

PROJECT BENCHMARK: SURVEY CONTROL POINT #533
 1/2" IRON ROD W/ CAP Located along north side of Right of way
 between Ledgestone Trail and Royder Road at Station 31+19.12 and
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



T.979.260.6963
 F.979.260.3564
 FIRM# F-1443
 3204 EARL RUDDER FWY S.
 COLLEGE STATION, TX 77845

PLAN & DESIGN SPECIALISTS IN
 CIVIL ENGINEERING • HYDRAULICS
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Job No. 1533-9600-DM-1p Culverts.dwg
 Drawn By: JM
 FILENAME: 1533-9600-DM-1p Culverts.dwg
 PLOTTED: 28 Jul 2016 9:24 am

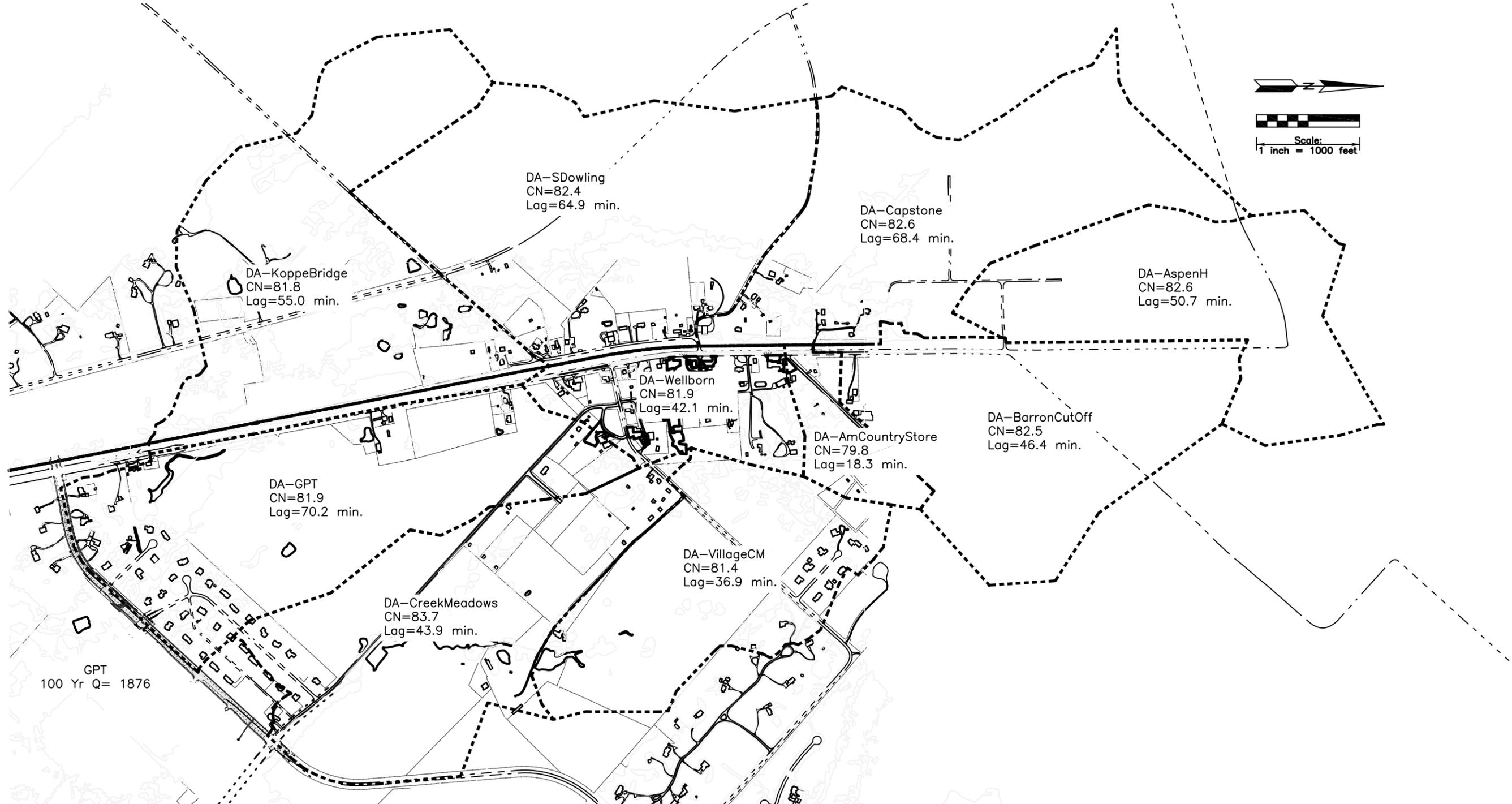
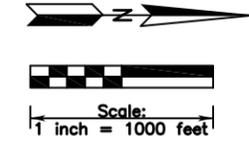
Prepared For:
 City of College Station
 Public Works Department
 310 Krenek Tap Rd
 College Station, TX
 77840

Revisions

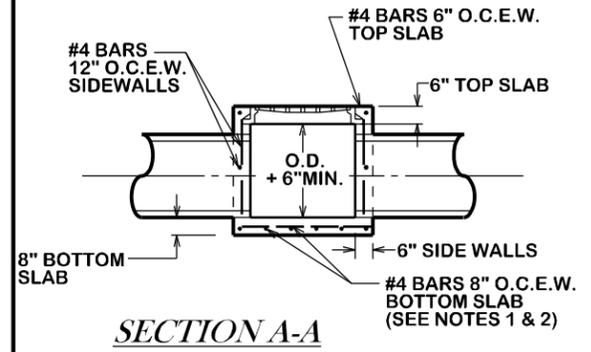
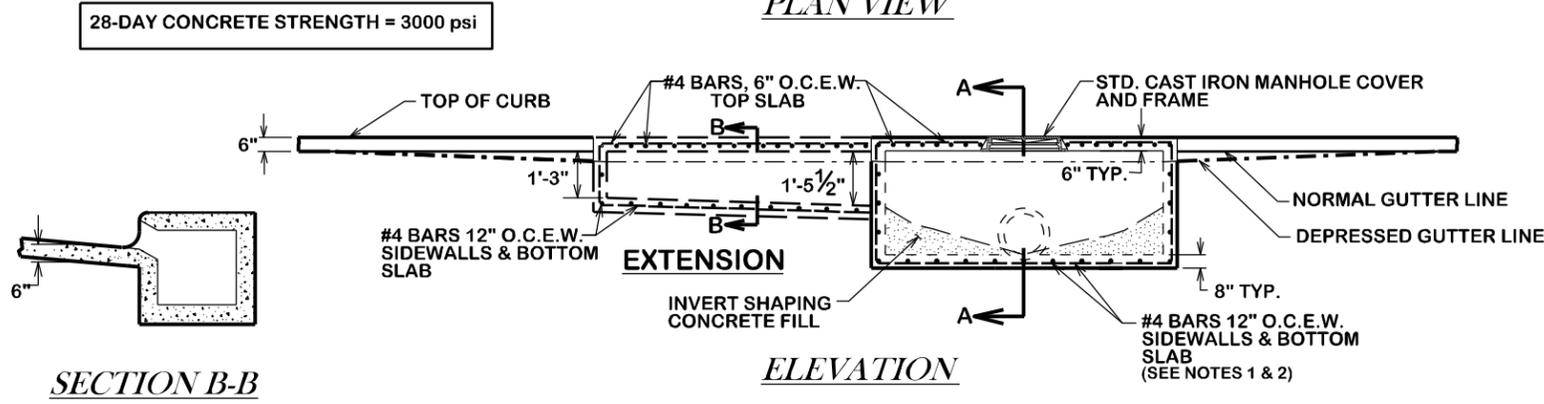
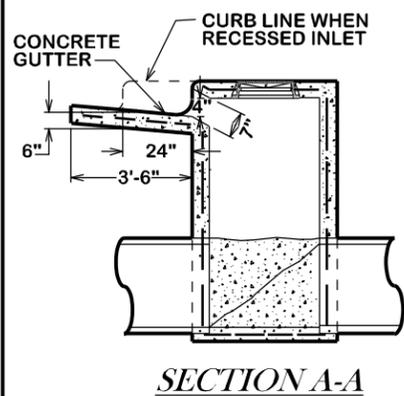
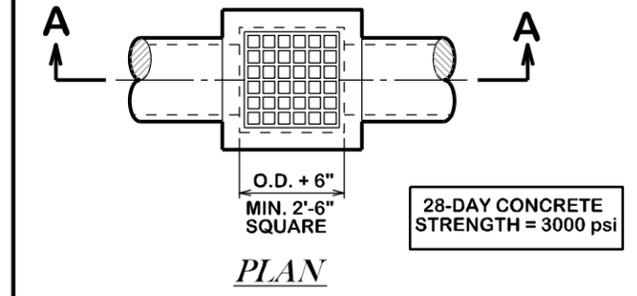
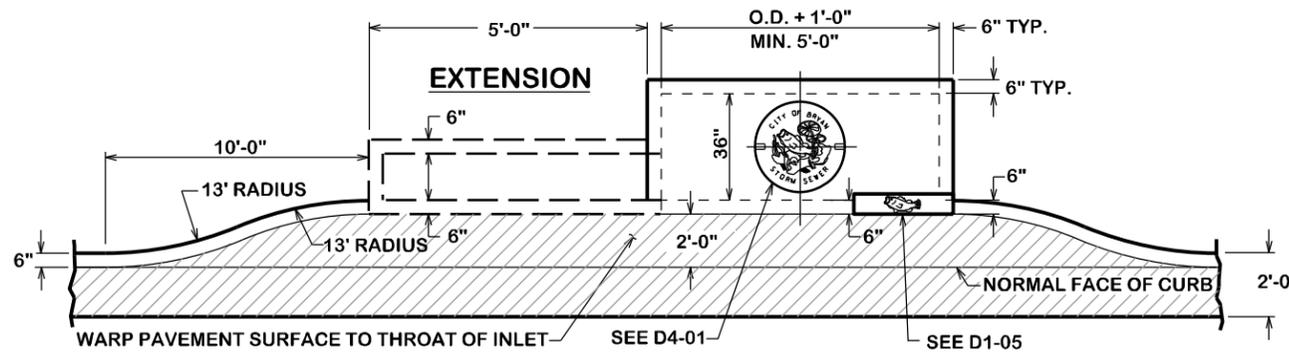
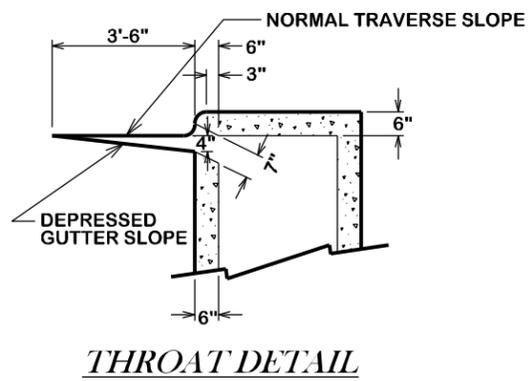
**CULVERT DRAINAGE AREA MAP
 GREENS PRAIRIE TRAIL
 ROADWAY CAPACITY IMPROVEMENTS**

71

Of 190 Sheets



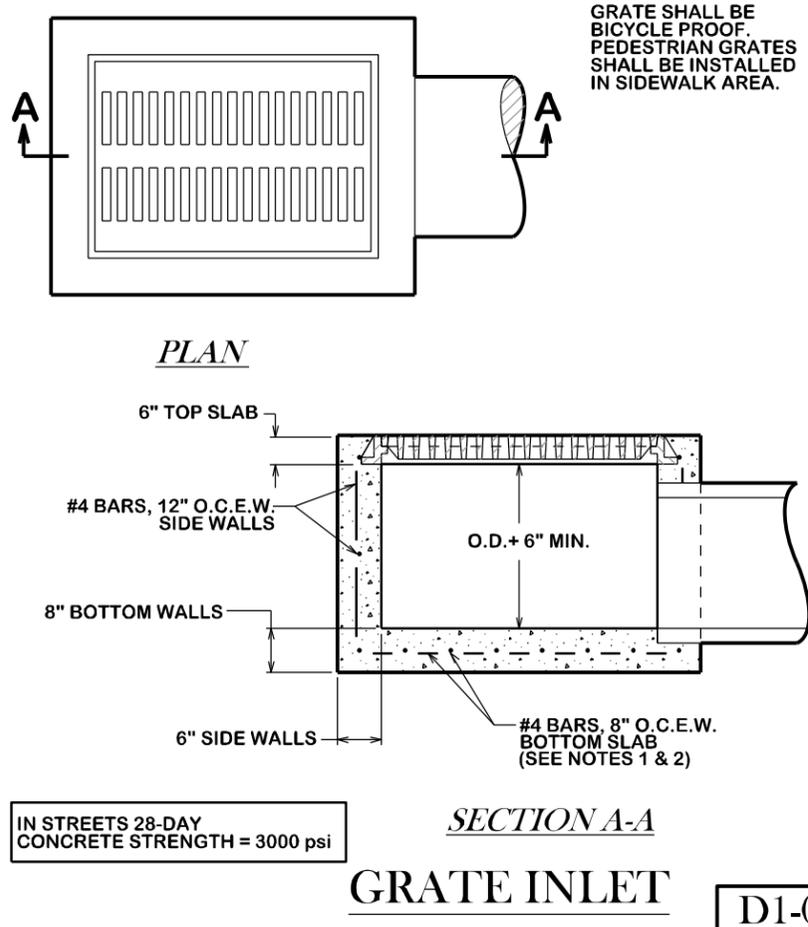
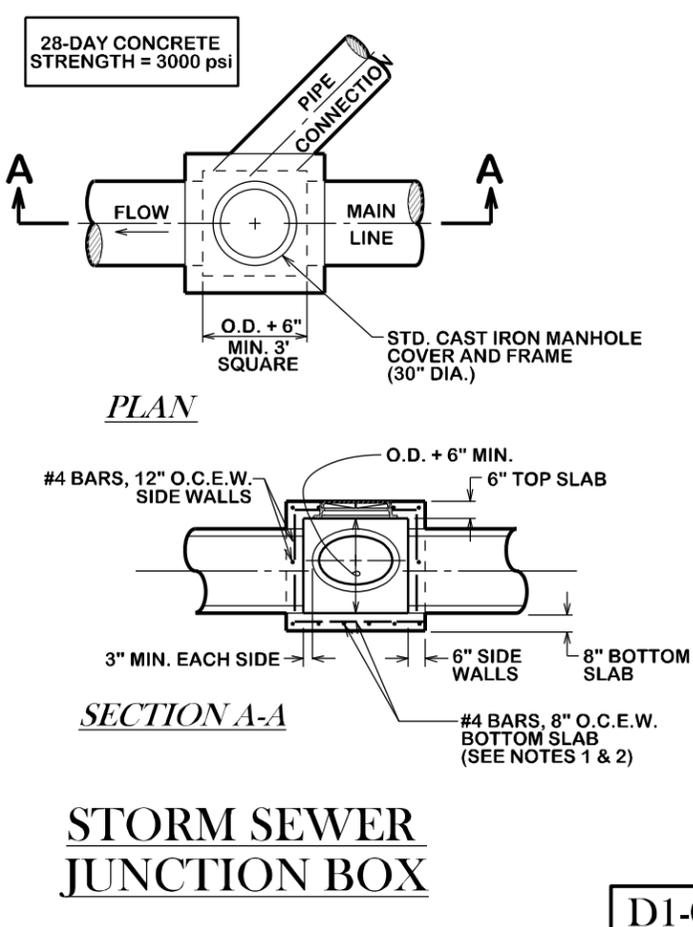
AREA #	AREA MILES	HYD LENGHT	Elev at 85% of F.P.	Elev at 10% of F.P.	VERT DROP	SLOPE FT/FT	Impervious Area %	CURVE #	LAG HOURS	Lag Mins	PROP CN	PROP % MOD	% MOD ADJ.	PROP % IMP	% IMP ADJ.	PROP LAG (hrs)	PROP LAG (min)	PROP Vel.
DA-AspenH	0.1800	4887.8	352.6	321.32	31.28	0.01067	10.00	82.6	1.01	60	83.84	10.0	0.94	10.0	0.94	0.84	50.7	1.61
DA-Capstone	0.2510	6062.2	343.46	313.42	30.04	0.00826	10.00	82.6	1.36	82	83.84	10.0	0.94	10.0	0.94	1.14	68.4	1.48
Da-BarronCutOff	0.2160	3878.8	346.04	321.41	24.63	0.01058	5.00	82.5	0.84	51	83.13	5.0	0.97	5.0	0.97	0.77	46.4	1.39
DA-AmCountrySto	0.0380	1943.3	352.03	326.16	25.87	0.02219	10.00	79.8	0.37	22	81.32	10.0	0.94	10.0	0.94	0.30	18.3	1.77
DA-Wellborn	0.0850	3436.5	339.1	320.15	18.95	0.00919	10.00	81.9	0.84	50	83.21	10.0	0.94	10.0	0.94	0.70	42.1	1.36
DA-SDowling	0.2900	4328.9	322.84	304.11	18.73	0.00721	2.00	82.4	1.12	67	82.65	2.0	0.99	2.0	0.99	1.08	64.9	1.11
DA-KoppeBridge	0.2910	4806.9	332.2	296.67	35.53	0.01232	2.00	81.8	0.95	57	82.06	2.0	0.99	2.0	0.99	0.92	55.0	1.46
DA-GPT	0.2610	6299.8	327.18	281.89	45.29	0.01198	1.00	81.9	1.19	71	82.03	1.0	0.99	1.0	0.99	1.17	70.2	1.49
DA-VillageCM	0.1740	3975.7	349.12	312.1	37.02	0.01552	10.00	81.4	0.74	44	82.76	10.0	0.94	10.0	0.94	0.62	36.9	1.79
DA-CreekMeadows	0.2330	4896.2	334.61	295.47	39.14	0.01332	10.00	83.7	0.87	52	84.83	10.0	0.94	10.0	0.94	0.73	43.9	1.86



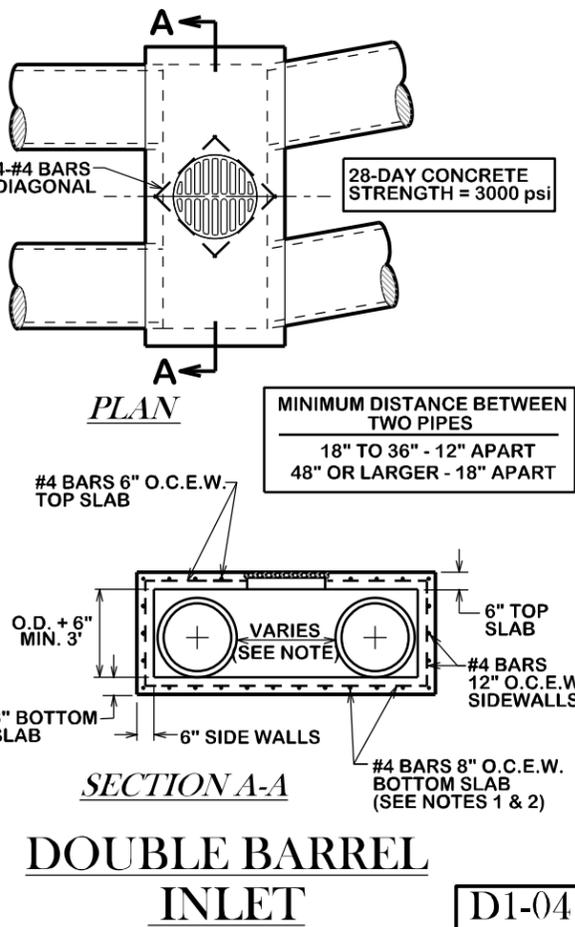
SINGLE RECESSED CURB INLET & CURB INLET W/EXTENSION

D1-00

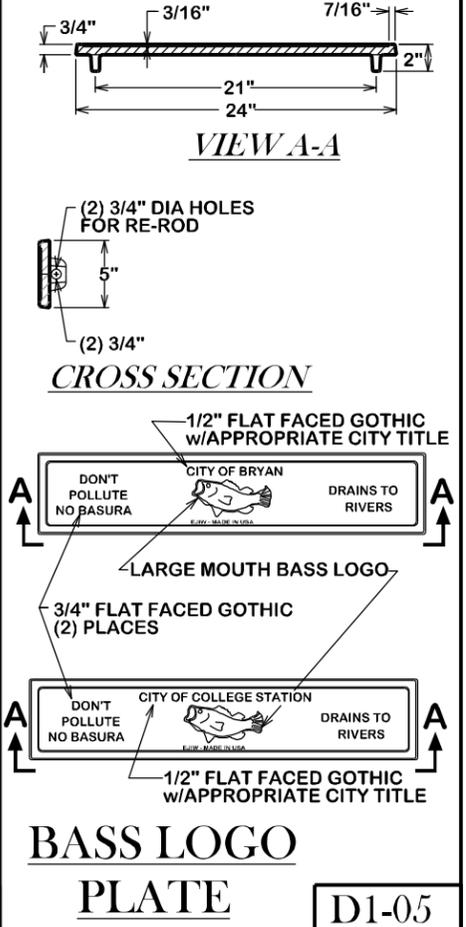
D1-01



GRATE SHALL BE BICYCLE PROOF. PEDESTRIAN GRATES SHALL BE INSTALLED IN SIDEWALK AREA.



MINIMUM DISTANCE BETWEEN TWO PIPES
18" TO 36" - 12" APART
48" OR LARGER - 18" APART



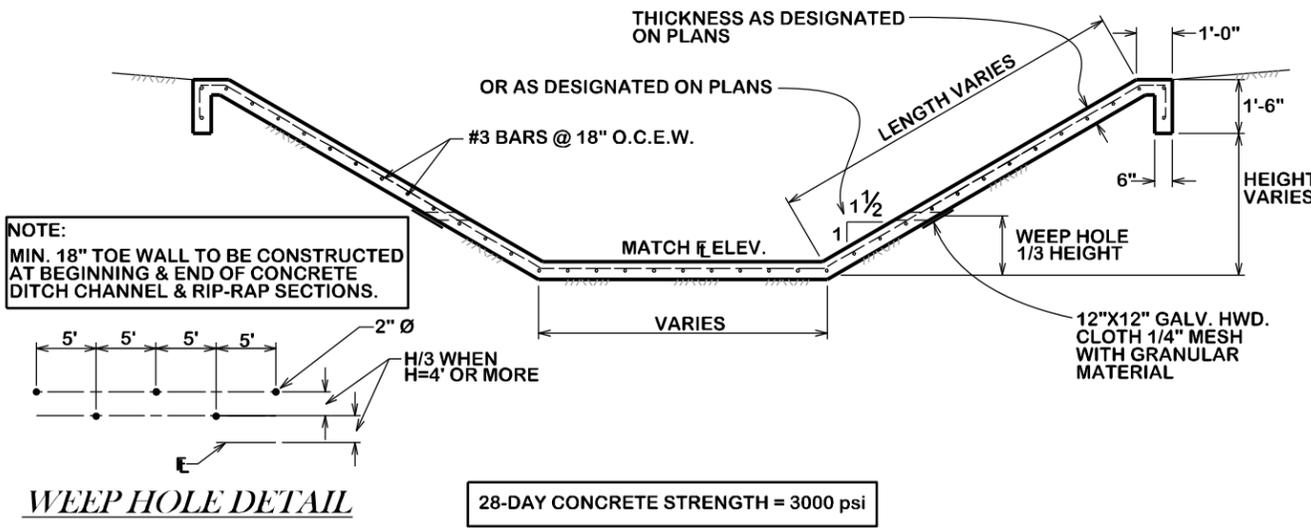
REVISIONS

BRYAN - COLLEGE STATION
STANDARD DRAINAGE DETAILS



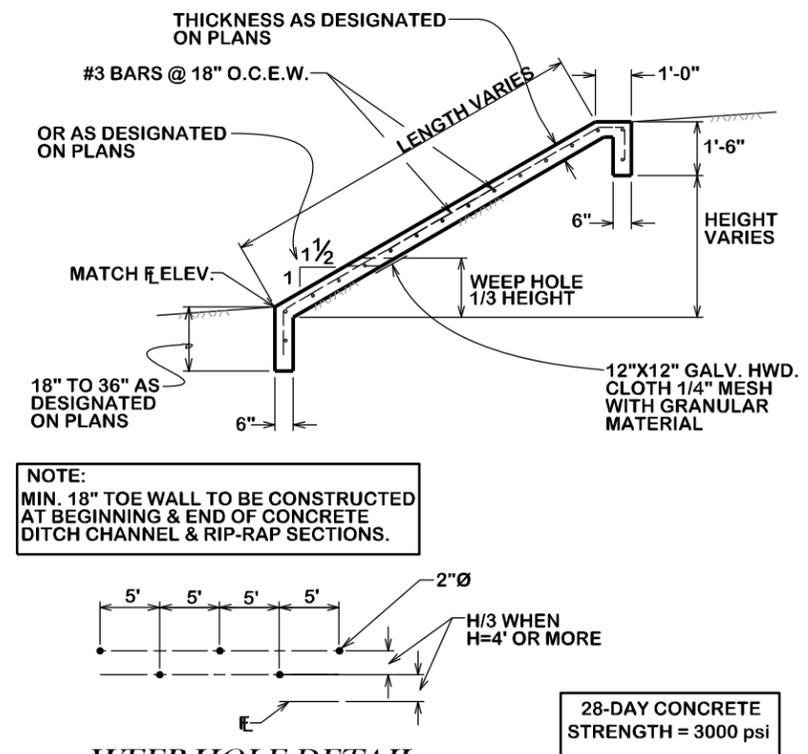
DRAWN BY: C.L.M.
DATE: 08-01-12
SCALE: N T S
APPROVED: W.P.K.

FIGURE:
D1
SHEET 1 OF 4



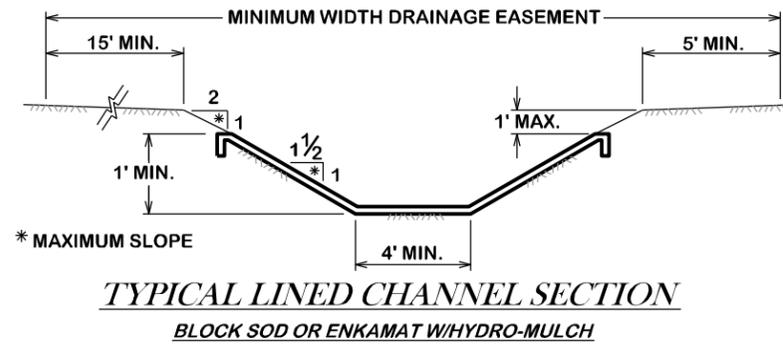
CONCRETE CHANNEL LINING

D2-00



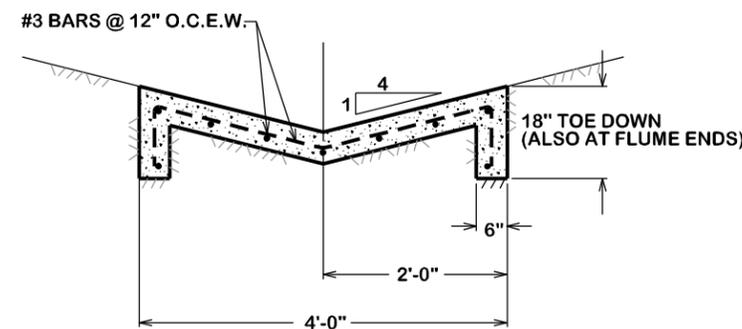
CONCRETE RIP-RAP

D2-01



STANDARD CHANNEL SECTION

D2-02

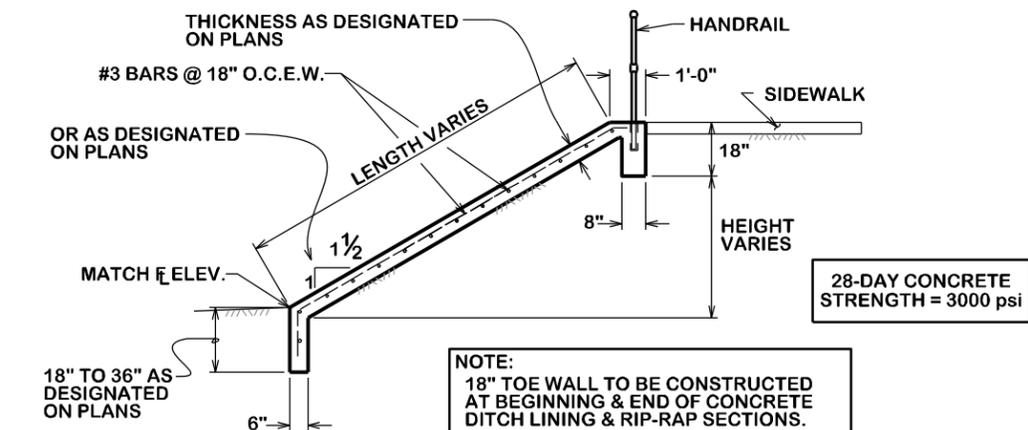


28-DAY CONCRETE STRENGTH = 3000 psi

STANDARD FLUME SECTION

EXPANSION JOINTS AT 60' O.C.

D2-04



CONCRETE SIDE SLOPE PROTECTION

D2-03

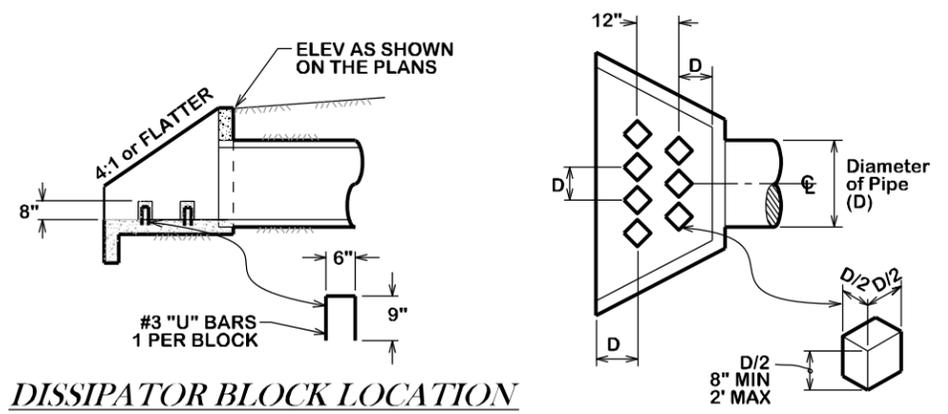
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BRYAN - COLLEGE STATION
STANDARD DRAINAGE DETAILS



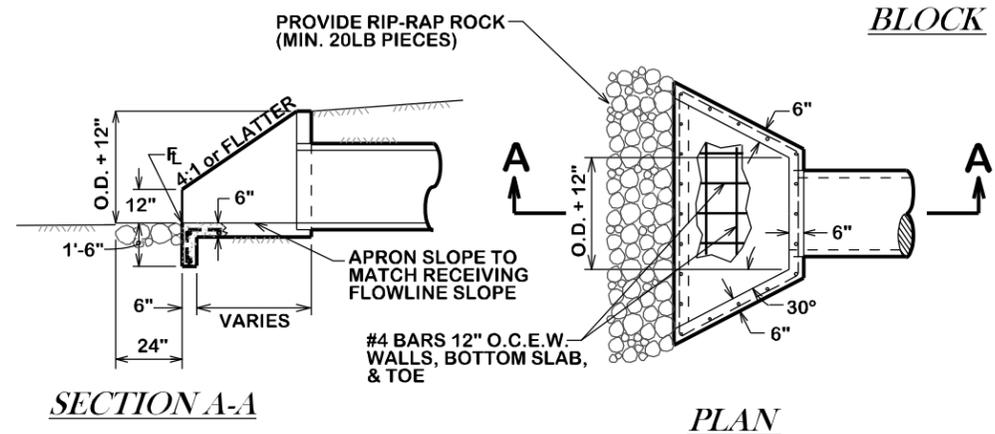
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FIGURE:
D2
SHEET 2 OF 4



DISSIPATOR BLOCK LOCATION

DISSIPATOR BLOCK



SECTION A-A

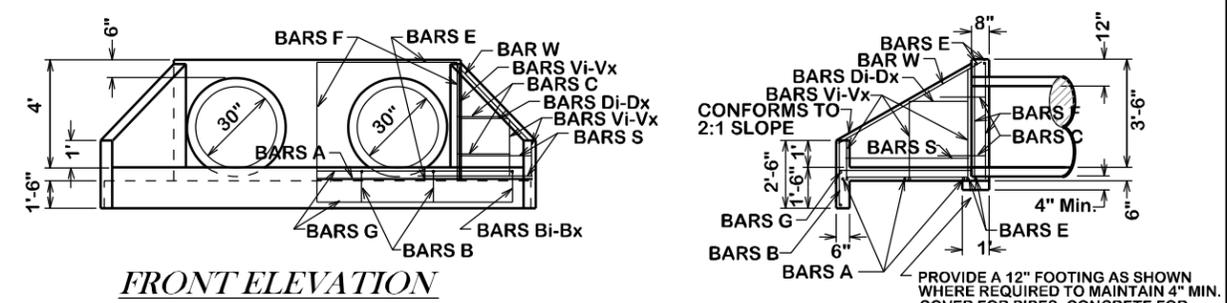
PLAN

28-DAY CONCRETE STRENGTH = 3000 psi

MINIMUM DISTANCE BETWEEN TWO PIPES
 18" TO 36" - 12" APART
 48" OR LARGER - 18" APART

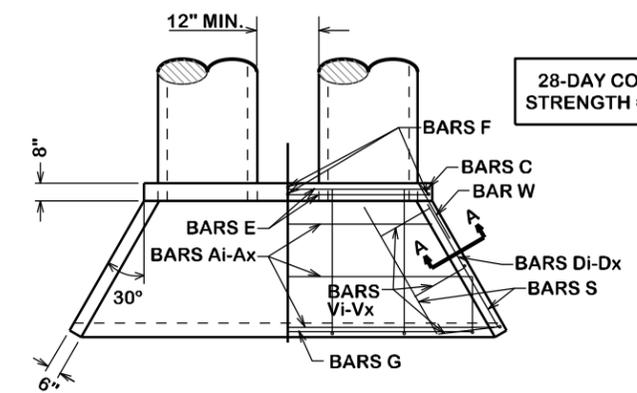
TYPICAL CONCRETE HEADWALL & END WALL WITH WINGS

D3-00



FRONT ELEVATION

SIDE ELEVATION



PLAN VIEW

SECTION A-A

28-DAY CONCRETE STRENGTH = 3000 psi

DISSIPATOR BLOCKS TO BE INSTALLED AS SHOWN IN DETAIL D3-00

GENERAL NOTES:

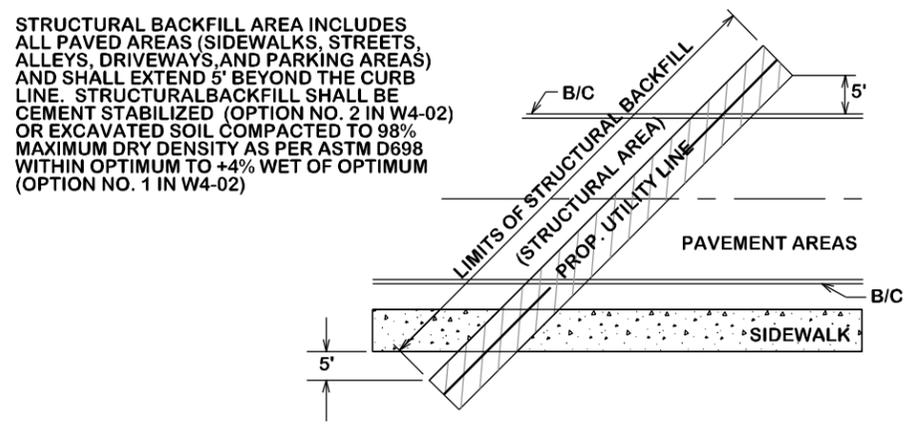
ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4". REINFORCING STEEL SHALL BE PLACED WITH THE CENTER OF THE OUTSIDE LAYER OF BARS 2" FROM THE SURFACE OF THE CONCRETE. TOTAL QUANTITIES INCLUDE ONE 20 DIAMETER LAP FOR ALL BARS OVER 6'-0" IN LENGTH.

REINFORCING STEEL FOR ONE HEADWALL

BARS Ai-Ax	BARS B	BARS Bi-Bx	BARS C	BARS Di-Dx	BARS E	BARS F	BARS G	BARS S	BARS Vi-Vx	BARS W
#4@12"±	#3@18"±	#3@18"±	#4@12"±	#3@12"±	#5	#4	#3	#4	#4@12"±	#5

CONCRETE HEADWALL FOR 2 PIPES

D3-01



STRUCTURAL BACKFILL AREA

D3-02

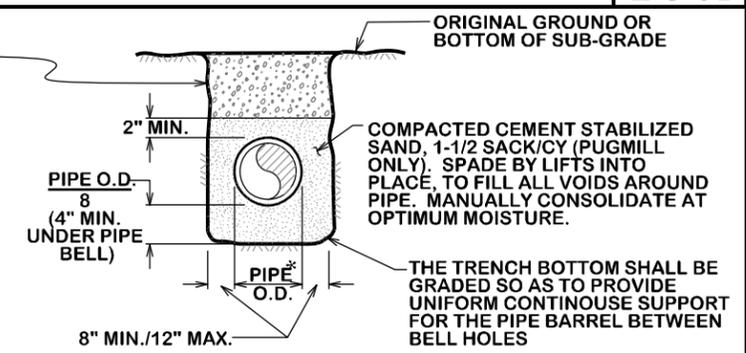
SELECT MATERIAL

MATERIAL EXCAVATED FROM THE DITCH, (WHICH IS FREE OF ROCKS, LUMPS, CLODS, OR DEBRIS LARGER THAN TWO (2) INCHES IN THE LARGEST DIMENSION, COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698 (STANDARD) AT A MOISTURE CONTENT WITHIN OPTIMUM TO +4% OF OPTIMUM UNDER NON-STRUCTURAL AREAS (ie...YARDS, PASTURES, EASEMENTS) AND TO A MINIMUM OF 98% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698 (STANDARD) AT A MOISTURE CONTENT WITHIN OPTIMUM TO +4% OF OPTIMUM UNDER NEW STREET AREAS AND STREETS TO BE RECONSTRUCTED.

* PE MUST DESIGN TRENCH DETAIL SITE SPECIFIC FOR HDPE PIPE.

HDPE PIPE IS NOT TO BE USED UNDER PUBLIC STREET PAVEMENT

CEMENT STABILIZED SAND AS A MINIMUM WILL ALWAYS BE REQUIRED.



BEDDING AND TRENCH FOR REINFORCED CONCRETE PIPE AND BOX CULVERTS

D3-03

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 STANDARD DRAINAGE DETAILS



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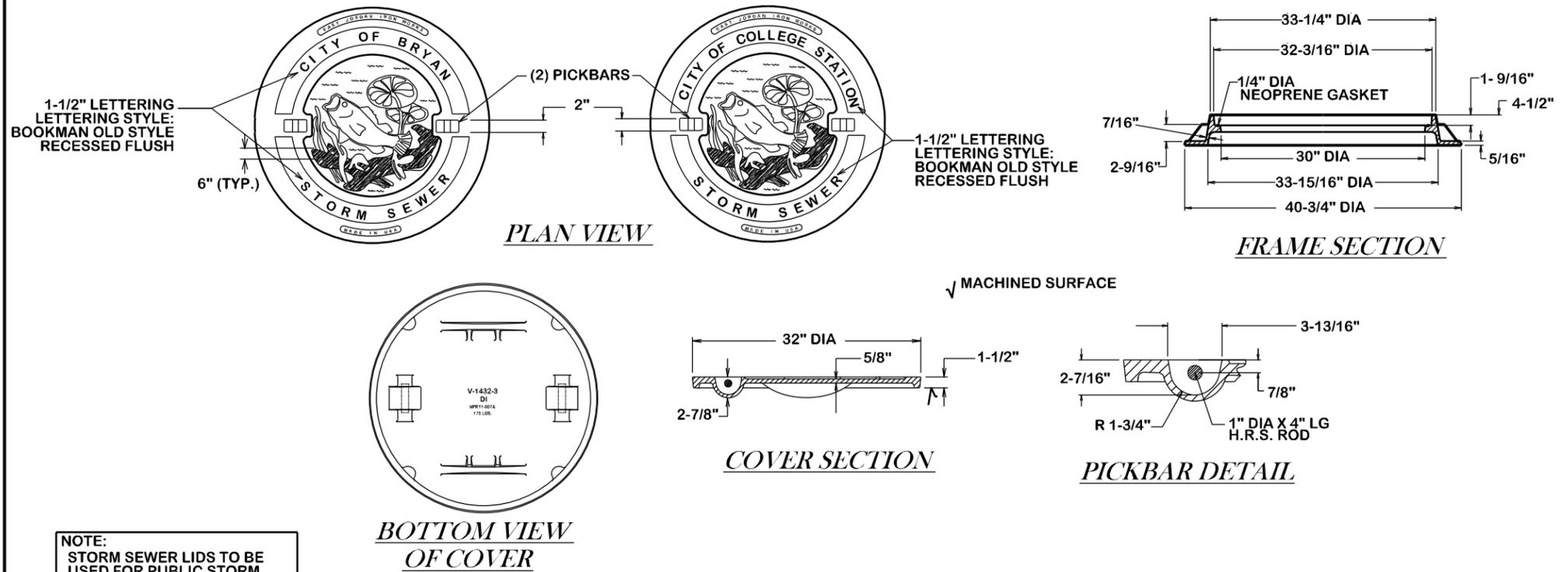
FIGURE:
D3
 SHEET 3 OF 4

GENERAL NOTES:

1. BASE THICKNESS AND FOUNDATION SHALL BE AS FOLLOWS:

INLET DEPTH (FT.) (MEASURED FROM FLOWLINE TO FINAL GRADE)	BASE THICKNESS
0 - 12	8"
12 AND OVER	12"

2. DEPTHS GREATER THAN 12' WILL REQUIRE 2 MATS OF REINFORCING STEEL IN THE BASE.
3. ALL AREAS WHERE EXISTING VEGETATION AND GRASS COVER HAVE BEEN BARED BY CONSTRUCTION SHALL BE ADEQUATELY BLOCK SODDED OR HYDROMULCHED AND WATERED UNTIL GROWTH IS ESTABLISHED. IN DEVELOPED AREAS WHERE GRASS IS PRESENT, BLOCK SOD WILL BE REQUIRED.
4. APPROVED EROSION CONTROL MEASURES MUST BE INSTALLED DURING THE ENTIRE TIME THAT EARTH HAS BEEN BARED BY CONSTRUCTION AND SHALL STAY IN PLACE UNTIL ACCEPTABLE VEGETATIVE GROWTH IS ESTABLISHED AFTER CONSTRUCTION IS COMPLETE AND THEN REMOVED BY CONTRACTOR.

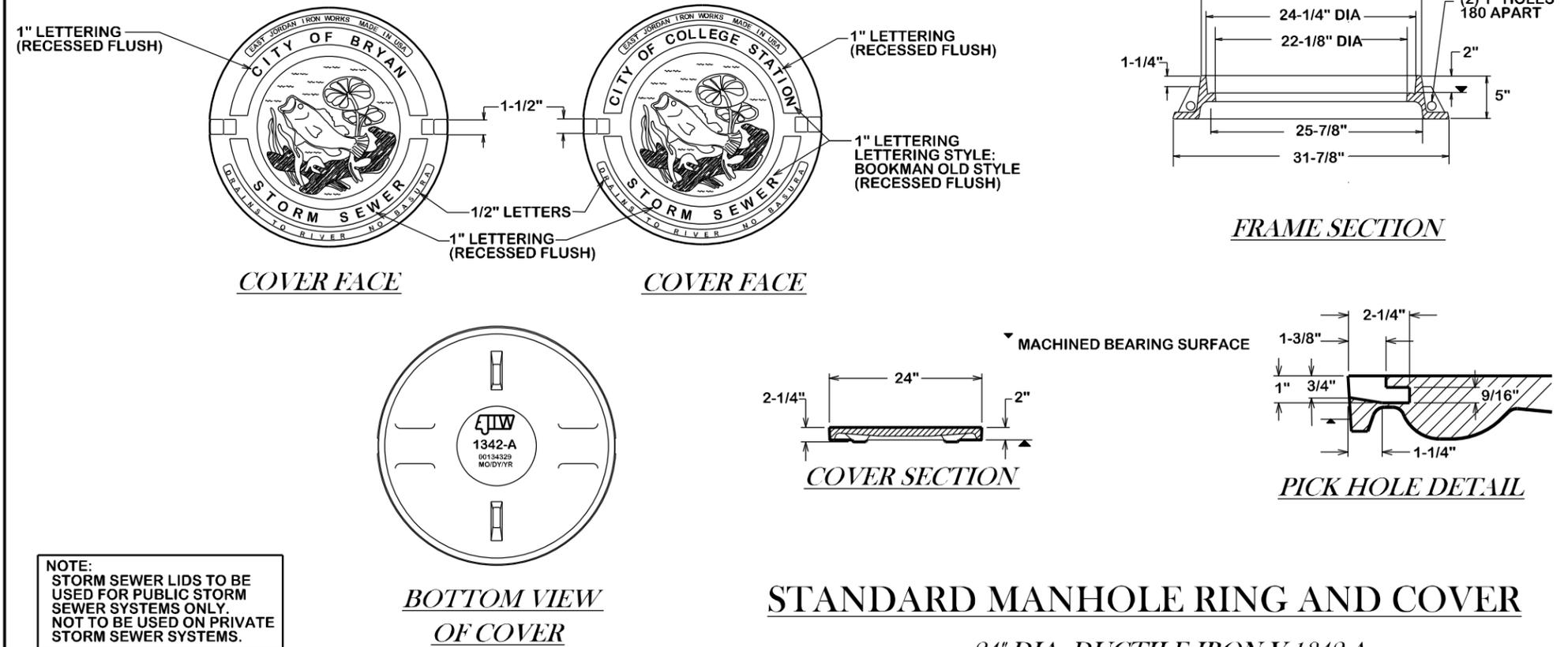


NOTE:
STORM SEWER LIDS TO BE
USED FOR PUBLIC STORM
SEWER SYSTEMS ONLY.
NOT TO BE USED ON PRIVATE
STORM SEWER SYSTEMS.

STANDARD MANHOLE RING AND COVER

32" DIA. DUCTILE IRON V-1432-3

D4-00



NOTE:
STORM SEWER LIDS TO BE
USED FOR PUBLIC STORM
SEWER SYSTEMS ONLY.
NOT TO BE USED ON PRIVATE
STORM SEWER SYSTEMS.

STANDARD MANHOLE RING AND COVER

24" DIA. DUCTILE IRON V-1342-A

D4-01

REVISIONS:

BRYAN - COLLEGE STATION
STANDARD DRAINAGE DETAILS



CITY OF BRYAN
The Good Life, Texas Style.

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SCALE: N T S
APPROVED: W. P. K.

