CONSTRUCTION PLANS

CUDEENGINEERS.COM

STREET AND DRAINAGE CONSTRUCTION PLANS

- C1 - ULTIMATE MASTER DRAINAGE PLAN
- C2 - ULTIMATE MASTER DRAINAGE PLAN - RATIONAL METHOD CALCULATIONS
- C3 - STREET PLAN & PROFILE - HOMESTEAD RIDGE
- C4 - STREET PLAN & PROFILE - BIEDENHARN RANCH LANE
- C5 - STREET PLAN & PROFILE - BIEDENHARN RANCH LANE
- C6 - STREET PLAN & PROFILE - MILKHOUSE LANE
- C7 - STREET PLAN & PROFILE - SAN SABA WAY & PONY BEND
- C8 - STREET PLAN & PROFILE - JERSEY LANE
- C9 - STREET PLAN & PROFILE - BULK TANK STREET
- C10 - STREET PLAN & PROFILE - RUSTIC GROVE NORTH
- C11 - STREET PLAN & PROFILE - RUSTIC GROVE SOUTH
- C12 - STREET PLAN & PROFILE - DAIRY CATTLE DRIVE
- C13 - TURN LANE PLAN
- C14 - TURN LANE PLAN
- C15 - TRAFFIC SIGNAGE & STRIPING PLAN
- C16 - CITY OF BOERNE STANDARD STREET DETAILS
- C17 - DRAIN PLAN & PROFILE - DRAIN 'A-A'
- C18 - DRAIN PLAN & PROFILE - DRAIN 'A-A'
- C19 - DRAIN PLAN & PROFILE - DRAIN 'A-A'
- C20 - DRAIN PLAN & PROFILE - DRAIN 'A-A'
- C21 - DRAIN PLAN & PROFILE - DRAIN 'A-A'
- C22 - DRAIN PLAN & PROFILE - DRAIN 'A-B'
- C23 - DRAIN PLAN & PROFILE - DRAIN 'A-C'
- C24 - DRAIN PLAN & PROFILE - DRAIN 'A-D'
- C25 - DRAIN PLAN & PROFILE - DRAIN 'A-E'
- C26 - DRAIN PLAN & PROFILE - DRAIN 'A-E'
- C27 - DRAIN PLAN & PROFILE - DRAIN 'A-E'
- C28 - DRAIN PLAN & PROFILE - DRAIN 'A-F'
- C29 - DRAIN PLAN & PROFILE - DRAIN 'A-G'
- C30 - DRAIN PLAN & PROFILE - DRAIN 'A-H'
- C31 - DRAIN PLAN & PROFILE - DRAIN 'A-I'
- C32 - DRAIN PLAN & PROFILE - DRAIN 'A-I'
- C33 - DRAIN PLAN & PROFILE - DRAIN 'A-I'
- C34 - DRAIN PLAN & PROFILE - DRAIN 'A-J'
- C35 - DRAIN PLAN & PROFILE - DRAIN 'A-J'
- C36 - SIDEWALK BOX DRAIN '1', '2', & '3' PLAN AND PROFILE
- C37 - MULTIPLE BOX CULVERTS CAST-IN-PLACE DETAIL
- C38 - TXDOT CONCRETE HEADWALLS NON-SKEWED DETAIL
- C39 - TXDOT FLARED WING DETAIL
- C40 - TXDOT PARALLEL WING DETAIL
- C41 - TXDOT PAVEMENT MARKING DETAILS
- C42 - TXDOT PRECAST 3' 4'&5' CULVERT BOXES & COB CONC. RIP-RAP DETAILS
- C43 - TXDOT SAFETY END TREATMENT DETAILS
- C44 - TXDOT SAFETY END TREATMENT PARALLEL DRAINAGE 12" TO 72"
- C45 - CURB INLET DETAILS

SANITARY SEWER CONSTRUCTION PLANS

- C46 - SANITARY SEWER GENERAL NOTES
- C47 - OVERALL SANITARY SEWER PLAN
- C48 - SANITARY SEWER PLAN & PROFILE LINE "D"
- C49 - SANITARY SEWER PLAN & PROFILE LINE "D"
- C50 - SANITARY SEWER PLAN & PROFILE LINE "D"
- C51 - SANITARY SEWER PLAN & PROFILE LINE "S"
- C52 - SANITARY SEWER PLAN & PROFILE LINE "S"
- C53 - SANITARY SEWER PLAN & PROFILE LINE "T" & "W"
- C54 - SANITARY SEWER PLAN & PROFILE LINE "U" & "V"
- C55 - SANITARY SEWER PLAN & PROFILE LINE "X"
- C56 - SANITARY SEWER STANDARD DETAILS

WATER DISTRIBUTION CONSTRUCTION PLANS

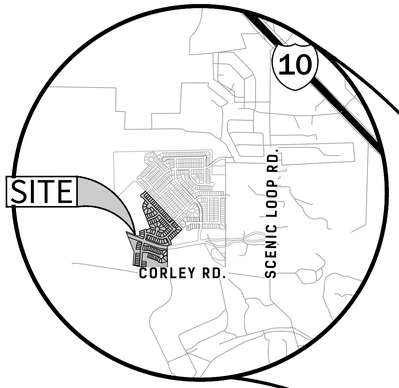
- C57 - WATER DISTRIBUTION PLAN
- C58 - WATER DISTRIBUTION PLAN
- C59 - WATER DISTRIBUTION STANDARD DETAILS

GAS DISTRIBUTION CONSTRUCTION PLANS

- C60 - NATURAL GAS DISTRIBUTION PLAN
- C61 - NATURAL GAS DISTRIBUTION PLAN
- C62 - NATURAL GAS DISTRIBUTION STANDARD DETAILS

MISCELLANEOUS CONSTRUCTION PLANS

- C63 - UTILITY LAYOUT PLAN
- C64 - UTILITY LAYOUT PLAN
- C65 - STORM WATER POLLUTION PREVENTION PLAN
- C66 - OVERALL GRADING PLAN



CORLEY FARMS SUBDIVISION IS VESTED TO THE SUBDIVISION ORDINANCE NO. 2007-56 OF THE CITY OF BOERNE, TEXAS (REVISED 10.08.2019) PER THE DEVELOPMENT AGREEMENT EXECUTED BETWEEN BOERNEBAK, LLC., AND THE CITY OF BOERNE, TEXAS EFFECTIVE NOVEMBER 26, 2019.

LOCATION MAP

VICINITY MAP

CORLEY FARMS UNIT 4

CONSTRUCTION PLANS

PRESSURE ZONE 12

2

Developer's Name	PULTE HOMES OF TEXAS, L.P.				
Developer's Address	1718 DRY CREEKWAY, SUITE 120				
City	SAN ANTONIO	State	TEXAS	Zip	78259
Phone #	(210) 496-1985	Fax #	(210) 496-0449		
SAWS Block Map #	XXX-XXX	Total EDU's	125	Total Acreage	35.80
Total Linear Footage of Pipe	16" W - 1,567 L.F. / 8" W - 4,361 L.F. / 2" W - 1,096 L.F.			Plat No.	N/A (CORLEY FARMS UNIT 4 PLAT)
Number of Lots	119	SAWS Job No.		22-1190	

PULTE HOMES

DEVELOPER:
PULTE HOMES OF TEXAS, L.P.
CONTACT PERSON: FELIPE GONZALEZ
1718 DRY CREEK WAY, SUITE 120
SAN ANTONIO, TX 78259
TEL: (210) 496-1985
FAX: (210) 496-0449

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

DRAWN BY	DATE	
CA/CG/XV	07/16/2024	
CHECKED BY	PROJECT NO.	SAWS JOB NO.
XV/JC/AL	03481.008	22-1190

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
07/16/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

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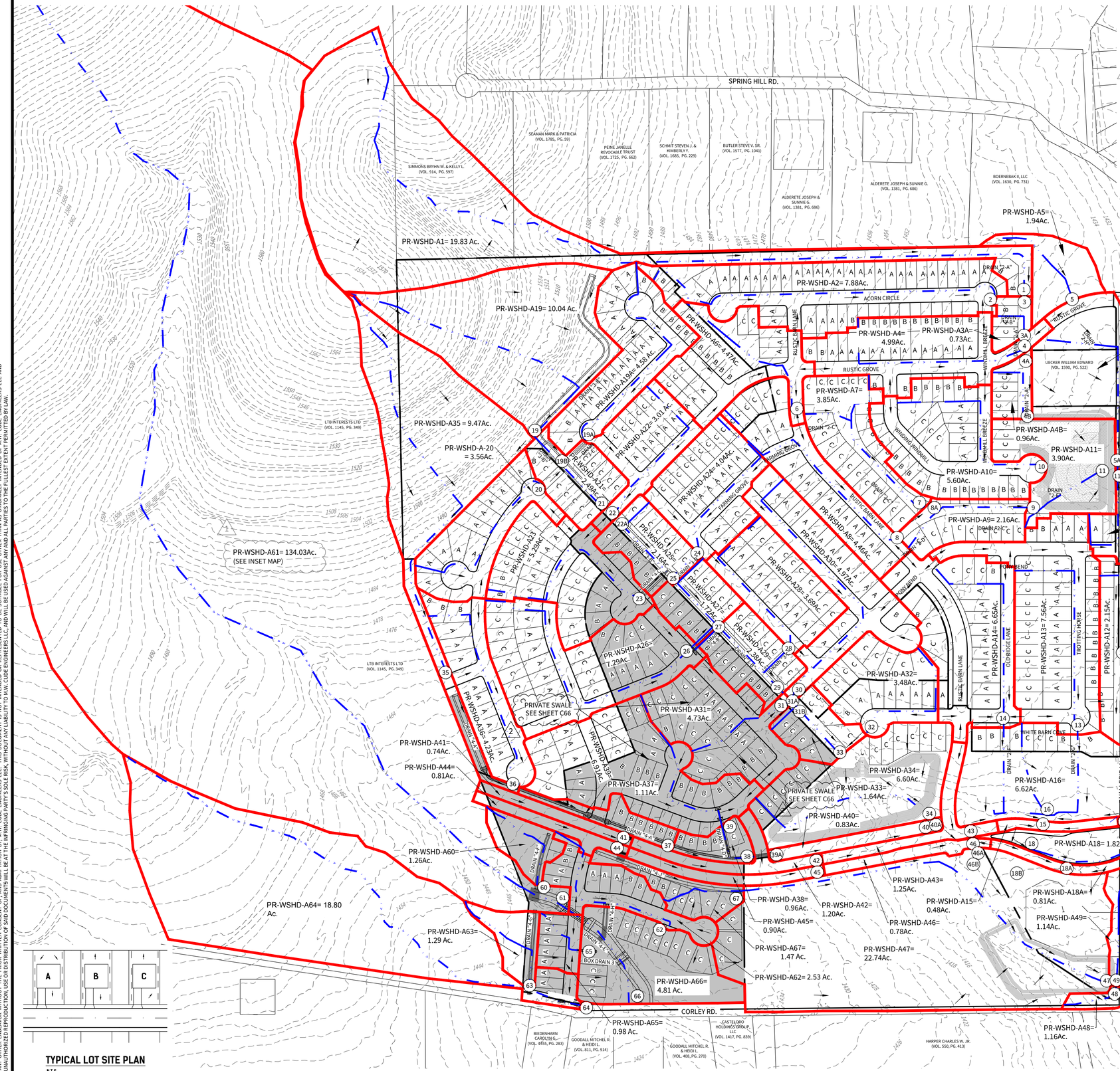
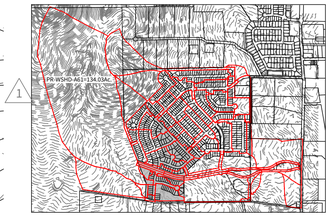


INSET MAP
N.T.S.



SCALE: 1"=200'
200 100 0 200

LEGEND
- UNIT BOUNDARY
- DRAINAGE AREA BOUNDARY
- Tc FLOW PATH
- ACCUMULATION POINT (XX)
- FLOW ARROWS

TYPICAL LOT SITE PLAN
N.T.S.

CUDEENGINEERS.COM
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4122 Pond Hill Road, Suite 101
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CORLEY FARMS UNIT 4

ULTIMATE MASTER DRAINAGE PLAN

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
1. 02-08-2024	ADDED AG1 LABEL
2. 06-26-2024	ADDED PRIVATE SWALE LABELS
3.	
4.	
5.	
6.	
7.	
8.	
9.	

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
06/27/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C1

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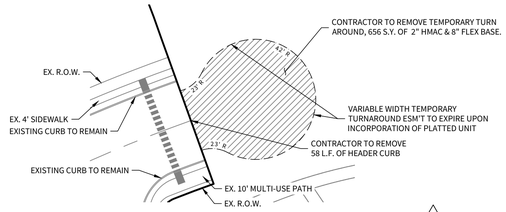
Project Name: Corley Farms
Calculation Summary for Time of Concentrations & Ultimate Flow, "U"

Precipitation Area Atlas 14 = PA1

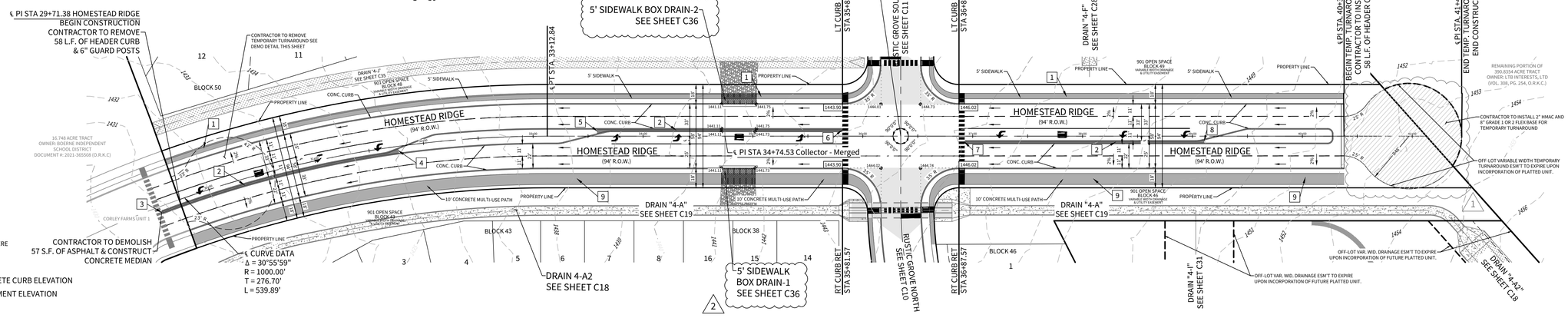
HYDROLOGY							Sheet Flow Tc Compuations				Shallow Conc. Tc Compuations				Concentrated Tc Compuations			Overall	INTENSITY			Q FLOW			
Drainage Shed/ Computation point	Area (Ac.)	AREA OF ACCUMULATION (Ac.)	Rational Shed Area (Ac.)	C	25 Year Cf = 1.1 C*Cf	100 Year Cf = 1.25 C*Cf	*Length - 300'*	Manning's Roughness Coefficient (n)	Slope	Time of Concentration	*Length*	Manning's Roughness Coefficient (n)	Slope	Time of Concentration	*Length*	Velocity (fps)	Time of Concentration	Time of Concentration (min)	I5	I25	I100	Q5	Q25	Q100	Drainage Shed/ Computation Point
A1/1	**19.83**	A1	**19.83**	0.66	0.73	0.83	*300.00*	0.2	2.57%	8.91	*253.00*	0.2	2.57%	5.26	*3145.00*	6	8.74	**22.91**	4.33	6.06	7.65	56.67	**87.24**	**125.15**	**A1/1**
A2/2	**7.88**	A2	**7.88**	0.66	0.73	0.83	*300.00*	0.3	2.83%	12.74	*50.00*	0.2	2.50%	1.05	*1255.00*	6	3.49	**17.28**	4.99	7.00	8.84	25.95	**40.05**	**57.47**	**A2/2**
-/3	**0.00**	A1:A2	**27.71**	0.66	0.73	0.83	*300.00*	0.2	2.57%	8.91	*253.00*	0.2	2.57%	5.26	*3145.00*	6	8.74	**22.91**	4.33	6.06	7.65	79.19	**121.91**	**174.88**	**-/3**
A3A/-	**0.73**	A3A	**0.73**	0.66	0.73	0.83	*120.00*	0.3	2.68%	5.24	*0.00*		0.00%		*95.00*	6	0.26	**5.50**	7.75	10.93	13.90	3.73	**5.79**	**8.37**	**A3A/-**
-/3A	**0.00**	A1:A3A	**28.44**	0.66	0.73	0.83	*300.00*	0.2	2.57%	8.91	*253.00*	0.2	2.57%	5.26	*3145.00*	6	8.74	**22.91**	4.33	6.06	7.65	81.28	**125.12**	**179.49**	**-/3A**
A4/4	**4.99**	A4	**4.99**	0.66	0.73	0.83	*192.00*	0.3	1.00%	13.71					*701.00*	6	1.95	**15.66**	5.23	7.33	9.25	17.22	**26.55**	**38.08**	**A4/4**
-/4A	**0.00**	A1:A4	**33.43**	0.66	0.73	0.83	*300.00*	0.2	2.57%	8.91	*253.00*	0.2	2.57%	5.26	*3145.00*	6	8.74	**22.91**	4.33	6.06	7.65	95.54	**147.08**	**210.99**	**-/4A**
A4B/-	**0.96**	A4B	**0.96**	0.66	0.73	0.83	*120.00*	0.3	2.08%	5.94					*195.00*	6	0.54	**6.48**	7.40	10.42	13.24	4.69	**7.26**	**10.49**	**A4B/-**
-/4B	**0.00**	A1:A4B	**34.39**	0.66	0.73	0.83	*300.00*	0.2	2.57%	8.91	*253.00*	0.2	2.57%	5.26	*3145.00*	6	8.74	**22.91**	4.33	6.06	7.65	98.28	**151.30**	**217.04**	**-/4B**
A5/5	**1.94**	A5	**1.94**	0.66	0.73	0.83	*300.00*	0.2	2.61%	8.84	*126.00*	0.15	2.23%	2.11				**10.95**	6.12	8.61	10.89	7.84	**12.13**	**17.43**	**A5/5**
A5A/-	**4.32**	A5A	**4.32**	0.66	0.73	0.83	*300.00*	0.3	2.00%	15.15					*515.00*	6	1.43	**16.58**	5.09	7.15	9.02	14.51	**22.42**	**32.15**	**A5A/-**
-/5A	**0.00**	A5:A5A	**6.26**	0.66	0.73	0.83	*300.00*	0.3	2.00%	15.15					*515.00*	6	1.43	**16.58**	5.09	7.15	9.02	21.03	**32.50**	**46.58**	**-/5A**
A6/6	**4.47**	A6	**4.47**	0.66	0.73	0.83	*300.00*	0.3	4.51%	10.09	*252.00*	0.2	3.90%	4.25	*250.00*	6	0.69	**15.04**	5.31	7.43	9.39	15.67	**24.11**	**34.63**	**A6/6**
A7/-	**3.85**	A7	**3.85**	0.66	0.73	0.83	*255.00*	0.3	2.00%	12.88					*527.00*	6	1.46	**14.34**	5.44	7.63	9.64	13.82	**21.33**	**30.62**	**A7/-**
-/7	**0.00**	A6:A7	**8.32**	0.66	0.73	0.83	*300.00*	0.3	4.51%	10.09	*252.00*	0.2	3.90%	4.25	*250.00*	6	0.69	**15.04**	5.31	7.43	9.39	29.16	**44.88**	**64.45**	**-/7**
A8/8	**4.46**	A8	**4.46**	0.66	0.73	0.83	*278.00*	0.3	3.20%	11.10					*765.00*	6	2.13	**13.23**	5.65	7.93	10.03	16.63	**25.68**	**36.91**	**A8/8**
-/8A	**0.00**	A6:A8	**12.78**	0.66	0.73	0.83	*300.00*	0.3	4.51%	10.09	*252.00*	0.2	3.90%	4.25	*250.00*	6	0.69	**15.04**	5.31	7.43	9.39	44.79	**68.94**	**99.00**	**-/8A**
A9/-	**2.16**	A9	**2.16**	0.66	0.73	0.83	*209.00*	0.3	2.00%	10.56					*376.00*	6	1.04	**11.60**	5.98	8.40	10.63	8.53	**13.17**	**18.94**	**A9/-**
-/9	**0.00**	A6:A9	**14.94**	0.66	0.73	0.83	*300.00*	0.3	4.51%	10.09	*252.00*	0.2	3.90%	4.25	*250.00*	6	0.69	**15.04**	5.31	7.43	9.39	52.36	**80.59**	**115.74**	**-/9**
A10/10	**5.60**	A10	**5.60**	0.66	0.73	0.83	*300.00*	0.2	2.32%	9.38	*50.00*	0.3	2.84%	1.48	*510.00*	6	1.42	**12.28**	5.83	8.20	10.37	21.55	**33.34**	**47.91**	**A10/10**
A11/-	**3.90**	A11	**3.90**	0.66	0.73	0.83	*121.00*	0.3	2.50%	5.47	*280.00*	0.1	0.50%	6.60				**12.07**	5.88	8.26	10.45	15.14	**23.39**	**33.62**	**A11/-**
-/11	**0.00**	A1:A4B, A6:A11	**58.83**	0.66	0.73	0.83	*300.00*	0.2	2.57%	8.91	*253.00*	0.2	2.57%	5.26	*3145.00*	6	8.74	**22.91**	4.33	6.06	7.65	168.12	**258.83**	**371.29**	**-/11**
A11A/11A	**0.75**	A11A	**0.75**	0.66	0.73	0.83	*131.00*	0.3	1.50%	7.64					*425.00*	6	1.18	**8.82**	6.65	9.36	11.87	3.29	**5.10**	**7.34**	**A11A/11A**
-/11B	**0.00**	A1:A11A	**59.58**	0.66	0.73	0.83	*300.00*	0.2	2.57%	8.91	*253.00*	0.2	2.57%	5.26	*3145.00*	6	8.74	**22.91**	4.33	6.06	7.65	170.27	**262.13**	**376.02**	**-/11B**
A12/12	**2.15**	A12	**2.15**	0.66	0.73	0.83	*87.00*	0.3	1.00%	6.21								**6.21**	7.49	10.56	13.42	10.63	**16.48**	**23.80**	**A12/12**
A13/13	**7.56**	A13	**7.56**	0.66	0.73	0.83	*251.00*	0.3	1.20%	16.37					*660.00*	6	1.83	**18.20**	4.86	6.82	8.61	24.25	**37.43**	**53.70**	**A13/13**
A14/14	**6.65**	A14	**6.65**	0.66	0.73	0.83	*300.00*	0.2	1.50%	11.66					*590.00*	6	1.64	**13.30**	5.64	7.91	10.00	24.75	**38.19**	**54.86**	**A14/14**
A15/15	**0.48**	A15	**0.48**	0.66	0.73	0.83	*36.00*	0.2	2.00%	1.21					*286.00*	6	0.79	**2.01**	9.01	12.71	16.24	2.85	**4.43**	**6.43**	**A15/15**
A16/-	**6.62**	A16	**6.62**	0.66	0.73	0.83	*300.00*	0.3	1.59%	16.99	*103.00*	0.2	1.59%	2.72				**19.72**	4.67	6.56	8.27	20.40	**31.53**	**45.17**	**A16/-**
-/16	**0.00**	A13:A16	**21.31**	0.66	0.73	0.83	*251.00*	0.3	1.20%	16.37					*660.00*	6	1.83	**18.20**	4.86	6.82	8.61	68.35	**105.51**	**151.37**	**-/16**
A17/17	**0.18**	A17	**0.18**	0.66	0.73	0.83	*36.00*	0.2	2.00%	1.21								**1.21**	9.29	13.11	16.77	1.10	**1.71**	**2.49**	**A17/17**
A18/-	**1.82**	A18	**1.82**	0.66	0.73	0.83	*180.00*	0.2	1.07%	8.29					*260.00*	6	0.72	**9.01**	6.60	9.29	11.77	7.93	**12.28**	**17.67**	**A18/-**
-/18	**0.00**	A17:A18	**2.00**	0.66	0.73	0.83	*180.00*	0.2	1.07%	8.29					*260.00*	6	0.72	**9.01**	6.60	9.29	11.77	8.71	**13.49**	**19.42**	**-/18**
A18A/18A	**0.81**	A18A	**0.81**	0.66	0.73	0.83	*35.00*	0.2	2.00%	1.18					*150.00*	6	0.42	**1.60**	9.16	12.92	16.51	4.90	**7.60**	**11.03**	**A18A/18A**
-/18B	**0.00**	A13:A18A	**24.12**	0.66	0.73	0.83	*251.00*	0.3	1.20%	16.37					*660.00*	6	1.83	**18.20**	4.86	6.82	8.61	77.37	**119.43**	**171.33**	**-/18B**
A19/19	**10.04**	A19	**10.04**	0.44	0.48	0.55	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*290.00*	6	0.81	**15.77**	5.21	7.31	9.23	23.02	**35.52**	**50.97**	**A19/19**
A19A/19A	**4.58**	A19A	**4.58**	0.66	0.73	0.83	*137.00*	0.2	2.38%	6.34					*913.00*	6	2.54	**8.88**	6.64	9.34	11.83	20.07	**31.06**	**44.70**	**A19A/19A**
-/19B	**0.00**	A19+A19A	**14.62**	0.51	0.56	0.64	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*290.00*	6	0.81	**15.77**	5.21	7.31	9.23	38.85	**59.96**	**86.03**	**-/19B**
A20/20	**3.56**	A20	**3.56**	0.66	0.73	0.83	*126.00*	0.3	2.50%	5.69					*801.00*	6	2.23	**7.92**	6.92	9.74	12.35	16.26	**25.17**	**36.27**	**A20/20**
A21/-	**2.49**	A21	**2.49**	0.66	0.73	0.83	*135.00*	0.3	3.12%	5.46					*274.00*	6	0.76	**6.22**	7.49	10.56	13.41	12.31	**19.09**	**27.55**	**A21/-**
-/21	**0.00**	A19:A21	**20.67**	0.55	0.61	0.69	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*417.00*	6	1.16	**16.12**	5.16	7.24	9.15	58.66	**90.54**	**130.03**	**-/21**
A22/22	**3.01**	A22	**3.01**	0.66	0.73	0.83	*252.00*	0.3	5.40%	7.75					*487.00*	6	1.35	**9.10**	6.58	9.26	11.73	13.07	**20.24**	**29.13**	**A22/22**
-/22A	**9.79**	A19:A22	**23.68**	0.57	0.63	0.71	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*475.00*	6	1.32	**16.28**	5.14	7.21	9.10	69.38	**107.05**	**153.54**	**-/22A**
A23/23	**5.24**	A23	**5.24**	0.66	0.73	0.83	*255.00*	0.3	3.92%	9.20					*612.00*	6	1.70	**10.90**	6.14	8.63	10.91	21.23	**32.83**	**47.16**	**A23/23**
A24/24	**4.04**	A24	**4.04**	0.66	0.73	0.83	*258.00*	0.2	3.02%	7.07					*513.00*	6	1.43	**8.49**	6.75	9.50	12.04	18.00	**27.86**	**40.13**	**A24/24**
A25/-	**2.16**	A25	**2.16**	0.66	0.73	0.83	*180.00*	0.3	1.79%	7.56					*320.00*	6	0.89	**8.45**	6.76	9.52	12.06	9.64	**14.93**	**21.49**	**A25/-**
-/25	**0.00**	A19:A25	**35.12**	0.60	0.66	0.75	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*795.00*	6	2.21	**17.17**	5.01	7.03	8.87	105.57	**162.95**	**233.64**	**-/25**
A26/26	**7.29**	A26	**7.29**	0.66	0.73	0.83	*269.00*	0.3	3.79%	9.87					*965.00*	6	2.68	**12.55**	5.78	8.12	10.27	27.81	**42.98**	**61.77**	**A26/26**
A27/-	**1.72**	A27	**1.72**	0.66	0.73	0.83	*149.00*	0.3	2.09%	7.36					*250.00*	6	0.69	**8.06**	6.87	9.68	12.27	7.80	**12.09**	**17.41**	**A27/-**
-/27	**0.00**	A19:A27	**44.13**	0.61	0.67	0.76	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*1050.00*	6	2.92	**17.88**	4.91	6.88	8.69	132.17	**203.73**	**292.41**	**-/27**
A28/28	**3.69**	A28	**3.69**	0.66	0.73	0.83	*251.00*	0.3	3.70%	9.32					*495.00*	6	1.38	**10.70**	6.19	8.71	11.02	15.08	**23.33**	**33.55**	**A28/28**
A29/-	**2.38**	A29	**2.38**	0.66	0.73	0.83	*140.00*	0.3	2.50%	6.32					*392.00*	6	1.09	**7.41**	7.08	9.97	12.65	11.12	**17.23**	**24.84**	**A29/-**
-/29	**0.00**	A19:A29	**50.20**	0.62	0.68	0.78	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*1437.00*	6	3.99	**18.96**	4.77	6.69	8.44	148.46	**229.04**	**328.36**	**-/29**
A30/30	**4.97**	A30	**4.97**	0.66	0.73	0.83	*131.00*	0.3	1.50%	7.64					*1133.00*	6	3.15	**10.79**	6.16	8.68	10.97	20.21	**31.32**	**44.98**	**A30/30**
A31/31	**4.73**	A31	**4.73**	0.66	0.73	0.83	*267.00*	0.2	2.80%	7.60					*215.00*	6	0.60	**8.20**	6.83	9.62	12.20	21.32	**33.03**	**47.61**	**A31/31**
-/31A	**0.00**	A30+A31	**9.70**	0.66	0.73	0.83	*131.00*	0.3	1.50%	7.64					*1133.00*	6	3.15	**10.79**	6.16	8.68	10.97	39.44	**61.13**	**87.79**	**-/31A**
-/31B	**0.00**	A19:A31	**59.90**	0.62	0.68	0.78	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*1495.00*	6	4.15	**19.12**	4.75	6.66	8.40	176.41	**272.07**	**389.95**	**-/31B**
A32/32	**3.48**	A32	**3.48**	0.66	0.73	0.83	*294.00*	0.3	1.70%	16.11					*343.00*	6	0.95	**17.06**	5.02	7.05	8.90	11.53	**17.81**	**25.55**	**A32/32**
A33/-	**1.64**	A33	**1.64**	0.66	0.73	0.83	*129.00*	0.3	2.00%	6.52					*290.00*	6	0.81	**7.32**	7.11	10.01	12.70	7.70	**11.92**	**17.18**	**A33/-**
-/33	**0.00**	A19:A33	**65.02**	0.63	0.69	0.79	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*1791.00*	6	4.98	**19.94**	4.65	6.52	8.22	190.48	**293.78**	**420.89**	**-/33**
A34/-	**6.60**	A34	**6.60**	0.66	0.73	0.83	*135.00*	0.3	2.00%	6.82					*633.00*	6	1.76	**8.58**	6.72	9.46	11.99	29.27	**45.33**	**65.29**	**A34/-**
-/34	**0.00**	A19:A34	**71.62**	0.63	0.69	0.79	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*2263.00*	6	6.29	**21.25**	4.50	6.31	7.96	203.04	**313.18**	**448.95**	**-/34**
A35/35	**9.47**	A35	**9.47**	0.44	0.48	0.55	*200.00*	0.2	4.36%	4.56	*828.00*	0.2	9.67%	8.88	*827.00*	6	2.30	**15.73**	5.22	7.32	9.24	21.75	**33.55**	**48.13**	**A35/35**
A36/-	**4.23**	A36	**4.23**	0.66	0.73	0.83	*173.00*	0.3	2.53%	7.77					*779.00*	6	2.16	**9.93**	6.38	9.02	11.42	17.81	**27.70**	**39.85**	**A36/-**
-/36	**0.00**	A35:A36	**13.70**	0.51	0.56	0.64	*200.00*	0.2	4.36%	4.56	*828.00*	0.2	9.67%	8.88	*827.00*	6	2.30	**15.73**	5.22	7.32	9.24	36.47	**56.26**	**80.70**	**-/36**
A37/-	**1.11**	A37	**1.11**	0.66	0.73	0.83	*45.00*	0.2	1.74%	1.62					*422.00*	6	1.17	**5.00**	7.93	11.18	14.23	5.81	**9.01**	**13.03**	**A37/-**
-/37	**0.00**	A35:A37+A41	**15.55**	0.51	0.56	0.64	*200.00*	0.2	4.36%	4.56	*828.00*	0.2	9.67%	8.88	*827.00*	6	2.30	**15.73**	5.22	7.32	9.24	41.40	**63.86**	**91.60**	**-/37**
A38/-	**0.96**	A38	**0.96**	0.66	0.73	0.83	*140.00*	0.3	1.74%	7.58					*131.00*	6	0.36	**7.94**	6.91	9.73	12.33	4.38	**6.78**	**9.77**	**A38/-**
-/38	**0.00**	A35:A38+41	**16.51**	0.52	0.57	0.65	*200.00*	0.2	4.36%	4.56	*828.00*	0.2	9.67%	8.88	*827.00*	6	2.30	**15.73**	5.22	7.32	9.24	44.81	**69.13**	**99.16**	**-/38**
A39/39	**6.91**	A39	**6.91**	0.66	0.73	0.83	*260.00*	0.2	1.52%	10.04					*748.00*	6	2.08	**12.12**	5.87	8.25	10.43	26.77	**41.39**	**59.46**	**A39/39**
-/39A	**0.00**	A35:A39+A41	**23.42**	0.57	0.63	0.71	*200.00*	0.2	4.36%	4.56	*828.00*	0.2	9.67%	8.88	*827.00*	6	2.30	**15.73**	5.22	7.32	9.24	69.68	**107.49**	**154.19**	**-/39A**
A40/-	**0.83**	A40	**0.83**	0.66	0.73	0.83	*58.00*	0.2	2.00%	1.95					*628.00*	6	1.74	**5.00**	7.93	11.18	14.23	4.34	**6.74**	**9.74**	**A40/-**
-/40	**0.00**	A35:A40	**24.25**	0.57	0.63	0.71	*200.00*	0.2	4.36%	4.56	*828.00*	0.2	9.67%	8.88	*827.00*	6	2.30	**15.73**	5.22	7.32	9.24	72.15	**111.30**	**159.65**	**-/40**
-/40A	**0.00**	A19:A40	**95.87**	0.61	0.67	0.76	*200.00*	0.2	2.83%	5.66	*871.00*	0.2	9.74%	9.30	*2353.00*	6	6.54	**21.50**	4.47	6.27	7.91	261.41	**403.34**	**578.23**	**-/40A**
A41/41	**0.74**	A41	**0.74**	0.66	0.73	0.83	*39.00*	0.2	2.12%	1.28					*579.00*	6	1.61	**5.00**	7.93	11.18	14.23	3.87	**6.01**	**8.69**	**A41/41**
A42/42	**1.20**	A42	**1.20**	0.66	0.73	0.83	*43.00*	0.2	3.13%	1.16					*420.00*	6	1.17	**5.00**	7.93	11.18	14.23	6.28	**9.74**	**14.09**	**A42/42**
A43/43	**1.25**	A43	**1.25**	0.66	0.73	0.83	*37.00*	0.2	1.37%	1.51					*360.00*	6	1.00	**5.00**	7.93	11.18	14.23	6.54	**10.15**	**14.67**	**A43/43**
A44/44	**0.81**	A44	**0.81**	0.66	0.73	0.83	*52.00*	0.2	2.83%	1.47					*421.00*	6	1.17	**5.00**	7.93	11.18	14.23	4.24	**6.57**	**9.51**	**A44/44**
A45/45	**0.90**	A45	**0.90**	0.66	0.73	0.83	*77.00*	0.2	3.00%	2.12					*230.00*	6	0.64	**5.00**	7.93	11.18	14.23	4.71	**7.31**	**10.57**	**A45/45**
A46/46	**0.78**	A46	**0.78**	0.66	0.73	0.83	*10.00*	0.2	2.00%	0.34					*352.00*	6	0.98	**5.00**	7.93	11.18	14.23	4.08	**6.33**	**9.16**	**A46/46**
-/46A	**0.00**	A43+A46	**2.03**	0.66	0.73	0.83												**5.00**	7.93	11.18	14.23	10.62	**16.48**	**23.83**	**-/46A**
-/46B	**0.00**	A19:A40+A43+A46	**97.90**	0.62	0.68	0.78	*294.00*	0.3	1.70%	16.11					*3048.00*	6	8.47	**24.57**	4.17	5.85	7.37	253.11	**390.59**	**559.18**	**-/46B**
A47/-	**22.74**	A47	**22.74**	0.74	0.81	0.93	*300.00*	0.3	2.00%	15.15	*1070.00*	0.2	2.27%	23.67	*880.00*	6	2.44	**41.27**	3.11	4.34	5.48	52.33	**80.33**	**115.27**	**A47/-**
-/47	**0.00**	A19:A40+A43+A46:A47	**120.64**	0.62	0.68	0.78	*300.00*	0.3	2.00%	15.15	*1070.00*	0.2	2.27%	23.67	*880.00*	6	2.44	**41.27**	3.11	4.34	5.48	232.62	**357.08**	**512.36**	**-/47**
A48/48	**1.16**	A48	**1.16**	0.74	0.81	0.93	*200.00*	0.2	4.88%	4.31	*238.00*	0.2	2.44%	5.08				**9.39**	6.51	9.18	11.63	5.59	**8.67**	**12.48**	**A48/48**
A49/-	**1.14**	A49	**1.14**	0.66	0.73	0.83	*300.00*	0.2	2.46%	9.11					*290.00*	6	0.81	**9.91**	6.38	9.02	11.43	4.80	**7.47**	**10.75**	**A49/-**
-/49	**0.00**	A19:A40+A43+A46:A49	**122.94**	0.62	0.68	0.78	*300.00*	0.3	2.00%	15.15	*1070.00*	0.2	2.27%	23.67	*880.00*	6	2.44	**41.27**	3.11	4.34	5.48	237.05	**363.89**	**522.13**	**-/49**
A50/50	**1.61**	A50	**1.61**	0.66	0.73	0.83	*167.00*	0.2	3.04%	4.56	*141.00*	0.2	3.03%	2.70	*271.00*	6	0.75	**8.01**	6.89	9.69	12.29	7.32	**11.33**	**16.32**	**A50/50**
A51/51	**0.44**	A51	**0.44**	0.66	0.73	0.83												**5.00**	7.93	11.18	14.23	2.30	**3.57**	**5.17**	**A51/51**
A52/52	**0.51**	A52	**0.51**	0.66	0.73	0.83												**5.00**	7.93	11.18	14.23	2.67	**4.14**	**5.99**	**A52/52**
A53/53	**0.20**	A53	**0.20**	0.66	0.73	0.83												**5.00**	7.93	11.18	14.23	1.05	**1.62**	**2.35**	**A53/53**
A53A/53A	**2.37**	A53A	**2.37**	0.77	0.85	0.96	*300.00*	0.2	1.41%	12.03	*257.00*	0.2	1.53%	6.93	*148.00*	7	0.35	**19.31**	4.72	6.63	8.36	8.61	**13.31**	**19.07**	**A53A/53A**
A54/54	**2.12**	A54	**2.12**	0.44	0.48	0.55	*300.00*	0.2	1.70%	10.96	*160.00*	0.2	1.00%	5.33	*90.00*	6	0.25	**16.54**	5.10	7.16	9.03	4.76	**7.35**	**10.53**	**A54/54**
-/55	**0.00**	A52:A54	**2.83**	0.66	0.73	0.83	*300.00*	0.2	1.70%	10.96	*160.00*	0.2	1.00%	5.33	*90.00*	6	0.25	**16.54**	5.10	7.16	9.03	9.53	**14.71**	**21.08**	**-/55**
A56/56	**0.53**	A56	**0.53**	0.66	0.73	0.83												**5.00**	7.93	11.18	14.23	2.77	**4.30**	**6.22**	**A56/56**
A57/57	**16.09**	A57	**16.09**	0.77	0.85	0.96	*300.00*	0.2	1.65%	11.12	*862.00*	0.2	2.51%	18.14	*320.00*	6	0.89	**30.15**	3.73	5.19	6.53	46.21	**70.73**	**101.13**	**A57/57**
-/58	**0.00**	A52:A54+A56:A57	**19.45**	0.77	0.85	0.96	*300.00*	0.2	1.65%	11.12	*862.00*	0.2	2.51%	18.14	*320.00*	6	0.89	**30.15**	3.73	5.19	6.53	55.86	**85.50**	**122.25**	**-/58**
A59/59	**5.80**	A59	**5.80**	0.77	0.85	0.96	*300.00*	0.2	1.80%	10.65	*603.00*	0.2	2.00%	14.21				**24.86**	4.14	5.81	7.32	18.49	**28.54**	**40.86**	**A59/59**
A60	**1.26**	A60	**1.26**	0.63	0.69	0.79	*292.00*	0.2	2.45%	8.88					*176.00*	6	0.49	**9.37**	6.51	9.18	11.63	5.17	**8.02**	**11.54**	**A60**
A61/-	**134.03**	A61	**134.03**	0.44	0.48	0.55	*300.00*	0.2	14.33%	3.77	*1241.00*	0.2	9.16%	13.67	*4209.00*	6	11.69	**29.13**	3.80	5.31	6.70	224.10	**344.46**	**493.90**	**A61/-**
-/61	**0.00**	A60 + A61	**135.29**	0.44	0.48	0.55	*300.00*	0.2	14.33%	3.77	*1241.00*	0.2	9.16%	13.67	*4209.00*	6	11.69	**29.13**	3.80	5.31	6.70	226.20	**347.70**	**498.54**	**-/61**
A62	**2.53**	A62	**2.53**	0.66	0.73	0.83	*122.18*	0.2	1.93%	4.19					*653.44*	6	1.82	**6.00**	7.57	10.67	13.56	12.64	**19.60**	**28.30**	**A62**
A63	**1.29**	A63	**1.29**	0.60	0.66	0.75	*300.00*	0.2	2.92%	8.36	*55.00*	0.2	2.65%	1.13	*151.00*	6	0.42	**9.91**	6.38	9.03	11.43	4.94	**7.69**	**11.06**	**A63**
A64	**18.80**	A64	**18.80**	0.45	0.50	0.56	*300.00*	0.2	3.73%	7.40	*916.00*	0.2	2.61%	18.90	*937.00*	6	2.60	**28.90**	3.82	5.34	6.73	32.32	**49.69**	**71.17**	**A64**
-/A64	**0.00**	A63 + A64	**20.09**	0.46	0.51	0.58	*300.00*	0.2	3.73%	7.40	*916.00*	0.2	2.61%	18.90	*937.00*	6	2.60	**28.90**	3.82	5.34	6.73	35.30	**54.28**	**77.74**	**-/A64**
A65	**0.98**	A65	**0.98**	0.66	0.73	0.83	*150.00*	0.2	2.62%	4.41					*93.00*	6	0.26	**4.67**	8.05	11.35	14.45	5.21	**8.08**	**11.68**	**A65**
A66	**4.81**	A66	**4.81**	0.46	0.51	0.58									*497.31*	6	1.38	**1.38**	9.23	13.03	16.65	20.42	**31.71**	**46.05**	**A66**
-/A66	**0.00**	A61 : A66	**163.70**	0.46	0.51	0.58	*300.00*	0.2	14.33%	3.77	*1241.00*	0.2	9.16%	13.67	*4706.31*	6	13.07	**30.51**	3.70	5.16	6.50

KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. MEDIAN TO BE CONSTRUCTED WITH CONCRETE RIP-RAP WHEN WIDTH IS 4' OR LESS. (THESE AREAS ARE HATCHED AS APPLICABLE)
3. BEGIN CONCRETE MEDIAN STA 29+52.37
4. END CONCRETE MEDIAN STA 31+76.57
5. BEGIN CONCRETE MEDIAN STA 33+58.37
6. END CONCRETE MEDIAN STA 35+80.79
7. BEGIN CONCRETE MEDIAN STA 36+88.29
8. END CONCRETE MEDIAN STA 39+10.75
9. MULTI USE CONCRETE PATH TO BE CONSTRUCTED WITH INFRASTRUCTURE



DEMO DETAIL
1" = 50'



**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

ELEVATIONS:

- XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION
- XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

LEGEND:

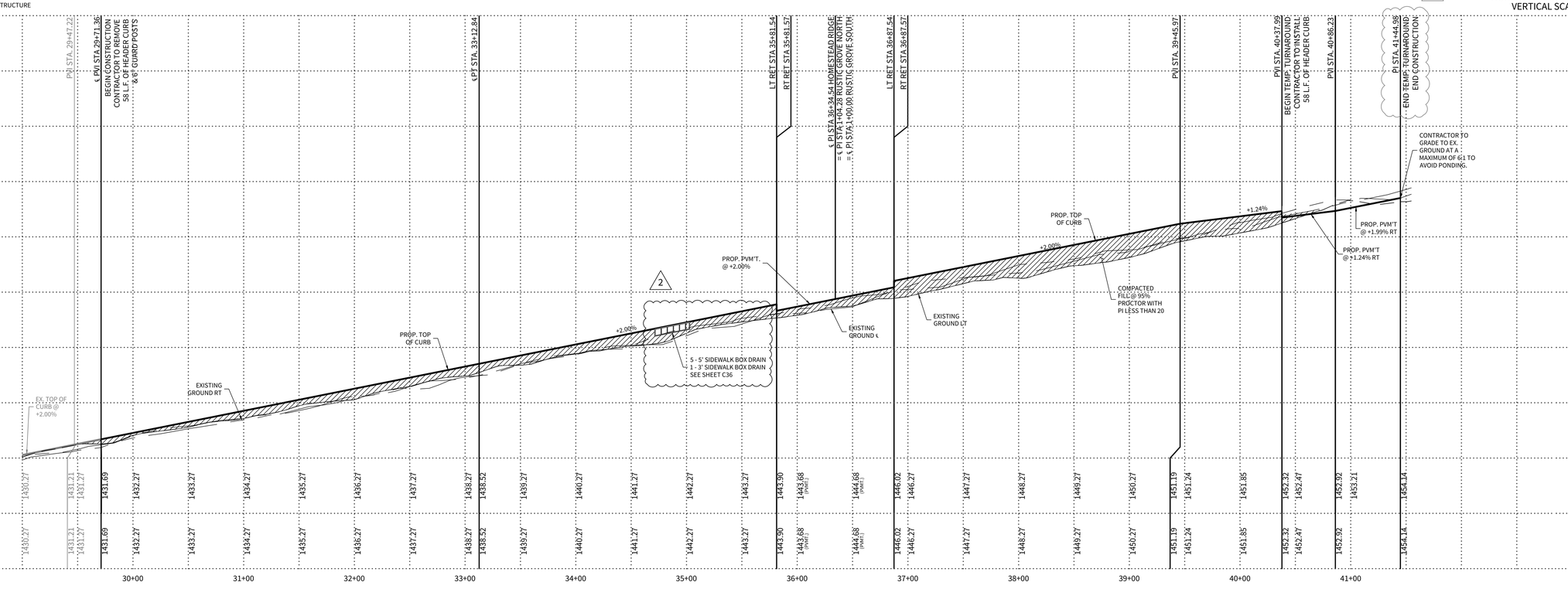
- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE

HOMESTEAD RIDGE

STA. 29+71.36 TO STA. 41+02.28

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CUDEENGINEERS.COM

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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - HOMESTEAD RIDGE

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

Δ	DATE	
1.	02-08-2024	INCREASED TEMP. TURNAROUND RADIUS
2.	06-26-2024	REVISED SIDEWALK BOX DRAINS
3.		
4.		
5.		
6.		
7.		
8.		
9.		

