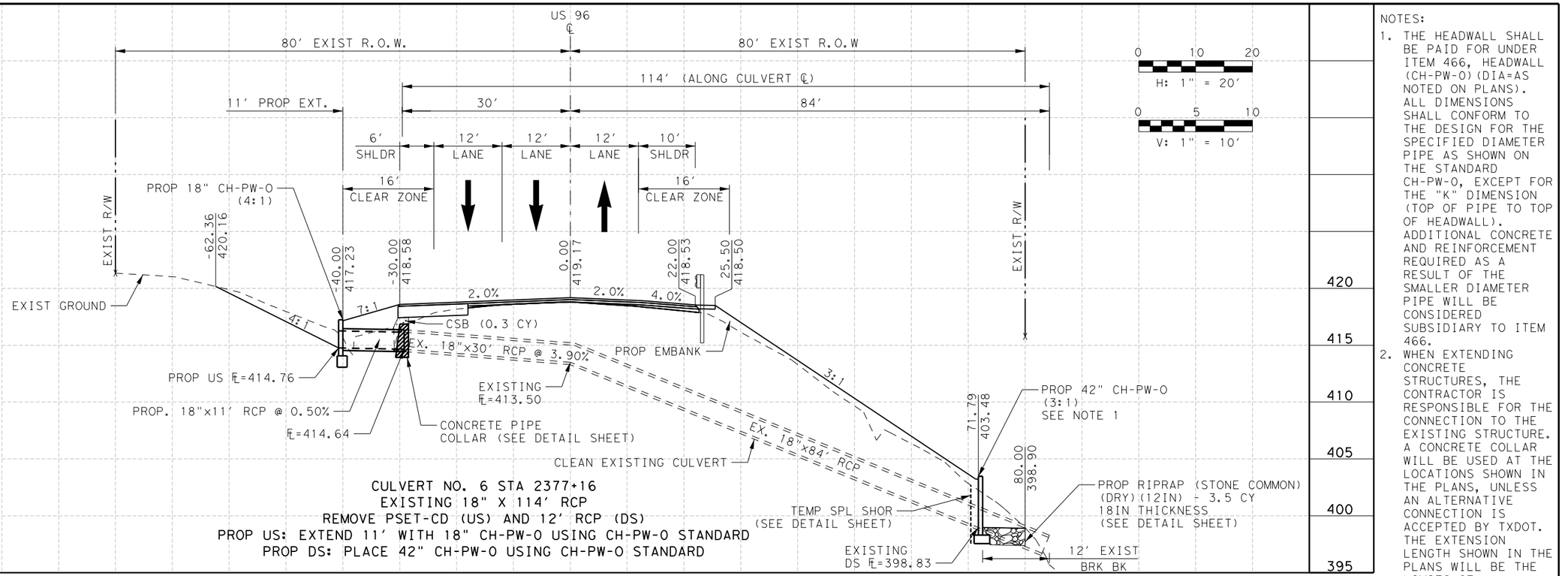
HUITT-ZOLLARS

HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION
©2022

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		105

9/28/2022 9:22:12 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04•DRAINAGE\6802CULVXSEC-05.dgn



CULVERT NO. 6 STA 2377+16
EXISTING 18" X 114' RCP
REMOVE PSET-CD (US) AND 12' RCP (DS)
PROP US: EXTEND 11' WITH 18" CH-PW-O USING CH-PW-O STANDARD
PROP DS: PLACE 42" CH-PW-O USING CH-PW-O STANDARD

0 10 20
H: 1" = 20'

0 5 10
V: 1" = 10'

NOTES:

1. THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-O)(DIA=AS NOTED ON PLANS). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR THE SPECIFIED DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-O, EXCEPT FOR THE "K" DIMENSION (TOP OF PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.
2. WHEN EXTENDING CONCRETE STRUCTURES, THE CONTRACTOR IS RESPONSIBLE FOR THE CONNECTION TO THE EXISTING STRUCTURE. A CONCRETE COLLAR WILL BE USED AT THE LOCATIONS SHOWN IN THE PLANS, UNLESS AN ALTERNATIVE CONNECTION IS ACCEPTED BY TXDOT. THE EXTENSION LENGTH SHOWN IN THE PLANS WILL BE THE LIMITS OF MEASUREMENT FOR PAYMENT.

-- SECTION LEFT INTENTIONALLY BLANK --

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

9/28/2022

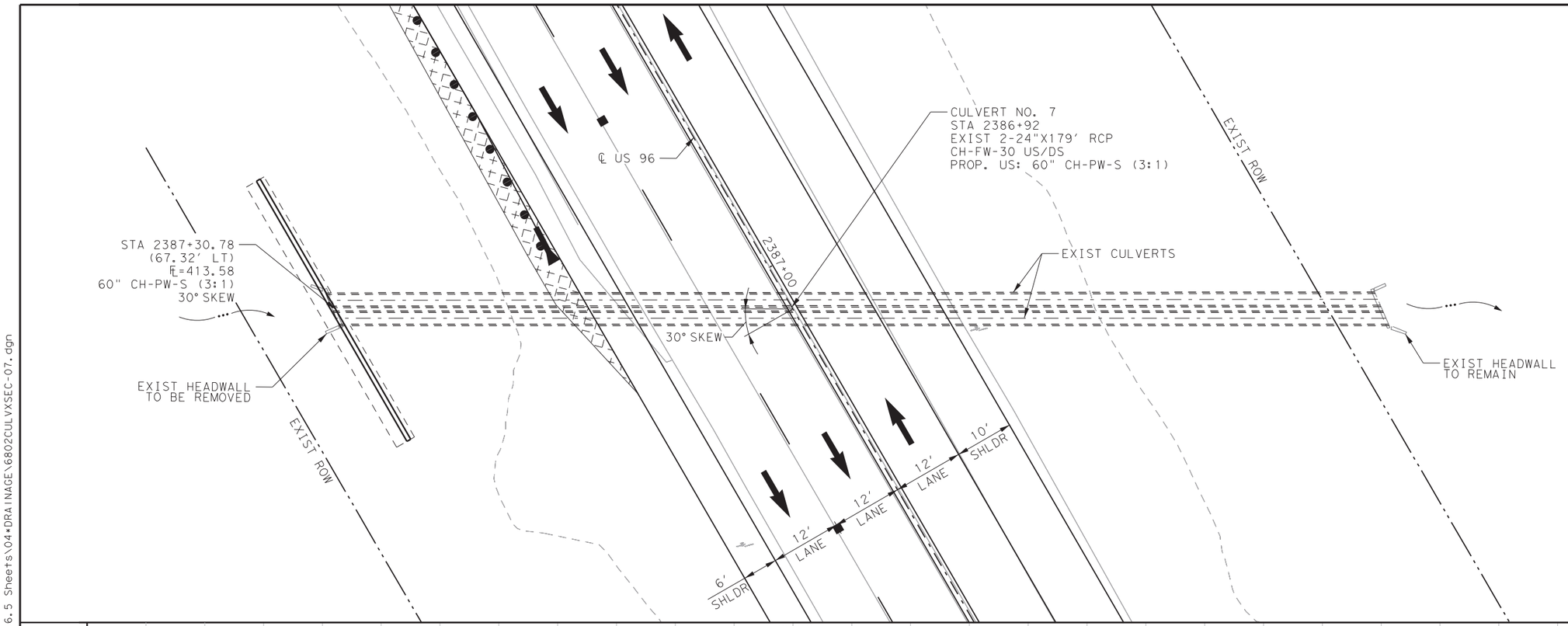
CULVERT LAYOUTS

(SHEET 5 OF 11)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

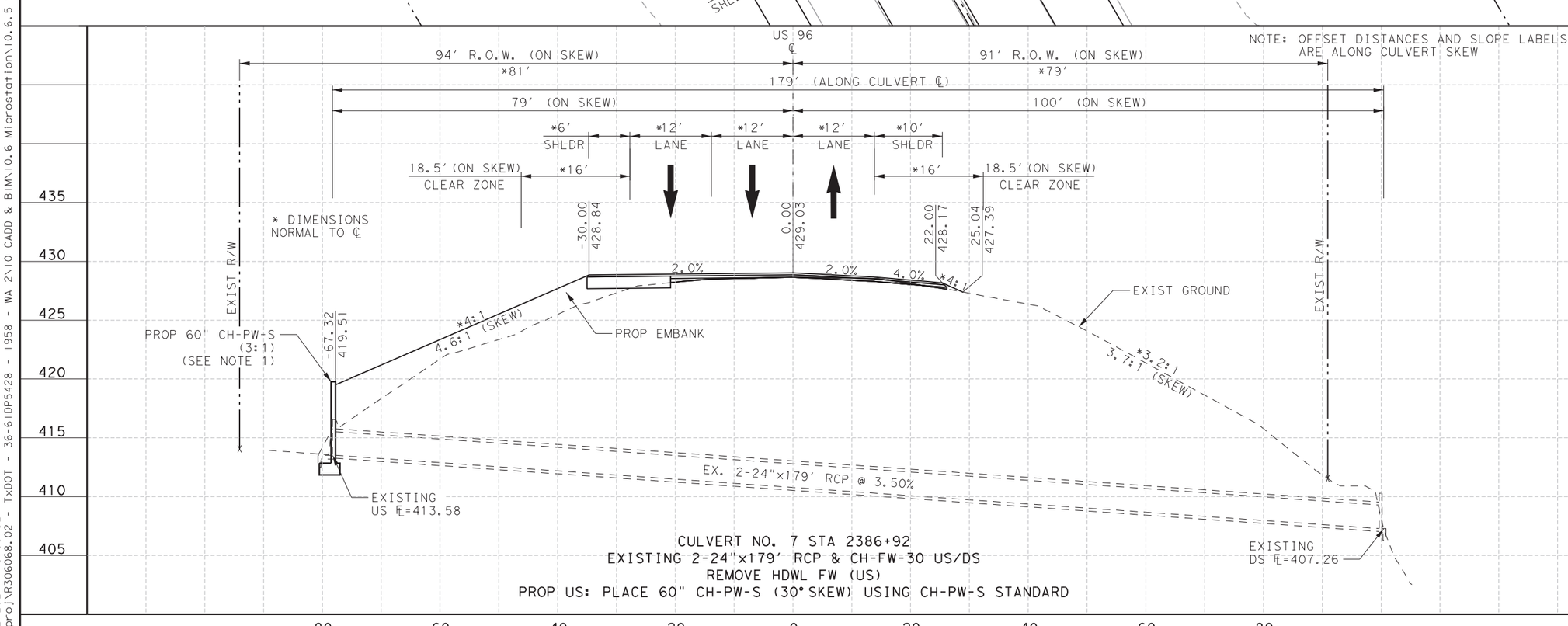
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		106

9/28/2022 9:22:12 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-06.dgn



NOTES:

1. THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-S)(DIA=AS NOTED ON PLANS). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR THE SPECIFIED DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-S, EXCEPT FOR THE "K" DIMENSION (TOP OF PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.



CULVERT NO. 7 STA 2386+92
EXISTING 2-24"x179' RCP & CH-FW-30 US/DS
REMOVE HDWL FW (US)
PROP US: PLACE 60" CH-PW-S (30°SKEW) USING CH-PW-S STANDARD

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

11/2/2021

CULVERT LAYOUTS

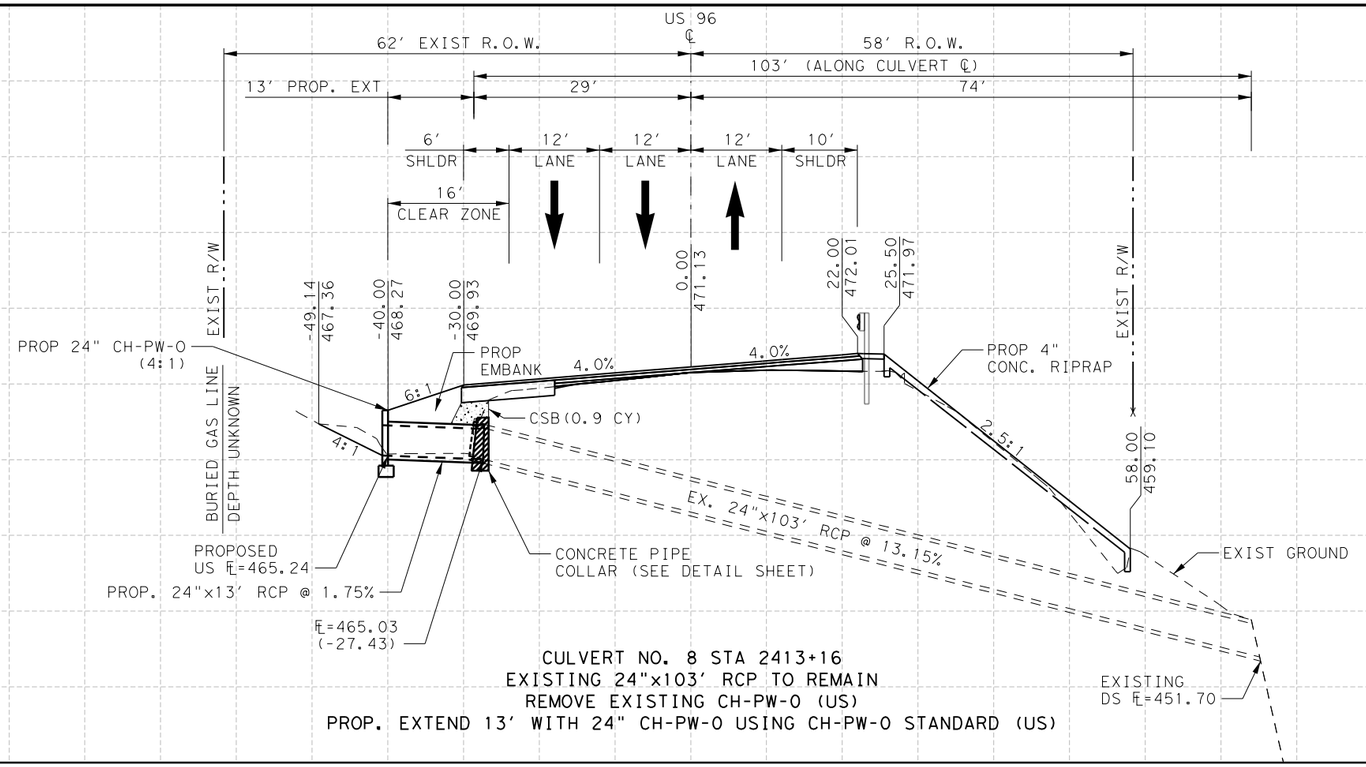
(SHEET 6 OF 11)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

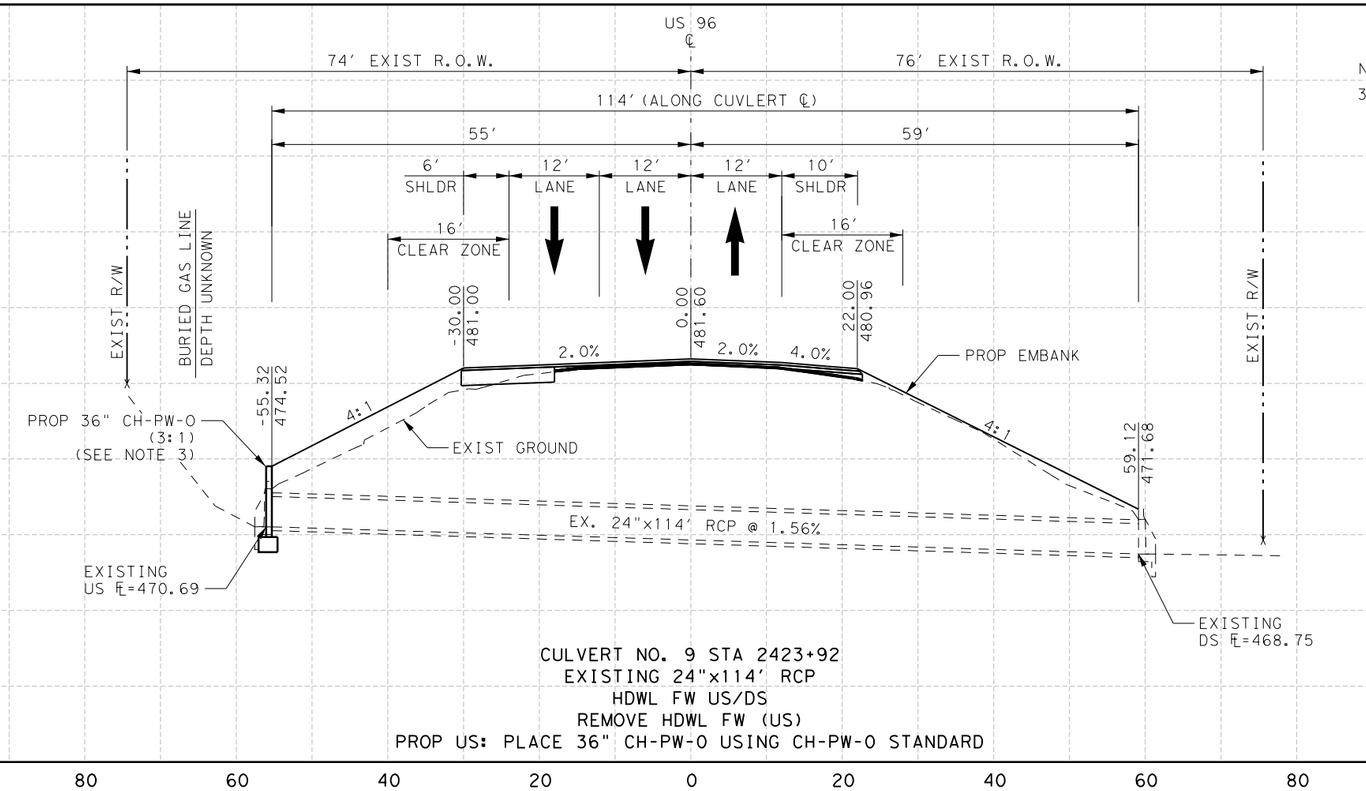
TEXAS DEPARTMENT OF TRANSPORTATION
©2021

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		107

11/2/2021 3:39:32 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-07.dgn



CULVERT NO. 8 STA 2413+16
EXISTING 24"x103' RCP TO REMAIN
REMOVE EXISTING CH-PW-O (US)
PROP. EXTEND 13' WITH 24" CH-PW-O USING CH-PW-O STANDARD (US)



CULVERT NO. 9 STA 2423+92
EXISTING 24"x114' RCP
HDWL FW US/DS
REMOVE HDWL FW (US)
PROP US: PLACE 36" CH-PW-O USING CH-PW-O STANDARD

0 10 20
H: 1" = 20'

0 5 10
V: 1" = 10'

NOTES:

1. SEE CONCRETE RIPRAP DETAILS FOR MORE INFORMATION.
2. WHEN EXTENDING CONCRETE STRUCTURES, THE CONTRACTOR IS RESPONSIBLE FOR THE CONNECTION TO THE EXISTING STRUCTURE. A CONCRETE COLLAR WILL BE USED AT THE LOCATIONS SHOWN IN THE PLANS, UNLESS AN ALTERNATIVE CONNECTION IS ACCEPTED BY TXDOT. THE EXTENSION LENGTH SHOWN IN THE PLANS WILL BE THE LIMITS OF MEASUREMENT FOR PAYMENT.
3. THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-O)(DIA=AS NOTED ON PLANS). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR THE SPECIFIED DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-O, EXCEPT FOR THE "K" DIMENSION (TOP OF PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

9/28/2022

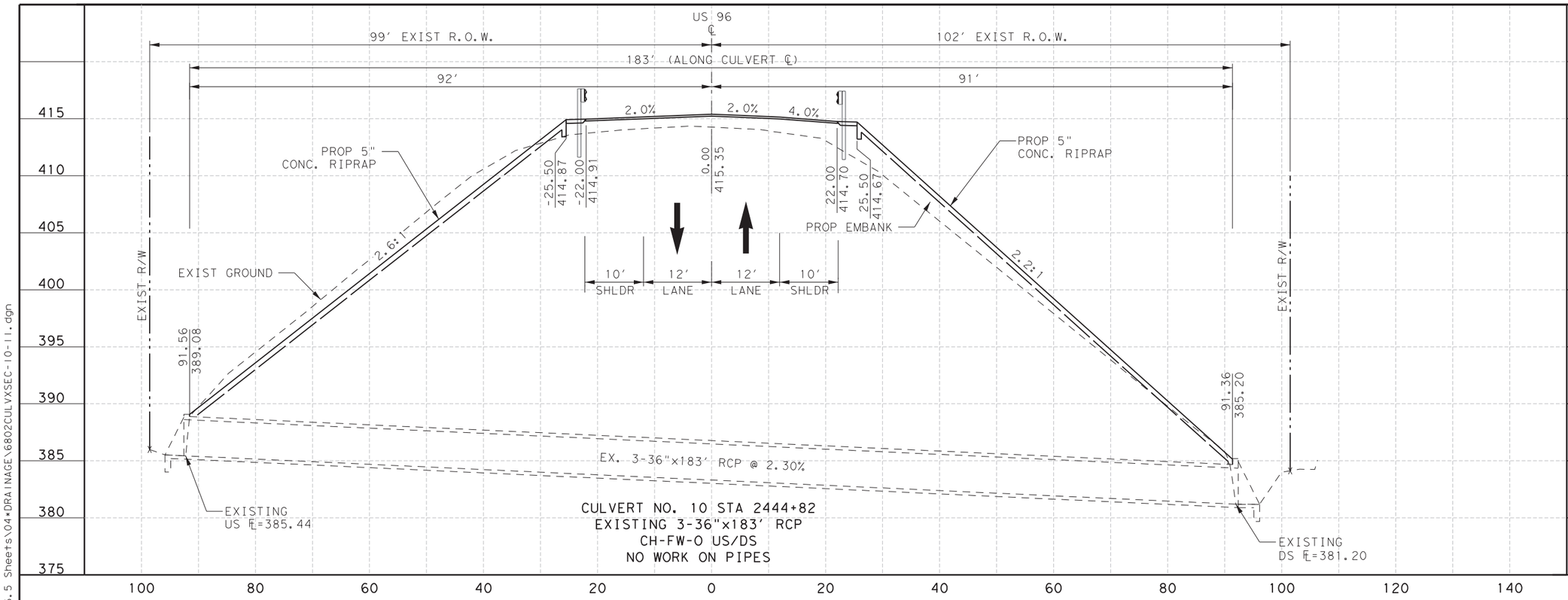
CULVERT LAYOUTS

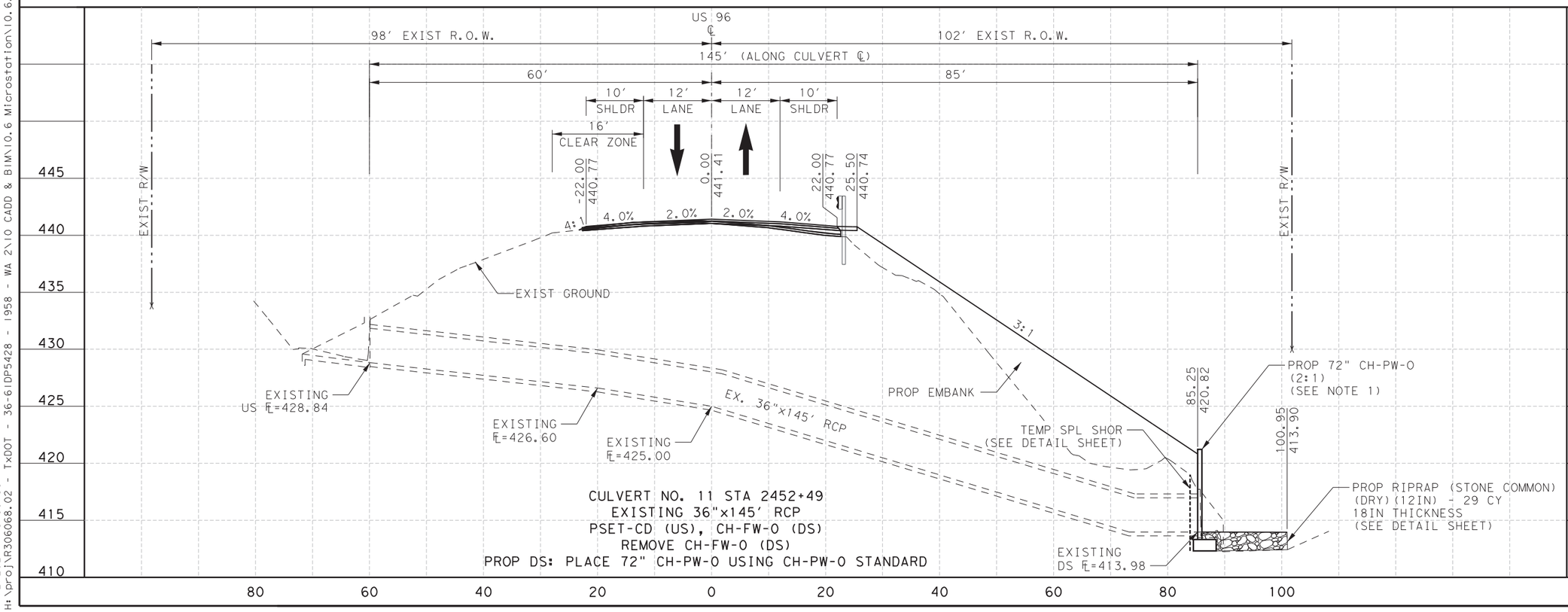
(SHEET 7 OF 11)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		108

9/28/2022 9:22:13 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-08-09.dgn





0 10 20
H: 1" = 20′

0 5 10
V: 1" = 10′

NOTES:

1. THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-O)(DIA=AS NOTED ON PLANS). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR THE SPECIFIED DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-O, EXCEPT FOR THE "K" DIMENSION (TOP OF PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.
2. SEE CONCRETE RIPRAP DETAILS FOR MORE INFORMATION.

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

11/2/2021

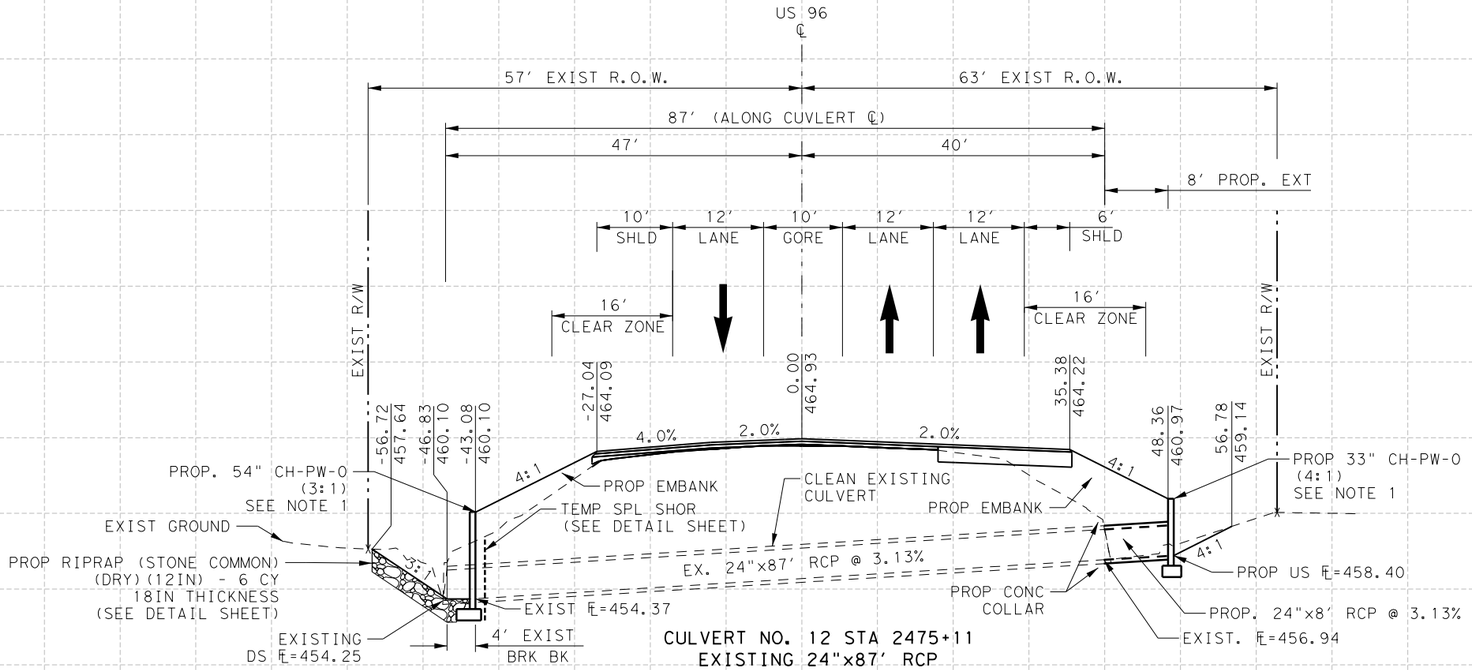
CULVERT LAYOUTS

(SHEET 8 OF 11)

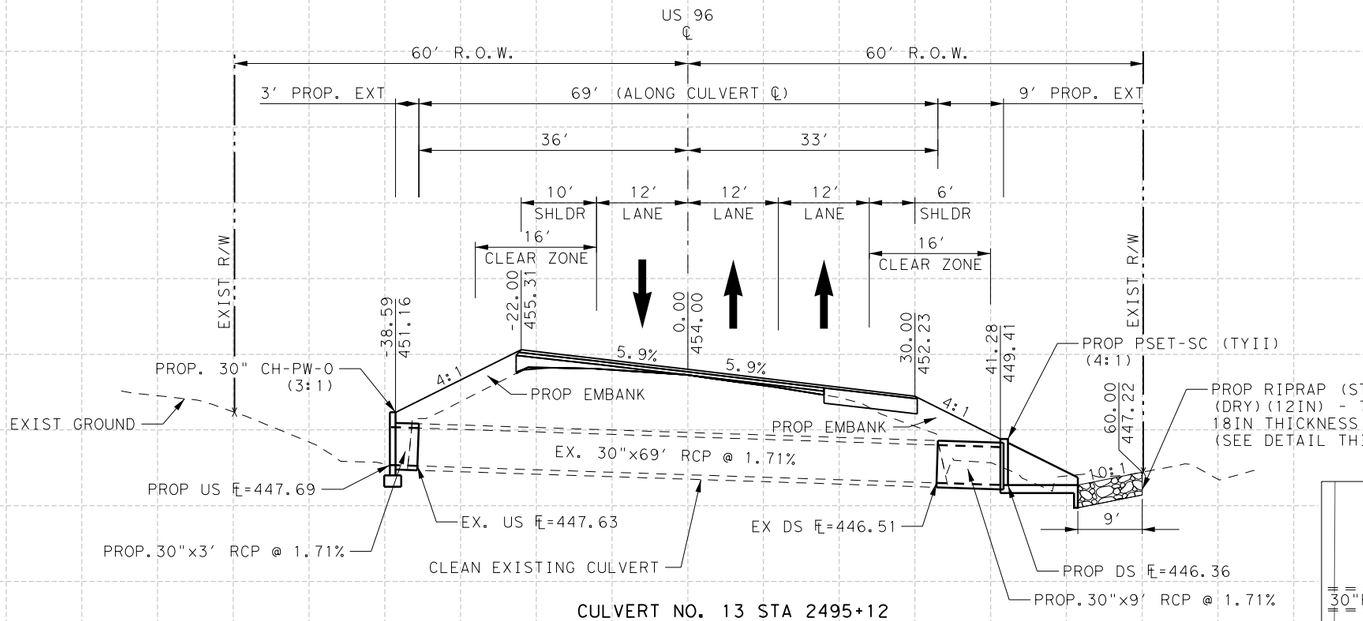
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		109

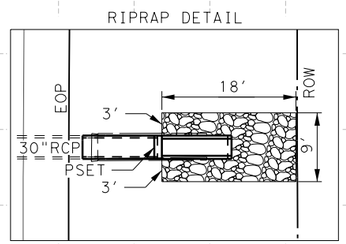
11/2/2021 3:39:33 PM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-10-11.dgn



CULVERT NO. 12 STA 2475+11
EXISTING 24"x87' RCP
REMOVE 4'-24" RCP & PSET (DS), REMOVE PSET (US)
PROP US: EXTEND 8' & 33" CH-PW-0 USING CH-PW-0 STANDARD
PROP DS: PLACE 54" CH-PW-0 USING CH-PW-0 STANDARD



CULVERT NO. 13 STA 2495+12
EXISTING 30"x69' RCP
REMOVE PSETS (US/DS)
PROP US: EXTEND 3' & 30" CH-PW-0 USING CH-PW-0 STANDARD
PROP DS: EXTEND 9' & 30" (4:1)(TY II) PSET-SC



NOTES:
1. THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-0)(DIA=AS NOTED ON PLANS). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR THE SPECIFIED DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-0, EXCEPT FOR THE "K" DIMENSION (TOP OF PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.
2. WHEN EXTENDING CONCRETE STRUCTURES, THE CONTRACTOR IS RESPONSIBLE FOR THE CONNECTION TO THE EXISTING STRUCTURE. A CONCRETE COLLAR WILL BE USED AT THE LOCATIONS SHOWN IN THE PLANS, UNLESS AN ALTERNATIVE CONNECTION IS ACCEPTED BY TXDOT. THE EXTENSION LENGTH SHOWN IN THE PLANS WILL BE THE LIMITS OF MEASUREMENT FOR PAYMENT.

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

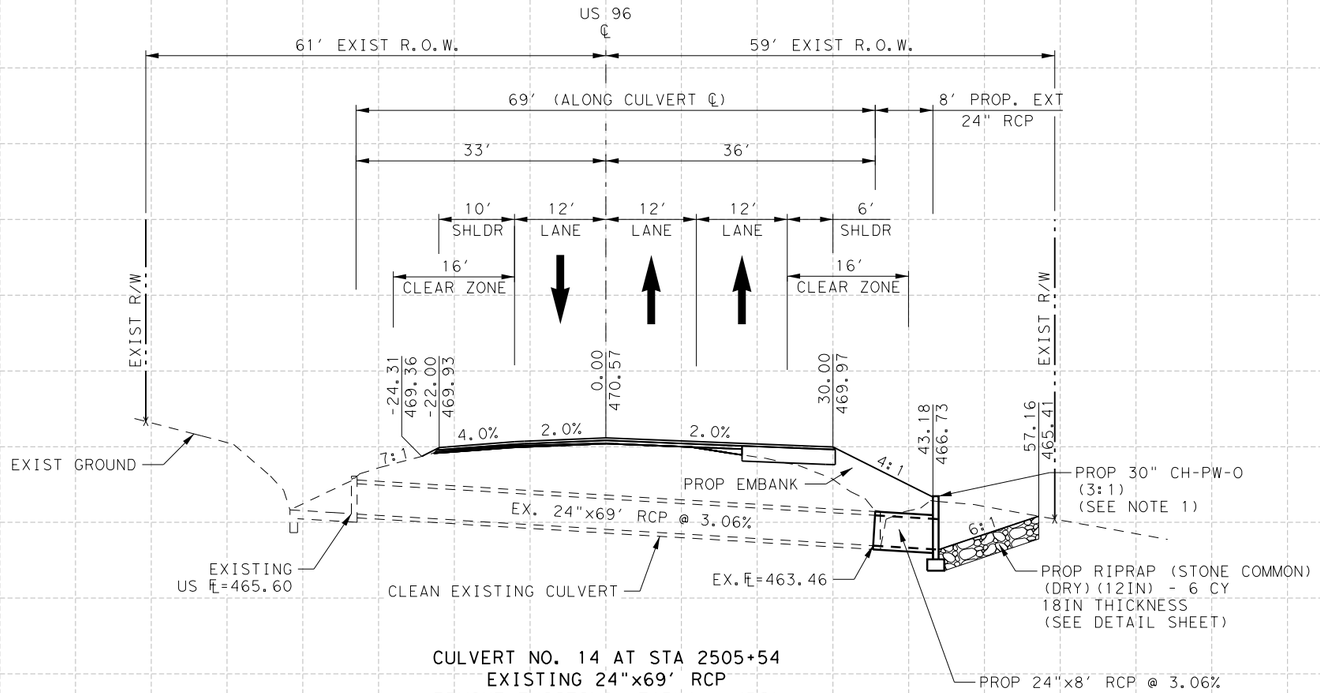
CULVERT LAYOUTS

(SHEET 9 OF 11)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		110

9/28/2022 9:22:13 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-12-13.dgn



CULVERT NO. 14 AT STA 2505+54
EXISTING 24"x69′ RCP
REMOVE EXISTING HEADWALL (DS)
PROP DS: EXTEND 8′ & 30" CH-PW-0 USING CH-PW-0 STANDARD

NOTES:

1. THE HEADWALL SHALL BE PAID FOR UNDER ITEM 466, HEADWALL (CH-PW-0)(DIA=AS NOTED ON PLANS). ALL DIMENSIONS SHALL CONFORM TO THE DESIGN FOR THE SPECIFIED DIAMETER PIPE AS SHOWN ON THE STANDARD CH-PW-0, EXCEPT FOR THE "K" DIMENSION (TOP OF PIPE TO TOP OF HEADWALL). ADDITIONAL CONCRETE AND REINFORCEMENT REQUIRED AS A RESULT OF THE SMALLER DIAMETER PIPE WILL BE CONSIDERED SUBSIDIARY TO ITEM 466.
2. WHEN EXTENDING CONCRETE STRUCTURES, THE CONTRACTOR IS RESPONSIBLE FOR THE CONNECTION TO THE EXISTING STRUCTURE. A CONCRETE COLLAR WILL BE USED AT THE LOCATIONS SHOWN IN THE PLANS, UNLESS AN ALTERNATIVE CONNECTION IS ACCEPTED BY TXDOT. THE EXTENSION LENGTH SHOWN IN THE PLANS WILL BE THE LIMITS OF MEASUREMENT FOR PAYMENT.

0 10 20
H: 1" = 20′

0 5 10
V: 1" = 10′

-- SECTION LEFT INTENTIONALLY BLANK --

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

9/28/2022

CULVERT LAYOUTS

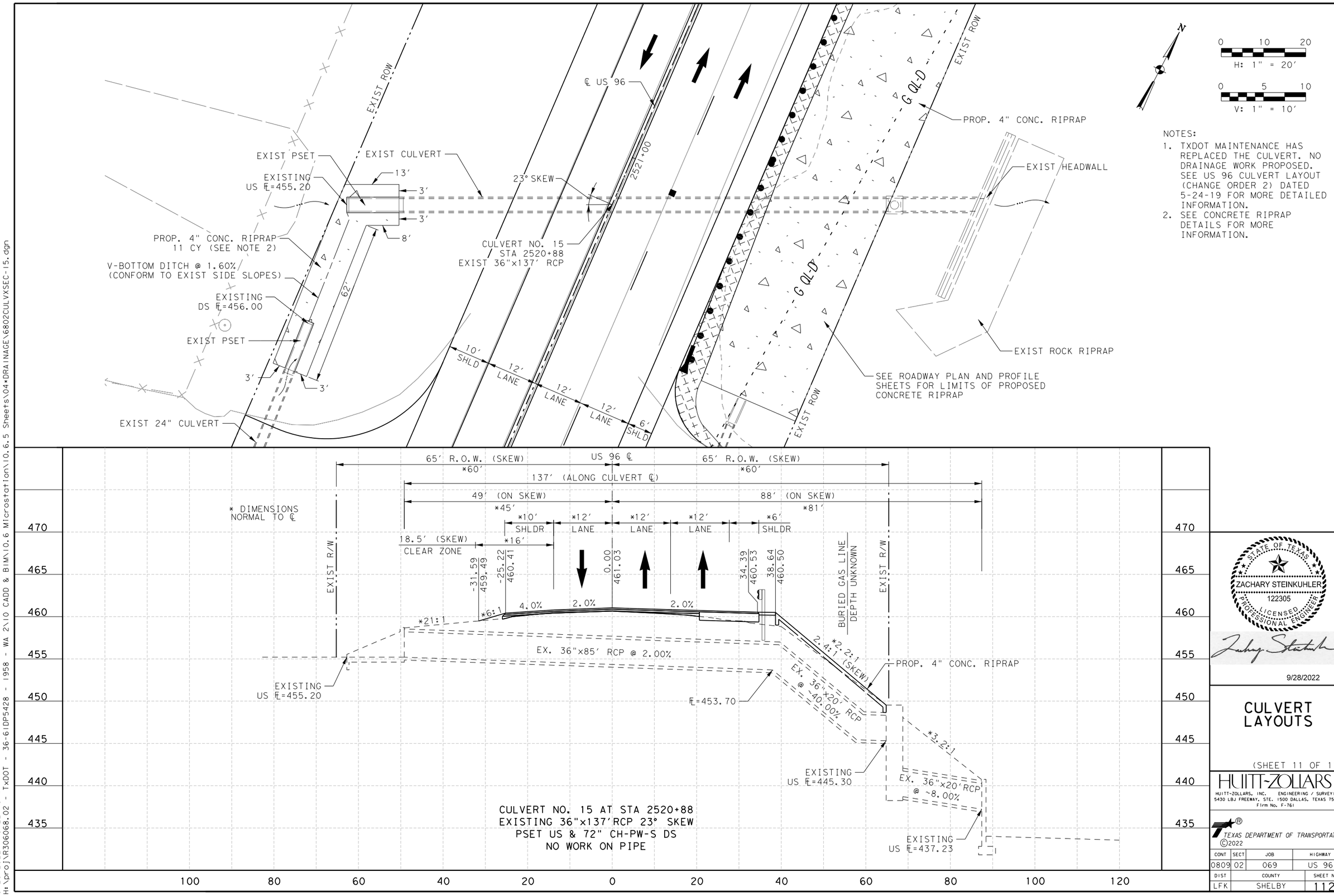
(SHEET 10 OF 11)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		111

9/28/2022 9:22:15 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-14.dgn



CULVERT NO. 15 AT STA 2520+88
EXISTING 36"x137′RCP 23° SKEW
PSET US & 72" CH-PW-S DS
NO WORK ON PIPE

NOTES:

1. TXDOT MAINTENANCE HAS REPLACED THE CULVERT. NO DRAINAGE WORK PROPOSED. SEE US 96 CULVERT LAYOUT (CHANGE ORDER 2) DATED 5-24-19 FOR MORE DETAILED INFORMATION.
2. SEE CONCRETE RIPRAP DETAILS FOR MORE INFORMATION.

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

9/28/2022

CULVERT LAYOUTS

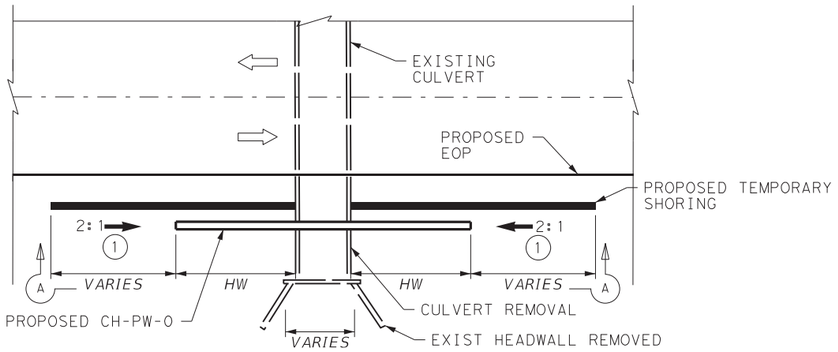
(SHEET 11 OF 11)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

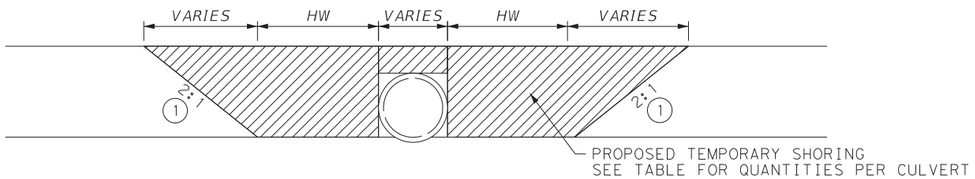
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		112

9/28/2022 9:22:15 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\6802CULVXSEC-15.dgn



TEMPORARY SHORING PLAN VIEW

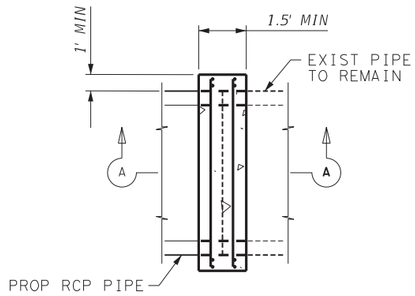
N.T.S.



TEMPORARY SHORING SECTION A-A

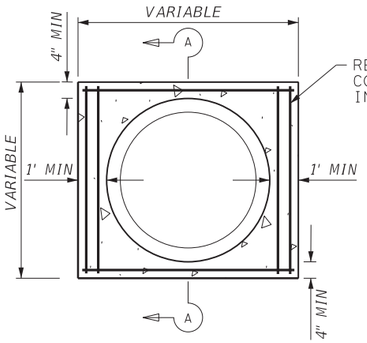
N.T.S.

STRUCTURE	403 6001 TEMPORARY SPL SHORING SF
CULVERT 2	310
CULVERT 4	250
CULVERT 6	200
CULVERT 11	310
CULVERT 12	330



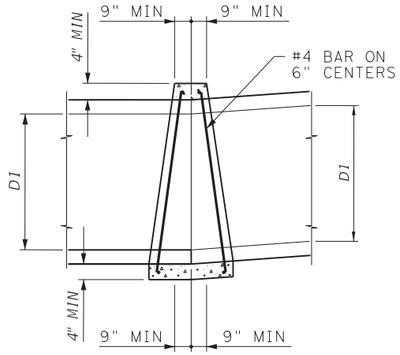
② CONCRETE COLLAR PLAN VIEW

N.T.S.



CONCRETE COLLAR FRONT ELEVATION

N.T.S.



CONCRETE COLLAR SECTION A-A

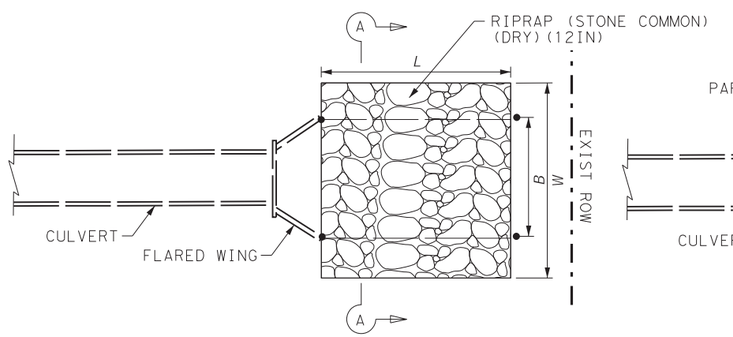
N.T.S.

1. CONTRACTOR SHALL REVISE SLOPE AND DIMENSIONS AS NECESSARY BASED ON SOIL CONDITIONS ENCOUNTERED IN THE FIELD.
2. CONCRETE SHALL BE CLASS "C" FOR CONCRETE COLLAR.

   REINFORCEMENT SHALL BE #4 BARS FIELD CUT TO FIT INSTALLATION.

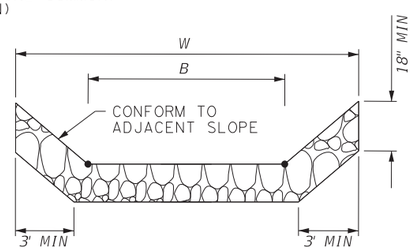
   REINFORCEMENT BARS SHALL HAVE A MINIMUM OF 1 ½" OF CLEAR COVER.

   CONCRETE COLLAR SHALL CONFORM TO THE OUTSIDE DIAMETER OF THE RCP.



RIPRAP DETAIL

N.T.S.



RIPRAP SECTION A-A

RIPRAP DIMENSIONS				
LOCATION	L	W	B	CY
STA 2316+04 (RT)	3′	9′	3′	1.5
STA 2328+64 (LT)	10′	9′	3′	5
STA 2346+74 (LT)	7′	24′	7′	10
STA 2353+30 (LT)	SEE CULV LAYOUT			10
STA 2377+16 (RT)	7′	8′	2′	3.5
STA 2452+49 (RT)	15′	35′	4′	29
STA 2475+11 (LT)	13′	9′	3′	6
STA 2495+12 (RT)	SEE CULV LAYOUT			7
STA 2505+54 (RT)	13′	9′	3′	6
PROJECT TOTAL				78

STATE OF TEXAS
ZACHARY STEINKUHLER
122305
LICENSED PROFESSIONAL ENGINEER

11/2/2021

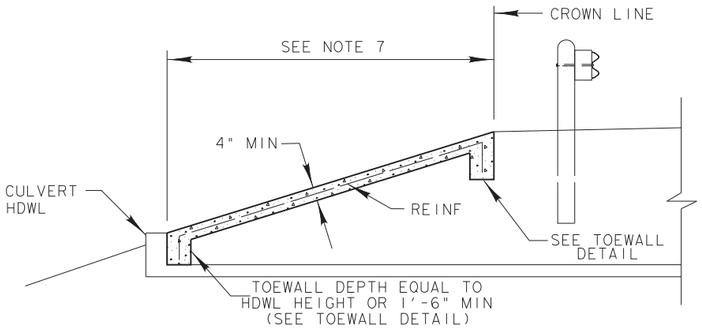
MISCELLANEOUS DRAINAGE DETAILS

TEXAS DEPARTMENT OF TRANSPORTATION
©2021

HUITT-ZOLLARS

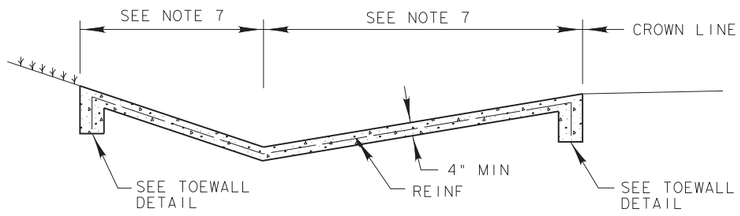
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		113



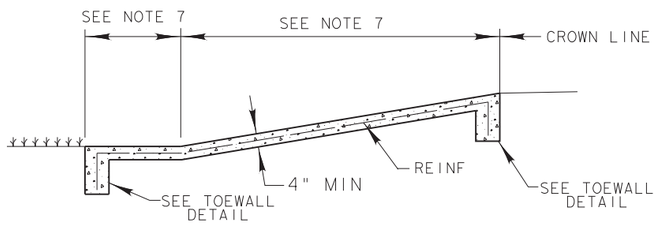
CONCRETE RIPRAP AT CULVERT SECTION

QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC)(4 IN).



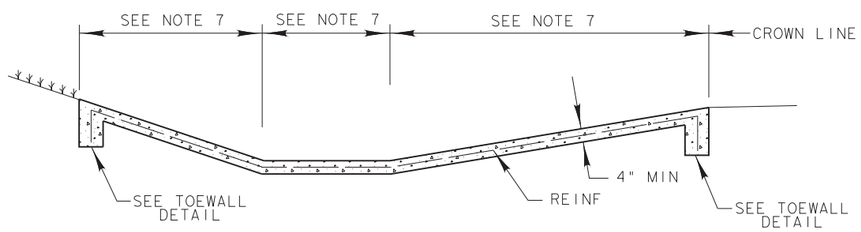
CONCRETE RIPRAP AT TYPICAL V-BOTTOM DITCH

QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC)(4 IN).



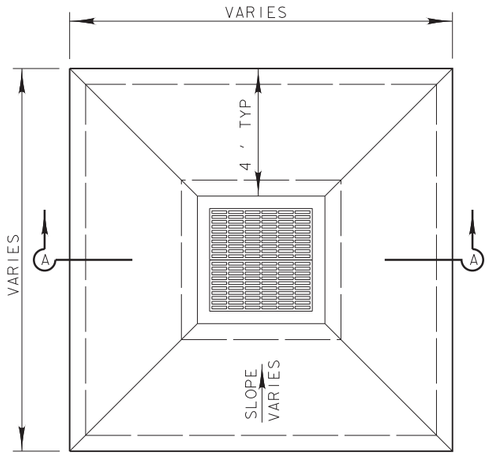
CONCRETE RIPRAP AT TYPICAL FILL SECTION

QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC)(4 IN).

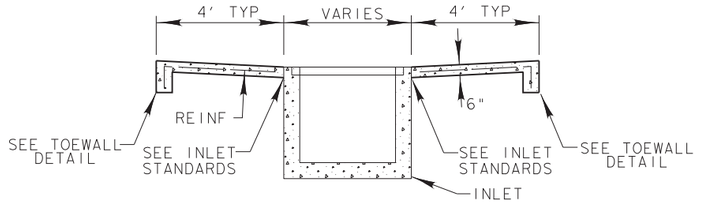


CONCRETE RIPRAP AT TYPICAL FLAT BOTTOM DITCH

QUANTITY FOR 4" CONC RIPRAP INCLUDES THE QUANTITY FOR THE 6" WIDE TOEWALL AND WILL BE PAID FOR UNDER ITEM 432, RIPRAP (CONC)(4 IN).

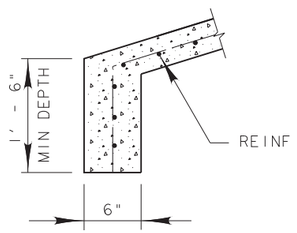


CONCRETE RIPRAP AT INLET



CONCRETE RIPRAP AT INLET RIPRAP APRON DETAILS

SECTION A-A



TOEWALL DETAIL

GENERAL NOTES:

1. USE CL B CONCRETE UNLESS OTHERWISE NOTED IN PLANS. USE CL A CONCRETE FOR RIPRAP APRON AROUND INLETS.
2. PROVIDE CONSTRUCTION JOINTS OR GROOVED JOINTS EXTENDING THE FULL SLANT SLOPE HEIGHT AT INTERVALS OF APPROXIMATELY 20 FEET UNLESS OTHERWISE DIRECTED.
3. PLACE PREMOLDED OR BOARD EXPANSION JOINTS VERTICALLY AND AT RIGHT ANGLES TO THE LONGITUDINAL AXIS OF THE RIPRAP IN SECTIONS NO LESS THAN 8 FEET IN WIDTH OR MORE THAN 40 FEET IN LENGTH.
4. RIPRAP MAY EXTEND BEYOND CROWN LINE, UP TO EDGE OF PAVEMENT.
5. USE NO.3 OR NO.4 BARS @ 12" O.C. IN BOTH DIRECTIONS SUPPORTED ON REINFORCING CHAIRS.
6. SEE QUANTITY SUMMARIES FOR RIPRAP LOCATIONS.
7. CONSTRUCT SLOPES TO THAT OF THE APPROPRIATE TYPICAL SECTION OR CROSS SECTION UNLESS OTHERWISE DIRECTED.

NOT TO SCALE

LUFKIN DISTRICT STANDARD

CONCRETE RIPRAP DETAILS

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		114

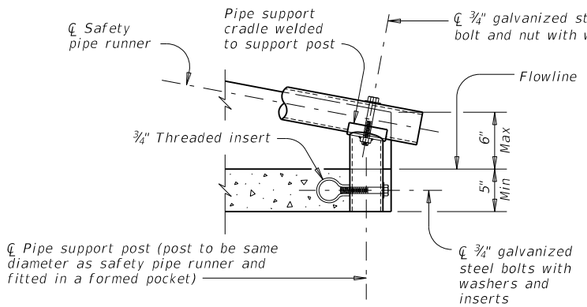
ISSUED 01-09
REVISED 03-14
REVISED 10/20/2016: MODIFIED TITLE BLOCK
REVISED 04/03/2017: MODIFIED NOTES FOR PAYMENT

11/2/2021 3:39:36 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\04*DRAINAGE\ConcRiprapDet*DistStnd.dgn

DATE: 9/28/2022 10:01:15 AM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\03_DRAINAGE\psetscss-21.dgn

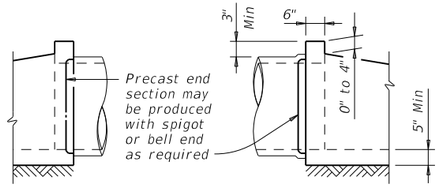
REQUIREMENTS FOR CULVERT PIPES AND SAFETY PIPE RUNNERS

Pipe I.D.	RCP Wall "B" Thickness	TP Wall Thickness (8)	"D" (1)	Slope	Min Length of Unit	Single Pipe		Multiple Pipes	
						Skew	Pipe Runners Required	Skew	Pipe Runners Required
12"	2"	1.15"	17.00"	3:1	2' – 11"	≤ 45°	No	≤ 45°	No
				4:1	3' – 6"				
				6:1	4' – 9"				
15"	2 ¼"	1.30"	20.50"	3:1	3' – 8"	≤ 45°	No	≤ 45°	No
				4:1	4' – 7"				
				6:1	6' – 5"				
18"	2 ½"	1.60"	24.00"	3:1	4' – 6"	≤ 45°	No	≤ 45°	No
				4:1	5' – 8"				
				6:1	8' – 0"				
24"	3"	1.95"	31.00"	3:1	6' – 2"	≤ 45°	No	= 30°	No
				4:1	7' – 10"			> 30°	Yes
				6:1	11' – 3"				
30"	3 ½"	2.65"	38.50"	3:1	7' – 10"	= 15°	No	= 15°	No
				4:1	10' – 1"	> 15°	Yes	> 15°	Yes
				6:1	14' – 8"				
36"	4"	2.75"	45.50"	3:1	9' – 5"	= 0°	No	≥ 0°	Yes
				4:1	12' – 3"	> 0°	Yes		
				6:1	17' – 11"				
42"	4 ½"	2.7"	52.50"	3:1	11' – 1"	≥ 0°	Yes	≥ 0°	Yes
				4:1	14' – 5"				
				6:1	21' – 2"				



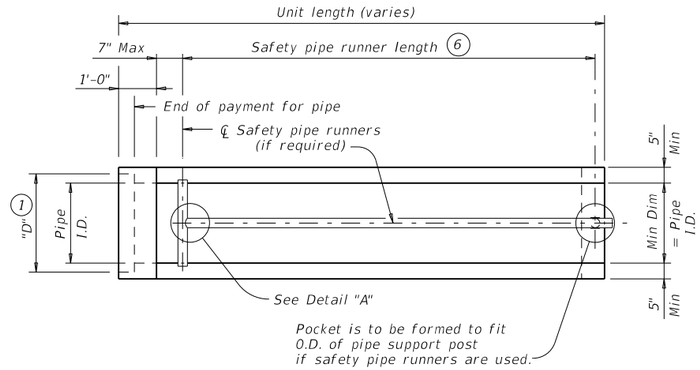
END DETAIL FOR INSTALLATION OF SAFETY PIPE RUNNERS

(If required)



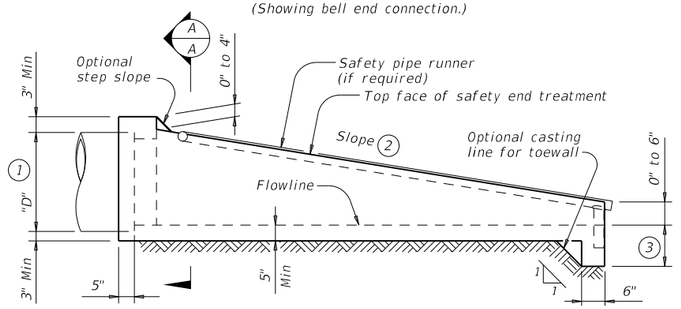
OPTIONAL JOINT FOR RCP

(Showing joint between RCP and precast safety end treatment)



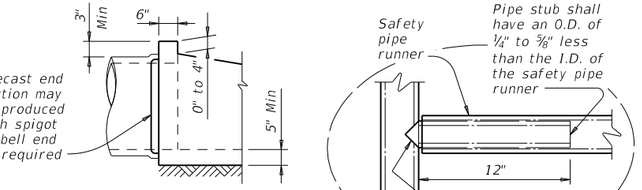
PLAN

(Showing bell end connection.)



LONGITUDINAL ELEVATION

(Showing bell end connection.)