FIGURE:

D4

SHEET 4 OF 4

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DATE: FILE:

TABLE OF DIMENSIONS & REINFORCING STEEL (Wings for One Structure End)

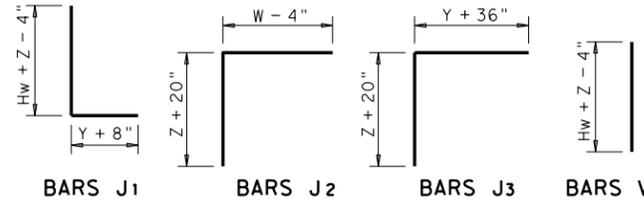
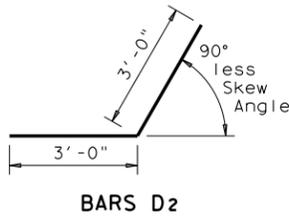
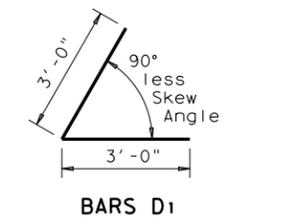
Maximum Wingwall Height Hw	Dimensions				Variable Reinforcing				Estimated Quantities per ft of wing (2-Wings)		Estimated Quantities per ft of Toewall (1-Toewall)	
	W	X	Y	Z	Bars J1	Bars J2	Size	Spa	Reinf (Lb/Ft)	Conc (CY/Ft)	Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	48.64	0.406	6.85	0.071
2'-9"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.31	0.424	6.85	0.071
3'-0"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	49.98	0.444	6.85	0.071
3'-3"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.32	0.462	6.85	0.071
3'-6"	2'-10"	10"	1'-0"	7"	#4	1'-0"	#4	1'-0"	53.98	0.480	6.85	0.071
4'-0"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	55.77	0.532	6.85	0.071
4'-6"	3'-2"	1'-2"	1'-0"	7"	#4	1'-0"	#4	1'-0"	59.77	0.568	6.85	0.071
5'-0"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	63.45	0.632	6.96	0.075
5'-6"	3'-9"	1'-7"	1'-2"	7"	#4	1'-0"	#4	1'-0"	67.46	0.668	6.96	0.075
6'-0"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	80.67	0.730	7.07	0.078
6'-6"	4'-4"	2'-0"	1'-4"	7"	#5	1'-0"	#5	1'-0"	85.05	0.768	7.07	0.078
7'-0"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	92.15	0.864	8.07	0.093
7'-6"	5'-0"	2'-3"	1'-9"	8"	#5	1'-0"	#5	1'-0"	96.54	0.902	8.07	0.093
8'-0"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	139.04	0.962	8.13	0.095
8'-6"	5'-6"	2'-8"	1'-10"	8"	#5	6"	#5	6"	144.47	1.000	8.13	0.095
9'-6"	6'-0"	2'-10"	2'-2"	9"	#5	6"	#5	6"	156.93	1.136	8.41	0.110
10'-6"	6'-5"	3'-0"	2'-5"	9"	#6	6"	#5	6"	196.27	1.234	8.57	0.117
11'-6"	7'-2"	3'-6"	2'-8"	11"	#6	6"	#6	6"	230.13	1.438	9.52	0.140
12'-6"	7'-8"	3'-9"	2'-11"	1'-0"	#7	6"	#6	6"	283.41	1.592	9.74	0.157
13'-6"	8'-2"	4'-0"	3'-2"	1'-2"	#8	6"	#6	6"	348.72	1.804	10.02	0.186
14'-6"	8'-10"	4'-5"	3'-5"	1'-4"	#9	6"	#6	6"	432.94	2.046	10.30	0.218
15'-6"	9'-6"	4'-10"	3'-8"	1'-6"	#9	6"	#7	6"	489.52	2.302	11.24	0.253
16'-0"	9'-11"	5'-0"	3'-11"	1'-7"	#9	6"	#7	6"	505.72	2.448	11.47	0.279

TABLE OF WINGWALL REINFORCING (2-Wings)

Bar	Size	No.	Spa
D1	#6	~	1'-0"
D2	#6	~	1'-0"
E1	#4	~	1'-0"
F	#4	~	1'-0"
G	#6	~	8"
M1	#4	4	~
P	#4	~	1'-0"
V	#4	~	1'-0"

TABLE OF TOEWALL REINFORCING

Bar	Size	No.	Spa
J3	#4	~	1'-0"
M2	#4	2	~
E2	#4	~	1'-0"



WING DIMENSION CALCULATIONS:

Formulas: (All values are in Feet)

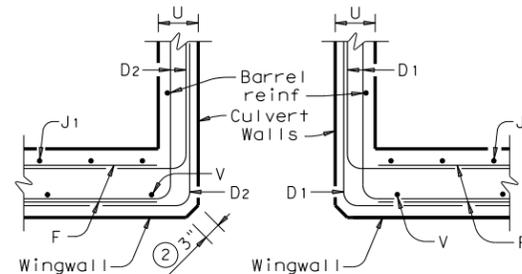
$H_w = H + T + C$
 $L_w = (H_w) (SL) \div \text{Cosine } \theta$ for Ty PW-1
 $L_w = (H_w - 1') (SL) \div \text{Cosine } \theta$ for Ty PW-2 and $H_w \geq 4'$
 $L_w = (H_w - 0.5') (SL) \div \text{Cosine } \theta$ for Ty PW-2 and $H_w < 4'$

For Cast-in-place culverts:
 $L_{tw} = [(N) (S) + (N + 1) (U)] \div \text{Cosine } \theta$

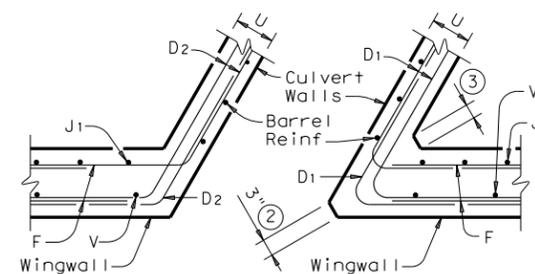
For Precast culverts:
 $L_{tw} = [(N) (2U + S) + (N - 1) (0.5')] \div \text{Cosine } \theta$
 Total Wingwall Area (Two Wings ~ SF)
 $= (2) (H_w) (L_w)$ for Ty PW-1
 $= (2) (H_w) (L_w) - 6 \text{ SF}$ for Ty PW-2 and $H_w \geq 4'$
 $= (2) (H_w) (L_w) - 1.5 \text{ SF}$ for Ty PW-2 and $H_w < 4'$

H_w = Height of Wingwall
 L_w = Length of Wingwall
 L_{tw} = Culvert Toewall Length
 N = Number of Culvert Spans
 $SL:1$ = Channel Slope ratio. (Horizontal: 1 Vertical, Usual value is 2:1)
 θ = Culvert Skew

See applicable box culvert standard for S, H, T and U values.



SECTION C-C



SECTION C-C

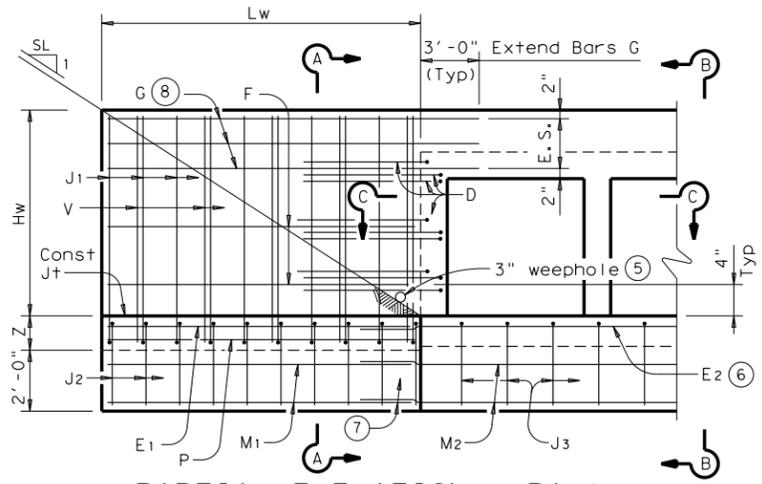
- Skew Angle = 0°
- At discharge end, chamfer may be 3/4".
- For 15° Skew ~ 1"
For 30° Skew ~ 2"
For 45° Skew ~ 3"
- Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
- Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
- Extend Bars E2 1'-6" minimum into the wingwall footing.
- Lap Bars M1 1'-6" minimum with Bars M2.
- Bars G equally spaced at 8" maximum, place as shown. Provide at least two pair Bars G per wing.
- 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 bridge rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- For vehicle safety, the following requirements must be met:
- For structures without bridge rail, curbs cannot project more than 3" above finished grade.
- For structures with bridge rail, build curbs flush with finished grade.
Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 1'-0" typical. 2'-0" typical when RAC standard is referenced elsewhere in the plans.
- 3'-0" for Hw < 4'.
- 6" for Hw < 4'.

GENERAL NOTES:

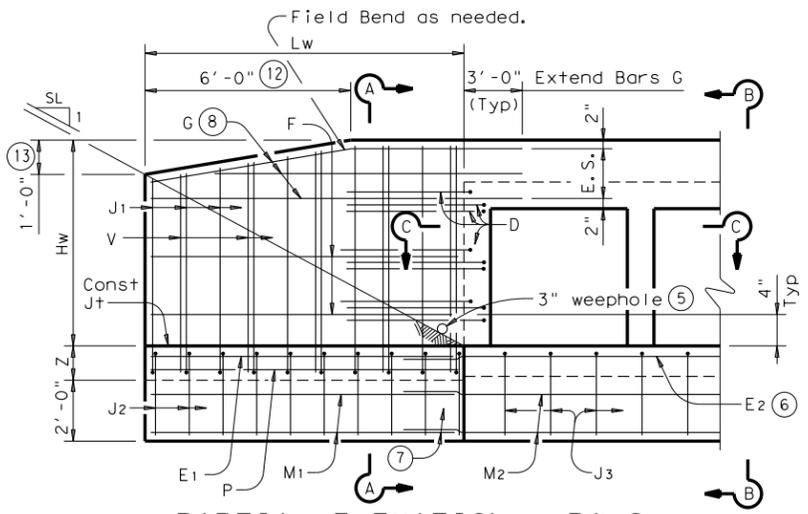
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
 Provide Class "C" Concrete (f'c = 3,600 psi Min) and Grade 60 reinforcing steel.
 Provide 1/4" Min clear cover to reinforcing steel.
 Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
 See BCS sheet for wingwall type and additional dimensions and information.
 The quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

DESIGNER NOTES:

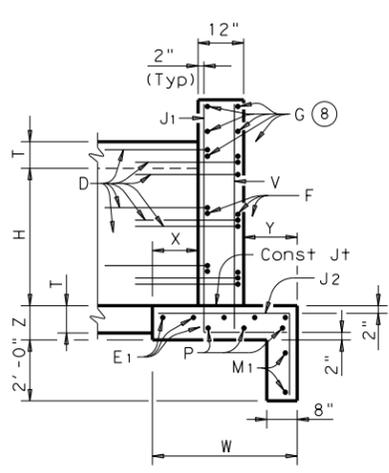
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
 Type PW-2 can only be used for applications without a railing mounted to the wingwall.



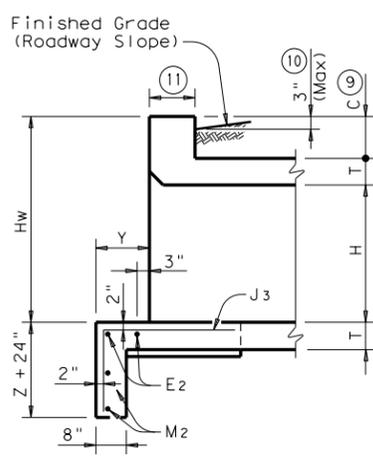
PARTIAL ELEVATION - PW-1



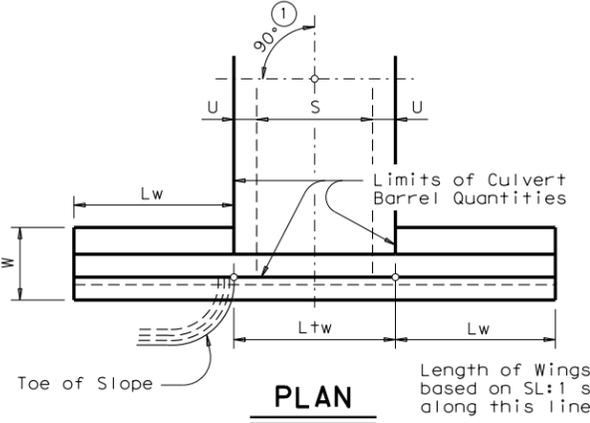
PARTIAL ELEVATION - PW-2



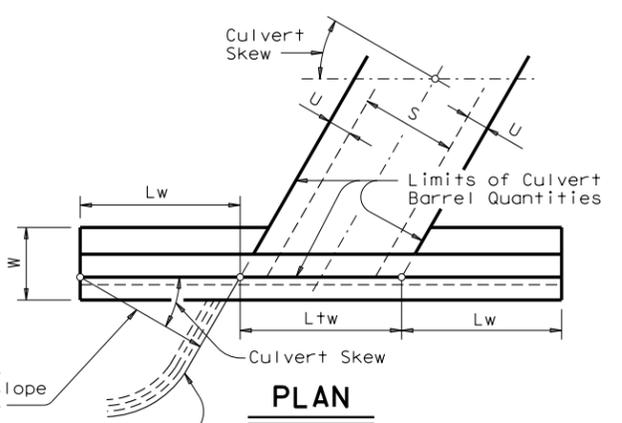
SECTION A-A
(Showing Wing Reinf)



SECTION B-B
(Showing Wing Reinf)



DETAILS FOR NON-SKEWED BOX CULVERTS



DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° Skew)

		Bridge Division Standard	
CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2			
PW			
FILE: pwstd01.dgn	DN: GAF	CK: CAT	DW: TxDOT
©TxDOT February 2010	CONT	SECT	JOB
REVISIONS			HIGHWAY
11-10: Reinforcing Quantities.			
01-12: PW-1 & PW-2.	DIST	COUNTY	SHEET NO.

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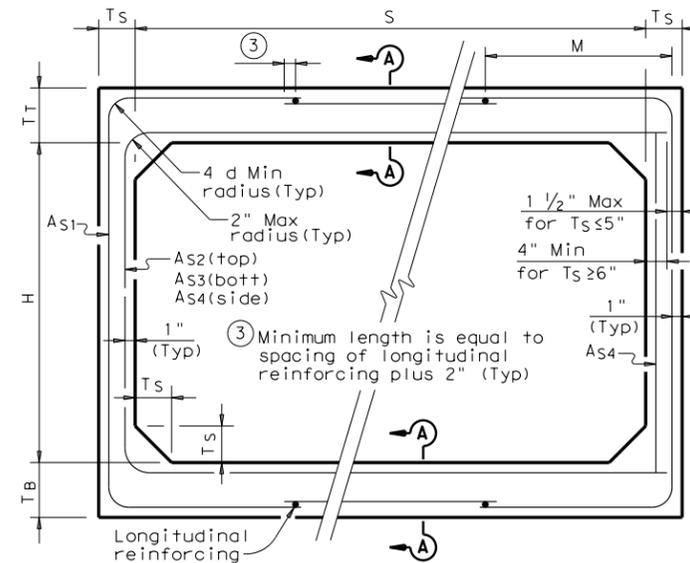
DATE: FILE:

BOX DATA

SECTION DIMENSIONS					Fill Height (ft)	M (in)	REINFORCING (in ² /ft) ^②								Lift Weight (Tons) ^①
S (ft)	H (ft)	T _T (in)	T _B (in)	T _S (in)			A _{S1}	A _{S2}	A _{S3}	A _{S4}	A _{S5}	A _{S6}	A _{S7}	A _{S8}	
10	5	10	10	10	<2	-	0.30	0.36	0.30	0.24	0.24	0.24	0.24	0.24	17.5
10	5	10	10	10	2<3	58	0.35	0.39	0.34	0.24	-	-	-	-	17.5
10	5	10	10	10	3-5	53	0.28	0.31	0.30	0.24	-	-	-	-	17.5
10	5	10	10	10	10	52	0.33	0.35	0.36	0.24	-	-	-	-	17.5
10	5	10	10	10	15	47	0.42	0.46	0.47	0.24	-	-	-	-	17.5
10	5	10	10	10	20	47	0.55	0.59	0.61	0.24	-	-	-	-	17.5
10	5	10	10	10	25	47	0.68	0.73	0.75	0.24	-	-	-	-	17.5
10	6	10	10	10	<2	-	0.28	0.38	0.33	0.24	0.24	0.24	0.24	0.24	18.5
10	6	10	10	10	2<3	58	0.32	0.42	0.37	0.24	-	-	-	-	18.5
10	6	10	10	10	3-5	52	0.26	0.34	0.33	0.24	-	-	-	-	18.5
10	6	10	10	10	10	52	0.30	0.38	0.39	0.24	-	-	-	-	18.5
10	6	10	10	10	15	47	0.39	0.49	0.51	0.24	-	-	-	-	18.5
10	6	10	10	10	20	47	0.50	0.63	0.65	0.24	-	-	-	-	18.5
10	6	10	10	10	25	47	0.61	0.78	0.80	0.24	-	-	-	-	18.5
10	7	10	10	10	<2	-	0.25	0.40	0.36	0.24	0.24	0.24	0.24	0.24	19.5
10	7	10	10	10	2<3	58	0.30	0.45	0.40	0.24	-	-	-	-	19.5
10	7	10	10	10	3-5	58	0.24	0.36	0.35	0.24	-	-	-	-	19.5
10	7	10	10	10	10	52	0.28	0.40	0.42	0.24	-	-	-	-	19.5
10	7	10	10	10	15	47	0.36	0.52	0.54	0.24	-	-	-	-	19.5
10	7	10	10	10	20	47	0.46	0.67	0.69	0.24	-	-	-	-	19.5
10	7	10	10	10	25	47	0.56	0.82	0.85	0.24	-	-	-	-	19.5
10	8	10	10	10	<2	-	0.24	0.41	0.38	0.24	0.24	0.24	0.24	0.24	20.5
10	8	10	10	10	2<3	64	0.27	0.47	0.43	0.24	-	-	-	-	20.5
10	8	10	10	10	3-5	58	0.24	0.38	0.38	0.24	-	-	-	-	20.5
10	8	10	10	10	10	52	0.26	0.42	0.44	0.24	-	-	-	-	20.5
10	8	10	10	10	15	47	0.34	0.54	0.57	0.24	-	-	-	-	20.5
10	8	10	10	10	20	47	0.43	0.69	0.72	0.24	-	-	-	-	20.5
10	9	10	10	10	<2	-	0.24	0.42	0.41	0.24	0.24	0.24	0.24	0.24	21.5
10	9	10	10	10	2<3	70	0.26	0.50	0.46	0.24	-	-	-	-	21.5
10	9	10	10	10	3-5	64	0.24	0.40	0.40	0.24	-	-	-	-	21.5
10	9	10	10	10	10	58	0.25	0.43	0.46	0.24	-	-	-	-	21.5
10	9	10	10	10	15	52	0.32	0.56	0.59	0.24	-	-	-	-	21.5
10	9	10	10	10	20	47	0.40	0.71	0.75	0.24	-	-	-	-	21.5
10	10	10	10	10	<2	-	0.24	0.44	0.44	0.24	0.24	0.24	0.24	0.24	22.5
10	10	10	10	10	2<3	79	0.25	0.52	0.48	0.24	-	-	-	-	22.5
10	10	10	10	10	3-5	70	0.24	0.42	0.43	0.24	-	-	-	-	22.5
10	10	10	10	10	10	64	0.24	0.44	0.48	0.24	-	-	-	-	22.5
10	10	10	10	10	15	52	0.30	0.57	0.61	0.24	-	-	-	-	22.5
10	10	10	10	10	20	52	0.38	0.73	0.77	0.24	-	-	-	-	22.5

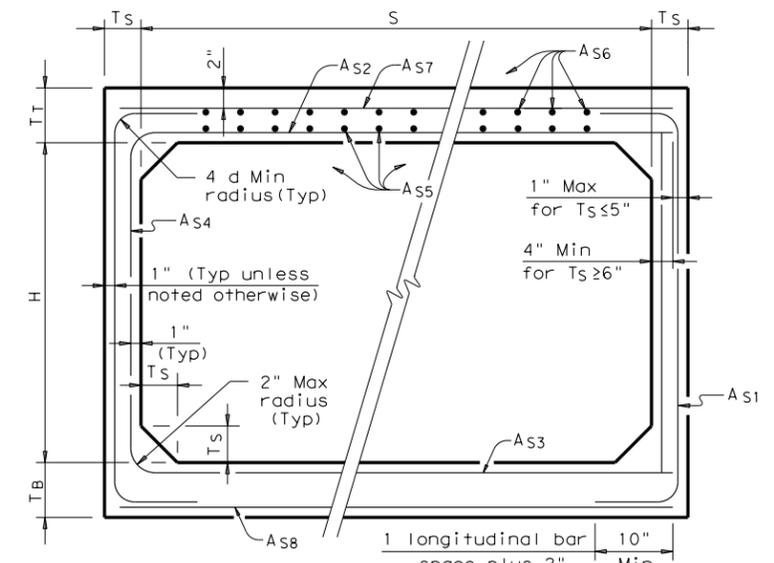
① For Box Length = 8'-0"

② A_{S1} thru A_{S4}, A_{S7} and A_{S8} are minimum required areas of reinforcement per linear foot of box length. A_{S6} and A_{S5} are minimum required areas of reinforcement per linear foot of box width.



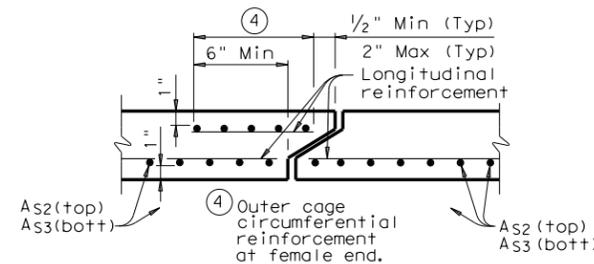
CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT 2 FT AND GREATER



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT



SECTION A-A

(TOP AND BOTTOM SLAB
JOINT REINFORCEMENT)

GENERAL NOTES:

Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
 All concrete shall be Class "H" Concrete with a minimum compressive strength of 5,000 psi.
 See SCP-MD standard sheet for miscellaneous details and notes not shown.
 In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Shop plans for alternate designs shall be submitted in accordance with Item "Precast Concrete Structural Members (Fabrication)".

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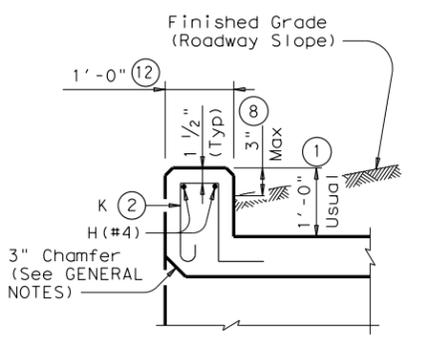
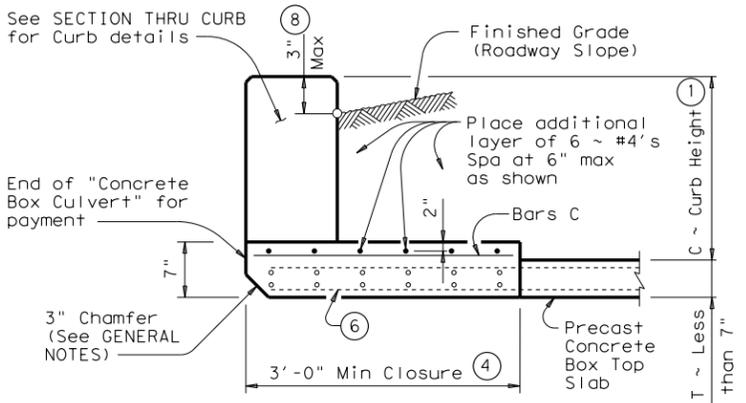
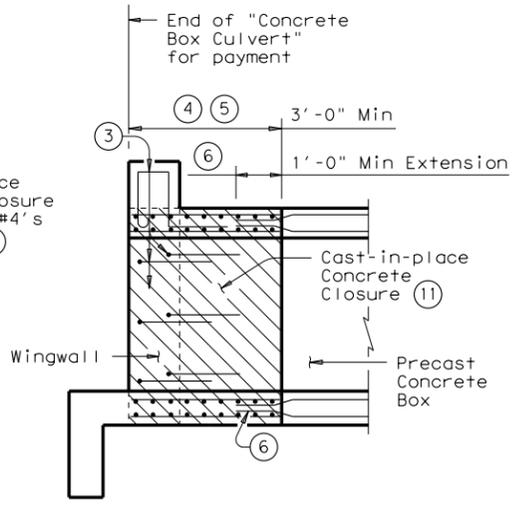
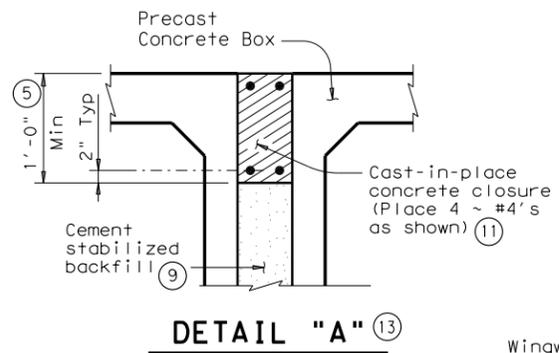
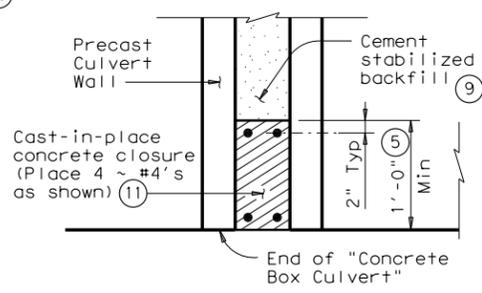
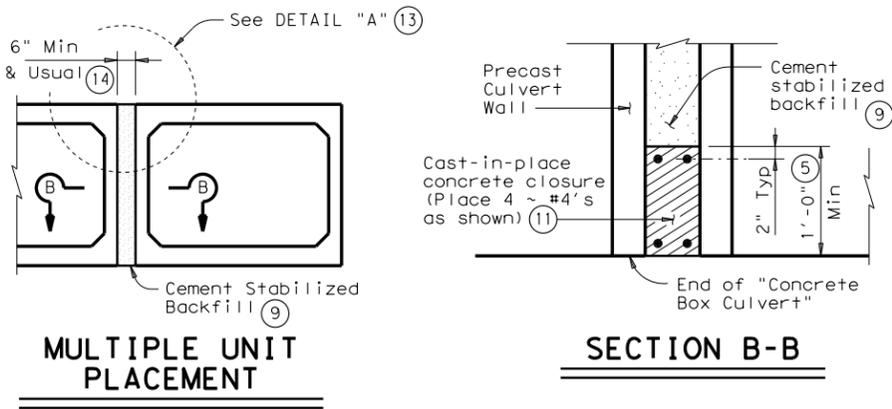
SINGLE BOX CULVERTS PRECAST 10'-0" SPAN

SCP-10

FILE: scp10sts.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT	CK: GAF
©TxDOT February 2010	CONT	SECT	JOB	HIGHWAY
REVISIONS				
DIST	COUNTY		SHEET NO.	

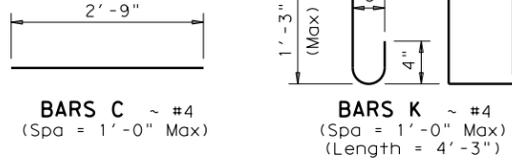
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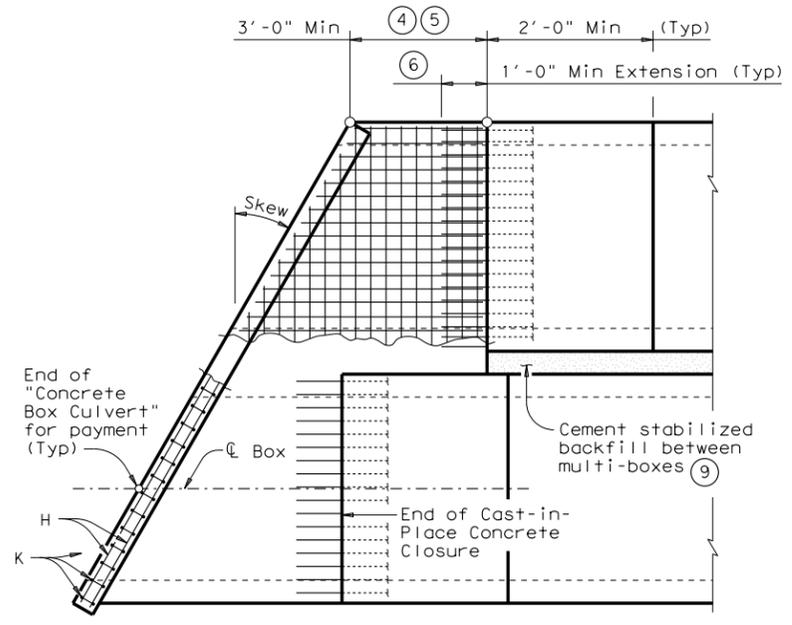
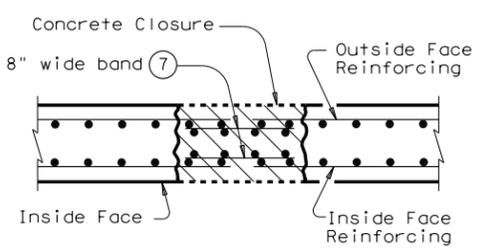
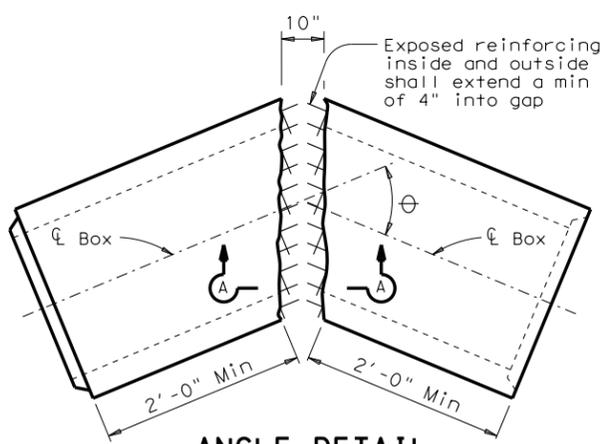
(10) QUANTITIES PER FOOT OF CURB

Reinforcing Steel	4.18 Lb
Concrete	0.037 CY



- 1 0" min to 5'-0" max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail or curbs taller than 1'-0", refer to ECD standard. For structures with T6 traffic rail, refer to T6-CM standard. For structures with traffic rail, other than T6, refer to RAC standard.
- 2 For curbs less than 1'-0" high, tilt Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
- 3 Curb, Wingwall or Safety End Treatment reinforcing shall extend into concrete closure. Any reinforcing that does not fit into the closure shall be bent or trimmed as necessary.
- 4 Cast-in-place concrete closure shall be 3'-0" min. Boxes shall be cast short or broken back in the field. All reinforcing in the closure shall be the same size and spacing as in the precast box section. Except where shown otherwise, the cast-in-place closure shall be flush with the inside and outside faces of the precast box section.
- 5 For multiple unit placements the length of the closure for the interior walls may be adjusted as necessary. The length of the top slab, bottom slab, and exterior wall closure shall not be less than 3'-0". See Section B-B detail when interior walls are cast full length.
- 6 Precast box reinforcing shall extend a minimum of 1'-0" into concrete closure (Typ).
- 7 Bands of reinforcing matching the inside and outside face reinforcing shall be placed in the gaps of the top and bottom slabs. A band matching the outside face reinforcing of the wall shall be placed in the gaps of the walls (placed in the outside face only). The bands shall be tack welded to the exposed reinforcing at each point of contact.
- 8 For vehicle safety, the following requirements must be met:
 - For structures without bridge rail, curbs shall project no more than 3" above finished grade.
 - For structures with bridge rail, curbs shall be flush with finished grade.
 Curb heights shall be reduced, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
- 9 Cement Stabilized Backfill between boxes is considered part of the Box Culvert for payment.
- 10 All curb concrete and reinforcing is considered part of the Box Culvert for payment.
- 11 Any additional concrete and reinforcing required for the closures shall be considered as subsidiary to the Concrete Box Culvert.
- 12 1'-0" typical. 2'-0" when RAC standard is referred to elsewhere in the plans.
- 13 For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in DETAIL "A".
- 14 This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

GENERAL NOTES:
 Designed according to AASHTO LRFD Specifications.
 All closure concrete shall be Class "C" with a minimum compressive strength of 3600 psi and shall be placed according to the Item, "Concrete Structures".
 Any additional concrete required for the closures shall be considered as subsidiary to the Concrete Box Culvert.
 Refer to the Single Box Culverts Precast standard for details not shown.
 The bottom edge of the top slab closure shall be chamfered 3 inches at the entrance.



HL93 LOADING

		Bridge Division Standard	
BOX CULVERTS PRECAST MISCELLANEOUS DETAILS			
SCP-MD			
FILE: scpmdste.dgn	DN: GAF	CK: LMW	DW: BWH/TxDOT
©TxDOT February 2010	CONT	SECT	JOB
REVISIONS			HIGHWAY
	DIST	COUNTY	SHEET NO.



Job No. 15-0016
Designed By: JM
Drawn By: JM

Prepared For:
City of College Station
Public Works Department
310 Krenek Tap Rd
College Station, TX
77840

Revisions

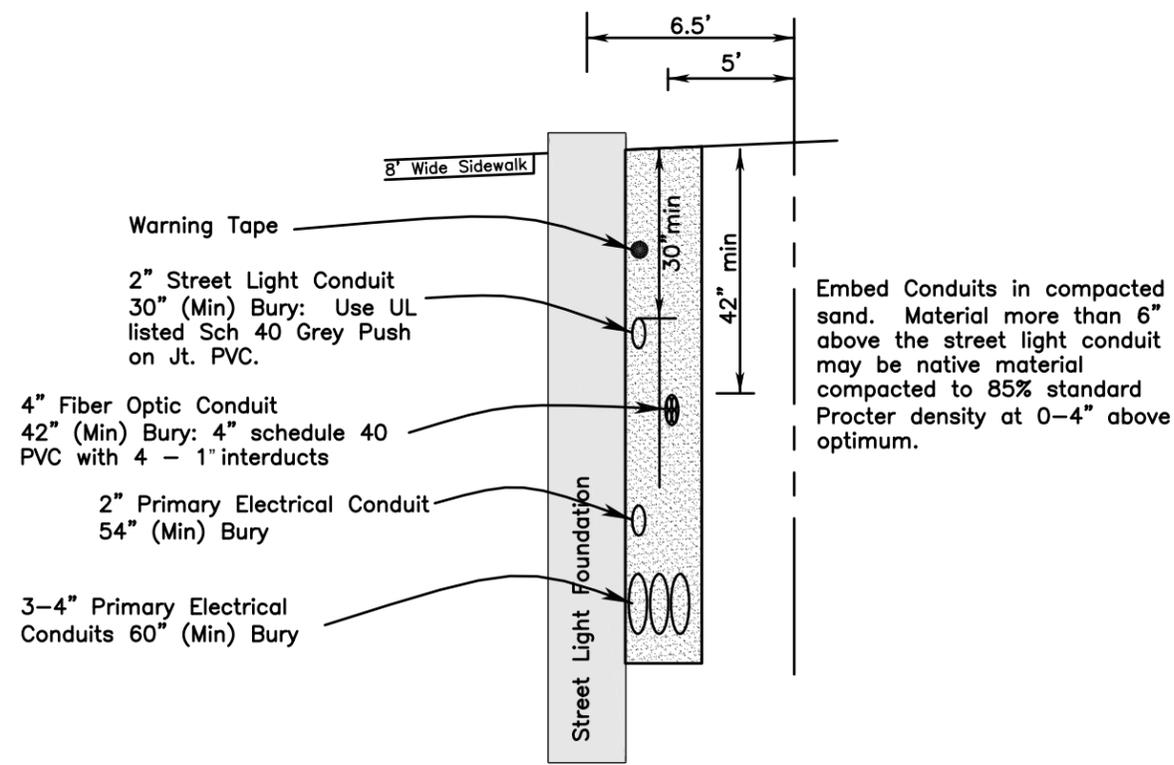
STREET LIGHT DETAILS
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

STREET LIGHT NOTES:

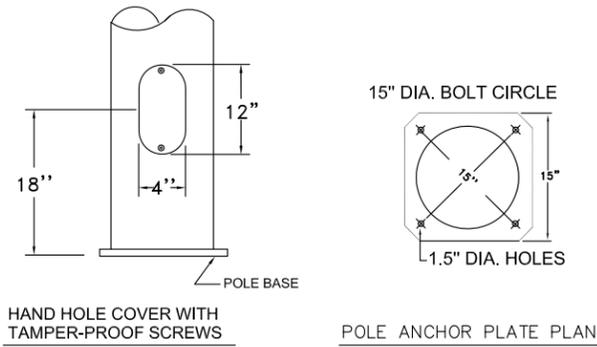
1. All street light conduit shall be 2" Grey Schedule 40 PVC with 2 #4 stranded copper conductors (1 white and 1 black) and 1-#8 stranded copper conductor (green-ground.)
2. The contractor shall furnish and install all conductors.
3. The contractor shall furnish and install the Lighting Controller. The Lighting controller shall be by Ripley Lighting Controls, Control Contactor Pedestal, Catalog number CC1002NOCISWL1C1.
4. BTU shall place the conduit and install the conductors for the service, and shall connect and energize the system.

PRIMARY ELECTRICAL CONDUIT NOTES:

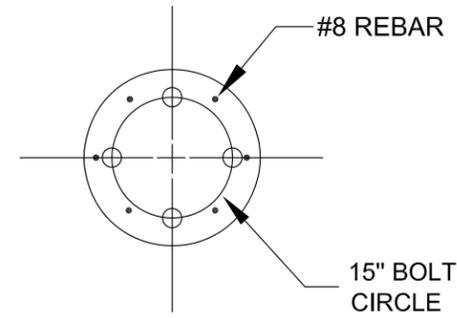
1. All Primary and Secondary conduit shall be placed by the contractor. A pull string shall be left in place to facilitate the pulling of all primary and secondary conductors by BTU.
2. The contractor shall set all pull boxes and grade the earth in preparation for the transformer pads and pedestals for the various electrical equipment shown on these sheets.



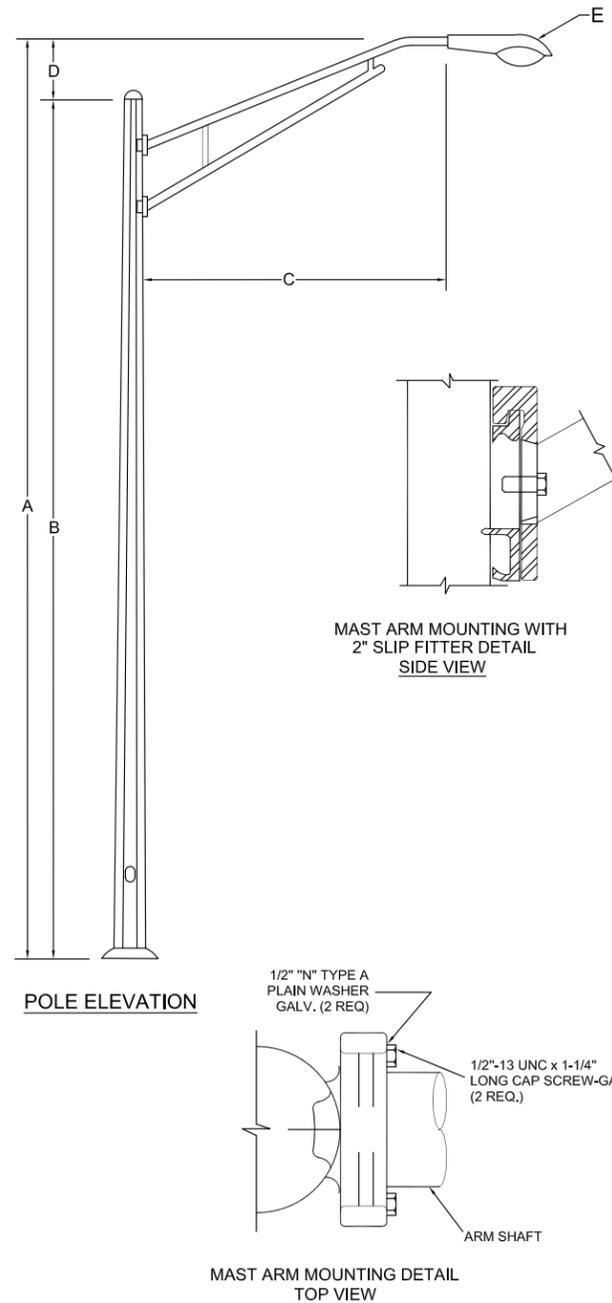
**Duct Bank
Embedment Detail**



DARK BRONZE POWDER COAT STEEL POLE AND ARM DIMENSIONS	
A	OVERALL HEIGHT 42.5'
B	POLE HEIGHT 37.5'
C	MAST ARM LENGTH 15'-0"
D	MAST ARM RISE 5'-0"
E	LUMINAIRE - 15,700 LUMENS LED

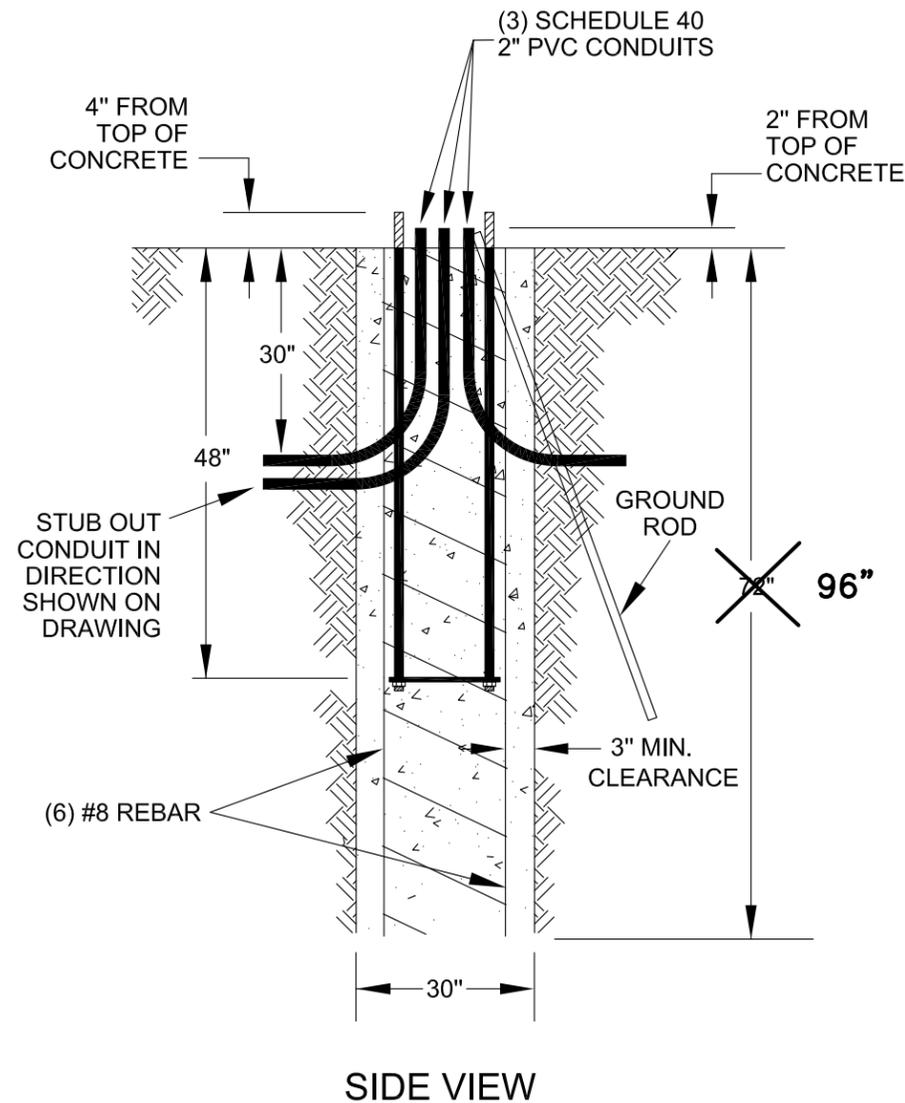


TOP VIEW ANCHOR BOLTS



NOTES:

- POLE SHAFT CONFORMING TO ASTM DESIGNATION: A595 WITH 5,000 PSI MINIMUM YIELD STRENGTH LINEAR TAPER-0.14"/FT.
- ARM SHAFTS-2-3/8" O.D. - .154 WALL STEEL TUBING-36,000 P.S.I. MINIMUM YIELD STRENGTH.
- ARM STRUTS- 3/8"= 2" COMMERCIAL GRADE HOT ROLLED MILLED STEEL BAR.
- ARM CONNECTION - SIMPLEX ATTACHMENTS ARE ASTM DESIGNATION: A27 GRADE 65-35. PLATE GUSSETS ARE HOT ROLLED COMMERCIAL GRADE STEEL.
- CAST POLE TOP CAP SECURED IN PLACE WITH 3 PLATED SET SCREWS.
- BASE PLATE - CONFORMING TO ASTM DESIG. A36.
- ALL THREADED FASTENERS TO BE GALVANIZED TO ASTM DESIG. A153 UNLESS OTHERWISE NOTED.
- POLE AND ARM TO BE GALVANIZED TO ASTM DESIGNATION - A123 AND HAVE DARK BRONZE POWDER COATING. EXTERIOR COAT SHALL PROVIDE FOR ALL GALVANIZED SURFACES VISUALLY EXPOSED TO BE COATED WITH A URETHANE OR TRIGLY-CIDYL ISOCYANURATE (TGIC) POLYESTER POWDER TO MINIMUM FILM THICKNESS OF 2.0 MILS. THE COATING SHALL BE ELECTROSTATICALLY APPLIED AND CURED IN A CONVECTION OVEN BY HEATING THE
- ACCESSORIES TO BE GALVANIZED TO ASTM DESIGNATION - A153 AND HAVE POLYESTER POWDER COATING.
- ALL POLE BASES TO USE A 15" BOLT CIRCLE.
- FOUR (4) 1-1/4" x 42" ANCHOR BOLTS, INCLUDING TWO (2) HEX NUTS AND TWO (2) ROUND WASHERS PER ANCHOR BOLT, SHALL BE FURNISHED WITH POLE.
- POLE SHALL BE CAPABLE OF WITHSTANDING A SUSTAINED WIND VELOCITY OF NOT LESS THAN 80 M.P.H. ISOTACH (MPHI) WITH A GUST FACTOR 1.3.
- GROUNDING LUG TO BE WELDED TO THE SHAFT ACCESSIBLE THROUGH HAND HOLE.
- LUMINAIRE SHALL BE AN AMERICAN ELECTRIC LIGHTING, AUTOBAHN SERIES ATBM, LED, ROADWAY TYPE III, 15,700 LUMENS. CATALOG NO. ATBM_F_MVOLT_R3_BZ_XL_P5_NL LUMINAIRE TO BE FURNISHED WITH ACUITY CONTROLS ROAM CATALOG NO. REN127_DV1_0_G_M50
- STREET LIGHT POLE AND ARM SHALL BE VALMONT CATALOG NO. DS60950A37615SFFPGVHH.
- (3) #12 CU STRANDED THHN TO RUN FROM BASE TO LUMINAIRE. CONNECTORS AS REQUIRED



SIDE VIEW

SPECIFICATIONS:

- Reinforcing steel to be #8 spiral with 4" pitch and (6) #8 rebar.
- (4) Anchor bolts to be 1-1/4" x 48" long with 4" projection from concrete.
- Anchor bolts to have a 6" thread with the top 2' to be galvanized.
- Anchor bolts shall conform with ASTM A-325, along with (2) nuts and (2) square washers.
- All concrete to be 3,000 PSI (Class A).
- Install 5/8" x 8' ground rod.
- All conduit elbows shall be Long Sweep Elbows.
- See TxDOT Specifications RID (6)-04 for all additional specifications.