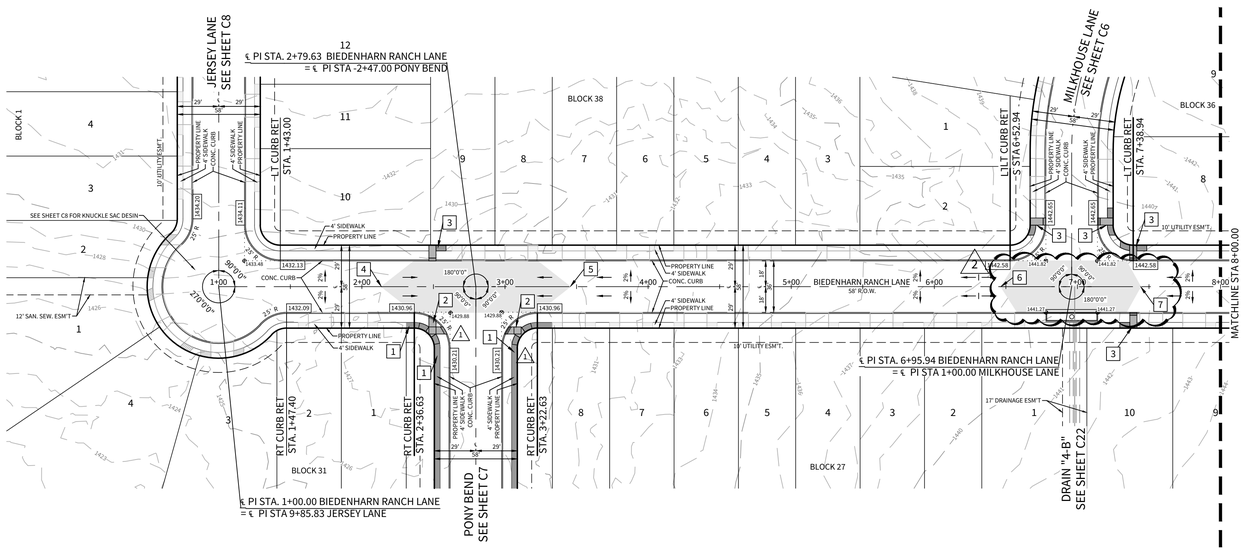
STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C3

P:\03481\008\2-Drawings\C3 STREET PLAN & PROFILE - HOMESTEAD RIDGE.dwg 2024/06/27 5:03pm EDavis



**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

ELEVATIONS:

- XXXX.XX — PROPOSED TOP OF CONCRETE CURB ELEVATION
- XXXX.XX — PROPOSED ASPHALT PAVEMENT ELEVATION
- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

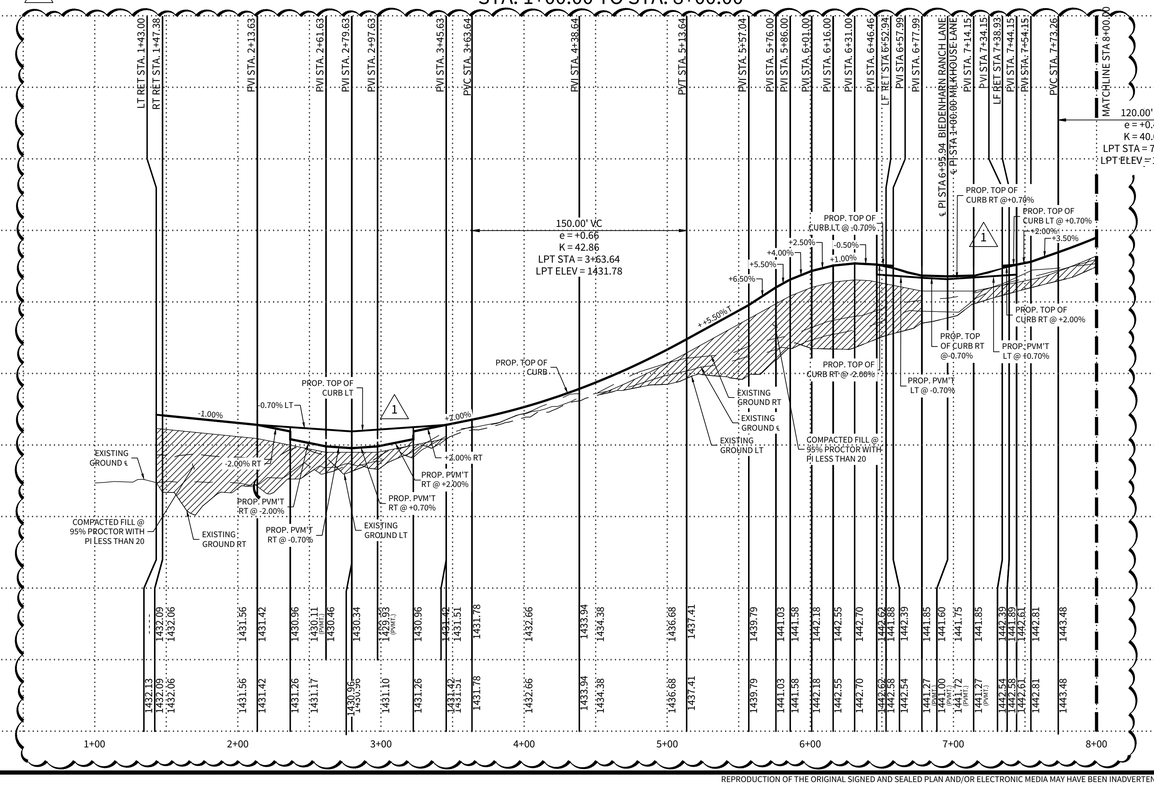
KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
3. ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING
4. BEGIN WASHOUT STA. 2+13.63
5. END WASHOUT STA. 3+45.63
6. BEGIN WASHOUT STA. 6+46.46
7. END WASHOUT STA. 7+44.15
8. BEGIN WASHOUT STA. 9+66.69
9. END WASHOUT STA. 10+66.18

BIEDENHARN RANCH LANE

STA. 1+00.00 TO STA. 8+00.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
3. ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING
4. BEGIN WASHOUT STA. 2+13.63
5. END WASHOUT STA. 3+45.63
6. BEGIN WASHOUT STA. 6+46.46
7. END WASHOUT STA. 7+44.15
8. BEGIN WASHOUT STA. 9+66.69
9. END WASHOUT STA. 10+66.18

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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - BIEDENHARN RANCH LANE

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02-08-2024	REVISED STREET GRADING & ADA RAMPS
2.	06-27-2024	REVISED STREET INTERSECTION GRADING & WASHOUT
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C4

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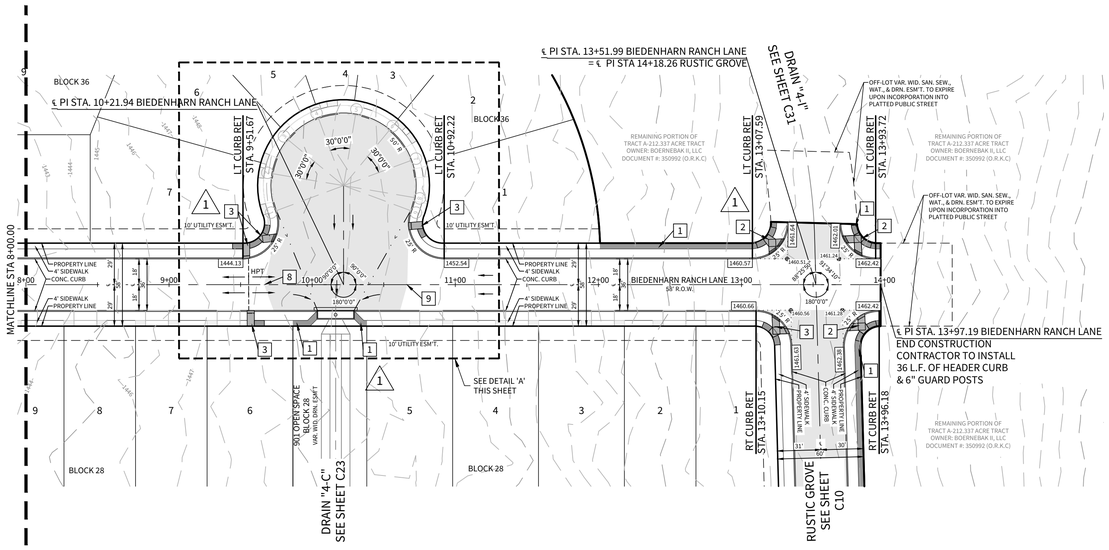
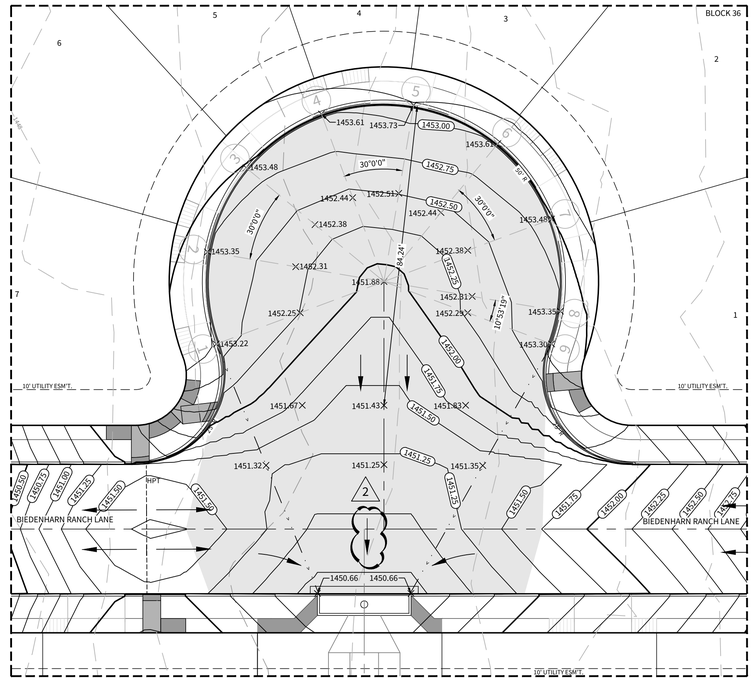
G:\03481\008\Drawings\C4 STREET PLAN & PROFILE - BIEDENHARN RANCH LANE.dwg 2024/06/27 2:20pm EDiaz





DETAIL 'A'
SCALE: 1" = 20'

**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

ELEVATIONS:

- XXXX.XX — PROPOSED TOP OF CONCRETE CURB ELEVATION
- XXXX.XX — PROPOSED ASPHALT PAVEMENT ELEVATION
- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE

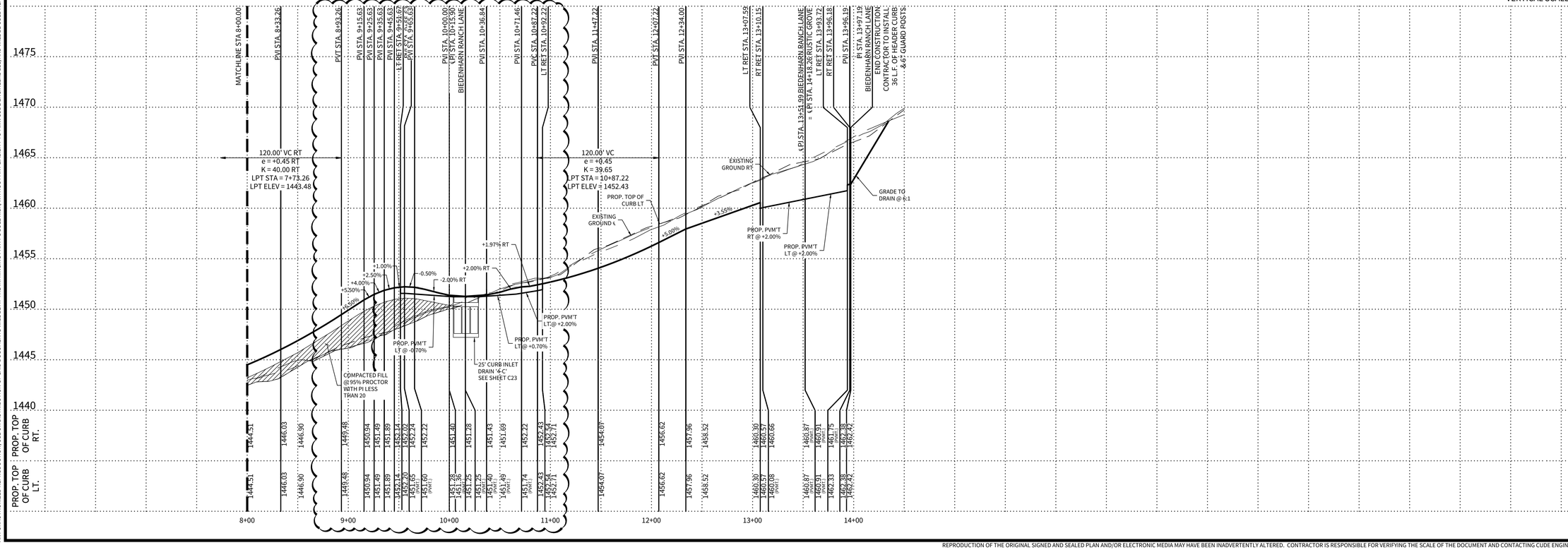
KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
3. ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING
4. BEGIN WASHOUT STA. 2+13.63
5. END WASHOUT STA. 3+45.63
6. BEGIN WASHOUT STA. 6+46.46
7. END WASHOUT STA. 7+44.15
8. BEGIN WASHOUT STA. 9+66.69
9. END WASHOUT STA. 10+66.18

BIEDENHARN RANCH LANE

STA. 8+00.00 TO END

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - BIEDENHARN RANCH LANE

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
1. 02.08.2024	REVISED SIDEWALK HATCH & ADA RAMPS
2. 06.27.2024	ARROW FLOW ADDED AND REVISED STREET SECTION
3.	
4.	
5.	
6.	
7.	
8.	
9.	

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C5

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P:\03481\000\3 Drawings\C5 STREET PLAN & PROFILE - BIEDENHARN RANCH LANE.dwg 2024/06/27 4:29pm DGiambi

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**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

KEYNOTES:

1 ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING

ELEVATIONS:

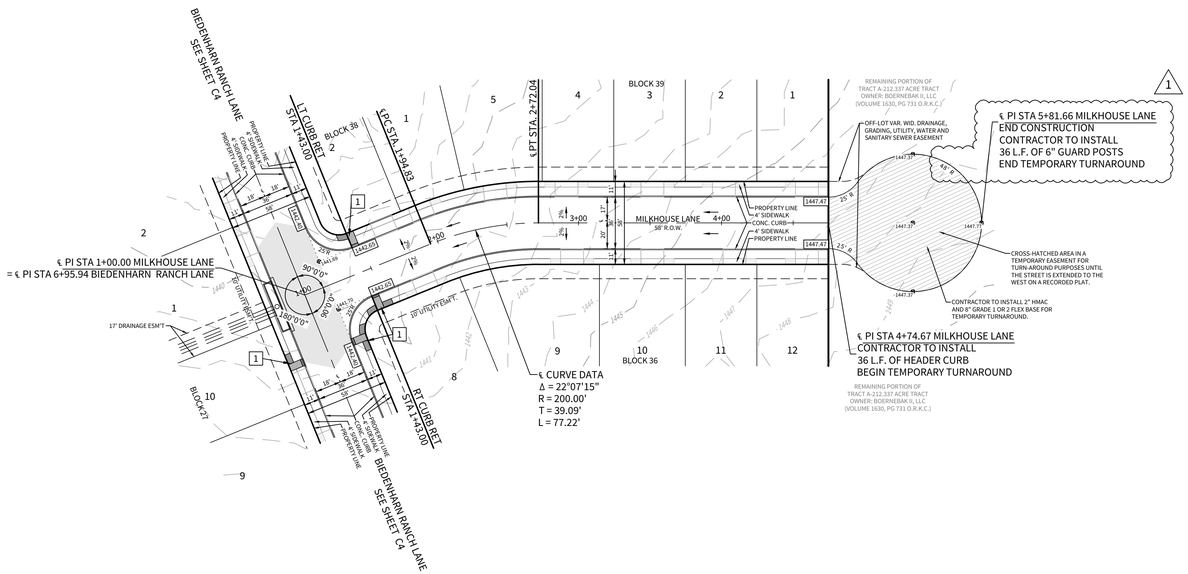
XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION

XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

LEGEND:

- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

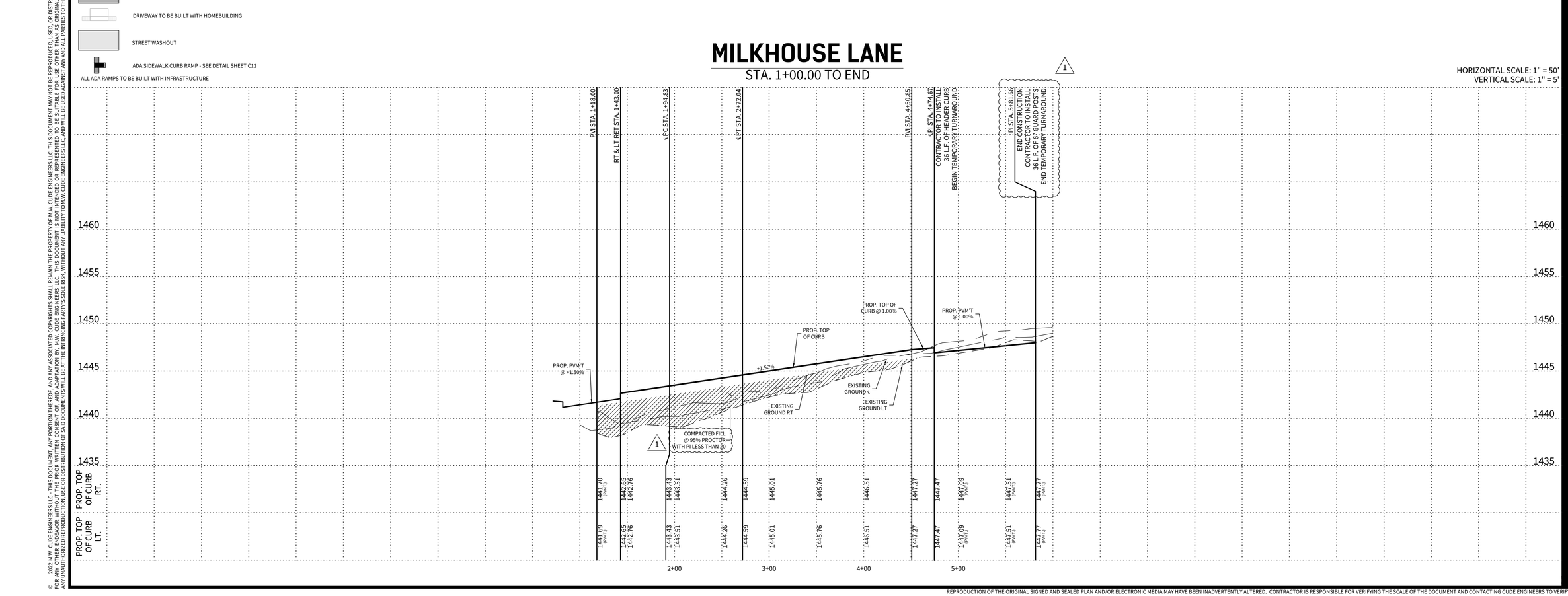
ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE



MILKHOUSE LANE

STA. 1+00.00 TO END

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - MILKHOUSE LANE

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02-08-2024	REVISED LABEL & TEMP. TURNAROUND RADIUS
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
05/08/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C6

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P:\03481\008\2-Drawings\05 STREET PLAN & PROFILE - MILKHOUSE LANE.dwg 2024/05/08 11:13am DSmith

**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
3. ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING
4. BEGIN WASHOUT STA. 1+68.15
5. END WASHOUT STA. 1+78.51
6. BEGIN WASHOUT STA. 3+75.00
7. END WASHOUT STA. 3+99.27
8. EXISTING MULTI USE CONCRETE PATH
9. EXISTING BEGIN SIDEWALK TRANSITION
10. EXISTING END SIDEWALK TRANSITION
11. EXISTING BEGIN SIDEWALK TRANSITION
12. EXISTING END SIDEWALK TRANSITION
13. EXISTING ADA RAMP

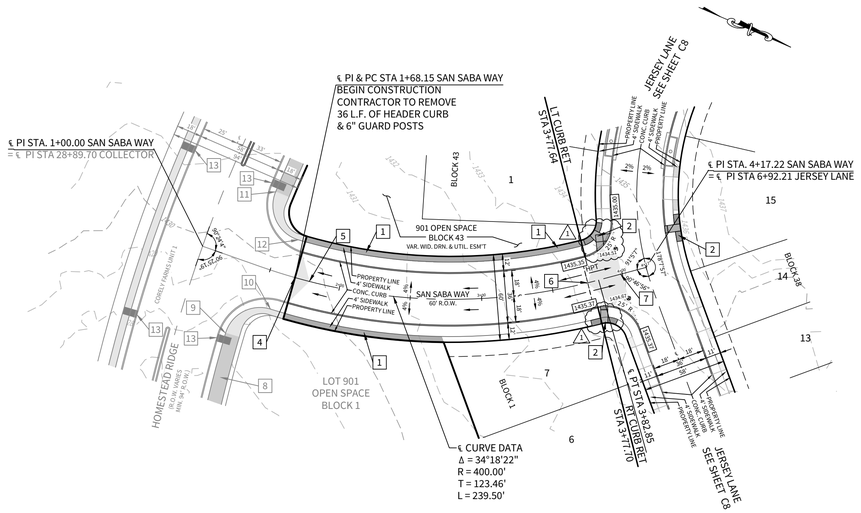
ELEVATIONS:

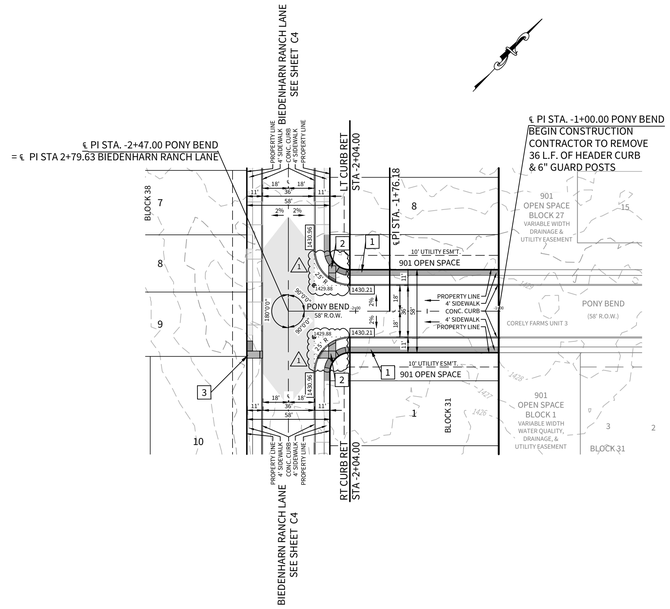
- XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION
- XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

LEGEND:

- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

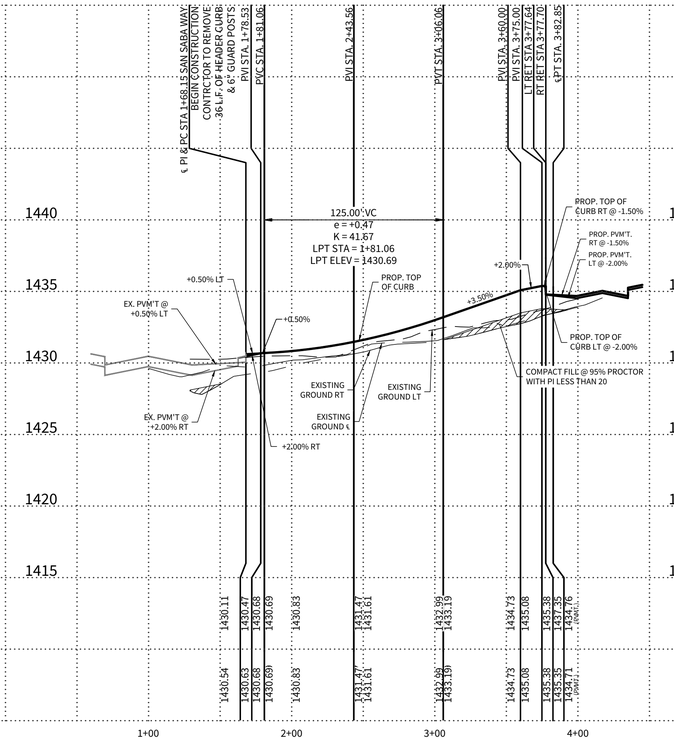
ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE





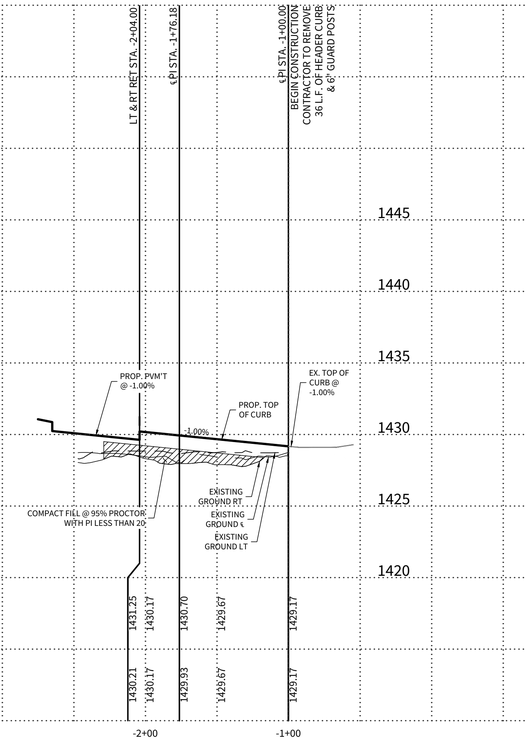
SAN SABA WAY

STA. 1+00.00 TO STA. END



PONY BEND

STA. -2+47.00 TO END



HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

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CUDEENGINEERS.COM

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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - SAN SABA WAY & PONY BEND

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
02-08-2024	REVISED ADA RAMPS

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
05/08/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C7

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P:\03481.008\2-Drawings\07-STREET PLAN & PROFILE - SAN SABA WAY & PONY BEND.dwg, 2024/5/8 8:11:13 AM, EDGAR HO

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**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
3. ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING

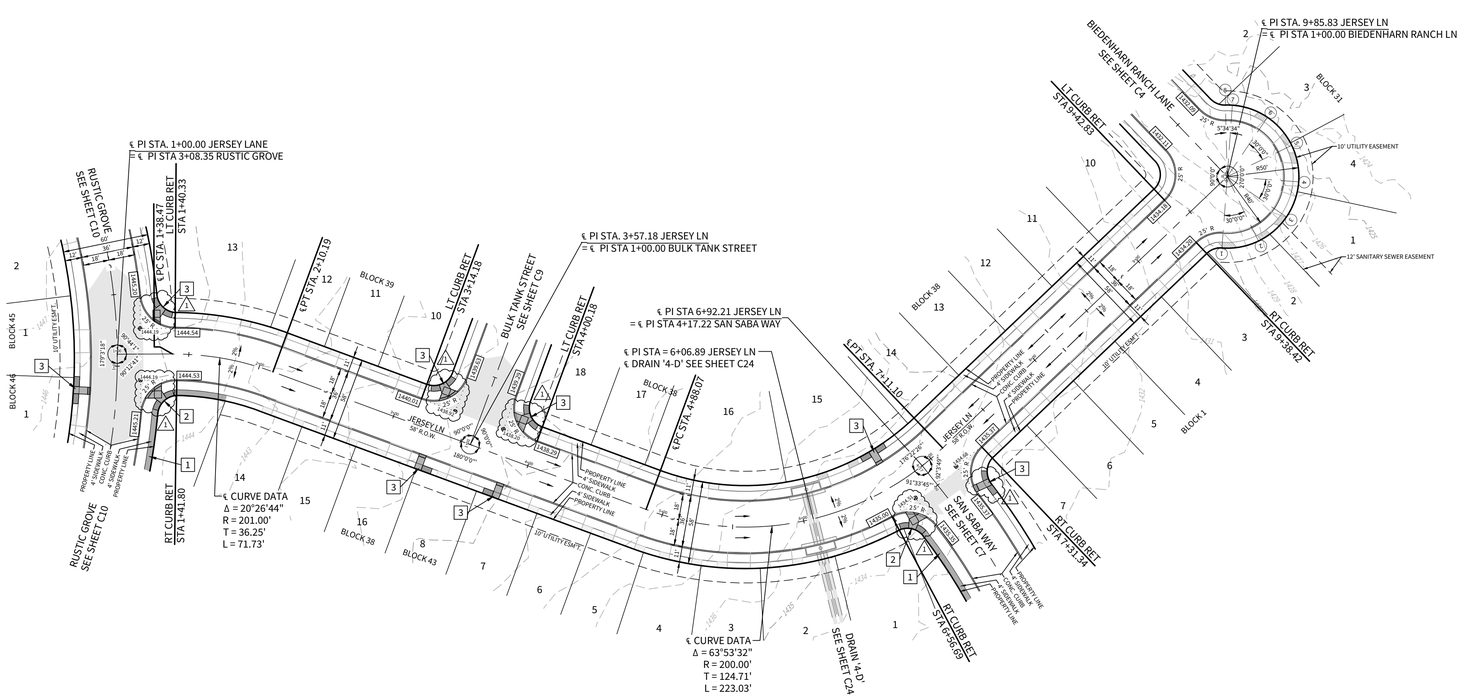
ELEVATIONS:

- XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION
- XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

LEGEND:

- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

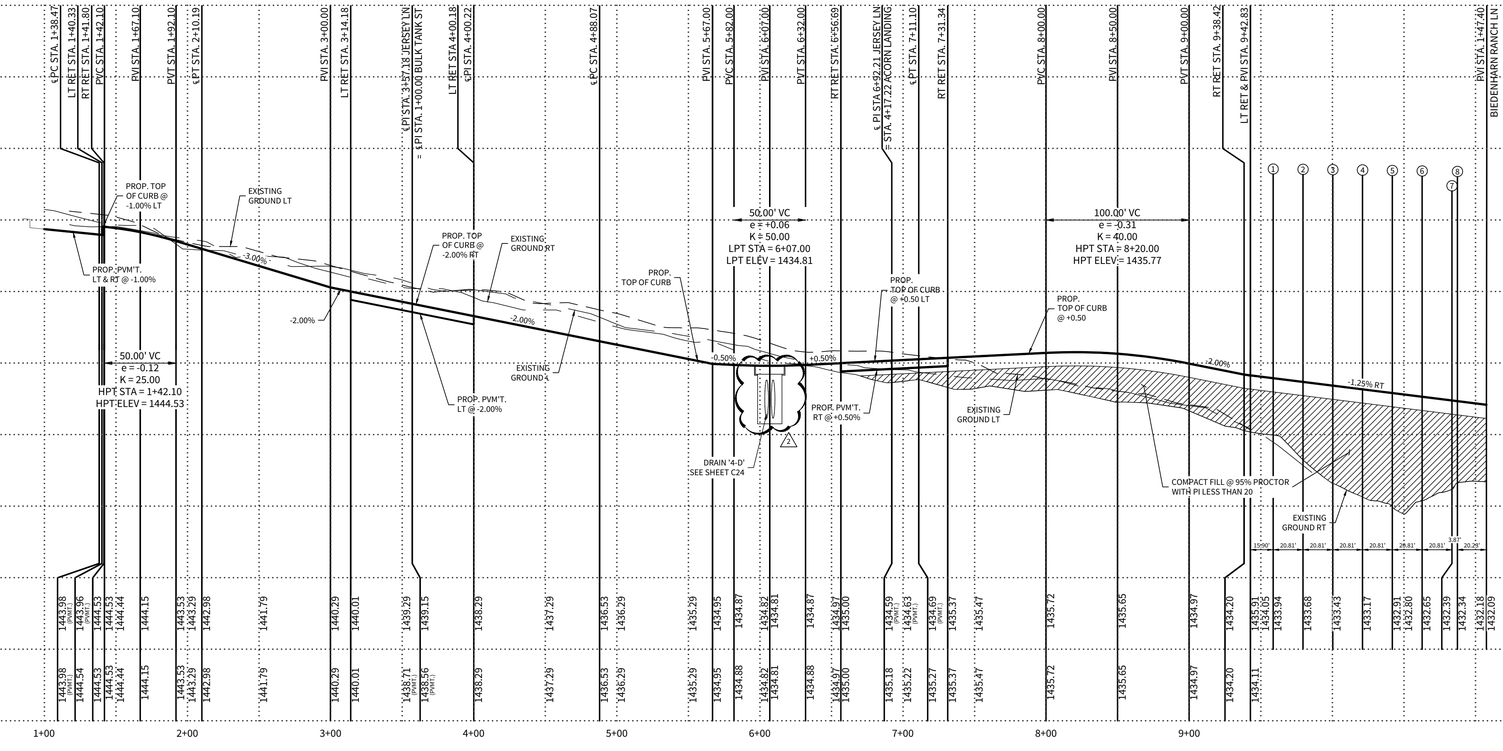
ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE



JERSEY LN

STA. 1+00.00 TO END

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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4122 Pond Hill Road, Suite 101
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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - JERSEY LANE

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	REVISED ADA RAMPS
2.	06.26.2024	REVISED INLET LINEWORK
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C8

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P:\03481\003\Drawings\03 STREET PLANS & PROFILE - JERSEY LANE.dwg Aug 26, 2024 06:07 AJ Sam Hidayat

**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

KEYNOTES:

1. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING
3. BEGIN WASHOUT STA. 1+18.00
4. END WASHOUT STA. 1+66.00

ELEVATIONS:

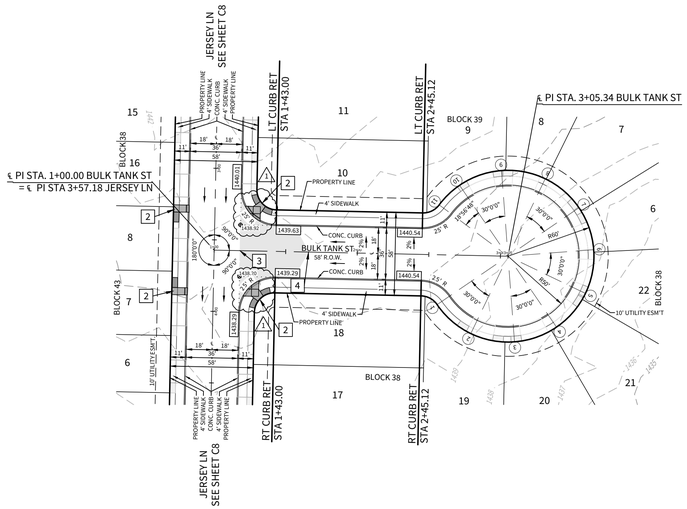
XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION

XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

LEGEND:

- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

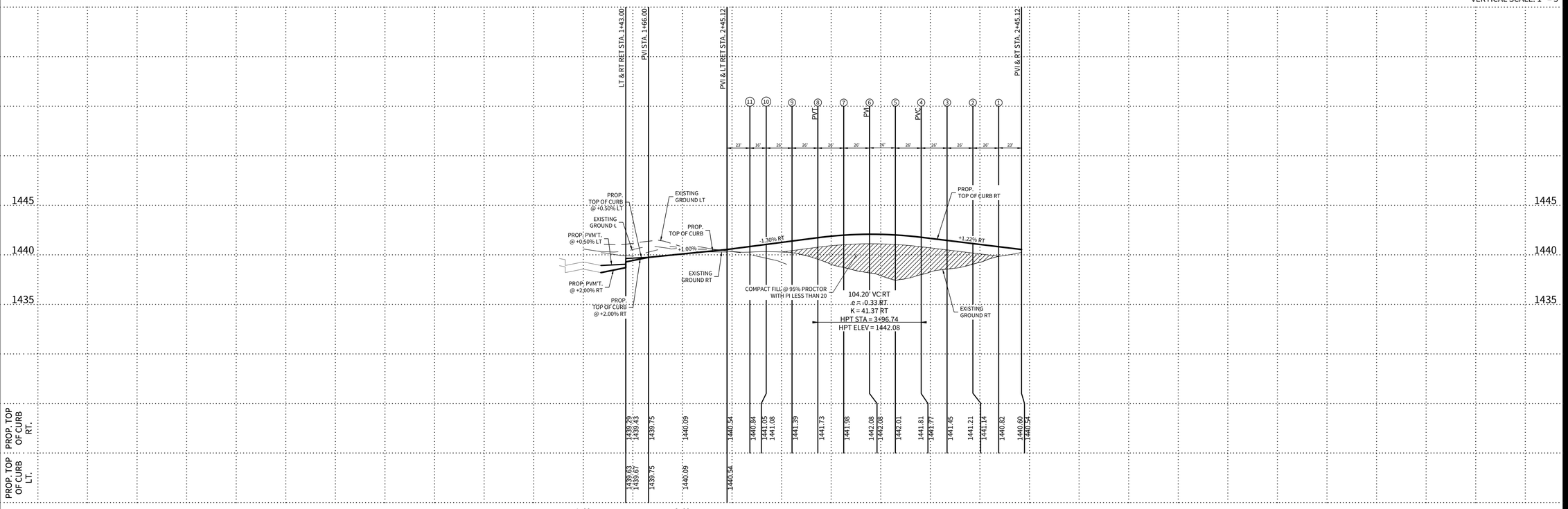
ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE



BULK TANK ST

STA. 1+00.00 TO END

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - BULK TANK STREET

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
02.08.2024	1. REVISED ADA RAMPS
	2.
	3.
	4.
	5.
	6.
	7.
	8.
	9.

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
05/08/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C9

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P:\03481\Docs\2 Drawings\C6 STREET PLAN & PROFILE - BULK TANK STREET.dwg 2/24/05/08 11:54am EDSantin

**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
3. ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING
4. BEGIN WASHOUT STA. 1+33.28
5. END WASHOUT STA. 1+94.86
6. BEGIN WASHOUT STA. 2+42.99
7. END WASHOUT STA. 3+73.46
8. END WASHOUT STA. 13+75.16
9. END WASHOUT STA. 14+00.25
10. END WASHOUT STA. 14+36.27
11. END WASHOUT STA. 15+65.32

ELEVATIONS:

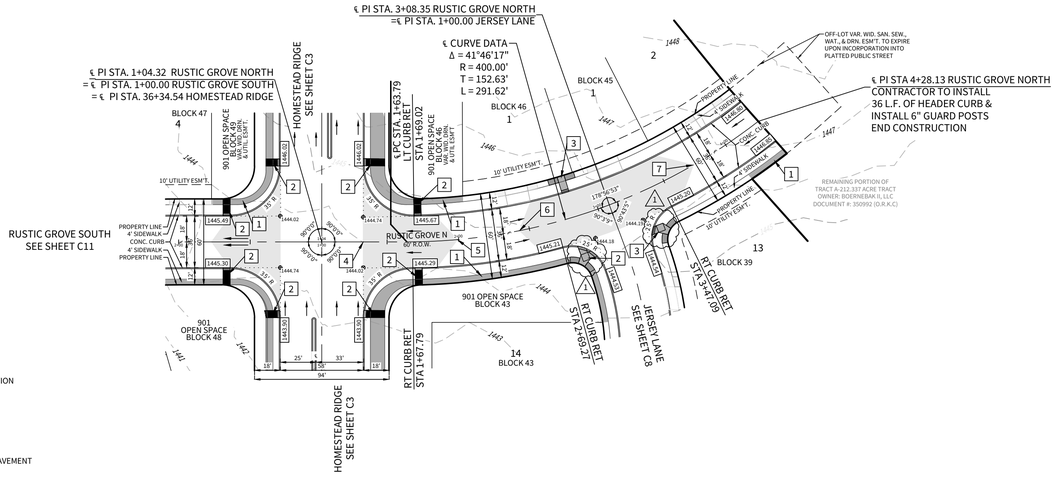
XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION

XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

LEGEND:

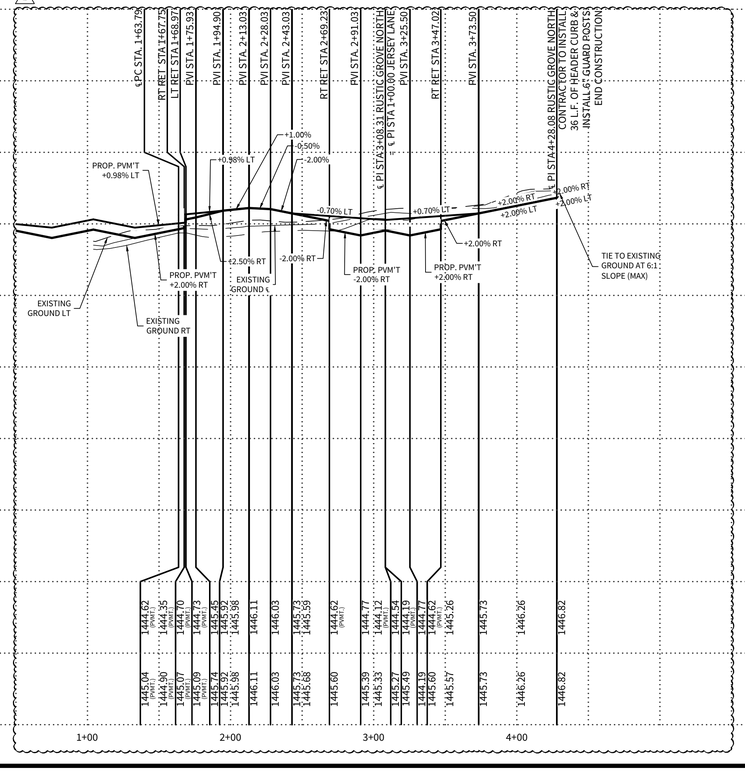
- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

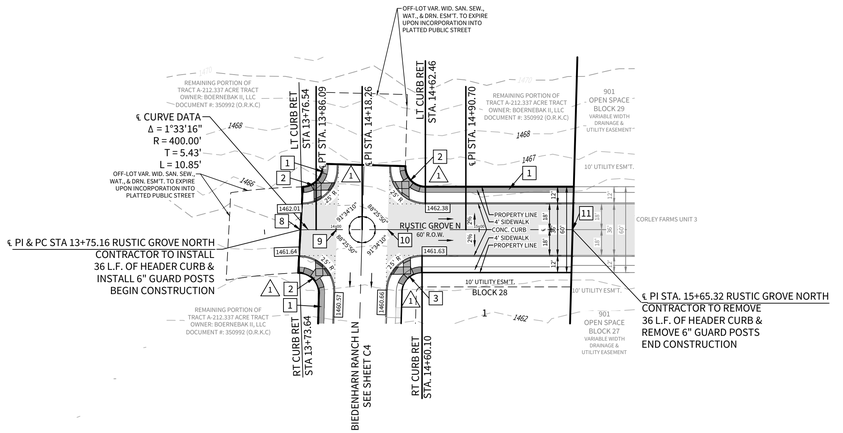
ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE



RUSTIC GROVE (NORTH)

STA. 1+04.32 TO END

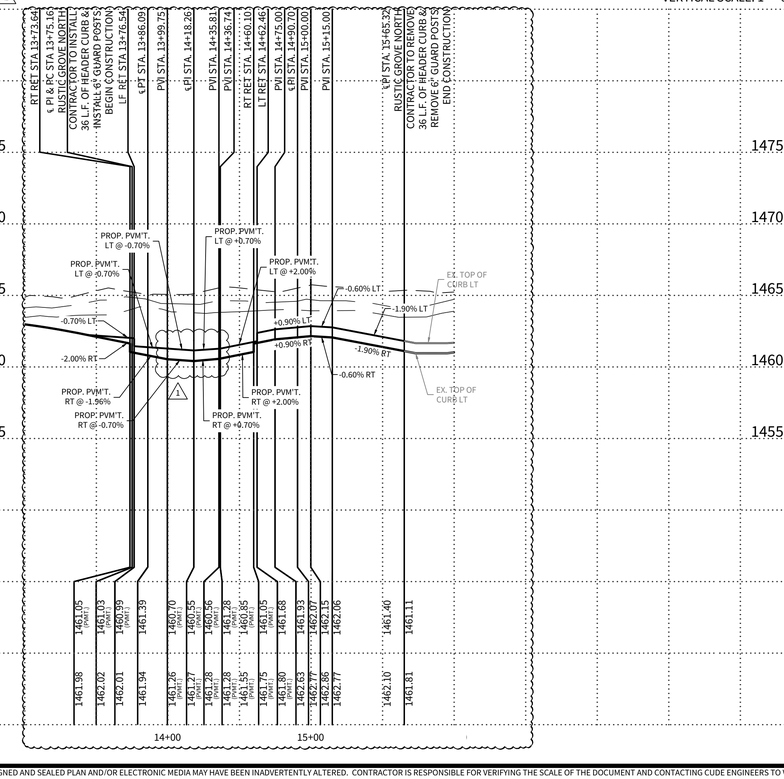




RUSTIC GROVE (NORTH)

STA. 13+73.63 TO END

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - RUSTIC GROVE NORTH

REVISIONS

DATE	
1. 02-08-2024	REVISED ADA RAMPS & STREET SLOPES
2. 06-27-2024	STREET SLOPES

ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

SAWS JOB NO.
22-1190

C10

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P:\03481\003\3 Drawings\10 STREET PLAN & PROFILE - RUSTIC GROVE N.dwg 6/26/2024 8:53pm EDOakes

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KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
3. BEGIN WASHOUT STA. 1+29.00
4. END WASHOUT STA. 1+77.00
5. BEGIN WASHOUT STA. 5+44.50
6. END WASHOUT STA. 6+55.50
7. BEGIN WASHOUT STA. 7+63.40
8. END WASHOUT STA. 8+33.79 CONTRACTOR TO MATCH EX. PVM'T
9. ADA RAMP TO BE INSTALLED AT THE TIME OF HOMEBUILDING

**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

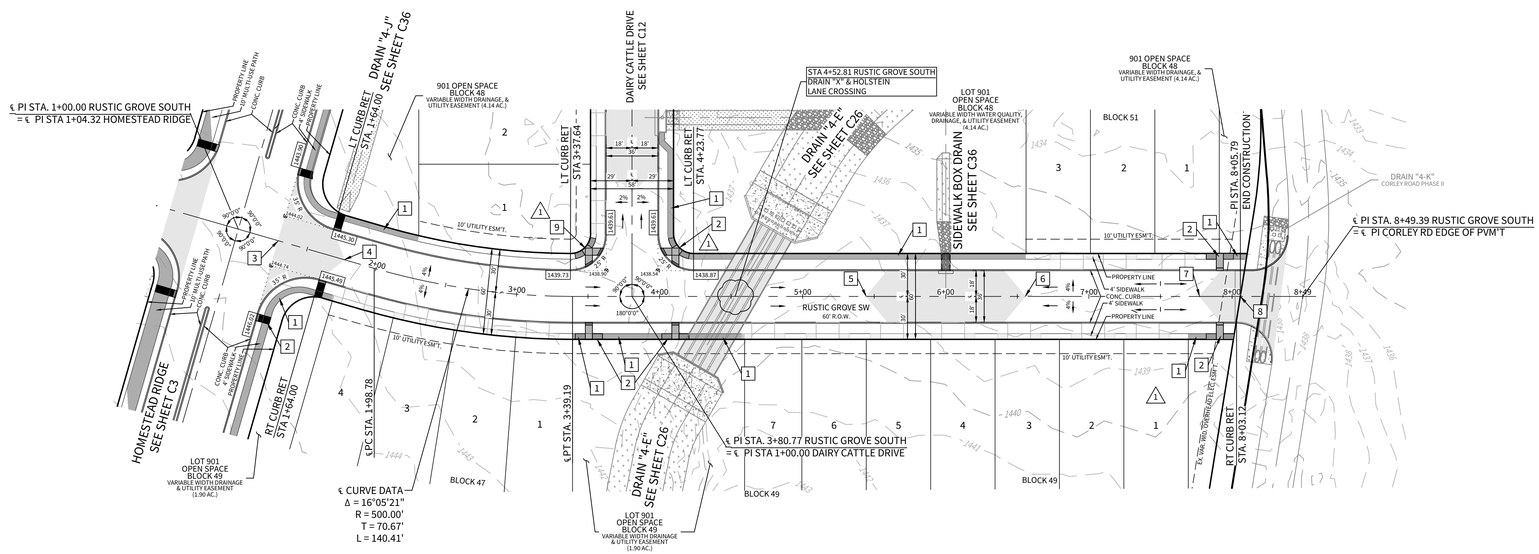
ELEVATIONS:

- XXXX.XX — PROPOSED TOP OF CONCRETE CURB ELEVATION
- XXXX.XX — PROPOSED ASPHALT PAVEMENT ELEVATION

LEGEND:

- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE

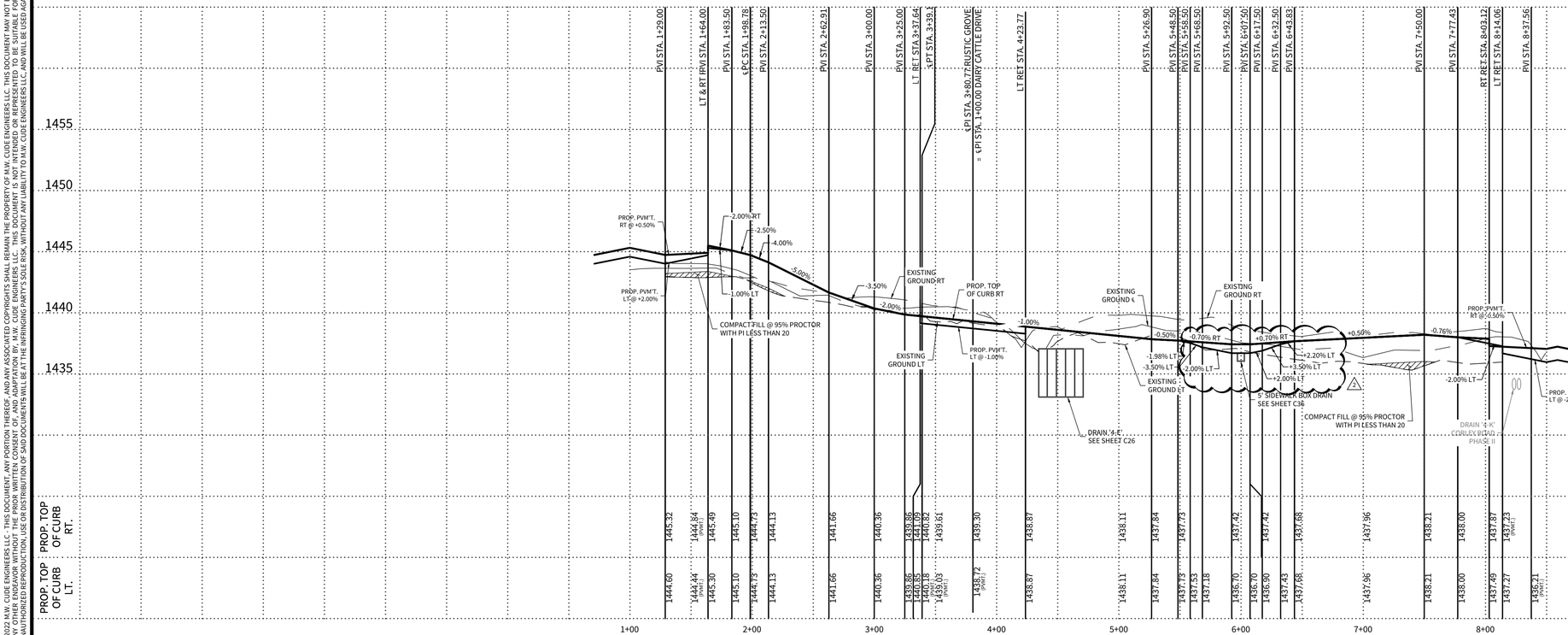


NOTE:
A KENDALL COUNTY RIGHT-OF-WAY PERMIT MUST BE OBTAINED BEFORE WORKING IN EXISTING KENDALL COUNTY R.O.W.

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'

RUSTIC GROVE (SOUTH)

STA. 1+00.00 TO STA. 4+28.06



	PROP. TOP OF CURB LT.	PROP. TOP OF CURB RT.
PVI STA. 1+29.00	1444.80	1445.32
LT & RT IPVI STA. 1+64.00	1444.44 (PVM'T.)	1444.84 (PVM'T.)
PVI STA. 1+83.50	1445.30	1445.49
℄PC STA. 1+98.78	1445.10	1445.10
PVI STA. 2+13.50	1444.73	1444.73
PVI STA. 2+62.91	1444.13	1444.13
PVI STA. 3+00.00	1441.86	1441.86
PVI STA. 3+25.00	1440.36	1440.36
LT RET STA 3+37.64	1439.86	1439.86
℄PT STA. 3+39.19	1440.18	1441.09
℄PI STA. 3+80.77 RUSTIC GROVE SOUTH = ℄PI STA. 1+00.00 DAIRY CATTLE DRIVE	1440.82	1440.82
	1439.03 (PVM'T.)	1439.61
LT RET STA. 4+23.77	1438.72 (PVM'T.)	1439.30
PVI STA. 5+26.90	1438.87	1438.87
PVI STA. 5+48.59	1438.11	1438.11
PVI STA. 5+58.59	1437.84	1437.84
PVI STA. 5+68.59	1437.73	1437.73
PVI STA. 5+92.50	1437.53	1437.42
PVI STA. 6+07.59	1437.18	1437.18
PVI STA. 6+17.50	1436.70	1437.42
PVI STA. 6+32.50	1436.90	1437.42
PVI STA. 6+43.83	1437.43	1437.68
PVI STA. 7+50.00	1437.96	1437.96
PVI STA. 7+77.43	1438.21	1438.21
RT RET STA. 8+03.12	1438.00	1438.00
LT RET STA. 8+14.06	1437.49 (PVM'T.)	1437.87 (PVM'T.)
PVI STA. 8+37.56	1437.27	1437.23 (PVM'T.)
	1436.21 (PVM'T.)	

