INDEX OF SHEETS

SEE PLAN SHEET 2

STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

DESIGN SPEED- N/A

ADT-16,600

FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
6	C 111-9-44		1
STATE	DIST.	COUNTY	
TEXAS	HOU	BRAZORIA	
CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B, ETC.

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

BRAZORIA COUNTY
BS 288B, LOOP 274
CSJ 0111-09-044, ETC.

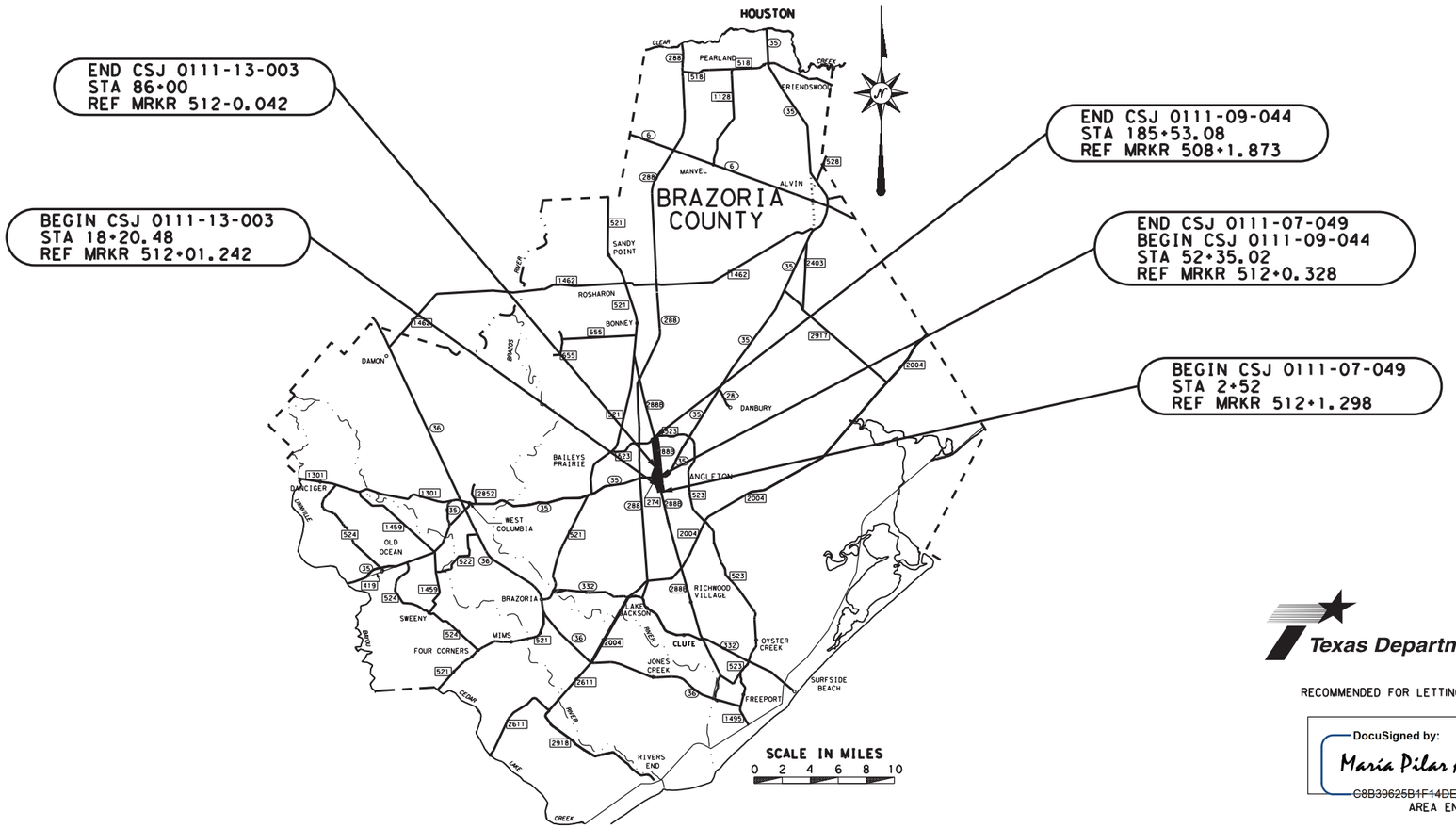
STATE PROJECT NO. C 111-9-44

TOTAL LENGTH OF PROJECT: 26,922.55 FT = 5.098 MILES

LIMITS: FROM SH 35 TO FM 523

FOR THE CONSTRUCTION OF ASPHALT CONCRETE PAVEMENT OVERLAY CONSISTING OF PAVEMENT REPAIR, SEAL COAT, ASPHALT CONCRETE PAVEMENT OVERLAY, SIGNING AND STRIPING

HIGHWAY NUMBER	CSJ	NET LENGTH	
		FEET	MILES
BS 288B	0111-09-044	15,160.01	2.871
BS 288B	0111-07-049	4,983.02	0.943
LOOP 274	0111-13-003	6,779.52	1.284
	TOTAL	26,922.55	5.098



PROJECT VICINITY MAP

RAILROAD CROSSING: ONE (UNION PACIFIC RAILROAD)
EXCEPTIONS: NONE
EQUATIONS: ONE

Texas Department of Transportation®

RECOMMENDED FOR LETTING: 1/20/2022

DocuSigned by:
María Pilar Aponte, P.E.
C8B39625B1F14DE...
AREA ENGINEER

APPROVED FOR LETTING: 2/2/2022

DocuSigned by:
Larry W. Blackburn, P.E.
B9928A69E03E42F...
FOR DISTRICT ENGINEER

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

1/20/2022
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STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

THE STANDARD SHEETS (#) SPECIFICALLY INDENTIFIED ABOVE, HAVE BEEN SELECTED BY ME OR UNDER MY RESPONSIBLE SUPERVISION AS BEING APPLICABLE TO THIS PROJECT.

Eugene Ampomah, P.E.

01.02.2022

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		2

SHEET 1 OF 1

2/1/2022
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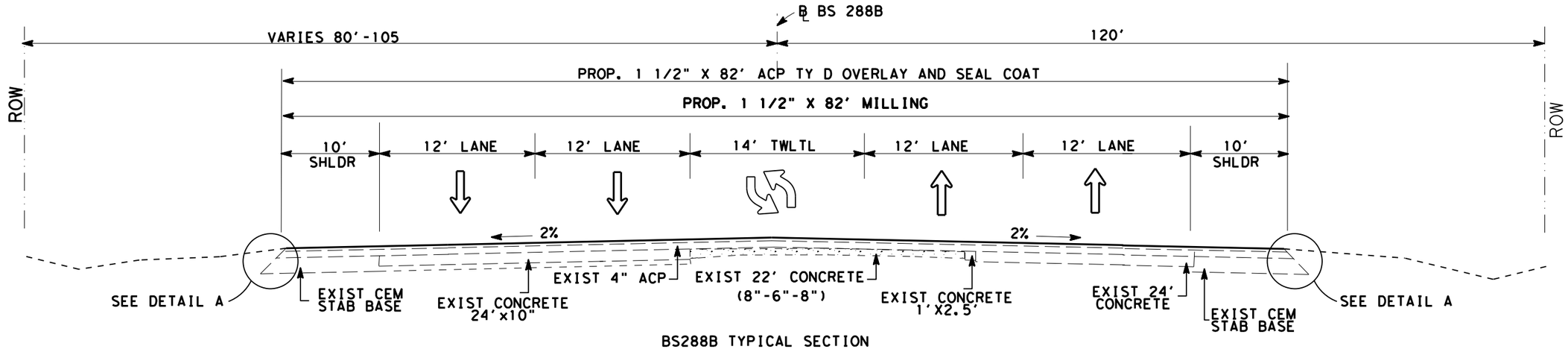
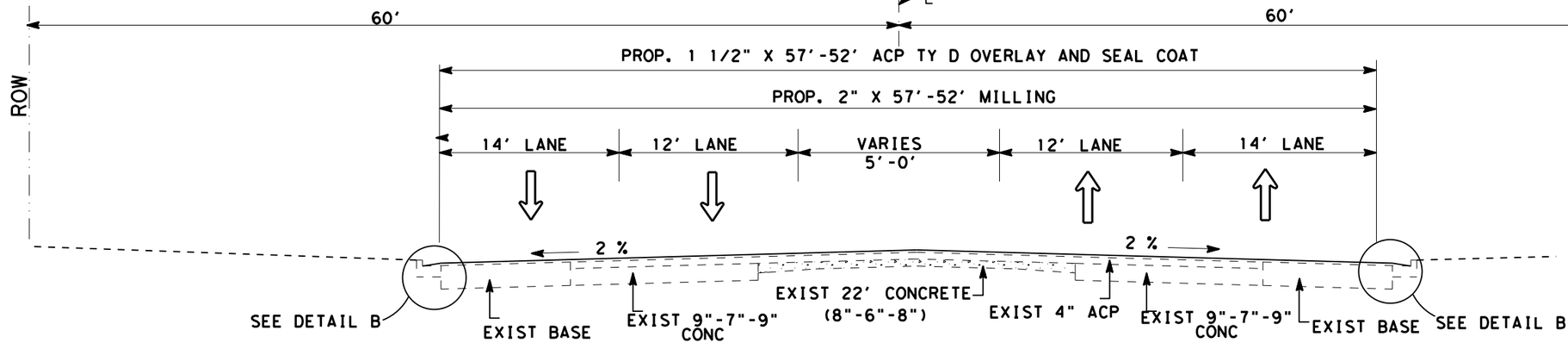


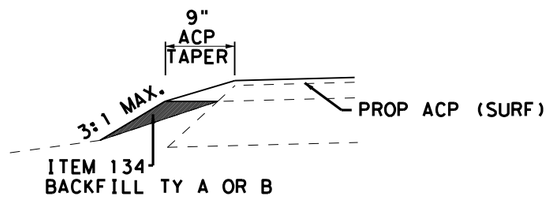
BS288B TYPICAL SECTION

STA 2+52 TO STA 18+20.48



BS288B TYPICAL SECTION

STA 30+11.77 TO STA 34+53.60



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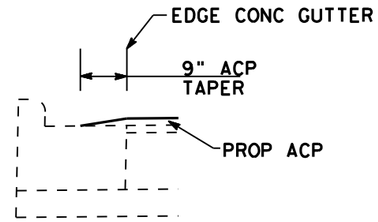

DETAIL B

NOTES:

1. PAY SCHEDULE 3 WILL BE USED ON THIS PROJECT.
2. REMOVE EXISTING VEGETATION IN PREPARATION OF PLACING HOT MIX.
3. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
4. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD

SCALE N.T.S
SHEET 1 OF 5

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.02.2022

BS 288B TYPICAL SECTIONS

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		3

1/31/2022
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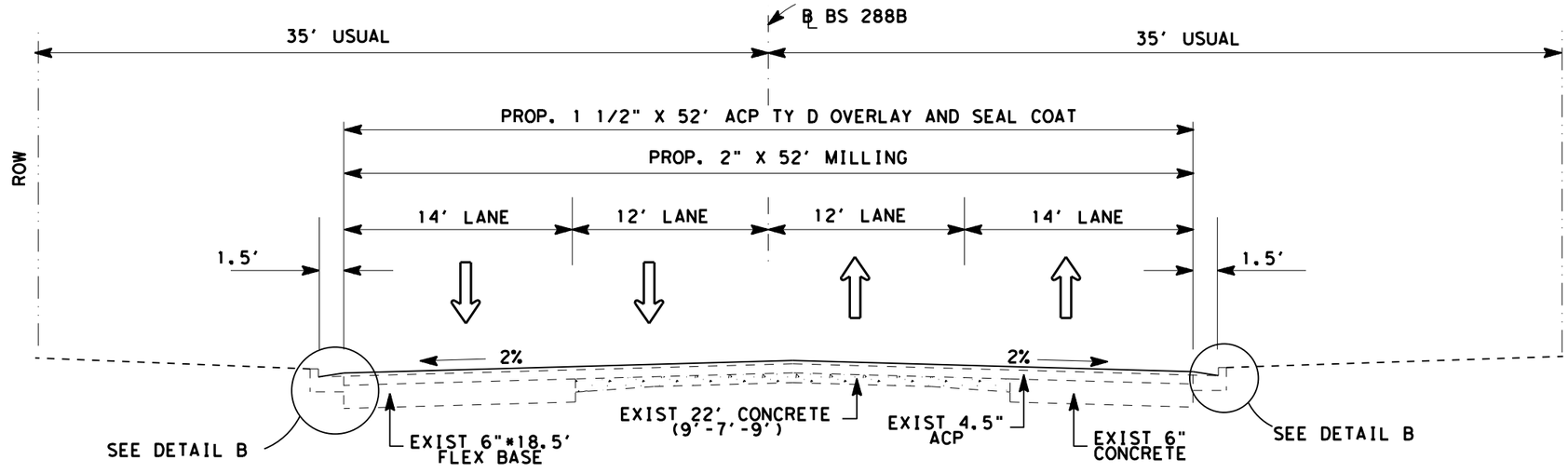
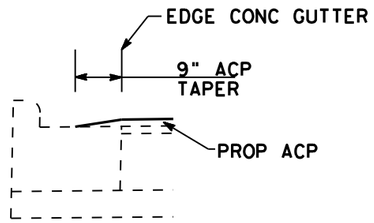


BS288B TYPICAL SECTION

STA 34+53.60 TO STA 52+00



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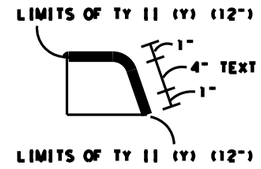

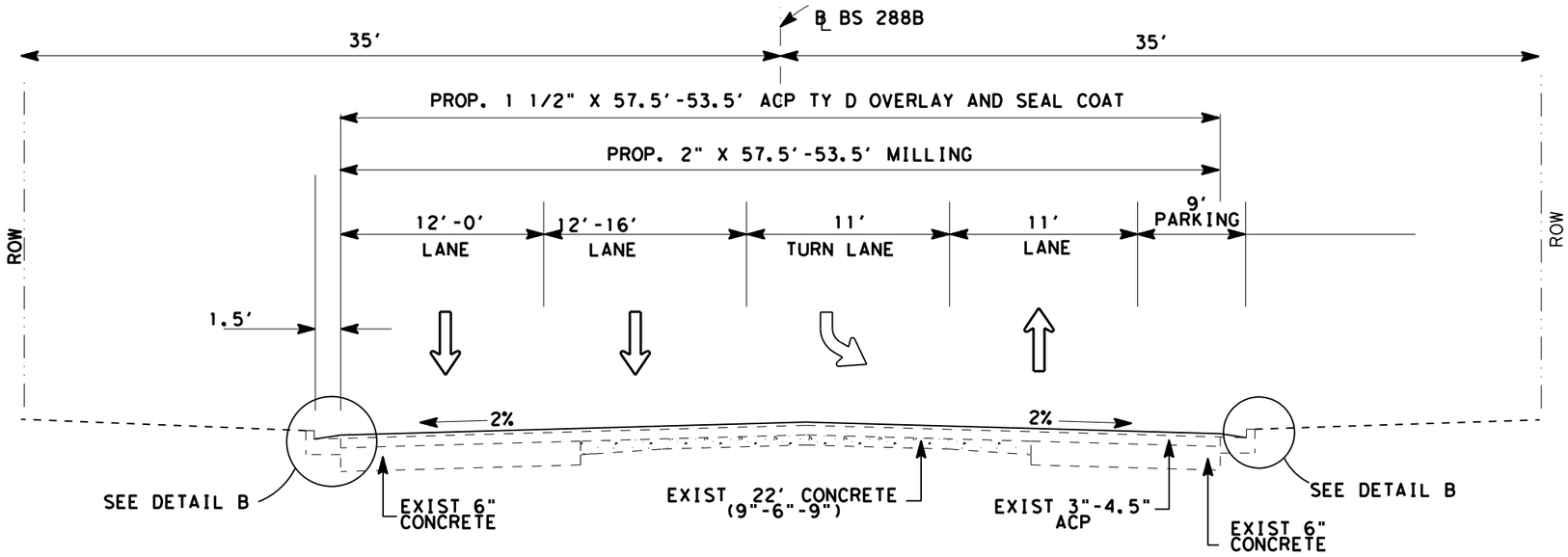

BS288B TYPICAL SECTION

STA 52+73 TO STA 55+51.59

NOTES:

1. PAY SCHEDULE 3 WILL BE USED ON THIS PROJECT.
2. REMOVE EXISTING VEGETATION IN PREPARATION OF PLACING HOT MIX.
3. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
4. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD

SCALE N.T.S
SHEET 2 OF 5

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.02.2022

BS 288B
TYPICAL SECTIONS

Texas Department of Transportation®

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		4

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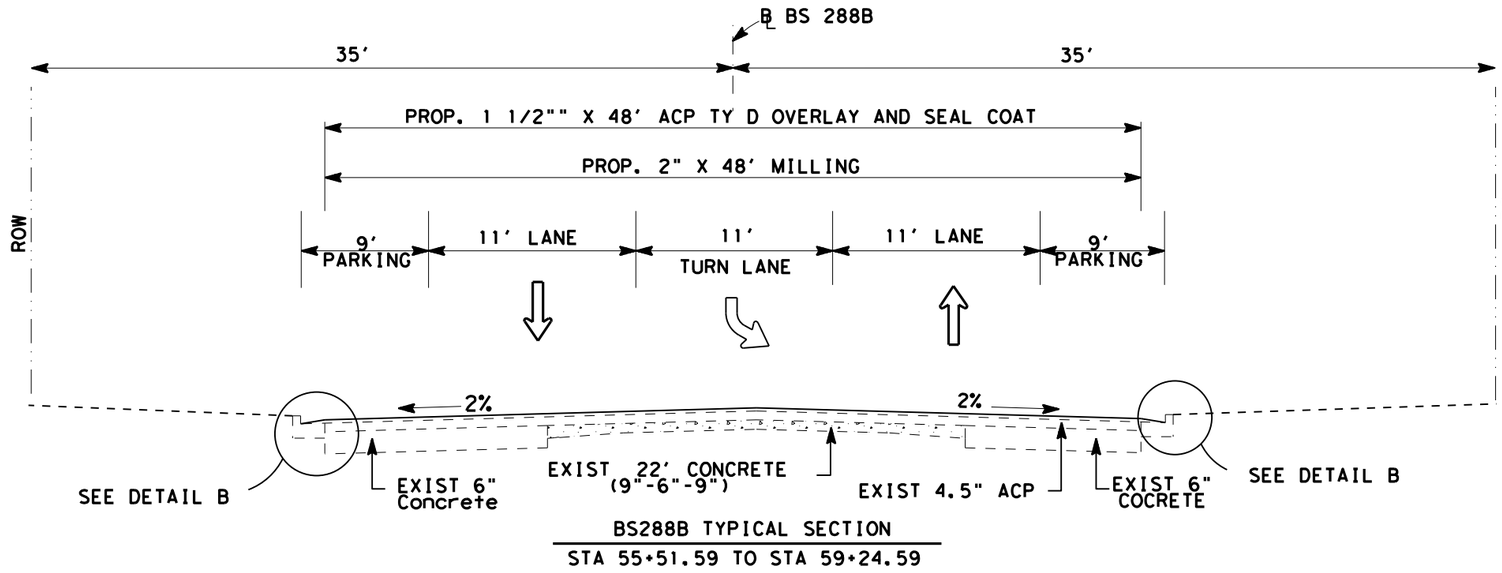
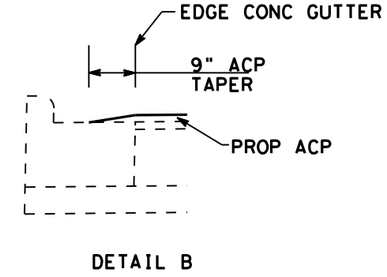


BS288B TYPICAL SECTION

STA 55+51.59 TO STA 59+24.59



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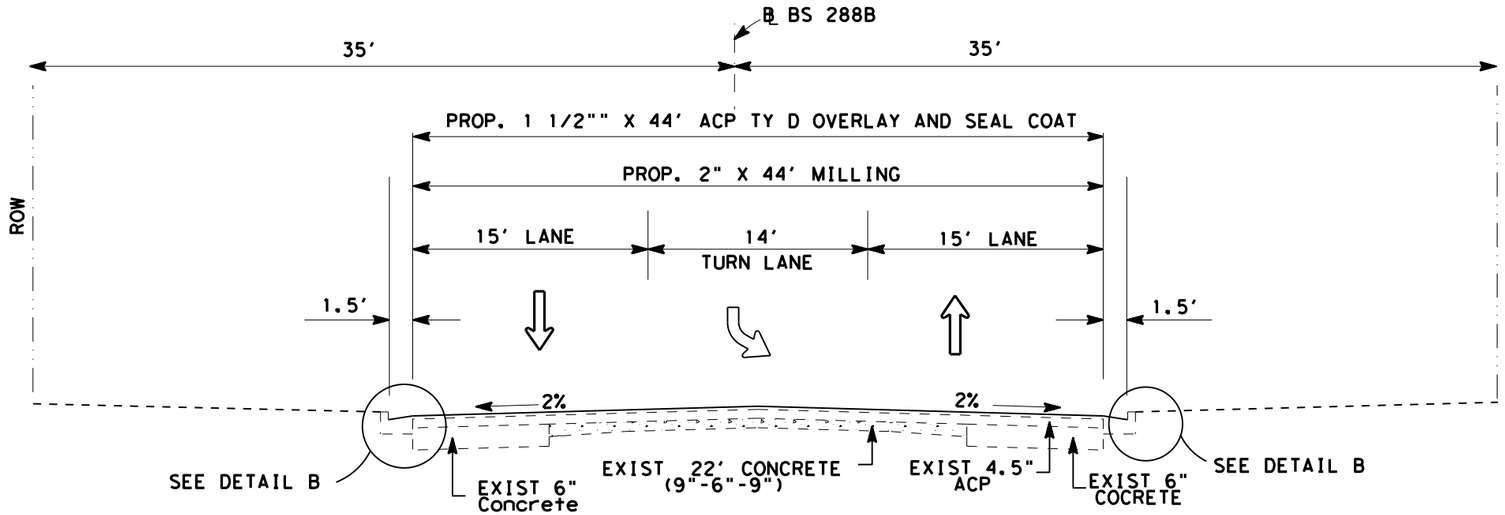
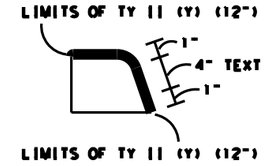


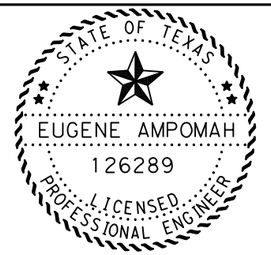
BS288B TYPICAL SECTION

STA 59+24.59 TO STA 71+08.97



NOTES:

1. PAY SCHEDULE 3 WILL BE USED ON THIS PROJECT.
2. REMOVE EXISTING VEGETATION IN PREPARATION OF PLACING HOT MIX.
3. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
4. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD



Eugene Ampomah, P.E.

01.02.2022

BS 288B
TYPICAL SECTIONS

Texas Department of Transportation®

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		5

SCALE N.T.S
SHEET 3 OF 5

1/31/2022
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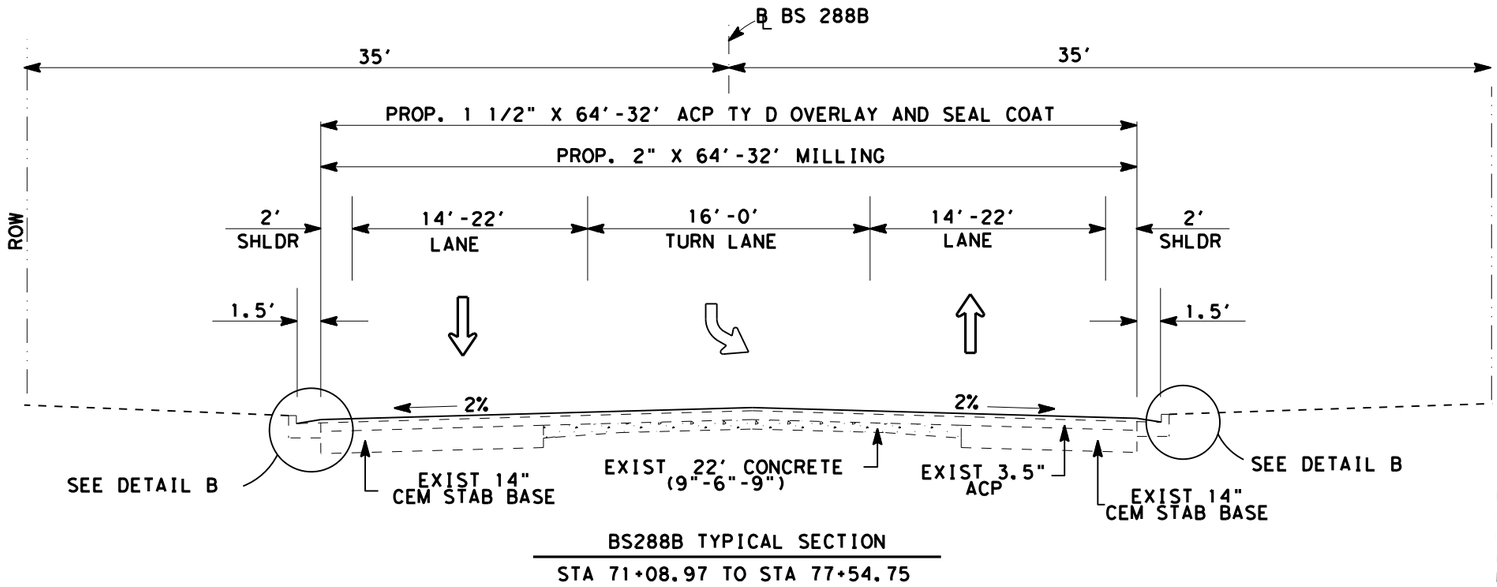
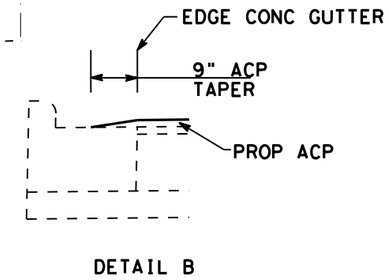


BS288B TYPICAL SECTION

STA 71+08.97 TO STA 77+54.75



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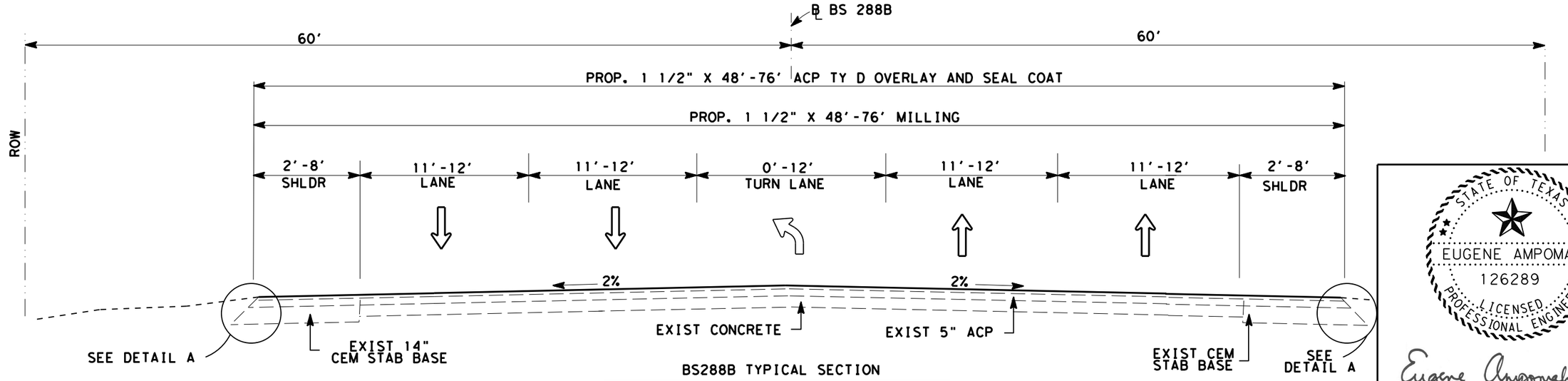
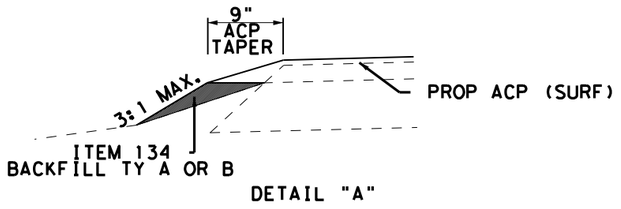


BS288B TYPICAL SECTION

STA 77+54.75 TO STA 84+49.47

TRANSITION STA 77+54.75 TO 81+71.11



DETAIL "A"

NOTES:

1. PAY SCHEDULE 3 WILL BE USED ON THIS PROJECT.
2. REMOVE EXISTING VEGETATION IN PREPARATION OF PLACING HOT MIX.
3. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
4. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD

SCALE N.T.S

SHEET 4 OF 5

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.02.2022

BS 288B TYPICAL SECTIONS

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		6

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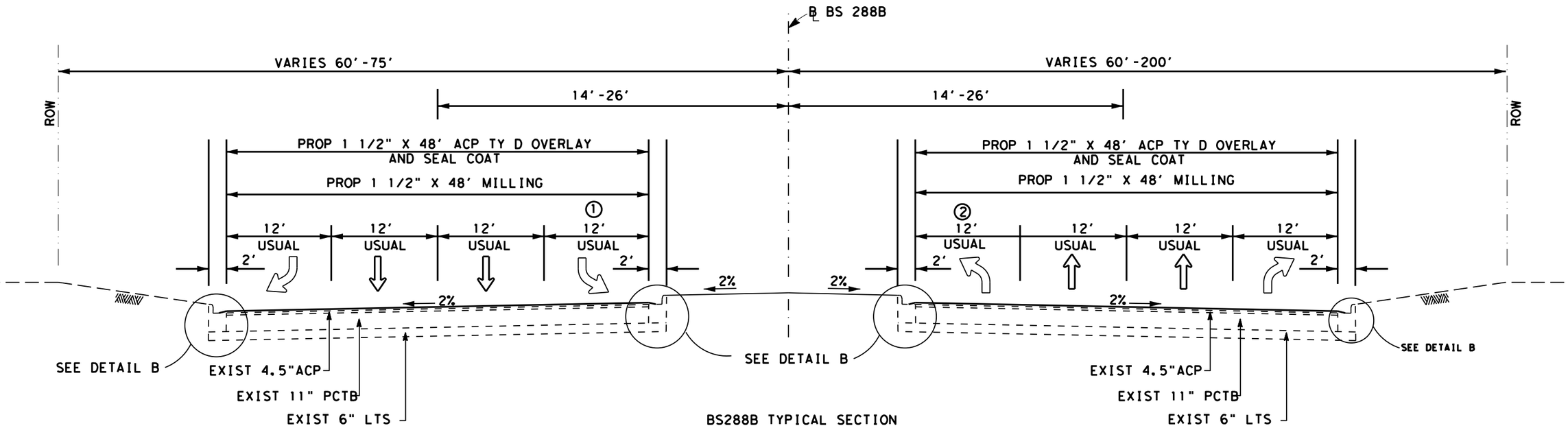
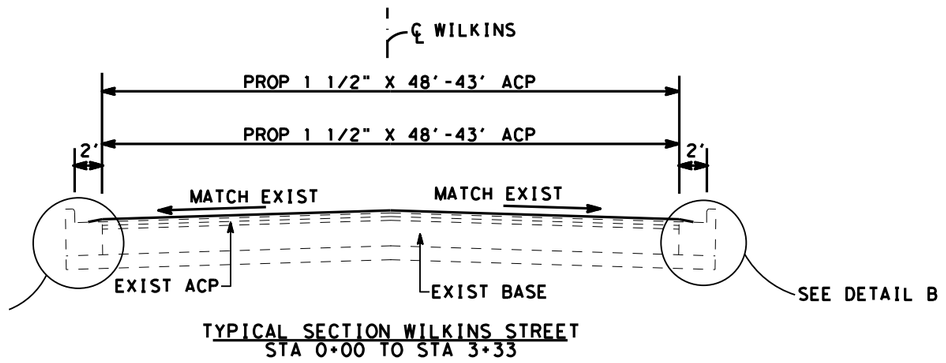


BS288B TYPICAL SECTION

STA 84.84.39 (FWD) TO STA 91+83.88

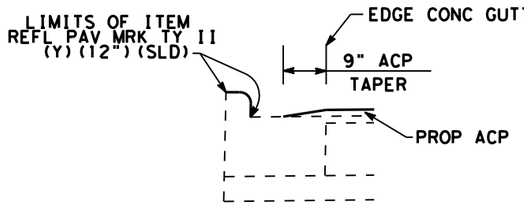
① STA 85+33.44 TO STA 87+23.37 (12')
STA 87+23.37 TO STA 88+47.53 (12'-0')
STA 89+67 TO STA 91+83.88 (12')

② STA 88+43.14 TO STA 89+63.14 (0'-12')
STA 89+63.14 TO STA 90+36.01 (12')



SEE DETAIL B

TYPICAL SECTION WILKINS STREET
STA 0+00 TO STA 3+33



DETAIL B

1. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
2. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD

SCALE N.T.S
SHEET 2 OF 3

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.02.2022

BS 288B
TYPICAL SECTIONS

Texas Department of Transportation®

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		7

1/31/2022
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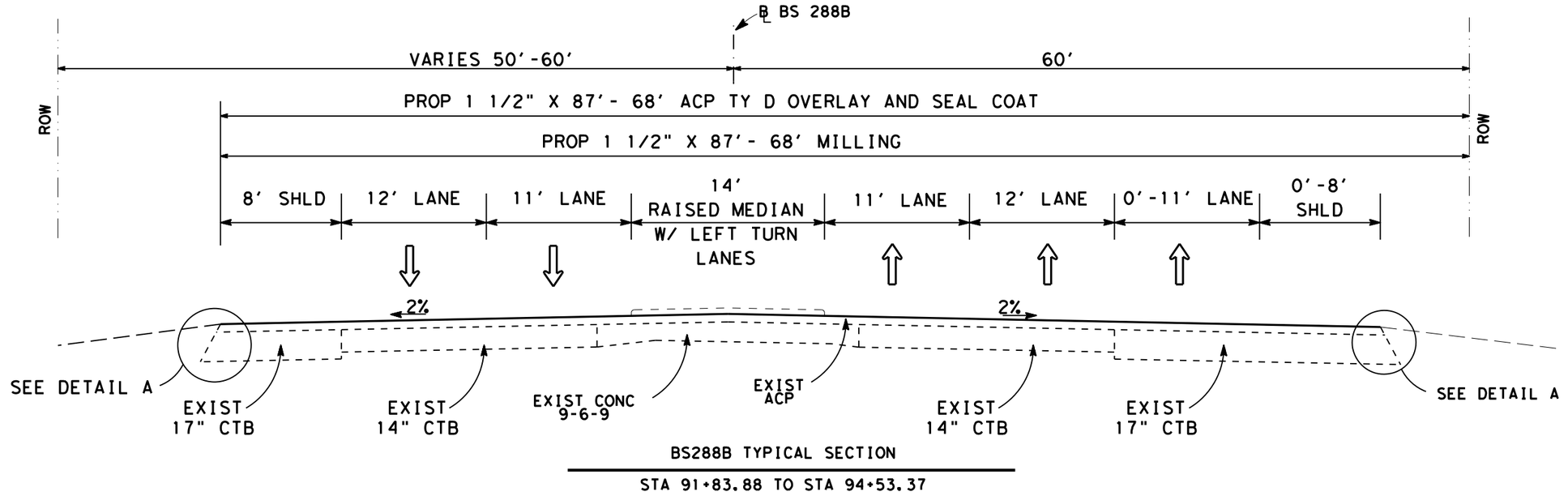
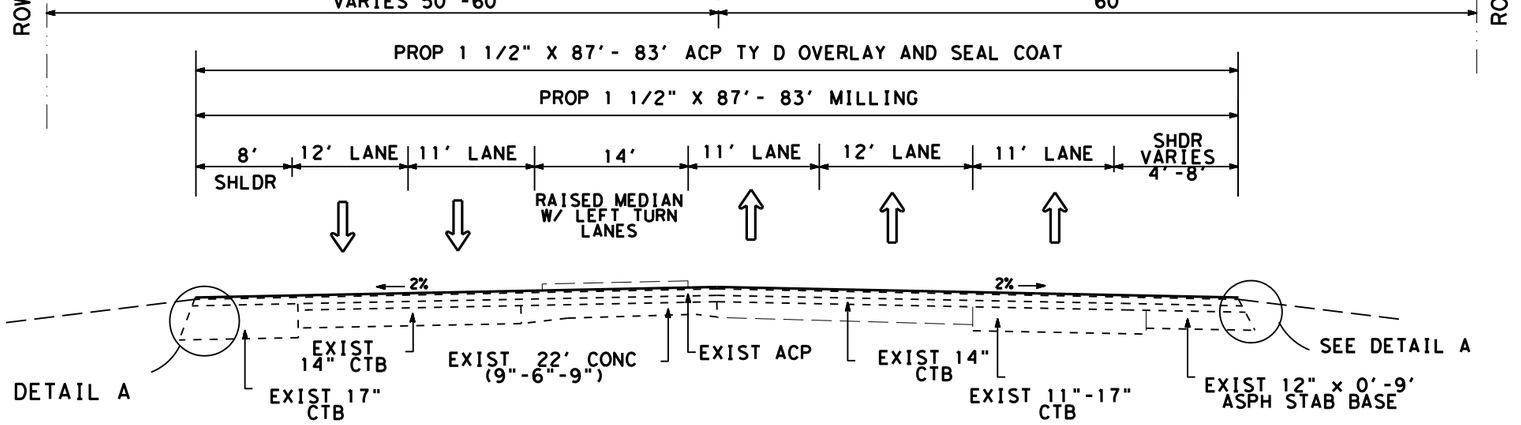


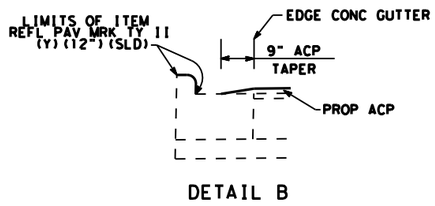
BS288B TYPICAL SECTION

STA 91+83.88 TO STA 94+53.37



BS288B TYPICAL SECTION

STA 94+53.37 TO STA 95+17.58



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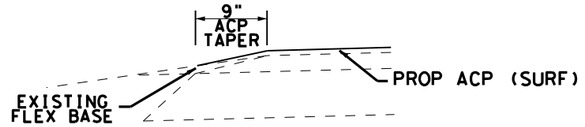

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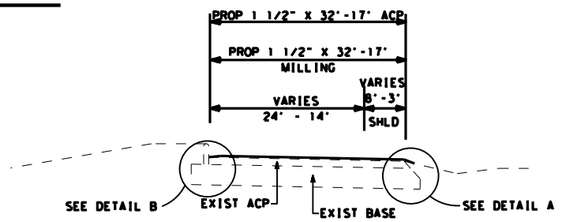

LOOP 274 TIE-IN

STA 32+75.88 TO STA 39+06.88

1. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
2. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD

SCALE N.T.S
SHEET 3 OF 3

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.02.2022

BS 288B TYPICAL SECTIONS

Texas Department of Transportation®

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
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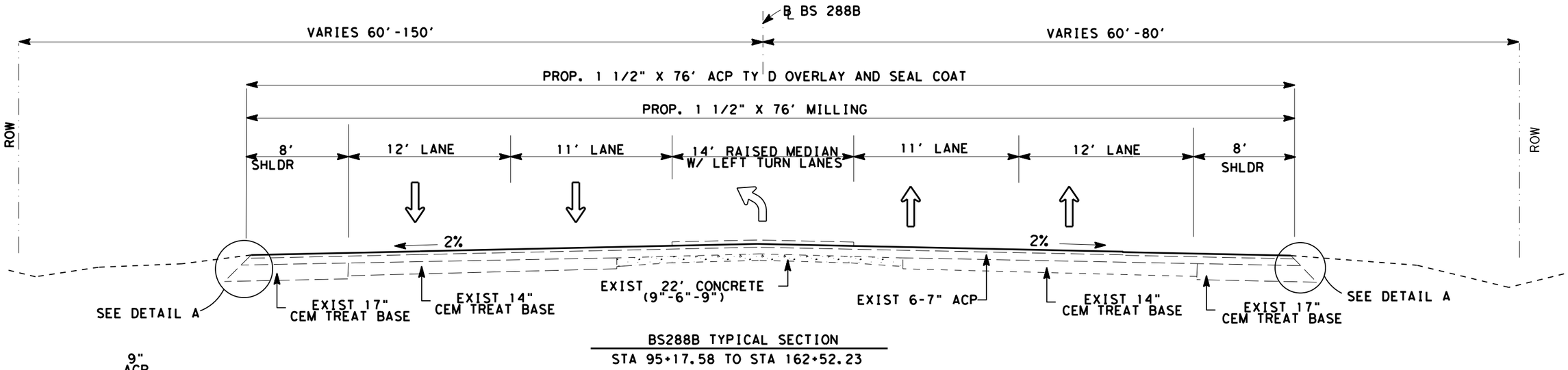
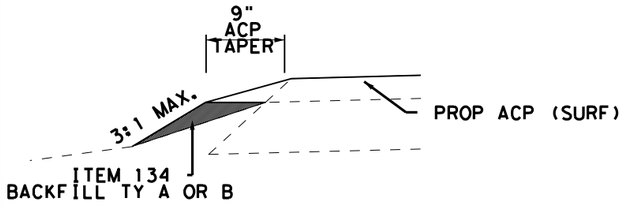


BS288B TYPICAL SECTION

STA 95+17.58 TO STA 162+52.23



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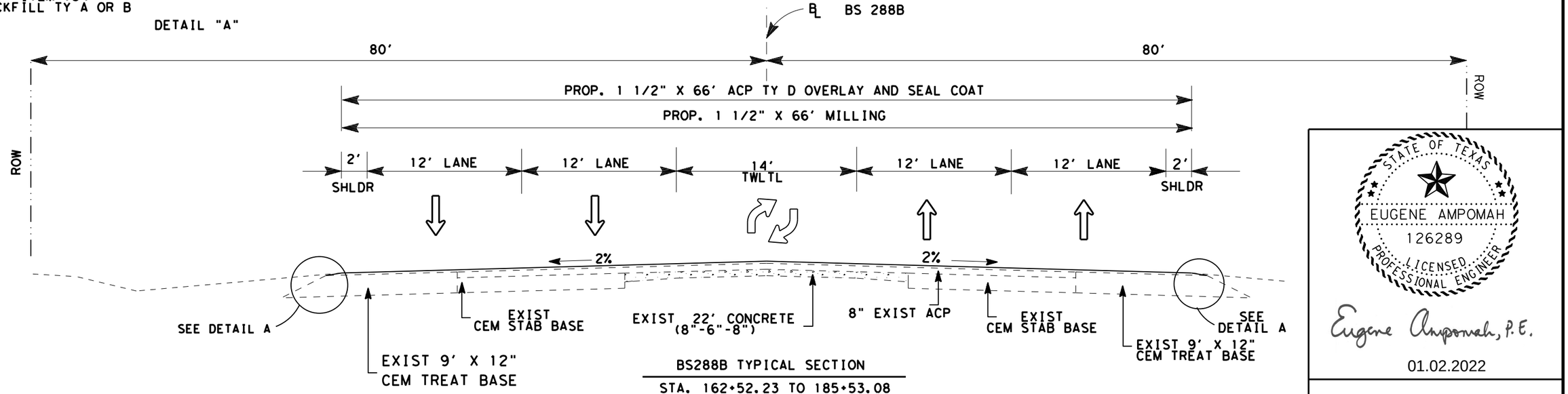

BS288B TYPICAL SECTION

STA. 162+52.23 TO 185+53.08

NOTES:

1. PAY SCHEDULE 3 WILL BE USED ON THIS PROJECT.
2. REMOVE EXISTING VEGETATION IN PREPARATION OF PLACING HOT MIX.
3. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
4. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.02.2022

BS 288B TYPICAL SECTIONS

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
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HOU	BRAZORIA		9

SCALE N.T.S
SHEET 5 OF 5

1/31/2022
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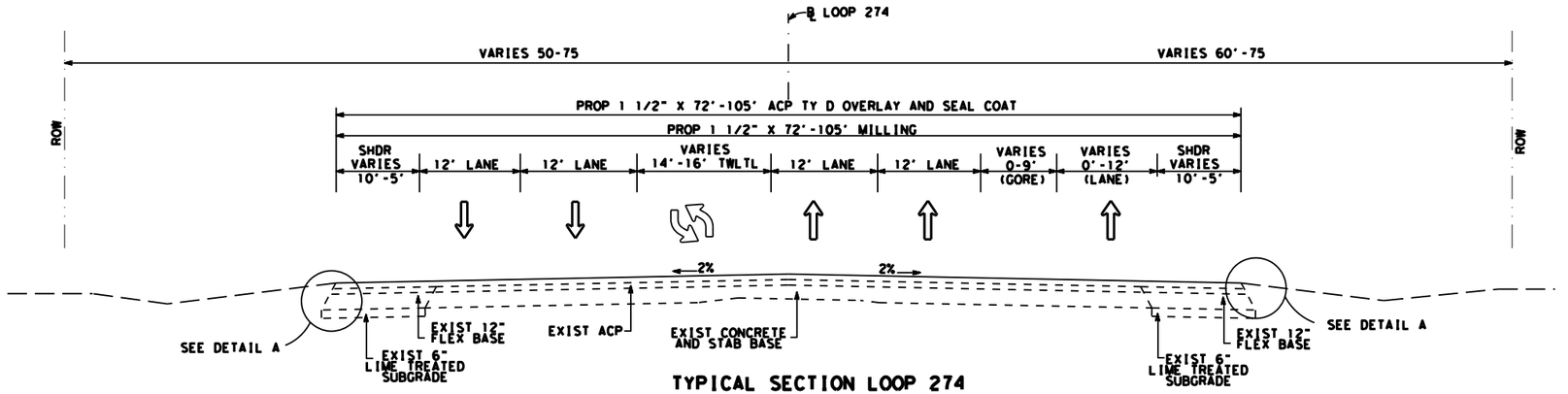
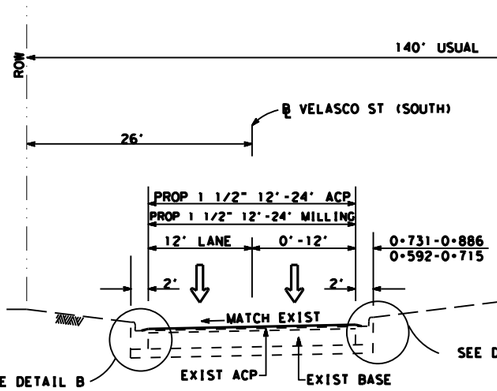


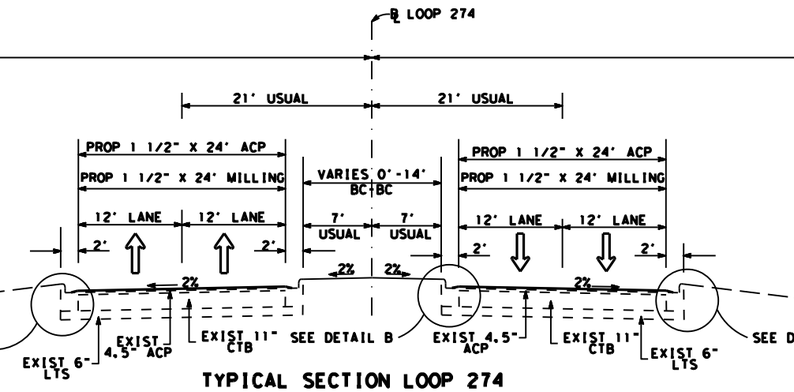
TYPICAL SECTION LOOP 274

STA 18+20.48 TO STA 19+93.17



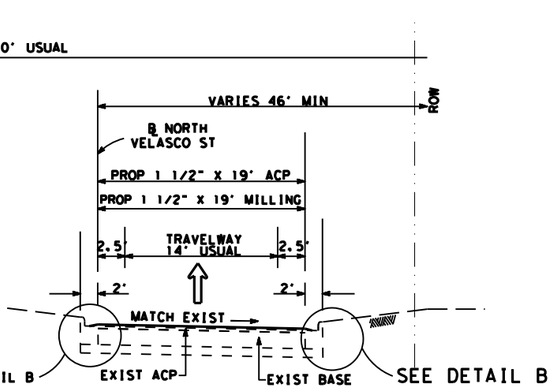
VELASCO STREET (SOUTH)

STA 19+93.17 TO STA 28+41.17



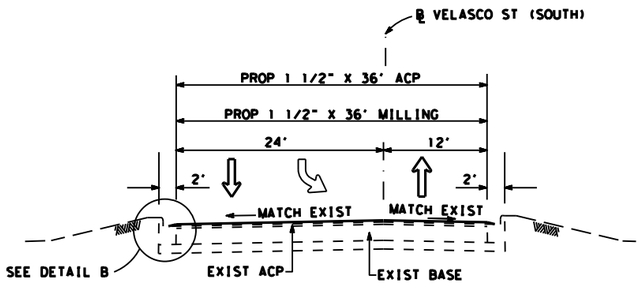
TYPICAL SECTION LOOP 274

STA 19+93.17 TO STA 27+60.83



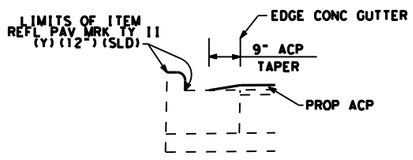
VELASCO STREET (NORTH)

STA 19+93.17 TO STA 26+24.64



VELASCO STREET (SOUTH)

STA 28+14.17 TO STA 29+78



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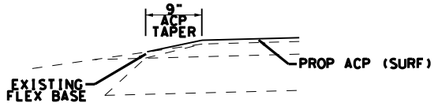

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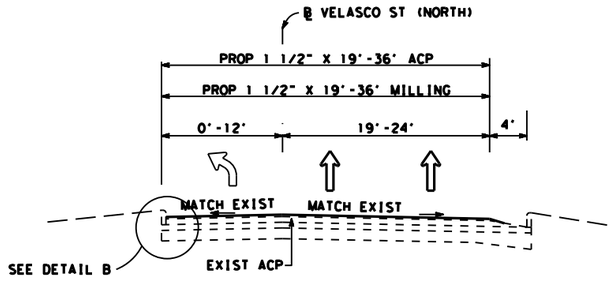

VELASCO STREET (NORTH)

STA 26+24.64 TO STA 30+11.77

1. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
2. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.02.2022

LOOP 274
TYPICAL SECTIONS

Texas Department of Transportation®

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		10

SCALE N.T.S
SHEET 1 OF 3

1/31/2022
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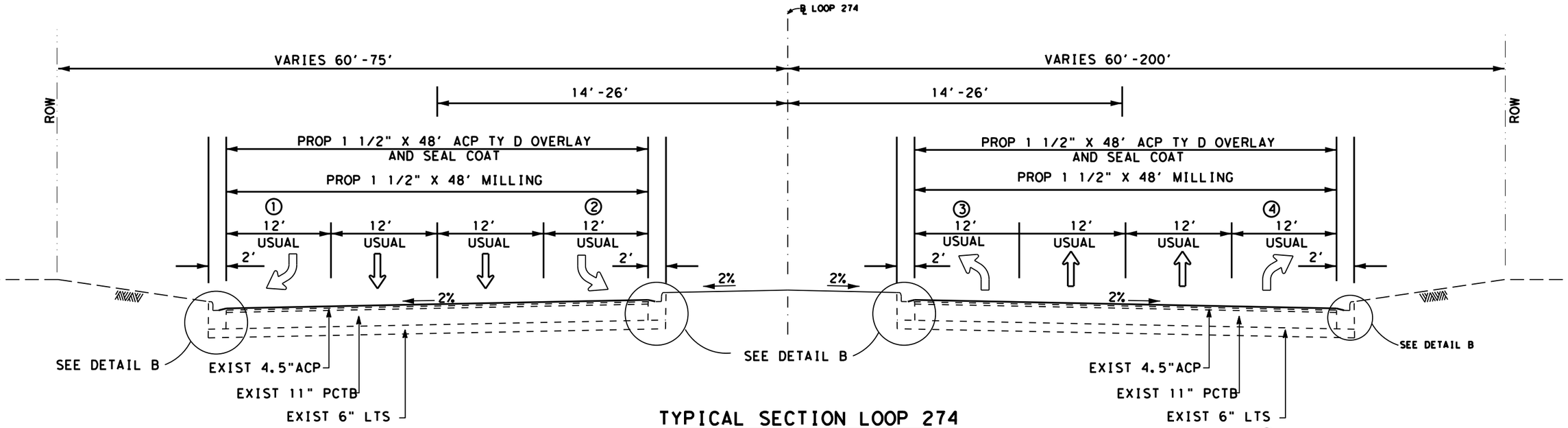


TYPICAL SECTION LOOP 274

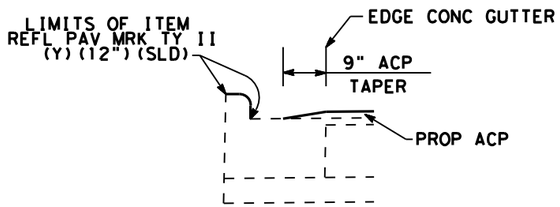
STA 35+31.81 TO STA 52+45
STA 53+54 TO STA 86+00

① STA 42+65.09 TO STA 45+27.54 (12')
STA 45+27.54 TO STA 46+91.54 (12'-0')
STA 53+70.67 TO STA 56+33.17 (12')
STA 56+33.17 TO STA 57+97.17 (12'-0')
STA 64+58.00 TO STA 65+68.03 (12')
STA 65+68.03 TO STA 67+18.03 (12'-0')

② STA 42+65.09 TO STA 45+27.54 (12')
STA 45+27.54 TO STA 46+91.54 (12'-0')
STA 53+70.67 TO STA 56+33.17 (12')
STA 56+33.17 TO STA 57+97.17 (12'-0')
STA 64+58.00 TO STA 66+35.52 (12')
STA 66+35.52 TO STA 67+39.19 (12'-0')
STA 72+31.32 TO STA 75+11.58 (12')
STA 75+11.58 TO STA 76+29.72 (12'-0')
STA 77+96.92 TO STA 79+18.45 (12')
STA 79+18.45 TO STA 80+00.73 (12'-0')

③ STA 38+05.73 TO STA 39+35.73 (0'-12')
STA 39+35.73 TO STA 41+66.61 (12')
STA 46+58.74 TO STA 48+22.74 (0'-12')
STA 48+22.74 TO STA 52+49.28 (12')
STA 60+83.45 TO STA 61+83.25 (0'-12')
STA 61+83.25 TO STA 63+62.41 (12')
STA 66+35.29 TO STA 67+39.19 (0'-12')
STA 67+39.19 TO STA 71+24.22 (12')
STA 75+12.07 TO STA 76+29.72 (0'-12')
STA 76+29.72 TO STA 77+14.43 (12')
STA 82+68.25 TO STA 83+55.25 (0'-12')
STA 83+55.25 TO STA 85+62.88 (12')

④ STA 38+05.73 TO STA 39+35.73 (0'-12')
STA 39+35.73 TO STA 41+66.61 (12')
STA 46+58.74 TO STA 48+22.74 (0'-12')
STA 48+22.74 TO STA 52+49.28 (12')
STA 59+64.58 TO STA 61+14.58 (0'-12')
STA 61+14.58 TO STA 63+62.41 (12')
STA 67+22.67 TO STA 68+52.67 (0'-12')
STA 68+52.67 TO STA 71+08.85 (12')



DETAIL B

1. SEE MISCELLANEOUS DETAILS FOR LIMITS OF ITEM 354
2. LIMITS OF ITEM 134 WILL BE DETERMINED BY THE ENGINEER IN THE FIELD

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.02.2022

LOOP 274
TYPICAL SECTIONS

Texas Department of Transportation®

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		11

SCALE N.T.S
SHEET 2 OF 3

1/31/2022
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FY	MSEC	HIGHWAY	RDBD	REFERENCE MARKERS BEGIN	REFERENCE MARKERS END	LEN	PTYPE	IRI(IN/MI) TEST MM/DD/YY	IRI(IN/MI) LEFT	IRI(IN/MI) RIGHT	IRI(IN/MI) SI	COMMENTS
2021	02	BS0288B	K1	0506 + 1.346	0506 + 1.446	0.1	09	8/13/2020	63	79	4.2	
2021	02	BS0288B	K1	0506 + 1.446	0506 + 1.546	0.1	09	8/13/2020	74	77	4.1	
2021	02	BS0288B	K1	0506 + 1.546	0506 + 1.646	0.1	09	8/13/2020	65	81	4.2	
2021	02	BS0288B	K1	0506 + 1.646	0506 + 1.746	0.1	09	8/13/2020	76	110	3.8	
2021	02	BS0288B	K1	0506 + 1.746	0506 + 1.846	0.1	09	8/13/2020	75	125	3.7	
2021	02	BS0288B	K1	0506 + 1.846	0508 + 0.014	0.1	09	8/13/2020	85	95	3.8	
2021	02	BS0288B	K1	0508 + 0.014	0508 + 0.114	0.1	09	8/13/2020	77	97	3.9	
2021	02	BS0288B	K1	0508 + 0.114	0508 + 0.214	0.1	09	8/13/2020	97	99	3.7	
2021	02	BS0288B	K1	0508 + 0.214	0508 + 0.314	0.1	09	8/13/2020	71	77	4.2	
2021	02	BS0288B	K1	0508 + 0.314	0508 + 0.414	0.1	09	8/13/2020	62	79	4.3	
2021	02	BS0288B	K1	0508 + 0.414	0508 + 0.514	0.1	09	8/13/2020	89	105	3.7	
2021	02	BS0288B	K1	0508 + 0.514	0508 + 0.614	0.1	09	8/13/2020	57	59	4.6	
2021	02	BS0288B	K1	0508 + 0.614	0508 + 0.714	0.1	09	8/13/2020	70	90	4.1	
2021	02	BS0288B	K1	0508 + 0.714	0508 + 0.814	0.1	09	8/13/2020	69	88	4.1	
2021	02	BS0288B	K1	0508 + 0.814	0508 + 0.914	0.1	09	8/13/2020	66	90	4.1	
2021	02	BS0288B	K1	0508 + 0.914	0508 + 1.014	0.1	09	8/13/2020	60	75	4.3	
2021	02	BS0288B	K1	0508 + 1.014	0508 + 1.114	0.1	09	8/13/2020	81	87	4.0	
2021	02	BS0288B	K1	0508 + 1.114	0508 + 1.214	0.1	09	8/13/2020	81	104	3.8	
2021	02	BS0288B	K1	0508 + 1.214	0508 + 1.314	0.1	09	8/13/2020	75	89	4.0	
2021	02	BS0288B	K1	0508 + 1.314	0508 + 1.414	0.1	09	8/13/2020	78	91	4.0	
2021	02	BS0288B	K1	0508 + 1.414	0508 + 1.514	0.1	09	8/13/2020	103	96	3.7	
2021	02	BS0288B	K1	0508 + 1.514	0508 + 1.614	0.1	09	8/13/2020	113	98	3.6	
2021	02	BS0288B	K1	0508 + 1.614	0508 + 1.714	0.1	01	8/13/2020	154	139	2.9	
2021	02	BS0288B	K1	0508 + 1.714	0508 + 1.814	0.1	01	8/13/2020	148	162	2.8	
2021	02	BS0288B	K1	0508 + 1.814	0508 + 1.914	0.1	09	8/13/2020	114	126	3.3	
2021	02	BS0288B	K1	0508 + 1.914	0510 + 0.005	0.1	09	8/13/2020	73	94	4.0	
2021	02	BS0288B	K1	0510 + 0.005	0510 + 0.105	0.1	09	8/13/2020	72	97	4.0	
2021	02	BS0288B	K1	0510 + 0.105	0510 + 0.205	0.1	09	8/13/2020	96	83	3.9	
2021	02	BS0288B	K1	0510 + 0.205	0510 + 0.305	0.1	09	8/13/2020	103	178	3.0	
2021	02	BS0288B	K1	0510 + 0.305	0510 + 0.405	0.1	09	8/13/2020	90	136	3.4	
2021	02	BS0288B	K1	0510 + 0.405	0510 + 0.505	0.1	09	8/13/2020	61	55	4.6	
2021	02	BS0288B	K1	0510 + 0.505	0510 + 0.605	0.1	09	8/13/2020	60	73	4.4	
2021	02	BS0288B	K1	0510 + 0.605	0510 + 0.705	0.1	09	8/13/2020	68	72	4.3	
2021	02	BS0288B	K1	0510 + 0.705	0510 + 0.805	0.1	09	8/13/2020	60	64	4.5	
2021	02	BS0288B	K1	0510 + 0.805	0510 + 0.905	0.1	09	8/13/2020	59	70	4.4	
2021	02	BS0288B	K1	0510 + 0.905	0510 + 1.005	0.1	09	8/13/2020	62	70	4.4	

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SCALE 1"=000'
SHEET 1 OF 3

IRI DATA
BS 288B

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		12

FY	MSEC	HIGHWAY	RDBD	REFERENCE MARKERS BEGIN	REFERENCE MARKERS END	LEN	PTYPE	IRI(IN/MI) TEST MM/DD/YY	LEFT	RIGHT	SI	COMMENTS
2021	02	BS0288B	K1	0510 + 1.005	0510 + 1.105	0.1	09	8/13/2020	57	62	4.5	
2021	02	BS0288B	K1	0510 + 1.105	0510 + 1.205	0.1	09	8/13/2020	70	106	3.9	
2021	02	BS0288B	K1	0510 + 1.205	0510 + 1.305	0.1	09	8/13/2020	66	74	4.3	
2021	02	BS0288B	K1	0510 + 1.305	0510 + 1.405	0.1	09	8/13/2020	51	68	4.5	
2021	02	BS0288B	K1	0510 + 1.405	0510 + 1.505	0.1	09	8/13/2020	47	64	4.6	
2021	02	BS0288B	K1	0510 + 1.505	0510 + 1.605	0.1	09	8/13/2020	61	78	4.3	
2021	02	BS0288B	K1	0510 + 1.605	0510 + 1.685	0.1	09	8/13/2020	79	171	3.2	
2021	02	BS0288B	K1	0510 + 1.760	0510 + 1.860	0.1	09	8/13/2020	143	185	2.7	
2021	02	BS0288B	K1	0510 + 1.860	0510 + 1.960	0.1	09	8/13/2020	97	123	3.5	
2021	02	BS0288B	K1	0510 + 1.960	0510 + 2.060	0.1	09	8/13/2020	134	165	2.9	
2021	02	BS0288B	K1	0510 + 2.060	0512 + 0.072	0.1	09	8/13/2020	149	155	2.8	
2021	02	BS0288B	K1	0512 + 0.072	0512 + 0.172	0.1	09	8/13/2020	179	267	2.0	
2021	02	BS0288B	K1	0512 + 0.172	0512 + 0.272	0.1	09	8/13/2020	135	186	2.7	
2021	02	BS0288B	K1	0512 + 0.272	0512 + 0.372	0.1	09	8/13/2020	221	309	1.6	
2021	02	BS0288B	K1	0512 + 0.372	0512 + 0.472	0.1	09	8/13/2020	164	277	2.0	
2021	02	BS0288B	K1	0512 + 0.472	0512 + 0.572	0.1	09	8/13/2020	138	132	3.1	
2021	02	BS0288B	K1	0512 + 0.572	0512 + 0.672	0.1	09	8/13/2020	162	169	2.7	
2021	02	BS0288B	K1	0512 + 0.672	0512 + 0.772	0.1	09	8/13/2020	148	144	2.9	
2021	02	BS0288B	K1	0512 + 0.772	0512 + 0.872	0.1	09	8/13/2020	122	141	3.1	
2021	02	BS0288B	K1	0512 + 0.872	0512 + 0.972	0.1	09	8/13/2020	196	264	1.9	
2021	02	BS0288B	K1	0512 + 0.972	0512 + 1.072	0.1	09	8/13/2020	145	139	3.0	
2021	02	BS0288B	K1	0512 + 1.072	0512 + 1.172	0.1	09	8/13/2020	95	132	3.4	
2021	02	BS0288B	K1	0512 + 1.172	0512 + 1.272	0.1	09	8/13/2020	52	59	4.6	
2021	02	BS0288B	K1	0512 + 1.272	0512 + 1.372	0.1	09	8/13/2020	105	149	3.2	
2021	02	BS0288B	K1	0512 + 1.372	0512 + 1.472	0.1	09	8/13/2020	42	49	4.9	
2021	02	BS0288B	L1	0510 + 1.833	0510 + 1.910	0.1	08	8/13/2020	123	150	3.1	
2021	02	BS0288B	R1	0510 + 1.835	510 + 1.911	0.1	08	8/13/2020	99	204	2.8	

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N.T.S
SHEET 2 OF 3

IRI DATA
BS 288B

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		13

FY	MSEC	HIGHWAY	RDBD	REFERENCE MARKERS BEGIN	REFERENCE MARKERS END	LEN	PTYPE	TEST MM/DD/YYYY	IRI(IN/MI) DIST TLEFT	IRI(IN/MI) RIGHT	IRI(IN/MI) SI	COMMENTS
2021	02	SL0274	A1	0512 + 0.000	0512 + 0.100	0.1	05	8/13/2020	121	246	2.4	
2021	02	SL0274	A1	0512 + 0.100	0512 + 0.199	0.1	05	8/13/2020	150	189	2.6	
2021	02	SL0274	A1	0512 + 0.223	0512 + 0.323	0.1	05	8/13/2020	143	157	2.9	
2021	02	SL0274	A1	0512 + 0.323	0512 + 0.423	0.1	05	8/13/2020	133	158	2.9	
2021	02	SL0274	A1	0512 + 0.423	0512 + 0.523	0.1	05	8/13/2020	218	246	1.9	
2021	02	SL0274	A1	0512 + 0.523	0512 + 0.623	0.1	05	8/13/2020	316	288	1.2	
2021	02	SL0274	A1	0512 + 0.623	0512 + 0.631	0.1	05	8/13/2020	122	170	2.9	
2021	02	SL0274	K1	0512 + 0.922	0512 + 1.022	0.1	05	8/13/2020	148	171	2.7	
2021	02	SL0274	K1	0512 + 1.022	0512 + 1.088	0.1	05	8/13/2020	182	247	2.1	
2021	02	SL0274	L1	0000 + 0.000	0000 + 0.032	0.1	05	8/13/2020	71	127	3.7	
2021	02	SL0274	L1	0512 + 0.000	0512 + 0.022	0.1	05	8/13/2020	67	113	3.8	
2021	02	SL0274	L1	0512 + 0.022	0512 + 0.122	0.1	05	8/13/2020	93	146	3.3	
2021	02	SL0274	L1	0512 + 0.122	0512 + 0.222	0.1	05	8/13/2020	119	109	3.4	
2021	02	SL0274	L1	0512 + 0.222	0512 + 0.322	0.1	05	8/13/2020	115	130	3.3	
2021	02	SL0274	L1	0512 + 0.322	0512 + 0.422	0.1	05	8/13/2020	97	129	3.4	
2021	02	SL0274	L1	0512 + 0.422	0512 + 0.522	0.1	05	8/13/2020	95	96	3.7	
2021	02	SL0274	L1	0512 + 0.522	0512 + 0.622	0.1	05	8/13/2020	148	164	2.8	
2021	02	SL0274	L1	0512 + 0.622	0512 + 0.722	0.1	05	8/13/2020	103	119	3.5	
2021	02	SL0274	L1	0512 + 0.722	0512 + 0.822	0.1	05	8/13/2020	112	121	3.4	
2021	02	SL0274	L1	0512 + 0.822	0512 + 0.922	0.1	05	8/13/2020	126	130	3.2	
2021	02	SL0274	L1	0512 + 1.085	0512 + 1.115	0.1	05	8/13/2020	103	231	2.6	
2021	02	SL0274	L1	0512 + 1.115	0512 + 1.215	0.1	05	8/13/2020	104	170	3.1	
2021	02	SL0274	R1	0000 + 0.000	0000 + 0.033	0.1	05	8/13/2020	156	119	3.0	
2021	02	SL0274	R1	0512 + 0.000	0512 + 0.100	0.1	05	8/13/2020	97	162	3.2	
2021	02	SL0274	R1	0512 + 0.100	0512 + 0.200	0.1	05	8/13/2020	111	153	3.1	
2021	02	SL0274	R1	0512 + 0.200	0512 + 0.300	0.1	05	8/13/2020	112	143	3.2	
2021	02	SL0274	R1	0512 + 0.300	0512 + 0.400	0.1	05	8/13/2020	149	196	2.6	
2021	02	SL0274	R1	0512 + 0.400	0512 + 0.500	0.1	05	8/13/2020	72	93	4.0	
2021	02	SL0274	R1	0512 + 0.500	0512 + 0.600	0.1	05	8/13/2020	156	228	2.3	
2021	02	SL0274	R1	0512 + 0.600	0512 + 0.700	0.1	05	8/13/2020	74	121	3.7	
2021	02	SL0274	R1	0512 + 0.700	0512 + 0.800	0.1	05	8/13/2020	105	121	3.4	
2021	02	SL0274	R1	0512 + 0.800	0512 + 0.900	0.1	05	8/13/2020	111	151	3.1	
2021	02	SL0274	R1	0512 + 0.900	0512 + 0.926	0.1	05	8/13/2020	137	486	1.1	
2021	02	SL0274	R1	0512 + 1.087	0512 + 1.187	0.1	05	8/13/2020	156	186	2.6	
2021	02	SL0274	R1	0512 + 1.187	0512 + 1.215	0.1	05	8/13/2020	167	370	1.5	
2021	02	SL0274	X1	0512 + 0.000	0512 + 0.045	0.1	05	8/13/2020	145	225	2.4	
2021	02	SL0274	X1	0512 + 0.045	0512 + 0.145	0.1	05	8/13/2020	155	127	3.0	
2021	02	SL0274	X1	0512 + 0.145	0512 + 0.245	0.1	05	8/13/2020	169	110	3.0	
2021	02	SL0274	X1	0512 + 0.268	0512 + 0.355	0.1	05	8/13/2020	106	111	3.5	
2021	02	SL0274	X1	0512 + 0.355	0512 + 0.455	0.1	05	8/13/2020	201	196	2.3	
2021	02	SL0274	X1	0512 + 0.479	0512 + 0.568	0.1	05	8/13/2020	126	150	3.0	
2021	02	SL0274	X1	0512 + 0.568	0512 + 0.668	0.1	05	8/13/2020	149	214	2.5	
2021	02	SL0274	X1	0512 + 0.685	0512 + 0.718	0.1	05	8/13/2020	79	151	3.4	
2021	02	SL0274	X1	0512 + 0.718	0512 + 0.818	0.1	05	8/13/2020	131	258	2.3	

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N.T.S
SHEET 3 OF 3

IRI DATA
LOOP 274

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		14

General Notes:

General:

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

Maria P. Aponte *Maria.aponte@txdot.gov*
Rajendra Hada *Rajendra.Hada@txdot.gov*

Contractor questions will be accepted through email, phone, and in person by the above individuals. Contractor questions will be reviewed by the Area Engineer or Assistant Area Engineer. Once a response is developed, it will be posted to TxDOT's Public FTP at the following address:

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

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

Unless otherwise shown on the plans, RAP generated by this project will become the property of the Contractor for use in the current construction project or in future projects.

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

Superelevate the curves to match the existing surface.

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

The following standard detail sheets are modified:

Modified Standards

TCP (7-1)-13 (MOD)

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

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

Grade street intersections and median openings for surface drainage.

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

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

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

Clearly mark or highlight on the shop drawings, the items being furnished for this project. Submit required shop drawings in accordance with the shop drawing distribution list shown in the note for Item 5 for review and distribution.

Procure permits and licenses, which are to be issued by the City, County, or Municipal Utility District.

General: Roadway Illumination and Electrical

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

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

General: Traffic Signals

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

General: Site Management

Mow the grass and weeds within the project limits a maximum of 3 times a year as directed. This work is subsidiary to the various bid items.

Mark stations every 100 ft. and maintain the markings for the project duration. Remove the station markings at the completion of the project. This work is subsidiary to the various bid items.

Record the beginning and ending stations of any no passing zones in the field before beginning the overlay. Restripe the no passing zones immediately after the overlay in the same locations, unless otherwise shown in the plans, or otherwise directed.

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

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

Assume ownership of debris and dispose of at an approved location. Do not dispose of debris on private property unless approved in writing by the District Engineer.

Control the dust caused by construction operations. For sweeping the base material in preparation for laying asphalt and for sweeping the finished concrete pavement, use one of the following types of sweepers or approved equal:

Tricycle Type	**Truck Type - 4 Wheel**
Wayne Series 900	M-B Cruiser II
Elgin White Wing	Wayne Model 945
Elgin Pelican	Mobile TE-3
	Mobile TE-4
	Murphy 4042

General: Traffic Control and Construction

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

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

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

General: Utilities

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

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

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

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

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

Item 5: Control of Work

Submit shop drawings electronically for the fabrication of items as documented in Table 1 below. Information and requirements for electronic submittals can be viewed in the "Guide to Electronic Shop Drawing Submittal" which can be accessed through the following web link, ftp://ftp.dot.state.tx.us/pub/txdot-info/library/pubs/bus/bridge/e_submit_guide.pdf. References to 11 in. x 17 in. sheets in individual specifications for structural items imply electronic CAD sheets.

Table 1

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

Spec Item No.'s	Product	Submittal Required	Approval Required (Y/N)	Contractor/ Fabricator P.E. Seal Required	Reviewing Party	Shop or Working Drawing (Note 1)
7.16.1&.2	Construction Load Analyses	Y	Y	Y	B	WD
400	Excavation and Backfill for Structures (cofferdams)	Y	N	Y	A	WD
403	Temporary Special Shoring	Y	N	Y	C	WD
420	Formwork/Falsework	Y	N	Y	A	WD
423	Retaining Walls, (calcs req'd.)	Y	Y	Y	C	SD
425	Optional Design Calculations (Prstrs Bms)	Y	Y	Y	B	SD
425	Prestr Concr Sheet Piling	Y	Y	N	B	SD
425	Prestr Concr Beams	Y	Y	N	B	SD
425	Prestr Concr Bent	Y	Y	N	B	SD
426	Post Tension Details	Y	Y	N	B	SD
434	Elastomeric Bearing Pads (All)	Y	Y	N	B	SD
441	Bridge Protective Assembly	Y	Y	N	B	SD
441	Misc Steel (various steel assemblies)	Y	Y	N	B	SD
441	Steel Pedestals (bridge raising)	Y	Y	N	B	SD

441	Steel Bearings	Y	Y	N	B	SD
441	Steel Bent	Y	Y	N	B	SD
441	Steel Diaphragms	Y	Y	N	B	SD
441	Steel Finger Joint	Y	Y	N	B	SD
441	Steel Plate Girder	Y	Y	N	B	SD
441	Steel Tub-Girders	Y	Y	N	B	SD
441	Erection Plans, including Falsework	Y	N	Y	A	WD
449	Sign Structure Anchor Bolts	Y	Y	N	T	SD
450	Railing	Y	Y	N	A	SD
462	Concrete Box Culvert	Y	Y	N	C	SD
462	Concrete Box Culvert (Alternate Designs Only,calcs reqd.)	Y	Y	Y	B	SD
464	Reinforced Concrete Pipe (Jack and Bore only; ONLY when requested)	Y	Y	Y	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets	Y	Y	N	A	SD
465	Pre-cast Junction Boxes, Grates, and Inlets (Alternate Designs Only, calcs req'd.)	Y	Y	Y	B	SD
466	Pre-cast Headwalls and Wingwalls	Y	Y	N	A	SD
467	Pre-cast Safety End Treatments	Y	Y	N	A	SD
495	Raising Existing Structure (calcs reqd.)	Y	Y	Y	B	SD
610	Roadway Illumination Supports (Non-Standard only, calcs reqd.)	Y	Y	Y	BRG	SD
613	High Mast Illumination Poles (Non-standard only, calcs reqd.)	Y	Y	Y	BRG	SD
627	Treated Timber Poles	Y	Y	N	T	SD
644	Special Non-Standard Supports (Bridge Mounts, Barrier Mounts, Etc.)	Y	Y	Y	T	SD
647	Large Roadside Sign Supports	Y	Y	Y	T	SD
650	Cantilever Sign Structure Supports - Alternate Design Calcs.	Y	Y	Y	T	SD
650	Sign Structures	Y	Y	N	T	SD
680	Installation of Highway Traffic Signals	Y	Y	N	T	SD
682	Vehicle and Pedestrian Signal Heads	Y	Y	N	T	SD
684	Traffic Signal Cables	Y	Y	N	T	SD
685	Roadside Flashing Beacon Assemblies	Y	Y	N	T	SD
686	Traffic Signal Pole Assemblies (Steel) (Non-Standard only)	Y	Y	Y	T	SD
687	Pedestal Pole Assemblies	Y	Y	N	T	SD
688	Detectors	Y	Y	N	A	SD
784	Repairing Steel Bridge Members	Y	Y	Y	B	WD
SS	Prestr Concr Crown Span	Y	Y	N	B	SD
SS	Sound Barrier Walls	Y	Y	Y	A	SD
SS	Camera Poles	Y	Y	Y	TMS	SD
SS	Pedestrian Bridge (Calcs req'd.)	Y	Y	Y	B	SD
SS	Screw-In Type Anchor Foundations	Y	Y	N	T	SD
SS	Fiber Optic/Communication Cable	Y	Y	N	TMS	SD
SS	Spread Spectrum Radios for Signals	Y	Y	N	T	SD
SS	VIVDS System for Signals	Y	Y	N	T	SD
SS	CTMS Equipment	Y	Y	N	TMS	SD

Notes:

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

Key to Reviewing Party

A - Area Office

Area Office	Email Address
Brazoria Area Office	HOU-BRZAShpDrwgs@txdot.gov

B - Houston Bridge Engineer

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

C - Construction Office

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

T - Traffic Engineer

Traffic Operations	HOU-TrfShpDrwgs@txdot.gov

Item 7: Legal Relations and Responsibilities

This project does not require a U.S. Army Corps of Engineers (USACE) Section 404 Permit before letting, but if a permit is needed during construction, assume responsibility for preparing the permit application. Submit the permit application to the Department's District Environmental Section for approval. Once the permit application is approved, the Department will submit it to the USACE. Assume responsibility for the requested revisions, in coordination with the Department's District Environmental Section.

Maintain the roadway slope stability. Maintaining slope stability is subsidiary to the various bid items.

If the work is on or in the vicinity of an at-grade railroad crossing, involves incidental work on railroad right of way, or involves construction of a railroad grade separation structure, notify the railroad company's Division Engineer and the Department's Project Engineer at least 30 days before performing any work on the railroad right of way and make arrangements for railroad flaggers unless otherwise shown in the contract. Obtain the required Railroad Right of Entry Permit from the railroad company. Payment of applicable permit fees is the responsibility of the Contractor. Acquiring the Railroad Right of Entry Permit is a lengthy process, allow sufficient time for this.

No significant traffic generator events have been identified.

Item 8: Prosecution and Progress

The Department will supply bidders, upon written request, one electronic copy of the time determination schedule. The time determination schedule provided is for informational use only and is not intended for bidding or construction purposes.

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

Working days will be computed and charged based on a 6-day workweek in accordance with Section 8.3.3.1 six-day work week (night-time).

The Lane Closure Assessment Fee is $ 400. This fee applies to the Contractor for closures or obstructions that overlap into restricted hour traffic for each hour or portion thereof, per lane, regardless of the length of lane closure or obstruction. For Restricted Hours subject to Lane Assessment Fee refer to the Item, "Barricades, Signs, and Traffic Handling." The time increment for the Lane Closure Assessment fee for this project is one hour.

Item 134: Backfilling Pavement Edges

Quantity by station includes both sides of the roadway.

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

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

If using salvaged asphalt concrete pavement, size it so that all the material, passes the 2-in. sieve. Use RAP that does not contain deleterious material such as clay or organic material.

Flex Base must meet the requirements of Item 247, Type A, Grade 1-2. Department Test Method Tex-117-E will not be required.

Crushed concrete must meet the requirements of Item 247, Grade 1-2. Department Test Methods Tex-116-E and Tex-117-E will not be required.

Place emulsified asphalt (SS-1, CSS-1, or CSS-1H) at an application rate of 0.25 gal/sq. yard.

Item 162: Sodding for Erosion Control

Item 166: Fertilizer

Item 168: Vegetative Watering

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

Item 316: Seal Coat

Seal coat will be required to be covered up with ACP overlay prior to opening to traffic.
The asphalt application rate shown on the "Basis of Estimate" is an average rate for calculating asphalt quantities. Vary the rate based on the pavement conditions and other factors such as the type and grade of aggregate used, weather, and traffic.

Allowable Asphalt Cements based on Average Daily Traffic (ADT) are shown below:

For ADT greater than 5000 (CSJ:0111-09-044, 0111-13-003)	**ADT 1000 to 5000 (CSJ 0111-07-049)**
AC-20 XP	AC-15P
AC-20-5TR	AC-20-5TR
	AC-20-XP
	AC-10-2TR

Item 3076: Dense-Graded Hot Mix Asphalt

Taper the asphalt concrete pavement at the beginning and ending points.

Use a maximum 6H:1V slope for the asphalt concrete pavement edge.

Where the 6H:1V ACP edge taper extends over onto the unsurfaced shoulders, blade off the loose existing shoulder material to provide a solid base for the outside taper edge. After placing the ACP overlay, blade this material back against the edge taper. This work is subsidiary to the various bid items.

The stockpile will be the point of sampling of coarse aggregate for test method TEX-217-F (Part II, decantation).

Place the asphalt concrete pavement in courses as shown on the typical sections.

Do not use petroleum-based solvents in the beds of hot mix asphalt delivery vehicles.

Do not use Surface Aggregate Classification (SAC) C for this project.

For determining the Asphalt Content, only ignition ovens will be allowed.

Item 351: Flexible Pavement Structure Repair

Use asphalt stabilized base for the base material.

For base repair, place the asphalt stabilized base in compacted lifts of 4 in. maximum, unless otherwise directed.

Item 464: Reinforced Concrete Pipe

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

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

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

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

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

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

Item 502: Barricades, Signs, and Traffic Handling

Use a traffic control plan for handling traffic through the various phases of construction. Follow the phasing sequence unless otherwise agreed upon by the Area Engineer and the Project Manager. Ensure this plan conforms to the latest "Texas Manual on Uniform Traffic Control Devices" and the latest Barricade and Construction (BC) Standard Sheets. The latest versions of Work Zone Standard Sheets WZ (BTS-1) and WZ (BTS-2) are the traffic control plan for the signal installations.

Submit changes to the traffic control plan to the Area Engineer. Provide a layout showing the construction phasing, signs, striping, and signalizations for changes to the original traffic control plan.

Furnish and maintain the barricades and warning signs, including the necessary temporary and portable traffic control devices, during the various phases of construction. Place and construct these barricades and warning signs in accordance with the latest "Texas Manual on Uniform Traffic Control Devices" for typical construction layouts.

Cover work zone signs when work related to the signs is not in progress, or when any hazard related to the signs no longer exists.

Keep the delineation devices, signs, and pavement markings clean. This work is subsidiary to the Item, "Barricades, Signs, and Traffic Handling."

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

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

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

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

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

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

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

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

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

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

One Lane Closure

Day	Daytime Closure Hours	Nighttime Closure Hours	Restricted Hours Subject to Lane Assessment Fee
Sunday pm – Monday am	Engineer Approval	9:00 PM – 05:00 AM	05:00 AM – 09:00 AM 3:00 PM – 9:00 PM
Monday pm – Tuesday am	Engineer Approval	9:00 PM – 05:00 AM	05:00 AM – 09:00 AM 3:00 PM – 9:00 PM
Tuesday pm - Wednesday am	Engineer Approval	9:00 PM – 05:00 AM	05:00 AM – 09:00 AM 3:00 PM – 9:00 PM
Wednesday pm - Thursday am	Engineer Approval	9:00 PM – 05:00 AM	05:00 AM – 09:00 AM 3:00 PM – 9:00 PM
Thursday pm - Friday am	Engineer Approval	9:00 PM – 05:00 AM	05:00 AM – 09:00 AM 3:00 PM – 9:00 PM
Friday pm – Saturday am	Engineer Approval	9:00 PM – 05:00 AM	05:00 AM – 09:00 AM 3:00 PM – 9:00 PM
Saturday pm – Sunday am	Emergency Only	Engineer Approval	None

The above times are approved for the traffic control conditions listed. The Area Engineer may approve other closure times if traffic counts warrant. The Area Engineer may reduce the above times for special events.

Law enforcement assistance will be required for this project and is expected to be required for major traffic control changes and lane closures. Coordinate with local law enforcement and arrange for law enforcement as directed or agreed by the Engineer. Before payment will be made, complete the "Daily Report on Law Enforcement Force Account Work" (Form 318), provided by the Department and submit daily invoices that agree with this form for any day during the month in which approved services were provided.

Provide full-time, off-duty, uniformed, certified peace officers, as part of traffic control operations. The peace officers must be able to show proof of certification by the Texas Commission on Law Enforcement Officers Standards. The cost of the officers is paid for on a force account basis.

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

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

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

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

Item 506: Temporary Erosion, Sedimentation and Environmental Controls

Due to the nature of the work involved, a Storm Water Pollution Prevention Plan (SWP3) is not required. However, if a SWP3 becomes necessary, it will be paid as extra work.

The Storm Water Pollution Prevention Plan (SWP3) consists of temporary erosion control measures needed and provided for under this Item. The disturbed area is less than one acre and use of erosion control measures is not anticipated. If physical conditions encountered at the job site require necessary controls, BMP installation, maintenance, and removal will be paid as extra work on a force account basis per Articles 4.4 and 9.7. Since the disturbed area is less than 5 acres, a "Notice of Intent" (NOI) is not required.

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

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

Item 531: Sidewalks

An air-entraining admixture is not required.

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

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

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

Item 540: Metal Beam Guard Fence

Painting the timber posts is not required.

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

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

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

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

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

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

Item 542: Removing Metal Beam Guard Fence

Replace removed wood posts which are unusable because of damage by the Contractor, at no expense to the Department

Item 585: Ride Quality for Pavement Surfaces

To eliminate the need for corrective action due to excessive deviations in the final surface layers, exercise caution to ensure satisfactory profile results in the intermediate paving layers (mixture).

Milling will not be allowed as a corrective action for excessive deviations in the final surface layer of hot-mix asphalt.

For asphalt mainlanes and direct connectors, use Surface Test Type B and Pay Adjustment Schedule 2. For ramps use Surface Test Type A.

For all other roads (cross streets and intersections), use Surface Test Type A.

Item 618: Conduit

Item 620: Electrical Conductors

Item 628: Electrical Services

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

Item 618: Conduit

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

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

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

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

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

Item 620: Electrical Conductors

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

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

For both transformer and shoe-base type illumination poles, provide double-pole breakaway fuse holders as shown on the Department's Construction Division (CST) material producers list. Check the latest link on the Department's website for this list. The category is "Roadway

Illumination and Electrical Supplies." The fuse holder is shown on the list under Items 610 and 620. Provide 10 Amp time delay fuses.

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

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

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

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

Item 636: Signs

Include aluminum route markers, exit only panels, routing signs, and other special panels attached to guide signs in the unit bid price for the parent guide sign material.

Furnish and install signs shown on the traffic signal "Summary of Traffic Signal Materials" sheet. Ensure that the legend on these sign panels is in accordance with the latest "Standard Highway Sign Designs for Texas" manual.

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

Item 644: Small Roadside Sign Assemblies

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

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

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

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

Use Type E Super High Specific Intensity (Fluorescent Prismatic) yellow green reflective sheeting background to fabricate school signs (S1-1, S3-1, S4-3, S5-1, W16-2, SW16-9p, and SW16-7pL(R)).

Assume ownership of the removed existing signs.

Locations of the relocated signs are approximate. Before placing them, obtain approval of and then stake the exact locations for these signs.

Replace existing signs that become damaged during relocation at no expense to the Department.

Item 662: Work Zone Pavement Markings

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

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

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

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

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

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

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

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

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

If using paint and bead markings as described above, purchase the traffic paint from the open market.

If the Type II markings become dirty and require cleaning by washing, brushing, compressed air, or other approved methods before applying the Type I thermoplastic markings, this additional cleaning is subsidiary to the Item, "Reflectorized Pavement Markings."

Establish the alignment and layout for work zone striping and permanent striping.

Stripe all roadways before opening them to traffic.

Place pavement markings under these items in accordance with details shown on the plans, the latest "Texas Manual on Uniform Traffic Control Devices," or as directed.

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

Item 672: Raised Pavement Markers

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

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

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

Item 682: Vehicle and Pedestrian Signal Heads

Install two set screws on vehicle signal head mounting hardware fittings.

Furnish black housings for vehicle and pedestrian signals. Furnish black vehicle signal head back plates with 2 in. retroreflective yellow borders.

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

A shadow vehicle with Truck Mounted Attenuators (TMAs) or Trailer Attenuators (TAs) is required as shown on the appropriate Traffic Control Plan (TCP) sheets. TMAs/TAs must meet the requirements of the Compliant Work Zone Traffic Control Device List.

Level 3 Compliant TMAs/TAs are required for this project.

A total of one (1) shadow vehicle with a TMA/TA is required for the work with the exception of Pavement Marking Operations. The Contractor is responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed on the project.

A total of three (3) shadow vehicles with a TMA/TA are required for Pavement Marking Operations. The Contractor is responsible for determining if one or more of these operations will be ongoing at the same time to determine the total number of TMAs/TAs needed on the project.

Basis of Estimate

Item	Description	Limit and Rate	Unit
134	Backfilling Pavement Edges • Asphalt Emulsion	 0.25 Gal. / Sq. Yd.	STA
316	Seal Coat • Asphalt • Aggregate (Gr 4) A-R Binder • Asphalt • Aggregate (Gr 4)	 0.32 Gal. / Sq. Yd. 1/130 Cu. Yd. / Sq. Yd. 0.42 Gal. / Sq. Yd. 1/130 Cu. Yd. / Sq. Yd.	 GAL CY GAL CY
3076	Dense-Graded Hot Mix Asphalt • Asphalt • Aggregate Tack Coat • Applied on new HMA • Applied on Existing HMA • Applied on Milled HMA	110 Lb. / Sq. Yd.-In. 6 % by weight 94 % by weight 0.06 Gal. / Sq. Yd. 0.09 Gal. / Sq. Yd. 0.11 Gal. / Sq. Yd.	TON

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0111-09-044 **DISTRICT** Houston **COUNTY** Brazoria
HIGHWAY BS 288B, SL 274

			CONTROL SECTION JOB	**0111-07-049**		**0111-09-044**		**0111-13-003**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00126513**		**A00126515**		**A00126516**			
			COUNTY	**Brazoria**		**Brazoria**		**Brazoria**			
			HIGHWAY	**BS 288B**		**BS 288B**		**SL 274**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	105-6021	REMOVING STAB BASE AND ASPH PAV (0-4")	SY					155.550		155.550	
	105-6023	REMOVING STAB BASE AND ASPH PAV (5")	SY			200.000				200.000	
	134-6004	BACKFILL (TY A OR B)	STA			90.000				90.000	
	162-6002	BLOCK SODDING	SY			225.000				225.000	
	166-6001	FERTILIZER	AC			0.100				0.100	
	168-6001	VEGETATIVE WATERING	MG			30.000				30.000	
	316-6001	ASPH (MULTI OPTION)	GAL	6,601.000		29,359.000		20,475.000		56,435.000	
	316-6224	AGGR(TY-PB GR-4 SAC-B)	CY	159.000		706.000		492.000		1,357.000	
	351-6008	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	SY			204.000		326.000		530.000	
	351-6013	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	SY	17.000		187.000		150.000		354.000	
	354-6041	PLANE ASPH CONC PAV (1.5")	SY	7,863.000		78,805.000		63,984.000		150,652.000	
	354-6045	PLANE ASPH CONC PAV (2")	SY	12,463.000		12,675.000				25,138.000	
	354-6146	PLANE ASPH CONC PAV (1.5'-2")	SY	303.000		267.000				570.000	
	400-6005	CEM STABIL BKFL	CY			10.000				10.000	
	432-6045	RIPRAP (MOW STRIP)(4 IN)	CY					69.060		69.060	
	464-6005	RC PIPE (CL III)(24 IN)	LF			12.000				12.000	
	467-6395	SET (TY II) (24 IN) (RCP) (6: 1) (P)	EA			1.000				1.000	
	500-6001	MOBILIZATION	LS	0.112		0.565		0.323		1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	2.000		3.000		2.000		7.000	
	531-6002	CONC SIDEWALKS (5")	SY			139.000				139.000	
	531-6004	CURB RAMPS (TY 1)	EA			3.000				3.000	
	540-6001	MTL W-BEAM GD FEN (TIM POST)	LF					737.500		737.500	
	540-6016	DOWNSTREAM ANCHOR TERMINAL SECTION	EA					5.000		5.000	
	540-6018	MTL BM GD FEN TRANS (NON - SYM)	EA					2.000		2.000	
	540-6020	MTL W - BEAM GD FEN (LOW FILL CULVERT)	LF					25.000		25.000	
	540-6021	MTL THRIE-BEAM GD FEN (TIM POST)	EA					4.000		4.000	
	540-6043	TL-3 31" SHORT RADIUS (POSTS 2 THRU 7)	EA					1.000		1.000	
	542-6001	REMOVE METAL BEAM GUARD FENCE	LF					975.000		975.000	
	542-6002	REMOVE TERMINAL ANCHOR SECTION	EA					4.000		4.000	
	544-6001	GUARDRAIL END TREATMENT (INSTALL)	EA					3.000		3.000	
	544-6003	GUARDRAIL END TREATMENT (REMOVE)	EA					2.000		2.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF			245.000		310.000		555.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	245.000		575.000		305.000		1,125.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF					40.000		40.000	
	618-6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF			15.000		75.000		90.000	
	618-6070	CONDT (RM) (2")	LF			85.000				85.000	
	618-6074	CONDT (RM) (3")	LF			45.000				45.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0111-09-044 **DISTRICT** Houston **COUNTY** Brazoria
HIGHWAY BS 288B, SL 274

			CONTROL SECTION JOB	**0111-07-049**		**0111-09-044**		**0111-13-003**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00126513**		**A00126515**		**A00126516**			
			COUNTY	**Brazoria**		**Brazoria**		**Brazoria**			
			HIGHWAY	**BS 288B**		**BS 288B**		**SL 274**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	620-6009	ELEC CONDR (NO.6) BARE	LF			995.000		660.000		1,655.000	
	636-6001	ALUMINUM SIGNS (TY A)	SF	12.500		42.500		109.750		164.750	
	636-6007	REPLACE EXISTING ALUMINUM SIGNS(TY A)	SF	233.000		776.000		631.000		1,640.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA			17.000		2.000		19.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	EA			2.000				2.000	
	644-6007	IN SM RD SN SUP&AM TY10BWG(1)SA(U)	EA	1.000		23.000				24.000	
	644-6027	IN SM RD SN SUP&AM TYS80(1)SA(P)	EA	6.000						6.000	
	644-6033	IN SM RD SN SUP&AM TYS80(1)SA(U)	EA	1.000		4.000		1.000		6.000	
	644-6034	IN SM RD SN SUP&AM TYS80(1)SA(U-1EXT)	EA			6.000				6.000	
	644-6035	IN SM RD SN SUP&AM TYS80(1)SA(U-2EXT)	EA			5.000				5.000	
	644-6076	REMOVE SM RD SN SUP&AM	EA			37.000				37.000	
	658-6013	INSTL DEL ASSM (D-SW)SZ (BRF)CTB	EA			8.000		20.000		28.000	
	658-6062	INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI)	EA			6.000		21.000		27.000	
	658-6083	INSTL DEL ASSM (D-SW)SZ 1(WFLX)SRF	EA					13.000		13.000	
	662-6001	WK ZN PAV MRK NON-REMOV (W)4"(BRK)	LF	4,350.000		16,500.000		9,210.000		30,060.000	
	662-6002	WK ZN PAV MRK NON-REMOV (W)4"(DOT)	LF			174.000				174.000	
	662-6004	WK ZN PAV MRK NON-REMOV (W)4"(SLD)	LF	10,695.000		66,735.000		5,145.000		82,575.000	
	662-6012	WK ZN PAV MRK NON-REMOV (W)8"(SLD)	LF	3,120.000		17,355.000		18,378.000		38,853.000	
	662-6014	WK ZN PAV MRK NON-REMOV (W)12"(SLD)	LF			210.000		1,125.000		1,335.000	
	662-6016	WK ZN PAV MRK NON-REMOV (W)24"(SLD)	LF	1,671.000		5,064.000		7,281.000		14,016.000	
	662-6017	WK ZN PAV MRK NON-REMOV (W)(ARROW)	EA	51.000		219.000		105.000		375.000	
	662-6023	WK ZN PAV MRK NON-REMOV (W)(RR XING)	EA					6.000		6.000	
	662-6029	WK ZN PAV MRK NON-REMOV(W)(WORD)	EA	15.000		135.000		105.000		255.000	
	662-6032	WK ZN PAV MRK NON-REMOV (Y)4"(BRK)	LF	2,220.000		4,230.000		300.000		6,750.000	
	662-6034	WK ZN PAV MRK NON-REMOV (Y)4"(SLD)	LF	20,500.000		43,107.000		12,576.000		76,183.000	
	662-6039	WK ZN PAV MRK NON-REMOV (Y)12"(SLD)	LF	237.000		1,323.000		279.000		1,839.000	
	662-6081	WK ZN PAV MRK REMOV (W)(DBL ARROW)	EA					6.000		6.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	39.000				58.000		97.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	1,630.000		4,281.000		6,983.000		12,894.000	
	666-6042	REFL PAV MRK TY I (W)12"(SLD)(100MIL)	LF					129.000		129.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	1,080.000		1,969.000		3,008.000		6,057.000	
	666-6141	REFL PAV MRK TY I (Y)12"(SLD)(100MIL)	LF	79.000		442.000		93.000		614.000	
	666-6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)	LF	1,640.000		4,590.000		3,769.000		9,999.000	
	666-6180	REFL PAV MRK TY II (W) 12" (SLD)	LF			28.000		452.000		480.000	
	666-6181	REFL PAV MRK TY II (W) 18" (SLD)	LF					32.000		32.000	
	666-6212	REFL PAV MRK TY II (Y) 12" (SLD)	LF	264.000		3,015.000		11,428.000		14,707.000	
	666-6213	REFL PAV MRK TY II (Y) 18" (SLD)	LF			3,586.000		348.000		3,934.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0111-09-044 **DISTRICT** Houston **COUNTY** Brazoria
HIGHWAY BS 288B, SL 274

			CONTROL SECTION JOB		**0111-07-049**		**0111-09-044**		**0111-13-003**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00126513**		**A00126515**		**A00126516**			
			COUNTY		**Brazoria**		**Brazoria**		**Brazoria**			
			HIGHWAY		**BS 288B**		**BS 288B**		**SL 274**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	666-6225	PAVEMENT SEALER 6"		LF	13,220.000		40,266.000		12,444.000		65,930.000	
	666-6226	PAVEMENT SEALER 8"		LF	947.000		4,281.000		6,983.000		12,211.000	
	666-6228	PAVEMENT SEALER 12"		LF					129.000		129.000	
	666-6230	PAVEMENT SEALER 24"		LF	947.000		4,281.000		5,779.000		11,007.000	
	666-6231	PAVEMENT SEALER (ARROW)		EA	25.000		76.000		93.000		194.000	
	666-6232	PAVEMENT SEALER (WORD)		EA	9.000		38.000		83.000		130.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)		LF	1,630.000		4,600.000		3,870.000		10,100.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)		LF	120.000		939.000		440.000		1,499.000	
	666-6318	RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL)		LF	740.000		13,318.000		100.000		14,158.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)		LF	7,391.000		14,369.000		5,078.000		26,838.000	
	666-6343	REF PROF PAV MRK TY I(W)6"(SLD)(100MIL)		LF	3,339.000		19,999.000		2,956.000		26,294.000	
	668-6077	PREFAB PAV MRK TY C (W) (ARROW)		EA	21.000		66.000		83.000		170.000	
	668-6078	PREFAB PAV MRK TY C (W) (DBL ARROW)		EA	4.000		10.000		10.000		24.000	
	668-6085	PREFAB PAV MRK TY C (W) (WORD)		EA	9.000		38.000		83.000		130.000	
	668-6089	PREFAB PAV MRK TY C (W) (RR XING)		EA	2.000				2.000		4.000	
	668-6091	PREFAB PAV MRK TY C (W) (18")(YLD TRI)		EA					28.000		28.000	
	672-6007	REFL PAV MRKR TY I-C		EA	100.000		284.000		227.000		611.000	
	672-6009	REFL PAV MRKR TY II-A-A		EA	209.000		530.000		247.000		986.000	
	672-6010	REFL PAV MRKR TY II-C-R		EA	46.000		170.000		329.000		545.000	
	682-6001	VEH SIG SEC (12")LED(GRN)		EA			6.000				6.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)		EA	2.000		8.000		13.000		23.000	
	682-6003	VEH SIG SEC (12")LED(YEL)		EA			6.000				6.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)		EA	4.000		4.000		26.000		34.000	
	682-6005	VEH SIG SEC (12")LED(RED)		EA			6.000				6.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)		EA	2.000		2.000		13.000		17.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM		EA	16.000		40.000		31.000		87.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM		EA	2.000		32.000		22.000		56.000	
	684-6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)		LF			1,165.000				1,165.000	
	690-6086	REMOVE VID IMAGE VEH DET SYS (VIVDS)		EA			2.000				2.000	
	3076-6041	D-GR HMA TY-D SAC-A PG70-22		TON	1,702.000		7,570.000		5,279.000		14,551.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN		DAY	25.000		35.000		20.000		80.000	
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)		EA			1.000		1.000		2.000	
	6185-6002	TMA (STATIONARY)		DAY	30.000		90.000		40.000		160.000	
	6185-6005	TMA (MOBILE OPERATION)		DAY	15.000		25.000		15.000		55.000	
	6292-6004	RVDS(PRESENCE DET ONLY)(INSTALL ONLY)		EA	4.000		24.000		19.000		47.000	
	6292-6005	RVDS(ADVANCE DET ONLY)(INSTALL ONLY)		EA	2.000		14.000		9.000		25.000	
	02	RAILROAD FLAGGING: RAILROAD FORCE ACCOUNT WORK (NON PARTICIPATING)		LS			1.000				1.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0111-09-044 **DISTRICT** Houston **COUNTY** Brazoria
HIGHWAY BS 288B, SL 274

			CONTROL SECTION JOB	**0111-07-049**		**0111-09-044**		**0111-13-003**		TOTAL EST.	TOTAL FINAL
			PROJECT ID	**A00126513**		**A00126515**		**A00126516**			
			COUNTY	**Brazoria**		**Brazoria**		**Brazoria**			
			HIGHWAY	**BS 288B**		**BS 288B**		**SL 274**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	06	MATERIAL FURNISHED BY STATE (PARTICIPATING)	LS			1.000				1.000	
	08	CONTRACTOR FORCE ACCOUNT LAW ENFORCEMENT (NON-PARTICIPATING)	LS			1.000				1.000	
		CONTRACTOR FORCE ACCOUNT EROSION CONTROL MAINTENANCE (NON-PARTICIPATING)	LS			1.000				1.000	
		CONTRACTOR FORCE ACCOUNT SAFETY CONTINGENCY (NON-PARTICIPATING)	LS			1.000				1.000	

CSJ	134 6004	316 6001	316 6224	105 6023	351 6013	351 6008	354 6041	354 6045	354 6146	464 6005	467 6395	531 6002	531 6004	3076 6041	6001 6001	6185 6002	6185 6005	400 6005
	BACKFILL (TY A OR B)	ASPH (MULTI OPTION)	AGGR (TY-PB GR-4 SAC-B)	REMOVING STAB BASE AND ASPH PAV (5")	FLEXIBLE PAVEMENT STRUCTURE REPAIR(4")	FLEXIBLE PAVEMENT STRUCTURE REPAIR(12")	PLANE ASPH CONC PAV (1.5")	PLANE ASPH CONC PAV (2")	PLANE ASPH CONC PAV (1.5'-2")	RC PIPE (CL III)(24 IN)	SET (TY II) (24 IN) (RCP)(6: 1) (P)	CONC SIDEWALKS (5")	CURB RAMPS (TY 1)	D-GR HMA TY-D SAC-A PG70-22	PORTABLE CHANGEABLE MESSAGE SIGN	TMA (STATIONARY)	TMA (MOBILE OPERATION)	CEM STABIL BKFL
	STA	GAL	CY	SY	SY	SY	SY	SY	SY	LF	EA	SY	EA	TON	DAY	DAY	DAY	CY
0111-07-049	-	6601	159	-	17	-	7863	12463	303	-	-	-	-	1702	25	30	15	
0111-09-044	90	29359	706	200	187	204	78805	12675	267	12	1	139	3	7570	35	90	25	10
0111-13-003	-	20475	492	-	150	326	63984	-	-	-	-	-	-	5279	20	40	15	
PROJECT TOTALS	90	56435	1357	200	354	530	150652	25138	570	12	1	139	3	14551	80	160	55	10

1/31/2022
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SHEET 1 OF 1

SUMMARY OF ROADWAY QUANTITIES

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		26

FILE: H:\Trf\Signing\0389-05-116.etc\Summaries.xls

SUMMARY OF PERMANENT PAVEMENT MARKING QUANTITIES

LAYOUT SHEET NO.	666-REFL PAV MRK														
	(6018) TY I (W)6"(DOT)(100MIL) EA	(6036) TY I (W)8"(SLD)(100MIL) EA	(6042) TY I (W)12"(SLD)(100MIL) EA	(6048) TY I (W)24"(SLD)(100MIL) EA	(6141) TY I (Y)12"(SLD)(100MIL) LF	(6162) RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL) LF	(6180) REFL PAV MRK TY II (W) 12" (SLD) LF	(6181) REFL PAV MRK TY II (W) 18" (SLD) LF	(6212) REFL PAV MRK TY II (Y) 12" (SLD) LF	(6213) REFL PAV MRK TY II (Y) 18" (SLD) EA	(6225) PAVEMENT SEALER 6" EA	(6226) PAVEMENT SEALER 8" EA	(6228) PAVEMENT SEALER 12" EA	(6230) PAVEMENT SEALER 24" EA	(6231) PAVEMENT SEALER (ARROW) EA
CSJ:0111-13-003															
1A	-	1204	72	-	-	229	-	-	577	-	1417	1204	72	-	-
1B	-	518	57	72	93	750	-	-	908	-	4770	518	57	518	4
2A	-	964	-	535	-	520	-	-	1646	-	1306	964	-	964	16
2B	-	1328	-	589	-	500	-	-	2290	-	600	1328	-	1328	20
3A	-	1164	-	498	-	510	-	-	2263	-	640	1164	-	1164	20
3B	-	499	-	815	-	510	-	-	2031	-	560	499	-	499	8
4	58	1306	-	499	-	750	452	32	1713	348	3151	1306	-	1306	25
TOTALS	58	6983	129	3008	93	3769	452	32	11428	348	12444	6983	129	5779	93
CSJ:0111-07-049															
5A	-	96	-	166	-	470	-	-	-	-	4718	96	-	96	7
5B	39	297	-	-	-	350	-	-	-	-	3550	297	-	297	7
6A	-	415	-	174	79	180	-	-	264	-	1394	415	-	415	4
6B	-	-	-	57	-	290	-	-	-	-	1500	-	-	-	-
7A	-	-	-	492	-	280	-	-	-	-	1620	-	-	-	4
7B	-	139	-	191	-	70	-	-	-	-	438	139	-	139	3
TOTALS	39	947	0	1080	79	1640	0	0	264	0	13220	947	0	947	25
CSJ:0111-09-044															
7B	-	324	-	411	-	-	-	-	-	-	847	324	-	324	5
8A	-	263	-	498	-	-	-	-	-	-	1941	263	-	263	6
8B	-	157	-	261	187	-	-	-	116	-	1508	157	-	157	4
9A	-	189	-	310	127	-	-	-	-	-	2874	189	-	189	4
9B	-	-	-	-	128	260	-	-	-	-	3390	-	-	-	-
10	-	377	-	-	-	430	-	-	955	321	2149	377	-	377	2
11	-	537	-	-	-	640	-	-	1246	614	3245	537	-	537	3
12A	-	524	-	406	-	280	28	-	128	434	1543	524	-	524	11
12B	-	337	-	-	-	290	-	-	-	533	1500	337	-	337	2
TOTALS	0	2708	0	1886	442	1900	28	0	2445	1902	18997	2708	0	2708	37

Texas Department of Transportation

SUMMARY OF PERMANENT PAVEMENT MARKING QUANTITIES

STATE	FEDERAL	PROJECT NO.		SHEET
DISTRICT	REGION			27
12	6			HIGHWAY
COUNTY	CONTROL	SECTION	JOB	NO.
HARRIS	0111	09	044	BS288

SUMMARY OF PERMANENT PAVEMENT MARKING QUANTITIES

LAYOUT SHEET NO.	666-REFL PAV MRK														
	(6018) TY I (W)6"(DOT)(100MIL) EA	(6036) TY I (W)8"(SLD)(100MIL) EA	(6042) TY I (W)12"(SLD)(100MIL) EA	(6048) TY I (W)24"(SLD)(100MIL) EA	(6141) TY I (Y)12"(SLD)(100MIL) LF	(6162) RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL) LF	(6180) REFL PAV MRK TY II (W) 12" (SLD) LF	(6181) REFL PAV MRK TY II (W) 18" (SLD) LF	(6212) REFL PAV MRK TY II (Y) 12" (SLD) LF	(6213) REFL PAV MRK TY II (Y) 18" (SLD) EA	(6225) PAVEMENT SEALER 6" EA	(6226) PAVEMENT SEALER 8" EA	(6228) PAVEMENT SEALER 12" EA	(6230) PAVEMENT SEALER 24" EA	(6231) PAVEMENT SEALER (ARROW) EA
CSJ:0111-09-044															
13	-	757	-	-	-	640	-	-	308	889	3250	757	-	757	5
14	-	457	-	-	-	650	-	-	262	580	4254	457	-	457	9
15	-	359	-	83	-	580	-	-	-	215	5523	359	-	359	11
16	-	-	-	-	-	650	-	-	-	-	6500	-	-	-	12
17	-	-	-	-	-	170	-	-	-	-	1742	-	-	-	2
TOTALS	0	1573	0	83	0	2690	0	0	570	1684	21269	1573	0	1573	39
COMBINED TOTALS	97	12211	129	6057	614	9999	480	32	14707	3934	65930	12211	129	11007	194

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Texas Department of Transportation

SUMMARY OF PERMANENT PAVEMENT MARKING QUANTITIES

STATE	FEDERAL	PROJECT NO.		SHEET
DISTRICT	REGION			28
12	6			HIGHWAY
COUNTY	CONTROL	SECTION	JOB	NO.
HARRIS	0111	09	044	BS288

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SUMMARY OF PERMANENT PAVEMENT MARKING QUANTITIES

LAYOUT SHEET NO.	666-REFL PAV MRK						672-REFL PAV MRKR			668-PREFAB PAV MRK				
	(6232) PAVEMENT SEALER (WORD) EA	(6306) RE PM W/RET REQ TY I (W)6"(BRK)(100MIL) EA	(6309) RE PM W/RET REQ TY I (W)6"(SLD)(100MIL) EA	(6318) RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL) EA	(6321) RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL) LF	(6343) REF PROF PAV MRK TY I(W)6"(SLD)(100MIL) LF	(6007) REFL PAV MRKR TY I-C LF	(6009) REFL PAV MRKR TY II-A-A LF	(6010) REFL PAV MRKR TY II-C-R LF	(6077) PREFAB PAV MRK TY C (W) (ARROW) EA	(6078) PREFAB PAV MRK TY C (W) (DBL ARROW) EA	(6085) PREFAB PAV MRK TY C (W) (WORD) EA	(6089) PREFAB PAV MRK TY C (W) (RR XING) EA	(6091) PREFAB PAV MRK TY C (W) (18")(YLD TRI) EA
CSJ:0111-13-003														
1A	-	240	-	100	412	665	12	11	60	-	-	-	-	-
1B	2	760	-	-	3280	730	47	168	11	2	2	2	2	16
2A	16	540	80	-	686	-	28	24	50	16	-	16	-	-
2B	20	520	80	-	-	-	26	-	67	20	-	20	-	-
3A	20	520	120	-	-	-	27	-	61	20	-	20	-	-
3B	6	520	40	-	-	-	27	-	26	6	2	6	-	-
4	19	770	120	-	700	1561	60	44	54	19	6	19	-	12
TOTALS	83	3870	440	100	5078	2956	227	247	329	83	10	83	2	28
CSJ:0111-07-049														
5A	1	460	40	380	1920	1918	29	58	-	7	-	1	-	-
5B	1	350	-	360	1419	1421	20	37	16	7	-	1	-	-
6A	4	160	-	-	1234	-	9	58	30	4	-	4	2	-
6B	-	300	-	-	1200	-	15	14	-	-	-	-	-	-
7A	-	290	80	-	1250	-	15	22	-	-	4	-	-	-
7B	3	70	-	-	368	-	12	20	-	3	-	3	-	-
TOTALS	9	1630	120	740	7391	3339	100	209	46	21	4	9	2	0
CSJ:0111-09-044														
7B	3	-	-	-	556	291	8	28	-	3	2	3	-	-
8A	4	-	779	-	1162	-	15	60	-	3	3	4	-	-
8B	2	-	-	-	1508	-	8	76	-	3	1	2	-	-
9A	2	-	-	-	1924	950	11	100	-	2	2	2	-	-
9B	-	260	-	-	2020	1110	13	100	-	-	-	-	-	-
10	2	420	-	-	-	1729	21	-	20	2	-	2	-	-
11	3	650	-	-	-	2595	33	-	28	3	-	3	-	-
12A	8	280	80	-	-	1183	15	-	31	9	2	8	-	-
12B	3	300	-	-	-	1200	15	-	18	2	-	3	-	-
TOTALS	27	1910	859	-	7170	9058	139	364	97	27	10	27	-	-

Texas Department of Transportation

SUMMARY OF PERMANENT PAVEMENT MARKING QUANTITIES

STATE	FEDERAL	PROJECT NO.		SHEET
DISTRICT	REGION			29
12	6			HIGHWAY
COUNTY	CONTROL	SECTION	JOB	NO.
HARRIS	0111	09	044	BS288

SUMMARY OF PERMANENT PAVEMENT MARKING QUANTITIES

LAYOUT SHEET NO.	666-REFL PAV MRK						672-REFL PAV MRKR			668-PREFAB PAV MRK				
	(6232) PAVEMENT SEALER (WORD) EA	(6306) RE PM W/RET REQ TY I (W)6"(BRK)(100MIL) EA	(6309) RE PM W/RET REQ TY I (W)6"(SLD)(100MIL) EA	(6318) RE PM W/RET REQ TY I (Y)6"(BRK)(100MIL) EA	(6321) RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL) LF	(6343) REF PROF PAV MRK TY I(W)6"(SLD)(100MIL) LF	(6007) REFL PAV MRKR TY I-C LF	(6009) REFL PAV MRKR TY II-A-A LF	(6010) REFL PAV MRKR TY II-C-R LF	(6077) PREFAB PAV MRK TY C (W) (ARROW) EA	(6078) PREFAB PAV MRK TY C (W) (DBL ARROW) EA	(6085) PREFAB PAV MRK TY C (W) (WORD) EA	(6089) PREFAB PAV MRK TY C (W) (RR XING) EA	(6091) PREFAB PAV MRK TY C (W) (18")(YLD TRI) EA
CSJ:0111-09-044														
13	5	650	-	-	-	2600	32	-	37	5	-	5	-	-
14	4	640	-	200	814	2600	33	20	25	9	-	4	-	-
15	2	590	80	390	2028	2435	38	63	11	11	-	2	-	-
16	-	650	-	650	2600	2600	33	65	-	12	-	-	-	-
17	-	160	-	170	706	706	9	18	-	2	-	-	-	-
TOTALS	11	2690	80	1410	6148	10941	145	166	73	39	0	11	0	0
COMBINED TOTALS	130	10100	1499	2250	25787	26294	611	986	545	170	24	130	4	28

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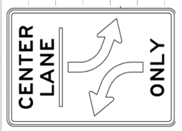
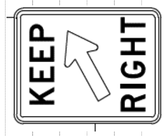
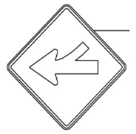
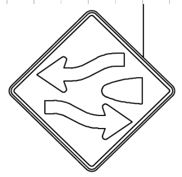
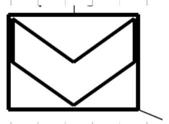
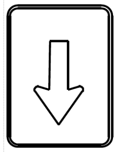
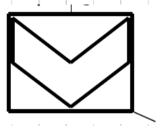
Texas Department of Transportation

SUMMARY OF PERMANENT PAVEMENT MARKING QUANTITIES

SHEET 4 OF 4

STATE	FEDERAL	PROJECT NO.		SHEET NO.
DISTRICT 12	REGION 6			30
COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
HARRIS	0111	09	044	BS288

636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF		2	6	5	30	6.75		16	7.5	3.9	9	3	2	2	4	2.19	3	102
	6001	ALUM SIGNS (TY A)	SF																		
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA																		
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																		
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																		
	6039	TYS80(1)SB(P)	EA																		
	6035	TYS80(1)SA(U-2EXT)	EA																		
	6034	TYS80(1)SA(U-1EXT)	EA																		
	6033	TY S80 (1) SA (U)	EA																		
	6031	TY S80 (1) SA (T-2EXT)	EA																		
	6030	TY S80 (1) SA (T)	EA																		
	6028	TY S80 (1) SA (P-BM)	EA																		
	6027	TY S80 (1) SA (P)	EA																		
	6012	TY 10BWG (1) SB (T)	EA																		
	6009	TY 10BWG (1) SB (P)	EA																		
	6007	TY 10BWG (1) SA (U)	EA																		
	6005	TY 10BWG (1) SA (T-2EXT)	EA																		
	6004	TY 10BWG (1) SA (T)	EA																		
	6002	TY 10BWG (1) SA (P-BM)	EA																		
	6001	TY 10BWG (1) SA (P)	EA								X										1
SUMMARY OF SMALL SIGNS		ALUMINUM TYPE A			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	SHEET TOTAL
		PLYWOOD TYPE A																			
		SIGN DIMENSIONS			24X12	24X36	24X30	72X60	54X18	36X36	48X48	30X36	36X36X36	36X36	18X24	24X12	24X12	24X24	21X15	18X24	
		SIGN TEXT		PROPOSED	BEGIN			EXIST	ONE WAY	RIGHT LANE ENDS		SPEED LIMIT 45	YIELD			SOUTH	BUSSINESS	288 TEXAS			
		SIGN TYPE			M4-14	R3-9B	R4-7b	E5-1	R6-1R	W9-1R	W4-1R	R2-1	R1-2	W6-2	W1-8	M3-3	M4-3	M1-6TB-3	M6-1L	W1-8	
		SIGN NO.			R1		R2	R3	R4	1	R1	R2	R3	R4	R5	R6				R7	
		PLAN SHEET NO.		1A							1B										

Sign support 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.