FILENAME: 153-060-Street Light Details.dwg
PLOTED: 27 Jul 2016 - 5:35 pm

McCord Engineering, Inc.
Texas Registered Engineering Firm F-2664
916 Southwest Parkway East
College Station, TX 77840
(979) 764-8356

CITY OF COLLEGE STATION
STREET LIGHT POLE AND MAST ARM
(37.5 Foot Pole)
(Dark Bronze Powder Coat)

DRAWING NAME: CSU-065	
SCALE: NTS	DATE: 7-2-99
DRAWN BY: SCE	REV. BY: FRE 06-27-16
CSSL-37.5-S	

McCord Engineering, Inc.
916 Southwest Parkway East
P.O. Box 10047
College Station, Texas 77842
(979) 764-8356

STREETLIGHT POLE
CONCRETE FOUNDATION
(Poured, 48" Anchor Bolts)
30" Diameter

DRAWING NAME: MEI-6782	
SCALE: N.T.S.	DATE: 12-1-05
DRAWN BY: MRC	REV. BY: JKP 3-27-06
SL-CF-C	

MITCHELL
MORGAN

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Job No. 153-060
Designed By: JM
Drawn By: JM

Prepared For:
City of College Station
Public Works Department
310 Krenek Tap Rd
College Station, TX
77840

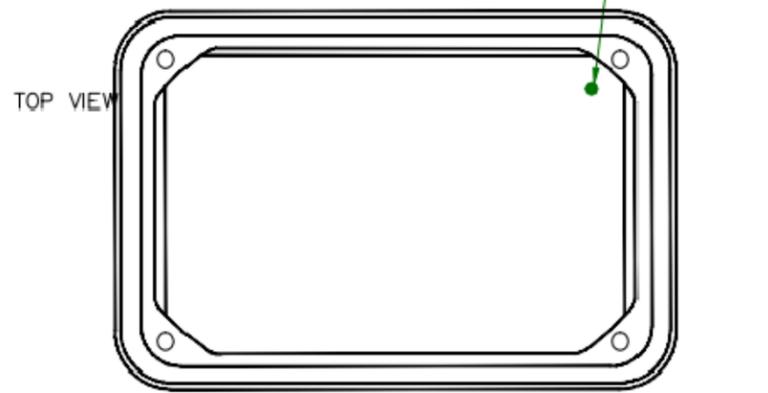
Revisions

STREET LIGHT DETAILS
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

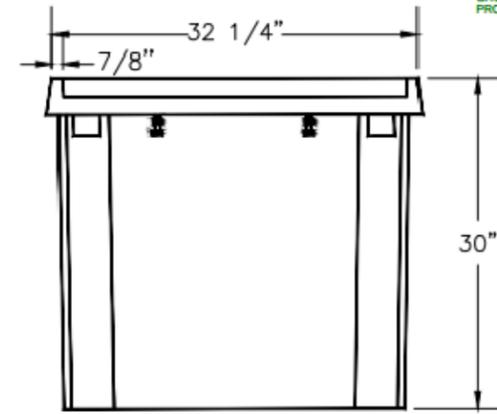
82

Of 190 Sheets

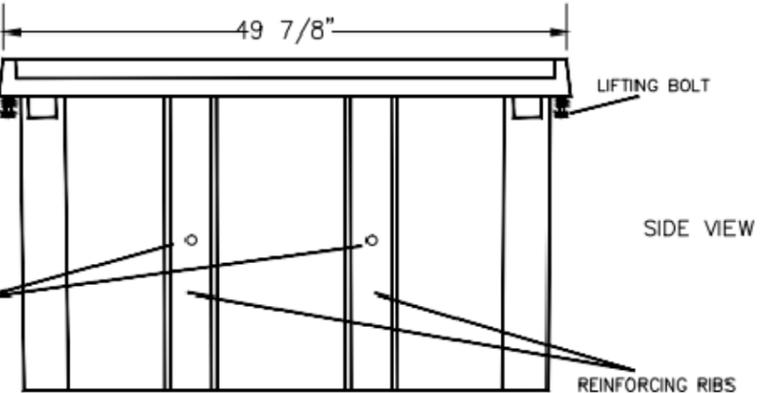
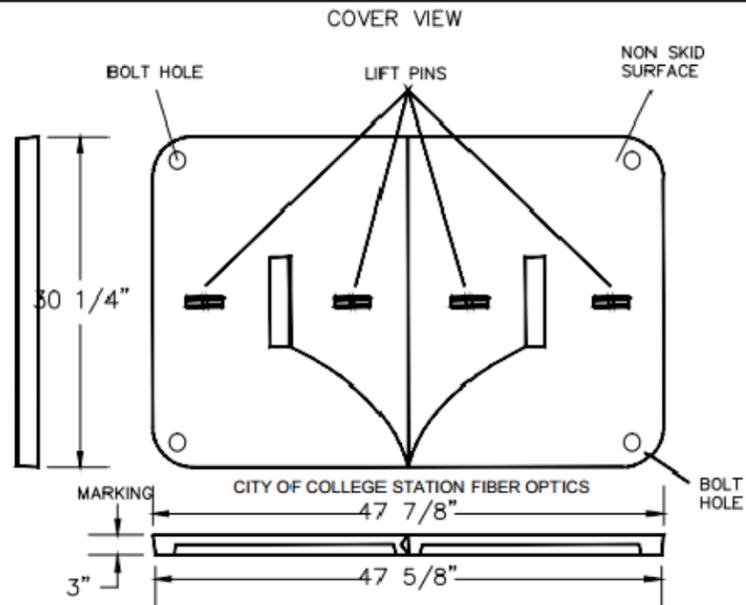
304830 Polymer Concrete Box & Cover



1. PULL BOX TO BE SET WITH TOP BOX EVEN WITH FINAL GRADE.
2. 6" OF PEA SIZE GRAVEL TO BE PLACED EVENLY IN BOTTOM OF PULL BOX.
3. 5/8" X 8" GROUND ROD SHALL BE PLACED IN ONE CORNER OF PULL BOX, WITH 1" EXPOSED ABOVE PEA GRAVEL. GROUND ROD SHALL HAVE 25 OR LESS. CONTRACTOR IS TO TEST GROUND ROD RESISTANCE AND PROVIDE TEST RESULTS TO CITY.



END VIEW PART NO. 304830 PC



SIDE VIEW

MATERIAL: POLYMER CONCRETE
STANDARD COLOR: GRAY
OTHER COLORS AVAILABLE

McCORD ENGINEERING, INC.
Texas Registered Engineering Firm F-2664
916 Southwest Parkway East
College Station, TX 77840
(979) 764-8356

CITY OF COLLEGE STATION
MARTIN ENTERPRISES
COMMUNICATIONS PULL BOX
30" X 48" X 30"
(POLYMER CONCRETE)

PB-COMM	
NTS	10-19-15
MTF	-
PB-COMM	

Cable Vault Specifications

First vault out from intersection of road, street, or highway will be 30" X 48" X 36" depth H10 or better rated, open bottom with "CITY OF COLLEGE STATION FIBER OPTICS" raised letter on lid. Placement of top of vault will be even with final ground grade, 50' of curb radius or right of way line of intersection road. 6" of pea size gravel placed in bottom of vault. A 8' ground rod will be placed in each vault, with 1' exposed above pea gravel. The ground resistance of this ground rod will be 25 ohm or less, contractor will provide testing and results.

All other pull assist vaults will be placed at 550' to 600' from each other. These vaults will be 30" X 48" X 36" depth H10 or better rated, open bottom with "CITY OF COLLEGE STATION FIBER OPTICS" raised letter on lid. Placement of top of vault will be even with final ground grade and with 6" of pea size gravel placed in bottom of vault. A 8' ground rod will be placed in each vault, with 1' exposed above pea gravel.

Conduit Specifications

4" schedule 40 PVC with 4 - 1" interducts with low friction, polyester fiber pull tape, 1800 psi tensile strength. A tracer wire, 10 AWG insulated, will be placed with the interducts. The 4" duct will be place with a minimum of 42" of cover and a 6" orange warning tape place 1' below the final ground grade with "Fiber Optic Line" printed on it repeatedly. The interducts will enter all the vaults with a minimum of 18" exposed above pea gravel.

Route Marking Specifications

Fiber cable route marker signs will be place on edge of right-a-way near the location of the vaults, each side of road crossing, or crossing of other underground utilities or placed no farther than 600'. The sign will be a PolyDome Fiber Optic Cable Marker PDM-35FO or equivalent with "City of College Station", "Call Before You Dig - Dial 811" on them.

Riser Specifications

Risers will be 4" duct with 3 attachment/stand-off points on the pole, and continuing the riser 4" duct system underground to a 30" X 48" X 30" handhole (H/H), near the base of pole. The riser shall have a cap with a 3/4" hole for cable placement.

FROM THE CONTRACT SPECIAL CONDITIONS:

FIBER OPTIC FACILITIES: The fiber optic system to be constructed with the project is operated by the City of College Station. The contractor shall construct the duct bank and place all pull boxes. The contractor shall provide and pull the fiber optic lines, ensuring that extra fiber optic cable (100 foot per box except where shown) is "rolled up" and placed in each pull box. CoCS forces shall then connect and test the system prior to acceptance or demolition of the existing system. The fiber shall be "AT-3BE27DT-048-CLCB_Double Jkt ADSS Double PE Jkts, Dielectric Central Member ALLWAVE-SM-.35/.31/.25 db/km@ 1310/1385/1550" by Corning or approved equal. **PLEASE NOTE: Research shows that the low cost venders of this product require a long lead time to deliver the material. The contractor is responsible for acquiring the cable in a timeframe which will work with the schedule in the construction documents.**

FIBER OPTIC SCHEDULE REQUIREMENTS: College Station ISD / Greens Prairie Elementary School uses the Fiber Optic Facilities in place along the south side of Greens Prairie Road at the Royder Road Intersection. The school system will need to maintain this connection during work hours. The contractor shall construct the Fiber Optic Duct bank from the CoCS Lift Station on the east end of the project to the southeast side of Greens Prairie Trail / Royder Intersection, and then to the southwest side of Greens Prairie Trail / Royder Intersection setting the two pull boxes along the way. When this portion is complete, CoCS and CSISD shall re-pull the fiber optic cable from the lift station to the school during a weekend. This switchover of the existing fiber optic system to the new facilities must occur prior to the removal of the existing system along the south side of the roadway. The construction of the southernmost drive lanes will not be able to be completed until the Fiber Optic System along the south side of the road is removed. This task will likely be the critical path of the project. This requirement is limited to the portion of the Fiber Optic System which feed the schools. The CoCS shall accept this portion of the work in advance of substantial completion of the rest of the project.



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Job No. 2015
Designed By: JM
Drawn By: JM

Prepared For:
City of College Station
Public Works Department
310 Krenek Tap Rd
College Station, TX
77840

Revisions	

FIBER OPTIC DETAILS
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

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 PLOTTED: 28 JUN 2016 7:11 AM

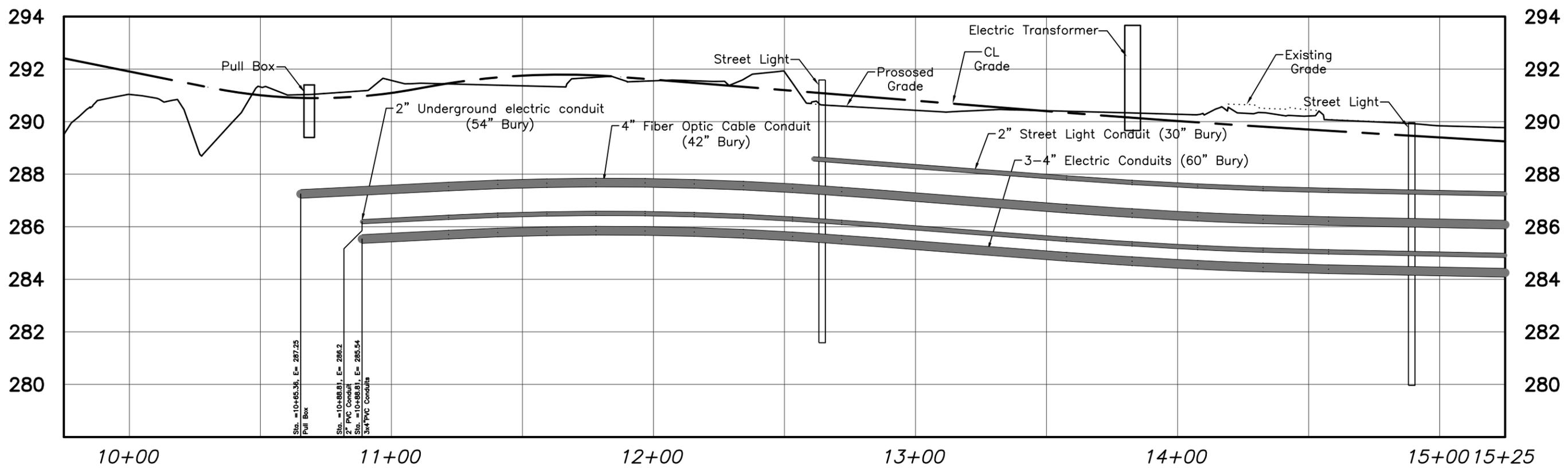
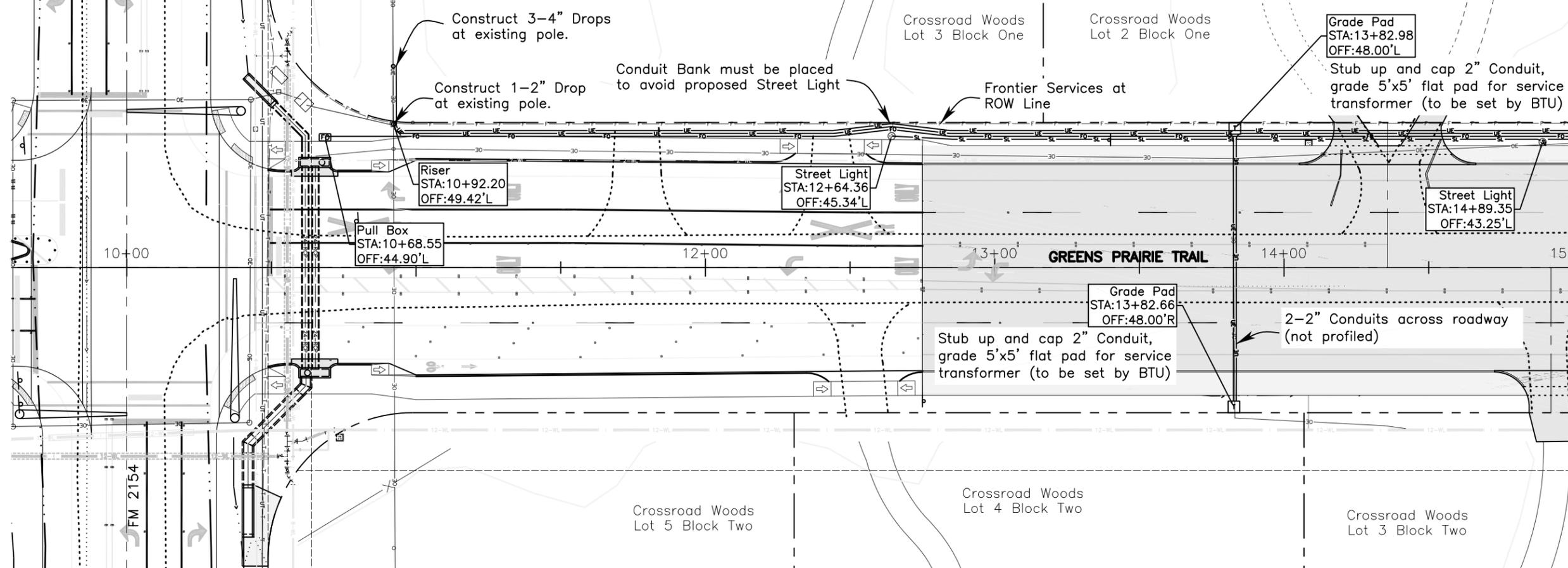


Job No. 1533-0800
 Designed By: JM
 Drawn By: JM

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Revisions

**DUCT BANK P&P
 GREENS PRAIRIE TRAIL
 ROADWAY CAPACITY IMPROVEMENTS**



FILENAME: 1533-0800-Duct Bank P&P.dwg
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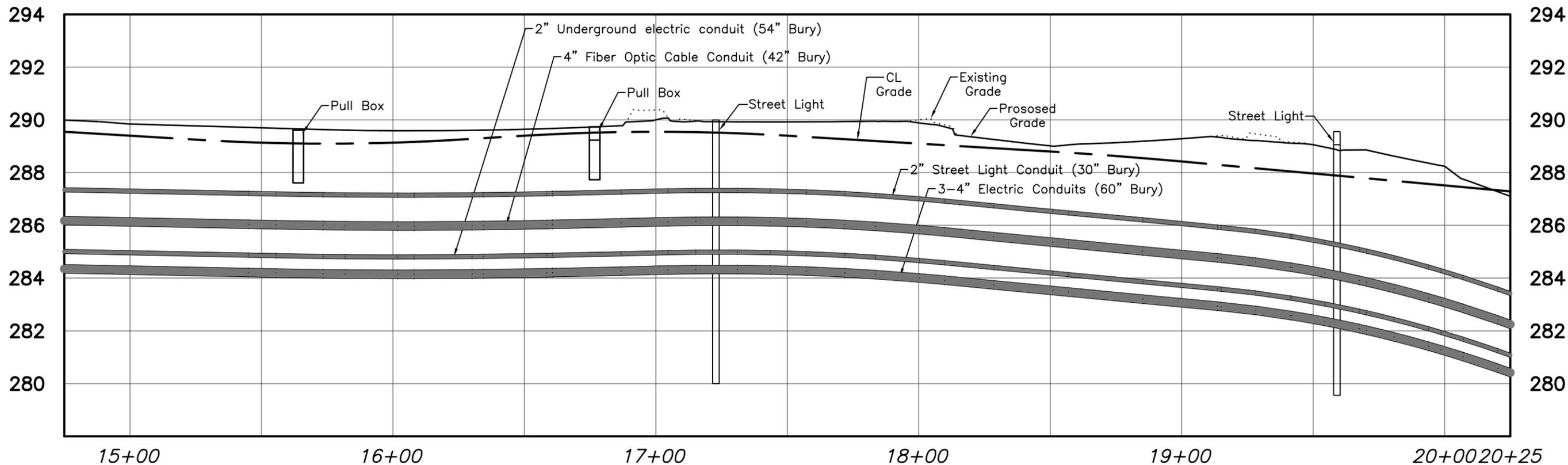
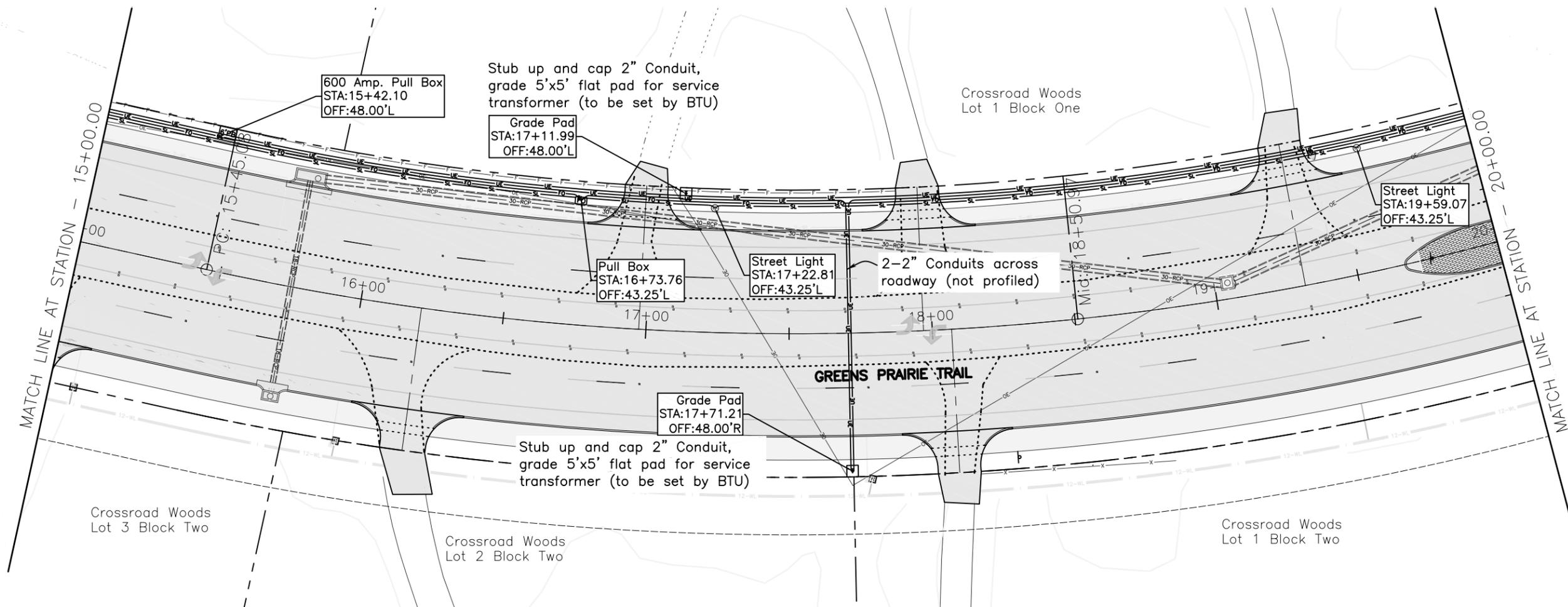


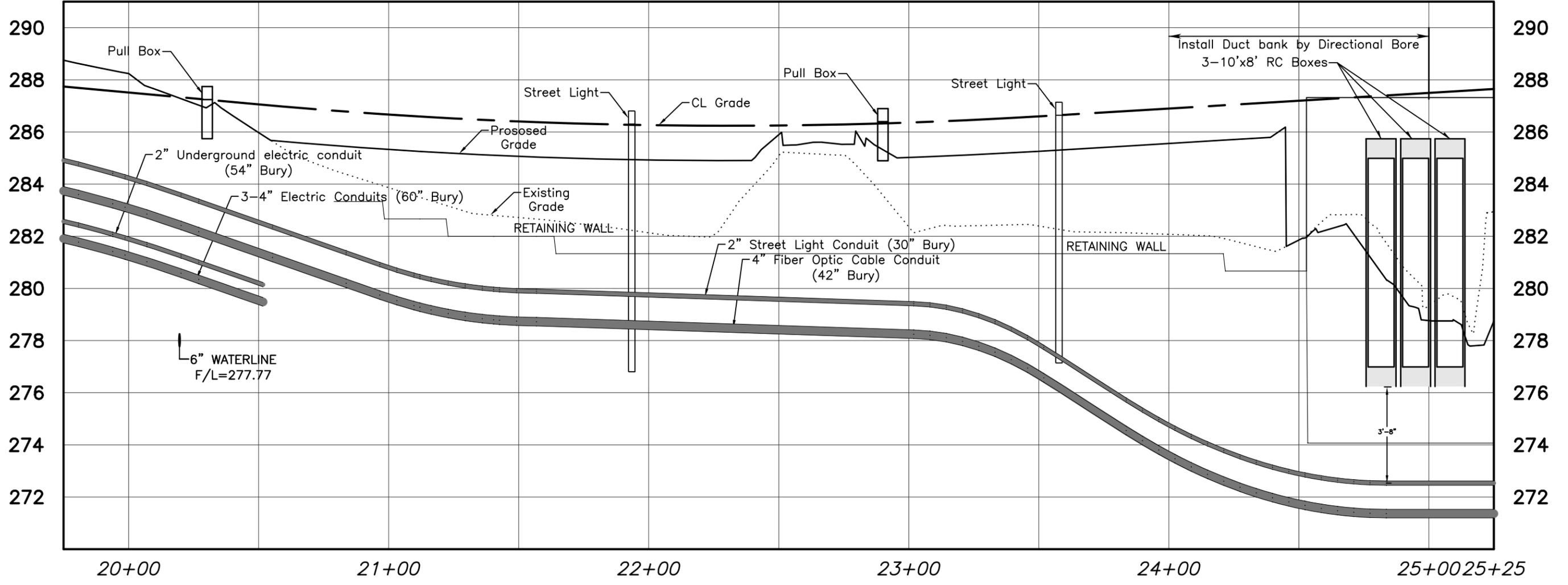
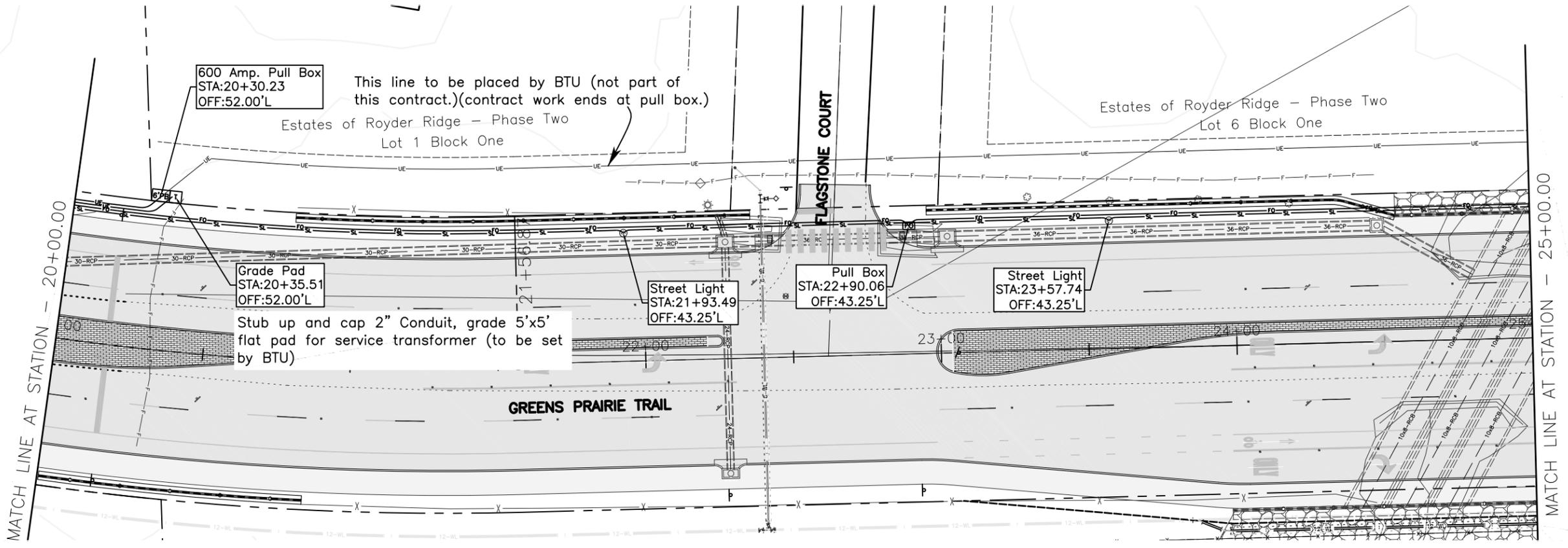
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Designed By: JM
Drawn By: JM

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DUCT BANK P&P
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS





FILENAME: 1533-0800-Duct Bank P&P.dwg
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MITCHELL MORGAN

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STATE OF TEXAS
REGISTERED PROFESSIONAL ENGINEER
JOEL J. MITCHELL
80649

Job No. 1533-0800
Designed By: JM
Drawn By: JM

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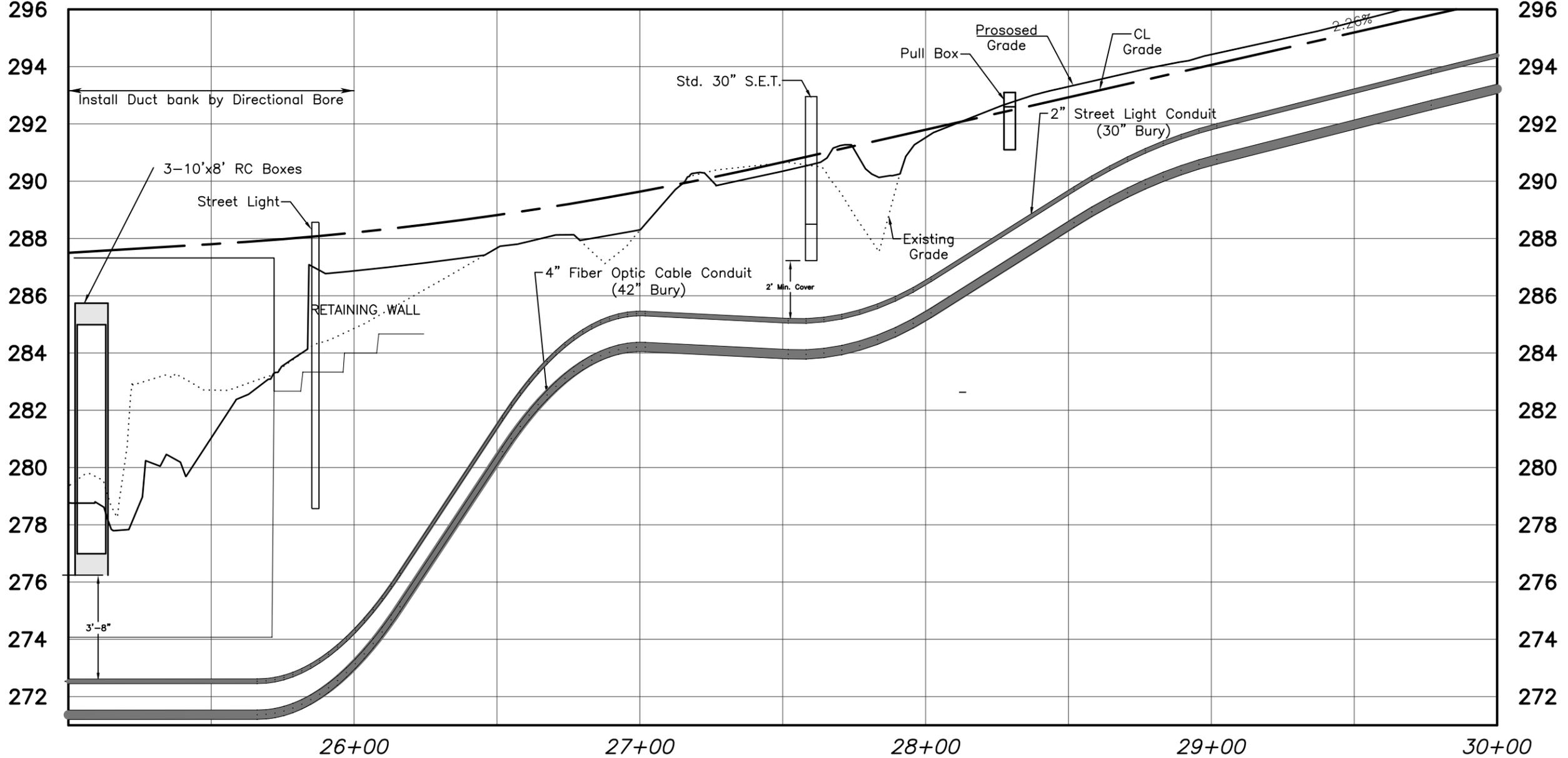
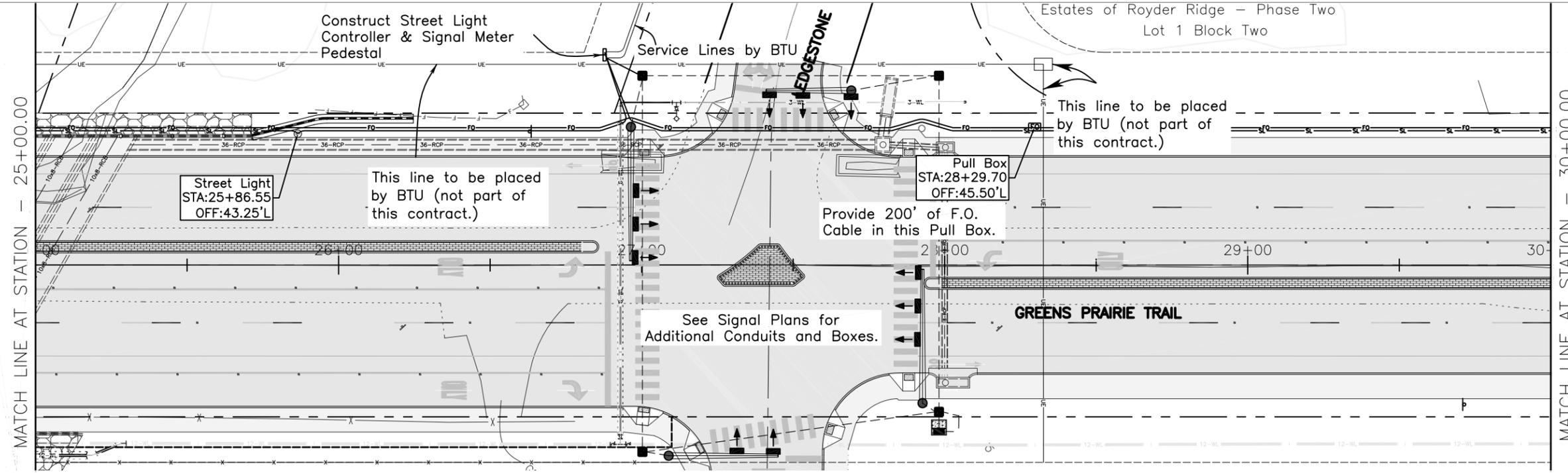
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**DUCT BANK P&P
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS**

86

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FILENAME: 1533-0800-Duct Bank P&P.dwg
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STATE OF TEXAS
 JOEL J. MITCHELL
 80649
 REGISTERED PROFESSIONAL ENGINEER
 Job No. 1533-0800
 Drawn By: JM

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 Public Works Department
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 GREENS PRAIRIE TRAIL
 ROADWAY CAPACITY IMPROVEMENTS**

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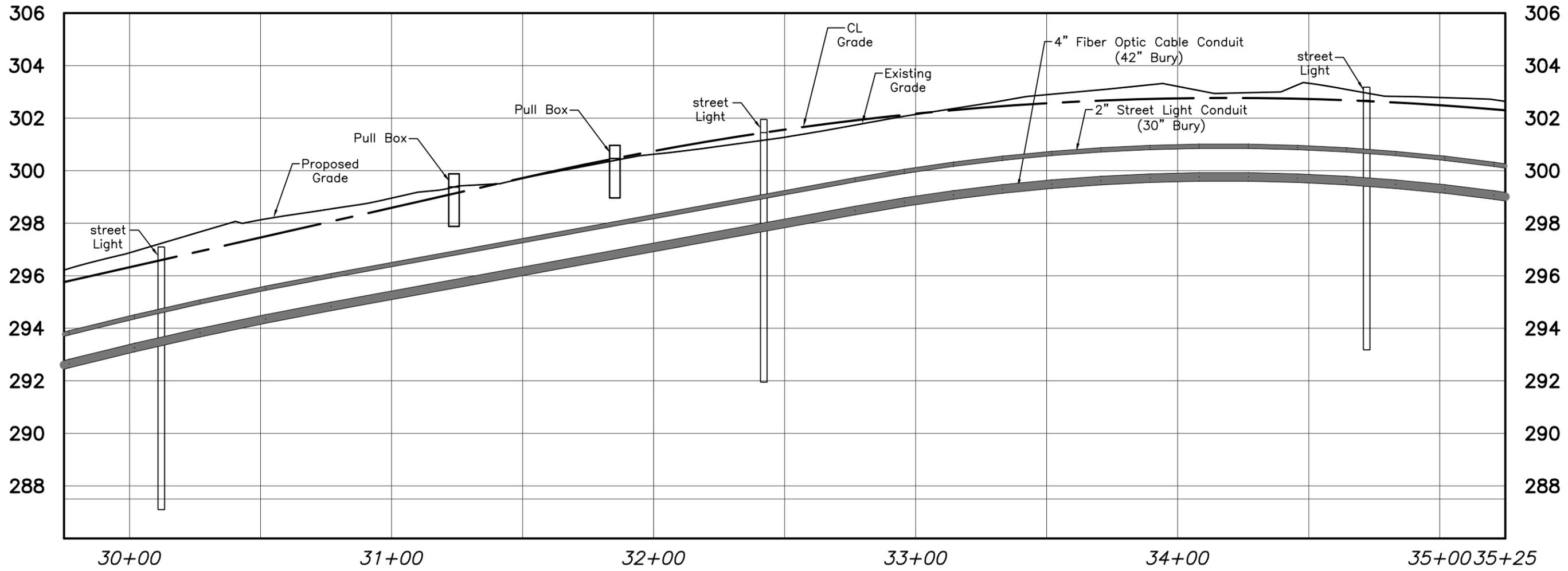
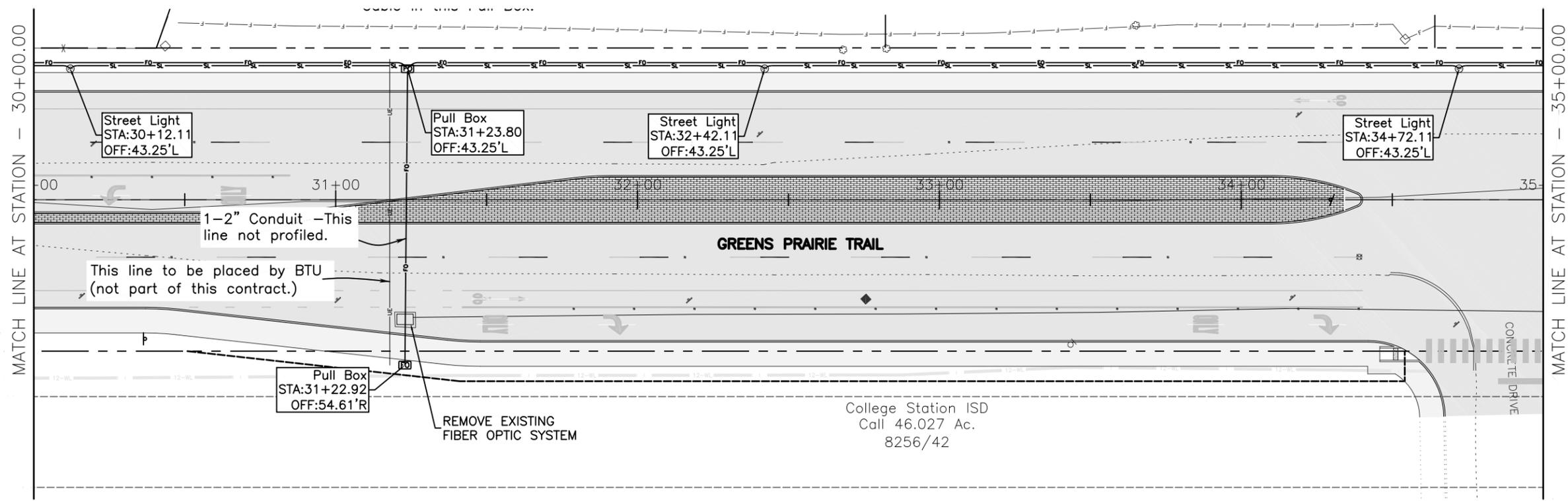


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Designed By: JM
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College Station, TX
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DUCT BANK P&P
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS



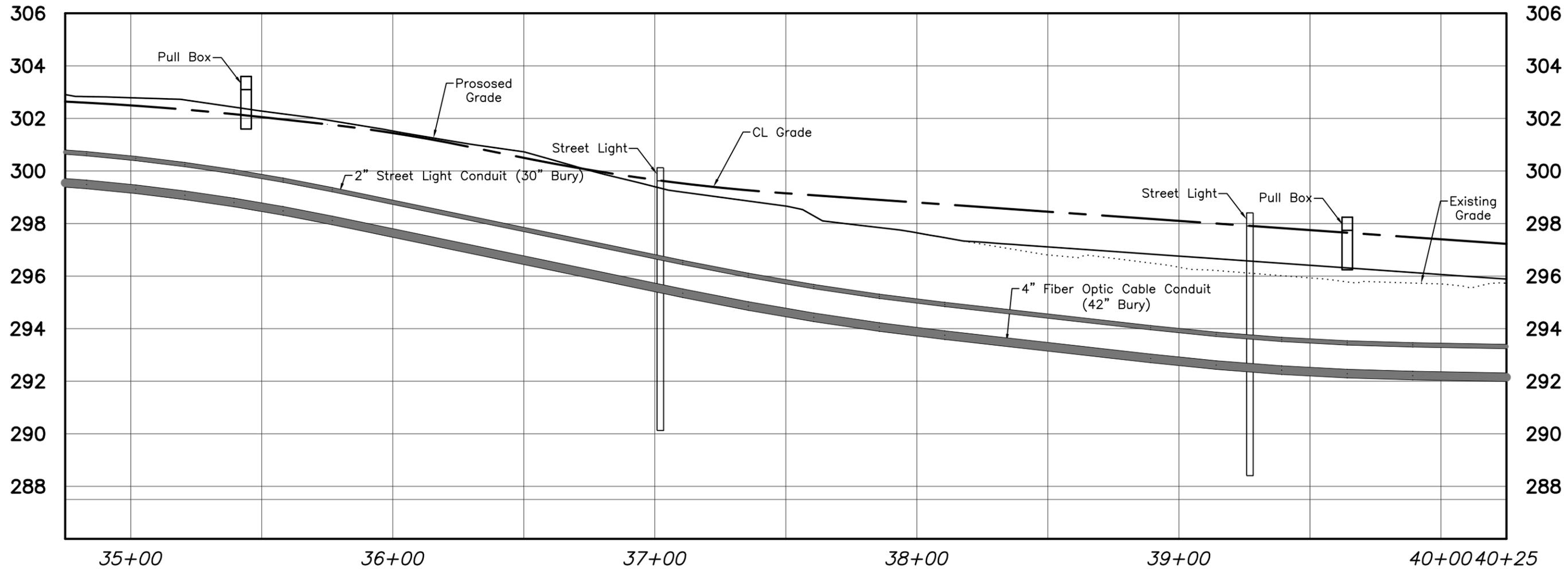
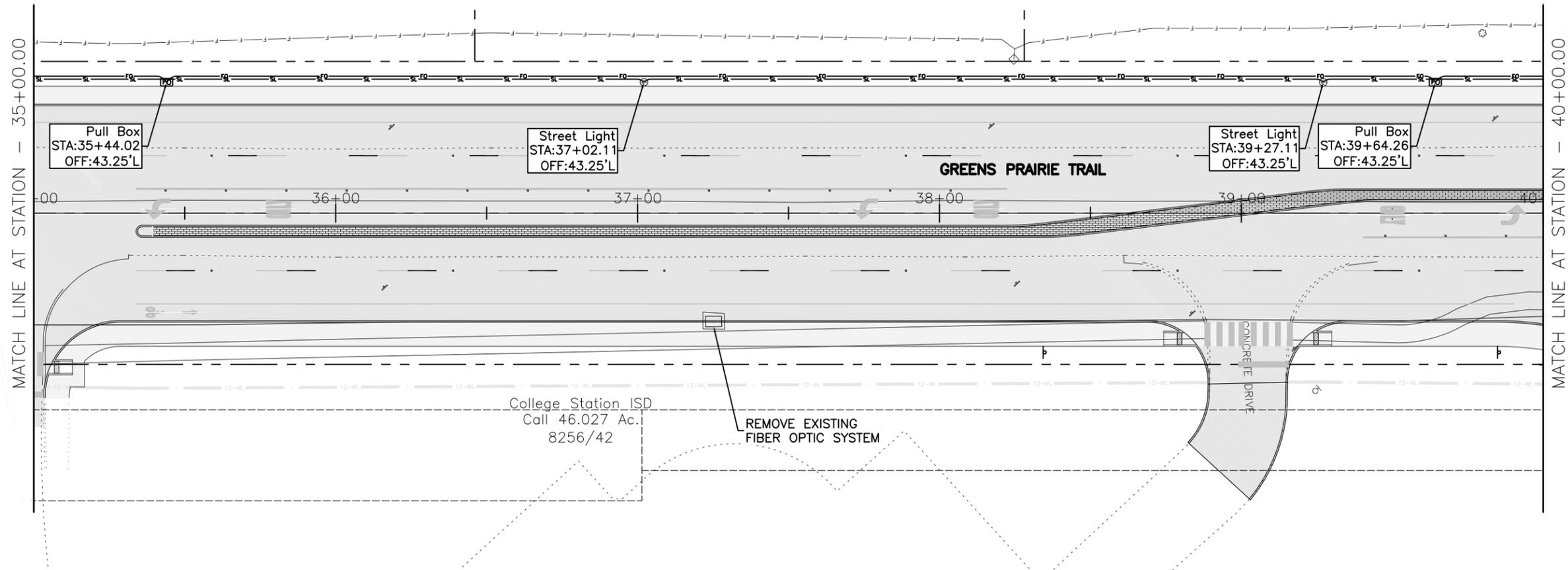


Job No. 153-0800
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Drawn By: JM