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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - RUSTIC GROVE SOUTH

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02-08-2024	ADDED SIDEWALK, REVISED ADA RAMPS & ACCESS TO CORLEY ROAD
2.	06-27-2024	REVISED RUNNING SLOPES IN STREET

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

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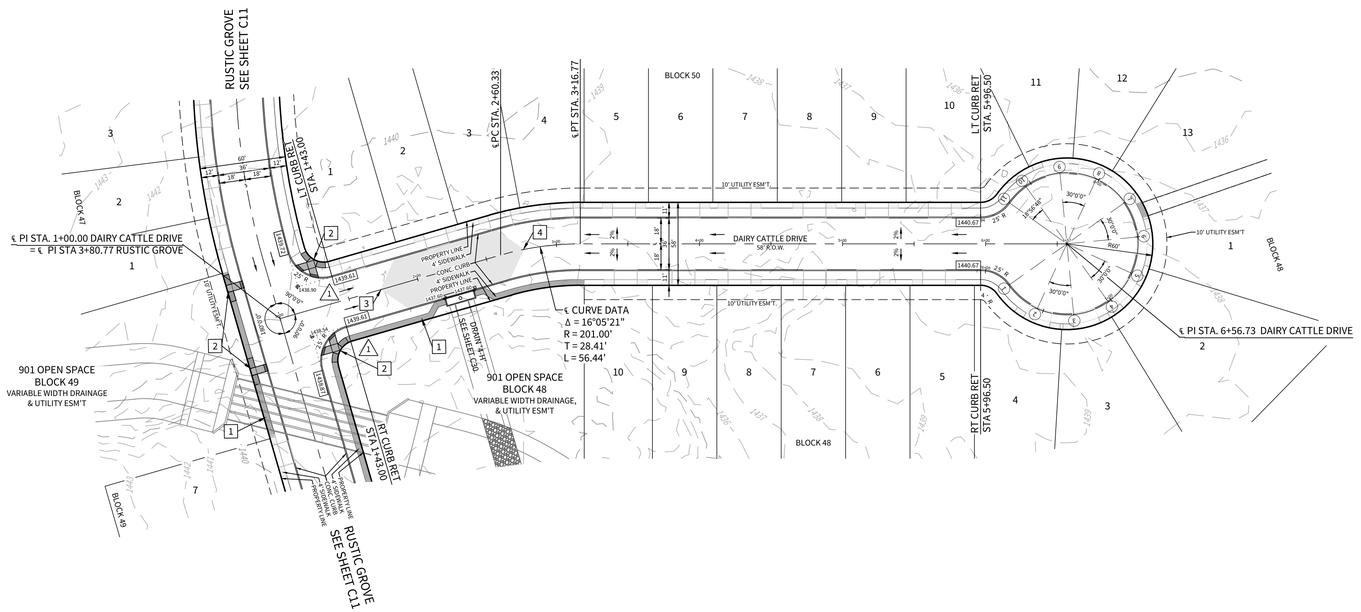


KEYNOTES:

1. SIDEWALK TO BE CONSTRUCTED WITH INFRASTRUCTURE
2. ADA RAMP TO BE INSTALLED WITH INFRASTRUCTURE
3. BEGIN WASHOUT STA. 1+73.33
4. END WASHOUT STA. 2+76.67

**ALTERNATE CURB TO BE USED EVERYWHERE WHERE LOTS ARE FRONTING THE STREET.

ELEVATIONS:

- XXXX.XX PROPOSED TOP OF CONCRETE CURB ELEVATION
- XXXX.XX PROPOSED ASPHALT PAVEMENT ELEVATION

LEGEND:

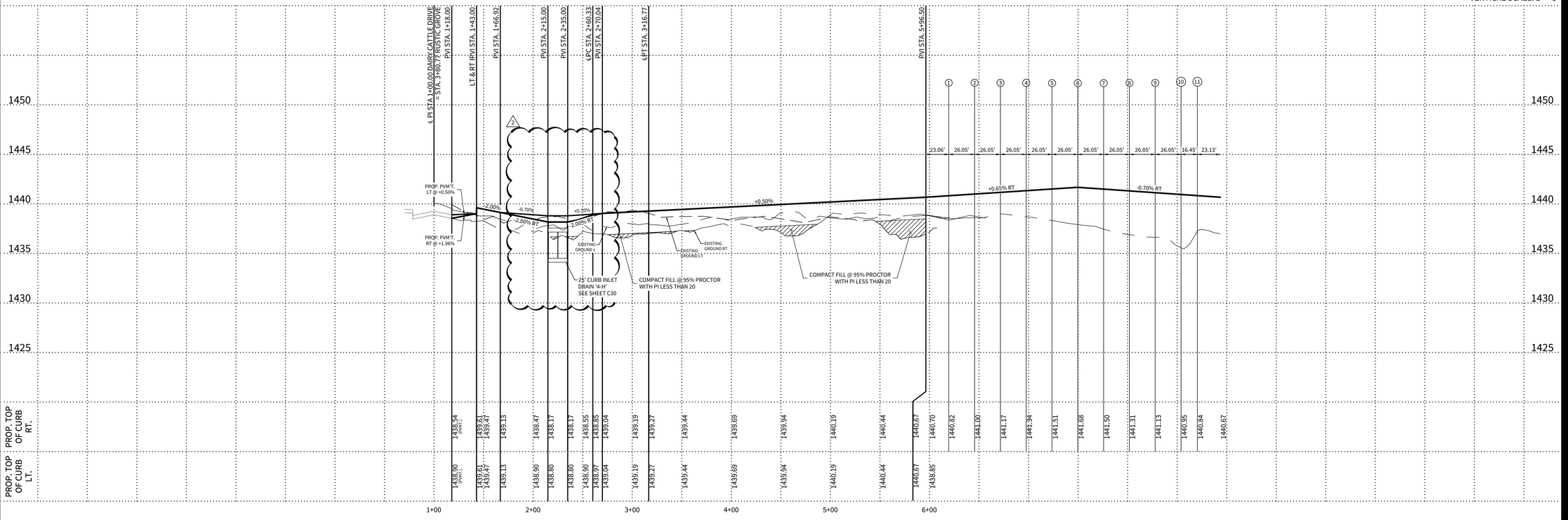
- TEMPORARY TURNAROUND PAVEMENT
- PROPOSED 4' SIDEWALK - TO BE CONSTRUCTED WITH INFRASTRUCTURE
- DRIVEWAY TO BE BUILT WITH HOMEBUILDING
- STREET WASHOUT
- ADA SIDEWALK CURB RAMP - SEE DETAIL SHEET C12

ALL ADA RAMPS TO BE BUILT WITH INFRASTRUCTURE

DAIRY CATTLE DRIVE

STA. 1+00.00 TO END

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

STREET PLAN & PROFILE - DAIRY CATTLE DRIVE

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	REVISED ADA RAMPS
2.	06.27.2024	REVISED STREET CROSS SLOPES
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C12

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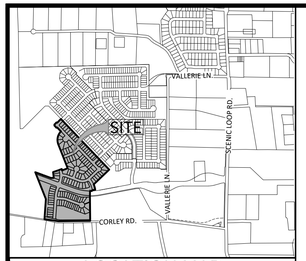
P:\03481\008\3-Drawings\C12 STREET PLAN & PROFILE - DAIRY CATTLE DRIVE.dwg 2024/06/27 4:22pm mbryant



LOCATION MAP
N.T.S.

OWNER/DEVELOPER:

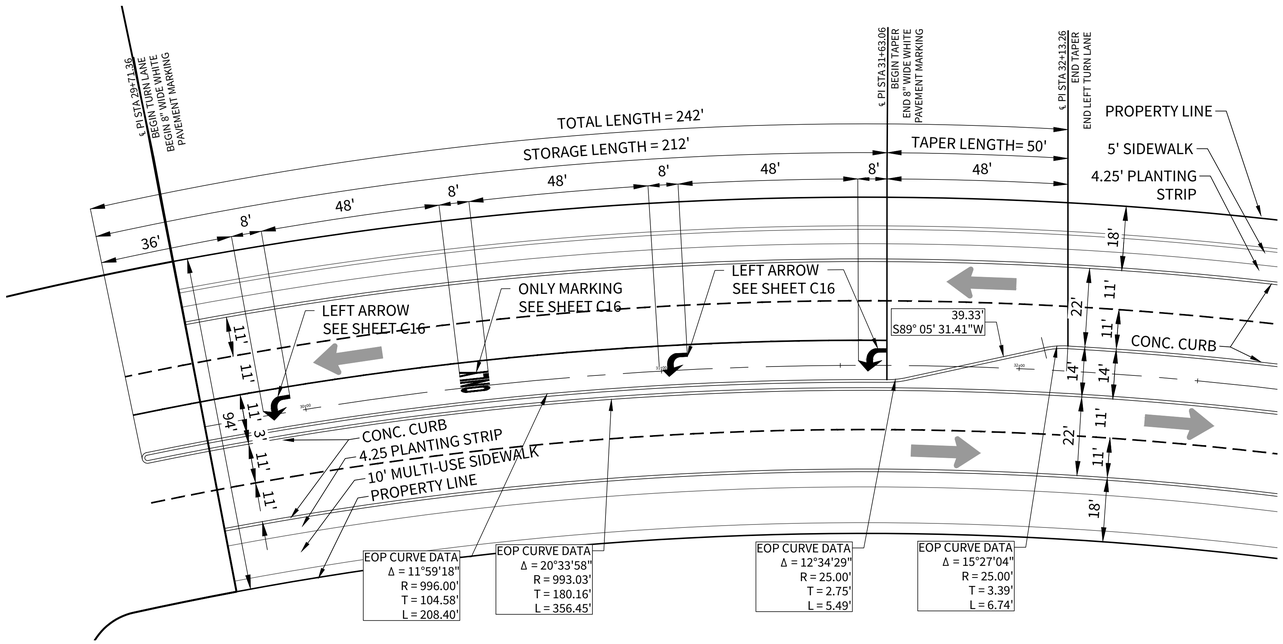
PULTE HOMES OF TEXAS, L.P.
CONTACT PERSON: FELIPE GONZALEZ
1718 DRY CREEK WAY, SUITE 120
SAN ANTONIO,TX 78259
TEL: (210) 496-1985
FAX: (210) 496-0449

CIVIL ENGINEER:

M.W. CUDE ENGINEERS, L.L.C.
CONTACT PERSON: DAVID D. CUPIT II, P.E.
4122 POND HILL ROAD, SUITE 101
SAN ANTONIO, TX 78231
TEL: (210) 681-2951
FAX: (210) 523-7112

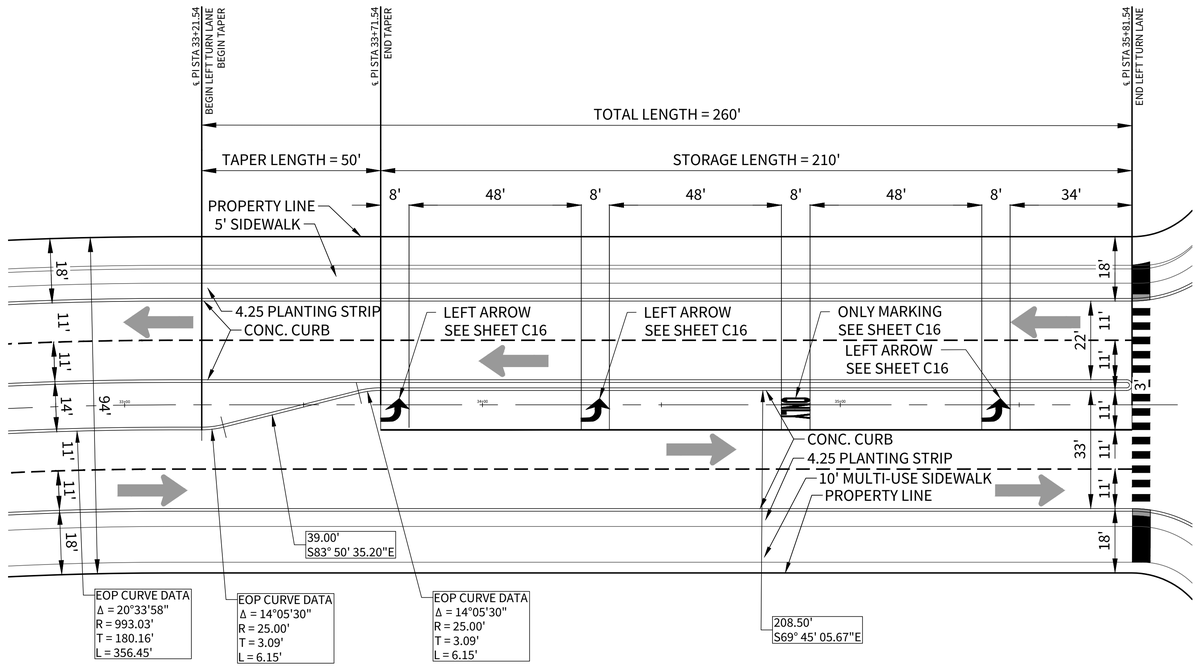
LEGEND

- TRAFFIC FLOW ARROWS INDICATING DIRECTION



HOMESTEAD RIDGE

EAST BOUND LEFT TURN STA. 29+71.36 TO STA. 32+13.26



HOMESTEAD RIDGE

WEST BOUND LEFT TURN STA. 33+21.54 TO STA. 35+81.54

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4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

TURN LANE PLAN

DATE
01/12/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	A
	1.
	2.
	3.
	4.
	5.
	6.
	7.
	8.
	9.

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C13

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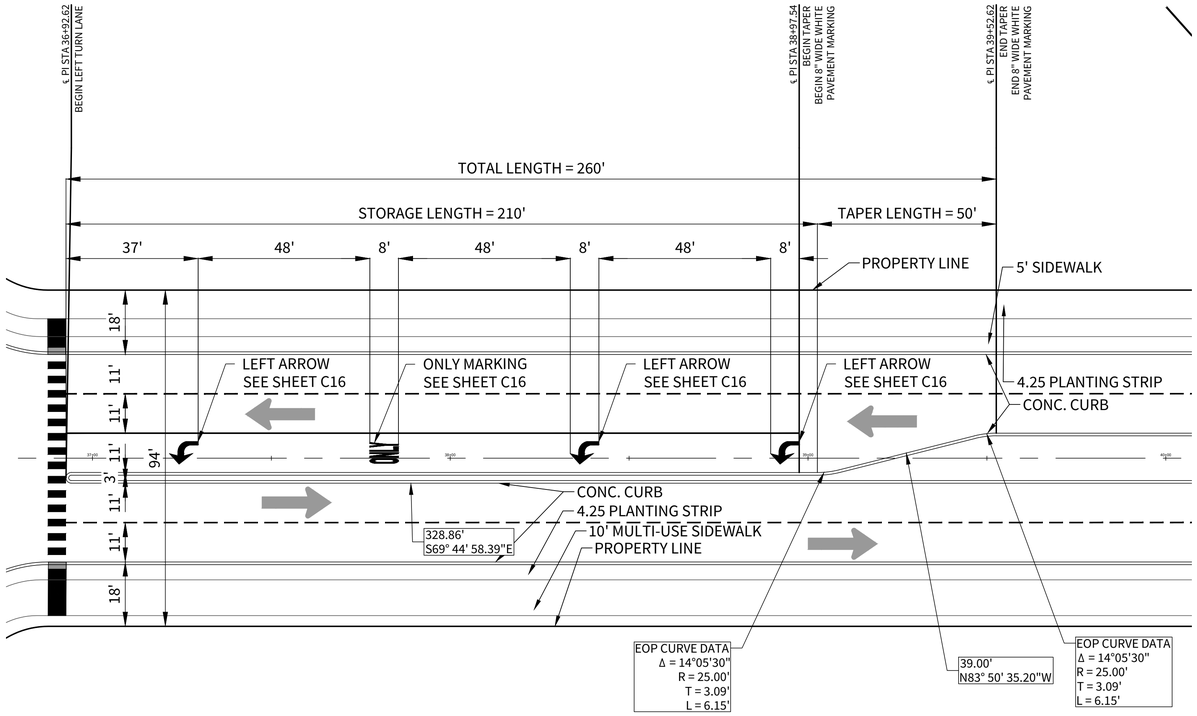
P:\03481\000\2-Xlsm\dgn\C13 TURN LANE PLAN.dwg 2024/01/12 3:29pm gilbert

LEGEND

- TRAFFIC FLOW ARROWS INDICATING DIRECTION



SCALE: 1"=20'

0 10 20

HOMESTEAD RIDGE

WEST BOUND LEFT TURN STA. 36+87.54 TO STA. 39+47.54

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CORLEY FARMS UNIT 4

TURN LANE PLAN

DATE
01/12/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	A	1.	2.	3.	4.	5.	6.	7.	8.	9.

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

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P:\03481\008\2-Drawings\04-TURN LANE PLAN.dwg 2024/02/12 3:29pm ejilbert

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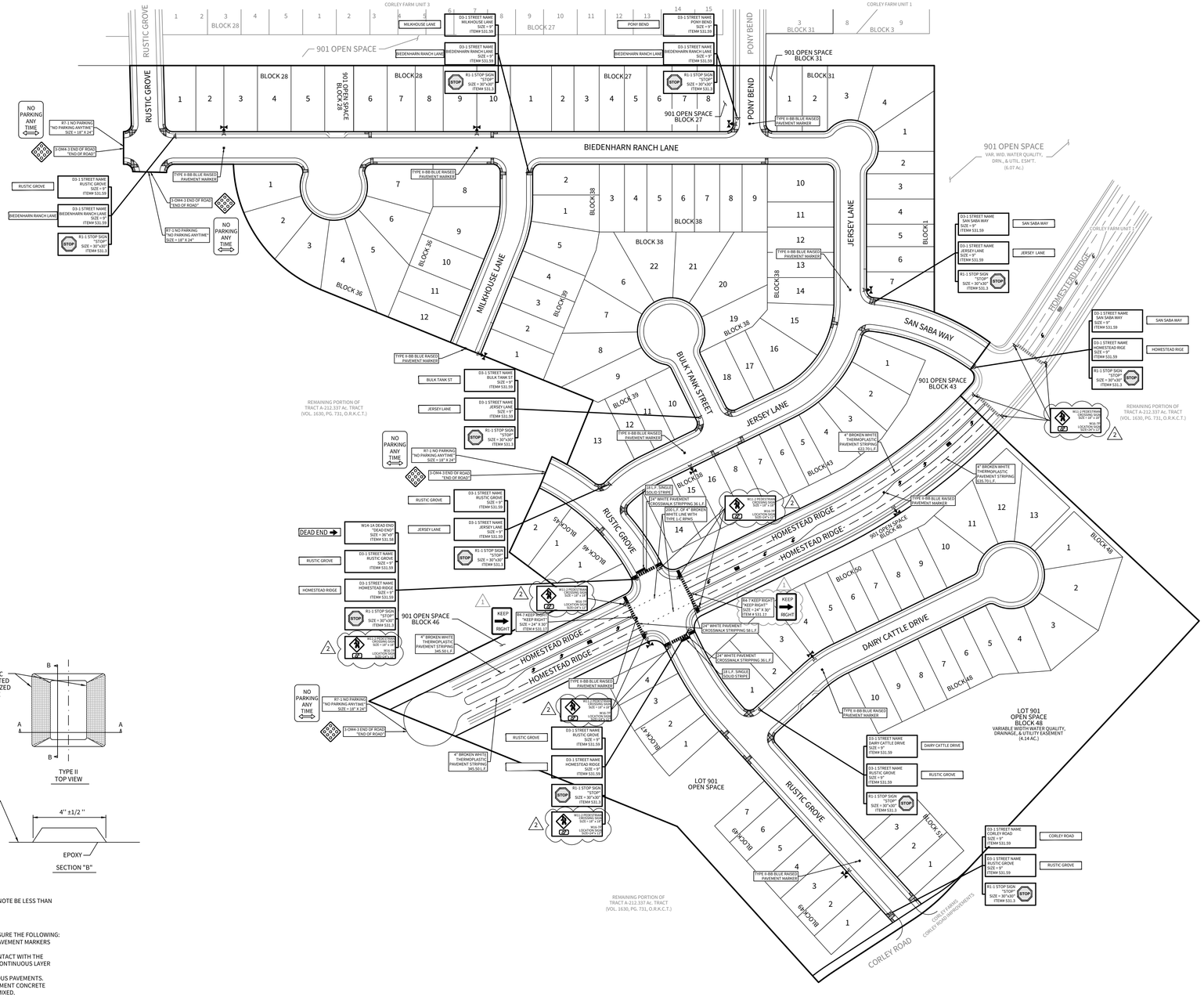

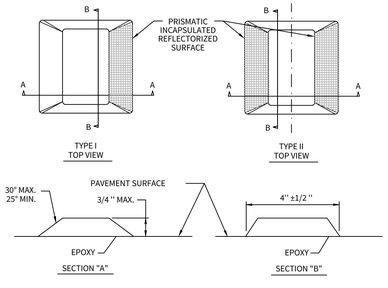

NOTE:
MINIMUM AREA OF MARKER EXPOSED TO TRAFFIC SHALL NOTE BE LESS THAN 2.5 SQUARE INCHES.

1) REFLECTORIZED BLUE - FIRE HYDRANT

2) ADHESIVE SHALL BE APPLIED IN SUFFICIENT TO ENSURE THE FOLLOWING:
   a) 100 PERCENT OF THE BONDING AREA OF RAISED PAVEMENT MARKERS SHALL BE IN CONTACT WITH THE ADHESIVE.
   b) RAISED PAVEMENT MARKERS SHALL NOT BE IN CONTACT WITH THE PAVEMENT SURFACE, BUT SHALL BE SEATED ON A CONTINUOUS LAYER OF ADHESIVE.
   c) BITUMINOUS ADHESIVE FOR MARKERS ON BITUMIOUS PAVEMENTS. EPOXY ADHESIVE FOR MARKERS ON PORTLAND CEMENT CONCRETE PAVEMENTS. EPOXY ADHESIVE SHALL BE MACHINE MIXED.

3) RAISED PAVEMENT MARKERS SHALL BE FREE OF RUST, SCALE, DIRT, OIL, GREASE, MOISTURE, OR CONTAMINATES WHICH MIGHT ADVERSELY AFFECT THE ADHESIVE BOND. ADHESIVE OR ANY OTHER MATERIAL THAT IMPAIRS THE FUNCTIONAL REFLECTIVITY WILL NOT BE ACCEPTABLE.

4) PLACEMENT OF RAISED PAVEMENT MARKERS SHALL BE 4 FEET OFF STREET CENTELINE TOWARD ITEM MARKED.

PAVEMENT REFLECTORS DETAIL

N.T.S.

SCALE: 1"=100'

0 100 200

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CORLEY FARMS UNIT 4

TRAFFIC SIGNAGE & STRIPING PLAN

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02-08-2024	ADDED WARNING SIGNS AND CROSSWALKS
2.	06-27-2024	CROSS WALK SIGNS ADDED
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

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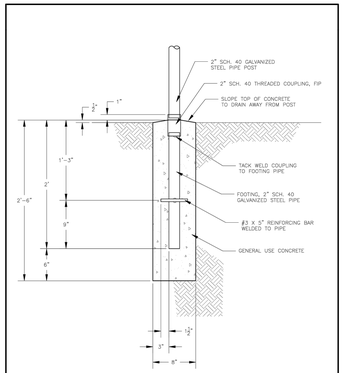
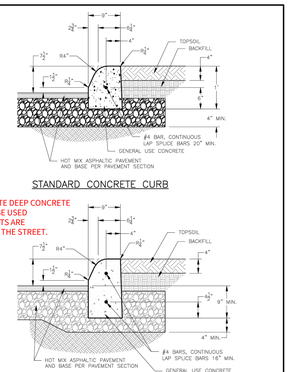


CITY OF BOERNE

SIGN POST AND FOUNDATION

SCALE: N.T.S. | DRAWING NO.: 02514-1.1 | DATE: JULY 2015



STANDARD CONCRETE CURB

*ALTERNATE DEEP CONCRETE CURB TO BE USED WHERE LOTS ARE FRONTING THE STREET.

ALTERNATE DEEP CONCRETE CURB

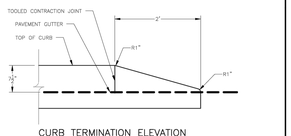
NOTE:
STANDARD CURB MUST BE REMOVED AND REPLACED WITH A HEADER CURB TO ACCOMODATE DRIVEWAYS.

THE ALTERNATE DEEP CURB MAY BE SAW CUT HORIZONTALLY TO ACHIEVE A HEADER CURB SECTION FOR DRIVEWAYS.

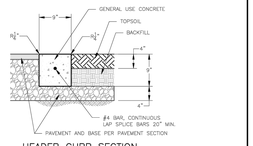
CITY OF BOERNE

CONCRETE CURB

SCALE: N.T.S. | DRAWING NO.: 02502-2.0 | DATE: JULY 2015



CURB TERMINATION ELEVATION

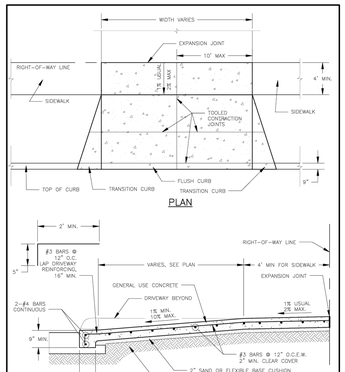


HEADER CURB SECTION

CITY OF BOERNE

CONCRETE CURB TERMINATION AND HEADER CURB

SCALE: N.T.S. | DRAWING NO.: 02502-2.1 | DATE: JULY 2015



PLAN

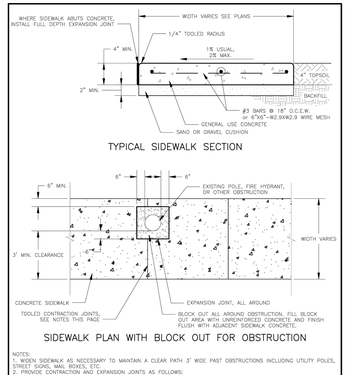
SECTION

NOTE: THE HEADER CURB CONSTRUCTION MAY BE DELETED WHEN CONSTRUCTING DRIVEWAY ADJACENT TO AN EXISTING HEADER CURB THAT IS A MINIMUM OF 9" DEEP WITH AT LEAST ONE HORIZONTAL BAR. INSTALL AN EXPANSION JOINT BETWEEN THE EXISTING HEADER CURB AND DRIVEWAY.

CITY OF BOERNE

CONCRETE DRIVEWAY APPROACH SIDEWALK AT ROW LINE

SCALE: N.T.S. | DRAWING NO.: 02502-3.1 | DATE: JULY 2015



TYPICAL SIDEWALK SECTION

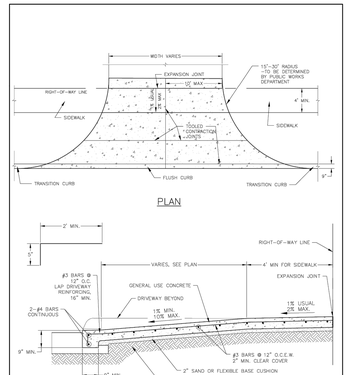
SIDEWALK PLAN WITH BLOCK OUT FOR OBSTRUCTION

NOTES:
1. WIDEN SIDEWALK AS NECESSARY TO MAINTAIN A CLEAR PATH 3' WIDE PAST OBSTRUCTIONS INCLUDING UTILITY POLES, STREET SIGNS, MAIL BOXES, ETC.
2. PROVIDE CONTRACTION AND EXPANSION JOINTS AS FOLLOWS:
   - 4 FT WIDE SIDEWALK: TOOLED CONTRACTION JOINTS AT 4 FT INTERVALS, EXPANSION JOINTS AT 48 FT INTERVALS.
   - 5 FT WIDE SIDEWALK: TOOLED CONTRACTION JOINTS AT 5 FT INTERVALS, EXPANSION JOINTS AT 50 FT INTERVALS.
   - 6 FT AND WIDER SIDEWALKS: TOOLED CONTRACTION JOINTS AT 6 FT INTERVALS AND EXPANSION JOINTS AT 48 FT INTERVALS.

CITY OF BOERNE

CONCRETE SIDEWALK

SCALE: N.T.S. | DRAWING NO.: 02502-4.0 | DATE: JULY 2015



PLAN

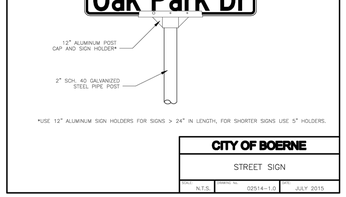
SECTION

NOTE: THE HEADER CURB CONSTRUCTION MAY BE DELETED WHEN CONSTRUCTING DRIVEWAY ADJACENT TO AN EXISTING HEADER CURB THAT IS A MINIMUM OF 9" DEEP WITH AT LEAST ONE HORIZONTAL BAR. INSTALL AN EXPANSION JOINT BETWEEN THE EXISTING HEADER CURB AND DRIVEWAY.

CITY OF BOERNE

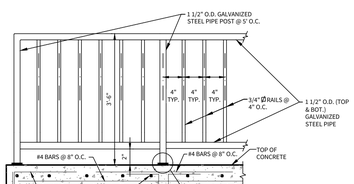
NON-RESIDENTIAL CONCRETE DRIVEWAY APPROACH SIDEWALK AT ROW LINE

SCALE: N.T.S. | DRAWING NO.: 02502-3.1A | DATE: JULY 2015



NOTES:
FOR PUBLIC STREETS:
BACKGROUND COLOR: WHITE
LEGEND AND BORDER: BLACK

FOR PRIVATE STREETS:
BACKGROUND COLOR: BLACK
LEGEND AND BORDER: WHITE

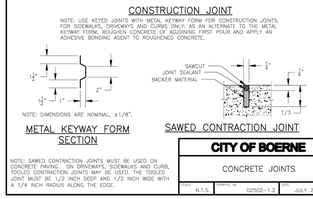


*USE 12" ALUMINUM SIGN HOLDERS FOR SIGNS > 24" IN LENGTH, FOR SHORTER SIGNS USE 5" HOLDERS.

CITY OF BOERNE

STREET SIGN

SCALE: N.T.S. | DRAWING NO.: 02514-1.2 | DATE: JULY 2015



EXPANSION JOINT

NOTE: DL = MINIMUM DEVELOPMENT LENGTH OF REINFORCING, 16 IN MINIMUM.

CONSTRUCTION JOINT

NOTE: USE KEYED JOINTS WITH METAL KEYWAY FORM FOR CONSTRUCTION JOINTS. FOR SIDEWALKS, DRIVEWAYS AND CURBS ONLY, AS AN ALTERNATE TO THE METAL KEYWAY FORM, ROUGHEN CONCRETE OF ADJOINING FIRST POUR AND APPLY AN ADHESIVE BONDING AGENT TO ROUGHENED CONCRETE.

NOTE: DIMENSIONS ARE NOMINAL, ±1/8".

METAL KEYWAY FORM SECTION

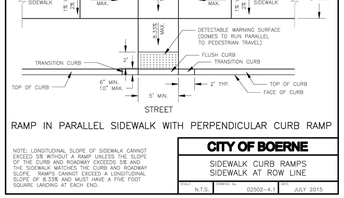
SAWED CONTRACTION JOINT

NOTE: SAWED CONTRACTION JOINTS MUST BE USED ON CONCRETE PAVING ON GRADE (PATIOS, SIDEWALKS AND CURB, EDGE). CONTRACTION JOINTS MAY BE SAWN THE FOLLOWING JOINT MUST BE 1/3 INCH DEEP AND 1/3 INCH WIDE WITH A 1/4 INCH RADIUS ALONG THE EDGE.

CITY OF BOERNE

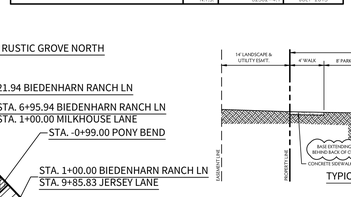
CONCRETE JOINTS

SCALE: N.T.S. | DRAWING NO.: 02502-1.2 | DATE: JULY 2015



STREET

CURB RAMP IN PERPENDICULAR SIDEWALK



STREET

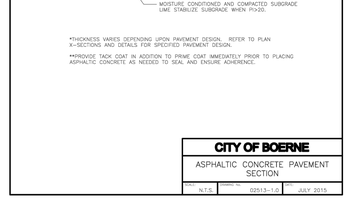
RAMP IN PARALLEL SIDEWALK WITH PERPENDICULAR CURB RAMP

NOTE: LONGITUDINAL SLOPE OF SIDEWALK CANNOT EXCEED 5% WITHOUT A RAMP UNLESS THE SLOPE OF THE CURB AND ROADWAY EXCEEDS 5% AND THE SIDEWALK MATCHES THE CURB AND ROADWAY SLOPE. RAMPS SHALL HAVE A LONGITUDINAL SLOPE OF 8.33% AND MUST HAVE A FIVE FOOT SQUARE LANDING AT EACH END.

CITY OF BOERNE

SIDEWALK CURB RAMPS SIDEWALK AT ROW LINE

SCALE: N.T.S. | DRAWING NO.: 02502-4.1 | DATE: JULY 2015



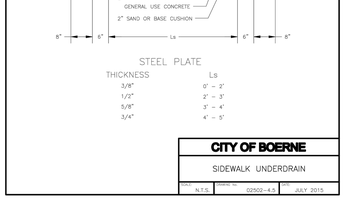
*THICKNESS VARIES DEPENDING UPON PAVEMENT DESIGN. REFER TO PLAN X-SECTIONS AND DETAILS FOR SPECIFIED PAVEMENT DESIGN.

**PROVIDE TACK COAT IN ADDITION TO PRIME COAT IMMEDIATELY PRIOR TO PLACING ASPHALTIC CONCRETE AS NEEDED TO SEAL AND ENSURE ADHERENCE.

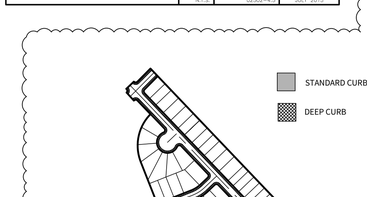
CITY OF BOERNE

ASPHALTIC CONCRETE PAVEMENT SECTION

SCALE: N.T.S. | DRAWING NO.: 02513-1.0 | DATE: JULY 2015



DETAIL



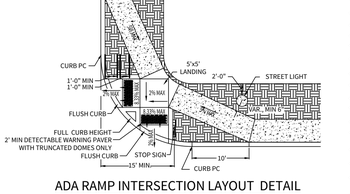
STEEL PLATE

THICKNESS	Ls
3/8"	0' - 3'
1/2"	2' - 3'
5/8"	3' - 4'
3/4"	4' - 5'

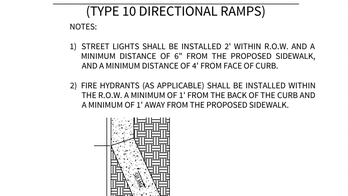
CITY OF BOERNE

SIDEWALK UNDERDRAIN

SCALE: N.T.S. | DRAWING NO.: 02502-4.5 | DATE: JULY 2015

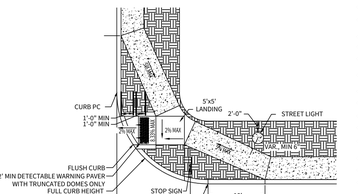


WASHOUT CROWN TRANSITION DETAIL



ADA RAMP INTERSECTION LAYOUT DETAIL
(TYPE 10 DIRECTIONAL RAMPS)

NOTES:
1) STREET LIGHTS SHALL BE INSTALLED 2' WITHIN R.O.W. AND A MINIMUM DISTANCE OF 6" FROM THE PROPOSED SIDEWALK, AND A MINIMUM DISTANCE OF 4' FROM FACE OF CURB.
2) FIRE HYDRANTS (AS APPLICABLE) SHALL BE INSTALLED WITHIN THE R.O.W. A MINIMUM OF 1' FROM THE BACK OF THE CURB AND A MINIMUM OF 1' AWAY FROM THE PROPOSED SIDEWALK.

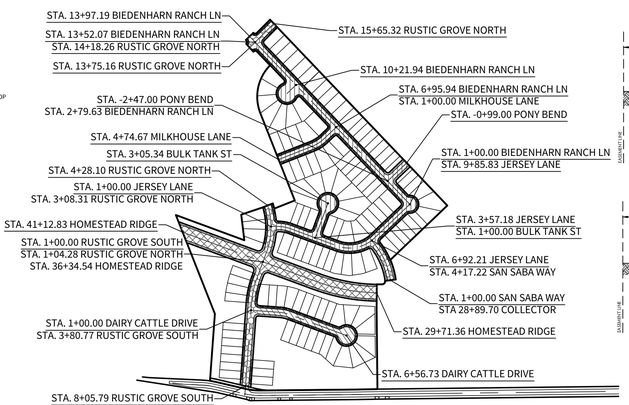


ADA RAMP INTERSECTION LAYOUT DETAIL
(TYPE 10 DIRECTIONAL RAMPS - SINGLE DIRECTION)

NOTES:
1) STREET LIGHTS SHALL BE INSTALLED 2' WITHIN R.O.W. AND A MINIMUM DISTANCE OF 6" FROM THE PROPOSED SIDEWALK, AND A MINIMUM DISTANCE OF 4' FROM FACE OF CURB.
2) FIRE HYDRANTS (AS APPLICABLE) SHALL BE INSTALLED WITHIN THE R.O.W. A MINIMUM OF 1' FROM THE BACK OF THE CURB AND A MINIMUM OF 1' AWAY FROM THE PROPOSED SIDEWALK.

TYPICAL SIDEWALK BRIDGE SECTION AND SIDEWALK PIPE RAILING

N.T.S.



NOTES:

1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT. SEE TABLE FOR STRUCTURAL NUMBER CALCULATION. REFERENCE PROJECT GEOTECHNICAL REPORT AND PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS AND ALTERNATE PAVEMENT SECTIONS.
2. ANY AREAS OF CLAY ENCOUNTERED DURING CONSTRUCTION SHALL BE REMOVED DOWN TO THE WEATHERED/FRIABLE MARLSTONE/LIMESTONE AND PROPERLY BACKFILLED WITH MARLSTONE/LIMESTONE MILLINGS HAVING A CBR VALUE DETERMINED BY THE GEOTECHNICAL ENGINEER.
3. A GEOTECHNICAL ENGINEERING REPRESENTATIVE SHALL BE RETAINED TO: (1) OBSERVE THE SITE PREPARATION AND SUBGRADE OPERATIONS. (2) EVALUATE THE ACTUAL SUBGRADE MATERIAL CLASSIFICATION, AND (3) VERIFY THAT RECOMMENDATIONS ARE FOLLOWED. THE ACTUAL SUBGRADE CONDITION AT A PARTICULAR LOCATION WILL NEED TO BE EVALUATED DURING CONSTRUCTION ONCE THE SUBGRADE IS CUT/FILLED TO THE PROPER GRADE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.
5. CONTRACTOR MAY LEAVE VERTICAL CUT BANKS AT R.O.W. LINE AND MEDIANS PROVIDED PROJECT GEOTECHNICAL ENGINEER DETERMINES ROCK IS COMPETENT TO STAND ON ITS OWN.
6. IF ALTERNATE PAVEMENT SECTION CHOSEN, CITY OF BOERNE SHALL BE PROVIDED WITH REVISED CONSTRUCTION PLANS INDICATING SELECTED PAVEMENT DESIGN PRIOR TO CONSTRUCTION.
7. PAVEMENT SECTIONS ARE SUBJECT TO CHANGE DUE TO RETESTING OF SOIL AFTER STREET EXCAVATION HAS BEEN DONE TO TOP OF CUBB.
8. CONTRACTOR SHALL CONTACT ENGINEER 48 HRS IN ADVANCE FOR FIELD OBSERVATION DURING STREET CONSTRUCTION. CONTRACTOR WILL BE REQUIRED TO CONTACT ENGINEER FOR INSPECTION OF THE SUBGRADE, BASE, ASPHALT, AND CURB.
9. GENERAL FILL MATERIALS SHOULD CONSIST OF ONSITE SOILS OR CLEAN IMPORTED FILL SOILS WITH EQUAL OR BETTER CBR CHARACTERISTICS TO THE ONSITE SOILS. GENERAL FILL MATERIAL SHOULD BE CLEAN AND FREE OF ANY VEGETATION ROOTS, ORGANIC MATERIALS, TRASH OR GARBAGE, CONSTRUCTION DEBRIS, OR OTHER DELETERIOUS MATERIALS AND SHOULD CONTAIN NO LARGER THAT THREE (3) INCHES IN MAXIMUM DIMENSION.

PAVEMENT DESIGN SCHEMATIC

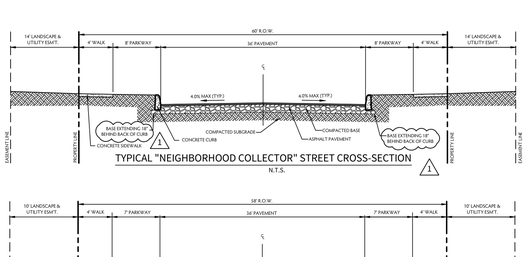
NOTE:
1. REFERENCE GEOTECHNICAL REPORT (InTEC PROJECT NO. S201216-P, DATED SEPTEMBER 23, 2020) FOR BORING INFORMATION AND CBR LOCATIONS.

LEGEND:

TYPICAL "ARTERIAL"
HOMESTEAD RIDGE — STA. 4+12.83 - 29+71.36

TYPICAL "NEIGHBORHOOD COLLECTOR"
RUSTIC GROVE SOUTH — STA. 1+00.00 – 8+05.79
RUSTIC GROVE NORTH — STA. 1+04.28 – 3+08.31
RUSTIC GROVE NORTH — STA. 13+75.15 – 15+65.32
SAN SABA WAY — STA. 1+00.00 – 4+17.22

TYPICAL "RESIDENTIAL LOCAL"
DAIRY CATTLE DRIVE — STA. 1+00.00 – 6+56.73
JERSEY LANE — STA. 1+00.00 – 9+85.83
BULK TANK STREET — STA. 1+00.00 – 3+05.34
BIEDENHARN RANCH LN — STA. 1+00.00 – 13+52.07
PONY BEND — STA. -2+47.00 – -0+99.00
MULKHOUSE LANE — STA. 1+00.00 – 4+74.67



TYPICAL "NEIGHBORHOOD COLLECTOR" STREET CROSS-SECTION

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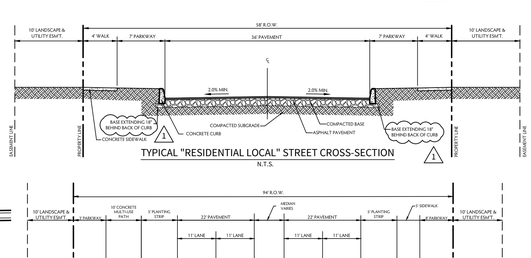

TYPICAL "RESIDENTIAL LOCAL" STREET CROSS-SECTION

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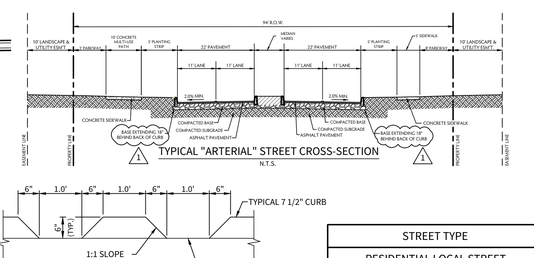
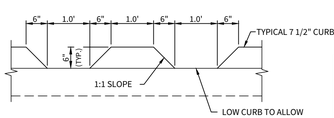


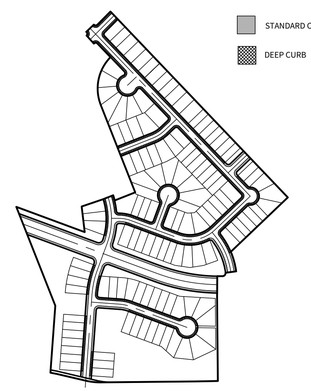
TYPICAL "ARTERIAL" STREET CROSS-SECTION

N.T.S.



SAWTOOTH CURB DETAIL

(NOT TO SCALE)



CURB DETAIL

(NOT TO SCALE)

STREET PAVEMENT DESIGN OPTIONS

1. SUBGRADE – GEOTECH ENGINEER WILL BE PRESENT TO DETERMINE IF NATIVE MARL/ROCK SUBGRADE IS SUFFICIENT FOR PAVEMENT SECTION LISTED ABOVE.
2. CONTRACTOR SHALL APPLY CLAY SUBGRADE PAVEMENT SECTION (SEE GEOTECH REPORT BY InTEC, PROJECT NO. S201216-P, DATED 09/23/20) IF GEOTECH ENGINEER DETERMINES NATIVE MARL/ROCK IS NOT SUFFICIENT. IF LIME TREATMENT IS REPLACED BY NATIVE MARL/ROCK, CITY OF BOERNE PUBLIC WORKS WILL BE INFORMED OF ALL CHANGES. REVISIONS WILL BE SUBMITTED INDICATING WHERE LIME TREATMENT WAS USED, ALONG WITH STATIONING. CONTRACTOR TO REVIEW GEOTECH RECOMMENDATIONS PRIOR TO FINAL SUBGRADE PREPARATION.
3. FILL MATERIAL – CONTRACTOR SHALL OVER-EXCAVATE STREET SUBGRADE AREAS CONTAINING SOILS HAVING A PLASTICITY INDEX GREATER THAN 20 AND REPLACE A MINIMUM OF 8" OF SUBGRADE WITH ON-SITE LIMESTONE MILLINGS THAT HAVE A PLASTICITY INDEX OF LESS THAN 20 OR USE FILL MATERIAL FROM AREAS OF SIMILAR SUBGRADE MATERIAL FOR ROADWAY EMBANKMENTS. GEOTECHNICAL ENGINEER WILL BE PRESENT AT THE TIME OF SUBGRADE PREPARATION TO DETERMINE THE EXTENTS OF APPLICABLE PAVEMENT SECTIONS BASED ON FINAL SUBGRADE.

STREET TYPE	HMAC TYPE "D"	HMAC TYPE "C"	HMAC TYPE "B"	FLEX BASE (TY A GR 2)	LIME TREATED SUBGRADE (42 LB/SY)	BASE UNDER CURB	STRUCTURAL NUMBER
RESIDENTIAL LOCAL STREET	2.0"	---	---	9.5"	8.0"	5.5"	2.85
NEIGHBOORHOOD COLLECTOR STREET	3.0"	---	---	16.0"	8.0"	5.5"	4.20
94' R.O.W. ARTERIAL (OPTION 1)	2.0"	2.0"	---	22.5"	8.0"	5.5"	5.55

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CORLEY FARMS UNIT 4

CITY OF BOERNE STANDARD STREET DETAILS

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	REVISIONS
02-08-2024	REVISED ADA RAMPS DETAIL, REVISED STRT CROSS-SECTION, & ADDED DEEP CURB/RAMP

1 2 3 4 5 6 7 8 9

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
05/08/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C16

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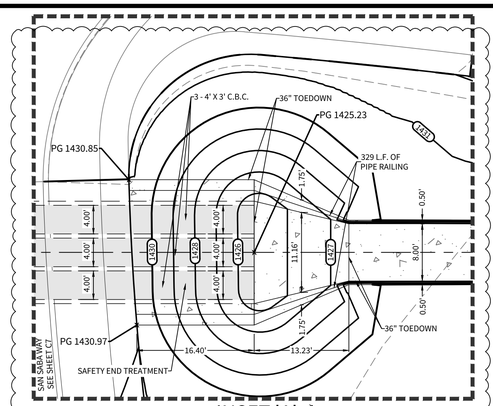
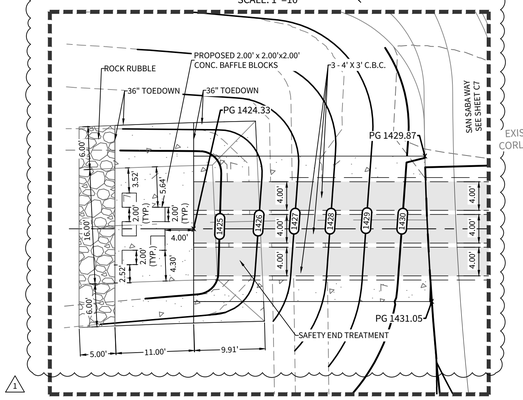
P:\03481.008\03-Drawings\12A-CITY OF BOERNE STANDARD STREET DETAILS.dwg 2024/05/08 1:23pm DGiberto



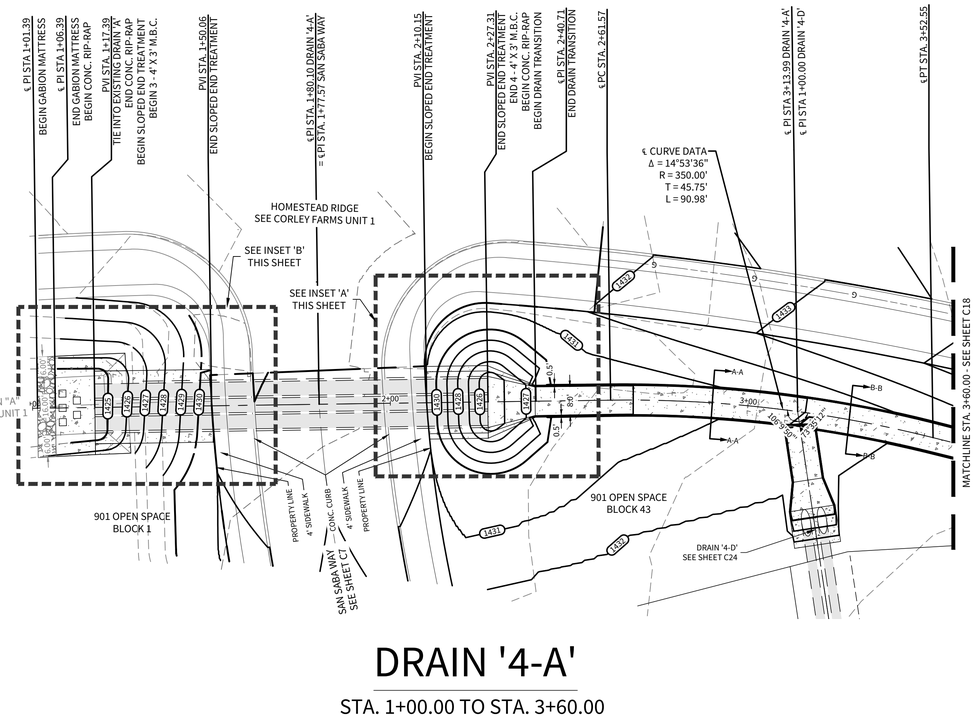
INSET 'A'

SCALE: 1"=10'



INSET 'B'

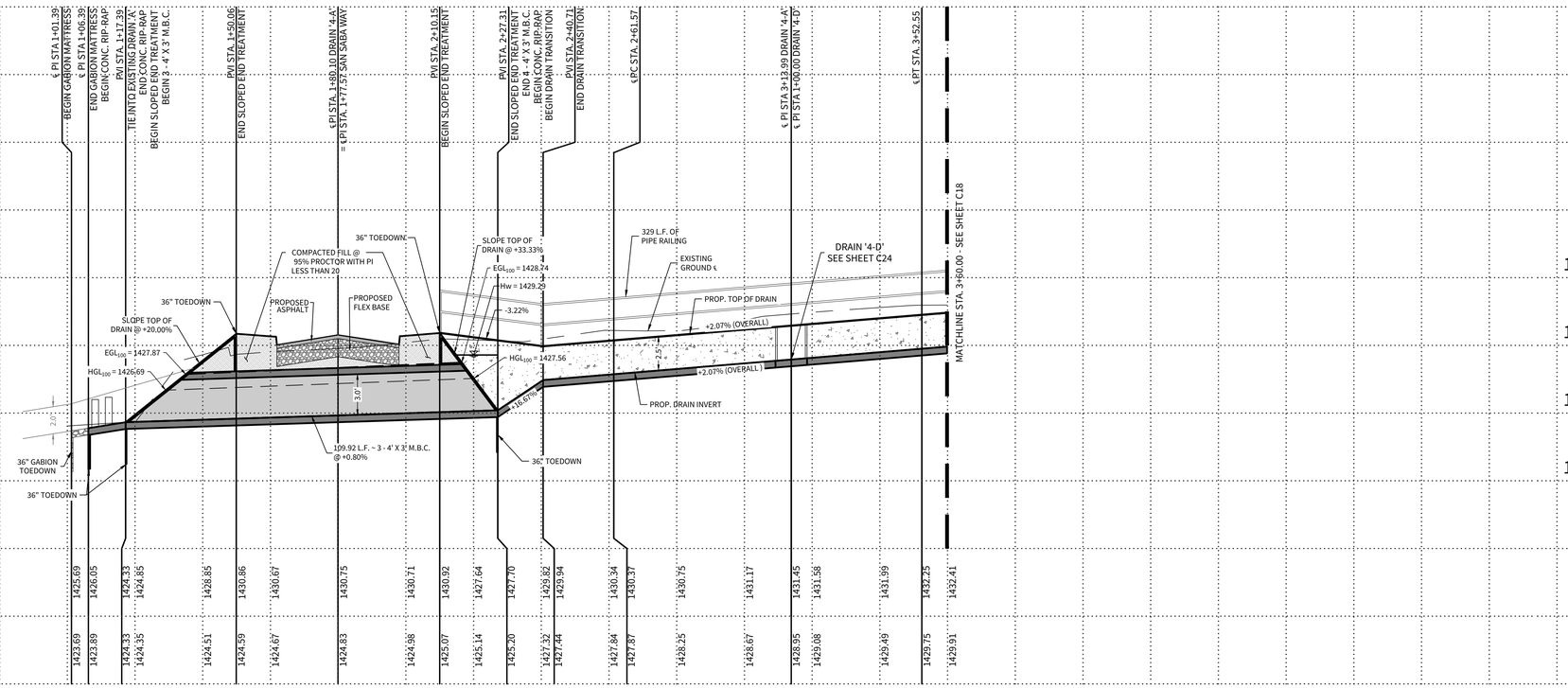
SCALE: 1"=10'

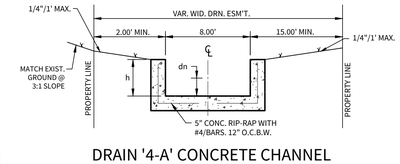


DRAIN '4-A'

STA. 1+00.00 TO STA. 3+60.00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'





DRAIN '4-A' CONCRETE CHANNEL

(N.T.S.)