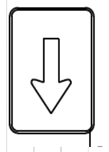
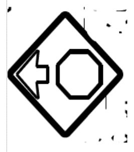
ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

SHEET 1 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				31
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF		2	4	6	6	6	6	2	2	4	2.19	3	3	6	7.5	4	6	2	2	4	3	8.75	6	6.25	6			132
	6001	ALUM SIGNS (TY A)	SF																												
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA																												
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																												
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																												
	6039	TYS80(1)SB(P)	EA																												
	6035	TYS80(1)SA(U-2EXT)	EA																												
	6034	TYS80(1)SA(U-1EXT)	EA																												
	6033	TY S80 (1) SA (U)	EA																												
	6031	TY S80 (1) SA (T-2EXT)	EA																												
	6030	TY S80 (1) SA (T)	EA						MOUNTED BACK TO BACK							MOUNTED BACK TO BACK															
	6028	TY S80 (1) SA (P-BM)	EA																												
	6027	TY S80 (1) SA (P)	EA																												
	6012	TY 10BWG (1) SB (T)	EA																												
	6009	TY 10BWG (1) SB (P)	EA																												
	6007	TY 10BWG (1) SA (U)	EA																												
	6005	TY 10BWG (1) SA (T-2EXT)	EA																												
	6004	TY 10BWG (1) SA (T)	EA																												
	6002	TY 10BWG (1) SA (P-BM)	EA																												
	6001	TY 10BWG (1) SA (P)	EA																										X	X	2
SUMMARY OF SMALL SIGNS		ALUMINUM TYPE A			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		PLYWOOD TYPE A																													
		SIGN DIMENSIONS			24X12	24X24	36X36	36X36	36X36	36X36	24X12	24X12	24X24	21X15	36X12	36X12	36X36	30X36	24X24	36X36	24X12	24X12	24X24	24X18	42X30	36X36	30X30	36X36	36X36	36X36	
		SIGN TEXT		PROPOSED	NORTH	LOOP 274	BRIDGE MAY ICE IN COLD WEATHER	LEFT LANE MUST TURN LEFT	LEFT LANE MUST TURN LEFT	DO NOT ENTER	NORTH	BUSSINESS	288 TEXAS		ONE WAY	ONE WAY	STOP		20 M.P.H	LEFT LANE MUST TURN LEFT	SOUTH	BUSSINESS	288 TEXAS	LEFT LANE	WRONG WAY	DO NOT ENTER		STOP	LANE ENDS MERGE RIGHT	LEFT LANE ENDS	SHEET TOTAL
		SIGN TYPE			M3-1	M1-6L-3	W8-13aT	R3-7L	R3-7L	R5-1	M3-1	M4-3	M1-6TB-3	M6-1L	R6-1L	R6-1L	R1-1	W1-2L	W13-1	R3-7L	M3-3	M4-3	M1-6TB-3	M5-4	R5-1a	R5-1	W3-1	R1-1	W9-2R	W9-1L	
		SIGN NO.			R8		R9	R10	R11		R12				R13			R14		R15	R16				R17	R18	R19	R20	1	2	
		PLAN SHEET NO.		1B																											

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

© TxDOT 2021 SHEET 2 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				32
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

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636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF																											
	6001	ALUM SIGNS (TY A)	SF																											
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA																				X				X			2
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																											
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																											
	6039	TYS80(1)SB(P)	EA																											
	6035	TYS80(1)SA(U-2EXT)	EA						X										X											2
	6034	TYS80(1)SA(U-1EXT)	EA																											
	6033	TY S80 (1) SA (U)	EA																											
	6031	TY S80 (1) SA (T-2EXT)	EA																											
	6030	TY S80 (1) SA (T)	EA																											
	6028	TY S80 (1) SA (P-BM)	EA																											
	6027	TY S80 (1) SA (P)	EA																											
	6012	TY 10BWG (1) SB (T)	EA																											
	6009	TY 10BWG (1) SB (P)	EA																											
	6007	TY 10BWG (1) SA (U)	EA																											
	6005	TY 10BWG (1) SA (T-2EXT)	EA																											
	6004	TY 10BWG (1) SA (T)	EA																											
	6002	TY 10BWG (1) SA (P-BM)	EA																											
	6001	TY 10BWG (1) SA (P)	EA													X														1
SUMMARY OF SMALL SIGNS		ALUMINUM TYPE A			X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		PLYWOOD TYPE A																												
		SIGN DIMENSIONS			24X12	24X12	24X24	24X12		24X12	24X12	24X24	21X15	36 DIA	24X12	24X12	24X24	21X15	24X12	24X12	24X24	24X12	36X36	24X12	24X24	24X12	24X12	24X24	21X15	
		SIGN TEXT		PROPOSED	NORTH	BUSSINESS	288 TEXAS	←		SOUTH	BUSSINESS	288 TEXAS	↑	R R	SOUTH	BUSSINESS	288 TEXAS	↓	NORTH	BUSSINESS	288 TEXAS	←	LANE ENDS MERGE RIGHT	NORTH	BUSSINESS 288	←	SOUTH	BUSSINESS 288	↑	SHEET TOTAL
		SIGN TYPE			M3-1	M4-3	M1-6TB-3	M6-3		M3-3	M4-3	M1-6TB-3	M6-1R	W10-1	M3-3	M4-3	M1-6TB-3	M6-1L	M3-1	M4-3	M1-6TB-3	M6-3	W9-2R	M3-1	M1-6	M6-3	M3-3	M1-6	M6-1R	
		SIGN NO.			3									4	5								X1	X2						
		PLAN SHEET NO.		1B																										

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

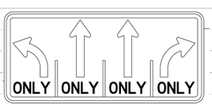
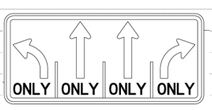
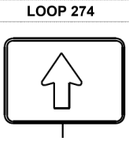
SUMMARY OF SMALL SIGNS

© TxDOT 2021 SHEET 2 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				33
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

FILE: H:\TfSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																				636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																									
2A																												
	R1	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	36X36		X																						9
	R2	R1-1	STOP	30X30		X																						6.25
		R3-2		30X30		X																						6.25
	R3	R5-1	DO NOT ENTER	36X36		X																						9
		R1-2	YIELD	36X36X36		X	MOUNTED BACK TO BACK																					3.9
		R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																						9
	R4	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																						9
	R5	R2-1	SPEED LIMIT 45	30X36		X																						7.5
	R6	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																						9
	R7	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																						9
	R8	R5-1	DO NOT ENTER	36X36		X																						9
	R9	R1-2	YIELD	36X36X36		X	MOUNTED BACK TO BACK																					3.9
		R5-1	DO NOT ENTER	36X36		X																						9
		R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																						9
	R10	R6-1R	ONE WAY	36X12		X																						3
	R11	M2-1	JCT	21X15		X																						2.19
		M1-6T-2	35 TEXAS	24X24		X																						4
	1	D3-2	Plum St NEXT SIGNAL	54X30							X																	
	2	R3-8LSSR		66X30		X					X																	
	3	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X	X																					
	4	R3-8LSSR		66X30		X					X																	
	5	D3-2	Plum St NEXT SIGNAL	54X30		X					X																	
	6	D3-2	Mulberry St NEXT SIGNAL	66X30		X					X																	
2B																												
	R1	R2-1	SPEED LIMIT 45	30X36		X																						7.5
	R2	M3-3	SOUTH	24X12		X																						2
		M1-6L-3	LOOP 274	24X24		X																						4
		M6-3		24X12		X																						2
	R3	R6-1R	ONE WAY	36X12		X																						3
SHEET TOTAL							1				5																	136

ALUMINUM SIGN BLANKS (TYPE A)

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

Sign support 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.

SUMMARY OF SMALL SIGNS

DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.	SHEET
12	6		34

COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA	0111	09	044	BS 288

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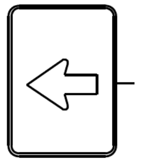
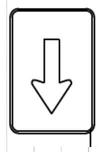
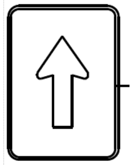
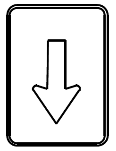
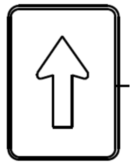
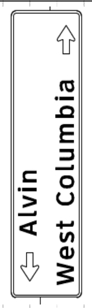
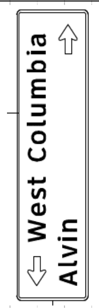
636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF		2	4	2	4	2.19	2	4	2.19	9	6.25	2	4	2.19	2	4	2.19	9	7.5	15	9	15	110
	6001	ALUM SIGNS (TY A)	SF																							
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA																							
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																							
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																							
	6039	TYS80(1)SB(P)	EA																							
	6035	TYS80(1)SA(U-2EXT)	EA																							
	6034	TYS80(1)SA(U-1EXT)	EA																							
	6033	TY S80 (1) SA (U)	EA																							
	6031	TY S80 (1) SA (T-2EXT)	EA																							
	6030	TY S80 (1) SA (T)	EA																							
	6028	TY S80 (1) SA (P-BM)	EA																							
	6027	TY S80 (1) SA (P)	EA																							
	6012	TY 10BWG (1) SB (T)	EA																							
	6009	TY 10BWG (1) SB (P)	EA																							
	6007	TY 10BWG (1) SA (U)	EA																							
	6005	TY 10BWG (1) SA (T-2EXT)	EA																							
	6004	TY 10BWG (1) SA (T)	EA																							
	6002	TY 10BWG (1) SA (P-BM)	EA																							
	6001	TY 10BWG (1) SA (P)	EA																							
SUMMARY OF SMALL SIGNS	ALUMINUM TYPE A				X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
	PLYWOOD TYPE A																									
	SIGN DIMENSIONS				24X12	24X24	24X12	24X24	21X15	24X12	24X24	21X15	36X36	30X30	24X12	24X24	21X15	24X12	24X24	21X15	36X36	30X36	90X24	36X36	90X24	
	SIGN TEXT			PROPOSED	NORTH	35 TEXAS		LOOP 274		SOUTH	LOOP 274		RIGHT LANE MUST TURN RIGHT	DO NOT ENTER	NORTH	35 TEXAS		SOUTH	35 TEXAS		RIGHT LANE MUST TURN RIGHT	SPEED LIMIT 45	 Alvin West Columbia	RIGHT LANE MUST TURN RIGHT	 West Columbia Alvin	SHEET TOTAL
	SIGN TYPE				M3-1	M1-6T-2	M6-3	M1-6L-3	M6-1L	M3-3	M1-6L-3	M6-1R	R3-7R	R5-1	M3-1	M1-6T-2	M6-1L	M3-3	M1-6T-2	M6-1R	R3-7R	R2-1	D1-2	R3-7R	D1-2	
	SIGN NO.				R4								R5	R6	R7						R8	R9	R10	R11	R12	
	PLAN SHEET NO.			2B																						

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

SHEET 4 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				35
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

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SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A
2B	R13	M3-3	PROPOSED SOUTH	24X12		X
		M1-6T-2	35 TEXAS	24X24		X
		M6-1L		21X15		X
		M3-1	NORTH	24X12		X
		M1-6T-2	35 TEXAS	24X24		X
		M6-1R		21X15		X
	R14	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X
	R15	R1-2	YIELD	36X36X36		X
		R5-1	DO NOT ENTER	36X36		X
		R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X
	R16	R5-1	DO NOT ENTER	36X36		X
	R17	M3-3	SOUTH	24X12		X
		M1-6T-2	35 TEXAS	24X24		X
		M6-3		24X12		X
		M1-6L-3	LOOP 274	24X24		X
		M6-1L		21X15		X
		M3-1	NORTH	24X12		X
		M1-6L-3	LOOP 274	24X24		X
		M6-1R		21X15		X
	1	R3-8LSSR	ONLY ONLY ONLY ONLY	66X30		X
	2	R3-8LSSR	ONLY ONLY ONLY ONLY	66X30		X
	3	D3-2	Mulberry St NEXT SIGNAL	66X30		X
SHEET TOTAL						79

644-INS SM RD SN SUP & AM

6007	REPLACE EXT ALUM SIGNS (TY A)	SF		79
6001	ALUM SIGNS (TY A)	SF		
6076	REMOVE SM RD SN SUP & AM	EA		
6070	RELOCATE SM RD SN SUP&AM TY S80	EA		
6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA		
6039	TYS80(1)SB(P)	EA		
6035	TYS80(1)SA(U-2EXT)	EA		
6034	TYS80(1)SA(U-1EXT)	EA		
6033	TY S80 (1) SA (U)	EA		
6031	TY S80 (1) SA (T-2EXT)	EA		
6030	TY S80 (1) SA (T)	EA		
6028	TY S80 (1) SA (P-BM)	EA		
6027	TY S80 (1) SA (P)	EA		
6012	TY 10BWG (1) SB (T)	EA		
6009	TY 10BWG (1) SB (P)	EA		
6007	TY 10BWG (1) SA (U)	EA		3
6005	TY 10BWG (1) SA (T-2EXT)	EA		
6004	TY 10BWG (1) SA (T)	EA		
6002	TY 10BWG (1) SA (P-BM)	EA		
6001	TY 10BWG (1) SA (P)	EA		

MOUNTED BACK TO BACK

636

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				36
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

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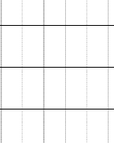
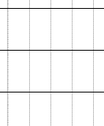
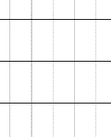
636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF											2.19	4	2	4	2.19	2	4	2.19	9	7.5	2	4	11.3	7.5	9	9	6.25	3.9	9	101
	6001	ALUM SIGNS (TY A)	SF																														
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA						X		X																						2
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																														
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																														
	6039	TYS80(1)SB(P)	EA																														
	6035	TYS80(1)SA(U-2EXT)	EA																														
	6034	TYS80(1)SA(U-1EXT)	EA																														
	6033	TY S80 (1) SA (U)	EA																												MOUNTED BACK TO BACK		
	6031	TY S80 (1) SA (T-2EXT)	EA																														
	6030	TY S80 (1) SA (T)	EA																														
	6028	TY S80 (1) SA (P-BM)	EA																														
	6027	TY S80 (1) SA (P)	EA																														
	6012	TY 10BWG (1) SB (T)	EA																														
	6009	TY 10BWG (1) SB (P)	EA																														
	6007	TY 10BWG (1) SA (U)	EA																														
	6005	TY 10BWG (1) SA (T-2EXT)	EA																														
	6004	TY 10BWG (1) SA (T)	EA																														
	6002	TY 10BWG (1) SA (P-BM)	EA																														
	6001	TY 10BWG (1) SA (P)	EA			X		X	X																								3
SUMMARY OF SMALL SIGNS		ALUMINUM TYPE A			X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		PLYWOOD TYPE A																															
		SIGN DIMENSIONS			24X12	24X24	24X12	30X36	30X36	24X12	24X24	24X12		21X15	24X24	24X12	24X24	21X15	24X12	24X24	21X15	36X36	30X36	24X12	24X24	54X30	30X36	36X36	36X36	30X30	36X36X36	36X36	
		SIGN TEXT		PROPOSED	NORTH	LOOP 274		SPEED LIMIT 45	SPEED LIMIT 45	NORTH	LOOP 274			JCT	35 TEXAS	NORTH	LOOP 274		SOUTH	LOOP 274		RIGHT LANE MUST TURN RIGHT	SPEED LIMIT 45	SOUTH	LOOP 274	Locust St NEXT SIGNAL	SPEED LIMIT 45	RIGHT LANE MUST TURN RIGHT	RIGHT LANE MUST TURN RIGHT		YIELD	DO NOT ENTER	SHEET TOTAL
		SIGN TYPE			M3-1	M1-6L-3	M6-3	R2-1	R2-1	M3-1	M1-6L-3	M6-3		M2-1	M1-6T-2	M3-1	M1-6L-3	M6-1L	M3-3	M1-6L-3	M6-1R	R3-7R	R2-1	M3-3	M1-6L-3	D3-2	R2-1	R3-7R	R3-7R	R3-2	R1-2	R5-1	
		SIGN NO.			4			5	X1	X2				R1		R2						R3	R4	R5		R6	R7	R8	R9	R10	R11		
		PLAN SHEET NO.		2B									3A																				

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

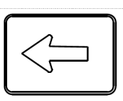
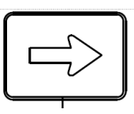
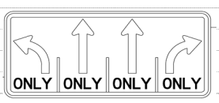
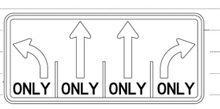
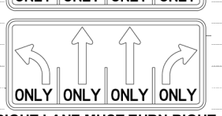
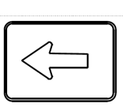
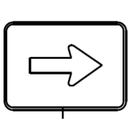
SUMMARY OF SMALL SIGNS

© TxDOT 2021 SHEET 4 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				37
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

FILE: H:\TFSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																				636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																									
3A																												
	R12	M3-3	SOUTH	24X12		X																						2
		M1-6L-3	LOOP 274	24X24		X																						4
		M6-1L		21X15		X																						2.19
		M3-1	NORTH	24X12		X																						2
		M1-6L-3	LOOP 274	24X24		X																						4
		M6-1R		21X15		X																						2.19
	R13	D3-2	Cedar St NEXT SIGNAL	54X30		X																						11.3
	R14	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																						9
	1	R3-8LSSR		66X30		X					X																	
	2	D3-2	Locust St NEXT SIGNAL	54X30							X																	
	3	R3-8LSSR		66X30		X					X																	
	4	R3-8LSSR		66X30		X					X																	
	5	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36			X																					
	X1	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																			X			
	X2	D3-2	Locust St NEXT SIGNAL	54X30																					X			
3B																												
	R1	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																						9
	R2	M3-1	NORTH	24X12		X																						2
		M1-6L-3	LOOP 274	24X24		X																						4
		M6-1L		21X15		X																						2.19
		M3-3	SOUTH	24X12		X																						2
		M1-6L-3	LOOP 274	24X24		X																						4
		M6-1R		21X15		X																						2.19
	R3	D3-2	Cedar St NEXT SIGNAL	54X30		X																						11.3
	R4	R1-1	STOP	30X30		X																						6.25
SHEET TOTAL							1				4													2		80		

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

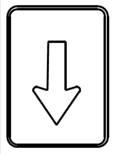
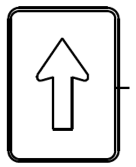
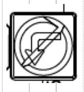
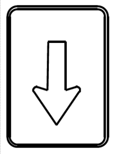
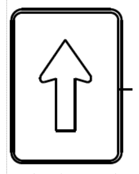
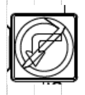
SUMMARY OF SMALL SIGNS

SHEET 4 OF 12

DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.	SHEET
12	6		38
COUNTY			HIGHWAY NO.
BRAZORIA			BS 288
CONTROL	SECTION	JOB	
0111	09	044	

FILE: H:\TrfSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF		2	4	2.19	2	4	2.19	6.25	3.9	9	3	2	4	2.19	2	4	2.19	2	4	16.3	3.9	9	6.25	7.5				104
	6001	ALUM SIGNS (TY A)	SF																												
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA									MOUNTED BACK TO BACK												MOUNTED BACK TO BACK							
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																												
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																												
	6039	TYS80(1)SB(P)	EA																												
	6035	TYS80(1)SA(U-2EXT)	EA																												
	6034	TYS80(1)SA(U-1EXT)	EA																												
	6033	TY S80 (1) SA (U)	EA																									X			1
	6031	TY S80 (1) SA (T-2EXT)	EA																												
	6030	TY S80 (1) SA (T)	EA																												
	6028	TY S80 (1) SA (P-BM)	EA																												
	6027	TY S80 (1) SA (P)	EA																												
	6012	TY 10BWG (1) SB (T)	EA																												
	6009	TY 10BWG (1) SB (P)	EA																												
	6007	TY 10BWG (1) SA (U)	EA																											X	1
	6005	TY 10BWG (1) SA (T-2EXT)	EA																												
	6004	TY 10BWG (1) SA (T)	EA																												
	6002	TY 10BWG (1) SA (P-BM)	EA																												
	6001	TY 10BWG (1) SA (P)	EA																										X		1
		ALUMINUM TYPE A			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	
		PLYWOOD TYPE A																													
		SIGN DIMENSIONS			24X12	24X24	21X15	24X12	24X24	21X15	30X30	36X36X36	36X36	36X12	24X12	24X24	21X15	24X12	24X24	21X15	24X12	24X24	78X30	36X36X36	36X36	30X30	30X36	78X30	30X30	60X30	
		SIGN TEXT		PROPOSED	NORTH	LOOP 274		SOUTH	LOOP 274			YIELD	DO NOT ENTER	ONE WAY	SOUTH	LOOP 274		NORTH	LOOP 274		NORTH	LOOP 274	Miller Street NEXT CROSS STREET	YIELD	DO NOT ENTER	STOP	SPEED LIMIT 45	Miller Street NEXT CROSS STREET		Wilkins St NEXT SIGNAL	SHEET TOTAL
		SIGN TYPE			M3-1	M1-6L-3	M6-1L	M3-3	M1-6L-3	M6-1R	R3-2	R1-2	R5-1	R6-1R	M3-3	M1-6L-3	M6-1L	M3-1	M1-6L-3	M6-1R	M3-1	M1-6L-3	D3-2	R1-2	R5-1	R1-1	R2-1	D3-2	R3-2		
		SIGN NO.			R5						R6	R7		R8	R9						R10		R11	R12		R13	R14	1	2	3	
		PLAN SHEET NO.		3B																											

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

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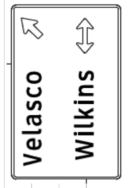
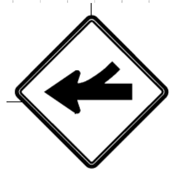
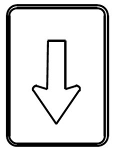
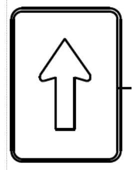
STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				39
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF					2	4	3.9	7.5	5	7.5	2	2	4	7.5	9	2	2	4	9	9	7.5									88
	6001	ALUM SIGNS (TY A)	SF																														
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA	X		X																											2
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																														
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																														
	6039	TYS80(1)SB(P)	EA																														
	6035	TYS80(1)SA(U-2EXT)	EA																														
	6034	TYS80(1)SA(U-1EXT)	EA																									X				1
	6033	TY S80 (1) SA (U)	EA																														
	6031	TY S80 (1) SA (T-2EXT)	EA																														
	6030	TY S80 (1) SA (T)	EA																														
	6028	TY S80 (1) SA (P-BM)	EA																														
	6027	TY S80 (1) SA (P)	EA																														
	6012	TY 10BWG (1) SB (T)	EA																														
	6009	TY 10BWG (1) SB (P)	EA																														
	6007	TY 10BWG (1) SA (U)	EA																														
	6005	TY 10BWG (1) SA (T-2EXT)	EA																														
	6004	TY 10BWG (1) SA (T)	EA																														
	6002	TY 10BWG (1) SA (P-BM)	EA																														
	6001	TY 10BWG (1) SA (P)	EA																														
SUMMARY OF SMALL SIGNS		ALUMINUM TYPE A			X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X		X	X	X	
		PLYWOOD TYPE A																															
		SIGN DIMENSIONS			78X30	60X36		24X12	24X24	36X36X36	30X36	24X30	30X36	24X12	24X12	24X24	30X36	36X36	24X12	24X12	24X24	36X36	36X36	30X36	24X12	24X12	24X24	21X15		24X12	24X24	21X15	
		SIGN TEXT		PROPOSED	Miller Street NEXT CROSS STREET			SOUTH	LOOP 274	YIELD	SPEED LIMIT 45	NO PARKING	SPEED LIMIT 35	SOUTH	BUSSINESS	288 TEXAS	SPEED LIMIT 45	LEFT LANE ENDS	NORTH	BUSSINESS	288 TEXAS	LANE ENDS MERGE RIGHT		SPEED LIMIT 45	NORTH	BUSSINESS	288 TEXAS			SOUTH	LOOP 274		
		SIGN TYPE			D3-2	D1-2		M3-3	M1-6L	R1-2	R2-1	R8-3a	R2-1	M3-3	M4-3	M1-6TB-3	R2-1	W9-1L	M3-1	M4-3	M1-6TB-3	W9-2TR	W4-1R	R2-1	M3-1	M4-3	M1-6TB-3	M6-1L		M3-3	M1-6L-3	M6-1R	
		SIGN NO.			X1	X2		R1		R2	R3	R4	R5	R6			R7	R8	R9			R10	R11	R12	1								
		PLAN SHEET NO.		3B			4																										

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

SHEET 5 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				40
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

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SUMMARY OF SMALL SIGNS

																															SHEET TOTAL
636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF																												
	6001	ALUM SIGNS (TY A)	SF																												
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA																												
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																												
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																												
	6039	TYS80(1)SB(P)	EA																												
	6035	TYS80(1)SA(U-2EXT)	EA															X											1
	6034	TYS80(1)SA(U-1EXT)	EA					X																			X				2
	6033	TY S80 (1) SA (U)	EA																												
	6031	TY S80 (1) SA (T-2EXT)	EA																												
	6030	TY S80 (1) SA (T)	EA																												
	6028	TY S80 (1) SA (P-BM)	EA																												
	6027	TY S80 (1) SA (P)	EA																												
	6012	TY 10BWG (1) SB (T)	EA																												
	6009	TY 10BWG (1) SB (P)	EA																												
	6007	TY 10BWG (1) SA (U)	EA													X															1
	6005	TY 10BWG (1) SA (T-2EXT)	EA																												
	6004	TY 10BWG (1) SA (T)	EA												X																1
	6002	TY 10BWG (1) SA (P-BM)	EA																												
	6001	TY 10BWG (1) SA (P)	EA																												
SUMMARY OF SMALL SIGNS		ALUMINUM TYPE A			X	X	X		X	X	X	X	X	X	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X	
		PLYWOOD TYPE A																													
		SIGN DIMENSIONS			24X12	24X24	21X15		24X12	24X12	24X24	21X15	72X12	60X30	24X12	24X12	24X24	21X15		24X12	24X12	24X24	21X15	24X12	24X24	21X15	24X12	24X12	24X24	21X15	
		SIGN TEXT		PROPOSED	SOUTH	LOOP 274	⇩		NORTH	BUSSINESS	288 TEXAS	⇧	Velasco St ⇕	Wilkins St NEXT SIGNAL	NORTH	BUSSINESS	288 TEXAS	⇩		SOUTH	BUSSINESS	288 TEXAS	⇧	SOUTH	LOOP 274	⇩	NORTH	BUSSINESS	288 TEXAS	⇧	
		SIGN TYPE			M3-3	M1-6L-3	M6-1L		M3-1	M4-3	M1-6TB-3	M6-1R	D21-1TDBL	D3-2	M3-1	M4-3	M1-6TB-3	M6-1L		M3-3	M4-3	M1-6TB-3	M6-1R	M3-3	M1-6L-3	M6-1L	M3-1	M4-3	M1-6TB-3	M6-1R	
		SIGN NO.			2								3	4	5									6							
		PLAN SHEET NO.		4																											

Sign support 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.

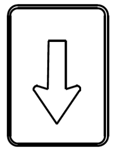
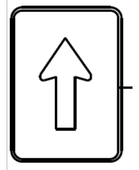
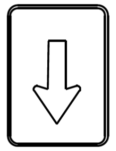
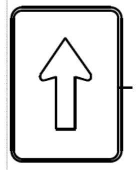
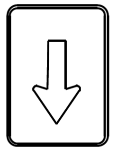
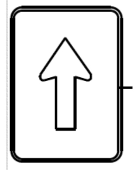
ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

© TxDOT 2021 SHEET 5 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				41
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

636	6007	REPLACE EXT ALUM SIGNS (TY A)	SF																							
	6001	ALUM SIGNS (TY A)	SF																							
644-INS SM RD SN SUP & AM	6076	REMOVE SM RD SN SUP & AM	EA				X						X						X				X	X	X	6
	6070	RELOCATE SM RD SN SUP&AM TY S80	EA																							
	6068	RELOCATE SM RD SN SUP&AM TY 10BWG	EA																							
	6039	TYS80(1)SB(P)	EA																							
	6035	TYS80(1)SA(U-2EXT)	EA																							
	6034	TYS80(1)SA(U-1EXT)	EA																							
	6033	TY S80 (1) SA (U)	EA																							
	6031	TY S80 (1) SA (T-2EXT)	EA																							
	6030	TY S80 (1) SA (T)	EA																							
	6028	TY S80 (1) SA (P-BM)	EA																							
	6027	TY S80 (1) SA (P)	EA																							
	6012	TY 10BWG (1) SB (T)	EA																							
	6009	TY 10BWG (1) SB (P)	EA																							
	6007	TY 10BWG (1) SA (U)	EA																							
	6005	TY 10BWG (1) SA (T-2EXT)	EA																							
	6004	TY 10BWG (1) SA (T)	EA																							
	6002	TY 10BWG (1) SA (P-BM)	EA																							
	6001	TY 10BWG (1) SA (P)	EA																							
SUMMARY OF SMALL SIGNS		ALUMINUM TYPE A			X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X			X	
		PLYWOOD TYPE A																								
		SIGN DIMENSIONS			24X12	24X24	21X15	24X12	24X24	21X15	24X12	24X24	21X15	24X12	24X24	21X15	24X12	24X24	21X15	24X12	24X24	21X15	30X30	36X36	36X36X36	
		SIGN TEXT		PROPOSED	NORTH	BUSSINESS 288		SOUTH	LOOP 274		SOUTH	LOOP 274		NORTH	BUSSINESS 288		SOUTH	LOOP 274		NORTH	BUSSINESS 288			DO NOT CROSS DOUBLE WHITE LINE	YIELD	SHEET TOTAL
		SIGN TYPE			M3-1	M1-6	M6-1L	M3-3	M1-6L-3	M6-1R	M3-3	M1-6L-3	M6-1L	M3-1	M1-6	M6-1R	M3-3	M1-6L-3	M6-1L	M3-1	M1-6	M6-1R	W3-2	R4-3bT	R1-2	
		SIGN NO.			X1						X2						X3						X4	X5	X6	
		PLAN SHEET NO.		4																						

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

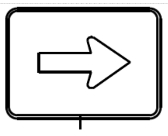
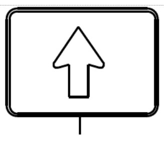
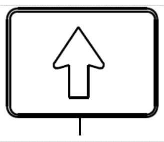
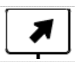
SUMMARY OF SMALL SIGNS

SHEET 6 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

FILE: H:\TrfSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																		636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																							
5A																										
	R1	M4-14	BEGIN	24X12		X																				2
		R3-9B		24X36		X																				6
	R2	R2-1	SPEED LIMIT 45	30X36		X																				7.5
	R3	D2-2		60X24		X																				10
	1	D3-2	Cemetery Rd NEXT SIGNAL	72X30							X															
	2	M3-1	NORTH	24X12		X																				
		M4-3	BUSSINESS	24X12		X																				
		M1-6TB-3	288 TEXAS	24X24		X	X																			
		M6-1R		21X15		X																				
	X1	D3-2	Cemetery Rd NEXT SIGNAL	72X30																				X		
	X2	M4-5	TO	24X12		X																				
		M3-4	WEST	24X12		X																				
		M1-6T-2	35 TEXAS	24X24		X																				
		M6-3		24X12		X																				
																								X		
		M3-1	NORTH	24X12		X																				
		M1-6	BUSSINESS 288	24X24		X																				
		M3-2	EAST	24X12		X																				
		M1-6T	105 TEXAS	24X24		X																				
		M6-2R		21X15		X																				
5B																										
	R1	R2-1	SPEED LIMIT 45	30X36		X																				7.5
	R2	R3-33T	RIGHT LANE MUST EXIST	48X48		X																				16
	1	M3-1	NORTH	24X12		X																				
		M1-6L-3	LOOP 274	24X24		X																				
		M6-3		24X12		X											X									
		D3-4T	Velasco St	8X30		X																				
		M6-2R		21X15		X																				
			SHEET TOTAL				1				1							1						2		49

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

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SHEET 6 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42A
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	636 6007 REPLACE EXT ALUM SIGNS (TY A) SF	636 6001 ALUM SIGNS (TY A) SF	644-INS SM RD SN SUP & AM 6076 REMOVE SM RD SN SUP & AM EA	6070 RELOCATE SM RD SN SUP&AM TY S80 EA	6068 RELOCATE SM RD SN SUP&AM TY 10BWG EA	6039 TYS80(1)SB(P) EA	6035 TYS80(1)SA(U-2EXT) EA	6034 TYS80(1)SA(U-1EXT) EA	6033 TY S80 (1) SA (U) EA	6031 TY S80 (1) SA (T-2EXT) EA	6030 TY S80 (1) SA (T) EA	6028 TY S80 (1) SA (P-BM) EA	6027 TY S80 (1) SA (P) EA	6012 TY 10BWG (1) SB (T) EA	6009 TY 10BWG (1) SB (P) EA	6007 TY 10BWG (1) SA (U) EA	6005 TY 10BWG (1) SA (T-2EXT) EA	6004 TY 10BWG (1) SA (T) EA	6002 TY 10BWG (1) SA (P-BM) EA	6001 TY 10BWG (1) SA (P) EA
5B			PROPOSED																							
	2	W9-2TL	LANE ENDS MERGE LEFT	36X36		X																				X
	X1	M3-1	NORTH	24X12		X			X																	
		M1-6L-3	LOOP 274	24X24		X																				
		M6-3		24X12		X																				
6A	R1	D3-4T	Kiber St	30x8		X	1.67																			
		D3-4T	Velasco St	30x8		X																				
		R6-1L	ONE WAY	36x12		X	3																			
		R6-1L	ONE WAY	36x12		X	3																			
		R1-1	STOP	30X30		X	6.25																			
	R1	R2-1	SPEED LIMIT 45	30X36		X	7.5																			
	R2	R1-2	YIELD	36X36X36		X	3.9																			
	R3		KIBER ST LEFT ONLY	24X24		X	4																			
		M3-3	SOUTH	24X12		X	2																			
		M4-3	BUSSINESS	24X12		X	2																			
		M1-6TB-3	288 TEXAS	24X24		X	4																			
		M6-1R		21X15		X	2.19																			
	R4	M3-3	SOUTH	24X12		X	2																			
		M4-3	BUSSINESS	24X12		X	2																			
		M1-6TB-3	288 TEXAS	24X24		X	4																			
		M6-1R		21X15		X	2.19																			
	R5	W10-9	NO TRAIN HORN	36X36		X																				
	R6	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X	9																			
	R7	D3-4T	Munson St	30x8		X	9																			
		D3-4T	Velasco St	30x8		X	1.67																			
		R1-1	STOP	30X30		X	1.67																			
	R8	R10-7	DO NOT BLOCK INTERSECTION	24X30		X	6.25																			
	R9	W10-1		36 DIA		X	5																			
							7.1																			
	R10	W10-9	NO TRAIN HORN	36X36		X																				
	R11	R2-1	SPEED LIMIT 35	30X36		X	9																			
							7.5																			
			SHEET TOTAL				106		1																	1

MOUNTED BACK TO BACK

Sign support 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.

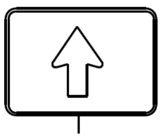
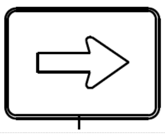
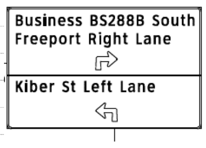
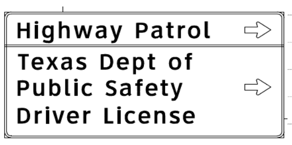
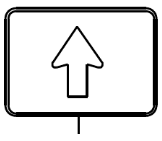
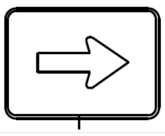
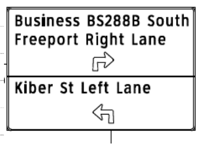
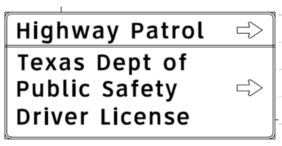
ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42B
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																		636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																							
6A																										
	1	M3-3	SOUTH	24X12		X																				
		M4-3	BUSSINESS	24X12		X																				
		M1-6TB-3	288 TEXAS	24X24		X																				
		M6-3		21X15		X																				
																				X						
		M3-1	NORTH	24X12		X																				
		M4-3	BUSSINESS	24X12		X																				
		M1-6TB-3	288 TEXAS	24X24		X																				
		M6-1R		21X15		X																				
	2		 Business BS288B South Freeport Right Lane Kiber St Left Lane	108X66		X								X												
														X												
	3																									
			 Highway Patrol Texas Dept of Public Safety Driver License	96X66		X								X												
														X												
	X1	M3-3	SOUTH	24X12		X																				
		M1-6	BUSSINESS 288	24X24		X																				
		M6-3		21X15		X																				
																								X		
		M3-1	NORTH	24X12		X																				
		M1-6	BUSSINESS 288	24X24		X																				
		M6-1R		21X15		X																				
	X2		 Business BS288B South Freeport Right Lane Kiber St Left Lane	108X66		X																		X		
	X3																							X		
			 Highway Patrol Texas Dept of Public Safety Driver License	96X66		X																				
SHEET TOTAL														4						1				3		

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

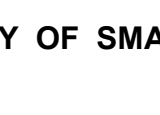
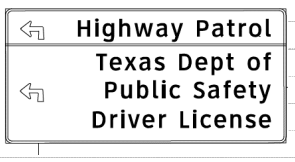
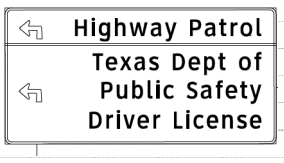
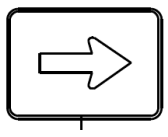
SUMMARY OF SMALL SIGNS

SHEET 7 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42C
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

FILE: H:\TrfSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM 6001 TY 10BWG (1) SA (P) EA	6002 TY 10BWG (1) SA (P-BM) EA	6004 TY 10BWG (1) SA (T) EA	6005 TY 10BWG (1) SA (T-2EXT) EA	6007 TY 10BWG (1) SA (U) EA	6009 TY 10BWG (1) SB (P) EA	6012 TY 10BWG (1) SB (T) EA	6027 TY S80 (1) SA (P) EA	6028 TY S80 (1) SA (P-BM) EA	6030 TY S80 (1) SA (T) EA	6031 TY S80 (1) SA (T-2EXT) EA	6033 TY S80 (1) SA (U) EA	6034 TYS80(1)SA(U-1EXT) EA	6035 TYS80(1)SA(U-2EXT) EA	6039 TYS80(1)SB(P) EA	6068 RELOCATE SM RD SN SUP&AM TY 10BWG EA	6070 RELOCATE SM RD SN SUP&AM TY S80 EA	6076 REMOVE SM RD SN SUP & AM EA	636 6001 ALUM SIGNS (TY A) SF	6007 REPLACE EXT ALUM SIGNS (TY A) SF
			PROPOSED																								
6B																											
	R1	D3-4T	Murray St	30x8		X																					1.67
		D3-4T	Velasco St	30x8		X																					1.67
		R1-1	STOP	30X30		X																					6.25
	R2	R10-7	DO NOT BLOCK INTERSECTION	24X30		X																					5
	R3	D3-4T	Plum St	30x8		X																					1.67
		D3-4T	Velasco St	30x8		X																					1.67
		R1-1	STOP	30X30		X																					6.25
	R4	D3-4T	Murray St	30x8		X																					1.67
		D3-4T	Velasco St	30x8		X																					1.67
		R1-1	STOP	30X30		X																					6.25
	R5	M4-5	TO	24X12		X																					2
		M1-6L-3	LOOP 274	24X24		X																					4
		M6-1L		21X15		X																					2.19
	R6	D3-4T	Plum St	30x8		X																					1.67
		D3-4T	Velasco St	30x8		X																					1.67
		R1-1	STOP	30X30		X																					6.25
	1			108X72		X								X X													
	X1			108X72		X																			X			
7A																											
	R1	M4-5	TO	24X12		X																					2
		M1-6L	LOOP 274	24X24		X																					4
		M6-1R		21X15		X																					2.19
	R2	D3-4T	Peach St	30x8		X																					1.67
		D3-4T	Velasco St	30x8		X																					1.67
		R1-1	STOP	30X30		X																					6.25
	R3	D3-4T	Peach St	30x8		X																					1.67
		D3-4T	Velasco St	30x8		X																					1.67
		R1-1	STOP	30X30		X																					6.25
SHEET TOTAL														2											1		79

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

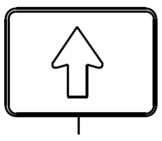
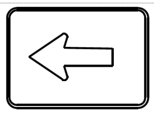
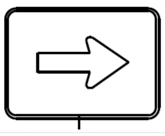
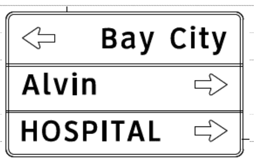
Square Ft.	Min. Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

SUMMARY OF SMALL SIGNS

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.	SHEET
12	6		42D

COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA	0111	09	044	BS 288

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																		636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																							
7A																										
	R4	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																				9
	1	D3-2	Orange St NEXT SIGNAL	60X30		X					X															
	2	M2-1	JCT	21X15		X	X																			
		M1-6T-2	35 TEXAS	24X24		X																				
	X1	M2-1	JCT	21X15		X																		X		
		M1-6T-2	35 TEXAS	24X24		X																				
7B																										
	R1	M3-3	SOUTH	24X12		X																				2
		M4-3	BUSSINESS	24X12		X																				2
		M1-6TB-3	288 TEXAS	24X24		X																				4
	R2	R2-1	SPEED LIMIT 30	30X36		X																				7.5
	R3	M2-1	JCT	21X15		X																				2.19
		M1-6T-2	35 TEXAS	24X24		X																				4
	R4	R2-1	SPEED LIMIT 35	30X36		X																				7.5
	1	D3-2	Orange St NEXT SIGNAL	60X30		X					X															
	2	M4-3	BUSSINESS	24X12		X																				
		M1-6TB-3	288 TEXAS	24X24		X																				
		M6-3		21X15		X																				
		M3-1	NORTH	24X12		X																				
		M1-6T-2	35 TEXAS	24X24		X															X					
		M6-1L		21X15		X																				
		M3-3	SOUTH	24X12		X																				
		M1-6T-2	35 TEXAS	24X24		X																				
		M6-1R		21X15		X																				
	3			66X42													X									
SHEET TOTAL							1				2							1		1				1		38

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

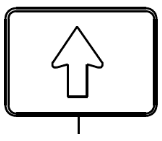
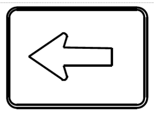
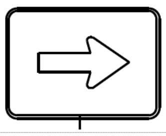
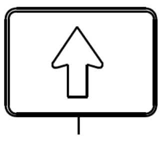
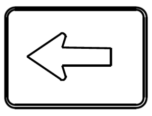
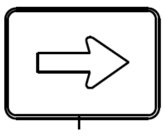
SHEET 7 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42E
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

FILE: H:\TrfSigning\0338-03-089\Summaries.xls

FILE: H:\TrfSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

							644-INS SM RD SN SUP & AM																		636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																							
7B																										
	4	M1-6T-2	35 TEXAS	24X24		X																				
		M6-3		21X15		X																				
		M3-1	NORTH	24X12		X																				
		M4-3	BUSSINESS	24X12		X																				
		M1-6TB-3	288 TEXAS	24X24		X													X							
		M6-1L		21X15		X																				
		M3-3	SOUTH	24X12		X																				
		M4-3	BUSSINESS	24X12		X																				
		M1-6TB-3	288 TEXAS	24X24		X																				
		M6-1R		21X15		X																				
	5	M1-6T-2	35 TEXAS	24X24		X																				
		M6-3		21X15		X																				
		M3-3	SOUTH	24X12		X																				
		M1-6	BUSSINESS 288	24X24		X																				
		M6-1L		21X15		X													X							
		M3-1	NORTH	24X12		X																				
		M4-3	BUSSINESS	24X12		X																				
		M1-6TB-3	288 TEXAS	24X24		X																				
		M6-1R		21X15		X																				
SHEET TOTAL																			2							

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

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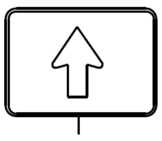
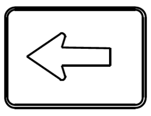
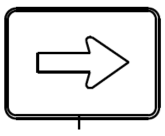
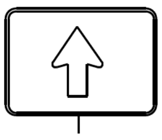
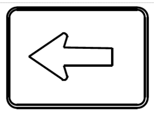
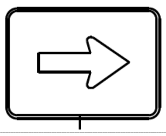
SHEET 8 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42F
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																		636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																							
7B																										
	6	M4-3	BUSSINESS	24X12		X																				
		M1-6TB-3	288 TEXAS	24X24		X																				
		M6-3		21X15		X																				
		M3-3	SOUTH	24X12		X																				
																			X							
		M1-6T	35 TEXAS	24X24		X																				
		M6-1L		21X15		X																				
		M3-1	NORTH	24X12		X																				
		M1-6T	35 TEXAS	24X24		X																				
		M6-1R		21X15		X																				
	X1	M1-6T	BUSINESS 288	24X24		X																				
		M6-3		21X15		X																				
		M3-1	NORTH	24X12		X																				
		M1-6T-2	35 TEXAS	24X24		X																				
		M6-1L		21X15		X																	X		
		M3-3	SOUTH	24X12		X																				
		M1-6T-2	35 TEXAS	24X24		X																				
		M6-1R		21X15		X																				
			SHEET TOTAL																1					1		

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Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

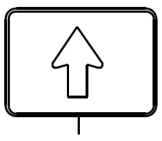
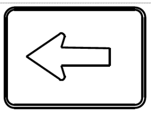
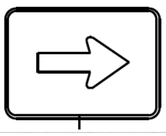
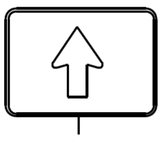
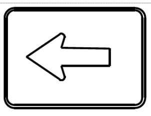
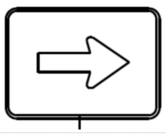
Square Ft.	Min. Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

SUMMARY OF SMALL SIGNS

SHEET 9 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42G
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																		636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																							
7B																										
	X2	M1-6T-2	35 TEXAS	24X24		X																				
		M6-3		21X15		X																				
		M3-1	NORTH	24X12		X																				
		M1-6T	BUSINESS 288	24X24		X																				
		M6-1L		21X15		X																		X		
		M3-3	SOUTH	24X12		X																				
		M1-6T	BUSINESS 288	24X24		X																				
		M6-1R		21X15		X																				
	X3	M1-6T-2	35 TEXAS	24X24		X																				
		M6-3		21X15		X																				
		M3-3	SOUTH	24X12		X																				
		M1-6T	BUSINESS 288	24X24		X																				
		M6-1L		21X15		X																		X		
		M3-1	NORTH	24X12		X																				
		M1-6T	BUSINESS 288	24X24		X																				
		M6-1R		21X15		X																				
SHEET TOTAL																								2		

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

© TxDOT 2021 SHEET 9 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42H
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

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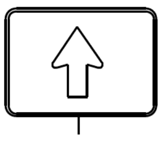
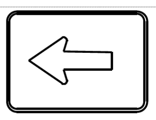
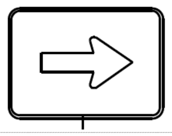
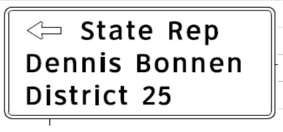
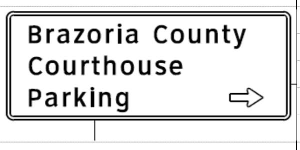
FILE: H:\TrfSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

							644-INS SM RD SN SUP & AM																		636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																							
7B																										
	X4	M1-6T	BUSINESS 288	24X24		X																				
		M6-3		21X15		X																				
		M3-3	SOUTH	24X12		X																				
		M1-6T-2	35 TEXAS	24X24		X																				
		M6-1L		21X15		X																		X		
		M3-1	NORTH	24X12		X																				
		M1-6T-2	35 TEXAS	24X24		X																				
		M6-1R		21X15		X																				
8A																										
	R1	D23-1TL	 State Rep Dennis Bonnen District 25	54X24		X																				9
	R2	W11-2		36X36		X																				9
	1	D3-2	Magnolia St NEXT SIGNAL	66X30		X					X															
	2	D3-2	Magnolia St NEXT SIGNAL	66X30		X					X															
	X1	D3-4T	Myrtle St	30x8		X																		X		
		D3-4T	Velasco St	30x8		X																				
	X2	D3-4T	Magnolia St	30x8		X																		X		
		D3-4T	Velasco St	30x8		X																				
8B																										
	R1	D3-4T	Locust St	30x8		X																				1.67
		D3-4T	Velasco St	30x8		X																				1.67
		R1-1	STOP	30X30		X																				6.25
	R2	R2-1	SPEED LIMIT 35	30X36		X																				7.5
	R3	D26-7TR	 Brazoria County Courthouse Parking	60X24		X																				10
			SHEET TOTAL								2													3		45

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

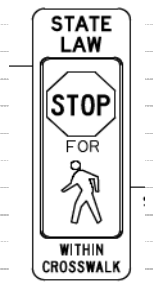
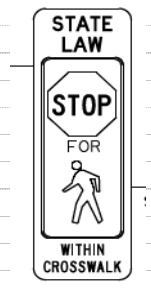
Square Ft.	Min. Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

SUMMARY OF SMALL SIGNS

SHEET 9 OF 12

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.			SHEET
12	6				42I
COUNTY		CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA		0111	09	044	BS 288

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM 6001 TY 10BWG (1) SA (P) EA	6002 TY 10BWG (1) SA (P-BM) EA	6004 TY 10BWG (1) SA (T) EA	6005 TY 10BWG (1) SA (T-2EXT) EA	6007 TY 10BWG (1) SA (U) EA	6009 TY 10BWG (1) SB (P) EA	6012 TY 10BWG (1) SB (T) EA	6027 TY S80 (1) SA (P) EA	6028 TY S80 (1) SA (P-BM) EA	6030 TY S80 (1) SA (T) EA	6031 TY S80 (1) SA (T-2EXT) EA	6033 TY S80 (1) SA (U) EA	6034 TYS80(1)SA(U-1EXT) EA	6044 TY S80 (1) SB (U) EA	6035 TYS80(1)SA(U-2EXT) EA	6039 TYS80(1)SB(P) EA	6070 RELOCATE SM RD SN SUP&AM TY S80 EA	6076 REMOVE SM RD SN SUP & AM EA	636 6001 ALUM SIGNS (TY A) SF	6007 REPLACE EXT ALUM SIGNS (TY A) SF
			PROPOSED																								
8B																											
	R4	D3-4T	Live Oak St	30x8		X																					1.67
		D3-4T	Velasco St	30x8		X																					1.67
		R1-1	STOP	30X30		X																					6.25
		R7-1	NO PARKING ANY TIME	12x18																							1.5
	R5	R1-6		12X36		X																					3
	R6	D3-4T	Locust St	30x8		X																					1.67
		D3-4T	Velasco St	30x8		X																					1.67
		R1-1	STOP	30X30		X																					6.25
	R7	R1-6		12X36		X																					3
	R8	R2-1	SPEED LIMIT 35	30X36		X																					7.5
	1	D3-2	Cedar St NEXT SIGNAL	54X30		X					X																
9A																											
	R1	M3-3	SOUTH	24X12		X																					2
		M4-3	BUSSINESS	24X12		X																					2
		M1-6TB-3	288 TEXAS	24X24		X																					4
	R2	R7-1	NO PARKING ANY TIME	12X18		X																					1.5
	R3	W11-2		36X36		X																					9
	R4	R2-1	SPEED LIMIT 35	30X36		X																					7.5
	R5	W8-18bT	WHEN FLOODED TURN AROUND DON'T DROWN	48X48		X																					16
	R6	D12-5bTR	TEXAS TRAVEL INFORMATION CENTER	48X24		X																					8
	R7	D3-3bTR	USDA Service Center	66X36		X	MOUNTED BACK TO BACK																				16.5
		D3-3bTL	USDA Service Center	66X36		X																					16.5
	R8	R2-1	SPEED LIMIT 35	30X36		X																					7.5
SHEET TOTAL											1																125

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SUMMARY OF SMALL SIGNS

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.	SHEET
12	6		42J

COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA	0111	09	044	BS 288

FILE: H:\TrfSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

							644-INS SM RD SN SUP & AM																636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6044	6035	6039	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TY S80 (1) SB (U)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																							
9A																										
	1	D12-5bTL	TEXAS TRAVEL INFORMATION CENTER	54X24		X			X																	
	2	D3-2	Cedar St NEXT SIGNAL	54X30							X															
	X1	D3-4T	Cedar St	30x8		X																				
		D3-4T	Velasco St	30x8		X																		X		
	X2	M1-6T	BUSINESS 288	24X24		X																		X		
9B																										
	R1	D3-4T	Miller St	30x8		X																				1.67
		D3-4T	Velasco St	30x8		X																				1.67
		R1-1	STOP	30X30		X																				6.25
	R2	R8-2T	NO PARKING WITH IN 10 FEET OF PAVEMENT	24X30		X																				5
	R3	R5-2		24X24		X																				4
	R4	D3-4T	Miller St	30x8		X																				1.67
		D3-4T	Velasco St	30x8		X																				1.67
		R1-1	STOP	30X30		X																				
	1	D3-2	Wilkins St NEXT SIGNAL	60X30		X					X															
10																										
	R1	R8-2T	NO PARKING WITH IN 10 FEET OF PAVEMENT	24X30		X																				5
	R2	R8-2T	NO PARKING WITH IN 10 FEET OF PAVEMENT	24X30		X																				5
	R3	R2-1	SPEED LIMIT 45	30X36		X																				7.5
	1	R2-1	SPEED LIMIT 45	30X36		X	X																			
11																										
	R1	R8-2T	NO PARKING WITH IN 10 FEET OF PAVEMENT	24X30		X																				5
	R2	R8-2T	NO PARKING WITH IN 10 FEET OF PAVEMENT	24X30		X																				5
	R3	R2-1	SPEED LIMIT 45	30X36		X																				7.5
	R4	D1-2		96X30		X																				20
	1	D1-2		96X30		X												X								
12A																										
	R1	M3-3	SOUTH	24X12		X																				2
		M4-3	BUSSINESS	24X12		X																				2
		M1-6TB-3	288 TEXAS	24X24		X																				4
	R2	R10-30	RIGHT TURN ON RED MUST YIELD TO U TURN	30X36		X																				7.5
SHEET TOTAL							1		1		2							1						2		92

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.	SHEET
12	6		42K

COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA	0111	09	044	BS 288

FILE: H:\TrfSigning\0338-03-089\Summaries.xls

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																			636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																								
12A																											
	R3	D1-2	Police Dept ⇨ Post Office ⇨	96X30		X																				20	
	R4	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																				9	
	R5	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																					
	R6	M3-1	NORTH	24X12		X																				2	
		M4-3	BUSSINESS	24X12		X																				2	
		M1-6TB-3	288 TEXAS	24X24		X																				4	
	R7	R2-1	SPEED LIMIT 45	30X36		X																				7.5	
	X1	D3-4T	Tigner St	30x8		X																					
		D3-4T	Velasco St	30x8		X																		X			
	X2	D3-4T	Cannan Dr	30x8		X																					
		D3-4T	Velasco St	30x8		X																		X			
	1	D1-2	⇦ Cannan Dr Tigner St ⇨	96X30		X												X									
13																											
	R1	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48X48		X																				16	
	R2	D2-2	Bonney 9 Houston 41	24X60		X																				10	
	R3	W11-8		24X24		X																				4	
14																											
	R1	I-3	Brushy Bayou	36X18		X																				4.5	
	R2	R2-1	SPEED LIMIT 45	30X36		X																				7.5	
	R3	W8-13aT	BRIDGE MAY ICE IN COLD WEATHER	48X48		X																				16	
	R4	I-3	Brushy Bayou	36X18		X																				4.5	
	R5	R2-1	SPEED LIMIT 45	30X36		X																				7.5	
	1	D3-2	Henderson Rd NEXT SIGNAL	72X30							X																
SHEET TOTAL											1							1						2		115	

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

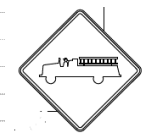
Square Ft.	Min. Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

SUMMARY OF SMALL SIGNS

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.	SHEET
12	6		42L

COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA	0111	09	044	BS 288

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN TYPE	SIGN TEXT	SIGN DIMENSIONS	PLYWOOD TYPE A	ALUMINUM TYPE A	644-INS SM RD SN SUP & AM																				636	
							6001	6002	6004	6005	6007	6009	6012	6027	6028	6030	6031	6033	6034	6035	6039	6068	6070	6076	6001	6007
							TY 10BWG (1) SA (P)	TY 10BWG (1) SA (P-BM)	TY 10BWG (1) SA (T)	TY 10BWG (1) SA (T-2EXT)	TY 10BWG (1) SA (U)	TY 10BWG (1) SB (P)	TY 10BWG (1) SB (T)	TY S80 (1) SA (P)	TY S80 (1) SA (P-BM)	TY S80 (1) SA (T)	TY S80 (1) SA (T-2EXT)	TY S80 (1) SA (U)	TYS80(1)SA(U-1EXT)	TYS80(1)SA(U-2EXT)	TYS80(1)SB(P)	RELOCATE SM RD SN SUP&AM TY 10BWG	RELOCATE SM RD SN SUP&AM TY S80	REMOVE SM RD SN SUP & AM	ALUM SIGNS (TY A)	REPLACE EXT ALUM SIGNS (TY A)
							EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	SF	SF
			PROPOSED																									
15																												
	R1	R2-1	SPEED LIMIT 45	30X36		X																						7.5
	R2	W11-8		24X24		X																						4
	R3	R3-7R	RIGHT LANE MUST TURN RIGHT	36X36		X																						9
	R4	M3-1	NORTH	24X12		X																						2
		M4-3	BUSSINESS	24X12		X																						2
		M1-6TB-3	288 TEXAS	24X24		X																						4
	R5	M4-14	BEGIN	24X12		X																						2
		R3-9B		24X36		X																						6
	1	D3-2	Henderson Rd NEXT SIGNAL	72X30		X					X																	
	2	R2-1	SPEED LIMIT 55	30X36		X	X																					
	3	W3-5		36X36			X																					
	X1	D3-4aT	HENDERSON RD	42X08		X																			X			
	X2	D3-4aT	HENDERSON RD	42X08		X																			X			
16																												
	R1	M3-1	NORTH	24X12		X																						2
		M4-3	BUSSINESS	24X12		X																						2
		M1-6TB-3	288 TEXAS	24X24		X																						4
	R2	D14-4T	ADOPT A HIGHWAY NEXT X MILES GROUP NAME	48X48		X																						16
	1	R2-1	SPEED LIMIT 55	30X36		X	X																					
	2	R2-1	SPEED LIMIT 55	30X36		X	X																					
	3	M3-1	NORTH	24X12		X																						
		M4-3	BUSSINESS	24X12		X	X																					
		M1-6TB-3	288 TEXAS	24X24		X																						
	X1	R2-1	SPEED LIMIT 55	30X36		X																			X			
	X2	R2-1	SPEED LIMIT 55	30X36		X																			X			
17																												
	1	R19-6bT	PROHIBITED ELECTRONIC MESSAGING WHILE DRIVING STATE LAW-UP TO $200 FINE	54X48														X										
	R1		SPEED ZONE HEAD	24X24																					X			
SHEET TOTAL							5				1							1							5		61	
GRAND TOTAL							19		2		24			6				6	6	5					37		1640	

Sign support 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.

ALUMINUM SIGN BLANKS (TYPE A)

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

SUMMARY OF SMALL SIGNS

STATE DISTRICT	FEDERAL REGION	FEDERAL AID PROJECT NO.	SHEET
12	6		42M

COUNTY	CONTROL	SECTION	JOB	HIGHWAY NO.
BRAZORIA	0111	09	044	BS 288

FILE: H:\TrfSigning\0338-03-089\Summaries.xls

SUMMARY OF MBGF

LOCATION	105 6021 REMOVING STAB BASE AND ASPH PAV (0-4") SY	432 6045 RIPRAP (MOW STRIP)(4 IN) CY	540 6001 MTL W-BEAM GD FEN (TIM POST) LF	540 6018 MTL BM GD FEN TRANS (NON - SYM) EA	540 6016 DOWNSTREAM ANCHOR TERMINAL SECTION EA	540 6020 MTL W - BEAM GD FEN (LOW FILL CULVERT) LF	540 6021 MTL THRIE-BEAM GD FEN (TIM POST) EA	540 6043 TL-3 31" SHORT RADIUS (POSTS 2 THRU 7) EA	542 6001 REMOVE METAL BEAM GUARD FENCE LF	542 6002 REMOVE TERMINAL ANCHOR SECTION EA	544 6001 GUARDRAIL END TREATMENT (INSTALL) EA	544 6003 GUARDRAIL END TREATMENT (REMOVE) EA	658 6013 INSTL DEL ASSM (D-SW)SZ (BRF)CTB EA	658 6062 INSTL DEL ASSM (D-SW)SZ 1(BRF)GF2(BI) EA
CSJ 0111-13-003														
LOCATION A (STA 12+00 LT)	53.47								112.5	1				
LOCATION B (STA 13+00 LT)	48.61	9.55	62.5		1	12.5			125		1			3
LOCATION C (STA 13+50 RT)	53.47	17.8	75	2	2	12.5		1	112.5	1				3
BRIDGE													20	
NORTHBOUND APPROACH		7.54	25				1		25		1	1		3
NORTHBOUND DEPARTURE		20.84	450		1		1		450	1				6
SOUTHBOUND APPROACH		7.54	25				1		25		1	1		3
SOUTHBOUND DEPARTURE		5.79	100		1		1		125	1				3
SUB-TOTAL FOR 0111-13-003	**155.55**	**69.06**	**737.5**	**2**	**5**	**25**	**4**	**1**	**975**	**4**	**3**	**2**	**20**	**21**
CSJ 0111-09-044														
BRIDGE													8	
NORTHBOUND APPROACH														3
SOUTHBOUND APPROACH														3
SUB-TOTAL FOR 0111-09-044	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**8**	**6**
PROJECT TOTALS	**155.55**	**69.06**	**737.5**	**2**	**5**	**25**	**4**	**1**	**975**	**4**	**3**	**2**	**28**	**27**

NOTES:

REMOVAL OF ASPHALT AND BASE MATERIAL ENCOUNTERED WHILE DRILLING HOLES FOR POST IS INCIDENTAL TO VARIOUS BID ITEMS.

SHEET 1 OF 1

SUMMARY OF MBGF QUANTITIES

Texas Department of Transportation®

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		43

1/24/2022
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CK1 DW1 CK2 DN2

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MATERIALS FOR HIGHWAY TRAFFIC SIGNAL

ITEM	DESC CODE	DESCRIPTION	UNIT	LOOP 247 AT PLUM ST	LOOP 247 AT W LOCUST ST	LOOP 274 AT WARREN ST/ CEDAR ST	LOOP 274 AT W. WILKINS ST	BS 288-B AT CEMETRY RD	BS 288-B AT ORANGE ST	BS 288-B AT MYRTLE ST	BS 288-B AT MAGNOLIA ST	BS 288-B AT CEDAR ST	BS 288-B AT CANNAN DR/TIGNER ST	BS 288-B AT HENDERSON RD	BS 288-B AT FM 523	TOTAL
				QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY	QUANTITY
618	6046	CONDT (PVC) (SCH 80) (2")	LF	30	20	15	245				85	90	20	20	30	555
618	6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF				305		245	225	135	140			75	1125
618	6053	CONDT (PVC) (SCH 80) (3")	LF				40									40
618	6054	CONDT (PVC) (SCH 80) (3") (BORE)	LF				75			15						90
618	6070	CONDT (RM) (2")	LF										40	45		85
618	6074	CONDT (RM) (3")	LF												45	45
620	6009	ELEC CONDR (NO.6) BARE	LF				660			340	220	230		60	145	1655
636	6001	ALUMINUM SIGNS (TY A)	SF	12.5	12.5	12.5	72.25	12.5		15	15		12.5			164.75
		** SIGN "Business SH 288 B" (108"x18") (13.5 SF)	EA				1									1
		** SIGN "Loop 247" (60"x18") (7.5 SF)	EA				2									2
		** SIGN R10-17T "LEFT TURN YIELD ON FLASHING YELLOW ARROW" (30" X 30") ℄6.25 SFℰ	EA	2	2	2	7	2					2			17
		** SIGN R10-12 "LEFT TURN YIELD ON GREEN" (30" X 36") ℄7.5 SFℰ	EA							2	2					4
682	6001	VEH SIG SEC (12")LED(GRN)	EA							2	2	2				6
682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA	2	2	2	7	2		2	2	2	2			23
682	6003	VEH SIG SEC (12")LED(YEL)	EA							2	2	2				6
682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA	4	4	4	14	4					4			34
682	6005	VEH SIG SEC (12")LED(RED)	EA							2	2	2				6
682	6006	VEH SIG SEC (12")LED(RED ARW)	EA	2	2	2	7	2					2			17
682	6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	8	8	8	7	8	8	6	6	6	8	6	8	87
682	6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	2	2	2	14	2		2	2	2	2	4	4	38
684	6012	TRF SIG CBL (TY A)(12 AWG)(7 CONDR)	LF							290	405	470				1165
690	6086	REMOVE VID IMAGE VEH DET SYS (VIVDS)	EA											1	1	2
6058	6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA				1							1		2
6292	6004	RVDS(PRESENCE DET ONLY)(INSTALL ONLY)	EA	4	4	4	7		4	4	4	4	4	4	4	47
		** RADAR PRESENCE DETECTOR CABLE (22/4C AWG)(COMM)/(18/2C AWG)(POWER)	LF	705	650	680	1630		435	575	445	450	700	625	1020	7915
6292	6005	RVDS(ADVANCE DET ONLY)(INSTALL ONLY)	EA	2	2	2	3		2	2	2	2	2	2	4	25
		** RADAR PRESENCE DETECTOR CABLE (22/4C AWG)(COMM)/(18/2C AWG)(POWER)	LF	355	330	460	670		270	270	205	255	350	310	1020	4495

** MATERIAL SUBSIDAIRY TO PERTINENT ITEMS

SUMMARY OF TRAFFIC SIGNAL QUANTITIES

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		44

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 4-03 7-13 9-07 8-14 5-10 5-21	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		45

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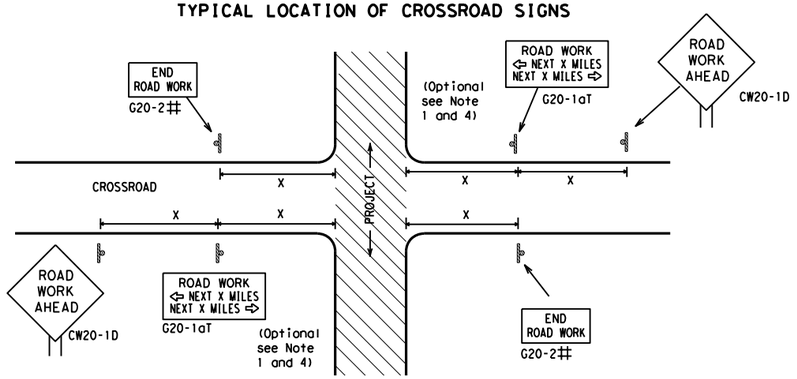
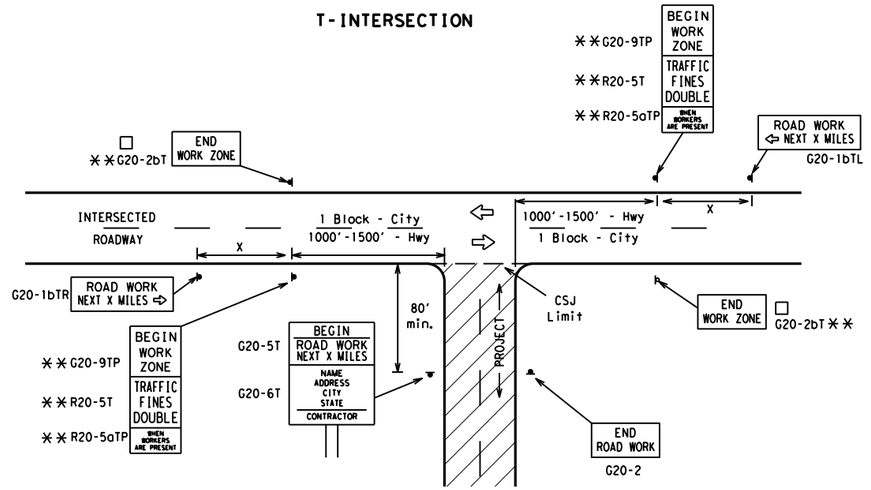
TYPICAL LOCATION OF CROSSROAD SIGNS



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

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

T-INTERSECTION



CSJ LIMITS AT T-INTERSECTION

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

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

SIZE

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

SPACING

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

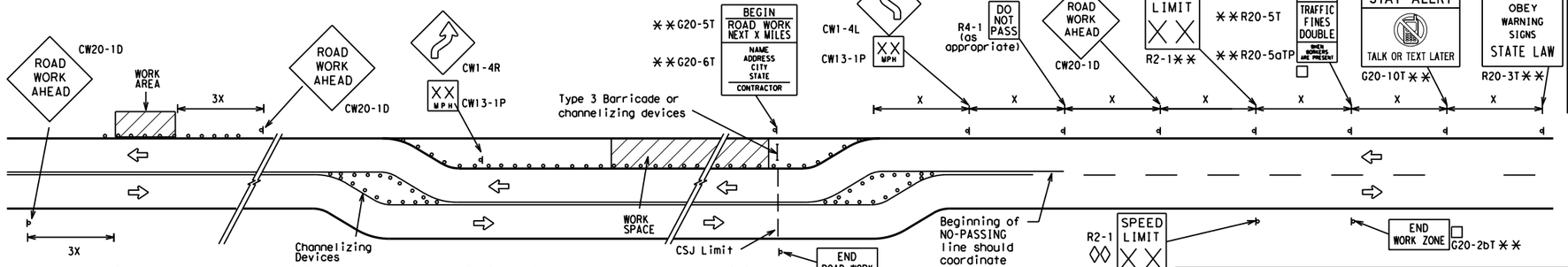
* For typical sign spacings on divided highways, expressways and freeways, see Part 6 of the "Texas Manual on Uniform Traffic Control Devices" (TMUTCD) typical application diagrams or TCP Standard Sheets.

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

GENERAL NOTES

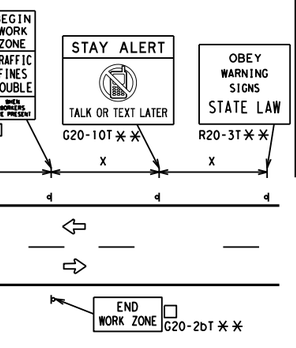
1. Special or larger size signs may be used as necessary.
2. Distance between signs should be increased as required to have 1500 feet advance warning.
3. Distance between signs should be increased as required to have 1/2 mile or more advance warning.
4. 36" x 36" "ROAD WORK AHEAD" (CW20-1D)signs may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

WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

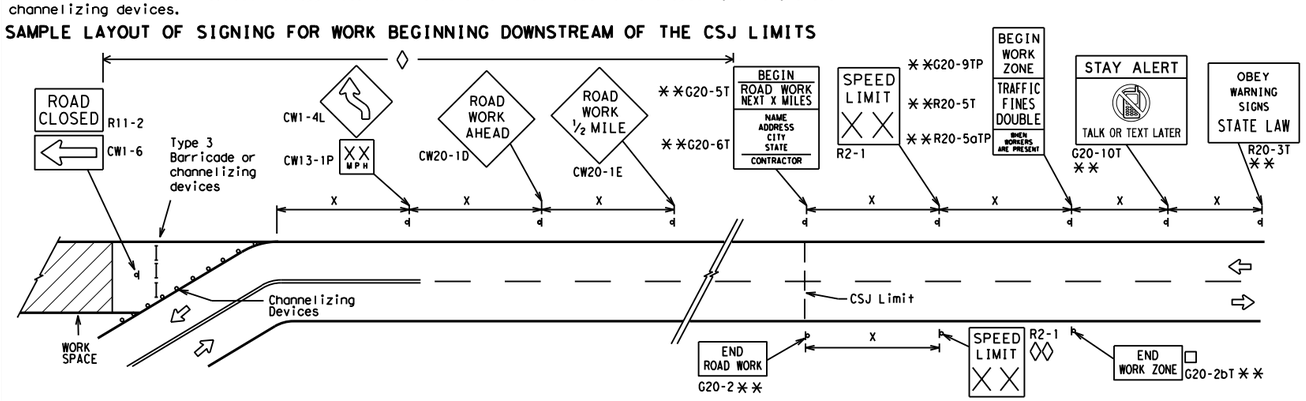


When extended distances occur between minimal work spaces, the Engineer/Inspector should ensure additional "ROAD WORK AHEAD"(CW20-1D)signs are placed in advance of these work areas to remind drivers they are still within the project limits. See the applicable TCP sheets for exact location and spacing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

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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



NOTES

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

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

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

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

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

LEGEND

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PROJECT LIMIT

BC(2)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	BRAZORIA		46

DATE: 1/20/2022 2:33:15 PM
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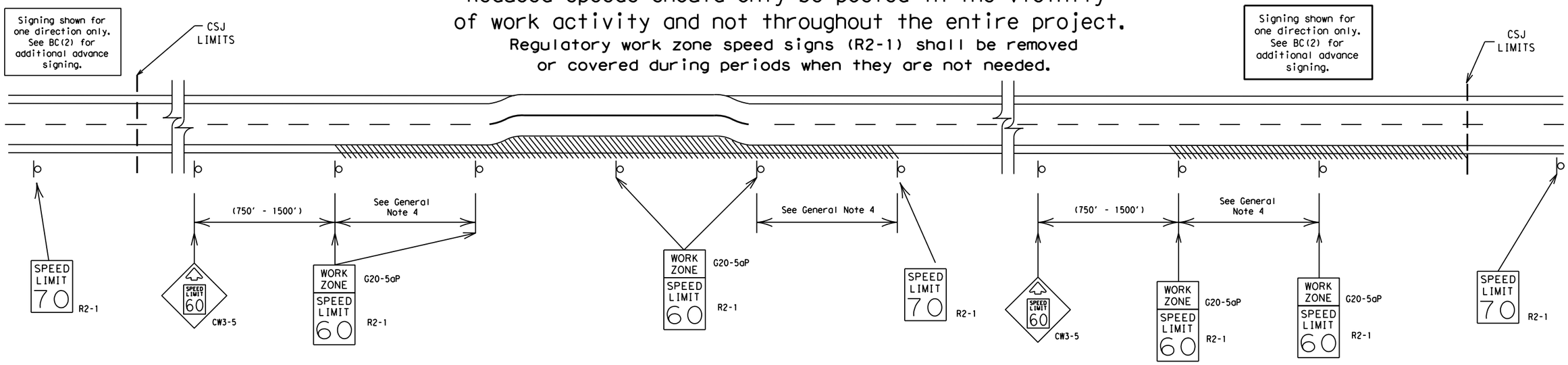
TYPICAL APPLICATION OF WORK ZONE SPEED LIMIT SIGNS

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 9-07 8-14 7-13 5-21	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		47

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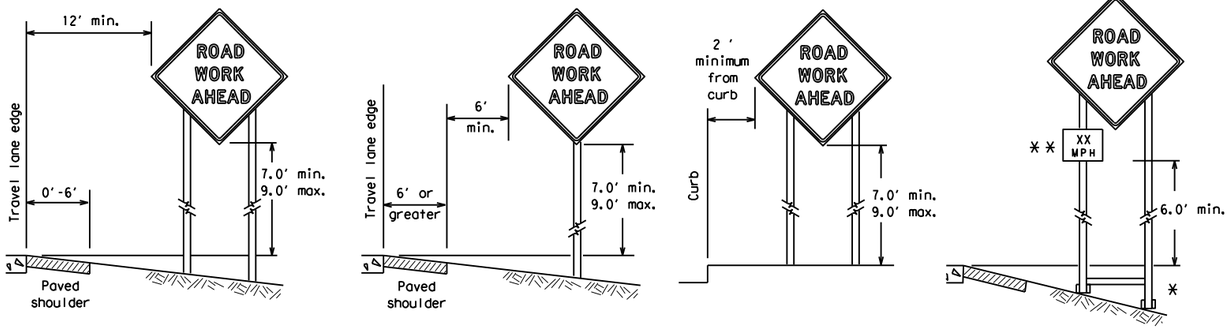
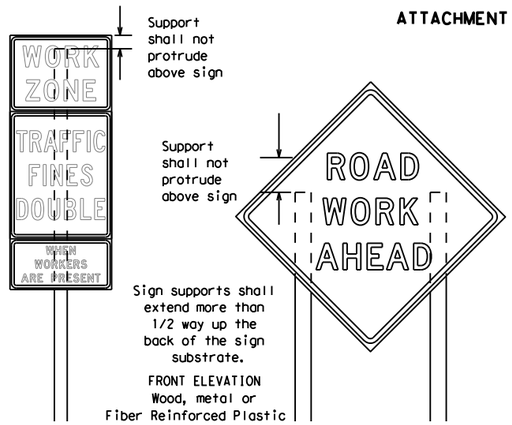
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

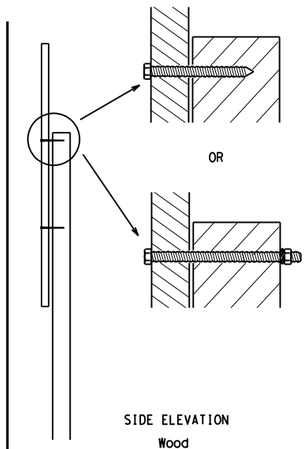


* When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

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

ATTACHMENT FOR SIGN SUPPORTS





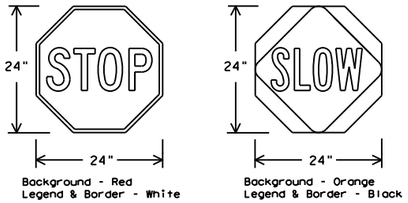
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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

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

STOP/SLOW PADDLES

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



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

CONTRACTOR REQUIREMENTS FOR MAINTAINING PERMANENT SIGNS WITHIN THE PROJECT LIMITS

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

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

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

SIGN MOUNTING HEIGHT

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

SIZE OF SIGNS

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

SIGN SUBSTRATES

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

REFLECTIVE SHEETING

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

SIGN LETTERS

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

REMOVING OR COVERING

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

SIGN SUPPORT WEIGHTS

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

FLAGS ON SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION TEMPORARY SIGN NOTES

BC(4)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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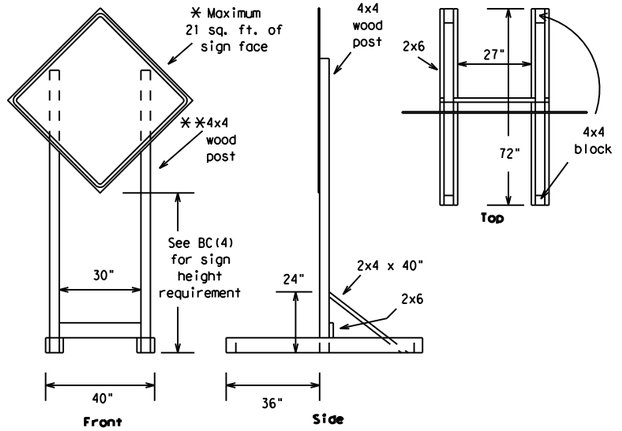
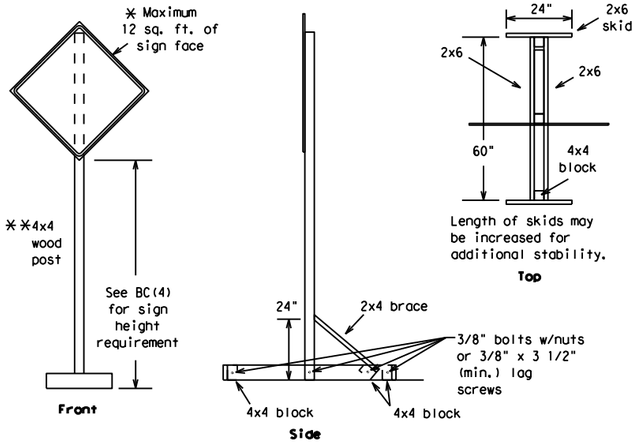
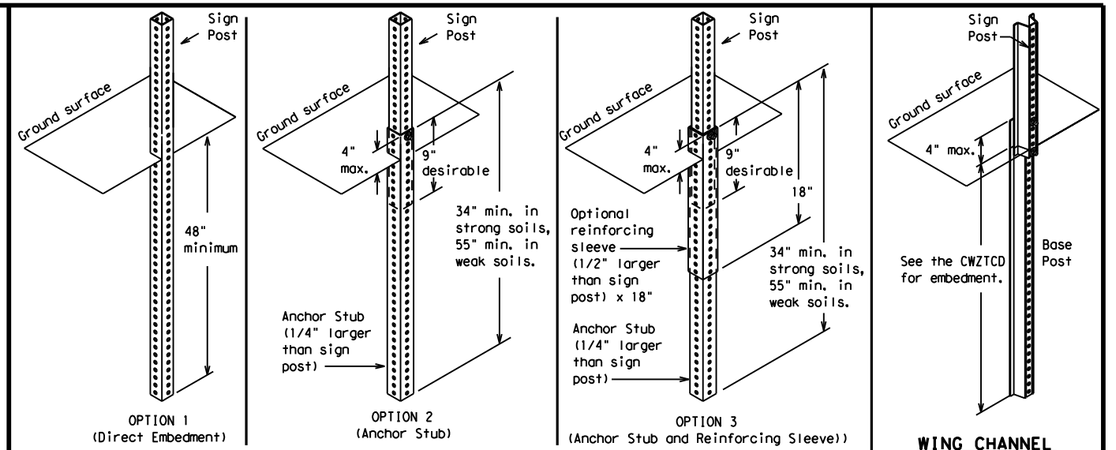




SKID MOUNTED WOOD SIGN SUPPORTS

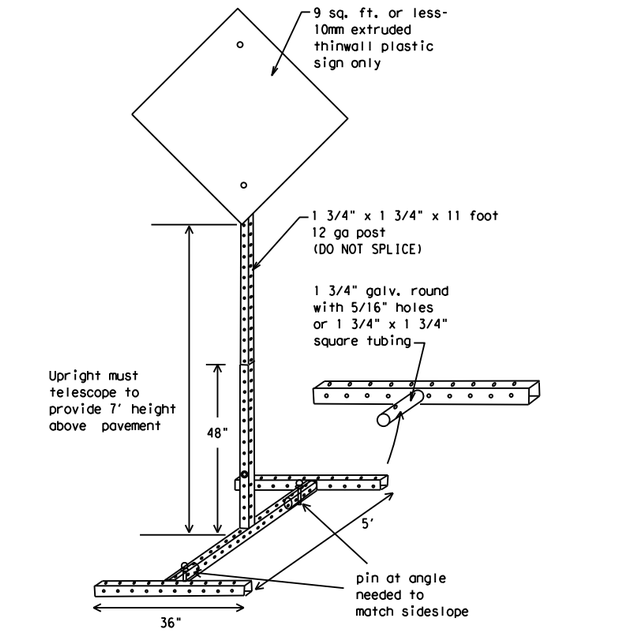
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

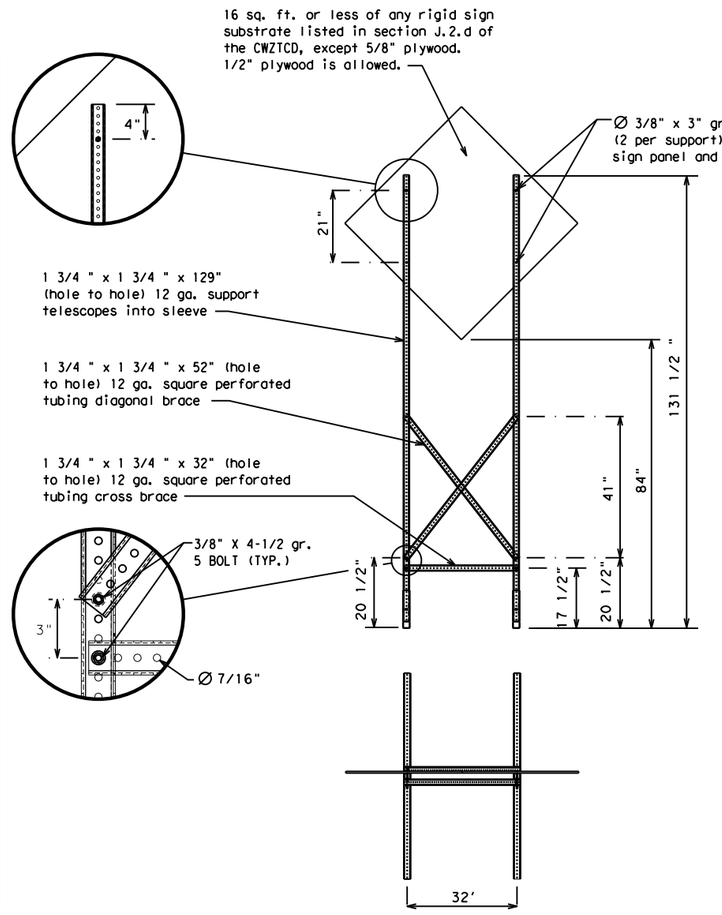


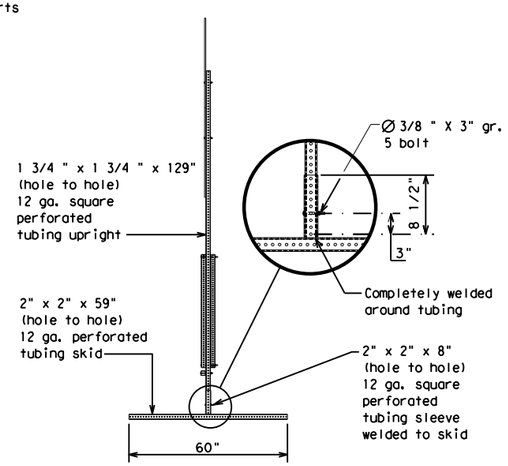
PERFORATED SQUARE METAL TUBING

GROUND MOUNTED SIGN SUPPORTS

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







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	0111	09	044, ETC	BS 288B
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	BRAZORIA		49

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

PORTABLE CHANGEABLE MESSAGE SIGNS

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

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

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

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

RECOMMENDED PHASES AND FORMATS FOR PCMS MESSAGES DURING ROADWORK ACTIVITIES

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

Phase 1: Condition Lists

Road/Lane/Ramp Closure List

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

Other Condition List

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

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

Phase 2: Possible Component Lists

Action to Take/Effect on Travel List

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

Location List

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

Warning List

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

** Advance Notice List

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	BRAZORIA		50

100

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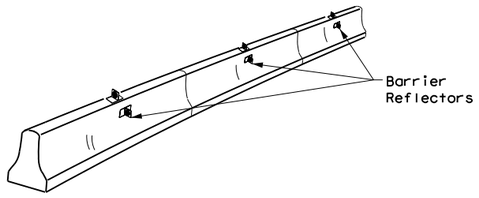
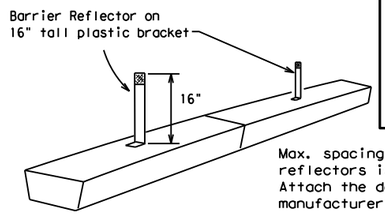
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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



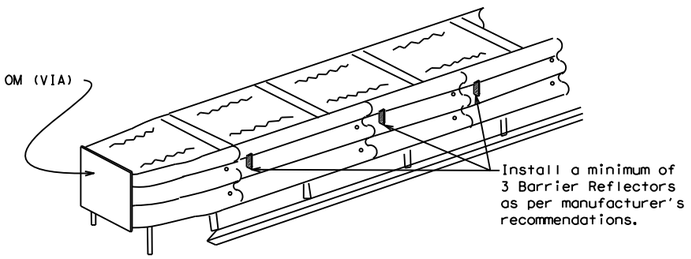
CONCRETE TRAFFIC BARRIER (CTB)

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



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

LOW PROFILE CONCRETE BARRIER (LPCB)



DELINEATION OF END TREATMENTS

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

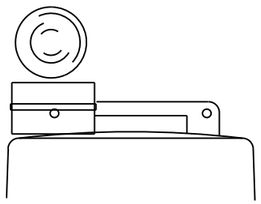
LPCB is approved for use in work zone locations, where the posted speed is 45mph, or less. See Roadway Standard Sheet LPCB.

END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS

WARNING LIGHTS

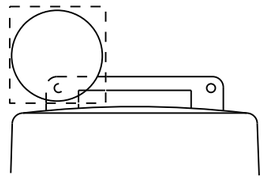


Type C Warning Light or approved substitute mounted on a drum adjacent to the travel way.

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.



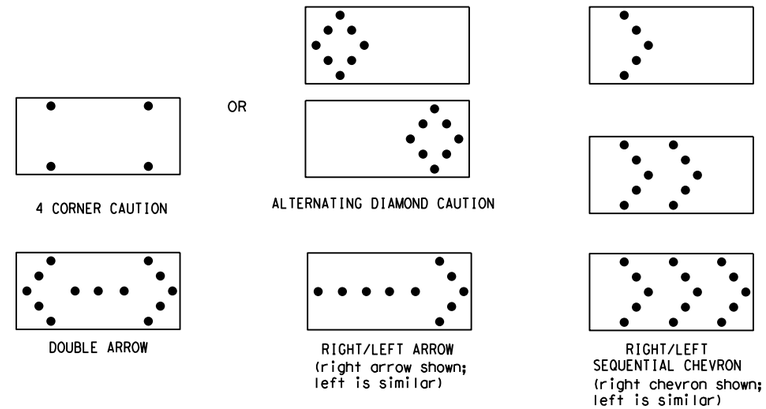
Warning reflector may be round or square. Must have a yellow reflective surface area of at least 30 square inches

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

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

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

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



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

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

ATTENTION

Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	HOU	BRAZORIA		51

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GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

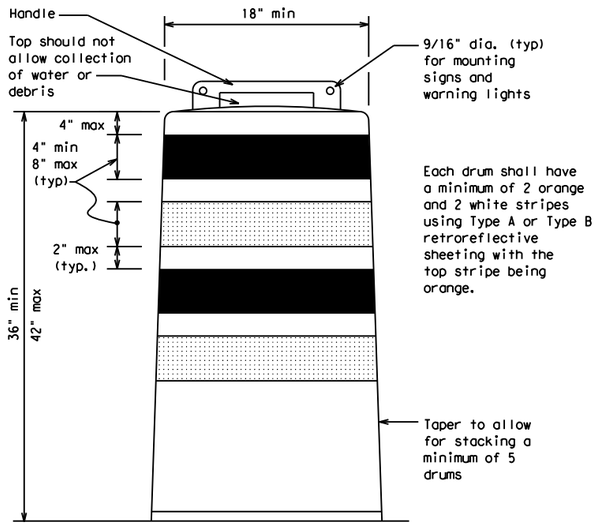
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

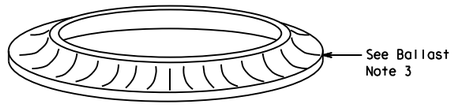
RETROREFLECTIVE SHEETING

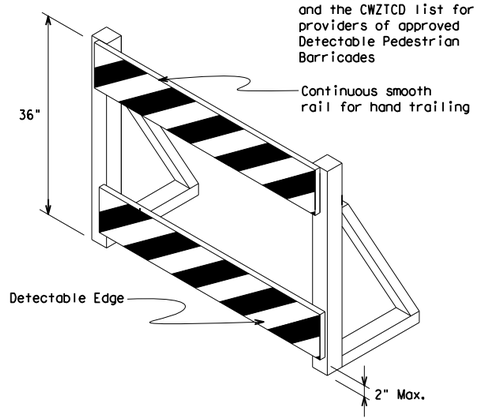
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials." Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

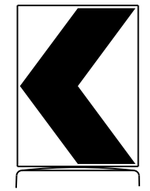




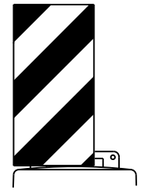


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

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REVISIONS	0111	09	044, ETC	BS 288B
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9-07 5-21	HOU	BRAZORIA		52
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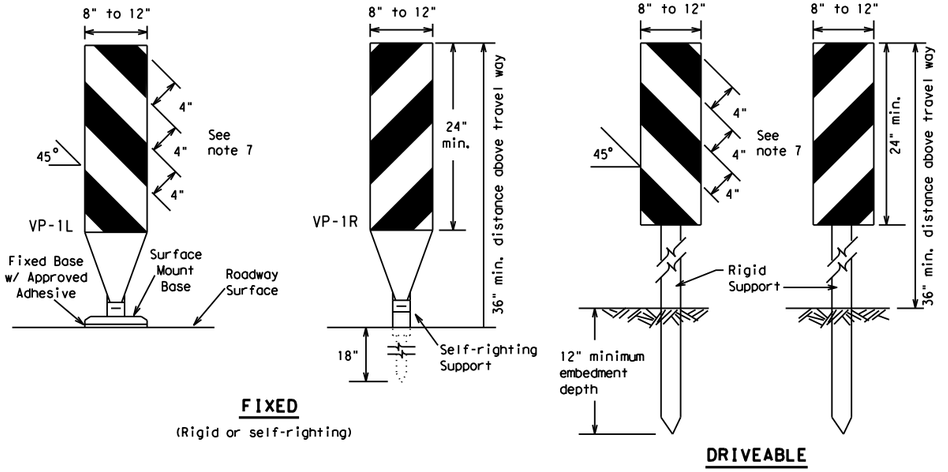
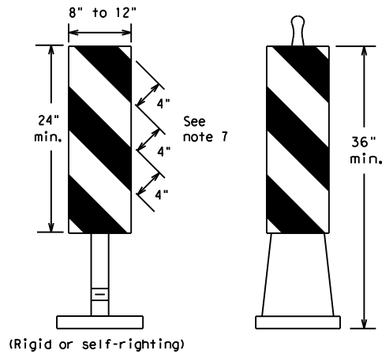


FIXED
(Rigid or self-righting)

DRIVEABLE

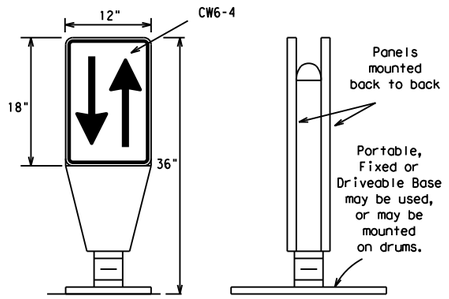


(Rigid or self-righting)

PORTABLE

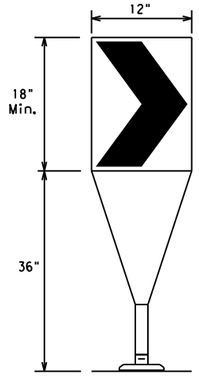
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



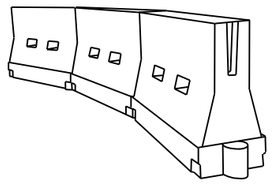
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

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BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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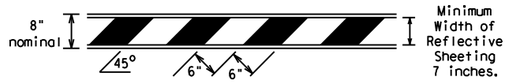
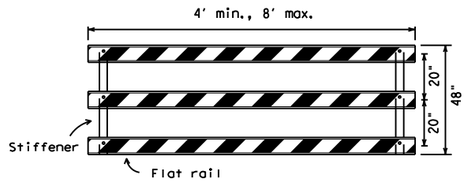
TYPE 3 BARRICADES

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

Barricades shall NOT be used as a sign support.



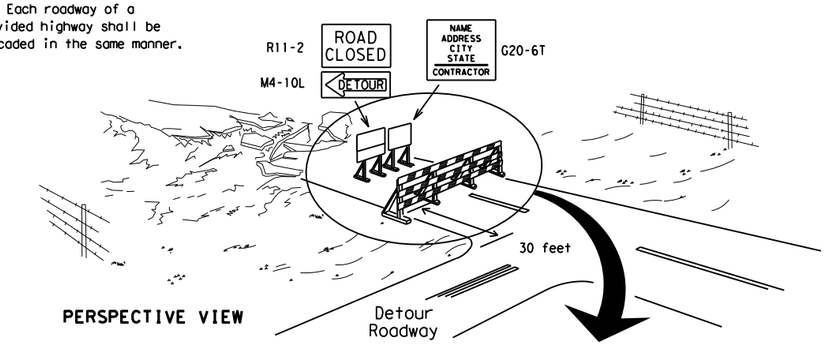
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

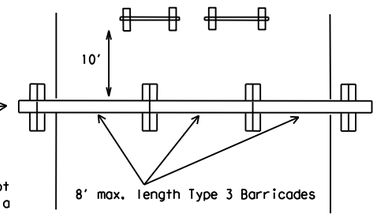
TYPICAL PANEL DETAIL FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

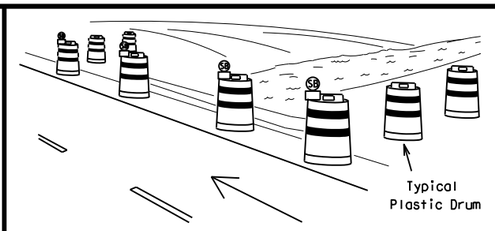
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

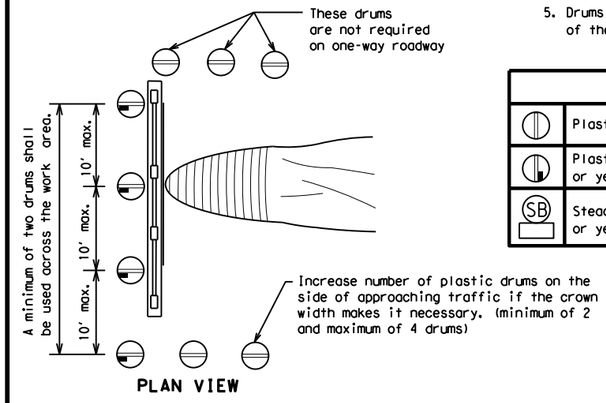
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

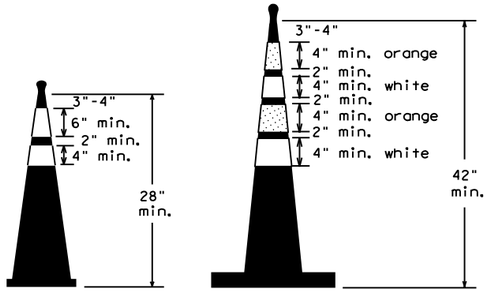
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



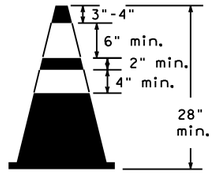
LEGEND	
	Plastic drum
	Plastic drum with steady burn light or yellow warning reflector
SB	Steady burn warning light or yellow warning reflector

PLAN VIEW

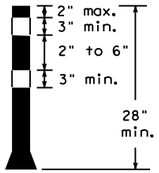
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



Two-Piece cones



One-Piece cones

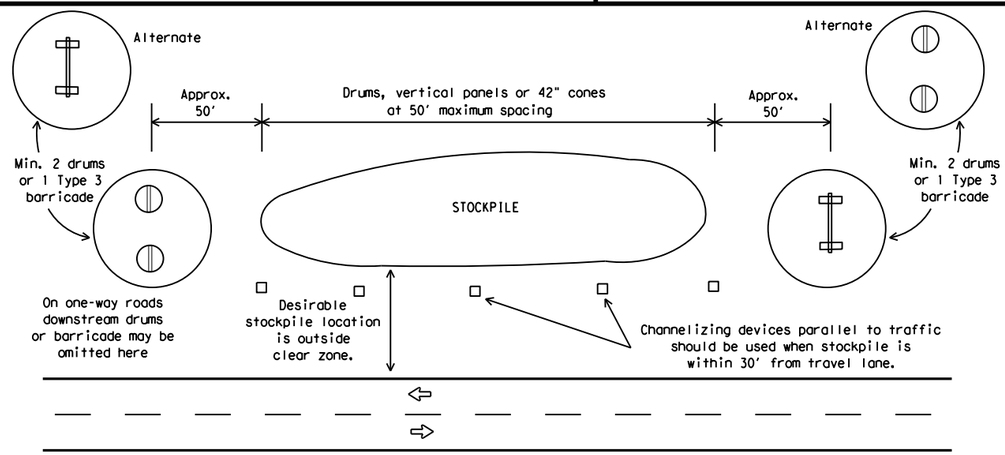


Tubular Marker

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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

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Texas Department of Transportation — Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

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© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 9-07 8-14 7-13 5-21	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		54

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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

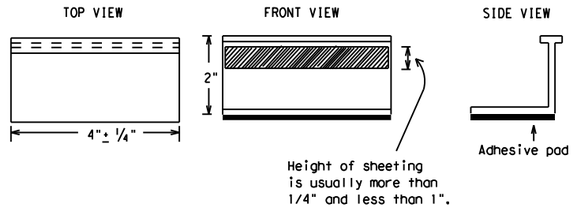
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
2-98 9-07 5-21	DIST	COUNTY		SHEET NO.
1-02 7-13	HOU	BRAZORIA		55
11-02 8-14				

TDS

DATE: 1/20/2022 2:33:27 PM
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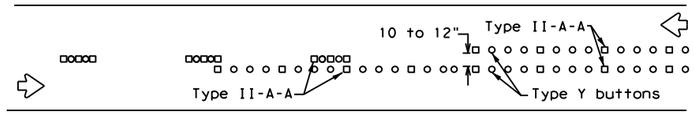
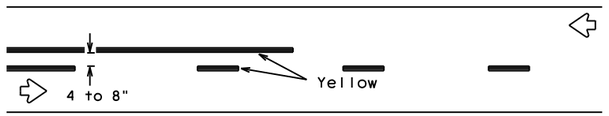
PAVEMENT MARKING PATTERNS

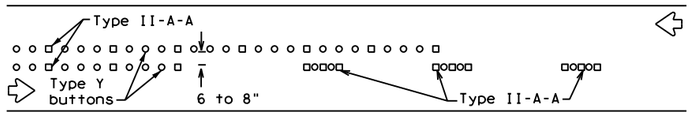
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



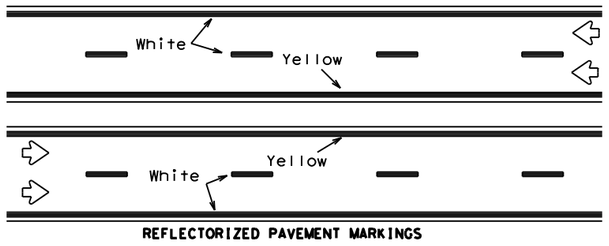
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



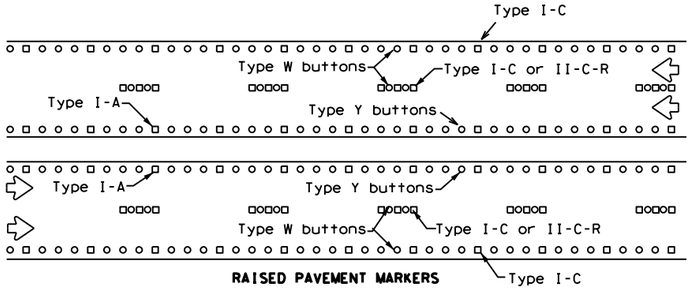
RAISED PAVEMENT MARKERS - PATTERN B

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

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



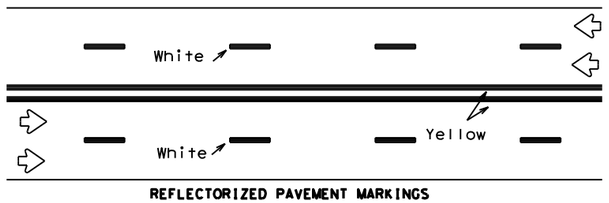
REFLECTORIZED PAVEMENT MARKINGS



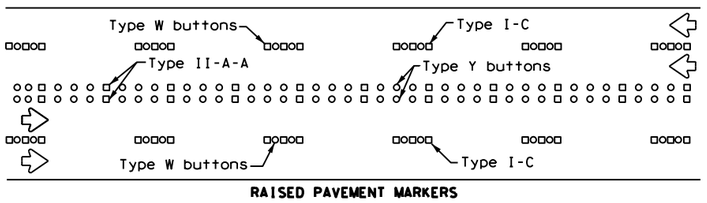
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



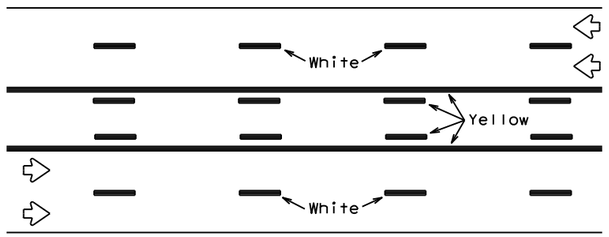
REFLECTORIZED PAVEMENT MARKINGS



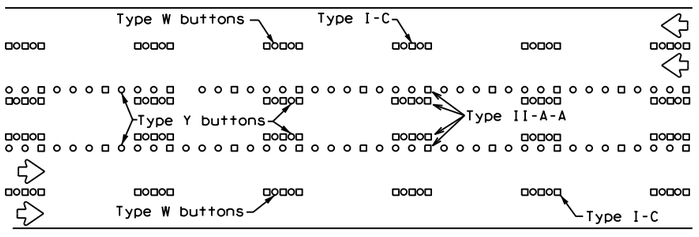
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

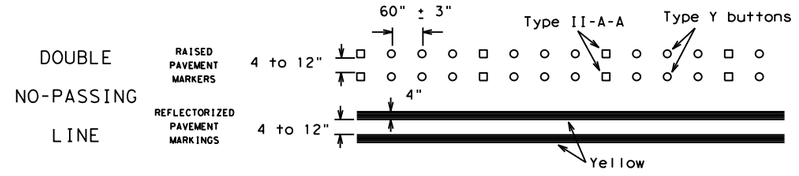
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

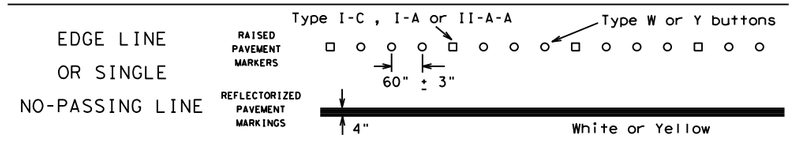
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

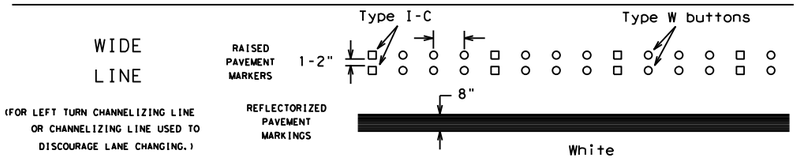


EDGE LINE OR SINGLE NO-PASSING LINE



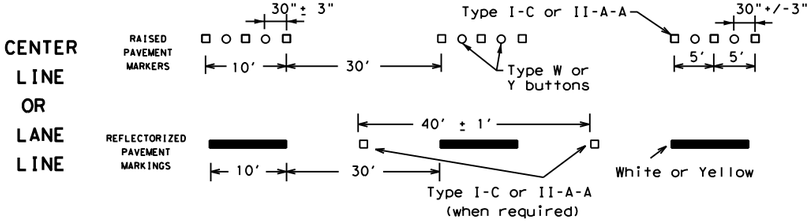
WIDE LINE

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

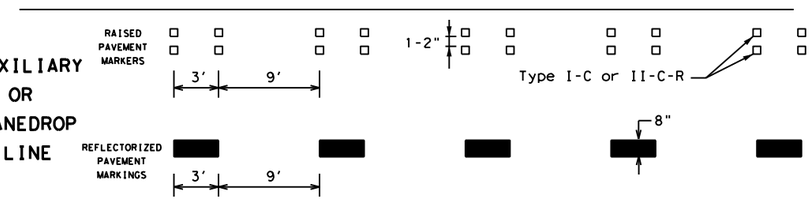


BROKEN LINES

CENTER LINE OR LANE LINE

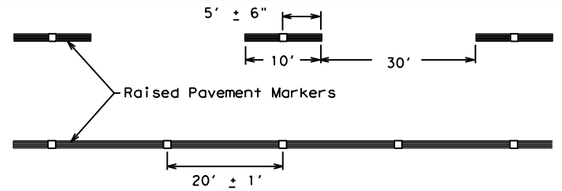


AUXILIARY OR LANEDROP LINE



REMOVABLE MARKINGS WITH RAISED PAVEMENT MARKERS

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



Centerline only - not to be used on edge lines

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKING PATTERNS

BC(12)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 1-97 9-07 5-21 2-98 7-13 11-02 8-14	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		56

106

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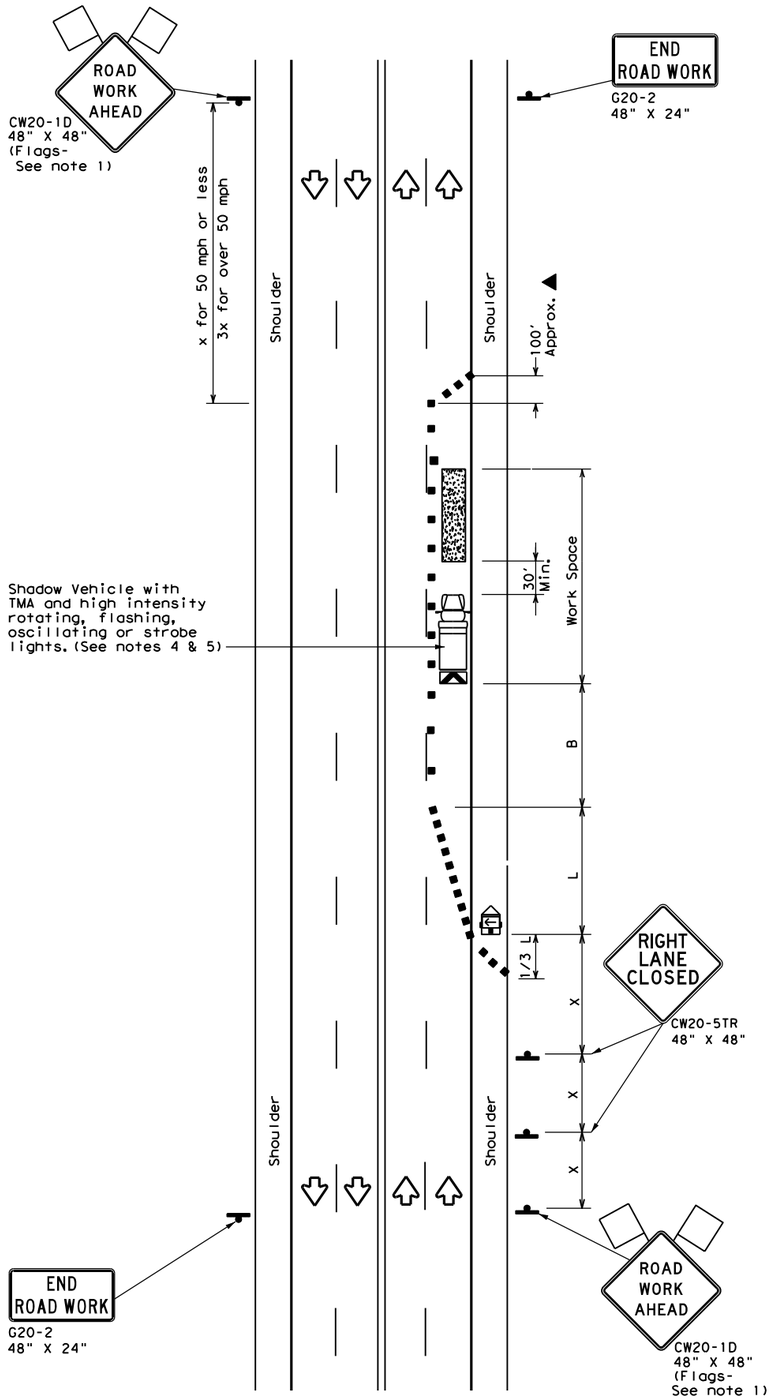
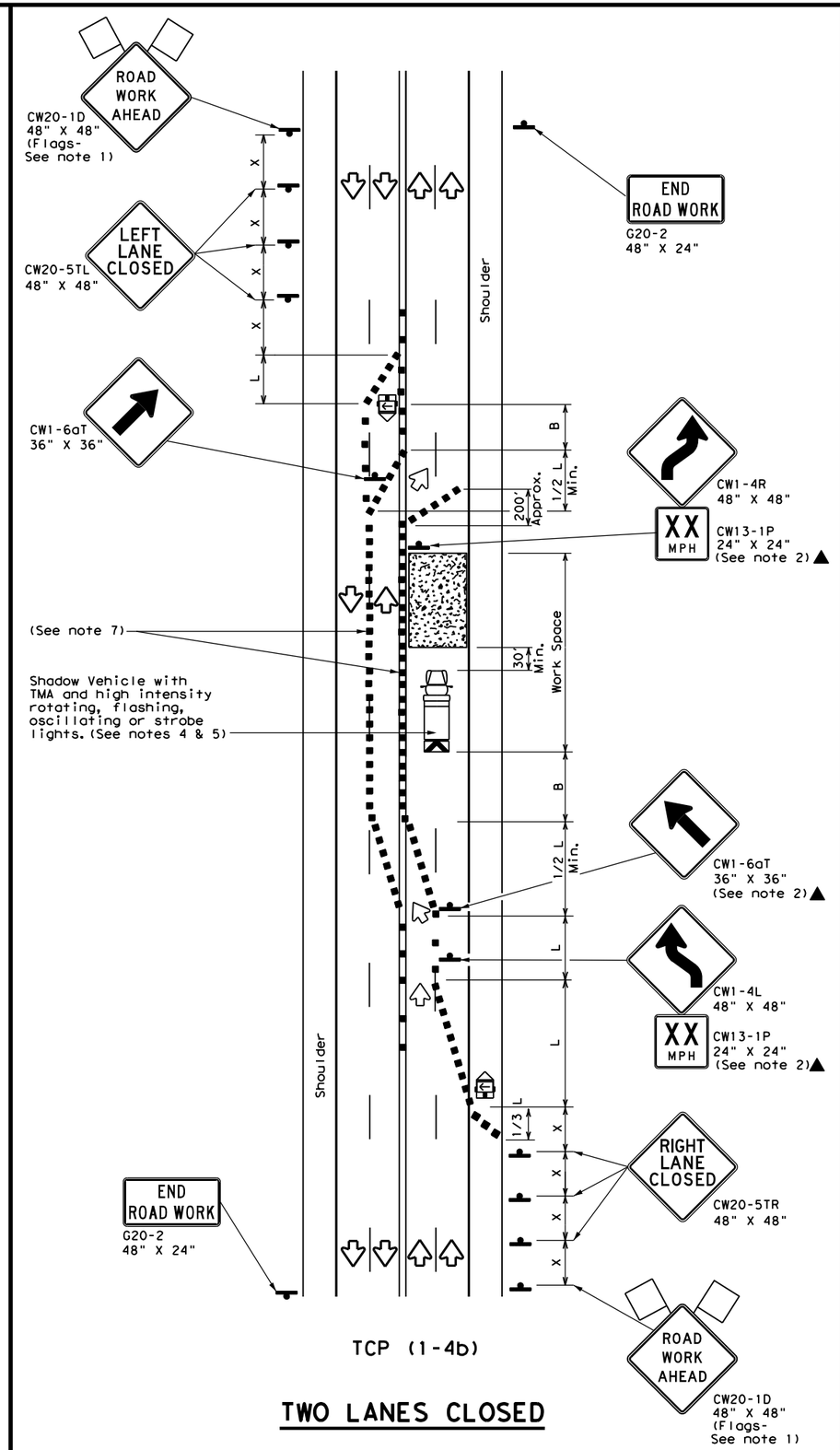


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

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

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(1-4)-18

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	HOU	BRAZORIA		57
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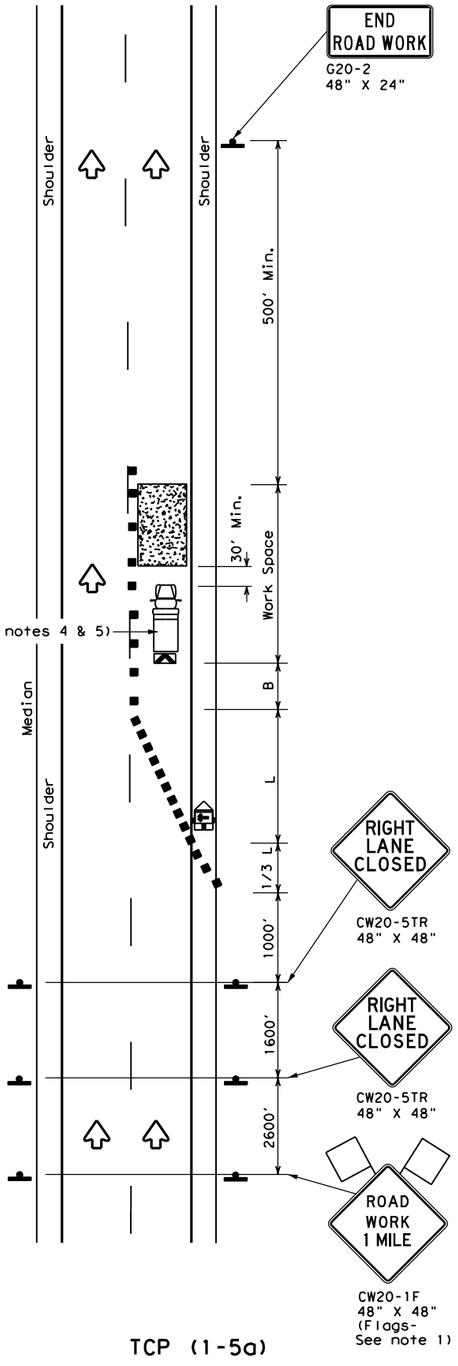
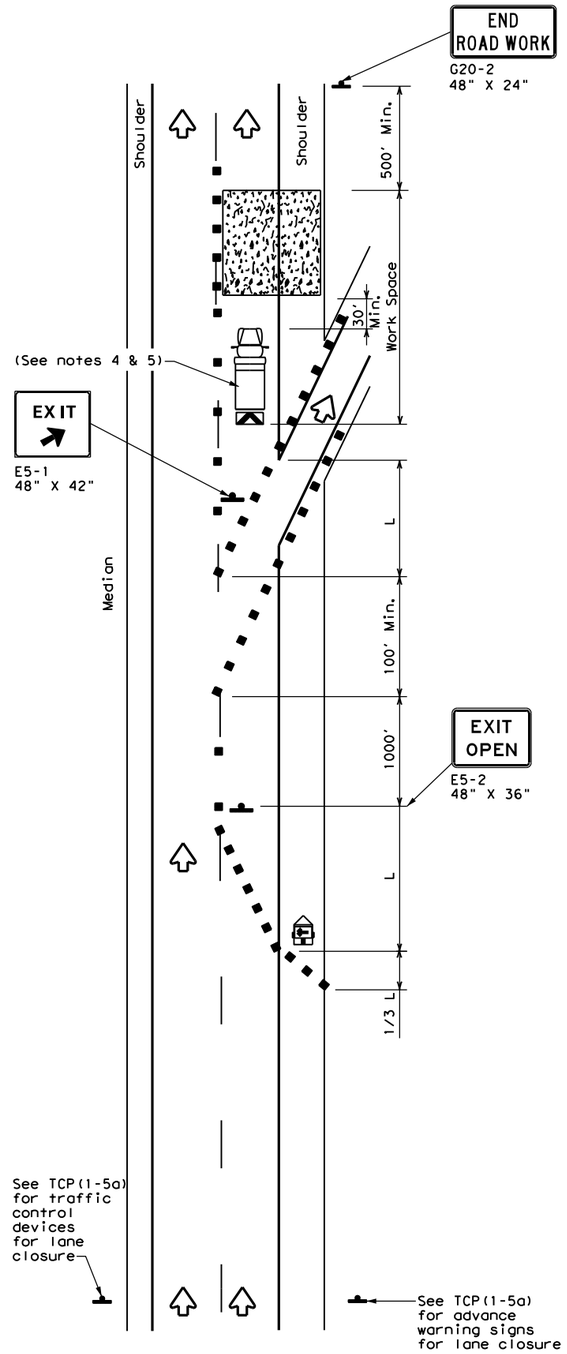


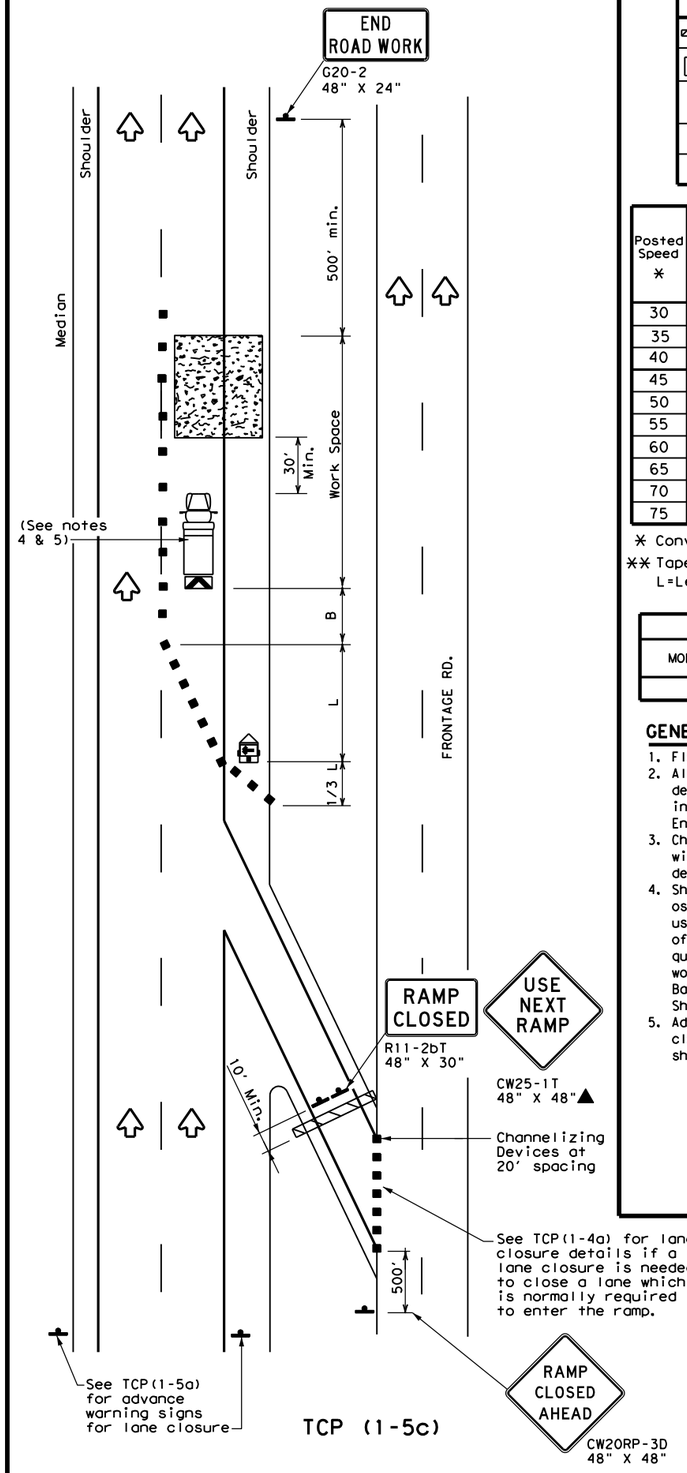
TCP (1-5a)

ONE LANE CLOSURE



TCP (1-5b)

LANE CLOSURE NEAR EXIT RAMPS



TCP (1-5c)

LANE CLOSURE NEAR ENTRANCE RAMPS

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES FOR DIVIDED HIGHWAYS

TCP(1-5)-18

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©TxDOT February 2012	CONT	SECT	JOB	HIGHWAY
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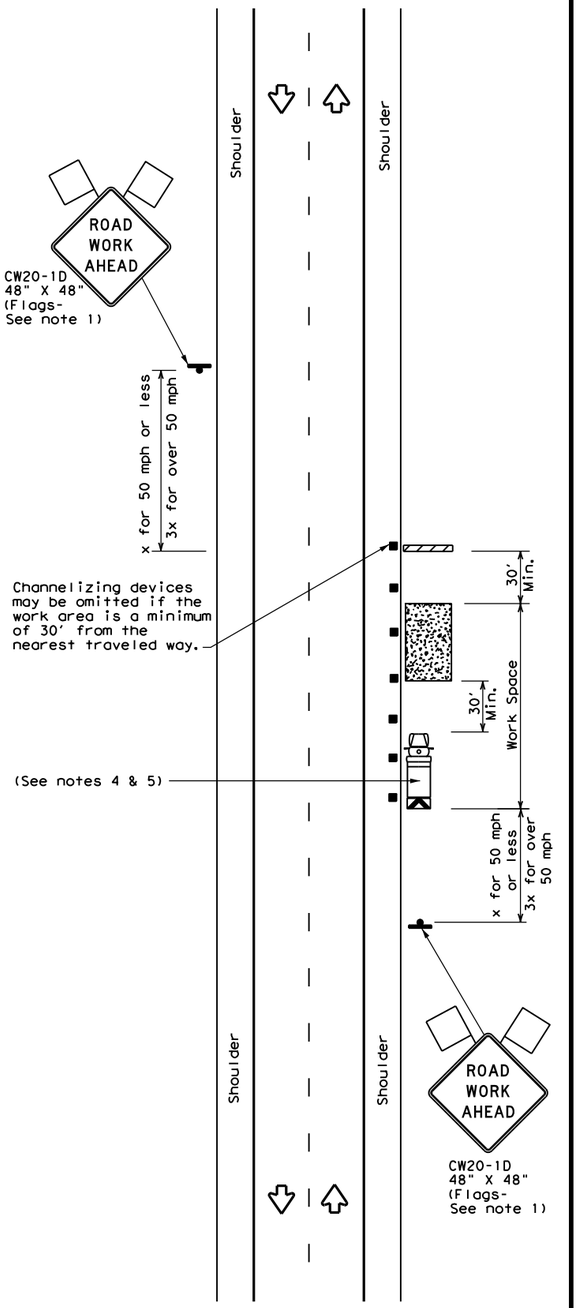
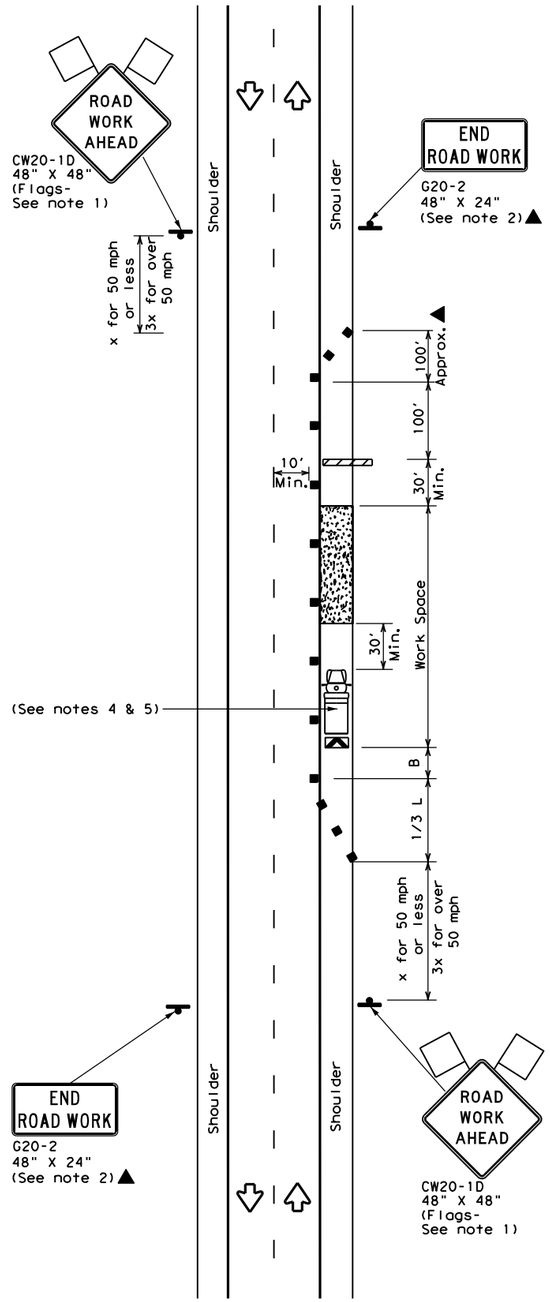
	HOU	BRAZORIA		58