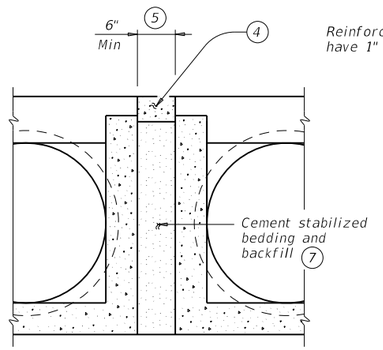


OPTION A

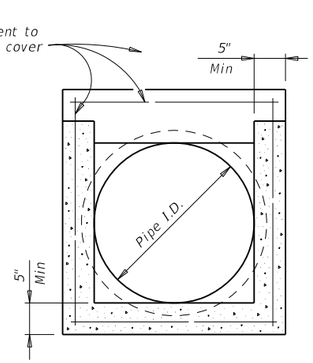
DETAIL A

(If required)

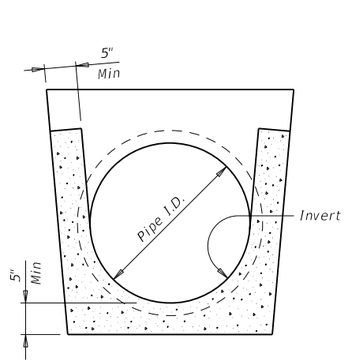
OPTION B



MULTIPLE PIPE INSTALLATION

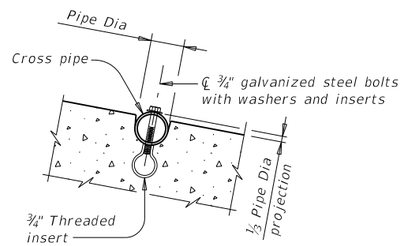


OPTION WITH SQUARE BOTTOM



OPTION WITH INVERT BOTTOM

SECTION A-A



INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)

SAFETY PIPE RUNNER DIMENSIONS

Max Safety Pipe Runner Length	Required Pipe Runner Size		
	Pipe Size	Pipe O.D.	Pipe I.D.
11' – 2"	3" STD	3.500"	3.068"
15' – 6"	3 ½" STD	4.000"	3.548"
20' – 10"	4" STD	4.500"	4.026"
35' – 4"	5" STD	5.563"	5.047"

(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 plans. Slope of 3:1 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) Measured along slope.

(7) 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.

(8) 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 1,800 Lbs at yield as recommended by Research Report 280-1, "Safety Treatment of Roadside Cross-Drainage Structures", Texas Transportation Institute, March 1981.

Provide safety pipe runners, cross pipes, pipe support posts, and pipe stubs meeting the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

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

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

Texas Department of Transportation

Bridge Division Standard

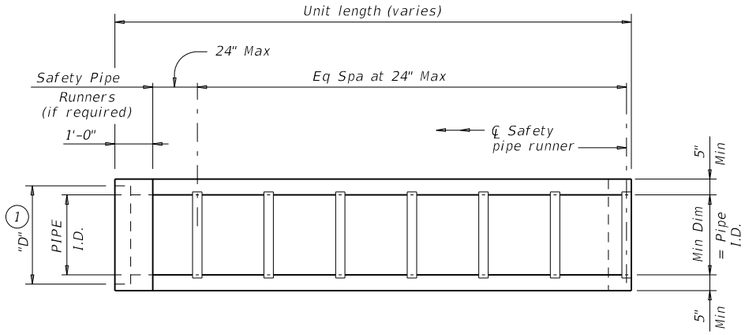
PRECAST SAFETY END TREATMENT

TYPE II ~ CROSS DRAINAGE

PSET-SC

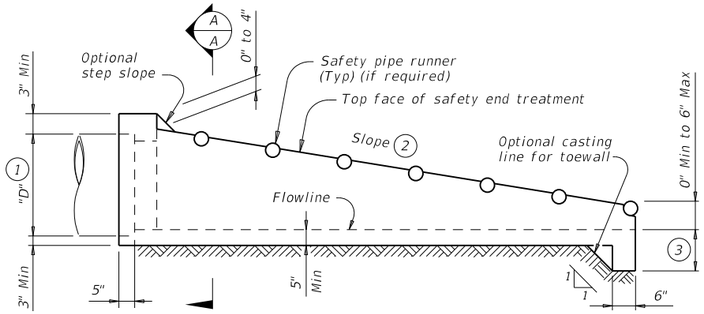
FILE: psetscss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		115

DATE: 9/28/2022 10:01:16 AM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\03_DRAINAGE\psetspss-21.dgn



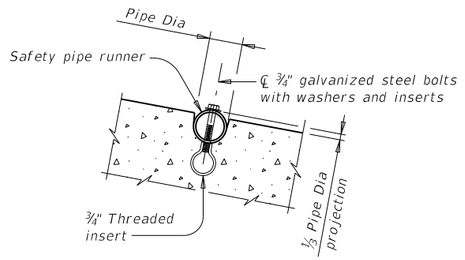
PLAN

(Showing bell end connection.)



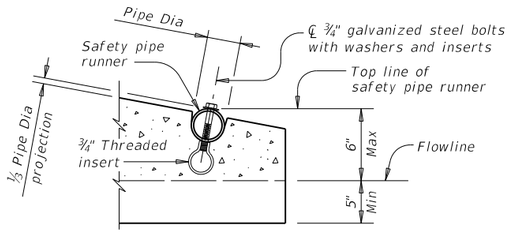
LONGITUDINAL ELEVATION

(Showing bell end connection.)

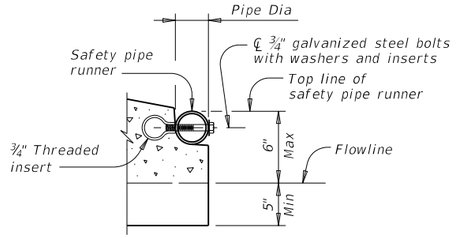


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



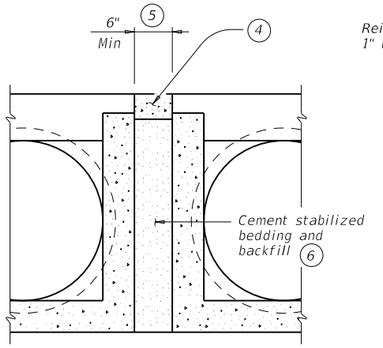
OPTION A



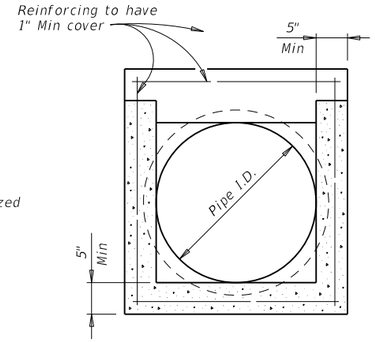
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

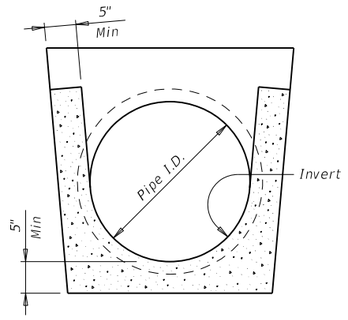
(If required)



MULTIPLE PIPE INSTALLATION

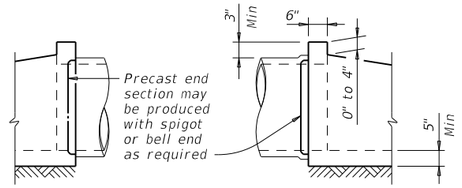


OPTION WITH SQUARE BOTTOM



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"	2.7"	52.50"	6:1	21' – 2"	Yes	Yes	4" STD	4.500"	4.026"

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

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

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

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

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

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

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

GENERAL NOTES:

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

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

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

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

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

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

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

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

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

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

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

Texas Department of Transportation

Bridge Division Standard

PRECAST SAFETY END TREATMENT

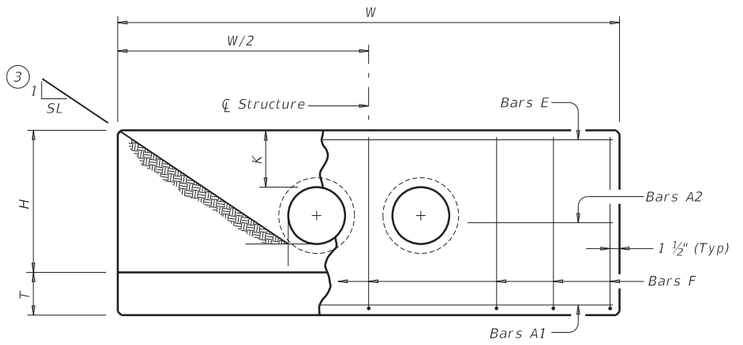
TYPE II ~ PARALLEL DRAINAGE

PSET-SP

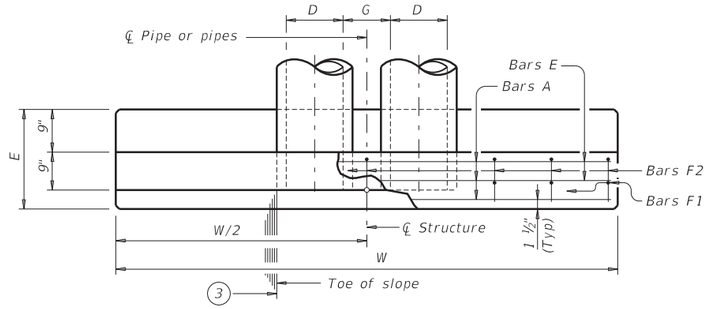
FILE: psetspss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		116

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

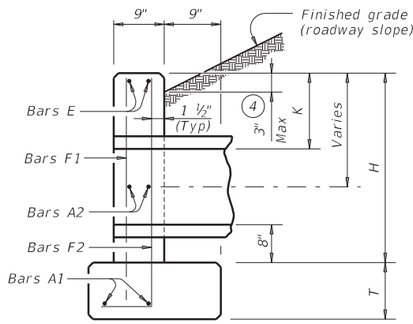
Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' – 0"	122	1.1	1' – 9"	15	0.2
	15"	10' – 3"	136	1.3	2' – 2"	16	0.2
	18"	11' – 6"	163	1.5	2' – 8"	19	0.3
	21"	12' – 9"	200	1.8	3' – 1"	31	0.4
	24"	14' – 0"	217	2.1	3' – 7"	34	0.4
	27"	15' – 3"	254	2.4	3' – 11"	37	0.5
	30"	16' – 6"	272	2.7	4' – 4"	40	0.6
	33"	17' – 9"	314	3.1	4' – 8"	43	0.6
	36"	19' – 0"	371	3.9	5' – 1"	46	0.8
	42"	21' – 6"	442	4.9	5' – 10"	52	1.0
	48"	25' – 0"	569	6.4	6' – 7"	59	1.3
	54"	27' – 6"	701	7.5	7' – 6"	82	1.6
	60"	30' – 0"	794	8.8	8' – 3"	90	1.8
	66"	32' – 6"	894	10.2	8' – 9"	96	2.0
	72"	35' – 0"	1,055	11.7	9' – 4"	103	2.3
3:1	12"	13' – 0"	175	1.6	1' – 9"	14	0.2
	15"	14' – 9"	193	1.9	2' – 2"	17	0.2
	18"	16' – 6"	228	2.2	2' – 8"	19	0.3
	21"	18' – 3"	299	2.6	3' – 1"	31	0.4
	24"	20' – 0"	323	3.0	3' – 7"	33	0.4
	27"	21' – 9"	371	3.5	3' – 11"	37	0.5
	30"	23' – 6"	415	4.0	4' – 4"	40	0.5
	33"	25' – 3"	469	4.6	4' – 8"	43	0.6
	36"	27' – 0"	556	5.7	5' – 1"	46	0.8
	42"	30' – 6"	675	7.1	5' – 10"	52	1.0
	48"	35' – 6"	837	9.2	6' – 7"	59	1.3
	54"	39' – 0"	1,015	11.0	7' – 6"	84	1.6
	60"	42' – 6"	1,171	12.9	8' – 3"	91	1.8
	66"	46' – 0"	1,298	14.9	8' – 9"	98	2.0
	72"	49' – 6"	1,561	17.1	9' – 4"	103	2.3
4:1	12"	17' – 0"	229	2.0	1' – 9"	15	0.2
	15"	19' – 3"	266	2.4	2' – 2"	17	0.2
	18"	21' – 6"	308	2.9	2' – 8"	19	0.3
	21"	23' – 9"	382	3.5	3' – 1"	31	0.3
	24"	26' – 0"	430	3.9	3' – 7"	34	0.4
	27"	28' – 3"	486	4.7	3' – 11"	37	0.5
	30"	30' – 6"	539	5.2	4' – 4"	40	0.6
	33"	32' – 9"	603	6.0	4' – 8"	42	0.6
	36"	35' – 0"	738	7.5	5' – 1"	47	0.8
	42"	39' – 6"	881	9.3	5' – 10"	52	1.0
	48"	46' – 0"	1,102	12.1	6' – 7"	61	1.3
	54"	50' – 6"	1,364	14.4	7' – 6"	84	1.6
	60"	55' – 0"	1,547	16.9	8' – 3"	91	1.8
	66"	59' – 6"	1,741	19.5	8' – 9"	98	2.0
	72"	64' – 0"	2,077	22.4	9' – 4"	102	2.3
6:1	12"	25' – 0"	336	3.0	1' – 9"	14	0.2
	15"	28' – 3"	384	3.6	2' – 2"	17	0.2
	18"	31' – 6"	452	4.2	2' – 8"	19	0.3
	21"	34' – 9"	581	5.1	3' – 1"	31	0.4
	24"	38' – 0"	644	5.8	3' – 7"	34	0.4
	27"	41' – 3"	737	6.9	3' – 11"	37	0.5
	30"	44' – 6"	807	7.7	4' – 4"	39	0.6
	33"	47' – 9"	912	8.9	4' – 8"	44	0.6
	36"	51' – 0"	1,108	11.0	5' – 1"	48	0.8
	42"	57' – 6"	1,318	13.7	5' – 10"	54	1.0
	48"	67' – 0"	1,682	17.9	6' – 7"	59	1.3
	54"	73' – 6"	2,072	21.3	7' – 6"	83	1.6
	60"	80' – 0"	2,351	24.9	8' – 3"	89	1.8
	66"	86' – 6"	2,643	28.9	8' – 9"	96	2.0
	72"	93' – 0"	3,121	33.1	9' – 4"	101	2.3



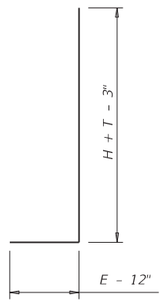
ELEVATION



PLAN OF NON-SKEWED PIPES



SECTION AT CENTER OF PIPE



BARS F2

(1) Total quantities include one 3'-1" lap for bars over 60' in length.

(2) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(3) Indicated slope is perpendicular to centerline pipe or pipes.

(4) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) Dimensions shown are usual and maximum.

(6) Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' – 9"	1' – 0"	2' – 8"	0' – 9"	1' – 9"
15"	0' – 11"	1' – 0"	2' – 11"	0' – 9"	1' – 9"
18"	1' – 2"	1' – 0"	3' – 2"	0' – 9"	1' – 9"
21"	1' – 4"	1' – 0"	3' – 5"	0' – 9"	2' – 0"
24"	1' – 7"	1' – 0"	3' – 8"	0' – 9"	2' – 0"
27"	1' – 8"	1' – 0"	3' – 11"	0' – 9"	2' – 3"
30"	1' – 10"	1' – 0"	4' – 2"	0' – 9"	2' – 3"
33"	1' – 11"	1' – 0"	4' – 5"	0' – 9"	2' – 6"
36"	2' – 1"	1' – 0"	4' – 8"	1' – 0"	2' – 6"
42"	2' – 4"	1' – 0"	5' – 2"	1' – 0"	2' – 9"
48"	2' – 7"	1' – 3"	5' – 11"	1' – 0"	3' – 0"
54"	3' – 0"	1' – 3"	6' – 5"	1' – 0"	3' – 3"
60"	3' – 3"	1' – 3"	6' – 11"	1' – 0"	3' – 6"
66"	3' – 3"	1' – 3"	7' – 5"	1' – 0"	3' – 9"
72"	3' – 4"	1' – 3"	7' – 11"	1' – 0"	4' – 0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' – 6"	~
E	#5	~	2
F	#5	1' – 0"	~

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation

Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

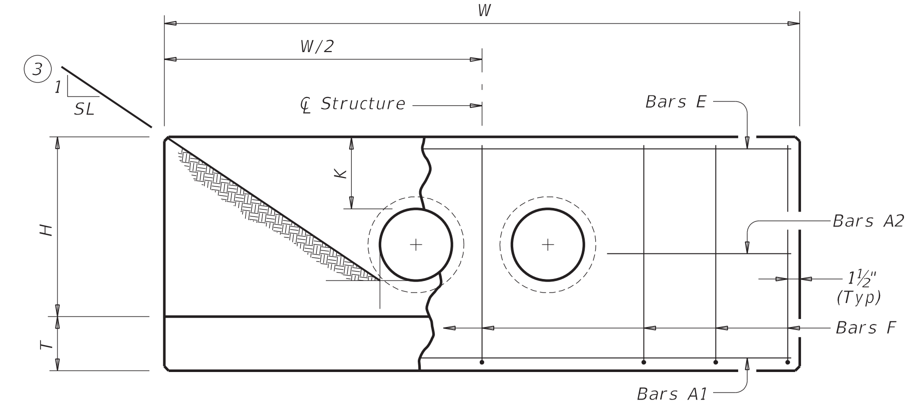
CH-PW-0

FILE: chpw0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		117

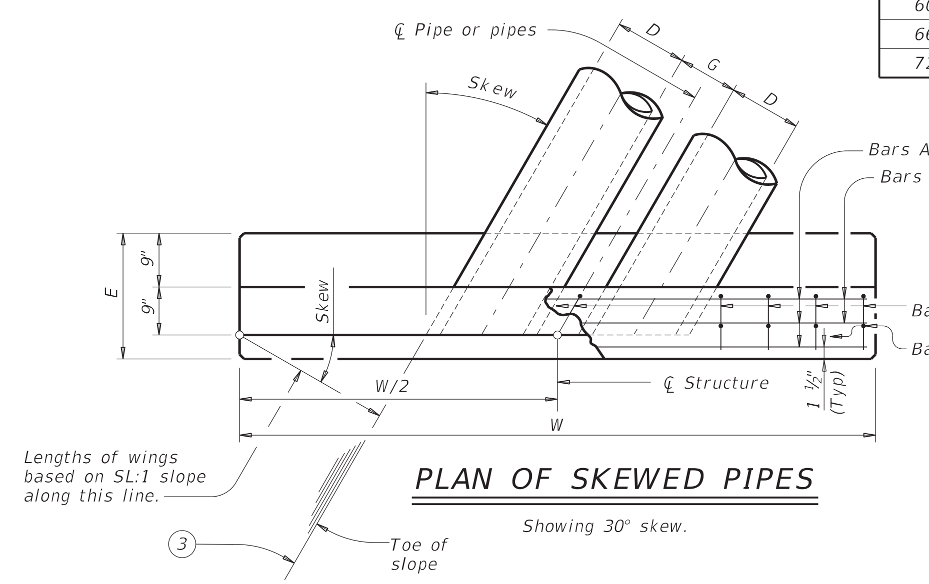
DATE: 11/2/2021 3:39:38 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM files\Standards\chpw0ste-20.dgn

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

Slope	Dia of Pipe (D)	15° Skew: Values for One Pipe			15° Skew: Values To Be Added for Each Addt'l Pipe			30° Skew: Values for One Pipe			30° Skew: Values To Be Added for Each Addt'l Pipe			45° Skew: Values for One Pipe			45° Skew: Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' - 4"	124	1.1	1' - 9 ¾"	15	0.2	10' - 5"	130	1.2	2' - 0"	16	0.2	12' - 9"	159	1.5	2' - 5 ¾"	17	0.3
	15"	10' - 7"	136	1.3	2' - 3"	17	0.2	11' - 10"	159	1.5	2' - 6"	18	0.2	14' - 6"	191	1.8	3' - 0 ¾"	20	0.3
	18"	11' - 11"	165	1.5	2' - 9"	19	0.3	13' - 3"	174	1.7	3' - 1"	29	0.3	16' - 3"	207	2.1	3' - 9 ¼"	33	0.4
	21"	13' - 2"	203	1.9	3' - 2 ¼"	31	0.4	14' - 9"	233	2.1	3' - 6 ¾"	33	0.4	18' - 0"	276	2.6	4' - 4 ¼"	36	0.5
	24"	14' - 6"	240	2.1	3' - 8 ¼"	34	0.4	16' - 2"	251	2.4	4' - 1 ¾"	36	0.5	19' - 10"	318	2.9	5' - 0 ¾"	39	0.6
	27"	15' - 9"	258	2.5	4' - 0 ¾"	38	0.5	17' - 7"	292	2.8	4' - 6 ¼"	39	0.6	21' - 7"	342	3.4	5' - 6 ¼"	44	0.7
	30"	17' - 1"	297	2.8	4' - 5 ¾"	40	0.6	19' - 1"	311	3.1	5' - 0"	42	0.6	23' - 4"	388	3.8	6' - 1 ¾"	47	0.8
	33"	18' - 5"	320	3.3	4' - 9 ¾"	43	0.6	20' - 6"	358	3.6	5' - 4 ¾"	46	0.7	25' - 1"	439	4.4	6' - 7 ¼"	51	0.9
	36"	19' - 8"	401	4.0	5' - 3"	47	0.9	21' - 11"	422	4.5	5' - 10 ¾"	50	0.9	26' - 10"	517	5.5	7' - 2 ¼"	55	1.2
	42"	22' - 3"	476	5.0	6' - 0 ¾"	53	1.1	24' - 10"	528	5.6	6' - 8 ¾"	56	1.2	30' - 5"	634	6.9	8' - 3"	76	1.4
	48"	25' - 11"	577	6.6	6' - 9 ¾"	60	1.3	28' - 10"	637	7.3	7' - 7 ¼"	79	1.5	35' - 4"	791	9.0	9' - 3 ¾"	88	1.8
	54"	28' - 6"	711	7.8	7' - 9"	83	1.6	31' - 9"	781	8.7	8' - 8"	81	1.8	38' - 11"	958	10.7	10' - 7 ¼"	97	2.2
	60"	31' - 1"	805	9.2	8' - 6 ¼"	91	1.9	34' - 8"	881	10.2	9' - 6 ¼"	97	2.1	42' - 5"	1,113	12.5	11' - 8"	124	2.6
	66"	33' - 8"	907	10.6	9' - 0 ¾"	98	2.1	37' - 6"	1,028	11.8	10' - 1 ¼"	102	2.4	46' - 0"	1,235	14.5	12' - 4 ¼"	132	2.9
	72"	36' - 3"	1,071	12.1	9' - 8"	105	2.4	40' - 5"	1,207	13.5	10' - 9 ¼"	110	2.6	49' - 6"	1,446	16.6	13' - 2 ¼"	141	3.2
3:1	12"	13' - 6"	178	1.6	1' - 9 ¾"	15	0.2	15' - 0"	189	1.8	2' - 0"	15	0.2	18' - 5"	237	2.2	2' - 5 ¾"	17	0.2
	15"	15' - 3"	212	1.9	2' - 3"	17	0.2	17' - 0"	223	2.1	2' - 6"	17	0.3	20' - 10"	276	2.6	3' - 0 ¾"	20	0.3
	18"	17' - 1"	231	2.3	2' - 9"	19	0.3	19' - 1"	259	2.5	3' - 1"	29	0.3	23' - 4"	318	3.1	3' - 9 ¼"	32	0.4
	21"	18' - 11"	306	2.7	3' - 2 ¼"	31	0.4	21' - 1"	339	3.0	3' - 6 ¾"	33	0.4	25' - 10"	413	3.7	4' - 4 ¼"	36	0.5
	24"	20' - 8"	345	3.1	3' - 8 ¾"	35	0.4	23' - 1"	384	3.5	4' - 1 ¾"	36	0.5	28' - 3"	462	4.2	5' - 0 ¾"	40	0.6
	27"	22' - 6"	376	3.7	4' - 0 ¾"	38	0.5	25' - 1"	438	4.1	4' - 6 ¼"	39	0.6	30' - 9"	522	5.0	5' - 6 ¼"	44	0.7
	30"	24' - 4"	422	4.1	4' - 5 ¾"	40	0.6	27' - 2"	466	4.6	5' - 0"	42	0.6	33' - 3"	578	5.6	6' - 1 ¾"	47	0.8
	33"	26' - 2"	476	4.8	4' - 10"	43	0.6	29' - 2"	522	5.3	5' - 4 ¾"	46	0.7	35' - 9"	644	6.5	6' - 7 ¼"	51	0.9
	36"	27' - 11"	590	5.9	5' - 3"	47	0.8	31' - 2"	645	6.6	5' - 10 ¾"	50	0.9	38' - 2"	787	8.0	7' - 2 ¼"	56	1.2
	42"	31' - 7"	684	7.3	6' - 0 ¼"	53	1.1	35' - 3"	776	8.2	6' - 8 ¾"	56	1.2	43' - 2"	933	10.0	8' - 3"	79	1.4
	48"	36' - 9"	880	9.6	6' - 9 ¾"	61	1.3	41' - 0"	953	10.7	7' - 7 ¼"	81	1.5	50' - 2"	1,166	13.1	9' - 3 ¾"	88	1.8
	54"	40' - 5"	1,065	11.4	7' - 9"	85	1.6	45' - 0"	1,185	12.7	8' - 8"	89	1.8	55' - 2"	1,435	15.5	10' - 7 ¼"	97	2.2
	60"	44' - 0"	1,224	13.3	8' - 6 ¼"	93	1.9	49' - 1"	1,356	14.8	9' - 6 ¼"	96	2.1	60' - 1"	1,635	18.2	11' - 8"	124	2.6
	66"	47' - 7"	1,357	15.4	9' - 1"	98	2.1	53' - 1"	1,497	17.2	10' - 1 ¼"	103	2.3	65' - 1"	1,892	21.1	12' - 4 ¼"	130	2.9
	72"	51' - 3"	1,624	17.7	9' - 8"	105	2.3	57' - 2"	1,787	19.7	10' - 9 ¼"	109	2.6	70' - 0"	2,218	24.1	13' - 2 ¼"	139	3.2
4:1	12"	17' - 7"	232	2.1	1' - 9 ¾"	15	0.2	19' - 8"	259	2.4	2' - 0"	16	0.2	24' - 0"	314	2.9	2' - 5 ¾"	18	0.2
	15"	19' - 11"	272	2.5	2' - 3"	17	0.2	22' - 3"	301	2.8	2' - 6"	18	0.3	27' - 3"	361	3.5	3' - 0 ¾"	21	0.3
	18"	22' - 3"	313	3.0	2' - 9"	19	0.3	24' - 10"	344	3.3	3' - 1"	29	0.3	30' - 5"	427	4.0	3' - 9 ¼"	32	0.4
	21"	24' - 7"	407	3.6	3' - 2 ¼"	31	0.4	27' - 5"	446	4.0	3' - 6 ¾"	33	0.4	33' - 7"	549	4.9	4' - 4 ¼"	36	0.5
	24"	26' - 11"	455	4.1	3' - 8 ¾"	35	0.4	30' - 0"	499	4.5	4' - 1 ¾"	36	0.5	36' - 9"	609	5.6	5' - 0 ¾"	40	0.6
	27"	29' - 3"	514	4.8	4' - 0 ¾"	38	0.5	32' - 7"	562	5.4	4' - 6 ¼"	40	0.6	39' - 11"	703	6.6	5' - 6 ¼"	43	0.7
	30"	31' - 7"	568	5.4	4' - 5 ¾"	40	0.6	35' - 3"	620	6.0	5' - 0"	42	0.6	43' - 2"	768	7.4	6' - 1 ¾"	49	0.8
	33"	33' - 11"	634	6.2	4' - 10"	43	0.7	37' - 10"	710	7.0	5' - 4 ¾"	46	0.7	46' - 4"	848	8.5	6' - 7 ¼"	52	0.9
	36"	36' - 3"	776	7.7	5' - 3"	48	0.9	40' - 5"	868	8.6	5' - 10 ¾"	49	0.9	49' - 6"	1,058	10.6	7' - 2 ¼"	56	1.1
	42"	40' - 11"	921	9.6	6' - 0 ¼"	53	1.0	45' - 7"	1,022	10.7	6' - 8 ¾"	57	1.2	55' - 10"	1,262	13.1	8' - 3"	78	1.4
	48"	47' - 7"	1,152	12.6	6' - 10"	61	1.3	53' - 1"	1,268	14.0	7' - 7 ¼"	80	1.5	65' - 1"	1,587	17.2	9' - 3 ¾"	86	1.8
	54"	52' - 3"	1,416	14.9	7' - 9 ¼"	86	1.6	58' - 4"	1,589	16.6	8' - 8"	89	1.8	71' - 5"	1,924	20.4	10' - 7 ¼"	95	2.2
	60"	56' - 11"	1,606	17.5	8' - 6 ¾"	92	1.9	63' - 6"	1,806	19.5	9' - 6 ¼"	95	2.1	77' - 9"	2,192	23.9	11' - 8"	122	2.6
	66"	61' - 7"	1,819	20.2	9' - 0 ¾"	97	2.1	68' - 8"	2,019	22.5	10' - 1 ¼"	101	2.4	84' - 2"	2,472	27.6	12' - 4 ¼"	131	2.9
	72"	66' - 3"	2,150	23.2	9' - 8"	104	2.4	73' - 11"	2,379	25.9	10' - 9 ¼"	108	2.6	90' - 6"	2,937	31.7	13' - 2 ¼"	138	3.2
6:1	12"	25' - 11"	342	3.1	1' - 9 ¾"	15	0.2	28' - 10"	374	3.5	2' - 0"	16	0.2	35' - 4"	456	4.3	2' - 5 ¾"	17	0.2
	15"	29' - 3"	390	3.7	2' - 3"	17	0.2	32' - 7"	442	4.2	2' - 6"	18	0.2	39' - 11"	549	5.1	3' - 0 ¾"	20	0.3
	18"	32' - 7"	459	4.4	2' - 9"	20	0.3	36' - 4"	515	4.9	3' - 1"	29	0.3	44' - 7"	629	6.0	3' - 9 ¼"	33	0.4
	21"	36' - 0"	608	5.3	3' - 2 ¼"	31	0.4	40' - 2"	660	5.9	3' - 6 ¾"	33	0.4	49' - 2"	823	7.2	4' - 4 ¼"	38	0.5
	24"	39' - 4"	672	6.0	3' - 8 ¾"	35	0.4	43' - 11"	748	6.7	4' - 1 ¾"	36	0.5	53' - 9"	920	8.2	5' - 0 ¾"	42	0.6
	27"	42' - 8"	770	7.1	4' - 0 ¾"	38	0.5	47' - 8"	852	8.0	4' - 6 ¼"	41	0.5	58' - 4"	1,039	9.7	5' - 6 ¼"	45	0.7
	30"	46' - 1"	839	8.0	4' - 5 ¾"	40	0.6	51' - 5"	949	8.9	5' - 0"	44	0.6	62' - 11"	1,162	10.9	6' - 1 ¾"	48	0.8
	33"	49' - 5"	947	9.2	4' - 10"	45	0.7	55' - 2"	1,040	10.3	5' - 4 ¾"	48	0.7	67' - 6"	1,292	12.6	6' - 7 ¼"	50	0.9
	36"	52' - 10"	1,151	11.4	5' - 3"	49	0.8	58' - 11"	1,287	12.7	5' - 10 ¾"	51	1.0	72' - 1"	1,583	15.6	7' - 2 ¼"	55	1.1
	42"	59' - 6"	1,365	14.2	6' - 0 ¼"	55	1.0	66' - 5"	1,530	15.8	6' - 8 ¾"	57	1.2	81' - 4"	1,875	19.4	8' - 3"	76	1.4
	48"	69' - 4"	1,737	18.5	6' - 10"	59	1.3	77' - 4"	1,942	20.7	7' - 7 ¼"	79	1.5	94' - 9"	2,368	25.3	9' - 3 ¾"	86	1.8
	54"	76' - 1"	2,138	22.0	7' - 9 ¼"	83	1.6	84' - 10"	2,378	24.6	8' - 8"	87	1.8	103' - 11"	2,912	30.1	10' - 7 ¼"	95	2.2
	60"	82' - 10"	2,426	25.8	8' - 6 ¾"	90	1.9	92' - 5"	2,681	28.8	9' - 6 ¼"	94	2.1	113' - 2"	3,294	35.3	11' - 8"	122	2.6
	66"	89' - 7"	2,730	29.9	9' - 0 ¾"	96	2.1	99' - 11"	3,038	33.3	10' - 1 ¼"	101	2.4	122' - 4"	3,697	40.8	12' - 4 ¼"	130	2.9
	72"	96' - 3"	3,218	34.2	9' - 8"	102	2.4	107' - 5"	3,580	38.2	10' - 9 ¼"	108	2.6	131' - 6"	4,372	46.8	13' - 2 ¼"	139	3.2

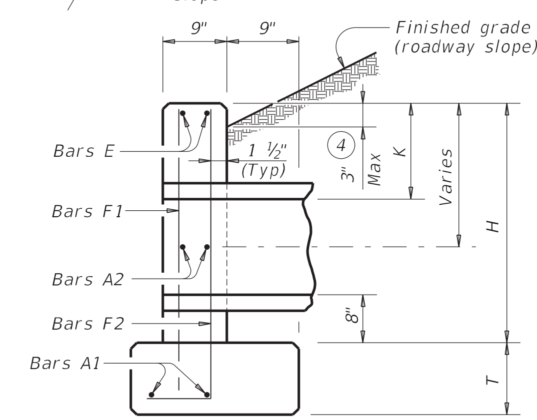


ELEVATION



PLAN OF SKEWED PIPES

Showing 30° skew.



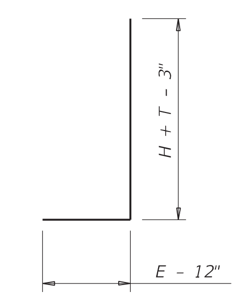
SECTION AT CENTER OF PIPE

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' - 9"	1' - 0"	2' - 8"	0' - 9"	1' - 9"
15"	0' - 11"	1' - 0"	2' - 11"	0' - 9"	1' - 9"
18"	1' - 2"	1' - 0"	3' - 2"	0' - 9"	1' - 9"
21"	1' - 4"	1' - 0"	3' - 5"	0' - 9"	2' - 0"
24"	1' - 7"	1' - 0"	3' - 8"	0' - 9"	2' - 0"
27"	1' - 8"	1' - 0"	3' - 11"	0' - 9"	2' - 3"
30"	1' - 10"	1' - 0"	4' - 2"	0' - 9"	2' - 3"
33"	1' - 11"	1' - 0"	4' - 5"	0' - 9"	2' - 6"
36"	2' - 1"	1' - 0"	4' - 8"	1' - 0"	2' - 6"
42"	2' - 4"	1' - 0"	5' - 2"	1' - 0"	2' - 9"
48"	2' - 7"	1' - 3"	5' - 11"	1' - 0"	3' - 0"
54"	3' - 0"	1' - 3"	6' - 5"	1' - 0"	3' - 3"
60"	3' - 3"	1' - 3"	6' - 11"	1' - 0"	3' - 6"
66"	3' - 3"	1' - 3"	7' - 5"	1' - 0"	3' - 9"
72"	3' - 4"	1' - 3"	7' - 11"	1' - 0"	4' - 0"

TABLE OF (6) REINFORCING STEEL

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' - 6"	~
E	#5	~	2
F	#5	1' - 0"	~



BARS F2

MATERIAL NOTES:

Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:

Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing dimensions are out-to-out of bars.

(1) Total quantites include one 3'-1" lap for bars over 60' in length.

(2) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(3) Indicated slope is perpendicular to centerline pipe or pipes.

(4) For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(5) Dimensions shown are usual and maximum.

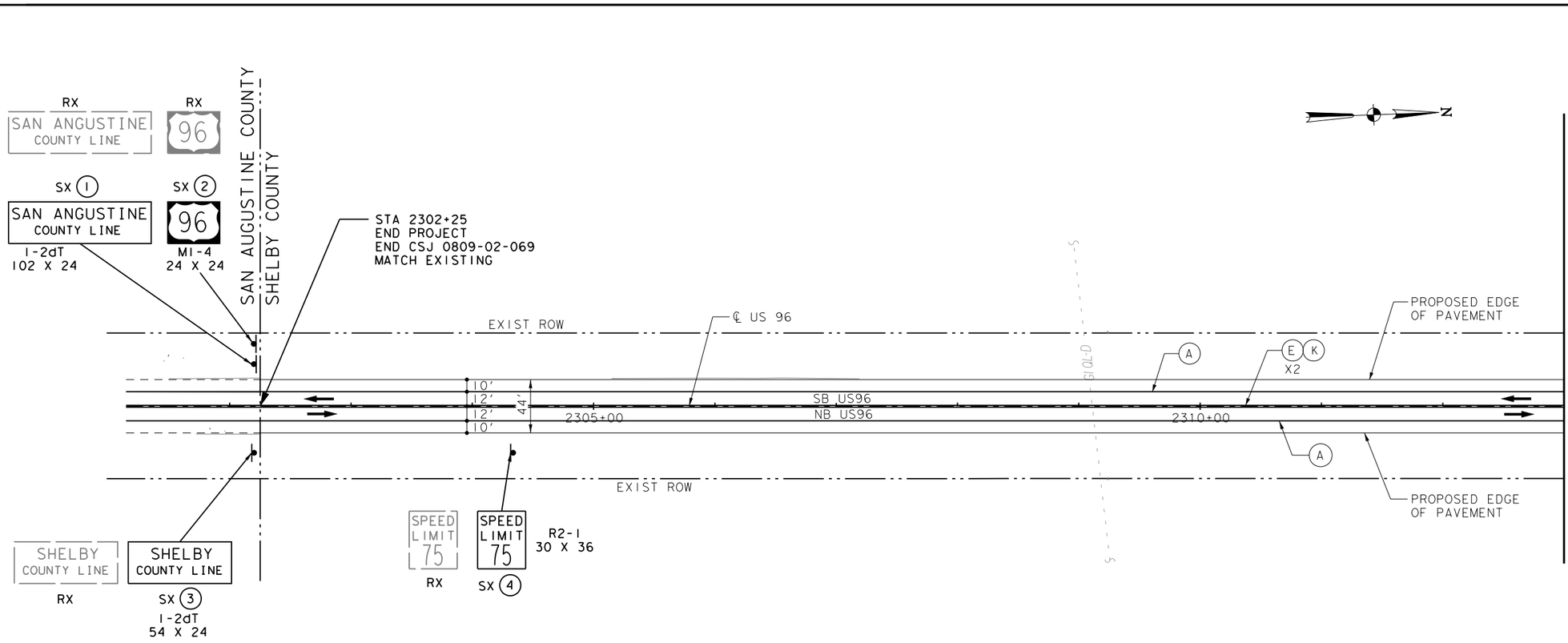
(6) Quantities shown are for one structure end only (one headwall).

Texas Department of Transportation | Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR SKEWED PIPE CULVERTS

CH-PW-S

FILE: chpwsste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT 0809	SECT 02	JOB 069	HIGHWAY US 96
REVISIONS	DIST LFK		COUNTY SHELBY	SHEET NO. 118



0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

SIGNING & PAVEMENT MARKING LAYOUTS

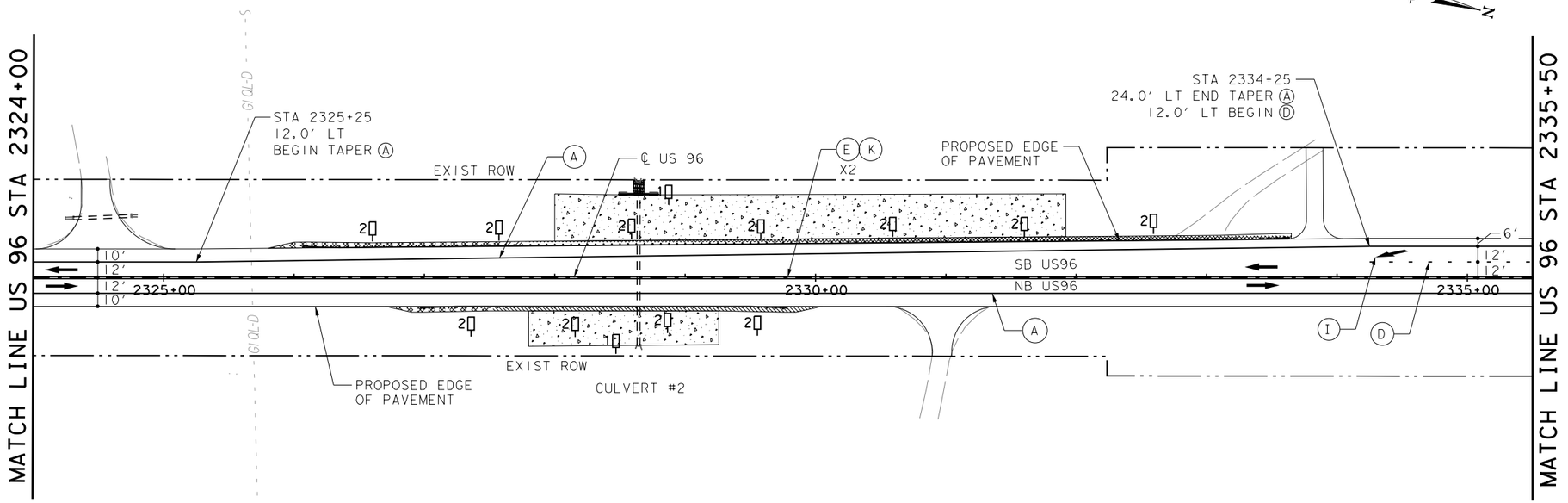
(SHEET 1 OF 12)

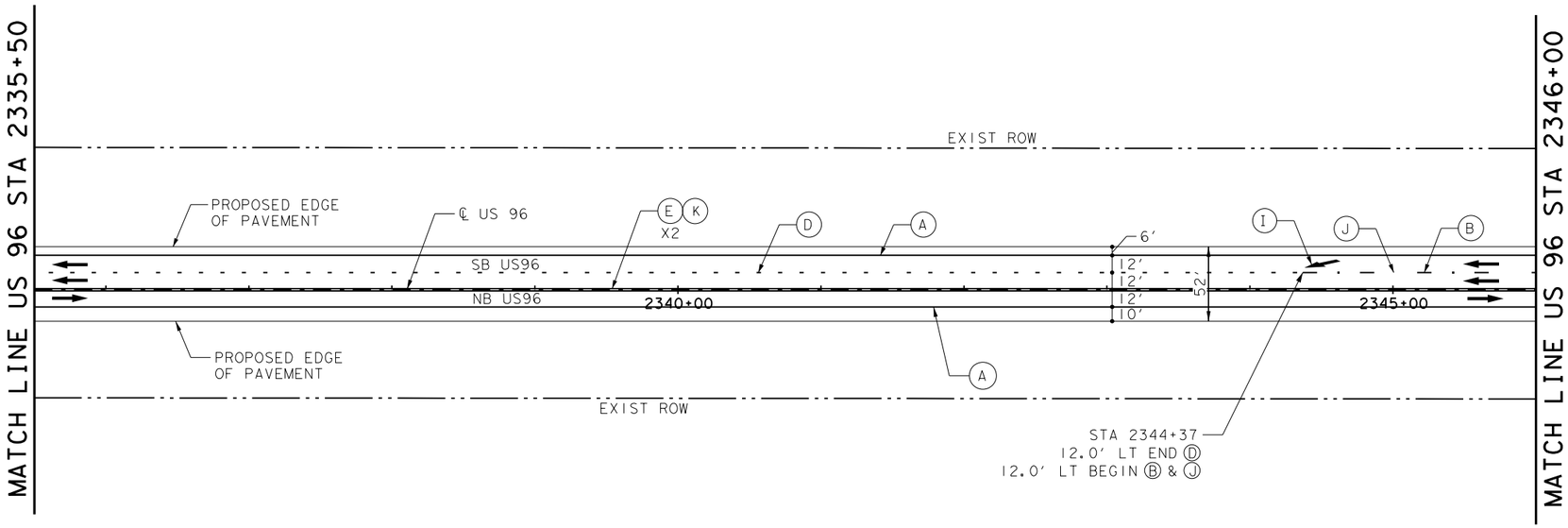
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		119

9/28/2022 9:29:32 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\08*TRAFF\6802TSS0I.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

SIGNING & PAVEMENT MARKING LAYOUTS

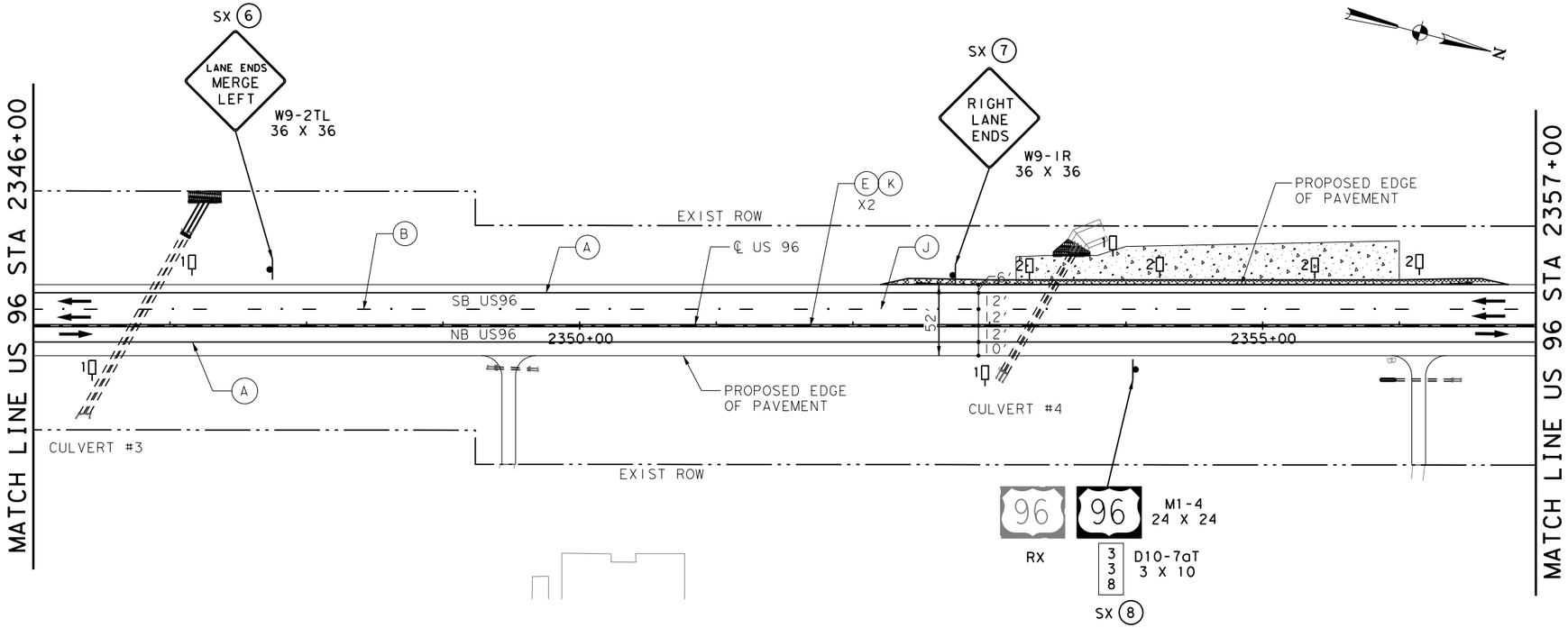
(SHEET 2 OF 12)

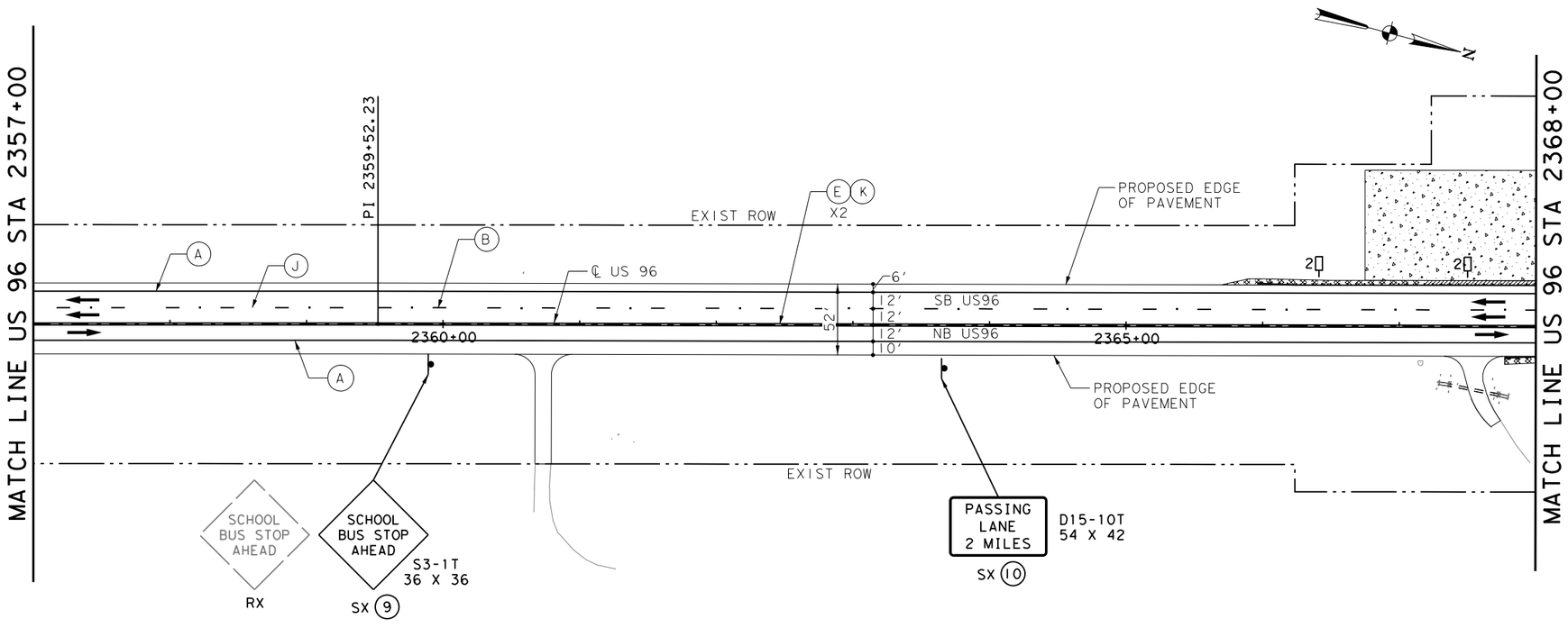
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		120

9/28/2022 9:29:32 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\08*TRAFF\6802TSS02.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

SIGNING & PAVEMENT MARKING LAYOUTS

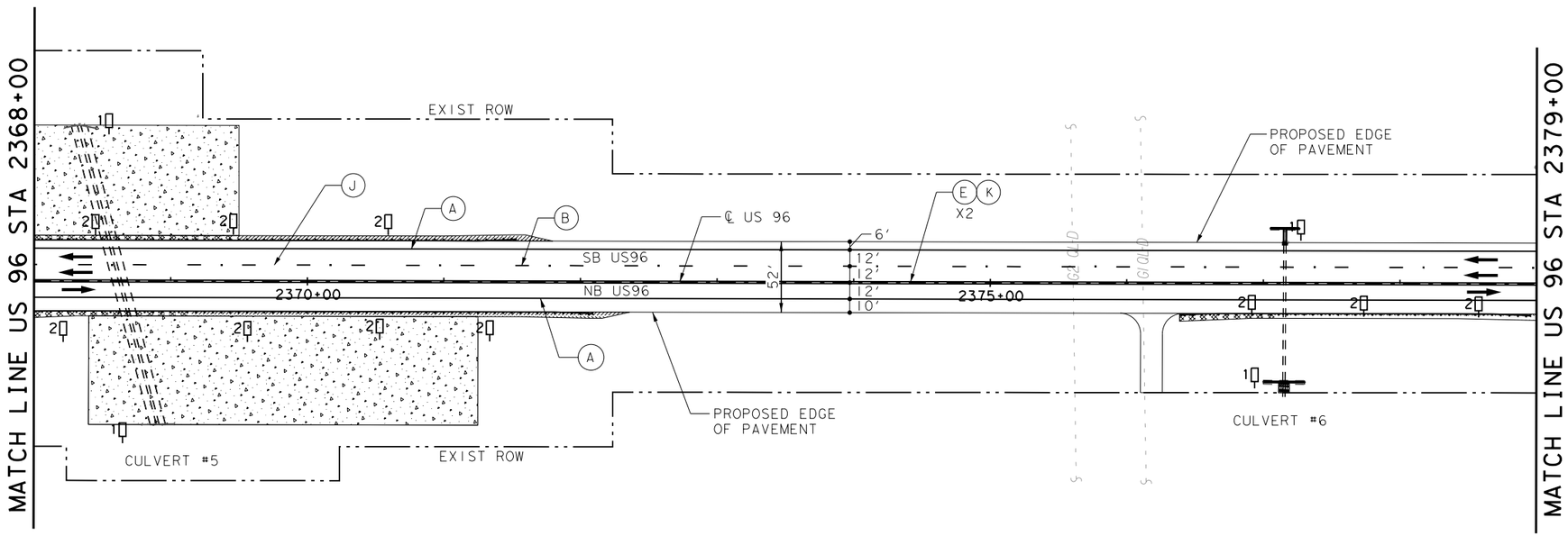
(SHEET 3 OF 12)

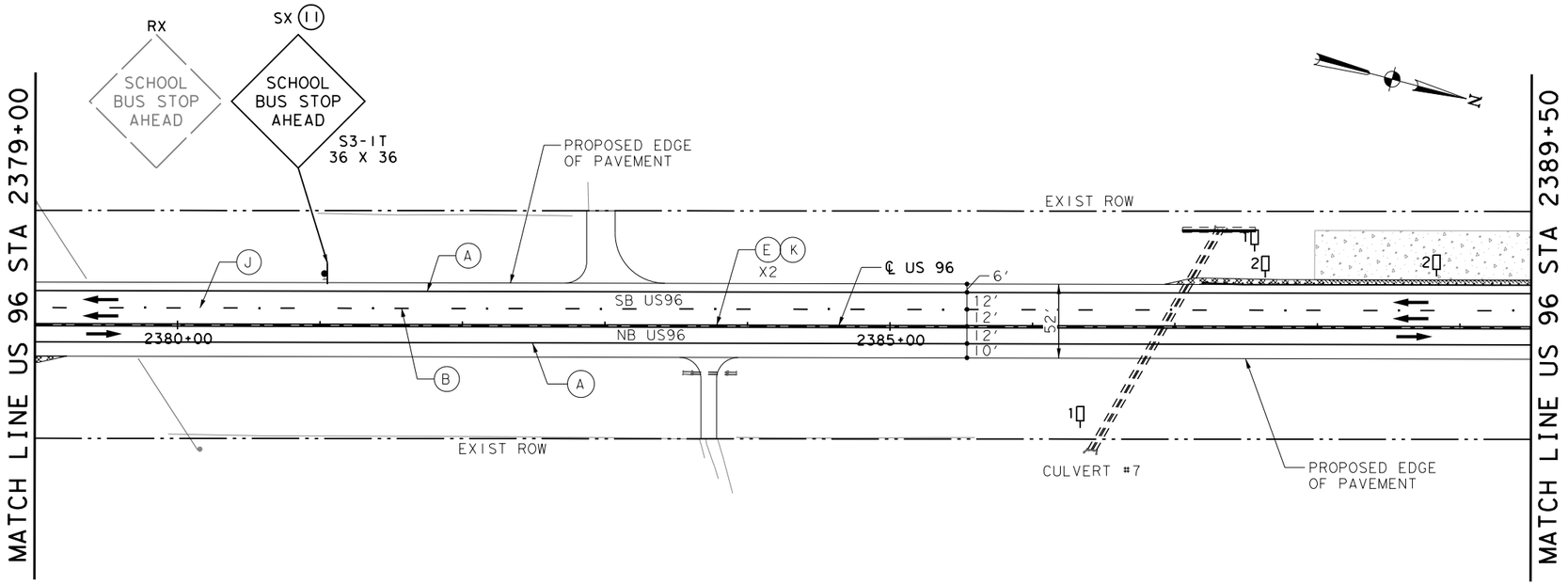
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		121

9/28/2022 9:29:33 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08*TRAFF\6802TSS03.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

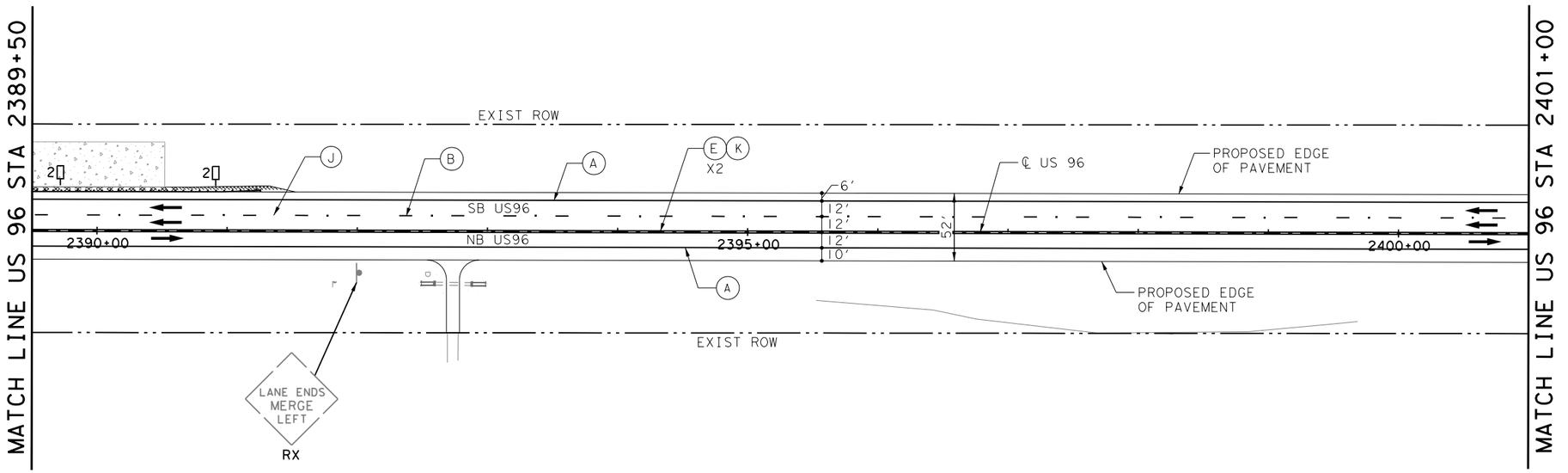
SIGNING & PAVEMENT MARKING LAYOUTS

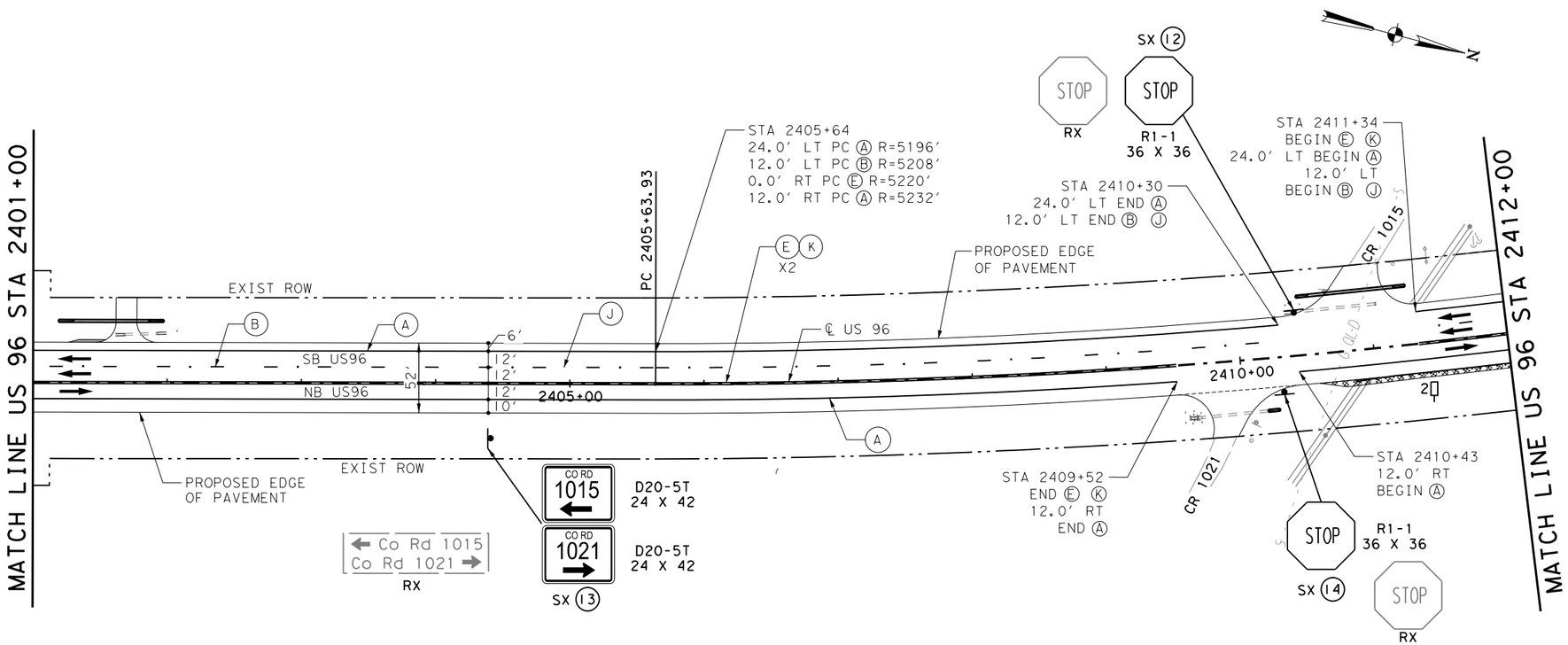
(SHEET 4 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		122