"A-A" STA. 2+40.71 TO STA. 3+13.99
"B-B" STA. 3+13.99 TO STA. 7+34.58

	"A-A"	"B-B"
BEGIN STA.	2+40.71	3+13.99
END STA.	3+13.99	7+34.58
Q_{100} (cfs)	238.10	183.07
B_W (ft)	8.00'	8.00'
z (ft)	0.00'	0.00'
n	0.013	0.013
D (ft)	2.50'	2.50'
S (%)	2.07	2.07
d_c (ft)	1.63'	1.37'
V (fps)	18.21	16.71
Fr	2.507	2.508

1

DRAIN "4-A" (USBR TYPE III) BAFFLE BLOCK CALCULATIONS

Y_1 = 1.99 FT V_1 = 10.02 FPS F_1 = 1.25

V_2 = 6.00 FPS

$Y_2/Y_1 = \frac{1}{2}(\sqrt{1+8(F1)^2}-1) = 1.34$

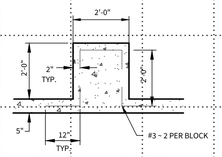
Y_2 = 2.67 FT

$L_b = 4.5(Y_2) / (F_1)^{0.76}$ = 10.11 FT (USED 11 FT)

$L_b / 3$ = 3.37 FT (USED 4.00 FT)

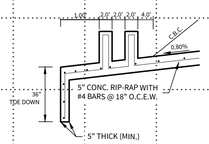
$H = Y_1(0.168*F_1+0.58)$ = 1.57 FT (USED 2.00 FT)

EXIT VELOCITY = 6.00 FPS



DRAIN "4-A" BAFFLE BLOCK REINFORCEMENT DETAIL 'A'

(N.T.S.)



DRAIN '4-A" BAFFLE BLOCK DETAIL 'A'

(N.T.S.)

CULVERT SUMMARY

3 - 4' X 3' M.B.C.

$Q_{(100)}$ = 238.10 c.f.s.

MANNING'S COEFFICIENT = 0.013

CULVERT SHAPE = BOX

RISE = 36"

SPAN = 48"

CHANNEL SLOPE = 0.80%

OUTFALL V_{100} = 10.02 FPS

SCALE: 1"=20'

0 20 40

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED RIGHT OF WAY
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- PROPOSED GAS MAIN (G)
- PROPOSED CULVERT
- CONCRETE RIP RAP
- ROCK RUBBLE

NOTES:

1. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI IN 28 DAYS
2. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF BOERNE. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
3. REFERENCE CITY OF BOERNE CONCRETE RIP-RAP TYPICAL SECTION DETAIL ON THIS SHEET
4. PER THE CITY OF BOERNE DEVELOPMENT AGREEMENT, EARTHEN CHANNELS MUST BE SOD LINED WHERE VELOCITIES OF STORM WATER RUNOFF ARE 3 - 6 FPS.

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CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-A'

DATE
05/29/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED DIMENSIONS & LABELS TO DETAILS & MINOR FINISHES PER CORPS SECTION 5
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

ANDREW R. LOWRY
125410
LICENSED PROFESSIONAL ENGINEER
05/29/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C17

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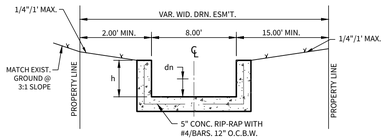
P:\03481.008\3 Drawings\C17 DRAIN PLAN & PROFILE - DRAIN '4-A'.dwg 2024/05/29 5:53pm ED Dobbs

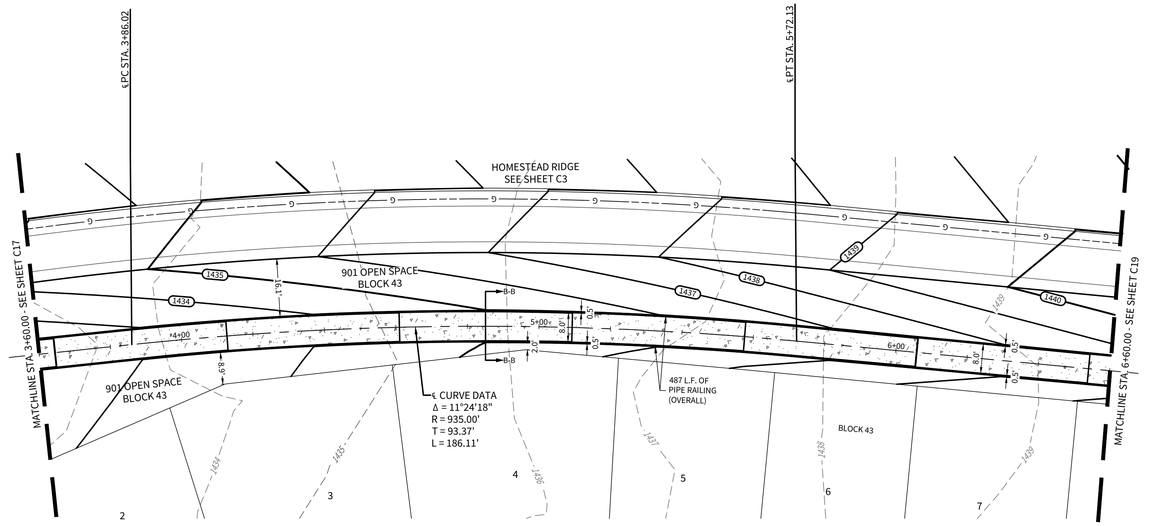


DRAIN '4-A' CONCRETE CHANNEL

(N.T.S.)

"B-B" STA. 3+13.99 TO STA. 7+34.58

	"B-B"
BEGIN STA.	3+13.99
END STA.	7+34.58
Q_{100} (cfs)	183.07
B_W (ft)	8.00'
z (ft)	0.00'
n	0.013
D (ft)	2.50'
S (%)	2.07
d_N (ft)	1.37'
V (fps)	16.71
Fr	2.508



LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR — 499 —
- EXISTING 5' CONTOUR — 500 —
- PROPOSED 1' CONTOUR — 499 —
- PROPOSED 5' CONTOUR — 500 —
- PROPOSED WATER LINE — W —
- PROPOSED SEWER MAIN — SS —
- PROPOSED GAS MAIN — G —
- PROPOSED CULVERT
- CONCRETE RIP RAP

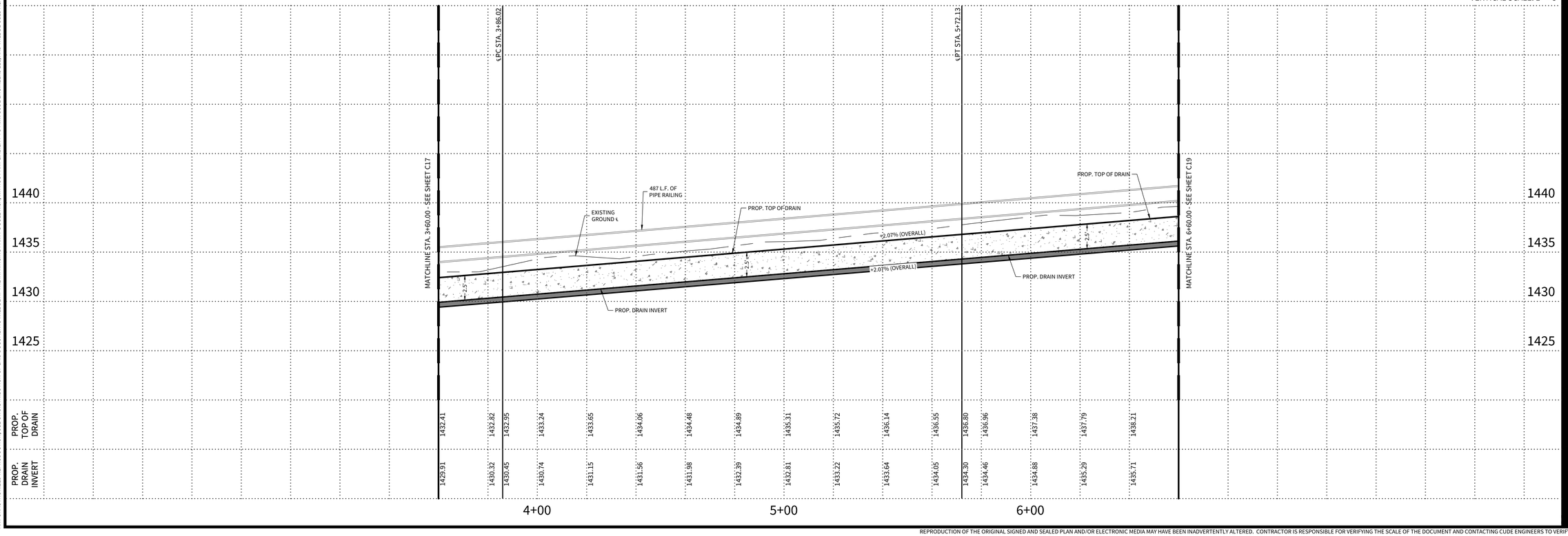
NOTES:

1. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI IN 28 DAYS
2. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF BOERNE. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
3. REFERENCE CITY OF BOERNE CONCRETE RIP-RAP TYPICAL SECTION DETAIL ON THIS SHEET
4. PER THE CITY OF BOERNE DEVELOPMENT AGREEMENT, EARTHEN CHANNELS MUST BE SOD LINED WHERE VELOCITIES OF STORM WATER RUNOFF ARE 3 - 6 FPS.

DRAIN '4-A'

STA. 3+60.00 TO STA. 6+60.00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-A'

DATE
05/29/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED FROUDE # TO CROSS-SECTIONS
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
05/29/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

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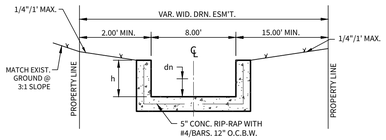


DRAIN '4-A' CONCRETE CHANNEL

(N.T.S.)

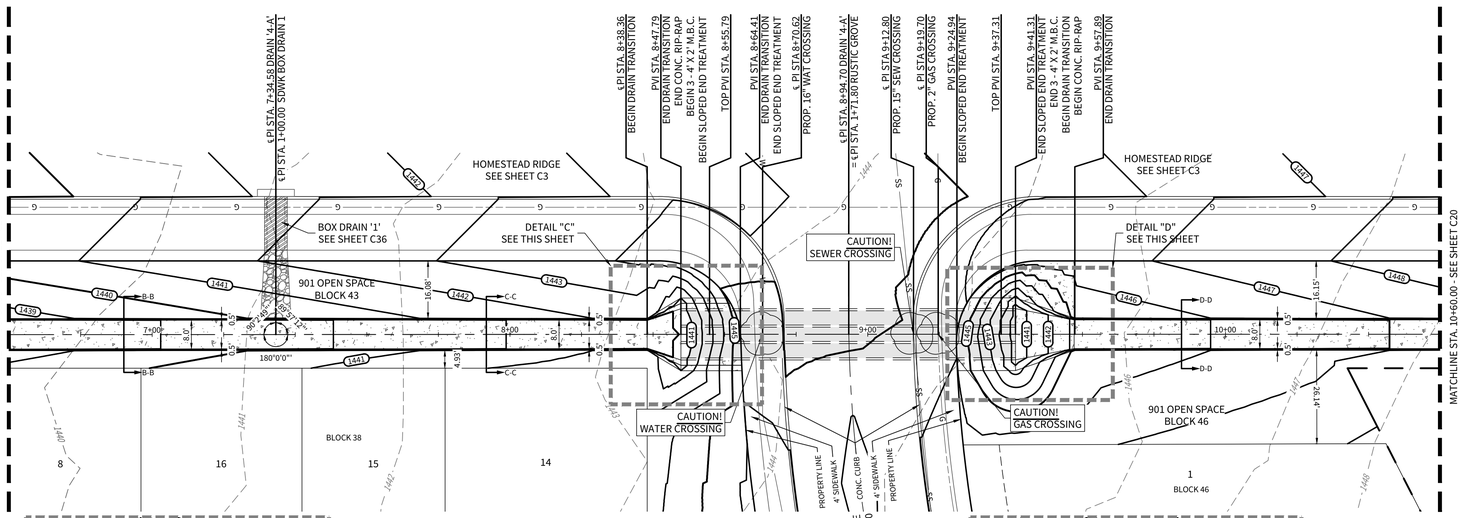
"B-B" STA. 3+13.99 TO STA. 7+34.58
"C-C" STA. 7+34.58 TO STA. 8+38.36
"D-D" STA. 9+57.89 TO STA. 11+63.09

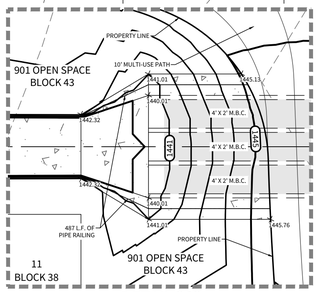
	"B-B"	"C-C"	"D-D"
BEGIN STA.	3+13.99	7+34.58	9+57.89
END STA.	7+34.58	8+38.36	11+63.09
Q_{100} (cfs)	183.07	175.51	175.51
B_w (ft)	8.00'	8.00'	8.00'
z (ft)	0.00'	0.00'	0.00'
n	0.013	0.013	0.013
D (ft)	2.50'	2.50'	2.00'
S (%)	2.07	2.07	2.00
d_n (ft)	1.37'	1.33'	1.35'
V (fps)	16.71	16.48	16.29
Fr	2.508	2.510	2.472

1

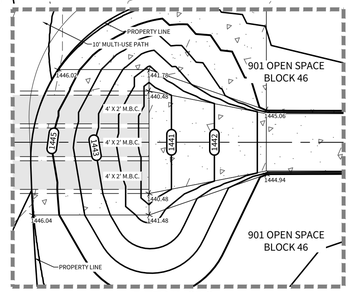
NOTES:

1. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI IN 28 DAYS
2. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF BOERNE. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
3. REFERENCE CITY OF BOERNE CONCRETE RIP-RAP TYPICAL SECTION DETAIL ON THIS SHEET
4. PER THE CITY OF BOERNE DEVELOPMENT AGREEMENT, EARTHEN CHANNELS MUST BE SOD LINED WHERE VELOCITIES OF STORM WATER RUNOFF ARE 3 - 6 FPS.





DETAIL "C"
(SCALE: 1" = 10')

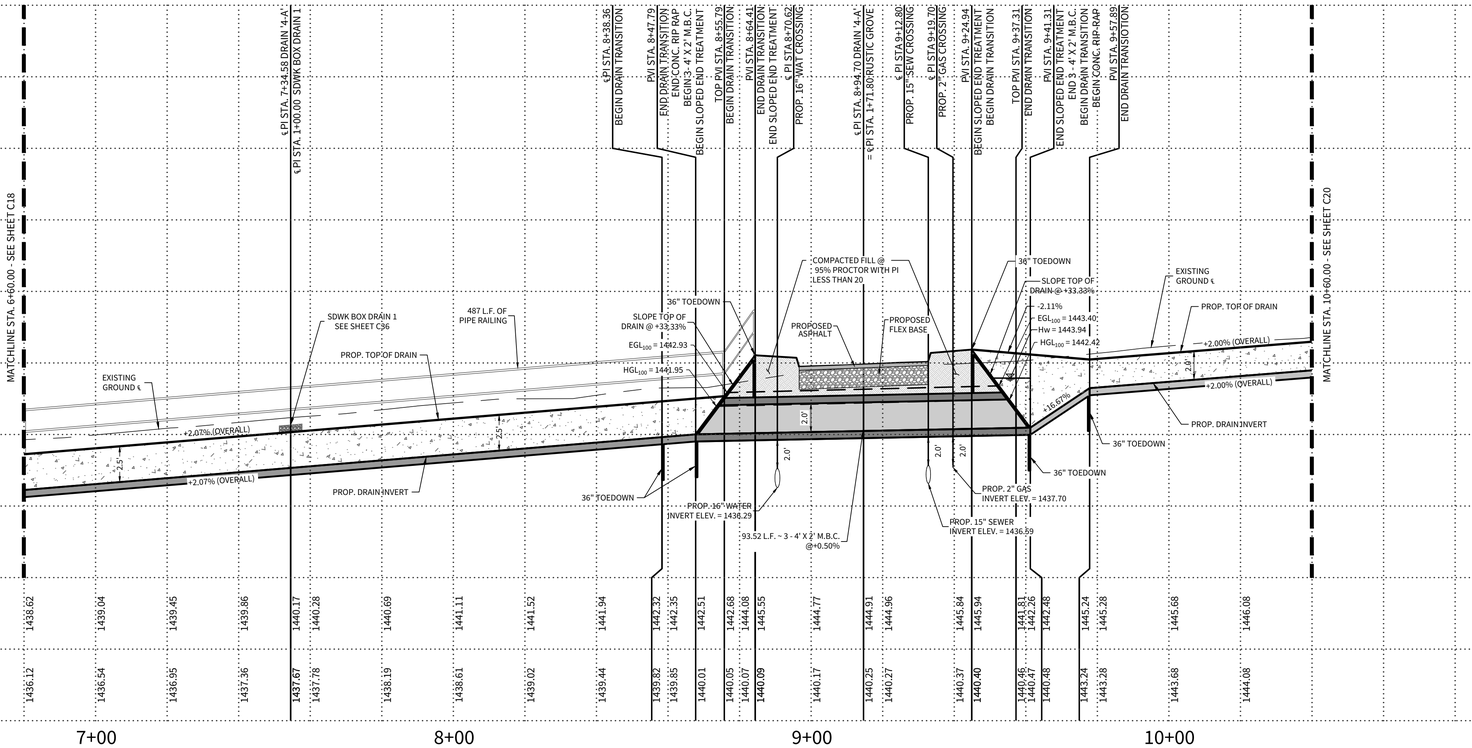


DETAIL "D"
(SCALE: 1" = 10')

DRAIN '4-A'

STA. 6+60.00 TO STA. 10+60.00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



	7+00	8+00	9+00	10+00
PROP. TOP OF DRAIN	1438.62	1439.04	1439.45	1439.86
PROP. DRAIN INVERT	1436.12	1436.54	1436.95	1437.36

	7+00	8+00	9+00	10+00
PROP. TOP OF DRAIN	1440.17	1440.28	1440.69	1441.11	1441.52	1441.94	1442.32	1442.35	1442.51	1442.68	1444.08	1445.55	1444.77	1444.91	1444.96	1445.84	1445.94	1441.81	1442.26	1442.48	1445.24	1445.28	1445.68	1446.08
PROP. DRAIN INVERT	1437.67	1437.78	1438.19	1438.61	1439.02	1439.44	1439.82	1439.85	1440.01	1440.05	1440.07	1440.09	1440.17	1440.25	1440.27	1440.37	1440.40	1440.46	1440.47	1440.48	1443.24	1443.28	1443.68	1444.08

CULVERT SUMMARY

3 - 4' X 2' M.B.C.
Q_{100} = 184.58 c.f.s.
MANNING'S COEFFICIENT = 0.013
CULVERT SHAPE = BOX
RISE = 36"
SPAN = 48"
CHANNEL SLOPE = 0.50%
OUTFALL V_{100} = 7.91 FPS

SCALE: 1"=20'
0 20 40

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- PROPOSED WATER LINE (W)
- PROPOSED SEWER MAIN (SS)
- PROPOSED GAS MAIN (G)
- PROPOSED CULVERT
- CONCRETE RIP RAP

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CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-A'

DATE
05/29/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
02.08.2024	1. ADDED FROUDE # TO CROSS-SECTIONS
	2.
	3.
	4.
	5.
	6.
	7.
	8.
	9.

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
05/29/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C19

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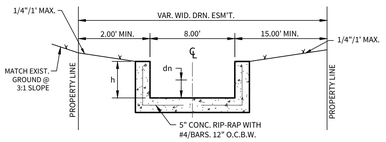
P:\03481.008\2 Drawings\C3 DRAIN PLAN & PROFILE - DRAIN '4-A'.dwg 2024/05/29 5:53pm ED Gaido



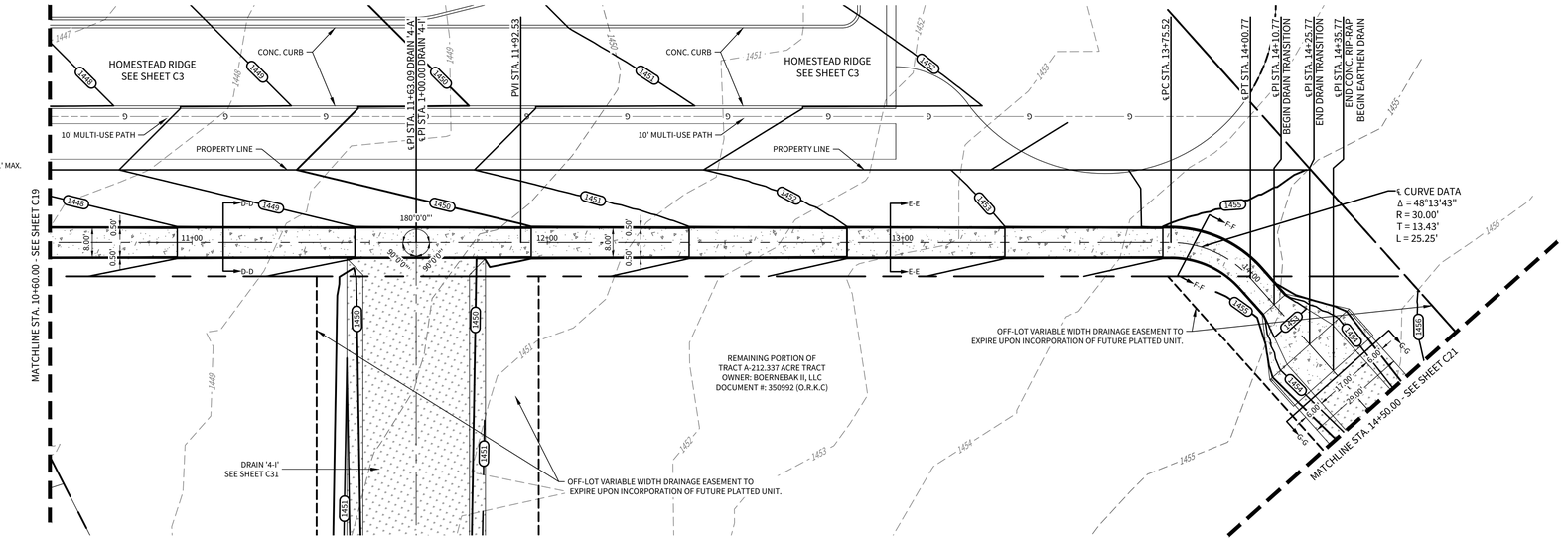
DRAIN '4-A' CONCRETE CHANNEL

(N.T.S.)

"D-D" STA. 9+57.89 TO STA. 11+63.09
"E-E" STA. 11+63.09 TO STA. 13+75.52

	"D-D"	"E-E"
BEGIN STA.	9+57.89	11+63.09
END STA.	11+63.09	13+75.52
Q_{100} (cfs)	175.51	87.24
B_w (ft)	8.00'	8.00'
z (ft)	0.00'	0.00'
n	0.013	0.013
D (ft)	2.00'	2.00'
S (%)	2.00	2.25
d_k (ft)	1.35'	0.82'
V (fps)	16.29	13.30
Fr	2.472	2.574

1



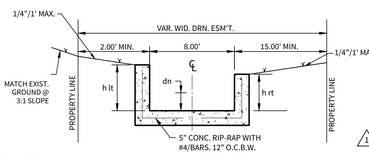
SCALE: 1"=20'
0 20 40

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- PROPOSED GAS MAIN
- CONCRETE RIP RAP
- SOD-LINED EARTHEN DRAINAGE CHANNEL

NOTES:

1. **ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI IN 28 DAYS**
2. **85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF BOERNE. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.**
3. **REFERENCE CITY OF BOERNE CONCRETE RIP-RAP TYPICAL SECTION DETAIL ON THIS SHEET**
4. **PER THE CITY OF BOERNE DEVELOPMENT AGREEMENT, EARTHEN CHANNELS MUST BE SOD LINED WHERE VELOCITIES OF STORM WATER RUNOFF ARE 3 – 6 FPS.**



DRAIN '4-A' CONCRETE CHANNEL

(N.T.S.)

"F-F" STA. 13+75.52 TO STA. 14+10.77

	"F-F"
BEGIN STA.	13+75.52
END STA.	14+10.77
Q_{100} (cfs)	87.24
B_w (ft)	8.00'
z (ft)	0.00'
n	0.013
D lt (ft)	3.00'
D rt (ft)	2.00'
S (%)	2.25
d_k (ft)	**2.28'
V (fps)	13.30
Fr	1.553

1

9.3.15 - Super Elevation
Channel Bends and Turns - Freeboard. Allowance for extra freeboard shall be made when the centerline radius of the channel is less than three (3) times the bottom width or for super-critical flow regime. Where bends or high velocities are involved and the flow regime is sub-critical, the applicant shall use the following formula for computing the extra freeboard:

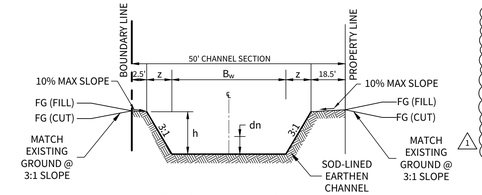
(Equation 9.3.15)

$$d_2 - d_1 = \frac{V^2(T+B)}{2gR}$$

d_2 = depth of flow at the inside of the bend in feet.
d_2 = depth of flow at the outside of the bend in feet.
B = bottom width of the channel in feet.
V = the average approach velocity in the channel in feet per second.
T = width of flow at the water surface in feet.
g = 32.2 feet/second squared.
R = the center line radius of the turn or bend in feet.

DRAIN '4-A'

STA. 10+60.00 TO STA. 14+50.00



DRAIN '4-A' EARTHEN CHANNEL

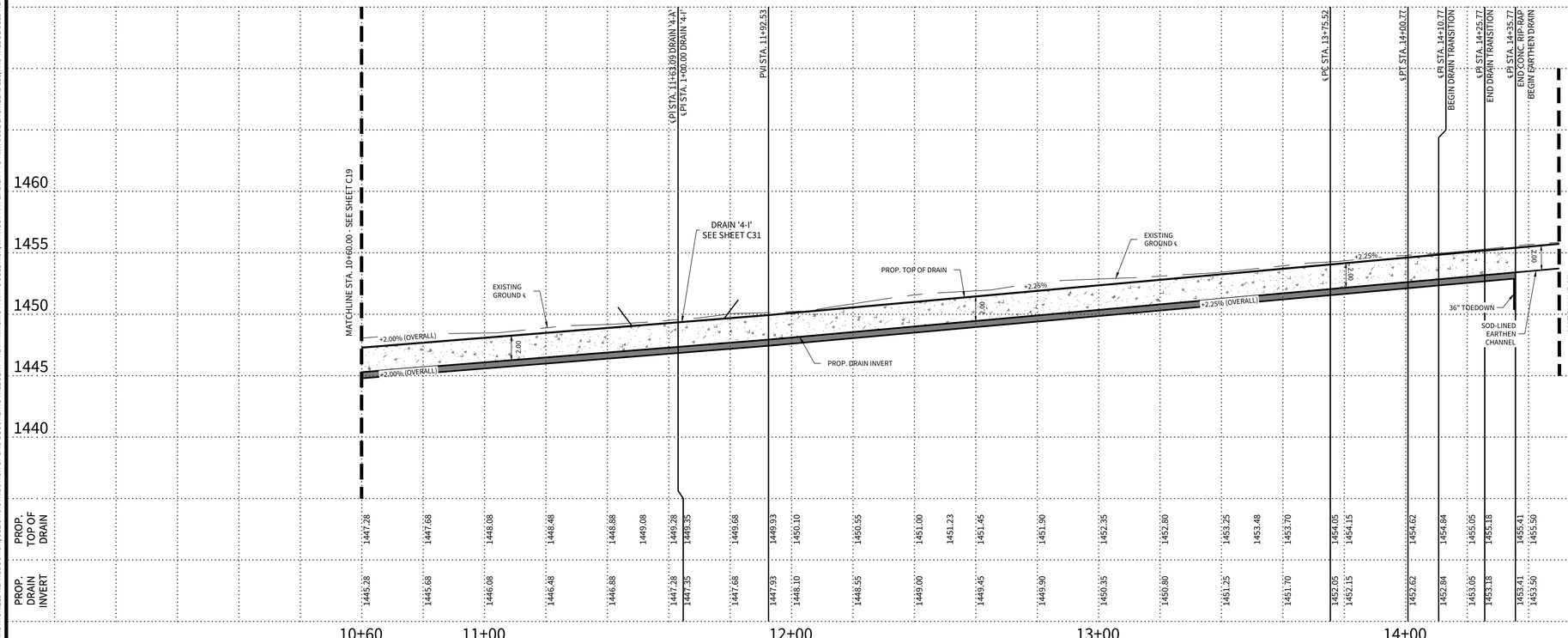
(N.T.S.)

"G-G" STA. 14+35.77 TO STA. 14+92.53

	"G-G"
BEGIN STA.	14+35.77
END STA.	14+92.53
Q_{100} (cfs)	87.24
B_w (ft)	17.00'
z (ft)	6.00'
n	0.035
D (ft)	2.00'
S (%)	2.25
d_k (ft)	0.82'
V (fps)	4.87
Fr	0.985

1

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-A'

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED FROUDE # TO CROSS-SECTIONS
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
05/08/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C20

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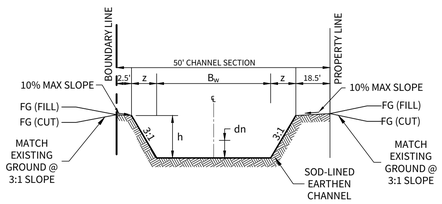
P:\03481\008\2 Drawings\CD DRAIN PLAN & PROFILE - DRAIN '4-A'.dwg 2024/05/08 11:46am EDSmith

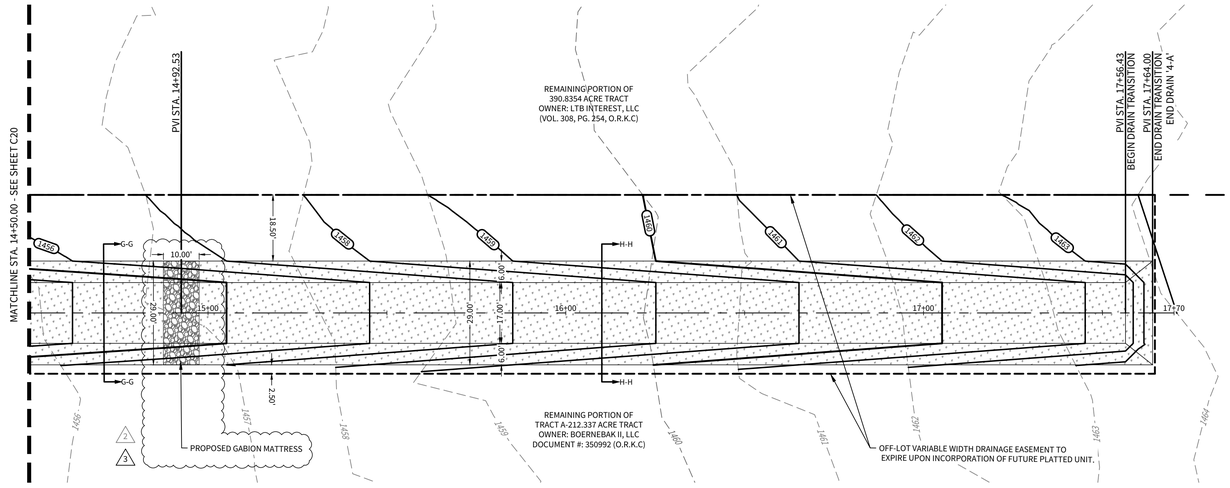


DRAIN '4-A' EARTHEN CHANNEL

(N.T.S.)

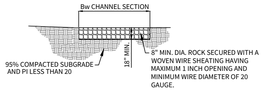
"G-G" STA. 14+35.77 TO STA. 14+92.53
"H-H" STA. 14+92.53 TO STA. 17+56.43

	"G-G"	"H-H"
BEGIN STA.	14+35.77	14+92.53
END STA.	14+92.53	17+56.43
Q_{100} (cfs)	87.24	87.24
B_w (ft)	17.00'	17.00'
z (ft)	6.00'	6.00'
n	0.035	0.035
D (ft)	2.00'	2.00'
S (%)	2.25	2.50
d_n (ft)	0.82'	0.79'
V (fps)	4.87	5.04
Fr	0.985	1.036



LEGEND

- OVERALL UNIT BOUNDARY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- SOD-LINED EARTHEN DRAINAGE CHANNEL
- PROPOSED GABION MATTRESS



GABION STYLE ROCK EROSION CONTROL MATTRESS DETAIL

NOTE: GABION MATTRESS TO BE FREE OF GEO-TEXTILE FABRIC LINING.
(N.T.S.)

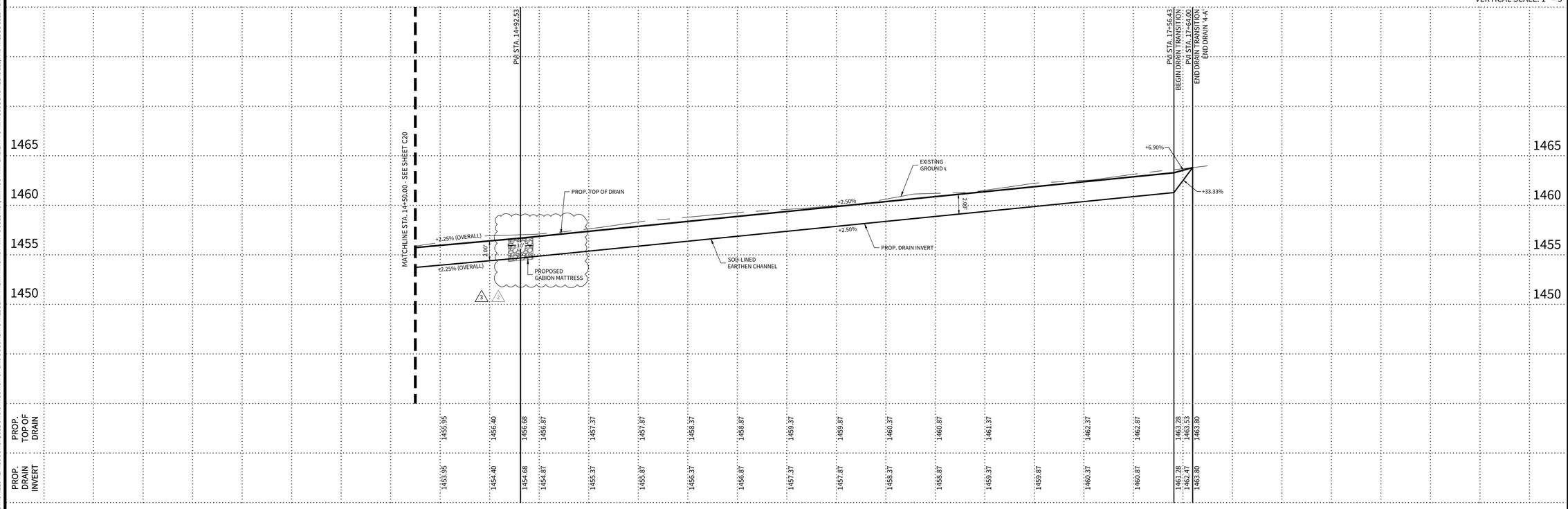
NOTES:

1. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 4,000 PSI IN 28 DAYS
2. 85% OF CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION PRIOR TO ACCEPTANCE OF THE CHANNEL BY THE CITY OF BOERNE. HYDROMULCH PAY ITEM TO INCLUDE SOIL, SEEDING, OR SODDING & WATERING FOR THE TIME PERIOD NEEDED TO ACHIEVE 85% VEGETATION.
3. REFERENCE CITY OF BOERNE CONCRETE RIP–RAP TYPICAL SECTION DETAIL ON THIS SHEET
4. PER THE CITY OF BOERNE DEVELOPMENT AGREEMENT, EARTHEN CHANNELS MUST BE SOD LINED WHERE VELOCITIES OF STORM WATER RUNOFF ARE 3 – 6 FPS.

DRAIN '4-A'

STA. 14+50.00 TO END

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-A'

DATE
07/16/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED FROUDE # TO CROSS-SECTIONS
2.	06.26.2024	ADDED GABION MATTRESS
3.	07.15.2024	ADDED GABION MATTRESS DIMENSIONS
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
07/16/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C21

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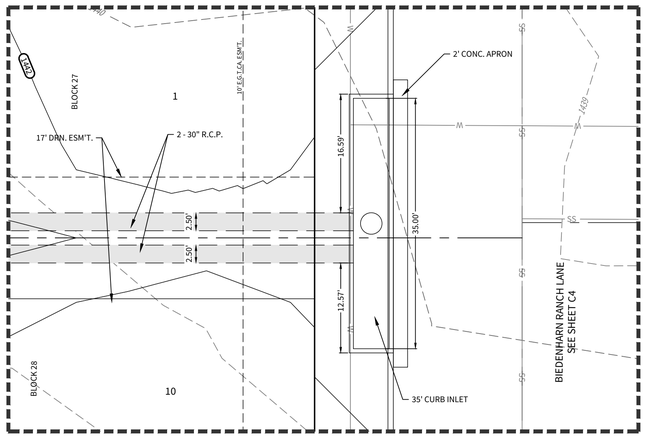
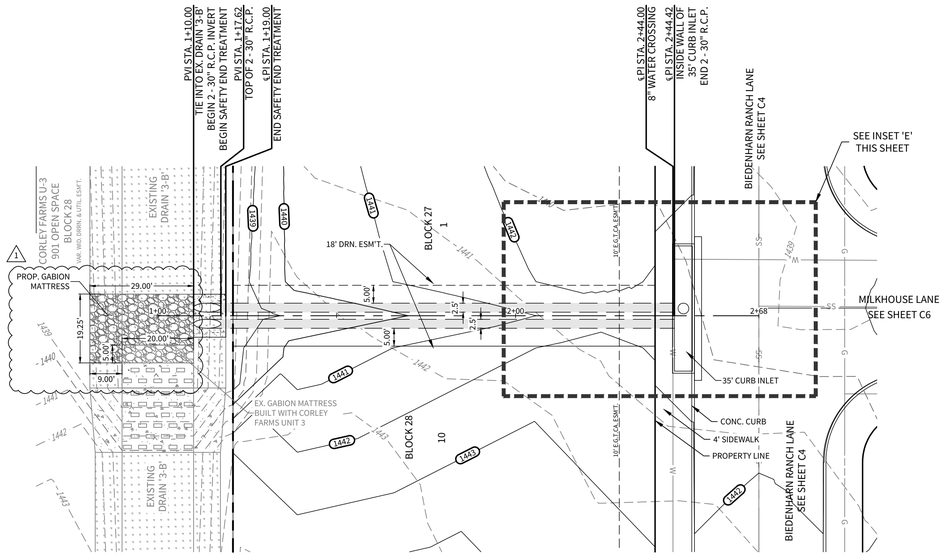
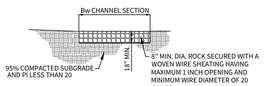


INSET 'E'

SCALE: 1"=10'





GABION STYLE ROCK EROSION CONTROL MATTRESS DETAIL

NOTE: GABION MATTRESS TO BE FREE OF GEO-TEXTILE FABRIC LINING.

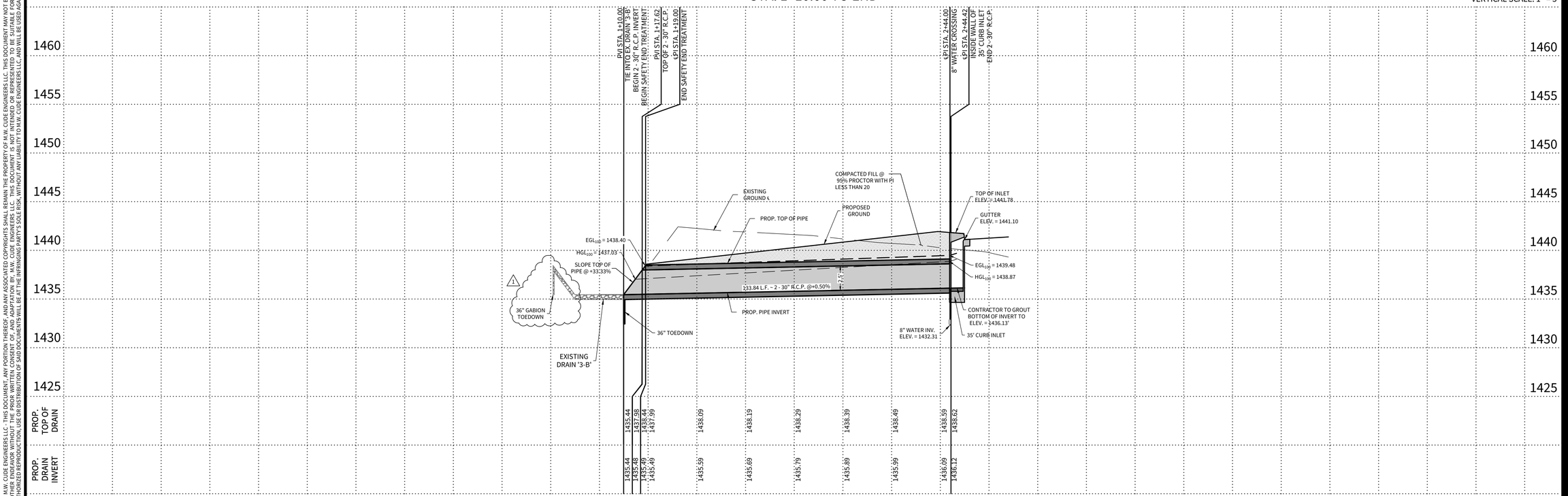
(N.T.S.)

CULVERT SUMMARY

Q_{100} = 61.77 c.f.s.
MANNING'S COEFFICIENT = 0.013
CULVERT SHAPE = CIRCULAR
D = 2~ 30"
PIPE SLOPE = 0.50%
OUTFALL V = 9.38 f.p.s.

DRAIN '4-B'

STA. 1+10.00 TO END



35' CURB INLET OPENING
DRAIN 4-B

$Q_{100\ PROJECT}$ = 61.77 c.f.s.
$Q_{100\ ULTIMATE}$ = 61.77 c.f.s.

$$L = Q/(C*w*(2*g*h)^{1/2}) = \frac{61.77}{0.7*0.50*(2*32.2*0.54)^{1/2}}$$

L = 29.93' INLET REQ'D.
USED - 35' INLET (TYPE C-1)
A = 9.81 s.f. (2 - 2.5' DIAMETER OPENING(S))
V = 6.30 f.p.s.
Hv = 0.62'
1.5Hv = 0.92'
Hw = z + y + 1.5Hv
Hw = 1436.13+2.5+0.92
Hw = 1,439.55
GUTTER = 1,441.10

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.C.A. EASEMENT
- EXISTING 1' CONTOUR — 499 —
- EXISTING 5' CONTOUR — 500 —
- PROPOSED 1' CONTOUR 499
- PROPOSED 5' CONTOUR 500
- PROPOSED WATER LINE — W —
- PROPOSED SEWER MAIN — SS —
- PROPOSED GAS MAIN — G —
- PROPOSED CULVERT
- CONCRETE RIP RAP
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

CUDEENGINEERS.COM

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P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-B'

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02-08-2024	ADDED GABION MATTRESS
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL
ENGINEER

05/08/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C22

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P:\03481.008\2.0 Drawings\C22 DRAIN PLAN & PROFILE - DRAIN '4-B'.dwg 2024/05/08 11:41am EDSmith

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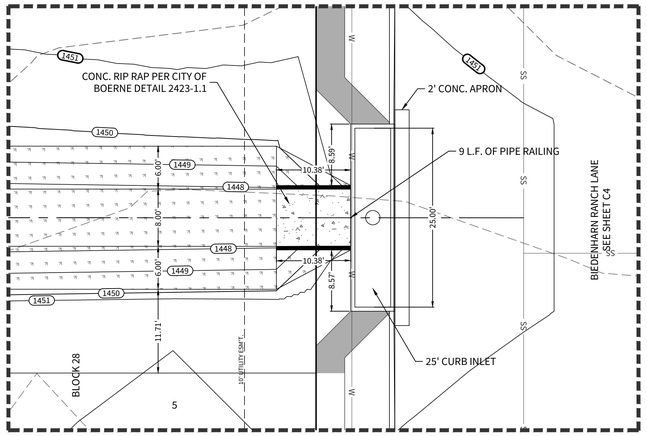
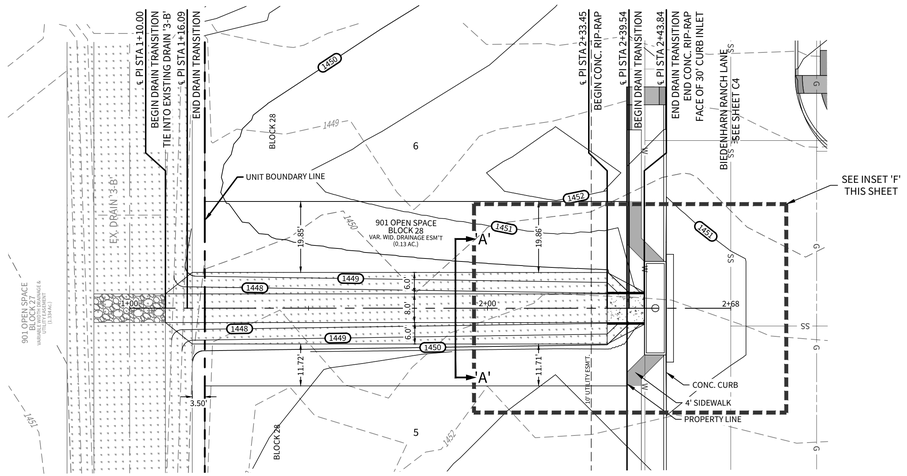


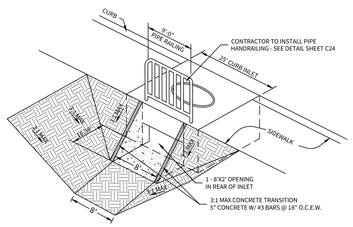
INSET 'F'

SCALE: 1"=10'



LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR — 499
- EXISTING 5' CONTOUR — 500
- PROPOSED 1' CONTOUR — 499
- PROPOSED 5' CONTOUR — 500
- PROPOSED WATER LINE — W
- PROPOSED SEWER MAIN — SS
- PROPOSED GAS MAIN — G
- PROPOSED CULVERT
- CONCRETE RIP RAP
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE



DRAIN '4-C' CURB INLET & EARTHEN DRAIN DETAIL (N.T.S.)