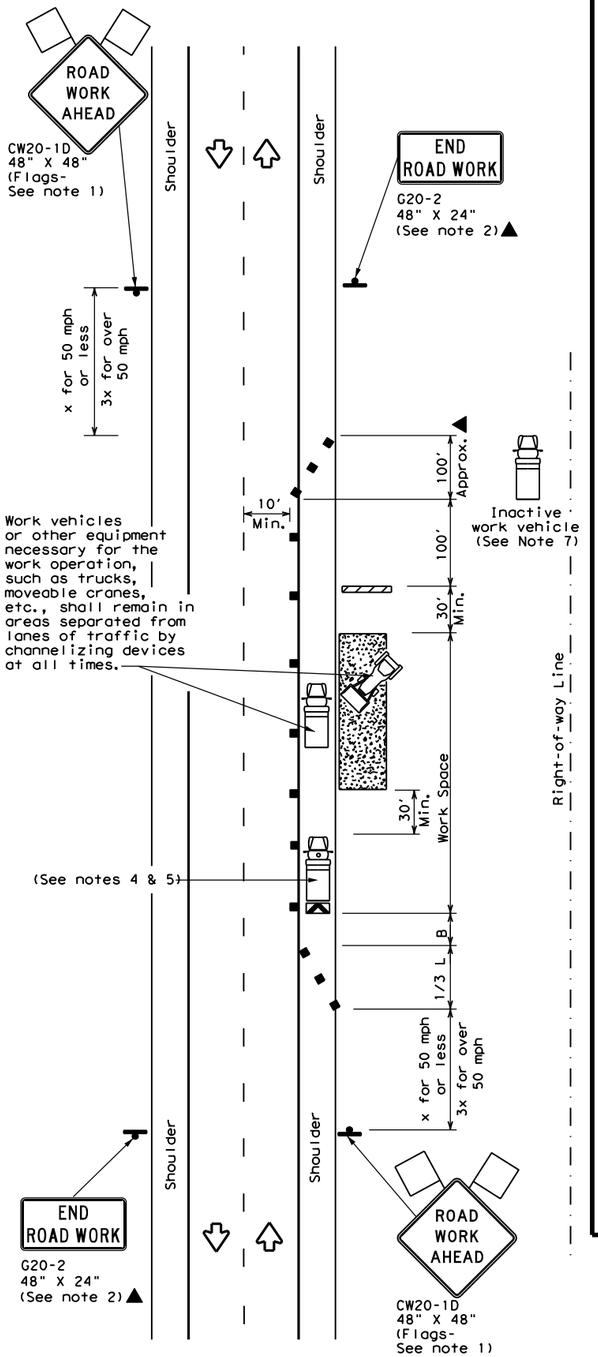
TCP (2-1a)

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 CW20-1D "ROAD WORK AHEAD" signs for shoulder work on conventional roadways.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN CONVENTIONAL ROAD SHOULDER WORK

TCP(2-1)-18

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	HOU	BRAZORIA		59
1-97 2-18				

161

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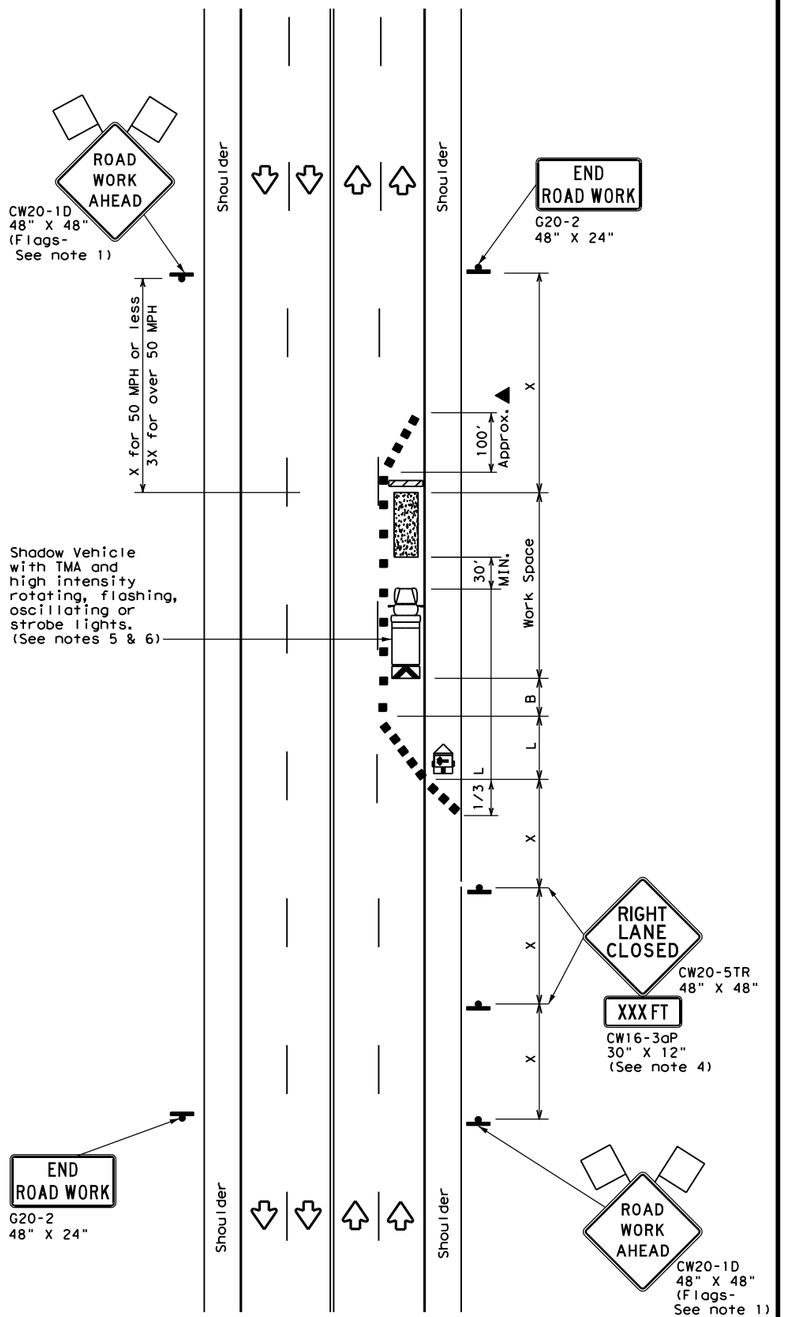
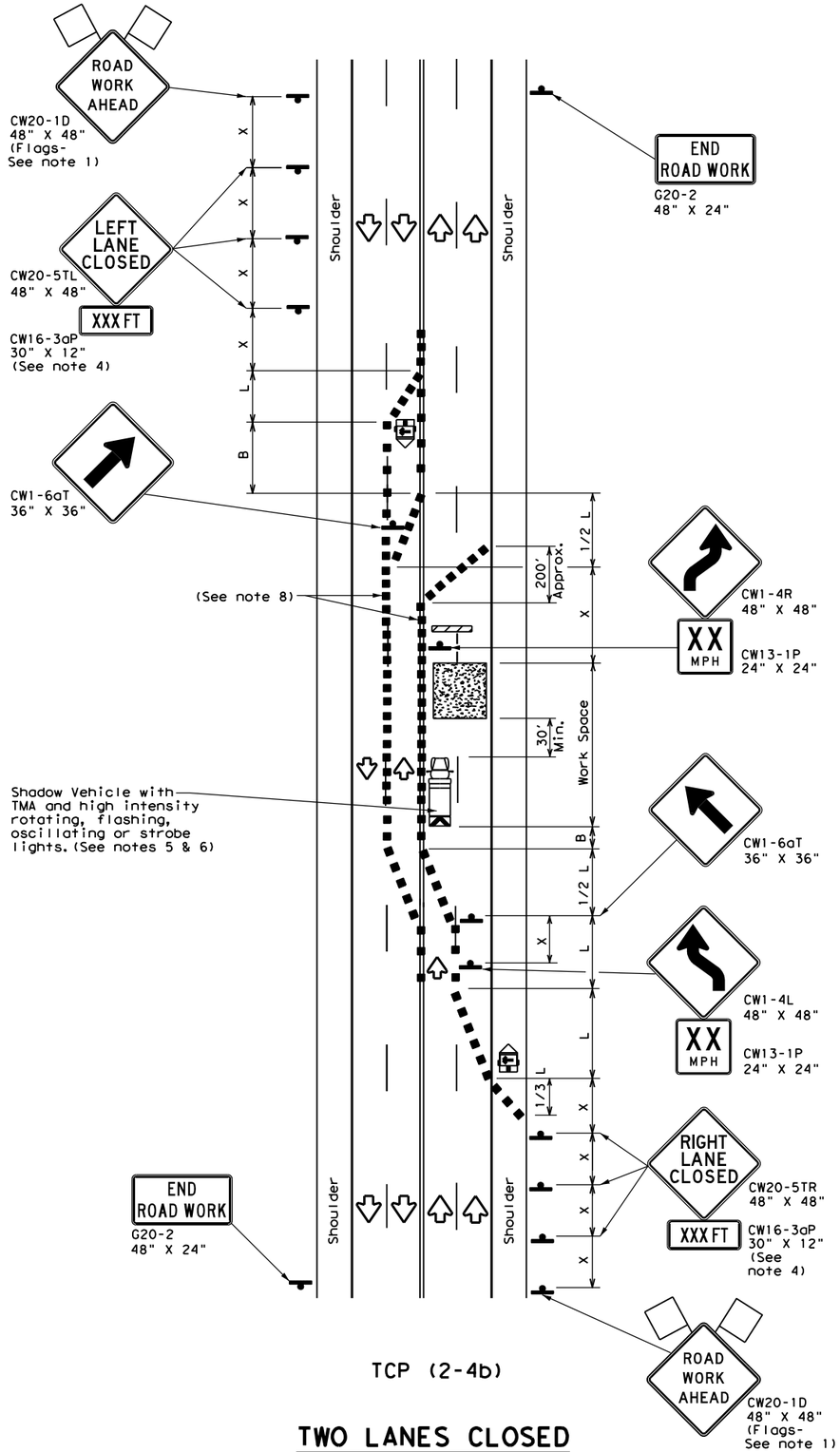


TCP (2-4a)

ONE LANE CLOSED



TCP (2-4b)

TWO LANES CLOSED

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

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

* Conventional Roads Only

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

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

GENERAL NOTES

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

TCP (2-4a)

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

TCP (2-4b)

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

Texas Department of Transportation — Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

TCP(2-4)-18

FILE: tcp2-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-95 3-03	0111	09	044, ETC	BS 288B
1-97 2-12	DIST	COUNTY		SHEET NO.
4-98 2-18	HOU	BRAZORIA		60

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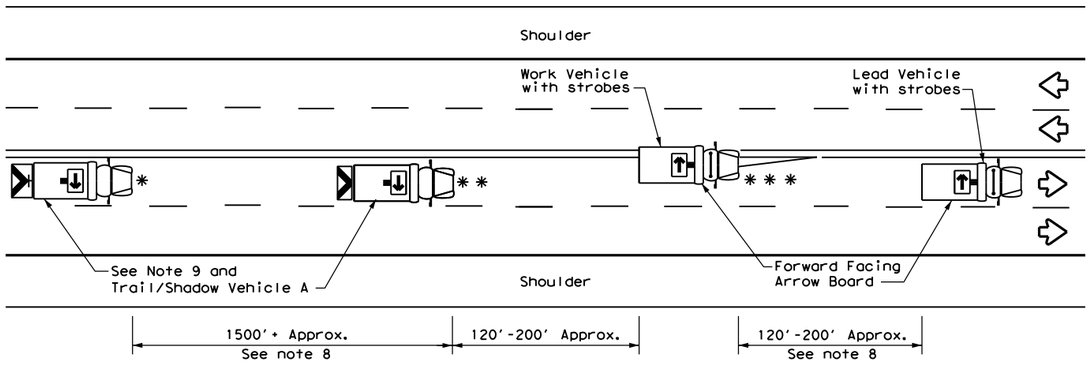
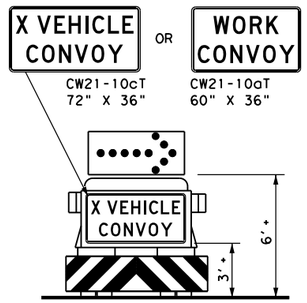


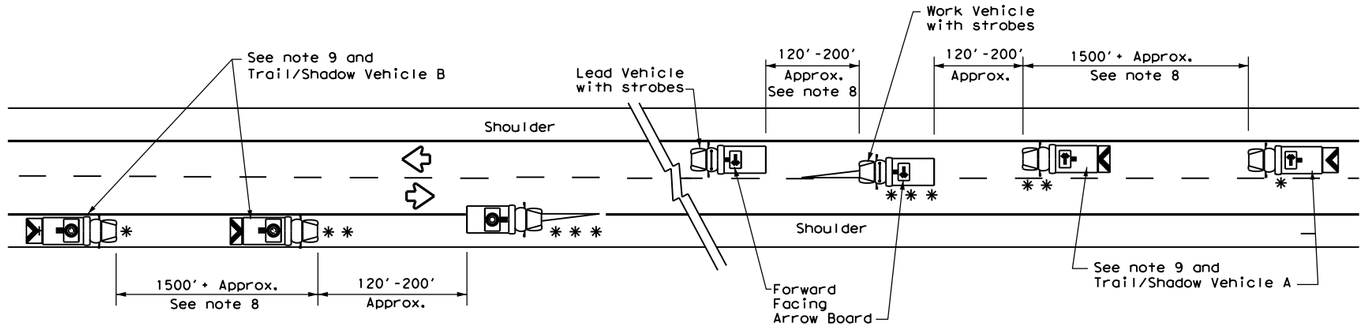
TCP (3-1a)

UNDIVIDED MULTILANE ROADWAY



TRAIL/SHADOW VEHICLE A

with RIGHT Directional display Flashing Arrow Board

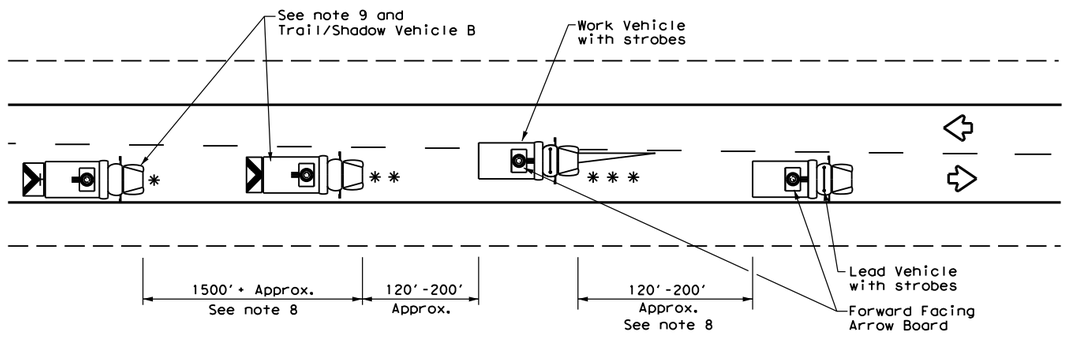


WORK ON SHOULDER

WORK ON TRAVEL LANE

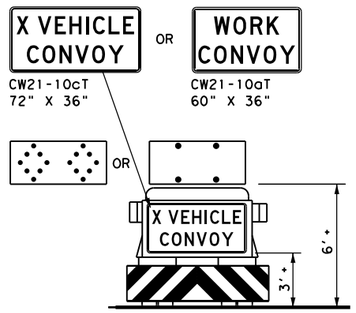
TCP (3-1b)

TWO-WAY ROADWAY WITH PAVED SHOULDERS



TCP (3-1c)

TWO-WAY ROADWAY WITHOUT PAVED SHOULDERS



TRAIL/SHADOW VEHICLE B

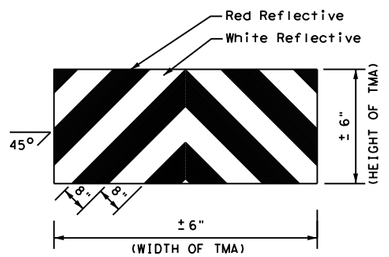
with Flashing Arrow Board in CAUTION display

LEGEND			
*	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 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

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©TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0111	09	044, ETC	BS 288B
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	HOU	BRAZORIA		61

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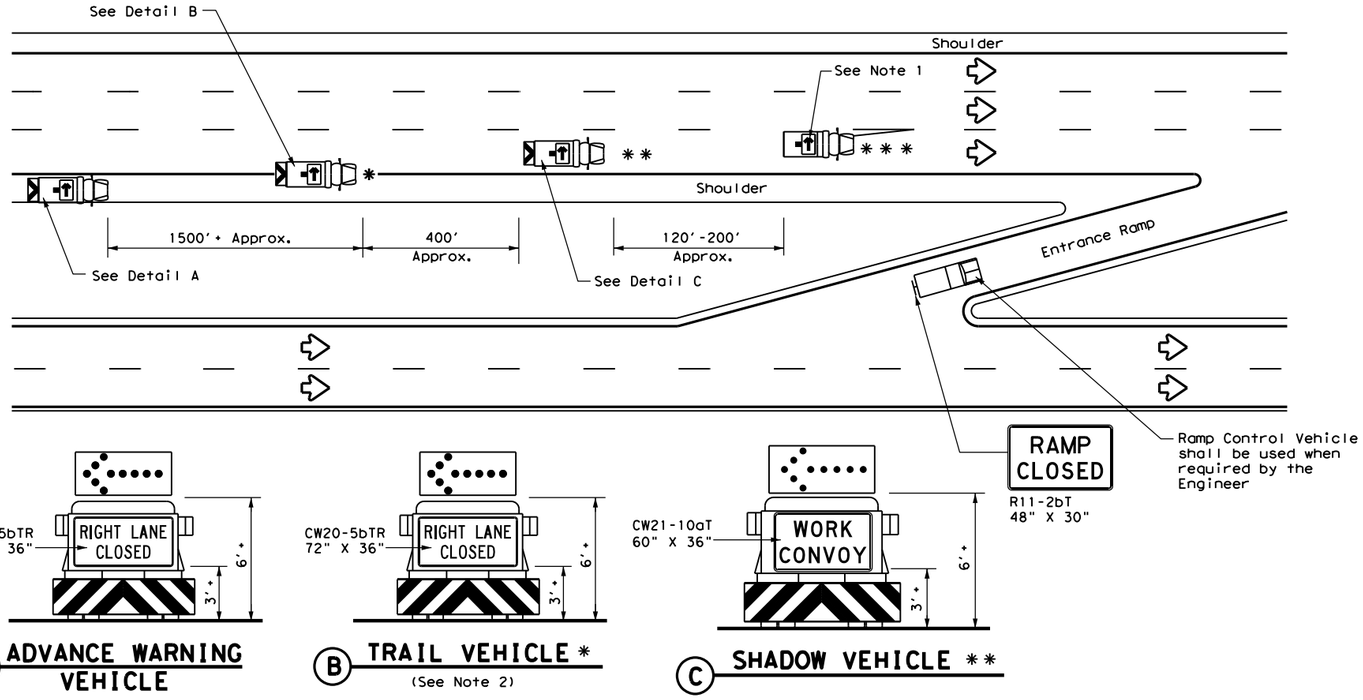
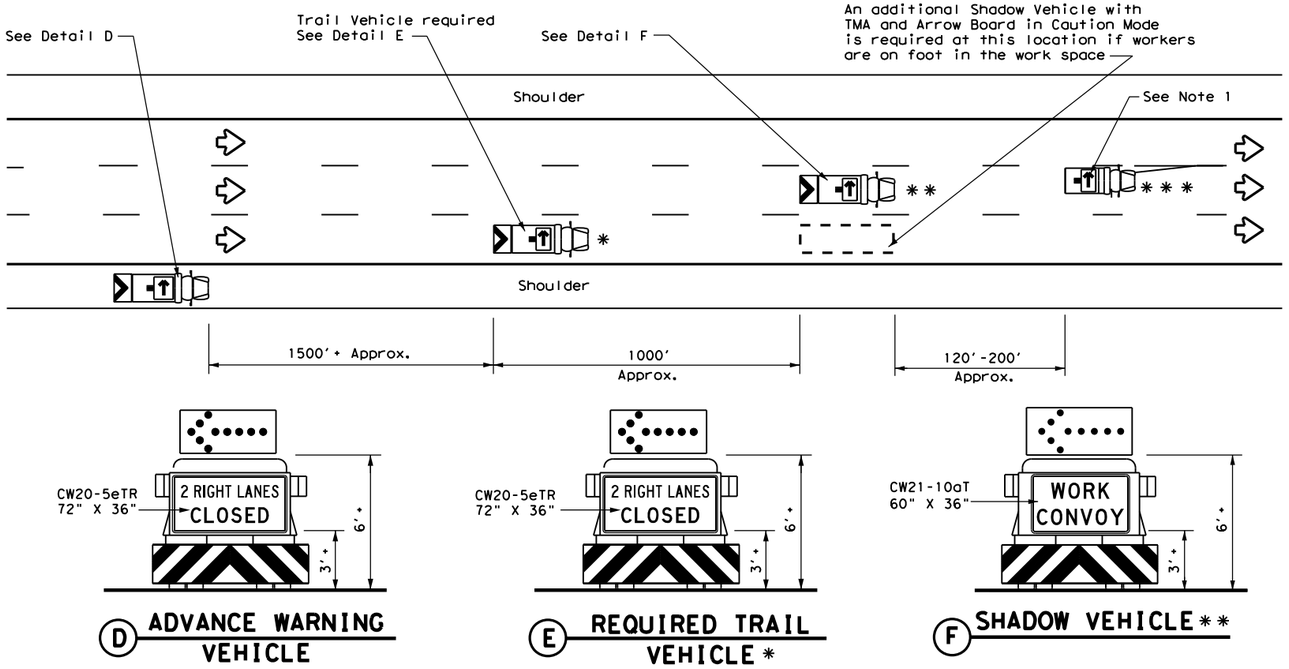


RIGHT LANE CLOSURE ON DIVIDED HIGHWAY - TCP(3-2a)



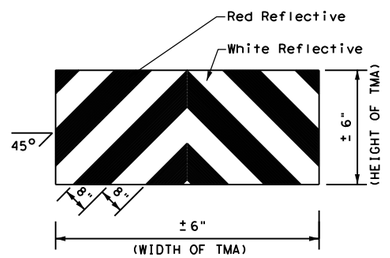
INTERIOR LANE CLOSURE ON MULTI-LANE DIVIDED HIGHWAY - TCP(3-2b)

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

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

GENERAL NOTES

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



STRIPING FOR TMA

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS DIVIDED HIGHWAYS

TCP(3-2)-13

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© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-94 4-98 8-95 7-13 1-97	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		62

176

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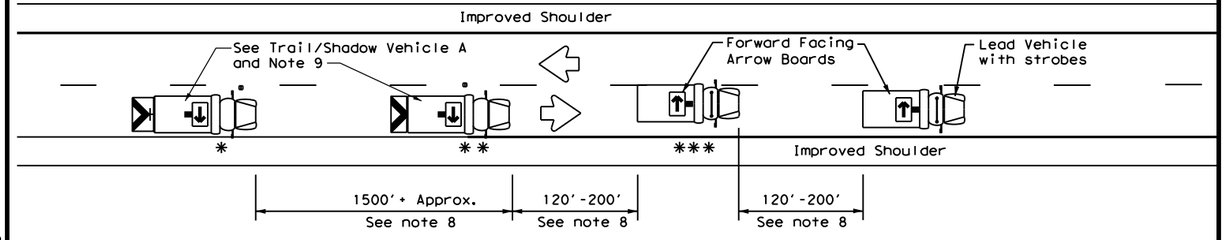
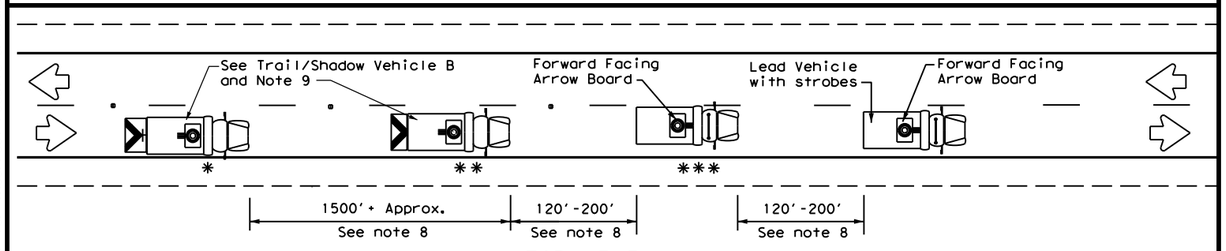


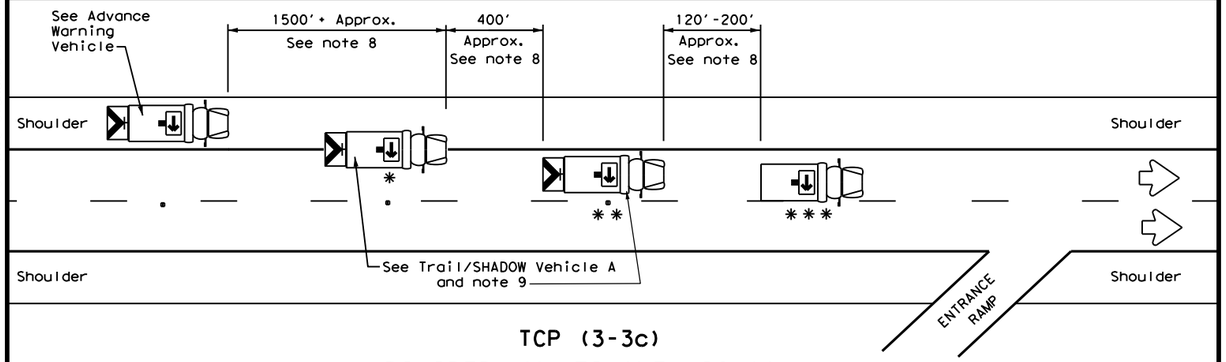
TCP (3-3a)

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



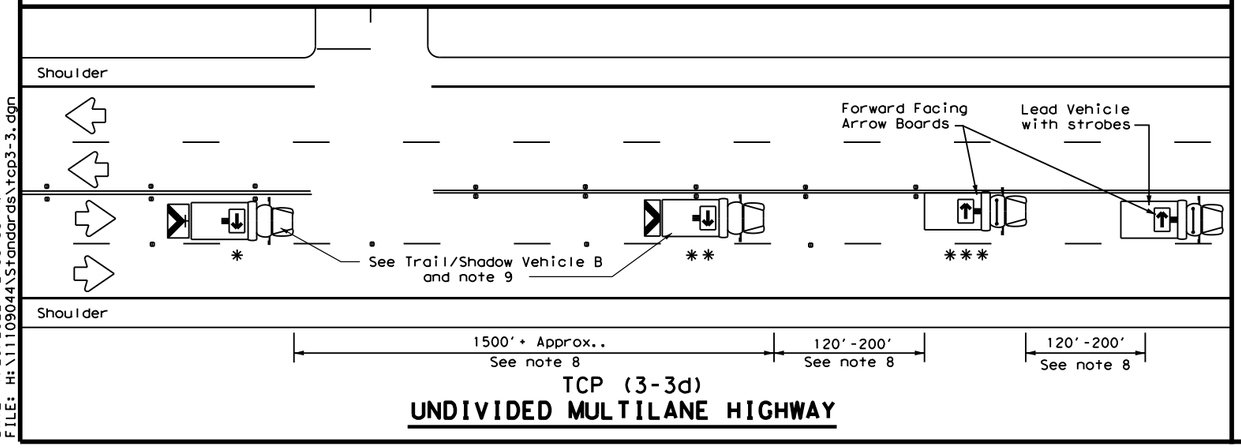
TCP (3-3b)

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



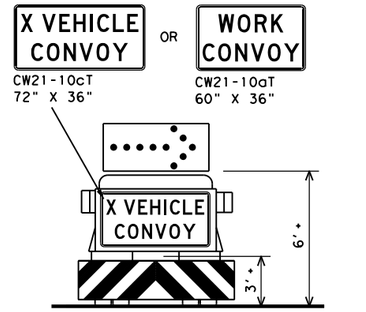
TCP (3-3c)

DIVIDED MULTILANE HIGHWAY



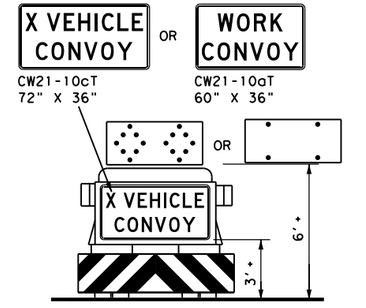
TCP (3-3d)

UNDIVIDED MULTILANE HIGHWAY



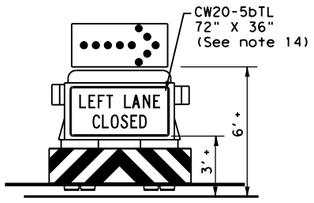
TRAIL/SHADOW VEHICLE A

with RIGHT Directional display
Flashing Arrow Board

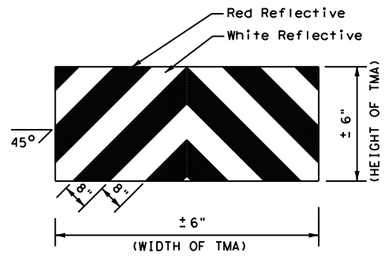


TRAIL/SHADOW VEHICLE B

with Flashing Arrow Board
in Caution Mode



ADVANCE WARNING VEHICLE



STRIPING FOR TMA

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

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

GENERAL NOTES

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN MOBILE OPERATIONS RAISED PAVEMENT MARKER INSTALLATION/ REMOVAL

TCP(3-3)-14

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©TxDOT September 1987	CONT	SECT	JOB	HIGHWAY
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2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 7-13	HOU	BRAZORIA		63
1-97 7-14				

177

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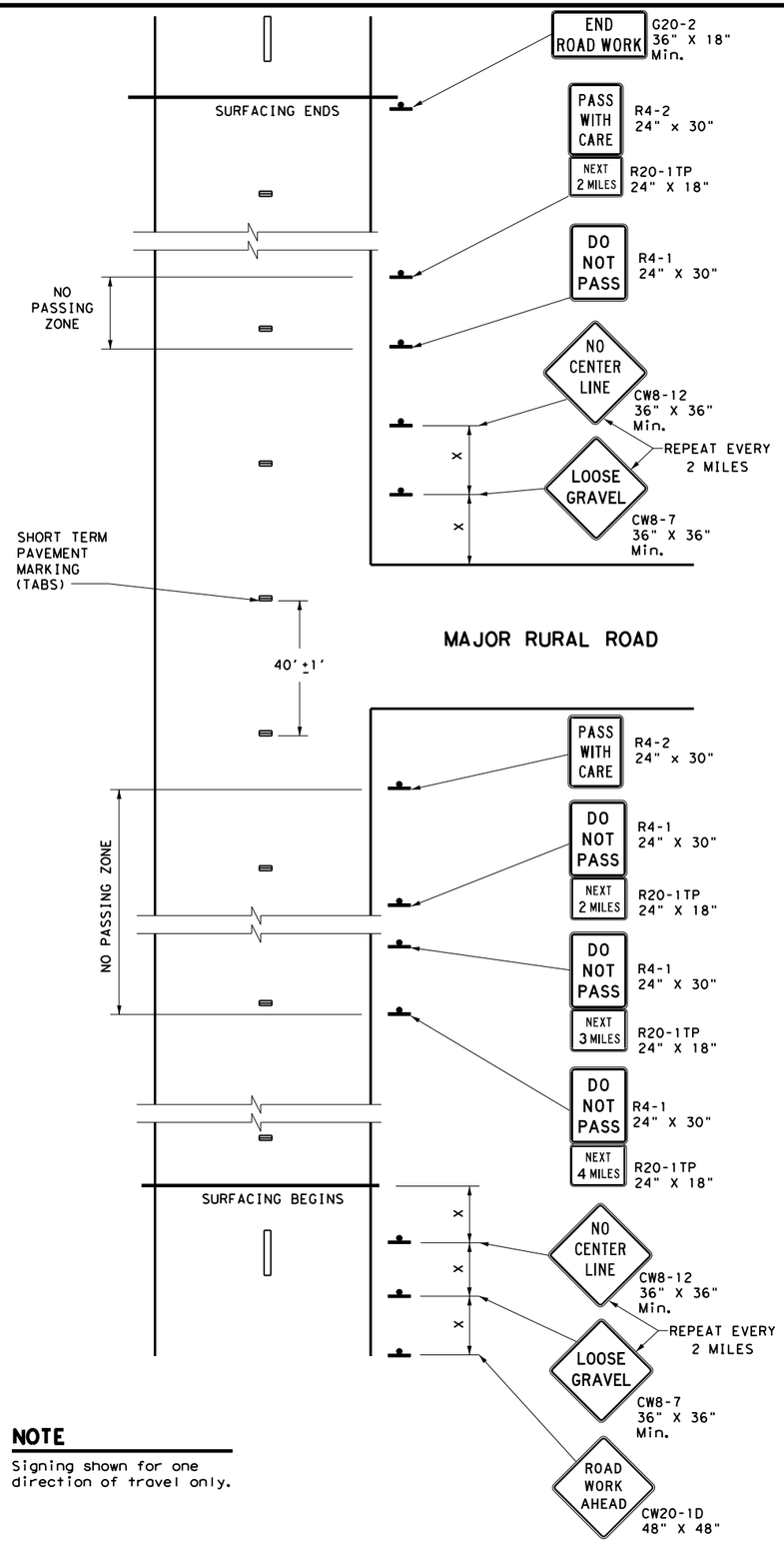
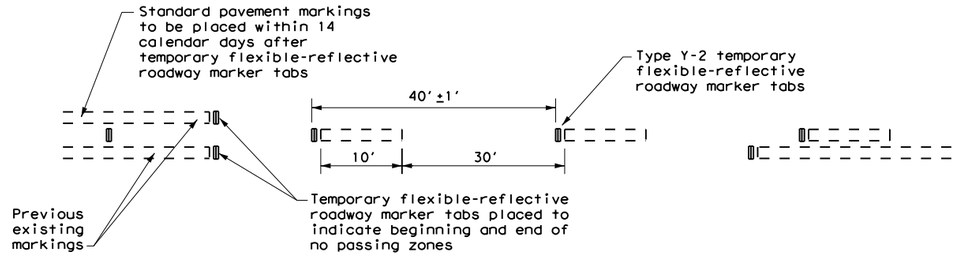


NOTE

Signing shown for one direction of travel only.

NO PASSING ZONES ON TWO-LANE TWO-WAY ROADS



TABS ON CENTERLINES OF TWO-LANE TWO-WAY ROADS

For seal coat, micro-surface or similar operations

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

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

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

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

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

"NO CENTER LINE" SIGN (CW8-12)

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

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

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

"LOOSE GRAVEL" SIGN (CW8-7)

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

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

PAVEMENT MARKINGS (FOR EMERGENCY USE ONLY) ⚠1

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

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

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

COORDINATION OF SIGN LOCATIONS

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

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

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

* Conventional Roads Only

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

GENERAL NOTES

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

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED
PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.21.2022

⚠1 CHANGED VERBAGE FOR PAVEMENT MARKINGS

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL DETAILS FOR SURFACING OPERATIONS

TCP(7-1)-13(MOD)

FILE: tcp7-1.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT March 1991	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
4-92 4-98	DIST	COUNTY		SHEET NO.
1-97 7-13	HOU	BRAZORIA		64

210

DATE: 1/20/2022 4:28:01 PM
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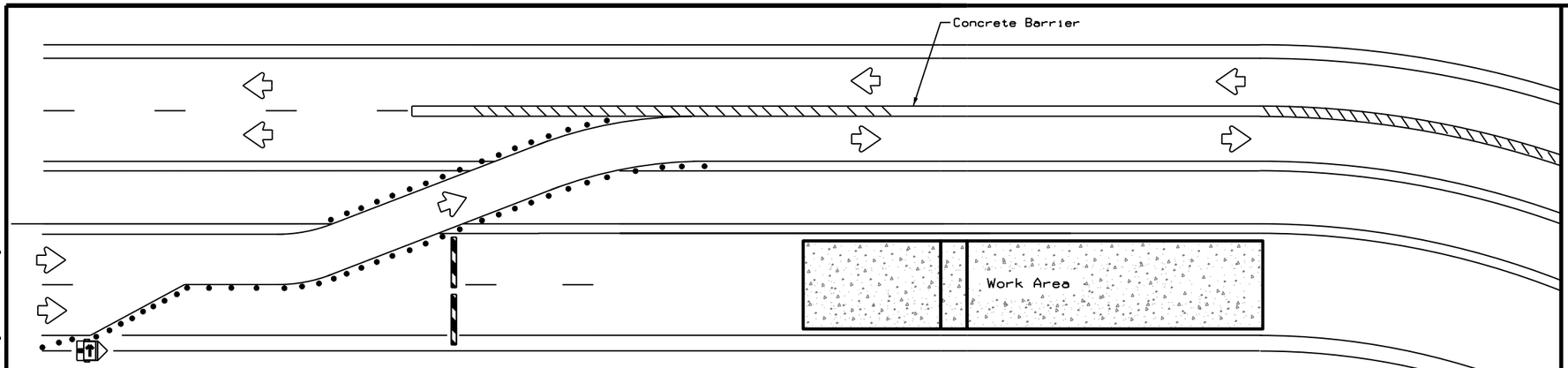


NOTES:

1. Length of Safety Glare screen will be specified elsewhere in the plans.
2. The cumulative nominal length of the modular safety glare screen units shall equal the length of the individual sections of temporary concrete traffic barrier on which they are installed so the joint between barrier sections will not be spanned by any one safety glare screen unit.
3. Screen Panel/blades will be designed such that reflective sheeting conforming with Departmental Material Specification DMS-8300, Sign Face Materials, Type B or C Yellow, minimum size of 2 inches by 12 inches can be attached to the edge of the panel/blade. The sheeting shall be attached to one glare screen panel/blade per section of concrete barrier not to exceed a spacing of 30 feet. Barrier reflectors are not necessary when panel/blades are installed with reflective sheeting as described.
4. Payment for these devices will be under statewide Special Specification "Modular Glare Screens for Headlight Barrier."
5. This detail is only intended to show types of locations where Glare Screens would be appropriate. Required signing and other devices shall be as shown elsewhere in the plans.

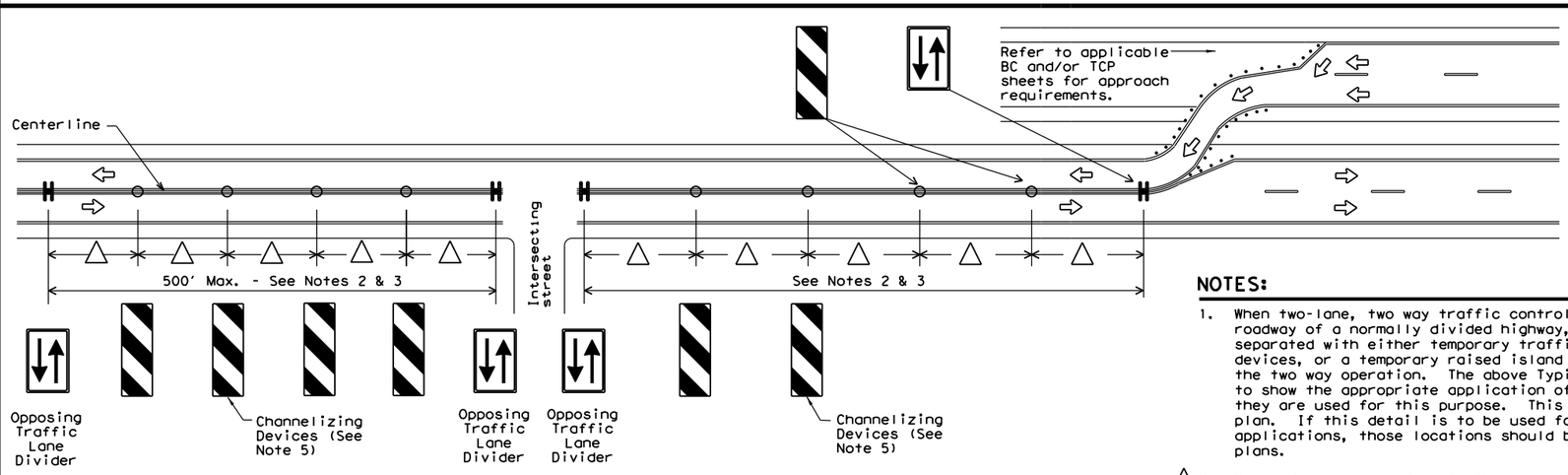
BARRIER DELINEATION WITH MODULAR GLARE SCREENS

LEGEND	
	Type 3 Barricade
• • •	Channelizing Devices
	Trailer Mounted Flashing Arrow Board
	Sign
\\\\	Safety glare screen

DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
DELINEATORS AND OBJECT MARKERS	DMS-8600
MODULAR GLARE SCREENS FOR HEADLIGHT BARRIER	DMS-8610

Only pre-qualified products shall be used. A copy of the Compliant Work Zone Traffic Control Devices List" CWZTCD)describes pre-qualified products and their sources and may be found at the following web address:

http://www.txdot.gov/business/resources/producer-list.html



VERTICAL PANELS & OPPOSING TRAFFIC LANE DIVIDERS (OTLD) SEPARATING TWO-WAY TRAFFIC ON NORMALLY DIVIDED HIGHWAYS

NOTES:

1. When two-lane, two way traffic control must be maintained on one roadway of a normally divided highway, opposing traffic shall be separated with either temporary traffic barriers, channelizing devices, or a temporary raised island throughout the length of the two way operation. The above Typical Application is intended to show the appropriate application of channelizing devices when they are used for this purpose. This is not a traffic control plan. If this detail is to be used for other types of roads or applications, those locations should be stated elsewhere in the plans.
2. △ Space devices according to the Tangent Spacing shown on the Device Spacing table on BC(9) but not exceeding 100'.
3. Every fifth device should be an OTLD except when spaced closer to accommodate an intersection. An OTLD should be the first device on each side of intersecting streets or roads.
4. Locations where surface mount bases with adhesives or self-righting devices will be required in order to maintain them in their proper position should be noted elsewhere in the plans.
5. Channelizing devices are to be vertical panels, 42" cones or tubular markers that are at least 36" tall. Tubular markers used to separate traffic should have a rubber base weighing at least 30 pounds. Tubular markers that are 42" tall or more shall have four bands of reflective material as detailed for 42" cones on BC(10). Tubular markers less than 42" but at least 36" tall shall have three bands of 3" wide white reflective material spaced 2" apart. Reflective material shall meet DMS-8300, Type A.

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN TYPICAL DETAILS

WZ(TD)-17

FILE: wztd-17.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT February 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 2-17 3-03 7-13	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		65

110

DATE: DATE/TIME 2:33:42 PM
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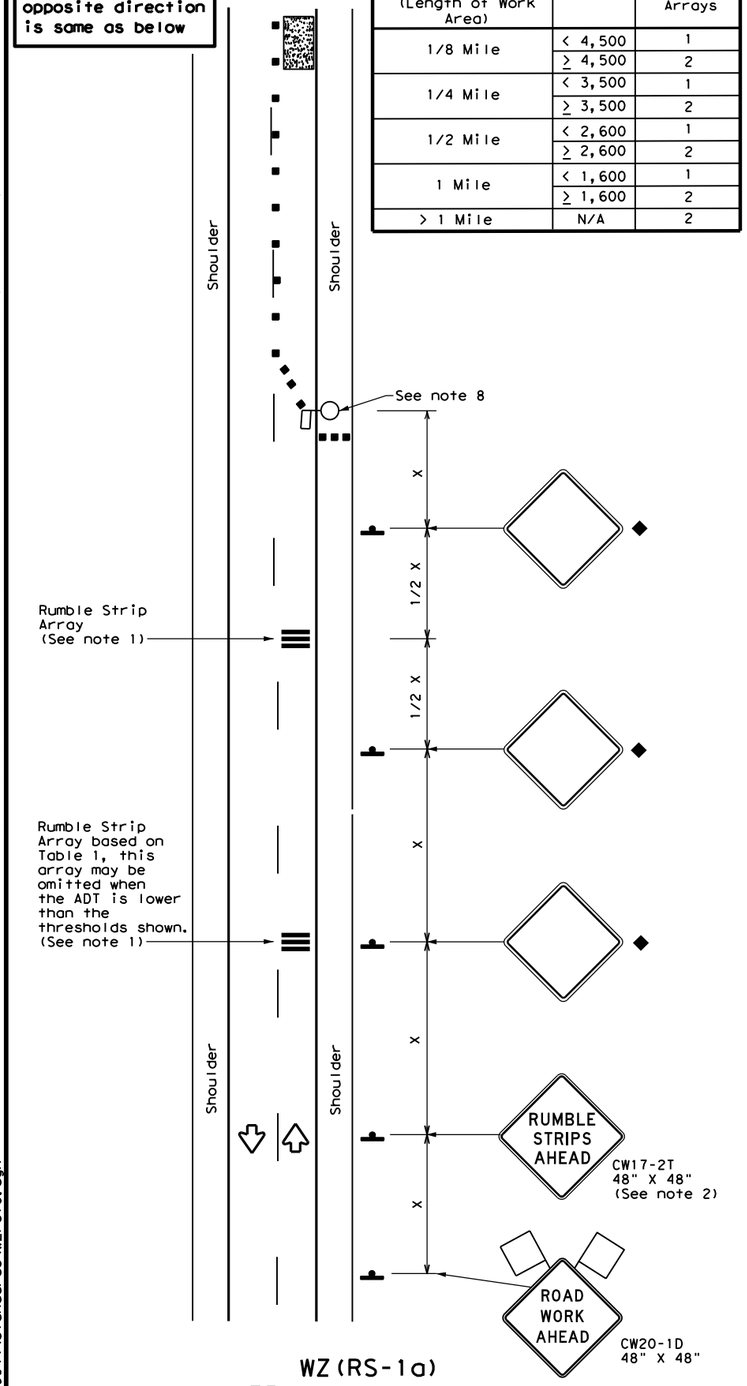
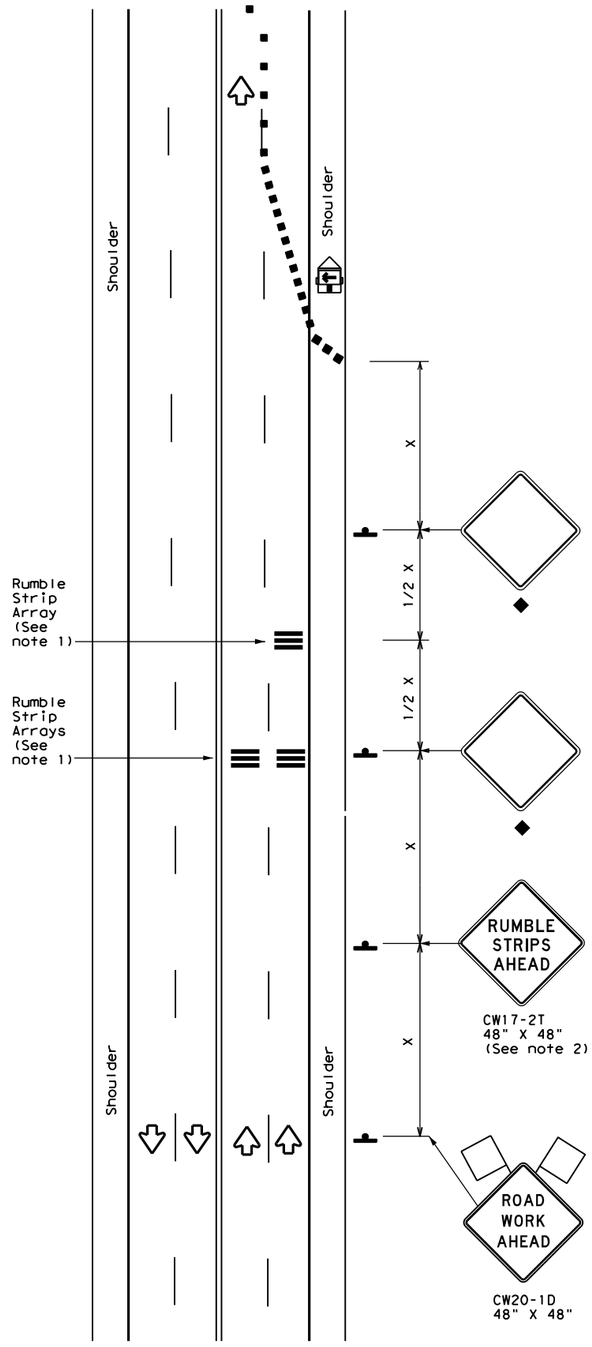
Warning sign and rumble strip sequence in opposite direction is same as below



WZ(RS-1a)
75 mph or Less

RUMBLE STRIPS ON ONE-LANE TWO-WAY APPLICATION

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-1b)
75 mph or Less

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. Removal of the Temporary Rumble Strips should be accomplished before removing the advance 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 AFAD or a portable traffic signal.
9. Temporary Rumble Strips may be used on freeways or expressways based on engineering judgment.

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.**

TABLE 2	
Speed	Approximate distance between strips in an Array
≤ 40 MPH	10'
> 40 MPH & ≤ 55 MPH	15'
> 55 MPH	20'

Texas Department of Transportation

Traffic Operations Division Standard

TEMPORARY RUMBLE STRIPS

WZ(RS)-16

FILE: wzrs16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2012	CONT	SECT	JOB	HIGHWAY
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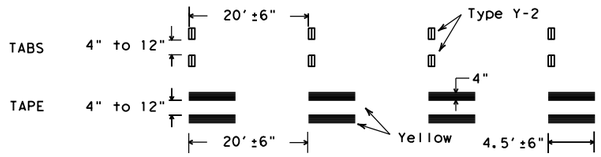
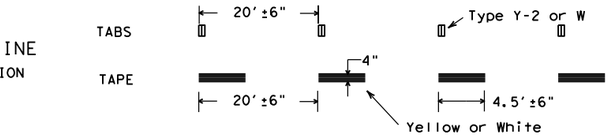
WORK ZONE SHORT TERM PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

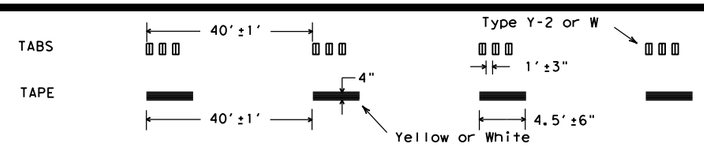


SINGLE NO-PASSING LINE or CHANNELIZATION LINE



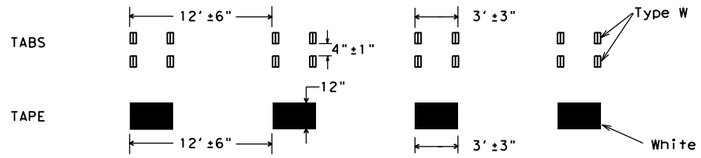
BROKEN LINES

(FOR CENTER LINE OR LANE LINE)

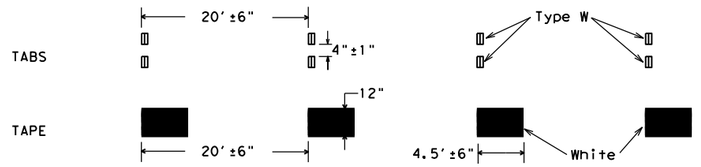


WIDE DOTTED LINES

(FOR LANE DROP LINES)



WIDE GORE MARKINGS



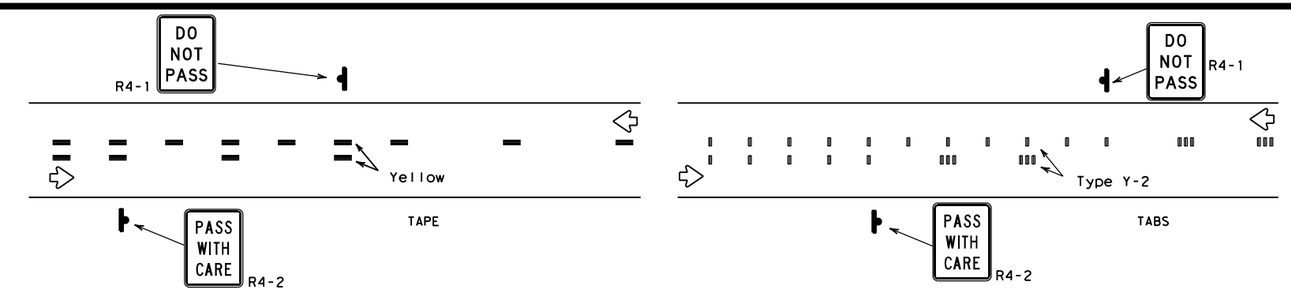
NOTES:

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

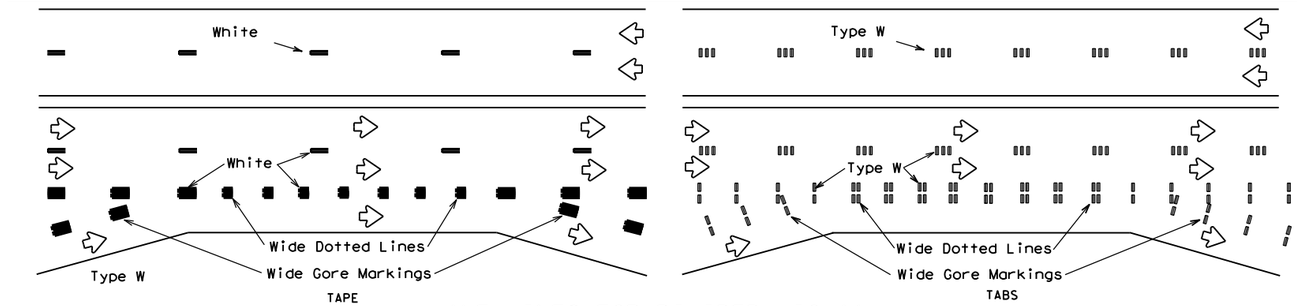
TEMPORARY FLEXIBLE, REFLECTIVE ROADWAY MARKER TABS (TABS)

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

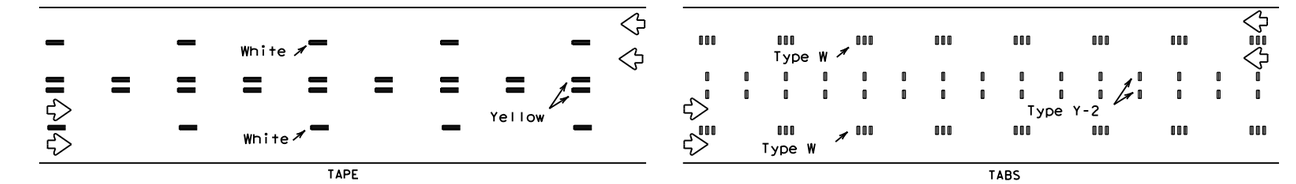
WORK ZONE SHORT TERM PAVEMENT MARKINGS PATTERNS



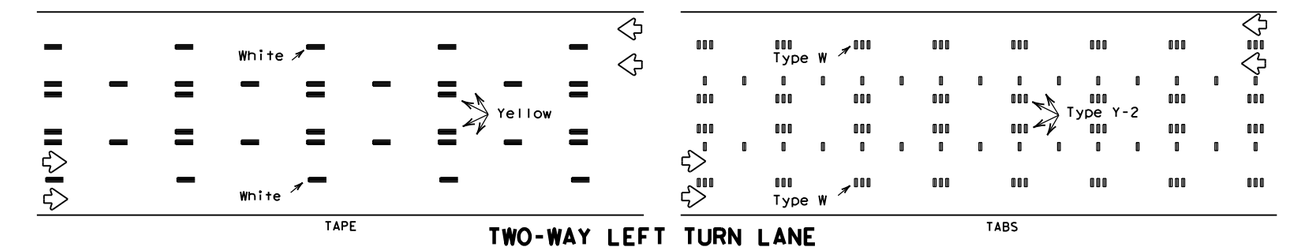
CENTER LINE & NO-PASSING ZONE BARRIER LINES FOR TWO LANE TWO-WAY HIGHWAYS



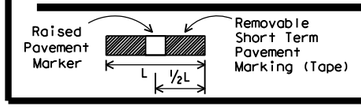
LANE LINES FOR DIVIDED HIGHWAY



LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



TWO-WAY LEFT TURN LANE



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

PREFABRICATED PAVEMENT MARKINGS

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

RAISED PAVEMENT MARKERS

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

WORK ZONE SHORT TERM PAVEMENT MARKINGS

WZ(STPM)-13

FILE:	wzstpm-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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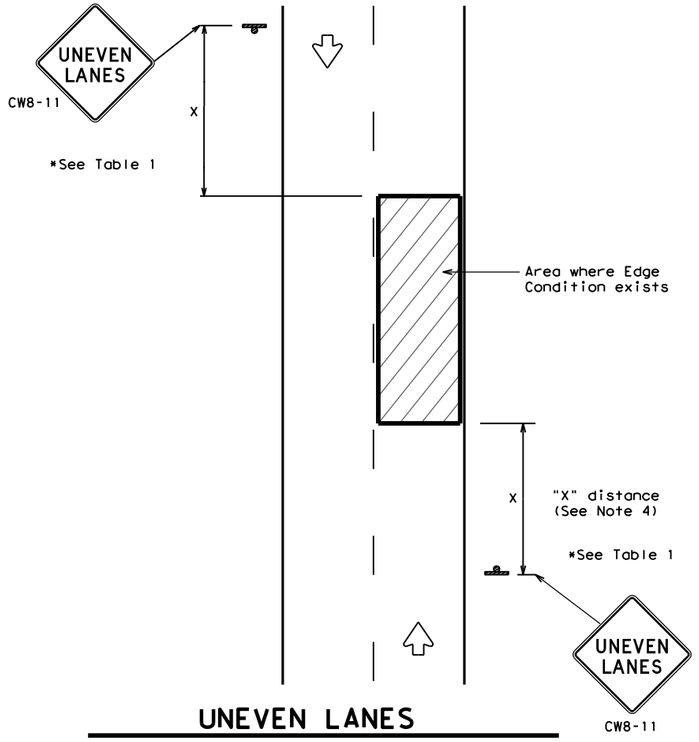
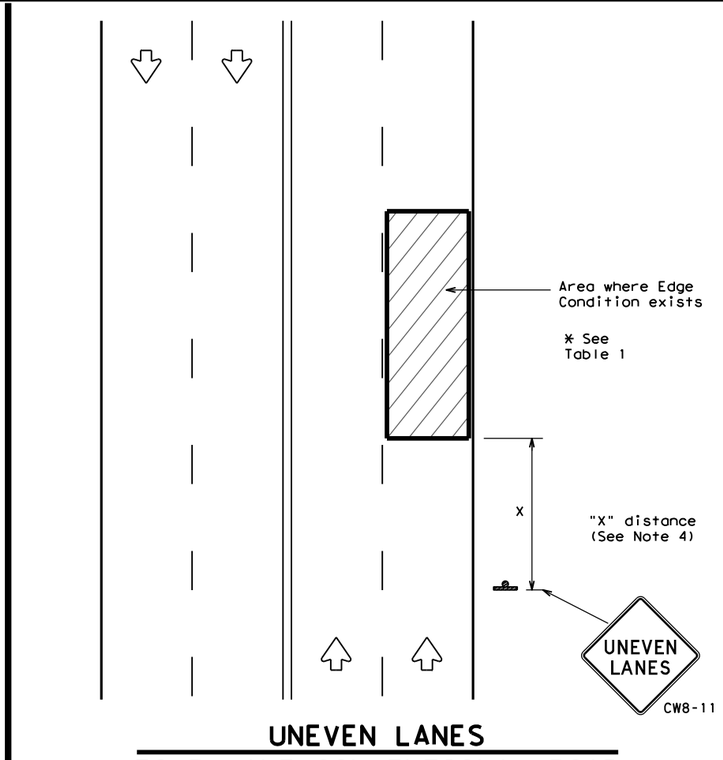
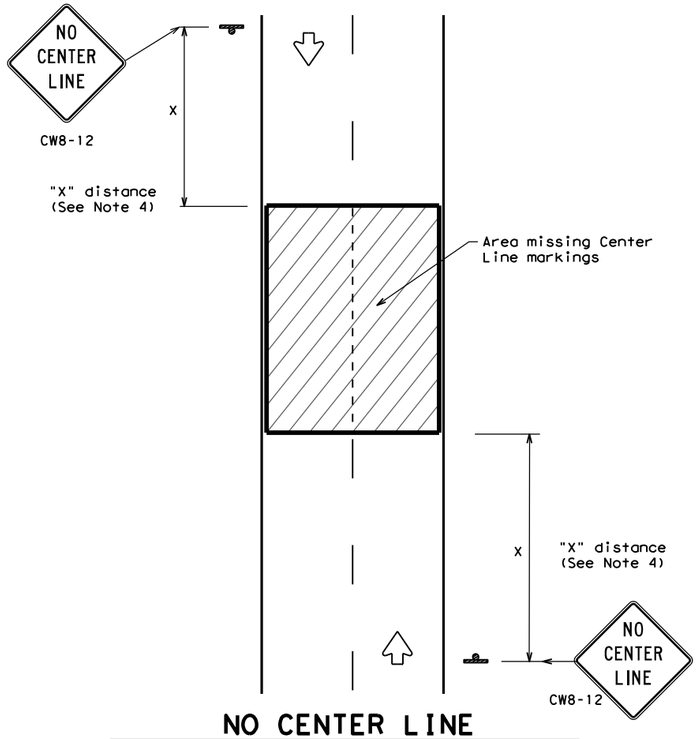
1-97		DIST	COUNTY		SHEET NO.
3-03		HOU	BRAZORIA		67
7-13					



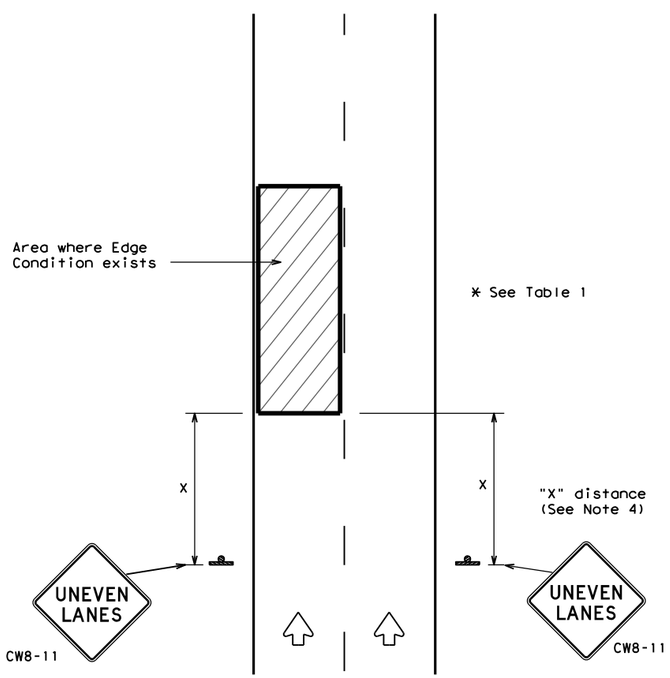
UNEVEN LANES
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
FOUR LANE CONVENTIONAL ROAD



NO CENTER LINE
TWO LANE CONVENTIONAL ROAD



UNEVEN LANES
DIVIDED ROADWAY

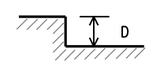
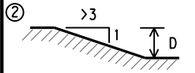
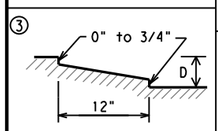
DEPARTMENTAL MATERIAL SPECIFICATIONS	
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
TEMPORARY (REMOVABLE) PREFABRICATED PAVEMENT MARKINGS	DMS-8241
SIGN FACE MATERIALS	DMS-8300

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

GENERAL NOTES

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

TABLE 1

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

SIGNING FOR UNEVEN LANES

WZ(UL)-13

FILE: wzul-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
8-95 2-98 7-13	DIST	COUNTY		SHEET NO.
1-97 3-03	HOU	BRAZORIA		68

112

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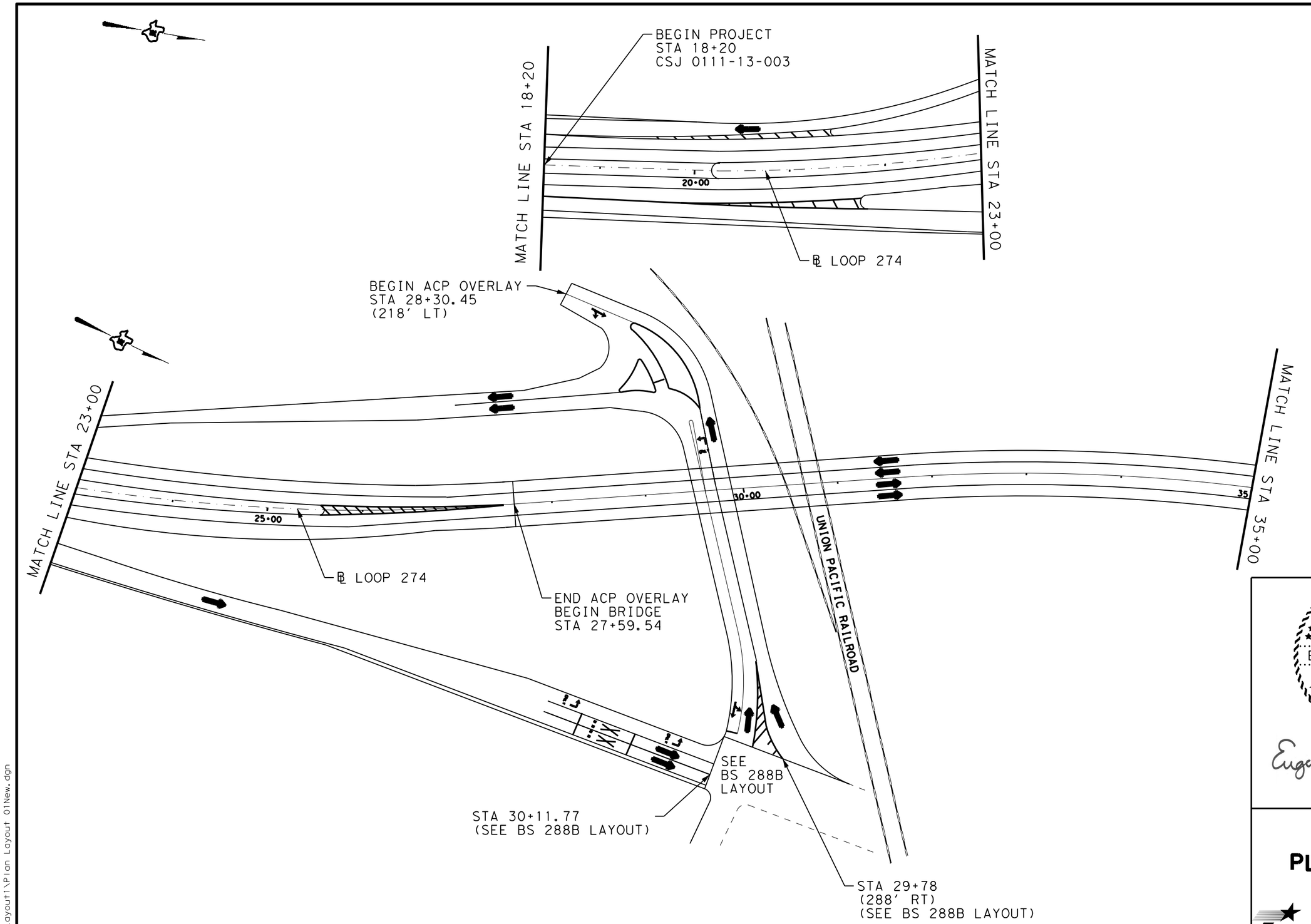

1/31/2022
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STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED
PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

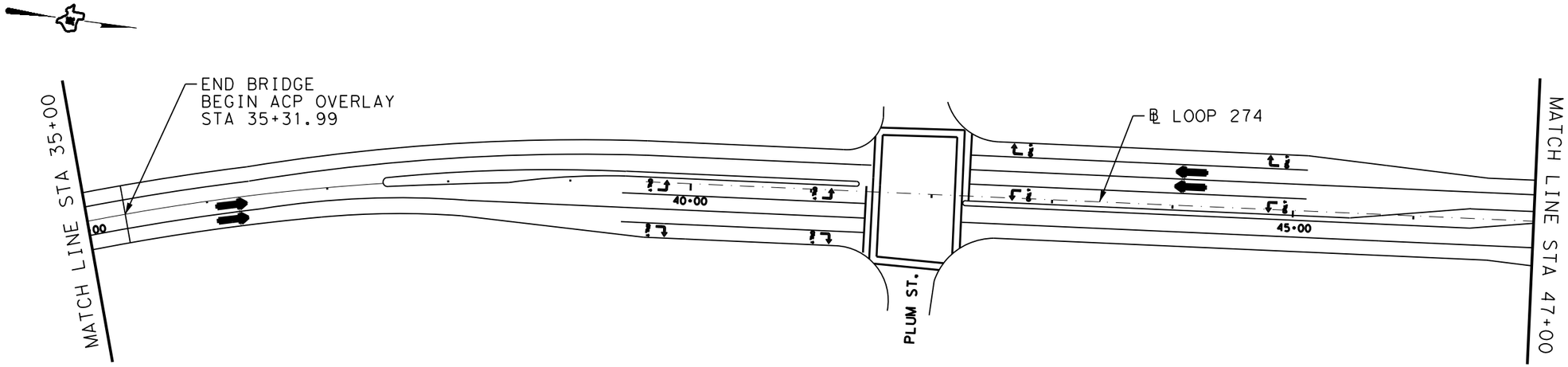
01.02.2022

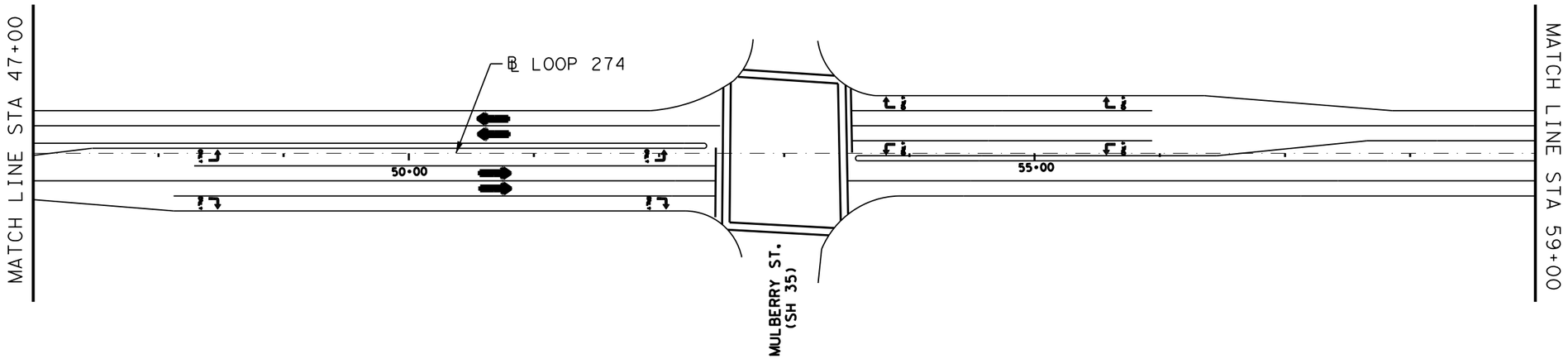
PLAN LAYOUT
LOOP 274

Texas Department of Transportation®

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		69

SCALE N.T.S.
SHEET 1 OF 3





STATE OF TEXAS
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01.02.2022

PLAN LAYOUT
LOOP 274

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		70

SCALE N.T.S.
SHEET 2 OF 3

1/31/2022
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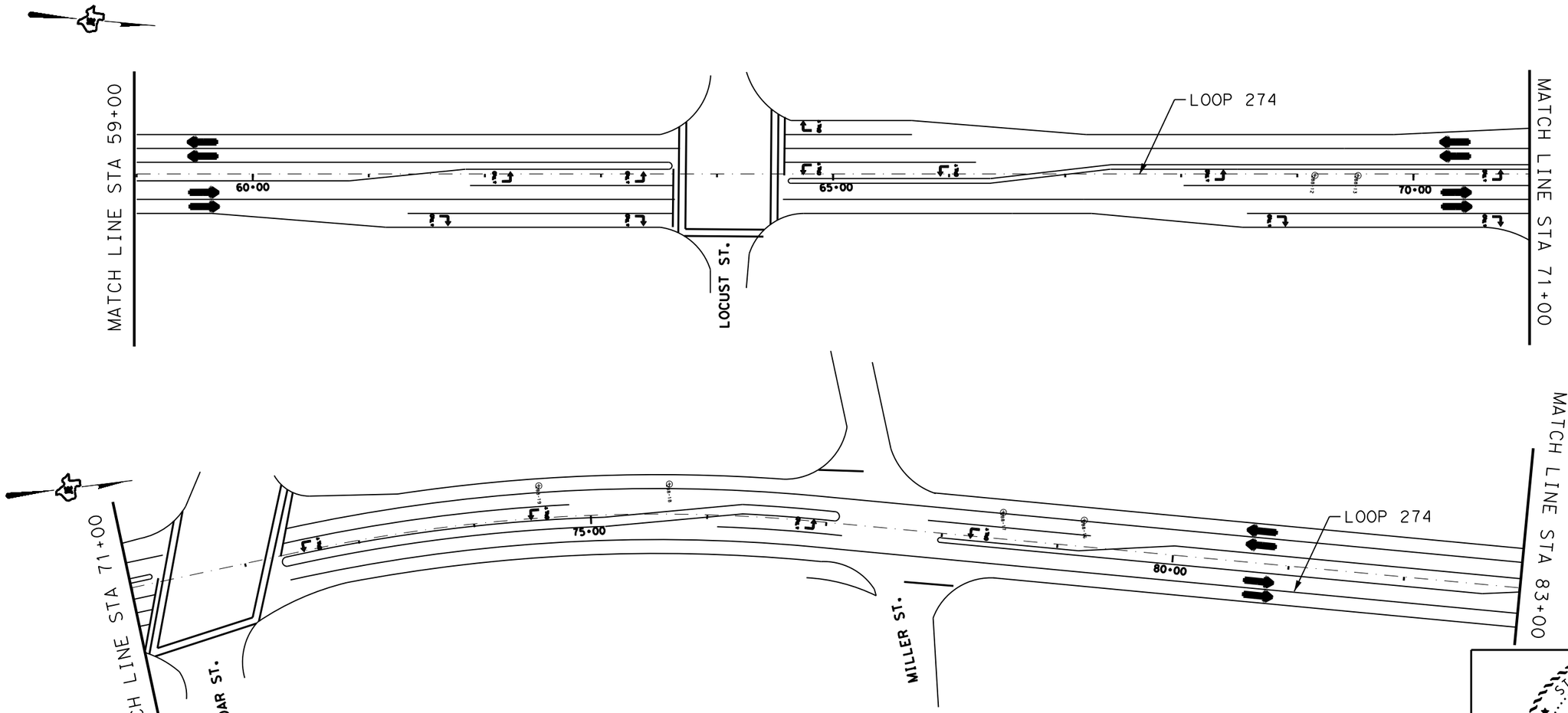

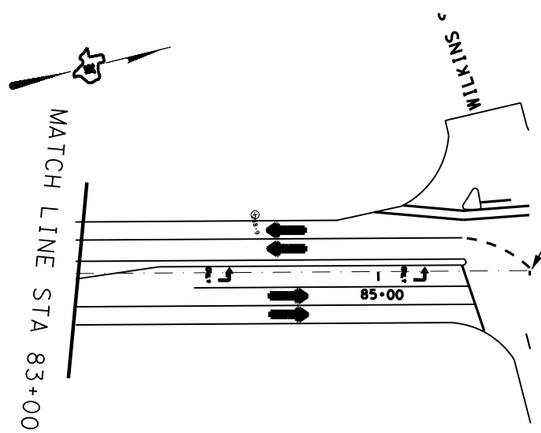

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SCALE N.T.S.
SHEET 3 OF 3

STATE OF TEXAS
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PLAN LAYOUT LOOP 274

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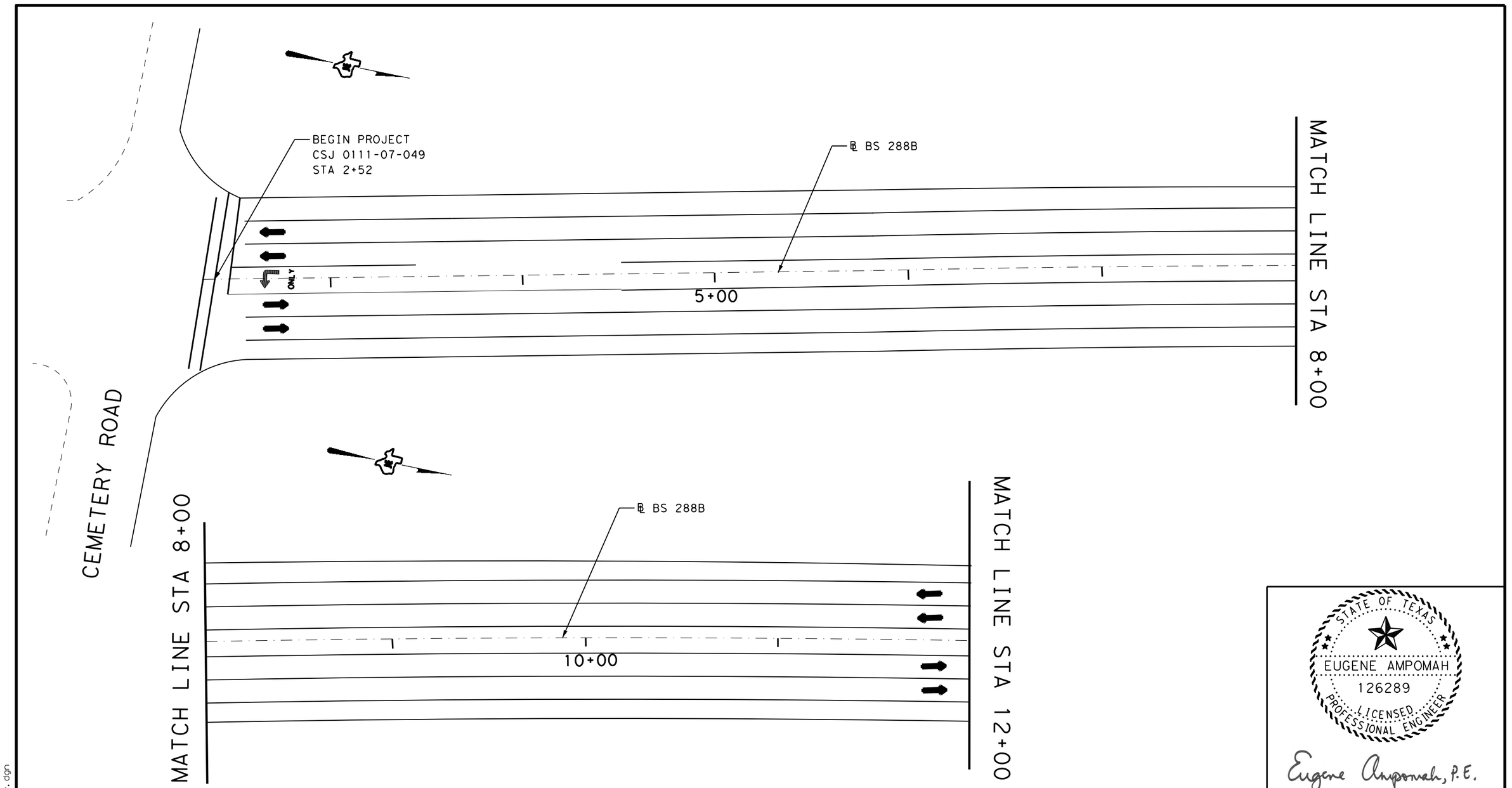
CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		71



STATE OF TEXAS
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PLAN LAYOUT
BS 288B

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		72

SCALE 1"=50'
SHEET 1 OF 15

1/20/2022
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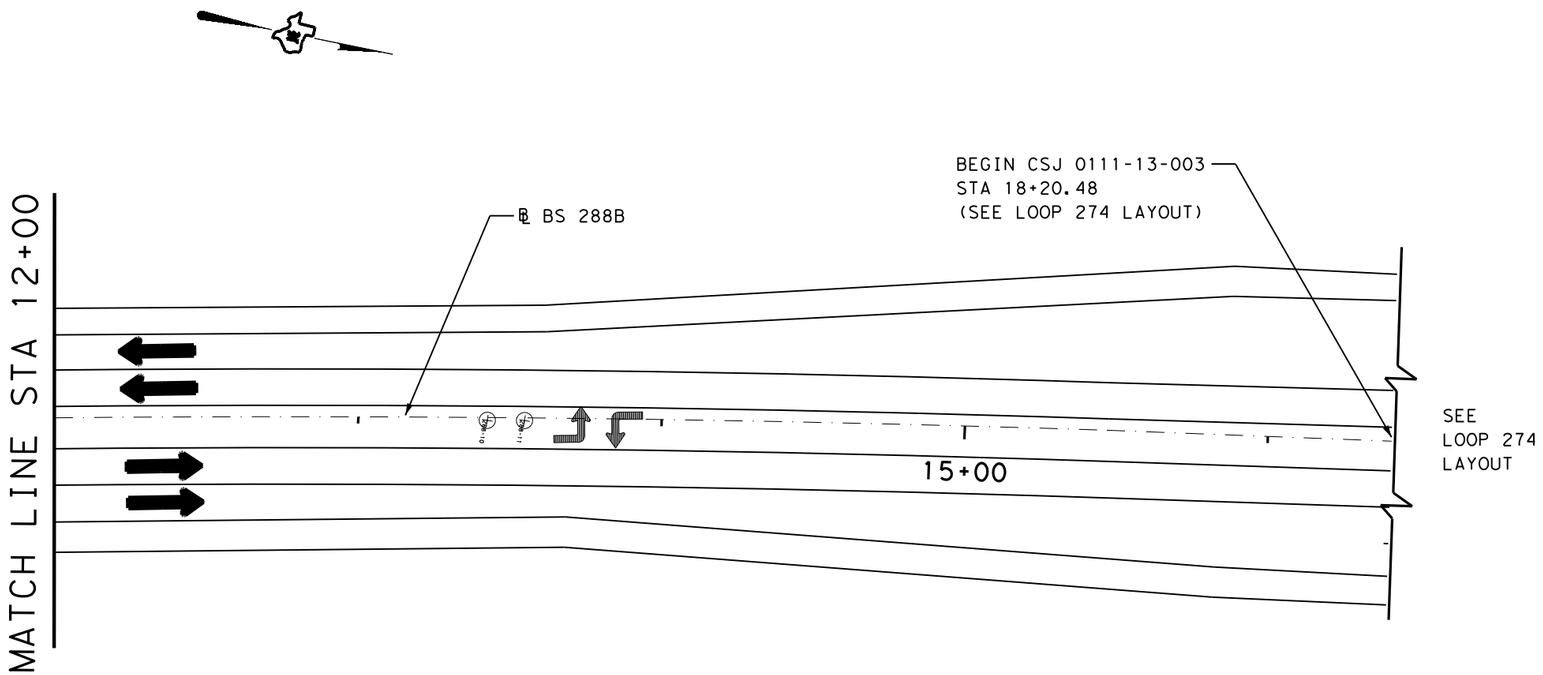

SCALE 1"=50'
SHEET 2 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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PLAN LAYOUT
BS 288B

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		73

1/20/2022
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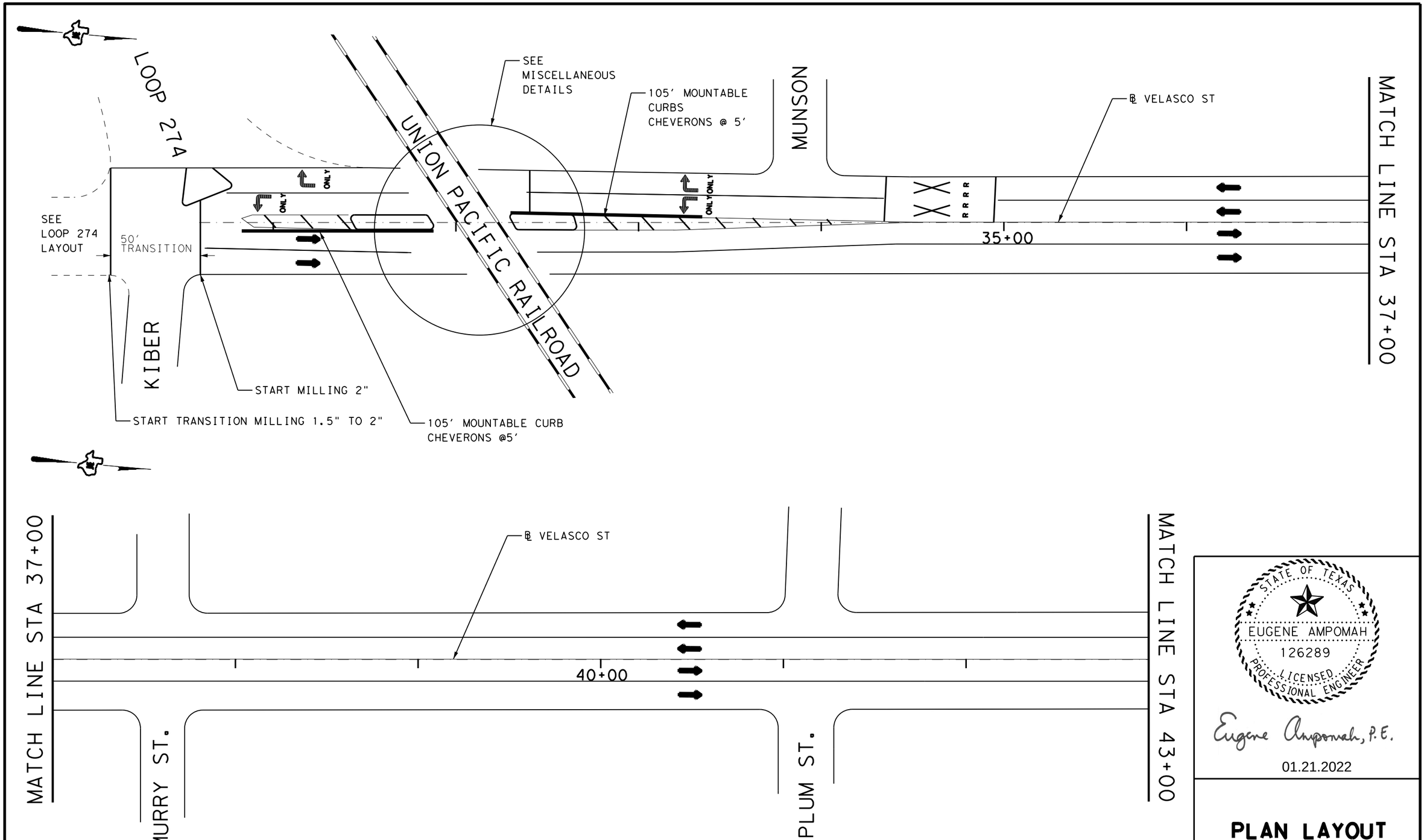

SCALE 1"=50'
SHEET 3 OF 15

STATE OF TEXAS
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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		74

1/20/2022
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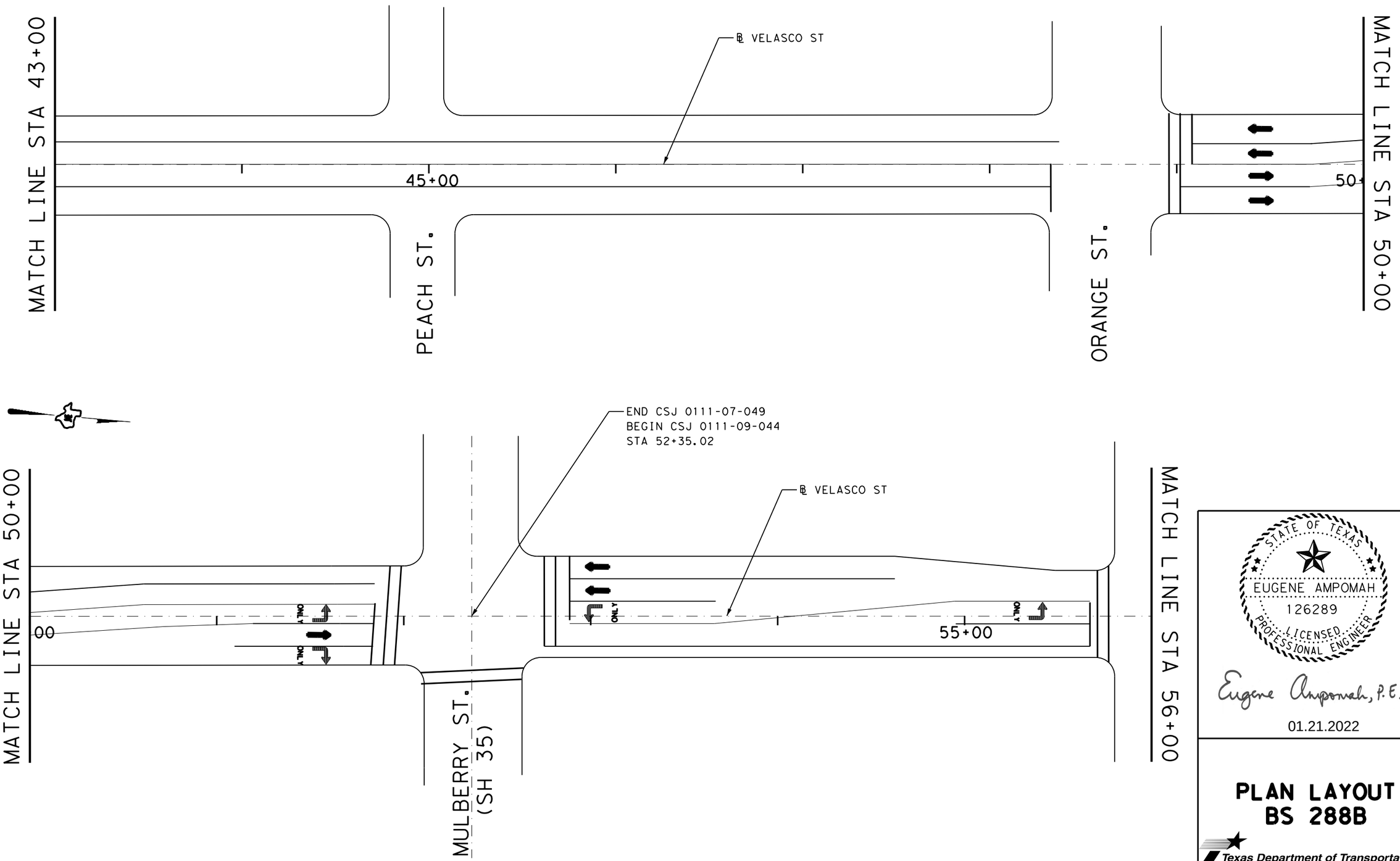

SCALE 1"=50'
SHEET 4 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		75

1/20/2022
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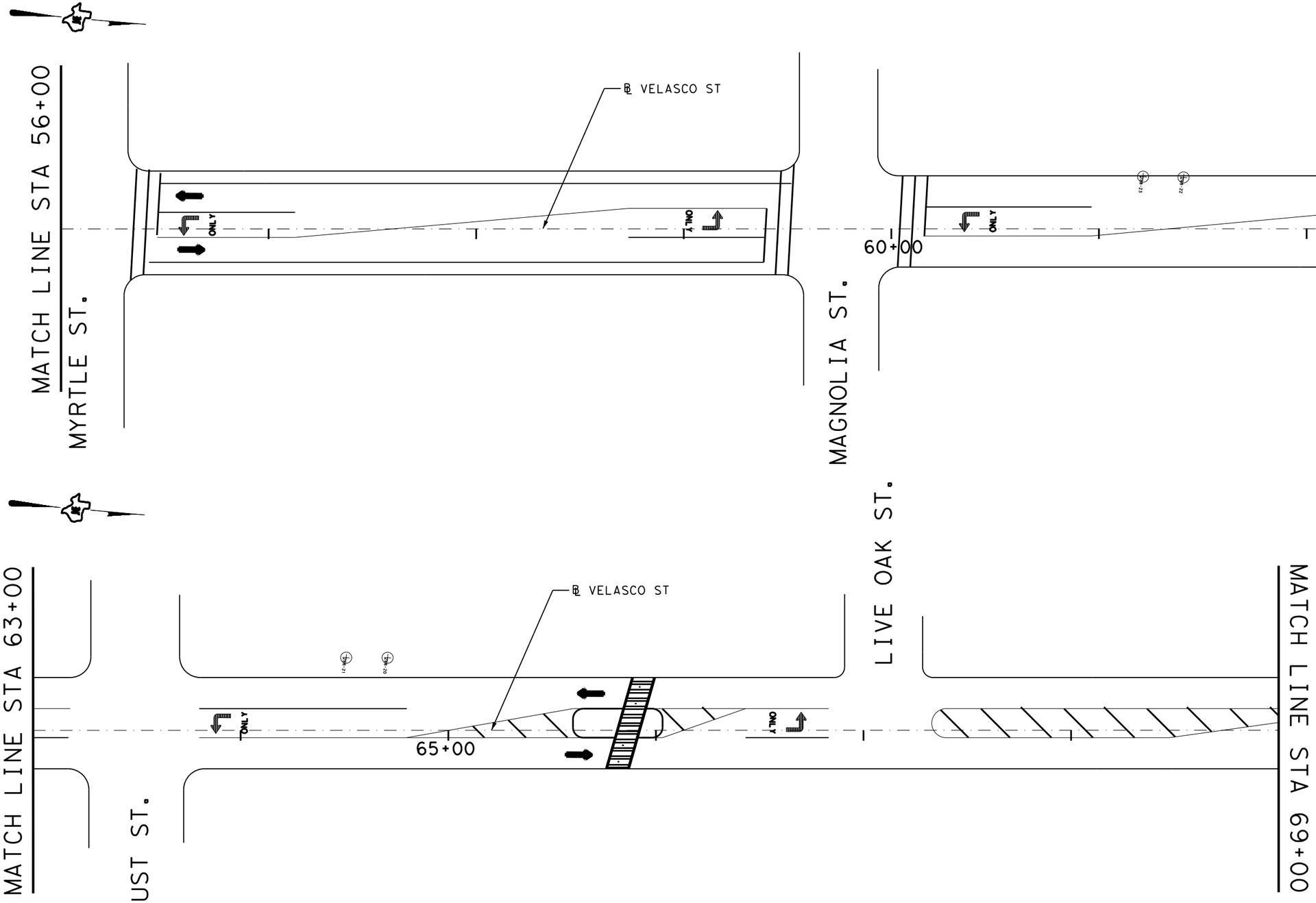

SCALE 1"=50'
SHEET 5 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		76

1/20/2022
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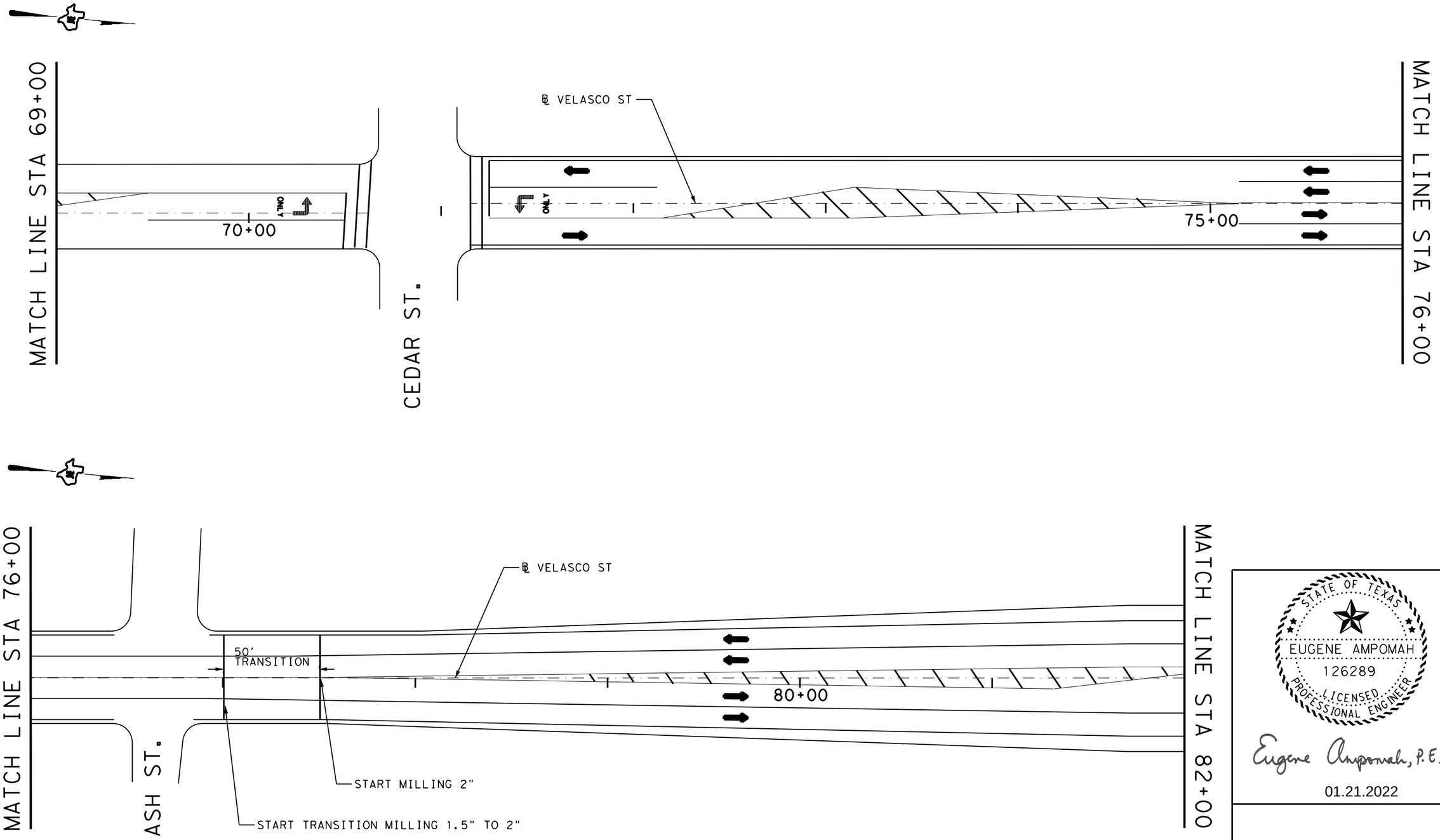

SCALE 1"=50'
SHEET 6 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		77

1/20/2022
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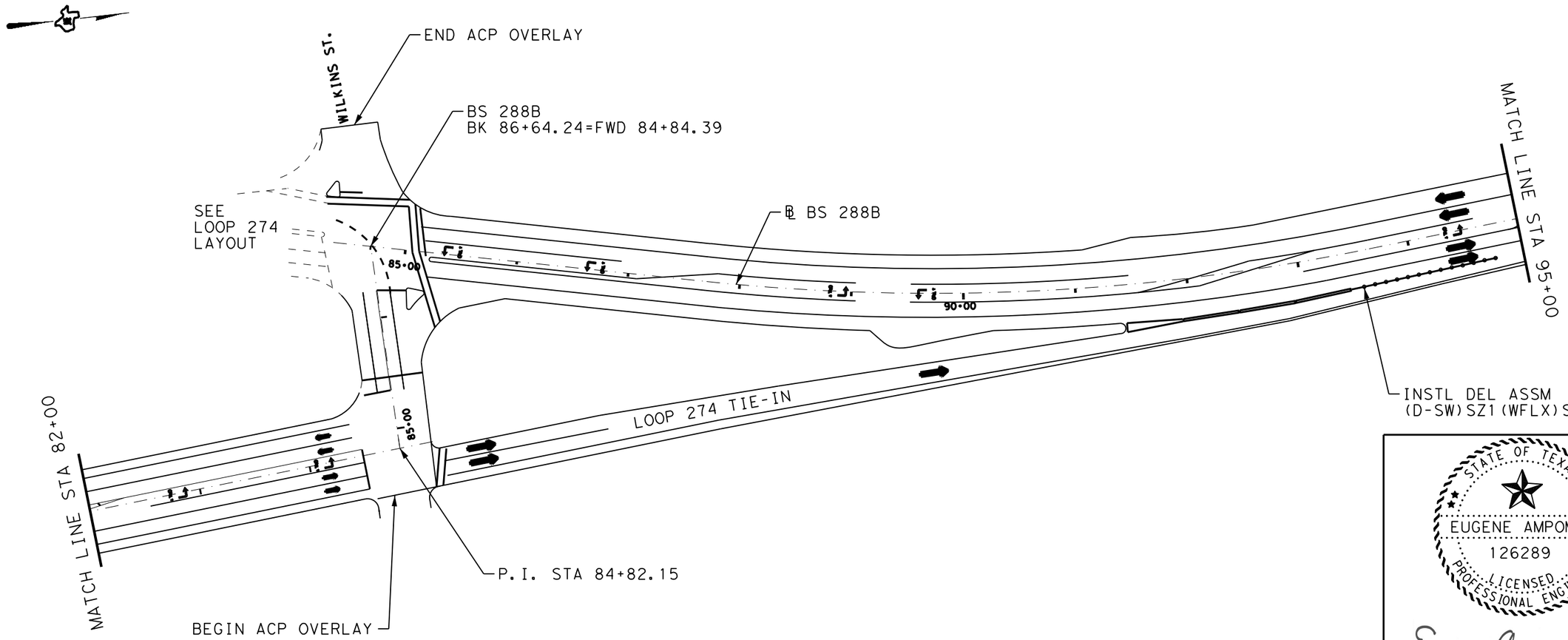

STATE OF TEXAS
EUGENE AMPOMAH
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Eugene Ampomah, P.E.

01.21.2022

PLAN LAYOUT
BS 288B

Texas Department of Transportation

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		78

SCALE N.T.S.
SHEET 7 OF 15

1/20/2022
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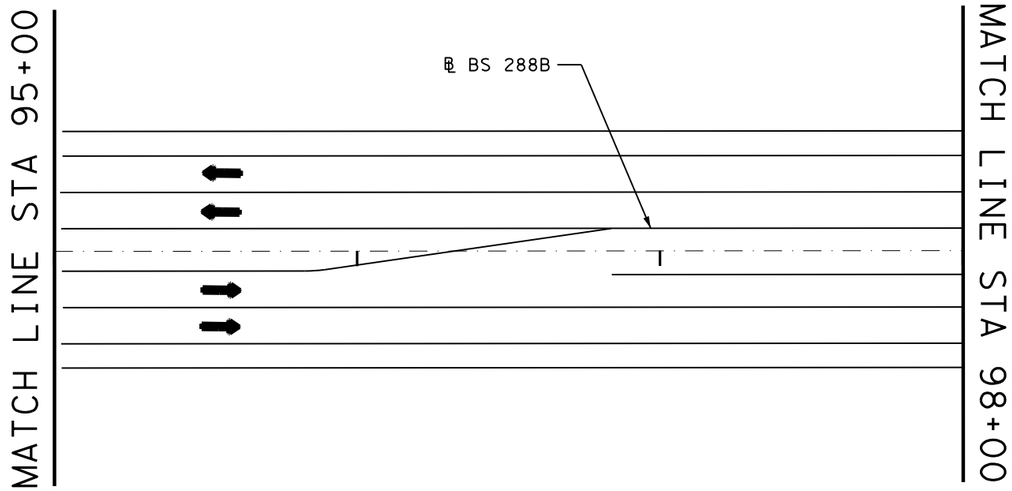

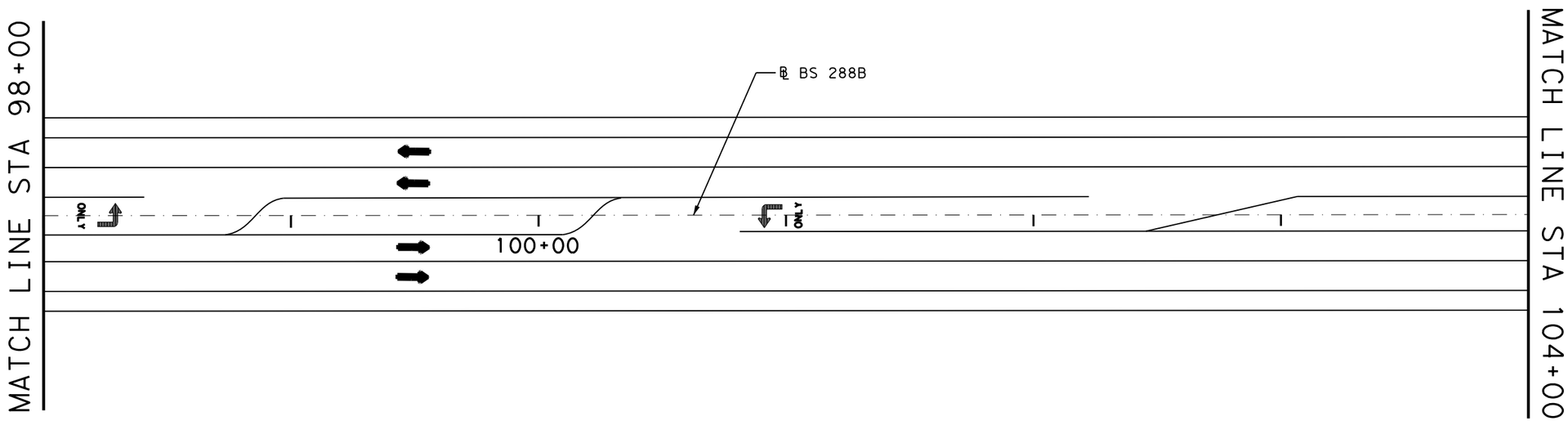

SCALE 1"=50'
SHEET 8 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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PLAN LAYOUT
BS 288B

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		79

1/20/2022
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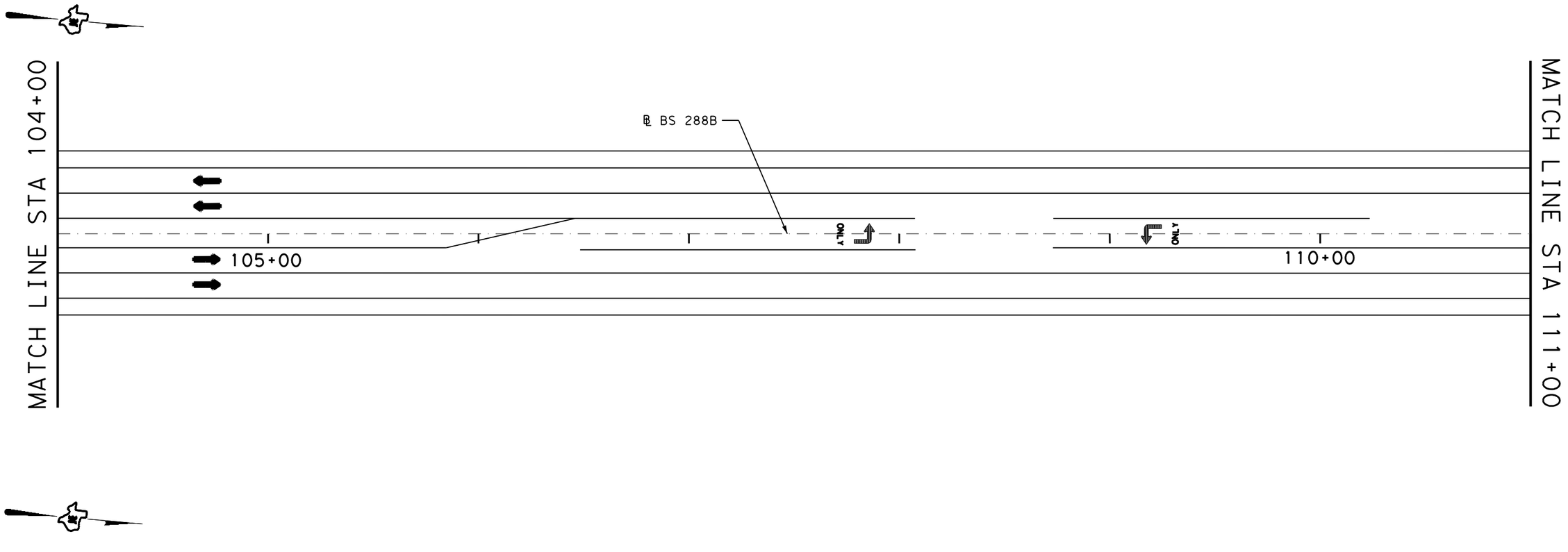

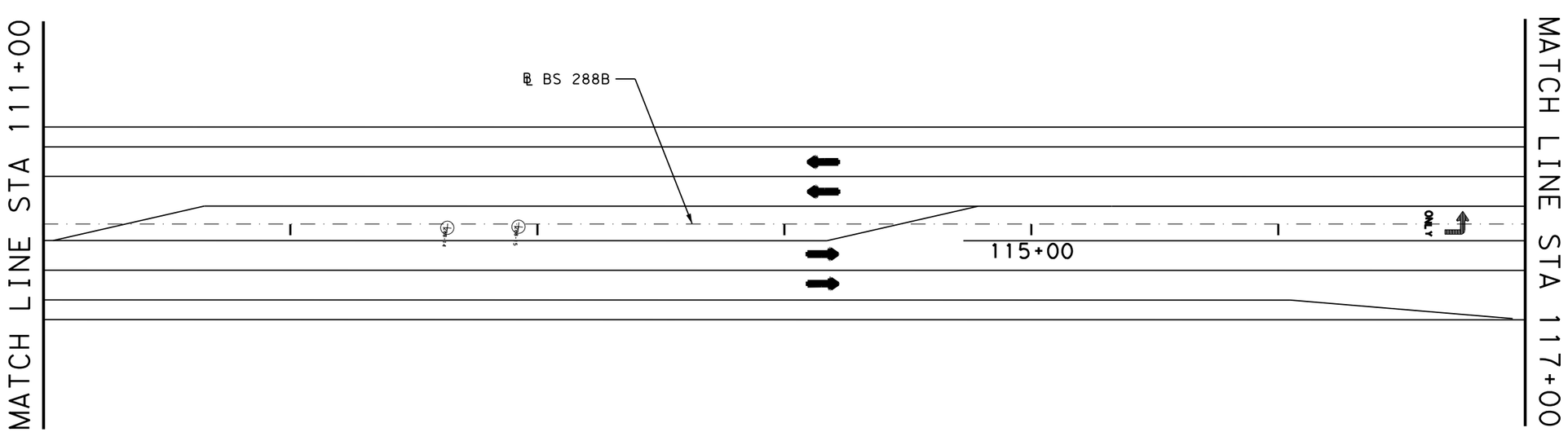

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SCALE 1"=50'
SHEET 9 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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01.21.2022

PLAN LAYOUT
BS 288B

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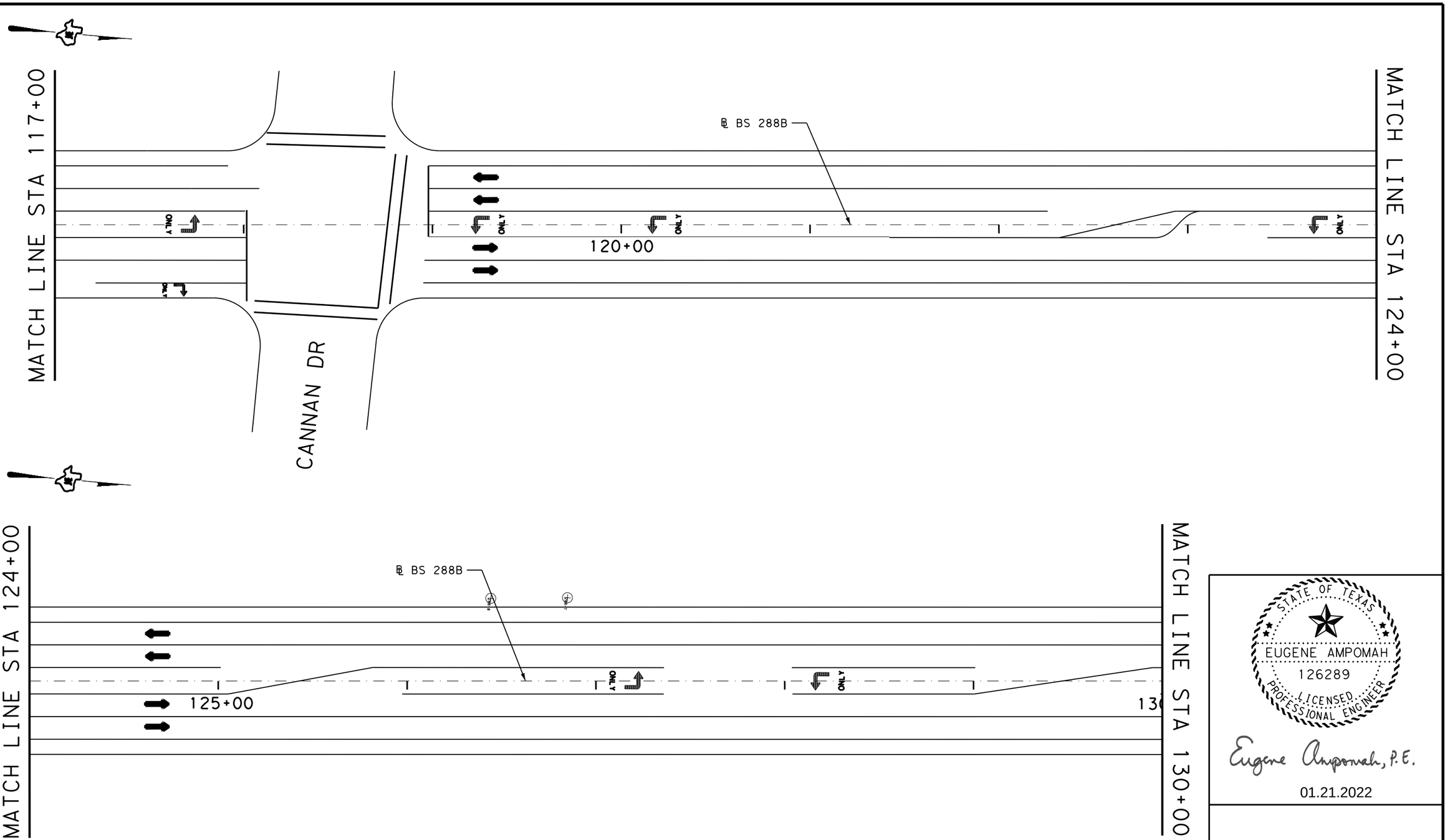
CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		80



SCALE 1"=50'
SHEET 10 OF 15

EUGENE AMPOMAH
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STATE OF TEXAS

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		81

1/20/2022
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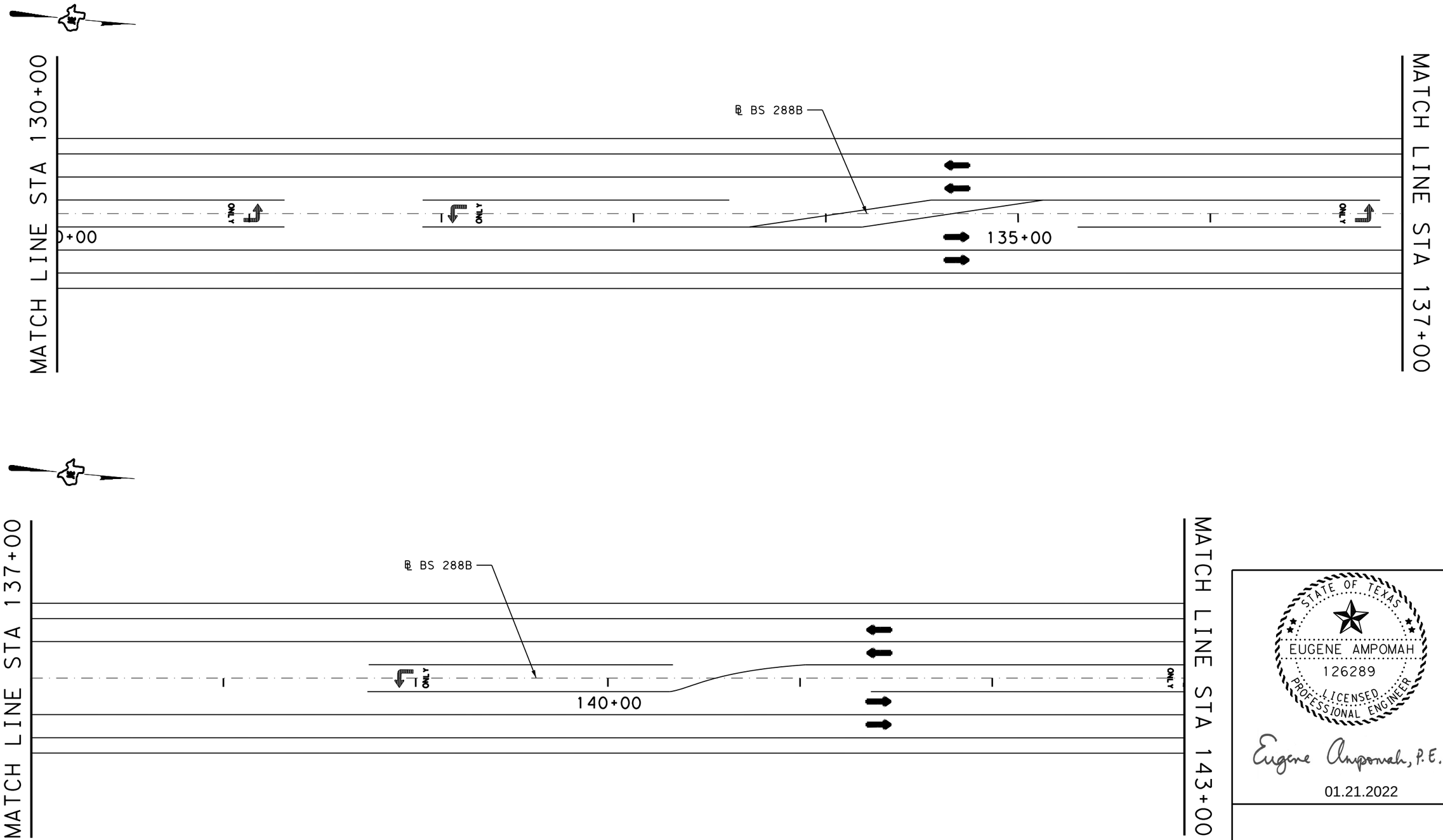

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SCALE 1"=50'
SHEET 11 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
126289
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01.21.2022

PLAN LAYOUT
BS 288B

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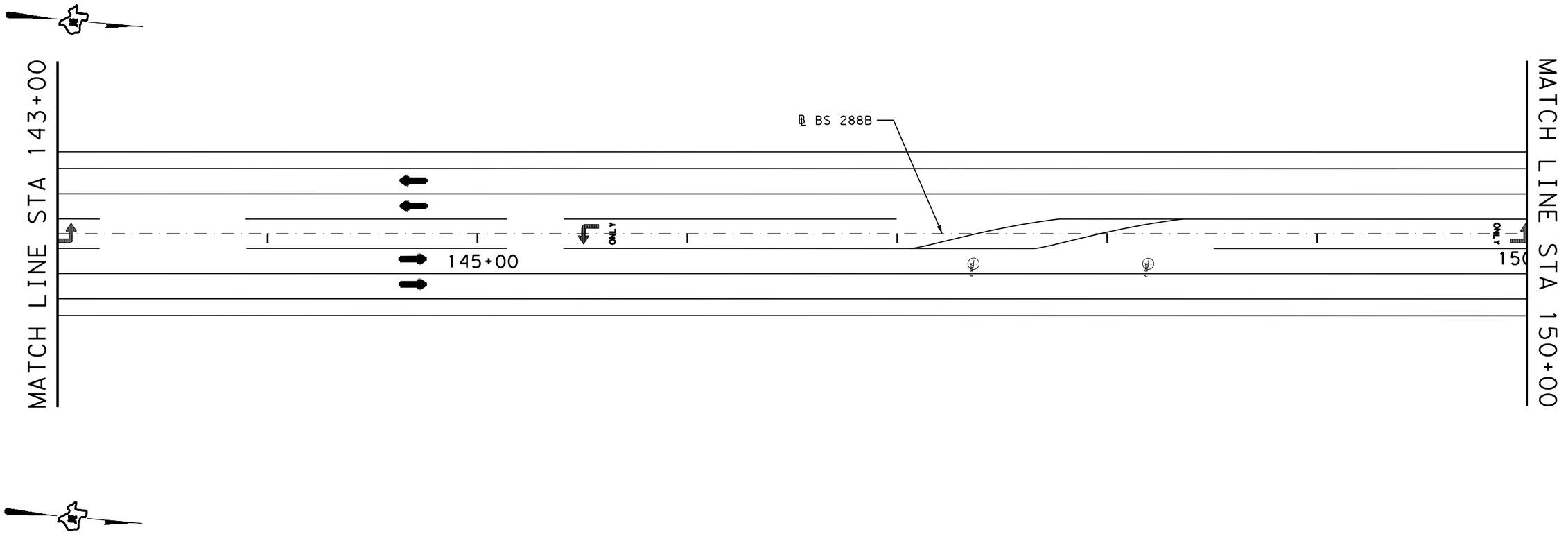
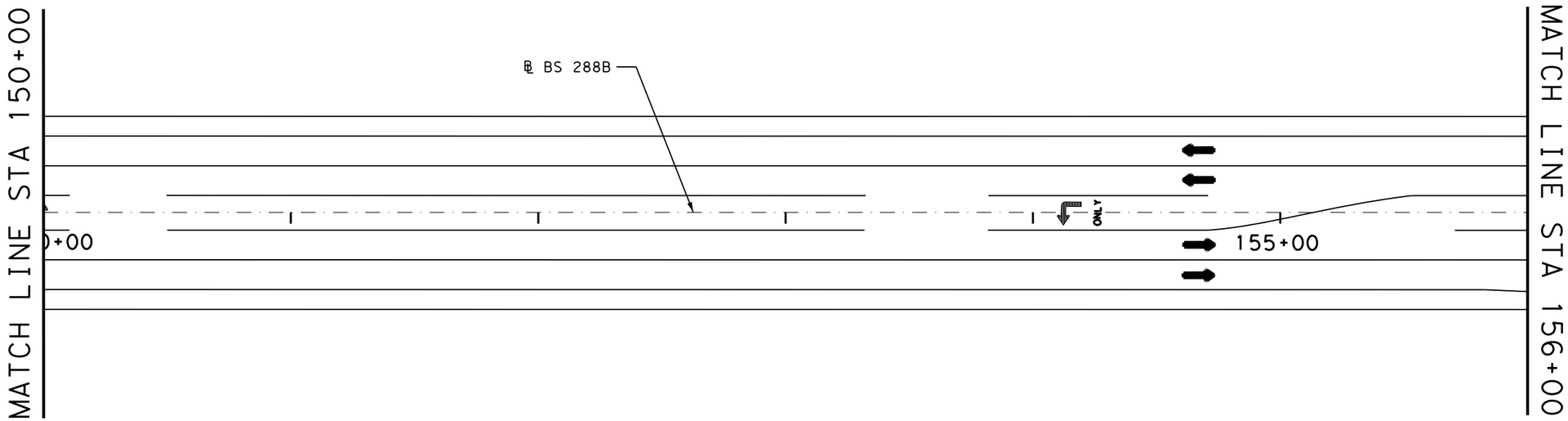
CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		82





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SCALE 1"=50'
SHEET 12 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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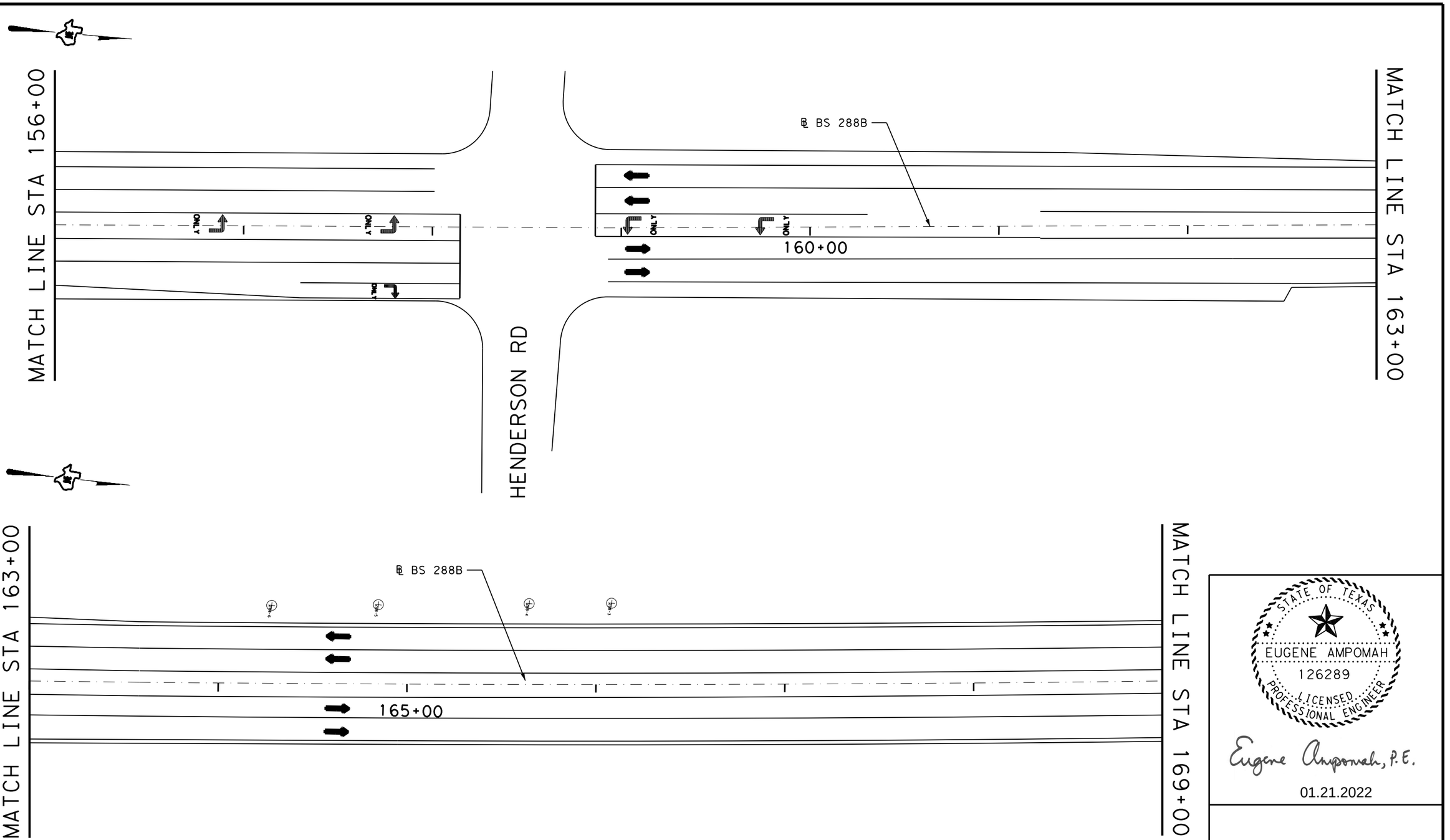
CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		83



SCALE 1"=50'
SHEET 13 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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PLAN LAYOUT
BS 288B

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		84

1/20/2022
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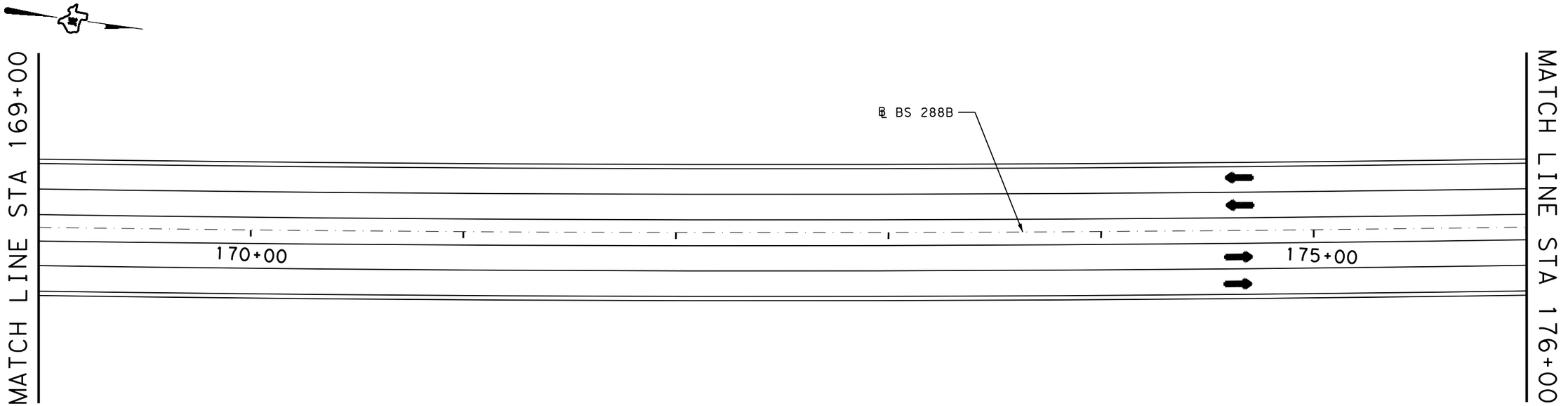

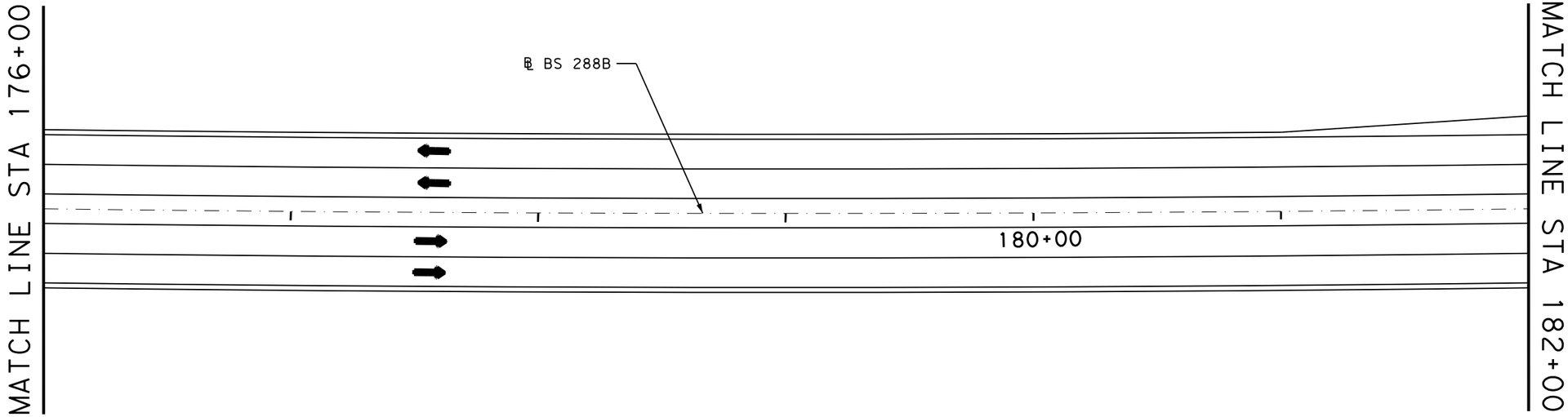

SCALE 1"=50'
SHEET 14 OF 15

STATE OF TEXAS
EUGENE AMPOMAH
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LICENSED PROFESSIONAL ENGINEER

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01.21.2022

PLAN LAYOUT
BS 288B

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		85

1/20/2022
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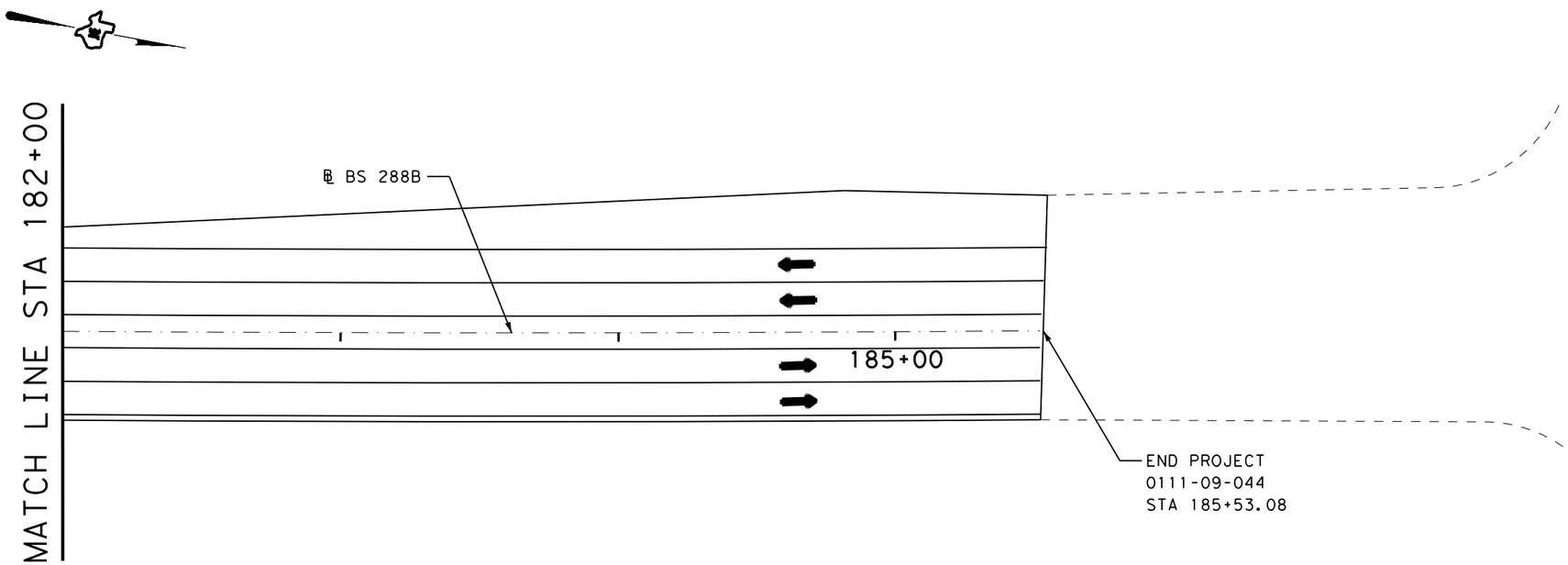

STATE OF TEXAS
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01.21.2022

PLAN LAYOUT
BS 288B

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		86

SCALE 1"=50'
SHEET 15 OF 15

1/20/2022
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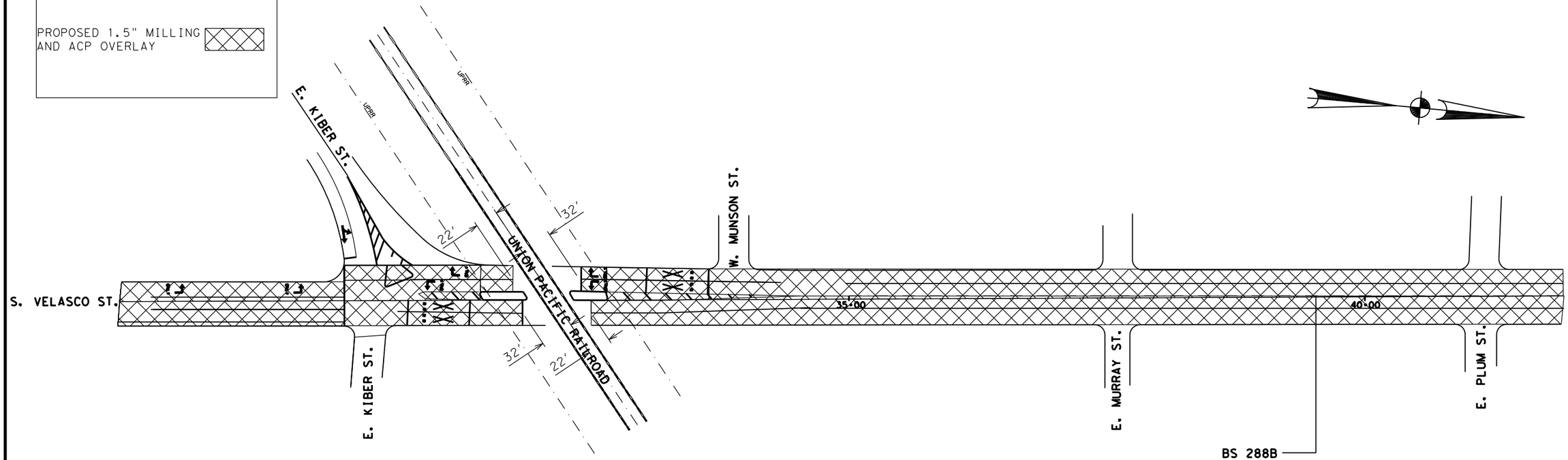
LEGEND

PROPOSED 1.5" MILLING AND ACP OVERLAY



1/20/2022
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SCALE N.T.S
SHEET 1 OF 1

STATE OF TEXAS
EUGENE AMPOMAH
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01.21.2022

LAYOUT NEAR RR CROSSING

Texas Department of Transportation

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		87

PROP 12' RCP W/SET

2-CURB RAMPS (TY 1)

ROW

ROW

A

A

A

A

1-CUEB RAMP (TY 1)

PROP SIDEWALK

REMOVE BASE & ASPH AS NEEDED

PROP SIDEWALK

TIGNER ST

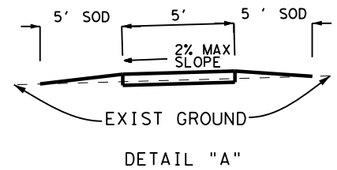
CANNAN DR.

