STATE OF TEXAS
DEPARTMENT OF TRANSPORTATION

PLANS OF PROPOSED
STATE HIGHWAY IMPROVEMENT

STATE PROJECT OR FEDERAL-AID PROJECT STP 2B24(404)VRUG

HULEN ST., ETC.

TARRANT COUNTY

FEDERAL AID PROJECT NO.			
STP 2B24(404)VRUG			
CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC.	HULEN ST
DIST	COUNTY		SHEET NO.
FTW	TARRANT		1

HULEN STREET AT SOUTH DRIVE
FUNCTIONAL CLASS: URBAN COLLECTOR
DESIGN SPEED: 40 MPH
AADT 2014: 35,433

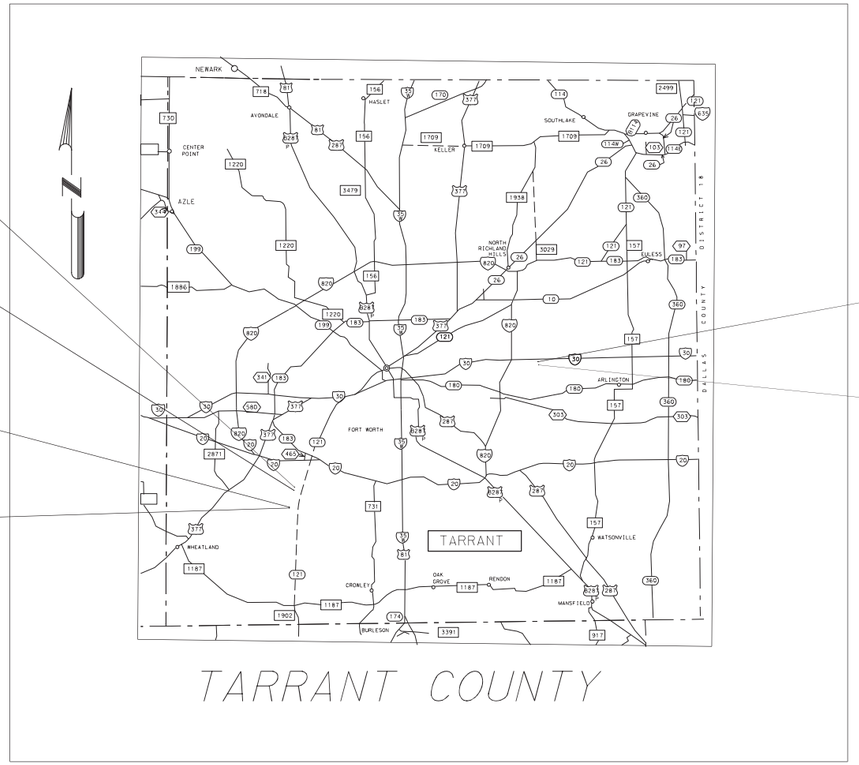
COOKS LANE AT BRENTWOOD STAIR ROAD
FUNCTIONAL CLASS: URBAN COLLECTOR
DESIGN SPEED: 40 MPH
AADT 2019: 8,376

HULEN STREET AT OAKMONT BOULEVARD
FUNCTIONAL CLASS: URBAN COLLECTOR
DESIGN SPEED: 40 MPH
AADT 2019: 33,173

CSJ	HWY	LIMITS	ROADWAY LENGTH		PROJECT LENGTH	
			FEET	MILES	FEET	MILES
0902-90-207	HULEN ST	HULEN ST AT SOUTH DR W	625.01	0.118	625.01	0.118
0902-90-209	COOKS LN	COOKS LN AT BRENTWOOD STAIR ROAD	596.01	0.113	596.01	0.113
0902-90-212	HULEN ST	HULEN ST AT OAKMONT BLVD	269.00	0.051	269.00	0.051

TOTAL PROJECT LENGTH = 0.282 MILES

FOR THE CONSTRUCTION OF INTERSECTION AND OPERATIONAL IMPROVEMENT PROJECT
CONSISTING OF: ROADWAY, SIDEWALK, PAVEMENT MARKINGS, AND TRAFFIC SIGNAL IMPROVEMENTS



TARRANT COUNTY

END PROJECT
END CSJ 0902-90-207
STA 17+67.76

BEGIN PROJECT
BEGIN CSJ 0902-90-207
STA 11+42.75

END PROJECT
END CSJ 0902-90-212
STA 14+34.00

BEGIN PROJECT
BEGIN CSJ 0902-90-212
STA 11+65.00

END PROJECT
END CSJ 0902-90-209
STA 13+74.11

BEGIN PROJECT
BEGIN CSJ 0902-90-209
STA 13+78.01

REGISTERED ACCESSIBILITY SPECIALIST (RAS) INSPECTION REQUIRED.
TDLR NO. EABPR.: TABS2024018266

LETTING DATE:
CONTRACTOR:
WORK BEGAN:
WORK COMPLETED:
WORK ACCEPTED:
CHANGE ORDERS:

halff

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED PROFESSIONAL ENGINEER
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #230

STATE OF TEXAS
CHRISTOPHER M. HARTKE
112377
LICENSED PROFESSIONAL ENGINEER
Christopher Hartke
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #230

REQUIRED SIGNS SHALL BE IN ACCORDANCE WITH BC (1)- 21 THRU BC (12)- 21 AND THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".

SPECIFICATIONS ADOPTED BY THE TEXAS DEPARTMENT OF TRANSPORTATION, NOVEMBER 1, 2014 AND SPECIFICATION ITEMS LISTED AND DATED AS FOLLOWS, SHALL GOVERN ON THIS PROJECT:
REQUIRED CONTRACT PROVISIONS, FEDERAL-AID CONSTRUCTION CONTRACTS (FORM FHWA 1273, OCTOBER, 2023)

FILE NO.: X-27891, X-27889, X-27890, X-3139, X-3137, X-3138
CITY PROJECT NO.: 104095, 104035, 104039

EQUATIONS : NONE
RAILROAD : NONE
EXCEPTIONS : NONE
TDLR REQUIRED

FINAL
100% SUBMITTAL

MICHAEL OWEN,
CITY OF FORT WORTH CITY ENGINEER

CHAD ALLEN,
CITY OF FORT WORTH PROGRAM MANAGER

Texas Department of Transportation

SUBMITTED FOR LETTING:
DocuSigned by: Maribel Rangel
AREA ENGINEER
E0D25AC6252D429...

RECOMMENDED FOR LETTING: 5/20/2024
DocuSigned by:
DIRECTOR, TP&D
7879B0B92E5D403...

APPROVED FOR LETTING: 5/20/2024
DocuSigned by: David M Salazar, P.E.
DISTRICT ENGINEER
B741E64FAD82411...

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SHEET NO.		DESCRIPTION
I. GENERAL		
1		TITLE SHEET
2 - 3		INDEX OF SHEETS
4		PROJECT LAYOUT AND SURVEY CONTROL - HULEN STREET AT SOUTH DRIVE WEST
5		PROJECT LAYOUT AND SURVEY CONTROL - HULEN STREET AT OAKMONT BOULEVARD
6		PROJECT LAYOUT AND SURVEY CONTROL - COOKS LANE AT BRENTWOOD STAIR ROAD
7		EXISTING TYPICAL SECTIONS - HULEN STREET AT SOUTH DRIVE WEST
8		PROPOSED TYPICAL SECTIONS - HULEN STREET AT SOUTH DRIVE WEST
9 - 10		TYPICAL SECTIONS - HULEN STREET AT OAKMONT BOULEVARD
11		EXISTING AND PROPOSED TYPICAL SECTIONS - COOKS LANE AT BRENTWOOD STAIR ROAD
12 - 14		EXISTING UTILITY LAYOUT - HULEN STREET AT SOUTH DRIVE WEST
15		WATER LINE LAYOUT - HULEN STREET AT SOUTH DRIVE WEST
16		SANITARY SEWER LAYOUT - HULEN STREET AT SOUTH DRIVE WEST
17 - 18		EXISTING UTILITY PLANS - HULEN STREET AT OAKMONT BOULEVARD
19		EXISTING UTILITY LAYOUT - COOKS LANE AT BRENTWOOD STAIR ROAD
20		GENERAL NOTES
21		ESTIMATE AND QUANTITY SHEET
22 - 24		SUMMARY OF QUANTITIES
II. TRAFFIC CONTROL PLAN		
25		TRAFFIC CONTROL NARRATIVE - HULEN STREET AT SOUTH DRIVE WEST
26		TRAFFIC CONTROL NARRATIVE - HULEN STREET AT OAKMONT BOULEVARD
27		TRAFFIC CONTROL NARRATIVE - COOKS LNAE AT BRENTWOOD STAIR
28		TRAFFIC CONTROL PLAN - ADVANCED WARNING LAYOUT HULEN STREET AT OAKMONT BOULEVARD
		STANDARDS
29 - 40	#*+	BC(1)-21 THRU BC(12)-21
41	#*+	TCP(1-4)-18
42	#	TSR(3)-13
43	#+	TSR(4)-13
44 - 45	#*+	WZ(BTS-1)-13 &WZ(BTS-2)-13
III. ROADWAY		
46		REMOVAL PLAN - HULEN STREET AT SOUTH DRIVE WEST
47		REMOVAL PLAN - HULEN STREET AT OAKMONT BOULEVARD
48		REMOVAL PLAN - COOKS LANE AT BRENTWOOD STAIR ROAD
49		PAVING PLAN - HULEN STREET AT SOUTH DRIVE WEST
50		PAVING PLAN - HULEN STREET AT OAKMONT BOULEVARD
51		PAVING PLAN - COOKS LANE AT BRENTWOOD STAIR ROAD
52		GRADING PLAN - HULEN STREET AT SOUTH DRIVE WEST
53		CURB RAMP GRADING PLAN - HULEN STREET AT SOUTH DRIVE WEST

SHEET NO.		DESCRIPTION
54		SIDEWALK & CURB RAMP LAYOUT - HULEN STREET AT OAKMONT BOULEVARD
55		CURB RAMP GRADING PLAN - COOKS LANE AT BRENTWOOD STAIR ROAD
		STANDARDS
56 - 59	#*+	PED-18 - PEDESTRIAN FACILITIES-CURB RAMPS
60	#*+	CCCG(FTW) - CONCRETE CURB AND CURB AND GUTTER DETAILS
61	#*	CSWD (FW) - CONCRETE SIDEWALK DETAILS
62	#*+	CP-TEP (FTW) - CONCRETE TIES TO EXISTING PAVEMENT
63 - 64	#*	CRCP (1)-23 - CONTINUOUSLY REINFORCED CONCRETE PAVEMENT
65	#	EDGECON - TREATMENT FOR VARIOUS EDGE CONDITIONS
IV. RETAINING WALL		
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V. DRAINAGE		
		NO PLANS IN THIS SECTION
VI. BRIDGES		
		NO PLANS IN THIS SECTION
VII. ILLUMINATION		
66		PROPOSED ILLUMINATION LAYOUT - COOKS LANE AT BRENTWOOD STAIR ROAD
VIII. TRAFFIC ITEMS		
67		SIGNING AND PAVEMENT MARKING LAYOUT - HULEN STREET AT SOUTH DRIVE WEST
68		PROPOSED SIGNAL LAYOUT - HULEN STREET AT SOUTH DRIVE WEST
69 - 72		PROPOSED SIGNAL LAYOUT DETAIL -HULEN STREET AT SOUTH DRIVE WEST
73		SIGNAL PHASING AND CHARTS - HULEN STREET AT SOUTH DRIVE WEST
74		CHANNEL ASSIGNMENT - HULEN STREET AT SOUTH DRIVE WEST

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED
PROFESSIONAL ENGINEER

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

Marie C. Wagner P.E. 4/22/2024
DATE

STATE OF TEXAS
CHRISTOPHER M. HARTKE
112377
LICENSED
PROFESSIONAL ENGINEER
Christopher Hartke

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

Christopher Hartke P.E. 4/22/2024
DATE

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED
PROFESSIONAL ENGINEER

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

P.E. 4/22/2024
DATE

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

FORT WORTH INTERSECTIONS INDEX

SCALE: AS SHOWN SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	2

FTW
WAGNER-4219
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SHEET NO.		DESCRIPTION
VIII. TRAFFIC ITEMS		
75		PAVEMENT MARKING LAYOUT - HULEN STREET AT OAKMONT BOULEVARD
76		SIGNING LAYOUT - HULEN STREET AT OAKMONT BOULEVARD
77		PROPOSED SIGNAL LAYOUT - HULEN STREET AT OAKMONT BOULEVARD
78	81	PROPOSED SIGNAL LAYOUT DETAIL - HULEN STREET AT OAKMONT BOULEVARD
82 -	83	SIGNAL PHASING AND CHARTS - HULEN STREET AT OAKMONT BOULEVARD
84		CHANNEL ASSIGNMENT - HULEN STREET AT OAKMONT BOULEVARD
85		SIGNING AND PAVEMENT MARKING LAYOUT - COOKS LANE AT BRENTWOOD STAIR ROAD
86		PROPOSED SIGNAL LAYOUT - COOKS LANE AT BRENTWOOD STAIR ROAD
87 -	90	PROPOSED SIGNAL LAYOUT DETAIL - COOKS LANE AT BRENTWOOD STAIR ROAD
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93		CHANNEL ASSIGNMENT - COOKS LANE AT BRENTWOOD STAIR ROAD
94		LONG MAST ARM ASSEMBLY PARTS LIST - COOKS LANE AT BRENTWOOD STAIR ROAD
		STANDARDS (TxDOT)
95		SUMMARY OF SMALL SIGNS - HULEN STREET AT SOUTH DRIVE WEST
96 - 103	*+	ED (1, 3, 4, 5, 6, 7, 8, 10)-14 ELECTRICAL DETAILS
104	*+	SMD (GEN)-08 - SIGN MOUNTING DETAILS
105 - 107	*+	SMD (SLIP 1 THRU SLIP 3)-08 - SIGN MOUNTING DETAILS TRIANGULAR SLIP BASE SYSTEM
108	#+	TS-CF-21 - TRAFFIC SIGNAL CONTROLLER FOUNDATION/BASE
109	+	TS-BP-20 TRAFFIC SIGNAL HEAD WITH BACKPLATE
110	#+	MA-DPD-20 - MAST ARM DAMPING PLATE DETAILS
111 - 115	+	LMA(1)-12 - TRAFFIC SIGNAL SUPPORT STRUCTURE LONG MAST ARM ASSEMBLY
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		STANDARDS (CITY)
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123	*	D127 - WATER TRANSMISSION GATE VALVE & VAULT
124	*	D208 - STANDARD SANITARY SEWER MANHOLE
125	#*	D601 - TRAFFIC SIGNAL GROUND BOX DETAILS
126	#+	D602 - TRAFFIC SIGNAL ELECTRICAL SERVICE DETAILS
127	#*	D603 - TRAFFIC SIGNAL PEDESTAL SERVICE DETAIL
128	#*+	D604 - TRAFFIC SIGNAL WIRING CONNECTION DETAILS
129	#*+	D605 - TRAFFIC SIGNAL POLE FOUNDATION DETAILS
130	#+	D605A - SPREAD FOOTING PEDESTAL POLE FOUNDATION
131	#*+	D606 - TRAFFIC SIGNAL TYPE 352i SINGLE GB FOUNDATION DETAIL
132	#*+	D607 - TRAFFIC SIGNAL MISCELLANEOUS DETAILS
133	#*+	D608 - TRAFFIC SIGNAL BACKPLATE DETAILS
134	#*+	D611 - TRAFFIC SIGNAL VIDEO DETECTION DETAILS

SHEET NO.		DESCRIPTION
VIII. TRAFFIC ITEMS		
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135	#*+	D612 - TRAFFIC SIGNAL STRUCTURES 1
136	#*+	D613 - TRAFFIC SINGAL STRUCTURES 2
137	#*+	D620 -TRAFFIC SIGNAL BATTERY BACK UP
138	#*+	D621 - STREET LUMINAIRE POLE AND FIXTURE DETAILS
139	*	D622 - STREET LUMINAIRE POLE FOUNDATION DETAILS
140	*	D624 - STREET LUMINAIRE CONDUIT AND GROUND BOX DETAILS
141 - 143	*	D625 - 120-240V STREET LUMINAIRE PEDESTAL SERVICE DETAIL
144	#*+	D633 - METRO STREET NAME SIGNS
145 - 150	#*+	D642 - TYPICAL PAVEMENT MARKINGS
151	#*	D643 - CROSSWALKS, STOP BARS AND YIELD LINES
152	#*	D645 - PAVEMENT MARKINGS - ARROWS
153	#*	D673 - AUDIBLE PEDSTRIAN PUSHBUTTON STATION (APS) DETAILS
154	#*	D674 - AUDIBLE PEDESTRIAN PUSHBUTTON STATION (APS) DETAILS
155	#	D690 - CLAMP-ON TYPE MAST ARM FOR 8-12 DIA. POLES FOR STREET SIGNS
156	*	H.M.A.C PAVEMENT CONSTRUCTION DETAILS
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159		ENVIRONMENTAL PERMITS & COMMENTS - EPIC
160		SW3P LAYOUT - HULEN STREET AT SOUTH DRIVE WEST
161		SW3P LAYOUT - HULEN STREET AT OAKMONT BOULEVARD
162		PARKS AND RECREATION DEPARTMENT NOTES (CFW)
		STANDARDS
163 - 165	*#	EC(9)-16 - TEMPORARY EROSION, CONTROL MEASURES (EROSION CONTROL LOG)

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

STATE OF TEXAS
CHRISTOPHER M. HARTKE
112377
LICENSED PROFESSIONAL ENGINEER

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED PROFESSIONAL ENGINEER

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

Marie C. Wagner P.E. — 4/22/2024 DATE

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

Christopher Hartke P.E. — 4/22/2024 DATE

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

Jorge Rodriguez P.E. — 4/22/2024 DATE

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

FORT WORTH INTERSECTIONS INDEX

SCALE: AS SHOWN — SHEET 2 OF 2

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	3

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Beginning chain HULEN description
Feature: Geom_Centerline
===========================================================================

Point HULEN1          N    6,929,228.97 E    2,307,267.11 Sta     10+00.00

Course from HULEN1 to HULEN3 N 1° 41' 39" E Dist 502.46

Point HULEN3          N    6,929,731.21 E    2,307,281.97 Sta     15+02.46

Course from HULEN3 to PC HULEN_5 N 1° 44' 09" E Dist 285.28

                              Curve Data
                            *-----------*
Curve HULEN_5
P.I.  Station          19+96.68  N        6,930,225.21  E        2,307,296.75
Delta        =      16° 01' 36"  (RT)
Degree       =       3° 51' 37"
Tangent      =           208.94
Length       =           415.15
Radius       =         1,484.19
External     =            14.64
Long Chord   =           413.80
Mid. Ord.    =            14.49
P.C.  Station          17+87.74  N        6,930,016.36  E        2,307,290.61
P.T.  Station          22+02.90  N        6,930,424.25  E        2,307,360.31
C.C.                             N        6,929,972.75  E        2,308,774.16
Back         = N   1° 41' 02" E
Ahead        = N  17° 42' 38" E
Chord Bear   = N   9° 41' 50" E

Course from PT HULEN_5 to HULEN7 N 17° 42' 38" E Dist 60.00

Point HULEN7          N    6,930,481.41 E    2,307,378.56 Sta     22+62.90

===========================================================================
Ending chain HULEN description
Beginning chain SOUTH description
Feature: Geom_Centerline
===========================================================================

Point SOUTH1          N    6,929,717.89 E    2,307,062.22 Sta     10+00.00

Course from SOUTH1 to SOUTH3 S 88° 18' 02" E Dist 404.95

Point SOUTH3          N    6,929,705.88 E    2,307,467.00 Sta     14+04.96

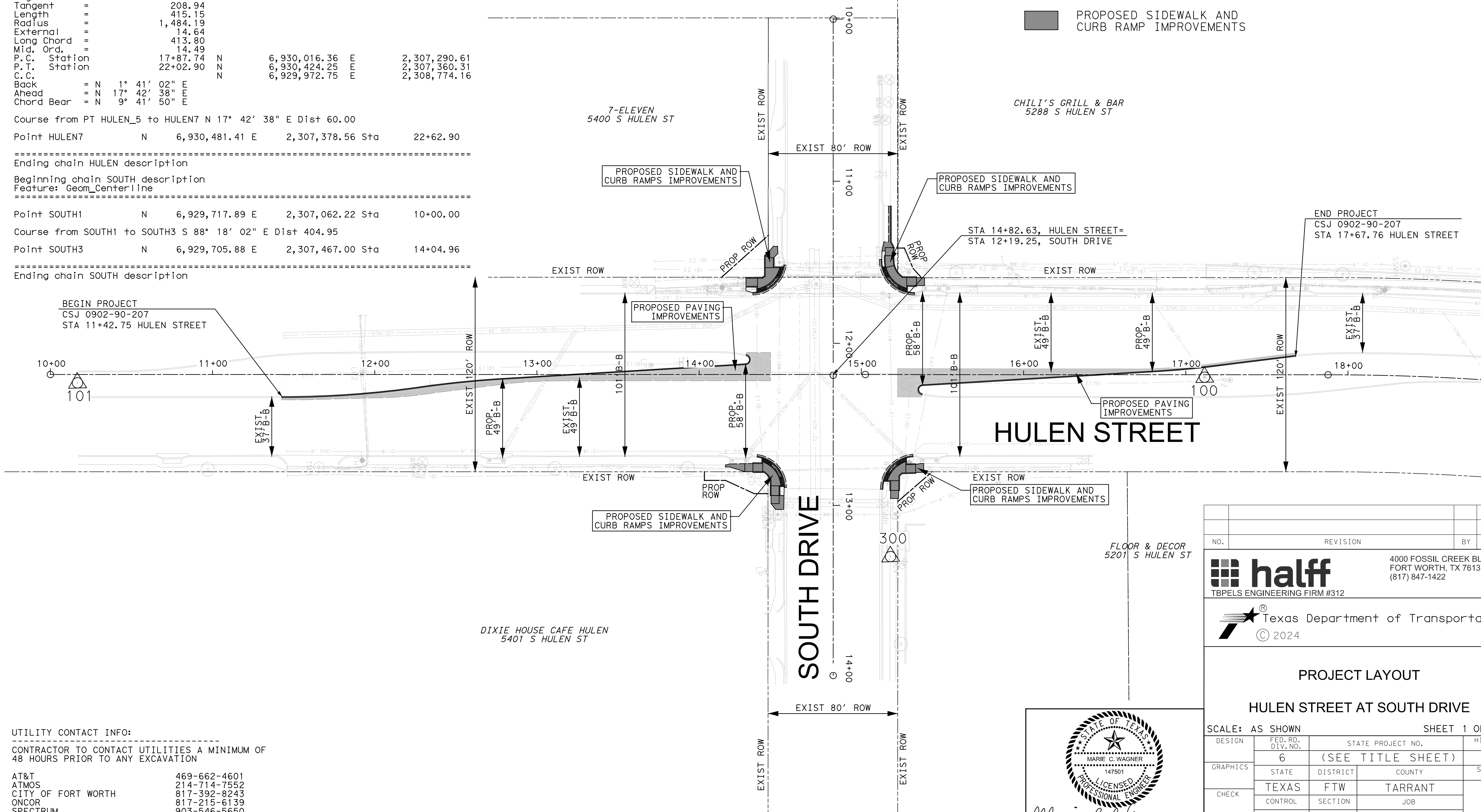
===========================================================================
Ending chain SOUTH description
```

CONTROL POINTS			
CP #	NORTHING	EASTING	ELEVATION
100	6929940.22	2307289.81	707.57
101	6929245.50	2307272.73	713.35
300	6929743.39	2307394.69	705.25

LEGEND

- CONTROL POINT
- EXISTING ROW LINE
- PROPOSED ROW LINE
- PROPOSED PAVING IMPROVEMENTS
- PROPOSED SIDEWALK AND CURB RAMP IMPROVEMENTS

0 30 60
SCALE: 1"=60'



UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation
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STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

PROJECT LAYOUT

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	4

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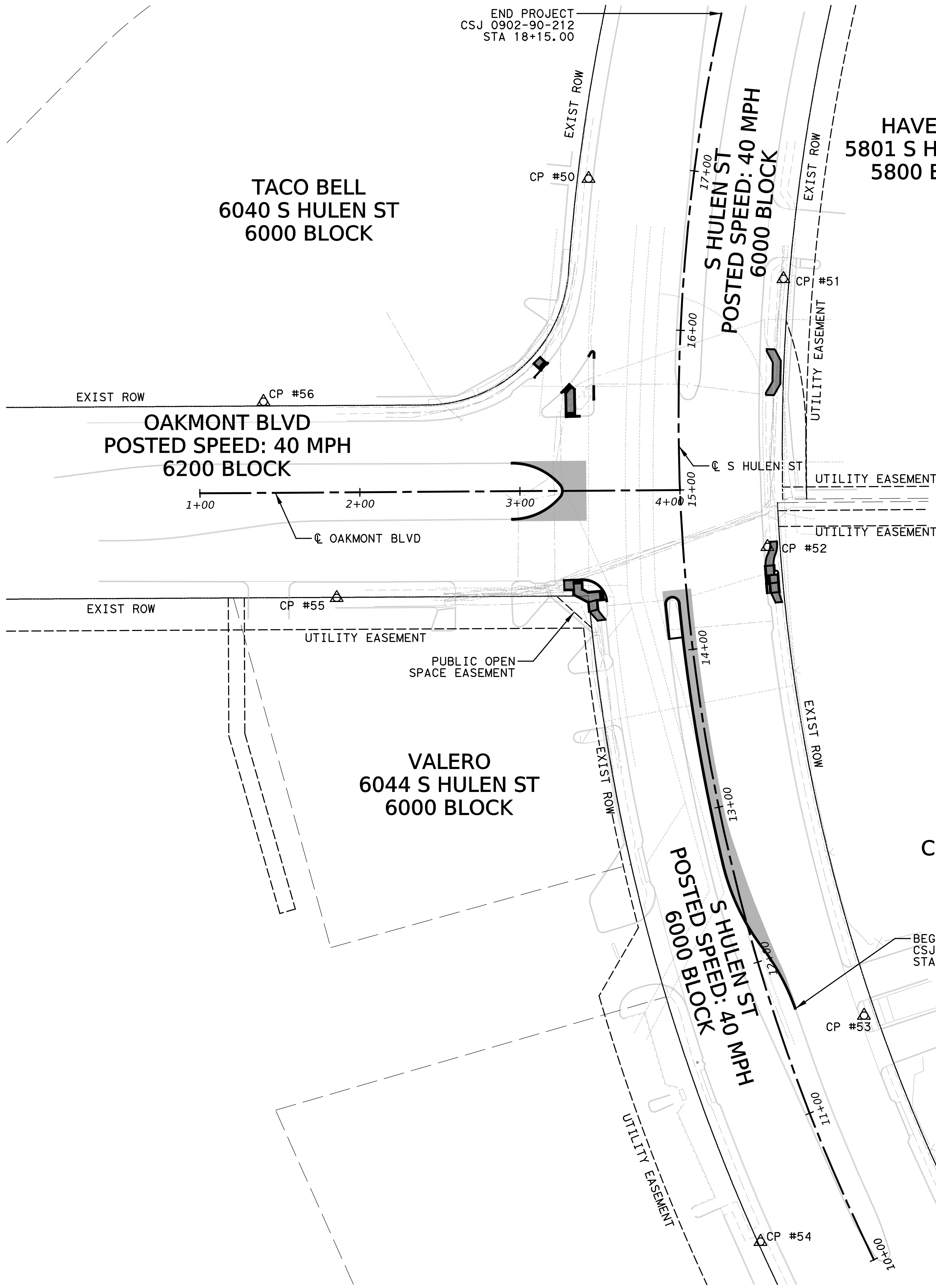

CONTROL POINTS				
#	DESCRIPTION	ELEV	NORTHING	EASTING
50	5/8" IRON ROD W/ CAP	710.36	6926902.121	2306471.924
51	5/8" IRON ROD W/ CAP	710.88	6926839.424	2306593.733
52	5/8" IRON ROD W/ CAP	711.79	6926671.807	2306583.733
53	5/8" IRON ROD W/ CAP	714.11	6926378.584	2306644.101
54	5/8" IRON ROD W/ CAP	715.97	6926237.190	2306579.454
55	5/8" IRON ROD W/ CAP	713.88	6926639.872	2306314.524
56	5/8" IRON ROD W/ CAP	714.29	6926762.569	2306268.772

tnp

40 0 20 40 80

GRAPHIC SCALE

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PROPOSED S HULEN ST - HORIZONTAL ALIGNMENT

Beginning chain CL_S HULEN_ST description
==============================================================================

                              Curve Data
                             *-----------*
Curve HULEN1
P.I.  Station          14+15.00  N      6,926,599.161  E      2,306,467.636
Delta       =      38° 12' 0.00" (RT)
Degree      =       4° 46' 48.00"
Tangent     =            415.50
Length      =            800.00
Radius      =          1,200.00
External    =             69.90
Long Chord  =            785.27
Mid. Ord.   =             66.05
P.C.  Station          10+00.00  N      6,926,225.931  E      2,306,650.237
P.T.  Station          18+00.00  N      6,927,005.393  E      2,306,554.926
Back        = N  26° 4' 12.00" W
Ahead       = N  12° 7' 48.00" W
Chord Bear  = N   6° 58' 2.00" E

==============================================================================
Ending chain CL_S HULEN_ST description

PROPOSED OAKMONT BLVD - HORIZONTAL ALIGNMENT

Beginning chain CL_OAKMONT description
==============================================================================

Point OAK01       N   6,926,705.253 E   2,306,229.035 Sta     1+00.00

Course from OAK01 TO OAK02  N  89° 36' 36" E  Dist 300.00

Point OAK02       N   6,926,707.296 E   2,306,529.028 Sta     4+00.00
==============================================================================
Ending chain CL_OAKMONT description
```

LEGEND	
(light shading)	PROPOSED PAVING IMPROVEMENTS
(dark shading)	PROPOSED SIDEWALK AND CURB RAMP IMPROVEMENTS
△	CONTROL POINT
— - —	EXISTING ROW LINE

UTILITY CONTACT INFO:
CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.

AT&T	817-338-6202
ATMOS	800-817-8090
FORT WORTH ELECTRIC	817-970-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR	817-443-3432
SPECTRUM	811
ZAYO	811

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED
PROFESSIONAL ENGINEER
4/16/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

PROJECT LAYOUT AND SURVEY CONTROL

SCALE: 1"=80'   SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	5

$OFFICE$ $WORKSTATION$ $PENTBL$ $FILENAME$ T:\Projects\FTW22299\Eng-MS\01-PSE\PROD\... $MODELNAME$ $CLIENT$ 4/16/2024 18:53 PBaker

Beginning chain GEOMCL4 description
Feature: Geom_Centerline

Curve Data

Curve GEOMCL4_1						
P.I. Station	10+85.0004	N	6,959,823.2249	E	2,373,603.1675	
Delta	4° 33′ 48.50"	(RT)				
Degree	2° 41′ 08.88"					
Tangent	85.0004					
Length	169.9110					
Radius	2,133.2843					
External	1.6927					
Long Chord	169.8661					
Mid. Ord.	1.6914					
P.C. Station	10+00.0000	N	6,959,741.0672	E	2,373,624.9666	
P.T. Station	11+69.9110	N	6,959,906.8564	E	2,373,587.9742	
C.C.		N	6,960,288.1670	E	2,375,686.9035	
Back	= N 14° 51′ 36.18" W					
Ahead	= N 10° 17′ 47.68" W					
Chord Bear	= N 12° 34′ 41.93" W					

Course from PT GEOMCL4_1 to PC GEOMCL4_4 N 9° 41′ 12.28" W Dist 55.2343

Curve Data

Curve GEOMCL4_4						
P.I. Station	13+41.3697	N	6,960,075.8705	E	2,373,559.1243	
Delta	14° 14′ 48.93"	(RT)				
Degree	6° 09′ 39.01"					
Tangent	116.2244					
Length	231.2499					
Radius	930.0000					
External	7.2343					
Long Chord	230.6546					
Mid. Ord.	7.1784					
P.C. Station	12+25.1453	N	6,959,961.3032	E	2,373,578.6804	
P.T. Station	14+56.3952	N	6,960,191.7270	E	2,373,568.3649	
C.C.		N	6,960,117.7863	E	2,374,495.4209	
Back	= N 9° 41′ 12.28" W					
Ahead	= N 4° 33′ 36.65" E					
Chord Bear	= N 2° 33′ 47.81" W					

Course from PT GEOMCL4_4 to PC GEOMCL4_7 N 4° 33′ 36.65" E Dist 118.1331

Curve Data

Curve GEOMCL4_7						
P.I. Station	16+12.7230	N	6,960,347.4929	E	2,373,581.5418	
Delta	4° 54′ 34.90"	(LT)				
Degree	6° 25′ 52.02"					
Tangent	38.1948					
Length	76.3428					
Radius	890.9148					
External	0.8184					
Long Chord	76.3194					
Mid. Ord.	0.8176					
P.C. Station	15+74.5282	N	6,960,309.4861	E	2,373,577.7572	
P.T. Station	16+50.8710	N	6,960,385.6841	E	2,373,582.0597	
C.C.		N	6,960,397.7645	E	2,372,691.2268	
Back	= N 5° 41′ 11.84" E					
Ahead	= N 0° 46′ 36.94" E					
Chord Bear	= N 3° 13′ 54.39" E					

Course from PT GEOMCL4_7 to GEOMCL49 N 0° 58′ 44.16" W Dist 496.3359

Point GEOMCL49 N 6,960,881.9476 E 2,373,573.5799 Sta 21+47.2069

Ending chain GEOMCL4 description

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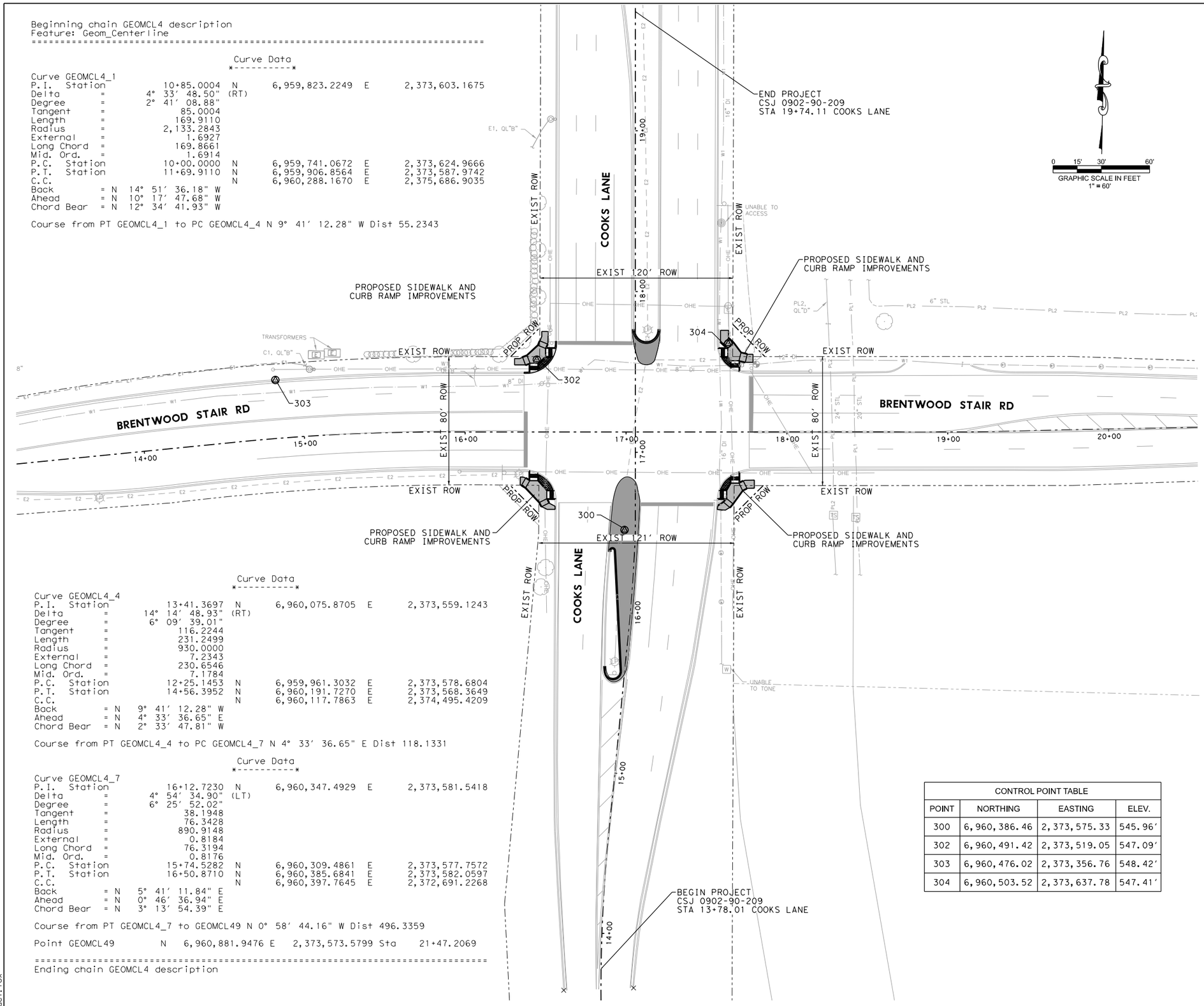


LEGEND

- PROPOSED PAVING IMPROVEMENTS
- PROPOSED SIDEWALK AND CURB RAMP IMPROVEMENTS
- CONTROL POINT
- EXISTING ROW LINE

0 15' 30' 60'
GRAPHIC SCALE IN FEET
1" = 60'

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
ATMOS ENERGY	800-817-8090
FORT WORTH ELECTRIC	817-870-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR ELECTRIC CORPORATION	817-443-3432
TARRENT COUNTY R.O.W.DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED PROFESSIONAL ENGINEER

4/19/2024

CONTROL POINT TABLE			
POINT	NORTHING	EASTING	ELEV.
300	6,960,386.46	2,373,575.33	545.96′
302	6,960,491.42	2,373,519.05	547.09′
303	6,960,476.02	2,373,356.76	548.42′
304	6,960,503.52	2,373,637.78	547.41′

NO.	REVISION	BY	DATE

DEC | ENGINEERING EXCELLENCE™
T.B.O.E. FIRM REGISTRATION #392
415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

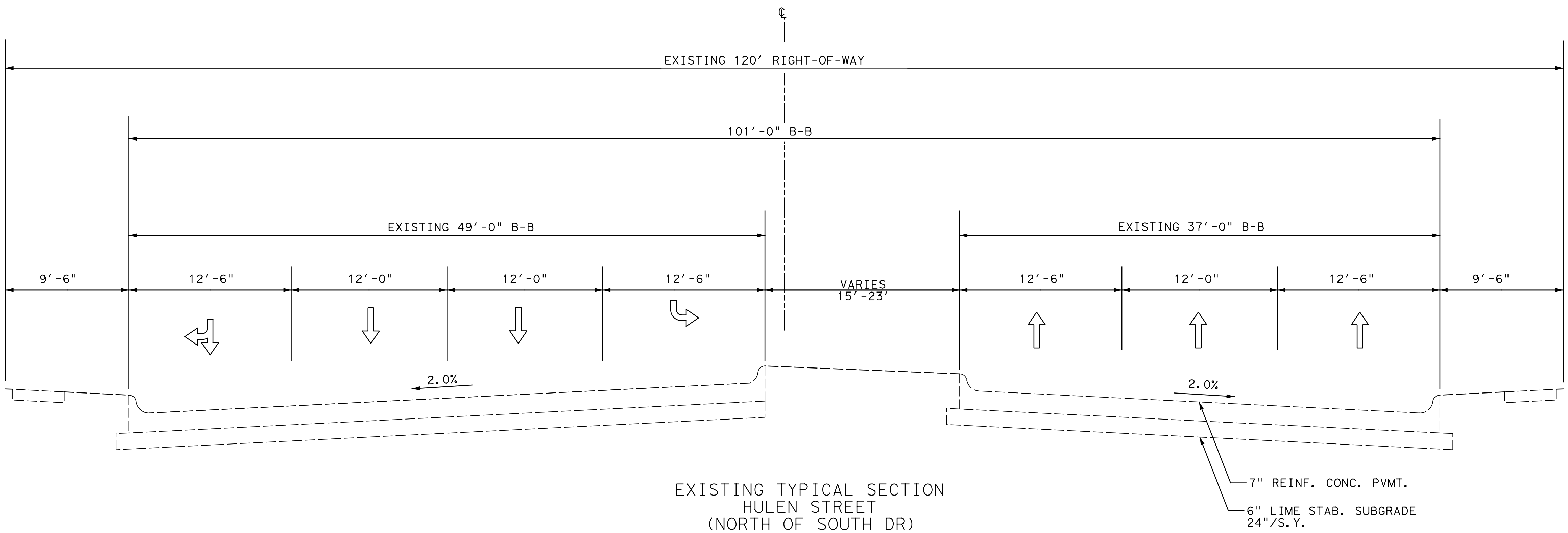
Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

PROJECT LAYOUT AND SURVEY CONTROL

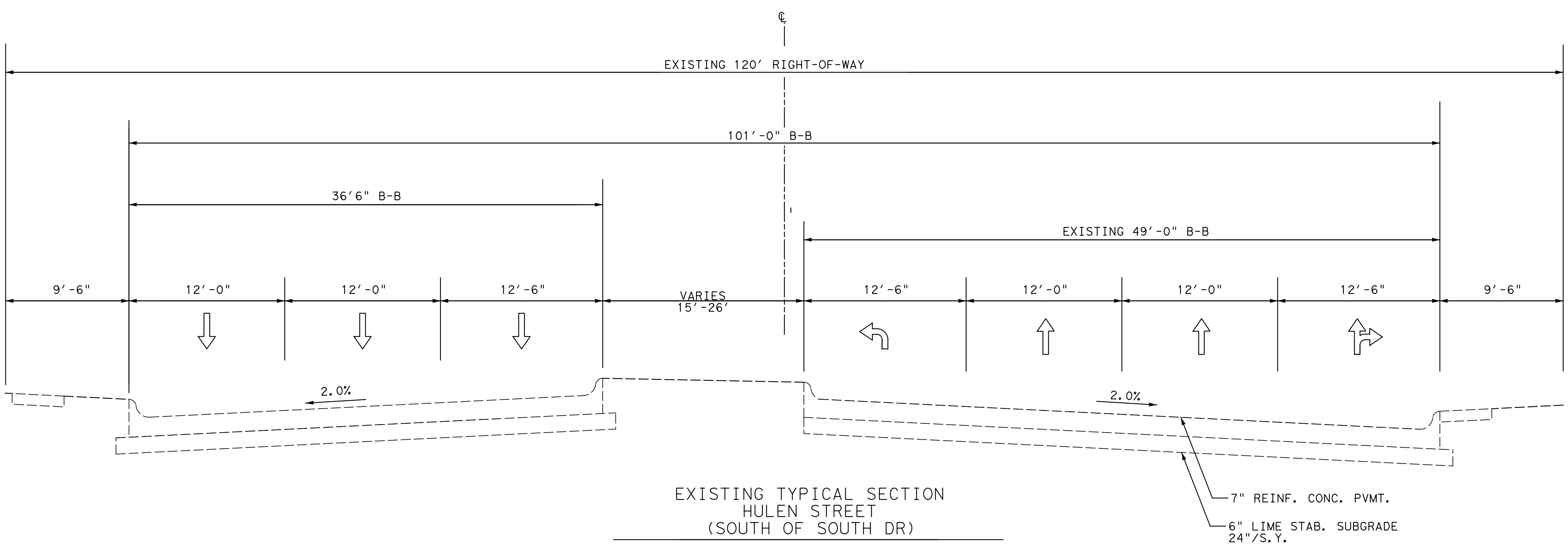
SCALE: 1" = 60′ SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	
CHECK	CONTROL	SECTION	JOB	6
CHECK	0902	90	209	



EXISTING TYPICAL SECTION
HULEN STREET
(NORTH OF SOUTH DR)

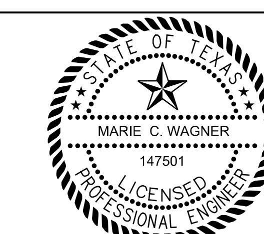
SCALE: 1" = 5′ HORIZ.
1" = 2′ VERT.



EXISTING TYPICAL SECTION
HULEN STREET
(SOUTH OF SOUTH DR)

SCALE: 1" = 5′ HORIZ.
1" = 2′ VERT.

NOTES:
1) EXISTING PAVEMENT STRUCTURE IDENTIFIED IN
CITY OF FORT WORTH PROVIDED AS-BUILT



Marie C. Wagner
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

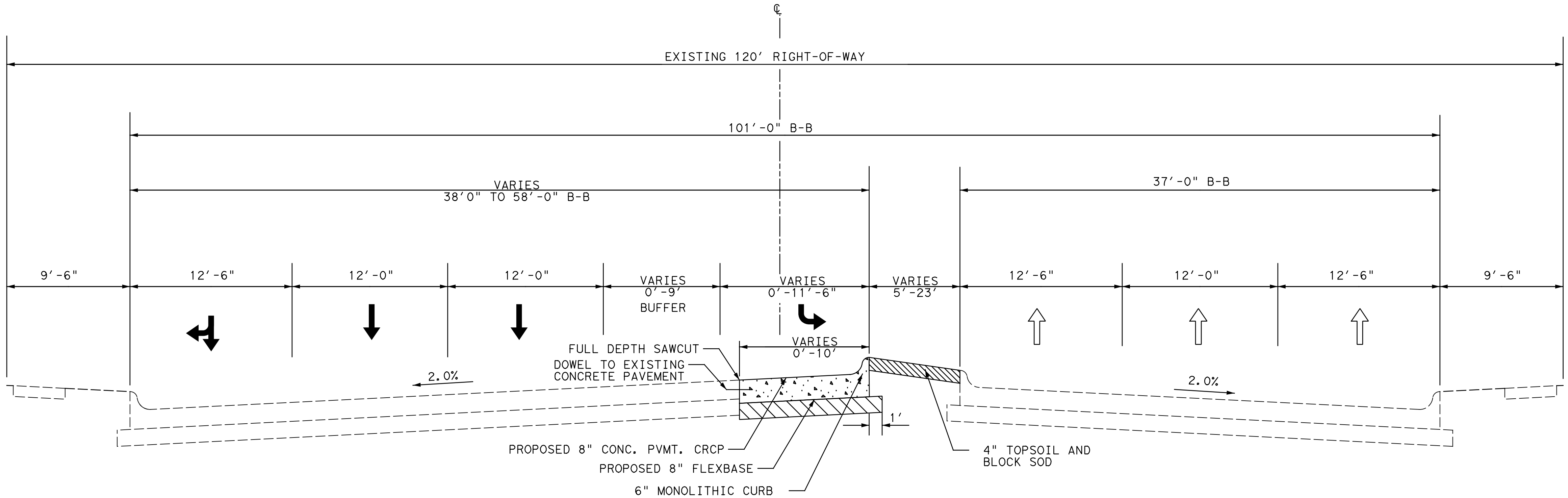
EXISTING TYPICAL SECTIONS

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN
SHEET 1 OF 1

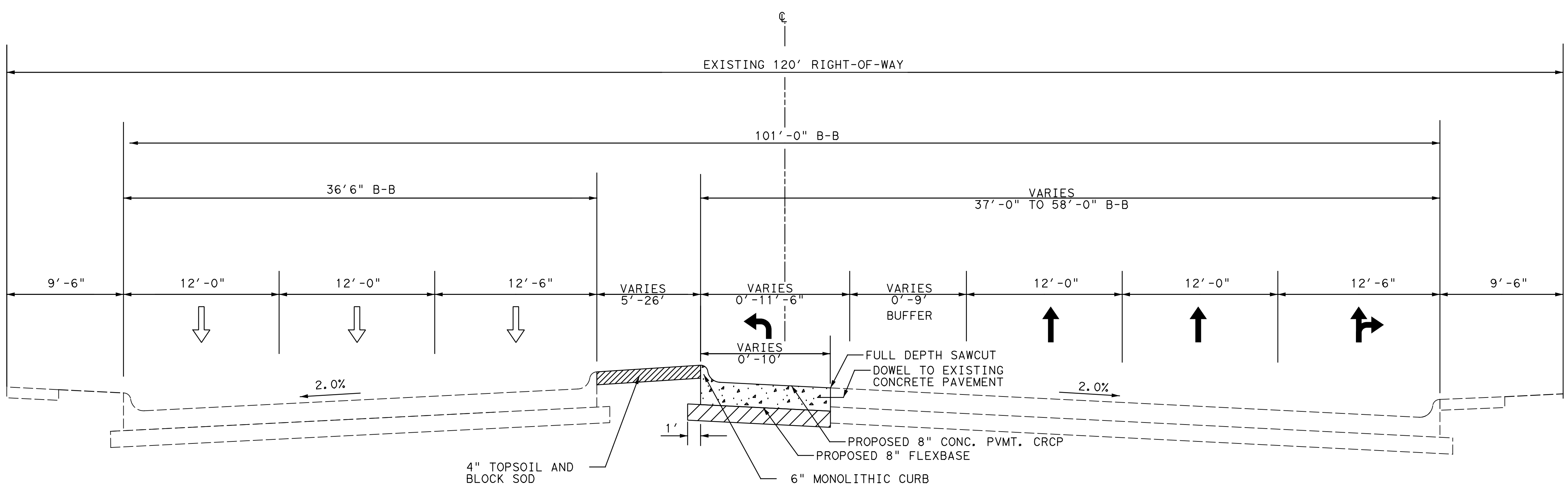
DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	7

FTW
WAGNER-4219
TXDOT-OR
Sheet



PROPOSED TYPICAL SECTION
HULEN STREET
(NORTH OF SOUTH DR)

SCALE: 1" = 5' HORIZ.
1" = 2' VERT.



PROPOSED TYPICAL SECTION
HULEN STREET
(SOUTH OF SOUTH DR)

SCALE: 1" = 5' HORIZ.
1" = 2' VERT.

LEGEND

- PROPOSED 8" CONCRETE PAVEMENT CRCP
- PROPOSED 8" FLEXBASE
- 4" TOPSOIL AND BLOCK SOD

NOTES:
1) GEOTECHNICAL ENGINEERING NOT PERFORMED
2) CITY OF FORT WORTH PROVIDED PAVEMENT DESIGN

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED
PROFESSIONAL ENGINEER

Marie C. Wagner
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

PROPOSED TYPICAL SECTIONS

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	8
CHECK	0902	90	207, ETC.	

FTW
WAGNER-4219
..\TXDOT-OR*MON*PENTABLE.tbl
...RD-TSEC-PROP-47647_002.dgn
Sheet
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TXDOT-OR
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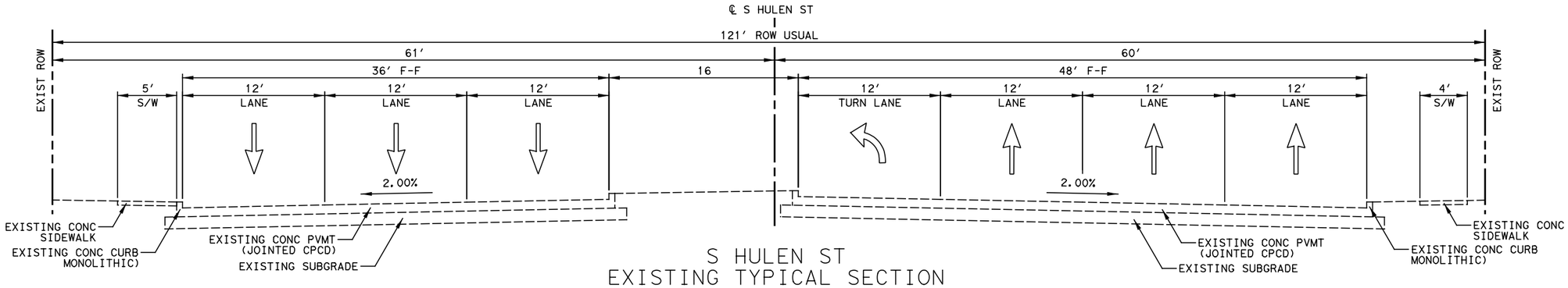
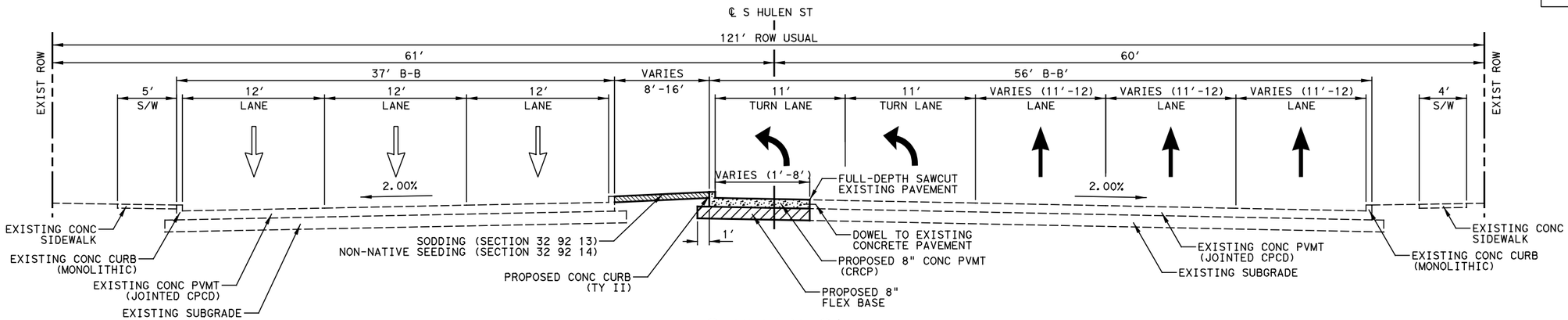


S HULEN ST
EXISTING TYPICAL SECTION
STA 11+65.00 TO STA 14+37.00



S HULEN ST
PROPOSED TYPICAL SECTION
STA 11+65.00 TO STA 14+34.00

LEGEND	
	8" CRCP
	8" FLEXBASE
	4" TOPSOIL AND BLOCK SOD

NOTES:
1. GEOTECHNICAL ENGINEERING NOT PERFORMED.
2. CITY OF FORT WORTH PROVIDED PAVEMENT DESIGN.

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED PROFESSIONAL ENGINEER
4/16/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

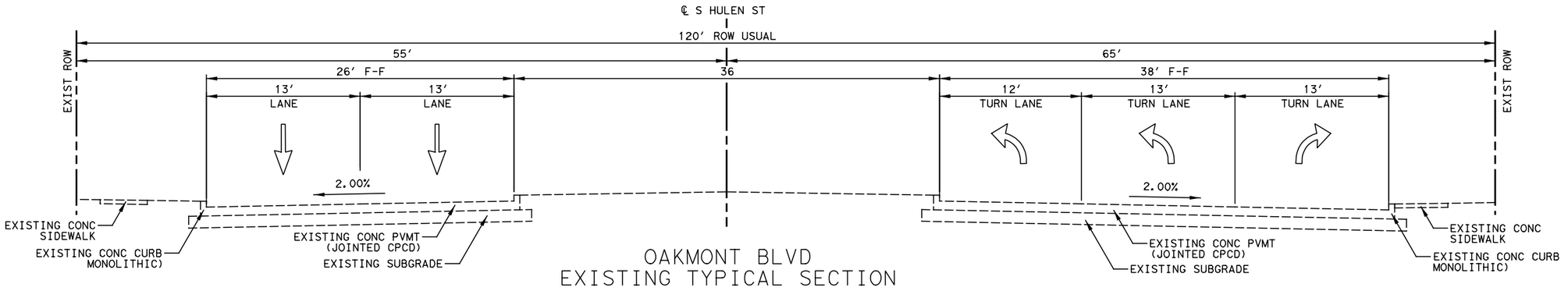
Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

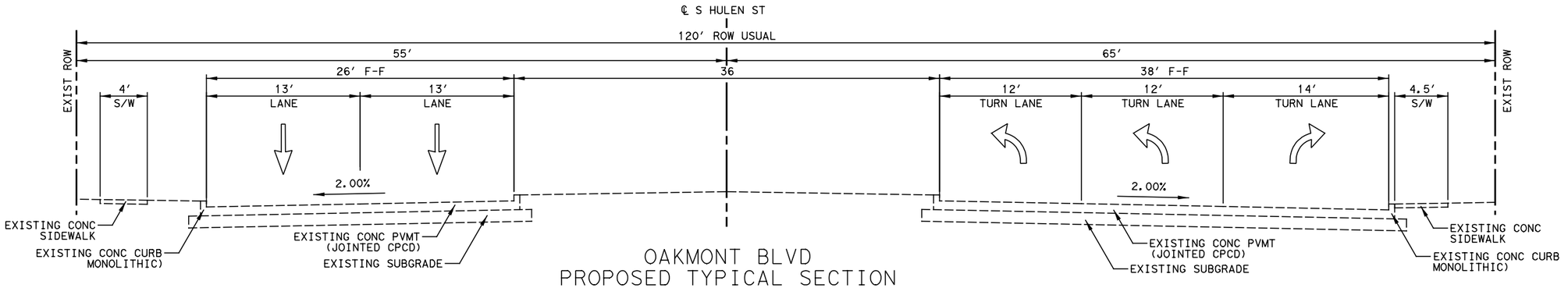
TYPICAL SECTIONS

SCALE: N.T.S SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	9



OAKMONT BLVD
EXISTING TYPICAL SECTION



OAKMONT BLVD
PROPOSED TYPICAL SECTION

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

TYPICAL SECTIONS

SCALE: N.T.S

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	10

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED PROFESSIONAL ENGINEER
4/16/2024

$OFFICE$
$WORKSTATION$
$MODELNAME$
$CLIENT$
$PENTBLA$
T:\Projects\FTW22293\Eng-MS\01-PSE\PROD\xSHEETSXXX SECT-02.dgn
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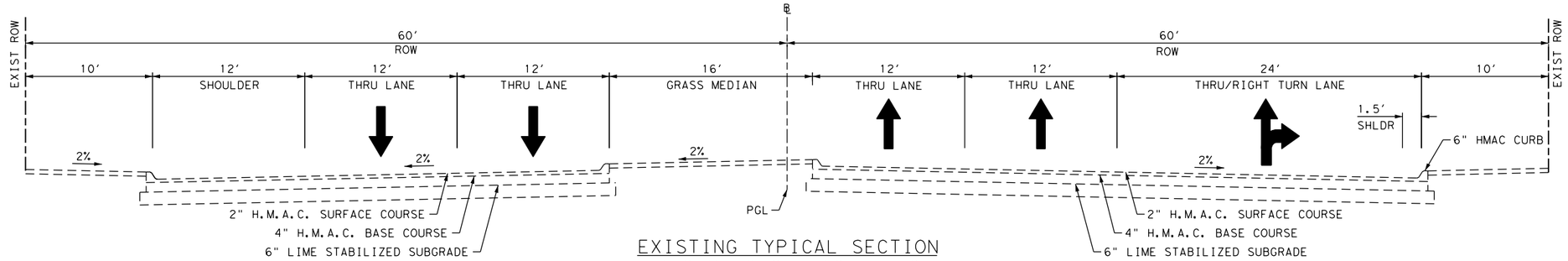
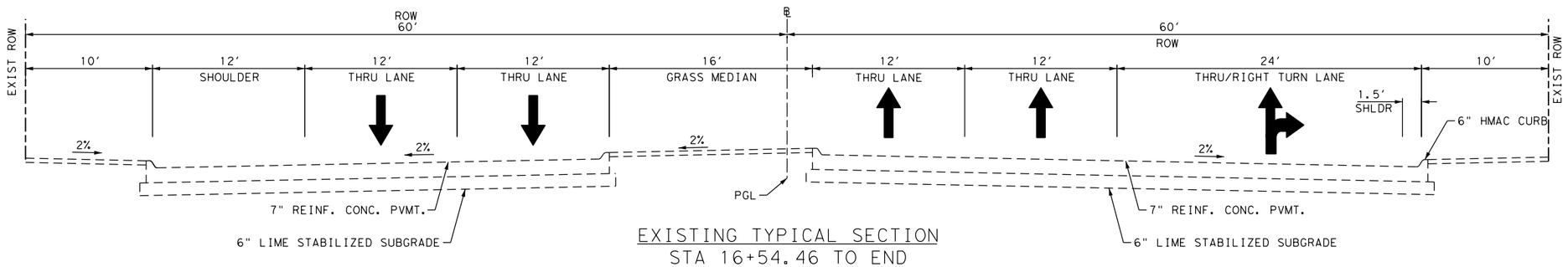
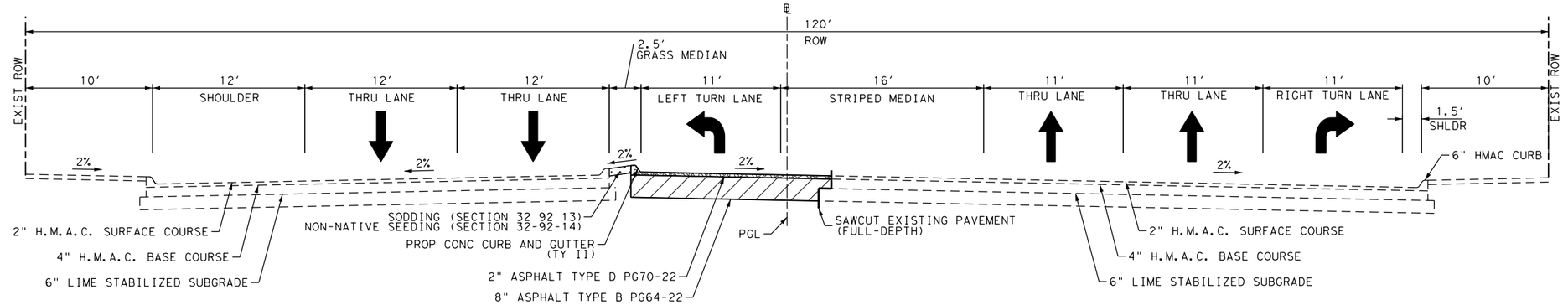


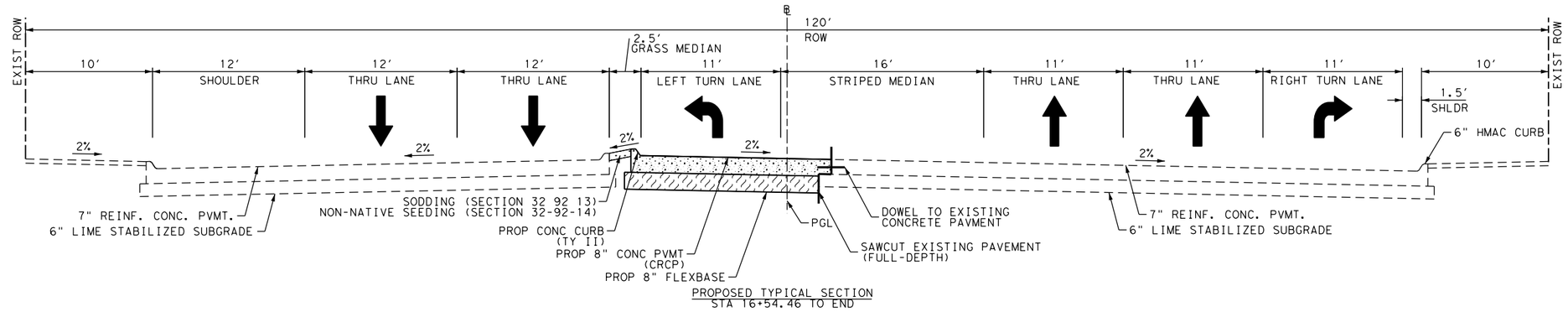
EXISTING TYPICAL SECTION
BEGIN TO STA 16+54.46



EXISTING TYPICAL SECTION
STA 16+54.46 TO END



PROPOSED TYPICAL SECTION
BEGIN TO STA 16+54.46



PROPOSED TYPICAL SECTION
STA 16+54.46 TO END

LEGEND

- PROPOSED TOPSOIL AND SOD
- PROPOSED FLEXBASE
- PROPOSED 8" CONC PVMT
- PROPOSED 8" TYPE B ASPHALT
- PROPOSED 2" TYPE D ASPHALT

NOTE:
1. REFER TO COFW PROJECT RESOURCES 32 92 13 FOR SODDING AND 32 92 14 FOR NON-NATIVE SEEDING INFORMATION.

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED
PROFESSIONAL ENGINEER

4/19/2024

NO.	REVISION	BY	DATE

DEC | ENGINEERING EXCELLENCE™
T.B.O.E. FIRM REGISTRATION #392
415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

EXISTING / PROPOSED TYPICAL SECTION

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	
CHECK	CONTROL	SECTION	JOB	11
CHECK	0902	90	209	

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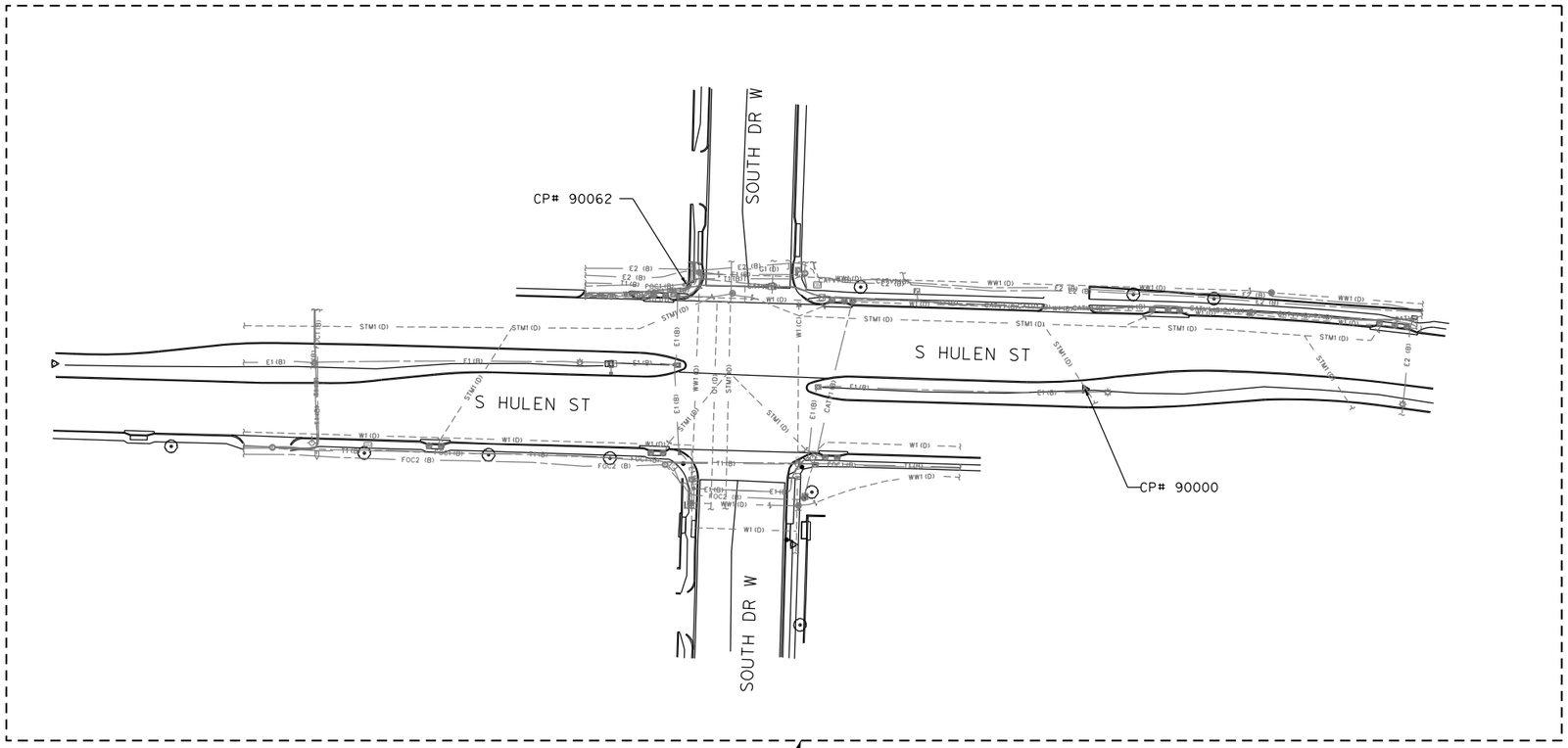

SHEET 4

CONTROL POINTS

ALL COORDINATES ARE REFERENCED TO THE TEXAS COORDINATE SYSTEM OF 1983 (NAD 83, 2011), NORTH CENTRAL ZONE (4202).

THE UNIT OF MEASURE IS THE U.S. SURVEY FEET.

ALL COORDINATES AND DISTANCES ARE SURFACE VALUES AND CAN BE CONVERTED TO GRID VALUES BY DIVIDING BY THE PROJECT SURFACE ADJUSTMENT FACTOR OF 1.00012 (TARRANT COUNTY).

CP# 90062
NORTHING: 6929671.306
EASTING: 2307218.802
ELEVATION: 705.557'

CP# 90000
NORTHING: 6929940.241
EASTING: 2307289.927
ELEVATION: 707.820'

UTILITY CONTACT LIST

COMPANY	CONTACT	PHONE	EMAIL
AT&T	NORTH TEXAS RECORDS REQUEST	(469)-662-4601	G11289@ATT.COM
ATMOS	EDIE LOPEZ	(214)-714-7552	EDIE.LOPEZ@ATMOSENERGY.COM
CITY OF FORT WORTH	HOLLIE SMITH	(817)-392-8243	HOLLIE.SMITH2@FORTWORTHTEXAS.GOV
ONCOR	BRIENNA FIELDS	(817)-215-6139	BRIENNA.FIELDS2@ONCOR.COM
SPECTRUM	LUKE WHITE	(903)-546-5650	FORCERELOS@KINETIC-ENG.COM

0 50 100
1" = 100'

INDEX

TOTAL QUANTITIES	
LEVEL "B"=	7,077'
LEVEL "C"=	171'
OVERHEAD	0'
LEVEL "D"=	3,495'
TOTAL=	10,743'

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
12/05/2023

NO.	REVISIONS	BY	DATE

ARS ENGINEERS, INC.

Texas Department of Transportation
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INTERSECTION OF NORTH HULEN STREET AND SOUTH DRIVE WEST

NORTH HULEN STREET AND SOUTH DRIVE WEST EXISTING UTILITY LAYOUT

DSN: --	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
DRN: JC	6	TEXAS	(SEE TITLE SHEET)			
CK: JS	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
APRV: AMS	33	TARRANT	0902	90	209	12

12/5/2023 2:02:08 PM

P:\22-043.04 Hulen & South St\Utilities\DGN\LAYOUT SHEETS\2-LAYOUT,CONTROL-Hulen & South St.dgn

SUE LEGEND

ELECTRIC	E1 (B)	CITY OF FORT WORTH
ELECTRIC	E2 (B)	ONCOR
TELEPHONE	T1 (B)	AT&T
FIBER OPTIC	FOC1 (B)	AT&T
FIBER OPTIC	FOC2 (B)	SPECTRUM
CABLE	CATV1 (B)	SPECTRUM
GAS	G1 (B)	ATMOS
GAS	G1 (D)	ATMOS
WATER	W1 (B)	CITY OF FORT WORTH
WATER	W1 (C)	CITY OF FORT WORTH
WATER	W1 (D)	CITY OF FORT WORTH
WASTEWATER	WW1 (B)	CITY OF FORT WORTH
WASTEWATER	WW1 (D)	CITY OF FORT WORTH
STORM	STM1 (B)	CITY OF FORT WORTH
STORM	STM1 (D)	CITY OF FORT WORTH

- TRANSMISSION TOWER
- CELL TOWER
- POWER POLE
- POWER POLE WITH LIGHT
- POWER MANHOLE
- PULL/TRANSFORMER BOX
- ELECTRIC METER
- UG ELECTRIC MARKER
- LIGHT POLE
- TRAFFIC SIGNAL POLE
- TRAFFIC SIGNAL CONTROL BOX
- SIGNAL PEDESTAL
- TELEPHONE HAND HOLE
- TELEPHONE PEDESTAL
- TELEPHONE MANHOLE
- CATV PEDESTAL
- UG TELEPHONE MARKER
- UG FIBER MARKER
- GAS MANHOLE
- GAS METER
- GAS APPURTENANCE
- UG GAS MARKER
- GAS VENT
- GAS TEST VALVE
- WATER VALVE
- FIRE HYDRANT
- WATER METER
- WATER MANHOLE
- WASTEWATER MANHOLE
- WASTEWATER CLEANOUT
- UG WASTEWATER MARKER
- STORM SEWER MANHOLE
- STORM OUTFALL
- STORM INLET
- CONTROL POINT
- CONTINUATION MARK
- QUALITY LEVEL CHANGE

SUE QUALITY LEGEND

T1 (B)	QUALITY LEVEL "B"
T1 (C)	QUALITY LEVEL "C"
T1 (D)	QUALITY LEVEL "D"

GENERAL NOTES

QUALITY LEVEL "D":

QUALITY LEVEL VALUE ASSIGNED TO A UTILITY SEGMENT OR UTILITY FEATURE AFTER A REVIEW AND COMPILATION OF DATA SOURCES SUCH AS EXISTING RECORDS, ORAL RECOLLECTIONS, ONE-CALL MARKINGS, AND DATA REPOSITORIES.

QUALITY LEVEL "C":

QUALITY LEVEL VALUE ASSIGNED TO A UTILITY SEGMENT OR UTILITY FEATURE AFTER SURVEYING ABOVEGROUND (I.E., VISIBLE) UTILITY FEATURES AND USING PROFESSIONAL JUDGMENT TO CORRELATE THE SURVEYED LOCATIONS OF THESE FEATURES WITH THOSE FROM EXISTING UTILITY RECORDS.

QUALITY LEVEL "B":

DESIGNATE: QUALITY LEVEL VALUE ASSIGNED TO A UTILITY SEGMENT OR SUBSURFACE UTILITY FEATURE WHOSE EXISTENCE AND POSITION IS BASED UPON APPROPRIATE SURFACE GEOPHYSICAL METHODS COMBINED WITH PROFESSIONAL JUDGMENT AND WHOSE LOCATION IS TIED TO THE PROJECT SURVEY DATUM. HORIZONTAL ACCURACY OF DESIGNATED UTILITIES IS WITHIN SEVERAL INCHES OF THE ACTUAL UTILITY SEGMENT, WHENEVER POSSIBLE.

QUALITY LEVEL "A":

QUALITY LEVEL VALUE ASSIGNED TO A PORTION (X, Y, AND Z GEOMETRY) OF A POINT OF A SUBSURFACE UTILITY FEATURE THAT IS DIRECTLY EXPOSED, MEASURED, AND WHOSE LOCATION AND DIMENSIONS ARE TIED TO THE PROJECT SURVEY DATUM.

NOTES:
SUBSURFACE UTILITY ENGINEERING (SUE) CERTIFICATION
THE ENGINEER'S SEAL HEREON IS TO CERTIFY THAT THE UTILITIES SHOWN HAVE BEEN INVESTIGATED IN ACCORDANCE WITH STANDARD SUE INDUSTRY PRACTICES. WHERE INDICATED UTILITY SIZES AND MATERIALS TAKEN FROM BEST AVAILABLE RECORDS. ALL OTHER INFORMATION HEREON HAS BEEN PROVIDED BY OTHERS AND IS NOT A PART OF THIS CERTIFICATION.

UTILITY LOCATIONS REPRESENTED IN THESE DRAWING ARE INTENDED FOR DESIGN PURPOSES AND NOT FOR CONSTRUCTION. CONTRACTORS MUST CALL TEXAS 811, 48 HOURS PRIOR TO EXCAVATION.

ARS ENGINEERS, INC. IS NOT RESPONSIBLE FOR REPRESENTING PROPOSED OR NEW UTILITY INSTALLATIONS, OR MODIFICATIONS AND ADJUSTMENTS TO EXISTING UTILITIES, AFTER THE SUE INVESTIGATION COMPLETION DATE.

ALL LOW WIRE CLEARANCE MEASUREMENTS ARE FROM SINGLE DAY, ON-SITE SURVEY VISITS AND WILL VARY BASED ON CHANGES IN TEMPERATURE, WEATHER CONDITIONS, OR ANY MAINTENANCE OR MODIFICATIONS OF THE UTILITIES THEMSELVES.

ELECTRONIC DEPTHS (ED) SHOWN ARE SUBJECT TO VARIABLE CONDITIONS AND ARE NOT RELIABLE FOR ACCURATE DEPTH DETERMINATIONS WITHOUT QUALITY LEVEL A TEST HOLES.

UTILITY LINE LIMITS DEPICTED HEREIN REPRESENT FIELD DESIGNATING LIMITS AND NOT END POINTS OF UTILITIES UNLESS OTHERWISE NOTED.

WITHOUT VISUAL VERIFICATION, UTILITIES LOCATED BY MEANS OF TRACER WIRE MAY NOT DEPICT THE ACTUAL LOCATION OF THE UTILITY AS THE TRACER WIRE MAY NOT BE DIRECTLY ON OR ABOVE THE UTILITY.

FLOWLINE INFORMATION SHOWN HEREIN IS BASED ON FIELD MEASURED DEPTHS AND IS APPROXIMATE.

UTILITY SERVICE LINES ARE NOT IDENTIFIED HEREIN UNLESS OTHERWISE DEPICTED.

IRRIGATION LINES ARE NOT IDENTIFIED HEREIN UNLESS OTHERWISE DEPICTED.

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
12/05/2023

NO.	REVISIONS	BY	DATE

ARS ENGINEERS, INC.

Texas Department of Transportation
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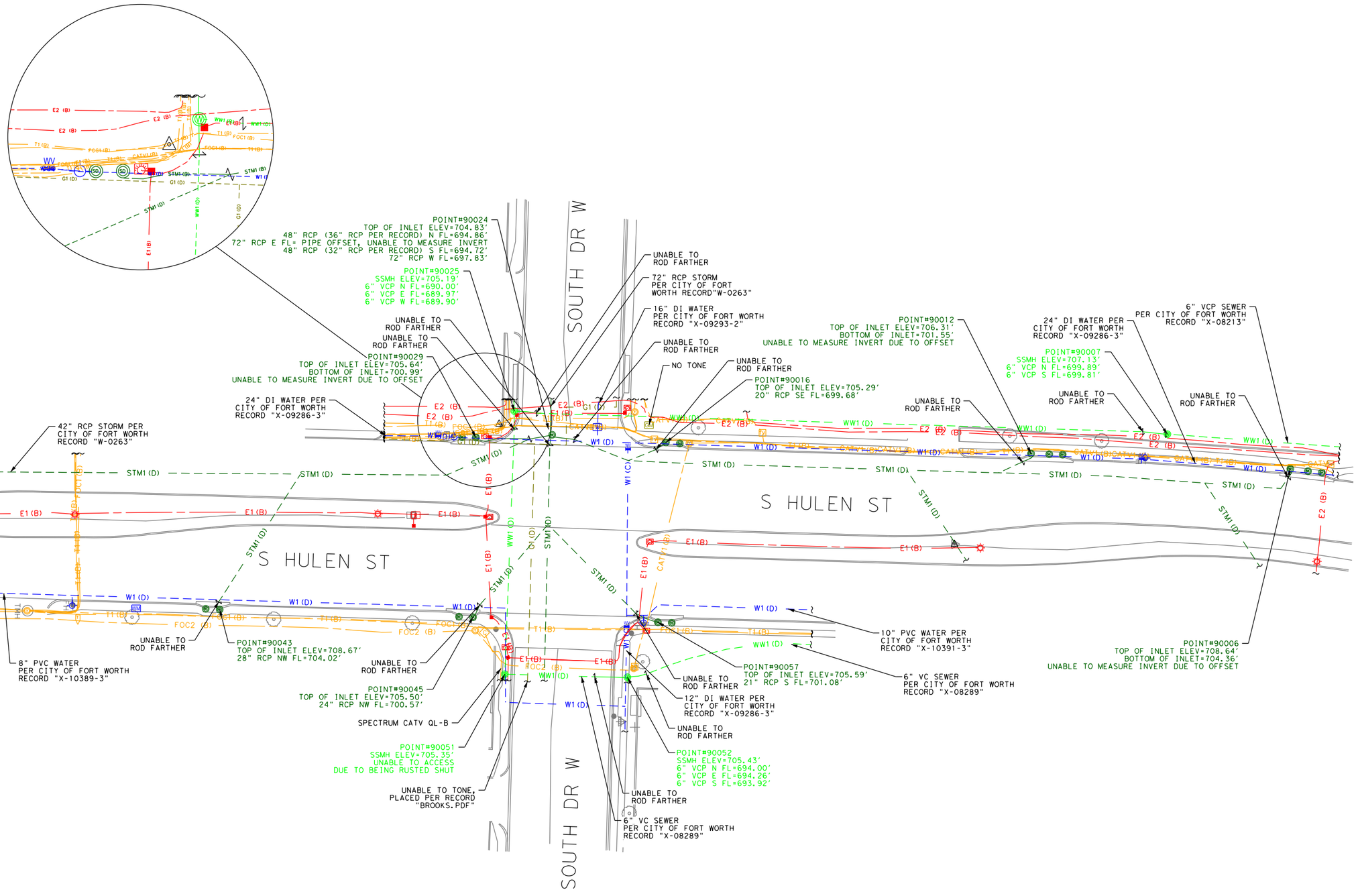
INTERSECTION OF NORTH HULEN STREET AND SOUTH DRIVE WEST

NORTH HULEN STREET AND SOUTH DRIVE WEST EXISTING UTILITY LEGEND

DSN: --	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
DRN: JC	6	TEXAS	(SEE TITLE SHEET)			
CK: JS	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
APRV: AMS	33	TARRANT	0902	90	209	13

12/5/2023 2:02:08 PM

P:\22-043.04 Hulen & South St\Utilities\DGN\LAYOUT SHEETS\3-LEGEND SHEET -Hulen & South St.dgn



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0 30 60

1" = 60'

SUE QUANTITIES	
LEVEL "B"	7,077'
LEVEL "C"	171'
OVERHEAD	0'
LEVEL "D"	3,495'
TOTAL=	10,743'

QUALITY LEVEL LEGEND

QL "A"
QL "B" T1 (B)
QL "C" T1 (C)
QL "D" T1 (D)

STATE OF TEXAS
ANEIL M. SANDHU
114532
LICENSED
PROFESSIONAL ENGINEER
12/05/2023

NO.	REVISIONS	BY	DATE

ARS ENGINEERS, INC.

Texas Department of Transportation
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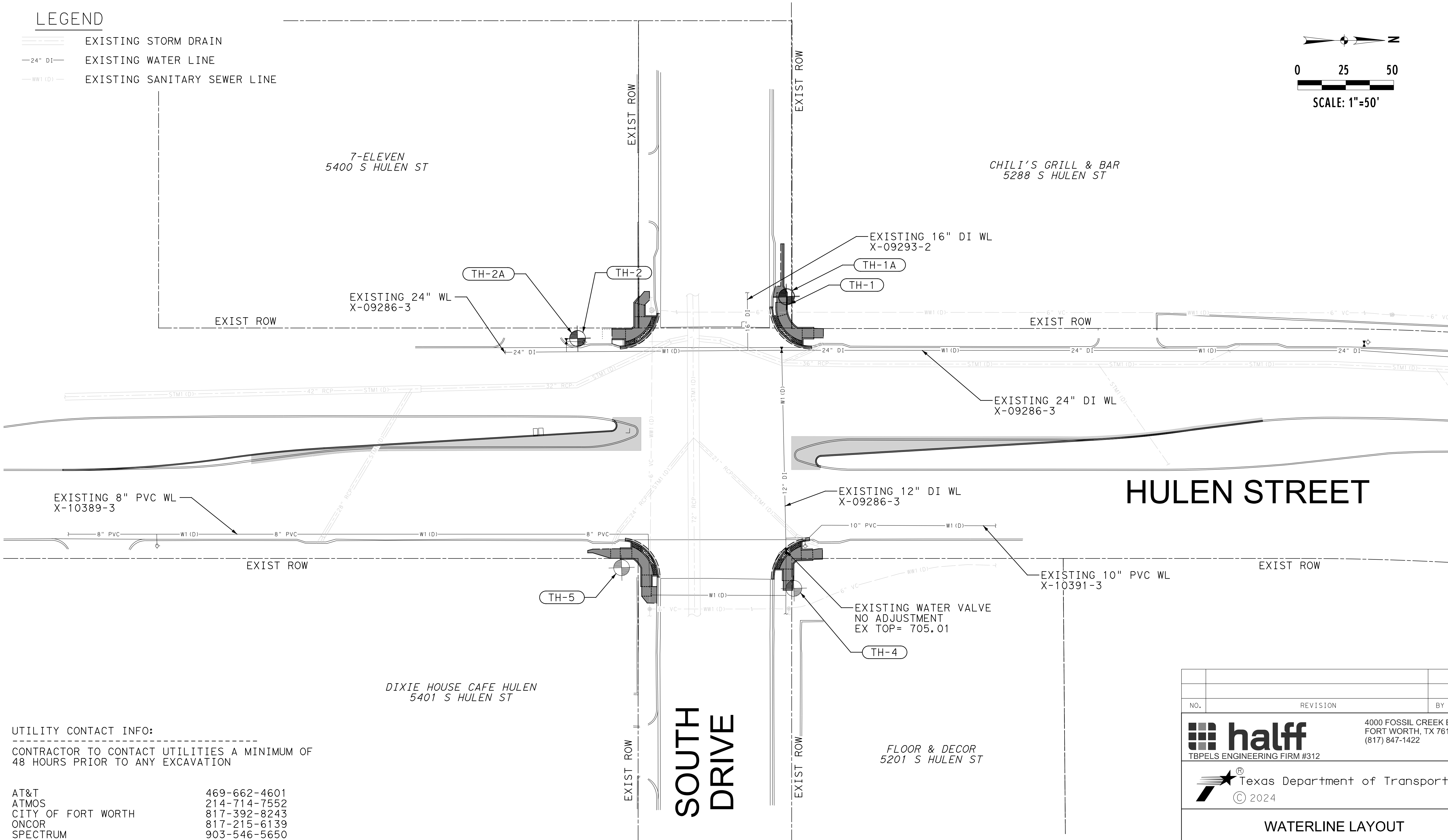
INTERSECTION OF NORTH HULEN STREET AND SOUTH DRIVE WEST

NORTH HULEN STREET AND SOUTH DRIVE WEST EXISTING UTILITY PLAN

DSN: --	FED. RD. DIV. NO.	STATE	PROJECT NO.			HIGHWAY NO.
DRN: JC	6	TEXAS	(SEE TITLE SHEET)			
CK: JS	STATE DISTRICT	COUNTY	CONTROL NO.	SECTION NO.	JOB NO.	SHEET NO.
APRV: AMS	33	TARRANT	0902	90	209	14

12/5/2023 2:02:08 PM



UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

TEST HOLE #	UTILITY SIZE O.D.	MATERIAL	UTILITY TYPE	DEPTH OF UTILITY	NORTHING	EASTING	GROUND ELEV	TOP OF UTILITY
1	2"	DBC	ONCOR (ELECTRIC)	(4.52)'	6929750.67	2307206.4	705.39'	700.87'
1A	(3)-2"	DBC	ONCOR (ELECTRIC)	(4.42)'	6929750.82	2307206.06	705.15'	700.73'
2	1"	STEEL	UNKNOWN	(2.54)'	6929641.33	2307224.83	705.80'	703.26'
2A	4"	PVC	AT&T (TELEPHONE)	(1.20)'	6929641.26	2307224.66	705.80'	704.60'
4	12" (PER RECORD	DI	CITY OF FORT WORTH (WATE	(6.31)'	6929750.05	2307358.15	705.12'	698.81'
5	3"	PE	SPECTRUM (FIBER)	(2.04)'	6929660.70	2307344.71	706.30'	704.26'

NO.	REVISION	BY	DATE

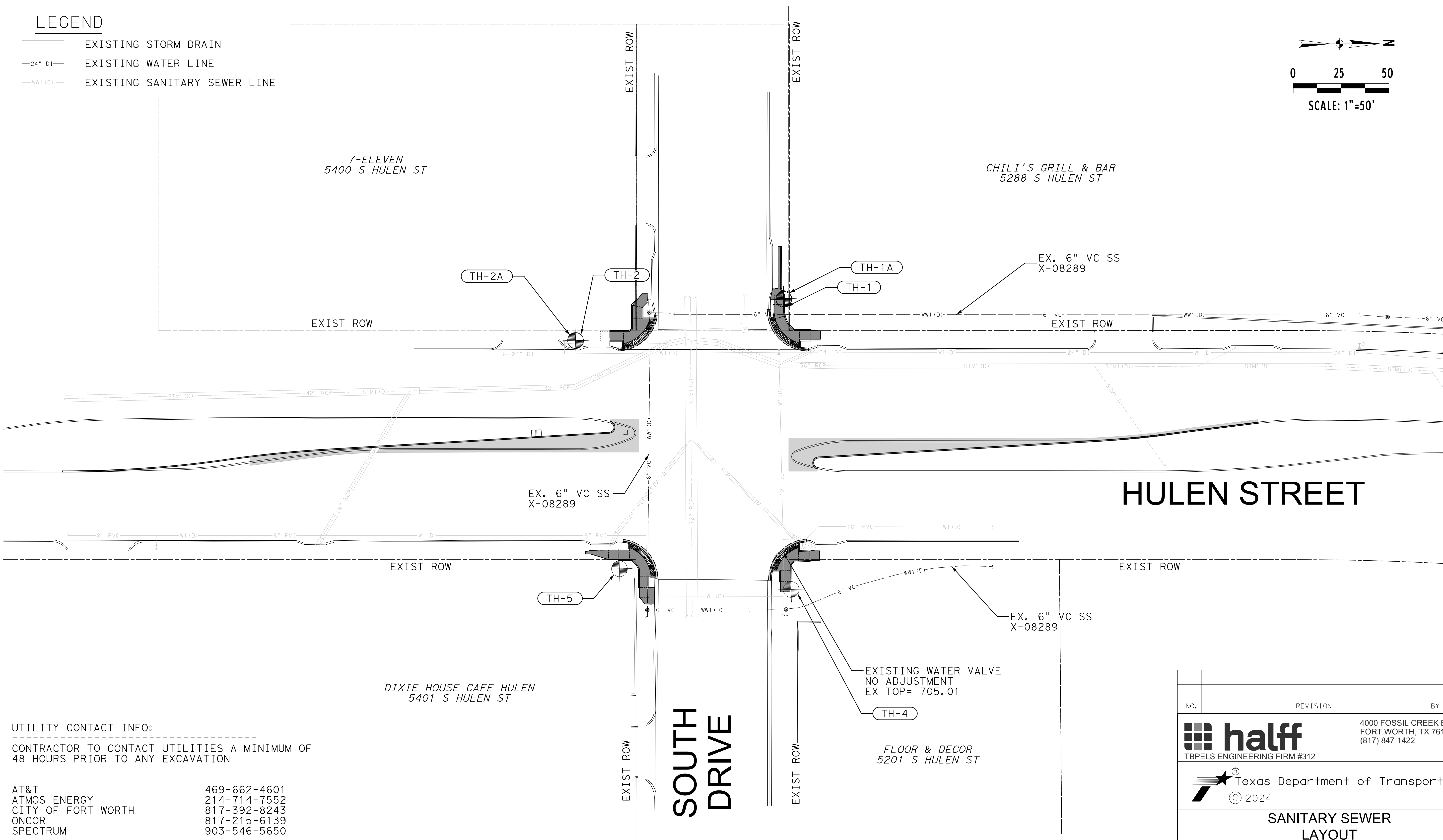
halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

WATERLINE LAYOUT

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	15



UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS ENERGY	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

TEST HOLE #	UTILITY SIZE O.D.	MATERIAL	UTILITY TYPE	DEPTH OF UTILITY	NORTHING	EASTING	GROUND ELEV	TOP OF UTILITY
1	2"	DBC	ONCOR (ELECTRIC)	(4.52)'	6929750.67	2307206.4	705.39'	700.87'
1A	(3)-2"	DBC	ONCOR (ELECTRIC)	(4.42)'	6929750.82	2307206.06	705.15'	700.73'
2	1"	STEEL	UNKNOWN	(2.54)'	6929641.33	2307224.83	705.80'	703.26'
2A	4"	PVC	AT&T (TELEPHONE)	(1.20)'	6929641.26	2307224.66	705.80'	704.60'
4	12" (PER RECORD	DI	CITY OF FORT WORTH (WATER)	(6.31)'	6929750.05	2307358.15	705.12'	698.81'
5	3"	PE	SPECTRUM (FIBER)	(2.04)'	6929660.70	2307344.71	706.30'	704.26'

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

SANITARY SEWER LAYOUT

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	16

LINESTYLE LEGEND

Electric	E1	Oncor
Electric	E1(C)	Oncor
Electric	E1(D)	Oncor
Electric	E2	City of Fort Worth
Electric	E2(C)	City of Fort Worth
Electric	E2(D)	City of Fort Worth
FIBER	FO1	AT&T
FIBER	FO1(C)	AT&T
FIBER	FO1(D)	AT&T
FIBER	FO2	Zayo
FIBER	FO2(C)	Zayo
FIBER	FO2(D)	Zayo
FIBER	FO3	Spectrum
FIBER	FO3(C)	Spectrum
FIBER	FO3(D)	Spectrum
TELEPHONE	T1	AT&T
TELEPHONE	T1(D)	AT&T
TELEPHONE	T1(D)	AT&T
GAS	G1	Atmos
GAS	G1(C)	Atmos
GAS	G1(D)	Atmos
Water	W1	City of Fort Worth
Water	W1(C)	City of Fort Worth
Water	W1(D)	City of Fort Worth
Storm Sewer	STM1	City of Fort Worth
Storm Sewer	STM1(C)	City of Fort Worth
Storm Sewer	STM1(D)	City of Fort Worth
Sanitary Sewer	WW1	City of Fort Worth
Sanitary Sewer	WW1(C)	City of Fort Worth
Sanitary Sewer	WW1(D)	City if Fort Worth
Abandoned Sanitary Sewer	WW1(D)-X	City if Fort Worth

SYMBOL LEGEND

- WATER FAUCET
- FIRE HYDRANT
- WATER VALVE BOX
- CATHODIC PROTECTION
- PHOTO TAKEN HERE
- WASTEWATER MANHOLE
- SEWER CLEAN OUT
- STORM MANHOLE
- STORM SEWER INLET
- STORM CLEAN OUT
- GAS MANHOLE
- GAS METER
- GAS VALVE
- GAS TEST STATION
- CATV PEDESTAL
- CATV SERVICE BOX
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- TELEPHONE POLE
- TELEPHONE HAND HOLE
- TELEPHONE JUNCTION BOX
- TELEPHONE REPEATER
- FIBER OPTIC HAND HOLE
- FIBER OPTIC JUNCTION BOX
- FIBER OPTIC MANHOLE
- UTILITY MARKER POST
- RAILROAD SIGNAL
- TOWER
- WATER MANHOLE
- WATER METER
- AIR RELEASE VALVE
- WATER VALVE
- DETECTOR CHECK VALVE
- ELECTRIC PEDESTAL
- ELECTRIC MANHOLE
- ELECTRIC METER
- ELECTRIC PULLBOX
- HIGH MAST LIGHTING TOWER
- ELECTRIC TRANSFORMER
- TRAFFIC CAMERA
- LUMINAIRE STANDARD
- SIGNAL CONTROL PANEL
- POWER POLE
- POWER POLE WITH RISER
- ILLUMINATION POLE
- GUY ANCHOR
- GUY POLE DEADMAN
- SOLAR PANEL
- TRAFFIC SIGNAL BOX
- STREET SIGN
- TRAFFIC SIGNAL POLE
- GENERIC MANHOLE
- LEVEL 'A' TEST HOLE
- CONTROL POINT
- TRAFFIC SIGNAL PEDESTAL

GENERAL NOTES

SIZE INFORMATION SHOWN IS TAKEN FROM AVAILABLE UTILITY RECORDS.

UTILITY QUALITY LEVEL A:

PRECISE HORIZONTAL AND VERTICAL LOCATION OF UTILITIES OBTAINED BY THE ACTUAL EXPOSURE (OR VERIFICATION OF PREVIOUSLY EXPOSED AND SURVEYED UTILITIES) AND SUBSEQUENT MEASUREMENT OF SUBSURFACE UTILITIES, USUALLY AT A SPECIFIC POINT.

UTILITY QUALITY LEVEL B:

INFORMATION OBTAINED THROUGH THE APPLICATION OF APPROPRIATE SURFACE GEOPHYSICAL METHODS TO DETERMINE THE EXISTENCE AND APPROXIMATE HORIZONTAL POSITION OF SUBSURFACE UTILITIES. QUALITY LEVEL B DATA SHOULD BE REPRODUCIBLE BY SURFACE GEOPHYSICS AT ANY POINT OF THEIR DEPICTION. THIS INFORMATION IS SURVEYED TO APPLICABLE TOLERANCES DEFINED BY THE PROJECT AND REDUCED ONTO PLAN DOCUMENTS.

UTILITY QUALITY LEVEL C:

INFORMATION OBTAINED BY SURVEYING AND PLOTTING VISIBLE ABOVE-GROUND UTILITY FEATURES AND BY USING PROFESSIONAL JUDGEMENT IN CORRELATING THIS INFORMATION TO QUALITY LEVEL D INFORMATION

UTILITY QUALITY LEVEL D:

INFORMATION DERIVED FROM EXISTING RECORDS OR ORAL RECOLLECTIONS.

QUALITY LEVEL LEGEND

WW1	QUALITY LEVEL B
WW1(C) WW1(C)	QUALITY LEVEL C
WW1(D) WW1(D)	QUALITY LEVEL D

LINESTYLE LEGEND

	EXIST. R.O.W.
	LIMITS OF INVESTIGATION

PRELIMINARY

CONTACT LIST

COMPANY	UTILITY COORDINATOR	PHONE	E-MAIL	ADDRESS
AT&T		469- 662-4601	g11289@att.com	2513 W E Roberts Dr, Rm 213.26 Grand Prairie, TX 75051
Atmos			Map.Requests@atmosenergy.com	
City of Fort Worth	Hollie Smith	817-392-8243	Hollie.Smith2@fortworthtexas.gov	
Oncor	Brienna Fields	817-980-6928	Brienna.Fields2@oncor.com	777 Main Street, Suite 707 Fort Worth, TX 76102
Spectrum	Mary Pimentel		forcerelos@kinetic-eng.com	1585 Jameson Road Van Alstyne, TX 75495
Zayo	Galyna Muraclenko		gmuravlenko.zayo@gmail.com	

This document is for interim review and is not intended for construction, bidding or permit purposes.

Andrew R. Luce
P.E., Tx. Reg. 110084
1/17/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

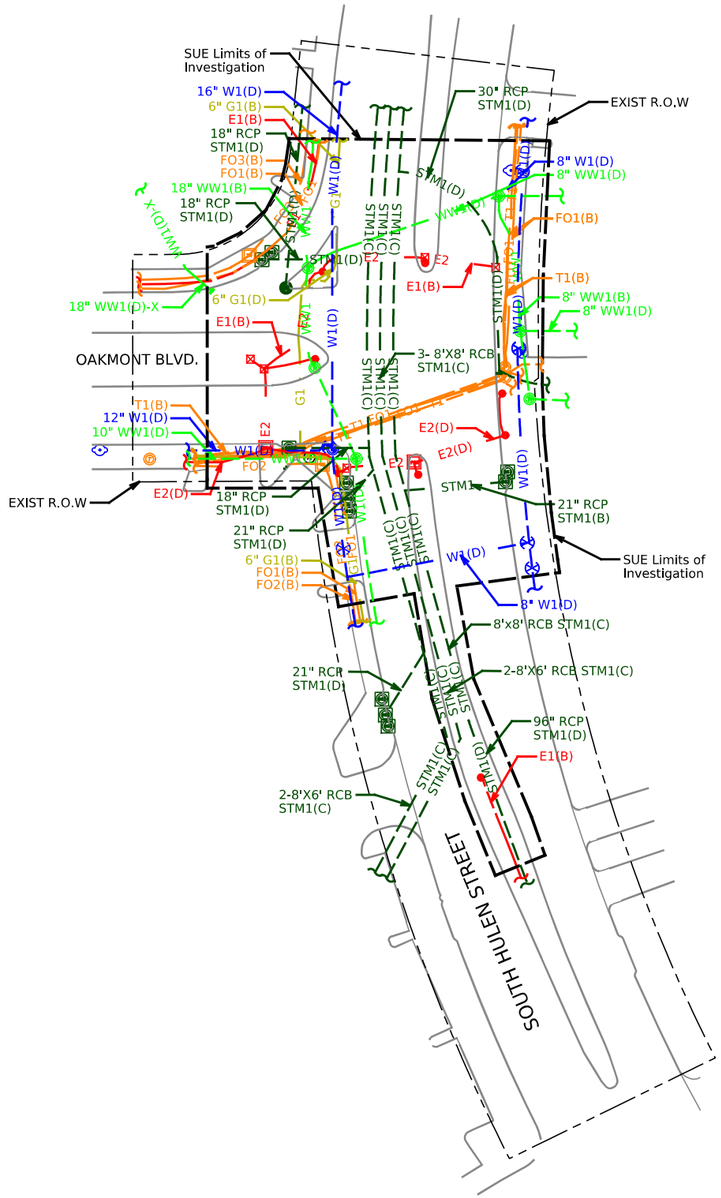
S HULEN ST AT OAKMONT BLVD

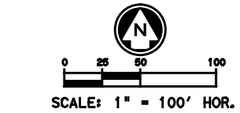
EXISTING UTILITY PLANS
GENERAL NOTES/LEGENDS

SCALE: 1"=100'

SHEET 1 OF 2

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	17





GENERAL NOTES:
1. CONTRACTOR TO VERIFY ALL UTILITIES PRIOR TO CONSTRUCTION AND NOTIFY SUE ENGINEER OF ANY DISCREPANCIES.
2. ZAYO DENIED TNP ACCESS TO LOCATE THEIR FIBER OPTIC LINES. THE FIBER LINE LOCATIONS ARE DEPICTED BASED ON DIGTESS MARKINGS

PRELIMINARY

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

EXISTING UTILITY PLANS

SCALE: 1"=100'

SHEET 2 OF 2

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	18

This document is for interim review and is not intended for construction, bidding or permit purposes.

Andrew R. Luce
P.E. Tx. Reg. 110084
1/17/2024

LEGEND OF U.G. UTILITY TYPES

COMMUNICATIONS
- AT&T (TELE) — QL"B" — C1
- AT&T (TELE) — QL"C"/"D" — C1

GAS / PETROLEUM
- SUMMIT MIDSTREAM — QL"B" — PL1
- WILLIAMS — QL"B" — PL2
- SUMMIT MIDSTREAM — QL"C"/"D" — PL1
- WILLIAMS — QL"C"/"D" — PL2

ELECTRIC / POWER
- ONCOR — QL"B" — E1
- CITY OF FORT WORTH — QL"B" — E2
- ONCOR — QL"C"/"D" — E1
- CITY OF FORT WORTH — QL"C"/"D" — E2

POTABLE WATER
- CITY OF FORT WORTH — QL"B" — W1
- CITY OF FORT WORTH — QL"C"/"D" — W1

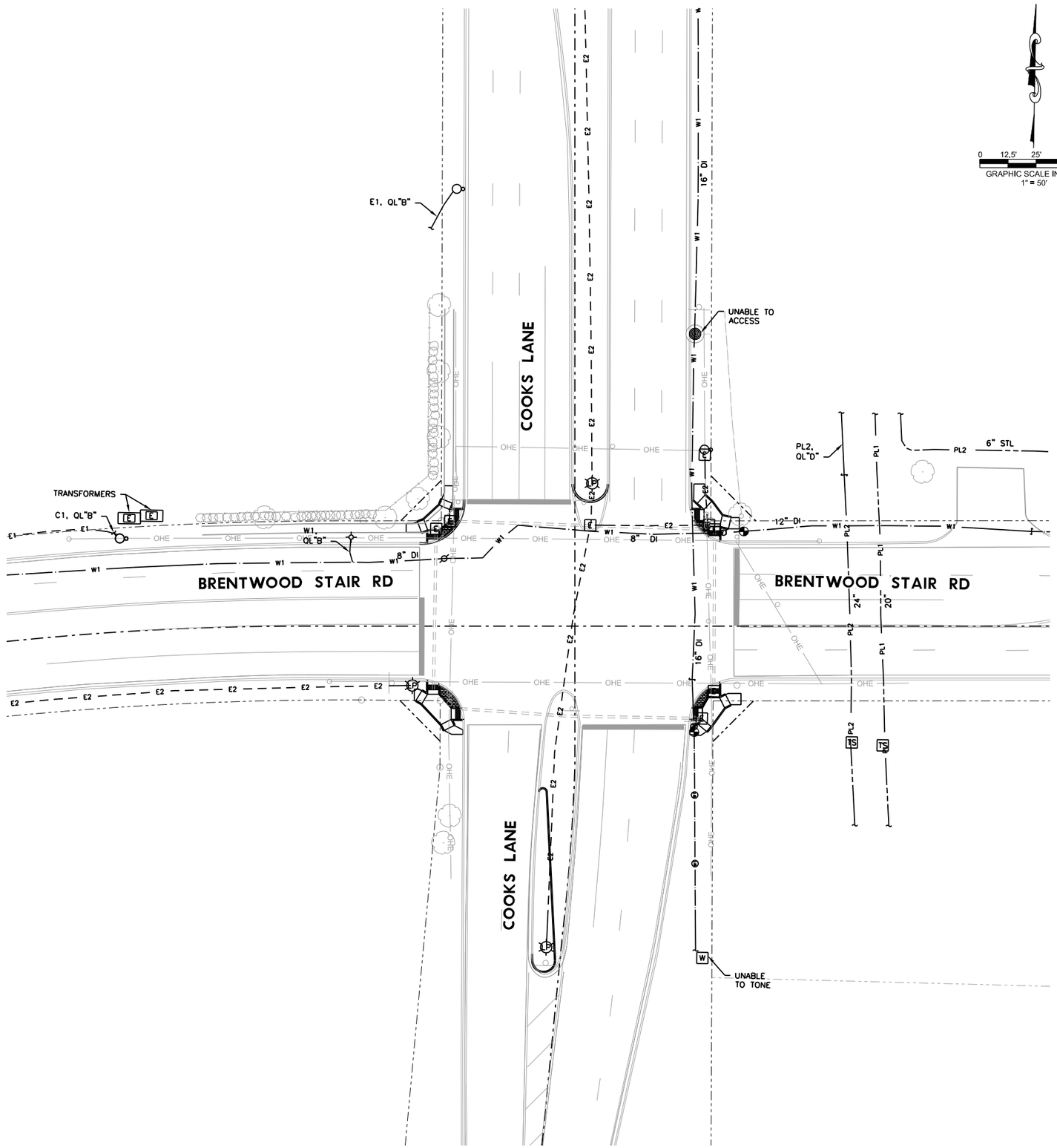
SANITARY SEWER
- CITY OF FORT WORTH — QL"B" — WW1
- CITY OF FORT WORTH — QL"C"/"D" — WW1

STORM DRAIN
- CITY OF FORT WORTH — QL"B" — SD1
- CITY OF FORT WORTH — QL"C"/"D" — SD1

- ABANDONED UTILITY
- UNKNOWN UTILITY

LEGEND OF UTILITY SYMBOLS

- END CAP
- QUALITY LEVEL CHANGE
- TEST HOLE
- UTILITY CONTINUATION
- CATV CABINET — C
- CATV HANDHOLE — C
- CATV PEDESTAL — C
- FIBER CABINET — F
- FIBER HANDHOLE — F
- TELEPHONE CABINET — T
- TELEPHONE HANDHOLE (VAULT) — T
- TELEPHONE MANHOLE — T
- TELEPHONE PEDESTAL — T
- TELEPHONE POLE — TP
- TELEPHONE POLE W/RISER — TP
- ELECTRIC GROUND LIGHT — GL
- ELECTRIC HANDHOLE — E
- ELECTRIC JUNCTION BOX (CABINET) — E
- ELECTRIC MANHOLE — E
- ELECTRIC METER — EM
- ELECTRIC POLE (POWER) — PP
- ELECTRIC POLE W/RISER — PP
- LIGHT POLE — LP
- TRANSMISSION POLE
- SIGNAL HANDHOLE/BOX — SB
- SIGNAL POLE — SP
- GAS MANHOLE
- GAS METER — GM
- GAS TEST STATION — TS
- GAS VALVE
- GAS VENT PIPE (GAS RISER)
- STORM SEWER INLET — INL
- STORM SEWER MANHOLE
- STORM SEWER OUTFALL
- WASTE WATER CLEANOUT
- WASTE WATER MANHOLE
- FIRE HYDRANT
- WATER MANHOLE
- WATER METER — WM
- WATER VALVE — W
- WATER VAULT



0 12.5' 25' 50'
GRAPHIC SCALE IN FEET
1" = 50'

UTILITY CONTACT INFO:

CONTRACTOTR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
ATMOS ENERGY	800-817-8090
FORT WORTH ELECTRIC	817-870-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR ELECTRIC CORPORATION	817-443-3432
TARRENT COUNTY R.O.W.DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED PROFESSIONAL ENGINEER

4/19/2024

NO.	REVISION	BY	DATE

DEC ENGINEERING EXCELLENCE™
T.B.O.E. FIRM REGISTRATION #392
415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD
EXISTING UTILITY LAYOUT

SCALE: 1" = 50' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	19
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

4/19/2024
11:18:22 AM
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Control: 0902-90-207, ETC.

County: TARRANT

Highway: HULEN ST., ETC.

Specification Data

Basis of Estimate

Item	Description	Rate	Unit
168	Vegetative Watering	169,400 gal./acre	1,000 gal.

Compaction Requirements for Base Courses

Item	Material	Course	Min. Density
247	Flex Base	All	100 %

(Minimum Density is the percentage of density required based on results of Tex-113-E, Tex-114-E, Tex-120-E, and/or Tex-121-E)

Special Notes

Electronic files containing answered pre-letting questions and other project related design information will be placed in the following FTP site periodically.

Check this site for new information. Notices of new postings will not be sent out by the Engineer.

The data located in these files is for non-construction purposes only and can be found at TxDOT's public FTP site at https://ftp.dot.state.tx.us/pub/txdot-info/Pre-Letting Responses/.

Access is read-only.

All files in the FTP site are subject to the License Agreement shown on the FTP site.

To obtain a copy of the project plans free of charge, submit a request from the following site:
http://www.txdot.gov/business/letting-bids/plans-online.html

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

Control: 0902-90-207, ETC.

County: TARRANT

Highway: HULEN ST., ETC.

Area Engineer's Email: Maribel.Rangel@txdot.gov
Assistant Area Engineer's Email: Justin.Thomey@txdot.gov
Design Manager's Email: Maribel.Rangel@txdot.gov

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

For Q&A's on Proposals navigate to https://tableau.txdot.gov/views/ProjectInformationDashboard/NoticetoContractors. Use the dashboard to navigate to the project you are interested in by scrolling or filtering the dashboard using the controls on the left. Hover over the blue hyperlink for the project you want to view the Q&A for and click on the link in the window that pops up.

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

Single lane closures, except as otherwise shown in the plans, will be restricted to off-peak hours as defined in the following table:

Peak Hours		Off-Peak Hours	
6 to 9 AM Monday through Friday	3 to 7 PM Monday through Friday	9 AM to 3 PM and 7 PM to 6 AM Monday through Friday	All day Saturday and Sunday

Work that requires closure of multiple travel lanes in the same direction, except as otherwise shown in the plans, are restricted to night hours between 9 PM and 6 AM.

Existing storm sewers and utilities are shown from the best available information. Verify the location of all underground facilities prior to starting work.

For dimensions of right-of-way not shown on the plans, see right-of-way map on file at the TxDOT District Office.

Modifications to Lane Closure / Work Restrictions:

Submit a request in writing for approval by the Engineer a minimum of 10 days in advance of implementing a change to lane closure restrictions.

When deemed necessary, the Engineer will lengthen, shorten, or otherwise modify lane closure restrictions as traffic conditions warrant.

When deemed necessary, the Engineer will modify the list of major events when new events develop, existing events are rescheduled, or when warranted.

Special Events/ Special Situations will be handled on a case-by-case basis. No work restricting lane closures is allowed from 3 PM a day before to 9 AM the day after the Special Event or Special Situation.

Remove all existing fences within the right of way and remove and replace all existing fences within easements where such fences conflict with the work. Protect the remaining fence from damage due to slacking. Erect temporary fencing in the easement areas as necessary to secure the property. Provide at least one week notice to the property owner prior to removing or relocating the fence. Restore permanent fencing to an equal or better condition.

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

Where necessary, the governing slopes indicated herein may be varied from the limits shown, to the extent approved.

All driveway openings will be determined by the Engineer and will conform with Texas Department of Transportation "Regulations for Access Driveways to State Highways" adopted September 1953, and revised June 2004.

Locations and lengths of all private entrances are approximate only. The actual locations, lengths, lines and grades are to be determined by the Engineer and shall conform to the regulations of The City of Fort Worth.

Do not discolor or damage existing curb and curb and gutter during construction operations. In the event of discoloration or damage, clean or repair as directed.

Remove the grass from the crown of shoulders or pavement edges by blading or other approved methods. Payment for this work will not be made directly, but will be subsidiary to the various items of the contract.

Provide temporary drain openings at all low points or other drainage structures, as required, at the Contractor's expense.

Control: 0902-90-207, ETC.

County: TARRANT

Highway: HULEN ST., ETC.

Remove any obstructions to existing drainage due to the contractor's operations, as required, at the Contractor's expense.

Utility Coordinating:
The Contractor is advised of the UCC one call numbers which must be called 48 hours in advance. Fort Worth waterline locates can be requested thru 811. For location of street light cables, call the City Call Center at 817-392-8100 Monday thru Friday from 7:00 am to 6:00 pm and Saturdays from 7:00 am to 4:00 pm. Contractor to provide the Initial transmittal numbers which are to be indicated on the first daily inspection report.

Item 2 – Instructions to Bidders

Proposals with a bid of more than 171 working days for the substantial completion of the project will be considered unresponsive.

Item 4 – Scope of Work

Reimbursement for project overhead will not be considered until project completion has extended beyond the original Contract Time.

Item 5. Control of the Work

When supplementary bridge plans, shop drawings, shop details, erection drawings, working drawings, forming plans, or other drawings are required, prepare and submit drawings on sheets 8-1/2 by 11 inches, 17 by 22 inches, or full size drawings reduced to half scale if completely legible. If, in the opinion of the Engineer, the drawings are not completely legible, prepare and submit on sheets 22 by 34 inches, with a 1-1/2 inch left margin, and 1/2 inch top, right, and bottom margins.

Submit all sheets with a title in the lower right hand corner. The title must include the sheet index data shown on the lower right corner of the project plans, name of the structure or element or stream, sheet numbering for the shop drawings, name of the fabricator and the name of the Contractor.

Standard Operating Procedure for Alternate Precast Proposal Submission" found online at:
https://www.txdot.gov/inside-txdot/forms-publications/consultants-contractors/publications/bridge.html#design. Acceptance or denial of an alternate is at the sole discretion of the Engineer. Impacts to the project schedule and any additional costs resulting from the use of alternates are the sole responsibility of the Contractor.

Item 6. Control of Materials

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

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

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

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

Item 7. Legal Relations and Responsibilities

This contract requires work to be done on railroad property. Cooperate with the railroads and comply with all of their requirements including obtaining any required training before performing work on railroad property.

Submit to the Engineer an original railroad liability insurance policy.

Do not initiate activities in a project specific location (PSL) associated with a U.S. Army Corps of Engineers (USACE) permit area that has not been previously evaluated by the USACE as part of the permit review of this project. Such activities include, but are not limited to haul roads, equipment staging areas, borrow and disposal sites. "Associated" as defined here means materials are delivered to or from the PSL. The permit area includes all waters of the U.S. or associated wetlands affected by activities associated with this project. Special restrictions may be required for such work. The contractor will be responsible for all consultations with the USACE regarding activities, including project specific locations (PSLs) that have not been previously evaluated by the USACE. Provide the Department with a copy of all consultations or approvals from the USACE prior to initiating activities.

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

Control: 0902-90-207, ETC.

County: TARRANT

Highway: HULEN ST., ETC.

Document and coordinate with the USACE, if required, prior to any excavation hauled from or embankment hauled into a USACE permit area by either (1) or (2) below.

(1) **Restricted Use of Materials for Previously Evaluated Permit Areas.** Document both the project specific location (PSL) and its authorization. Maintain copies for review by the Department or any regulatory agency. When an area within the project limits has been evaluated by the USACE as part of the permit process for this project:
   a. Suitable excavation of required material in the areas shown on the plans and cross sections as specified in Item 110 is used for permanent or temporary fill (Item 132, Embankment) within a USACE permit area;
   b. Suitable embankment (Item 132) from within the USACE permit area is used as fill within a USACE evaluated area; and,
   c. Unsuitable excavation or excess excavation ["Waste"] (Item 110) that is disposed of at a location approved by the Engineer within a USACE evaluated area.

(2) **Contractor Materials from Areas Other than Previously Evaluated Areas.** Provide the Department with a copy of all USACE coordination or approvals prior to initiating any activities for an area within the project limits that has not been evaluated by the USACE or for any off right of way locations used for the following, but not limited to haul roads, equipment staging areas, borrow and disposal sites:
   a. Item 132, Embankment, used for temporary or permanent fill within a USACE permit area: and,
   b. Unsuitable excavation or excess excavation ["Waste"] (Item 110, Excavation) that is disposed of outside a USACE evaluated area.

The total area disturbed for this project is 0.08 acres. The disturbed area in this project, all project locations in the Contract, and the Contractor project specific locations (PSLs), within 1 mile of the project limits, for the Contract will further establish the authorization requirements for storm water discharges. The Department will obtain an authorization to discharge storm water from the Texas Commission on Environmental Quality (TCEQ) for the construction activities shown on the plans. The Contractor is to obtain required authorization from the TCEQ for Contractor PSLs for construction support activities on or off the right of way. When the total area disturbed in the Contract and PSLs within 1 mile of the project limits exceeds 5 acres, provide a copy of the Contractor NOI for PSLs on the right of way to the Engineer and to the local government that operates a separate storm sewer system.

When a bridge deck is milled, seal coated and overlaid, remove excess material. Do not just broom to the sides of the bridge, under guardrail, etc. Cover or protect all sealed expansion joints and rails on bridges and all railroad tracks encountered as

approved. Clean and repair all of these features if they weren't properly protected at contractor's expense. This work is subsidiary work to applicable bid items.

Prevention of Migratory Bird Nesting

It is anticipated that migratory birds, a protected group of species, may try to nest on bridges, culverts, vegetation, or gravel substrate, at any time of the year. The preferred nesting season for migratory birds is from February 15 through October 1. When practicable, schedule construction operations outside of the preferred nesting season. Otherwise, avoid nests containing migratory birds and perform no work in the nesting areas until the young birds have fledged.

Structures

Do not begin bridge and culvert construction operations until swallow nesting prevention is implemented, until after October 1 if it's determined that swallow nesting is actively occurring, or until it's determined swallow nests have been abandoned. If the State installed nesting deterrent on the bridges and culverts, maintain the existing nesting deterrent to prevent swallow nesting until October 1 or completion of the bridge and culvert work, whichever occurs earlier. If new nests are built and occupied after the beginning of the work, do not perform work that can interfere with or discourage swallows from returning to their nests. Prevention of swallow nesting can be performed by one of the following methods:

1. By February 15 begin the removal of any existing mud nests and all other mud placed by swallows for the construction of nests on any portion of the bridge and culverts. The Engineer will inspect the bridges and culverts for nest building activity. If swallows begin nest building, scrape or wash down all nest sites. Perform these activities daily unless the Engineer determines the need to do this work more frequently. Remove nests and mud through October 1 or until bridge and culvert construction operations are completed.

2. By February 15 place a nesting deterrent (which prevents access to the bridge and culvert by swallows) on the entire bridge (except deck and railing) and culverts.

No extension of time or compensation payment will be granted for a delay or suspension of work caused by nesting swallows. This work is subsidiary to the various bid items.

The following Holiday/Event lane closure restriction requirements apply to this project:

No work that restricts or interferes with traffic shall be allowed between 3 PM on the day preceding a Holiday or Event and 9 AM on the day after the Holiday or Event.

Control: 0902-90-207, ETC.

County: TARRANT

Highway: HULEN ST., ETC.

Holiday Lane Closure Restrictions	
New Year's Eve and New Year's Day (December 31 through January 1)	3 PM December 30 through 9 AM January 2
Easter Holiday Weekend (Friday through Sunday)	3PM Thursday through 9 AM Monday
Memorial Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Independence Day (July 3 through July 5)	3 PM July 2 through 9 AM July 6
Labor Day Weekend (Friday through Monday)	3 PM Thursday through 9 AM Tuesday
Thanksgiving Holiday (Wednesday through Sunday)	3 PM Tuesday through 9 AM Monday
Christmas Holiday (December 23 through December 26)	3 PM December 22 through 9 AM December 27

Plan work schedules around the appropriate dates above to ensure productive work is performed without lane closures.

Event Lane Closure Restrictions

3 PM the day before Event to 9 AM the day after the Event

Within one mile radius of major retail traffic generators i.e. malls (Thanksgiving Day through January 2)

Item 8. Prosecution and Progress

Working days will be computed and charged in accordance with Section 8.3.1.1. "Five-Day Workweek."

The number of working days for final acceptance will be 171 working days.

Use Critical Path Method (CPM) schedule in P6 format for this project. Submit the baseline schedule and obtain approval prior to beginning construction. The baseline schedule working days will be the same as the number of working days established by the Contract. The Estimate will be held if a monthly schedule update is not submitted. Also submit the XER file.

Item 100. Preparing Right of Way
Measurement for this item will be along the centerline of the project with the limits of measurements as shown on the plans.

Removal of existing concrete pavement will be in accordance with Item 104, "Removing Concrete" except that this work will not be paid for directly, but will be subsidiary to Item 100, "Preparing Right of Way."

Item 162. Sodding for Erosion Control

Furnish and place Bermudagrass sod.

Item 168. Vegetative Watering

Furnish and install an approved rain gauge at the project site, as directed. Furnishing and installation of the rain gauge will not be paid for directly, but will be subsidiary to Item 168.

Apply vegetative watering for an establishment period of thirteen weeks following application of seed or installation of sod, at a rate of 1/2 inch of water depth per week (approximately 13,030 gallons per acre). During the first four weeks after seeding, apply water twice per week, on non-consecutive days, each at half the weekly application rate. For the remainder of the establishment period, apply vegetative watering once per week during the months of January through June or September through December, at the weekly application rate; apply watering twice per week, on non-consecutive days during the months of July and August, each at one-half the weekly application rate.

Average weekly rainfall rates for the District are:

January—0.39"	April—0.86"	July—0.48"	October—0.68"
February—0.46"	May—1.00"	August—0.47"	November—0.46"
March—0.48"	June—0.63"	September—0.74"	December—0.37"

Item 360. Concrete Pavement

When using the Hardy Chair-Lok to support reinforcing steel, chair spacing may be increased to 1.67 sq. yd. per chair, placed in a diamond or square pattern. Do not exceed 60" longitudinal spacing.

The provisions of Article 360.6.2, "Deficient Thickness Adjustment," will not be a requirement and the pavement will not be cored.

Control: 0902-90-207, ETC.

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Highway: HULEN ST., ETC.

Include the approved mix design number on each delivery ticket.

Item 502. Barricades, Signs, and Traffic Handling

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 typically 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.

Permanent signs may be installed when construction in an area is complete and they will not conflict with the traffic control plan for the remainder of the job.

Existing signs are to remain as long as they do not interfere with construction and they do not conflict with the traffic control plan.

Any sign not detailed in the plans but called for in the layout will be as shown in the current "Standard Highway Sign Designs for Texas".

When traffic is obstructed, arrange warning devices in accordance with the latest edition of the "Texas Manual on Uniform Traffic Control Devices".

Cover or remove any work zone signs when work or condition referenced is not occurring.

Do not place barricades, signs, or any other traffic control devices where they interfere with sight distance at driveways or side streets. Provide access to all driveways during all phases of construction unless otherwise noted in the plans or as directed.

Item 506. Temporary Erosion, Sedimentation, and Environmental Controls

The SW3P for this project will consist of using the following items as directed:

- Erosion control logs

Remove accumulated sediment or replace SW3P controls when the capacity has been reduced by 50% or when the depth of sediment at the control structure exceeds one foot.

Control: 0902-90-207, ETC.

County: TARRANT

Highway: HULEN ST., ETC.

Items 530 And 531. Intersections, Driveways and Turnouts, and Sidewalks

The furnishing and installation of the sand cushion in proposed sidewalks, sidewalk ramps, and driveways will not be paid for directly but will be subsidiary to this bid item.

Item 666. Reflectorized Pavement Markings with Retroreflective Requirements

Collection of retroreflectivity readings using a mobile retroreflectometer is the preferred method. If retroreflectivity readings are collected using a portable or handheld unit, then measurement is defined as a collective average of at least 20 readings taken along a 200-foot test section. A minimum of three measurements will be required per mile of roadway. Measurements collected on a centerline stripe will be averaged separately for stripe in each direction of travel. A TxDOT inspector must witness the calibration and collection of all retro-reflectivity data.

Item 6001. Portable Changeable Message Signs

Provide all portable changeable message signs and arrow panels with a photoelectric device to allow for automatic dimming of operations to approximately 50% of their normal brightness when ambient light drops to approximately five footcandles, and then increase back again for daytime operations.

4 electronic portable changeable message sign unit(s) will be required. Individual or collective use of signs will be required by the Engineer when deemed necessary to supplement the traffic control plan.

Each sign must have programmed in its permanent memory the following 15 messages:

1. Exit Closed Ahead
2. Use Other Routes
3. Right Lane
4. Left Lane
5. Closed Ahead
6. Two Lane
7. Detour Ahead
8. Thru Traffic
9. Prepare To Stop
10. Merging Traffic
11. Expect 15 Minute Delay
12. Max Speed ** MPH
13. Merge Right

Control: 0902-90-207, ETC.

County: TARRANT

Highway: HULEN ST., ETC.

14. Merge Left
15. No Exit Next ** Miles

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

In addition to the shadow vehicles with truck mounted attenuator (TMA) that are specified as being required on the traffic control plan for this project, provide 1 additional shadow vehicle(s) with TMA for TCP (1-4)-18 as detailed on General Note of this standard sheet.

Therefore, 4 total shadow vehicles with TMA will be required for this type of work. Determine if one or more of these operations will be ongoing at the same time to determine the total number of TMAs needed for the project.