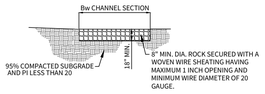
NOTE: CONTRACTOR TO DOWEL CONC. TRANSITION TO REAR OF INLET WITH #4 DOWELS @ 12" O.C.

25' CURB INLET OPENING
DRAIN 4-C

$Q_{100\ PROJECT}$ = 47.16 c.f.s.
$Q_{100\ ULTIMATE}$ = 47.16 c.f.s.

$$L = Q/(C*w*(2*g*h)^{1/2}) = \frac{47.16}{0.7*0.50*(2*32.2*0.54)^{1/2}}$$

L = 22.85' INLET REQ'D.
USED - 25' INLET
A = 16.00 s.f. (1 - 8'x2' OPENING(S))
V = 2.95 f.p.s.
Hv = 0.13'
1.5Hv = 0.20'
Hw = z + y + 1.5Hv
Hw = 1447.98+2.0+0.20
Hw = 1,450.18
GUTTER = 1,450.66



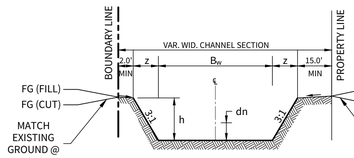
8" MIN. DIA. ROCK SECURED WITH A WOVEN WIRE SHEATING HAVING MAXIMUM 1 INCH OPENING AND MINIMUM WIRE DIAMETER OF 20 GAUGE.

GABION STYLE ROCK EROSION CONTROL MATRESS DETAIL

NOTE: GABION MATTRESS TO BE FREE OF GEO-TEXTILE FABRIC LINING.
(N.T.S.)

DRAIN '4-C'

STA. 1+10.00 TO END



DRAIN '4-C' EARTHEN CHANNEL

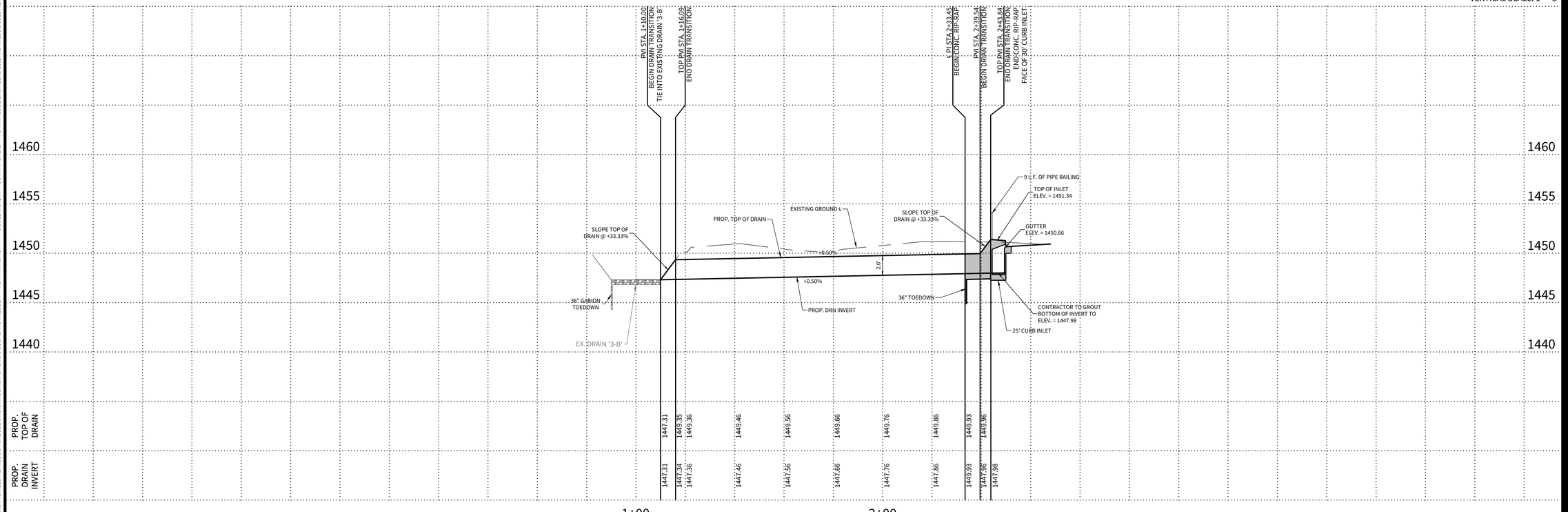
(N.T.S.)
"A-A" STA. 1+16.09 TO STA. 2+33.45

	"A-A"
BEGIN STA.	1+16.09
END STA.	2+33.45
Q_{100} (cfs)	47.16
B_w (ft)	8.00'
z (ft)	6.00'
n	0.035
D (ft)	2.00'
S (%)	0.50
d_n (ft)	1.19
V (fps)	2.60
Fr	0.457

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

1

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS
UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-C'

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
02.08.2024	1. ADDED FROUDE # TO CROSS-SECTION
	2.
	3.
	4.
	5.
	6.
	7.
	8.
	9.

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
05/08/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C23

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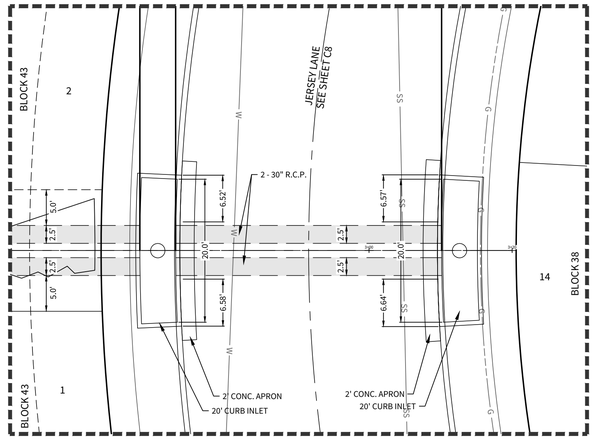
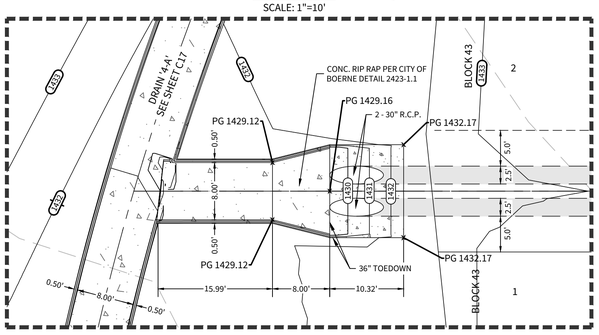
P:\03481.008\2 Drawings\C23 DRAIN PLAN & PROFILE - DRAIN '4-C'.dwg 2024/05/08 11:42am EDeakins



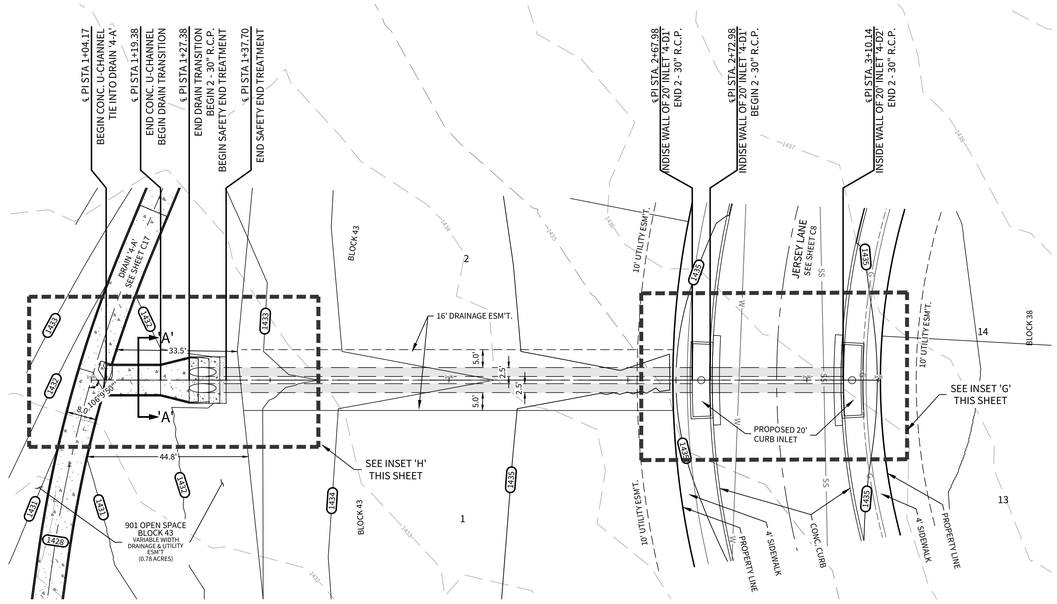
INSET 'G'

SCALE: 1"=10'



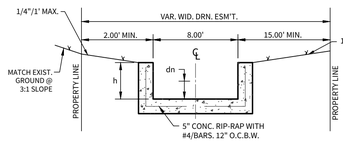
INSET 'H'

SCALE: 1"=10'



DRAIN '4-D'

STA. 1+04.17 TO END



DRAIN '4-D' CONCRETE CHANNEL

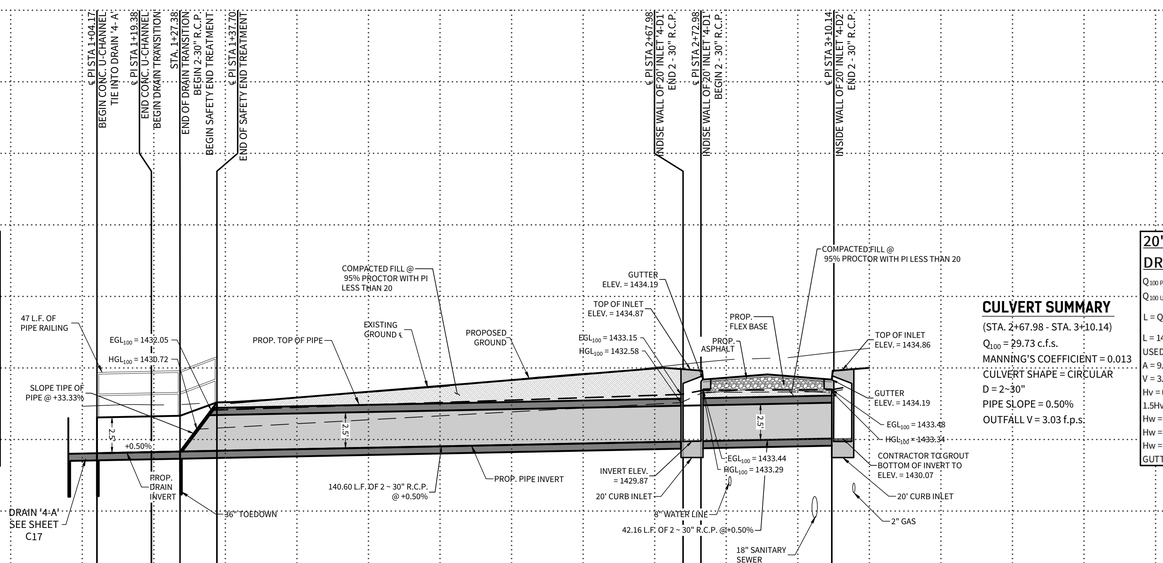
(N.T.S.)

"A-A" STA. 1+04.17 TO STA. 1+19.38

"A-A"	
BEGIN STA.	1+04.17
END STA.	1+19.38
Q_{100} (cfs)	59.46
B_w (ft)	8.00'
z (ft)	0.00'
n	0.013
D (ft)	2.50'
S (%)	0.50
d_n (ft)	1.04
V (fps)	7.14
Fr	1.380

1

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



CULVERT SUMMARY

(STA. 1+27.38 - STA. 2+67.98)

Q_{100} = 59.46 c.f.s.

MANNING'S COEFFICIENT = 0.013

CULVERT SHAPE = CIRCULAR

D = 2~30"

PIPE SLOPE = 0.50%

OUTFALL V = 9.25 f.p.s.

20' CURB INLET OPENING
DRAIN 4-D1

$Q_{100\ PROJECT}$ = 29.73 c.f.s.

$Q_{100\ ULTIMATE}$ = 29.73 c.f.s.

$L = Q/(C*w*(2*g*h)^{1/2}) = \frac{29.73}{0.7*0.50*(2*32.2*0.54)^{1/2}}$

L = 14.40' INLET REQ'D.

USED - 20' INLET (TYPE C-1)

A = 9.81 s.f. (2 - 2.5' DIAMETER OPENING(S))

V = 3.03 f.p.s.

Hv = 0.14'

1.5Hv = 0.21'

Hw = z + y + 1.5Hv

Hw = 1429.87+2.5+0.21

Hw = 1,432.58

GUTTER = 1,434.19

CULVERT SUMMARY

(STA. 2+67.98 - STA. 3+10.14)

Q_{100} = 29.73 c.f.s.

MANNING'S COEFFICIENT = 0.013

CULVERT SHAPE = CIRCULAR

D = 2~30"

PIPE SLOPE = 0.50%

OUTFALL V = 3.03 f.p.s.

20' CURB INLET OPENING
DRAIN 4-D2

$Q_{100\ PROJECT}$ = 29.73 c.f.s.

$Q_{100\ ULTIMATE}$ = 29.73 c.f.s.

$L = Q/(C*w*(2*g*h)^{1/2}) = \frac{29.73}{0.7*0.50*(2*32.2*0.54)^{1/2}}$

L = 14.40' INLET REQ'D.

USED - 20' INLET (TYPE C-1)

A = 9.81 s.f. (2 - 2.5' DIAMETER OPENING(S))

V = 3.03 f.p.s.

Hv = 0.14'

1.5Hv = 0.21'

Hw = z + y + 1.5Hv

Hw = 1430.08+2.5+0.21

Hw = 1,432.79

GUTTER = 1,434.19

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- PROPOSED WATER LINE (W)
- PROPOSED SEWER MAIN (SS)
- PROPOSED GAS MAIN (G)
- PROPOSED CULVERT
- CONCRETE RIP RAP
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE

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CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-D'

DATE
05/29/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
A 02.08.2024	1. ADDED FROUDE # TO CROSS-SECTION

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
05/29/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C24

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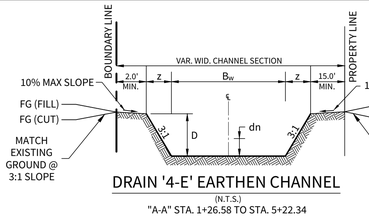


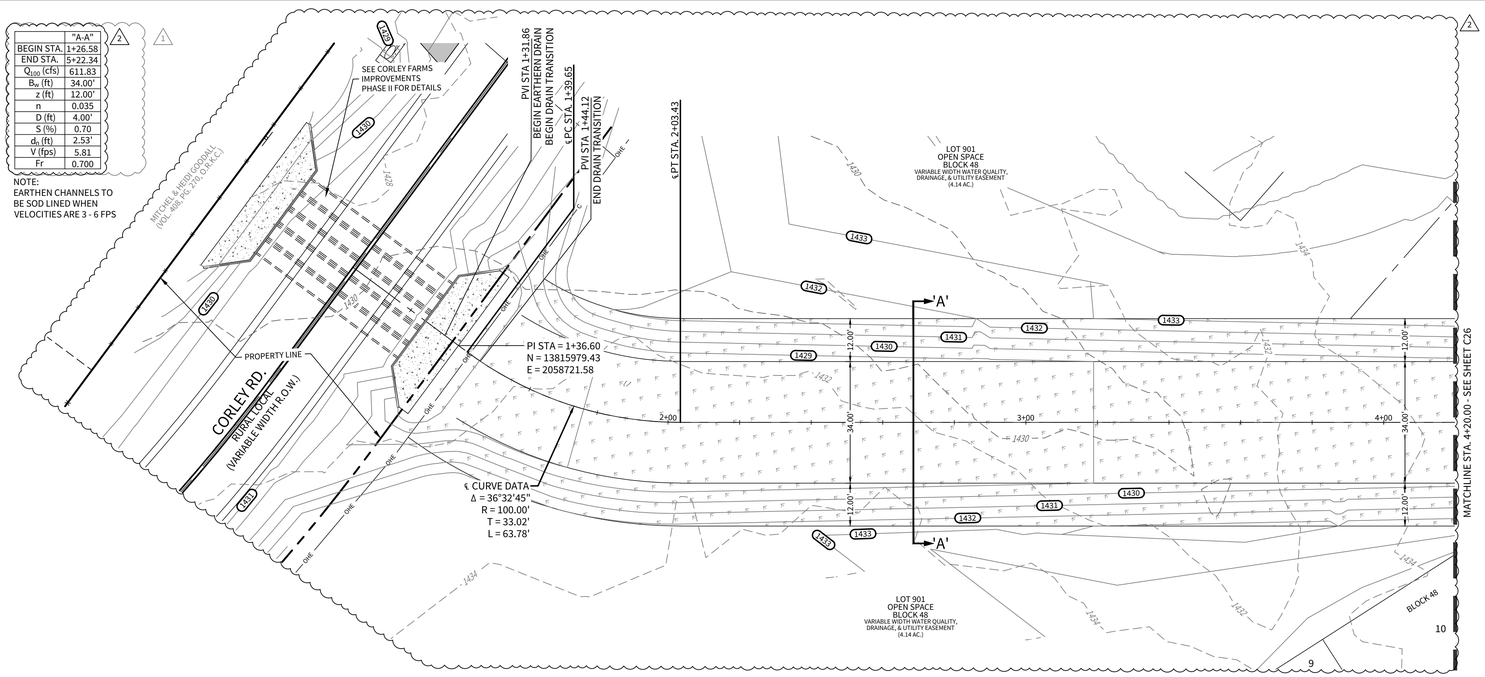
DRAIN '4-E' EARTHEN CHANNEL

(N.T.S.)

"A-A" STA. 1+26.58 TO STA. 5+22.34

	"A-A"
BEGIN STA.	1+26.58
END STA.	5+22.34
Q_{100} (cfs)	611.83
B_W (ft)	34.00'
z (ft)	12.00'
n	0.035
D (ft)	4.00'
S (%)	0.70
d_n (ft)	2.53'
V (fps)	5.81
Fr	0.700

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS



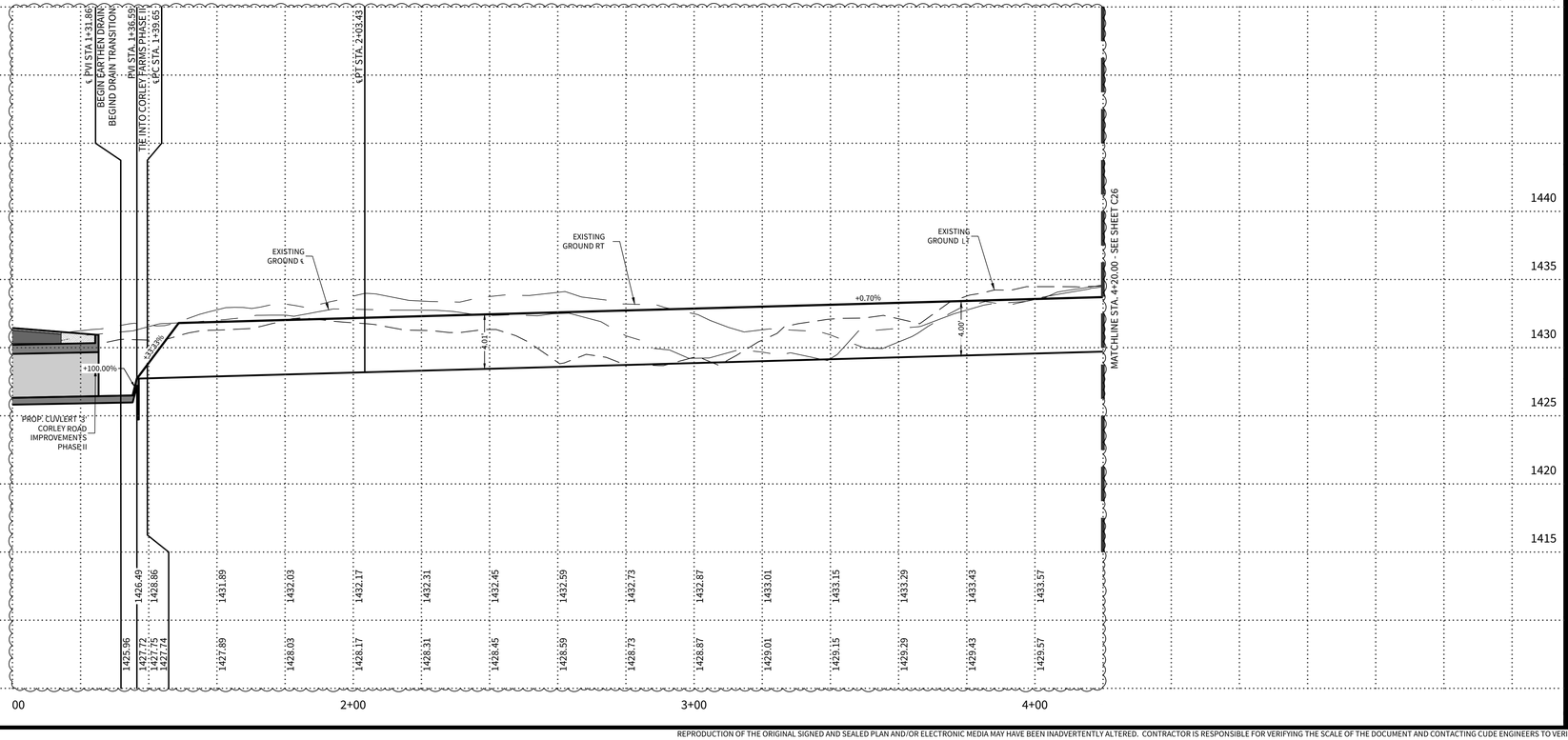
LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- PROPOSED WATER LINE
- PROPOSED SEWER MAIN
- PROPOSED GAS MAIN
- PROPOSED CULVERT
- CONCRETE RIP RAP
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE
- PROPOSED PAVEMENT

DRAIN '4-E'

STA. 1+00.00 TO 4+20.00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-E'

DATE
03/19/2025

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED PROVIDE # TO CROSS-SECTION
2.	12.17.2024	PER CORLEY ROAD COMMENTS, DRAIN PROFILE HAS ONE SECTION WITH TWO SLOPES
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
03/19/25

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C25

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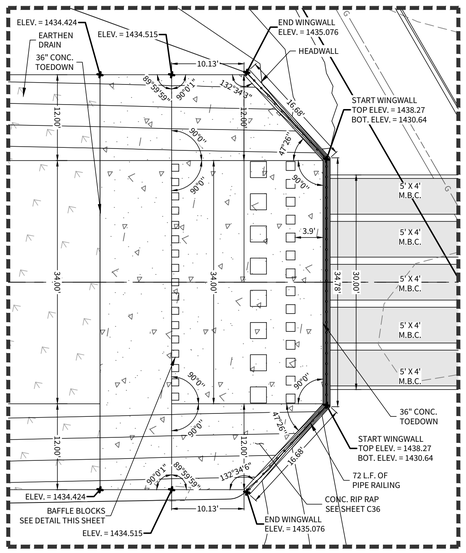
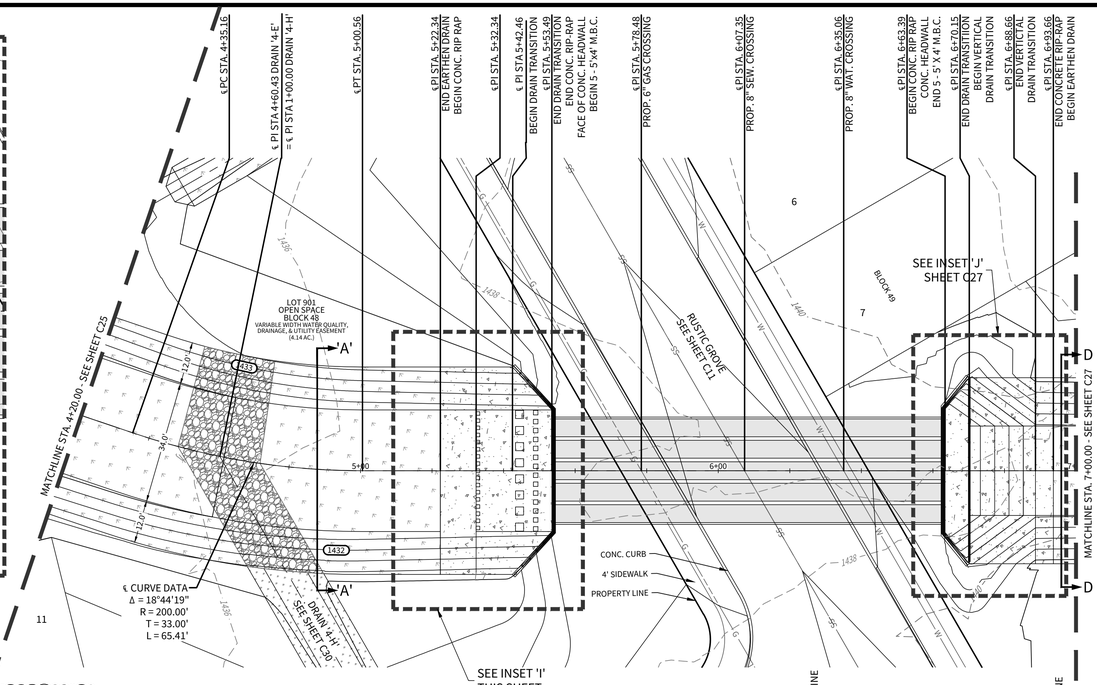
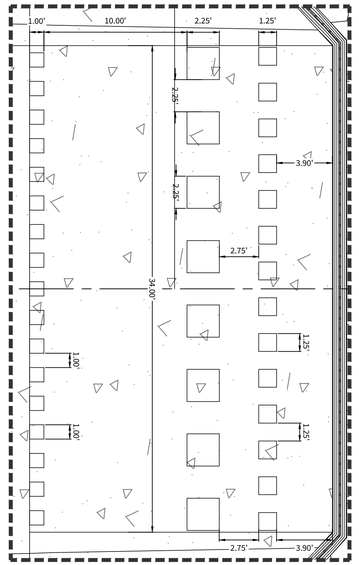


INSET 'I'

SCALE: 1"=10'



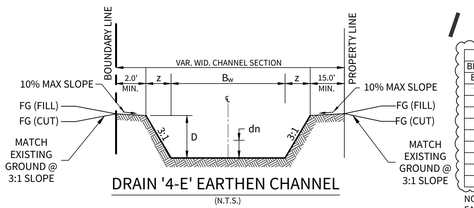


DRAIN "4-E" BAFFLE BLOCK DETAIL

SCALE: 1"=5'

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR — 499
- EXISTING 5' CONTOUR — 500
- PROPOSED 1' CONTOUR — 499
- PROPOSED 5' CONTOUR — 500
- PROPOSED WATER LINE — W
- PROPOSED SEWER MAIN — SS
- PROPOSED GAS MAIN — G
- PROPOSED CULVERT
- CONCRETE RIP RAP
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE



DRAIN '4-E' EARTHEN CHANNEL

(N.T.S.)

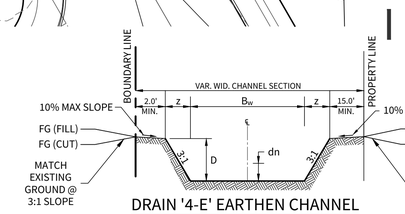
"A-A" STA. 1+26.58 TO STA. 5+22.34

	"A-A"
BEGIN STA.	1+26.58
END STA.	5+22.34
Q_{100} (cfs)	611.83
B_w (ft)	34.00'
z (ft)	12.00'
n	0.035
D (ft)	4.00'
S (%)	0.70
d_n (ft)	2.53'
V (fps)	5.81
Fr	0.700

NOTE: EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

DRAIN '4-E'

STA. 4+20.00 TO 7+00.00



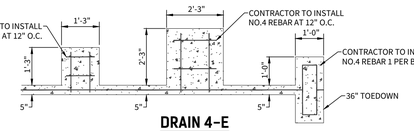
DRAIN '4-E' EARTHEN CHANNEL

(N.T.S.)

"D-D" STA. 6+93.66 TO STA. 8+11.69

	"D-D"
BEGIN STA.	6+93.66
END STA.	8+11.69
Q_{100} (cfs)	498.54
B_w (ft)	25.00'
z (ft)	13.50'
n	0.035
D (ft)	4.50'
S (%)	0.50
d_n (ft)	2.88'
V (fps)	5.15
Fr	0.599

NOTE: EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS



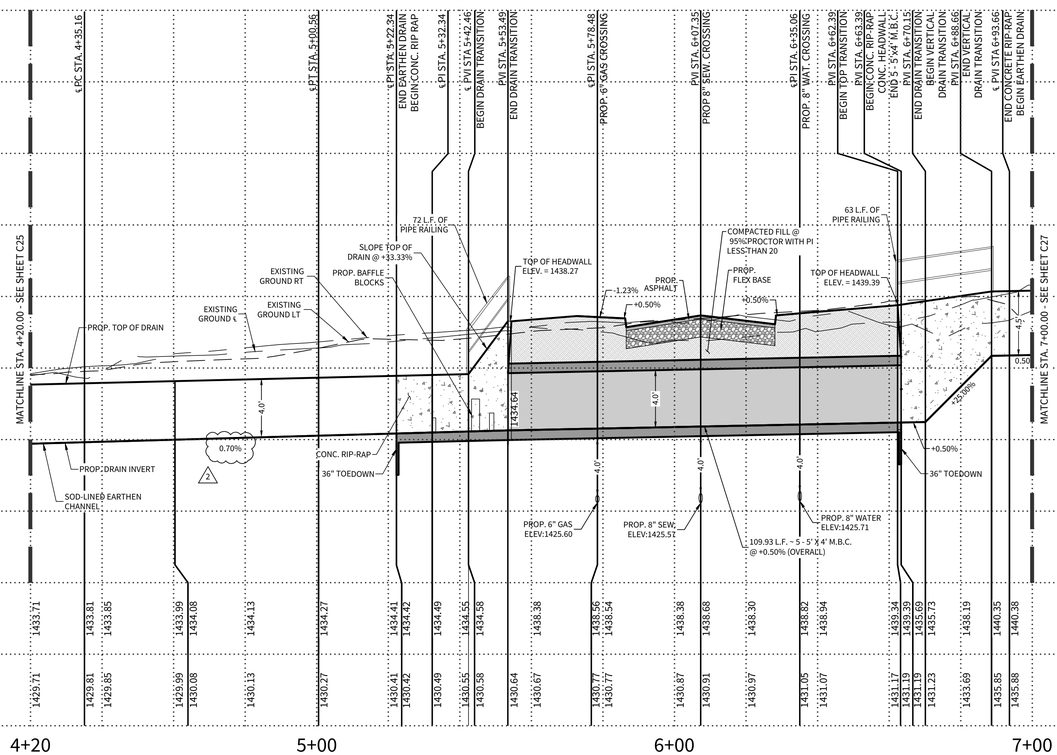
DRAIN 4-E BAFFLE BLOCK REINFORCEMENT DETAIL

(N.T.S.)

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

DRAIN "4-E" CULVERT SUMMARY

- 5--5'-X 4' M.B.C.
- Q_{100} = 788 FT^3/S
- V_{100} = 12.97 FT/S
- ALLOWABLE HW = 1441.48
- COMPUTED HW = 1438.55
- TAILWATER = 3.90 FT
- CHANNEL SLOPE = 0.50%
- MANNING'S COEFFICIENT = 0.013
- V_{EXIT} = 5.33 FT/S



DRAIN "4-E" (CONTRA COSTA) BAFFLE BLOCK CALCULATIONS

Y_0 = 2.43 FT V_0 = 12.97 FPS F_r = 1.46

Q_{100} = 788 FT^3/S

Y_2 = 4.42 FT

TAILWATER = 3.90 FT

L_1 = 3.96 FT

L_2 = 7.92 FT

L_3 = 12.09 FT (USED 12.25 FT)

H_1 = 1.06 FT (USED 1.25 FT)

H_2 = 2.11 FT (USED 2.25 FT)

H_3 = 0.40 FT (USED 1.00 FT)

EXIT VELOCITY = 5.33 FPS

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EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
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CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-E'

DATE
12/17/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED FROUDE # TO X-SECTION
2.	12.17.2024	PER CORLEY ROAD COMMENTS, DRAIN PROFILE WAS ONLY SECTION WITH PIPING SHOWN
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
12/20/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C26

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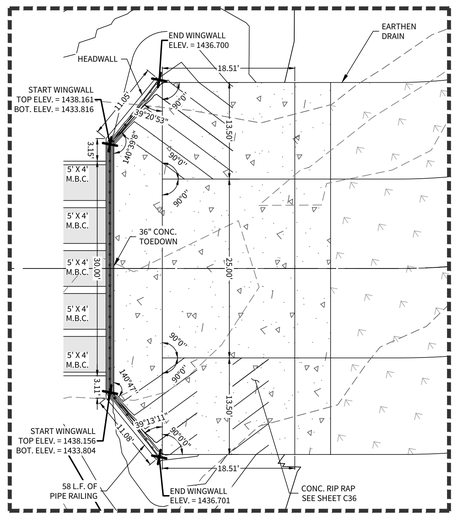
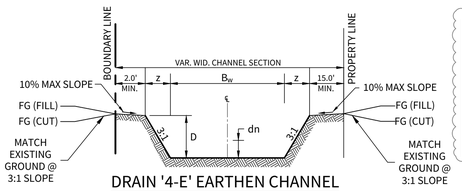


INSET 'J'

SCALE: 1"=10'



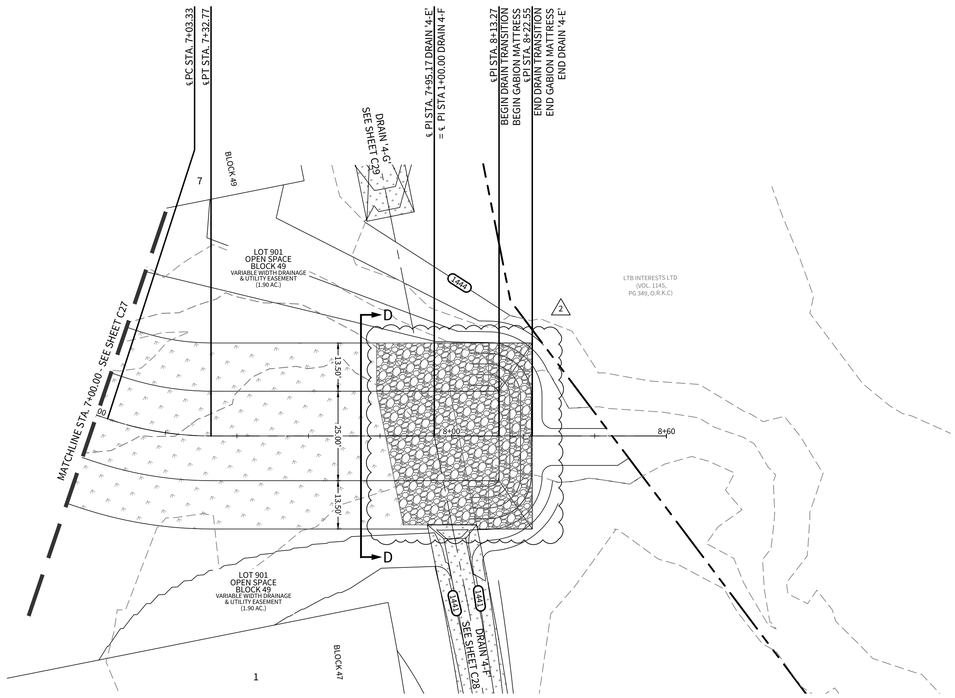
DRAIN '4-E' EARTHEN CHANNEL

(N.T.S.)

"D-D" STA. 6+93.66 TO STA. 8+11.69

"D-D"	
BEGIN STA.	6+93.66
END STA.	8+11.69
Q_{100} (cfs)	498.54
B_w (ft)	25.00'
z (ft)	13.50'
n	0.035
D (ft)	4.50'
S (%)	0.50
d_n (ft)	2.88'
V (fps)	5.15
Fr	0.599

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

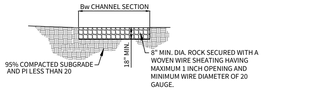


DRAIN '4-E'

STA. 7+00.00 TO END

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- PROPOSED WATER LINE (W)
- PROPOSED SEWER MAIN (SS)
- PROPOSED GAS MAIN (G)
- PROPOSED CULVERT
- CONCRETE RIP RAP
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE



GABION STYLE ROCK EROSION CONTROL MATRESS DETAIL

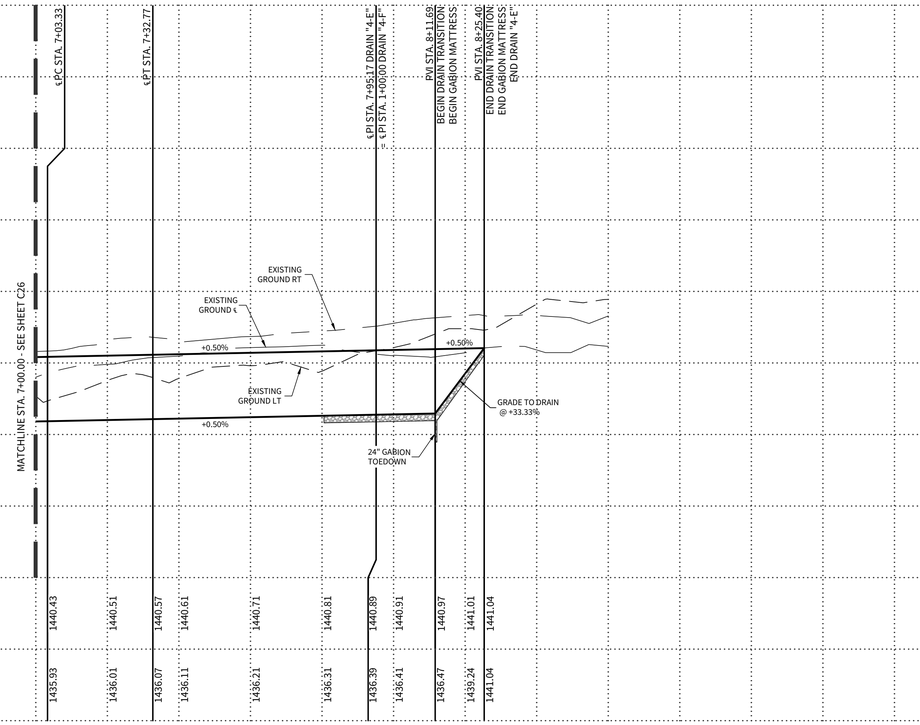
NOTE: GABION MATTRESS TO BE FREE OF GEO-TEXTILE FABRIC LINING.

(N.T.S.)

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

DRAIN "4-E" CULVERT SUMMARY

5 - 5' X 4' M.B.C.
Q_{100} = 788 FT^3/S
V_{100} = 12.97 FT/S
ALLOWABLE HW = 1441.48
COMPUTED HW = 1438.55
TAILWATER = 3.90 FT
CHANNEL SLOPE = 0.50%
MANNING'S COEFFICIENT = 0.013
V_{EXIT} = 5.33 FT/S



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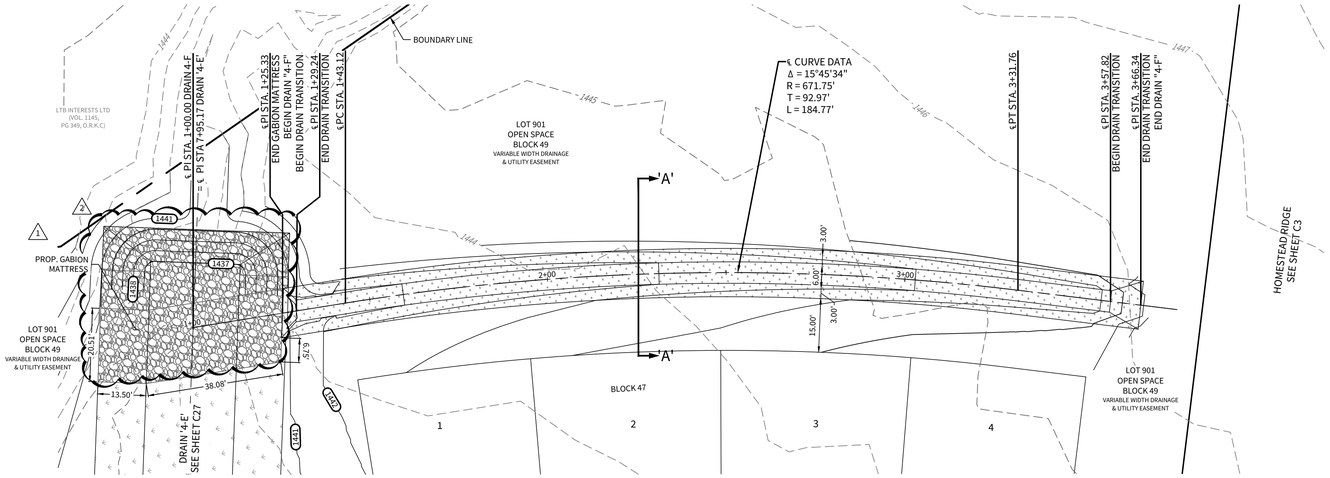
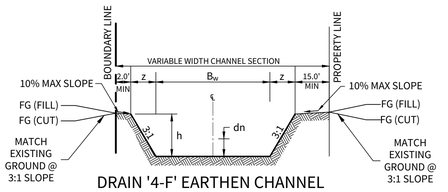




DRAIN '4-F' EARTHEN CHANNEL

(N.T.S.)

"A-A" STA. 1+25.33 TO STA. 3+53.37

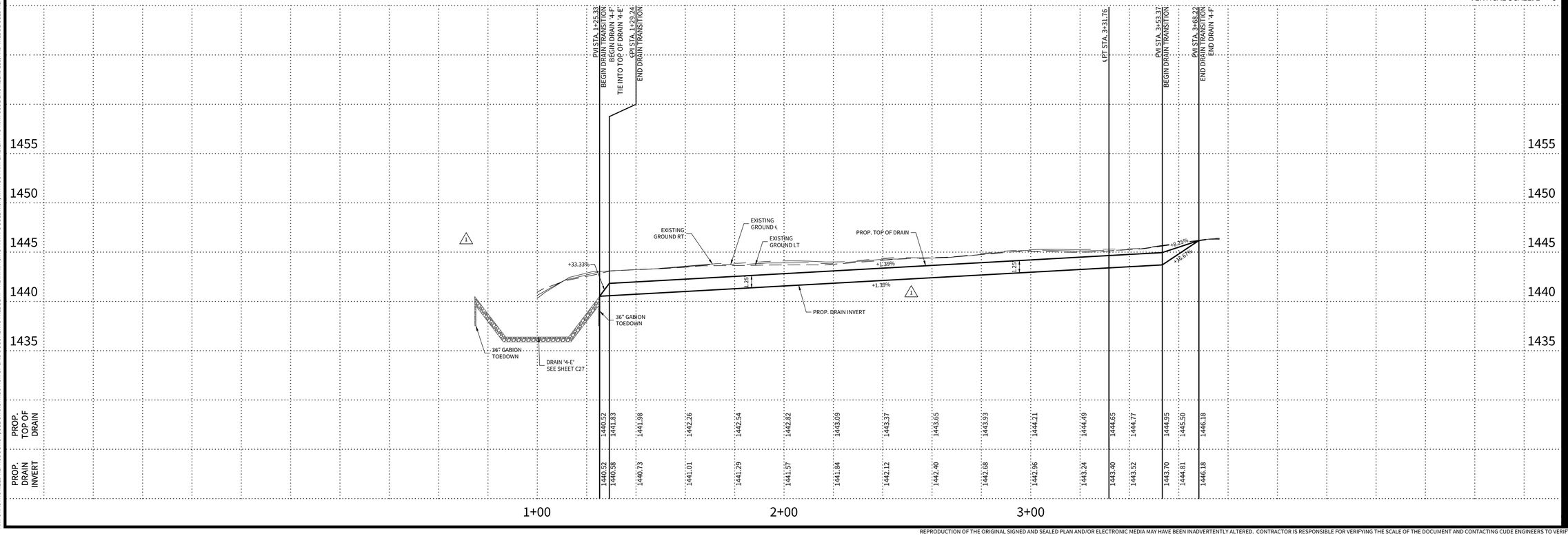
	"A-A"
BEGIN STA.	1+25.33
END STA.	3+53.37
Q_{100} (cfs)	11.54
B_w (ft)	6.00'
z (ft)	3.75'
n	0.035
D (ft)	1.25'
S (%)	1.39
d_n (ft)	0.52
V (fps)	2.78
Fr	0.734

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

DRAIN '4-F'

STA. 1+25.33 TO END

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- EXISTING 1' CONTOUR — 499
- EXISTING 5' CONTOUR — 500
- PROPOSED 1' CONTOUR — 499
- PROPOSED 5' CONTOUR — 500
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE

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CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-F'

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED GABION MATTRESS & REVISED DRAIN DESIGN
2.	06.26.2024	REVISED GABION MATTRESS
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C28

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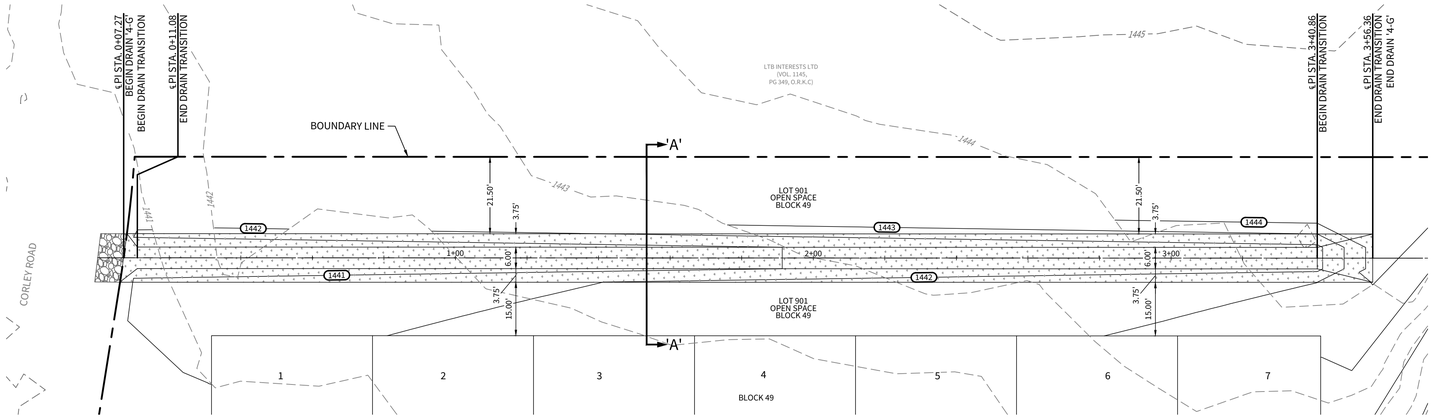
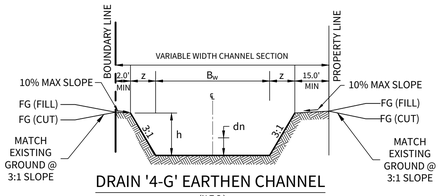


LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- EXISTING 1' CONTOUR — 499
- EXISTING 5' CONTOUR — 500
- PROPOSED 1' CONTOUR — 499
- PROPOSED 5' CONTOUR — 500
- EARTHEN DRAINAGE CHANNEL



DRAIN '4-G' EARTHEN CHANNEL
(N.T.S.)
"A-A" STA. 0+11.08 TO STA. 3+40.86

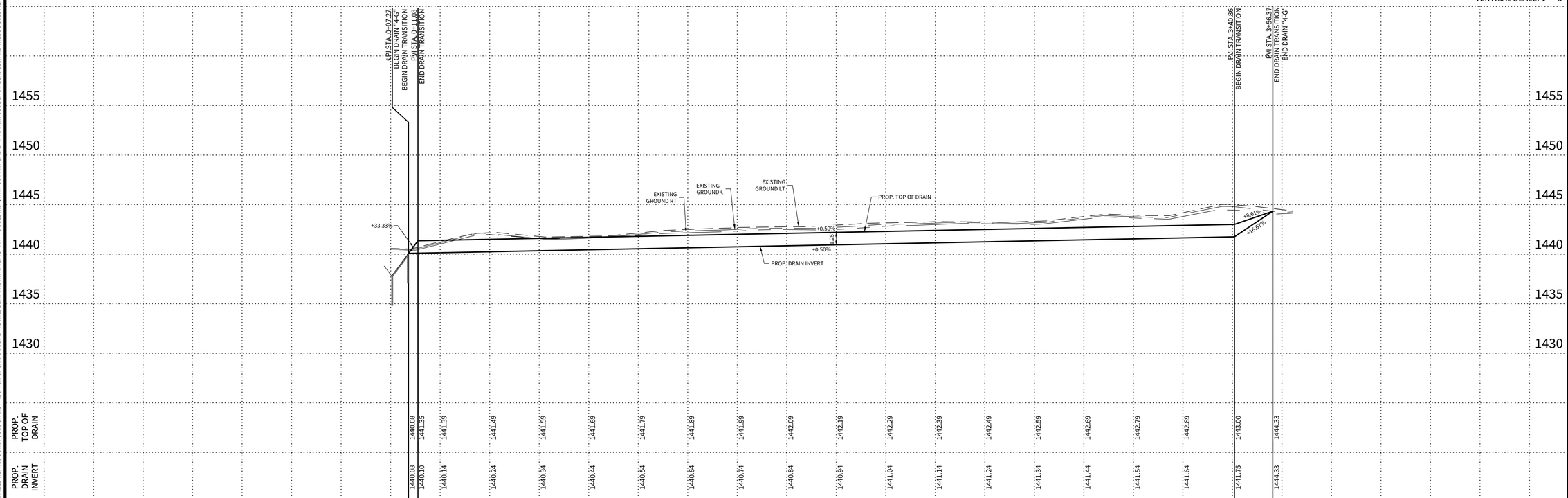
	"A-A"
BEGIN STA.	0+11.08
END STA.	3+40.86
Q_{100} (cfs)	11.06
B_w (ft)	6.00'
z (ft)	3.75'
n	0.035
D (ft)	1.25'
S (%)	0.50
d_n (ft)	0.67
V (fps)	1.93
Fr	0.456

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

DRAIN '4-G'

STA. 0+07.27 TO END

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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CUDEENGINEERS.COM

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P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS
UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-G'

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
02-08-2024	ADDED RROUDE # TO X-SECTION

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
05/08/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C29

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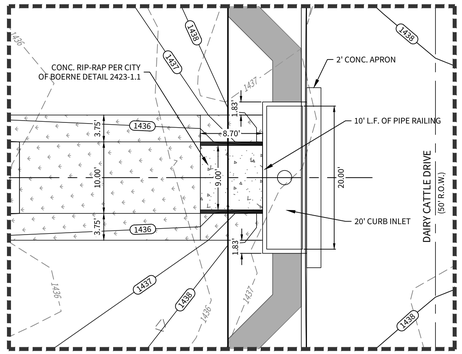
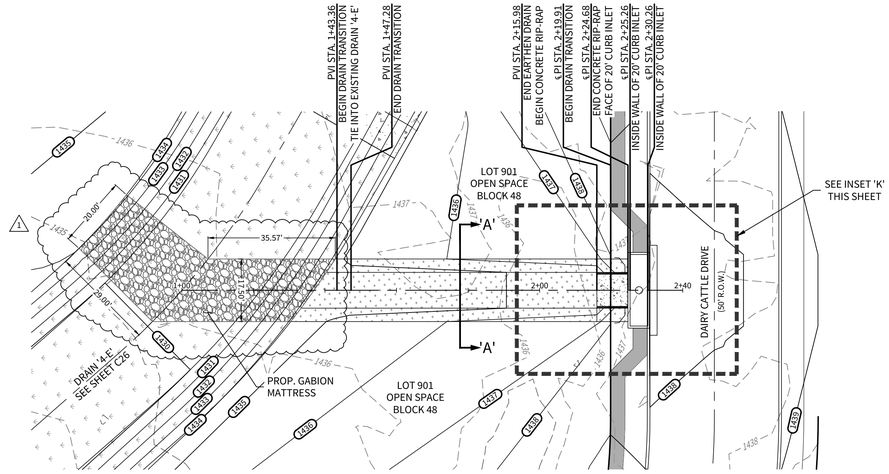
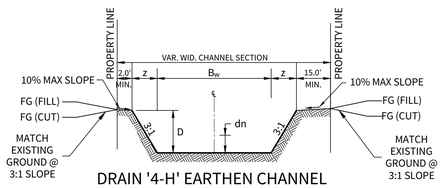


INSET 'K'

SCALE: 1"=10'





DRAIN '4-H' EARTHEN CHANNEL

(N.T.S.)