BS 288B

ROW

ROW

SCALE 1"=50'
SHEET 1 OF 1



DETAIL "A"

SHOULDERING UP TO SIDEWALK IS INCIDENTAL TO ITEM 531.

STATE OF TEXAS
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01.21.2022

PROPOSED SIDEWALK LAYOUT

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CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		88

1/20/2022
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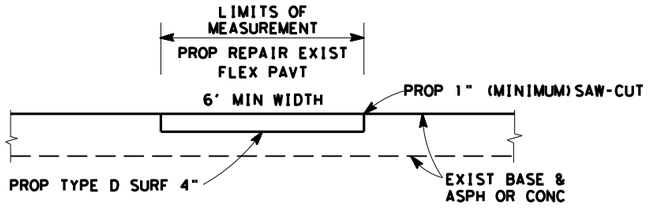
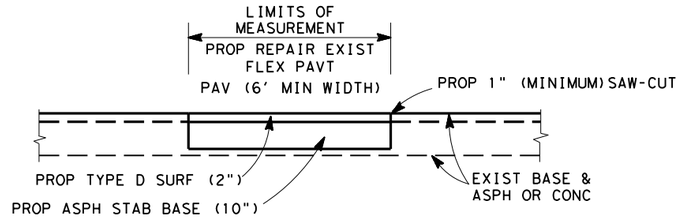


4" FLEX PAV REPAIR DETAIL
ITEM 351



12" FLEX PAV REPAIR DETAIL
ITEM 351

PAVEMENT REPAIR NOTES:

THE LOCATION OF ALL REPAIRS SHALL BE MARKED BY THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.

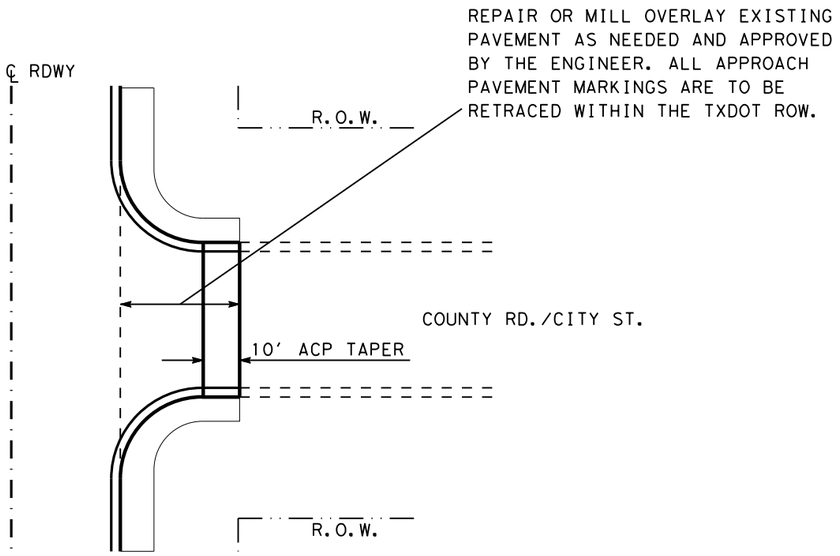
ALL BASE REPAIR SHALL BE PERFORMED IN ACCORDANCE WITH ITEM 351.

AT ALL REPAIR LOCATIONS, THE SIDES SHALL BE CUT VERTICAL THEN CLEANED OF ALL LOOSE MATERIAL AND TACKED PRIOR TO ANY PLACEMENT OF ASPH STAB BASE.

SAWCUTS SHALL BE INCIDENTAL TO ITEM 351.

ASPH STAB BASE SHALL MEET THE REQUIREMENTS OF ITEM 292.

ASPH CONC PAV SHALL MEET THE REQUIREMENTS OF ITEM 3076.



SIDE STREET OVERLAY DETAIL
NOT TO SCALE

STATE OF TEXAS
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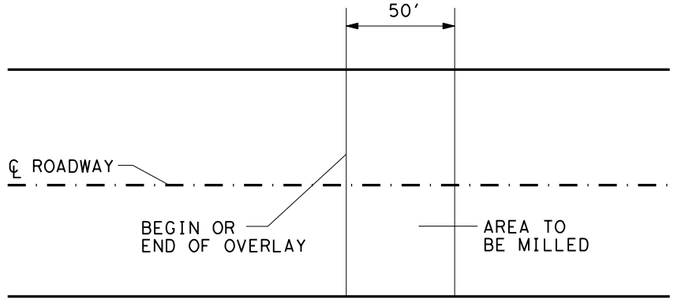
01.02.2022

MISCELLANEOUS DETAILS

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		89

N. T. S.
SHEET 1 OF 2

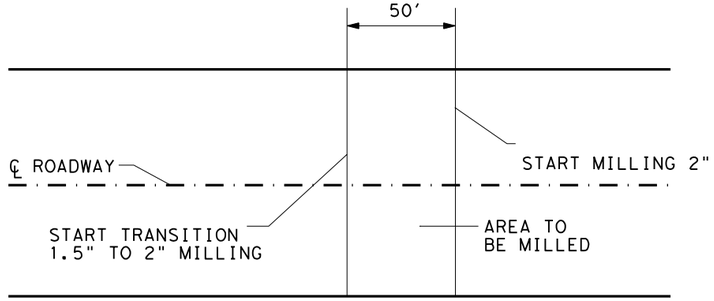
1/28/2022 H:\11109044\MISC.dgn



NOTE: CONTRACTOR TO MILL ROADWAY

AT BEGINNING AND END OF PROJECT

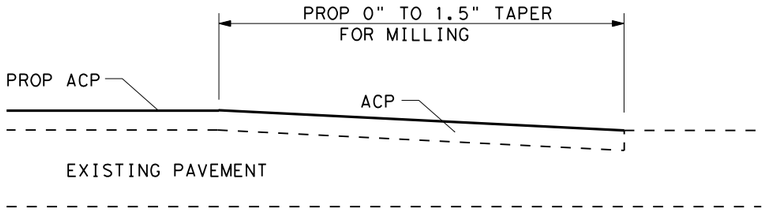
TYPICAL PLAN
MILLING TAPER



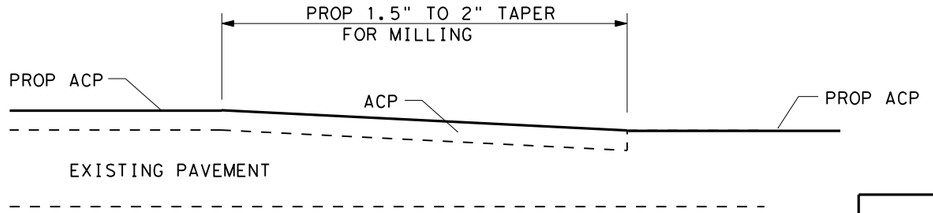
NOTE: CONTRACTOR TO MILL ROADWAY

AT TRANSITION 1.5" TO 2"

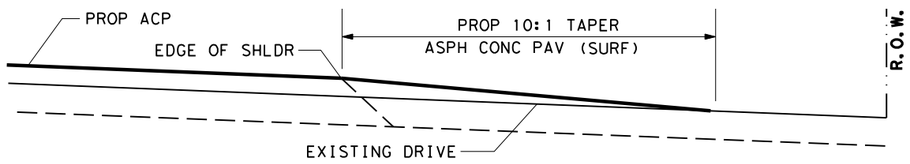
TYPICAL PLAN
MILLING TAPER



TYPICAL PROFILE
MILLING TAPER



TYPICAL PROFILE
MILLING TAPER



TYPICAL ACP
DRIVEWAY TAPER

N.T.S.

SHEET 2 OF 2

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

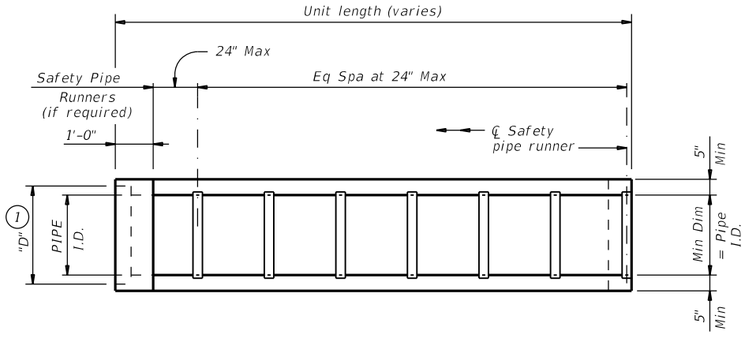
01.21.2022

MISCELLANEOUS DETAILS

Texas Department of Transportation®

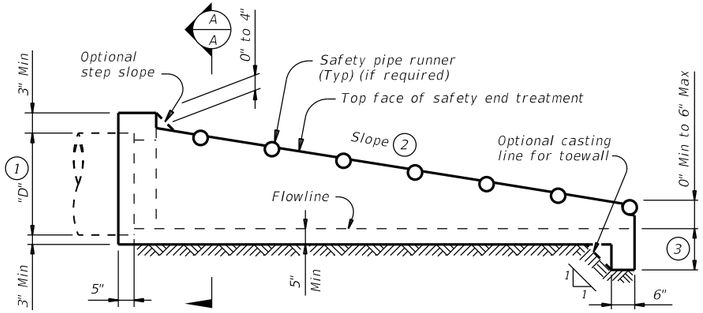
CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		90

1/20/2022 H:\11109044\MISC.dgn



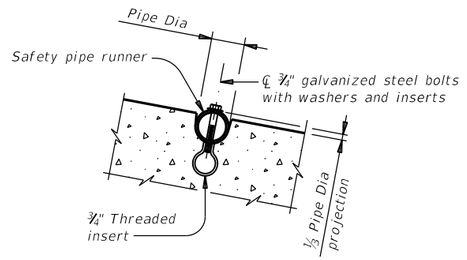
PLAN

(Showing bell end connection.)



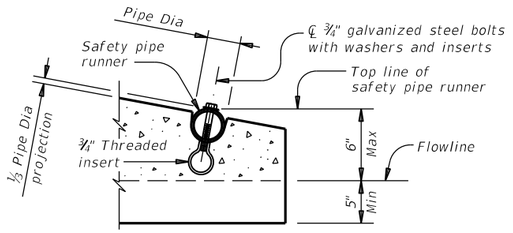
LONGITUDINAL ELEVATION

(Showing bell end connection.)

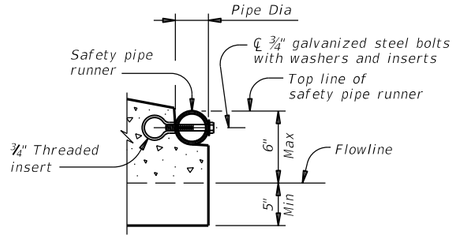


INSTALLATION DETAIL FOR SAFETY PIPE RUNNERS

(If required)



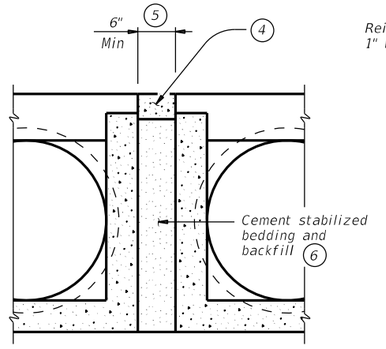
OPTION A



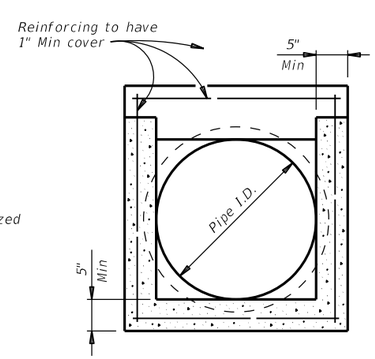
OPTION B

END DETAILS FOR INSTALLATION OF SAFETY PIPE RUNNERS

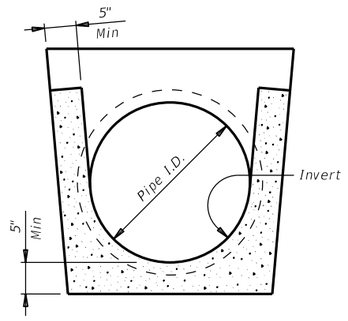
(If required)



MULTIPLE PIPE INSTALLATION

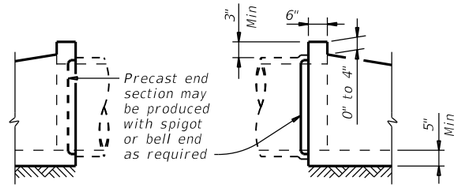


OPTION WITH SQUARE BOTTOM



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

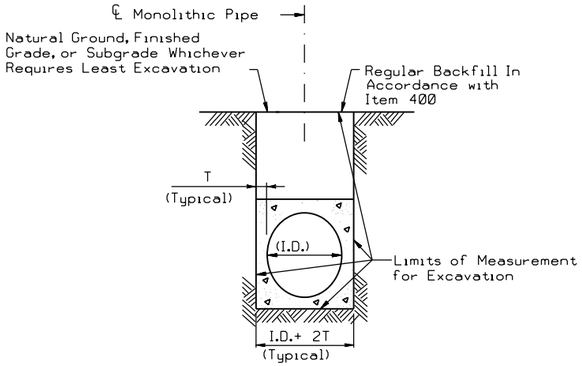
PRECAST SAFETY END TREATMENT

TYPE II ~ PARALLEL DRAINAGE

PSET-SP

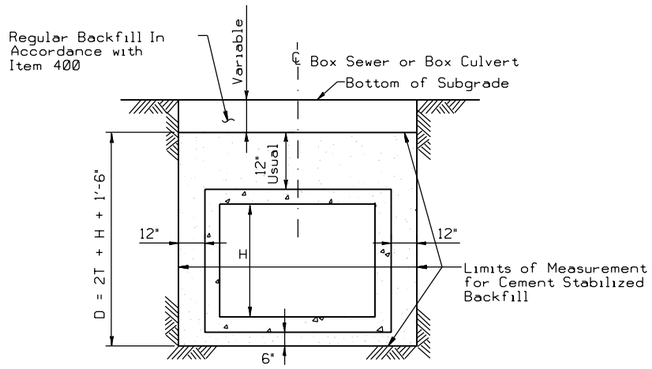
FILE: psetspss-21.dgn	DN: RLW	CK: KLR	DW: JTR	CK: GAF
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-21: Added 42" TP	0111	09	044,etc	BS 288b,etc
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		90A

DATE: 1/28/2022 11:48:21 AM
FILE: H:\1110044\psetspss-21.dgn



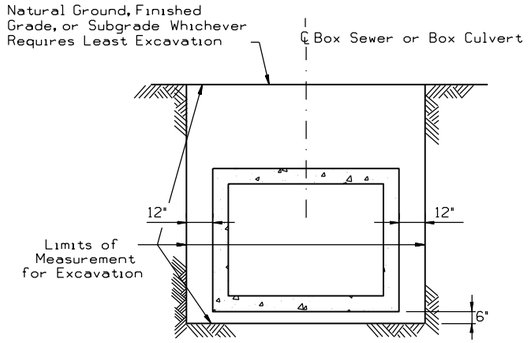
EXCAVATION DETAIL

MONOLITHIC PIPE
IN A PAVED OR GRADED AREA



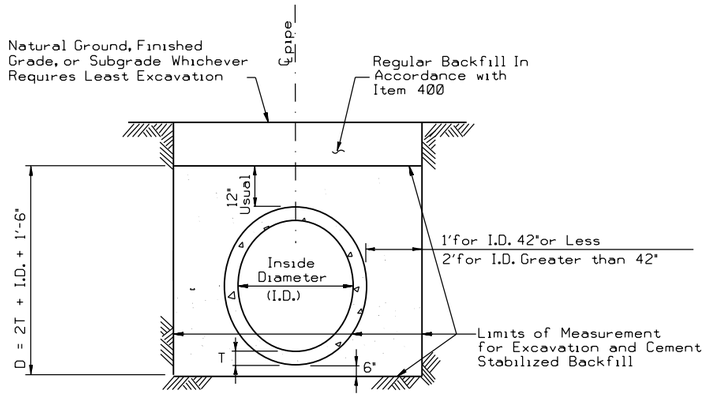
BACKFILL DETAIL

BOX CULVERTS
IN A GRADED OR PAVED AREA
INCLUDING DETOURS *



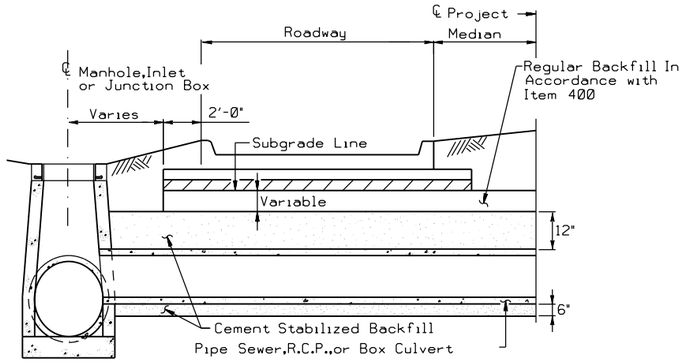
EXCAVATION DETAIL

BOX CULVERTS
IN A GRADED AREA



EXCAVATION & BACKFILL DETAIL

REINFORCED CONCRETE PIPE
IN A GRADED OR PAVED AREA
INCLUDING DETOURS



BACKFILL DETAIL

AT MANHOLE, INLET OR JUNCTION BOX

D = Depth
H = Height
T = Thickness
R = Radius
Dia = Diameter

REINFORCED CONCRETE PIPE

EXCAVATION AND BACKFILL QUANTITIES

PIPE DIA. IN.	T FT.	CULVERT OR SEWER EXCAVATION IN A PAVED OR GRADED AREA C.Y.PER L.F.PER FT.OF DEPTH	CEMENT STABILIZED BACKFILL IN A PAVED OR GRADED AREA C.Y.PER L.F. OF PIPE
18	0.19	0.144	0.383
24	0.23	0.165	0.478
30	0.29	0.188	0.586
36	0.33	0.210	0.692
42	0.38	0.231	0.808
48	0.42	0.327	1.394
54	0.46	0.349	1.560
60	0.50	0.370	1.731
66	0.54	0.392	1.907
72	0.58	0.414	2.088
78	0.62	0.435	2.275
84	0.67	0.457	2.474

MONOLITHIC PIPE

EXCAVATION QUANTITIES

PIPE DIA. IN.	T FT.	EXCAVATION C.Y.PER L.F.PER FT.OF DEPTH
36	0.417	0.142
42	0.458	0.164
48	0.458	0.182
54	0.500	0.204
60	0.583	0.228
66	0.583	0.247
72	0.625	0.269
78	0.625	0.287
84	0.625	0.306

NOTE:

Cement stabilized backfill may be omitted in private driveways as indicated elsewhere in the plans.

Rubber gaskets shall be required for all joints on proposed cross drainage, pipe culverts and proposed storm sewer systems, unless otherwise shown in the plans.

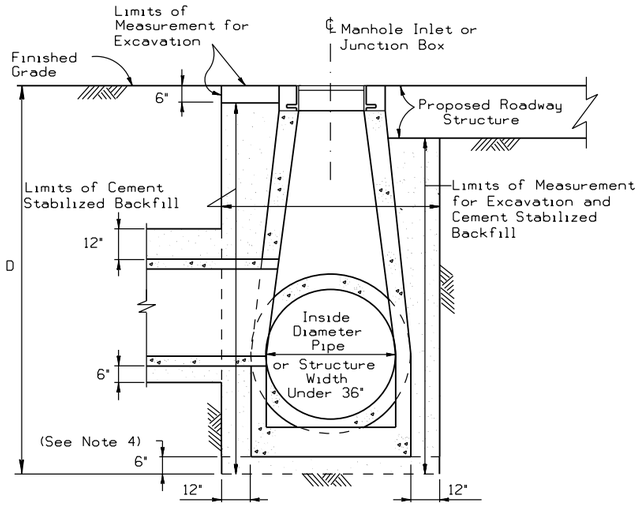
- Backfill with cement stabilized material will be required for all structures under detours unless noted otherwise in the General Notes.

Texas Department of Transportation
Houston District

EXCAVATION AND BACKFILL DIAGRAMS

E&BD

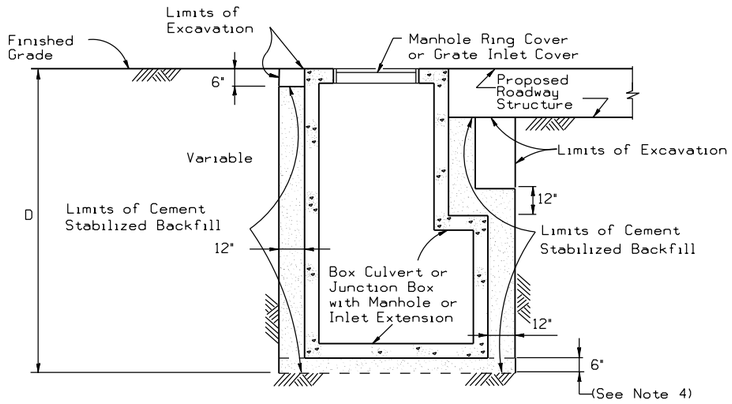
FILE: STDE1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
© TxDOT FEB 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REVISED 11/05 REVISED 2/2010 Added note to Table 1,Sht 2 of 2. REVISED 6/12 REVISED 9/14	HOUSTON	6		90B
	COUNTY		CONTROL SECT JOB	HIGHWAY
	BRAZORIA		0111 09 044	BS288



EXCAVATION AND BACKFILL DETAIL

MANHOLES SMALLER THAN 36 IN.
IN A PAVED OR GRADED AREAS

N.T.S.



EXCAVATION AND BACKFILL DETAIL

JUNCTION BOXES IN A
PAVED OR GRADED AREA

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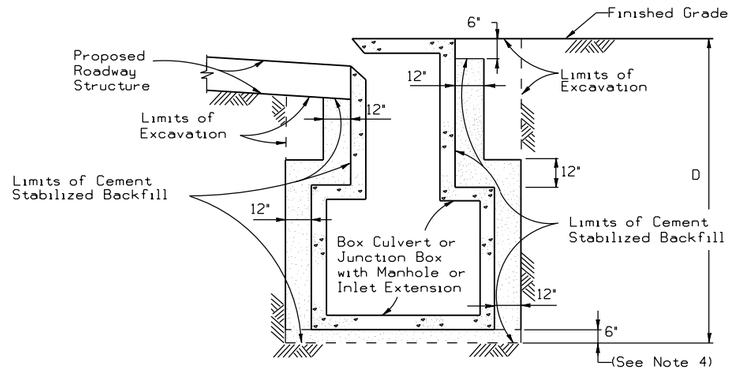
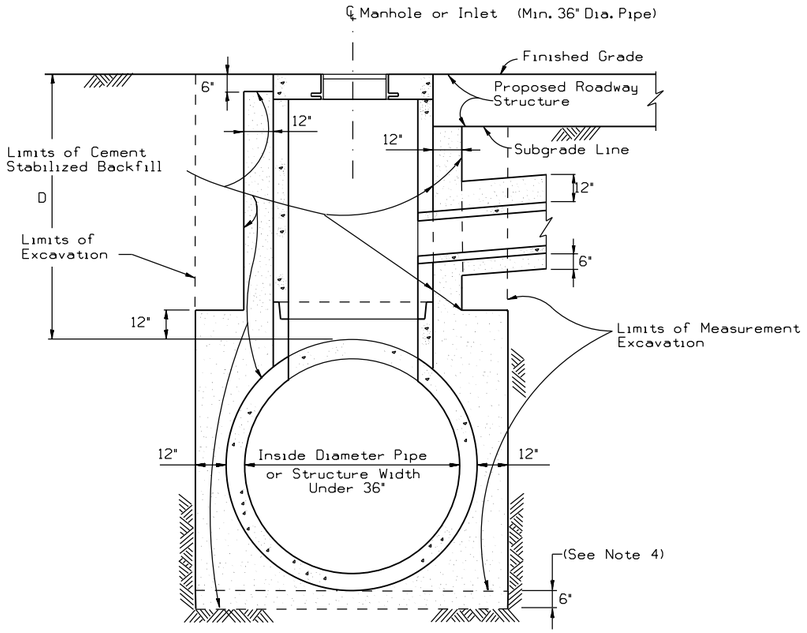


EXCAVATION AND BACKFILL DETAIL

INLET EXTENSIONS ON A BOX CULVERT
IN A PAVED OR GRADED AREA

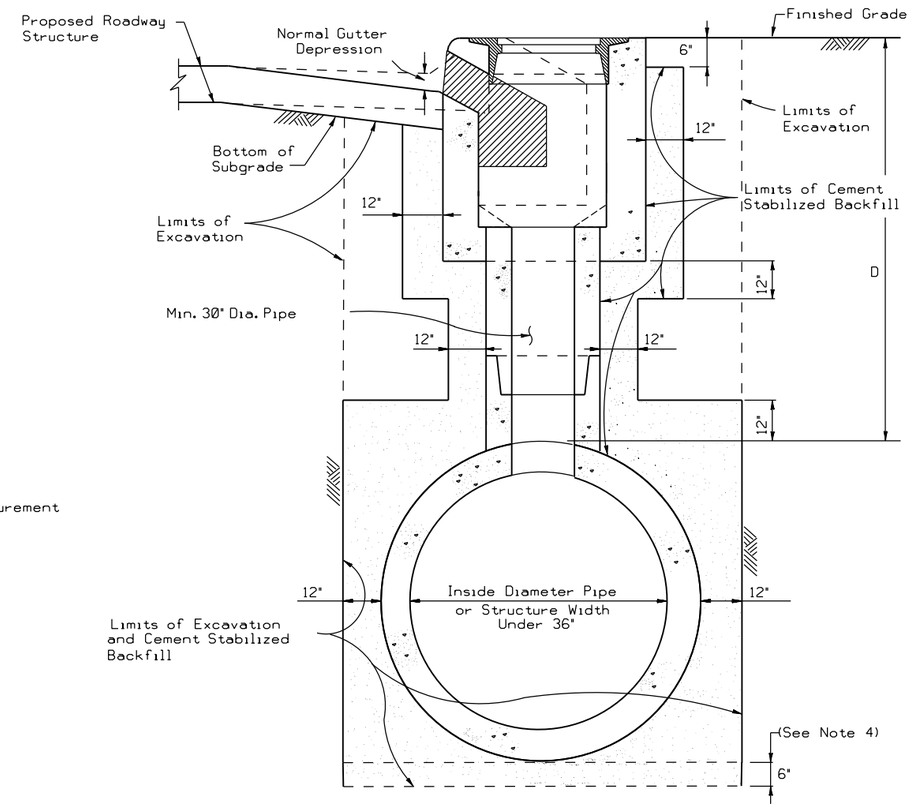
N.T.S.



EXCAVATION AND BACKFILL DETAIL

MANHOLES 36 IN. AND GREATER
IN A PAVED OR GRADED AREA

N.T.S.



EXCAVATION AND BACKFILL DETAIL

CURB INLETS IN A PAVED OR GRADED AREA

N.T.S.

TABLE 1

SCHEDULE FOR PAY QUANTITIES OF CEMENT STABILIZED BACKFILL (SEE NOTE 1)

MANHOLE OR INLET DEPTH (D) IN FEET	CEMENT STABILIZED BACKFILL IN CUBIC YARDS
0 through 5	5.75
> 5 through 10	8.25
greater than 10	12.75

TO BE PAID UNDER ITEM 400-6009 CEMENT STABILIZED BACKFILL (INLET OR MANHOLE)

NOTES:

1. The Contractor is paid a fixed estimated amount for cement stabilized backfill based on depth (D) and Table. 1.
2. Proposed roadway structure includes pavement, base and any subgrade.
3. For backfill of intersecting pipes and box culverts, see "Excavation and Backfill Diagram for Pipes and Box Culverts."
4. 6" cement stabilized backfill will be required only for precast units.

D = Depth
H = Height
T = Thickness
R = Radius
Dia = Diameter

Texas Department of Transportation
Houston District

EXCAVATION AND BACKFILL DIAGRAMS

E&BD

FILE: STDE1.DGN	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
© TxDOT FEB 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS REVISED 2/2010 Added note to Table 1. REVISED 6/12 REVISED 9/14 REVISED 3/15	HOUSTON	6		90C
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS288

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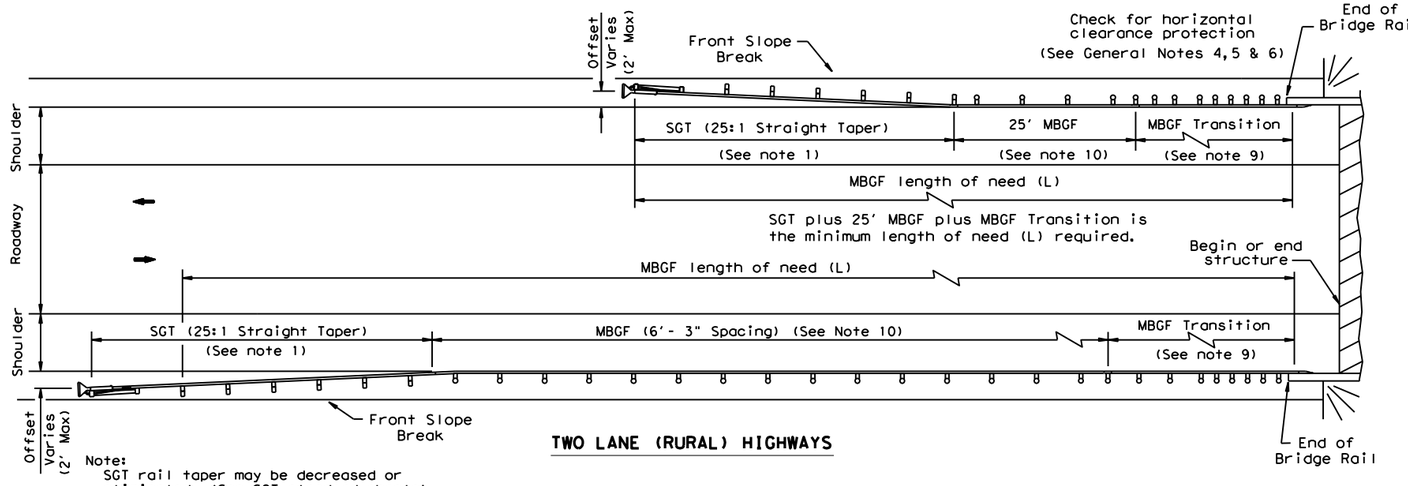
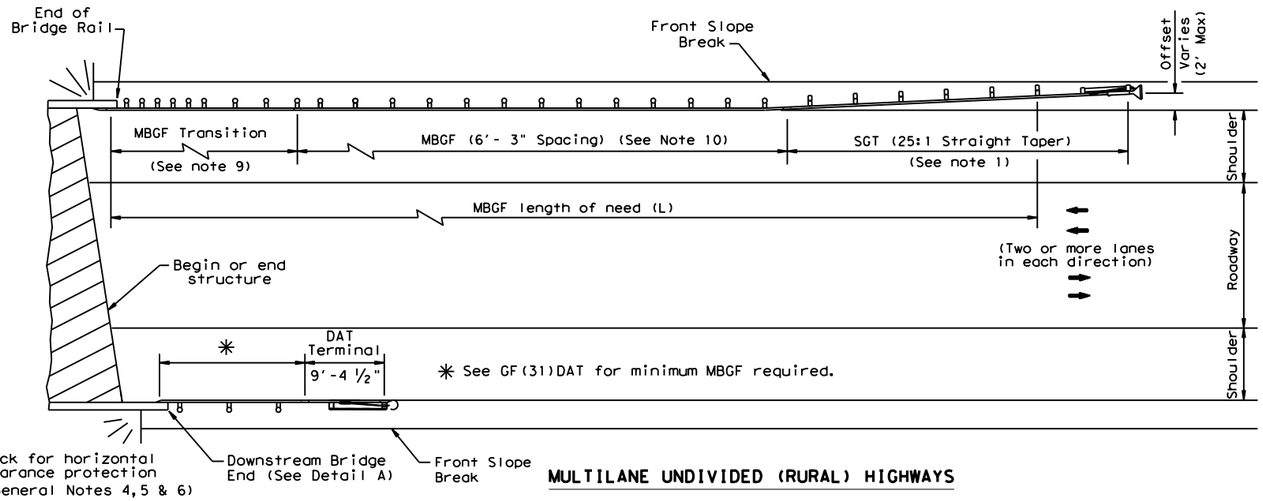
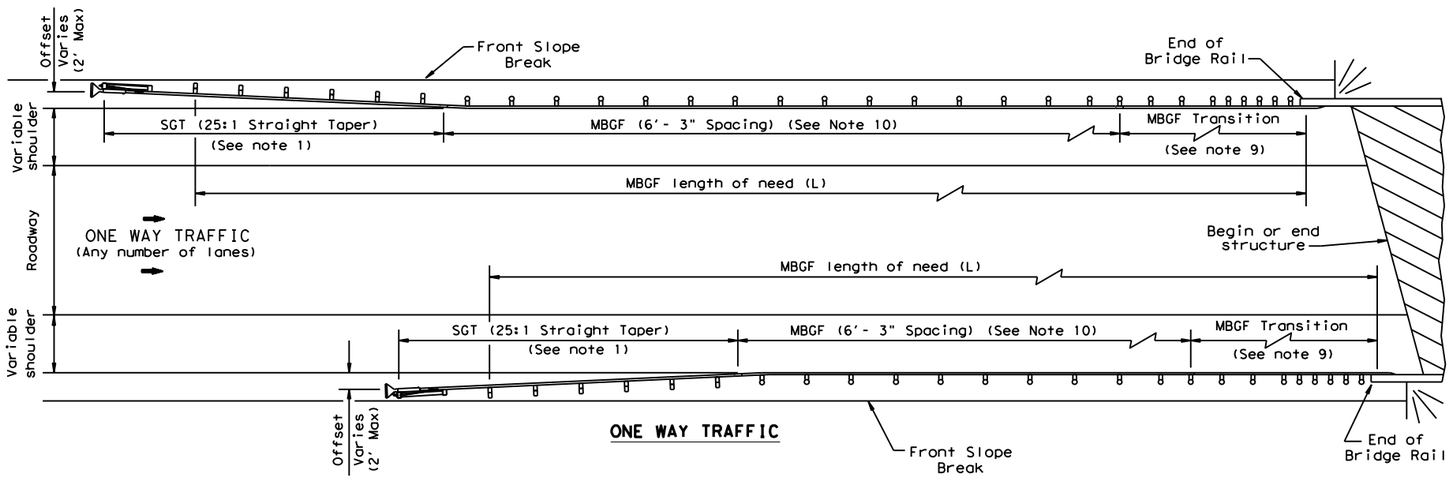


TWO LANE (RURAL) HIGHWAYS

Note:
SGT rail taper may be decreased or eliminated. (See SGT standard sheets)



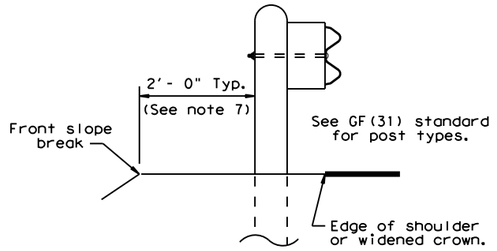
MULTILANE UNDIVIDED (RURAL) HIGHWAYS



ONE WAY TRAFFIC

GENERAL NOTES

1. For more detail: See GF(31), SGT( )31, GF(31)TR, and GF(31)TL2 standard sheets.
2. Quantities of metal beam guard fence (MBGF) at individual bridge ends are as shown in the plans.
3. Use average daily traffic (ADT) for the current year to determine MBGF length of need in accordance with the Roadway Design Manual unless otherwise specified. Where significant traffic volume growth is anticipated on low volume (0-750 ADT) highways, use length determinations for the higher volume category.
4. MBGF may not be required to shield departure end of bridge unless other obstacles within the horizontal clearance limits or opposing traffic indicate a MBGF consideration.
5. Downstream anchor terminals (DAT) are only for downstream end anchorage use, outside the horizontal clearance area of opposing traffic.
6. Direct connection of MBGF to concrete rails are only for downstream rail connections outside the horizontal clearance area of opposing traffic. (This requires a minimum of three standard line posts plus the DAT terminal, See Detail A)
7. The crown shall be widened to accommodate MBGF. Typically the "front slope" break should be 2'- 0" from the back of the MBGF post. This applies to new construction on new alignment or where existing roadway cross section is to be widened to increase roadway width. This does not apply to rehabilitation work where existing roadway crown width is to be retained (See Typical Cross Section at MBGF).
8. For restrictive bridge widths: The MBGF should be properly transitioned from the existing bridge rail to the adjoining MBGF (See MBGF Transition Standards). Metal beam guard fence at these bridge location(s) shall be flared at the rate of 25:1 or flatter, and be of the length necessary to locate the terminal end at the 2 ft. "maximum" offset from the shoulder edge in the approach direction.
9. Transition length and post spacing will vary depending on the transition type. Transition type will be shown elsewhere in the plans.
10. A minimum 25' length of MBGF will be required.



TYPICAL CROSS SECTION AT MBGF

Note:
All rail elements shall be lapped in the direction of adjacent traffic.

DETAIL A

Showing Downstream Rail Attachment

Texas Department of Transportation — Design Division Standard

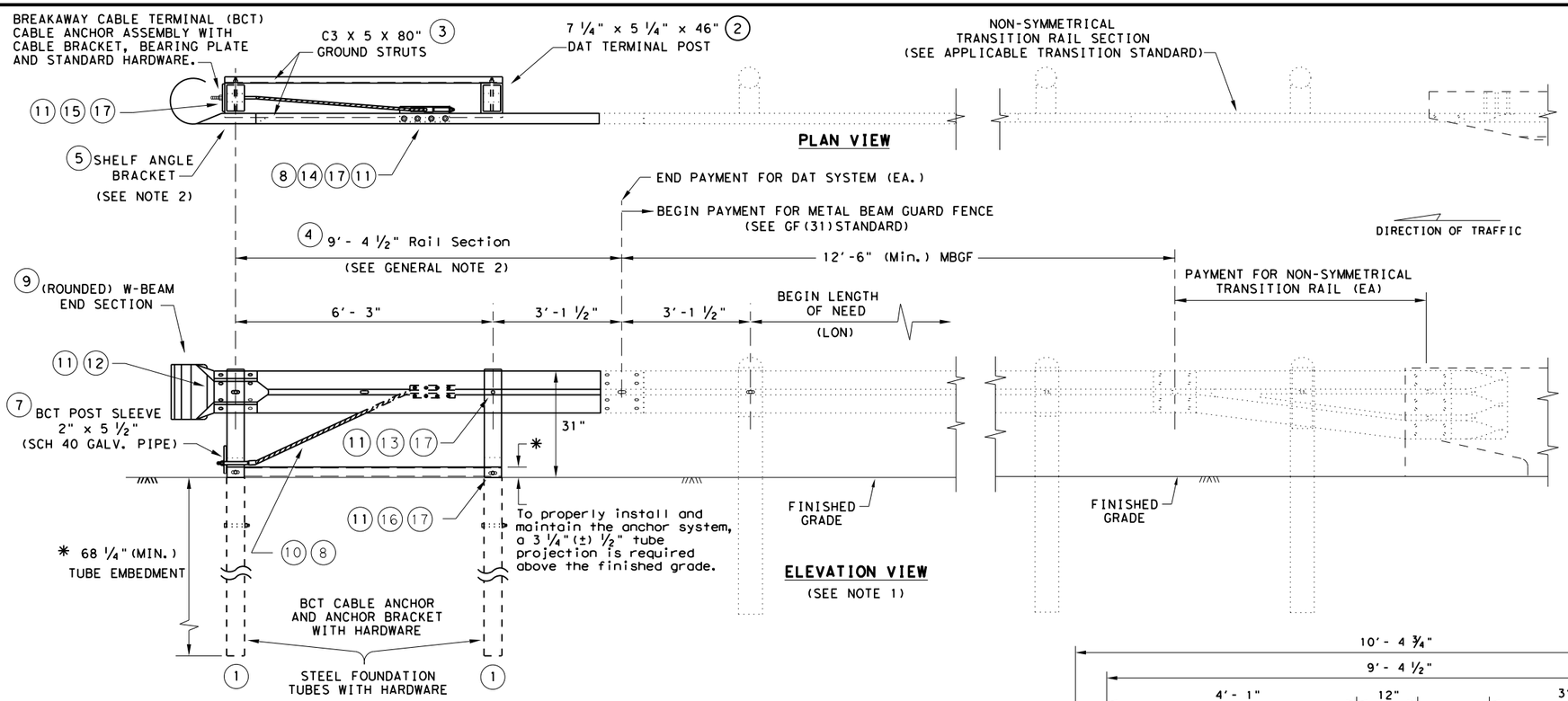
BRIDGE END DETAILS

(METAL BEAM GUARD FENCE APPLICATIONS TO RIGID RAILS)

BED-14

FILE: bed14.dgn	DN: TxDOT	CK: AM	DW: BD/VP	CK: CGL
© TxDOT: December 2011	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
REVISED APRIL 2014 SEE (MEMO 0414)	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		91

DATE: 1/20/2022
FILE: H:\1109044\Standards\mbgf\gf31dat19.dgn



DOWNSTREAM ANCHOR TERMINAL (DAT)

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

GENERAL NOTES

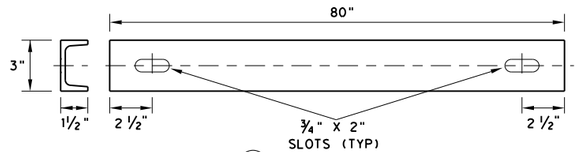
1. THE DETAIL SHOWN IS THE MINIMUM LENGTH OF NEED (LON) FOR A DOWNSTREAM ANCHOR TERMINAL (DAT) CONNECTED TO A CONCRETE RAIL.
2. THE RAIL SECTION AT THE END POST IS SUPPORTED BY THE SHELF ANGLE BRACKET. THE RAIL ELEMENT IS NOT ATTACHED TO THE END POST.
3. THE FOUNDATION TUBES SHALL NOT PROJECT MORE THAN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

MOW STRIP INSTALLATION

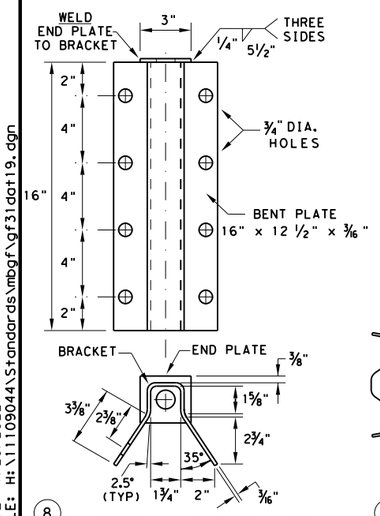
IF A MOW STRIP IS REQUIRED WITH THE DAT INSTALLATION THE LEAVE-OUT AREA AROUND THE STEEL FOUNDATION TUBES AND THE TWO CHANNEL STRUTS MAY BE OMITTED. THIS WILL REQUIRE A FULL POUR AT THE FOUNDATION TUBES.

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

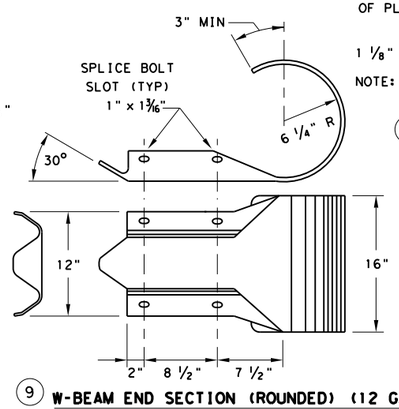
(4) TERMINAL RAIL ELEMENT FOR DAT



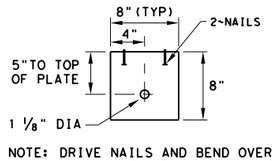
(3) CHANNEL STRUT
C3 X 5 X 80", GRADE A36



(8) GUARDRAIL ANCHOR BRACKET

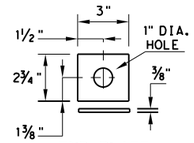


(9) W-BEAM END SECTION (ROUNDED) (12 GA.)

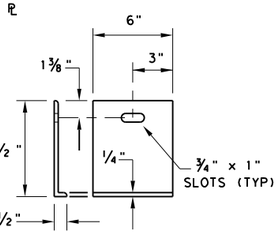


NOTE: DRIVE NAILS AND BEND OVER TO PREVENT PLATE ROTATION

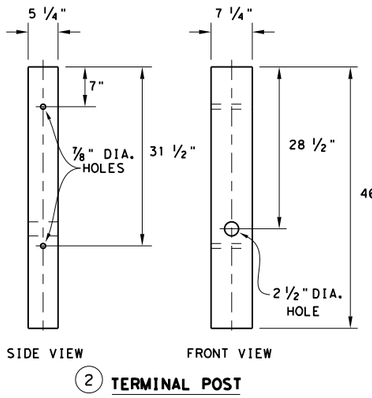
(6) BEARING PLATE
8"x 8"x 5/8" R



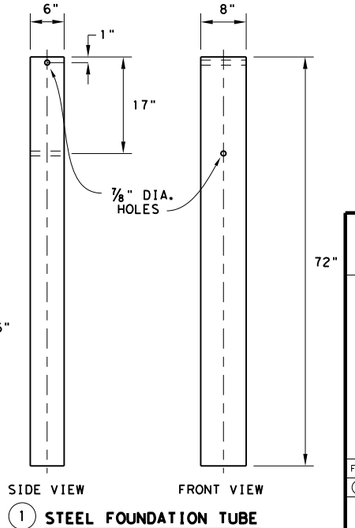
END PLATE



(5) SHELF ANGLE BRACKET



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



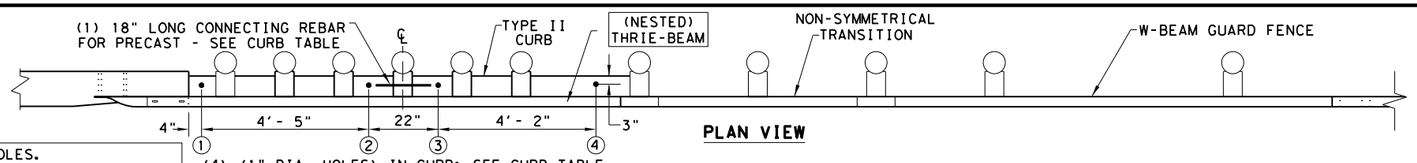
(1) STEEL FOUNDATION TUBE
6"x 8"x 1/8" x 72" STEEL TUBE

Texas Department of Transportation — Design Division Standard

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

GF(31)DAT-19

FILE: gf31dat19.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		92



PLAN VIEW

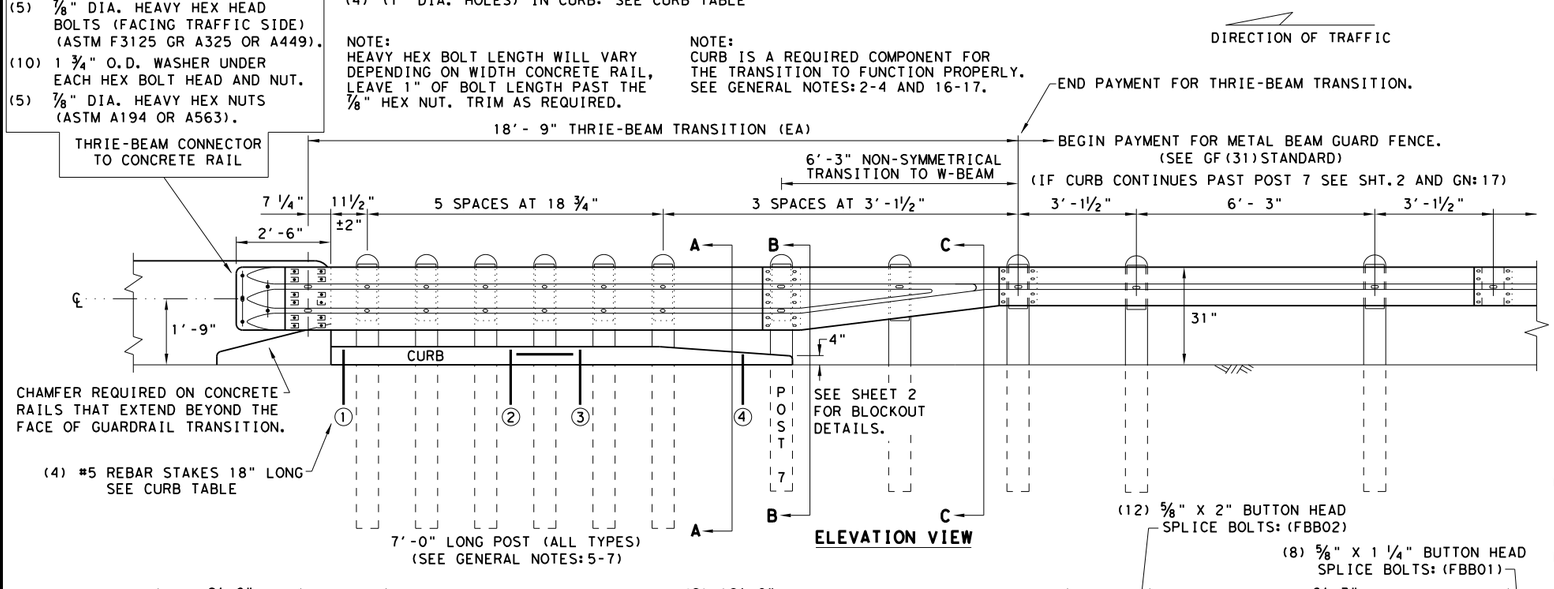
(4) (1" DIA. HOLES) IN CURB: SEE CURB TABLE

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

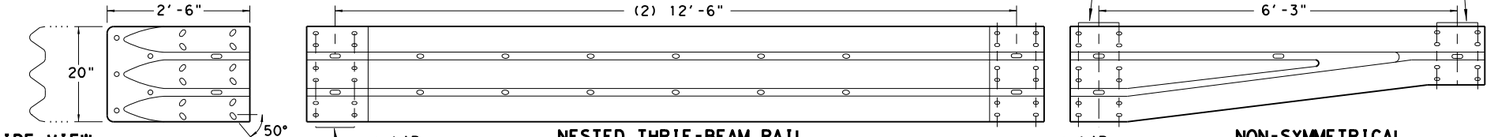
NOTE:
HEAVY HEX BOLT LENGTH WILL VARY DEPENDING ON WIDTH CONCRETE RAIL, LEAVE 1" OF BOLT LENGTH PAST THE ⅞" HEX NUT. TRIM AS REQUIRED.

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

DIRECTION OF TRAFFIC



ELEVATION VIEW



SIDE-VIEW

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

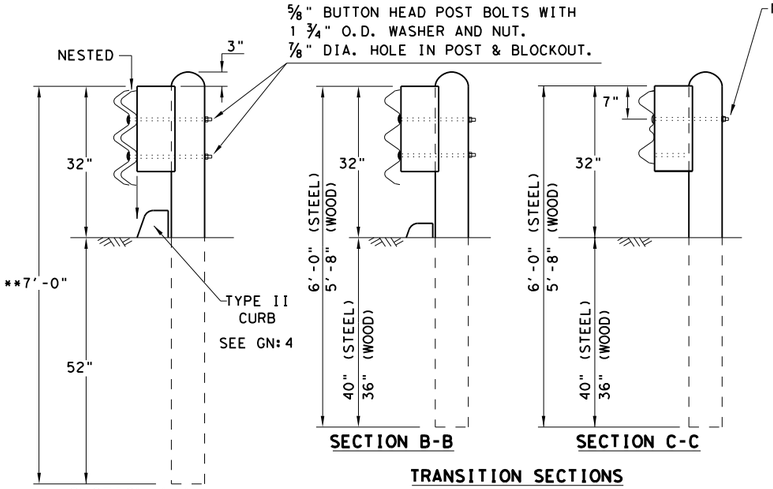
NESTED THRIE-BEAM RAIL
PART DESIGNATOR RTM10a

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

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

PLATE WASHER INSTRUCTIONS

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



SECTION A-A

SECTION B-B

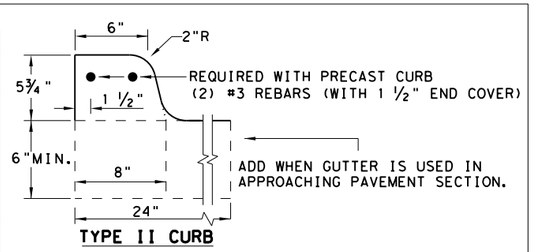
SECTION C-C

TRANSITION SECTIONS

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

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

THRIE-BEAM TERMINAL - CURB TABLE
PRECAST CURB FULL LENGTH EQUALS 12'- 2" THE PRECAST CURB MAY BE FORMED INTO TWO SECTIONS.
CURB (1) LENGTH 5'- 8"
CURB (2) LENGTH 6'- 6"
TAPER CURB (2) TO A HEIGHT OF 4" AT POST 7
CONNECTING PRECAST CURB SECTIONS (1) & (2):
FORM OR CORE 1" DIA. HOLE 9" LONG INTO EACH CURB END. USE (1) #5 GR.60 REBAR 18" LONG TO CONNECT BOTH CURBS.
SECURING PRECAST OR CAST-IN-PLACE TO FINISHED GRADE *:
FORM OR CORE (4) 1" DIA. HOLES, SEE PLAN AND ELEVATION VIEWS FOR HOLE LOCATIONS. DRIVE (4) #5 GR.60 REBAR STAKES 18" LONG INTO THE GROUND AND ½" BELOW TOP OF CURB. FILL HOLES WITH APPROVED GROUT MIXTURE.



TYPE II CURB

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

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

TYPE II CURB DETAILS

GENERAL NOTES

1. CONTACT THE DESIGN DIVISION FOR DRAINAGE CUT OUT OPTIONS NEEDED WITHIN THE CURB SECTION OF THE THRIE-BEAM TRANSITION. (512) 416-2678
2. CONCRETE CURB MAY BE CAST-IN-PLACE OR PRECAST AS SHOWN ON THIS SHEET. WHEN USED IN CONJUNCTION WITH THE THRIE-BEAM TRANSITIONS, CURB SHALL BE TYPE II (5- ¾" HEIGHT); SEE CURRENT CCCG STANDARD SHEET FOR FURTHER DETAILS. IF OTHER CURB HEIGHTS ARE SHOWN IN THE PLANS IN CONJUNCTION WITH THE TRANSITION, THE CURB HEIGHT MAY BE FROM 4" TO 8" WITH A RELATIVELY VERTICAL FACE. CONCRETE CURB SHALL BE CONTINUOUS TO THE SEVENTH POST UNLESS OTHERWISE SHOWN IN THE PLANS. SEE GENERAL NOTE: 17 FOR CIRCUMSTANCES WHERE CURB CONTINUES PAST POST 7.
3. CONCRETE CURB TYPE II SUBSIDIARY TO "METAL BEAM GUARD FENCE TRANSITION". IF NO ADDITIONAL CURB IS INDICATED BEYOND THE TRANSITION, THEN ANY CURB HEIGHT GREATER THAN 4" WILL BE TAPERED DOWN BEGINNING AT THE LAST 7 FT. POST TO A MAXIMUM HEIGHT OF 4" AT POST 7. IF SHOWN ELSEWHERE IN THE PLANS, ADDITIONAL CURB UNDERNEATH GUARDRAIL WILL BE PAID FOR BY THE LINEAR FOOT.
4. UNLESS OTHERWISE SHOWN IN THE PLANS, TRANSITIONS SHALL BE PLACED WITH THE BLOCKOUT FACE IN FRONT OF OR DIRECTLY ABOVE THE CURB FACE. SEE SECTION A-A.
5. FOR ROUND WOOD POST SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE THRIE-BEAM TRANSITION.
6. THE TYPE OF POST (ROUND WOOD POST, RECTANGULAR WOOD POST OR STEEL POST) WILL BE AS SHOWN IN THE PLANS. REFER TO GF(31) STANDARD SHEET.
7. THE POST LENGTH SHALL BE MARKED ON ALL 7'- 0" LONG POSTS BY THE MANUFACTURER. THE MARK SHALL BE LOCATED WITHIN THE TOP 1 FT. REGION OF THE POST, AT LEAST ⅝" IN HEIGHT, AND VISIBLE AFTER INSTALLATION. WOODEN POSTS SHALL BE MARKED WITH A BRAND, AND STEEL POSTS WITH A STENCIL BEFORE GALVANIZING.
8. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
9. RAIL ELEMENTS SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED ON THE PLANS. THE THRIE-BEAM TERMINAL CONNECTOR AND THE THRIE-BEAM TRANSITION TO W-BEAM SHALL BE OF THE SAME MATERIAL, BUT SHALL NOT BE LESS THAN 10 GAUGE. CONTRACTOR SHALL VERIFY THAT THE LOCATIONS OF BOLT HOLES MATCH THOSE IN THE THRIE-BEAM TERMINAL CONNECTOR PRIOR TO ORDERING MATERIALS.
10. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM REMAINING BOLT LENGTH TO MEET REQUIRED LENGTH.
11. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
12. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
13. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
14. UNLESS OTHERWISE SHOWN IN THE PLANS, A COMPOSITE MATERIAL BLOCK THAT MEETS THE REQUIREMENTS OF DMS-7210, "COMPOSITE MATERIAL POSTS AND BLOCKS FOR METAL BEAM GUARD FENCE" MAY BE SUBSTITUTED FOR BLOCKS OF SIMILAR DIMENSIONS. TXDOT'S MATERIALS AND TESTS DIVISION MAINTAINS A MATERIAL PRODUCER LIST (MPL) FOR PRODUCERS OF MATERIALS CONFORMING TO DMS-7210. ONLY PRODUCERS ON THE MPL CAN FURNISH COMPOSITE MATERIAL BLOCKS.
15. REFER TO GF(31) STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
16. THE INSTALLATION OF THE TYPE II CURB IS CRITICAL FOR THE PERFORMANCE OF THE THRIE-BEAM TRANSITION SYSTEM. THE CURB PREVENTS (VEHICLE WHEEL SNAGGING) AT THE CONCRETE RAIL AND IS REQUIRED TO MEET MASH CRASH TEST CRITERIA.
17. IF CURB EXTENDS BEYOND POST 7, 25' OF NESTED W-BEAM GUARDRAIL SHALL BE INSTALLED BEYOND THE PAY LIMITS OF THRIE-BEAM TRANSITION SECTION, (SEE SHT.2). PAYMENT FOR THIS 25' SECTION WILL BE BY LINEAR FOOT, PAY ITEM "0540 6XXX MTL W-BEAM GD FEN (NESTED)(TIM POST)" OR "540 6XXX MTL W-BEAM GD FEN (NESTED)(STEEL POST)" AS APPLICABLE FOR POST TYPE. SEE SHT.2 FOR ADDITIONAL INFORMATION.

HIGH-SPEED TRANSITION

Texas Department of Transportation — Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31trt1320.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0111	09	044, ETC	BS 288B	
	DIST	COUNTY		SHEET NO.	
	HOU	BRAZORIA		93	

DATE: 1/20/2022
FILE: H:\1110904A\Standards\mbgf\gf31trt1320.dgn

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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: 1/20/2022
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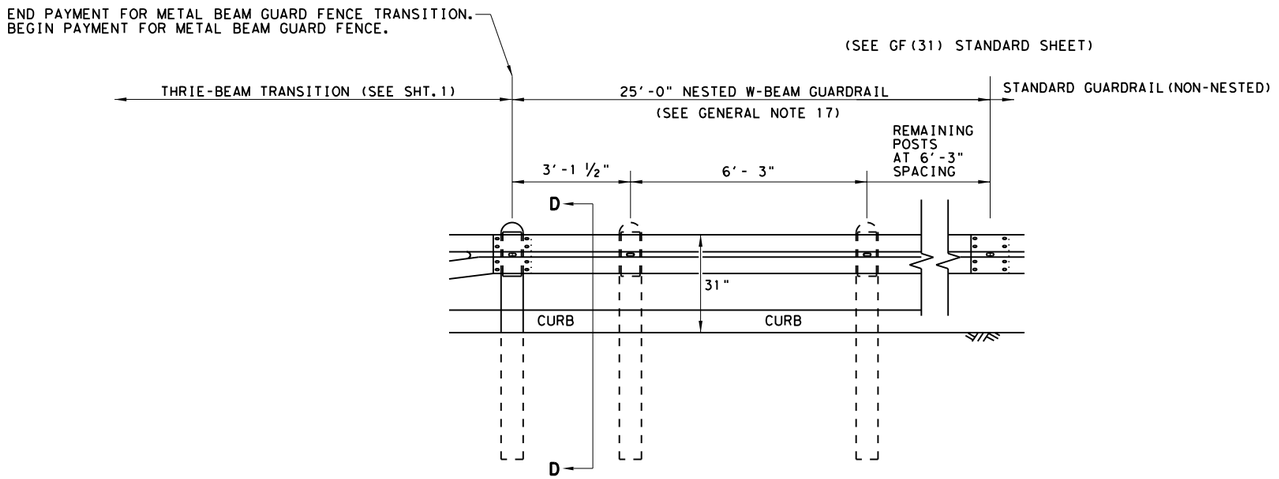
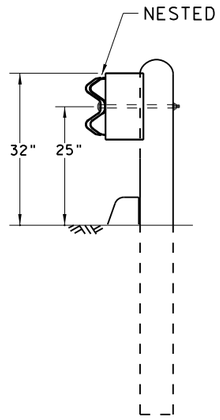
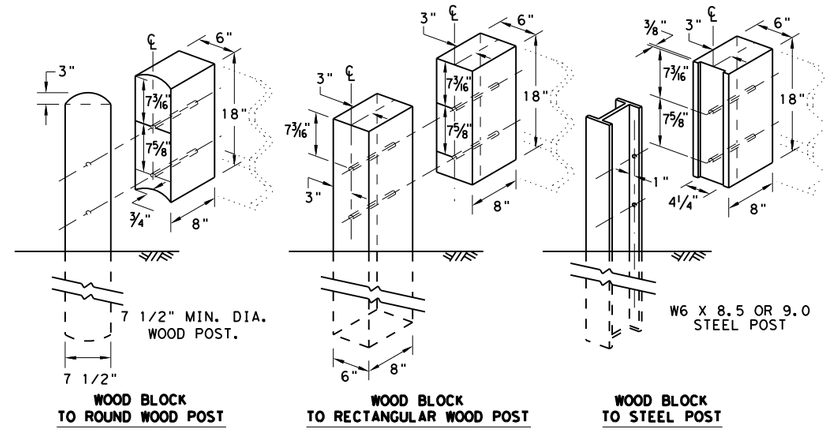
REQUIRED ALTERNATIVE FOR CONTINUOUS CURB EXTENDING PAST POST 7 (SEE SHT. 1 GENERAL NOTE 17)



ELEVATION VIEW



SECTION D-D



THRIE BEAM TRANSITION BLOCKOUT DETAILS

HIGH-SPEED TRANSITION

SHEET 2 OF 2

Texas Department of Transportation | Design Division Standard

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

GF(31)TR TL3-20

FILE: gf31tr1320.dgn	DN: TxDOT	CK: KM	DW: KM	CK: CGL/AG	
©TxDOT: NOVEMBER 2020	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0111	09	044, ETC	BS 288B	
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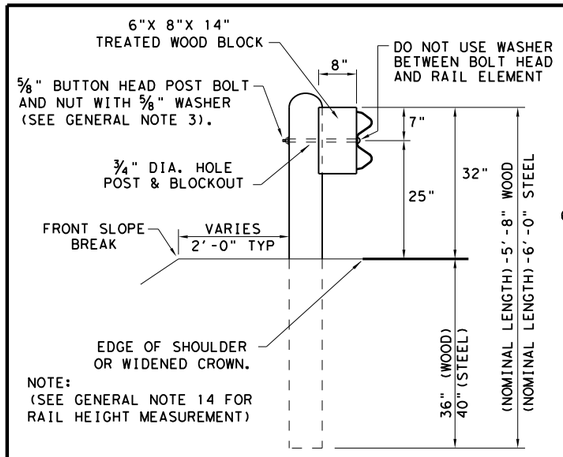
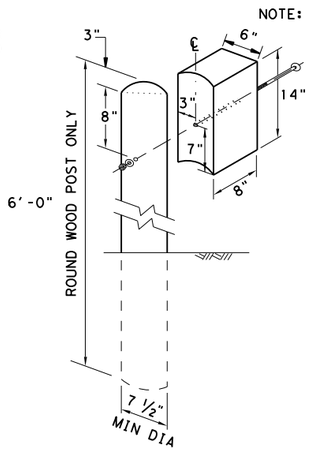
	HOU	BRAZORIA		94	

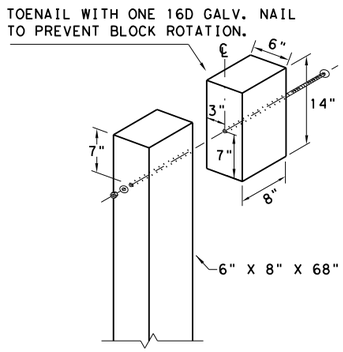


TYPICAL POST PLACEMENT

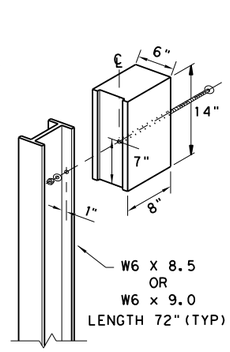


WOOD BLOCK TO ROUND WOOD POST

NOTE: TOENAIL WITH ONE 16D GALV. NAIL TO PREVENT BLOCK ROTATION.

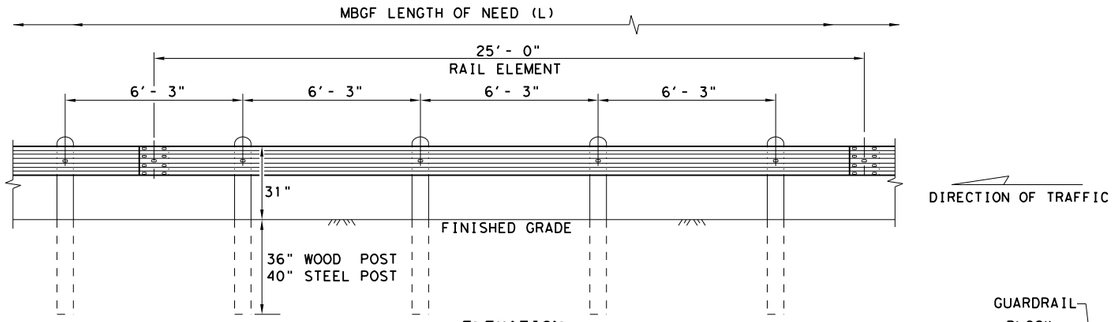


WOOD BLOCK TO RECTANGULAR WOOD POST



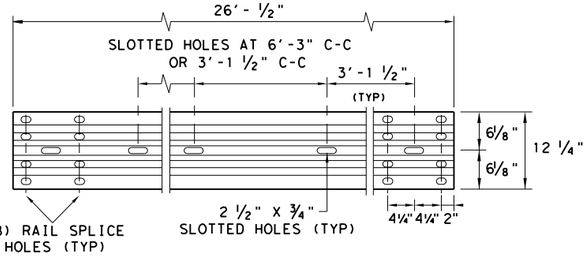
ROUTED WOOD BLOCK TO I-BEAM STEEL POST

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



ELEVATION
MID-SPAN RAIL SPLICE

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



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

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

NOTE:
FOUR TYPES OF BUTTON-HEAD GUARD RAIL BOLTS COME WITH A RECCESSED NUT.

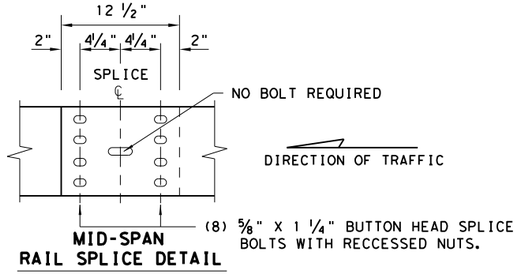
SPLICE BOLT LENGTH → VARIES

FBB01 = 1 ¼"
FBB02 = 2"
⅝"

POST & BLOCK LENGTH
FBB03 = 10"
FBB04 = 18"

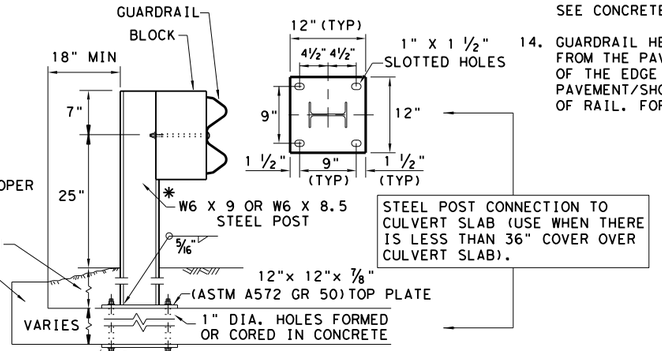
BUTTON HEAD BOLT

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



MID-SPAN RAIL SPLICE DETAIL

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



LOW FILL CULVERT POST

NOTE: TWO INSTALLATION OPTIONS.

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

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

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

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

GENERAL NOTES

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

Texas Department of Transportation

Design Division Standard

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

FILE: gf3119.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		95

DATE: 1/20/2022
FILE: H:\1110904\Standards\mbgf\gf3119.dgn

NOTE: STEEL I-BEAM POST W6 X 8.5 (6'-0") PN: 533G
STANDARD WOOD BLOCKOUTS (6"X8"X14") PN: 4076B
AT (POSTS 2 THRU 8)

⅝" X 10" HGR BOLT PN: 3500G
⅝" HGR NUT PN: 3340G

LINE AT THE BACK OF POST #2 THRU #8

FROM THE CENTERLINE OF POST(1) & POST(0)

ANCHOR PADDLE PN: 15204A

ANGLE STRUT PN: 15202G

16"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3) POST(1) POST(0)

PLAN VIEW

MASH TEST LEVEL 3 (TL-3) LENGTH OF SoftStop TERMINAL (50'-9 ½")

BEGIN LENGTH OF NEED

DO NOT BOLT ANCHOR RAIL TO - POST (2)

SEE DETAIL 1

TRAFFIC FLOW

50'-9 ½" STANDARD INSTALLATION LENGTH (MASH TL-3 SoftStop)

BEGIN STANDARD MBGF

END PAYMENT FOR SGT

6¼" 3'-1 ½" 6'-3" 6'-3"

ANCHOR RAIL WITH SLOTS - (THREADED THRU HEAD)
SEE SoftStop MANUAL FOR COMPLETE DETAILS

MIDDLE SLOT CUTOUT
(1) 1 ¾" X 6'-10 ¼"

OUTSIDE SLOTS CUTOUT
(2) 1½" X 6'-9 ⅝"

MBGF LAPPED IN DIRECTION OF TRAFFIC FLOW

25'-0" DOWNSTREAM W-BEAM GUARDRAIL PN: 61G

SoftStop ANCHOR RAIL (12GA) PN: 15215G

SoftStop FACE SEE GN(3) & NOTE: B

3'-1 ½"(+/-) 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 6'-3" 5'-8" 4'-7"

ANCHOR PADDLE PN: 15204A

END OF ANCHOR RAIL PN: 15215G

SEE NOTE: A

SEE NOTE: C

POST 32" HEIGHT

31" RAIL HEIGHT

RAIL 25'-0" PN: 61G

RAIL 25'-0" PN: 15215G

(8) ⅝"x 1- ¼" GR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

(8) ⅝"x 1- ¼" HGR BOLTS PN: 3360G
⅝" HEX NUTS PN: 3340G

POST 40" DEPTH (TYP 1-8)

DO NOT BOLT ANCHOR RAIL TO POST(2)

SEE DETAIL 2

13/16" DIA. YIELDING HOLES

13/16" DIA. YIELDING HOLES

SEE DETAIL 3

6'-1⅜"

POST(8) POST(7) POST(6) POST(5) POST(4) POST(3) POST(2) 6'-0" (SYTP) PN: 15000G POST(1) 4'-9 ½" SYTP PN: 15203G POST(0) 6'-5 ⅜" PN: 15205A

ELEVATION VIEW

HARDWARE FOR POST(2) THRU POST(8)
(1) ⅝"x 10" HGR BOLT PN: 3500G
(1) ⅝" HGR HEX NUT PN: 3340G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

ALTERNATE BLOCKOUT SEE GENERAL NOTE: 6

4" X 7 ½" X 14" BLOCKOUT COMPOSITE PN: 6777B

6" X 8" X 14" BLOCKOUT WOOD PN: 4076B

NOTE: DO NOT BOLT ANCHOR RAIL TO POST(2)

8" 6" 14"

⅝" HGR NUT PN: 3340G

⅝" X 10" HGR POST BOLT PN: 3500G

13/16" DIAMETER YIELDING HOLES LOCATED IN FLANGES

FINISHED GRADE

(HOLES APROXIMATELY CENTERED AT FINISHED GRADE)

ISOMETRIC VIEW POST(1 & 2)

W6 X 8.5 I-BEAM POST SHOWING STANDARD WOOD BLOCKOUT

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

(1) ⅝" x 1 ¾" HEX HD BOLT PN 3391G

ANGLE STRUT PN: 15202G

(2) ⅝" WASHERS PN 4372G

(1) ⅝" HGR HEX NUT PN 3340G

DETAIL 1

SHOWN AT POST(1) NEAR GROUND

(1) ⅝" HEX NUT

(1) ⅝" x 1- ½" HEX HD BOLT-GR-5 PN: 105286

(2) ⅝" ROUND WASHERS PN: 3240G

DETAIL 2

SHOWN AT POST(1)

ANCHOR KEEPER PLATE (24 GA) PN: 15207G

ANCHOR PLATE WASHER ½" THICK PN: 15206G

1" ROUND WASHER F463 PN: 4902G

(2) ⅝" x 2 ½" HEX HD BOLT GR-5 PN: 105285G

ALTERNATE BLOCKOUT SEE GENERAL NOTE: 6

(2) ⅝" ROUND WASHER (WIDE) PN: 3240G

ANCHOR PADDLE PN: 15204A

(2) ⅝" HEX NUT A563 GR.DH PN: 3245G

1" NUT PN: 3908G SHALL BE SECURELY TIGHTENED AFTER FINAL ASSEMBLY, BUT NOT DEFORMING THE KEEPER PLATE.

W-BEAM FLATTENED (4 PLIES)

ANGLE STRUT PN: 15202G

SEE NOTE: A

(2) ¾" x 2 ½" HEX BOLT (TYP) PN: 3717G

(4) ¾" FLAT WASHER (TYP) PN: 3701G

(2) ¾" HEX NUT (TYP) PN: 3704G

6'-1 ⅜" POST DEPTH

(2) ANCHOR POST ANGLE PN: 15201G

DETAIL 3 AT POST(0)

6'-5 ⅜" (W6 X 15) I-BEAM POST PN: 15205A

TRAFFIC FLOW

W-BEAM RAIL 25'-0"

6" X 8" X 14" BLOCKOUT WOOD

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

FINISHED GRADE

LINE POST (3, 4, 5, 6, 7 & 8)

SECTION VIEW B-B

6'-0" (W6 X 8.5)
I-BEAM POST PN: 533G

W-BEAM RAIL 25'-0"

6" X 8" X 14" BLOCKOUT WOOD

⅝" X 10" HGR POST BOLT PN: 3500G

⅝" HGR NUT PN: 3340G

POST HEIGHT 32"

31" RAIL HEIGHT

40"

FINISHED GRADE

POST(2)

SECTION VIEW A-A

6'-0" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15000G

NOTE: DO NOT BOLT ANCHOR RAIL PANEL TO POST(2)

POST 17"- ½" HEIGHT

4'-9 ½"

13/16" DIA. YIELDING HOLES

40"

POST(1)

FRONT VIEW POST(1)

4'-9 ½" (W6 X 8.5)
(SYTP) I-BEAM POST PN: 15203G

NOTE: NO BLOCKOUT INSTALLED AT POST(1)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

2'-0"

STANDARD MBGF

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX. RAIL OFFSET

APPROACH GRADING (1V:10H OR FLATTER) SEE PRODUCT ASSEMBLY MANUAL FOR ADDITIONAL GUIDANCE.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: TRINITY HIGHWAY AT 1(888)323-6374. 2525 N. STEMMONS FREEWAY, DALLAS, TX 75207
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; SoftStop END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL. PN: 620237B
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. A COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
7. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL AND REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
8. POSTS SHALL NOT BE SET IN CONCRETE.
9. IT IS ACCEPTABLE TO INSTALL THE SoftStop IMPACT HEAD PARALLEL TO THE GRADE LINE OR WITH AN UPWARD TILT.
10. DO NOT ATTACH THE SoftStop SYSTEM DIRECTLY TO A RIGID BARRIER.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE SoftStop SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.

NOTE: A	THE INSTALLATION HEIGHT OF FULLY ASSEMBLED ANCHOR POST WILL VARY FROM 3-¾" MIN. TO 4" MAX. ABOVE FINISHED GRADE.
NOTE: B	PART PN: 5852B RIGHT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING) PART PN: 5851B LEFT-SIDE (HIGH INTENSITY REFLECTIVE SHEETING)
NOTE: C	W-BEAM SPLICE LOCATED BETWEEN LINE POST(4) AND LINE POST(5) GUARDRAIL PANEL 25'-0" PN: 61G ANCHOR RAIL 25'-0" PN: 15215G LAP GUARDRAIL IN DIRECTION OF TRAFFIC FLOW.

PART	QTY	MAIN SYSTEM COMPONENTS
620237B	1	PRODUCT DESCRIPTION ASSEMBLY MANUAL (LATEST REV.)
15208A	1	SoftStop HEAD (SEE MANUAL FOR RIGHT-LEFT APPROACH)
15215G	1	SoftStop ANCHOR RAIL (12GA) WITH CUTOUT SLOTS
61G	1	SoftStop DOWNSTREAM W-BEAM RAIL (12GA) (25'- 0")
15205A	1	POST #0 - ANCHOR POST (6'- 5 ⅜")
15203G	1	POST #1 - (SYTP) (4'- 9 ½")
15000G	1	POST #2 - (SYTP) (6'- 0")
533G	6	POST #3 THRU #8 - I-BEAM (W6 x 8.5) (6'- 0")
4076B	7	BLOCKOUT - WOOD (ROUTED) (6" x 8" x 14")
6777B	7	BLOCKOUT - COMPOSITE (4" x 7 ½" x 14")
15204A	1	ANCHOR PADDLE
15207G	1	ANCHOR KEEPER PLATE (24 GA)
15206G	1	ANCHOR PLATE WASHER (½" THICK)
15201G	2	ANCHOR POST ANGLE (10" LONG)
15202G	1	ANGLE STRUT
		HARDWARE
4902G	1	1" ROUND WASHER F436
3908G	1	1" HEAVY HEX NUT A563 GR.DH
3717G	2	¾" x 2 ½" HEX BOLT A325
3701G	4	¾" ROUND WASHER F436
3704G	2	¾" HEAVY HEX NUT A563 GR.DH
3360G	16	⅝" x 1 ¼" W-BEAM RAIL SPLICE BOLTS HGR
3340G	25	⅝" W-BEAM RAIL SPLICE NUTS HGR
3500G	7	⅝" x 10" HGR POST BOLT A307
3391G	1	⅝" x 1 ¾" HEX HD BOLT A325
4489G	1	⅝" x 9" HEX HD BOLT A325
4372G	4	⅝" WASHER F436
105285G	2	⅝" x 2 ½" HEX HD BOLT GR-5
105286G	1	⅝" x 1 ½" HEX HD BOLT GR-5
3240G	6	⅝" ROUND WASHER (WIDE)
3245G	3	⅝" HEX NUT A563 GR.DH
5852B	1	HIGH INTENSITY REFLECTIVE SHEETING - SEE NOTE: B

NOTE:
THIS STANDARD IS A BASIC REPRESENTATION OF THE SoftStop END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

TRINITY HIGHWAY
SOFTSTOP END TERMINAL
MASH - TL-3

SGT(10S)31-16

FILE: sgt10s3116	DN: TxDOT	CK: KM	DW: VP	CK: MB/VP
©TxDOT: JULY 2016	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		96

DATE: 1/20/2022
FILE: H:\1109044\Standards\mbgf\sgt10s3116.dgn

(SEE GN NOTE 15)
STANDARD 31" MBGF

ITEM (6)
INNER SIDE SLIDER
(ISS) PANEL FOR RAIL 3

FIELD-SIDE
(RAIL 3)

NOTE:
RECESSED HEX NUTS FACING
TRAFFIC-SIDE **SEE DETAIL (C)**

REFERENCE LINE USED TO INSTALL
LINE POST(9) THRU POST(2)

POST 1 OFFSET DISTANCE MEASURED
7-⅝" FROM REFERENCE LINE

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2

RAIL 4 | RAIL 3 | RAIL 2 | RAIL 1

ITEM (10)
CABLE ASSEMBLY

ITEM (2)
GROUNDSTRUT

NO BLOCKOUT
AT (POST 1)

CABLES

ITEM (5)
TRAFFIC SIDE SLIDER
(TSS) PANEL FOR RAIL 2

NOTE: SECURE THE (TSS) PANEL TO OUTSIDE
OF RAIL 2 WITH THE PANEL ARROWS
POINTING TOWARDS THE HEAD.

NOTES:
1. ITEM (12) COMPOSITE BLOCKOUTS INSTALLED AT LINE POST(9) THRU LINE POST(2).
2. DO NOT INSTALL A BLOCKOUT AT LINE POST(1).

PLAN VIEW

MBGF
RAIL 2

INSTALL GUARD FENCE RECESSED
HEX NUTS ON TRAFFIC-SIDE

MBGF
RAIL 1

DETAIL (C)

TRAFFIC FLOW

END PAYMENT (SGT) BY EACH

DO NOT BOLT
RAIL TO POST 6

INSTALLATION LENGTH 55'- ½"

BEGIN LENGTH OF NEED

49'-8 9/16"

ITEM (25)
MAX-TENSION HEAD
SEE DETAIL (A)

6'-3" | 6'-3" | 6'-3" | 6'- ¾" | 6'-3" | 6'-3" | 6'-3" | 37 ½" | 5'-3 11/16"

RAIL
HEIGHT
31"

ARROWS

DETAIL (D)

ITEM (13) RAIL 4 | ITEM (13) RAIL 3 | ITEM (13) RAIL 2 | ITEM (13) RAIL 1

RAIL
HEIGHT
31"

HEAD
HEIGHT

DETAIL (B)

32-¼"

68-⅛"

FINISHED
GRADE

CABLES

FINISHED
GRADE

ITEM (10)
CABLE
ASSEMBLY

ITEM (2)
GROUNDSTRUT

POST 9 | POST 8 | POST 7 | POST 6 | POST 5 | POST 4 | POST 3 | POST 2 | POST 1
ITEM (4)
I-BEAM
W6 X 9
NO BLOCKOUT
AT (POST 1)

(8) X-LITE LINE POST - ITEM (11)

ELEVATION VIEW

**SOIL
ANCHOR POST**
ITEM (1)

A

A

TSS PANEL
GALVANIZED
ITEM (5)

RSS PLATE
GALVANIZED
ITEM (8)

INSTALL THE TSS AND RSS
WITH THE ARROWS POINTING
TOWARDS THE MAX-HEAD

TSS PANEL AND RSS PLATE
DETAIL (D)

HEAD
HEIGHT
32-¼"

TOP OF POST

31-⅞"

FINISHED
GRADE

40-⅛"

68-⅛"
ANCHOR POST
DEPTH

ITEM (1)
ANCHOR

ITEM (11)
LINE POSTS
2 THRU 9
(NOTE: ITEM (4) POST 1 (NOT SHOWN),
TO BE INSTALLED AT SAME DEPTH
AS LINE POSTS.)

**SOIL ANCHOR, POST 1
& LINE POST 2 THRU 9**

SECTION VIEW A-A

NOTE:
USE THE MASH APPROVED
X-TENSION CABLE ASSEMBLY.

7 5/16"

2 ⅛"

UPPER CABLE
(BACK SIDE)

LOWER CABLE
(TRAFFIC SIDE)

DETAIL (B)

CABLE
FRICTION PLATE
HEAD UNIT
ITEM (9)

NOTE:
INSTALL ⅝" RECESSED HEX
NUTS ON TRAFFIC SIDE.

ITEM (24)
ITEM (21)

ITEM (20)
8X

ITEM (17)
8X

ITEM (23)
6X
3 SCREWS
EACH SIDE

(RAIL 1)

ITEM (22)
BRACKET
SHIPPED FLAT

ITEM (3)

ITEM (16)
4X

* ITEM (25)
HIGH INTENSITY
REFLECTIVE SHEETING

NOTE: DELINEATION MARKER IN
ACCORDANCE WITH TEXAS MUTCD.

SPLICE FOR IMPACT-HEAD
TO GUARD FENCE (RAIL1)

DETAIL (A)

APPROX 5'-10"

5'-0"

50' APPROACH GRADING

STANDARD
MBGF

2'-0"

EDGE OF PAVEMENT

NOTE: ADJUST WIDTH ACCORDINGLY WHEN OFFSET IS USED. (OFFSET "OPTION" SHOWN)

2'-0" MAX.
RAIL OFFSET

APPROACH GRADING
(1V:10H OR FLATTER)
SEE PRODUCT ASSEMBLY MANUAL
FOR ADDITIONAL GUIDANCE.

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT
USED FOR ALL TANGENT TYPE END TREATMENTS.

APPROACH GRADING AT GUARDRAIL END TREATMENTS

TRAFFIC FLOW

GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: LINDSAY TRANSPORTATION SOLUTIONS (LTS) - BARRIER SYSTEMS, INC. AT (707) 374-6800
2. FOR INSTALLATION, REPAIR, & MAINTENANCE REFER TO THE; MAX-TENSION INSTALLATION INSTRUCTION MANUAL. P/N MANMAX REV D (ECN 3516).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURE'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. ALL STEEL COMPONENTS ARE GALVANIZED PER ASTM A123 OR EQUIVALENT UNLESS OTHERWISE STATED.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POST WITH COMPOSITE BLOCKOUTS.
7. COMPOSITE MATERIAL BLOCKOUT THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST(MPL)FOR CERTIFIED PRODUCERS.
8. REFER TO INSTALLATION MANUAL FOR SPECIFIC PANEL LAPPING GUIDANCE.
9. IF SOLID ROCK IS ENCOUNTERED SEE THE MANUFACTURER'S INSTALLATION MANUAL FOR INSTALLATION GUIDANCE.
10. POSTS SHALL NOT BE SET IN CONCRETE.
11. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POST TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST.
12. MAX-TENSION SYSTEM SHALL NEVER BE INSTALLED WITHIN A CURVED SECTION OF GUARDRAIL.
13. IF A DELINEATION MARKER IS REQUIRED, MARKER SHALL BE IN ACCORDANCE WITH TEXAS MUTCD.
14. THE SYSTEM IS SHOWN WITH 12'-6" MBGF PANELS, 25'-0" MBGF PANELS ARE ALSO ALLOWED.
15. A MINIMUM OF 12'-6" OF 12GA. MBGF IS REQUIRED IMMEDIATELY DOWNSTREAM OF THE MAX-TENSION SYSTEM.

ITEM #	PART NUMBER	DESCRIPTION	QTY
1	BSI-1610060-00	SOIL ANCHOR - GALVANIZED	1
2	BSI-1610061-00	GROUND STRUT - GALVANIZED	1
3	BSI-1610062-00	MAX-TENSION IMPACT HEAD	1
4	BSI-1610063-00	W6x9 I-BEAM POST 6FT.-GALVANIZED	1
5	BSI-1610064-00	TSS PANEL - TRAFFIC SIDE SLIDER	1
6	BSI-1610065-00	ISS PANEL - INNER SIDE SLIDER	1
7	BSI-1610066-00	TOOTH - GEOMET	1
8	BSI-1610067-00	RSS PLATE - REAR SIDE SLIDER	1
9	B061058	CABLE FRICTION PLATE - HEAD UNIT	1
10	BSI-1610069-00	CABLE ASSEMBLY - MASH X-TENSION	2
11	BSI-1012078-00	X-LITE LINE POST-GALVANIZED	8
12	B090534	8" W-BEAM COMPOSITE-BLOCKOUT XT110	8
13	BSI-4004386	12'-6" W-BEAM GUARD FENCE PANELS 12GA.	4
14	BSI-1102027-00	X-LITE SQUARE WASHER	1
15	BSI-2001886	⅝" X 7" THREAD BOLT HH (GR.5)GEOMET	1
16	BSI-2001885	¾" X 3" ALL-THREAD BOLT HH (GR.5)GEOMET	4
17	4001115	⅝" X 1 ¼" GUARD FENCE BOLTS (GR.2)MGAL	48
18	2001840	⅝" X 10" GUARD FENCE BOLTS MGAL	8
19	2001636	⅝" WASHER F436 STRUCTURAL MGAL	2
20	4001116	⅝" RECESSED GUARD FENCE NUT (GR.2)MGAL	59
21	BSI-2001888	⅝" X 2" ALL THREAD BOLT (GR.5)GEOMET	1
22	BSI-1701063-00	DELINEATION MOUNTING (BRACKET)	1
23	BSI-2001887	¼" X ¾" SCREW SD HH 410SS	7
24	4002051	GUARDRAIL WASHER RECT AASHTO FWR03	1
* 25	SEE NOTE BELOW	HIGH INTENSITY REFLECTIVE SHEETING	1
** 26	4002337	8" W-BEAM TIMBER-BLOCKOUT, PDB01B	8
** 27	BSI-4004431	25' W-BEAM GUARDRAIL PANEL,8-SPACE,12GA.	2
28	MANMAX Rev-(D)	MAX-TENSION INSTALLATION INSTRUCTIONS	1

* TO BE PROVIDED BY DISTRIBUTOR OR CONTRACTOR.

** ALTERNATIVE ITEMS NOT SHOWN.
ITEM(26) 8" WOOD-BLOCKOUTS
ITEM(27) 25'GUARD FENCE PANELS

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

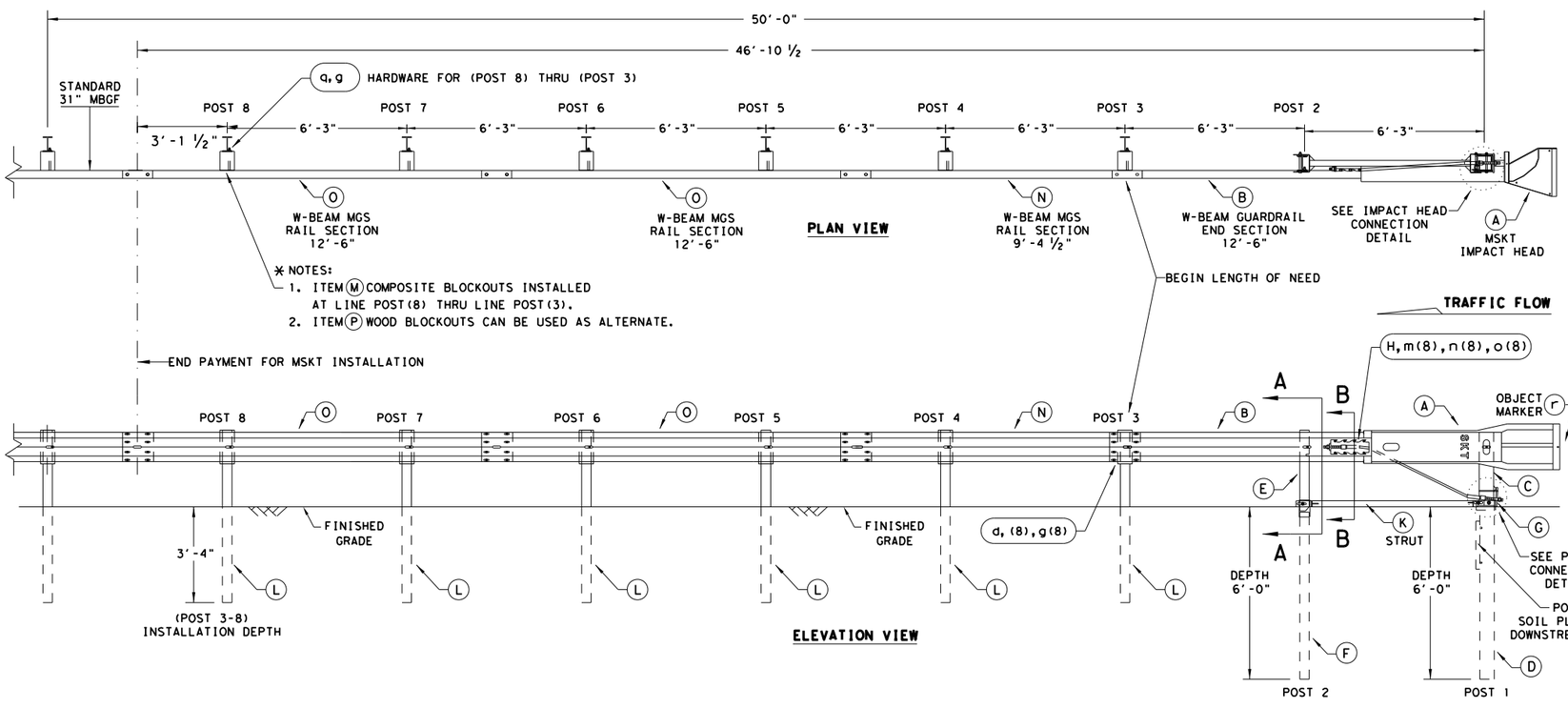
Design Division Standard

MAX-TENSION END TERMINAL
MASH - TL-3
SGT(11S)31-18

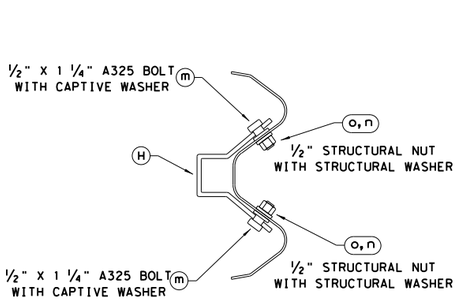
FILE: sgt11s3118.dgn	DN: TxDOT	CK: KM	DW: TxDOT	CK: CL
© TxDOT: FEBRUARY 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		97

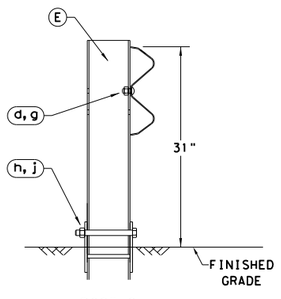
DATE: 1/20/2022
FILE: H:\1109044\Standards\mbgf\sgt11s3118.dgn

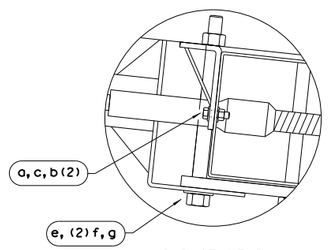
DATE: 1/20/2022
FILE: H:\1109044\Standards\mbgf\sgt12s3118.dgn

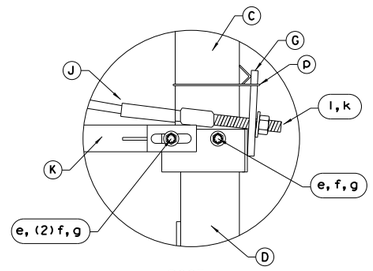


NOTE: SEE (GENERAL NOTE 14) FOR DRIVING CAP INFORMATION.









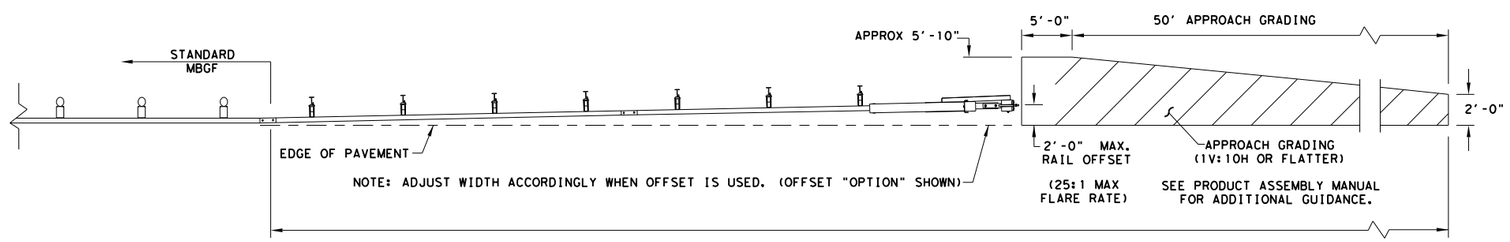
GENERAL NOTES

1. FOR SPECIFIC INFORMATION REGARDING INSTALLATION AND TECHNICAL GUIDANCE OF THE SYSTEM, CONTACT: ROAD SYSTEMS, INC. (432)263-2435. 3616 OLD HOWARD COUNTY AIRPORT, BIG SPRING, TX 79720
2. FOR INSTALLATION, REPAIR AND MAINTENANCE REFER TO THE; MSKT END TERMINAL, PRODUCT DESCRIPTION ASSEMBLY MANUAL (PUBLICATION~062717).
3. APPLY HIGH INTENSITY REFLECTIVE SHEETING, "OBJECT MARKER" ON THE FRONT FACE OF THE DEVICE PER MANUFACTURER'S RECOMMENDATIONS. OBJECT MARKER SHALL CONFORM TO THE STANDARDS REQUIRED IN TEXAS MUTCD.
4. FOR POST (LEAVE-OUT) INSTALLATION AND GUIDANCE SEE TXDOT'S LATEST ROADWAY MOW STRIP STANDARD.
5. HARDWARE (BOLTS, NUTS, & WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING". FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM.
6. SYSTEM SHOWN USING STEEL WIDE FLANGE POSTS WITH COMPOSITE BLOCKOUTS.
7. A COMPOSITE MATERIAL BLOCKOUTS THAT MEETS THE REQUIREMENTS OF DMS-7210, MAY BE SUBSTITUTED FOR BLOCKOUTS OF SIMILAR DIMENSIONS. SEE CONSTRUCTION DIVISION MATERIAL PRODUCER LIST (MPL) FOR CERTIFIED PRODUCERS.
8. IF SOLID ROCK IS ENCOUNTERED IN THE AREA OF (POST 1) AND / OR (POST 2) CONTACT THE MANUFACTURER, & REFER TO THE LATEST ROADWAY MBGF STANDARD FOR INSTALLATION GUIDANCE.
9. POSTS SHALL NOT BE SET IN CONCRETE.
10. SYSTEM MUST BE ATTACHED TO STANDARD 31" MBGF.
11. UNDER NO CIRCUMSTANCES SHALL THE GUARDRAIL WITHIN THE MSKT SYSTEM BE CURVED.
12. A FLARE RATE OF UP TO 25:1 MAY BE USED TO PREVENT THE TERMINAL HEAD FROM ENCROACHING ON THE SHOULDER. THE FLARE MAY BE DECREASED OR ELIMINATED FOR SPECIFIC INSTALLATIONS, IF DIRECTED BY THE ENGINEER.
13. THE SYSTEM IS SHOWN WITH TWO 12'-6" MBGF PANELS, ONE 25'-0" MBGF PANEL IS ALSO ALLOWED IN THEIR PLACE.
14. A DRIVING CAP WITH A TIMBER OR PLASTIC INSERT SHALL BE USED WHEN DRIVING POSTS 3-8 TO PREVENT DAMAGE TO THE GALVANIZING ON TOP OF THE POST. SPECIAL DRIVING CAP TO BE USED ON LOWER POSTS 1 & 2 TO PREVENT DAMAGE TO THE WELDED PLATES.

ITEM	QTY	MAIN SYSTEM COMPONENTS	ITEM NUMBERS
A	1	MSKT IMPACT HEAD	MS3000
B	1	W-BEAM GUARDRAIL END SECTION, 12 Ga.	SF1303
C	1	POST 1 - TOP (6" X 6" X ⅛" 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 ½")	G12025
O	2	W-BEAM MGS RAIL SECTION (12'-6")	G1203A
P	6	WOOD BLOCKOUT 6" X 8" X 14"	P675
Q	1	W-BEAM MGS RAIL SECTION (25'-0")	G1209
		SMALL HARDWARE	
a	2	⅝" x 1" HEX BOLT (GRD 5)	B5160104A
b	4	⅝" WASHER	W0516
c	2	⅝" HEX NUT	N0516
d	25	⅝" Dia. x 1 ¼" SPLICE BOLT (POST 2)	B580122
e	2	⅝" Dia. x 9" HEX BOLT (GRD A449)	B580904A
f	3	⅝" WASHER	W050
g	33	⅝" Dia. H.G.R NUT	N050
h	1	¾" Dia. x 8 ½" HEX BOLT (GRD A449)	B340854A
j	1	¾" Dia. HEX NUT	N030
k	2	1 ANCHOR CABLE HEX NUT	N100
l	2	1 ANCHOR CABLE WASHER	W100
m	8	½" x 1 ¼" A325 BOLT WITH CAPTIVE WASHER	SB12A
n	8	½" STRUCTURAL NUTS	N012A
o	8	1 1/16" O.D. x ⅜" I.D. STRUCTURAL WASHERS	W012A
p	1	BEARING PLATE RETAINER TIE	CT-100ST
q	6	⅝" x 10" H.G.R. BOLT	B581002
r	1	OBJECT MARKER 18" X 18"	E3151

SEE NOTES: *

ALTERNATIVE ITEMS NOT SHOWN. **
* ITEM(P) 8" WOOD-BLOCKOUT
** ITEM(Q) 25'GUARD FENCE PANEL



APPROACH GRADING AT GUARDRAIL END TREATMENTS

NOTE: TXDOT GENERIC APPROACH GRADING LAYOUT USED FOR ALL TANGENT TYPE END TREATMENTS.

NOTE: THIS STANDARD IS A BASIC REPRESENTATION OF THE MSKT END TERMINAL, IT IS NOT INTENDED TO REPLACE THE PRODUCT DESCRIPTION ASSEMBLY MANUAL.

Texas Department of Transportation

Design Division Standard

SINGLE GUARDRAIL TERMINAL

MSKT-MASH-TL-3

SGT(12S)31-18

FILE: sgt12s3118.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CL	
© TxDOT: APRIL 2018	CONT	SECT	JOB	HIGHWAY	
REVISIONS	0111	09	044, ETC	BS 288B	
	DIST	COUNTY		SHEET NO.	
	HOU	BRAZORIA		98	

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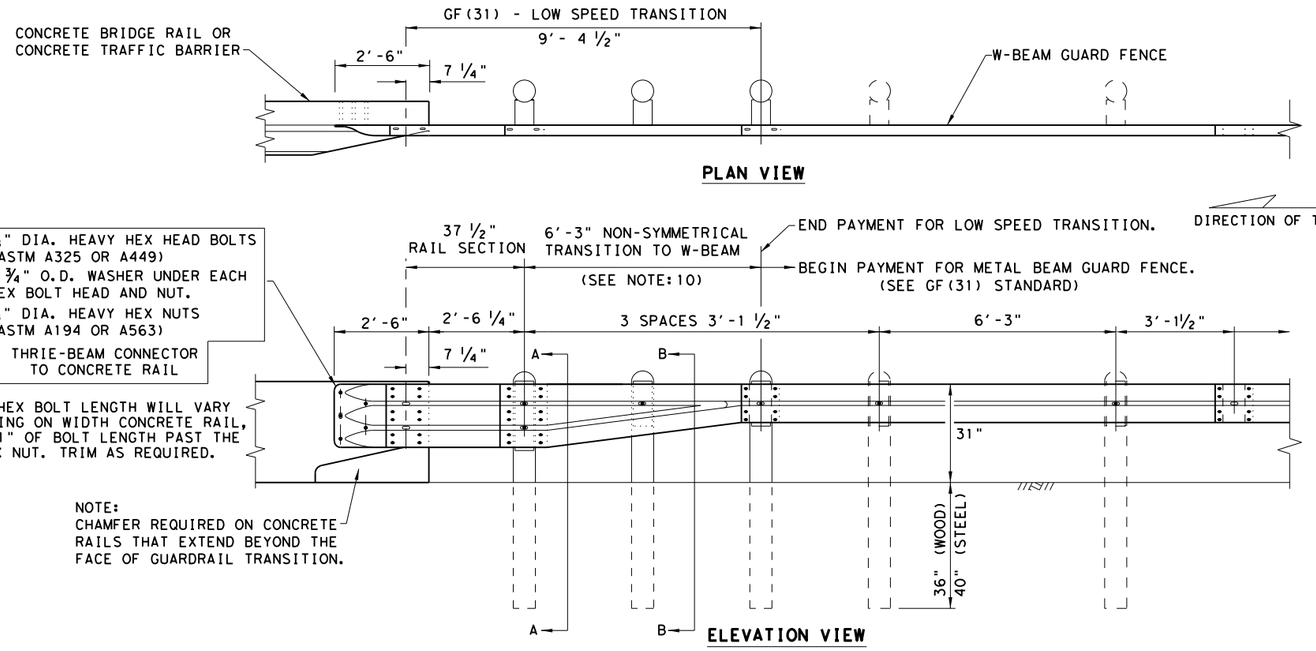
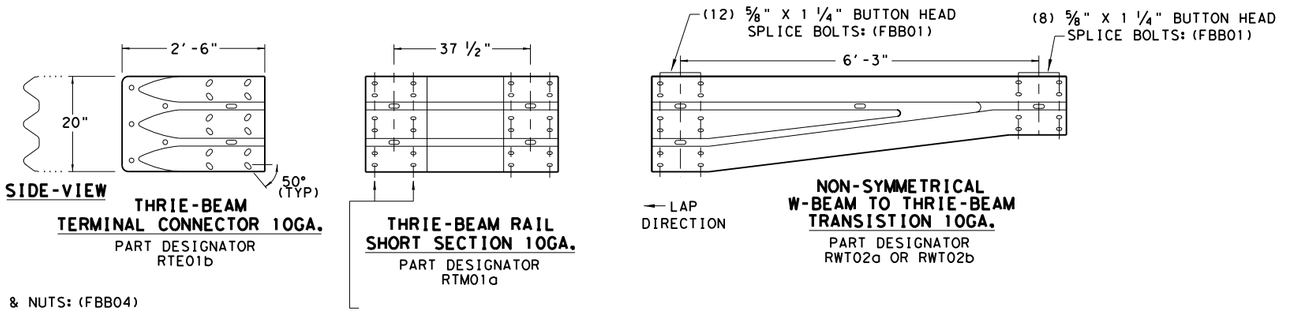


GENERAL NOTES

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 TRANSITIONS SHALL BE AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER. REFER TO GF(31)STANDARD SHEET.
2. RAIL ELEMENT SHALL MEET THE REQUIREMENTS OF ITEM 540, "METAL BEAM GUARD FENCE" EXCEPT AS MODIFIED IN THE PLANS.
3. FITTINGS (BOLTS, NUTS, AND WASHERS) SHALL BE GALVANIZED IN ACCORDANCE WITH ITEM 445, "GALVANIZING." FITTINGS SHALL BE SUBSIDIARY TO THE BID ITEM REQUIRING CONSTRUCTION OF THE TRANSITION.
4. BUTTON HEAD "POST BOLTS & NUTS" SHALL MEET THE REQUIREMENTS OF (ASTM A307), AND SHALL BE OF SUFFICIENT LENGTH TO EXTEND THROUGH THE FULL THICKNESS OF THE NUT AND ⅝" WASHER (FWC16a) AND NOT MORE THAN 1" BEYOND IT. TRIM BOLT LENGTH TO MEET REQUIRED LENGTH.
5. POSTS SHALL NOT BE SET IN CONCRETE, OF ANY DEPTH.
6. CROWN SHALL BE WIDENED TO ACCOMMODATE TRANSITIONS.
7. WHERE SOLID ROCK IS ENCOUNTERED, CONTACT THE DESIGN DIVISION FOR ADDITIONAL GUIDANCE. (512) 416-2678
8. 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 CAN FURNISH COMPOSITE MATERIAL BLOCKS.
9. REFER TO GF(31)STANDARD SHEET & BRIDGE RAILING DETAILS FOR ADDITIONAL DETAILS.
10. FOR ROUND WOOD POSTS SYSTEMS, ALL ROUND WOOD POSTS SHALL BE 7 ½" DIA. MINIMUM THROUGHOUT THE TRANSITION.