General Notes

Division 01 – General Requirements

General:

1. The Contractor shall be responsible for locating all utilities, whether public or private, prior to excavation. The information and data shown with respect to existing underground facilities at or contiguous to the site is approximate and based on information furnished by the owners of such underground facilities or on physical appurtenances observed in the field. The City and Engineer shall not be responsible for the accuracy or completeness of any such information or data. The Contractor shall have full responsibility for reviewing and checking all such information or data, for locating all underground facilities, for coordination of the work with the owners of such underground facilities during construction and for the safety and protection thereof and repairing any damage thereto resulting from the Work. This Work shall be considered as a subsidiary item of Work, the cost of which shall be included in the price bid in the Proposal for various bid items. The Contractor shall notify any affected owners (utility companies) or agencies in writing at least 48 hours prior to construction.
    a. Notify TEXAS 811 (*1-800-DIG-TESS or www.texas811.org*) to locate existing utilities prior to construction.
    b. Caution! Buried electric lines may exist along this project. Contact electrical providers 48 hours prior to excavation :
        - *Oncor Nicholas A. Britain 682-362-5606*

    c. Caution! Buried gas lines may exist along this project. Contact *Atmos Energy* 48 hours prior to excavation, and within two (2) hours of encountering a gas line (*Corney Wiebe 682-201-0337*)
    d. Caution! Buried communication cables may exist along this project. Contact communication companies 48 hours prior to excavation:
        - *AT&T James W. LeCompte 682-225-0992*
        - *Spectrum Sherri Trahan 817-271-8108*
        - *Verizon Bryant Sanchez 469-670-8399*
    e. Caution! When doing work within 200 feet of any signalized intersection, the Contractor shall notify Traffic Management Division of City of Fort Worth T/PW, 72 hours prior to excavation (*Aziz Rahman: 817-392-8653*). The Contractor shall protect existing signal hardware, ground boxes, detection loops, and underground conduit at signalized intersections. Any damages at signalized intersections shall be replaced at the expense of the Contractor. The Contractor shall contact the City at 817-392-8100 to perform conduit line locates at signalized intersections 72 hours prior to commencing work at the intersection.
    f. The Contractor shall notify the City of Fort Worth Project Manager 48 hours prior to the start of any excavation (*Fanta Kaba: 817-682-3181*)
2. The location of all driveways, retaining walls, structures, etc. which may be shown on these plans are approximate. The Contractor shall verify the exact size, location, elevation, and configuration of all structures prior to construction.
3. Protect concrete curb and gutter, driveways, and sidewalks that are not designated for removal. Removal and replacement of these items shall be as designated in the drawings.
4. Contractor shall be responsible for maintaining the general safety at and adjacent to the project area, including the personal safety of public and private property. Contractor shall provide temporary sanitary sewer facilities to affected property owners, if necessary per Section 01 50 00 Temporary Facilities and Controls. Not a separate pay item.
5. Contractor's personnel shall have identifying clothing, hats or badges at all times which identify the Contractor's name, logo or company.
6. The contractor shall distribute notices (Door Hanger) to all affected property owners prior to beginning work on each property per Section 01 35 13.
7. The Contractor shall video all potentially impacted private property areas prior to work. Videos shall include date, notation, and audio identification of property address and main/lateral name and station number. This pre-construction video of impacted properties shall be considered subsidiary work per Section 01 32 33 Preconstruction Video.
8. Contractor's personnel shall have identifying clothing or hats at all times. The contractor shall also have identification on all vehicles.
9. Construction activities shall be limited to the hours of 7:00 AM to 6:00 PM Monday thru Friday unless approved or directed by the City. At the pre-construction meeting, the Contractor shall provide a construction schedule in accordance with Section 01 32 16, and provide monthly updates along with the progress payment per General Conditions, Section 00 72 00, Article 6.04. Any proposed work beyond regular working hours will require written request by the Contractor per General Conditions, Section 00 72 00, Article 6.02.
10. Shop drawings shall be submitted to the City Inspector, City Project Manager at the pre-construction meeting for review. Any construction activity, materials, etc. that are identified by the City as non-compliant with the standard details and specifications shall be removed and replaced with materials that conform with the standard details and specifications at the contractor's expense. Reference Section 01 33 00 Submittals and Section 01 60 00 Product Requirements, and the General Conditions.
11. The Contractor is responsible for keeping streets and sidewalks adjacent to project free of mud and debris from the construction per Section 01 74 23. Work associated with this item is considered subsidiary to various items bid.
12. The Contractor shall clean up and restore the area of operations to a condition as good as or better than that which existed prior to work, per Section 01 74 23.
13. Prior to scheduling the Project Final, the Contractor shall provide redlines, cut sheets, final approved pipe shop drawings, CCTV video/reports, liner results, etc., Pipe Report and Service Report per Sections 01 77 19, 01 78 39, and 33 01 31 to the City for review, revisions, and final acceptance.
14. When it is required that a Contractor work or enter private property, the Contractor shall contact the property owner 48 hours prior to construction per Section 01 11 00. Do not store equipment or material on private property unless and until the specified approval of the property owner has been secured in writing by the Contractor and a copy furnished to the City.
15. The contractor shall remove from the project area all surplus material. This shall be incidental and not a separate pay item. Surplus materials from excavation including dirt, trash, etc. shall be properly disposed of at a site acceptable to the City's Flood Plain Administrator if within the City limits. If the location is not within the City limits, the Contractor shall provide a letter stating so. Surplus material may not be placed in natural drainage way without written permission from the affected property owner and the City's Flood Plain Administrator. If the Contractor places excess material in the areas without written permission, Contractor shall responsible for all damage resulting from such fill and shall remove the material at their own cost.

16. Costs associated with proposed connections to existing facilities shall be included in each respective bid item, if no specific bid item is included. No separate pay, except as specifically indicated within these plans or the contract documents.
17. Contractor shall contact local schools prior to beginning construction to inform Principals and Administrators of construction in the area. A note on the school marquee is suggested to inform parents and students of construction, construction duration, and possible alternative routes around construction sites. One lane shall remain open at all times, and all lanes of traffic shall be open up at the end of each work day.
18. Street Use permit shall be submitted per Section 01 55 26 to the City Inspector and TPW for work in City ROW.
19. The Contractor shall remove all fences, located within easements, interfering with construction operation and provide temporary fencing during construction. Removed fences, wooden or chain link, shall be replaced with a new fence or undamaged original fencing. All affected property owners shall be notified prior to construction. Removal and replacement of existing and temporary fences per Section 01 11 00 Summary of Work, shall be considered subsidiary to the project cost and reflected in the unit bid prices for various items listed in the proposal.

Division 02 – Existing Conditions

1. No separate pay item will be made for the removal and disposal of existing public facilities (pipes, valves, etc.) within a proposed utility trench unless otherwise indicated within the project specifications. Items to be removed or abandoned outside of a proposed utility trench shall be paid as a separate pay item per Section 02 41 14.
2. Contractor shall protect concrete curb and gutter, driveways, and sidewalks that are not designated for removal. Removal and replacement of these items shall be as designated.
3. The Contractor shall preserve and protect or remove and replace when shown on the plans (with prior approval of City Parks and Community Services and/or affected property owners) all trees, shrubs, hedges, retaining walls, landscaping, buildings, walks, etc. in or near proposed construction area. If specific bid item(s) are not included, this work shall be considered incidental and not a separate pay item.
4. Where applicable, two (2) permanent painted drive addresses must be installed at the base of the curb on each side of every driveway. Address signs shall be posted in a position to be plainly visible and legible. Numbers shall be at least 3-inches in height and contrast.
5. Contractor shall not crack, break, mar, or otherwise damage tile street name markers. In the event a tile street name marker is located in an area of construction and cannot be protected, contractor should remove the section of curb and gutter containing the full tile street name marker. Contractor shall replace the full section of the curb and street marker.

Division 03 – Concrete

1. Horizontal blocking for water lines has been omitted for clarity. However, blocking shall be constructed and shop drawings submitted to the City Inspector for review, in accordance with Section 03 30 00.

Division 31 – Earthwork

1. The contractor must review and maintain a copy of the storm water pollution prevention plan with all conditions, attachments, exhibits, and permit modifications in good condition at the construction site. The complete permit must be available for review upon request.
2. Erosion control measures may only be placed in front of inlets, or in channels, drainage ways, or borrow ditches at risk of contractor. Contractor shall remain liable for any damage caused by the measures, including flooding damage, which may occur due to blocked drainage. At the conclusion of any project, all channels, drainage ways, and borrow ditches in the work zone shall be dredged of any sediment generated by the project or deposited as a result of erosion control measures.
3. The contractor shall comply with all federal, state, and local erosion, conservation, and siltation ordinances. The contractor shall use sediment filters or other measures approved by the engineer and construction manager to prevent silt and construction debris from clogging storm sewer pipes or proposed or existing inlets, or from being transported to adjacent properties and street right-of-ways. All erosion control devices shall be installed prior to site disturbance and shall remain in place until final grading and paving is complete and permanent soil stabilization is achieved.
4. Construction operations shall be managed so that as much of the site as possible is left covered with existing topsoil and vegetation.
5. All slopes and areas disturbed by construction shall be graded smooth. Sodding or seeding shall be per Sections 32 92 13 “Sodding” or 32 92 14 “Non-Native Seeding”, respectively.
6. Contractor shall construct a stabilized construction entrance at all primary points of access. Contractor is responsible for ensuring that all construction traffic utilizes the stabilized entrance at all times for ingress and egress to the site.
7. Site entry and exit locations shall be maintained in a condition which shall prevent tracking or flowing of sediment onto public roadways. All sediment spilled, dropped, washed, or tracked on a public roadway shall be removed immediately. When washing is required to remove sediment prior to entrance to a public roadway, it shall be done on an area stabilized with crushed stone which drains into an approved sediment basin. All fines imposed for tracking onto public roads shall be paid by the contractor.

8. Contractor is responsible for proper maintenance of the required erosion control devices throughout the entire construction process. Erosion controls shall be repaired or replaced as inspection deems necessary, or as directed by the owner's representative. Accumulated silt in any erosion control device shall be removed and shall be distributed on site in a manner not contributing to additional siltation. The contractor is responsible for re-establishing any erosion control device which is disturbed.
9. Before any earthwork is done, the contractor shall stake out and mark the limits of construction and other items established by the plans. The contractor shall protect and preserve control points at all times during the course of the project. The grading contractor shall provide all necessary engineering and surveying for line and grade control points related to earthwork.
10. Contractor staging area to be agreed upon by owner prior to beginning construction.
11. Take appropriate measures to preserve wildlife in accordance with applicable federal, state and local guidelines.

Division 32 – Exterior Improvements

General:

1. At locations where the curb and gutter are to be replaced, the Contractor shall assume all responsibility for the re-establishment of existing street and gutter grades. If bid item from Construction Staking is not included, establishment of grades shall be considered as a subsidiary item of Work, the cost of which shall be included in the price bid in the Proposal for various bid items.
2. All driveways, which are open cut, shall have at least a temporary driving surface at the end of each day. The temporary surface shall be considered as a subsidiary item of Work. The cost of which shall be included in the price bid in the Proposal for various bid items.
3. Contractor shall verify with City Project Manager the location of all City owned parkland associated with and adjacent to the project and City owned land that is maintained by PARD. Additionally, the Contractor may need a separate agreement in order to access City parkland for staging and/or construction. Contact Park Planner at 817-392-5764 to verify need for separate agreement.

Sidewalks and Curb Ramps:

1. The curb ramp standard details are intended to show typical layouts for the construction of the curb ramps. The information shown on the standard details meet the requirements shown in the "2012 Texas Accessibility Standards" (TAS) and the "2010 ADA Standards for Accessible Design" by the Department of Justice.
2. The Contractor may not make changes to the sidewalk and curb ramp layout without approval of the City. The Contractor may propose changes to the sidewalk and curb ramp layout due to field conditions, but any proposed changes must be approved by the City.
3. Landings shall be provided at the top or bottom of curb ramps, as shown on drawings. The landing clear length shall be 5 feet minimum from the end of ramp. The landing clear width shall be at least as wide as the curb ramp, excluding flares. The landing shall have a maximum slope of 2% in any direction.
4. Counter slopes of adjoining gutters and road surfaces immediately adjacent to the curb ramp shall not be steeper than 5% (20:1) in any direction.
5. Contractor shall protect concrete curb and gutter, driveways, and sidewalks that are not designated for removal. Removal and replacement of these items shall be as designated. At locations where the curb and gutter are to be replaced, the contractor shall assume all responsibility for the re-establishment of existing street and gutter grades. Establishment of grade shall be performed prior to construction and is not a separate pay item, but shall be considered incidental to the project price.
6. All driveways, shall have at least a temporary riding surface at the end of each day. The temporary surface will be considered a non-pay item.
7. Contractor shall saw cut existing curb and gutter, pavement, driveways, sidewalks at areas where pavement or concrete is to be removed. Saw cutting shall be considered subsidiary to the item being installed.
8. Contractor shall provide compacted subgrade as needed to repair damaged drives, streets, walks, and patios.

Park & Recreation Department (PARD) Notes: Pertains to all work in and through City parkland, land managed and maintained by PARD including right-of-way, medians, roundabouts, corner cuts, parkways**,** and may pertain to work adjacent to City parkland

City Parks (Contact Park Planner 817-392-5764):

1. All proposed utility improvements outside of a recorded easement(s) and located in and/or through a park shall require parkland conversion in accordance to State of Texas, Parks and Wildlife Code Chapter 26.
2. **Construction equipment and/or staging, materials storage, and materials testing may not occur on City parkland without prior written approval from PARD.**
3. **Prior to beginning work on parkland, contact PARD at 817/392-5764, to schedule an on-site meeting to locate PARD utilities, tree protection, and parkland fencing. Provide 72-hours minimum notice.**
4. Install fencing at park property line to protect parkland. Fencing to remain until construction completed.
5. All disturbance to existing soil, vegetation, irrigation, or equipment on must be repaired or replaced to existing pre-construction conditions or better at no additional cost to PARD.
6. Soil shall be free of construction debris and rocks greater than 1-inch. Backfill with clean soil prior to seeding or sodding. (Refer to 32 91 19, 32 92 13 and 32 92 14)

7. Turf installation must comply with CFW Standard Construction Specification Documents 32 92 13-Sodding and/or 32 92 14-Non-Native Seeding.

8. Upon request, the contractor shall provide to PARD a copy of certifications on soil, sod, seeding, and hydromulching prior to installation; along with the delivery ticket. (Refer to 32 92 13 and 32 92 14

9. All erosion control materials and fencing to be removed, including silt fence and tree protection, at completion of project.

City Trees (Contact City Forester 817-392-5729, 817-392-5739):

10. Per Chapter 33, Park & Recreation-Forestry Section (PARD-Forestry) has jurisdiction over trees on city-owned property including right-of-way. **Approval of plans does not constitute approval to proceed with work until corresponding permit has been issued.** Permits for removal, planting or pruning of city-owned trees shall be obtained from PARD-Forestry. Pruning required for preconstruction purposes requires the utilization of an ISA-Certified Arborist, as stated in the permit, at no expense to PARD. Contact PARD-Forestry: www.fortworthtexas.gov/departments/parks/services/forestry or CityTreePermits@fortworthtexas.gov or 817/392-5729 or 817/392-5739.

    a. **Tree protection** shall be put in place **before grading/construction begins**, be inspected by City Forester and remain until completion of the project.

        i. 4-foot tall, chain link fencing installed at the tree dripline with bilingual sign on protective fencing in English and Spanish that reads, “Keep Out, Tree Protection Area” (“No Entre, Área de Protección de Árboles”).

        ii. No entry, grading, excavation, parking or storing of equipment or supplies inside the protective tree fencing without City Forester approval.

        iii. All work inside protective tree fencing to be done by hand, unless prior approval given by City Forester.

        iv. Roots 2-inch or larger shall not be cut without City Forester approval. Roots shall be clean cut with a saw.

        v. All cuts on oak trees, including roots, shall be painted with general purpose spray paint within 30 minutes of exposure to prevent oak wilt spread.

    b. **Assessment of Damages to Trees**

        i. The Contractor will check trees in the contract area before contract work begins, any damage will be noted and reported to the Contract Administrator.

        ii. The Contract Administrator will conduct random checks of the trees during the contract period.

        iii. A check of all trees may be made at the end of the contract period. City Forester, Contract Administrator, and Contractor will attend the inspection.

        iv. Damages shall be documented by memo to the City Forester with copy to contract file and the Contractor.

        v. Contractor may have the option of replacement or payment for severely damaged trees at a location to be designated by PARD. Replacement shall be made on a caliper inch per caliper inch basis with a minimum size of replacement tree of 2-inch in caliper for trees damaged or removed which are less than 30-inch DBH and 2-inch per inch for trees which are 30-inch DBH or greater. The Contractor shall be responsible for the planting, watering, mulching and maintenance of replacement trees for a period of not less than 2-years. Any tree that does not survive the 2-year establishment period shall be compensated for by the Contractor to Tree Fund at a rate of $200 per caliper inch.

        vi. Slight damage shall be defined, in the opinion of the City Forester, as damage that may compartmentalize. Examples include but are not limited to: scarring of the trunk into the cambial layer Y ' to 2-inch in width, but less than 1 /3 trunk circumference; or breaking of limbs less than 2-inch in diameter or limbs less than 1 /3 trunk caliper, whichever is less. Slight damage shall also include: removal or laying down of protective tree fencing prior to end of construction; storing equipment or supplies within the critical root zone (CRZ); or disposing of paint or concrete within the CRZ, but not closer to the trunk than 50% radius of the CRZ. Slight damage to trees shall be assessed at a rate of $100.00 for each instance. Each day tree fencing is not properly placed, equipment or supplies are stored within CRZ, or fill is stored within the CRZ shall be considered one instance.

        vii. Moderate damage shall be defined, in the opinion of the City Forester, as damage that contributes to the poor health and reduced longevity of the tree. Examples include, but are not limited to: scarring of the trunk into the cambial layer greater than 2-inch, but less than 1 /3 the trunk circumference; or breaking of limbs more than 2-inch in diameter, but less than 1/3 trunk caliper. Moderate damage shall also include: compaction of soil; grading or filling in 20% of the CRZ on 1 of 4 sides, but outside the 50% radius of the CRZ; or disposing of paint or concrete within 50% radius of the CRZ. Moderate damages shall be calculated at a rate of % the assessed value of the tree per each instance of damage.

        viii. Severe damage or removal of trees is subject to penalty of $200 per diameter inch of trees removed or damaged for trees less than 30-inch DBH or $400 per diameter inch for trees 30-inch DBH or greater. Severe damage or removal shall include, but is not limited to: scarring of the trunk to the cambial layer greater than 1/3 the trunk circumference; uprooting or causing a tree to lean; or damage to a scaffolding branch or any branch greater than 1/3 of trunk caliper. Severe damage shall also include: compaction of soil, grading or filling more than 20% of the CRZ, or within 50% radius of the CRZ, or on more than one of 4 sides. Cutting 1 /3 of the buttress roots within 3 times the distance of the DBH of the trunk, or cutting 4 roots 4-inch or greater in diameter within 4-feet of the trunk shall also be considered severe damage.

ix. Branches shall be measured at the point of attachment or at the lateral to which the branch would be pruned back to according to ANSI standards. Trees caliper shall be measured according to accepted industry standards. Trees greater than 6-inch in caliper shall be measured using diameter at breast height (DBH). Trees that must be removed due to damage caused by the Contractor shall be removed by the Forestry Section's tree removal contractor at the Contractor's expense.

x. AII damages shall be paid to the City Tree Fund. Failure to replace or pay for damaged trees shall result in a breach of contract and the Contractor will be automatically assessed damages. Damages as described herein shall be deduced from payments otherwise due the Contractor.

Landscaping and Irrigation (Contact Park Planner 817-392-5479):

11. All planting material shall be warrantied for a period of two years. A Maintenance bond shall be posted for all landscaping materials (hardscapes, irrigation, plantings).

12. All plant identification tags must remain on plant materials for PARD inspection. Contact PARD 72-hours in advance for inspection of tree and landscape plantings.

13. Irrigation systems must comply with Texas Commission on Environmental Quality (TCEQ) Title 30, Texas Administrative Code (TAC) Chapter 344, Rules for Landscape Irrigation and City of Fort Worth Texas Ordinance number 18444-01-2009. Any irrigation system that is connected to a public or private potable water supply must be connected through an approved backflow prevention assembly, and must be tested upon installation, or repair by a licensed Backflow Prevention Assembly Tester (BPAT) who is registered with the City of Fort Worth Water Department. For additional information regarding permitting, contact Development Services Customer Services 817-392-2222.

    a. Once irrigation lines have been inspected, approved and ‘green tag’ has been supplied, trees and planting materials can be installed.

    b. If existing median is altered, contact PARD 72 hours in advance for inspection of all irrigation lines, depth, and pressure PRIOR to backfilling. Contact 817-392-5479.

Right-of-Way including parkways, medians, corner clips, roundabouts maintained by PARD (Contact Park Planner 817-392-5479):

14. Sod shall be replaced in all areas disturbed by construction. Sod shall match existing grasses, per Section 32 92 13.

15. Soil shall be free of construction debris and rocks greater than 1-inch. Backfill with clean soil prior to seeding or sodding. (Refer to 32 91 19, 32 92 13 and 32 92 14)

16. Turf installation must comply with CFW Standard Construction Specification Documents 32 92 13-Sodding and/or 32 92 14-Non-Native Seeding.

17. Upon request, the contractor shall provide to PARD a copy of certifications on soil, sod, seeding, and hydromulching prior to installation; along with the delivery ticket. (Refer to 32 92 13 and 32 92 14)

18. All disturbance to existing soil, vegetation, or irrigation must be repaired or replaced to existing pre-construction conditions or better at no additional cost to PARD.

19. Construction equipment and/or staging, materials storage, and materials testing may not occur on existing medians maintained by PARD without prior written approval from PARD.

20. Pre-existing medians/ROWs within construction confines shall be maintained by Contractor for high grass and weeds every 14 days until construction complete and City acceptance after Final.

21. New Medians/ROWs shall be watered, mowed, and maintained by Contractor until grass coverage is established per CFW Seed/Sod specifications prior to City acceptance.

Division 33 - Utilities

General:

1. When it is required that a Contractor work on private property within utility easements, the Contractor shall contact the property owner 48 hours prior to construction. Once the pipe has been installed or rehabilitated, the Contractor shall immediately commence surface restoration. Surface restoration must be completed to the owner’s satisfaction within ten (10) working days. Failure to maintain and/or complete site restoration, as noted above, may result in deferment of further pipe installation activities.
2. Existing vertical deflections and pipe slopes shown on the plans were obtained from record drawings and have not been field verified. Some pipeline slopes were adjusted to match surveyed manhole flow lines. Rim elevations, flow lines, and horizontal locations of existing manholes were determined from field survey. However, if conflicts with paving, additional fill, storm sewer, drainage headwalls, inlets, bridge piers, embankments, MSE walls, retaining walls, above ground structures, franchise utilities, etc. have been identified, the utilities in conflict shall be located and potholed using vacuum excavation method per Section 33 05 30 prior to construction of the main. Contractor shall provide all pothole data and other documentation of these conflicts (plans, shop drawings, survey data, etc.) to the City Inspector, Water Engineering, Water Field Operations, as plans shall be revised and submitted for review by the City in order to avoid a conflict.
3. Maintain all existing water and sewer connections to customers in working order at all times, except for brief interruptions in service for water and sewer services to be reinstated. In no case shall services be allowed to remain out of service overnight.

4. Provide and follow approved Confined Space Entry Program in accordance with OSHA requirements. Confined Spaces shall include manholes and all other confined spaces in accordance with OSHA's Permit required for Confined Spaces.
5. Only City prequalified Contractors, by appropriate Water Department work category, shall be allowed to adjust valve boxes, manholes, ring & covers, etc.
6. Contractor is responsible for all trench safety. The contractor shall construct the proposed work utilizing a trench safety plan prepared by a Licensed Professional Engineer in the State of Texas, for this project, in accordance with OSHA excavation safety standards, Federal and State requirements, per Section 33 05 10. A trench safety plan shall be submitted at the pre-construction meeting. This would also include a Ground Water Control Plan if conditions meeting criteria outlined in Section 33 05 10 exist.
7. All embedment and backfill shall be in accordance with specification 33 05 10. Contractor shall provide the embedment/backfill density test plan which outlines testing notification, frequency, testing lab, test methods, test result format, contact information etc. Contractor shall notify the City Inspector in writing to obtain samples and perform standard proctor test in accordance with ASTM D698. Upon commencing of backfill placement, Contractor shall schedule a demonstration of means and methods to obtain the required densities. Depth of lifts for backfill shall not exceed 12-inches. Test reports shall be posted within 48 hours. Includes the installation of the trench geotextile fabric and utility marker tape in accordance with Section 33 05 26. All pavement repair shall be per Sections 32 01 17, 32 01 18, and 32 01 29. All non-conforming work shall be removed and replaced.
8. Existing utility information is provided for information only. Although this data is shown as accurately as possible, the Contractor is cautioned that the City and the Engineer neither assumes nor implies any responsibility for the accuracy of the data.
9. Existing utility crossings shown on the profile are from reference plans, and from information obtained from the utility companies. It shall be the Contractor's responsibility to field verify the horizontal and vertical locations of the existing utilities.

Water:

1. Provide thrust restraint by means of restraining joints at fittings and concrete blocking. When specifically indicated on the Drawings, provide thrust restraint at designated joints beyond the fittings. Each method shall be capable of thrust restraint independent of the other system. The Contractor shall refer to City Standard Details for area required to install concrete blocking.
2. All ductile iron mechanical joint fittings shall be restrained to pipe using retainer glands.
3. Proposed water mains shall have a minimum cover of 48-inches cover above the top of pipe, unless shown otherwise on the drawings or details.
4. All water services shall be installed above storm sewers, except where shown otherwise in the drawings.
5. Elevation adjustment at connections may be made with bends, offsets, or joint deflections. Joint deflections shall not exceed fifty percent (50%) of manufacturer's recommendations.
6. Temporary pressure plugs required for sequencing of construction and testing of proposed water lines shall be considered subsidiary to the work and shall be included in the price bid in the Proposal for various bid items.
7. 12-inch diameter and smaller water mains shall be installed with a minimum cover of 48-inches and 16-inch and larger water mains shall be installed a minimum cover of 60-inches, measured from top of surface (existing and proposed) except where shown otherwise in these plans.
8. Valves shall be installed where designated on these plans in accordance and shop drawings provided to the City Inspector for review per Section 33 12 20. Vaults shall be installed on all mains 16-inch diameter and larger per Sections 33 12 20, 33 05 16, and 03 30 00.
9. Fire hydrants shall be a minimum of 3 ft. behind the back of curb (maximum 9 ft.) and in line with the property/lot lines except where shown otherwise in these plans. Construction and shop drawing submittals to the City Inspector per Section 33 12 40.
10. Contractor shall provide a cleaning plan and disinfection plan for 24-inch and larger water mains, prior to construction in accordance with Section 33 04 40, Part 1.5, Submittals. Insert cleaning pig in water main where directed. Cleaning pig shall be provided by Contractor in accordance with Section 33 04 40. Flushing is only permitted when specially designated in the Drawings, and the Contractor shall provide the plan submittals to the City Inspector, City Project Manager, Water Field Operations and Water Engineering for review at least 1 week prior to start of construction.
11. Install chlorination and sampling points at designated locations per Section 33 04 40.
12. Corporation stops shall be tested for full flow when the system is pressure tested. Construction and shop drawing submittals per Section 33 12 10.
13. All water mains crossing below storm sewer lines shall be ductile iron pipe per Section 33 11 10 and backfilled with CLSM per Section 03 34 13, unless noted otherwise.
14. Contractor shall provide pipe shop drawings in accordance with the Specifications. Detailed pipe shop drawings/lay schedule water mains 16-inch diameter and larger, signed and sealed by a Licensed Professional Engineer in Texas for Ductile Iron Pipe, Concrete, and Steel Pipe are required submittals before start of construction. Elevation adjustment at connections may be made with bends, offsets, or joint deflections (for example, PVC joint deflections not to exceed 50% of the manufacturer's recommendations per Section 33 11 12). Reference Ductile Iron, Concrete, and Steel Pipe per Sections 33 11 10, 33 11 13, 33 11 14, for the deflection requirements. Prior to scheduling the Project Final, the Contractor shall provide redlines, cut sheets, final approved pipe shop drawings, etc., Pipe Report and Service Report per Sections 01 77 19, 01 78 39, and 33 01 31 to the City for review, revisions, and final acceptance.
15. All non-standard bends shall be made by using the closest standard MJ fittings or fittings with the required joint deflections. Joint deflections and associated shop drawing submittals, shall be in accordance with Sections 33 11 10, 33 11 11, 33 11 13, and 33 11 14.
16. All existing ¾-inch water service lines shall be replaced with 1-inch type K copper service lines (per ASTM B88), with 1-inch corporation stops and if required 1-inch tapping saddle and 1-inch x ¾-inch reducer at the ¾-inch curb stop as directed by the Engineer. Shop drawings shall indicate flared copper tubing with thread dimensions per AWWA C800 and service saddles shall be double strap per Section 33 12 10.
17. All existing water meters shall be relocated 3 ft. behind the curb or as directed by the Engineer (Section 33 12 10).
18. The Contractor shall install a 2-inch temporary water service main per Section 33 04 30. Large domestic services (3-inch and larger) and fire lines shall require a larger main for temporary water service during construction.
19. All PVC water mains 12-inch diameter and smaller shall be DR-14 per Section 33 11 12. All ductile iron water mains shall be poly wrapped per Section 33 11 10, 33 11 11. Cathodic protection study is required on all pipes other than PVC. In accordance with the recommendations from the cathodic protection study, the drawings and specifications for cathodic protection shall apply.

20. All water mains shall have temporary plugs per Sections 33 04 40, 33 12 25 and detail at the end of each work day. Deflect water mains at joints to clear curb inlets. Minimum horizontal separation from outer wall of main to outer wall of inlet shall be 5 feet. Minimum horizontal separation from outer wall of main to outer diameter drilled shafts, and outer wall of headwalls shall be 10 ft.
21. Unless otherwise noted on the plans, the gate valves shall be installed to line up with the property/ROW line.
22. Contractor and City Inspector shall contact Water Field Operations prior to all items being removed or salvaged. Contractor shall provide the documents to the City Inspector for all items removed and salvaged to Water Field Operations Warehouse. Contact Warehouse Supervisor and deliver all salvaged materials to the Warehouse located at 1608 11th Ave. Fort Worth TX 76102.

Sanitary Sewer:

1. Verify that all connections to the sanitary sewer system are for sanitary sewer only. Notify City of any discovered illicit connections.
2. The Contractor shall be liable for all damages to properties, homes, and basements from backup, which may result during the installation of new pipe and/or abandonment of existing pipe. The Contractor will be allowed to open clean outs where available. The Contractor will be responsible for all clean up associated with opening clean outs.
3. For all sanitary sewer service connections at manholes, provide a hydraulic slide in accordance with the details.
4. The proposed sanitary sewer lines at times will be laid close to other existing utilities and structures both above and below ground. The Contractor shall make necessary provisions for the support and protection of all utility poles, gas mains, telephone cables, sanitary sewer mains, water mains, drainage pipes, utility services, and all other utilities and structures both above and below ground during construction. Contractor shall submit shop drawings at the pre-construction meeting per Section 01 33 00 for support/protection of large diameter water mains (16-inch and larger) and sanitary sewer mains (15-inch and larger) for review by City Inspector, Water Engineering, and Water Field Operations prior to construction in these areas. In addition, the Contractor shall submit a Contingency Plan and Emergency Plan to the same personnel which includes acceptable pipe materials on-site for repairs. The Contractor is liable for all damages to existing water and sanitary sewer mains as a result of the Contractor's operations.
5. Contractor shall conduct a Pre-Construction Television Inspection (CCTV) of all existing sanitary sewer lines, which are to be abandoned or rehabilitated via trenchless methods, to verify locations of all sanitary sewer service connections prior to construction of the entire project. Format of the CCTV video, plan exhibits, and report shall be in accordance with Section 33 01 31. Report shall clearly identify existing sanitary sewer main/lateral number, manholes, station number (from and to), street address, pipe size, pipe material, service locations, pipe material changes, etc. Copies of the CCTV video, layout, marked up plans showing limits, and report shall be provided to the City Inspector, City Project Manager, Water Engineering, and Water Field Operations, as the schedule shall allow for a review time of 2 weeks.
6. Contractor shall ensure that all active services can be reconnected and/or rerouted to the new sanitary sewer main/lateral per Section 33 31 50. Contactor shall notify the City Inspector, City Project Manager, Water Engineering, and Water Field Operations of any potential conflicts prior to construction, so modifications to the plans can be made if necessary. Not a separate pay item, as this work shall be subsidiary to the Pre-Construction Television Inspection of sanitary sewer lines.
7. Contractor shall bypass pump sewage around section of pipe prior to being replaced or rehabilitated per Section 33 03 10. Not a separate pay item for lines 15-inch diameter and smaller. Payment shall be incidental to the replacement of sewer.
8. New manholes shall be constructed such that the manhole cover is at finished surface grade, or as noted on the plans. Concrete collars per specification 33 05 13 and detail shall be installed with all new manholes (including manholes outside of pavement and/or on easements), as required for this project. Concrete collars identified in the field that are not in compliance with the specifications and details (i.e. incorrect collar thickness, no steel reinforcement) shall be removed and replaced at the Contractor's expense.
9. Sanitary Sewer Services larger than 6-inch diameter shall connect to a manhole. For all sanitary sewer service connections at the manhole, Contractor shall provide a hydraulic slide in accordance with Section 33 39 20 and standard detail.
10. Sanitary sewer manholes called out for interior corrosion protection shall conform to Section 33 39 60 Liner System for Sanitary Sewer Structures. This shall include manholes on mains with 3% or greater grade, all drop manholes, siphons, junction structures on large collector mains 15-inch diameter and larger, and other manholes where turbulence is an issue.
11. Odor control is required for all sanitary sewer manholes in City Park areas, public spaces, near residences, or other areas as determined by the City on mains 15-inch diameter and larger.

Storm Drain:

1. Maintain the existing storm drainage system until the proposed system is in service. In no case should the Contractor leave the existing storm drain out of service whereby runoff would cause damage to adjacent property.
2. Construct all drainage improvements from the downstream end to the upstream end to allow continued storm drain service. If the Contractor proposes to construct the system otherwise, the Contractor shall submit a sequencing plan to the City for approval.

Division 34 - Transportation

Traffic Signals:

1. Prior to activating traffic signals with new or revised signal timing, the contractor shall e-mail Aziz Rahman, Engineering Manager, at aziz.rahman@fortworthtexas.gov at least three (3) weeks in advance to schedule that.
2. If new cabinets and controllers are being installed and the controllers need to be programmed and tested by City Forces; the contractor shall deliver them to the City of Fort Worth, Signal Shop at 5001 James Ave., at least three (3) weeks in advance to schedule that. If a cellular modem is being installed, the contractor shall also deliver the modem with the cabinet to the City of Fort Worth Signal Shop so the modem can be activated prior to installation.
3. Unless there is a compelling reason with approval by the Traffic Signal Engineering Group, a new traffic signal will be put on flash on Thursdays and working colors the following Tuesday.
4. Switching from old traffic signal to a new one, this shall be done between Tuesday and Thursdays only.
5. Notify Traffic Management Division (817-392-7738) Project Representative at least 24-hours in advance of all concrete pours. Inspector must be present when concrete is placed on the project site.
6. **If applicable,** equipment supplied by the City will be available for pick up from the Transportation/Public Works (T/PW) Warehouse at 5001 James Avenue. The Project Representative must authorize all equipment pickups.

7. Contractor shall provide a 5-year manufacturer warranty on APS systems. The warranty documentation shall include the start date (when material is delivered to job site) and the end date of the warranty and the serial number of the equipment.
8. The City will not provide traffic signal cabinet or traffic signal controller to the Contractor. The cost for these items must be included in the City project budget, or for all privately funded projects, the cost must be included in the bid package for purchase from the vendor.
9. The Contractor shall provide all materials needed to construct a fully operational traffic signal as called out for in the plans and specifications.
10. All existing signal equipment shall remain in place and operating until new equipment is in place and ready to operate.
11. The Contractor shall contact Adrian Olguin, TPW Superintendent, at 817-392-7239 or Adrian.Olguin@fortworthtexas.gov at least one (1) week in advance of any disposal of material to coordinate any material that the city may need salvaged. The Contractor is responsible for hauling and properly disposing of salvaged material from the job site to a disposal site of their choosing. The Contractor will not be allowed to drop off salvaged materials at the City yards unless otherwise directed by TPW Superintendent for the specified material only.

Foundations:

1. Dimensions shown on plans for locations of signal foundations, conduit, and other items may vary in order to meet local conditions. All locations of foundations, conduit, and ground boxes shall be approved by City Traffic Signal Engineer.
2. Contractor shall contact the City traffic signal inspector prior to pouring cabinet foundation to be sure that template and bolt patterns are correct for type of cabinet being supplied. Foundation shall be installed per City Specification and City Detail.
3. Pier Foundations shall be poured together in one piece.
4. No signal poles shall be placed on foundations prior to five (5) calendar days following pouring of concrete.
5. Contractor shall clean up and remove all loose material resulting from construction operations each day prior to the work is being suspended.
6. Controller cabinet concrete apron shall be subsidiary to the bid item for the controller cabinet foundation. Cabinet foundation and apron shall be poured together in one piece.

Controller and Cabinet:

1. Contractor shall install controller cabinet and connect all associated field wiring.
2. Ethernet cable shall be provided to connect controller to communication device. Material and installation shall be subsidiary to install of controller or controller cabinet bid item.
3. City will install signal timing and program controller.

Conduit:

1. A continuous grounded system shall be provided in PVC conduit by running 1 No. 8 bare copper stranded ground wire in conduit between foundations and grounding at each foundation ground rod.
2. Grounding shall not exceed 25 ohms at each ground rod.
3. All conduits shall be Schedule 80 PVC.

Signal Heads:

1. All signal heads shall be either McCain™, Econolite™, or approved equivalent style and dimensions.
2. All signal heads shall be covered with burlap or other approved material from the time of installation until the signal is placed in operation.
3. All signal head attachments shall be designed such that the wiring to each signal head shall pass from the mast arm through a rain tight connector to the signal head bracing or attachment hardware to the signal head. A small amount of exposed signal cable shall form a drip loop.
4. All LED signal indications shall be General Electric (GE) Gelcore™ or equivalent and shall meet the latest ITE standards.
5. Signal heads (all displays) and pedestrian Walk and Don't Walk heads with countdown displays shall have LED inserts.
6. Clam-Shell mounting assemblies shall be used for pedestrian indications.
7. All LED signals shall be of the incandescent appearance.
8. All signal heads shall have black aluminum, louvered, single piece back plates compatible with McCain™, Econolite™, or approved equivalent signal head housings.

Traffic Signs and Pavement Markings:

1. All traffic signs and mounting hardware shown on the plans will be furnished and installed by the contractor including the metro street name signs. The contractor shall provide a detail sheet for the metro street name signs with block numbers to the City for approval prior to fabrication and installation.
2. Existing stop signs and posts will be removed by the contractor upon, or before, the signal turn-on.

Detection System:

1. The Contractor shall furnish and install the detection system and cable unless otherwise called out in the plans.
2. Ethernet cable shall be provided connecting the detection central control unit to the communication device. Material and installation shall be subsidiary to the installation detection system bid item.

3. The Contractor shall install, aim and program all detectors as per City Standard Specifications and City Details.
4. The Contractor shall refer to City Standard Details and project plans for detection zones placement.

Emergency Vehicle Preemption Equipment (EVP):

1. The Contractor shall furnish and install the Opticom™ EVP (detectors, cable, and discriminator units) unless otherwise called out in the plans.
2. The Contractor shall install the EVP detectors on the mast arm as shown on the plans and appropriate City Detail, and run one continuous EVP cable from the detector to the cabinet. Installation of the EVP system will be paid for per bid item.

Accessible Pedestrian Signal (APS):

1. APS units with audible message shall be installed on all TxDOT locations or as called out in the plans.
2. Ethernet cable shall be connected from APS central control unit to communication device. Material and installation shall be subsidiary to installation of APS bid item.
3. APS units shall comply with the latest version of the Texas Manual on Uniform Traffic Control Devices (TMUTCD).
4. APS units shall be installed per City Standard Specification and City Detail.
5. APS units shall be programmed by the Contractor.

Powder Coating and Paint:

1. All new signal poles, pedestrian poles, and mast arms shall be powder coated black (RAL 9017). If called outs in the plans, all existing signal poles, pedestrian poles, and mast arms shall be painted black (RAL 9017).

Battery Backup:

1. If called out for in the plans, battery backup units supplied shall be Alpha or approved equivalent. Installation shall be completed per City Standard Specifications and City Detail.
2. Ethernet cable shall be provided for BBUs connecting BBU to the communication device. When mounting an external BBU, ensure cable is routed into the cabinet. Ethernet cable shall be subsidiary to the installation of BBU bid item.

PTZ Camera:

1. If called out for in the plans, PTZ Camera units shall comply with the City Standard Specifications.
2. Power supply and ethernet cable material and installation shall be subsidiary to installation of PTZ camera bid item.

Cellular Modem:

1. Antenna, ethernet cable, power supply, and unmanaged network switch material and installation shall be subsidiary to installation of Cellular Modem bid item.

Traffic Control:

1. The Contractor shall submit a Work Schedule, Traffic Control Plan, and acquire a Street-use Permit from TPW Department, at 200 Texas Street. Contact Chuck McLure (817-392-7219).
2. The Contractor shall be responsible for the safety of pedestrians and motorists in the area of the traffic signal construction site.
3. Roads and streets shall be kept open to traffic at all times. Contractor shall arrange construction so as to close only one lane of a roadway at a time.
4. All construction operations shall be conducted to provide minimal interference to traffic. All traffic signal equipment installations shall be arranged so as to permit continuous movement of traffic in all directions at all times.
5. Contractor shall be responsible for any signage necessary during construction.
6. Unless otherwise noted, it is the contractor's responsibility to ensure that signal indications and timing are adjusted and maintained to ensure safety in work zone at all times.
7. Any traffic signal modifications during construction are subsidiary to traffic control plan (TCP) pay item.
8. Any traffic signal modifications shall be in compliance with the latest version of the Texas Manual on Uniform Traffic Control Devices (TMUTCD) and the City of Fort Worth Standards.
9. The contractor shall submit any proposed traffic signal modifications to the Traffic Signal Engineering Section for their approval ten (10) days prior to any changes.
10. Two-way traffic must be maintained at all times. One lane of traffic around construction operations in progress with adequate safeguards will be acceptable on minor streets only, unless otherwise directed by the Engineer.

Electric Service:

1. Install the required electric services and obtain an electrical service permit in each instance, cost of which will be paid by the Contractor.
2. The electrical service shall comply with City Lighting Standards, Specifications and Details as applicable per plans.

Luminaires:

1. The pre-qualified lighting contractor shall submit a contractor material package along with a copy of applicable plan sheets of the project to the Transportation Public Works, Street Light Department for review and approval before purchasing any lighting material for said project. All materials located within the City lighting system shall be an approved product.

2. The City will not furnish lighting system material to the contractor. The pre-qualified lighting contractor shall furnish and install lighting system in accordance with the latest City Standard Specifications, City Details, and plans.
3. The lighting system must follow the current City Lighting Standards, Specifications, and Details. Contact the City Street Light Section for direction on light pole types allowed and design requirements.

Estimate & Quantity Sheet

Texas Department of Transportation

CONTROLLING PROJECT ID 0902-90-207 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY COOKS LN, HULEN ST

				0902-90-207		0902-90-209		0902-90-212		TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB									
		PROJECT ID		A00178784		A00178789		A00178795			
		COUNTY		Tarrant		Tarrant		Tarrant			
		HIGHWAY		HULEN ST		COOKS LN		HULEN ST			
ALT	BID CODE	DESCRIPTION	UNIT	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	100-6002	PREPARING ROW	STA	9.000						9.000	
	104-6001	REMOVING CONC (PAV)	SY	36.000				132.000		168.000	
	104-6021	REMOVING CONC (CURB)	LF					8.000		8.000	
	104-6029	REMOVING CONC (CURB OR CURB & GUTTER)	LF	707.000		313.000				1,020.000	
	104-6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	103.000		18.000		75.000		196.000	
	160-6003	FURNISHING AND PLACING TOPSOIL (4")	SY	376.000				105.000		481.000	
	162-6002	BLOCK SODDING	SY	376.000				105.000		481.000	
	168-6001	VEGETATIVE WATERING	MG	42.000				12.000		54.000	
	247-6230	FL BS (CMP IN PLACE)(TY A GR 1-2)(8")	SY	356.000		40.000		406.000		802.000	
	360-6002	CONC PVMT (CONT REINF - CRCP) (8")	SY	299.000		40.000		351.000		690.000	
	416-6030	DRILL SHAFT (TRF SIG POLE) (24 IN)	LF					11.000		11.000	
	416-6031	DRILL SHAFT (TRF SIG POLE) (30 IN)	LF					10.000		10.000	
	416-6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	50.000		37.000		26.000		113.000	
	416-6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF			22.000				22.000	
	479-6004	ADJUSTING MANHOLES (SANITARY)	EA					1.000		1.000	
	479-6005	ADJUSTING MANHOLES (WATER VALVE BOX)	EA					1.000		1.000	
	496-6053	REMOV STR (WOOD STR)	EA			2.000				2.000	
	500-6001	MOBILIZATION	LS	1.000						1.000	
	502-6001	BARRICADES, SIGNS AND TRAFFIC HANDLING	MO	8.000						8.000	
	506-6040	BIODEG EROSN CONT LOGS (INSTL) (8")	LF	227.000				100.000		327.000	
	506-6043	BIODEG EROSN CONT LOGS (REMOVE)	LF	227.000				100.000		327.000	
	528-6001	COLORED TEXTURED CONC (4")	SY	54.000		13.000				67.000	
	529-6001	CONC CURB (TY I)	LF	87.000						87.000	
	529-6002	CONC CURB (TY II)	LF			317.000		426.000		743.000	
	529-6005	CONC CURB (MONO) (TY II)	LF	768.000						768.000	
	531-6001	CONC SIDEWALKS (4")	SY	35.000		78.000		32.000		145.000	
	531-6004	CURB RAMPS (TY 1)	EA	8.000		8.000		1.000		17.000	
	531-6005	CURB RAMPS (TY 2)	EA					1.000		1.000	
	531-6006	CURB RAMPS (TY 3)	EA					1.000		1.000	
	531-6017	CURB RAMPS (TY 22)	EA					1.000		1.000	
	610-6026	IN RD IL AM (TY SA) 30T-4 (150W) S	EA					1.000		1.000	
	610-6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA			8.000				8.000	
	618-6046	CONDT (PVC) (SCH 80) (2")	LF	95.000		73.000		480.000		648.000	
	618-6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	380.000		210.000		425.000		1,015.000	
	618-6053	CONDT (PVC) (SCH 80) (3")	LF	100.000		85.000		45.000		230.000	
	618-6058	CONDT (PVC) (SCH 80) (4")	LF	30.000				190.000		220.000	
	618-6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	380.000		315.000		365.000		1,060.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-207 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY COOKS LN, HULEN ST

			CONTROL SECTION JOB		**0902-90-207**		**0902-90-209**		**0902-90-212**		TOTAL EST.	TOTAL FINAL
			PROJECT ID		**A00178784**		**A00178789**		**A00178795**			
			COUNTY		**Tarrant**		**Tarrant**		**Tarrant**			
			HIGHWAY		**HULEN ST**		**COOKS LN**		**HULEN ST**			
ALT	**BID CODE**	**DESCRIPTION**		**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	620-6006	ELEC CONDR (NO.10) INSULATED		LF	1,140.000				1,580.000		2,720.000	
	620-6007	ELEC CONDR (NO.8) BARE		LF	1,105.000		886.000		1,460.000		3,451.000	
	620-6008	ELEC CONDR (NO.8) INSULATED		LF			952.000				952.000	
	620-6009	ELEC CONDR (NO.6) BARE		LF	45.000						45.000	
	620-6010	ELEC CONDR (NO.6) INSULATED		LF	125.000		20.000		240.000		385.000	
	624-6003	GROUND BOX TY B (122322)		EA			3.000				3.000	
	624-6004	GROUND BOX TY B (122322)W/APRON		EA			1.000				1.000	
	624-6009	GROUND BOX TY D (162922)		EA	5.000				1.000		6.000	
	624-6010	GROUND BOX TY D (162922)W/APRON		EA	5.000		5.000		7.000		17.000	
	624-6028	REMOVE GROUND BOX		EA			7.000				7.000	
	628-6187	ELC SRV TY D 120/240 070(NS)SS(E)PS(U)		EA			1.000				1.000	
	628-6239	ELC SRV TY D 120/240 100(NS)SS(E)PS(U)		EA					1.000		1.000	
	628-6249	ELC SRV TY D 120/240 100(NS)SS(N)PS(U)		EA	1.000						1.000	
	644-6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)		EA	4.000		9.000		3.000		16.000	
	644-6004	IN SM RD SN SUP&AM TY10BWG(1)SA(T)		EA					1.000		1.000	
	644-6030	IN SM RD SN SUP&AM TYS80(1)SA(T)		EA					1.000		1.000	
	644-6076	REMOVE SM RD SN SUP&AM		EA			8.000				8.000	
	644-6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)		EA			1.000				1.000	
	666-6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)		LF			67.000		99.000		166.000	
	666-6030	REFL PAV MRK TY I (W)8"(DOT)(100MIL)		LF			27.000				27.000	
	666-6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)		LF	400.000		496.000		1,244.000		2,140.000	
	666-6045	REFL PAV MRK TY I (W)18"(SLD)(100MIL)		LF	100.000		55.000				155.000	
	666-6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)		LF	678.000		719.000		528.000		1,925.000	
	666-6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)		EA	8.000		7.000		11.000		26.000	
	666-6063	REFL PAV MRK TY I(W)(UTURN ARW)(100MIL)		EA					1.000		1.000	
	666-6072	REFL PAV MRK TY I(W)(LNDP ARW)(100MIL)		EA			3.000				3.000	
	666-6078	REFL PAV MRK TY I (W)(WORD)(100MIL)		EA	6.000		6.000		12.000		24.000	
	666-6099	REF PAV MRK TY I(W)18"(YLD TRI)(100MIL)		EA					12.000		12.000	
	666-6144	REFL PAV MRK TY I (Y)18"(SLD)(100MIL)		LF			207.000				207.000	
	666-6156	REFL PAV MRK TY I(Y)(MED NOSE)(100MIL)		EA	2.000						2.000	
	666-6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)		LF	1,000.000		1,080.000		370.000		2,450.000	
	666-6225	PAVEMENT SEALER 6"		LF	2,633.000		3,969.000		2,205.000		8,807.000	
	666-6226	PAVEMENT SEALER 8"		LF	400.000		523.000		1,244.000		2,167.000	
	666-6229	PAVEMENT SEALER 18"		LF	100.000		262.000				362.000	
	666-6230	PAVEMENT SEALER 24"		LF	678.000		719.000		528.000		1,925.000	
	666-6231	PAVEMENT SEALER (ARROW)		EA			7.000		11.000		18.000	
	666-6232	PAVEMENT SEALER (WORD)		EA			6.000		12.000		18.000	

TxDOTCONNECT

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DISTRICT	COUNTY	CCSJ	SHEET
Fort Worth	Tarrant	0902-90-207	21A

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-207 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY COOKS LN, HULEN ST

											TOTAL EST.	TOTAL FINAL
		CONTROL SECTION JOB		**0902-90-207**		**0902-90-209**		**0902-90-212**				
		PROJECT ID		**A00178784**		**A00178789**		**A00178795**				
		COUNTY		**Tarrant**		**Tarrant**		**Tarrant**				
		HIGHWAY		**HULEN ST**		**COOKS LN**		**HULEN ST**				
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL			
	666-6236	PAVEMENT SEALER (UTURN ARROW)	EA					1.000			1.000	
	666-6237	PAVEMENT SEALER (LNDP ARROW)	EA			3.000					3.000	
	666-6243	PAVEMENT SEALER (YLD TRI)	EA					12.000			12.000	
	666-6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	1,833.000		270.000		266.000			2,369.000	
	666-6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	800.000		560.000		500.000			1,860.000	
	666-6315	RE PM W/RET REQ TY I (Y)4"(SLD)(100MIL)	LF	404.000							404.000	
	666-6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	404.000		3,072.000		970.000			4,446.000	
	672-6009	REFL PAV MRKR TY II-A-A	EA	25.000		62.000					87.000	
	672-6010	REFL PAV MRKR TY II-C-R	EA	55.000		67.000		86.000			208.000	
	677-6001	ELIM EXT PAV MRK & MRKS (4")	LF	868.000		660.000		340.000			1,868.000	
	677-6002	ELIM EXT PAV MRK & MRKS (6")	LF	80.000							80.000	
	677-6003	ELIM EXT PAV MRK & MRKS (8")	LF	467.000		502.000		780.000			1,749.000	
	677-6005	ELIM EXT PAV MRK & MRKS (12")	LF			85.000					85.000	
	677-6007	ELIM EXT PAV MRK & MRKS (24")	LF	168.000		168.000		324.000			660.000	
	677-6008	ELIM EXT PAV MRK & MRKS (ARROW)	EA	1.000				6.000			7.000	
	677-6009	ELIM EXT PAV MRK & MRKS (DBL ARROW)	EA	3.000							3.000	
	677-6012	ELIM EXT PAV MRK & MRKS (WORD)	EA	1.000				6.000			7.000	
	678-6002	PAV SURF PREP FOR MRK (6")	LF					2,205.000			2,205.000	
	678-6004	PAV SURF PREP FOR MRK (8")	LF					1,244.000			1,244.000	
	678-6008	PAV SURF PREP FOR MRK (24")	LF					528.000			528.000	
	678-6009	PAV SURF PREP FOR MRK (ARROW)	EA			7.000		11.000			18.000	
	678-6012	PAV SURF PREP FOR MRK (UTURN ARR)	EA					1.000			1.000	
	678-6016	PAV SURF PREP FOR MRK (WORD)	EA			6.000		12.000			18.000	
	678-6022	PAV SURF PREP FOR MRK (18")(YLD TRI)	EA					12.000			12.000	
	680-6004	REMOVING TRAFFIC SIGNALS	EA	1.000				1.000			2.000	
	682-6001	VEH SIG SEC (12")LED(GRN)	EA	10.000		10.000		7.000			27.000	
	682-6002	VEH SIG SEC (12")LED(GRN ARW)	EA	4.000		4.000		4.000			12.000	
	682-6003	VEH SIG SEC (12")LED(YEL)	EA	10.000		10.000		7.000			27.000	
	682-6004	VEH SIG SEC (12")LED(YEL ARW)	EA	8.000		8.000		4.000			20.000	
	682-6005	VEH SIG SEC (12")LED(RED)	EA	10.000		10.000		9.000			29.000	
	682-6006	VEH SIG SEC (12")LED(RED ARW)	EA	4.000		4.000		2.000			10.000	
	682-6007	VEH SIG SEC (12")LED(GRN U-TURN ARW)	EA					1.000			1.000	
	682-6008	VEH SIG SEC (12")LED(YEL U-TURN ARW)	EA					2.000			2.000	
	682-6009	VEH SIG SEC (12")LED(RED U-TURN ARW)	EA					1.000			1.000	
	682-6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8.000		8.000		4.000			20.000	
	682-6054	BACKPLATE W/REF BRDR(3 SEC)(VENT)ALUM	EA	10.000		12.000		11.000			33.000	
	682-6055	BACKPLATE W/REF BRDR(4 SEC)(VENT)ALUM	EA	4.000		2.000					6.000	

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DISTRICT	COUNTY	CCSJ	SHEET
Fort Worth	Tarrant	0902-90-207	21B

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-207 **DISTRICT** Fort Worth **COUNTY** Tarrant
HIGHWAY COOKS LN, HULEN ST

		CONTROL SECTION JOB		**0902-90-207**		**0902-90-209**		**0902-90-212**		TOTAL EST.	TOTAL FINAL
		PROJECT ID		**A00178784**		**A00178789**		**A00178795**			
		COUNTY		**Tarrant**		**Tarrant**		**Tarrant**			
		HIGHWAY		**HULEN ST**		**COOKS LN**		**HULEN ST**			
ALT	**BID CODE**	**DESCRIPTION**	**UNIT**	EST.	FINAL	EST.	FINAL	EST.	FINAL		
	682-6056	BACKPLATE W/REF BRDR(5 SEC)(VENT)ALUM	EA					1.000		1.000	
	684-6029	TRF SIG CBL (TY A)(14 AWG)(3 CONDR)	LF	1,260.000		1,100.000		760.000		3,120.000	
	684-6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	120.000		80.000		545.000		745.000	
	684-6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	1,130.000		758.000		75.000		1,963.000	
	684-6036	TRF SIG CBL (TY A)(14 AWG)(10 CONDR)	LF					300.000		300.000	
	684-6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	570.000		515.000		750.000		1,835.000	
	686-6031	INS TRF SIG PL AM(S)1 ARM(28')LUM	EA					1.000		1.000	
	686-6049	INS TRF SIG PL AM(S)1 ARM(48')	EA			2.000				2.000	
	686-6051	INS TRF SIG PL AM(S)1 ARM(48')LUM	EA	2.000						2.000	
	686-6059	INS TRF SIG PL AM(S)1 ARM(55')LUM	EA					1.000		1.000	
	686-6061	INS TRF SIG PL AM(S)1 ARM(60')	EA			1.000				1.000	
	686-6063	INS TRF SIG PL AM(S)1 ARM(60')LUM	EA	2.000				1.000		3.000	
	686-6065	INS TRF SIG PL AM(S)1 ARM(65')	EA			1.000				1.000	
	687-6001	PED POLE ASSEMBLY	EA					1.000		1.000	
	687-6002	PEDESTRIAN PUSH BUTTON POLE	EA	4.000		4.000				8.000	
	687-6005	REMOVE PED POLE ASSEMBLY	EA					2.000		2.000	
	688-6001	PED DETECT PUSH BUTTON (APS)	EA	8.000		8.000		4.000		20.000	
	688-6003	PED DETECTOR CONTROLLER UNIT	EA			1.000		1.000		2.000	
	690-6009	REMOVAL OF CABLES	LF			843.000				843.000	
	690-6127	REMOVE LUMINAIRE POLE	EA	1.000				1.000		2.000	
	3076-6002	D-GR HMA TY-B SAC-B PG64-22	TON			57.000				57.000	
	3076-6042	D-GR HMA TY-D SAC-B PG70-22	TON			15.000				15.000	
	6001-6001	PORTABLE CHANGEABLE MESSAGE SIGN	DAY	28.000		100.000		45.000		173.000	
	6010-6002	CCTV FIELD EQUIPMENT (DIGITAL)	EA	1.000		1.000		1.000		3.000	
	6027-6003	CONDUIT (PREPARE)	LF			218.000				218.000	
	6058-6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1.000		1.000		1.000		3.000	
	6083-6001	VIDEO IMAGING AND RAD VEH DETECTION SYS	EA	1.000		1.000		3.000		5.000	
	6089-6002	CAT 5 ETHERNET CABLE	LF	935.000		810.000		1,115.000		2,860.000	
	6185-6002	TMA (STATIONARY)	DAY	28.000		50.000		45.000		123.000	
	6185-6003	TMA (MOBILE OPERATION)	HR					8.000		8.000	
	6365-6001	HIGHWAY TRAFFIC SIGNALS	EA	1.000		1.000		1.000		3.000	
	6396-6001	COFW EMR VEH (EV) PREEMPT (INST ONLY)	EA	4.000		4.000		3.000		11.000	
	6421-6001	COFW CELLULAR ROUTER (INSTALL ONLY)	EA	1.000		1.000		1.000		3.000	
	18	SAFETY CONTINGENCY: CONTRACTOR FORCE ACCOUNT WORK (PARTICIPATING)	LS	1.000				1.000		2.000	
		EROSION CONTROL MAINTENANCE: CONTRACTOR FORCE ACCOUNT WORK (PART)	LS	1.000				1.000		2.000	

Estimate & Quantity Sheet

CONTROLLING PROJECT ID 0902-90-207

DISTRICT Fort Worth
HIGHWAY COOKS LN, HULEN ST

COUNTY Tarrant

TxDOTCONNECT

Report Generated By: txdotconnect_internal_ext

Report Created On: May 29, 2024 11:59:49

DISTRICT	COUNTY	CCSJ	SHEET
Fort Worth	Tarrant	0902-90-207	21D

SUMMARY OF REMOVAL ITEMS

LOCATION	100 6002	104 6001	104 6021	104 6029	104 6036	496 6053	624 6028	644 6076	644 6078	677 6001	677 6002	677 6003	677 6005	677 6007	677 6008	677 6009	677 6012	687 6005	690 6009	690 6127
	PREPARING ROW	REMOVING CONC (PAV)	REMOVING CONC (CURB)	REMOVING CONC (CURB OR CURB & GUTTER)	REMOVING CONC (SIDEWALK OR RAMP)	REMOV STR (WOOD STR)	REMOVE GROUND BOX	REMOVE SM RD SN SUP&AM	REMOVE SM RD SN SUP&AM (SIGN ONLY)	ELIM EXT PAV MRK & MRKS (4")	ELIM EXT PAV MRK & MRKS (6")	ELIM EXT PAV MRK & MRKS (8")	ELIM EXT PAV MRK & MRKS (12")	ELIM EXT PAV MRK & MRKS (24")	ELIM EXT PAV MRK & MRKS (ARROW)	ELIM EXT PAV MRK & MRKS (DBL ARROW)	ELIM EXT PAV MRK & MRKS (WORD)	REMOVE PED POLE ASSEMBLY	REMOVAL OF CABLES	REMOVE LUMINAIRE POLE
	STA	SY	LF	LF	SY	EA	EA	EA	EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	LF	EA
CSJ:0902-90-207	9	36	0	707	103	0	0	0	0	868	80	467	0	168	1	3	1	0	0	1
CSJ:0902-90-209	0	0	0	313	18	2	7	8	1	660	0	502	85	168	0	0	0	0	843	0
CSJ:0902-90-212	0	132	8	0	75	0	0	0	0	340	0	780	0	324	6	0	6	2	0	1
PROJECT TOTALS	9	168	8	1020	196	2	7	8	1	1868	80	1749	85	660	7	3	7	2	843	2

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	666 6018	666 6030	666 6036	666 6045	666 6048	666 6054	666 6063	666 6072	666 6078	666 6099	666 6144	666 6156	666 6162	666 6225	666 6226	666 6229	666 6230	666 6231	666 6232	666 6236	666 6237	666 6243	666 6306
	REFL PAV MRK TY I (W)6" (DOT) (100MIL)	REFL PAV MRK TY I (W)8" (DOT) (100MIL)	REFL PAV MRK TY I (W)8" (SLD) (100MIL)	REFL PAV MRK TY I (W)18" (SLD) (100MIL)	REFL PAV MRK TY I (W)24" (SLD) (100MIL)	REFL PAV MRK TY I (W) (ARROW) (100MIL)	REFL PAV MRK TY I (W) (UTURN ARW) (100 MIL)	REFL PAV MRK TY I (W) (LNDP ARW) (100 MIL)	REFL PAV MRK TY I (W) (WORD) (100MIL)	REF PAV MRK TY I (W) 18" (YLD TRI) (100 MIL)	REFL PAV MRK TY I (Y) 18" (SLD) (100MIL)	REFL PAV MRK TY I (Y) (MED NOSE) (100MIL)	RE PV MRK TY I (BLACK) 6" (SHADOW) (100MIL)	PAVEMENT SEALER 6"	PAVEMENT SEALER 8"	PAVEMENT SEALER 18"	PAVEMENT SEALER 24"	PAVEMENT SEALER (ARROW)	PAVEMENT SEALER (WORD)	PAVEMENT SEALER (UTURN ARROW)	PAVEMENT SEALER (LNDP ARROW)	PAVEMENT SEALER (YLD TRI)	RE PM W/RET REQ TY I (W)6" (BRK) (100MIL)
	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	LF	EA	LF	LF	LF	LF	LF	EA	EA	EA	EA	EA	LF
CSJ: 0902-90-207	0	0	400	100	678	8	0	0	6	0	0	2	1000	2633	400	100	678	0	0	0	0	0	1833
CSJ:0902-90-209	67	27	496	55	719	7	0	3	6	0	207	0	1080	3969	523	262	719	7	6	0	3	0	270
CSJ:0902-90-212	99	0	1244	0	528	11	1	0	12	12	0	0	370	2205	1244	0	528	11	12	1	0	12	266
PROJECT TOTALS	166	27	2140	155	1925	26	1	3	24	12	207	2	2450	8807	2167	362	1925	18	18	1	3	12	2369

SUMMARY OF PAVEMENT MARKING ITEMS

LOCATION	666 6309	666 6315	666 6321	672 6009	672 6010	678 6002	678 6004	678 6008	678 6009	678 6012	678 6016	678 6022
	RE PM W/RET REQ TY I (W)6" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y)4" (SLD) (100MIL)	RE PM W/RET REQ TY I (Y)6" (SLD) (100MIL)	REFL PAV MRKR TY II-A-A	REFL PAV MRKR TY II-C-R	PAV SURF PREP FOR MRK (6")	PAV SURF PREP FOR MRK (8")	PAV SURF PREP FOR MRK (24")	PAV SURF PREP FOR MRK (ARROW)	PAV SURF PREP FOR MRK (UTURN ARR)	PAV SURF PREP FOR MRK (WORD)	PAV SURF PREP FOR MRK (18") (YLD TRI)
	LF	LF	LF	EA	EA	LF	LF	LF	EA	EA	EA	EA
CSJ: 0902-90-207	800	404	404	25	55	0	0	0	0	0	0	0
CSJ:0902-90-209	560	0	3072	62	67	0	0	0	7	0	6	0
CSJ:0902-90-212	500	0	970	0	86	2205	1244	528	11	1	12	12
PROJECT TOTALS	1860	404	4446	87	208	2205	1244	528	18	1	18	12

SUMMARY OF WORKZONE TRAFFIC CONTROL ITEMS

LOCATION	502 6001	6001 6001
	BARRICADES, SIGNS AND TRAFFIC HANDLING	PORTABLE CHANGEABLE MESSAGE SIGN
	MO	DAY
CSJ:0902-90-207	8	28
CSJ:0902-90-209	0	0
CSJ:0902-90-212	0	0
PROJECT TOTALS	8	28

FTW
WAGNER-4219

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

FORT WORTH
INTERSECTIONS
QUANTITY SUMMARY

SCALE: AS SHOWN
SHEET 1 OF 3

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	22
CHECK	0902	90	207, ETC.	

SUMMARY OF TRAFFIC SIGNAL ITEMS																		
LOCATION	416 6030	416 6031	416 6032	416 6034	618 6046	618 6047	618 6053	618 6058	618 6059	620 6006	620 6007	620 6008	620 6009	620 6010	624 6004	624 6009	624 6010	628 6187
	DRILL SHAFT (TRF SIG POLE) (24 IN)	DRILL SHAFT (TRF SIG POLE) (30 IN)	DRILL SHAFT (TRF SIG POLE) (36 IN)	DRILL SHAFT (TRF SIG POLE) (48 IN)	CONDT (PVC) (SCH 80) (2")	CONDT (PVC) (SCH 80) (2") (BORE)	CONDT (PVC) (SCH 80) (3")	CONDT (PVC) (SCH 80) (4")	CONDT (PVC) (SCH 80) (4") (BORE)	ELEC CONDR (NO.10) INSULATED	ELEC CONDR (NO.8) BARE	ELEC CONDR (NO.8) INSULATED	ELEC CONDR (NO.6) BARE	ELEC CONDR (NO.6) INSULATED	GROUND BOX TY B (122322) W/APRON	GROUND BOX TY D (162922)	GROUND BOX TY D (162922) W/APRON	ELC SRV TY D 120/240 070(NS)S S(E)PS(U)
	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	LF	EA	EA	EA	EA
CSJ: 0902-90-207	0	0	50	0	95	380	100	30	380	1140	1105	0	45	125	0	5	5	0
CSJ:0902-90-209	0	0	37	22	73	210	85	0	315	0	886	952	0	20	1	0	5	1
CSJ:0902-90-212	11	10	26	0	480	425	45	190	365	1580	1460	0	0	240	0	1	7	0
PROJECT TOTALS	11	10	113	22	648	1015	230	220	1060	2720	3451	952	45	385	1	6	17	1

SUMMARY OF TRAFFIC SIGNAL ITEMS																		
LOCATION	628 6239	628 6249	680 6004	682 6001	682 6002	682 6003	682 6004	682 6005	682 6006	682 6007	682 6008	682 6009	682 6018	682 6054	682 6055	682 6056	684 6029	684 6031
	ELC SRV TY D 120/240 100(NS)S S(E)PS(U)	ELC SRV TY D 120/240 100(NS)S S(N)PS(U)	REMOVING TRAFFIC SIGNALS	VEH SIG SEC (12")LED (GRN)	VEH SIG SEC (12")LED (GRN ARW)	VEH SIG SEC (12")LED (YEL)	VEH SIG SEC (12")LED (YEL ARW)	VEH SIG SEC (12")LED (RED)	VEH SIG SEC (12")LED (RED ARW)	VEH SIG SEC (12")LED (GRN U-TURN ARW)	VEH SIG SEC (12")LED (YEL U-TURN ARW)	VEH SIG SEC (12")LED (RED U-TURN ARW)	PED SIG SEC (LED) (COUNTDOWN)	BACKPLATE W/REF BRDR (3 SEC) (VENT) ALUM	BACKPLATE W/REF BRDR (4 SEC) (VENT) ALUM	BACKPLATE W/REF BRDR (5 SEC) (VENT) ALUM	TRF SIG CBL (TY A) (14 AWG) (3 CONDR)	TRF SIG CBL (TY A) (14 AWG) (5 CONDR)
	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF	LF
CSJ: 0902-90-207	0	1	1	10	4	10	8	10	4	0	0	0	8	10	4	0	1260	120
CSJ:0902-90-209	0	0	0	10	4	10	8	10	4	0	0	0	8	12	2	0	1100	80
CSJ:0902-90-212	1	0	1	7	4	7	4	9	2	1	2	1	4	11	0	1	760	545
PROJECT TOTALS	1	1	2	27	12	27	20	29	10	1	2	1	20	33	6	1	3120	745

SUMMARY OF TRAFFIC SIGNAL ITEMS																		
LOCATION	684 6033	684 6036	684 6046	686 6031	686 6049	686 6051	686 6059	686 6061	686 6063	686 6065	687 6001	687 6002	688 6001	688 6003	6010 6002	6058 6001	6083 6001	6089 6002
	TRF SIG CBL (TY A) (14 AWG) (7 CONDR)	TRF SIG CBL (TY A) (14 AWG) (10 CONDR)	TRF SIG CBL (TY A) (14 AWG) (20 CONDR)	INS TRF SIG PL AM(S)1 ARM(28') LUM	INS TRF SIG PL AM(S)1 ARM(48')	INS TRF SIG PL AM(S)1 ARM(48') LUM	INS TRF SIG PL AM(S)1 ARM(55') LUM	INS TRF SIG PL AM(S)1 ARM(60')	INS TRF SIG PL AM(S)1 ARM(60') LUM	INS TRF SIG PL AM(S)1 ARM(65')	PED POLE ASSEMBLY	PEDESTRIAN PUSH BUTTON POLE	PED DETECT PUSH BUTTON (APS)	PED DETECTOR CONTROLLER UNIT	CCTV FIELD EQUIPMENT (DIGITAL)	BBU SYSTEM (EXTERNAL BATT CABINET)	VIDEO IMAGING AND RAD VEH DETECTION SYS	CAT 5 ETHERNET CABLE
	LF	LF	LF	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	EA	LF
CSJ: 0902-90-207	1130	0	570	0	0	2	0	0	2	0	0	4	8	0	1	1	1	935
CSJ:0902-90-209	758	0	515	0	2	0	0	1	0	1	0	4	8	1	1	1	1	810
CSJ:0902-90-212	75	300	750	1	0	0	1	0	1	0	1	0	4	1	1	1	3	1115
PROJECT TOTALS	1963	300	1835	1	2	2	1	1	3	1	1	8	20	2	3	3	5	2860

SUMMARY OF TRAFFIC SIGNAL ITEMS			
LOCATION	6365 6001	6396 6001	6421 6001
	HIGHWAY TRAFFIC SIGNALS	COFW EMR VEH (EV) PREEMPT (INST ONLY)	COFW CELLULAR ROUTER (INSTALL ONLY)
	EA	EA	EA
CSJ: 0902-90-207	1	4	1
CSJ:0902-90-209	1	4	1
CSJ:0902-90-212	1	3	1
PROJECT TOTALS	3	11	3

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

FORT WORTH INTERSECTIONS QUANTITY SUMMARY

SCALE: AS SHOWN

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	23

FTW
WAGNER-4219

...\TXDOT-OR*MON*PENTABLE, tbl
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TXDOT-OR
4/19/2024 2:50:23 PM 13581

SUMMARY OF ROADWAY ITEMS

LOCATION	247 6230	360 6002	528 6001	529 6001	529 6002	529 6005	531 6001	531 6004	531 6005	531 6006	531 6017	3076 6002	3076 6042
	FL BS (CMP IN PLACE)(TY A GR 1-2)(8")	CONC PVMT (CONT REINF - CRCP) (8")	COLORED TEXTURED CONC (4")	CONC CURB (TY I)	CONC CURB (TY II)	CONC CURB (MONO) (TY II)	CONC SIDEWALKS (4")	CURB RAMPS (TY 1)	CURB RAMPS (TY 2)	CURB RAMPS (TY 3)	CURB RAMPS (TY 22)	D-GR HMA TY-B SAC-B PG64-22	D-GR HMA TY-D SAC-B PG70-22
	SY	SY	SY	LF	LF	LF	SY	EA	EA	EA	EA	TON	TON
CSJ: 0902-90-207	356	299	54	87	0	768	35	8	0	0	0	0	0
CSJ:0902-90-209	40	40	13	0	317	0	78	8	0	0	0	57	15
CSJ:0902-90-212	406	351	0	0	426	0	32	1	1	1	1	0	0
PROJECT TOTALS	802	690	67	87	743	768	145	17	1	1	1	57	15

SUMMARY OF EROSION CONTROL ITEMS

LOCATION	160 6003	162 6002	168 6001	506 6040	506 6043
	FURNISHING AND PLACING TOPSOIL (4")	BLOCK SODDING	VEGETATIVE WATERING	BIODEG EROSN CONT LOGS (INSTL) (8")	BIODEG EROSN CONT LOGS (REMOVE)
	SY	SY	MG	LF	LF
CSJ: 0902-90-207	376	376	42	227	227
CSJ:0902-90-209	0	0	0	0	0
CSJ:0902-90-212	105	105	12	100	100
PROJECT TOTALS	481	481	54	327	327

SUMMARY OF ILLUMINATION ITEMS

LOCATION	610 6026	610 6102	624 6003	6027 6003
	IN RD IL AM (TY SA) 30T-4 (150W) S	REPLACE LUMINAIRE W/LED (250W EQ)	GROUND BOX TY B (122322)	CONDUIT (PREPARE)
	EA	EA	EA	LF
CSJ: 0902-90-207	0	0	0	0
CSJ:0902-90-209	0	8	3	218
CSJ:0902-90-212	1	0	0	0
PROJECT TOTALS	1	8	3	218

SUMMARY OF UTILITY ITEMS

LOCATION	479 6004	479 6005
	ADJUSTING MANHOLES (SANITARY)	ADJUSTING MANHOLES (WATER VALVE BOX)
	EA	EA
CSJ: 0902-90-207	0	0
CSJ:0902-90-209	0	0
CSJ:0902-90-212	1	1
PROJECT TOTALS	1	1

SUMMARY OF SIGNING ITEMS

LOCATION	644 6001	644 6004	644 6030
	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	IN SM RD SN SUP&AM TY10BWG(1)SA(T)	IN SM RD SN SUP&AM TYS80(1)SA(T)
	EA	EA	EA
CSJ: 0902-90-207	4	0	0
CSJ:0902-90-209	9	0	0
CSJ:0902-90-212	3	1	1
PROJECT TOTALS	16	1	1

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

FORT WORTH INTERSECTIONS QUANTITY SUMMARY

SCALE: AS SHOWN

SHEET 3 OF 3

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	24
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	

DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC,"OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THESE REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

GENERAL

1. A SEVEN (7) DAY ADVANCE NOTIFICATION MUST BE PROVIDED TO TXDOT SOUTH TARRANT AREA OFFICE AND CITY OF FORT WORTH PM (FANTA KABA, 817-682-3181) PRIOR TO COMMENCING WORK AND INSTALLATION OF TRAFFIC CONTROL PLAN.
2. TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.
3. THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FORM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.
4. DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC.
5. ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.
6. TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.
7. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EXISTING DRAINAGE PATTERNS DURING CONSTRUCTION.
8. LANE CLOSURES SHALL BE BETWEEN THE HOURS OF 9:00AM TO 3:00PM

SAFETY

1. THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGN IN ACCORDANCE WITH STATE STANDARDS BC (1-12)-21. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS SHALL BE IN THE CONFORMANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS"AND "THE STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS."
2. BARRICADES AND WARNING SIGNS SHALL BE PLACED AS INDICATED ON THE PLANS. THIS SHALL BE CONSIDERED THE MINIMUM REQUIRED TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGN DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE PASSAGE OF TRAFFIC IN SAFETY AT ALL TIMES.
3. THE CONTRACTOR SHALL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

HAULING EQUIPMENT

1. THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENTED SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT. THEY SHALL PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED/APPROVED BY THE ENGINEER.

FINAL CLEAN UP

1. UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION.

PAYMENT

1. ALL BARRICADES, SIGNS, AND FLAGGERS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING. ALL EROSION AND SEDIMENT CONTROL DEVICES WILL BE PAID FOR UNDER ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS. ALL OTHER WORK AND MATERIALS SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS UNLESS OTHERWISE INDICATED IN THE PLANS.

SEQUENCE OF WORK

CSJ 0902-90-207

1. INSTALL TRAFFIC CONTROL DEVICES AND SIDEWALK DETOURS OR CLOSURE AS NECESSARY PER TCP(1-4)-18, WZ(BTS-1)-13, AND WZ(BTS02)-13, INCLUDING PROJECT LIMIT AND WORKZONE SIGNAGE AS SHOWN ON STANDARD DETAILS IN PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. ADJUST TRAFFIC CONTROL AS NECESSARY AS PROJECT PROGRESSES.
2. INSTALL EROSION CONTROL DEVICES AS SHOWN IN STANDARD DETAILS IN PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. INSTALL WATER VALVE PROTECTION AND TREE PROTECTION AS NECESSARY.
3. REMOVE PAVEMENT MARKINGS.
4. REMOVE/COVER CONFLICTING ROADWAY SIGNAGE.
5. PREPARE RIGHT OF WAY, AS NECESSARY.
6. INSTALL SIGNALS AND RELATED APPURTENANCES PER PLANS AND STANDARD DETAILS.
7. CONSTRUCT PAVING, SIDEWALKS, RAMPS AND RELATED APPURTENANCES PER PLANS.
8. INSTALL PAVEMENT MARKINGS.
9. PLACE TOPSOIL, SOD, AND WATER TO ESTABLISHMENT.
10. ACTIVATE NEW SIGNAL AS DIRECTED BY ENGINEER AND CITY OF FORT WORTH PERSONNEL.
11. PERFORM CLEAN UP OF CONSTRUCTION AREA. COMPLETE PUNCHLIST.
12. REMOVE EROSION CONTROL DEVICES.
13. REMOVE TRAFFIC CONTROL DEVICES.

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

TRAFFIC CONTROL NARRATIVE HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN — SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	25
	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	

DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC," OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THESE REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT.

GENERAL

1. A SEVEN(7) DAY ADVANCE NOTIFICATION MUST BE PROVIDED TO TXDOT SOUTH TARRANT AREA OFFICE AND CITY OF FORT WORTH PM (FANTA KABA, 817-682-3181) PRIOR TO COMMENCING WORK AND INSTALLATION OF TRAFFIC CONTROL PLAN.
2. TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.
3. THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION BY THE CONTRACTOR SHALL INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE/SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FORM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.
4. DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC.
5. ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.
6. TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.
7. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL EXISTING DRAINAGE PATTERNS DURING CONSTRUCTION.
8. LANE CLOSURES SHALL BE BETWEEN THE HOURS OF 9:00AM TO 3:00PM.

SAFETY

1. THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGN IN ACCORDANCE WITH STATE STANDARDS BC (1-12)-21. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS SHALL BE IN THE CONFORMANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS"AND "THE STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS."
2. BARRICADES AND WARNING SIGNS SHALL BE PLACED AS INDICATED ON THE PLANS. THIS SHALL BE CONSIDERED THE MINIMUM REQUIRED TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGN DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE PASSAGE OF TRAFFIC IN SAFETY AT ALL TIMES.
3. THE CONTRACTOR SHALL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY SHALL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

HAULING EQUIPMENT

1. THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENTED SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT. THEY SHALL PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED/APPROVED BY THE ENGINEER.

FINAL CLEAN UP

1. UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR SHALL CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION.

PAYMENT

1. ALL BARRICADES, SIGNS, AND FLAGGERS SHALL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING. ALL EROSION AND SEDIMENT CONTROL DEVICES WILL BE PAID FOR UNDER ITEM 506 TEMPORARY EROSION, SEDIMENTATION, AND ENVIRONMENTAL CONTROLS. ALL OTHER WORK AND MATERIALS SHALL BE SUBSIDIARY TO THE VARIOUS BID ITEMS UNLESS OTHERWISE INDICATED IN THE PLANS.

SEQUENCE OF WORK

CSJ 0902-90-212

1. INSTALL TRAFFIC CONTROL DEVICES AND SIDEWALK DETOURS OR CLOSURE IN NECESSARY, INCLUDING PROJECT LIMIT AND WORKZONE SIGNAGE AS SHOWN ON STANDARD DETAILS IN PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER. ADJUST TRAFFIC CONTROL AS NECESSARY AS PROJECT PROGRESSES.
2. INSTALL EROSION CONTROL DEVICES AS SHOWN IN STANDARD DETAILS IN PLANS AND/OR AS DIRECTED/APPROVED BY THE ENGINEER.
3. REMOVE PAVEMENT MARKINGS.
4. REMOVE/COVER CONFLICTING ROADWAY SIGNAGE.
5. PREPARE RIGHT OF WAY, AS NECESSARY.
6. INSTALL SIGNALS AND RELATED APPURTENANCES PER PLANS AND STANDARD DETAILS.
7. CONSTRUCT PAVING, SIDEWALKS, RAMPS AND RELATED APPURTENANCES PER PLANS.
8. PLACE TOPSOIL, SOD, AND WATER TO ESTABLISHMENT.
9. INSTALL PAVEMENT MARKINGS.
10. ACTIVATE NEW SIGNAL AS DIRECTED BY ENGINEER AND CITY OF FORT WORTH PERSONNEL.
11. PERFORM CLEAN UP OF CONSTRUCTION AREA. COMPLETE PUNCHLIST.
12. REMOVE EROSION CONTROL DEVICES.
13. REMOVE TRAFFIC CONTROL DEVICES.

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED PROFESSIONAL ENGINEER
4/16/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

TRAFFIC CONTROL NARRATIVE

SCALE: N.T.S SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	26
CHECK	0902	90	207, ETC	

DETOURS, BARRICADES, WARNING SIGNS, SEQUENCE OF WORK, ETC.

THE CONTRACTOR'S ATTENTION IS DIRECTED TO THE REQUIREMENTS OF ITEM 7, "LEGAL RELATIONS AND RESPONSIBILITIES TO THE PUBLIC", OF THE STANDARD SPECIFICATIONS. IN ADDITION TO THESE REQUIREMENTS, THE FOLLOWING PROVISIONS SHALL ALSO GOVERN ON THIS CONTRACT:

1. GENERAL

(1) A SEVEN (7) DAY ADVANCE NOTIFICATION MUST BE PROVIDED TO TXDOT SOUTH TARRANT AREA OFFICE AND CITY OF FORT WORTH PM (FANTA KABA, 817-682-3181) PRIOR TO COMMENCING WORK AND INSTALLATION OF TRAFFIC CONTROL PLAN.

(2) TRAFFIC MUST BE HANDLED THROUGHOUT THE PROJECT DURING CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING A SAFE AND COMFORTABLE PASSAGE FOR VEHICULAR AND PEDESTRIAN TRAFFIC WITH MINIMAL INCONVENIENCE TO THE PUBLIC, AS SHOWN IN THE PLANS OR AS DIRECTED/APPROVED BY THE ENGINEER.

(3) THE CONTRACTOR MAY PROPOSE/RECOMMEND MODIFICATIONS TO THE SEQUENCE OF WORK FOR CONSIDERATION BY THE ENGINEER. ANY MAJOR RECOMMENDED MODIFICATION BY THE CONTRACTOR MUST INCLUDE ANY CHANGES TO THE VARIOUS BID ITEMS, IMPACT TO TRAFFIC, EFFECT OF OVERALL PROJECT IN TIME AND COST, ETC. IF THIS PROPOSAL IS IMPLEMENTED, THE CONTRACTOR WILL BE RESPONSIBLE FOR DEVELOPING DETAILED PLAN SHEETS TO BE SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR INCLUSION WITH THE CHANGE ORDER. THE CONTRACTOR CANNOT PROCEED WITH ANY CONSTRUCTION OPERATIONS BASED ON A REVISED PHASE / SEQUENCE UNTIL WRITTEN APPROVAL IS OBTAINED FROM THE ENGINEER. IF AT ANY TIME DURING CONSTRUCTION THE CONTRACTOR'S PROPOSED PLAN OF OPERATION FOR HANDLING TRAFFIC DOES NOT PROVIDE FOR SAFE AND COMFORTABLE MOVEMENT, THE CONTRACTOR WILL IMMEDIATELY CHANGE THEIR OPERATION TO CORRECT THE UNSATISFACTORY CONDITION.

(4) DO NOT STORE ANY CONSTRUCTION MATERIAL OR EQUIPMENT AT ANY LOCATION THAT WILL CONSTITUTE A HAZARD AND WILL ENDANGER TRAFFIC.

(5) THE CONTRACTOR WILL PROVIDE ADVANCE NOTIFICATION TO THE ENGINEER OF IMPENDING / UPCOMING LANE CLOSURES FOR ALL TEMPORARY AND / OR PERMANENT LANE CLOSURES OR DETOURS. SEE GENERAL NOTES FOR NOTIFICATION REQUIREMENTS.

(6) ACCESS TO ADJOINING PROPERTY MUST BE MAINTAINED AT ALL TIMES.

(7) TEMPORARY DRAINAGE IS THE RESPONSIBILITY OF THE CONTRACTOR.

(8) UNLESS OTHERWISE NOTED IN THE PLANS AND/OR AS DIRECTED BY THE ENGINEER, DAILY LANE CLOSURES WILL BE LIMITED ACCORDING TO THE FOLLOWING RESTRICTIONS:

SCHOOL TIME: LIMITED TO 9:00 AM TO 3:00PM (MONDAY THROUGH FRIDAY) OR AS DIRECTED BY THE ENGINEER. NO DAYTIME CLOSURES UNLESS DIRECTED AND APPROVED BY THE ENGINEER.

NIGHTTIME: LIMITED TO 9:00 PM TO 5:00 AM (SUNDAY THROUGH THURSDAY), WITH UNIFORMED OFF DUTY LAW ENFORCEMENT OFFICERS, OR AS DIRECTED BY THE ENGINEER. CONTRACTOR SHALL REQUEST PERMISSION AND OBTAIN APPROVAL FROM THE ENGINEER AT LEAST 1 WEEK IN ADVANCE PRIOR TO NIGHTTIME WORK.

WEEKEND CLOSURES WHEN APPROVED BY THE ENGINEER.

NO LANE CLOSURES WILL BE PERMITTED FOR THE FOLLOWING DATES:

BETWEEN DECEMBER 15 AND JANUARY 1.

WEDNESDAY BEFORE THANKSGIVING THRU THE SUNDAY AFTER

THANKSGIVING

SATURDAY AND SUNDAY BEFORE MEMORIAL DAY AND LABOR DAY.

SATURDAY OR SUNDAY WHEN JULY 4 FALLS ON A FRIDAY OR MONDAY.

(9) REMOVAL AND DISPOSAL OF EXISTING ABANDONED UTILITIES (EITHER PREVIOUSLY ABANDONED OR ABANDONED DURING THIS PROJECT) REQUIRED TO SUPPORT THIS PROJECT'S CONSTRUCTION WILL BE PERFORMED UNDER AND CONSIDERED SUBSIDIARY TO THE VARIOUS BID ITEMS.

(10) COORDINATE WITH ADJACENT PROJECTS.

(11) COVER PERMANENT SIGNS IF NOT USED. THIS IS SUBSIDIARY TO ITEM 502.

(12) CRANES WILL BE FULLY LOWERED/RETRACTED AT THE END OF EACH WORK DAY. AT NO TIME SHALL A CRANE BE LEFT UNATTENDED WHILE BEING EXTENDED.

(13) ALL LANE CLOSURES WILL USE PLASTIC DRUMS AS CHANNELIZING DEVICES.

2. SEQUENCE OF WORK

(1) THIS PROJECT WILL BE CONSTRUCTED IN ONE PHASE WITH CONCURRENT ACTIVITIES (ILLUMINATION, SIGNING & STRIPING, AND TRAFFIC SIGNAL DESIGN). INSTALL ADVANCE WARNING SIGNS, TEMPORARY SIGNS AND BARRICADES AS SHOWN ON THE PLANS AND / OR AS DIRECTED / APPROVED BY THE ENGINEER. DAILY LANE CLOSURES WILL BE USED IN ACCORDANCE WITH STATE TCP STANDARDS. DROP OFF CONDITIONS OF GREATER THAN 2" MUST HAVE A 3:1 SLOPE AT THE END OF EACH DAY, AS WELL AS THROUGHOUT THE PROJECT WHERE ACCESS TO ADJACENT PROPERTIES IS ALLOWED TO DRIVEWAYS AND SIDE STREETS.

(2) PREPARING ROW / REMOVAL OF EXISTING ITEMS TO BE DONE ONLY IN AREAS WHERE WORK IS OCCURING.

(3) A BRIEF DESCRIPTION OF CONSTRUCTION IS AS FOLLOWS:

CONSTRUCTION

INSTALL ALL ADVANCED WARNING SIGNS FOR THE PROJECT IN ACCORDANCE WITH THE TRAFFIC CONTROL SCHEDULE OF BARRICADES AND TXDOT TCP STANDARDS AND BARRICADE AND CONSTRUCTION (BC(1)-14 THRU BC(12)-21) STANDARDS.

CONSTRUCT ALL FOUNDATIONS AND PLACE CONDUIT. THIS INCLUDES THE FOLLOWING CONSTRUCTION ACTIVITIES BUT IS NOT LIMITED TO DRILL SHAFTS FOR FOUNDATIONS, TRENCH / BORE CONDUIT AND THE INSTALLATION OF GROUND BOXES. TEST ALL NEWLY INSTALLED LIGHT FIXTURES AND SIGNAL EQUIPMENT.

FOR LANE CLOSURES AND MEDIAN CLOSURES UTILIZE TCP(1-4a)-18 STANDARD.

FOR TRAFFIC SIGNAL WORK UTILIZE WZ (BTS) STANDARDS.

FOR CONSTRUCTION OF SIDEWALKS, ADA RAMPS, AND SIGNS USE TCP(1-4a)-18 AND WZ(BTS)-13 STANDARDS.

CONTRACTOR IS RESPONSIBLE FOR THE PROPER REPAIR OF EXISTING SIDEWALK AND CURB AND GUTTER (C & G)IF DAMAGE OCCURS DURING THE CONSTRUCTION PHASE BY THEIR OWN ACTIVITIES AND WORKERS. SIDEWALK AND C & G REPAIRS WILL BE FROM JOINT TO JOINT.

3. SAFETY

(1) THE CONTRACTOR WILL PROVIDE, CONSTRUCT AND MAINTAIN BARRICADES AND SIGNS IN ACCORDANCE WITH STATE STANDARDS BC (1 - 12)-21. ANY SIGNS REQUIRED THAT ARE NOT DETAILED IN THE STANDARD SHEETS WILL BE IN CONFORMANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS" AND THE "STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS."

(2) BARRICADES AND WARNING SIGNS WILL BE PLACED AS INDICATED ON THE PLANS. THIS WILL BE CONSIDERED THE MINIMUM REQUIRED TO PROVIDE FOR THE SAFETY OF TRAFFIC DURING CONSTRUCTION. THE CONTRACTOR MUST PROVIDE AND MAINTAIN OTHER SUCH BARRICADES AND SIGNS DEEMED NECESSARY BY THE ENGINEER OR AS DIRECTED BY FIELD CONDITIONS, TO PROVIDE FOR THE PASSAGE OF TRAFFIC IN SAFETY AT ALL TIMES.

(3) THE CONTRACTOR WILL KEEP THE ROADWAY CLEAN AND FREE OF DIRT OR OTHER MATERIALS DURING HAULING OPERATIONS. IF THE CONTRACTOR DOES NOT MAINTAIN A CLEAN ROADWAY, THEY WILL CEASE ALL CONSTRUCTION OPERATIONS, WHEN DIRECTED BY THE ENGINEER, TO CLEAN THE ROADWAY TO THE SATISFACTION OF THE ENGINEER.

4. HAULING EQUIPMENT

(1) THE USE OF RUBBER-TIRED EQUIPMENT WILL BE REQUIRED FOR MOVING DIRT OR OTHER MATERIALS ALONG OR ACROSS PAVEMENTED SURFACES. WHERE THE CONTRACTOR DESIRES TO MOVE ANY EQUIPMENT NOT LICENSED FOR OPERATION ON PUBLIC HIGHWAYS, ON OR ACROSS PAVEMENT. THEY MUST PROTECT THE PAVEMENT FROM DAMAGE AS DIRECTED / APPROVED BY THE ENGINEER.

5. FINAL CLEAN UP

UPON COMPLETION OF THE WORK AND BEFORE FINAL ACCEPTANCE AND FINAL PAYMENT IS MADE, THE CONTRACTOR MUST CLEAR AND REMOVE FROM THE SITE ALL SURPLUS AND DISCARDED MATERIALS AND DEBRIS OF EVERY KIND AND LEAVE THE ENTIRE PROJECT IN A SMOOTH, NEAT AND SIGHTLY CONDITION.

6. PAYMENT

ALL BARRICADES, SIGNS, AND FLAGGERS WILL BE SUBSIDIARY TO ITEM 502 BARRICADES, SIGNS AND TRAFFIC HANDLING.

SUMMARY OF TRAFFIC CONTROL		
COOKS LANE AT BRENTWOOD STAIR ROAD	6001	6185
	6001	6002
	PCMs	TMA (STATIONARY)
	DAY	DAY
PROJECT TOTAL	100	50

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED PROFESSIONAL ENGINEER

4/19/2024

NO.	REVISION	BY	DATE

DEC | ENGINEERING EXCELLENCE™
T.B.O.E. FIRM REGISTRATION #392
415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

TRAFFIC CONTROL NARRATIVE

SCALE: N.T.S SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	27
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

4/19/2024
11:22:42 AM
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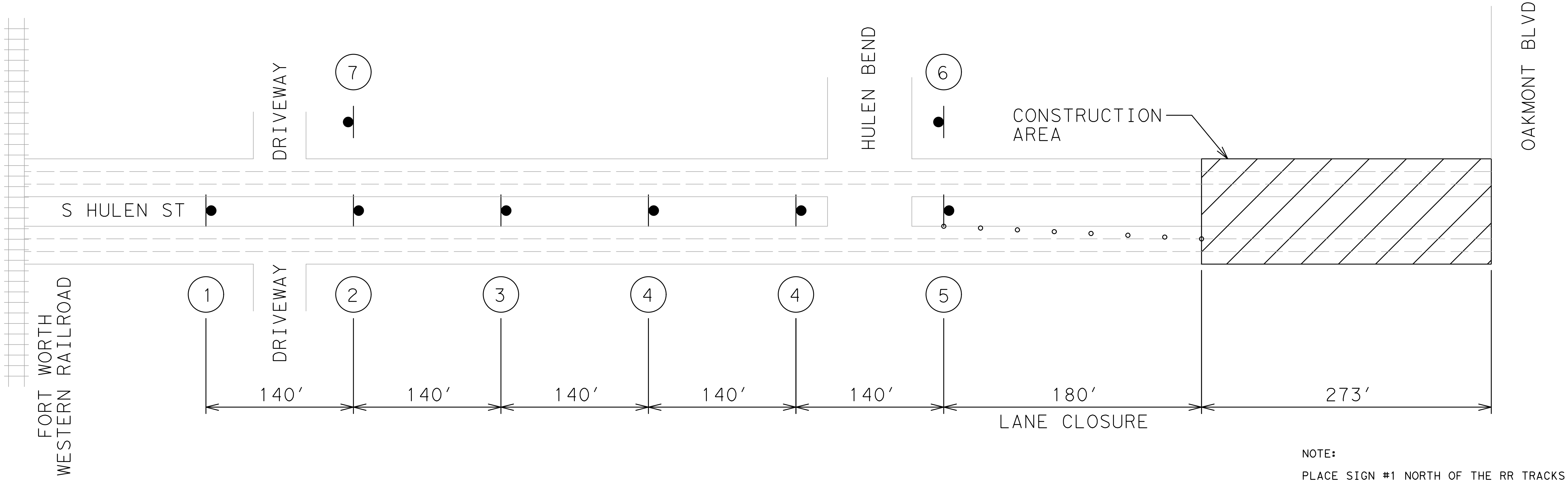
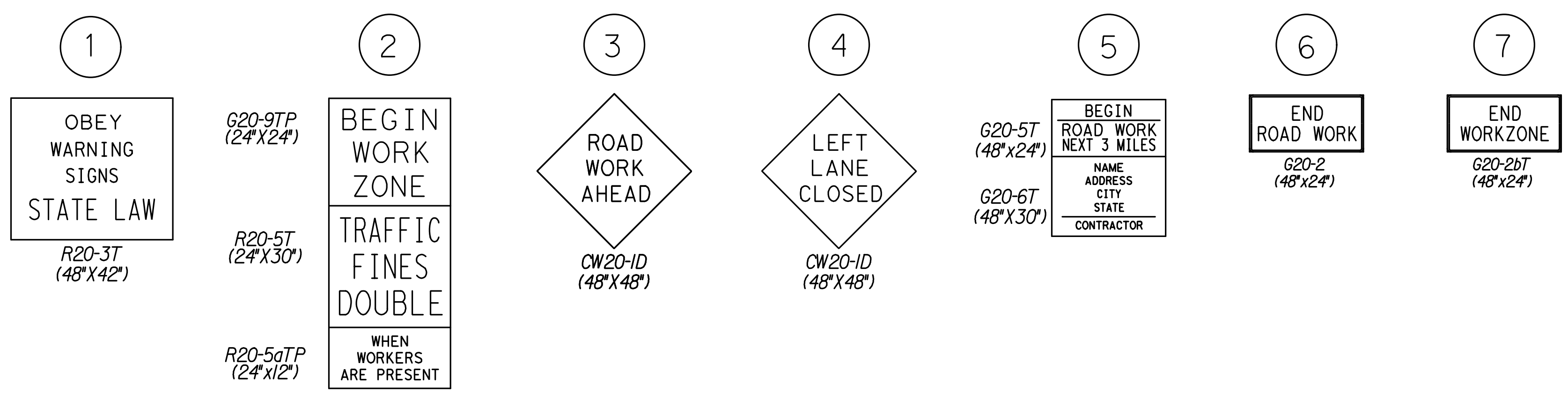


NOTE:

PLACE SIGN #1 NORTH OF THE RR TRACKS FOR THE NB HULEN ST TRAFFIC.



STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED PROFESSIONAL ENGINEER
6/27/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation © 2024

S HULEN ST AT OAKMONT BLVD

TRAFFIC CONTROL PLAN
ADVANCED WARNING LAYOUT

SCALE: N.T.S SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	28
CHECK	0902	90	207, ETC	

DATE:
FILE:

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

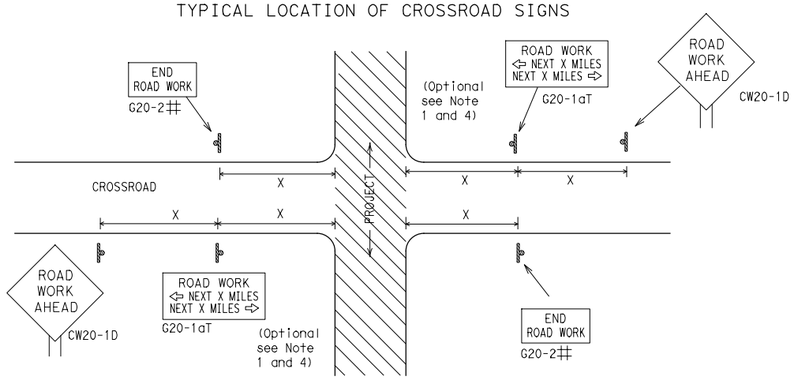
BC(1)-21

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	0902	90	207, ETC	HULEN ST, ETC
	DIST	COUNTY		SHEET NO.
	33	TARRANT		29

95

DATE:
FILE:

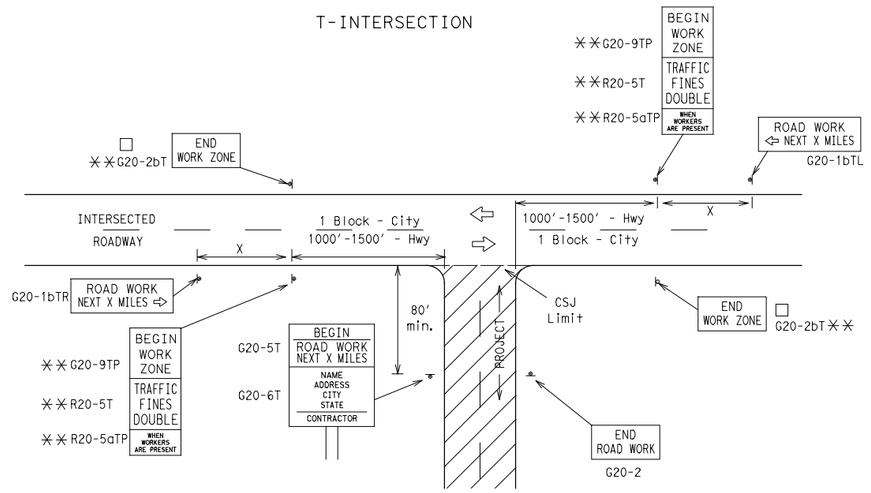
TYPICAL LOCATION OF CROSSROAD SIGNS



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.

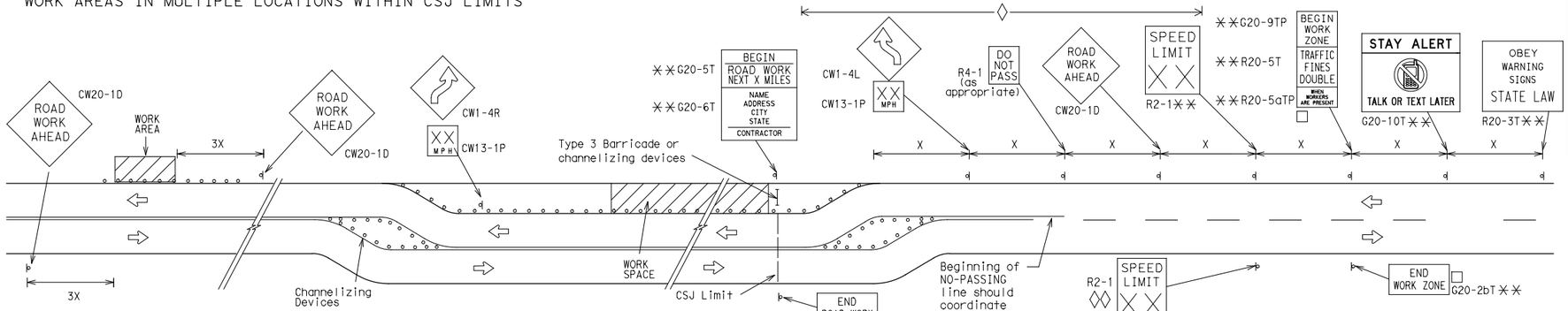
△ Minimum distance from work area to first Advance Warning sign nearest the work area and/or distance between each additional sign.

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.

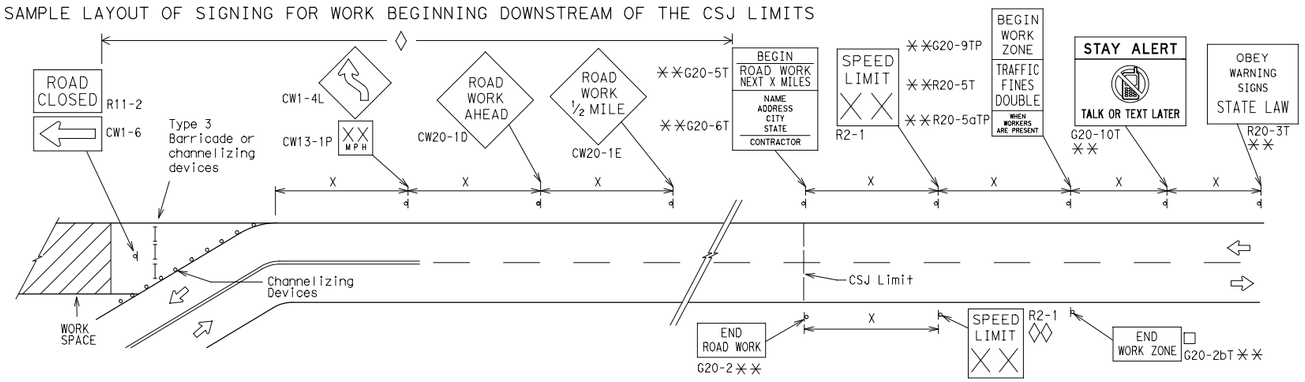
WORK AREAS IN MULTIPLE LOCATIONS WITHIN CSJ LIMITS

SAMPLE LAYOUT OF SIGNING FOR WORK BEGINNING AT THE CSJ LIMITS



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

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



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	0902	90	207, ETC	HULEN ST, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	33	TARRANT		30

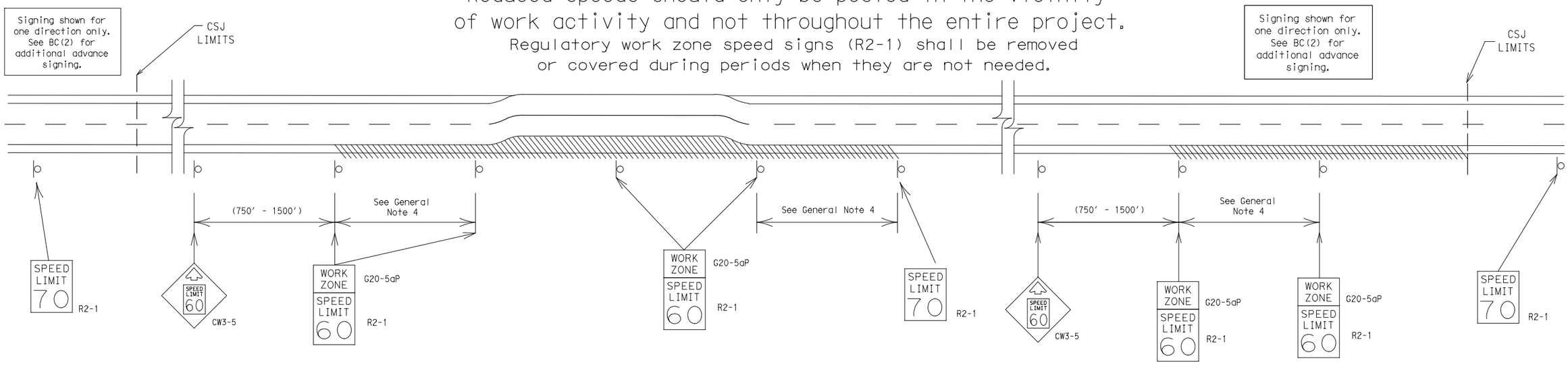
DATE:
FILE:

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	0902	90	207, ETC	HULEN ST, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	33	TARRANT		31

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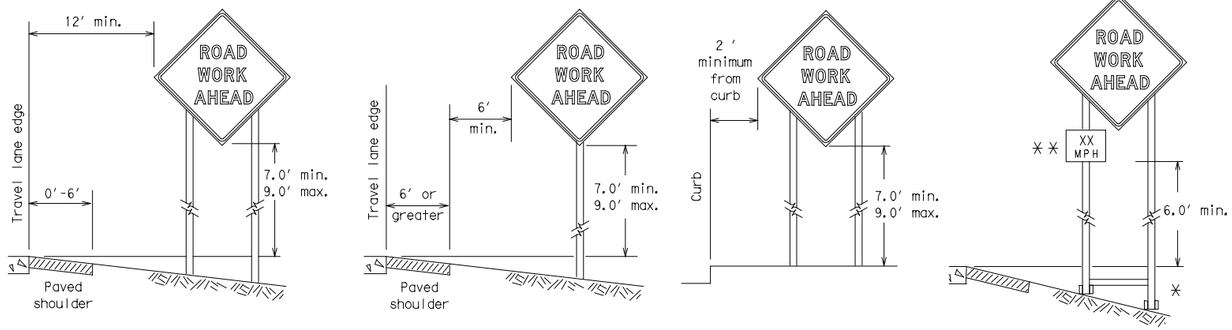
DATE:
FILE:

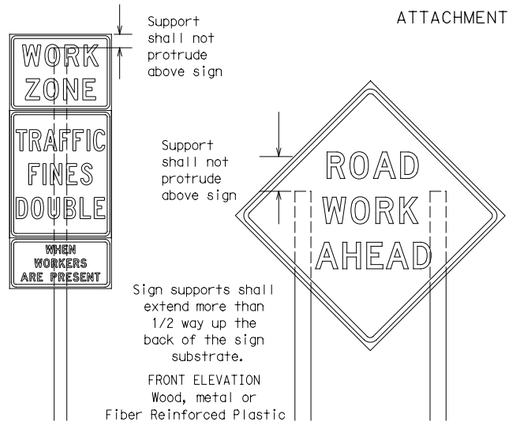
TYPICAL MINIMUM CLEARANCES FOR LONG TERM AND INTERMEDIATE TERM SIGNS

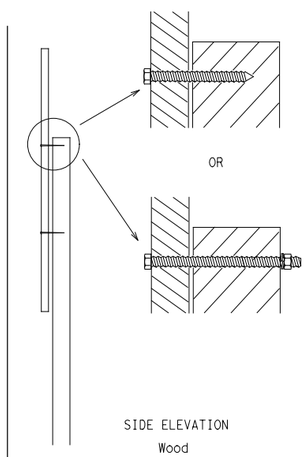


⚹ When placing skid supports on unlevel ground, the leg post lengths must be adjusted so the sign appears straight and plumb. Objects shall NOT be placed under skids as a means of leveling.

⚹⚹ 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





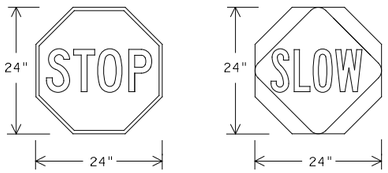
Attachment to wooden supports will be by bolts and nuts or screws. Use TxDOT's or manufacturer's recommended procedures for attaching sign substrates to other types of sign supports

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.



Background - Red
Legend & Border - White

Background - Orange
Legend & Border - Black

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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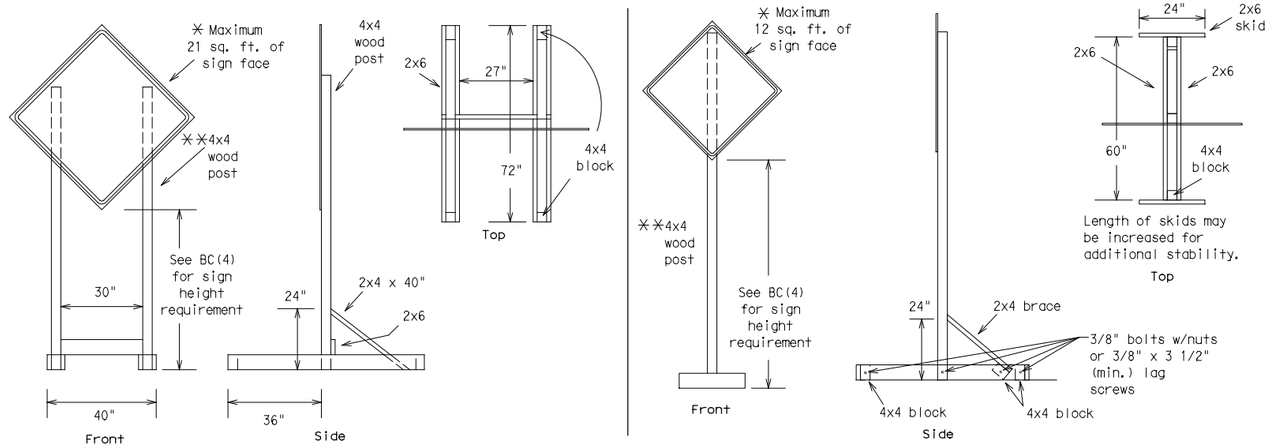
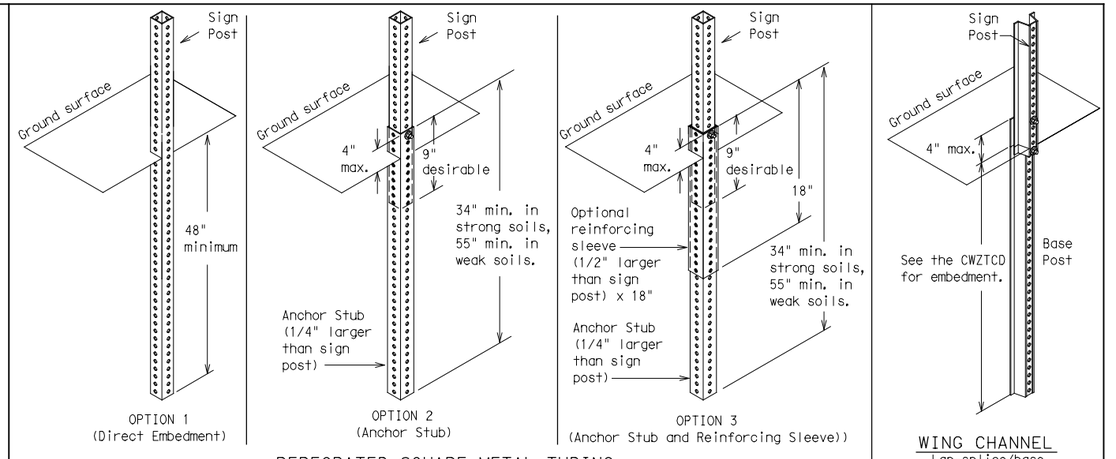


SKID MOUNTED WOOD SIGN SUPPORTS

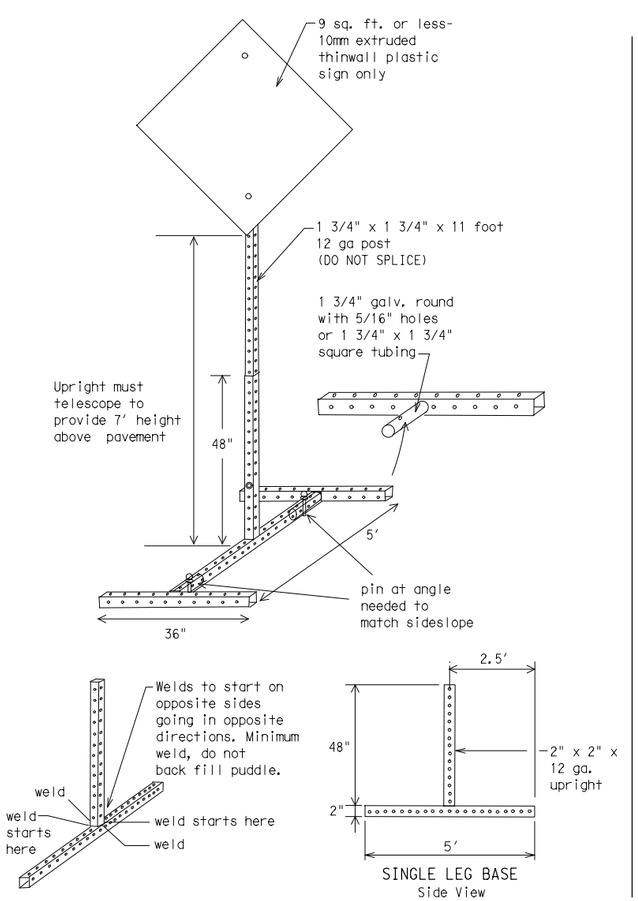
* LONG/INTERMEDIATE TERM STATIONARY - PORTABLE SKID MOUNTED SIGN SUPPORTS

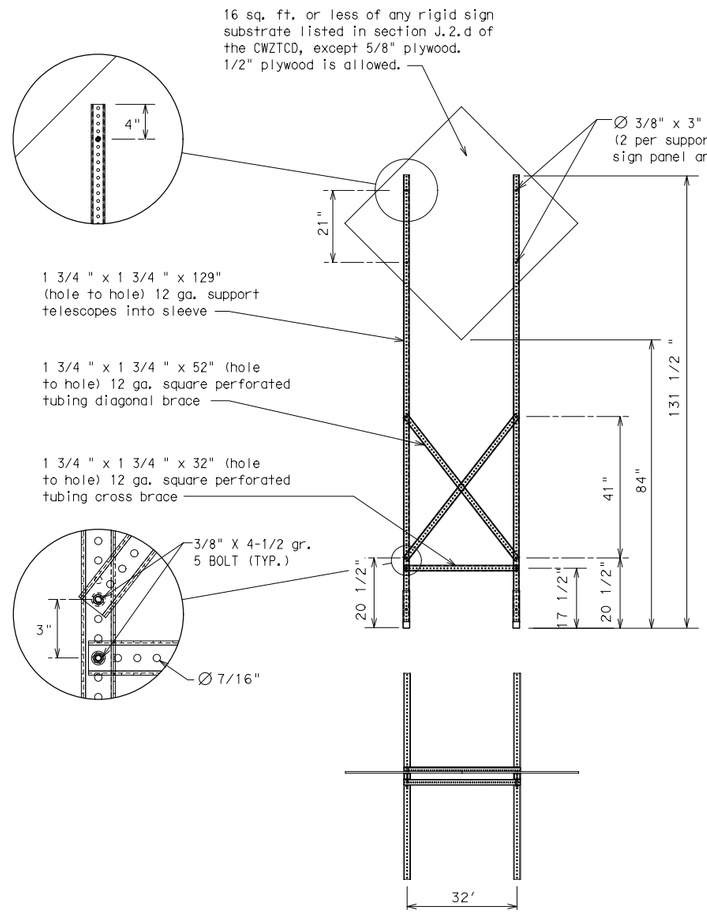


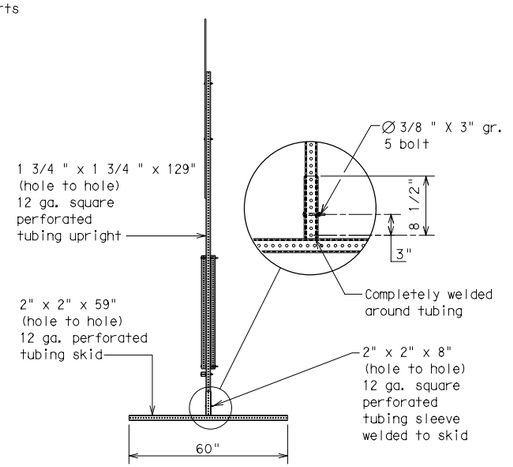
PERFORATED SQUARE METAL TUBING

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
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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

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

** See Application Guidelines Note 6.

APPLICATION GUIDELINES

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

WORDING ALTERNATIVES

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

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

FULL MATRIX PCMS SIGNS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PORTABLE CHANGEABLE MESSAGE SIGN (PCMS)

BC(6)-21

FILE:	bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS		0902	90	207, ETC	HULEN ST, ETC
9-07 8-14		DIST	COUNTY		SHEET NO.
7-13 5-21		33	TARRANT		34

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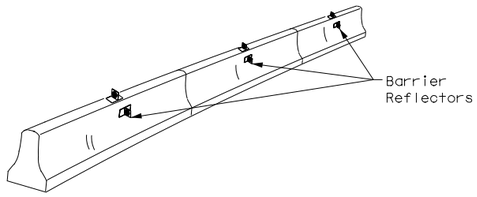
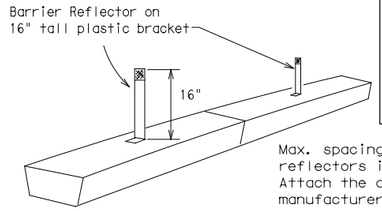
1. Barrier Reflectors shall be pre-qualified, and conform to the color and reflectivity requirements of DMS-8600. A list of prequalified Barrier Reflectors can be found at the Material Producer List web address shown on BC(1).
2. Color of Barrier Reflectors shall be as specified in the TMUTCD. The cost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

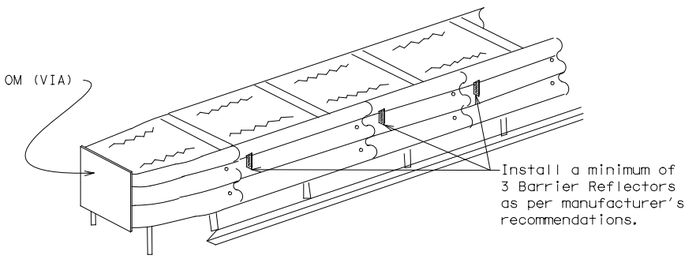


Max. spacing of barrier reflectors is 20 feet. Attach the delineators as per manufacturer's recommendations.

LOW PROFILE CONCRETE BARRIER (LPCB)

LOW PROFILE CONCRETE BARRIER (LPCB) USED IN WORK ZONES

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

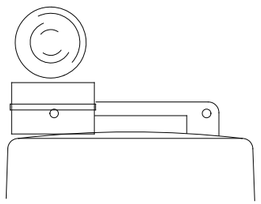


DELINEATION OF END TREATMENTS

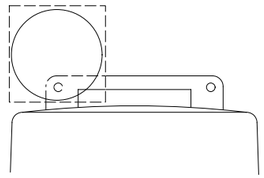
END TREATMENTS FOR CTB'S USED IN WORK ZONES

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

BARRIER REFLECTORS FOR CONCRETE TRAFFIC BARRIER AND ATTENUATORS



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



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

WARNING LIGHTS

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

WARNING LIGHTS MOUNTED ON PLASTIC DRUMS

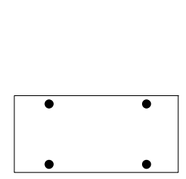
1. Type A flashing warning lights are intended to warn drivers that they are approaching or are in a potentially hazardous area.
2. Type A random flashing warning lights are not intended for delineation and shall not be used in a series.
3. A series of sequential flashing warning lights placed on channelizing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

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

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

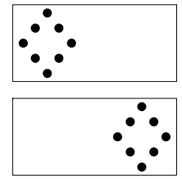
Arrow Boards may be located behind channelizing devices in place for a shoulder taper or merging taper, otherwise they shall be delineated with four (4) channelizing devices placed perpendicular to traffic on the upstream side of traffic.

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

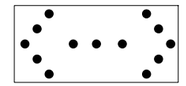


4 CORNER CAUTION

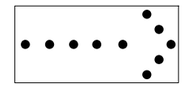
OR



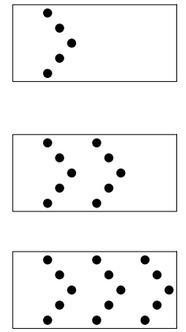
ALTERNATING DIAMOND CAUTION



DOUBLE ARROW



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



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

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

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

ATTENTION
Flashing Arrow Boards shall be equipped with automatic dimming devices.

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

FLASHING ARROW BOARDS

TRUCK-MOUNTED ATTENUATORS

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

Texas Department of Transportation

Traffic Safety Division Standard

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

BC(7)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
9-07 8-14	DIST	COUNTY		SHEET NO.
7-13 5-21	33	TARRANT		35

101

DATE:
FILE:

GENERAL NOTES

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

GENERAL DESIGN REQUIREMENTS

Pre-qualified plastic drums shall meet the following requirements:

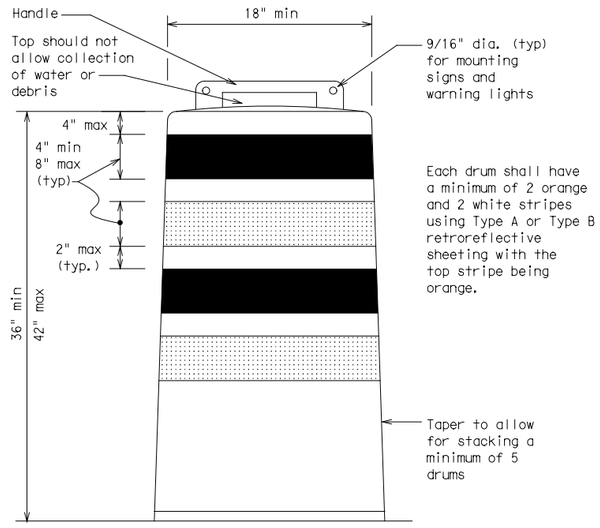
1. Plastic drums shall be a two-piece design; the "body" of the drum shall be the top portion and the "base" shall be the bottom.
2. The body and base shall lock together in such a manner that the body separates from the base when impacted by a vehicle traveling at a speed of 20 MPH or greater but prevents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

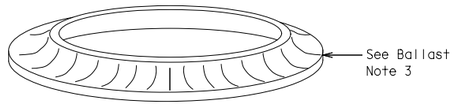
RETROREFLECTIVE SHEETING

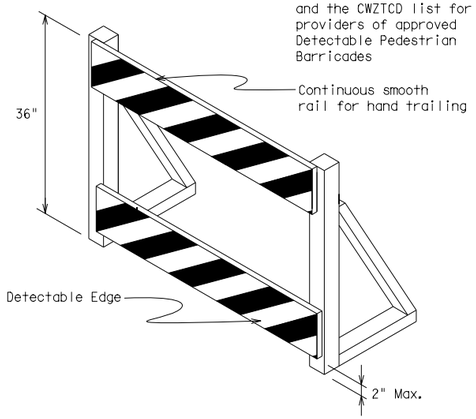
1. The stripes used on drums shall be constructed of sheeting meeting the color and retroreflectivity requirements of Departmental Materials Specification DMS-8300, "Sign Face Materials," Type A or Type B reflective sheeting shall be supplied unless otherwise specified in the plans.
2. The sheeting shall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

BALLAST

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

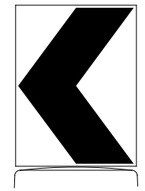




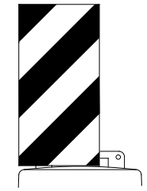


DETECTABLE PEDESTRIAN BARRICADES

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



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



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

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

SIGNS, CHEVRONS, AND VERTICAL PANELS MOUNTED ON PLASTIC DRUMS

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(8)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT November 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
4-03 8-14	DIST	COUNTY		SHEET NO.
9-07 5-21	33	TARRANT		36
7-13				

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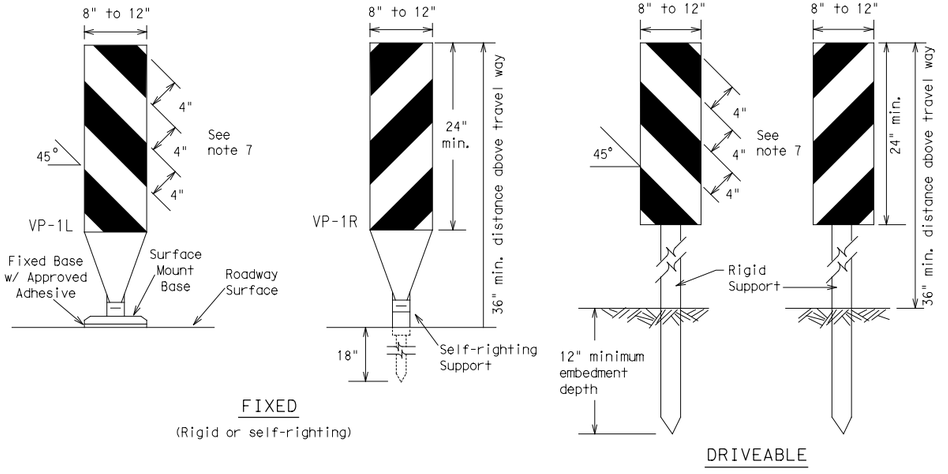
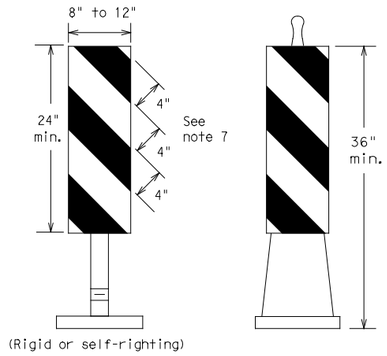


FIXED
(Rigid or self-righting)

DRIVEABLE

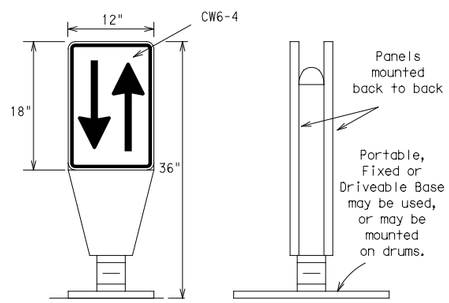


(Rigid or self-righting)

PORTABLE

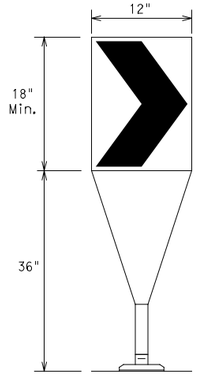
1. Vertical Panels (VP's) are normally used to channelize traffic or divide opposing lanes of traffic.
2. VP's may be used in daytime or nighttime situations. They may be used at the edge of shoulder drop-offs and other areas such as lane transitions where positive daytime and nighttime delineation is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

VERTICAL PANELS (VPs)



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

OPPOSING TRAFFIC LANE DIVIDERS (OTLD)



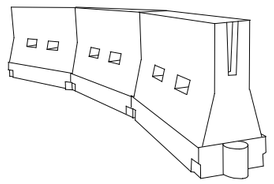
Fixed Base w/ Approved Adhesive (Driveable Base, or Flexible Support can be used)

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

CHEVRONS

GENERAL NOTES

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



LONGITUDINAL CHANNELIZING DEVICES (LCD)

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

WATER BALLASTED SYSTEMS USED AS BARRIERS

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

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

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

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

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

SUGGESTED MAXIMUM SPACING OF CHANNELIZING DEVICES AND MINIMUM DESIRABLE TAPER LENGTHS

SHEET 9 OF 12

Texas Department of Transportation | Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(9)-21

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7-13 5-21		33	TARRANT		37

DATE:
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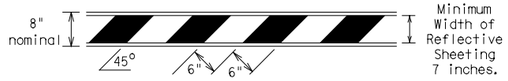
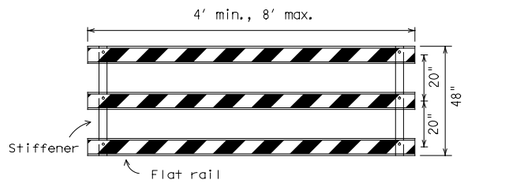
TYPE 3 BARRICADES

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.