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Public Works Department
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College Station, TX
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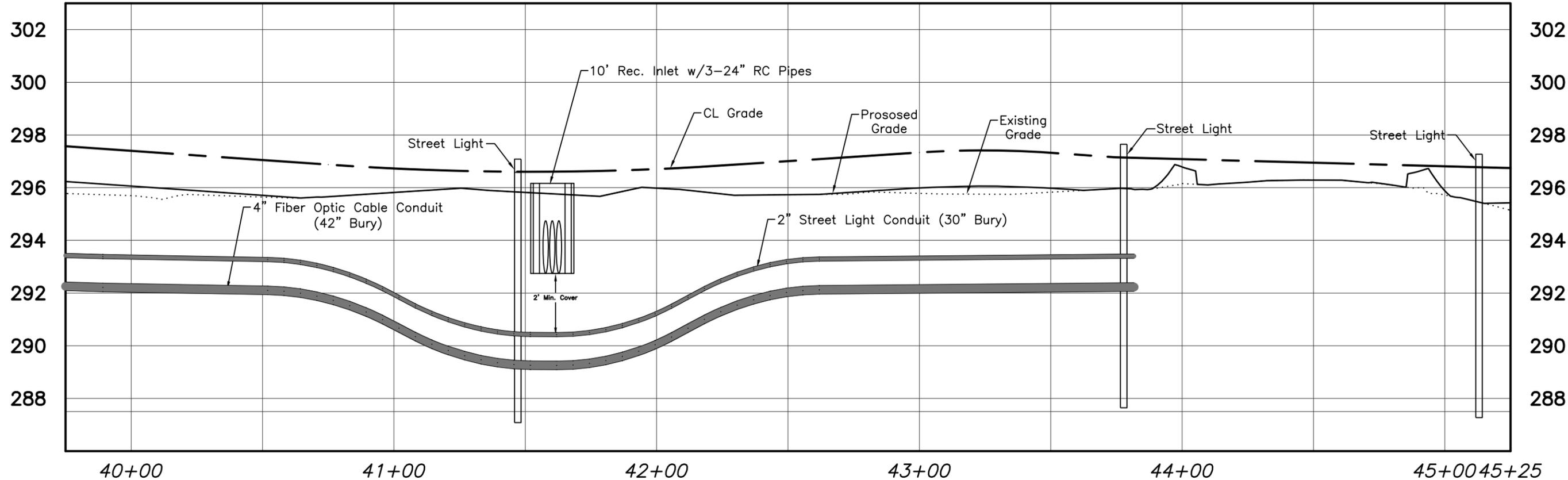
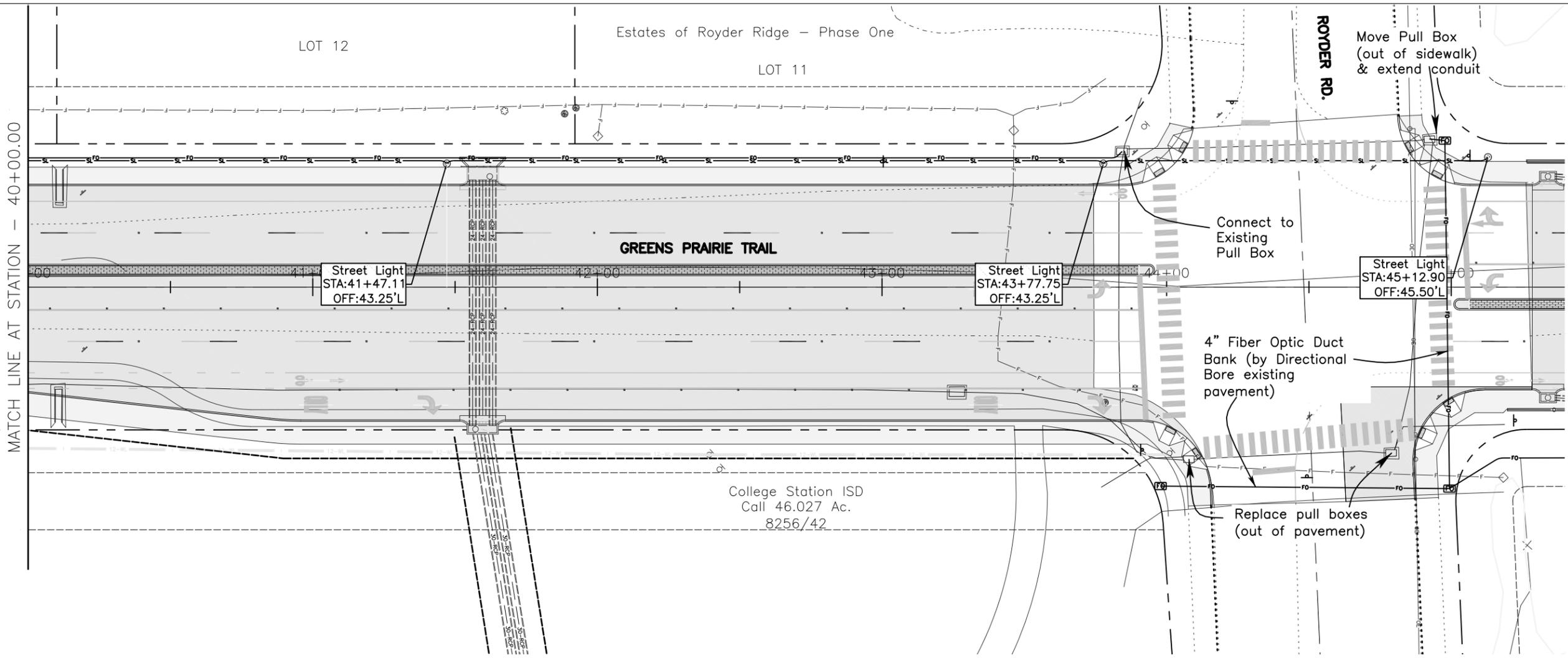
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GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS**

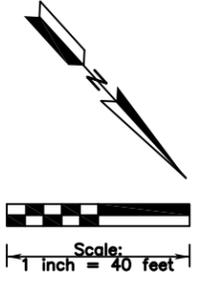
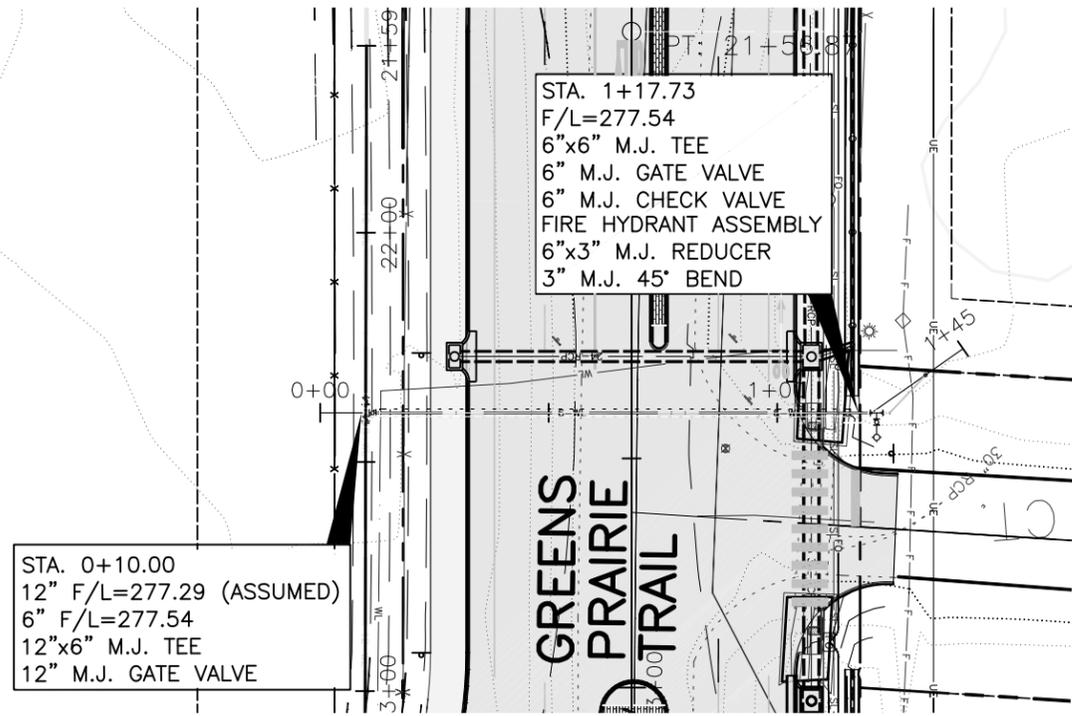


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ROADWAY CAPACITY IMPROVEMENTS



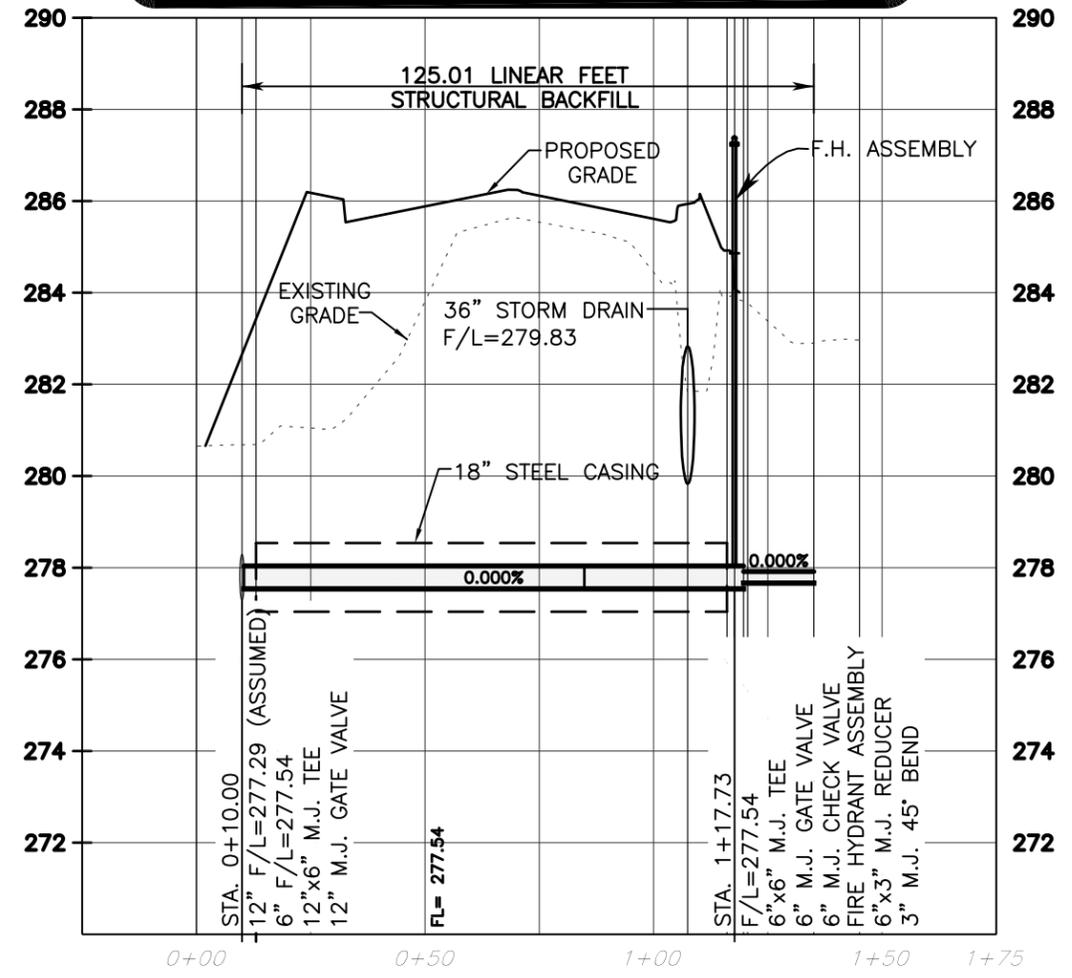
PROJECT BENCHMARK: SURVEY CONTROL POINT #533
 1/2" IRON ROD W/ CAP Located along north side of Right of way
 between Ledgestone Trail and Royder Road at Station 31+19.12 and
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



STA. 0+10.00
 12" F/L=277.29 (ASSUMED)
 6" F/L=277.54
 12"x6" M.J. TEE
 12" M.J. GATE VALVE

STA. 1+17.73
 F/L=277.54
 6"x6" M.J. TEE
 6" M.J. GATE VALVE
 6" M.J. CHECK VALVE
 FIRE HYDRANT ASSEMBLY
 6"x3" M.J. REDUCER
 3" M.J. 45° BEND

WATERLINE WL-A
6" & 3" PVC (AWWA C900-DR14)
 SEE DETAIL SHEET FOR EMBEDMENT



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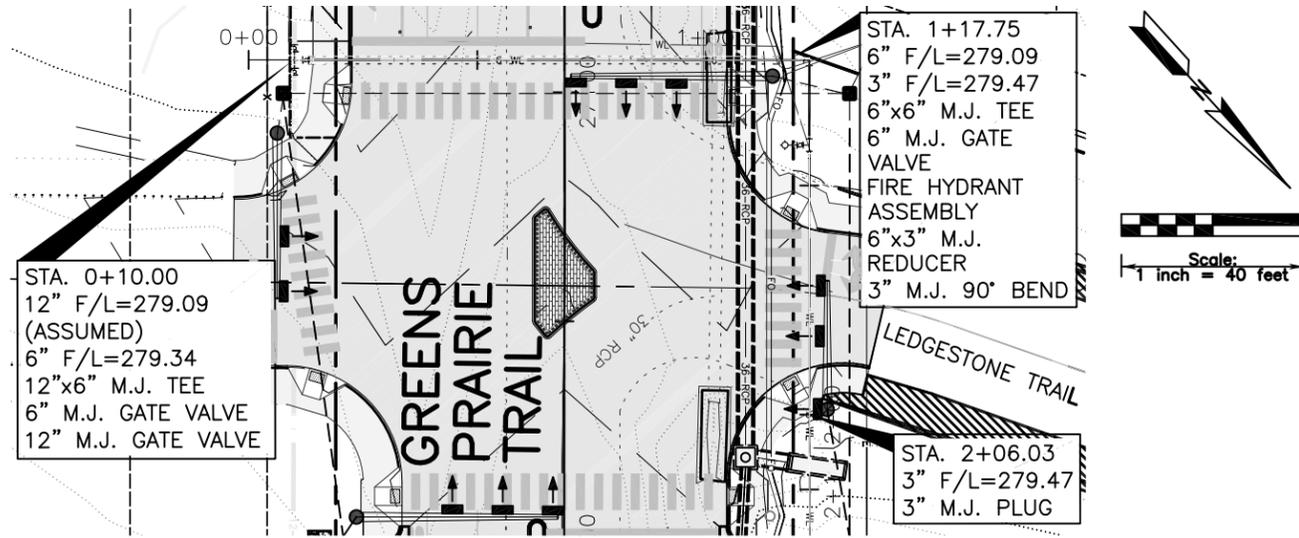
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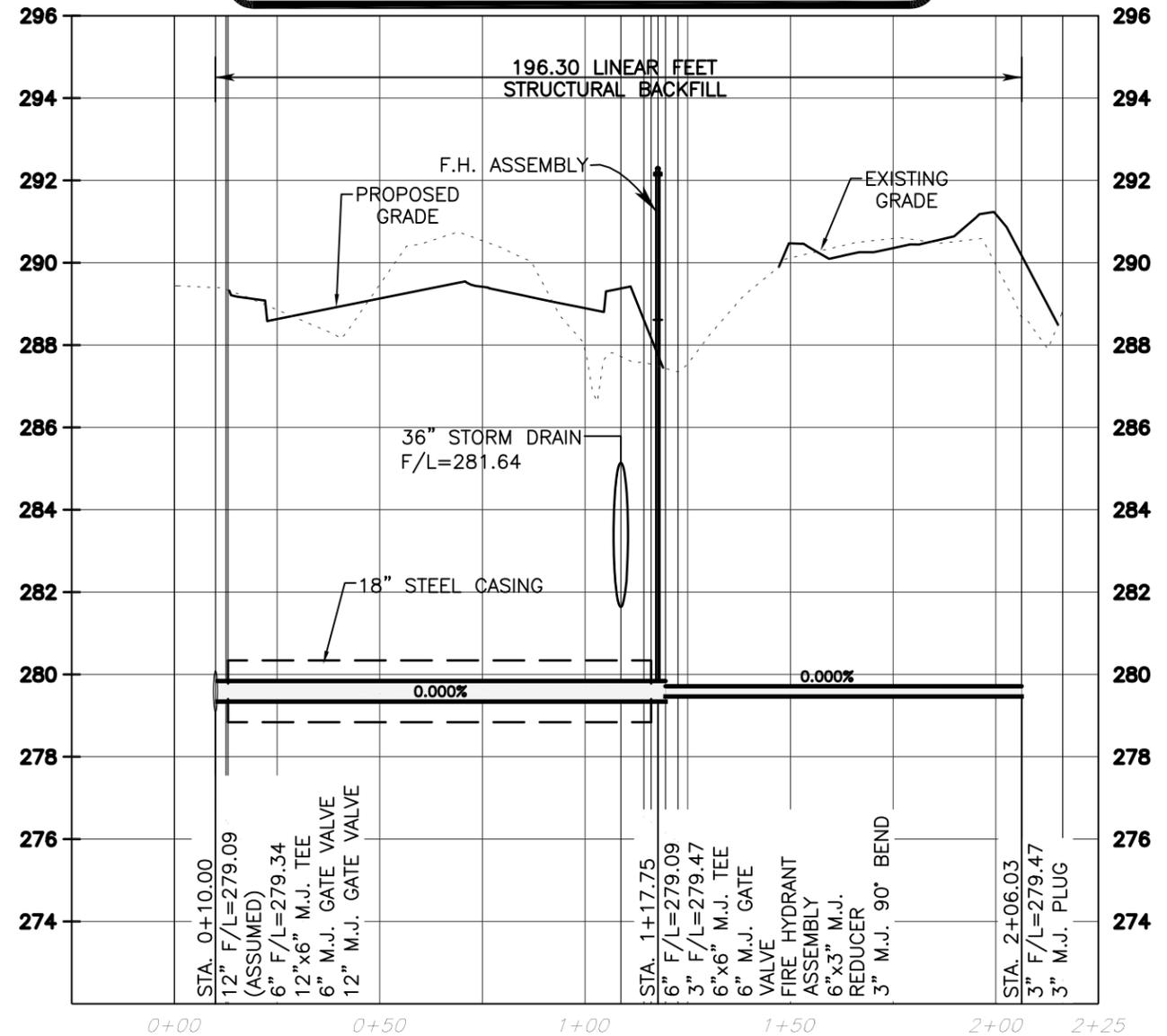
WATERLINE A
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

103
 Of 190 Sheets

PROJECT BENCHMARK: SURVEY CONTROL POINT #533
 1/2" IRON ROD W/ CAP Located along north side of Right of way
 between Ledgestone Trail and Royder Road at Station 31+19.12 and
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



WATERLINE WL-B
6" & 3" PVC (AWWA C900-DR14)
 SEE DETAIL SHEET FOR EMBEDMENT



FILENAME: 1533-7000-Water_SheetsB.dwg
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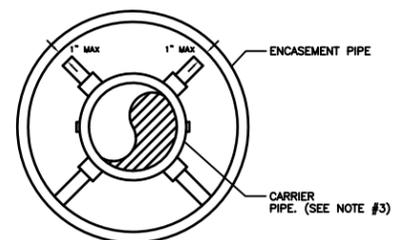
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WATERLINE B
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

94

Of 190 Sheets

PROJECT BENCHMARK: SURVEY CONTROL POINT #533
 1/2" IRON ROD W/ CAP Located along north side of Right of way
 between Ledgestone Trail and Royder Road at Station 31+19.12 and
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.



PIPE ENCASEMENT-BLOCKING DETAIL

NOTES:

1. CASING SPACERS ARE TO BE STAINLESS STEEL AS MANUFACTURED BY CASCADE WATERWORKS MANUFACTURING COMPANY OR APPROVED EQUAL. THEY SHALL BE INSTALLED PER MANUFACTURER SPECIFICATIONS AND SPACED AT 5' ON CENTER, UNLESS MANUFACTURER RECOMMENDED SPACING IS MORE RESTRICTIVE.
2. CASING SPACERS TO BE LOCATED AS TO PROVIDE A MAXIMUM OF ONE INCH CLEARANCE BETWEEN ENCASEMENT PIPE AND SPACER RUNNER.
3. WHERE MORE THAN 1 JOINT ON THE CARRIER PIPE FALLS WITHIN THE ENCASEMENT PIPE, ALL CARRIER PIPE SHALL BE CLASS 350 DIP (CLASS 250 IF DIAMETER IS LESS THAN OR EQUAL TO 16") WITH "FIELD LOCK GASKETS" OR APPROVED EQUAL.
4. IF D.I.P. CARRIER PIPE IS USED, IT SHALL BE COVERED WITH 8 MIL. POLYWRAP TO ONE FOOT BEYOND AND OUTSIDE OF THE ENCASEMENT PIPE ON EACH END.
5. ENDS OF ALL ENCASEMENT PIPE SHALL BE SEALED BY USE OF (MINIMUM) ONE EIGHTH INCH SYNTHETIC RUBBER SEAL SECURED WITH STAINLESS STEEL BANDING STRAPS. UNDER SPECIAL CONDITIONS, AND AS APPROVED BY THE ENGINEER, ENDS MAY BE PLUGGED WITH BRICK AND MORTAR FOR A MINIMUM WIDTH OF EIGHT INCHES.
6. NUMBER OF RISER/RUNNERS REQUIRED FOR STANDARD SPACERS.
 4 RUNNERS THROUGH 14" PIPE DIAMETER
 6 RUNNERS THROUGH 36" PIPE DIAMETER
 7 RUNNERS THROUGH 48" PIPE DIAMETER

ENCASEMENT PIPE MATERIAL & SIZES

CARRIER PIPE SIZE	PVC D2241 SDR26	PVC C905 DR25	STEEL A134 OR A139	DIP CL250	RCP CLIII ASTM C76
6" OR 8"	16"	16"	16" (3/8)" (1/2)"**	16"	15"
12"		24"	20" (3/8)" (1/2)"**	20"	24"
18"		30"	26" (3/8)" (1/2)"**	30"	30"
24"			32" (1/2)" (1/2)"**	36"	36"

**WALL THICKNESS FOR CITY CROSSINGS
 ***WALL THICKNESS FOR RAILROAD CROSSINGS



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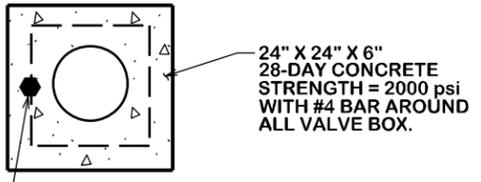
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SPECIAL WATERLINE DETAILS
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

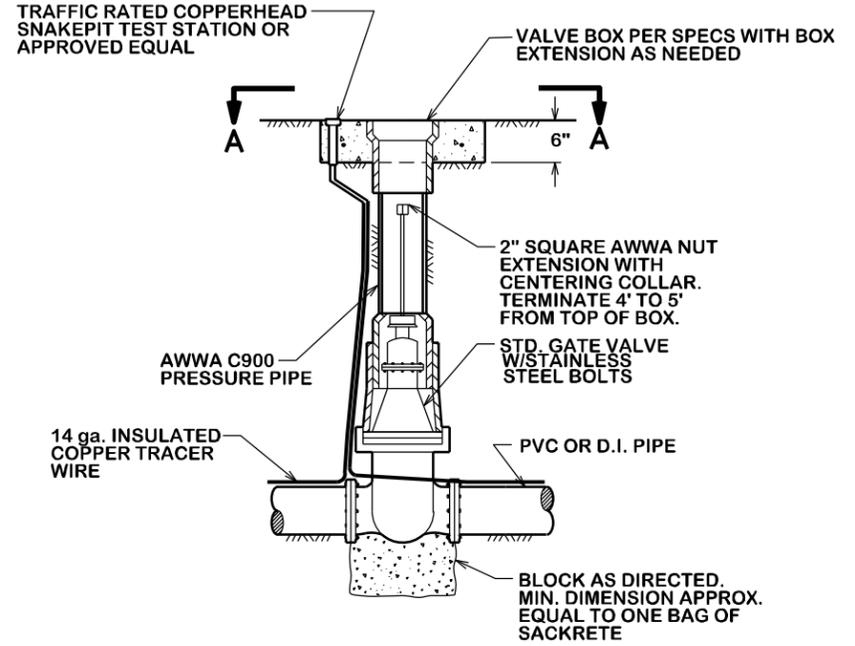


Of 190 Sheets



- NOTE:**
1. VALVE EXTENSION TO BE USED ONLY WHEN TOP OF GATE VALVE IS DEEPER THAN 5 FEET FROM FINISHED GRADE.
 2. ALL VALVE OPERATING NUT EXTENSIONS ARE TO BE MADE OF STEEL, SIZED AS NOTED, AND PAINTED WITH TWO (2) COATS OF METAL PAINT.
 3. EXTENSIONS SHALL BE A MINIMUM OF ONE (1) FOOT LONG.
 4. VALVE BOX LIDS LOCATED ON VALVES TO ISOLATE FIRE SUPPRESSION LINES FROM PUBLIC WATER LINES SHALL BE AMPRO USA, LL562 LOCKABLE LID.

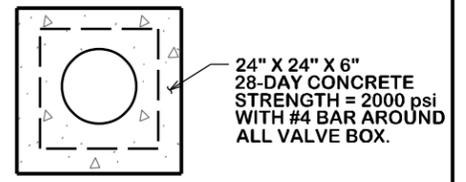
VIEW A - A



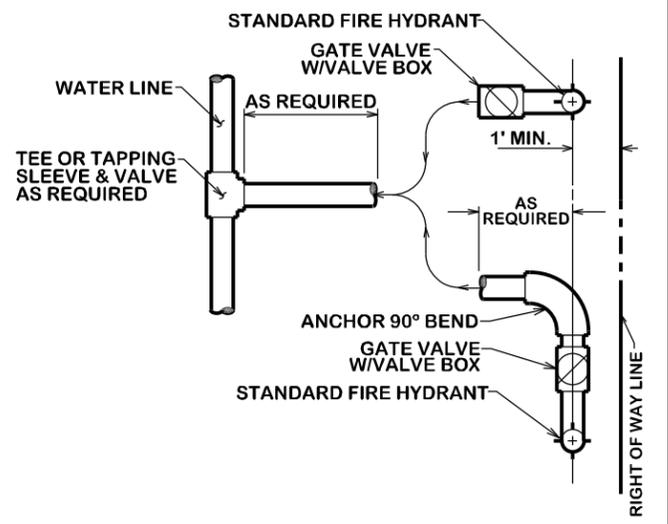
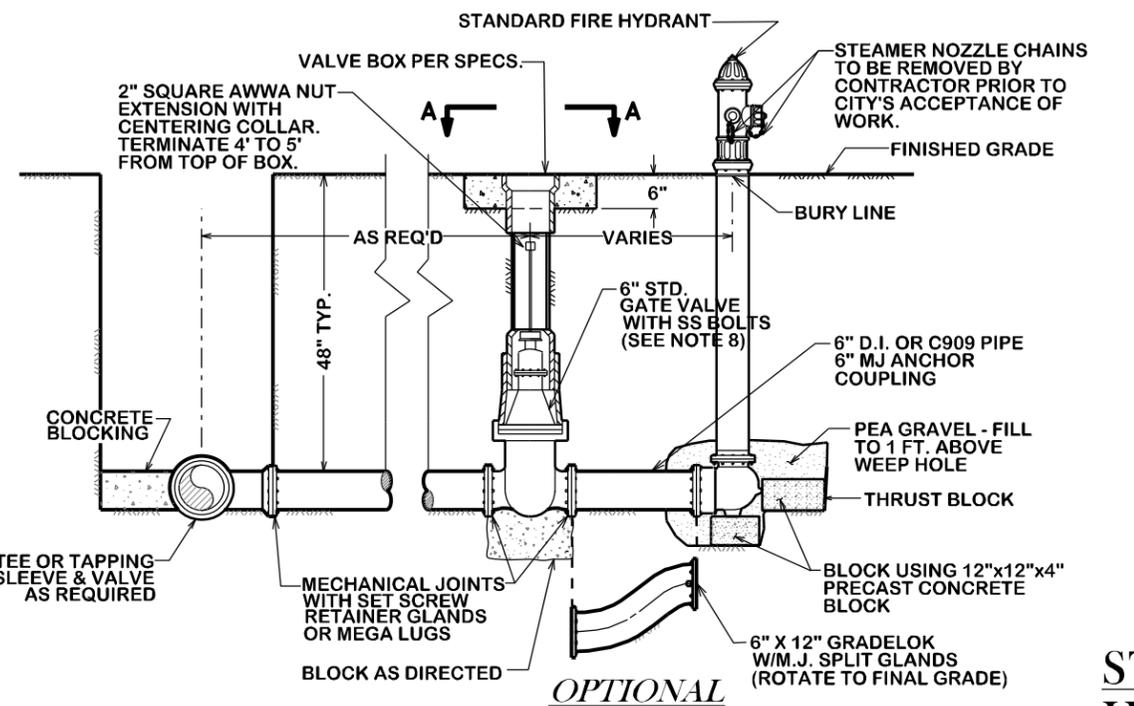
GATE VALVE & BOX

W1-00

- GENERAL NOTES:**
1. FINELY DIVIDED EARTH FREE OF ROCK, LUMPS AND CLODS EXCEEDING 6" SHALL BE PLACED BY HAND, AND COMPACTED AROUND THE CAST IRON PIPE TO A DEPTH OF 12" OVER THE TOP OF THE PIPE BEFORE BACKFILL IS BEGUN BY ANY MECHANICAL EQUIPMENT.
 2. ALL CONCRETE BLOCKING SHALL BE - 28 DAY CONCRETE STRENGTH = 2000psi.
 3. ALL THRUST BLOCKING SHALL PROVIDE A MINIMUM OF 2 SQUARE FEET OF BEARING AREA OF CONCRETE ON UNDISTURBED SOIL, OR AS DIRECTED BY THE ENGINEER.
 4. WATER MAINS WILL NOT BE FULLY PRESSURIZED UNTIL CONCRETE HAS REACHED 7 DAY STRENGTH.
 5. ALL PIPE WILL BE LAID SO AS THE ENTIRE BARRELL WILL HAVE FULL BEARING ON THE FINE GRADED TRENCH BOTTOM. BELL HOLES SHALL BE CUT FOR EACH BELL AND FIRE HYDRANT.
 6. ALL FITTING SHALL BE MECHANICAL JOINTS UNLESS OTHERWISE DIRECTED.
 7. HYDRANTS SHALL BE LOCATED NO CLOSER THAN 3 FEET MEASURED FROM THE BACK OF CURB TO THE FACE OF THE STEAMER ON THE FIRE HYDRANT.
 8. IF MAIN VALVE IS WITHIN 50 FEET OF FIRE HYDRANT THEN ASSEMBLY VALVE MAY BE OMITTED ON A DEAD END HYDRANT LEAD WITH NO ADDITIONAL CONNECTIONS.
 9. HEIGHT OF FIRE HYDRANT MEASURED FROM THE STEAMER NOZZLE SHALL BE 18 TO 24 INCHES ABOVE NEAREST FINAL GRADE.



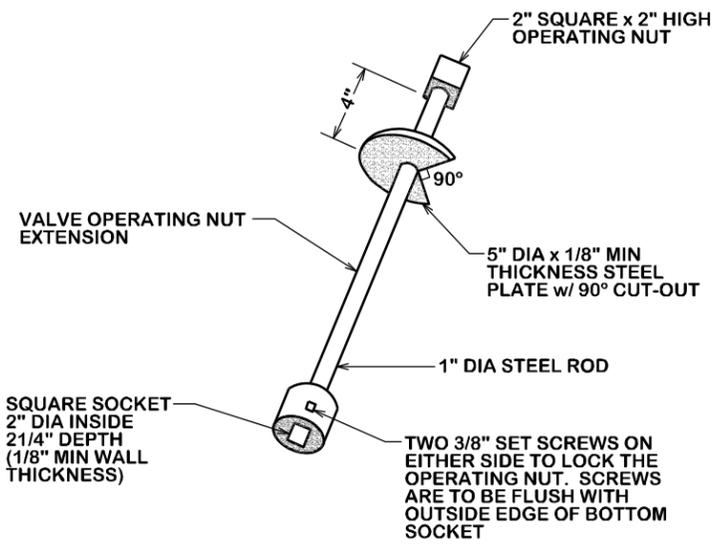
VIEW A - A



FIRE HYDRANT LOCATION REALIGN AS NEEDED

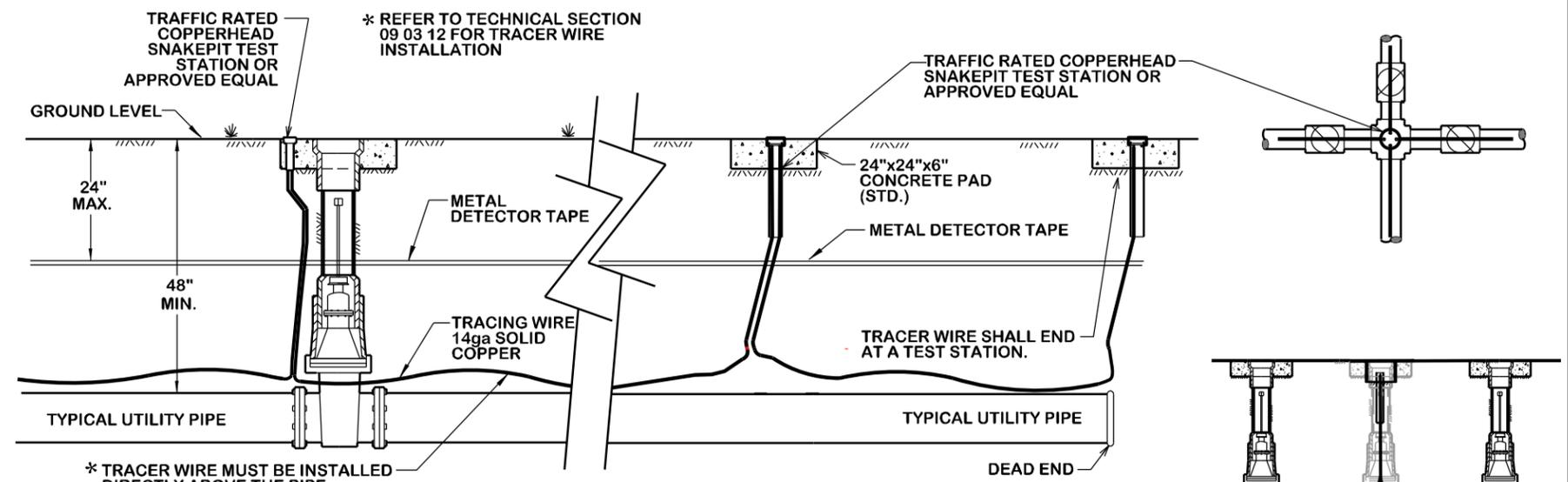
STANDARD FIRE HYDRANT ASSEMBLY

W1-02



GATE VALVE EXTENSION

W1-01



UTILITY PIPE LOCATION MATERIALS

W1-03

REVISIONS

BRYAN - COLLEGE STATION
STANDARD WATER DETAILS



DRAWN BY: C.L.M.
DATE: 08-01-12
SCALE: N T S
APPROVED: W.P.K.
FIGURE:

W1
SHEET 1 OF 7

THRUST BLOCK NOTES:

1. ALL CALCULATIONS ARE BASED ON INTERNAL PRESSURE OF 200 psi FOR 24" AND SMALLER INNER DIAMETER PIPE.
2. ALL BEARING SURFACES OF THRUST BLOCKS SHALL BE PLACED AGAINST UNDISTURBED EARTH OR ROCK.
3. CONCRETE FOR BLOCKING SHALL BE 2000 psi.
4. DIMENSIONS MAY BE VARIED AS REQUIRED BY FIELD WHERE AND AS DIRECTED BY THE ENGINEER. THE VOLUME OF CONCRETE BLOCKING SHALL NOT BE LESS THAN SHOWN HERE.
5. WATER MAIN SHALL NOT BE PRESSURIZED UNTIL ALL CONCRETE BLOCKING HAS REACHED 1500 psi.

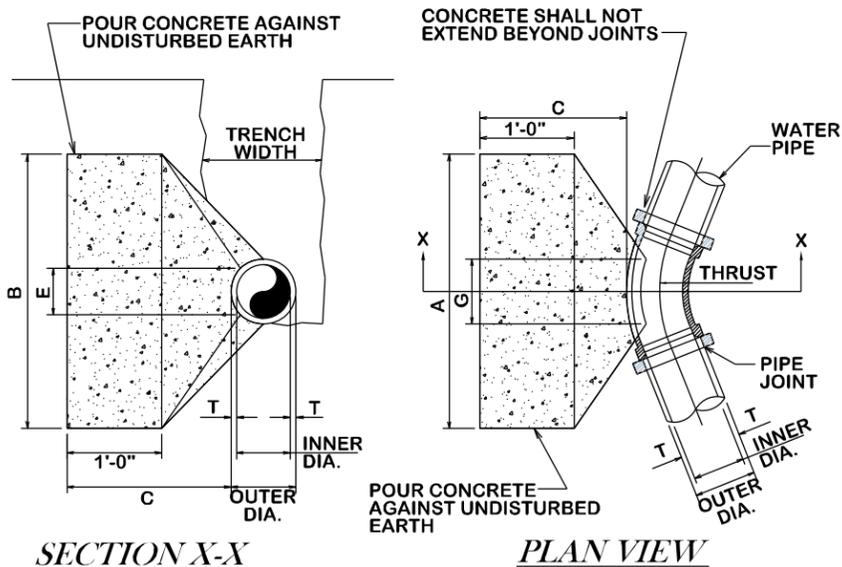
TEE SCHEDULE					
ID (in)	THRUST (tons)	C (ft)	A (ft)	VOLUME (c.y.)	
4,6,8	5.1	1.5	2.5	0.3	
10,12	11.3	1.5	3.5	0.6	

NOTE:
USE POLYETHYLENE WRAP OR EQUAL BETWEEN CONCRETE & PLUG TO PREVENT CONCRETE FROM STICKING TO PLUG.

HORIZONTAL THRUST BLOCK SCHEDULE

BEND	SIZE	A (ft)	B (ft)	C (ft)	E (ft)	G (ft)	VOLUME (c.y.)
90°	6,8"	5.0	1.5	1.5	0.9	2.7	0.4
	10,12"	6.5	2.5	1.5	1.2	4.0	1.0
45°	6,8"	2.0	2.0	1.5	0.9	1.5	0.2
	10,12"	3.5	2.5	1.5	1.2	2.2	0.5
22.5°	6,8"	1.5	1.5	1.5	0.9	0.8	0.1
	10,12"	2.0	2.5	1.5	1.2	1.1	0.3
11.25°	6,8"	1.0	1.5	1.5	0.9	0.4	0.1
	10,12"	1.5	1.5	1.5	1.2	0.6	0.1

THRUST BLOCK DETAILS



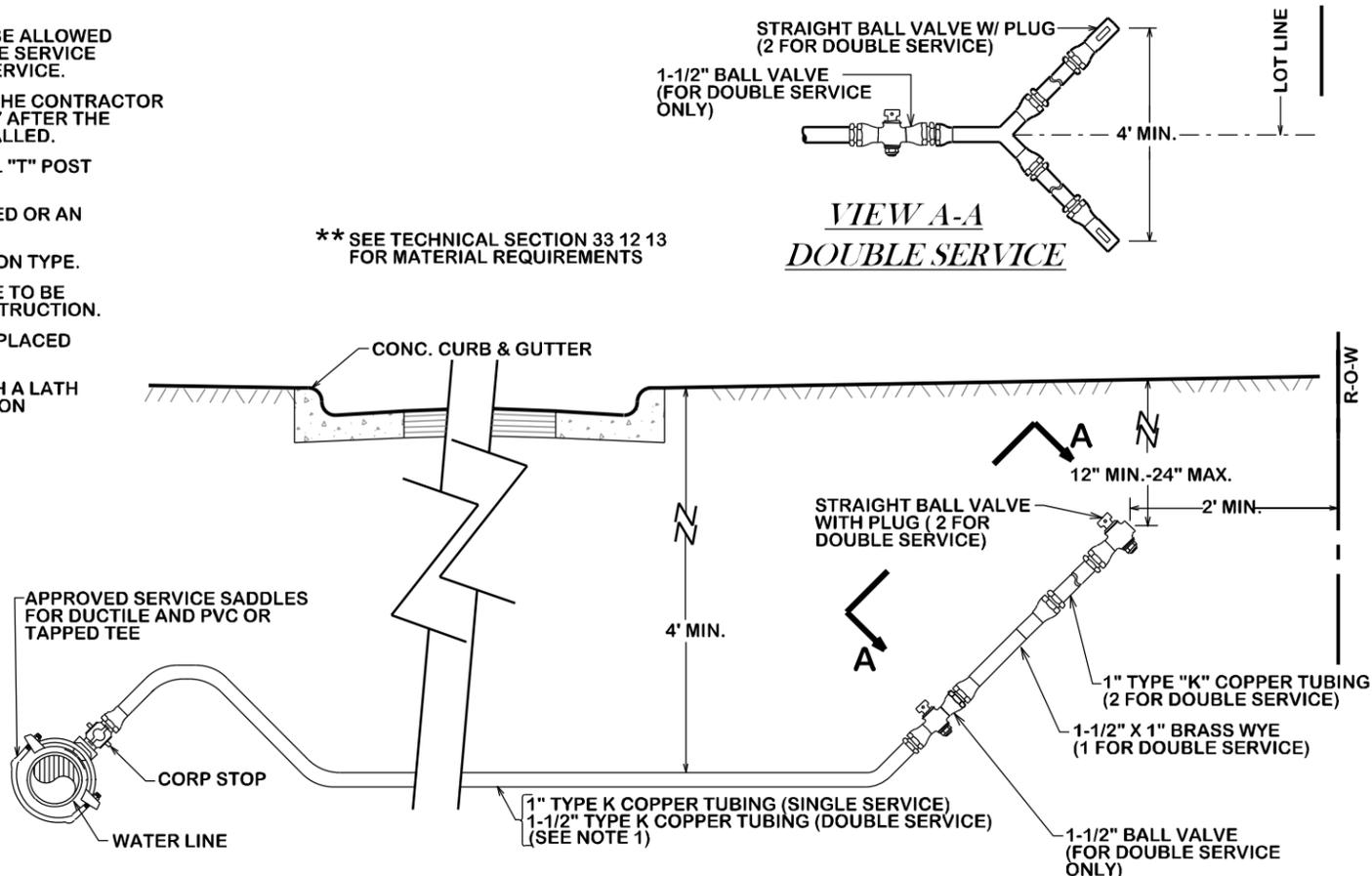
TEE THRUST BLOCK

TYPICAL HORIZONTAL THRUST BLOCK

W2-00

NOTES:

1. NO SPLICES IN COPPER TUBING WILL BE ALLOWED FOR SINGLE SERVICE OR BETWEEN THE SERVICE SADDLE AND THE WYE FOR DOUBLE SERVICE.
2. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PRESSURE TEST LINE IMMEDIATELY AFTER THE STREET CROSSINGS HAVE BEEN INSTALLED.
3. MARK EACH SERVICE END WITH METAL "T" POST PAINTED BLUE.
4. MATERIAL USED SHALL BE AS SPECIFIED OR AN APPROVED EQUAL.
5. ALL CONNECTIONS TO BE COMPRESSION TYPE.
6. ALL SERVICE WYES & EXTENSIONS ARE TO BE INSTALLED WITH THE MAIN LINE CONSTRUCTION.
7. METERS AND VALVE BOXES SHALL BE PLACED BY THE CITY UPON PAYMENT OF FEE.
8. LOT CORNERS SHALL BE MARKED WITH A LATH UNDER THE SUPERVISION F A RPLS UPON COMPLETION OF CONSTRUCTION.