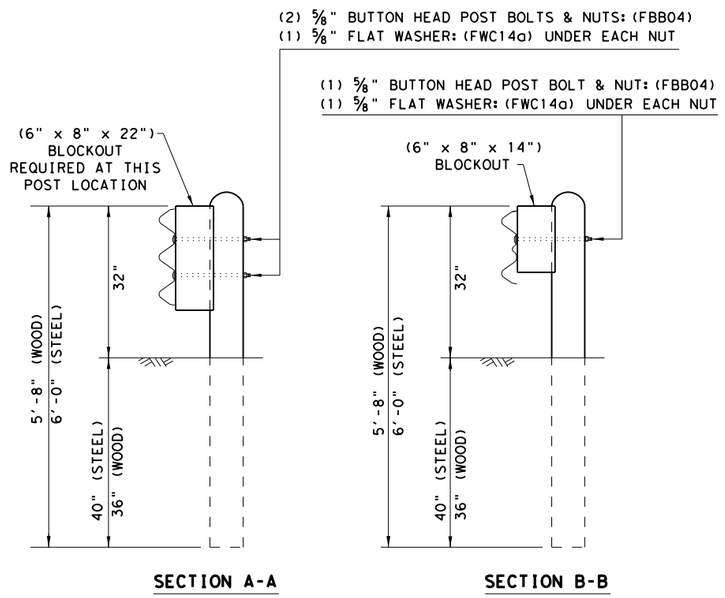
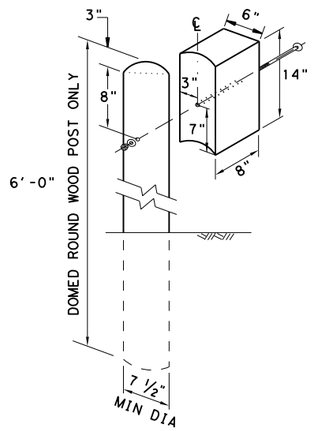
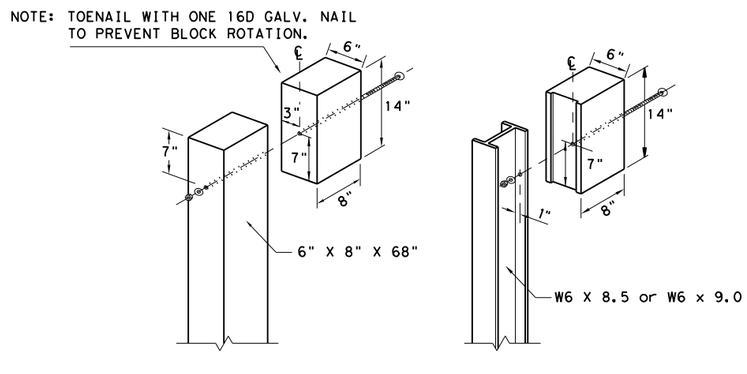


PLATE WASHER INSTRUCTIONS

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





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

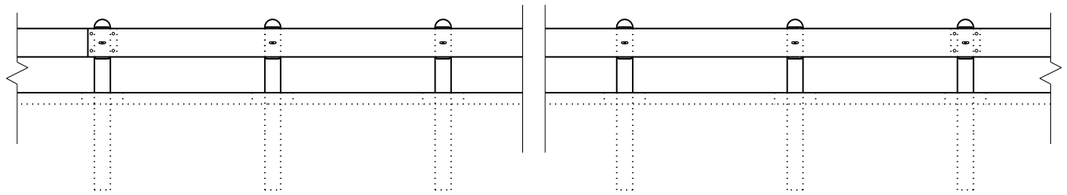
LOW-SPEED TRANSITION

Texas Department of Transportation — Design Division Standard

METAL BEAM GUARD FENCE THRIE-BEAM TRANSITION TL-2 MASH COMPLIANT

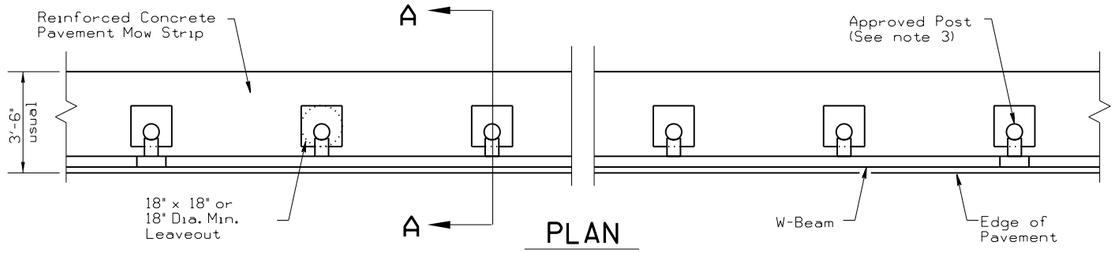
GF(31)TR TL2-19

FILE: gf31trt1219.dgn	DN: TxDOT	CK: KM	DW: VP	CK: CGL/AG
©TxDOT: NOVEMBER 2019	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		99

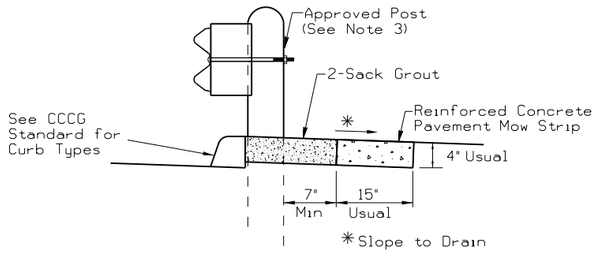


ELEVATION

TRAFFIC

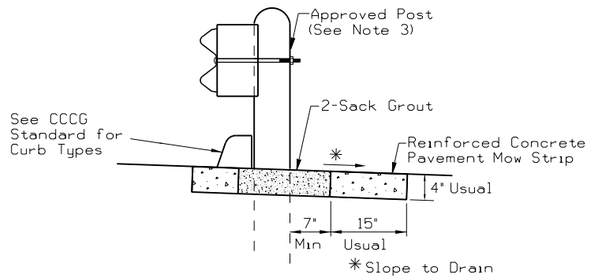


PLAN



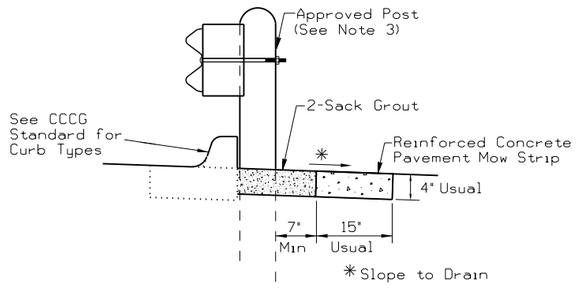
CURB OPTION (1)

Shown at Curbed Location

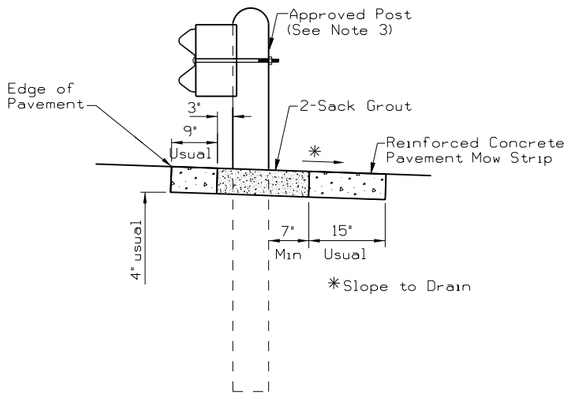


CURB OPTION (2)

Curb Shown on Top of Mow Strip

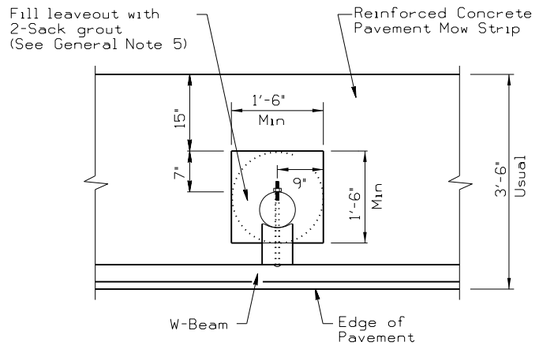


CURB OPTION (3)



SECTION A-A

Typical



MOW STRIP DETAIL

Reinforced Concrete Pavement
Mow Strip with 18" x 18"or 18"
dia. minimum leaveout.

GENERAL NOTES

1. Place concrete riprap mow strips at all Metal Beam Guard Fence locations, and in accordance with Item 432, "Riprap". Use Class B Concrete, reinforced with No. 3 bars spaced at 18 in. centers each direction and 2 in. below the surface.

2. Provide a minimum of 7 in. leave out behind the post. Do not place concrete in the leave out.

3. The type of approved post is shown elsewhere on the plans. See the applicable standard sheets for additional details and information.

4. Other curb placement options may be used. Curbs are not considered part of the mow strip and are paid for under other pertinent bid items.

5. Fill the leave outs with no more than a 2-sack grout mixture and place in accordance with Section 421.2.7, ""Mortar and Grout." Payment for furnishing and placing the grout mixture is subsidiary to the Item 432, "RIPRAP."

6. Place the mow strip the entire length of the guard fence plus any Terminal Anchor Section (TAS) or Single Guardrail Terminal (SGT) to 2 ft. beyond the face of the object marker at the end of the SGT. Do not allow concrete to adhere to the ground line strut shown on the SGT standard sheet.

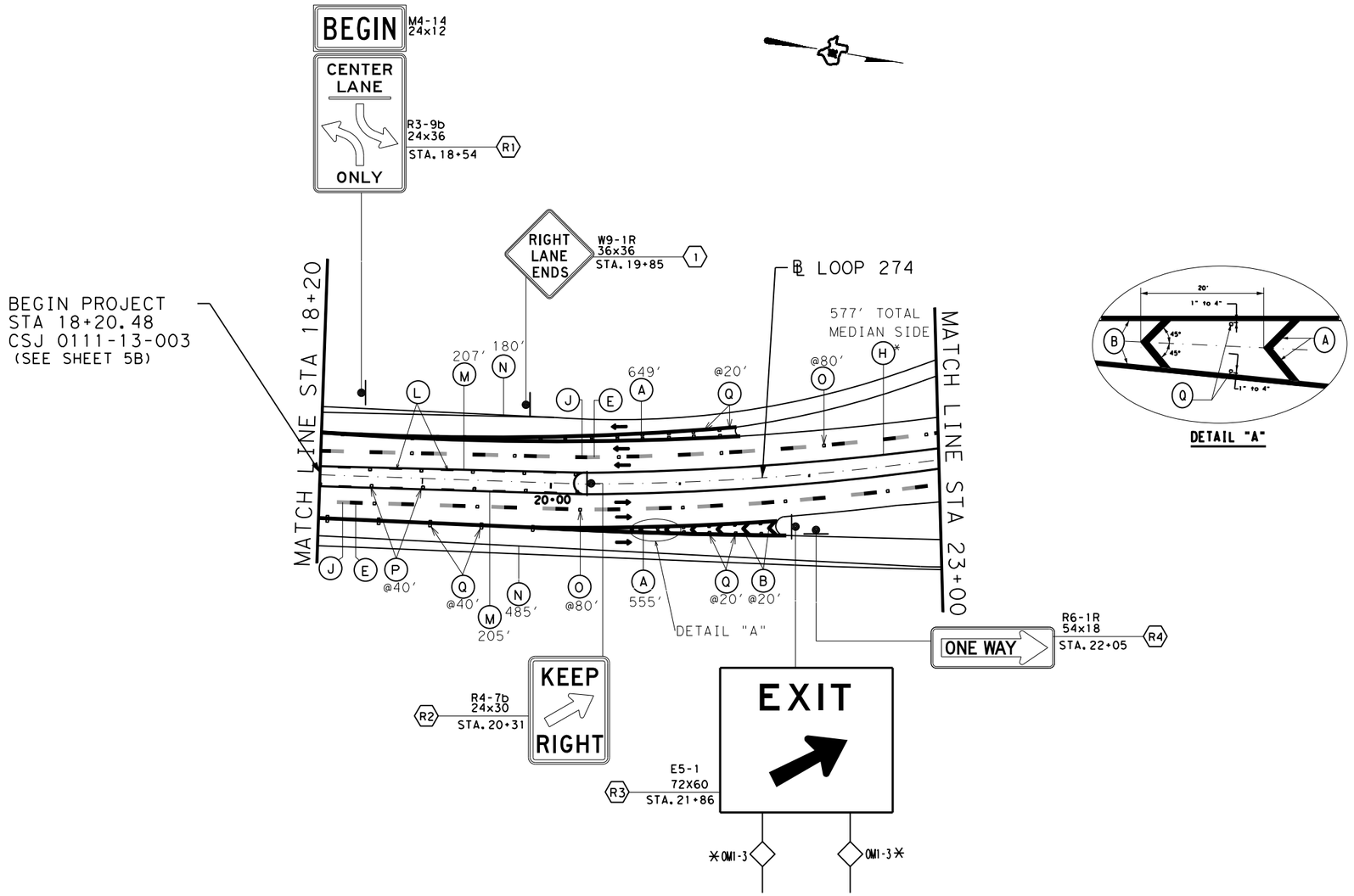
Texas Department of Transportation
Houston District

MOW STRIP

MS

FILE:	DN:	CK:	DW:	CK:	
© TxDOT 2014	DIST	FED REG	PROJECT NO.		SHEET
REVISIONS	HOU	6	111-9-44		99A
03/15 2014 SPECS	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	BRAZORIA		0111	09	[illegible]	[illegible]

STDE5.DGN



DETAIL "A"

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇆ DIRECTION OF TRAVEL

STATE OF TEXAS
NGUYEN LE
127269
LICENSED
PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

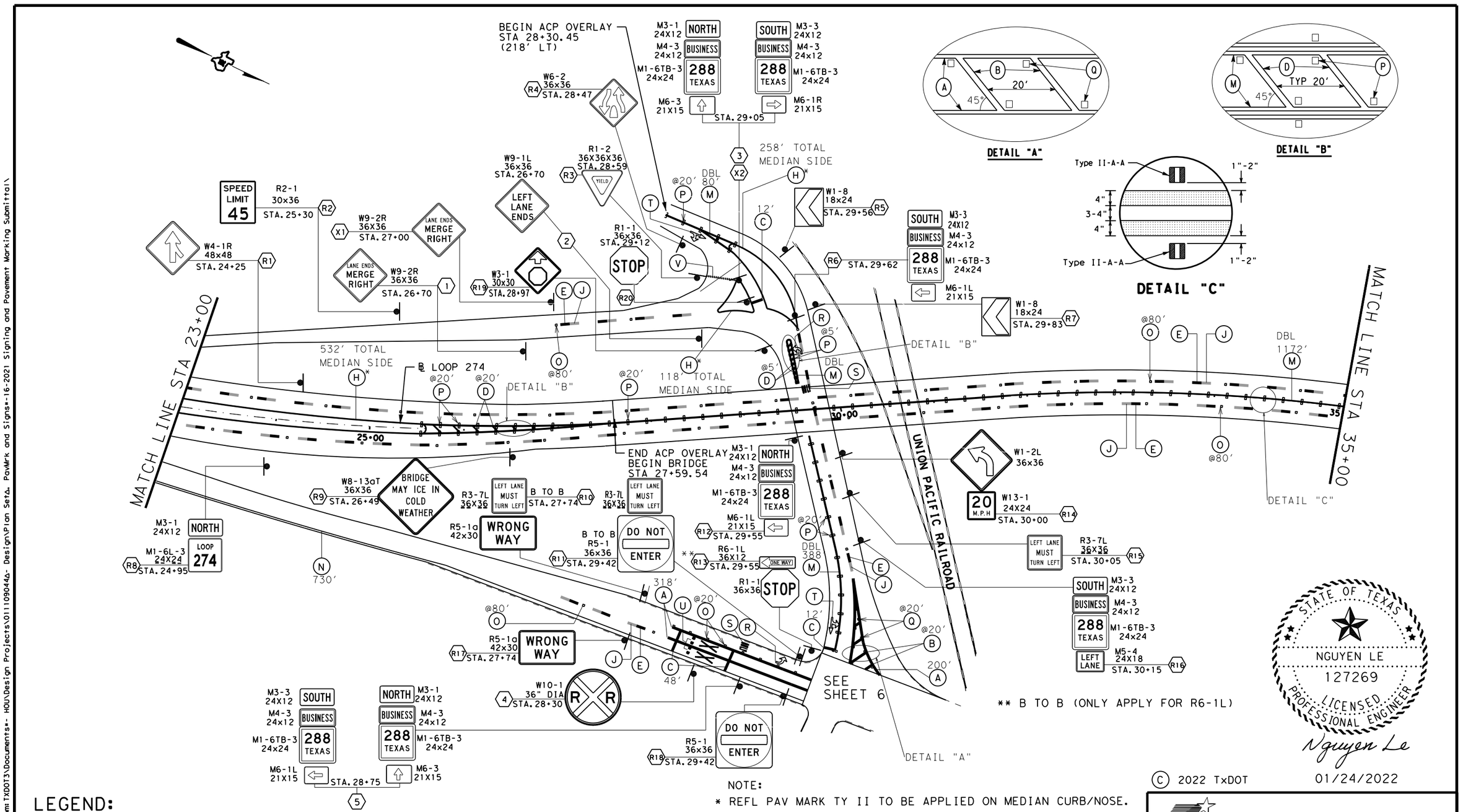
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 100'

SHEET 1A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - REVISIONS	HOU	6		100
CK.: -	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
DN.: -	BRAZORIA	0111	09	044	BS 288B
CK.: -					

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOUDesign Projects\0111090440- Design\Plan Sets, PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



NOTE:
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- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇆ DIRECTION OF TRAVEL

STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

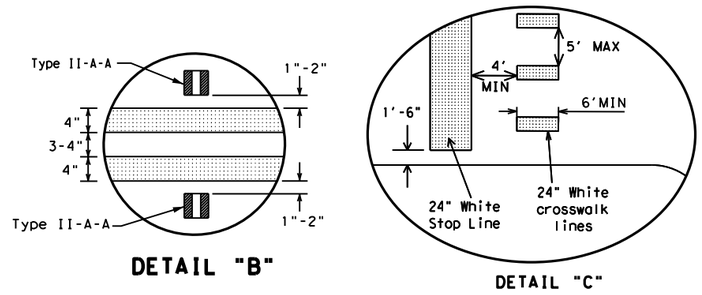
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

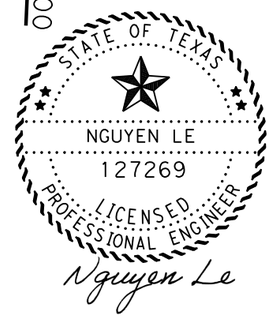
SCALE: 1" : 100'

SHEET 1B OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO			SHEET
REVISIONS	HOU	6				101
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA		0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090440- Design\Plan Sets\ PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\





01/24/2022

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇆ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

TEXAS DEPARTMENT OF TRANSPORTATION

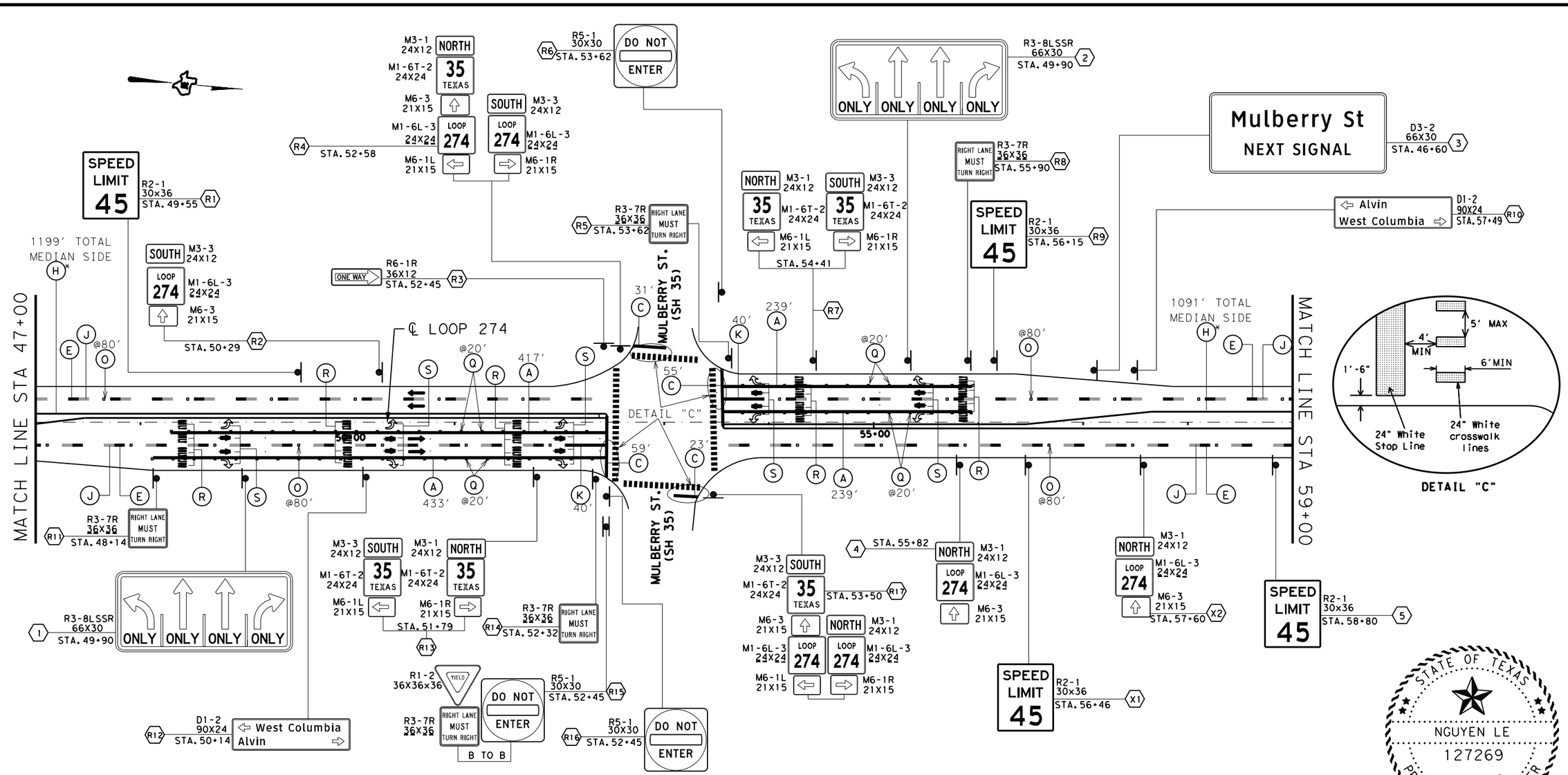
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 100'

SHEET 2A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: REVISIONS	HOU	6		102
CK.:	COUNTY		CONTROL SECTION JOB	HIGHWAY
DR.:	BRAZORIA		0111 09 044	BS 288B
CK.:				

DATE: 1/14/2022
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents* - HOU\Design Projects\0111090044a- Design\Plan Sets, PavMrk and Signs*-16-2021 Signing and Pavement Marking Submittal\



STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇌ DIRECTION OF TRAVEL

TEXAS DEPARTMENT OF TRANSPORTATION

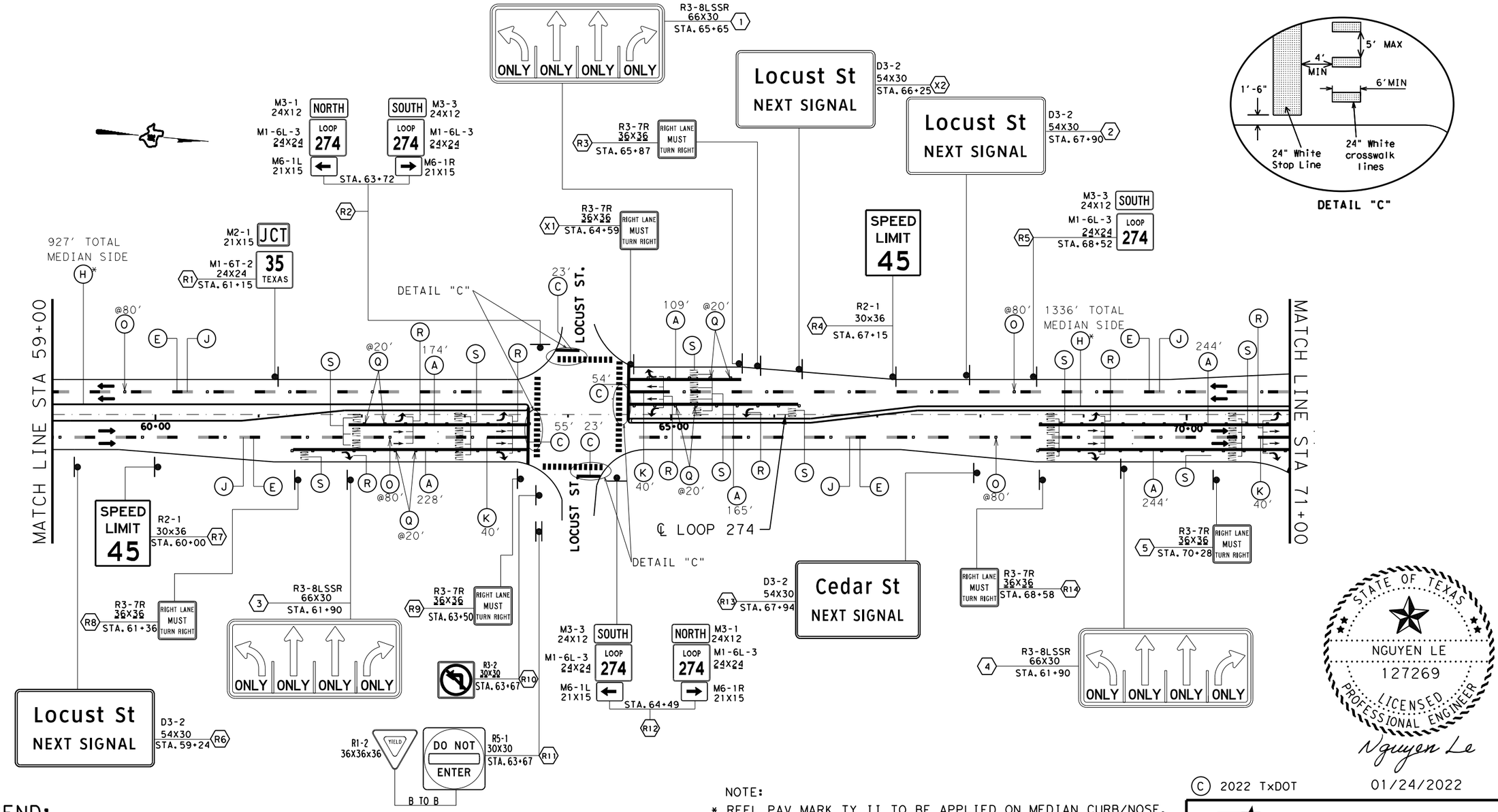
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 100'

SHEET 2B OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		103
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090446\- Design\Plan Set\- PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW) ⇆ DIRECTION OF TRAVEL
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

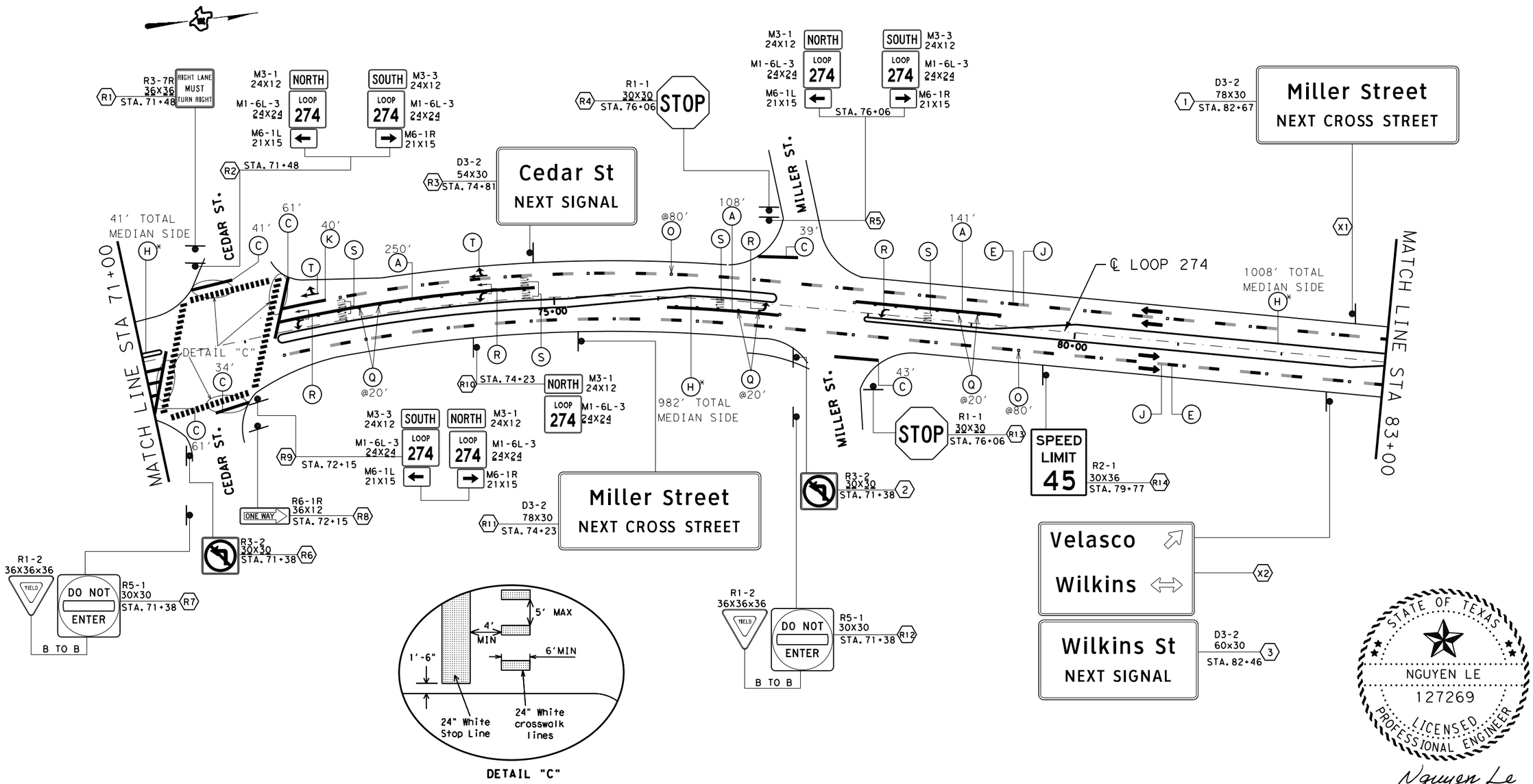
TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 100' SHEET 3A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		104
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOUvDesign Projects\0111090440- DesignPlan Sets, PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NGUYEN LE 127269 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
Nguyen Le
01/24/2022

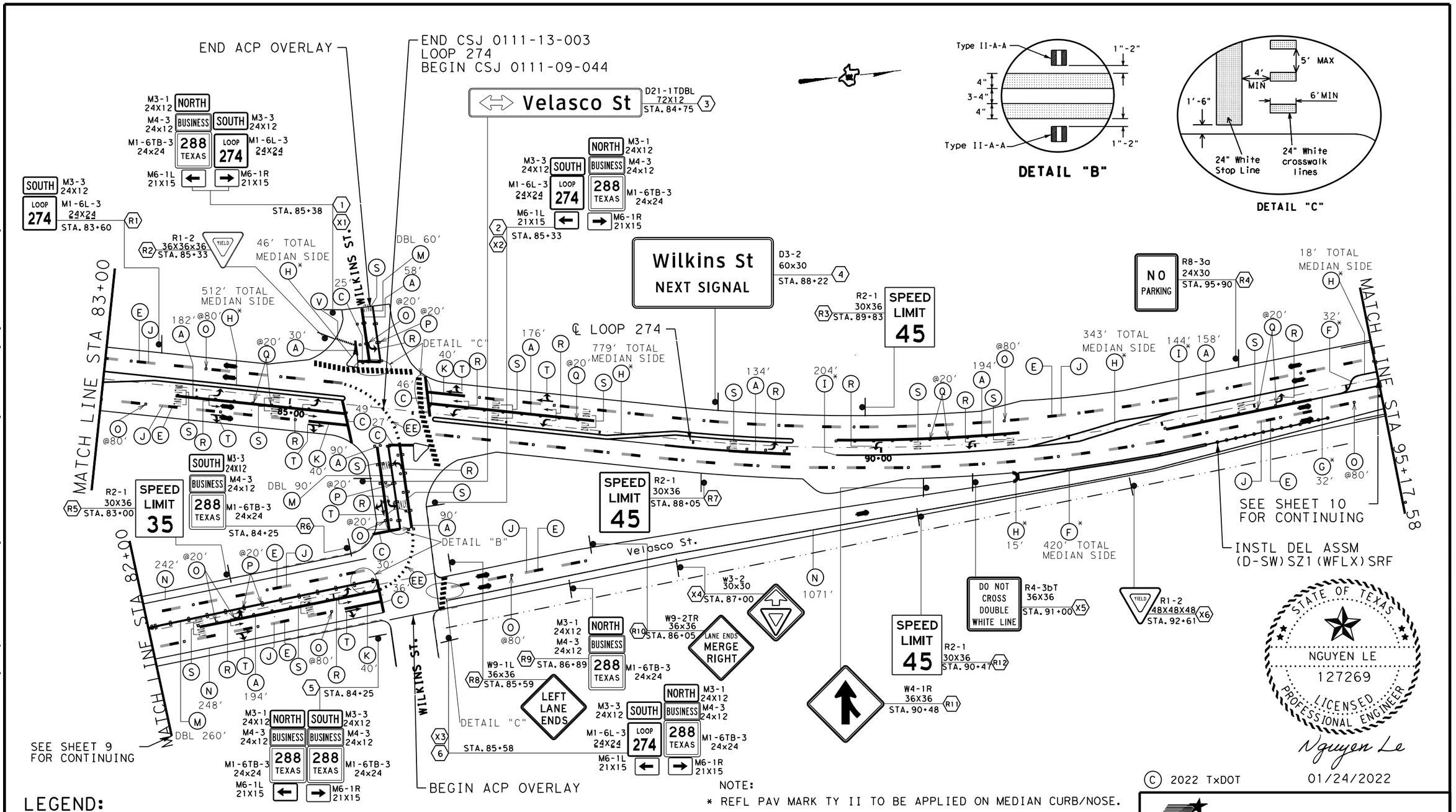
TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 100'

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		105
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090440- Design\Plan Sets\ PowMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



DETAIL "B"

DETAIL "C"

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇆ DIRECTION OF TRAVEL

NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

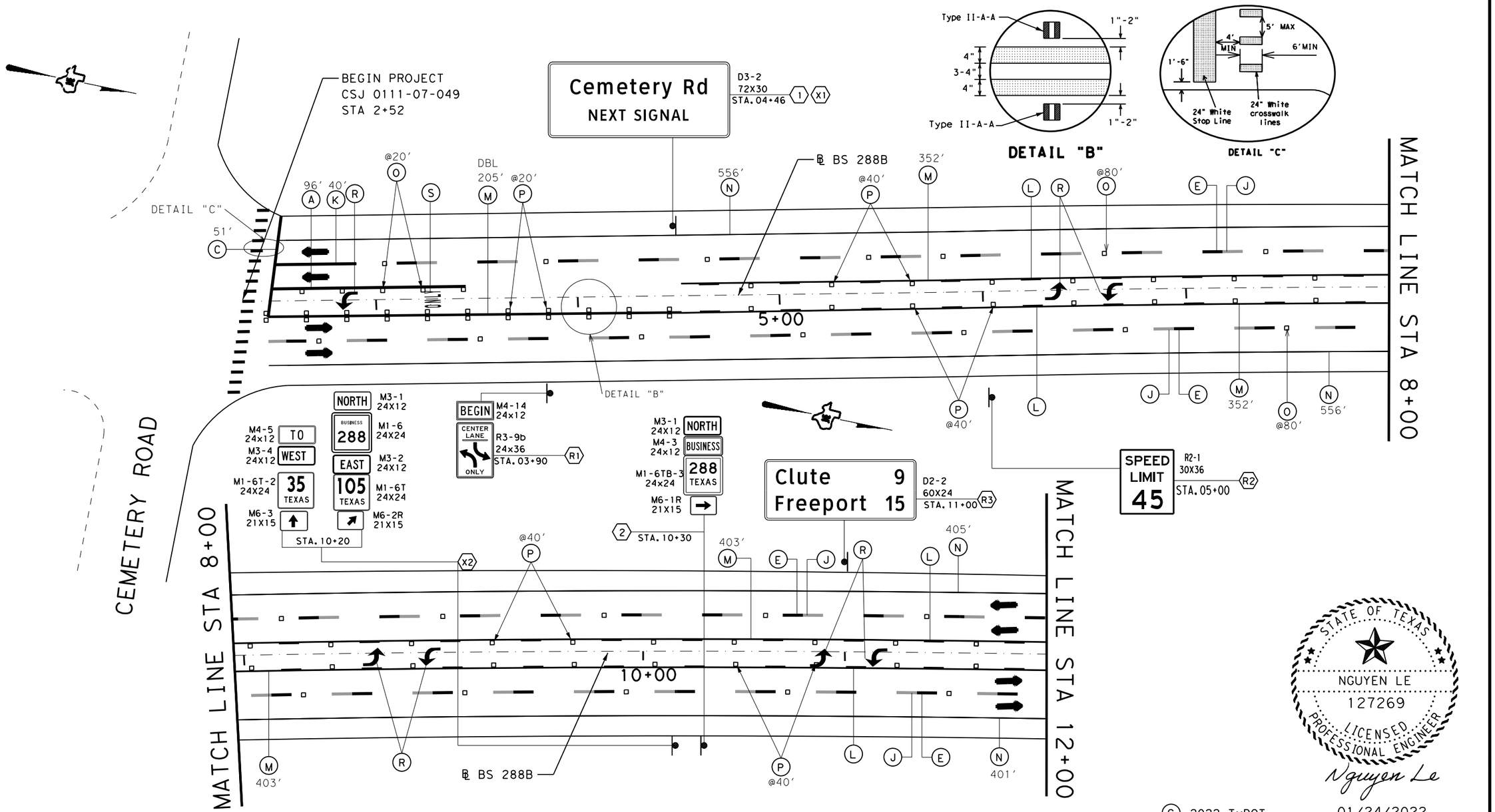
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 100'

SHEET 4 OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO			SHEET
REVISIONS	HOU	6				106
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA		0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOUDesign Projects\0111090440- Design\Plan Sets, PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇆ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

STATE OF TEXAS
NGUYEN LE
127269
LICENSED
PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 5A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022		STATE DISTRICT	FEDERAL REGION	PROJECT NO		SHEET
DN.:	REVISIONS	HOU	6			107
CK.:		COUNTY		CONTROL	SECTION	JOB	HIGHWAY
DR.:		BRAZORIA		0111	09	044	BS 288B
CK.:							

DATE: 1/14/2022
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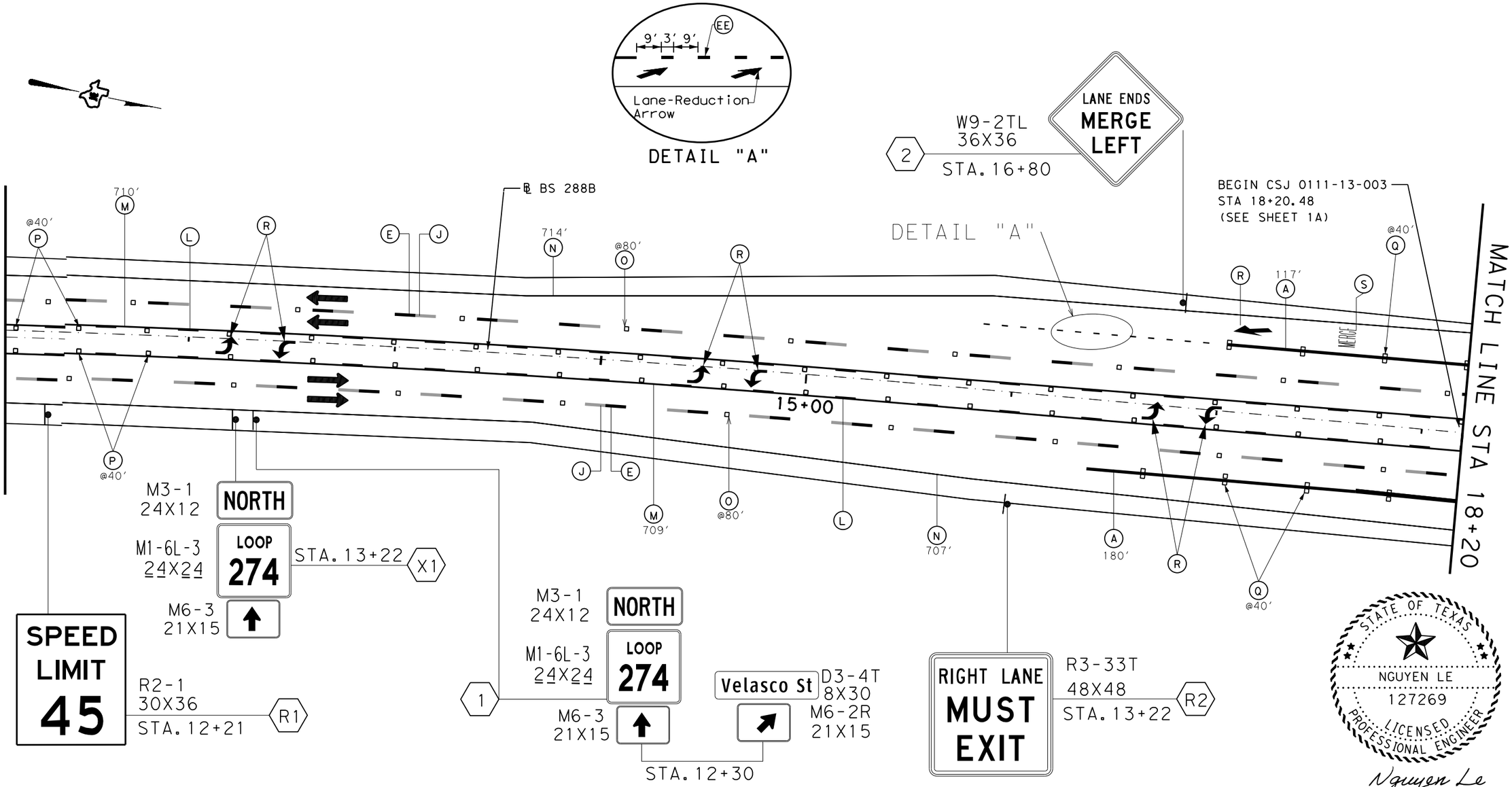


STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER

Nguyen Le
01/24/2022

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

TEXAS DEPARTMENT OF TRANSPORTATION

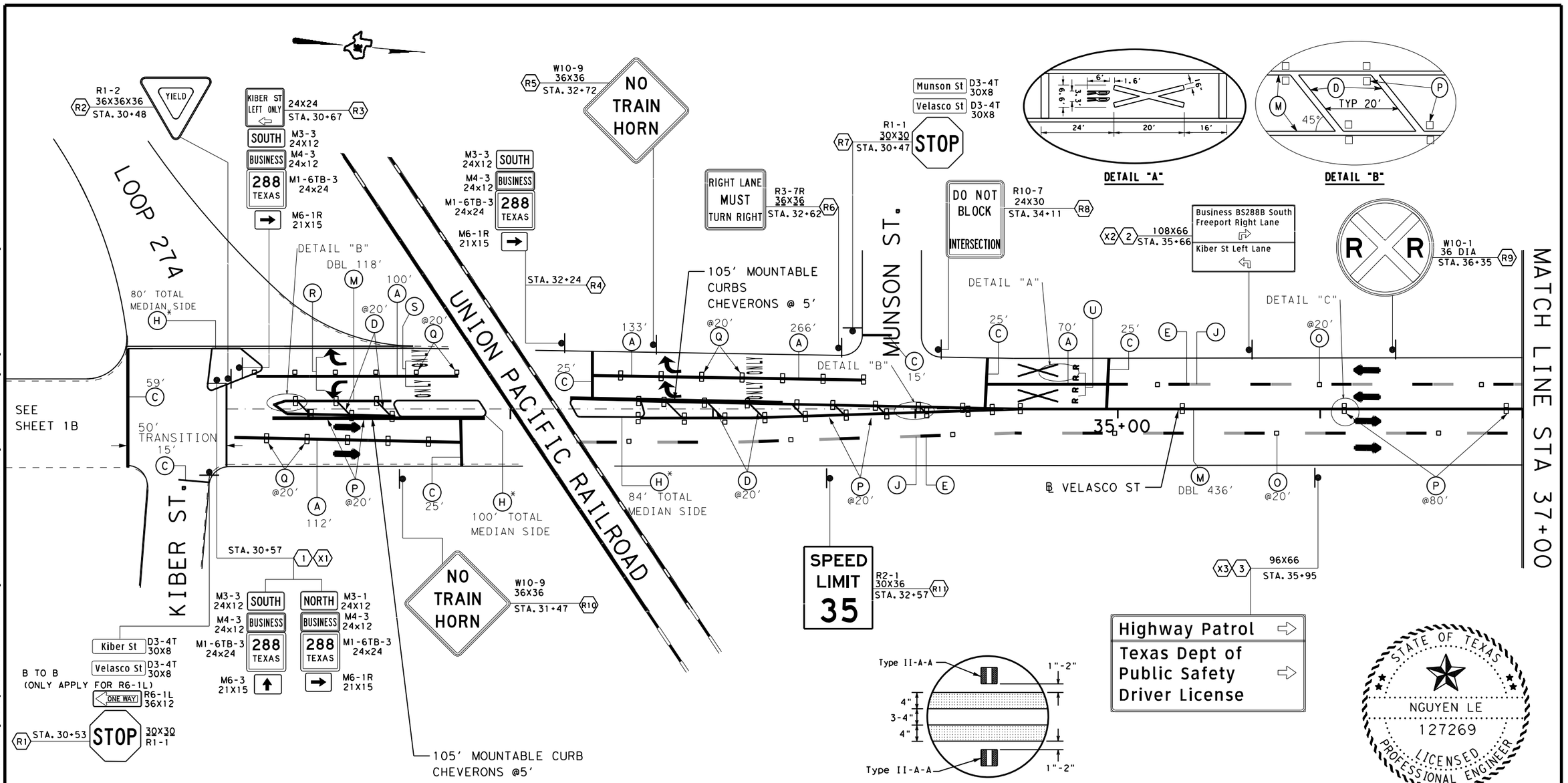
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 100'

SHEET 5B OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		108
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\V01109044a- DesignPlan Sets, PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇆ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

NGUYEN LE 127269 LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
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01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

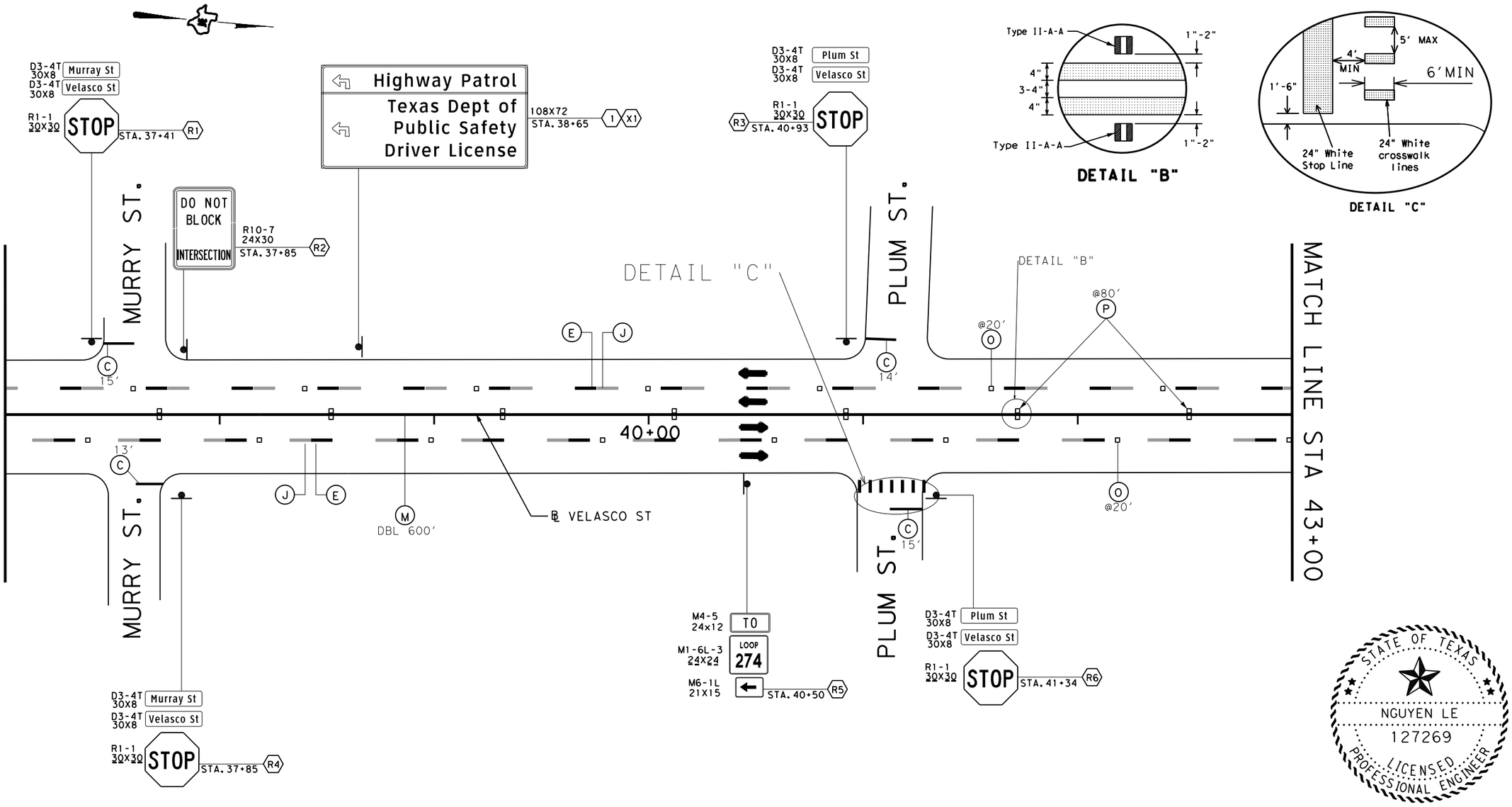
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 6A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		109
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\\txdot.projectwiseonline.com:TXDOT3\Documents\- HOUDesign Projects\0111090440- DesignPlan Sets, PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents* - HOU\Design Projects\0111090440 - Design\Plan Sets, PavMrk and Signs*-16-2021 Signing and Pavement Marking Submittal\

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER

Nguyen Le
01/24/2022

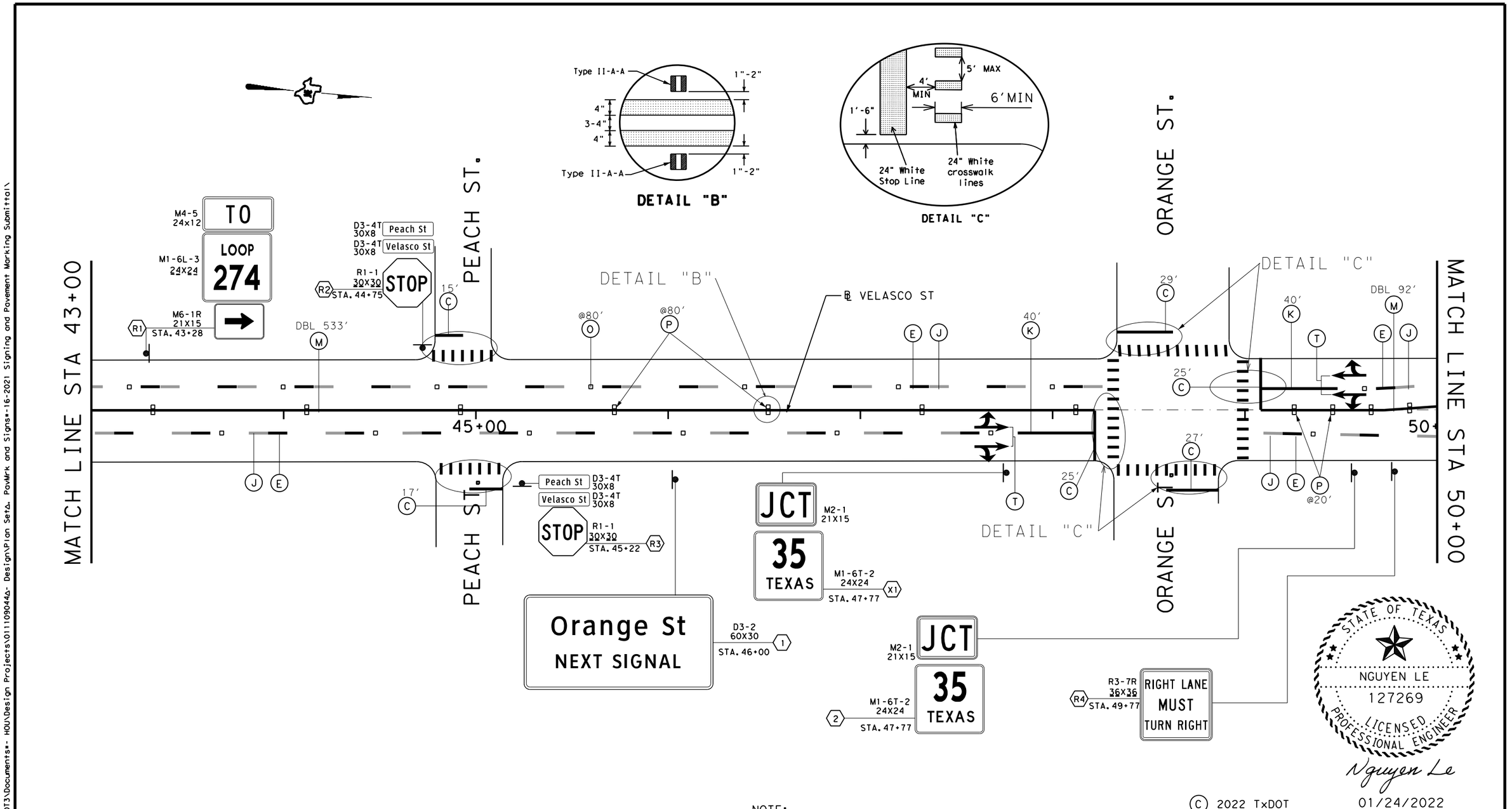
TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 6B OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		110
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA		0111	09	044	BS 288B



NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 7A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO			SHEET
DN.: - CK.: - DW.: - CK.: - REVISIONS	HOU	6				111
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA		0111	09	044	BS 288B

DATE: 1/14/2022
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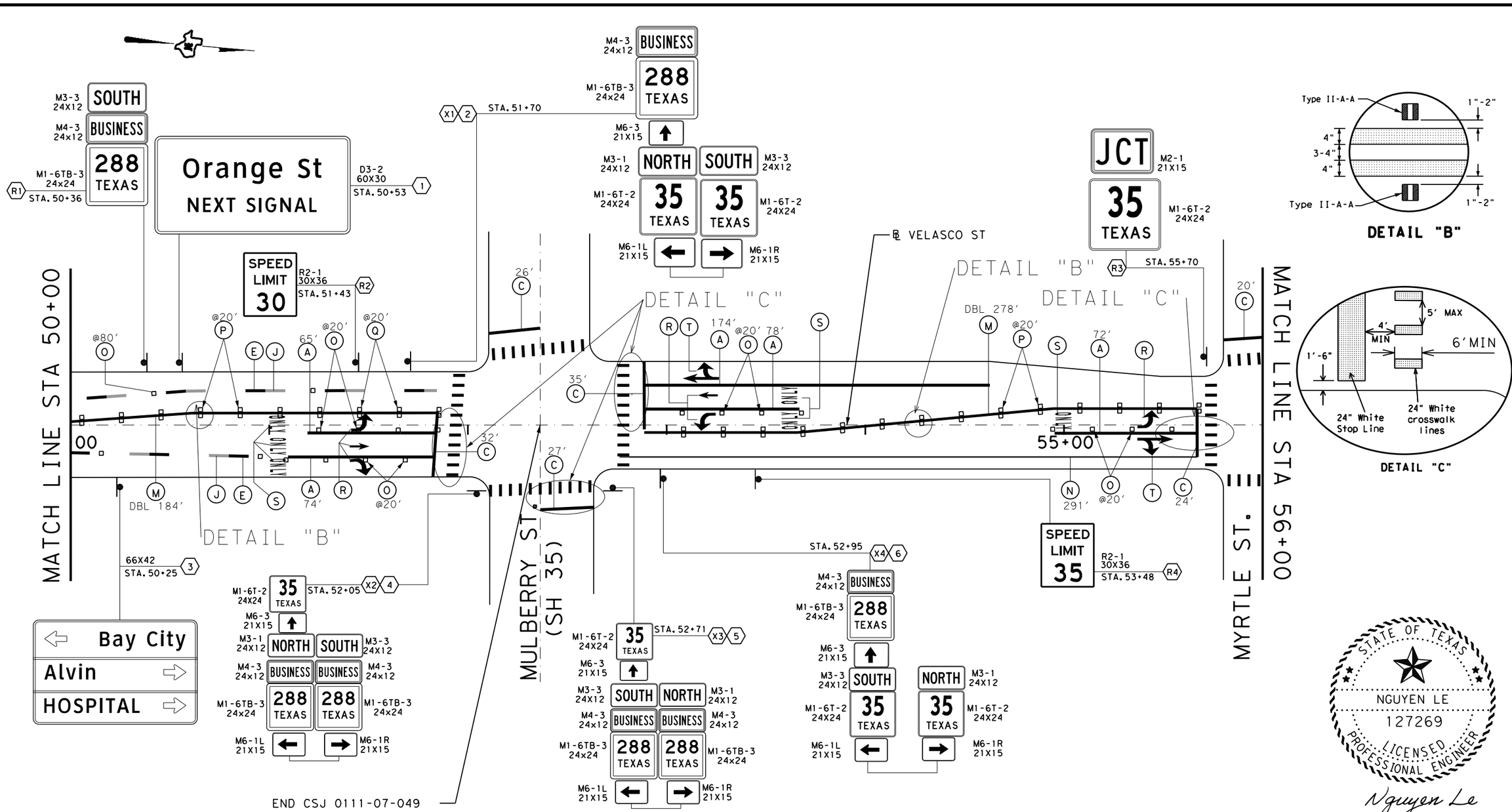

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LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

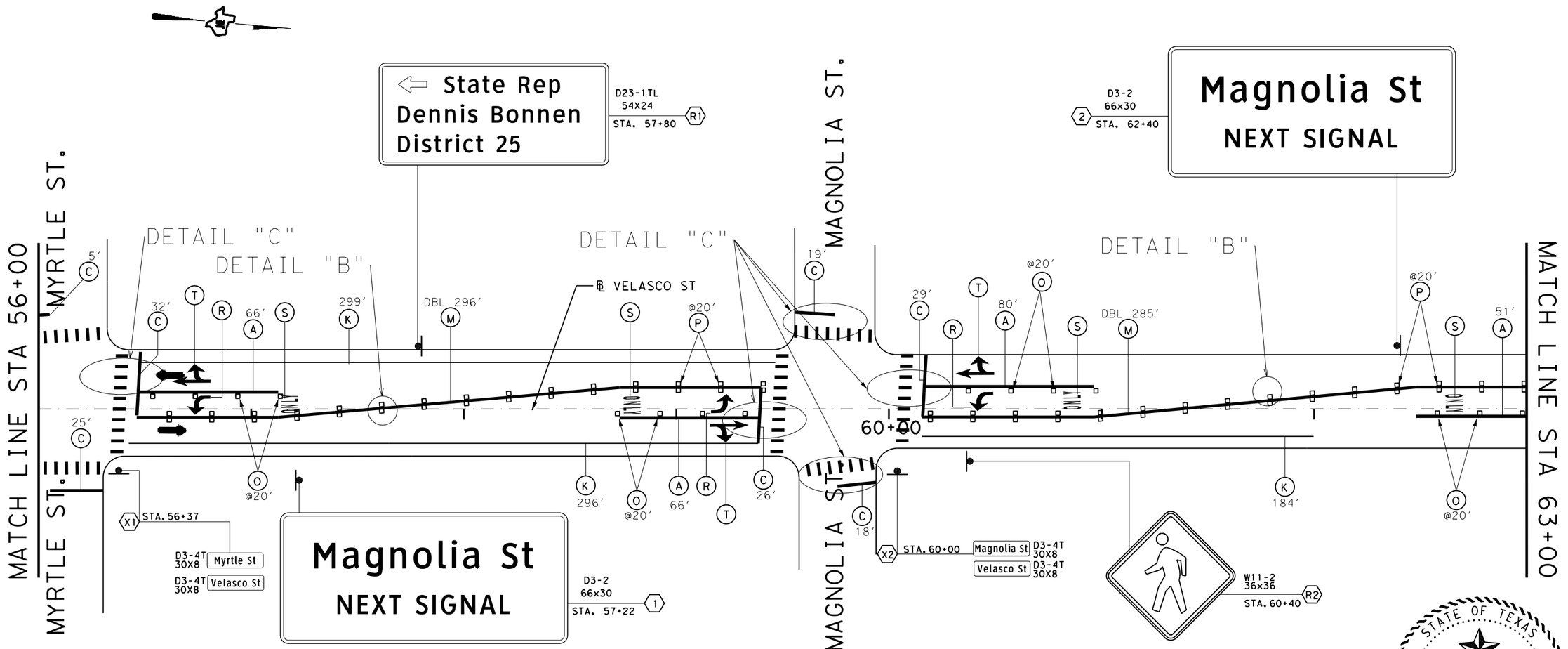
TEXAS DEPARTMENT OF TRANSPORTATION

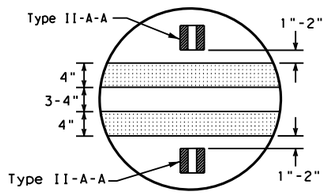
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

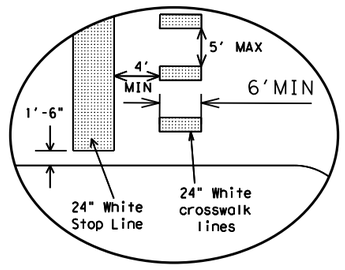
SHEET 7B OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - CK.: - DW.: - CK.: - REVISIONS	HOU	6		112
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B





DETAIL "B"



DETAIL "C"

LEGEND:

(A)	REFL PAV MRK TY I (W)(8")(SLD)(100MIL)	(I)	REFL PAV MRK TY II (Y)(18")(SLD)	(R)	PREFAB PAV MRK TY C (W)(ARROW)
(B)	REFL PAV MRK TY I (W)(12")(SLD)(100MIL)	(J)	RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)	(S)	PREFAB PAV MRK TY C (W)(WORD)
(C)	REFL PAV MRK TY I (W)(24")(SLD)(100MIL)	(K)	RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)	(T)	PREFAB PAV MRK TY C (W)(DBL ARROW)
(D)	REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)	(L)	RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)	(U)	PREFAB PAV MRK TY C (W)(RR XING)
(E)	REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)	(M)	RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)	(V)	PREFAB PAV MRK TY C (W) (18")(YLD TRI)
(EE)	REFL PV MRK TY I (W)(6")(DOT)(100MIL)	(N)	REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)	⬡	PROPOSED SMALL SIGN
(F)	REFL PAV MRK TY II (W)(12")(SLD)	(O)	REFL PAV MRKR TY-I-C	(T-)	RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
(G)	REFL PAV MRK TY II (W)(18")(SLD)	(P)	REFL PAV MRKR TY-II-A-A	(R-)	REPLACE SIGN PANEL
(H)	REFL PAV MRK TY II (Y)(12")(SLD)	(Q)	REFL PAV MRKR TY-II-CR	(X-)	REMOVE SM RD SN SUP & AM

⇆ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

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01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 8A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO			SHEET
REVISIONS	HOU	6				113
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA		0111	09	044	BS 288B

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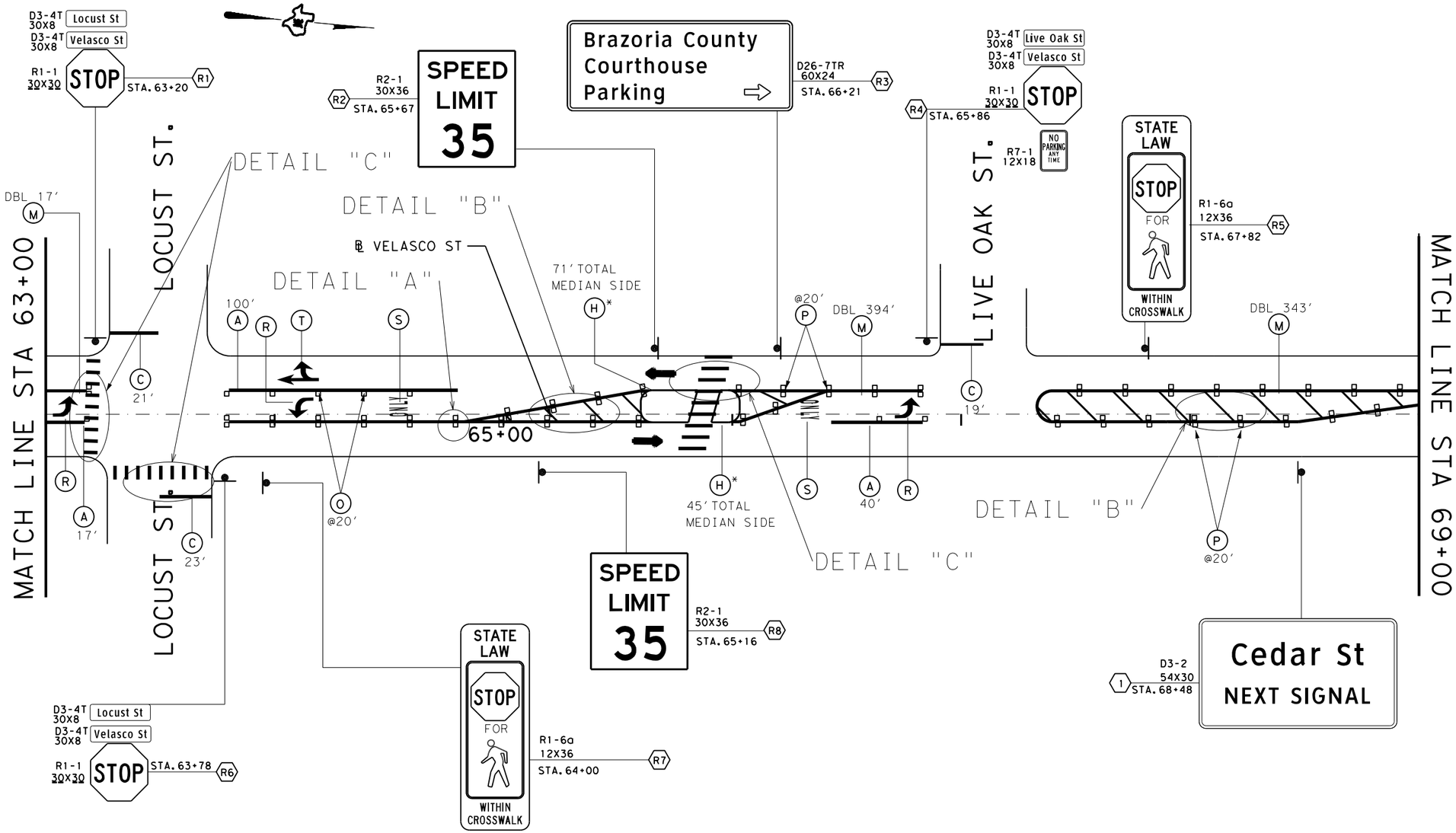

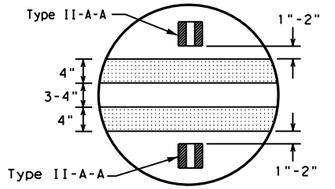

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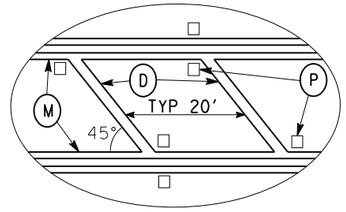

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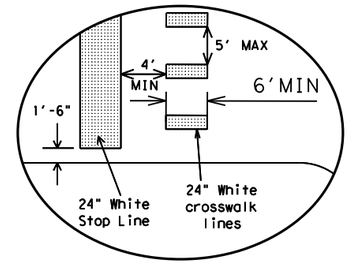

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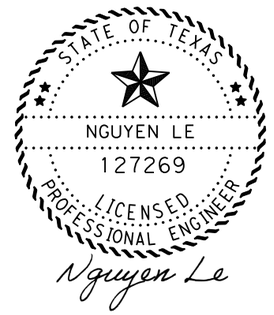

01/24/2022

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
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- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
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- (F) REFL PAV MRK TY II (W)(12")(SLD)
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- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
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- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW) ⇄ DIRECTION OF TRAVEL
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 8B OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - REVISIONS	HOU	6		114
CK.: -	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
DW.: -	BRAZORIA	0111	09	044	BS 288B
CK.: -					

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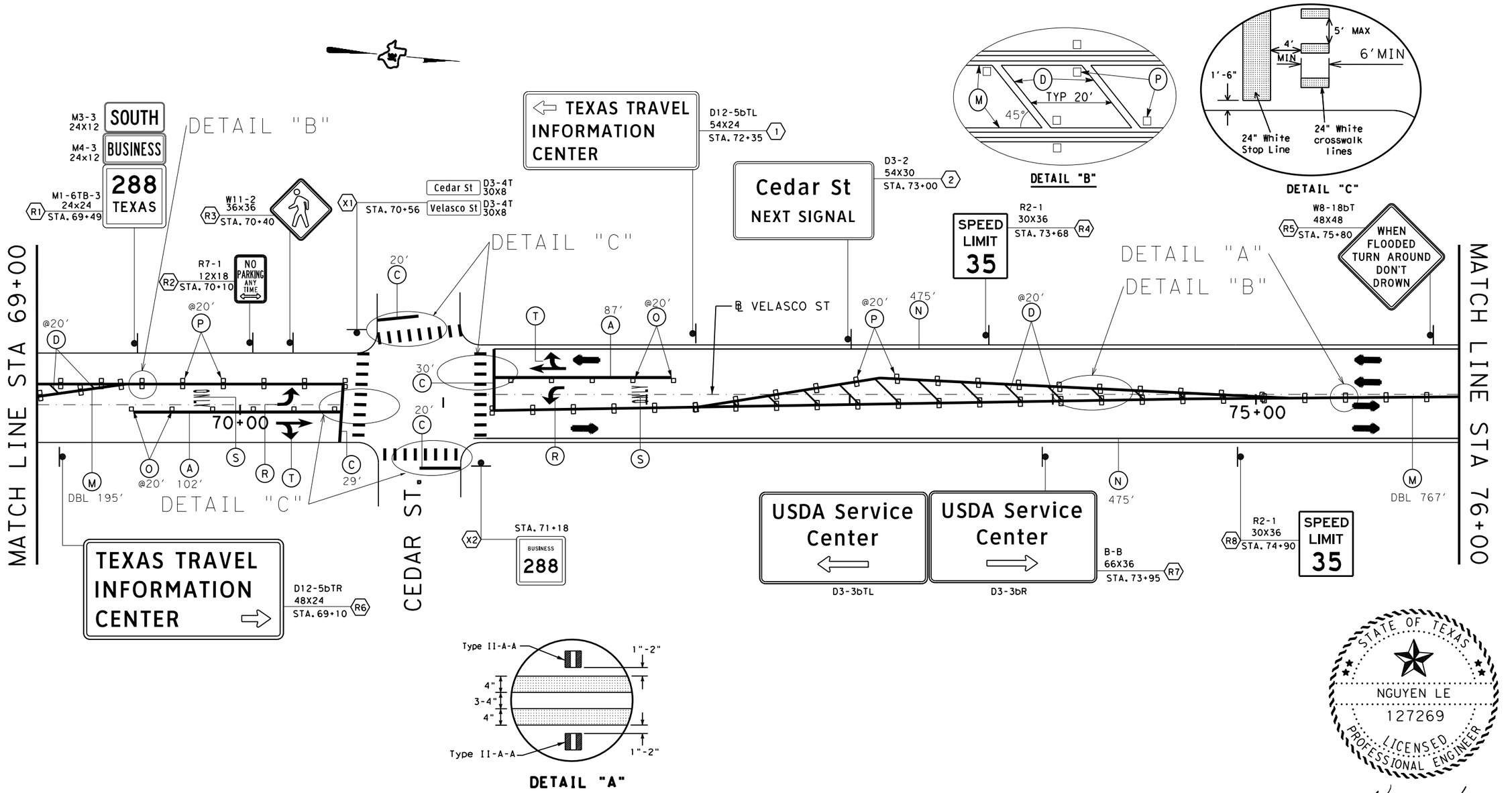

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- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
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- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
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- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
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- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 9A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO			SHEET
DN.: - REVISIONS	HOU	6				115
CK.: -	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
DW.: -	BRAZORIA		0111	09	044	BS 288B
CK.: -						

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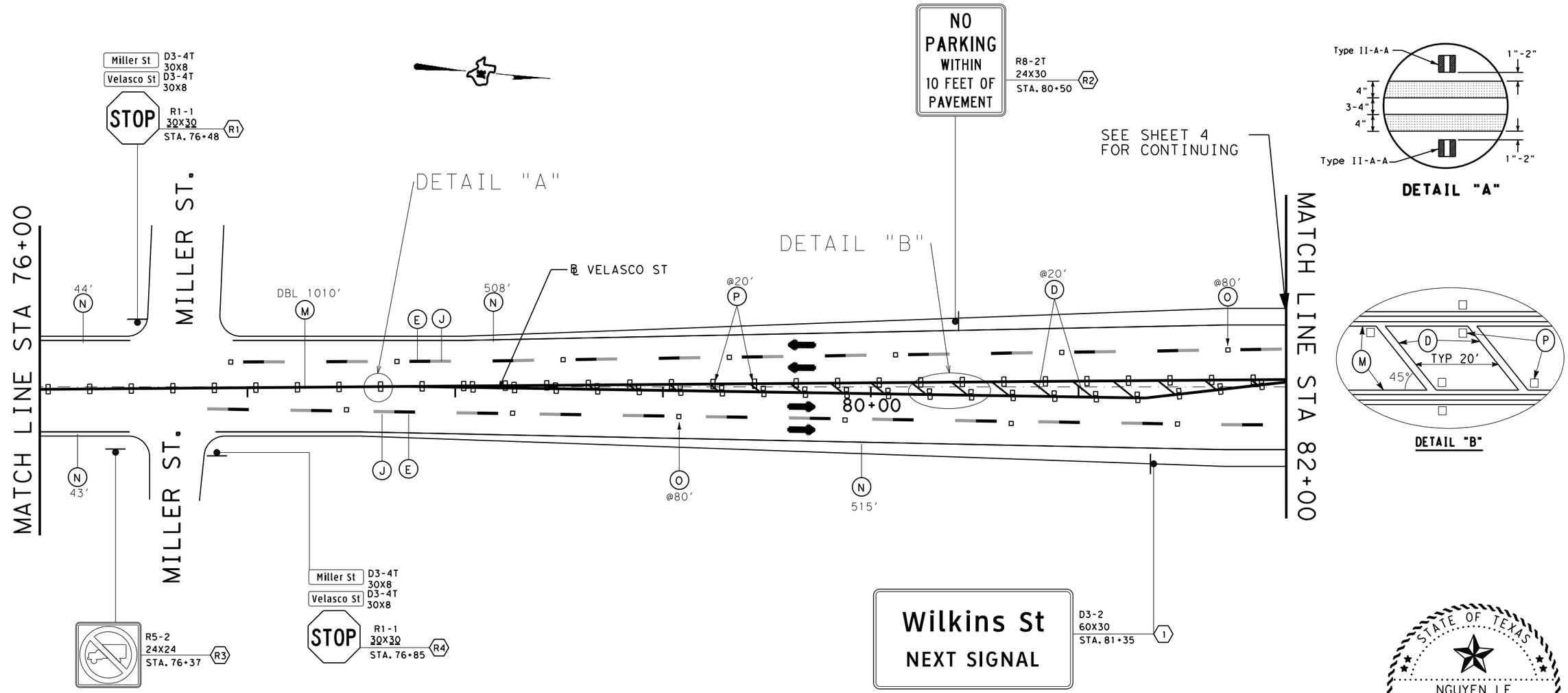

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- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

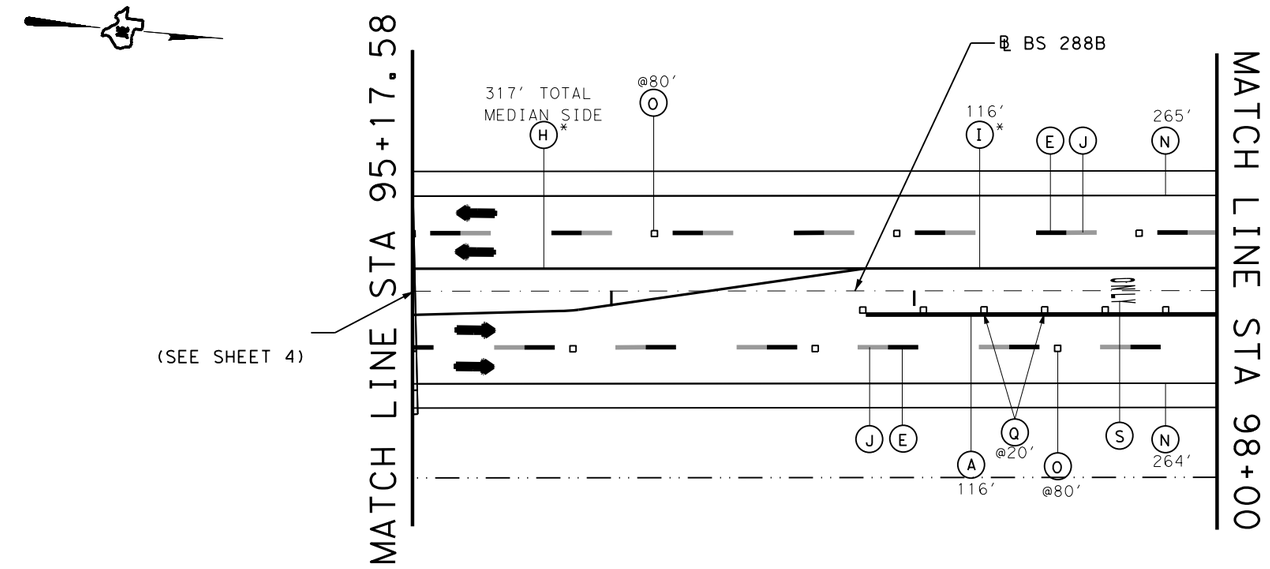
STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

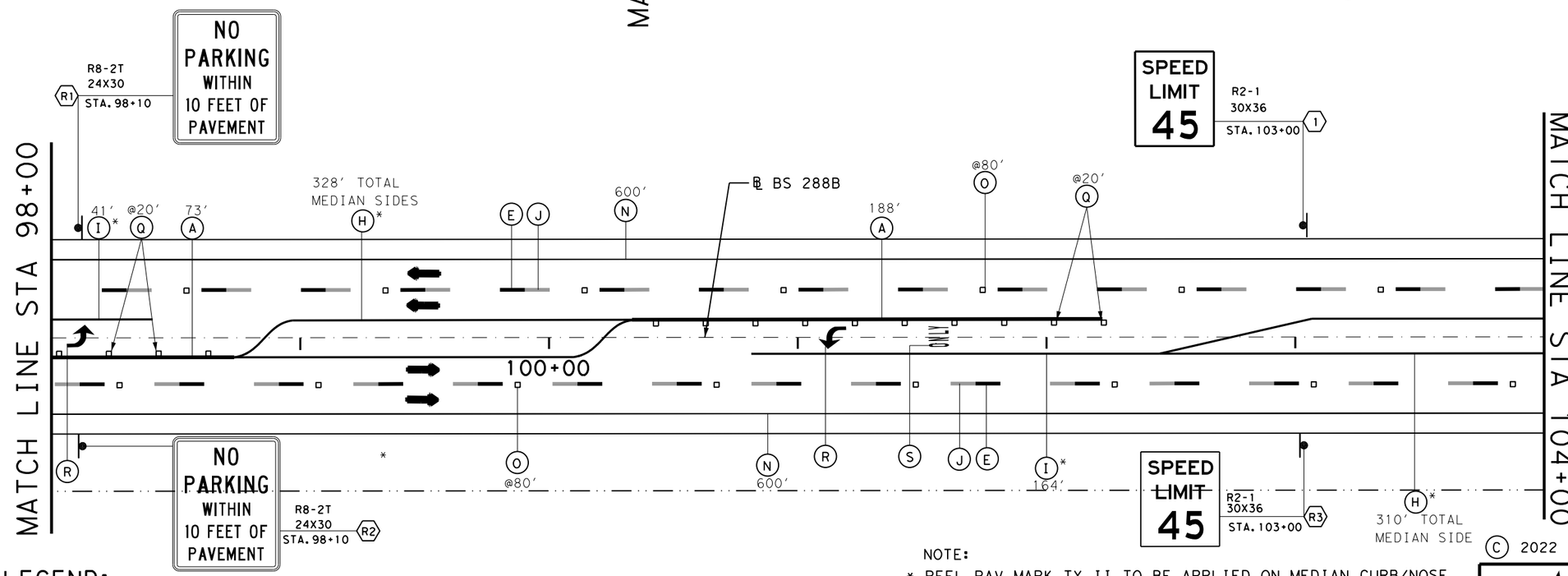
TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50′ SHEET 9B OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO				SHEET
REVISIONS	HOU	6					116
	COUNTY		CONTROL	SECTION	JOB		HIGHWAY
	BRAZORIA		0111	09	044		BS 288B





NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R) REPLACE SIGN PANEL
- (X) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

STATE OF TEXAS
NGUYEN LE
127269
LICENSED
PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

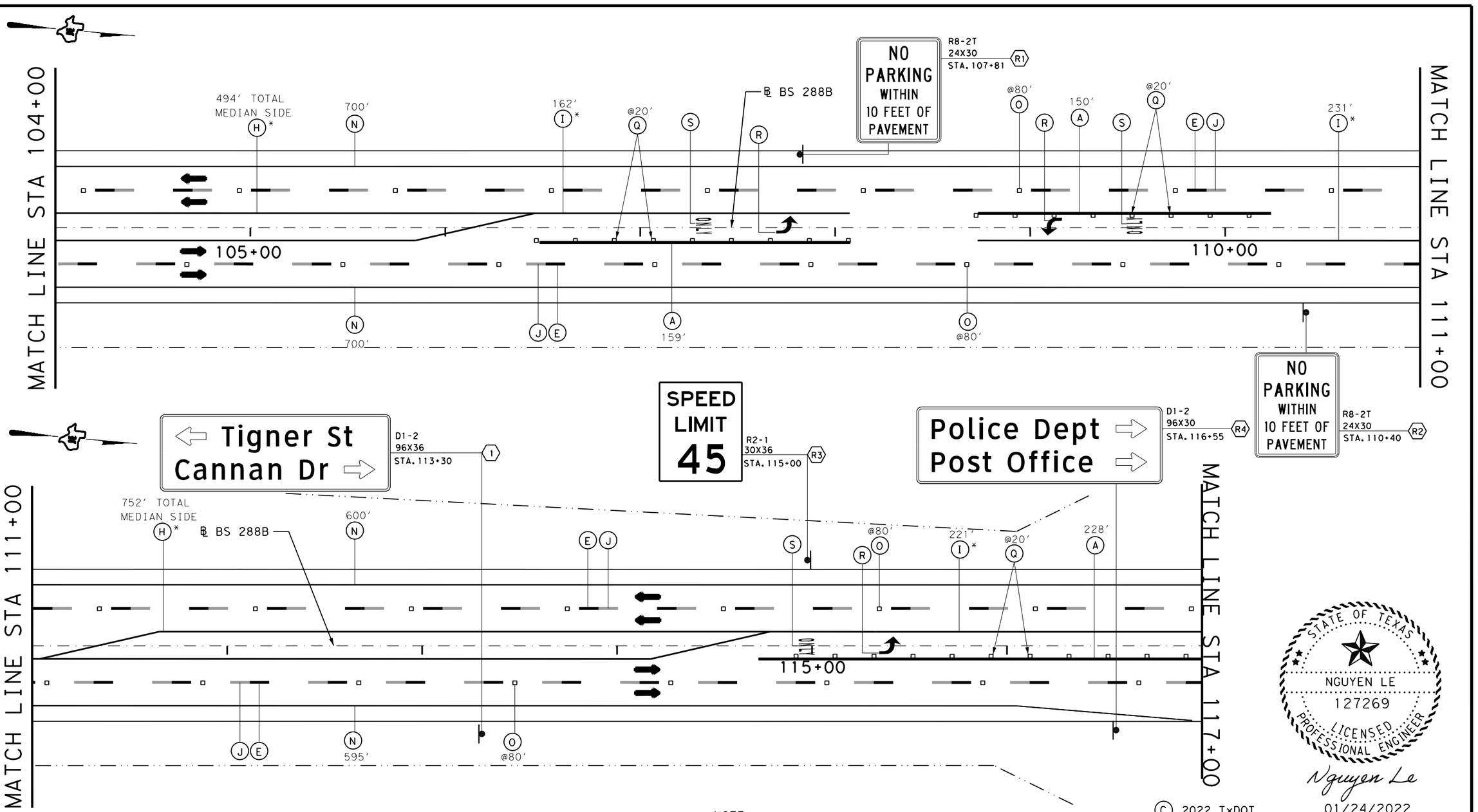
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 10 OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		117
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090440- Design\Plan Sets\ PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

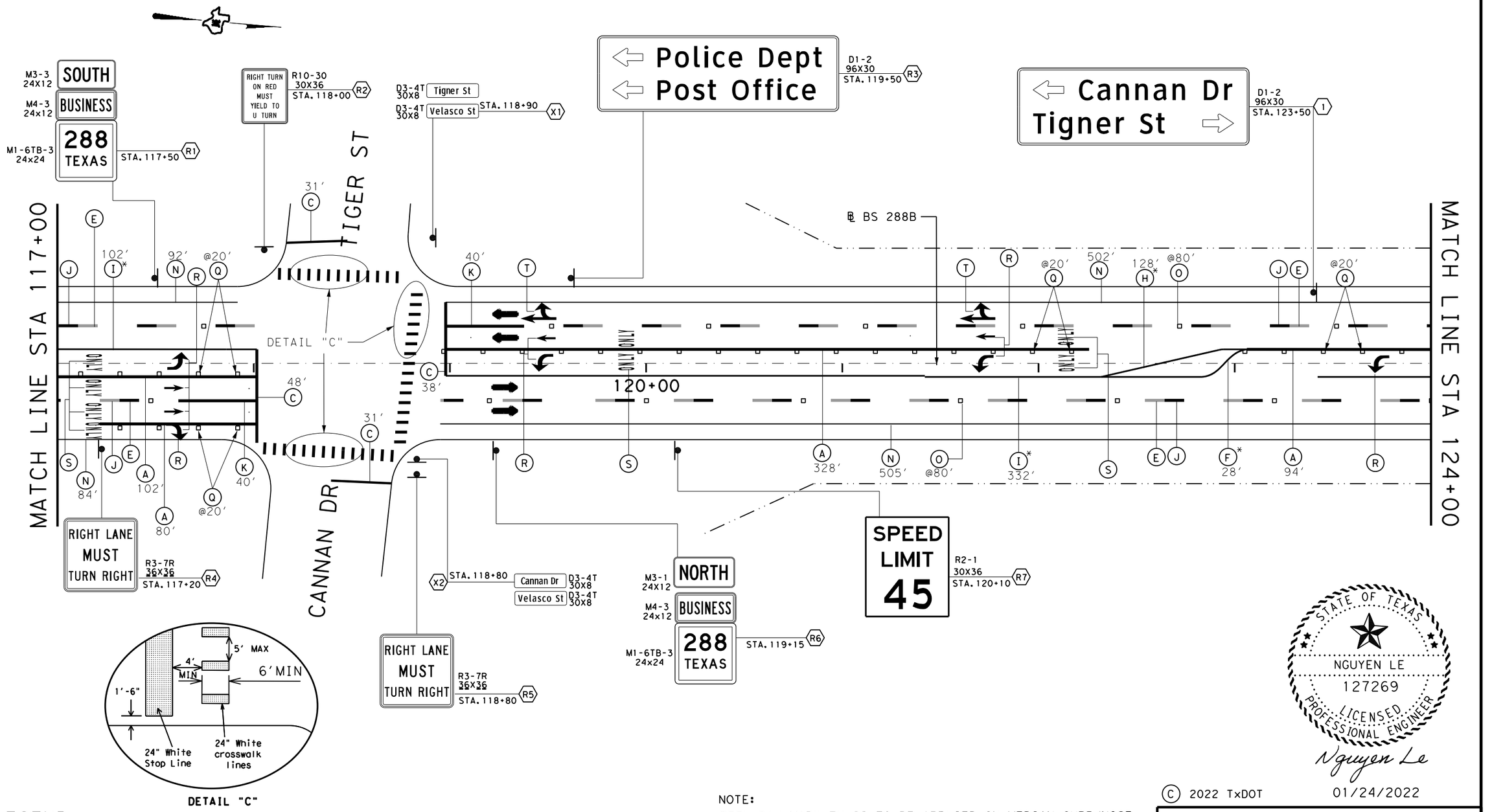
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 11 OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		118
DN.: -	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
CK.: -	BRAZORIA	0111	09	044	BS 288B
DN.: -					
CK.: -					

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents*- HOU\Design Projects\0111090440- Design\Plan Sets\ PavMrk and Signs*-16-2021 Signing and Pavement Marking Submittal\



LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

NGUYEN LE
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LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

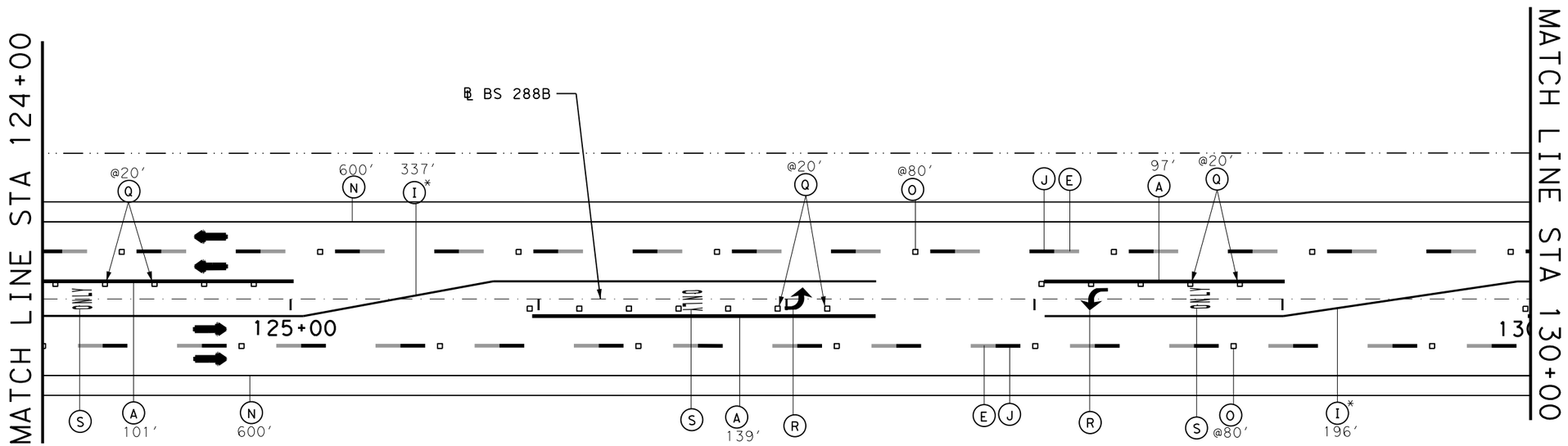
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 12A OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		119
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090044- Design\Plan Sets\ PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

STATE OF TEXAS
NGUYEN LE
127269
LICENSED
PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

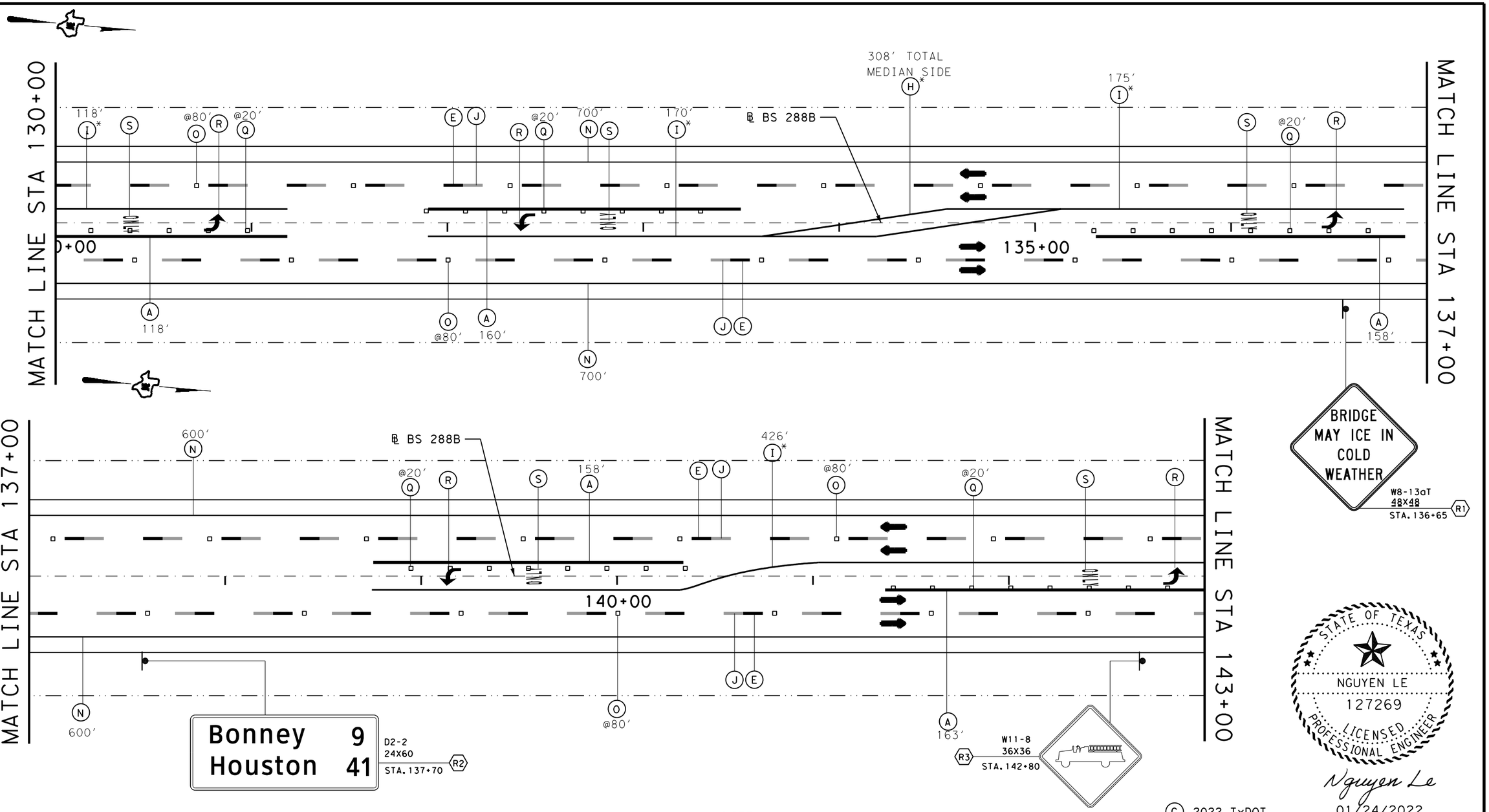
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 12B OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		120
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090440- Design\Plan Sets\ PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

STATE OF TEXAS
NGUYEN LE
127269
LICENSED
PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

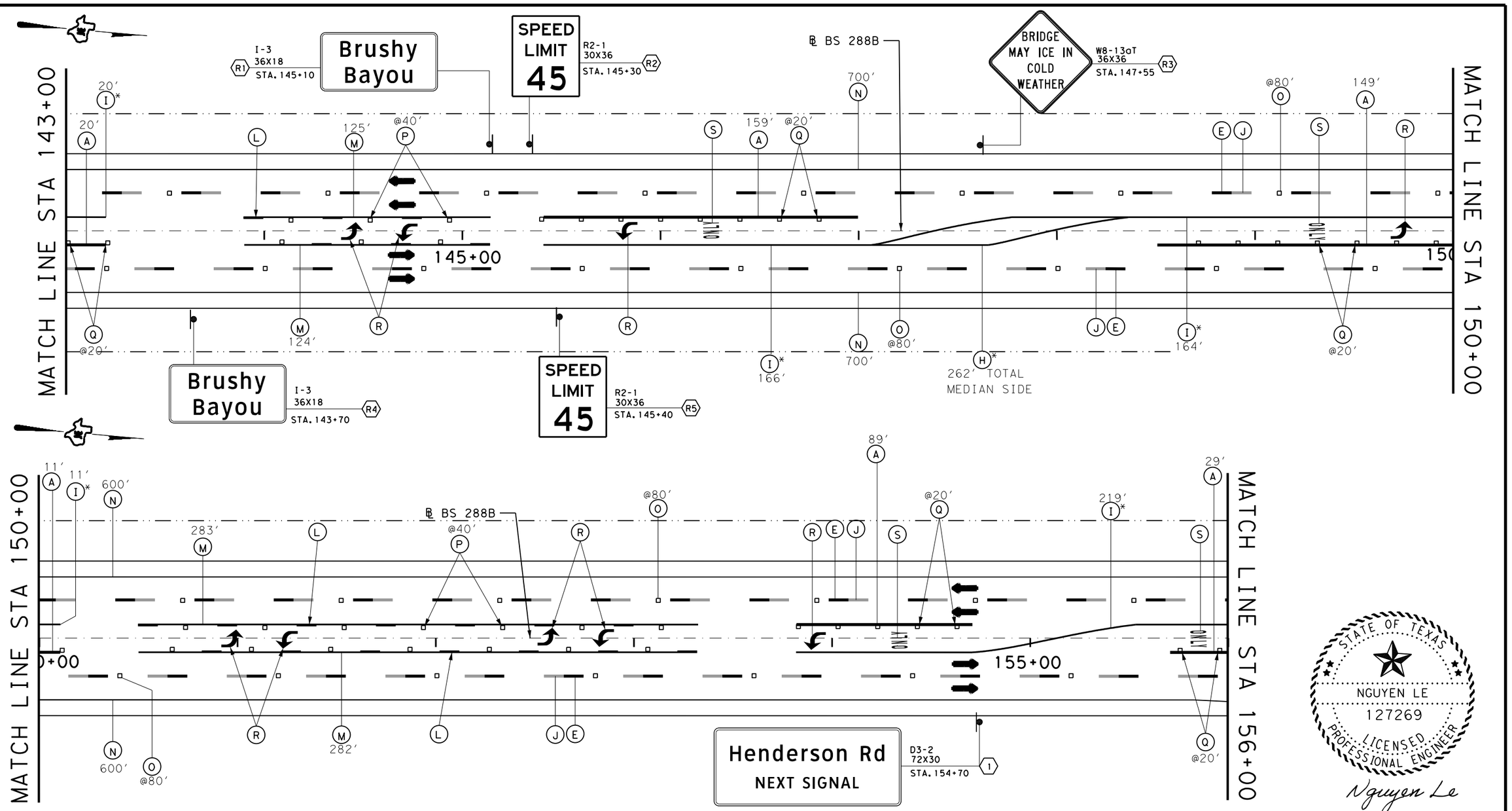
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 13 OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO			SHEET
REVISIONS	HOU	6				121
DN.:	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
CK.:	BRAZORIA		0111	09	044	BS 288B
DW.:						
CK.:						

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090440- Design\Plan Set\- PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

STATE OF TEXAS
NGUYEN LE
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LICENSED
PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

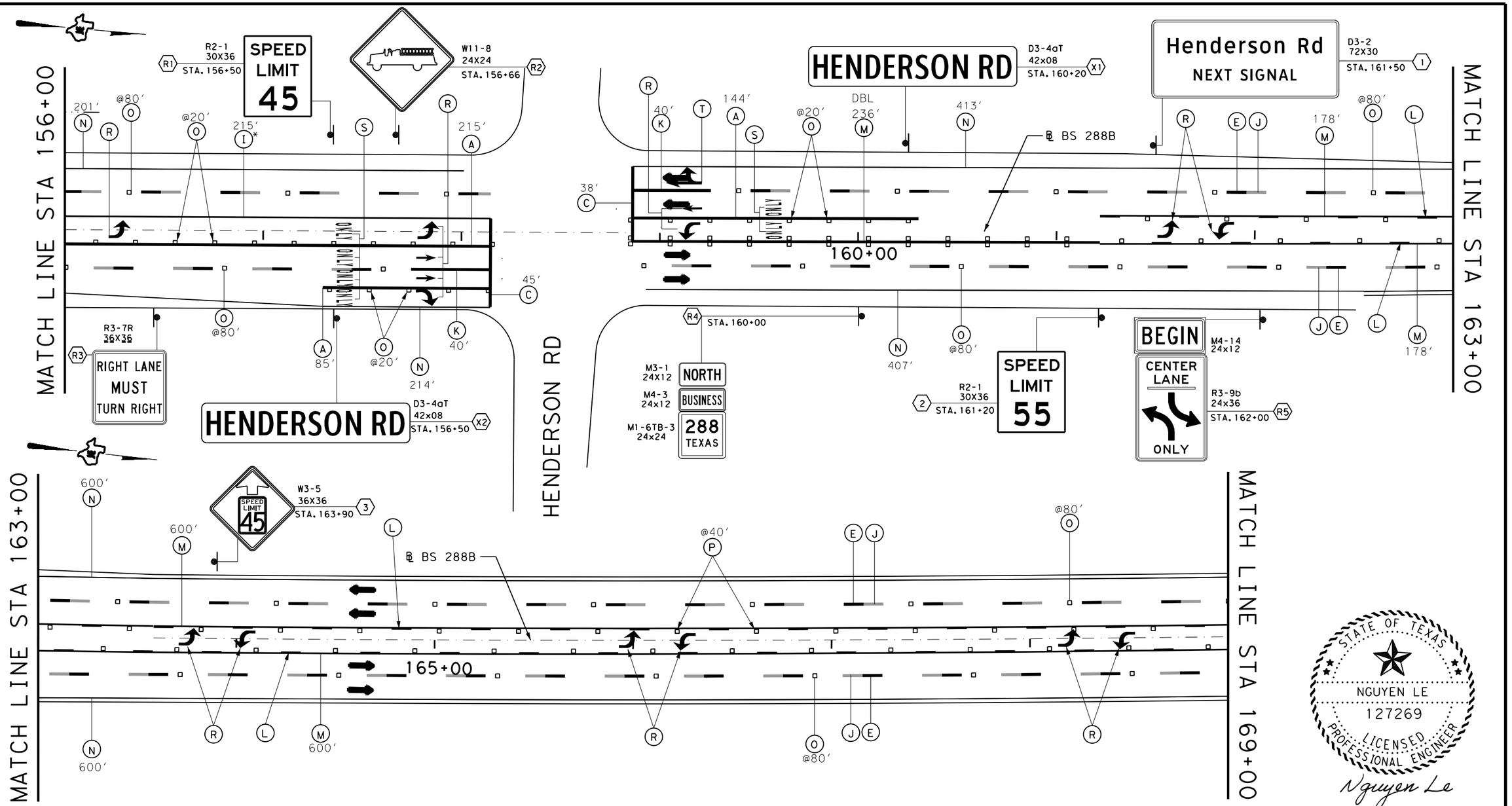
SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50'

SHEET 14 OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		122
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents*- HOU\Design Projects\0111090440- Design\Plan Sets, PavMrk and Signs*-16-2021 Signing and Pavement Marking Submittal\



NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇆ DIRECTION OF TRAVEL

NGUYEN LE
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LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
Nguyen Le
01/24/2022

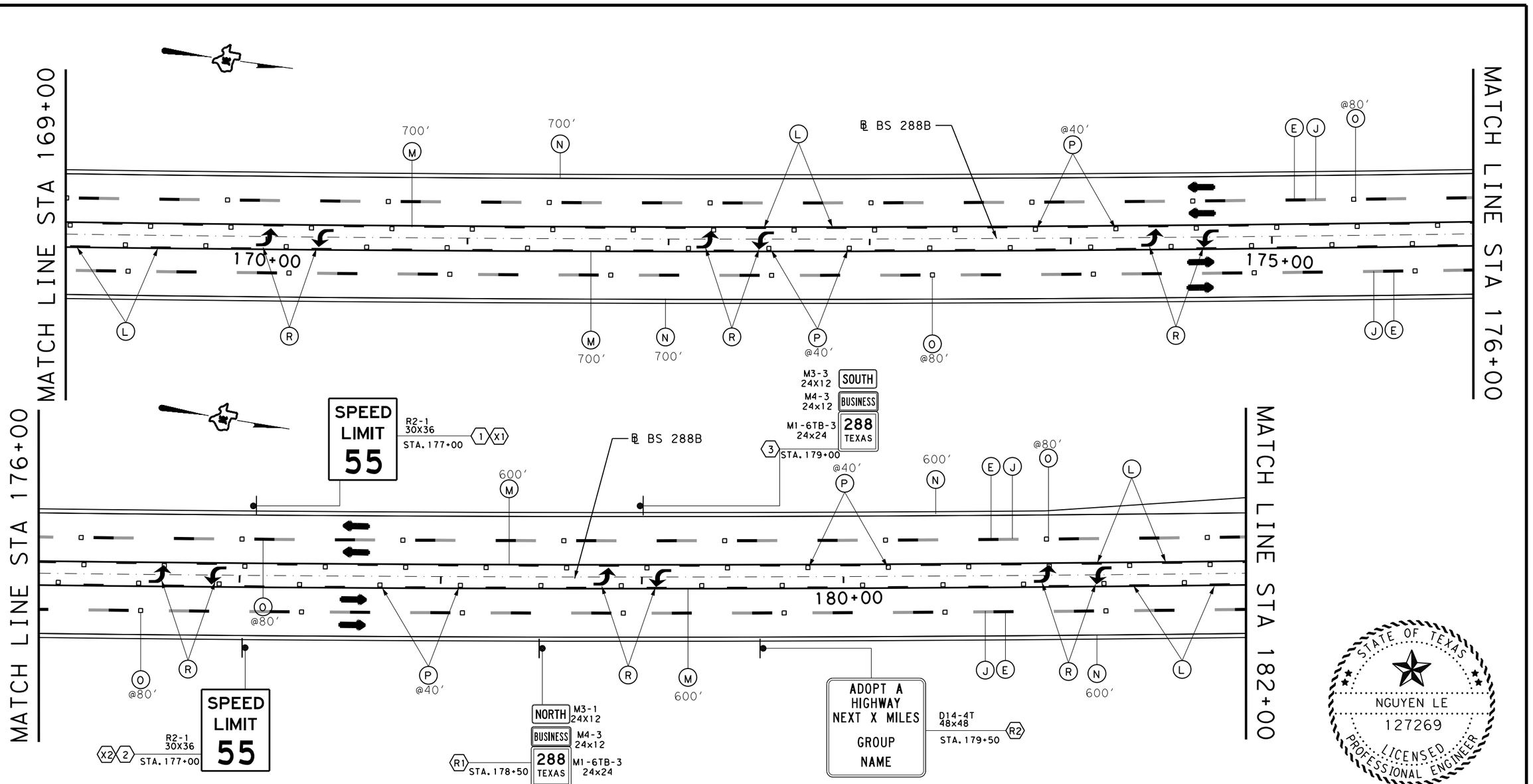
TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50′ SHEET 15 OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
REVISIONS	HOU	6		123
DN.: - CK.: - DW.: - CK.: -	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090440- Design\Plan Sets, PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

STATE OF TEXAS
NGUYEN LE
127269
LICENSED PROFESSIONAL ENGINEER
Nguyen Le
01/24/2022

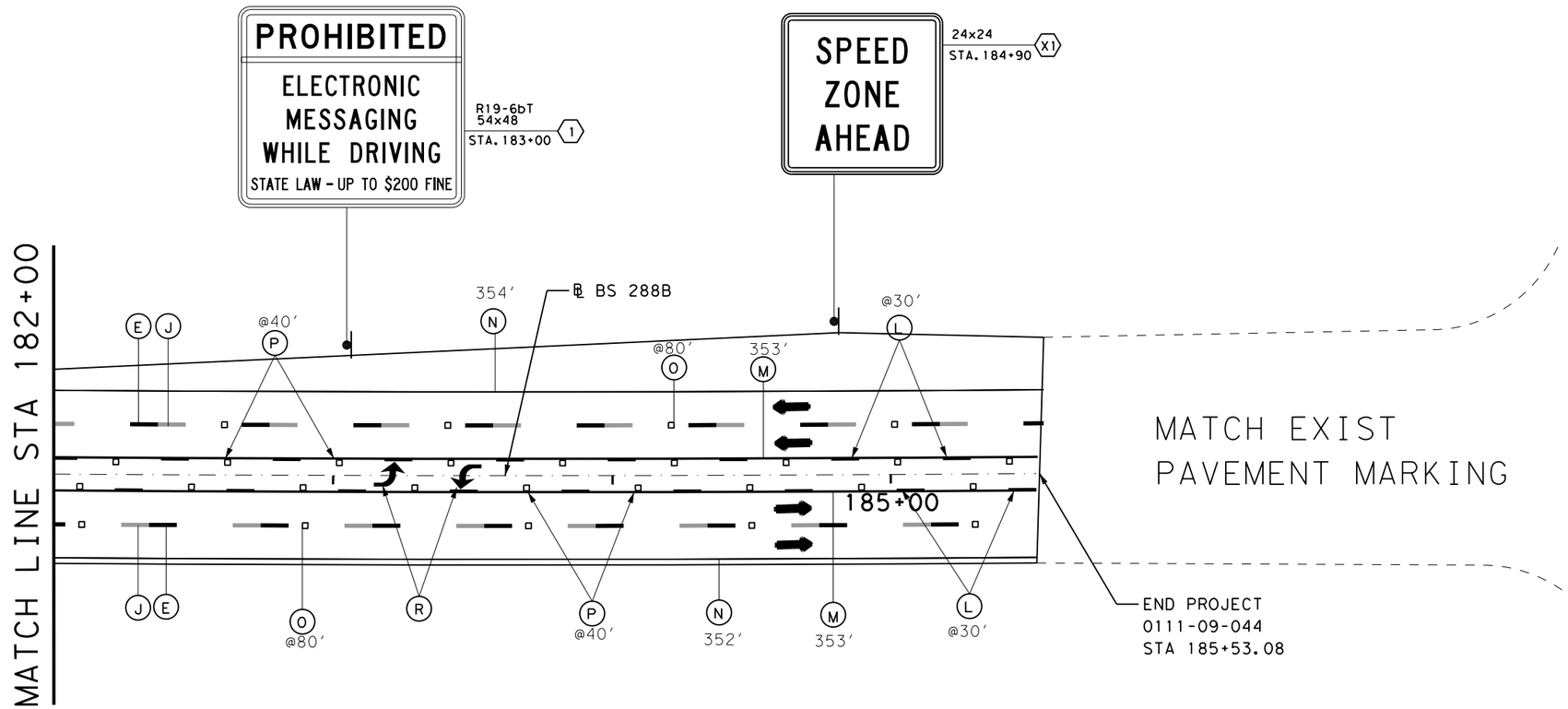
TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

SCALE: 1" : 50′ SHEET 16 OF 17

ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - REVISIONS	HOU	6		124
CK.: -	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
DN.: -	BRAZORIA	0111	09	044	BS 288B
CK.: -					

DATE: 1/14/2022
FILE: pw:\txdot.projectwiseonline.com:TXDOT3\Documents\- HOU\Design Projects\0111090440 - Design\Plan Sets. PavMrk and Signs\-16-2021 Signing and Pavement Marking Submittal\



LEGEND:

- (A) REFL PAV MRK TY I (W)(8")(SLD)(100MIL)
- (B) REFL PAV MRK TY I (W)(12")(SLD)(100MIL)
- (C) REFL PAV MRK TY I (W)(24")(SLD)(100MIL)
- (D) REFL PAV MRK TY I (Y)(12")(SLD)(100MIL)
- (E) REFL PV MRK TY I (BLACK)(6")(SHADOW)(100MIL)
- (EE) REFL PV MRK TY I (W)(6")(DOT)(100MIL)
- (F) REFL PAV MRK TY II (W)(12")(SLD)
- (G) REFL PAV MRK TY II (W)(18")(SLD)
- (H) REFL PAV MRK TY II (Y)(12")(SLD)
- (I) REFL PAV MRK TY II (Y)(18")(SLD)
- (J) RE PM W/RET REQ TY I (W)(6")(BRK)(100MIL)
- (K) RE PM W/RET REQ TY I (W)(6")(SLD)(100MIL)
- (L) RE PM W/RET REQ TY I (Y)(6")(BRK)(100MIL)
- (M) RE PM W/RET REQ TY I (Y)(6")(SLD)(100MIL)
- (N) REF PROF PAV MRK TY I (W)(6")(SLD)(100MIL)
- (O) REFL PAV MRKR TY-I-C
- (P) REFL PAV MRKR TY-II-A-A
- (Q) REFL PAV MRKR TY-II-CR
- (R) PREFAB PAV MRK TY C (W)(ARROW)
- (S) PREFAB PAV MRK TY C (W)(WORD)
- (T) PREFAB PAV MRK TY C (W)(DBL ARROW)
- (U) PREFAB PAV MRK TY C (W)(RR XING)
- (V) PREFAB PAV MRK TY C (W) (18")(YLD TRI)
- ⬡ PROPOSED SMALL SIGN
- (T-) RELOCATE SM RD SN SUP & AM TY 10BWG (644-6068)
- (R-) REPLACE SIGN PANEL
- (X-) REMOVE SM RD SN SUP & AM

⇄ DIRECTION OF TRAVEL

NOTE:
* REFL PAV MARK TY II TO BE APPLIED ON MEDIAN CURB/NOSE.

STATE OF TEXAS
NGUYEN LE
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Nguyen Le
01/24/2022

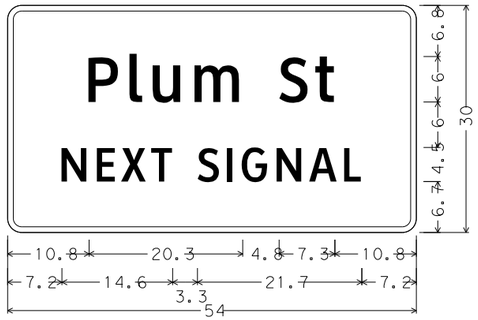
TEXAS DEPARTMENT OF TRANSPORTATION

SIGNING & PAVEMENT MARKING LAYOUT (BS 288B, ETC.)

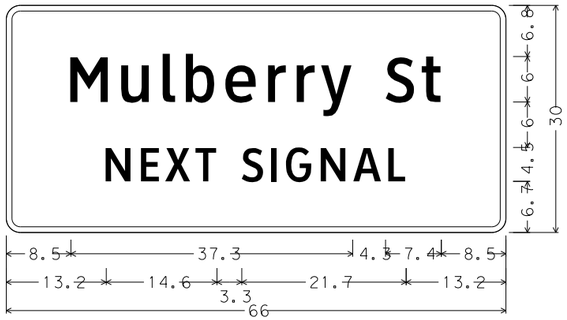
SCALE: 1" : 50'

SHEET 17 OF 17

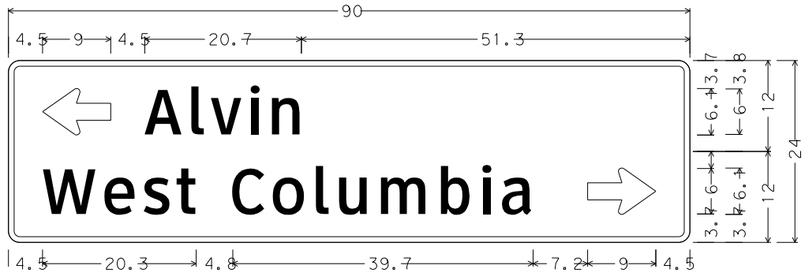
ORIGINAL DRAWING DATE: DECEMBER, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - REVISIONS	HOU	6		125
CK.: -	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
DR.: -	BRAZORIA	0111	09	044	BS 288B
CK.: -					



D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Plum St", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;
SHEET 2A OF 17 SIGN #1, #5



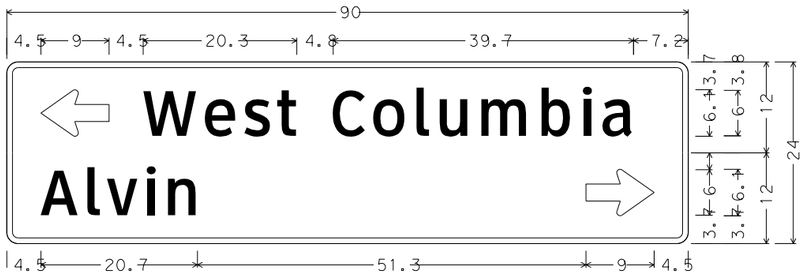
D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Mulberry St", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;
SHEET 2A OF 17 SIGN #6
SHEET 2B OF 17 SIGN #3



D1-2 6in LT-RT;

1.5" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.0" X 6.1" 180′; "Alvin", ClearviewHwy-3-W;

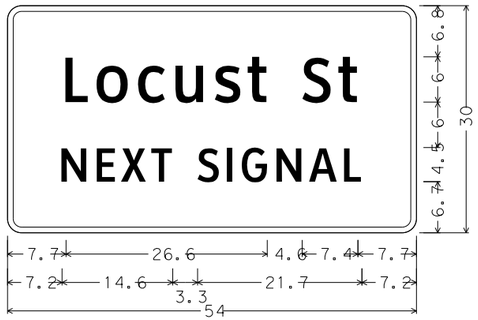
1.5" Radius, 0.8" Border, White on, Green;
"West Columbia", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0′;
SHEET 02B OF 17 SIGN # R10



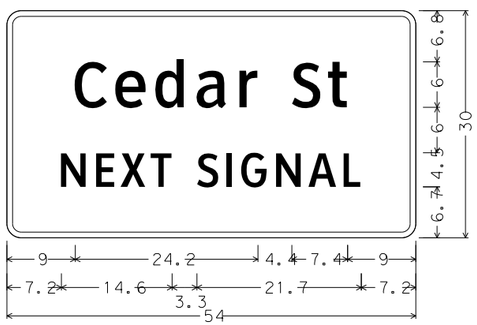
D1-2 6in LT-RT;

1.5" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.0" X 6.1" 180′; "West Columbia", ClearviewHwy-3-W;

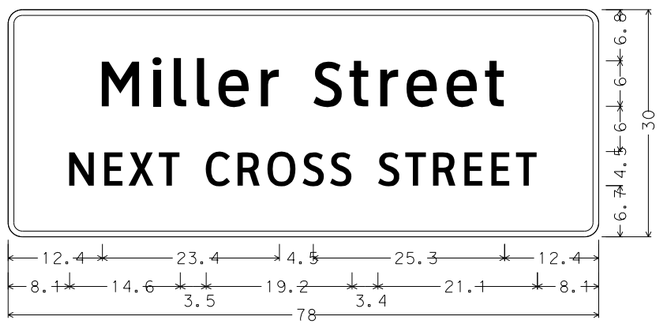
1.5" Radius, 0.8" Border, White on, Green;
"Alvin", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0′;
SHEET 02B OF 17 SIGN #R12



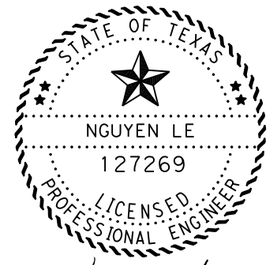
D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Locust St", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;
SHEET 3A OF 17 SIGN #2, #R6



D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Cedar St", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;
SHEET 3A OF 17 SIGN #R13
SHEET 3B OF 17 SIGN #R3



D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Miller Street", ClearviewHwy-3-W;
"NEXT CROSS STREET", ClearviewHwy-3-W;
SHEET 3B OF 17 SIGN #1, # R11



01/24/2022

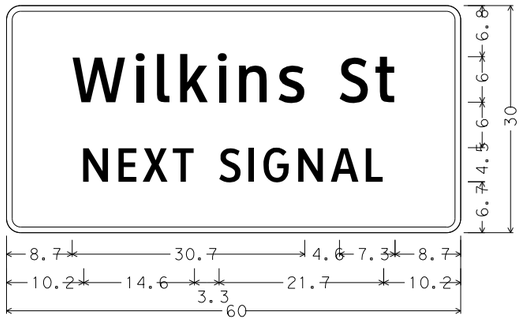
TEXAS DEPARTMENT OF TRANSPORTATION

SMALL SIGNS DETAILS (BS 288B, ETC.)