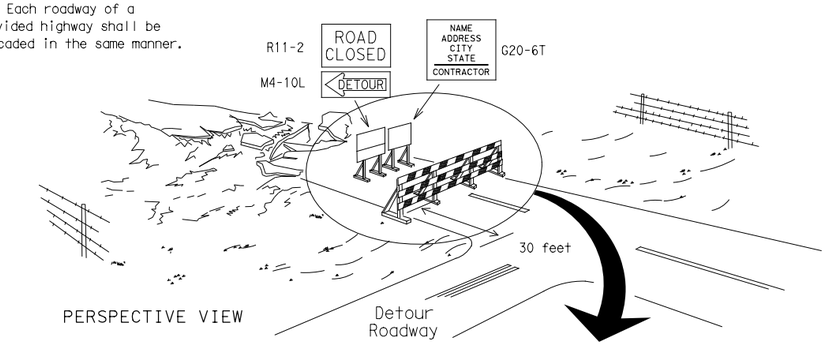
TYPICAL STRIPING DETAIL FOR BARRICADE RAIL



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

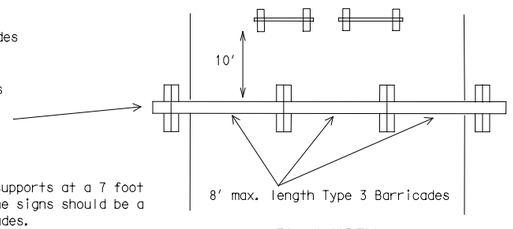
TYPICAL PANEL DETAIL
FOR SKID OR POST TYPE BARRICADES

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



PERSPECTIVE VIEW

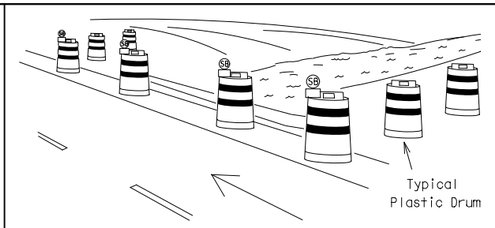
The three rails on Type 3 barricades shall be reflectorized orange and reflective white stripes on one side facing one-way traffic and both sides for two-way traffic.
Barricade striping should slant downward in the direction of detour.



PLAN VIEW

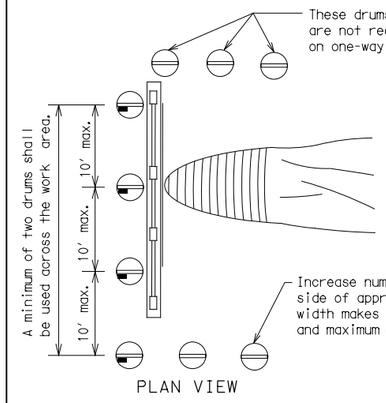
1. Signs should be mounted on independent supports at a 7 foot mounting height in center of roadway. The signs should be a minimum of 10 feet behind Type 3 Barricades.
2. Advance signing shall be as specified elsewhere in the plans.

TYPE 3 BARRICADE (POST AND SKID) TYPICAL APPLICATION



PERSPECTIVE VIEW

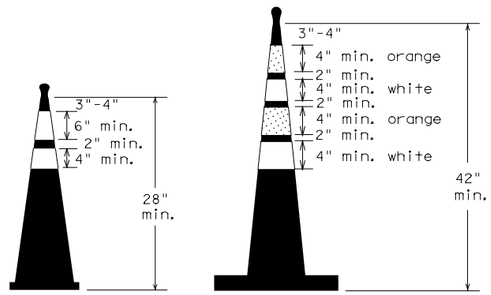
1. Where positive redirectional capability is provided, drums may be omitted.
2. Plastic construction fencing may be used with drums for safety as required in the plans.
3. Vertical Panels on flexible support may be substituted for drums when the shoulder width is less than 4 feet.
4. When the shoulder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



PLAN VIEW

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

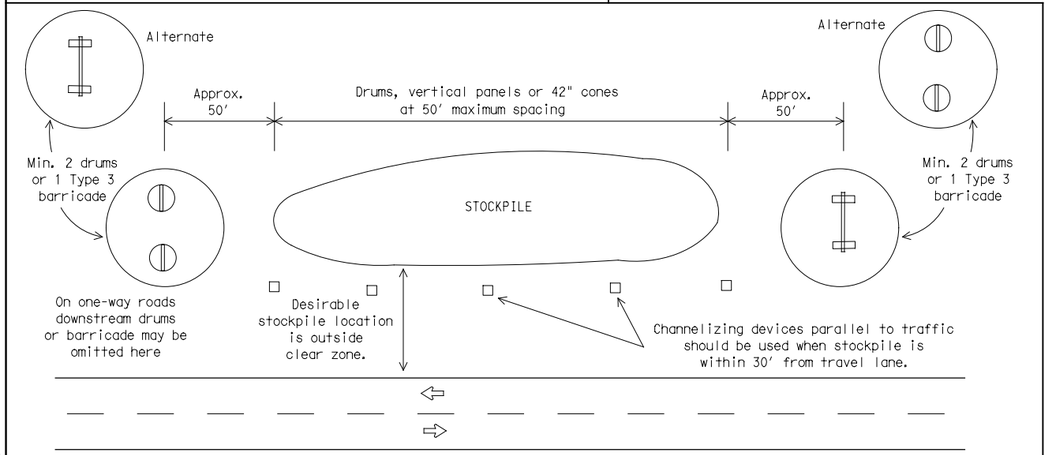
CULVERT WIDENING OR OTHER ISOLATED WORK WITHIN THE PROJECT LIMITS



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

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

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



TRAFFIC CONTROL FOR MATERIAL STOCKPILES

DATE:
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Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION CHANNELIZING DEVICES

BC(10)-21

FILE: bc-21.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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9-07 8-14	DIST	COUNTY		SHEET NO.
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WORK ZONE PAVEMENT MARKINGS

GENERAL

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

RAISED PAVEMENT MARKERS

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

PREFABRICATED PAVEMENT MARKINGS

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

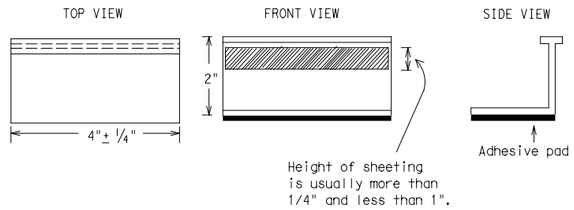
MAINTAINING WORK ZONE PAVEMENT MARKINGS

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

REMOVAL OF PAVEMENT MARKINGS

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

Temporary Flexible-Reflective Roadway Marker Tabs



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

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

RAISED PAVEMENT MARKERS USED AS GUIDEMARKS

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

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

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

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

Texas Department of Transportation

Traffic Safety Division Standard

BARRICADE AND CONSTRUCTION PAVEMENT MARKINGS

BC(11)-21

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1-02 7-13	33	TARRANT		39
11-02 8-14				

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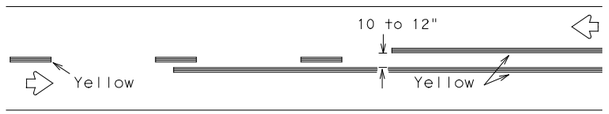
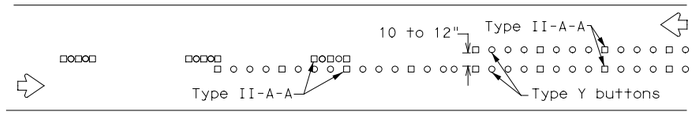
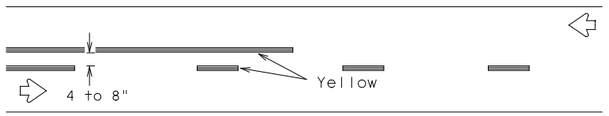
PAVEMENT MARKING PATTERNS



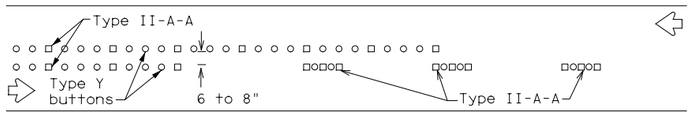
REFLECTORIZED PAVEMENT MARKINGS - PATTERN A



RAISED PAVEMENT MARKERS - PATTERN A



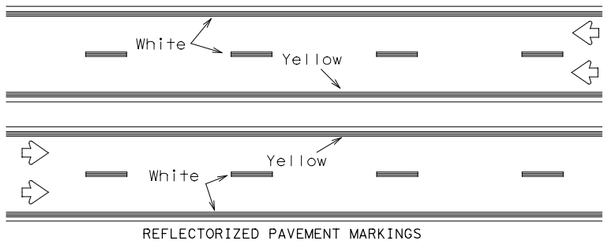
REFLECTORIZED PAVEMENT MARKINGS - PATTERN B



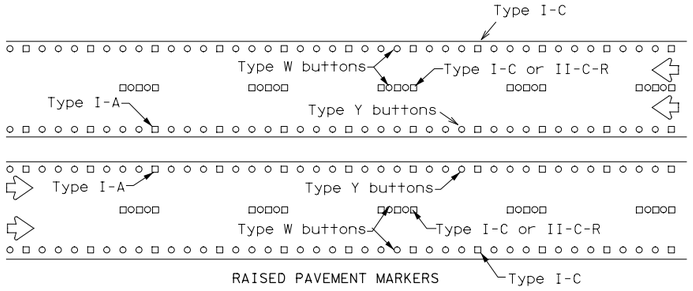
RAISED PAVEMENT MARKERS - PATTERN B

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



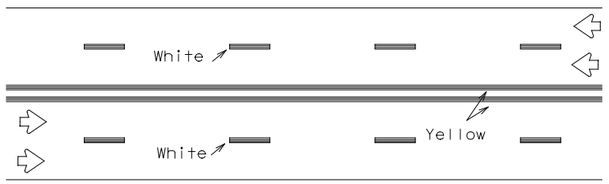
REFLECTORIZED PAVEMENT MARKINGS



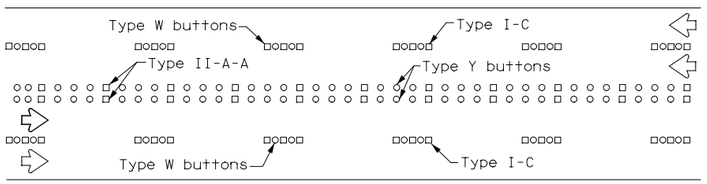
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

EDGE & LANE LINES FOR DIVIDED HIGHWAY



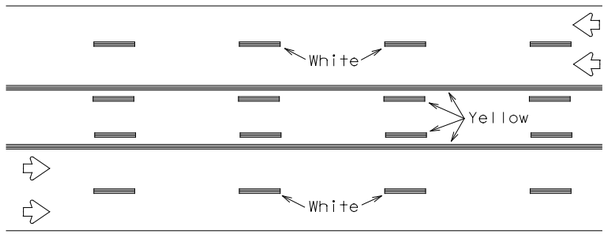
REFLECTORIZED PAVEMENT MARKINGS



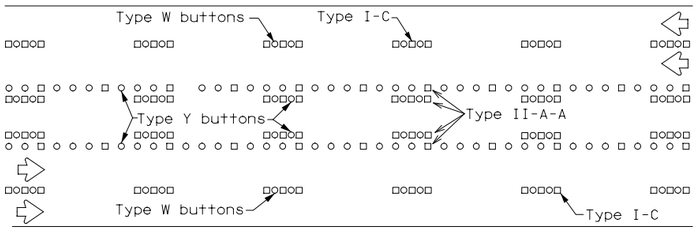
RAISED PAVEMENT MARKERS

Prefabricated markings may be substituted for reflectorized pavement markings.

LANE & CENTER LINES FOR MULTILANE UNDIVIDED HIGHWAYS



REFLECTORIZED PAVEMENT MARKINGS



RAISED PAVEMENT MARKERS

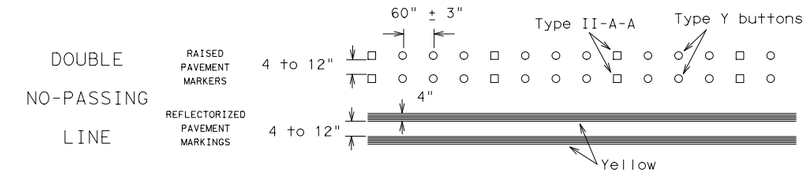
Prefabricated markings may be substituted for reflectorized pavement markings.

TWO-WAY LEFT TURN LANE

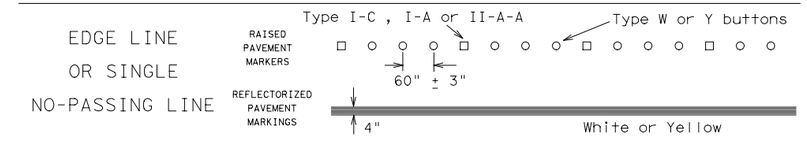
STANDARD WORK ZONE PAVEMENT MARKINGS DETAILS

SOLID LINES

DOUBLE NO-PASSING LINE

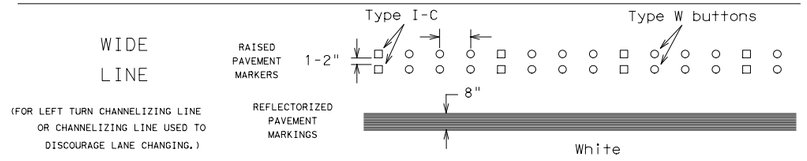


EDGE LINE OR SINGLE NO-PASSING LINE



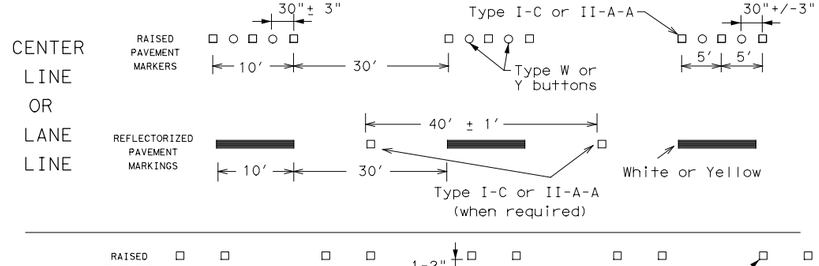
WIDE LINE

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

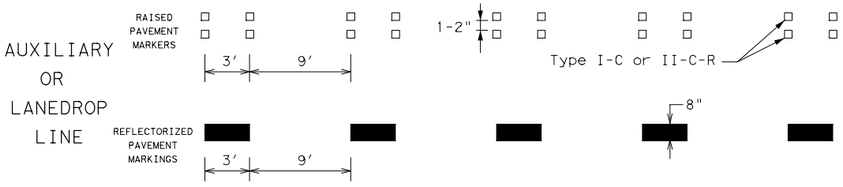


BROKEN LINES

CENTER LINE OR LANE LINE

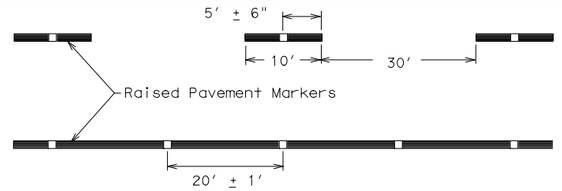


AUXILIARY OR LANEDROP LINE



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	0902	90	207, ETC	HULEN ST, ETC
	DIST	COUNTY		SHEET NO.
	33	TARRANT		40

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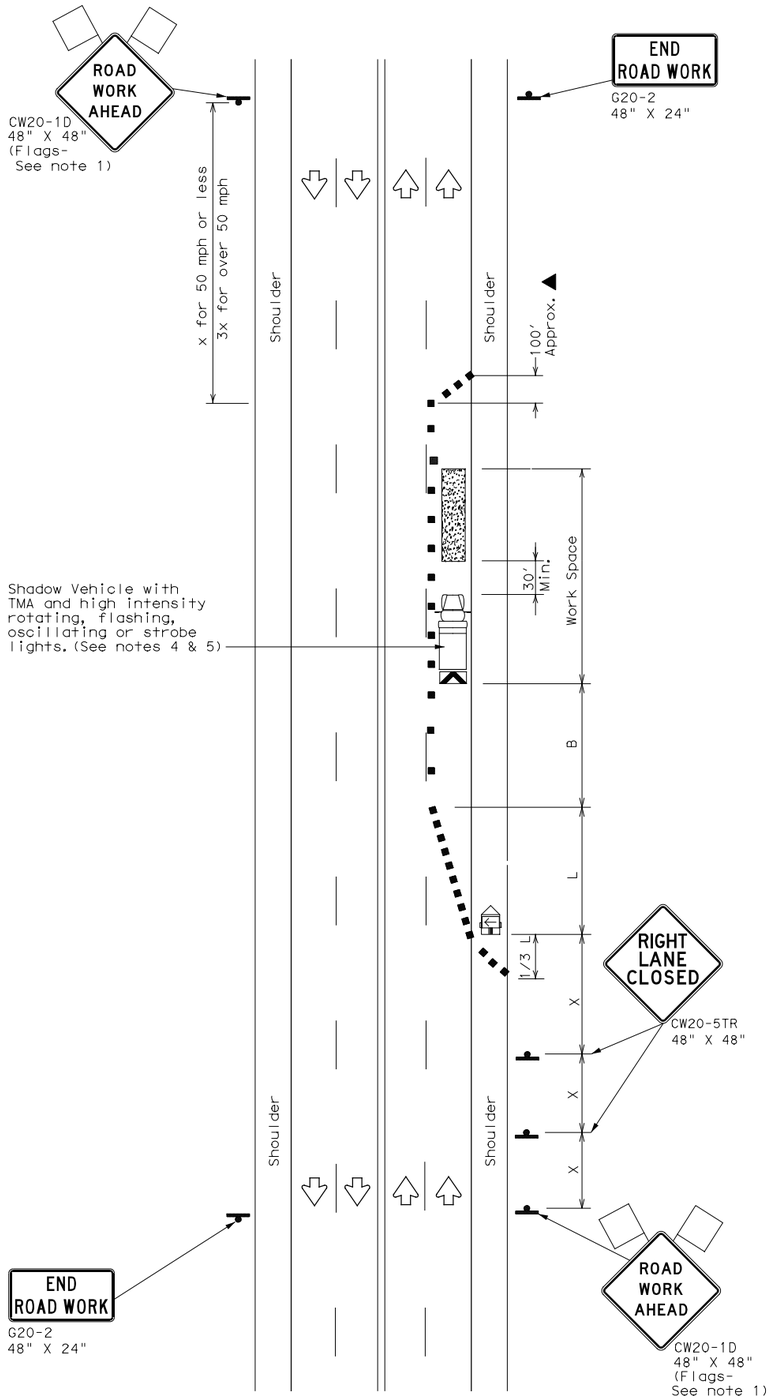
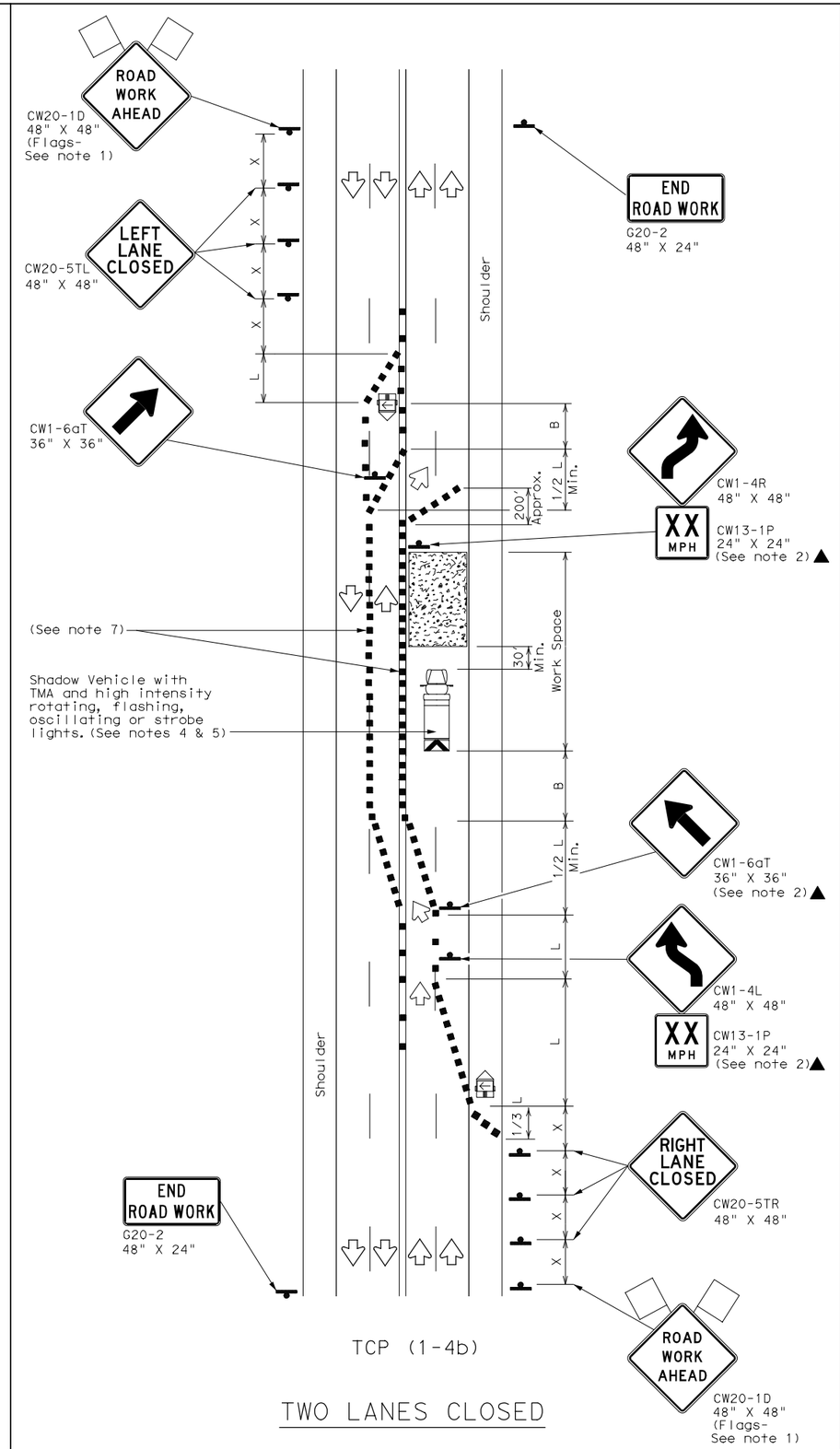


TCP (1-4a)

ONE LANE CLOSED



TCP (1-4b)

TWO LANES CLOSED

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

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

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

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

GENERAL NOTES

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

TCP (1-4a)

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

TCP (1-4b)

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

Texas Department of Transportation

Traffic Operations Division Standard

TRAFFIC CONTROL PLAN LANE CLOSURES ON MULTILANE CONVENTIONAL ROADS

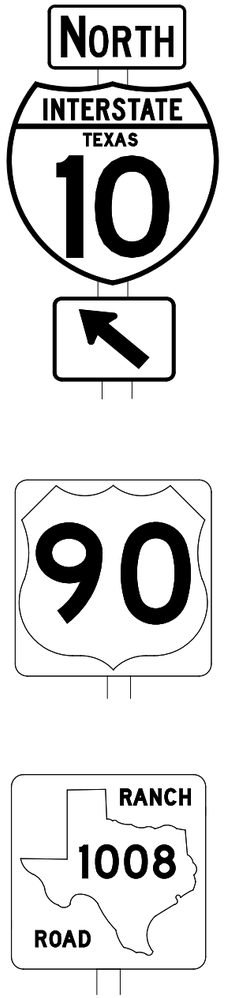
TCP(1-4)-18

FILE: tcp1-4-18.dgn	DN:	CK:	DW:	CK:
© TxDOT December 1985	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
2-94 4-98	DIST	COUNTY		SHEET NO.
8-95 2-12	33	TARRANT		41
1-97 2-18				

DATE:
FILE:

REQUIREMENTS FOR INDEPENDENT MOUNTED ROUTE SIGNS

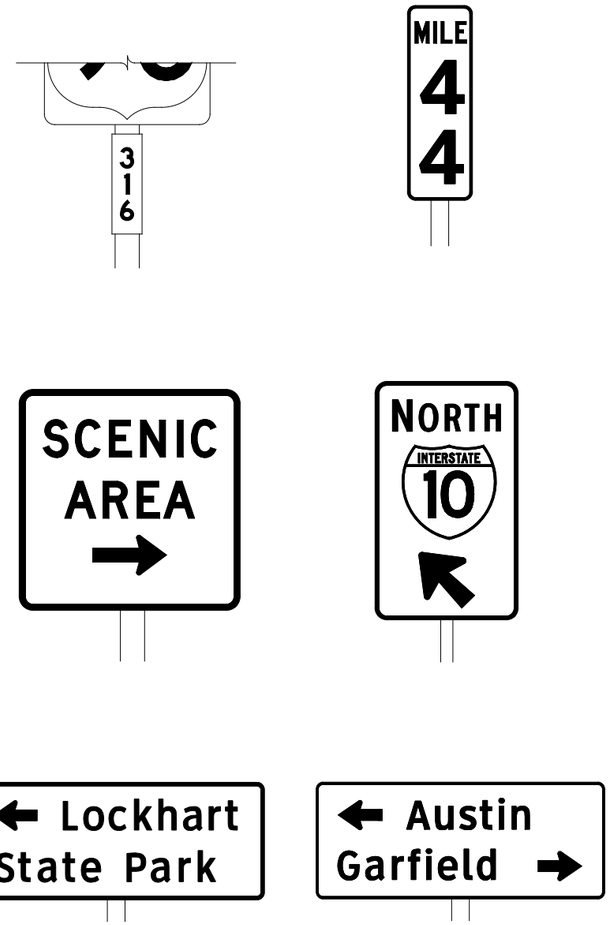
SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE A SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & BORDERS	ALL OTHERS	TYPE B or C SHEETING



TYPICAL EXAMPLES

REQUIREMENTS FOR BLUE, BROWN & GREEN D AND I SERIES GUIDE SIGNS

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	ALL	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE D SHEETING
LEGEND, SYMBOLS & BORDERS	ALL OTHERS	TYPE B OR C SHEETING



TYPICAL EXAMPLES

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).

2. White legend shall use the Clearview Alphabet. The following Clearview fonts shall be used to replace the existing white Federal Highway Administration (FHWA) Standard Highway Alphabets, when not specified in the SHSD, or in the plans.

B	CV-1W
C	CV-2W
D	CV-3W
E	CV-4W
Emod	CV-5WR
F	CV-6W

3. Route sign legend (ie. IH, US, SH and FM shields) shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets B, C, D, E, Emod or F).

4. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.

5. Independent mounted route sign with white or colored legend and borders shall be applied by screening process with transparent color ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof. White legend, symbols and borders on all other signs shall be cut-out white sheeting applied to colored background sheeting.

6. Information regarding borders and radii for signs is found in the "Standard Highway Sign Designs for Texas". Dimensions shown and described for borders and corner radii on parent sign are nominal. Borders may vary in width as much as 1/2 inch. Corner radii above 3 inches may vary in width as much as 1 inch. Borders and corner radii within a parent sign must be of matching widths. The sign area outside the corner radius should be trimmed or rounded.

7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.

8. Mounting details of roadside signs are shown in the "SMD series" Standard Plan Sheets.

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(3)-13

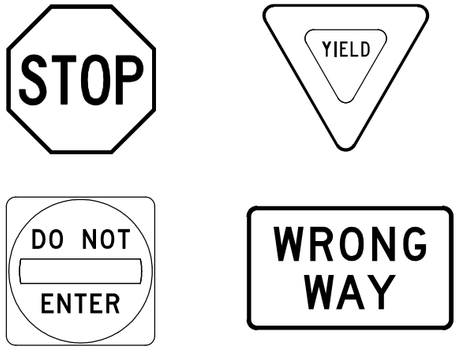
FILE: tsr3-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	33	TARRANT		42

3

DATE:
FILE:

REQUIREMENTS FOR RED BACKGROUND REGULATORY SIGNS

(STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)



REQUIREMENTS FOR FOUR SPECIFIC SIGNS ONLY

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	RED	TYPE B OR C SHEETING
BACKGROUND	WHITE	TYPE B OR C SHEETING
LEGEND & BORDERS	WHITE	TYPE B OR C SHEETING
LEGEND	RED	TYPE B OR C SHEETING

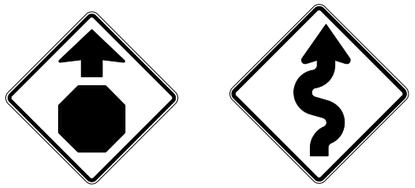
REQUIREMENTS FOR WHITE BACKGROUND REGULATORY SIGNS

(EXCLUDING STOP, YIELD, DO NOT ENTER AND WRONG WAY SIGNS)

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	ALL OTHERS	TYPE B OR C SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND, BORDERS AND SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR WARNING SIGNS



TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	FLOURESCENT YELLOW	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND & BORDERS	BLACK	ACRYLIC NON-REFLECTIVE FILM
LEGEND & SYMBOLS	ALL OTHER	TYPE B OR C SHEETING

REQUIREMENTS FOR SCHOOL SIGNS

TYPICAL EXAMPLES

SHEETING REQUIREMENTS		
USAGE	COLOR	SIGN FACE MATERIAL
BACKGROUND	WHITE	TYPE A SHEETING
BACKGROUND	FLOURESCENT YELLOW GREEN	TYPE B_{FL} OR C_{FL} SHEETING
LEGEND, BORDERS AND SYMBOLS	BLACK	ACRYLIC NON-REFLECTIVE FILM
SYMBOLS	RED	TYPE B OR C SHEETING

GENERAL NOTES

1. Signs to be furnished shall be as detailed elsewhere in the plans and/or as shown on sign tabulation sheet. Standard sign designs and arrow dimensions can be found in the "Standard Highway Sign Designs for Texas" (SHSD).
2. Sign legend shall use the Federal Highway Administration (FHWA) Standard Highway Alphabets (B, C, D, E, Emod or F).
3. Lateral spacing between letters and numerals shall conform with the SHSD, and any approved changes thereto. Lateral spacing of legend shall provide a balanced appearance when spacing is not shown.
4. Black legend and borders shall be applied by screening process or cut-out acrylic non-reflective black film to background sheeting, or combination thereof.
5. White legend and borders shall be applied by screening process with transparent colored ink, transparent colored overlay film to white background sheeting or cut-out white sheeting to colored background sheeting, or combination thereof.
6. Colored legend shall be applied by screening process with transparent colored ink, transparent colored overlay film or colored sheeting to background sheeting, or combination thereof.
7. Sign substrate shall be any material that meets the Departmental Material Specification requirements of DMS-7110 or approved alternative.
8. Mounting details for roadside mounted signs are shown in the "SMD series" Standard Plan Sheets.

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080
7.5 to 15	0.100
Greater than 15	0.125

DEPARTMENTAL MATERIAL SPECIFICATIONS	
ALUMINUM SIGN BLANKS	DMS-7110
SIGN FACE MATERIALS	DMS-8300

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

Texas Department of Transportation

Traffic Operations Division Standard

TYPICAL SIGN REQUIREMENTS

TSR(4)-13

FILE: tsr4-13.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT October 2003	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
12-03 7-13	DIST	COUNTY		SHEET NO.
9-08	33	TARRANT		43

4

DATE:
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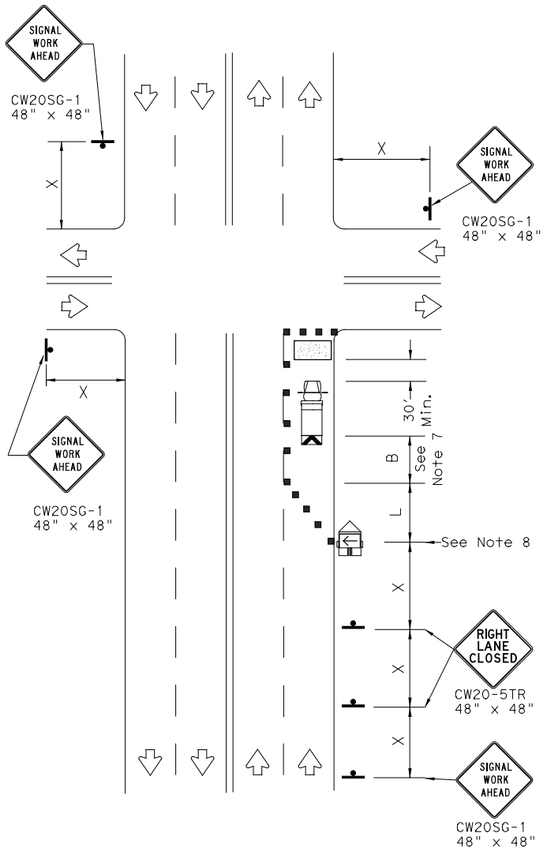
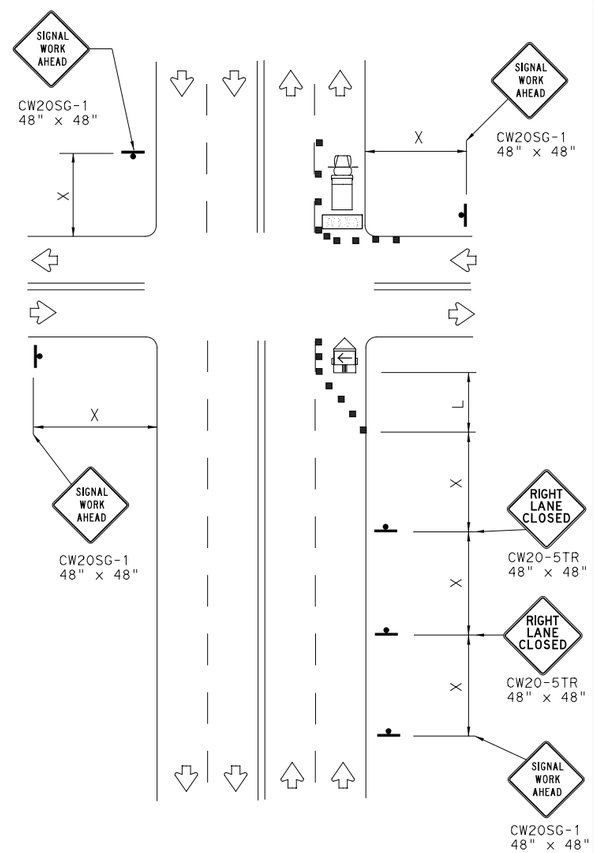


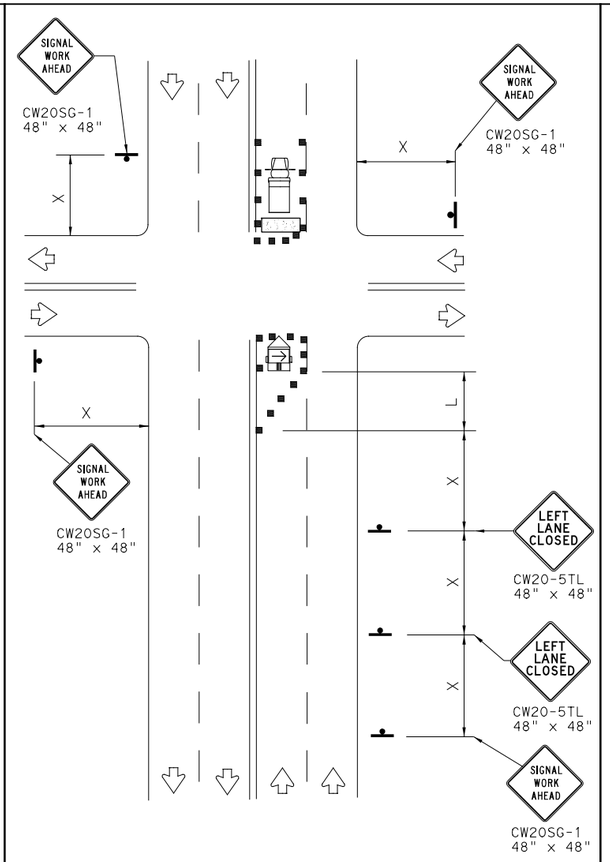
NEAR SIDE LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY



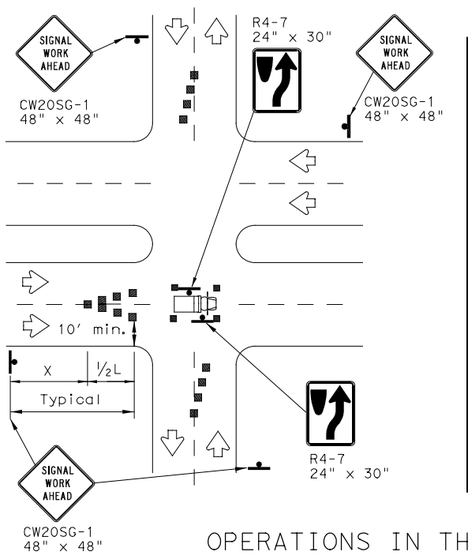
FAR SIDE RIGHT LANE CLOSURE

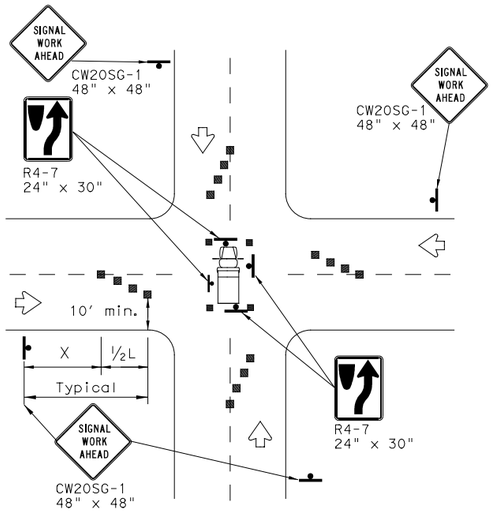
SHORT DURATION OR SHORT TERM STATIONARY



FAR SIDE LEFT LANE CLOSURE

SHORT DURATION OR SHORT TERM STATIONARY





OPERATIONS IN THE INTERSECTION

SHORT DURATION

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.

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
©TxDOT April 1992	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
2-98 10-99 7-13	DIST	COUNTY		SHEET NO.
4-98 3-03	33	TARRANT		44

114

DATE:
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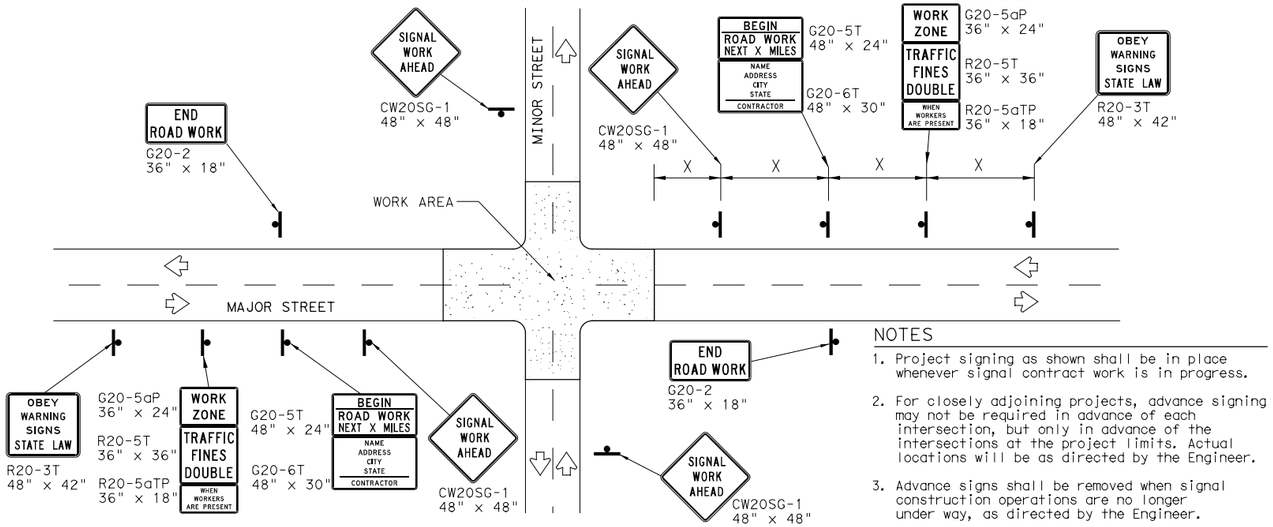


TYPICAL ADVANCE SIGNAL PROJECT SIGNING

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

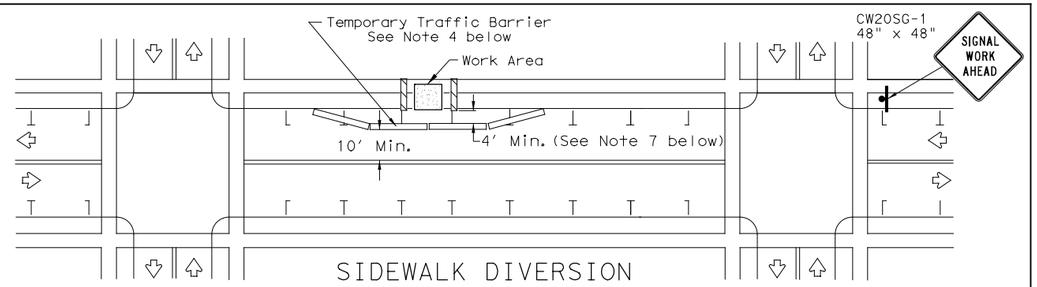
1. Weights used to keep signs from turning over should be sandbags filled with dry, cohesionless material.
2. The sandbags will be tied shut to keep the sand from spilling and to maintain a constant weight.
3. Rock, concrete, iron, steel or other solid objects will not be permitted for use as sign support 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

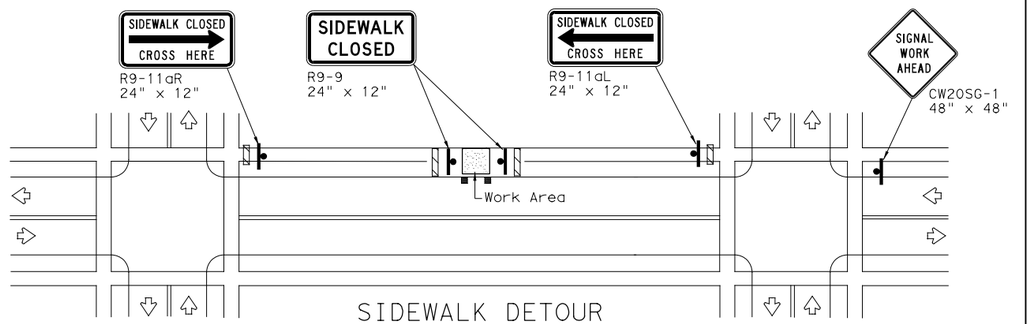
DEPARTMENTAL MATERIAL SPECIFICATIONS	
SIGN FACE MATERIALS	DMS-8300
FLEXIBLE ROLL-UP REFLECTIVE SIGNS	DMS-8310

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

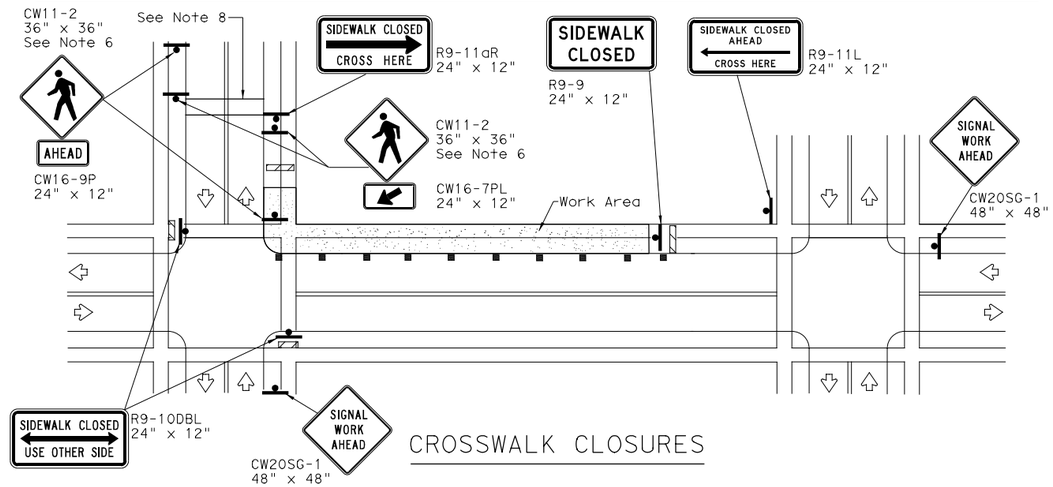
Only pre-qualified products shall be used. A copy of the "Compliant Work Zone Traffic Control Devices List" (CWZTCD) describes pre-qualified products and their sources and may be found at the following web address:
http://www.txdot.gov/txdot_library/publications/construction.htm



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.

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		0902	90	207, ETC	HULEN ST, ETC
2-98 10-99 7-13		DIST	COUNTY		SHEET NO.
4-98 3-03		33	TARRANT		45

LEGEND

- EXISTING CONCRETE PAVEMENT TO BE REMOVED
- EXISTING SIGN (TS)
- EXISTING CONCRETE SIDEWALK AND PEDESTRIAN RAMP TO BE REMOVED
- EXISTING ROW
- EXISTING LIGHTPOLE (LP2)
- EXISTING CONDUIT

NOTES:

1) ALL EXISTING PULL BOXES TO BE REMOVED UNLESS NOTED OTHERWISE.
2) EXISTING CONDUIT TO BE REMOVED OR ABANDONED. REMOVE CABLE FROM ABANDONED CONDUITS AND CAP.
3) ALL EXISTING PEDESTRIAN SIGNAL HEADS TO BE REMOVED. ALL PEDESTRIAN PUSH BUTTONS TO BE REMOVED.
4) REMOVE ALL SIGNAL POLES AND FOUNDATIONS. FOUNDATION TO BE CUT 2 FEET BELOW GRADE. BACKFILL HOLES WITH MATERIAL EQUAL IN COMPOSITION AND DENSITY TO SURROUNDING THE AREA AND COMPACT MATERIAL TO BE LEVEL WITH GRADE.
5) CONTRACTOR SHALL PROTECT ALL EXISTING TREES, FENCES, SIGNS, UTILITIES, RETAINING WALLS, AND STRUCTURES UNLESS OTHERWISE NOTED.

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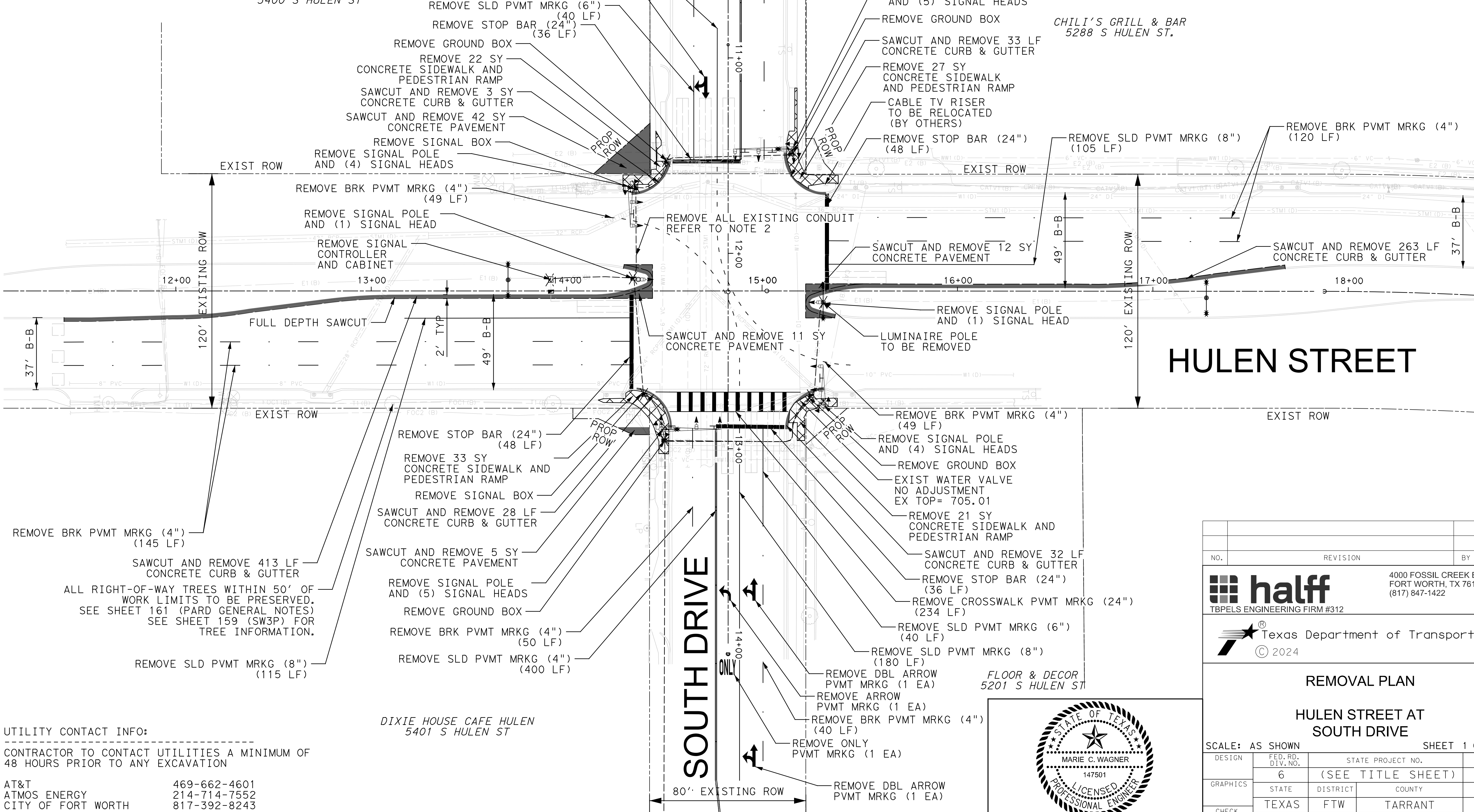
SCALE: 1"=50'



UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS ENERGY	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation
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REMOVAL PLAN

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	46
CHECK	0902	90	207, ETC.	

FTW WAGNER-4219

...\TXDOT-OR*MON*PENTABLE.tbl

TXDOT-OR Sheet

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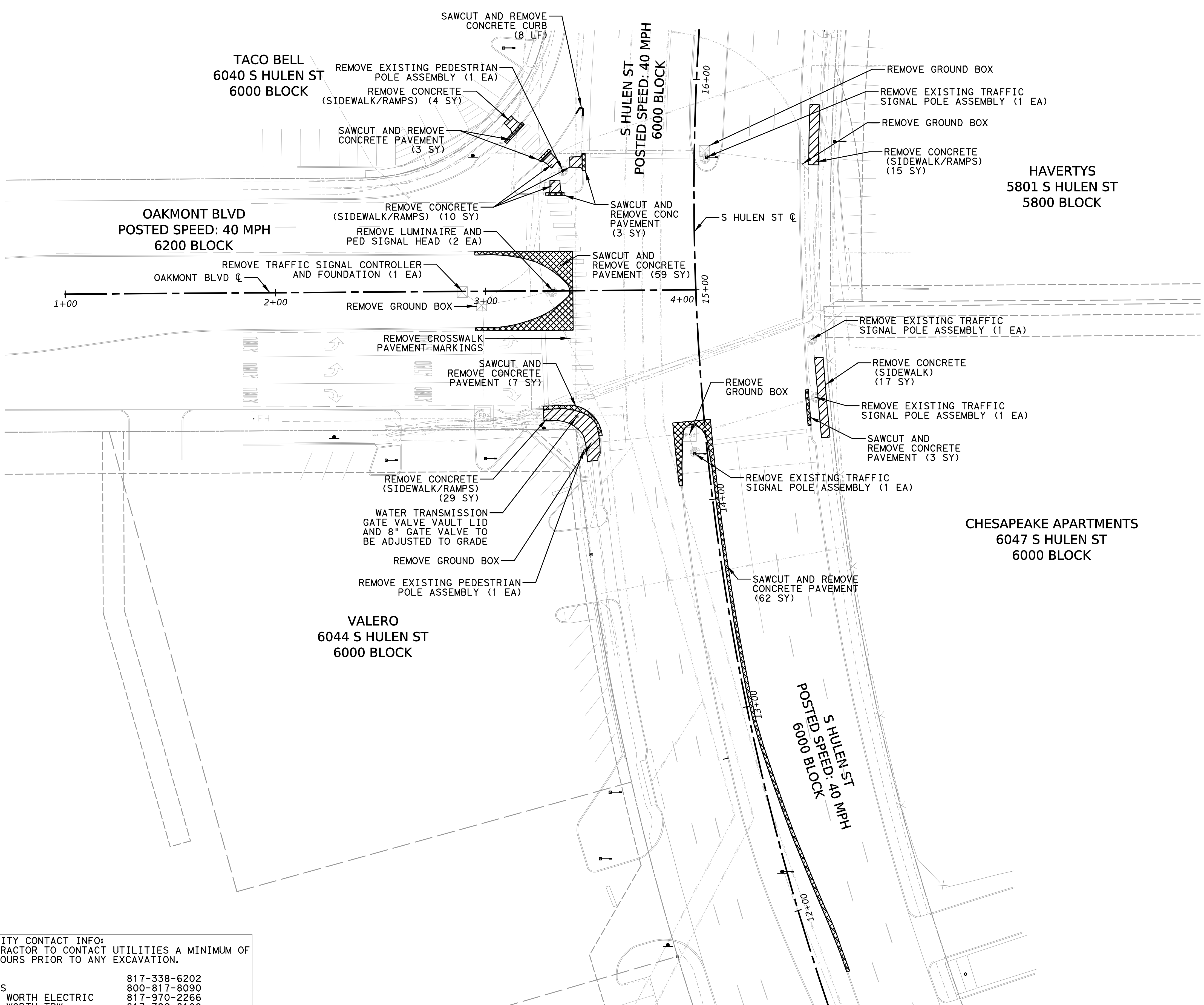


tnp

25 0 12.5 25 50

GRAPHIC SCALE

LEGEND	
[crosshatch]	REMOVE EXISTING CONCRETE PAVEMENT/CURB
[diagonal hatch]	REMOVE EXISTING CONCRETE SIDEWALK/CURB RAMP

NOTES:

1. CONTRACTOR SHALL REFER TO PAVING LAYOUT SHEETS FOR DIMENSIONAL CONTROL.
2. CONTRACTOR SHALL ELIMINATE EXISTING PAVEMENT MARKINGS WHERE NEW MARKINGS ARE BEING PLACED. PAID UNDER ITEM 677.
3. CONTRACTOR SHALL TAKE EXTRA CARE WHEN REMOVING THE SIDEWALK AROUND THE WATER TRANSMISSION GATE VALVE VAULT AS TO NOT DAMAGE THE GATE VALVE INSIDE.

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED PROFESSIONAL ENGINEER
4/16/2024

UTILITY CONTACT INFO:
CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.

AT&T	817-338-6202
ATMOS	800-817-8090
FORT WORTH ELECTRIC	817-970-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR	817-443-3432
SPECTRUM	811
ZAYO	811

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

REMOVAL PLAN

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	47

$OFFICE$ $WORKSTATION$ $PENTBLA$ $MODELNAME$ $CLIENT$ T:\Projects\FTW22299\Eng-MS\01-PSE\PROD*SHEETS\REMOVAL-01.dgn 4/16/2024 20:48 JBaker

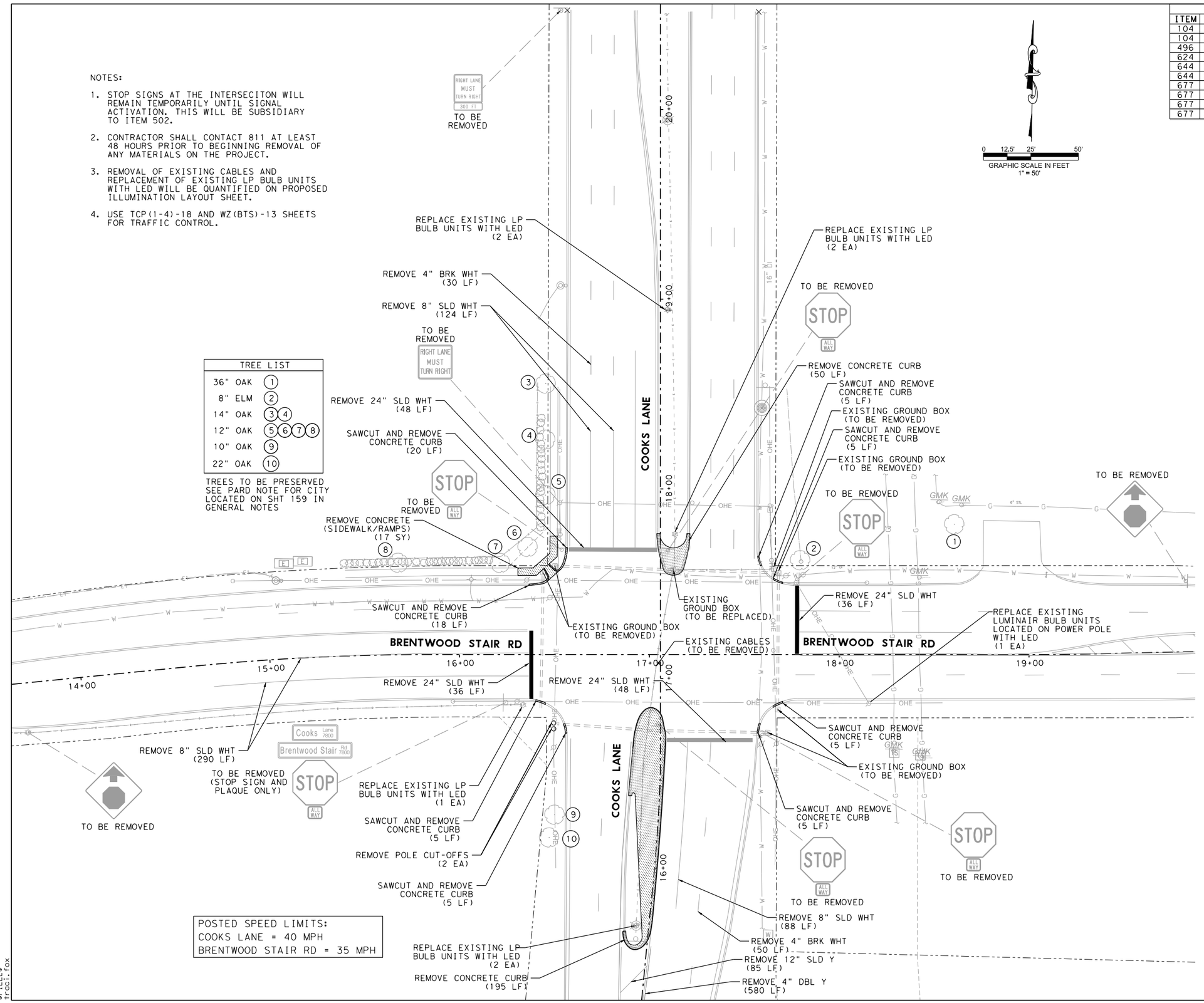
NOTES:

1. STOP SIGNS AT THE INTERSECITON WILL REMAIN TEMPORARILY UNTIL SIGNAL ACTIVATION. THIS WILL BE SUBSIDIARY TO ITEM 502.
2. CONTRACTOR SHALL CONTACT 811 AT LEAST 48 HOURS PRIOR TO BEGINNING REMOVAL OF ANY MATERIALS ON THE PROJECT.
3. REMOVAL OF EXISTING CABLES AND REPLACEMENT OF EXISTING LP BULB UNITS WITH LED WILL BE QUANTIFIED ON PROPOSED ILLUMINATION LAYOUT SHEET.
4. USE TCP(1-4)-18 AND WZ(BTS)-13 SHEETS FOR TRAFFIC CONTROL.

TREE LIST	
36" OAK	1
8" ELM	2
14" OAK	3 4
12" OAK	5 6 7 8
10" OAK	9
22" OAK	10

TREES TO BE PRESERVED SEE PARD NOTE FOR CITY LOCATED ON SHT 159 IN GENERAL NOTES

POSTED SPEED LIMITS:
COOKS LANE = 40 MPH
BRENTWOOD STAIR RD = 35 MPH



0 12.5' 25' 50'
GRAPHIC SCALE IN FEET
1" = 50'

QUANTITY SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QTY
104	6029	REMOVING CONC (CURB OR CURB & GUTTER)	LF	313
104	6036	REMOVING CONC (SIDEWALK OR RAMP)	SY	18
496	6053	REMOV STR (WOOD STR)	EA	2
624	6028	REMOVE GROUND BOX	EA	7
644	6076	REMOVE SM RD SN SUP&AM	EA	8
644	6078	REMOVE SM RD SN SUP&AM (SIGN ONLY)	EA	1
677	6001	ELIM EXT PAV MRK & MRKS (4")	LF	660
677	6003	ELIM EXT PAV MRK & MRKS (8")	LF	502
677	6005	ELIM EXT PAV MRK & MRKS (12")	LF	85
677	6007	ELIM EXT PAV MRK & MRKS (24")	LF	168

LEGEND

LIMITS OF REMOVAL

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
ATMOS ENERGY	800-817-8090
FORT WORTH ELECTRIC	817-870-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR ELECTRIC CORPORATION	817-443-3432
TARRENT COUNTY R.O.W.DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED PROFESSIONAL ENGINEER

4/19/2024

NO.	REVISION	BY	DATE

DEC | ENGINEERING EXCELLENCE™
T.B.O.E. FIRM REGISTRATION #392
415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

REMOVAL PLAN

SCALE: 1" = 50' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	48
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

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LEGEND

- PROPOSED CONCRETE PAVEMENT
- PROPOSED CONCRETE SIDEWALK
- DETECTABLE WARNING
- COLORED, TEXTURED CONCRETE PAVMENT
- TYPE II MONOLITHIC CURB
- DIRECTION OF FLOW ARROWS

N

0 25 50

SCALE: 1"=50'

NOTE: SEE CURB RAMP GRADING PLAN FOR FURTHER DETAIL AT EACH INTERSECTION CORNER

7-ELEVEN
5400 S HULEN ST

CHILI'S GRILL & BAR
5288 S HULEN ST

DIXIE HOUSE CAFE HULEN
5401 S HULEN ST

FLOOR & DECOR
5201 S HULEN ST

STA 14+82.63, HULEN STREET=
STA 12+19.25, SOUTH DRIVE
TIE INTO EXIST SIDEWALK
STA 11+40.20
34.29' LT SOUTH DRIVE
EXIST CONC TO REMAIN
CONSTRUCT 12 LF 6" TYPE II CURB
CONSTRUCT 4 SY CONCRETE SIDEWALK
CONSTRUCT 5' TYPE 1 RAMP (1 EACH)
CONSTRUCT 15 SF COLORED, STAMPED CONC
CONSTRUCT 26 LF 3" MOUNTABLE CURB ISLAND TYPE I CURB
CONSTRUCT 29 LF 6" TYPE II CURB
CONSTRUCT 5' TYPE 1 RAMP (1 EACH)
TIE INTO EXIST SIDEWALK
STA 14+28.84
54.58' LT HULEN STREET

TIE INTO EXIST SIDEWALK
STA 11+15.43
34.08' LT SOUTH DRIVE
CONSTRUCT 54 LF 6" TYPE II CURB
CONSTRUCT 8 SY CONCRETE SIDEWALK
CONSTRUCT 24 LF 6" TYPE II CURB
CONSTRUCT 5' TYPE 1 RAMP (1 EACH)
CONSTRUCT 15 SY COLORED, STAMPED CONC
CONSTRUCT 21 LF 3" MOUNTABLE CURB ISLAND TYPE I CURB
CONSTRUCT 5' TYPE 1 RAMP (1 EACH)
CONSTRUCT 13 LF 6" TYPE II CURB
CONSTRUCT 3 SY CONCRETE SIDEWALK
TIE INTO EXIST SIDEWALK
STA 15+38.89
54.85' LT HULEN ST

STA 17+67.76 11.47' LT HULEN STREET=
MATCH EXIST PAVEMENT
P.T.

STA 12+78.80 2.39' RT HULEN STREET
PT.
T/C=709.70

EXIST ROW
PROP ROW
R=20.5'
CONSTRUCT 10 LF 6" TYPE II CURB
CONSTRUCT 294 LF 6" TYPE II CURB
CONSTRUCT 168 SY CONC PAVEMENT
CONSTRUCT 131 SY CONC PAVEMENT
CONSTRUCT 238 LF 6" TYPE II CURB
R=2.5'
R=19.5'
R=20.5'
150' STORAGE
2.0' TYP
37' B-B
48' B-B
58' B-B
101' B-B
120' EXISTING ROW
38' B-B
12+00
13+00
14+00
15+00
17+00
18+00
10+00
11+00
12+00
13+00
14+00

HULEN STREET

SOUTH DRIVE

STA 11+42.75 13.60' RT HULEN STREET
MATCH EXIST PAVEMENT
P.C.

STA 12+29.14 7.46' RT HULEN STREET=
P.R.C.
T/C=710.71

ALL RIGHT-OF-WAY TREES WITHIN 50' OF WORK LIMITS TO BE PRESERVED.
SEE SHEET 161 (PARD GENERAL NOTES)
SEE SHEET 159 (SW3P) FOR TREE INFORMATION

TIE INTO EXIST SIDEWALK
STA 14+16.21
55.84' RT HULEN STREET
CONSTRUCT 7 SY CONCRETE SIDEWALK
CONSTRUCT 11 LF 6" TYPE II CURB
CONSTRUCT 5' TYPE 1 RAMP (1 EACH)
CONSTRUCT 23 LF 6" TYPE II CURB
CONSTRUCT 23 LF 3" MOUNTABLE CURB ISLAND TYPE I CURB
CONSTRUCT 14 SF COLORED, STAMPED CONC
CONSTRUCT 5' TYPE 1 RAMP (1 EACH)
CONSTRUCT 7 SY CONCRETE SIDEWALK
CONSTRUCT 14 LF 6" TYPE II CURB
TIE INTO EXIST SIDEWALK
STA 13+04.27
30.52' RT SOUTH DRIVE

CONSTRUCT 13 LF 6" TYPE II CURB
TIE INTO EXIST SIDEWALK
STA 15+38.49
54.89' RT HULEN ST
CONSTRUCT 3 SY CONCRETE SIDEWALK
CONSTRUCT 5' TYPE 1 RAMP (1 EACH)
CONSTRUCT 10 SF COLORED, STAMPED CONC
EXIST WATER VALVE
NO ADJUSTMENT
EX TOP= 705.01
CONSTRUCT 17 LF 3" MOUNTABLE CURB ISLAND TYPE I CURB
CONSTRUCT 19 LF 6" TYPE II CURB
CONSTRUCT 5' TYPE 1 RAMP (1 EACH)
CONSTRUCT 3 SY CONCRETE SIDEWALK
TIE INTO EXIST SIDEWALK
STA 12+95.75
35.37' LT SOUTH DRIVE
CONSTRUCT 14 LF 6" TYPE II CURB

STA 17+17.93 5.24' LT HULEN STREET
P.T.
T/C=707.33

STA 16+79.39 1.68' LT HULEN STREET
P.C.
T/C=707.15

CURVE DATA

1. Δ=8° 16' 41" R=600.00 T=43.42 L=86.69
2. Δ=4° 46' 05" R=600.00 T=24.98 L=49.93
3. Δ=3° 41' 49" R=600.00 T=19.36 L=38.72

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

PAVING PLAN

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN SHEET 1 OF 1

DESIGN	FED.RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	49
CHECK	0902	90	207, ETC.	

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

FTW
WAGNER-4219

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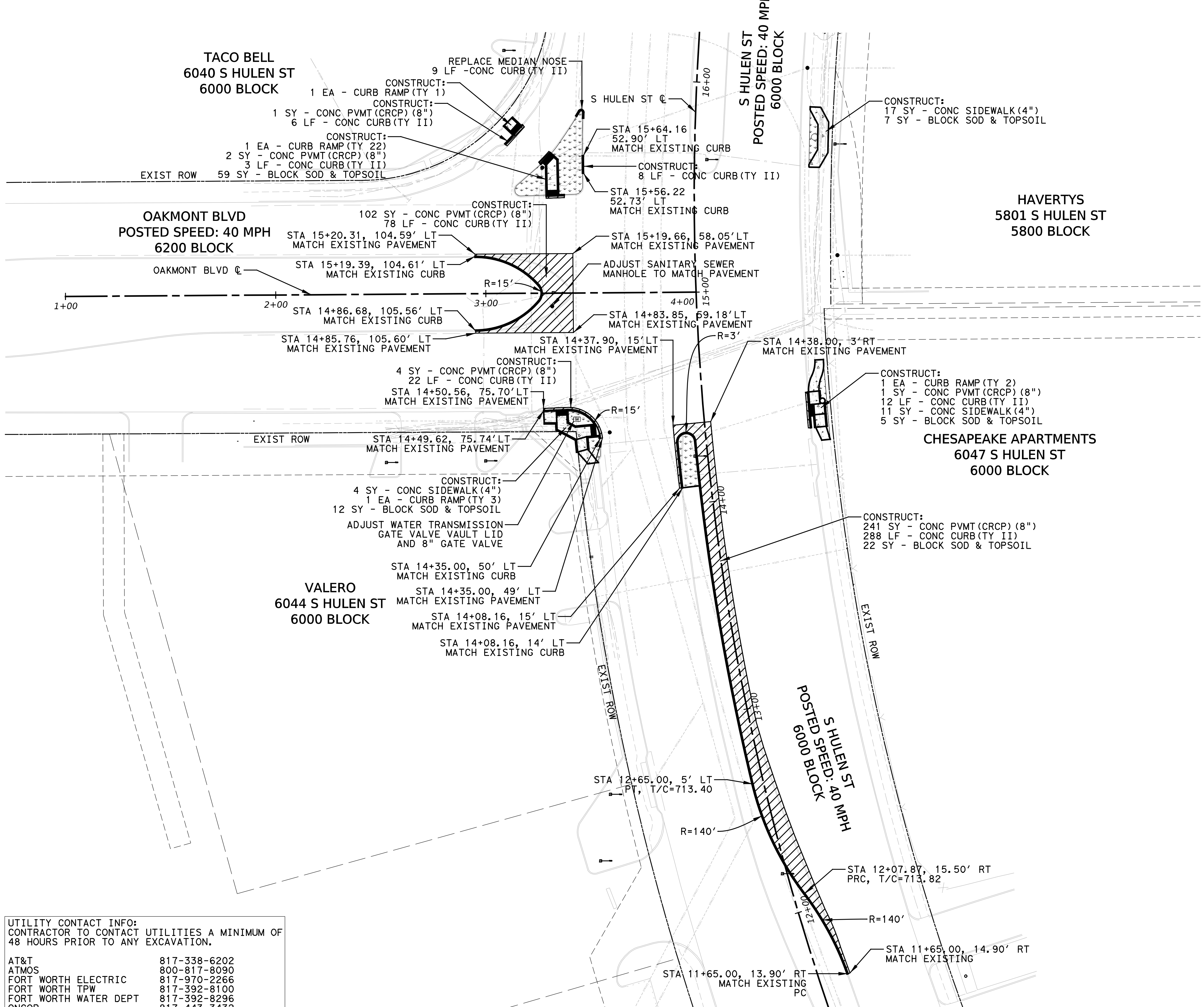


LEGEND	
[pattern]	PROPOSED CONCRETE SIDEWALK (4")
[hatch]	PROPOSED CONCRETE PAVEMENT (CRCP)(8")
[pattern]	PROPOSED BLOCK SODDING

NOTES:

1. STATION AND OFFSET CALLOUTS ARE BASED ON THE S HULEN ST ℄ ALIGNMENT.
2. THE PAVEMENT SAWCUTS ARE 1' FROM THE EXISTING FACE OF CURB.
3. THE CONTRACTOR SHALL USE THE CURRENT WATER TRANSMISSION GATE VALVE & VAULT CIRCULAR MANHOLE INSTEAD OF MATCHING THE EXISTING RECTANGULAR LID. TAKE EXTRA CARE TO NOT DAMAGE THE GATE VALVE WHILE WORKING AROUND THE EXISTING VAULT.

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED
PROFESSIONAL ENGINEER
4/16/2024

UTILITY CONTACT INFO:
CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.

AT&T	817-338-6202
ATMOS	800-817-8090
FORT WORTH ELECTRIC	817-970-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR	817-443-3432
SPECTRUM	811
ZAYO	811

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

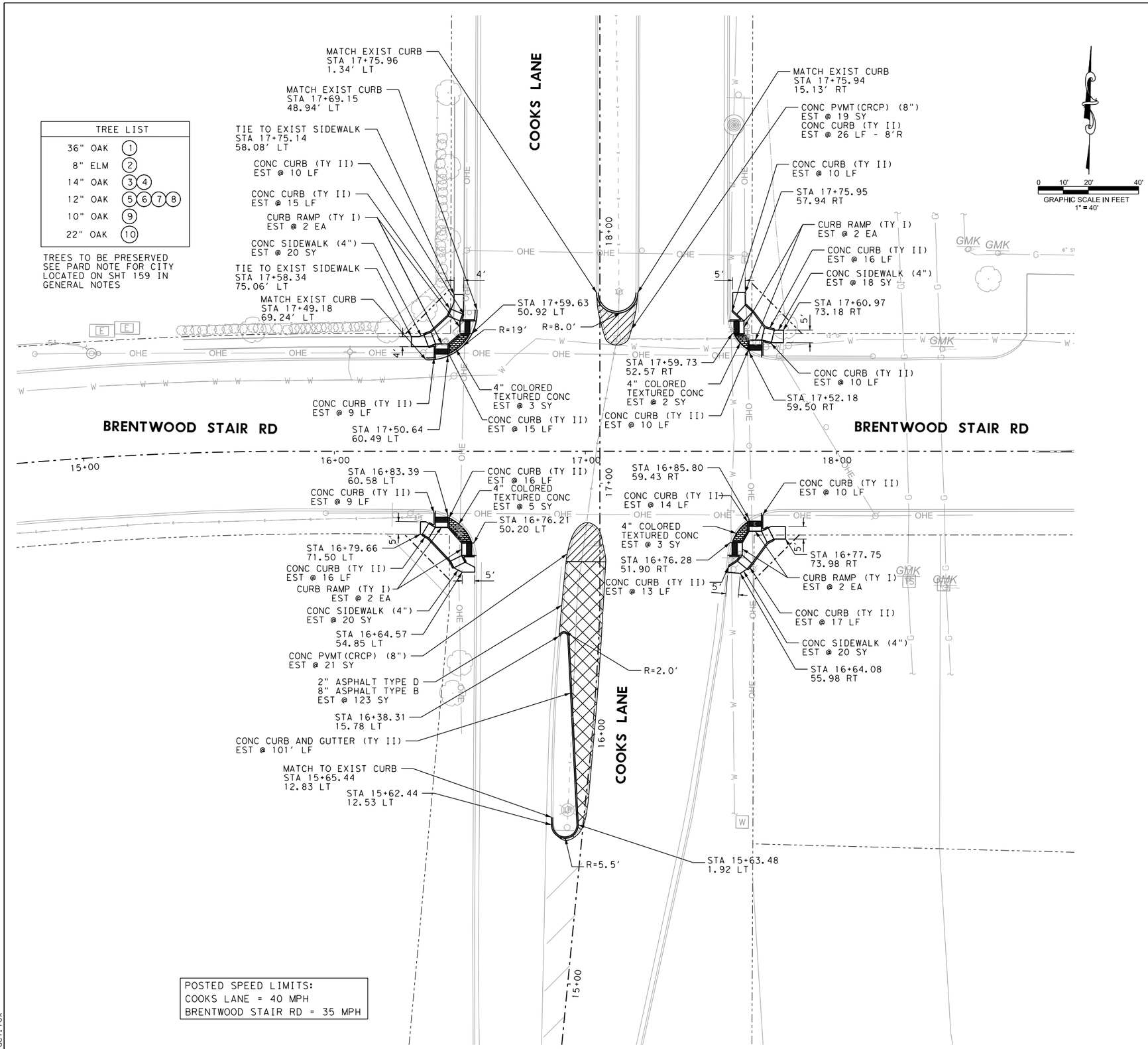
S HULEN ST AT OAKMONT BLVD

PAVING PLAN

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	50
CHECK	0902	90	207, ETC	

$OFFICE$ $WORKSTATION$ $PENTBLA$ $MODELNAME$ $CLIENT$ 4/16/2024 20:56 Baker



QUANTITY SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QTY
247	6230	FL BS (CMP IN PLACE)(TY A GR 1-2)(8")	SY	40
360	6002	CONC PVMT (CONT REINF - CRCP) (8")	SY	40
528	6001	COLORED TEXTURED CONC (4")	SY	13
529	6002	CONC CURB (TY II)	LF	216
529	6008	CONC CURB & GUTTER (TY II)	LF	101
531	6001	CONC SIDEWALKS (4")	SY	78
531	6004	CURB RAMPS (TY 1)	EA	8
3076	6002	D-GR HMA TY-B SAC-B PG64-22	TON	57
3076	6042	D-GR HMA TY-D SAC-B PG70-22	TON	15

UTILITY CONTACT INFO:

CONTRACTRO TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
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FORT WORTH TPW	817-392-8100
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TARRENT COUNTY R.O.W.DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
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LICENSED
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4/19/2024

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415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

PAVING PLAN

SCALE: 1" = 40' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	
CHECK	CONTROL	SECTION	JOB	51
CHECK	0902	90	209	

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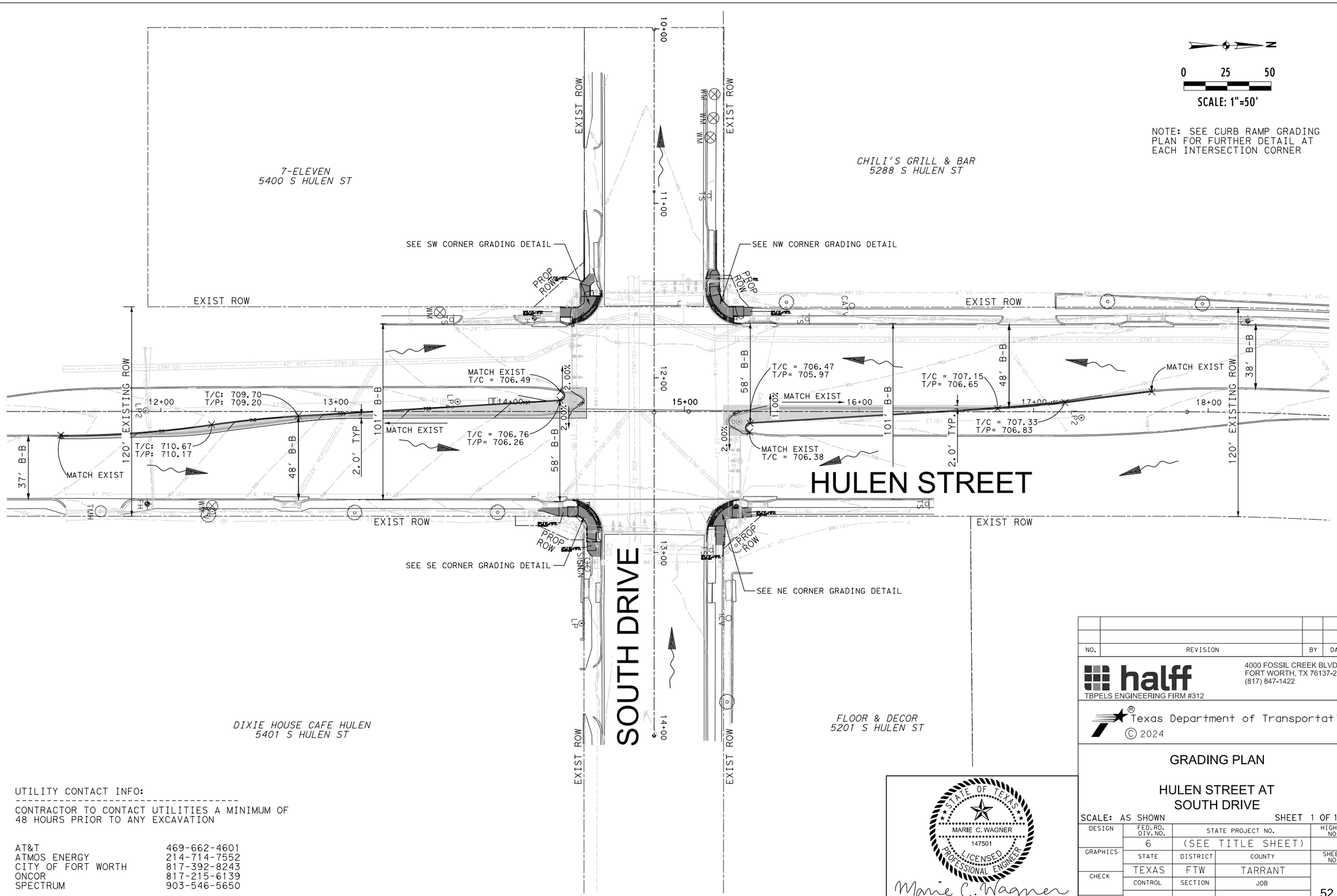

UTILITY CONTACT INFO:

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AT&T	469-662-4601
ATMOS ENERGY	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

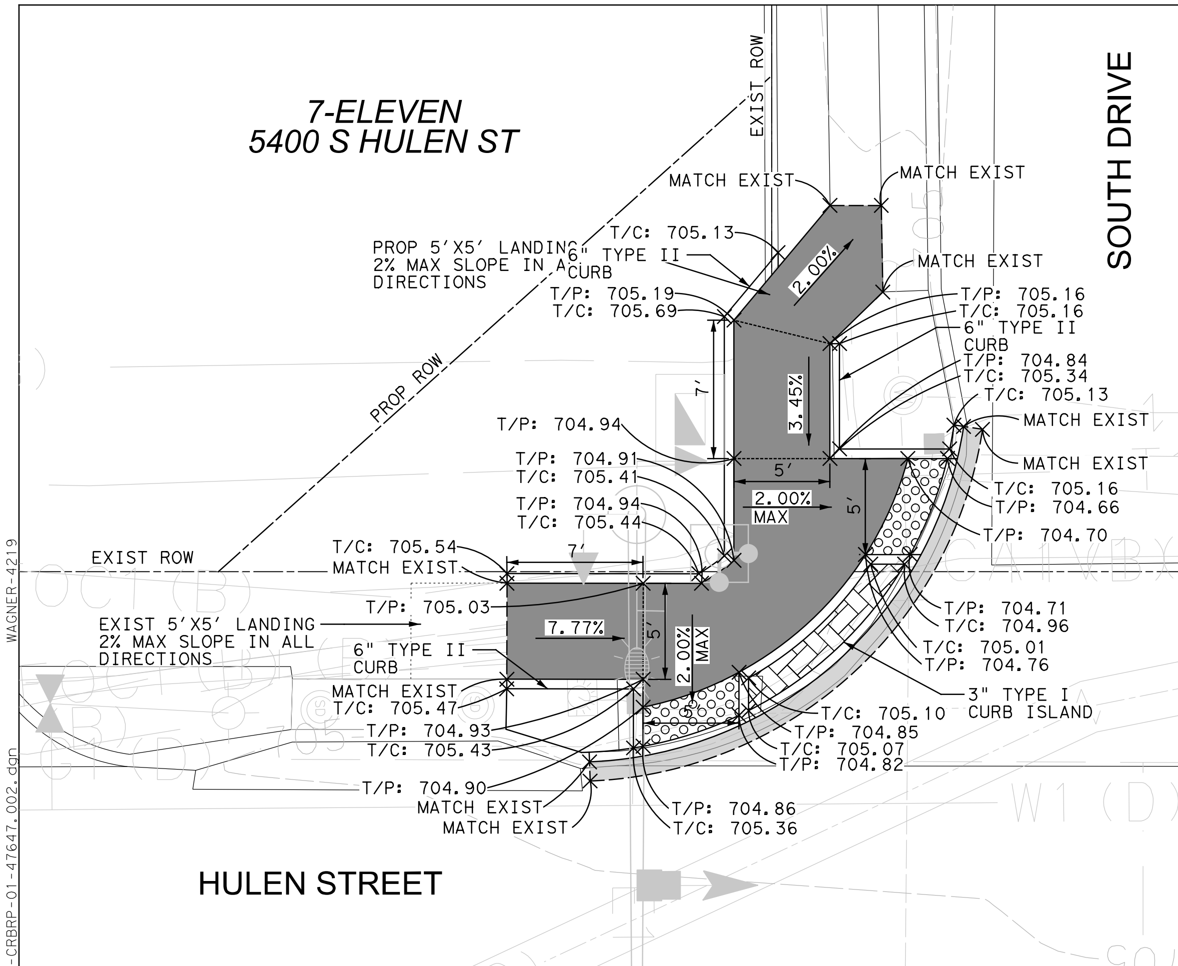
halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

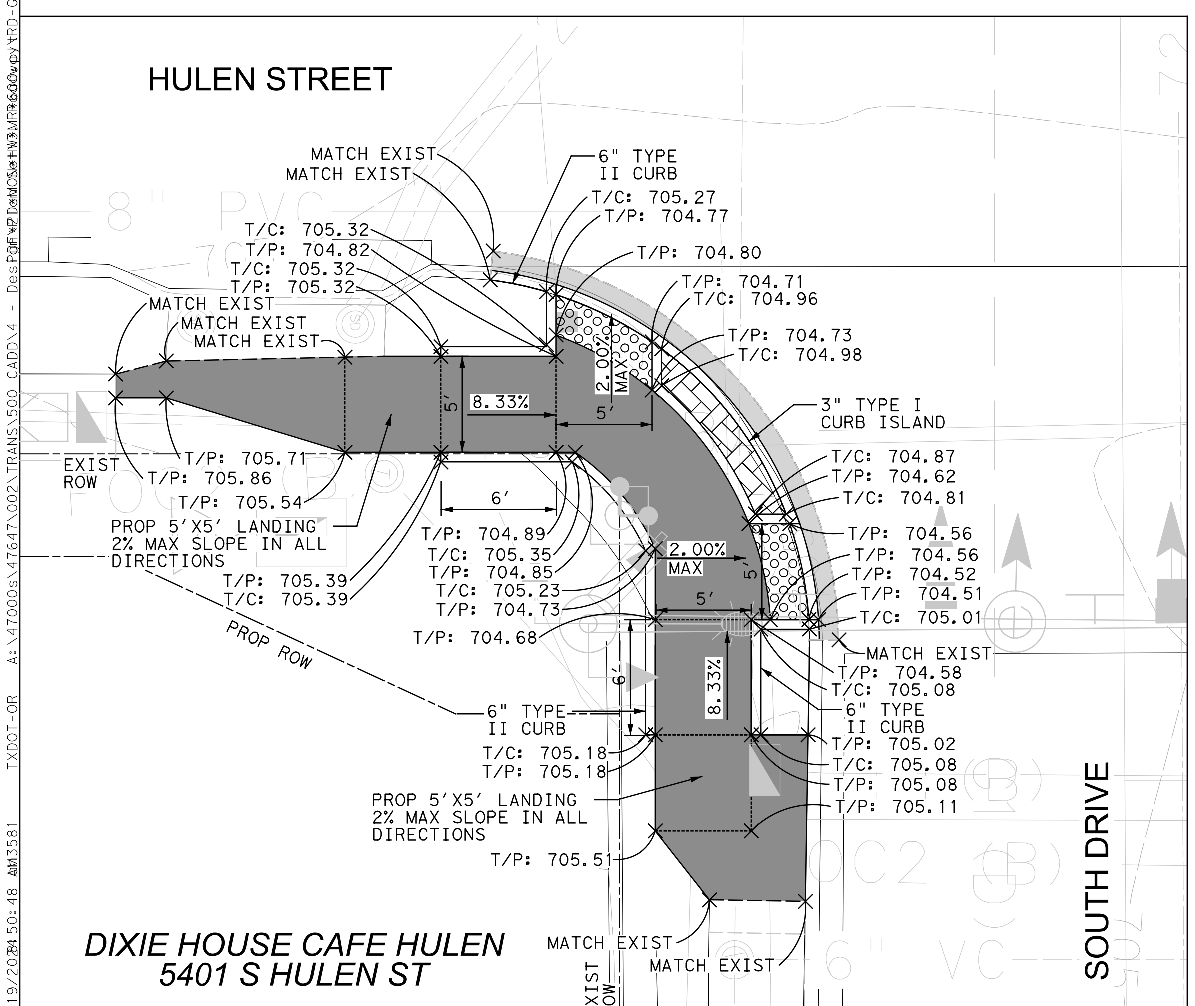
GRADING PLAN

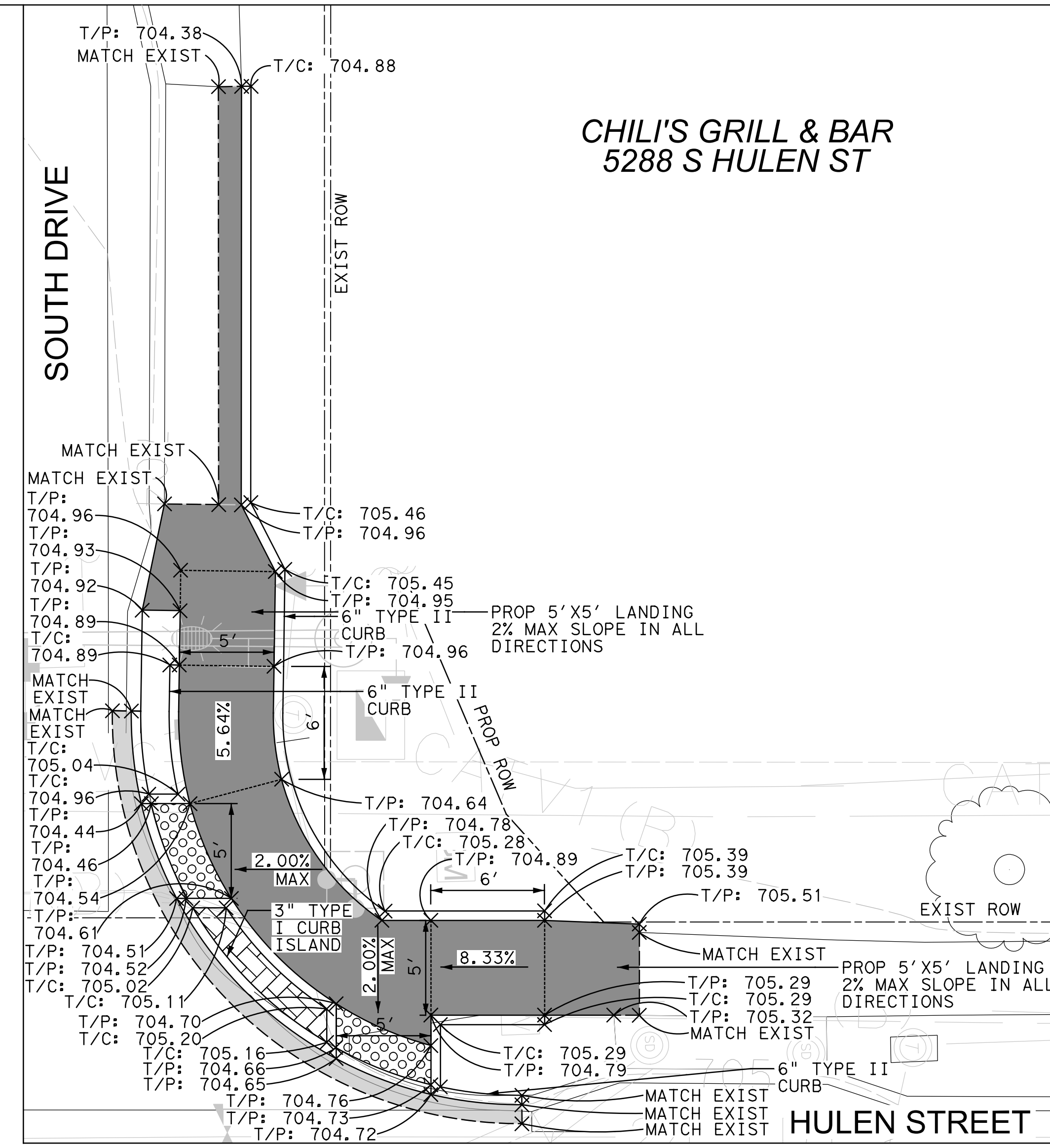
HULEN STREET AT SOUTH DRIVE

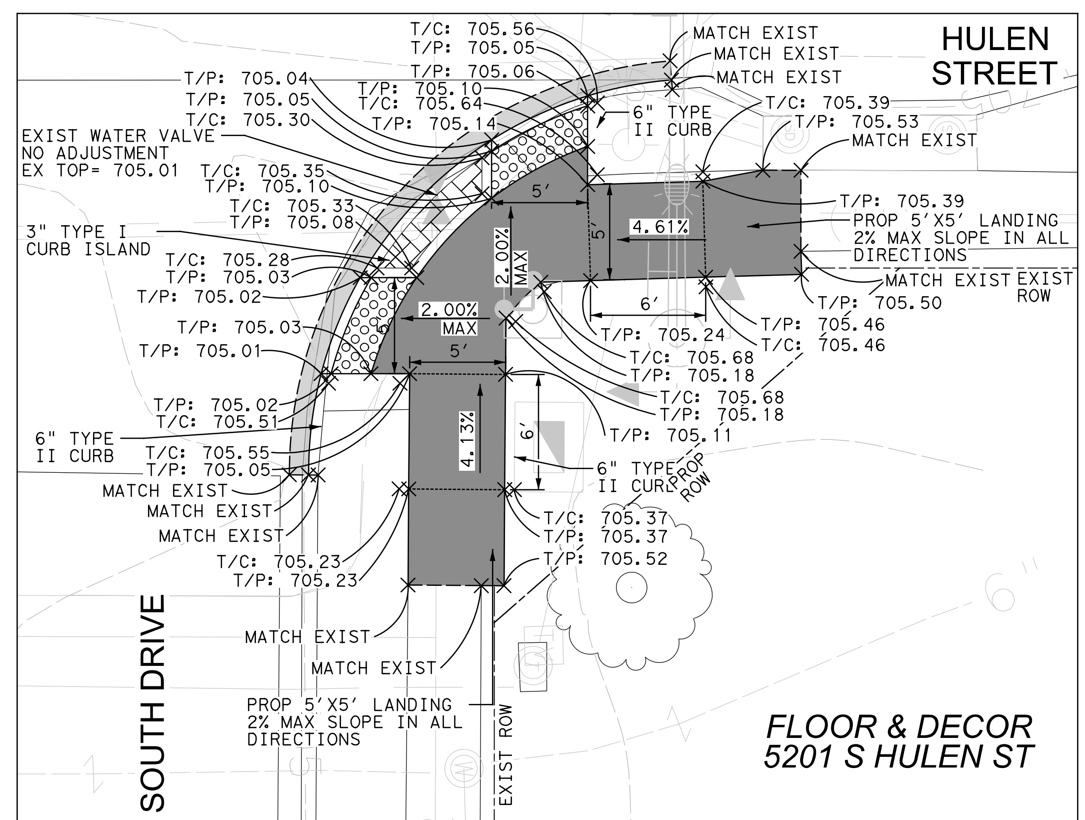
SCALE: AS SHOWN SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	52
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	









LEGEND

	PROPOSED CONCRETE SIDEWALK
	DETECTABLE WARNING
	TYPE II CURB AND GUTTER
T/C:500.00	PROPOSED TOP OF CURB ELEVATION
T/P:500.00	PROPOSED TOP OF PAVEMENT ELEVATION
2.0%	DIRECTION SLOPE INDICATION

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

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ATMOS ENERGY	214-714-7552
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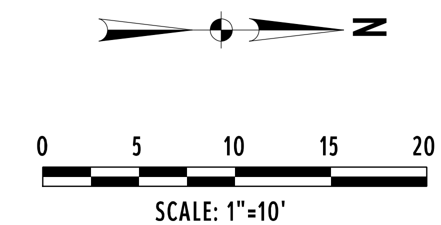
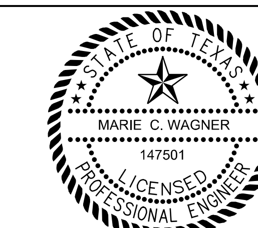
ONCOR	817-215-6139
SPECTRUM	903-546-5650





DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation
© 2024

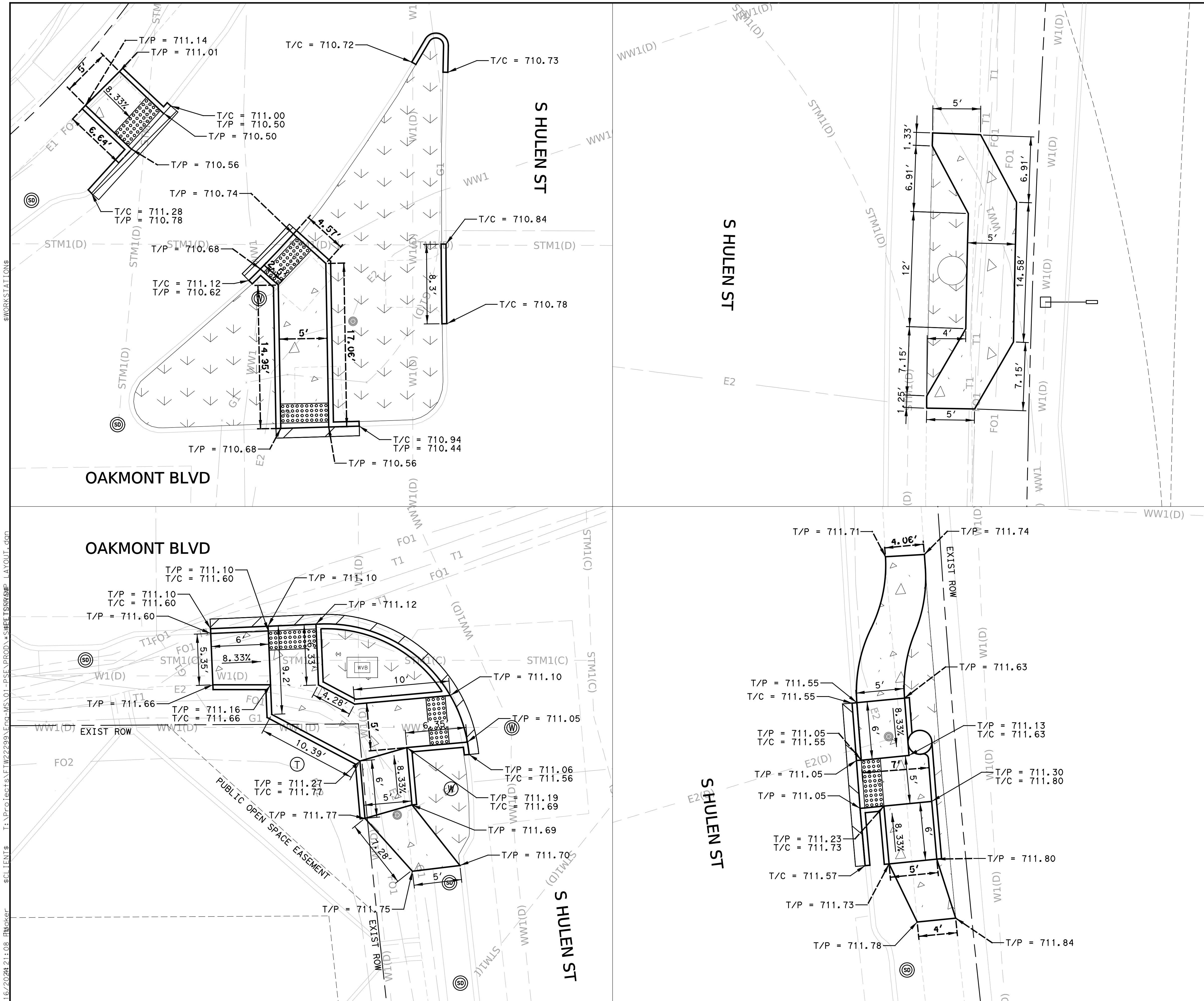
CURB RAMP GRADING PLAN

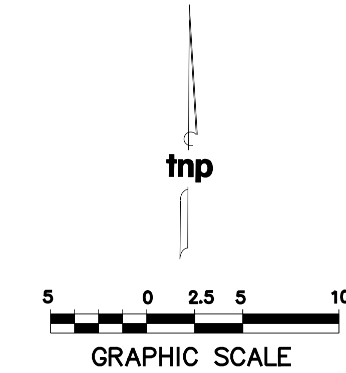
HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	53
CHECK	0902	90	207, ETC.	

FTW WAGNER-4219
...\TXDOT-OR*MON*PENTABLE.tbl
TXDOT-OR
4/19/2024 50:48 AM





LEGEND	
T/C	PROPOSED TOP OF CURB ELEVATION
T/P	PROPOSED TOP OF PVMT ELEVATION
	PROPOSED CONCRETE SIDEWALK (4")
	PROPOSED CONCRETE PAVEMENT (8")
	PROPOSED BLOCK SODDING

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED
PROFESSIONAL ENGINEER
4/16/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

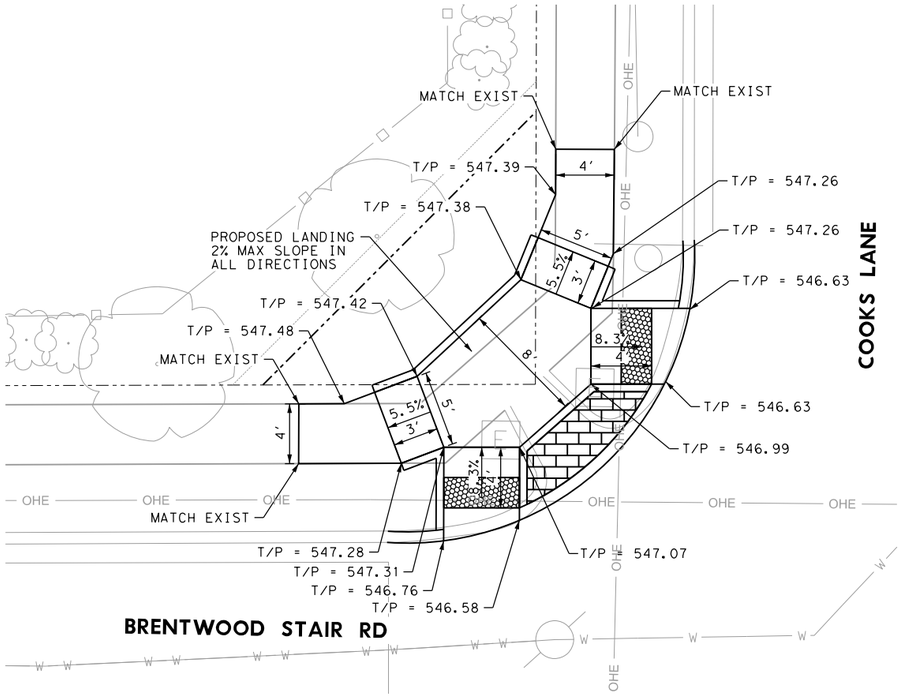
S HULEN ST AT OAKMONT BLVD

SIDEWALK & CURB RAMP LAYOUT

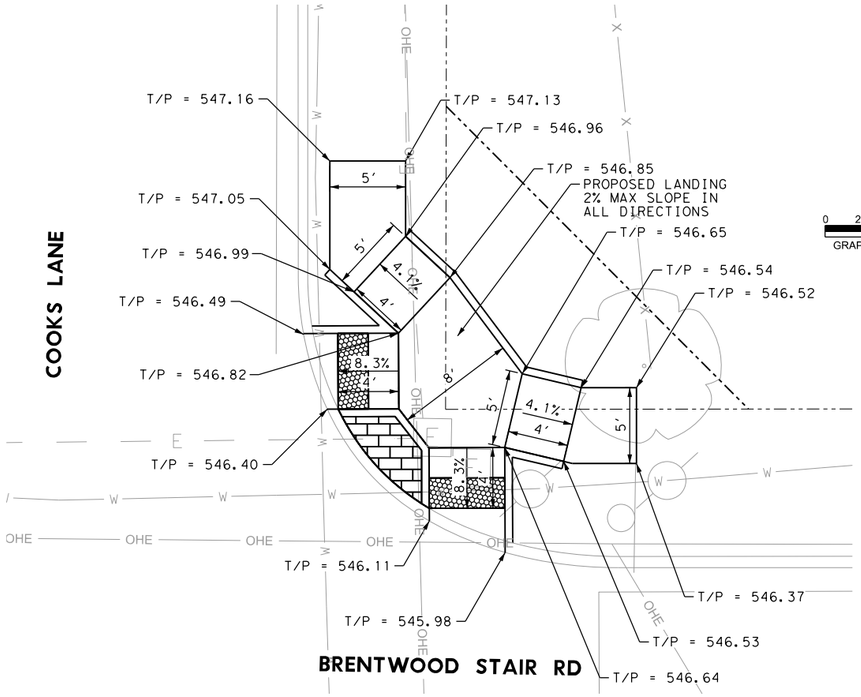
SCALE: 1"=10'   SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	54

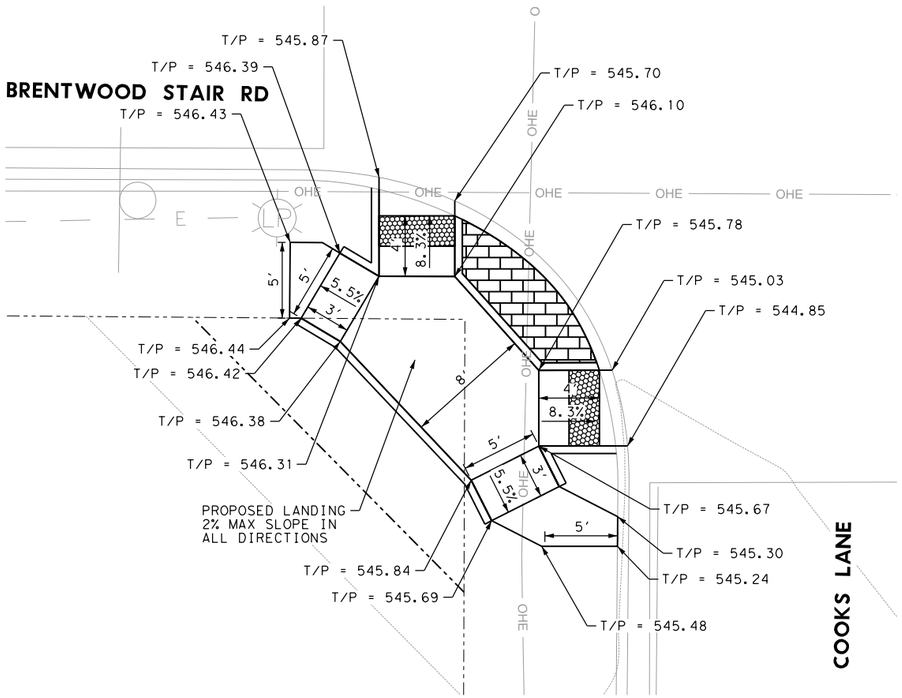
$OFFICE$ $WORKSTATION$ $PENTBL$ $SPECIFICATION$ $MODELNAME$ T:\Projects\FTW22299\Eng-MSV01-PSE\PROD\ RAMP LAYOUT.dgn $CLIENT$ 4/16/2024 1:21:08 PM jbaker



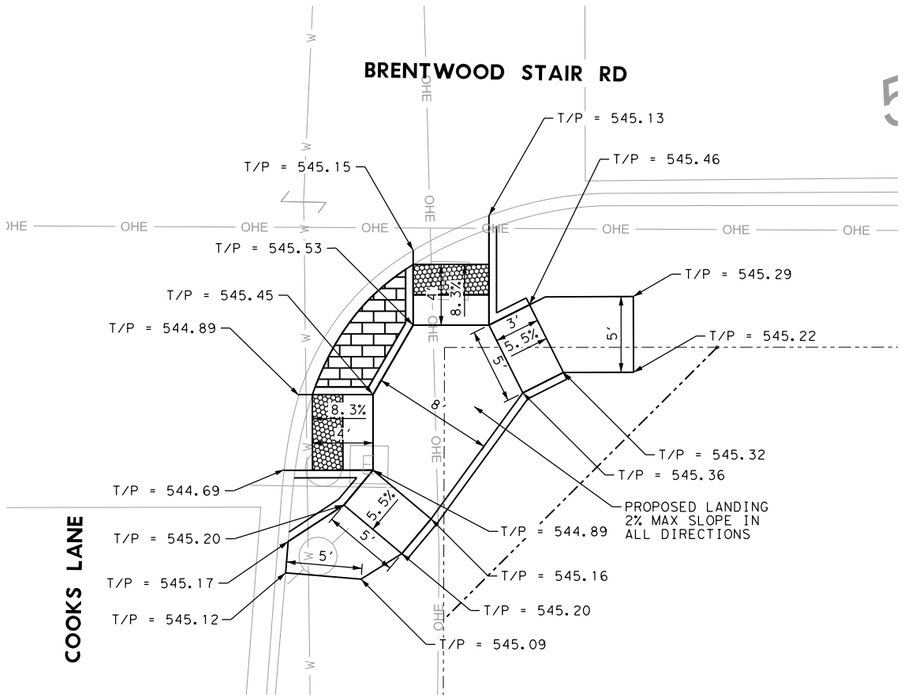
NORTHWEST QUADRANT



NORTHEAST QUADRANT



SOUTHWEST QUADRANT



SOUTHEAST QUADRANT

LEGEND

T/C 595.00	PROPOSED TOP OF CURB ELEVATION
T/P 595.00	PROPOSED TOP OF PAVEMENT ELELVATION
	PROPOSED COLORED TEXTURED CONCRETE (4")
	PROPOSED CONCRETE SIDEWALK

0 2.5' 5' 10'
GRAPHIC SCALE IN FEET
1" = 10'

NOTE:

1. LONGITUDINAL RAMP DIMENSIONS ARE TO THE CENTERLINE OF THE RAMP AND THE BACK OF THE CURB.

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
ATMOS ENERGY	800-817-8090
FORT WORTH ELECTRIC	817-870-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR ELECTRIC CORPORATION	817-443-3432
TARRENT COUNTY R.O.W.DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED
PROFESSIONAL ENGINEER

4/19/2024

NO.	REVISION	BY	DATE

DEC | ENGINEERING EXCELLENCE™
T.B.O.E. FIRM REGISTRATION #392
415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

CURB RAMP GRADING PLAN

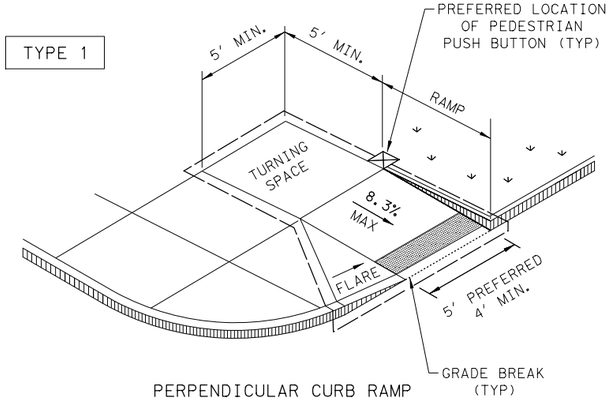
SCALE: 1" = 10' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	55

4/19/2024
11:18:44 AM
$FILEL$
traci.fox

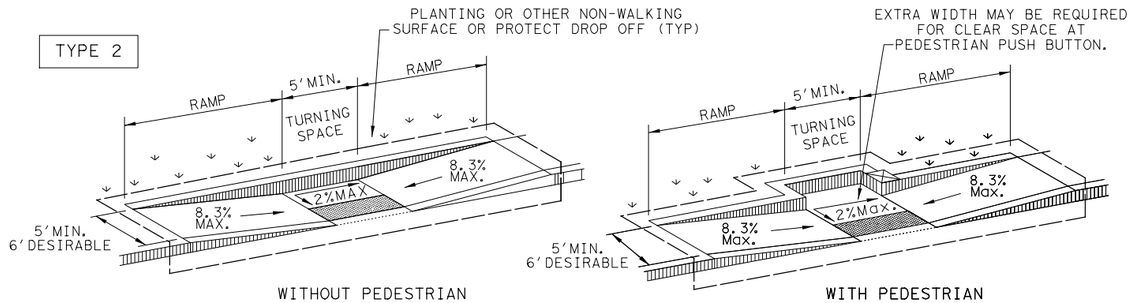
DATE:
FILE:

TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

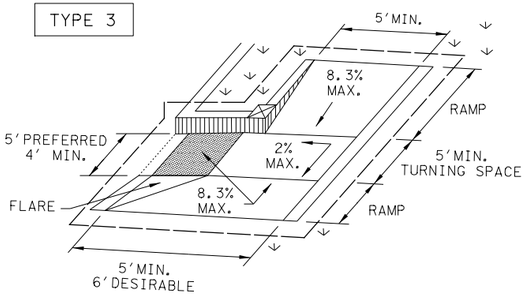


WITHOUT PEDESTRIAN PUSH BUTTON

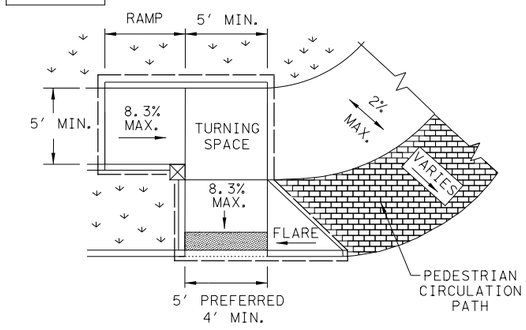
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

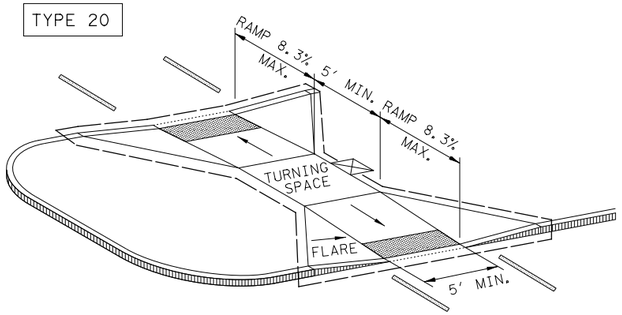


TYPE 6



COMBINATION CURB RAMPS

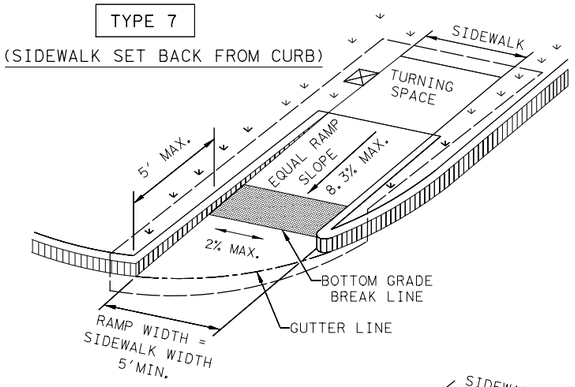
TYPE 20



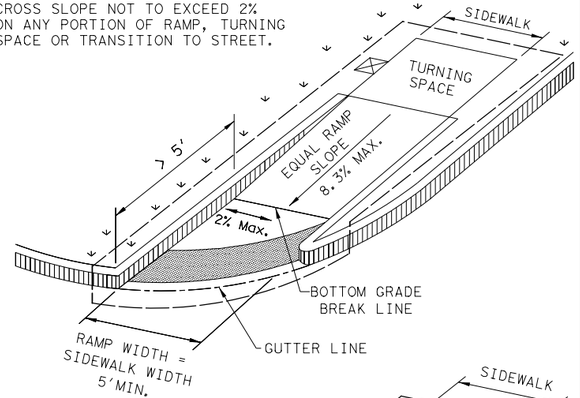
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)

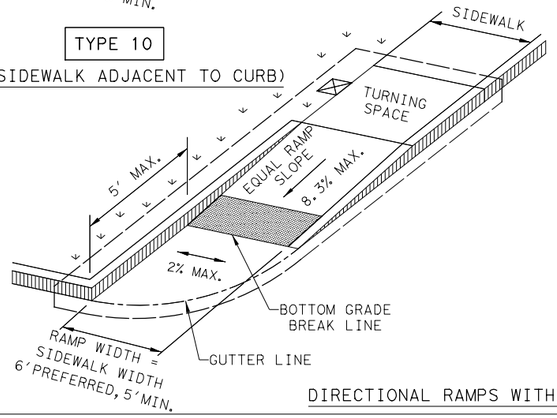


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.

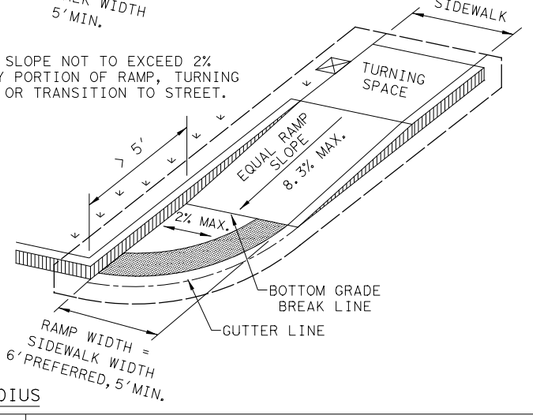


TYPE 10

(SIDEWALK ADJACENT TO CURB)

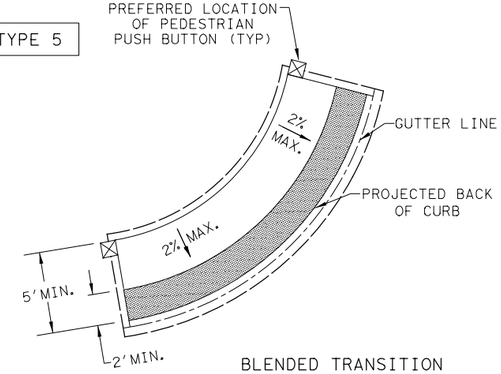


CROSS SLOPE NOT TO EXCEED 2% ON ANY PORTION OF RAMP, TURNING SPACE OR TRANSITION TO STREET.



DIRECTIONAL RAMPS WITHIN RADIUS

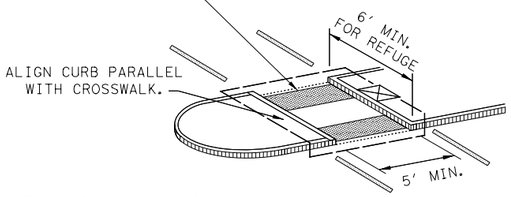
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

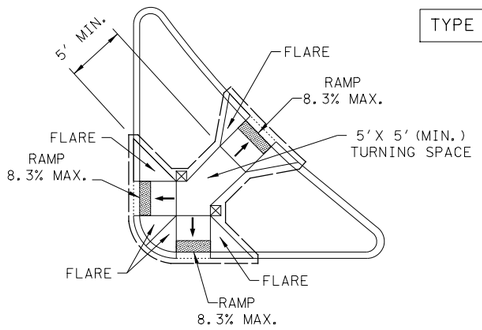
TYPE 21

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

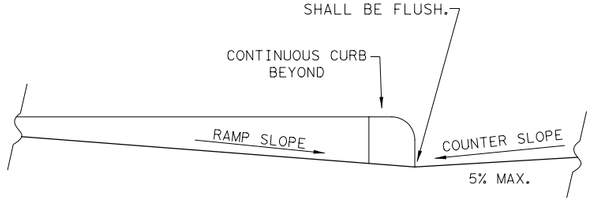


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

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

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST	COUNTY		SHEET NO.
	33	TARRANT		56

DATE:
FILE:

GENERAL NOTES

CURB RAMPS

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

DETECTABLE WARNING MATERIAL

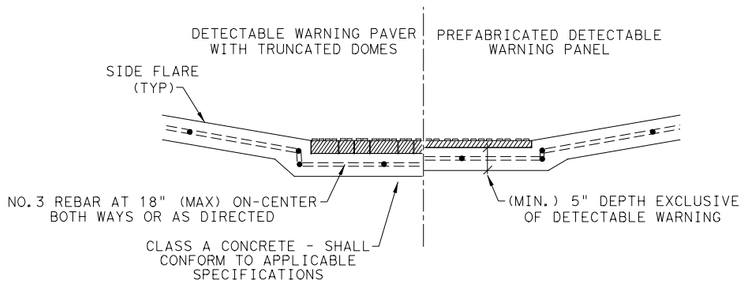
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material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

DETECTABLE WARNING PAVERS (IF USED)

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

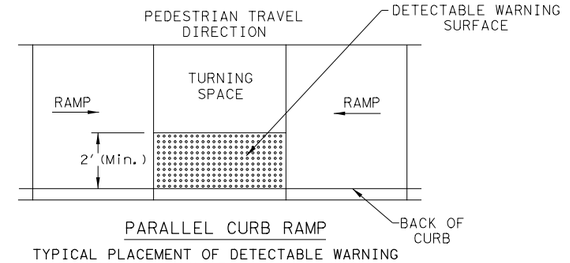
SIDEWALKS

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



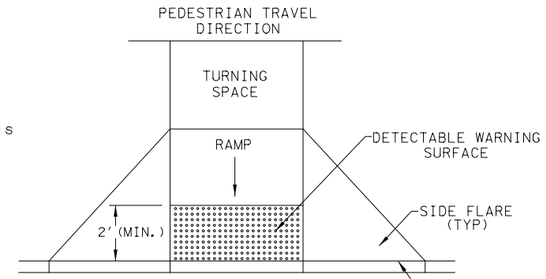
SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

DETECTABLE WARNING SURFACE DETAILS



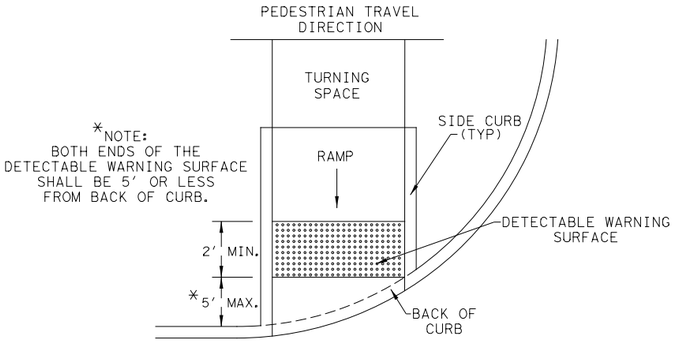
PARALLEL CURB RAMP

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



PERPENDICULAR CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

Texas Department of Transportation

Design Division Standard

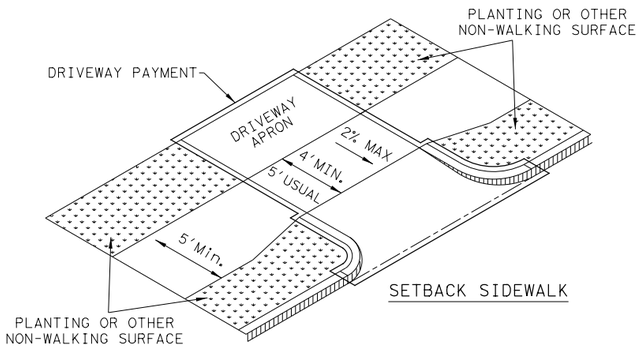
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

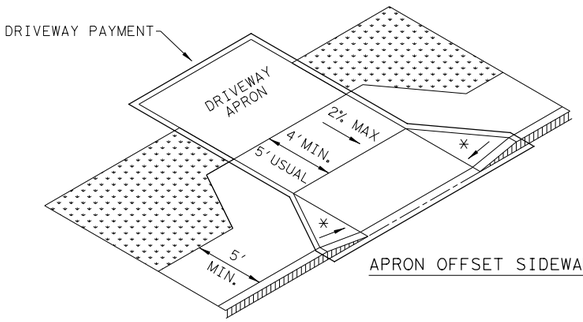
FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0902	90	207, ETC		HULEN ST, ETC
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST		COUNTY		SHEET NO.
	33		TARRANT		57

DATE:
FILE:

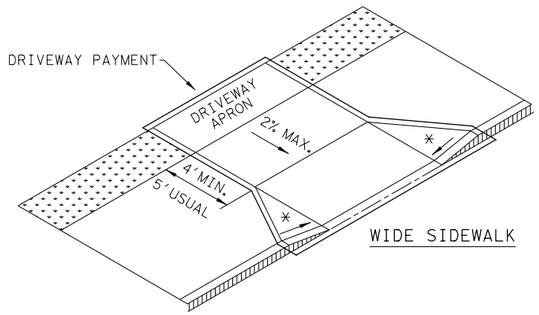
SIDEWALK TREATMENT AT DRIVEWAYS



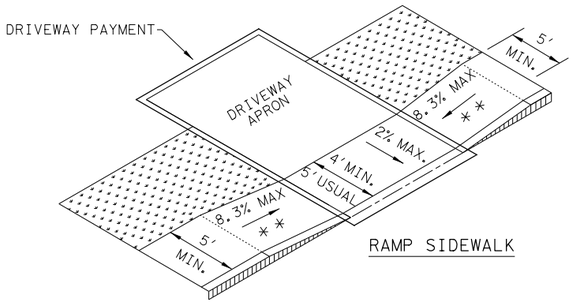
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



WIDE SIDEWALK

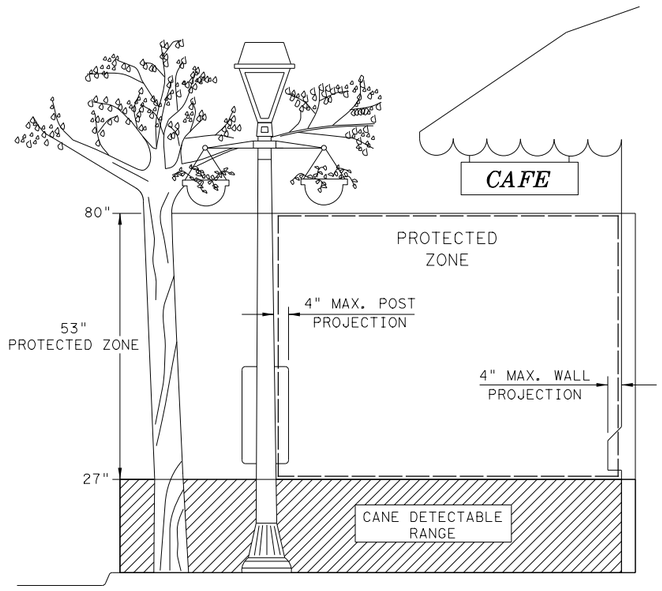


RAMP SIDEWALK

NOTES:

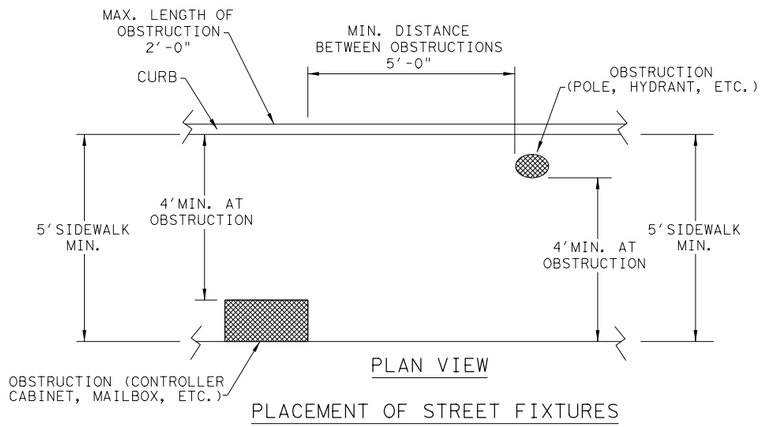
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

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



PROTECTED ZONE

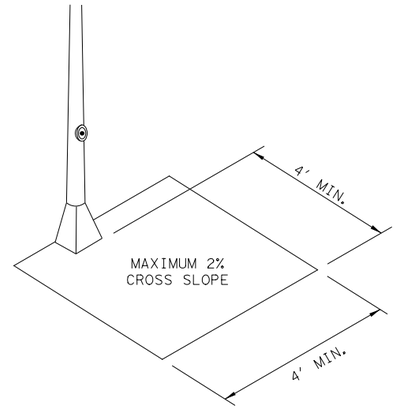
NOTE: IN PEDESTRIAN CIRCULATION AREA, MAXIMUM 4" PROJECTION FOR POST OR WALL MOUNTED OBJECTS BETWEEN 27" AND 80" ABOVE THE SURFACE.