9/28/2022 9:29:33 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08+TRAFF\6802TSS04.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

Ⓐ	RE PM TY I (W) 6" (SLD)
Ⓑ	RE PM TY I (W) 6" (BRK)
Ⓒ	RE PM TY I (W) 8" (SLD)
Ⓓ	RE PM TY I (W) 6" (LNDP)
Ⓔ	RE PM TY I (Y) 6" (SLD)
Ⓕ	PRFB MRK (W) 24" (SLD)
Ⓖ	PRFB MRK (W)(WORD)
Ⓗ	PRFB MRK (W)(ARROW)
Ⓘ	PRFB MRK (W) (LNDP ARROW)
Ⓙ	TY I-C RAISED PAVEMENT MARKER
Ⓚ	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

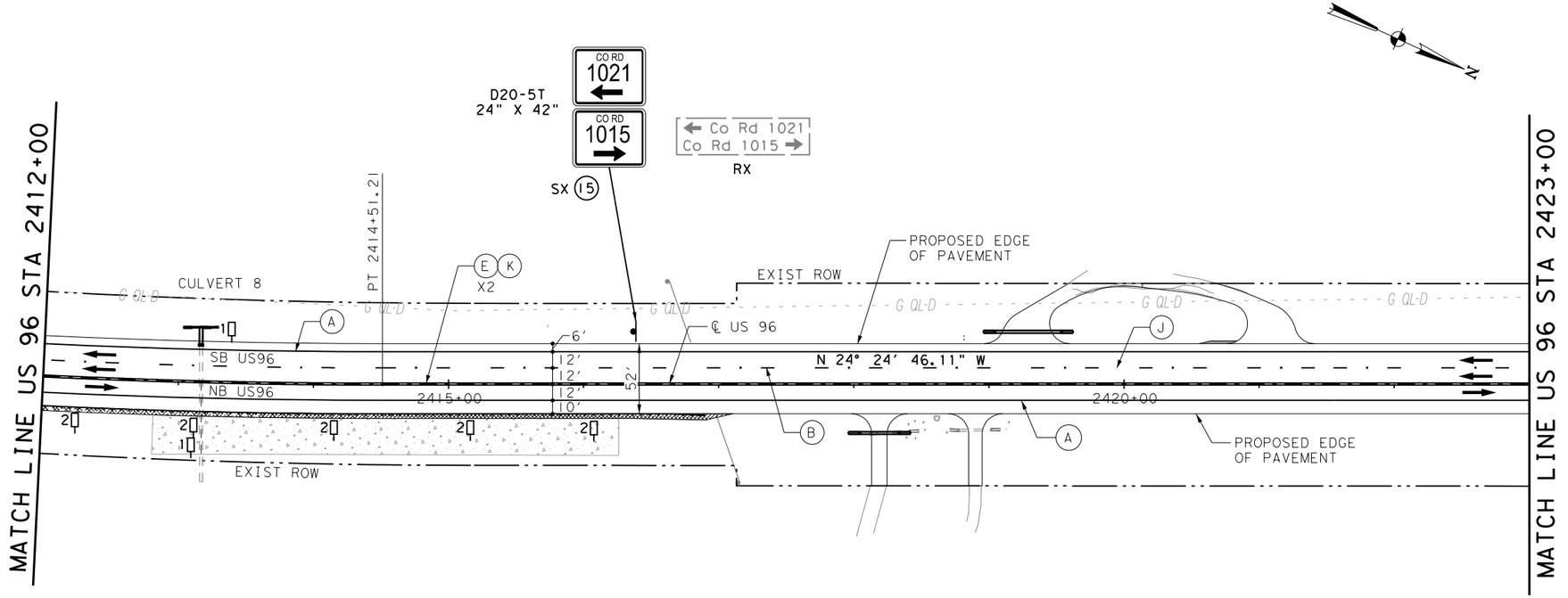
SIGNING & PAVEMENT MARKING LAYOUTS

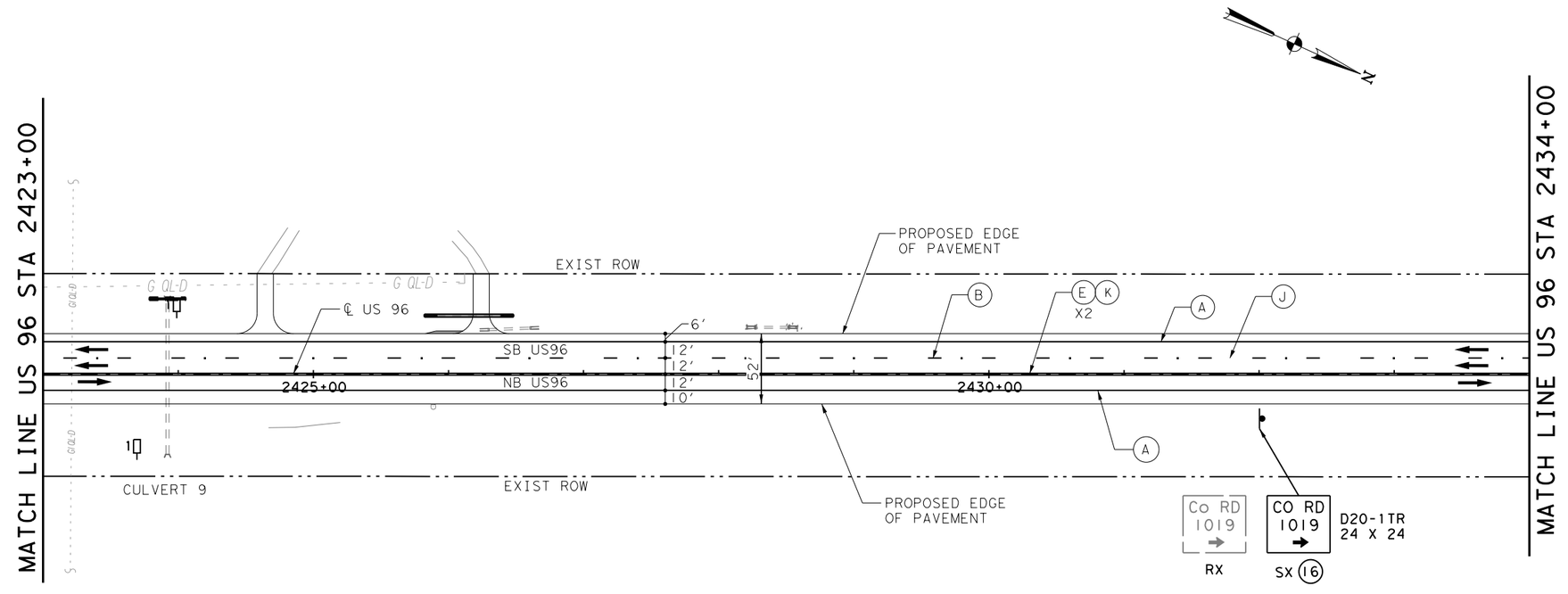
(SHEET 5 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		123

9/28/2022 9:29:34 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08*TRAFF\6802TSS05.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

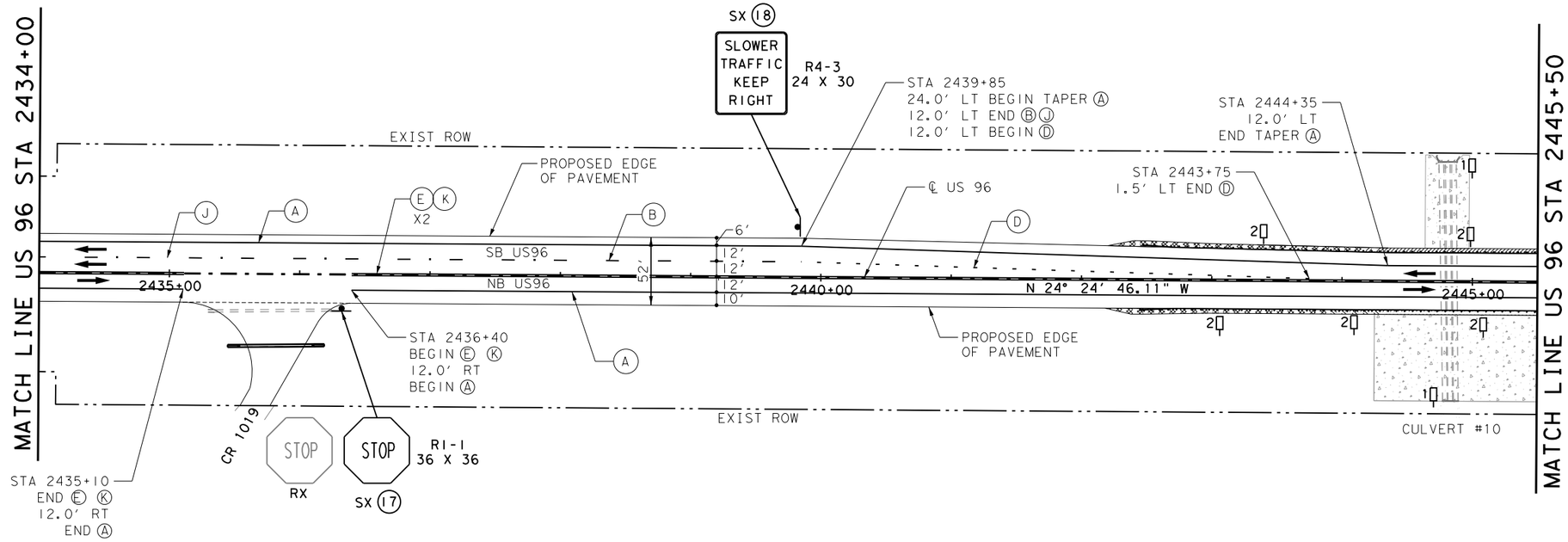
SIGNING & PAVEMENT MARKING LAYOUTS

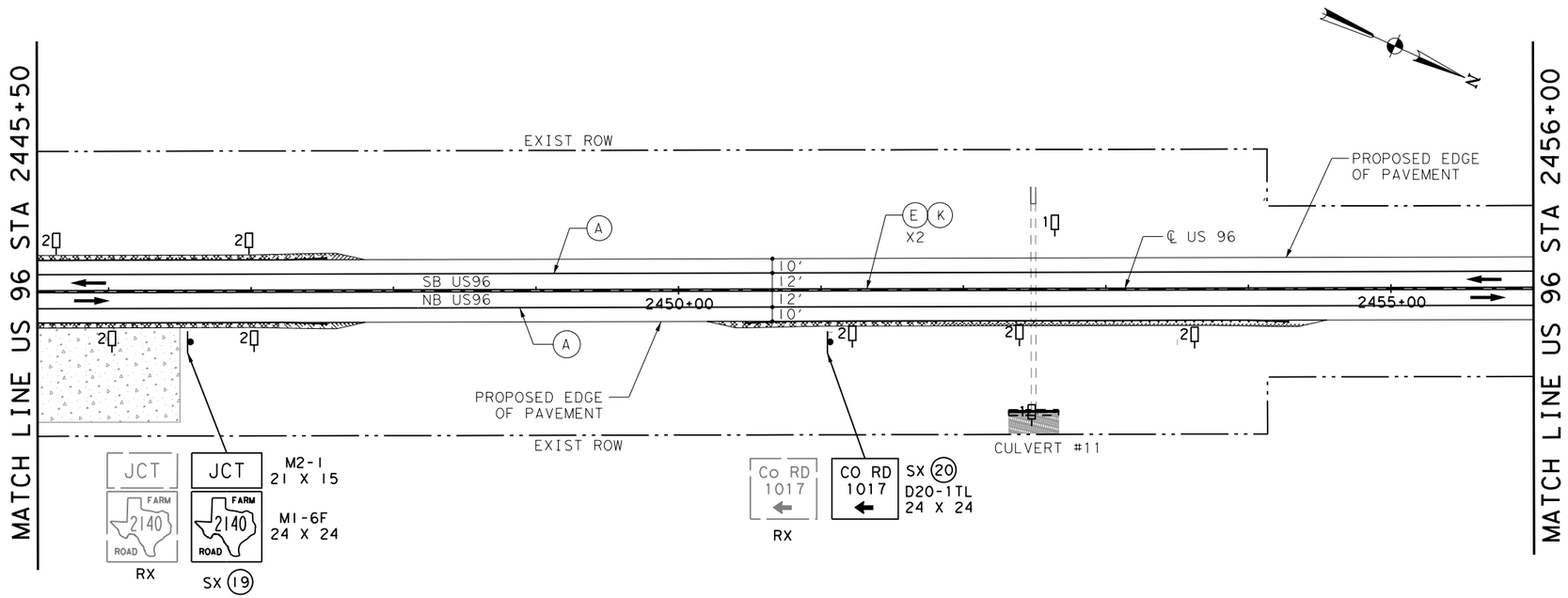
(SHEET 6 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		124

9/28/2022 9:29:34 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08-TRAFF\6802TSS06.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

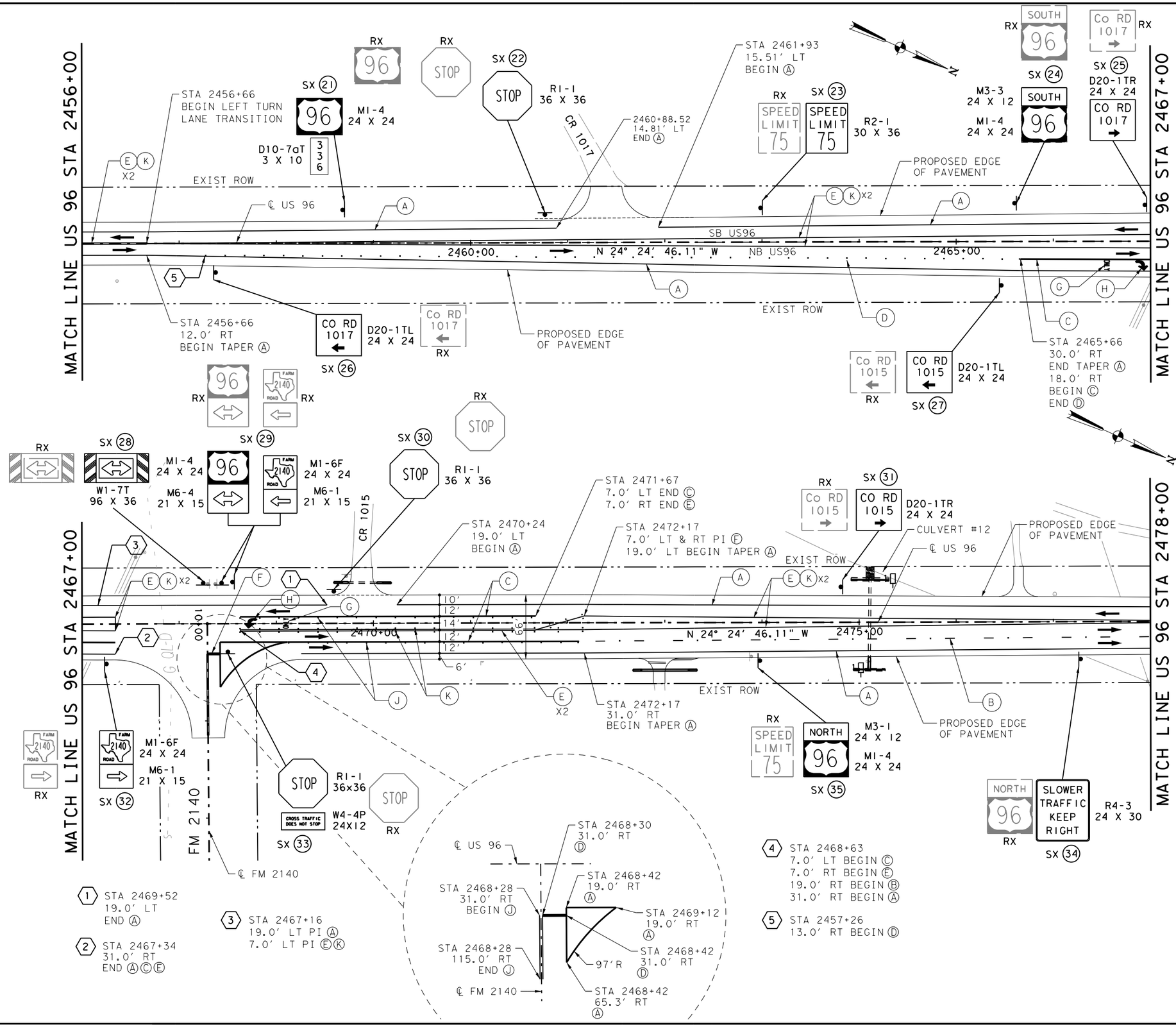
SIGNING & PAVEMENT MARKING LAYOUTS

(SHEET 7 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		125

9/28/2022 9:29:35 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08*TRAFF\6802TSS07.dgn



0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

Ⓐ	RE PM TY I (W) 6" (SLD)
Ⓑ	RE PM TY I (W) 6" (BRK)
Ⓒ	RE PM TY I (W) 8" (SLD)
Ⓓ	RE PM TY I (W) 6" (LNDP)
Ⓔ	RE PM TY I (Y) 6" (SLD)
Ⓕ	PRFB MRK (W) 24" (SLD)
Ⓖ	PRFB MRK (W)(WORD)
Ⓗ	PRFB MRK (W)(ARROW)
Ⓘ	PRFB MRK (W) (LNDP ARROW)
Ⓙ	TY I-C RAISED PAVEMENT MARKER
Ⓚ	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3),TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

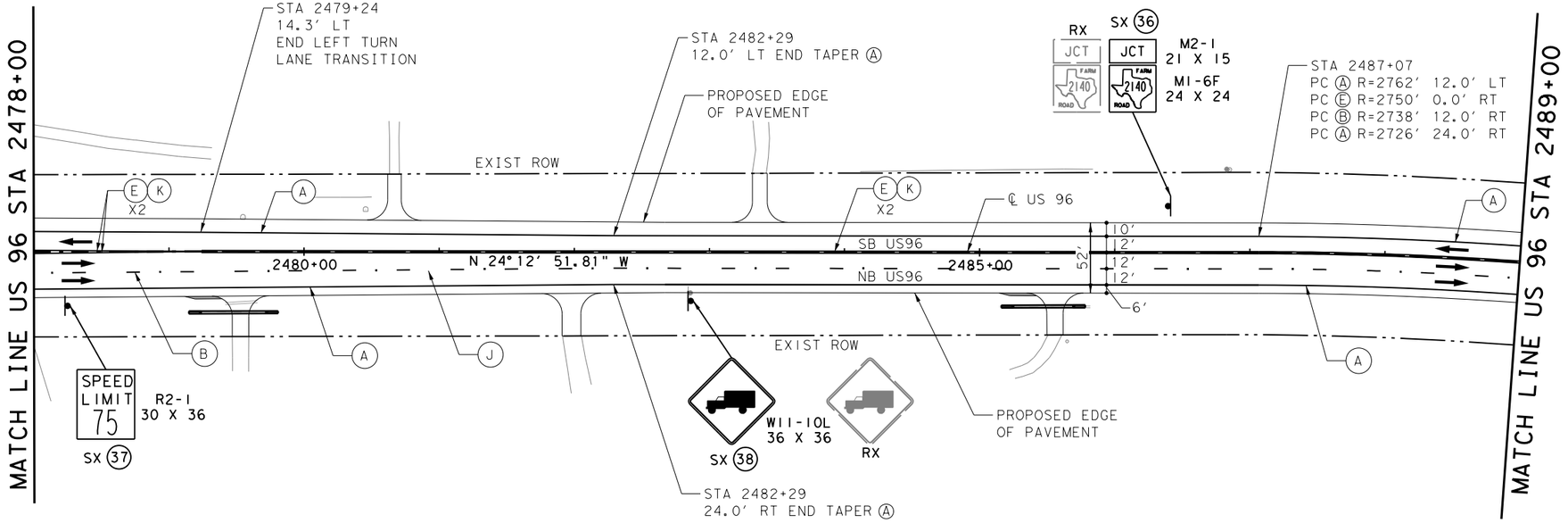
SIGNING & PAVEMENT MARKING LAYOUTS

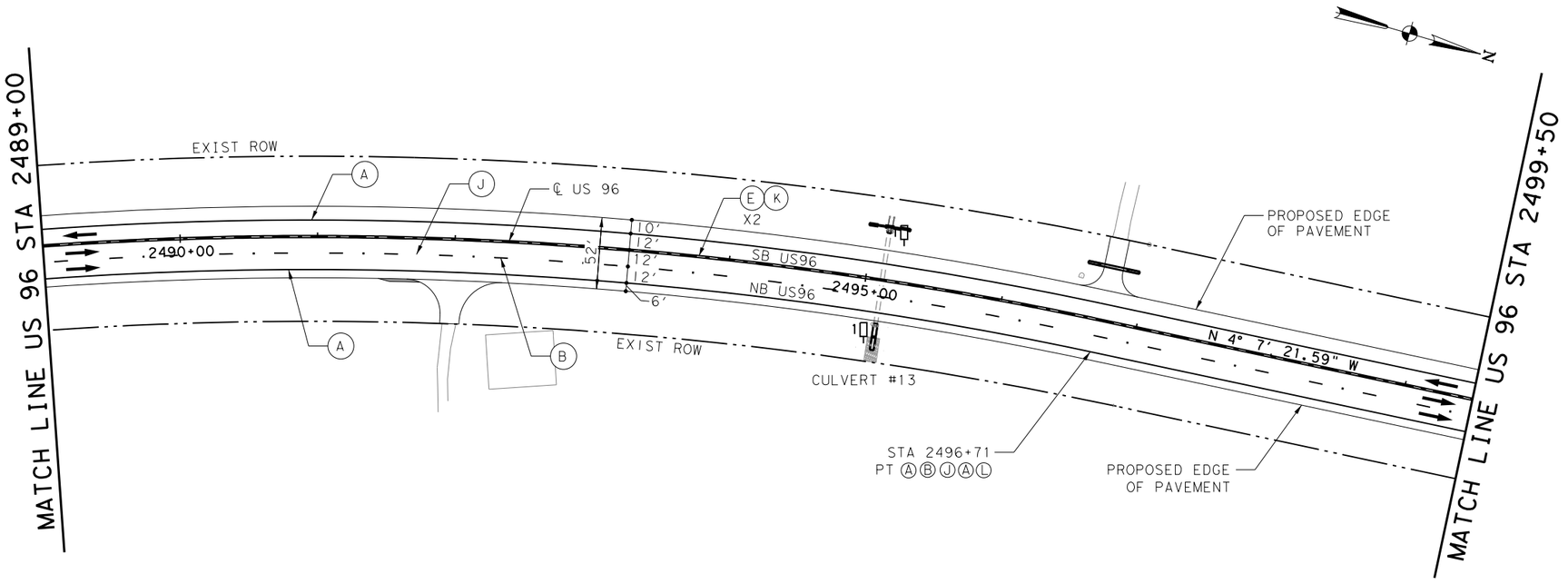
(SHEET 8 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		126

9/28/2022 9:29:36 AM
H:\proj\R306068.02 - TxDOT - 36-6\DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08+TRAFF\6802TSS08.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

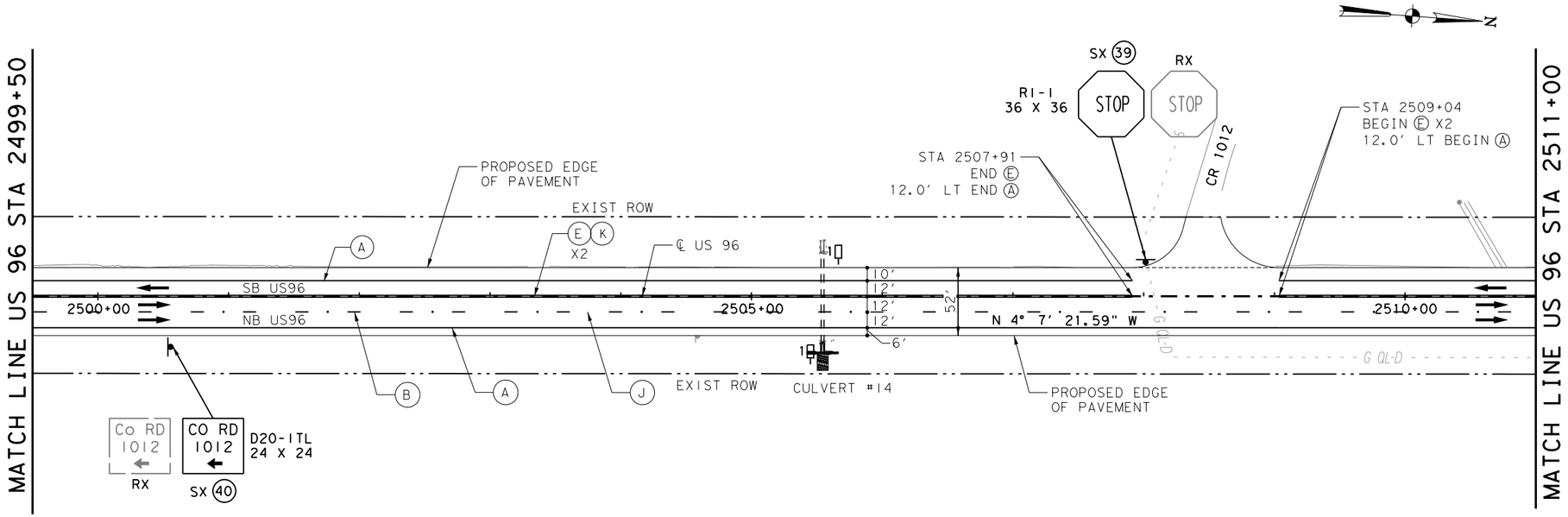
SIGNING & PAVEMENT MARKING LAYOUTS

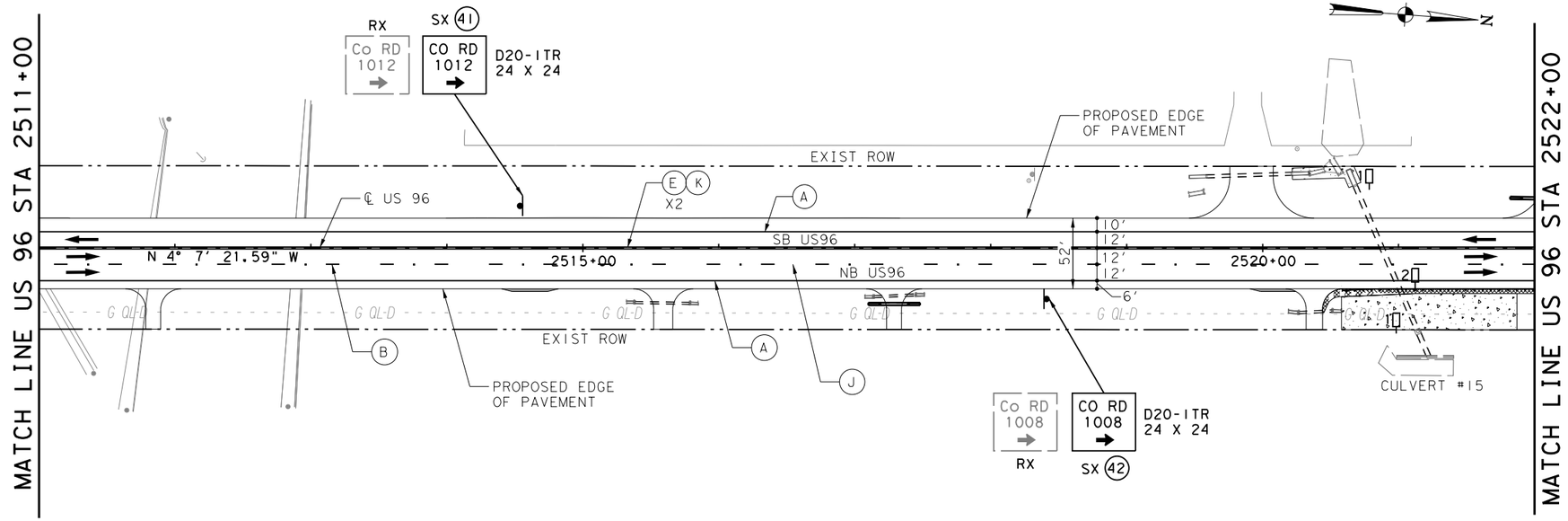
(SHEET 9 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		127

9/28/2022 9:29:36 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08*TRAFF\6802TSS09.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

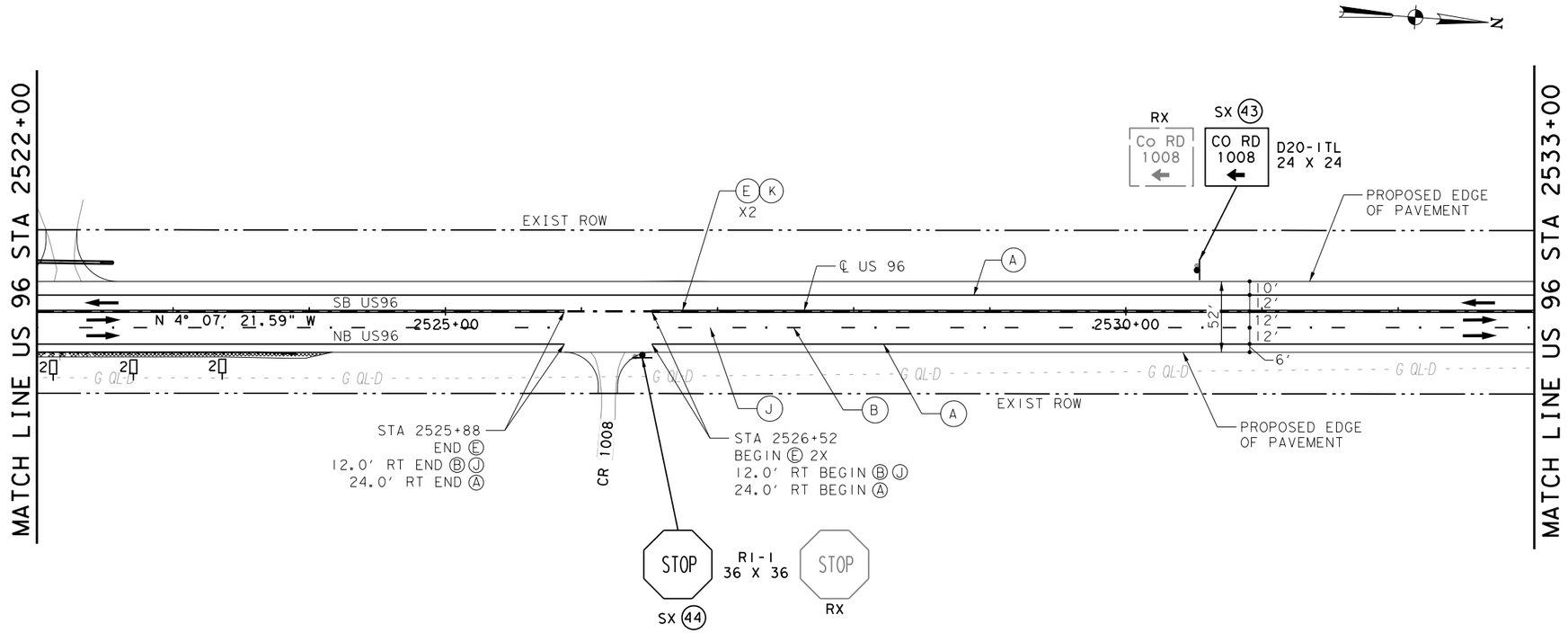
SIGNING & PAVEMENT MARKING LAYOUTS

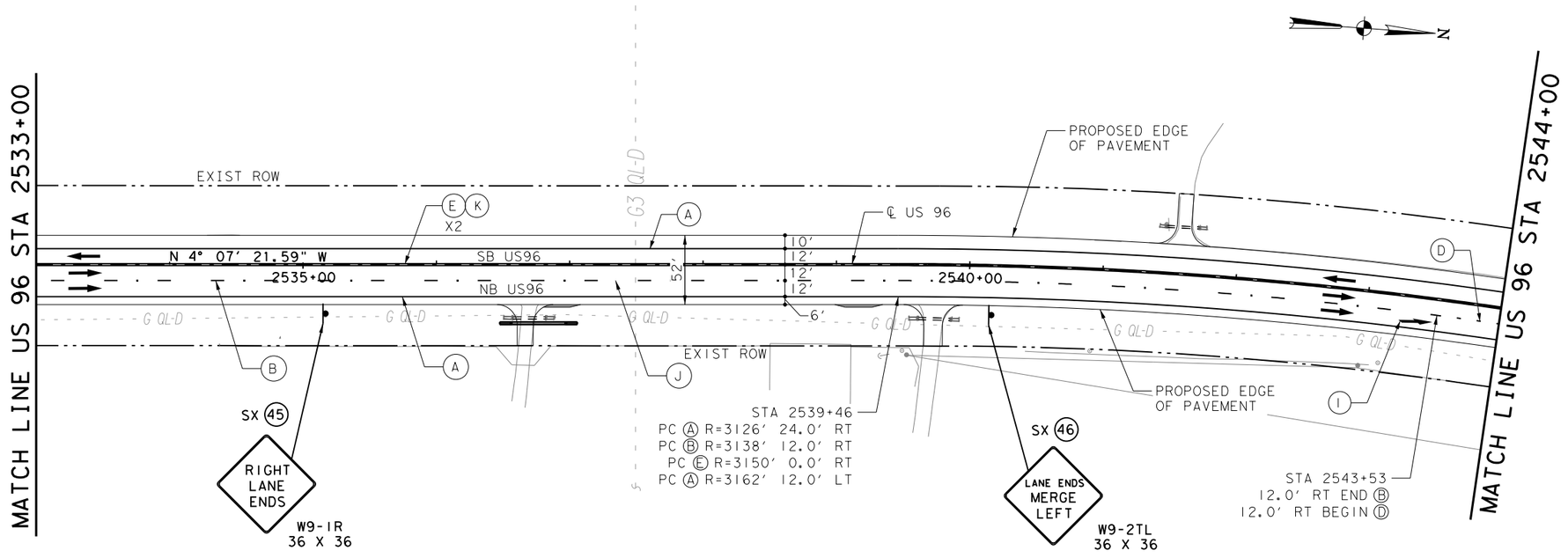
(SHEET 10 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		128

9/28/2022 9:29:37 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08 TRAFF\6802TSS10.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

A	RE PM TY I (W) 6" (SLD)
B	RE PM TY I (W) 6" (BRK)
C	RE PM TY I (W) 8" (SLD)
D	RE PM TY I (W) 6" (LNDP)
E	RE PM TY I (Y) 6" (SLD)
F	PRFB MRK (W) 24" (SLD)
G	PRFB MRK (W)(WORD)
H	PRFB MRK (W)(ARROW)
I	PRFB MRK (W) (LNDP ARROW)
J	TY I-C RAISED PAVEMENT MARKER
K	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

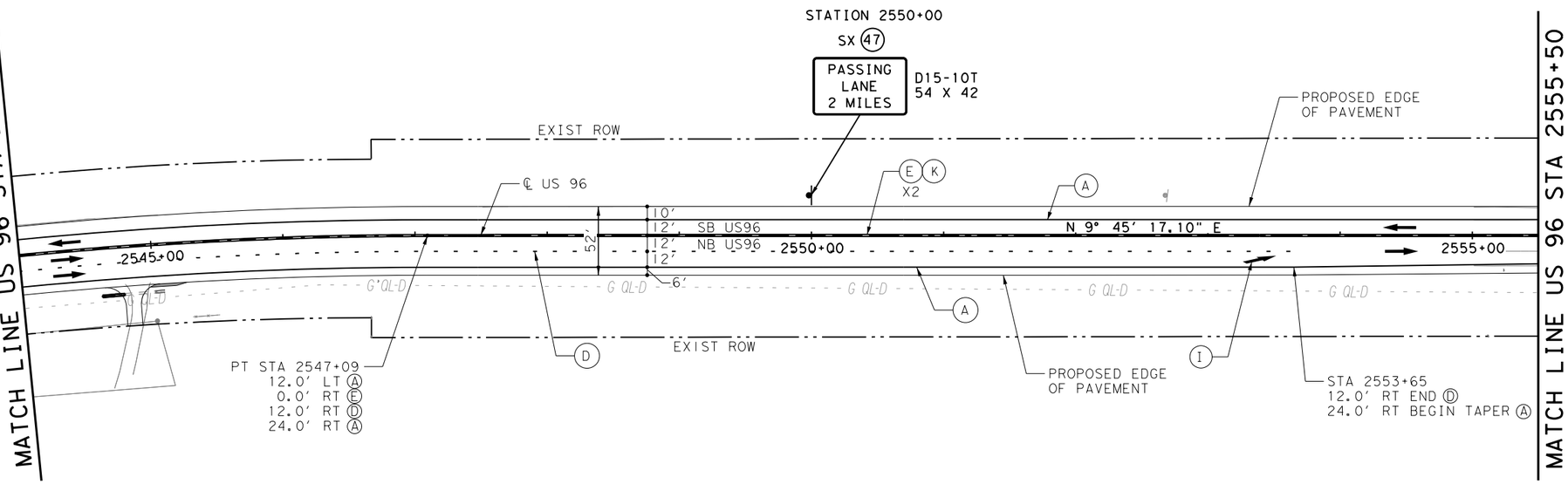
SIGNING & PAVEMENT MARKING LAYOUTS

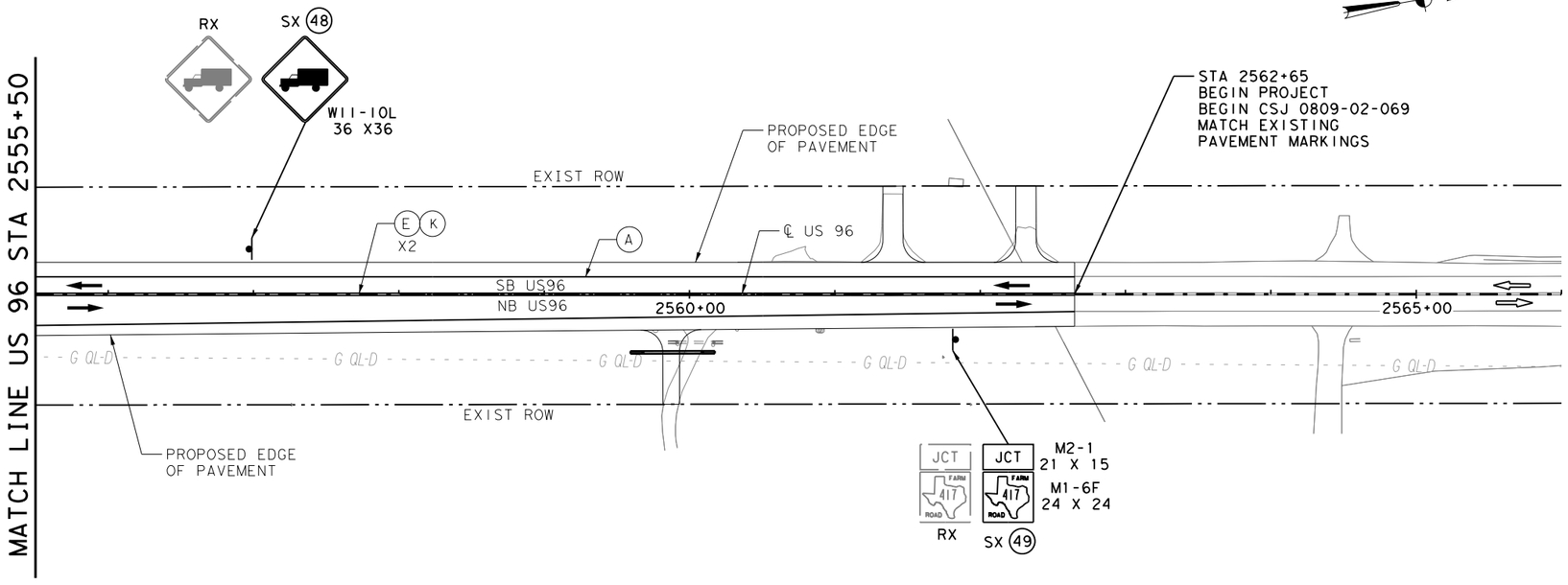
(SHEET 11 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		129

9/28/2022 9:29:37 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08 TRAFF\6802TSS11.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

(A)	RE PM TY I (W) 6" (SLD)
(B)	RE PM TY I (W) 6" (BRK)
(C)	RE PM TY I (W) 8" (SLD)
(D)	RE PM TY I (W) 6" (LNDP)
(E)	RE PM TY I (Y) 6" (SLD)
(F)	PRFB MRK (W) 24" (SLD)
(G)	PRFB MRK (W)(WORD)
(H)	PRFB MRK (W)(ARROW)
(I)	PRFB MRK (W) (LNDP ARROW)
(J)	TY I-C RAISED PAVEMENT MARKER
(K)	TY II A-A RAISED PAVEMENT MARKER
SX	PROPOSED SIGN
RX	REMOVE EXISTING SIGN
EX	EXIST SIGN TO REMAIN
1	OM ASSM (OM-2Z) (WFLX)SRF(BI)
2	DEL ASSM (D-SW) SZ 1 (BRF)GF2(BI)

NOTES:

1. ALL SIGN DIMENSIONS ARE IN INCHES.
2. SEE TXDOT STANDARD DRAWING PM(1)-(3), TS2(PL-1) FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

SIGNING & PAVEMENT MARKING LAYOUTS

(SHEET 12 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		130

9/28/2022 9:29:37 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08+TRAFF\6802TSS12.dgn

ELECTRICAL SERVICE DATA												
ELEC SERV ID	PLAN SHEET NUMBER	ELECTRICAL SERVICE DESCRIPTION	SERVICE CONDUIT SIZE	SERVICE CONDUCTOR NO. /SIZE	SAFETY SWITCH AMPS	MAIN CKT. BRK. POLE/AMPS	TWO-POLE CONTACTOR AMPS	PANEL BD/ LOADCENTER AMP RATING	BRANCH CIRCUIT ID	BRANCH CKT. BRK. POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
1	131	TY A (120/240) 060 (NS) SS (E) SP (O)	1½ IN.	3/#6	N/A	2P/60	60	N/A	A	2P/20	2	0.5

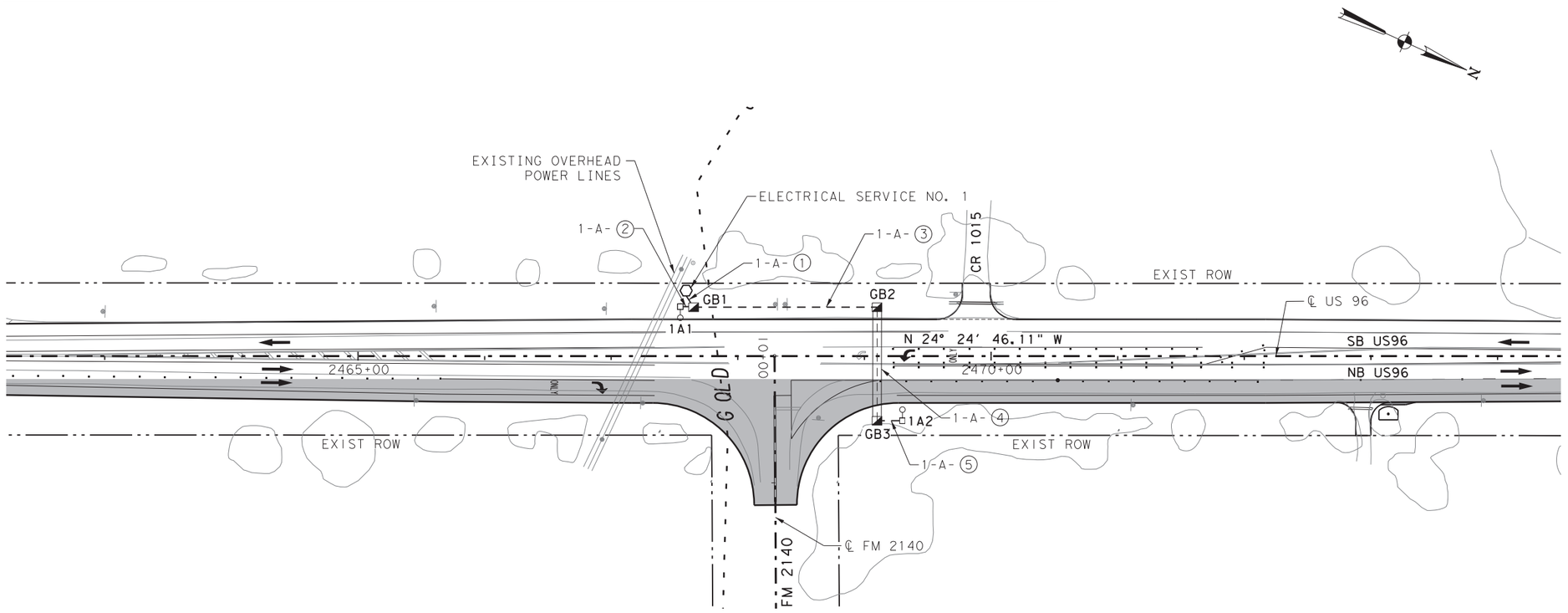
ROAD ILLUMINATION ASSEMBLIES SUMMARY						
LUMINAIRE POLE NUMBER	DESCRIPTION	CENTERLINE	STATION	OFFSET	X	Y
1A1	IN RD IL (TY SA) 40T-8 (250W EQ) LED	US 96	2467+55	39	4215420.9107	10624966.1249
1A2	IN RD IL (TY SA) 40T-8 (250W EQ) LED	US 96	2469+30	51	4215430.3874	10625163.0433

LEGEND

- PROP IN RD IL (TY SA) 40T-8 (250W EQ) LED
- PROPOSED GROUND BOX TY C (W/APRON)
- PROPOSED ELECTRIC SERVICE
- PROPOSED CONDUIT
- PROPOSED CONDUIT (BORE)
- DIRECTION OF TRAFFIC FLOW
- (X) CONDUIT RUN NUMBER

RUN ID: X-X-(X)
- RUN NUMBER
- CIRCUIT LETTER
- SERVICE NUMBER

POLE ID: XXX
- POLE NUMBER
- CIRCUIT LETTER
- SERVICE NUMBER



0 50 100
HORIZONTAL SCALE IN FEET

SCALE 1" = 100'

NOTES:

THE CONTRACTOR SHALL LOCATE ALL UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES FOR LOCATION OF UNDERGROUND FACILITIES AT LEAST 48 HOURS PRIOR TO ANY DRILLING, BORING, TRENCHING, OR EXCAVATING. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGE CAUSED BY CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES, WHETHER UNDERGROUND, ABOVE GROUND, OR OVERHEAD.

POLE LOCATIONS ARE APPROXIMATE. FINAL LOCATION OF POLES SHALL BE APPROVED BY THE ENGINEER.

CONDUIT AND CONDUCTOR SUMMARY									
SERVICE NO	CIRCUIT LETTER	RUN NO	RUN LENGTH (FEET)	CONDUIT (NO & LENGTH IN FEET) 618		CONDUCTOR (NO & LENGTH IN FEET) (1) 620			
				CONDT (PVC) (SCH 40) (2")	CONDT (PVC) (SCH 40) (2") (BORE)	(GROUND) ELEC CONDR (NO. 8) BARE		ELEC CONDR (NO. 8) INSULATED	
						NO	LF	NO	LF
1	A	1	5	5		1	10	2	20
1	A	2	11	11		1	16	2	32
1	A	3	145	145		1	150	2	300
1	A	4	90		90	1	95	2	190
1	A	5	18	18		1	23	2	46
TOTAL			269	179	90		294		588

(1) INCLUDES 5' TURNS IN GROUND BOXES AND POLE SUPPORTS

SHEET SUMMARY			
ITEM	DESCRIPTION	UNIT	EST QTY
*416	DRILL SHAFT (RDWY ILL POLE) (30 IN)	LF	16
610	IN RD IL (TY SA) 40T-8 (250W EQ) LED	EA	2
618	CONDT (PVC) (SCH 40) (2")	LF	179
618	CONDT (PVC) (SCH 40) (2") (BORE)	LF	90
620	ELEC CONDR (NO. 8) BARE	LF	294
620	ELEC CONDR (NO. 8) INSULATED	LF	588
624	GROUND BOX TY C (162911) W/APRON	EA	3
628	TY A 120/240 060 (NS)SS(E)SP(O)	EA	1

* ASSUMED N=10 BLOWS/FT

STATE OF TEXAS
DAVID A. NUFER
68818
LICENSED PROFESSIONAL ENGINEER

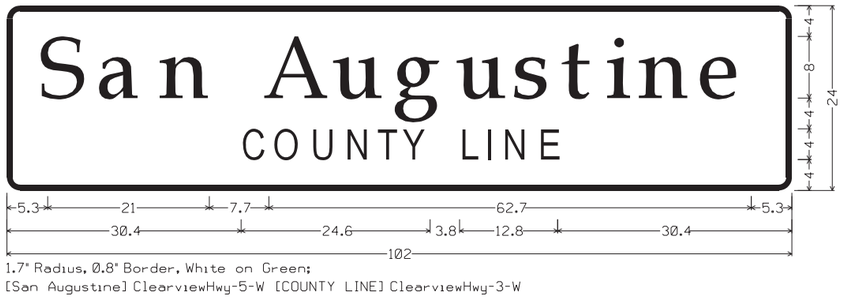
11/2/2021

ILLUMINATION LAYOUT
(FM 2140)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

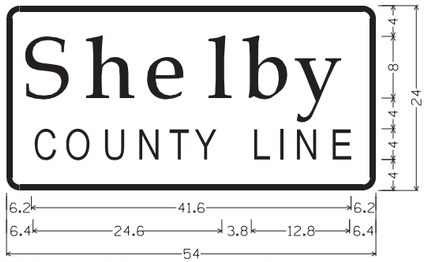
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		131

11/2/2021 3:40:50 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08*TRAFF\6802ILLUM01.dgn



1.7" Radius, 0.8" Border, White on Green;
[San Augustine] ClearviewHwy-5-W [COUNTY LINE] ClearviewHwy-3-W

SIGN 1



1.7" Radius, 0.8" Border, White on Green;
[Shelby] ClearviewHwy-5-W
[COUNTY LINE] ClearviewHwy-3-W

SIGN 3

SCALE: 1" = 20"

SIGN DIMENSIONS
ARE IN INCHES

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

11/2/2021

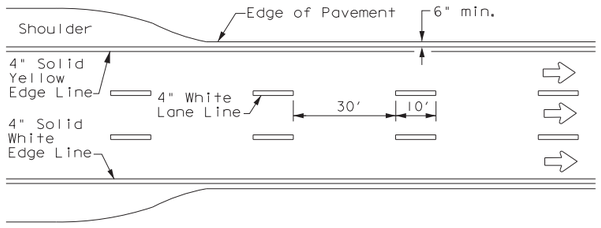
SIGN DETAILS

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

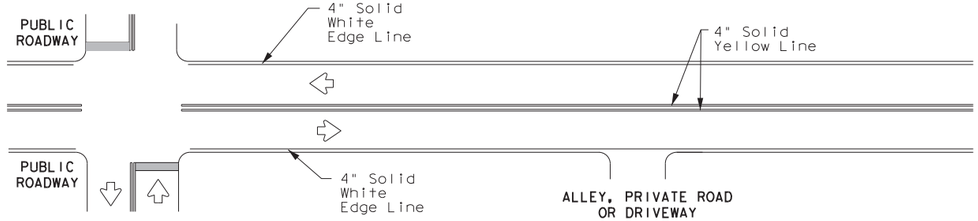
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		132

11/2/2021 3:40:50 PM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\08*TRAFF\6802SIGN DETAIL.dgn

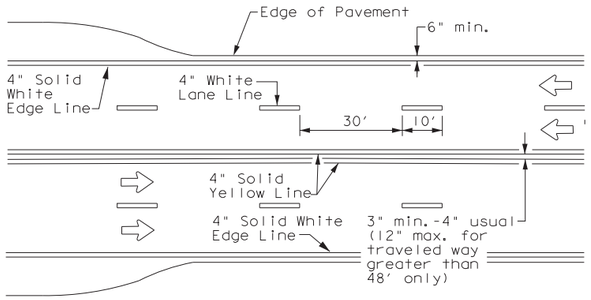
DATE: 11/2/2021 3:40:50 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\pmi-20.dgn



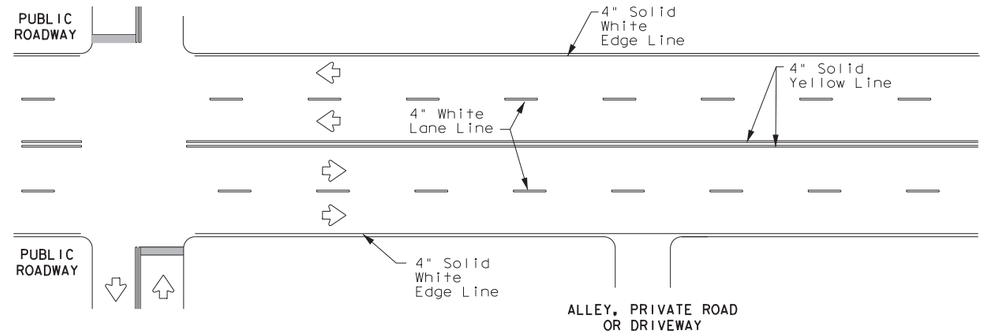
EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



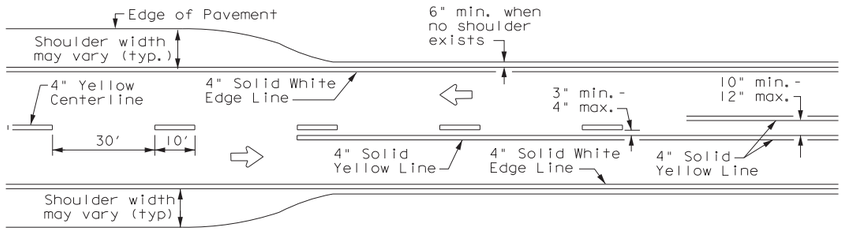
TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



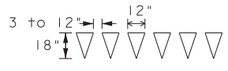
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



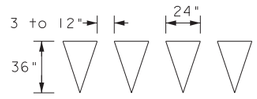
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

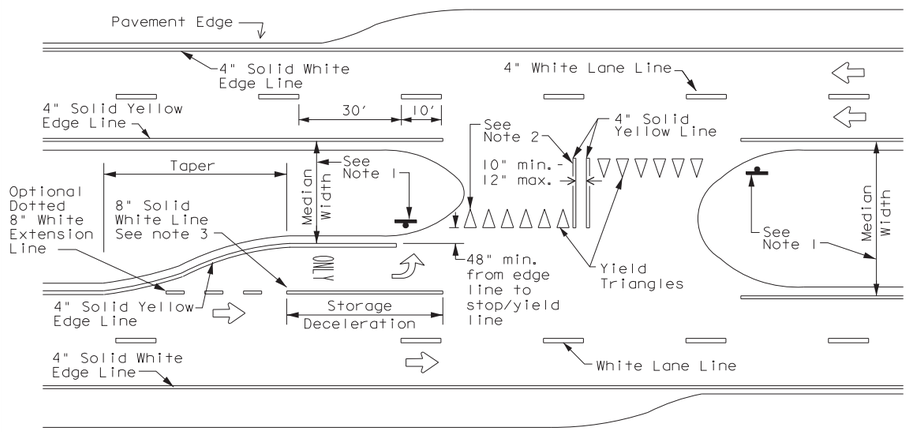


For posted speed on road being marked equal to or less than 40 MPH.



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.

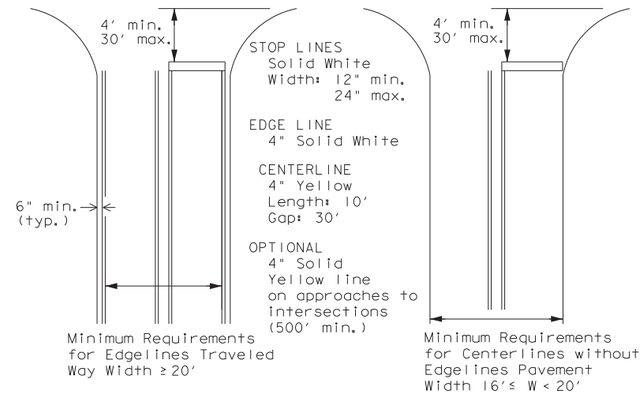
GENERAL NOTES

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

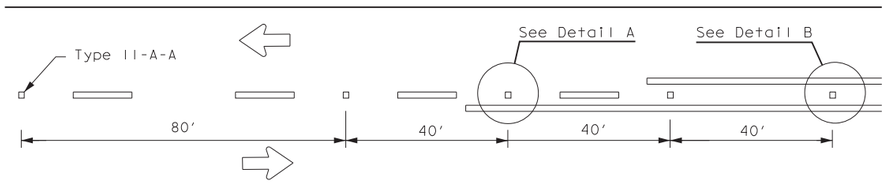
TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-20

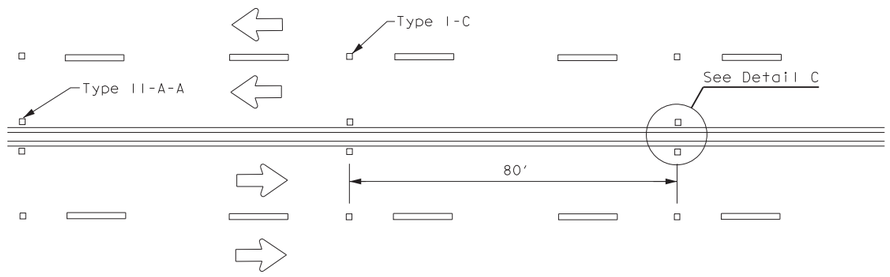
FILE: pmi-20.dgn	DN:	CK:	DW:	CK:
© TxDOT November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0809	02	069	US 96
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	LFK	SHELBY		133

22B

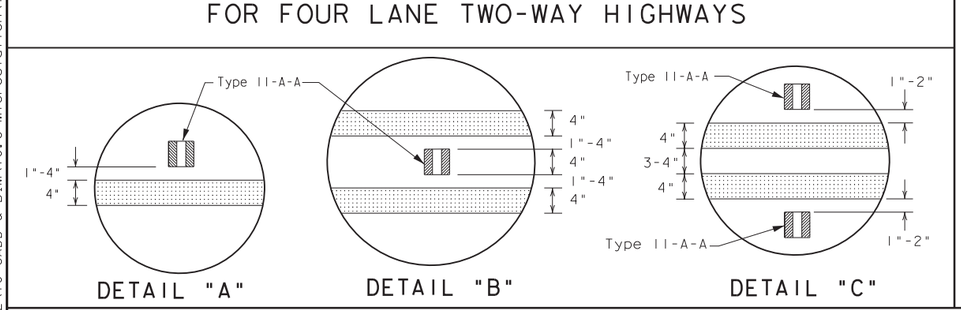
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



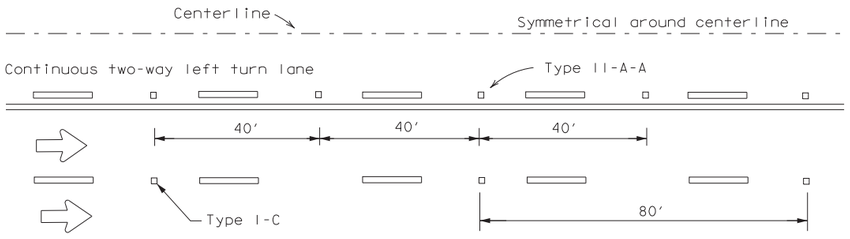
CENTERLINE FOR ALL TWO LANE ROADWAYS



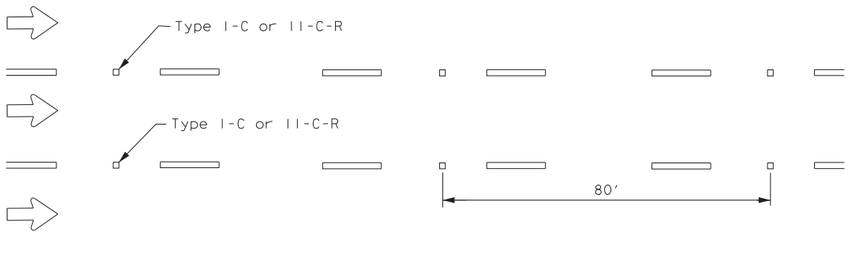
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



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



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

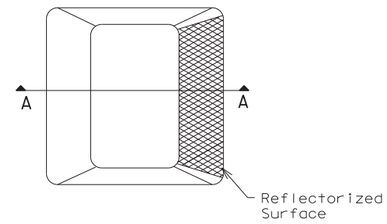


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

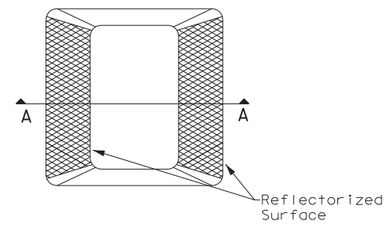
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

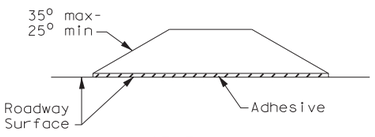
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

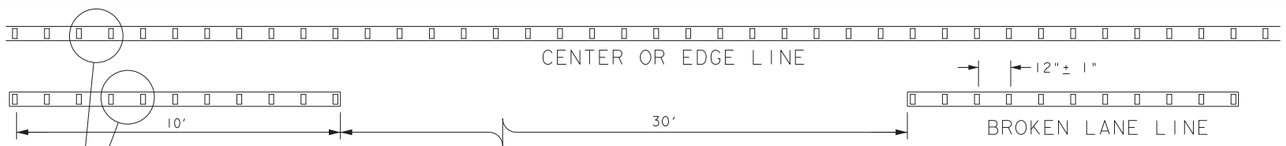


Type II (Top View)



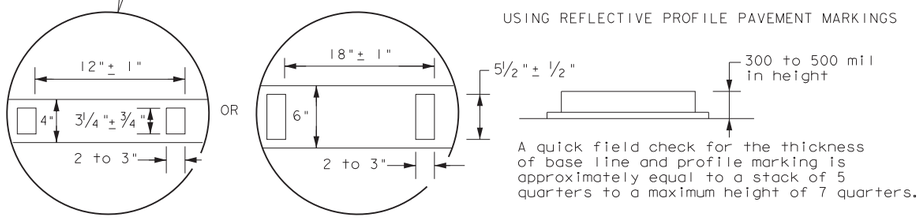
SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



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.