SCALE: N.S.T

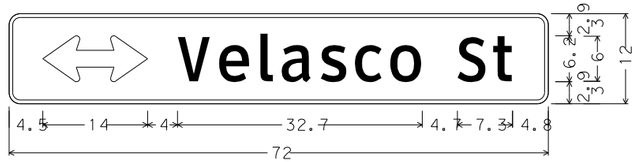
SHEET 1 OF 6

ORIGINAL DRAWING DATE: APRIL, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO			SHEET
DN.: - CK.: - DW.: - CK.: - REVISIONS	HOU	6				126
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA		0111	09	044	BS 288B



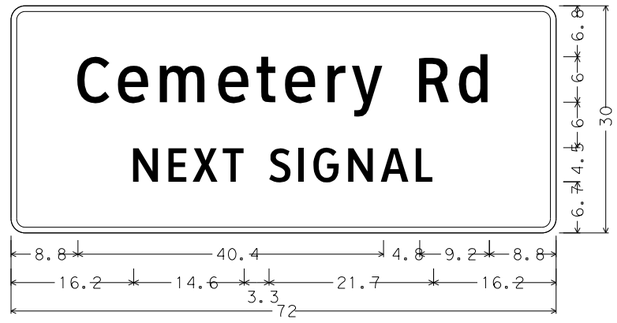
D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Wilkins St", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;

SHEET 3B OF 17 SIGN #3
SHEET 04 OF 17 SIGN #3
SHEET 9B OF 17 SIGN #1



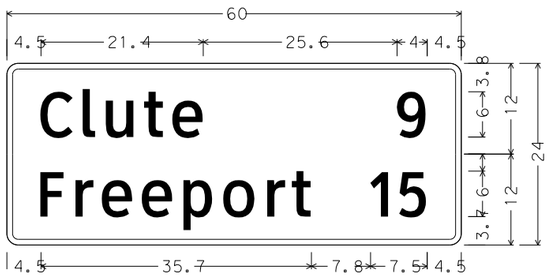
D21-1TDBL_VARx12;
1.5" Radius, 0.5" Border, White on, Green;
Double Headed Arrow Custom - 14.0" 0';
"Velasco St", ClearviewHwy-3-W;

SHEET 04 OF 17 SIGN #3



D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Cemetery Rd", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;

SHEET 5A OF 17 SIGN #1

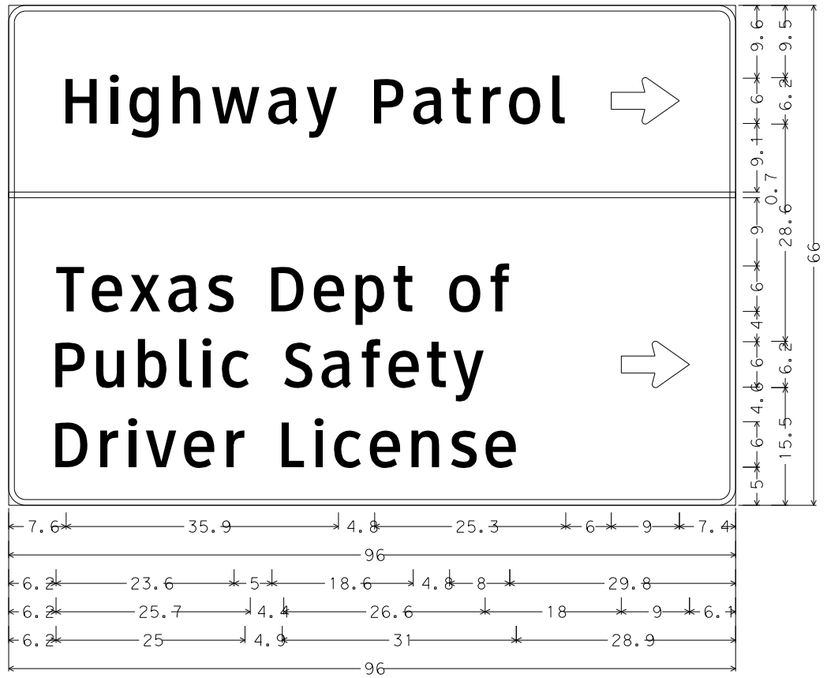


D2-2 6in;

1.5" Radius, 0.8" Border, White on, Green;
"Clute ", ClearviewHwy-3-W; "9", ClearviewHwy-3-W;

1.5" Radius, 0.8" Border, White on, Green;
"Freeport", ClearviewHwy-3-W; "15", ClearviewHwy-3-W;

SHEET 5A OF 17 SIGN #R3



D21-3T(1)_VARx36;
2.3" Radius, 0.8" Border, White on, Green;
"Highway Patrol", ClearviewHwy-3-W; Standard Arrow Custom 9.0" X 6.1" 0';
"Texas Dept of", ClearviewHwy-3-W; "Public Safety", ClearviewHwy-3-W;
Standard Arrow Custom 9.0" X 6.1" 0'; "Driver License ", ClearviewHwy-3-W;

SHEET 6A OF 17 SIGN #3
SHEET 6B OF 17 SIGN #1

STATE OF TEXAS
NGUYEN LE
127269
LICENSED
PROFESSIONAL ENGINEER
Nguyen Le

01/24/2022

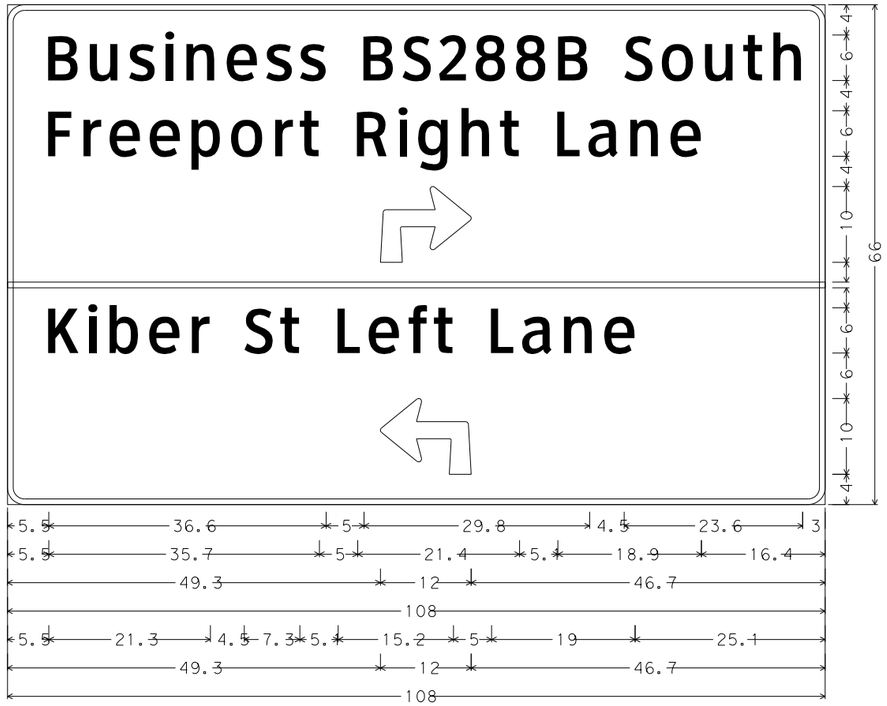
TEXAS DEPARTMENT OF TRANSPORTATION

SMALL SIGNS DETAILS (BS 288B, ETC.)

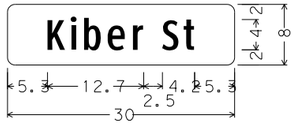
SCALE: N.S.T

SHEET 2 OF 6

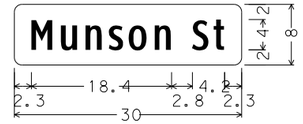
ORIGINAL DRAWING DATE: APRIL, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - CK.: - DW.: - CK.: - REVISIONS	HOU	6		126A
	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA		0111	09	044	BS 288B



D21-3T(1)_VARx36;
2.3" Radius, 0.8" Border, White on, Green;
"Business BS288B South", ClearviewHwy-3-W; "Freeport Right Lane", ClearviewHwy-3-W;
90 Deg Advance Turn Arrow 12.0" X 10.0"; "Kiber St Left Lane", ClearviewHwy-3-W;
90 Deg Advance Turn Arrow 12.0" X 10.0";
SHEET 6A OF 17 SIGN #2

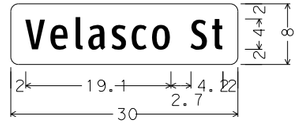


D3-4T;
1.0" Radius, No border, Green;
"Kiber St" White, ClearviewHwy-2-W specified length;
SHEET 6A OF 17 SIGN #R1

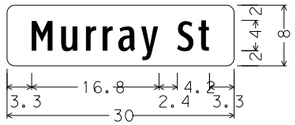


D3-4T;
1.0" Radius, No border, Green;
"Munson St" White, ClearviewHwy-2-W specified length;
SHEET 6A OF 17 SIGN #R7

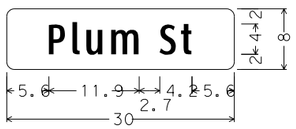
24x24;
1.5" Radius, 0.6" Border, 0.4" Indent, Black on, White;
"KIBER", C specified length;
"ST", D specified length;
"LEFT", B specified length;
"ONLY", B specified length;
Standard Arrow Custom 7.9" X 4.7" 180° White;
SHEET 6A OF 17 SIGN #R3



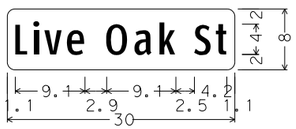
D3-4T;
1.0" Radius, No border, Green;
"Velasco St" White, ClearviewHwy-2-W specified length;
SHEET 6A OF 17 SIGN #R1, #R7
SHEET 6B OF 17 SIGN #R1, #R3, #R4, #R6
SHEET 7A OF 17 SIGN #R2, #R3
SHEET 8B OF 17 SIGN #R1, #R4, #R6
SHEET 9B OF 17 SIGN #R1, #R4



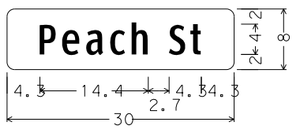
D3-4T;
1.0" Radius, No border, Green;
"Murray St" White, ClearviewHwy-2-W specified length;
SHEET 6B OF 17 SIGN #R1, #R4



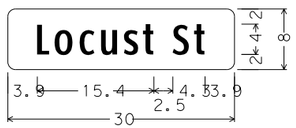
D3-4T;
1.0" Radius, No border, Green;
"Plum St" White, ClearviewHwy-2-W specified length;
SHEET 6B OF 17 SIGN #R3, #R6



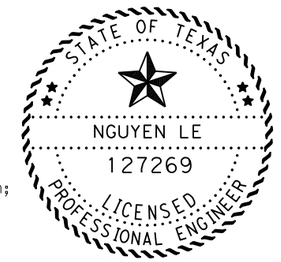
D3-4T;
1.0" Radius, No border, Green;
"Live Oak St" White, ClearviewHwy-2-W specified length;
SHEET 8B OF 17 SIGN #R4



D3-4T;
1.0" Radius, No border, Green;
"Peach St" White, ClearviewHwy-2-W specified length;
SHEET 7A OF 17 SIGN #R2, #R3



D3-4T;
1.0" Radius, No border, Green;
"Locust St" White, ClearviewHwy-2-W specified length;
SHEET 8B OF 17 SIGN #R1, #R6



Nguyen Le
01/24/2022

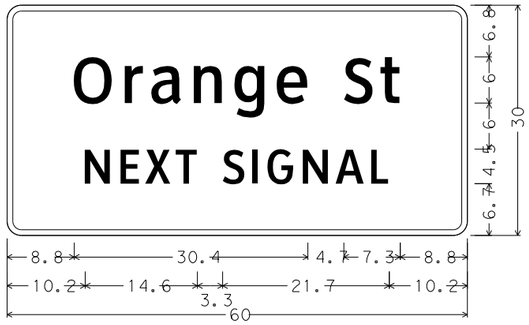
TEXAS DEPARTMENT OF TRANSPORTATION

SMALL SIGNS DETAILS (BS 288B, ETC.)

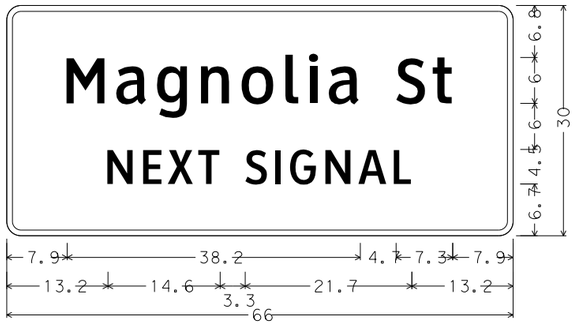
SCALE: N.S.T

SHEET 3 OF 6

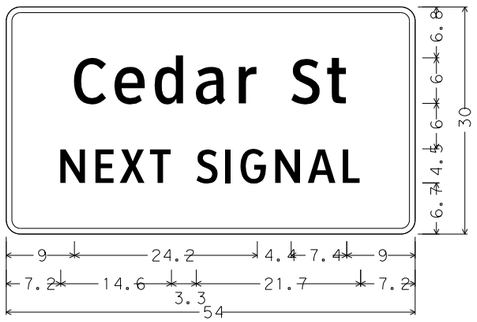
ORIGINAL DRAWING DATE: APRIL, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - CK.: - DW.: - CK.: - REVISIONS	HOU	6		126B
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B



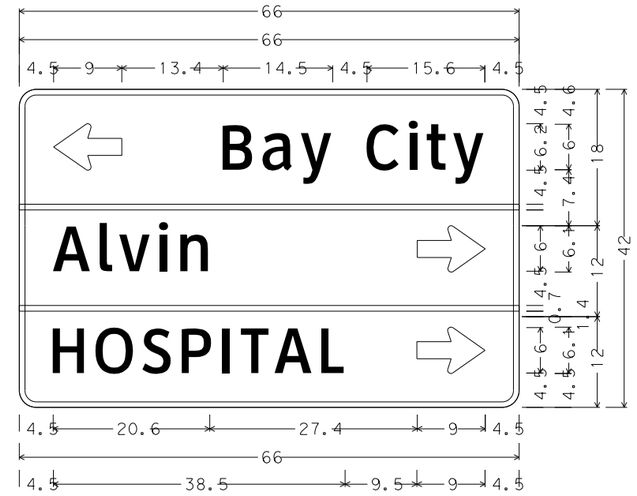
D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Orange St", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;
SHEET 7A OF 17 SIGN #1
SHEET 7B OF 17 SIGN #1



D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Magnolia St", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;
SHEET 8A OF 17 SIGN #1, #2



D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Cedar St", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;
SHEET 8B OF 17 SIGN #1
SHEET 9A OF 17 SIGN #2

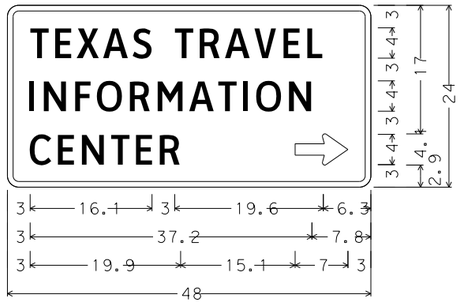


D1-3 6in LT-RT-RT;

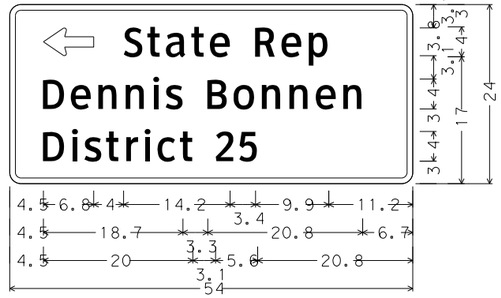
2.3" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 9.0" X 6.1" 180';
"Bay City", ClearviewHwy-3-W;

2.3" Radius, 0.8" Border, White on, Green;
"Alvin", ClearviewHwy-3-W;
Standard Arrow Custom 9.0" X 6.1" 0';

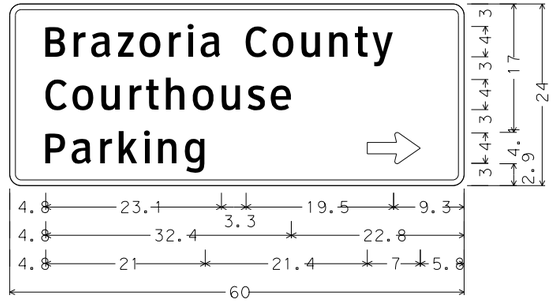
2.3" Radius, 0.8" Border, White on, Blue;
"HOSPITAL", ClearviewHwy-3-W;
Standard Arrow Custom 9.0" X 6.1" 0';
SHEET 7B OF 17 SIGN #3



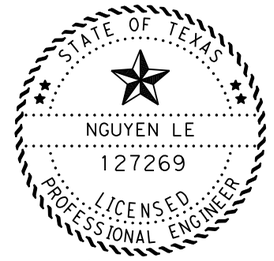
D12-5bTR_48x24;
1.5" Radius, 0.8" Border, White on, Blue;
"TEXAS TRAVEL", ClearviewHwy-3-W;
"INFORMATION", ClearviewHwy-3-W;
"CENTER", ClearviewHwy-3-W;
Standard Arrow Custom 7.0" X 4.1" 0';
SHEET 9A OF 17 SIGN #R6



D23-1TL(1)_VARx24;
1.5" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 6.8" X 3.7" 180';
"State Rep", ClearviewHwy-3-W;
"Dennis Bonnen", ClearviewHwy-3-W;
"District 25", ClearviewHwy-3-W;
SHEET 8A OF 17 SIGN #R1



D26-7TR_54x24;
1.5" Radius, 0.8" Border, White on, Green;
"Brazoria County", ClearviewHwy-3-W;
"Courthouse", ClearviewHwy-3-W;
"Parking", ClearviewHwy-3-W;
Standard Arrow Custom 7.0" X 4.1" 0';
SHEET 8B OF 17 SIGN #R3



Nguyen Le
01/24/2022

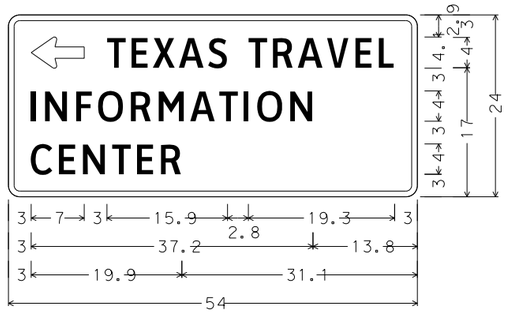
TEXAS DEPARTMENT OF TRANSPORTATION

SMALL SIGNS DETAILS (BS 288B, ETC.)

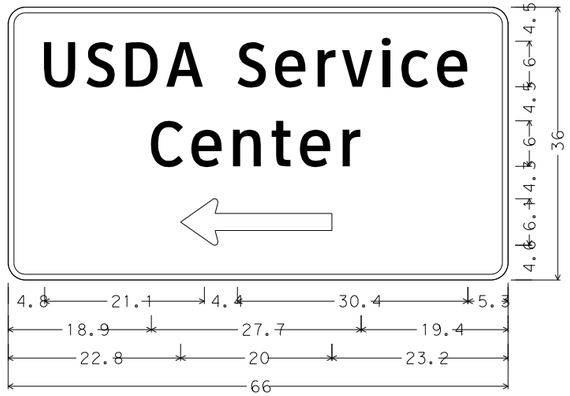
SCALE: N.S.T

SHEET 4 OF 6

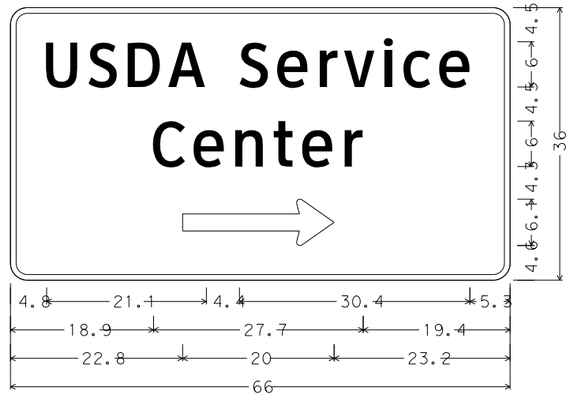
ORIGINAL DRAWING DATE: APRIL, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - REVISIONS	HOU	6		126C
CK.: -	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
DR.: -	BRAZORIA		0111	09	044	BS 288B
CK.: -						



D12-5bTL_54x24;
1.5" Radius, 0.8" Border, White on, Blue;
Standard Arrow Custom 7.0" X 4.1" 180′;
"TEXAS TRAVEL", ClearviewHwy-3-W specified length;
"INFORMATION", ClearviewHwy-3-W;
"CENTER", ClearviewHwy-3-W;
SHEET 9A OF 17 SIGN #1



D3-3bTL_VARx36;
2.3" Radius, 0.8" Border, White on, Green;
"USDA Service", ClearviewHwy-3-W;
"Center", ClearviewHwy-3-W;
Standard Arrow Custom 20.0" X 6.1" 180′;
SHEET 9A OF 17 SIGN #R7



D3-3bTR_VARx36;
2.3" Radius, 0.8" Border, White on, Green;
"USDA Service", ClearviewHwy-3-W;
"Center", ClearviewHwy-3-W;
Standard Arrow Custom 20.0" X 6.1" 0′;
SHEET 9A OF 17 SIGN #R7

D1-2 8in LT-RT;

1.9" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 12.0" X 7.1" 180′; "Tigner St", ClearviewHwy-3-W;

1.9" Radius, 0.8" Border, White on, Green;
"Cannan Dr", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0′;
SHEET 11 OF 17 SIGN #1

D1-2 8in RT-RT;

1.9" Radius, 0.8" Border, White on, Green;
"Police Dept", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0′;

1.9" Radius, 0.8" Border, White on, Green;
"Post Office", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0′;
SHEET 11 OF 17 SIGN #R4

STATE OF TEXAS
NGUYEN LE
127269
LICENSED
PROFESSIONAL ENGINEER

Nguyen Le

01/24/2022

TEXAS DEPARTMENT OF TRANSPORTATION

SMALL SIGNS DETAILS (BS 288B, ETC.)

SCALE: N.S.T

SHEET 5 OF 6

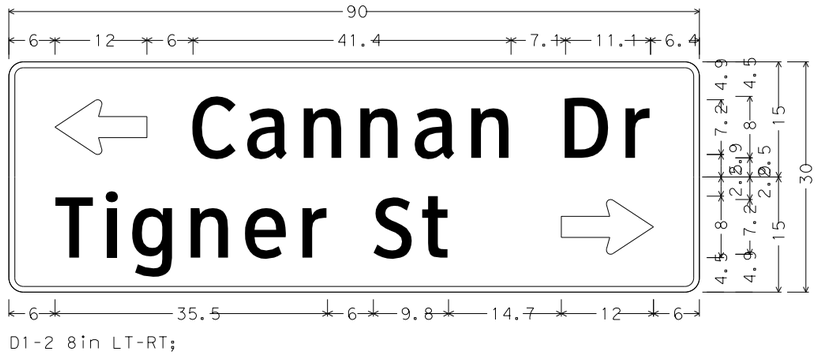
ORIGINAL DRAWING DATE: APRIL, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - REVISIONS	HOU	6		126D
CK.: -	COUNTY		CONTROL	SECTION	JOB	HIGHWAY
DN.: -	BRAZORIA		0111	09	044	BS 288B
CK.: -						

D1-2 8in LT-LT;

1.9" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 12.0" X 7.1" 180′; "Police Dept", ClearviewHwy-3-W;

1.9" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 12.0" X 7.1" 180′; "Post Office", ClearviewHwy-3-W;

SHEET 12A OF 17 SIGN #R3

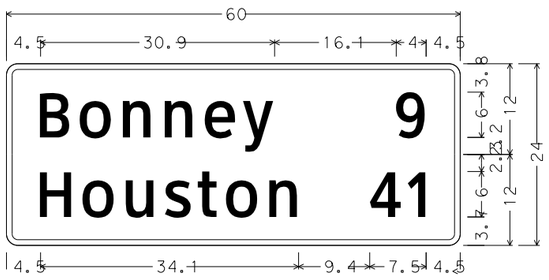


D1-2 8in LT-RT;

1.9" Radius, 0.8" Border, White on, Green;
Standard Arrow Custom 12.0" X 7.1" 180′; "Cannan Dr", ClearviewHwy-3-W;

1.9" Radius, 0.8" Border, White on, Green;
"Tigner St", ClearviewHwy-3-W; Standard Arrow Custom 12.0" X 7.1" 0′;

SHEET 12A OF 17 SIGN 1

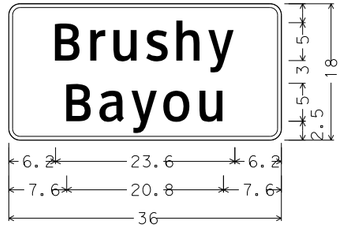


D2-2 6in;

1.5" Radius, 0.8" Border, White on, Green;
"Bonney", ClearviewHwy-3-W; "9", ClearviewHwy-3-W;

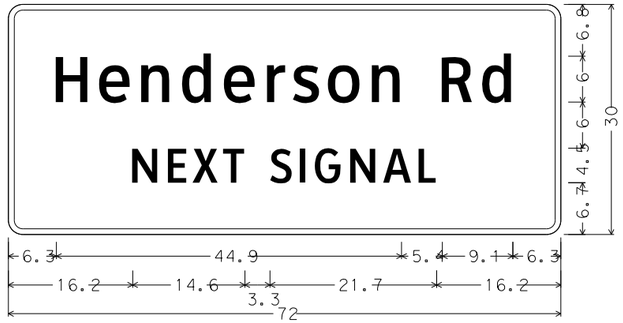
1.5" Radius, 0.8" Border, White on, Green;
"Houston", ClearviewHwy-3-W; "41", ClearviewHwy-3-W;

SHEET 13 OF 17 SIGN #R2



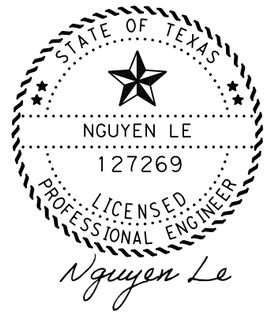
I-3 5in;
1.5" Radius, 0.5" Border, White on, Green;
"Brushy", ClearviewHwy-3-W;
"Bayou", ClearviewHwy-3-W;

SHEET 14 OF 17 SIGN #R1, #R4



D3-2(1)_VARx30;
1.9" Radius, 0.8" Border, White on, Green;
"Henderson Rd", ClearviewHwy-3-W;
"NEXT SIGNAL", ClearviewHwy-3-W;

SHEET 14 OF 17 SIGN #1
SHEET 15 OF 17 SIGN #1



01/24/2022

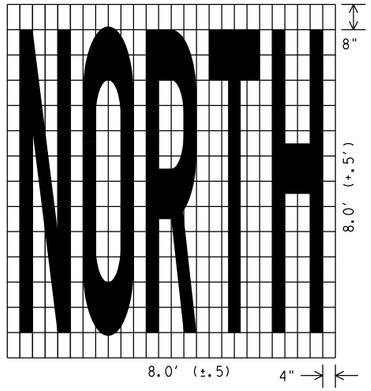
TEXAS DEPARTMENT OF TRANSPORTATION

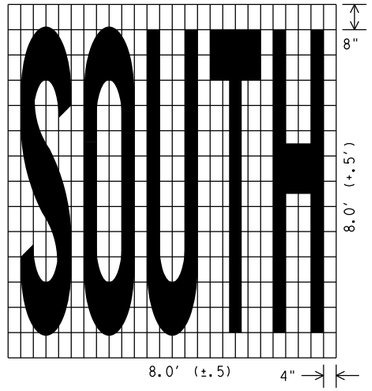
SMALL SIGNS DETAILS (BS 288B, ETC.)

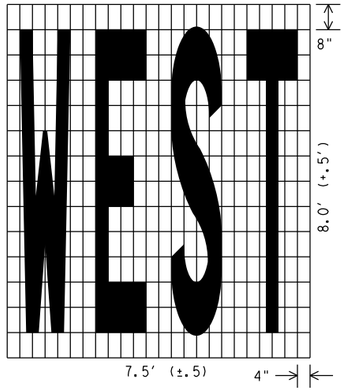
SCALE: N.S.T

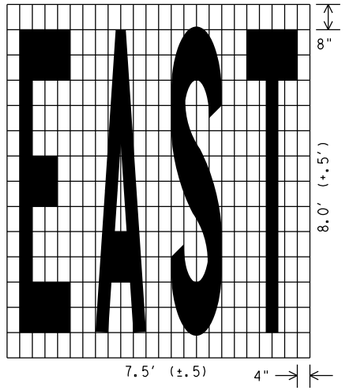
SHEET 6 OF 6

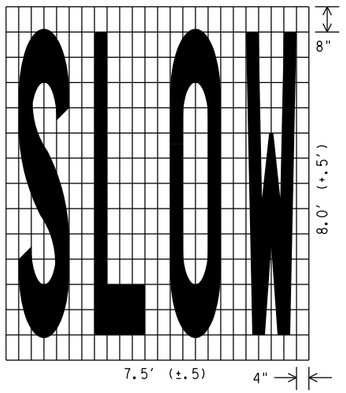
ORIGINAL DRAWING DATE: APRIL, 2022	STATE DISTRICT	FEDERAL REGION	PROJECT NO	SHEET
DN.: - CK.: - DN.: - CK.: - REVISIONS	HOU	6		126E
	COUNTY	CONTROL	SECTION	JOB	HIGHWAY
	BRAZORIA	0111	09	044	BS 288B

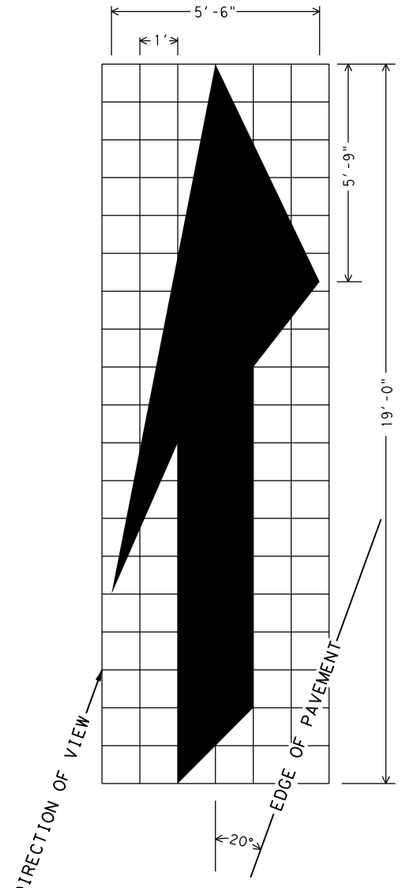






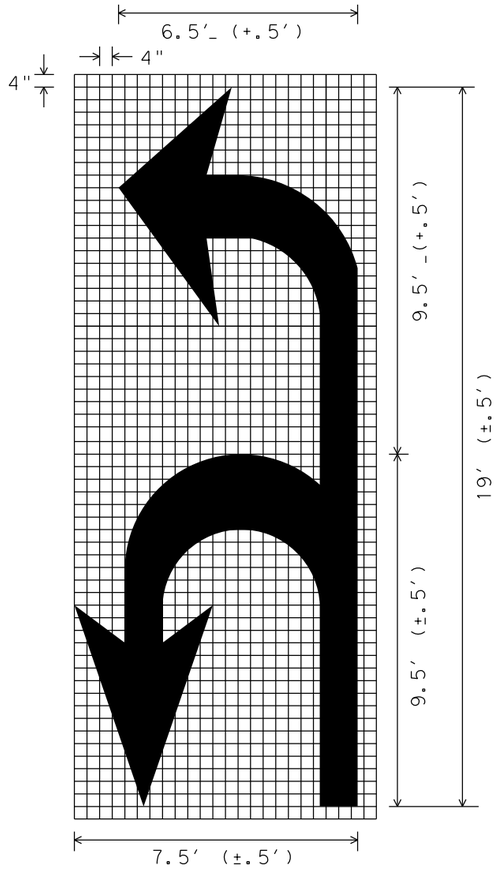




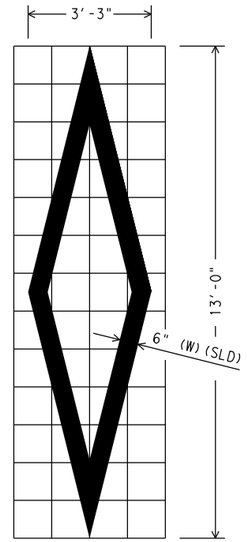


ISOMETRIC ARROW

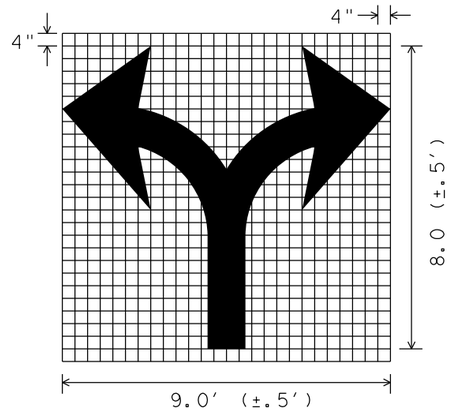
12 INCH GRID
AREA = 42 SQ. FT.
RIGHT LANE DROP ARROW
(FOR LEFT LANE, USE MIRROR IMAGE)



U-L ARROW



DIAMOND SYMBOL



SCALE 1/4" = 1′

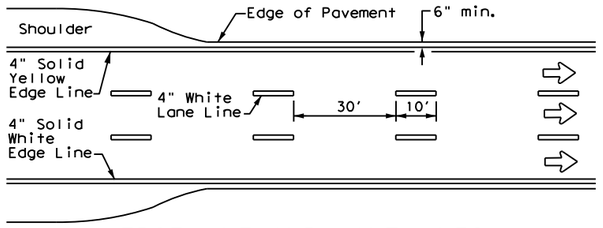
Texas Department of Transportation
Houston District

PAVEMENT MARKINGS (WORDS, ARROWS & SYMBOLS)

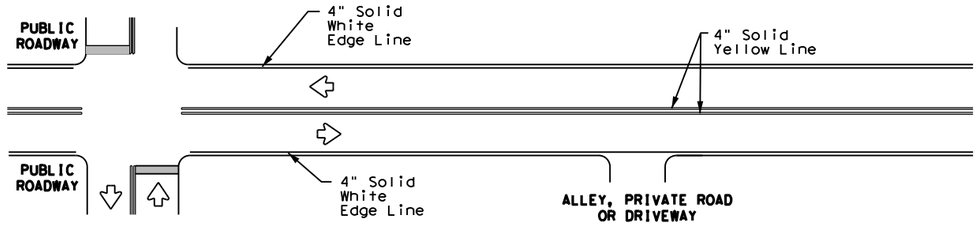
PM(WAS)-07

FILE:	DN:	CK:	DW:	CK:	
© TxDOT 2007	DIST	FED REG	PROJECT NO.		SHEET
REVISIONS 03-19-07	HOU	6	111-9-44		127
	COUNTY		CONTROL	SECT	JOB	HIGHWAY
	BRAZORIA		0111	09	044, ETC	BS 288B

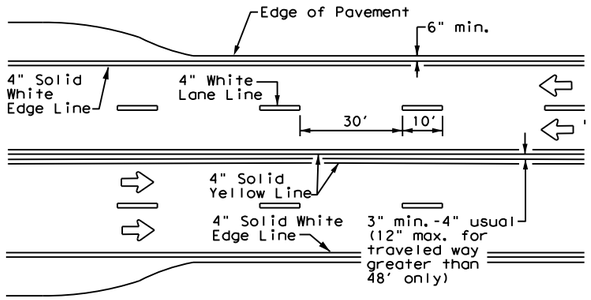
STD-N31



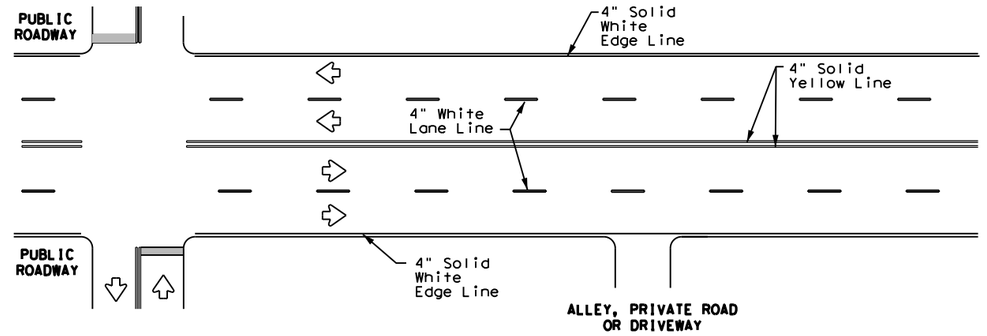
EDGE LINE AND LANE LINES ONE-WAY ROADWAY WITH OR WITHOUT SHOULDERS



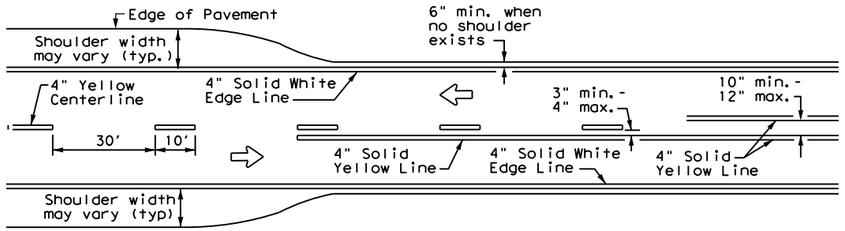
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



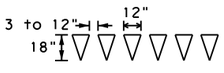
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



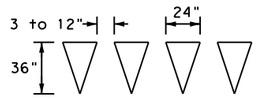
TYPICAL MULTI-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS



TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

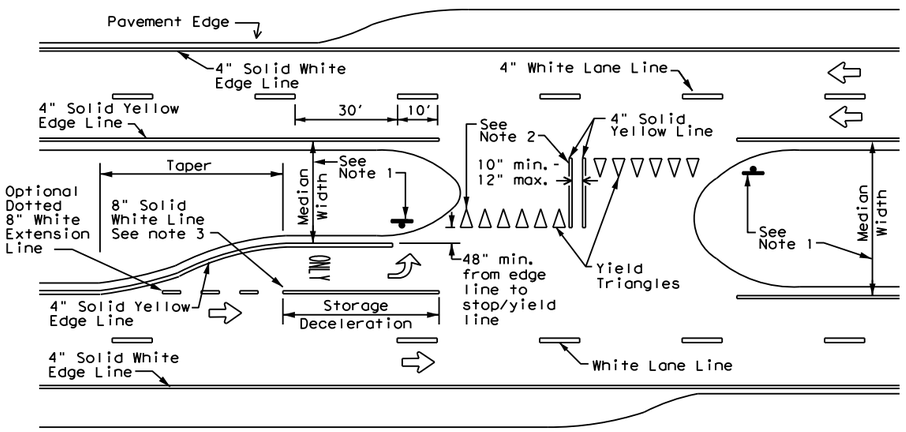


For posted speed on road being marked equal to or less than 40 MPH.



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

YIELD LINES



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTE:

1. Irrespective of shoulder, use 6in width lines (edge lines).
2. Use 4 in. width lines (edge and lane lines) when lane width is 10 ft. or less; and 6 in. width lines when lane width is greater than 10 ft.

NOTES

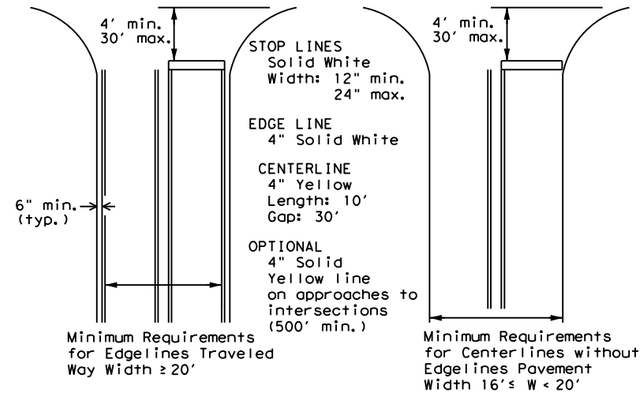
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop bars/yield triangles) when a 50' or greater median centerline can be placed. Stop bars shall only be used with stop signs. Yield traingles shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

GENERAL NOTES

1. Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should not be placed less less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to the inside of edgeline of a two lane roadway.

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

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



GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Highways

Texas Department of Transportation
HOUSTON DISTRICT STANDARD

TYPICAL STANDARD PAVEMENT MARKINGS

PM-20

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

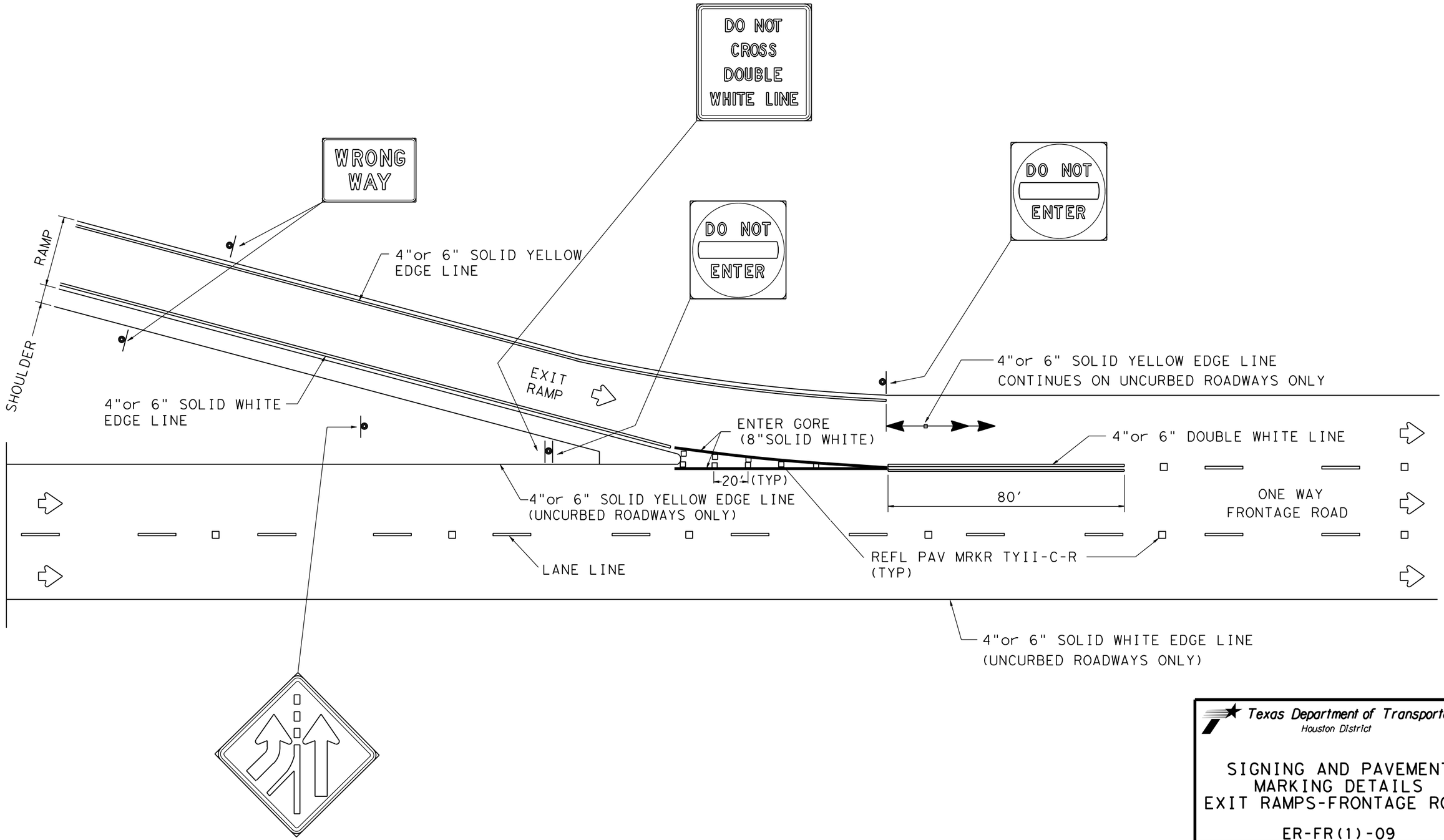
REVISIONS: 8-95 2-12; 5-00 8-16; 8-00 7-20; 3-03

CONT	SECT	JOB	HIGHWAY
0111	09	044, ETC	BS 288B

DIST	COUNTY	SHEET NO.
HOU	BRAZORIA	128

STD N-5a

DATE: 1/20/2022 2:35:09 PM
FILE: H:\1110044\Standards\stdn5.dgn



DRAWING SCALE: NONE

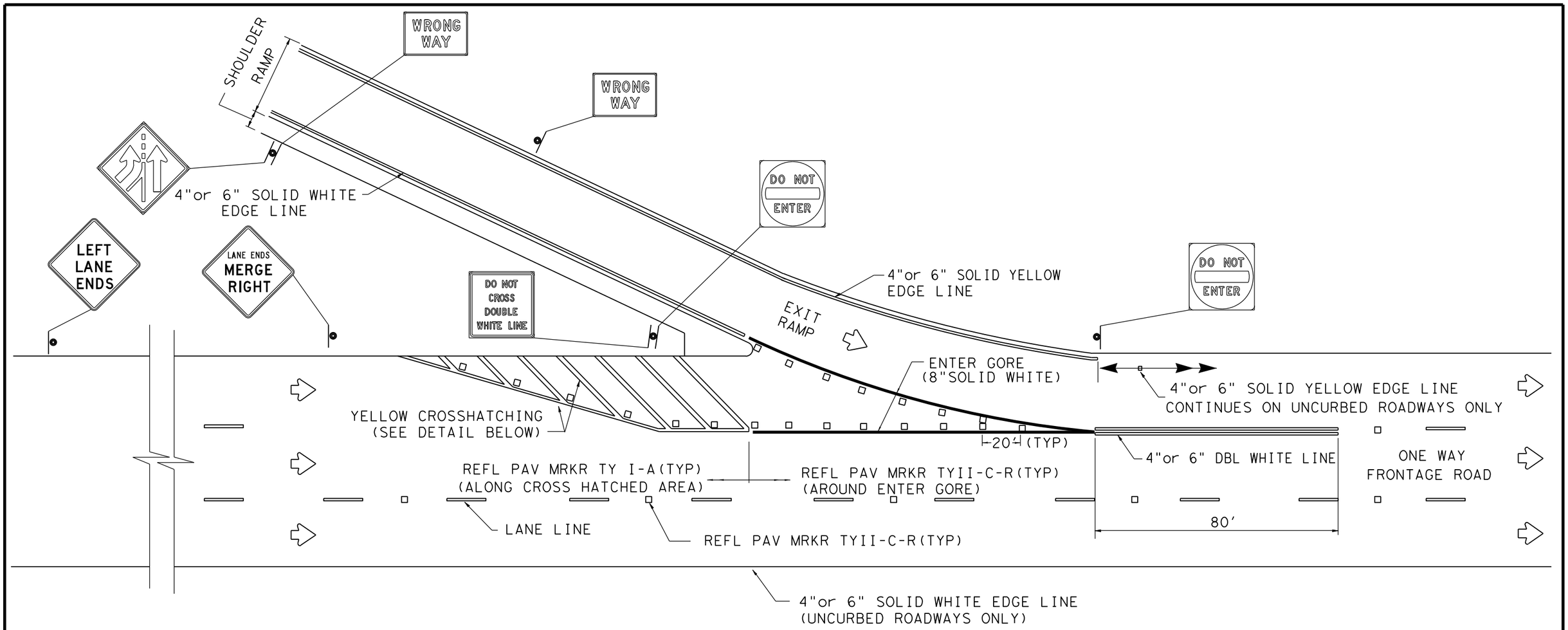
Texas Department of Transportation
Houston District

SIGNING AND PAVEMENT MARKING DETAILS EXIT RAMPS-FRONTAGE ROAD

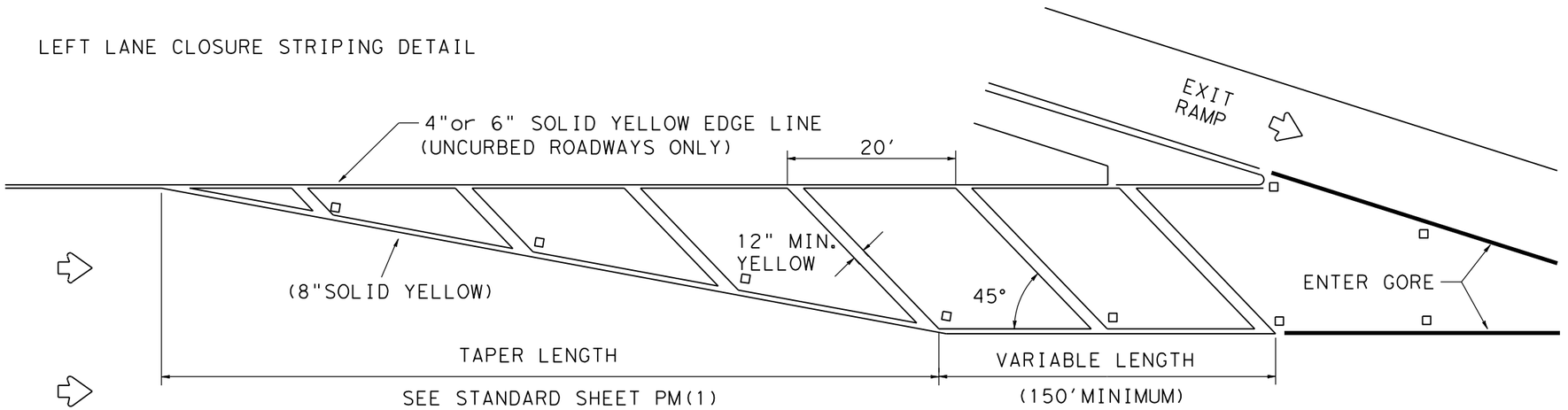
ER-FR(1)-09

FILE:	DN:	CK:	DW:	CK:
© TxDOT 1998	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS FEB., 2008 DEC., 2009	HOU	6	111-9-44	129
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	BRAZORIA	0111	09 044, ETC	BS 288B

STD N-25



LEFT LANE CLOSURE STRIPING DETAIL



DRAWING SCALE: NONE

Texas Department of Transportation
Houston District

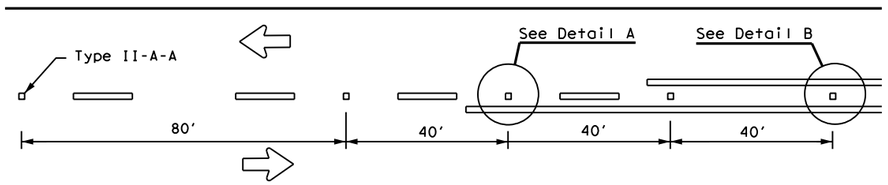
SIGNING AND PAVEMENT MARKING DETAILS EXIT RAMPS-FRONTAGE ROAD

ER-FR(2)-09

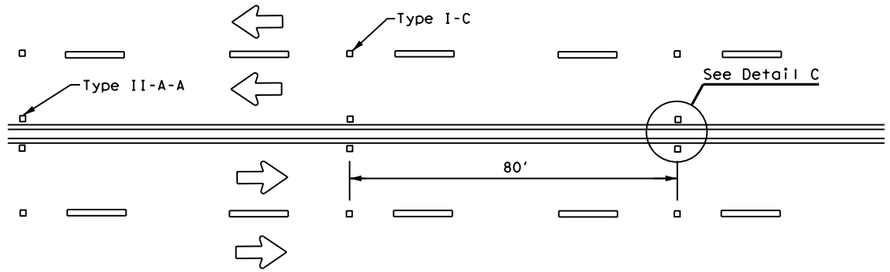
FILE:	DN:	CK:	DW:	CK:
© TxDOT 1998	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS FEB., 2008 DEC., 2009	HOU	6	111-9-44	130
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	BRAZORIA	0111	09 044, ETC	BS 288B

STD N-26

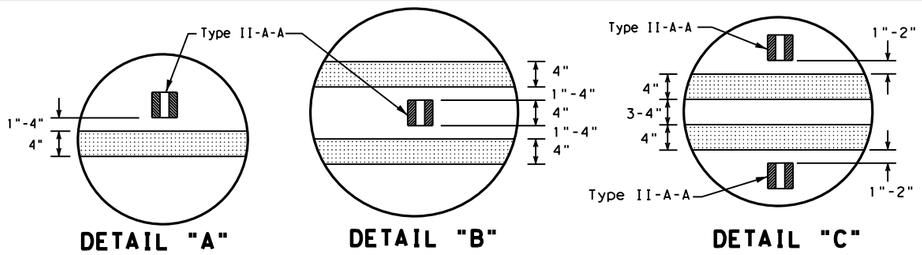
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



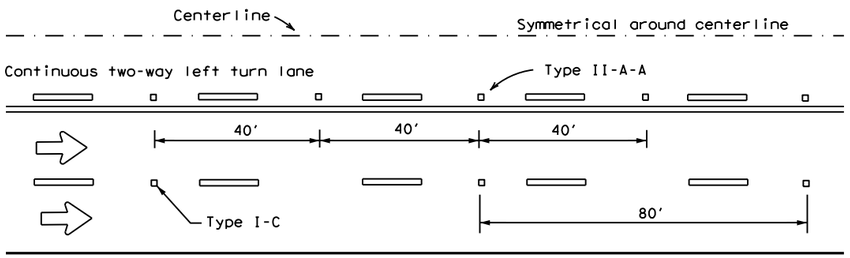
CENTERLINE FOR ALL TWO LANE ROADWAYS



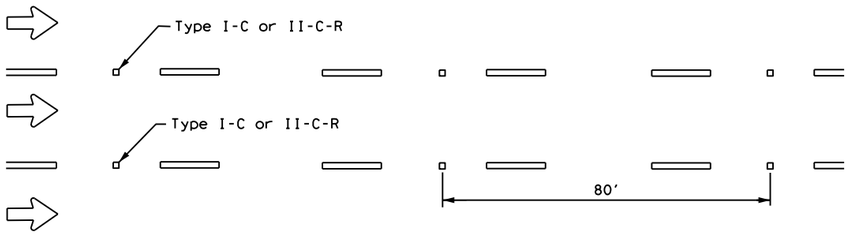
CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS



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



CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

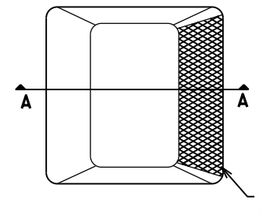


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

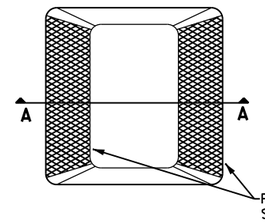
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

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

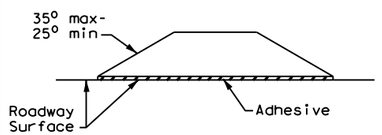
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)

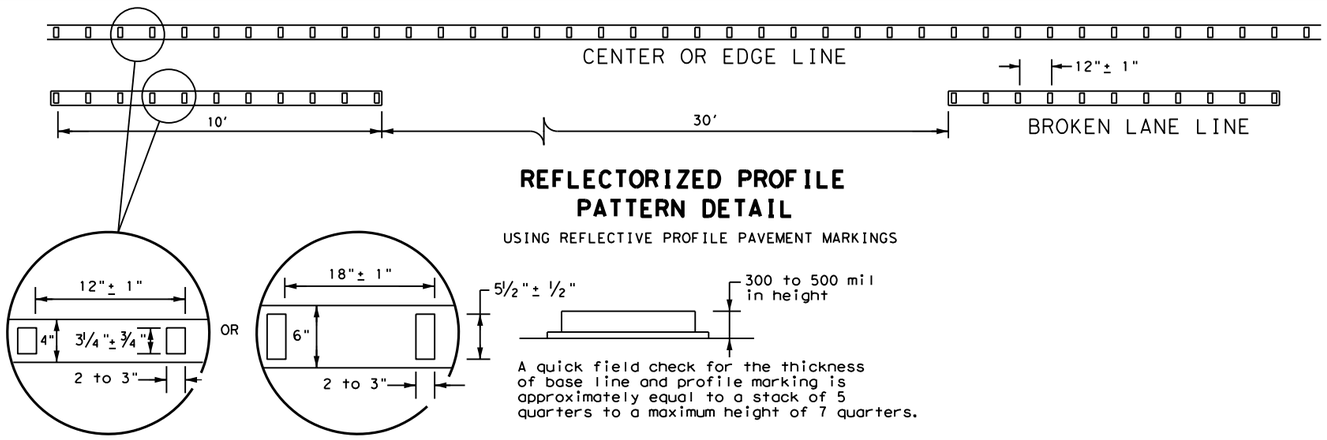


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

NOTE

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

GENERAL NOTES

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

DATE: 1/20/2022 2:35:13 PM
FILE: H:\1109044\Standards\pm2-20.dgn

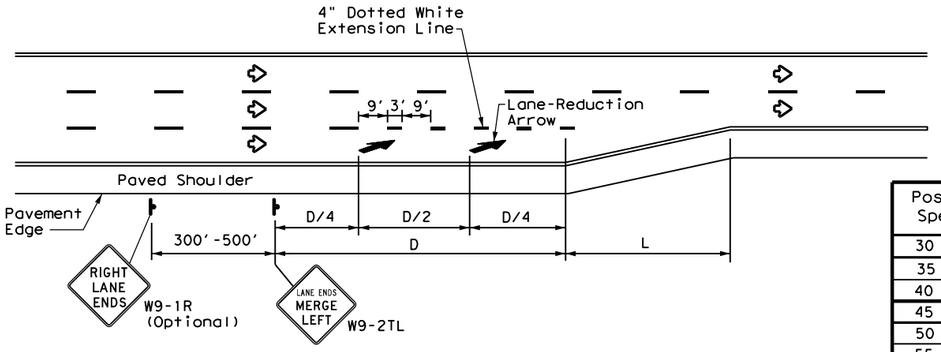
Texas Department of Transportation

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 5-00 2-12 8-00 6-20	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		131

22B

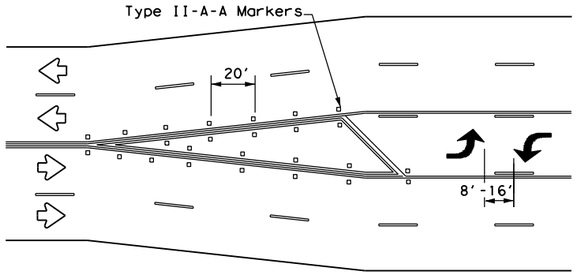


LANE REDUCTION

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.

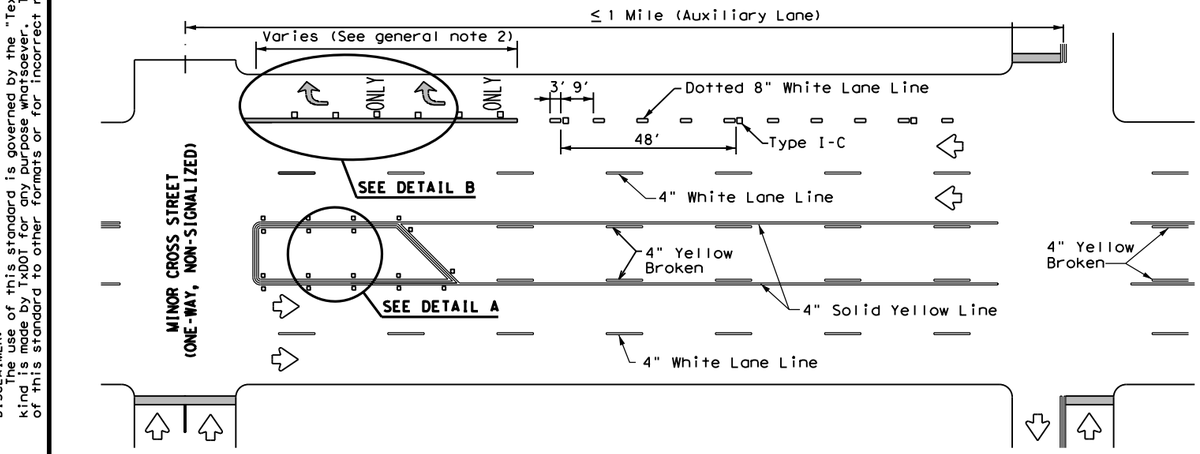
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

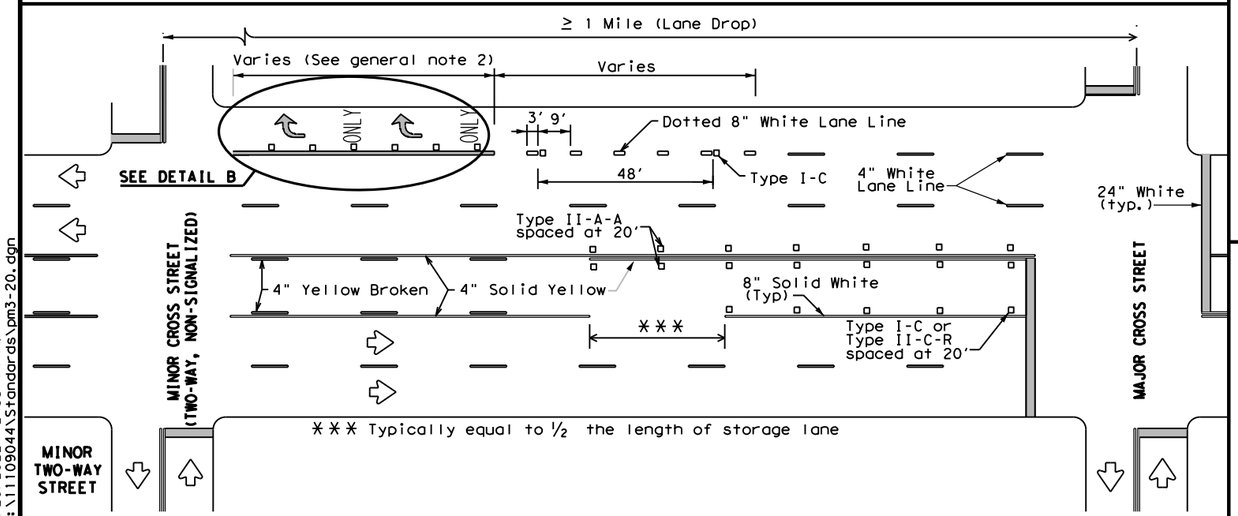
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn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

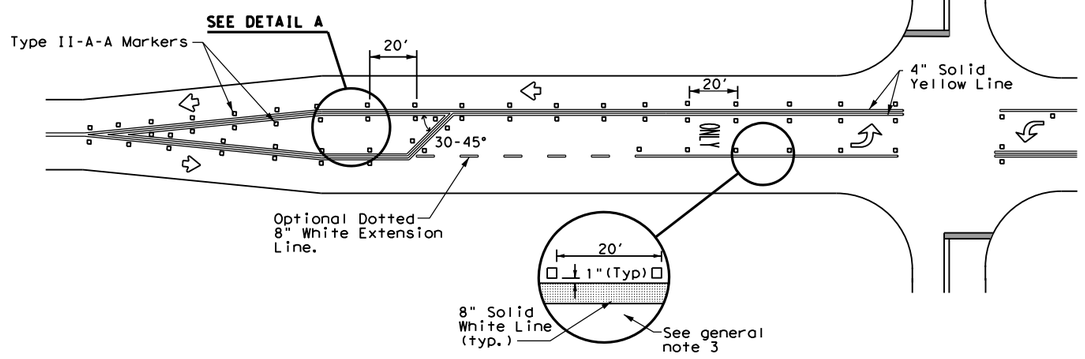
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



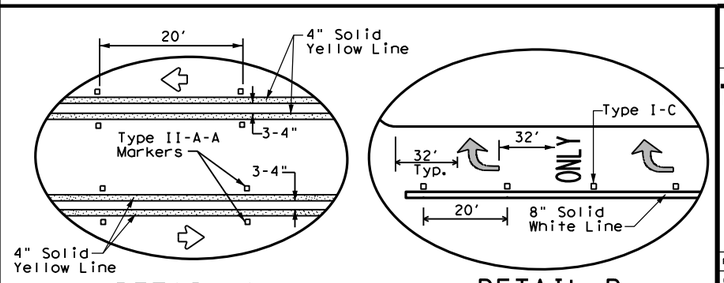
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



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	0111	09	044, ETC	BS 288B
5-00 2-10	DIST	COUNTY		SHEET NO.
8-00 2-12	HOU	BRAZORIA		132
3-03 6-20				

22C

DATE: 1/20/2022 2:35:14 PM
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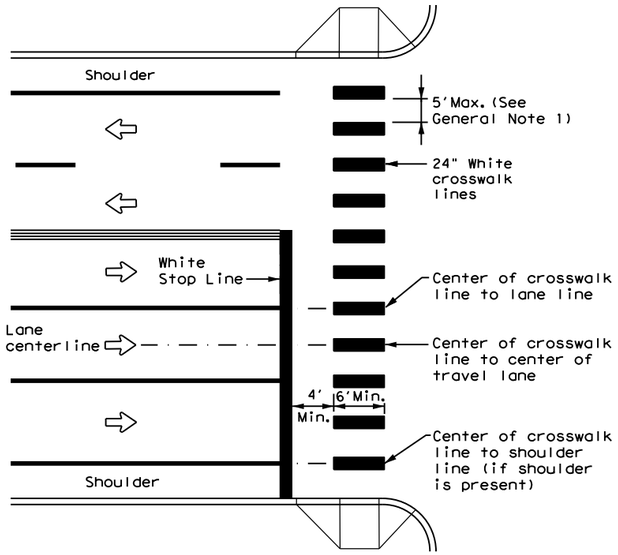


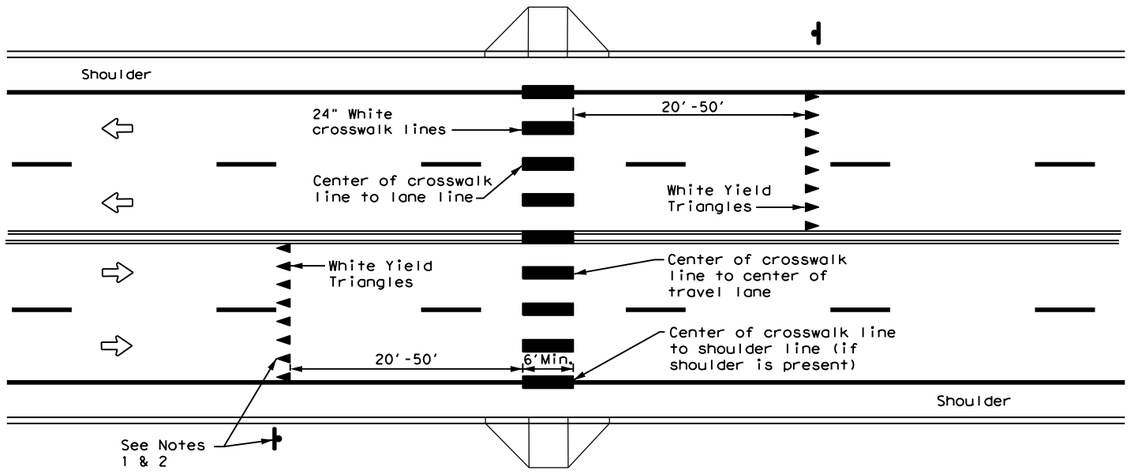
HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH

GENERAL NOTES

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

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

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



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES

1. Use yield triangles with "Yield Here to Pedestrians" signs at unsignalized mid block crosswalks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-20

FILE: pm4-20.dgn	DN:	CK:	DW:	CK:
© TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		133

22D

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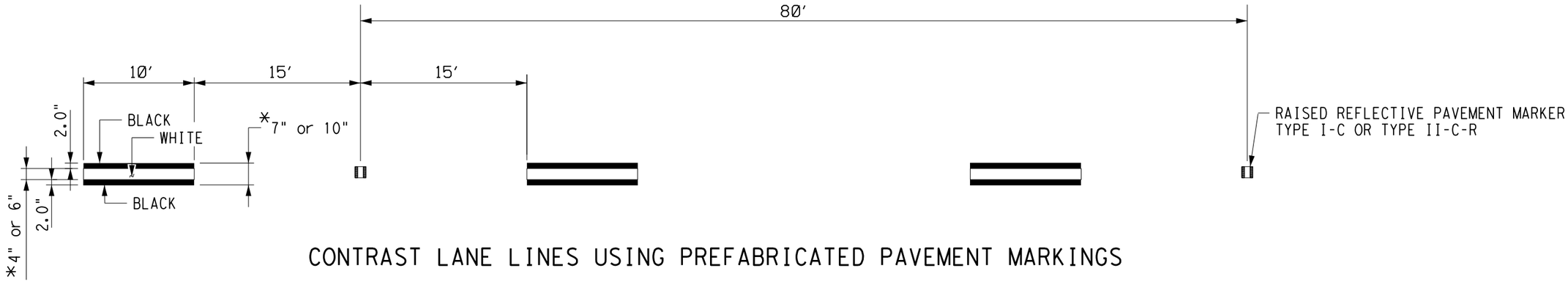
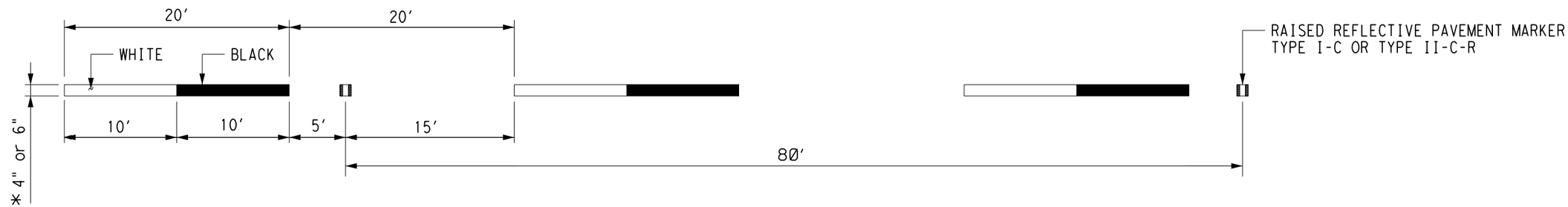


CONTRAST LANE LINES USING PREFABRICATED PAVEMENT MARKINGS

DIRECTION OF TRAFFIC



CONTRAST LANE LINES USING LIQUID APPLICATIONS
(MULTIPOLYMER, THERMOPLASTIC, ETC.)

* AS SHOWN ON THE PLANS.

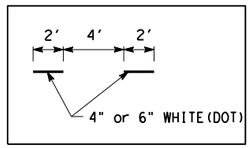
Texas Department of Transportation
Houston District

PAVEMENT MARKINGS
(CONTRAST LANE LINES)

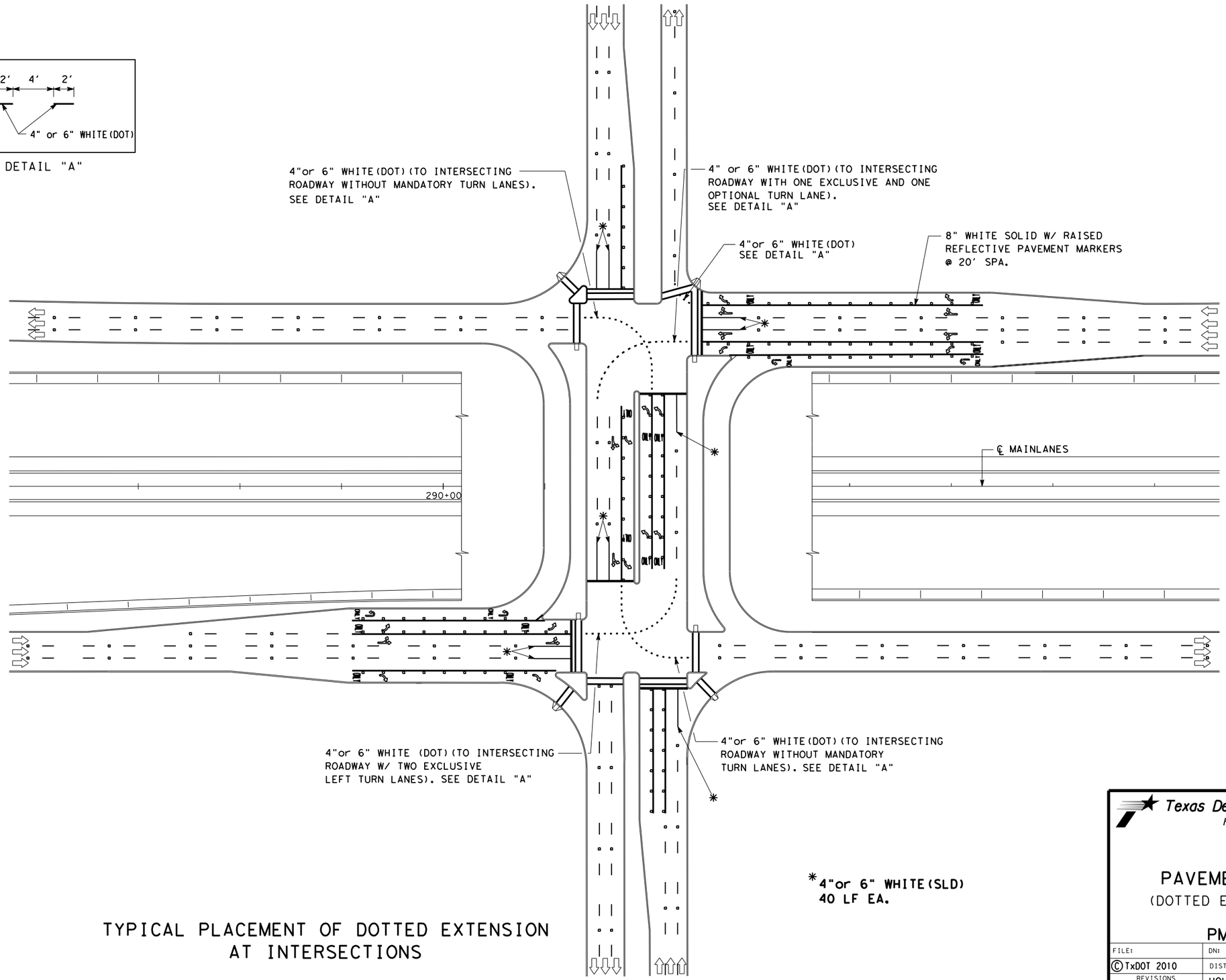
PM(CLL)-14

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2003	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 01-10-06 02-12-08 10-2019 9" to 10"	HOU	6	111-9-44	134
	COUNTY	CONTROL	SECT JOB	HIGHWAY
	BRAZORIA	0111	09 044,	ETC BS 288B

STD N-30



DETAIL "A"



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

TYPICAL PLACEMENT OF DOTTED EXTENSION AT INTERSECTIONS

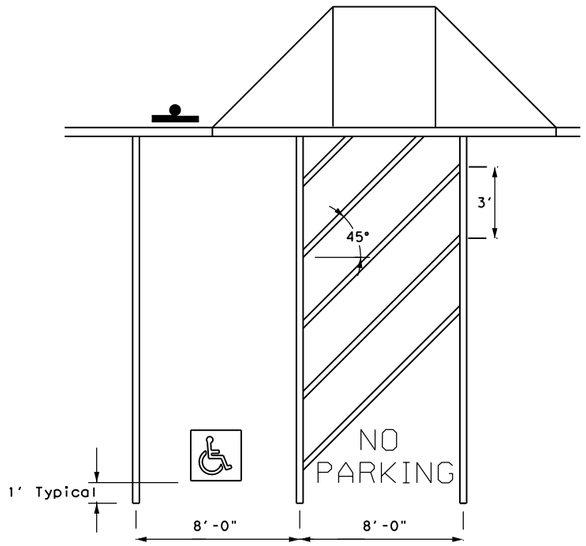
Texas Department of Transportation
Houston District

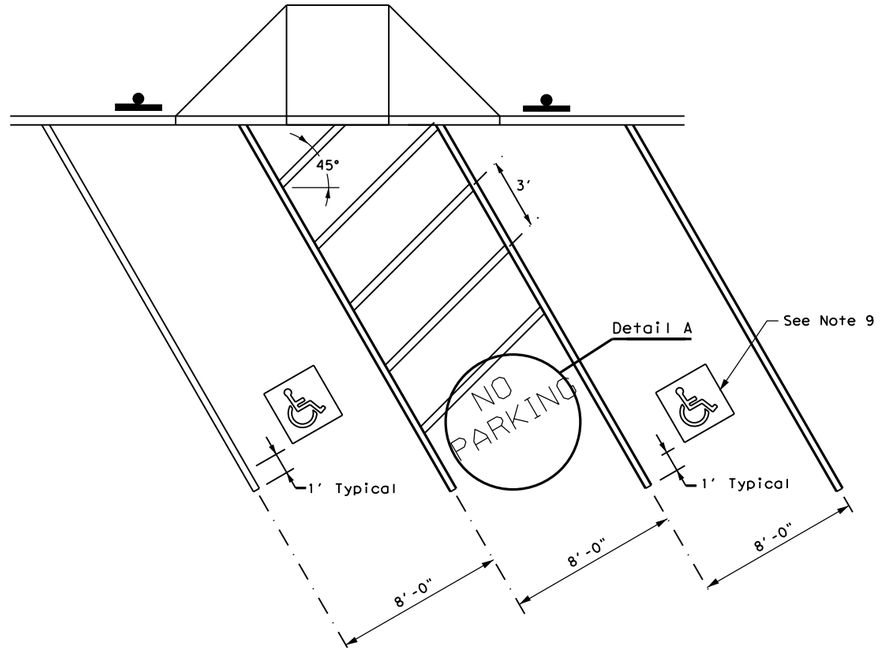
PAVEMENT MARKINGS
(DOTTED EXTENSION DETAILS)

PM(DOT)-11

FILE:	DN:	CK:	DW:	CK:
© TxDOT 2010	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS 4/2010 4/2011	HOU	6	111-9-44	135
	COUNTY	CONTROL	SECT	JOB	HIGHWAY
	BRAZORIA	0111	09	044,	ETCBS 288B

STD N-28





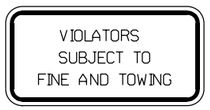
PERPENDICULAR OR ANGLED ACCESSIBLE PARKING SPACE DIMENSIONS

GENERAL NOTES:

1. All paved accessible parking space limit lines shall be 4" solid white lines.
2. Paved accessible parking spaces must include a white International Symbol of Accessibility applied conspicuously on the surface in a color that contrasts the pavement. A blue background with white border may supplement the symbol for additional contrast.
3. The words "NO PARKING" must be applied on any access aisle adjacent to the parking space. The words must be white, applied:
   a) in all capital letters.
   b) centered within each access aisle adjacent to the parking space.
4. RESERVED PARKING (R7-8T) sign including the International Symbol of Accessibility.
   a) shall be REQUIRED for each accessible parking space.
   b) shall NOT be placed between two accessible parking spaces.
   c) shall NOT be placed in a location that restricts movement of wheelchairs within the adjacent sidewalk.
   d) shall have a mounting height of 7 feet to the bottom of the sign.
5. A sign identifying the consequences of parking illegally in a paved accessible parking space. Must:
   a) at a minimum state "VIOLATORS SUBJECT TO FINE AND TOWING" (Plaque)(R7-8aPT).
   b) be mounted on a pole, post, wall or freestanding board.
   c) be no more than eight inches (8") below sign R7-8T a sign required by the Texas Accessibility Standards, 502.6.
   d) be installed so that the bottom edge of the sign is no lower than 48 inches and no higher than 80 inches above the ground level.
6. Signs identifying van parking spaces shall contain the designation "VAN ACCESSIBLE" (R7-8P) Signs shall be 60 inches minimum above the ground level measured to the bottom of the sign.
7. Perpendicular or angled parking spaces shall be 8 feet wide minimum with an access aisle 8 feet minimum wide (van accessible). Two parking spaces are permitted to share a common access aisle.
8. Access aisles shall be at street level, extend the full length of the parking space they serve, follow ADA surface requirements, and marked to discourage parking in the access aisle. Curb ramps shall connect the access aisle to the adjacent pedestrian access route. Curb ramps shall not be located within the access aisle.
9. International Symbol of Accessibility Parking Space Marking and sign details can be found in The Standard Highway Sign Designs for Texas (SHSD) at the following website. http://www.txdot.gov/

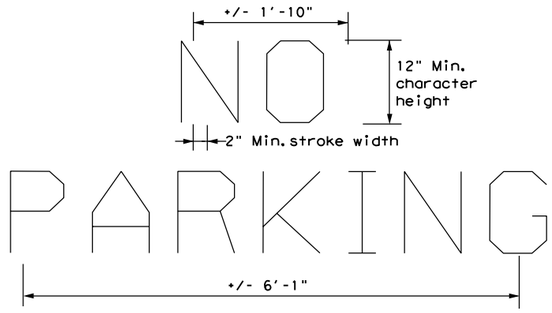
R7-8T

R7-8P



R7-8aPT

ACCESSIBLE PARKING SIGNS



Detail A

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
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240
SIGN FACE MATERIALS	DMS-8300

Texas Department of Transportation

Traffic Safety Division Standard

PAVEMENT MARKINGS AND SIGNING FOR ACCESSIBLE PARKING

PM(AP)-21

FILE: pm(ap)-21	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT July 2021	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		136

22F

DATE: 1/20/2022 2:35:20 PM
FILE: H:\1110044\Standards\pm(ap)-21.dgn

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

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

Number of Posts (1 or 2)

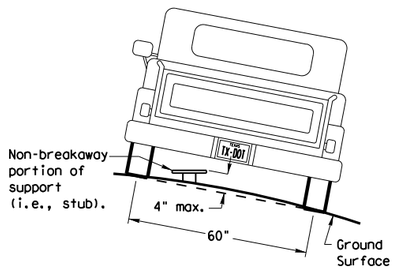
Anchor Type

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

Sign Mounting Designation

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

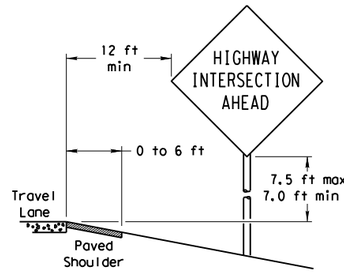
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

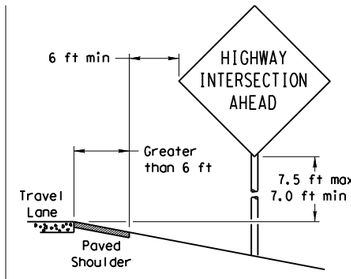
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

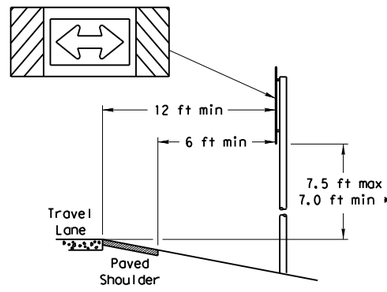
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



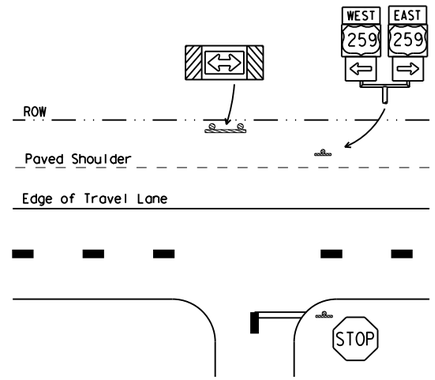
GREATER THAN 6 FT. WIDE

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

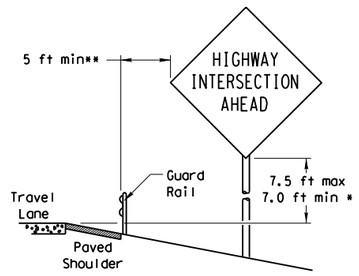
T-INTERSECTION



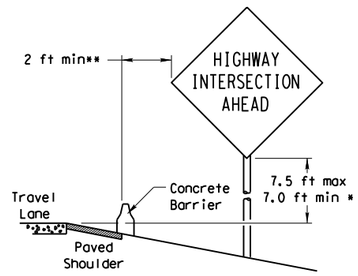
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

* 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

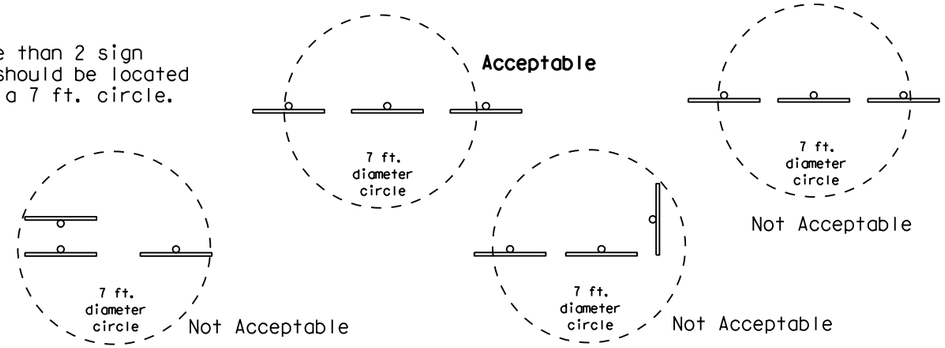
(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

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.

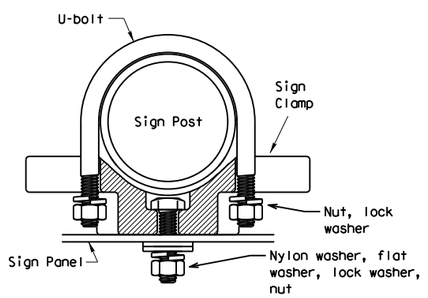
The website address is:
http://www.txdot.gov/publications/traffic.htm

No more than 2 sign posts should be located within a 7 ft. circle.

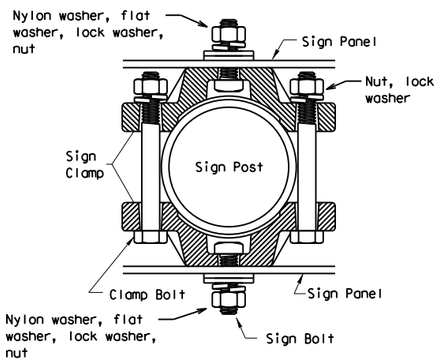


TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



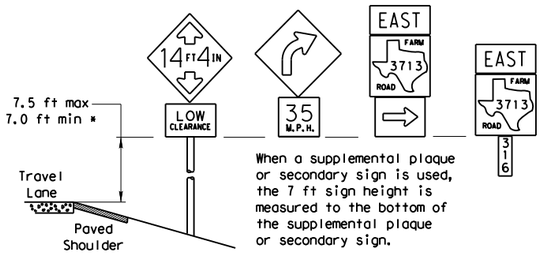
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

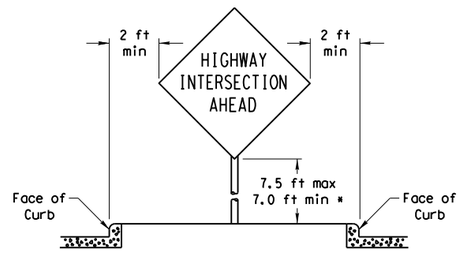
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



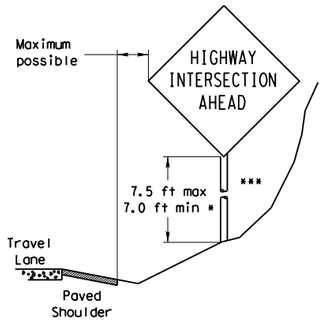
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

9-08 REVISIONS

DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0111	09	044, ETC	BS 288B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		137

26A

DATE: 1/20/2022 2:35:21 PM
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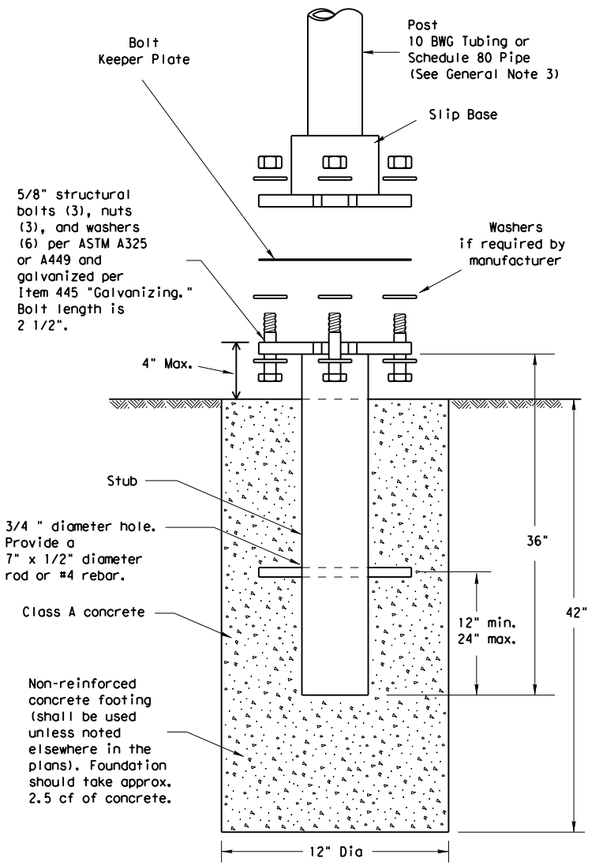
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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.

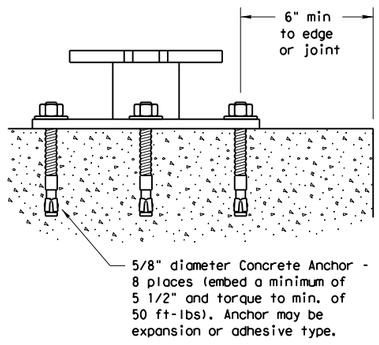
   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum 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

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0111	09	044, ETC	BS 288B

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HOU	BRAZORIA	138

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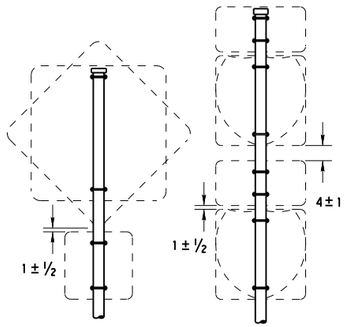
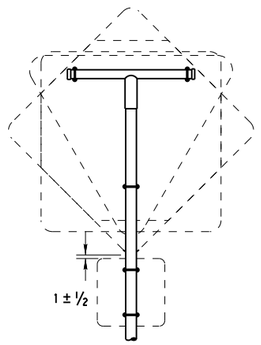


SM RD SGN ASSM TY XXXXX(1)XX(P)



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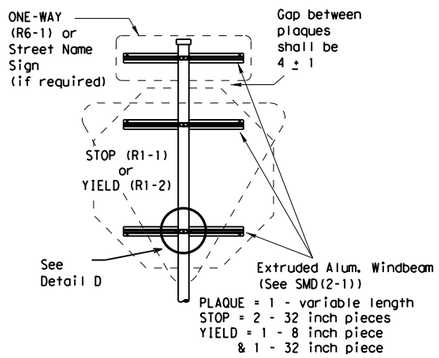

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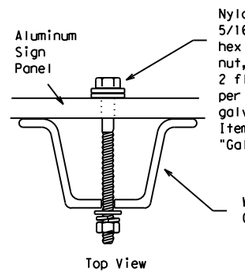
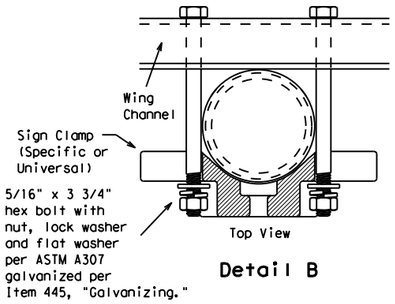
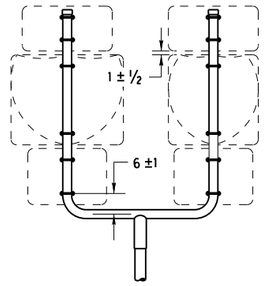


Detail A



Detail B



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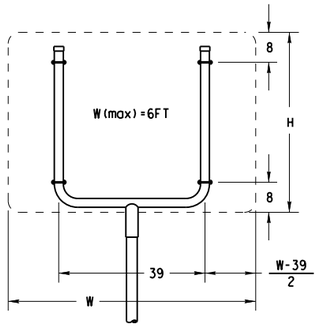
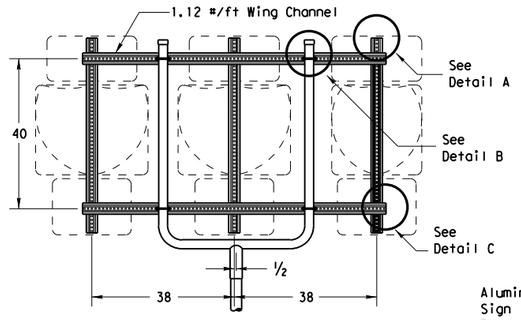
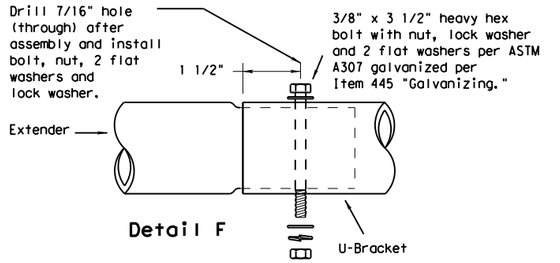


SM RD SGN ASSM TY XXXXX(1)XX(U)

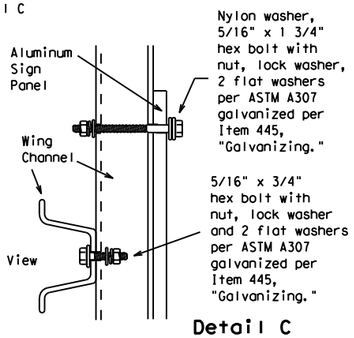


SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

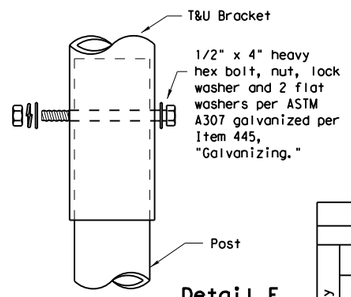


Detail F

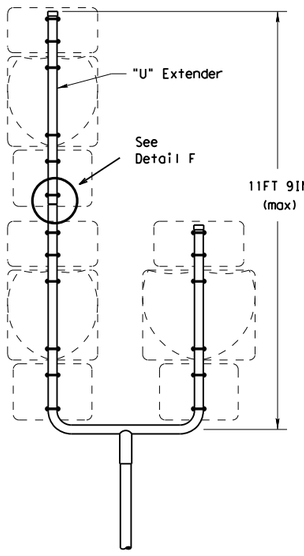
Splices shall only be allowed behind the sign substrate.



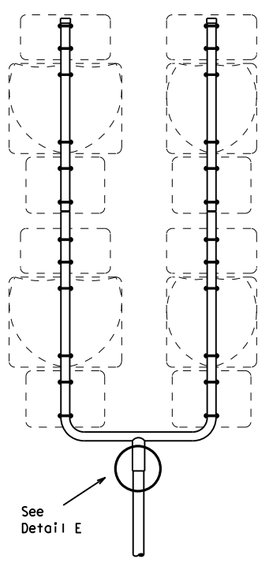
Detail C



Detail E



SM RD SGN ASSM TY S80(1)XX(U-1EXT)



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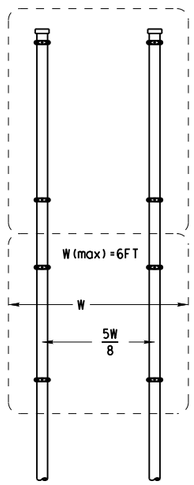
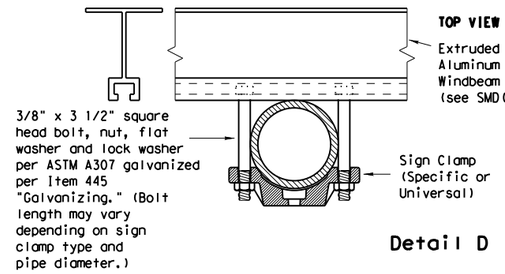
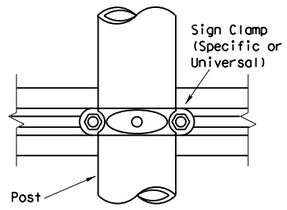


SM RD SGN ASSYM TY XXXXX(2)XX(P)

SIDE VIEW



Detail D



GENERAL NOTES:

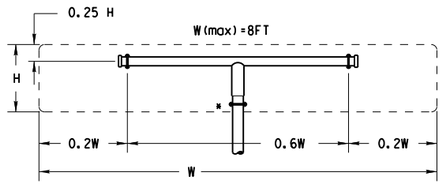
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT

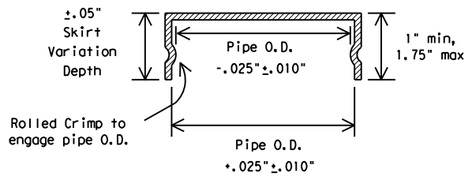
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

REVISIONS	DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
9-08	CONT	SECT	JOB	HIGHWAY
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	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		139

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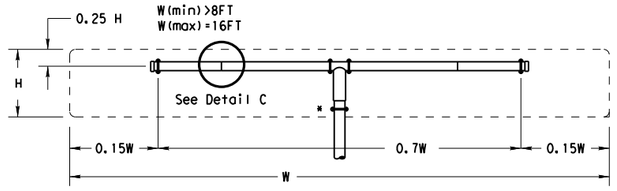
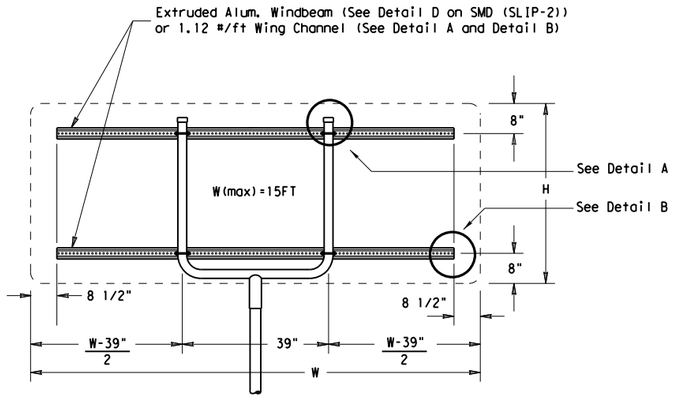
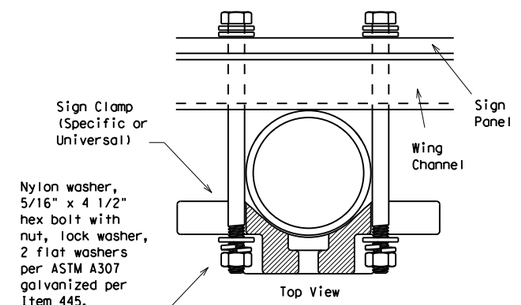


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)

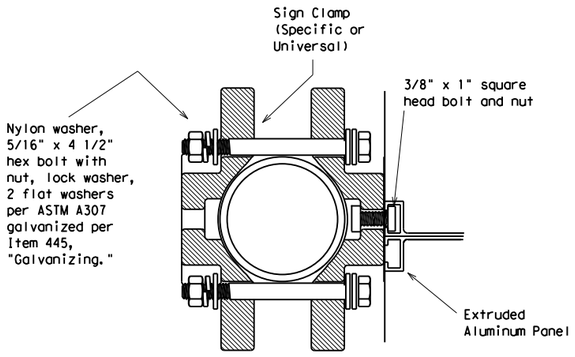
(* - See Note 12)



SM RD SGN ASSM TY XXXXX(1)XX(U-XX)

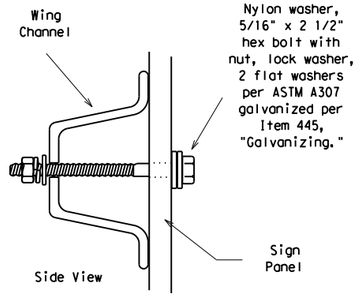


Detail A

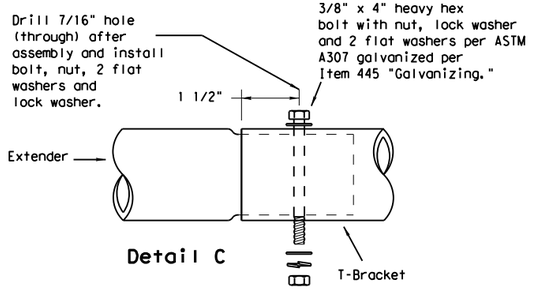


Detail D

EXTRUDED ALUMINUM SIGN WITH T BRACKET

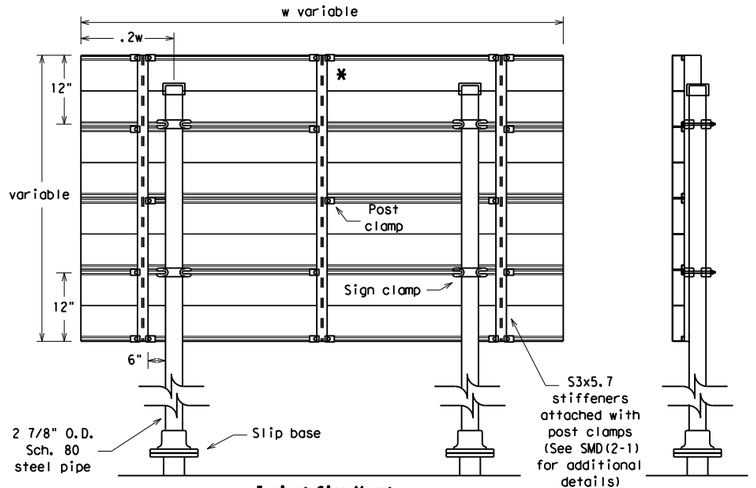


Detail B



Detail C

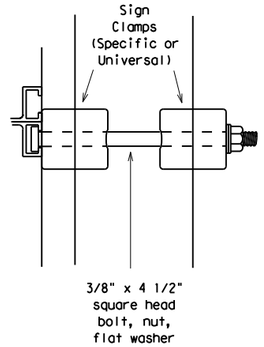
Splices shall only be allowed behind the sign substrate.



Typical Sign Mount

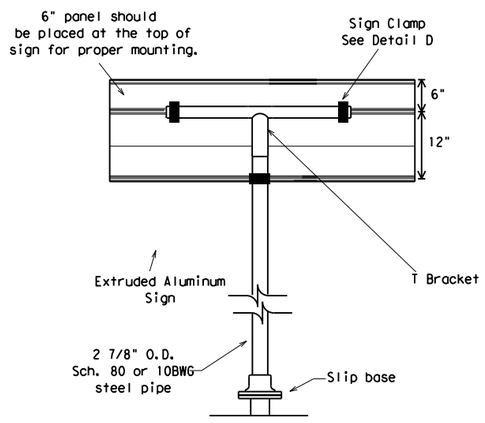
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

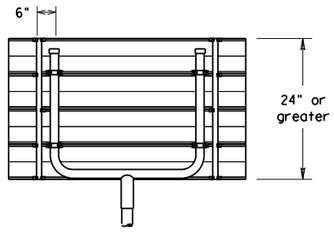


Detail E

See Detail E
for clamp installation



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

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. 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.
2. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
3. 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.
4. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
5. 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.
6. 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.
7. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
8. 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."
9. Sign blanks shall be the sizes and shapes shown on the plans.
10. 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.
11. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

REVISIONS

9-08

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

CONT	SECT	JOB	HIGHWAY
0111	09	044, ETC	BS 288B

DIST	COUNTY	SHEET NO.
HOU	BRAZORIA	140

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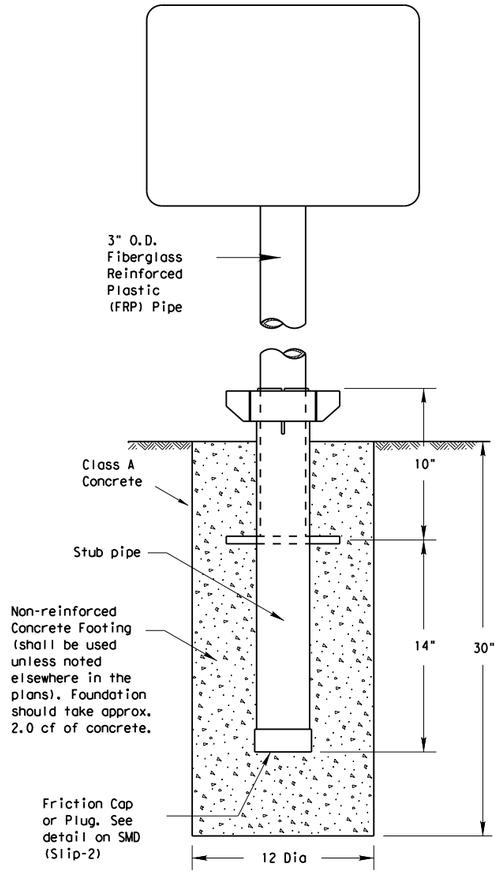
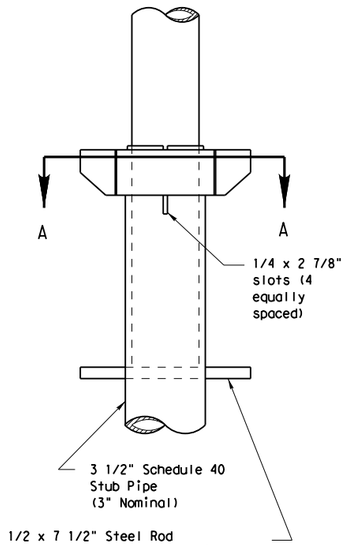
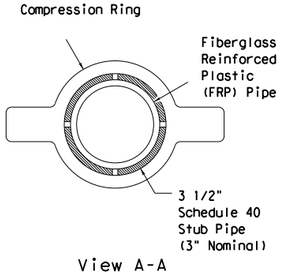
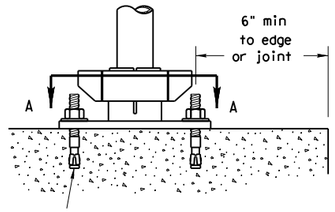
Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post









Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Top of bolt shall extend at least flush with top of nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 3 3/8" minimum embedment, shall have a minimum allowable tension and shear of 2450 and 1525 psi, respectively. Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations.

BOLT-DOWN DETAILS

SM RD SGN ASSM TY FRP(X)UA(P)

SM RD SGN ASSM TY FRP(X)UB(P)

GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing:
   Texas Department of Transportation
   Traffic Operations Division
   125 East 11th Street
   Austin, Texas 78701-2483

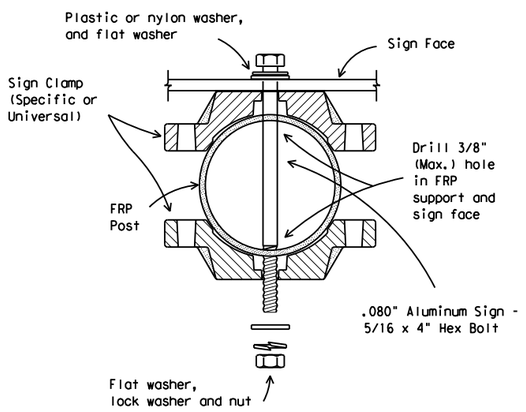
UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert base post in foundation hole to depths shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
4. Level and plumb the base post with coupler using a torpedo level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer. Bottom of base post slots shall be above the concrete footing.
5. Attach sign to FRP post.
6. Insert sign post into base post. Lower until the post comes to rest on the steel rod.
7. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
8. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

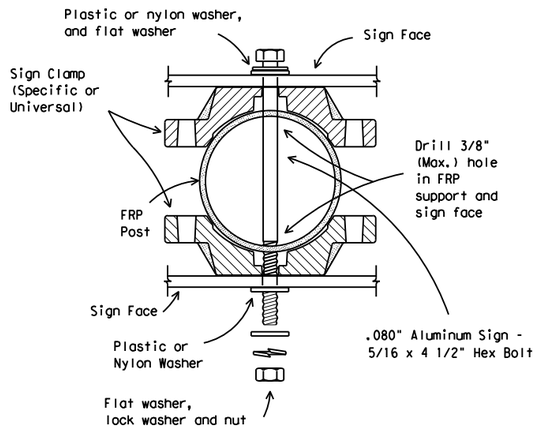
BOLT DOWN SIGN SUPPORT

1. Position base plate with coupler on existing concrete.
2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
3. Attach sign to FRP post.
4. Insert bottom of sign post into pipe stub.
5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

Typical Sign Mounting Detail for FRP Support with Single Sign



Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs



Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD(FRP)-08

REVISIONS
9-08

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

CONT	SECT	JOB	HIGHWAY
0111	09	044, ETC	BS 288B

DIST	COUNTY	SHEET NO.
HOU	BRAZORIA	141

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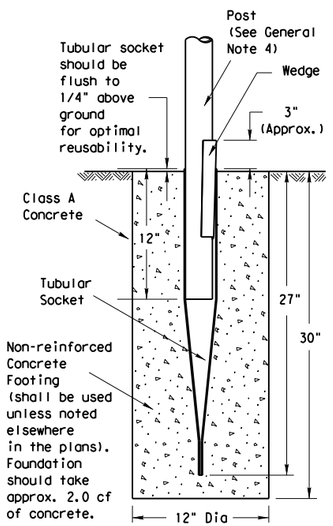
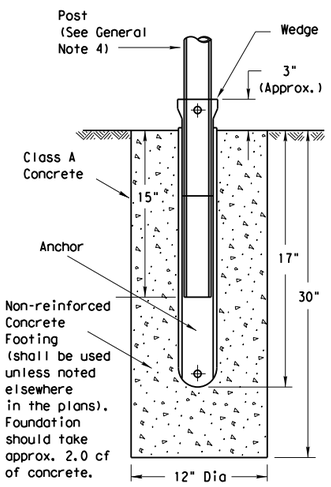
Wedge Anchor Steel System



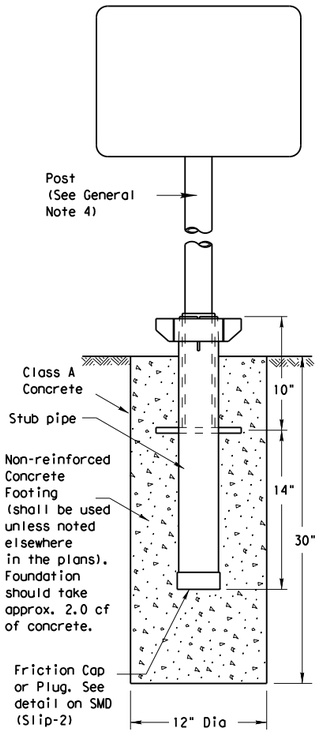
SM RD SGN ASSM TY TWT(X)WS(X)

Wedge Anchor High Density Polyethylene (HDPE) System

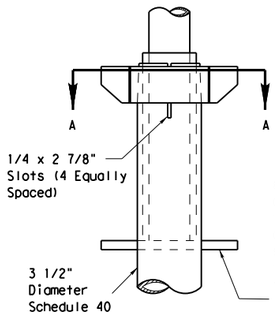


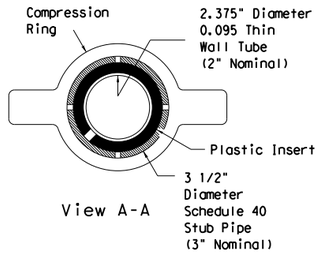
SMD RD SGN ASSM TY TWT(X)WP(X)

Universal Anchor System with Thin-Walled Tubing Post



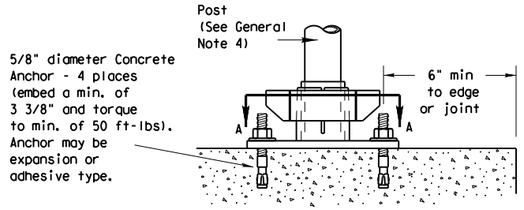
SM RD SGN ASSM TY TWT(X)UA(P)



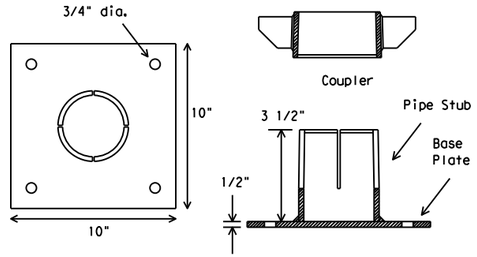


View A-A

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.

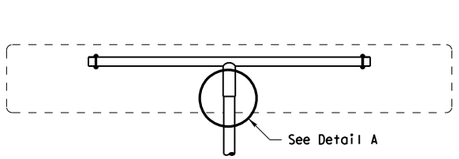


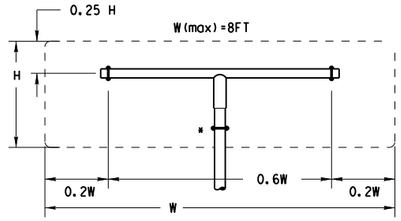
Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. A heavy hex nut per ASTM A563 and hardened washer per ASTM F436. The stud bolt shall have minimum yield and ultimate tensile strengths of 50 and 75 ksi, respectively. Nuts, bolts and washers shall be galvanized 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)

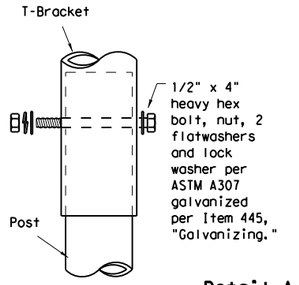
Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post





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

9-08 REVISIONS

CONT	SECT	JOB	HIGHWAY
0111	09	044, ETC	BS 288B

DIST	COUNTY	SHEET NO.
HOU	BRAZORIA	142

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I. WORK AT CROSSING LOCATIONS (AT GRADE, HIGHWAY OVERPASS, HIGHWAY UNDERPASS, PEDESTRIAN, OR CLOSED/ABANDONED)

DOT #: 448606J
Crossing Type: AT GRADE
RR Company Owning Track at Crossing: UNION PACIFIC RAILROAD COMPANY (UPRR)
Operating RR Company at Track: UPRR
RR MP: 0320.280
RR Subdivision: ANGLETON
City: ANGLETON
County: BRAZORIA
CSJ at this Crossing: 0111-07-049
Highway/Roadway name crossing the railroad: BS 288B
# of regularly scheduled trains per day at this crossing: 33
# of switching movements per day at this crossing: 10
% of estimated contract cost of work within railroad ROW: 0.19 %

Scope of Work at this Crossing to Be Performed by State Contractor:

1. Milling 1.5" of ACP
2. Seal Coat
3. Place 1.5" of ACP overlay
4. TCP (2-4)-18, One Lane Closed.
5. Pavement Marking, RCD(1)-16 AND RCD(2)-16.

Scope of Work at this Crossing to Be Performed by Railroad Company:

N/A

II. OTHER PROJECT WORK WITHIN RAILROAD RIGHTS-OF-WAY (ROW)

N/A

III. FLAGGING & INSPECTION

of Days of Railroad Flagging Expected: 6

On this project, night or weekend flagging is:

☐ Expected
☒ Not Expected

Flagging services will be provided by:

☐ Railroad Company: TxDOT will pay flagging invoices
☒ Outside Party: Contractor will pay flagging invoices, to be reimbursed by TxDOT

Contractor must incorporate flaggers into anticipated construction schedule. The Railroad requires a 30 day notice if their flaggers are to be utilized. If Contractor falls behind schedule due to their own negligence and is not ready for scheduled flaggers, any flagging charges will be paid by Contractor.

Contact Information for Flagging:

☒ UPRR - UP.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ BNSF - BNSF.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging

☐ KCS - KCS.info@railpros.com
Call Center 877-315-0513, Select #1 for flagging
- Bottom Line On-Track Safety Services
bottomline076@aol.com, 903-767-7630

☐ OTHERS _____

Contractor must incorporate Construction Inspection into anticipated construction schedule.

☒ Not Required

☐ Required: Contact Information for Construction Inspection:

IV. CONSTRUCTION WORK TO BE PERFORMED BY THE RAILROAD

On this project, construction work to be performed by a railroad company is:

☐ Required
☒ Not Required

Coordinate with TxDOT for any work to be performed by the Railroad Company. TxDOT must issue a work order for any work done by the Railroad Company prior to the work being performed.

V. RAILROAD INSURANCE REQUIREMENTS

Railroad reference number shall be provided by TxDOT CST or DO.

The Contractor shall confirm the insurance requirements with the Railroad as the insurance limits are subject to change without notice.

Insurance policies must be issued for and on behalf of the Railroad. Where more than one Railroad Company is operating on the same right of way or where several Railroad Companies are involved and operate on their own separate rights of way, provide separate insurance policies in the name of each Railroad Company.

No direct compensation will be made to the Contractor for providing the insurance coverages shown below or any deductibles. These costs are incidental to the various bid items.

Type of Insurance	Amount of Coverage (Minimum)
Workers Compensation	$500,000 / $500,000 / $500,000
Commercial General Liability	$2,000,000 / $4,000,000
Business Automobile	$2,000,000 combined single limit
Railroad Protective Liability	
☐ Not Required	
☒ Non - Bridge Projects	$2,000,000 / $6,000,000
☐ Bridge Projects	$5,000,000 / $10,000,000
☐ Other	

VI. CONTRACTOR'S RIGHT OF ENTRY (ROE) AGREEMENT

On this project, an ROE agreement is:

☐ Not Required
☒ Required: TxDOT CST to assist in obtaining with the UPRR (see Item 5, Article 8.3)
☐ Required: Contractor to obtain (see Item 5, Article 8.4)

With the following railroad companies: _____

To view previously approved ROE Agreement templates agreed upon between the State and Railroad, see:

http://www.txdot.gov/inside-txdot/division/rail/samples.html

Approved ROE Agreement templates are not to be modified by the Contractor.

Contractor shall not operate within Railroad Right of Way without an executed Construction & Maintenance Agreement between the State and the Railroad and an executed ROE agreement between the Contractor and the Railroad if required on project.

VII. RAILROAD COORDINATION MEETING

On this project, a Railroad Coordination Meeting is:

☒ Not Required
☐ Required

See Item 5, Article 8.1 for more details.

VIII. SUBCONTRACTORS

Contractor shall not subcontract work without written consent of TxDOT. Subcontractors are required to maintain the same insurance coverage as required of the Contractor.

IX. EMERGENCY NOTIFICATION

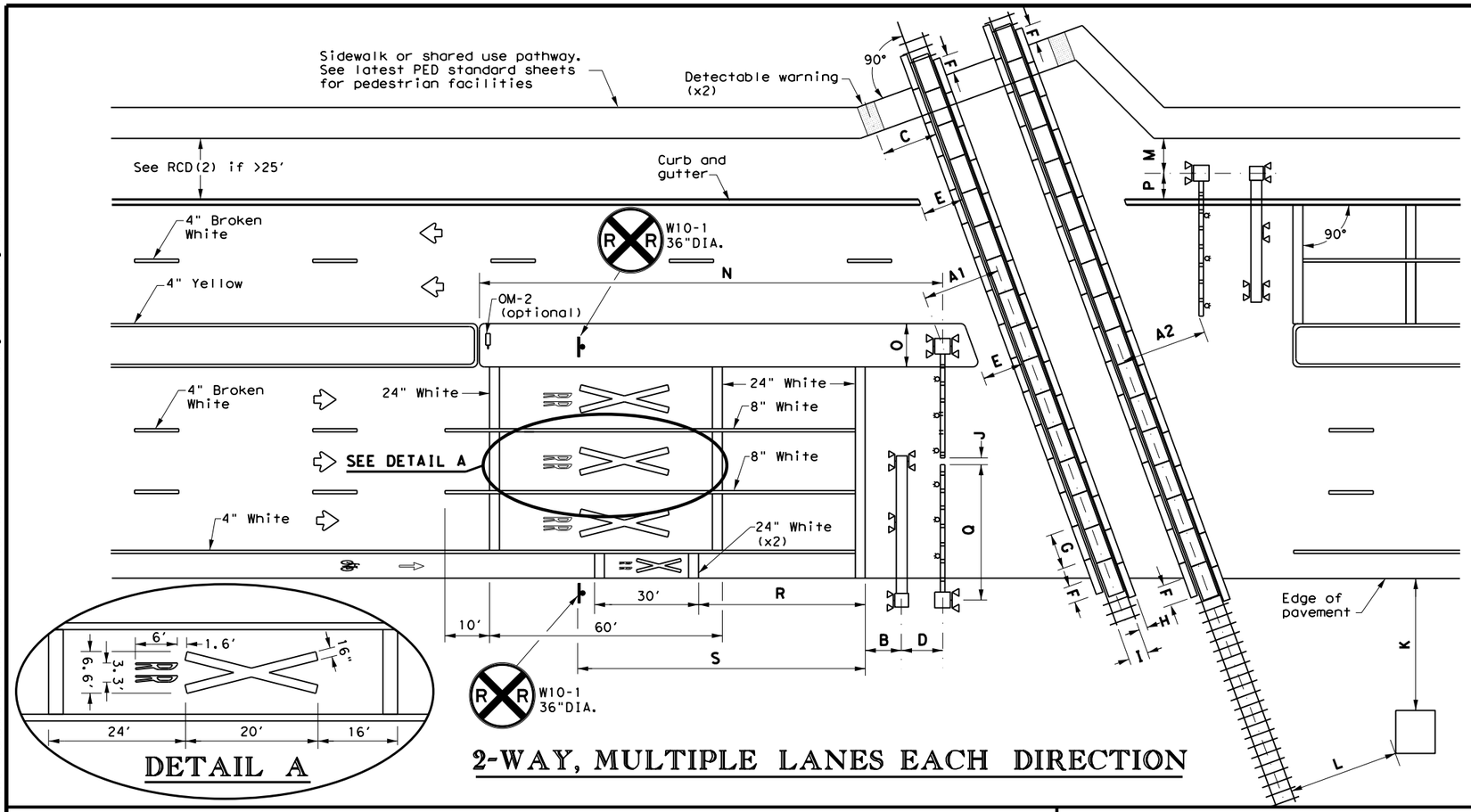
In Case of Railroad Emergency
Call Union Pacific Railroad Company
Railroad Emergency Line at 888-877-7267
Location: DOT 448606J
RR Milepost 0320.280
Subdivision ANGLETON

Texas Department of Transportation — Rail Division

RAILROAD SCOPE OF WORK

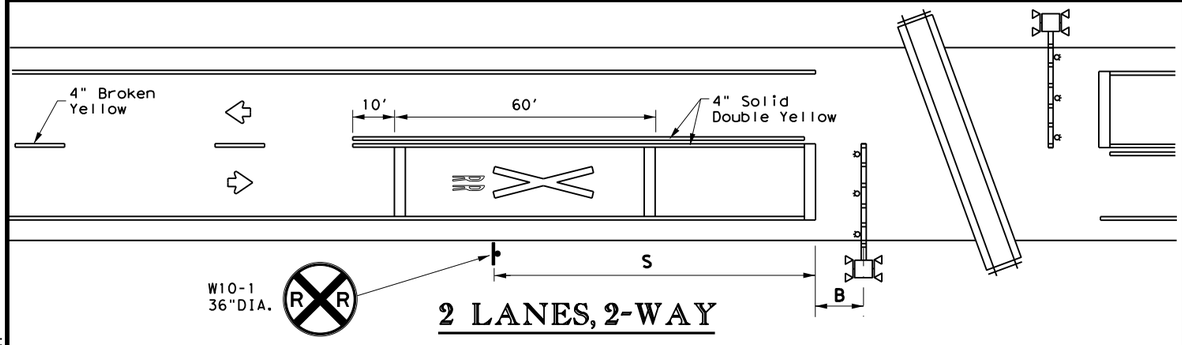
PROJECT SPECIFIC DETAILS

FILE: RR Scope of Work.dgn	DN: TxDOT	CK:	DW:	CK:
©TxDOT June 2014	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044,ETC	BS 288B
3/2020	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		143

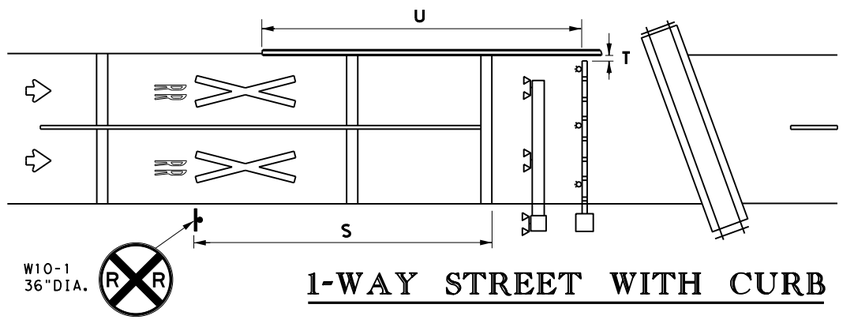


DETAIL A

2-WAY, MULTIPLE LANES EACH DIRECTION



2 LANES, 2-WAY



1-WAY STREET WITH CURB

NOTES

T: Tip of gate to edge of curb: 1' max for Quiet Zone SSM, 90% of traveled way covered by gates for all other locations

U: Non-traversable curb length from gate: 100' min. for a Quiet Zone SSM, 10' min for all other locations.