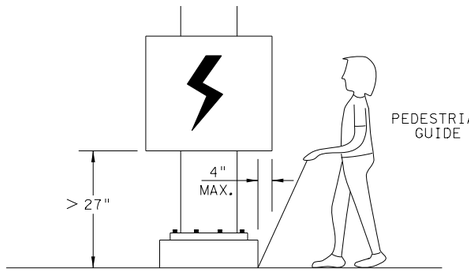
PLAN VIEW

PLACEMENT OF STREET FIXTURES

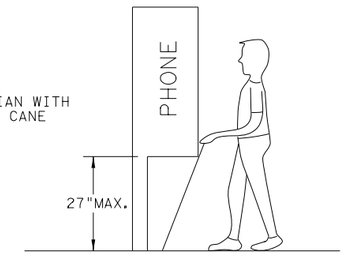
NOTE: ITEMS NOT INTENDED FOR PUBLIC USE. MINIMUM 4' X 4' CLEAR GROUND SPACE REQUIRED AT PUBLIC USE FIXTURES.



CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



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



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

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

Texas Department of Transportation

Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

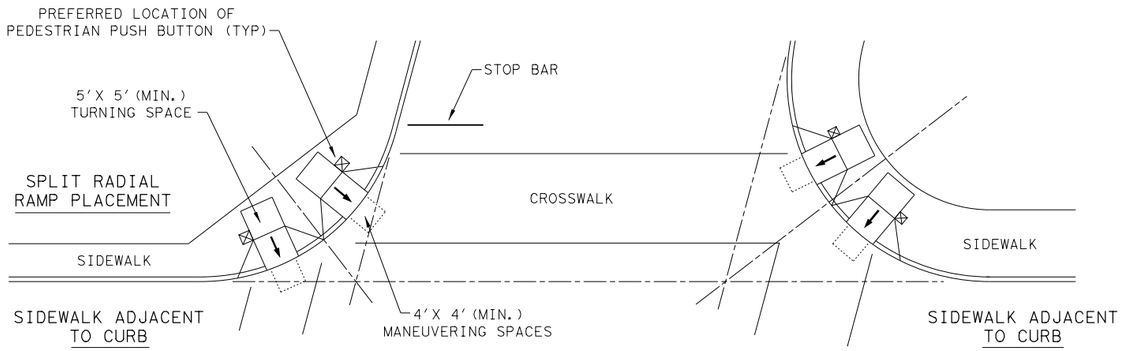
PED-18

FILE: ped18	DN: TxDOT		DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS	0902	90	207, ETC		HULEN ST, ETC
REVISED 08,2005 REVISED 06,2012 REVISED 01,2018	DIST		COUNTY		SHEET NO.
	33		TARRANT		58

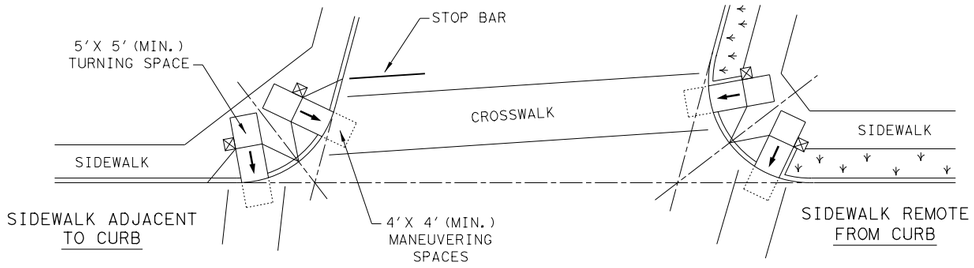
DATE:
FILE:

TYPICAL CROSSING LAYOUTS

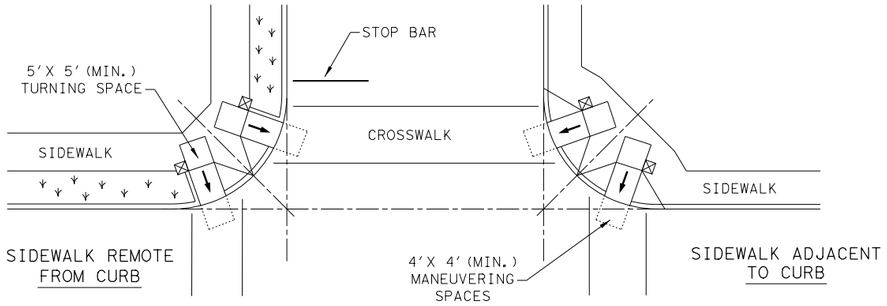
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



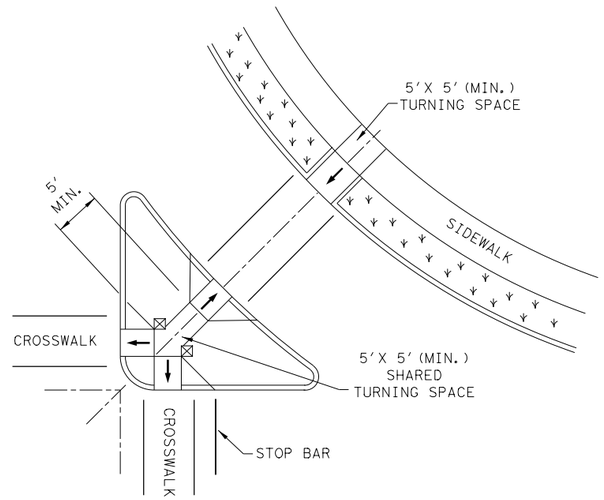
SKEWED INTERSECTION WITH "LARGE" RADIUS



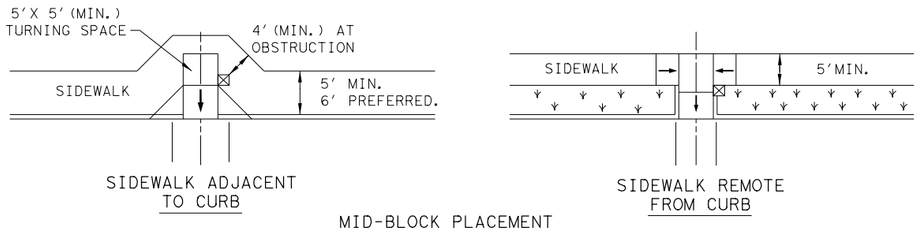
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE. →

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

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

SHEET 4 OF 4

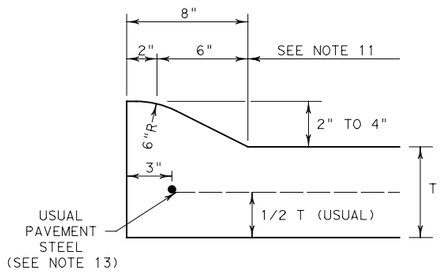
Texas Department of Transportation

Design Division Standard

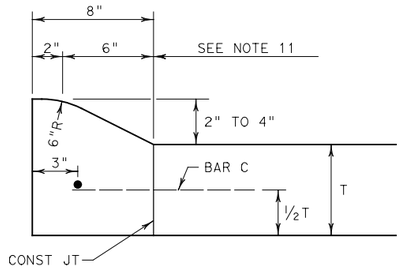
PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

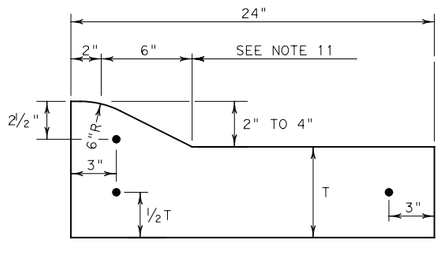
FILE: ped18	DN: TxDOT	DW: VP	CK: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
REVISED 08, 2005 REVISED 06, 2012 REVISED 01, 2018	DIST	COUNTY		SHEET NO.
	33	TARRANT		59



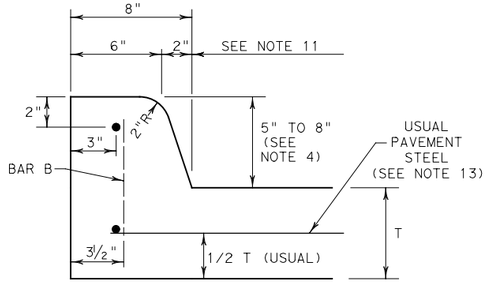
TYPE I CURB (MONOLITHIC)
2" - 4" HEIGHT



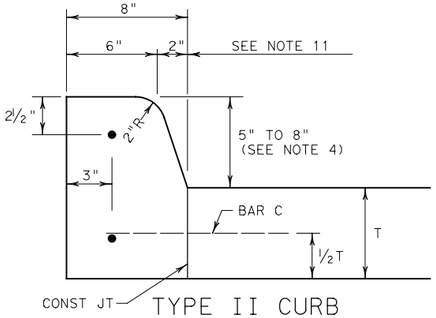
TYPE I CURB
2" - 4" HEIGHT



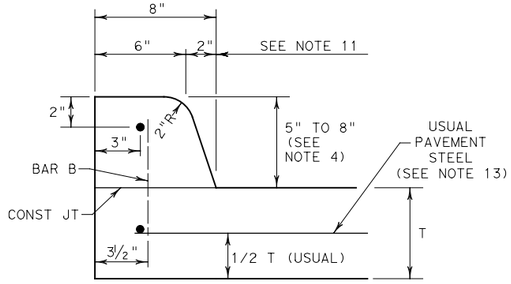
TYPE I CURB AND GUTTER
2" - 4" HEIGHT



TYPE II CURB (MONOLITHIC)
5" - 8" HEIGHT



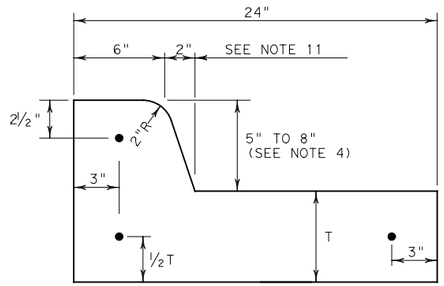
TYPE II CURB
5" - 8" HEIGHT
DOWELED VERTICAL JOINT



TYPE II CURB
5" - 8" HEIGHT
DOWELED HORIZONTAL JOINT

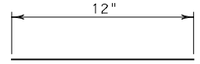
GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION SHALL BE IN ACCORDANCE WITH ITEM 529, "CONCRETE CURB, GUTTER, AND COMBINED CURB AND GUTTER".
2. ALL CONCRETE SHALL BE CLASS "A".
3. ALL REINFORCING BARS SHALL BE #4, UNLESS OTHERWISE SHOWN.
4. UNLESS OTHERWISE SHOWN, ALL TYPE II CURB SHALL BE 6" HEIGHT .
5. ROUND EXPOSED SHARP EDGES WITH A ROUNDING TOOL, TO A MINIMUM RADIUS OF ¼".
6. ALL EXISTING CURBS AND DRIVEWAYS TO BE REMOVED SHALL BE SAW CUT FULL DEPTH OR REMOVED AT EXISTING JOINTS.
7. WHERE CONCRETE CURB IS PLACED ON EXISTING CONCRETE PAVEMENT, THE PAVEMENT SHALL BE DRILLED AND THE REINFORCING BARS GROUTED OR EPOXIED IN PLACE.
8. EXPANSION AND CONTRACTION JOINTS SHALL BE CONSTRUCTED TO MATCH PAVEMENT JOINTS IN ALL CURBS OR CURB AND GUTTER ADJACENT TO JOINTED CONCRETE PAVEMENT. WHERE PLACEMENT OF CURB OR CURB AND GUTTER IS NOT ADJACENT TO CONCRETE PAVEMENT, EXPANSION JOINTS SHALL BE PROVIDED AT STRUCTURES, CURB RETURNS AT STREETS OR DRIVEWAYS, AND AT LOCATIONS DIRECTED BY THE ENGINEER.
9. VERTICAL AND HORIZONTAL DOWELS BARS AND TRANSVERSE REINFORCING BARS SHALL BE PLACED AT 4' C-C.
10. DIMENSION "T" SHOWN IS THE THICKNESS OF ADJACENT CONCRETE PAVEMENT, OR, WHEN CURB IS INSTALLED ADJACENT TO FLEXIBLE PAVEMENT, "T" IS 6" MINIMUM, 8" MAXIMUM.
11. USUAL PROFILE GRADE LINE. REFER TO TYPICAL SECTIONS AND PLAN-PROFILE SHEETS FOR EXACT LOCATIONS.
12. A SEALED, ½" EXPANSION JOINT SHALL BE PROVIDED WHERE CURB AND GUTTER IS ADJACENT TO SIDEWALK OR RIPRAP.
13. LONGITUDINAL AND TRANSVERSE PAVEMENT STEEL SHALL BE PLACED IN ACCORDANCE WITH PAVEMENT DETAILS SHOWN ELSEWHERE IN THE PLANS.

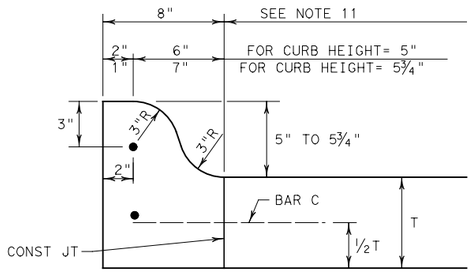


TYPE II CURB AND GUTTER
5" - 8" HEIGHT

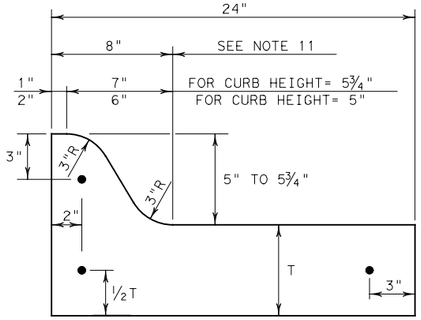
BAR B
L = (T/2) + (H- 1½")
WHERE "H" = CURB HEIGHT
FOR NEW PAVEMENT, EMBED T/2 INTO FRESH CONCRETE.
FOR EXISTING PAVEMENT, DRILL 3/8" DIAM HOLE T/2 + 1/4" INTO PAVEMENT. SECURE WITH TY III EPOXY, CLASS "E" OR "F".



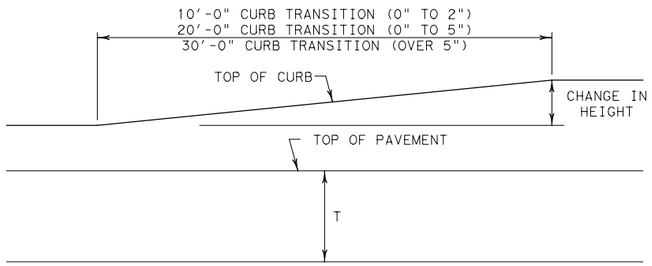
BAR C
EMBED 6" INTO EXISTING CONCRETE PAVEMENT.
DRILL 3/8" X 6 1/4" HOLE SECURE WITH TY III EPOXY, CLASS "E" OR "F".



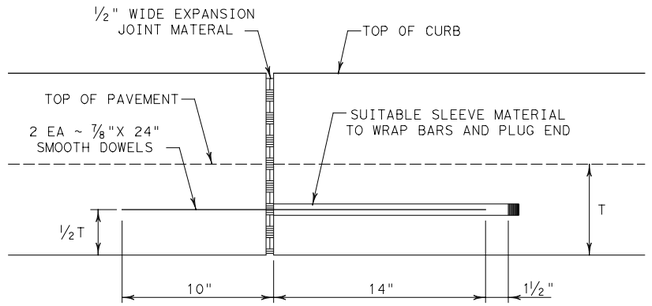
TYPE IIA CURB
5" - 5 3/4" HEIGHT



TYPE IIA CURB AND GUTTER
5" - 5 3/4" HEIGHT



CURB TRANSITION
NOTE: TO BE PAID FOR AS HIGHEST CURB



EXPANSION JOINT DETAIL

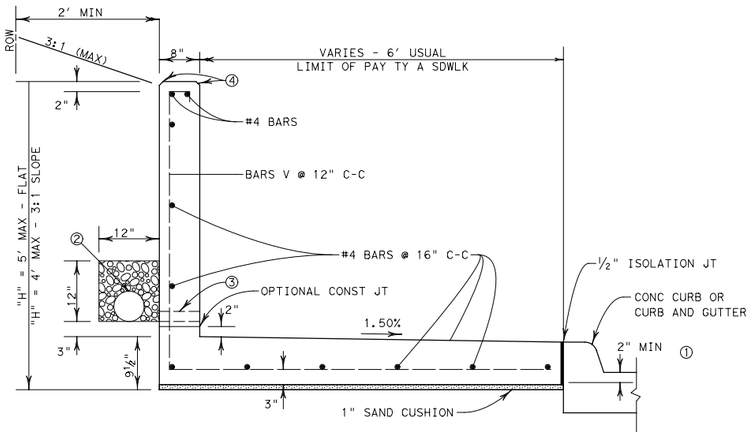
Texas Department of Transportation

Fort Worth District Standard

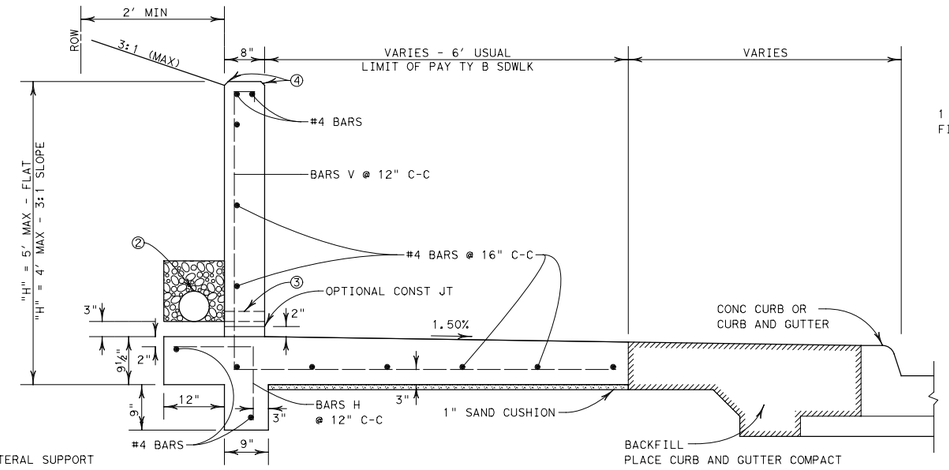
CONCRETE CURB AND CURB AND GUTTER DETAILS

CCCG (FTW)

ORIGINAL DRAWING: 05/2019	cccg-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.	SHEET NO.
DATE	REVISIONS	6		
05/2019	NEW STANDARD	STATE	STATE DIST.NO.	COUNTY
07/2022	DESIGNATE USUAL 6" HEIGHT	TEXAS	02	HULEN ST, ETC
		CONT.	SECT. JOB	HIGHWAY NO.
		33	TARRANT	60

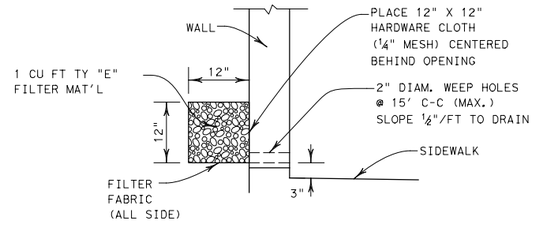


TYPE A SIDEWALK-ADJACENT TO CURB

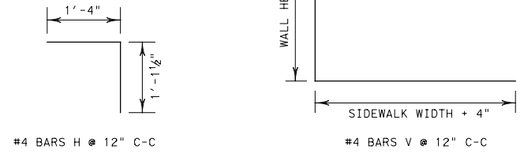


① 2" MINIMUM REQUIRED FOR LATERAL SUPPORT
② INSTALL 6" PIPE UNDERDRAIN (TY. 5, 6, 7, OR 8) ENTIRE LENGTH OF WALL. USE TY. "E" FILTER MATERIAL. SLOPE TO DRAIN AND CONNECT TO STORM DRAIN.
⑤ IF, IN THE OPINION OF THE ENGINEER, USE OF UNDERDRAIN IS IMPRACTICAL, INSTALL WEEP HOLES AS SHOWN.
④ ¾" CHAMFER

TYPE B SIDEWALK-REMOTE FROM CURB



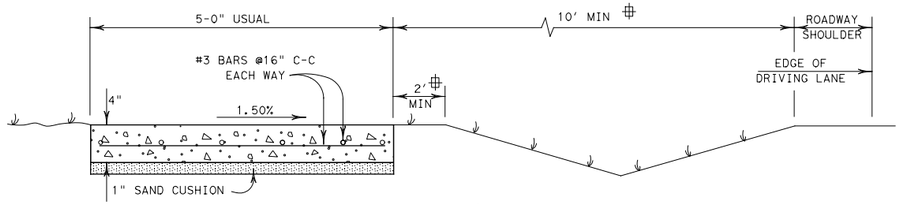
WEEP HOLE DETAIL



REINFORCING STEEL DETAILS

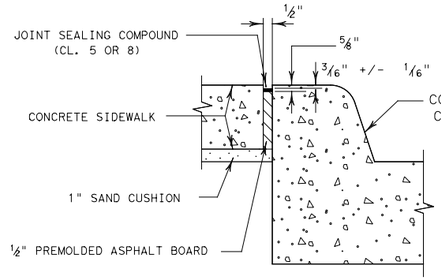
SPECIAL CONCRETE SIDEWALK w/ INTEGRATED RETAINING WALL

N.T.S.



SIDEWALK TO BE 10' MIN. FROM EDGE OF SHOULDER OR 2' MIN. FROM TOP OF DITCH BACK SLOPE, WHICHEVER IS GREATER (10' MIN. FROM EDGE OF SHOULDER IF NO DITCH.)

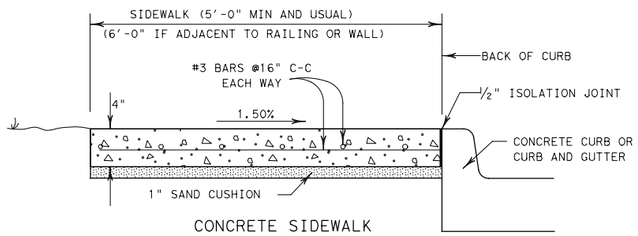
CONCRETE SIDEWALK
(ROADWAY W/O CURB)



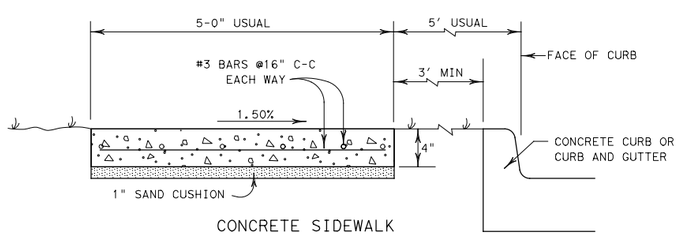
1/2" ISOLATION JOINT
(SIDEWALK ADJACENT TO CURB)

GENERAL NOTES:

1. ALL CONCRETE SHALL BE CLASS "C".
2. ALL REINFORCING STEEL SHALL BE GRADE 60, # 4 BARS UNLESS OTHERWISE INDICATED.
3. SEE PLAN SHEETS FOR LOCATIONS OF SIDEWALKS AND RETAINING WALLS.
4. LONGITUDINAL SLOPE OF SIDEWALKS SHALL NOT EXCEED 5% EXCEPT IN CASES WHERE THE ADJACENT ROADWAY SLOPE EXCEEDS 5%. IF ROADWAY SLOPE EXCEEDS 5%, LONGITUDINAL SLOPE OF SIDEWALK MAY MATCH THAT OF ROADWAY.
5. IF SIDEWALK WIDTH IS LESS THAN 5', PROVIDE 5' X 5' PASSING AREAS AT INTERVALS NOT TO EXCEED 200' SPACING.
6. RETAINING WALL WILL BE SUBSIDIARY TO THE ITEM, "CONC SIDEWALKS (SPECIAL) (TYPE A)" OR "CONC SIDEWALKS (SPECIAL)(TYPE B)", WITH LIMITS OF PAY AS SHOWN.
7. SURFACE TREATMENT OF RETAINING WALL FACE DETAILED ELSEWHERE IN THE PLANS.
8. SEE PED STANDARDS FOR TREATMENT AT INTERSECTIONS AND CROSSWALKS.



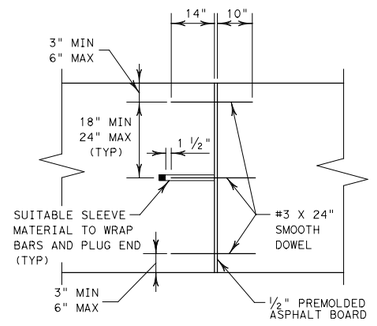
CONCRETE SIDEWALK
(ADJACENT TO CURB)



CONCRETE SIDEWALK
(REMOTE FROM CURB)

CONCRETE SIDEWALK DETAILS

N.T.S.



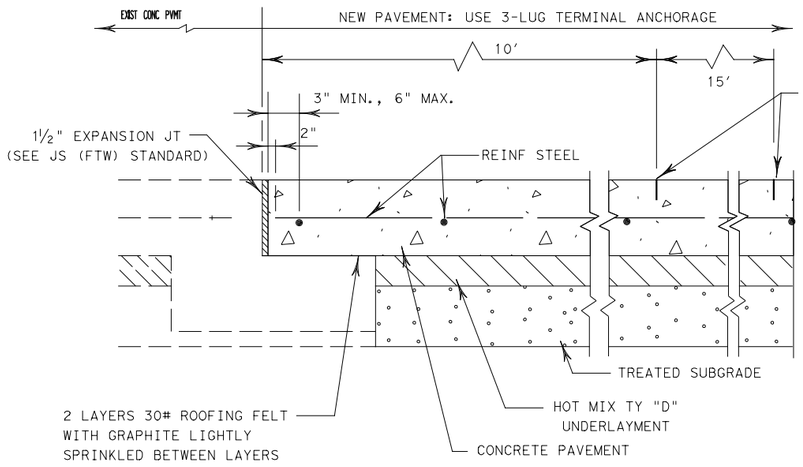
TRANSVERSE EXPANSION JOINT

Texas Department of Transportation

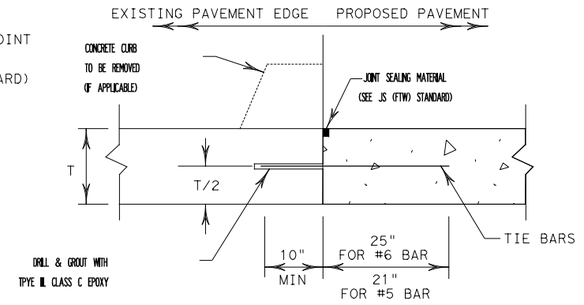
Fort Worth District Standard

CONCRETE SIDEWALK DETAILS
CSWD (FTW)

ORIGINAL DRAWING: 05/2019	cswd-ftw.dgn	PROJECT NO.			SHEET NO.
DATE	REVISIONS				
05/2019	NEW STANDARD	STATE	STATE DIST. NO.	COUNTY	
11/2020	REVISE JOINT NOMENCLATURE, REVISE ALLOWABLE SEALANT TYPES	TEXAS	2 0	HULEN ST, ETC	
		CONT.	SECT.	JOB	HIGHWAY NO.
		33	TARRANT		61

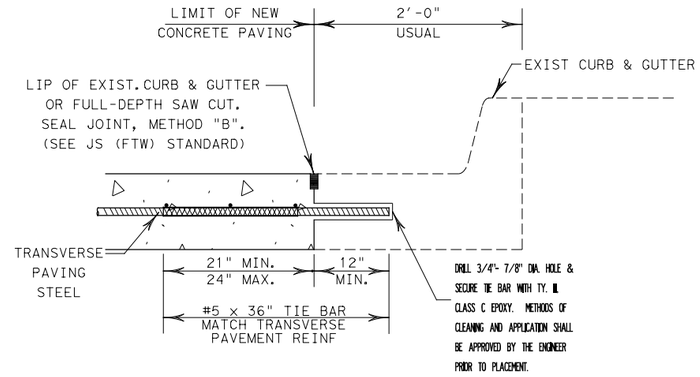


TIE TO EXIST. CONCRETE PAVEMENT
(TRANSVERSE JOINTS W/EXISTING "SLEEPER" SLAB)
N.T.S.



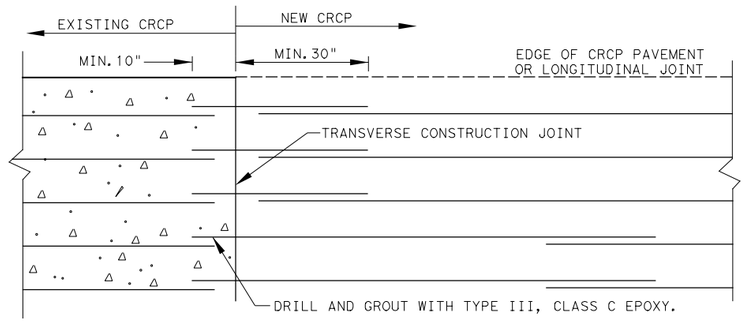
1. BEFORE WIDENING WORK, DEMONSTRATE THAT THE BOND STRENGTH OF THE EPOXY-GROUTED TIE BARS MEETS THE REQUIRMENTS OF PULL-OUT TEST SPECIFIED IN ITEM 361.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER SLABS, USE #5 TIE BARS FOR LESS THAN 8" THICK SLABS.

LONGITUDINAL WIDENING JOINT DETAIL
N.T.S.



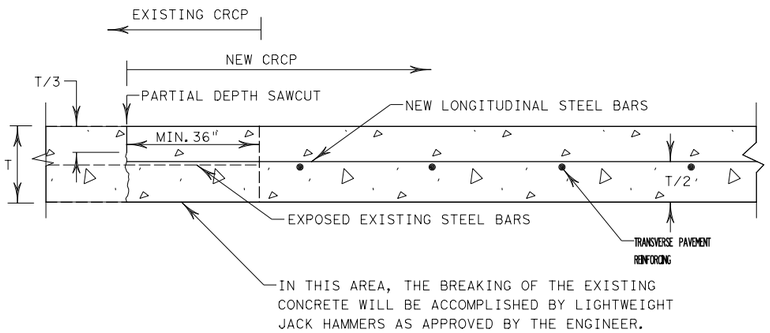
TIE TO EXIST. CONC. CURB & GUTTER
N.T.S.

NOTE:
SAWING OF PAVEMENT AND REMOVAL OF EXISTING CONC. WILL NOT BE PAID FOR DIRECTLY, BUT WILL BE SUBSIDIARY TO THE VARIOUS BID ITEMS.

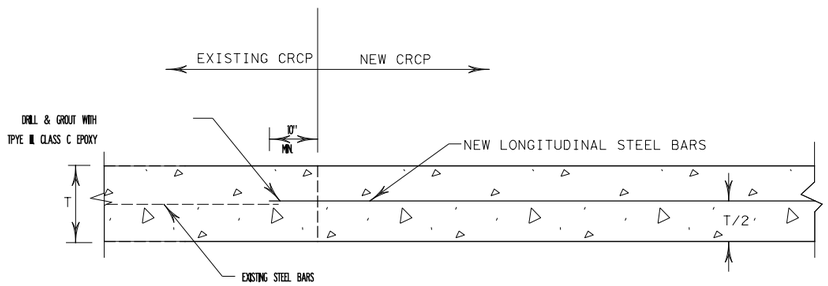


NOTE:
TIE BAR SIZE AND SPACING TO MATCH LONGITUDINAL REINFORCING. FOR LONGITUDINAL BAR SIZE AND SPACING, REFER TO CONCRETE PAVEMENT STANDARDS.

IF, IN THE OPINION OF THE ENGINEER, THE LENGTH OF AREA OF NEW PAVEMENT DOES NOT WARRANT STAGGERED LAPPING AS SHOWN, THIS REQUIREMENT MAY BE WAIVED.



TIED TRANSVERSE CONSTRUCTION JOINT DETAIL
EXISTING CRCP TO NEW CRCP
BREAKBACK AND LAP
N.T.S.



TIED TRANSVERSE CONSTRUCTION JOINT DETAIL
EXISTING CRCP TO NEW CRCP
DRILL AND EPOXY
N.T.S.

GENERAL NOTES

TIE BARS SHALL BE SECURED INTO THE EXISTING CONCRETE THE MINIMUM LENGTHS SHOWN, USING TY III EPOXY, CLASS "C" AND MUST MEET THE REQUIREMENTS OF THE PULL-OUT TEST SPECIFIED IN ITEM 361.

ALL HOLES FOR TIE BARS OR CONCRETE ANCHORS SHALL BE DRILLED WITH A CORE OR ROTARY DRILL. THE USE OF HAMMER DRILLS WILL NOT BE PERMITTED.

SEE JS (FTW) STANDARD FOR JOINT DETAILS.

SEE CONCRETE PAVEMENT STANDARD FOR ADDITIONAL INFORMATION

Texas Department of Transportation

Fort Worth District Standard

CONCRETE PAVEMENT TIES TO EXISTING PAVEMENT
CP-TEP (FTW)

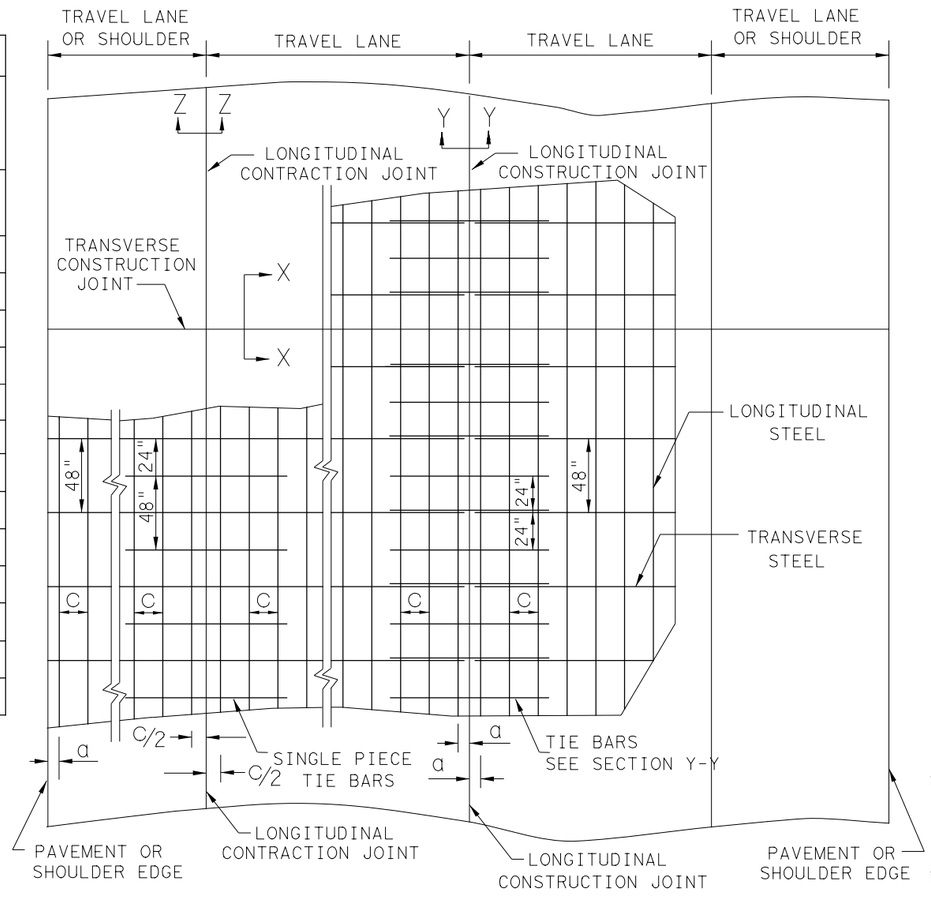
ORIGINAL DRAWING: 05/2019	cptep-ftw.dgn	FED.RD. DIV.NO.	PROJECT NO.		SHEET NO.
DATE	REVISIONS	6			
05/2019	NEW STANDARD	STATE	STATE DIST.NO.	COUNTY	
06/2020	ADD LONGITUDINAL AND TRAVERSE JOINTS	TEXAS	07	HULEN ST, ETC	
11/2020	ADD DRILL AND EPOXY TRANSVERSE JOINT DETAIL, REVISED JOINT NOMENCLATURE, ADD REFERENCE TO CONC PAVING STANDARDS	CONT.	SECT.	JOB	HIGHWAY NO.
		33	TARRANT		62

DATE:
FILE:

TABLE NO. 1 LONGITUDINAL STEEL				
SLAB THICKNESS AND BAR SIZE		LONGITUDINAL STEEL BARS	FIRST SPACING AT EDGE OR JOINT	LONG. STEEL VERTICAL POSITION FROM BOTTOM OF PAVEMENT
T (IN.)	BAR SIZE	SPACING C (IN.)	SPACING **a** (IN.)	T1 (IN.)
7.0	#5	6.5	3 TO 4	3.5
7.5	#5	6.0	3 TO 4	3.75
8.0	#6	9.0	3 TO 4	4.0
8.5	#6	8.5	3 TO 4	4.25
9.0	#6	8.0	3 TO 4	4.5
9.5	#6	7.5	3 TO 4	4.75
10.0	#6	7.0	3 TO 4	5.0
10.5	#6	6.75	3 TO 4	5.5
11.0	#6	6.5	3 TO 4	6.0
11.5	#6	6.25	3 TO 4	6.5
12.0	#6	6.0	3 TO 4	7.0
12.5	#6	5.75	3 TO 4	7.5
13.0	#6	5.5	3 TO 4	8.0

TABLE NO. 2 TRANSVERSE STEEL AND TIE BARS						
SLAB THICKNESS (IN.)	TRANSVERSE STEEL		TIE BARS AT LONGITUDINAL CONTRACTION JOINT (SECTION Z-Z)		TIE BARS AT LONGITUDINAL CONSTRUCTION JOINT (SECTION Y-Y)	
	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)	BAR SIZE	SPACING (IN.)
7.0 - 7.5	#5*	48	#5*	48	#5*	24
8.0 - 13.0	#5*	48	#6	48	#6	24

*CONTRACTOR MAY USE #6 REINFORCING STEEL INSTEAD OF #5 REINFORCING STEEL OR COMBINATION OF EACH SIZE

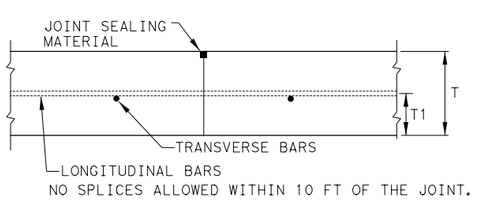


TYPICAL PAVEMENT LAYOUT

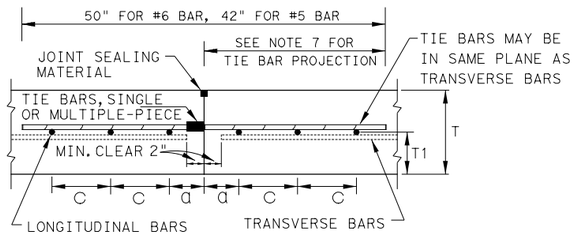
PLAN VIEW (NOT TO SCALE)

GENERAL NOTES

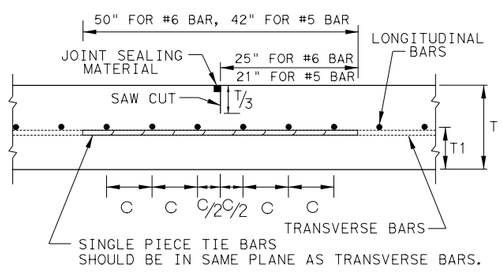
1. DETAILS FOR PAVEMENT WIDTH, PAVEMENT THICKNESS AND THE CROWN CROSS-SLOPE SHALL BE SHOWN ELSEWHERE IN THE PLANS. FOR PAVEMENTS WIDER THAN 100 FT. WITHOUT A FREE LONGITUDINAL JOINT, ADDITIONAL DETAIL MAY BE SHOWN ELSEWHERE IN THE PLANS.
2. USE COARSE AGGREGATES WITH A RATED COEFFICIENT OF THERMAL EXPANSION (CoTE) OF NOT MORE THAN 5.5 X 10^{-6} IN/IN/ °F AS LISTED IN THE CONCRETE RATED SOURCE QUALITY CATALOG (CRSQC).
3. ALL THE REINFORCING STEEL AND TIE BARS SHALL BE DEFORMED STEEL BARS CONFORMING TO ASTM A 615 (GRADE 60) OR ASTM A 996 (GRADE 60) OR ABOVE. STEEL BAR SIZES AND SPACINGS SHALL CONFORM TO TABLE NO.1 AND TABLE NO.2.
4. STEEL BAR PLACEMENT TOLERANCE SHALL BE +/- 1 IN. HORIZONTALLY AND +/- 0.5 IN. VERTICALLY. CALCULATED AVERAGE BAR SPACING (CONCRETE PLACEMENT WIDTH / NUMBER OF LONGITUDINAL BARS) SHALL CONFORM TO TABLE NO.1.
5. ADJUST REINFORCING STEEL VERTICALLY USING SHIMS OR OTHER METHODS, AS APPROVED, TO MEET VERTICAL TOLERANCES PRIOR TO CONCRETE PLACEMENT.
6. PAVEMENT WIDTHS OF MORE THAN 15 FT. SHALL HAVE A LONGITUDINAL JOINT (SECTION Z-Z OR SECTION Y-Y). THESE JOINTS SHALL BE LOCATED WITHIN 6 IN. OF THE LANE LINE UNLESS THE JOINT LOCATION IS SHOWN ELSEWHERE ON THE PLANS.
7. THE MINIMUM PROJECTION OF TIE BARS INTO THE ADJACENT PLACEMENT IS 22.5 IN. for #6 BARS AND 18.5 IN. FOR #5 BARS.
8. SEE STANDARD SHEET "CONCRETE CURB AND CURB AND GUTTER," FOR DETAILS WHEN TYING CONCRETE CURB OR CURB GUTTER AT A LONGITUDINAL JOINT.
9. REPLACE MISSING OR DAMAGED TIE BARS WITHOUT ADDITIONAL COMPENSATION BY DRILLING MIN.10 IN. DEEP AND GROUTING TIE BARS WITH TYPE III, CLASS C EPOXY. MEET THE PULL-OUT TEST REQUIREMENTS IN ITEM 361.
10. OMIT TIE BARS LOCATED WITHIN 18-IN. OF THE TRANSVERSE CONSTRUCTION JOINTS (SECTION X-X). USE HAND-OPERATED IMMERSION VIBRATORS TO CONSOLIDATE THE CONCRETE ADJACENT TO ALL FORMED JOINTS.
11. THE DETAIL FOR THE JOINT SEALANT AND RESERVOIR IS SHOWN ON STANDARD SHEET "CONCRETE PAVING DETAILS, JOINT SEALS."



TRANSVERSE CONSTRUCTION JOINT
SECTION X - X



LONGITUDINAL CONSTRUCTION JOINT
SECTION Y - Y



LONGITUDINAL CONTRACTION JOINT
SECTION Z - Z

SHEET 1 OF 2

Texas Department of Transportation

Design Division Standard

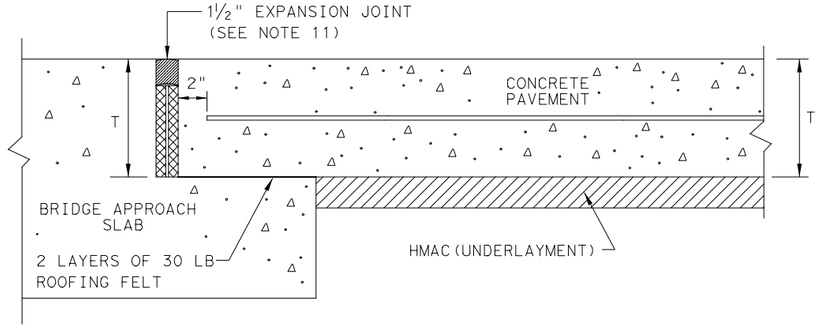
CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

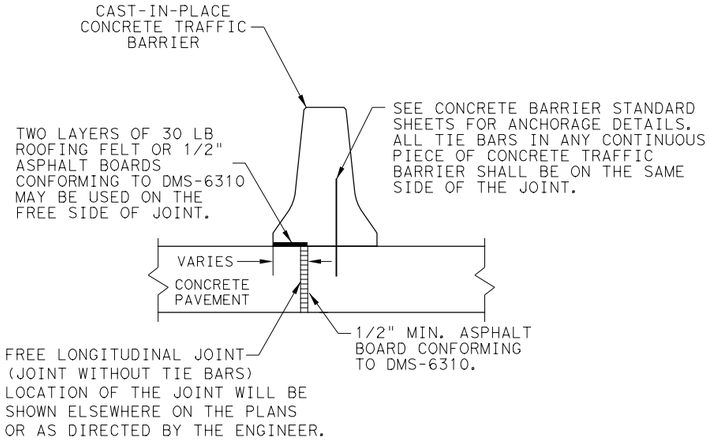
CRCP(1)-23

FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
©TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
APRIL 2023: REVISED LONG. STEEL VERTICAL LOCATION. REMOVED ADDITIONAL TIEBAR AT TRANSVERSE CONSTRUCTION JOINTS	DIST	COUNTY		SHEET NO.
	33	TARRANT		63

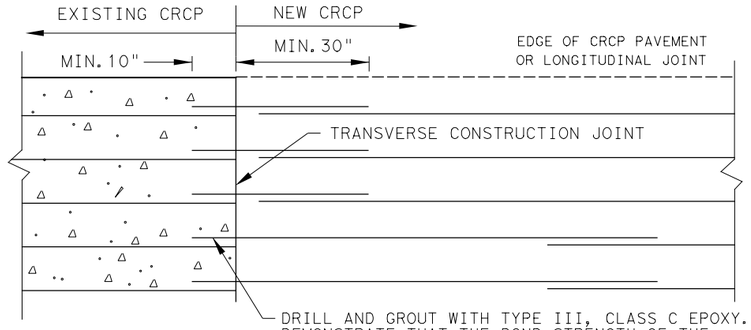
DATE:
FILE:



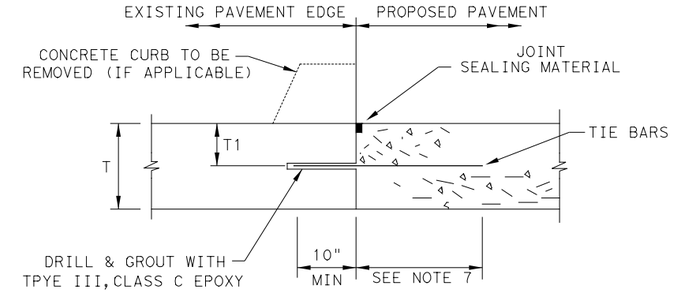
TRANSVERSE EXPANSION JOINT DETAIL
AT BRIDGE APPROACH



CENTERLINE FREE LONGITUDINAL JOINT DETAIL

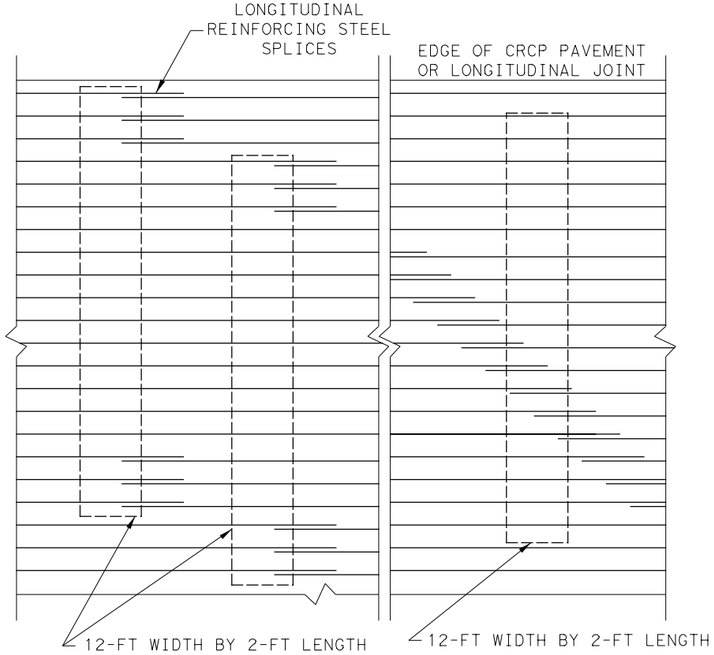


OPTION A: DRILL AND EPOXY
PLAN VIEW (NOT TO SCALE)



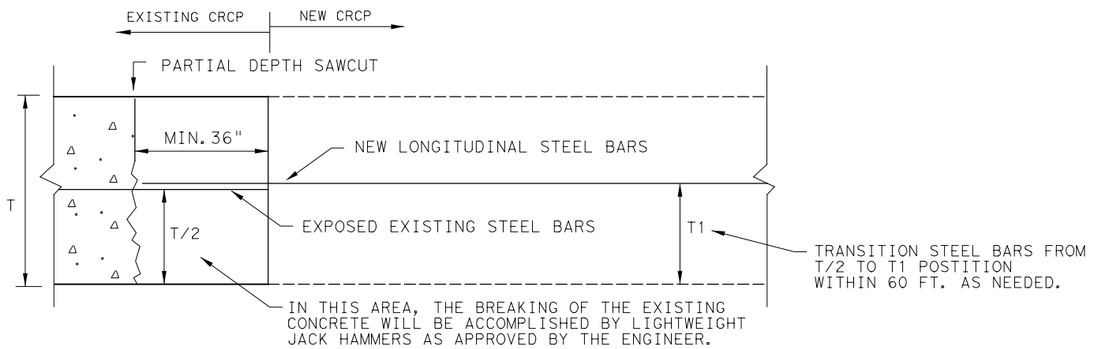
1. BEFORE CONCRETE PLACEMENT, PERFORM PULL-OUT TESTS ON EPOXY-GROUTED TIE BARS IN ACCORDANCE WITH ITEM 360.
2. SPACE TIE BARS AT 24" SPACING. USE #6 TIE BARS FOR 8" AND THICKER PAVEMENTS, USE #5 TIE BARS FOR LESS THAN 8" THICK PAVEMENTS.

LONGITUDINAL WIDENING JOINT DETAIL



STAGGER THE LAP LOCATIONS SO THAT NO MORE THAN 1/3 OF THE LONGITUDINAL STEEL IS SPLICED IN ANY GIVEN 12-FT. WIDTH AND 2-FT. LENGTH OF THE PAVEMENT. ANY OTHER LAP CONFIGURATION MEETING THIS REQUIREMENT WILL BE ALLOWED.

EXAMPLES OF LAP CONFIGURATION
PLAN VIEW (NOT TO SCALE)



OPTION B: BREAKBACK AND LAP

TRANSVERSE TIE JOINT DETAIL
NEW CRCP TO EXISTING CRCP

SHEET 2 OF 2

Texas Department of Transportation

Design Division Standard

CONTINUOUSLY REINFORCED CONCRETE PAVEMENT

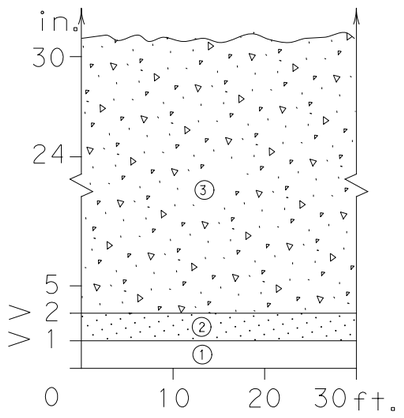
ONE LAYER STEEL BAR PLACEMENT
T - 7 to 13 INCHES

CRCP(1)-23

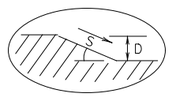
FILE: crcp123.dgn	DN: TxDOT	CK: KM	DW: CES	CK:
©TxDOT: APRIL 2023	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
APRIL 2023: MODIFIED EXPANSION JOINT DETAIL AT BRIDGE APPROACH SLAB	DIST	COUNTY		SHEET NO.
	33	TARRANT		64

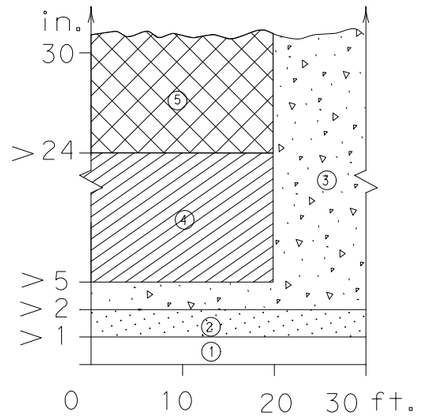
DEFINITION OF TREATMENT ZONES FOR VARIOUS EDGE CONDITIONS

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

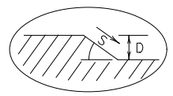


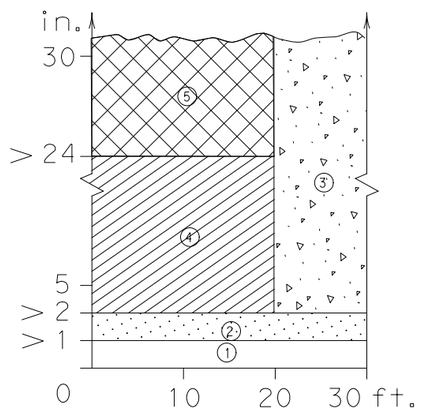
Edge Condition I
S = (3:1) (or flatter)



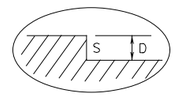


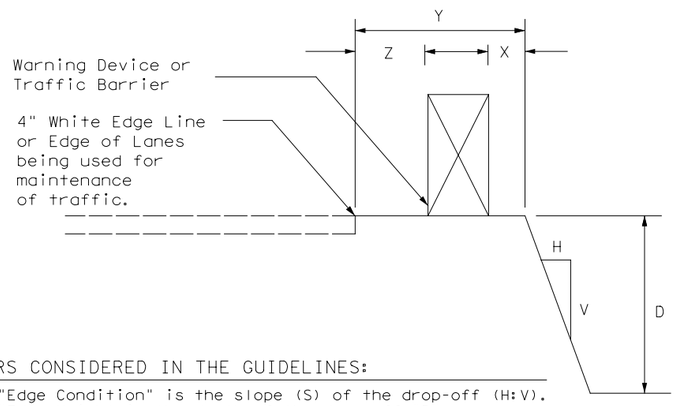
Edge Condition II
S = ((2.99):1) to (1:1)





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





FACTORS CONSIDERED IN THE GUIDELINES:

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

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

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

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

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

Zone	Treatment Types Guidelines:
①	No treatment
②	CW 8-11 "Uneven Lanes" signs.
③	CW 8-9a Shoulder Drop-Off" or CW 8-11 signs plus vertical panels.
④	CW8-9a or CW 8-11, signs plus drums. Where restricted space precludes the use of drums, use vertical panels. An edge slope to that of the profered Edge Condition I.
⑤	Check indications (Figure-1) for possitive barrier. Where positive barrier is not indicated, the treatment shown above for Zone-4 may be used after consideration of other applicable factors.

Edge Condition Notes:

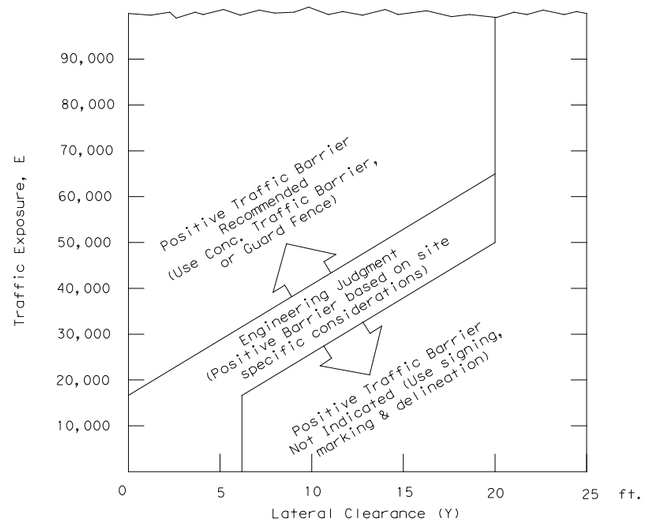
1. Edge Condition I: Most vehicles are able to traverse an edge condition with a slope rate of (3 to 1) or flatter. The slope must be constructed with a compacted material capable of supporting vehicles.

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

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

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

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



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

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

3. An approved end treatment should be provided for any positive barrier end located within the clear zone.

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

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

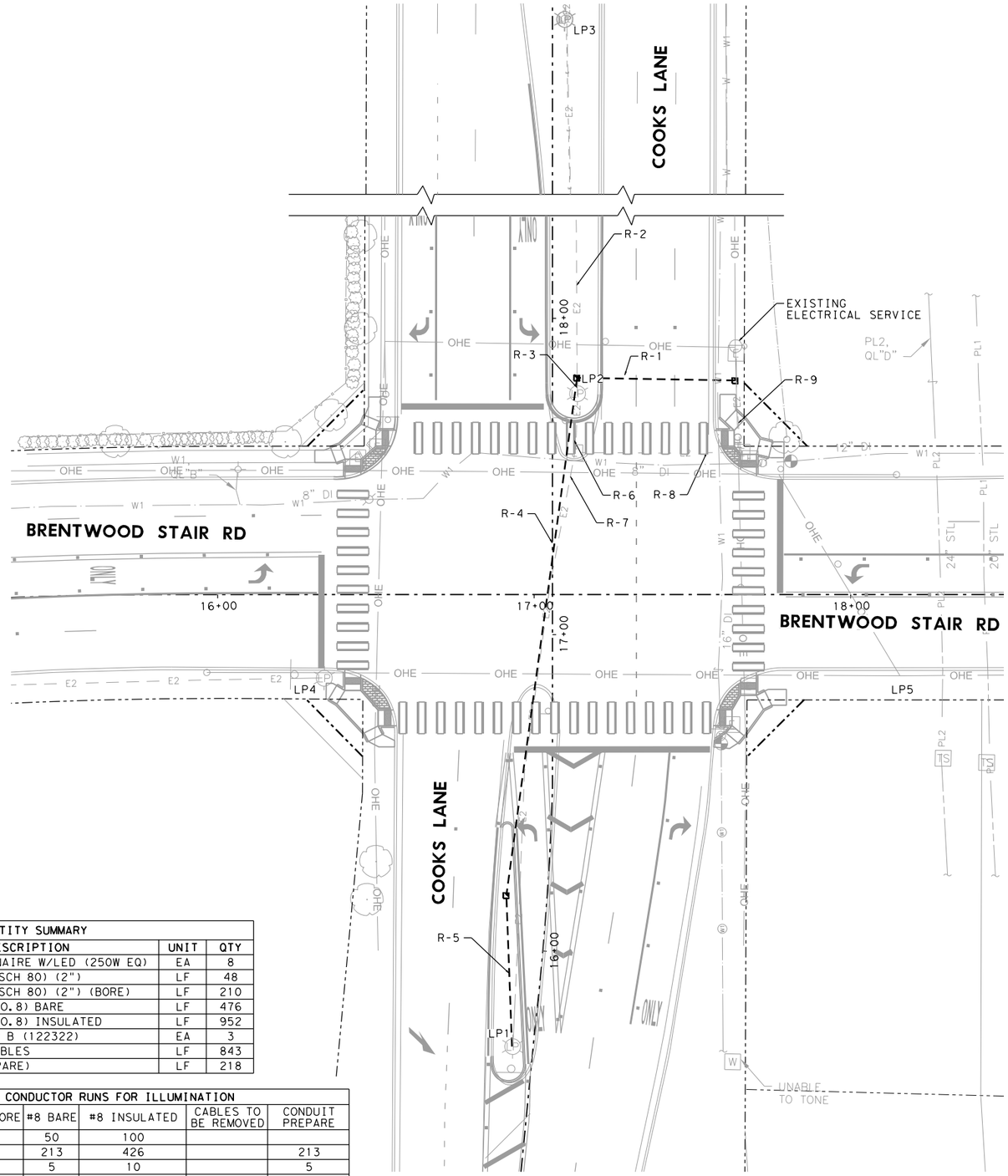
Texas Department of Transportation

Traffic Safety Division Standard

TREATMENT FOR VARIOUS EDGE CONDITIONS

FILE: edgecon.dgn	DN:	CK:	DW:	CK:
©TxDOT August 2000	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
03-01 08-01 9-21	DIST	COUNTY		SHEET NO.
	33	TARRANT		65

DATE:
FILE:



0 10' 20' 40'
GRAPHIC SCALE IN FEET
1" = 40'

LEGEND

- PROPOSED CONDUIT
- PROPOSED GROUND BOX (TY D)
- PROPOSED GROUND BOX (TY B)
- EXISTING LIGHT POLE TO REMAIN

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
ATMOS ENERGY	800-817-8090
FORT WORTH ELECTRIC	817-870-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR ELECTRIC CORPORATION	817-443-3432
TARRENT COUNTY R.O.W.DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED PROFESSIONAL ENGINEER

4/19/2024

QUANTITY SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QTY
610	6102	REPLACE LUMINAIRE W/LED (250W EQ)	EA	8
618	6046	CONDT (PVC) (SCH 80) (2")	LF	48
618	6047	CONDT (PVC) (SCH 80) (2") (BORE)	LF	210
620	6007	ELEC CONDR (NO.8) BARE	LF	476
620	6008	ELEC CONDR (NO.8) INSULATED	LF	952
624	6003	GROUND BOX TY B (122322)	EA	3
690	6009	REMOVAL OF CABLES	LF	843
6027	6003	CONDUIT (PREPARE)	LF	218

CONDUIT AND CONDUCTOR RUNS FOR ILLUMINATION

RUN	LENGTH	2" TRENCH	2" BORE	#8 BARE	#8 INSULATED	CABLES TO BE REMOVED	CONDUIT PREPARE
1	50		1	50	100		
2	213	EXIST		213	426		213
3	5	EXIST		5	10		5
4	160		1	160	320		
5	48	1		48	96		
6	15	EXIST				45	
7	186	EXIST				558	
8	50	EXIST				150	
9	30	EXIST				90	
TOTAL		48	210	476	952	843	218

POSTED SPEED LIMITS:
COOKS LANE = 40 MPH
BRENTWOOD STAIR RD = 35 MPH

NOTES:
1. EXISTING ILLUMINATION ITEMS (POLES, ELECTRICAL SERVICES, CONDUITS, GROUND BOXES, AND CABLES) ARE SHOWN BASED ON RECORDS DRAWINGS AVAILABLE AND FIELD INVESTIGATIONS. THE LOCATION OF THESE ITEMS IS APPROXIMATELY AND MUST BE FILED VERIFIED BY THE CONTRACTOR BEFORE COMMENCING THE WORK.
2. VERIFY WITH ALL UTILITY COMPANIES THE EXACT LOCATIONS OF EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION TO AVOID CONFLICT OR DAMAGE TO THESE UTILITIES.
3. INSTALL PROPOSED GROUND BOXES TO INTERSECT EXISTING ILLUMINATION CONDUITS TO REWIRE ILLUMINATION POLES. EXISTING ILLUMINATION GROUND BOXES AND CABLES WILL BE REMOVED AS SHOWN ON LAYOUTS.
4. REPLACE EXISTING LUMINAIRES WITH A NEW 250W EQ. ALL LUMINAIRES SHALL BE ATBO P303 MVOLT R2 3K MP NL P7 AORFD322793.
5. REMOVE EXISTING CONDUCTORS AND RECONNECT EXISTING ILLUMINATION POLES (LP1, LP2 AND LP3) WITH THE EXISTING ELECTRICAL SERVICE AS SHOW ON LAYOUTS.
6. CONDUITS RUNS 6,7,8, AND 9 WILL BE ABANDON.

NO.	REVISION	BY	DATE

DEC | ENGINEERING EXCELLENCE
T.B.O.E. FIRM REGISTRATION #392
415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

PROPOSED ILLUMINATION LAYOUT

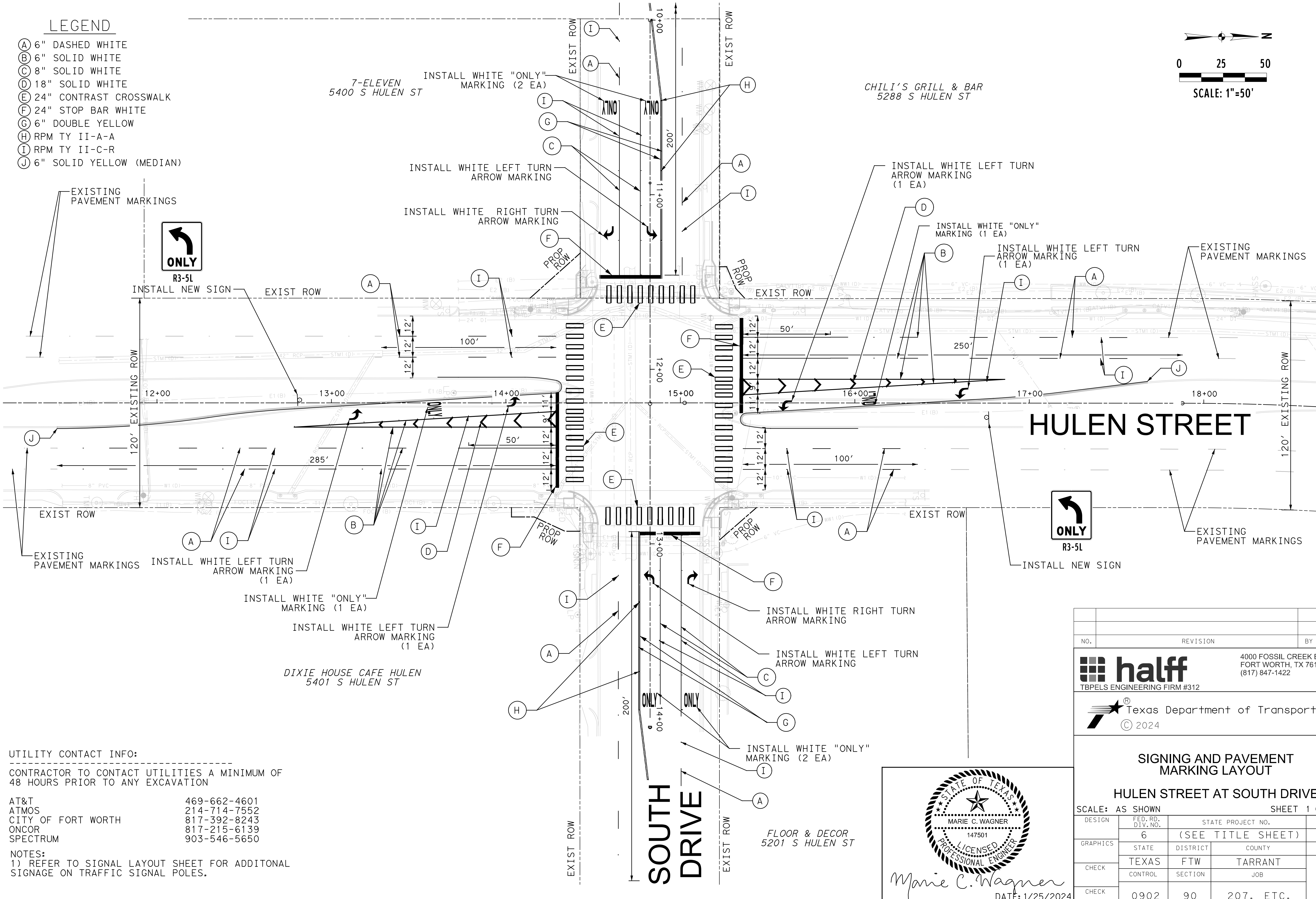
SCALE: 1" = 40' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	66
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

4/19/2024
11:18:54 AM
$FILEL$
troci.fox

LEGEND

- (A) 6" DASHED WHITE
- (B) 6" SOLID WHITE
- (C) 8" SOLID WHITE
- (D) 18" SOLID WHITE
- (E) 24" CONTRAST CROSSWALK
- (F) 24" STOP BAR WHITE
- (G) 6" DOUBLE YELLOW
- (H) RPM TY II-A-A
- (I) RPM TY II-C-R
- (J) 6" SOLID YELLOW (MEDIAN)



UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

NOTES:
1) REFER TO SIGNAL LAYOUT SHEET FOR ADDITONAL SIGNAGE ON TRAFFIC SIGNAL POLES.

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation
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SIGNING AND PAVEMENT MARKING LAYOUT

HULEN STREET AT SOUTH DRIVE

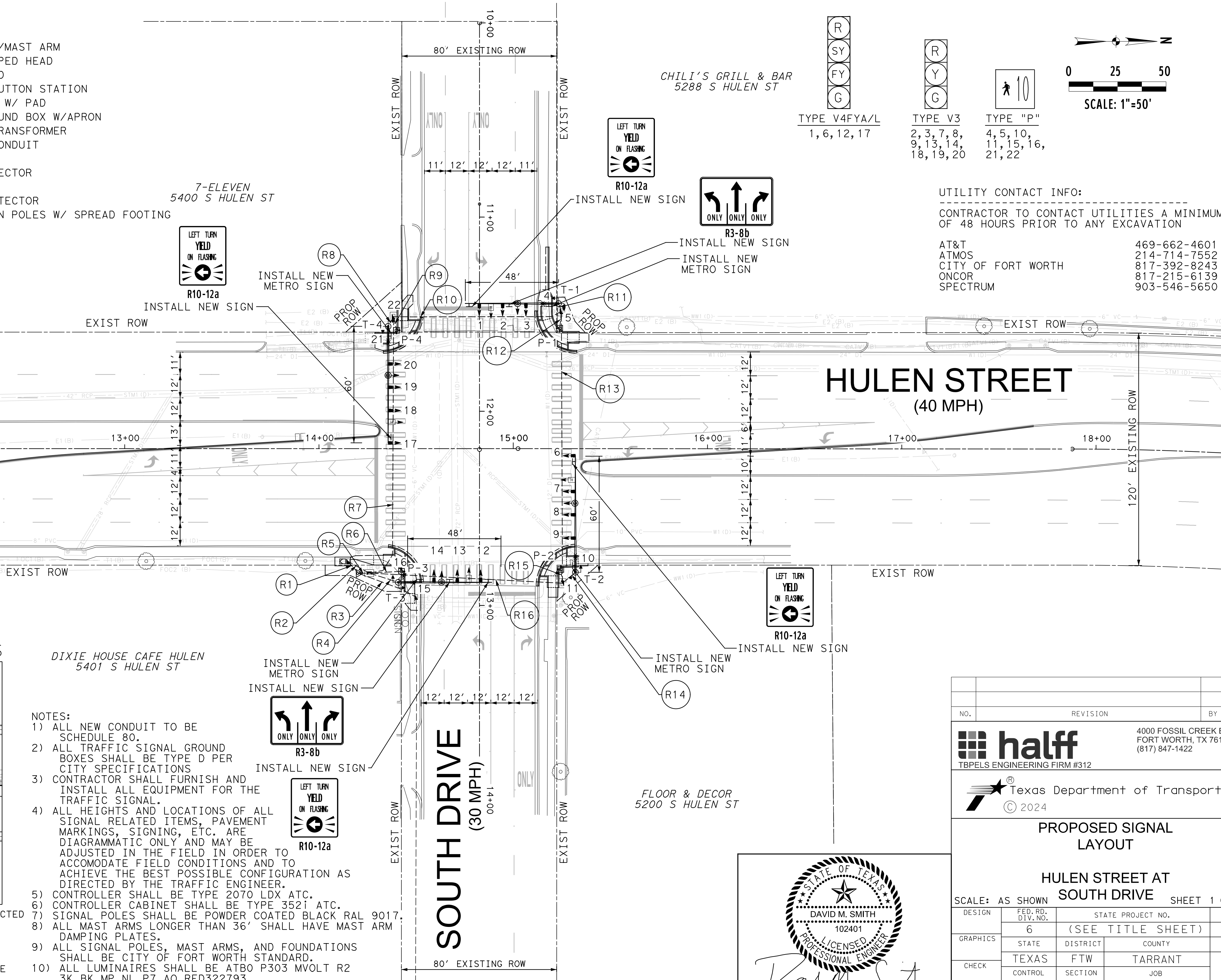
SCALE: AS SHOWN SHEET 1 OF 1

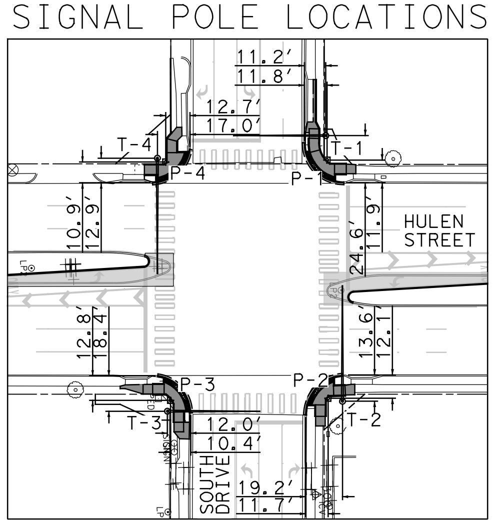
DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	67
CHECK	0902	90	207, ETC.	

FTW WAGNER-4219
Sheet TXDOT-OR 4/19/2024 4:50:56 AM

LEGEND

- METAL POLE/MAST ARM
- COUNTDOWN PED HEAD
- SIGNAL HEAD
- APS PUSH BUTTON STATION
- CONTROLLER W/ PAD
- TYPE D GROUND BOX W/APRON
- ELECTRIC TRANSFORMER
- ELECTRIC CONDUIT
- LUMINAIRE
- HYBRID DETECTOR
- PTZ CAMERA
- OPTICOM DETECTOR
- PUSH BUTTON POLES W/ SPREAD FOOTING





*ALL DIMENSIONS ARE MEASURED FROM PROJECTED BACK OF CURB

CONTRACTOR SHALL VERIFY PROPOSED SIGNAL POLE LOCATION DOES NOT CONFLICT WITH EXISTING UTILITES. LOCATIONS MAY NEED TO BE ADJUSTED AS NEEDED TO AVOID DAMAGE THERETO.

NOTES:

1) ALL NEW CONDUIT TO BE SCHEDULE 80.
2) ALL TRAFFIC SIGNAL GROUND BOXES SHALL BE TYPE D PER CITY SPECIFICATIONS
3) CONTRACTOR SHALL FURNISH AND INSTALL ALL EQUIPMENT FOR THE TRAFFIC SIGNAL.
4) ALL HEIGHTS AND LOCATIONS OF ALL SIGNAL RELATED ITEMS, PAVEMENT MARKINGS, SIGNING, ETC. ARE DIAGRAMMATIC ONLY AND MAY BE ADJUSTED IN THE FIELD IN ORDER TO ACCOMODATE FIELD CONDITIONS AND TO ACHIEVE THE BEST POSSIBLE CONFIGURATION AS DIRECTED BY THE TRAFFIC ENGINEER.
5) CONTROLLER SHALL BE TYPE 2070 LDX ATC.
6) CONTROLLER CABINET SHALL BE TYPE 352i ATC.
7) SIGNAL POLES SHALL BE POWDER COATED BLACK RAL 9017.
8) ALL MAST ARMS LONGER THAN 36' SHALL HAVE MAST ARM DAMPING PLATES.
9) ALL SIGNAL POLES, MAST ARMS, AND FOUNDATIONS SHALL BE CITY OF FORT WORTH STANDARD.
10) ALL LUMINAIRES SHALL BE ATBO P303 MVOLT R2 3K BK MP NL P7 AO RFD322793.

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation
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PROPOSED SIGNAL LAYOUT

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN   SHEET 1 OF 1

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
GRAPHICS	6	(SEE TITLE SHEET)		
	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	68
	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	

FTW WAGNER-4219
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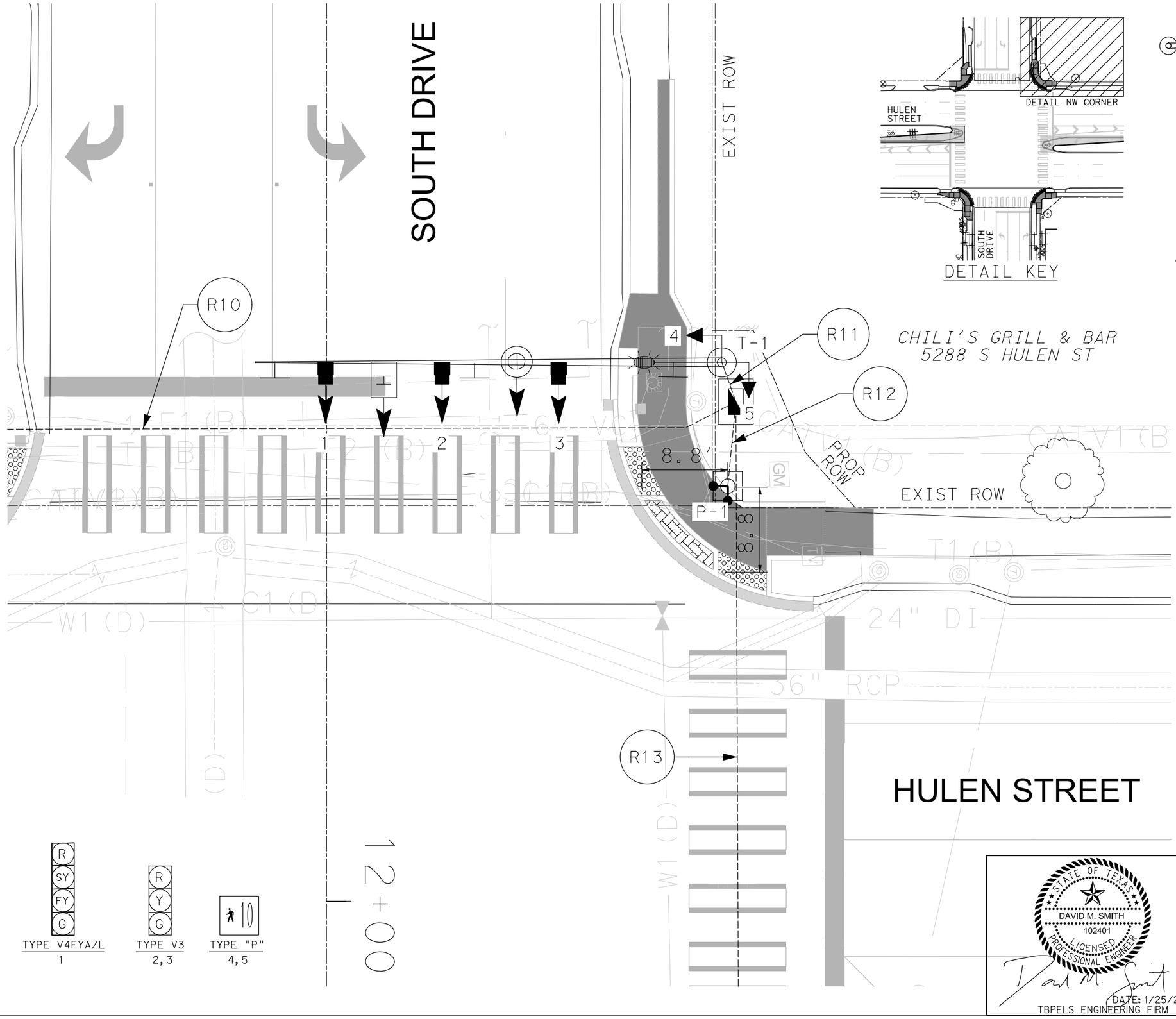

LEGEND

- METAL POLE/MAST ARM
- 1 — SIGNAL HEAD & NO.
- PED POLES
- 1 — PED SIGNAL HEAD & NO.
- CONTROLLER
- TYPE D GROUND BOX
- TYPE D GROUND BOX W/APRON
- (T) — ELECTRIC TRANSFORMER
- ELECTRIC CONDUIT
- (1) — CONDUIT RUN LABEL
- LUMINAIRE
- (H) — HYBRID DETECTOR
- PTZ CAMERA
- OPTICOM DETECTOR

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

0 5 10 15 20

SCALE: 1"=10'

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

TYPE V4FYA/L (R, SY, FY, G) — 1
TYPE V3 (R, Y, G) — 2, 3
TYPE "P" (10) — 4, 5

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

PROPOSED SIGNAL LAYOUT DETAIL

HULEN STREET AT SOUTH DRIVE
NORTHWEST CORNER

SCALE: AS SHOWN — SHEET 1 OF 4

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	69

FTW
WAGNER-4219
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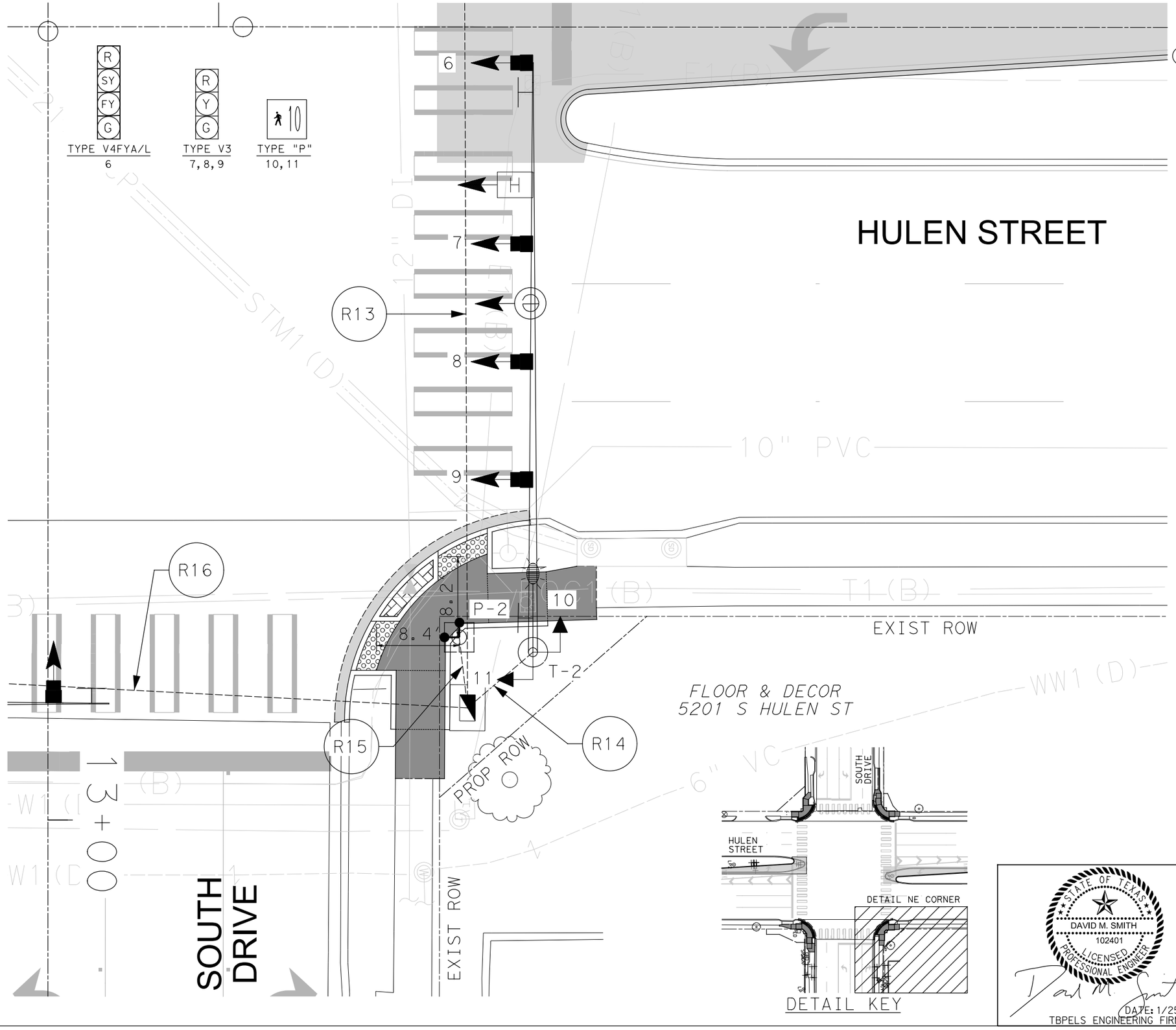

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

N

0 5 10 15 20

SCALE: 1"=10'

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

PROPOSED SIGNAL LAYOUT DETAIL

HULEN STREET AT SOUTH DRIVE
NORTHEAST CORNER

SCALE: AS SHOWN SHEET 2 OF 4

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	70

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER

DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

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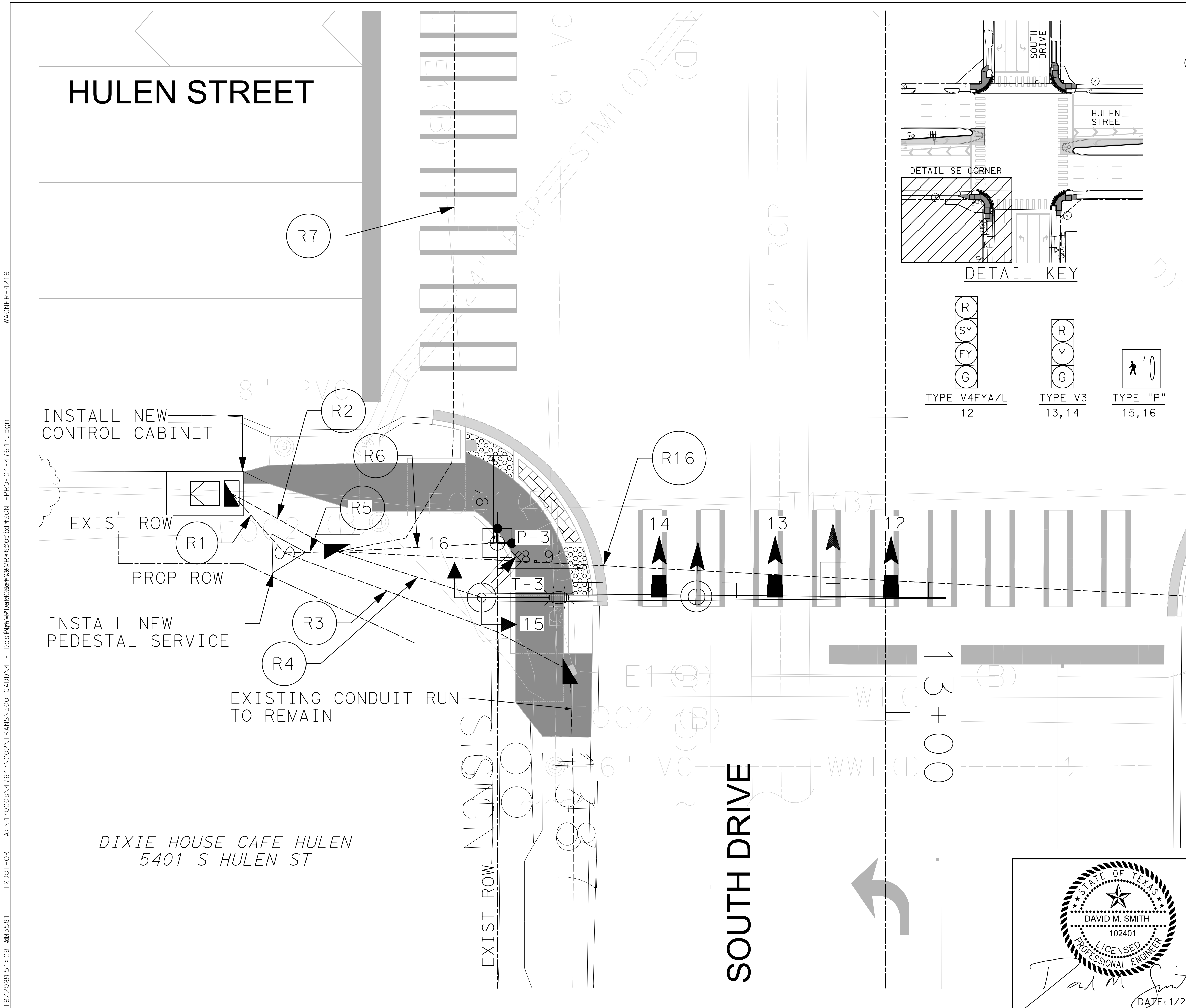

LEGEND

- METAL POLE/MAST ARM
- SIGNAL HEAD & NO.
- PED POLES
- PED SIGNAL HEAD & NO.
- CONTROLLER
- TYPE D GROUND BOX
- TYPE D GROUND BOX W/APRON
- ELECTRIC TRANSFORMER
- ELECTRIC CONDUIT
- CONDUIT RUN LABEL
- LUMINAIRE
- HYBRID DETECTOR
- PTZ CAMERA
- OPTICOM DETECTOR

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

0 5 10 15 20
SCALE: 1"=10'

NO.	REVISION	BY	DATE

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4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

PROPOSED SIGNAL LAYOUT DETAIL

HULEN STREET AT SOUTH DRIVE
SOUTHEAST CORNER

SCALE: AS SHOWN SHEET 3 OF 4

FED. RD. DIV. NO.	STATE PROJECT NO.			HIGHWAY NO.
6	(SEE TITLE SHEET)			
STATE	DISTRICT	COUNTY		SHEET NO.
TEXAS	FTW	TARRANT		
CONTROL	SECTION	JOB		
0902	90	207, ETC.		71

DESIGN
GRAPHICS
CHECK
CHECK

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

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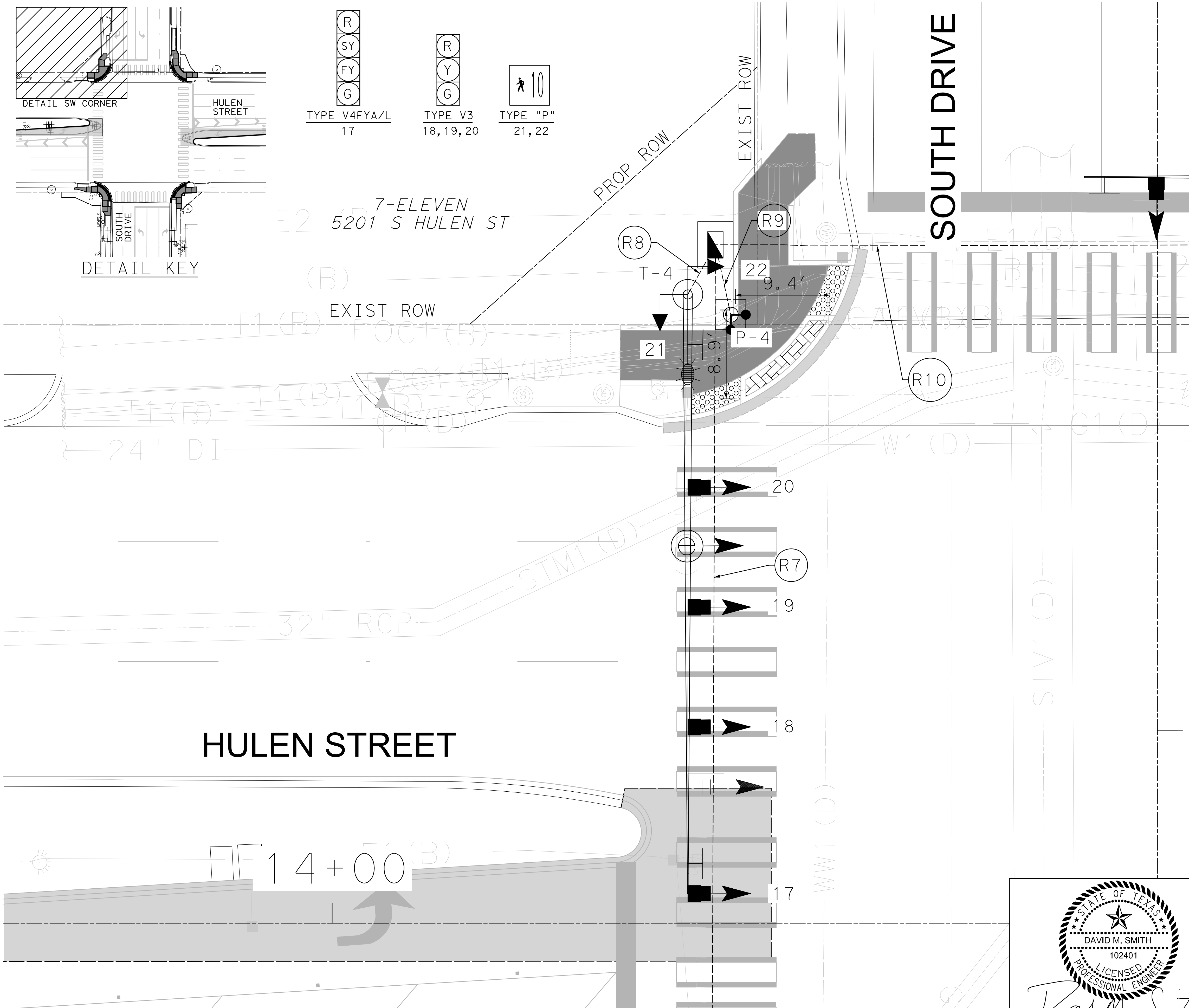

LEGEND

- METAL POLE/MAST ARM
- SIGNAL HEAD & NO.
- PED POLES
- PED SIGNAL HEAD & NO.
- CONTROLLER
- TYPE D GROUND BOX
- TYPE D GROUND BOX W/APRON
- ELECTRIC TRANSFORMER
- ELECTRIC CONDUIT
- CONDUIT RUN LABEL
- LUMINAIRE
- HYBRID DETECTOR
- PTZ CAMERA
- OPTICOM DETECTOR

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	469-662-4601
ATMOS	214-714-7552
CITY OF FORT WORTH	817-392-8243
ONCOR	817-215-6139
SPECTRUM	903-546-5650

0 5 10 15 20
SCALE: 1"=10'

NO.	REVISION	BY	DATE

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4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

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PROPOSED SIGNAL LAYOUT DETAIL

HULEN STREET AT SOUTH DRIVE
SOUTHWEST CORNER

SCALE: AS SHOWN SHEET 4 OF 4

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	72

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

FTW WAGNER-4219

POLE NUMBER	T-1					P-1	T-2						P-2	T-3					P-3	T-4						P-4
SIGNAL ARM LENGTH	48′					PED	60′						PED	48′					PED	60′						PED
POLE/FOUNDATION	TYPE 43/36" TYPE 4					5′ PED/ SPREAD	TYPE 45/36" TYPE 5						5′ PED/ SPREAD	TYPE 43/36" TYPE 4					5′ PED/ SPREAD	TYPE 45/36" TYPE 5						5′ PED/ SPREAD
LUMINAIRES	YES					NO	YES						NO	YES					NO	YES						NO
SIZE OF LENS	12"			X	X		12"				X	X		12"			X	X		12"				X	X	
SIGNAL TYPE	V4FYA/L	V3	V3	P	P		V4FYA/L	V3	V3	V3	P	P		V4FYA/L	V3	V3	P	P		V4FYA/L	V3	V3	V3	P	P	
SIGNAL FACE NO.	1	2	3	4	5		6	7	8	9	10	11		12	13	14	15	16		17	18	19	20	21	22	
SIGNAL INDICATIONS	R<-	R	R	DW	DW		R<-	R	R	R	DW	DW		R<-	R	R	DW	DW		R<-	R	R	R	DW	DW	
	SY<-	Y	Y	W	W		SY<-	Y	Y	Y	W	W		SY<-	Y	Y	W	W		FY<-	Y	Y	Y	W	W	
	FY<-	G	G				FY<-	G	G	G				FY<-	G	G				SY<-	G	G	G			
	G<-						G<-							G<-						G<-						
APS PED BUTTONS	0					2	0						2	0					2	0						2

SUMMARY OF CONDUIT AND CABLES

RUN NO.	CONDUIT QTY/SIZE 2"	3"	4"	LENGTH (LF)	BORE (B) TRENCH (T)	20 COND. #14	3 COND. #14	#6 BARE GROUND	#6 XHHW BLACK/WHITE	#8 BARE GROUND	#10 XHHW BLACK/WHITE	OPITCOM CABLE	HYBRID DETECTOR CABLE (CAT5E)	VIDEO DETECTOR CABLE (CAT5E)	PTZ CAMERA CABLE (CAT5E)
R1	1			10	T			1	2						
R2			2	15	T	4	8			1		4	2	2	1
R3	1			35	T			1	3						
R4A		1		15	T	1				1		1		1	1
R4B	1			15	T					1	2				
R5	1			10	T					1	4				
R6		1		20	T		2			1					
R7A			1	140	B	2	4			1		2	1	1	
R7B	1			140	B					1	2				
R8A		1		10	T	1				1		1	1		
R8B	1			10	T					1	2				
R9		1		10	T		2			1					
R10A			1	90	B	1	2			1		1		1	
R10B	1			90	B					1	2				
R11A		1		5	T	1				1		1		1	
R11B	1			5	T					1	2				
R12		1		15	T		2			1					
R13A			1	140	B					1					
R13B	1			140	B					1					
R14A		1		10	T	1				1		1	1		
R14B	1			10	T					1	2				
R15		1		15	T		2			1					
R16A			1	100	B	1	2			1		1	1		
R16B	1			100	B					1	2				
CABLE TOTALS (CONDUIT ONLY)						570	1180	45	125	1105	780	570	290	280	30

CONDUIT TOTALS	
2" TRENCH	95
2" BORE	380
3" TRENCH	100
3" BORE	0
4" TRENCH	30
4" BORE	380

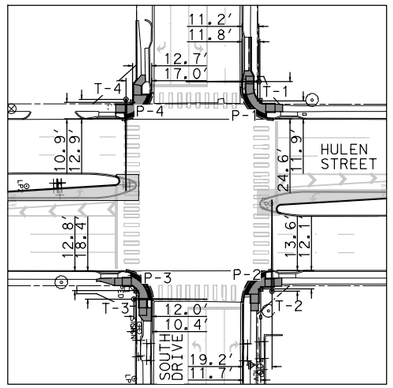
Notes:
Cable totals do not reflect the quantities of cable inside the pole and mast arm.
T = Trench, B = Bore, EX = Existing, OH = Overhead, RM = Rigid Metal

NOTES:
1) ALL SIGNAL HEADS SHALL HAVE BLACK, ALUMINUM, VENTED BACKPLATES WITH 2-INCH RETRO-REFLECTIVE BORDERS.
2) ALL PEDESTRIAN SIGNALS SHALL BE COUNTDOWN TYPE.

CABLE/WIRE INSIDE POLE (FEET)

POLE NUMBER	3 CNDR 14 AWG	5 CNDR 14 AWG	7 CNDR 14 AWG	NO. 10 XHHW	OPTICOM CABLE	HYBRID DETECTOR CABLE (CAT5E)	VIDEO DETECTOR CABLE (CAT5E)	PTZ CAMERA CABLE (CAT5E)
T-1		30	225	90	75		75	
P-1	20							
T-2		30	340	90	85	85		
P-2	20							
T-3		30	225	90	75		75	35
P-3	20							
T-4		30	340	90	85	85		
P-4	20							
TOTAL	80	120	1130	360	320	170	150	35

SIGNAL POLE LOCATIONS



*ALL DIMENSIONS ARE MEASURED FROM PROJECTED BACK OF CURB

CONTRACTOR SHALL VERIFY PROPOSED SIGNAL POLE LOCATION DOES NOT CONFLICT WITH EXISTING UTILITES. LOCATIONS MAY NEED TO BE ADJUSTED AS NEEDED TO AVOID DAMAGE THERETO.

STATE OF TEXAS
DAVID M. SMITH
102401
LICENSED PROFESSIONAL ENGINEER
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

SIGNAL PHASING AND CHARTS

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	73

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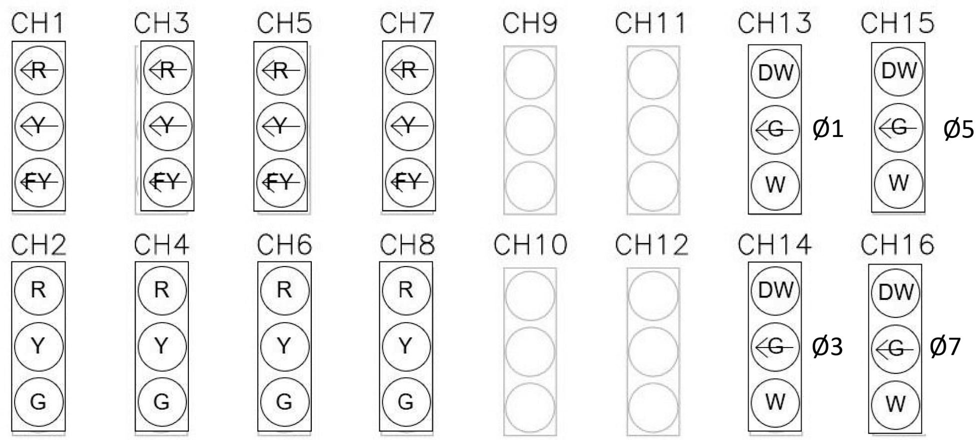
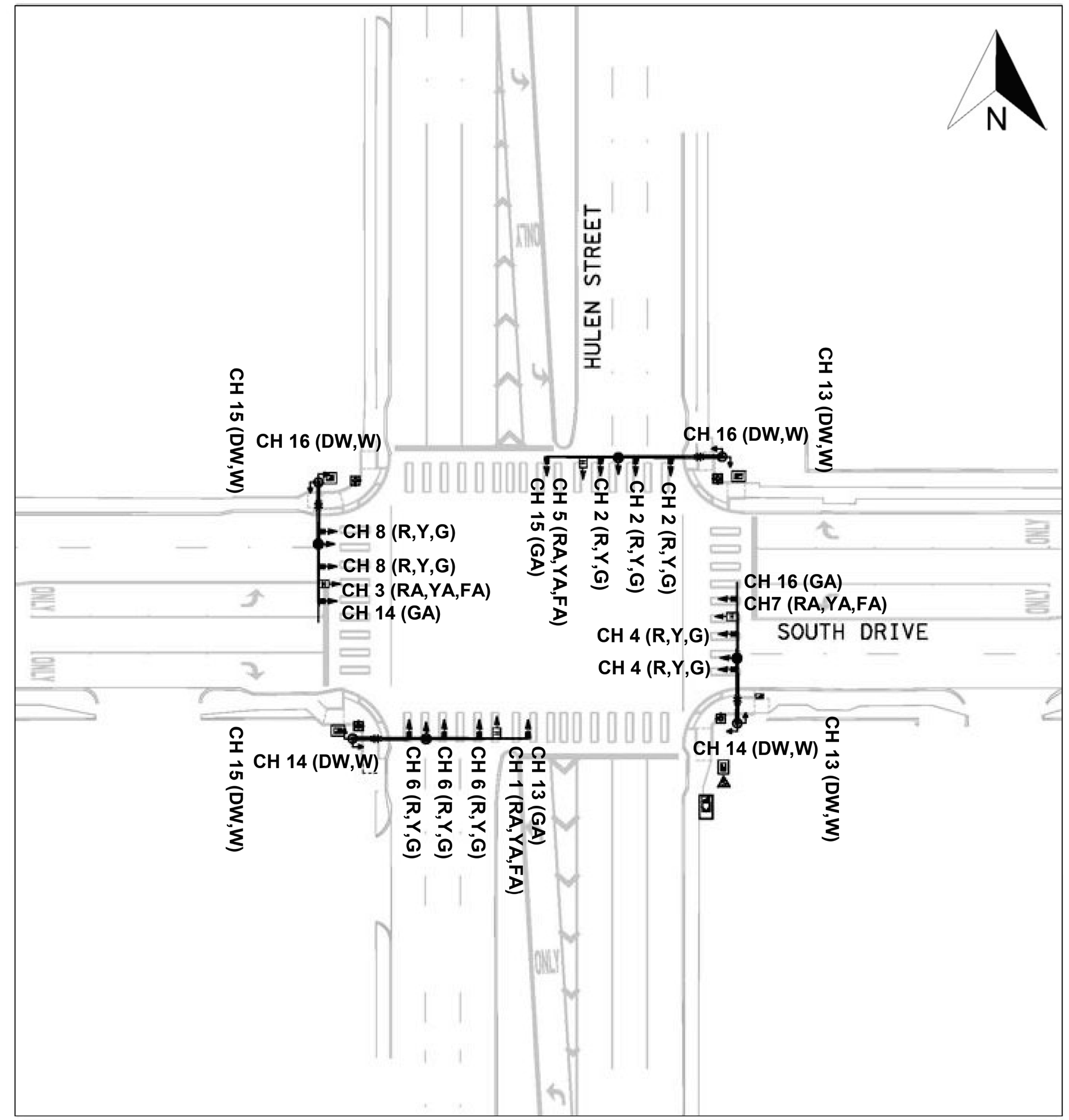
LOAD SWITCH OUTPUT ASSIGNMENT



SIGNAL DETECTOR ATTRIBUTE / CHANNEL												
	1	2	3	4	5	6	7	8	9	10	11	12
352i ATC							PED 2 DET 13	PED 6 DET 15			PRE EMPT NB DET 21	PRE EMPT WB DET 23
							PED 4 DET 14	PED 8 DET 16			PRE EMPT SB DET 22	PRE EMPT EB DET 24

ALL VEHICULAR DETECTION SHALL BE THROUGH SDLC



FORT WORTH.
5001 JAMES AVENUE
FORT WORTH, TX 76115
PHONE: (817) 392-8656
FAX: (817) 392-2533

LEGEND

- SIGNAL HEAD
- PED HEAD
- PED POLE
- MAST ARM

STATE OF TEXAS — MOHAMMAD AZIZUR RAHMAN — 118252 — LICENSED PROFESSIONAL ENGINEER — 1-18-24

CITY OF FORT WORTH

DEPARTMENT OF TRANSPORATION AND PUBLIC WORKS
TRAFFIC MANAGEMENT DIVISION

HULEN ST AND SOUTH DR

CHANNEL ASSIGNMENT DRAWING

NOTES	NAME	DATE
DESIGN BY	Sagar M	01/15/24
ENGINEER	Sagar M	01/18/24
APPROVED	Aziz R	01/18/24
SHEET No.	1	

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

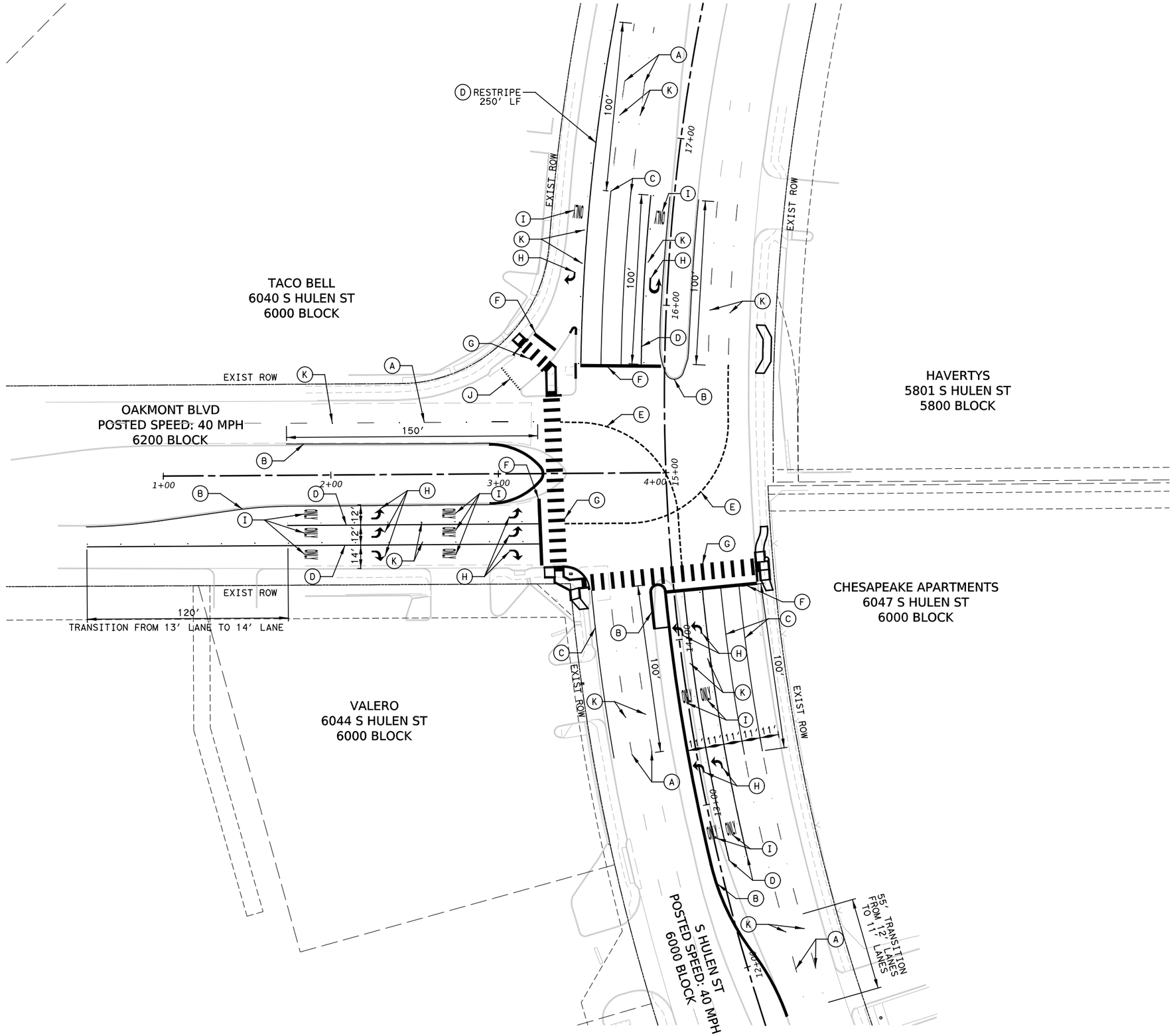
Texas Department of Transportation

CHANNEL ASSIGNMENT

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
	CONTROL	SECTION	JOB	74
CHECK	0902	90	207, ETC.	



tnp

30 0 15 30 60

GRAPHIC SCALE

LEGEND	
A	6" WHITE BRK
B	6" YELLOW SLD
C	6" WHITE SLD
D	8" WHITE SLD
E	6" WHITE DOT
F	24" WHITE SLD
G	24" CONTRAST CROSSWALK
H	WHITE (ARROW)
I	WHITE (WORD)
J	18" YIELD TRIANGLE
K	TY II C-R REFL MRKR

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED
PROFESSIONAL ENGINEER
4/16/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

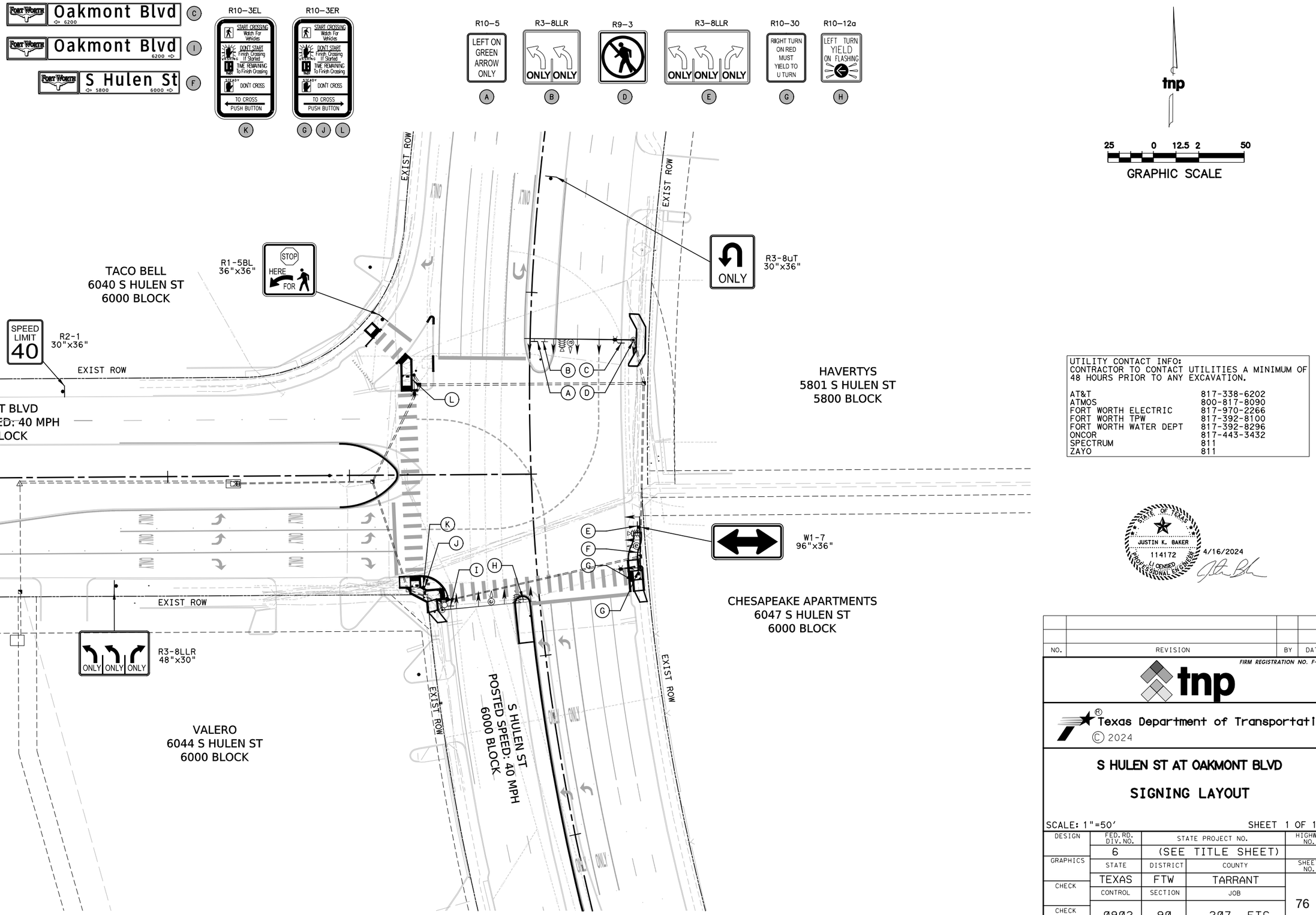
Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

PAVEMENT MARKING LAYOUT

SCALE: 1"=60' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	75
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	



UTILITY CONTACT INFO:
CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.

AT&T	817-338-6202
ATMOS	800-817-8090
FORT WORTH ELECTRIC	817-970-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR	817-443-3432
SPECTRUM	811
ZAYO	811

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED PROFESSIONAL ENGINEER
4/16/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

SIGNING LAYOUT

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	76
CHECK	0902	90	207, ETC	

TACO BELL
6040 S HULEN ST
6000 BLOCK

HAVERTYS
5801 S HULEN ST
5800 BLOCK

OAKMONT BLVD
POSTED SPEED: 40 MPH
6200 BLOCK

S HULEN ST
POSTED SPEED: 40 MPH
6000 BLOCK

VALERO
6044 S HULEN ST
6000 BLOCK

CHESAPEAKE APARTMENTS
6047 S HULEN ST
6000 BLOCK

EXIST ROW
UTILITY EASEMENT
S HULEN ST
OAKMONT BLVD
HYBRID
OPTICOM
SIGNAL CONTROLLER AND EXTERNAL BBU WITH CABINET 352i
EXISTING TRANSFORMER
R1 R2 R3 R5 R6 R7 R8 R9 R10 R11 R12 R13 R14 R15 R16 R17 R18 R19 R20 R21 R22 R23 R24 R25 R26 R27 R28 R29 R30 R31
P-1 P-2 T-1 T-2 T-3
60' 52' 28'

PEDESTRIAN SIGNAL
TYPE "P" 1,10,15,16
TYPE V3 W/BACKPLATE 4,5,6,9 12,13,14
TYPE V3L W/BACKPLATE 2,3
TYPE V3L (MOD) W/BACKPLATE 7,8
TYPE V4FYA/L (MOD) W/BACKPLATE 11

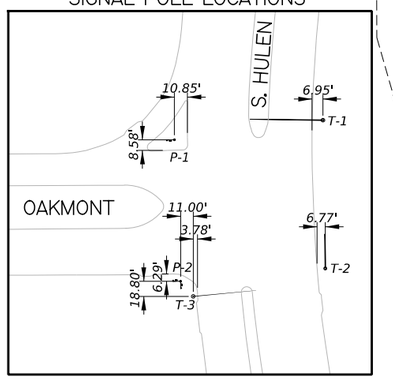
tnp

25 0 12.5 25 50
GRAPHIC SCALE

LEGEND

- PROPOSED CONDUIT
- PROPOSED SIGNAL POLE
- PROPOSED PEDESTRIAN POLE
- TRAFFIC CONTROLLER AND FOUNDATION W/ GROUND BOX AND EXTERNAL BBU
- PROPOSED ELECTRICAL SERVICE
- PROPOSED LUMINAIRE HEAD
- PROPOSED SIGNAL HEAD
- PROPOSED PEDESTRIAN HEAD AND PUSHBUTTON
- PROPOSED TY D GROUND BOX (162922) W/ APRON
- PROPOSED HYBRID DETECTION (VIDEO AND RADAR)
- PROPOSED MAST ARM SIGN
- PROPOSED OPTICOM DETECTOR
- PROPOSED PTZ CAMERA

SIGNAL POLE LOCATIONS



UTILITY CONTACT INFO:
CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.

AT&T	817-338-6202
ATMOS	800-817-8090
FORT WORTH ELECTRIC	817-970-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR	817-443-3432
SPECTRUM	811
ZAYO	811

NOTES:

1. ALL MAST ARMS LONGER THAN 36 FT SHALL HAVE MAST ARM DAMPING PLATES.
2. ALL SIGNAL POLES SHALL BE POWDER COATED BLACK RAL 9017 AND IS SUBSIDIARY TO ITEM 680.
3. ALL SIGNAL POLES, MAST ARMS AND FOUNDATIONS SHALL FOLLOW CITY OF FORT WORTH STANDARDS.
4. ALL LUMINAIRES SHALL BE ATBO P303 MVOLT R2 3K BK MP NL P7 AO RFD322793.

STATE OF TEXAS
M. DALTON MENN
145158
LICENSED
PROFESSIONAL ENGINEER
4-16-2024
Dalton Menn

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

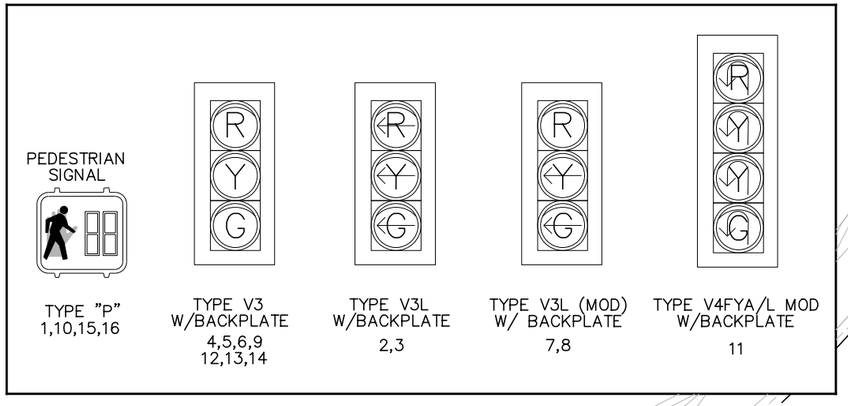
S HULEN ST AT OAKMONT BLVD

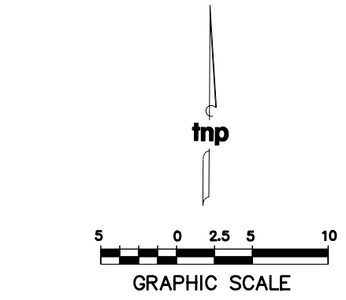
PROPOSED SIGNAL LAYOUT

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	77
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	

TACO BELL





LEGEND	
	PROPOSED CONDUIT
	PROPOSED SIGNAL POLE
	PROPOSED PEDESTRIAN POLE
D	TRAFFIC CONTROLLER AND FOUNDATION W/ GROUND BOX
S	PROPOSED ELECTRICAL SERVICE
	PROPOSED LUMINAIRE HEAD
	PROPOSED SIGNAL HEAD
	PROPOSED PEDESTRIAN HEAD AND PUSHBUTTON
	PROPOSED TY D GROUND BOX (162922) W/ APRON
	PROPOSED HYBRID DETECTION (VIDEO AND RADAR)
	PROPOSED MAST ARM SIGN
C	PROPOSED OPTICOM DETECTOR
	PROPOSED PTZ CAMERA

UTILITY CONTACT INFO:
CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.

AT&T	817-338-6202
ATMOS	800-817-8090
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SPECTRUM	811
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NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

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Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

TRAFFIC SIGNAL
NW CORNER DETAILS

SCALE: 1"=10' SHEET 1 OF 4

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	78
CHECK	0902	90	207, ETC	

S HULEN ST
POSTED SPEED: 40 MPH
6000 BLOCK

60'

HYBRID
OPTICOM

T-1

2 3 4 5 6

R15
R16
R17
R18
R19
R20

PEDESTRIAN SIGNAL
TYPE "P"
1,10,15,16

TYPE V3 W/BACKPLATE
4,5,6,9
12,13,14

TYPE V3L W/BACKPLATE
2,3

TYPE V3L (MOD) W/ BACKPLATE
7,8

TYPE V4FYA/L MOD W/BACKPLATE
11

UTILITY CONTACT INFO:
CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.