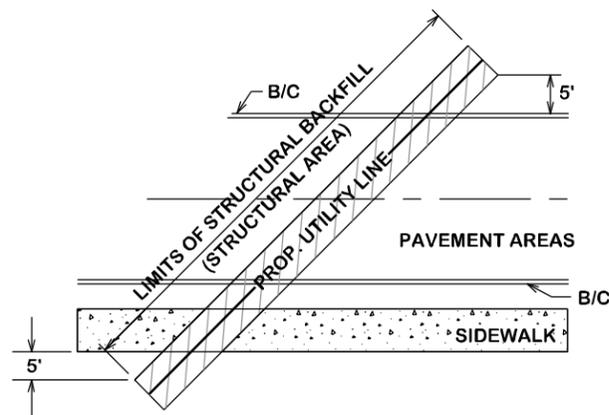


NEW WATER SERVICE

(SHORT AND LONG SIDE)

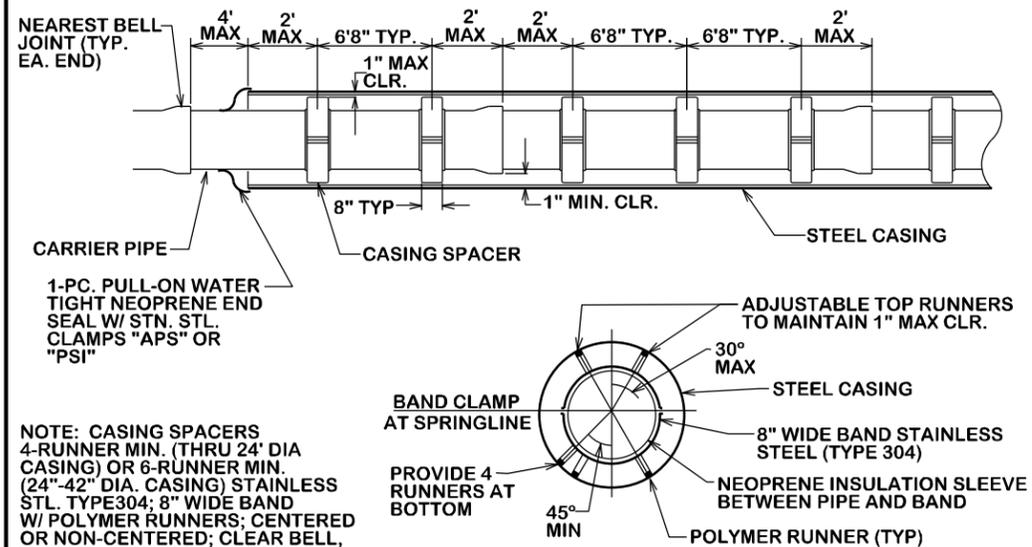
W2-01

STRUCTURAL BACKFILL AREA INCLUDES ALL PAVED AREAS (SIDEWALKS, STREETS, ALLEYS, DRIVEWAYS AND PARKING AREAS) AND SHALL EXTEND 5' BEYOND THE CURB LINE. STRUCTURAL BACKFILL SHALL BE CEMENT STABILIZED (SEE DETAIL W4-02 - AREASTO BE PAVED) OR EXCAVATED SOIL COMPACTED TO 98% MAXIMUM DRY DENSITY AS PER ASTM D698 WITHIN OPTIMUM TO +4% WET OF OPTIMUM (SEE DETAIL W4-02 - NON-STRUCTURAL AREAS)



STRUCTURAL BACKFILL AREA

W2-02



CASING DETAIL

W2-03

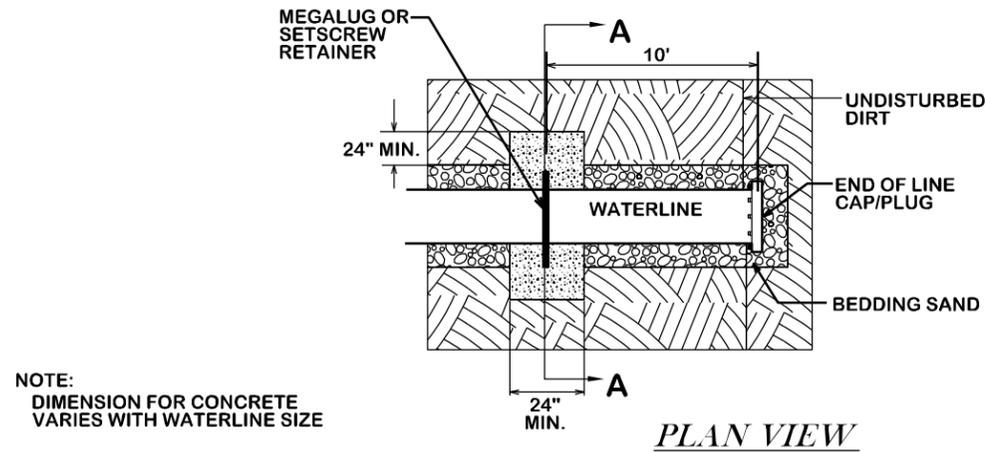
REVISIONS

**BRYAN - COLLEGE STATION
STANDARD WATER DETAILS**

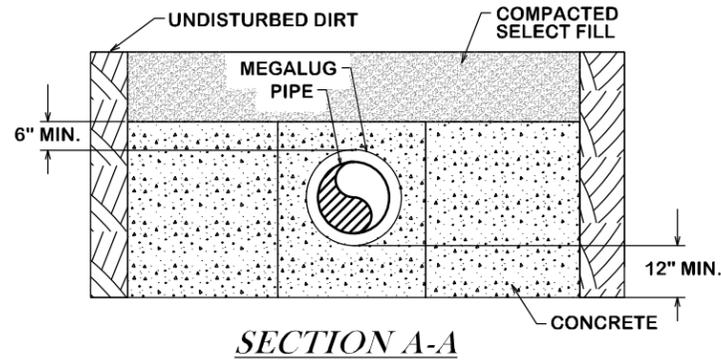


DRAWN BY: C.L.M.
DATE: 08-01-12
SCALE: N T S
APPROVED: W.P.K.
FIGURE:

W2
SHEET 2 OF 7

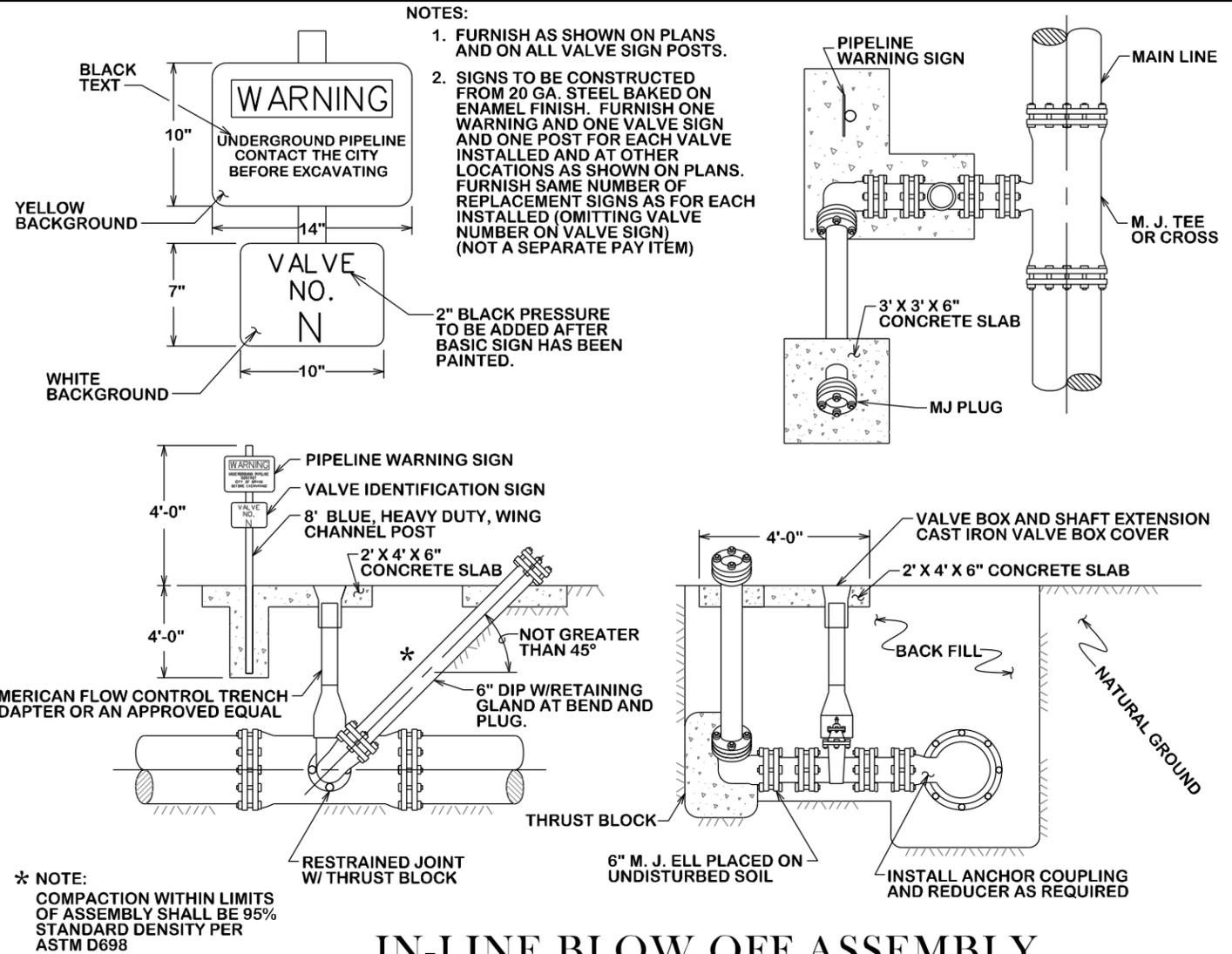


NOTE:
DIMENSION FOR CONCRETE
VARIES WITH WATERLINE SIZE



END OF LINE BLOCKING

W3-00



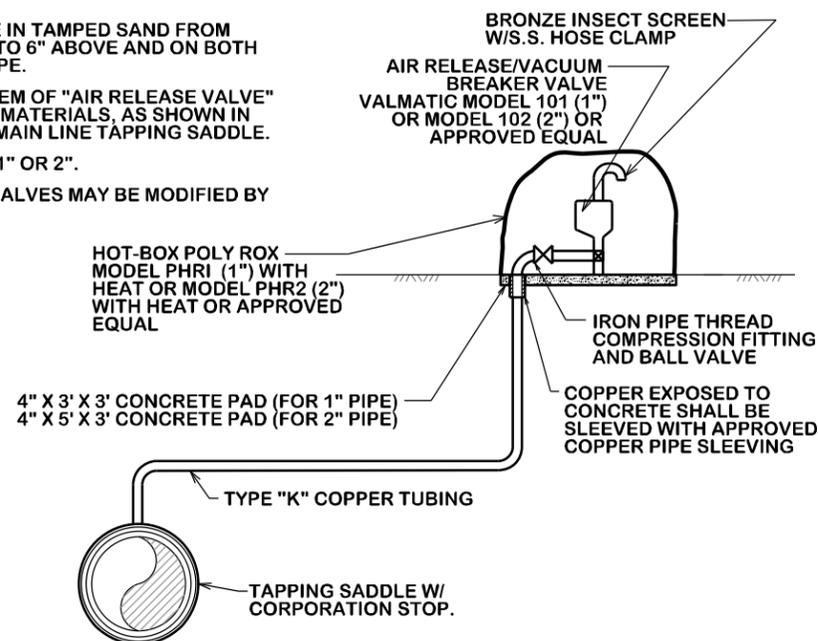
* NOTE:
COMPACTION WITHIN LIMITS
OF ASSEMBLY SHALL BE 95%
STANDARD DENSITY PER
ASTM D698

IN-LINE BLOW OFF ASSEMBLY

W3-01

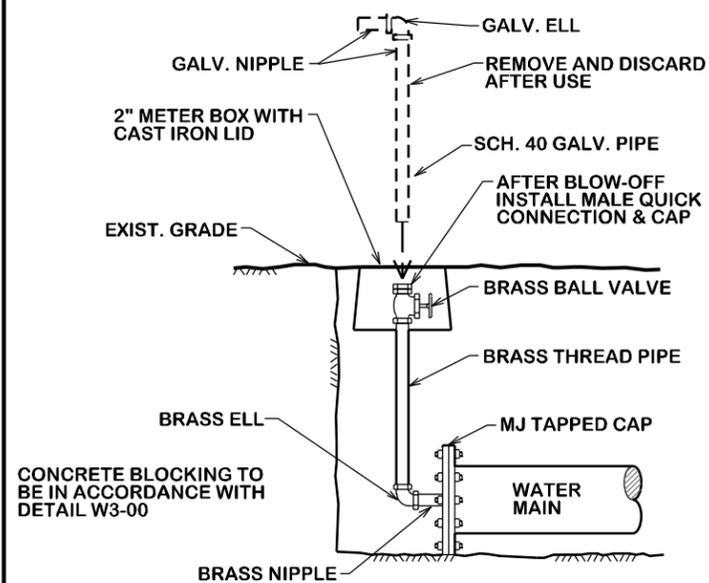
NOTE:

1. EMBED COPPER LINE IN TAMPED SAND FROM UNDISTURBED SOIL TO 6" ABOVE AND ON BOTH SIDES OF COPPER PIPE.
2. PAYMENT FOR BID ITEM OF "AIR RELEASE VALVE" SHALL INCLUDE ALL MATERIALS, AS SHOWN IN DETAIL, INCLUDING MAIN LINE TAPPING SADDLE.
3. PIPE SIZE SHALL BE 1" OR 2".
4. SIZE OF LINES AND VALVES MAY BE MODIFIED BY THE ENGINEER



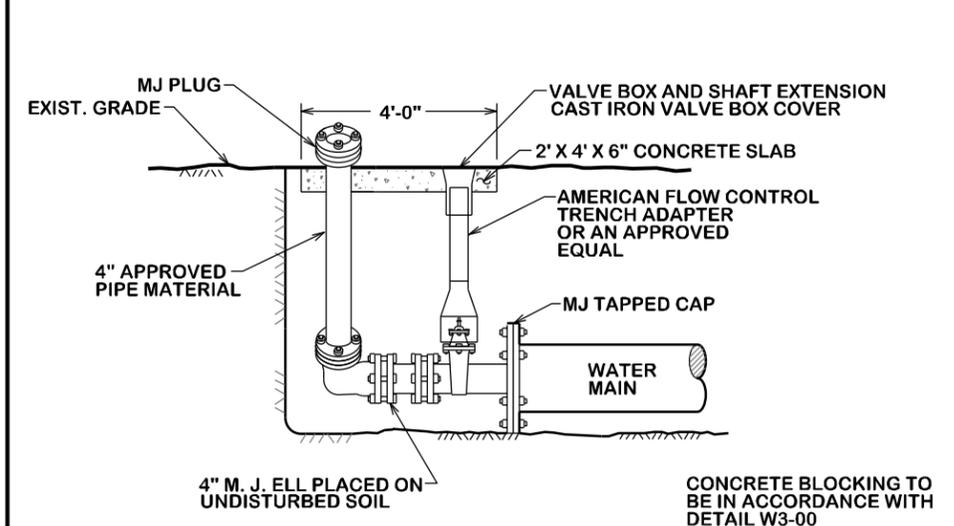
AIR RELEASE VALVE & VACUUM CHECK VALVE

W3-02



2\"/>

W3-03



4\"/>

W3-04

REVISIONS

BRYAN - COLLEGE STATION
STANDARD WATER DETAILS



CITY OF BRYAN
The Good Life, Texas Style.

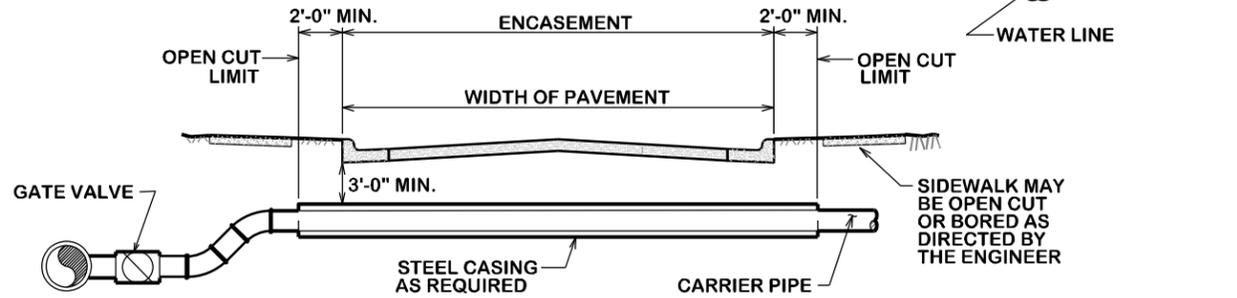
DRAWN BY: C.L.M.
DATE: 08-01-12
SCALE: N T S
APPROVED: W.P.K.
FIGURE:

W3

SHEET 3 OF 7

NOTE:

1. FOR MORE INFORMATION ON WATER AND SEWER LINE CROSSING SEE CITY STANDARD SPECIFICATION FOR WATER AND SEWER LINE CONSTRUCTION
2. STEEL CASING SHALL BE AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS.
3. DRY BORING PREFERRED, WET BORING ALLOWED ONLY WHEN APPROVED BY THE CITY ENGINEER.
4. PIPE CROSSING A ROADWAY SHALL BE INSTALLED ABOVE THE MAIN IT TIES INTO WITH A BEND SUCH THAT THE CARRIER PIPE CAN BE PULLED ABOVE THE PARALLEL MAIN.

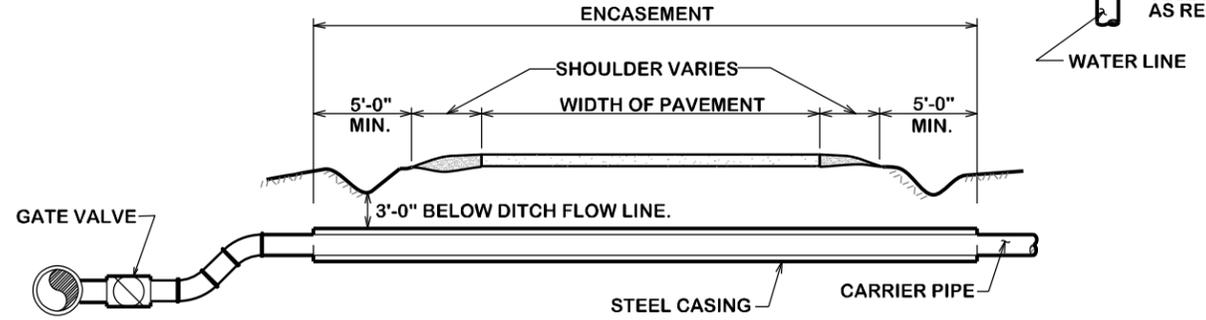


TYPICAL URBAN CITY STREET CROSSING

W4-00

NOTE:

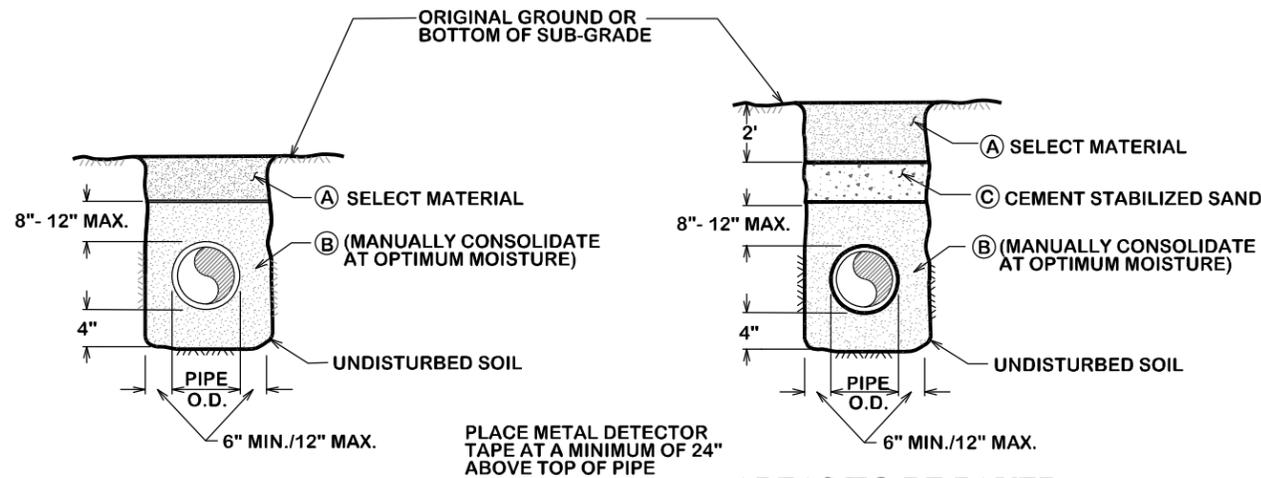
1. FOR MORE INFORMATION ON WATER AND SEWER LINE CROSSING SEE CITY STANDARD SPECIFICATION FOR WATER AND SEWER LINE CONSTRUCTION
2. STEEL CASING SHALL BE AS SPECIFIED IN THE TECHNICAL SPECIFICATIONS.
3. DRY BORING IS REQUIRED.
4. PIPE CROSSING A ROADWAY SHALL BE INSTALLED ABOVE THE MAIN IT TIES INTO WITH A BEND SUCH THAT THE CARRIER PIPE CAN BE PULLED ABOVE THE PARALLEL MAIN.



TYPICAL RURAL STREET CROSSING

W4-01

- (A) SELECT MATERIAL**
MATERIAL EXCAVATED FROM THE DITCH, (WHICH IS FREE OF ROCKS, LUMPS, CLODS, OR DEBRIS LARGER THAN TWO (2) INCHES IN THE LARGEST DIMENSION), COMPACTED TO A MINIMUM OF 90% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698 (STANDARD) AT A MOISTURE CONTENT WITHIN OPTIMUM TO +4% OF OPTIMUM UNDER NON-STRUCTURAL AREAS (ie...YARDS, PASTURES, EASEMENTS) AND TO A MINIMUM OF 98% OF MAXIMUM DENSITY AS DETERMINED BY ASTM D698 (STANDARD) AT A MOISTURE CONTENT WITHIN OPTIMUM TO +4% OF OPTIMUM UNDER NEW STREET AREAS AND STREETS TO BE RECONSTRUCTED.
- (B) GRANULAR MATERIAL**
MATERIAL SHALL BE BANK RUN RIVER SAND WHICH IS FREE OF DETRIMENTAL QUANTITIES OF CLAY, DEBRIS, OR ORGANIC MATERIAL AND WHICH, WHEN TESTED BY STANDARD LABORATORY METHODS, MEET THE FOLLOWING REQUIREMENTS:
- | | |
|---------------------------------------|-----|
| MAXIMUM LIQUID LIMIT | 45 |
| MAXIMUM PLASTICITY INDEX | 15 |
| MAXIMUM PERCENT PASSING NO. 200 SIEVE | 35 |
| MINIMUM PERCENT PASSING 3/4" SIEVE | 100 |
- THE MATERIAL SHALL BE FREE FLOWING AND WHEN WET, SHALL NOT ADHERE TO FORM A BALL WHEN PRESSED IN THE HAND.
- (C) CEMENT STABILIZED SAND**



NON-STRUCTURAL AREAS

AREAS TO BE PAVED OR STREETS TO BE RECONSTRUCTED

NOTES:

1. FOR BEDDING AND TRENCHING WITHIN ALL EXISTING PAVED AREAS, SEE DETAILS FOR OPEN CUT STREETS. (Details ST4-00, ST4-01, ST4-02). THIS NOTE DOES NOT APPLY TO STREETS BEING RECONSTRUCTED.
2. EVERY 100 FEET PROVIDE A WATER STOP BLOCK COMPOSED OF CEMENT SAND OR NATIVE MATERIAL DEPENDING ON EMBEDMENT. BLOCK SHALL BE 6 FEET IN LENGTH. NO BEDDING SAND IN THIS AREA.
3. ALL BEDDING & INSTALLATION OF PVC PIPE SHALL BE IN ACCORDANCE WITH ANSI/AWWA STANDARDS FOR PVC PIPE.
4. ALL BEDDING & INSTALLATION OF DUCTILE IRON PIPE SHALL BE IN ACCORDANCE WITH ANSI/AWWA C-150/A21.50
5. COMPACTION SHALL BE ATTAINED BY MECHANICAL TAMPING.
6. RELATIVE COMPACTION SHALL BE TESTED IN THE PRESENCE OF THE CITY ENGINEER.
7. DUST RESULTING FROM THE CONTRACTOR'S PERFORMANCE OF THE WORK, EITHER INSIDE OR OUTSIDE THE RIGHT-OF-WAY, SHALL BE CONTROLLED BY THE CONTRACTOR.
8. ALL TRENCHES SHALL BE BACK FILLED AND TEMPORARY PAVING OR PLATING PLACED AT THE END OF EACH WORKING DAY.

BEDDING AND TRENCH FOR DI PIPE & PVC PIPE

W4-02

GENERAL NOTES:

- ALL AREAS WHERE EXISTING VEGETATION AND GRASS COVER HAVE BEEN BARED BY CONSTRUCTION SHALL BE ADEQUATELY BLOCK SODDED OR HYDROMULCHED AND WATERED UNTIL GROWTH IS ESTABLISHED. IN DEVELOPED AREAS WHERE GRASS IS PRESENT, BLOCK SOD WILL BE REQUIRED. BARED AREAS SHALL BE SEEDED OR SODDED WITHIN 14 CALENDAR DAYS OF LAST DISTURBANCE.
- APPROVED EROSION CONTROL MEASURES MUST BE INSTALLED DURING THE ENTIRE TIME THAT EARTH HAS BEEN BARED BY CONSTRUCTION AND SHALL STAY IN PLACE UNTIL ACCEPTABLE VEGETATIVE GROWTH IS ESTABLISHED AFTER CONSTRUCTION IS COMPLETE AND THEN REMOVED BY CONTRACTOR.
- ALL EROSION CONTROL MEASURES SHOULD BE CLEANED OF SILT AFTER EVERY RAIN.
- ESTABLISHMENT OF VEGETATION MAY BE A WARRANTY ITEM.

REVISIONS

BRYAN - COLLEGE STATION
STANDARD WATER DETAILS



DRAWN BY: C.L.M.
DATE: 08-01-12
SCALE: N T S
APPROVED: W.P.K.

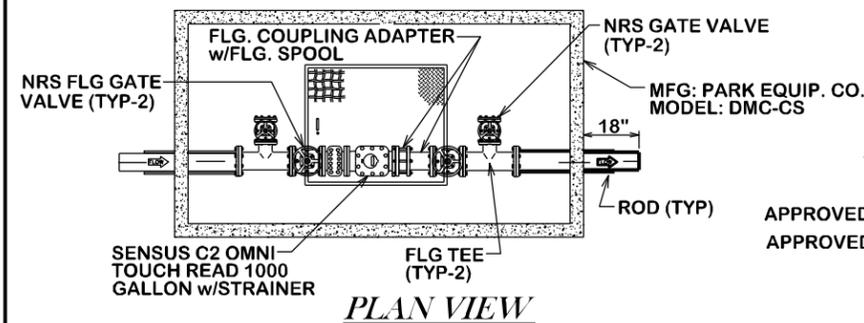
FIGURE:
W4
SHEET 4 OF 7



SPECIAL CONDITIONS

1. METER REGISTER SHALL BE NO DEEPER THAN 12 INCHES BELOW FINISHED GRADE.
2. FLOOR OF VAULT WILL BE A MINIMUM OF 6 INCHES FROM BOTTOM OF ANY PIPING APPARATUS OR METER WITHIN THE VAULT.
3. REINFORCED CONCRETE VAULT BASE (FLOOR) SHALL BE CONSTRUCTED USING A STANDARD FIVE SACK CONCRETE MIX AND REINFORCING COMPRISED OF #3 REBAR ON 12 INCH CENTERS WITH A MINIMUM BASE THICKNESS OF 6 INCHES.
4. SET SCREW RETAINER GLANDS SHALL BE INSTALLED AT EACH FITTING ON MECHANICAL JOINT PIPE.
5. VALVES SHALL MEET THE CITY SPECIFICATIONS FOR VALVES.
6. THERE SHALL BE NO PIPING UNDER THE FLOOR OF THE VAULT.

MODEL	SIZE	L1	W1	H1	WEIGHT LBS
DMC-CS3	3"	8'-8"	5'-0"	4'-6"	12,000
DMC-CS4	4"	8'-8"	5'-0"	4'-6"	12,000
DMC-CS6	6"	11'-0"	6'-0"	4'-9"	12,000

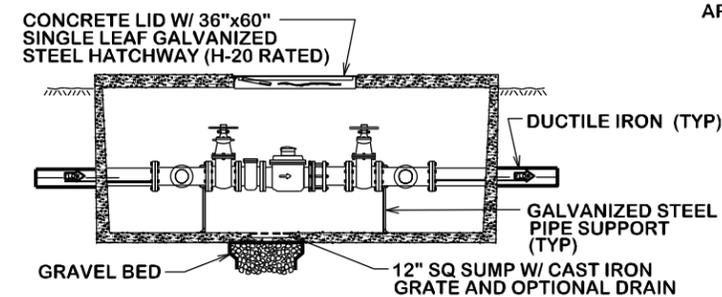


APPROVED 3" OR LARGER COMPOUND METERS, VAULTS & MATERIALS

APPROVED METERS - SENSUS SRH (U. S. GALLONS)
APPROVED VAULTS - PARK DMC-BR PRE-CAST CONCRETE VAULT W/ ADEQUATE ACCESS AND VAULT DIMENSIONS FOR METER SELECTED

APPROVED MATERIALS - DUCTILE IRON PIPE WITH MECHANICAL JOINT. SET SCREW RETAINER GLANDS WILL BE BASED ON ALL M.J. FITTINGS.

ANY DEVIATIONS FROM THE ABOVE SPECIAL CONDITIONS OR APPROVED METERS, VAULTS OR MATERIALS MUST BE SUBMITTED TO THE DIVISION MANAGER, WATER SERVICES, 72 HOURS PRIOR TO ANTICIPATED DEVIATION.

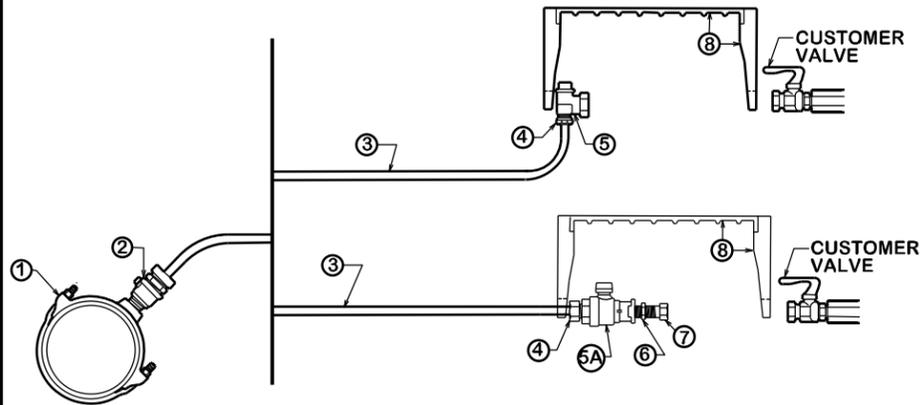


**CITY OF COLLEGE STATION
METER VAULT ASSEMBLY**

W5-00

NOTES:

- ① Service saddle, SS straps, CC threads Installed per manufacturer's recommendations. All main types: Smith Blair 317
- ② Corporation Stop: Ford FB 1000-4-Q - 1"
- ③ Service tubing: Type K copper - soft - 1"
- ④ Ford male adapter - C84-44-Q - 1"
- ⑤ Meter box valve:
5 = Ford Angle Stop - BA13-342W - 1"
5A = Ford Straight Stop - B11-444W - 1"
- ⑥ Brass bushing IPS - 1" x 3/4"
- ⑦ Meter nipple - C38-23-2-5 - 3/4"
- ⑧ Meter box and lid: Old Castle meter box, CI lid with Reader #36

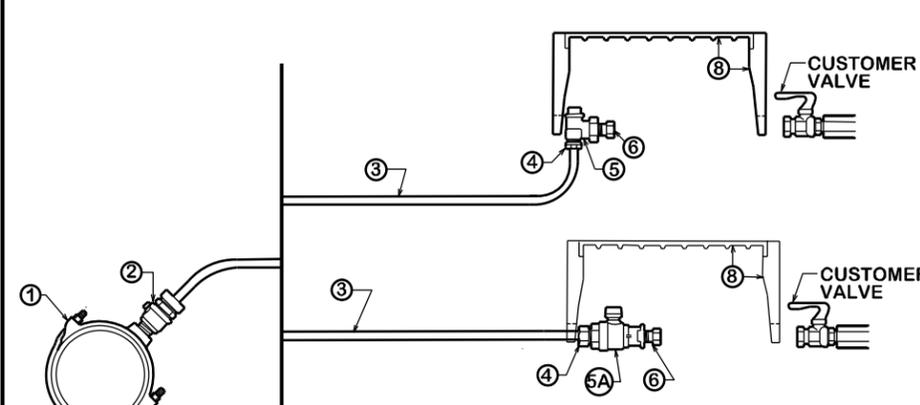


CITY OF BRYAN
STRAIGHT OR ANGLE TAP - 3/4"

W6-00

NOTES:

- ① Service saddle, SS straps, CC threads Installed per manufacturer's recommendations. All main types: Smith Blair 317
- ② Corporation Stop: Ford FB 1000-4-Q - 1"
- ③ Service tubing: Type K copper - soft - 1"
- ④ Ford male adapter - C84-44-Q - 1"
- ⑤ Meter box valve:
5 = Ford Angle Stop - BA-13-444W-Q - 1"
5A = Ford Straight Stop - B11-444W - 1"
- ⑥ Meter nipple - C38-44-2-625 - 1"
- ⑧ Meter box and lid: Old Castle meter box, CI lid with Reader #36

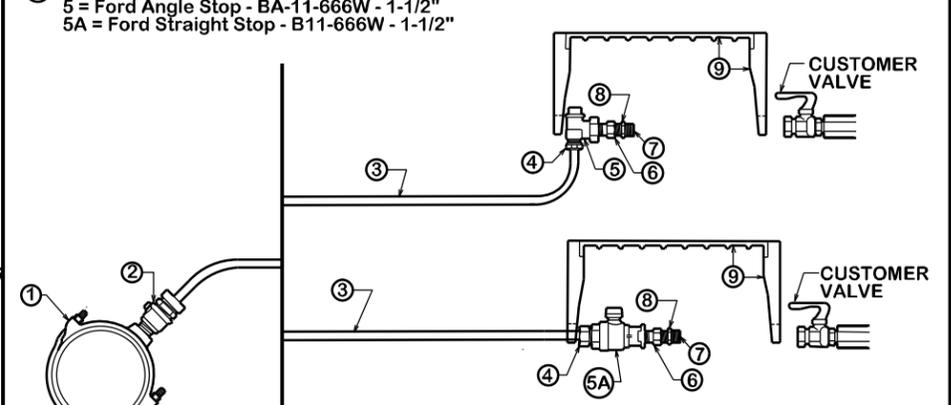


CITY OF BRYAN
STRAIGHT OR ANGLE TAP - 1"

W6-01

NOTES:

- ① Service saddle, SS straps, CC threads Installed per manufacturer's recommendations. All main types: Smith Blair 317
- ② Corporation Stop: Ford FB 1000-6-Q - 1-1/2"
- ③ Service tubing: Type K copper - soft - 1-1/2"
- ④ Ford male adapter - C84-66-Q - 1-1/2"
- ⑤ Meter box valve:
5 = Ford Angle Stop - BA-11-666W - 1-1/2"
5A = Ford Straight Stop - B11-666W - 1-1/2"
- ⑥ Swivel nut - C38-66-2-875 - 1-1/2"
- ⑦ Brass all thread I.P.S. - 1-1/2"
- ⑧ Meter adapter - BBIM 66 - 1-1/2"
- ⑨ Meter box and lid: Old Castle meter box, CI lid with Reader #65

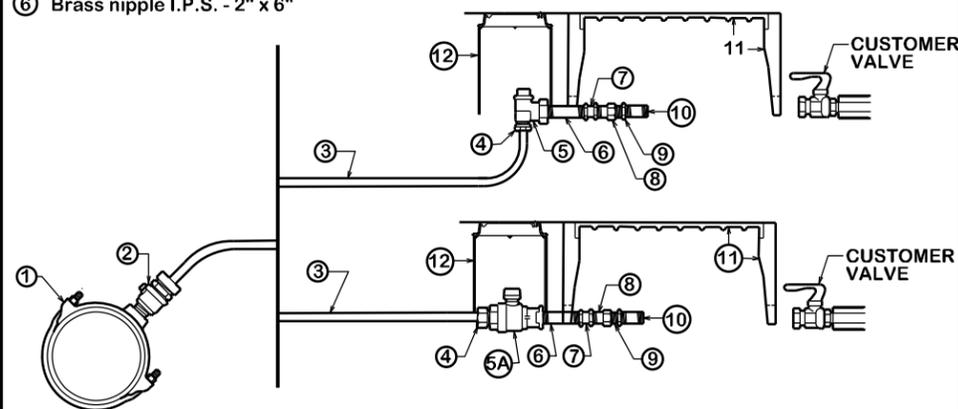


CITY OF BRYAN
STRAIGHT OR ANGLE TAP - 1-1/2"

W6-02

NOTES:

- ① Service saddle, SS straps, CC threads Installed per manufacturer's recommendations. All main types: Smith Blair 317
- ② Corporation Stop: Ford FB 1000-7-Q (cc thread) - 2"
- ③ Service tubing: Type K copper - cu - soft - 2"
- ④ Ford male adapter - C84-77-Q - 2"
- ⑤ Meter box valve:
5 = Ford Angle Stop - BA-11-777W - 2"
5A = Ford Straight Stop - B11-777W - 2"
- ⑥ Brass nipple I.P.S. - 2" x 6"
- ⑦ Brass coupling I.P.S. - 2"
- ⑧ Swivel nut - C38-77 - 2"
- ⑨ Meter adapter - BBIM 77 - 2"
- ⑩ Brass nipple I.P.S. - 2" x 3"
- ⑪ Meter box and lid: Old Castle meter box, CI lid with Reader #65
- ⑫ Meter box and lid: Old Castle 12" round valve box #3RT



CITY OF BRYAN
STRAIGHT OR ANGLE TAP - 2"

W6-03

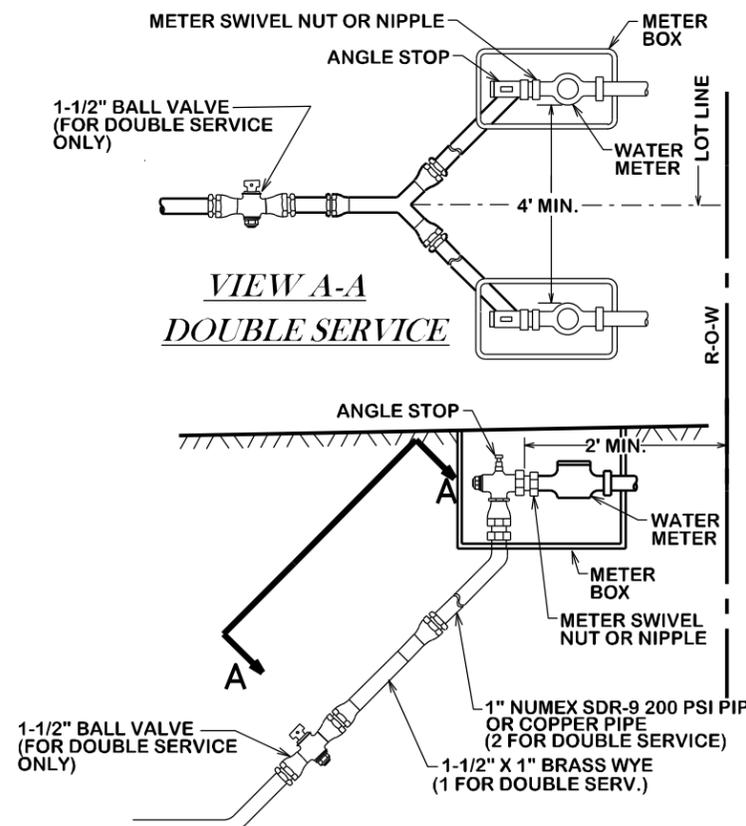
NOTES:

1. ALL CONNECTIONS TO BE COMPRESSION TYPE.
2. MATERIAL USED SHALL BE AS SPECIFIED OR AN APPROVED EQUAL.
3. ALL SERVICE WYES & EXTENSIONS ARE TO BE INSTALLED WITH THE MAIN LINE CONSTRUCTION.
4. EXISTING METER BOXES ARE TO BE REMOVED. THE NEW METER BOXES SHALL BE OLD CASTLE.

METER NUT SIZE	FORD PART NO.
3/4" x 2.5" Long	C38-23-2-5
3/4" x 3" Long	C38-23-3
3/4" x 12" Long	C38-23-12
1" x 2.625" Long	C38-44-2-625
1" x 8.5" Long	C38-44-8-5
1-1/2" Meter Nipple	C38-66-2-875
1-1/2" Meter Bushing	BBIM-66
2" Meter Nipple	C38-77
2" Meter Bushing	BBIM-77

CITY OF BRYAN
WATER SERVICE RECONNECTION

W6-04



REVISIONS:

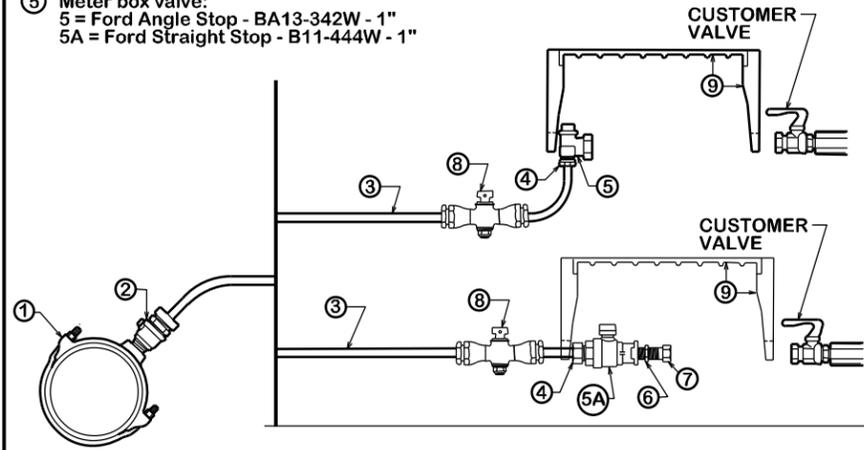
BRYAN - COLLEGE STATION
STANDARD WATER DETAILS



DRAWN BY: C.L.M.
DATE: 08-01-12
SCALE: N T S
APPROVED: W.P.K.
FIGURE:
W6
SHEET 6 OF 7

NOTES:

- ① Service saddle, SS straps, CC threads installed per manufacturer's recommendations. All main types: Cambridge 800 Series or Ford S70/S90
- ② Corporation Stop: Ford FB 1000-4- 1"
- ③ Service tubing: Type K copper - soft - 1"
- ④ Ford male adapter - C84-44- 1"
- ⑤ Meter box valve:
5 = Ford Angle Stop - BA13-342W - 1"
5A = Ford Straight Stop - B11-444W - 1"
- ⑥ Brass bushing IPS - 1" x 3/4"
- ⑦ Meter nipple - C38-23-2-5 - 3/4"
- ⑧ Ball valve
- ⑨ Meter box and lid: Old Castle meter box, CI lid with Reader #36

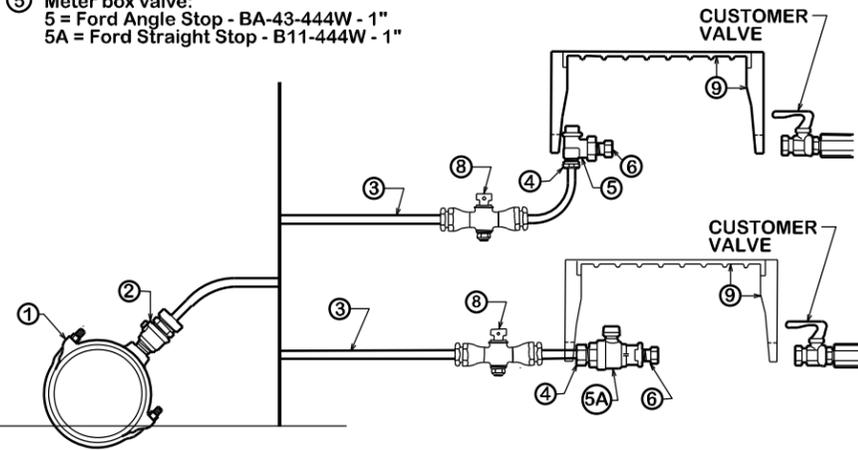


CITY OF COLLEGE STATION
STRAIGHT OR ANGLE TAP - 3/4"

W7-00

NOTES:

- ① Service saddle, SS straps, CC threads installed per manufacturer's recommendations. All main types: Cambridge 800 Series or Ford S70/S90
- ② Corporation Stop: Ford FB 1000-4- 1"
- ③ Service tubing: Type K copper - soft - 1"
- ④ Ford male adapter - C84-44- 1"
- ⑤ Meter box valve:
5 = Ford Angle Stop - BA-43-444W - 1"
5A = Ford Straight Stop - B11-444W - 1"
- ⑥ Meter nipple - C38-44-2-625 - 1"
- ⑧ Ball valve
- ⑨ Meter box and lid: Old Castle meter box, CI lid with Reader #36

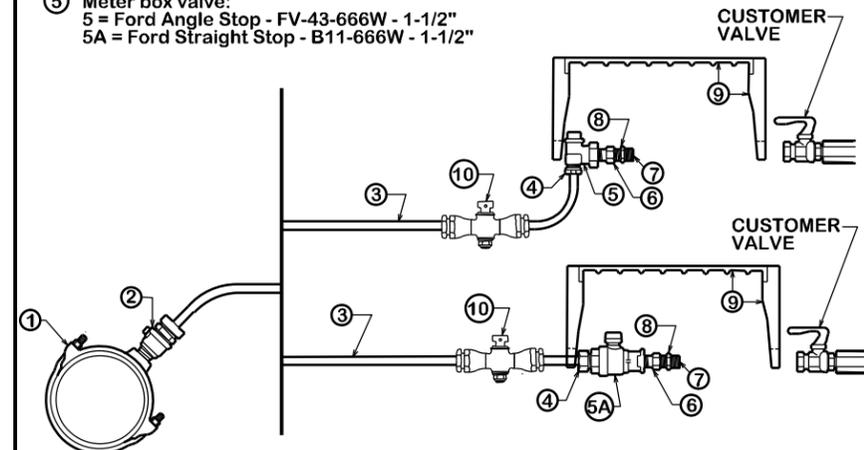


CITY OF COLLEGE STATION
STRAIGHT OR ANGLE TAP - 1"

W7-01

NOTES:

- ① Service saddle, SS straps, CC threads installed per manufacturer's recommendations. All main types: Cambridge 800 Series or Ford S70/S90
- ② Corporation Stop: Ford FB 1000-6- 1-1/2"
- ③ Service tubing: Type K copper - soft - 1-1/2"
- ④ Ford male adapter - C84-66- 1-1/2"
- ⑤ Meter box valve:
5 = Ford Angle Stop - FV-43-666W - 1-1/2"
5A = Ford Straight Stop - B11-666W - 1-1/2"
- ⑥ Swivel nut - C38-66-2-875 - 1-1/2"
- ⑦ Brass all thread I.P.S. - 1-1/2"
- ⑧ Meter adapter - BBIM 66 - 1-1/2"
- ⑨ Meter box and lid: Old Castle meter box, CI lid with Reader #65
- ⑩ Ball valve

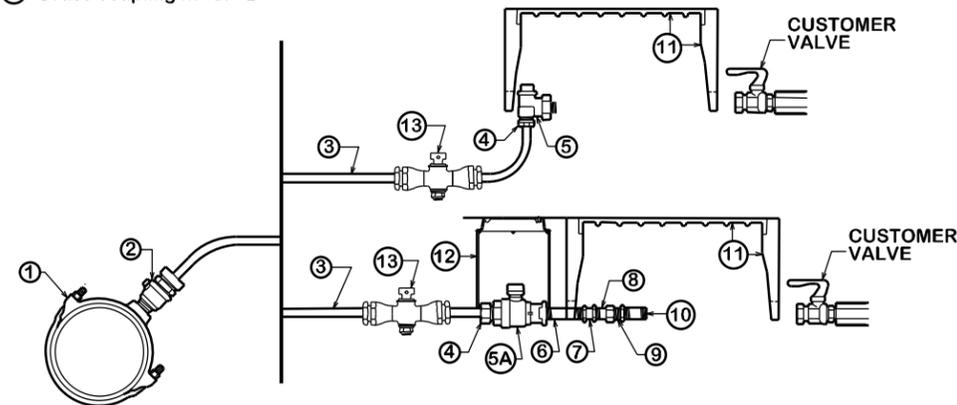


CITY OF COLLEGE STATION
STRAIGHT OR ANGLE TAP - 1-1/2"

W7-02

NOTES:

- ① Service saddle, SS straps, CC threads installed per manufacturer's recommendations. All main types: Cambridge 800 Series or Ford S70/S90
- ② Corporation Stop: Ford FB 1000-7 (cc thread) - 2"
- ③ Service tubing: Type K copper - cu - soft - 2"
- ④ Ford male adapter - C84-77- 2"
- ⑤ Meter box valve:
5 = Ford Angle Stop - FV-43-777W - 2"
5A = Ford Straight Stop - B11-777W - 2"
- ⑥ Brass nipple I.P.S. - 2" x 6"
- ⑦ Brass coupling I.P.S. - 2"
- ⑧ Swivel nut - C38-77 - 2"
- ⑨ Meter adapter - BBIM 77 - 2"
- ⑩ Brass nipple I.P.S. - 2" x 3"
- ⑪ Meter box and lid: Old Castle meter box, CI lid with Reader #65
- ⑫ Meter box and lid: Old Castle 12" round valve box #3RT
- ⑬ Ball valve



CITY OF COLLEGE STATION
STRAIGHT OR ANGLE TAP - 2"

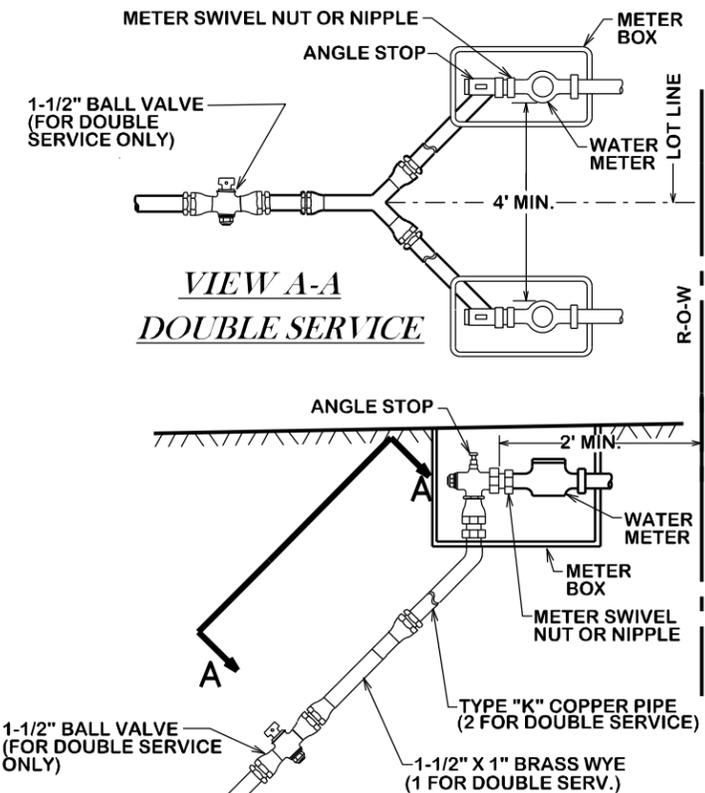
W7-03

NOTES:

1. ALL CONNECTIONS TO BE COMPRESSION TYPE.
2. MATERIAL USED SHALL BE AS SPECIFIED OR AN APPROVED EQUAL.
3. ALL SERVICE WYES & EXTENSIONS ARE TO BE INSTALLED WITH THE MAIN LINE CONSTRUCTION.
4. EXISTING METER BOXES ARE TO BE REMOVED. THE NEW METER BOXES SHALL BE OLD CASTLE.