NOTES

A1: Center of RR mast to center of rail: 12' minimum, 15' typical.

A2: Tip of gate to center of rail: 12' minimum, 15' typical.

B: Center of mast (cantilever, gate, or mast flasher) of nearest active traffic control device to stop line: 8' (NOTE: Stop line may be moved as needed, but should be at least 8' back from gates, if present).

C: Center of detectable warning device to nearest rail: 6' minimum

D: Center of gate mast to center of cantilever mast: 6' typical. NOTE: Cantilever may be located in front or behind gates.

E: Edge of median or curb to nearest rail: 10' typical. NOTE: Design median edge to be parallel with rail.

F: Edge of planking panel from edge of pavement or sidewalk: 3' minimum. NOTE: Field panels need not be in line with gauge panels.

G: Length of panels along rail: 8' typical.

H: Width of field panel: 2' typical (check with railroad company).

I: Distance between rails: 4'-8.5".

J: Tip of gate to tip of gate: 2' maximum for Quiet Zone SSM or 90% of traveled way covered by gates for all other locations.

K: Nearest edge of RR cabin from edge of pavement: 30' typical. NOTE: Cabinet not required to be parallel to edge of pavement.

L: Nearest edge of RR cabin from nearest rail: 25' typical.

M: Center of RR mast to edge of sidewalk: 6' minimum.

N: Center of gate mast to leading edge of non-traversable median: 100' minimum to qualify as a Quiet Zone SSM. NOTE: 60'will suffice if there is a street intersection within the 100' and all street intersections within 60' are closed.

O: Width of median: 8'-6" minimum, 10' typical when using median gates. NOTE: Center of gate mast minimum 4'-3" from face of curb.

P: Center of RR mast to face of curb: 4'-3" minimum.
Center of RR mast to edge of pavement (with shoulder): 6' minimum
Center of RR mast to edge of pavement (no shoulder): 8'-3" minimum
NOTE: BNSF prefers 5'-3", 7', and 9'-3" minimums, respectively.

Q: Gate length: 28' or less typical, but railroad company may allow up to 32'under special circumstances.

R: Stop line to first RR Crossing transverse line (bike lane): 50' typical.

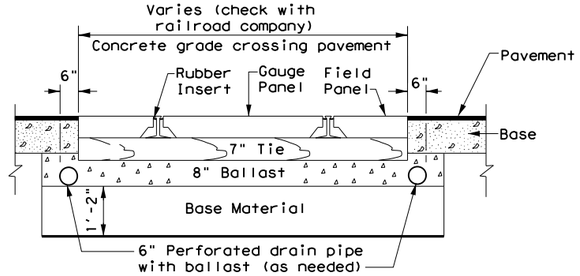
S: Stop line to GRADE CROSSING ADVANCE WARNING (W10-1) sign and adjacent RR Crossing pavement markings. See Table 1. See RCD(2) for other signs.

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

LEGEND	
	Sign
	Object Marker
	Traffic Flow
	Cantilever
	Gate Assembly
	Mast Flasher Pair

GENERAL NOTES

1. Medians and curbs must be non-traversable to qualify as a Quiet Zone Supplementary Safety Measure (SSM). Non-traversable curbs in Quiet Zones are 6" tall minimum and used on roadways where speed does not exceed 40 mph.
2. Raised pavement markers may be used to supplement striping. See PM(2) and PM(3) standard sheets.
3. Medians preferred whenever possible to prevent vehicles from driving around gates.
4. Longitudinal edge striping may be continued thru crossing as needed. Illumination may also be considered for nighttime visibility.
5. See SMD standard sheets for sign mounting details.
6. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.



CROSSING SURFACE CROSS SECTION

Texas Department of Transportation

Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING, STRIPING, AND DEVICE PLACEMENT RCD(1)-16

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REVISIONS	0111	09	044, ETC	BS 288B
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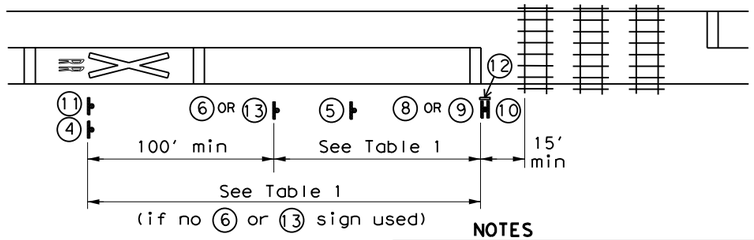
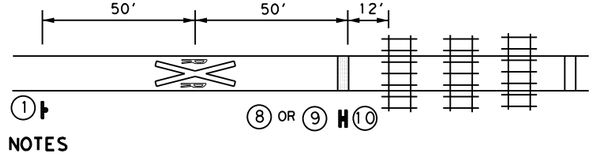


NOTES

1. Stop or yield sign may also be installed to the left of the crossbuck sign, rather than below it.
2. A 2" white retroreflective strip shall be installed on front and back of crossbuck sign post.

PASSIVE CROSSING



NOTES

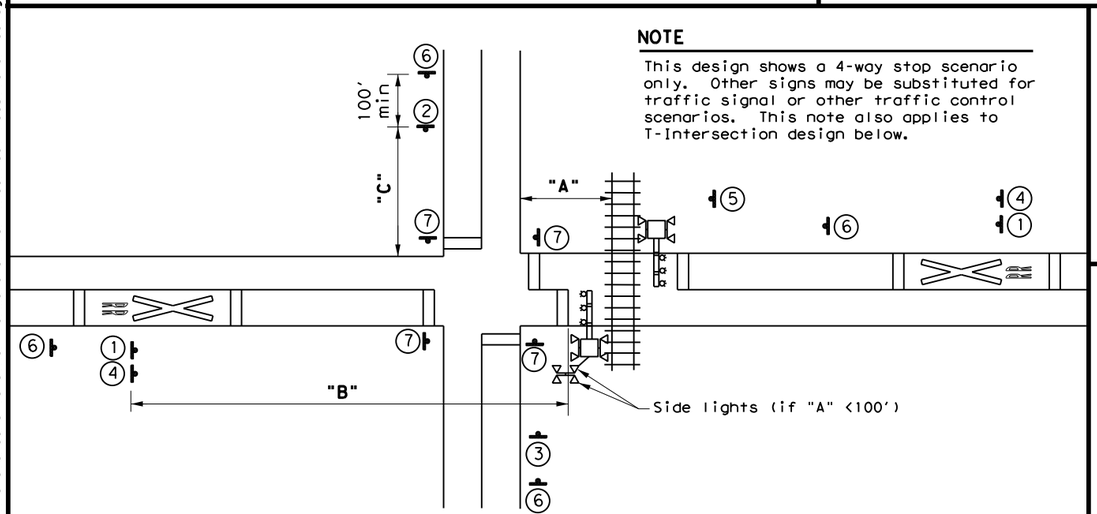
1. A shared use pathway is considered a separate pathway crossing when more than 25′ from traveled way of adjacent roadway.
2. Detectable warning used at stop bar.
3. Smaller sign sizes preferred than shown to the right on this sheet.

PATHWAY CROSSING

TABLE 1	
Approach Speed (mph)	Desirable Placement (feet)
20	100
25	100
30	100
35	100
40	125
45	175
50	250
55	325
60	400
65	475
70	550
75	650

GENERAL NOTES

1. Railroad company to provide active traffic control devices, CROSSBUCK (R15-1), NUMBER OF TRACKS Plaque (R15-2P) (if more than 1 track), and EMERGENCY NOTIFICATION (I-13) signs.
2. LOW GROUND CLEARANCE (W10-5) signs may be relocated further upstream of crossing to provide advance warning of alternate route.
3. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2) signs may be modified as needed to fit roadway geometry.
4. Table 1 placement distances may vary per Sect. 2C.05 of the TMUTCD.
5. See Table 1 to determine placement of STOP AHEAD (W3-1) and YIELD AHEAD (W3-2) signs unless shown otherwise.
6. DO NOT STOP ON TRACKS (R8-8) signs installed when potential for vehicles stopping on tracks is significant as determined by sealing engineer. Install so sign does not block view of RR mast.
7. See the Standard Highway Sign Design for Texas (SHSD) manual for sign and pavement marking details.

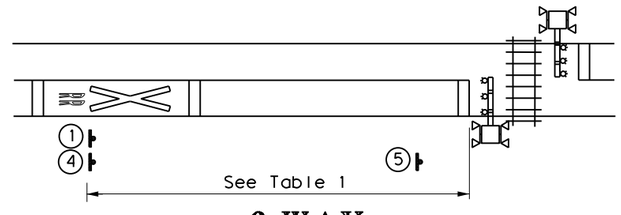


NOTE

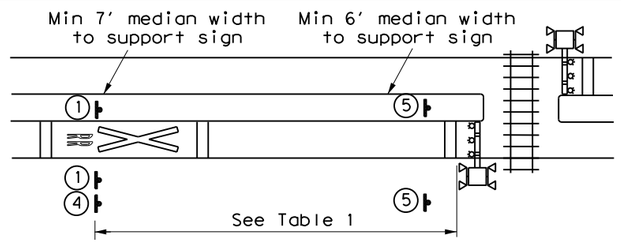
This design shows a 4-way stop scenario only. Other signs may be substituted for traffic signal or other traffic control scenarios. This note also applies to T-Intersection design below.

	"A" <100′	"A" ≥100′
"B"	See Table 1. Place pavement markings and signs on opposite side of intersection from rail if spacing from Table 1 would put markings within intersection.	See Table 1. Place pavement markings and signs between rail and intersection if spacing from Table 1 would put markings within intersection.
"C"	See Table 1.	GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-2, W10-3, W10-4) signs should only be installed if W10-1 sign is not between intersection and railroad crossing. If needed, see Table 1.

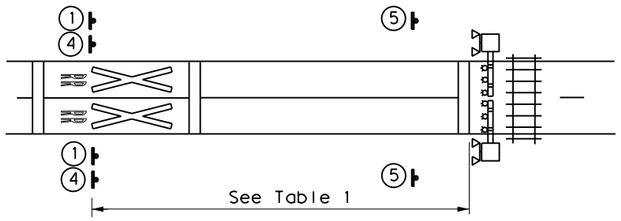
GRADE CROSSING NEAR A PARALLEL STREET



2-WAY



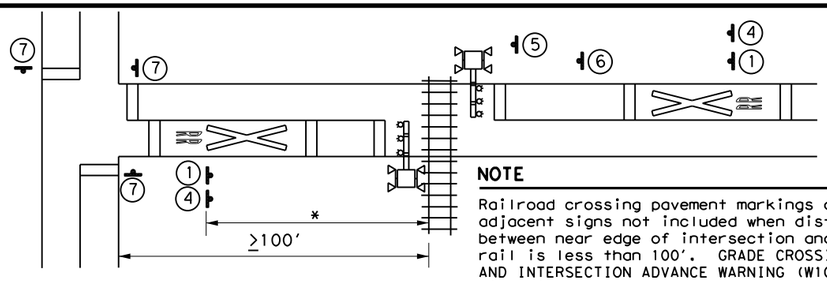
2-WAY WITH MEDIAN



1-WAY

SIGNS

** R R ① W10-1 36"DIA.	** ② W10-2L 36"X36"	** ③ W10-2R 36"X36"	IF NEEDED ④ W10-5 36"X36" / LOW GROUND CLEARANCE W10-5P 30"x24"
IF NEEDED DO NOT STOP ON TRACKS ⑤ R8-8 24"X30"	IF NEEDED ⑥ W3-1 30"X30"	STOP R1-1 36"X36" / ALL WAY R1-3P 18"X6" ⑦	RAIL CROSSING ROAD 3 TRACKS R15-1 48"X9" / R15-2P 27"X18" / STOP R1-1 36"X36" ⑧
RAIL CROSSING ROAD 3 TRACKS R15-1 48"X9" / R15-2P 27"X18" / YIELD R1-2 48"X48"X48" ⑨	RAIL CROSSING ROAD 3 TRACKS R15-1 48"X9" / R15-2P 27"X18" ⑩	R R W10-1 36"DIA. / NO GATES OR LIGHTS W10-13P 30"X24" ⑪ **	REPORT EMERGENCY OR PROBLEM 1-800-555-5555 CROSSING 836 597 H Sign may be placed perpend. to travel lanes. ⑫ I-13 15"X9"
IF NEEDED ⑬ W3-2 30"X30"	** Includes a NO TRAIN HORN Plaque (W10-9P) if crossing is in a Quiet Zone. LOW GROUND CLEARANCE Plaque (W10-5P) if needed is mounted below W10-2/W10-3/W10-4 signs.		
NO TRAIN HORN W10-9P 30"X24"	LOW GROUND CLEARANCE W10-5P 30"X24"		

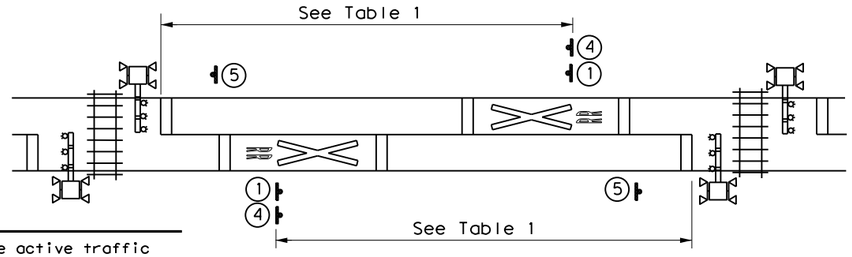


*Use Table 1 if sufficient space exists.

NOTE

Railroad crossing pavement markings and adjacent signs not included when distance between near edge of intersection and near rail is less than 100′. GRADE CROSSING AND INTERSECTION ADVANCE WARNING (W10-3) signs installed on roadway parallel with rail in this case.

T-INTERSECTION



NOTE

Separate active traffic control devices, railroad crossing pavement markings, and adjacent signs required when tracks are more than 100′ apart.

2 ADJACENT CROSSINGS

Texas Department of Transportation

Traffic Operations Division Standard

RAILROAD CROSSING DETAILS SIGNING & STRIPING

RCD(2)-16

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	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		145

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PART 1 - GENERAL

1.01 DESCRIPTION

This project includes construction work within the right of way and/or properties of the Railroad and adjacent to its tracks, wire lines and other facilities. These sheets describe the minimum special requirements for coordination with the Railroad when working upon, over or under Railroad Right of Way or when impacting current or future Railroad operations. Coordinate with the Railroad while performing the work outlined herein, and afford the same cooperation with the Railroad as with TxDOT. Complete all submittals and work in accordance with TxDOT Standard Specifications, Railroad Guidelines and AREMA recommendations as modified by these minimum special requirements or as directed in writing by the Railroad Designated Representative.

For purposes of this project, the Railroad Designated Representative is the person or persons designated by the Railroad Manager of Industry and Public Projects to handle specific tasks related to the project.

1.02 REQUEST FOR INFORMATION / CLARIFICATION

Submit Requests for Information ("RFI") involving work within any Railroad Right of Way to the TxDOT Engineer. The TxDOT Engineer will submit the RFI to the Railroad Designated Representative for review and approval for RFI's corresponding to work within Railroad Right of Way. Allow six (6) weeks total time for review and approval, which includes four (4) weeks for review and approval by the Railroad.

1.03 PLANS / SPECIFICATIONS

TxDOT has received written Railroad approval of the plans and specifications for this project. Any revisions or changes in the plans after award of the Contract must have the approval of TxDOT and the Railroad.

PART 2 - UTILITIES AND FIBER OPTIC

Construct all utility installations in accordance with current AREMA recommendations, Railroad, TxDOT and owning utility specifications and requirements. Railroad general guidelines can be found on the Railroad website or by contacting the Railroad Designated Representative.

PART 3 - CONSTRUCTION

3.01 GENERAL

A. Perform all work in compliance with all applicable Railroad, Federal Railroad Administration (FRA), and TxDOT rules and regulations. Arrange and conduct work in a manner that does not endanger or interfere with the safe operation of the tracks and property of the Railroad and the traffic moving on such tracks, or the wires, signals and other property of the Railroad, its tenants or licensees, at or in the vicinity of the Work. The safe operation of railroad train movements takes precedence over any work to be performed by the Contractor. The Contractor is responsible for train delay cost and lost revenue claims due to any delays or interruption of train operations resulting from Contractor's construction or other activities.

B. Construction activities within 15 feet of the operational tracks will only be allowed if absolutely necessary and the Railroad's Designated Representative grants approval. Construction activities within 15 feet of the operational track(s) preferably allow the tracks to stay operational. In such cases, coordination and approval by the Railroad Track Manager is required with regard to schedule, flagging, and slow orders. See Sections 3.07 and 3.08 for additional information.

C. Provide track protection for all work equipment (including rubber tired equipment) operating within 25 feet from nearest rail. When not in use, keep Contractor machinery and materials at least 50 feet from the Railroad's nearest track.

D. Vehicular crossings of railroad track are allowed only at existing crossings, or haul road crossings developed with Railroad approval.

E. The Contractor is also advised that new railroad facilities within the project may be built by the Railroad. If applicable, these facilities are delineated in the plans. Be aware of the limits of responsibilities and coordinate efforts with the Railroad and TxDOT.

F. Railroad requirements do not allow work within 50 feet of track centers when a train passes the work site and all personnel must clear the area within 50 feet of the track centerline and secure all equipment. Additional allowances may be pursued as outlined in 3.02 and 3.03.

G. All permanent clearances shall be verified before project closing.

3.02 RAILROAD OPERATIONS

A. Trains and/or equipment are expected on any track, at any time, in either direction. Become familiar with the train schedules in this location and structure bid assuming intermittent track windows in this period, as defined in Paragraph B that follows.

B. All railroad tracks within and adjacent to the contract site are active, and rail traffic over these facilities shall be maintained throughout the Project. Activities may include both through moves and switching moves to local customers. railroad traffic and operations will occur continuously throughout the day and night on these tracks and shall be maintained at all times as defined herein. Coordinate and schedule the work so that construction activities do not interfere with railroad operations.

C. Coordinate work windows with TxDOT and the Railroad's Designated Representative. Types of work windows include Conditional Work Windows and Absolute Work Windows, as defined below:

1. Conditional Work Window: A Conditional Work Window is a period of time that railroad operations have priority over construction activities. When construction activities may occur on and/or adjacent to the railroad tracks within 25 feet of the nearest track, a railroad flag person will be required. At the direction of the railroad flag person, upon approach of a train, and when trains are present on the tracks, the tracks must be cleared (i.e., no construction equipment, materials or personnel within 25 feet, or as directed by the Railroad Designated Representative, from the tracks). Conditional Work Windows are available for the Project.

2. Absolute Work Window: An Absolute Work Window is a period of time that construction activities are given priority over railroad operations. During this time frame, the designated railroad track(s) will be inactive for train movements and may be fouled by the Contractor. At the end of an Absolute Work Window, the railroad tracks and/or signals must be completely operational for train operations and all Railroad, Public Utilities Commission (PUC) and FRA requirements, codes and regulations for operational tracks must be satisfied. In the situation where the operating tracks and/or signals have been affected, the Railroad will perform inspections of the work prior to placing that track back into service. Railroad flag persons will be required for construction activities requiring an Absolute Work Window. Absolute Work Windows will not generally be granted. Any request will require a detailed explanation for Railroad review.

3.03 RIGHT OF ENTRY, ADVANCE NOTICE AND WORK STOPPAGES

A. Do not perform any work within Railroad Right of Way without a valid executed Right of Entry Agreement if required on this project.

B. Give advance notice to the Railroad as required in the "Contractor's Right of Entry Agreement" before commencing work in connection with construction upon or over Railroad Right of Way and observe the Railroad's rules and regulations with respect thereto.

C. Perform all work upon Railroad Right of Way in a manner to avoid interference with or endanger the operations of the Railroad. Whenever work may affect the operations or safety of trains, submit the work method to the Railroad Designated Representative for approval. Approval does not relieve the Contractor from liability. Do not commence any work which requires flagging service or inspection service until the flagging protection required by the Railroad is available at the job site. See Section 3.15 for railroad flagging requirements.

D. Make requests in writing for both Absolute and Conditional Work Windows, at least 30 days in advance of any work. Include in the written request:
1. Exactly what the work entails.
2. The days and hours that work will be performed.
3. The exact location of work, and proximity to the tracks.
4. The type of window requested and the amount of time requested.
5. The designated contact person.

Provide a written confirmation notice to the Railroad at least 48 hours before commencing work in connection with approved work windows when work is within 25 feet of nearest rail. Perform all work in accordance with previously approved work plans.

E. Make provisions to protect operations and property of the Railroad should a condition arising from, or in connection with the work, require immediate and unusual action. If in the judgment of the Railroad Designated Representative such provisions are insufficient, the Railroad Designated Representative may require or provide such provisions as deemed necessary. In any event, such provisions shall be at the Contractor's expense and without cost to the Railroad or TxDOT. The Railroad or TxDOT shall have the right to order the Contractor to temporarily cease operations in the event of an emergency or, if in the opinion of the Railroad Designated Representative, the Contractor's operations could endanger railroad operations. In the event of such an order, immediately notify TxDOT of the order.

3.04 INSURANCE

Do not begin work upon or over Railroad Right of Way until furnishing the Railroad with the insurance policies, binders, certificates and endorsements required by the "Contractor's Right of Entry Agreement", and until the Railroad Designated Representative has advised TxDOT that such insurance is in accordance with the Agreement.

3.05 RAILROAD SAFETY ORIENTATION

A. Complete the railroad course "Orientation for Contractor's Safety", and maintain current registration prior to working on railroad property. This course is required to be completed annually by Contractor and Subcontractor personnel working on site.

"UPRR, BNSF, KCS/TEXMEX will not accept on-track safety training certificates from other railroads. Refer to Railroad specific contractor right of entry for training information."

B. Know and follow the "Contractor's Right of Entry Agreement" EXHIBIT D, MINIMUM SAFETY REQUIREMENTS regarding clothing, personal protective equipment, and general safety requirements.

3.06 COOPERATION

The Railroad will cooperate with Contractor so that work may be conducted in an efficient manner, and will cooperate with Contractor in enabling use of Railroad Right of Way in performing the work.

3.07 MINIMUM CONSTRUCTION CLEARANCES FOR FALSEWORK AND OTHER TEMPORARY STRUCTURES

Abide by the following minimum temporary clearances during the course of construction:
A. 15' - 0" (BNSF)(UPRR)and 14'-0" (KCS) horizontal from centerline of track
B. 22' (KCS) and 21' - 6" (UPRR & BNSF) vertically above top of rail.

For construction clearance less than listed above, obtain local Railroad Operating Unit review and approval.

3.08 APPROVAL OF REDUCED CLEARANCES

A. Maintain minimum track clearances during construction as specified in Section 3.07.

B. Submit any proposed infringement on the specified minimum clearances to the Railroad Designated Representative through TxDOT at least 30 days in advance of the work. Do not proceed with such infringement without written approval by the Railroad Designated Representative.

C. Do not commence work involving an approved infringement without receiving written assurance from the Railroad Designated Representative that arrangements have been made for any necessary flagging service.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

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	HOU	BRAZORIA		146

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3.09 MAINTENANCE OF RAILROAD FACILITIES

A. Maintain all ditches and drainage structures free of silt or other obstructions resulting from Contractor's operations. Repair eroded areas and any other damage within Railroad Right of Way and repair any other damage to the property of the Railroad, or its tenants.

B. Perform all such maintenance and repair of damages due to the Contractors's operations at Contractor's expense.

C. Submit a proposed method of erosion control for review by the Railroad prior to beginning any grading on the project site. Comply with all applicable local, state and federal regulations when developing and implementing such erosion control.

3.10 SITE INSPECTIONS BY RAILROAD's DESIGNATED REPRESENTATIVE

A. In addition to the office reviews of construction submittals, site inspections may be performed by the Railroad Designated Representative at significant points during construction, including the following if applicable:
   1. Pre-construction meetings.
   2. Pile driving/drilling of caissons or drilled shafts.
   3. Reinforcement and concrete placement for railroad bridge substructure and/or superstructure.
   4. Erection of precast concrete or steel bridge superstructure.
   5. Placement of waterproofing (prior to placing ballast on bridge deck).
   6. Completion of the bridge structure.

B. Site inspection is not limited to the milestone events listed above. Site visits to check progress of the work may be performed at any time throughout the construction as deemed necessary by the Railroad.

C. Provide a detailed construction schedule, including the proposed temporary horizontal and vertical clearances and construction sequence for all work to TxDOT for submittal to the Railroad Designated Representative for review prior to commencement of work. Include the anticipated dates when the above listed events will occur. Update this schedule for the above listed events as necessary and each month at a minimum to allow the Railroad to schedule site inspections.

3.11 RAILROAD REPRESENTATIVES

Railroad representatives, conductors, flag person or watch person will be provided by the Railroad at expense of TxDOT to protect Railroad facilities, property and movements of its trains or engines. In general, the Railroad will furnish such personnel or other protective services as follows:

A. When any part of any equipment is standing or being operated within 25 feet, measured horizontally, from nearest rail of any track on which trains may operate, or when any object is off the ground and any dimension thereof could extend inside the 25 foot limit, or when any erection or construction activities are in progress within such limits, regardless of elevation above or below track.

B. For any excavation below elevation of track subgrade if, in the opinion of the Railroad Designated Representative, track or other railroad facilities may be subject to settlement or movement.

C. During any clearing, grubbing, excavation or grading in proximity to railroad facilities, which, in the opinion of the Railroad Designated Representative, may endanger railroad facilities or operations.

D. During any Contractor's operations when, in the opinion of the Railroad Designated Representative, railroad facilities, including, but not limited to, tracks, buildings, signals, wire lines, or pipe lines, may be endangered.

E. Arrange with the Railroad Designated Representative to provide the adequate number of flag persons to accomplish the work.

3.12 COMMUNICATIONS AND SIGNAL LINES

If required, the Railroad will rearrange its communications and signal lines, its grade crossing warning devices, train signals and tracks, and facilities that are in use and maintained by the Railroad's forces in connection with its operation at expense of TxDOT. This work by the Railroad will be done by its own forces and it is not a part of the Work under this Contract.

3.13 TRAFFIC CONTROL

Coordinate any operations that control traffic across or around railroad facilities with the Railroad Designated Representative.

3.14 CONSTRUCTION EXCAVATIONS AND BORING ACTIVITIES UNDER TRACK

A. Take special precaution and care in connection with excavating and shoring. Excavations for construction of footings, piers, columns, walls or other facilities that require shoring shall comply with requirements of TxDOT, OSHA, AREMA and Railroad "Guidelines for Temporary Shoring".

B. The project plans indicate whether there are fiber optic lines or other such telecommunications systems that require consideration. Regardless, contact the necessary call center to determine if such cable systems are present:

   UPRR 1-800-336-9193
   7:00 AM to 9:00 PM CST Monday-Friday except holidays,
   staffed 24 hrs/day for emergencies
   48 hrs notice required

   BNSF 1-800-533-2891
   24 hour number
   5 working days notice required

   KCS 1-800-344-8377
   Texas One Call, a 24 hour number
   48 hrs notice required, excluding weekends and holidays

   If a telecommunications system is buried anywhere on or near railroad property, coordinate with TxDOT, the Railroad and the Telecommunication Company(ies) to arrange for relocation or protective measures prior to beginning work on or near railroad property. Refer to the project General Notes for additional information.

C. Projects involving a boring or jack and bore operation under track such as drainage pipes or culverts and utilities require an installation plan reviewed and approved by the Railroad and TxDOT prior to proceeding with such construction. A railroad inspector and contractor assisted monitoring of ground and track movement is required to maintain safe passage of rail traffic. Stop installation and do not allow passage of trains if movements in excess of 1/4 inch vertical or horizontal is detected in the tracks. Immediately repair the damage to the satisfaction of TxDOT and the Railroad before proceeding.

3.15 RAILROAD FLAGGING

Per the Right of Entry Agreement for flagging, notify the Railroad Representative at least 10 working days in advance of Contractor's work and at least 30 working days in advance of any Contractor's work in which any person or equipment will be within 25 feet of nearest rail or as specified in the Contractor Right of Entry (CROE).

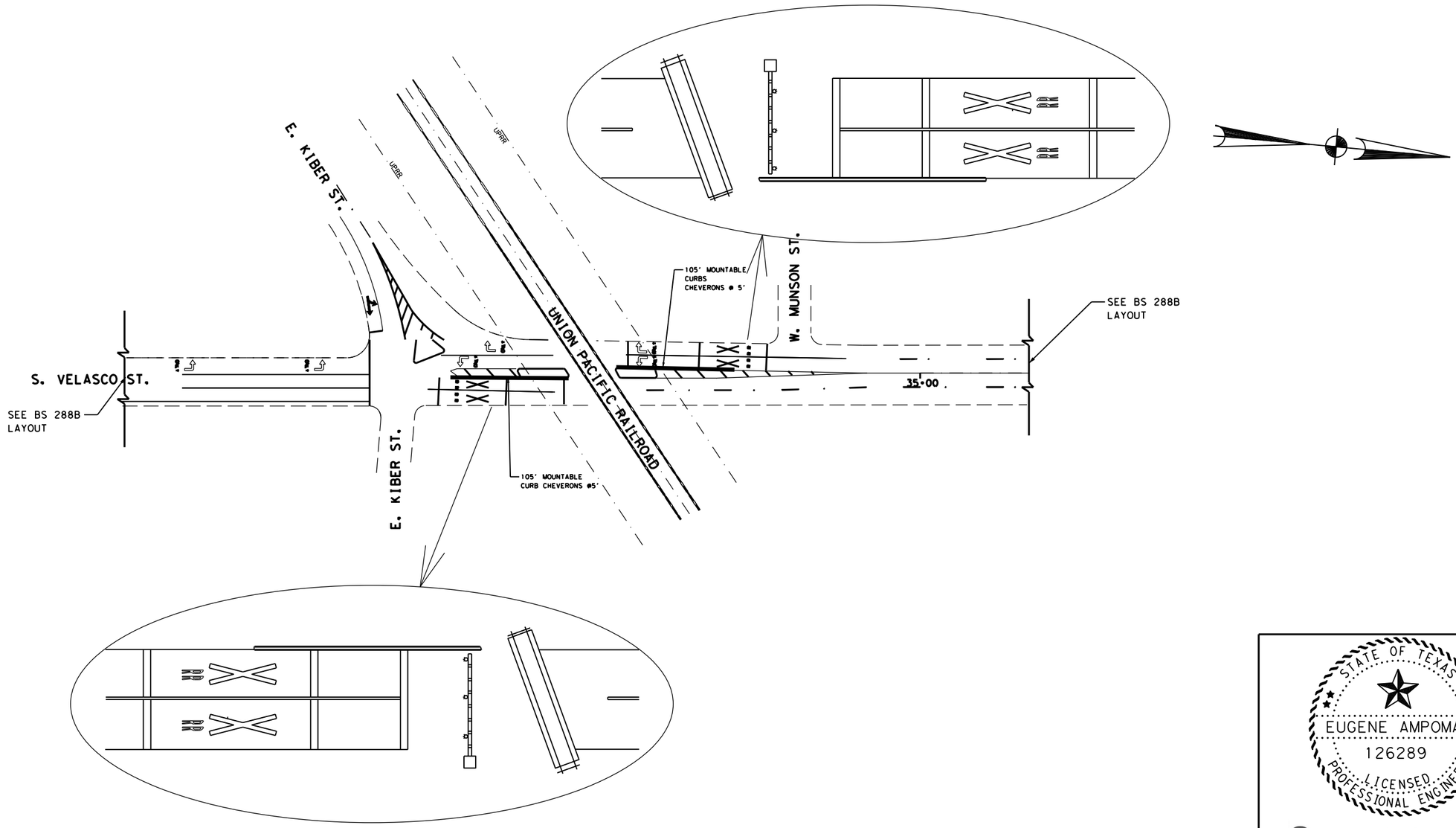
3.16 CLEANING OF RIGHT-OF-WAY

When work is complete, remove all tools, implements, and other materials brought into Railroad Right of Way and leave the right of Way in a clean and presentable condition to the satisfaction of TxDOT and the Railroad.

Texas Department of Transportation | Rail Division

RAILROAD REQUIREMENTS FOR NON-BRIDGE CONSTRUCTION PROJECTS

FILE:	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT October 2018	CONT	SECT	JOB	HIGHWAY
REVISIONS March 2020	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		147



NOTE:

For signs and pavement marking locations refer to RCD (1)-16 and RCD (2)-16.

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.21.2022

PAVEMENT MARKING LAYOUT NEAR RR CROSSING

CONT.	SECT.	JOB	HIGHWAY NO.
0111	09	044, ETC	BS 288B
DIST.	COUNTY		SHEET NO.
HOU	BRAZORIA		148

SCALE N.T.S
SHEET 1 OF 1

1/20/2022
H:\1110904\PM LAYOUT*NEAR*RR CROSSING.dgn

1. FURNISH BLACK HOUSING FOR VEHICLE SIGNALS. FURNISH BLACK VEHICLE SIGNAL HEAD BACK PLATES WITH 2 IN. RETROFLECTIVE YELLOW BORDER.

2. FURNISH VEHICLE SIGNALS WITH LIGHT EMITTING DIODE (LED) SIGNAL LAMP UNITS.

3. USE TYPE B (HIGH INTENSITY PRISMATIC) OR TYPE D (DIAMOND GRADE) RETROREFLECTIVE SHEETING FOR SIGNS MOUNTED UNDER OR ADJACENT TO THE SIGNAL HEADS.

4. THE DEPARTMENT'S TRAFFIC SIGNAL MAINTENANCE OFFICE WILL PROVIDE PHASING FOR TEMPORARY AND PERMANENT TRAFFIC SIGNALS. THE CONTRACTOR WILL PROVIDE TIMING.

5. LOCATE CABINET(S), STEEL SIGNAL POLES, SIGNAL DETECTORS, ETC., AS APPROVED.

6. REPAIR OR REPLACE PAVEMENT AND SIDEWALKS DAMAGED BY THE CONTRACTOR'S FORCES DURING CONSTRUCTION AT NO COST TO THE DEPARTMENT.

7. ALL TRAFFIC SIGNAL DETECTION DEVICES AND RELATED COMPONENTS SHALL BE SALVAGED AND RETURNED TO THE DEPARTMENT'S SIGNAL SHOP AT 6810 OLD KATY ROAD, HOUSTON, TEXAS, BETWEEN 9:00 AM AND 3:00 PM, MONDAY THROUGH FRIDAY. CAREFULLY REMOVE THE MATERIALS SO THAT THEY WILL NOT BE MARRED OR DAMAGED. REPLACE MATERIALS THAT ARE SCARRED, BATTERED OR BROKEN BY THE CONTRACTOR AT NO EXPENSE TO THE DEPARTMENT.

8. FOR ALL OTHER TRAFFIC SIGNAL RELATED COMPONENTS, CONTACT MR. MICHAEL AWA, P.E., AT TEXAS DEPARTMENT OF TRANSPORTATION, P.O. BOX 1386, HOUSTON, TEXAS 77251-1386, TEL. NO. (713) 802-5661; HIS EMPLOYEES WILL DETERMINE WHICH ITEMS WILL BE SALVAGED. ITEMS DEEMED SALVAGEABLE WILL BE DELIVERED TO THE DEPARTMENT'S SIGNAL SHOP AT 6810 OLD KATY ROAD, HOUSTON, TEXAS, BETWEEN 9:00 AM AND 3:00 PM, MONDAY THROUGH FRIDAY. CAREFULLY REMOVE THE MATERIALS SO THAT THEY WILL NOT BE MARRED OR DAMAGED. REPLACE MATERIALS THAT ARE SCARRED, BATTERED OR BROKEN BY THE CONTRACTOR AT NO EXPENSE TO THE DEPARTMENT. DISPOSE OF OTHER ITEMS REMOVED BY THE CONTRACTOR AT NO EXPENSE TO THE DEPARTMENT.

9. ASSUME OWNERSHIP OF THE REMOVED EXISTING SIGNS.

10. SEAL ENDS OF ALL CONDUITS WITH DUCT SEAL, EXPANDABLE FOAM, OR BY OTHER METHODS APPROVED BY THE ENGINEER. SEAL CONDUIT IMMEDIATELY AFTER COMPLETION OF CONDUCTOR INSTALLATION AND PULL TESTS. DO NOT USE DUCT TAPE AS PERMANENT CONDUIT SEALANT. DO NOT USE SILICON CAULK AS A CONDUIT SEALANT.

11. CAP SPARE CONDUITS INSTALLED IN POLE FOUNDATIONS AND GROUND BOXES USING APPROVED CAPPING DEVICES.

12. DO NOT PLACE SIGNAL HEADS OVER THE ROADWAY UNTIL ALL NECESSARY MATERIALS ARE ON HAND AS APPROVED.

13. INSTALL TWO SET SCREWS ON ALL VEHICLE SIGNAL HEAD MOUNTING HARDWARE FITTINGS.

14. PROVIDE CONTINUED OPERATION OF THE EXISTING SIGNAL(S) DURING CONSTRUCTION AND UNTIL THE PROPOSED OPERATION IS COMPLETED.

15. ONCE THE INTEGRITY AND/OR FUNCTION OF THE EXISTING TRAFFIC SIGNAL(S) IS ALTERED BY THE CONTRACTOR, MAINTAIN AND OPERATE THE EXISTING TRAFFIC SIGNAL(S) UNTIL THE TRAFFIC SIGNAL WORK IS ACCEPTED BY THE DEPARTMENT. DURING THE CONSTRUCTION OF THE PROPOSED TRAFFIC SIGNAL WORK, MAINTAIN THE EXISTING TRAFFIC SIGNAL(S) AND/OR TEMPORARY CONSTRUCTION TRAFFIC SIGNAL(S) IN CONFORMANCE WITH THE LATEST TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

16. DURING CONSTRUCTION OF THE PROPOSED SIGNAL WORK, IF THE EXISTING TRAFFIC SIGNAL EQUIPMENT REQUIRES REPLACEMENT DUE TO WEAR, DETERIORATION, OR ANY CIRCUMSTANCE OVER WHICH THE CONTRACTOR HAS NO CONTROL, THE EQUIPMENT WILL BE FURNISHED BY THE DEPARTMENT AT NO COST TO THE CONTRACTOR. INSTALL THIS EQUIPMENT AT NO COST TO THE DEPARTMENT. SUCH MATERIALS WILL BE PROVIDED AT THE DEPARTMENT'S SIGNAL SHOP LOCATED AT 6810 KATY ROAD, HOUSTON, TEXAS. CONTACT MR. MICHAEL AWA, P.E., AT TELEPHONE NUMBER (713) 802-5661.

17. MAINTAIN THE INTEGRITY AND FUNCTION OF EACH EXISTING SIGNALIZED INTERSECTION. ONCE THE INTEGRITY OR FUNCTION OF THE SIGNAL HAS BEEN ALTERED, PURSUE THE WORK AT THAT LOCATION WITHOUT DELAY OR INTERRUPTION TO RESTORE OPERATION TO ITS ORIGINAL OR FINAL OPERATIONAL DESIGN.

18. WRAP SIGNAL HEADS WITH DARK PLASTIC OR SUITABLE MATERIAL TO CONCEAL THE SIGNAL FACES FROM THE TIME OF INSTALLATION UNTIL PLACING INTO OPERATION.

19. INSTALL A CLOSE NIPPLE WITH LOCK NUT AND BUSHING (SIZE AS REQUIRED) WHERE THE CABLE ENTERS THE UPPER PORTION OF THE SIGNAL POLE.

20. REFER TO TXDOT'S WEBSITE FOR PREQUALIFIED PRODUCTS LIST REGARDING RADAR DETECTORS, VIVDS CAMERAS, WIRELESS MAGNETOMETERS, VEHICLE LED TRAFFIC SIGNAL LAMP UNIT, SYMBOLIC PEDESTRIAN SIGNAL HEAD, SYMBOLIC PEDESTRIAN SIGNAL LAMP, ACCESSIBLE PEDESTRIAN SIGNALS, SIGNAL CONTROLLERS, SIGNAL CABINETS, BUS INTERFACE UNITS, BATTERY BACKUP UNITS. CHECK WEBSITE PERIODICALLY FOR CURRENT UPDATES.

21. THE CONTRACTOR IS RESPONSIBLE FOR THE SIGNAL CARRYING CAPABILITY AND PERFORMANCE OF THE CABLE. INSTALL EACH WIRE WITH A LIGHTNING PROTECTION DEVICE UNLESS OTHERWISE NOTED.

22. CONTRACTOR TO ADJUST SIGNAL HEAD ALIGNMENT, AS NEEDED, USING ARTICULATING SIGNAL BRACKET ASSEMBLIES WITH A MINIMUM OF THREE ADJUSTABLE AXES.

23. SEAL WITH WATERPROOF SEALANT EACH END OF THE COMMUNICATIONS CABLE THAT IS EXPOSED TO THE ELEMENTS DURING STORAGE AND AFTER INSTALLATION.

24. THE CONTRACTOR TO FURNISH AND INSTALL ALL EQUIPMENT CALLED FOR AND REQUIRED AS NEEDED FOR A FULLY OPERATIONAL TRAFFIC SIGNAL.

25. THE VENDORS' REPRESENTATIVES OF THE RADAR EQUIPMENT SUPPLIED FOR THIS PROJECT MUST SUPERVISE THE INSTALLATION, SETUP AND TESTING OF THIS EQUIPMENT AND BE FACTORY CERTIFIED. THE REPRESENTATIVE MUST BE ON SITE DURING THIS TIME. ANY EQUIPMENT REQUIRED FOR SETUP AND OPERATION OF THE RADAR DEVICES MUST BE PROVIDIED TO TXDOT OR THE CITY UPON COMPLETION. THE VENDORS' REPRESENTATIVE MUST PROVIDE TRAINING TO THE MUNICIPALITIES WHO WILL BE RESPONSIBLES FOR THE MAINTENANCE OF THE RADAR EQUIPMENT AFTER ACCEPTANCE OF THE PROJECT.

26. THE RADAR PRESENCE DETECTOR AND RADAR ADVANCE DETECTION DEVICES MUST BE COMPATIBLE WITH EACH OTHER AND FROM THE SAME MANUFACTURER.

27. RADAR PRESENCE DETECTION DEVICE MUST UTILIZE TRUE-PRESENCE DETECTION. SYSTEM USING LOCKING ALGORITHMS TO ATTEMPT PRESENCE DETECTION WILL NOT BE ACCEPTED.

28. RADAR ADVANCE DETECTION DEVICE MUST CONTINUOUSLY TRACK VEHICLE SPEED, DISTANCE, AND ESTIMATED TIME OF ARRIVAL.

29. COMMUNICATION AND POWER TO THE RADAR DEVICES SHALL BE VIA CONTINUOUS CABLE RUN OF UP TO 1000 FEET WITH THE USE OF REPEATERS.

30. THE FINAL PLACEMENT OF RADAR DEVICES TO BE APPROVED BY ENGINEER.

31. THE LOCATION OF THE RADAR DETECTION ZONE IS APPROXIMATE. THE EXACT LOCATION WILL BE DETERMINED BY THE ENGINEER AND/OR DEPARTMENT'S TRAFFIC OPERATIONS SECTION.

1. ONCE THE CONTRACT HAS BEEN EXECUTED OR DURING THE KICK-OFF MEETING, THE ENGINEER OR HIS/HER REPRESENTATIVE WILL COORDINATE OR ARRANGE FOR THE RADAR EQUIPMENT TO BE PROVIDED BY THE DEPARTMENT.

2. THE ENGINEER OR HIS/HER REPRESENTATIVE WILL COORDINATE THE ORDERING OF THE RADAR EQUIPMENT BY USING THE FORCE ACCOUNT. ENGINEER OR HIS/HER REPRESENTATIVE WILL CONTACT ARNOLD TREVINO AT (713) 866-7101 TO ORDER THE RADAR EQUIPMENT.

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

01/25/2022

TRAFFIC SIGNAL NOTES FOR PROPOSED LAYOUT

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		149

DATE: 1/25/2022 TIME
FILE: H:\Traffic Signals\Thai Truong\CSJ 0111-09-044_BS 288 and SL 274_Detection Upgrade\SUMMARY OF TRAFFIC SIGNAL QUANTITIES BS 288 B AT VARIOUS.dgn

DN: | CK: | DW: | CK: | DN: | CK:

CALLOUTS:

(A) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)

(B) EXISTING STEEL STRAIN SIGNAL WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA)AND PUSH BUTTONS (2 EA)

(C) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)

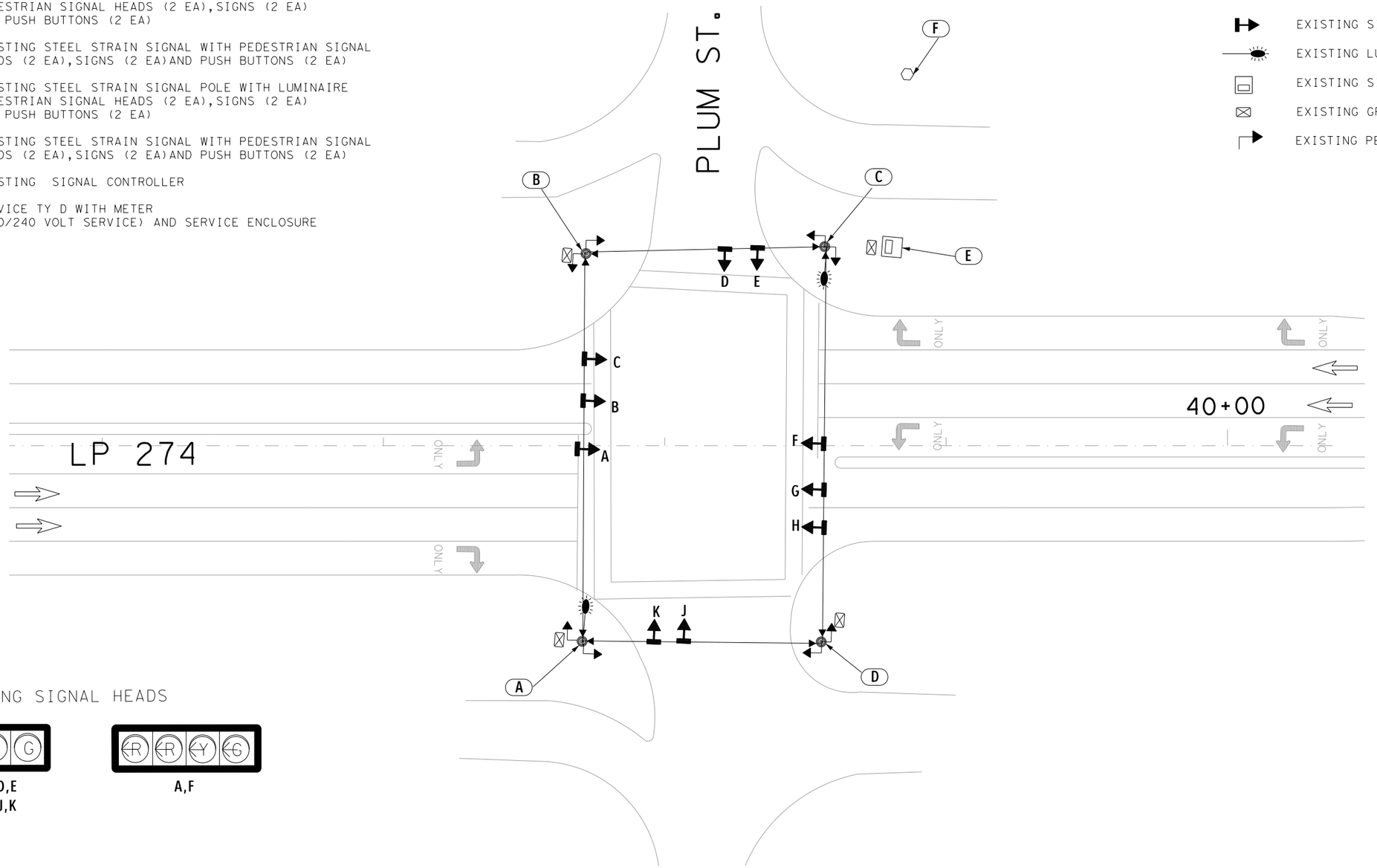
(D) EXISTING STEEL STRAIN SIGNAL WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA)AND PUSH BUTTONS (2 EA)

(E) EXISTING SIGNAL CONTROLLER

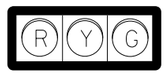
(F) SERVICE TY D WITH METER (120/240 VOLT SERVICE) AND SERVICE ENCLOSURE

LEGEND:

- TRAFFIC DIRECTION
- EXISTING SIGNAL HEAD
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING PEDESTRIAN SIGNAL HEAD



EXISTING SIGNAL HEADS



B,C,D,E
G,H,J,K

A,F

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

01/25/2022

LP 274 AT PLUM ST TRAFFIC SIGNAL EXISTING LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	LP 274
DIST	COUNTY		SHEET NO.
HOU	BARZORIA		150

DATE: 1/25/2022 3:10:00 PM
FILE: c:\txdot\dgn\tk\bs288-b_loop274_0111_09_044\plan\LP 274 AT PLUM ST TRAFFIC SIGNAL EXISTING LAYOUT.dgn

CALLOUTS:

(A) EXISTING STEEL STRAIN SIGNAL WITH LUMINAIRE,PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA)AND PUSH BUTTONS (2 EA) WITH PROPOSED ADVANCE RADAR DETECTION (1 EA)AND PRESENCE RADAR DETECTION (1 EA)

(B) EXISTING STEEL STRAIN SIGNAL POLE WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA),PUSH BUTTONS (2 EA) WITH PROPOSED LUMINAIRE ARM AND PRESENCE RADAR DETECTION (1 EA)

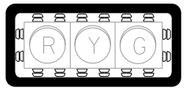
(C) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA) WITH PROPOSED ADVANCE RADAR DETECTION (1 EA) AND PRESENCE RADAR DETECTION (1 EA)

(D) EXISTING STEEL STRAIN SIGNAL POLE WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA)AND PUSH BUTTONS (2 EA) WITH PROPOSED LUMINAIRE ARM AND PRESENCE RADAR DETECTION (1 EA)

(E) EXISTING SIGNAL CONTROLLER

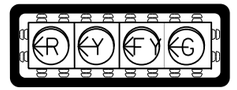
(F) SERVICE TY D WITH METER (120/240 VOLT SERVICE) AND SERVICE ENCLOSURE

EXISTING SIGNAL HEADS WITH PROPOSED BACKPLATE



B,C,D,E G,H,J,K

PROPOSED SIGNAL HEADS WITH BACKPLATE

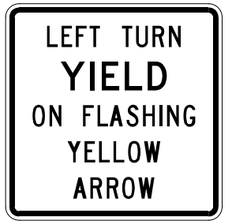


A,F

LEGEND:

- TRAFFIC DIRECTION
- EXISTING SIGNAL HEAD
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED SIGNAL HEAD
- ADV1 PROPOSED ADVANCE RADAR DETECTOR
- PRE1 PROPOSED PRESENCE RADAR DETECTOR
- S1 1 PROPOSED SIGN
- PROPOSED CONDUIT

SPAN WIRE SIGN S1



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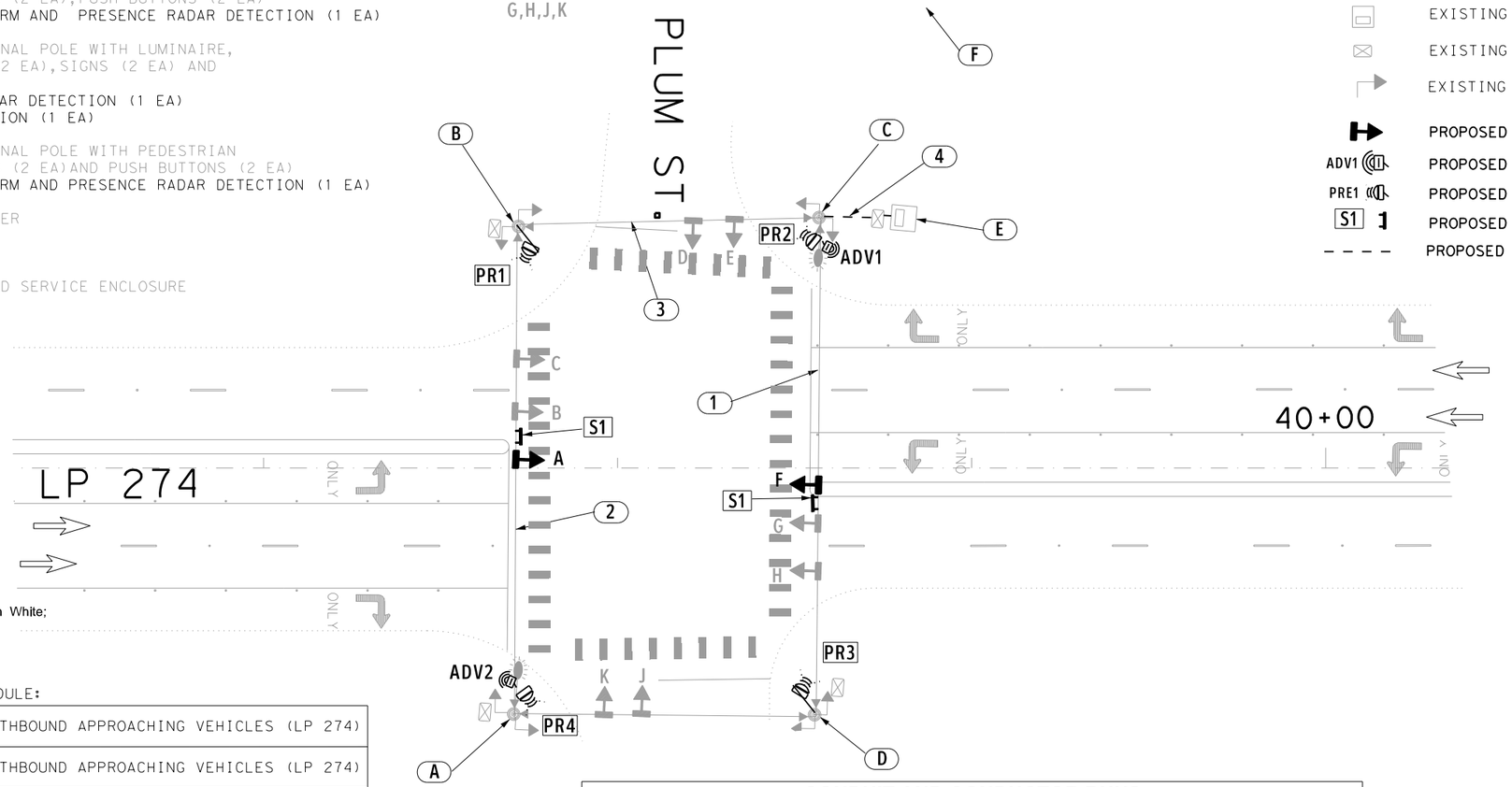
[ON FLASHING] C; [YELLOW] C; [ARROW] C;



PROPOSED RADAR DETECTIONS SCHEDULE:

ADV1	DESIGNATED FOR NORTHBOUND APPROACHING VEHICLES (LP 274)
ADV2	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES (LP 274)
PR1	DESIGNATED FOR SOUHTBOUND VEHICLES (LP 274)
PR2	DESIGNATED FOR WESTHBOUND VEHICLES (PLUM ST)
PR3	DESIGNATED FOR NORTHBOUND VEHICLES (LP 274)
PR4	DESIGNATED FOR EASTHBOUND VEHICLES (PLUM ST)

NOTES:

THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES AT LEAST 72 HOURS PRIOR TO ANY WORK. TXDOT IS NOT A MEMBER OF 811. THE CONTRACTOR SHALL CONTACT TXDOT FIVE (5) BUSINESS DAYS TO LOCATE TXDOT OWNED EXISTING TXDOT COMMUNICATIONS, ILLUMINATION, AND TRAFFIC SIGNAL CABLING. TXDOT HOUSTON DISTRICT TRAFFIC OPERATIONS OFFICE CAN BE REACHED AT: HOU-LOCATEREQUEST@TXDOT.GOV

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY CONTRACTOR S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES WHETHER UNDERGROUND OR ABOVE GROUND. UTILITIES ON THE PLANS ARE SHOWN IN APPROXIMATE LOCATIONS.

CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618)		CONDUCTORS (620)		RADAR (6292)		RADAR (6292)	
	PVC		POWER		PRES. RADAR		ADV. RADAR	
	2" (SCHD 80)		#6 BARE		# 18/2C & #22/4C (Subsidiary)		# 18/2C & #22/4C (Subsidiary)	
	(6046)		(6009)		(6004)		(6005)	
	NO.	TRENCH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF
1					1	140		
2					1	140	1	140
3					2	85	1	85
4	1	25			4	25	2	25
POLE B					4	30	2	30
TOTAL (LF)		25		0		670		335
EST. TOTAL		30		0		705		355

01/25/2022

LP 274
AT PLUM ST
TRAFFIC SIGNAL
PROPOSED LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	LP 274
DIST	COUNTY		SHEET NO.
HOU	BARZORIA		151

DATE: 1/25/2022 3:10:01 PM
FILE: c:\txdot\dgn\tk\bs288-b_loop274_0111_09_044\plan\LP 274 AT PLUM ST TRAFFIC SIGNAL PROPOSED LAYOUT.dgn

CK:
DW:
CK:
DN:

CALLOUTS:

(A) EXISTING STEEL STRAIN SIGNAL WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA)AND PUSH BUTTONS (2 EA)

(B) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)

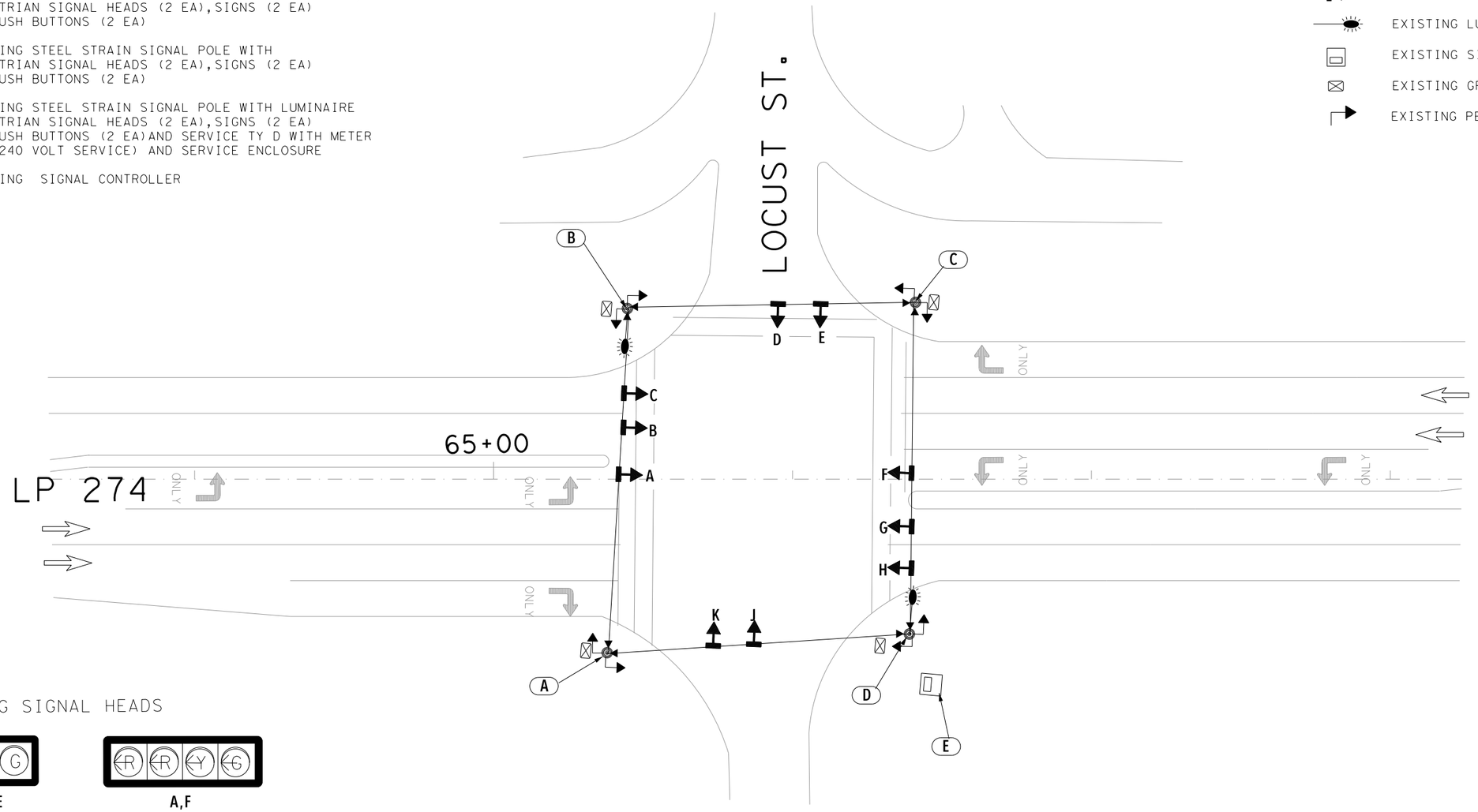
(C) EXISTING STEEL STRAIN SIGNAL POLE WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)

(D) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)AND SERVICE TY D WITH METER (120/240 VOLT SERVICE) AND SERVICE ENCLOSURE

(E) EXISTING SIGNAL CONTROLLER

LEGEND:

- TRAFFIC DIRECTION
- EXISTING SIGNAL HEAD
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING PEDESTRIAN SIGNAL HEAD



EXISTING SIGNAL HEADS

B,C,D,E
G,H,J,K

A,F

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

01/25/2022

LP 274
AT LOCUST ST
TRAFFIC SIGNAL
EXISTING LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	LP 274
DIST	COUNTY		SHEET NO.
HOU	BARZORIA		152

DATE: 1/25/2022 3:10:04 PM
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CALLOUTS:

(A) EXISTING STEEL STRAIN SIGNAL WITH PEDESTRIAN SIGNAL HEADS (2 EA), SIGNS (2 EA) AND PUSH BUTTONS (2 EA) WITH PROPOSED LUMINAIRE ARM, ADVANCE RADAR DETECTION (1 EA) AND PRESENCE RADAR DETECTION (1 EA)

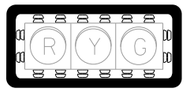
(B) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA), SIGNS (2 EA), PUSH BUTTONS (2 EA) AND PROPOSED PRESENCE RADAR DETECTION (1 EA)

(C) EXISTING STEEL STRAIN SIGNAL POLE WITH PEDESTRIAN SIGNAL HEADS (2 EA), SIGNS (2 EA), PUSH BUTTONS (2 EA) AND PROPOSED LUMINAIRE ARM, ADVANCE RADAR DETECTION (1 EA) AND PRESENCE RADAR DETECTION (1 EA)

(D) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA), SIGNS (2 EA), PUSH BUTTONS (2 EA) AND SERVICE TY D WITH METER (120/240 VOLT SERVICE) WITH SERVICE ENCLOSURE AND PROPOSED PRESENCE RADAR DETECTION (1 EA)

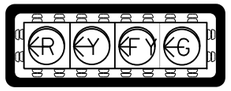
(E) EXISTING SIGNAL CONTROLLER

EXISTING SIGNAL HEADS WITH PROPOSED BACKPLATE



B,C,D,E
G,H,J,K

PROPOSED SIGNAL HEADS WITH BACKPLATE

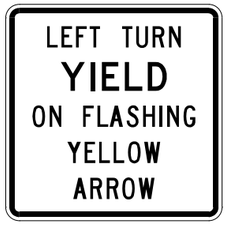


A,F

LEGEND:

- TRAFFIC DIRECTION
- EXISTING SIGNAL HEAD
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED SIGNAL HEAD
- ADV1 PROPOSED ADVANCE RADAR DETECTOR
- PRE1 PROPOSED PRESENCE RADAR DETECTOR
- S1 PROPOSED SIGN
- PROPOSED CONDUIT

SPAN WIRE SIGN S1



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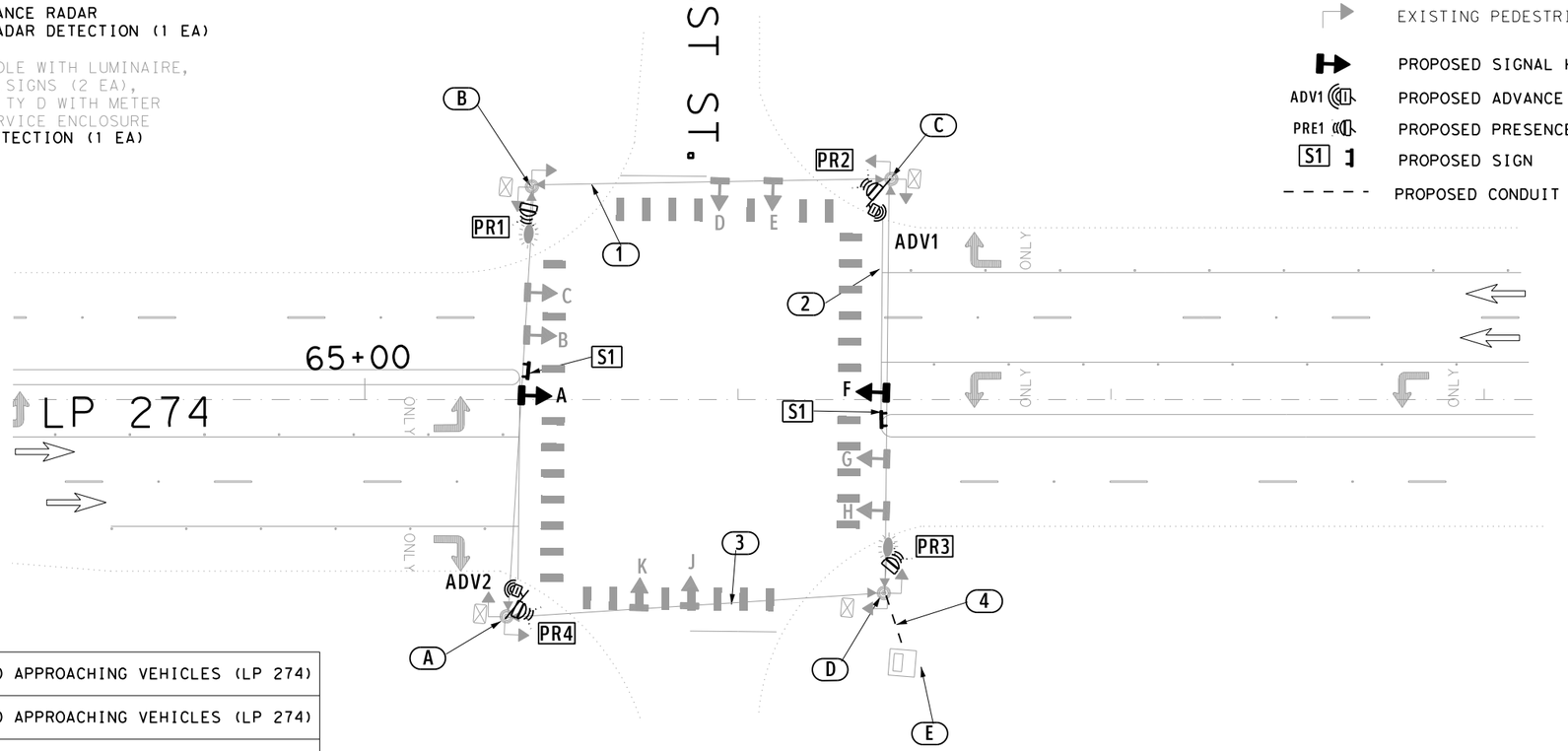
[ON FLASHING] C; [YELLOW] C; [ARROW] C;



PROPOSED RADAR DETECTIONS SCHEDULE:

ADV1		DESIGNATED FOR NORTHBOUND APPROACHING VEHICLES (LP 274)
ADV2		DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES (LP 274)
PR1		DESIGNATED FOR SOUHTBOUND VEHICLES (LP 274)
PR2		DESIGNATED FOR WESTHBOUND VEHICLES (LOCUST ST)
PR3		DESIGNATED FOR NORTHBOUND VEHICLES (LP 274)
PR4		DESIGNATED FOR EASTHBOUND VEHICLES (LOCUST ST)

NOTES:

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THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY CONTRACTOR S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES WHETHER UNDERGROUND OR ABOVE GROUND. UTILITIES ON THE PLANS ARE SHOWN IN APPROXIMATE LOCATIONS.

CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618)		CONDUCTORS (620)		RADAR (6292)		RADAR (6292)	
	PVC		POWER		PRES. RADAR		ADV. RADAR	
	2" (SCHD 80)		#6 BARE		# 18/2C & #22/4C (Subsidiary)		# 18/2C & #22/4C (Subsidiary)	
	(6046)		(6009)		(6004)		(6005)	
	NO.	TRENCH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF
1					1	100		
2					2	115	1	115
3					1	105	1	105
4	1	15			4	15	2	15
POLE B					4	30	2	30
TOTAL (LF)		15		0		615		310
EST. TOTAL		20		0		650		330

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

01/25/2022

LP 274
AT LOCUST ST
TRAFFIC SIGNAL
PROPOSED LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	LP 274
DIST	COUNTY		SHEET NO.
HOU	BARZORIA		153

DATE: 1/25/2022 3:10:04 PM
FILE: c:\txdot\dgn\tk\bs288-b_loop274_0111_09_044\plan\LP 274 AT LOCUST ST TRAFFIC SIGNAL PROPOSED LAYOUT.dgn

CALLOUTS:

(A) EXISTING STEEL STRAIN SIGNAL WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA)AND PUSH BUTTONS (2 EA)

(B) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)

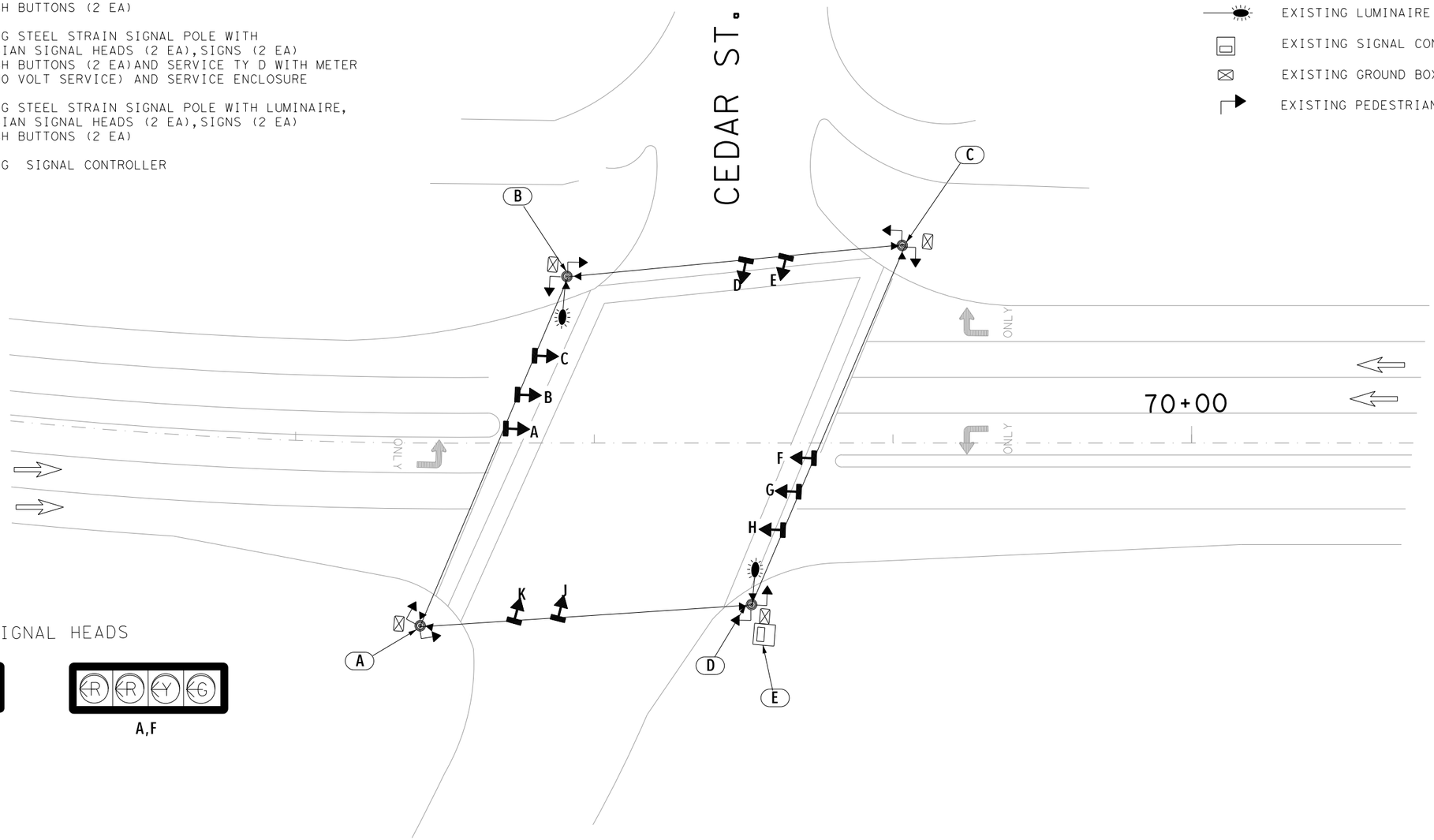
(C) EXISTING STEEL STRAIN SIGNAL POLE WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)AND SERVICE TY D WITH METER (120/240 VOLT SERVICE) AND SERVICE ENCLOSURE

(D) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)

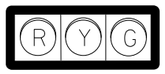
(E) EXISTING SIGNAL CONTROLLER

LEGEND:

- TRAFFIC DIRECTION
- EXISTING SIGNAL HEAD
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING PEDESTRIAN SIGNAL HEAD



EXISTING SIGNAL HEADS



B,C,D,E
G,H,J,K

A,F

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

01/25/2022

LP 274
AT CEDAR ST
TRAFFIC SIGNAL
EXISTING LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	LP 274
DIST	COUNTY		SHEET NO.
HOU	BARZORIA		154

DATE: 1/25/2022 3:10:07 PM
FILE: c:\txdot\dgn\tk\bs288-b_loop274_0111_09_044\plan\LP 274 AT CEDAR RD TRAFFIC SIGNAL EXISTING LAYOUT.dgn

CALLOUTS:

(A) EXISTING STEEL STRAIN SIGNAL WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA)AND PUSH BUTTONS (2 EA)
WITH PROPOSED LUMINAIRE ARM,ADVANCE RADAR DETECTION (1 EA)AND PRESENCE RADAR DETECTION (1 EA)

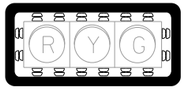
(B) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA), PUSH BUTTONS (2 EA)
AND PROPOSED PRESENCE RADAR DETECTION (1 EA)

(C) EXISTING STEEL STRAIN SIGNAL POLE WITH PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA),PUSH BUTTONS (2 EA) AND SERVICE TY D WITH METER (120/240 VOLT SERVICE) WITH SERVICE ENCLOSURE
AND PROPOSED LUMINAIRE ARM,ADVANCE RADAR DETECTION (1 EA)AND PRESENCE RADAR DETECTION (1 EA)

(D) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, PEDESTRIAN SIGNAL HEADS (2 EA),SIGNS (2 EA) AND PUSH BUTTONS (2 EA)
AND PROPOSED PRESENCE RADAR DETECTION (1 EA)

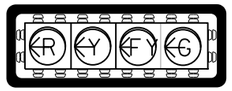
(E) EXISTING SIGNAL CONTROLLER

EXISTING SIGNAL HEADS
WITH PROPOSED BACKPLATE



B,C,D,E
G,H,J,K

PROPOSED SIGNAL HEADS
WITH BACKPLATE



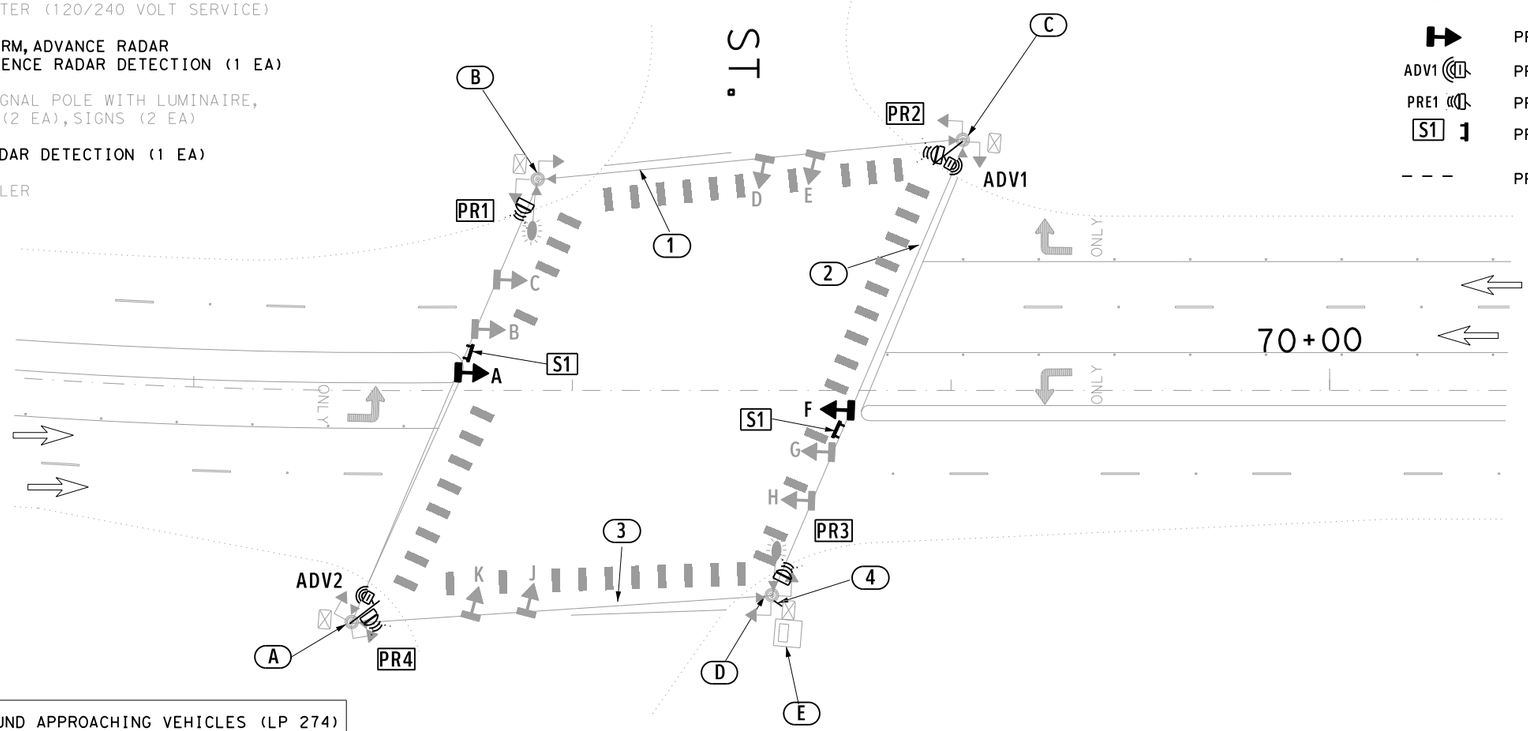
A,F

LEGEND:

- TRAFFIC DIRECTION
- EXISTING SIGNAL HEAD
- EXISTING LUMINAIRE
- EXISTING SIGNAL CONTROLLER
- EXISTING GROUND BOX
- EXISTING PEDESTRIAN SIGNAL HEAD
- PROPOSED SIGNAL HEAD
- ADV1 PROPOSED ADVANCE RADAR DETECTOR
- PRE1 PROPOSED PRESENCE RADAR DETECTOR
- S1 PROPOSED SIGN
- PROPOSED CONDUIT

SPAN WIRE SIGN S1

Identifier : R10-17T_30x30;
1.88" Radius, 0.75" Border, 0.50" Indent, Black on White;
[LEFT TURN] C; [YIELD] D;
[ON FLASHING] C; [YELLOW] C; [ARROW] C;



PROPOSED RADAR DETECTIONS SCHEDULE:

ADV1	DESIGNATED FOR NORTHBOUND APPROACHING VEHICLES (LP 274)
ADV2	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES (LP 274)
PR1	DESIGNATED FOR SOUHTBOUND VEHICLES (LP 274)
PR2	DESIGNATED FOR WESTHBOUND VEHICLES (CEDAR ST)
PR3	DESIGNATED FOR NORTHBOUND VEHICLES (LP 274)
PR4	DESIGNATED FOR EASTHBOUND VEHICLES (CEDAR ST)

NOTES:

THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES AT LEAST 72 HOURS PRIOR TO ANY WORK. TXDOT IS NOT A MEMBER OF 811. THE CONTRACTOR SHALL CONTACT TXDOT FIVE (5) BUSINESS DAYS TO LOCATE TXDOT OWNED EXISTING TXDOT COMMUNICATIONS, ILLUMINATION, AND TRAFFIC SIGNAL CABLING. TXDOT HOUSTON DISTRICT TRAFFIC OPERATIONS OFFICE CAN BE REACHED AT: HOU-LOCATEREQUEST@TXDOT.GOV

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY CONTRACTOR S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES WHETHER UNDERGROUND OR ABOVE GROUND. UTILITIES ON THE PLANS ARE SHOWN IN APPROXIMATE LOCATIONS.

CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618) PVC 2" (SCHD 80) (6046) NO. EA	CONDUIT (618) PVC 2" (SCHD 80) (6046) TRENCH LF	CONDUCTORS (620) POWER #6 BARE (6009) NO. EA	CONDUCTORS (620) POWER #6 BARE (6009) LENGTH LF	RADAR (6292) PRES. RADAR # 18/2C & #22/4C (Subsidiary) (6004) NO. EA	RADAR (6292) PRES. RADAR # 18/2C & #22/4C (Subsidiary) (6004) LENGTH LF	RADAR (6292) ADV. RADAR # 18/2C & #22/4C (Subsidiary) (6005) NO. EA	RADAR (6292) ADV. RADAR # 18/2C & #22/4C (Subsidiary) (6005) LENGTH LF
1					1	115	1	115
2					2	130	1	130
3					1	110	1	110
4	1	10			4	10	2	10
POLE D					4	30	2	30
TOTAL (LF)		10		0		645		435
EST. TOTAL		15		0		680		460

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

01/25/2022

LP 274
AT CEDAR ST
TRAFFIC SIGNAL
PROPOSED LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	LP 274
DIST	COUNTY		SHEET NO.
HOU	BARZORIA		155

DATE: 1/25/2022 3:10:07 PM
FILE: c:\txdot\dgn\tk\bs288-b_loop274_0111_09_044\plan\LP 274 AT CEDAR RD TRAFFIC SIGNAL PROPOSED LAYOUT.dgn

EXISTING GROUNDBOX
(TO BE REMOVED)

LOOP 274

85+00

EXISTING GROUNDBOX
(TO BE REMOVED)

A
B
C

D E F

EXISTING GROUNDBOX
(TO BE REMOVED)

LOOP 274

G
H
I

L K J

W. WILKINS ST

ONLY

BS 288 B

M N O P Q R

U T S

BS 288 B

EXISTING GROUNDBOX
(TO BE REMOVED)

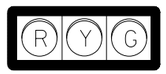
EXISTING GROUNDBOX
(TO BE REMOVED)

N

LEGEND:

- DIRECTION OF TRAFFIC
- EXISTING GROUNDBOX
- EXISTING LUMINAIRE LED
- EXISTING SERVICE POLE
- EXISTING CONTROLLER
- EXISTING LOOP DETECTOR
- EXISTING SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING MAST ARM POLE

EXISTING SIGNAL HEAD



A, B, E, F, H, I, K, L, N, O, P, Q, T, U.

C, D, G, J, M, R, S.

LOOP 274 AT W. WILKINS ST TRAFFIC SIGNAL EXSISTING LAYOUT

0 20 40
SCALE IN FEET
1" = 40'

STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER

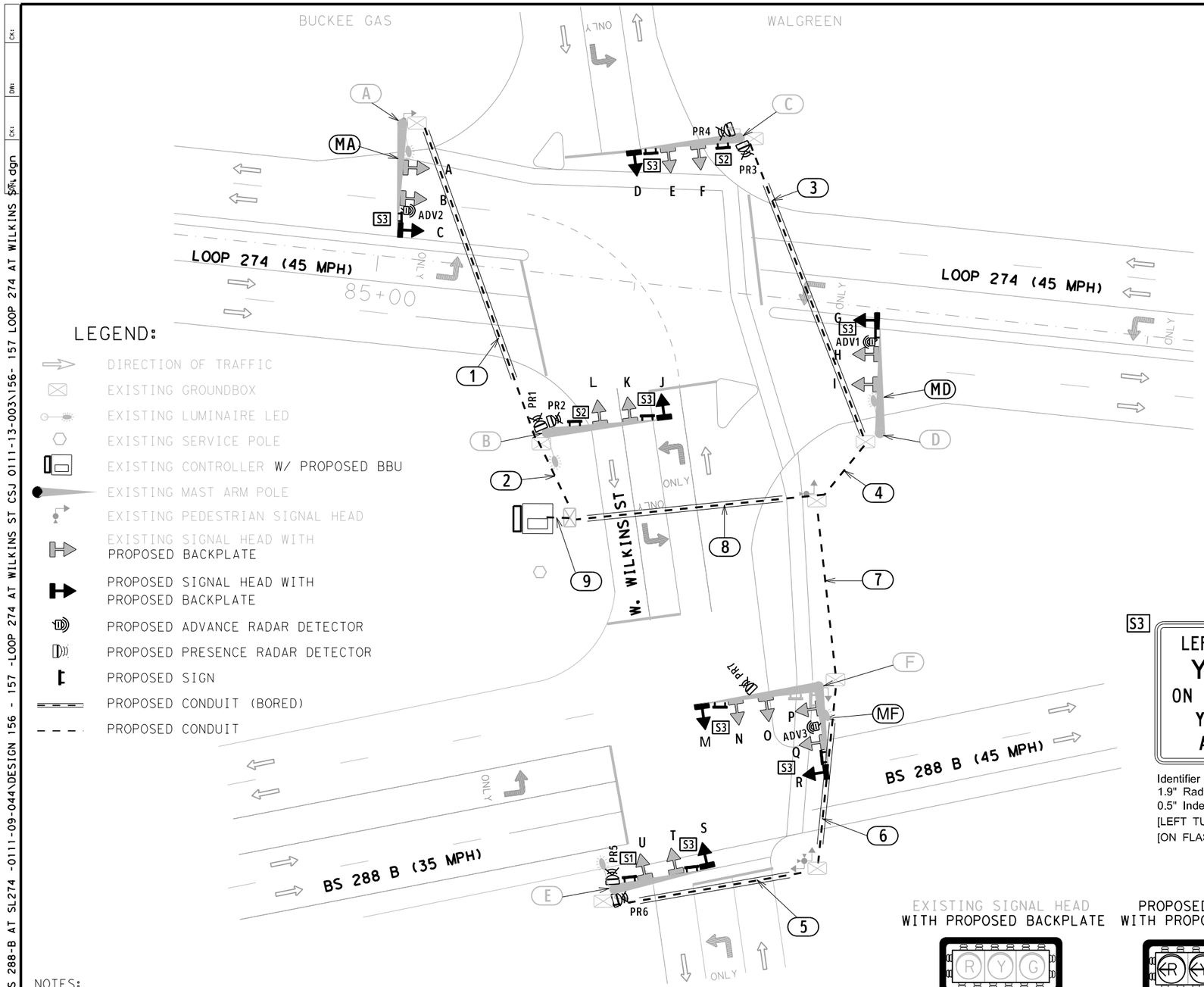
P.E.

01/25/2022

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	LOOP 274
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		156

DATE: 1/25/2022 TIME
FILE: H:\Traffic Signals\LienNguyen\BS 288-B AT SL274 -0111-09-044\DESIGN 156 - 157 -LOOP 274 AT WILKINS ST CSJ 0111-13-003\156- 157 LOOP 274 AT WILKINS ST.dgn



LEGEND:

- DIRECTION OF TRAFFIC
- EXISTING GROUNDBOX
- EXISTING LUMINAIRE LED
- EXISTING SERVICE POLE
- EXISTING CONTROLLER W/ PROPOSED BBU
- EXISTING MAST ARM POLE
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING SIGNAL HEAD WITH PROPOSED BACKPLATE
- PROPOSED SIGNAL HEAD WITH PROPOSED BACKPLATE
- PROPOSED ADVANCE RADAR DETECTOR
- PROPOSED PRESENCE RADAR DETECTOR
- PROPOSED SIGN
- PROPOSED CONDUIT (BORED)
- PROPOSED CONDUIT

CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618) PVC 2" (SCHD 80) (6046) NO. EA	(6046) TRENCH LF	2" (SCHD 80) (6047) NO. EA	(6047) BORE LF	3" (SCHD 80) (6053) NO. EA	(6053) TRENCH LF	(6054) NO. EA	(6054) BORE LF	CONDUCTORS (620) GROUND #6 BARE (6009) NO. EA	(6009) LENGTH LF	RADAR (6292) PRES. RADAR # 18/2C & #22/4C (6004) NO. EA	(6004) LENGTH LF	RADAR (6292) ADV. RADAR # 18/2C & #22/4C (6005) NO. EA	(6005) LENGTH LF
1	1	30	1	90					1	120			1	120
2	1	35							1	35	2	35	1	35
3	1	20	1	100					1	120	2	120		
4	1	35							1	35	2	35	1	35
5	1	25	1	55					1	80	2	80		
6	1	20	1	45					1	65	2	65		
7	1	65							1	65	3	65	1	65
8					1	25	1	70	1	95	5	95	2	95
9					1	10			1	10	7	10	3	10
A													1	20
MA													1	40
B											2	20		
C											2	20		
D													1	20
MD													1	40
E											2	20		
F											1	20	1	20
MF													1	20
TOTAL (LF)		230		290		35		70		625		1550		635
EST. TOTAL		245		305		40		75		660		1630		670

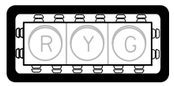
PROPOSED RADAR DETECTIONS SCHEDULE:

ADV1	DESIGNATED FOR NORTHBOUND VEHICLES (LOOP 274)
ADV2	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES(LOOP 274)
ADV3	DESIGNATED FOR NORTHBOUND VEHICLES (BS 288-B)
PR1	DESIGNATED FOR NORTHBOUND VEHICLES (LOOP 274)
PR2	DESIGNATED FOR WESTBOUND VEHICLES (WILKINS ST)
PR3	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES(LOOP 274)
PR4	DESIGNATED FOR EASTBOUND VEHICLES (WILKINS ST)
PR5	DESIGNATED FOR NORTHBOUND VEHICLES (BS 288-B)
PR6	DESIGNATED FOR WESTBOUND VEHICLES (WILKINS ST)
PR7	DESIGNATED FOR EASTBOUND VEHICLES (WILKINS ST)

S3

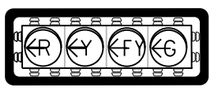
Identifier : R10-17T 30"x30";
1.9" Radius, 0.8" Border,
0.5" Indent, Black on White;
[LEFT TURN] C; [YIELD] D;
[ON FLASHING] C;

EXISTING SIGNAL HEAD WITH PROPOSED BACKPLATE



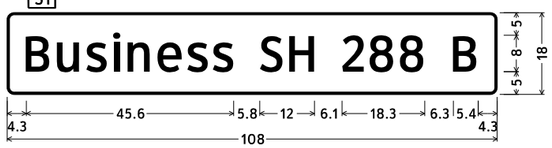
A, B, E, F, H, I, K, L, N, O, P, Q, T, U.

PROPOSED SIGNAL HEAD WITH PROPOSED BACKPLATE



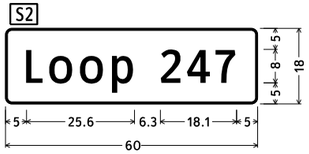
C, D, G, J, M, R, S.

S1



1.5" Radius, 0.5" Border, White on, Green;
"Business SH 288 B", ClearviewHwy-3-W 75% spacing;

S2



1.5" Radius, 0.5" Border, White on, Green;
"Loop 247", ClearviewHwy-3-W;

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

01/25/2022

LOOP 274 AT W. WILKINS ST TRAFFIC SIGNAL PROPOSED LAYOUT

0 20 40
SCALE IN FEET
1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	LOOP 274
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		157

DATE: 1/25/2022 TIME
FILE: H:\Traffic Signals\LienNguyen\BS 288-B AT SL274 -0111-09-044\DESIGN 156 - 157 -LOOP 274 AT WILKINS ST CSJ 0111-13-003\156- 157 LOOP 274 AT WILKINS ST.dgn

CALL OUTS:

(A) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA), VIDEO CAMERAS (2 EA), PRESENCE RADAR DETECTOR AND ADVANCE RADAR DETECTORS.

(B) EXISTING STEEL STRAIN SIGNAL POLE WITH SIGNAL HEAD, STREET NAME SIGN, VIDEO CAMERA AND PRESENCE RADAR DETECTOR.

(C) EXISTING STEEL STRAIN SIGNAL POLE WITH LUMINAIRE, SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA), VIDEO CAMERAS (2 EA), PRESENCE RADAR DETECTOR AND ADVANCE RADAR DETECTORS.

(D) EXISTING STEEL STRAIN SIGNAL POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA) AND PRESENCE RADAR DETECTOR.

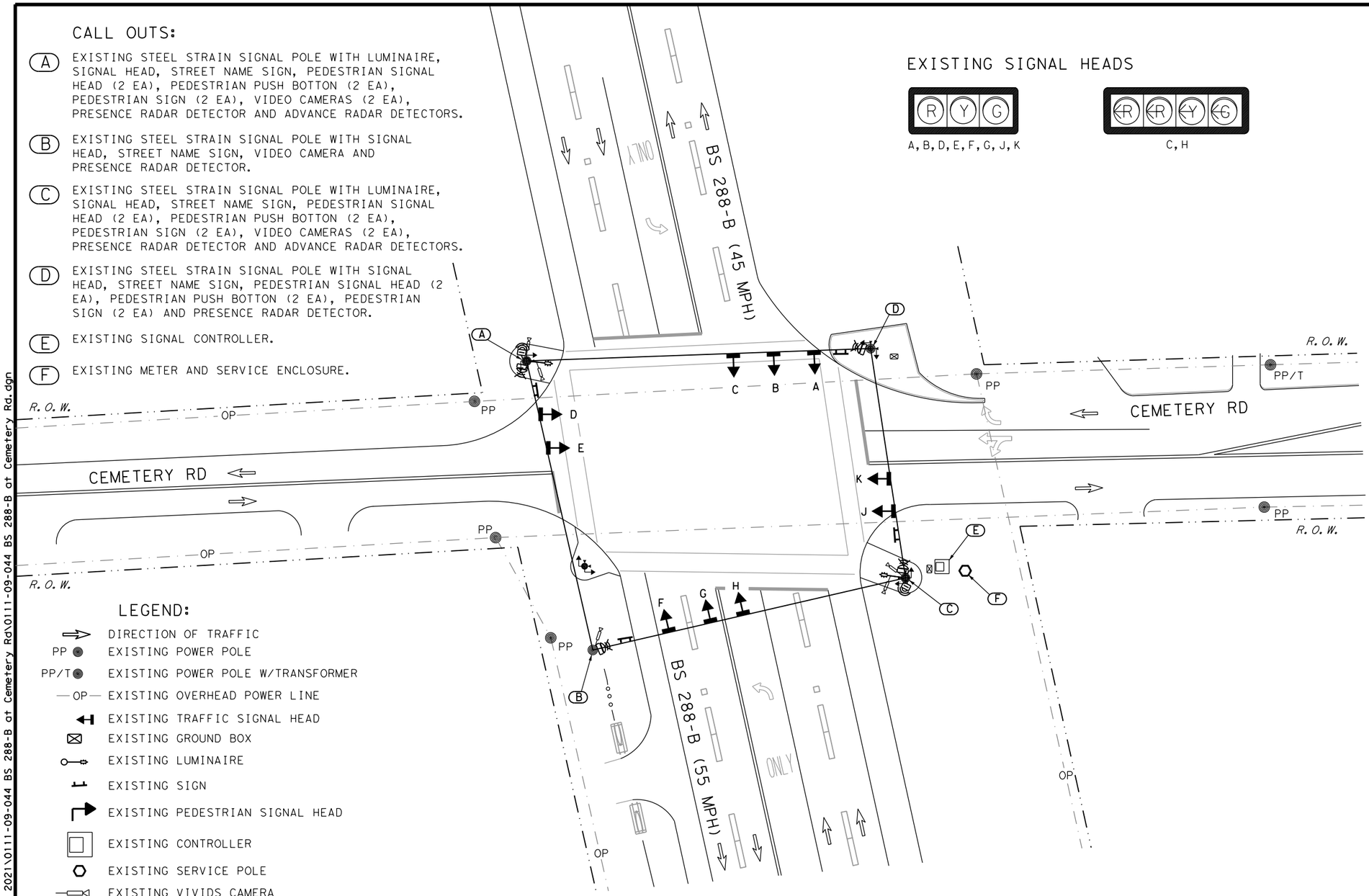
(E) EXISTING SIGNAL CONTROLLER.

(F) EXISTING METER AND SERVICE ENCLOSURE.

EXISTING SIGNAL HEADS

A, B, D, E, F, G, J, K

C, H



LEGEND:

- DIRECTION OF TRAFFIC
- PP — EXISTING POWER POLE
- PP/T — EXISTING POWER POLE W/TRANSFORMER
- OP — EXISTING OVERHEAD POWER LINE
- EXISTING TRAFFIC SIGNAL HEAD
- EXISTING GROUND BOX
- EXISTING LUMINAIRE
- EXISTING SIGN
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING CONTROLLER
- EXISTING SERVICE POLE
- EXISTING VIVIDS CAMERA
- EXISTING PRESENCE RADAR DETECTOR
- EXISTING ADVANCE RADAR DETECTOR

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

01/25/2022

BS 288-B
AT CEMETERY RD
TRAFFIC SIGNAL EXISTING LAYOUT

0 20 40 FT
SCALE: 1" = 40'

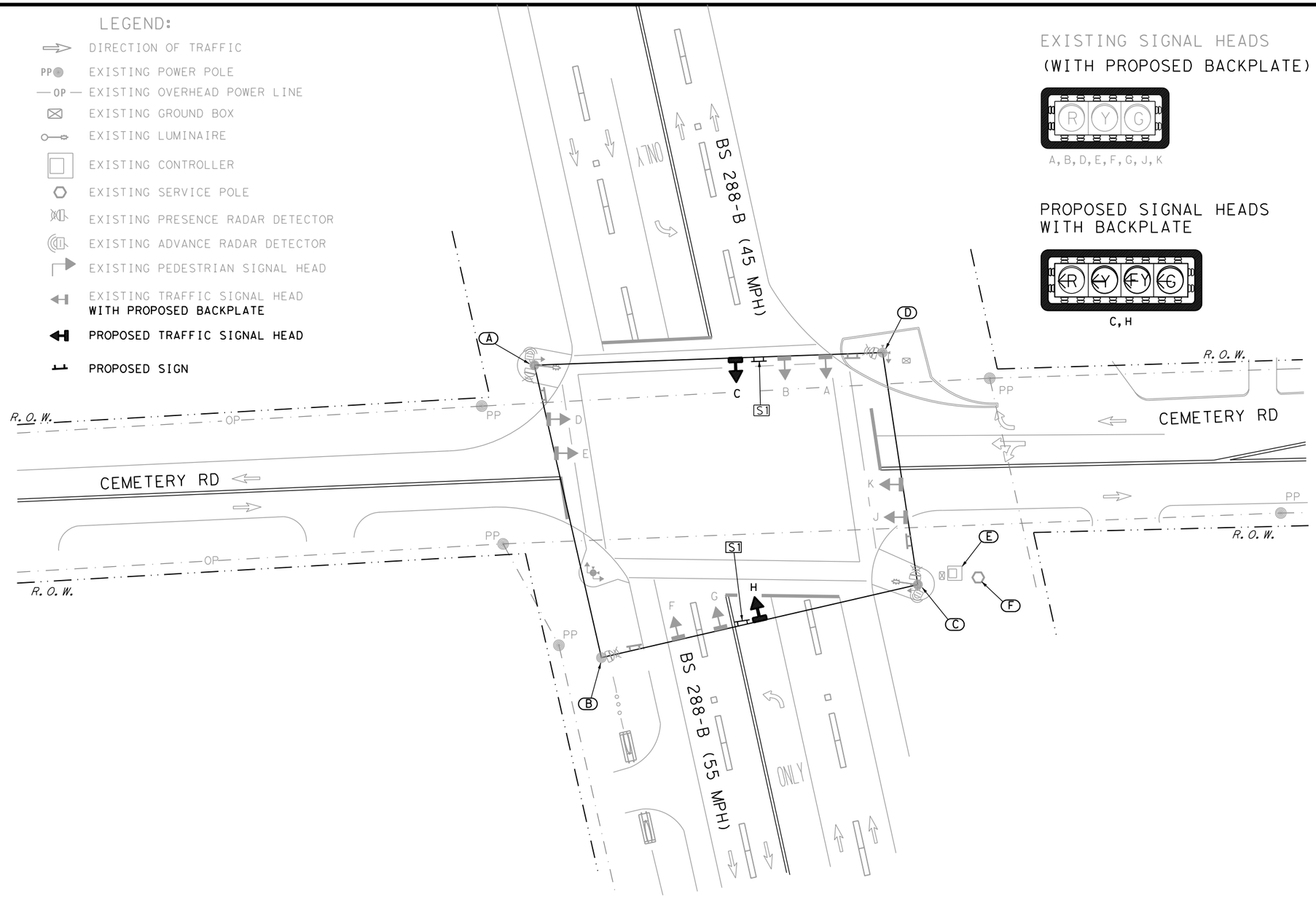
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288-B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		158

DATE: 1/25/2022
FILE: H:\Traffic Signals\Hoang Tran\Projects 2021\0111-09-044 BS 288-B at Cemetery Rd\0111-09-044 BS 288-B at Cemetery Rd.dgn

LEGEND:

- DIRECTION OF TRAFFIC
- PP — EXISTING POWER POLE
- — OP — EXISTING OVERHEAD POWER LINE
- EXISTING GROUND BOX
- EXISTING LUMINAIRE
- EXISTING CONTROLLER
- EXISTING SERVICE POLE
- EXISTING PRESENCE RADAR DETECTOR
- EXISTING ADVANCE RADAR DETECTOR
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING TRAFFIC SIGNAL HEAD WITH PROPOSED BACKPLATE
- PROPOSED TRAFFIC SIGNAL HEAD
- PROPOSED SIGN



EXISTING SIGNAL HEADS
(WITH PROPOSED BACKPLATE)

A, B, D, E, F, G, J, K

PROPOSED SIGNAL HEADS
WITH BACKPLATE

C, H

PROPOSED STREET SIGN:
SPAN WIRE SIGN

S1

Identifier : R10-17T_30x30;
1.9" Radius, 0.8" Border,
0.5" Indent, Black on White;
[LEFT TURN] C; [YIELD] D;
[ON FLASHING] C; [YELLOW] C;
[ARROW] C;

NOTES:

THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES AT LEAST 72 HOURS PRIOR TO ANY WORK. TXDOT IS NOT A MEMBER OF 811, THE CONTRACTOR SHALL CONTACT TXDOT FIVE (5) BUSINESS DAYS TO LOCATED TXDOT OWNED EXISTING TXDOT COMMUNICATIONS, ILLUMINATION, AND TRAFFIC SIGNAL CABLING. TXDOT HOUSTON DISTRICT TRAFFIC OPERATIONS OFFICE CAN BE REACHED AT: HOU-LOCATEREQUEST@TXDOT.GOV

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES WHETHER UNDERGROUND OR ABOVE GROUND. UTILITIES ON THE PLANS ARE SHOWN IN APPROXIMATE LOCATIONS.

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

01/25/2022

BS 288-B
AT CEMETERY RD
TRAFFIC SIGNAL PROPOSED LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288-B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		159

DATE: 1/25/2022
FILE: H:\Traffic Signals\Hoang Tran\Projects 2021\0111-09-044 BS 288-B at Cemetery Rd.dgn

CALL OUTS:

(A) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA).

(B) EXISTING PEDESTRIAN POLE WITH PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

(C) EXISTING MAST ARM POLE WITH LUMINAIRE, SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

(D) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

(E) EXISTING PEDESTRIAN POLE WITH PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

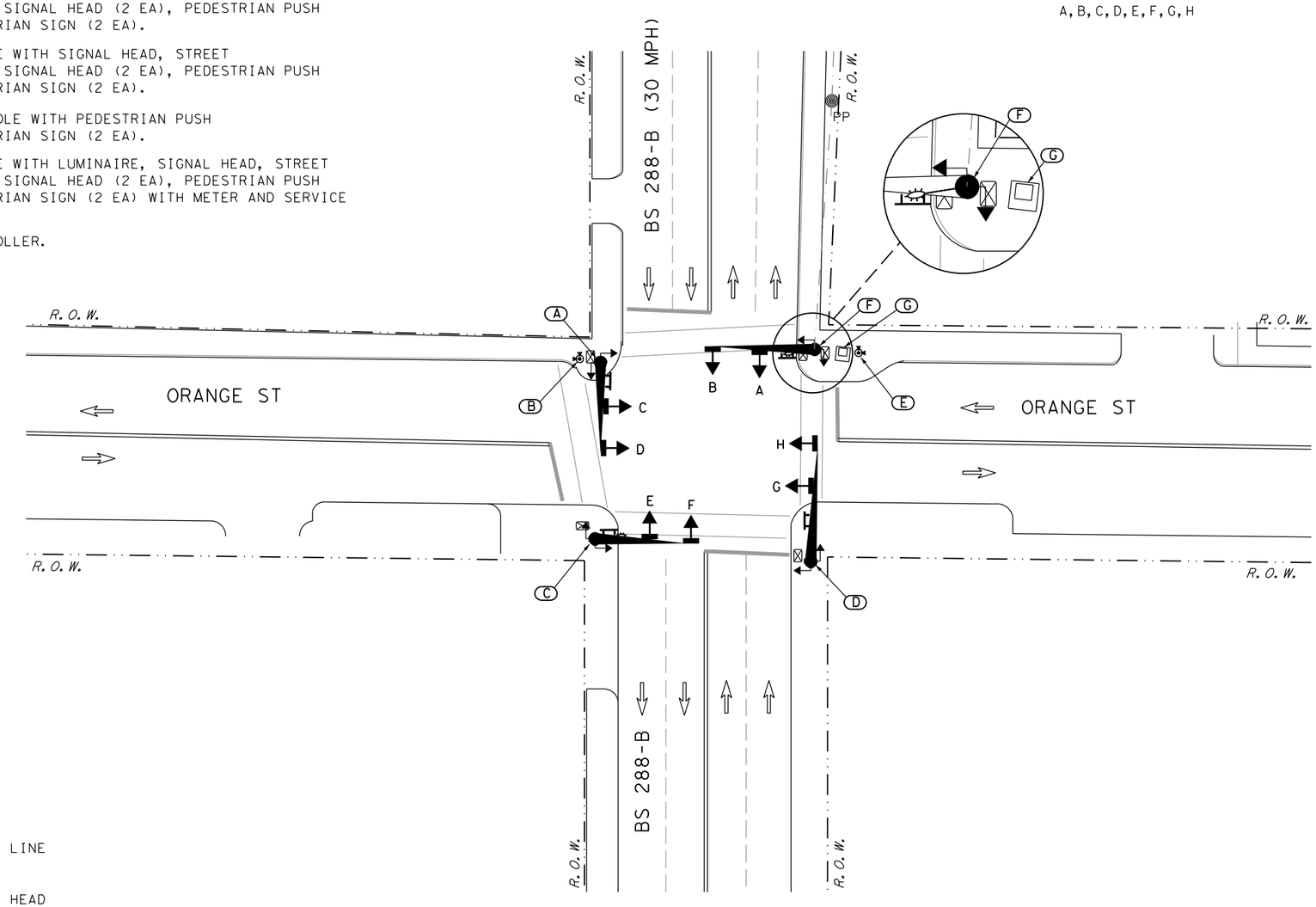
(F) EXISTING MAST ARM POLE WITH LUMINAIRE, SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA) WITH METER AND SERVICE ENCLOSURE.

(G) EXISTING SIGNAL CONTROLLER.

EXISTING SIGNAL HEADS

R Y G

A, B, C, D, E, F, G, H



LEGEND:

- DIRECTION OF TRAFFIC
- PP EXISTING POWER POLE
- —OP— EXISTING OVERHEAD POWER LINE
- EXISTING MAST ARM POLE
- EXISTING TRAFFIC SIGNAL HEAD
- EXISTING GROUND BOX
- EXISTING LUMINAIRE
- EXISTING SIGN
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING PED. POLE WITH PUSH BUTTON
- EXISTING CONTROLLER

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

01/25/2022

BS 288-B
AT ORANGE ST
TRAFFIC SIGNAL EXISTING LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288-B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		160

DATE: 1/25/2022
FILE: H:\Traffic Signals\Hoang Tran\Projects 2021\0111-09-044 BS 288-B at Orange St\0111-09-044 BS 288-B at Orange St.dgn

CALL OUTS:

(A) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA).
WITH PROPOSED PRESENCE RADAR DETECTOR.

(B) EXISTING PEDESTRIAN POLE WITH PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

(C) EXISTING MAST ARM POLE WITH LUMINAIRE, SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).
WITH PROPOSED PRESENCE RADAR AND ADVANCE RADAR DETECTORS.

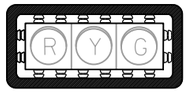
(D) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).
WITH PROPOSED PRESENCE RADAR DETECTOR.

(E) EXISTING PEDESTRIAN POLE WITH PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

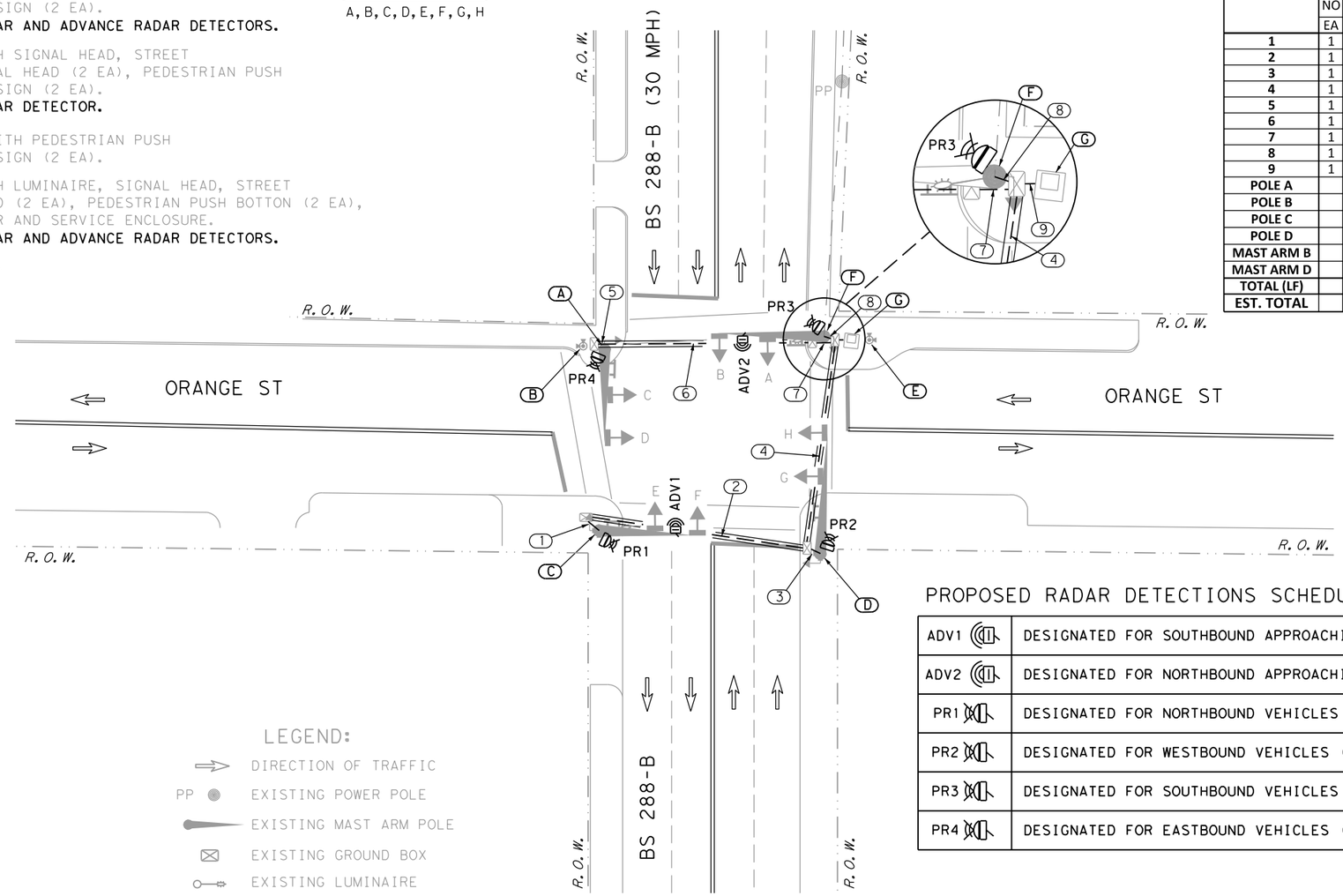
(F) EXISTING MAST ARM POLE WITH LUMINAIRE, SIGNAL HEAD, STREET NAME SIGN, PED. SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PED. SIGN (2 EA) WITH METER AND SERVICE ENCLOSURE.
WITH PROPOSED PRESENCE RADAR AND ADVANCE RADAR DETECTORS.

(G) EXISTING SIGNAL CONTROLLER.

EXISTING SIGNAL HEADS (WITH PROPOSED BACKPLATE)



A, B, C, D, E, F, G, H



CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618) PVC		CONDUCTORS (620) GROUND		RADAR (6292) PRE. RADAR		RADAR (6292) ADV. RADAR	
	2" (SCHD 80) (6047)		#6 BARE (6009)		# 18/2C & #22/4C (Subsidiary)		# 18/2C & #22/4C (Subsidiary)	
	NO EA	BORE LF	NO. EA	LENGTH LF	NO EA	LENGTH LF	NO EA	LENGTH LF
1	1	5	1	5	1	5	1	5
2	1	70	1	70	1	70	1	70
3	1	5	1	5	1	5		
4	1	65	1	65	2	65	1	65
5	1	5	1	5	1	5		
6	1	65	1	65	1	65		
7	1	5	1	5	1	5		
8	1	5	1	5	1	5	1	5
9	1	5	1	5	4	5	2	5
POLE A			1	25	1	25		
POLE B			1	25	1	25	1	25
POLE C			1	25	1	25		
POLE D			1	25	1	25	1	25
MAST ARM B			1	25			1	25
MAST ARM D			1	25			1	25
TOTAL (LF)		230		380		410		255
EST. TOTAL		**245**		**400**		**435**		**270**

PROPOSED RADAR DETECTIONS SCHEDULE:

ADV1	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES (BS 288-B)
ADV2	DESIGNATED FOR NORTHBOUND APPROACHING VEHICLES (BS 288-B)
PR1	DESIGNATED FOR NORTHBOUND VEHICLES (BS 288-B)
PR2	DESIGNATED FOR WESTBOUND VEHICLES (ORANGE ST)
PR3	DESIGNATED FOR SOUTHBOUND VEHICLES (BS 288-B)
PR4	DESIGNATED FOR EASTBOUND VEHICLES (ORANGE ST)

LEGEND:

- DIRECTION OF TRAFFIC
- PP — EXISTING POWER POLE
- EXISTING MAST ARM POLE
- EXISTING GROUND BOX
- EXISTING LUMINAIRE
- EXISTING SIGN
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING PED. POLE WITH PUSH BUTTON
- EXISTING CONTROLLER
- EXISTING TRAFFIC SIGNAL HEAD WITH PROPOSED BACKPLATE
- PR1 — PROPOSED PRESENCE RADAR DETECTOR
- ADV1 — PROPOSED ADVANCE RADAR DETECTOR
- PROPOSED CONDUIT (BORE)

NOTES:

THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES AT LEAST 72 HOURS PRIOR TO ANY WORK. TXDOT IS NOT A MEMBER OF 811, THE CONTRACTOR SHALL CONTACT TXDOT FIVE (5) BUSINESS DAYS TO LOCATED TXDOT OWNED EXISTING TXDOT COMMUNICATIONS, ILLUMINATION, AND TRAFFIC SIGNAL CABLING. TXDOT HOUSTON DISTRICT TRAFFIC OPERATIONS OFFICE CAN BE REACHED AT: HOU-LOCATEREQUEST@TXDOT.GOV

THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR ANY DAMAGES CAUSED BY CONTRACTOR'S FAILURE TO LOCATE AND PRESERVE THESE UTILITIES WHETHER UNDERGROUND OR ABOVE GROUND. UTILITIES ON THE PLANS ARE SHOWN IN APPROXIMATE LOCATIONS.

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

01/25/2022

BS 288-B AT ORANGE ST TRAFFIC SIGNAL PROPOSED LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288-B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		161

DATE: 1/25/2022
FILE: H:\Tr\Signals\Hoang Tran\Projects 2021\0111-09-044 BS 288-B at Orange St\0111-09-044 BS 288-B at Orange St.dgn

CALL OUTS:

(A) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

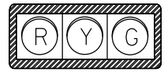
(B) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

(C) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA) WITH METER AND SERVICE ENCLOSURE.

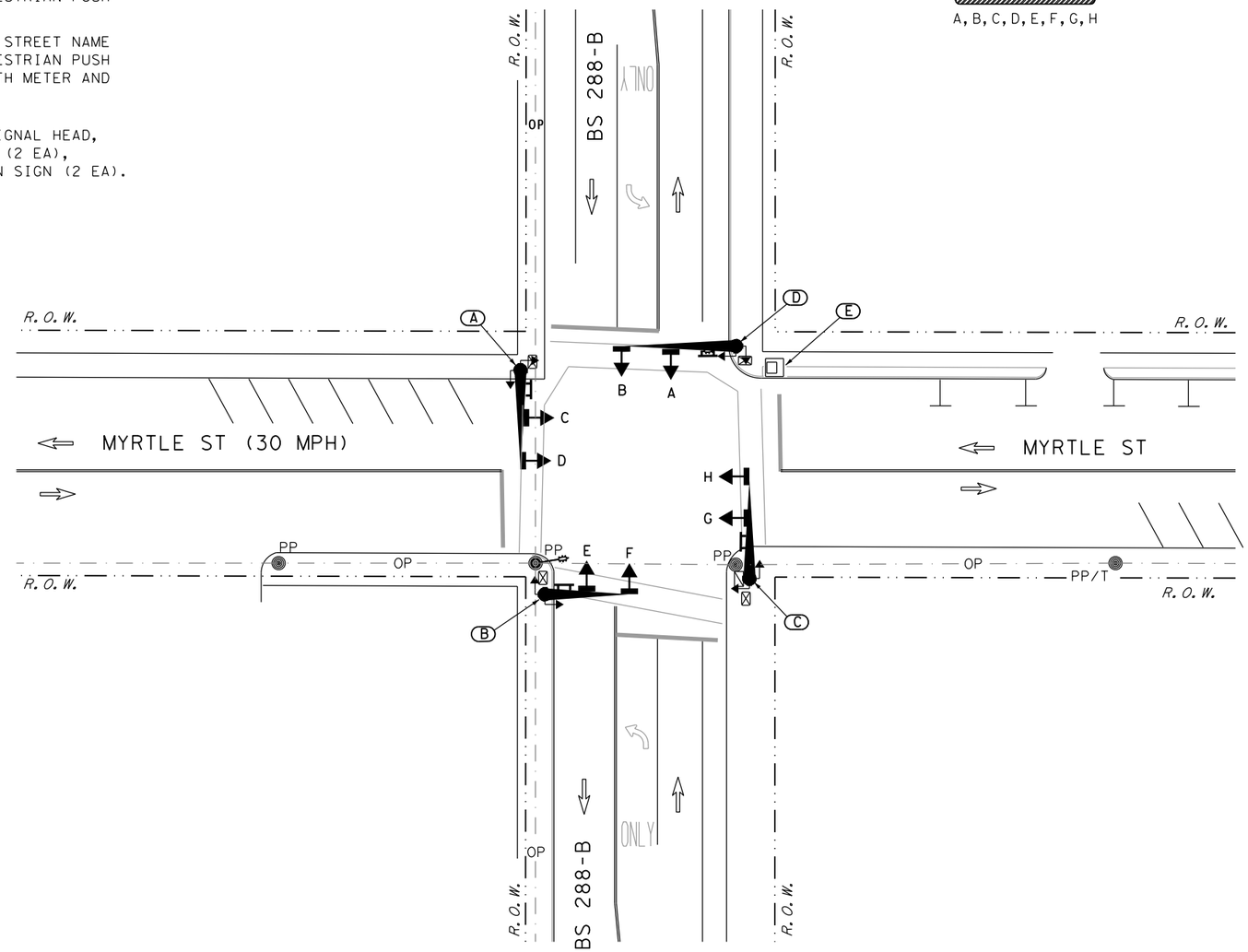
(D) EXISTING MAST ARM POLE WITH LUMINAIRE, SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).