AT&T	817-338-6202
ATMOS	800-817-8090
FORT WORTH ELECTRIC	817-970-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR	817-443-3432
SPECTRUM	811
ZAYO	811

tnp

5 0 2.5 5 10
GRAPHIC SCALE

LEGEND

- PROPOSED CONDUIT
- PROPOSED SIGNAL POLE
- PROPOSED PEDESTRIAN POLE
- TRAFFIC CONTROLLER AND FOUNDATION W/ GROUND BOX
- PROPOSED ELECTRICAL SERVICE
- PROPOSED LUMINAIRE HEAD
- PROPOSED SIGNAL HEAD
- PROPOSED PEDESTRIAN HEAD AND PUSHBUTTON
- PROPOSED TY D GROUND BOX (162922) W/ APRON
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- PROPOSED MAST ARM SIGN
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- PROPOSED PTZ CAMERA

STATE OF TEXAS
M. DALTON MENN
145158
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4-16-2024

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FIRM REGISTRATION NO. F-230

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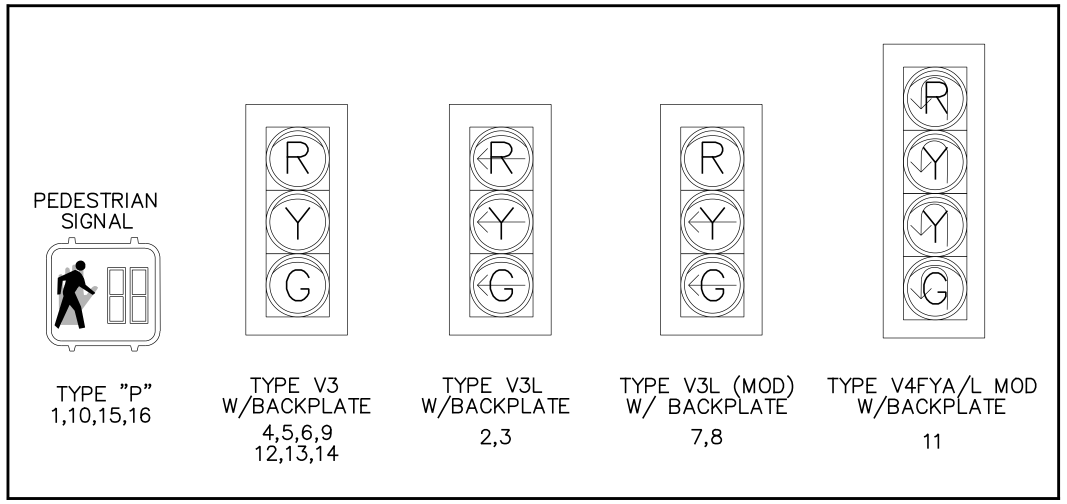
Texas Department of Transportation

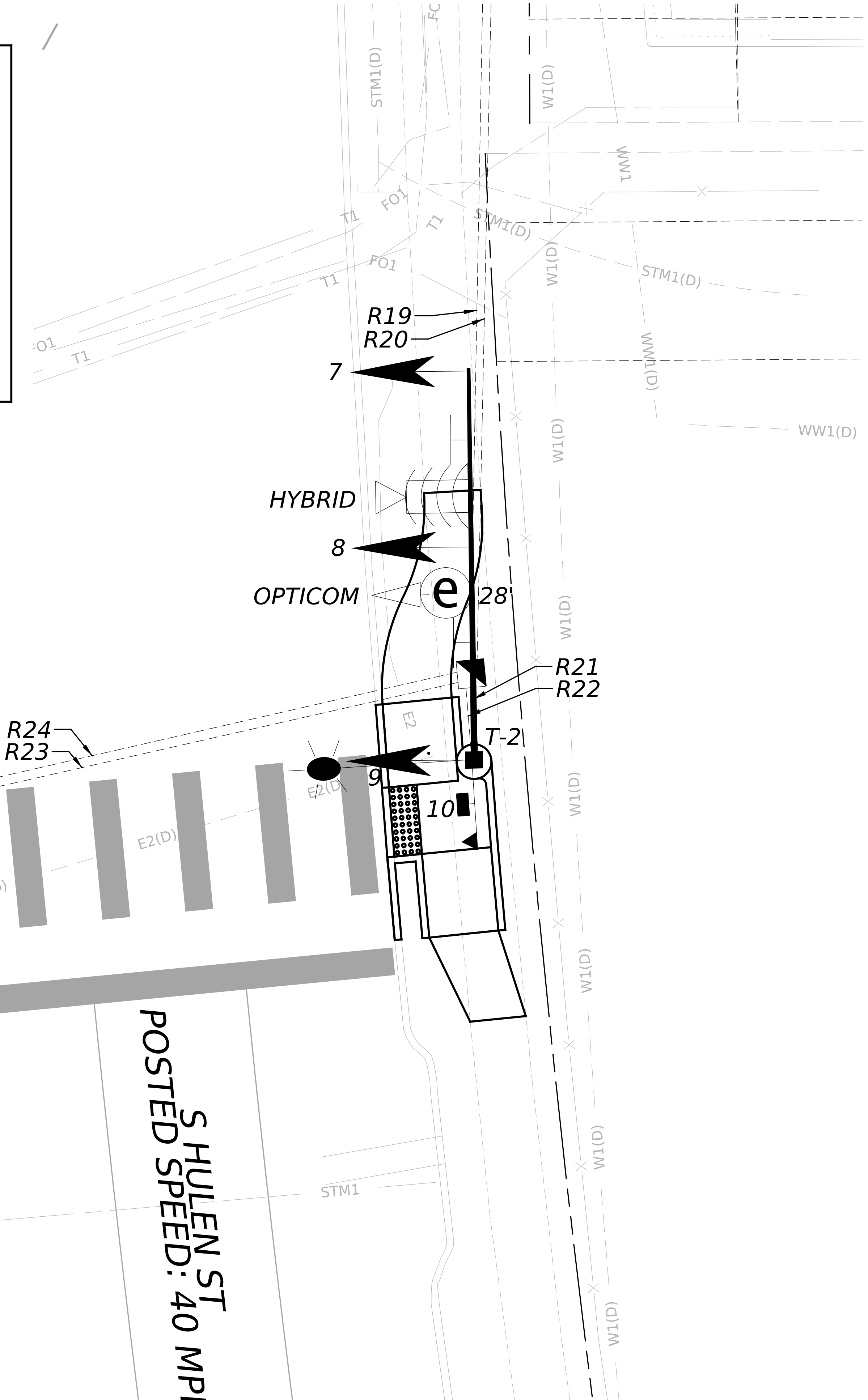
S HULEN ST AT OAKMONT BLVD

TRAFFIC SIGNAL
NE CORNER DETAILS

SCALE: 1"=10' SHEET 2 OF 4

DESIGN	FED.RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	79
CHECK	0902	90	207, ETC	





GRAPHIC SCALE

5 0 2.5 5 10

LEGEND	
	PROPOSED CONDUIT
	PROPOSED SIGNAL POLE
	PROPOSED PEDESTRIAN POLE
	TRAFFIC CONTROLLER AND FOUNDATION W/ GROUND BOX
	PROPOSED ELECTRICAL SERVICE
	PROPOSED LUMINAIRE HEAD
	PROPOSED SIGNAL HEAD
	PROPOSED PEDESTRIAN HEAD AND PUSHBUTTON
	PROPOSED TY D GROUND BOX (162922) W/ APRON
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	PROPOSED MAST ARM SIGN
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	PROPOSED PTZ CAMERA

STATE OF TEXAS
M. DALTON MENN
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4-16-2024

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FORT WORTH WATER DEPT	817-392-8296
ONCOR	817-443-3432
SPECTRUM	811
ZAYO	811

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

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Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

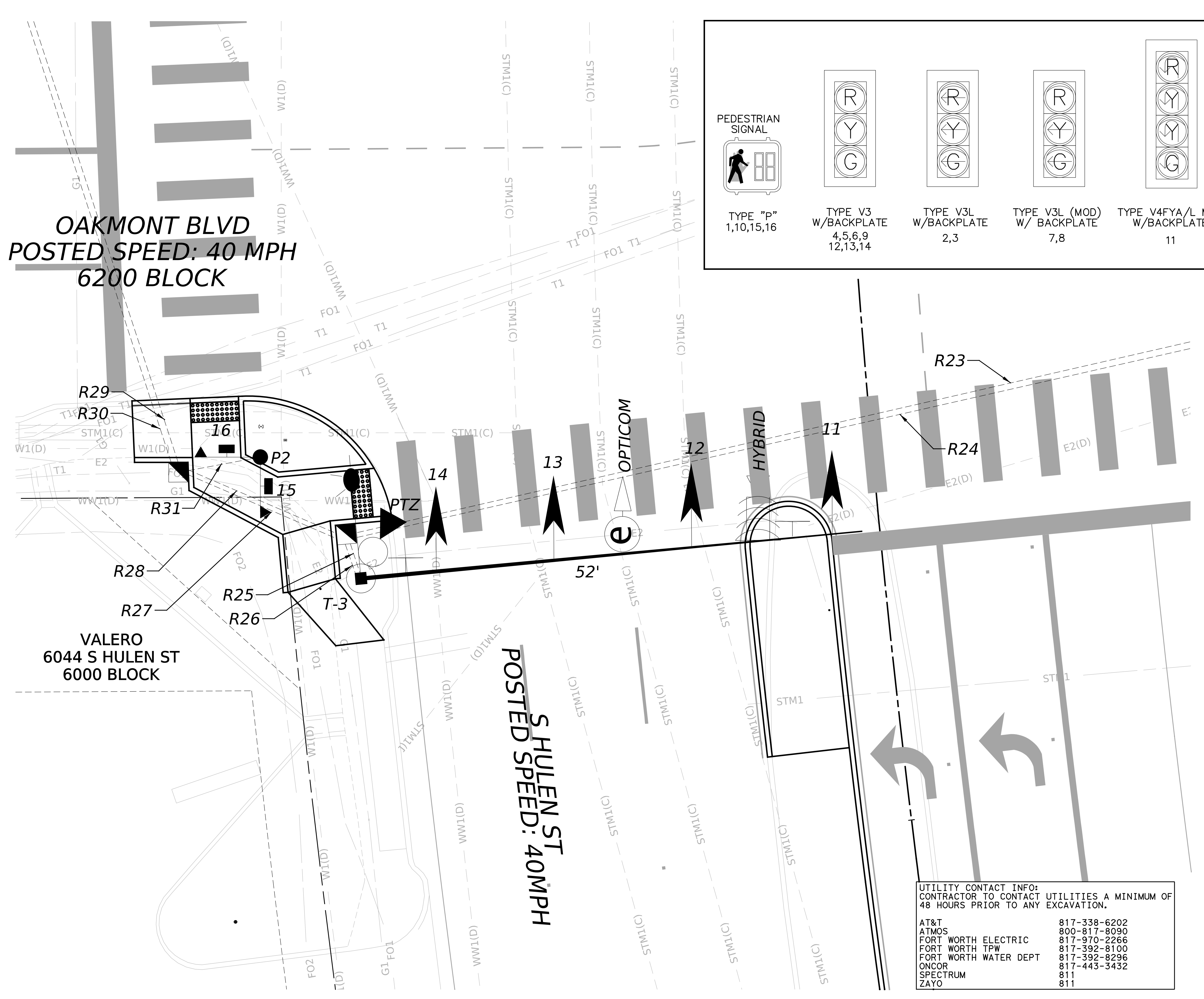
TRAFFIC SIGNAL SE CORNER DETAILS

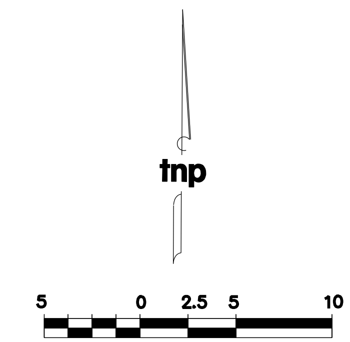
SCALE: 1"=10'

SHEET 3 OF 4

FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
6	(SEE TITLE SHEET)		
STATE	DISTRICT	COUNTY	SHEET NO.
TEXAS	FTW	TARRANT	
CONTROL	SECTION	JOB	
0902	90	207, ETC	80

DESIGN / GRAPHICS / CHECK / CHECK





LEGEND

- PROPOSED CONDUIT
- PROPOSED SIGNAL POLE
- PROPOSED PEDESTRIAN POLE
- TRAFFIC CONTROLLER AND FOUNDATION W/ GROUND BOX
- PROPOSED ELECTRICAL SERVICE
- PROPOSED LUMINAIRE HEAD
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- PROPOSED PEDESTRIAN HEAD AND PUSHBUTTON
- PROPOSED TY D GROUND BOX (162922) W/ APRON
- PROPOSED HYBRID DETECTION (VIDEO AND RADAR)
- PROPOSED MAST ARM SIGN
- PROPOSED OPTICOM DETECTOR
- PROPOSED PTZ CAMERA

STATE OF TEXAS
M. DALTON MENN
145158
LICENSED
PROFESSIONAL ENGINEER

4-16-2024

Dalton Menn

UTILITY CONTACT INFO:
CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION.

AT&T	817-338-6202
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FORT WORTH ELECTRIC	817-970-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR	817-443-3432
SPECTRUM	811
ZAYO	811

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

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Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

TRAFFIC SIGNAL
SW CORNER DETAILS

SCALE: 1"=10' SHEET 4 OF 4

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	81
CHECK	0902	90	207, ETC	

$OFFICE$ $WORKSTATION$ $PENTBL$ $MODELNAME$ T:\Projects\FTW22299\Eng-MSV01-PSE\PROD\SHEETS\SIG\TRFSIG-04.dgn $CLIENT$ 4/16/2024 2:21:46 PM

POLE NUMBER	P-1	T-1					T-2				T-3				P-2	
SIGNAL ARM LENGTH	N/A	60'					28'				52'				N/A	
POLE/FOUNDATION	TYPE 8/24"	TYPE 45/36" TYPE 5					TYPE 41/30" TYPE 3				TYPE 45/36" TYPE 5				10' PED/24"	
LUMINAIRES	YES	YES					YES				YES				NO	
SIZE OF LENS	X	12"					12"			X	12"				X	X
SIGNAL TYPE	P	V3L	V3L	V3	V3	V3	V3L (MOD)	V3L (MOD)	V3	P	V4FYA/L (MOD)	V3	V3	V3	P	P
SIGNAL FACE NO.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
SIGNAL INDICATIONS	DW	<-R-	<-R-	R	R	R	R	R	R	DW	R (U-ARROW)	R	R	R	DW	DW
	W	<-Y-	<-Y-	Y	Y	Y	<-Y-	<-Y-	Y	W	SY (U-ARROW)	Y	Y	Y	W	W
	-	<-G-	<-G-	G	G	G	<-G-	<-G-	G	-	FY (U-ARROW)	G	G	G	-	-
											G (U-ARROW)					
APS PED BUTTONS	1	0					1				0				2	

1. ALL SIGNAL HEADS SHALL BE FEDERAL YELLOW WITH A TRAFFIC BLACK ALUMINUM VENTED BACK PLATE WITH A 2" RETRO-REFLECTIVE BORDER.
2. PEDESTRIAN SIGNAL HEADS SHALL BE COUNTDOWN TYPE.
3. ALL SIGNAL HEADS SHALL BE LED.

SUMMARY OF CONDUIT AND CABLES

RUN NO.	CONDUIT SIZE & INSTALLATION T - TRENCH B - BORE	LENGTH (FT)	XHHW #6 AWG CABINET	BARE #8 AWG GROUND	XHHW #10 AWG LIGHTING	20C #14 AWG SIGNAL	10C #14 AWG SIGNAL	3C #14 AWG APS	OPTICOM DETECTOR CABLE	CAT5E CABLE (HYBRID DETECTION)	CAT 5E CABLE (PTZ CAM)
R-1	2" - T	25	ELECTRICAL CONDUCTORS TO BE INSTALLED BY ONCOR FROM THE TRANSFORMER TO THE METER.								
R-2	NOT USED	-									
R-3	2" - B	60									
R-4	NOT USED	-									
R-5	2" - T	120		1	2						
R-6	2" - T	120	2	1							
R-7	3" - T	5		1				4	3	3	1
R-8	3" - T	5		1		3	2				
R-9	2" - T	75		1	2						
R-10	4" - T	75		1		3	2	4	3	3	1
R-11	2" - B	60		1	2						
R-12	4" - B	60		1		1	1	1	1	1	
R-13	2" - T	5		1	4						
R-14	3" - T	5		1			1	1			
R-15	2" - B	125		1	2						
R-16	4" - B	125		1		1			1	1	
R-17	2" - T	25		1	4						
R-18	3" - T	25		1		1			1	1	
R-19	2" - T	95		1	2						
R-20	4" - T	95		1							
R-21	2" - T	5		1	4						
R-22	3" - T	5		1		1		1	1	1	
R-23	2" - B	115		1	2						
R-24	4" - B	115		1		1		1	1	1	
R-25	2" - T	10		1	2						
R-26	3" - T	10		1		1			1	1	1
R-27	2" - T	20		1							
R-28	4" - T	20		1		2		1	2	2	1
R-29	2" - B	65		1							
R-30	4" - B	65		1		2	1	3	2	2	1
R-31	3" - T	10		1			1	2			
CABLE IN RUNS (ft)		-	240	1460	1340	750	300	740	750	750	175

** THIS CHART DOES NOT REFLECT THE QUANTITIES OF CABLE INSIDE THE POLE. QUANTITIES OF CABLE INSIDE THE POLE WILL NOT BE PAID DIRECTLY, BUT SHALL BE CONSIDERED SUSIDIARY TO BID ITEM 686.

STATE OF TEXAS
M. DALTON MENN
145158
LICENSED
PROFESSIONAL ENGINEER
4-16-2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation
© 2024

S HULEN ST AT OAKMONT BLVD

SIGNAL PHASING AND CHARTS

SCALE: N.T.S SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	82
CHECK	0902	90	207, ETC	

CABLE/WIRE INSIDE POLES (FT)									
POLE NO.	POLE DESCRIPTION	DESIGNATION	3C #14 AWG APS	5C #14 AWG SIGNAL	7C #14 AWG SIGNAL	XHHW #10 AWG LIGHTING	OPTICOM DETECTOR CABLE	CAT5E CABLE (HYBRID DETECTION)	CAT 5E CABLE (PTZ CAM)
P1	27.5' LUMINAIRE POLE WITH PEDESTRIAN SIGNAL		5	10		60			
T-1	27.5' TRAFFIC SIGNAL POLE WITH LUMINARE - 60' MAST ARM	FW-45-60-33A		275		60	65	70	
T-2	27.5' TRAFFIC SIGNAL POLE WITH LUMINARE - 28' MAST ARM	FW-43-28-33A	5	100		60	40	50	
T-3	27.5' TRAFFIC SIGNAL POLE WITH LUMINARE - 52' MAST ARM	FW-45-52-33A		140	75	60	55	65	25
P2	10' PEDESTRIAN SIGNAL POLE		10	20					
TOTALS			20	545	75	240	160	185	25

** QUANTITIES OF CABLE INSIDE THE POLE WILL NOT BE PAID DIRECTLY, BUT SHALL BE CONSIDERED SUSIDIARY TO BID ITEM 686.

ELECTRICAL SERVICE DATA										
Elec. Service No.	Electrical Service Description (see ED (5), (6) & (9) - 14)	Service Conduit Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amp	Two-Pole Contactor Amps	Panelbd/ Loadcenter Amp Rating	Circuit No.	Branch Ckt. Bkr. Pole/Amps	KVA Load
1	ELC SRV TY D 120/240 100 (NS)SS(E)PS(U)	2"	3/#4	N/A	2P/100	N/A	100	1. TRAFFIC SIGNAL	1P/50	3.0
								2. LUMINAIRES	2P/20	

SUGGESTED APS PROGRAMMING CHART						
APS UNIT	POLE ID	CALL PED HEAD #	INSTALL R10-3eL	INSTALL R10-3eR	STREET NAME BEING CROSSED	CROSS SIDE STREET NAME
1	P1	16		X	OAKMONT BLVD	S HULEN ST
2	P2	1	X		OAKMONT BLVD	S HULEN ST
3	P2	10		X	S HULEN ST	OAKMONT BLVD
4	T2	15		X	S HULEN ST	OAKMONT BLVD
APS UNIT PROGRAMMING SETTING WHEN UNITS AT LEAST 10' APART						
REGULAR PUSH SPEECH MESSAGE= "WAIT"						
COUNTDOWN SPEECH MESSAGE= OFF						
EXTENDED PUSH SPEECH MESSAGE = "WAIT TO CROSS (STREET NAME BEING CROSSED) AT (CROSS SIDE STREET NAME)"						
APS UNIT PROGRAMMING SETTING WHEN UNITS LESS THAN 10' APART						
REGULAR PUSH SPEECH MESSAGE= "WAIT"						
WALK INDICATION SPEECH MESSAGE = "(STREET NAME BEING CROSSED), WALK SIGN IS ON TO CROSS (STREET NAME BEING CROSSED)"						
COUNTDOWN SPEECH MESSAGE= OFF						
EXTENDED PUSH SPEECH MESSAGE = "WAIT TO CROSS (STREET NAME BEING CROSSED) AT (CROSS SIDE STREET NAME)"						

SUMMARY OF GROUND BOXES	
GROUND BOX	NUMBER (EA)
TYPE D WITHOUT APRON	1
TYPE D W/ APRON	7
TOTAL	8

CONDUIT TYPE SCHD 40 PVC	QUANTITY (LF)
2" TRENCH	500
2" BORE	425
3" TRENCH	65
4" TRENCH	190
4" BORE	365

STATE OF TEXAS
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tnp

Texas Department of Transportation

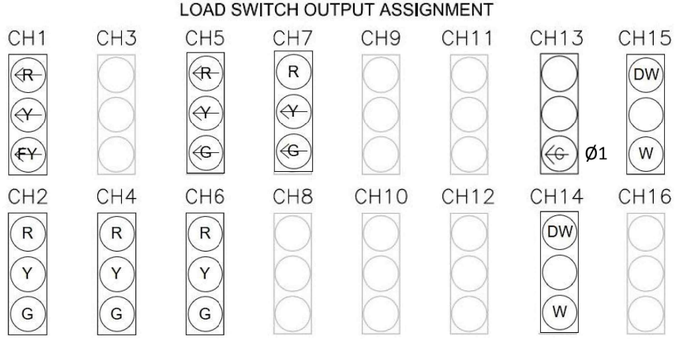
S HULEN ST AT OAKMONT BLVD

SIGNAL PHASING AND CHARTS

SCALE: N.T.S SHEET 2 OF 2

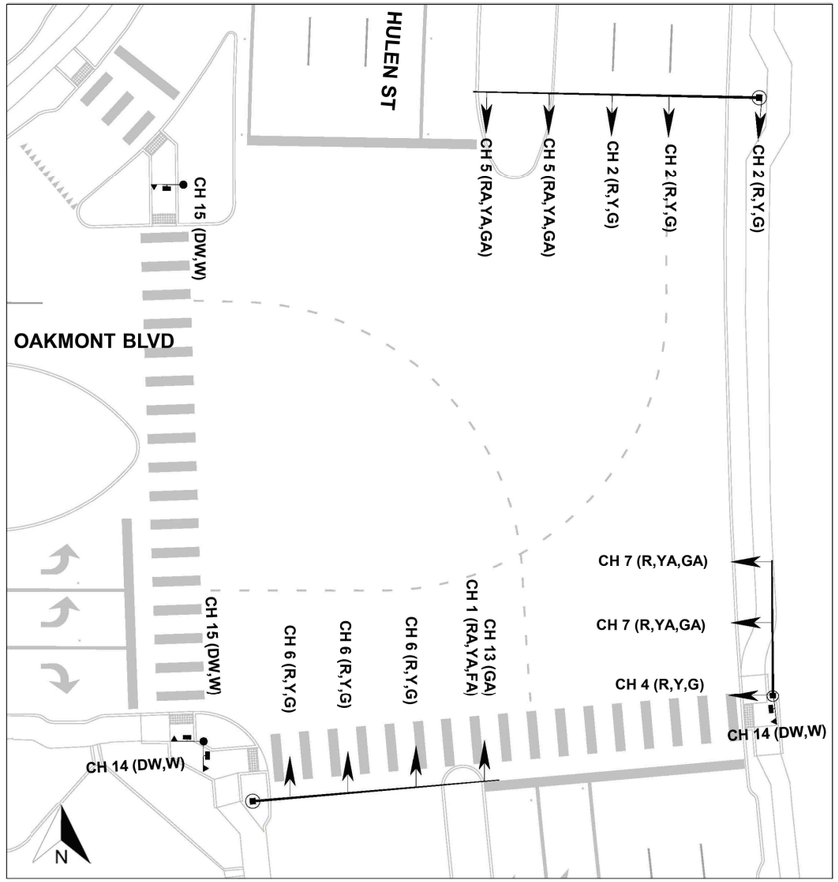
DESIGN	FED.RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	83
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	

LOAD SWITCH OUTPUT ASSIGNMENT



SIGNAL DETECTOR ATTRIBUTE / CHANNEL												
	1	2	3	4	5	6	7	8	9	10	11	12
352i ATC								PED 6 DET 15			PRE EMPT NB DET 21	
							PED 4 DET 14				PRE EMPT SB DET 22	PRE EMPT EB DET 24

ALL VEHICULAR DETECTION SHALL BE THROUGH SDLC



FORT WORTH.
5001 JAMES AVENUE
FORT WORTH, TX 76115
PHONE: (817) 392-8656
FAX: (817) 392-2533

LEGEND

SIGNAL HEAD — PED POLE

PED HEAD — MAST ARM

CITY OF FORT WORTH
DEPARTMENT OF TRANSPORATION AND PUBLIC WORKS
TRAFFIC MANAGEMENT DIVISION

HULEN ST AND OAKMONT BLVD.

CHANNEL ASSIGNMENT DRAWING

NOTES	NAME	DATE
DESIGN BY	Sagar M	01/15/24
ENGINEER	Sagar M	04/22/24
APPROVED	Aziz R	04/22/24
SHEET No.	1	

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

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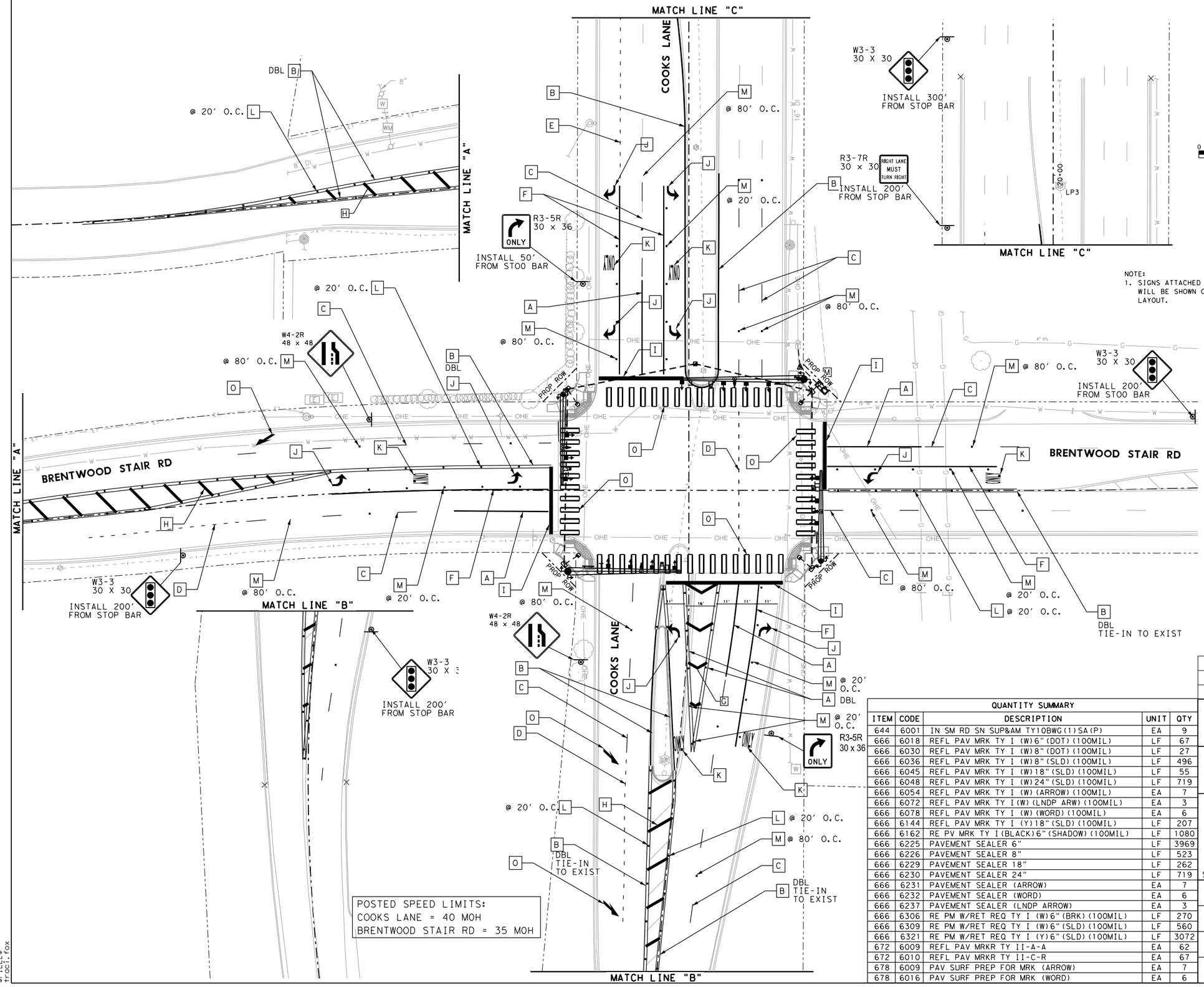
Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

CHANNEL ASSIGNMENTS

SCALE: N.T.S SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	84
CHECK	0902	90	207, ETC	



LEGEND

- A 6" SLD PVMT MARKING (W)
- B 6" SLD PVMT MARKING (Y)
- C 6" BRK PVMT MARKING (W)
- D 6" DOT PVMT MARKING (W)
- E 8" DOT PVMT MARKING (W)
- F 8" SLD PVMT MARKING (W)
- G 18" SLD PVMT MARKING (W)
- H 18" SLD PVMT MARKING (Y)
- I 24" SLD PVMT MARKING (W)
- J LANE LEGEND ARROW
- K LANE LEGEND ONLY
- L REFL RAISED MARKER TY II-A-A
- M REFL RAISED MARKER TY II-C-R
- N LANE LEGEND LNDRP ARROW
- O 24" CONTRAST CROSSWALK
- ⇦ DIRECTION OF TRAFFIC FLOW

NOTE:
1. SIGNS ATTACHED TO THE MAST ARM WILL BE SHOWN ON PROPOSED SIGNAL LAYOUT.

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
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FORT WORTH ELECTRIC	817-870-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR ELECTRIC CORPORATION	817-443-3432
TARRENT COUNTY R.O.W.DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED
PROFESSIONAL ENGINEER

4/19/2024

QUANTITY SUMMARY

ITEM	CODE	DESCRIPTION	UNIT	QTY
644	6001	IN SM RD SN SUP&AM TY10BWG(1)SA(P)	EA	9
666	6018	REFL PAV MRK TY I (W)6"(DOT)(100MIL)	LF	67
666	6030	REFL PAV MRK TY I (W)8"(DOT)(100MIL)	LF	27
666	6036	REFL PAV MRK TY I (W)8"(SLD)(100MIL)	LF	496
666	6045	REFL PAV MRK TY I (W)18"(SLD)(100MIL)	LF	55
666	6048	REFL PAV MRK TY I (W)24"(SLD)(100MIL)	LF	719
666	6054	REFL PAV MRK TY I (W)(ARROW)(100MIL)	EA	7
666	6072	REFL PAV MRK TY I(W)(LNDP ARW)(100MIL)	EA	3
666	6078	REFL PAV MRK TY I (W)(WORD)(100MIL)	EA	6
666	6144	REFL PAV MRK TY I (Y)18"(SLD)(100MIL)	LF	207
666	6162	RE PV MRK TY I(BLACK)6"(SHADOW)(100MIL)	LF	1080
666	6225	PAVEMENT SEALER 6"	LF	3969
666	6226	PAVEMENT SEALER 8"	LF	523
666	6229	PAVEMENT SEALER 18"	LF	262
666	6230	PAVEMENT SEALER 24"	LF	719
666	6231	PAVEMENT SEALER (ARROW)	EA	7
666	6232	PAVEMENT SEALER (WORD)	EA	6
666	6237	PAVEMENT SEALER (LNDP ARROW)	EA	3
666	6306	RE PM W/RET REQ TY I (W)6"(BRK)(100MIL)	LF	270
666	6309	RE PM W/RET REQ TY I (W)6"(SLD)(100MIL)	LF	560
666	6321	RE PM W/RET REQ TY I (Y)6"(SLD)(100MIL)	LF	3072
672	6009	REFL PAV MRKR TY II-A-A	EA	62
672	6010	REFL PAV MRKR TY II-C-R	EA	67
678	6009	PAV SURF PREP FOR MRK (ARROW)	EA	7
678	6016	PAV SURF PREP FOR MRK (WORD)	EA	6

NO.	REVISION	BY	DATE

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Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

SIGNING AND PAVEMENT MARKING LAYOUT

SCALE: 1" = 50'

SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	85
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

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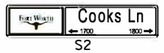
PROPOSED MAST ARM SIGNS

S1



S2

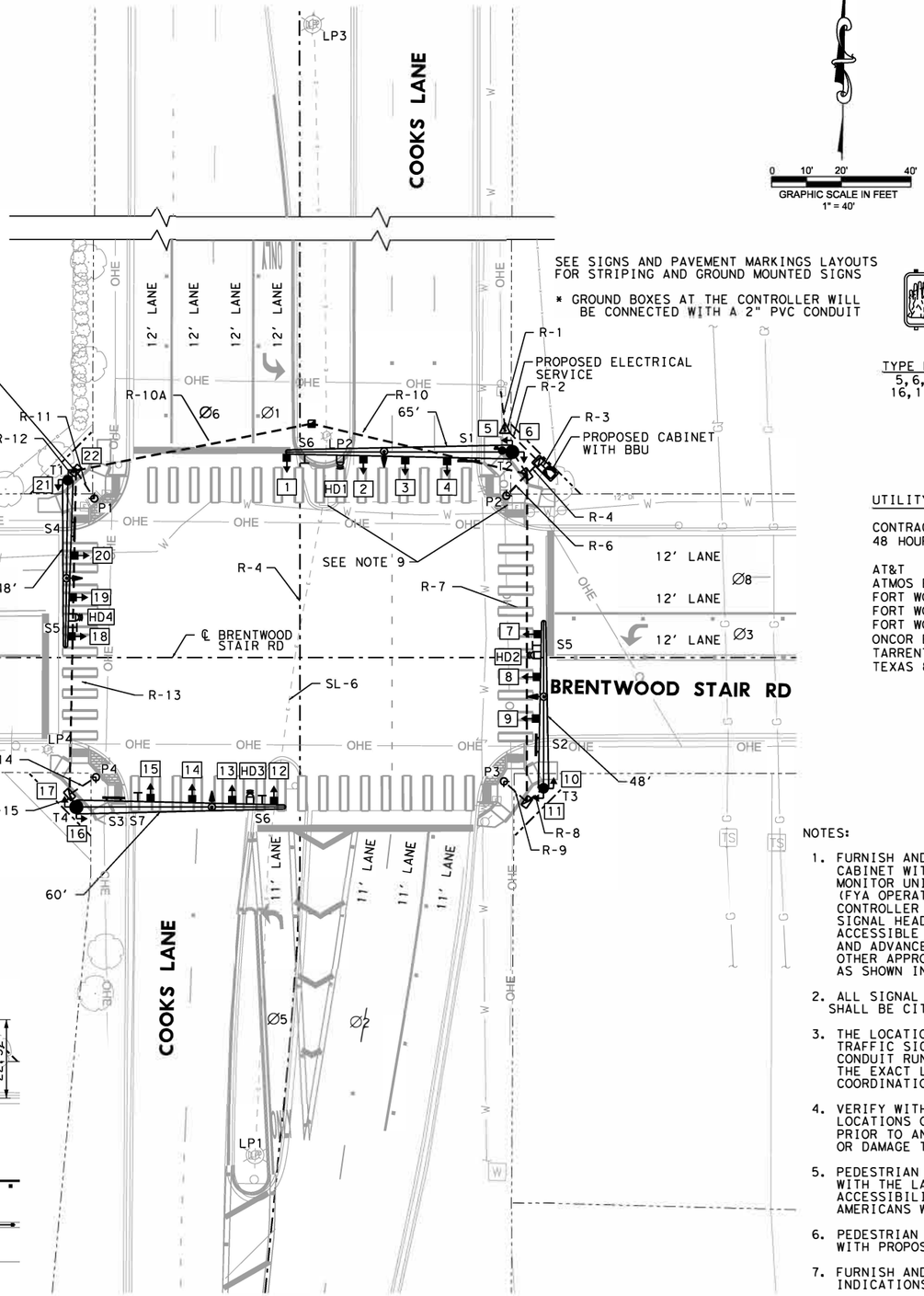
S3

S4

R10-5L 30 x 36
S5

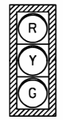
R10-17T 30 x 36
S6

R3-5R 30 x 36
S7



SEE SIGNS AND PAVEMENT MARKINGS LAYOUTS FOR STRIPING AND GROUND MOUNTED SIGNS

* GROUND BOXES AT THE CONTROLLER WILL BE CONNECTED WITH A 2" PVC CONDUIT



TYPE V3
2, 3, 4, 8, 9, 13, 14, 15, 19, 20


TYPE V4FYA/L
1, 7, 12, 18


TYPE PED 152A
5, 6, 10, 11, 16, 17, 21, 22

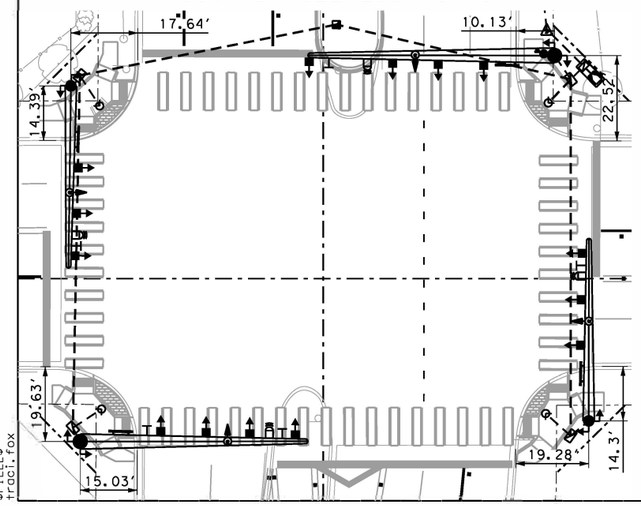

TYPE R10-3EL
P5, P10, P16, P21


TYPE R10-3ER
P6, P11, P17, P22

LEGEND

- PROPOSED MAST ARM AND POLE
- PROPOSED VERTICAL LED SIGNAL HEAD
- PROPOSED PEDESTRIAN POLE
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PROPOSED CONDUIT
- PROPOSED GROUND BOX (TY D)
- PROPOSED GROUND BOX (TY B)
- PROPOSED OVERHEAD SIGN
- PROPOSED ELECTRICAL SERVICE
- PROP CABINET W/ BATTERY BACKUP
- DIRECTION OF TRAFFIC FLOW
- HYBRID DETECTOR (ITERIS VANTAGE VECTOR)
- PROPOSED PTZ DOME CAMERA
- PROPOSED OPTICOM 711
- PROPOSED SMALL SIGN
- EXISTING LIGHT POLE TO REMAIN

SIGNAL POLE LOCATIONS



POSTED SPEED LIMITS:
COOKS LANE = 40 MPH
BRENTWOOD STAIR RD = 35 MPH

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
ATMOS ENERGY	800-817-8090
FORT WORTH ELECTRIC	817-870-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR ELECTRIC CORPORATION	817-443-3432
TARRENT COUNTY R.O.W. DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

NOTES:

1. FURNISH AND INSTALL A TRAFFIC CONTROLLER CABINET WITH A 16-LOAD SWITCH, MALFUNCTIONING MONITOR UNIT (MMU), FLASHING YELLOW ARROWS (FYA OPERATION), STEEL POLES WITH MAST ARMS, CONTROLLER FOUNDATION, SIGNAL CABLES, LED SIGNAL HEADS, LED PEDESTRIAN SIGNAL HEADS, ACCESSIBLE PEDESTRIAN PUSH BUTTONS, PRESENCE AND ADVANCE RADARS, GROUND BOXES AND ALL OTHER APPROVED ITEMS SPECIFIED BY TxDOT AS SHOWN IN PLANS.
2. ALL SIGNAL POLES, MAST ARMS AND FOUNDATIONS SHALL BE CITY OF FORT WORTH STANDARD.
3. THE LOCATIONS FOR CABINET CONTROLLER, TRAFFIC SIGNAL POLES, GROUND BOXES AND CONDUIT RUNS ARE APPROXIMATE. DETERMINE THE EXACT LOCATIONS IN THE FIELD IN COORDINATION WITH THE ENGINEER.
4. VERIFY WITH ALL UTILITY COMPANIES THE EXACT LOCATIONS OF EXISTING UNDERGROUND UTILITIES PRIOR TO ANY CONSTRUCTION TO AVOID CONFLICT OR DAMAGE TO THESE UTILITIES.
5. PEDESTRIAN PUSH BUTTON CONTROLS WILL COMPLY WITH THE LATEST REQUIREMENTS OF THE TEXAS ACCESSIBILITY STANDARDS (TAS) AND THE AMERICANS WITH DISABILITIES ACT (ADA).
6. PEDESTRIAN SIGNAL HEADS WILL BE IN LINE WITH PROPOSED CROSSWALKS.
7. FURNISH AND INSTALL NEW LED'S FOR ALL SIGNAL INDICATIONS AND PEDESTRIAN SIGNAL HEADS.
8. TRAFFIC SIGNAL PHASING AND TIMINGS WILL BE DETERMINED BY THE CITY.
9. EXISTING GROUND BOXES TO BE REMOVED. SEE ILLUMINATION LAYOUT SHEET FOR MORE DETAILS.
10. OPTICOM AND MODEM TO BE PROVIDED BY CITY.
11. ALL SIGNAL POLES, MAST ARMS AND FOUNDATIONS SHALL BE CITY OF FORT WORTH STANDARDS.

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED PROFESSIONAL ENGINEER

4/19/2024

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COOKS LN AT BRENTWOOD STAIR RD

PROPOSED SIGNAL LAYOUT

SCALE: 1" = 40' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	86

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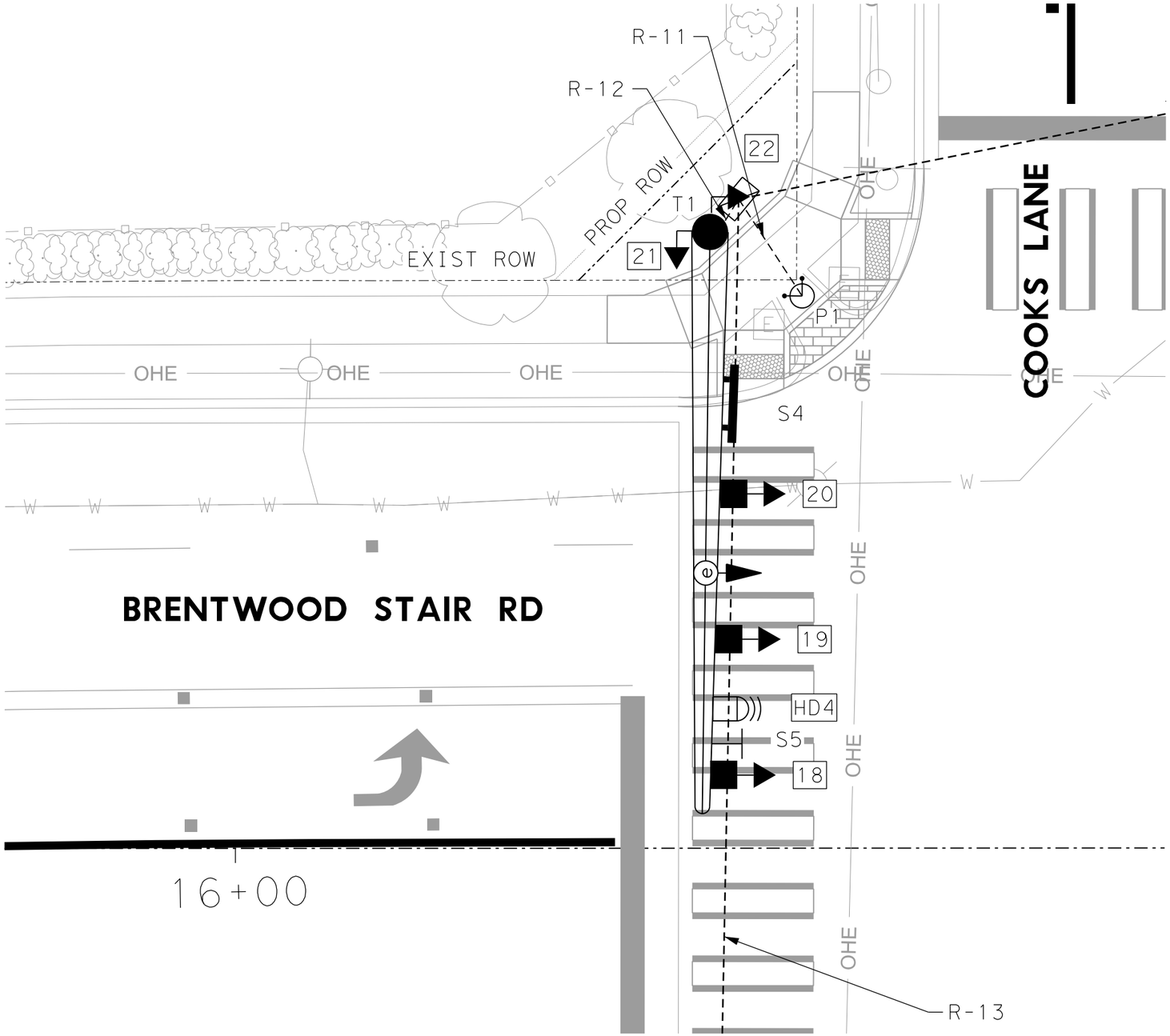

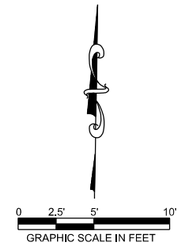

LEGEND

- PROPOSED MAST ARM AND POLE
- PROPOSED VERTICAL LED SIGNAL HEAD
- PROPOSED PEDESTRIAN POLE
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PROPOSED CONDUIT
- PROPOSED GROUND BOX (TY D)
- PROPOSED GROUND BOX (TY B)
- PROPOSED OVERHEAD SIGN
- PROPOSED ELECTRICAL SERVICE
- PROP CABINET W/ BATTERY BACKUP
- DIRECTION OF TRAFFIC FLOW
- HYBRID DETECTOR (ITERIS VANTAGE VECTOR)
- PROPOSED PTZ DOME CAMERA
- PROPOSED OPTICOM 711
- PROPOSED SMALL SIGN
- EXISTING LIGHT POLE TO REMAIN

UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	816-338-6202
ATMOS ENERGY	800-817-8090
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COOKS LN AT BRENTWOOD STAIR RD

PROPOSED SIGNAL LAYOUT DETAIL NORTHWEST CORNER

SCALE: 1" = 10' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	
CHECK	CONTROL	SECTION	JOB	87
CHECK	0902	90	209	

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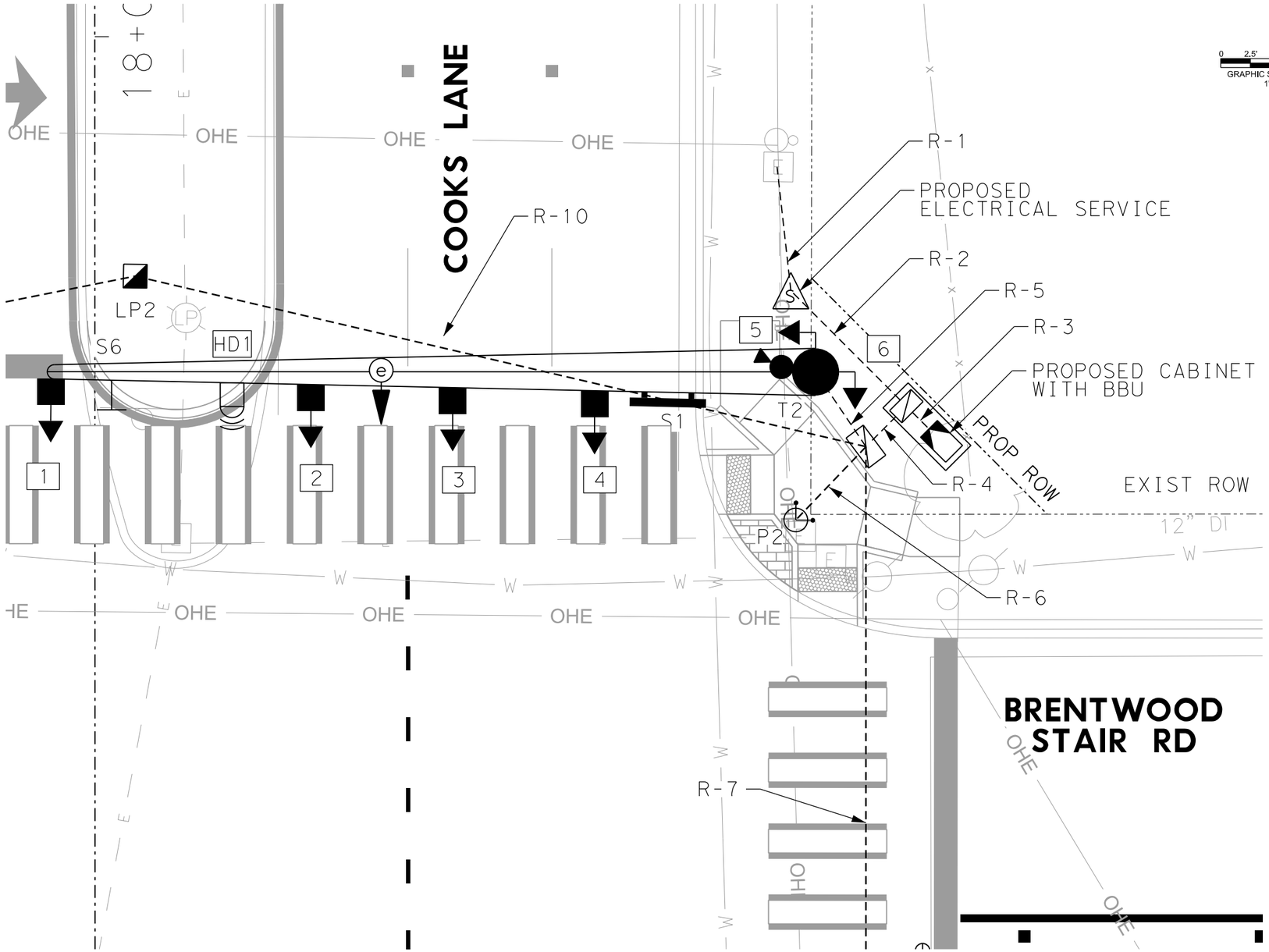

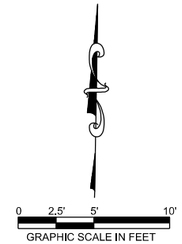

LEGEND

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TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
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COOKS LN AT BRENTWOOD STAIR RD

PROPOSED SIGNAL LAYOUT DETAIL NORTHEAST CORNER

SCALE: 1" = 10' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	
CHECK	CONTROL	SECTION	JOB	88
CHECK	0902	90	209	

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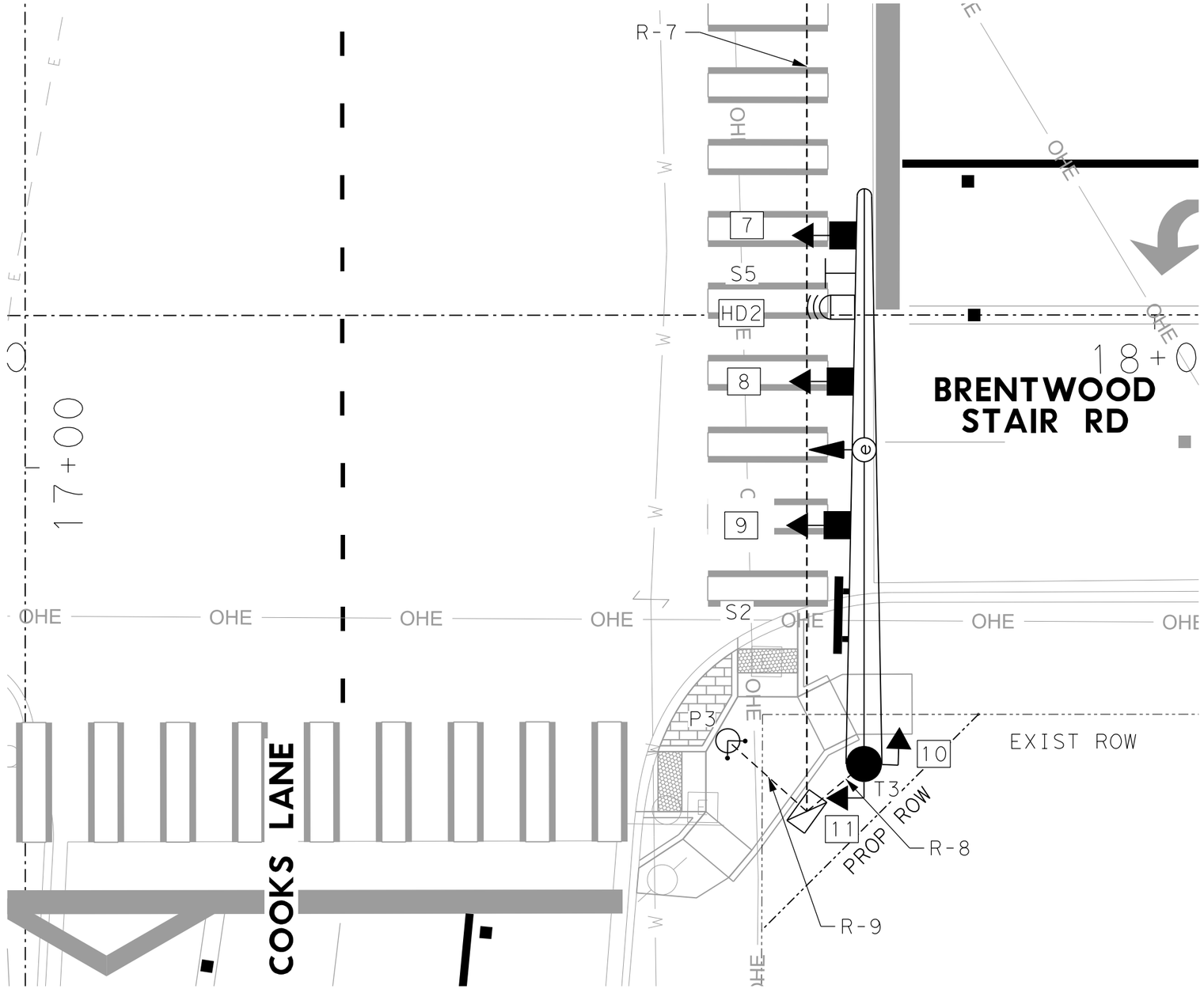

0 2.5' 5' 10'
GRAPHIC SCALE IN FEET
1" = 10'

LEGEND

- PROPOSED MAST ARM AND POLE
- PROPOSED VERTICAL LED SIGNAL HEAD
- PROPOSED PEDESTRIAN POLE
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PROPOSED CONDUIT
- PROPOSED GROUND BOX (TY D)
- PROPOSED GROUND BOX (TY B)
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ONCOR ELECTRIC CORPORATION	817-443-3432
TARRENT COUNTY R.O.W. DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
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LICENSED PROFESSIONAL ENGINEER

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Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

PROPOSED SIGNAL LAYOUT DETAIL SOUTHEAST CORNER

SCALE: 1" = 10' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	89
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

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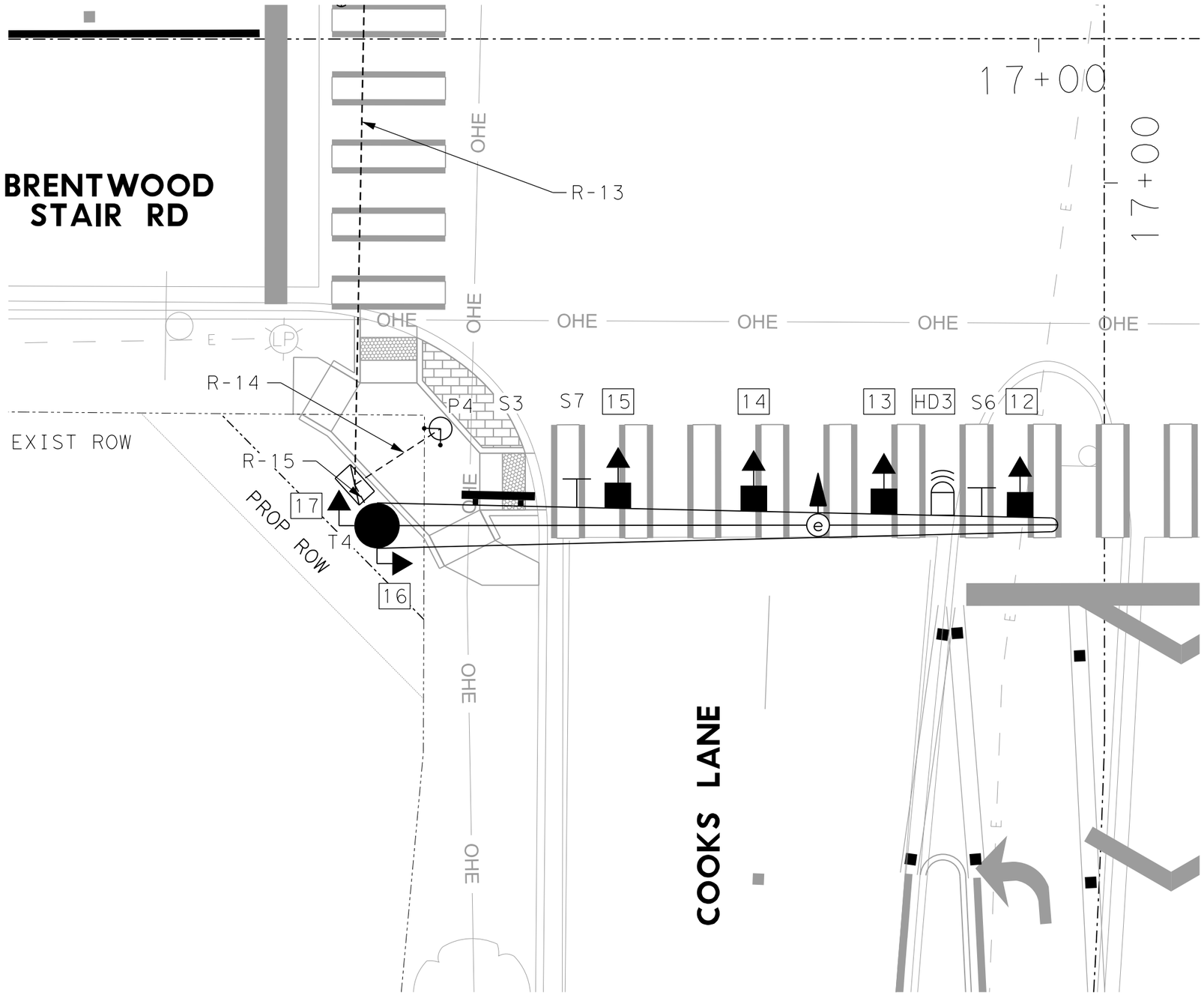

0 2.5' 5' 10'
GRAPHIC SCALE IN FEET
1" = 10'

LEGEND

- PROPOSED MAST ARM AND POLE
- PROPOSED VERTICAL LED SIGNAL HEAD
- PROPOSED PEDESTRIAN POLE
- PROPOSED PEDESTRIAN SIGNAL HEAD
- PROPOSED CONDUIT
- PROPOSED GROUND BOX (TY D)
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Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

PROPOSED SIGNAL LAYOUT DETAIL SOUTHWEST CORNER

SCALE: 1" = 10' SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	90
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

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SUMMARY OF CONDUIT AND CABLES														
RUN NO	CONDUIT					20 COND. #14	10 COND. #14	3 COND. #14	#8 BARE	#6 XHHW	HYBRID DETECTOR CABLE (CAT5E)	PTZ CAMERA CABLE (CAT5E)	OPTICOM CABLE**
	SIZE			LENGTH (LF)	BORE (B) TRENCH (T)								
	2"	3"	4"										
R-1	1			15	T								
R-2	1			5	T				1	2			
R-3	1	1		5	T	4		8	3	2			
		1		5	T						4	1	4
R-4		1		5	T	4		8	2				
		1		5	T						4	1	4
R-5		1		10	T	1			1		1	1	1
R-6		1		10	T			2	1				
R-7			1	90	B	1		2	1		1		1
R-8		1		5	T	1			1		1		1
R-9		1		10	T			2	1				
R-10			1	65	B	2		4	1		2		2
R-10A			1	70	B	2		4	1		2		2
R-11		1		10	T			2	1				
R-12		1		5	T	1			1		1		1
R-13			1	90	B	1		2	1		1		1
R-14		1		10	T			2	1				
R-15		1		5	T	1			1		1		1
CABLE TOTALS (LF)						515	0	1060	410	20	515	20	515

CONDUIT TOTALS (LF)	
2" TRENCH	25
2" BORE	0
3" TRENCH	85
3" BORE	0
4" TRENCH	0
4" BORE	315

Notes:
Cable totals do not reflect the quantities of cable inside the pole and mast arm T = Trench, B = Bore, EX = Existing, OH = Overhead, RM = Rigid Metal

** PROVIDED BY CITY AND INSTALLED BY CONTRACTOR

GROUND BOXES	
GROUND BOX TYPE	TOTAL (EA)
TYPE B	1
TYPE D W/APRON	5

SIGNAL HEAD AND POLE PLACEMENT							
POLE NO.	POLE TYPE	POLE HEIGHT	SIGNAL ARM SPAN	ITEM 684 SIGNAL CABLE TYPE-A PED HEADS	ITEM 684 SIGNAL CABLE TYPE-A SIGNAL HEADS	ITEM 684 SIGNAL CABLE TYPE-C APS	ITEM HYBRID DETECTOR CABLE (CAT5E)	OPTICOM CABLE**	PTZ CAMERA CABLE (CAT5E)
				5 CNDR. CABLE 14 AWG	7 CNDR. CABLE 14 AWG	3 CNDR. CABLE 14 AWG			
		(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	(LF)	
ES									
T-1	TYPE 44/36"	20	48	20	174		58	46	
P-1	PED POLE	5				10			
T-2	65	19.5	65	20	220		62.5	49.5	30
P-2	PED POLE	5				10			
T-3	TYPE 44/36"	20	48	20	168		56	44	
P-3	PED POLE	5				10			
T-4	TYPE 46/36"	20	60	20	196		68.5	57.5	
P-4	PED POLE	5				10			
TOTAL (FT)				80	758	40	245	197	30

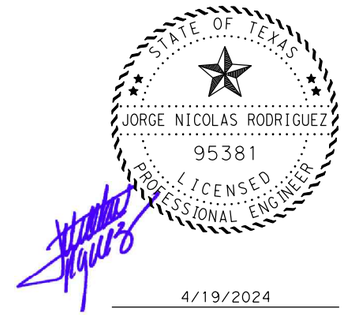
** PROVIDED BY CITY AND INSTALLED BY CONTRACTOR

PROPOSED ELECTRICAL SERVICE DATA											
ELECTRICAL SERVICE ID	ELECTRICAL SERVICE DESCRIPTION (SEE ED (6) - 14)	SERVICE CONDUIT SIZE	SERVICE CONDUCTORS NO./SIZE	SAFETY SWITCH AMPS	MAIN DISCONNECT	TWO-POLE CONTACTOR AMPS	PANELBD./ LOADCENTER AMP RATING	CIRCUIT NO.	BRANCH CIRCUIT POLE/AMPS	BRANCH CIRCUIT AMPS	KVA LOAD
COOKS LN AT BRENTWOOD STAIR RD	TY D (120/240) 070 (NS) SS (E) SP (O)	1 1/4" PVC	3/#6	N/A	2P/070	30	100	TRAFFIC SIGNAL	1P/50	40	4.8

* VERIFY SERVICE CONDUIT SIZE WITH UTILITY. SIZE MAY CHANGE DUE TO UTILITY METER REQUIREMENTS. ENSURE CONDUIT SIZE MEETS THE NATIONAL ELECTRICAL CODE.

VEHICLE AND PEDESTRIAN SIGNAL HEADS																																			
POLE NUMBER	T1					P1	T2						P2	T3					P3	T4						P4										
MAST ARM LENGTH	48′					PED	65′						PED	48′					PED	60′						PED										
POLE/FOUNDATION	TYPE 44/36"					* 5′ PED/24"	65						*5′ PED/24"	TYPE 44/36"					* 5′ PED/24"	TYPE 46/36"						* 5′ PED/24"										
WITH LUMINAIRES	NO					NO	NO						NO	NO					NO	NO						NO										
SIZE OF LENS	12"			X	X		12"			X	X			12"			X	X		12"			X	X											
SIGNAL TYPE	V4FYA/L	V3	V3	152A	152A		V4FYA/L	V3	V3	152A	152A			V4FYA/L	V3	V3	152A	152A		V4FYA/L	V3	V3	V3	152A	152A										
SIGNAL FACE NO.	18	19	20	21	22		1	2	3	4	5	6		7	8	9	10	11		12	13	14	15	16	17										
SIGNAL INDICATIONS	R <-	R	R	DW	DW		R <-	R	R	R	DW	DW		R <-	R	R	DW	DW		R <-	R	R	R	DW	DW										
	SY <-	Y	Y	W	W		SY <-	Y	Y	Y	W	W		SY <-	Y	Y	W	W		SY <-	Y	Y	Y	W	W										
	FY <-	G	G				FY <-	G	G	G				FY <-	G	G				FY <-	G	G	G												
	G <-						G <-							G <-						G <-															
APS PED BUTTONS	0					2	0						2	0					2	0						2										

* 24" FOUNDATION SUBSIDIARY TO BID ITEM 687



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NO.	REVISION	BY	DATE

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415 EMBASSY OAKS, SUITE 102 SAN ANTONIO, TEXAS 78216 (210) 249-2280

Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

SIGNAL PHASING AND CHARTS

SHEET 1 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	91
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

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APS MESSAGE CHART			
POLE LOCATION	PEDESTRIAN MOVEMENT	FUNCTIONS	SPEECH MESSAGE/ SOUND DETAILS
P-1	Ø8	BUTTON PUSH ON DW	WAIT.
		EXTENDED BUTTON PUSH	WAIT TO CROSS COOKS LN
		LOCATOR TONE	SLOW TICK.
		WALK INDICATION *	RAPID TICK.
P-1	Ø6	BUTTON PUSH ON DW	WAIT.
		EXTENDED BUTTON PUSH	WAIT TO CROSS BRENTWOOD STAIR RD
		LOCATOR TONE	SLOW TICK.
		WALK INDICATION *	RAPID TICK.
P-2	Ø2	BUTTON PUSH ON DW	WAIT.
		EXTENDED BUTTON PUSH	WAIT TO CROSS BRENTWOOD STAIR RD
		LOCATOR TONE	SLOW TICK.
		WALK INDICATION *	RAPID TICK.
P-2	Ø8	BUTTON PUSH ON DW	WAIT.
		EXTENDED BUTTON PUSH	WAIT TO CROSS COOKS LN
		LOCATOR TONE	SLOW TICK.
		WALK INDICATION *	RAPID TICK.
P-3	Ø4	BUTTON PUSH ON DW	WAIT.
		EXTENDED BUTTON PUSH	WAIT TO CROSS COOKS LN
		LOCATOR TONE	SLOW TICK.
		WALK INDICATION *	RAPID TICK.
P-3	Ø2	BUTTON PUSH ON DW	WAIT.
		EXTENDED BUTTON PUSH	WAIT TO CROSS BRENTWOOD STAIR RD
		LOCATOR TONE	SLOW TICK.
		WALK INDICATION *	RAPID TICK.
P-4	Ø6	BUTTON PUSH ON DW	WAIT.
		EXTENDED BUTTON PUSH	WAIT TO CROSS BRENTWOOD STAIR RD
		LOCATOR TONE	SLOW TICK.
		WALK INDICATION *	RAPID TICK.
P-4	Ø4	BUTTON PUSH ON DW	WAIT.
		EXTENDED BUTTON PUSH	WAIT TO CROSS COOKS LN
		LOCATOR TONE	SLOW TICK.
		WALK INDICATION *	RAPID TICK.

* COUNTDOWN SPEECH MESSAGE "OFF" FOR ALL UNITS.

QUANTITY SUMMARY				
ITEM	CODE	DESCRIPTION	UNIT	QTY
416	6032	DRILL SHAFT (TRF SIG POLE) (36 IN)	LF	37
416	6034	DRILL SHAFT (TRF SIG POLE) (48 IN)	LF	22
618	6046	CONDT (PVC) (SCH 80) (2")	LF	25
618	6053	CONDT (PVC) (SCH 80) (3")	LF	85
618	6059	CONDT (PVC) (SCH 80) (4") (BORE)	LF	315
620	6007	ELEC CONDR (NO.8) BARE	LF	410
620	6010	ELEC CONDR (NO.6) INSULATED	LF	20
624	6004	GROUND BOX TY B (122322)W/APRON	EA	1
624	6010	GROUND BOX TY D (162922)W/APRON	EA	5
628	6187	ELC SRV TY D 120/240 070(NS)SS(E)PS(U)	EA	1
682	6001	VEH SIG SEC (12")LED(GRN)	EA	10
682	6002	VEH SIG SEC (12")LED(GRN ARW)	EA	4
682	6003	VEH SIG SEC (12")LED(YEL)	EA	10
682	6004	VEH SIG SEC (12")LED(YEL ARW)	EA	8
682	6005	VEH SIG SEC (12")LED(RED)	EA	10
682	6006	VEH SIG SEC (12")LED(RED ARW)	EA	4
682	6018	PED SIG SEC (LED)(COUNTDOWN)	EA	8
682	6054	BACKPLATE W/REF BRDR(3SEC) (VENT)ALUM	EA	12
682	6055	BACKPLATE W/REF BRDR(4SEC) (VENT)ALUM	EA	2
684	6029	TRF SIG CBL (TY A)(14 AWG)(3 CONDR)	LF	1100
684	6031	TRF SIG CBL (TY A)(14 AWG)(5 CONDR)	LF	80
684	6033	TRF SIG CBL (TY A)(14 AWG)(7 CONDR)	LF	758
684	6036	TRF SIG CBL (TY A)(14 AWG)(10 CONDR)	LF	0
684	6046	TRF SIG CBL (TY A)(14 AWG)(20 CONDR)	LF	515
686	6049	INS TRF SIG PL AM(S)1 ARM(48')	EA	2
686	6061	INS TRF SIG PL AM(S)1 ARM(60')	EA	1
686	6065	INS TRF SIG PL AM(S)1 ARM(65')	EA	1
687	6002	PEDESTRIAN PUSH BUTTON POLE	EA	4
688	6001	PED DETECT PUSH BUTTON (APS)	EA	8
688	6003	PED DETECTOR CONTROLLER UNIT	EA	1
6010	6002	CCTV FIELD EQUIPMENT (DIGITAL)	EA	1
6058	6001	BBU SYSTEM (EXTERNAL BATT CABINET)	EA	1
6083	6001	VIDEO IMAGING AND RAD VEH DETECTION SYS	EA	1
6089	6002	CAT 5 ETHERNET CABLE	LF	810
6365	6001	HIGHWAY TRAFFIC SIGNALS	EA	1
	*	TRAFFIC CABINET AND CONTROLLER	EA	1
	*	CONTROLLER FOUNDATION	EA	1
	*	COPPER -CLAD GROUND BOX (5/8" X 10")	EA	1
	*	SIGNS (STREET NAMES)	EA	4
	*	SIGNS (R10-5L)	EA	2
	*	SIGNS (R10-17T)	EA	2
	*	SIGNS (R3-5R)	EA	1
6396	6001	COFW EMR VEH (EV) PREEMPT (INST ONLY)	EA	4
	**	OPTICOM CABLE	LF	712
6421	6001	COFW CELLULAR ROUTER (INSTALL ONLY)	EA	1

* SUBSIDIARY TO PERTINENT BID ITEM
** POVIDED BY TXDOT

RADAR DETECTION ZONE DETAILS*			
DETECTOR	PHASE OF DETECTION	TYPE OF DETECTION	ADVANCE DETECTION ZONE LOCATIONS
HD3	Ø1 + Ø6	PRESENCE AND ADVANCE	175' AND 290' FROM THE STOPBAR
HD1	Ø2 + Ø5	PRESENCE AND ADVANCE	175' AND 290' FROM THE STOPBAR
HD4	Ø3 + Ø8	PRESENCE AND ADVANCE	90' AND 190' FROM THE STOPBAR
HD2	Ø4 + Ø7	PRESENCE AND ADVANCE	90' AND 190' FROM THE STOPBAR

* FOR INFORMATION ONLY, THE RADAR WILL BE INSTALLED AS DIRECTED BY THE ENGINEER.

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED
PROFESSIONAL ENGINEER

4/19/2024

NO.	REVISION	BY	DATE

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COOKS LN AT BRENTWOOD STAIR RD

SIGNAL PHASING AND CHARTS

SHEET 2 OF 2

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	92
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

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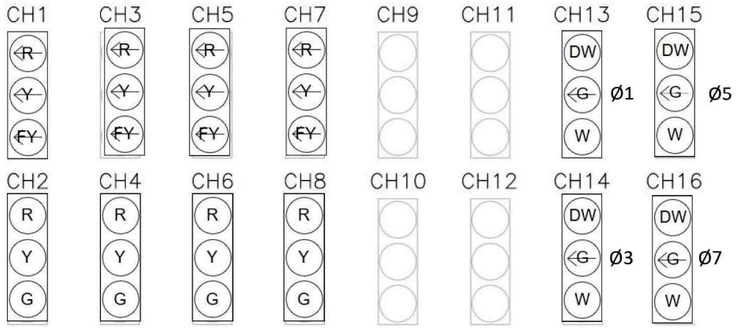
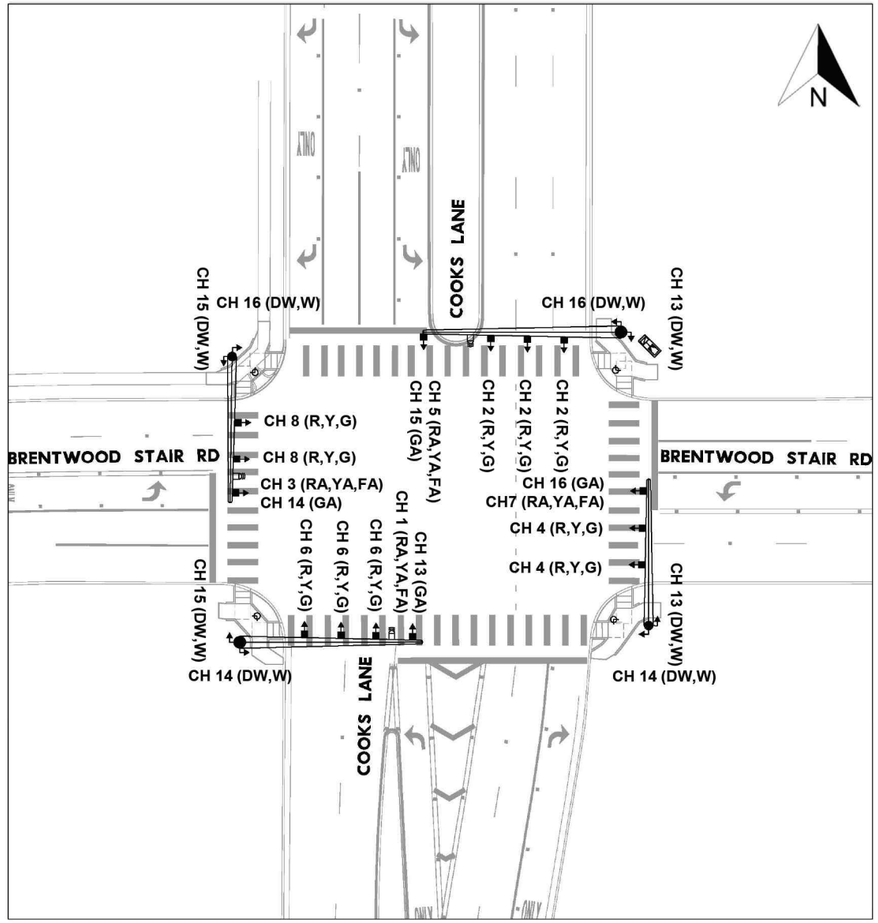
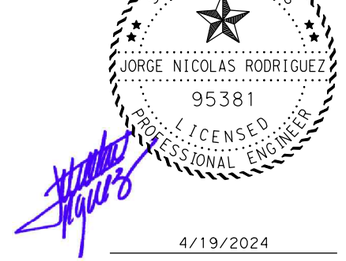


SIGNAL DETECTOR ATTRIBUTE / CHANNEL												
	1	2	3	4	5	6	7	8	9	10	11	12
352i ATC							PED 2 DET 13	PED 6 DET 15			PRE EMPT NB DET 21	PRE EMPT WB DET 23
							PED 4 DET 14	PED 8 DET 16			PRE EMPT SB DET 22	PRE EMPT EB DET 24

ALL VEHICULAR DETECTION SHALL BE THROUGH SDLC





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FORT WORTH
5001 JAMES AVENUE
FORT WORTH, TX 76115
PHONE: (817) 392-8656
FAX: (817) 392-2533

LEGEND

SIGNAL HEAD — PED POLE

PED HEAD — MAST ARM

CITY OF FORT WORTH
DEPARTMENT OF TRANSPORATION AND PUBLIC WORKS
TRAFFIC MANAGEMENT DIVISION

COOKS LN AND BRENTWOOD STAIR RD

CHANNEL ASSIGNMENT DRAWING

NOTES	NAME	DATE
DESIGN BY	Sagar M	01/15/24
ENGINEER	Sagar M	01/16/24
APPROVED	Aziz R	01/16/24
SHEET No.	1	

NO.	REVISION	BY	DATE

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Texas Department of Transportation

COOKS LN AT BRENTWOOD STAIR RD

CHANNEL ASSIGNMENT

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	33	TARRANT	93
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	209	

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Shipping Parts List						
Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.						
Nominal Arm Length	30' Poles with Luminaire See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		24' Poles with ILSN See note above plus one small hand hole		19.50' (Single Mast Arm) 20.25' (Dual Mast Arm) Poles with no Luminaire and no ILSN See note above	
Single Mast Arm						
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L		50S		50	
55	55L		55S		55	
60	60L		60S		60	
65	65L		65S		65	1
Dual Mast Arm						
Lf ft. / Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50 / 20	5020L		5020S		5020	
24	5024L		5024S		5024	
28	5028L		5028S		5028	
32	5032L		5032S		5032	
36	5036L		5036S		5036	
40	5040L		5040S		5040	
44	5044L		5044S		5044	
55 / 20	5520L		5520S		5520	
24	5524L		5524S		5524	
28	5528L		5528S		5528	
32	5532L		5532S		5532	
36	5536L		5536S		5536	
40	5540L		5540S		5540	
44	5544L		5544S		5544	
60 / 20	6020L		6020S		6020	
24	6024L		6024S		6024	
28	6028L		6028S		6028	
32	6032L		6032S		6032	
36	6036L		6036S		6036	
40	6040L		6040S		6040	
44	6044L		6044S		6044	
65 / 20	6520L		6520S		6520	
24	6524L		6524S		6524	
28	6528L		6528S		6528	
32	6532L		6532S		6532	
36	6536L		6536S		6536	
40	6540L		6540S		6540	
44	6544L		6544S		6544	

Shipping Parts List		
Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm with listed equipment attached		
Nominal Arm Length	Type IV Arm (4 Signals) 3 Bracket Assembly and 4 CGB Connectors	
ft.	Designation	Quantity
50	50IV	
55	55IV	
60	60IV	
65	65IV	1

Luminaire Arms (1 per 30' pole)

Nominal Arm Length	Quantity
8' Arm	

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7' Arm	
9' Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	

Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5' - 3"	1

Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet)
			48-A
T2	10		22
Total Drill Shaft Length			22

Notes

** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Abbreviations

Lf= Fixed Arm Length

Lc= Clamp-on Arm Length (44' Max.)

STATE OF TEXAS
JORGE NICOLAS RODRIGUEZ
95381
LICENSED
PROFESSIONAL ENGINEER

4/19/2024

Texas Department of Transportation
Traffic Operations Division

LONG MAST ARM ASSEMBLY PARTS LIST

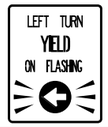
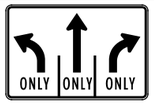
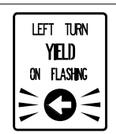
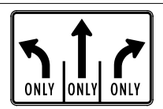
LMA(5)-12

Sheet 5 of 5

©TxDOT November 2000	DN: JK	CK: GRB	DW: FDN	CK: CAL
REVISIONS 4-20-01 1-12	CONT	SECT	JOB	HIGHWAY
	0902	90	207, ETC	HULEN ST, ETC
	DIST	COUNTY		SHEET NO.
	33	TARRANT		94

131E

SUMMARY OF SMALL SIGNS

PLAN SHEET NO.	SIGN NO.	SIGN NOMENCLATURE	SIGN	DIMENSIONS	FLAT ALUMINUM (TYPE A)	EXAL ALUMINUM (TYPE G)	SM RD SGN ASSM TY XXXXX (X) XX (X-XXXX) POST TYPE: FRP = Fiberglass; TWT = Thin-Wall; 10BWG = 10 BWG; S80 = Sch 80	POSTS: 1 or 2	ANCHOR TYPE: UA=Universal Conc; UB=Universal Bolt; SA=Slipbase-Conc; SB=Slipbase-Bolt; WS=Wedge Steel; WP=Wedge Plastic	MOUNTING DESIGNATION: PREFABRICATED: P = "Plain"; T = "T"; U = "U"	MOUNTING DESIGNATION: 1EXT or 2EXT = # of Ext; BM = Extruded Wind Beam; WC = 1.12 #/ft Wing Channel; EXAL= Extruded Alum Sign Panels	BRIDGE MOUNT CLEARANCE SIGNS (See Note 2) TY = TYPE: TY N; TY S
79	1	R3-5L		30X36			10 BWG	1	SA	P		
79	2	R3-5L		30X36			10 BWG	1	SA	P		
80	3	R10-12a		30x36			MAST ARM					
80	4	R10-12a		30x36			MAST ARM					
80	5	R3-8b		48X30			MAST ARM					
80	6	R10-12a		30x36			MAST ARM					
80	7	R10-12a		30x36			MAST ARM					
80	8	R3-8b		48X30			MAST ARM					
80	9	METRO SIGN		20X120			MAST ARM					
80	9	METRO SIGN		20X120			MAST ARM					
80	9	METRO SIGN		20X120			MAST ARM					
80	9	METRO SIGN		20X120			MAST ARM					

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DATE:
FILE:

PRELIMINARY

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MARIE WAGNER 147501
TBPELS Engineering Firm #312 P.E. NO.
DATE 4/19/2024

ALUMINUM SIGN BLANKS THICKNESS	
Square Feet	Minimum Thickness
Less than 7.5	0.080"
7.5 to 15	0.100"
Greater than 15	0.125"

The Standard Highway Sign Designs for Texas (SHSD) can be found at the following website.

http://www.txdot.gov/

NOTE:

1. Sign supports shall be located as shown on the plans, except that the Engineer may shift the sign supports, within design guidelines, where necessary to secure a more desirable location or to avoid conflict with utilities. Unless otherwise shown on the plans, the Contractor shall stake and the Engineer will verify all sign support locations.
2. For installation of bridge mount clearance signs, see Bridge Mounted Clearance Sign Assembly (BMCS)Standard Sheet.
3. For Sign Support Descriptive Codes, see Sign Mounting Details Small Roadside Signs General Notes & Details SMD(GEN).

Texas Department of Transportation

Traffic Operations Division Standard

SUMMARY OF SMALL SIGNS
SOSS
HULEN STREET AT SOUTH DRIVE

FILE: sums16.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT May 1987	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC.	HULEN ST
4-16	DIST	COUNTY		SHEET NO.
8-16	FTW	TARRANT		95

18

DATE:
FILE:

GENERAL NOTES FOR ALL ELECTRICAL WORK

1. The location of all conduits, junction boxes, ground boxes, and electrical services is diagrammatic and may be shifted to accommodate field conditions.

2. Provide new and unused materials. Ensure that all materials and installations comply with the applicable articles of the National Electrical Code (NEC), TxDOT standards and specifications, National Electrical Manufacturers Association (NEMA), and are listed by Underwriters Laboratories (UL) or a Nationally Recognized Testing Lab (NRTL). NRTLs such as Canadian Standard Association (CSA), Intertek Testing Services NA Inc., or FM Approvals LLC can be considered equivalent to UL. Where reference is made to NEMA listed devices, International Electrotechnical Commission (IEC) listed devices will not be considered an acceptable equal to a NEMA listed device. Acceptable devices may have both a NEMA and IEC listing. Faulty fabrication or poor workmanship in any material, equipment, or installation is justification for rejection. Replace or reinstall rejected material or equipment at no additional cost to the Department.

3. Miscellaneous nuts, bolts and hardware, except for high strength bolts, may be stainless steel when plans specify galvanized, provided the bolt size is ½ in. or less in diameter.

4. Provide the following test equipment as required by the Engineer to confirm compliance with the contract and the NEC: voltmeter, ammeter, megohm meter (1000 volt DC), ground resistance tester, torque wrenches, and torque screwdrivers. Ensure all equipment has been properly calibrated within the last year. Provide calibration certification to the Engineer upon request. Operate test equipment during inspection as requested by the Engineer.

5. Install grounding as shown on the plans and in accordance with the NEC. Ensure all metallic conduits; metal poles; luminaires; and metal enclosures are bonded to the equipment grounding conductor. Provide stranded bare copper or green insulated grounding conductors. Ground rods, connectors, and bonding jumpers are subsidiary to the various bid items.

6. When required by the Engineer, notify the Department in writing of materials from the Material Producers List (MPL) intended for use on each project. Prequalified materials are listed on the MPL on TxDOT's website under "Roadway Illumination and Electrical Supplies." No substitutions will be allowed for materials on this list.

CONDUIT

A. MATERIALS

1. Provide conduit, junction boxes, fittings, and hardware as per TxDOT Departmental Material Specification (DMS) 11030 "Conduit" and Item 618 "Conduit" of TxDOT's "Standard Specifications For Construction And Maintenance Of Highways, Streets, And Bridges," latest edition. Provide conduits listed under Item 618 on the MPL under "Roadway Illumination and Electrical Supplies." Provide conduit types according to the descriptive code or as shown on the plans. Do not substitute other types of conduits for those shown. Provide liquidtight flexible metal conduit (LFMC) when flexible conduit is called for on galvanized steel rigid metallic conduit (RMC) systems. Provide liquidtight flexible nonmetallic conduit (LFNC) when flexible conduit is called for on polyvinyl chloride (PVC) systems.

2. Provide galvanized steel RMC for all exposed conduits, unless otherwise shown on the plans. Properly bond all metal conduits.

3. Unless otherwise shown on the plans, provide junction boxes with a minimum size as shown in the following table, which applies to the greatest number of conductors entering the box through one conduit with no more than four conduits per box. When a mixture of conductor sizes is present, count the conductors as if all are of the larger size. For situations not applicable to the table, size junction boxes in accordance with NEC.

AWG	3 CONDUCTORS	5 CONDUCTORS	7 CONDUCTORS
#1	10" x 10" x 4"	12" x 12" x 4"	16" x 16" x 4"
#2	8" x 8" x 4"	10" x 10" x 4"	12" x 12" x 4"
#4	8" x 8" x 4"	10" x 10" x 4"	10" x 10" x 4"
#6	8" x 8" x 4"	8" x 8" x 4"	10" x 10" x 4"
#8	8" x 8" x 4"	8" x 8" x 4"	8" x 8" x 4"

4. Junction boxes with an internal volume of less than 100 cu. in. and supported by entering raceways must have threaded entries or hubs identified for the intended purpose and supported by connection of two or more rigid metal conduits. Secure conduit within 3 ft. of the enclosure or within 18 in. of the enclosure if all conduit entries are on the same side. Mechanically secure all junction boxes with an internal volume greater than 100 cu. inches.

5. Provide hot dipped galvanized cast iron or sand cast aluminum outlet boxes for junction boxes containing only 10 AWG or 12 AWG conductors. Do not use die cast aluminum boxes. Size outlet boxes according to the NEC.

6. Do not use intermediate metal conduit (IMC) or electrical metallic tubing (EMT) unless specifically required by the plan sheets. When EMT is called for, provide junction boxes made from galvanized steel sheeting, listed and approved for outdoor use, unless otherwise noted on the plans. Size all galvanized steel junction boxes in accordance with the NEC. Provide junction boxes for IMC conduit systems that meet the same requirements for junction boxes used with RMC systems.

7. Provide PVC junction boxes intended for outdoor use on PVC conduit systems, unless otherwise noted on the plans.

8. Provide PVC elbows in PVC conduit systems, unless otherwise shown on the plans. Use only a flat, high tensile strength polyester fiber pull tape for pulling conductors through the PVC conduit system. When galvanized steel RMC elbows are specifically called for in the plans and any portion of the RMC elbow is buried less than 18 in., ground the RMC elbow by means of a grounding bushing on a rigid metal extension. Grounding of the rigid metal elbow is not required if the entire RMC elbow is encased in a minimum of 2 in. of concrete. PVC extensions are allowed on these concrete encased rigid metal elbows. RMC or PVC elbows are subsidiary to various bid items.

9. When required, provide High-Density Polyethylene (HDPE) conduit with factory installed internal conductors according to Item 622 "Duct Cable." At the Contractor's request and with approval by the Engineer, substitute HDPE conduit with no conductors for bored schedule 40 or schedule 80 PVC conduit bid under Item 618. Ensure bored HDPE substituted for PVC is schedule 40 and of the same size PVC called for in the plans. Ensure the substituted HDPE meets the requirements of Item 622, except that the conduit is supplied without factory-installed conductors. Make the transition of the HDPE conduit to PVC (or RMC elbow when required) at the bore pit. Provide conduit of the size and schedule as shown on the plans. Do not extend substituted conduit into ground boxes or foundations. Provide PVC or galvanized steel RMC elbows as called for at all ground boxes and foundations.

10. Use two-hole straps when supporting 2 in. and larger conduits. On electrical service poles, properly sized stainless steel or hot dipped galvanized one-hole standoff straps are allowed on the service riser conduit.

B. CONSTRUCTION METHODS

1. Provide and install expansion joint conduit fittings on all structure-mounted conduits at the structure's expansion joints to allow for movement of the conduit. In addition, provide and install expansion joint fittings on all continuous runs of galvanized steel RMC conduit externally exposed on structures such as bridges at maximum intervals of 150 ft. When requested by the project Engineer, supply manufacturer's specification sheet for expansion joint conduit fittings. Repair or replace expansion joint fittings that do not allow for movement at no additional cost to the Department. Provide the method of determining the amount of expansion to the Engineer upon request. Do not use LFMC or LFNC as a substitute for the required expansion conduit fittings.

2. Space all conduit supports at maximum intervals of 5 ft. Install conduit spacers when attaching metal conduit to surface of concrete structures. See "Conduit Mounting Options" on ED(2). Install conduit support within 3 ft. of all enclosures and conduit terminations.

3. Do not attach conduit supports directly to pre-stressed concrete beams except as shown specifically in the plans or as approved by the Engineer.

4. Unless otherwise shown on the plans, jack or bore conduit placed beneath existing roadways, driveways, sidewalks, or after the base or surfacing operation has begun. Backfill and compact the bore pits below the conduit per Item 476 "Jacking, Boring, or Tunneling Pipe or Box" prior to installing conduit or duct cable to prevent bending of the connections.

5. When placing conduit in the sub-grade of new roadways, backfill all trenches with excavated material unless otherwise noted on the plans. When placing conduit in the sub-base of new roadways, backfill all trenches with cement-stabilized base as per requirements of Items 110 "Excavation", 400 "Excavation and Backfill for Structures", 401 "Flowable Backfill", 402 "Trench Excavation Protection", and 403 "Temporary Special Shoring."

6. Provide and place warning tape approximately 10 in. above all trenched conduit as per Item 618.

7. During construction, temporarily cap or plug open ends of all conduit and raceways immediately after installation to prevent entry of dirt, debris and animals. Temporary caps constructed of durable duct tape are allowed. Tightly fix the tape to the conduit opening. Clean out the conduit and prove it clear in accordance with Item 618 prior to installing any conductors.

8. Ensure conduit entry into the top of any enclosure is waterproof by installing conduit sealing hubs or using boxes with threaded bosses. This includes surface mounted safety switches, meter cans, service enclosures, auxiliary enclosures and junction boxes. Grounding bushings on water tight sealing hubs are not required.

9. Fit the ends of all PVC conduit terminations with bushings or bell end fittings. Provide and install a grounding type bushing on all metal conduit terminations.

10. Install a bonding jumper from each grounding bushing to the nearest ground rod, grounding lug, or equipment grounding conductor. Ensure all bonding jumpers are the same size as the equipment grounding conductor. Bonding of conduit used as a casing under roadways for duct cable is not required, if the duct extends the full length through the casing.

11. At all electrical services, install a 6 AWG solid copper grounding electrode conductor.

12. Place conduits entering ground boxes so that the conduit openings are between 3 in. and 6 in. from the bottom of the box. See the ground box detail on sheet ED(4).

13. Seal ends of all conduits with duct seal, expandable foam, or by other methods approved by the Engineer. Seal conduit immediately after completion of conductor installation and pull tests. Do not use duct tape as a permanent conduit sealant. Do not use silicone caulk as a conduit sealant.

14. File smooth the cut ends of all mounting strut and conduit. Before installing, paint the field cut ends of all mounting strut and RMC (threaded or non-threaded) with zinc rich paint (94% or more zinc content) to alleviate overspray. Use zinc rich paint to touch up galvanized material as allowed under Item 445 "Galvanizing." Do not paint non-galvanized material with a zinc rich paint as an alternative for materials required to be galvanized.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS CONDUITS & NOTES

ED(1)-14

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		DIST	COUNTY		SHEET NO.
		33	TARRANT		96

71A

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.

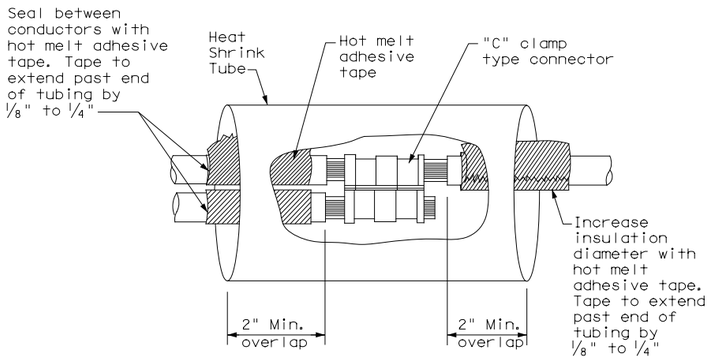
3. Install ground rods so the imprinted part number is at the upper end of the rod.

4. Remove all non-conductive coatings such as concrete splatter from the rod at the clamp location.

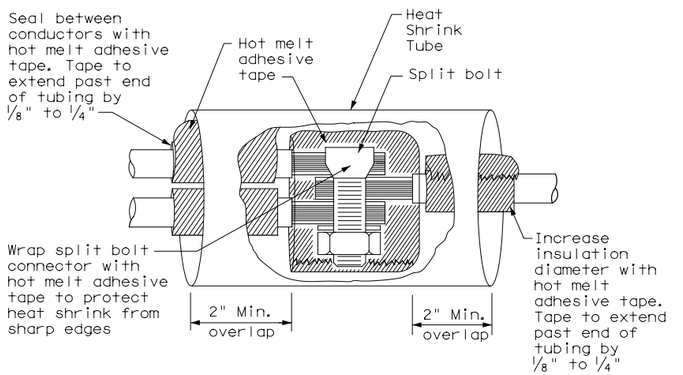
5. Route all conductors as short and straight as possible for connection to lightning protection ground rods. When a bend is required, ensure a minimum radius bend of four inches for these conductors.

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.

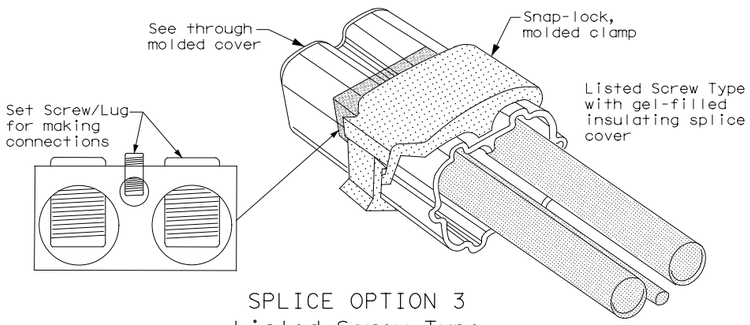
7. Written authorization is required before installing a ground rod in a horizontal trench for rocky soil or a solid rock bottom.



SPLICE OPTION 1
Compression Type



SPLICE OPTION 2
Split Bolt Type



SPLICE OPTION 3
Listed Screw Type

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ELECTRICAL DETAILS CONDUCTORS

ED(3)-14

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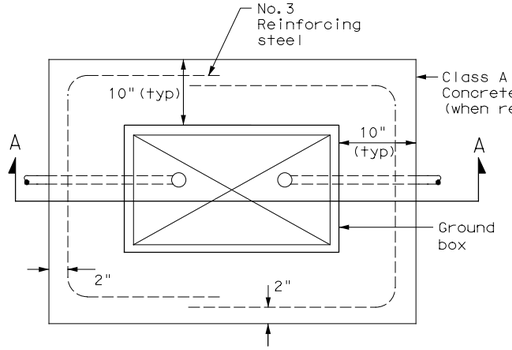
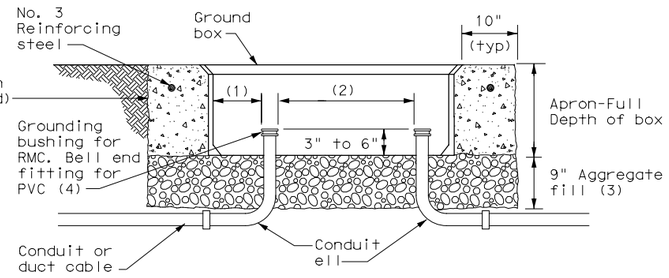


PLAN VIEW



SECTION A - A

APRON FOR GROUND BOX

(1) Uniformly space ends of conduits within the ground box. Position ends of conduits so that ground box walls do not interfere with the installation of grounding bushings or bell end fittings.

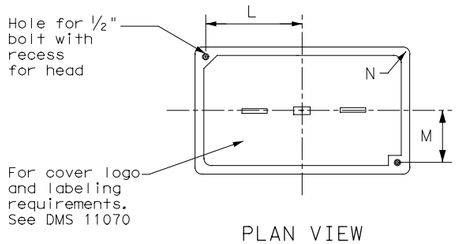
(2) Maintain sufficient space between conduits to allow for proper installation of bushing.

(3) Place aggregate under the box, not in the box. Aggregate should not encroach on the interior volume of the box.

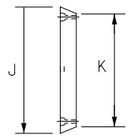
(4) Install a grounding bushing on the upper end of all RMC terminating in a ground box. Ground RMC elbows when any part of the elbow is less than 18 in. below the bottom of the ground box. Install a PVC bushing or bell end fitting on the upper end of all PVC conduits terminating in a ground box.

GROUND BOX DIMENSIONS	
TYPE	OUTSIDE DIMENSIONS (INCHES) (Width x Length X Depth)
A	12 X 23 X 11
B	12 X 23 X 22
C	16 X 29 X 11
D	16 X 29 X 22
E	12 X 23 X 17

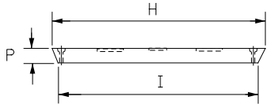
GROUND BOX COVER DIMENSIONS								
TYPE	DIMENSIONS (INCHES)							
	H	I	J	K	L	M	N	P
A, B & E	23 1/4	23	13 3/4	13 1/2	9 7/8	5 1/8	1 3/8	2
C & D	30 1/2	30 1/4	17 1/2	17 1/4	13 1/4	6 3/4	1 3/8	2



PLAN VIEW



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

ED(4)-14

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ELECTRICAL SERVICES NOTES

1. Provide new materials. Ensure installation and materials comply with the applicable provisions of the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards. Ensure material is Underwriters Laboratories (UL) listed. Provide and install electrical service conduits, conductors, disconnects, contactors, circuit breaker panels, and branch circuit breakers as shown on the Electrical Service Data chart in the plans. Faulty fabrication or poor workmanship in material, equipment, or installation is justification for rejection. Where manufacturers provide warranties and guarantees as a customary trade practice, furnish these to the State.

2. Provide electrical services in accordance with Electrical Details standard sheets, Departmental Material Specification (DMS) 11080 "Electrical Services,"DMS 11081 "Electrical Services-Type A," DMS 11082 "Electrical Services-Type C," DMS 11083 "Electrical Services-Type D," DMS 11084 "Electrical Services-Type T," DMS 11085 "Electrical Services-Pedestal (PS)", and Item 628 "Electrical Services" of the Standard Specifications. Provide electrical service types A, C, and D, as listed on the Material Producers List (MPL) on the Department web site under "Roadway Illumination and Electrical Supplies," Item 628. Provide other service types as detailed on the plans.

3. Provide all work, materials, services, and any incidentals needed to install a complete electrical service as specified in the plans.

4. Coordinate with the Engineer and the utility provider for metering and compliance with utility requirements. Primary line extensions, connection charges, meter charges, and other charges by the utility company to provide power to the location are paid for in accordance with Item 628. Get approval for the costs associated with these charges prior to engaging the utility company to do the work. Consult with the utility provider to determine costs and requirements, and coordinate the work as approved.

5. The enclosure manufacturer will provide Master Lock Type 2 with brass tumblers keyed #2195 for all custom electrical enclosures. Installing Contractor is to provide Master Lock #2195 Type 2 with brass tumblers for "off the shelf" enclosures. Master Lock #2195 keys and locks become property of the State. Unless otherwise approved, do not energize electrical service equipment until locks are installed.

6. Enclosures with external disconnects that de-energize all equipment inside the enclosure do not need a dead front trim. Protect incoming line terminations from incidental contact as required by the NEC.

7. When galvanized is specified for nuts, screws, bolts or miscellaneous hardware, stainless steel may be used.

8. Provide wiring and electrical components rated for 75°C. Provide red, black, and white colored XHHW service entrance conductors of minimum size 6 American Wire Gauge (AWG). Identify size 6 AWG conductors by continuous color jacket. Identify electrical conductors sized 4 AWG and larger by continuous color jacket or by colored tape. Mark at least 6 inches of the conductor's insulation with half laps of colored tape, when identifying conductors. Ensure each service entrance conductor exits through a separately bushed non-metallic opening in the weatherhead. The lengths of the conductors outside the weatherhead are to be 12 inches minimum, 18 inches maximum, or as required by utility.

9. All electrical service conduit and conductors attached to the electrical service including the riser or the elbow below ground are subsidiary to the electrical service. For an underground utility feed, all service conduit and conductors after the elbow, including service conduit and conductors for the utility pole riser when furnished by the Contractor, will be paid for separately.

10. Provide rigid metal conduit (RMC) for all conduits on service, except for the ½ in. PVC conduit containing the electrical service grounding electrode conductor. Size the service entrance conduit as shown in the plans. Ensure conduit for branch circuit entry to enclosure is the same size as that shown on the layout sheets for branch circuit conduit. Extend all rigid metal conduits a minimum of 6 inches underground and then couple to the type and schedule of the conduit shown on the layout for that particular branch circuit. Install a grounding bushing on the RMC where it terminates in the service enclosure.

11. Use of liquidtight flexible metal conduit (LFMC) is allowed between the meter and service enclosure when they are mounted 90 to 180 degrees to each other. Size the LFMC the same size as service entrance conduit. LFMC must not exceed 3 feet in length. Strap LFMC within 1 foot of each end. LFMC less than 12 inches in length need not be strapped. Each end of LFMC must have a grounding bushing or be terminated with a grounding fitting. The LFMC must contain a grounded (neutral) conductor. Ensure any bend in LFMC never exceeds 180 degrees. A pull test is required on all installed conductors, with at least six inches of free conductor movement demonstrated to the satisfaction of the Engineer.

12. Ensure all mounting hardware and installation details of services conform to utility company specifications.

13. For all electrical service enclosures listed under Item 628 on the MPL, the UL 508 enclosure manufacturers will prepare and submit a schematic drawing unique to each service. Before shipment to the job site, place the applicable laminated schematic drawings and the laminated plan sheet showing the electrical service data chart used to build the enclosure in the enclosure's data pocket. The installing contractor will copy and laminate the actual project plan sheets detailing all equipment and branch circuits supplied by that service. The laminated plan sheets are to be placed in the service enclosure's document pocket. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in. before laminating. If the installation differs from the plan sheets, the installing contractor is to redline plan sheets before laminating.

14. When providing an "Off The Shelf" Type D or Type T service, provide laminated plan sheets detailing equipment and branch circuits supplied by that service. Reduce 11 in. x 17 in. plan sheets to 8 ½ in. x 11 in before laminating. Deliver these drawings before completion of the work to the Engineer, instead of placing in enclosure that has no door pocket.

15. Do not install conduit in the back wall of a service enclosure where it would penetrate the equipment mounting panel inside the enclosure. Provide grounding bushings on all metal conduits, and terminate bonding jumpers to grounding bus. Grounding bushings are not required when the end of the metal conduit is fitted with a conduit sealing hub or threaded boss, such as a meter base hub.

SERVICE ASSEMBLY ENCLOSURE

1. Provide threaded hub for all conduit entries into the top of enclosure.

2. Type galvanized steel (GS) enclosures may be used for Type C panelboards and for Type D and T services that do not use an enclosure mounted photocell or lighting contactor. Provide GS enclosures in accordance with DMS 11080, 11082, 11083, and 11084.

3. Provide aluminum (AL) and stainless steel (SS) enclosures for Types A, C, and D in accordance with DMS 11080, 11081, 11082, 11083, and 11084. Do not paint stainless steel.

4. Provide pedestal service (PS) enclosures in accordance with ED(9) and DMS 11080 and 11085. Do not provide GS pedestal services. If GS is shown in the PS descriptive code, provide an AL enclosure.

MAIN DISCONNECT & BRANCH CIRCUIT BREAKERS

1. Field drill flange-mounted remote operator handle if needed, to ensure handle is lockable in both the "On" and "Off" positions.

2. When the utility company provides a transformer larger than 50 KVA, verify that the available fault current is less than the circuit breaker's ampere interrupting capacity (AIC) rating and provide documentation from the electric utility provider to the Engineer.

PHOTOELECTRIC CONTROL

1. Provide photocell as listed on the MPL. Move, adjust, or shield the photocell from stray or ambient night time light to ensure proper operation. Mount photocell facing north when practical. Mount top of pole photocells as shown on Top Mounted Photocell Detail.

* ELECTRICAL SERVICE DATA

Elec. Service ID	Plan Sheet Number	Electrical Service Description	Service Conduit **Size	Service Conductors No./Size	Safety Switch Amps	Main Ckt. Bkr. Pole/Amps	Two-Pole Contractor Amps	Panelbd/ Loadcenter Amp Rating	Branch Circuit ID	Branch Ckt. Bkr. Pole/Amps	Branch Circuit Amps	KVA Load
SB 183	289	ELC SRV TY A 240/480 100(SS)AL(E)SF(U)	2"	3/#2	100	2P/100	100	N/A	Lighting NB	2P/40	26	28.1
									Lighting SB	2P/40	25	
									Underpass	1P/20	15	
NB Access	30	ELC SRV TY D 120/240 060(NS)SS(E)TS(O)	1 ¼"	3/#6	N/A	2P/60		100	Sig. Controller	1P/30	23	5.3
							30		Luminaires	2P/20	9	
									CCTV	1P/20	3	
2nd & Main	58	ELC SRV TY T 120/240 000(NS)GS(N)SP(O)	1 ¼"	3/#6	N/A	N/A	N/A	70	Flashing Beacon 1	1P/20	4	1.0
									Flashing Beacon 2	1P/20	4	

* Example only, not for construction. All new electrical services must have electrical service data chart specific to that service as shown in the plans.

** Verify service conduit size with utility. Size may change due to utility meter requirements. Ensure conduit size meets the National ELectrical Code.

EXPLANATION OF ELECTRICAL SERVICE DESCRIPTIVE CODE

ELEC SERV TY X XXX/XXX XXX (XX) XX (X) XX (X)

Schematic Type

Service Voltage V / V

Disconnect Amp Rating
000 indicates main lug only/
Typically Type T

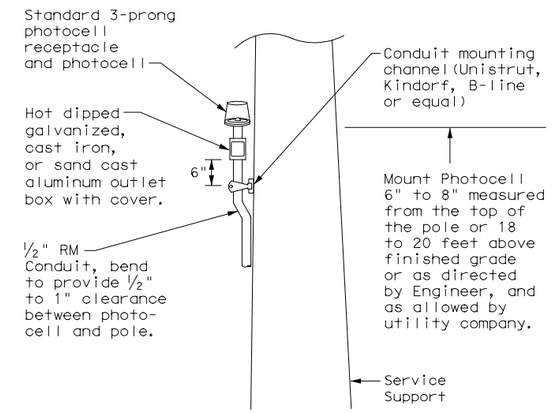
(SS)= Safety Switch Ahead of Meter-Check with Utility
(NS)= No safety Switch Ahead of Meter-Check with Utility

Enclosure Type
GS= Galvanized steel("off the shelf")
SS= Stainless steel(Custom Enclosure)See MPL
AL= Aluminum (Custom Enclosure)See MPL

Photocell Mounting Location
(E)= Inside Service/Enclosure Mounted
(T)= Top of pole
(L)= Luminaire mounted
(N)= None/No Photocell or Lighting Contactor Required

Service Support Type
GC= Granite concrete
OC= Other concrete
TP= Timber pole
SP= Steel pole
SF= Steel frame
OT= Pole by others or paid for separately
EX= Existing pole
TS= Service on traffic signal pole
PS= Pedestal Service

O= Overhead Service Feed from Utility
U= Underground Service Feed from Utility



TOP MOUNTED PHOTOCELL

Install conduit strap maximum 3 feet from box. 5 foot maximum spacing between straps supporting conduit.

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE NOTES & DATA

ED(5)-14

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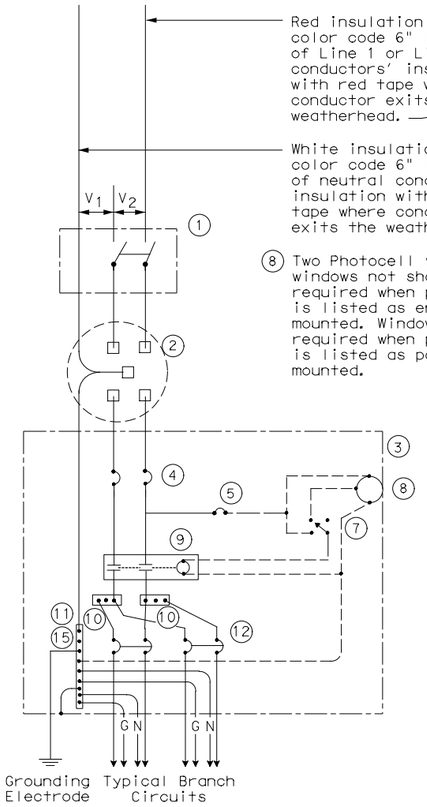
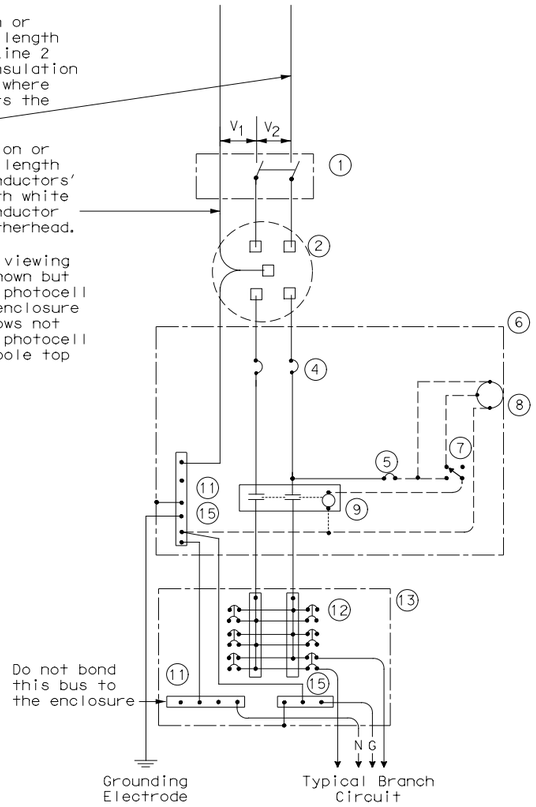
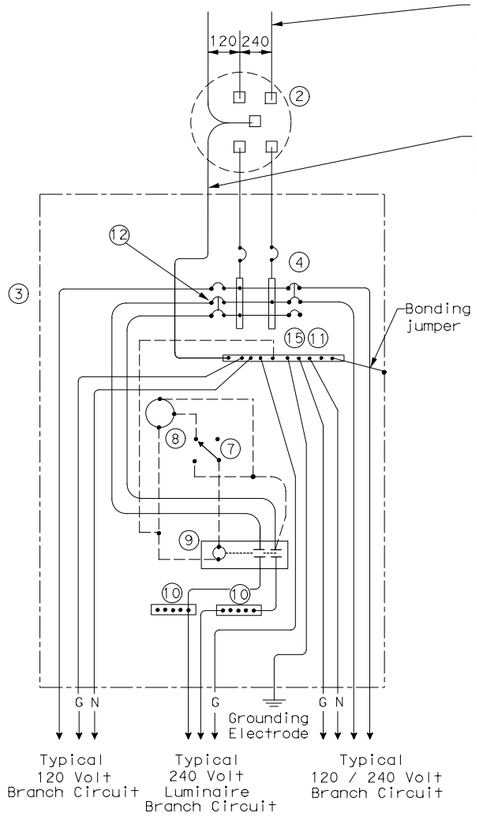


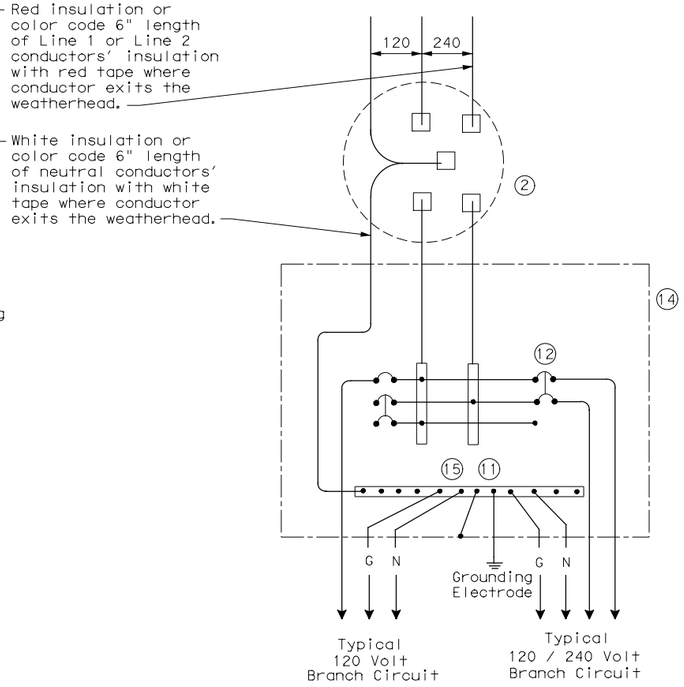
SCHEMATIC TYPE A
THREE WIRE



SCHEMATIC TYPE C
THREE WIRE



SCHEMATIC TYPE D - CUSTOM
120/240 VOLTS - THREE WIRE



SCHEMATIC TYPE T
120/240 VOLTS - THREE WIRE

Galvanized steel-"Buy Off The Shelf" only. When required install photocell top of the pole or on luminaire only, no lighting contractor will be installed.

WIRING LEGEND	
———	Power Wiring
- - - - - -	Control Wiring
—N—	Neutral Conductor
—G—	Equipment grounding conductor-always required

SCHEMATIC LEGEND	
1	Safety Switch (when required)
2	Meter (when required-verify with electric utility provider)
3	Service Assembly Enclosure
4	Main Disconnect Breaker (See Electrical Service Data)
5	Circuit Breaker, 15 Amp (Control Circuit)
6	Auxiliary Enclosure
7	Control Station ("H-O-A" Switch)
8	Photo Electric Control (enclosure-mounted shown)
9	Lighting Contactor
10	Power Distribution Terminal Blocks
11	Neutral Bus
12	Branch Circuit Breaker (See Electrical Service Data)
13	Separate Circuit Breaker Panelboard
14	Load Center
15	Ground Bus

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE ENCLOSURE AND NOTES

ED(6)-14

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SUPPORT TYPE STEEL POLE (SP) AND STEEL FRAME (SF)

1. Provide steel pole and steel frame supports as per TxDOT Departmental Material Specification (DMS)11080 "Electrical Services." Mount all equipment and conduit on 12 gauge galvanized steel or stainless steel channel strut, 1 ½ in. or 1 ⅝ in. wide by 1 in. up to 3 ¾ in. deep Unistrut, Kindorf, B-line or equal. Bolt or weld all channel and hardware to vertical members as approved. Do not stack channel. File smooth and paint field cut ends of all channel with zinc-rich paint before installing.

2. Provide poles for overhead service with an eyebolt or similar fitting for attachment of the service drop to the pole in conformance with the electric utility provider's specifications.

3. Provide and install galvanized ¾ in. x 18 in. x 4 in. (dia. x length x hook length) anchor bolts for underground service supports. Provide and install galvanized ¾ in. x 56 in. x 4 in. anchor bolts for overhead service supports. Ensure anchor bolts have 3 in of thread, with 3 ¼ in. to 3 ½ in. of the exposed anchor bolt projecting above finished foundation. Provide and install leveling nuts for all anchor bolts.

4. Bond one of the anchor bolts to the rebar cage with 6 AWG bare stranded copper conductor. Use listed mechanical connectors rated for embedment in concrete. See Inset B.

5. Furnish and install rigid metallic ells in all steel pole and steel frame foundations for all conduits entering the service from underground.

6. Use class C concrete for foundations. Ensure reinforcing steel is Grade 60 with 3" of unobstructed concrete cover.

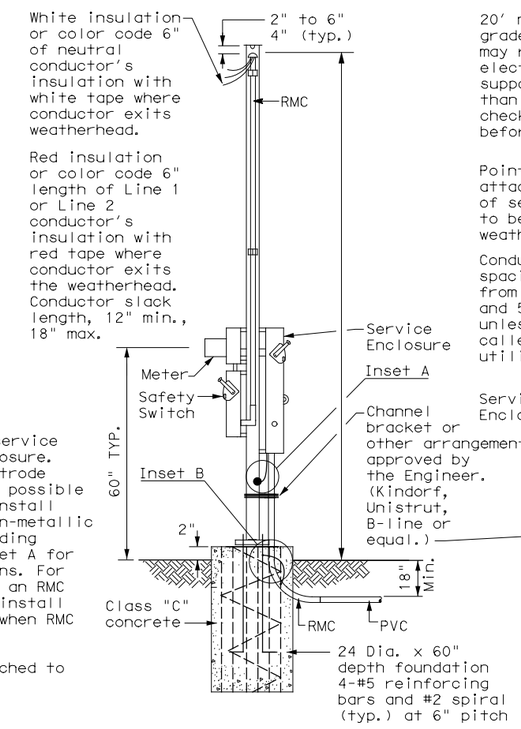
7. Drill and tap steel poles and frames for ½ in. X 13 UNC tank ground fitting. For steel pole service supports, provide and install tank ground fitting 4 in. to 6 in. below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. For steel frame service supports, provide and install tank ground fitting on steel frame post. Install service grounding electrode conductor in a non-metallic conduit or tubing from the enclosure to the steel frame post. Connect electrical service grounding electrode conductor to the tank ground fitting. See steel frame and steel pole details and Inset A for more information. Size service entrance conduit and branch circuit conduit as shown in the plans. For underground conduit runs from the electrical service, extend RMC from the service enclosure to an RMC elbow, and then connect the schedule type and size of conduit shown in the plans. Provide and install grounding bushings where RMC terminates in the enclosure. Grounding bushings are not required when RMC is fitted into a sealing hub or threaded boss.

8. If Steel pole or frame is painted, bond each separate painted piece with a bonding jumper attached to a tapped hole.

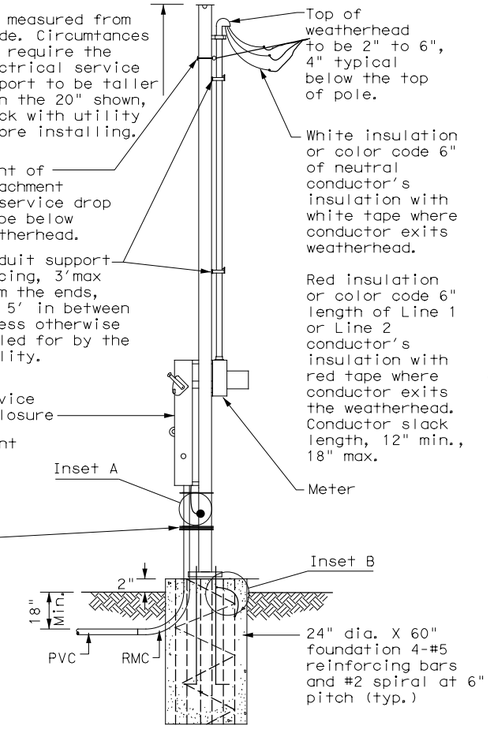
9. Provide ¼" - 20 machine screws for bonding. Do not use sheet metal screws. Remove all non-conductive material at contact points. Terminate bonding jumpers with listed devices. Install minimum size 6 AWG stranded copper bonding jumpers. Make up all threaded bonding connections wrench tight.

10. Avoid contact of the service drop and service entrance conductors with the metal pole to prevent abrasion of the insulated conductors.

11. Shop drawings are not required for service support structure unless specifically stated elsewhere or directed by the Engineer.

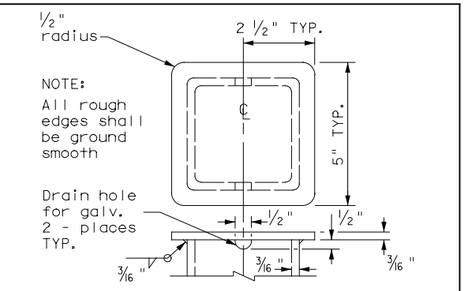


WITH SAFETY SWITCH

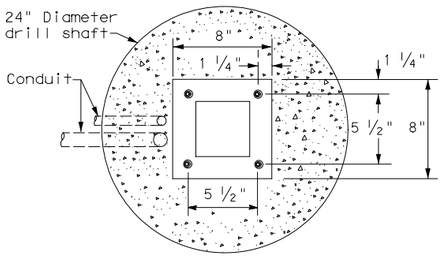


WITHOUT SAFETY SWITCH

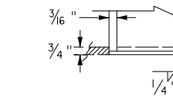
SERVICE SUPPORT TYPE SP (O) - OVERHEAD SERVICE



POLE TOP PLATE

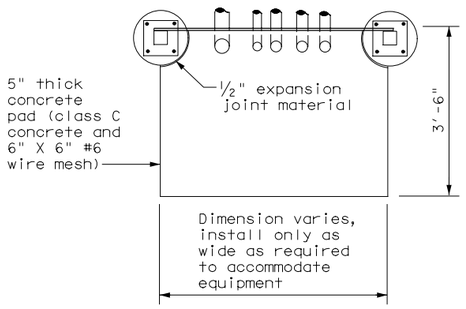


BASE PLATE DETAIL



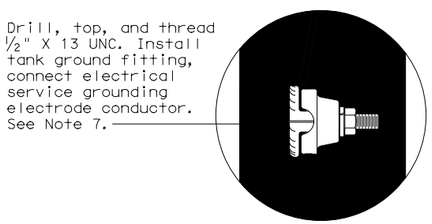
BOTTOM OF POLE

SERVICE SUPPORT TYPE SF & SP



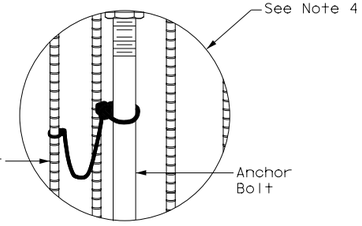
TOP VIEW

SERVICE SUPPORT TY SF (O) & SF (U)

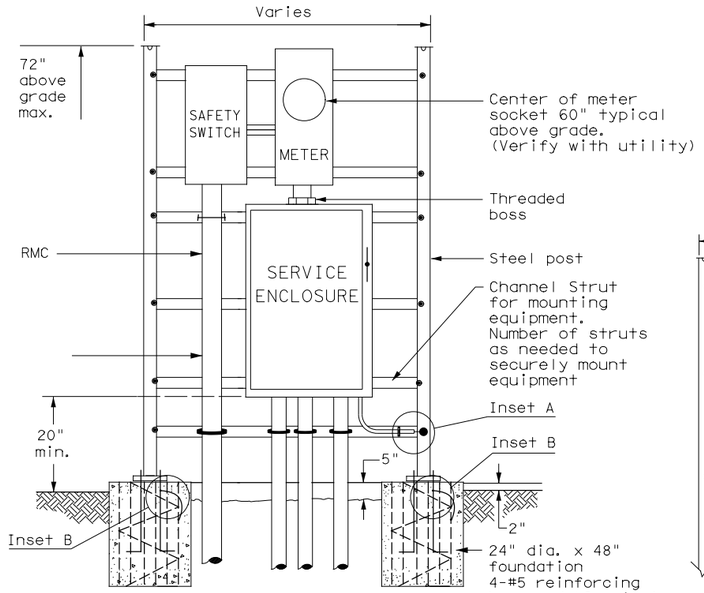


FRONT VIEW

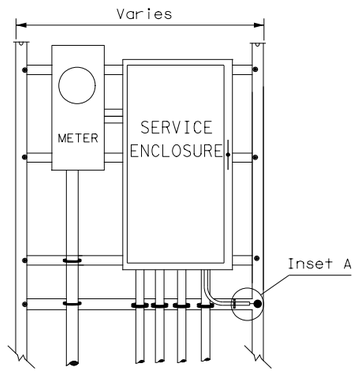
INSET A



INSET B

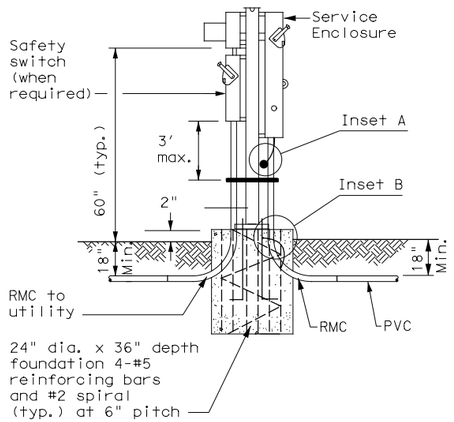


WITH SAFETY SWITCH
FRONT VIEW

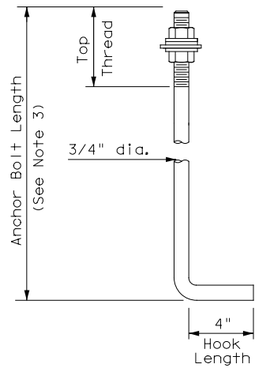


WITHOUT SAFETY SWITCH

SERVICE SUPPORT TYPE SF(U) - UNDERGROUND SERVICE



WITH SAFETY SWITCH



HOOKED ANCHOR DETAIL

SERVICE SUPPORT TYPE SP(U) - UNDERGROUND SERVICE

Texas Department of Transportation

Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES SF & SP

ED(7)-14

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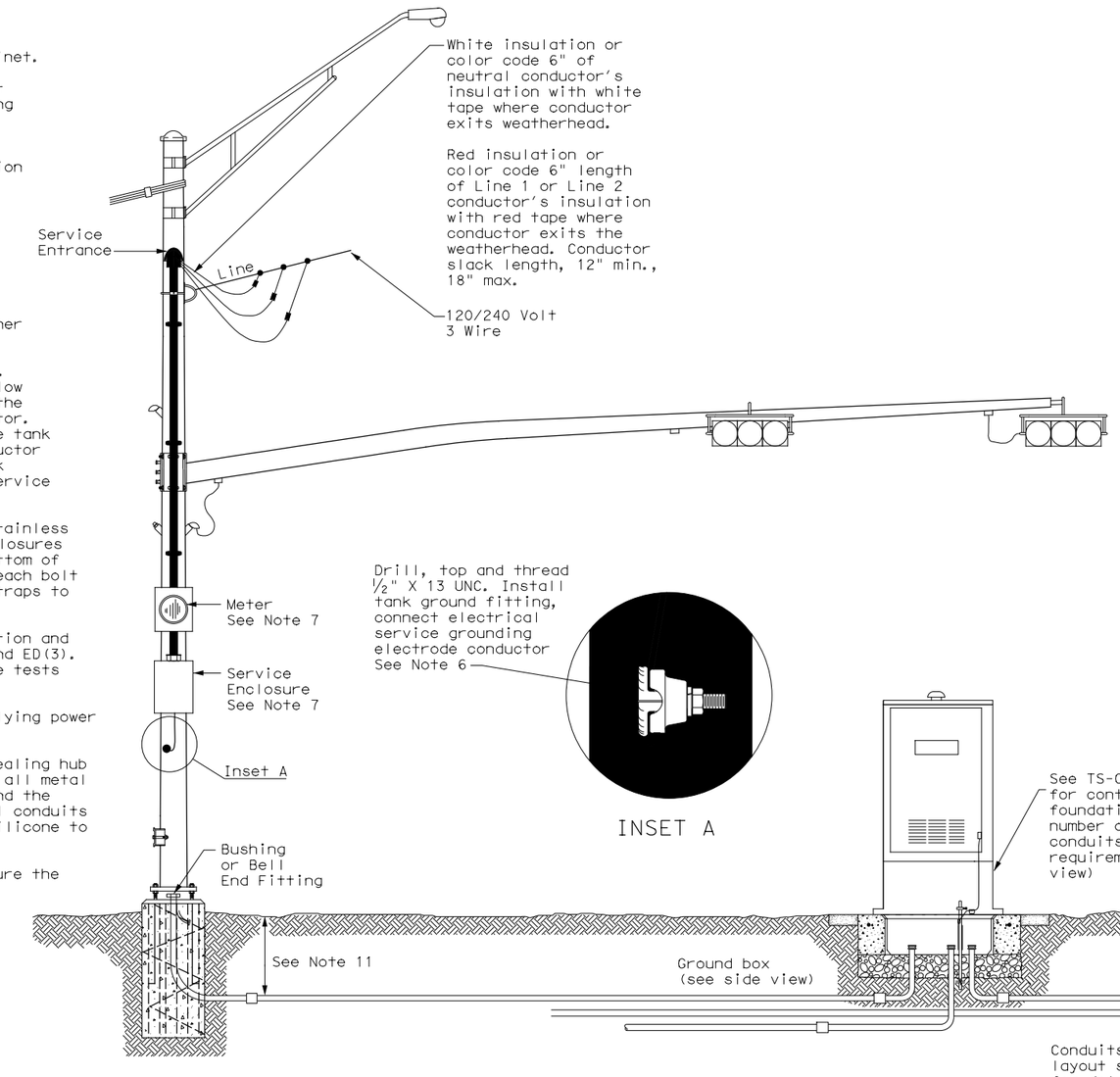
TRAFFIC SIGNAL NOTES

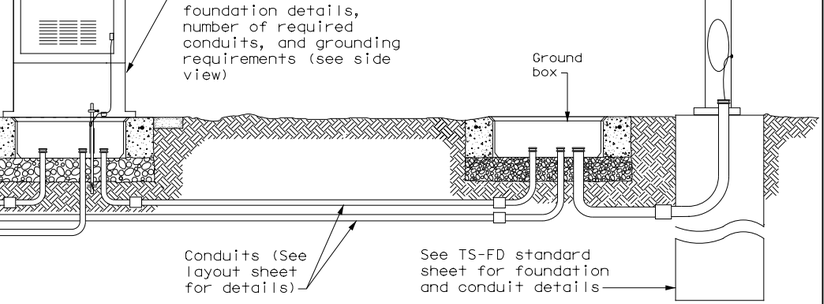
1. Do not pass luminaire conductors through the signal controller cabinet.
2. Include an equipment grounding conductor in all conduits throughout the electrical system. Bond all exposed metal parts to the grounding conductor.
3. Provide roadway luminaires, when required, in accordance with the material and construction sections of Item 610, "Roadway Illumination Assemblies," except for performance testing of luminaires. Test installed roadway luminaires for proper operation as a part of the associated traffic signal system test.
4. If internally illuminated street name signs are approved for use, ground the fixture to the pole with a 12 AWG green XHHW conductor.
5. Bond anchor bolts to rebar cage in two locations using #3 bars or 6 AWG stranded copper conductors. Use listed mechanical connectors rated for embedment in concrete. See TXDOT standard TS-FD for further details.
6. Drill and tap signal poles for ½ in. X 13 UNC tank ground fitting. Provide and install tank ground fitting 4 in. to 6 in. directly below electrical service enclosure. Provide properly sized hole through the bottom of the enclosure for the service grounding electrode conductor. Connect the electrical service grounding electrode conductor to the tank ground fitting. Ensure electrical service grounding electrode conductor is as short and straight as possible from the enclosure to the tank ground fitting. See Inset A detail for further information. Size service entrance conduit and branch circuit conduit as shown in the plans.
7. Mount electrical service enclosure and meter to signal pole with stainless steel bands. Ensure bands are a minimum width of ¾ in. Secure enclosures to bands using two-bolt brackets. Install brackets near top and bottom of each enclosure. Install properly sized stainless steel washers on each bolt in the enclosure. Band or drill and tap properly sized stand-off straps to signal pole for attaching conduit.
8. Conduct pull tests and insulation resistance tests on all illumination and power conductors as required in Item 620 "Electrical Conductors" and ED(3). To prevent electronics damage, do not conduct insulation resistance tests on traffic signal cables after termination.
9. Lock all enclosures and bolt down all ground box covers before applying power to the signal installation.
10. Terminate conduits entering the top of enclosures with a conduit-sealing hub or threaded boss such as meter hub. Install a grounding bushing on all metal conduits not connected to conduit-sealing hub or threaded boss. Bond the grounding bushing to the ground bus with a bonding jumper. Seal all conduits entering enclosures with duct seal or expanding foam. Do not use silicone to seal conduit ends.
11. For all conduits, ensure the burial depth is a minimum of 18". Ensure the minimum burial depth for conduit placed under a roadway is 24".