METER NUT SIZE	FORD PART NO.
3/4" x 2.5" Long	C38-23-2-5
3/4" x 3" Long	C38-23-3
3/4" x 12" Long	C38-23-12
1" x 2.625" Long	C38-44-2-625
1" x 8.5" Long	C38-44-8-5
1-1/2" Meter Nipple	C38-66-2-875
1-1/2" Meter Bushing	BBIM-66
2" Meter Nipple	C38-77
2" Meter Bushing	BBIM-77

CITY OF COLLEGE STATION
WATER SERVICE RECONNECTION



W7-04

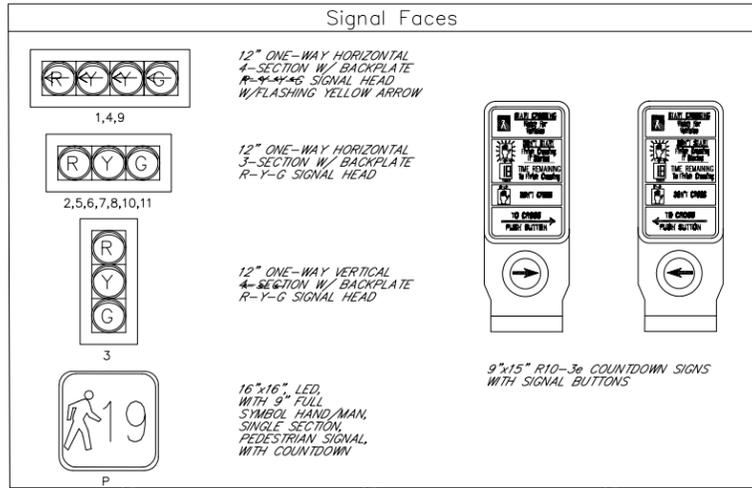
REVISIONS:

BRYAN - COLLEGE STATION
STANDARD WATER DETAILS



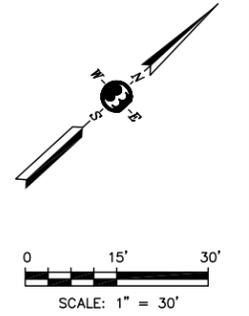
DRAWN BY: C.L.M.
DATE: 06-01-12
SCALE: N T S
APPROVED: W.P.K.
FIGURE:
W7
SHEET 7 OF 7

PROJECT BENCHMARK: Railroad spike for a benchmark on a 14' Elm tree about 139 feet north of the centerline of the creek.
 X: 3560319.4857, Y: 10188662.1134, Elevation: 269.44



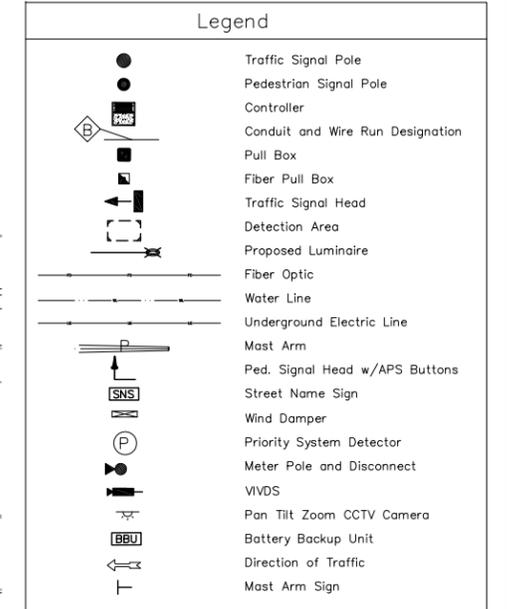
GENERAL NOTES:

1. Location of signal poles, controller and pull boxes shall be staked by the Contractor and approved by the traffic signal foreman.
2. All pavement markings shall be installed by the Contractor.
3. All conduits and fittings shall be made from PVC Schedule 40, gray in color.
4. Location of underground utilities are based on the most accurate information available. Contractor shall be responsible for locating all utilities in the way of construction, whether or not shown on plans.
5. All construction signs and barricades shall conform to the most recent edition of the Texas Manual on Uniform Traffic Control Devices.
6. The Contractor shall replace all curbs, pavement or sidewalks damaged by his forces during construction. Such repair shall be considered incidental to this project and shall not be considered as an additional cost to the city of College Station.
7. It shall be the responsibility of the Contractor to verify the exact location of all existing underground utilities. Furthermore, the Contractor shall contact all utility company representatives a minimum of 48 hours in advance of any excavation. Contact Texas One Call at 811.

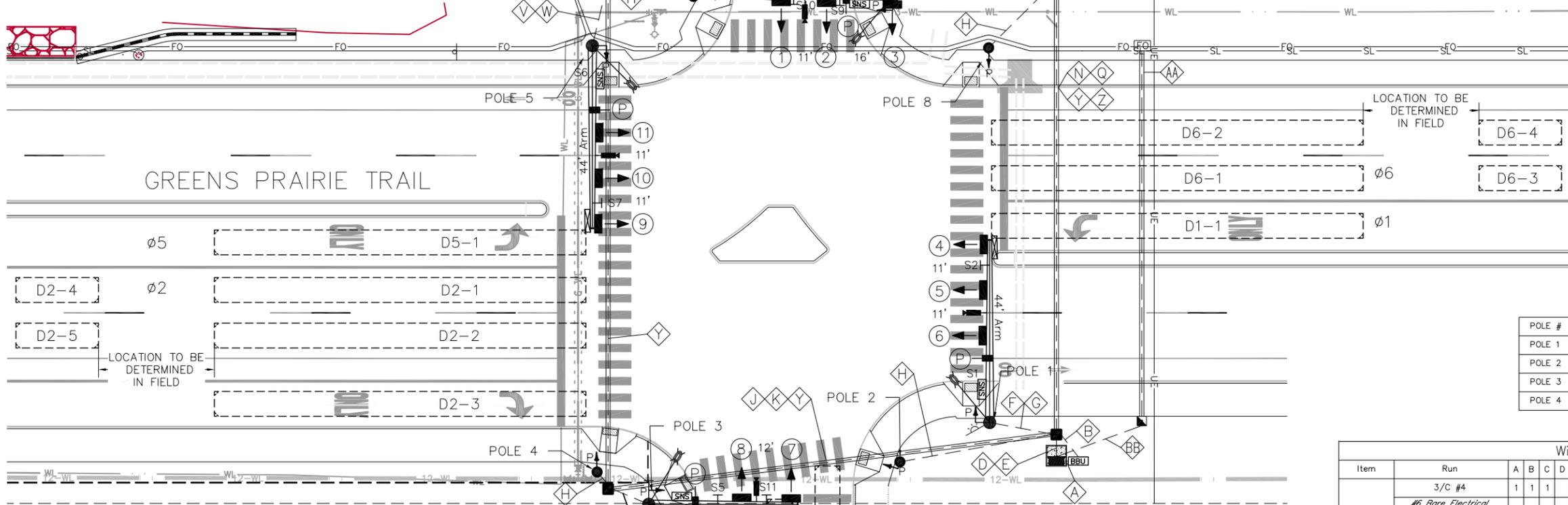


AT LEAST 72 HOURS BEFORE DRILLING FOR POLE FOUNDATIONS OR BEGINNING TRENCHING OPERATIONS, THE CONTRACTOR SHALL NOTIFY THE FOLLOWING:

- | | |
|------------------------------|--------------|
| CITY ENGINEERING OFFICE | 979-764-3570 |
| CITY ELECTRICAL DIST. OFFICE | 979-764-3674 |
| CITY WATER/WASTE WATER | 979-764-3838 |
| VERIZON SOUTHWEST | 800-344-8377 |
| ATMOS | 979-774-2506 |
| SUDENLINK CABLE | 979-595-2429 |
| CITY PUBLIC WORKS DEPARTMENT | 979-764-3695 |



POLE #	STATION	OFFSET	POLE #	STATION	OFFSET
POLE 1	27+92.69	45.50 - RT	POLE 5	26+96.46	45.50 - LT
POLE 2	27+70.95	54.99 - RT	POLE 6	27+20.94	57.40 - LT
POLE 3	27+10.11	65.24 - RT	POLE 7	27+69.20	57.49 - LT
POLE 4	26.97.59	57.44 - RT	POLE 8	27+92.45	45.00 - LT



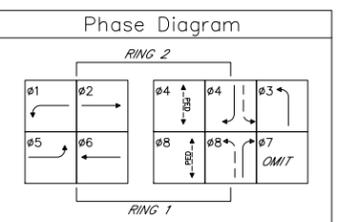
SPECIAL NOTES:

1. Contractor shall supply and install all new permanent signs.
2. After signal installation is complete, all signal heads shall remain bagged until city authorizes signal turn-on.
3. Contractor shall provide and install all conduit and wiring beginning from the meter pedestal to the signal installation. Contractor shall provide and install 2" PVC conduit from meter pedestal to power source pole. Contractor shall extend conduit elbow upward adjacent to the pole, and end the conduit 6" to 8" above the ground. Contractor shall cap the conduit with a PVC cap. City of College Station shall provide and install wire and remaining conduit from power source to meter pedestal. Contractor shall coordinate power installation with City Electrical Distribution Office and obtain necessary permits.
4. Existing STOP signs and other signs labeled for removal shall be removed at signal turn-on and delivered to a location within the city of College Station as specified by the Inspector.
5. All signal lenses shall be L.E.D.
6. Contractor shall install L.E.D. confirmation lights on all signal poles.
7. Luminaire arms shall be installed directly above signal mast arms.
8. All new pavement markings shall be thermoplastic.
9. Contractor shall exercise appropriate caution and insure that all appropriate traffic control devices called for in the traffic control plan are in place before performing any work within right-of-way.

VVDS Detection Details

AREA	Function
D1-1	DCE #1
D2-1, D2-2, D2-3	DCE #2
D2-4, D2-5	CE #2
D3-1	DCE #3
D4-1	DCE #4
D5-1	DCE #5
D6-1, D6-2	DCE #6
D6-3, D6-4	CE #6
D8-1	DCE #8

DCE - Delay Call and Extend, CE - Call and Extend



Color Sequence Chart

Phase	ø1 + ø5	CLR to ø2 + ø6	ø2 + ø6	CLR to ø4 + ø8	ø4 + ø8	CLR to ø3 + ø8	ø3 + ø8	CLR to ø1 + ø5	Emergency Flash
Signal Face									
1	RA	RA	RA	RA	FYA	YA	GA	YA	RA
2	R	R	R	R	G	G	G	Y	R
3	R	R	R	R	G	G	G	Y	R
4	GA	YA	FYA	YA	RA	RA	RA	RA	RA
5	R	R	G	Y	R	R	R	R	R
6	R	R	G	Y	R	R	R	R	R
7	R	R	R	R	G	Y	R	R	R
8	R	R	R	R	G	Y	R	R	R
9	GA	YA	FYA	YA	RA	RA	RA	RA	RA
10	R	R	G	Y	R	R	R	R	R
11	R	R	G	Y	R	R	R	R	R

R-RED BALL, Y-YELLOW BALL, G-GREEN BALL
 RA-RED ARROW, YA-YELLOW ARROW, GA-GREEN ARROW
 FYA-FLASHING YELLOW ARROW

Wire Run

Item	Run	A	B	C	D	E	F	G	H	J	K	L	M	N	Q	R	S	T	U	V	W	X	Y	Z	AA	BB
Wire	3/C #4	1	1	1																				1	1	
	#6 Bare Electrical Conductor (ground wire)	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	3-1/C #10			4			1		1		1				2		1		3				1			
	Opticom Infrared System Model 138 Cable						4		1		1		1			2		1				1				
	5/C #14						8		1		2		1			4		1				2				
Conduit	7/C #14						7		2		2		1		4		2				2		2			
	3/C #16 Confirmation Light						4		1		1		1			2		1					1			
	1" PVC																							1	1	
	2" PVC																							1	1	
CCTV	2" PVC Bore																								1	
	3" PVC Bore																								1	
	4" PVC Bore																								1	
	CAT 6 ETHERNET CABLE																								1	

Binkley & Barfield, Inc.
 1801 Gateway Blvd., Suite 101, Richardson, Texas 75080
 Telephone: (972) 644-2800 Fax: (972) 644-2817
 Website: www.binkleybarfield.com

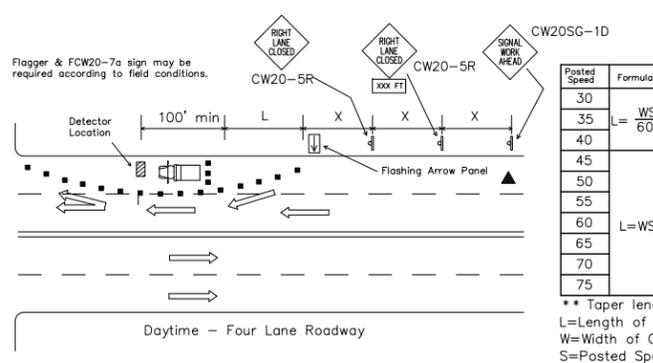
Professional Engineer License No. 10485
 State of Texas
 Mechanical
 Exp. 12/31/2016

THE CITY OF COLLEGE STATION

Revisions

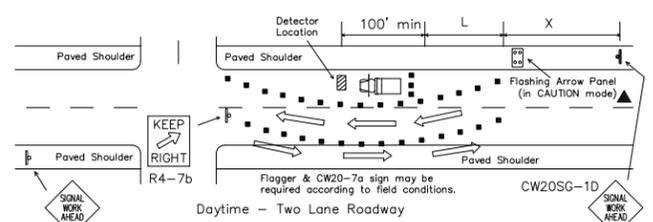
No.	Description

SIGNAL LAYOUT SHEET
 GREENS PRAIRIE TRAIL WIDENING
 COLLEGE STATION, TEXAS

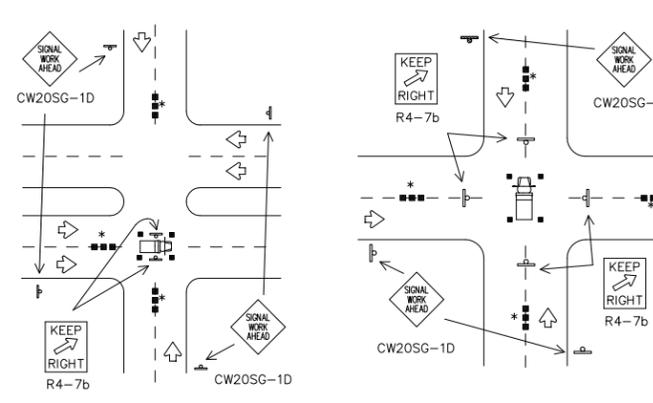


Posted Speed	Formula	Minimum Desirable Taper Lengths - FT			Suggested Maximum Spacing of Device			Minimum Sign Spacing X Distance
		10' Offset	11' Offset	12' Offset	On a Taper	On a Tangent		
30	$L = \frac{WS^2}{60}$	150'	165'	180'	30'	60'-75'	120'	
35		205'	225'	245'	35'	70'-90'	160'	
40	L=WS	265'	295'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

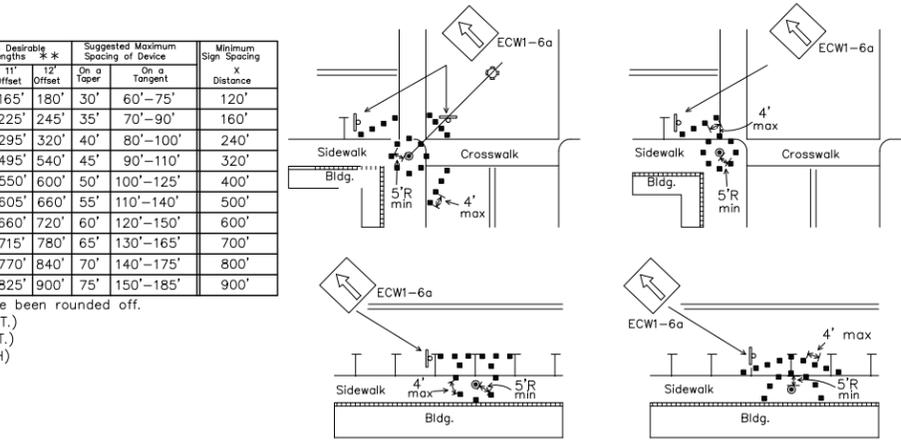
** Taper lengths have been rounded off.
L=Length of Taper (FT.)
W=Width of Offset (FT.)
S=Posted Speed (MPH)



TYPICAL DETECTOR INSTALLATION
OR OTHER WORK OPERATIONS THAT ARE SHORT TERM OR SHORT DURATION
Nighttime Channelizing Devices shall be reflectorized.

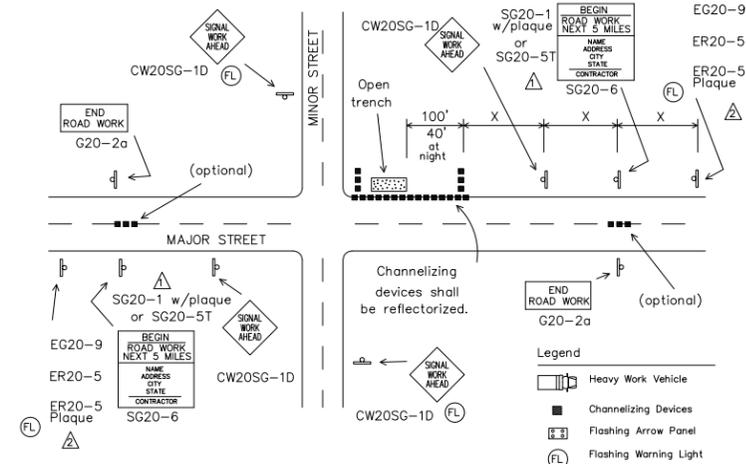


TYPICAL HANGING SIGNAL INSTALLATIONS
OR OTHER WORK OPERATIONS THAT ARE SHORT TERM OR SHORT DURATION
* Advance warning channelizing devices are optional.

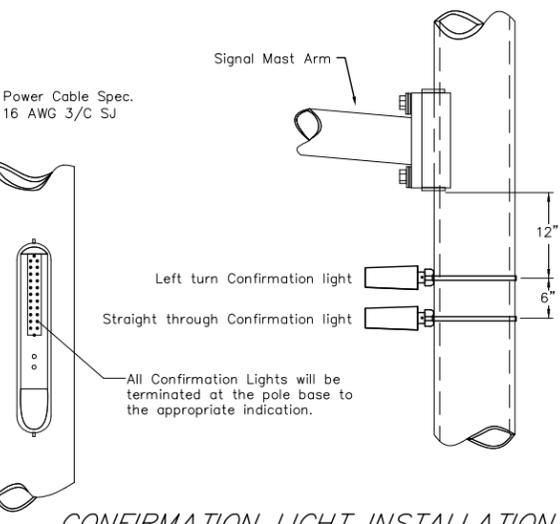


Channelizing devices should not be placed closer than 5 foot radius (minimum) to signal poles.
Parking may be eliminated by placing channelizing devices in spaces.
If pedestrian walkways are blocked, refer to the Texas Manual on Uniform Traffic Control Devices (TMUTCD) Part 6.

TYPICAL RESTRICTED PEDESTRIAN MOVEMENTS
FOR ALL WORK OPERATIONS REGARDLESS OF WORK DURATION

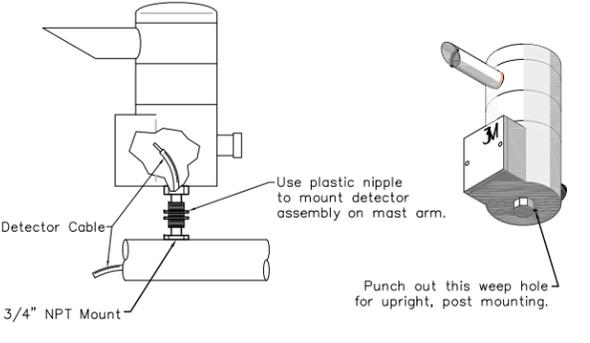


TYPICAL ADVANCE SIGNING
FOR LONG TERM and INTERMEDIATE-TERM STATIONARY WORK OPERATIONS
Observe Warning Signs State Law (R20-3) shall be required. See BC(2).
Location will be as directed by the Engineer.

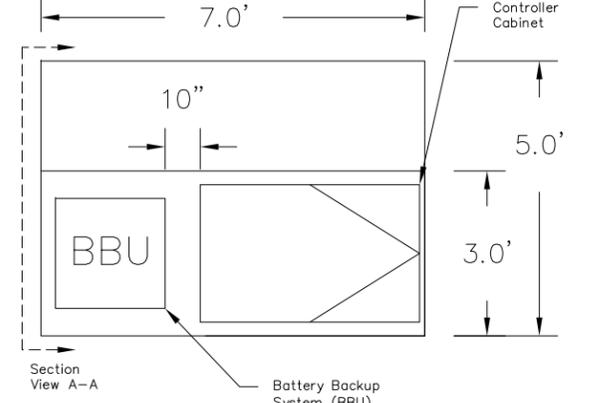


CONFIRMATION LIGHT INSTALLATION

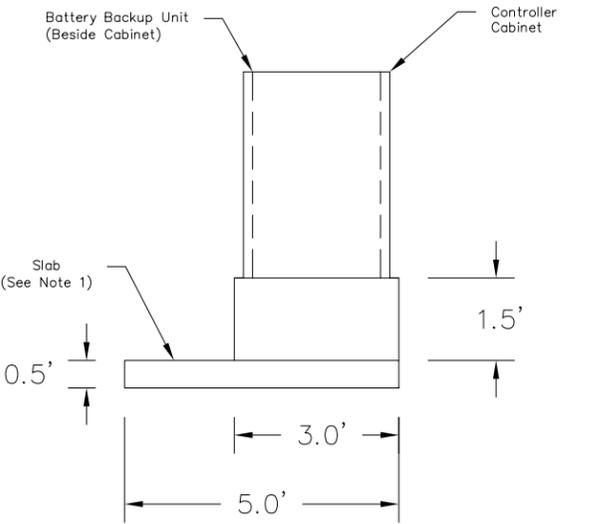
- ▲ The arrow panel may be omitted when stated elsewhere in the plans.
- 1. Typical channelizing device is the 28" cone.
- 2. Plastic drums or vertical panels may be used if approved by the Engineer.
- 3. For several closely adjoining projects, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits.
- 4. See details elsewhere in the plans for advance signing requirements.
- 5. Advance signs shall be in place when signal construction operations are in progress.
- 6. The contractor shall remove advance signs when no construction operations are underway.
- 7. Obstructions or hazards at the work area shall be clearly marked and delineated at all times.
- 8. All holes, trenches or other hazardous areas shall be adequately protected by lights or other protective devices.
- 9. Trenches shall be covered or surrounded with orange plastic construction fence as directed by the Engineer.
- 10. Flagger and FCW20-7a sign may be required according to field conditions.
- 11. Vehicles parked in roadway shall be equipped with two strobes.
- 12. High level flags at corners of vehicle may also be used.
- 13. Work operations that require work vehicle in traveled way 20 minutes or less may use cones, high level flags and strobes as advance warning devices.
- 14. Cones should only be placed around vehicle.



DETECTOR MOUNT AND WEEP HOLE LOCATION
PRIORITY CONTROL SYSTEM DETECTOR INSTALLATION

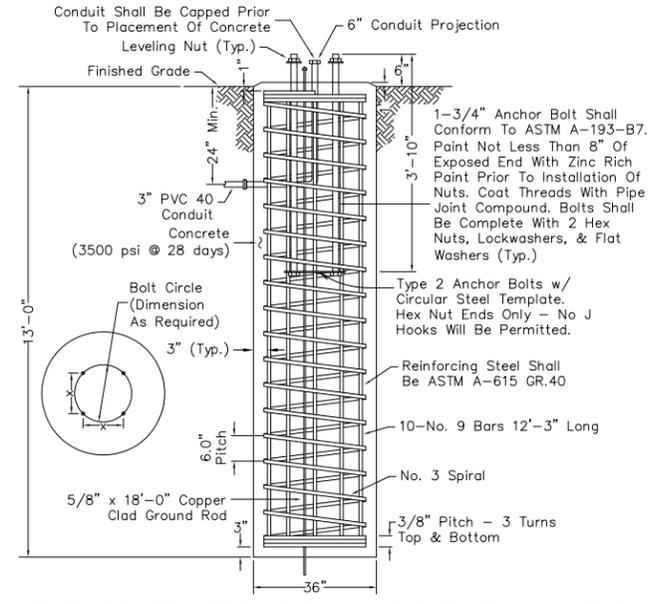


CONTROLLER CABINET/BBU CONFIGURATION PLAN VIEW

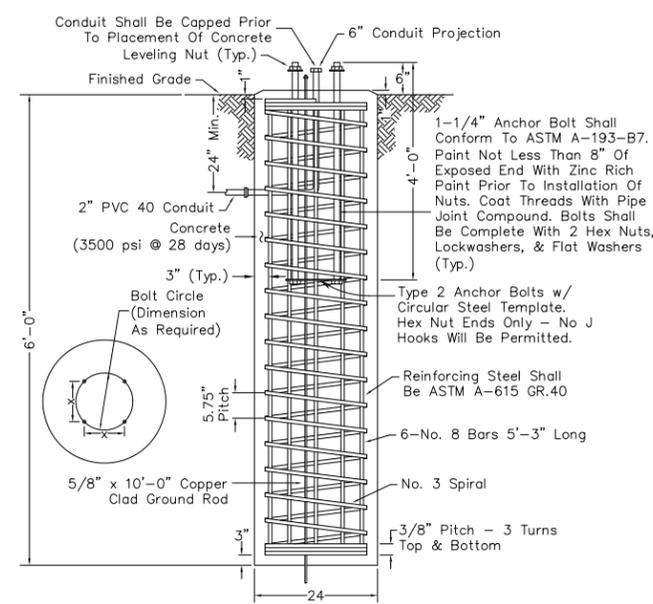


CABINET/BBU CONFIGURATION SECTION VIEW A-A

CABINET/BBU NOTES:
1. Refer to TxDOT details TS-CF-04 for information on reinforcement of the cabinet pad.



CANTILEVER TRAFFIC SIGNAL POLE FOUNDATION
(Not To Scale)
(Single Mast Arms 33'-48' in Length)



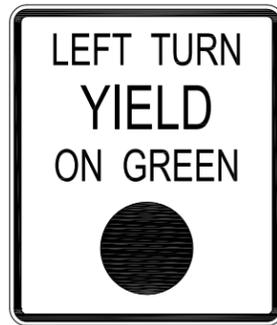
PEDESTAL POLE FOUNDATION
(Not To Scale)

Binkley & Barfield, Inc.
1801 Gateway Blvd., Suite 101, Richardson, Texas 75080
Phone: (972) 644-2800 Fax: (972) 644-2817
www.binkleybarfield.com

THE CITY OF COLLEGE STATION

MISCELLANEOUS DETAILS
GREENS PRAIRIE TRAIL WIDENING
COLLEGE STATION, TEXAS

103
Of 185 Sheets



R10-12
(30x36)
"S11"



R10-17T
(36x42)
"S2, S7, S10"



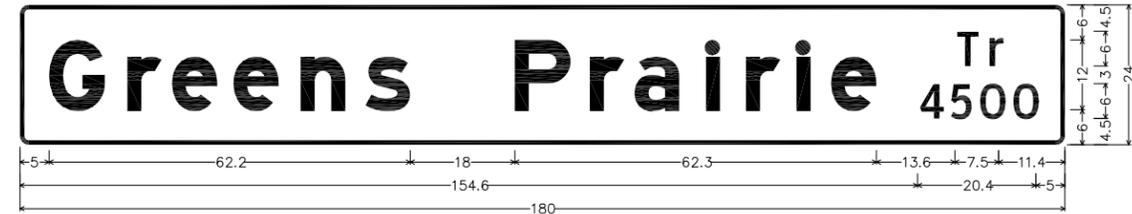
R3-27
(36x36)
"S4"



R3-8CT
(30x30)
"S5"

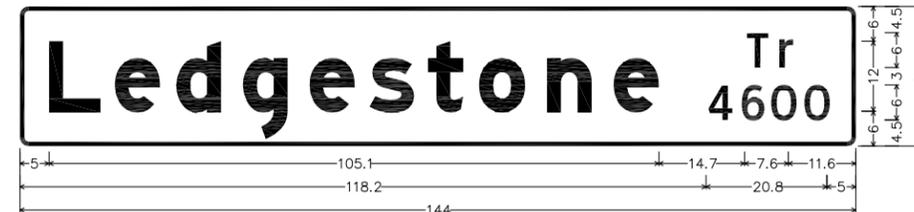


R3-8LR
(30x30)
"S9"



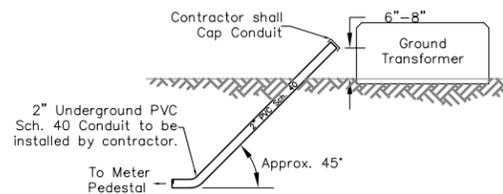
1.5" Radius, 0.8" Border, White on Green;
[Greens Prairie] E Mod; [Tr] ClearviewHwy-3-W; [4500] ClearviewHwy-3-W;

STREET NAME SIGN DETAIL "S3 & S8"
Not to scale

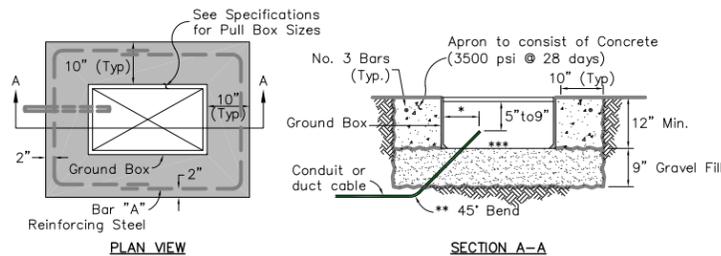


1.5" Radius, 0.8" Border, White on Green;
[Ledgestone] E Mod; [Tr] ClearviewHwy-3-W; [4600] ClearviewHwy-3-W;

STREET NAME SIGN DETAIL "S1 & S6"
Not to scale

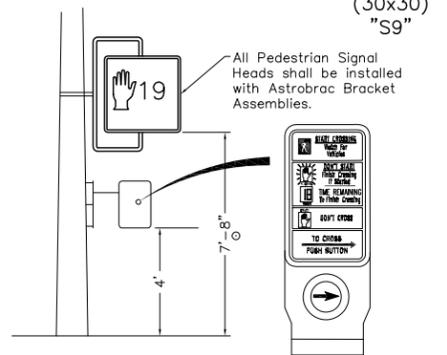


Power Outlet From Ground Transformer



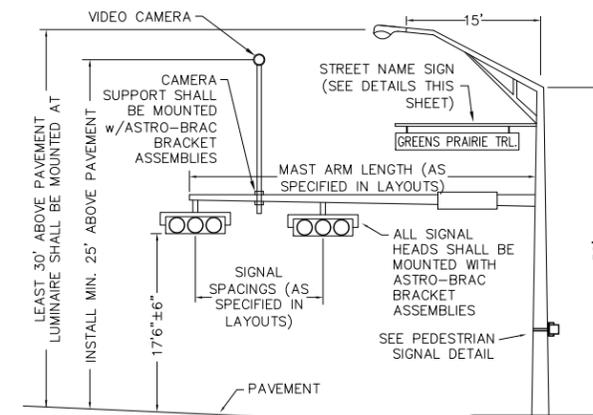
- * Final position of end of conduit shall not exceed one-half of the distance to the side of the box opposite of the conduit entry.
- ** 90° when approved by the engineer.
- *** Place gravel "under" the box, not "in" the box. Gravel should not encroach on the interior volume of the box.

Apron For Ground Boxes

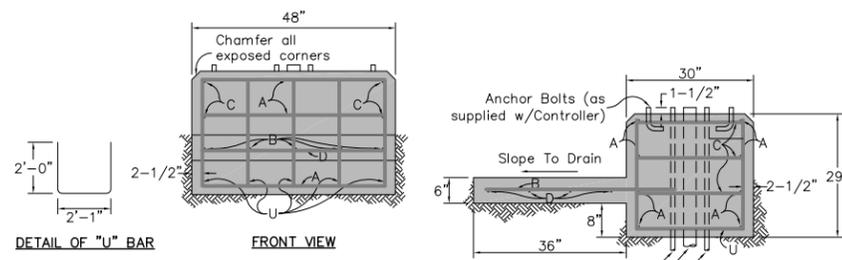


NOTE: The Pedestrian Push Button and Sign Shall be positioned to face parallel with the direction the Pedestrian will be traveling.

Pedestrian Signal Detail



Signal Pole, Video Camera, Street Name Sign And Luminaire Mountings

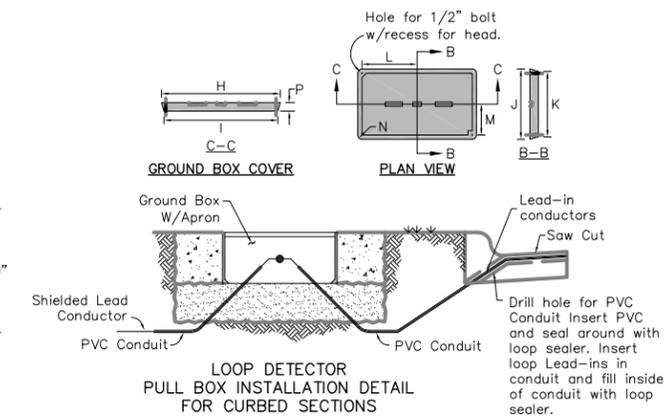


BAR NO.	SIZE	SPACE	LENGTH	WEIGHT
"A"	#4	8"	3'-7"	19
"B"	#4	11"	3'-9"	13
"C"	#4	8"	2'-1"	8
"D"	#4	10"	3'-7"	10
"U"	#4	11"	6'-1"	20
TOTAL				70

5/8"x12" Copper Ground Rod
Conduit to Pullbox (as shown on plans)
Conduit to Power Source (as shown on plans)

QUANTITIES FOR CONTROLLER PEDESTAL		
ITEM	UNIT	QUANT.
CONCRETE (3500 psi @ 28 DAYS)	C.Y.	1.12
REINFORCING STEEL	LB	70

Controller Pedestal



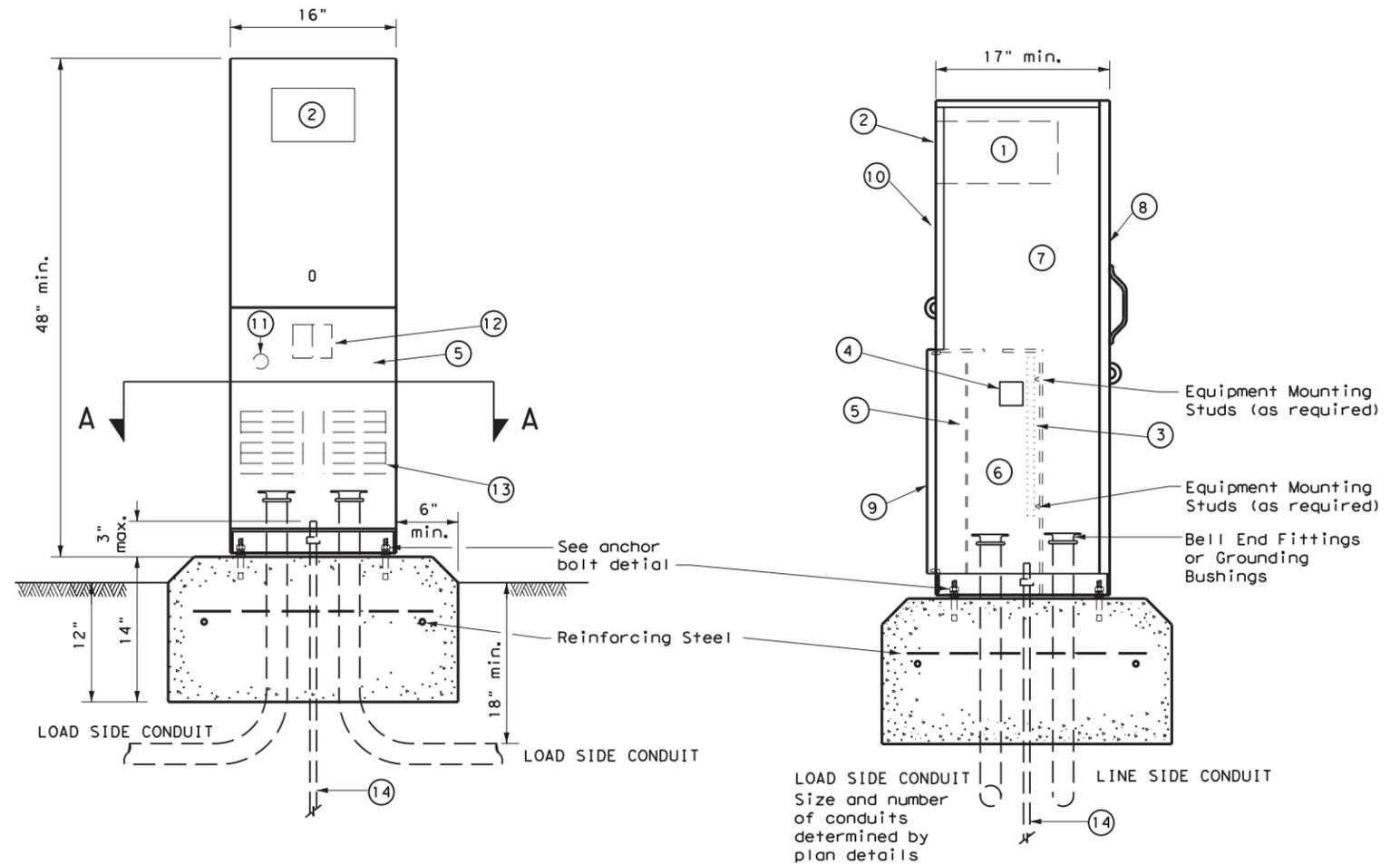
TYPE	BOX SIZE	GROUND BOX COVER DIMENSIONS (INCHES)							
		H	I	J	K	L	M	N	P
B	11.5"x21"x20"	23-1/4	23	13-3/4	13-1/2	9-7/8	5-1/8	1-3/8	2
D	15.25"x28.25"x20"	30-1/2	30-1/4	17-1/2	17-1/4	13-1/4	6-3/4	1-3/8	2

Typical Pull Box Details

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

PEDESTAL SERVICE NOTES

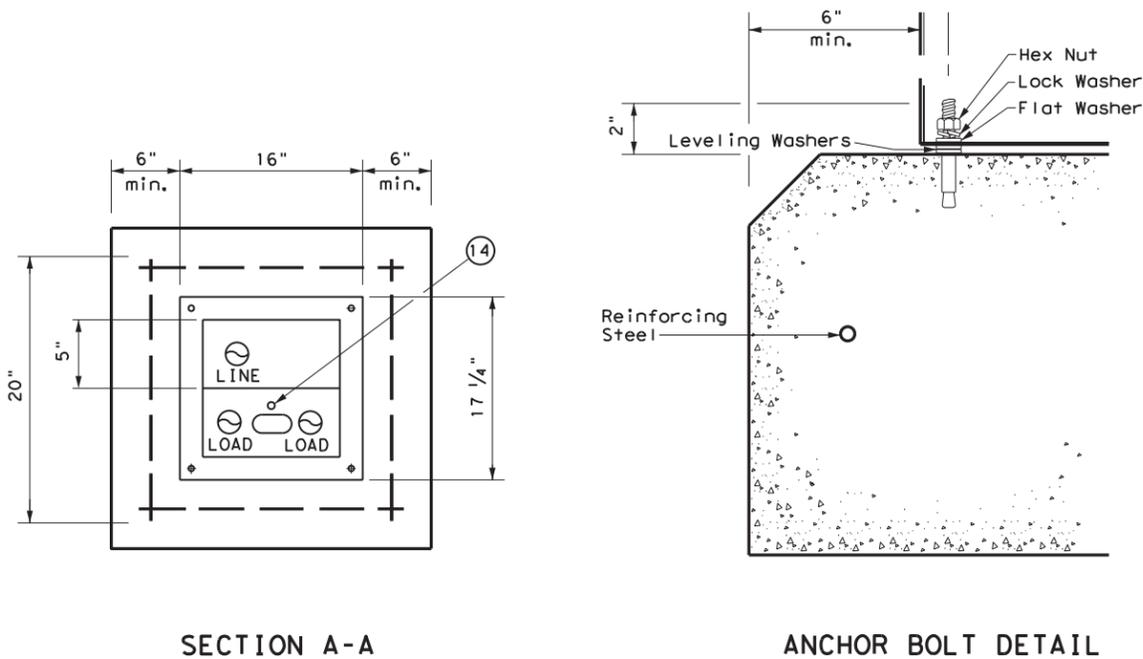
1. Manufacture pedestal electrical services in accordance with Departmental Material Specifications (DMS) 11080 "Electrical Services", 11085 "Electrical Services-Pedestal (PS)" and Item 628 "Electrical Services." Provide pedestal electrical services as listed on the Material Producers List (MPL) on the Department's web site under "Roadway Illumination and Electrical Supplies," Item 628. Ensure all mounting hardware and installation details of services meet utility company specifications. Contact the local utility company for approval of pedestal details prior to installing the electrical pedestal service. Submit any changes required by the utility company prior to manufacturing the pedestal enclosure.
2. When a meter socket is required, provide a socket with a minimum 100 amp rating that complies with local utility requirements.
3. Provide Class A or C concrete for pedestal service foundations in accordance with Item 420, "Concrete Substructures," except that concrete will not be paid for directly but is considered subsidiary to Item 628.
4. Provide #4 reinforcing steel for foundations in accordance with Item 440, "Reinforcement for Concrete."
5. Install 1/2 in. X 2 1/16 in. minimum length concrete single expansion type anchors for mounting pedestal enclosure to foundation. Anchor location to match mounting holes in each corner of enclosure. Secure each of the four corners of the pedestal enclosure to the anchors in the foundation with a 1/2 in. galvanized or stainless steel machine thread bolt, a properly sized locknut and a flat washer.
6. Finish top of concrete foundation in a neat and workmanlike manner. If leveling washers are used, ensure no more than 1/8 in. gap at any corner. Do not exceed a maximum dip or rise in the foundation of 1/8 in. per foot. When properly installed, ensure the top of the service enclosure is level front to back and side to side within 1/4 in. Repair rocking or movement of the service enclosure at no additional cost to the department.
7. Do not use liquidtight flexible metal conduit (LFMC) on pedestal type services.
8. Ensure all elbows in the foundation are sized as per utility provider's conduit requirements for underground conduit and feeders. PVC extensions may be installed provided the ends of the rigid metal conduits are more than 2 in. below the top of the concrete foundation. Where extension conduits are metal, grounding bushings must be installed with a bonding jumper properly terminated.



FRONT VIEW

SIDE VIEW

TYPE C shown, TYPE A similar except that TYPE A shall have individual circuit breakers (CB) mounted on an equipment mounting panel. CB Handles shall protrude through hinged deadfront trim.