Texas Department of Transportation

Traffic Safety Division Standard

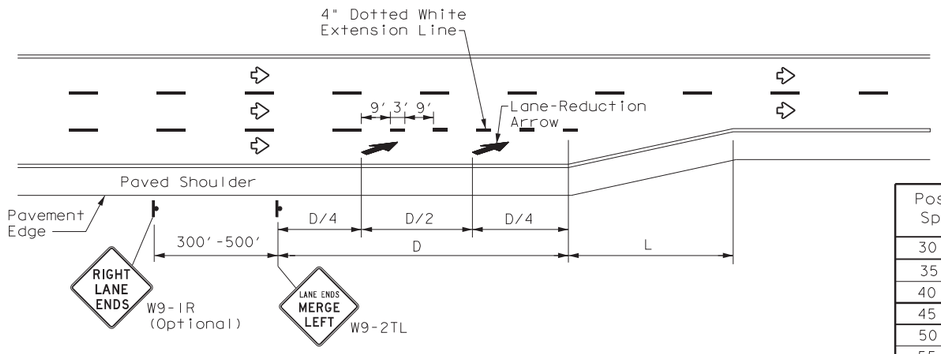
POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE: pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-92 2-10	0809	02	069	US 96
5-00 2-12	DIST	COUNTY		SHEET NO.
8-00 6-20	LFK	SHELBY		134

22B

DATE: 11/2/2021 3:40:51 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS_04_TRAFFIC\pm2-20.dgn

DATE: 11/2/2021 3:40:51 PM
FILE: H:\Proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\pm3-20.dgn

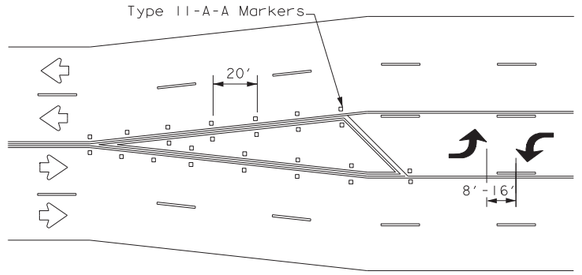


LANE REDUCTION

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.

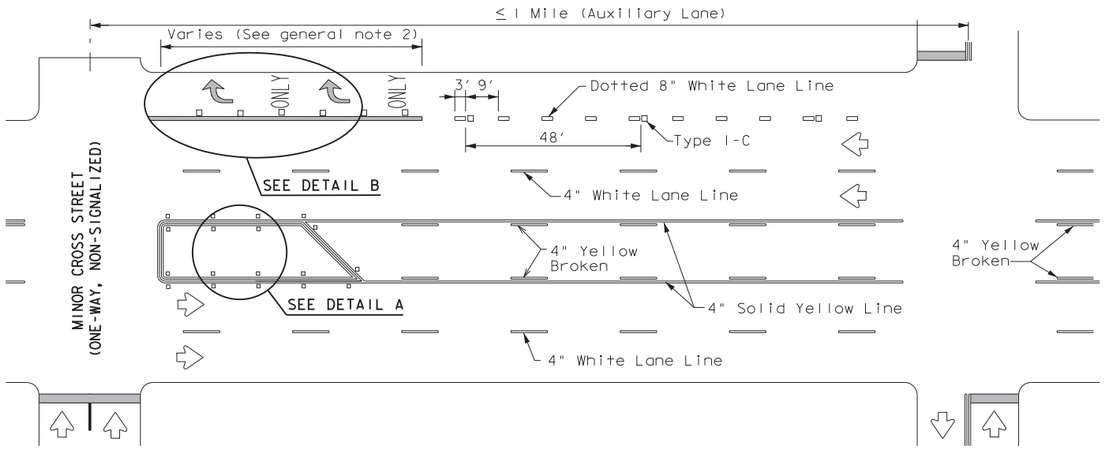
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

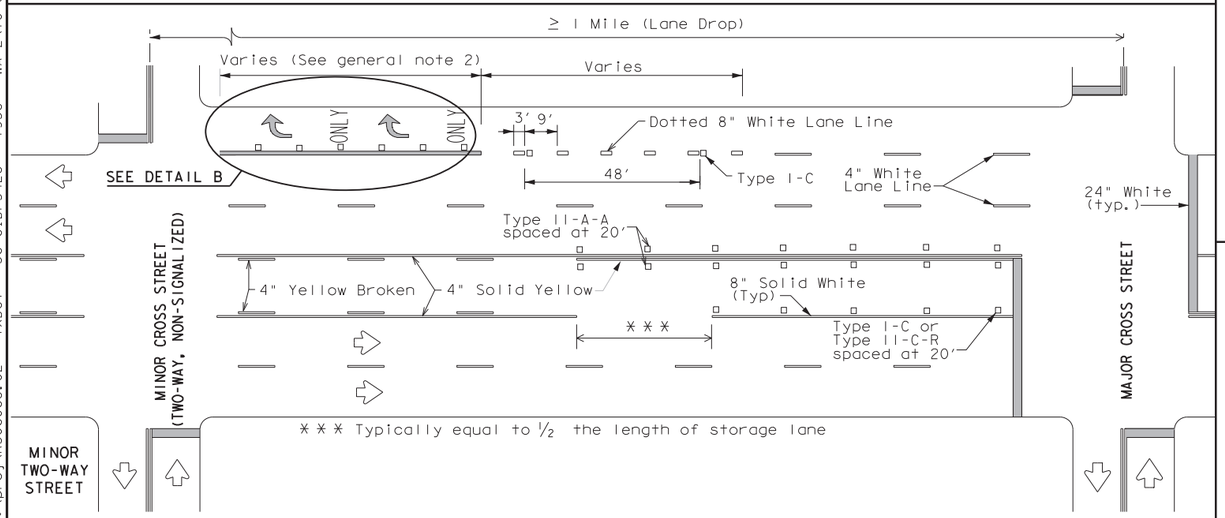
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

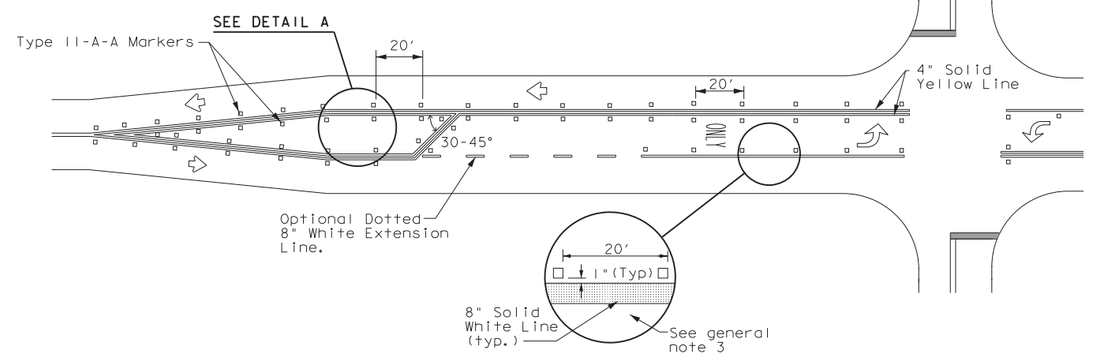
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



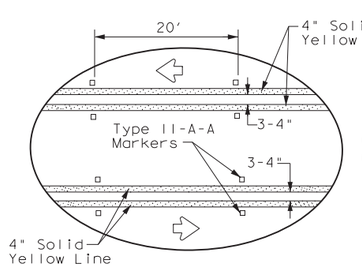
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



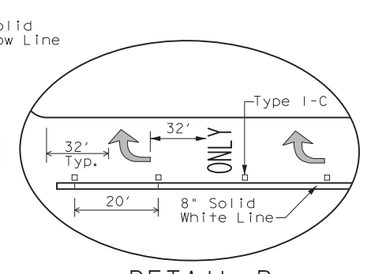
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



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

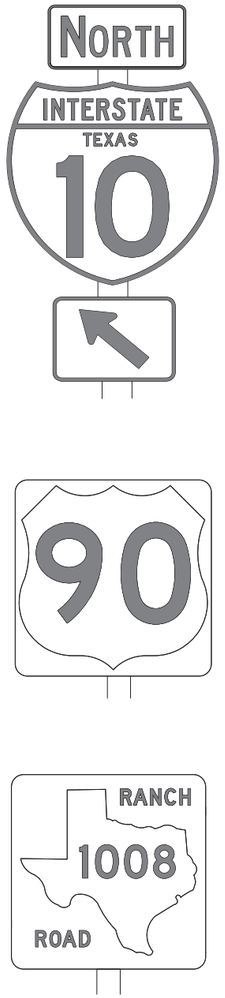
FILE: pm3-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	LFK	SHELBY		135
3-03 6-20				

22D

DATE: 11/2/2021 3:40:51 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\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

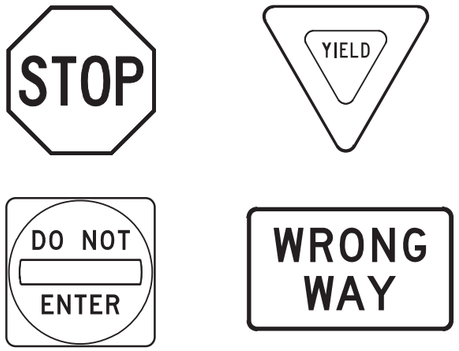
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LFK	SHELBY		136

3

DATE: 11/2/2021 3:40:52 PM
FILE: H:\proj\N306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\tsr4-13.dgn

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

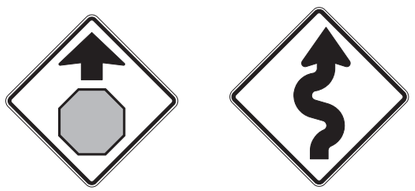
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(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

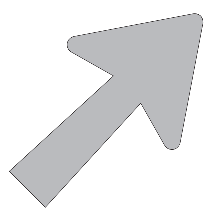
FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	LFK	SHELBY		137

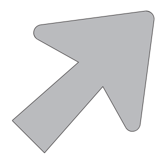
4

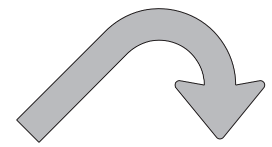
DATE: 11/2/2021 3:40:52 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM

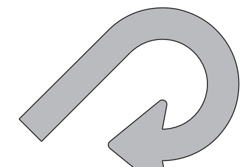
ARROW DETAILS

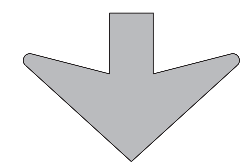
for Large Ground-Mounted and Overhead Guide Signs


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

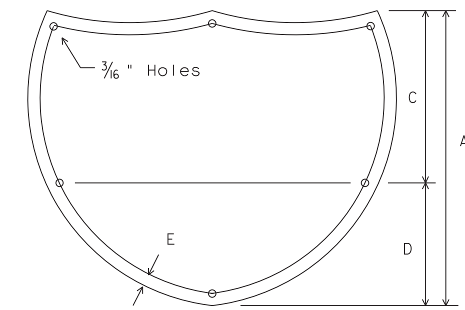
NOTE

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.

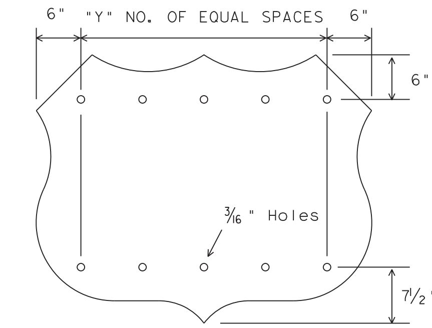
http://www.txdot.gov/

SIGN BLANK PUNCHING DETAILS FOR ATTACHMENTS WHEN SPECIFIED TO BE TYPE A ALUMINUM SIGNS (FOR MOUNTING TO GUIDE SIGN FACE)



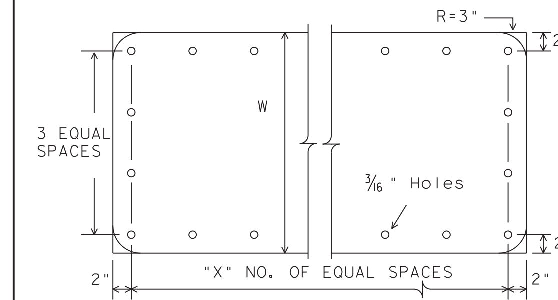
INTERSTATE ROUTE MARKERS

A	C	D	E
36	21	15	1 1/2
48	28	20	1 3/4



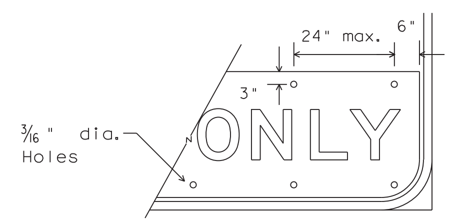
U.S. ROUTE MARKERS

Sign Size	"Y"
24x24	2
30x24	3
36x36	3
45x36	4
48x48	4
60x48	5



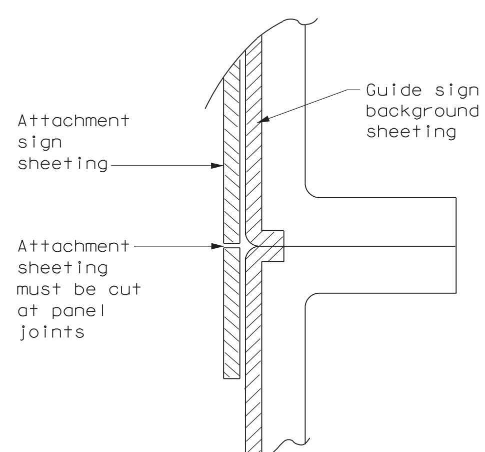
STATE ROUTE MARKERS

No. of Digits	W	X
4	24	4
4	36	5
4	48	6
3	24	3
3	36	4
3	48	5

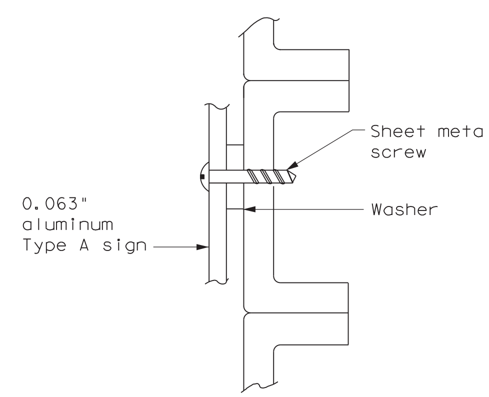


EXIT ONLY PANEL

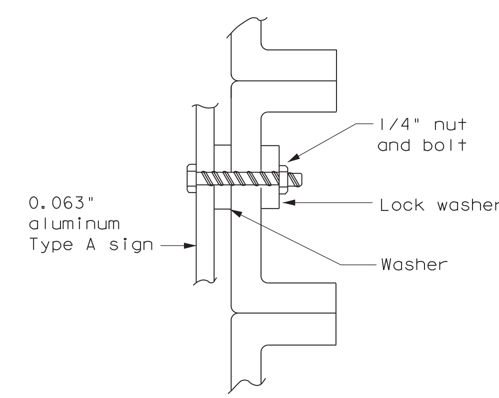
MOUNTING DETAILS OF ATTACHMENTS TO GUIDE SIGN FACE ("EXIT ONLY" AND "LEFT EXIT" PANELS, ROUTE MARKERS AND OTHER ATTACHMENTS)



DIRECT APPLIED ATTACHMENT



SCREW ATTACHMENT



NUT/BOLT ATTACHMENT

NOTE:

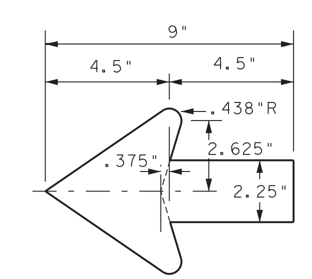
1. Sheeting for legend, symbols, and borders must be cut at panel joints.
2. Direct applied attachment signs will be subsidiary to "Aluminum Signs" or "Fiberglass Signs".

NOTE:

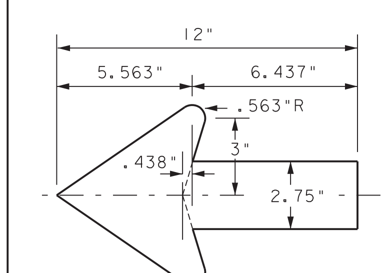
Furnish Type A aluminum sign attachments only when specified in the plans. These signs will be paid for under "Aluminum Signs".

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 12-03 7-13 9-08	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		138

DATE: 11/2/2021 3:40:52 PM
FILE: H:\Proj\N306068.02 - TxDOT - 36-6\DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\04*TRAFFIC\smdgen.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)

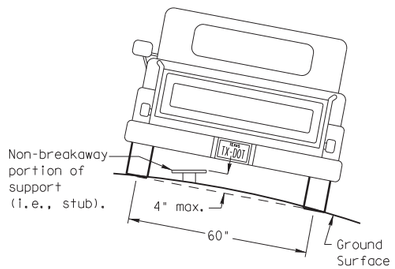
Anchor Type

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

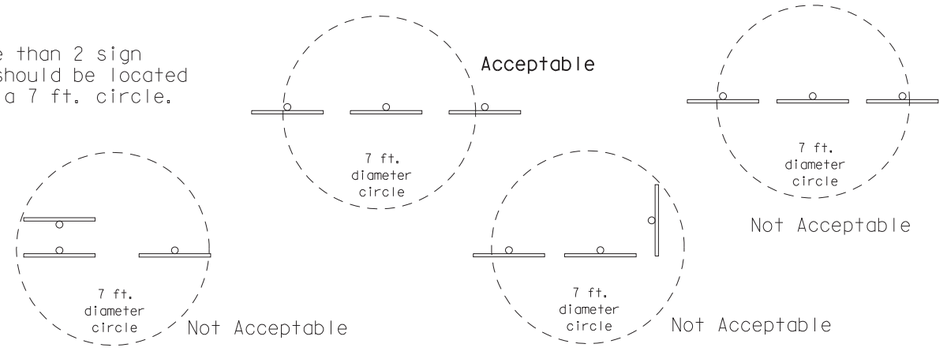
P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))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

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



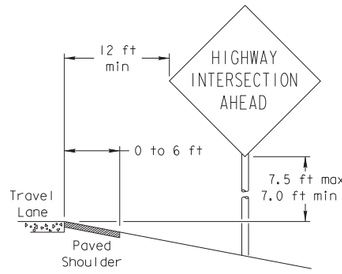
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

No more than 2 sign posts should be located within a 7 ft. circle.



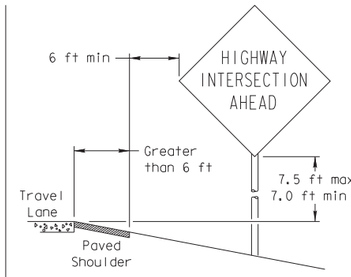
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

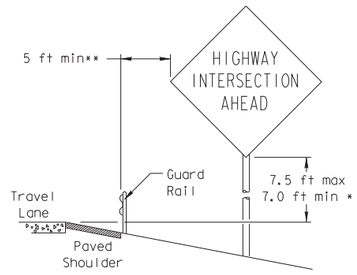
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



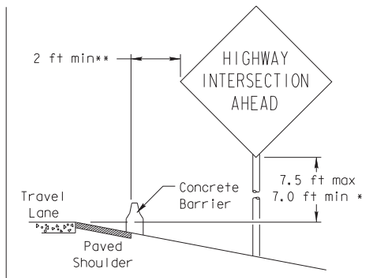
GREATER THAN 6 FT. WIDE

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.

BEHIND BARRIER



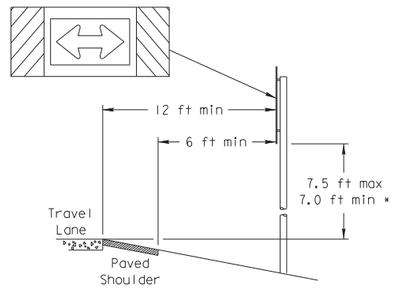
BEHIND GUARDRAIL



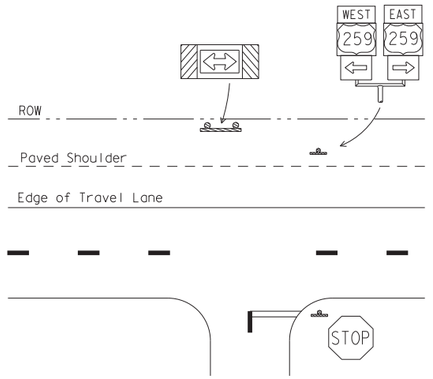
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

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.



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

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

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

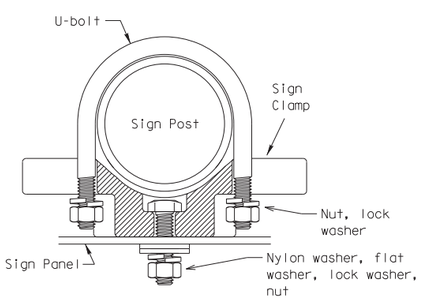
The maximum values may be increased when directed by the Engineer.

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

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

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

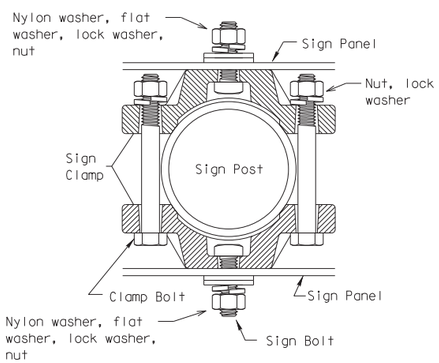


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

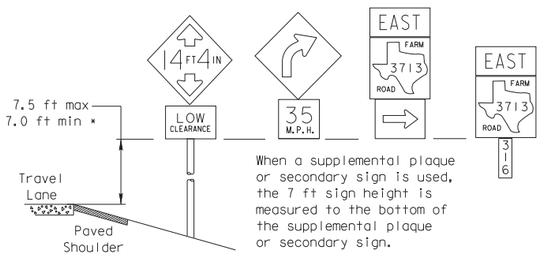
Sign clamps may be either the specific size clamp or the universal clamp.

Back-to-Back Signs



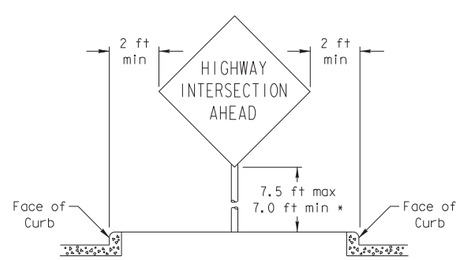
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



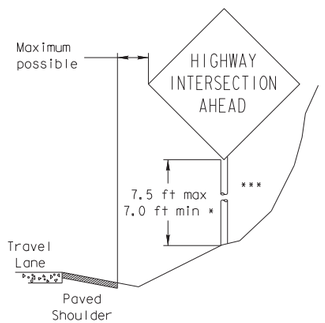
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

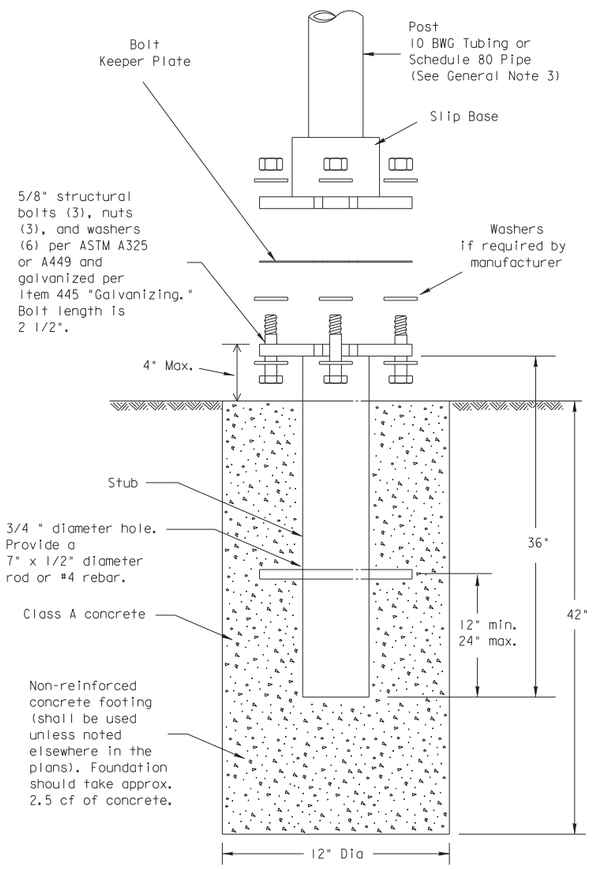
SMD(GEN)-08

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

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		139

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

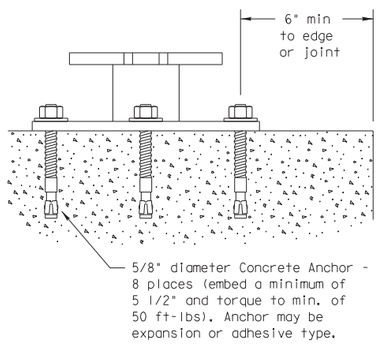
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support
1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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

REVISIONS
9-08

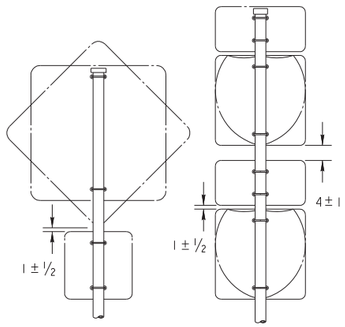
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96

DIST	COUNTY	SHEET NO.
LFK	SHELBY	140

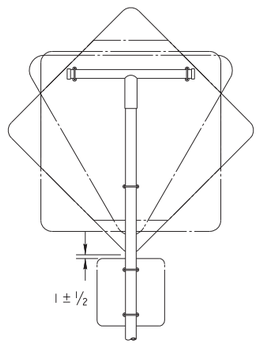
26B

DATE: 11/2/2021 3:40:53 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\04*TRAFFIC\smds1.dgn

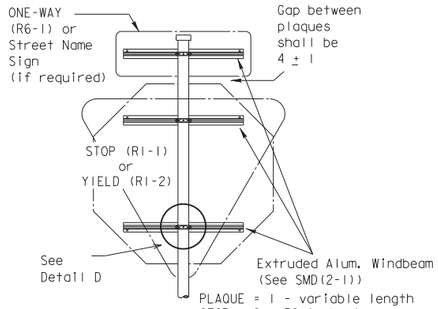
DATE: 11/2/2021 3:40:53 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\I0 CADD & BIM\I0.6 Microstation\I0.6.5 Sheets\I2*STANDARDS\04*TRAFFIC\smds2.dgn



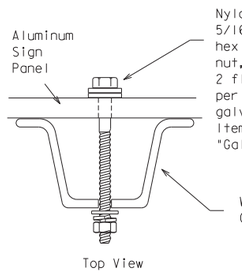
SM RD SGN ASSM TY XXXXX(I)XX(P)



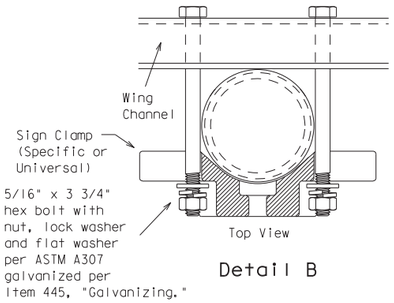
SM RD SGN ASSM TY XXXXX(I)XX(T)



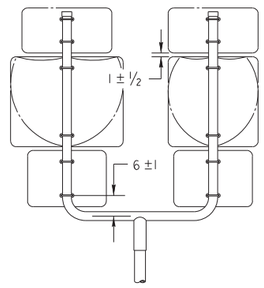
SM RD SGN ASSM TY XXXXX(I)XX(P-BM)



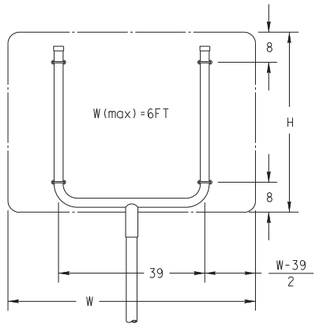
Detail A



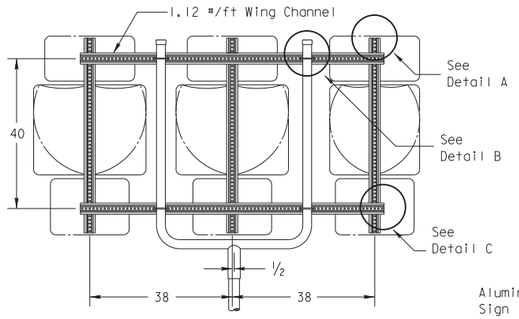
Detail B



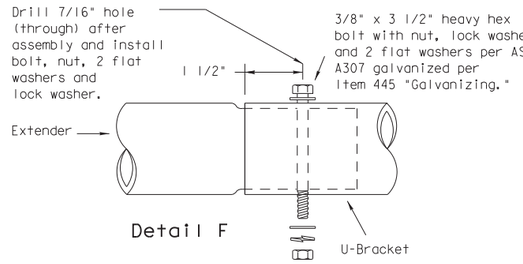
SM RD SGN ASSM TY XXXXX(I)XX(U)



SM RD SGN ASSM TY XXXXX(I)XX(U)

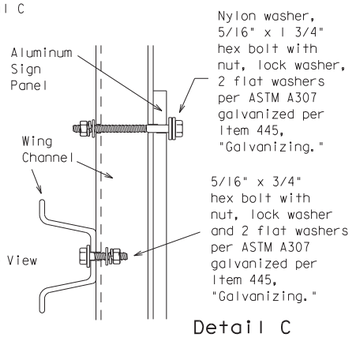


SM RD SGN ASSM TY XXXXX(I)XX(U-WC)
(See Note II)

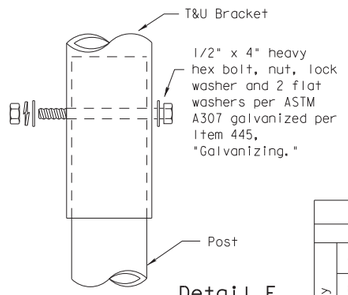


Detail F

Splices shall only be allowed behind the sign substrate.



Detail C



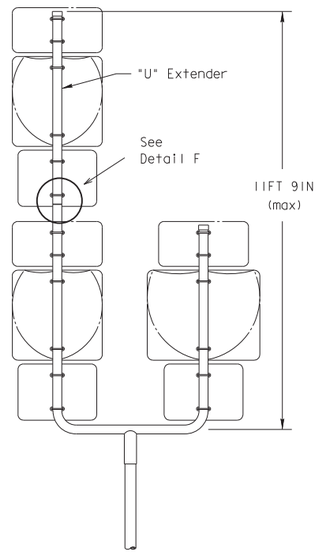
Detail E

GENERAL NOTES:

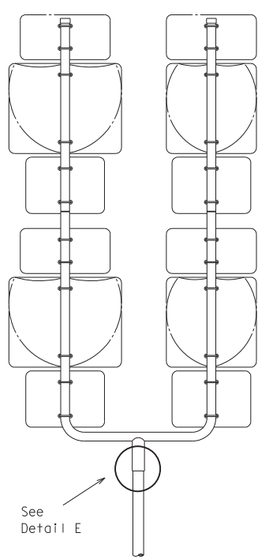
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
I0 BWG	I	I6 SF
I0 BWG	2	32 SF
Sch 80	I	32 SF
Sch 80	2	64 SF

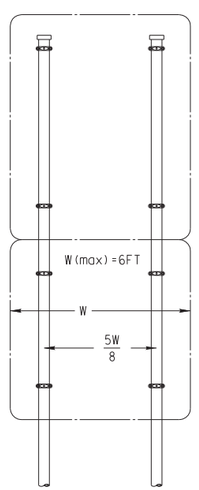
2. The Engineer may require that a Schedule 80 post be used in place of a I0 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7II0 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.I00 for signs 7.5 to I5 sq. ft., and 0.I25 for signs greater than I5 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 I0II SS Gr 50 and be galvanized per ASTM A I23.
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 I.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



SM RD SGN ASSM TY S80(I)XX(U-IEXT)

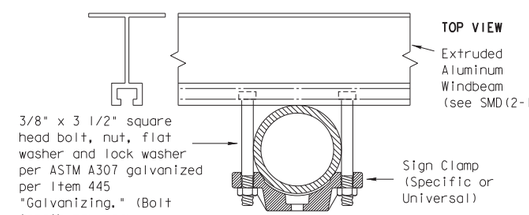


SM RD SGN ASSM TY S80(I)XX(U-2EXT)

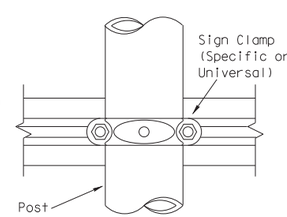


SM RD SGN ASSYM TY XXXXX(2)XX(P)

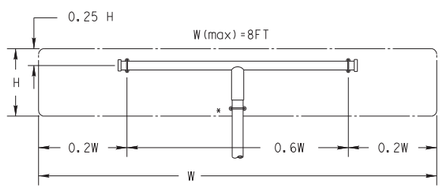
SIDE VIEW



Detail D



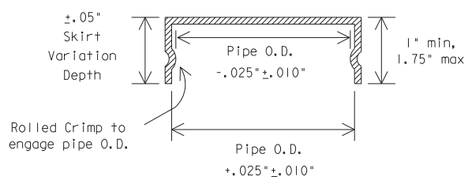
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (RI-I)	TY I0BWG(I)XX(T) TY I0BWG(I)XX(P-BM)
	60-inch YIELD sign (RI-2)	TY I0BWG(I)XX(T) TY I0BWG(I)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-I)	TY I0BWG(I)XX(T) TY I0BWG(I)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY I0BWG(I)XX(T)
	48x60-inch signs	TY S80(I)XX(T)
Warning	48x48-inch signs (diamond or square)	TY I0BWG(I)XX(T)
	48x60-inch signs	TY S80(I)XX(T)
	48-inch Advance School X-ing sign (SI-I)	TY I0BWG(I)XX(T)
	48-inch School X-ing sign (S2-I)	TY I0BWG(I)XX(T)
	Large Arrow sign (WI-6 & WI-7)	TY I0BWG(I)XX(T)



All dimensions are in english unless detailed otherwise.

SM RD SGN ASSM TY XXXXX(I)XX(T)
(* - See Note I2)

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

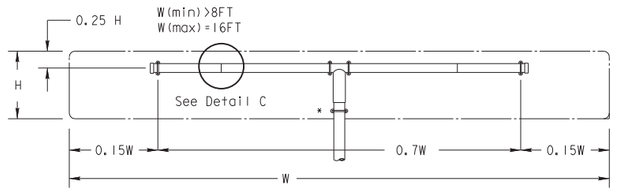
SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		I4I

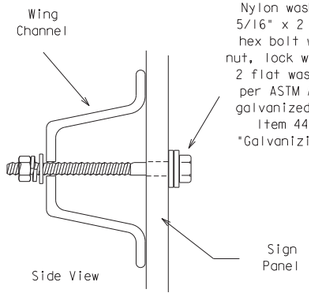
26C

DATE: 11/2/2021 3:40:53 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\04*TRAFFIC\smds3.dgn

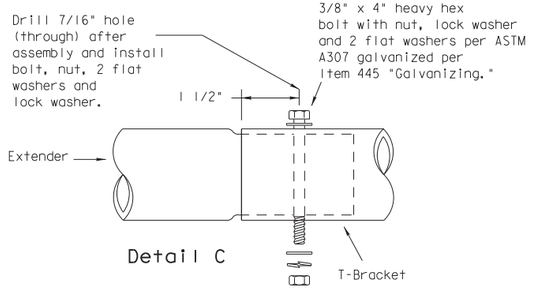


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

(* - See Note 12)



Detail B



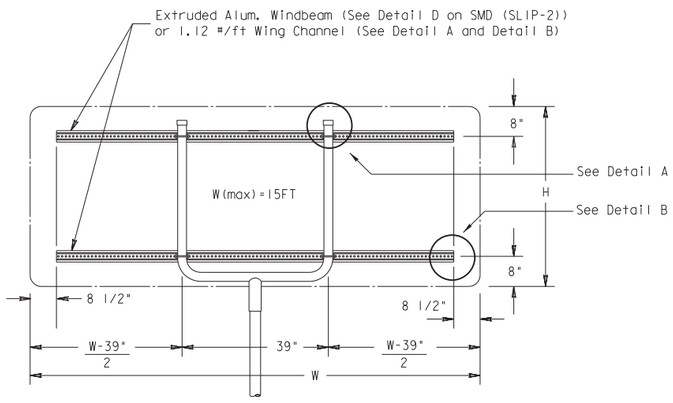
Detail C

Splices shall only be allowed behind the sign substrate.

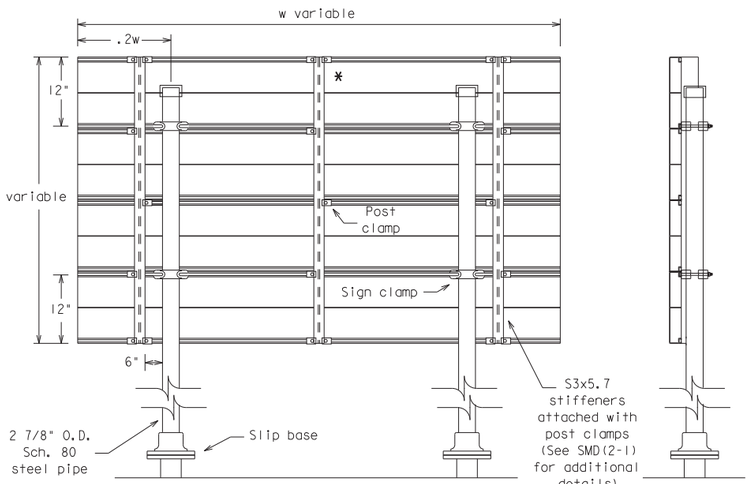
GENERAL NOTES:

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.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.



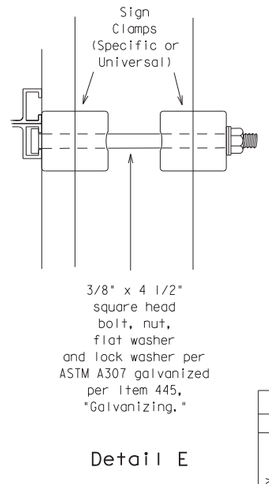
SM RD SGN ASSM TY XXXXX(1)XX(U-XX)



Typical Sign Mount

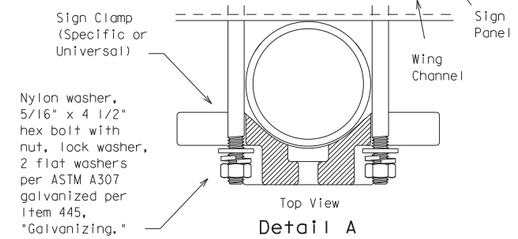
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

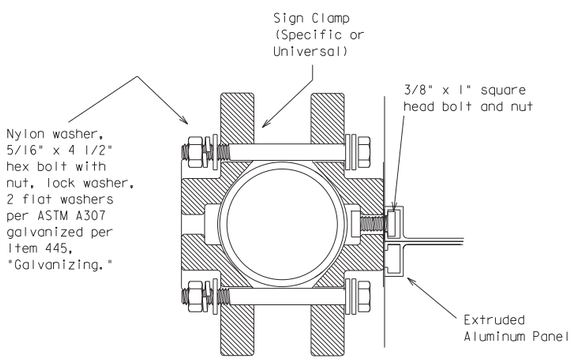


Detail E

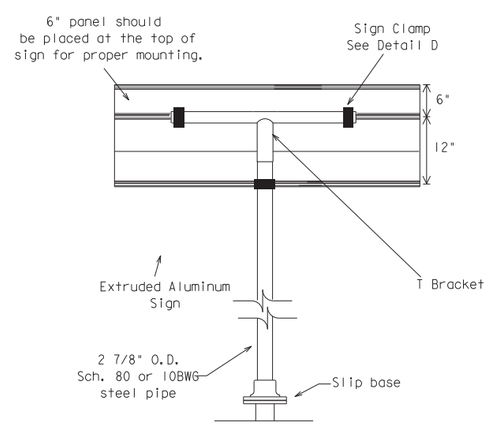
See Detail E for clamp installation



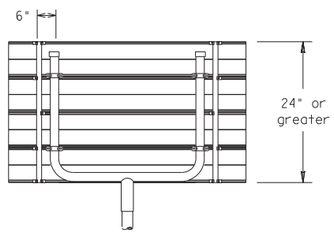
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

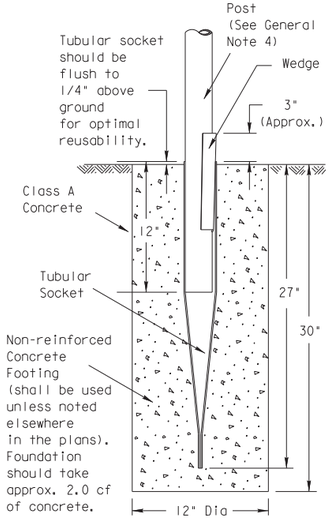
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		142

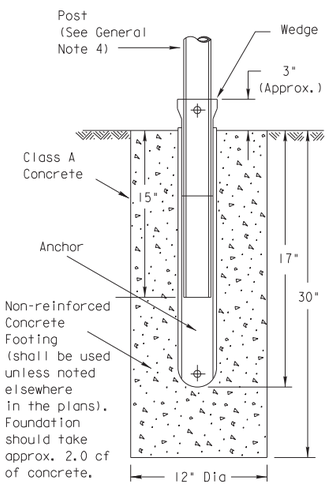
DATE: 11/2/2021 3:40:54 PM
FILE: H:\proj\N306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12*STANDARDS\04*TRAFFIC\smdtwt1.dgn

Wedge Anchor Steel System



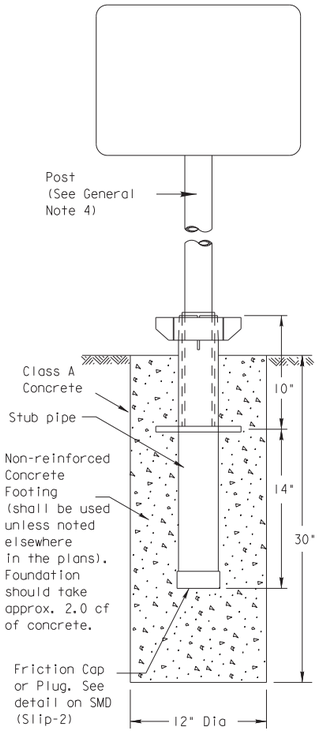
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

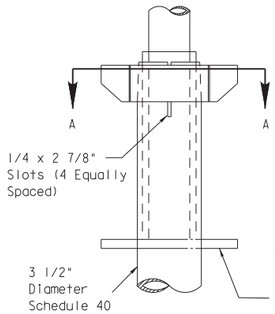


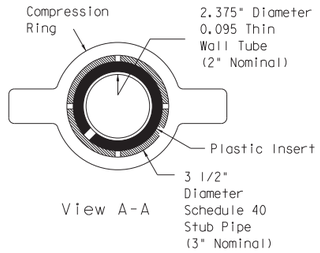
SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



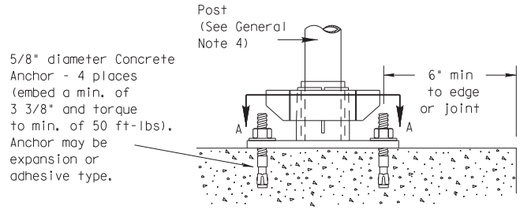
SM RD SGN ASSM TY TWT(X)UA(P)



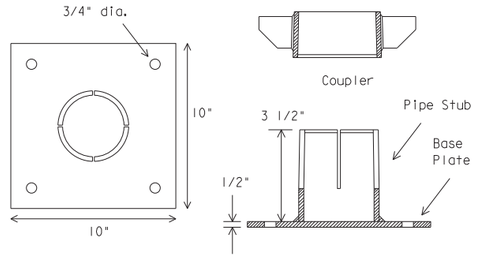


View A-A

Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10" long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2" when used with the Bolt Down Universal Anchor System.

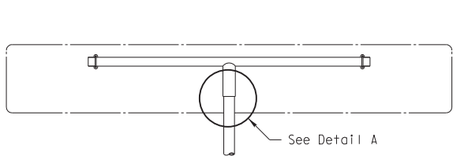


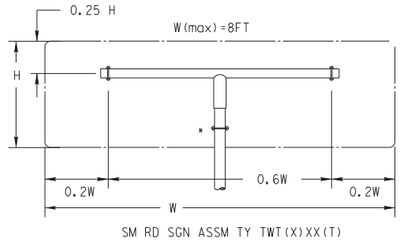
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.



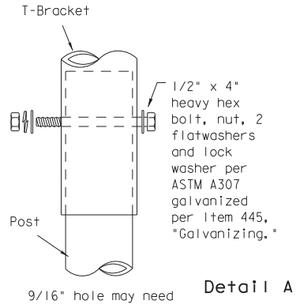
SM RD SGN ASSM TY TWT(X)UB(P)

Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post





SM RD SGN ASSM TY TWT(X)XX(T)
(* - See General Note 6)



Detail A

9/16" hole may need to be drilled through post to accommodate bolt.

NOTE

The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer list.htm
4. Material used as post with this system shall conform to the following specifications:
   13 BWG Tubing (2.375" outside diameter) (TWT)
   0.095" nominal wall thickness
   Seamless or electric-resistance welded steel tubing
   Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the following:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   18% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of .083" to .099"
   Outside diameter (uncoated) shall be within the range of 2.369" to 2.381"
   Galvanization per ASTM 123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximaely 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

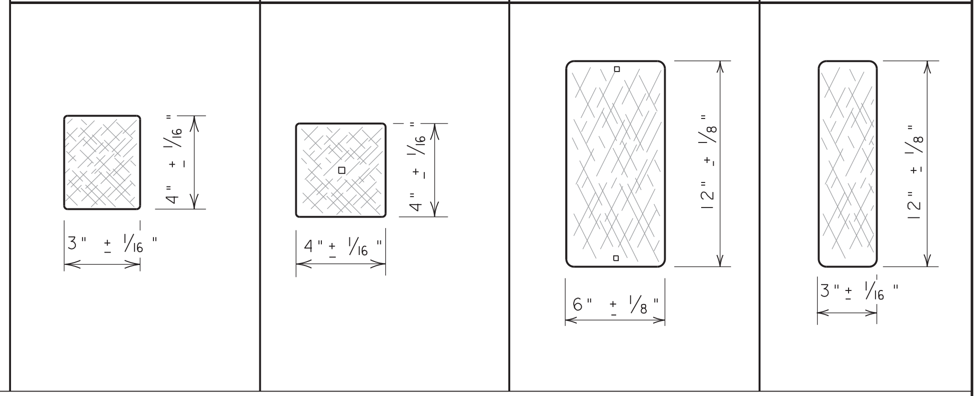
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		143

26E

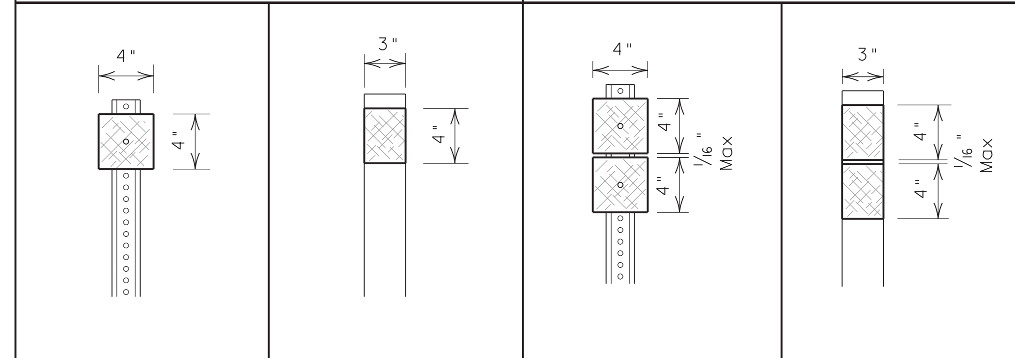
DATE: 11/2/2021 3:40:54 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\

REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS



	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE	4" ± 1/16" × 3" ± 1/16"	4" ± 1/16" × 4" ± 1/16"	12" ± 1/8" × 6" ± 1/8"	12" ± 1/8" × 3" ± 1/16"
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

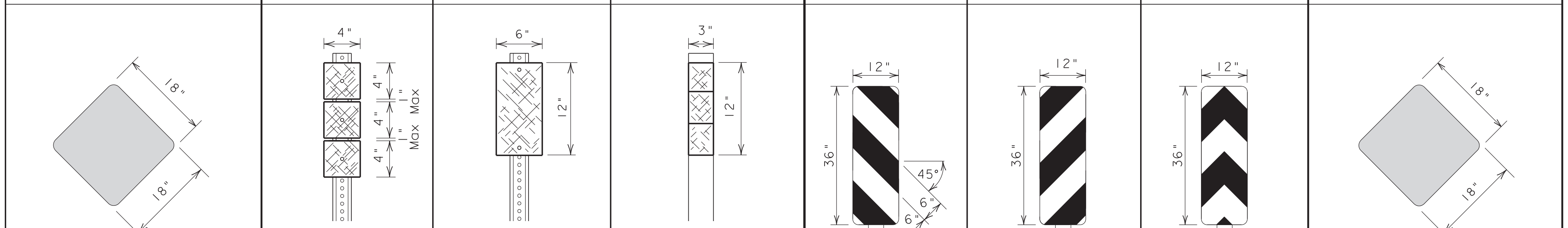
NUMBER OF REFLECTORS OR DIRECTION
- X = 3-Size 2 reflector units (Type 2 only)
- Y = 1-Size 3 reflector unit (Type 2 only)
- Z = 3-Size 1 or 1-Size 4 reflector unit(s)(Type 2 only)
- L = Left Side (Type 3 Object Marker only)
- R = Right Side (Type 3 Object Marker only)
- C = Center (Type 3 Object Marker 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

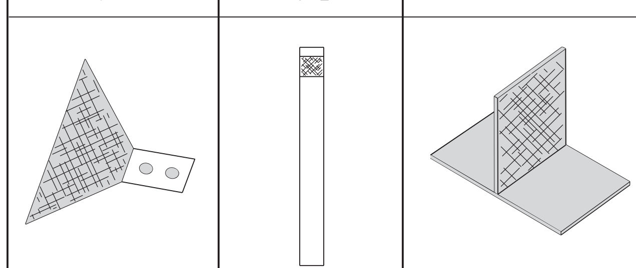
OBJECT MARKERS



	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)



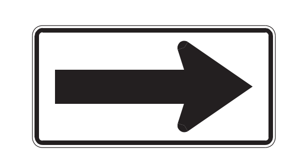
	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

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	

ONE DIRECTION LARGE ARROW



W1-6

SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

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).

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: doml-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
10-09 3-15	DIST		COUNTY	SHEET NO.
4-10 7-20	LFK		SHELBY	144

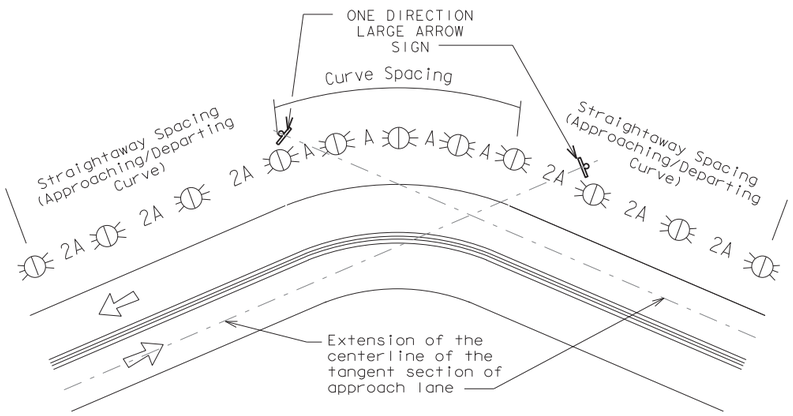
20A

DATE: 11/2/2021 3:41:06 PM
FILE: H:\proj\R30606B.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\dom3-20.dgn

MINIMUM WARNING DEVICES AT CURVES WITH ADVISORY SPEEDS

Amount by which Advisory Speed is less than Posted Speed	Curve Advisory Speed	
	Turn (30 MPH or less)	Curve (35 MPH or more)
5 MPH & 10 MPH	• RPMs	• RPMs
15 MPH & 20 MPH	• RPMs and One Direction Large Arrow sign	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons.
25 MPH & more	• RPMs and Chevrons; or • RPMs and One Direction Large Arrow sign where geometric conditions or roadside obstacles prevent the installation of chevrons	• RPMs and Chevrons

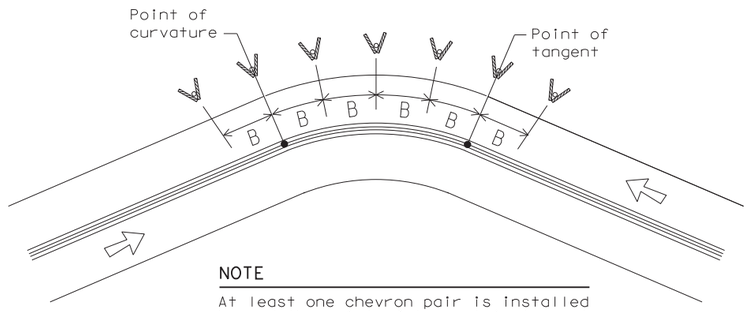
SUGGESTED SPACING FOR DELINEATORS ON HORIZONTAL CURVES



NOTE

ONE DIRECTION LARGE ARROW (W1-6) sign should be located at approximately and perpendicular to the extension of the centerline of the tangent section of approach lane.

SUGGESTED SPACING FOR CHEVRONS ON HORIZONTAL CURVES



NOTE

At least one chevron pair is installed beyond the point of tangent in tangent section.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS KNOWN

Degree of Curve	FEET			
	Radius of Curve	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
		A	2A	B
1	5730	225	450	——
2	2865	160	320	——
3	1910	130	260	200
4	1433	110	220	160
5	1146	100	200	160
6	955	90	180	160
7	819	85	170	160
8	716	75	150	160
9	637	75	150	120
10	573	70	140	120
11	521	65	130	120
12	478	60	120	120
13	441	60	120	120
14	409	55	110	80
15	382	55	110	80
16	358	55	110	80
19	302	50	100	80
23	249	40	80	80
29	198	35	70	40
38	151	30	60	40
57	101	20	40	40

Curve delineator approach and departure spacing should include 3 delineators spaced at 2A. This spacing should be used during design preparation or when the degree of curve is known.

DELINEATOR AND CHEVRON SPACING

WHEN DEGREE OF CURVE OR RADIUS IS NOT KNOWN

Advisory Speed (MPH)	Spacing in Curve	Spacing in Straightaway	Chevron Spacing in Curve
	A	2xA	B
65	130	260	200
60	110	220	160
55	100	200	160
50	85	170	160
45	75	150	120
40	70	140	120
35	60	120	120
30	55	110	80
25	50	100	80
20	40	80	80
15	35	70	40

If the degree of curve is not known, delineator spacing may be determined based on the Advisory Speed of the curve. Use the delineator curve spacing for each Advisory Speed (MPH).