"A-A" STA. 1+43.36 TO STA. 2+15.98

	"A-A"
BEGIN STA.	1+43.36
END STA.	2+15.98
Q_{100} (cfs)	28.30
B_W (ft)	10.00'
z (ft)	3.75'
n	0.035
D (ft)	1.25'
S (%)	1.50
d_n (ft)	0.66
V (fps)	3.46
Fr	0.812

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

CULVERT SUMMARY

Q_{100} = 28.30 c.f.s.
MANNING'S COEFFICIENT = 0.013
CULVERT SHAPE = CIRCULAR
DIAMETER = 2~24"
PIPE SLOPE = 0.50%
OUTFALL V_{100} = 4.56 f.p.s.

15' CURB INLET OPENING
DRAIN 4-H

$Q_{100\ PROJECT}$ = 28.30 c.f.s.
$Q_{100\ ULTIMATE}$ = 28.30 c.f.s.

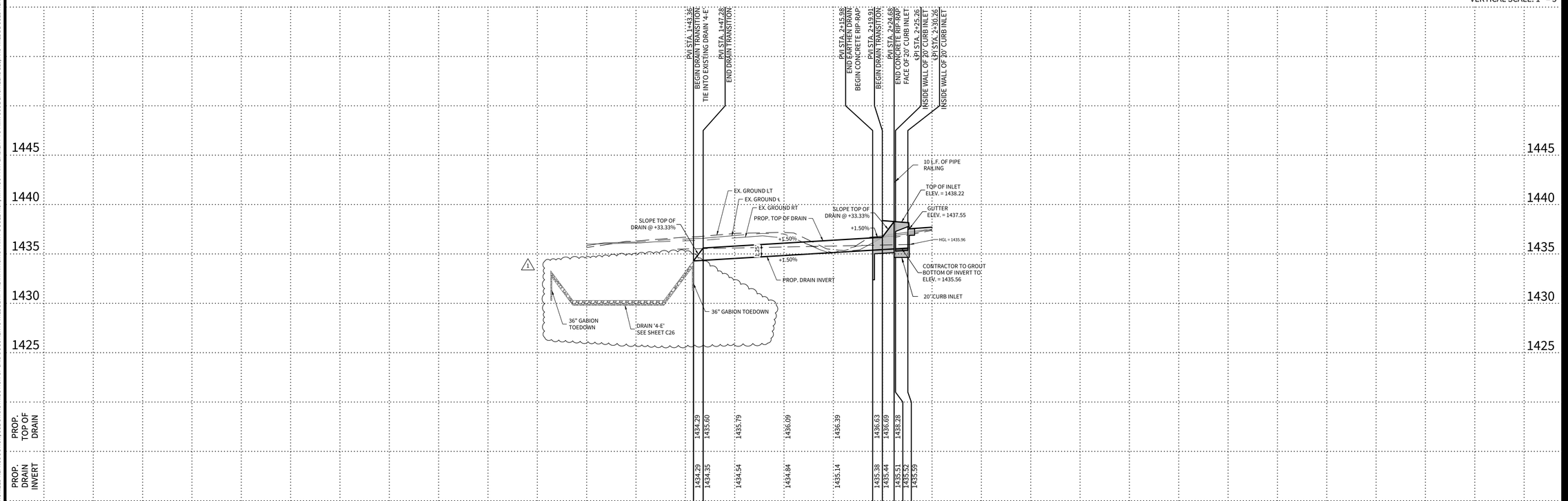
$$L = Q/(C*w*(2*g*h)^{1/2}) = \frac{28.3}{0.7*0.50*(2*32.2*0.54)^{1/2}}$$

L = 13.71' INLET REQ'D.
USED - 15' INLET
A = 6.28 s.f. (2 - 2.0' DIAMETER OPENING(S))
V = 4.51 f.p.s.
Hv = 0.32'
1.5Hv = 0.47'
Hw = z + y + 1.5Hv
Hw = 1433.83+2.0+0.47
Hw = 1,436.30
GUTTER = 1,437.16

DRAIN '4-H'

STA. 1+00.00 TO END

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- PROPOSED WATER LINE (W)
- PROPOSED SEWER MAIN (SS)
- PROPOSED GAS MAIN (G)
- PROPOSED CULVERT
- CONCRETE RIP RAP
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE

CUDEENGINEERS.COM

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CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-H'

REVISIONS

DATE	
02-08-2024	ADDED GABION MATTRESS AND LABELS, ADDED PROVIDE #.

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
05/08/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C30

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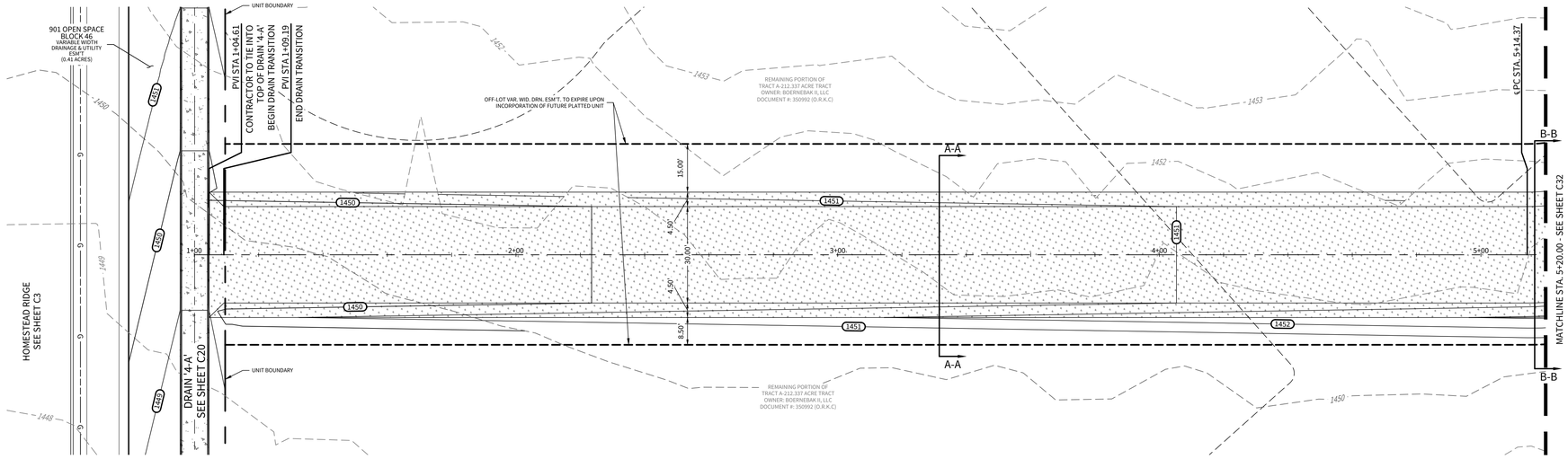
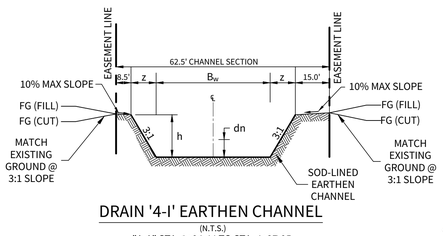




DRAIN '4-I' EARTHEN CHANNEL

(N.T.S.)

"A-A" STA. 1+04.44 TO STA. 4+97.05

	"A-A"	"B-B"
BEGIN STA.	1+04.61	5+14.37
END STA.	5+14.37	5+73.43
Q_{100} (cfs)	83.91	83.91
B_w (ft)	30.00'	30.00'
z (ft)	4.50'	4.50'
n	0.035	0.035
D (ft)	1.50'	1.50'
S (%)	0.55	0.55
d_n (ft)	0.90	**1.00
V (fps)	2.73	2.73
Fr	0.523	0.481

NOTE:
EARTHEN CHANNELS TO
BE SOD LINED WHEN
VELOCITIES ARE 3 - 6 FPS

9.3.15 - Super Elevation
Channel Bends and Turns - Freeboard. Allowance for extra freeboard shall be made when the centerline radius of the channel is less than three (3) times the bottom width or for super-critical flow regime. Where bends or high velocities are involved and the flow regime is sub-critical, the applicant shall use the following formula for computing the extra freeboard:

(Equation 9.3.15)

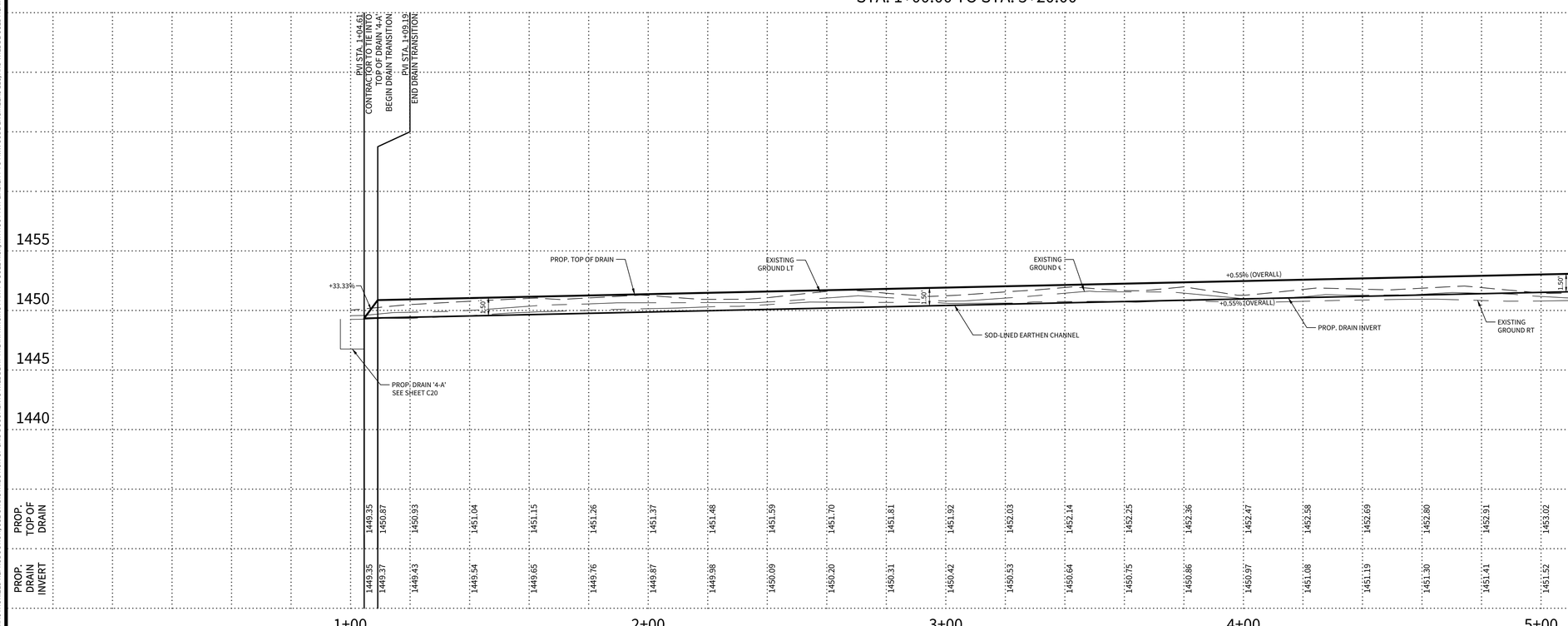
$$d_2 - d_1 = \frac{V^2(T+B)}{2gR}$$

d_1 = depth of flow at the inside of the bend in feet.
d_2 = depth of flow at the outside of the bend in feet.
B = bottom width of the channel in feet.
V = the average approach velocity in the channel in feet per second.
T = width of flow at the water surface in feet.
g = 32.2 feet/second squared.
R = the center line radius of the turn or bend in feet.

DRAIN '4-I'

STA. 1+00.00 TO STA. 5+20.00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR — 499
- EXISTING 5' CONTOUR — 500
- PROPOSED 1' CONTOUR — 499
- PROPOSED 5' CONTOUR — 500
- PROPOSED WATER LINE — W
- PROPOSED SEWER MAIN — SS
- PROPOSED GAS MAIN — G
- PROPOSED CULVERT
- CONCRETE RIP RAP
- SOD-LINED EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE

CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-I'

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED TROUDE # TO X-SECTION & ADDED "BB" X-SECTION
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
05/08/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C31

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P:\03481.008\02 Drawings\C31 DRAIN PLAN & PROFILE - DRAIN '4-I'.dwg 2/08/2024 11:48am ED/admin

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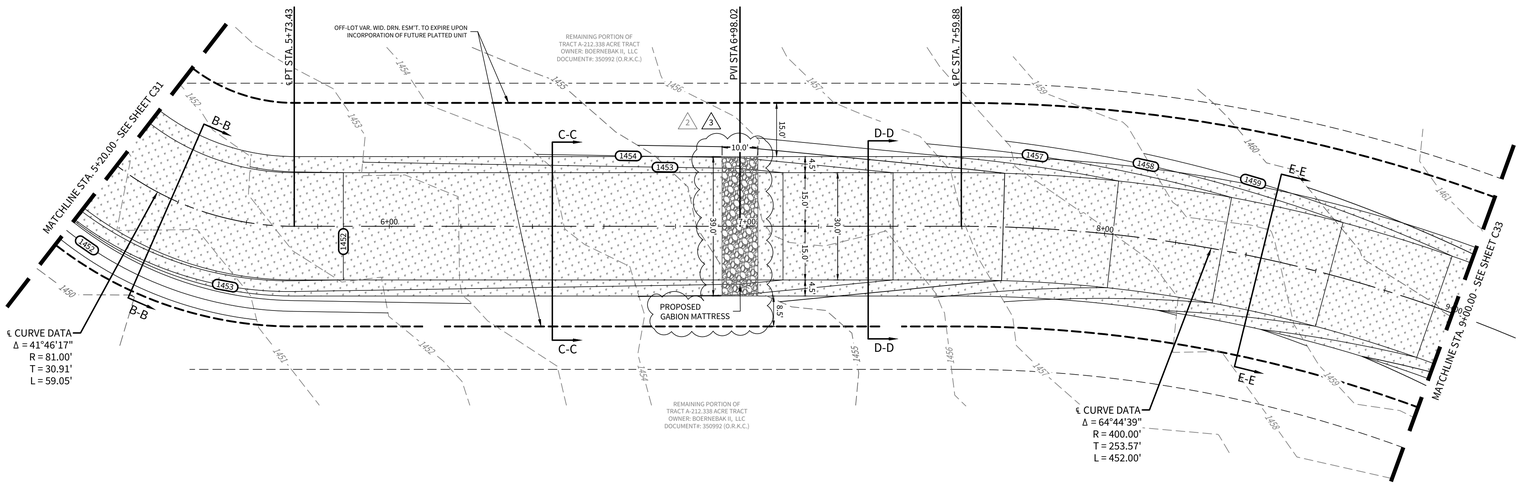
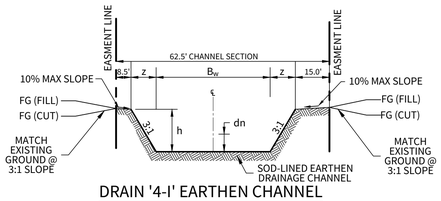


LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR
- EXISTING 5' CONTOUR
- PROPOSED 1' CONTOUR
- PROPOSED 5' CONTOUR
- PROPOSED WATER LINE
- PROPOSED SEWER MAIN
- PROPOSED GAS MAIN
- PROPOSED CULVERT
- CONCRETE RIP RAP
- SOD-LINED EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE



DRAIN '4-I' EARTHEN CHANNEL

(N.T.S.)

"B-B" STA. 5+14.37 TO STA. 5+73.43
"C-C" STA. 5+73.43 TO STA. 6+98.02
"D-D" STA. 6+98.02 TO STA. 7+59.88
"E-E" STA. 7+59.88 TO STA. 9+00.00

	"B-B"	"C-C"	"D-D"	"E-E"
BEGIN STA.	5+14.37	5+73.43	6+98.02	7+59.88
END STA.	5+73.43	6+98.02	7+59.88	9+28.64
Q_{100} (cfs)	83.91	83.91	83.91	83.91
B_w (ft)	30.00'	30.00'	30.00'	30.00'
z (ft)	4.50'	4.50'	4.50'	4.50'
n	0.035	0.035	0.035	0.035
D (ft)	1.50'	1.50'	1.50'	1.50'
S (%)	0.55	0.55	3.25	3.25
d_n (ft)	**1.00	0.90	0.54	**0.60
V (fps)	2.73	2.73	4.82	4.82
Fr	0.481	0.523	1.175	1.097

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

9.3.15 - Super Elevation

Channel Bends and Turns - Freeboard. Allowance for extra freeboard shall be made when the centerline radius of the channel is less than three (3) times the bottom width or for super-critical flow regime. Where bends or high velocities are involved and the flow regime is sub-critical, the applicant shall use the following formula for computing the extra freeboard:

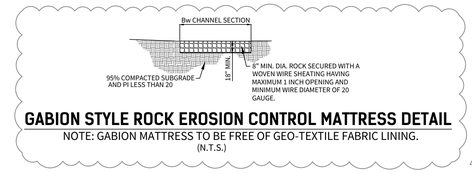
(Equation 9.3.15)

$$d_2 - d_1 = \frac{V^2(T+B)}{2gR}$$

d_1 = depth of flow at the inside of the bend in feet.
d_2 = depth of flow at the outside of the bend in feet.
B = bottom width of the channel in feet.
V = the average approach velocity in the channel in feet per second.
T = width of flow at the water surface in feet.
g = 32.2 feet/second squared.
R = the center line radius of the turn or bend in feet.

DRAIN '4-I'

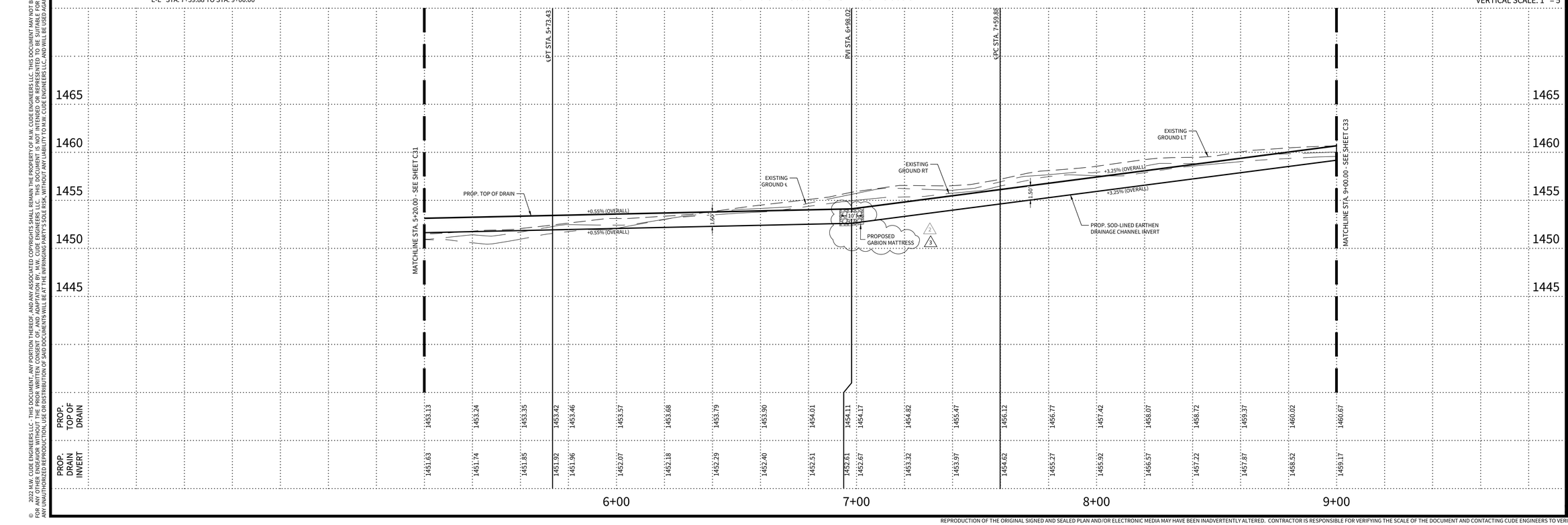
STA. 5+20.00 TO STA. 9+00.00



GABION STYLE ROCK EROSION CONTROL MATTRESS DETAIL

NOTE: GABION MATTRESS TO BE FREE OF GEO-TEXTILE FABRIC LINING.
(N.T.S.)

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



PROP. TOP OF DRAIN	PROP. DRAIN INVERT
1453.13	1451.63
1453.24	1451.74
1453.35	1451.85
1453.42	1451.92
1453.46	1451.96
1453.57	1452.07
1453.68	1452.18
1453.79	1452.29
1453.90	1452.40
1454.01	1452.51
1454.11	1452.61
1454.17	1452.67
1454.82	1453.32
1455.47	1453.97
1456.12	1454.62
1456.77	1455.27
1457.42	1455.92
1458.07	1456.57
1458.72	1457.22
1459.37	1457.87
1460.02	1458.52
1460.67	1459.17

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P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-I'

DATE
07/16/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED FROUDE # TO X-SECTION
2.	06.26.2024	ADDED GABION MATTRESS
3.	07.15.2024	ADDED GABION MATTRESS DIMENSIONS
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
07/16/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C32

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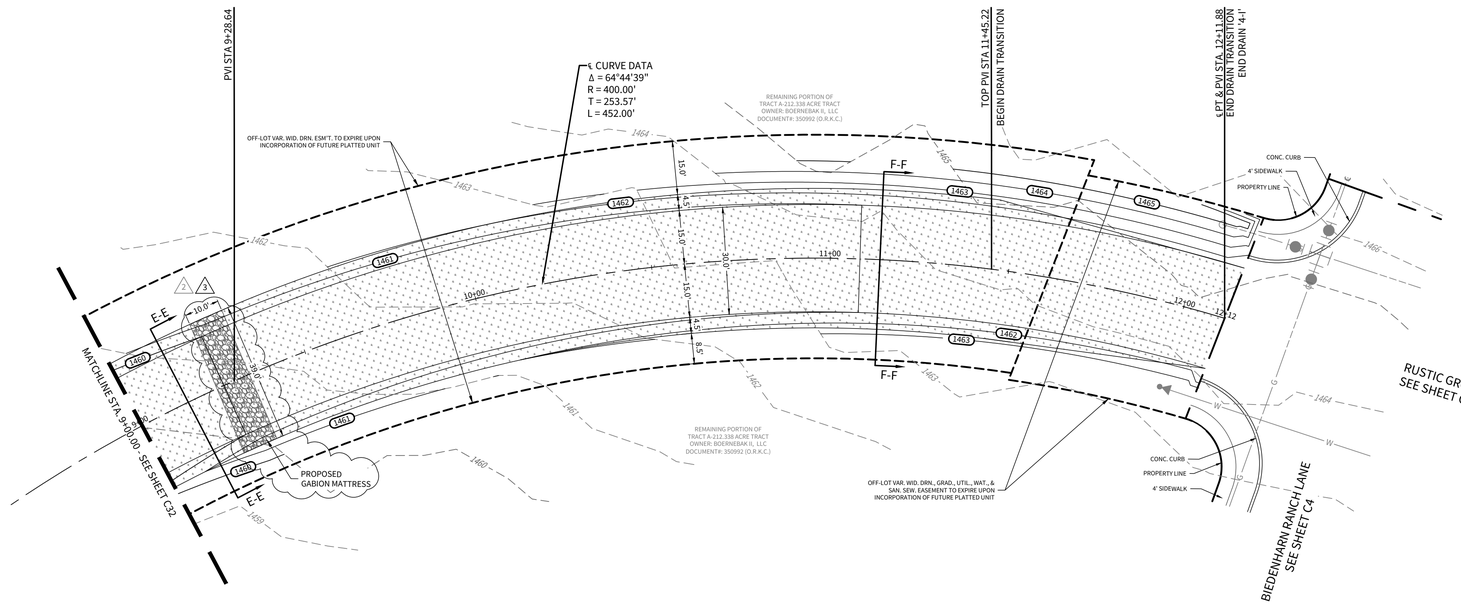
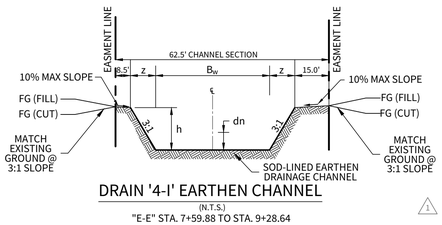




DRAIN '4-I' EARTHEN CHANNEL
(N.T.S.)
"E-E" STA. 7+59.88 TO STA. 9+28.64
"F-F" STA. 9+28.64 TO STA. 12+11.88

	"E-E"	"F-F"
BEGIN STA.	7+59.88	9+28.64
END STA.	9+28.64	12+11.88
Q_{100} (cfs)	83.91	83.91
B_w (ft)	30.00'	30.00'
z (ft)	4.50'	4.50'
n	0.035	0.035
D (ft)	1.50'	1.50'
S (%)	3.25	0.50
d_h (ft)	**0.60	**0.96
V (fps)	4.82	2.64
Fr	1.097	0.475

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

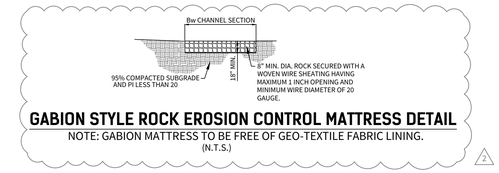
9.3.15 - Super Elevation
Channel Bends and Turns - Freeboard. Allowance for extra freeboard shall be made when the centerline radius of the channel is less than three (3) times the bottom width or for super-critical flow regime. Where bends or high velocities are involved and the flow regime is sub-critical, the applicant shall use the following formula for computing the extra freeboard:

(Equation 9.3.15)

$$d_2 - d_1 = \frac{V^2(T+B)}{2gR}$$

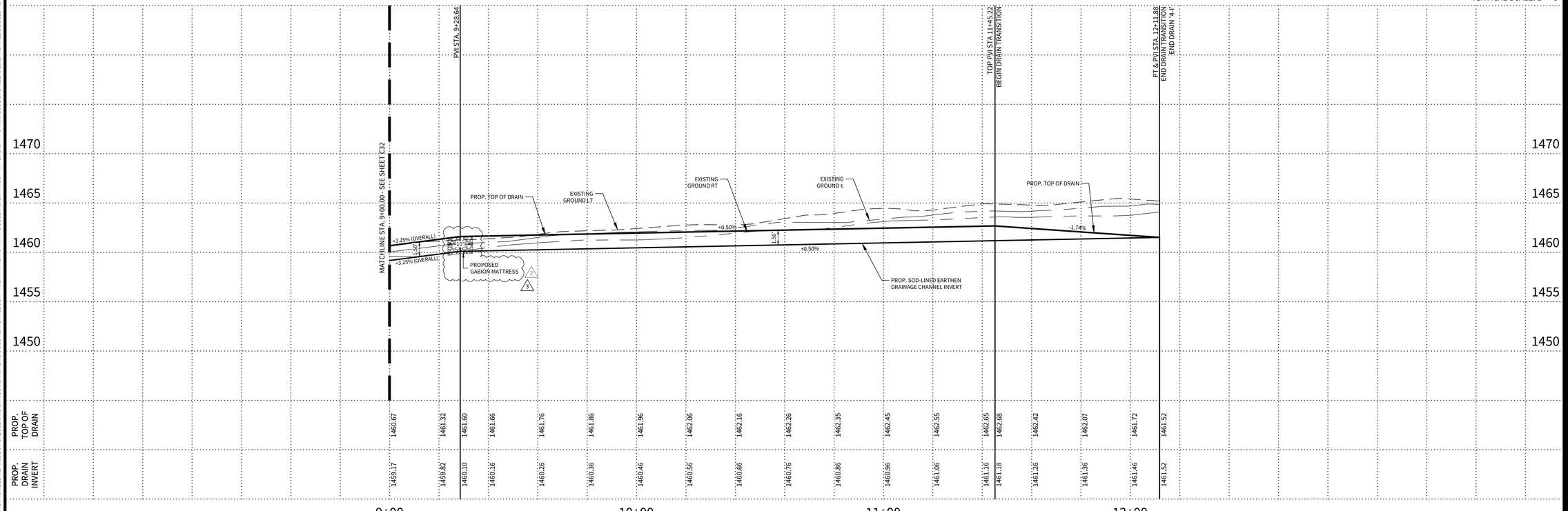
d_1 = depth of flow at the inside of the bend in feet.
d_2 = depth of flow at the outside of the bend in feet.
B = bottom width of the channel in feet.
V = the average approach velocity in the channel in feet per second.
T = width of flow at the water surface in feet.
g = 32.2 feet/second squared.
R = the center line radius of the turn or bend in feet.

DRAIN '4-I'
STA. 9+00.00 TO END



GABION STYLE ROCK EROSION CONTROL MATTRESS DETAIL
NOTE: GABION MATTRESS TO BE FREE OF GEO-TEXTILE FABRIC LINING.
(N.T.S.)

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



	9+00	9+28.64	9+50	9+75	10+00	10+25	10+50	10+75	11+00	11+25	11+45.22	11+50	11+75	12+00	12+11.88
PROP. TOP OF DRAIN	1460.67	1461.32	1461.60	1461.66	1461.76	1461.86	1461.96	1462.06	1462.16	1462.26	1462.35	1462.45	1462.55	1462.65	1462.68	1462.42	1462.07	1461.72	1461.52
PROP. DRAIN INVERT	1459.17	1459.82	1460.10	1460.16	1460.26	1460.36	1460.46	1460.56	1460.66	1460.76	1460.86	1460.96	1461.06	1461.16	1461.18	1461.26	1461.36	1461.46	1461.52

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- PROPOSED WATER LINE (W)
- PROPOSED SEWER MAIN (SS)
- PROPOSED GAS MAIN (G)
- PROPOSED CULVERT
- CONCRETE RIP RAP
- SOD-LINED EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE

CUDEENGINEERS.COM
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-I'

DATE 07/16/2024
PROJECT NO. 03481.008
DRAWN BY CG/ED/AG/JR/RC/LW
CHECKED BY CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED FROUDE # TO X-SECTION
2.	06.26.2024	ADDED GABION MATTRESS
3.	07.15.2024	ADDED GABION MATTRESS DIMENSIONS
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
07/16/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO. 22-1190

C33

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P:\03481\008\3 Drawings\C33 DRAIN PLAN & PROFILE - DRAIN '4-I'.dwg 2:\AG\07.16.11:15am:CDSmith

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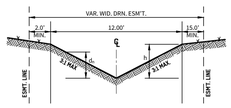
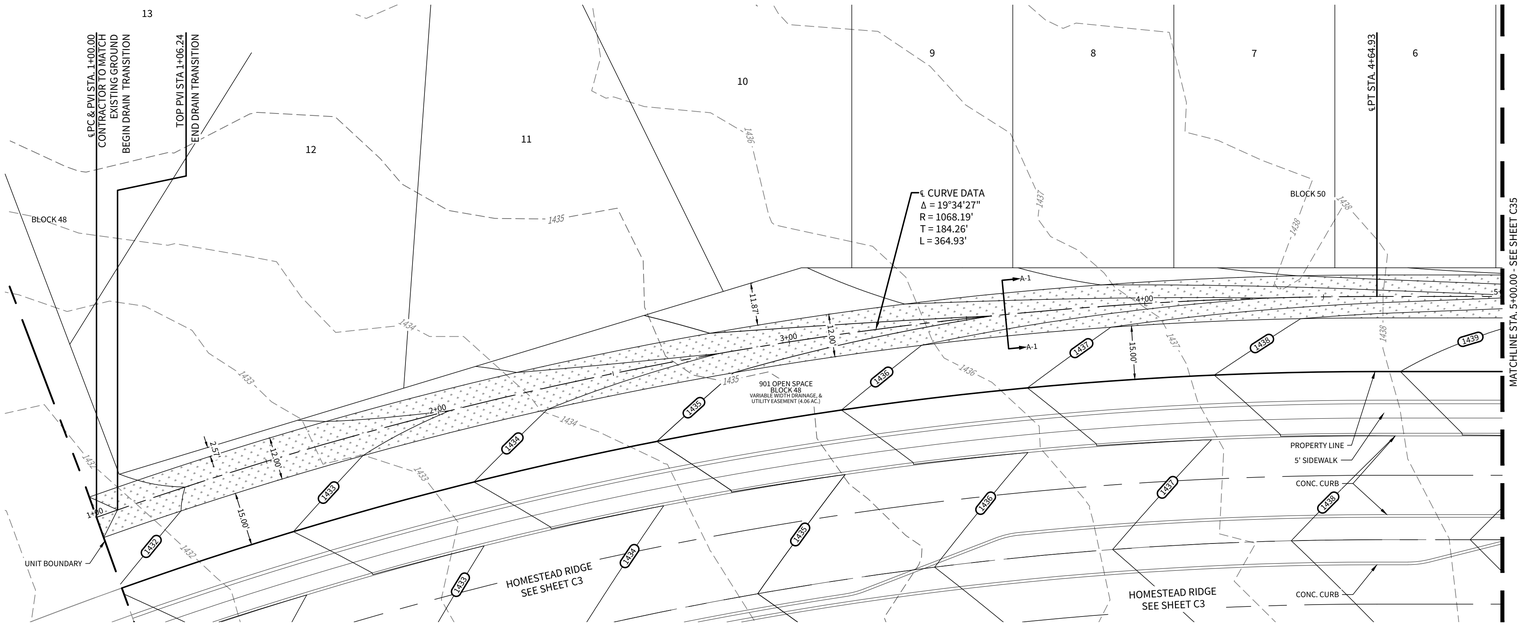


DRAIN '4-J' "A-A" SECTION (N.T.S.)

"A-A" STA. 1+00.00 TO 7+39.64

	"A-A"
BEGIN STA.	1+00.00
END STA.	7+39.64
Q_{100} (cfs)	30.51
B_w (ft)	0.00'
z (ft)	3.00'
n	0.035
D (ft)	2.00'
S (%)	1.30
d_b (ft)	1.50
V (fps)	4.02
Fr	0.792

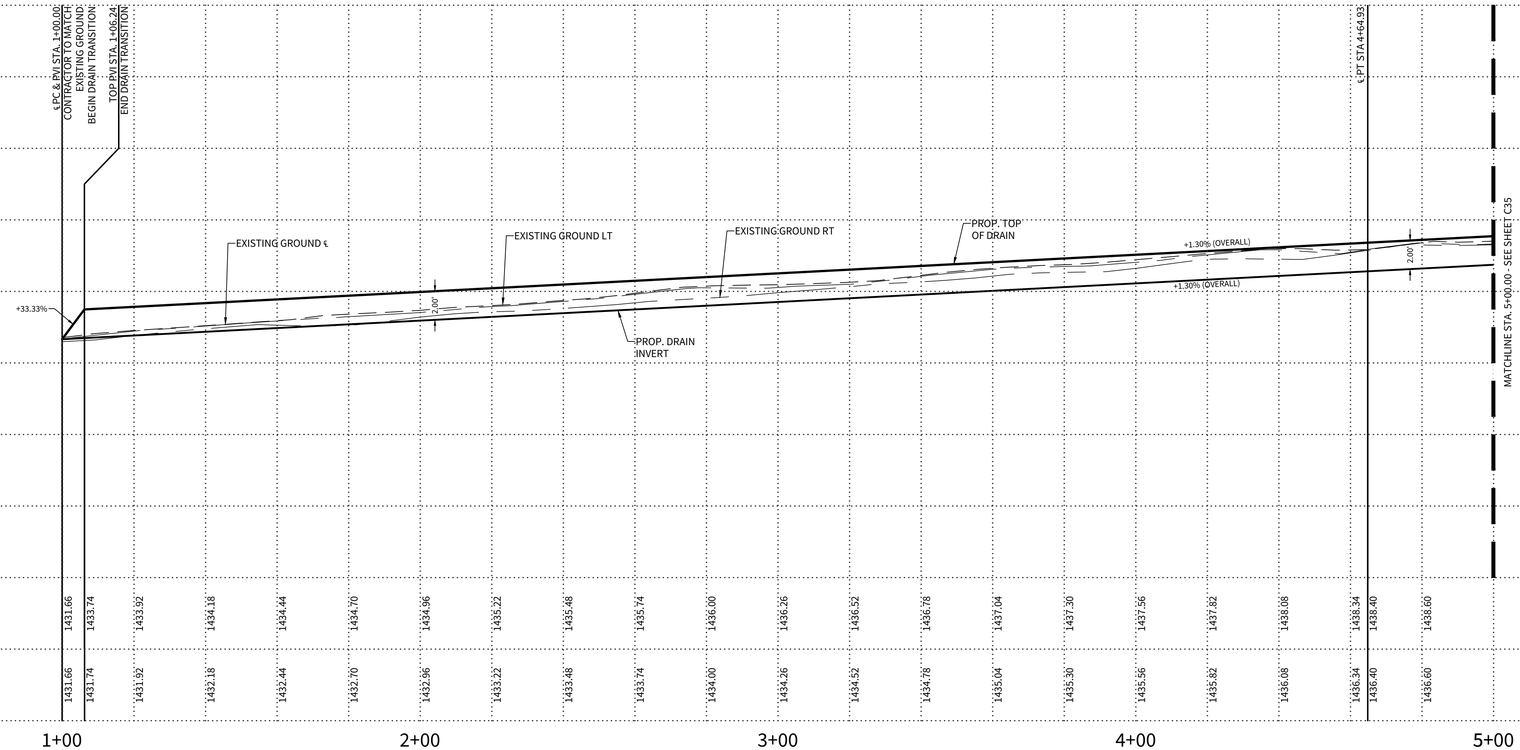
1 NOTE: EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS

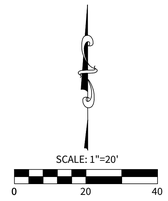


DRAIN '4-J'

STA. 1+00.00 TO STA. 5+00.00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'





LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED RIGHT OF WAY
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- PROPOSED GAS MAIN (G)
- EARTHEN DRAINAGE CHANNEL

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-J'

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02-08-2024	ADDED FROUDE # & SOD LINED NOTE
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
05/08/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C34

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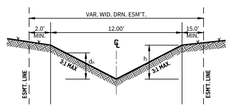
P:\03481\008\3 Drawings\C34 DRAIN PLAN & PROFILE - DRAIN '4-J'.dwg 5/8/2024 5:56:11 PM by EDSantos

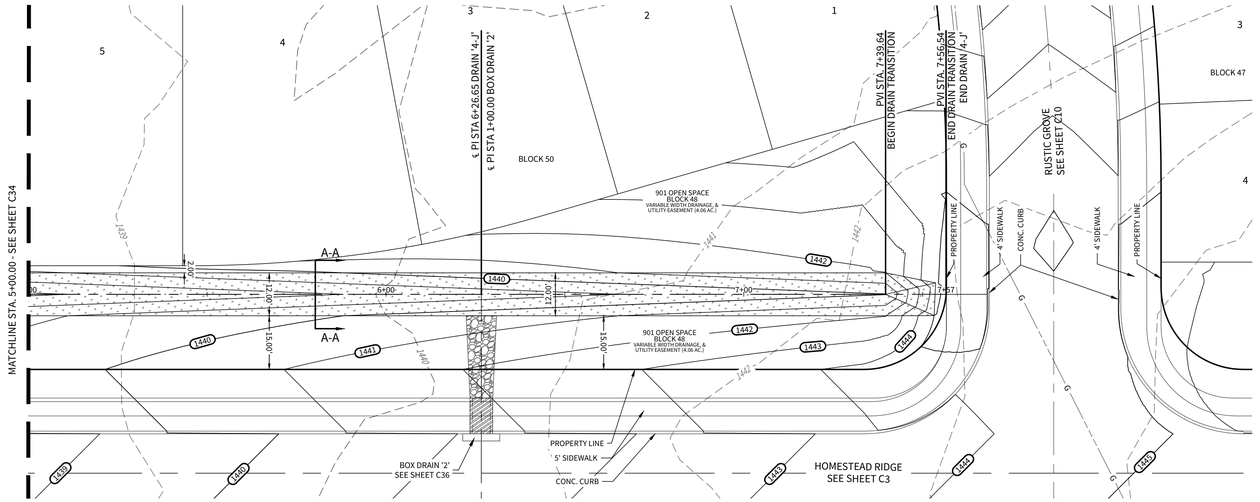


DRAIN '4-J' "A-A" SECTION (N.T.S.)

"A-A" STA. 1+00.00 TO 7+39.64

	"A-A"
BEGIN STA.	1+00.00
END STA.	7+39.64
Q_{100} (cfs)	30.51
B_w (ft)	0.00'
z (ft)	3.00'
n	0.035
D (ft)	2.00'
S (%)	1.30
d_c (ft)	1.50
V (fps)	4.02
Fr	0.792

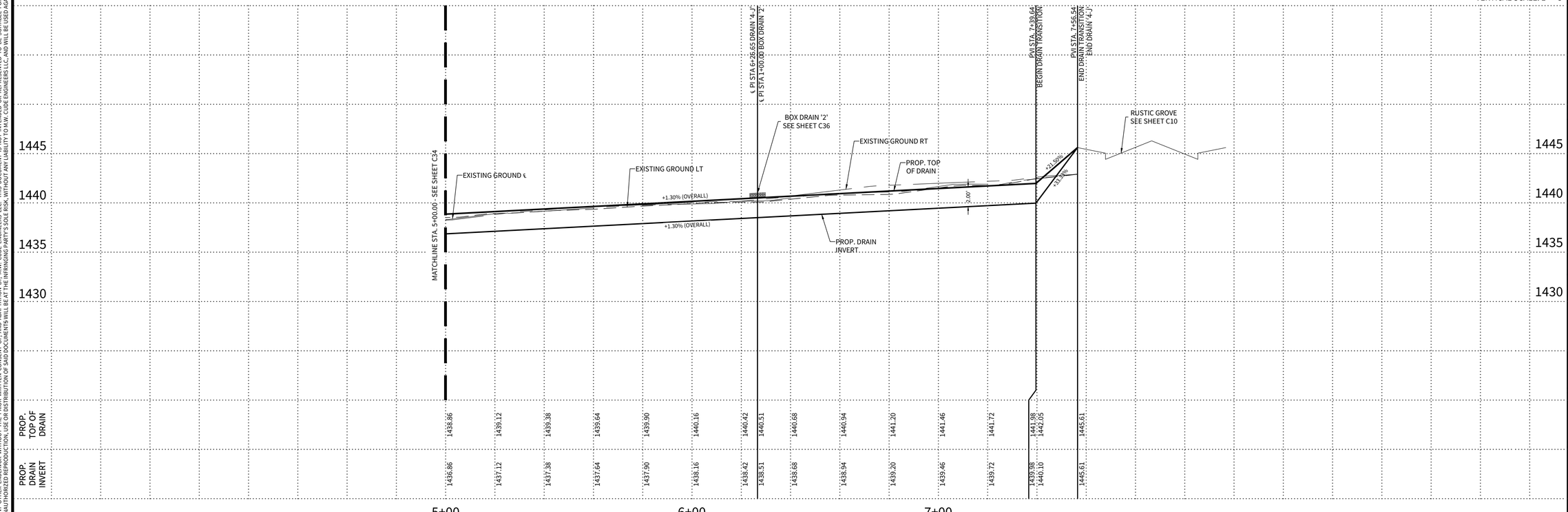
1 NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS



DRAIN '4-J'

STA. 5+00.00 TO END

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED RIGHT OF WAY
- EXISTING 1' CONTOUR (499)
- EXISTING 5' CONTOUR (500)
- PROPOSED 1' CONTOUR (499)
- PROPOSED 5' CONTOUR (500)
- PROPOSED GAS MAIN (G)
- EARTHEN DRAINAGE CHANNEL

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS
UNIT 4

DRAIN PLAN & PROFILE - DRAIN '4-J'

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02.08.2024	ADDED PROJECT # & SOD LINED NOTE
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER

05/08/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C35

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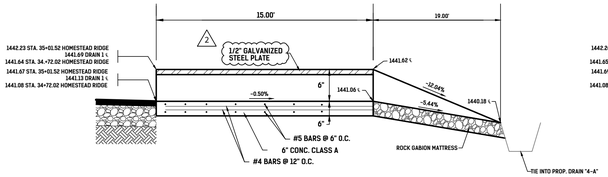
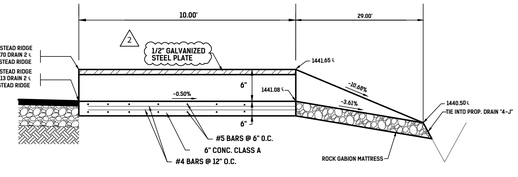
P:\03481\008\3-Drawings\C34 DRAIN PLAN & PROFILE - DRAIN '4-J'.dwg | 5/8/2024 8:05:59 AM | Adam Eldredge

For Review
06/18/2025



BOX DRAIN "1" INLET SECTION
(N.T.S)

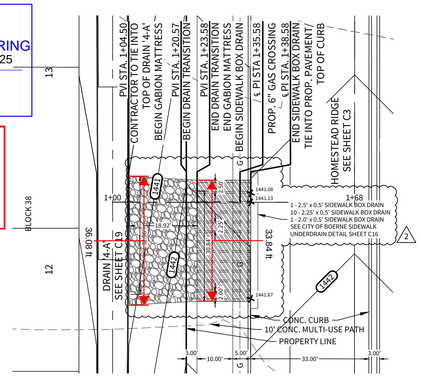


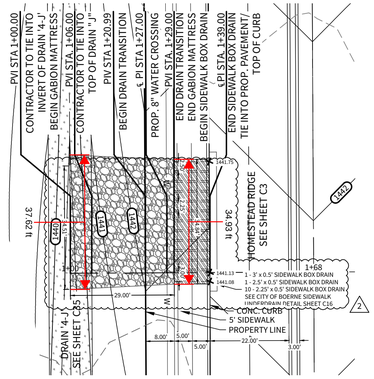
BOX DRAIN "2" INLET SECTION
(N.T.S)

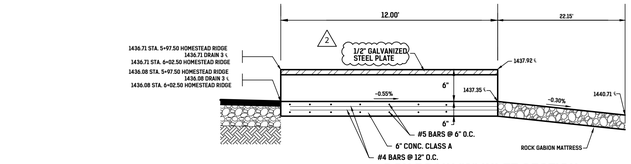
Reviewed by City of Boerne Engineering & Mobility:
Approved for Construction ___X___
Approved as Noted _____
Disapproved _____
Incomplete - Not Reviewed _____
Not Reviewed - Accepted FIO _____
By: Cheryl J. Rogers Date: 7/14/2025

REVIEWED
CITY OF BOERNE
DEVELOPMENT ENGINEERING
By: [signature] DATE 06/27/2025
Freestone Water
NO COMMENT

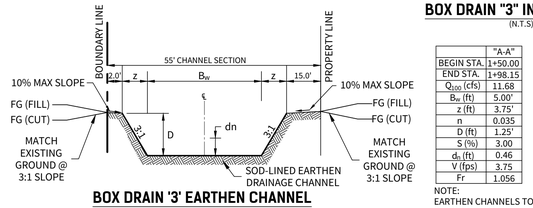
REVIEWED
CITY OF BOERNE
UTILITIES DEPARTMENT
[signature]
06/27/2025
NO COMMENTS







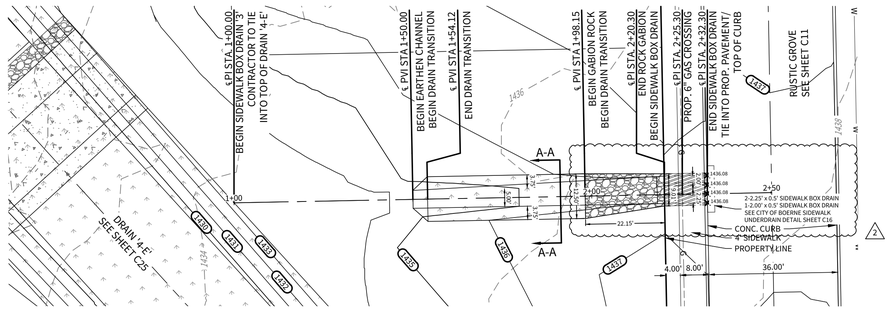
BOX DRAIN "3" INLET SECTION
(N.T.S)



BOX DRAIN '3' EARTHEN CHANNEL
(N.T.S.)
"A-A" STA. 1+54.12 TO STA. 1+98.15

	"A-A"
BEGIN STA.	1+50.00
END STA.	1+98.15
Q_{100} (cfs)	11.68
B_W (ft)	5.00'
z (ft)	3.75'
n	0.035
D (ft)	1.25'
S (%)	3.00
d_N (ft)	0.46
V (fps)	3.75
Fr	1.056

NOTE:
EARTHEN CHANNELS TO BE SOD LINED WHEN VELOCITIES ARE 3 - 6 FPS



Use horizontal scale (1"=20') for plan view

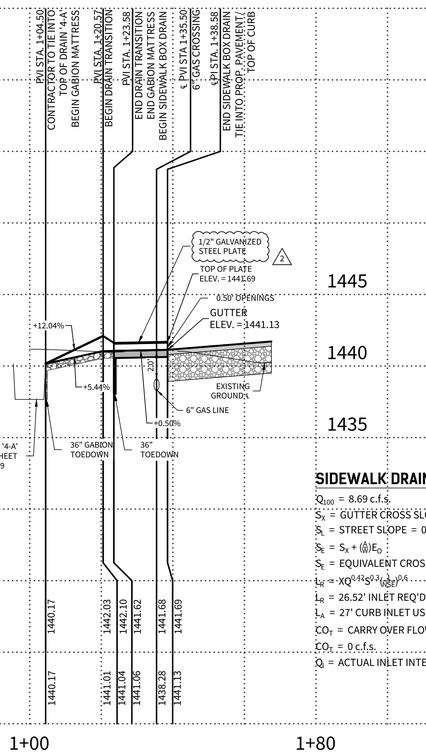
HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING 1' CONTOUR — 499
- EXISTING 5' CONTOUR — 500
- PROPOSED 1' CONTOUR — 499
- PROPOSED 5' CONTOUR — 500
- PROPOSED WATER LINE — W
- PROPOSED SEWER MAIN — SS
- PROPOSED GAS MAIN — G
- CONCRETE RIP RAP
- EARTHEN DRAINAGE CHANNEL
- ROCK RUBBLE

BOX DRAIN '1'

STA. 1+00.00 TO END

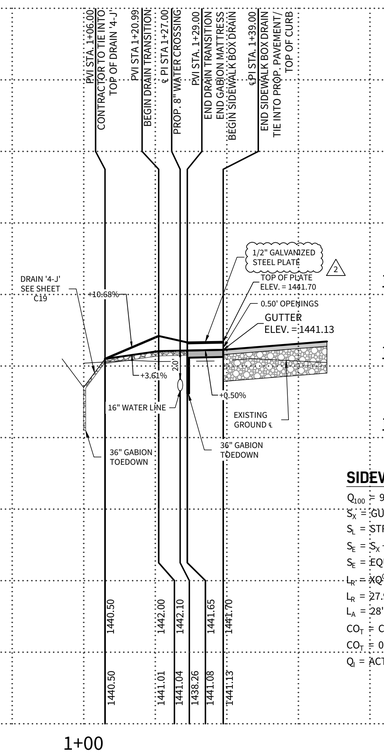


SIDEWALK DRAIN 1 TXDOT METHOD

Q_{100} = 8.69 c.f.s.
S_x = GUTTER CROSS SLOPE = 0.02
S_s = STREET SLOPE = 0.02
$S_e = S_x + (\frac{a}{0})E_0$
S_e = EQUIVALENT CROSS SLOPE = 0.07
$L_T = XQ^{0.42}S^{0.3}(\frac{1}{nSE})^{0.6}$
L_R = 26.52' INLET REQ'D
L_A = 27' CURB INLET USED
CO_T = CARRY OVER FLOW = $Q_{100}[(1-\frac{L_A}{L_T})^{1.8}]$
CO_T = 0 c.f.s.
Q_i = ACTUAL INLET INTERCEPTION = 8.69 c.f.s.