SECTION A-A

ANCHOR BOLT DETAIL

LEGEND

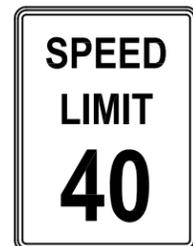
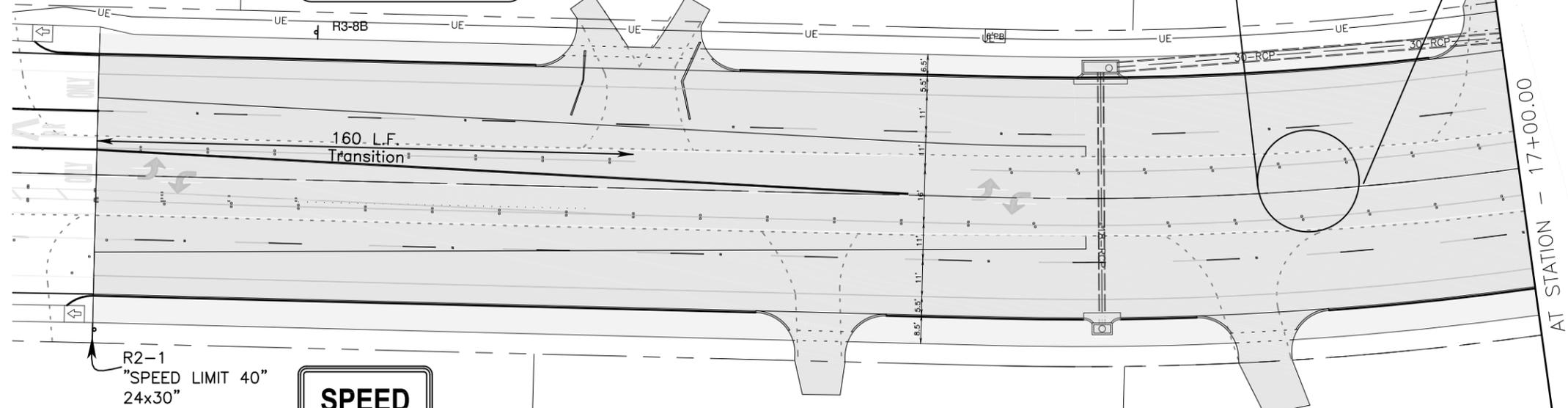
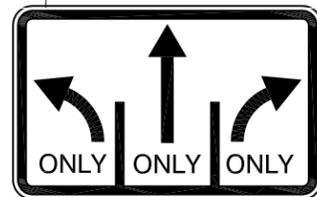
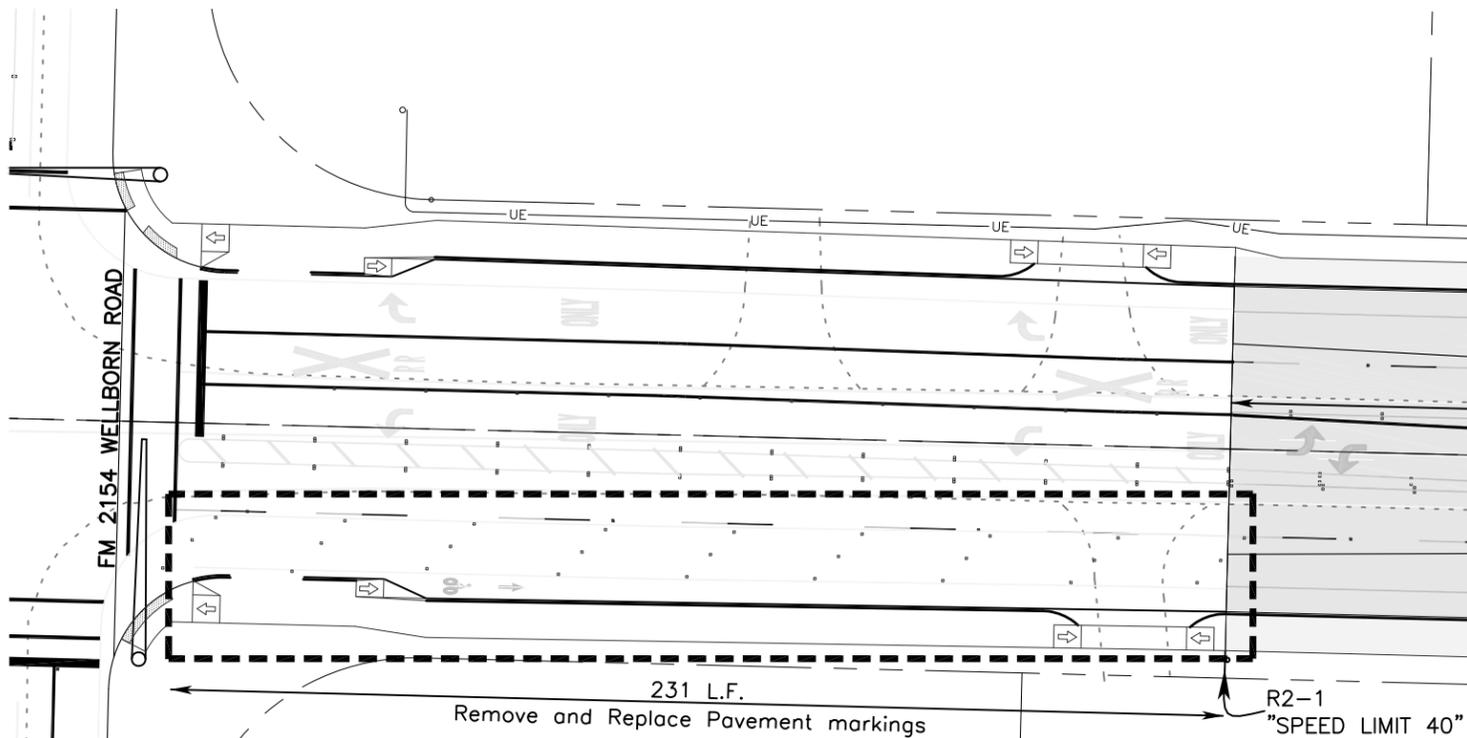
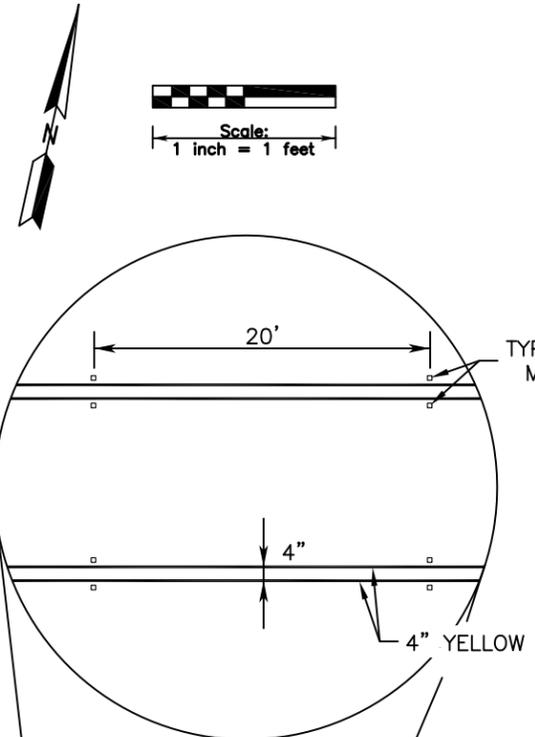
1	Meter Socket, (when required)
2	Meter Socket Window, (when required)
3	Equipment Mounting Panel
4	Photo Electric Control Window, (When required)
5	Hinged Deadfront Trim
6	Load Side Conduit Trim
7	Line Side Conduit Area
8	Utility Access Door, with handle
9	Pedestal Door
10	Hinged Meter Access
11	Control Station (H-O-A Switch)
12	Main Disconnect
13	Branch Circuit Breakers
14	Copper Clad Ground Rod - 5/8" X 10'

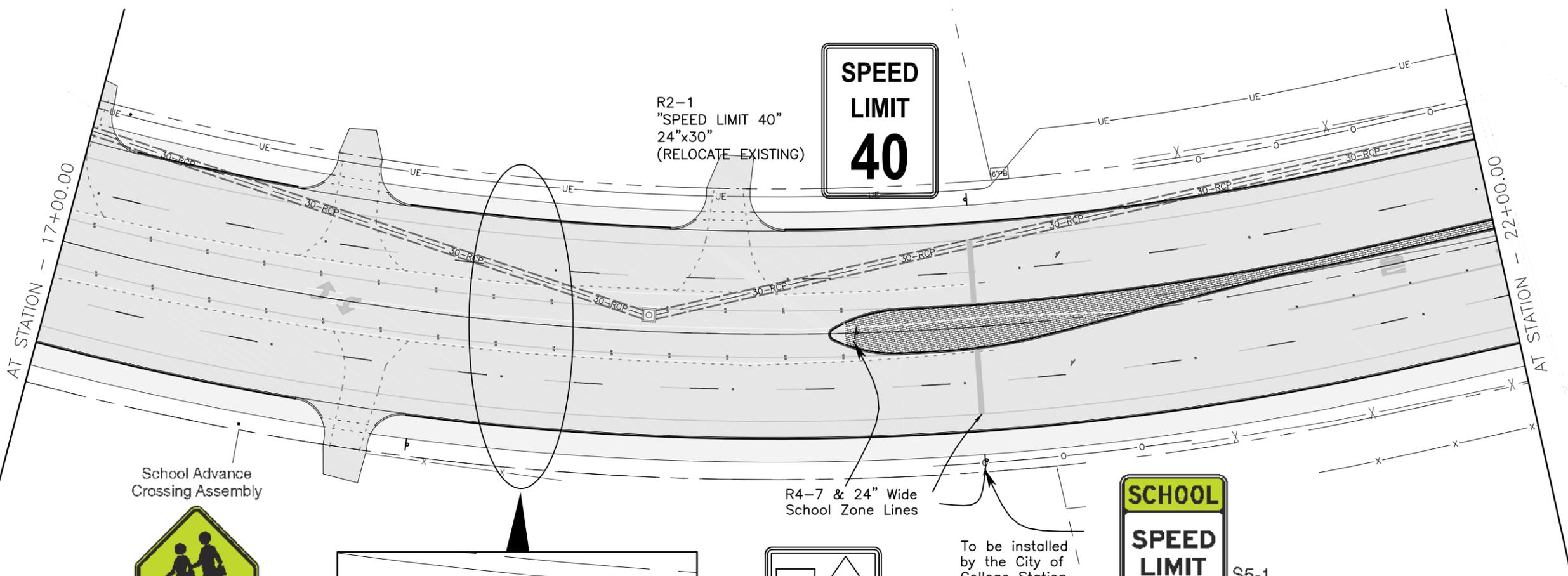
		Traffic Operations Division Standard	
ELECTRICAL DETAILS ELECTRICAL SERVICE SUPPORT PEDESTAL SERVICE TYPE PS			
ED(9) - 14			
FILE: ed9-14.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT
© TxDOT October 2014	CONT	SECT	JOB
REVISIONS			HIGHWAY
DIST	COUNTY	SHEET NO.	
		105 of 185	

DATE:
FILE:

Striping and Signing Notes:

1. ALL STRIPING SHALL CONFORM TO TxDOT STANDARD SPECIFICATION 666, "REFLECTORIZED PAVEMENT MARKINGS." ALL STRIPING ON CONCRETE PAVEMENT SHALL BE TYPE I, THERMOPLASTIC. ALL STRIPING ON ASPHALT PAVEMENT SHALL BE TYPE II, TRAFFIC PAINT. THIS PROJECT SHALL REQUIRE CONTRAST MARKINGS IN ACCORDANCE WITH TxDOT STANDARDS PM(CLL)-14 USING LIQUID APPLICATIONS (MULTIPOLYMER, THERMOPLASTIC, ETC.)
2. ALL TURN LANE ARROWS, "ONLY", ETC, SHALL CONFORM TO TxDOT STANDARD SPECIFICATION 668, "PREFABRICATED PAVEMENT MARKINGS"
3. ALL RAISED PAVEMENT MARKERS ON ASPHALT PAVEMENT SHALL CONFORM TO TxDOT STANDARD SPECIFICATION 672, "RAISED PAVEMENT MARKINGS."
4. PAVEMENT MARKING FIELD LOCATIONS SHALL BE FULLY LAYED OUT AND BE APPROVED BY THE ENGINEER OR ENGINEER'S REPRESENTATIVE PRIOR TO APPLICATION.
5. ALL SIGN LOCATIONS SHALL BE STAKED AND APPROVED BY THE ENGINEER OR ENGINEER'S REPRESENTATIVE PRIOR TO PLACEMENT.
6. SEE TxDOT STANDARD DETAIL SHEETS PM(1-3)-12 AND PM(6)-01 FOR ADDITIONAL STRIPING AND PAVEMENT MARKING DETAILS NOT SHOWN ON THIS PLAN.
7. EXISTING "NO PARKING, STOPPING, STANDING" SIGNS SHALL BE REMOVED FROM THE SITE AND DELIVERED TO THE CITY OF COLLEGE STATION.
8. THE SCHOOL ZONE FLASHER SHALL BE INSTALLED BY THE CITY OF COLLEGE STATION.





R2-1
"SPEED LIMIT 40"
24"x30"
(RELOCATE EXISTING)

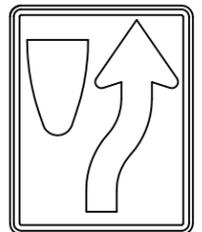


School Advance
Crossing Assembly



S1-1
SW16-9P

R4-7 & 24" Wide
School Zone Lines



To be installed
by the City of
College Station



S5-1

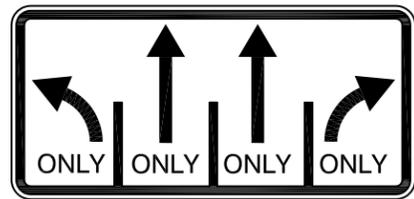


S7-1T
(optional)



20 Scale Inset
All dimensions to
face of curb and
centerline of stripe

FILENAME: 1533-8600-Striping & Signing.dwg
PLOTED: 28 Jul 2016 - 9:45 am



R3-8B



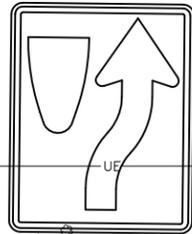
R4-4

AT STATION - 22+00.00

AT STATION - 27+00.00

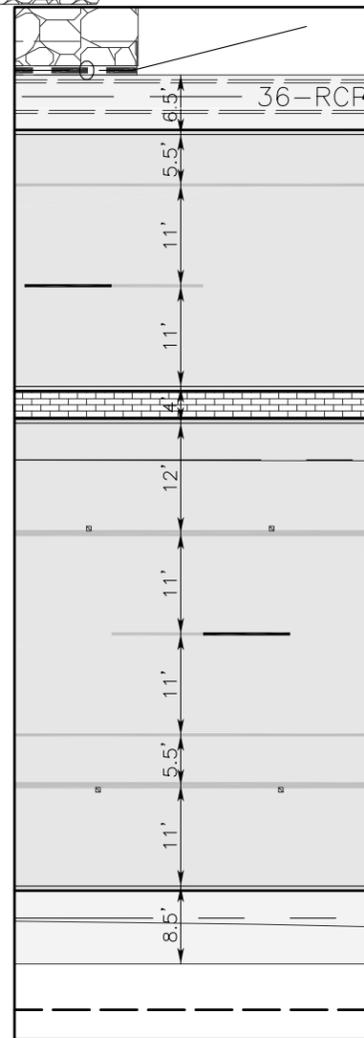
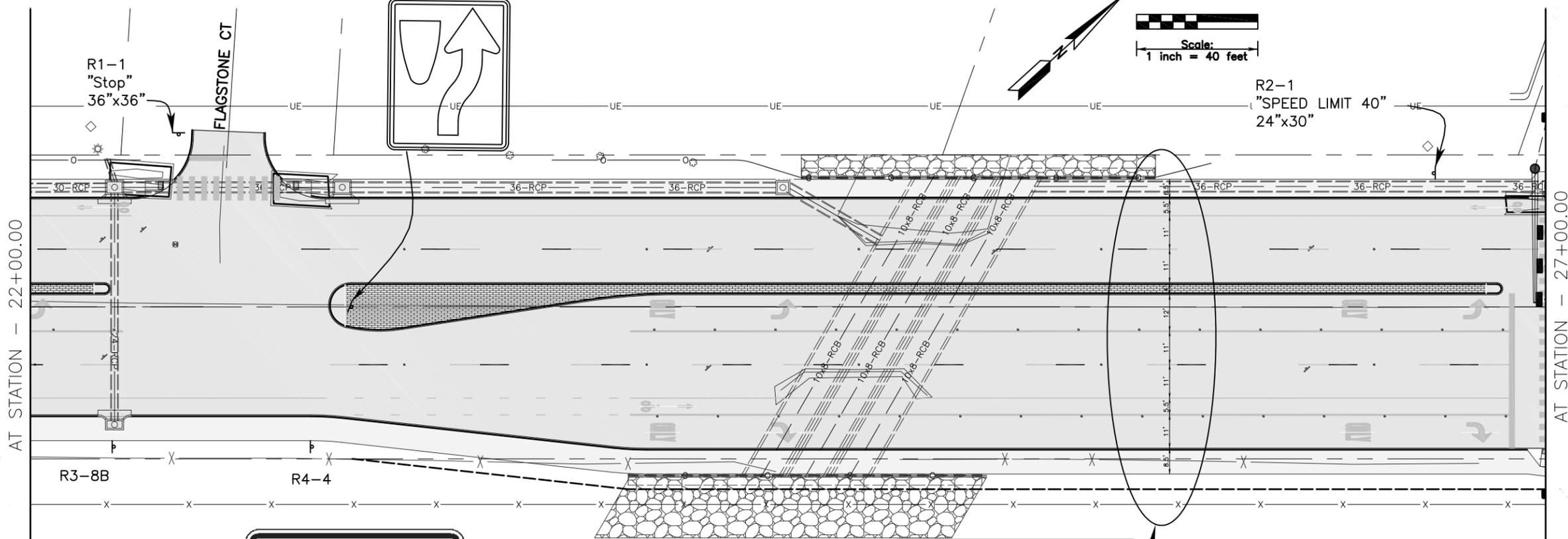
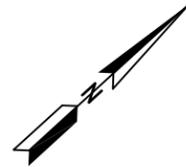
R1-1
"Stop"
36"x36"

FLAGSTONE CT



R2-1
"SPEED LIMIT 40"
24"x30"

Scale:
1 inch = 40 feet



20 Scale Inset
All dimensions to
face of curb and
centerline of stripe



T.979.260.6963
F.979.260.3564
FIRM# F-1443
3204 EARL RUDDER FWY S.
COLLEGE STATION, TX 77845

PLAN & DESIGN SPECIALISTS IN
CIVIL ENGINEERING • HYDRAULICS
HYDROLOGY • UTILITIES • STREETS
SITE PLANS • SUBDIVISIONS

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Job 2016
Designed By: JM
Drawn By: JM

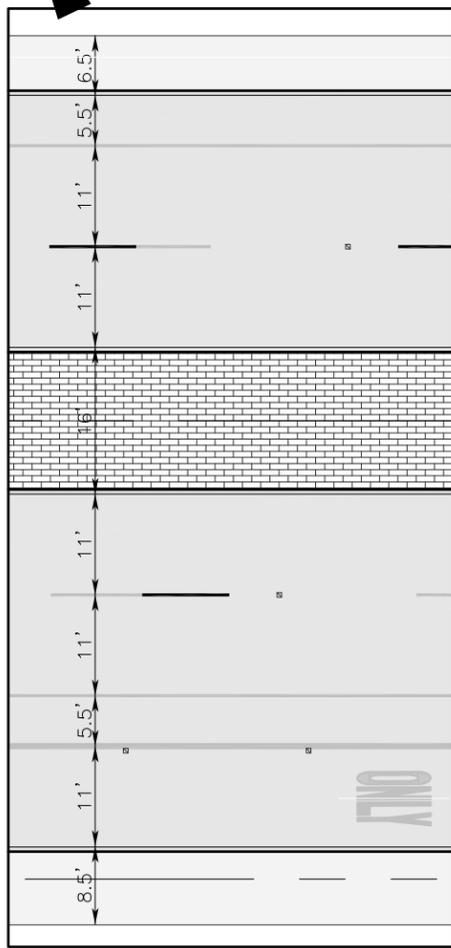
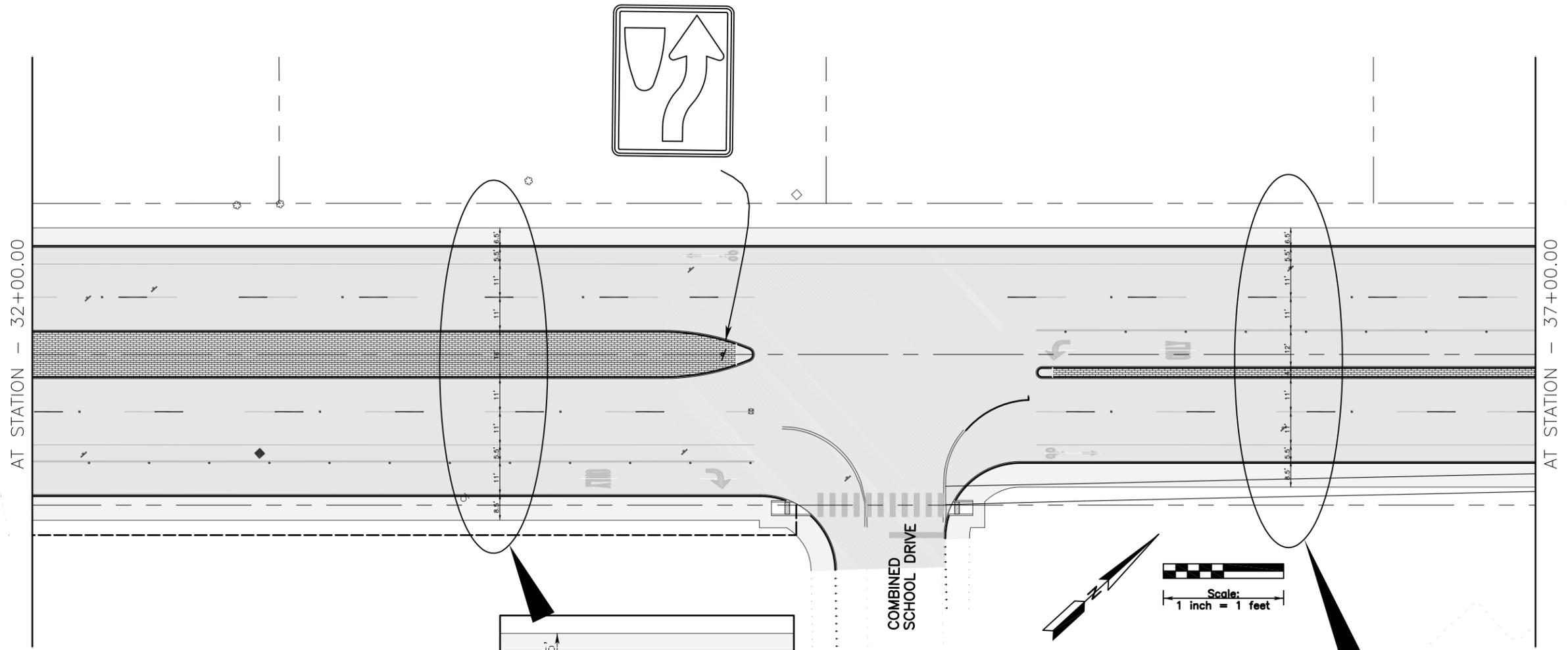
Prepared For:
City of College Station
Public Works Department
310 Krenek Tap Rd
College Station, TX
77840

Revisions

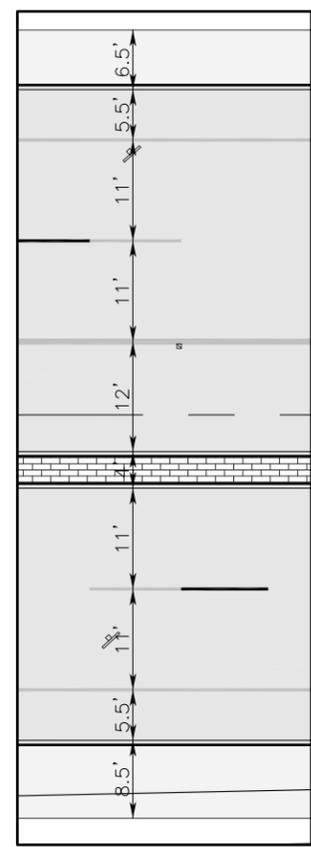
Striping & Signing
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

110

Of 190 Sheets

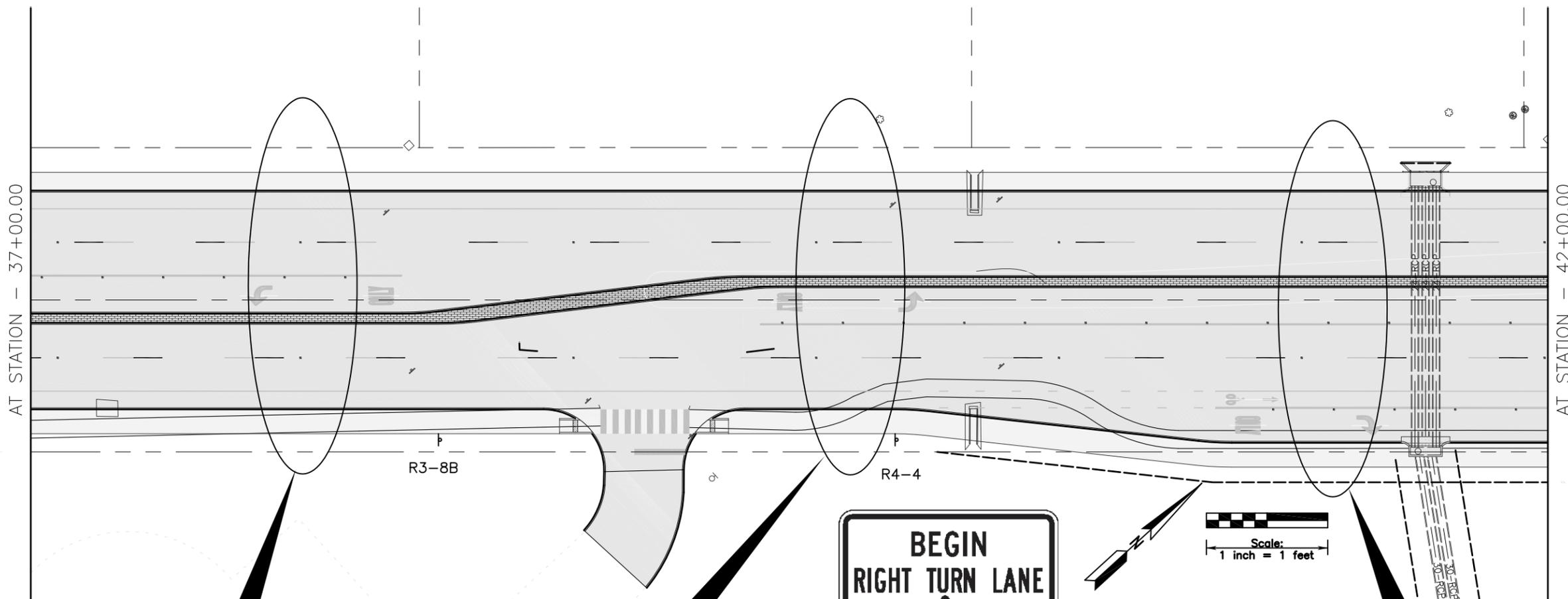


20 Scale Inset
 All dimensions to face of curb and centerline of stripe

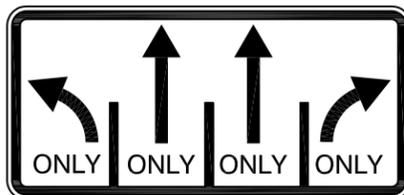


20 Scale Inset
 All dimensions to face of curb and centerline of stripe

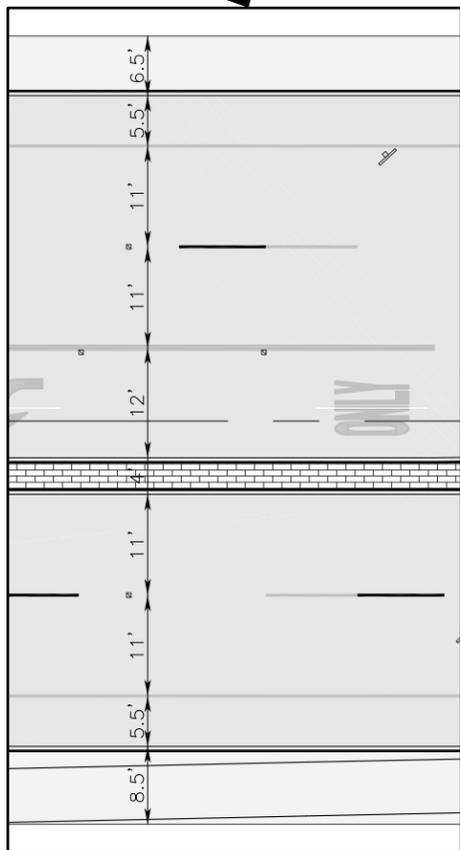
T.979.260.6963 F.979.260.3564 FIRM# F-1443 3204 EARL RUDDER FWY S. COLLEGE STATION, TX 77845	
PLAN & DESIGN SPECIALISTS IN CIVIL ENGINEERING • HYDRAULICS HYDROLOGY • UTILITIES • STREETS SITE PLANS • SUBDIVISIONS www.mitchellandmorgan.com	
July 2016 Designed By: JM Drawn By: JM	
Prepared For: City of College Station Public Works Department 310 Krenek Tap Rd College Station, TX 77840	Revisions
Striping & Signing GREENS PRAIRIE TRAIL ROADWAY CAPACITY IMPROVEMENTS	
112	
Of 190 Sheets	



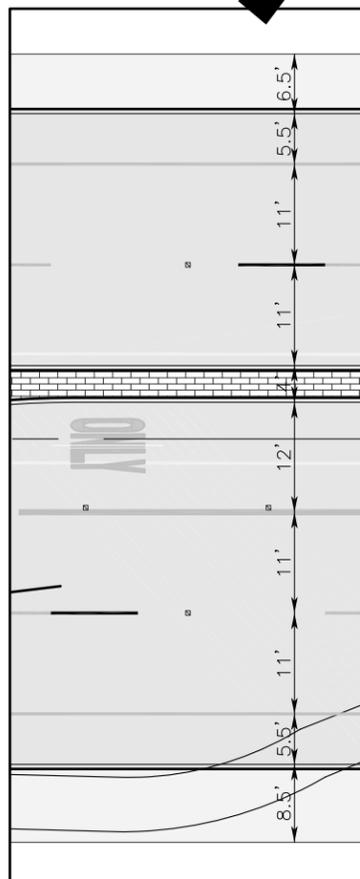
R4-4



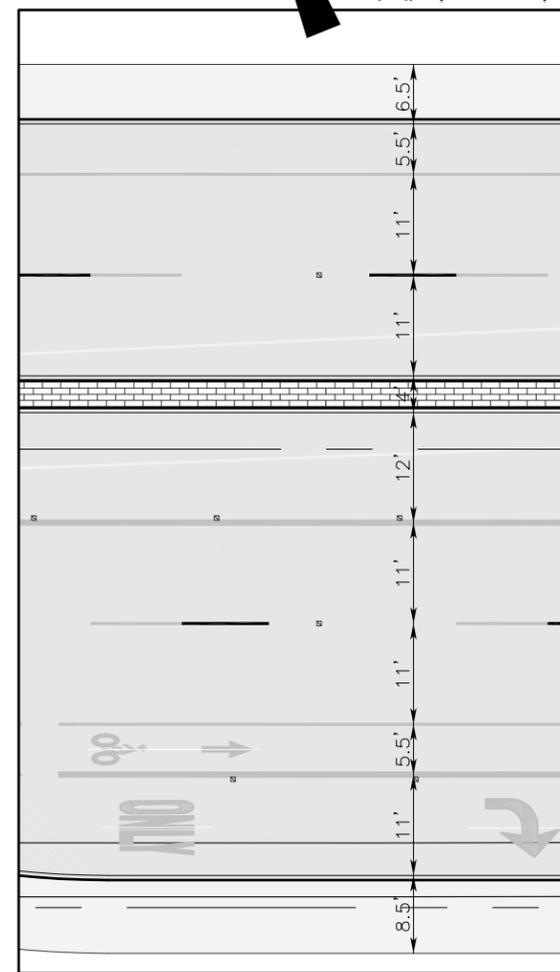
R3-8B



20 Scale Inset
All dimensions to face of curb and centerline of stripe

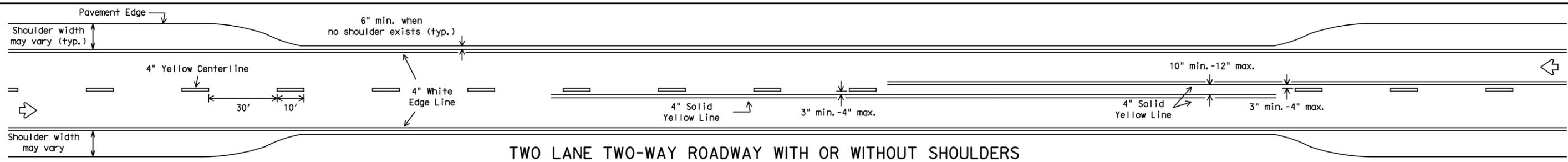


20 Scale Inset
All dimensions to face of curb and centerline of stripe

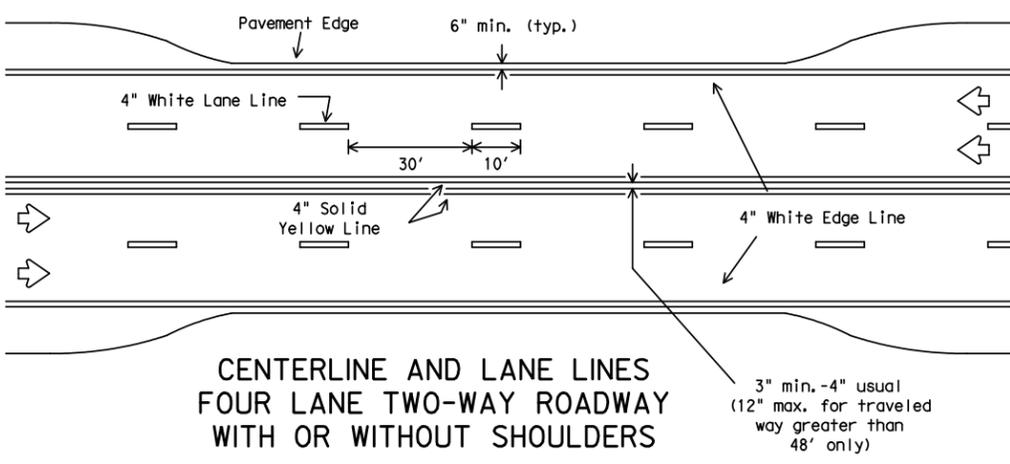


20 Scale Inset
All dimensions to face of curb and centerline of stripe

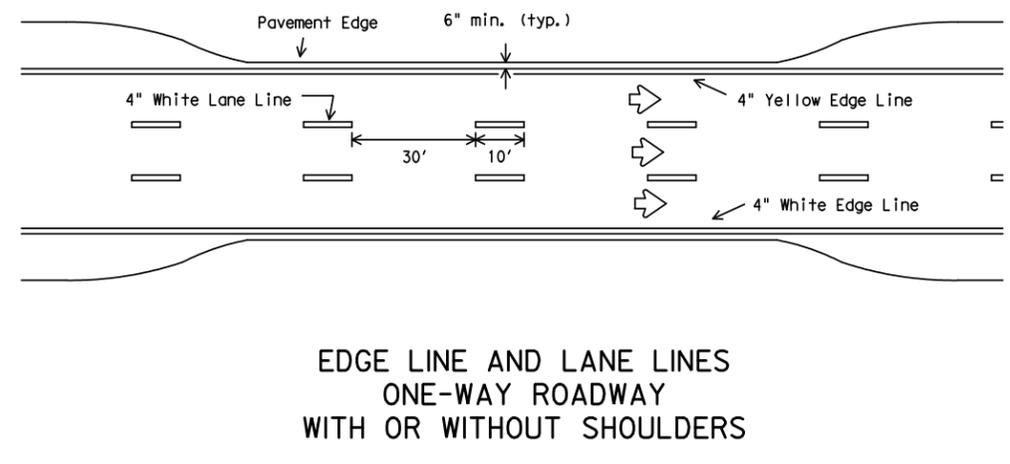
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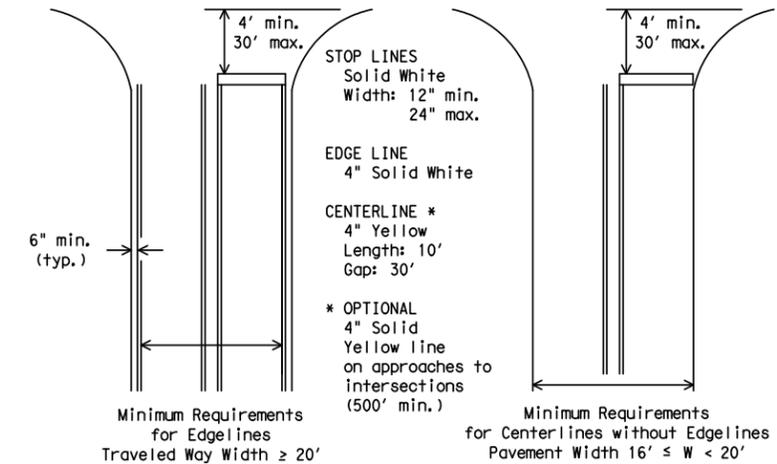
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



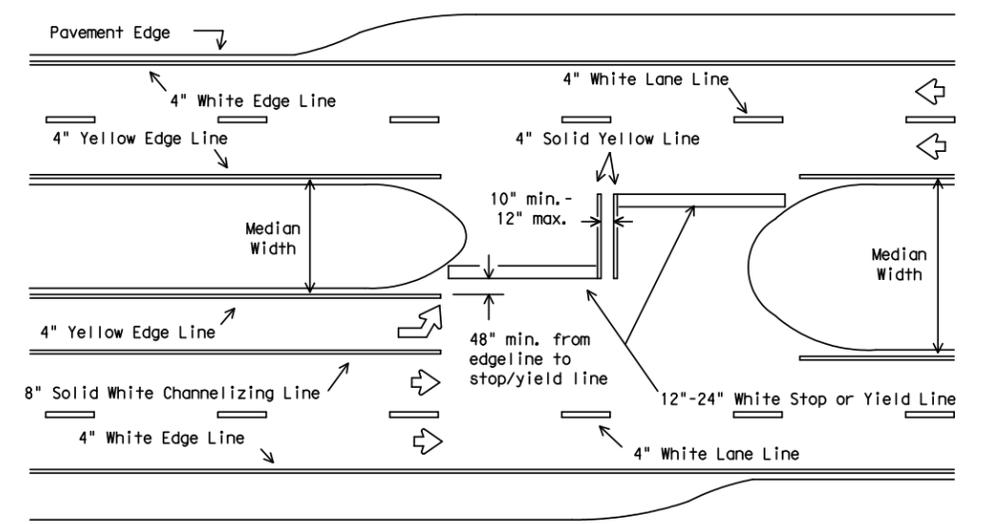
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



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

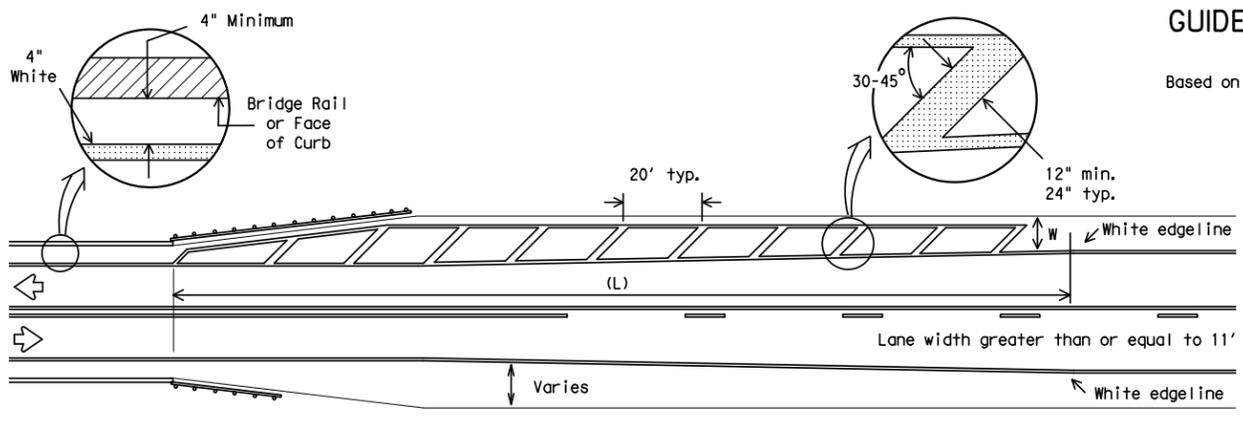


GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths for Undivided Highways



All medians shall be field measured to determine the location of necessary striping. Stop/Yield bars and centerlines shall be placed when the median width is greater than 30 ft. The median width is defined as the area between two roadways of a divided highway measured from edge of traveled way to edge of traveled way. The median excludes turn lanes. The median width might be different between intersections, interchanges and of opposite approaches of the same intersection. The narrow median width will be the controlling width to determine if markings are required.

FOUR LANE DIVIDED ROADWAY INTERSECTIONS



- NOTES:
- No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
 - For crosshatching length (L) see Table 1.
 - The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
 - The crosshatching is not required if delineators or barrier reflectors are used along the structure.
 - For guard fence details, refer elsewhere in the plans.

ROADWAYS WITH REDUCED SHOULDER
WIDTHS ACROSS BRIDGE OR CULVERT

TABLE 1 - TYPICAL LENGTH (L)

Posted Speed *	Formula
≤ 40	$L = \frac{WS^2}{60}$
≥ 45	$L = WS$

* 85th Percentile Speed may be used on roads where traffic speeds normally exceed the posted speed limit. Crosshatching length should be rounded up to nearest 5 foot increment.
L=Length of Crosshatching (FT.) W=Width of Offset (FT.) S=Posted Speed (MPH)

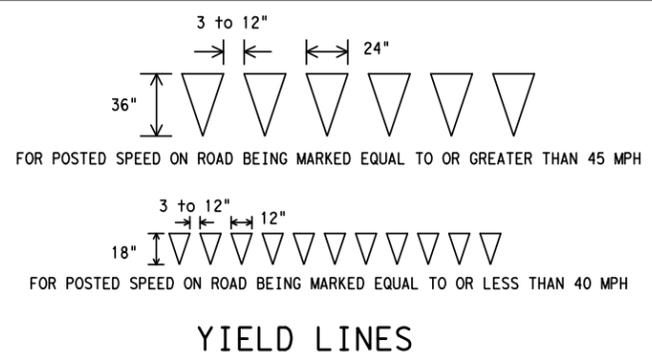
EXAMPLES:
An 8 foot shoulder in advance of a bridge reduces to 4 feet on a 70 MPH roadway. The length of the crosshatching should be:
 $L = 8 \times 70 = 560$ ft.
A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the crosshatching should be:
 $L = 4(40)^2 / 60 = 106.67$ ft. rounded to 110 ft.

GENERAL NOTES

- Edgeline striping shall be as shown in the plans or as directed by the Engineer. The edgeline should typically be placed a minimum of 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edgelines are not required in curb and gutter sections of roadways.
- The traveled way includes only that portion of the roadway used for vehicular travel and not the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the inside of edgeline to inside of edgeline of a two lane roadway.

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

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



YIELD LINES

Texas Department of Transportation
Traffic Operations Division

TYPICAL STANDARD
PAVEMENT MARKINGS

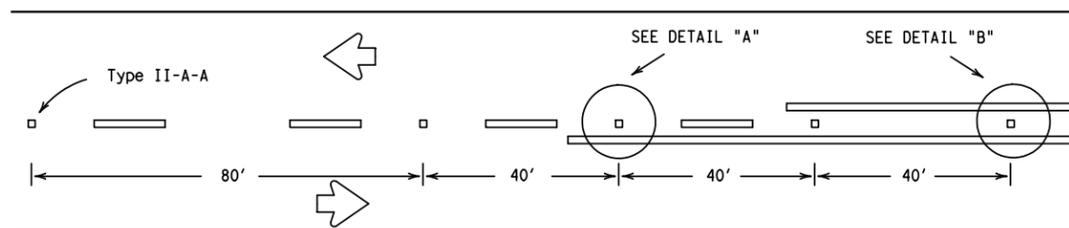
PM(1)-12

© TxDOT November 1978	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
8-95 2-12	0540	04	0540-04-072	FM 2154
5-00				
8-00	DIST	COUNTY		SHEET NO.
3-03	BRYAN	BRAZOS		119
22A				

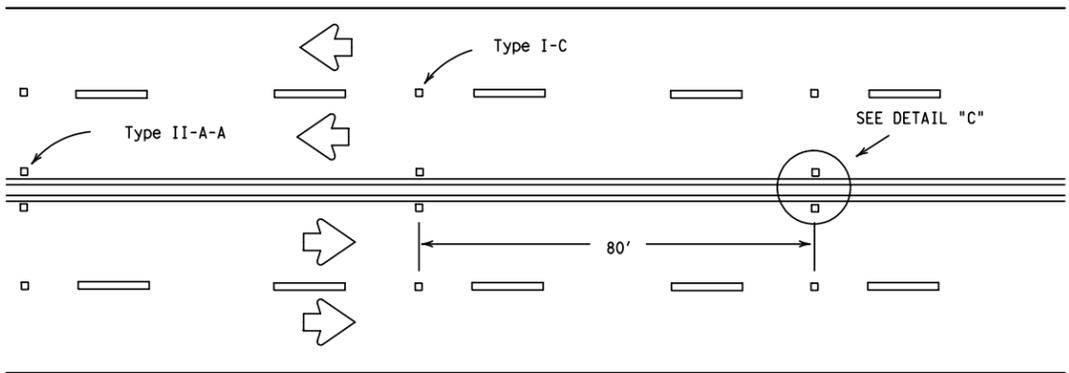
DATE:
FILE:

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REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

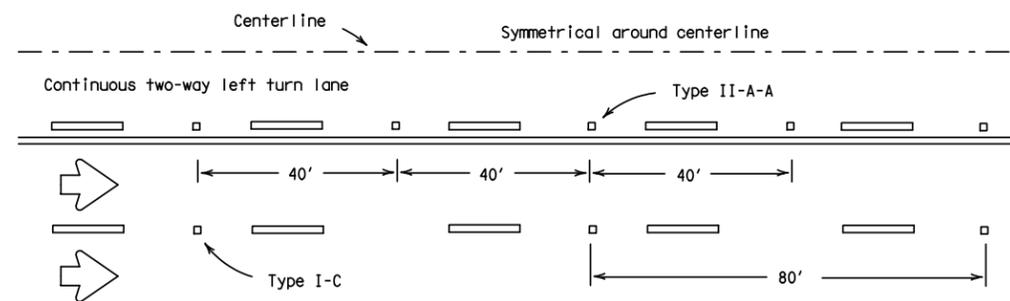


CENTERLINE FOR ALL TWO LANE ROADWAYS

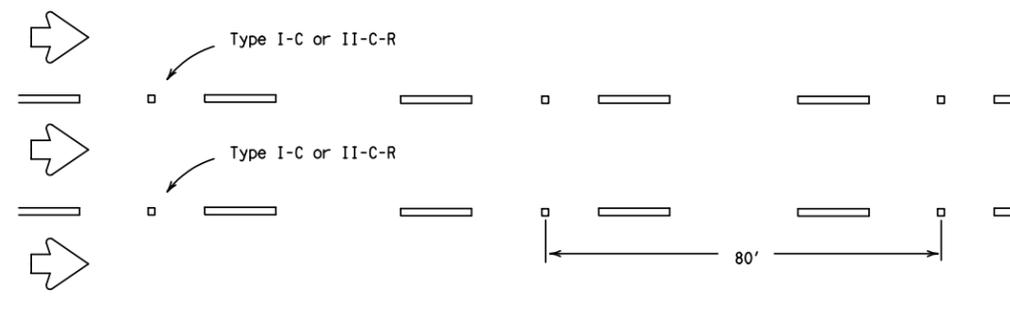


**CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS**

Raised pavement marker Type I-C, clear face toward normal traffic, shall be placed on 80-foot centers.