DELINEATOR AND OBJECT MARKER APPLICATION AND SPACING

CONDITION	REQUIRED TREATMENT	MINIMUM SPACING
Frwy./Exp. Tangent	RPMs	See PM-series and FPM-series standard sheets
Frwy./Exp. Curve	Single delineators on right side	See delineator spacing table
Frwy/Exp.Ramp	Single delineators on at least one side of ramp (should be on outside of curves) (see Detail 3 on D&OM(4))	100 feet on ramp tangents Use delineator spacing table for ramp curves ("straightway spacing" does not apply to ramp curves)
Acceleration/Deceleration Lane	Double delineators (see Detail 3 on D&OM(4))	100 feet (See Detail 3 on D & OM (4))
Truck Escape Ramp	Single red delineators on both sides	50 feet
Bridge Rail (steel or concrete)and Metal Beam Guard Fence	Bi-Directional Delineators when undivided with one lane each direction Single Delineators when multiple lanes each direction	Equal spacing (100'max) but not less than 3 delineators
Concrete Traffic Barrier (CTB) or Steel Traffic Barrier	Barrier reflectors matching the color of the edge line	Equal spacing 100' max
Cable Barrier	Reflectors matching the color of the edge line	Every 5th cable barrier post (up to 100'max)
Guard Rail Terminus/Impact Head	Divided highway - Object marker on approach end Undivided 2-lane highways - Object marker on approach and departure end	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5) and D & OM (6)
Bridges with no Approach Rail	Type 3 Object Marker (OM-3) at end of rail and 3 single delineators approaching rail	See D & OM(5)
Reduced Width Approaches to Bridge Rail	Type 2 and Type 3 Object Markers (OM-3) and 3 single delineators approaching bridge	Requires reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end See D & OM (5)
Culverts without MBGF	Type 2 Object Markers	See Detail 2 on D & OM(4)
Crossovers	Double yellow delineators and RPMs	See Detail 1 on D & OM (4)
Pavement Narrowing (lane merge) on Freeways/Expressway	Single delineators adjacent to affected lane for full length of transition	100 feet

NOTES

1. Unless indicated otherwise, the delineator or barrier reflector color shall conform to the color of the pavement edge line on the side of the road where the delineators or barrier reflectors are placed.
2. Barrier reflectors may be used to replace required delineators.
3. Single red delineators may be mounted on the back side of delineator posts for wrong way driver applications

LEGEND	
	Bi-directional Delineator
	Delineator
	Sign

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

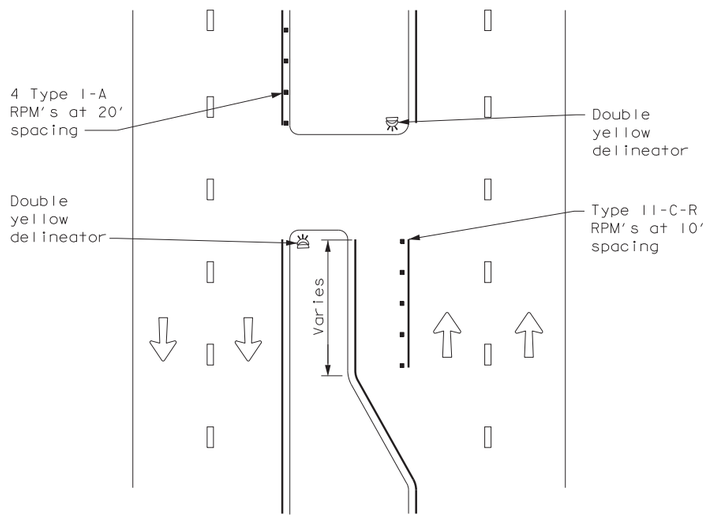
D & OM(3)-20

FILE: dom3-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
3-15 8-15	DIST	COUNTY		SHEET NO.
8-15 7-20	LFK	SHELBY		145

20C

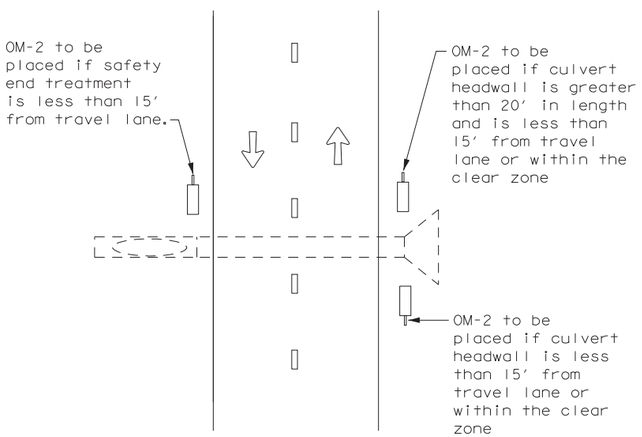
DATE: 11/2/2021 3:41:06 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\dom4-20.dgn

CROSSOVERS



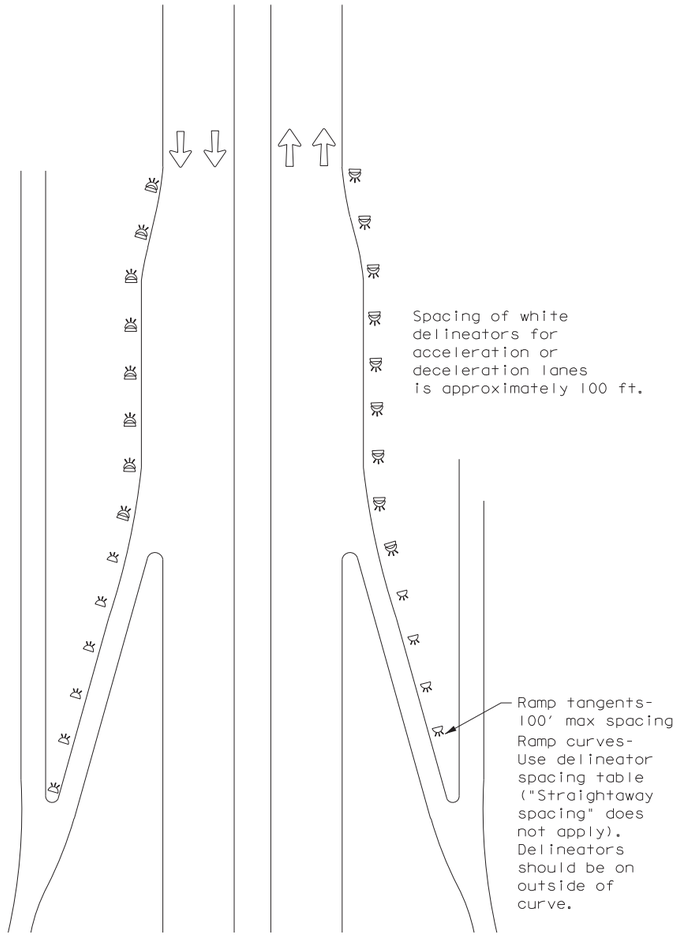
DETAIL 1

FOR CULVERTS WITHOUT MBGF



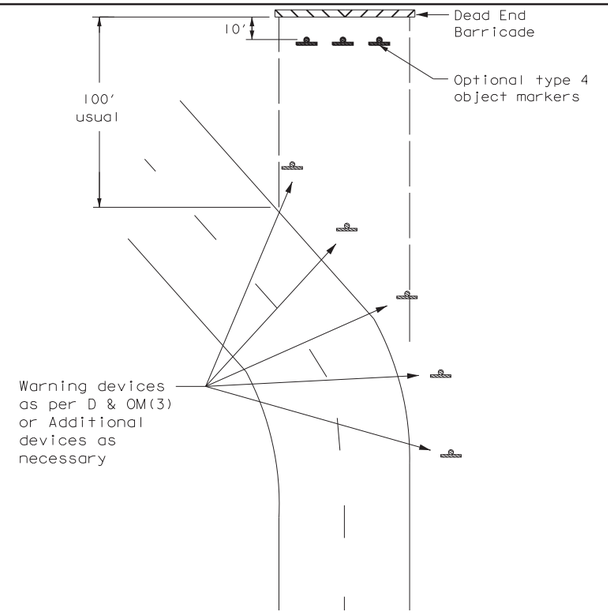
DETAIL 2

FREEWAY DELINEATION FOR RAMPS AND ACCELERATION/DECELERATION LANES



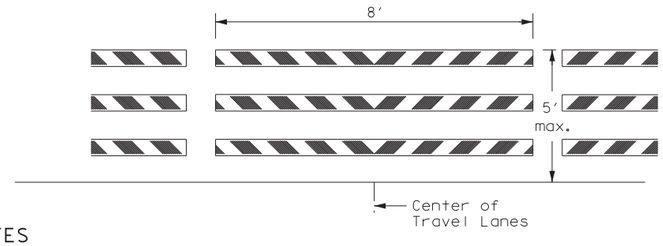
DETAIL 3

TYPICAL APPLICATION OF DEAD END BARRICADE



DETAIL 4

TYPICAL DEAD END BARRICADE INSTALLATION



NOTES

1. Barricade striping shall be red and white reflective sheeting for all permanent road closures.
2. Barricade striping is red and white sloping toward the center of the roadway.
3. Type 3 Barricade Supports should be anchored to soil or pavement as described in compliant Work Zone Traffic Control Devices List, section D.2.f and D.2.g.

DETAIL 5

LEGEND	
	Bidirectional Delineator
	Delineator
	OM-3
	Barricade
	Sign
	OM-2
	Double Delineator

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

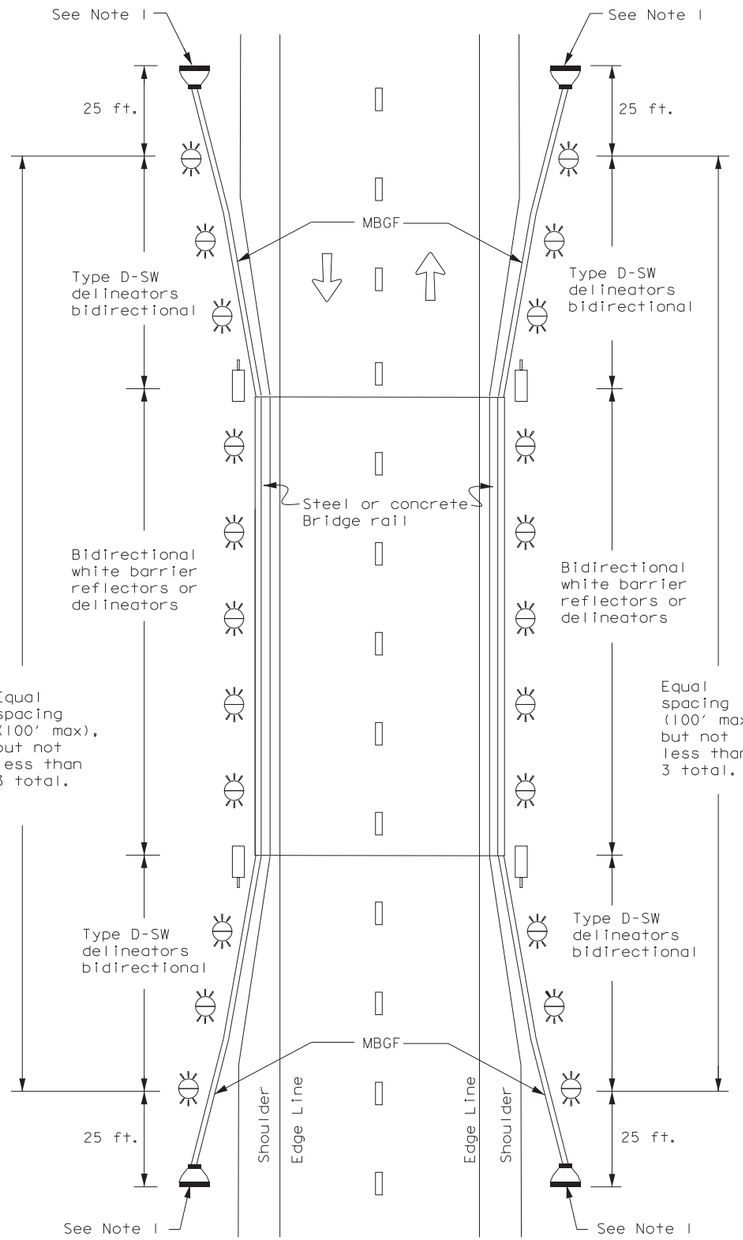
D & OM(4)-20

FILE: dom4-20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
3-15	DIST	COUNTY		SHEET NO.
7-20	LFK	SHELBY		146

20D

DATE: 11/2/2021 3:41:06 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\dom5-20.dgn

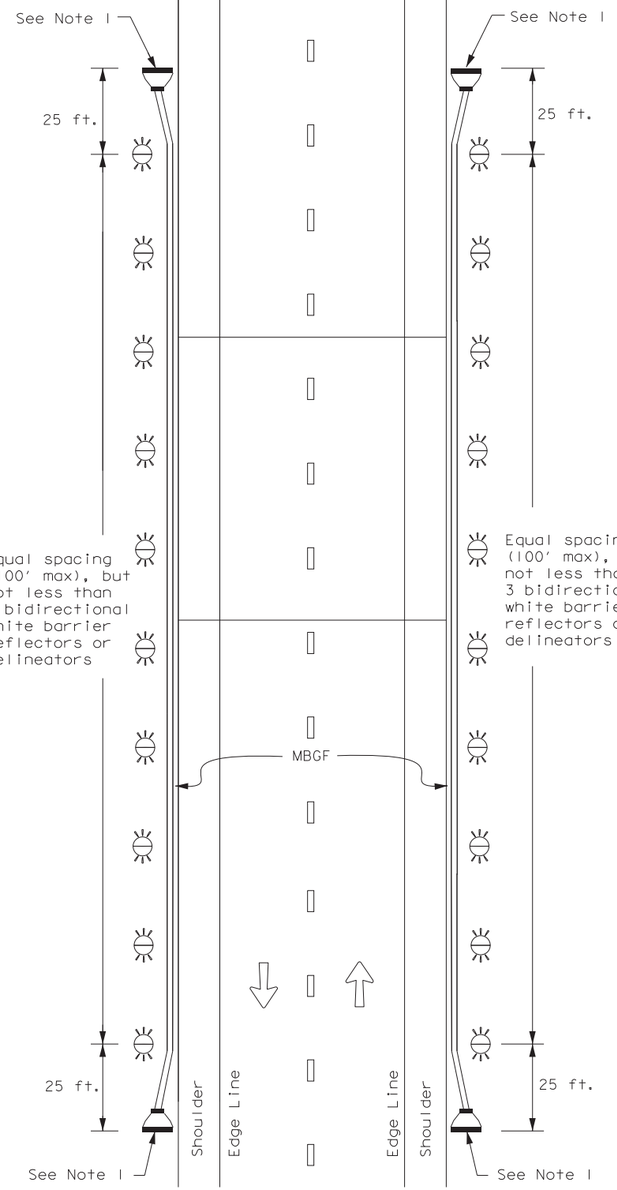
TWO-WAY, TWO LANE ROADWAY WITH REDUCED WIDTH APPROACH RAIL



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

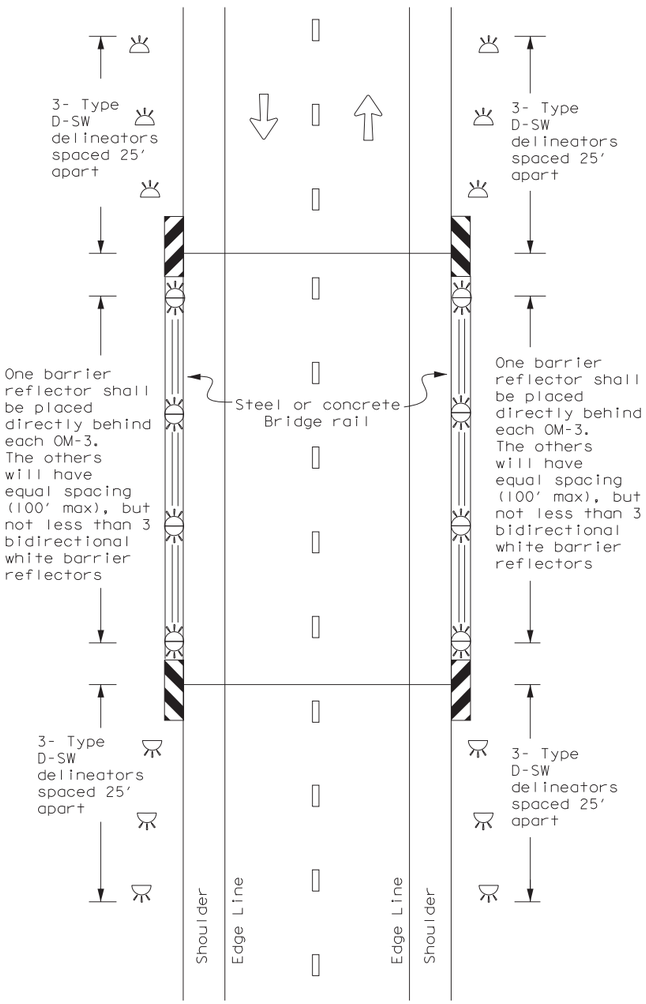
TWO-WAY, TWO LANE ROADWAY WITH METAL BEAM GUARD FENCE (MBGF)



NOTE:

1. Terminal ends require reflective sheeting provided by manufacturer per D & OM (VIA) or a Type 3 Object Marker (OM-3) in front of the terminal end.

TWO-WAY, TWO LANE ROADWAY BRIDGE WITH NO APPROACH RAIL



LEGEND

	Bidirectional Delineator
	Delineator
	OM-3
	OM-2
	Terminal End
	Traffic Flow

Texas Department of Transportation

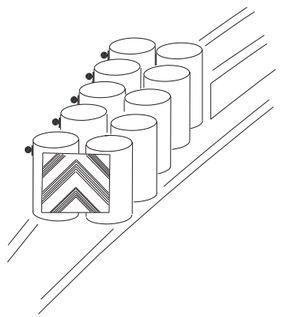
Traffic Safety Division Standard

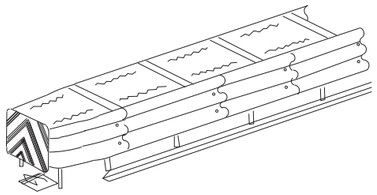
DELINEATOR & OBJECT MARKER PLACEMENT DETAILS

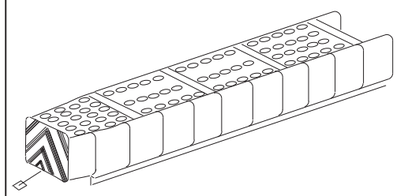
D & OM(5)-20

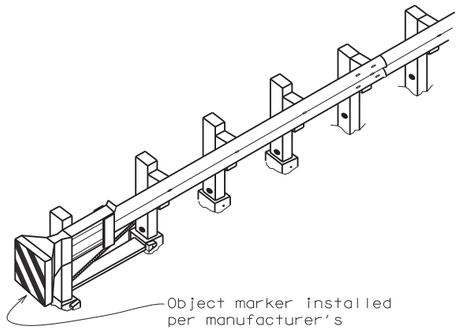
FILE: dom5-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
7-20	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		147

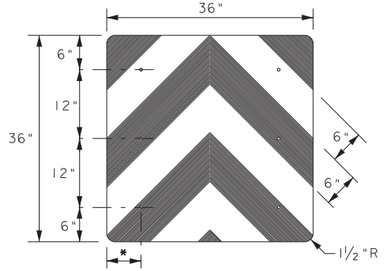
20E

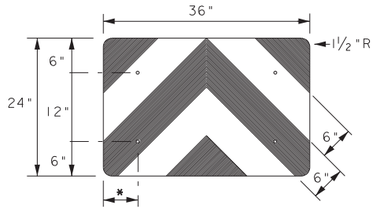




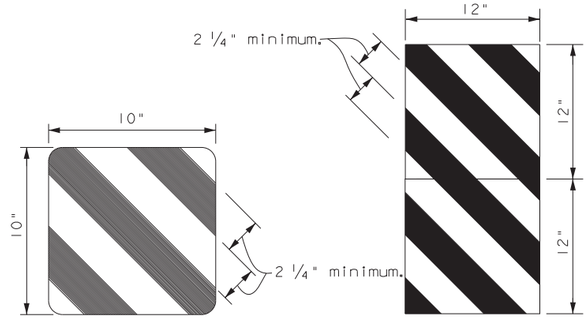




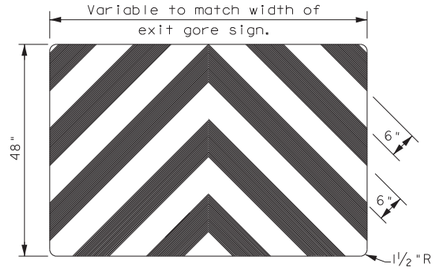


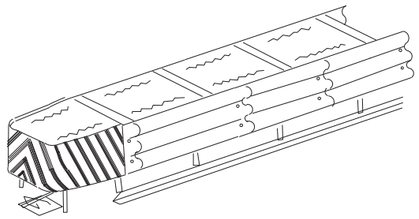


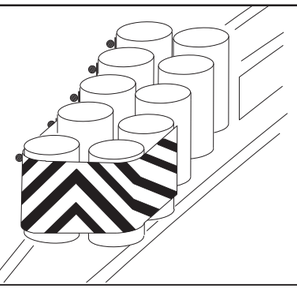
* Adjust to fit attenuator per manufacturer's recommendation, or as directed by the Engineer

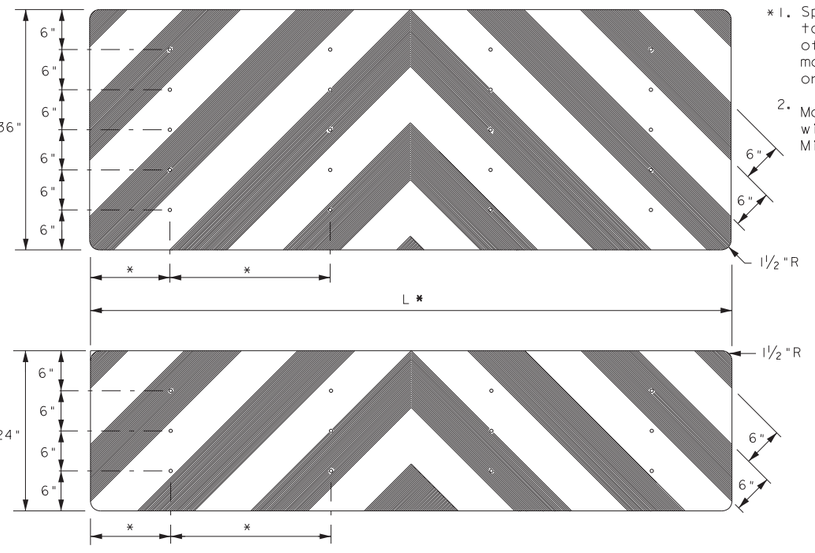


OBJECT MARKERS SMALLER THAN 3 FT^2









NOTES

*1. Spacing should be adjusted to attach through centerline of drum, per attenuator manufacturers recommendation, or as directed by the Engineer.

2. Mounting should be flush with top of attenuator. Minimum size 96" x 24".

NOTES

1. Object Markers shall conform to the Texas MUTCD and meet the color and reflectivity requirement of Department Material Specification DMS 8300. Background shall be yellow reflective sheeting (Type B or C) and Chevron shall be black.

2. Object Markers may be fabricated from adhesive backed reflective sheeting applied directly to guardrail end treatment, or applied directly to an "end cap" as per the manufacturer's recommendation. Direct applied sheeting shall provide a smooth surface and have no wrinkles, air bubbles, cuts or tears. A radius at the corners is not required for direct applied sheeting.

3. Object Marker size may be reduced to fit smaller devices. Width of alternating black and yellow stripes are typically 6". Object Markers smaller than 3ft may have reduced width stripes of a minimum of 2 ¼".

4. Pop rivets, screws, or nuts and bolts may be used to attach object markers and reflectors. Holes, slots or other openings may be cut or drilled through object markers to allow cable or other attachments.

5. Object Marker at nose of attenuator is subsidiary to the attenuator.

6. See D & OM (1-4) for required barrier reflectors.

Texas Department of Transportation

Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER FOR VEHICLE IMPACT ATTENUATORS

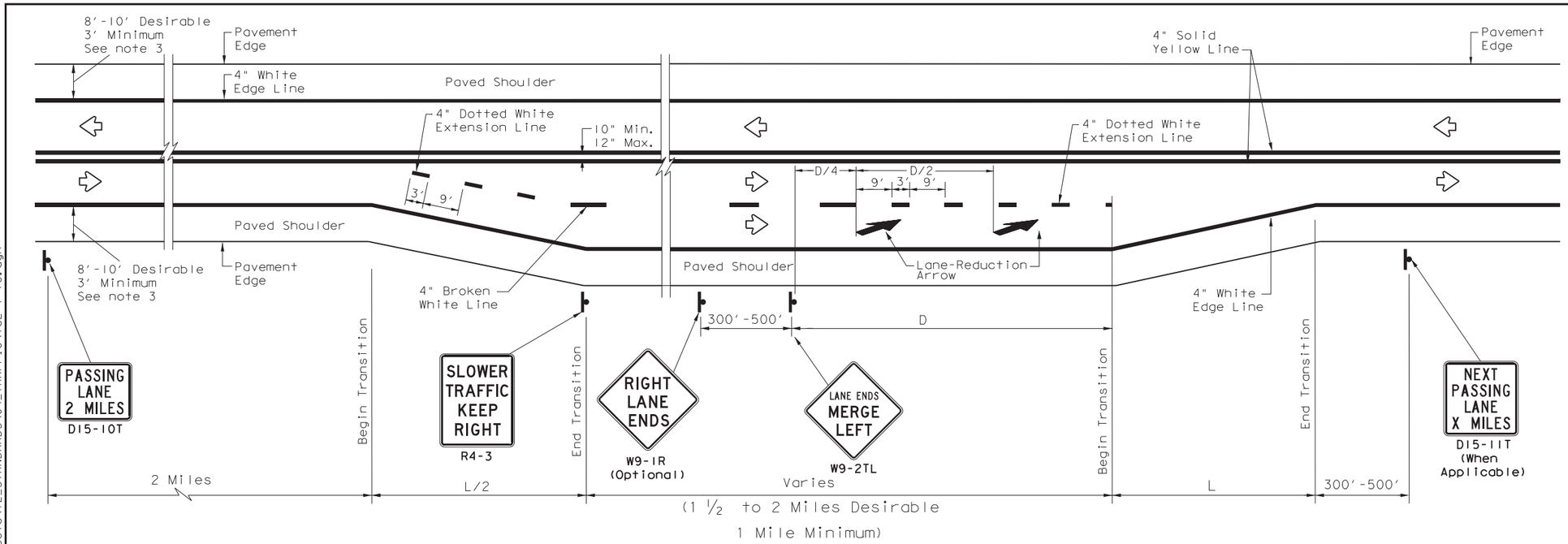
D & OM(VIA)-20

FILE: domvia20.dgn	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
©TxDOT December 1989	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
4-92 8-04	DIST	COUNTY		SHEET NO.
8-95 3-15	LFK	SHELBY		148
4-98 7-20				

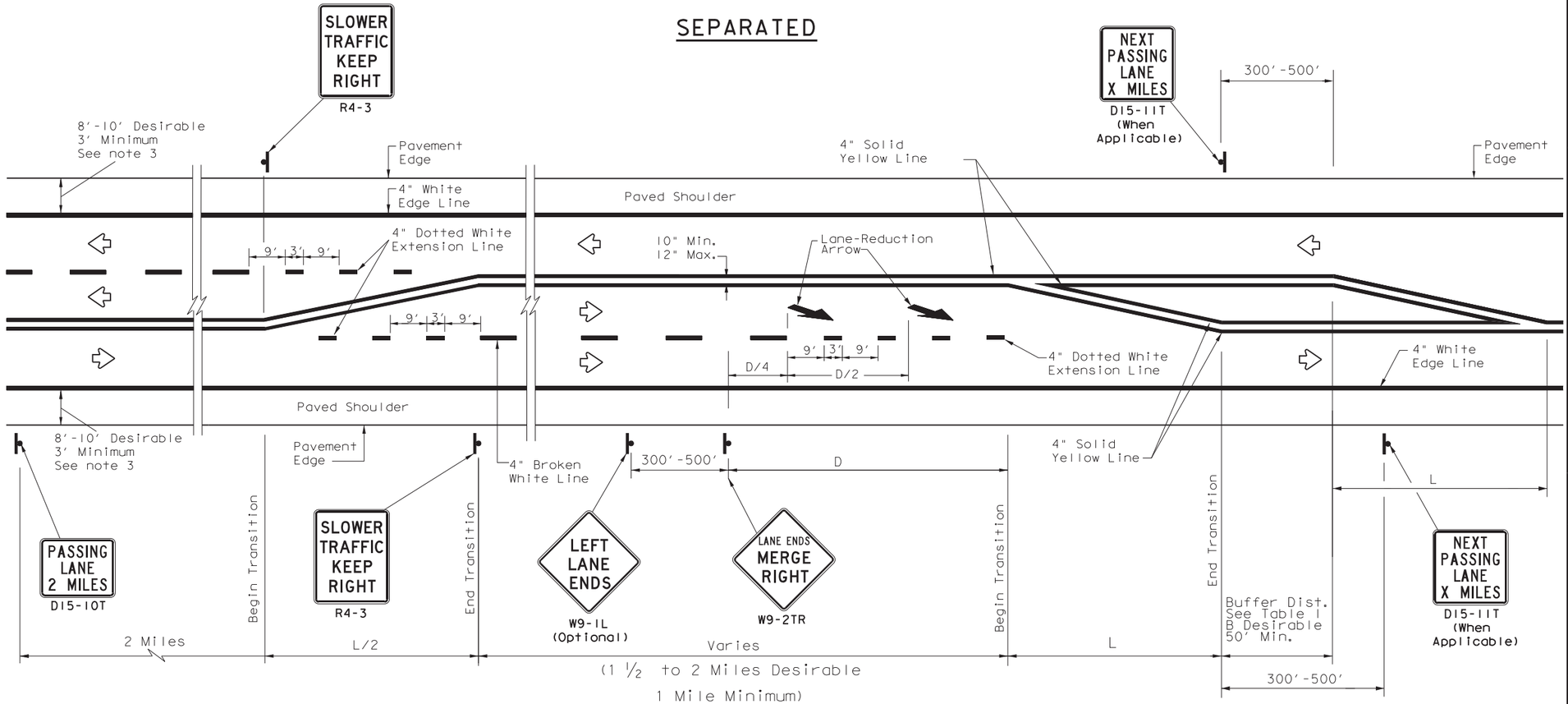
20G

DATE: 11/2/2021 3:41:07 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\domvia-20.dgn

DATE: 11/2/2021 3:41:07 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\ts2-1-18.dgn



SEPARATED



ALTERNATING

LEGEND	
	Sign
	Traffic Flow

TYPICAL TAPER LENGTH (L)

Formula *	L = WS

* Transition length should be rounded up to nearest 5 foot increment.

L=Length of Transition (FT)
W=Width of Offset (FT)
S=Posted Speed (MPH)

EXAMPLE

A 12 foot lane is added on a 70 mph roadway. The length of the transition should be:

L=12x70=840 ft

TABLE 1
ADVANCE WARNING SIGN DISTANCE (D) AND BUFFER DISTANCE (B)

Posted Speed	D (FT)	B (FT)
40	670	305
45	775	360
50	885	425
55	990	495
60	1100	570
65	1200	645
70	1250	730
75	1350	820

GENERAL NOTES

1. For minimum and desirable design details, see the Roadway Design Manual, Chapter 4, Section 6, Super 2 Highways.
2. For Raised Pavement Markers(RPM)details, see Pavement Markings Standard sheet, PM(2). Note that RPMs are not recommended on the 4" dotted white extension lines.
3. For rumble strip options available for the designed shoulder width, see rumble strip standard sheet RS(4).

Texas Department of Transportation

Traffic Operations Division Standard

TEXAS SUPER 2 PASSING LANES

TS2(PL-1)-18

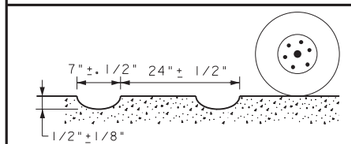
FILE: ts2-1-18.dgn	DN:	CK:	DW:	CK:
© TxDOT May 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
2-12	DIST	COUNTY		SHEET NO.
3-12	LFK	SHELBY		149
3-18				

25

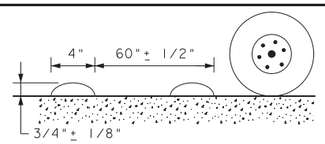
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE: 11/2/2021 3:41:07 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFICYrs(13)-13.dgn

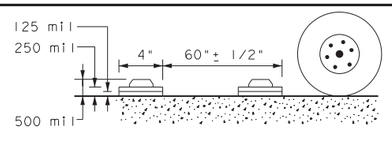
CENTERLINE RUMBLE STRIPS



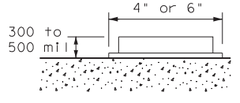
MILLED RUMBLE STRIPS



RAISED TRAFFIC BUTTONS

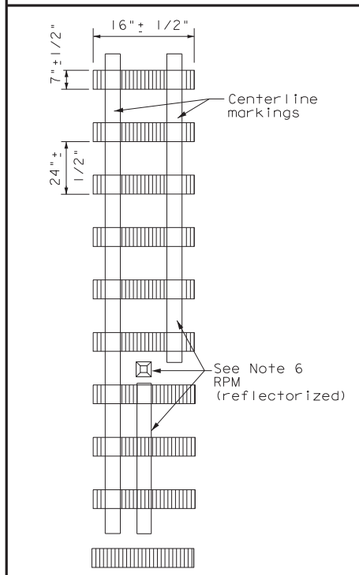


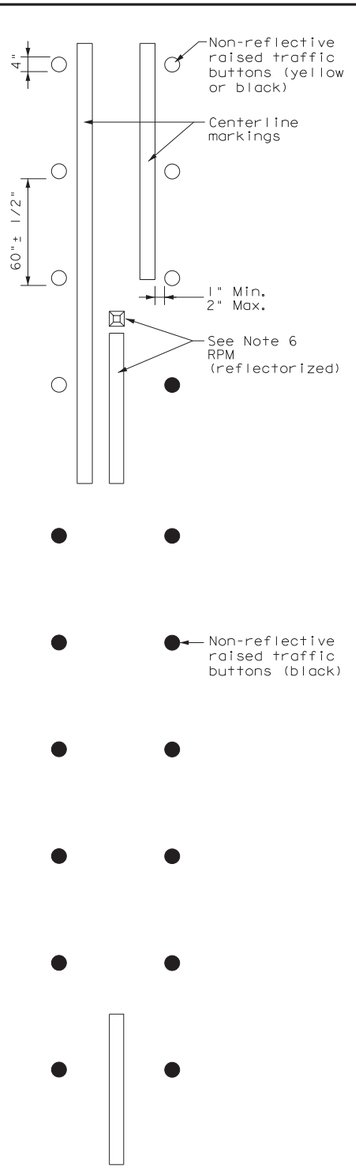
PREFORMED THERMOPLASTIC STRIPS

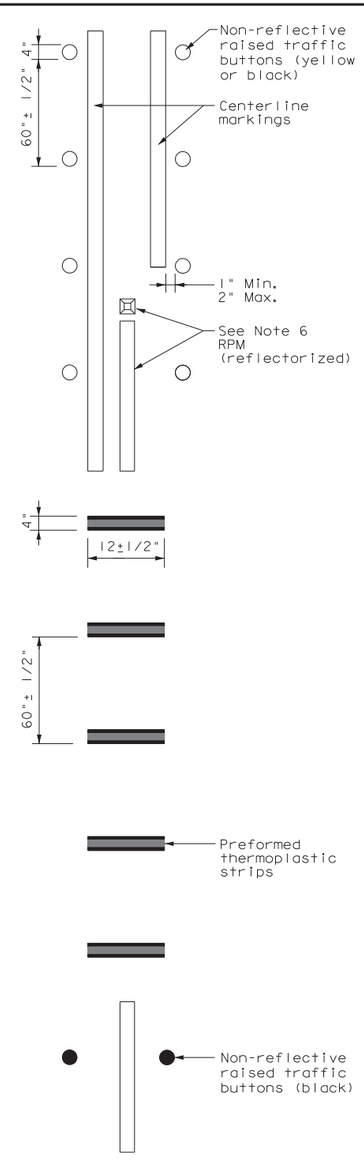


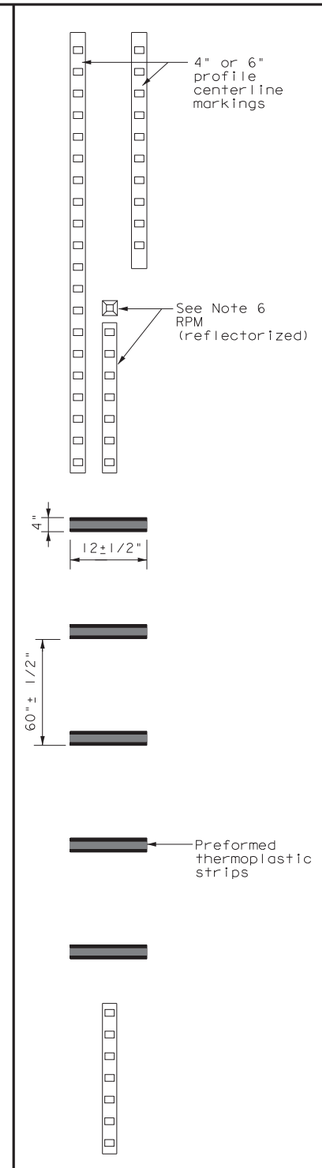
PROFILE MARKINGS

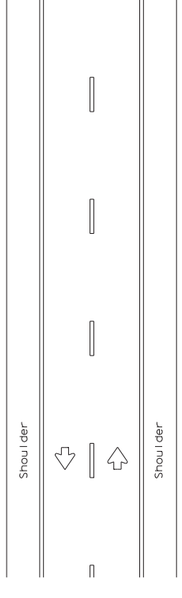
PROFILE VIEW



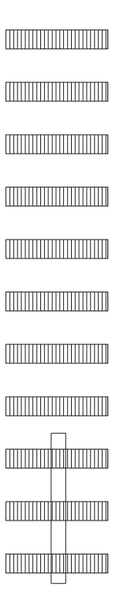








TWO LANE TWO-WAY ROADWAYS


PLAN VIEW
OPTION 1
MILLED CENTERLINE RUMBLE STRIPS

PLAN VIEW
OPTION 2
RAISED CENTERLINE RUMBLE STRIPS

PLAN VIEW
OPTION 3
RAISED CENTERLINE RUMBLE STRIPS AND PREFORMED THERMOPLASTIC STRIPS

PLAN VIEW
OPTION 4
PROFILE CENTERLINE MARKINGS AND PREFORMED THERMOPLASTIC STRIPS

GENERAL NOTES

1. This standard sheet provides guidelines for installing centerline rumble strips on two-lane highways with or without shoulders.
2. Centerline and edgeline rumble strips or profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.
3. Milled rumble strips are preferred when adequate pavement depth is available. If pavement thickness is less than 2 inches, milled rumble strips shall not be used. Rumble strips shall not be milled or depressed into bridge decks.
4. See dimensions for milled rumble strips. Other shapes and dimensions may be used if approved by the Traffic Operations Division.
5. Breaks in milled centerline rumble strips shall occur at least 50 feet and no more than 150 feet in advance of bridges, railroad crossings, intersections and driveways with high usage of large trucks.
6. Use Standard Sheet PM(2) for positioning, dimensioning, and spacing of all reflective raised pavement markers, and dimensions pavement markings and profile markings.
7. Consideration should be given to noise levels when centerline rumble strips are installed near residential areas, schools, churches, etc. A minimum of 3/8 inch depth of milled rumble strip may be considered in these areas.
8. Pavement markings must be applied over milled centerline rumble strips.

WHEN INSTALLING CENTERLINE RUMBLE STRIPS:

9. Raised rumble strips consisting of non-reflective raised traffic buttons may be used. Non-reflective raised traffic buttons can be affixed to asphalt or concrete with bitumen or adhesives, as per manufacturer's recommendations.
10. When using non-reflective raised traffic buttons as a centerline rumble strip, the button shall be placed adjacent to the pavement marking delineating the centerline. The buttons will be paid for under Item 672, "Raised Pavement Markers." Non-reflective traffic buttons must meet the requirements of DMS-4300.
11. The color of the button should be yellow for a continuous no passing roadway. Black buttons should be used in areas where passing is allowed.

WHEN INSTALLING EDGELINE RUMBLE STRIPS WITH OR WITHOUT CENTERLINE RUMBLE STRIPS ON UNDIVIDED HIGHWAYS:

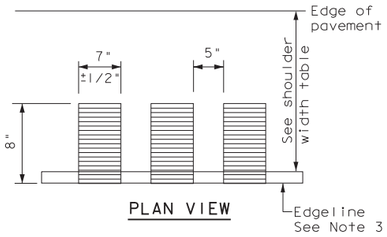
12. See standard sheet RS(4).

Texas Department of Transportation®
Traffic Operations Division Standard

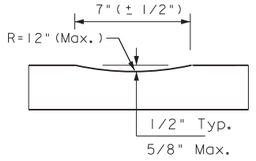
CENTERLINE RUMBLE STRIPS ON TWO LANE TWO-WAY HIGHWAYS

RS(3)-13

FILE: rs(3)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		150

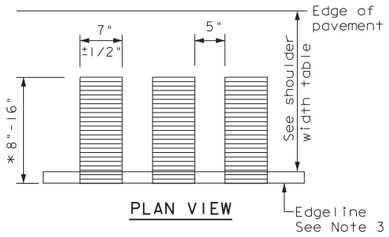


PLAN VIEW

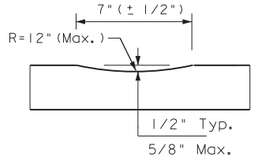


PROFILE VIEW
OPTION 1

CONTINUOUS MILLED DEPRESSIONS (Rumble Stripes)



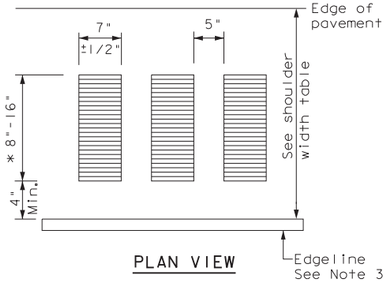
PLAN VIEW



* This distance may vary based on width of shoulder

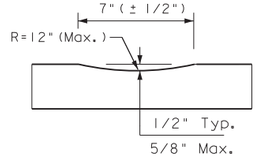
PROFILE VIEW
OPTION 2

CONTINUOUS MILLED DEPRESSIONS (Rumble Stripes)



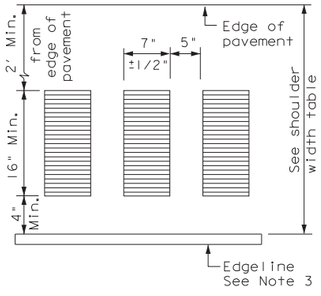
PLAN VIEW

* This distance may vary based on width of shoulder

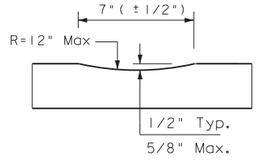


PROFILE VIEW
OPTION 3

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)

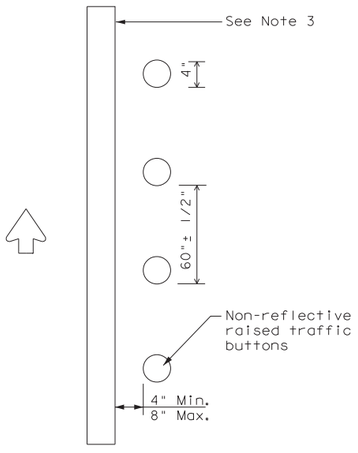


PLAN VIEW



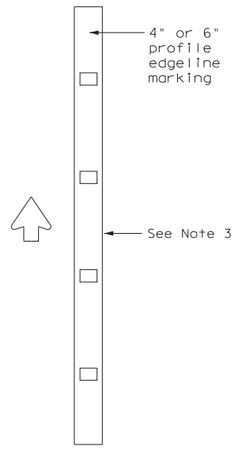
PROFILE VIEW
OPTION 4

CONTINUOUS MILLED DEPRESSIONS (Rumble Strips)



PLAN VIEW
OPTION 5

RAISED EDGELINE RUMBLE STRIPS



PLAN VIEW
OPTION 6

PROFILE EDGELINE MARKINGS

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

GENERAL NOTES

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

WHEN INSTALLING MILLED DEPRESSION EDGELINE RUMBLE STRIPS:

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

WHEN INSTALLING RAISED OR PROFILE EDGELINE RUMBLE STRIPS:

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

Texas Department of Transportation

Traffic Operations Division Standard

EDGELINE RUMBLE STRIPS ON UNDIVIDED OR TWO LANE HIGHWAYS RS(4)-13

FILE: rs(4)-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2013	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		151

DATE: 11/2/2021 3:41:08 PM
FILE: H:\proj\CR306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFICrs(4)-13.dgn

DATE: 11/2/2021 3:41:08 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\ed1-14.dgn

GENERAL NOTES FOR ALL ELECTRICAL WORK

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

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

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

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

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

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

CONDUIT

A. MATERIALS

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

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

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

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

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

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

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

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

FILE: ed1-14.dgn	DN:	CK:	DW:	CK:
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		152

7IA

DATE: 11/2/2021 3:41:08 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\ed3-14.dgn

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.

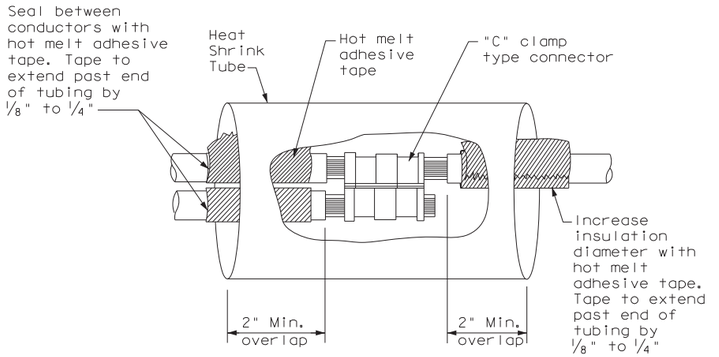
3. Install ground rods so the imprinted part number is at the upper end of the rod.

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

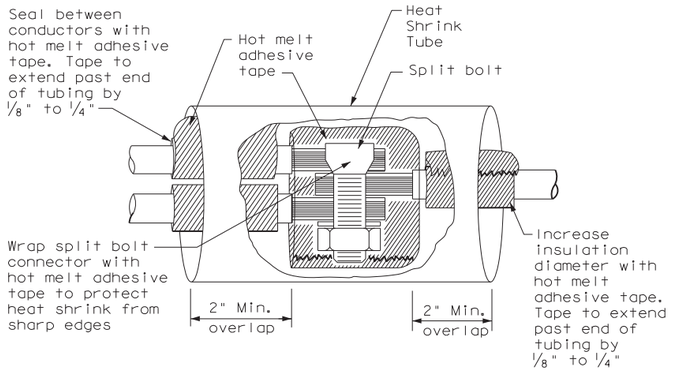
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

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.

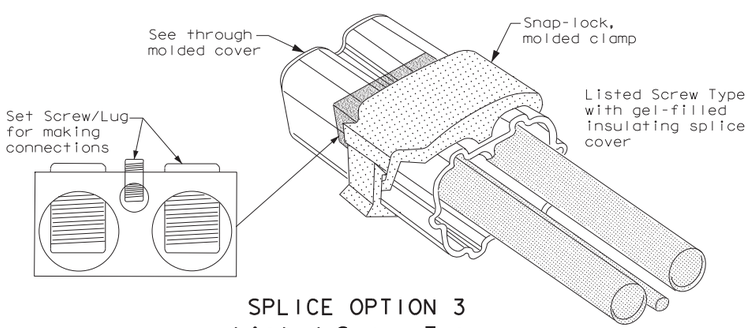
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



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

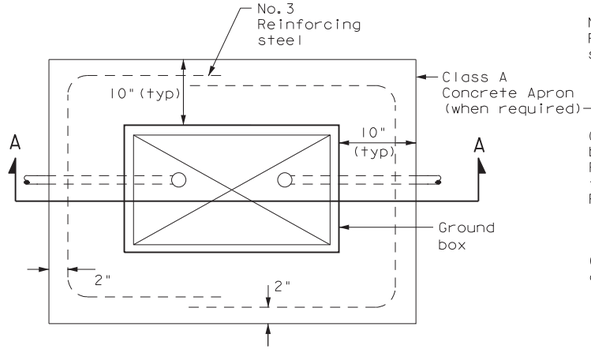
ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

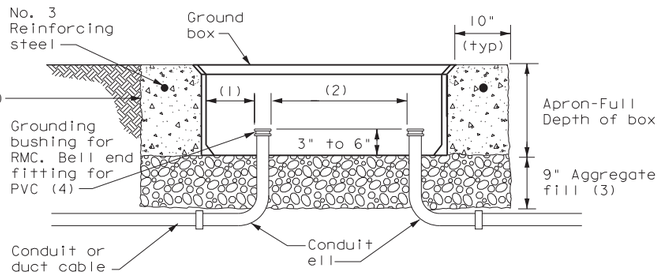
FILE: ed3-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		153

7IC

DATE: 11/2/2021 3:41:09 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\ed4-14.dgn



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

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.

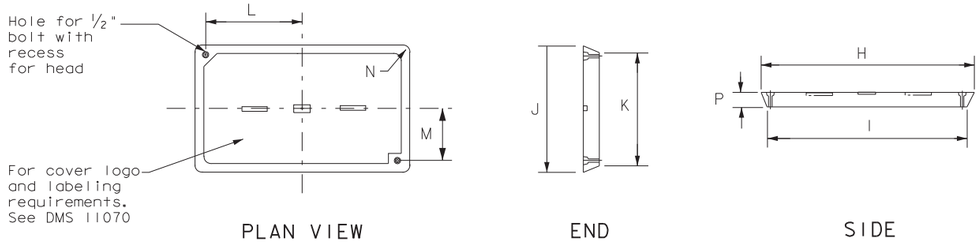
7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

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.



PLAN VIEW END SIDE

GROUND BOX COVER

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	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		154

7ID

DATE: 11/2/2021 3:41:09 PM
FILE: H:\proj\CR306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\ed5-14.dgn

ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

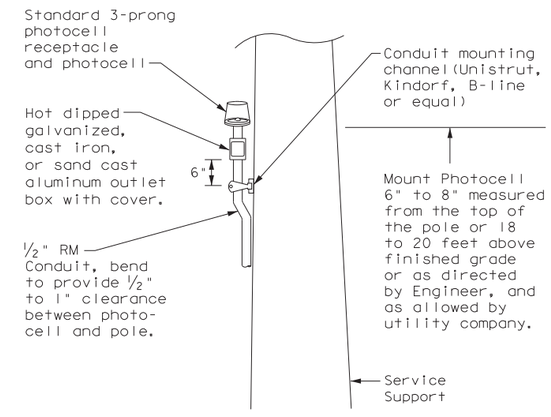
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

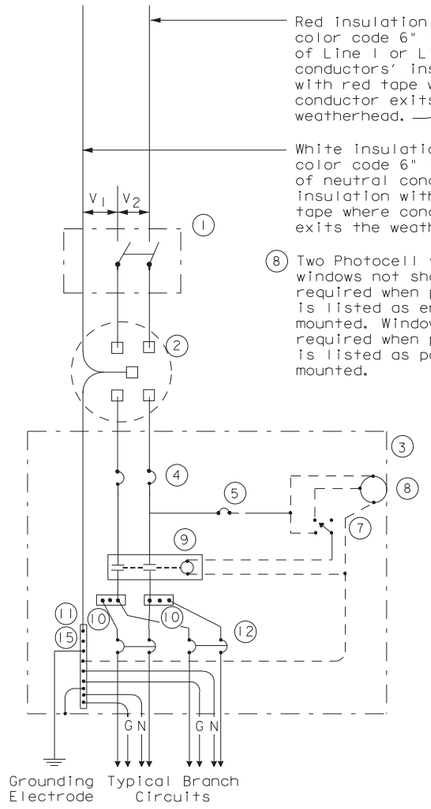
ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

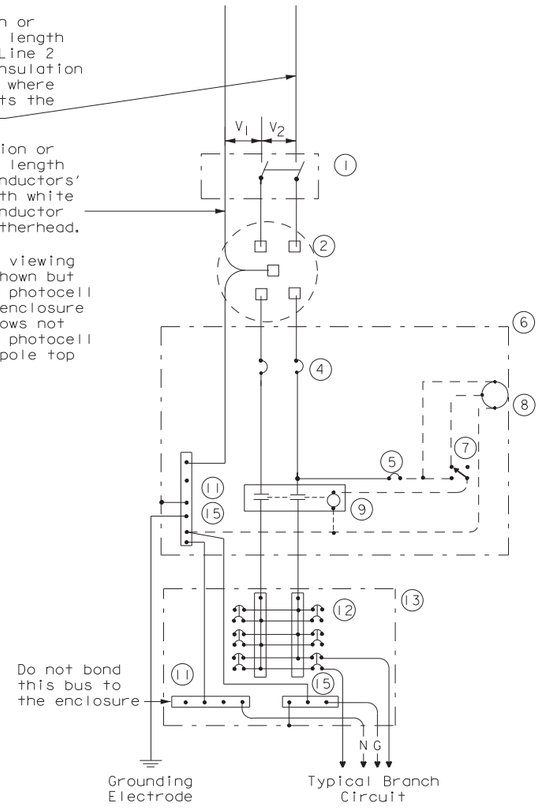
FILE: ed5-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		155

7IE

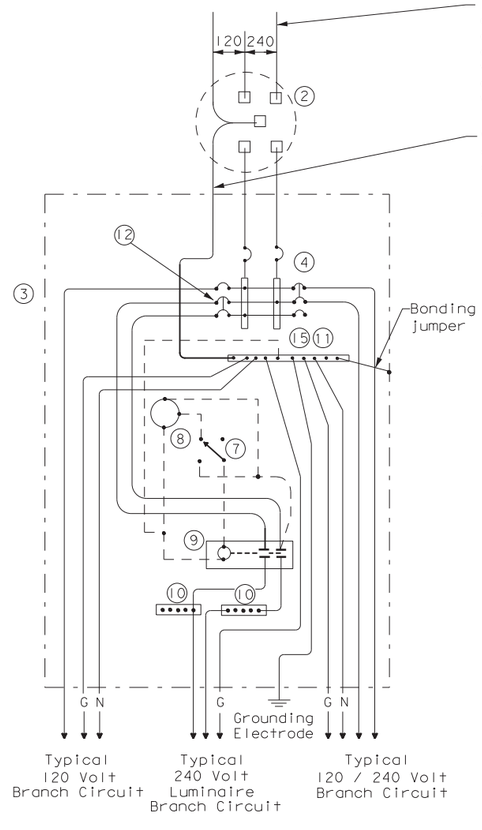
DATE: 11/2/2021 3:41:10 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFICVed6-14.dgn



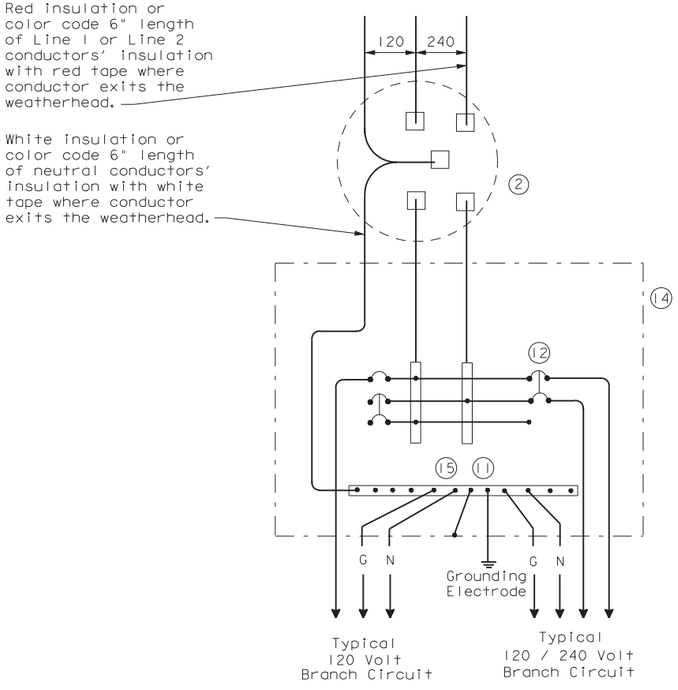
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
– – – –	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

FILE: ed6-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		156

7IF

DATE: 11/2/2021 3:41:10 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\ed7-14.dgn

SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 1/2 in. or 1 5/8 in. wide by 1 in. up to 3 3/4 in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized 3/4 in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized 3/4 in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 1/4 in. to 3 1/2 in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

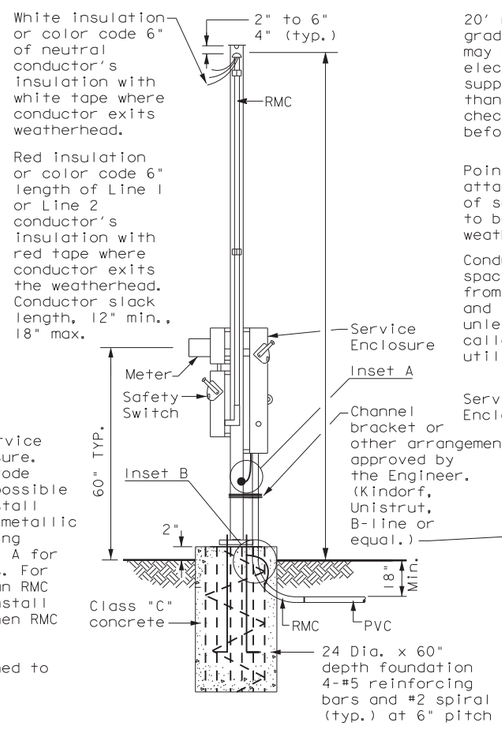
7. Drill and tap steel poles and frames for 1/2 in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

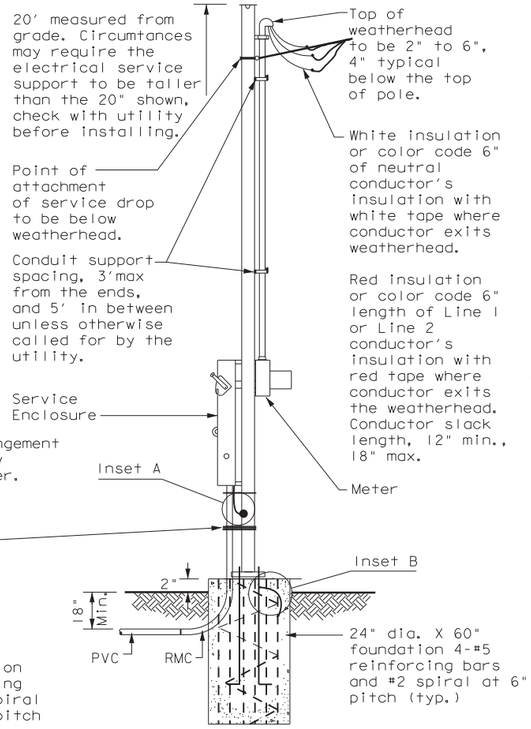
9. Provide 1/4" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

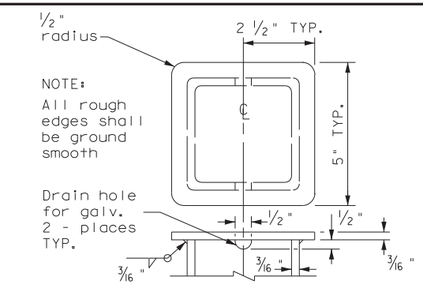


WITH SAFETY SWITCH

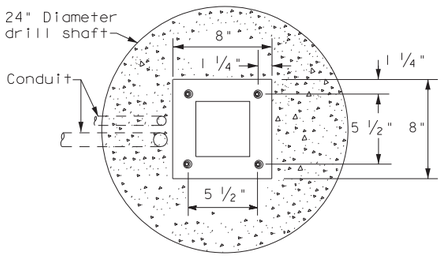


WITHOUT SAFETY SWITCH

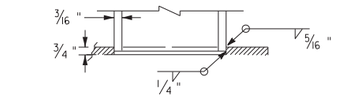
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

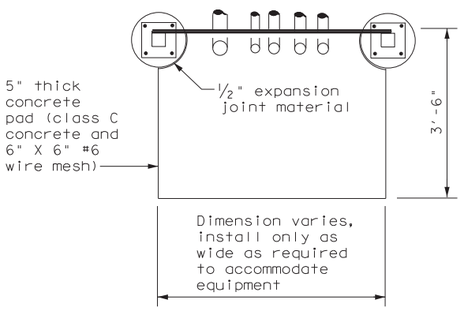


BASE PLATE DETAIL



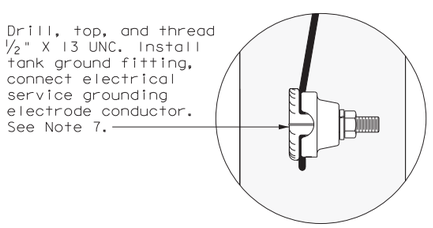
BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



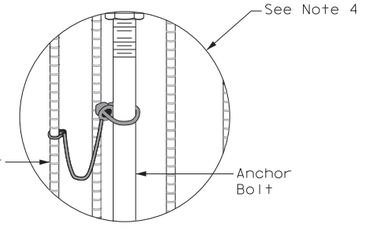
TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

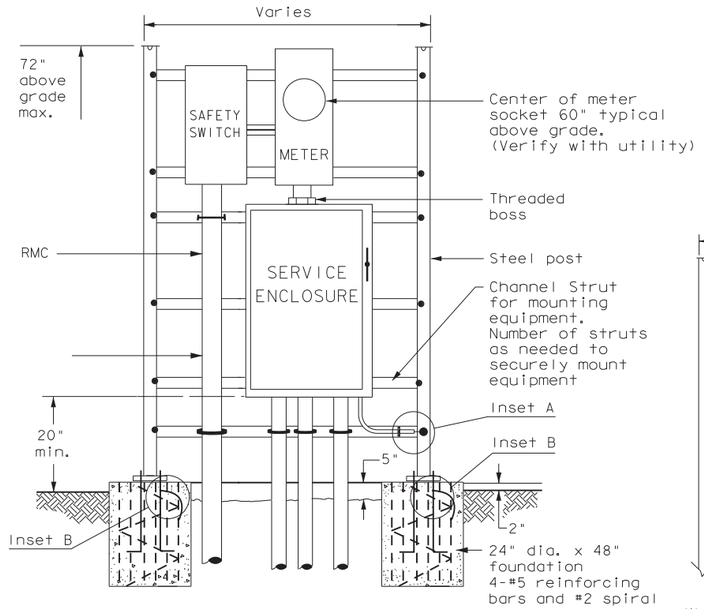


FRONT VIEW

INSET A

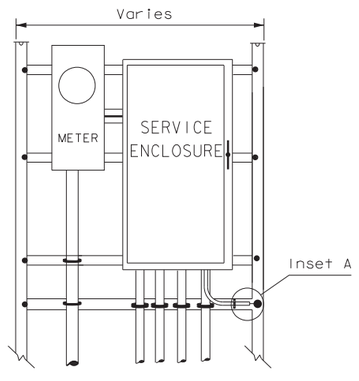


INSET B



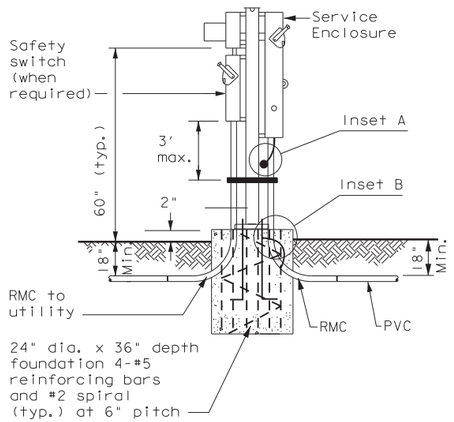
WITH SAFETY SWITCH

FRONT VIEW

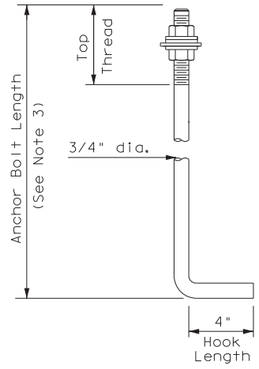


WITHOUT SAFETY SWITCH

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE



WITH SAFETY SWITCH



HOOKED ANCHOR DETAIL

SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE

Texas Department of Transportation | Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

FILE: ed7-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		157

71G

DATE: 11/2/2021 3:41:10 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\...