SIGNAL POLE WITH SERVICE

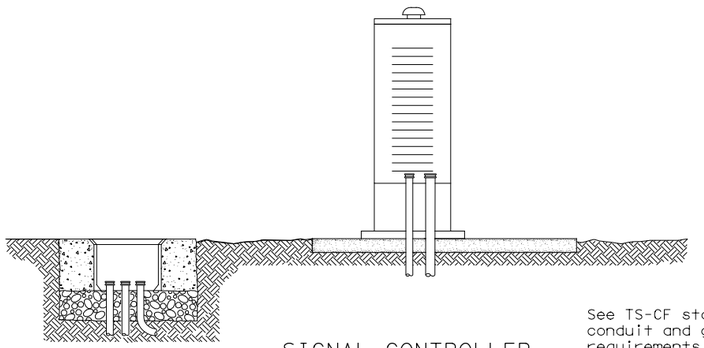
Type T electrical service mounted on signal pole shown as an example. See electrical details, layout sheets, and electrical service data chart for additional details.

INSET A



SIGNAL CONTROLLER FRONT VIEW

SIGNAL POLE



SIGNAL CONTROLLER SIDE VIEW

See TS-CF standard for conduit and grounding requirements. See layout sheets for ground box locations and any additional conduits that are required.

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Traffic Operations Division Standard

ELECTRICAL DETAILS TYPICAL TRAFFIC SIGNAL SYSTEM DETAILS

ED(8)-14

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TIMBER POLE(TP)SERVICE SUPPORT NOTES

1. Ensure electrical service support is a class 5 treated timber pole as per Item 627 "Treated Timber Poles." Embed timber pole to depth required in Item 627.
2. Conduit and electrical conductors attached to the electrical service pole and underground within 12 in. of service pole are not paid for directly but are subsidiary to the electrial service.
3. Install pole-top mounted photocell (T) on north side of pole, or in service enclosure (E) as required. See Electrical Service Data chart in plan set.
4. Gain pole as required to provide flat surface for each channel. Gain timber pole to 5/8 in. max. depth and 1 7/8 in. max. height. Gain pole in a neat and workmanlike manner.
5. Mount meter and service equipment on stainless steel or galvanized channel (Unistrut, Kindorf, or equal). Provide channel sized 1 in. to 3 3/4 in. maximum depth, and 1½ in. to 1⅝ in. maximum width. File smooth the cut ends of galvanized channel and paint with zinc rich paint before installing on pole. Secure each channel section to timber pole with two galvanized or SS lag bolts, ¼ in. minimum diameter by 1½ in. minimum length. Use a galvanized or SS flat washer on each lag bolt. Do not stack channel.
6. When excess length must be trimmed from poles, trim from the top end only.

(1) Class 5 pole, height as required

(2) Service drop from utility company (attached below weatherhead)

(3) Service conduit (RMC)and service entrance conductors - One Red, One Black, One White (See Electrical Service Data)

(4) Safety switch (when required)

(5) Meter (when required)

(6) Service enclosure

(7) 6 AWG bare grounding electrode conductor in ½ in. PVC to ground rod - extend ½ in. PVC 6 in. underground.

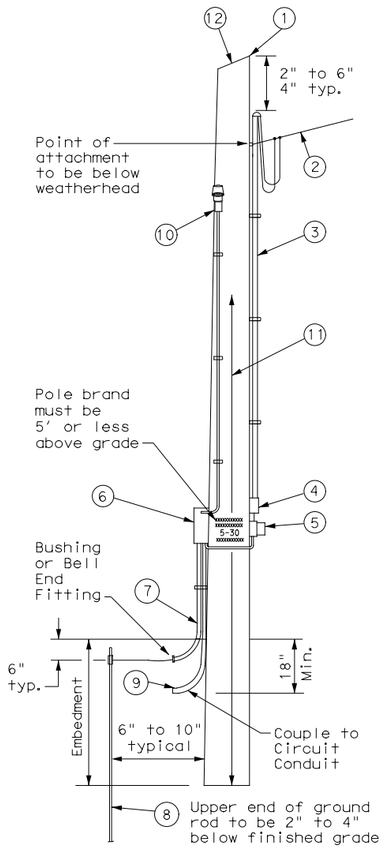
(8) 5/8 in. x 8 ft. Copper clad ground rod - drive ground rod to a depth of 2 in. to 4 in. below grade.

(9) RMC same size as branch circuit conduit.

(10) See pole-top mounted photocell detail on ED(5).

(11) When required by the serving utility provide bare 6 AWG copper conductor. Run wire from pole top to butt wrap or copper butt plate. Protect conductor with non-conductive material to a height of 8 ft. above finished grade.

(12) When required by utility, cut top of pole at an angle to enhance rain run off.

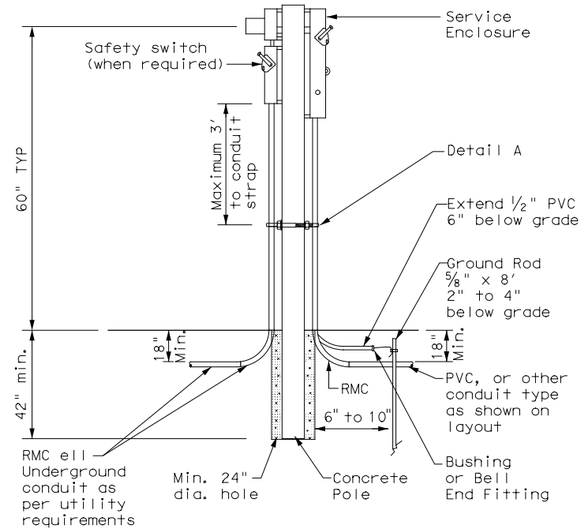


SERVICE SUPPORT TYPE TP (O)

GRANITE CONCRETE(GC)& OTHER CONCRETE(OC)NOTES

Ensure electrical service support structures bid as type Granite Concrete (GC) or Other Concrete (OC) meet the following requirements.

1. Provide GC and OC poles that meet the requirements of DMS 11080 "Electrical Services."
2. Provide prestressed concrete poles suitable for direct embedment into the ground without special foundations.
3. Verify poles are marked as required on DMS 11080. Location of marking should be approximately 4' above final grade. Use the two-point pickup locations when handling pole in horizontal position, and one-point pickup location for use in raising the pole to a vertical position. These marks are small but conspicuous.
4. Embed poles 42 in. or 10% of the length plus 2 ft., whichever is greater.
5. Ensure all installation details of services are in accordance with utility company specifications.
6. Install a one point rack or eye bolt bracket 6 inches to 12 inches below the weatherhead as an overhead service drop anchoring point for the electric utility.
7. Furnish and install galvanized or stainless steel channel strut 1 ½ in. or 1 5/8 in. wide by 1 in. up to 3 3/4 in. deep (Unistrut, Kindorf, B-line or equal). Attach channel strut with stainless steel concrete anchors (max. 1" depth), square U-bolts or back to back channel strut with long bolts, or other secure mounting as approved by the Engineer. Ensure bolts are galvanized in accordance with ASTM A153. Do not stack channel struts.
8. Backfill the holes thoroughly by tamping in 6 in. lifts. After tamping to grade, place additional backfill material in a 6 inch high cone around the pole to allow for settling. Use material equal in composition and density to the surrounding area. Backfilling will not be paid for directly but is subsidiary to various bid items.

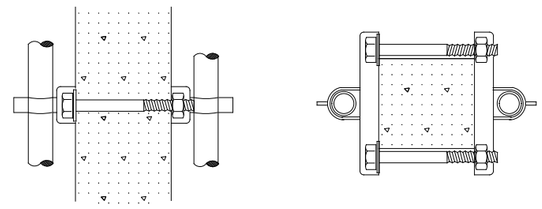


CONCRETE SERVICE SUPPORT

Underground(U)

CONCRETE SERVICE SUPPORT

Overhead(O)



DETAIL A

See Note 7. Before installing channel that has been cut, file sharp edges and paint with zinc-rich paint. Ensure there is no paint splatter on the pole.

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Traffic Operations Division Standard

ELECTRICAL DETAILS SERVICE SUPPORT TYPES GC, OC, & TP

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

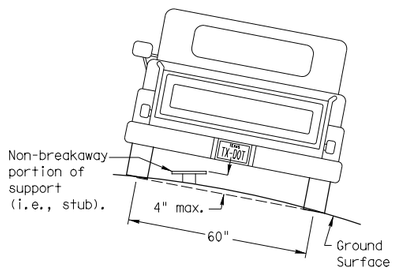
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED
1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-1))

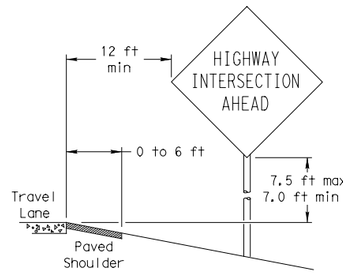
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

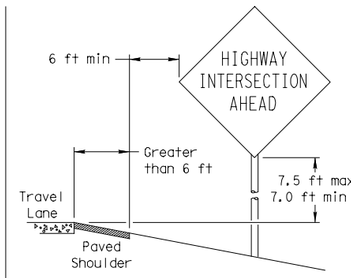
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

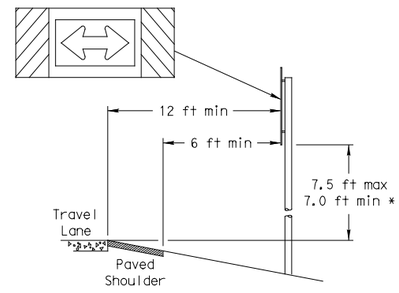
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



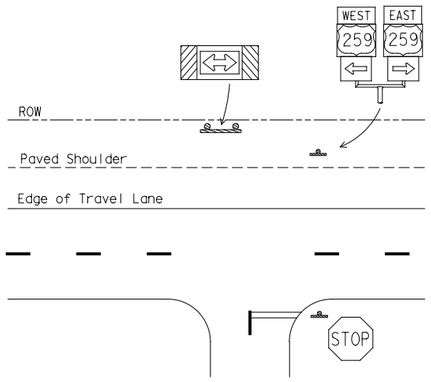
GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

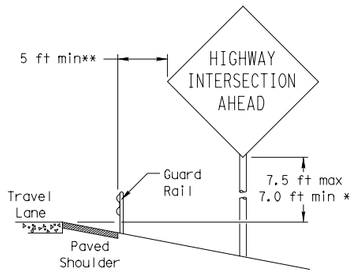
T-INTERSECTION



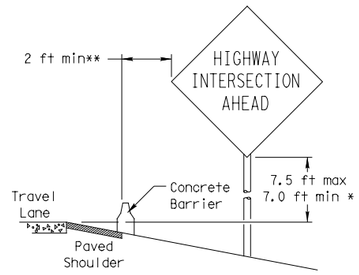
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



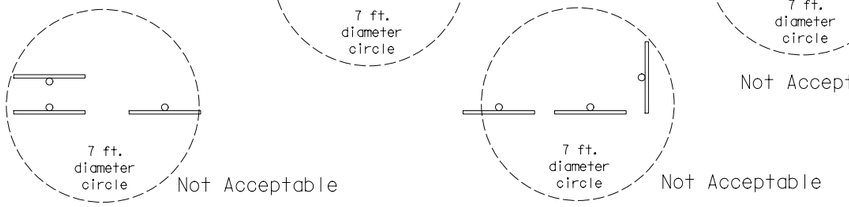
BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

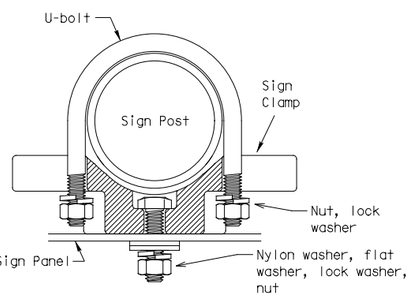
**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

No more than 2 sign posts should be located within a 7 ft. circle.

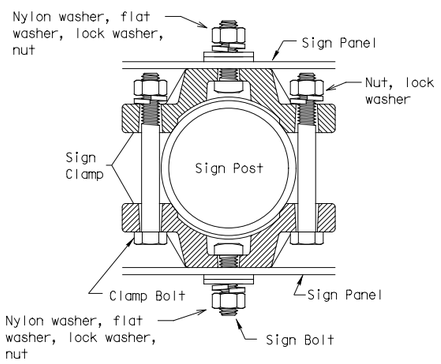


TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Back-to-Back Signs



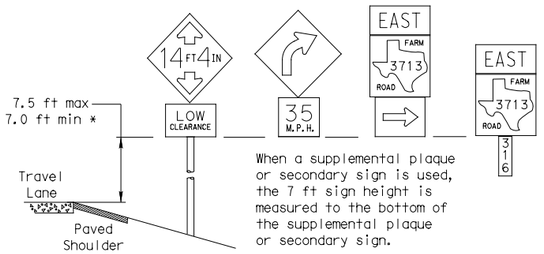
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

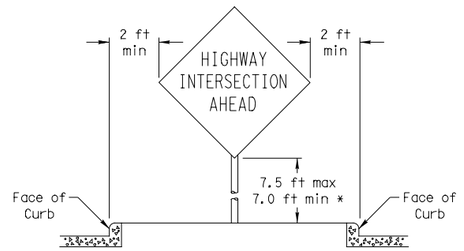
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



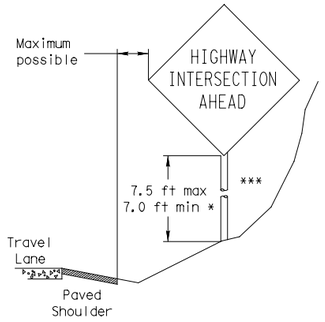
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

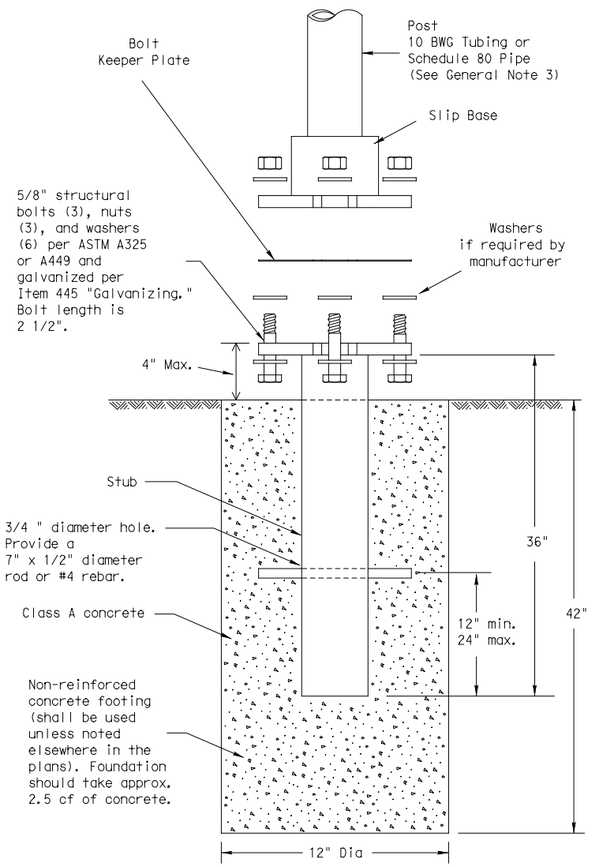
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT
CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC	HULEN ST, ETC
DIST	COUNTY		SHEET NO.
33	TARRANT		104

9-08 REVISIONS

DATE:
FILE:

26A

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   - 0.134" nominal wall thickness
   - Seamless or electric-resistance welded steel tubing or pipe
   - Steel shall be HSLAS Gr 55 per ASTM A1011 or ASTM A1008
   - Other steels may be used if they meet the following:
     - 55,000 PSI minimum yield strength
     - 70,000 PSI minimum tensile strength
     - 20% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   - Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
   - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.

   Schedule 80 Pipe (2.875" outside diameter)
   - 0.276" nominal wall thickness
   - Steel tubing per ASTM A500 Gr C
   - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
     - 46,000 PSI minimum yield strength
     - 62,000 PSI minimum tensile strength
     - 21% minimum elongation in 2"
   - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

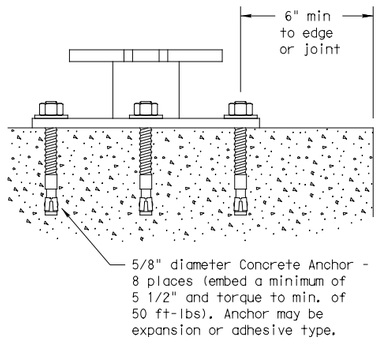
Foundation

1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per DMS-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

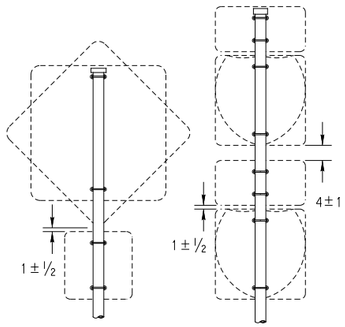
DN: TXDOT	CK: TXDOT	DW: TXDOT	CK: TXDOT

REVISIONS
9-08

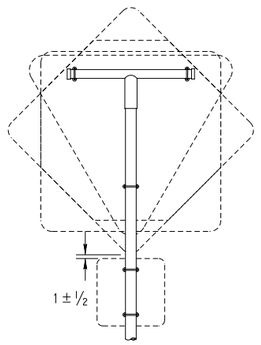
CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC	HULEN ST, ETC

DIST	COUNTY	SHEET NO.
33	TARRANT	105

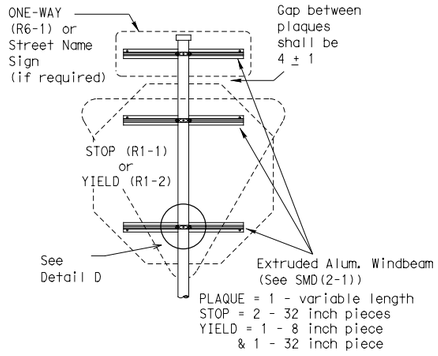
DATE:
FILE:



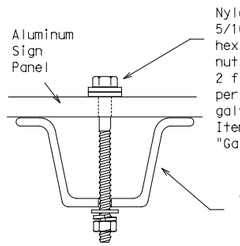
SM RD SGN ASSM TY XXXXX(1)XX(P)



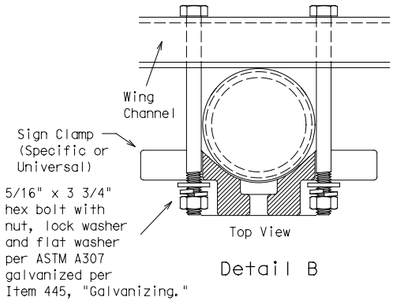
SM RD SGN ASSM TY XXXXX(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(P-BM)



Detail A



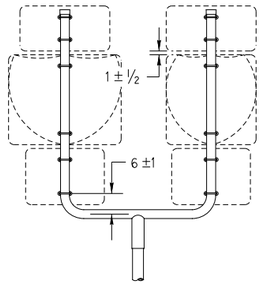
Detail B

GENERAL NOTES:

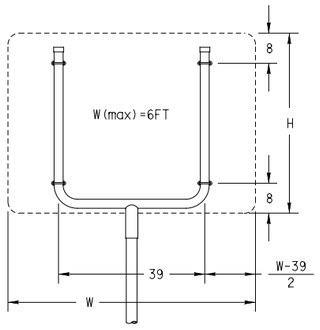
1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

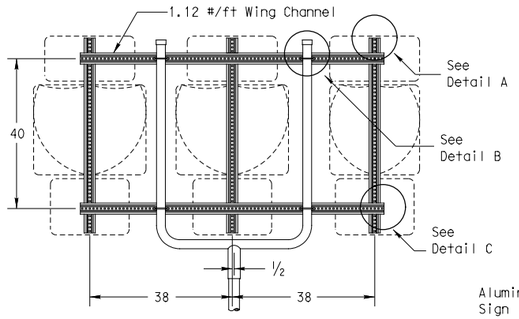
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Additional route markers may be added vertically, provided the total sign area does not exceed the maximum allowable amount per Note 1.
11. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.
13. Sign blanks shall be the sizes and shapes shown on the plans.



SM RD SGN ASSM TY XXXXX(1)XX(U)



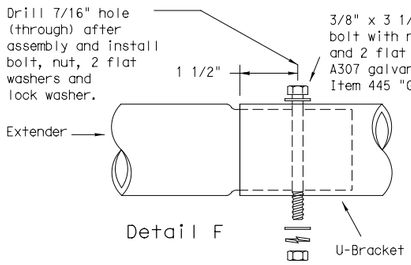
SM RD SGN ASSM TY XXXXX(1)XX(U)



SM RD SGN ASSM TY XXXXX(1)XX(U-WC)
(See Note 11)

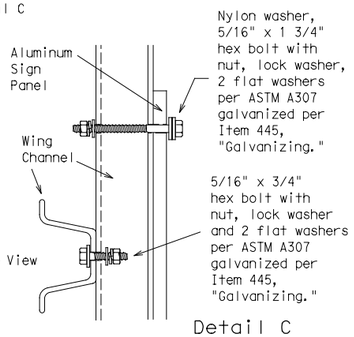
Drill 7/16" hole (through) after assembly and install bolt, nut, 2 flat washers and lock washer.

3/8" x 3 1/2" heavy hex bolt with nut, lock washer and 2 flat washers per ASTM A307 galvanized per Item 445 "Galvanizing."



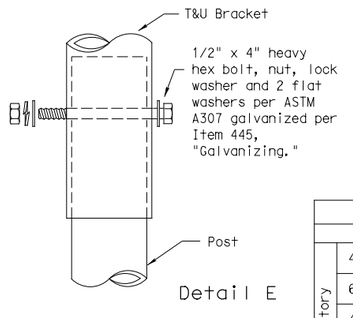
Detail F

Splices shall only be allowed behind the sign substrate.

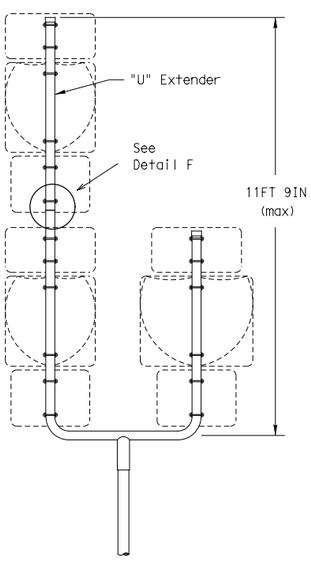


SIDE VIEW

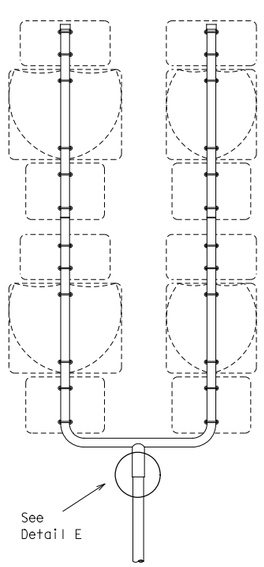
Detail C



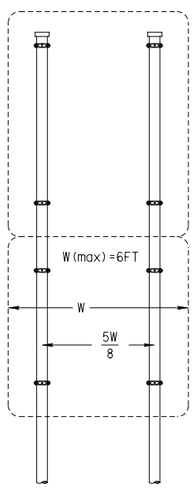
Detail E



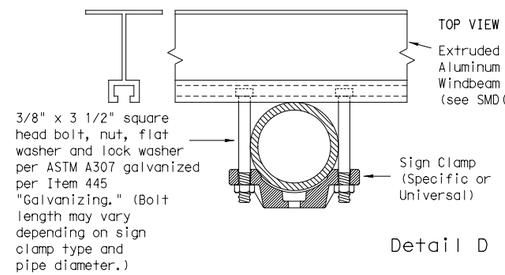
SM RD SGN ASSM TY S80(1)XX(U-1EXT)



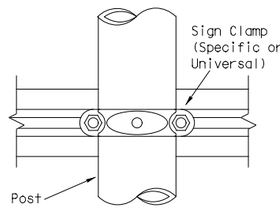
SM RD SGN ASSM TY S80(1)XX(U-2EXT)



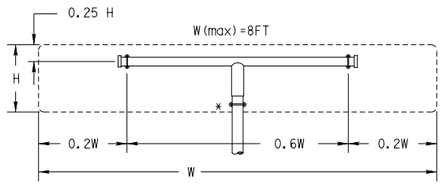
SM RD SGN ASSYM TY XXXXX(2)XX(P)



Detail D



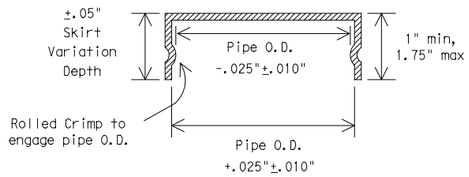
REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)



SM RD SGN ASSM TY XXXXX(1)XX(T)
(* - See Note 12)

All dimensions are in english unless detailed otherwise.

FRICTION CAP DETAIL



Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive protection against entrance of rainwater. They shall be free of sharp creases or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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

REVISIONS	CONT	SECT	JOB	HIGHWAY
9-08	0902	90	207, ETC	HULEN ST, ETC
	DIST	COUNTY		SHEET NO.
	33	TARRANT		106

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26C

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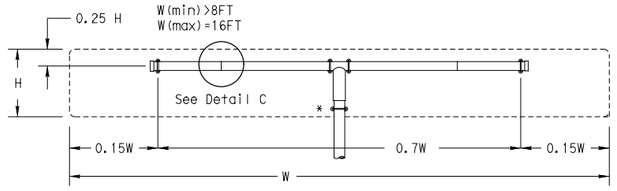
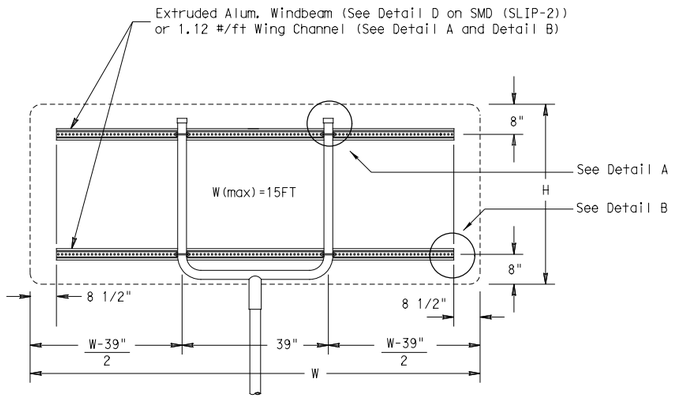


SM RD SGN ASSM TY XXXXX(1)XX(T-2EXT)
(* - See Note 12)



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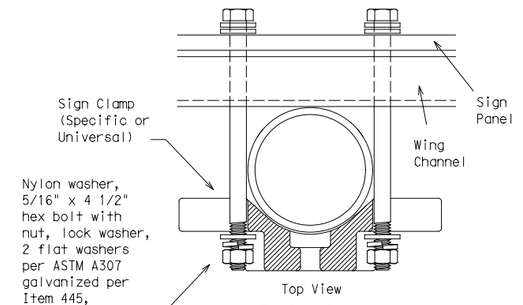
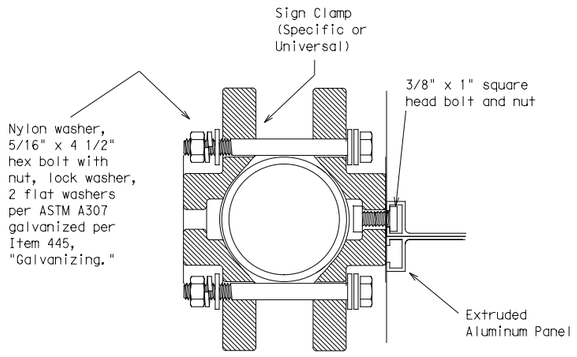
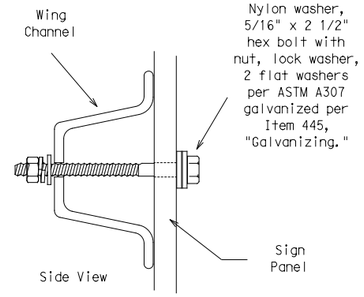


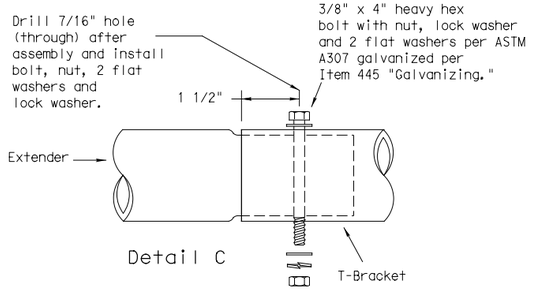
Detail A



Detail D
EXTRUDED ALUMINUM SIGN WITH T BRACKET

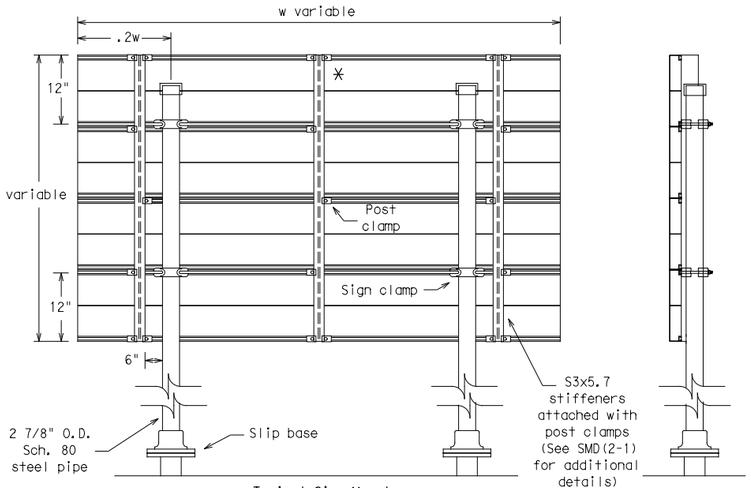


Detail B



Detail C

Splices shall only be allowed behind the sign substrate.

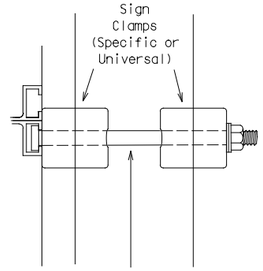


Typical Sign Mount

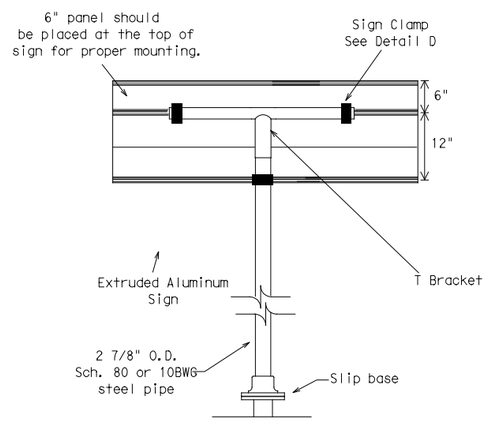
SM RD SGN ASSM TY S80(2)XX(P-EXAL)

* Additional stiffener placed at approximate center of signs when sign width is greater than 10'.

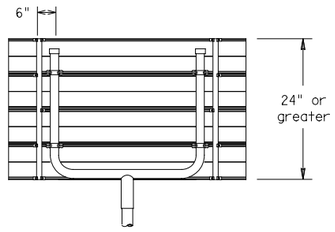
See Detail E
for clamp installation



Detail E



Extruded Aluminum Sign
With T Bracket



Use Extruded Alum. Windbeam as stiffeners
See SMD (2-1) for additional details

See Detail E
for clamp installation

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

2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. For horizontal rectangular signs fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamp required on the "T-bracket" post for 24 inch high signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with Friction Caps.

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY S80(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

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

REVISIONS
9-08

CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC	HULEN ST, ETC
DIST	COUNTY		SHEET NO.
33	TARRANT		107

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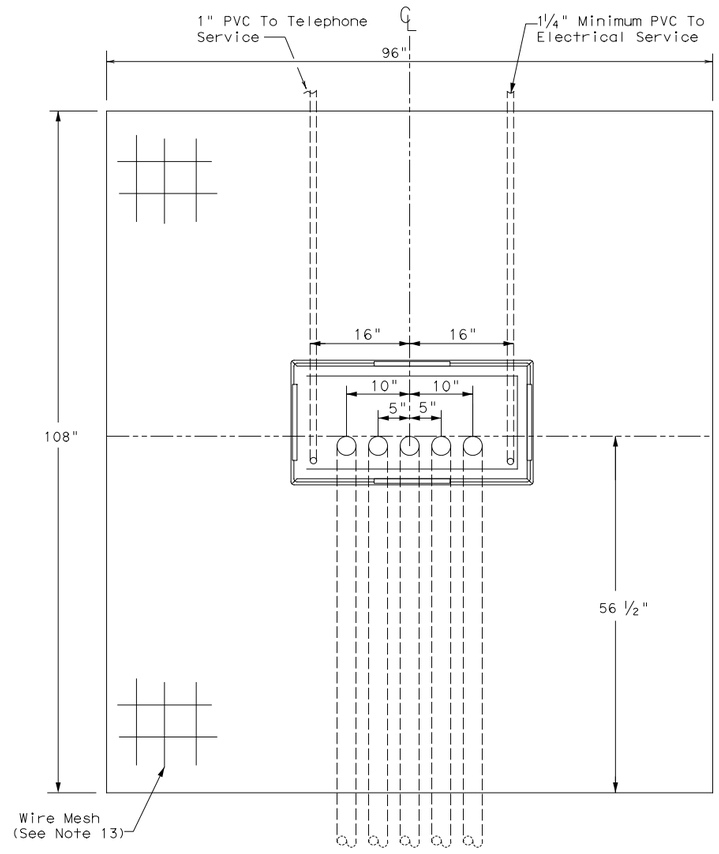
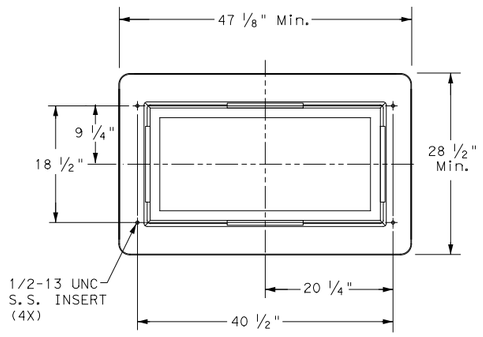
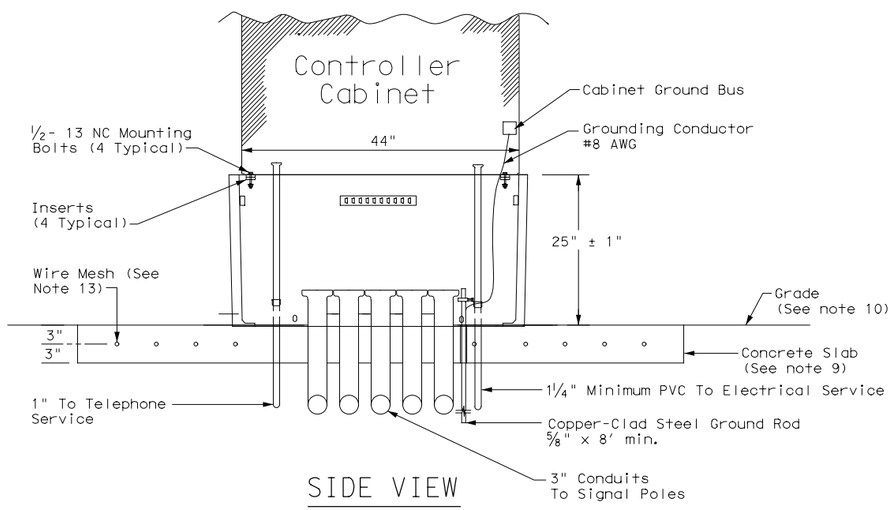


TOP VIEW



CABINET BASE



SIDE VIEW

TRAFFIC SIGNAL CONTROLLER BASE:

1. Provide a traffic signal controller base (cabinet base) manufactured of polymer concrete material consisting of calcareous and siliceous stone; glass fibers and thermoset polyester resin. The polymer concrete cabinet base must be reinforced on the inside of the cabinet base with fiberglass matting. Provide one of the following bases: Armorcast Part # A6001848X24, Quazite Model # PG3048Z709, or other as approved by TxDOT Traffic Safety Division.
2. The polymer concrete material must have a minimum compressive strength of 10,300 pounds per square inch (psi), minimum flexural strength of 3600 psi, and minimum shear strength of 3600 psi.
3. The polymer concrete cabinet base must conform to the dimensions shown and must accommodate a standard TxDOT basemount cabinet.
4. Supply the cabinet base with four 1#2"-13 UNC stainless steel inserts for attachment of the cabinet to the base. Inserts must withstand a minimum torque of 50 ft-lb and a minimum straight pull out strength of 750 lbs.
5. Provide the cabinet base with 4 cable racks mounted one on each side of the base 2" to 7 " from the top edge of the base. Unless approved otherwise, cable racks must be 1-1/2 x 9#16x 3#16inch steel channel with eight T-slots spaced at 1-1/2 inches. The cable racks must easily accommodate the insertion of tie wraps to attach field wiring to the racks to serve as strain relief. Secure cable racks to the base using 1#2"-13 UNC stainless steel screws and inserts.
6. The cabinet base, when secured to the concrete slab with controller cabinet attached, must withstand a minimum wind load of 125 mph or a 850 lb force applied at 49" above the bottom of the base without causing the base or cabinet to come out of their anchored position or cause any permanent deformation. The manufacturer must supply certification by an independent testing laboratory or sealed by a Texas Licensed Professional Engineer. Provide the cabinet base with hardware for attachment to a concrete slab.
7. The traffic signal base must be permanently marked either by impress or by permanent ink with the manufacturer's model number and name or logo.
8. Seal the base to the concrete with a silicone caulk bead and fastened to the slab per manufacturer's instructions.

CONCRETE SLAB:

9. Traffic signal controller pad must be a portland cement concrete slab poured in place, must conform to the dimensions shown, and must be level.
10. Grade earthwork such that it is flush with the concrete pad on all four sides, unless otherwise shown on the plans. Subsidiary to ITEM 680, four inch rip rap may be used in lieu of earthwork. Slopes shall gradually contour to match plans.
11. Bond a #8 AWG copper ground wire and an 8 ft ground rod bonded to the reinforcing mesh by a suitable UL Listed clamp and terminated to the cabinet grounding bus for the purpose of providing a local ground for the electrical grounding conductor. The electrical grounding conductor specified in Item 680-3.A.4 is required and must be terminated to the cabinet ground bus.
12. Install a PVC sleeve to prevent the ground rod from direct embedment in the slab.
13. Provide welded wire mesh 6X6-W2.9 X W2.9 for reinforcement. Provide joints and splices in the mesh with a minimum 6-inch overlap. Center the mesh between top and bottom and provide a minimum 3 inch cover on the edges.
14. Provide Class B concrete minimum for the slab in accordance with Item 421. Construct the slab in accordance with Item 531.

CONDUITS:

15. Stub up and run 3-inch conduits through the slab to the various traffic signal poles and ground boxes as shown on the layouts. Install the number of conduits as shown on layouts plus two additional 3 inch conduits for future use. Terminate the conduits with a bushing between 2 and 4-inches above the slab.
16. Extend conduits for future use at least 18-inches from the edge of the slab, terminate underground with a coupling, and cap and seal so that the seal can be removed without damaging the coupling. This must also apply to unused telephone conduit.
17. Stub up two separate conduits through the slab from the electrical and telephone services. Run the conduit for the electrical feed directly to the electrical service enclosure. Run the conduit for the telephone line directly to the telephone service, usually located on the same pole as the electrical service. Telephone must not under any circumstance share a conduit with any other function.
18. Terminate electric and telephone conduits above the slab with a coupling. After the base is installed, extend the conduits above the top of the base and secure to the base using a steel one-hole strap or similar suitable substitute.

CONTROLLER CABINET:

19. Anchor the controller cabinet to the base using four stainless steel 1/2-13 NC bolts.
20. The silicone caulk bead specified in Item 680.3.B must be RTV 133.

PAYMENT:

21. Bid TS-CF as subsidiary to Item 680.

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL CONTROLLER CABINET BASE AND PAD

TS-CF-21

FILE: ts-cf-21.dgn	DN:	CK:	DW:	CK:
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12-04	DIST	COUNTY		SHEET NO.
2-21	33	TARRANT		108

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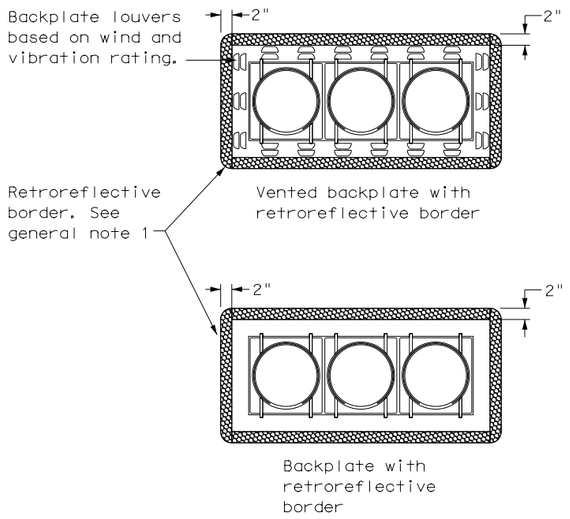
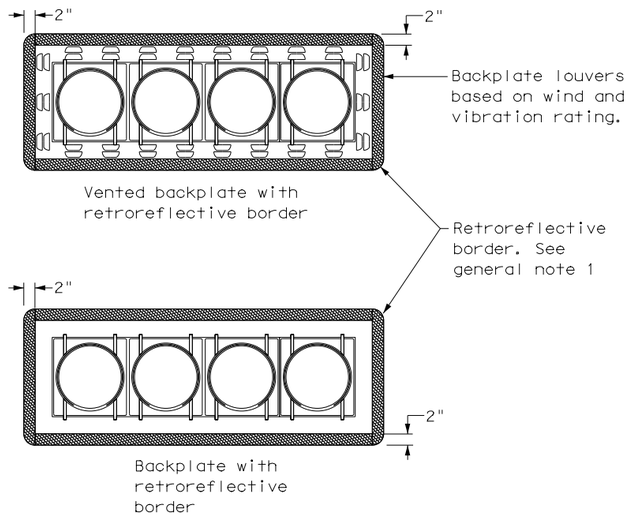


THREE-SECTION HEAD
HORIZONTAL OR VERTICAL



FOUR-SECTION HEAD
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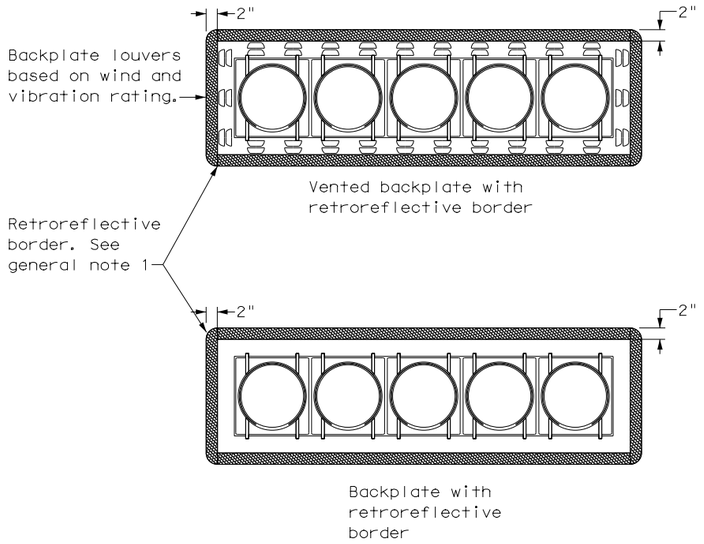

FIVE-SECTION HEAD
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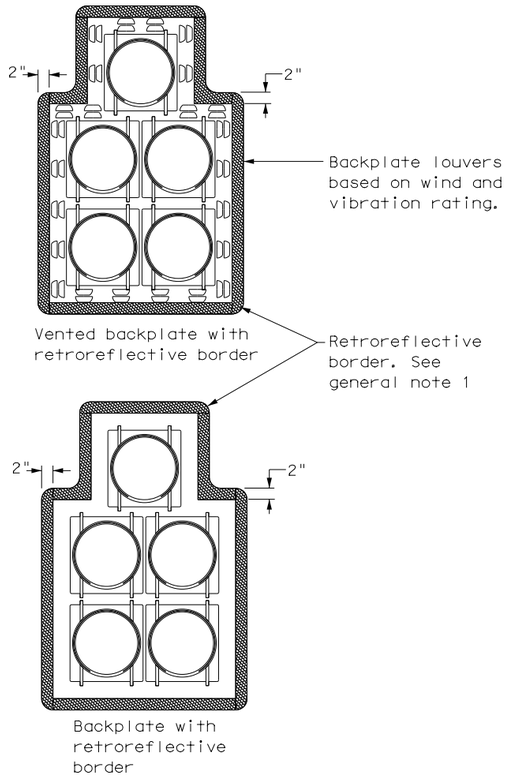
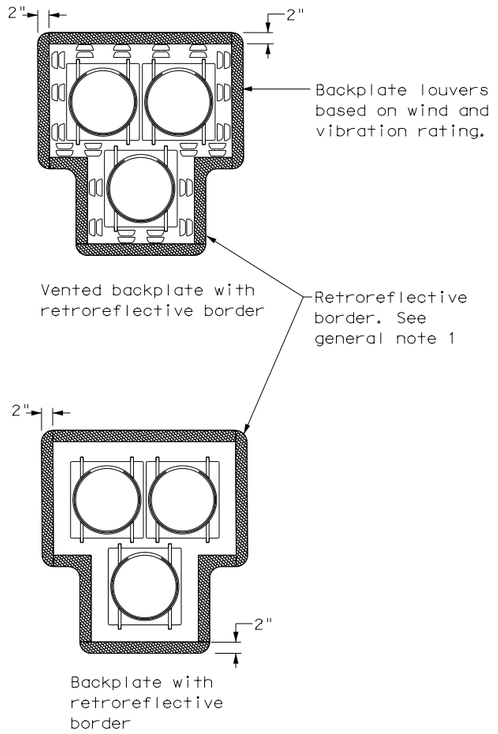


FIVE-SECTION HEAD
CLUSTER



PEDESTRIAN HYBRID
BEACON

GENERAL NOTES:

1. Backplates are optional for traffic signals and pedestrian hybrid beacons. When backplates are used, a 2-inch wide fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 is required. Place on all approaches when used.
2. Signal head and backplate compatability must be verified by the contractor prior to installation.
3. When using backplates on signal heads, venting is preferred to reduce cyclic vibration stress.
4. When a vented backplate is used, the retroreflective border must not be placed over the louvers.
5. This standard sheet applies to all signal heads with backplates, including but not limited to:
   - Pole mounted
   - Overhead mounted
   - Span wire mounted
   - Mast arm mounted
   - Vertical signal heads
   - Horizontal signal heads
   - Clustered signal heads
   - Pedestrian hybrid beacons

Texas Department of Transportation

Traffic Safety Division Standard

TRAFFIC SIGNAL HEAD WITH BACKPLATE

TS-BP-20

FILE: ts-bp-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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	33	TARRANT		109

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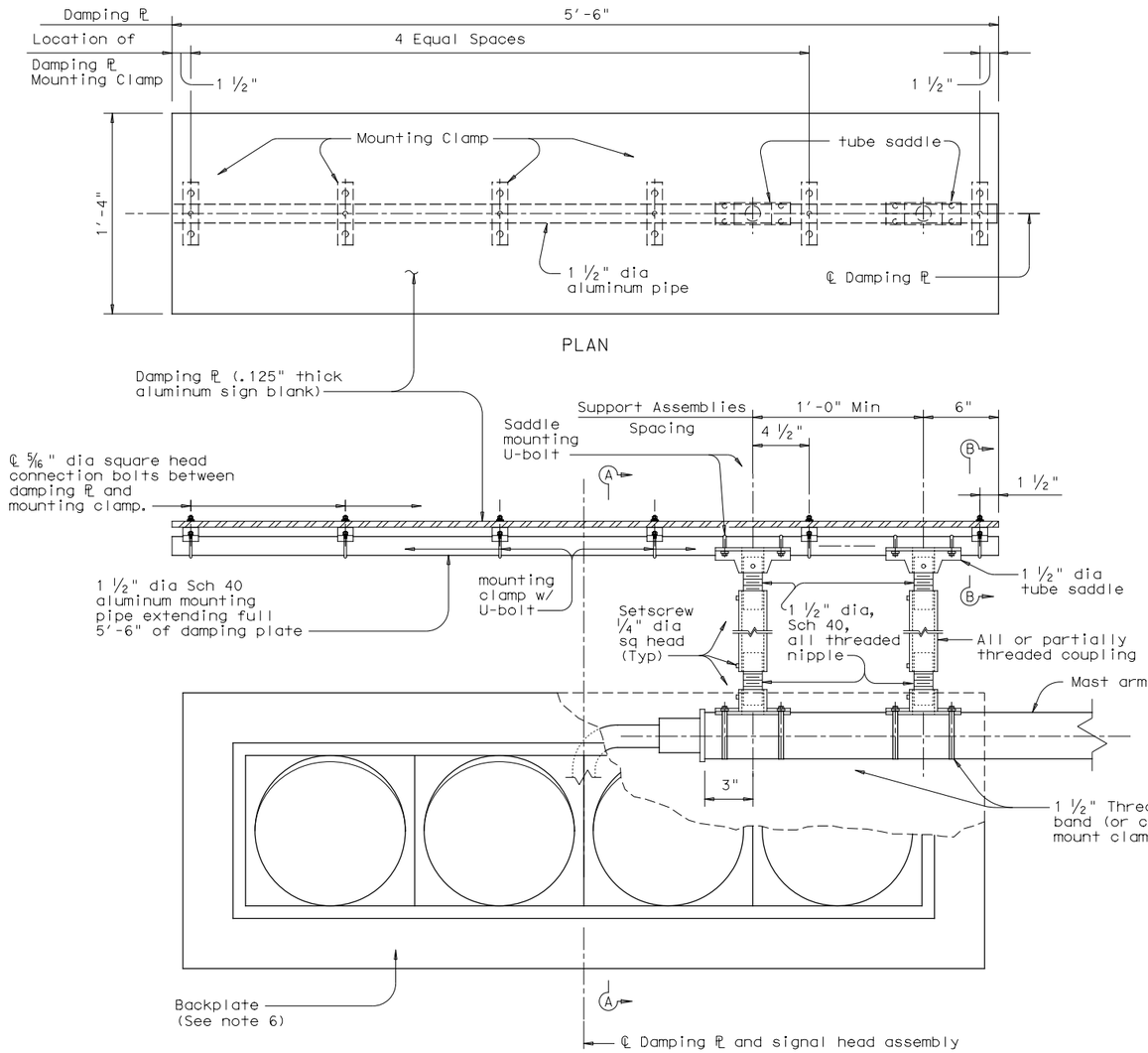
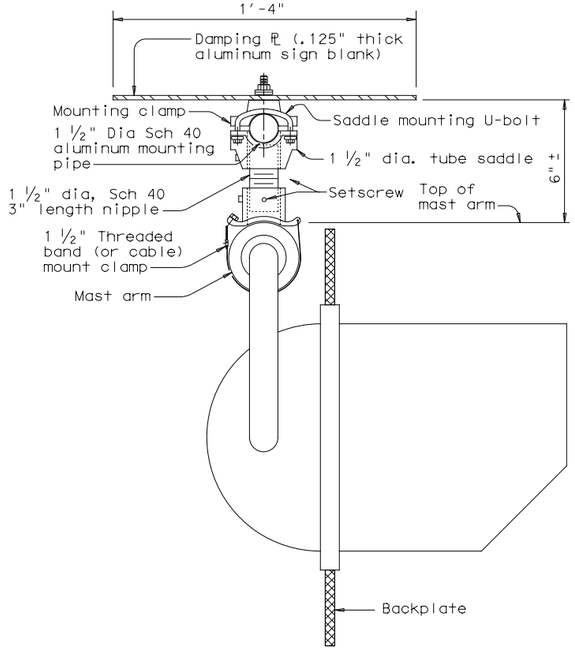


DAMPING PLATE MOUNTING DETAILS

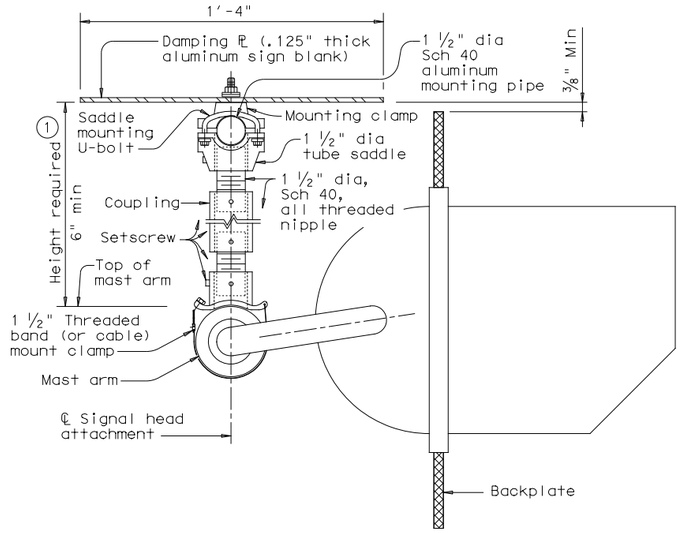
(Showing alternate placement of signal head)



SECTION A-A

(Showing standard placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)

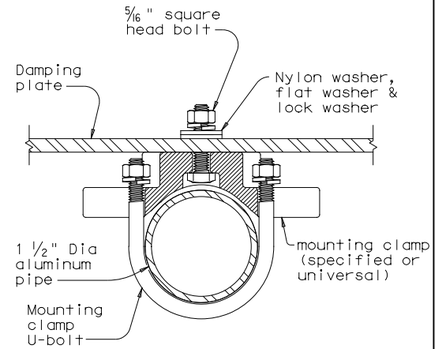


SECTION A-A

(Showing alternate placement of signal head)

(Mounting clamp U-bolt is not shown for clarity)

① Recommended supporting assemblies to achieve required height for horizontal section heads			
Height required	One nipple each length	Two nipples each length plus	One coupling each length
6"-6 ¾"	3"	-	-
7"-8 ½"	4"	-	-
9"-10 ½"	6"	-	-
11"-15 ½"	-	4"	5"
16"-24"	-	6"	10"



SECTION B-B

(Showing damping plate attachment)

GENERAL NOTES:

1. In accordance with the findings of TxDOT sponsored research, the installation of a damping plate in accordance with the details shown here at the end of signal mast arms of SMA and DMA standard structures reduces excessive harmonic vertical vibration, and thus fatigue damage. Any deviation from these details may reduce the effectiveness of this damping device.
2. Aluminum sign blank for damping plate will conform to Departmental Material Specifications DMS-7110. Materials for mast arm mounting clamp and tube saddle will be aluminum castings or aluminum alloys as in accordance with manufacturers' stipulations. Mounting pipe, pipe nipple and coupling will be aluminum alloy 6061-T6 or 6063-T6. Damping plate mounting clamp and u-bolt assemblies will conform to Standard sheet SMD(GEN). U-bolts for saddle mounting will have a minimum yield strength of 36 ksi.
3. Damping plate will be mounted horizontally. Position centerline of damping plate to align with centerline of mast arm or horizontal signal head assembly. Vertical clearance between signal head (with or without backing plate) and bottom of damping plate will be maintained as shown. The attachments shown here are examples only, other supporting details which meet both alignment and vertical clearance requirements are also acceptable.
4. Unless stipulated by the manufacturers, all steel parts will be galvanized finish in accordance with Standard Specification Item 445, "Galvanizing".
5. Contractor will verify applicable field dimensions before the installation.
6. Backplates are optional for traffic signals. When backplates are used, Backplates will have a 2-inch fluorescent yellow AASHTO Type B_{FL} or C_{FL} retroreflective border conforming to TxDOT DMS-8300 "Sign Face Materials." See Sheet TS-BP-20 for backplate details.

Texas Department of Transportation

Traffic Safety Division Standard

MAST ARM DAMPING PLATE DETAILS

MA-DPD-20

FILE: ma-dpd-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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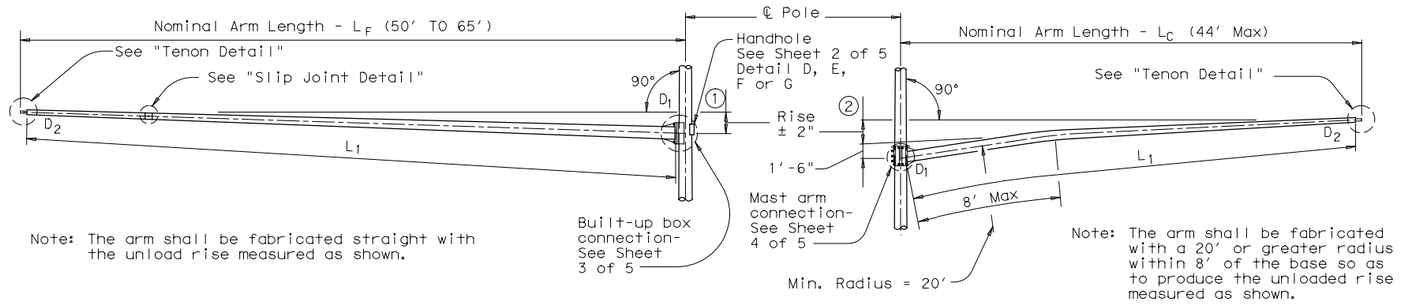
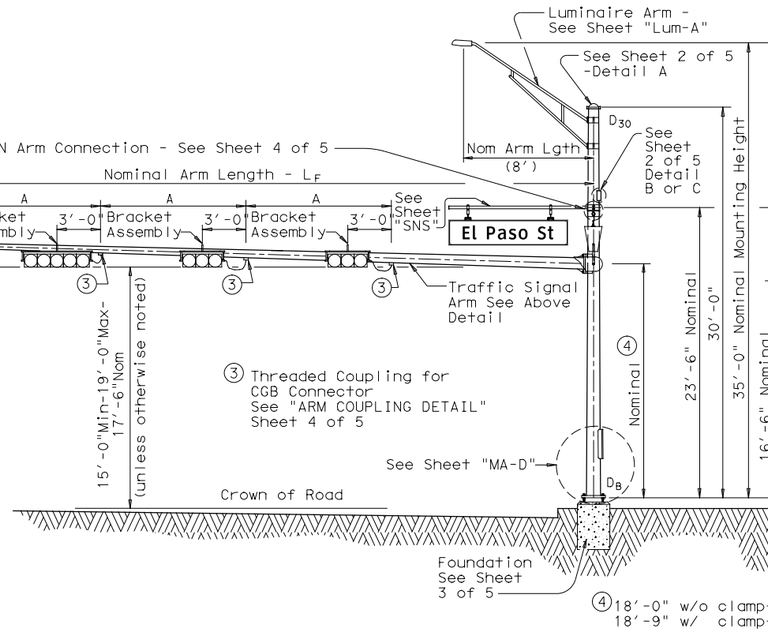
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
6-20	DIST	COUNTY		SHEET NO.
	33	TARRANT		110



FIXED MOUNT TRAFFIC SIGNAL ARM

① See Sheet 3 of 5 for Arm Rise



CLAMP-ON TRAFFIC SIGNAL ARM (IF REQUIRED)

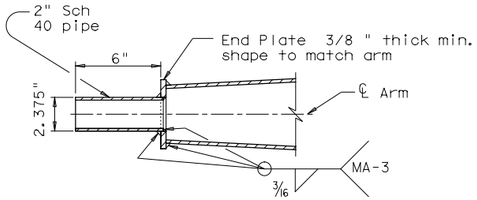
② See Sheet 4 of 5 for Arm Rise and Clamp-on Arm Details

ELEVATION
(Showing fixed mount arm)

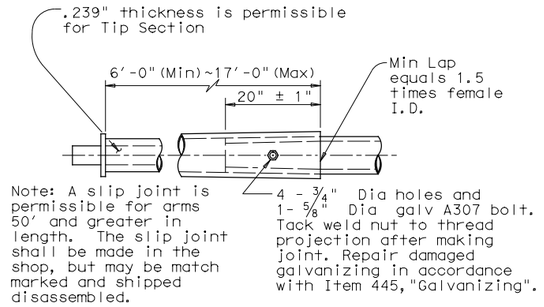
STRUCTURE ASSEMBLY

ELEVATION
(Showing clamp-on arm)

TABLE OF DIMENSIONS "A"										
Arm Length	24'	28'	32'	36'	40'	44'	50'	55'	60'	65'
Arm Type II	10'	11'	12'	13'						
Arm Type III			10'	11'	12'	12'				
Arm Type IV							12'	12'	12'	12'



TENON DETAIL



SLIP JOINT DETAIL (FIXED MOUNT ARM)

GENERAL NOTES:

Design conforms to 1994 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals and Interim Specifications thereto. Design Wind Speed can be either 100 mph or 80 mph plus a 1.3 gust factor. If clamp-on traffic signal is required, designs are based on an arm included angle of 90 degrees or more. Angles of less than approximately 75 degrees will require a special design.

Poles are designed to support one 8'-0" luminaire arm, two 9'-0" internally lighted street name (ILSN) signs and two traffic signal arms with limited length combinations.

Each arm with its related attachment is shown below

Arm	Equivalent DL ⑤	WL EPA ⑤⑥
8' Luminaire Arm	Luminaire 60 lbs	1.6 sq ft
9' ILSN Arm	Sign 85 lbs	11.5 sq ft
50' to 65' Fixed Mount Arm	Signal Loads 310 lbs	52 sq ft
Up to 44' Clamp-on Arm	Signal Loads 180 lbs	32.4 sq ft

⑤ Equivalent dead load plus horizontal wind load applied at the end of arm except ILSN arm, which applied 4.5' from the centerline of the pole.

⑥ Effective projected area (actual area times drag coefficient) for the application of horizontal wind load.

Except as noted in Sheet 1 thru 5 of 5, other details not covered shall refer to Standard Sheet "MA-D" for pole details, "LUM-A" for luminaire arm and connection details, "SNS" for internally lighted street name sign details, and "TS-FD" for anchor bolt and foundation details.

Fabrication shall be in accordance with Item 686, "Traffic Signal Pole Assemblies (Steel)" and with the details, dimensions, and weld procedures shown herein. Weld references call for preapproved weld procedures which the Fabricator must obtain prior to fabrication. Material, fabrication tolerances, and shipping practices shall also meet the requirements of this sheet and Item 686, "Traffic Signal Pole Assemblies (Steel)".

Unless otherwise noted, all parts shall be galvanized in accordance with Item 445, "Galvanizing" after fabrication.

Deviations from the details and dimensions shown herein require submission of shop drawings in accordance with the Item 441, "Steel Structures". Alternate designs are not acceptable.

Installation of damping plate for the long mast arm is not recommended.

Provision of the bracket assembly used to support the traffic signal heads shall be under the direction of the Engineer for approval.

Design also conforms to NCHRP Report 412 for fatigue resistance except that there are no stiffeners at the base plate. TxDOT is conducting tests to determine if stiffeners at the base plate will or will not result in optimal performance; depending upon the results of the tests, poles may need a retrofit to ensure optimal fatigue performance.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)
LMA(1)-12

Sheet 1 of 5

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT

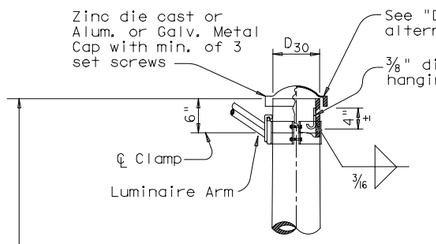
REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC	HULEN ST, ETC
DIST	COUNTY		SHEET NO.
33	TARRANT		111

DATE:
FILE:

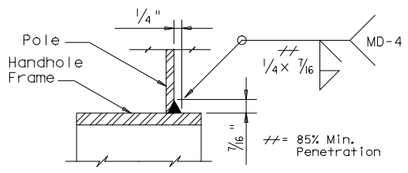
131A

DATE:
FILE:

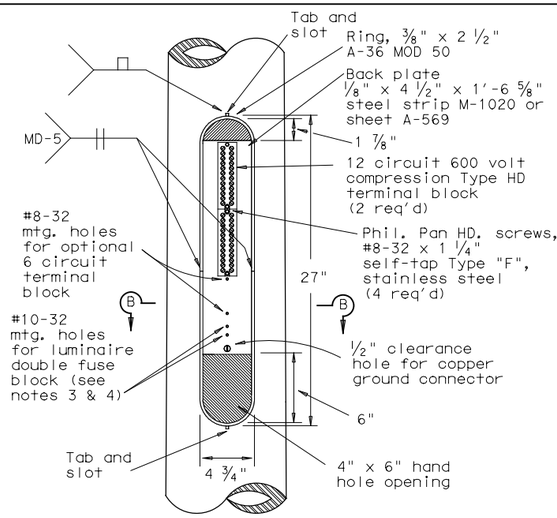


DETAIL A

(for pole with luminaire)



DETAIL H

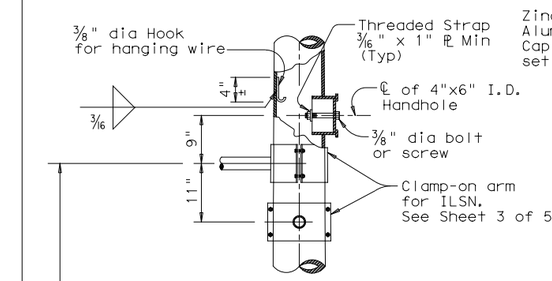


ACCESS COMPARTMENT

MATERIALS	
Round Shafts or Polygonal Shafts (7)	ASTM A595 Gr.A, A588, A1008 HSLAS Gr.50 Class 2, A1011 HSLAS Gr.50 Class 2, A572 Gr.50 or A1011 SS Gr.50 (8)
Plates (7)	ASTM A36, A588, or A572 Gr.50
Connection Bolts	ASTM A325, or A449 except where noted
Pin Bolts	ASTM A325
Pipe (7)	ASTM A53 Gr.B, A501, A1008 HSLAS-F Gr.50, A1011 HSLAS-F Gr.50
Misc. Hardware	Galvanized steel or stainless steel or as noted

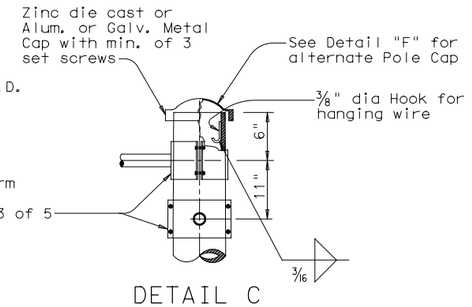
(7) ASTM A572, A1008 HSLAS, A1011 HSLAS, A1008 HSLAS-F, A1011 HSLAS-F, or A1011 SS may have higher yield strengths but shall not have less elongation than the grade indicated.

(8) ASTM A1011 SS Gr.50 shall also have a minimum elongation of 18 percent in 8 inches or 23 percent in 2 inches. Material thickness in excess of those stipulated under A1011 SS will be acceptable providing the material meets all other A1011 SS requirements and the requirements of this item.

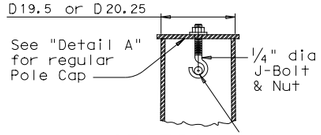


DETAIL B

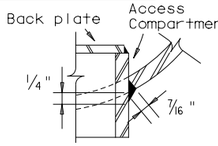
(If ILSN applied)



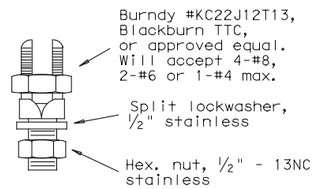
DETAIL C



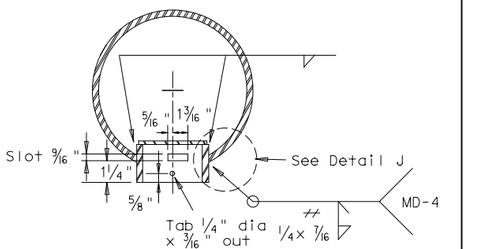
SECTION Y-Y



DETAIL J

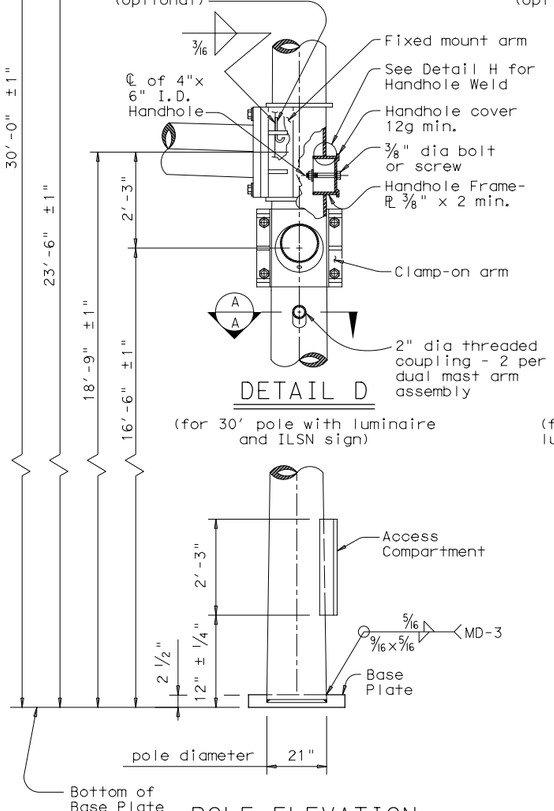


COPPER GROUND CONNECTOR



SECTION B-B // = 85% Min. Penetration

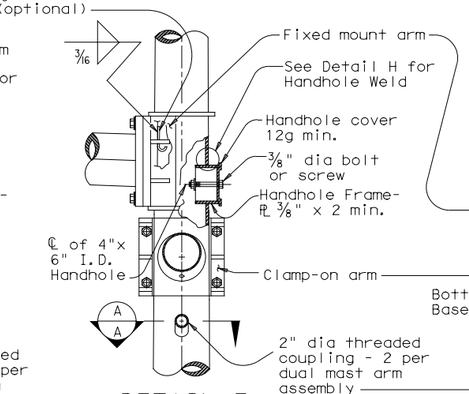
Opening for access compartment shall be no more than 1/16 inch wider than the access compartment itself.



DETAIL D

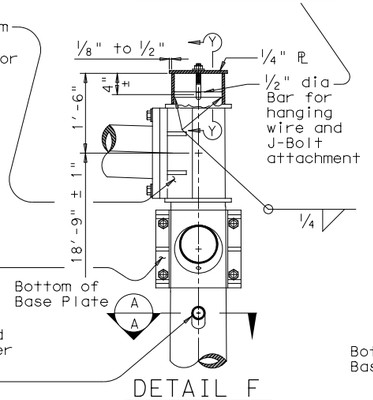
(for 30′ pole with luminaire and ILSN sign)

POLE ELEVATION



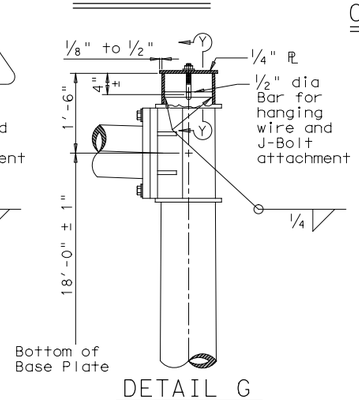
DETAIL E

(for 24′ pole with ILSN sign and no luminaire, single or dual mast arm)



DETAIL F

(for 20.25′ pole with no ILSN sign and no luminaire, dual mast arm)

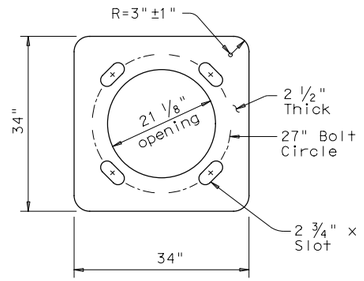


DETAIL G

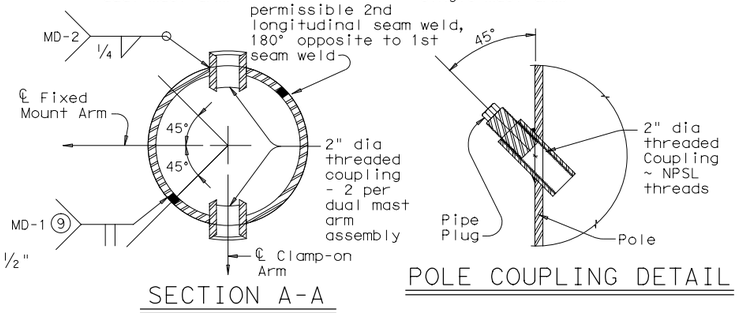
(for 19.5′ pole with no ILSN sign and no luminaire, single mast arm)

ACCESS COMPARTMENT NOTES:

1. The cover shall be one piece formed from ABS plastic, shall be a pearl gray color, and shall be suitable for exposure to harsh sunlight and extreme weather. Cover shall latch with two screw latches and shall fit tightly to the enclosure ring to create a rainproof seal. Latch screws shall be 1/4-20 stainless flat socket head screws with tamper proof feature.
2. The pole manufacturer shall provide with each pole a separate kit consisting of: one cover with two latching assemblies, two terminal strips (Marathon #985GP12CU or approved equal), four #8-32 x 1 1/4" self tapping type "F" stainless steel pan head screws, and one ground connector (Blackburn TTC, Burndy KC22J12T13, or Ilsco SSS-5). The traffic signal contractor shall install the kit items in the field.
3. The screw hole spacing on the enclosure back plate shall be for two Marathon #985GP12 terminal strips, one Marathon #985GP06CU terminal strip, and one Bussmann #BM6032B fuse block.
4. Install one Bussmann #BM6032B, Littelfuse #L60030M-2C, or Ferraz-Shawmut #30352 fuse block for poles where luminaires are to be installed.



BASE PLATE



SECTION A-A

POLE COUPLING DETAIL

(9) Longitudinal seam weld must be oriented within 90° (45° rotation each side) along the fixed mount arm. 60% min penetration required, 100% penetration within 6" of circumferential base weld.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

LMA(2)-12

Sheet 2 of 5

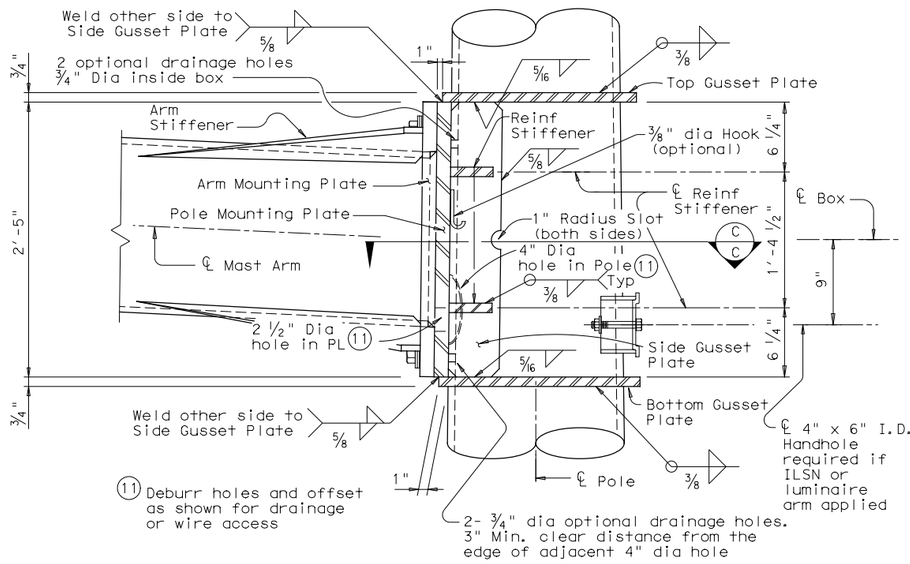
DN: JSY	CK: ARC	DW: TGG	CK: JSY

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC	HULEN ST, ETC

DIST	COUNTY	SHEET NO.
33	TARRANT	112

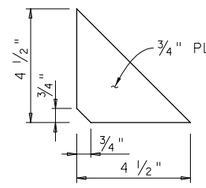
131B



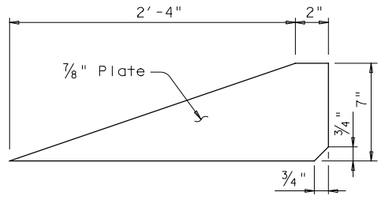
(11) Deburr holes and offset as shown for drainage or wire access

2- 3/4" dia optional drainage holes. 3" Min. clear distance from the edge of adjacent 4" dia hole

BUILT-UP BOX CONNECTION

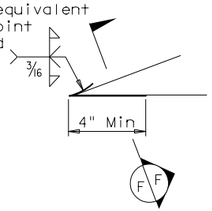


REINFORCING STIFFENER



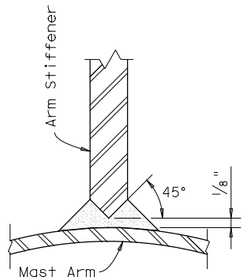
ARM STIFFENER
(Cut to match arm inclination and taper)

Provide Detail shown in SECTION F-F or equivalent 100% complete joint penetration weld from both sides.



Only 4" length at tip of Arm Stiffener requires a complete joint penetration weld. Smooth weld radius to connect Stiffener. Only a fillet weld is required for the remaining weld length.

DETAIL "K"



SECTION F-F

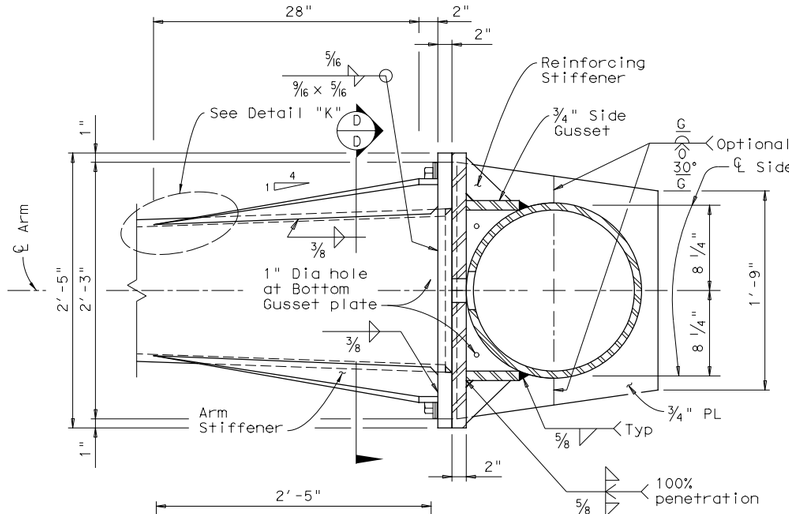
Fixed Mount Arm L_F	ROUND POLES (13)					Foundation Type
	D_B	$D_{19.5}$ or $D_{20.25}$	D_{24}	D_{30}	(12) thk	
ft.	in.	in.	in.	in.	in.	
50', 55' 60', 65'	21.0	18.2	17.6	16.8	.3125	48-A

Fixed Mount Arm L_F	ROUND ARMS (13)				
	L_1	D_1	D_2	(12) thk	Rise
ft.	ft.	in.	in.	in.	
50	49	18.5	11.7	.3125	3'- 3"
55	54	18.5	11.0	.3125	3'- 7"
60	59	18.5	10.3	.3125	3'-11"
65	64	18.5	9.6	.3125	4'- 4"

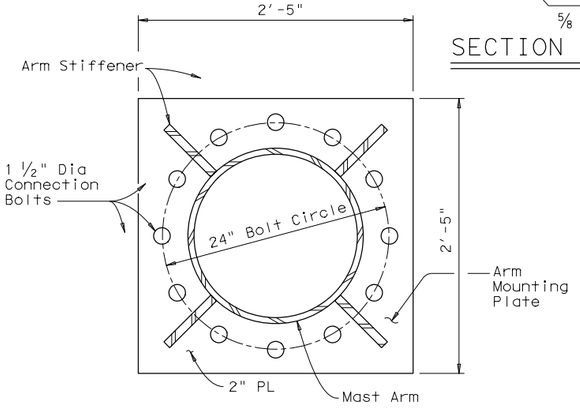
D_B = Pole Base O.D.
$D_{19.5}$ = Pole Top O.D. with no Luminaire and no ILSN (single mast arm)
$D_{20.25}$ = Pole Top O.D. with no Luminaire and no ILSN (dual mast arm)
D_{24} = Pole Top O.D. with ILSN w/out Luminaire
D_{30} = Pole Top O.D. with Luminaire
D_1 = Arm Base O.D.
D_2 = Arm End O.D.
L_1 = Shaft Length
L_F = Fixed Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

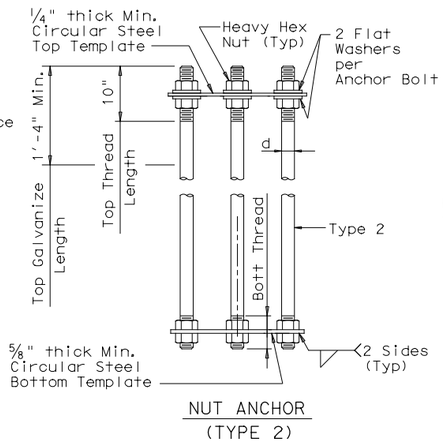
(13) Shaft profile 16-sided or 18-sided is considered to be equivalent to round section.



SECTION C-C

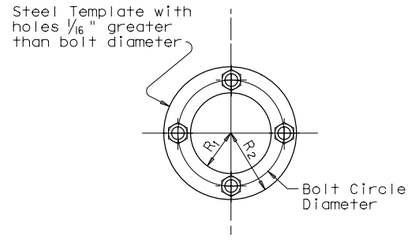


SECTION D-D



NUT ANCHOR
(TYPE 2)

ANCHOR BOLT ASSEMBLY



TEMPLATE DETAIL

FOUNDATION DESIGN TABLE													
FDN TYPE	DRILLED SHAFT DIA	REINFORCING STEEL		DRILLED SHAFT LENGTH-ft (16), (17), (18)			ANCHOR BOLT DESIGN (14)				FOUNDATION DESIGN LOAD (15)		TYPICAL APPLICATION
		VERT BARS	SPIRAL & PITCH	TEXAS CONE PENETROMETER N blows/ft			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips	
				10	15	40							
48-A	48"	20 #9	#4 at 6"	21.9	19.5	14.7	2 1/2"	55	27"	2	490	10	50' to 65' Mast arm assembly.

SEE SHEET "TS-FD" FOR ADDITIONAL DETAILS.

(14) Anchor bolt design develops the foundation capacity given under Foundation Design Laods.

(15) Foundation Design Loads are the allowable moments and shears at the base of the structure.

(16) Field Penetrometer readings at a depth of approximately 3 to 5 feet may be used to adjust shaft lengths.

(17) If rock is encountered, the Drilled Shaft shall extend a minimum of two diameters into solid rock.

(18) Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

GENERAL NOTES:

Built-up Box Connection: For the welded arm-to-pole connection as a build-up box configuration illustrated here is an example only, fabricators are required to submit a shop drawing of box connection for approval. The drawing shall specify the details of each box element, welds of arm-to-pole connection, arm-to-plate socket connection, and arm rise creation. Specify the proper location of drain holes along the pole. 2 1/2" dia hole in the pole mounting plate and 4" dia hole in the pole need to be aligned for wiring access or drainage. Arm stiffeners cut to match arm inclination and taper shall also be included.

The deviation from flat for either arm or pole mounting plate shall not exceed 1/32 in., which is measured along the center of mounting plate to a radial distance of 13.5 in. The deformed-from-flat connection between arm and pole mounting plates shall not be allowed if the center of both mounting plates cannot contact directly.

Fixed mount details are used for single mast arm assemblies and for the first arm on dual mast arm assemblies.

ANCHOR BOLT & TEMPLATE SIZE						
Bolt Dia in.	Length ‡	Top Thread	Bottom Thread	Bolt Circle	R_2	R_1
2 1/2"	5'-2"	10"	6 1/2"	27"	16"	11"

‡ Min dimension given, longer bolts are acceptable.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES
LONG MAST ARM ASSEMBLY (50 TO 65 FT)
(80 AND 100 MPH WIND ZONE)

Sheet 3 of 5 LMA(3)-12

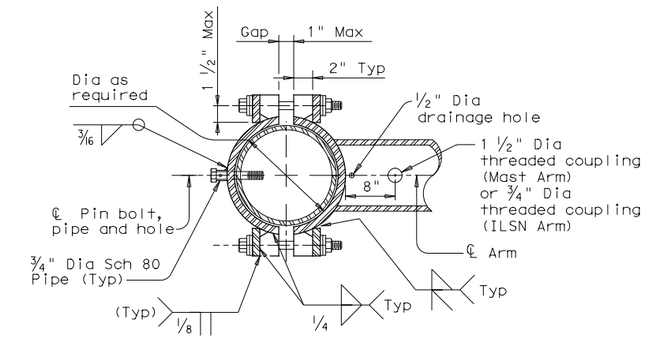
DN: JSY	CK: ARC	DW: TGG	CK: JSY

REVISIONS
4-20-01
1-12

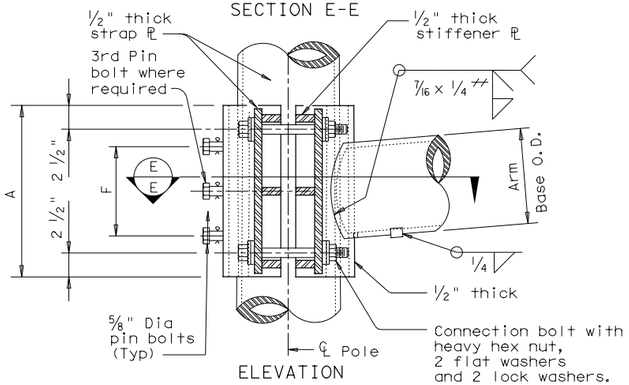
CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC	HULEN ST, ETC
DIST	COUNTY		SHEET NO.
33	TARRANT		113

131C

DATE:
FILE:



SECTION E-E



ELEVATION
(Mast Arm or ILSN Arm to pole)

⁄⁄ = 85% Min. Penetration

CLAMP-ON CONNECTION

80 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	6.5	3.8	.179	1'-9"	19.1	7.0	3.5	.179	1'-8"
24	23.1	7.5	4.3	.179	1'-10"	23.1	7.5	3.5	.179	1'-9"
28	27.1	8.0	4.2	.179	1'-11"	27.1	8.0	3.5	.179	1'-10"
32	31.0	9.0	4.7	.179	2'-1"	31.0	9.0	3.5	.179	2'-0"
36	35.0	9.5	4.6	.179	2'-4"	35.0	10.0	3.5	.179	2'-1"
40	39.0	9.5	4.1	.239	2'-8"	39.0	9.5	3.5	.239	2'-3"
44	43.0	10.0	4.1	.239	2'-11"	43.0	10.0	3.5	.239	2'-6"

100 MPH WIND

Clamp-on Arm Lc	ROUND ARMS					POLYGONAL ARMS				
	L_1	D_1	D_2	thk (12)	Rise	L_1	D_1	D_2	thk (12)	Rise
ft.	ft.	in.	in.	in.		ft.	in.	in.	in.	
20	19.1	8.0	5.3	.179	1'-8"	19.1	8.0	3.5	.179	1'-7"
24	23.1	9.0	5.8	.179	1'-9"	23.1	9.0	3.5	.179	1'-8"
28	27.1	9.5	5.7	.179	1'-10"	27.1	10.0	3.5	.179	1'-9"
32	31.0	9.5	5.2	.239	1'-11"	31.0	9.5	3.5	.239	1'-10"
36	35.0	10.0	5.1	.239	2'-0"	35.0	10.0	3.5	.239	1'-11"
40	39.0	10.5	5.1	.239	2'-3"	39.0	11.0	3.5	.239	2'-1"
44	43.0	11.0	5.1	.239	2'-8"	43.0	11.5	4.0	.239	2'-3"

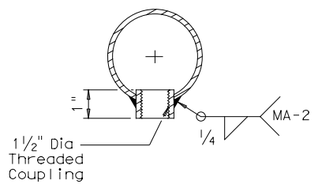
D1 = Arm Base O.D.
D2 = Arm End O.D.
L1 = Shaft Length
Lc = Clamp-on Arm Length

(12) Thickness shown is minimum, thicker materials may be used.

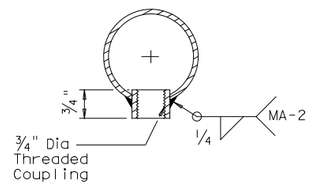
CLAMP-ON ARM CONNECTION

ILSN Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Sch 40 pipe Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
3	.216	10	4	¾	2

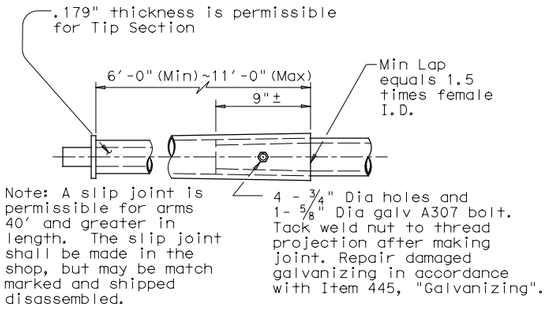
Mast Arm Size		A	F	4 Conn. Bolts	5/8" Dia. Pin Bolts
Base Dia	Thick			Dia	No.
in.	in.	in.	in.	in.	ea
6.5	.179	12	6	1	2
7.5	.179	14	8	1	2
8.0	.179	14	8	1	2
9.0	.179	16	10	1	2
9.5	.179	18	12	1 ¼	3
9.5	.239	18	12	1 ¼	3
10.0	.239	18	12	1 ¼	3
10.5	.239	18	12	1 ¼	3
11.0	.239	18	12	1 ¼	3
11.5	.239	18	12	1 ¼	3



ARM COUPLING DETAIL



ILSN ARM COUPLING DETAIL

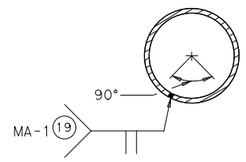


Note: A slip joint is permissible for arms 40' and greater in length. The slip joint shall be made in the shop, but may be match marked and shipped disassembled.

SLIP JOINT DETAIL (CLAMP-ON ARM)

Stainless steel bands (or Cables) and cast bracket as in "Astro-Brac", "Sky Bracket" or "Easy Bracket" with 1 ½" Dia Threaded Coupling.

BRACKET ASSEMBLY



ARM WELD DETAIL

(19) Longitudinal Seam Weld must be oriented within the lower 90° of the signal arm.
60% Min penetration
100% penetration within 6" of circumferential base welds.

GENERAL NOTES:

Clamp-on details are used for the second arm on dual mast arm assemblies or ILSN arm support. For a clamp-on mast arm, a maximum 1 ½" wide vertical slotted hole may be cut in the front clamp plate to facilitate drainage during galvanizing. The slot shall be centered behind the arm and shall be no longer than the arm diameter minus 1". For an ILSN arm, a 1 ½" diameter hole shall be cut in the front clamp plate for wire access. A matched hole shall be field drilled through the pole to provide wire access after arm is oriented. Deburr both holes.

Where duplicate parts occur on a detail, welds shown for part shall apply to all similar parts on the detail.

Pin bolts are required to prevent rotation of clamp-on arms under design wind forces. Pin bolts shall be ASTM A325 with threads excluded from the shear plane. Pin bolt and ¾" diameter pipe shall have 3/16" diameter holes for a 1/8" diameter galvanized cotter pin. Back clamp plate shall be furnished with a ¾" diameter hole for each pin bolt. An 11/16" diameter hole for each pin bolt shall be field drilled through the pole after arm orientations have been approved by the Engineer.

Texas Department of Transportation
Traffic Operations Division

TRAFFIC SIGNAL SUPPORT STRUCTURES

LONG MAST ARM ASSEMBLY (50 TO 65 FT) (80 AND 100 MPH WIND ZONE)

Sheet 4 of 5 LMA(4)-12

DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC	HULEN ST, ETC
DIST	COUNTY		SHEET NO.
33	TARRANT		114

131D

DATE:
FILE:

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Shipping Parts List						
Ship each pole with the following attached: enlarged hand hole, pole cap, fixed arm connection bolts and washers, and any additional hardware listed in the table.						
Nominal Arm Length	30′ Poles with Luminaire See note above plus: one (or two if ILSN attached) small hand hole, clamp-on simplex		24′ Poles with ILSN See note above plus one small hand hole		19.50′ (Single Mast Arm) 20.25′ (Dual Mast Arm) Poles with no Luminaire and no ILSN See note above	
Single Mast Arm						
Lf ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50	50L		50S		50	
55	55L		55S		55	
60	60L		60S		60	
65	65L		65S		65	
Dual Mast Arm						
Lf ft. / Lc ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
50 / 20	5020L		5020S		5020	
50 / 24	5024L		5024S		5024	
50 / 28	5028L		5028S		5028	
50 / 32	5032L		5032S		5032	
50 / 36	5036L		5036S		5036	
50 / 40	5040L		5040S		5040	
50 / 44	5044L		5044S		5044	
55 / 20	5520L		5520S		5520	
55 / 24	5524L		5524S		5524	
55 / 28	5528L		5528S		5528	
55 / 32	5532L		5532S		5532	
55 / 36	5536L		5536S		5536	
55 / 40	5540L		5540S		5540	
55 / 44	5544L		5544S		5544	
60 / 20	6020L		6020S		6020	
60 / 24	6024L		6024S		6024	
60 / 28	6028L		6028S		6028	
60 / 32	6032L		6032S		6032	
60 / 36	6036L		6036S		6036	
60 / 40	6040L		6040S		6040	
60 / 44	6044L		6044S		6044	
65 / 20	6520L		6520S		6520	
65 / 24	6524L		6524S		6524	
65 / 28	6528L		6528S		6528	
65 / 32	6532L		6532S		6532	
65 / 36	6536L		6536S		6536	
65 / 40	6540L		6540S		6540	
65 / 44	6544L		6544S		6544	

Foundation Summary Table **

Location Ident.	Avg. N Blow/ft.	No. Each	Drill Shaft *** Length (feet)
			48-A
Total Drill Shaft Length			

Shipping Parts List		
Traffic Signal Arms (Fixed Mount) (1 per pole) Ship each arm with listed equipment attached		
Nominal Arm Length	Type IV Arm (4 Signals) 3 Bracket Assembly and 4 CGB Connectors	
ft.	Designation	Quantity
50	50IV	
55	55IV	
60	60IV	
65	65IV	

Luminaire Arms (1 per 30′ pole)

Nominal Arm Length	Quantity
8′ Arm	

ILSN Arm (Max. 2 per pole) Ship with clamps, bolts and washers

Nominal Arm Length	Quantity
7′ Arm	
9′ Arm	

Traffic Signal Arms (80 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm Length	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp w/bolts and washers		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp w/bolts and washers	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-80					
24	24I-80		24II-80			
28	28I-80		28II-80			
32			32II-80		32III-80	
36			36II-80		36III-80	
40					40III-80	
44					44III-80	

Traffic Signal Arms (100 MPH Clamp-On Mount) (1 per pole) Ship each arm with listed equipment attached

Nominal Arm	Type I Arm (1 Signal) 2 CGB connector and 1 clamp w/bolts and washers		Type II Arm (2 Signals) 1 Bracket Assembly and 3 CGB connectors, and 1 clamp		Type III Arm (3 Signals) 2 Bracket Assembly and 4 CGB connectors, and 1 clamp	
ft.	Designation	Quantity	Designation	Quantity	Designation	Quantity
20	20I-100					
24	24I-100		24II-100			
28	28I-100		28II-100			
32			32II-100		32III-100	
36			36II-100		36III-100	
40					40III-100	
44					44III-100	

Anchor Bolt Assemblies (1 per pole)

Anchor Bolt Diameter	Anchor Bolt Length	Quantity
2 1/2 "	5′ - 3"	

Each anchor bolt assembly consists of the following: Top and bottom templates, 4 anchor bolts, 8 nuts, 8 flat washers and 4 nut anchor devices (type 2) per Standard Drawing "TS-FD". Templates may be removed for shipment.

Notes

** Foundations may be listed separately or grouped according to similarity of location and type. Quantities are for the Contractor's information only.

*** Decimal lengths in Design Table are to allow interpolation for other penetrometer values. Round to nearest foot for entry into Summary Table.

Abbreviations

Lf= Fixed Arm Length
Lc= Clamp-on Arm Length (44′ Max.)

Texas Department of Transportation
Traffic Operations Division

LONG MAST ARM ASSEMBLY PARTS LIST

LMA(5)-12

Sheet 5 of 5

DN: JK	CK: GRB	DW: FDN	CK: CAL

REVISIONS
4-20-01
1-12

CONT	SECT	JOB	HIGHWAY
0902	90	207, ETC	HULEN ST, ETC
DIST	COUNTY		SHEET NO.
33	TARRANT		115

131E

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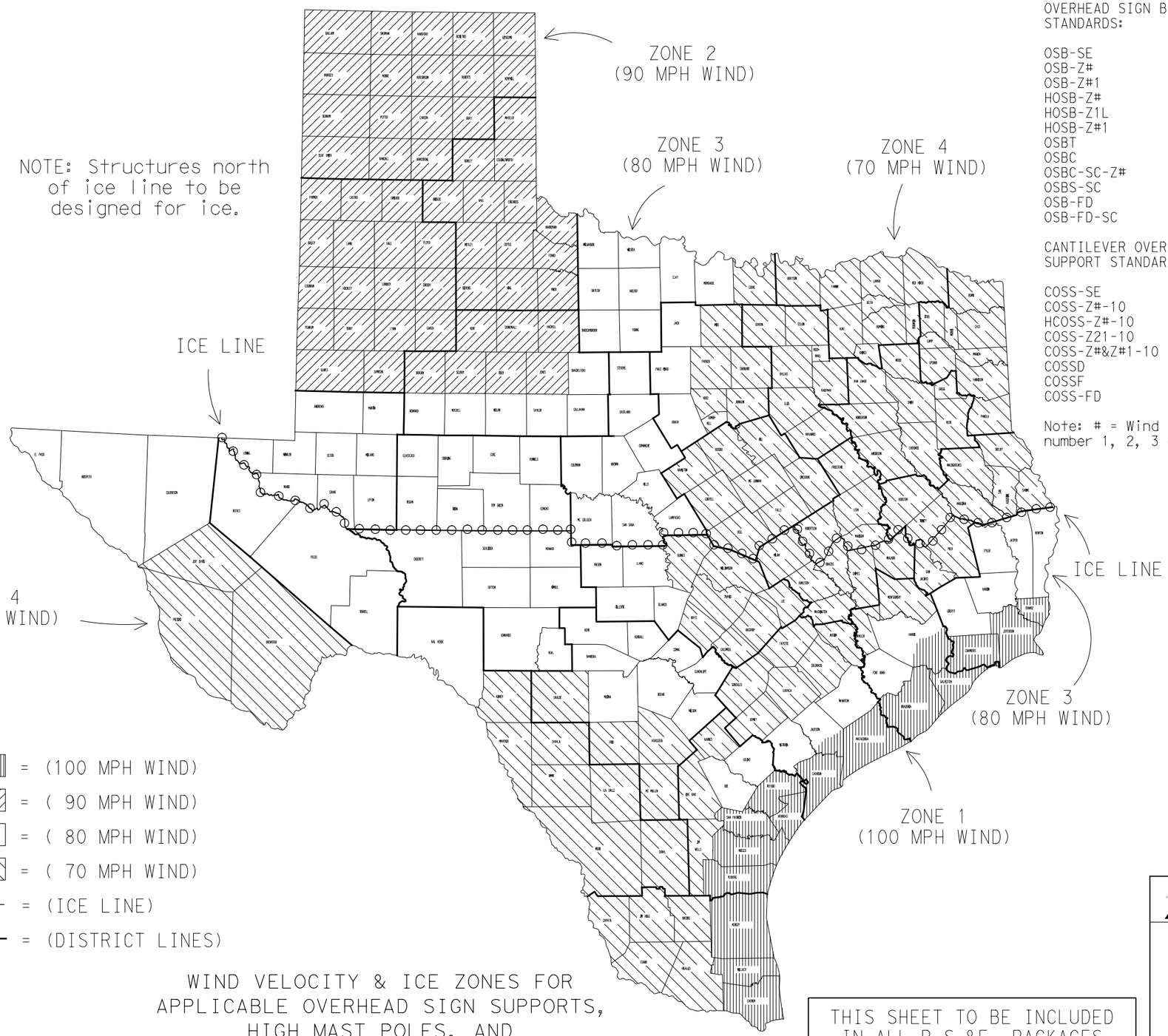


LEGEND

ZONE 1 - = (100 MPH WIND)
ZONE 2 - = (90 MPH WIND)
ZONE 3 - = (80 MPH WIND)
ZONE 4 - = (70 MPH WIND)
= (ICE LINE)
= (DISTRICT LINES)

WIND VELOCITY & ICE ZONES FOR APPLICABLE OVERHEAD SIGN SUPPORTS, HIGH MAST POLES, AND TRAFFIC SIGNAL POLES

Based on 50 Year Mean Recurrence Interval of Fastest Mile Wind Velocity at 33 feet height.

THIS SHEET TO BE INCLUDED IN ALL P.S.&E. PACKAGES CONTAINING ONE OR MORE OF THE APPLICABLE STANDARD SHEETS LISTED HEREON

APPLICABLE STANDARDS SHEETS

OVERHEAD SIGN BRIDGE STANDARDS:

OSB-SE
OSB-Z#
OSB-Z#1
HOSB-Z#
HOSB-Z1L
HOSB-Z#1
OSBT
OSBC
OSBC-SC-Z#
OSBS-SC
OSB-FD
OSB-FD-SC

CANTILEVER OVERHEAD SIGN SUPPORT STANDARDS:

COSS-SE
COSS-Z#-10
HCOSS-Z#-10
COSS-Z21-10
COSS-Z#&Z#1-10
COSSD
COSSF
COSS-FD

Note: # = Wind Zone number 1, 2, 3 or 4

HIGH MAST ILLUMINATION POLE STANDARDS:

HMIP-98
HMIF-98

WALKWAYS AND BRACKETS STANDARDS:

SWW
SB(SWL-1)

TRAFFIC SIGNAL POLE STANDARDS:

SP-80
SP-100
SMA-80
SMA-100
DMA-80
DMA-100
MA-C
MAC(ILSN)
MAD-D
TS-FD
LUM-A
CFA
LMA
TS-C
MA-DPD

FOR HARRIS CO. ONLY
Zone line is just North of US 90, around on the North, West and South sides of IH 610 and down the West side of SH 288.

FOR JACKSON CO. ONLY
Zone line is just North of SH 616.

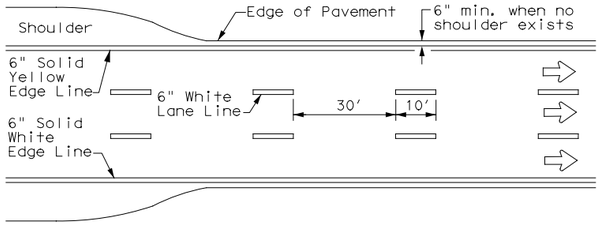
Texas Department of Transportation

Traffic Operations Division Standard

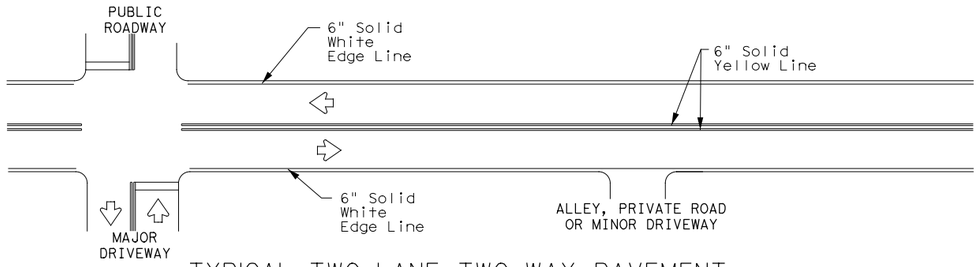
WIND VELOCITY AND ICE ZONES

WV & IZ-14

FILE: windice.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
© TxDOT April 1996	CONT	SECT	JOB	HIGHWAY
REVISIONS 8-14-Added list of applicable standards, restricting use to structures designed for fastest Mile wind speeds.	0902	90	207, ETC	HULEN ST, ETC
	DIST	COUNTY		SHEET NO.
	33	TARRANT		116



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



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

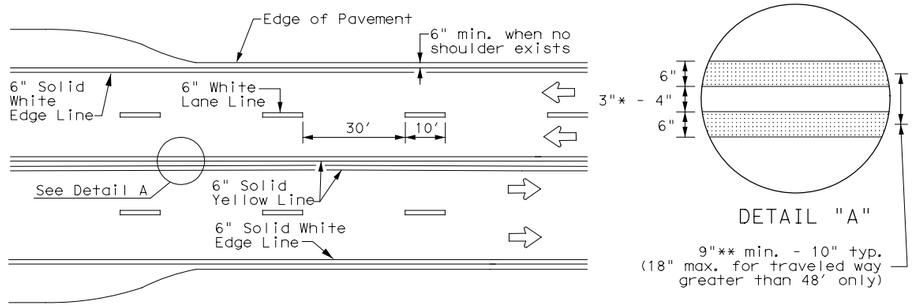
GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines 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 center of edge line to the center of edge line 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.



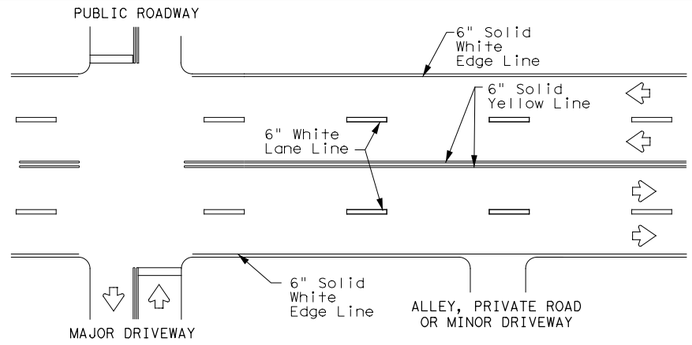
DETAIL "A"

9"** min. - 10" typ.
(18" max. for traveled way greater than 48' only)

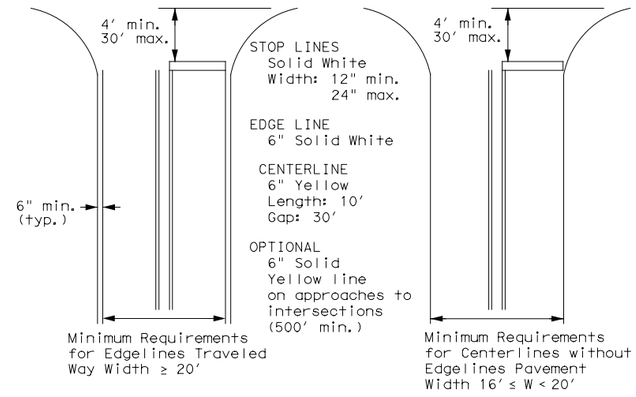
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS

* 2" minimum for restripe projects when approved by the Engineer.

** 8" minimum for restripe projects when approved by the Engineer.

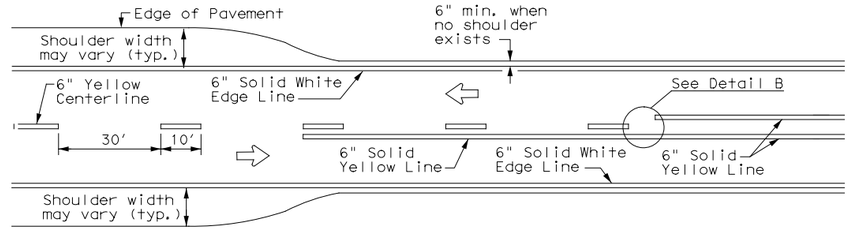


TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS

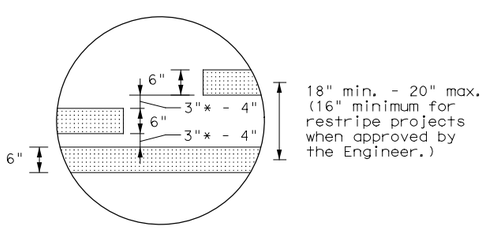


NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths
for Undivided Roadways

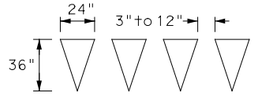


TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



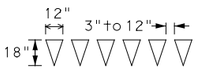
DETAIL "B"

* 2" minimum for restripe projects when approved by the Engineer.

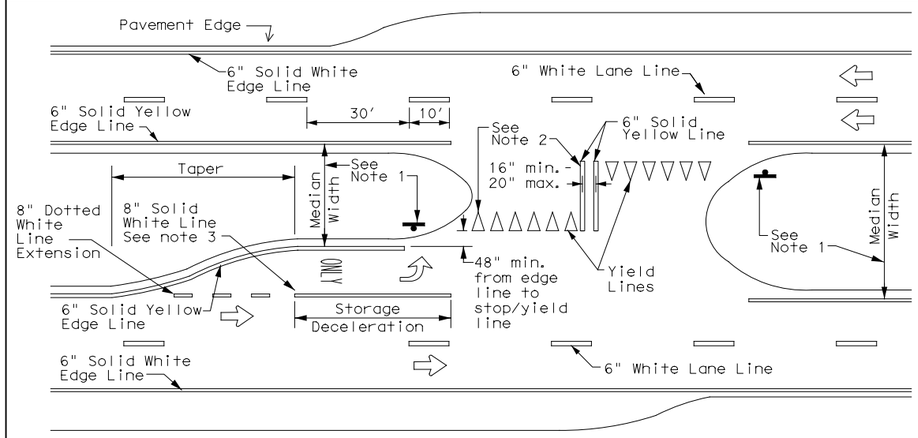


For posted speed on road being marked equal to or greater than 45 MPH.

YIELD LINES



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



FOUR LANE DIVIDED ROADWAY CROSSOVERS

NOTES

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

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

Texas Department of Transportation

Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

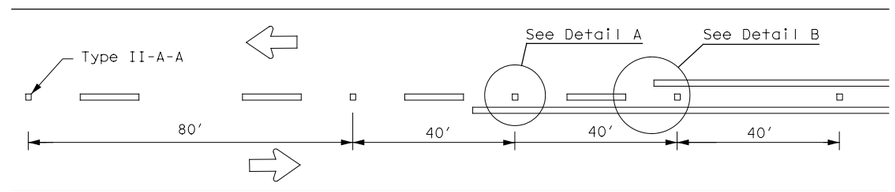
PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20	0902	90	207, ETC	HULEN ST, ETC
8-95 3-03 12-22	DIST	COUNTY		SHEET NO.
5-00 2-12	33	TARRANT		117

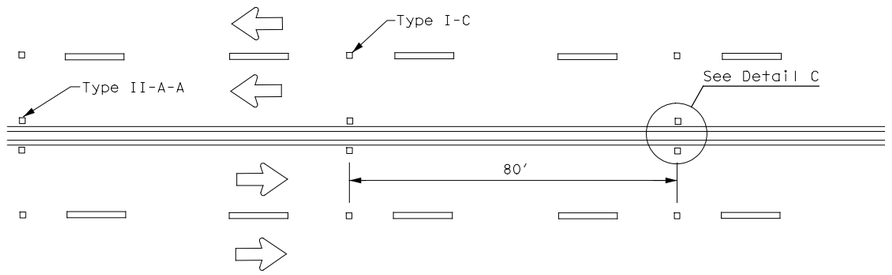
22A

DATE:
FILE:

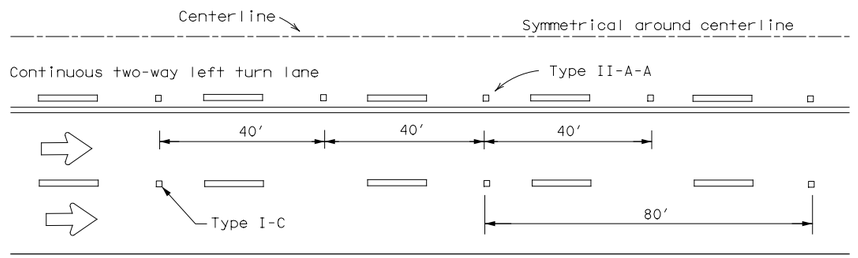
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE



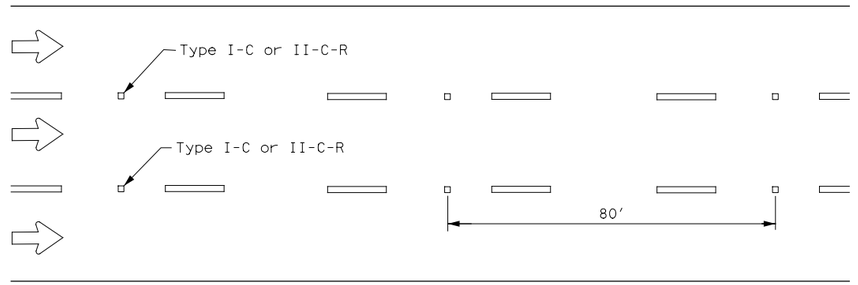
CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY ROADWAYS



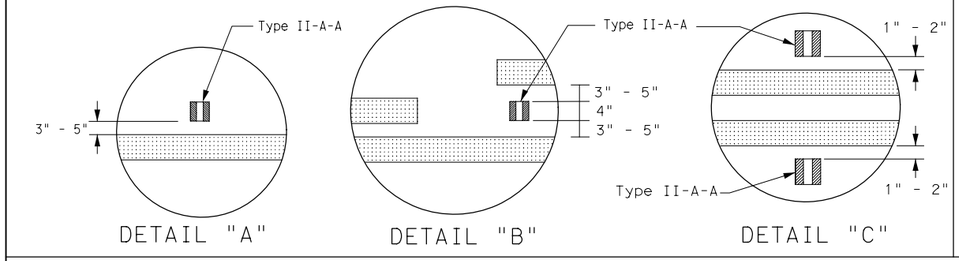
CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



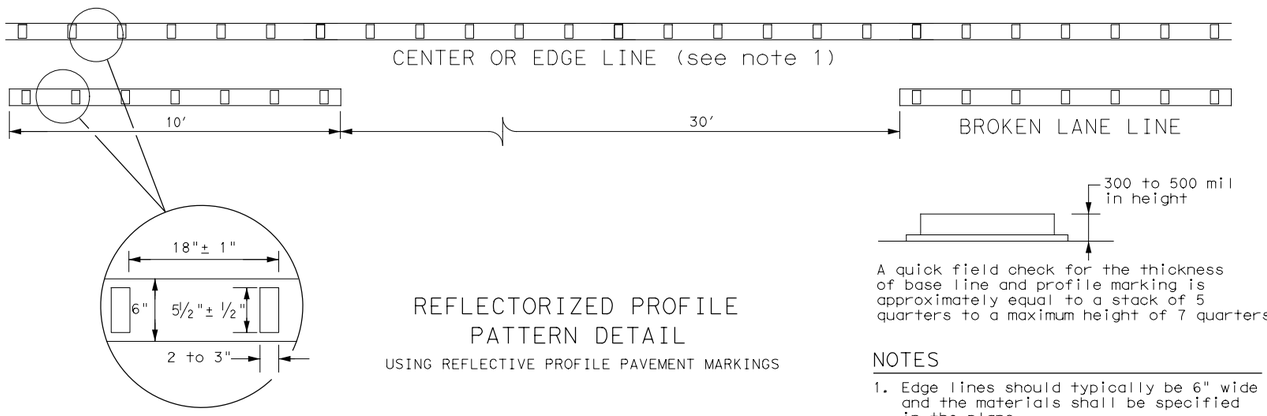
LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

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

See Note 3.



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



6" EDGE LINE, 6" CENTERLINE
OR 6" LANE LINE

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.

NOTES

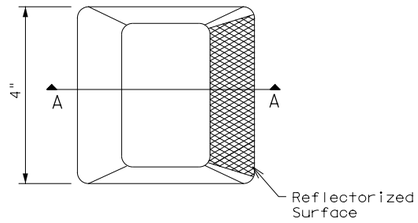
1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

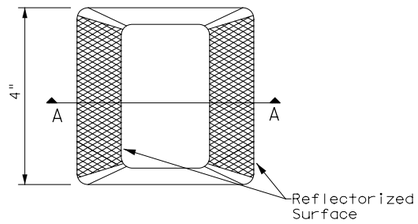
1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements, the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians, and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

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

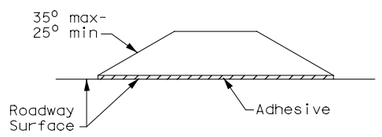
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation

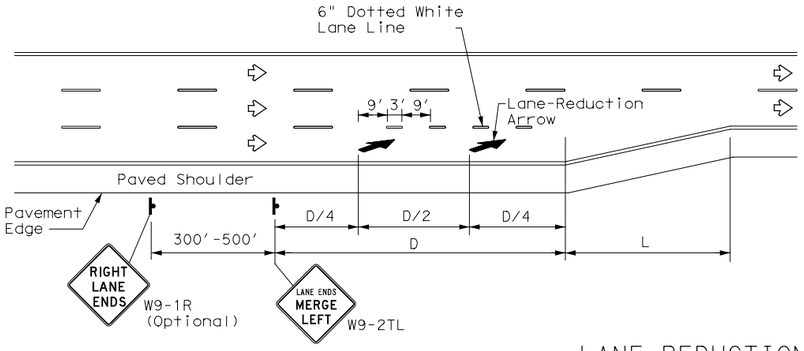
Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS REFLECTORIZED PROFILE MARKINGS PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20 4-92 2-10 12-22 5-00 2-12	0902	90	207, ETC	HULEN ST, ETC
	DIST	COUNTY		SHEET NO.
	33	TARRANT		118

22B

DATE:
FILE:

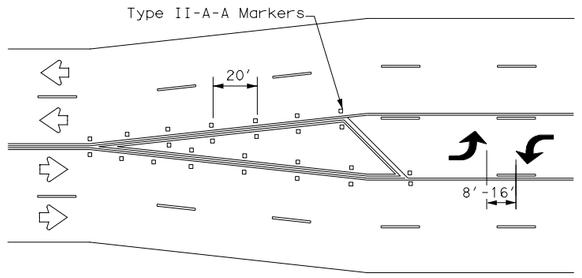


LANE REDUCTION

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 RIGHT LANE ENDS (W9-1R) 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.

ADVANCED WARNING SIGN DISTANCE (D)		
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	



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.

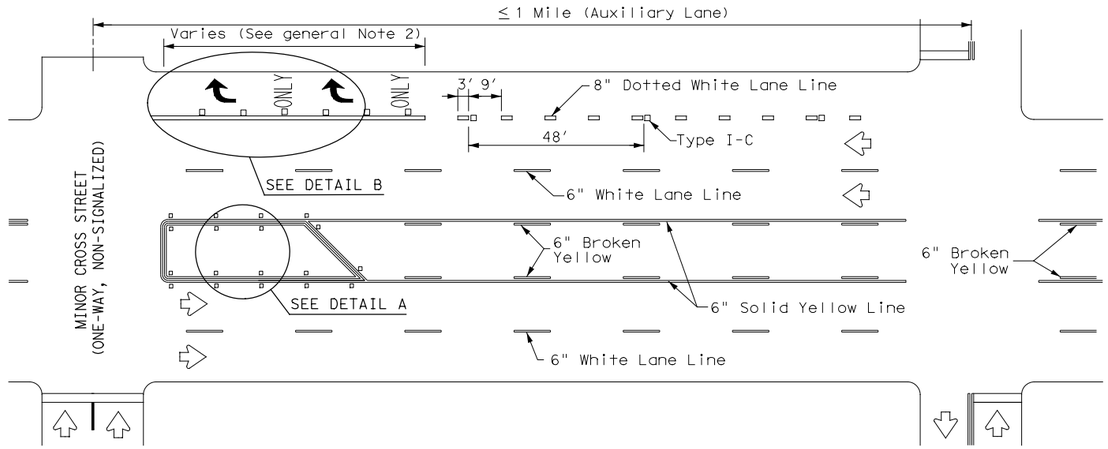
TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

GENERAL NOTES

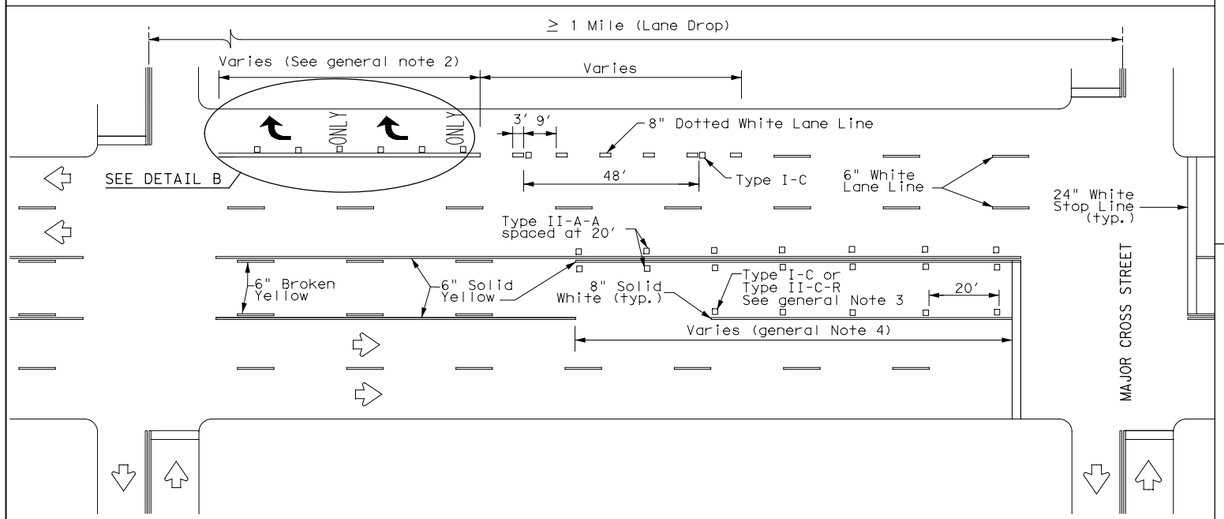
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn 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. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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

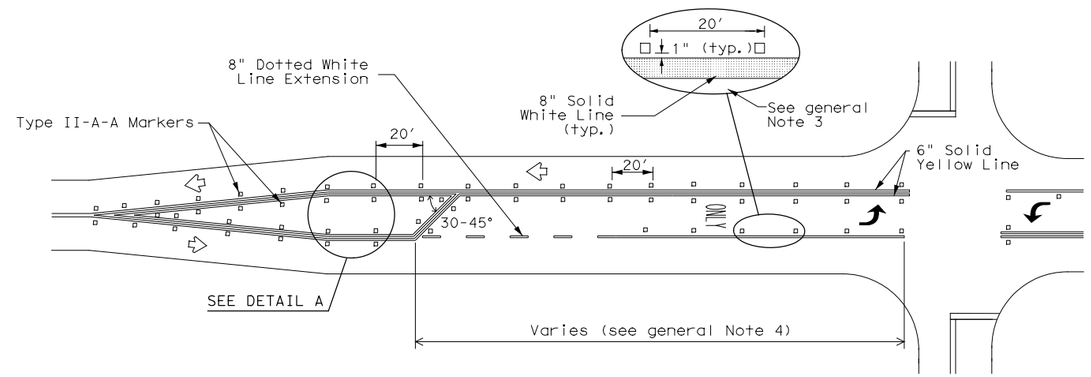
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



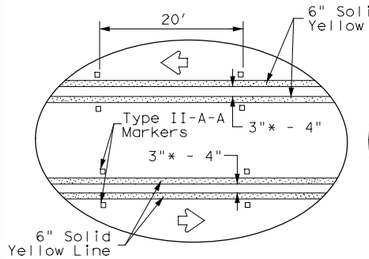
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



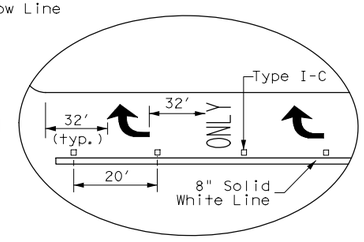
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL B

* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation

Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

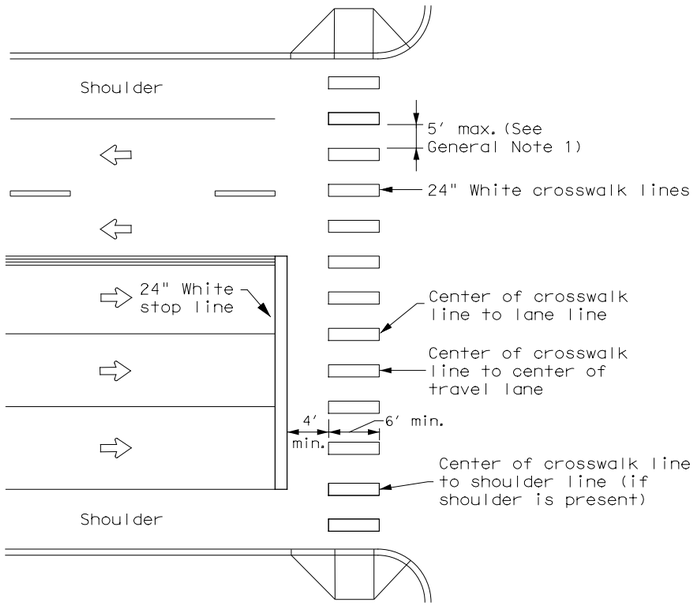
PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20 5-00 2-10 12-22 8-00 2-12	0902	90	207, ETC	HULEN ST, ETC
	DIST	COUNTY		SHEET NO.
	33	TARRANT		119

22C

DATE:
FILE:

DATE:
FILE:



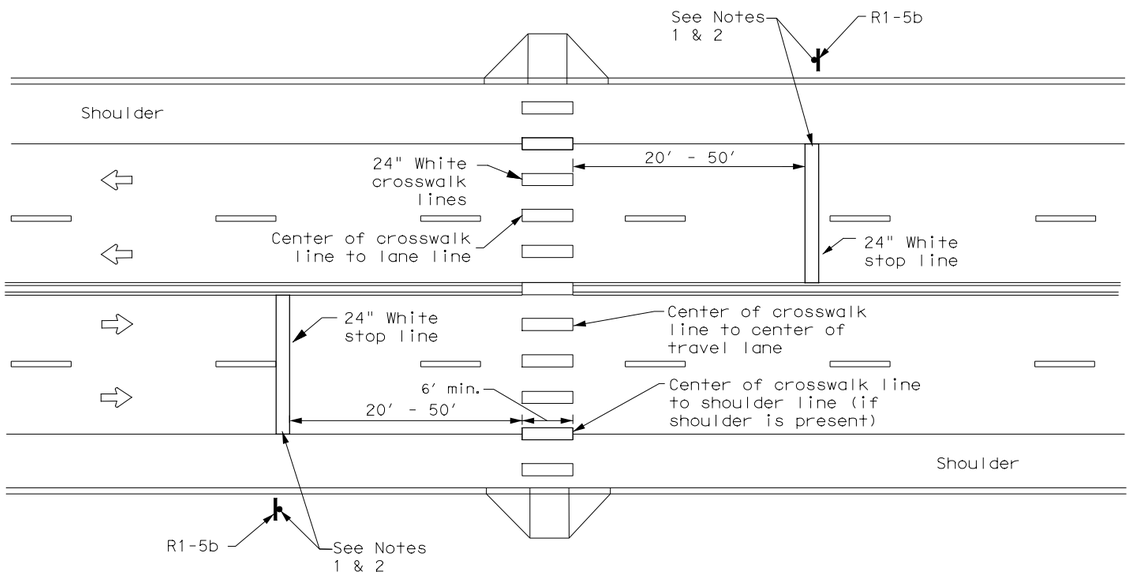
HIGH-VISIBILITY LONGITUDINAL CROSSWALK
AT CONTROLLED APPROACH

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6" clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6′ wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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

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



UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY
LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation

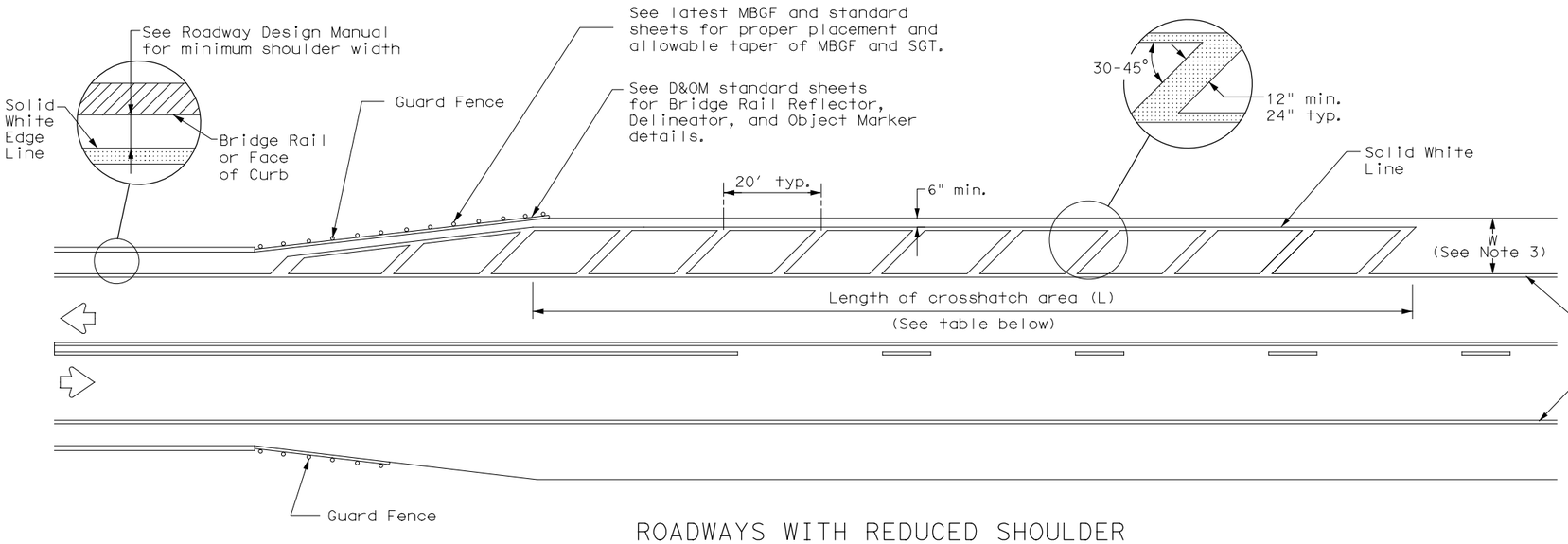
Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE: pm4-22a.dgn	DN:	CK:	DW:	CK:
© TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
6-20	DIST	COUNTY		SHEET NO.
6-22	33	TARRANT		120
12-22				
22D				

DATE:
FILE:



ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

CROSSHATCH LENGTH (L)	
Posted Speed (MPH)	L (ft)
30	300 ft
35	
40	
45	
50	500 ft
55	
60	
65	
70	
75	

NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 4 inches from the bridge rail or face of curb or 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions.
2. No-passing zone on bridge approach is optional. If used, the no-passing zone shall be a minimum 500 feet long from the beginning of the bridge.
3. The crosshatching should be required if the shoulder width in advance of the bridge is 4 feet or wider and a reduction of at least 3 feet in shoulder width across the bridge occurs.
4. On divided highways, review both the right and left shoulder widths for the need for narrow bridge pavement markings.