(E) EXISTING SIGNAL CONTROLLER.

EXISTING SIGNAL HEADS



A, B, C, D, E, F, G, H



LEGEND:

- DIRECTION OF TRAFFIC
- PP — EXISTING POWER POLE
- PP/T — EXISTING POWER POLE W/TRANSFORMER
- —OP— EXISTING OVERHEAD POWER LINE
- EXISTING MAST ARM POLE
- EXISTING TRAFFIC SIGNAL HEAD
- EXISTING GROUND BOX
- EXISTING LUMINAIRE
- EXISTING SIGN
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING CONTROLLER

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

01/25/2022

BS 288-B
AT MYRTLE ST
TRAFFIC SIGNAL EXISTING LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288-B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		162

DATE: 1/25/2022
FILE: H:\Trf\Signals\Hoang Tran\Projects 2021\0111-09-044 BS 288-B at Myrtle St\0111-09-044 BS 288-B at Myrtle St.dgn

LEGEND:

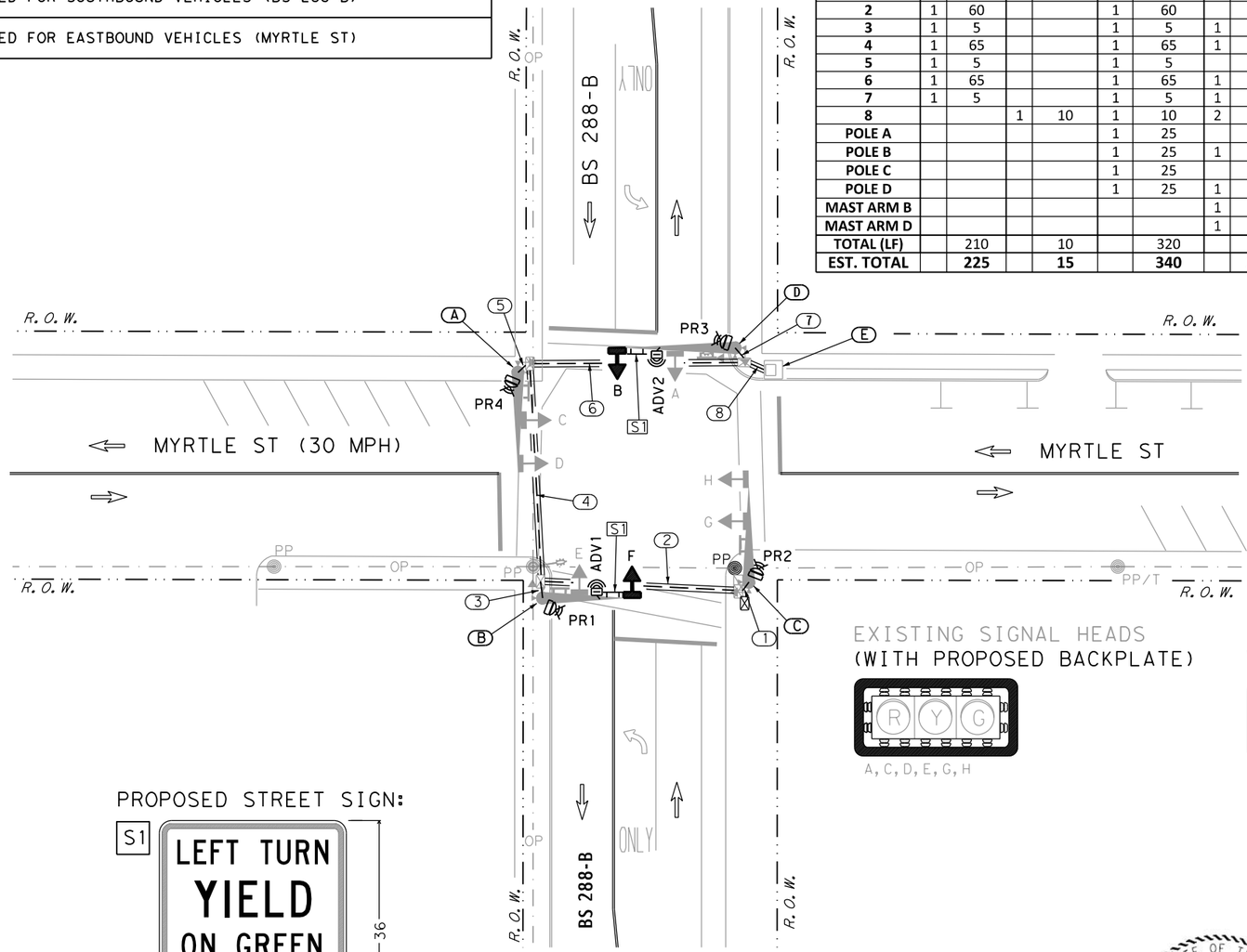
- DIRECTION OF TRAFFIC
- PP — EXISTING POWER POLE
- PP/T — EXISTING POWER POLE W/TRANSFORMER
- —OP— EXISTING OVERHEAD POWER LINE
- EXISTING MAST ARM POLE
- EXISTING GROUND BOX
- EXISTING LUMINAIRE
- EXISTING SIGN
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING CONTROLLER
- EXISTING TRAFFIC SIGNAL HEAD WITH PROPOSED BACKPLATE
- PR1 — PROPOSED PRESENCE RADAR DETECTOR
- ADV1 — PROPOSED ADVANCE RADAR DETECTOR
- PROPOSED CONDUIT (BORE)
- PROPOSED TRAFFIC SIGNAL HEAD

PROPOSED RADAR DETECTIONS SCHEDULE:

ADV1	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES (BS 288-B)
ADV2	DESIGNATED FOR NORTHBOUND APPROACHING VEHICLES (BS 288-B)
PR1	DESIGNATED FOR NORTHBOUND VEHICLES (BS 288-B)
PR2	DESIGNATED FOR WESTBOUND VEHICLES (MYRTLE ST)
PR3	DESIGNATED FOR SOUTHBOUND VEHICLES (BS 288-B)
PR4	DESIGNATED FOR EASTBOUND VEHICLES (MYRTLE ST)

CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618) PVC 2" SCHD 80) (6047) NO EA	CONDUIT (618) PVC 2" SCHD 80) (6047) BORE LF	CONDUIT (618) PVC 3" (SCHD 80) (6054) NO EA	CONDUIT (618) PVC 3" (SCHD 80) (6054) BORE LF	CONDUCTORS (620) #6 BARE GROUND NO. EA	CONDUCTORS (620) #6 BARE GROUND LENGTH LF	#12/7C SIGNAL NO EA	#12/7C SIGNAL LENGTH LF	RADAR (6292) # 18/2C & #22/4C PRE. RADAR NO EA	RADAR (6292) # 18/2C & #22/4C PRE. RADAR LENGTH LF	RADAR (6292) # 18/2C & #22/4C (Subsidiary) ADV. RADAR NO EA	RADAR (6292) # 18/2C & #22/4C (Subsidiary) ADV. RADAR LENGTH LF
1	1	5			1	5			1	5		
2	1	60			1	60			1	60		
3	1	5			1	5	1	5	1	5	1	5
4	1	65			1	65	1	65	2	65	1	65
5	1	5			1	5			1	5		
6	1	65			1	65	1	65	3	65	1	60
7	1	5			1	5	1	5	1	5	1	5
8			1	10	1	10	2	10	4	10	2	10
POLE A					1	25			1	25		
POLE B					1	25	1	25	1	25	1	25
POLE C					1	25			1	25		
POLE D					1	25	1	25	1	25	1	25
MAST ARM B							1	30			1	20
MAST ARM D							1	35			1	30
TOTAL (LF)		210		10		320		275		545		255
EST. TOTAL		**225**		**15**		**340**		**290**		**575**		**270**



CALL OUTS:

(A) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).
WITH PROPOSED PRESENCE RADAR DETECTOR

(B) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).
WITH PROPOSED PRESENCE RADAR AND ADVANCE RADAR DETECTORS

(C) EXISTING MAST ARM POLE WITH SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA) WITH METER AND SERVICE ENCLOSURE. **WITH PROPOSED PRESENCE RADAR DETECTOR**

(D) EXISTING MAST ARM POLE WITH LUMINAIRE, SIGNAL HEAD, STREET NAME SIGN, PEDESTRIAN SIGNAL HEAD (2 EA), PEDESTRIAN PUSH BOTTON (2 EA), PEDESTRIAN SIGN (2 EA).
WITH PROPOSED PRESENCE RADAR AND ADVANCE RADAR DETECTORS

(E) EXISTING SIGNAL CONTROLLER.

NOTES:

THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES AT LEAST 72 HOURS PRIOR TO ANY WORK. TXDOT IS NOT A MEMBER OF 811, THE CONTRACTOR SHALL CONTACT TXDOT FIVE (5) BUSINESS DAYS TO LOCATED TXDOT OWNED EXISTING TXDOT COMMUNICATIONS, ILLUMINATION, AND TRAFFIC SIGNAL CABLING. TXDOT HOUSTON DISTRICT TRAFFIC OPERATIONS OFFICE CAN BE REACHED AT: HOU-LOCATEREQUEST@TXDOT.GOV

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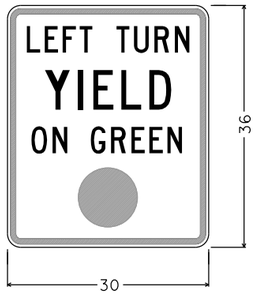
PROPOSED STREET SIGN:

S1

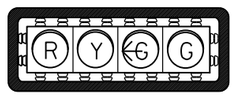


R10-12_30x36;
2.0" Radius, 0.8" Border, 0.5" Indent, Black on, White;
"LEFT TURN", C;
"YIELD", C 115% spacing;
"ON GREEN", C;

EXISTING SIGNAL HEADS (WITH PROPOSED BACKPLATE)

A, C, D, E, G, H

PROPOSED SIGNAL HEADS WITH BACKPLATE



B, F

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

01/25/2022

BS 288-B
AT MYRTLE ST
TRAFFIC SIGNAL PROPOSED LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288-B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		163

DATE: 1/25/2022
FILE: H:\Trf\Signals\Hoang Tran\Projects 2021\0111-09-044 BS 288-B at Myrtle St\0111-09-044 BS 288-B at Myrtle St.dgn

LEGEND

EXIST. GROUND BOX

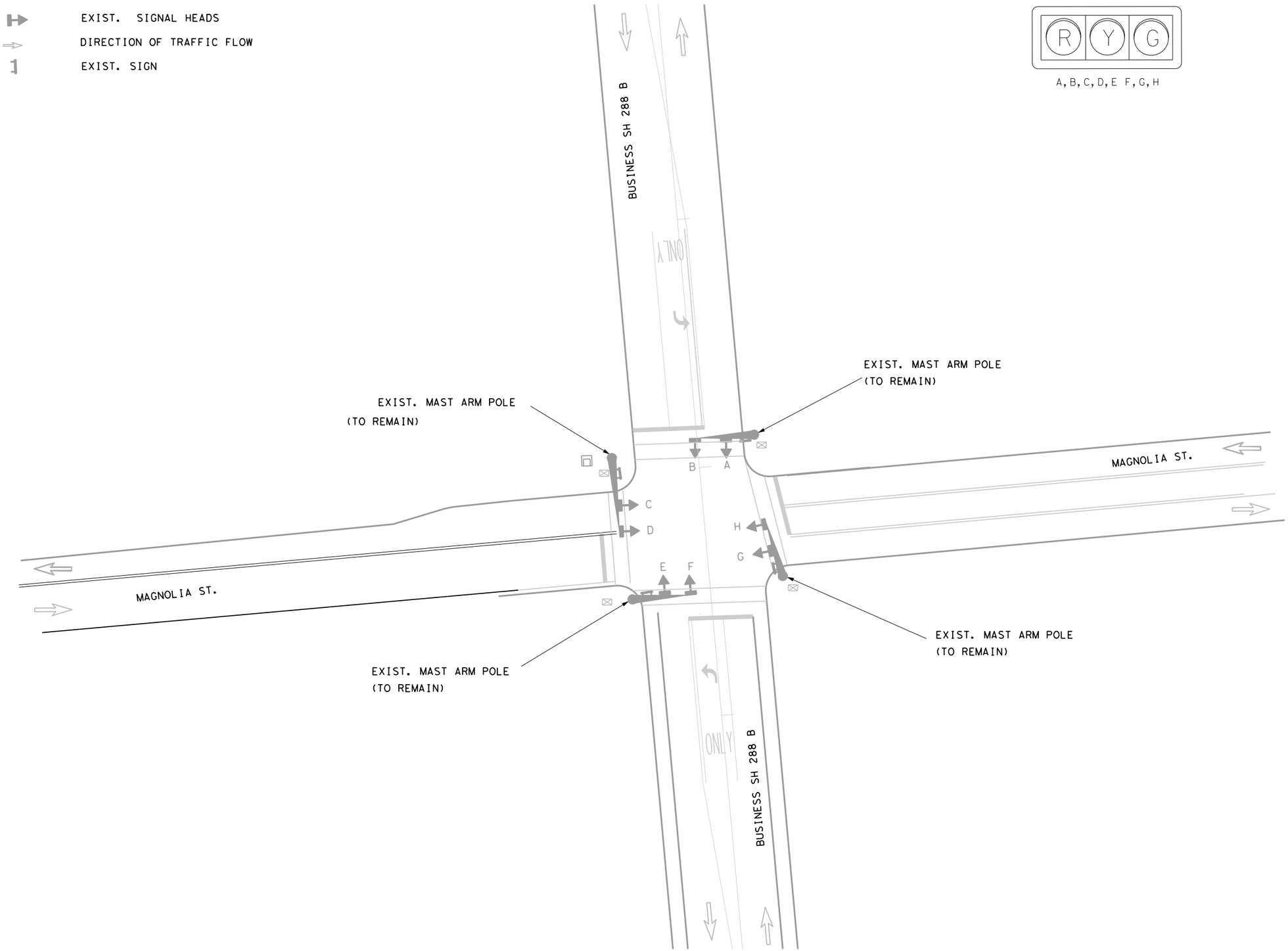
EXIST. SIGNAL HEADS

DIRECTION OF TRAFFIC FLOW

EXIST. SIGN

EXIST. SIGNAL HEADS

A, B, C, D, E F, G, H



STATE OF TEXAS
MICHAEL A. OLIVO
108793
LICENSED
PROFESSIONAL ENGINEER

P.E.

01/25/2022

BS 288 B AT MAGNOLIA ST. TRAFFIC SIGNAL EXISTING LAYOUT

0 20 40 FT

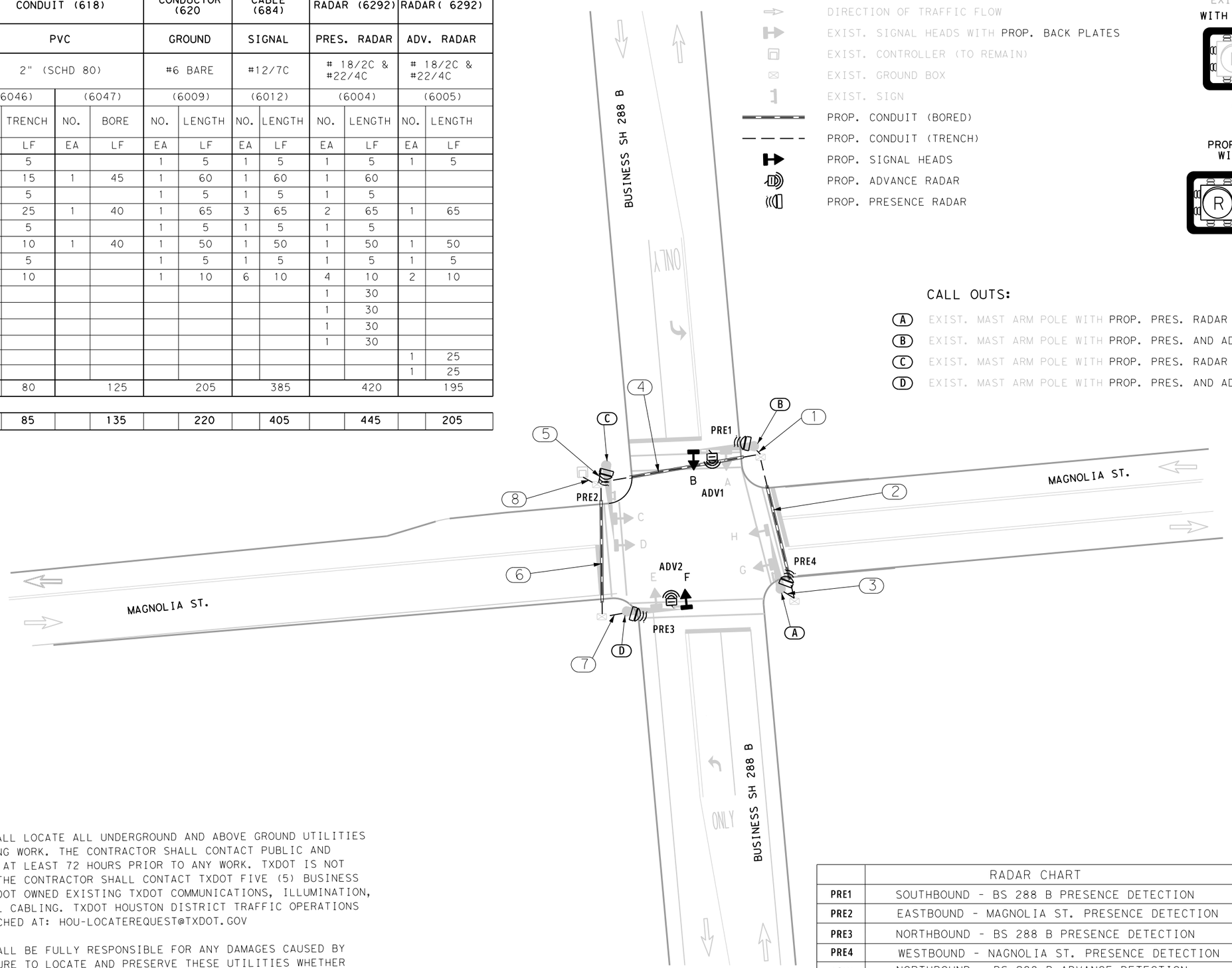
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288 B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		164

DATE: 1/25/2022 2:46:27 PM
FILE: H:\Traffic Signals\Thai Truong\CSJ 0111-09-044_BS 288 and SL 274_Detection Upgrade\95% Plan\Aryo\Plan Layout Project.dgn

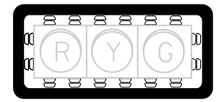
CONDUIT AND CONDUCTOR RUNS												
RUN NO.	CONDUIT (618)				CONDUCTOR (620		CABLE (684)		RADAR (6292)		RADAR(6292)	
	PVC				GROUND		SIGNAL		PRES. RADAR		ADV. RADAR	
	2" (SCHD 80)				#6 BARE		#12/7C		# 18/2C & #22/4C		# 18/2C & #22/4C	
	(6046)		(6047)		(6009)		(6012)		(6004)		(6005)	
	NO.	TRENCH	NO.	BORE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF
1	1	5			1	5	1	5	1	5	1	5
2	1	15	1	45	1	60	1	60	1	60		
3	1	5			1	5	1	5	1	5		
4	1	25	1	40	1	65	3	65	2	65	1	65
5	1	5			1	5	1	5	1	5		
6	1	10	1	40	1	50	1	50	1	50	1	50
7	1	5			1	5	1	5	1	5	1	5
8	1	10			1	10	6	10	4	10	2	10
POLE A									1	30		
POLE B									1	30		
POLE C									1	30		
POLE D									1	30		
MB											1	25
MD											1	25
TOTAL (LF)		80		125		205		385		420		195
EST. TOTAL		85		135		220		405		445		205



LEGEND:

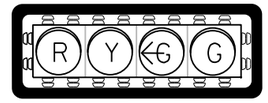
- DIRECTION OF TRAFFIC FLOW
- EXIST. SIGNAL HEADS WITH PROP. BACK PLATES
- EXIST. CONTROLLER (TO REMAIN)
- EXIST. GROUND BOX
- EXIST. SIGN
- PROP. CONDUIT (BORED)
- PROP. CONDUIT (TRENCH)
- PROP. SIGNAL HEADS
- PROP. ADVANCE RADAR
- PROP. PRESENCE RADAR

EXIT. SIGNAL HEAD WITH PROP. BACKPLATE



A, C, D, E, G, H

PROP. SIGNAL HEAD WITH BACKPLATE



B, F

CALL OUTS:

- (A) EXIST. MAST ARM POLE WITH PROP. PRES. RADAR DETECTOR
- (B) EXIST. MAST ARM POLE WITH PROP. PRES. AND ADVD. RADAR DETECTOR
- (C) EXIST. MAST ARM POLE WITH PROP. PRES. RADAR DETECTOR
- (D) EXIST. MAST ARM POLE WITH PROP. PRES. AND ADVD. RADAR DETECTOR

	RADAR CHART
PRE1	SOUTHBOUND - BS 288 B PRESENCE DETECTION
PRE2	EASTBOUND - MAGNOLIA ST. PRESENCE DETECTION
PRE3	NORTHBOUND - BS 288 B PRESENCE DETECTION
PRE4	WESTBOUND - NAGNOLIA ST. PRESENCE DETECTION
ADV1	NORTHBOUND - BS 288 B ADVANCE DETECTION
ADV2	SOUTHBOUND - BS 288 BADVANCE DETECTION

NOTES:

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

01/25/2022

BS 288 B AT MAGNOLIA ST. TRAFFIC SIGNAL PROPOSED LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288 B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		165

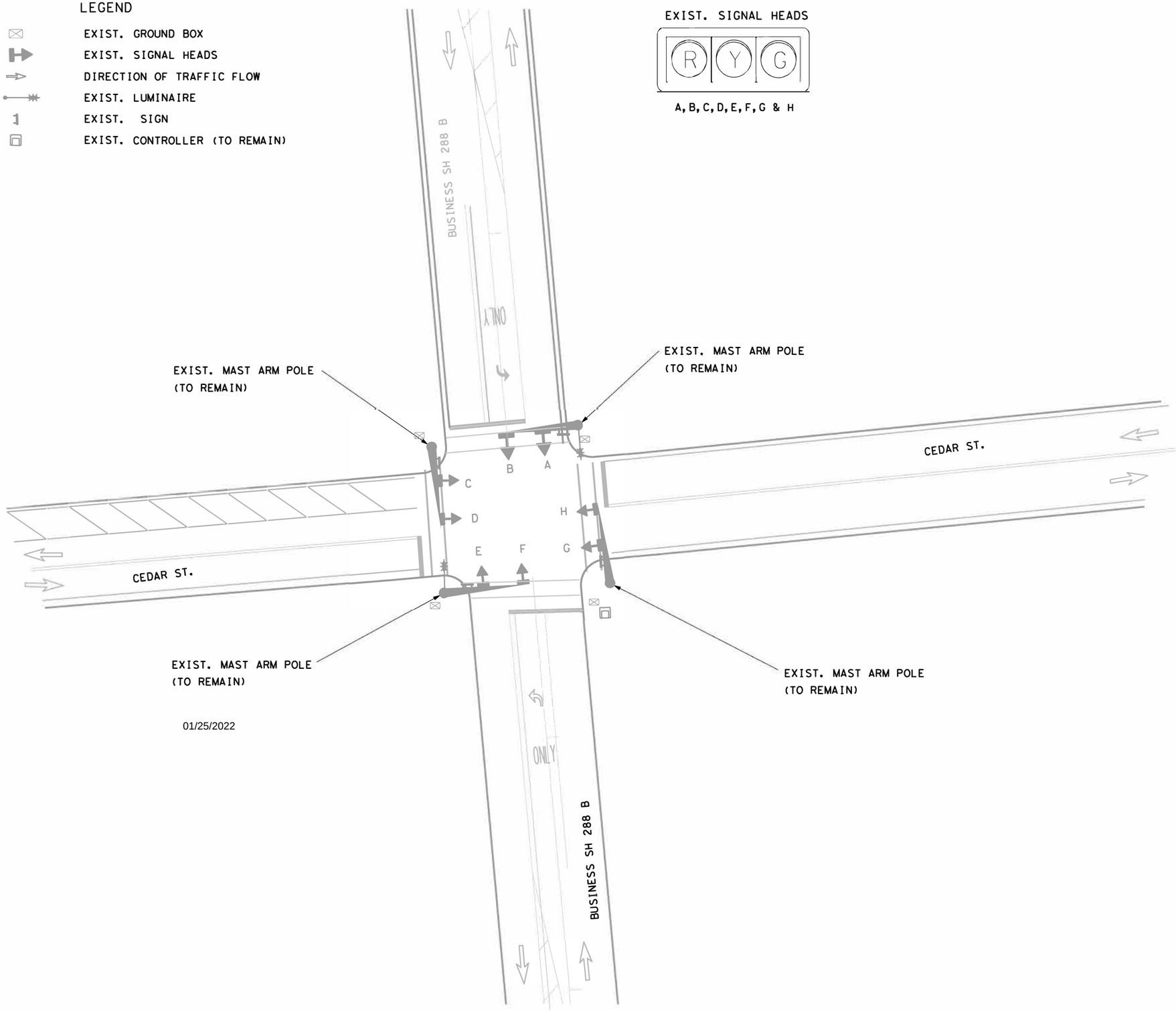
DATE: 1/25/2022 2:46:52 PM
FILE: H:\Tr\Signals\Thai Truong\CSJ 0111-09-044_BS 288 and SL 274_Detection Upgrade\95% Plan\Aryo\Plan Layout Project.dgn

LEGEND

- EXIST. GROUND BOX
- EXIST. SIGNAL HEADS
- DIRECTION OF TRAFFIC FLOW
- EXIST. LUMINAIRE
- EXIST. SIGN
- EXIST. CONTROLLER (TO REMAIN)

EXIST. SIGNAL HEADS

A, B, C, D, E, F, G & H



01/25/2022

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

BS 288 B AT CEDAR ST. TRAFFIC SIGNAL EXISTING LAYOUT

0 20 40 FT

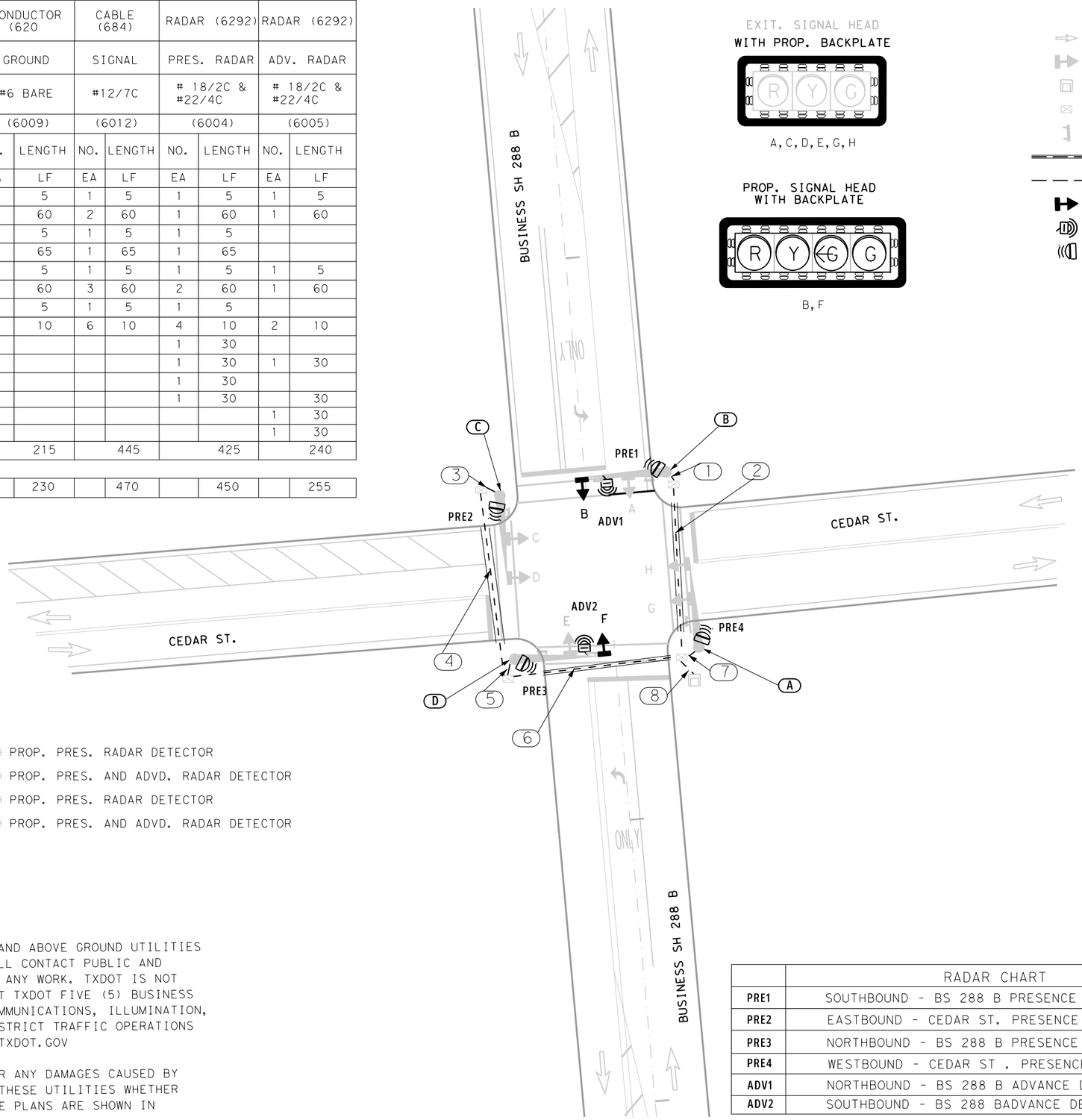
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288 B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		166

DATE: 1/25/2022 2:47:08 PM
FILE: H:\TrfSignals\Thai Truong\CSJ 0111-09-044_BS 288 and SL 274_Detection Upgrade\95% Plan\ArcGIS Plan Layout Project.dgn

CONDUIT AND CONDUCTOR RUNS												
RUN NO.	CONDUIT (618)				CONDUCTOR (620		CABLE (684)		RADAR (6292)		RADAR (6292)	
	PVC				GROUND		SIGNAL		PRES. RADAR		ADV. RADAR	
	2" (SCHD 80)				#6 BARE		#12/7C		# 18/2C & #22/4C		# 18/2C & #22/4C	
	(6046)		(6047)		(6009)		(6012)		(6004)		(6005)	
	NO.	TRENCH	NO.	BORE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF
1	1	5			1	5	1	5	1	5	1	5
2	1	15	1	45	1	60	2	60	1	60	1	60
3	1	5			1	5	1	5	1	5		
4	1	25	1	40	1	65	1	65	1	65		
5	1	5			1	5	1	5	1	5	1	5
6	1	15	1	45	1	60	3	60	2	60	1	60
7	1	5			1	5	1	5	1	5		
8	1	10			1	10	6	10	4	10	2	10
POLE A									1	30		
POLE B									1	30	1	30
POLE C									1	30		
POLE D									1	30		30
MB											1	30
MD											1	30
TOTAL (LF)		85		130		215		445		425		240
EST. TOTAL		90		140		230		470		450		255



EXIT. SIGNAL HEAD
WITH PROP. BACKPLATE

A, C, D, E, G, H

PROP. SIGNAL HEAD
WITH BACKPLATE

B, F

LEGEND:

- DIRECTION OF TRAFFIC FLOW
- EXIST. SIGNAL HEADS WITH
- EXIST. CONTROLLER (TO REMAIN)
- EXIST. GROUND BOX
- EXIST. SIGN
- PROP. CONDUIT (BORED)
- PROP. CONDUIT (TRENCH)
- PROP. SIGNAL HEADS
- PROP. ADVANCE RADAR
- PROP. PRESENCE RADAR

CALL OUTS:

- (A) EXIST. MAST ARM POLE WITH PROP. PRES. RADAR DETECTOR
- (B) EXIST. MAST ARM POLE WITH PROP. PRES. AND ADVD. RADAR DETECTOR
- (C) EXIST. MAST ARM POLE WITH PROP. PRES. RADAR DETECTOR
- (D) EXIST. MAST ARM POLE WITH PROP. PRES. AND ADVD. RADAR DETECTOR

NOTES:

THE CONTRACTOR SHALL LOCATE ALL UNDERGROUND AND ABOVE GROUND UTILITIES PRIOR TO COMMENCING WORK. THE CONTRACTOR SHALL CONTACT PUBLIC AND PRIVATE UTILITIES AT LEAST 72 HOURS PRIOR TO ANY WORK. TXDOT IS NOT A MEMBER OF 811. THE CONTRACTOR SHALL CONTACT TXDOT FIVE (5) BUSINESS DAYS TO LOCATE TXDOT OWNED EXISTING TXDOT COMMUNICATIONS, ILLUMINATION, AND TRAFFIC SIGNAL CABLING. TXDOT HOUSTON DISTRICT TRAFFIC OPERATIONS OFFICE CAN BE REACHED AT: HOU-LOCATEREQUEST@TXDOT.GOV

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	RADAR CHART
PRE1	SOUTHBOUND - BS 288 B PRESENCE DETECTION
PRE2	EASTBOUND - CEDAR ST. PRESENCE DETECTION
PRE3	NORTHBOUND - BS 288 B PRESENCE DETECTION
PRE4	WESTBOUND - CEDAR ST . PRESENCE DETECTION
ADV1	NORTHBOUND - BS 288 B ADVANCE DETECTION
ADV2	SOUTHBOUND - BS 288 BADVANCE DETECTION

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

01/25/2022

BS 288 B AT CEDAR ST. TRAFFIC SIGNAL PROPOSED LAYOUT

0 20 40 FT
SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288 B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		167

DATE: 1/25/2022 2:47:22 PM
FILE: H:\Traffic\Signals\Thoi Truong\CSJ 0111-09-044_BS 288 and SL 274_Detection Upgrade\95% Plan\Aryo\Plan Layout Project.dgn

LEGEND

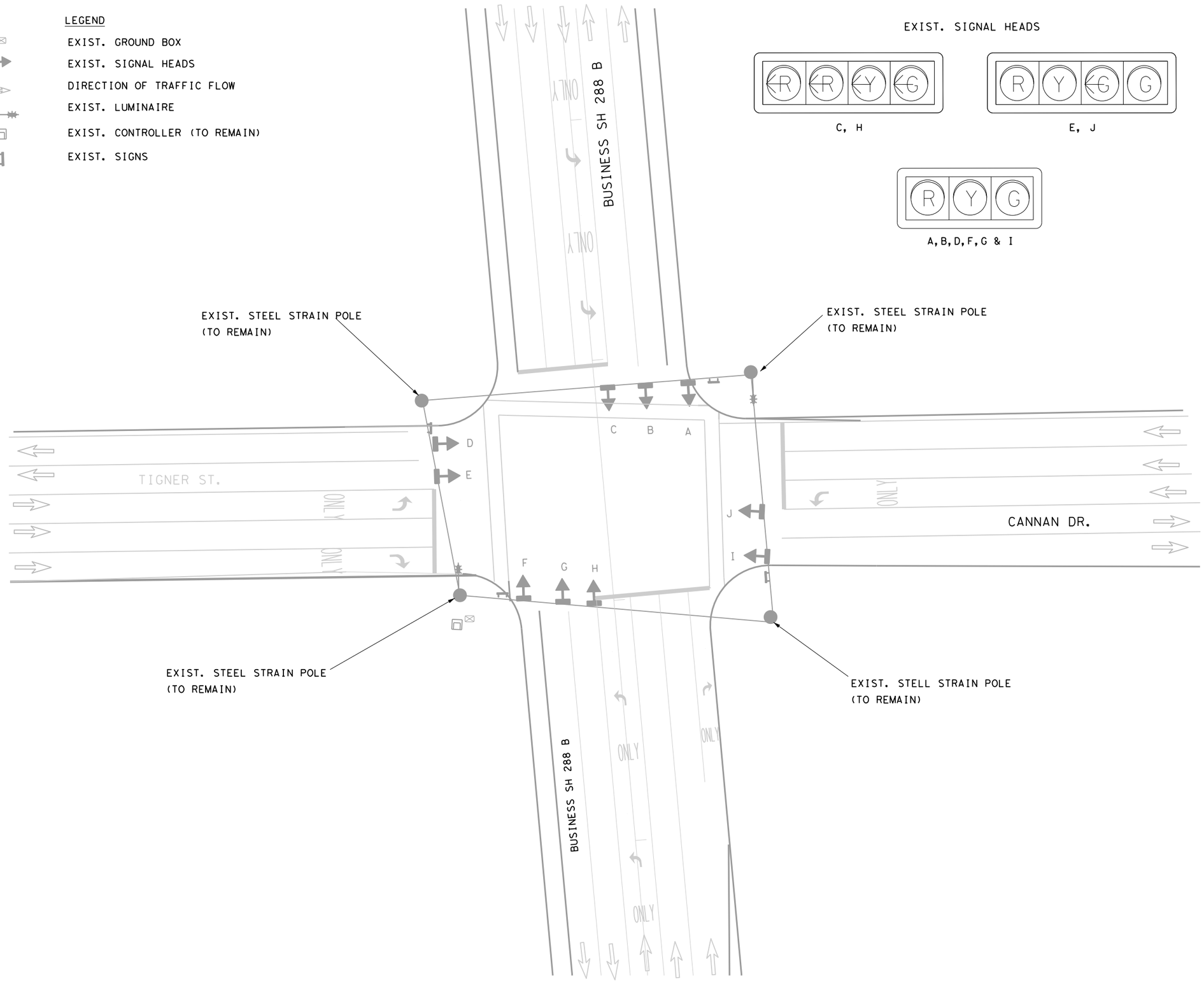
- EXIST. GROUND BOX
- EXIST. SIGNAL HEADS
- DIRECTION OF TRAFFIC FLOW
- EXIST. LUMINAIRE
- EXIST. CONTROLLER (TO REMAIN)
- 1 EXIST. SIGNS

EXIST. SIGNAL HEADS

C, H

E, J

A, B, D, F, G & I



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

01/25/2022

BS 288 B AT CANNAN DR./TIGNER ST. TRAFFIC SIGNAL EXISTING LAYOUT

0 20 40 FT

SCALE: 1" = 40'

Texas Department of Transportation

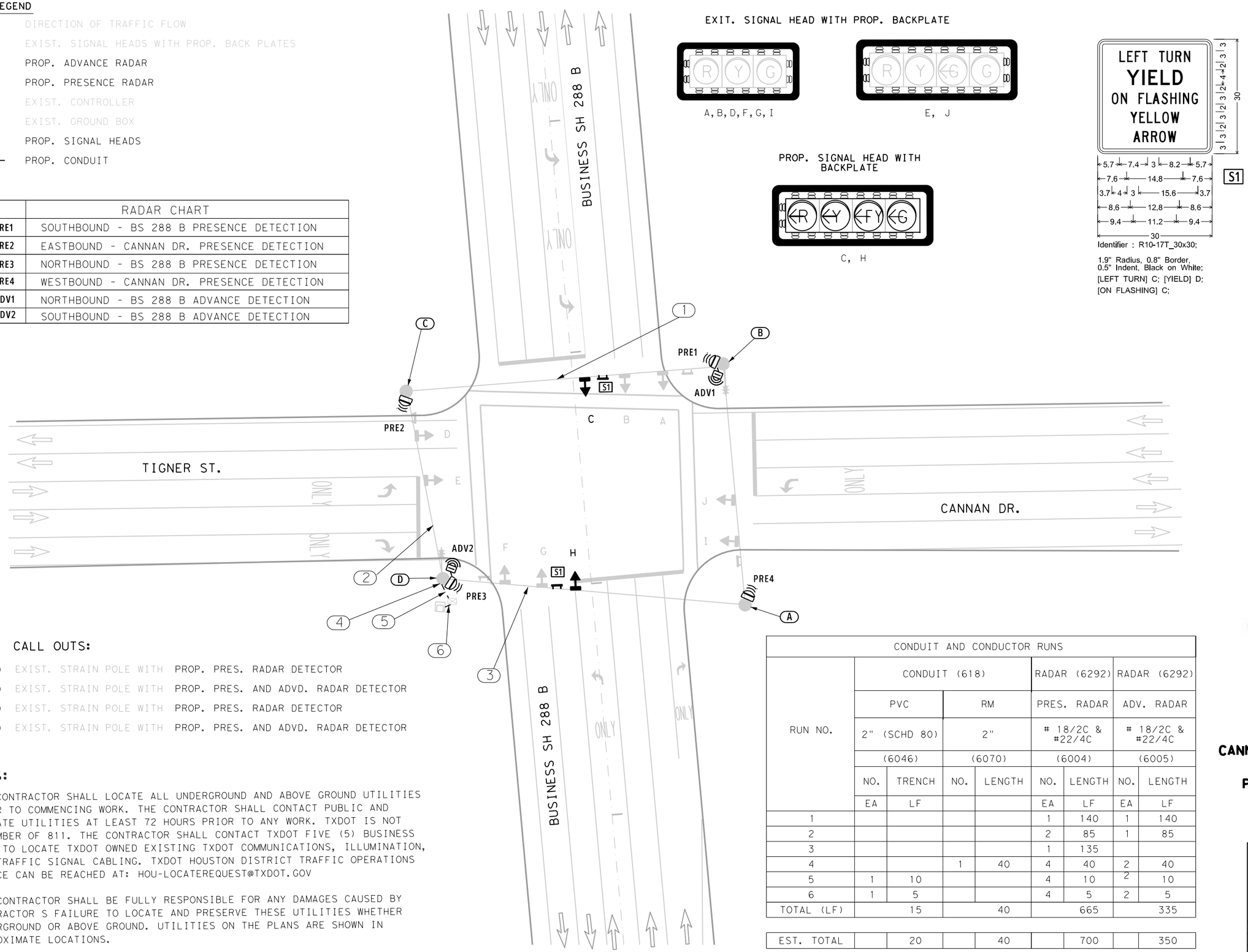
CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288 B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		168

DATE: 1/25/2022
FILE: H:\Traffic Signals\Thai Truong\CSJ 0111-09-044_BS 288 and SL 274_Detection Upgrade\95% Plan\Arya\Plan Layout Project.dgn

LEGEND

- DIRECTION OF TRAFFIC FLOW
- EXIST. SIGNAL HEADS WITH PROP. BACK PLATES
- PROP. ADVANCE RADAR
- PROP. PRESENCE RADAR
- EXIST. CONTROLLER
- EXIST. GROUND BOX
- PROP. SIGNAL HEADS
- PROP. CONDUIT

	RADAR CHART
PRE1	SOUTHBOUND - BS 288 B PRESENCE DETECTION
PRE2	EASTBOUND - CANNAN DR. PRESENCE DETECTION
PRE3	NORTHBOUND - BS 288 B PRESENCE DETECTION
PRE4	WESTBOUND - CANNAN DR. PRESENCE DETECTION
ADV1	NORTHBOUND - BS 288 B ADVANCE DETECTION
ADV2	SOUTHBOUND - BS 288 B ADVANCE DETECTION



EXIT. SIGNAL HEAD WITH PROP. BACKPLATE

A, B, D, F, G, I

E, J

PROP. SIGNAL HEAD WITH BACKPLATE

C, H

Identifier : R10-17T_30x30;

1.9" Radius, 0.8" Border, 0.5" Indent, Black on White;
[LEFT TURN] C; [YIELD] D; [ON FLASHING] C;

CALL OUTS:

- (A) EXIST. STRAIN POLE WITH PROP. PRES. RADAR DETECTOR
- (B) EXIST. STRAIN POLE WITH PROP. PRES. AND ADVD. RADAR DETECTOR
- (C) EXIST. STRAIN POLE WITH PROP. PRES. RADAR DETECTOR
- (D) EXIST. STRAIN POLE WITH PROP. PRES. AND ADVD. RADAR DETECTOR

NOTES:

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CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618)				RADAR (6292)		RADAR (6292)	
	PVC		RM		PRES. RADAR		ADV. RADAR	
	2" (SCHD 80)		2"		# 18/2C & #22/4C		# 18/2C & #22/4C	
	(6046)		(6070)		(6004)		(6005)	
	NO.	TRENCH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
	EA	LF			EA	LF	EA	LF
1					1	140	1	140
2					2	85	1	85
3					1	135		
4			1	40	4	40	2	40
5	1	10			4	10	2	10
6	1	5			4	5	2	5
TOTAL (LF)		15		40		665		335
EST. TOTAL		20		40		700		350

01/25/2022

BS 288 B AT CANNAN DR./TIGNER ST. TRAFFIC SIGNAL PROPOSED LAYOUT

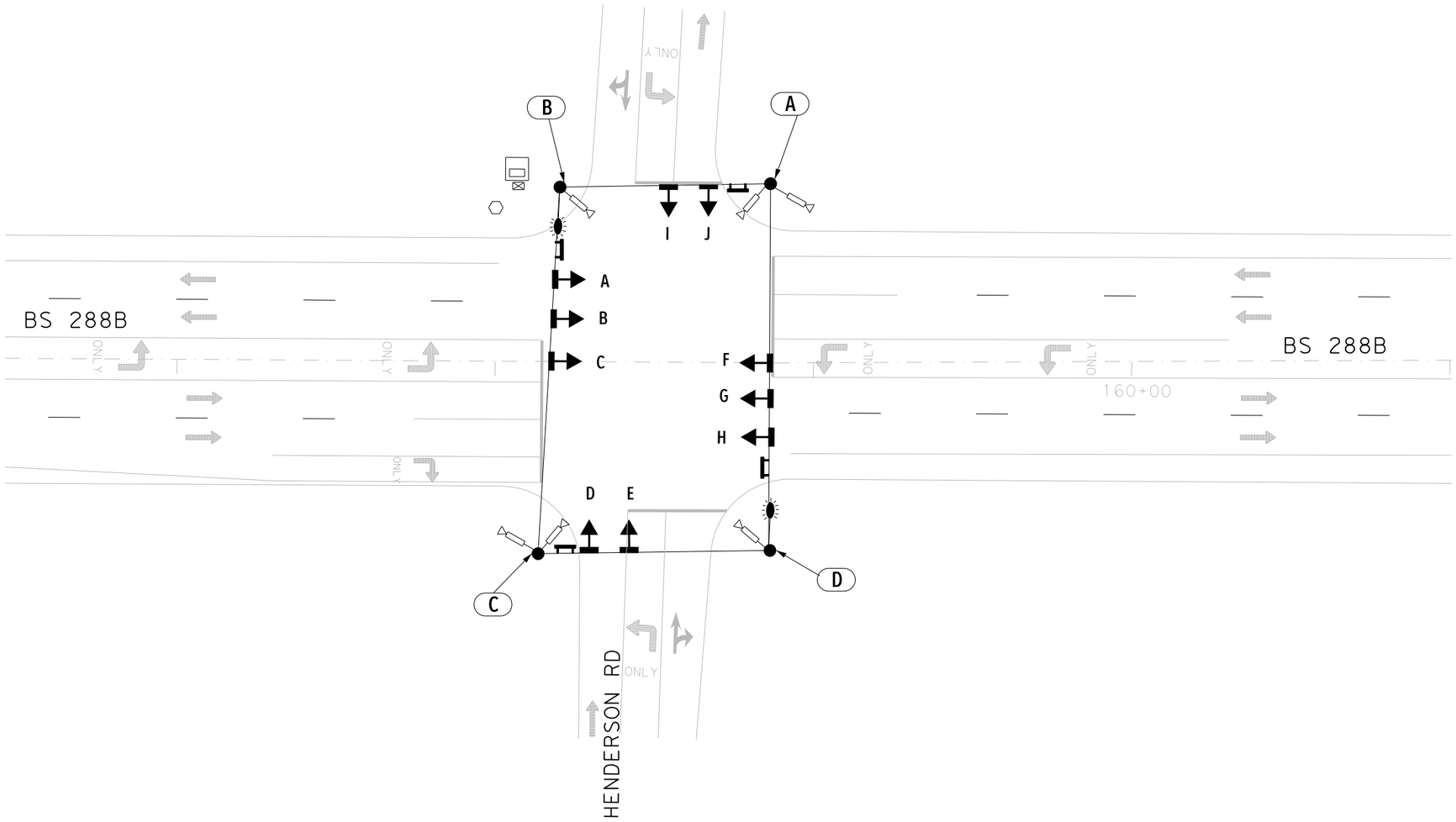
0 20 40 FT

SCALE: 1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288 B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		169

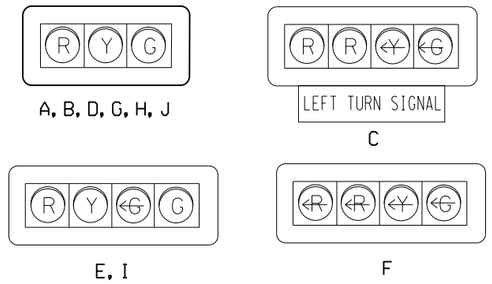
DATE: 1/25/2022 2:48:37 PM
FILE: H:\Traffic Signals\Thai Truong\CSJ 0111-09-044_BS 288 and SL 274_Detection Upgrade\95% Plan\Arya\Plan Layout Project.dgn



LEGEND:

- DIRECTION OF TRAFFIC
- EXISTING GROUNDBOX
- EXISTING LUMINAIRE LED
- EXISTING SERVICE POLE
- EXISTING CONTROLLER
- EXISTING VIDEO CAMERA
- EXISTING SIGNAL HEAD
- EXISTING STEEL STRAIN POLE (A B C D)

EXISTING SIGNAL HEAD



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

01/25/2022

BS 288B AT HENDERSON RD TRAFFIC SIGNAL EXISTING LAYOUT

0 20 40
SCALE IN FEET
1" = 40'

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		170

DATE: 1/25/2022 TIME
FILE: H:\TrfSignals\LienNguyen\BS 288-B AT SL274 -0111-09-044\DESIGN 170 - 171 - BS 288 AT HENDERSON RD CSJ 0111-09-044\170 - 171 BS 288 AT HENDERSON RD.dgn

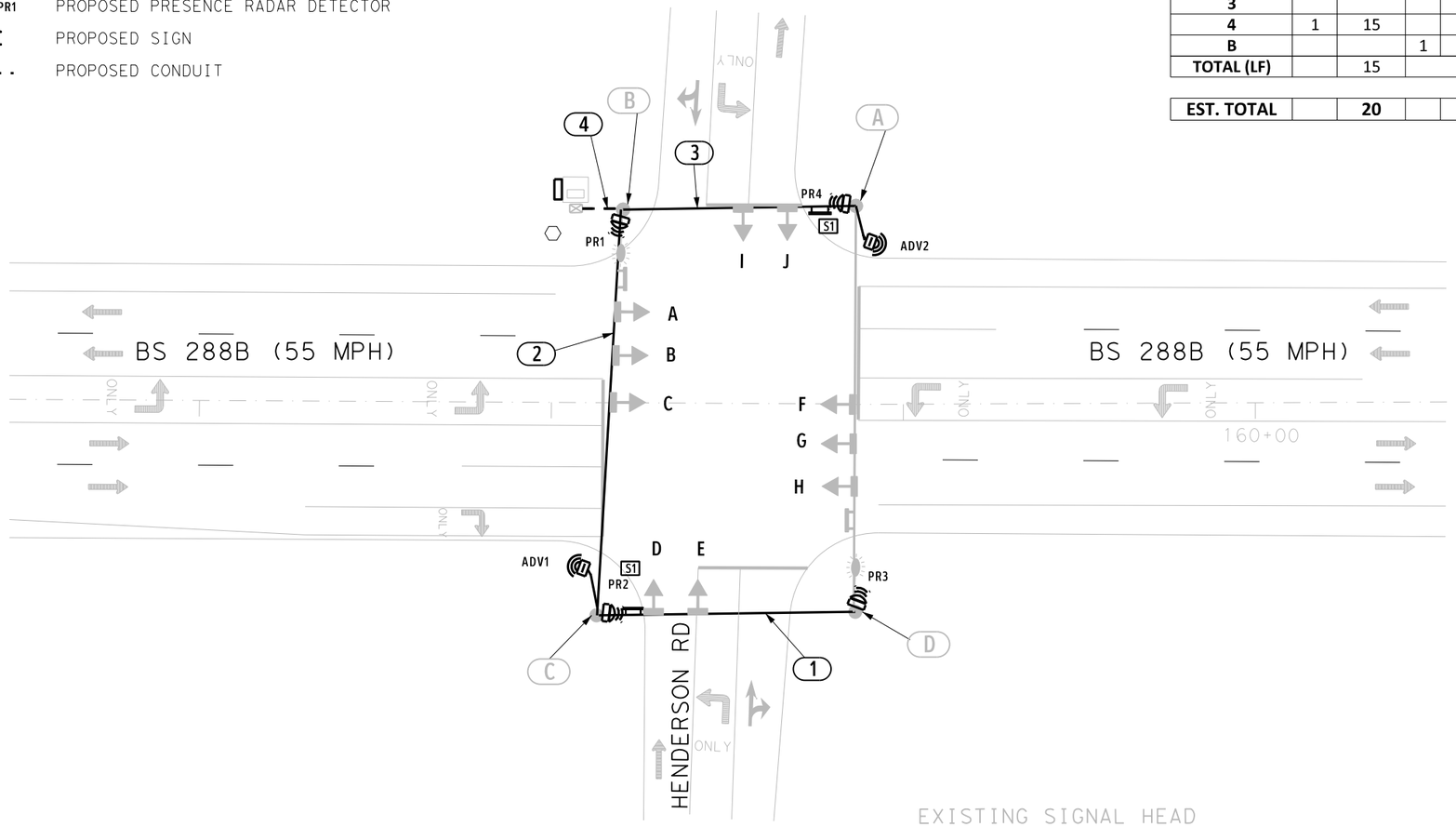
CK: | DW: | CK: |

LEGEND:

- DIRECTION OF TRAFFIC
- EXISTING GROUNDBOX
- EXISTING LUMINAIRE LED
- EXISTING SERVICE POLE
- EXISTING CONTROLLER W/ PROPOSED BBU
- A B C D — EXISTING STEEL STRAIN POLE
- EXISTING SIGNAL HEAD WITH PROPOSED BACKPLATE
- ADV1 — PROPOSED ADVANCE RADAR DETECTOR
- PR1 — PROPOSED PRESENCE RADAR DETECTOR
- S1 — PROPOSED SIGN
- PROPOSED CONDUIT

CONDUIT AND CONDUCTOR RUNS

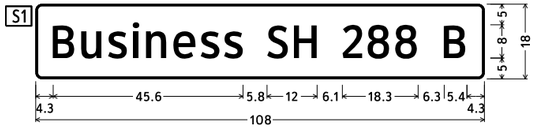
RUN NO.	CONDUIT (618)				CONDUCTORS (620)		RADAR (6292)		RADAR (6292)	
	PVC		RM		GROUND		PRES. RADAR		ADV. RADAR	
	2" (SCHD 80)		2"		#6 BARE		# 18/2C & #22/4C		# 18/2C & #22/4C	
	(6046)		(6070)		(6009)		(6004)		(6005)	
	NO.	TRENCH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF
1							1	75		
2							2	115	1	115
3							1	70	1	70
4	1	15			1	15	4	15	2	15
B			1	40	1	40	4	40	2	40
TOTAL (LF)		15		40		55		595		295
EST. TOTAL		20		45		60		625		310



PROPOSED RADAR DETECTIONS SCHEDULE:

ADV1	DESIGNATED FOR NORTHBOUND VEHICLES (BS 288-B)
ADV2	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES(BS 288-B)
PR1	DESIGNATED FOR NORTHBOUND VEHICLES (BS 288-B)
PR2	DESIGNATED FOR WESTBOUND VEHICLES (HENDERSON RD)
PR3	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES(BS 288-B)
PR4	DESIGNATED FOR EASTBOUND VEHICLES (HENDERSON RD)

S1



1.5" Radius, 0.5" Border, White on, Green;
"Business SH 288 B", ClearviewHwy-3-W 75% spacing;

NOTES:
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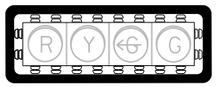
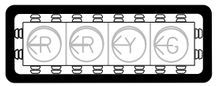
EXISTING SIGNAL HEAD
WITH PROPOSED BACKPLATE

A, B, D, G, H, J.

C.



E, I.



F.

BS 288B AT HENDERSON RD TRAFFIC SIGNAL PROPOSED LAYOUT

0 20 40
SCALE IN FEET
1" = 40'

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

01/25/2022

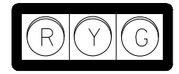
Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		171

LEGEND:

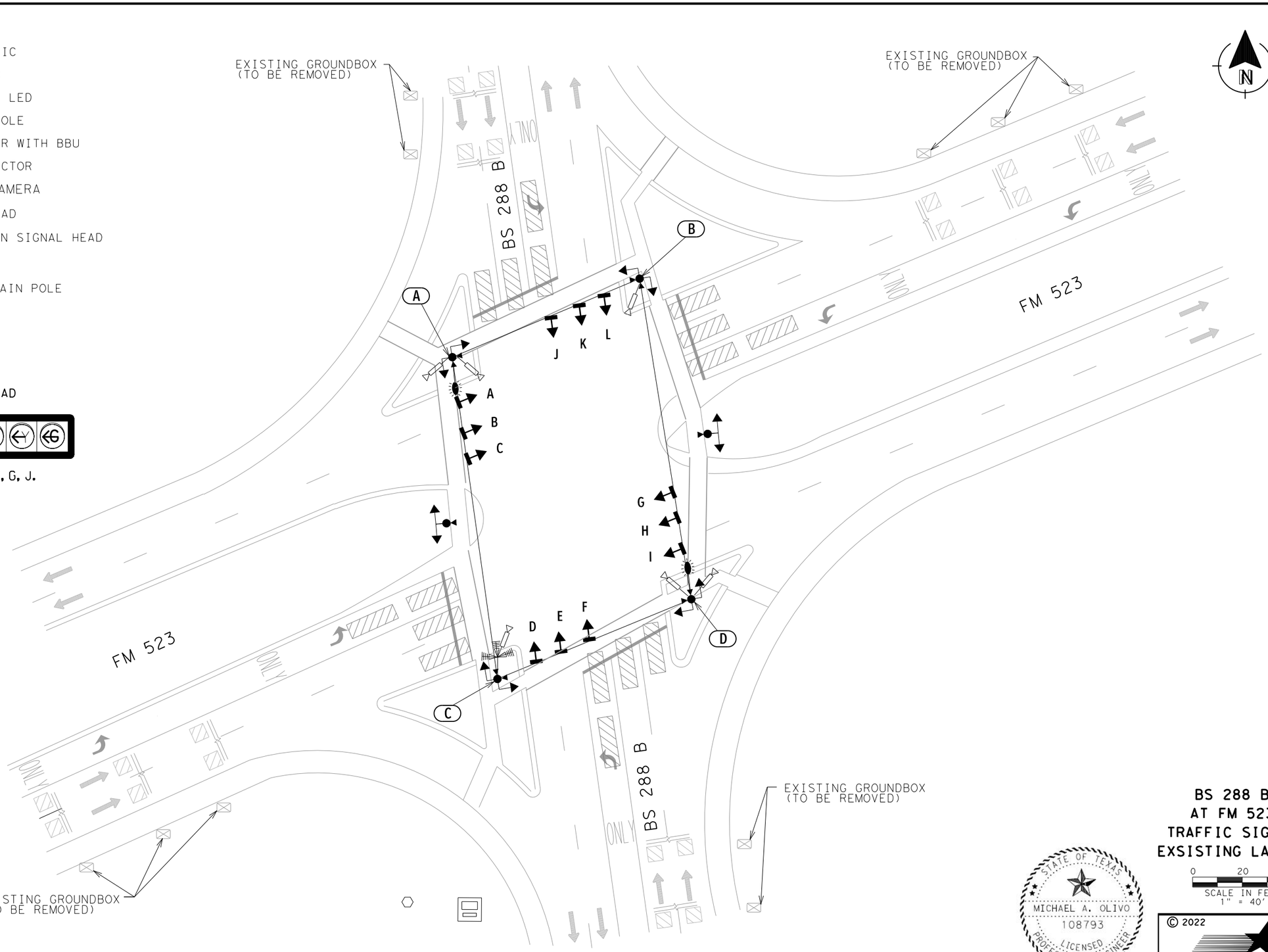
- DIRECTION OF TRAFFIC
- EXISTING GROUNDBOX
- EXISTING LUMINAIRE LED
- EXISTING SERVICE POLE
- EXISTING CONTROLLER WITH BBU
- EXISTING LOOP DETECTOR
- EXISTING VIDEO CAMERA
- EXISTING SIGNAL HEAD
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING ANTENNA
- (A) (B) (C) (D) EXISTING STEEL STRAIN POLE

EXISTING SIGNAL HEAD



A, B, D, E, H, I, K, L.

C, F, G, J.



BS 288 B
AT FM 523
TRAFFIC SIGNAL
EXSISTING LAYOUT

0 20 40
SCALE IN FEET
1" = 40'

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

01/25/2022

Texas Department of Transportation

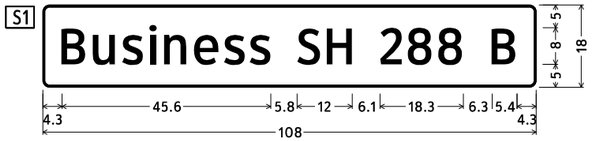
CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288 B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		172

1/25/2022 TIME
H:\TrfSignals\LienNguyen\BS 288-B AT SL274 -0111-09-044\DESIGN 172 - 173-BS 288-B at FM 523 CSJ 0111-09-044\172- 173 BS 288-B at FM 523.dgn

CONDUIT AND CONDUCTOR RUNS

RUN NO.	CONDUIT (618)						CONDUCTORS (620)		RADAR (6292)		RADAR (6292)	
	PVC				RM		GROUND		PRES. RADAR		ADV. RADAR	
	3" (SCHD 80)				3"		#6 BARE		# 18/2C & #22/4C		# 18/2C & #22/4C	
	(6053)		(6054)		(6074)		(6009)		(6004)		(6005)	
	NO.	TRENCH	NO.	BORE	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH	NO.	LENGTH
	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF	EA	LF
1									1	85	1	85
2									2	130	2	130
3									1	85	1	85
4	1	20	1	70			1	90	4	90	4	90
5	1	5					1	5	4	5	4	5
C					1	40	1	40	4	40	4	40
TOTAL (LF)		25		70		40		135		970		970
EST. TOTAL		30		75		45		145		1020		1020

S1



1.5" Radius, 0.5" Border, White on, Green;
"Business SH 288 B", ClearviewHwy-3-W 75% spacing;

EXISTING SIGNAL HEAD
WITH PROPOSED BACKPLATE

A, B, D, E, H, I, K, L.

C, F, G, J.

LEGEND:

- DIRECTION OF TRAFFIC
- EXISTING GROUNDBOX
- EXISTING LUMINAIRE LED
- EXISTING SERVICE POLE
- EXISTING CONTROLLER WITH BBU
- EXISTING PEDESTRIAN SIGNAL HEAD
- EXISTING STEEL STRAIN POLE
- EXISTING SIGNAL HEAD WITH PROPOSED BACKPLATE
- PROPOSED ADVANCE RADAR DETECTOR
- PROPOSED PRESENCE RADAR DETECTOR
- PROPOSED SIGN
- PROPOSED CONDUIT (BORED)
- PROPOSED CONDUIT

NOTES:
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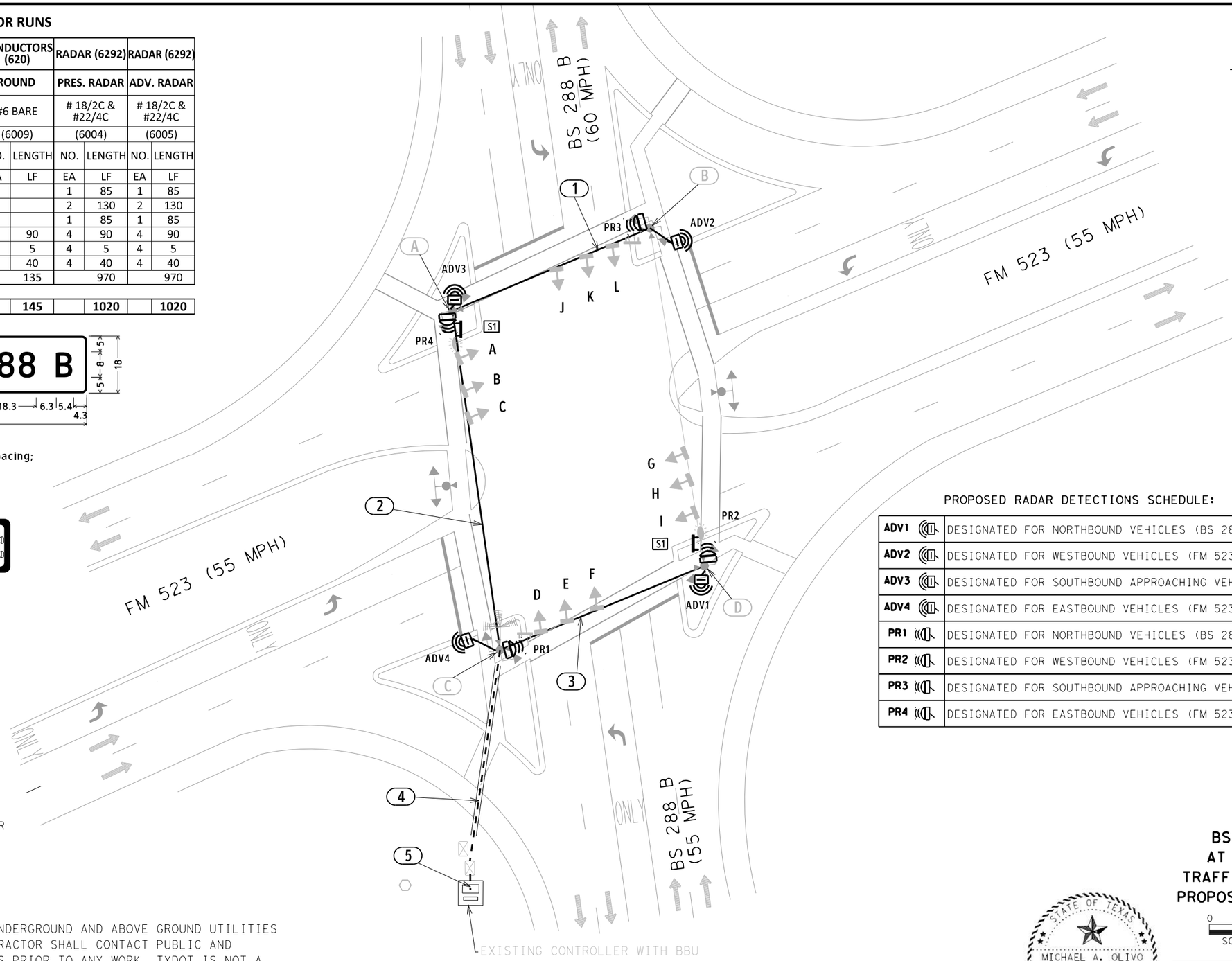

PROPOSED RADAR DETECTIONS SCHEDULE:

ADV1	DESIGNATED FOR NORTHBOUND VEHICLES (BS 288-B)
ADV2	DESIGNATED FOR WESTBOUND VEHICLES (FM 523)
ADV3	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES(BS 288-B)
ADV4	DESIGNATED FOR EASTBOUND VEHICLES (FM 523)
PR1	DESIGNATED FOR NORTHBOUND VEHICLES (BS 288-B)
PR2	DESIGNATED FOR WESTBOUND VEHICLES (FM 523)
PR3	DESIGNATED FOR SOUTHBOUND APPROACHING VEHICLES(BS 288-B)
PR4	DESIGNATED FOR EASTBOUND VEHICLES (FM 523)

BS 288 B AT FM 523 TRAFFIC SIGNAL PROPOSED LAYOUT

0 20 40
SCALE IN FEET
1" = 40'

01/25/2022

Texas Department of Transportation

CONT	SECT	JOB	HIGHWAY
0111	09	044	BS 288 B
DIST	COUNTY		SHEET NO.
HOU	BRAZORIA		173

1/25/2022 TIME
H:\TrfSignals\LienNguyen\BS 288-B AT SL274 -0111-09-044\DESIGN 172 - 173-BS 288-B at FM 523 CSJ 0111-09-044\172- 173 BS 288-B at FM 523.dgn

GENERAL NOTES FOR ALL ELECTRICAL WORK

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

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

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

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

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

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

CONDUIT

A. MATERIALS

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

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

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

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

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

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

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

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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		HOU	BRAZORIA		174

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ELECTRICAL CONDUCTORS

A. MATERIAL INFORMATION

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

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

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

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

B. CONSTRUCTION METHODS

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

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

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

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

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

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

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

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

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

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

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

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

C. TEMPORARY WIRING

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

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

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

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

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

GROUND RODS & GROUNDING ELECTRODES

A. MATERIAL INFORMATION

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

B. CONSTRUCTION METHODS

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

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

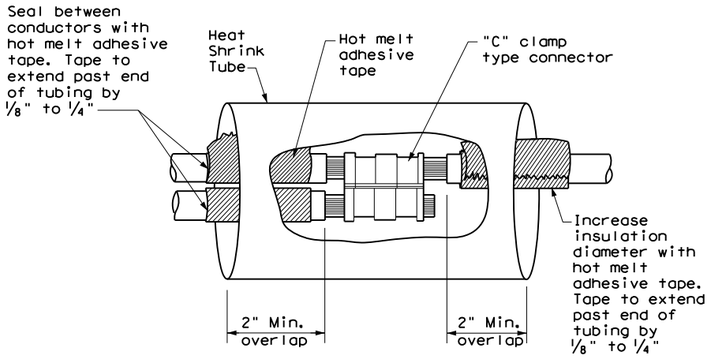
3. Install ground rods so the imprinted part number is at the upper end of the rod.

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

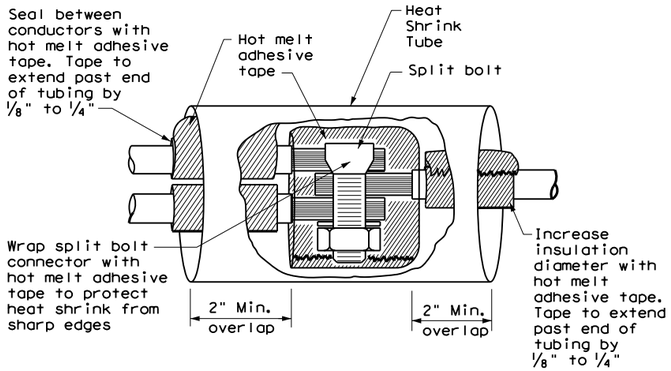
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

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

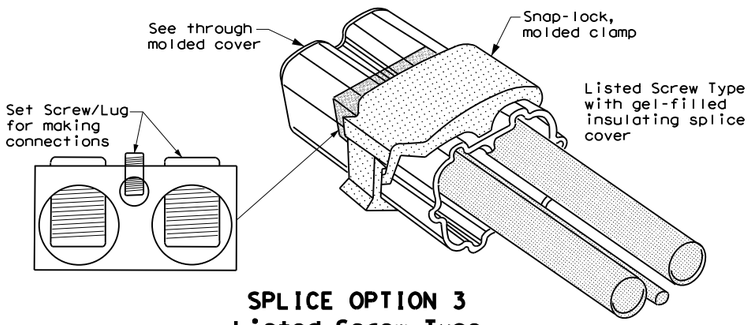
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

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ELECTRICAL DETAILS CONDUCTORS

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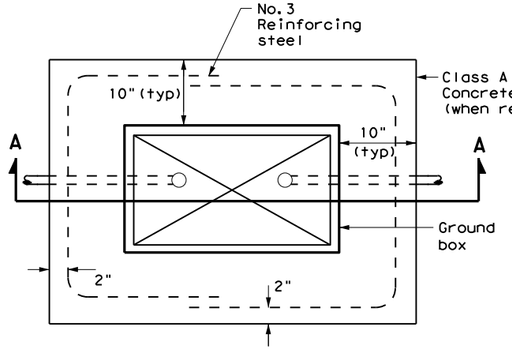
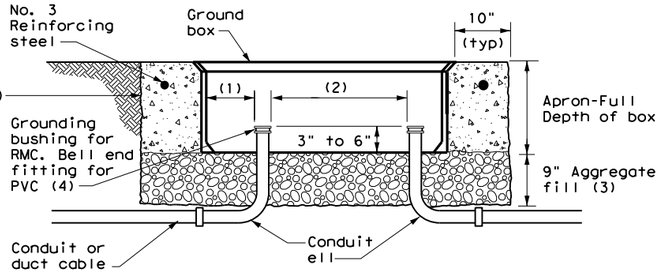


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

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

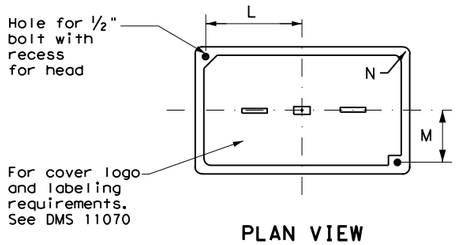
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

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

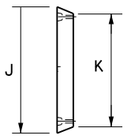
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

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

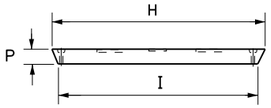
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



END



SIDE

GROUND BOX COVER

GROUND BOXES

A. MATERIALS

1. Provide polymer concrete ground boxes measuring 16x30x24 in. (WxLxD) or smaller in accordance with Departmental Material Specification (DMS) 11070 "Ground Boxes" and Item 624 "Ground Boxes."

2. Provide Type A, B, C, D, and E ground boxes as shown in the plans, and as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 624.

3. Ensure ground box cover is correctly labeled in accordance with DMS 11070.

4. Provide larger ground boxes in accordance with Item 624 and as shown in the plans.

B. CONSTRUCTION METHODS

1. Remove all gravel and dirt from conduit. Cap all conduits prior to placing aggregate and setting ground box. Provide Grade 3 or 4 coarse aggregate as shown on Table 2 of Item 302 "Aggregates for Surface Treatments." Ensure aggregate bed is in place and at least 9 inches deep, prior to setting the ground box. Install ground box on top of aggregate.

2. Cast ground box aprons in place. Reinforcing steel may be field bent. Ensure the depth of concrete for the apron extends from finished grade to the top of the aggregate bed under the box. Ground box aprons, including concrete and reinforcing steel, are subsidiary to ground boxes when called for by descriptive code.

3. Keep bolt holes in the box clear of dirt. Bolt covers down when not working in ground boxes.

4. Install all conduits and ells in a neat and workmanlike manner. Uniformly space conduits so grounding bushings and bell end fittings can easily be installed.

5. Temporarily seal all conduits in the ground box until conductors are installed.

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

7. When a ground rod is present in a ground box, bond all equipment grounding conductors together and to the ground rod with listed connectors.

8. When a type B or D ground box is stacked to meet volume requirements, it is allowable to cut an appropriately sized hole for conduit entry in the side wall at least 18 inches below grade.

9. If an existing ground box in the contract has a metal cover, bond the cover to the equipment grounding conductor with a 3 ft. long stranded bonding jumper the same size as the grounding conductor. The bonding jumper is subsidiary to various bid items. Verify existing ground boxes with metal covers are shown on the plans, with notes fully describing the work required.

10. If other ground boxes with metal covers are within the project limits but are not part of the contract, the Engineer may direct the Contractor to bond the metal covers, identifying the specific boxes in writing. This work will be paid for separately.

11. Bond metal ground box covers to the grounding conductor with a tank ground type lug.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS
GROUND BOXES

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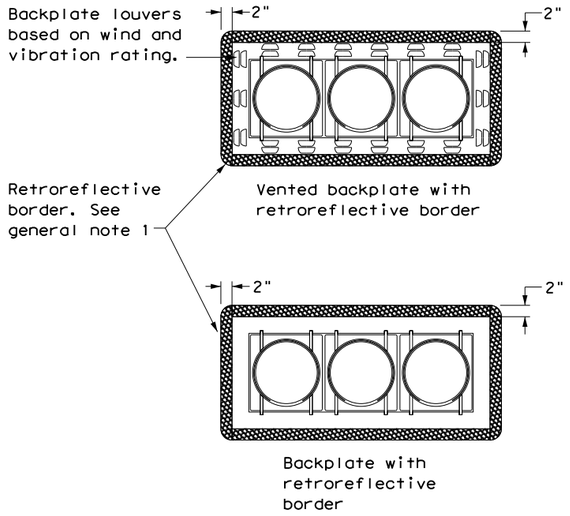
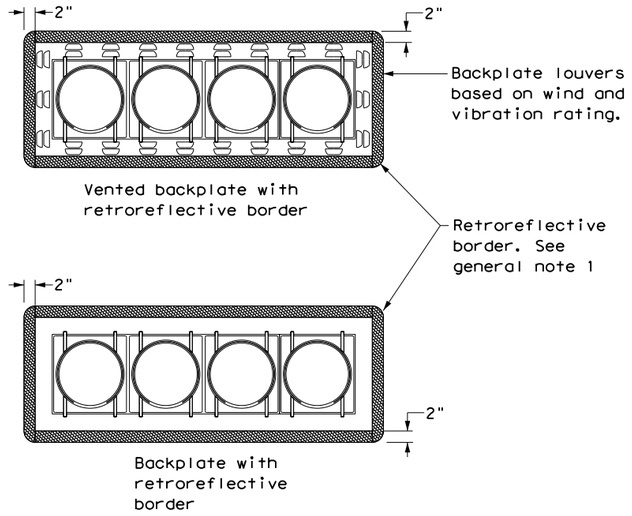


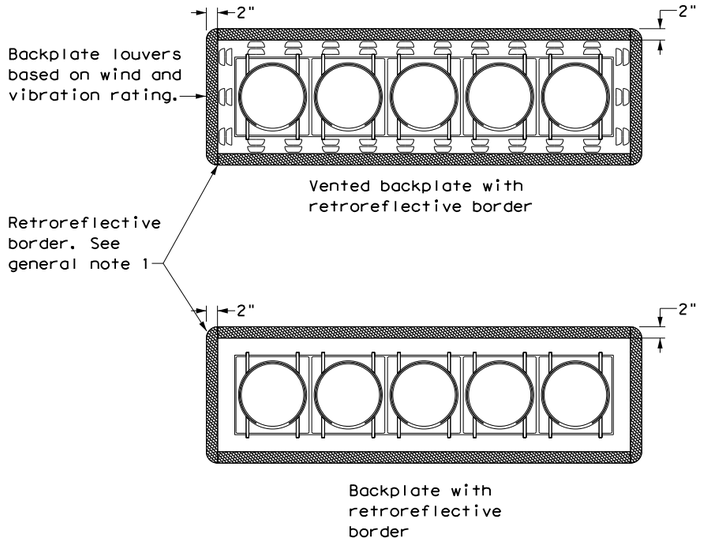
THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



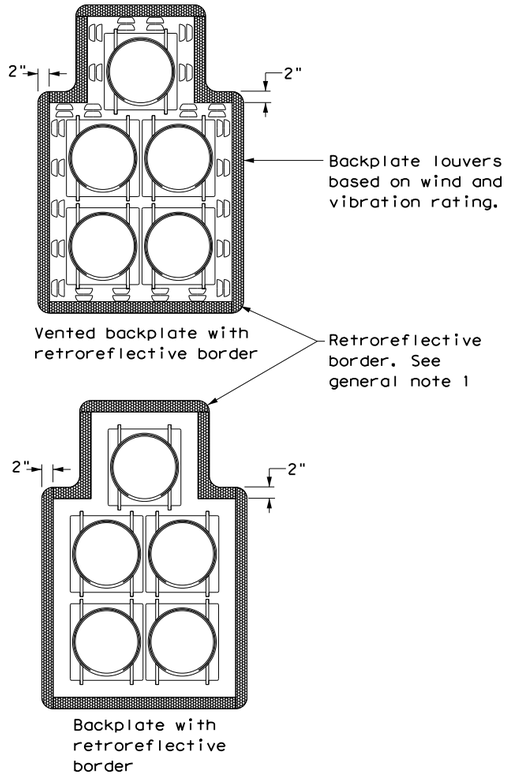
FOUR-SECTION HEAD
HORIZONTAL OR VERTICAL

GENERAL NOTES:

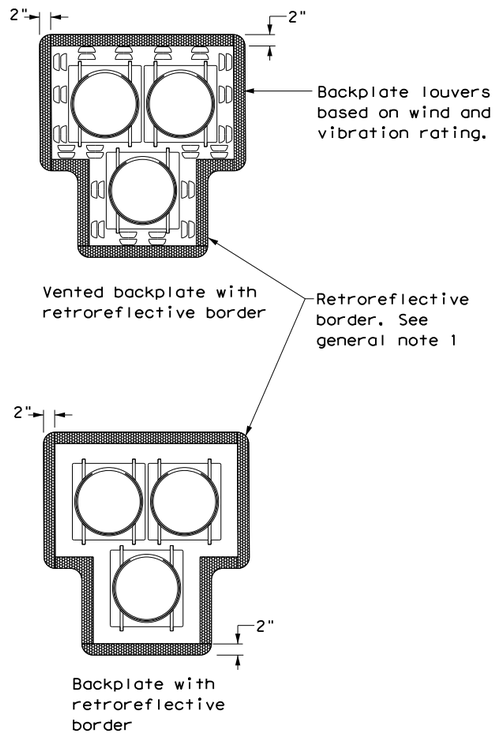
1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons



FIVE-SECTION HEAD
HORIZONTAL OR VERTICAL



FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE
TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT June 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		177

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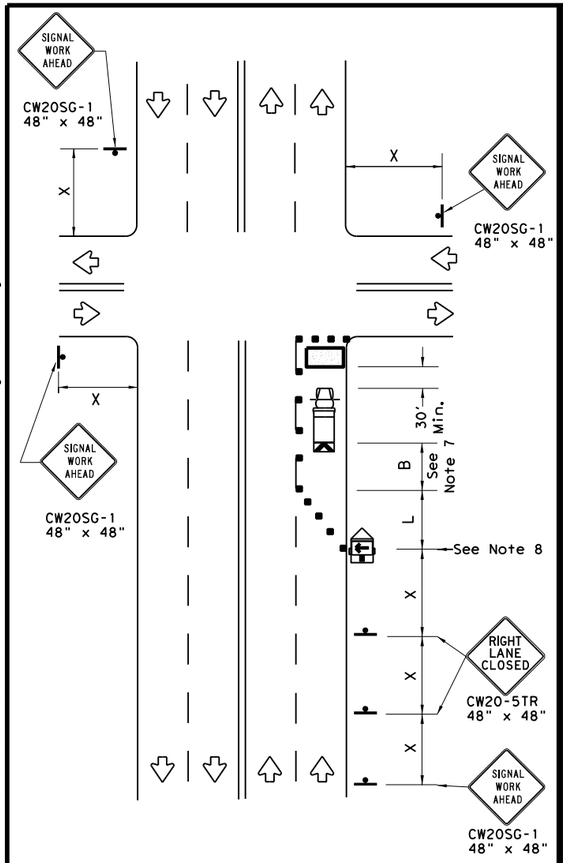
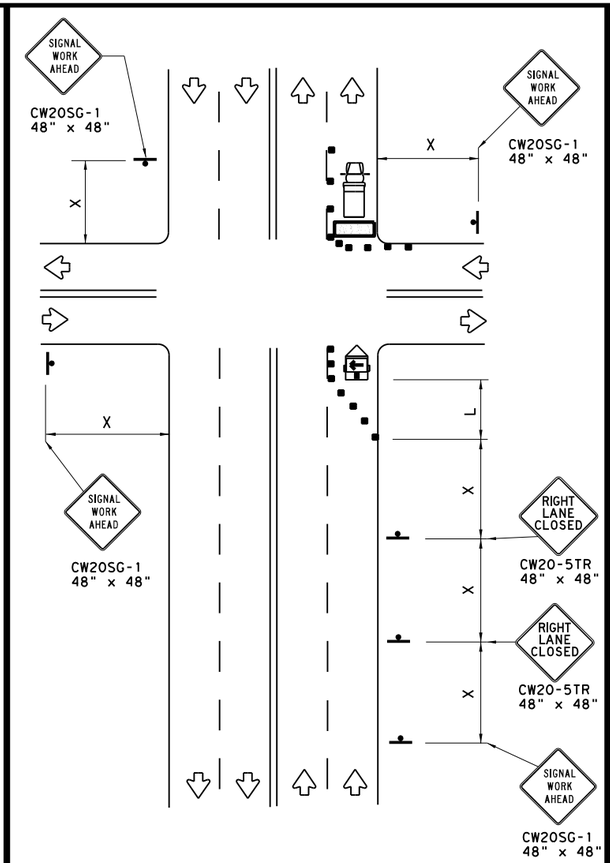


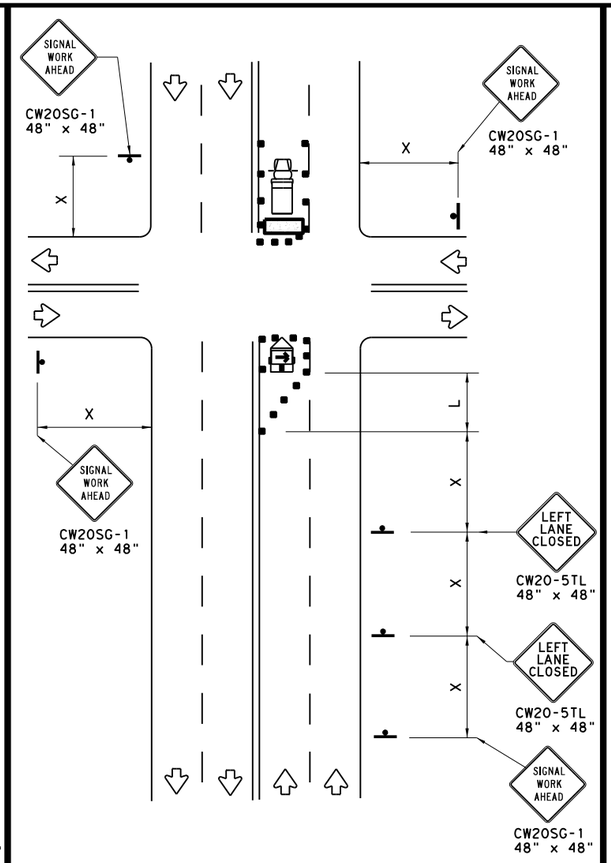
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE RIGHT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY

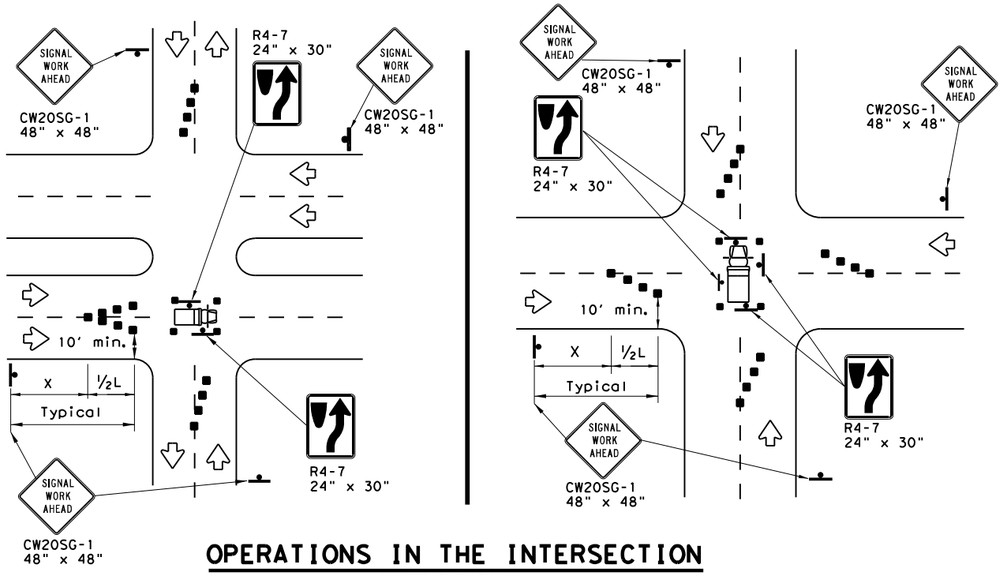
LEGEND			
	Type 3 Barricade		Channelizing Devices
	Heavy Work Vehicle		Truck Mounted Attenuator (TMA)
	Trailer Mounted Flashing Arrow Board	M	Portable Changeable Message Sign (PCMS)
	Sign		Traffic Flow
	Flag		Flagger

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

* Conventional Roads Only

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

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



OPERATIONS IN THE INTERSECTION

SHORT DURATION

GENERAL NOTES

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

Texas Department of Transportation | Traffic Operations Division Standard

TRAFFIC SIGNAL WORK TYPICAL DETAILS

WZ(BTS-1)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	0111	09	044, ETC	BS 288B
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	HOU	BRAZORIA		178

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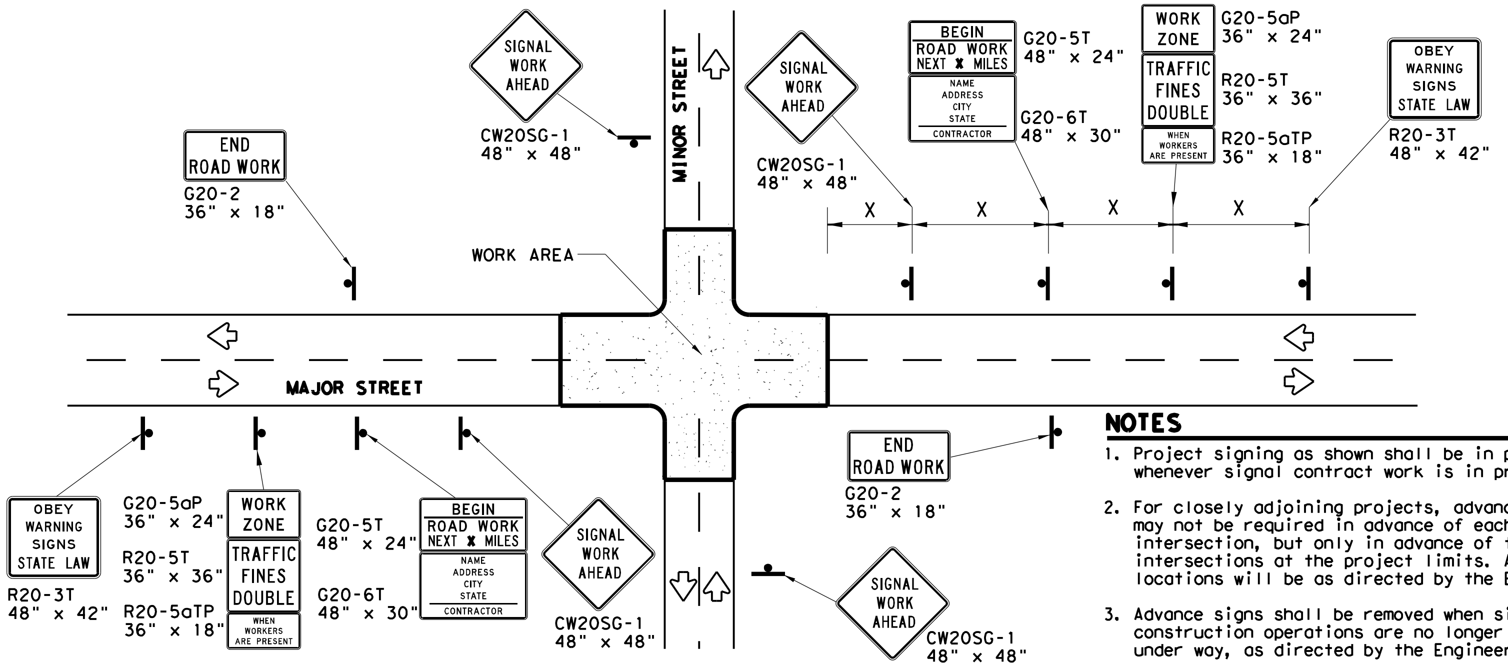


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS

NOTES

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

GENERAL NOTES FOR WORK ZONE SIGNS

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

DURATION OF WORK

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

SIGN MOUNTING HEIGHT

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

REMOVING OR COVERING

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

REFLECTIVE SHEETING

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

SIGN SUPPORT WEIGHTS

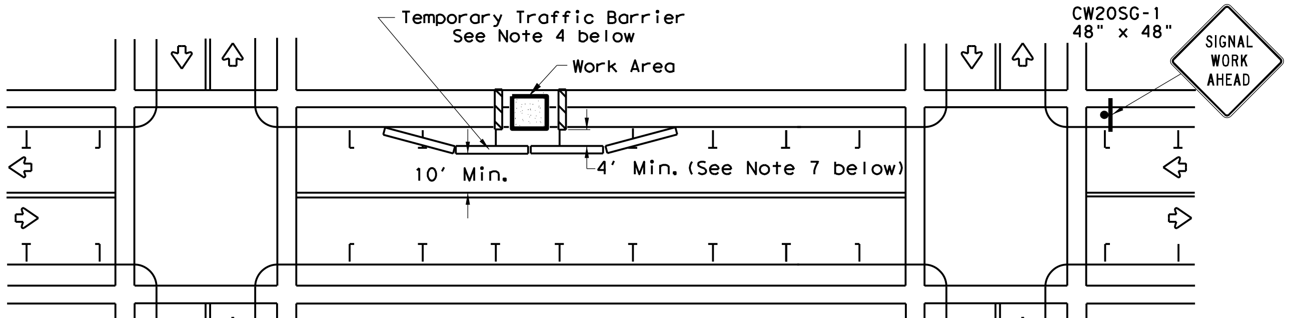
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support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

LEGEND	
┷	Sign
■ ■	Channelizing Devices
▨	Type 3 Barricade

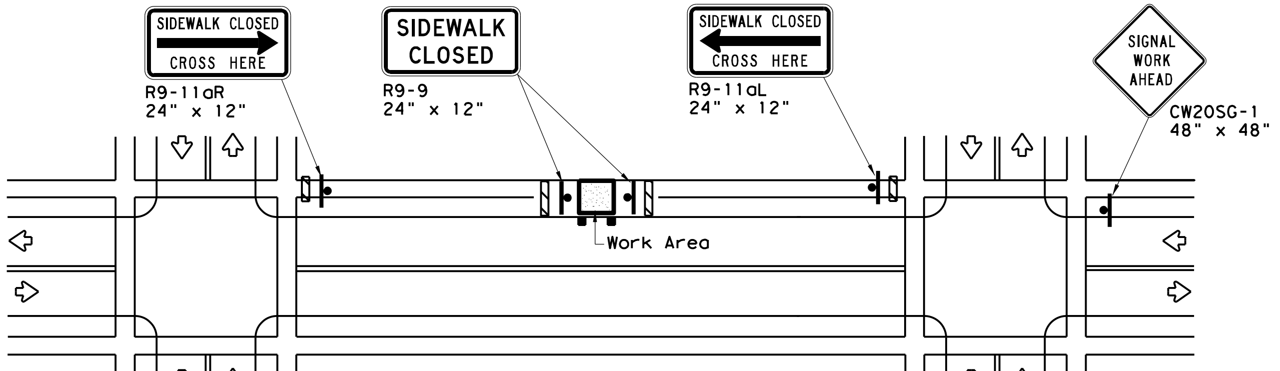
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

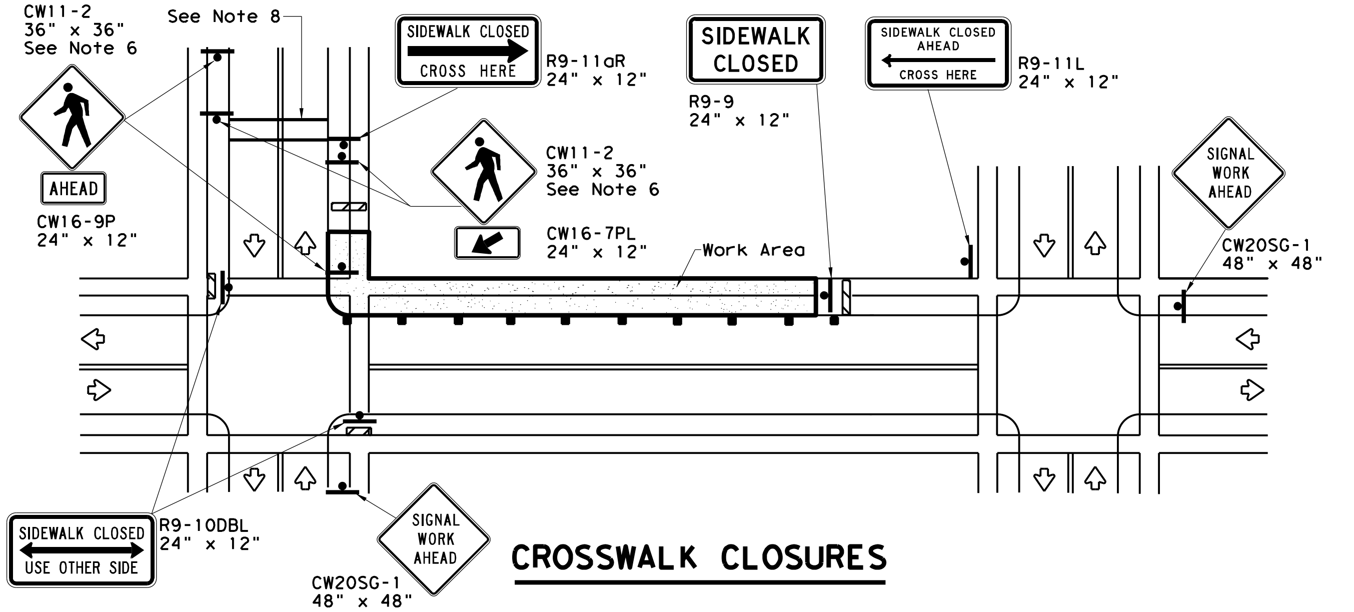
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



SIDEWALK DIVERSION



SIDEWALK DETOUR



CROSSWALK CLOSURES

PEDESTRIAN CONTROL

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

SHEET 2 OF 2

Texas Department of Transportation
Traffic Operations Division Standard

TRAFFIC SIGNAL WORK BARRICADES AND SIGNS

WZ(BTS-2)-13

FILE: wzbts-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS 2-98 10-99 7-13 4-98 3-03	0111	09	044, ETC	BS 288B
	DIST	COUNTY		SHEET NO.
	HOU	BRAZORIA		179

115

SITE DESCRIPTION

PROJECT LIMITS: FROM SH 35 TO FM 523, ETC.

PROJECT DESCRIPTION: PAVEMENT REPAIR, SEAL COAT, ACP OVERLAY AND PAVEMENT MARKINGS

MAJOR SOIL DISTURBING ACTIVITIES: NONE.

TOTAL PROJECT AREA: 36.34 ACRES

TOTAL AREA TO BE DISTURBED: 0.00 ACRES

WEIGHTED RUNOFF COEFFICIENT:
(AFTER CONSTRUCTION): NO CHANGE

EXISTING CONDITION OF SOIL & VEGETATIVE
COVER AND % OF EXISTING VEGETATIVE COVER: 95% COVERAGE

NAME OF RECEIVING WATERS: VARIOUS SIDE ROAD DITCHES CARRY WATER TO VARIOUS OUTFALLS TO THE GULF OF MEXICO (2442)

EROSION AND SEDIMENT CONTROLS

SOIL STABILIZATION PRACTICES:

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

OTHER: N/A

STRUCTURAL PRACTICES:

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

OTHER: N/A

NARRATIVE - SEQUENCE OF CONSTRUCTION (STORM WATER MANAGEMENT) ACTIVITIES: ____

N/A

STORM WATER MANAGEMENT: ANY DEVICES REQUIRED TO MINIMIZE RUNOFF IN THE EVENT OF A STORM WILL BE PLACED IN POSITION BEFORE CONSTRUCTION BEGINS. THE STORM WATER DRAINAGE WILL BE PROVIDED BY THE EXISTING SYSTEMS ALREADY IN PLACE. WATER WITHIN THE RIGHT OF WAY WILL BE CARRIED BY DITCHES WHERE IT WILL OUTFALL INTO THE RECEIVING WATERS.

THERE WILL BE NO DEVICES INSTALLED DURING THE CONSTRUCTION PROCESS TO CONTROL STORM WATER DISCHARGES THAT WILL REMAIN AFTER CONSRUCTION OPERATIONS HAVE BEEN COMPLETED.

OTHER EROSION AND SEDIMENT CONTROLS:

MAINTENANCE: All erosion and sediment controls will be maintained in good working order. If a repair is necessary it will be done at the earliest date possible, but no later than 7 calendar days after the surrounding exposed ground has dried sufficiently to prevent further damage from heavy equipment. The area adjacent to creeks and drainageways shall have priority followed by devices protecting storm sewer inlets.

INSPECTION: All inspections will be performed by a TxDOT inspector per one of the options below as directed by the Area Engineer.
1. At least every 7 calendar days
2. At least every 14 days or after 0.5 inches or more of rainfall
An inspection and maintenance report should be made for each inspection. Based on the inspection results, the controls shall be revised according to the inspection report.

WASTE MATERIALS: The dumpster used to store all waste material will meet all state and local city solid waste management regulations. All trash and construction debris will be deposited in the dumpster. The dumpster will be emptied as necessary or as required by local regulation and the trash will be hauled to a local dump. No construction waste material will be buried on site.

HAZARDOUS WASTE (INCLUDING SPILL REPORTING): In the event of a spill which may be considered hazardous, the Houston District Safety Office shall be contacted immediately at 713-802-5962.

SANITARY WASTE: All Sanitary Waste will be collected from the portable units as necessary or as required by local regulations by a licensed sanitary waste management contractor.

OFFSITE VEHICLE TRACKING:

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

OTHER: ____

REMARKS: Disposal areas, stockpiles, and haul roads shall be constructed in a manner that will minimize and control the sediment that may enter receiving waterways. Disposal areas shall not be located in any waterway, waterbody or streambed. Construction staging areas and vehicle maintenance areas shall be constructed by the Contractor in a manner which minimizes the runoff of all pollutants. All waterways shall be cleared as soon as practical of temporary embankments, temporary bridges, matting, falsework, piling, debris, and other obstructions placed during construction operations that are not part of the finished work.

STATE OF TEXAS
EUGENE AMPOMAH
126289
LICENSED
PROFESSIONAL ENGINEER

Eugene Ampomah, P.E.

01.26.2022

Texas Department of Transportation
Houston District

TxDOT STORM WATER POLLUTION PREVENTION PLAN

SWP3

	DN: TxDot	CK: TxDot	DW: TxDot	CK: TxDot
© TxDOT JANUARY 2007	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6	111-9-44	180
9/2010 INSPECTION NOTE	COUNTY		CONTROL SECT JOB	HIGHWAY
9/2013 INSPECTION NOTE				
11/2013 SW3P TO SWP3				
03/2015 2014 SPECS	CSJ		0111 09044, ETC	BS 288B

1/26/2022
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I. STORMWATER POLLUTION PREVENTION

Texas Pollutant Discharge Elimination System (TPDES) TXR 150000: Stormwater Discharge Permit or Construction General Permit is 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. Refer to Storm Water Pollution Prevention Plan (SWP3) Houston District standard plan.

No Additional Comments

II. WORK IN OR NEAR STREAMS, WATERBODIES AND WETLANDS

United States Army Corps of Engineers (USACE) Permit is required for filling, dredging, excavating or other work in water bodies, rivers, creeks, streams, wetlands or wet areas. The Contractor must adhere to all of the terms and general conditions associated with the following permit(s). If additional work not represented in the plans is required, contact the Engineer immediately.

☒ No United States Army Corps (USACE) Permit Required

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Nationwide Permit (NWP) without a Pre-Construction Notification (PCN). Project specific permit was not issued by USACE, therefore is not in the plan set. The USACE general conditions are in the "General Notes."

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Nationwide Permit (NWP) with a Pre-Construction Notification (PCN). The project specific permit issued by the United States Army Corps of Engineers (USACE) is included in the plan set. The USACE general conditions are in the "General Notes."

☐ Work is authorized by the United States Army Corps of Engineers (USACE) under a Individual Permit (IP). The project specific permit issued by the United States Army Corps of Engineers (USACE) is included in the plan set.

☐ Work would be authorized by the United States Army Corps of Engineers (USACE) permit. The project specific permit issued by the USACE will be provided to the contractor.

United States Coast Guard (USCG) Permit is required for projects that involve the construction or modification (including changes to lighting) of a bridge or causeway across a water body determined to be navigable by the United States Coast Guard (USCG) under Section 9 of the Rivers and Harbors Act. If additional work not represented in the plans is required, contact the Engineer immediately.

☒ No United States Coast Guard (USCG) Coordination Required

☐ United States Coast Guard (USCG) Permit

☐ United States Coast Guard (USCG) Exemption

No Additional Comments

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 area and contact the Engineer immediately.

No Additional Comments

IV. VEGETATION RESOURCES

Preserve native vegetation to the extent practical. Refer to TxDOT Standard Specifications in order to comply with requirements for invasive species, beneficial landscaping and tree/brush removal.

No Additional Comments

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

If any of the listed species below are observed, cease work in the area, do not disturb species or habitat and contact the Engineer immediately.

The work may not remove active nests (from bridges, structures, or vegetation adjacent to the roadway, etc.) during nesting season (February 15 to October 1). If removal of structures or vegetation is necessary during the nesting season, the Contractor shall conduct a bird survey no more than 3 days in advance of the clearing/demolish start date. All bird surveys shall be conducted by a Field Biologist and adhere to the guidance document "Avoiding Migratory Birds and Handling Potential Violations" found in the TxDOT Environmental Compliance Toolkits at the time of the survey. (See below for Field Biologist and Ornithologist qualifications)

No Additional Comments

Field Biologist, Ornithologist – a field biologist is defined as an individual qualified to perform field investigations, presence/absence surveys and habitat surveys for protected avian species or species of concern. A mandatory bachelor's degree in biology or a related science is required. At a minimum, the Field Biologist, Ornithologist, shall have completed and reported a minimum of three presence/absence and habitat surveys for protected avian species in the past five years. A minimum of three projects must have been conducted in Texas. Surveys shall have been performed for documentation of species in accordance with a protocol approved by USFWS or TPWD, or following generally accepted methodologies.

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

Refer to TxDOT Standard Specifications in the event potentially contaminated materials are observed, such as dead or distressed vegetation, trash disposal areas, drums, canisters, barrels, leaching or seepage of substances, unusual smells or odors, or stained soil, cease work in the area and contact the Engineer immediately.

No Additional Comments

VII. OTHER ENVIRONMENTAL ISSUES

Comments:

DATE: Feb 01, 2022
FILE:

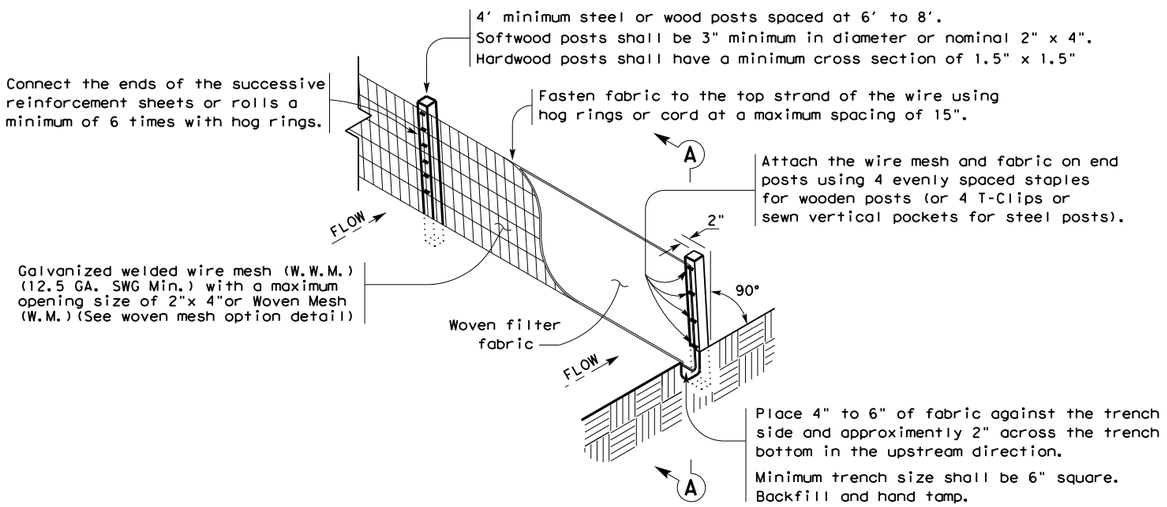
Version 2.1

Texas Department of Transportation | TxDOT Houston District

ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: EPIC Sheet.dgn	DN:	CK:	DW:	CK:
© TxDOT: March 2017	CONT	SECT	JOB	HIGHWAY
REVISIONS	0111	09	044.ETC	BS 288B
UPDATED section V. text and added definition (10/17) ADDED USCG and USACE notes in Section VII 04/18)	DIST	COUNTY		SHEET NO.
	HOU	Brazoria		181



TEMPORARY SEDIMENT CONTROL FENCE

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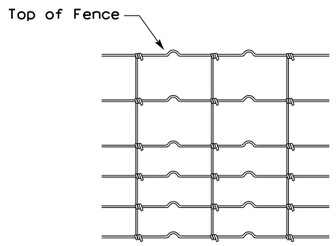
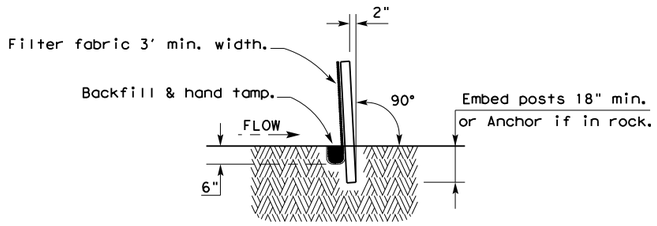




SECTION A-A

HINGE JOINT KNOT WOVEN MESH (OPTION) DETAIL

Galvanized hinge joint knot woven mesh (12.5 GA.SWG Min.) requires a minimum of five horizontal wires spaced at a maximum of 12 inches apart and all vertical wires spaced at a maximum of 12 inches apart.

SEDIMENT CONTROL FENCE USAGE GUIDELINES

A sediment control fence may be constructed near the downstream perimeter of a disturbed area along a contour to intercept sediment from overland runoff. A 2 year storm frequency may be used to calculate the flow rate to be filtered.

Sediment control fence should be sized to filter a maximum flow through rate of 100 GPM/FT^2. Sediment control fence is not recommended to control erosion from a drainage area larger than 2 acres.

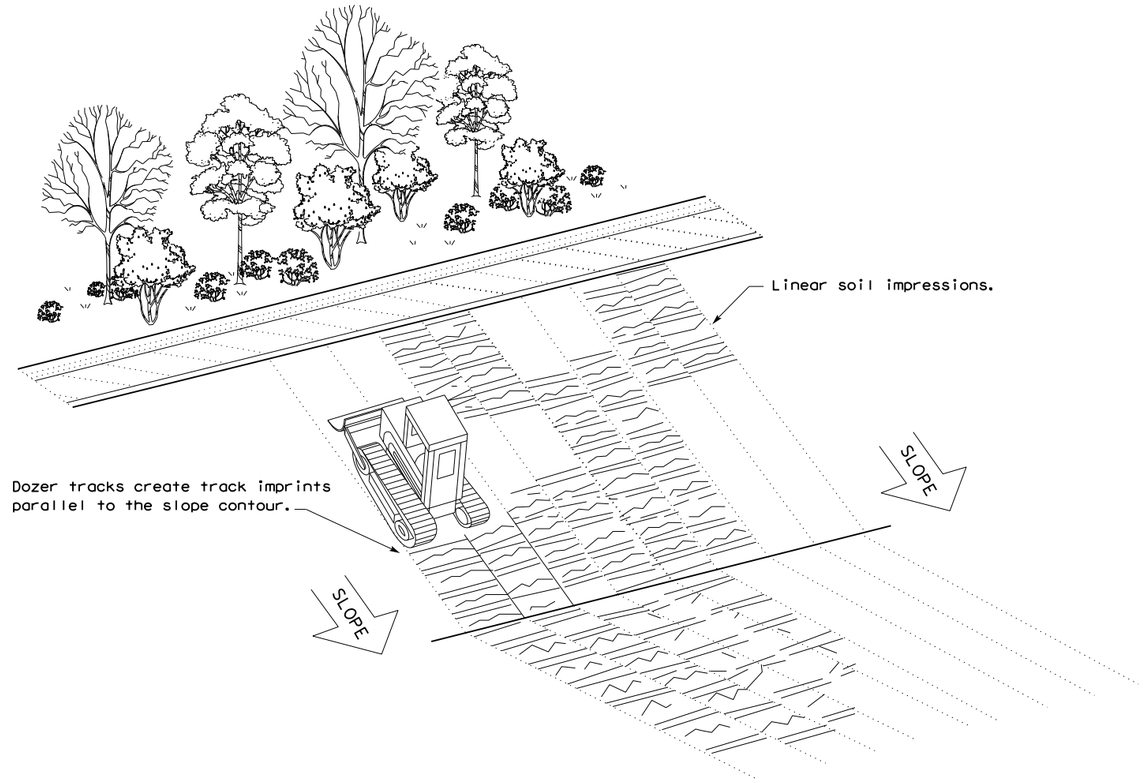
LEGEND

Sediment Control Fence

SCF

GENERAL NOTES

1. Vertical tracking is required on projects where soil distributing activities have occurred unless otherwise approved.
2. Perform vertical tracking on slopes to temporarily stabilize soil.
3. Provide equipment with a track undercarriage capable of producing linear soil impressions measuring a minimum of 12" in length by 2" to 4" in width by 1/2" to 2" in depth.
4. Do not exceed 12" between track impressions.
5. Install continous linear track impressions where the minimum 12" length impressions are perpendicular to the slope or direction of water flow.



VERTICAL TRACKING

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

FENCE & VERTICAL TRACKING

EC(1)-16

FILE: ec116	DN: TxDOT		CK: KM		DW: VP		DN/CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
REVISIONS	0111	09	044,ETC		BS 288B		
	DIST	COUNTY					SHEET NO.
	HOU	BRAZORIA					182

DATE: 2022
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TYPE OF WORK — ITEMS AND REQUIREMENTS FOR EACH TYPE OF WORK

SODDING	PERMANENT SEEDING	TEMPORARY SEEDING	Reference Item 161, 162, 164, 166, 168 of the Texas Standard Specifications for Construction and Maintenance of Highways, Streets and Bridges 2014 for specifications, dimensions, volumes and measurements that are not shown. Use latest Houston District, Special Provisions for those items indicated.		
	✓		**161-6017 COMPOST MANUF TOPSOIL (BIP)(4") SY**	APPLICATION RATE Item 161.2.1. Compost Manufactured Topsoil (CMT)	Item 161.2. Materials. Submit quality control (QC) documentation to the Engineer. Compost producer's STA certification must be dated to meet STA requirements (certification must be within 30 or 90 days per STA requirements). Lab analysis performed by an STA-certified lab must be dated within 30 days before delivery of the compost.
✓			**162-6002 BLOCK SODDING SY**	GRASS SPECIES Item 162.2. Materials. Common Bermuda (Cynodon Dactylon)	Item 162.2.1. Block Sod. Use block palletized or roll type sod. **REMOVE PLASTIC BACKING FROM ROLL TYPE SOD.** Place sod within 48 hours of delivery to site. No exceptions. Place sod with joints alternating on each row to prevent continuous joint lines. Peg sod as needed with wood pegs to hold sod in place. Pegging sod is subsidiary to Item 162.
	✓		**164-6066 DRILL SEEDING(PERM)(WARM OR COOL) SY** Item 164.1. Description Provide and install seeding as shown on District Standard	PLANTING MONTH / SEED MIX March, April, May, June, July, August, September, October: Hulled - Bermudagrass (Cynodon dactylon) - 40.0 lbs PLS/acre; Foxtail Millet (Setaria italica) - 34.0 lbs PLS/acre; Green Sprangletop (Leptochloa dubia) - 4.0 lbs PLS/acre; Sideoats Grama (Bouteloua curtipendula) - 3.2 lbs PLS/acre; Little Bluestem (Schizachyrium scoparium) - 1.4 lbs PLS/acre November, December, January, February: Unhulled - Bermudagrass (Cynodon dactylon) - 40.0 lbs PLS/acre; Oats (Avena sativa) - 72.0 lbs PLS/acre; Green Sprangletop (Leptochloa dubia) - 4.0 lbs PLS/acre; Sideoats Grama (Bouteloua curtipendula) - 3.2 lbs PLS/acre; Little Bluestem (Schizachyrium scoparium) - 1.4 lbs PLS/acre	PLS (Pure Live Seed) Provide documentation of PLS requirements per Item 164.2.1. CONSTRUCTION. Cultivate the area to a depth of 4 inches before placing the seed unless otherwise directed. When performing permanent seeding after an established temporary seeding, cultivate the seedbed to a depth of 4 inches or mow the area before placement of the permanent seed. Plant the seed and place the straw or hay mulch after the area has been completed to lines and grades as shown on the plans. Drill Seeding. Plant seed or seed mixture uniformly over the area shown on the plans at a depth of 1/4 to 1/3 inch using a cultipacker(turfgrass) type seeder. Plant seed along the contour of the slopes. Use broadcast seeding method where site conditions prevent drill seeding method. Broadcast Seeding. Distribute the dry seed or dry seed mixture uniformly over the areas shown on the plans using hand or mechanical distribution on top of soil.
	✓		**164-6052 BROADCAST SEED(PERM)(SPECIAL MIX) SY** Item 164.1. Description Provide and install seeding as shown on District Standard		
		✓	**164-6051 DRILL SEED(TEMP)(WARM OR COOL) SY** Item 164.1. Description Provide and install seeding as shown on District Standard	PLANTING MONTH / SEED MIX March, April, May, June, July, August, September, October: Foxtail Millet (Setaria italica) - 34.0 lbs PLS/acre November, December, January, February: Oats (Avena sativa - 72.0 lbs PLS/acre	
		✓	**164-6009 BROADCAST SEED(TEMP)(WARM) SY** Item 164.1. Description Provide and install seeding as shown on District Standard		
	✓	✓	**162-6003 STRAW OR HAY MULCH SY**	APPLICATION RATE Immediately after planting the seed or seed mixture, apply straw or hay mulch uniformly over the seeded area. Apply straw or hay mulch at 2 tons per acre. Use tacking agent with straw or hay mulch as described on this sheet.	Use straw or hay mulch in conformance with Article 162.2.5, "Mulch." Use biodegradable tacking agents only applied at a rate in accordance with manufacturer's recommendations. Use the following products or an approved equal(see note this sheet): Conweb/Contac Guar Gum, Profile Products Corporation, (307) 655-9565, Ramtec/Procol/Viscol Guar Gum, Ramtec Corporation, (800) 366-1180
✓	✓	✓	**166-6001 FERTILIZER AC** Item 166.2. Materials Use fertilizer as shown on District Standard	APPLICATION RATE Deliver and evenly distribute fertilizer at a rate of 4000 lbs/acre.	Use a **NON-CHEMICAL** fertilizer which meets all the following criteria: (1) BRAND NAME must be registered with the Texas State Chemist as a commercial fertilizer. (2) Meets USEPA guidelines for unrestricted use. (3) Derived from biological sources such as, but not limited to: sewage sludge, manures, vegetation, etc. (4) In granular form and essentially dust free. Submit proof of registration and nutrient source to Engineer. Use the following products or an approved equal(see note this sheet): Sigma, SIGMA AgriScience, 281-851-6749 Sustanite-standard grade, Automation Nation, Inc., 713-675-4999 Milorganite, MMSD, 800-287-9645 Agricultural Organic P/L, Ag Org, INC., 713-523-4396
✓	✓	✓	**168-6001 VEGETATIVE WATERING MG**	APPLICATION RATE Item 168.3 Construction. 6000 gallons/acre per working day x 20 consecutive working days = 120,000 gallons total/acre	Begin watering immediately after installation of seed or sod. Replace, fertilize, and water any seed or sod in poor condition due to the failure to apply the specified amount of water within the time allowed at no expense to the Department.

SEQUENCE OF WORK

BLOCK SOD	PERMANENT SEEDING	TEMPORARY SEEDING
1. FERTILIZER 2. CULTIVATE SOIL (ITEM 162.3) 3. SOD 4. VEGETATIVE WATERING	1. FERTILIZER 2. COMPOST MANUFACTURED TOPSOIL 3. CULTIVATE SOIL (ITEMS 164.3 AND 161.3.1) 4. PERMANENT SEEDING 5. STRAW OR HAY MULCH 6. VEGETATIVE WATERING	1. FERTILIZER 2. CULTIVATE SOIL (PER ITEM 164.3) 3. TEMPORARY SEEDING 4. STRAW OR HAY MULCH 5. VEGETATIVE WATERING

Texas Department of Transportation

HOUSTON DISTRICT

FERTILIZER, SEED, SOD, STRAW, COMPOST, AND WATER

SHEET 1 OF 1

REVISIONS	FILE:	FED DIV	STATE	PROJECT NUMBER			SHEET
10/2014 UPDATED TO 2014 SPECS 3/2015 MINOR CORRECTIONS	OCT 2014	6	TEXAS	111-9-44			183
	ORIGINAL:	DIST	COUNTY	CONTROL	SECT	JOB	HIGHWAY
		12	BRAZORIA	0111	09	044,ETC	BS 288B

STD K-1