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.

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.

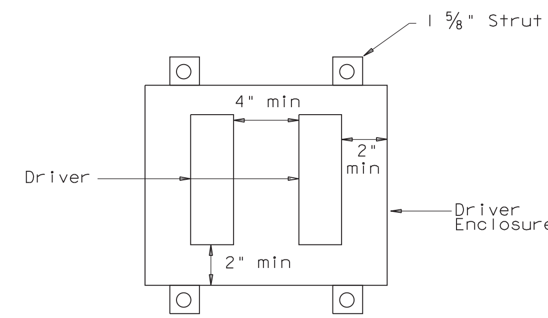
   c. Install drivers with at least 2 inches of space from enclosure walls.

   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

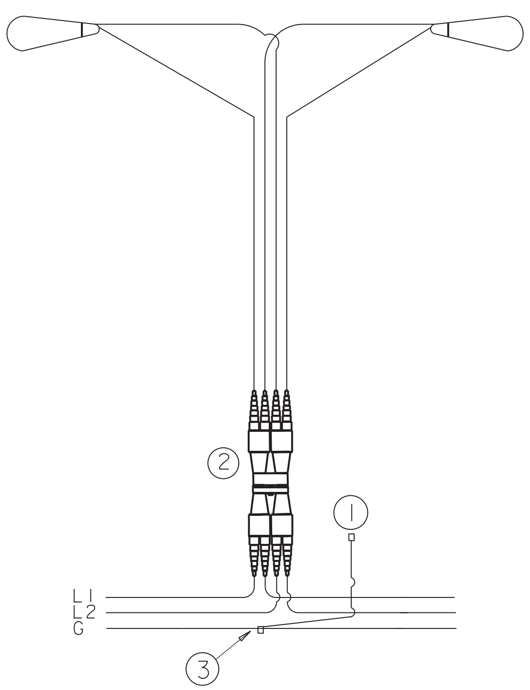
   e. For drivers mounted on back wall of enclosure, mount enclosure on 1 5/8" strut or other standoff to dissipate heat, or mount driver to side of the enclosure or to the metal cover.

   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



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.

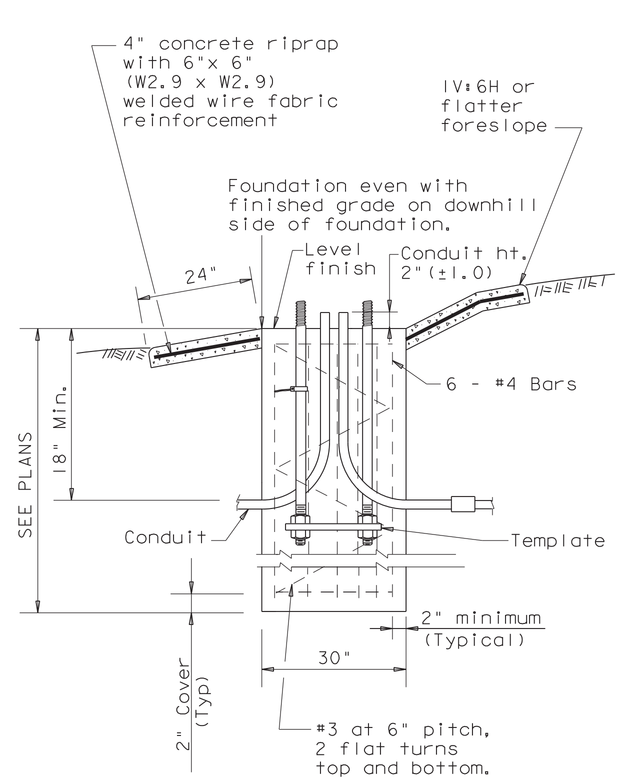
Texas Department of Transportation — Traffic Safety Division Standard

ROADWAY ILLUMINATION DETAILS

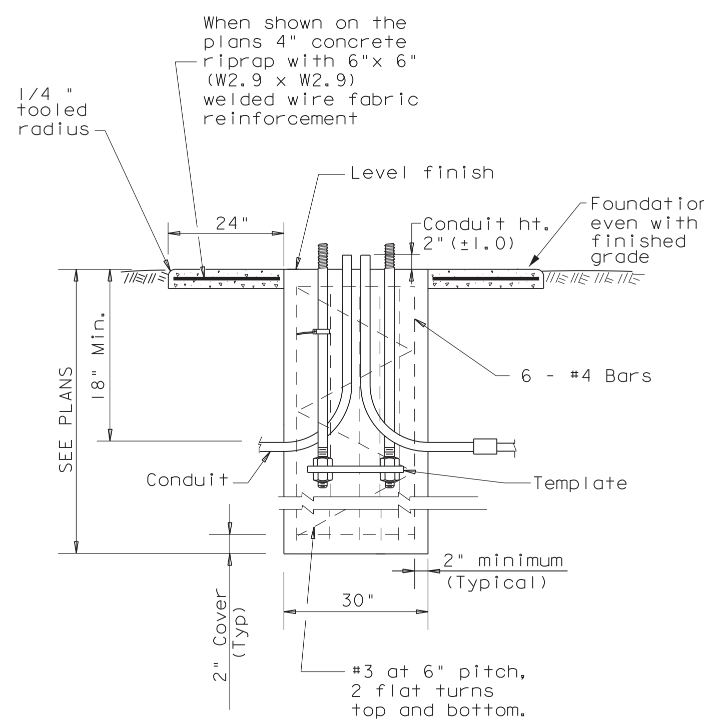
RID(1)-20

FILE: ridl-20.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
7-17 12-20	DIST		COUNTY	SHEET NO.
	LFK		SHELBY	158

72A



SECTION A-A
SHOWING SLOPED GRADE



SECTION A-A
SHOWING CONSTANT GRADE

TABLE 1

ANCHOR BOLTS			
POLE MOUNTING HEIGHT	BOLT CIRCLE Shoe Base	BOLT CIRCLE T-Base	ANCHOR BOLT SIZE
<40 ft.	13 in.	14 in.	1in.x 30in.
40-50 ft.	15 in.	17 1/4 in.	1 1/4 in. 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.

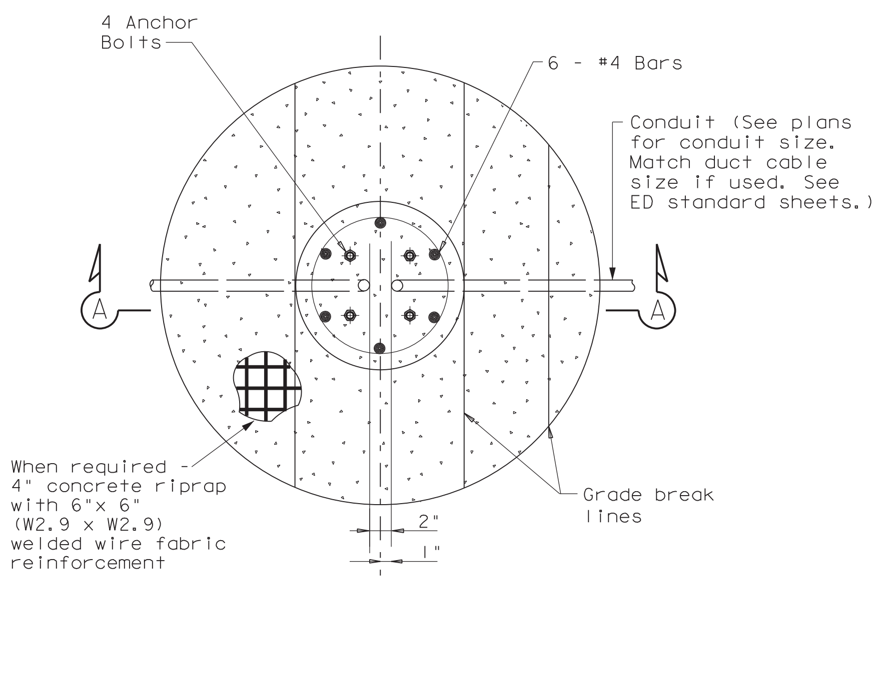
TABLE 4

BREAKAWAY POLE PLACEMENT (See note 6)

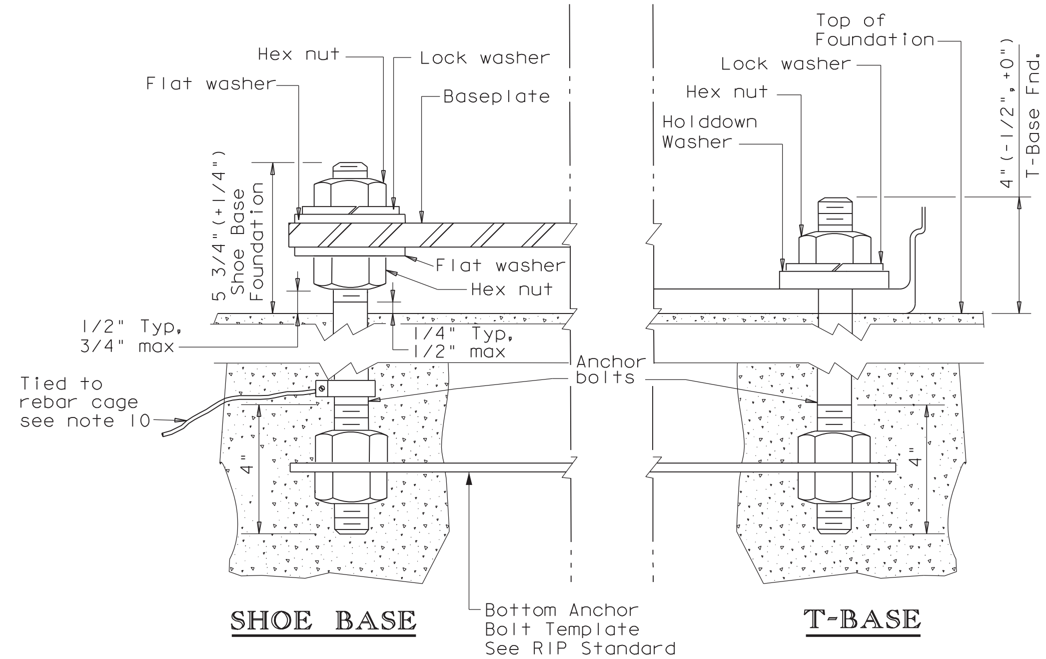
ROADWAY FUNCTIONAL CLASSIFICATION	** POLE OFFSET (DISTANCE TO FACE OF TRANSFORMER BASE)
Freeway Mainlanes (roadway with full control of access)	15 ft. (minimum and typical) from lane edge
All curbed, 45 mph or less design speed	2.5 ft. minimum (15 ft. desirable) from curb face
All others	10 ft. minimum*(15 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



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:
©TxDOT January 2007	CONT 0809	SECT 02	JOB 069	HIGHWAY US 96
REVISIONS 1-11 7-17 12-20	DIST LFK		COUNTY SHELBY	SHEET NO. 159

728

DATE: 11/2/2021 3:41:11 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\01_Microstation\06_Sheets\12_STANDARDS\04_TRAFFIC\rid2-20.dgn

DATE: 11/2/2021 3:41:11 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFICVrip(1-4)-19.dgn

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	
	(Type SA 40 S - 10)			(250W EQ) LED		(Type SA 40 T - 10)			(250W EQ) LED		(Type SP 38 S - 10)			(250W EQ) LED	
	(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

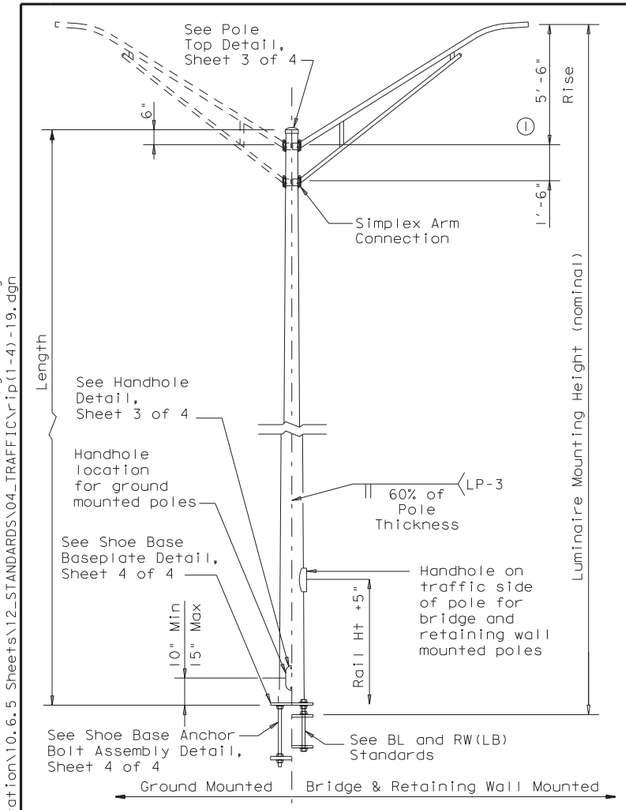
ROADWAY ILLUMINATION POLES

RIP(1)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
7-17	DIST	COUNTY		SHEET NO.
12-19	LFK	SHELBY		160

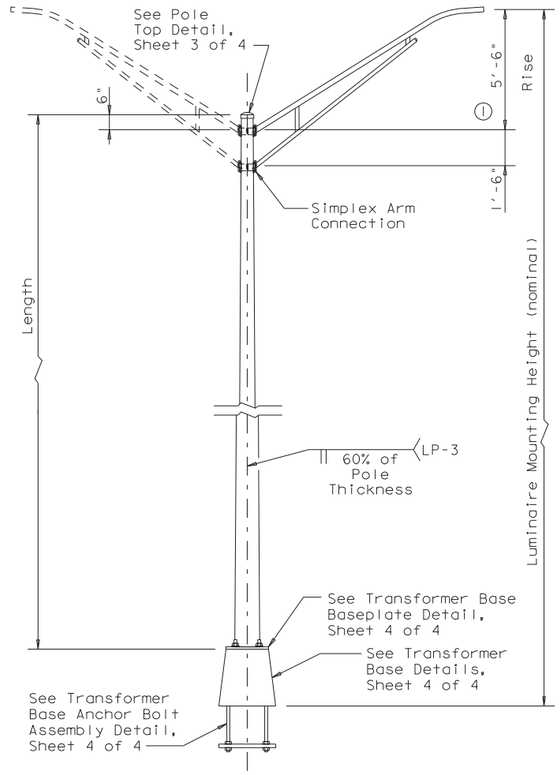
73A

DATE: 11/2/2021 3:41:12 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFICYrip(1-47-19.dgn



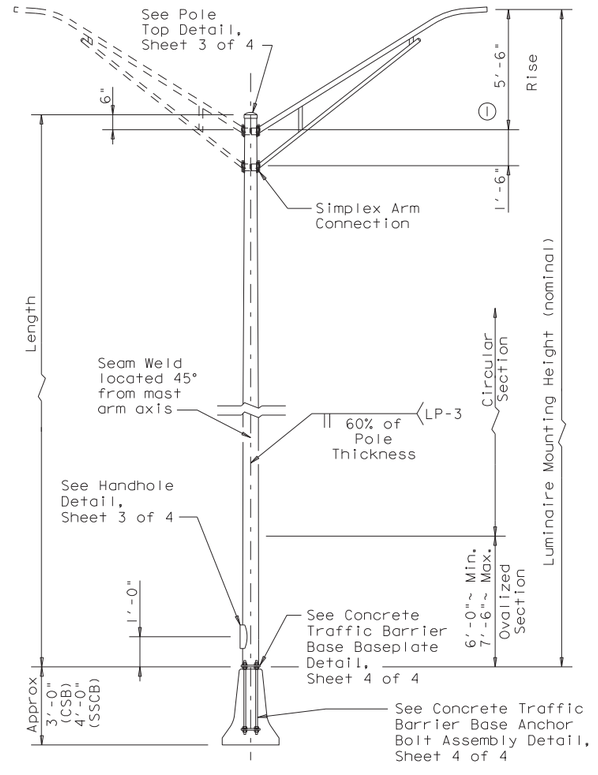
SHOE BASE POLE

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).

Texas Department of Transportation

Traffic Safety Division Standard

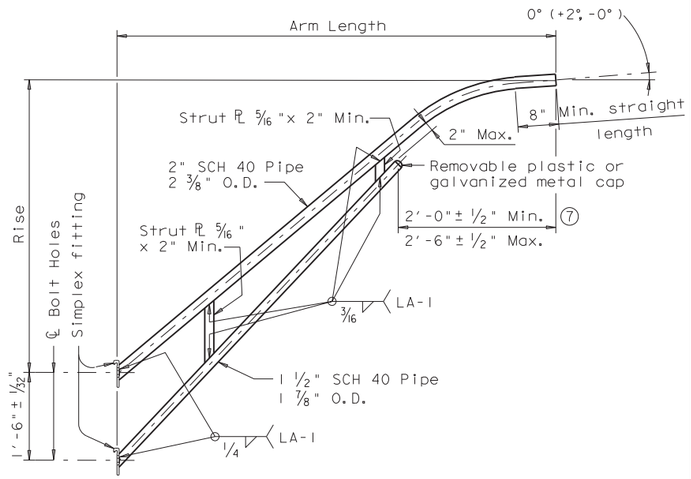
ROADWAY ILLUMINATION POLES

RIP(2)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
7-17	DIST	COUNTY		SHEET NO.
12-19	LFK	SHELBY		161

73B

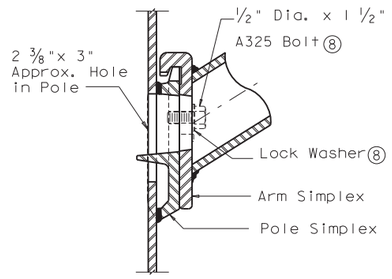
DATE: 11/2/2021 3:41:12 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\rip(1-4)-19.dgn



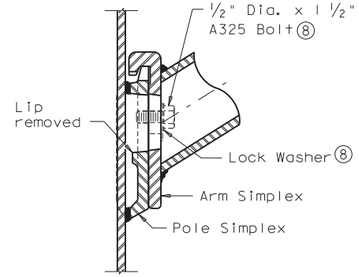
LUMINAIRE ARM

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"

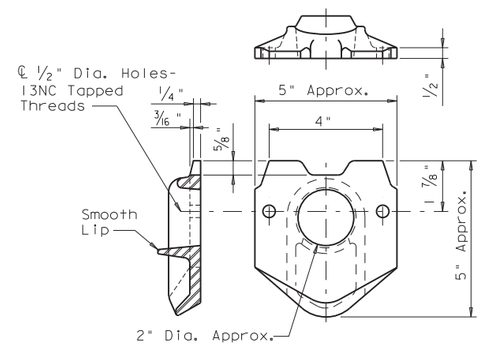


UPPER SIMPLEX FITTING
(Gusset not shown for clarity)

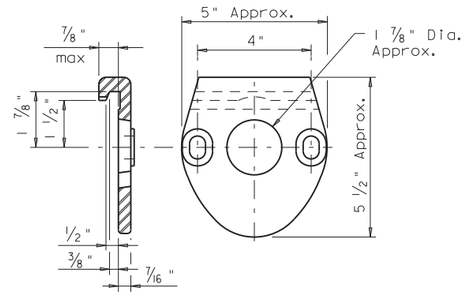


LOWER SIMPLEX FITTING
(Gusset not shown for clarity)

SECTION B-B



POLE SIMPLEX DETAIL ⑨



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.

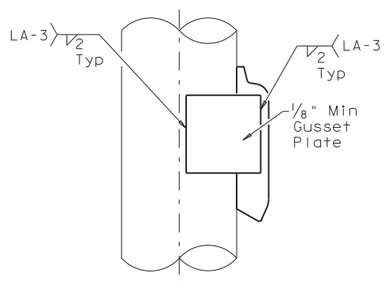
⑦ Dimensional limits are given to show acceptable variation in design. All of a Fabricator's production of a particular arm length shall have the same dimensions within specified tolerances.

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.

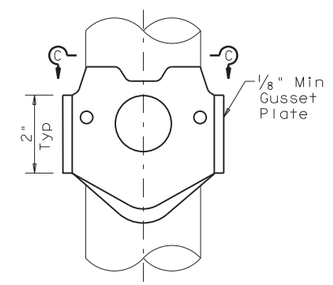
⑨ Proposed deviations in arm simplex dimensions or materials must be submitted to the Department for approval.

⑩ A welded handhole frame is permissible. Maximum of two (2) CJP weld splices is allowed.

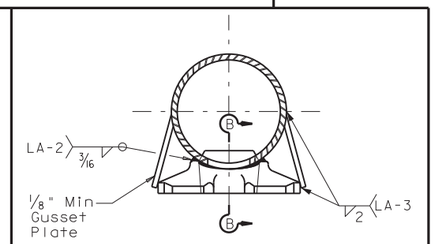
MATERIALS	
Pole or Arm Simplex	ASTM A27 Gr 65-35 or Gr 70-36, A148 Gr 80-50, A576 Gr 1021 ⑤, or A36 (Arm only)
Arm Pipes	ASTM A53 Gr A or B, A500 Gr B, A501, A 1008 HSLAS-F Gr 50 ⑥, or A1011 HSLAS-F Gr 50 ⑥
Arm Struts and Gusset Plates ④	ASTM A36, A572 Gr 50 ⑥, or A588
Misc.	ASTM designations as noted



SIDE

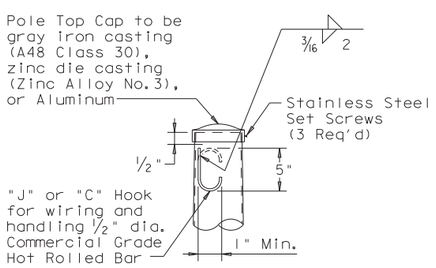


ELEVATION

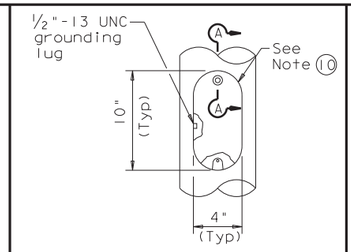


SECTION C-C

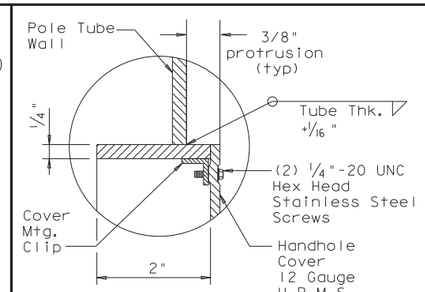
SIMPLEX ATTACHMENT DETAIL



POLE TOP



ELEVATION



SECTION A-A

HANDHOLE

Texas Department of Transportation

Traffic Safety Division Standard

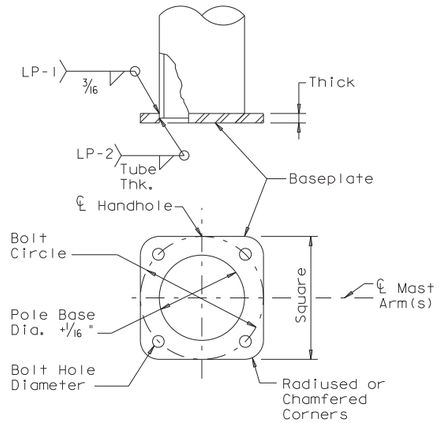
ROADWAY ILLUMINATION POLES

RIP(3)-19

FILE: rip-19.dgn	DN:	CK:	DW:	CK:
©TxDOT January 2007	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
7-17	DIST	COUNTY		SHEET NO.
12-19	LFK	SHELBY		162

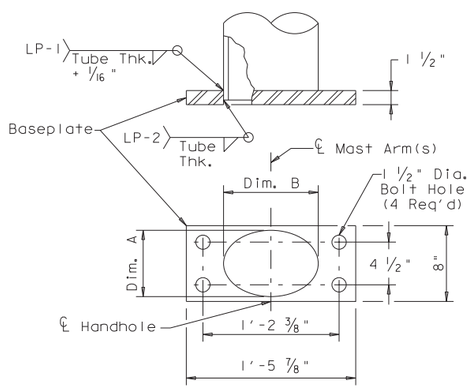
73C

DATE: 11/2/2021 3:41:12 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\04_TRAFFIC\rip(1-4)-19.dgn



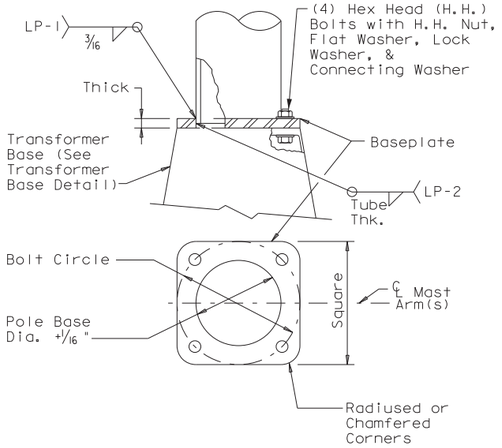
SHOE BASE BASEPLATE

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"



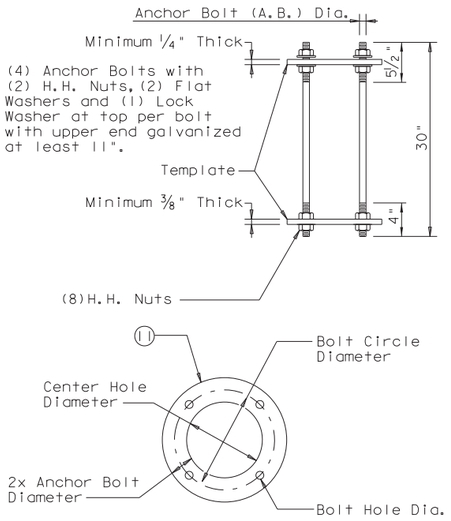
CONCRETE TRAFFIC BARRIER BASE BASEPLATE

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"



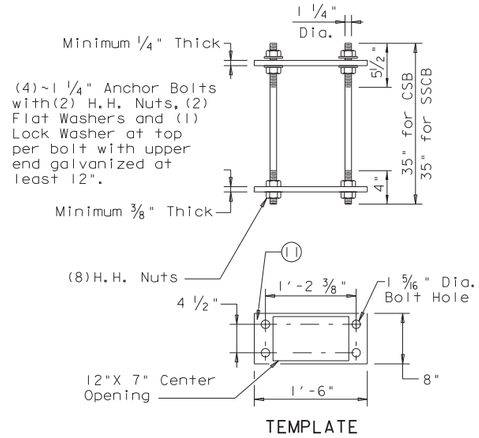
TRANSFORMER BASE BASEPLATE

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

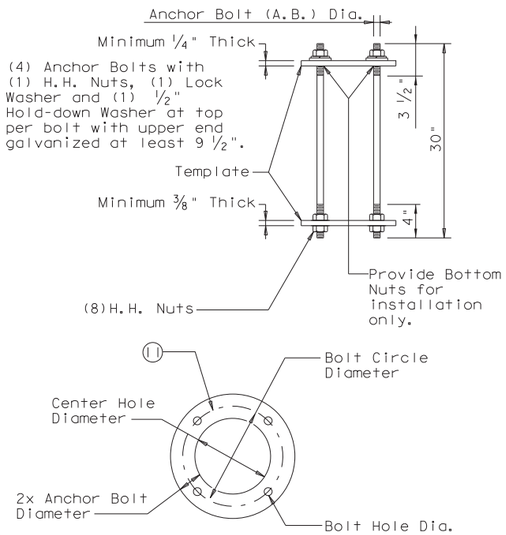
SHOE BASE ANCHOR BOLT ASSEMBLY TABLE				
MOUNTING HEIGHTS (nominal)	A.B. Dia.	BOLT CIRCLE DIAMETER	CTR. HOLE DIAMETER	BOLT HOLE DIAMETER
20'-39'	1"	13"	11"	1 1/16"
40'-50'	1 1/4"	15"	12 1/2"	1 5/16"



TEMPLATE

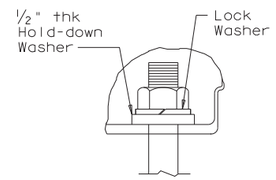
CONCRETE TRAFFIC BARRIER BASE ANCHOR BOLT ASSEMBLY

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"

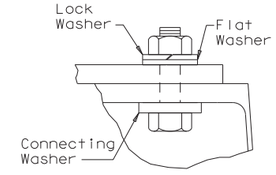


TRANSFORMER BASE ANCHOR BOLT ASSEMBLY

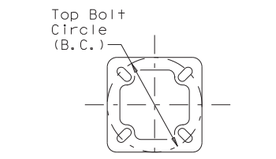
TRANSFORMER BASE TABLE		
TYPE	TOP B.C.	BTM. B.C.
A	13"	14"
B	15"	17 1/4"



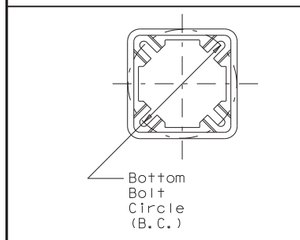
DETAIL A



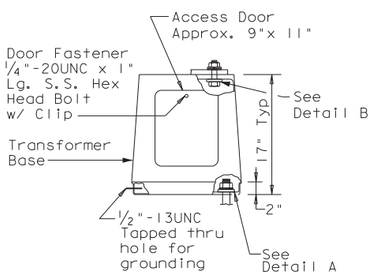
DETAIL B



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	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		163

730

NOTES:
(1) THE PURPOSE OF THIS SHEET IS TO POINT THE USER TO THE APPROPRIATE LOCATIONS TO FIND THE REQUIRED CONTENT OF THE SWP3.
(2) THE PROJECT LIMITS SHOWN ON THE TITLE SHEET AND LIMITS OF TXDOT RIGHT OF WAY SHALL ALSO BE THE LIMITS OF COVERAGE OF THE SWP3.

PROJECT DESCRIPTION

A. NATURE OF ACTIVITY: THE CONSTRUCTION OF ADDITIONAL PASSING LANES.

B. POTENTIAL POLLUTANTS AND THEIR SOURCES: POLLUTANT:SEDIMENT, SOURCE: DISTURBED SOIL; POLLUTANT: OIL AND GREASE, SOURCE: VEHICLES POLLUTANT: DREDGED SPOIL, SOURCE: CULVERTS POLLUTANT: GARBAGE/TRASH, SOURCE: WORKERS

C. INTENDED SEQUENCE OF ACTIVITIES: SEE CONSTRUCTION SCHEDULE FOR ESTIMATED START DATES AND DURATION OF SOIL-DISTURBING ACTIVITIES

D. TOTAL AREA OF SITE: 87.20 ACRE AREA TO BE DISTURBED: 19.80 ACRE

E. DATA DESCRIBING THE SOIL OR QUALITY OF ANY DISCHARGE FROM THE SITE:

93% OF PROJECT AREA IS LOAMY FINE SAND WITH RANGES FROM 0-15% SLOPES, RANGES OF EXCESSIVELY DRAINED TO WELL DRAINED AND RANGES OF LOW TO VERY LOW RUN-OFF; 7% OF PROJECT AREA IS FINE SANDY LOAM WITH 5-15% SLOPES, WELL DRAINED AND HIGH RUN-OFF.

F. GENERAL LOCATION MAP: SEE TITLE SHEET OF THE PROJECT PLANS

G. DETAILED SITE MAP/MAPS INDICATING THE FOLLOWING:
- i. DRAINAGE PATTERNS: SEE SWP3 LAYOUTS
- ii. ANTICIPATED SLOPES AFTER MAJOR GRADING ACTIVITIES: SEE TYPICAL SECTIONS
- iii. AREAS WHERE SOIL DISTURBANCE WILL OCCUR: SEE SWP3 LAYOUTS
- iv. LOCATIONS OF ALL CONTROLS OR BUFFERS (PLANNED/IN PLACE): SEE SWP3 LAYOUTS
- v. LOCATIONS WHERE TEMPORARY OR PERMANENT STABILIZATION PRACTICES ARE EXPECTED TO BE USED: SEE SWP3 LAYOUTS
- vi. LOCATION OF CONSTRUCTION SUPPORT ACTIVITIES: SEE SWP3 LAYOUTS
- vii. SURFACE WATERS, INCLUDING WETLANDS, AT, ADJACENT, OR IN CLOSE PROXIMITY TO THE SITE (* INDICATES IMPAIRED WATERS): SEE SWP3 LAYOUTS
- viii. LOCATIONS WHERE STORMWATER DISCHARGES DIRECTLY TO A SURFACE WATER BODY OR MS4: SEE SWP3 LAYOUTS
- ix. VEHICLE WASH AREAS: N/A
- x. DESIGNATED POINTS ON THE SITE WHERE VEHICLES WILL EXIT FROM UNSTABLE DIRT TO PAVED ROAD: SEE SWP3 LAYOUTS

H. LOCATION AND DESCRIPTION OF CONSTRUCTION SUPPORT ACTIVITIES AUTHORIZED UNDER THE PERMITTEE'S NOI: CONSTRUCTION SUPPORT ACTIVITIES ARE NOT COVERED UNDER THIS SWP3 AS IT IS NOT AUTHORIZED UNDER THIS PERMITTEE'S CGP. THE PERMITTEE WILL MAKE REFERENCE TO CONSTRUCTION SUPPORT ACTIVITIES THAT ARE COVERED UNDER THE CONTRACTOR'S SWP3 AND CGP ON SWP3 LAYOUTS

I. NAME OF RECEIVING WATER(S) AT OR NEAR SITE:

BIG IRON ORE CREEK, BAILEY BRANCH, STRAW CREEK, RASCAL CREEK, RIVERS CREEK, SANDY CREEK, WOODFIN BRANCH, BRADY CREEK, & UNNAMED TRIBS

AN ASTERISK (*) INDICATES AN IMPAIRED WATER

NEAREST CLASSIFIED SEGMENT NUMBER: 0612

CLASSIFIED SEGMENT NAME: ATTOYAC BAYOU

J. COPY OF TPDES GENERAL PERMIT: SEE SWP3 FILE

K. NOI AND ACKNOWLEDGEMENT CERTIFICATE OR SITE NOTICE: SEE SWP3 FILE

L. STORMWATER AND ALLOWABLE NON-STORMWATER DISCHARGE LOCATIONS: SEE SWP3 LAYOUTS

M. LOCATIONS OF POLLUTANT GENERATING ACTIVITIES: ACTIVITIES AUTHORIZED UNDER THIS PERMITTEE'S CGP CAN BE FOUND ON SWP3 LAYOUTS. THIS SHEET WILL ALSO REFERENCE THE LOCATION OF POLLUTANT GENERATING ACTIVITIES THAT ARE COVERED BY THE CONTRACTOR'S CGP AND SWP3.

DESCRIPTION OF BMPS

A. GENERAL REQUIREMENTS: EROSION AND SEDIMENT CONTROLS SHOWN ON SWP3 LAYOUTS WERE DESIGNED TO RETAIN SEDIMENT ON-SITE TO THE EXTENT PRACTICABLE WITH CONSIDERATION OF LOCAL TOPOGRAPHY, SOIL TYPE, AND RAINFALL. THE EROSION AND SEDIMENT CONTROLS WILL BE INSTALLED AND MAINTAINED ACCORDING TO MANUFACTURER AND TXDOT STORM WATER MANAGEMENT GUIDELINES. CONTROLS TO MINIMIZE THE OFF-SITE TRANSPORT OF LITTER, CONSTRUCTION DEBRIS, AND CONSTRUCTION MATERIALS INCLUDE: CONSTRUCTION MATERIALS TO BE STORED IN LOCATIONS THAT MINIMIZE THEIR EXPOSURE TO PRECIPITATION & STORM WATER RUNOFF; COLLECTION OF CONSTRUCTION DEBRIS IN RECEPTACLES WITH A SECURE COVER MEETING STATE AND LOCAL SOLID WASTE MANAGEMENT REGULATIONS; HAULING AND EMPTYING RECEPTACLES AT APPROVED LANDFILL SITES; PROHIBITING THE BURIAL OF CONSTRUCTION DEBRIS; COLLECTION OF SANITARY WASTE FROM PORTABLE UNITS AS NECESSARY OR AS REQUIRED BY LOCAL REGULATIONS BY A LICENSED SANITARY WASTE MANAGEMENT CONTRACTOR.

B. EROSION CONTROL AND STABILIZATION PRACTICES

T,P	TEMP/PERM SEEDING	___	PROTECTION OF TREES AND VEGETATION
___	MULCHING (HAY OR STRAW)	___	GEOTEXTILES
___	VEGETATIVE BUFFER STRIPS	T	SLOPE TEXTURING
___	SOD STABILIZATION	___	TEMP VELOCITY DISSIPATION DEVICES
P	BLOCK SOD	___	FLOW DIVERSION MECHANISMS
T,P	SOIL RET BLANKET		

T = TEMPORARY; P = PERMANENT

DATES:
1. MAJOR GRADING ACTIVITIES: SEE CONSTRUCTION SCHEDULE
2. WHEN CONSTRUCTION ACTIVITIES TEMPORARILY OR PERMANENTLY CEASE ON A PORTION OF THE SITE: SEE CONSTRUCTION SCHEDULE
3. WHEN STABILIZATION MEASURES ARE INITIATED: SEE CONSTRUCTION SCHEDULE

INITIATE EROSION CONTROL AND STABILIZATION MEASURES IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE TEMPORARILY CEASED AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. INITIATE STABILIZATION MEASURES THAT PROVIDE A PROTECTIVE COVER IMMEDIATELY IN THAT PORTION OF THE SITE WHERE CONSTRUCTION ACTIVITIES HAVE PERMANENTLY CEASED. "IMMEDIATELY" MEANS NO LATER THAN THE NEXT WORK DAY FOLLOWING THE DAY WHEN THE SOIL-DISTURBING ACTIVITIES HAVE TEMPORARILY OR PERMANENTLY CEASED. STABILIZATION MEASURES MUST BE COMPLETED NO MORE THAN 14 CALENDAR DAYS AFTER INITIATION BEGINS.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

C. SEDIMENT CONTROL PRACTICES

T	SILT FENCE	___	VEGETATIVE BUFFER STRIPS
T	OTHER (SOIL RETENTION BLANKETS, ROCK FILTER DAMS)		

IF SITE WILL DISTURB 10 OR MORE ACRES WITHIN A COMMON DRAINAGE LOCATION AND A SEDIMENTATION BASIN IS NOT FEASIBLE, PROVIDE REASON: DUE TO ROLLING TERRAIN AND LIMITED RIGHT OF WAY, A SEDIMENTATION BASIN IS NOT FEASIBLE.

THE SCHEDULE OF IMPLEMENTATION OF THESE PRACTICES WILL BE BASED ON THE INTENDED SEQUENCE OF MAJOR SOIL-DISTURBING ACTIVITIES. SEE CONSTRUCTION SCHEDULE

DESCRIPTION OF PERMANENT STORM WATER CONTROLS

PROVIDE A DESCRIPTION OF ANY MEASURES THAT WILL BE INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL POLLUTANTS IN STORM WATER DISCHARGES THAT MAY OCCUR AFTER CONSTRUCTION OPERATIONS HAVE BEEN COMPLETED: N/A

OTHER REQUIRED CONTROLS AND BMPS

TXDOT WILL UTILIZE ROCK AT CONSTRUCTION ENTRANCES AND SPRINKLING, AS NEEDED, TO MINIMIZE OFF-SITE VEHICLE TRACKING OF SEDIMENTS AND THE GENERATION OF DUST.

SEE SECTION A ABOVE FOR DESCRIPTION OF CONSTRUCTION AND WASTE MATERIALS AND CONTROLS USED FOR THOSE THAT MAY BE STORED ON-SITE.

AT A MINIMUM, ANY PRODUCTS IN THE FOLLOWING CATEGORIES ARE CONSIDERED TO BE HAZARDOUS: PAINTS, ACIDS FOR CLEANING MASONRY SURFACES, CLEANING SOLVENTS, FUELS, MOTOR OIL, ASPHALT PRODUCTS, CHEMICAL ADDITIVES FOR SOIL STABILIZATION, OR CONCRETE CURING COMPOUNDS AND ADDITIVES. STORE MATERIAL IN ACCORDANCE WITH APPLICABLE REGULATIONS. CONTACT THE SPILL COORDINATOR IMMEDIATELY IN THE EVENT OF A SPILL WHICH MAY BE HAZARDOUS.

MAINTENANCE REQUIREMENTS

EFFECTIVELY MAINTAIN THE OPERATING CONDITIONS OF ALL EROSION AND SEDIMENT CONTROL AND OTHER PROTECTIVE MEASURES IDENTIFIED IN THE SWP3. IF SITE INSPECTIONS REQUIRED BY THIS PERMIT IDENTIFY BMP'S THAT ARE NOT OPERATING EFFECTIVELY, MAINTENANCE SHALL BE PERFORMED BEFORE THE NEXT ANTICIPATED STORM EVENT, OR AS NECESSARY TO MAINTAIN THE CONTINUED EFFECTIVENESS OF STORM WATER CONTROLS. IF MAINTENANCE PRIOR TO THE NEXT ANTICIPATED STORM EVENT IS UNPRACTICABLE, SCHEDULE AND ACCOMPLISH MAINTENANCE AS SOON AS PRACTICAL. CONTROLS THAT HAVE BEEN INTENTIONALLY DISABLED, RUN-OVER, REMOVED OR OTHERWISE RENDERED INEFFECTIVE MUST BE REPLACED OR CORRECTED IMMEDIATELY UPON DISCOVERY. IF A CONTROL HAS BEEN USED INCORRECTLY, IS PERFORMING INADEQUATELY OR IS DAMAGED, THE OPERATOR SHALL REPLACE OR MODIFY THE CONTROL AS SOON AS PRACTICABLE AFTER THE DISCOVERY.

INSPECTION OF CONTROLS

A) QUALIFIED PERSONNEL SHALL INSPECT DISTURBED AREAS OF THE CONSTRUCTION SITE THAT HAVE NOT BEEN FINALLY STABILIZED, AREAS USED FOR STORAGE OF MATERIALS THAT ARE EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE, ONCE EVERY 7 CALENDAR DAYS. DISTURBED AREAS THAT ARE EXPOSED TO PRECIPITATION SHALL BE INSPECTED FOR EVIDENCE OF, OR THE POTENTIAL FOR, POLLUTANTS ENTERING THE DRAINAGE SYSTEM. SEDIMENT AND EROSION CONTROL MEASURES IDENTIFIED ON THE SWP3 SHALL BE OBSERVED TO ENSURE THAT THEY ARE OPERATING CORRECTLY. LOCATIONS WHERE VEHICLES ENTER OR EXIT THE SITE SHALL BE INSPECTED FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING.

D) THE SWP3 MUST BE MODIFIED BASED ON THE RESULTS OF INSPECTION TO BETTER CONTROL POLLUTANTS IN RUNOFF. REVISIONS TO THE SWP3 MUST BE COMPLETED WITHIN 7 CALENDAR DAYS FOLLOWING THE INSPECTION. IF EXISTING BMPS ARE MODIFIED OR ADDITIONAL BMPS ARE NECESSARY, AN IMPLEMENTATION SCHEDULE MUST BE DESCRIBED IN THE SWP3. IMPLEMENTATION OF CHANGES SHOULD BE DONE PRIOR TO THE NEXT STORM EVENT IF POSSIBLE, OTHERWISE, THEY SHOULD BE DONE AS SOON AS PRACTICABLE.

E) A REPORT SUMMARIZING THE SCOPE, DATE, NAME AND QUALIFICATIONS OF INSPECTOR, AND MAJOR OBSERVATIONS RELATING TO THE IMPLEMENTATION OF THE SWP3 SHALL BE PRODUCED AND RETAINED AS PART OF THE SWP3. MAJOR OBSERVATIONS INCLUDE: LOCATIONS OF DISCHARGES OF SEDIMENT OR OTHER POLLUTANTS FROM THE SITE, LOCATIONS OF BMPS THAT NEED TO BE MAINTAINED, LOCATIONS OF BMPS THAT FAILED TO OPERATE AS DESIGNED OR PROVED INADEQUATE FOR A PARTICULAR LOCATION AND LOCATIONS WHERE BMPS ARE NEEDED. ACTIONS TAKEN AS A RESULT OF INSPECTIONS MUST BE DESCRIBED WITHIN AND RETAINED AS PART OF THE SWP3. REPORTS MUST IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE. WHERE THE REPORT DOES NOT IDENTIFY ANY INCIDENTS OF NON-COMPLIANCE, THE REPORT MUST CONTAIN A CERTIFICATION THAT THE SITE IS IN COMPLIANCE WITH THE SWP3 AND PERMIT.

OTHER SWP3 CONTENT

TXDOT WILL ENSURE THE APPROPRIATE POLLUTION PREVENTION MEASURES (I.E. VEGETATED BUFFER STRIPS, SILT FENCE, ETC.) ARE IDENTIFIED AND IMPLEMENTED FOR ALL ELIGIBLE NON-STORMWATER WATER COMPONENTS OF DISCHARGE SUCH AS WASHING OF VEHICLES, STRUCTURES, AND PAVEMENT WHERE SOAPS AND DETERGENTS ARE NOT USED AND THE PURPOSE IS TO REMOVE DIRT, MUD OR DUST; UNCONTAMINATED WATER USED FOR DUST CONTROL; AND LAWN WATERING AND SIMILAR IRRIGATION DRAINAGE.

CHECKLIST FOR CONTENTS OF AREA OFFICE SWP3 FILE:

- ☐ CONTACT FORM *
- ☐ NOI AND ACKNOWLEDGEMENT CERTIFICATE (IF EQUAL OR GREATER THAN 5 ACRES)
- ☐ APPLICABLE CONSTRUCTION SITE NOTICE *
- ☐ SWP3 CERTIFICATION STATEMENT (SIGNED BY AE)
- ☐ TPDES GENERAL PERMIT
- ☐ SWP3 PLAN
- ☐ INSPECTION AND MAINTENANCE REPORT
- ☐ INSPECTOR QUALIFICATION FORM
- ☐ DELEGATION OF SIGNATURE AUTHORITY (ALL INSPECTORS SIGNING REPORTS)
- ☐ NOTICE OF TERMINATION

* SYMBOL INDICATES THAT THE INFORMATION SHOULD BE DISPLAYED ON THE PROJECT BULLETIN BOARD

ANY REPORTABLE QUANTITY OF HAZARDOUS MATERIAL RELEASE MUST BE REPORTED TO NATIONAL RESPONSE CENTER AT 1-800-424-8802 AND TO STATE OF TEXAS SPILL-REPORTING HOTLINE AT 1-800-832-8224

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

TXDOT SWP3 INDEX

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		164

(REVISED OCTOBER 30, 2013)

DATE: 9/27/2022 3:11:34 PM
FILE: c:\txdot\pw_online\txdot3\andrew.corbett\dms83920\080902069epic_sht1.dgn

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1.

2.

☐ No Action Required ☒ Required Action

Action No.

1. Prevent stormwater pollution by controlling erosion and sedimentation in accordance with TPDES Permit TXR 150000
2. Comply with the SWP3 and revise when necessary to control pollution or required by the Engineer.
3. Project requires that a NOI and Large Site Notice be posted on or near the site, accessible to the public and TCEQ, EPA or other inspectors.
4. NOT must be filed with TCEQ for the project when final stabilization has been achieved.

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

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

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

☐ No Permit Required

☒ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1. Unnamed Tributaries

2.

3.

4.

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

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

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.

In order to maintain compliance with Chapter 64 of the Texas Parks and Wildlife Code and Migratory Bird Treaty Act (MBTA), ROW clearing activities shall be conducted outside of the nesting season (March 15 to September 15). In the event birds or active nests (eggs and/or nestlings present) are encountered, contact the engineer prior to conducting work.

☐ No Action Required ☒ Required Action

Action No.

1.

2.

LIST OF ABBREVIATIONS

BMP:	Best Management Practice	SPCC:	Spill Prevention Control and Countermeasure
CGP:	Construction General Permit	SWP3:	Storm Water Pollution Prevention Plan
DSHS:	Texas Department of State Health Services	PCN:	Pre-Construction Notification
FHWA:	Federal Highway Administration	PSL:	Project Specific Location
MOA:	Memorandum of Agreement	TCEQ:	Texas Commission on Environmental Quality
MOU:	Memorandum of Understanding	TPDES:	Texas Pollutant Discharge Elimination System
MS4:	Municipal Separate Stormwater Sewer System	TPWD:	Texas Parks and Wildlife Department
MBTA:	Migratory Bird Treaty Act	TxDOT:	Texas Department of Transportation
NOT:	Notice of Termination	T&E:	Threatened and Endangered Species
NWP:	Nationwide Permit	USACE:	U.S. Army Corps of Engineers
NOI:	Notice of Intent	USFWS:	U.S. Fish and Wildlife Service

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

General (applies to all projects):

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

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

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

Contact the Engineer if any of the following are detected:

* Dead or distressed vegetation (not identified as normal)
* Trash piles, drums, canister, barrels, etc.
* Undesirable smells or odors
* Evidence of leaching or seepage of substances

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

☐ Yes ☒ No

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

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

VII. OTHER ENVIRONMENTAL ISSUES

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

☒ No Action Required ☐ Required Action

Action No.

1.

Texas Department of Transportation

Design Division Standard

EPIC

(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)

SHEET 1 OF 2

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
©TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0809	02	069	US 96
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	LFK	SHELBY		165

NWP GENERAL CONDITIONS

AS APPLICABLE TO
THIS PROJECT

2. AQUATIC LIFE MOVEMENTS. NO ACTIVITY MAY SUBSTANTIALLY DISRUPT THE NECESSARY LIFE CYCLE MOVEMENTS OF THOSE SPECIES OF AQUATIC LIFE INDIGENOUS TO THE WATERBODY, INCLUDING THOSE SPECIES THAT NORMALLY MIGRATE THROUGH THE AREA, UNLESS THE ACTIVITY'S PRIMARY PURPOSE IS TO IMPOUND WATER.

3. SPAWNING AREAS. ACTIVITIES IN SPAWNING AREAS DURING SPAWNING SEASONS MUST BE AVOIDED TO THE MAXIMUM EXTENT PRACTICABLE. ACTIVITIES THAT RESULT IN THE PHYSICAL DESTRUCTION (E.G., THROUGH EXCAVATION, FILL, OR DOWNSTREAM SMOTHERING BY SUBSTANTIAL TURBIDITY) OF AN IMPORTANT SPAWNING AREA ARE NOT AUTHORIZED.

6. SUITABLE MATERIAL. NO ACTIVITY MAY USE UNSUITABLE MATERIAL (E.G., TRASH, DEBRIS, CAR BODIES, ASPHALT, ETC.). MATERIAL USED FOR CONSTRUCTION OR DISCHARGED MUST BE FREE FROM TOXIC POLLUTANTS IN TOXIC AMOUNTS (SEE SECTION 307 OF THE CLEAN WATER ACT).

8. ADVERSE EFFECTS FROM IMPOUNDMENTS. IF THE ACTIVITY CREATES AN IMPOUNDMENT OF WATER, ADVERSE EFFECTS TO THE AQUATIC SYSTEM DUE TO ACCELERATING THE PASSAGE OF WATER, AND/OR RESTRICTING ITS FLOW MUST BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE.

9. MANAGEMENT OF WATER FLOWS. TO THE MAXIMUM EXTENT PRACTICABLE, THE PRE-CONSTRUCTION COURSE, CONDITION, CAPACITY, AND LOCATION OF OPEN WATERS MUST BE MAINTAINED FOR EACH ACTIVITY, INCLUDING STREAM CHANNELIZATION AND STORM WATER MANAGEMENT ACTIVITIES, EXCEPT AS PROVIDED BELOW. THE ACTIVITY MUST BE CONSTRUCTED TO WITHSTAND EXPECTED HIGH FLOWS. THE ACTIVITY MUST NOT RESTRICT OR IMPEDE THE PASSAGE OF NORMAL OR HIGH FLOWS, UNLESS THE PRIMARY PURPOSE OF THE ACTIVITY IS TO IMPOUND WATER OR MANAGE HIGH FLOWS. THE ACTIVITY MAY ALTER THE PRE-CONSTRUCTION COURSE, CONDITION, CAPACITY, AND LOCATION OF OPEN WATERS IF IT BENEFITS THE AQUATIC ENVIRONMENT (E.G., STREAM RESTORATION OR RELOCATION ACTIVITIES).

11. EQUIPMENT. HEAVY EQUIPMENT WORKING IN WETLANDS OR MUD FLATS MUST BE PLACED ON MATS, OR OTHER MEASURES MUST BE TAKEN TO MINIMIZE SOIL DISTURBANCE.

12. SOIL EROSION AND SEDIMENT CONTROLS. APPROPRIATE SOIL EROSION AND SEDIMENT CONTROLS MUST BE USED AND MAINTAINED IN EFFECTIVE OPERATING CONDITION DURING CONSTRUCTION, AND ALL EXPOSED SOIL AND OTHER FILLS, AS WELL AS ANY WORK BELOW THE ORDINARY HIGH WATER MARK OR HIGH TIDE LINE, MUST BE PERMANENTLY STABILIZED AT THE EARLIEST PRACTICABLE DATE. PERMITTEES ARE ENCOURAGED TO PERFORM WORK WITHIN WATERS OF THE UNITED STATES DURING PERIODS OF LOW-FLOW OR NO-FLOW.

13. REMOVAL OF TEMPORARY FILLS. TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO PRE-CONSTRUCTION ELEVATIONS. THE AFFECTED AREAS MUST BE REVEGETATED, AS APPROPRIATE.

14. PROPER MAINTENANCE. ANY AUTHORIZED STRUCTURE OR FILL SHALL BE PROPERLY MAINTAINED, INCLUDING MAINTENANCE TO ENSURE PUBLIC SAFETY AND COMPLIANCE WITH APPLICABLE NWP GENERAL CONDITIONS, AS WELL AS ANY ACTIVITY-SPECIFIC CONDITIONS ADDED BY THE DISTRICT ENGINEER TO AN NWP AUTHORIZATION.

23. MITIGATION. THE DISTRICT ENGINEER WILL CONSIDER SEVERAL FACTORS WHEN DETERMINING APPROPRIATE AND PRACTICABLE MITIGATION NECESSARY TO ENSURE THAT ADVERSE EFFECTS ON THE AQUATIC ENVIRONMENT ARE MINIMAL.

25. WATER QUALITY. WHERE STATES AND AUTHORIZED TRIBES, OR EPA WHERE APPLICABLE, HAVE NOT PREVIOUSLY CERTIFIED COMPLIANCE OF AN NWP WITH CWA SECTION 401, INDIVIDUAL 401 WATER QUALITY CERTIFICATION MUST BE OBTAINED OR WAIVED (SEE 33 CFR 330.4(C)). THE DISTRICT ENGINEER OR STATE OR TRIBE MAY REQUIRE ADDITIONAL WATER QUALITY MANAGEMENT MEASURES TO ENSURE THAT THE AUTHORIZED ACTIVITY DOES NOT RESULT IN MORE THAN MINIMAL DEGRADATION OR WATER QUALITY.

27. REGIONAL AND CASE-BY-CASE CONDITIONS. THE ACTIVITY MUST COMPLY WITH ANY REGIONAL CONDITIONS THAT MAY HAVE BEEN ADDED BY THE DIVISION ENGINEER (SEE 33 CFR 330.4(E)) AND WITH ANY CASE SPECIFIC CONDITIONS ADDED BY THE CORPS OR BY THE STATE, INDIAN TRIBE, OR U.S. EPA IN ITS SECTION 401 WATER QUALITY CERTIFICATION, OR BY THE STATE IN ITS COASTAL ZONE MANAGEMENT ACT CONSISTENCY DETERMINATION.

FOR A COMPLETE LIST OF GENERAL CONDITIONS GO TO:

http://www.swf.usace.army.mil/Missions/Regulatory/Permitting/NationwideGeneralPermits.aspx

USACE - PERMIT #14

AS APPLICABLE TO
THIS PROJECT

ACTIVITIES REQUIRED FOR CROSSINGS OF WATERS OF THE UNITED STATES ASSOCIATED WITH THE CONSTRUCTION, EXPANSION, MODIFICATION, OR IMPROVEMENT OF LINEAR TRANSPORTATION PROJECTS (E.G., ROADS, HIGHWAYS, RAILWAYS, TRAILS, AIRPORT RUNWAYS, AND TAXIWAYS) IN WATERS OF THE U.S. FOR LINEAR TRANSPORTATION PROJECTS IN NON-TIDAL WATERS, THE DISCHARGE CANNOT CAUSE THE LOSS OF GREATER THAN 1/2-ACRE OF WATERS OF THE U.S. ANY STREAM CHANNEL MODIFICATION, INCLUDING BANK STABILIZATION, IS LIMITED TO THE MINIMUM NECESSARY TO CONSTRUCT OR PROTECT THE LINEAR TRANSPORTATION PROJECT; SUCH MODIFICATIONS MUST BE IN THE IMMEDIATE VICINITY OF THE PROJECT.

THIS NWP ALSO AUTHORIZES TEMPORARY STRUCTURES, FILLS, AND WORK NECESSARY TO CONSTRUCT THE LINEAR TRANSPORTATION PROJECT. APPROPRIATE MEASURES MUST BE TAKEN TO MAINTAIN DOWNSTREAM FLOWS AND MINIMIZE FLOODING TO THE MAXIMUM EXTENT PRACTICABLE, WHEN TEMPORARY STRUCTURES, WORK, AND DISCHARGES, INCLUDING COFFERDAMS, ARE NECESSARY FOR CONSTRUCTION ACTIVITIES, ACCESS FILLS, OR DEWATERING OF CONSTRUCTION SITES. TEMPORARY FILLS MUST CONSIST OF MATERIALS, AND BE PLACED IN A MANNER THAT WILL NOT BE ERODED BY EXPECTED HIGH FLOWS. TEMPORARY FILLS MUST BE REMOVED IN THEIR ENTIRETY AND THE AFFECTED AREAS RETURNED TO PRE-CONSTRUCTION ELEVATIONS. THE AREAS AFFECTED BY TEMPORARY FILLS MUST BE REVEGETATED, AS APPROPRIATE.

THIS NWP CANNOT BE USED TO AUTHORIZE NON-LINEAR FEATURES COMMONLY ASSOCIATED WITH TRANSPORTATION PROJECTS, SUCH AS VEHICLE MAINTENANCE OR STORAGE BUILDINGS, PARKING LOTS, TRAIN STATIONS, OR AIRCRAFT HANGARS.

NOTIFICATION: THE PERMITTEE MUST SUBMIT A PRE-CONSTRUCTION NOTIFICATION (PCN) TO THE DISTRICT ENGINEER PRIOR TO COMMENCING THE ACTIVITY IF: (1) THE LOSS OF WATERS OF THE U.S. EXCEEDS 1/10-ACRE; OR (2) THERE IS A DISCHARGE IN A SPECIAL AQUATIC SITE, INCLUDING WETLANDS.

NOTE:

THE PROJECT CROSSES JURISDICTIONAL WATERS OF THE U.S. COORDINATION WITH USACE WAS NOT REQUIRED BECAUSE IMPACTS WILL NOT EXCEED THE ABOVE CRITERIA. THIS PERMIT AUTHORIZES THE ACTIVITIES WHICH WILL IMPACT WATERS OF THE U.S. THE NWP GENERAL CONDITIONS AND THE NWP #14 LIMITS MUST BE FOLLOWED IN ORDER TO MAINTAIN COMPLIANCE WITH THE NWP. PROJECT PLANS PROVIDE THE EXTENT OF WORK AUTHORIZED BY THE USACE. ANY CHANGES AT WATERS OF THE U.S. WILL REQUIRE COORDINATION WITH THE USACE. IF COORDINATION MAY BE NEEDED, CONTACT THE TXDOT LUFKIN DISTRICT ENVIRONMENTAL SECTION AT 1-800-687-8087.