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

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

Texas Department of Transportation

Traffic Safety Division Standard

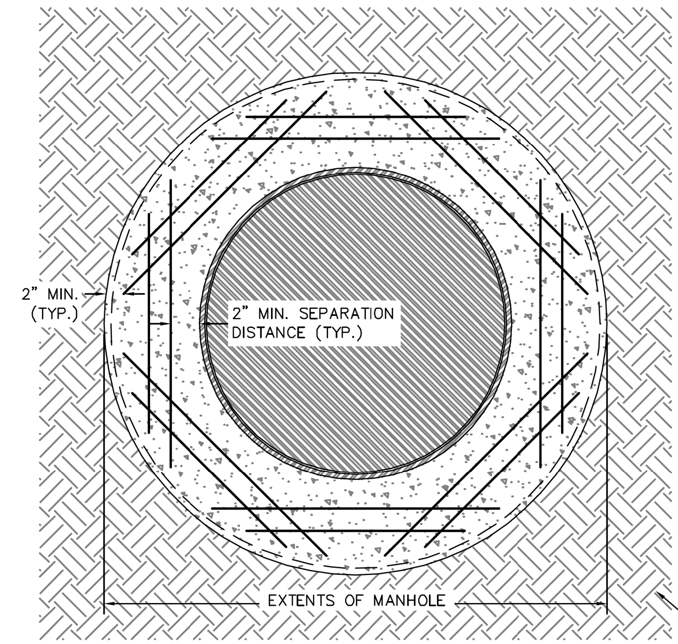
PAVEMENT MARKINGS FOR ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

PM(5)-22

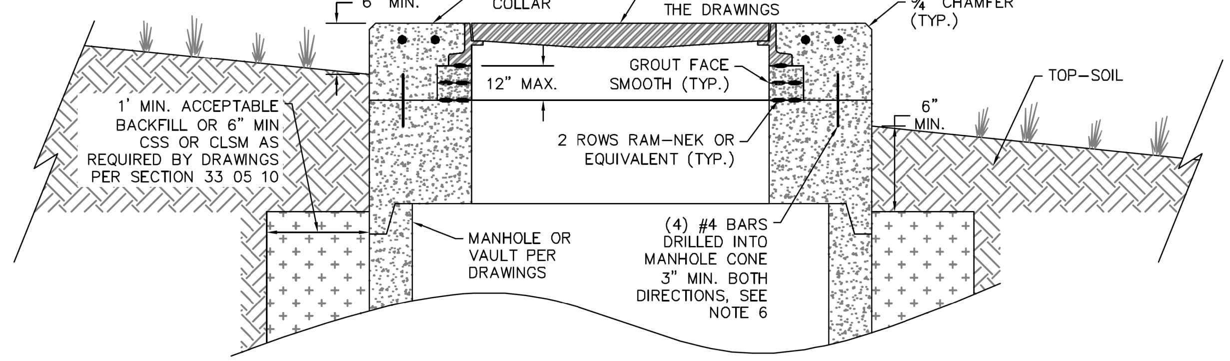
FILE: pm5-22.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
	CONT	SECT	JOB	HIGHWAY
REVISIONS	0902	90	207, ETC	HULEN ST, ETC
	DIST	COUNTY		SHEET NO.
	33	TARRANT		121

22E

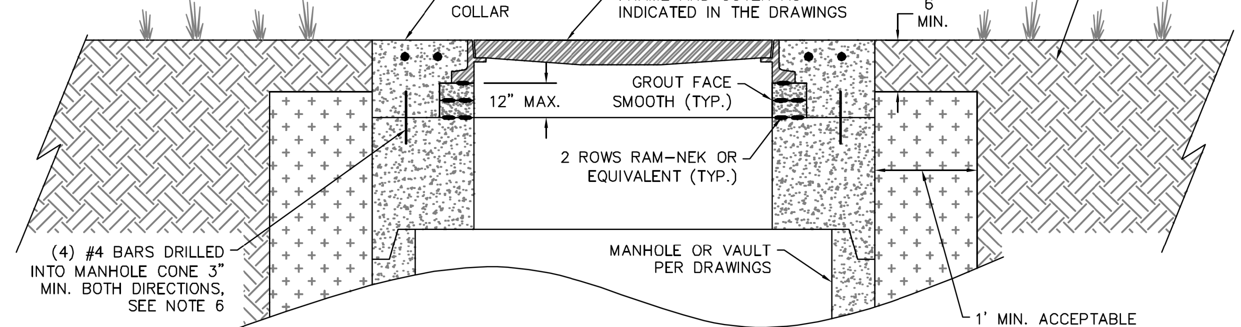
NOTES:
1. THIS DETAIL TO BE USED ONLY WHERE SPECIFIED ON THE DRAWINGS IN COMBINATION WITH PROPOSED MANHOLE OR VAULT IN THE SAME LOCATION.
2. ONLY FLAT TOP MANHOLES SHALL BE ALLOWED FOR UNIMPROVED SURFACES. CONE MANHOLES WILL NOT BE ALLOWED.
3. IF GRADE RINGS ARE USED THEY SHALL BE NO LESS THAN 2" THICK, AND SHALL NOT EXCEED 12" IN TOTAL HEIGHT. NO MORE THAN 3 TOTAL GRADE RINGS. SHALL BE ALLOWED.
4. ALL MEASUREMENTS ARE TYPICAL FOR ALL SIDES OF MANHOLE/VAULT LID ASSEMBLY.
5. MANHOLE FLAT TOP SHALL EXTEND 6" MIN. ABOVE HIGHEST ADJACENT UNIMPROVED SURFACE WHEN RAISED MANHOLE IS INDICATED IN THE DRAWINGS.
6. PROVIDE REINFORCEMENT TYING COLLAR TO MANHOLE.
7. WHERE POSSIBLE, RING AND FRAME MAY BE INTEGRALLY CAST INTO FLAT TOP, PROVIDED ALL OTHER SPACING REQUIREMENTS ARE MET.
8. WHEN USED, CONCRETE COLLARS SHALL BE POURED TO EXTENTS OF CONCRETE FLAT TOP.
9. MANHOLE SHALL BE RAISED OR FLUSH AS INDICATED ON THE DRAWINGS.



PLAN VIEW



RAISED SECTION VIEW



FLUSH SECTION VIEW

1' MIN. ACCEPTABLE BACKFILL OR 6" MIN CSS OR CLSM AS REQUIRED BY DRAWINGS PER SECTION 33 05 10

FORT WORTH

CITY OF FORT WORTH, TEXAS

MANHOLE LID ASSEMBLY - UNIMPROVED SURFACE (FLAT TOP)

REVISED: 08-31-2012

33 05 13-D015

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312

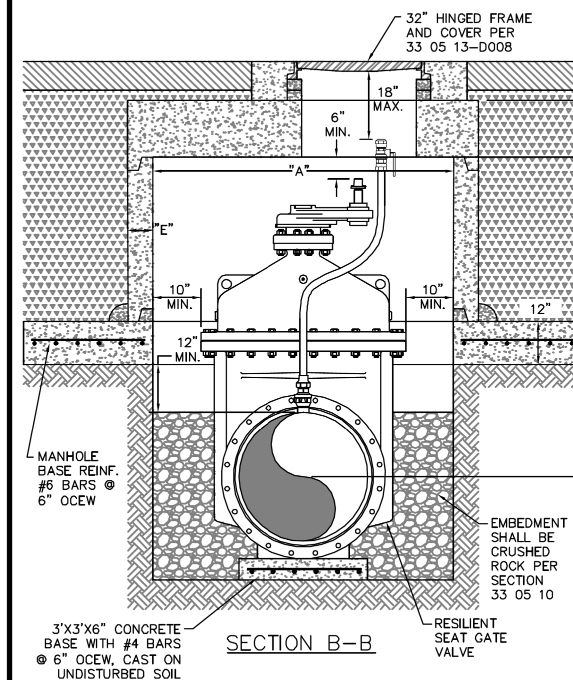
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

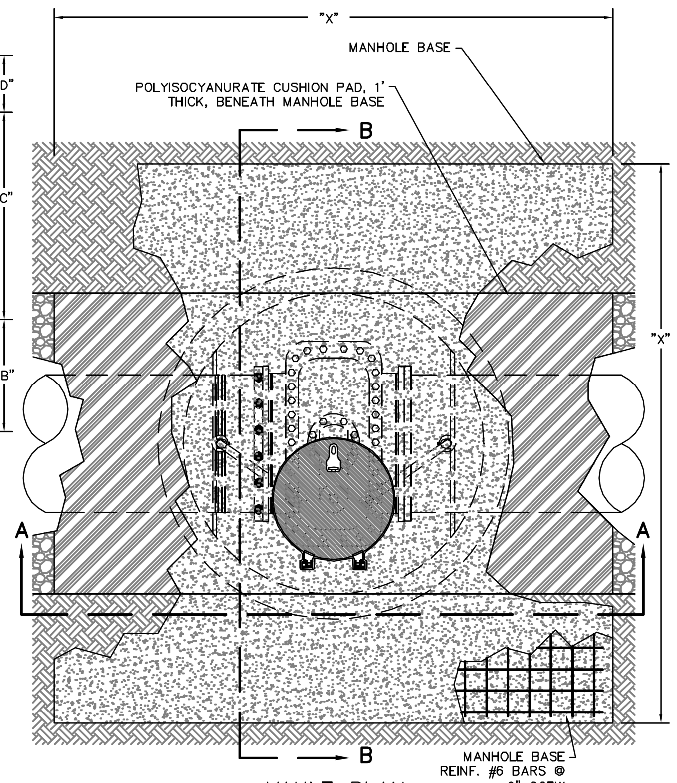
CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE:
SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	122



SECTION B–B



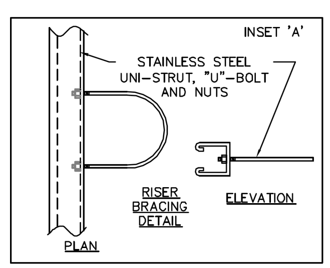
VAULT–PLAN

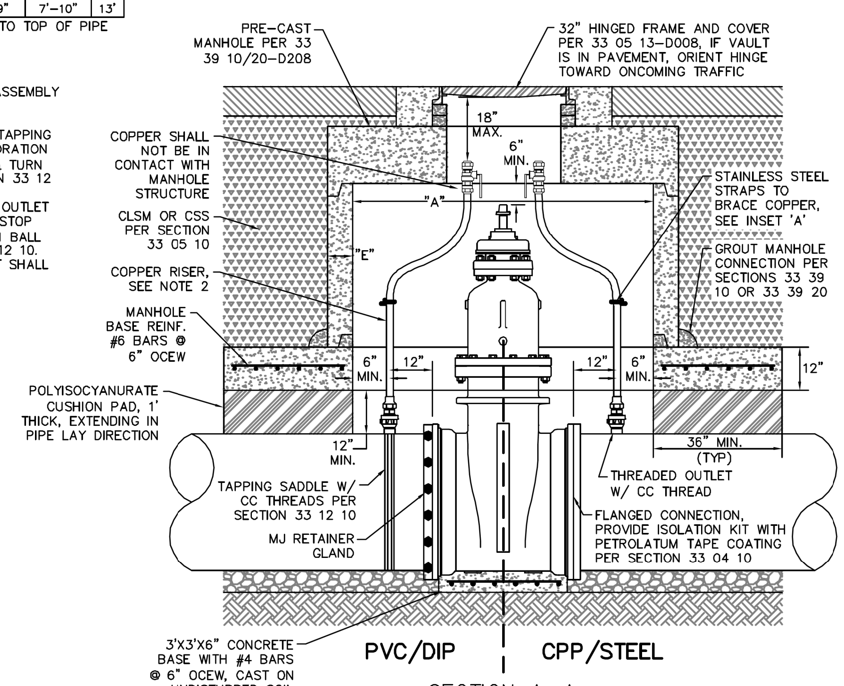
DIMENSION TABLE									
GATE VALVE SIZE	A	B	MIN. C	D	E	RISER SIZE	MIN. BURY DEPTH PAVED*	MIN. BURY DEPTH UNPAVED*	X
16"	5' ø	1'-8"	2'-6"	13"	5"	1"	6'-2"	5'-3"	11'
18"	6' ø	1'-9"	3'-7"	16"	6"	1"	6'-10"	5'-11"	12'
20"	6' ø	1'-10"	3'-7"	16"	6"	1"	6'-10"	5'-11"	12'
24"	6' ø	2'-0"	3'-9"	16"	6"	1"	7'-0"	6'-1"	12'
30"	7' ø	2'-3"	4'-11"	16"	7"	2"	8'-2"	7'-3"	13'
36"	7' ø	2'-6"	5'-6"	16"	8"	2"	8'-9"	7'-10"	13'

*MINIMUM BURY DEPTH IS FROM FINISHED GRADE TO TOP OF PIPE

NOTES:

1. VAULT TOP SHALL BE PER MANHOLE LID ASSEMBLY DETAILS AS INDICATED ON THE DRAWINGS.
2. RISERS:
   - 2.1. DUCTILE IRON OR PVC PIPE: PROVIDE TAPPING SADDLE WITH CC THREAD, BALL CORPORATION STOP CCxFLARE, COPPER RISER AND ¼ TURN BALL VALVE FLARExFLARE PER SECTION 33 12 10.
   - 2.2. STEEL OR CPP: PROVIDE A THREADED OUTLET WITH CC THREAD, BALL CORPORATION STOP CCxFLARE, COPPER RISER AND ¼ TURN BALL VALVE FLARExFLARE PER SECTION 33 12 10.
3. TO OPEN ALL VALVES THE OPERATING NUT SHALL BE TURNED TO THE RIGHT (CLOCKWISE).





SECTION A–A

FORT WORTH

CITY OF FORT WORTH, TEXAS

WATER TRANSMISSION GATE VALVE & VAULT (16" - 36")

REVISED: 08-31-2012

33 12 20-D127

MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

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FORT WORTH, TX 76137-2720
(817) 847-1422

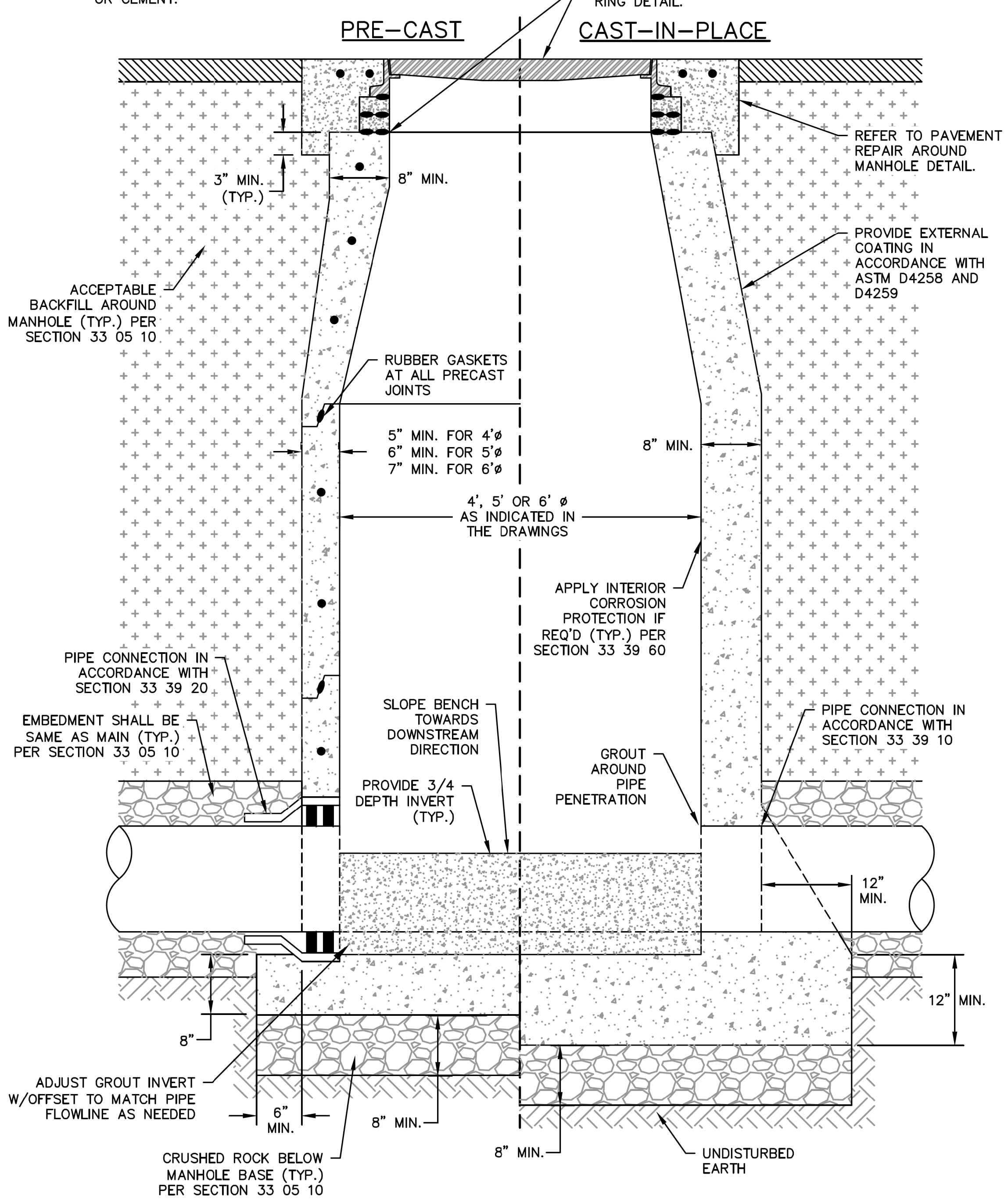
Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

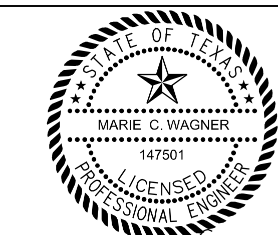
SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	123
CHECK	0902	90	207, ETC.	

NOTES:
1. MANHOLE TOP SHALL BE PER MANHOLE FRAME, COVER AND GRADE RING DETAIL AS INDICATED IN THE DRAWINGS.
2. FOR CAST-IN-PLACE MANHOLES, CURE FOR THREE DAYS BEFORE BACKFILLING AROUND STRUCTURE
3. IF SOIL CONDITIONS OR GROUND WATER PREVENT USE OF COARSE AGGREGATE BASE A 2-INCH MUD SLAB MAY BE SUBSTITUTED.
4. CAST-IN-PLACE CONCRETE SHALL BE PER SECTOIN 03 30 00.
5. PRE-CAST JOINTS SHALL CONFORM TO ASTM C478.
6. DO NOT WIPE JOINTS OR GRADE RINGS WITH GROUT, MORTAR OR CEMENT.
7. UNLESS OTHERWISE INDICATED IN THE DRAWINGS, 4'ø MANHOLES SHALL BE USED FOR 21" AND SMALLER SANITARY SEWER LINES AND 5'ø MANHOLES SHALL BE USED 24" UP TO 36" SANITARY SEWER LINES.
8. 6'ø STANDARD MANHOLES SHALL BE REQUIRED FOR 90° BENDS ON 36" SANITARY SEWER LINES.
9. CAST IRON HINGED LIDS SHALL BE REQUIRED FOR ALL SANITARY SEWER MANHOLES WITH A RIM ELEVATION GREATER THAN 12-INCHES ABOVE NATURAL GROUND.



FORT WORTH	CITY OF FORT WORTH, TEXAS	REVISED: 12-01-2021
	STANDARD SANITARY SEWER MANHOLE	33 39 10/20-D208



Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation
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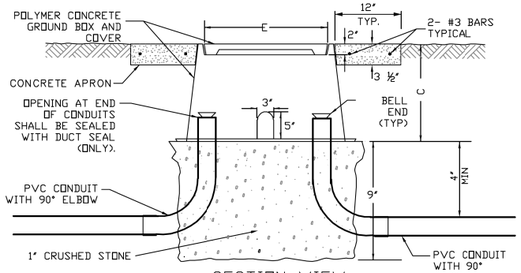
CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

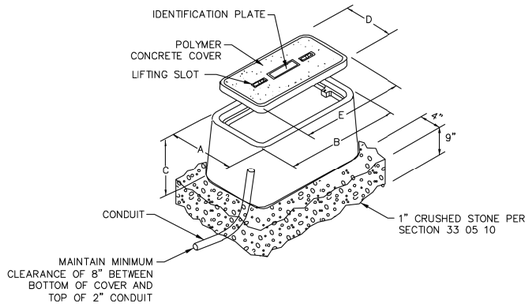
DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
CHECK	TEXAS	FTW	TARRANT	
	CONTROL	SECTION	JOB	124
CHECK	0902	90	207, ETC.	

Default
FTW
TXDOT-OR



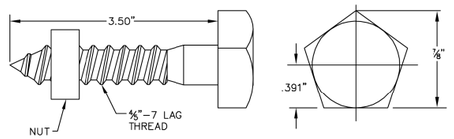
SECTION VIEW

SHOWING DIMENSIONS OF BOX AND ACCOMPANYING FIELD INSTALLATION

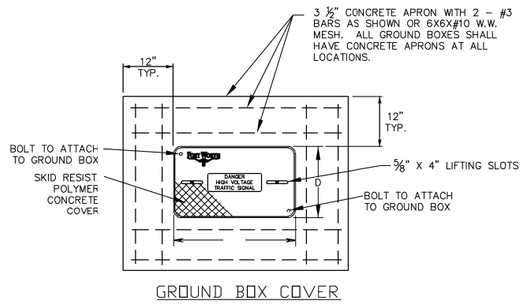


PULL BOX	NOMINAL GROUND BOX DIMENSIONS			NOMINAL COVER DIMENSIONS	
	A	B	C	D	E
TYPE B	15 ½"	25"	18"	13 ¾"	23 ¼"
TYPE D	19 ¼"	32 ¼"	22"	17 ½"	30 ½"

GROUND BOX DETAIL



SELF CLEANING BOLT AND NUT FOR COVERS



GROUND BOX COVER

NOTES:

1. ALL BOXES SHALL MEET ALL TEST REQUIREMENTS OF THE LATEST SCTE 77 "SPECIFICATION FOR UNDERGROUND ENCLOSURE INTEGRITY" FOR TIER 22 APPLICATIONS.
2. BOTTOM EDGE OF BOX OR EXTENSION SHALL BE FOOTED WITH A MINIMUM 1 ¼" FLANGE.
3. COVER LIFT EYE: MOLDED WITH COVER.
4. COVER LETTERING: 1" INCISED LETTERS "DANGER HIGH VOLTAGE TRAFFIC SIGNAL".
5. COVER MUST BE SECURED WITH "PENTA HEAD", STAINLESS STEEL, SELF CLEANING BOLTS AND NUTS. SEE DETAIL THIS SHEET. PROVIDE SECURITY BOLTS IF INDICATED IN THE PLANS.
6. THE GROUND BOXES FOR THIS PROJECT SHALL MEET THE REQUIREMENTS SHOWN ABOVE. THE CONTRACTOR WILL BE PERMITTED TO FURNISH LIKE MATERIALS OF ANY MANUFACTURER PROVIDED THEY ARE STAMPED AND CERTIFIED BY A PROFESSIONAL ENGINEER FROM THE STATE OF TEXAS, OR VERIFIED BY A NATIONALLY RECOGNIZED INDEPENDENT TESTING LAB AND THEY ARE OF EQUAL OR BETTER QUALITY AND COMPLY WITH THE SPECIFICATIONS.
7. LUBE BOLTS, CLEAN OUT COVER RIM, AND CLEAN GROUND BOX INSIDE AND OUT PRIOR TO FINAL INSPECTION.
8. COVER MUST HAVE INCISED CITY LOGO ON TOP LEFT CORNER. SIZE SHALL BE 9 IN INCH WIDTH AND 4.5 INCH IN HEIGHT.

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL GROUND BOX DETAILS

REVISED: 11-03-2021

34 41 10-D601

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	125

4/19/2024 4:41:00 PM TXDOT-OR Default ...\TXDOT-OR*MON*PENTABLE.tbl
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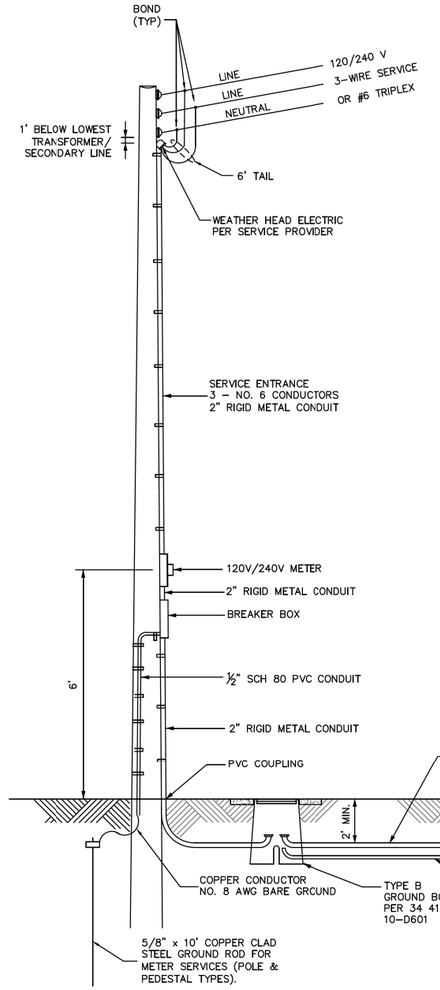
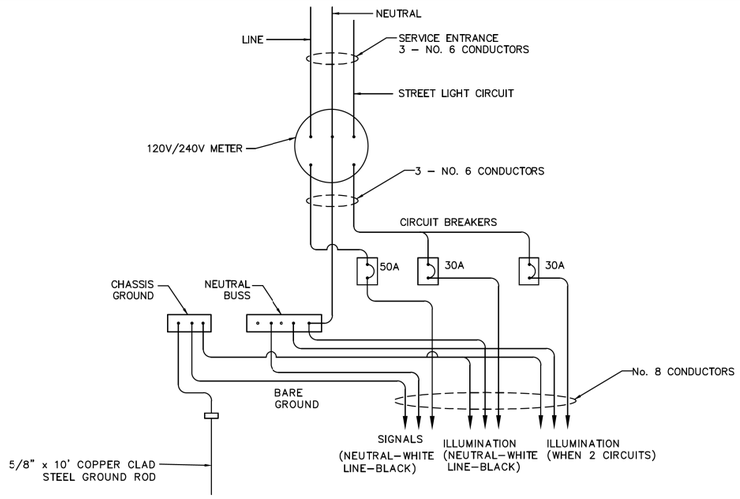
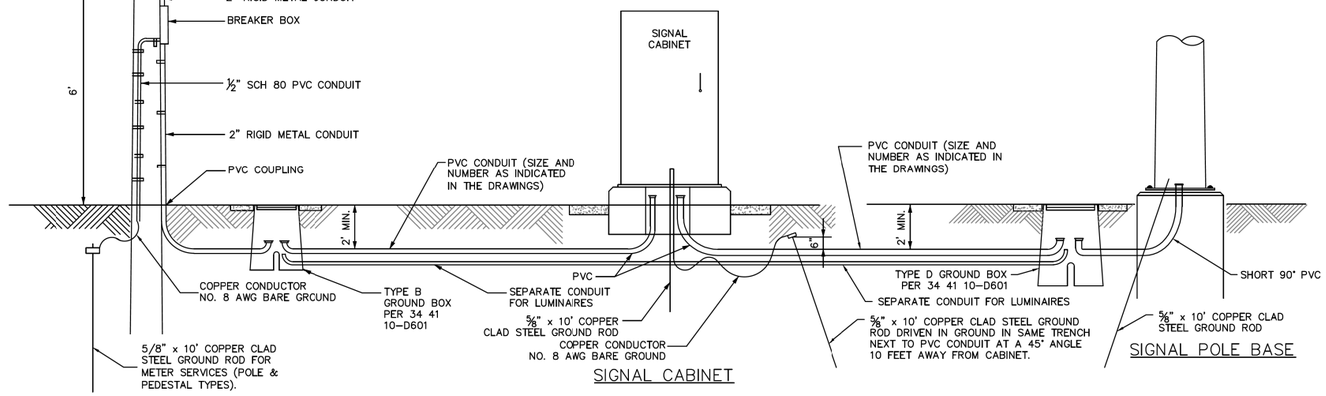


WOOD POLE SERVICE



120V/240V SERVICE ASSEMBLY SCHEMATIC



SIGNAL CABINET

SIGNAL POLE BASE

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL ELECTRICAL SERVICE DETAILS

REVISED: 11-19-2015

34 41 10-D602

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	126
CHECK	0902	90	207, ETC.	

4/19/2024 4:41:08 PM 3581 TXDOT-OR Default
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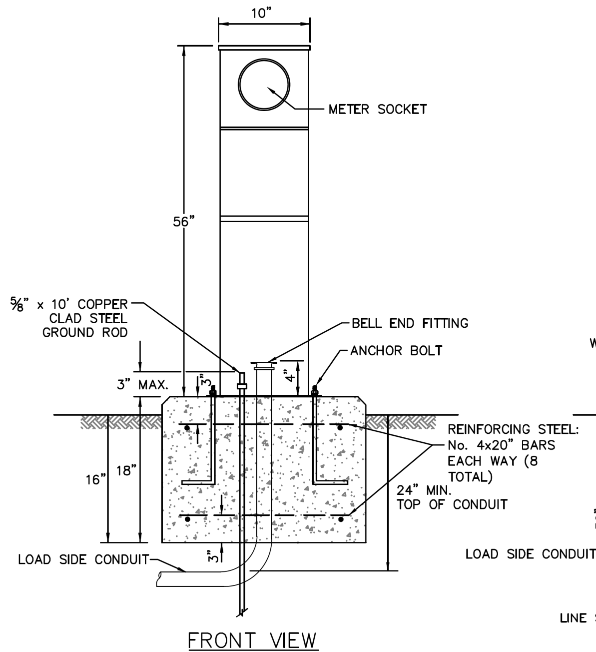
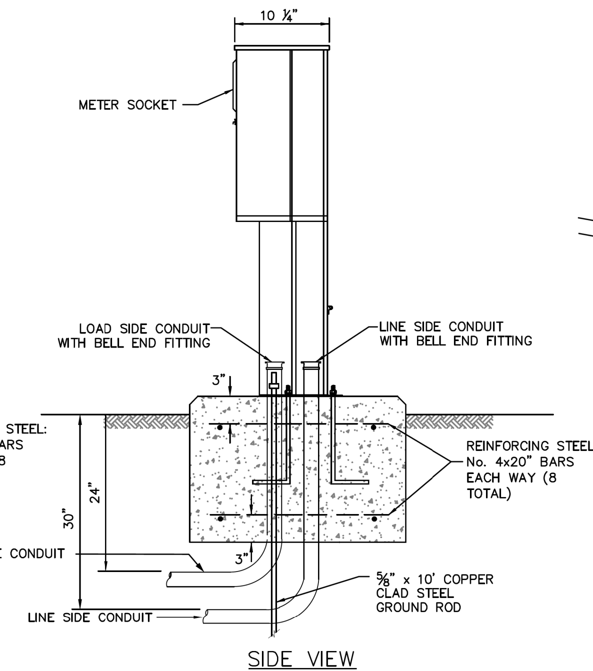
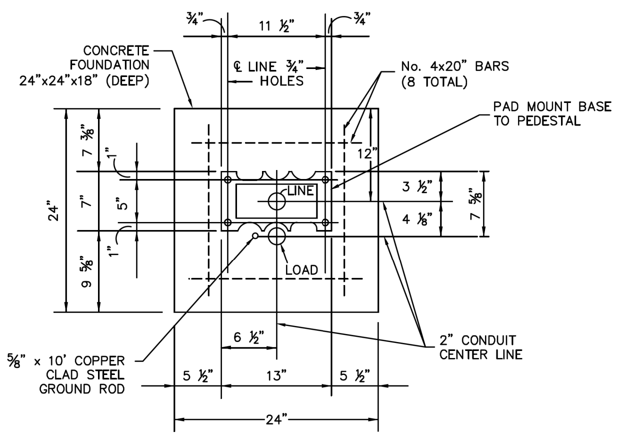
FTW



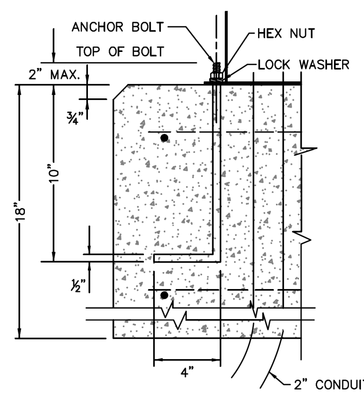
FRONT VIEW



SIDE VIEW



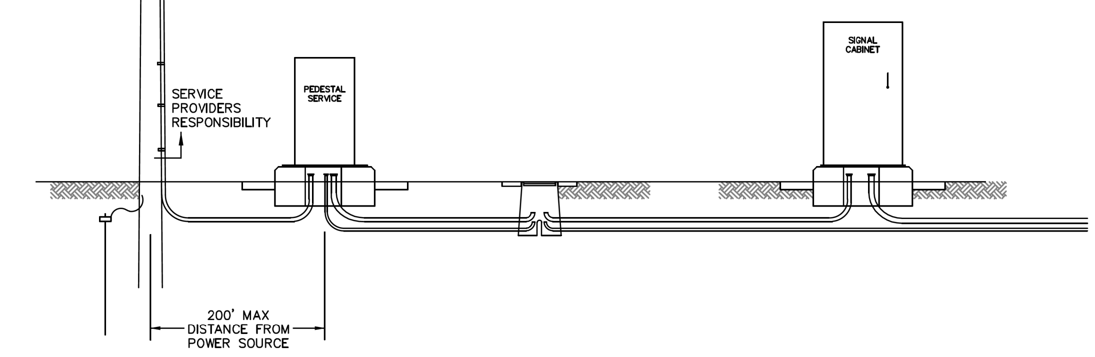
FOUNDATION PLAN



ANCHOR BOLT DETAIL

NOTES:

1. THE CITY WILL SUPPLY THE PEDESTAL SERVICE UNIT INCLUDING ELECTRIC BREAKERS AND ANCHOR BOLTS. THE CONTRACTOR WILL PURCHASE THE PEDESTAL SERVICE UNIT FROM THE CITY.
2. ALL MOUNTING HARDWARE AND INSTALLATION DETAILS OF SERVICES SHALL BE IN ACCORDANCE WITH UTILITY COMPANY SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE FOR CONTACTING THE LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTING THE ELECTRICAL PEDESTAL SERVICE.
3. METER SOCKET SHALL BE A MINIMUM OF 200 AMP RATING AND SHALL COMPLY WITH THE LOCAL UTILITY REQUIREMENTS.
4. CONCRETE FOR PEDESTAL SERVICE FOUNDATION SHALL BE 4,000 PSI AND PAID FOR DIRECTLY BUT SHALL BE CONSIDERED SUBSIDIARY TO, "ELECTRICAL SERVICES."
5. REINFORCING STEEL SHALL BE #5 REBAR.
6. ANCHOR BOLTS SHALL BE A36M55. ANCHOR BOLTS SHALL BE 1/2" x 12" x 4" (DIA. x LENGTH x HOOK LENGTH).
7. ALL CONDUIT AND ATTACHED TO THE PEDESTAL SERVICE AND WITHIN 12 INCHES OF THE PEDESTAL SERVICE WILL NOT BE PAID FOR DIRECTLY, BUT SHALL BE SUBSIDIARY TO THE PEDESTAL SERVICE. ALL SERVICE CONDUIT AND CONDUCTORS FROM THE UTILITY COMPANY TRANSFORMER TO A POINT 12" FROM THE PEDESTAL SERVICE SHALL BE PAID FOR SEPARATELY. SERVICE CONDUIT SHALL BE THE SIZE AND TYPE AS SHOWN IN THE PLANS.
8. THE CONTRACTOR MAY USE A 24" SONATUBE TO FORM THE CONCRETE FOUNDATION INSTEAD OF THE 24"x 24" SQUARE FOUNDATION SHOWN ON THE PLAN FOR THE ELECTRICAL PEDESTAL SERVICE. IF THE 24" ROUND SONATUBE IS USED THE REINFORCING SHALL BE 18" DIAMETER #3 BAR SPIRAL WITH A 6" PITCH AND 4-#4 VERTICAL REBAR SPACED EQUALLY.



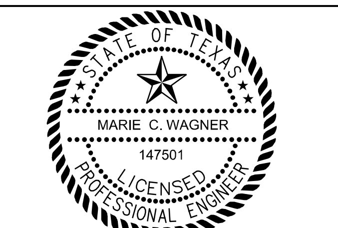
FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL PEDESTAL SERVICE DETAIL

REVISED: 11-19-2015

34 41 10-D603



Marie C. Wagner

DATE: 4/22/2024

TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff

TBPELS ENGINEERING FIRM #312

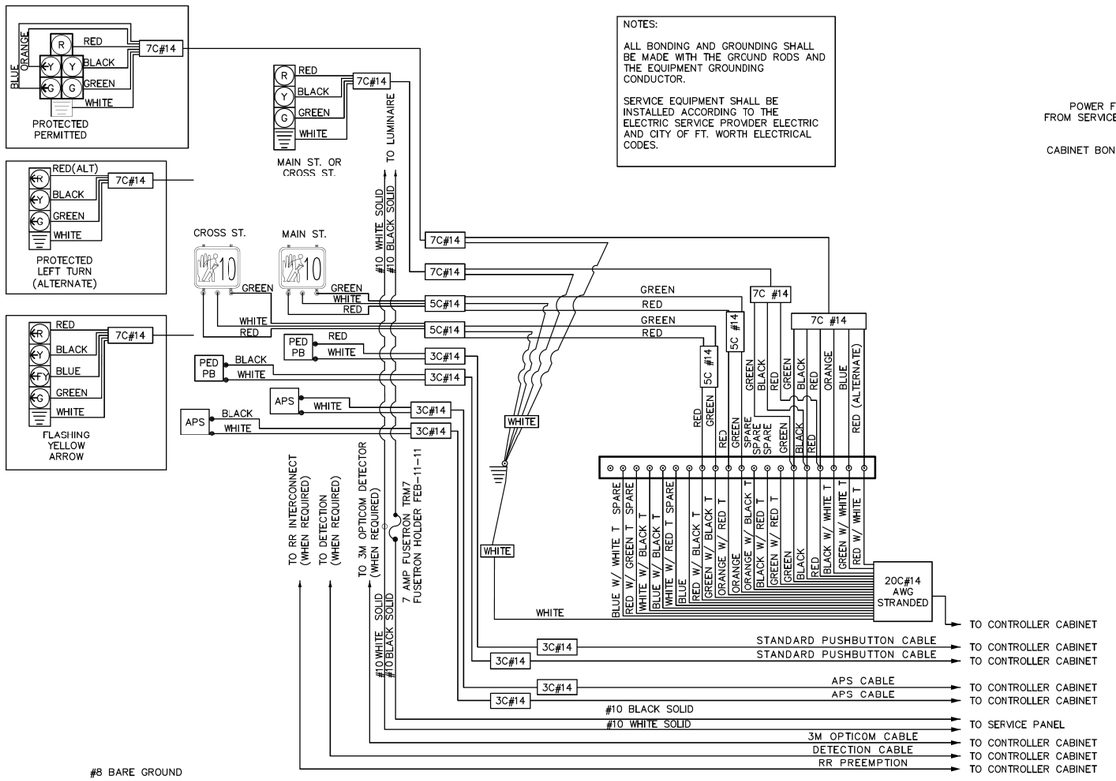
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

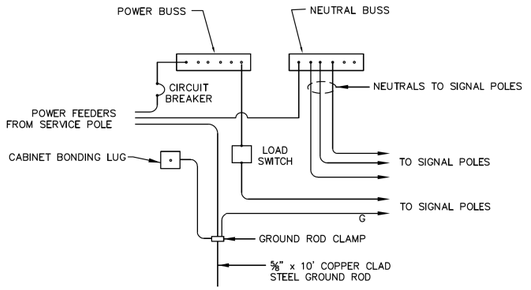
DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	127
CHECK	0902	90	207, ETC.	



NOTES:

ALL BONDING AND GROUNDING SHALL BE MADE WITH THE GRCUND RODS AND THE EQUIPMENT GROUNDING CONDUCTOR.

SERVICE EQUIPMENT SHALL BE INSTALLED ACCORDING TO THE ELECTRIC SERVICE PROVIDER ELECTRIC AND CITY OF FT. WORTH ELECTRICAL CODES.



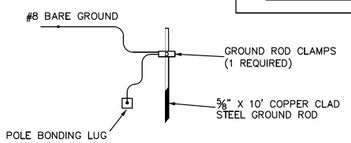
CONNECTIONS AT SIGNAL CABINETS

POLE TO CABINET WIRING COLOR CHART
FOR 20 CONDUCTOR CABLE

SIGNAL NEUTRAL	WHITE
MAIN ST. OR CROSS ST. – RED	RED
MAIN ST. OR CROSS ST. – YELLOW	BLACK
MAIN ST. OR CROSS ST. – GREEN	GREEN
MAIN ST. OR CROSS ST. – LEFT TURN RED	RED/WHITE
MAIN ST. OR CROSS ST. – LEFT TURN YELLOW ARROW	BLACK/WHITE
MAIN ST. OR CROSS ST. – LEFT TURN GREEN ARROW	GREEN/WHITE
DW – MAIN ST.	ORANGE/RED
W – MAIN ST.	ORANGE
DW – CROSS ST.	RED/BLACK
W – CROSS ST.	GREEN/BLACK
SPARE RED NEAR SIDE HEAD	RED/GREEN
SPARE YELLOW	BLACK/RED
SPARE GREEN	GREEN/RED
SPARE	ORANGE/BLACK
SPARE FLASHING YELLOW ARROW	BLUE/WHITE

NOTE:

WRAP COLORED ELECTRICAL TAPE ON BOTH ENDS OF EACH 20 CONDUCTOR CABLE (AT CABINET AND AT SIGNAL POLE) AS FOLLOWS:
NORTH BOUND = GREEN,
SOUTH BOUND = RED,
WEST BOUND = BLUE AND
EAST BOUND = YELLOW.



CONNECTIONS AT POLE BASE

TYPICAL POLE WIRING SCHEMATIC

NOTE:
1. ALL WIRING CABLES SHALL BE AS SHOWN UNLESS NOTED OTHERWISE IN THE DRAWINGS.
2. USE 2C#12 AWG FOR APS PUSH BUTTON FOR LARGER LENGTHS BETWEEN PUSH BUTTONS AND CONTROLLER TO MINIMIZE VOLTAGE DROP.

NO SPLICES ARE ALLOWED

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL WIRING CONNECTION DETAILS

REVISED: 03-07-2022

34 41 10-D604

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312

4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE:

SHEET 1 OF 1

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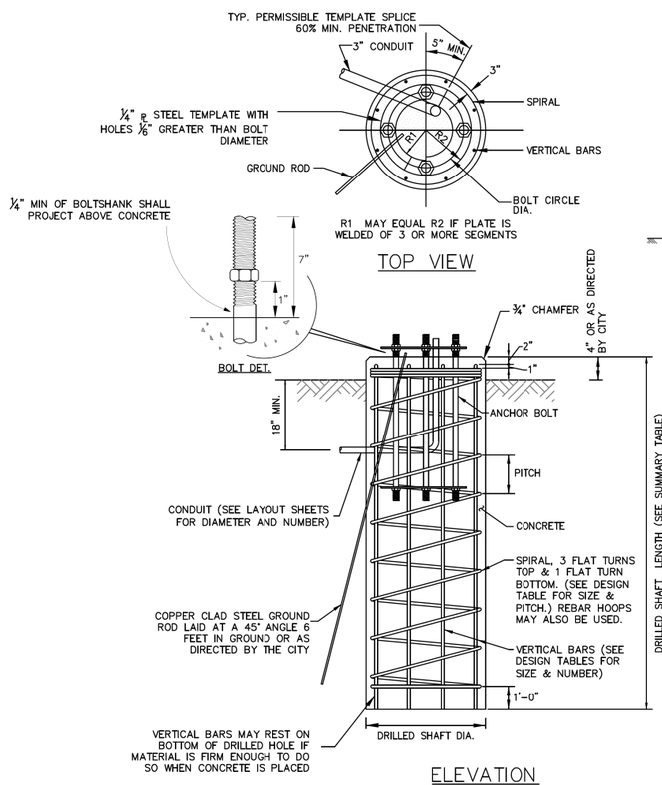
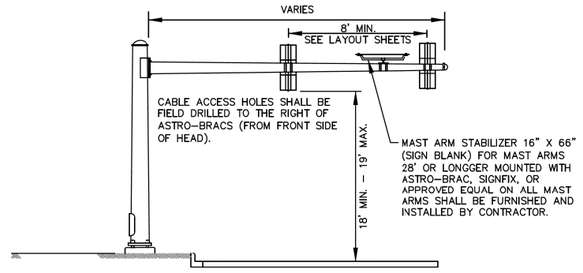
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	128



ELEVATION
FOUNDATION DETAILS



TYPICAL MAST ARM SIGNAL HEAD INSTALLATION
(REAR VIEW OF MAST ARM)

ANCHOR BOLT AND TEMPLATE SIZES						
BOLT DIA.	*BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
¾"	1'-6"	3"	---	14 ⅛"	7 ⅛"	5 ⅝"
1 ½"	4'-6"	8"	2 ½"	15"	8"	6 ½"
1 ¾"	4'-6"	8"	2 ½"	17"	10"	7"
2"	4'-6"	8"	2 ½"	21"	12 ½"	8 ½"

* MINIMUM DIMENSIONS GIVEN, LONGER BOLTS ARE ACCEPTABLE

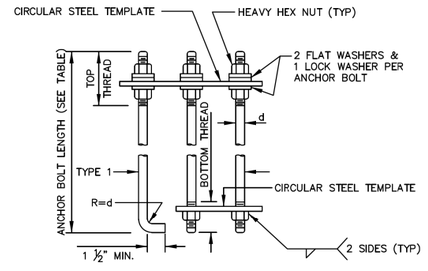
NOTES:
1. ANCHOR BOLT DESIGN DEVELOPS THE FOUNDATION CAPACITY GIVEN UNDER FOUNDATION DESIGN LOADS.
2. FOUNDATION DESIGN LOADS ARE THE ALLOWABLE MOMENTS AND SHEARS AT THE BASE OF THE STRUCTURE.
3. IF ROCK IS ENCOUNTERED, THE DRILL SHAFT SHALL EXTEND A MINIMUM OF TWO DIAMETERS INTO SOLID ROCK AND HAVE A MINIMUM DEPTH OF 8'-0".

FOUNDATION DESIGN TABLE														
FDN. TYPE	POLE TYPE	DRILLED SHAFT DIAMETER	REINFORCING STEEL		DRILLED SHAFT LENGTH (ft)	GROUND ROD SIZE	ANCHOR BOLT DESIGN (1)				FOUNDATION DESIGN LOAD (2)		APPLICATION	POLE HEIGHT (FT.)
			VERT BARS	SPIRAL & PITCH			ANCHOR BOLT DIA	Fy (ksi)	BOLT CIR DIA	ANCHOR TYPE	MOMENT K-ft	SHEAR Kips		
1	5'/10'/14'	24"	4-#5	#2 @ 12"	5.0	⅝" x 10'	¾"	N.A.	14 ⅛"	1	N.A.	N.A.	PUSH BUTTON/ PEDESTAL POLES	5/10/14
2*	8	24"	4-#5	#3 @ 6"	6.0	⅝" x 8'	1"	N.A.	11"	1	N.A.	N.A.	STREET LIGHT POLES	27.5
3	41	30"	8-#9	#3 @ 6"	10.0	⅝" x 10'	1 ½"	55	15"	2	87	3	16' TO 36' MAST ARM POLES	27.5
	42													21
4	43	36"	10-#9	#3 @ 6"	12.0	⅝" x 10'	1 ¾"	55	17"	2	131	5	40' TO 48' MAST ARM POLES	27.5
	44													21
5	45	36"	12-#9	#3 @ 6"	13.0	⅝" x 10'	2 "	55	21"	2	190	7	52' TO 60' MAST ARM POLES	27.5
	46													21

NOTE: TYPES 41, 43, AND 45 HAVE ILLUMINATION
* SEE STREET LUMINAIRE POLE FOUNDATION DETAILS.

NOTE:

1. CONCRETE MIX DESIGN SHALL BE IN ACCORDANCE WITH CITY OF FORTH WORTH STANDARD SPECIFICATIONS DIVISION 03 30 00, CAST-IN-PLACE CONCRETE. CONTRACTOR SHALL USE A PRE-APPROVED CONCRETE MIX DESIGN OR SUBMIT PROPOSED MIX DESIGN FOR APPROVAL PRIOR TO CONSTRUCTION. CONCRETE FOR STRUCTURES SHALL BE CLASS S AND HAVE A MINIMUM 28-DAY COMPRESSION STRENGTH OF 3,600 PSI.



HOOCKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

INSTALLATION PROCEDURE:
1. THREADS OF ANCHOR BOLTS SHALL BE COATED WITH PIPE JOINT COMPOUND PRIOR TO INSTALLATION OF UPPER NUTS WHEN ERECTING POLE. AFTER POLE IS PLUMBED AND IN PERMANENT ALIGNMENT, THE EXPOSED THREADS OF PAINTED BOLTS SHALL BE CLEANED AND AN ADDITIONAL COATING OF ZINC-RICH PAINT APPLIED TO SEAL THE BOLT THREAD-NUT JOINT. ANCHOR BOLT THREADS SHALL BE TAPED PRIOR TO POURING CONCRETE.

FORT WORTH

CITY OF FORT WORTH, TEXAS
TRAFFIC SIGNAL POLE FOUNDATION DETAILS

REVISED: 07-26-2021

34 41 10-D605

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

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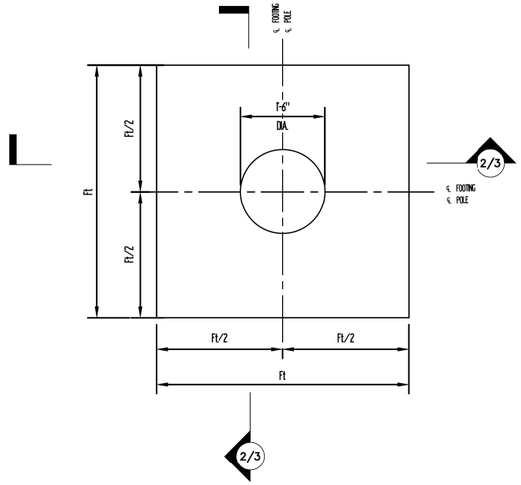
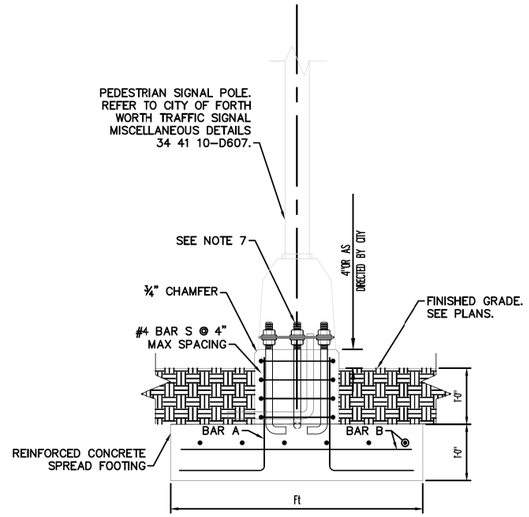
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	129



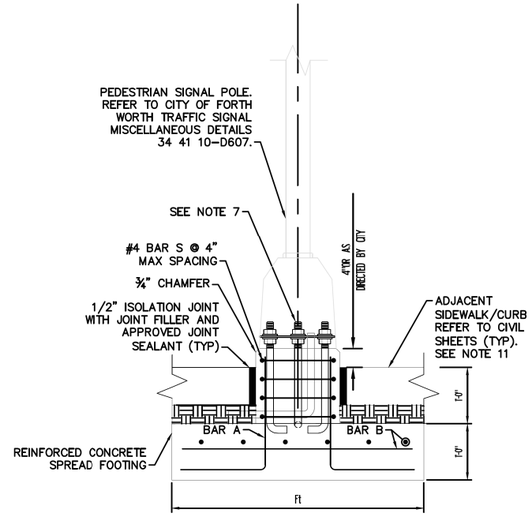
1 FOUNDATION PEDESTAL POLE DETAIL

SCALE: 1/2"=1'-0"



2 SECTION CUT

SCALE: 1/2"=1'-0"

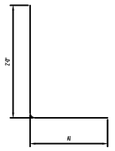


3 ISOLATION JOINT DETAIL

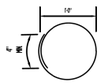
SCALE: 1/2"=1'-0"

PEDESTRIAN POLE				
DESCRIPTION	Ft*	BAR A	"A1"	BAR B
10/14 FOOT POLE	5'-0"	#5 @ 9"	1'-9"	#4 @ 6"
5 FOOT POLE	3'-0"	#5 @ 9"	0'-9"	#4 @ 6"

* Ft DIMENSION SHALL APPLY TO LENGTH AND WIDTH. FOUNDATION SHALL BE SQUARE.



BAR A



BAR S

NOTE:

1. FOUNDATION IS DESIGNED IN ACCORDANCE WITH 2013 EDITION OF AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS.
2. CONCRETE SHALL BE CAST AGAINST UNDISTURBED, IN-SITU MATERIAL. EXCAVATION, COMPACTION, AND BACKFILL SHALL BE IN ACCORDANCE WITH CITY OF FORT WORTH STANDARD SPECIFICATIONS.
3. ALL CONCRETE SHALL BE DESIGNED, MIXED, TRANSPORTED, AND PLACED IN ACCORDANCE WITH CITY OF FORT WORTH STANDARD SPECIFICATIONS FOR ALL CONSTRUCTION PROJECTS. AND THE LATEST EDITION OF ACI-318.
4. CONCRETE MIX DESIGN SHALL BE IN ACCORDANCE WITH CITY OF FORTH WORTH STANDARD SPECIFICATIONS DIVISION 03 30 00, CAST-IN-PLACE CONCRETE. CONTRACTOR SHALL USE A PRE-APPROVED CONCRETE MIX DESIGN OR SUBMIT PROPOSED MIX DESIGN FOR APPROVAL PRIOR TO CONSTRUCTION. CONCRETE FOR STRUCTURES SHALL BE CLASS S AND HAVE A MINIMUM 28-DAY COMPRESSION STRENGTH OF 3,600 PSI.
5. ALL REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60 IN ACCORDANCE WITH CITY OF FORTH WORTH STANDARD SPECIFICATIONS DIVISION 03 30 00, CAST-IN-PLACE CONCRETE. CONTRACTOR SHALL SUBMIT CERTIFICATION FOR REINFORCING STEEL. REINFORCING PLACEMENT SHALL BE IN ACCORDANCE WITH ACI-318.
6. ALL REINFORCING DIMENSIONS ARE TO OUTSIDE OF BAR UNLESS OTHERWISE NOTED.
7. SEE CITY OF FORTH WORTH STANDARD 34 41 10-D605 "TRAFFIC SIGNAL POLE FOUNDATION DETAILS" ANCHOR BOLT ASSEMBLY DETAIL (HOOKED ANCHOR TYPE 1) FOR DETAILS RELATED TO THE ANCHORAGE OF THE PEDESTAL POLE TO THE FOUNDATION.
8. JOINT SEALERS AND FILLERS SHALL BE IN ACCORDANCE WITH TXDOT ITEM 438 "CLEANING AND SEALING JOINTS." SUBMIT PRODUCT DATA FOR ALL JOINTS AND SEALANTS FOR APPROVAL.
9. ALL CLEAR COVER FOR REINFORCING SHALL BE 2" WHERE FORMED AND 3" WHERE CAST AGAINST EARTH, UNLESS OTHERWISE NOTED ON THE PLANS.
10. DESIGN IS BASED ON THE FOLLOWING GEOTECHNICAL ASSUMPTIONS. GEOTECHNICAL ENGINEER SHALL VERIFY THE FOLLOWING ASSUMED PARAMETERS PRIOR TO CONSTRUCTION.
    - 10.A. MINIMUM GROSS ALLOWABLE BEARING PRESSURE = 1.5 KSF
    - 10.B. MINIMUM ANGLE OF INTERNAL FRICTION = 20°
    - 10.C. MINIMUM COEFFICIENT OF BASE FRICTION = 0.30
11. IF PAVEMENT ABOVE FOOTING IS PLACED DIRECTLY ON FOOTING, APPLY A BOND BREAKER TO THE TOP OF FOOTING IN ACCORDANCE WITH CITY OF FORT WORTH STANDARD SPECIFICATION SECTION 32 13 73 "CONCRETE PAVING JOINT SEALANTS".

FORT WORTH

CITY OF FORT WORTH, TEXAS

SPREAD FOOTING PEDESTAL POLE FOUNDATION

REVISED: 07-26-2021

34 41 10-D605A

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024

TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312

4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

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SHEET 1 OF 1

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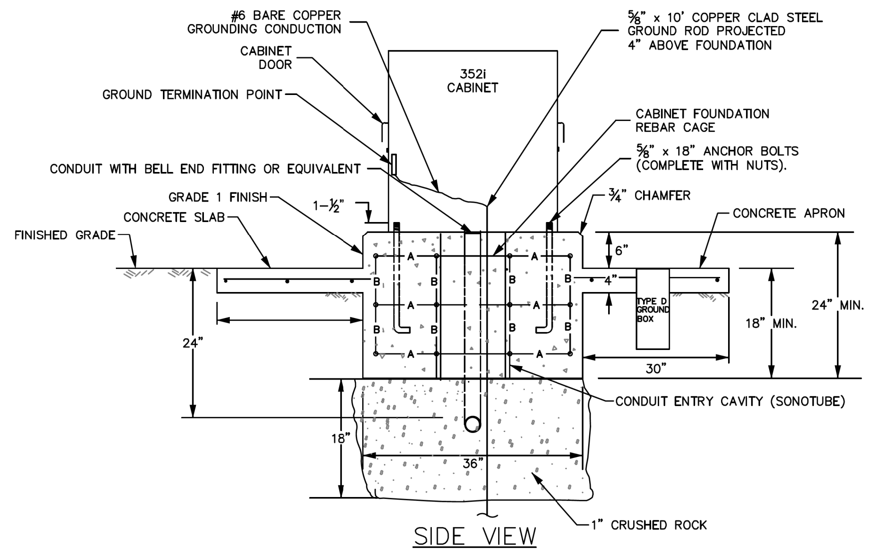


SIDE VIEW

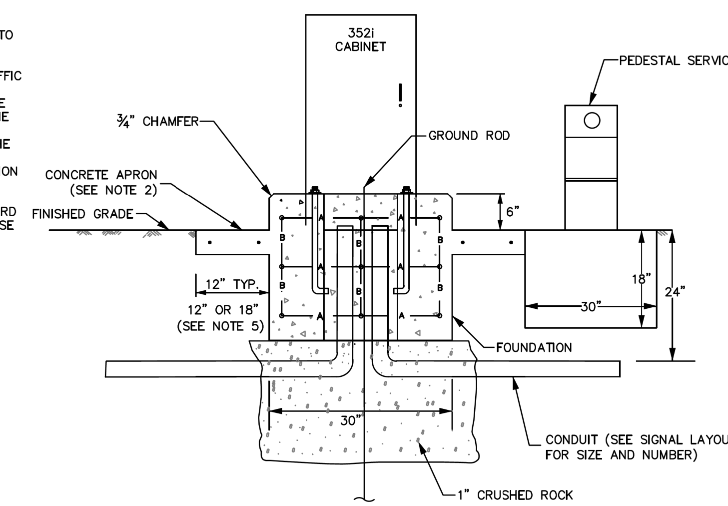
NOTES:

1. ANCHOR BOLT THREADS SHALL BE TAPED PRIOR TO POURING CONCRETE.
2. ALL OR PART OF CONCRETE APRON MAY BE REQUIRED DEPENDING ON THE PLACEMENT OF CABINET FOUNDATION IN RELATION TO EXISTING CONDITIONS.
3. CAVITY IN FOUNDATION (SONOTUBE) ALLOWS FOR FUTURE PLACEMENT OF CONDUIT. CAVITY EXTENDS FROM TOP TO BOTTOM OF FOUNDATION. PLACE 1" CRUSHED STONE IN CAVITY TO WITHIN 4" FROM THE TOP OF THE FOUNDATION.
4. CONTROLLER FOUNDATION APRON SHALL BE CONSTRUCTED OF CLASS B CONCRETE RIP-RAP AND SHALL BE SUBSIDIARY TO THE CONTROLLER FOUNDATION.
5. CABINET FOUNDATION SHALL BE 8' x 5.5' IF A BATTERY BACK-UP UNIT IS ATTACHED TO THE CABINET.
6. FIELD TERMINATIONS SIDE OF CABINET SHALL FACE TOWARDS INTERSECTION.
7. INSTALL TYPE B GROUND BOX FOR ILLUMINATION CIRCUIT AS DETERMINED BY CITY TRAFFIC ENGINEER.
8. INSTALL PEDESTAL SERVICE ON THE SAME PAD AS CABINET FOUNDATION UNLESS THERE ARE OTHER SITE CONSTRAINTS. THE PEDESTAL SERVICE SHALL NOT BE LOCATED ON THE FRONT AND BACK SIDE OF SIGNAL CABINET DOOR. IF THE PEDESTAL IS INSTALLED ON SAME PAD AS CABINET FOUNDATION, THE CONTRACTOR SHALL GET APPROVAL FROM THE CITY ON THE LOCATION ON PEDESTAL FOUNDATION PRIOR TO PORING FOUNDATION.
9. PEDESTAL SERVICE SHALL BE AT LEAST 4 FEET AWAY FORM SIGNAL CABINET FOUNDATION IF IT IS INSTALL SEPARATELY. LOCATION OF TYPE D GROUND BOX IN CONCRETE APRON WILL BE DETERMINED BY CITY TRAFFIC ENGINEER.
10. CONCRETE MIX DESIGN SHALL BE IN ACCORDANCE WITH CITY OF FORTH WORTH STANDARD SPECIFICATIONS DIVISION 03 30 00, CAST-IN-PLACE CONCRETE. CONTRACTOR SHALL USE A PRE-APPROVED CONCRETE MIX DESIGN OR SUBMIT PROPOSED MIX DESIGN FOR APPROVAL PRIOR TO CONSTRUCTION. CONCRETE FOR STRUCTURES SHALL BE CLASS S AND HAVE A MINIMUM 28-DAY COMPRESSION STRENGTH OF 3,600 PSI.

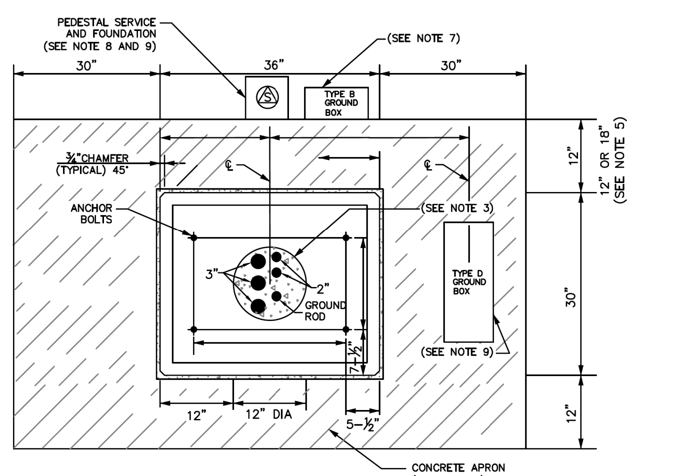
STEEL SUMMARY TABLE

BAR	NO. BARS	SIZE	LENGTH	SPACING
A	3	5	9'-8"	8" C.C.
B	10	5	2'-2"	VAR.
*C	6	3	1'- 8"	8.5" C.C.
**D	6	3	4'-0"	10" C.C.
E	6	3	0'-8"	10" C.C.
F	4	3	6'-8"	8" C.C.

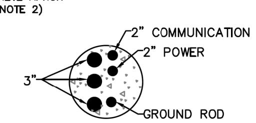
PROVIDE 2" MIN. COVER FOR TOP AND SIDES
* ADJUST THREE "C" BAR LENGTHS TO 9"-11" FOR GROUND BOX INSTALLATION
** ADJUST ONE "D" BAR LENGTH TO 14"-16" FOR GROUND BOX INSTALLATION



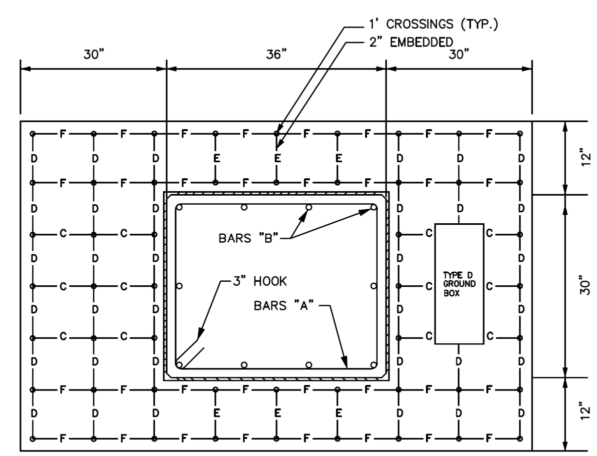
FRONT VIEW



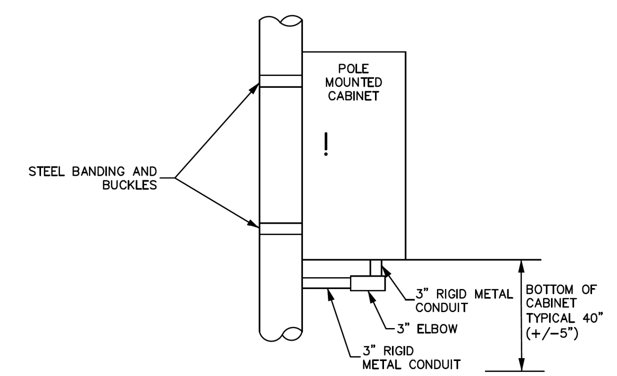
SIDEWALK / STREET SIDE
TOP VIEW
30" X 36" CABINET FOUNDATION WITH APRON



CONDUIT DETAIL



TOP VIEW
CONCRETE EMBEDDED REBAR AND CAGE DETAIL



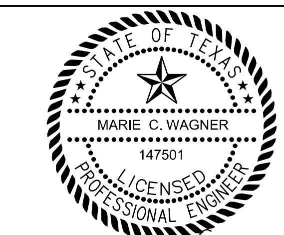
POLE MOUNTED CABINET
(CABINET IS BANDED TO POLE)
FOR CABINETS MOUNTED TO TIMBER POLES, USE ATTACHMENT METHODS APPROVED BY ENGINER

FORT WORTH

CITY OF FORT WORTH, TEXAS
TRAFFIC SIGNAL TYPE 352i SINGLE GROUND BOX FOUNDATION DETAIL

REVISED: 11-03-2021

34 41 10-D606



Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

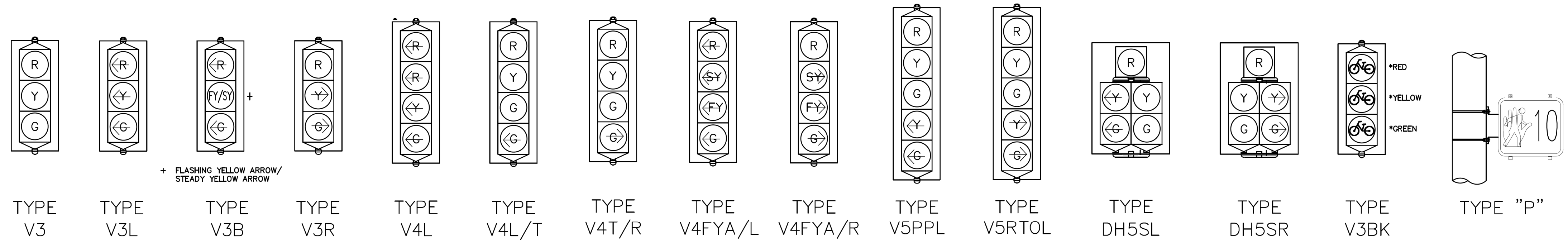
NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

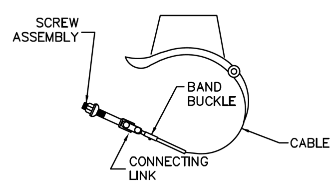
CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

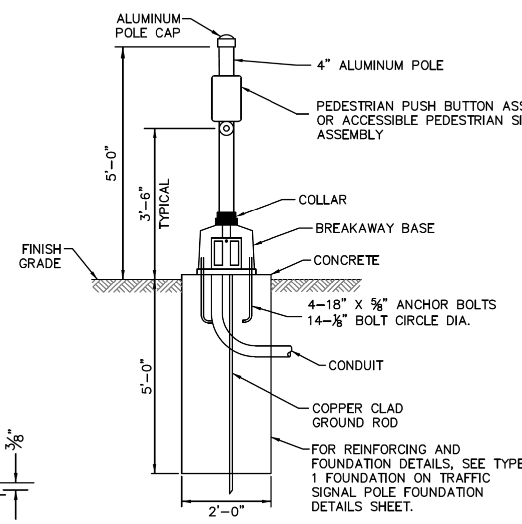
DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.			HIGHWAY NO.
	6	(SEE TITLE SHEET)			
GRAPHICS	STATE	DISTRICT	COUNTY		SHEET NO.
	TEXAS	FTW	TARRANT		
CHECK	CONTROL	SECTION	JOB		131
CHECK	0902	90	207, ETC.		



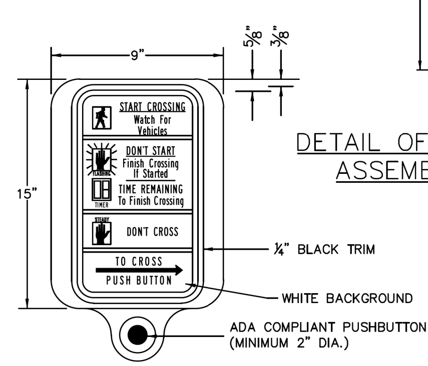
TRAFFIC SIGNAL HEADS



ASTRO BRAC ASSEMBLY

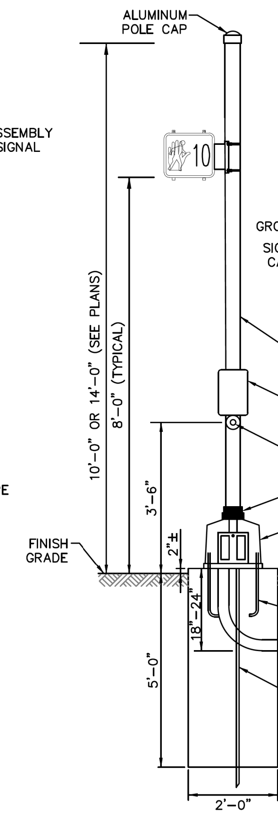


DETAIL OF 5' PUSH BUTTON POLE ASSEMBLY AND FOUNDATION

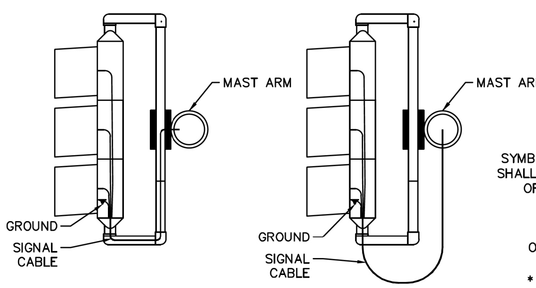


THE SIGN SHOWN SHALL BE USED ON MAST ARM POLES AND ON PEDESTAL POLES. THE PUSH BUTTON SHALL BE INSTALLED 3'-6" ABOVE GROUND LEVEL.

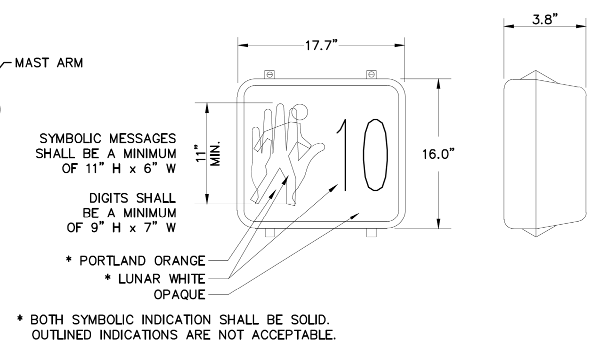
PEDESTRIAN PUSH BUTTON SIGN DETAILS R10-3e



DETAIL OF PEDESTAL POLE ASSEMBLY (10'/14') AND FOUNDATION



TYPICAL WIRING OF MAST ARM MOUNTED SIGNAL HEADS



* BOTH SYMBOLIC INDICATION SHALL BE SOLID. OUTLINED INDICATIONS ARE NOT ACCEPTABLE.

LED COUNTDOWN PEDESTRIAN SIGNAL HEAD

NOTES:

1. ALL SIGNAL HEAD LENSES SHALL BE 12" IN DIAMETER UNLESS OTHERWISE SHOWN.
2. VEHICLE SIGNAL HEADS SHALL BE MOUNTED WITH "ASTRO BRACS" AND APPROPRIATE TUBING. ALL SIGNAL HEADS SHALL BE ALUMINUM, PAINTED FEDERAL YELLOW AND HAVE LED DISPLAYS MEETING THE LATEST I.T.E. STANDARDS.
3. ALL VISORS SHALL BE TUNNEL VISORS, UNLESS OTHERWISE SPECIFIED.
4. ALL POLE MOUNTED VEHICLE AND PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE UNLESS ENGINEER APROVES OTHERWISE.
5. PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH "CLAM-SHELL" MOUNTING BRACKET.
6. THE PEDESTAL POLE TRANSFORMER BASE SHALL BE BREAKAWAY DESIGN (PELCO PART No. PB-5335 OR EQUAL) AND SHALL CONFORM TO ASTM B241 STANDARDS.
7. THE ADA COMPLIANT PUSHBUTTON (MINIMUM 2" DIA.) SHALL BE POLARA ENGINEERING, INC. PART No. BDLM2-Y OR EQUIVALANT.
8. ALL SIGNAL HEADS SHALL HAVE ALUMINUM, ONE-PIECE BLACK VENTED BACK PLATES.

FORT WORTH	CITY OF FORT WORTH, TEXAS **TRAFFIC SIGNAL MISCELLANEOUS DETAILS**	REVISED: 07-26-2021 **34 41 10-D607**

MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	132

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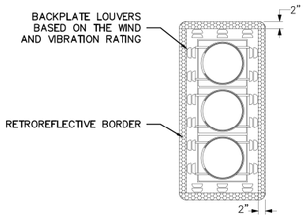
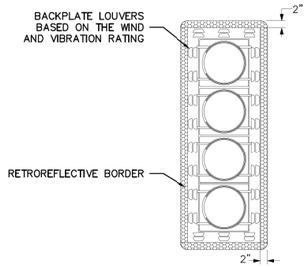
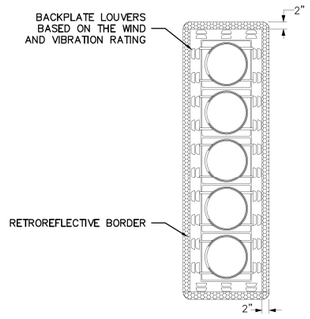


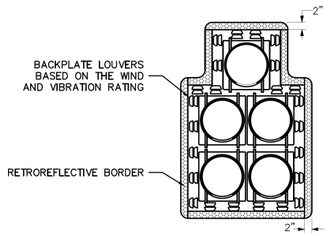
THREE–SECTION HEAD BACKPLATE
WITH VENTED RETROREFLECTIVE BORDER



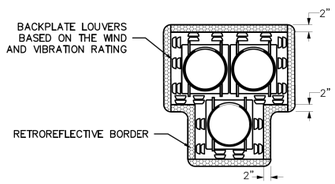
FOUR–SECTION HEAD BACKPLATE
WITH VENTED RETROREFLECTIVE BORDER



FIVE–SECTION HEAD BACKPLATE
WITH VENTED RETROREFLECTIVE BORDER



FIVE–SECTION (DOGHOUSE) HEAD BACKPLATE
WITH VENTED RETROREFLECTIVE BORDER



PEDESTRIAN HYBRID BEACON BACKPLATE
WITH VENTED RETROREFLECTIVE BORDER

NOTES:
1. ALL BACKPTES SHALL BE INSTALLED VERTICAL UNLESS OTHERWISE APPROVED BY THE CITY.
2. ALL BACKPLATES SHALL BE VENTED.
3. A 2 INCH WIDE FLUORESCENT YELLOW AASHTO TYPE B_{FL} OR C_{FL} RETROREFLECTIVE BORDER IS REQUIRED.
4. THE CONTRACTOR SHALL VERIFY SIGNAL HEAD AND BACKPLATE COMPATIBILITY PRIOR TO INSTALLATION.
5. RETROREFLECTIVE BORDERS SHALL NOT BE PLACED OVER THE LOUVERS.
6. BACKPLATES ARE REQUIRED FOR ALL SIGNALS HEADS, INCLUDING BUT NOT LIMITED TO:
   - POLE MOUNTED SIGNAL HEADS
   - OVERHEAD MOUNTED SIGNAL HEADS
   - SPAN WIRE MOUNTED SIGNAL HEADS (UNLESS OTHERWISE APPROVED BY THE CITY)
   - VERTICAL SIGNAL HEADS
   - HORIZONTAL SIGNAL HEADS
   - DOGHOUSE
   - PEDESTRIAN HYBRID BEACONS
   - OTHER FLASHING SIGNALS
7. THE COST FOR INSTALLATION OF BACKPLATES WILL BE INCLUDED ON THE COST OF RESPECTIVE SIGNAL HEADS INSTALLED. SEPARATE PAYMENT IS ONLY ALLOWED WHEN INSTALLING NEW BACKPLATES ON EXISTING SIGNAL HEADS.
8. RETROFLECTIVE BORDERS MAY BE WAVED FROM THE BACKPLATE BASED ON PROJECT NEED IF APPROVED BY THE TRANSPORTATION MANAGEMENT DIVISION.

FORT WORTH

CITY OF FORT WORTH, TEXAS
TRAFFIC SIGNAL BACKPLATE DETAILS

REVISED: 03-09-2022

34 41 10-D608

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	133

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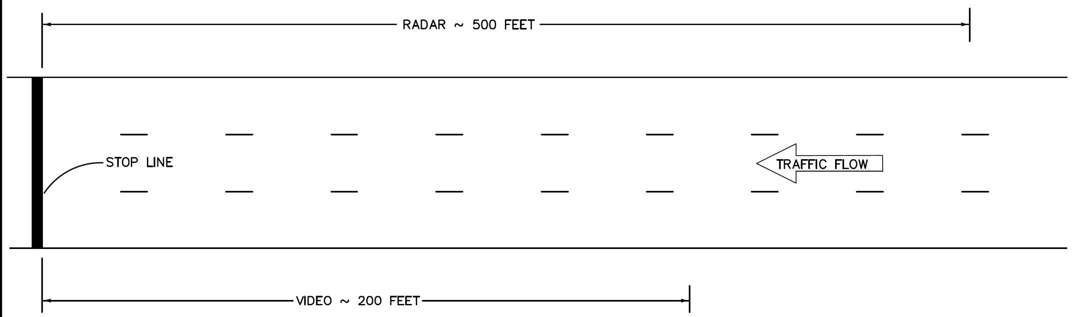
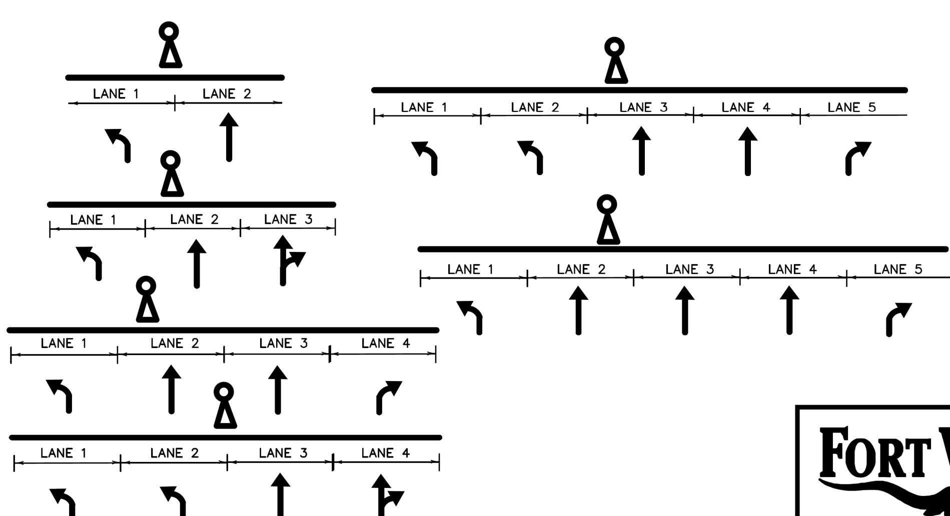


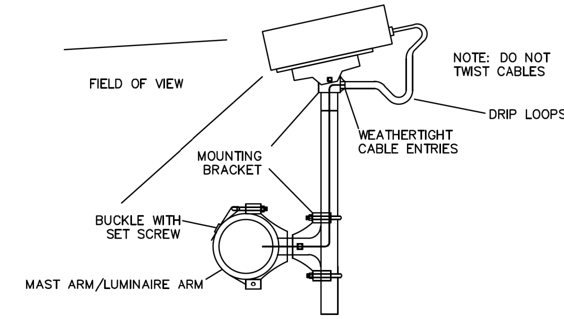
DETECTION LIMITS

NOTES:

1. THE CAMERA IS REQUIRED TO BE PLACED IN CENTER TO THE VEHICLE APPROACH AS MUCH AS POSSIBLE OR PER DIRECTION OF ENGINEER.
2. THE MAST ARM MOUNTING WOULD END UP WITH A CAMERA HEIGHT OF ABOUT 25 FEET WHEN USING A 5 FOOT EXTENSION WITH BRACKET.
3. THE CAMERA SHOULD BE ZOOMED IN UNTIL A MINIMUM OF 4 LANES ARE VISIBLE.
4. THE HORIZON SHOULD NOT BE INCLUDED AS PART OF THE FIELD OF VIEW.
5. THE ZONES SHOULD BE DRAWN WITHIN THE LANE LINES AND SHOULD BE THE SIZE OF A MEDIUM VEHICLE.
6. THE AREA BETWEEN THE STOP BAR AND THE BOTTOM OF THE SCREEN WILL NOT BE 40% OR LESS THAN THE TOTAL COVERAGE AREA.
7. THE CAMERA SUN SHIELD (VISOR) BE PLACED ENOUGH FORWARD TO GIVE THE CAMERA MAXIMUM PROTECTION FROM THE SUN.
8. USE ASTRO–BRAC TYPE MOUNTING BRACKET TO THE DESIRED LOCATION.
9. MANUFACTURER REPRESENTATIVE SHALL BE ON–SITE DURING INSTALLATION AND SETUP.
10. A SELF MOUNT OR RACK MOUNT DETECTION CONTROL UNIT WITH FOUR PORTS FOR ETHERNET CONNECTIVITY WILL BE REQUIRED.
11. THE DETECTION CONTROL UNIT WILL COMMUNICATE WITH CONTROLLERS VIA SDLC.
12. APPROACH WITH SPEED LIMIT 35MPH OR HIGHER USUALLY NEED VANTAGE VECTOR IN NEXT CAMERA.
13. INSTALL PTZ CAMERA ON POLE AS DIRECTED BY CITY.
14. ANY DETECTION OR PTZ CAMERA THAT USES CAT5E CABLES SHALL USE SHIELDED, GEL FILLED, AND UV RESISTANT CAT5E CABLES.

CAMERA PLACEMENT BASED ON LANE GEOMETRY



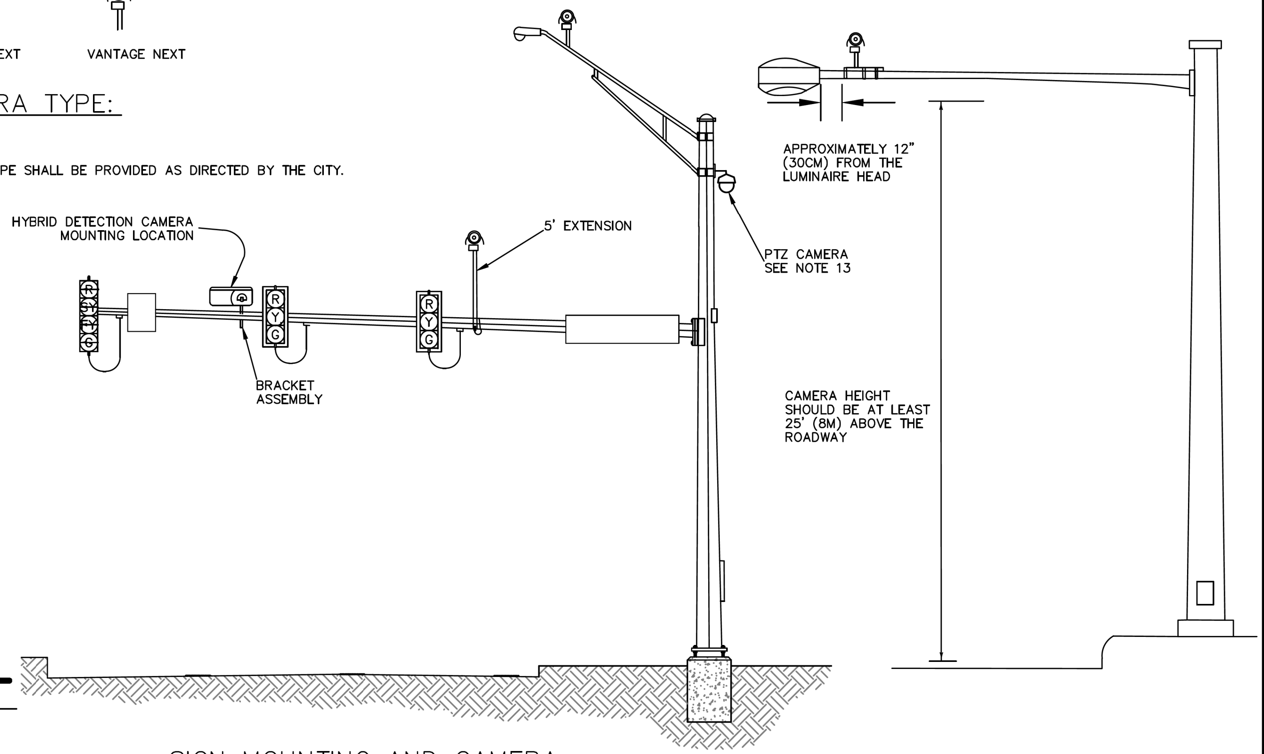


TYPICAL WIRING OF VIDEO VEHICLE DETECTION CAMERAS

CAMERA TYPE:

NOTE:

CAMERA TYPE SHALL BE PROVIDED AS DIRECTED BY THE CITY.



SIGN MOUNTING AND CAMERA MOUNTING LOCATION ON MAST ARM

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL VIDEO/ HYBRID DETECTION DETAILS

REVISED: 07-26-2021

34 41 10-D611

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024

TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

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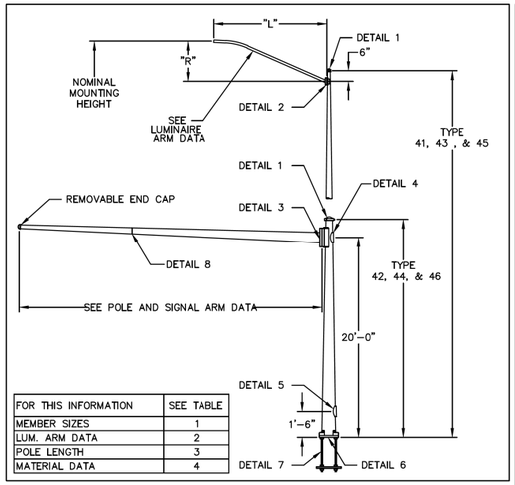
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	134
CHECK	0902	90	207, ETC.	

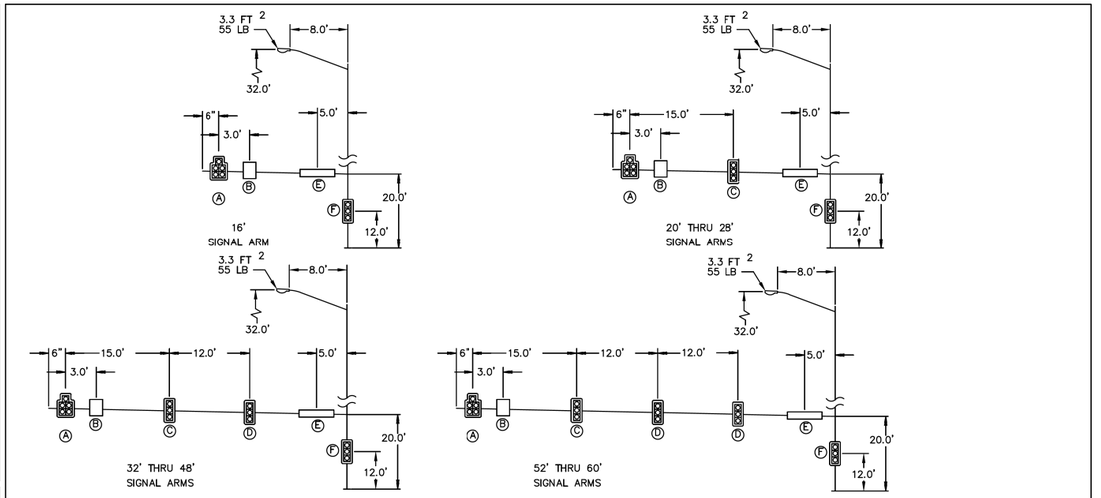


FOR THIS INFORMATION	SEE TABLE
MEMBER SIZES	1
LUM. ARM DATA	2
POLE LENGTH	3
MATERIAL DATA	4

DESIGNATION KEY

FW – 41 – 16 – 33A

- FW — FORT WORTH POLE SERIES (FW)
- 41 — POLE TYPE (41, 43, & 45 = 27.5' POLES) (42, 44, & 46 = 21.0' POLES)
- 16 — SIGNAL ARM SPAN (16–60)
- 33A — LUMINAIRE ARM SERIES (33A, 33B)



DEVICE	DESCRIPTION	PROJ.AREA (FT 2)	WEIGHT (LBS)
(A)	12"–5 SEC. SIGNAL WITH BACKPLATES	13.33	85
(B)	REGULATORY SIGN 30" X 30"	6.25	15
(C)&(D)&(F)	12"–3 SEC. SIGNAL WITH BACKPLATES	8.67	60
(E)	STREET NAME SIGN 18" X 84"	10.50	35

DESIGN CRITERIA:
1994 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES, AND TRAFFIC SIGNALS.

WIND VELOCITY:
80 MPH ISOTACH.

MAX. LOADING INFORMATION

TABLE 1: POLE AND SIGNAL ARM DATA

DESIGNATION KEY				POLE TUBE			POLE BASE					ANCHOR BOLT				SIGNAL ARM TUBE			
POLE SERIES	POLE TYPE	SIGNAL ARM SPAN (FT)	LUM. ARM SERIES	BASE DIA. (IN)	TOP DIA. (IN)	LENGTH (FT)	GAUGE OR THK. (IN)	SQUARE "S" (IN)	BOLT CIRCLE "Y" (IN)	THK. "M" (IN)	HOLE "Z" (IN)	DIA. "K" (IN)	LENGTH "J" (IN)	THREAD LENGTH "U" (IN)	THREAD LENGTH "W" (IN)	FIXED END DIA. (IN)	FREE END DIA. (IN)	GAUGE	SPAN (FT)
FW	41,42	16.00	33A,33B	11.00	SEE TABLE 3	SEE TABLE 3	3	16.00	15.00	1.50	1.75	1.50	54.00	8.00	2.50	6.00	3.76	7	16.00
		20.00	33A,33B	11.00			3	16.00	15.00	1.50	1.75	1.50	54.00	8.00	2.50	6.00	3.50	7	20.00
		24.00	33A,33B	11.00			3	16.00	15.00	1.50	1.75	1.50	54.00	8.00	2.50	7.00	3.60	7	24.00
		28.00	33A,33B	11.00			3	16.00	15.00	1.50	1.75	1.50	54.00	8.00	2.50	7.00	3.08	7	28.00
		32.00	33A,33B	11.00			3	16.00	15.00	1.50	1.75	1.50	54.00	8.00	2.50	8.00	3.52	7	32.00
		36.00	33A,33B	11.00			3	16.00	15.00	1.50	1.75	1.50	54.00	8.00	2.50	9.00	3.96	7	36.00
FW	43,44	40.00	33A,33B	13.00			3	18.00	17.00	1.75	2.00	1.75	54.00	8.00	2.50	10.00	4.40	7	40.00
		44.00	33A,33B	13.00			3	18.00	17.00	1.75	2.00	1.75	54.00	8.00	2.50	10.00	3.84	7	44.00
		48.00	33A,33B	13.00			3	18.00	17.00	1.75	2.00	1.75	54.00	8.00	2.50	10.50	3.78	7	48.00
FW	45,46	52.00	33A,33B	15.25			0.250	20.00	21.00	1.75	2.25	2.00	54.00	8.00	2.50	12.00	4.72	7/7	52.00
		56.00	33A,33B	15.25			0.250	20.00	21.00	1.75	2.25	2.00	54.00	8.00	2.50	12.00	4.10	5/7	56.00
		60.00	33A,33B	15.25			0.250	20.00	21.00	1.75	2.25	2.00	54.00	8.00	2.50	12.50	4.04	5/7	60.00

TABLE 2: LUM.ARM DATA

LUMINAIRE ARM SERIES	ARM SPAN "L"	RISE HEIGHT "R"	NOMINAL MOUNTING HEIGHT
33A	8'–0"	5'–0"	32'–0"
33B	8'–0"	3'–0"	30'–0"

TABLE 3: POLE LENGTH

POLE TYPE	41	42	43	44	45	46
LENGTH (FT)	27.50	21.00	27.50	21.00	27.50	21.00
TOP DIA (IN)	7.15	8.06	9.15	10.06	11.40	12.31

TABLE 4: MATERIAL DATA

COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)	COMPONENT	ASTM DESIGNATION	MIN. YIELD (KSI)
TAPERED TUBES	A595 GR.A OR A572	55	LUM. PIPE ARM	2" SCHED.40	35
			LUM. ARM ATTACHMENT	A27 GR.65–35 OR A36	35
BASE PLATE	A36	36	LUM. ARM BOLTS	SAE GR.5	92
ANCHOR BOLTS	F1554 GR.55	55	GALVANIZING–TUBES	A123	
SIGNAL ARM ATTACHMENT	A36	36	GALVANIZING–HARDWARE	F2329	
SIGNAL ARM BOLTS	A325	92			

NOTES:
1. INSTALLATION OF DUAL MAST ARMS SHALL BE IN ACCORDANCE WITH TXDOT STANDARDS.
2. INSTALLATION OF 65' MAST ARM SHALL BE IN ACCORDANCE WITH TXDOT STANDARDS.
3. REFER TO STANDARD D690 FOR INSTALLATION OF CANTILEVER ARM FOR METRO SIGN.
4. ALL SIGNAL POLES AND MAST ARMS SHALL BE POWDER COATED BLACK OR OTHER CITY APPROVED COLOR.

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL STRUCTURES STANDARD - OPTION 1 (1 OF 2)

DATE: 07-26-2021

34 41 10-D612

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE:

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	135

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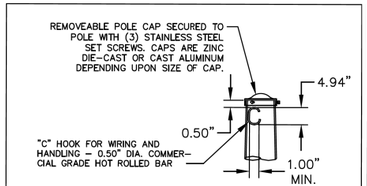
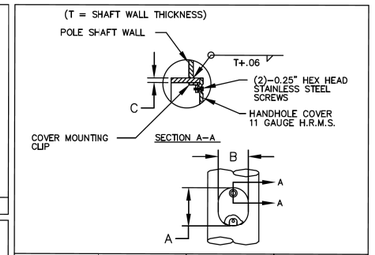
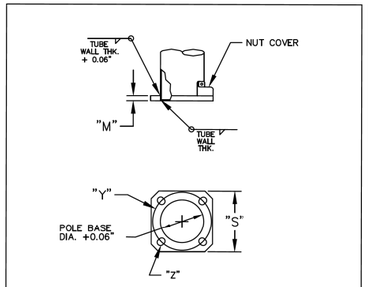


DETAIL 1 | POLE TOP

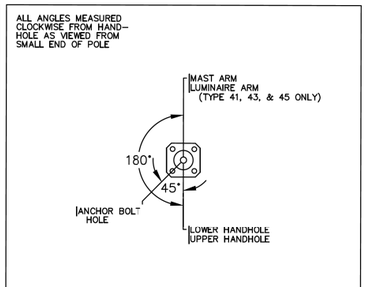


POLE WALL	A	B	C
3 GA	7.56"	5.19"	0.280"
0.25"	7.31"	5.63"	0.432"

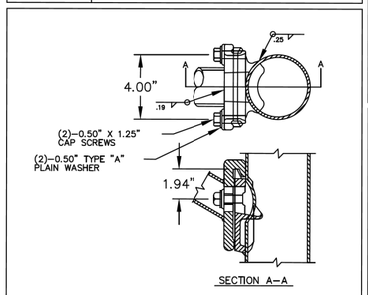
DETAIL 4 | HANDHOLE



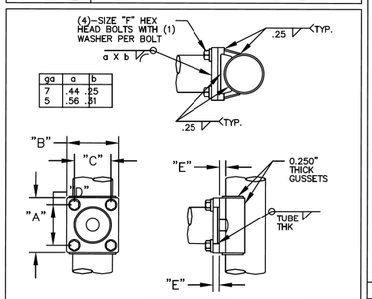
DETAIL 6 | POLE BASE



RADIAL INDEX



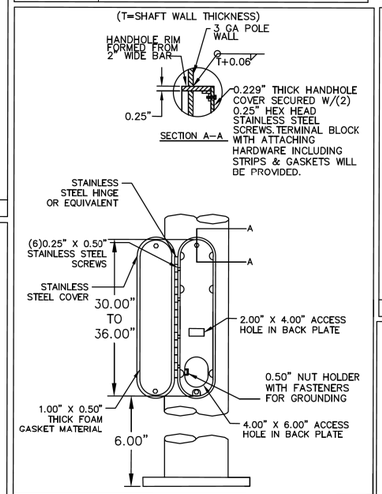
DETAIL 2 | LUMINAIRE ARM ATTACHMENT



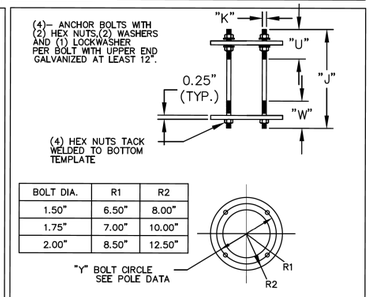
DETAIL 3 | SIGNAL ARM ATTACHMENT

SIGNAL ARM ATTACHMENT DATA

POLE BASE DIA.	"A" (IN)	"B" (IN)	"C" (IN)	"D" (IN)	"E" (IN)	"F" (IN)
11.00"	12.25	10.75	7.75	9.25	1.25	1.25 X 3.25
13.00"	16.25	15.00	11.00	12.25	1.50	1.50 X 3.50
15.25"	18.75	17.50	13.50	14.75	2.00	1.50 X 4.50

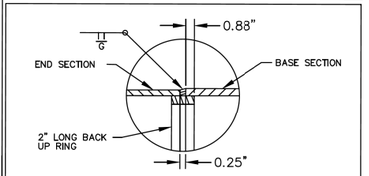


DETAIL 5 | BASE HANDHOLE



BOLT DIA.	R1	R2
1.50"	6.50"	8.00"
1.75"	7.00"	10.00"
2.00"	8.50"	12.50"

DETAIL 7 | ANCHOR BOLT



ARM SECTION DATA

SPAN	BASE SECTION LENGTH	BASE SECTION GAUGE	END SECTION LENGTH	END SECTION GAUGE
52.00'	30.00'	7	22.00'	7
56.00'	30.00'	5	26.00'	7
60.00'	21.00'	5	39.00'	7

DETAIL 8 | WELDED SIGNAL ARM SPLICE

NOTES:

1. TERMINAL BLOCKS SHALL BE INSTALLED IN EACH POLE.
2. TERMINAL BLOCKS SHALL BE 12 POINT, 7 ⅜" LONG, STACKED WHEN NEEDED.
3. SHALL USE FEED-THROUGH TYPE TERMINAL BLOCK.
4. BASE HANDHOLE AND COVER SHALL BE PREASSEMBLED ON THE POLE BY MANUFACTURER.

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL STRUCTURES STANDARD - OPTION 1 (2 OF 2)

DATE: 03-09-2022

34 41 10-D613

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

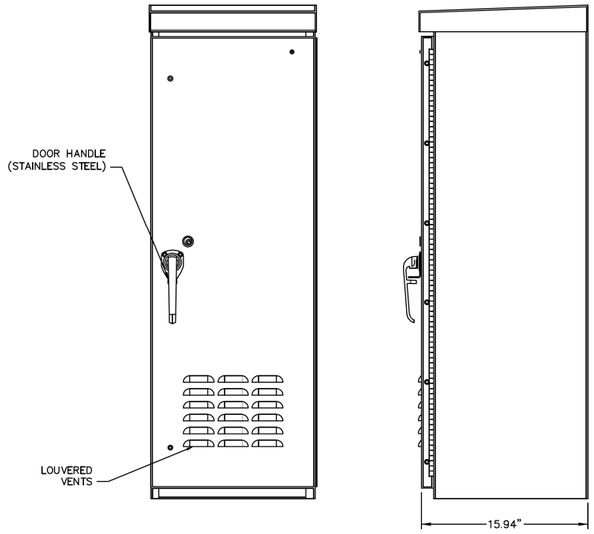
halff
TBPELS ENGINEERING FIRM #312

4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

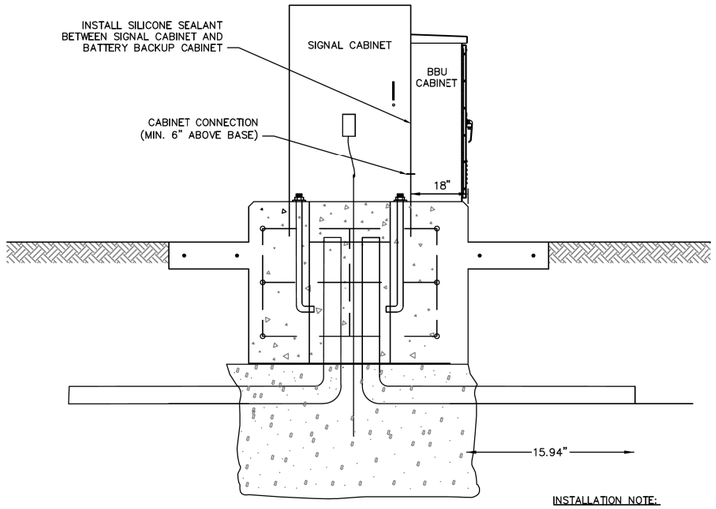
CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED.RD. DIV. NO.	STATE PROJECT NO.	HIGHWAY NO.
	6	(SEE TITLE SHEET)	
GRAPHICS	STATE	DISTRICT / COUNTY	SHEET NO.
	TEXAS	FTW / TARRANT	
CHECK	CONTROL	SECTION / JOB	
CHECK	0902	90 / 207, ETC.	136



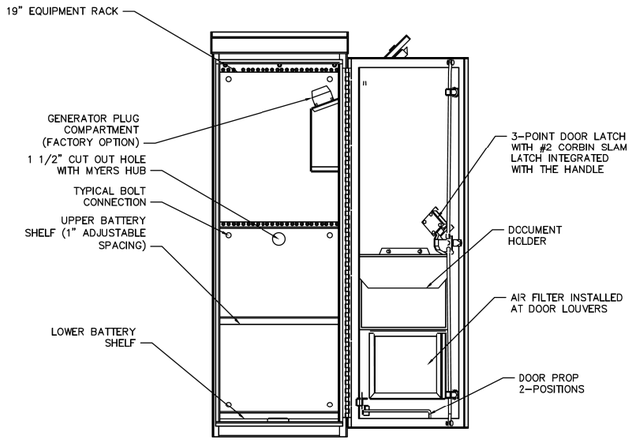
FRONT AND SIDE VIEW



CABINET MOUNTED TO TRAFFIC
SIGNAL CONTROLLER CABINET

INSTALLATION NOTE:

1. MOUNTING HOLES MUST BE DRILLED ON SITE AND MOUNTED WITH 6 SETS OF 1/4"-20 18-8 STAINLESS STEEL HEX HEAD BOLTS AND NUTS ASSEMBLY (SUPPLIED WITH SYSTEM).
2. BOLT SPACING SHOWN IN FRONT VIEW SHOWS TYPICAL LOCATIONS. LOCATION OF BOLTS MAY VARY TO ACCOMMODATE CONFLICTS.
3. INSPECTOR MUST APPROVE MOUNTING PRIOR TO INSTALLATION TO ENSURE PEDESTRIAN PATHWAYS ARE NOT BLOCKED AND THE MINIMUM CLEARANCE FROM FACE OF CURB OR EDGE OF PAVEMENT IS MET.
4. REFER TO DETAIL D606 FOR CABINET FOUNDATION DETAILS.
5. INSTALL 3" HOLE SAW CUT WITH THREADED NIPPLE ON EACH SIDE FOR CONNECTION BETWEEN CABINETS. CONNECTION POITN SHALL BE A MINIMUM OF 6" ABOVE BOTTOM OF CABINET.



FRONT VIEW
(SHOWN WITH DOOR OPENED)

NOTE:
INTERNAL BATTERY BACK UP SHALL BE ZINC 5 OR APPROVED EQUIVALENT. COORDINATE WITH CITY ON THE TYPE OF BATTERY BACK UP TO UTILIZE.

FORT WORTH

CITY OF FORT WORTH, TEXAS

TRAFFIC SIGNAL
BATTERY BACK UP DETAIL

DATE: 07-26-2021

34 41 10-D620

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED
PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

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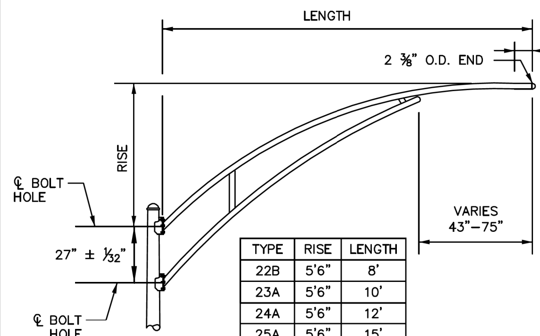
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

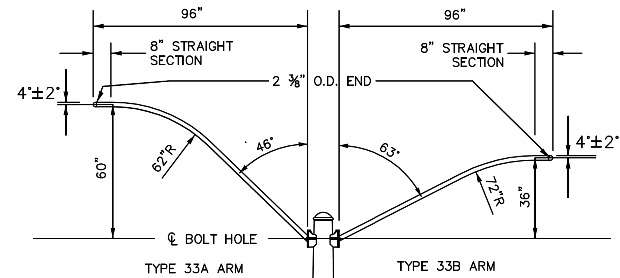
DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
	0902	90	207, ETC.	137
CHECK				

4/19/2024 8:45:45 AM 3581 TXDOT-OR Default ...\TXDOT-OR*MON*PENTABLE.tbl
A:\47000s\47647\002\TRANS\500 CADD\4 - Design\Details\D620-BATTERY BACKUP.dgn FTW WAGNER-4219

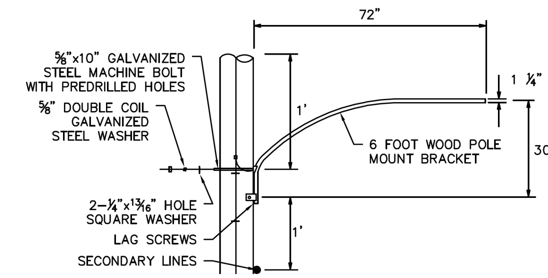


TYPE	RISE	LENGTH
22B	5'6"	8'
23A	5'6"	10'
24A	5'6"	12'
25A	5'6"	15'
25	3'	15'

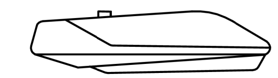
TRUSS TYPE LUMINAIRE SUPPORT ARM



SINGLE MEMBER LUMINAIRE SUPPORT ARM

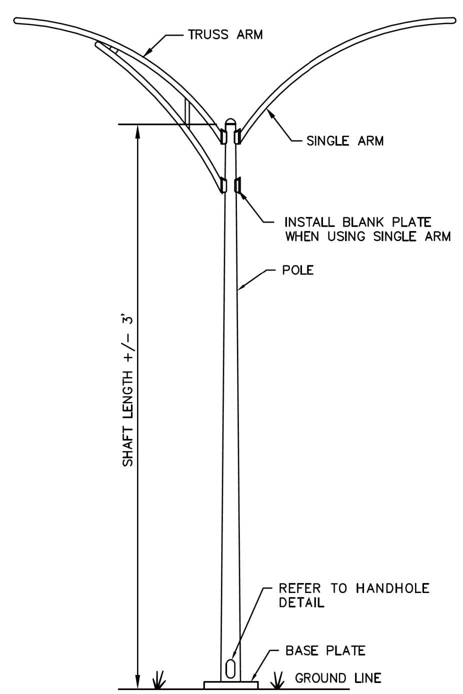


WOOD POLE ARM MOUNTING DETAIL



LED LUMINAIRE HEAD FIXTURE DETAIL

NOTE:
1. LED LUMINAIRE TO MEET SPECIFICATIONS AS SHOWN FOR ARTERIAL OR RESIDENTIAL APPLICATIONS. REFERENCE BUZZSAW FOR LATEST SPECIFICATIONS.
2. LED LUMINAIRE TO MEET 10 YEAR STANDARD WARRANTY
3. LED LUMINAIRE TO BE LABELED WITH WATTAGE PER ANSI STANDARDS.
4. LED LUMINAIRE TO BE APPROVED BY T/PW STREET LIGHTS PRIOR TO INSTALLATION.



SINGLE PIECE STEEL POLE SHAFT

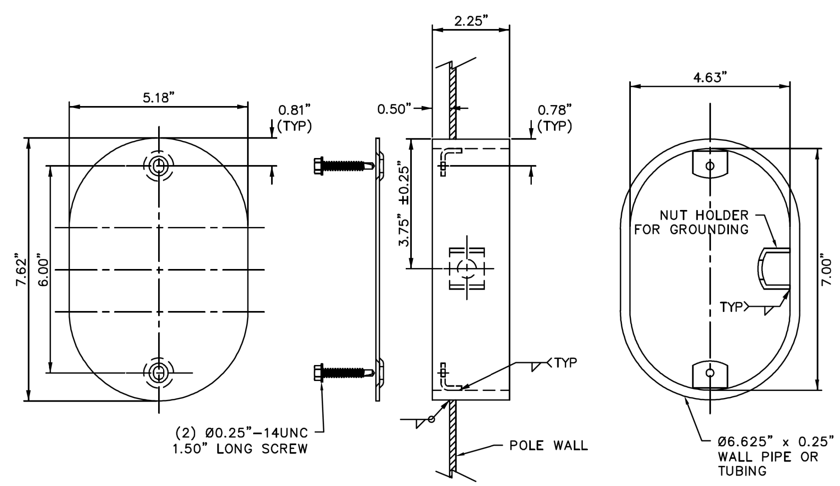
FOR POLE TYPE No's 8, 11, 18, 18A & 19

SINGLE PIECE STEEL POLE					
POLE TYPE	SHAFT LENGTH	SHAFT DIAMETER		GAUGE	DRILLED SHAFT FOUNDATION
		BOTTOM	TOP		
11	24.0'	7.0"	3.5"	11	*TYPE 1
8	27.5'	8.0"	3.5"	11	*TYPE 2
18	33.5'	8.5"	3.38"	11	*TYPE 3
18A	46'	10.0"	5.74"	11	*TYPE 6
19	27.5'	11.0"	7.15"	7	*TYPE 8

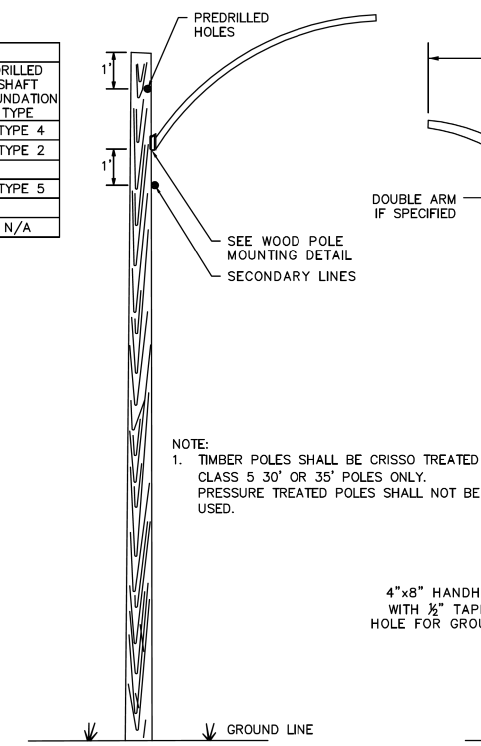
* PER 34 41 20–D622

SINGLE PIECE DAVIT POLE					
TYPE NUMBER	MOUNTING HEIGHT FT.	MINIMUM SHAFT SIZE AT BASE	SPAN	GAUGE (MIN.)	DRILLED SHAFT FOUNDATION TYPE
D25–6	25	7.5"	6'	#11	*TYPE 4
D30–6	30	8.0"	6'	#11	*TYPE 2
40 FT. DAVIT STANDARD					
D40–9	40	9.5"	9'	#11	*TYPE 5
DOUBLE DAVIT ARM					
D40–9T	N/A	N/A	9'	#11	N/A

* PER 34 41 20–D622

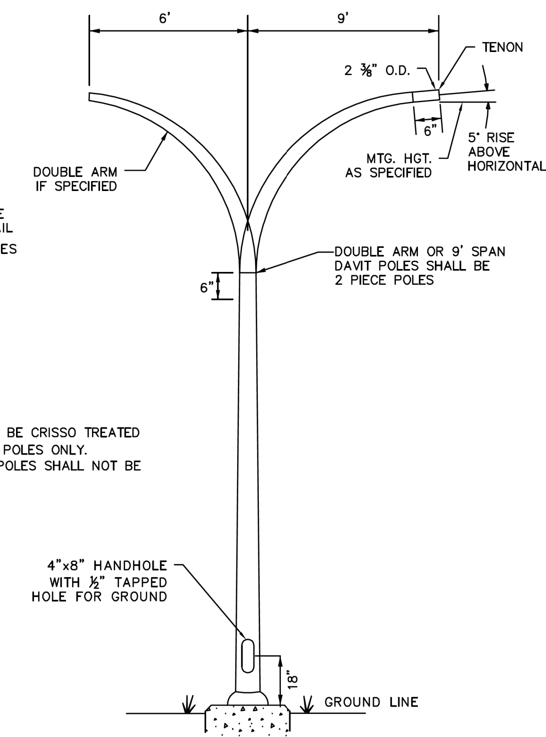


HANDHOLE DETAIL



NOTE:
1. TIMBER POLES SHALL BE CRISSO TREATED CLASS 5 30' OR 35' POLES ONLY. PRESSURE TREATED POLES SHALL NOT BE USED.

TIMBER POLE



DAVIT POLE

FORT WORTH

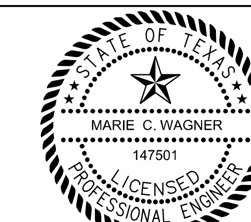
CITY OF FORT WORTH, TEXAS

STREET LUMINAIRE

POLE AND FIXTURE DETAILS

REVISED: 07-09-2014

34 41 20-D621



Marie C. Wagner

DATE: 4/22/2024

TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff

TBPELS ENGINEERING FIRM #312

4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE:

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	138

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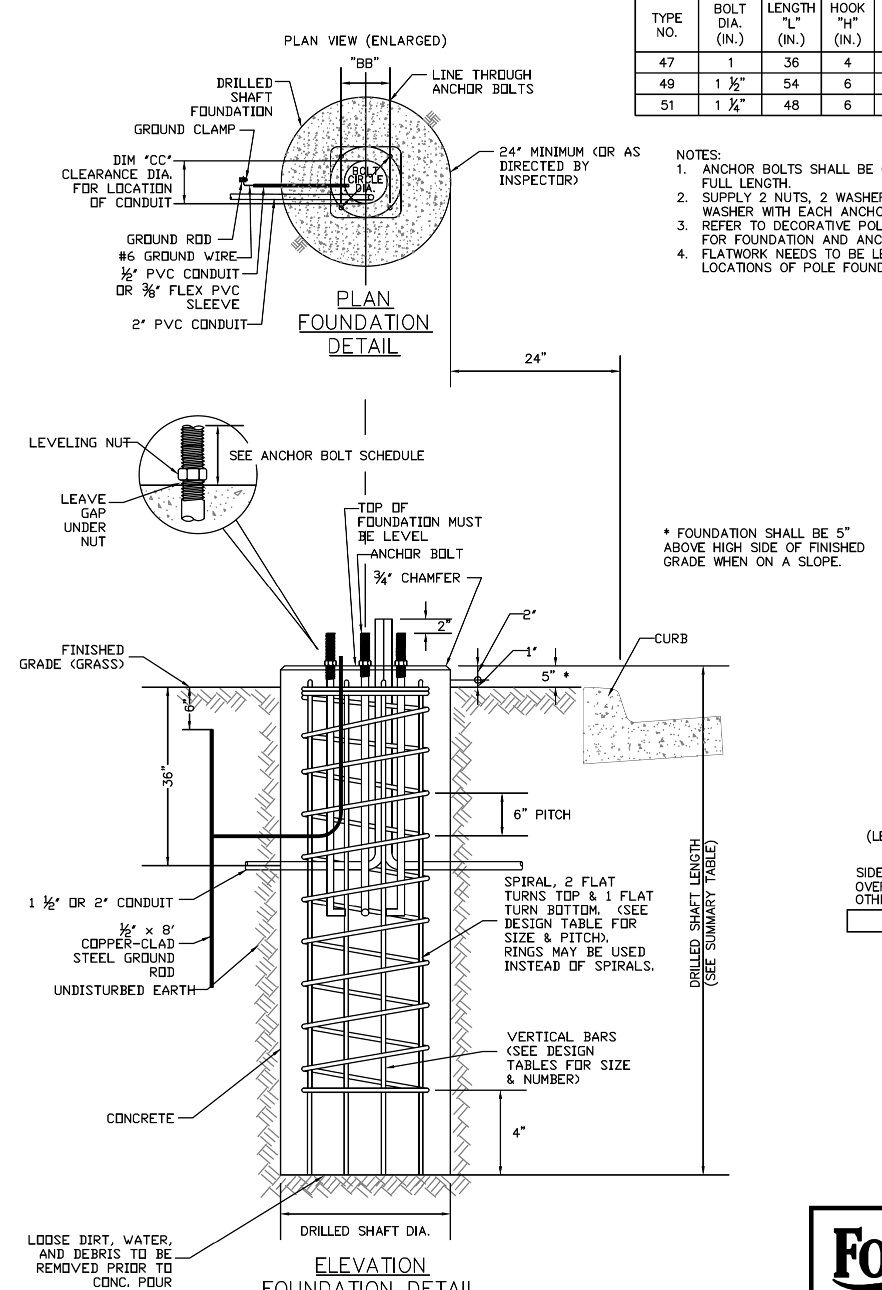
ANCHOR BOLT SCHEDULE

TYPE NO.	BOLT DIA. (IN.)	LENGTH "L" (IN.)	HOOK "H" (IN.)	THREAD "T" (IN.)	HEIGHT ABOVE FOUNDATION
47	1	36	4	6	4 ½"
49	1 ½"	54	6	9	7"
51	1 ¼"	48	6	9	5 ¼"

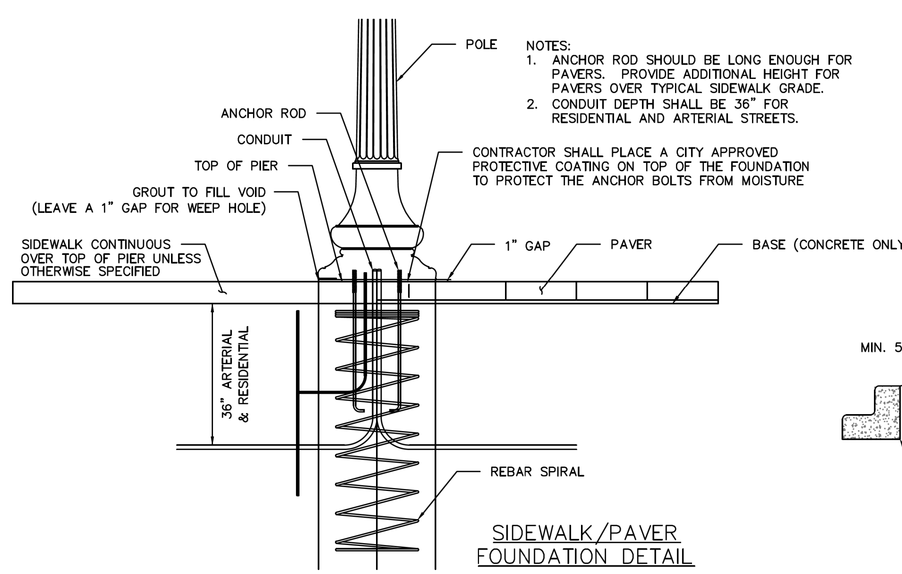
NOTES:
1. ANCHOR BOLTS SHALL BE GALVANIZED THE FULL LENGTH.
2. SUPPLY 2 NUTS, 2 WASHERS & 1 LOCK WASHER WITH EACH ANCHOR BOLT.
3. REFER TO DECORATIVE POLE DETAIL SHEETS FOR FOUNDATION AND ANCHOR BOLT DETAILS.
4. FLATWORK NEEDS TO BE LEVELED OUT AT LOCATIONS OF POLE FOUNDATIONS.