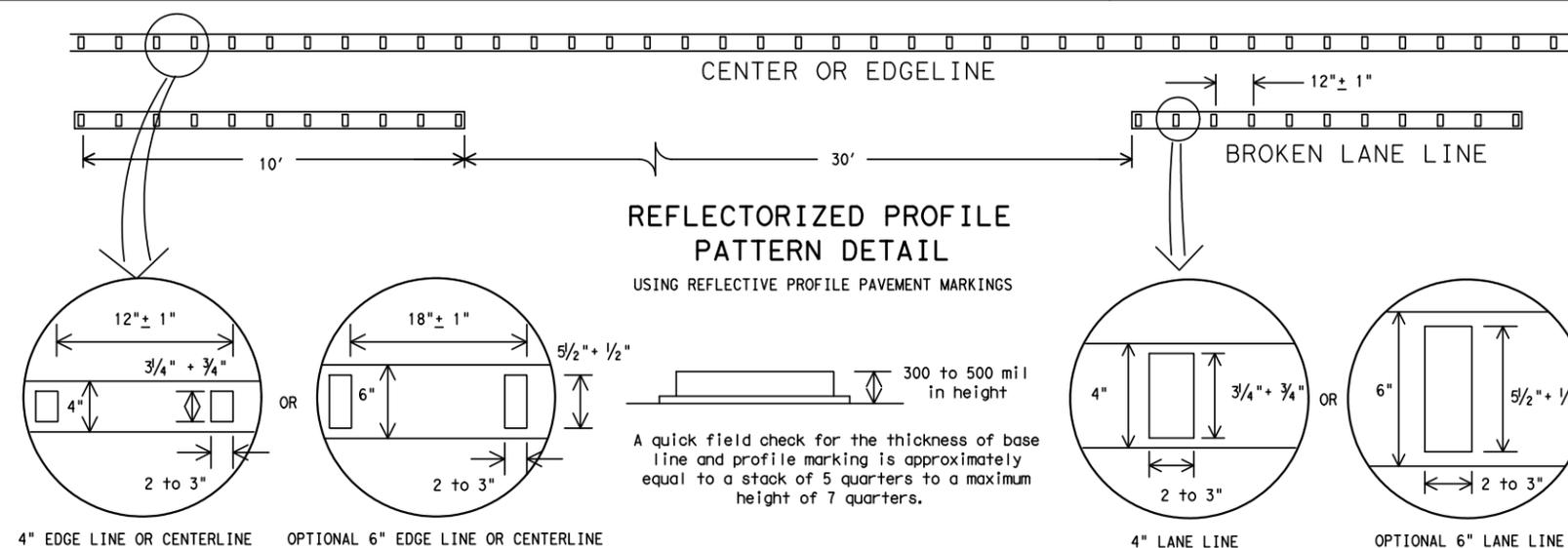
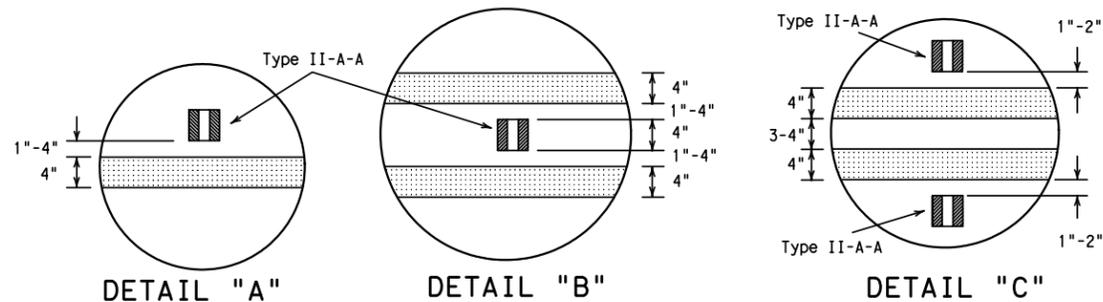


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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

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



**REFLECTORIZED PROFILE
PATTERN DETAIL**

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

NOTE:

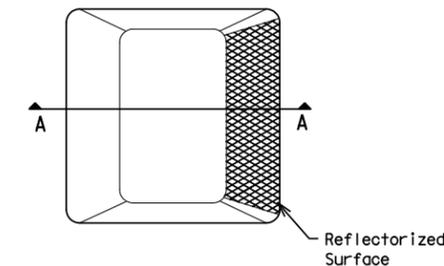
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

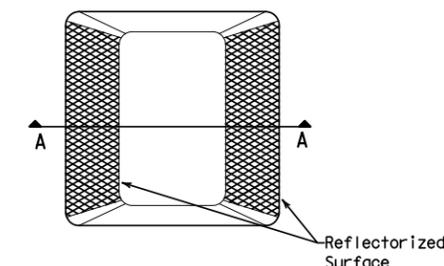
1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

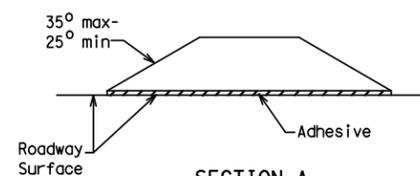
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



Type I (Top View)



Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS

Texas Department of Transportation
Traffic Operations Division

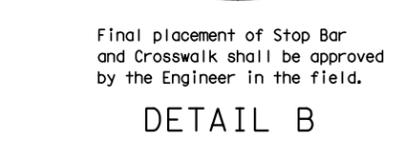
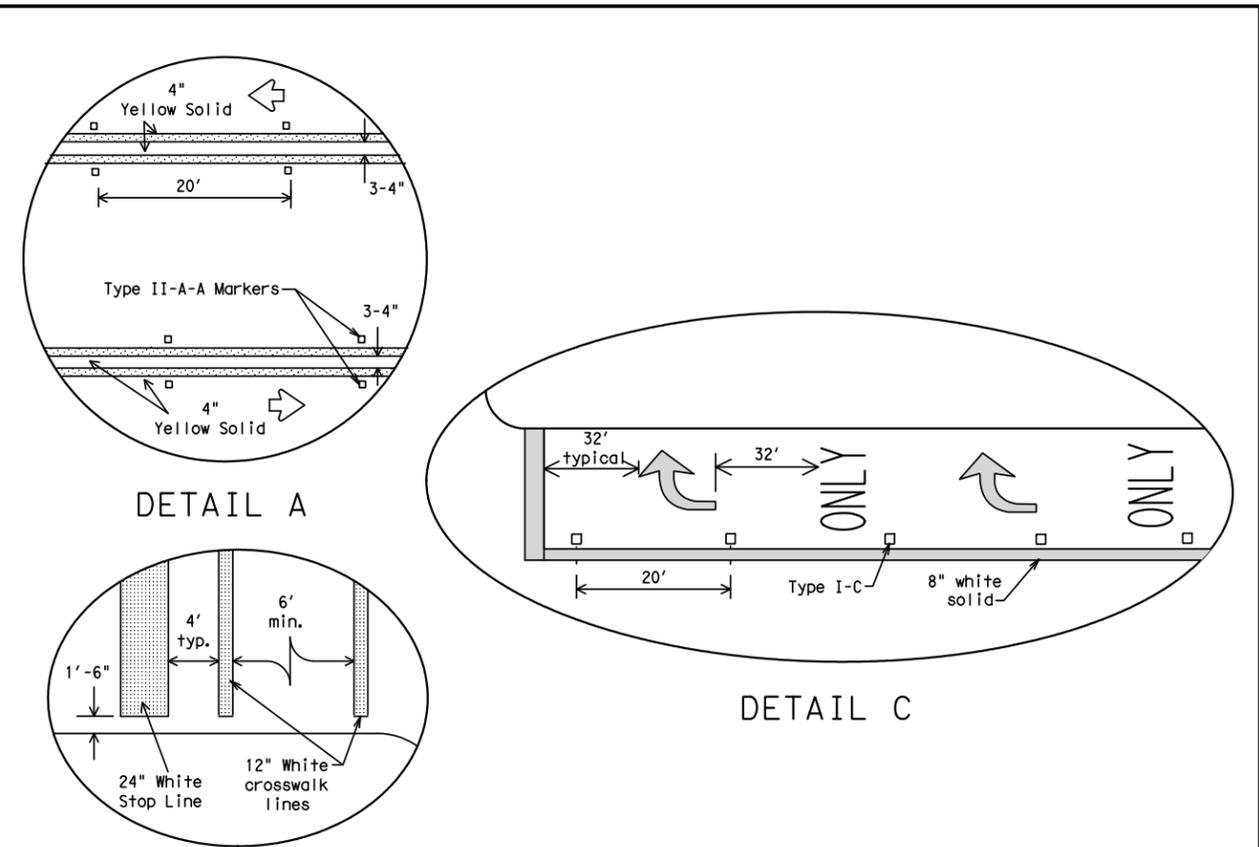
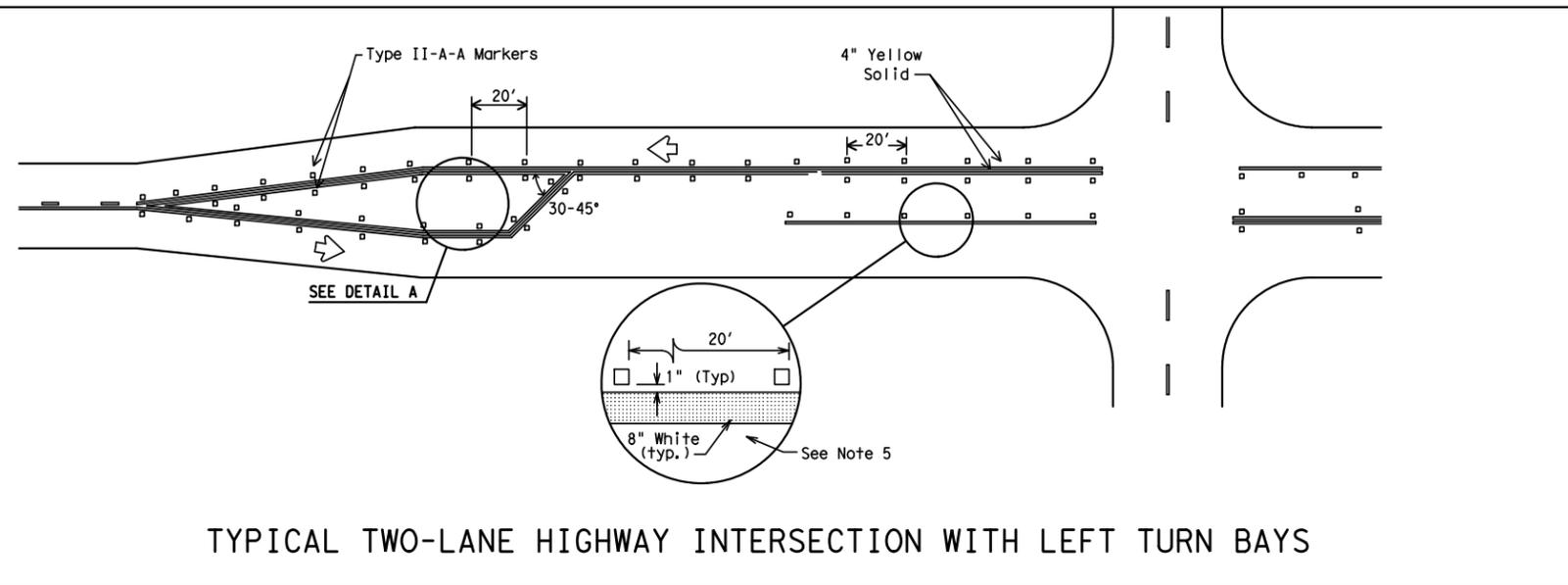
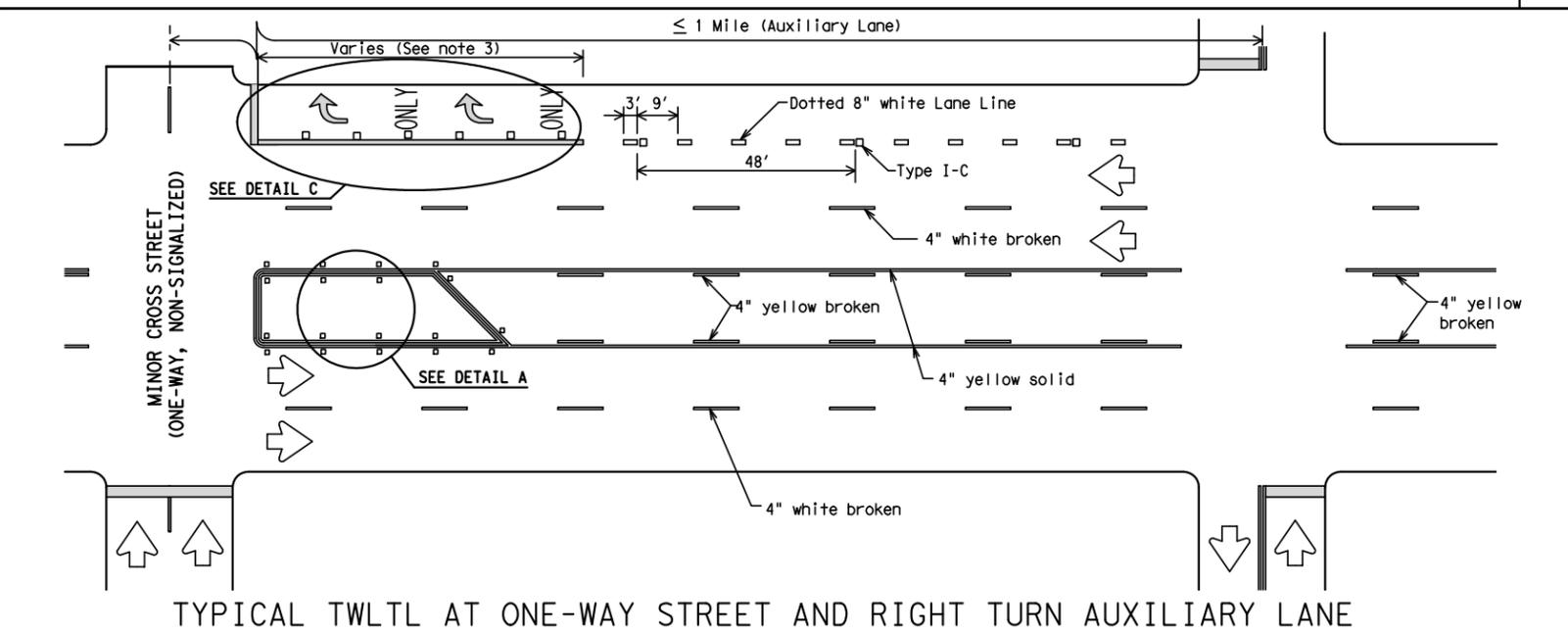
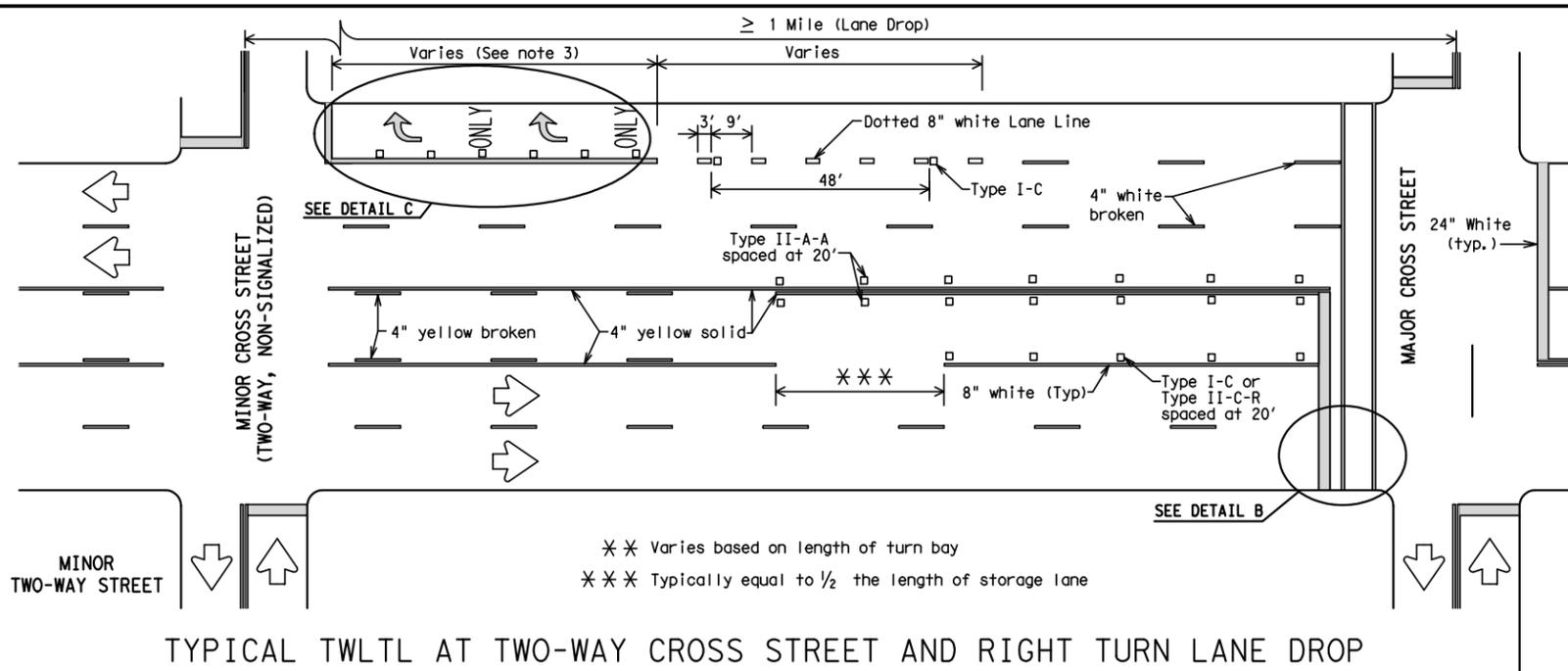
**POSITION GUIDANCE USING
RAISED MARKERS
REFLECTORIZED PROFILE
MARKINGS**

PM(2)-12

© TxDOT April 1977		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
4-92	2-10	0540	04	0540-04-072	FM 2154
5-00	2-12	DIST		COUNTY	SHEET NO.
8-00		BRYAN		BRAZOS	120
2-08					

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DATE:
FILE:

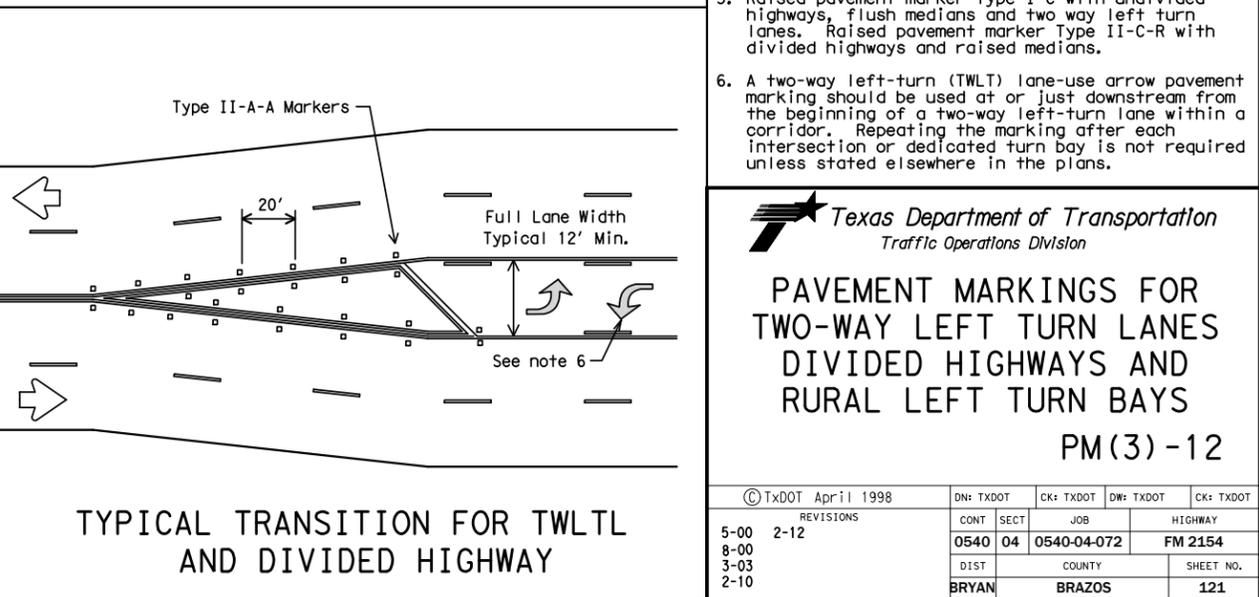


MATERIAL SPECIFICATIONS

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.

- GENERAL NOTES**
- Refer elsewhere in plans for additional RPM placement and details.
 - 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 as shown in the Standard Highway Sign Designs for Texas.
 - When lane used word 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.
 - Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used.
 - Raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Raised pavement marker Type II-C-R with divided highways and raised medians.
 - 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.



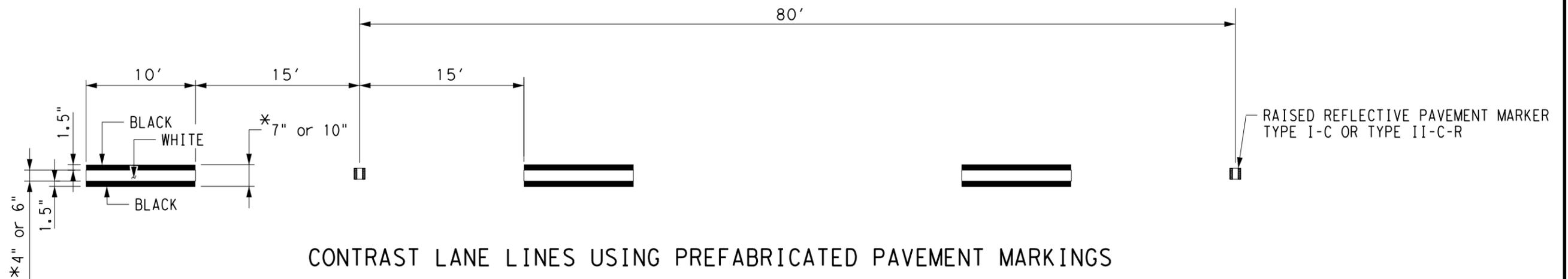
Texas Department of Transportation
Traffic Operations Division

PAVEMENT MARKINGS FOR TWO-WAY LEFT TURN LANES DIVIDED HIGHWAYS AND RURAL LEFT TURN BAYS

PM(3)-12

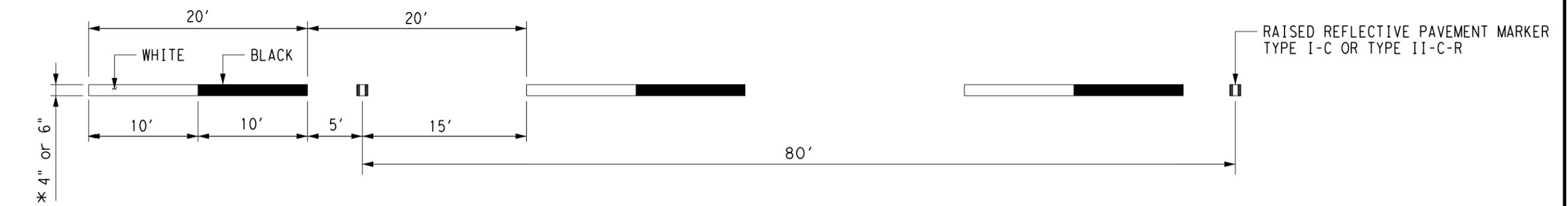
© TxDOT April 1998		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS		CONT	SECT	JOB	HIGHWAY
5-00	2-12	0540	04	0540-04-072	FM 2154
8-00					
3-03					
2-10					
		DIST	COUNTY		SHEET NO.
		BRYAN	BRAZOS		121

22C



CONTRAST LANE LINES USING PREFABRICATED PAVEMENT MARKINGS

➔ DIRECTION OF TRAFFIC



CONTRAST LANE LINES USING LIQUID APPLICATIONS
(MULTIPOLYMER, THERMOPLASTIC, ETC.)

* AS SHOWN ON THE PLANS.

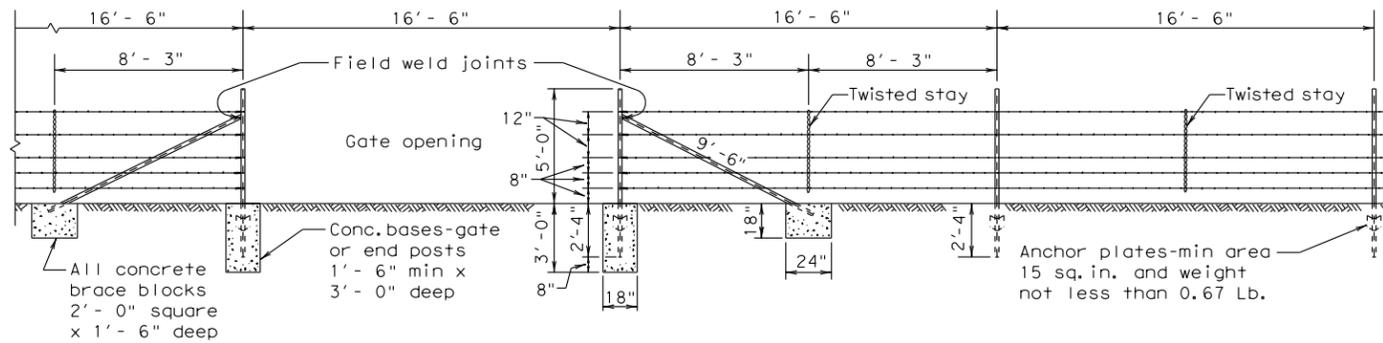
PAVEMENT MARKINGS
(CONTRAST LANE LINES)

PM (CLL) - 14

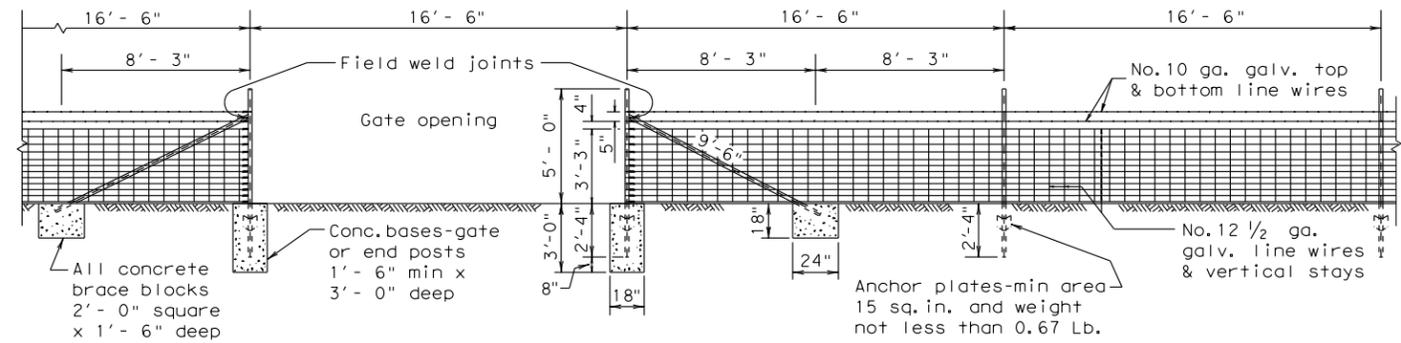
FILE:	DN:	CK:	DW:	CK:
© TxDOT 2003	DIST	FED REG	PROJECT NO.	SHEET
REVISIONS	HOU	6		
01-19-08	COUNTY	CONTROL	SECT	JOB
08-2014 "9" to 10"				HIGHWAY

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DATE: FILE:



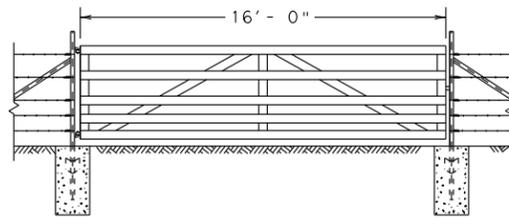
SECTION GALVANIZED BARBED WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "C" FENCE
(See General Note 8)



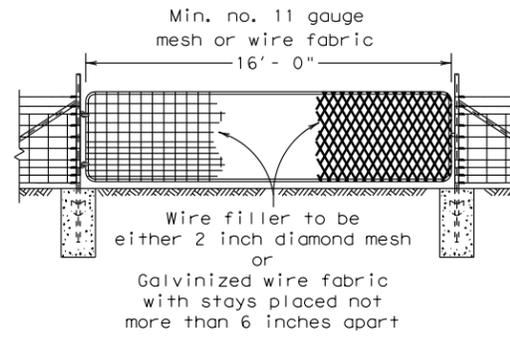
SECTION GALVANIZED WOVEN WIRE FENCE WITH METAL POSTS
BRACING DETAIL USED AT ENDS AND GATES
TYPE "D" FENCE
(See General Note 8)

Note:
For Steel pipe and
T-Post requirements.
(See General Notes 6 & 7)

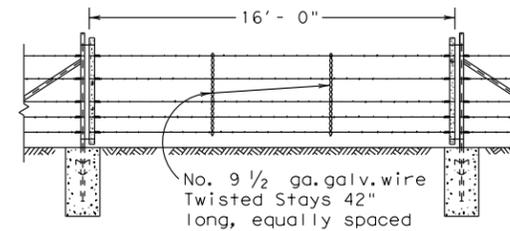
Metal gate shall consist of 5 panels not less than 4'-4" high and shall be aluminum or galvanized metal and of good quality. Gate and hardware shall meet the approval of the engineer.



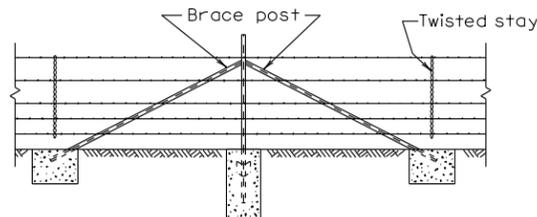
DETAIL TYPE 1 GATE



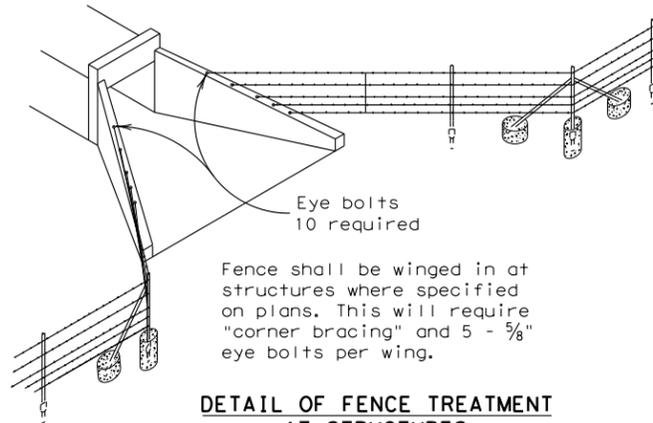
DETAIL TYPE 2 GATE



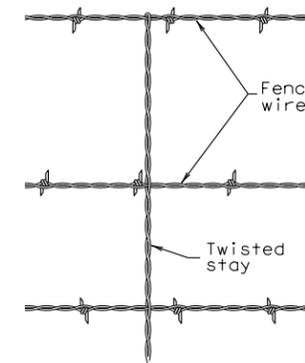
DETAIL TYPE 3 GATE



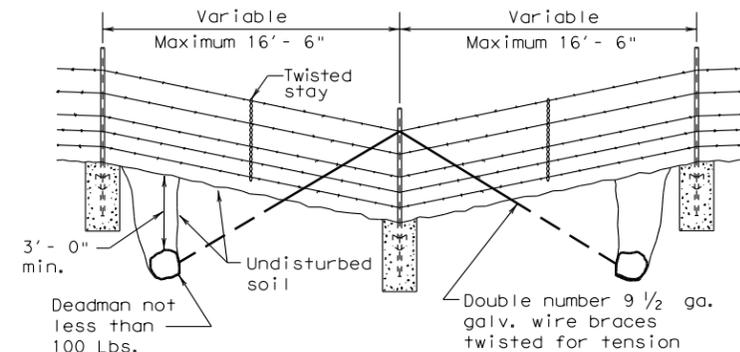
CORNER OR PULL POST ASSEMBLY



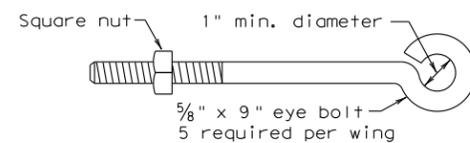
DETAIL OF FENCE TREATMENT AT STRUCTURES



DETAIL OF STAY
(Barbed Wire Fence)



DETAIL OF FENCE SAG



DETAIL OF EYE BOLT

GENERAL NOTES

- Any high point which interferes with the placing of wire mesh shall be excavated to provide a 2 inch clearance.
 - Latches for Type 1 and Type 2 gates shall be good commercial quality and design latch of the spring, fork or chain type. All latches shall be suitable to the gate and shall be approved by the Engineer.
 - Hinges for Type 2 gates shall be a commercial design approved by the Engineer suitable for post and gate.
 - Concrete shall be of the design and consistency approved by the Engineer and shall contain not less than 4 sacks of cement per cubic yard. Concrete footings are to be crowned at the top to shed water.
 - Steel anchor plates shall be of a design and thickness sufficient to prevent turning of the post in firm soil.
 - Steel pipe end posts, corner and pull posts shall be a minimum of 2" Std. pipe (2.375" O.D., 0.154" wall thickness) with a 1/4" Std. pipe brace (1.660" O.D., 0.140" wall thickness), with a 2"x2"x1/4" angle, or other as approved by the Engineer. Fasteners for securing barbed wire or woven wire fence to metal posts shall be a minimum of 11 gauge galvanized steel wire. Tubular posts shall be fitted with water malleable iron caps.
 - If Steel pipe is used for posts and braces, use standard pipe in accordance with ASTM A 53, Class B or A 501. For T-Posts use steel that meets ASTM A 702. Metal line posts shall be not less than 6'-6" in length and shall weigh not less than (1.33 lbs./lin. ft.). These items shall be in accordance with Item 552, "Wire Fence."
 - Barbed Wire shall be in accordance with ASTM A 121, Class 1 Design designation 12-2-4-1 4R or 12-2-5-1 4R, or as approved by the Engineer.
- Woven Wire Fence (Type D) shall be in accordance with ASTM A 116, Class 1 No. 12-1/2 Grade 60 (See Table 1 ASTM A 116) to the height and design shown on the plans, or as approved by the Engineer.
- The location of gates and corner posts will be as indicated elsewhere in these plans.

		Design Division Standard	
BARBED WIRE AND WOVEN WIRE FENCE (STEEL POSTS) WF (2) - 10			
FILE: wf210.dgn	DN: TxDOT	CK: AM	DW: VP
© TxDOT 1996	CONT	SECT	JOB
REVISIONS		HIGHWAY	
DIST		COUNTY	
		SHEET NO.	

PROJECT BENCHMARK: SURVEY CONTROL POINT #533
 1/2" IRON ROD W/ CAP Located along north side of Right of way
 between LedgeStone Trail and Royder Road at Station 31+19.12 and
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.

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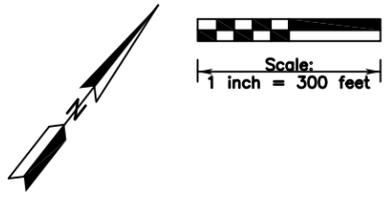
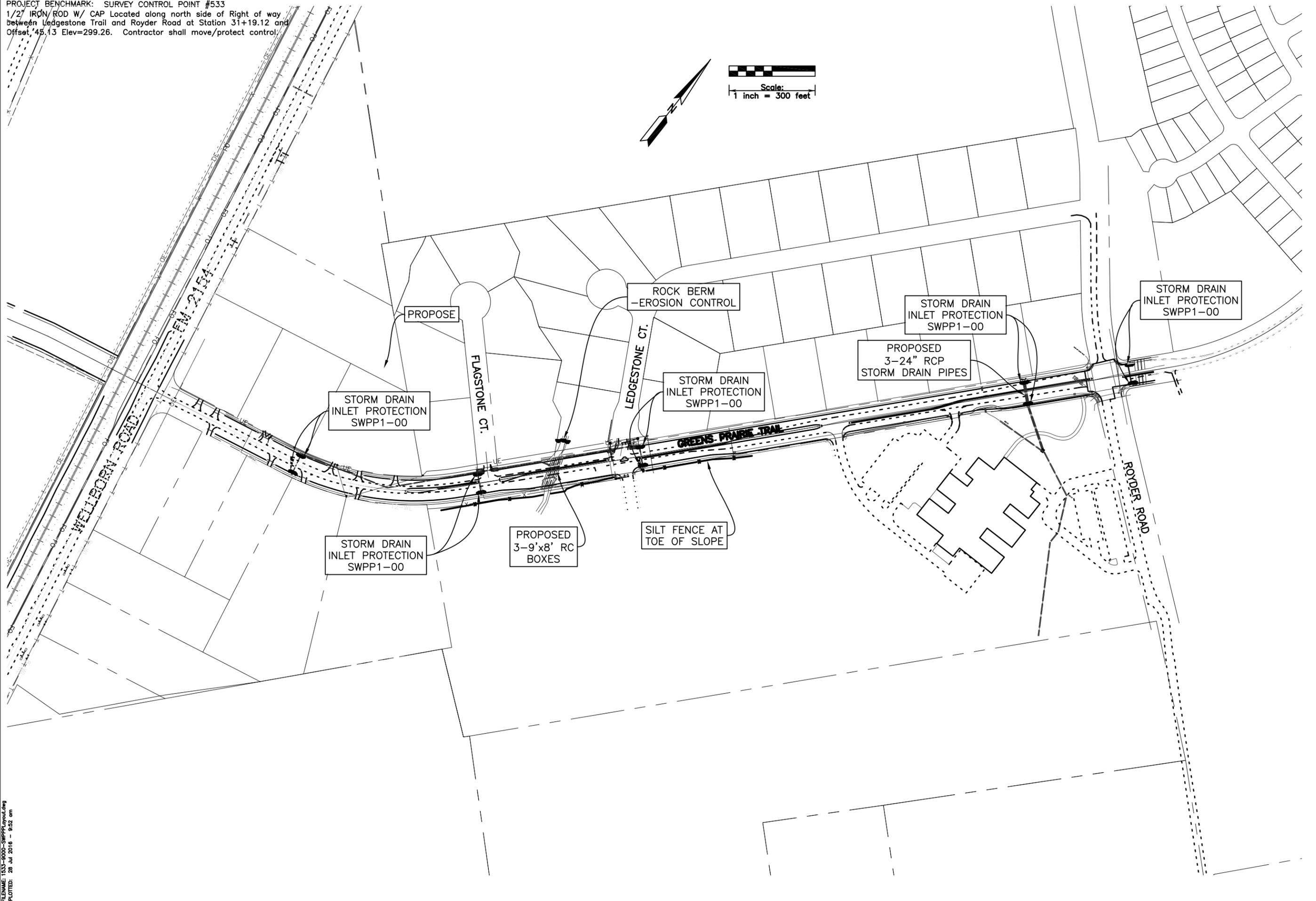
July 2016
 Designed By: JM
 Drawn By: JM

Prepared For:
 City of College Station
 Public Works Department
 310 Krenek Tap Rd
 College Station, TX
 77840

Revisions

SWPPP LAYOUT
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

FILENAME: 1533-9000-SWPPPLayout.dwg
 PLOTTED: 28 Jul 2016 - 9:32 am



PROJECT BENCHMARK: SURVEY CONTROL POINT #533
 1/2" IRON ROD W/ CAP Located along north side of Right of way
 between Ledgestone Trail and Royder Road at Station 31+19.12 and
 Offset 45.13 Elev=299.26. Contractor shall move/protect control.

SWPP PLAN NOTES:

1. All areas where existing vegetation and grass cover have been bared by construction shall be adequately block sodded or hydromulched and watered until growth is established. In developed areas where grass is present, block sod will be required. Bared areas shall be seeded or sodded within 14 calendars days of last disturbance.
2. Approved Erosion control measures must be installed during the entire time earth has been bared by construction and shall stay in place until acceptable vegetative growth is established after construction is complete and then removed by the contractor.
3. All erosion control measures should be cleaned of silt after every rain event.
4. Contractor is responsible for full compliance with TCEQ Stormwater Pollution Prevention Plan Regulations including monitoring, reporting and all required onsite paperwork.

CAUTION!!

CONTRACTOR MUST PROTECT THE WATER OF THE U.S. AS SHOWN HERE. NO WORK MAY BE DONE WITHIN THE WATER OF THE U.S. AREA.

CONTRACTOR MUST KEEP ONSITE THE NWP39 PERMIT DURING CONSTRUCTION ALONG WITH THE USACE AUTHORIZATION LETTER.

DISTURBED AREAS ADJACENT TO THE WATERS OF THE U.S. MUST BE STABILIZED TO PREVENT THE INTRODUCTION OF SEDIMENT TO ADJACENT WETLANDS OR WATER BODIES DURING WET WEATHER CONDITIONS (EROSION).

PRIOR TO PROJECTION INITIATION, THE PROJECT AREA MUST BE ISOLATED FROM ADJACENT WETLANDS AND WATER BODIES BY THE USE OF BMPs TO CONFINE SEDIMENT. WATER BODIES CAN BE ISOLATED BY THE USE OF ONE OR MORE OF THE REQUIRED BMPs IDENTIFIED FOR SEDIMENTATION CONTROL. THESE BMPs MUST BE MAINTAINED AND REMAIN IN PLACE UNTIL THE DREDGED MATERIAL IS STABILIZED. AT LEAST ONE OF THE FOLLOWING BMPs MUST BE MAINTAINED AND REMAIN IN PLACE UNTIL THE AREA HAS BEEN STABILIZED.

- SAND BAG BERM -ROCK BERM -SILT FENCE
- HAY BALE DIKE -TRIANGULAR FILTER DIKE -BRUSH BERMS

AFTER CONSTRUCTION HAS BEEN COMPLETED AND THE SITE IS STABILIZED, TOTAL SUSPENDED SOLIDS (TSS) LOADINGS SHALL BE CONTROLLED BY AT LEAST ONE OF THE FOLLOWING BMPs.

- VEGETATIVE FILTER STRIPS -VEGETATION LINED DRAINAGE DITCHES -GRASSY SWALES
- SAND FILTER SYSTEMS -MULCH FILTER SOCKS



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Job 2016
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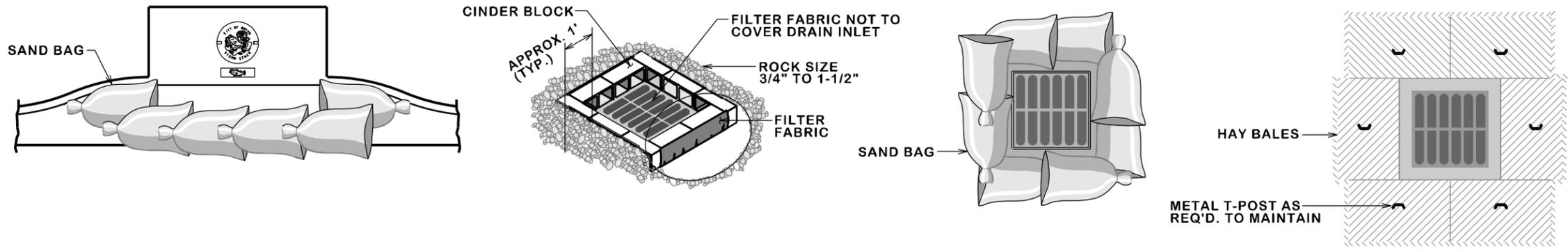
Prepared For:
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 310 Krenek Tap Rd
 College Station, TX
 77840

Revisions

SWPPP NOTES
GREENS PRAIRIE TRAIL
ROADWAY CAPACITY IMPROVEMENTS

121

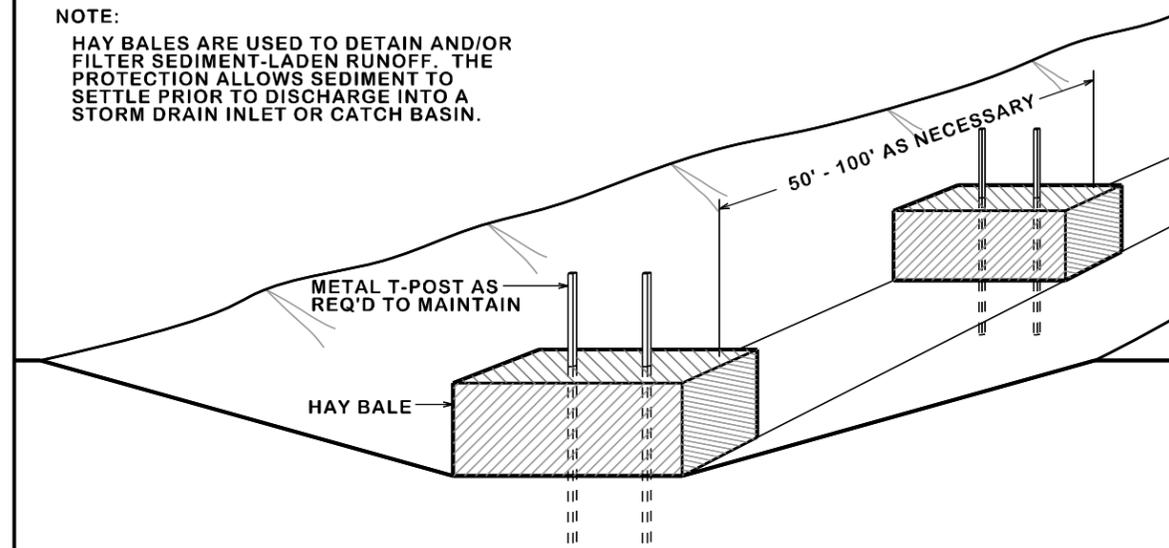
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STORM DRAIN INLET PROTECTION

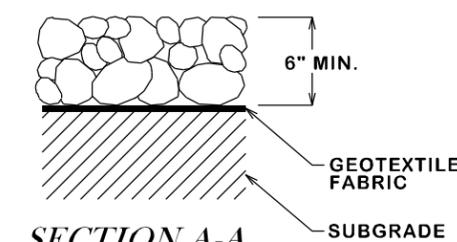
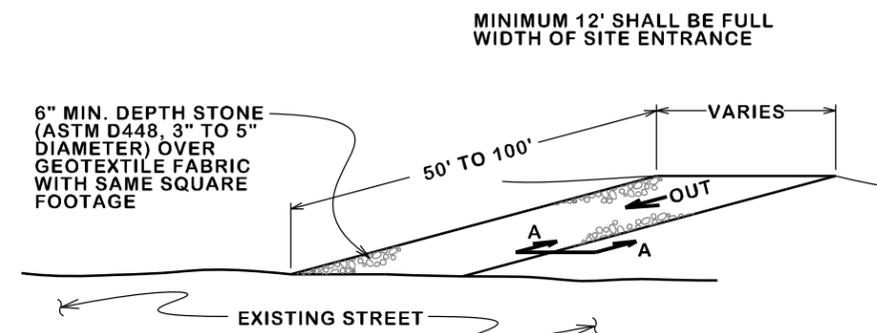
SWPP1-00

NOTE:
HAY BALES ARE USED TO DETAIN AND/OR FILTER SEDIMENT-LADEN RUNOFF. THE PROTECTION ALLOWS SEDIMENT TO SETTLE PRIOR TO DISCHARGE INTO A STORM DRAIN INLET OR CATCH BASIN.



EROSION CONTROL ALONG DITCH

SWPP1-01



NOTE:
DRESS WITH ADDITIONAL STONE AS NEEDED. STONE IS TO BE MAINTAINED SO AS TO PREVENT CONSTRUCTION TRAFFIC FROM TRACKING MUD ONTO ADJACENT PUBLIC STREETS.

CONSTRUCTION EXIT SILT CONTROL

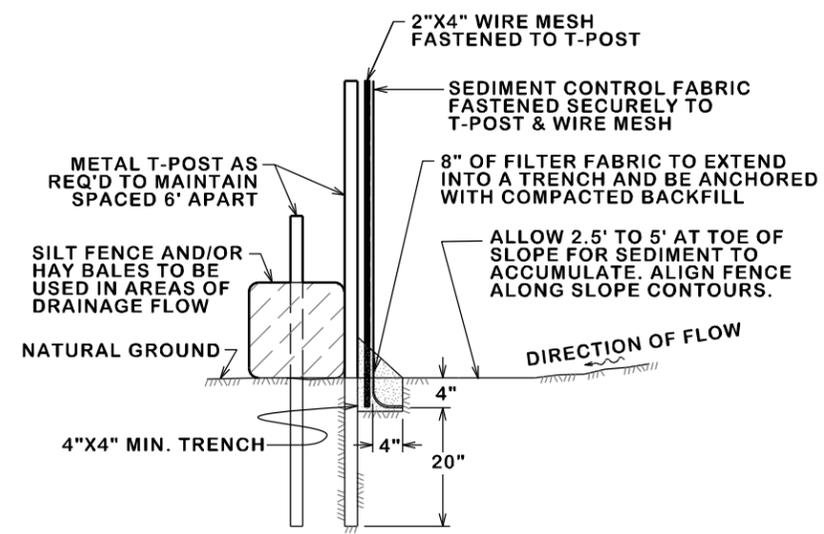
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GENERAL NOTES:

ALL AREAS WHERE EXISTING VEGETATION AND GRASS COVER HAVE BEEN BARED BY CONSTRUCTION SHALL BE ADEQUATELY BLOCK SODDED OR HYDROMULCHED AND WATERED UNTIL GROWTH IS ESTABLISHED. IN DEVELOPED AREAS WHERE GRASS IS PRESENT, BLOCK SOD WILL BE REQUIRED. BARED AREAS SHALL BE SEEDED OR SODDED WITHIN 14 CALENDAR DAYS OF LAST DISTURBANCE.

APPROVED EROSION CONTROL MEASURES MUST BE INSTALLED DURING THE ENTIRE TIME THAT EARTH HAS BEEN BARED BY CONSTRUCTION AND SHALL STAY IN PLACE UNTIL ACCEPTABLE VEGETATIVE GROWTH IS ESTABLISHED AFTER CONSTRUCTION IS COMPLETE AND THEN REMOVED BY CONTRACTOR.

ALL EROSION CONTROL MEASURES SHOULD BE CLEANED OF SILT AFTER EVERY RAIN.



SILT FENCE ASSEMBLY

SWPP1-03

NO.	DATE	REVISIONS

BRYAN - COLLEGE STATION
 STANDARD STORM WATER
 POLLUTION PREVENTION DETAILS



DRAWN BY: C.L.M.
 DATE: 08-01-12
 SCALE: N T S
 APPROVED: W.P.K.
 FIGURE:
SWPP1
 SHEET 1 OF 1