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS (EPIC)

USACE

Texas Department of Transportation

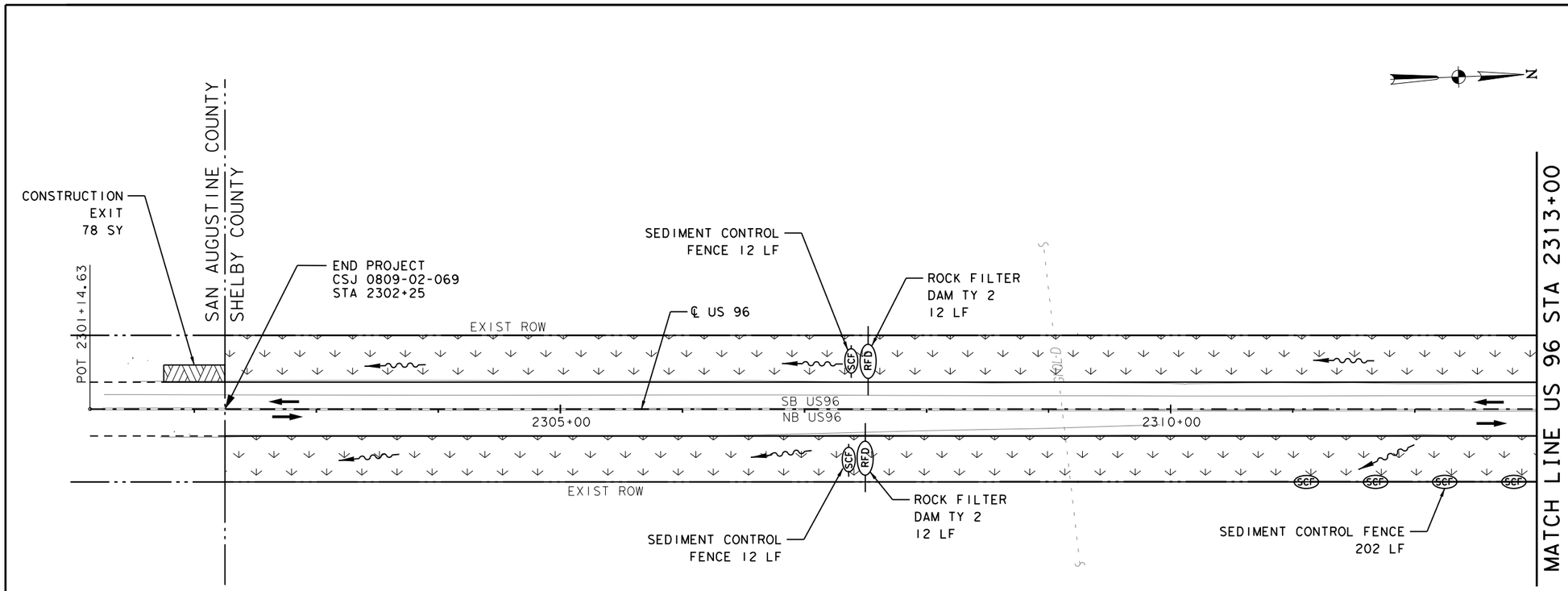
EPIC

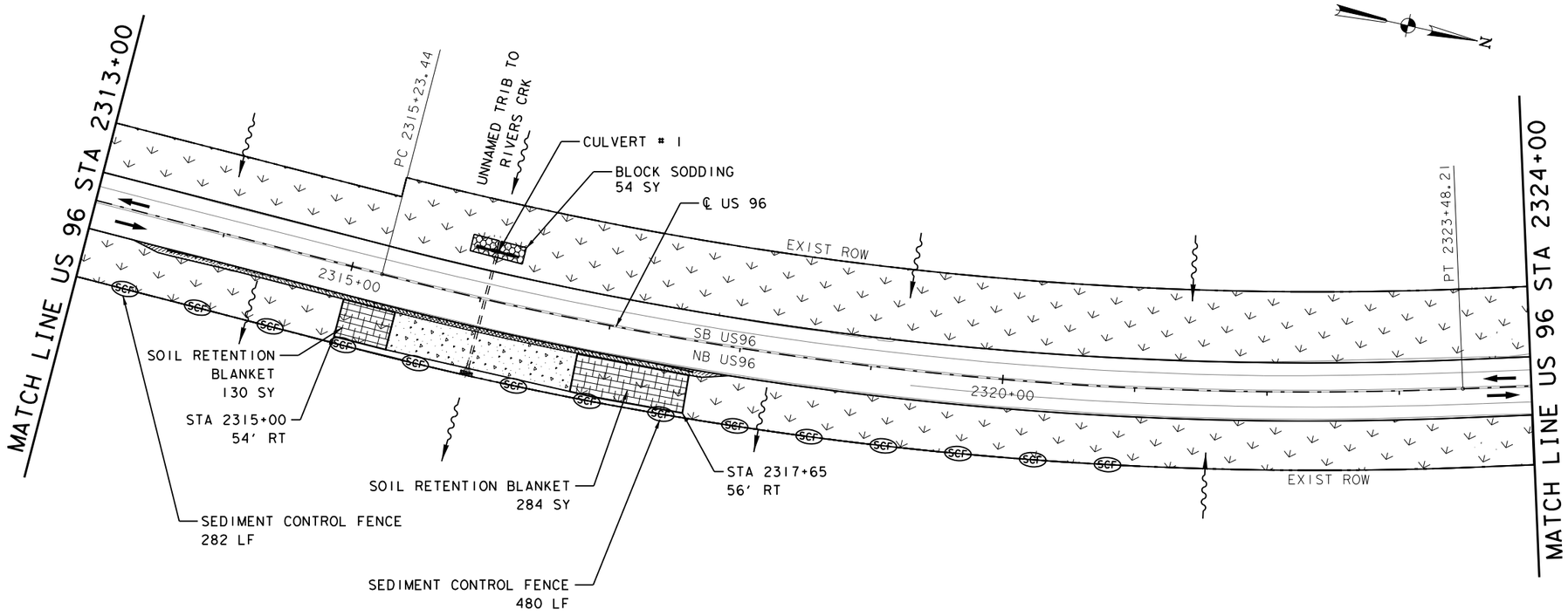
(ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS)

SHEET 2 OF 2

FILE: epic.dgn	DN: TxDOT		CK: RG	DW: VP		CK: AR	
©TxDOT: February 2015	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0809	02	069		US 96		
12-12-2011 (DS)	DIST	COUNTY			SHEET NO.		
05-07-14 ADDED NOTE SECTION IV.	LFK	SHELBY			166		
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.							

DATE: 9/27/2022 3:13:15 PM
FILE: c:\txdot\pw_online\txdot3\andrew.corbett\dms83920\080902069epic_sht2.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

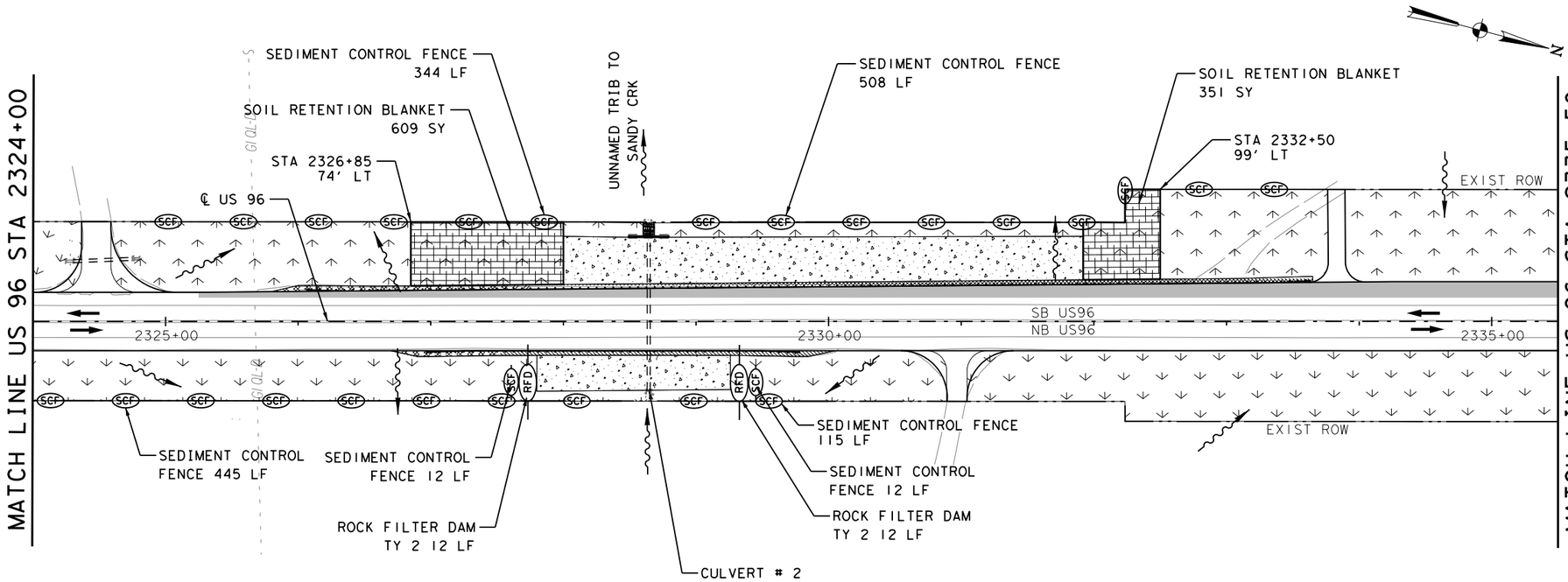
SWP3 LAYOUT

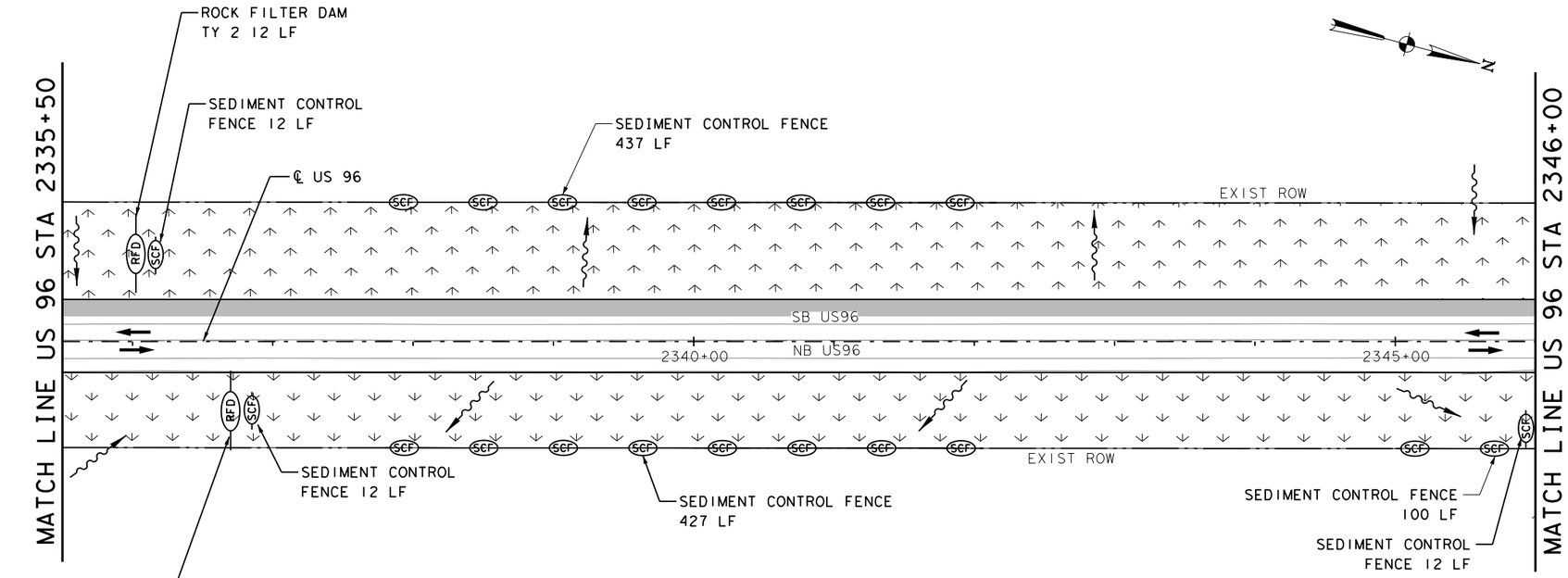
(SHEET 1 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		167

9/28/2022 9:32:37 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EV01.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

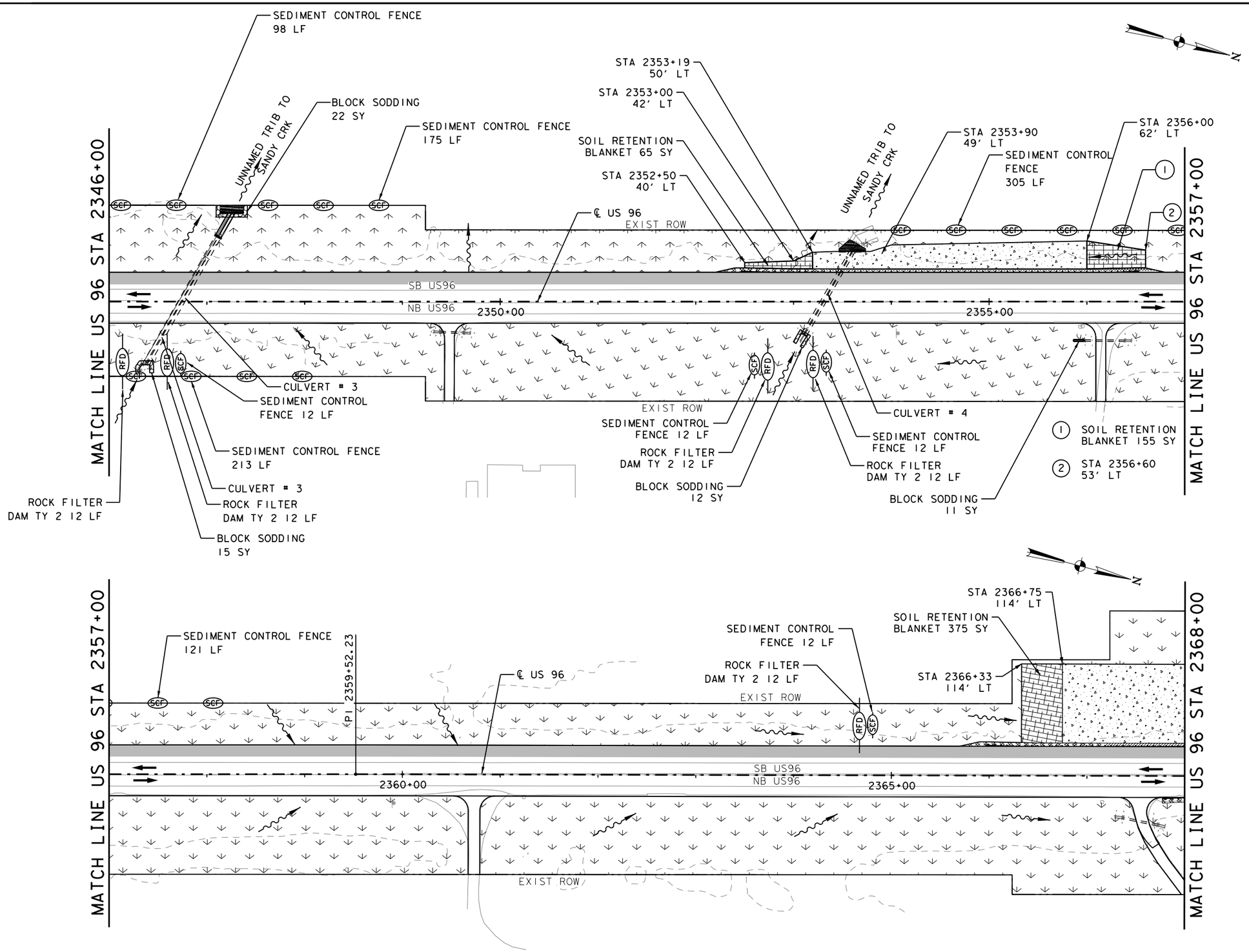
SWP3 LAYOUT

(SHEET 2 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		168

9/28/2022 9:32:37 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EV02.dgn



0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

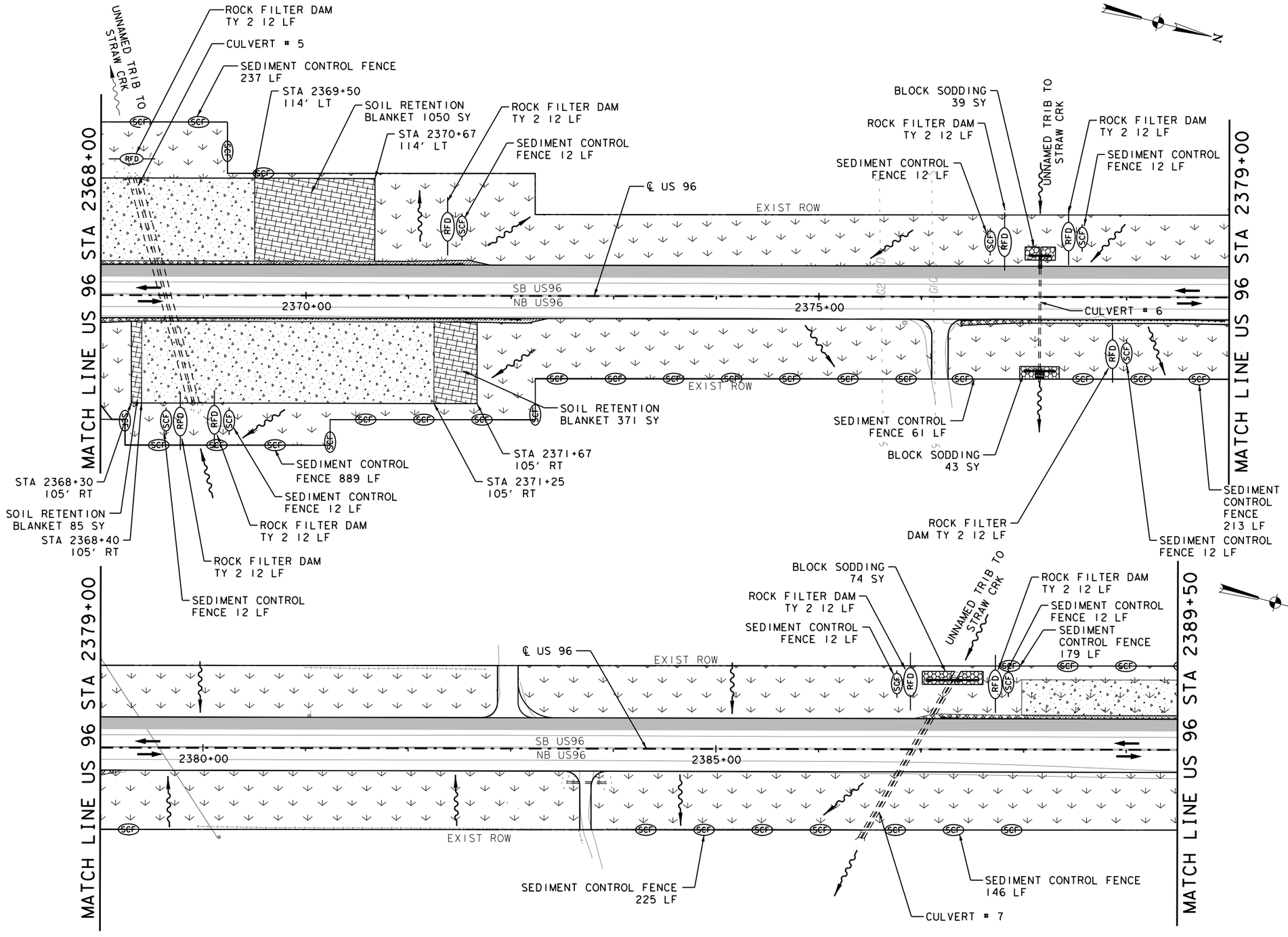
SWP3 LAYOUT

(SHEET 3 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		169

9/28/2022 9:32:38 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09+ENVIR\6802EV03.dgn



LEGEND

- ROCK FILTER DAM (TY 2)
- SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:

1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

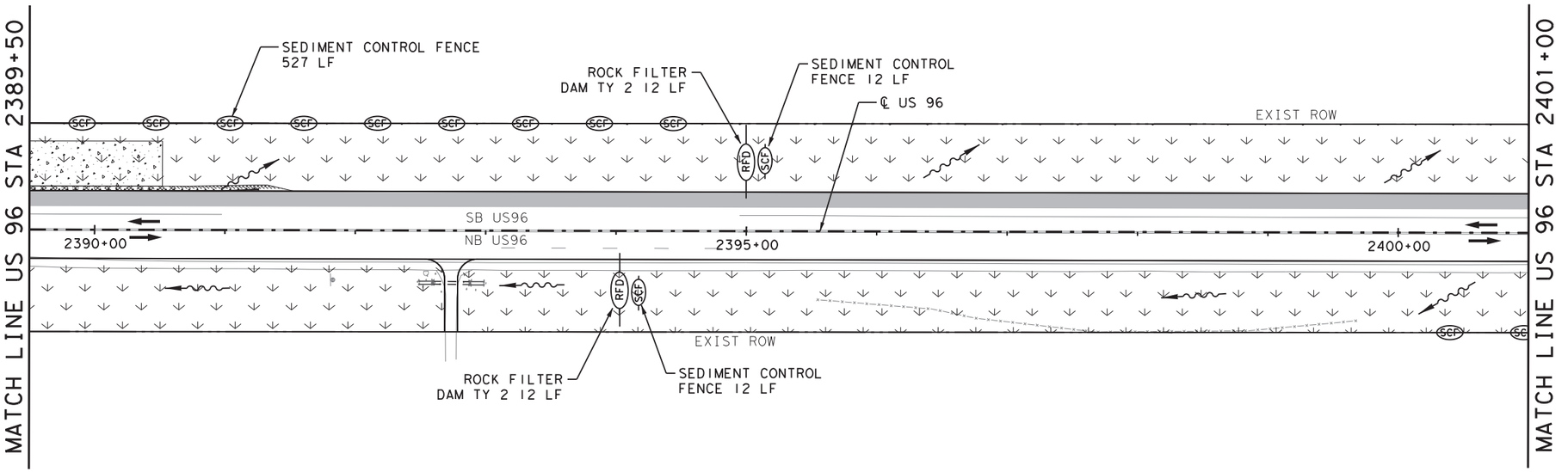
SWP3 LAYOUT

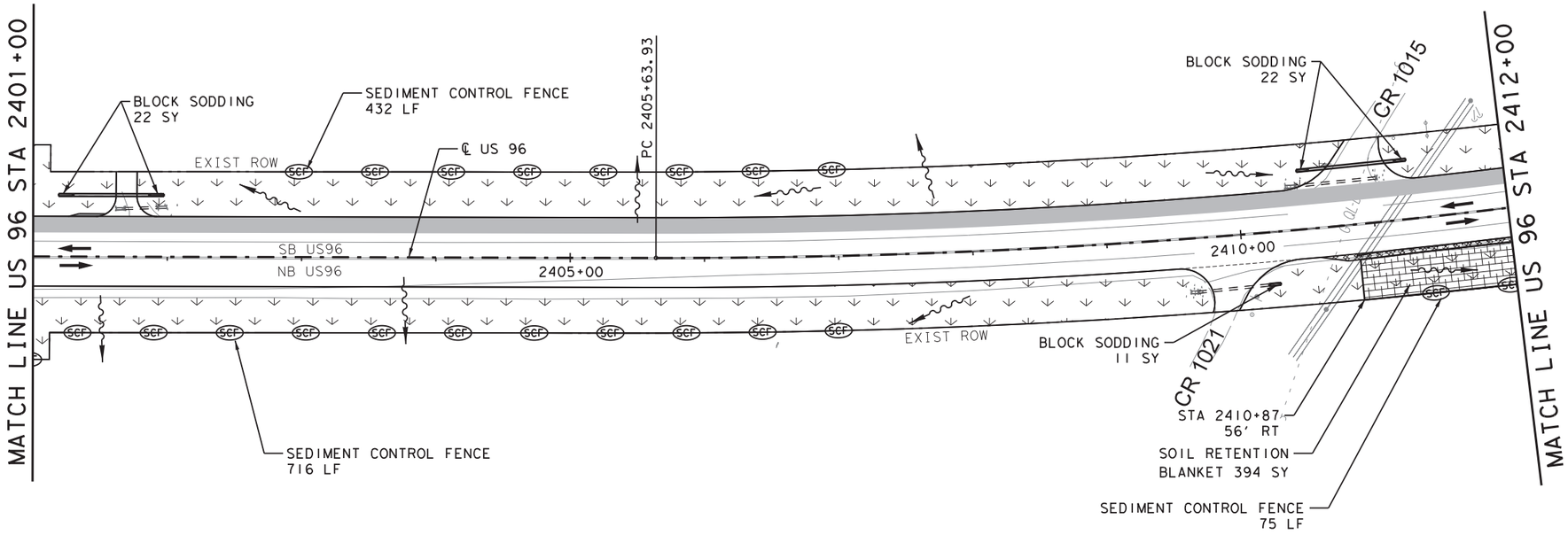
(SHEET 4 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		170

9/28/2022 9:32:39 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09+ENV\R\6802EV04.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

SWP3 LAYOUT

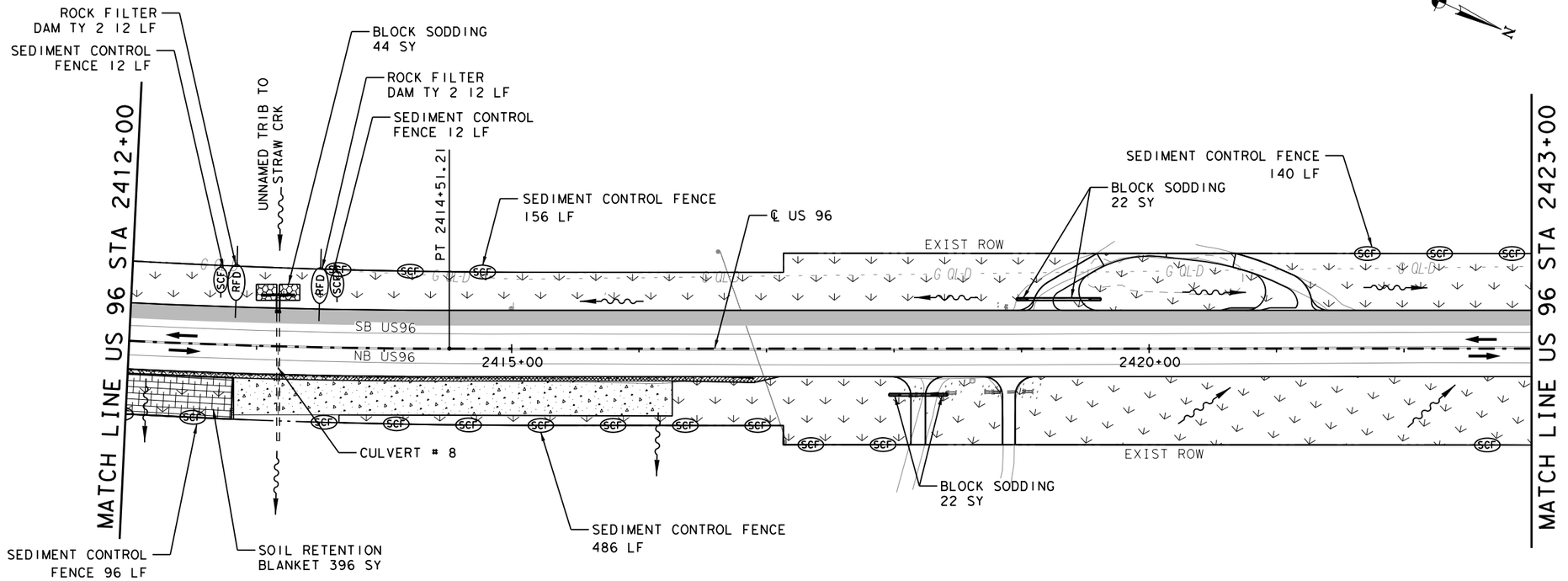
(SHEET 5 OF 12)

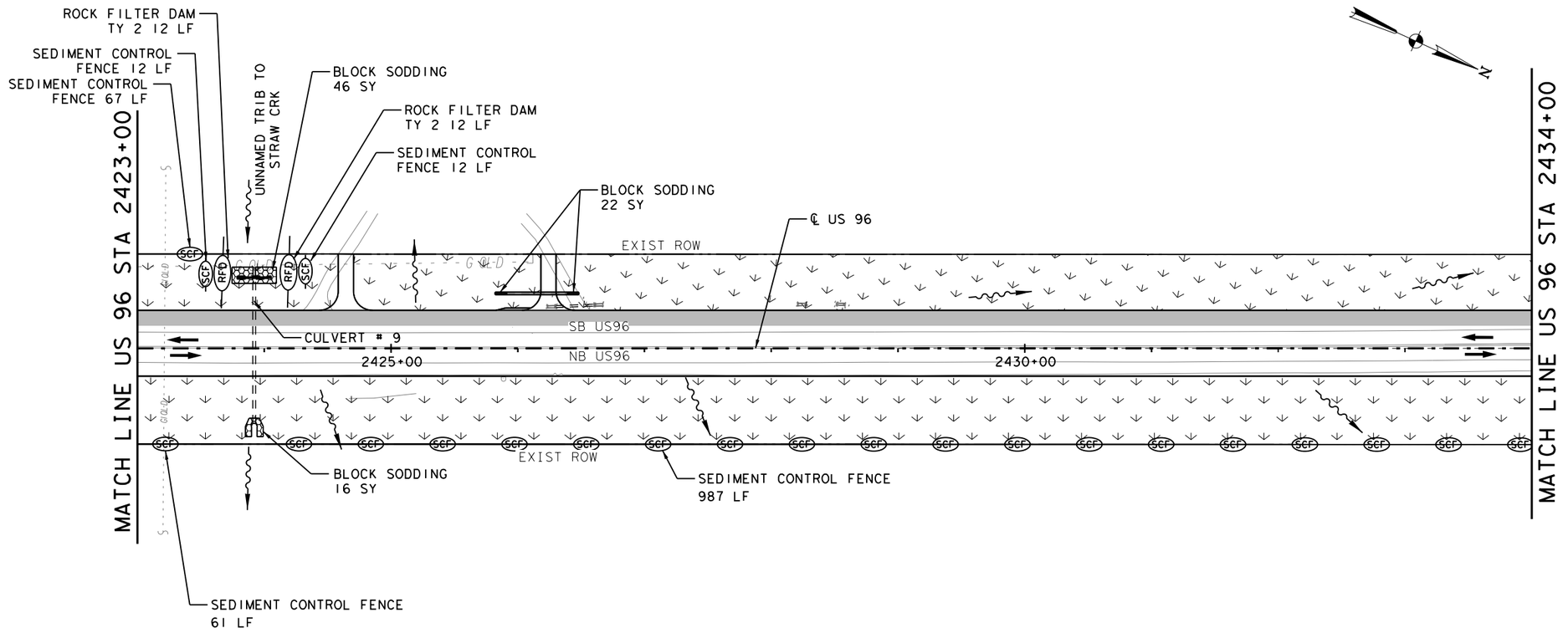
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		171

11/2/2021 3:42:28 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EV05.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

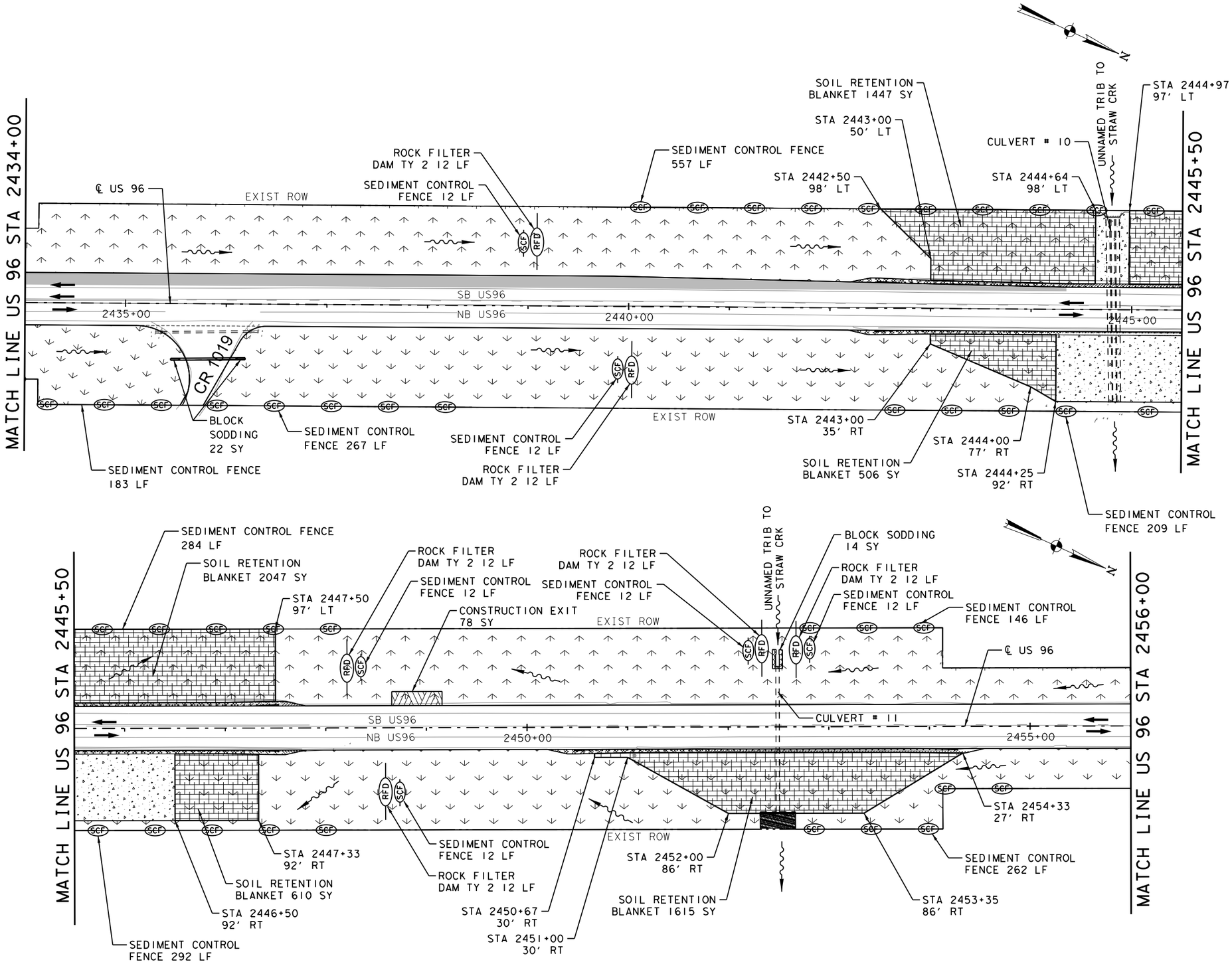
SWP3 LAYOUT

(SHEET 6 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		172

9/28/2022 9:32:39 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EV06.dgn



0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

SWP3 LAYOUT

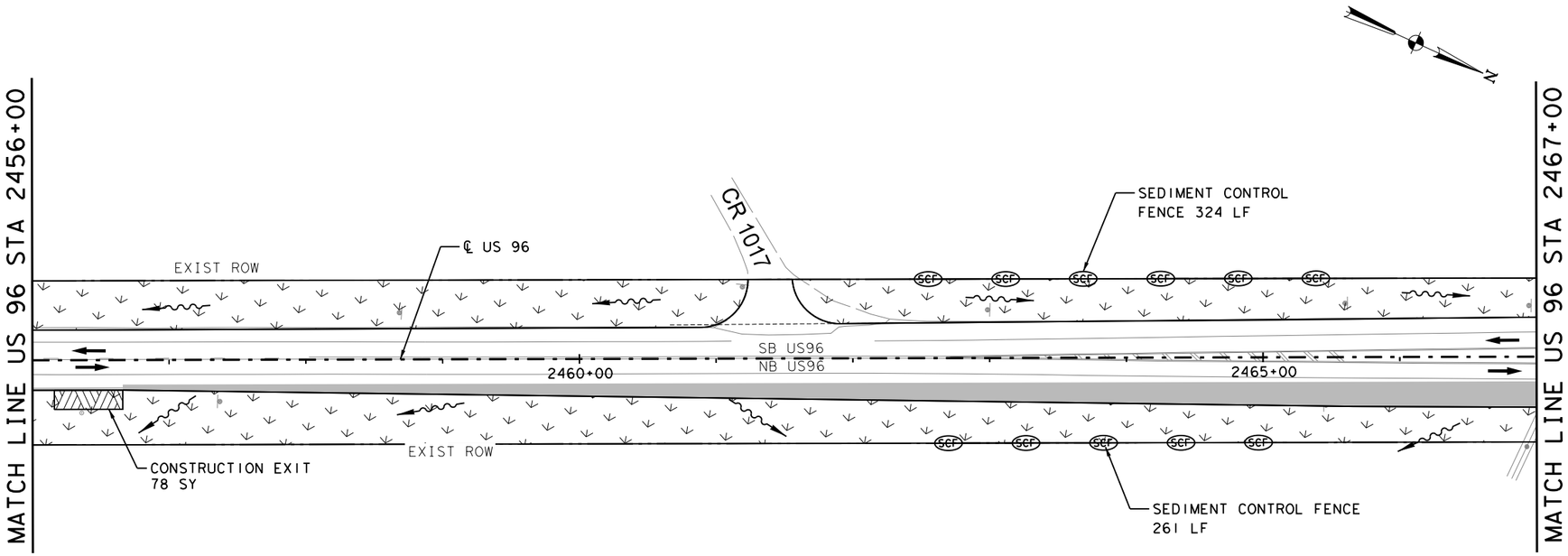
(SHEET 7 OF 12)

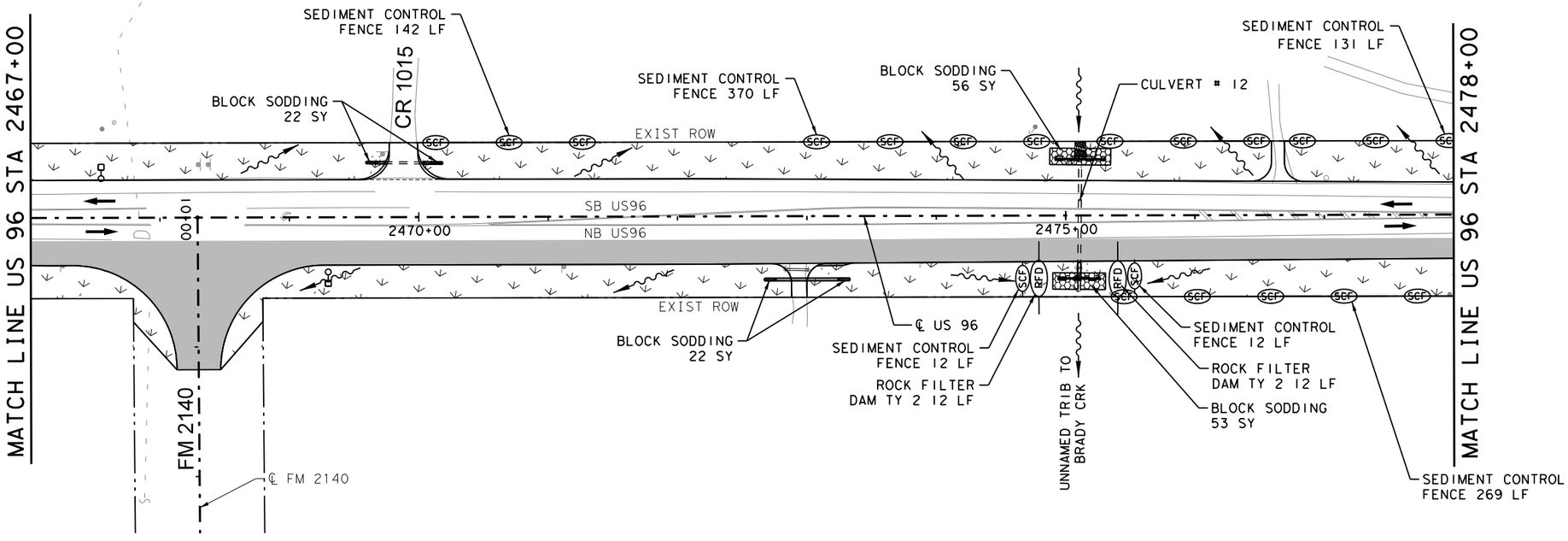
HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		173

9/28/2022 9:32:40 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09+ENVIR\6802EV07.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

9/28/2022

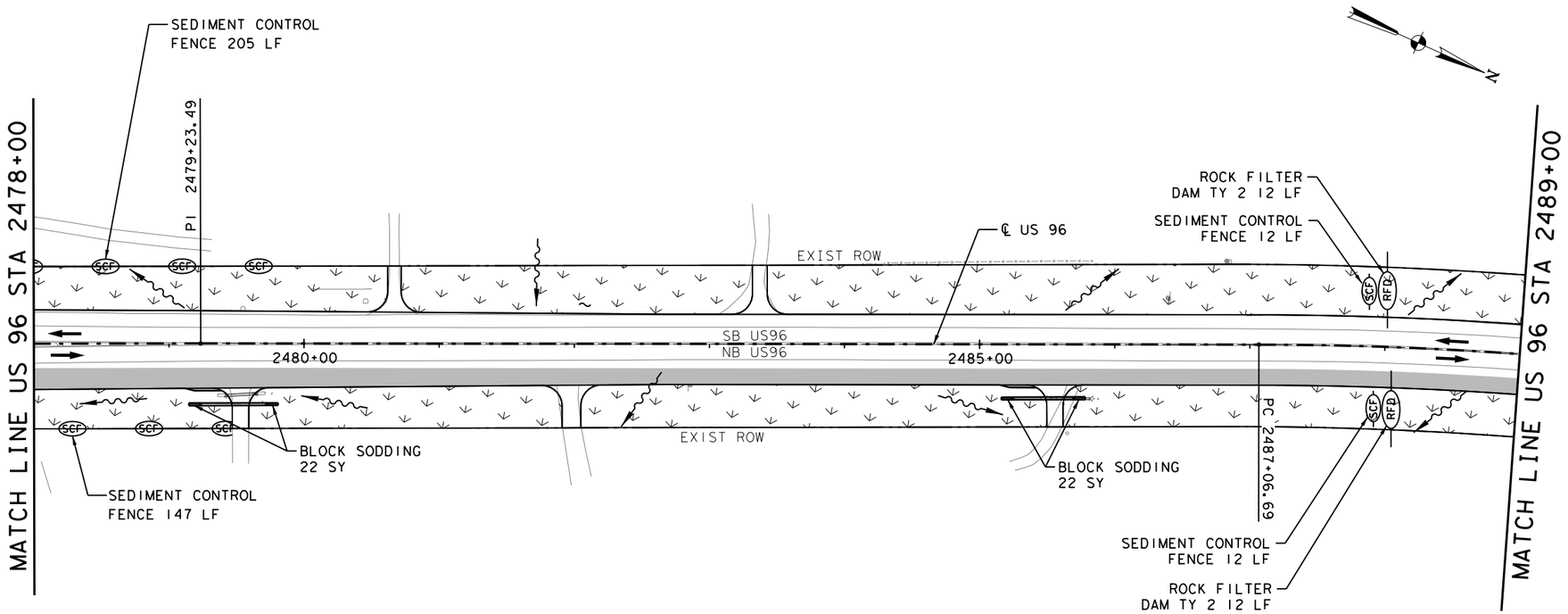
SWP3 LAYOUT

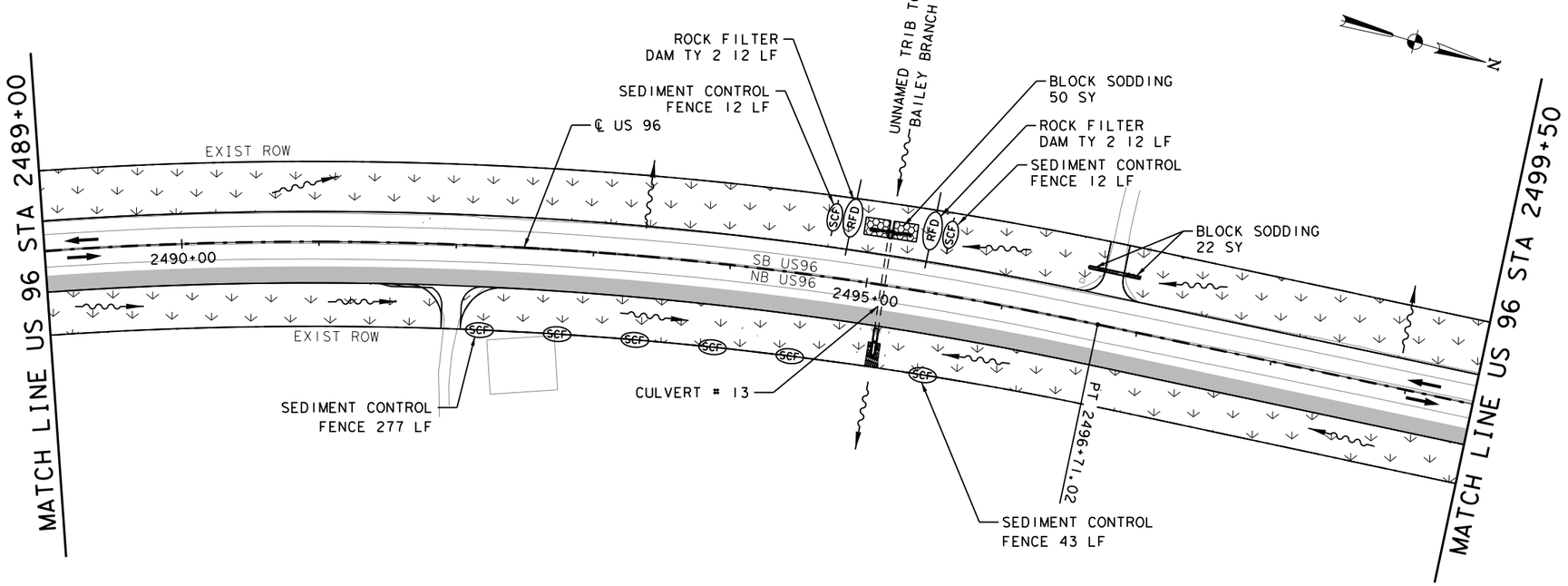
(SHEET 8 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		174

9/28/2022 9:32:41 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EV08.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

9/28/2022

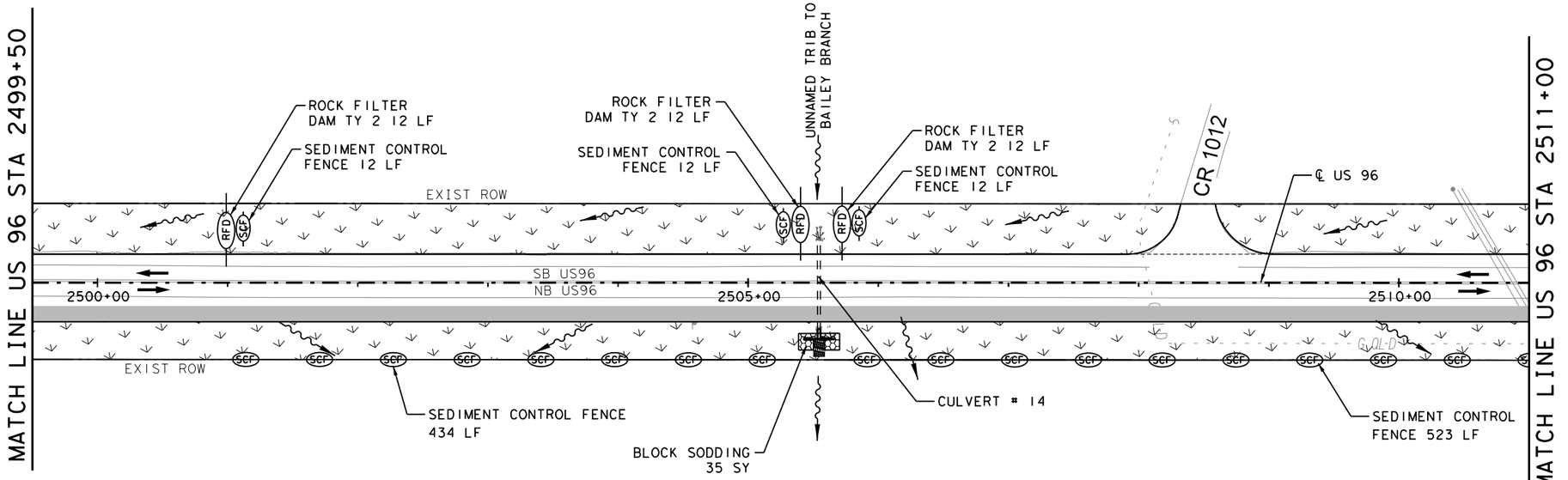
SWP3 LAYOUT

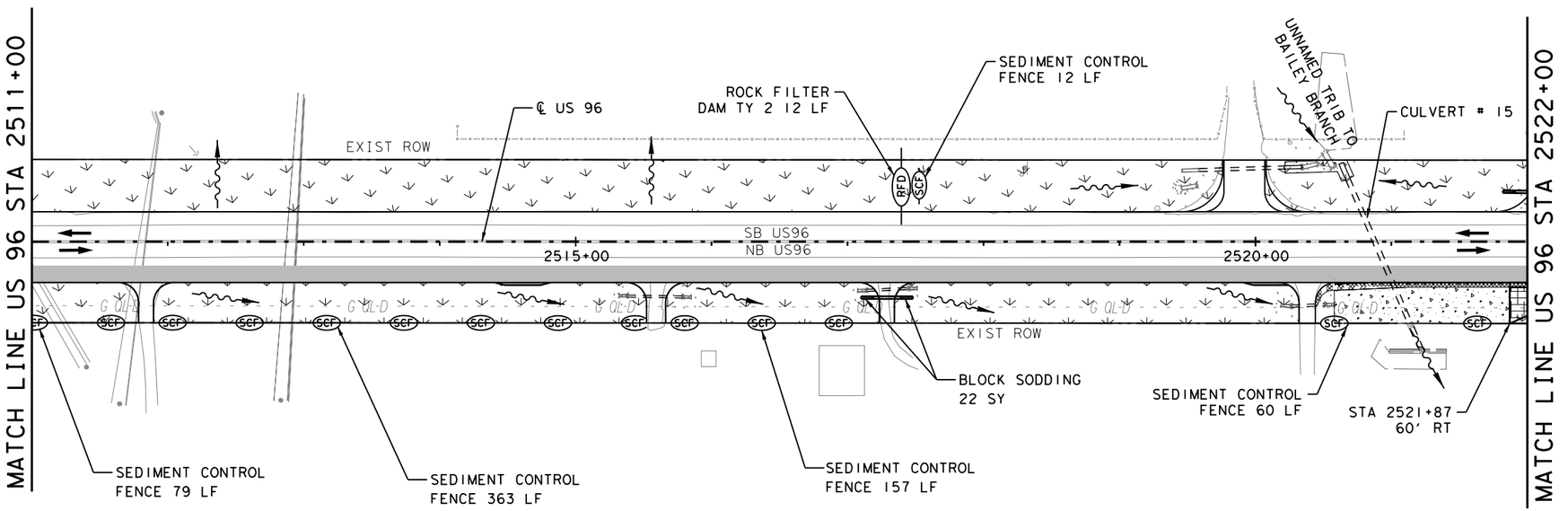
(SHEET 9 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		175

9/28/2022 9:32:41 AM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EV09.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.
4. ALL BMPs ARE TO BE PLACED INSIDE THE ROW. ANY BMPs THAT ARE SHOWN OUTSIDE THE ROW ARE INTENDED TO BE PLACED WITHIN THE ROW.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER
9/28/2022

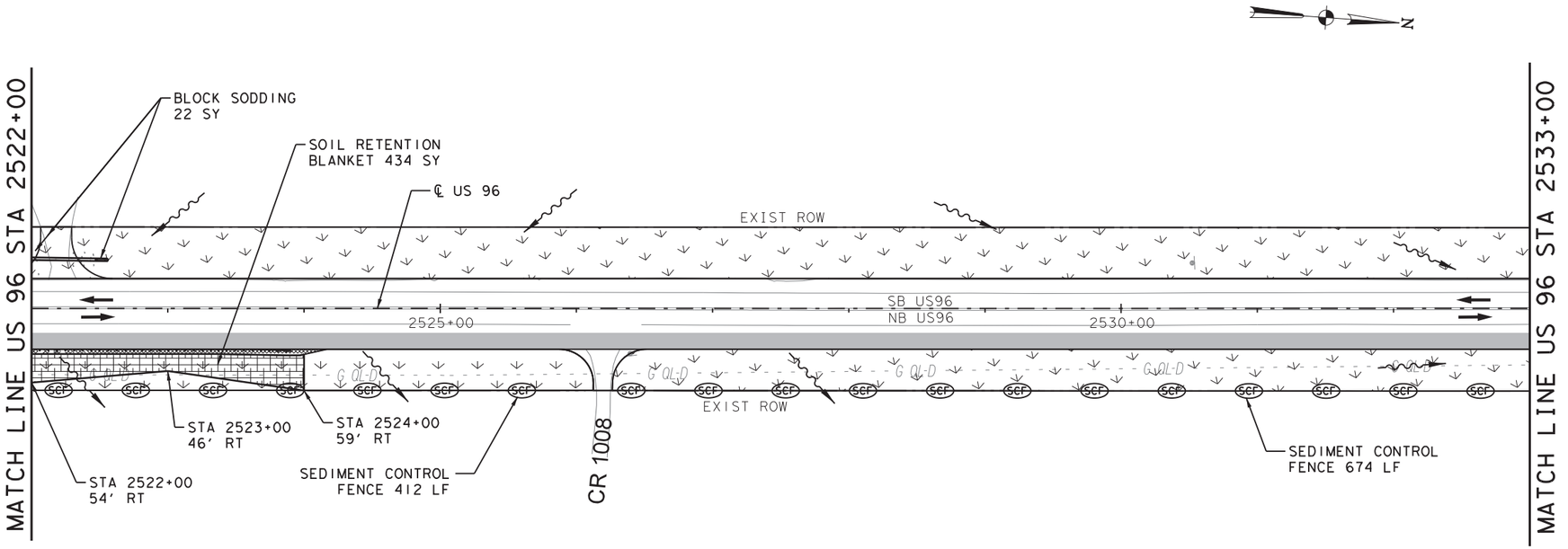
SWP3 LAYOUT

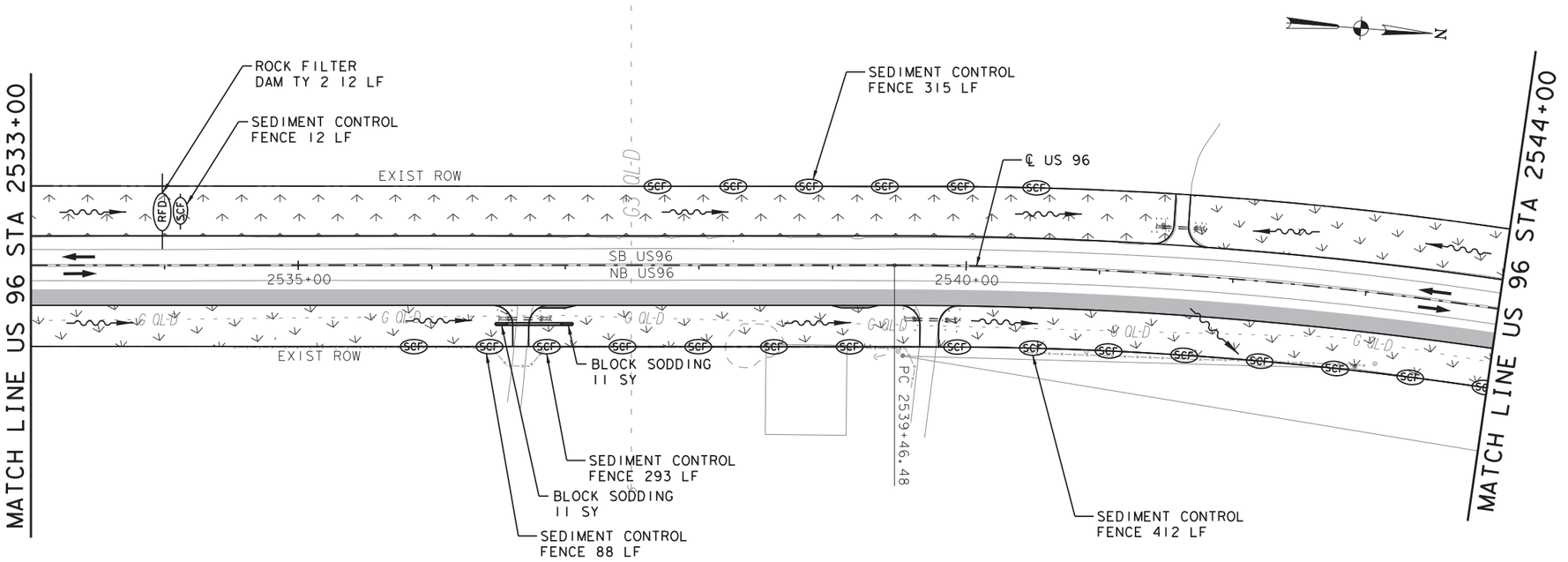
(SHEET 10 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
5430 LBJ FREEWAY, STE. 1500 DALLAS, TEXAS 75240
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		176

9/28/2022 9:32:42 AM
H:\proj\R306068.02 - TxDOT - 36-6|DP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EV10.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED
PROFESSIONAL ENGINEER

11/2/2021

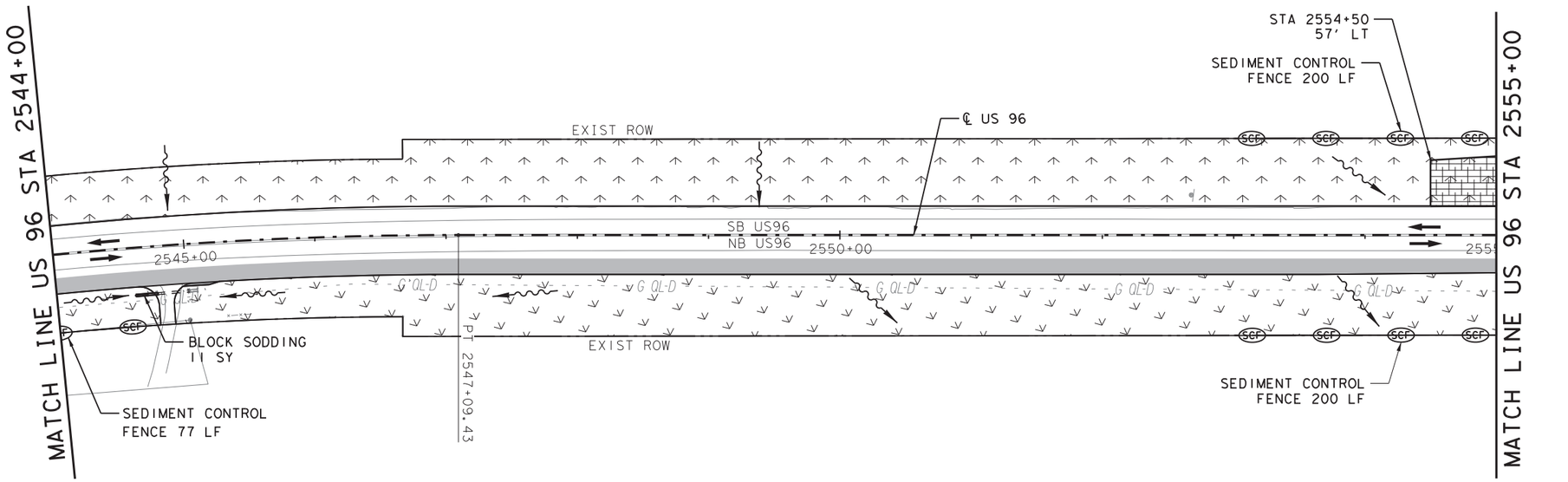
SWP3 LAYOUT

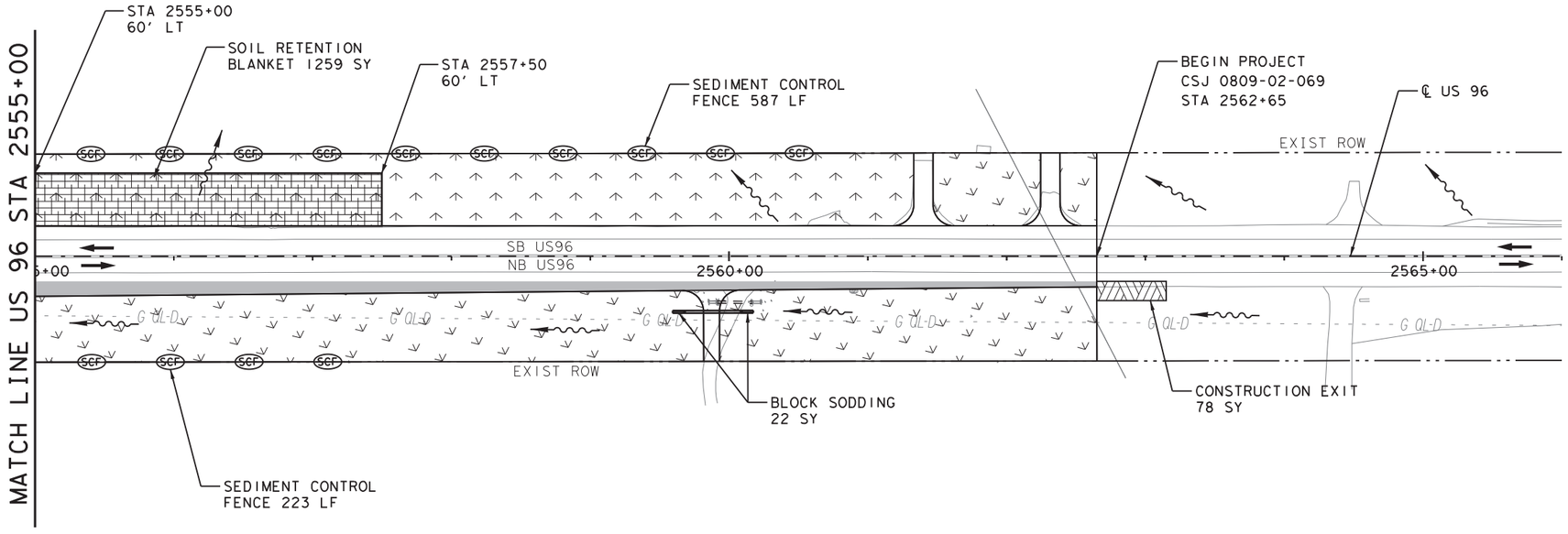
(SHEET 11 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		177

11/2/2021 3:42:32 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EVII.dgn





0 50 100
HORIZONTAL SCALE IN FEET

LEGEND

- RFD — ROCK FILTER DAM (TY 2)
- SCF — SEDIMENT CONTROL FENCE
- SOIL RETENTION BLANKET
- CONSTRUCTION EXIT
- BLOCK SODDING
- CELL FIBER MULCH SEED
- CONCRETE RIPRAP
- TRAFFIC FLOW ARROW
- WATER FLOW ARROW
- PROPOSED WIDENING

NOTES:
1. LOCATIONS OF CONSTRUCTION EXITS MAY BE ADJUSTED IN THE FIELD AS DIRECTED BY THE ENGINEER.
2. SWP3 ITEMS SHOULD BE ADJUSTED TO ACCOMMODATE ACTUAL FIELD CONDITIONS OR AS DIRECTED BY THE ENGINEER.
3. SEE BLOCK SODDING DETAIL FOR DETAILS NOT SHOWN HERE.