FOUNDATION DESIGN TABLE

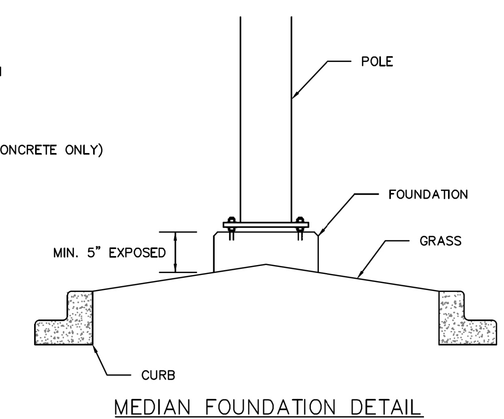
FND. TYPE	DRILLED SHAFT DIA.	REINFORCING STEEL		DRILLED SHAFT LENGTH (FEET)	GROUND ROD SIZE	ANCHOR BOLT DESIGN					DIM. "CC" CLEARANCE DIA. FOR LOCATION OF CONDUIT	FOR POLE TYPE
		VERT. BARS	SPIRAL & PITCH			ANCHOR BOLT DIA.	ANCHOR BOLT TOTAL LENGTH	BOLT CIR DIA.	ANCHOR TYPE NO.	DISTANCE ACROSS BOLTS DIM. "BB"		
1	24"	4–#5	18"x #3 AT 6"	6	½" x 8'	1"	40"	10"	47	7 1⁄16"	6 ½"	11
2	24"	4–#5	18"x #3 AT 6"	6	½" x 8'	1"	40"	11"	47	7 ¾"	7"	8 & D30–6
3	24"	4–#5	18"x #3 AT 6"	8	½" x 8'	1"	40"	11 ½"	47	8 ⅛"	7 ½"	18
4	24"	4–#5	18"x #3 AT 6"	6	½" x 8'	1"	40"	10 ½"	47	7 7⁄16"	6 ½"	D25–6
5	30"	6–#5	24"x #3 AT 6"	8	½" x 8'	1 ¼"	48"	13"	51	9 3⁄16"	8 ½"	D40–9T, *D40–9
6	30"	6–#5	24"x #3 AT 6"	8	½" x 8'	1 ¼"	54"	13 ½"	51	9 9⁄16"	9 ½"	18A
7	24"	4–#5	18"x #3 AT 6"	5	½" x 8'	¾"	24"	15"	N/A	10 ⅝"	10"	WASHINGTON STYLE
8	30"	6–#5	24"x #3 AT 6"	8	½" x 8'	1 ½"	60"	15"	49	10 ⅝"	10"	19, 41
9	30"	6–#5	24"x #3 AT 6"	8	½" x 8'	1 ¼"	54"	17 ¼"	51	12"	10"	41B
11	24"	4–#5	18"x #3 AT 6"	5	½" x 8'	¾"	20"	10 ½"	N/A	7.42"	6 ⅛"	OLEANDER STYLE – TYPE A
12	24"	4–#5	18"x #3 AT 6"	5	½" x 8'	¾"	27"	12 ½"	N/A	8.84"	8 ⅛"	OLEANDER STYLE – TYPE B
13	24"	4–#5	18"x #3 AT 6"	5	½" x 8'	¾"	24"	7"	N/A	5"	3 ½"	BERRY STYLE – 12'
16	24"	4–#5	18"x #3 AT 6"	5	½" x 8'	¾"	17"	7 ½"	N/A	5.30"	4" ±	WEST 7TH STYLE – 12'



ELEVATION FOUNDATION DETAIL



SIDEWALK/PAVER FOUNDATION DETAIL



MEDIAN FOUNDATION DETAIL

FORT WORTH

CITY OF FORT WORTH, TEXAS
STREET LUMINAIRE POLE FOUNDATION DETAILS

REVISED: 03-22-2016

34 41 20-D622

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
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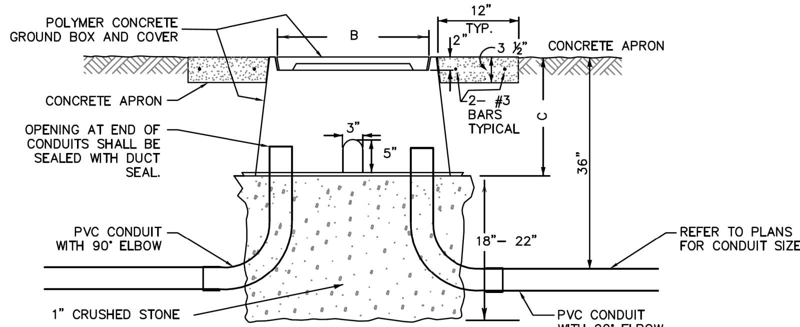
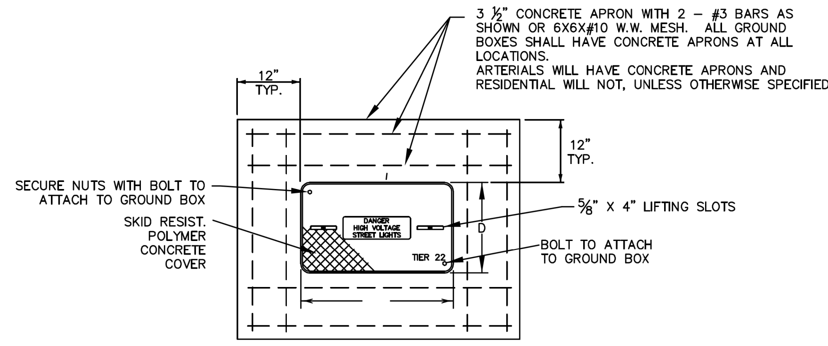
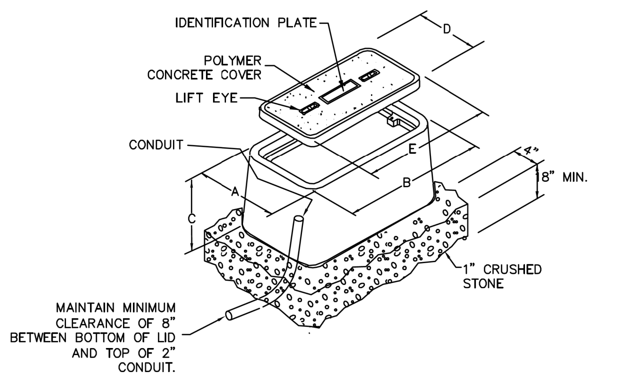


SECTION VIEW

SHOWING DIMENSIONS OF BOX AND ACCOMPANYING FIELD INSTALLATION



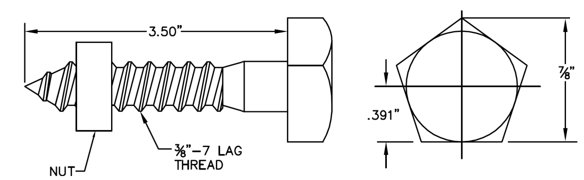
GROUND BOX COVER



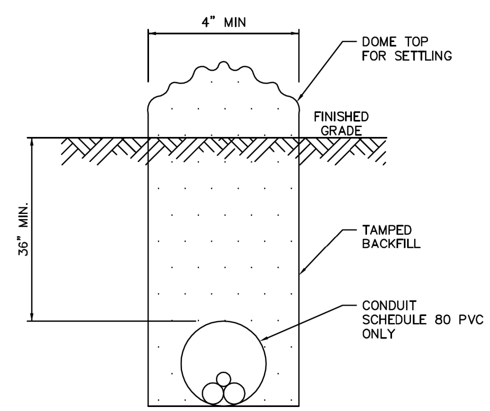
PULL BOX	NOMINAL GROUND BOX DIMENSIONS			NOMINAL COVER DIMENSIONS	
	A	B	C	D	E
TYPE B	15 ½"	25"	18"	13 ¾"	23 ¼"

GROUND BOX DETAIL

NOTES:
1. ALL BOXES SHALL MEET ALL TEST REQUIREMENTS OF THE LATEST SCTE 77 "SPECIFICATION FOR UNDERGROUND ENCLOSURE INTEGRITY" FOR TIER 22 APPLICATIONS.
2. BOTTOM EDGE OF BOX OR EXTENSION SHALL BE FOOTED WITH A MINIMUM 1 ¼" FLANGE.
3. COVER LIFT EYE: MOLDED WITH COVER.
4. COVER LETTERING: 1" INCISED LETTERS "DANGER HIGH VOLTAGE STREET LIGHT". SEE DETAIL THIS SHEET.
5. COVER MUST BE SECURED WITH "PENTA HEAD", STAINLESS STEEL, SELF CLEANING BOLTS AND NUTS. SEE DETAIL THIS SHEET.
6. THE GROUND BOXES FOR THIS PROJECT SHALL MEET THE REQUIREMENTS SHOWN ABOVE. THE CONTRACTOR WILL BE PERMITTED TO FURNISH LIKE MATERIALS OF ANY MANUFACTURER PROVIDED THEY ARE STAMPED AND CERTIFIED BY A PROFESSIONAL ENGINEER FROM THE STATE OF TEXAS, OR VERIFIED BY A NATIONALLY RECOGNIZED INDEPENDENT TESTING LAB AND THEY ARE OF EQUAL OR BETTER QUALITY AND COMPLY WITH THE SPECIFICATIONS.



SELF CLEANING BOLT AND NUT FOR COVERS



TRENCH REQUIREMENTS STREET LIGHT CONDUIT

NOTES:
1. TRENCH ALIGNMENT SHALL BE AS STRAIGHT AS CONDITIONS PERMIT. ANY DEVIATIONS FROM PLANNED ALIGNMENT SHALL HAVE PRIOR APPROVAL BY THE PROJECT ENGINEER/INSPECTOR. ALL TRENCH CUTS SHALL BE IN ACCORDANCE WITH EXISTING SAFETY REGULATIONS IN EFFECT.
2. TRENCH BOTTOM SHOULD BE UNDISTURBED, TAMPED, OR RELATIVELY SMOOTH EARTH. WHERE EXCAVATION IS IN ROCK, THE CONDUIT SHOULD BE LAID ON A LAYER OF CLEAN BACKFILL.
3. ALL BACKFILL SHOULD BE FREE OF DEBRIS OR OTHER MATERIAL THAT MAY DAMAGE THE CONDUIT SYSTEM OR CAUSE SETTLING. THE MATERIAL SHOULD FILL THE VOIDS AROUND THE CONDUIT TO PREVENT HOT SPOTS & SETTLING. BACKFILL MATERIAL SHALL NOT EXCEED 1 INCH IN DIAMETER.
4. BACKFILL SHOULD BE ADEQUATELY COMPACTED. BACKFILL NOT UNDER PAVEMENT SHOULD BE COMPACTED TO THE DENSITY OF THE SURROUNDING UNDISTURBED SOIL. BACKFILL UNDER PAVEMENT SHOULD BE COMPACTED TO NOT LESS THAN 95% OF THE DENSITY OF UNDISTURBED SOIL AS DETERMINED BY ASTM DESIGNATION D-698.
5. A 2500# OR 6000# PULL TAPE SHALL BE LEFT IN EACH CONDUIT. CONDUIT SHALL BE PLUGGED AT BOTH ENDS.
6. EACH RUN OF INSTALLED CONDUIT OF ALL TYPES WILL REQUIRE THAT A MANDREL CHECK BE MADE BY PULLING THROUGH THE ENTIRE LENGTH OF ALL CONDUITS IN THE INSTALLATION FOR FINAL INSPECTION.

FORT WORTH

CITY OF FORT WORTH, TEXAS

STREET LUMINAIRE CONDUIT AND GROUND BOX DETAILS

REVISED: 01-09-2014

34 41 20-D624

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

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TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE:
SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	140
CHECK	0902	90	207, ETC.	

FTW
TXDOT-OR Default
...\TXDOT-OR*MON*PENTABLE.tbl
A:\47000s\47647\002\TRANS\500 CADD\4 - Design\Ref\FW Standards\D624-STREET LUMINAIRE CONDUIT AND GROUND BOX DETAILS.dgn
4/19/2024 4:46:11 PM

120/240 V 1 Ø 3 W 100 AMPS

UTILITY _____ 10K AIC

DISTRIBUTOR ELECTROL SYSTEMS 210-599-6485

CONTRACTOR _____

PEDESTAL MATERIAL AND FINISH COLOR
- ■ ALUMINUM LT. GREEN
- ☐ STAINLESS STEEL #3 BRUSHED
- ☐ OTHER _____

■ SUITABLE FOR USE AS SERVICE EQUIPMENT

U.L. LABEL ■ ENCLOSED INDUSTRIAL CONTROL PANEL

PHOTOCELL REQUIRED ■ YES ☐ NO | PHOTOCELL PROVISIONS ■ YES ☐ NO

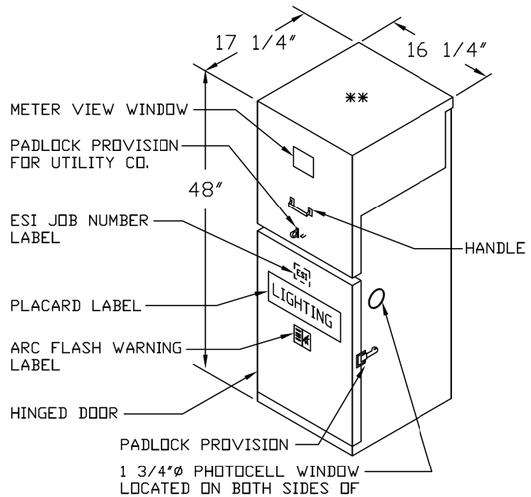
NEMA 3R CONSTRUCTION- -STAINLESS STEEL HARDWARE
.125 STAINLESS STEEL CONSTRUCTION WITH NATURAL FINISH
OR .125 ALUMINUM CONSTRUCTION WITH POWDER-COAT FINISH

ALL FACTORY WIRING CODE GAUGE COPPER CONDUCTORS WITH 600V INSULATION
SERVICE TERMINATIONS NO. 6 AWG TO 250 MCM CU/AL

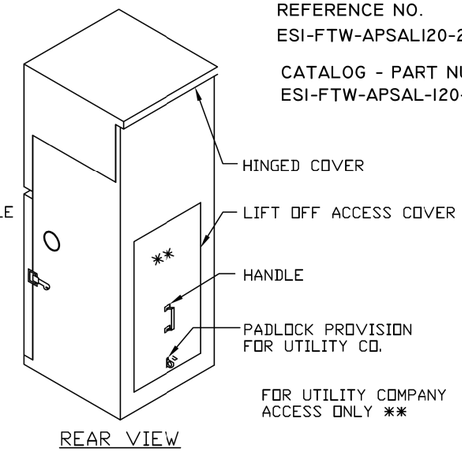
MATERIAL LIST

NO	DESCRIPTION	QTY	AMP	POLE	AIC/V	MANUFACTURER AND PART NUMBER	
MTR	METER SOCKET	1	200	4JAW	600V	CUTLER-HAMMER	CH673885M
1-2	MAIN	1	100	2	10K	SQUARE D	SQ/QOU2100
3	CONTROL	1	15	1	10K	SQUARE D	SQ/QOU115
1-6	120V LIGHTS	6	20	1	10K	SQUARE D	SQ/QOU120
7-10	240V LIGHTS	2	20	2	10K	SQUARE D	SQ/QOU220
PDB	POWER BLOCK	1	175	2	600V	MARATHON	1422570
HOA	3 POS. SELECTOR	1	20	-	600V	SQUARE D	ZB4BD3-ZB4BZ103
PEC	PHOTOELECTRIC SOCKET	2	20	-	600V	INTERMATIC -OR- BUSSMANN	K122 13661-W5418
	PE CELL	1	20	-	120V	TORK	S895
NOTE: PHOTOELECTRIC MAY BE LOCATED ON LEFT OR RIGHT SIDE OF CABINET							
C	CONTACTOR	1	100	2	120V	SQUARE D	LC1D80MEQ4096G7

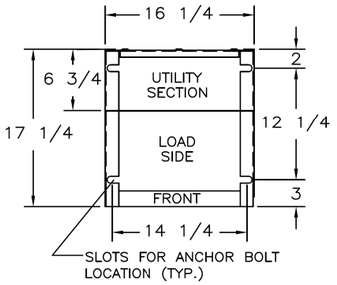
NOTE: USE SPECIAL XHHW WIRE!



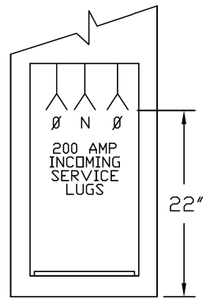
FRONT VIEW



REAR VIEW



ANCHOR BOLT INSTALLATION LAYOUT
BOTTOM VIEW



REAR LANDING DETAIL,
COVER REMOVED

120-240 VOLT SINGLE PHASE

METERED SERVICE PEDESTAL FOR LIGHTING (120V AND 240V)

FORT WORTH

CITY OF FORT WORTH, TEXAS
120-240 VOLT SINGLE PHASE METERED PEDESTAL

REVISED: 12-23-2016

34 41 20-D625

PAGE 1 OF 3
REFERENCE NO.
ESI-FTW-APSALI20-2016-11

CATALOG - PART NUMBER
ESI-FTW-APSAL-I20-6IP22P

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
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FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	141
CHECK	0902	90	207, ETC.	

NAME PLATE SCHEDULE			
N.P.	BREAKER	POLES	AMPS
NP-MB	MAIN	2	100
NP-1	LIGHTING 1	1	20
NP-2	LIGHTING 2	1	20
NP-3	LIGHTING 3	1	20
NP-4	LIGHTING 4	1	20
NP-5	LIGHTING 5	1	20

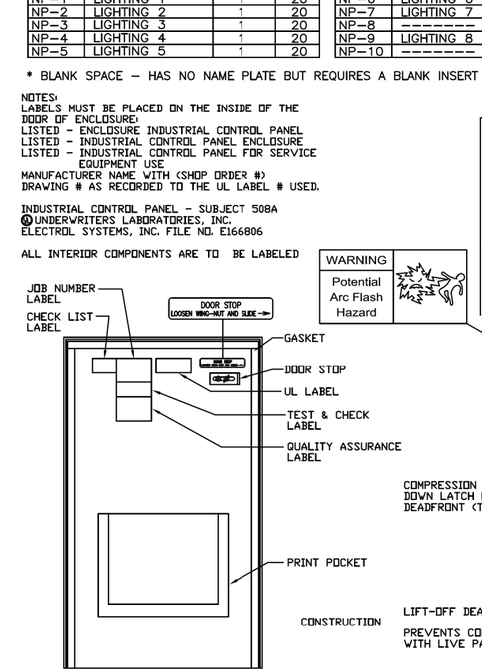
NAME PLATE SCHEDULE			
N.P.	BREAKER	POLES	AMPS
NP-CTL	CONTROL	1	15
NP-6	LIGHTING 6	1	20
NP-7	LIGHTING 7	2	20
NP-8	--------	----	---
NP-9	LIGHTING 8	2	20
NP-10	--------	----	---

* BLANK SPACE - HAS NO NAME PLATE BUT REQUIRES A BLANK INSERT ON DEAD FRONT

NOTES:
LABELS MUST BE PLACED ON THE INSIDE OF THE DOOR OF ENCLOSURE:
LISTED - ENCLOSURE INDUSTRIAL CONTROL PANEL
LISTED - INDUSTRIAL CONTROL PANEL ENCLOSURE
LISTED - INDUSTRIAL CONTROL PANEL FOR SERVICE EQUIPMENT USE
MANUFACTURER NAME WITH (SHOP ORDER #)
DRAWING # AS RECORDED TO THE UL LABEL # USED.

INDUSTRIAL CONTROL PANEL - SUBJECT 508A
Ⓤ UNDERWRITERS LABORATORIES, INC.
ELECTROL SYSTEMS, INC. FILE NO. E166806

ALL INTERIOR COMPONENTS ARE TO BE LABELED



FRONT DOOR - INSIDE VIEW

WARNING
Potential Arc Flash Hazard

120 / 240 VOLT 1ϕ

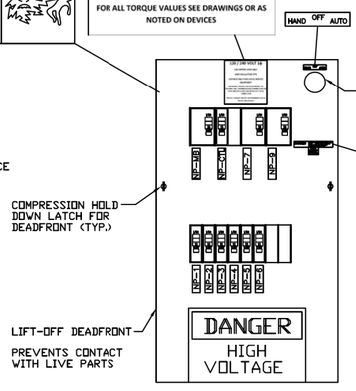
USE COPPER WIRE ONLY

WIRE INSULATION 75°C

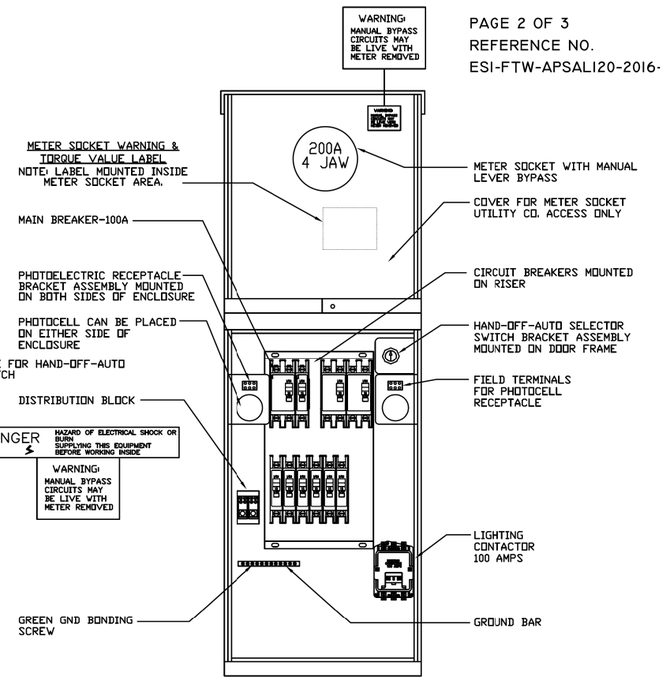
SUITABLE ONLY FOR USE AS SERVICE EQUIPMENT

INSTALLING CONTRACTOR IS RESPONSIBLE FOR CHECKING THAT TERMINALS/LUGS/TERMINATIONS ARE TIGHT AND/OR SECURE FOR PROPER ELECTRICAL CONNECTION

FOR ALL TORQUE VALUES SEE DRAWINGS OR AS NOTED ON DEVICES



LIFT-OFF DEADFRONT DOOR VIEW



INTERIOR VIEW

FORT WORTH

CITY OF FORT WORTH, TEXAS

120-240 VOLT SINGLE PHASE METERED PEDESTAL

REVISED: 12-23-2016

34 41 20-D625

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

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CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE:

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
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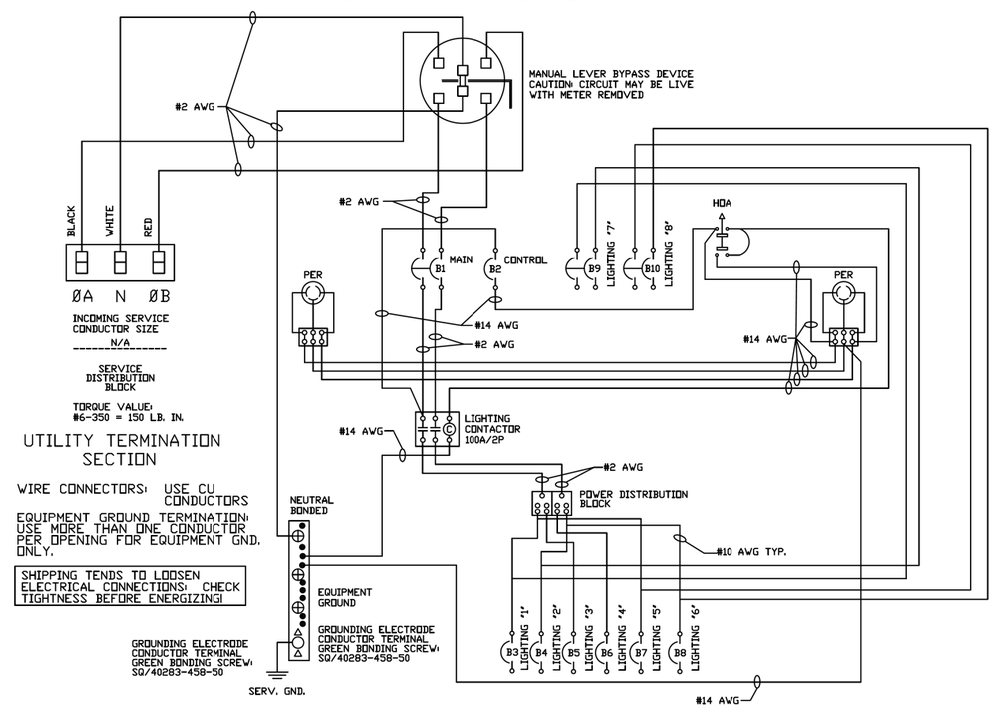
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	142

BONDED NEUTRAL, REMOVE BONDING MEANS FOR TEST PURPOSES ONLY
SERVICE DISCONNECT 100 AMPS OR LESS, 10KAIC; SQUARE D/ TYPE QOU
CIRCUIT BREAKERS 100 AMPS OR LESS; SQUARE D TYPE QOU.

SHORT CIRCUIT RATING; RMS SYMMETRICAL AMPS 10,000 AT 240/480 VAC. THE SHORT CIRCUIT RATING IS LIMITED TO THE LOWEST INTERRUPTING CAPACITY OF ANY DEVICE INSTALLED, REPLACEMENT BREAKERS MUST BE SAME TYPE AND RATING. FIELD INSTALLED CONDUCTORS SHOULD BE SIZED BASED ON 60°C AMPACITY FOR 14-1 AWG AND 75°C AMPACITY OVER 1 AWG PER TABLE 310-16 OF NEC.

METER SOCKET 200 AMPS CONTINUOUS



REFERENCE NO.
ESI-FTW-APSALI20-2016-13

POWER WIRING Ø8/12 WILL BE RED WIRE/TORQUE VALUE 50 IN. LB
#6 GAUGE WIRE AND SMALLER WILL HAVE RED INSULATION
#4 GAUGE WIRE AND LARGER WILL BE TAPED RED AT LEAST 6" ABOVE LUG
NEUTRAL WIRING WILL BE WHITE WIRE/TORQUE VALUE 50 IN. LB
#6 GAUGE WIRE AND SMALLER WILL HAVE WHITE INSULATION
#4 GAUGE WIRE AND LARGER WILL BE TAPED WHITE AT LEAST 6" ABOVE LUG

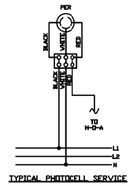
RAINPROOF TxDOT TYPE 3R.

CIRCUIT DIRECTORY

NO.	DESCRIPTION	AMP	POLE
B1	MAIN	100	2
B2	CONTROL	15	1
B3	120V LIGHTING 1	20	1
B4	120V LIGHTING 2	20	1
B5	120V LIGHTING 3	20	1
B6	120V LIGHTING 4	20	1
B7	120V LIGHTING 5	20	1
B8	120V LIGHTING 6	20	1
B9	240V LIGHTING 7	20	2
B10	240V LIGHTING 8	20	2

IF CIRCUIT BREAKER TRIPS, HANDLE WILL BE IN INTERMEDIATE POSITION. TO RESTORE POWER TURN TO FULL OFF, THEN ON

LOAD TORQUE VALUE; QOU TYPE CIRCUIT BREAKER 45 IN. LB.



FORT WORTH

CITY OF FORT WORTH, TEXAS
120-240 VOLT SINGLE PHASE METERED PEDESTAL

REVISED: 12-23-2016

34 41 20-D625

STATE OF TEXAS
MARIE C. WAGNER
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Marie C. Wagner
DATE: 4/22/2024
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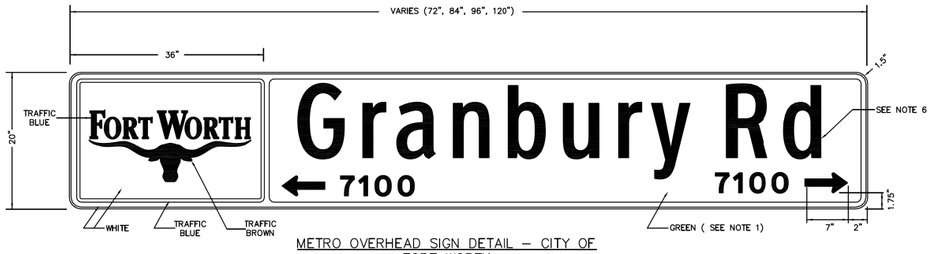
Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	143



METRO OVERHEAD SIGN DETAIL – CITY OF FORT WORTH

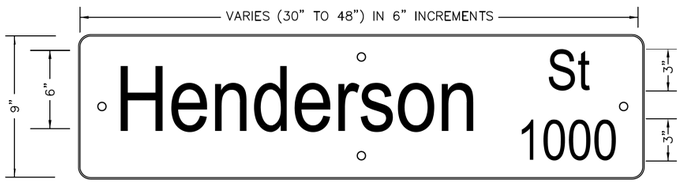
UPPERCASE: 11" CLEARVIEW 3W
LOWERCASE: 10" CLEARVIEW 3W
BLOCK NUMBER: 3" CLEARVIEW 4W

METRO OVERHEAD SIGN DETAIL (PRIVATE STREET) – CITY OF FORT WORTH

UPPERCASE: 11" CLEARVIEW 3W
LOWERCASE: 10" CLEARVIEW 3W
BLOCK NUMBER: 3" CLEARVIEW 4W

NOTES:

1. METRO SIGN SHEETING SHALL BE WHITE 3M DIAMOND GRADE CUBED (DG3) WITH GREEN ELECTRO-CUT (EC) TRANSPARENT FILM AS AN OVERLAY OR APPROVED EQUAL BY TRAFFIC MANAGEMENT.
2. FONT: HIGHWAY GOTHIC 'C' OR 'B' (DEPENDING ON LENGTH OF NAME)
3. SIGN BLANK FOR 2 INCH POST INSTALL: 0.08 FEDERAL SPEC. ALUM. (LP/SP INSTALL 0.125 UNDRILLED)
4. SIGNS LONGER THAN 10'-0" FOR STREET NAME METROS OR 4'-0" FOR STREET NAME BLADES SHALL HAVE TRAFFIC MANAGEMENT APPROVAL.



STREET NAME BLADE DETAIL

FORT WORTH

CITY OF FORT WORTH, TEXAS
STREET NAME SIGN DETAILS

DATE: 6-11-2015

34 41 30-D633

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

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CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
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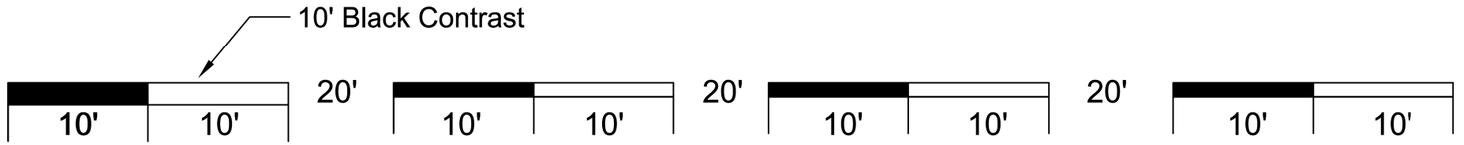
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	144

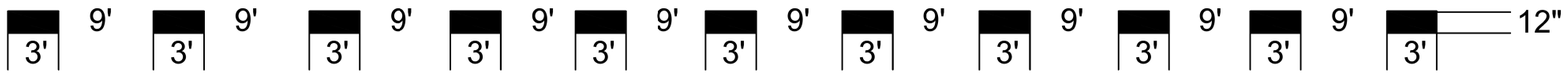
Solid Edge Line or Lane Line

Double Solid Lines



10' White Skip With 10' Black Contrast and 20' Gaps

10'–30' Skip Line



3'–9' Dotted Lane Drop Line

2'–4' Dotted Guide Line

FORT WORTH

CITY OF FORT WORTH, TEXAS

PAVEMENT MARKINGS DETAILS
SHEET 1 of 6

REVISED: 12-18-2020

32 17 23-D642

STATE OF TEXAS
MARIE C. WAGNER
147501
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Marie C. Wagner

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4000 FOSSIL CREEK BLVD
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CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE:

SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
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GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	145

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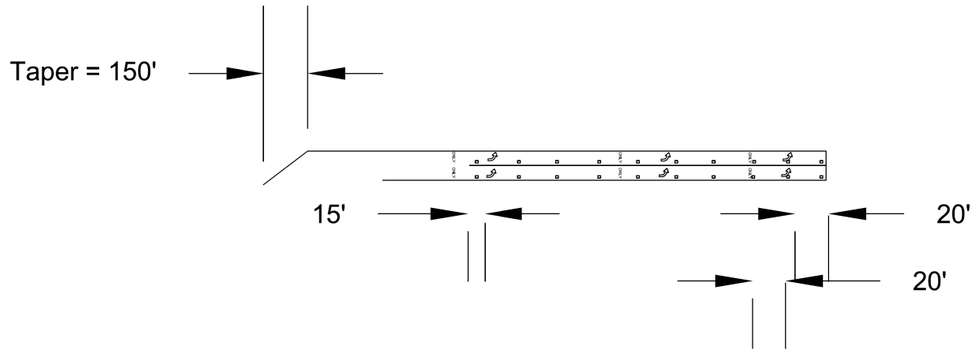
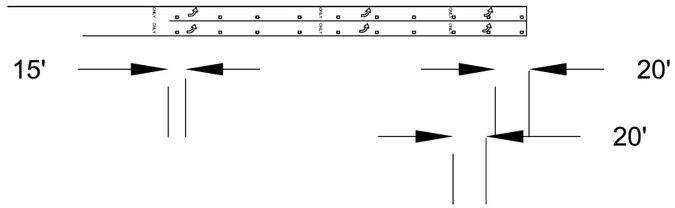
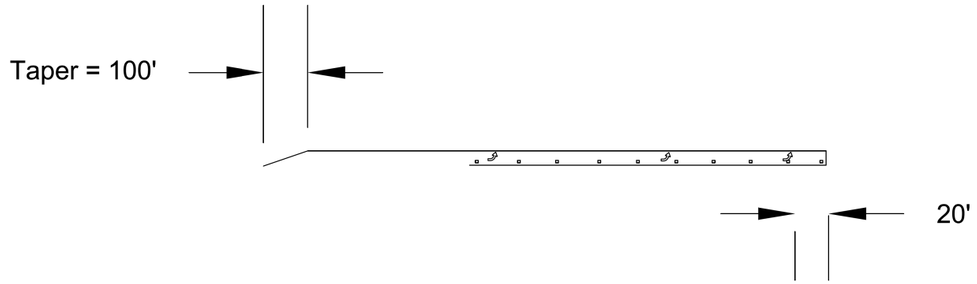
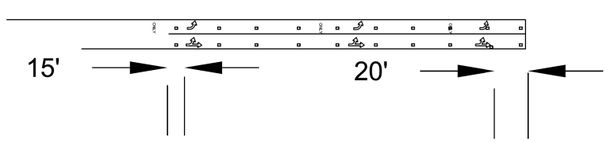


Double Left Turn Bay Markings



Through Lane Becomes Exclusive Left Turn





Through Lane Becomes Optional Left Turn

FORT WORTH

CITY OF FORT WORTH, TEXAS

PAVEMENT MARKINGS DETAILS
SHEET 2 of 6

REVISED: 12-18-2020

32 17 23-D642

STATE OF TEXAS
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CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

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GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	146

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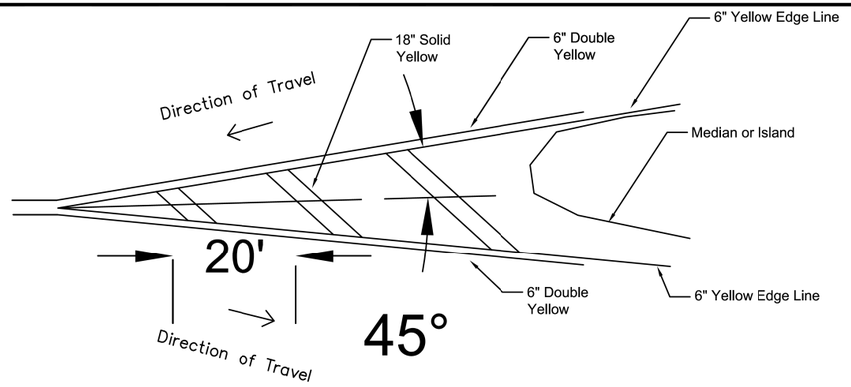
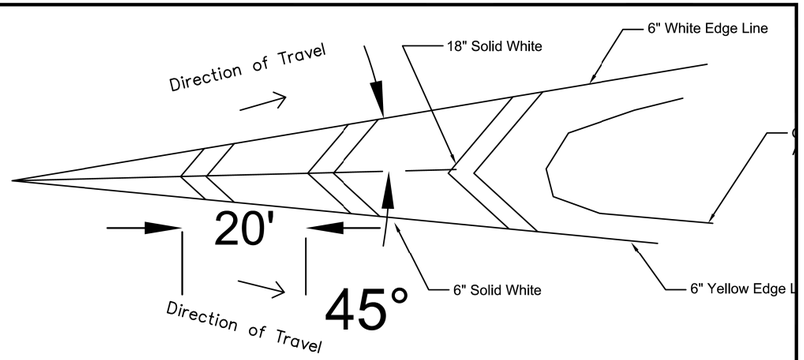
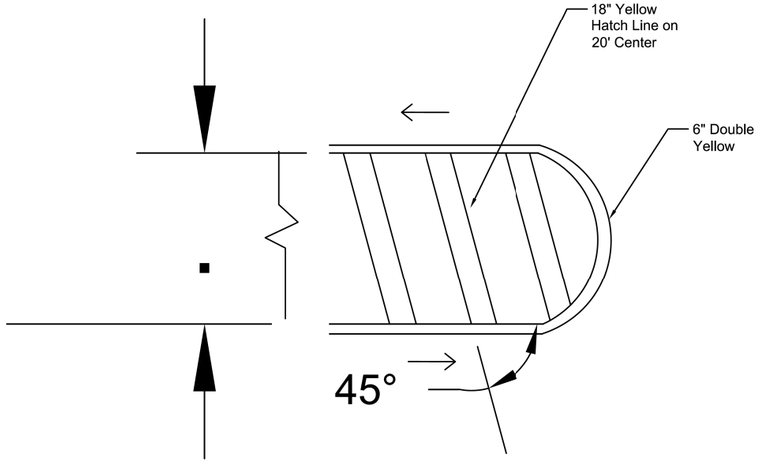
3581 MARIE C. WAGNER-42219



Pavement Markings For Traffic Separation

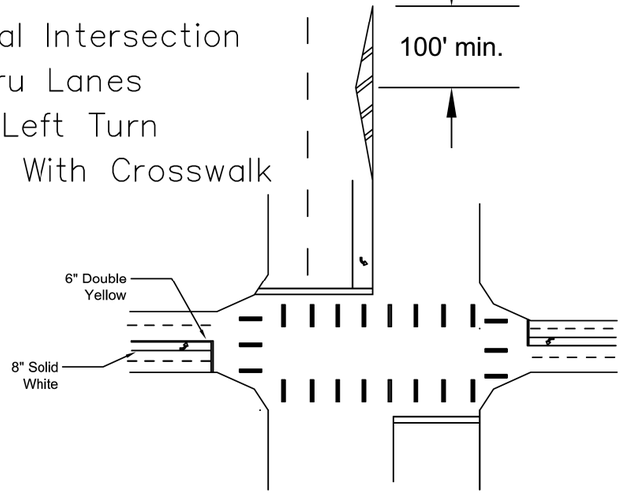


Pavement Markings For Traffic Flowing In The Same Direction



Median Extension

Typical Intersection
2 Thru Lanes
Plus Left Turn
Lane, With Crosswalk



FORT WORTH

CITY OF FORT WORTH, TEXAS

PAVEMENT MARKINGS DETAILS
SHEET 3 of 6

REVISED: 12-18-2020

32 17 23-D642

STATE OF TEXAS
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CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

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	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	147

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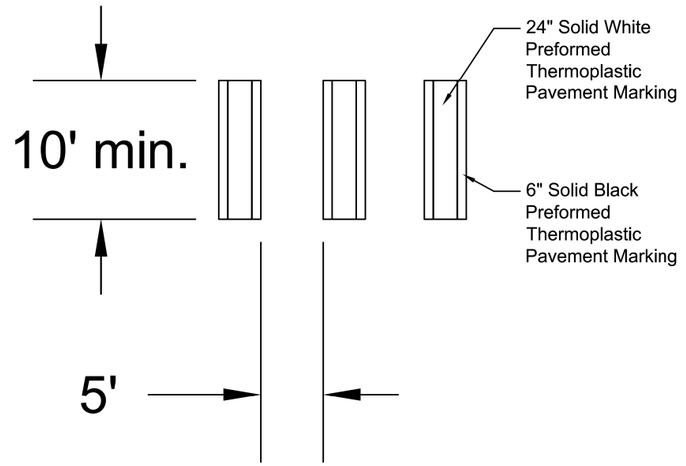
CONTRAST CROSSWALK

NOTES:

1. CROSSWALKS AND STOP BARS SHALL BE WHITE.

2. PREFORMED THERMOPLASTIC SHALL BE USED FOR ALL CROSSWALK PAVEMENT MARKINGS.

3. PREFORMED THERMOPLASTIC MATERIAL SHALL BE SUPPLIED BY A MANUFACTURER LISTED ON TxDOT'S MATERIAL PRODUCER LIST (MPL).



FORT WORTH	CITY OF FORT WORTH, TEXAS **PAVEMENT MARKINGS DETAILS** **SHEET 5 of 6**	REVISED: 12-18-2020 **32 17 23-D642**

STATE OF TEXAS
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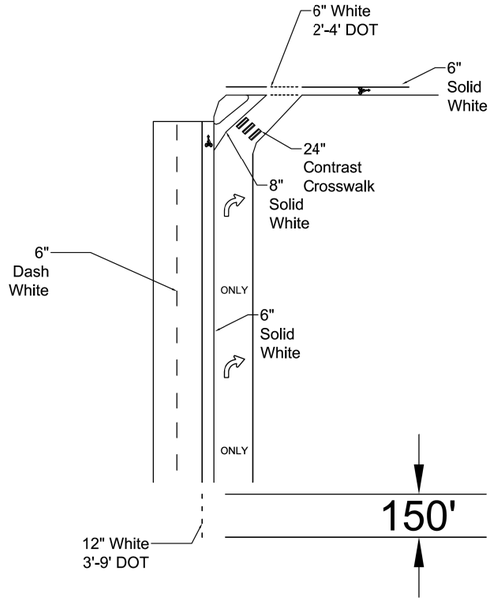
NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

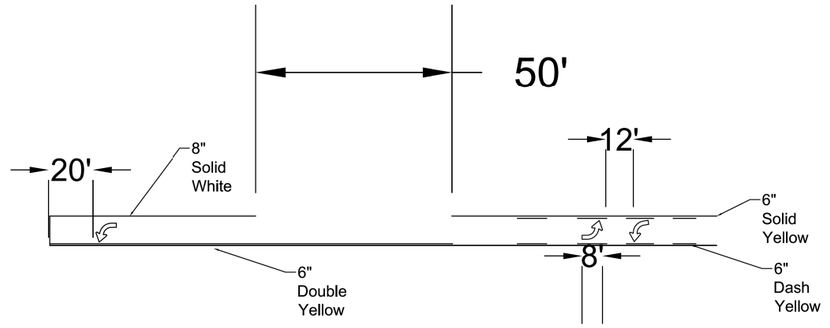
CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
	0902	90	207, ETC.	148
CHECK				



Right Turn Lane Drop And Island
Left Turn Lane Drop Is A Mirror Image



Two Way Left Turn Lane

FORT WORTH	CITY OF FORT WORTH, TEXAS **PAVEMENT MARKINGS DETAILS** **SHEET 4 of 6**	REVISED: 12-18-2020 **32 17 23-D642**

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED
PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	149

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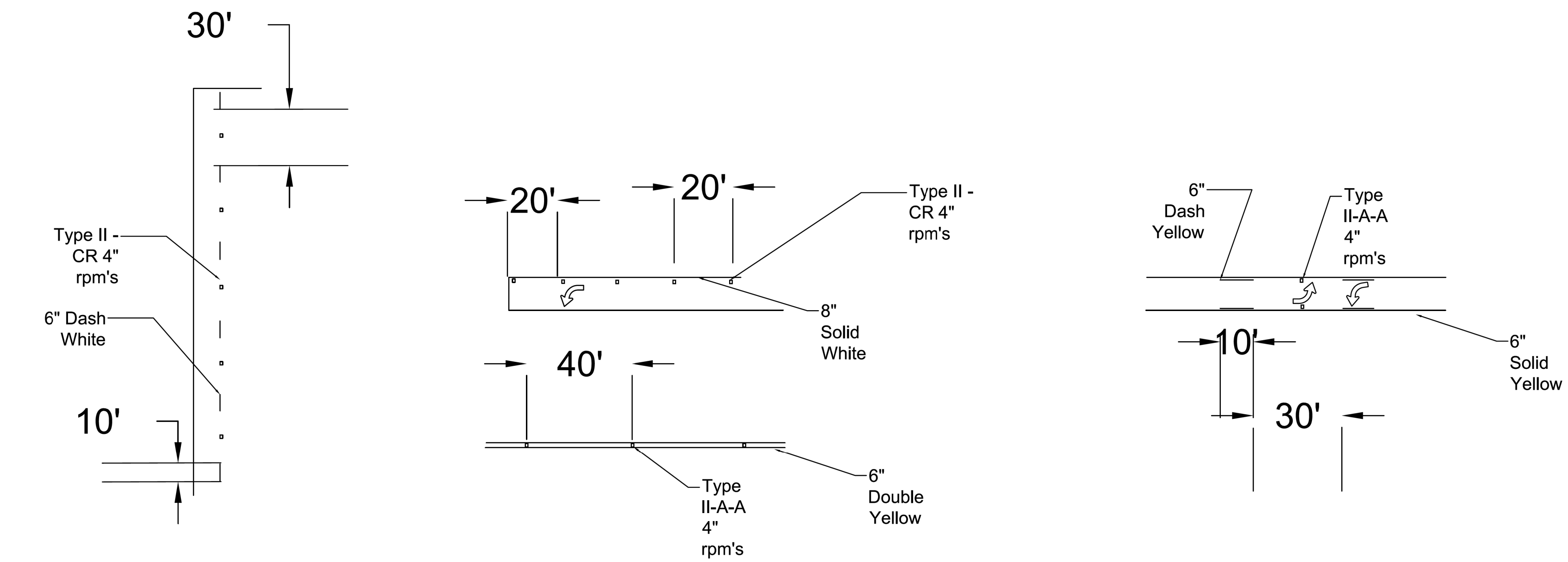

Reflector Placement

FORT WORTH

CITY OF FORT WORTH, TEXAS

PAVEMENT MARKINGS DETAILS
SHEET 6 of 6

REVISED: 12-18-2020

32 17 23-D642

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner
DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
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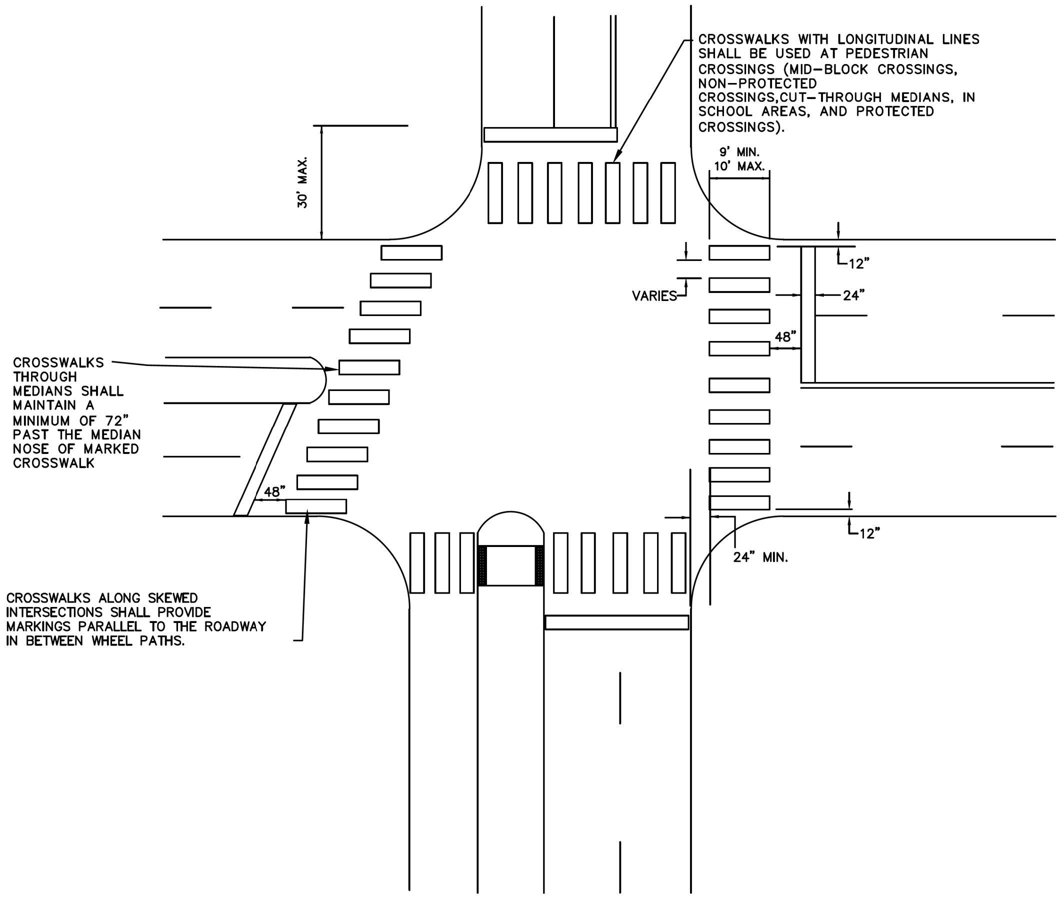
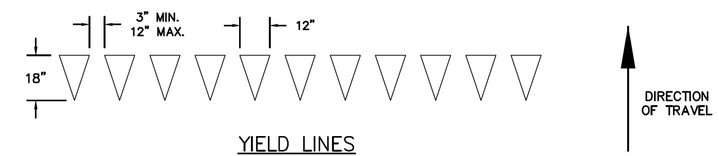


STANDARD CROSSWALKS AND STOP BAR PAVEMENT MARKINGS



YIELD LINES

NOTES:

1. ALL PAVEMENT MARKINGS SHALL BE INSTALLED ACCORDING TO THE CURRENT TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES AND MEET CURRENT CITY OF FORT WORTH SPECIFICATIONS.
2. CROSSWALK MARKINGS SHALL ALIGN WITH THE CURB RAMPS, IN ACCORDANCE WITH THE CURRENT TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
3. THE CROSS AND RUNNING SLOPES WITHIN A MARKED CROSSWALK SHALL COMPLY WITH THE LATEST EDITION OF THE TEXAS ACCESSIBILITY STANDARDS (TAS).
4. **LONGITUDINAL CROSSWALK LINES SHALL NOT BE PLACED IN WHEEL PATHS.**
5. FOR TxDOT MAINTAINED FACILITIES, REFER TO TxDOT PAVEMENT MARKING STANDARDS.
6. CROSSWALK SPACING ASSUMES A 12 FOOT LANE WIDTH. REFER TO NOTE #4 IF LANE WIDTH IS NOT 12 FEET.
7. CONTRACTOR SHALL NOTIFY THE CITY 48 HOURS PRIOR TO THE INSTALLATION OF PAVEMENT MARKINGS. CITY SHALL APPROVE PAVEMENT MARKINGS LAYOUTS AND LOCATIONS PRIOR TO INSTALLATION.
8. MARKINGS SHALL BE PLACED ONLY WHEN THE AMBIENT AIR AND PAVEMENT TEMPERATURE ARE A MINIMUM OF 60° FAHRENHEIT.
9. PREFABRICATED MARKINGS SHALL NOT BE USED.
10. TRANSVERSE LINES MAY BE USED AS DIRECTED FOR BRICK PAVER CROSSWALKS TO LEGALLY MARK THE CROSSWALK. TRANSVERSE LINES SHALL BE A MINIMUM OF 6' APART TO MEET CURRENT TRANSPORTATION CODE REQUIREMENTS.
11. MID-BLOCK CROSSWALKS WITH OR WITHOUT DECORATIVE PAVERS SHALL BE MARKED TO MEET CURRENT TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.

FORT WORTH

CITY OF FORT WORTH, TEXAS

CROSSWALKS, STOP BARS AND YIELD LINES

REVISED: 07-26-2021

32 17 23-D643

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024

TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312

4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
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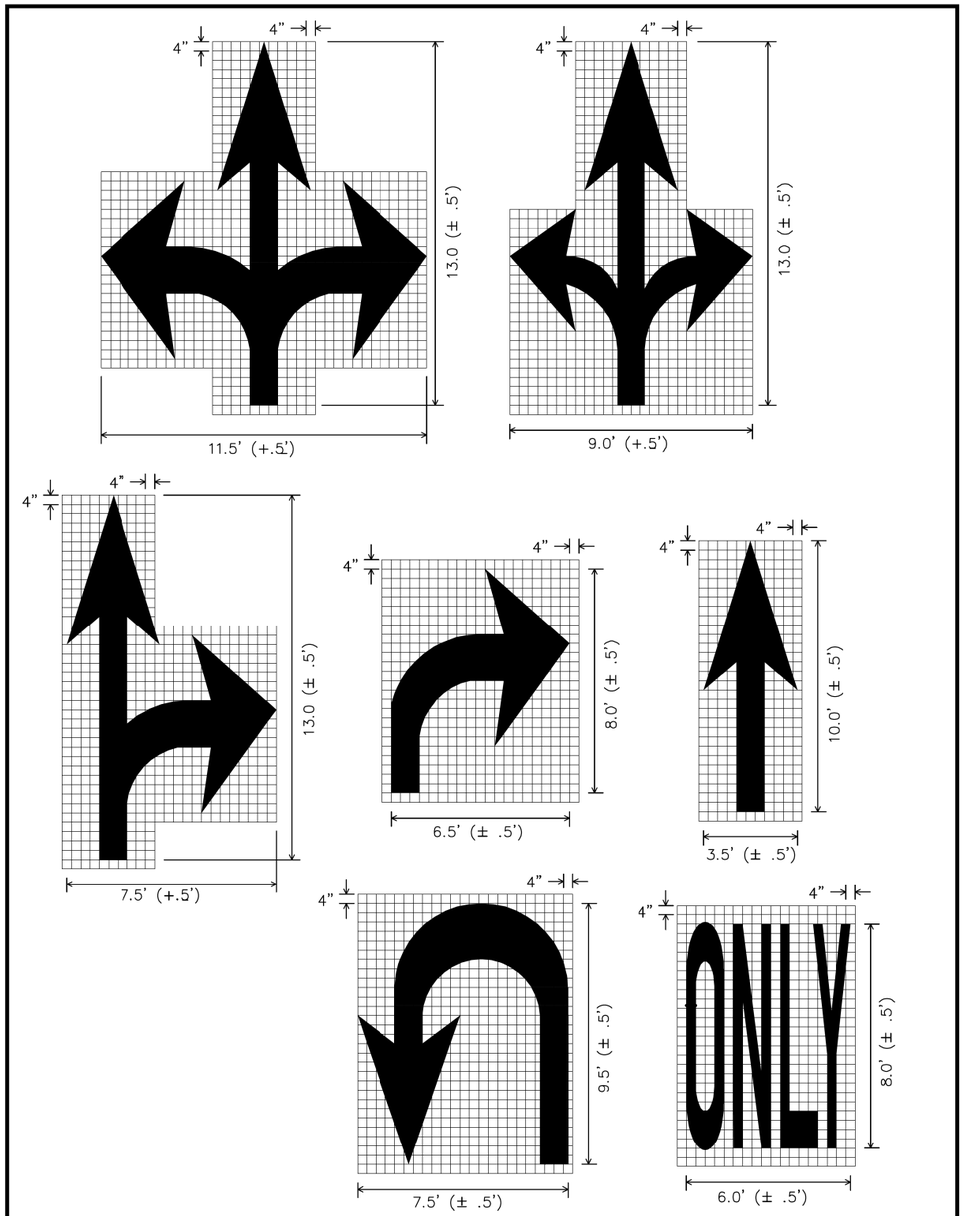
CHECK	0902	90	207, ETC.	



CITY OF FORT WORTH, TEXAS

PAVEMENT MARKINGS - ARROWS

REVISED: 08-31-2012

32 17 23-D645

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
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FTW

AUDIBLE PEDESTRIAN PUSHBUTTON STATION (APS) NOTES:

1. APS PUSHBUTTON STATIONS SHOULD BE LOCATED IN ACCORDANCE WITH THE PROVISIONS OF SECTION 4E.08 OF THE TEXAS MUTCD

2. APS PUSHBUTTON STATIONS SHALL COMPLY WITH THE US ACCESS BOARD'S "DRAFT GUIDELINES FOR ACCESSIBLE PUBLIC RIGHTS OF WAY" (PROWAG) SECTION R 306.

3. APS PUSHBUTTON STATIONS INCLUDE A PEDESTRIAN SIGN, A PUSHBUTTON, VIBROTACTILE ARROW AND AN AUDIBLE SPEAKER CONTAINED IN ONE UNIT WITH THE FOLLOWING FEATURES:

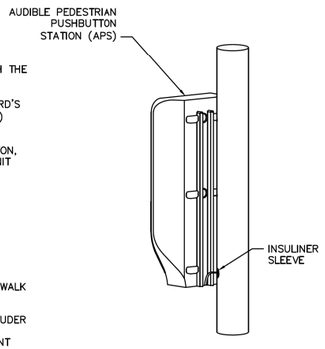
   3.1. VIBRATING TACTILE ARROW WITH HIGH VISUAL CONTRAST
   3.2. PUSHBUTTON LOCATOR TONE
   3.3. SPEECH WALK MESSAGE FOR THE WALKING PERSON INDICATION
   3.4. SPEECH PUSHBUTTON INFORMATION MESSAGE
   3.5. 9" X 15" PEDESTRIAN SIGN
   3.6. AUDIBLE TONE WALK INDICATIONS
   3.7. AUTOMATIC TONE WALK INDICATIONS
   3.8. AUTOMATIC VOLUME ADJUSTMENT
   3.9. PUSHBUTTON MUST BE ADA COMPLIANT AND ACTIVATE BOTH THE WALK INTERVAL AND ACCESSIBLE PEDESTRIAN SIGNAL.
   3.10. ACTUATION INDICATOR–TONE AND LIGHT
   3.11. EXTENDED BUTTON PRESS WHICH CAN BE USED TO REQUEST A LOUDER WALK SIGNAL AND LOCATOR TONE
   3.12. WEATHER–RESISTANT SPEAKER PROTECTED BY A VANDAL RESISTANT SCREEN

KEY:

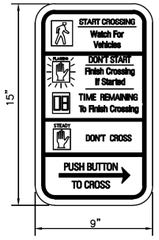
① FACE PLATE
② 1/4"–20 X 3/8" LONG STAINLESS STEEL SCREW
③ 1/4"–20 STAINLESS STEEL SCREWS
④ PUSHBUTTON FRAME ADAPTER
⑤ 1/4"–20 STAINLESS STEEL BOLT W/ WASHER AND LOCK WASHER
⑥ PUSHBUTTON STATION
⑦ DRILL AND TAP SHAFT FOR 1/4" DIAM. BOLT
⑧ DRILL AND TAP SHAFT FOR 5/8" WIRE GUIDE HOLE – ADD INSULINER

APS UNIT PROGRAMMING SETTING WHEN AT LEAST 10' APART	
REGULAR PUSH SPEECH MESSAGE	"WAIT"
COUNTDOWN SPEECH MESSAGE	OFF
EXTENDED PUSH SPEECH MESSAGE	"WAIT TO CROSS (STREET BEING CROSSED) AT (CROSS SIDE STREET NAME)"

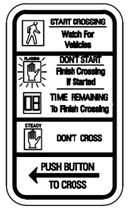
APS UNIT PROGRAMMING SETTING WHEN LESS THAN 10' APART	
REGULAR PUSH SPEECH MESSAGE	"WAIT"
WALK INDICATION SPEECH MESSAGE	"(STREET NAME BEING CROSSED), WALK SIGN IS ON TO (STREET NAME BEING CROSSED)"
COUNTDOWN SPEECH MESSAGE	OFF
EXTENDED PUSH SPEECH MESSAGE	"WAIT TO CROSS (STREET BEING CROSSED) AT (CROSS SIDE STREET NAME)"



WIRE ROUTING
PERSPECTIVE VIEW

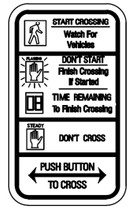


R10–3e (RIGHT)

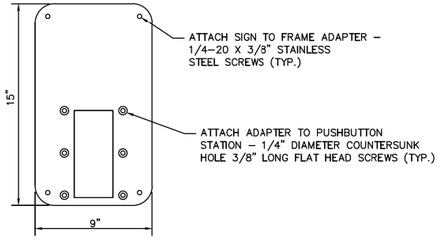


R10–3e (LEFT)

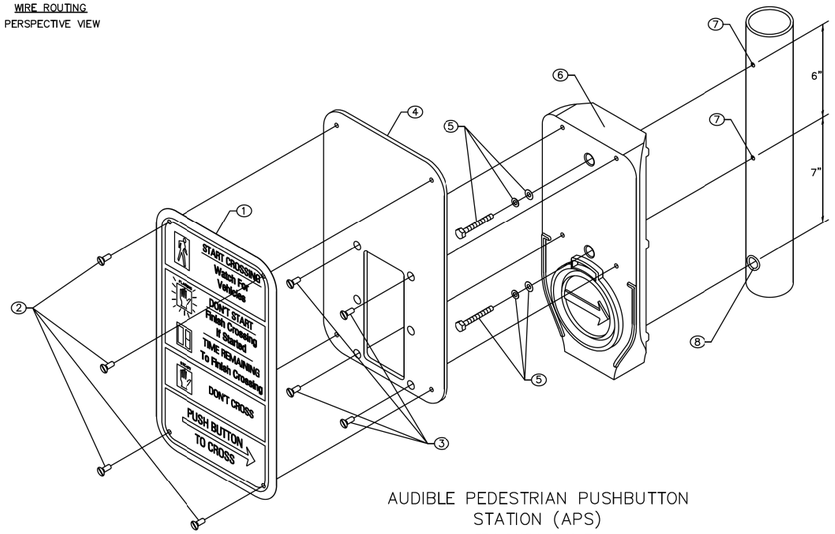
PEDESTRIAN PUSHBUTTON INSTRUCTIONAL SIGN



R10–3e (MOD.)



PEDESTRIAN PUSHBUTTON FRAME ADAPTER



AUDIBLE PEDESTRIAN PUSHBUTTON STATION (APS)
METAL POLE INSTALLATION

ISOMETRIC VIEW
(5' PUSH BUTTON POLE SHOWN)

FORT WORTH

CITY OF FORT WORTH, TEXAS
AUDIBLE PEDESTRIAN PUSHBUTTON STATION (APS) DETAILS
SHEET 1 OF 2

DATE: 07-26-2021

34 41 10-D673

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422
TBPELS ENGINEERING FIRM #312

Texas Department of Transportation

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
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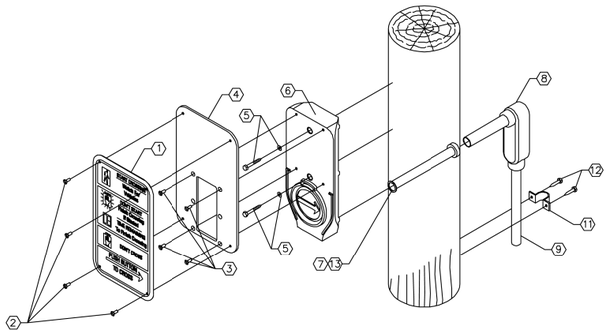
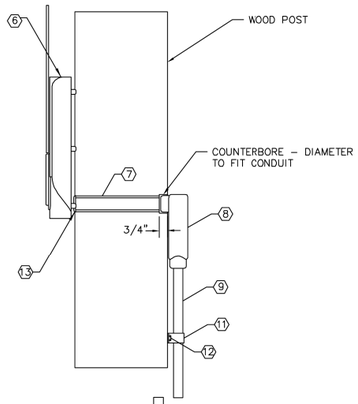
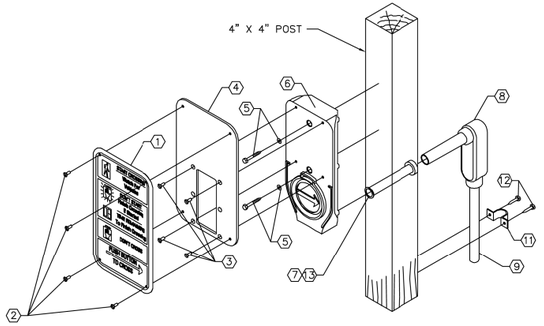


WOOD POLE INSTALLATION
ALTERNATIVE 1

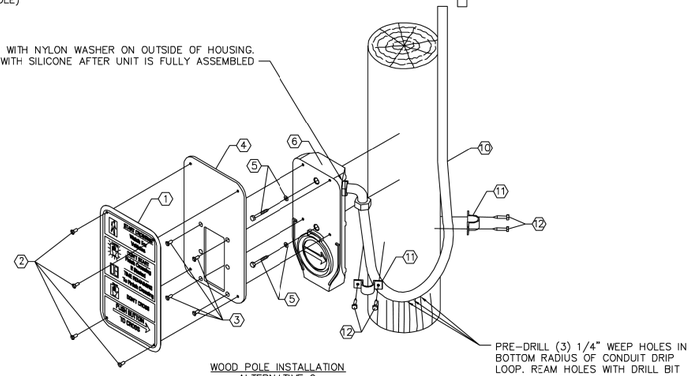
(AUDIBLE PEDESTRIAN PUSHBUTTON
STATION (APS) – TEMPORARY TIMBER STRAIN POLE)





WOOD POLE INSTALLATION
ALTERNATIVE 3

(AUDIBLE PEDESTRIAN PUSHBUTTON
STATION (APS) – TEMPORARY TIMBER POLE)



WOOD POLE INSTALLATION
ALTERNATIVE 2

(AUDIBLE PEDESTRIAN PUSHBUTTON
STATION (APS) – TEMPORARY TIMBER POLE)

KEY:

1. FACE PLATE
2. 1/4"–20 X 3/8" LONG STAINLESS STEEL SCREW
3. 1/4"–20 STAINLESS STEEL SCREWS
4. PUSHBUTTON FRAME ADAPTER
5. LAG BOLT WITH WASHER
6. PUSHBUTTON STATION
7. CONDUIT DIAMETER + 1/8" HOLE THRU POLE
8. CONDULET
9. 3/4" CONDUIT
10. 3/4" LIQUID–TITE FLEX CONDUIT
11. ONE PIECE TWO HOLE CLAMP
12. LAG BOLT
13. INSULINER SLEEVE

AUDIBLE PEDESTRIAN PUSHBUTTON STATION (APS)

FORT WORTH

CITY OF FORT WORTH, TEXAS
AUDIBLE PEDESTRIAN PUSHBUTTON STATION (APS) DETAILS SHEET 2 OF 2

DATE: 11-11-2013

34 41 10-D674

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
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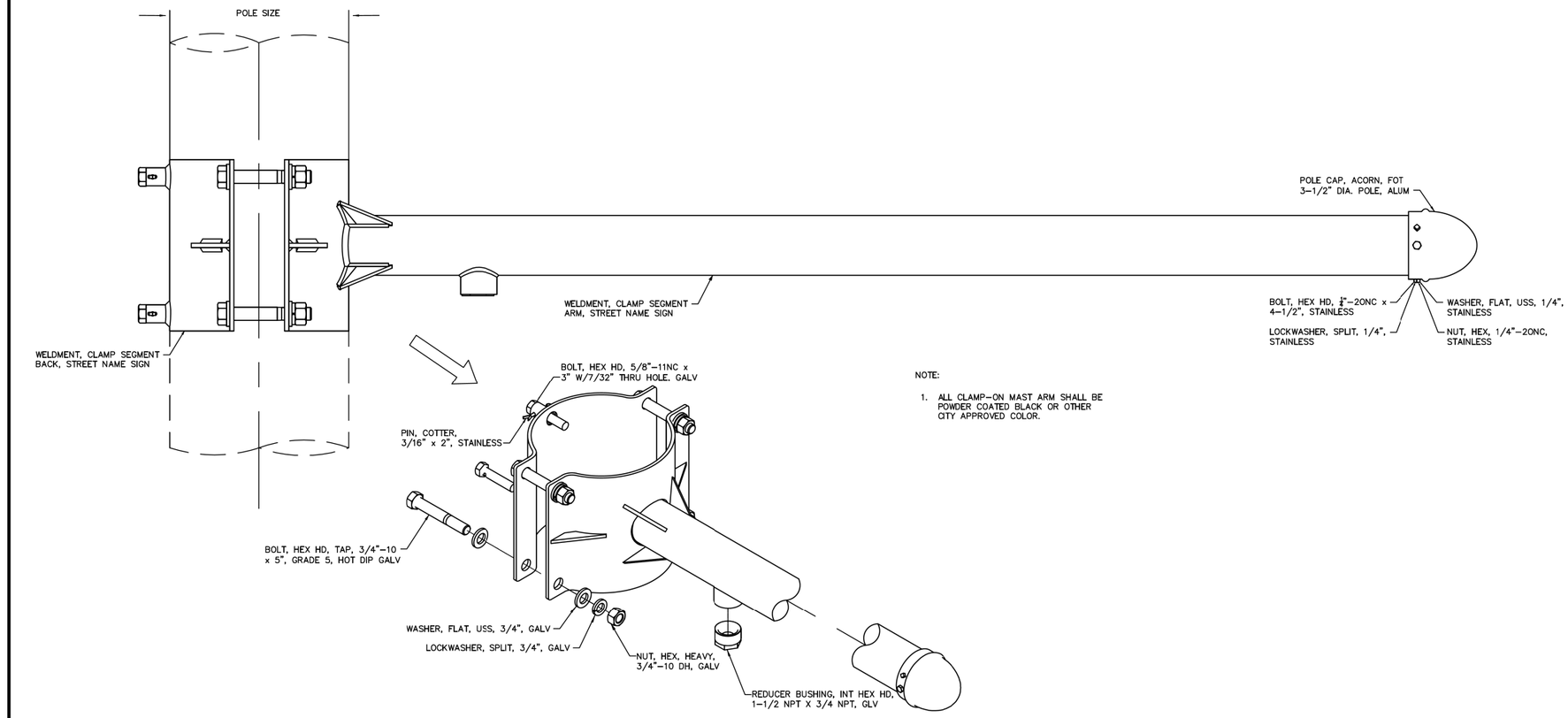

NOTE:

1. ALL CLAMP-ON MAST ARM SHALL BE POWDER COATED BLACK OR OTHER CITY APPROVED COLOR.

FORT WORTH

CITY OF FORT WORTH, TEXAS

CLAMP-ON TYPE MAST ARM FOR 8"-12" DIA. POLES FOR CANTILEVER STREET SIGNS

REVISED: 07-26-2021

34 41 16-D690

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
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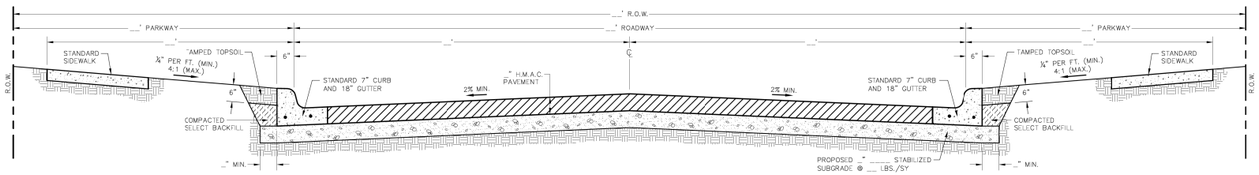


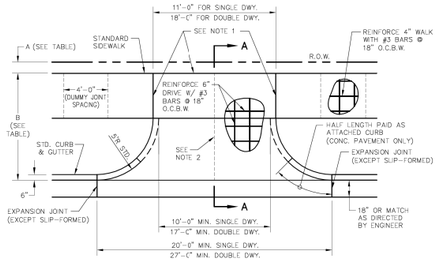
TYPICAL H.M.A.C. ROADWAY

NOT TO SCALE

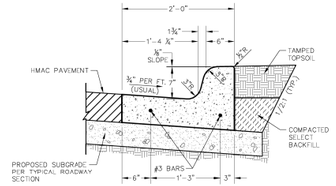
DRIVEWAY NOTES:

1. PROVIDE ½" PREMOLDED EXPANSION JOINT & SILICONE JOINT SEALANT, ONLY IF CONNECTING TO EXISTING CONCRETE DRIVE OR SIDEWALK (SUBSIDIARY TO DRIVEWAY). DOWEL INTO EXISTING CONCRETE DRIVEWAY WITH #4x24" BARS @ 18" O.C.
2. DUMMY JOINT IN DRIVEWAY RAMP IS OPTIONAL IN 11'-0" DRIVEWAY ONLY.
3. SIDEWALK SLOPE SHALL BE ¼" PER FOOT TO THE FACE OF CURB, OR AS DIRECTED BY THE ENGINEER.
4. SIDEWALK SECTION THRU DRIVEWAY TO BE POURED SAME THICKNESS AS DRIVEWAY APPROACH, AND PAID FOR AS DRIVEWAY APPROACH. EXISTING SIDEWALK, IF ANY, SHALL BE REMOVED AND REPLACED.

PARKWAY WIDTH	DIM "A"	DIM "B"
10'	1'	9'
11' TO 14'	2' TO 5'	9'
15 TO 19'	3' TO 7'	12'
20' TO 22'	5' TO 7'	15'

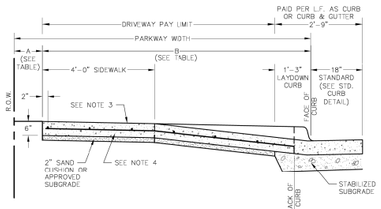


PLAN VIEW



STANDARD 7" CURB AND 18" GUTTER

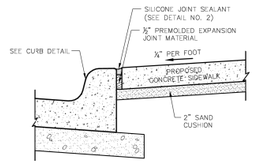
NOT TO SCALE



SECTION A–A

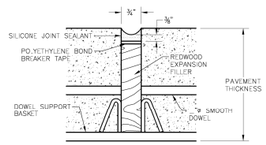
DRIVEWAY APPROACH

NOT TO SCALE



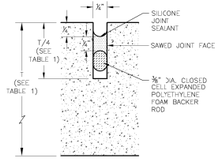
EXPANSION JOINT BETWEEN CURB & SIDEWALK

NOT TO SCALE



JOINT DETAIL NO. 1

NOT TO SCALE



JOINT DETAIL NO. 2

NOT TO SCALE

LEGEND

- CONCRETE CURB
- EDGE OF ASPHALT
- EDGE OF GRAVEL
- CENTERLINE (UNLESS NOTED AS SURVEY BASELINE)
- PROPERTY LINE
- R.O.W. LINE
- EASEMENT LINE
- DRAINAGE FLOW ARROW
- HMAC TRANSITION
- PROPOSED CONCRETE
- TAMPED SOIL
- PROPOSED SUBGRADE
- COMPACTED SELECT BACKFILL

CONSTRUCTION NOTES

1. FOR DEFORMED BAR SPLICES, LAP BARS 40 DIAMETERS AND TIE.
2. ALL HAND POURS IN THE STREET SHALL BE 6 SACK.
3. EXISTING CURB & GUTTER, IF ANY, MUST BE SAWED AS DIRECTED BY THE ENGINEER.
4. ALL BLOCKOUTS SHALL BE 9" FROM BACK OF CURB, EXCEPT FOR INLETS.
5. ALL CURB CONSTRUCTION SHALL BE MONOLITHICALLY POURED WITH CONCRETE PAVEMENT OR GUTTER.

TABLE 1
(SAWED DUMMY JOINT DEPTH)

DIM "T" = PAVEMENT THICKNESS	DIM T/4 = JOINT DEPTH
6"	1½"
7"	1¾"
8"	2"

DOE #_____
CITY PROJECT #_____
TPW PROJECT C__-__-_____
WATER PROJECT P__-__-_____
SEWER PROJECT P__-__-_____

CITY OF FORT WORTH
FORT WORTH
TRANSPORTATION & PUBLIC WORKS DEPARTMENT

H.M.A.C. PAVEMENT CONSTRUCTION DETAILS

DESIGNED:	SCALE:	DATE:	SHEET
DRAWN:	N/A	APRIL 2010	__ OF __

H.M.A.C. PAVEMENT CONSTRUCTION DETAILS

DOE #____

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 4/22/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

CITY OF FORT WORTH
TRAFFIC DETAILS

SCALE: SHEET 1 OF 1

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	156
CHECK	0902	90	207, ETC.	

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A:\47000s\47647\002\TRANS\500_CADD\4 - Design\Plan Sheets\500 DETAILS\HMAC Pavement Construction Details.dgn MWAGNER-4219

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

This SWP3 has been developed in accordance with TxDOT policy for projects disturbing less than 1 acre of soil, and not part of a larger common plan of development.

This SWP3 is consistent with requirements specified in applicable stormwater plans, and the project's environmental permits, issues, and commitments (EPICs).

1.0 SITE/PROJECT DESCRIPTION

1.1 PROJECT CONTROL SECTION JOB (CSJ):
0902-90-207, ETC.

1.2 PROJECT LIMITS:

From: 340 FT SOUTH OF SOUTH DRIVE WEST

To: 285 FT NORTH OF SOUTH DRIVE WEST

1.3 PROJECT COORDINATES:

BEGIN: (Lat) 32°40'12.4" ,(Long) (-)97°23'59.6"

END: (Lat) 32°40'19.3" ,(Long) (-)97°23'59.6"

1.4 TOTAL PROJECT AREA (Acres): 1.58

1.5 TOTAL AREA TO BE DISTURBED (Acres): 0.08

1.6 NATURE OF CONSTRUCTION ACTIVITY:

CONSTRUCTION OF TURN LANES AND PEDESTRIAN CURB RAMPS
PAVEMENT MARKINGS AND TRAFFIC SIGNAL IMPROVEMENTS

1.7 MAJOR SOIL TYPES:

Soil Type	Description

1.8 PROJECT SPECIFIC LOCATIONS (PSLs):

PSLs must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. PSLs may be identified during preconstruction meetings or during the construction process. Please choose from the options below:

☐ PSLs determined during preconstruction meeting
☐ PSLs determined during construction
☒ No PSLs planned for construction

Type	Sheet #s

All off-ROW PSLs required by the Contractor are the Contractor's responsibility. The Contractor shall secure all permits required by local, state, federal laws for off-ROW PSLs. The contractor shall provide diagrams, areas of disturbance, acreage, and BMPs for all off-ROW PSLs within one mile of the project.

1.9 CONSTRUCTION ACTIVITIES:

(Use the following list as a starting point when developing the Construction Activity Schedule and Ceasing Record in Attachment 2.3.)

☒ Mobilization
☒ Install sediment and erosion controls
☐ Blade existing topsoil into windrows, prep ROW, clear and grub
☒ Remove existing pavement
☒ Grading operations, excavation, and embankment
☒ Excavate and prepare subgrade for proposed pavement widening
☐ Remove existing culverts, safety end treatments (SETs)
☐ Remove existing metal beam guard fence (MBGF), bridge rail
☒ Install proposed pavement per plans
☐ Install culverts, culvert extensions, SETs
☐ Install mow strip, MBGF, bridge rail
☒ Place flex base
☐ Rework slopes, grade ditches
☐ Blade windrowed material back across slopes
☐ Revegetation of unpaved areas
☐ Achieve site stabilization and remove sediment and erosion control measures
☐ Other: _____
☐ Other: _____
☐ Other: _____

1.10 POTENTIAL POLLUTANTS AND SOURCES:

☐ Sediment laden stormwater from stormwater conveyance over disturbed area
☒ Fuels, oils, and lubricants from construction vehicles, equipment, and storage
☒ Solvents, paints, adhesives, etc. from various construction activities
☐ Transported soils from offsite vehicle tracking
☒ Construction debris and waste from various construction activities
☒ Contaminated water from excavation or dewatering pump-out water
☐ Sanitary waste from onsite restroom facilities
☒ Trash from various construction activities/receptacles
☐ Long-term stockpiles of material and waste
☒

☐ Other: _____
☐ Other: _____
☐ Other: _____

1.11 RECEIVING WATERS:

Receiving waters must be depicted on the Environmental Layout Sheets in Attachment 1.2 of this SWP3. Include Segment # for receiving waters.

Tributaries	Classified Waterbody

* Add (*) for impaired waterbodies with pollutant in ().

1.12 ROLES AND RESPONSIBILITIES: TxDOT

X Development of plans and specifications
X Perform SWP3 inspections
X Maintain SWP3 records and update to reflect daily operations
☐ Other: _____
☐ Other: _____

1.13 ROLES AND RESPONSIBILITIES: CONTRACTOR

X Day To Day Operational Control
X Maintain schedule of major construction activities
X Install, maintain and modify BMPs
☐ Other: _____
☐ Other: _____

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0902	90	207, ETC.	

STORMWATER POLLUTION PRVENTION PLAN (SWP3):

2.0 BEST MANAGEMENT PRACTICES (BMPs) AND CONTROLS, INSPECTION, AND MAINTENANCE

The Contractor shall be the responsible party for implementing the BMPs described herein and for complying with the SWP3 for control of erosion and sedimentation during day-to-day operations. The Contractor shall implement changes to this SWP3 approved by TxDOT within the times specified in this SWP3 or the CGP.

2.1 EROSION CONTROL AND SOIL STABILIZATION BMPs:

T / P

- ☐ ☐ Protection of Existing Vegetation
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Soil Retention Blankets
- ☐ ☐ Geotextiles
- ☐ ☐ Mulching/ Hydromulching
- ☐ ☐ Soil Surface Treatments
- ☐ ☐ Temporary Seeding
- ☐ ☒ Permanent Planting, Sodding or Seeding
- ☐ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Vertical Tracking
- ☐ ☐ Interceptor Swale
- ☐ ☐ Riprap
- ☐ ☐ Diversion Dike
- ☐ ☐ Temporary Pipe Slope Drain
- ☐ ☐ Embankment for Erosion Control
- ☐ ☐ Paved Flumes
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

2.2 SEDIMENT CONTROL BMPs:

T / P

- ☒ ☐ Biodegradable Erosion Control Logs
- ☐ ☐ Dewatering Controls
- ☒ ☐ Inlet Protection
- ☐ ☐ Rock Filter Dams/ Rock Check Dams
- ☐ ☐ Sandbag Berms
- ☐ ☐ Sediment Control Fence
- ☐ ☐ Stabilized Construction Exit
- ☐ ☐ Floating Turbidity Barrier
- ☐ ☐ Vegetated Buffer Zones
- ☐ ☐ Vegetated Filter Strips
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____
- ☐ ☐ Other: _____

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.3 PERMANENT CONTROLS:

(Coordinate post-construction BMPs with appropriate TxDOT maintenance sections.)

BMPs To Be Left In Place Post Construction:

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.4 OFFSITE VEHICLE TRACKING CONTROLS:

- ☐ Excess dirt/mud on road removed daily
- ☐ Haul roads dampened for dust control
- ☐ Loaded haul trucks to be covered with tarpaulin
- ☐ Stabilized construction exit
- ☐ Daily street sweeping
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.5 POLLUTION PREVENTION MEASURES:

- ☒ Chemical Management
- ☒ Concrete and Materials Waste Management
- ☒ Debris and Trash Management
- ☒ Dust Control
- ☐ Sanitary Facilities
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____
- ☐ Other: _____

2.6 VEGETATED BUFFER ZONES:

Natural vegetated buffers shall be maintained as feasible to protect adjacent surface waters. If vegetated natural buffer zones are not feasible due to site geometry, the appropriate additional sediment control measures have been incorporated into this SWP3.

Type	Stationing	
	From	To

Refer to the Environmental Layout Sheets/ SWP3 Layout Sheets located in Attachment 1.2 of this SWP3

2.7 ALLOWABLE NON-STORMWATER DISCHARGES:

- ☒ Fire hydrant flushings
- ☒ Irrigation drainage
- ☒ Pavement washwater (where spills or leaks have not occurred, and detergents are not used)
- ☒ Potable water sources
- ☒ Springs
- ☒ Uncontaminated groundwater
- ☒ Water used to wash vehicles or control dust
- ☒ Other allowable non-stormwater discharges as allowed by TPDES GP TXR150000.

2.8 DEWATERING:

Dewatering discharges of accumulated stormwater, groundwater, and surface water including discharges from dewatering of trenches, excavations, foundations, vaults, and other points of accumulation are prohibited unless managed by appropriate controls to prevent and minimize the offsite discharge of sediment and other pollutants.

2.9 INSPECTIONS:

All disturbed areas and erosion and sediment control devices shall be inspected at least once every seven (7) days. Inspections shall be performed by TxDOT as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3 .

2.10 MAINTENANCE:

Control measures shall be properly installed according to specifications. If it is determined that a BMP or control measure is not operating effectively, maintenance must be accomplished as soon as possible and before the next anticipated rain event, but in no case later than 7 calendar days after being able to access the site. Maintenance shall be performed by the Contractor as indicated on the Field Inspection and Maintenance Report Form 2118 and retained in Attachment 2.3 of this SWP3.

STORMWATER POLLUTION PREVENTION PLAN (SWP3) (Less Than 1 Acre)

Texas Department of Transportation

FED. RD. DIV. NO.	PROJECT NO.		SHEET NO.
6	(SEE TITLE SHEET)		
STATE	STATE DIST.	COUNTY	
TEXAS	FTW	TARRANT	
CONT.	SECT.	JOB	HIGHWAY NO.
0902	90	207, ETC.	

DATE:
FILE:

I. STORMWATER POLLUTION PREVENTION-CLEAN WATER ACT SECTION 402

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

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

1. City of Fort Worth

☐ No Action Required ☒ Required Action

Action 1:
The project disturbs more than one acre but less than five acres of surface area. The contractor is responsible for the PSL as defined in the Standard Specifications for Construction and Maintenance of Highways, Streets, and Bridges (2004 Edition, Section 7.19.F, Page 55). The total disturbed acreage is the combined acreage to be disturbed on the project and the contractor's PSL.
This EPIC must be updated if the disturbed area increases to five or more acres during the course of construction (refer to following this section). It may become necessary to post a site notice and NOI for the project and/or PSL.
Identify all MS4 Permit holders that may be impacted by the project.
Commitment 1:
Comply with TPDES CGP. TxDOT must post a Small Site Notice and send a copy to any non-TxDOT MS4 operator that receives discharge from the project. Refer to the SW3P Plan Sheet, BMPs, and Detail.
Commitment 2:
The contractor must stabilize the project site as stated in the SW3P.

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

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

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

☒ No Permit Required

☐ Nationwide Permit 14 - PCN not Required (less than 1/10th acre waters or wetlands affected)

☐ Nationwide Permit 14 - PCN Required (1/10 to <1/2 acre, 1/3 in tidal waters)

☐ Individual 404 Permit Required

☐ Other Nationwide Permit Required: NWP# _____

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

1.

2.

3.

4.

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

Best Management Practices:

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

III. CULTURAL RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

IV. VEGETATION RESOURCES

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

4.

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

☒ No Action Required ☐ Required Action

Special Note:
The Migratory Bird Act of 1918 states that it is unlawful to kill, capture, collect, possess, buy, sell, trade or transport any migratory bird, nest, young, feather, or egg in part or in whole, without a federal permit issued in accordance within the Act's policies and regulations. The contractor would remove all old migratory bird nests from any structure where work would be done from October 1 to February 15. In addition, the contractor would be prepared to prevent migratroy birds from building nests between February 15 to October 1. In the event that migratory birds are encountered on-site during project construction, efforts to avoid adverse impacts on protected birds, active nests, eggs and/or young would be observed.

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

LIST OF ABBREVIATIONS

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

VI. HAZARDOUS MATERIALS OR CONTAMINATION ISSUES

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

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

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

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

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

☐ Yes ☒ No

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

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

☐ Yes ☐ No

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

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

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

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

☒ No Action Required ☐ Required Action

Action No.

1.

2.

3.

VII. OTHER ENVIRONMENTAL ISSUES

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

☐ No Action Required ☒ Required Action

Action No.

1. Contractor shall minimize particulate matter emissions from construction sites by using fugitive dust control measures such as covering or treating disturbed areas with dust suppression techniques, sprinkling, covering loaded trucks, and other dust abatement controls, as appropriate.

2. Contractor shall make every reasonable effort to minimize construction noise through abatement measures such as work-hour controls and proper maintenance of muffler systems.

Texas Department of Transportation — Design Division Standard

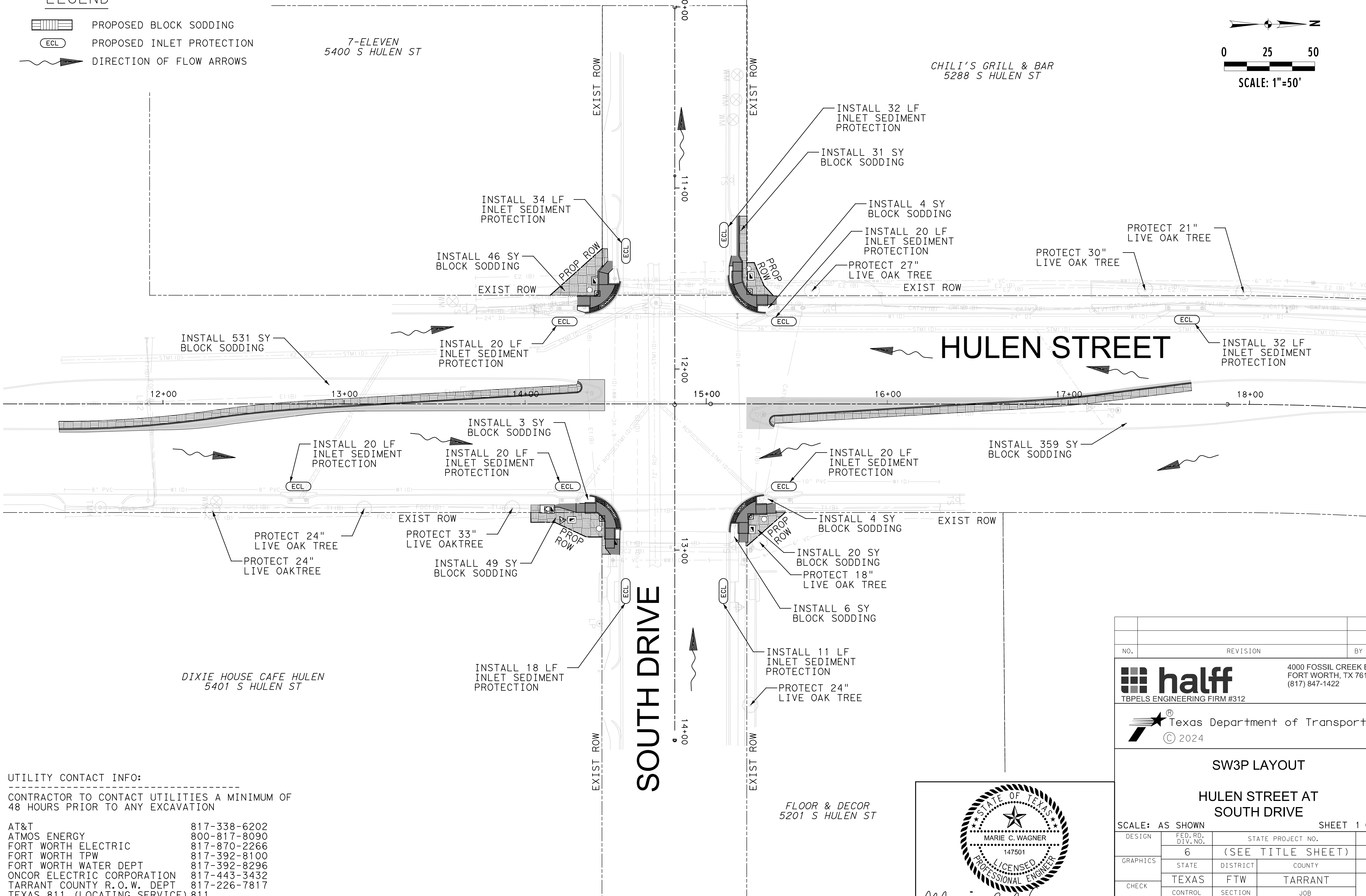
ENVIRONMENTAL PERMITS, ISSUES AND COMMITMENTS

EPIC

FILE: epic.dgn	DN: TxDOT	CK: RG	DW: VP	CK: AR
© TxDOT: February 2015	CONT	SECT	JOB	HIGHWAY
REVISIONS 12-12-2011 (DS)	0902	90	207	HULEN
05-07-14 ADDED NOTE SECTION IV.	DIST	COUNTY		SHEET NO.
01-23-2015 SECTION I (CHANGED ITEM 1122 TO ITEM 506, ADDED GRASSY SWALES.	FTW	TARRANT		159

LEGEND

- PROPOSED BLOCK SODDING
- (ECL) PROPOSED INLET PROTECTION
- DIRECTION OF FLOW ARROWS



UTILITY CONTACT INFO:

CONTRACTOR TO CONTACT UTILITIES A MINIMUM OF 48 HOURS PRIOR TO ANY EXCAVATION

AT&T	817-338-6202
ATMOS ENERGY	800-817-8090
FORT WORTH ELECTRIC	817-870-2266
FORT WORTH TPW	817-392-8100
FORT WORTH WATER DEPT	817-392-8296
ONCOR ELECTRIC CORPORATION	817-443-3432
TARRANT COUNTY R.O.W. DEPT	817-226-7817
TEXAS 811 (LOCATING SERVICE)	811

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER

Marie C. Wagner

DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

Texas Department of Transportation

SW3P LAYOUT

HULEN STREET AT SOUTH DRIVE

SCALE: AS SHOWN SHEET 1 OF 1

	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
DESIGN	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	160

FTW WAGNER-4219
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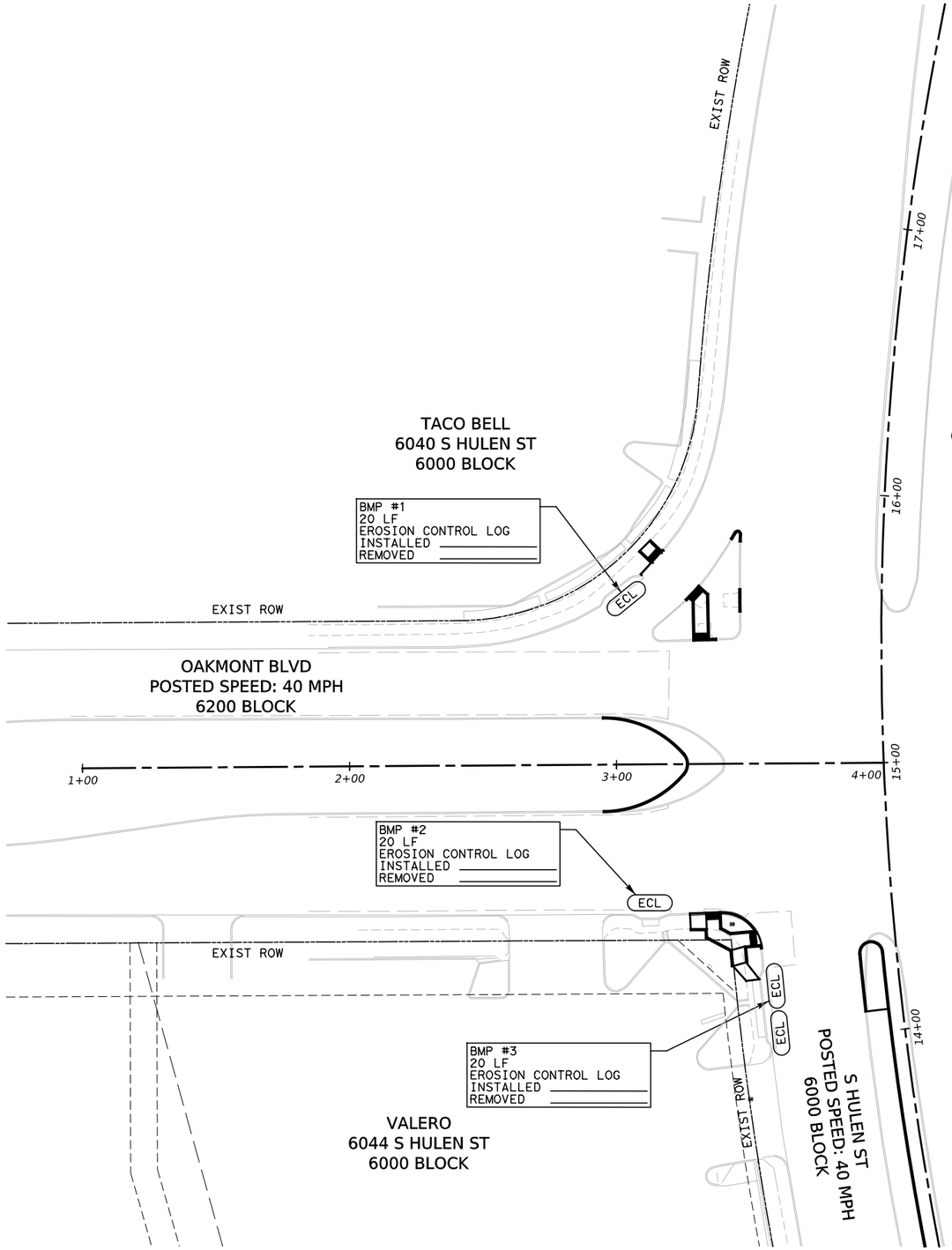

tnp

25 0 12.5 2 50

GRAPHIC SCALE

LEGEND	
ECL	8" EROSION CONTROL LOG

STATE OF TEXAS
JUSTIN K. BAKER
114172
LICENSED PROFESSIONAL ENGINEER
4/16/2024

NO.	REVISION	BY	DATE

FIRM REGISTRATION NO. F-230

tnp

Texas Department of Transportation

S HULEN ST AT OAKMONT BLVD

SW3P LAYOUT

SCALE: 1"=50' SHEET 1 OF 1

DESIGN	FED.RD. DIV.NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC	161

Park & Recreation Department (PARD) Notes: Pertains to all work in and through City parkland, land managed and maintained by PARD including right-of-way, medians, roundabouts, corner cuts, parkways, and may pertain to
work adjacent to City parkland

City Trees (Contact City Forester 817-392-5738):

1. Per Chapter 33, Park & Recreation-Forestry Section (PARD-Forestry) has jurisdiction over trees on city-owned property including right-of-way. Approval of plans does not constitute approval to proceed with work until corresponding permit has been issued. Permits for removal, planting or pruning of city-owned trees shall be obtained from PARD-Forestry. Pruning required for preconstruction purposes requires the utilization of an ISA-Certified Arborist, as stated in the permit, at no expense to PARD. Contact PARD-Forestry: www.fortworthtexas.gov/departments/parks/services/forestry or CityTreePermits@fortworthtexas.gov or 817/392-5738 or 817/392-5729.
   a. Tree protection shall be put in place before grading/construction begins, be inspected by City Forester and remain until completion of the project.
      i. 4-foot tall, chain link fencing installed at the tree dripline with bilingual sign on protective fencing in English and Spanish that reads, "Keep Out, Tree Protection Area" ("No Entre, !rea de Protecci*n de !rboles").
      ii. No entry, grading, excavation, parking or storing of equipment or supplies inside the protective tree fencing without City Forester approval.
      iii. All work inside protective tree fencing to be done by hand, unless prior approval given by City Forester.
      iv. Roots 2-inch or larger shall not be cut without City Forester approval. Roots shall be clean cut with a saw.
      v. All cuts on oak trees, including roots, shall be painted with general purpose spray paint within 30 minutes of exposure to prevent oak wilt spread.
   b. Assessment of Damages to Trees
      i. The Contractor will check trees in the contract area before contract work begins, any damage will be noted and reported to the Contract Administrator.
      ii. The Contract Administrator will conduct random checks of the trees during the contract period.
      iii. A check of all trees may be made at the end of the contract period. City Forester, Contract Administrator, and Contractor will attend the inspection.
      iv. Damages shall be documented by memo to the City Forester with copy to contract file and the Contractor.
      v. Contractor may have the option of replacement or payment for severely damaged trees at a location to be designated by PARD. Replacement shall be made on a caliper inch per caliper inch basis with a minimum size of replacement tree of 2-inch in caliper for trees damaged or removed which are less than 30-inch DBH and 2-inch per inch for trees which are 30-inch DBH or greater. The Contractor shall be responsible for the planting, watering, mulching and maintenance of replacement trees for a period of not less than 2-years. Any tree that does not survive the 2-year establishment period shall be compensated for by the Contractor to Tree Fund at a rate of $200 per caliper inch.
      vi. Slight damage shall be defined, in the opinion of the City Forester, as damage that may compartmentalize. Examples include but are not limited to: scarring of the trunk into the cambial layer Y ' to 2-inch in width, but less than 1 /3 trunk circumference; or breaking of limbs less than 2-inch in diameter or limbs less than 1 /3 trunk caliper, whichever is less. Slight damage shall also include: removal or laying down of protective tree fencing prior to end of construction; storing equipment or supplies within the critical root zone (CRZ); or disposing of paint or concrete within the CRZ, but not closer to the trunk than 50% radius of the CRZ. Slight damage to trees shall be assessed at a rate of $100.00 for each instance. Each day tree fencing is not properly placed, equipment or supplies are stored within CRZ, or fill is stored within the CRZ shall be considered one instance.
      vii. Moderate damage shall be defined, in the opinion of the City Forester, as damage that contributes to the poor health and reduced longevity of the tree. Examples include, but are not limited to: scarring of the trunk into the cambial layer greater than 2-inch, but less than 1 /3 the trunk circumference; or breaking of limbs more than 2-inch in diameter, but less than 1/3 trunk caliper. Moderate damage shall also include: compaction of soil; grading or filling in 20% of the CRZ on 1 of 4 sides, but outside the 50% radius of the CRZ; or disposing of paint or concrete within 50% radius of the CRZ. Moderate damages shall be calculated at a rate of % the assessed value of the tree per each instance of damage.
      viii. Severe damage or removal of trees is subject to penalty of $200 per diameter inch of trees removed or damaged for trees less than 30-inch DBH or $400 per diameter inch for trees 30-inch DBH or greater. Severe damage or removal shall include, but is not limited to: scarring of the trunk to the cambial layer greater than 1/3 the trunk circumference; uprooting or causing a tree to lean; or damage to a scaffolding branch or any branch greater than 1/3 of trunk caliper. Severe damage shall also include: compaction of soil, grading or filling more than 20% of the CRZ, or within 50% radius of the CRZ, or on more than one of 4 sides. Cutting 1 /3 of the buttress roots within 3 times the distance of the DBH of the trunk, or cutting 4 roots 4-inch or greater in diameter within 4-feet of the trunk shall also be considered severe damage.
      ix. Branches shall be measured at the point of attachment or at the lateral to which the branch would be pruned back to according to ANSI standards. Trees caliper shall be measured according to accepted industry standards. Trees greater than 6-inch in caliper shall be measured using diameter at breast height (DBH). Trees that must be removed due to damage caused by the Contractor shall be removed by the Forestry Section's tree removal contractor at the Contractor's expense.
      x. All damages shall be paid to the City Tree Fund. Failure to replace or pay for damaged trees shall result in a breach of contract and the Contractor will be automatically assessed damages. Damages as described herein shall be deduced from payments otherwise due the Contractor.

Landscaping and Irrigation (Contact Park Planner 817-392-5479):

2. All planting material shall be warrantied for a period of two years. A Maintenance bond shall be posted for all landscaping materials (hardscapes, irrigation, plantings).
3. All plant identification tags must remain on plant materials for PARD inspection. Contact PARD 72-hours in advance for inspection of tree and landscape plantings.
4. Irrigation systems must comply with Texas Commission on Environmental Quality (TCEQ) Title 30, Texas Administrative Code (TAC) Chapter 344, Rules for Landscape Irrigation and City of Fort Worth Texas Ordinance number 18444-01-2009. Any irrigation system that is connected to a public or private potable water supply must be connected through an approved backflow prevention assembly, and must be tested upon installation, or repair by a licensed Backflow Prevention Assembly Tester (BPAT) who is registered with the City of Fort Worth Water Department. For additional information regarding permitting, contact Development Services Customer Services 817-392-2222.
   a. Once irrigation lines have been inspected, approved and green tag has been supplied, trees and planting materials can be installed.
   b. If existing median is altered, contact PARD 72 hours in advance for inspection of all irrigation lines, depth, and pressure PRIOR to backfilling. Contact 817-392-5479.

Right-of-Way including parkways, medians, corner clips, roundabouts maintained by PARD (Contact Park Planner 817-392-5479):

5. Sod shall be replaced in all areas disturbed by construction. Sod shall match existing grasses.
6. Soil shall be free of construction debris and rocks greater than 1-inch. Backfill with clean soil prior to seeding or sodding.
7. Upon request, the contractor shall provide to PARD a copy of certifications on soil, sod, seeding, and hydromulching prior to installation; along with the delivery ticket.
8. All disturbance to existing soil, vegetation, or irrigation must be repaired or replaced to existing pre-construction conditions or better at no additional cost to PARD.
9. Construction equipment and/or staging, materials storage, and materials testing may not occur on existing medians maintained by PARD without prior written approval from PARD.
10. Pre-existing medians/ROWs within construction confines shall be maintained by Contractor for high grass and weeds every 14 days until construction complete and City acceptance after Final.
11. New Medians/ROWs shall be watered, mowed, and maintained by Contractor until grass coverage is established prior to City acceptance after Final.

NO.	REVISION	BY	DATE

halff
TBPELS ENGINEERING FIRM #312
4000 FOSSIL CREEK BLVD
FORT WORTH, TX 76137-2720
(817) 847-1422

PARKS AND RECREATION DEPARTMENT NOTES

SCALE: AS SHOWN SHEET 1 OF 1

STATE OF TEXAS
MARIE C. WAGNER
147501
LICENSED PROFESSIONAL ENGINEER
Marie C. Wagner
DATE: 1/25/2024
TBPELS ENGINEERING FIRM #312

DESIGN	FED. RD. DIV. NO.	STATE PROJECT NO.		HIGHWAY NO.
	6	(SEE TITLE SHEET)		
GRAPHICS	STATE	DISTRICT	COUNTY	SHEET NO.
	TEXAS	FTW	TARRANT	
CHECK	CONTROL	SECTION	JOB	
CHECK	0902	90	207, ETC.	162

4/19/2024 8:48:37 AM 3581 TXDOT-OR Sheet
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DATE:
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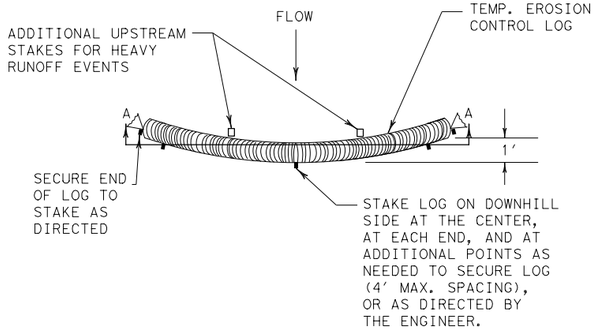
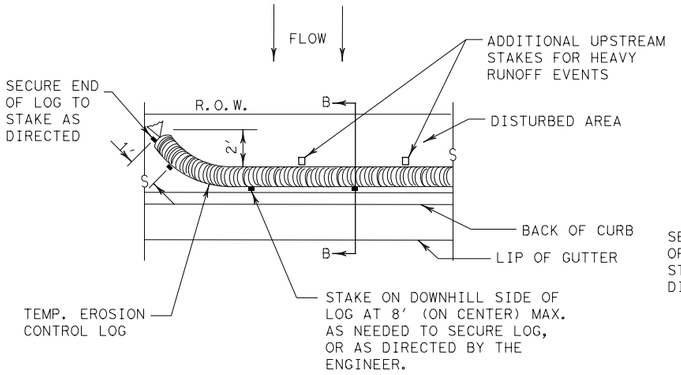


PLAN VIEW



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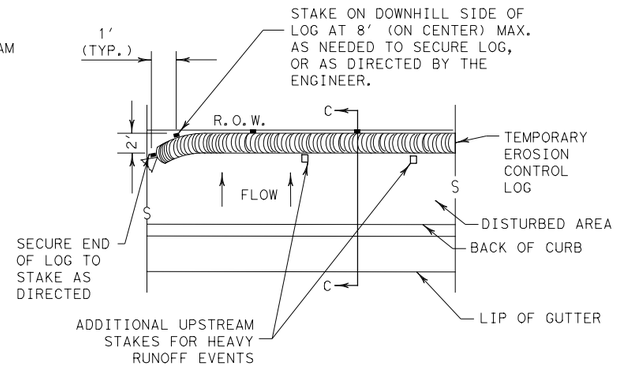

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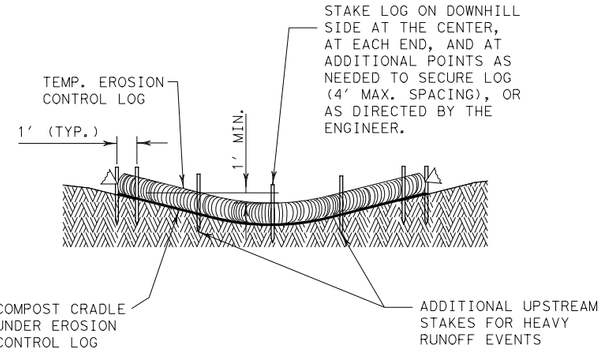
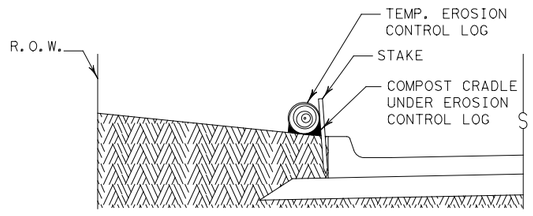


SECTION A-A

EROSION CONTROL LOG DAM

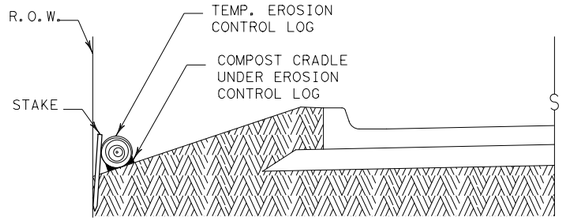
CL-D



SECTION B-B

EROSION CONTROL LOG AT BACK OF CURB

CL-BOC



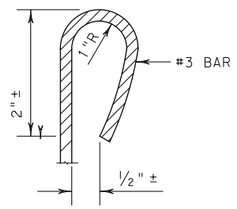
SECTION C-C

EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY

CL-ROW

LEGEND

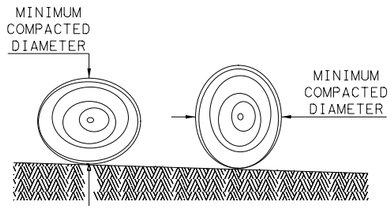
- CL-D — EROSION CONTROL LOG DAM
- CL-BOC — EROSION CONTROL LOG AT BACK OF CURB
- CL-ROW — EROSION CONTROL LOG AT EDGE OF RIGHT-OF-WAY
- CL-SST — EROSION CONTROL LOGS ON SLOPES STAKE AND TRENCHING ANCHORING
- CL-SSL — EROSION CONTROL LOGS ON SLOPES STAKE AND LASHING ANCHORING
- CL-DI — EROSION CONTROL LOG AT DROP INLET
- CL-CI — EROSION CONTROL LOG AT CURB INLET
- CL-GI — EROSION CONTROL LOG AT CURB & GRATE INLET



REBAR STAKE DETAIL

GENERAL NOTES:

1. EROSION CONTROL LOGS SHALL BE INSTALLED IN ACCORDANCE WITH MANFACTURER'S RECOMMENDATIONS, OR AS DIRECTED BY THE ENGINEER.
2. LENGTHS OF EROSION CONTROL LOGS SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND AS REQUIRED FOR THE PURPOSE INTENDED.
3. UNLESS OTHERWISE DIRECTED, USE BIODEGRADABLE OR PHOTODEGRADABLE CONTAINMENT MESH ONLY WHERE LOG WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. FOR TEMPORARY INSTALLATIONS, USE RECYCLABLE CONTAINMENT MESH.
4. FILL LOGS WITH SUFFICIENT FILTER MATERIAL TO ACHIEVE THE MINIMUM COMPACTED DIAMETER SPECIFIED IN THE PLANS WITHOUT EXCESSIVE DEFORMATION.
5. STAKES SHALL BE 2" X 2" WOOD OR #3 REBAR, 2'-4' LONG, EMBEDDED SUCH THAT 2" PROTRUDES ABOVE LOG, OR AS DIRECTED BY THE ENGINEER.
6. DO NOT PLACE STAKES THROUGH CONTAINMENT MESH.
7. COMPOST CRADLE MATERIAL IS INCIDENTAL & WILL NOT BE PAID FOR SEPARATELY.
8. SANDBAGS USED AS ANCHORS SHALL BE PLACED ON TOP OF LOGS & SHALL BE OF SUFFICIENT SIZE TO HOLD LOGS IN PLACE.
9. TURN THE ENDS OF EACH ROW OF LOGS UPSLOPE TO PREVENT RUNOFF FROM FLOWING AROUND THE LOG.
10. FOR HEAVY RUNOFF EVENTS, ADDITIONAL UPSTREAM STAKES MAY BE NECESSARY TO KEEP LOG FROM FOLDING IN ON ITSELF.



DIAMETER MEASUREMENTS OF EROSION CONTROL LOGS SPECIFIED IN PLANS

SEDIMENT BASIN & TRAP USAGE GUIDELINES

An erosion control log sediment trap may be used to filter sediment out of runoff draining from an unstabilized area.

Log Traps: The drainage area for a sediment trap should not exceed 5 acres. The trap capacity should be 1800 CF/Acre (0.5" over the drainage area).

Control logs should be placed in the following locations:

1. Within drainage ditches spaced as needed or min. 500' on center
2. Immediately preceding ditch inlets or drain inlets
3. Just before the drainage enters a water course
4. Just before the drainage leaves the right of way
5. Just before the drainage leaves the construction limits where drainage flows away from the project.

The logs should be cleaned when the sediment has accumulated to a depth of 1/2 the log diameter.

Cleaning and removal of accumulated sediment deposits is incidental and will not be paid for separately.

Texas Department of Transportation

Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
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	DIST		COUNTY			SHEET NO.
	33		TARRANT			163

DATE:
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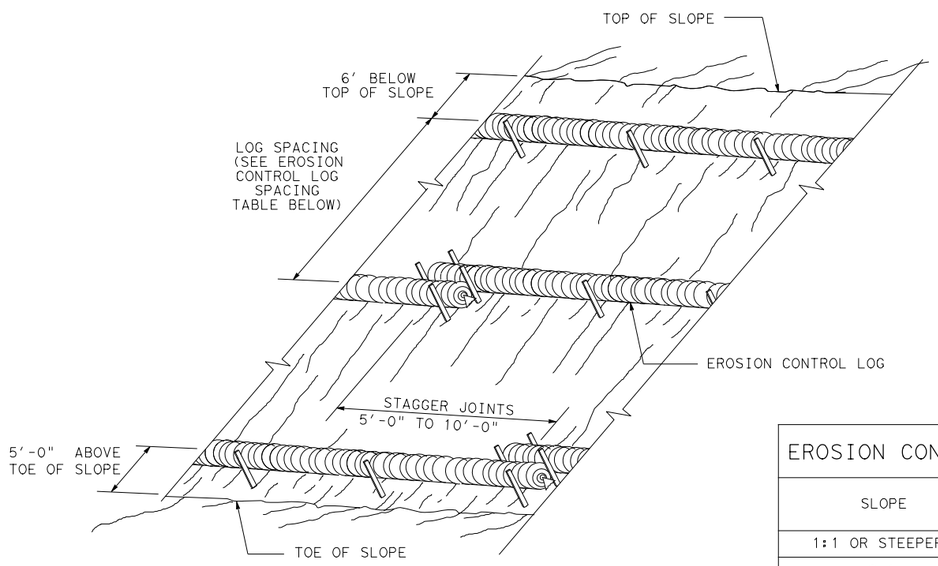
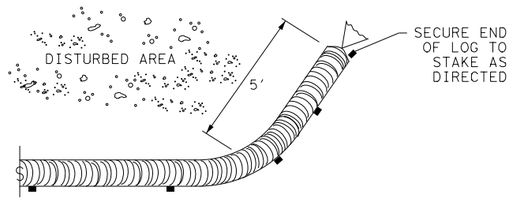


EROSION CONTROL LOGS ON SLOPES
STAKE AND TRENCHING ANCHORING

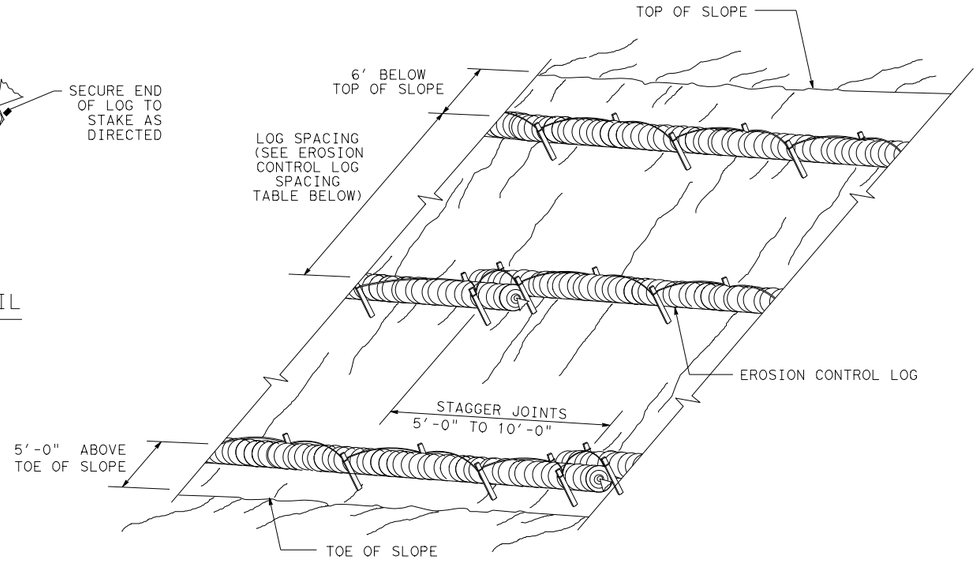
CL-SST



END SECTION RAP DETAIL

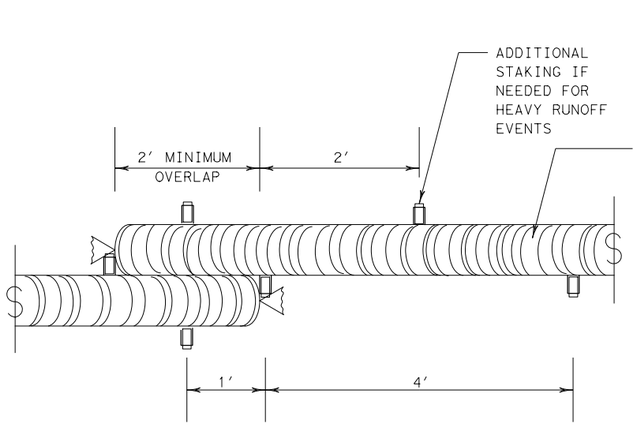
EROSION CONTROL LOG SPACING TABLE				
SLOPE	LOG DIAMETER			
	6"	8"	12"	18"
1:1 OR STEEPER	5′	10′	15′	20′
2:1	10′	20′	30′	40′
3:1	15′	30′	45′	60′
4:1 OR FLATTER	20′	40′	60′	80′

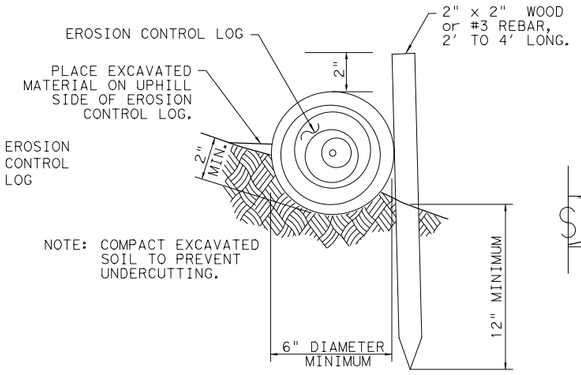
* ADJUSTMENTS CAN BE MADE FOR SOIL TYPE:
SOFT, LOAMY SOILS-ADJUST ROWS CLOSER TOGETHER;
HARD, ROCKY SOILS- ADJUST ROWS FARTHER APART



EROSION CONTROL LOGS ON SLOPES
STAKE AND LASHING ANCHORING

CL-SSL

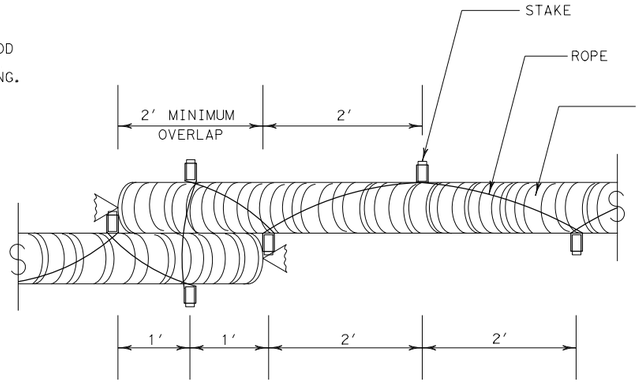


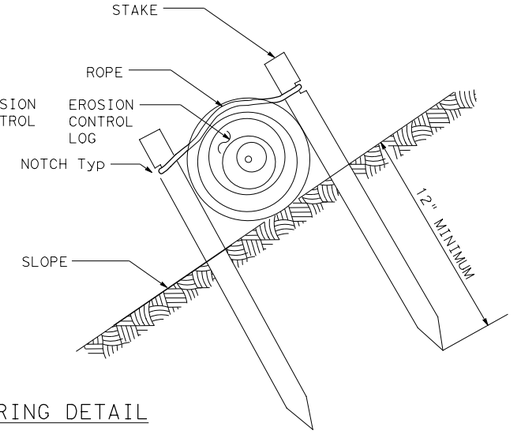


STAKE AND TRENCHING ANCHORING DETAIL

CL-SST

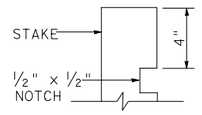
TRENCH DEPTH TABLE	
LOG DIAMETER	DEPTH
6"	2"
8"	3"
12"	4"
18"	5"





STAKE AND LASHING ANCHORING DETAIL

CL-SSL



STAKE NOTCH DETAIL

SHEET 2 OF 3

Texas Department of Transportation

Design Division Standard

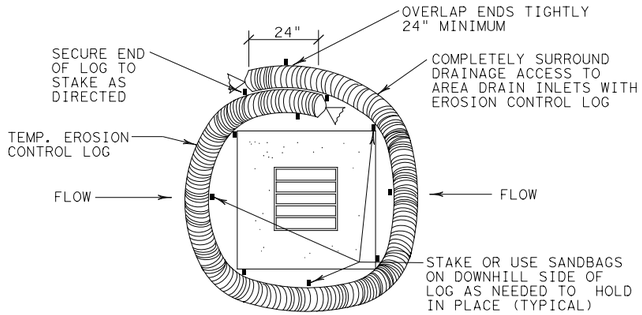
TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

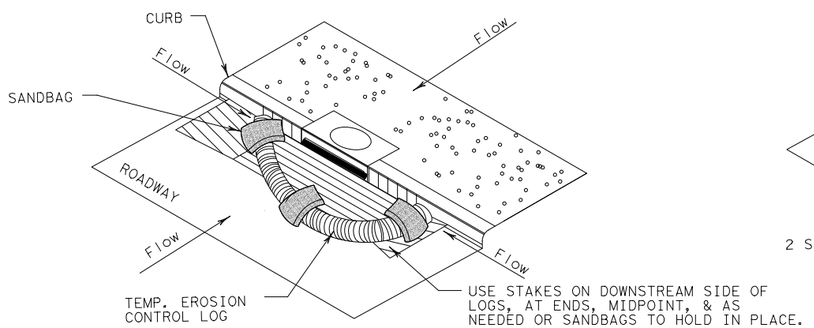
FILE: ec116	DN: TxDOT		CK: KM		DW: LS/PT	CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY	
REVISIONS	0902	90	207, ETC		HULEN ST, ETC	
	DIST	COUNTY			SHEET NO.	
	33	TARRANT			164	

DATE:
FILE:



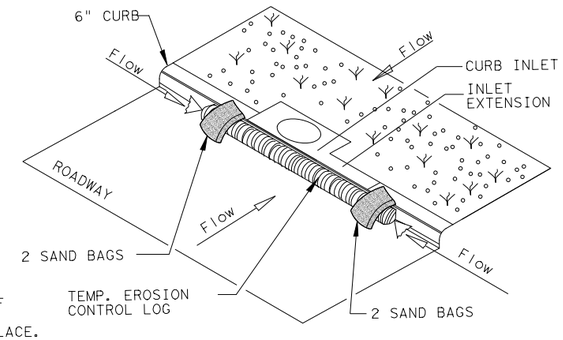
EROSION CONTROL LOG AT DROP INLET

CL-DI



EROSION CONTROL LOG AT CURB INLET

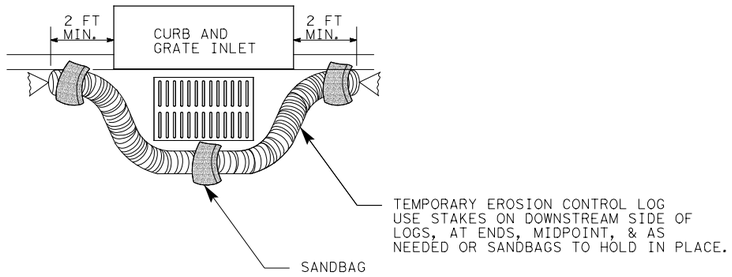
CL-CI



EROSION CONTROL LOG AT CURB INLET

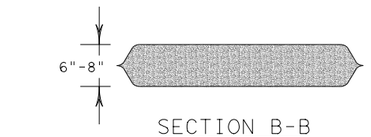
CL-CI

NOTE:
EROSION CONTROL LOGS USED AT CURB INLETS SHOULD ONLY BE USED IF THEY WILL NOT IMPEDE TRAFFIC OR FLOOD THE ROADWAY OR WHEN THE STORM SEWER SYSTEM IS NOT FULLY FUNCTIONAL.

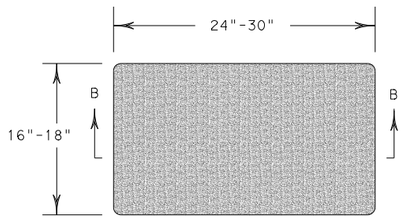


EROSION CONTROL LOG AT CURB & GRADE INLET

CL-GI



SECTION B-B



SANDBAG DETAIL

Texas Department of Transportation | Design Division Standard

TEMPORARY EROSION, SEDIMENT AND WATER POLLUTION CONTROL MEASURES

EROSION CONTROL LOG

EC(9)-16

FILE: ec916	DN: TxDOT		CK: KM		DW: LS/PT		CK: LS
© TxDOT: JULY 2016	CONT	SECT	JOB		HIGHWAY		
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	33	TARRANT			165		