BOX DRAIN '2'

STA. 1+00.00 TO END



SIDEWALK DRAIN 2 TXDOT METHOD

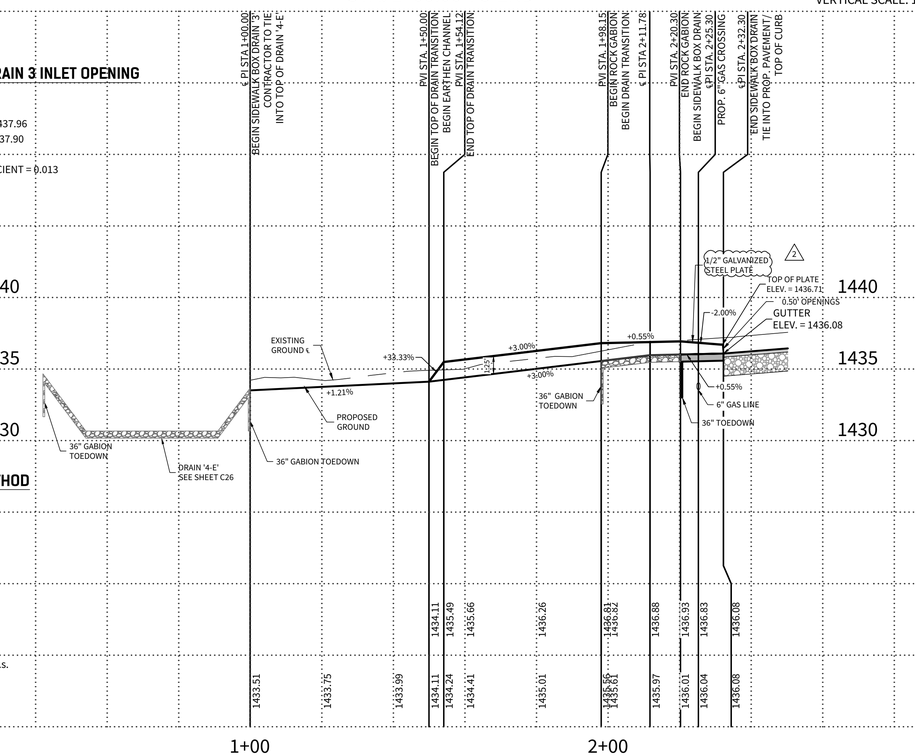
Q_{100} = 9.51 c.f.s.
S_x = GUTTER CROSS SLOPE = 0.02
S_s = STREET SLOPE = 0.02
$S_e = S_x + (\frac{a}{0})E_0$
S_e = EQUIVALENT CROSS SLOPE = 0.07
$L_T = XQ^{0.42}S^{0.3}(\frac{1}{nSE})^{0.6}$
L_R = 27.91' INLET REQ'D
L_A = 28' CURB INLET USED
CO_T = CARRY OVER FLOW = $Q_{100}[(1-\frac{L_A}{L_T})^{1.8}]$
CO_T = 0 c.f.s.
Q_i = ACTUAL INLET INTERCEPTION = 9.51 c.f.s.

BOX DRAIN '3'

STA. 1+00.00 TO END

SIDEWALK DRAIN 3 INLET OPENING

2-2.25' X 0.5' S.B.C.
1-2.00' X 0.5' S.B.C.
ALLOWABLE Hw = 1437.96
COMPUTED Hw = 1437.90
SLOPE = 0.55%
MANNING'S COEFFICIENT = 0.013
Q_{100} = 11.68 c.f.s.
V = 4.28 f.p.s.



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CORLEY FARMS
UNIT 4

SIDEWALK BOX DRAIN '1', '2', & '3' PLAN AND PROFILE

REVISIONS

	DATE	
1.	02-08-2024	ADDED 1:1 FLARE OF GABION MATTRESS & REVISED STEEL PLATES ON 5omIx BOX
2.	06-16-2025	JWH'S: REVISED 30'MIX BOX DRN '3'
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/16/2025
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

DATE
06/16/2025
PROJECT NO.
03481.008
DRAWN BY
CG/ED/AG/JR/RC/LW
CHECKED BY
CA/XV/JC/AL

SAWS JOB NO.
22-1190

C36

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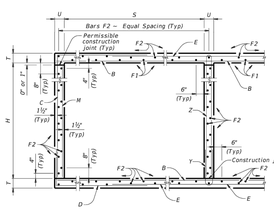
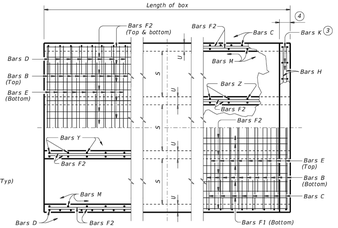
DATE:
FILE:



TYPICAL SECTION



BOTTOM SLAB PART PLANS TOP SLAB

1. 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
2. For vehicle safety, the following requirements must be met:
   - For structures without bridge rail, construct curbs no more than 3" above finished grade.
   - For structures with bridge rail, construct 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.
3. 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.
4. 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, M, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 2'-1" (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

CONSTRUCTION NOTES:
Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'_c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'_c = 4,000 psi) for top slabs of:
- culverts with overlay,
- culverts with 1-in-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

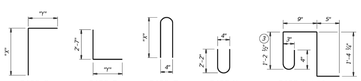
Provide bar laps, where required, as follows:
- Uncoated or galvanized – #4 – 1'-8" Min
- Uncoated or galvanized – #5 – 2'-1" Min
- Uncoated or galvanized – #6 – 2'-6" Min

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions shown are out-to-out of bar.

SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
2'-0"	2'-6 ½"	3'-8 ½"
3'-0"	3'-6 ½"	3'-8 ½"
4'-0"	4'-6 ½"	3'-8 ½"
5'-0"	5'-6 ½"	3'-8 ½"



BARS C BARS D BARS Z BARS Y BARS K (#4) (Spa = 1'-0" Max) (Length = 6'-2")

NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE
5'-0" SPAN
0' TO 20' FILL
MC-5-20

File: CD-MC520-20.dgn	dn: TBE	ck: BWP	dw: TxDOT	ck: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

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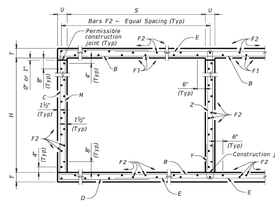
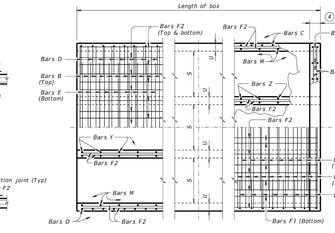
FILE:



TYPICAL SECTION



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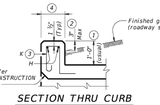

SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
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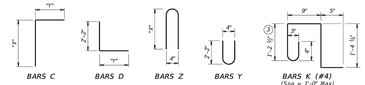
3'-0"	3'-6 ½"	3'-0"
4'-0"	4'-0 ½"	3'-0"



BARS C BARS D BARS Z BARS Y BARS K (#4) (Spa = 1'-0" Max) (Length = 6'-2")

NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI

Use this standard only when lengthening existing multiple box culverts.

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE
4'-0" SPAN
0' TO 23' FILL
FOR LENGTHENING ONLY
MC-4-23

File: CD-MC423-20.dgn	dn: TBE	ck: TAR	dw: TxDOT	ck: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

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DATE:
FILE:

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																														QUANTITIES					
					Bars B				Bars C & D								Bars E				Bars F1 ~ #4				Bars F2 ~ #4				Bars M ~ #4				Bars Y & Z ~ #4								Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total	
									Bars C				Bars D																																	
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	Length	Wt	No.	Wt.	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
2	5'-0"	2'-0"	8"	7"	108	#5	9"	11'-6"	1,295	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	38	18"	39'-9"	1,009	108	9"	2'-0"	144	54	9"	4'-7"	165	5'-3"	189	11'-6"	31	26	72	0.710	135.2	0.9	103	29.3	5,510
3	5'-0"	2'-0"	8"	7"	108	#5	9"	17'-1"	1,924	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	54	18"	39'-9"	1,434	108	9"	2'-0"	144	108	9"	4'-7"	331	5'-3"	379	17'-1"	46	38	106	1.029	188.8	1.3	152	42.4	7,705
4	5'-0"	2'-0"	8"	7"	108	#5	9"	22'-8"	2,553	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	70	18"	39'-9"	1,859	108	9"	2'-0"	144	162	9"	4'-7"	496	5'-3"	568	22'-8"	61	48	134	1.348	242.4	1.7	195	55.6	9,891
5	5'-0"	2'-0"	8"	7"	108	#5	9"	28'-3"	3,182	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	86	18"	39'-9"	2,284	108	9"	2'-0"	144	216	9"	4'-7"	661	5'-3"	758	28'-3"	75	60	167	1.667	296.0	2.1	242	68.8	12,082
6	5'-0"	2'-0"	8"	7"	108	#5	9"	33'-10"	3,811	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	102	18"	39'-9"	2,708	108	9"	2'-0"	144	270	9"	4'-7"	827	5'-3"	947	33'-10"	90	70	195	1.986	349.6	2.5	285	82.0	14,268
2	5'-0"	3'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	44	18"	39'-9"	1,168	108	9"	3'-0"	216	54	9"	4'-7"	165	7'-3"	262	11'-6"	31	26	72	0.775	159.9	0.9	103	31.9	6,497
3	5'-0"	3'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	62	18"	39'-9"	1,646	108	9"	3'-0"	216	108	9"	4'-7"	331	7'-3"	523	17'-1"	46	38	106	1.115	223.5	1.3	152	45.9	9,093
4	5'-0"	3'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	80	18"	39'-9"	2,124	108	9"	3'-0"	216	162	9"	4'-7"	496	7'-3"	785	22'-8"	61	48	134	1.456	287.2	1.7	195	59.9	11,682
5	5'-0"	3'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	98	18"	39'-9"	2,602	108	9"	3'-0"	216	216	9"	4'-7"	661	7'-3"	1,046	28'-3"	75	60	167	1.796	350.8	2.1	242	73.9	14,274
6	5'-0"	3'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	116	18"	39'-9"	3,080	108	9"	3'-0"	216	270	9"	4'-7"	827	7'-3"	1,308	33'-10"	90	70	195	2.137	414.5	2.5	285	88.0	16,863
2	5'-0"	4'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	44	18"	39'-9"	1,168	108	9"	4'-0"	289	54	9"	4'-7"	165	9'-3"	334	11'-6"	31	26	72	0.840	166.3	0.9	103	34.5	6,754
3	5'-0"	4'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	62	18"	39'-9"	1,646	108	9"	4'-0"	289	108	9"	4'-7"	331	9'-3"	667	17'-1"	46	38	106	1.202	231.8	1.3	152	49.4	9,422
4	5'-0"	4'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	80	18"	39'-9"	2,124	108	9"	4'-0"	289	162	9"	4'-7"	496	9'-3"	1,001	22'-8"	61	48	134	1.564	297.2	1.7	195	64.3	12,083
5	5'-0"	4'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	98	18"	39'-9"	2,602	108	9"	4'-0"	289	216	9"	4'-7"	661	9'-3"	1,335	28'-3"	75	60	167	1.926	362.7	2.1	242	79.1	14,748
6	5'-0"	4'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	116	18"	39'-9"	3,080	108	9"	4'-0"	289	270	9"	4'-7"	827	9'-3"	1,668	33'-10"	90	70	195	2.288	428.1	2.5	285	94.0	17,408
2	5'-0"	5'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	50	18"	39'-9"	1,328	108	9"	5'-0"	361	54	9"	4'-7"	165	11'-3"	406	11'-6"	31	26	72	0.904	176.7	0.9	103	37.0	7,171
3	5'-0"	5'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	70	18"	39'-9"	1,859	108	9"	5'-0"	361	108	9"	4'-7"	331	11'-3"	812	17'-1"	46	38	106	1.288	245.3	1.3	152	52.8	9,965
4	5'-0"	5'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	90	18"	39'-9"	2,390	108	9"	5'-0"	361	162	9"	4'-7"	496	11'-3"	1,217	22'-8"	61	48	134	1.672	313.9	1.7	195	68.6	12,750
5	5'-0"	5'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	110	18"	39'-9"	2,921	108	9"	5'-0"	361	216	9"	4'-7"	661	11'-3"	1,623	28'-3"	75	60	167	2.056	382.5	2.1	242	84.3	15,540
6	5'-0"	5'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	130	18"	39'-9"	3,452	108	9"	5'-0"	361	270	9"	4'-7"	827	11'-3"	2,029	33'-10"	90	70	195	2.439	451.0	2.5	285	100.1	18,326

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE
5'-0" SPAN
0' TO 20' FILL
MC-5-20

File: CD-MC520-20.dgn	dn: TBE	ck: BWP	dw: TxDOT	ck: TxDOT
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REVISIONS	DIST	COUNTY		SHEET NO.

NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI

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NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																														QUANTITIES					
					Bars B				Bars C & D								Bars E				Bars F1 ~ #4				Bars F2 ~ #4				Bars M ~ #4				Bars Y & Z ~ #4								Bars H 4 ~ #4		Bars K		Per Foot of Barrel		Curb		Total	
									Bars C				Bars D																																	
	S	H	T	U	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	No.	Size	Spa	Length	Wt	Length	Wt	No.	Wt.	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)	Conc (CY)	Reinf (Lb)
2	4'-0"	2'-0"	8"	7"	108	#5	9"	9'-6"	1,070	162	#4	6"	5'-8"	613	5'-4"	577	108	#5	9"	7'-4"	826	6	18"	39'-9"	159	36	18"	39'-9"	956	108	9"	2'-0"	144	54	9"	4'-7"	165	5'-3"	189	9'-6"	25	22	61	0.611	117.5	0.7	86	25.2	4,785
3	4'-0"	2'-0"	8"	7"	108	#5	9"	14'-1"	1,586	162	#4	6"	5'-8"	613	5'-4"	577	108	#5	9"	11'-1"	1,342	9	18"	39'-9"	239	51	18"	39'-9"	1,354	108	9"	2'-0"	144	108	9"	4'-7"	331	5'-3"	379	14'-1"	38	32	89	0.881	164.1	1.1	127	36.3	6,692
4	4'-0"	2'-0"	8"	7"	108	#5	9"	18'-8"	2,103	162	#4	6"	5'-8"	613	5'-4"	577	108	#5	9"	15'-6"	1,859	12	18"	39'-9"	319	66	18"	39'-9"	1,752	108	9"	2'-0"	144	162	9"	4'-7"	496	5'-3"	568	18'-8"	50	40	111	1.150	210.8	1.4	161	47.4	8,592
5	4'-0"	2'-0"	8"	7"	108	#5	9"	23'-3"	2,619	162	#4	6"	5'-8"	613	5'-4"	577	108	#5	9"	21'-1"	2,375	15	18"	39'-9"	398	81	18"	39'-9"	2,151	108	9"	2'-0"	144	216	9"	4'-7"	661	5'-3"	758	23'-3"	62	50	139	1.420	257.4	1.7	201	58.5	10,497
6	4'-0"	2'-0"	8"	7"	108	#5	9"	27'-10"	3,135	162	#4	6"	5'-8"	613	5'-4"	577	108	#5	9"	25'-8"	2,891	18	18"	39'-9"	478	96	18"	39'-9"	2,549	108	9"	2'-0"	144	270	9"	4'-7"	827	5'-3"	947	27'-10"	74	58	161	1.689	304.0	2.1	235	69.6	12,296
2	4'-0"	3'-0"	8"	7"	108	#5	9"	9'-6"	1,070	162	#4	6"	6'-8"	721	5'-4"	577	108	#5	9"	7'-4"	826	6	18"	39'-9"	159	42	18"	39'-9"	1,115	108	9"	3'-0"	216	54	9"	4'-7"	165	7'-3"	262	9'-6"	25	22	61	0.676	127.8	0.7	86	27.4	5,197
3	4'-0"	3'-0"	8"	7"	108	#5	9"	14'-1"	1,586	162	#4	6"	6'-8"	721	5'-4"	577	108	#5	9"	11'-1"	1,342	9	18"	39'-9"	239	59	18"	39'-9"	1,567	108	9"	3'-0"	216	108	9"	4'-7"	331	7'-3"	523	14'-1"	38	32	89	0.967	177.6	1.1	127	39.7	7,229
4	4'-0"	3'-0"	8"	7"	108	#5	9"	18'-8"	2,103	162	#4	6"	6'-8"	721	5'-4"	577	108	#5	9"	15'-6"	1,859	12	18"	39'-9"	319	76	18"	39'-9"	2,018	108	9"	3'-0"	216	162	9"	4'-7"	496	7'-3"	785	18'-8"	50	40	111	1.258	227.4	1.4	161	51.7	9,255
5	4'-0"	3'-0"	8"	7"	108	#5	9"	23'-3"	2,619	162	#4	6"	6'-8"	721	5'-4"	577	108	#5	9"	21'-1"	2,375	15	18"	39'-9"	398	93	18"	39'-9"	2,469	108	9"	3'-0"	216	216	9"	4'-7"	661	7'-3"	1,046	23'-3"	62	50	139	1.549	277.1	1.7	201	63.7	11,283
6	4'-0"	3'-0"	8"	7"	108	#5	9"	27'-10"	3,135	162	#4	6"	6'-8"	721	5'-4"	577	108	#5	9"	25'-8"	2,891	18	18"	39'-9"	478	110	18"	39'-9"	2,921	108	9"	3'-0"	216	270	9"	4'-7"	827	7'-3"	1,308	27'-10"	74	58	161	1.841	326.9	2.1	235	75.7	13,309
2	4'-0"	4'-0"	8"	7"	108	#5	9"	9'-6"	1,070	162	#4	6"	7'-8"	830	5'-4"	577	108	#5	9"	7'-4"	826	6	18"	39'-9"	159	42	18"	39'-9"	1,115	108	9"	4'-0"	289	54	9"	4'-7"	165	9'-3"	334	9'-6"	25	22	61	0.741	134.1	0.7	86	30.4	5,451
3	4'-0"	4'-0"	8"	7"	108	#5	9"	14'-1"	1,586	162	#4	6"	7'-8"	830	5'-4"	577	108	#5	9"	11'-1"	1,342	9	18"	39'-9"	239	59	18"	39'-9"	1,567	108	9"	4'-0"	289	108	9"	4'-7"	331	9'-3"	667	14'-1"	38	32	89	1.053	185.7	1.1	127	43.2	7,555
4	4'-0"	4'-0"	8"	7"	108	#5	9"	18'-8"	2,103	162	#4	6"	7'-8"	830	5'-4"	577	108	#5	9"	15'-6"	1,859	12	18"	39'-9"	319	76	18"	39'-9"	2,018	108	9"	4'-0"	289	162	9"	4'-7"	496	9'-3"	1,001	18'-8"	50	40	111	1.366	237.3	1.4	161	56.0	9,653
5	4'-0"	4'-0"	8"	7"	108	#5	9"	23'-3"	2,619	162	#4	6"	7'-8"	830	5'-4"	577	108	#5	9"	21'-1"	2,375	15	18"	39'-9"	398	93	18"	39'-9"

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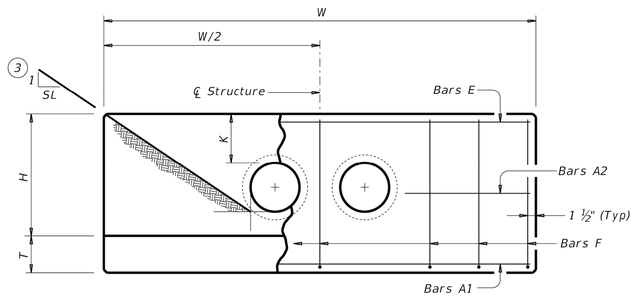
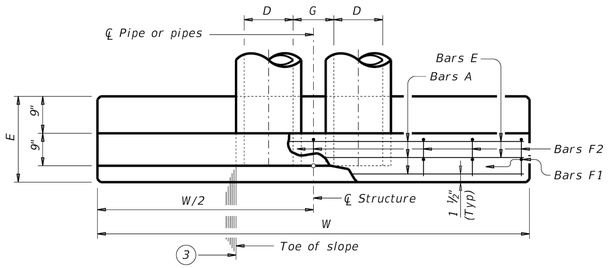
TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (5)

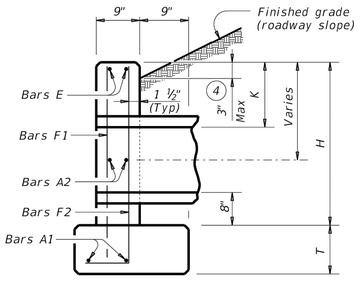
Slope	Dia of Pipe (D)	Values for One Pipe			Values To Be Added for Each Addt'l Pipe		
		W	Reinf (Lbs) (1)	Conc (CY) (2)	W	Reinf (Lbs) (1)	Conc (CY) (2)
2:1	12"	9' – 0"	122	1.1	1' – 9"	15	0.2
	15"	10' – 3"	136	1.3	2' – 2"	16	0.2
	18"	11' – 6"	163	1.5	2' – 8"	19	0.3
	21"	12' – 9"	200	1.8	3' – 1"	31	0.4
	24"	14' – 0"	217	2.1	3' – 7"	34	0.4
	27"	15' – 3"	254	2.4	3' – 11"	37	0.5
	30"	16' – 6"	272	2.7	4' – 4"	40	0.6
	33"	17' – 9"	314	3.1	4' – 8"	43	0.6
	36"	19' – 0"	371	3.9	5' – 1"	46	0.8
	42"	21' – 6"	442	4.9	5' – 10"	52	1.0
	48"	25' – 0"	569	6.4	6' – 7"	59	1.3
	54"	27' – 6"	701	7.5	7' – 6"	82	1.6
	60"	30' – 0"	794	8.8	8' – 3"	90	1.8
	66"	32' – 6"	894	10.2	8' – 9"	96	2.0
	72"	35' – 0"	1,055	11.7	9' – 4"	103	2.3
3:1	12"	13' – 0"	175	1.6	1' – 9"	14	0.2
	15"	14' – 9"	193	1.9	2' – 2"	17	0.2
	18"	16' – 6"	228	2.2	2' – 8"	19	0.3
	21"	18' – 3"	299	2.6	3' – 1"	31	0.4
	24"	20' – 0"	323	3.0	3' – 7"	33	0.4
	27"	21' – 9"	371	3.5	3' – 11"	37	0.5
	30"	23' – 6"	415	4.0	4' – 4"	40	0.5
	33"	25' – 3"	469	4.6	4' – 8"	43	0.6
	36"	27' – 0"	556	5.7	5' – 1"	46	0.8
	42"	30' – 6"	675	7.1	5' – 10"	52	1.0
	48"	35' – 6"	837	9.2	6' – 7"	59	1.3
	54"	39' – 0"	1,015	11.0	7' – 6"	84	1.6
	60"	42' – 6"	1,171	12.9	8' – 3"	91	1.8
	66"	46' – 0"	1,298	14.9	8' – 9"	98	2.0
	72"	49' – 6"	1,561	17.1	9' – 4"	103	2.3
4:1	12"	17' – 0"	229	2.0	1' – 9"	15	0.2
	15"	19' – 3"	266	2.4	2' – 2"	17	0.2
	18"	21' – 6"	308	2.9	2' – 8"	19	0.3
	21"	23' – 9"	382	3.5	3' – 1"	31	0.3
	24"	26' – 0"	430	3.9	3' – 7"	34	0.4
	27"	28' – 3"	486	4.7	3' – 11"	37	0.5
	30"	30' – 6"	539	5.2	4' – 4"	40	0.6
	33"	32' – 9"	603	6.0	4' – 8"	42	0.6
	36"	35' – 0"	738	7.5	5' – 1"	47	0.8
	42"	39' – 6"	881	9.3	5' – 10"	52	1.0
	48"	46' – 0"	1,102	12.1	6' – 7"	61	1.3
	54"	50' – 6"	1,364	14.4	7' – 6"	84	1.6
	60"	55' – 0"	1,547	16.9	8' – 3"	91	1.8
	66"	59' – 6"	1,741	19.5	8' – 9"	98	2.0
	72"	64' – 0"	2,077	22.4	9' – 4"	102	2.3
6:1	12"	25' – 0"	336	3.0	1' – 9"	14	0.2
	15"	28' – 3"	384	3.6	2' – 2"	17	0.2
	18"	31' – 6"	452	4.2	2' – 8"	19	0.3
	21"	34' – 9"	581	5.1	3' – 1"	31	0.4
	24"	38' – 0"	644	5.8	3' – 7"	34	0.4
	27"	41' – 3"	737	6.9	3' – 11"	37	0.5
	30"	44' – 6"	807	7.7	4' – 4"	39	0.6
	33"	47' – 9"	912	8.9	4' – 8"	44	0.6
	36"	51' – 0"	1,108	11.0	5' – 1"	48	0.8
	42"	57' – 6"	1,318	13.7	5' – 10"	54	1.0
	48"	67' – 0"	1,682	17.9	6' – 7"	59	1.3
	54"	73' – 6"	2,072	21.3	7' – 6"	83	1.6
	60"	80' – 0"	2,351	24.9	8' – 3"	89	1.8
	66"	86' – 6"	2,643	28.9	8' – 9"	96	2.0
	72"	93' – 0"	3,121	33.1	9' – 4"	101	2.3



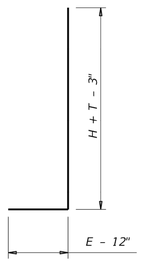
ELEVATION



PLAN OF NON-SKEWED PIPES



SECTION AT CENTER OF PIPE



BARS F2

1. Total quantities include one 3'–1" lap for bars over 60' in length.
2. Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
3. Indicated slope is perpendicular to centerline pipe or pipes.
4. For vehicle safety, construct curbs no more than 3" above finished grade. Reduce curb heights, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
5. Dimensions shown are usual and maximum.
6. Quantities shown are for one structure end only (one headwall).

TABLE OF CONSTANT DIMENSIONS

Dia of Pipe (D)	G	K (5)	H	T	E
12"	0' – 9"	1' – 0"	2' – 8"	0' – 9"	1' – 9"
15"	0' – 11"	1' – 0"	2' – 11"	0' – 9"	1' – 9"
18"	1' – 2"	1' – 0"	3' – 2"	0' – 9"	1' – 9"
21"	1' – 4"	1' – 0"	3' – 5"	0' – 9"	2' – 0"
24"	1' – 7"	1' – 0"	3' – 8"	0' – 9"	2' – 0"
27"	1' – 8"	1' – 0"	3' – 11"	0' – 9"	2' – 3"
30"	1' – 10"	1' – 0"	4' – 2"	0' – 9"	2' – 3"
33"	1' – 11"	1' – 0"	4' – 5"	0' – 9"	2' – 6"
36"	2' – 1"	1' – 0"	4' – 8"	1' – 0"	2' – 6"
42"	2' – 4"	1' – 0"	5' – 2"	1' – 0"	2' – 9"
48"	2' – 7"	1' – 3"	5' – 11"	1' – 0"	3' – 0"
54"	3' – 0"	1' – 3"	6' – 5"	1' – 0"	3' – 3"
60"	3' – 3"	1' – 3"	6' – 11"	1' – 0"	3' – 6"
66"	3' – 3"	1' – 3"	7' – 5"	1' – 0"	3' – 9"
72"	3' – 4"	1' – 3"	7' – 11"	1' – 0"	4' – 0"

TABLE OF REINFORCING STEEL (6)

Bar	Size	Spa	No.
A1	#5	~	2
A2	#5	1' – 6"	~
E	#5	~	2
F	#5	1' – 0"	~

4,000

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide Class C concrete (f'c = 3,600 psi).

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Do not mount bridge rails of any type directly to these culvert headwalls.
This standard may not be used for wall heights, H, exceeding the values shown.

Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out–to–out of bars.

1 NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI

Texas Department of Transportation | Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR NON-SKEWED PIPE CULVERTS

CH-PW-0

FILE:	chpw0ste-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS					
		DIST	COUNTY		SHEET NO.

DATE:
FILE:

CUDEENGINEERS.COM
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

TXDOT CONCRETE HEADWALLS NON-SKEWED DETAIL

DATE 06/27/2024
PROJECT NO. 03481.008
DRAWN BY CG/ED/AG/JR/RC/LW
CHECKED BY CA/XV/JC/AL

REVISIONS

	DATE	NOTE ADDED
1	06-26-2024	

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO. 22-1190

C38

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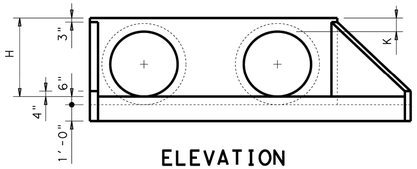
D:\03481\000\2-Drawings\CB TXDOT CONCRETE HEADWALLS NON-SKEWED DETAIL.dwg, 6/26/2024 5:53:26 PM, Andy

TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

SLOPE	DIA OF PIPE, D	Values for one Pipe W	X	Y	L	Reinf (Lbs)	Conc (CY) (1)	Values to be added for each addt'l Pipe X and W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	3'- 3 1/2"	2'- 8 3/4"	2'-10"	3'- 3 1/4"	81	0.5	1'- 9 3/4"	20	0.2
	15"	3'-10 1/2"	3'- 0 1/4"	3'- 4"	3'-10 1/4"	93	0.6	2'- 3"	25	0.3
	18"	4'- 5 1/2"	3'- 4"	3'-10"	4'- 5"	115	0.8	2'- 9 1/4"	32	0.4
	21"	5'- 0 3/4"	3'- 7 1/2"	4'- 4"	5'- 0"	128	0.9	3'- 2 1/4"	43	0.5
	24"	5'- 9 1/4"	4'- 0 3/4"	4'-10"	5'- 7"	148	1.1	3'- 8 1/2"	51	0.6
	27"	6'- 4 1/2"	4'- 4 1/2"	5'- 4"	6'- 2"	158	1.3	4'- 0 3/4"	57	0.7
	30"	6'-11 1/2"	4'- 8"	5'-10"	6'- 8 3/4"	181	1.5	4'- 5 3/4"	67	0.8
	33"	7'- 6 1/2"	4'-11 3/4"	6'- 4"	7'- 3 3/4"	197	1.7	4'-10"	73	0.9
	36"	8'- 1 3/4"	5'- 3 1/4"	6'-10"	7'-10 3/4"	223	1.9	5'- 3 1/4"	82	1.1
	42"	9'- 3 3/4"	5'-10 1/2"	7'-10"	9'- 0 1/2"	263	2.4	6'- 0 1/2"	100	1.4
	48"	10'- 9 1/2"	6'- 5 3/4"	9'- 4"	10'- 9 1/4"	315	3.2	6'- 9 3/4"	121	1.8
	54"	11'-11 3/4"	7'- 1"	10'- 4"	11'-11 1/4"	372	3.8	7'- 9 1/4"	154	2.2
	60"	13'- 1 3/4"	7'- 8 1/4"	11'- 4"	13'- 1"	419	4.5	8'- 6 1/2"	178	2.6
	66"	14'- 4"	8'- 3 1/2"	12'- 4"	14'- 3"	475	5.3	9'- 0 3/4"	198	3.0
	72"	15'- 6 1/4"	8'-10 3/4"	13'- 4"	15'- 4 3/4"	523	6.1	9'- 8"	220	3.3
3:1	12"	4'- 1 1/4"	2'- 8 3/4"	4'- 3"	4'-11"	104	0.7	1'- 9 3/4"	23	0.2
	15"	4'-10"	3'- 0 1/4"	5'- 0"	5'- 9 1/4"	123	0.9	2'- 3"	29	0.3
	18"	5'- 7"	3'- 4"	5'- 9"	6'- 7 3/4"	152	1.1	2'- 9 1/4"	37	0.5
	21"	6'- 3 3/4"	3'- 7 1/2"	6'- 6"	7'- 6"	171	1.3	3'- 2 1/4"	49	0.6
	24"	7'- 2"	4'- 0 3/4"	7'- 3"	8'- 4 1/2"	198	1.6	3'- 8 1/2"	59	0.7
	27"	7'-11"	4'- 4 1/2"	8'- 0"	9'- 2 3/4"	219	1.9	4'- 0 3/4"	68	0.9
	30"	8'- 7 3/4"	4'- 8"	8'- 9"	10'- 1 1/4"	254	2.2	4'- 5 3/4"	79	1.0
	33"	9'- 4 1/2"	4'-11 3/4"	9'- 6"	10'-11 3/4"	274	2.5	4'-10"	86	1.2
	36"	10'- 1 1/4"	5'- 3 1/4"	10'- 3"	11'-10"	305	2.9	5'- 3 1/4"	97	1.4
	42"	11'- 7"	5'-10 1/2"	11'- 9"	13'- 6 3/4"	371	3.7	6'- 0 1/2"	122	1.8
	48"	13'- 5 3/4"	6'- 5 3/4"	14'- 0"	16'- 2"	455	4.9	6'- 9 3/4"	152	2.4
	54"	14'-11 1/2"	7'- 1"	15'- 6"	17'-10 3/4"	532	5.9	7'- 9 1/4"	190	3.0
	60"	16'- 5"	7'- 8 1/4"	17'- 0"	19'- 7 1/2"	604	7.0	8'- 6 1/2"	224	3.5
	66"	17'-10 3/4"	8'- 3 1/2"	18'- 6"	21'- 4 1/4"	687	8.1	9'- 0 3/4"	248	4.0
	72"	19'- 4 1/4"	8'-10 3/4"	20'- 0"	23'- 1 1/4"	772	9.4	9'- 8"	281	4.6
4:1	12"	4'-11"	2'- 8 3/4"	5'- 8"	6'- 6 1/2"	132	0.9	1'- 9 3/4"	26	0.3
	15"	5'- 9 1/2"	3'- 0 1/4"	6'- 8"	7'- 8 1/2"	158	1.2	2'- 3"	33	0.4
	18"	6'- 8 1/4"	3'- 4"	7'- 8"	8'-10 1/4"	194	1.5	2'- 9 1/4"	43	0.6
	21"	7'- 6 3/4"	3'- 7 1/2"	8'- 8"	10'- 0"	226	1.8	3'- 2 1/4"	57	0.7
	24"	8'- 6 3/4"	4'- 0 3/4"	9'- 8"	11'- 2"	258	2.2	3'- 8 1/2"	68	0.9
	27"	9'- 5 1/4"	4'- 4 1/2"	10'- 8"	12'- 3 3/4"	286	2.6	4'- 0 3/4"	79	1.1
	30"	10'- 4"	4'- 8"	11'- 8"	13'- 5 3/4"	327	3.0	4'- 5 3/4"	91	1.3
	33"	11'- 2 1/2"	4'-11 3/4"	12'- 8"	14'- 7 1/2"	360	3.5	4'-10"	104	1.5
	36"	12'- 1"	5'- 3 1/4"	13'- 8"	15'- 9 1/4"	403	4.0	5'- 3 1/4"	115	1.7
	42"	13'-10"	5'-10 1/2"	15'- 8"	18'- 1"	487	5.1	6'- 0 1/2"	144	2.2
	48"	16'- 2 1/4"	6'- 5 3/4"	18'- 8"	21'- 6 3/4"	602	6.8	6'- 9 3/4"	183	3.0
	54"	17'-11 1/4"	7'- 1"	20'- 8"	23'-10 1/4"	717	8.2	7'- 9 1/4"	231	3.7
	60"	19'- 8 1/4"	7'- 8 1/4"	22'- 8"	26'- 2"	812	9.8	8'- 6 1/2"	270	4.4
	66"	21'- 5 1/2"	8'- 3 1/2"	24'- 8"	28'- 5 3/4"	933	11.4	9'- 0 3/4"	305	5.0
	72"	23'- 2 1/2"	8'-10 3/4"	26'- 8"	30'- 9 1/2"	1046	13.2	9'- 8"	342	5.7
6:1	12"	6'- 6 3/4"	2'- 8 3/4"	8'- 6"	9'- 9 3/4"	188	1.4	1'- 9 3/4"	30	0.4
	15"	7'- 8 3/4"	3'- 0 1/4"	10'- 0"	11'- 6 1/2"	226	1.9	2'- 3"	40	0.5
	18"	8'-10 3/4"	3'- 4"	11'- 6"	13'- 3 1/4"	277	2.4	2'- 9 1/4"	51	0.7
	21"	10'- 0 3/4"	3'- 7 1/2"	13'- 0"	15'- 0 1/4"	328	2.9	3'- 2 1/4"	69	1.0
	24"	11'- 4 1/4"	4'- 0 3/4"	14'- 6"	16'- 9"	371	3.5	3'- 8 1/2"	83	1.3
	27"	12'- 6 1/4"	4'- 4 1/2"	16'- 0"	18'- 5 3/4"	422	4.2	4'- 0 3/4"	98	1.5
	30"	13'- 8 1/4"	4'- 8"	17'- 6"	20'- 2 1/2"	482	4.9	4'- 5 3/4"	113	1.8
	33"	14'-10 1/4"	4'-11 3/4"	19'- 0"	21'-11 1/4"	543	5.7	4'-10"	130	2.0
	36"	16'- 0 1/4"	5'- 3 1/4"	20'- 6"	23'- 8"	598	6.5	5'- 3 1/4"	145	2.4
	42"	18'- 4 1/2"	5'-10 1/2"	23'- 6"	27'- 1 1/2"	732	8.4	6'- 0 1/2"	184	3.1
	48"	21'- 6 3/4"	6'- 5 3/4"	28'- 0"	32'- 4"	936	11.4	6'- 9 3/4"	240	4.1
	54"	23'-10 3/4"	7'- 1"	31'- 0"	35'- 9 1/2"	1112	13.8	7'- 9 1/4"	303	5.2
	60"	26'- 2 3/4"	7'- 8 1/4"	34'- 0"	39'- 3"	1266	16.4	8'- 6 1/2"	358	6.2



ELEVATION
Showing dimensions

1. Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.
2. For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
3. Provide a 1'-0" footing as shown where required to maintain 4" Min cover for pipes.
4. Quantities shown are for one structure end only (one headwall).
5. Min Length = $6" + 3" \times \left(\frac{12 \times H - 7}{12 \times L}\right)$

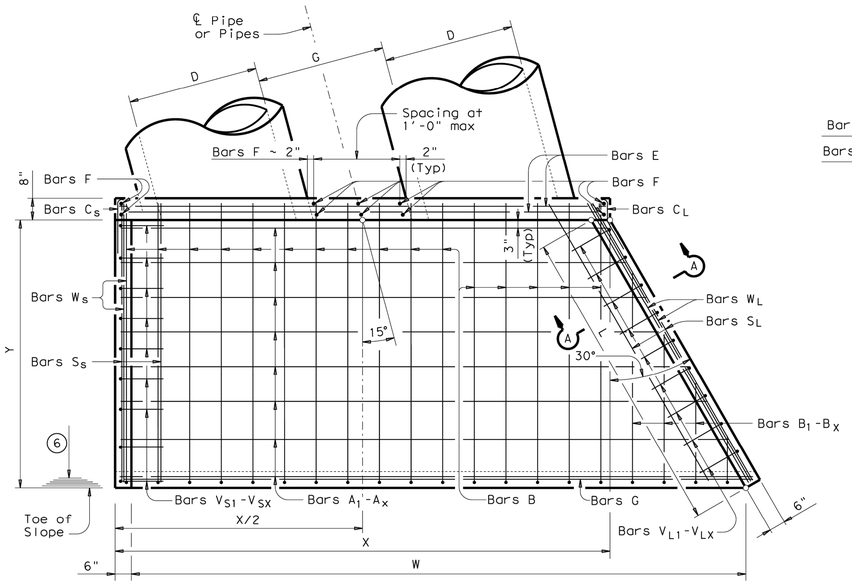
   Max Length = $12 \times H - 3" \times \left(\frac{12 \times H - 7}{12 \times L}\right) - 1"$
6. Lengths of wings based on SL:1 Slope along this line.

TABLE OF REINFORCING STEEL (4)

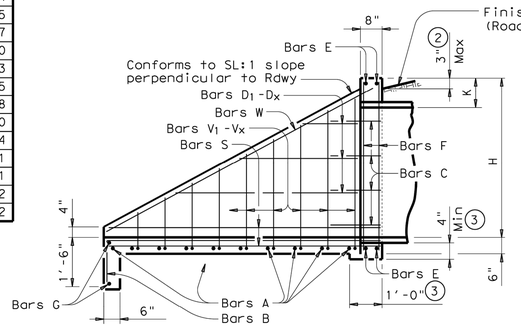
Bar	Size	Spa	No.
A	# 4	1'-0"	~
B	# 3	1'-6"	~
CL	# 4	1'-0"	~
CS	# 4	1'-0"	~
D	# 3	1'-0"	~
E	# 5	~	4
F	# 5	~	~
G	# 3	~	2
SL	# 4	~	3
SS	# 4	~	3
V	# 4	1'-0"	~
WL	# 5	~	2
WS	# 5	~	2

TABLE OF CONSTANT DIMENSIONS

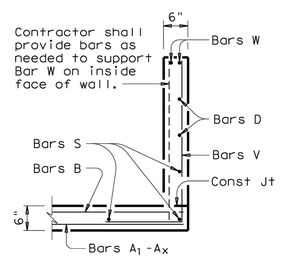
DIA OF PIPE, D	G	K	H
12"	9"	1'- 0"	2'- 0"
15"	11"	1'- 0"	2'- 3"
18"	1'- 2"	1'- 0"	2'- 6"
21"	1'- 4"	1'- 0"	2'- 9"
24"	1'- 7"	1'- 0"	3'- 0"
27"	1'- 8"	1'- 0"	3'- 3"
30"	1'-10"	1'- 0"	3'- 6"
33"	1'-11"	1'- 0"	3'- 9"
36"	2'- 1"	1'- 0"	4'- 0"
42"	2'- 4"	1'- 0"	4'- 6"
48"	2'- 7"	1'- 3"	5'- 3"
54"	3'- 0"	1'- 3"	5'- 9"
60"	3'- 3"	1'- 3"	6'- 3"
66"	3'- 3"	1'- 3"	6'- 9"
72"	3'- 4"	1'- 3"	7'- 3"



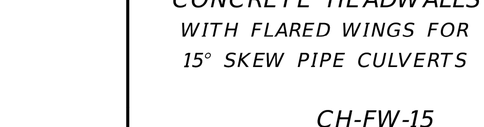
PLAN



TYPICAL WING ELEVATION

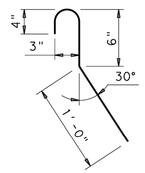


SECTION A-A

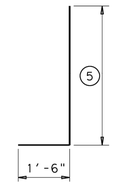


BARS B & B_1-B_X

BARS C_S
(2'-0" long)



BARS C_L
(2'-0" long)



BARS V_S & V_L

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.

4,000 reinforcing steel shall be Grade 60.

... concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

No bridge rails of any type may be mounted directly to these culvert headwalls.

1 NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI

Texas Department of Transportation | Bridge Division Standard

CONCRETE HEADWALLS WITH FLARED WINGS FOR 15° SKEW PIPE CULVERTS

CH-FW-15

FILE: chfw15se.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: GAF
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REVISIONS				
	DIST	COUNTY		SHEET NO.

DATE: FILE:

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CORLEY FARMS UNIT 4

TXDOT FLARED WING DETAIL

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	NOTE ADDED
A 06-26-2024	1. 2. 3. 4. 5. 6. 7. 8. 9.