SCALE 1" = 100'

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

SWP3 LAYOUT

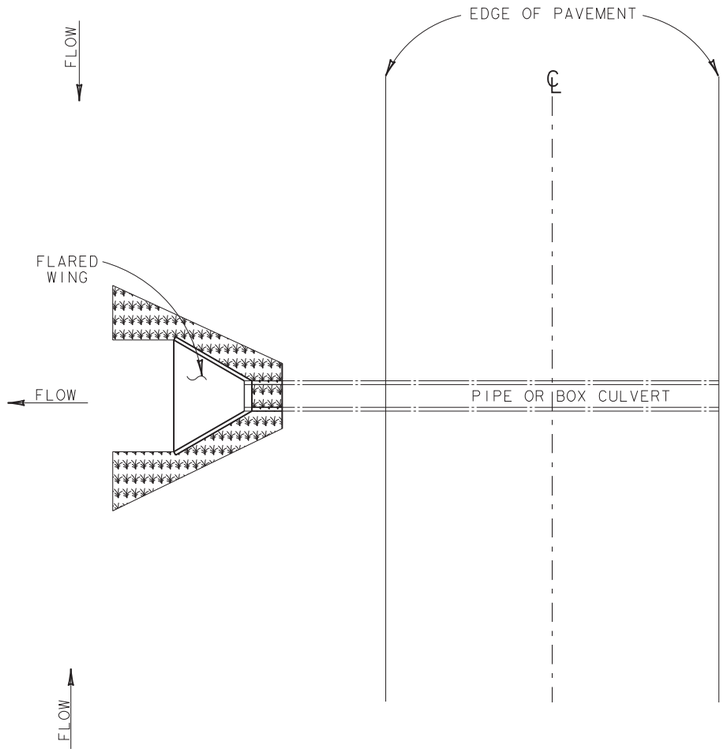
(SHEET 12 OF 12)

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

TEXAS DEPARTMENT OF TRANSPORTATION

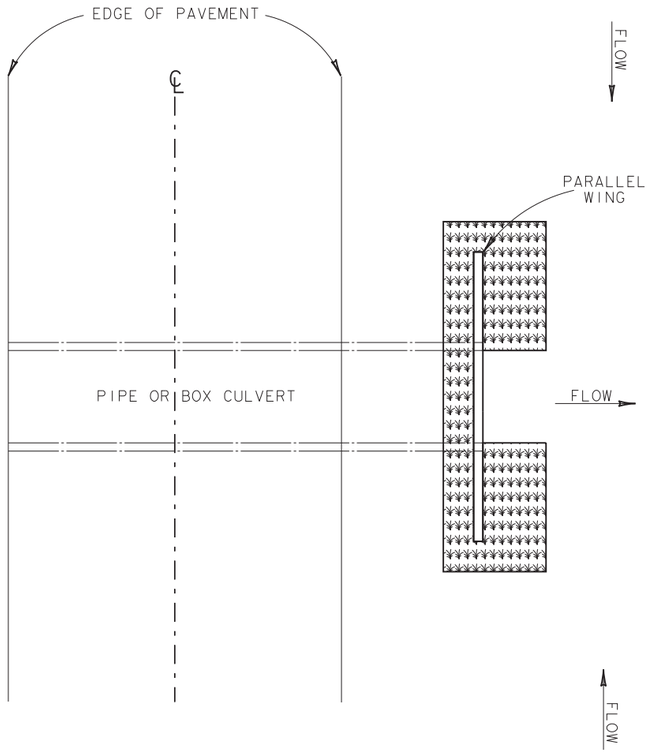
CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		178

11/2/2021 3:42:33 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\6802EVI2.dgn



FLARED WING CROSS DRAINAGE DETAIL (1)

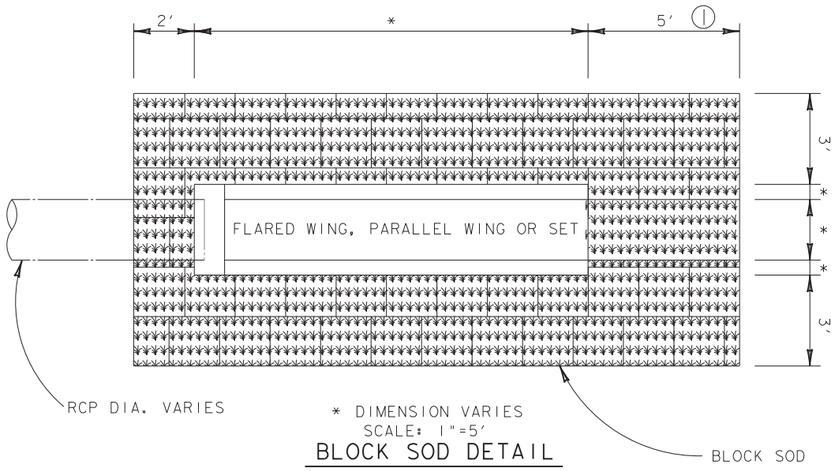
SCALE: 1"=20'



PARALLEL WING CROSS DRAINAGE DETAIL (1)

SCALE: 1"=20'

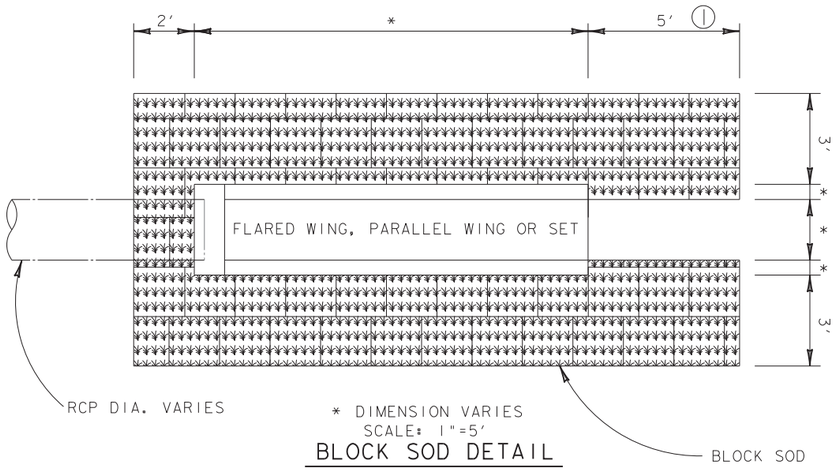
SYMBOL	DESCRIPTION
	BLOCK SODDING



* DIMENSION VARIES
SCALE: 1"=5'

BLOCK SOD DETAIL

PLACE AT ALL PARALLEL CULVERTS WHERE WORK IS PROPOSED.



* DIMENSION VARIES
SCALE: 1"=5'

BLOCK SOD DETAIL

PLACE AT ALL CROSSROAD CULVERTS WHERE WORK IS PROPOSED.
DO NOT PLACE SOD DIRECTLY IN THE CHANNEL.

(1) DO NOT PLACE BLOCK SOD WHERE RIPRAP (STONE COMMON) IS INSTALLED.

STATE OF TEXAS
CHRISTIAN L. MOORMAN
93828
LICENSED PROFESSIONAL ENGINEER

11/2/2021

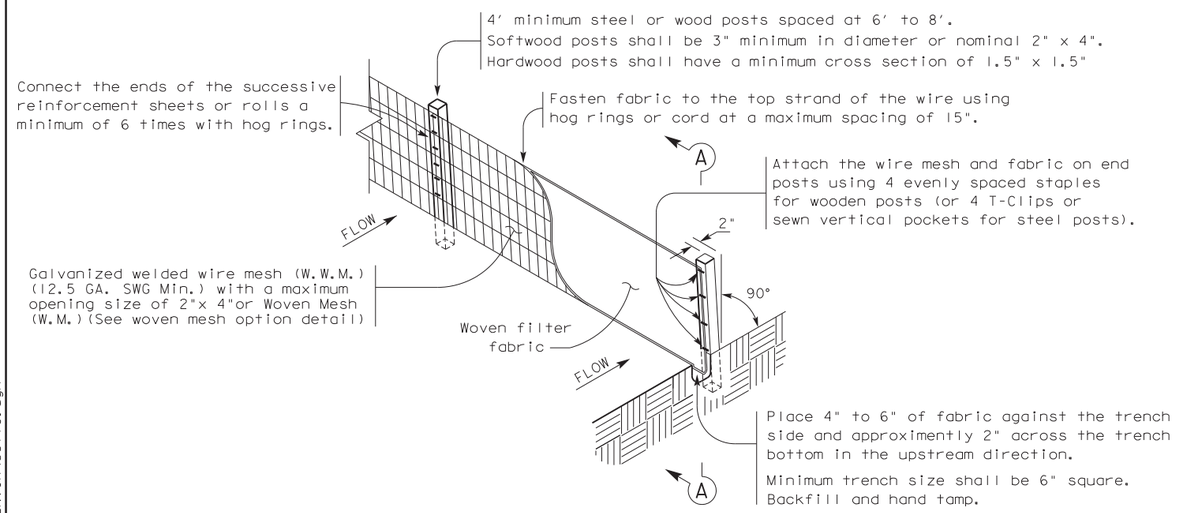
BLOCK SOD DETAILS

HUITT-ZOLLARS
HUITT-ZOLLARS, INC. ENGINEERING / SURVEYING
1717 McKINNEY AVE., STE. 1400 DALLAS, TEXAS 75202
Firm No. F-761

CONT	SECT	JOB	HIGHWAY
0809	02	069	US 96
DIST	COUNTY		SHEET NO.
LFK	SHELBY		179

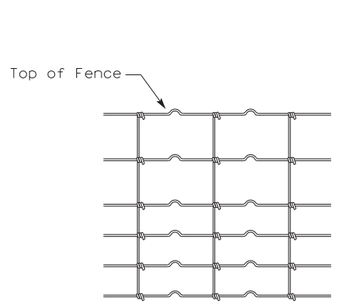
11/2/2021 3:42:33 PM
H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - I958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\09*ENVIR\BLOCK SOD DETAILS.dgn

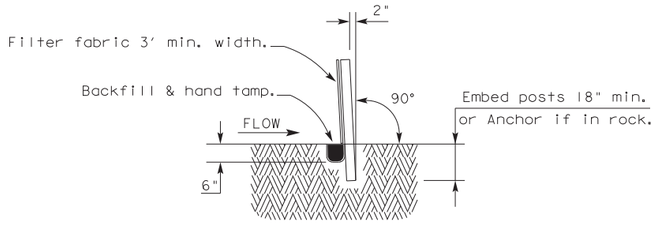
DATE:2021
FILE:ec116.dgn
DN:TxDOT CK:KM DW:VP DN/CK:LS
©TxDOT:JULY 2016
CONT:0809 SECT:02 JOB:069 HIGHWAY:US 96
DIST:LFK COUNTY:SHELBY SHEET NO.:180
REVISIONS
1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\05_ENVIR\ec116.dgn
36-6IDP5428 - TxDOT - 3060068.02



TEMPORARY SEDIMENT CONTROL FENCE

SCF





SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

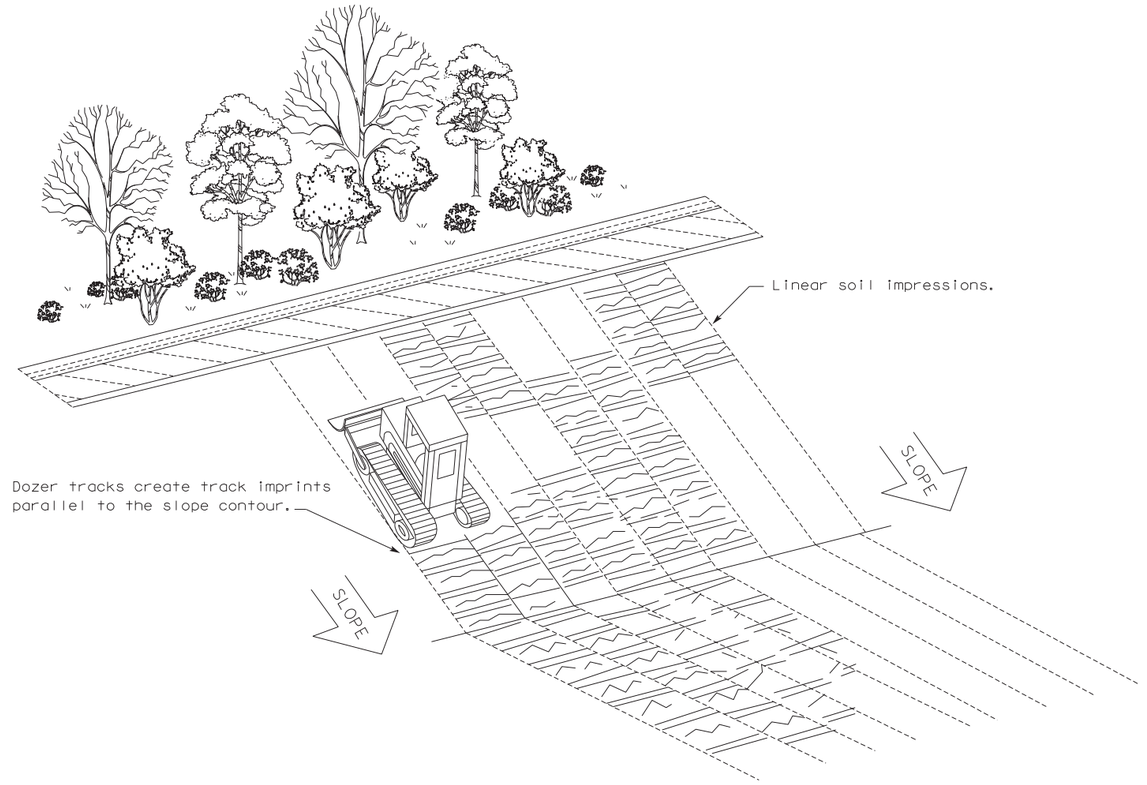
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

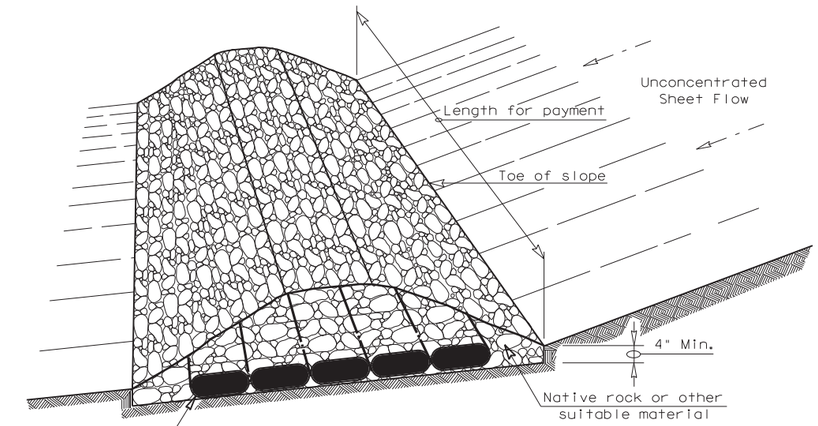
Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

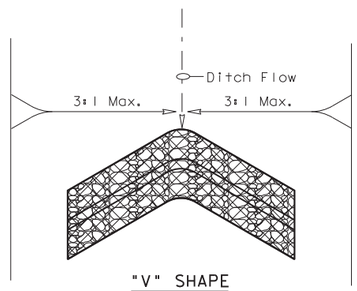
EC(1)-16

DATE: 11/2/2021
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\05_ENVIR\ec216.dgn

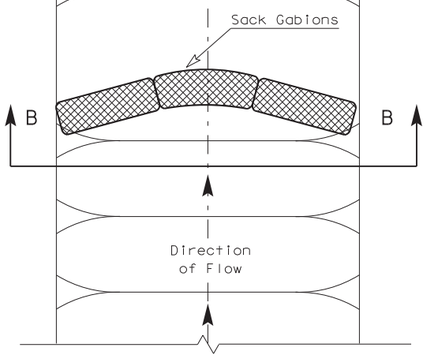


FILTER DAM AT TOE OF SLOPE

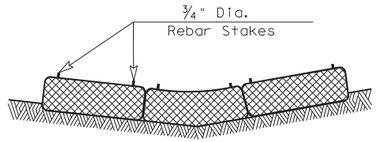
RFD1



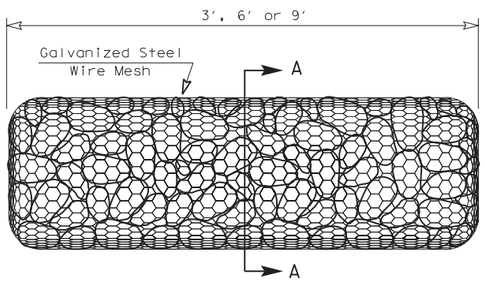
"V" SHAPE
PLAN VIEW



PLAN VIEW

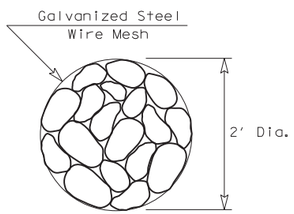


SECTION B-B

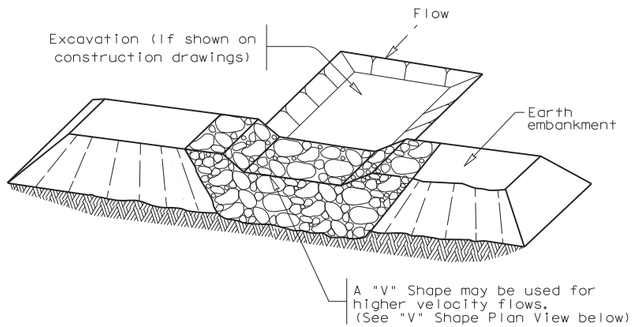


TYPE 4 (SACK GABIONS)

RFD4

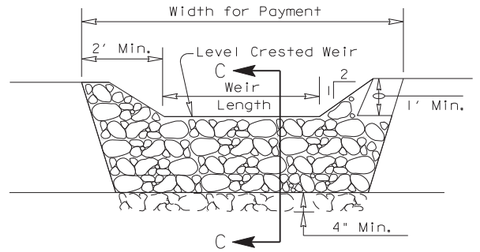


SECTION A-A

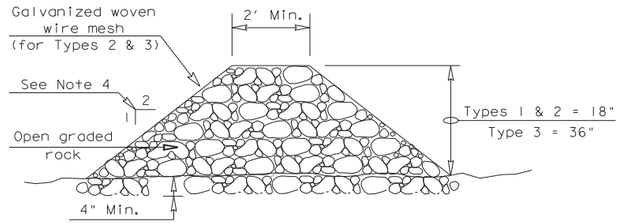


FILTER DAM AT SEDIMENT TRAP

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.

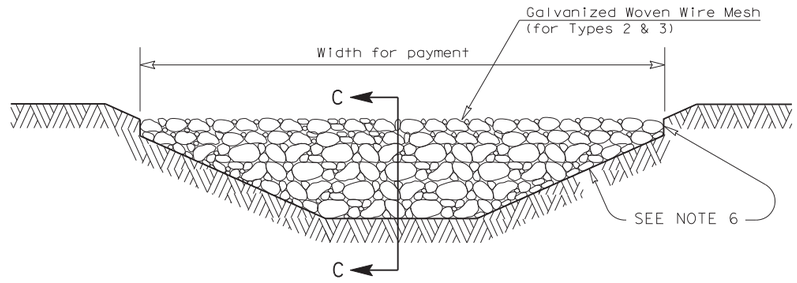
Type 1 (18" high with no wire mesh) (3" to 6" aggregate): Type 1 may be used at the toe of slopes, around inlets, in small ditches, and at dike or swale outlets. This type of dam is recommended to control erosion from a drainage area of 5 acres or less. Type 1 may not be used in concentrated high velocity 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

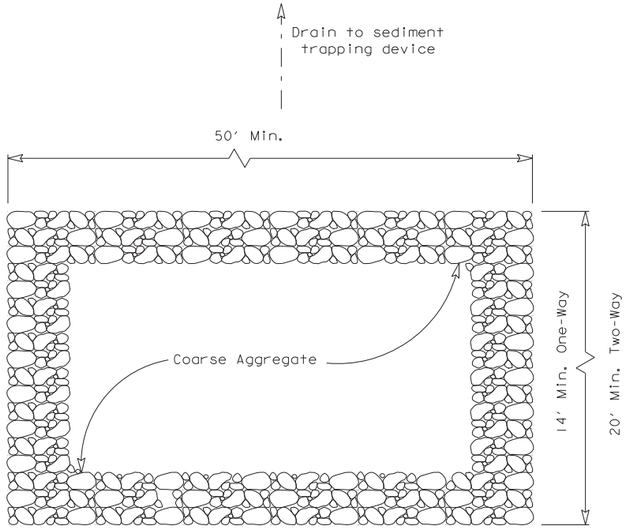
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

ROCK FILTER DAMS

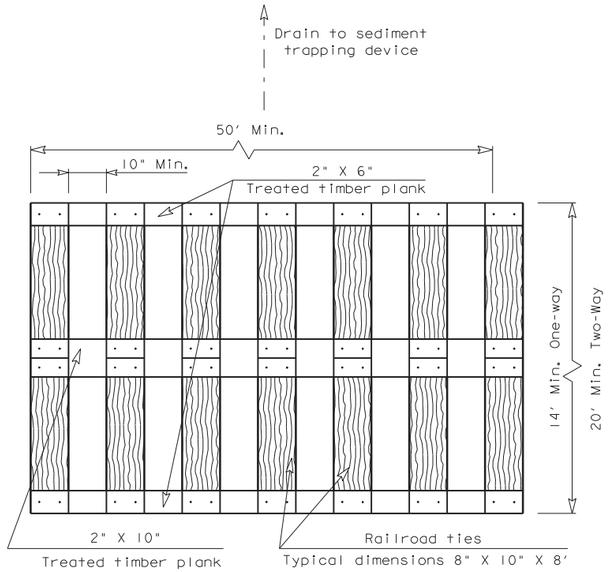
EC(2)-16

FILE: ec216	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		181

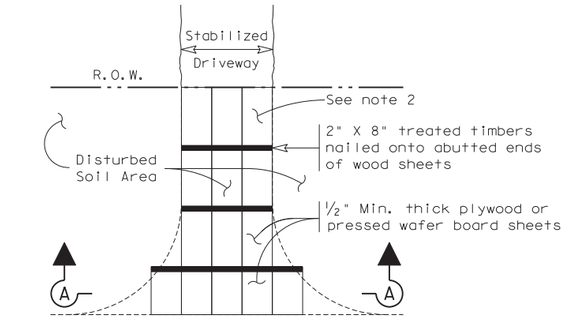
DATE: 11/2/2021
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\10.6 Microstation\10.6.5 Sheets\12_STANDARDS\05_ENV1R\ec316.dgn



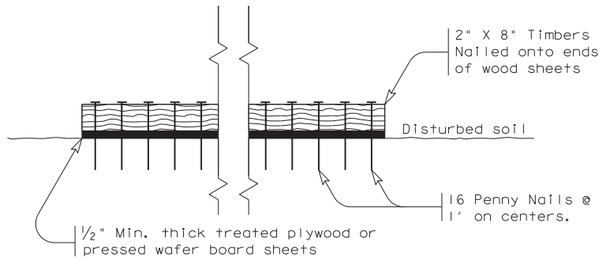
PLAN VIEW



PLAN VIEW

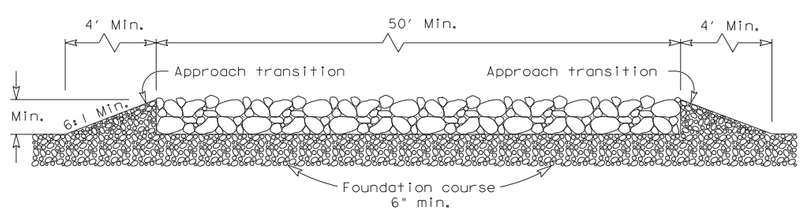


PLAN VIEW



SECTION A-A

SECTION A-A
CONSTRUCTION EXIT (TYPE 3)
SHORT TERM



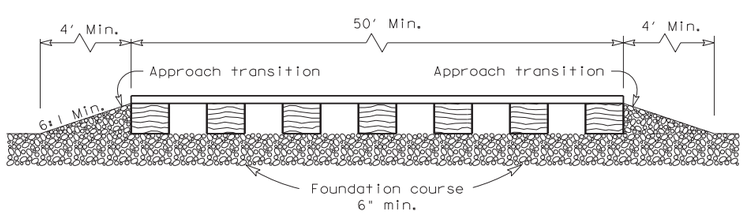
ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 1)

ROCK 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.



ELEVATION VIEW

CONSTRUCTION EXIT (TYPE 2)

TIMBER CONSTRUCTION (LONG TERM)

GENERAL NOTES (TYPE 2)

1. The length of the type 2 construction exit shall be as indicated on the plans, but not less than 50'.
2. The treated timber planks shall be attached to the railroad ties with ½"x 6" min. lag bolts. Other fasteners may be used as approved by the Engineer.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The approach transitions shall be no steeper than 6:1 and constructed as directed by the Engineer.
5. The construction exit foundation course shall be flexible base, bituminous concrete, portland cement concrete or other material as approved by the Engineer.
6. The construction exit should be graded to allow drainage to a sediment trapping device.
7. The guidelines shown hereon are suggestions only and may be modified by the Engineer.
8. Construct exits with a width of at least 14 ft. for one-way and 20 ft. for two-way traffic for the full width of the exit, or as directed by the engineer.

GENERAL NOTES (TYPE 3)

1. The length of the type 3 construction exit shall be as shown on the plans, or as directed by the Engineer.
2. The type 3 construction exit may be constructed from open graded crushed stone with a size of two to four inches spread a min. of 4" thick to the limits shown on the plans.
3. The treated timber planks shall be #2 grade min., and should be free from large and loose knots.
4. The guidelines shown hereon are suggestions only and may be modified by the Engineer.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

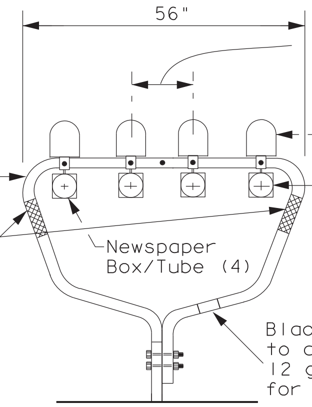
CONSTRUCTION EXITS

EC(3)-16

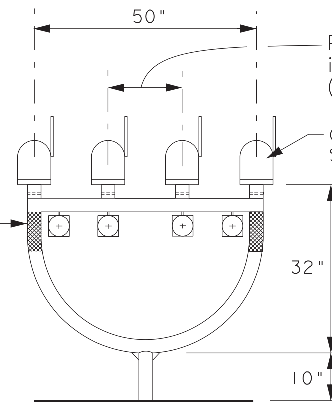
FILE: ec316	DN: TxDOT	CK: KM	DW: VP	DN/CK: LS
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0809	02	069	US 96
	DIST	COUNTY		SHEET NO.
	LFK	SHELBY		182

DATE: 11/2/2021 3:43:48 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-6IDP5428 - 1958 - WA 2\10 CADD & BIM\...

TYPE 1 - MULTIPLE



TYPE 4 - MULTIPLE



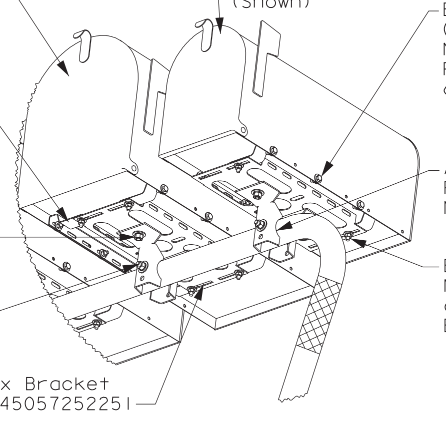
MAILBOX SIZES

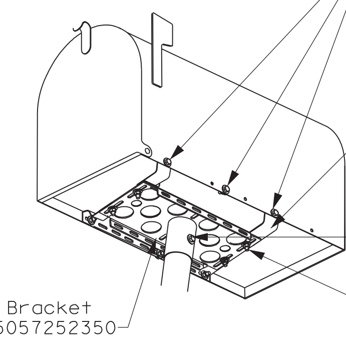
MAILBOX SIZE	TYPICAL DIMENSIONS LENGTH	WIDTH	HEIGHT	MAX ** WEIGHT
SMALL	19 1/2"	6"	7"	6 LBS
MEDIUM	22 1/2" *	8" *	11 1/2" *	8 LBS
LARGE	23 1/2"	11 1/2"	13 1/2"	11 LBS
EXTRA LARGE	18"	14"	12"	13 LBS
LOCKABLE	18"	11 1/2"	15"	23 LBS

* See Note 1.
** Excluding Molded Plastic on 4 X 4 Post

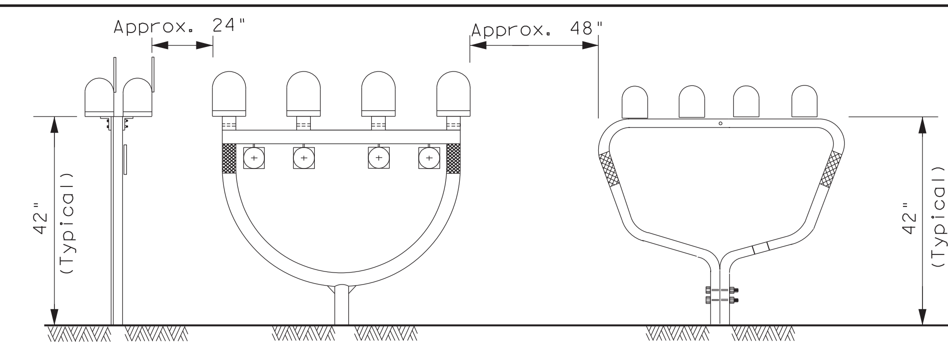
GENERAL NOTES:

1. Dimensions shown (length, width, and height) are typical, not maximums. However, anytime a medium size mailbox is mounted on a single/double mount or on the outside position on a multi mount, the dimensions shown are maximums.
2. Mailboxes shall be made of light weight sheet metal or light weight plastic. Heavy steel, cast iron or decorative mailboxes shall not be used on the state highway system.



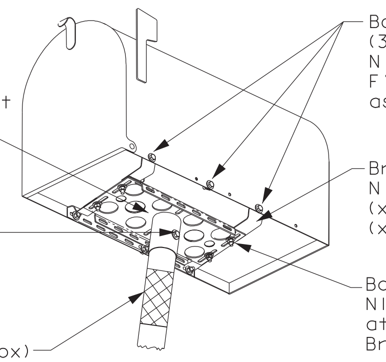


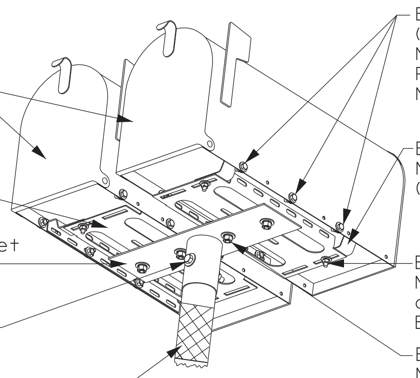
TYPICAL INSTALLATION MEASUREMENTS



NOTE:
Mailbox installations in sidewalk areas shall be in accordance with the latest TxDOT Design Standard sheets PED-Pedestrian Facilities Curb Ramps.

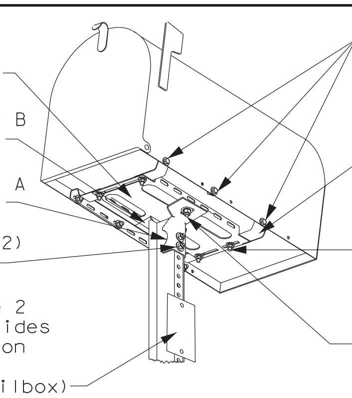
TYPE 2 and 4 - SINGLE/DOUBLE

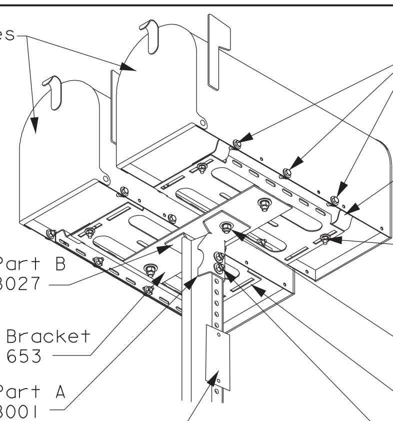




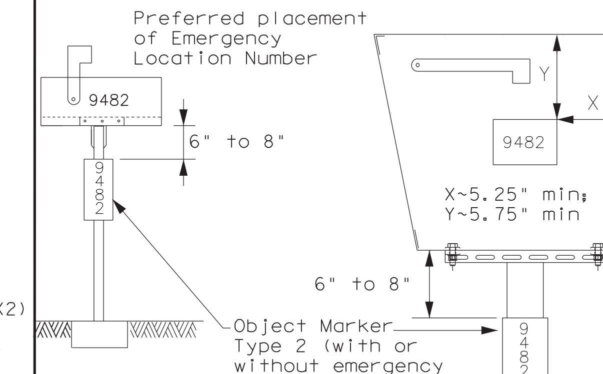
NOTE:
Double mailbox mounts are not allowed with a type 4 multiple mailbox installation

TYPE 3 - SINGLE/DOUBLE





PLACEMENT OF EMERGENCY LOCATION NUMBER

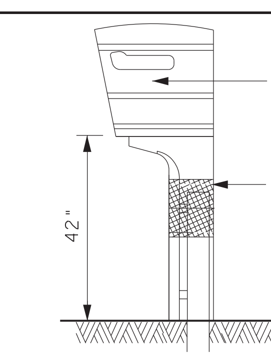


NOTES:

1. Location numbers are provided by homeowner. Minimum size 1" height.
2. Location number is typically placed on the mailbox in a contrasting color.
3. Black numbers may be placed on the Type 2 object marker if the numbers cannot be placed on the mailbox.
4. Alternatively, a green or blue plate with white numbers attached may be mounted below the object marker. Other contrasting color configuration, as approved, may be used.
5. See 3 of 4 for Foundation details.
6. See 4 of 4 for Hardware details.

SHEET 1 OF 4

TYPE 5



Typical Molded Plastic Mailbox

Texas Department of Transportation

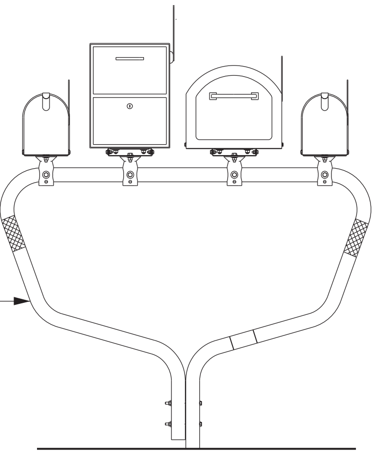
Maintenance Division Standard

MAILBOX MOUNTING AND ASSEMBLY

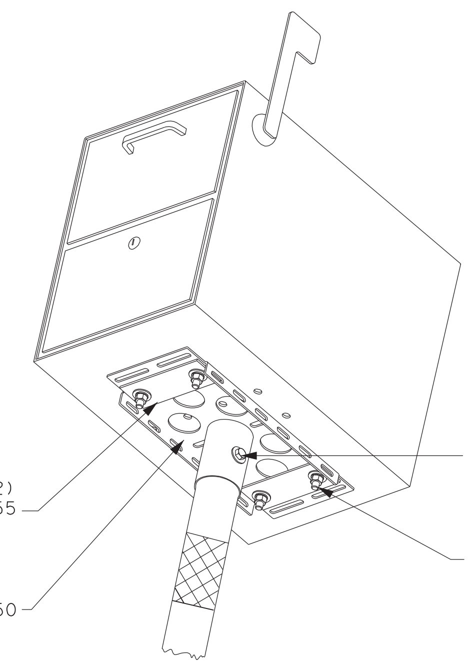
MB(1)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 2004	CONT 0809	SECT 02	JOB 069	HIGHWAY US 96
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	DIST LFK		COUNTY SHELBY	SHEET NO. 183

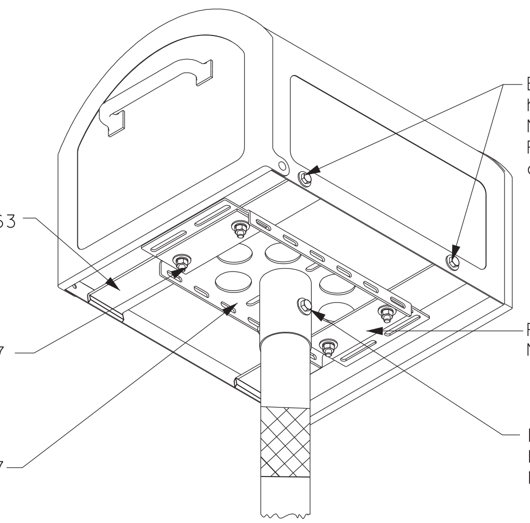
TYPE 1 - MULTI LOCKABLE AND XL MAILBOX



TYPE 2/4 - SINGLE LOCKABLE MAILBOX



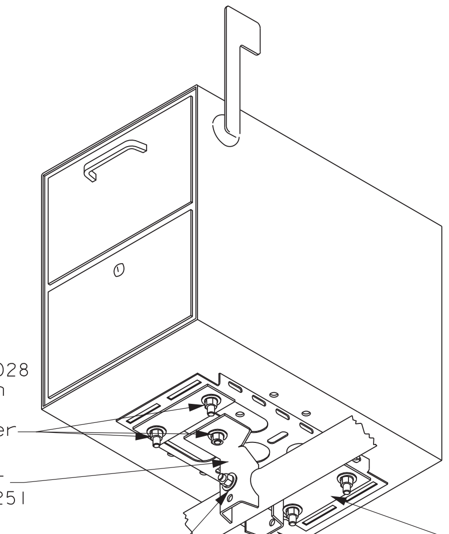
TYPE 2/4 - SINGLE XL MAILBOX



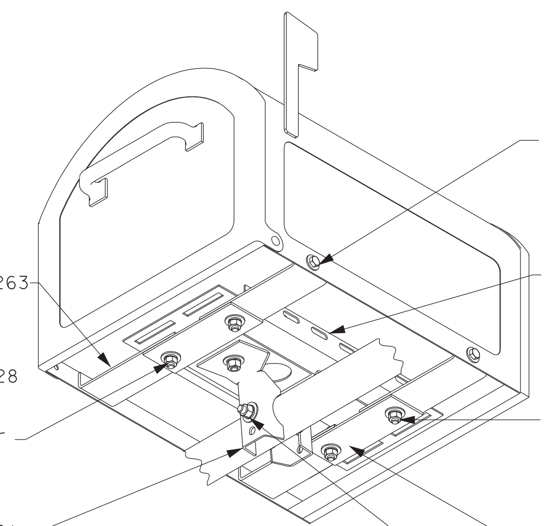
NOTE:

Follow same configuration when mounting an XL mailbox on a Type 4 multi post.

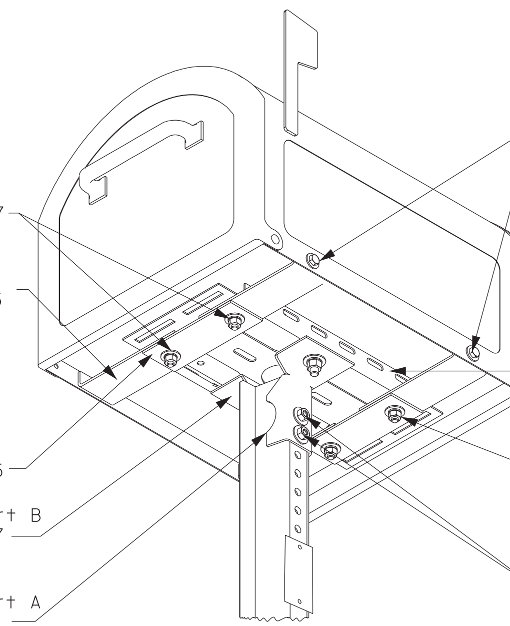
TYPE 1 MULTI – LOCKABLE ARCHITECTURAL (LA)



TYPE 1 MULTI – XL MAILBOX



TYPE 3 - XL MAILBOX MOUNTING



Texas Department of Transportation — Maintenance Division Standard

XL AND LOCKABLE ARCHITECTURAL MAILBOX ASSEMBLY

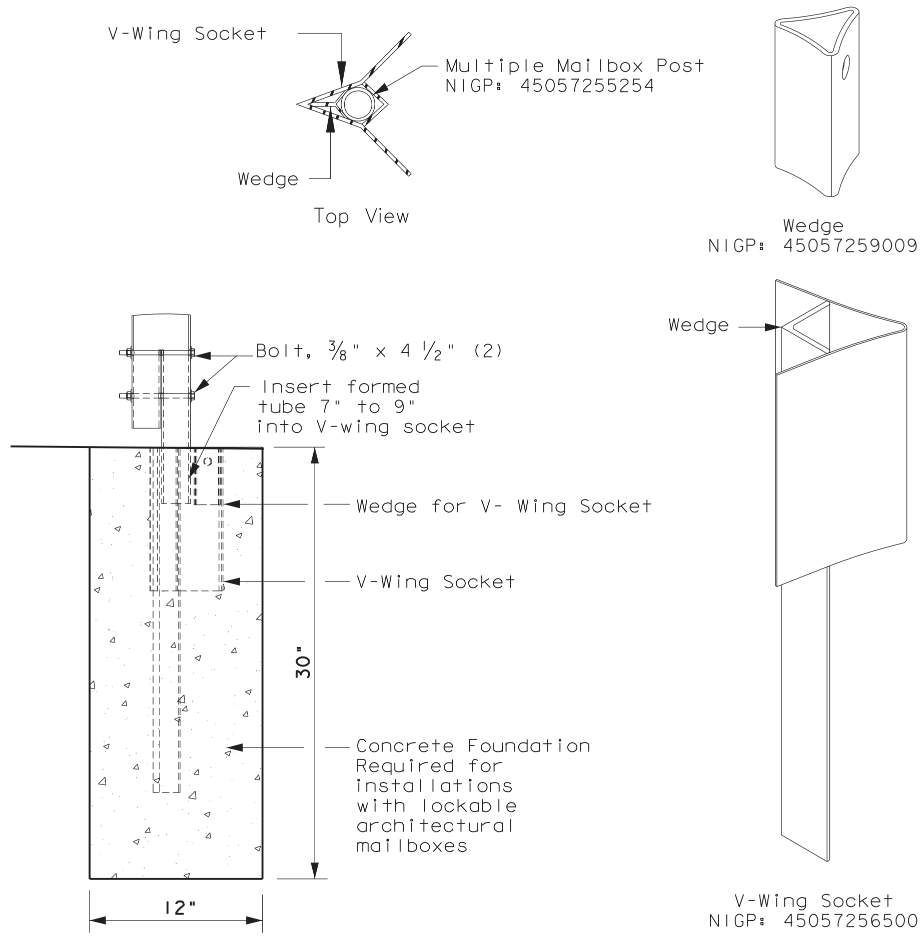
MB(2)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015	0809	02	069	US 96
6/2005 1/2011	DIST		COUNTY	SHEET NO.
11/2006 7/2014	LFK		SHELBY	184

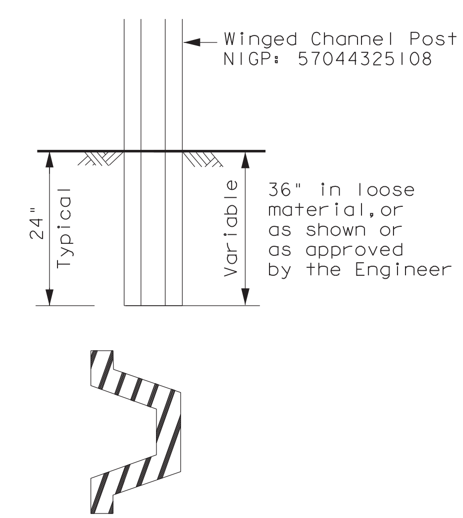
DATE: 11/2/2021 3:43:49 PM
FILE: H:\proj\R306068.02 - TxDOT - 36-61DP5428 - 1958 - WA 2\10 CADD & BIM\...

TYPE 1 - SUPPORT/FOUNDATION

Thin Wall Tube w/ V-LOC Anchorage



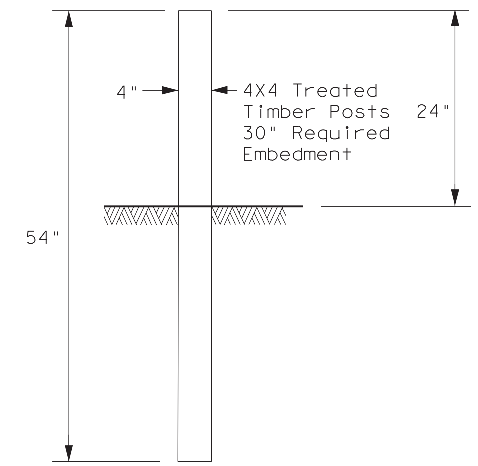
TYPE 3 - SUPPORT/FOUNDATION



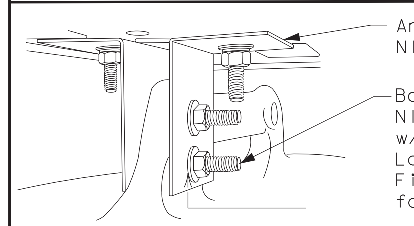
NOTES:

1. Attach Object Marker (OM) facing direction of traffic.
2. OM will also be required on opposite side if installed on a 2-Lane, 2-Way roadway.

TYPE 5 - SUPPORT/FOUNDATION



TYPE 6 - TEMPORARY MAILBOX SUPPORT



Plastic Drum NIGP: 55093383655
Rubber Collar NIGP: 55093387102

NOTES:

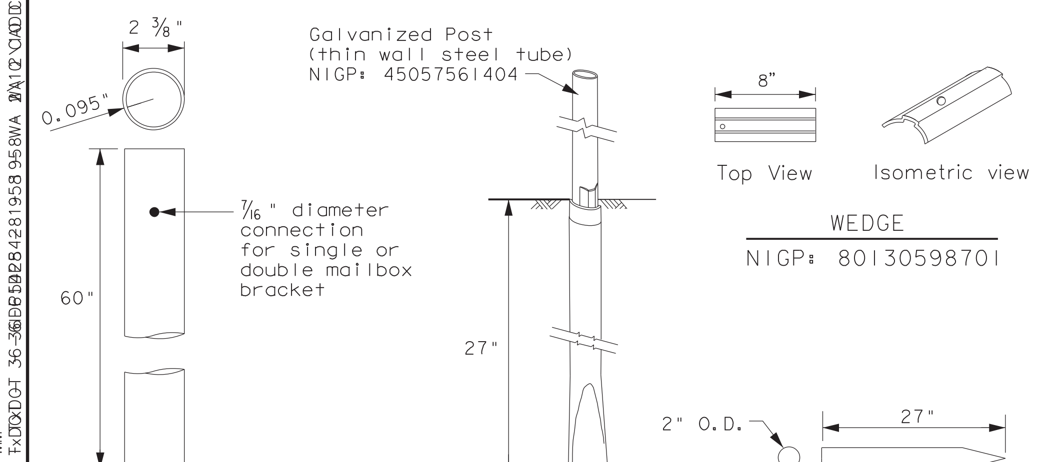
1. Place on approved plastic drum as shown in the Compliant Work Zone Traffic Control Devices (CWZTCD).
2. Existing attachment hardware shall be used unless damaged. Damaged hardware shall be replaced.

GENERAL NOTES:

1. Erect post plumb or vertical.
2. When galvanized part is required galvanize in accordance with Item 445.
3. 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, only on Type 1, Type 2, and Type 4

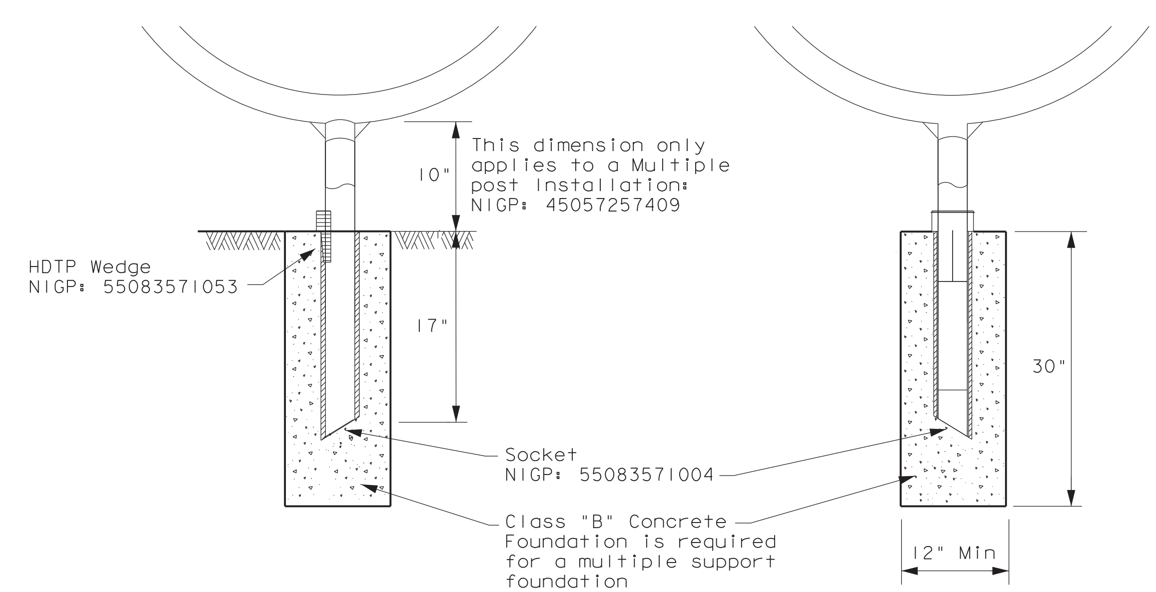
TYPE 2 - SUPPORT/FOUNDATION

Thin Wall Steel Tube w/Wedge Anchor System



TYPE 4 - SUPPORT/FOUNDATION

Whitecoated steel post NIGP: 45057561107
Multiple post NIGP: 45057257409
Recycled Rubber post (RR) NIGP: 45057561057



SHEET 3 OF 4

Texas Department of Transportation

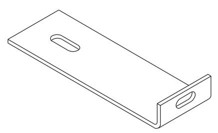
Maintenance Division Standard

MAILBOX SUPPORT AND FOUNDATION

MB(3)-21

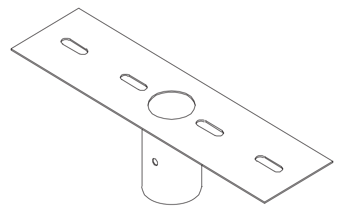
FILE: MB-21.dgn	DN:	CK:	DW:	CK:
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015 6/2005 1/2011 11/2006 7/2014	0809	02	069	US 96
	DIST		COUNTY	SHEET NO.
	LFK		SHELBY	185

TYPE	TYPE 1	TYPE 2	TYPE 3	TYPE 4			TYPE 5	TYPE 6
Configuration	Multiple	Single or Double	Single or Double	Single	Double	Multiple	Single	Single
Mailbox Size NIGP #	Outside Position: S or M Inside Position: S, M, L, XL, or LA	Single: S, M, L, XL, or LA Double: SS, SM, MM	Single: S, M, L, or XL Double: SS, SM, MM	S, M, L, XL, or LA	SS, SM, or MM	Outside Position: S or M Inside Position: S, M, L, or XL	Molded Plastic	S, or M
Mailbox Post NIGP #	45057255254 (Galvanized Multiple)	45057561404 (Thin Walled Gavanize)	57044325108 (Wing Channel Post)	45057561107 (Thin walled white powder coated) 45057561057 (Recycled Rubber Post: S or M only)	45057561107 (Thin Walled White Powder Coated)	45057257409 (White Powder Coated Multiple)	4x4 Timber	Construction Barrel
Post and Mailbox Hardware NIGP #	45057259009 (Wedge) 45057256500 (V-Wing Socket) 45057253002 (Bracket Extension) 45057252251 (Mailbox Bracket) 45057258001 (Part A Angle Bracket x2) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	80130598701 (Wedge) 80130238407 (Wedge Anchor) 45057253002 (Bracket Extension) 45057252343 (Double MB Bracket) 45057252350 (S. Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket forXL x4)	45057541653 (Type 3 Double Mailbox Bracket) 45057252251 (Mailbox Bracket) 45057253002 (Bracket Extension) 45057258001 (Part A Angle Bracket) 45057258027 (Part B Angle Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057252350 (Single Mailbox Bracket) 45057253002 (Bracket Extension) 45057250255 (Plate Washer for XL/LA x2) 45057250263 (L-Bracket for XL x4)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252343 (Double Mount Bracket) 45057252251 (Mailbox Bracket x2)	55083571053 (Wedge) 55083571004 (Socket) 45057253002 (Bracket Extension) 45057252350 (Single Mount Bracket) 45057250255 (Plate Washer for XL x2) 45057250263 (L-Bracket for XL x4)	None	45057251055 Angle Bracket (x2)
Foundation Used	Class B Concrete (Required for LA Mailboxes)	Class B Concrete (Required for LA Mailboxes)	None	Class B Concrete (not used with recycled rubber post, required for LA Mailboxes)	Class B Concrete (not required)	Class B Concrete	None	None



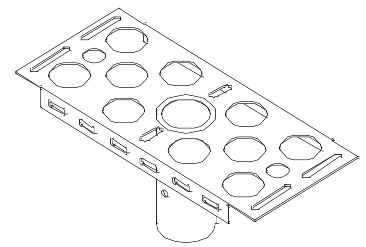
NIGP: 45057250263

L-Bracket x4 for XL sized mailboxes



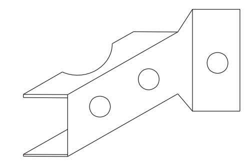
NIGP: 45057252343

Double Mailbox Bracket
For Type 2 and Type 4 double mount



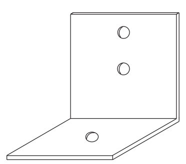
NIGP: 45057252350

Single Mailbox Bracket
For Type 2 single and for Type 4 single and multi mount



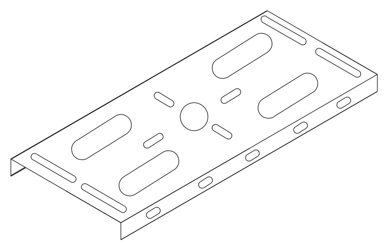
NIGP: 45057258001

Part "A" Angle Bracket
For Type 1 multi (2 per mailbox) and Type 3 single and double



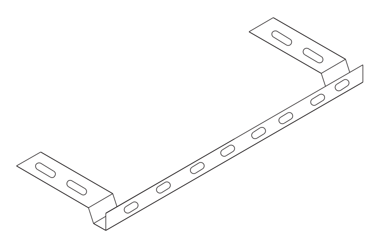
NIGP: 45057251055

Type 6 Angle Bracket
(2 per mailbox)



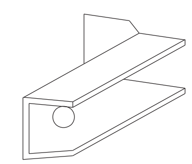
NIGP: 45057252251

Mailbox Bracket
For Type 1 multi and any double mount (use 2)



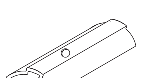
NIGP: 45057253002

Bracket Extension
Use 1 for a medium Mailbox
Use 2 for a Large Mailbox



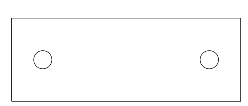
NIGP: 45057258027

Part "B" Angle Bracket
For Type 3 single and double



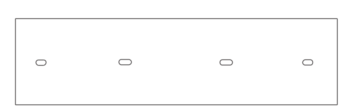
NIGP: 80130598701

Wedge for Type 2



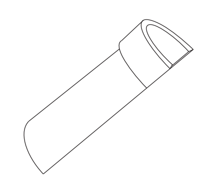
NIGP: 45057250255

Plate Washer for Architecural and XL Mailboxes



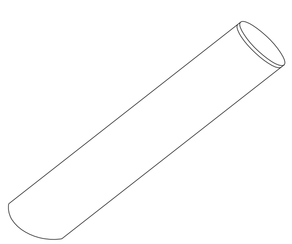
NIGP: 45057541653

Type 3 double mailbox bracket



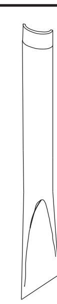
NIGP: 55083571053

Type 4 Mailbox Wedge



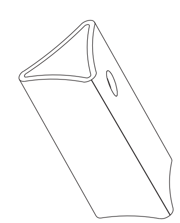
NIGP: 55083571004

Type 4 Mailbox Socket



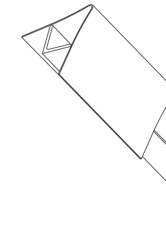
NIGP: 80130238407

Type 2 Wedge Anchor



NIGP: 45057259009

Wedge for Type 1 V-wing Socket



NIGP: 45057256500

V-wing Socket for Type 1 Foundation

NIGP #	OBJECT MARKERS AND CONFORMABLE SHEETING
55008311759	Type 2 OM 4"x4" (3 Needed) for Type 3 Wing Channel Post
55008312906	Type 2 OM 6"x12" (1 needed) for Type 3 Wing Channel Post
80149872006	12" Conformable Reflective Yellow Sheeting for Flexible Posts

NOTES:

1. Type 2 object marker in accordance with Traffic Engineering Standard Delineators & Object Markers.
2. A light weight receptacle for newspaper delivery can be attached to mailbox posts if the receptacle does not touch the mailbox, present a hazard to traffic or delivery of the mail, extend beyond the front of the mailbox, or display advertising, except the publication title.

BID CODES FOR CONTRACTS

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

Type of Mailbox
- S = Single
- D = Double
- M = Multiple
- MP = Molded 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

SHEET 4 OF 4

Texas Department of Transportation

Maintenance Division Standard

NIGP PARTS LIST AND COMPATIBILITY

MB(4)-21

FILE: MB-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT March 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS 2/2005 11/2009 4/2015	0809	02	069	US 96
6/2005 1/2011	DIST		COUNTY	SHEET NO.
11/2006 7/2014	LFK		SHELBY	186