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C39

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P:\03481\000\3 Drawings\CSR TXDOT FLARED WING DETAIL.dwg (JCA) 06/27/2024 12:52pm CSR.ctb

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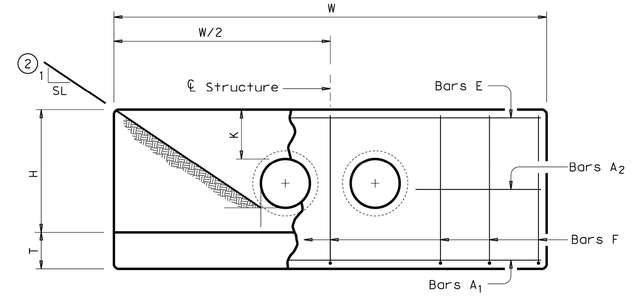
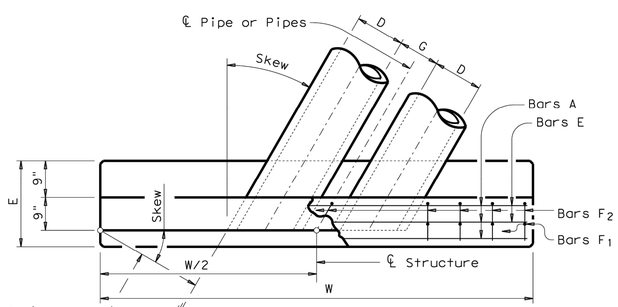
TABLE OF VARIABLE DIMENSIONS AND QUANTITIES FOR ONE HEADWALL (4)

SLOPE	DIA OF PIPE, D	15 Degrees						30 Degrees						45 Degrees					
		Values for one Pipe			Values to be added for each addt'l Pipe			Values for one Pipe			Values to be added for each addt'l Pipe			Values for one Pipe			Values to be added for each addt'l Pipe		
		W	Reinf (Lbs)	Conc (CY) (1)	W	Reinf (Lbs)	Conc (CY) (1)	W	Reinf (Lbs)	Conc (CY) (1)	W	Reinf (Lbs)	Conc (CY) (1)	W	Reinf (Lbs)	Conc (CY) (1)	W	Reinf (Lbs)	Conc (CY) (1)
2:1	12"	9'- 4"	124	1.1	1'- 9 3/4"	15	0.2	10'- 5"	130	1.2	2'- 0"	16	0.2	12'- 9"	159	1.5	2'- 5 3/4"	17	0.3
	15"	10'- 7"	136	1.3	2'- 3"	17	0.2	11'-10"	159	1.5	2'- 6"	18	0.2	14'- 6"	191	1.8	3'- 0 3/4"	20	0.3
	18"	11'-11"	165	1.5	2'- 9"	19	0.3	13'- 3"	174	1.7	3'- 1"	29	0.3	16'- 3"	207	2.1	3'- 9 1/4"	33	0.4
	21"	13'- 2"	203	1.9	3'- 2 1/4"	31	0.4	14'- 9"	233	2.1	3'- 6 3/4"	33	0.4	18'- 0"	276	2.6	4'- 4 1/4"	36	0.5
	24"	14'- 6"	240	2.1	3'- 8 1/4"	34	0.4	16'- 2"	251	2.4	4'- 1 3/4"	36	0.5	19'-10"	318	2.9	5'- 0 3/4"	39	0.6
	27"	15'- 9"	258	2.5	4'- 0 3/4"	38	0.5	17'- 7"	292	2.8	4'- 6 1/4"	39	0.6	21'- 7"	342	3.4	5'- 6 1/4"	44	0.7
	30"	17'- 1"	297	2.8	4'- 5 3/4"	40	0.6	19'- 1"	311	3.1	5'- 0"	42	0.6	23'- 4"	388	3.8	6'- 1 3/4"	47	0.8
	33"	18'- 5"	320	3.3	4'- 9 3/4"	43	0.6	20'- 6"	358	3.6	5'- 4 3/4"	46	0.7	25'- 1"	439	4.4	6'- 7 1/4"	51	0.9
	36"	19'- 8"	401	4.0	5'- 3"	47	0.9	21'-11"	422	4.5	5'-10 3/4"	50	0.9	26'-10"	517	5.5	7'- 2 1/4"	55	1.2
	42"	22'- 3"	476	5.0	6'- 0 3/4"	53	1.1	24'-10"	528	5.6	6'- 8 3/4"	56	1.2	30'- 5"	634	6.9	8'- 3"	76	1.4
	48"	25'-11"	577	6.6	6'- 9 3/4"	60	1.3	28'-10"	637	7.3	7'- 7 1/4"	79	1.5	35'- 4"	791	9.0	9'- 3 3/4"	88	1.8
	54"	28'- 6"	711	7.8	7'- 9"	83	1.6	31'- 9"	781	8.7	8'- 8"	87	1.8	38'-11"	958	10.7	10'- 7 1/4"	97	2.2
	60"	31'- 1"	805	9.2	8'- 6 1/4"	91	1.9	34'- 8"	881	10.2	9'- 6 1/4"	97	2.1	42'- 5"	1113	12.5	11'- 8"	124	2.6
	66"	33'- 8"	907	10.6	9'- 0 3/4"	98	2.1	37'- 6"	1028	11.8	10'- 1 1/4"	102	2.4	46'- 0"	1235	14.5	12'- 4 1/4"	132	2.9
	72"	36'- 3"	1071	12.1	9'- 8"	105	2.4	40'- 5"	1207	13.5	10'- 9 1/4"	110	2.6	49'- 6"	1446	16.6	13'- 2 1/4"	141	3.2
3:1	12"	13'- 6"	178	1.6	1'- 9 3/4"	15	0.2	15'- 0"	189	1.8	2'- 0"	15	0.2	18'- 5"	237	2.2	2'- 5 3/4"	17	0.2
	15"	15'- 3"	212	1.9	2'- 3"	17	0.2	17'- 0"	223	2.1	2'- 6"	17	0.3	20'-10"	276	2.6	3'- 0 3/4"	20	0.3
	18"	17'- 1"	231	2.3	2'- 9"	19	0.3	19'- 1"	259	2.5	3'- 1"	29	0.3	23'- 4"	318	3.1	3'- 9 1/4"	32	0.4
	21"	18'-11"	306	2.7	3'- 2 1/4"	31	0.4	21'- 1"	339	3.0	3'- 6 3/4"	33	0.4	25'-10"	413	3.7	4'- 4 1/4"	36	0.5
	24"	20'- 8"	345	3.1	3'- 8 3/4"	35	0.4	23'- 1"	384	3.5	4'- 1 3/4"	36	0.5	28'- 3"	462	4.2	5'- 0 3/4"	40	0.6
	27"	22'- 6"	376	3.7	4'- 0 3/4"	38	0.5	25'- 1"	438	4.1	4'- 6 1/4"	39	0.6	30'- 9"	522	5.0	5'- 6 1/4"	44	0.7
	30"	24'- 4"	422	4.1	4'- 5 3/4"	40	0.6	27'- 2"	466	4.6	5'- 0"	42	0.6	33'- 3"	578	5.6	6'- 1 3/4"	47	0.8
	33"	26'- 2"	476	4.8	4'-10"	43	0.6	29'- 2"	522	5.3	5'- 4 3/4"	46	0.7	35'- 9"	644	6.5	6'- 7 1/4"	51	0.9
	36"	27'-11"	590	5.9	5'- 3 1/4"	47	0.8	31'- 2"	645	6.6	5'-10 3/4"	50	0.9	38'- 2"	787	8.0	7'- 2 1/4"	56	1.2
	42"	31'- 7"	684	7.3	6'- 0 1/4"	53	1.1	35'- 3"	776	8.2	6'- 8 3/4"	56	1.2	43'- 2"	933	10.0	8'- 3"	79	1.4
	48"	36'- 9"	880	9.6	6'- 9 3/4"	61	1.3	41'- 0"	953	10.7	7'- 7 1/4"	81	1.5	50'- 2"	1166	13.1	9'- 3 3/4"	88	1.8
	54"	40'- 5"	1065	11.4	7'- 9"	85	1.6	45'- 0"	1185	12.7	8'- 8"	89	1.8	55'- 2"	1435	15.5	10'- 7 1/4"	97	2.2
	60"	44'- 0"	1224	13.3	8'- 6 1/4"	93	1.9	49'- 1"	1356	14.8	9'- 6 1/4"	96	2.1	60'- 1"	1627	18.2	11'- 8"	124	2.6
	72"	51'- 3"	1624	17.7	9'- 8"	105	2.3	57'- 2"	1787	19.7	10'- 9 1/4"	109	2.6	70'- 0"	2210	24.1	13'- 2 1/4"	139	3.2
4:1	12"	17'- 7"	232	2.1	1'- 9 3/4"	15	0.2	19'- 8"	259	2.4	2'- 0"	16	0.2	24'- 0"	314	2.9	2'- 5 3/4"	18	0.2
	15"	19'-11"	272	2.5	2'- 3"	17	0.2	22'- 3"	301	2.8	2'- 6"	18	0.3	27'- 3"	361	3.5	3'- 0 3/4"	21	0.3
	18"	22'- 3"	313	3.0	2'- 9"	19	0.3	24'-10"	344	3.3	3'- 1"	29	0.3	30'- 5"	427	4.0	3'- 9 1/4"	32	0.4
	21"	24'- 7"	407	3.6	3'- 2 1/4"	31	0.4	27'- 5"	446	4.0	3'- 6 3/4"	33	0.4	33'- 7"	549	4.9	4'- 4 1/4"	36	0.5
	24"	26'-11"	455	4.1	3'- 8 3/4"	35	0.4	30'- 0"	499	4.5	4'- 1 3/4"	36	0.5	36'- 9"	609	5.6	5'- 0 3/4"	40	0.6
	27"	29'- 3"	514	4.8	4'- 0 3/4"	38	0.5	32'- 7"	562	5.4	4'- 6 1/4"	40	0.6	39'-11"	703	6.6	5'- 6 1/4"	43	0.7
	30"	31'- 7"	568	5.4	4'- 5 3/4"	40	0.6	35'- 3"	620	6.0	5'- 0"	42	0.6	43'- 2"	768	7.4	6'- 1 3/4"	49	0.8
	33"	33'-11"	634	6.2	4'-10"	43	0.7	37'-10"	710	7.0	5'- 4 3/4"	46	0.7	46'- 4"	848	8.5	6'- 7 1/4"	52	0.9
	36"	36'- 3"	776	7.7	5'- 3"	48	0.9	40'- 5"	868	8.6	5'-10 3/4"	49	0.9	49'- 6"	1058	10.6	7'- 2 1/4"	56	1.1
	42"	40'-11"	921	9.6	6'- 0 1/4"	53	1.0	45'- 7"	1022	10.7	6'- 8 3/4"	57	1.2	55'-10"	1262	13.1	8'- 3"	78	1.4
	48"	47'- 7"	1152	12.6	6'-10"	61	1.3	53'- 1"	1268	14.0	7'- 7 1/4"	80	1.5	65'- 1"	1579	17.2	9'- 3 3/4"	86	1.8
	54"	52'- 3"	1416	14.9	7'- 9 1/4"	86	1.6	58'- 4"	1589	16.6	8'- 8"	89	1.8	71'- 5"	1916	20.4	10'- 7 1/4"	95	2.2
	60"	56'-11"	1606	17.5	8'- 6 3/4"	92	1.9	63'- 6"	1798	19.5	9'- 6 1/4"	95	2.1	77'- 9"	2184	23.9	11'- 8"	122	2.6
	66"	61'- 7"	1811	20.2	9'- 0 3/4"	97	2.1	68'- 8"	2011	22.5	10'- 1 1/4"	101	2.4	84'- 2"	2464	27.6	12'- 4 1/4"	131	2.9
	72"	66'- 3"	2142	23.2	9'- 8"	104	2.4	73'-11"	2371	25.9	10'- 9 1/4"	108	2.6	90'- 6"	2929	31.7	13'- 2 1/4"	138	3.2
6:1	12"	25'-11"	342	3.1	1'- 9 3/4"	15	0.2	28'-10"	374	3.5	2'- 0"	16	0.2	35'- 4"	456	4.3	2'- 5 3/4"	17	0.2
	15"	29'- 3"	390	3.7	2'- 3"	17	0.2	32'- 7"	442	4.2	2'- 6"	18	0.2	39'-11"	549	5.1	3'- 0 3/4"	20	0.3
	18"	32'- 7"	459	4.4	2'- 9"	20	0.3	36'- 4"	515	4.9	3'- 1"	29	0.3	44'- 7"	629	6.0	3'- 9 1/4"	33	0.4
	21"	36'- 0"	608	5.3	3'- 2 1/4"	31	0.4	40'- 2"	660	5.9	3'- 6 3/4"	33	0.4	49'- 2"	823	7.2	4'- 4 1/4"	38	0.5
	24"	39'- 4"	672	6.0	3'- 8 3/4"	35	0.4	43'-11"	748	6.7	4'- 1 3/4"	36	0.5	53'- 9"	920	8.2	5'- 0 3/4"	42	0.6
	27"	42'- 8"	770	7.1	4'- 0 3/4"	38	0.5	47'- 8"	852	8.0	4'- 6 1/4"	41	0.5	58'- 4"	1039	9.7	5'- 6 1/4"	45	0.7
	30"	46'- 1"	839	8.0	4'- 5 3/4"	40	0.6	51'- 5"	949	8.9	5'- 0"	44	0.6	62'-11"	1154	10.9	6'- 1 3/4"	48	0.8
	33"	49'- 5"	947	9.2	4'-10"	45	0.7	55'- 2"	1040	10.3	5'- 4 3/4"	48	0.7	67'- 6"	1284	12.6	6'- 7 1/4"	50	0.9
	36"	52'-10"	1151	11.4	5'- 3"	49	0.8	58'-11"	1287	12.7	5'-10 3/4"	51	1.0	72'- 1"	1575	15.6	7'- 2 1/4"	55	1.1
	42"	59'- 6"	1365	14.2	6'- 0 1/4"	55	1.0	66'- 5"	1522	15.8	6'- 8 3/4"	57	1.2	81'- 4"	1867	19.4	8'- 3"	76	1.4
	48"	69'- 4"	1729	18.5	6'-10"	59	1.3	77'- 4"	1934	20.7	7'- 7 1/4"	79	1.5	94'- 9"	2360	25.3	9'- 3 3/4"	86	1.8
	54"	76'- 1"	2130	22.0	7'- 9 1/4"	83	1.6	84'-10"	2370	24.6	8'- 8"	87	1.8	103'-11"	2904	30.1	10'- 7 1/4"	95	2.2
	60"	82'-10"	2414	25.8	8'- 6 3/4"	90	1.9	92'- 5"	2673	28.8	9'- 6 1/4"	94	2.1	113'-2"	3286	35.3	11'- 8"	122	2.6
	66"	89'- 7"	2712	29.9	9'- 0 3/4"	96	2.1	99'-11"	3030	33.3	10'- 1 1/4"	101	2.4	122'-4"	3689	40.8	12'- 4 1/4"	130	2.9
	72"	96'- 3"	3210	34.2	9'- 8"	102	2.4	107'-5"	3572	38.2	10'- 9 1/4"	108	2.6	131'-6"	4364	46.8	13'- 2 1/4"	139	3.2



ELEVATION

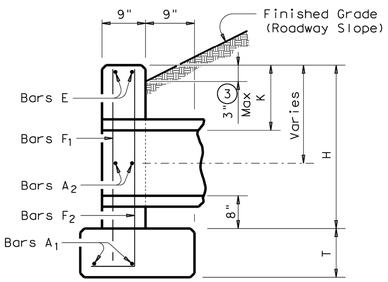


PLAN OF SKEWED PIPES

Showing 30° Skew

Lengths of wings based on SL:1 Slope along this line.

2 Toe of Slope



℄ SECTION

(1) Quantities shown are for concrete pipe and will increase slightly for metal pipe installations.

(2) Indicated slope is perpendicular to centerline Pipe or Pipes.

(3) For vehicle safety, curbs shall project no more than 3" above finished grade. Curb heights shall be reduced, if necessary, to meet these requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

(4) Quantities shown are for one structure end only (one headwall).

1 NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI

TABLE OF CONSTANT DIMENSIONS

DIA OF PIPE, D	G	K	H	T	E
12"	9"	1'- 0"	2'- 8"	9"	1'- 9"
15"	11"	1'- 0"	2'-11"	9"	1'- 9"
18"	1'- 2"	1'- 0"	3'- 2"	9"	1'- 9"
21"	1'- 4"	1'- 0"	3'- 5"	9"	2'- 0"
24"	1'- 7"	1'- 0"	3'- 8"	9"	2'- 0"
27"	1'- 8"	1'- 0"	3'-11"	9"	2'- 3"
30"	1'-10"	1'- 0"	4'- 2"	9"	2'- 3"
33"	1'-11"	1'- 0"	4'- 5"	9"	2'- 6"
36"	2'- 1"	1'- 0"	4'- 8"	1'- 0"	2'- 6"
42"	2'- 4"	1'- 0"	5'- 2"	1'- 0"	2'- 9"
48"	2'- 7"	1'- 3"	5'-11"	1'- 0"	3'- 0"
54"	3'- 0"	1'- 3"	6'- 5"	1'- 0"	3'- 3"
60"	3'- 3"	1'- 3"	6'-11"	1'- 0"	3'- 6"
66"	3'- 3"	1'- 3"	7'- 5"	1'- 0"	3'- 9"
72"	3'- 4"	1'- 3"	7'-11"	1'- 0"	4'- 0"

TABLE OF REINFORCING STEEL (4)

Bar	Size	Spa	No.
A1	# 5	~	2
A2	# 5	1'-6"	~
E	# 5	~	2
F	# 5	1'-0"	~

BARS F_2

GENERAL NOTES:

Designed according to AASHTO LRFD Specifications.

Reinforcing steel shall be placed with the center of the outside layer of bars 2" from the surface of the concrete.

4,000 reinforcing steel shall be Grade 60.

All concrete shall be Class "C" and shall have a minimum compressive strength of 3600 psi.

No bridge rails of any type may be mounted directly to these culvert headwalls.

Texas Department of Transportation — Bridge Division Standard

CONCRETE HEADWALLS WITH PARALLEL WINGS FOR SKEWED PIPE CULVERTS

CH-PW-S

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

DATE: 06/27/2024
FILE:

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CORLEY FARMS UNIT 4

TXDOT PARALLEL WING DETAIL

DATE: 06/27/2024
PROJECT NO.: 03481.008
DRAWN BY: CG/ED/AG/JR/RC/LW
CHECKED BY: CA/XV/JC/AL

REVISIONS

	DATE	NOTE ADDED
1.	06-26-2024	
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS — ANDREW R. LOWRY — 123410 — LICENSED PROFESSIONAL ENGINEER — 06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.: 22-1190

C40

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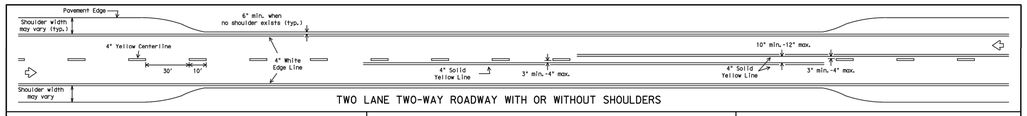
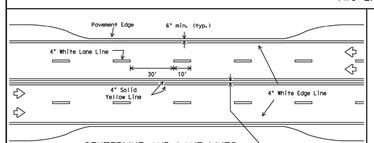
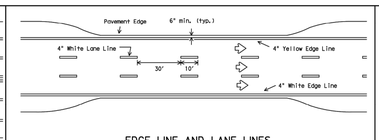


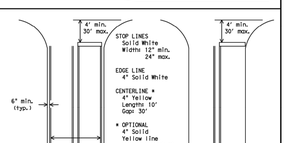
TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



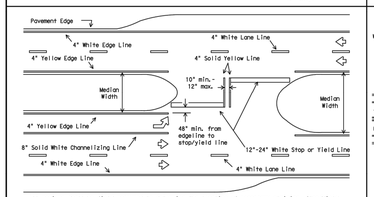
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



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

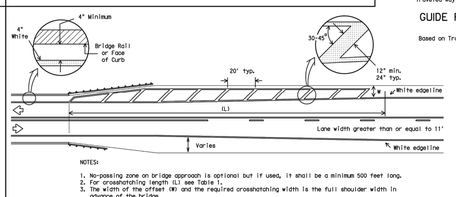


GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths for Undivided Highways



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:
1. No-passing zone on bridge approach is optional but if used, it shall be a minimum 500 feet long.
2. For crosshatching length (L) see Table 1.
3. The width of the offset (W) and the required crosshatching width is the full shoulder width in advance of the bridge.
4. The crosshatching is not required if delineators or barrier reflectors are used along the structure.
5. 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

*Either Permanently Posted or Temporary Construction Speed Limit. Crosshatching length shall 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 cross-hatching should be:
L = 8 x 70 = 560 ft.

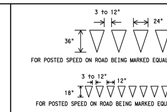
A 4 foot shoulder in advance of a bridge reduces to 2 feet on a 40 MPH roadway. The length of the cross-hatching should be:
L = 4160ft.² / 60 = 106.67 ft. rounded to 110 ft.

GENERAL NOTES

1. 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.
2. 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				
5-00	DIST	COUNTY		SHEET NO.
8-00				
2-08				

22A

DATE:
FILE:

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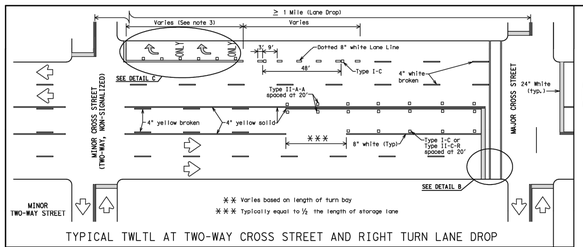
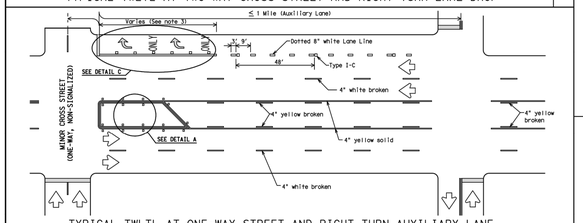
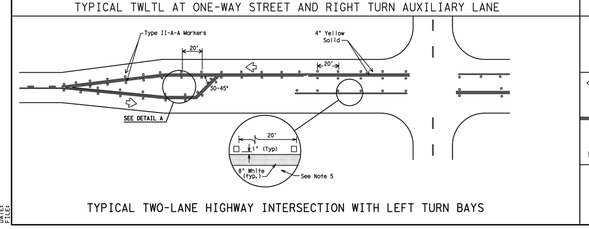


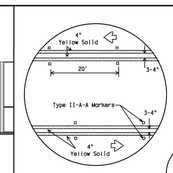
TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



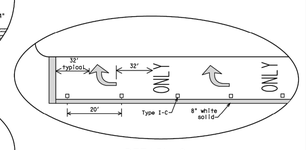
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



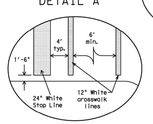
TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A



DETAIL C

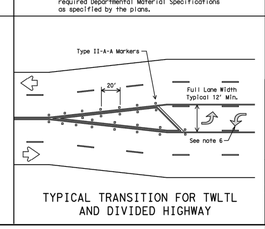


Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

DETAIL B

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

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



TYPICAL TRANSITION FOR TWLTL
AND DIVIDED HIGHWAY

GENERAL NOTES

1. Refer elsewhere in plans for additional RPM placement and details.
2. 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 lane use markings are shown in the Standard Highway Sign Designs for Texas.
3. When lane used word and arrow markings are used, two sets of arrows should be used. The length of the 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.
4. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used.
5. 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.
6. 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, depending the marking after each intersection. A two-way left-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				
5-03	DIST	COUNTY		SHEET NO.
8-03				
2-10				

23C

DATE:
FILE:

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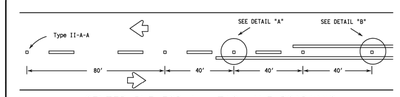
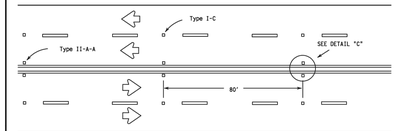
REFLECTIVE RAISED PAVEMENT MARKERS
FOR VEHICLE POSITIONING GUIDANCE

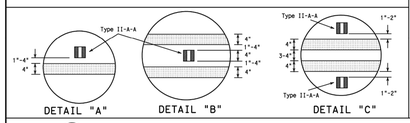


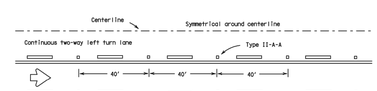
CENTERLINE FOR ALL TWO LANE ROADWAYS



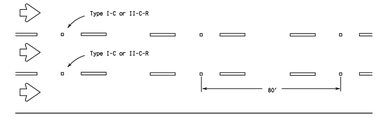
CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS

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



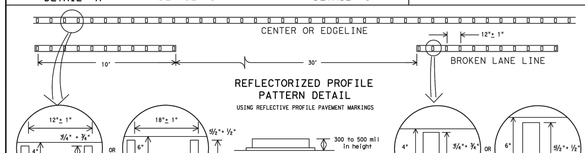


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE



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.



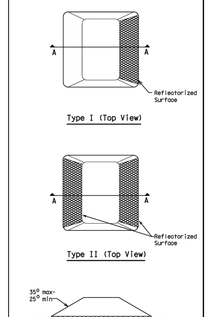
NOTE:
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

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.



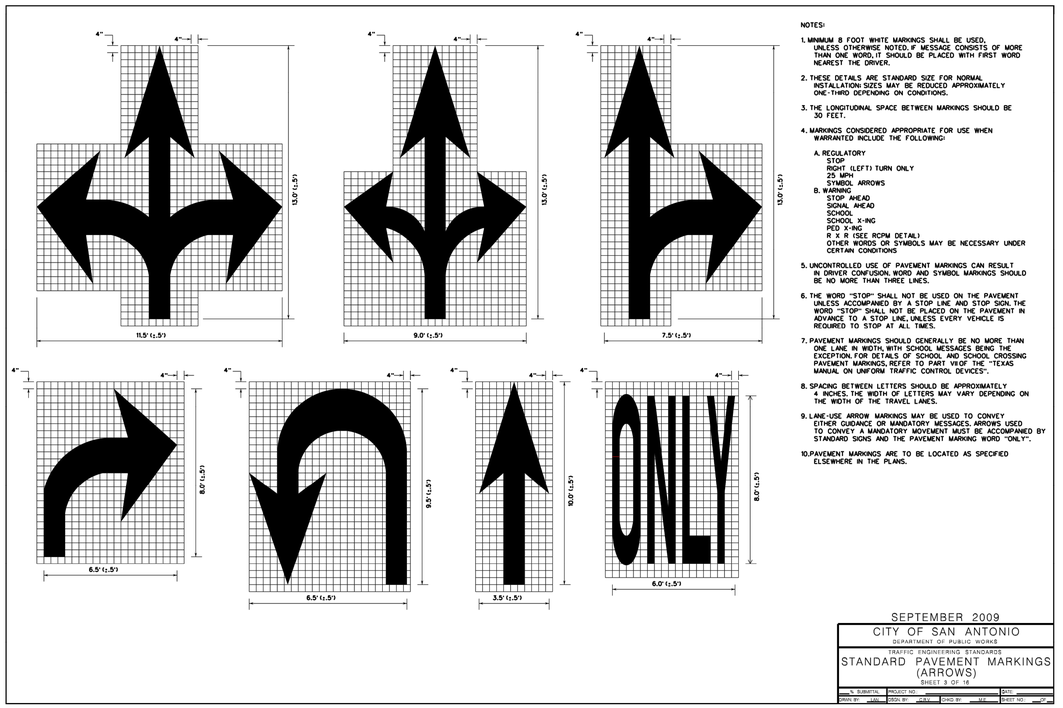
RAISED PAVEMENT MARKERS

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				
5-00 2-12				
8-00	DIST	COUNTY		SHEET NO.
2-08				

22B



NOTES:
1. MINIMUM 8 FOOT WHITE MARKINGS SHALL BE USED, UNLESS OTHERWISE NOTED. IF MESSAGE CONSISTS OF MORE THAN ONE WORD, IT SHOULD BE PLACED WITH FIRST WORD NEAREST THE DRIVER.
2. THESE DETAILS ARE STANDARD SIZE FOR NORMAL INSTALLATION. SIZES MAY BE REDUCED APPROXIMATELY ONE-THIRD DEPENDING ON CONDITIONS.
3. THE LONGITUDINAL SPACE BETWEEN MARKINGS SHOULD BE 30 FEET.
4. MARKINGS CONSIDERED APPROPRIATE FOR USE WHEN WARRANTED INCLUDE THE FOLLOWING:
   A. REGULATORY
      STOP
      RIGHT (LEFT) TURN ONLY
      25 MPH
      SYMBOL ARROWS
   B. WARNING
      STOP AHEAD
      SIGNAL AHEAD
      SCHOOL
      SCHOOL X-ING
      PED X-ING
      R X R (SEE RCPM DETAIL)
      OTHER WORDS OR SYMBOLS MAY BE NECESSARY UNDER CERTAIN CONDITIONS
5. UNCONTROLLED USE OF PAVEMENT MARKINGS CAN RESULT IN DRIVER CONFUSION. WORD AND SYMBOL MARKINGS SHOULD BE NO MORE THAN THREE LINES.
6. THE WORD "STOP" SHALL NOT BE USED ON THE PAVEMENT UNLESS ACCOMPANIED BY A STOP LINE AND STOP SIGN. THE WORD "STOP" SHALL NOT BE PLACED ON THE PAVEMENT IN ADVANCE TO A STOP LINE, UNLESS EVERY VEHICLE IS REQUIRED TO STOP AT ALL TIMES.
7. PAVEMENT MARKINGS SHOULD GENERALLY BE NO MORE THAN ONE LANE IN WIDTH, WITH SCHOOL MESSAGES BEING THE EXCEPTION. FOR DETAILS OF SCHOOL AND SCHOOL CROSSING PAVEMENT MARKINGS, REFER TO PART VI OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
8. SPACING BETWEEN LETTERS SHOULD BE APPROXIMATELY 4 INCHES. THE WIDTH OF LETTERS MAY VARY DEPENDING ON THE WIDTH OF THE TRAVEL LANES.
9. LANE-USE ARROW MARKINGS MAY BE USED TO CONVEY EITHER GUIDANCE OR MANDATORY MESSAGES. ARROWS USED TO CONVEY A MANDATORY MOVEMENT MUST BE ACCOMPANIED BY STANDARD SIGNS AND THE PAVEMENT MARKING WORD "ONLY".
10. PAVEMENT MARKINGS ARE TO BE LOCATED AS SPECIFIED ELSEWHERE IN THE PLANS.

SEPTEMBER 2009
CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS
TRAFFIC ENGINEERING STANDARDS
STANDARD PAVEMENT MARKINGS
(ARROWS)
SHEET 3 OF 16

℄ SUBMITTAL	PROJECT NO.	DATE
DRAWN BY: LMN	CHKD BY: MLV	CHKD BY: MJ
DRAWN BY: LMN	CHKD BY: MLV	CHKD BY: MJ
		SHEET NO. 3 OF 16

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CUDEENGINEERS.COM
CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS
UNIT 4

TxDOT PAVEMENT MARKING DETAILS

DATE
09/13/2022

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS
DATE
1 2 3 4 5 6 7 8 9

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C41

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1 NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI

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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

TXDOT PRECAST 3' 4'&5' CULVERT BOXES & COB CONC. RIP-RAP DETAILS

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	NOTE ADDED
A 06-26-2024	1 2 3 4 5 6 7 8 9

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C42

CUDEENGINEERS.COM

BOX DATA

SECTION DIMENSIONS					Fill Height	H (Min)	REINFORCING (sq. in. / ft.) ②							① Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
4	2	7.5	6	5	< 2	-	0.18	0.27	0.15	0.12	0.18	0.18	0.14	4.5
4	2	5	5	5	2 < 3	38	0.18	0.19	0.13	0.12	-	-	-	3.6
4	2	5	5	5	3 - 5	38	0.13	0.13	0.13	0.12	-	-	-	3.6
4	2	5	5	5	10	38	0.12	0.12	0.12	0.12	-	-	-	3.6
4	2	5	5	5	15	38	0.14	0.16	0.16	0.12	-	-	-	3.6
4	2	5	5	5	20	38	0.18	0.20	0.21	0.12	-	-	-	3.6
4	2	5	5	5	25	38	0.23	0.25	0.25	0.12	-	-	-	3.6
4	2	5	5	5	30	38	0.28	0.30	0.30	0.12	-	-	-	3.6
4	3	7.5	6	5	< 2	-	0.18	0.31	0.18	0.12	0.18	0.18	0.14	5.0
4	3	5	5	5	2 < 3	38	0.15	0.23	0.20	0.12	-	-	-	4.1
4	3	5	5	5	3 - 5	38	0.12	0.16	0.16	0.12	-	-	-	4.1
4	3	5	5	5	10	38	0.12	0.14	0.14	0.12	-	-	-	4.1
4	3	5	5	5	15	38	0.12	0.18	0.18	0.12	-	-	-	4.1
4	3	5	5	5	20	38	0.14	0.23	0.24	0.12	-	-	-	4.1
4	3	5	5	5	25	38	0.17	0.29	0.29	0.12	-	-	-	4.1
4	3	5	5	5	30	38	0.21	0.35	0.35	0.12	-	-	-	4.1
4	4	7.5	6	5	< 2	-	0.18	0.33	0.20	0.12	0.18	0.18	0.14	5.5
4	4	5	5	5	2 < 3	38	0.12	0.26	0.23	0.12	-	-	-	4.6
4	4	5	5	5	3 - 5	38	0.12	0.18	0.18	0.12	-	-	-	4.6
4	4	5	5	5	10	38	0.12	0.15	0.15	0.12	-	-	-	4.6
4	4	5	5	5	15	38	0.12	0.19	0.20	0.12	-	-	-	4.6
4	4	5	5	5	20	38	0.12	0.25	0.25	0.12	-	-	-	4.6
4	4	5	5	5	25	38	0.14	0.31	0.31	0.12	-	-	-	4.6
4	4	5	5	5	30	38	0.17	0.37	0.37	0.12	-	-	-	4.6

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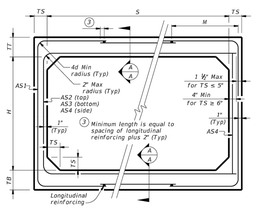
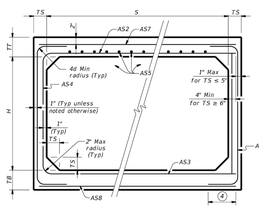
DATE:
FILE:

① For box length = 8'-0"

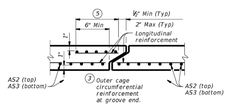
② AS1 thru AS4, AS7 and AS8 are minimum required areas of reinforcement per linear foot of box length. AS5 is minimum required area of reinforcement per linear foot of box width.



FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT



SECTION A-A
(Showing top and bottom slab joint reinforcement.)

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)

MATERIAL NOTES:
Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
Provide Class H concrete (f'c = 5,000 psi).

GENERAL NOTES:
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for 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. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

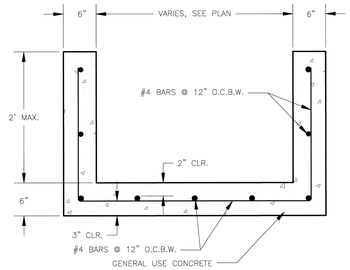
HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS
PRECAST
4'-0" SPAN

SCP-4

FILE:	scp04ts-20.dgn	dw: TxDOT	ck: TxDOT	dw: TxDOT	ck: TxDOT
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

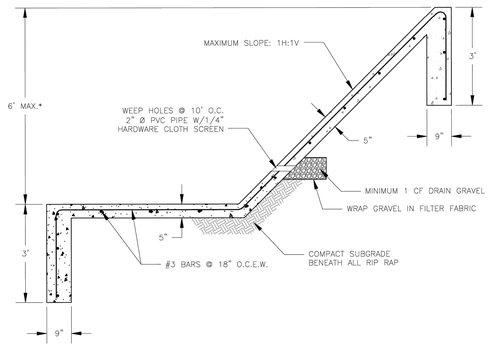


**IF VERTICAL WALL DEPTH IS GREATER THAN 2 FEET, CONTRACTOR TO INSTALL PIPE RAILING.

CITY OF BOERNE

CONCRETE FLUME

SCALE:	DRAWING No.	DATE:
N.T.S.	02423-1.0	JULY 2015



*MAXIMUM HEIGHT MAY BE EXCEEDED IF DESIGN MODIFIED BASED UPON GEOTECHNICAL SLOPE STABILITY ANALYSIS AND APPROPRIATE STRUCTURAL DESIGN.

CITY OF BOERNE

CONCRETE RIP RAP
TYPICAL SECTION

SCALE:	DRAWING No.	DATE:
N.T.S.	02423-1.1	JULY 2015

BOX DATA

SECTION DIMENSIONS					Fill Height	H (Min)	REINFORCING (sq. in. / ft.) ②							① Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
5	2	8	7	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0
5	2	6	6	6	2 < 3	44	0.22	0.20	0.16	0.14	-	-	-	5.1
5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	10	36	0.15	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	15	36	0.20	0.18	0.18	0.14	-	-	-	5.1
5	2	6	6	6	20	36	0.26	0.23	0.24	0.14	-	-	-	5.1
5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	-	-	5.1
5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	-	-	5.1
5	3	8	7	6	< 2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6
5	3	6	6	6	2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7
5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	5.7
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	5.7
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	5.7
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	5.7
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	5.7
5	4	8	7	6	< 2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2
5	4	6	6	6	2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3
5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	-	-	6.3
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	6.3
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	6.3
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	6.3
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	6.3
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	6.3
5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8
5	5	6	6	6	2 < 3	45	0.14	0.29	0.24	0.14	-	-	-	6.9
5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	6.9
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	6.9
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	6.9
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	6.9

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DATE:
FILE:

① For box length = 8'-0"

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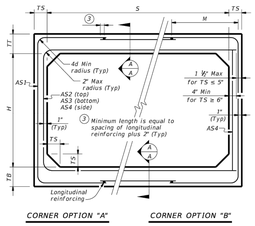
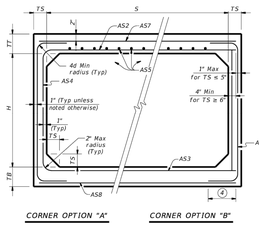
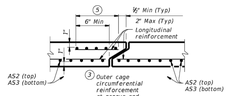


FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A
(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:
Provide 0.03 sq. in./ft. minimum longitudinal reinforcement at each face in slabs and walls. This minimum requirement may be met by the transverse wires when wire mesh reinforcement is used.
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HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS
PRECAST
5'-0" SPAN

SCP-5

FILE:	scp05ts-20.dgn	dw: TxDOT	ck: TxDOT	dw: TxDOT	ck: TxDOT
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REVISIONS		DIST	COUNTY		SHEET NO.

BOX DATA

SECTION DIMENSIONS					Fill Height	H (Min)	REINFORCING (sq. in. / ft.) ②							① Lift Weight
S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	(ft.)	(in.)	AS1	AS2	AS3	AS4	AS5	AS7	AS8	(tons)
3	2	7	6	4	< 2	-	0.17	0.25	0.16	0.10	0.17	0.17	0.14	3.3
3	2	4	4	4	2 < 3	31	0.13	0.19	0.18	0.10	-	-	-	2.4
3	2	4	4	4	3 - 5	31	0.10	0.11	0.12	0.10	-	-	-	2.4
3	2	4	4	4	10	31	0.10	0.10	0.10	0.10	-	-	-	2.4
3	2	4	4	4	15	31	0.10	0.13	0.13	0.10	-	-	-	2.4
3	2	4	4	4	20	31	0.11	0.17	0.17	0.10	-	-	-	2.4
3	2	4	4	4	25	31	0.14	0.21	0.21	0.10	-	-	-	2.4
3	2	4	4	4	30	31	0.17	0.25	0.25	0.10	-	-	-	2.4
3	2	4	4	4	35	31	0.20	0.29	0.30	0.10	-	-	-	2.4
3	3	7	6	4	< 2	-	0.17	0.27	0.17	0.10	0.17	0.17	0.14	3.7
3	3	4	4	4	2 < 3	31	0.10	0.22	0.21	0.10	-	-	-	2.8
3	3	4	4	4	3 - 5	31	0.10	0.14	0.14	0.10	-	-	-	2.8
3	3	4	4	4	10	31	0.10	0.11	0.11	0.10	-	-	-	2.8
3	3	4	4	4	15	31	0.10	0.14	0.15	0.10	-	-	-	2.8
3	3	4	4	4	20	31	0.10	0.18	0.19	0.10	-	-	-	2.8
3	3	4	4	4	25	31	0.10	0.23	0.23	0.10	-	-	-	2.8
3	3	4	4	4	30	31	0.12	0.27	0.28	0.10	-	-	-	2.8
3	3	4	4	4	35	31	0.14	0.32	0.32	0.10	-	-	-	2.8

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FILE:

① For box length = 8'-0"

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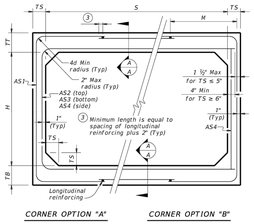
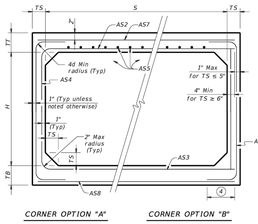
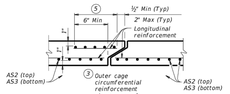


FILL HEIGHT 2 FT AND GREATER



FILL HEIGHT LESS THAN 2 FT

④ Length is equal to spacing of longitudinal reinforcing plus 2". (10" Min) (Typ)



SECTION A-A
(Showing top and bottom slab joint reinforcement.)

MATERIAL NOTES:
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HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

SINGLE BOX CULVERTS
PRECAST
3'-0" SPAN

SCP-3

FILE:	CD-SCP03-20.dgn	dw: TxDOT	ck: TxDOT	dw: TxDOT	ck: TxDOT
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

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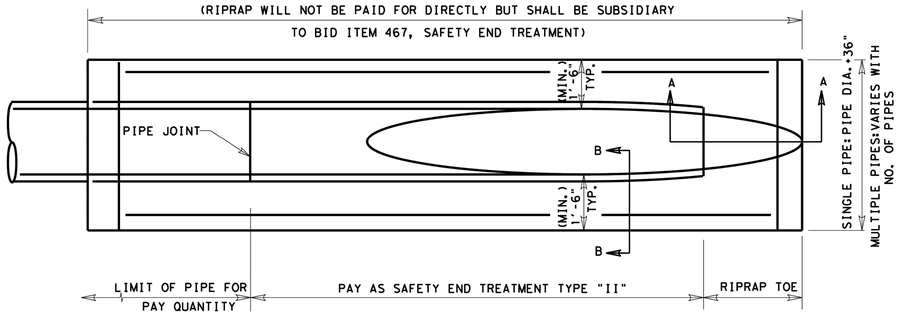
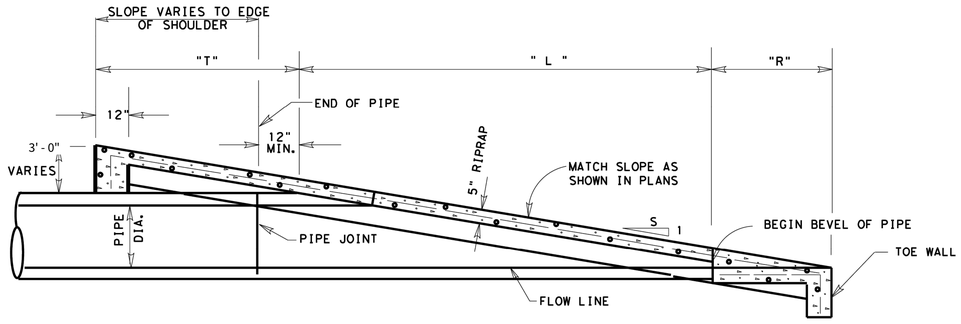
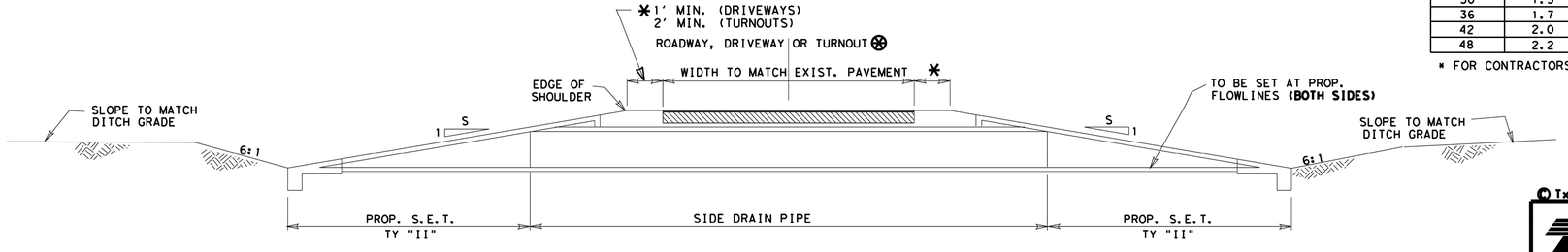
1 NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI



PLAN VIEW



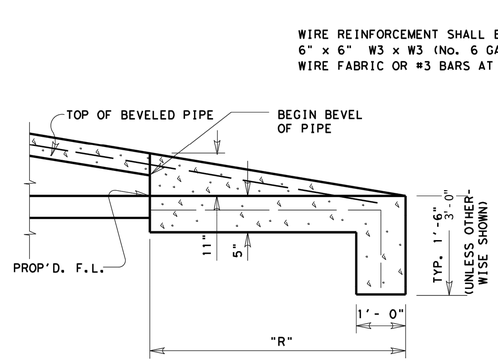
ELEVATION
SAFETY END TREATMENT



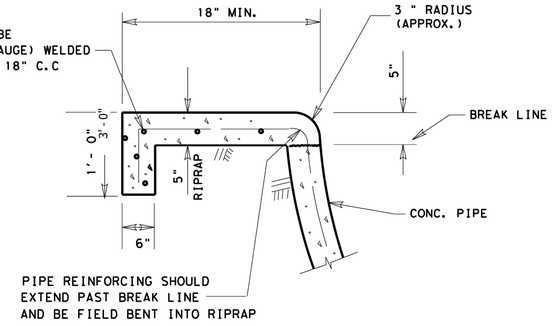
TYPICAL SIDEDRAIN SECTION

NOTE:

ALL EXCAVATION AND BACKFILL REQUIRED AT ALL PIPE SIDE DRAIN CONNECTIONS, ADJUSTMENTS AND/OR EXTENSIONS WILL NOT BE PAID FOR DIRECTLY BUT SHALL BE SUBSIDIARY TO THE BID ITEMS INVOLVED AND IN ACCORDANCE WITH ITEM 400 "STRUCTURAL EXCAVATION".



SEC. A-A



SEC. B-B

SAFETY END TREATMENT PIPE LENGTHS

PIPE DIA. (IN.)	"L" 3:1	4:1	5:1	6:1
12	2'-0"	2'-8"	3'-4"	4'-0"
15	2'-9"	3'-8"	4'-7"	5'-6"
18	3'-6"	4'-8"	5'-10"	7'-0"
24	5'-1½"	6'-10"	8'-6½"	10'-3"
30	6'-9"	9-0"	11'-3"	13'-6"
36	8'-6"	11'-4"	14'-2"	17'-0"
42	10'-1½"	13'-6"	16'-10½"	20'-3"
48	11'-9"	15'-8"	19'-7"	23'-6"

⊗ DRIVEWAYS & TURNOUTS ARE 6:1 ONLY

RIPRAP TOE LENGTHS

SLOPE	" R "	"T"
3:1	2'-9"	1'-9"
4:1	3'-8"	2'-4"
5:1	4'-7"	2'-11"
6:1	5'-6"	3'-6"

ESTIMATED RIPRAP VOLUME (CY)

PIPE DIA. (IN.)	3:1	4:1	5:1	6:1
12	.9	1.1	1.3	1.6
15	1.0	1.2	1.5	1.8
18	1.1	1.4	1.6	1.9
24	1.3	1.6	2.0	2.3
30	1.5	1.9	2.3	2.7
36	1.7	2.2	2.7	3.2
42	2.0	2.5	3.1	3.6
48	2.2	2.8	3.4	4.1

* FOR CONTRACTORS INFORMATION ONLY (SINGLE PIPE)

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PHARR DISTRICT STANDARDS

TEXAS DEPARTMENT OF TRANSPORTATION

SAFETY END TREATMENT DETAILS

REV. 9/16 SET.DGN

FED.RD. DIV.NO.	STATE AID PROJECT NO.		FILE NO.		SHEET NO.
6					
STATE	STATE DIST.NO.	COUNTY	CONT.	SECT.	JOB	HIGHWAY NO.
TEXAS	21					

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS
UNIT 4

TXDOT SAFETY END TREATMENT DETAILS

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	06-26-2024	NOTE ADDED
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C43

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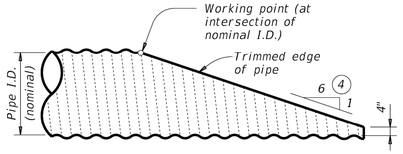
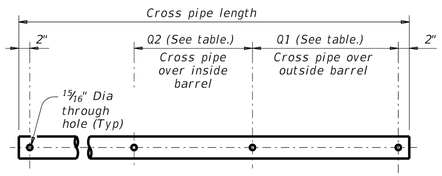
DATE:
FILE:



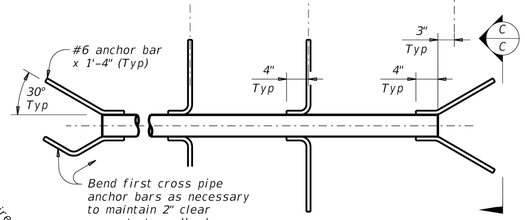
NOTE: All cross pipes, calculations, and dimensions are based on the pipe culverts mitered as shown in this detail. Alternate styles of mitered ends will require that appropriate adjustments be made to the values presented on this standard.

SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

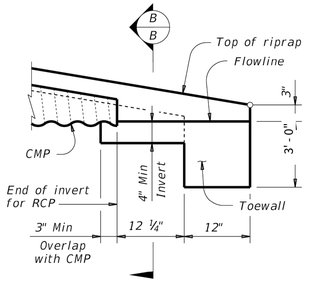
(Showing corrugated metal pipe (CMP) culvert Details at reinforced concrete pipe (RCP) culvert are similar.)



PIPE WITH BOLTED ANCHOR

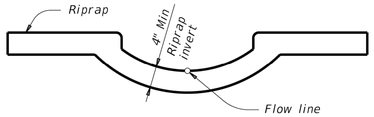


PIPE WITH ANCHOR BARS



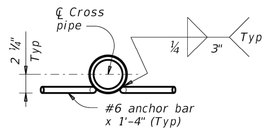
DETAIL "A"

(Showing invert with corrugated metal pipe (CMP) culvert. Reinforced concrete pipe (RCP) culvert details are similar. Cross pipes not shown for clarity.)



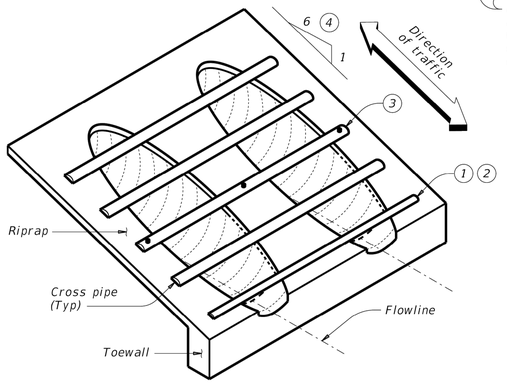
SECTION B-B

(Cross pipes not shown for clarity.)

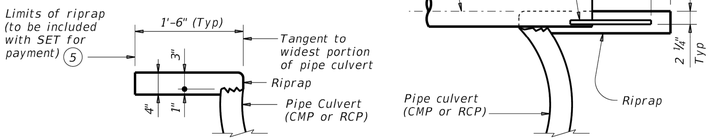


SECTION C-C

CROSS PIPE DETAILS

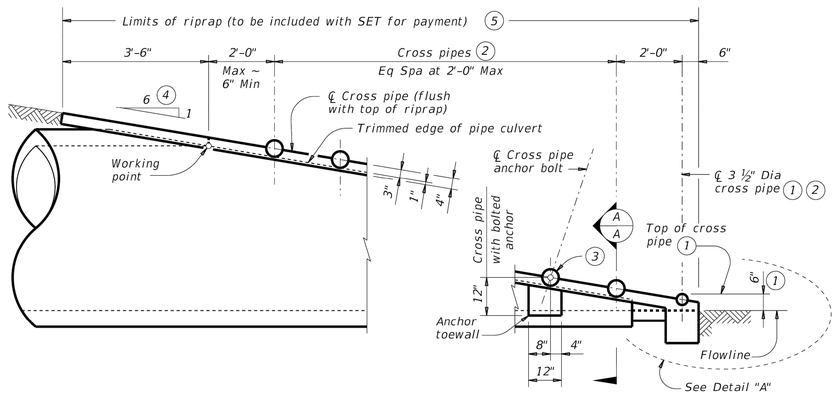


ISOMETRIC VIEW OF TYPICAL INSTALLATION



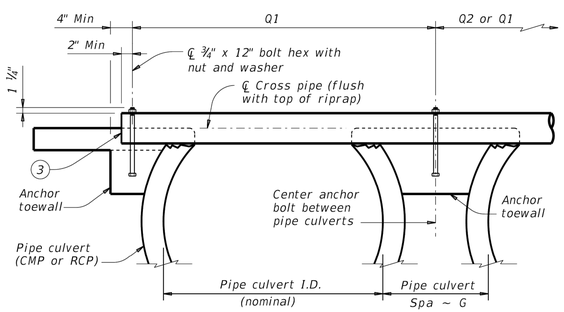
SHOWING TYPICAL PIPE CULVERT AND RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR



SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing reinforced concrete pipe (RCP) culvert. Details at corrugated metal pipe (CMP) culvert are similar.)



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A

CROSS PIPE LENGTHS, REQUIRED PIPE SIZES, AND RIPRAP QUANTITIES (2)

Nominal Culvert I.D.	Conc Riprap (CY) (6)	Pipe Culvert Spa ~ G	Single Barrel ~ Q1	Multi-Barrel ~ Q1	Q2	Conditions for Use of Cross Pipes	Cross Pipe Sizes
12"	0.6	0' - 9"	N/A	2' - 1"	1' - 9"	3 or more pipe culverts	3" Std (3.500" O.D.)
15"	0.7	0' - 11"	N/A	2' - 5"	2' - 2"		
18"	0.8	1' - 2"	N/A	2' - 10"	2' - 8"		
21"	0.9	1' - 4"	N/A	3' - 2"	3' - 1"		
24"	0.9	1' - 7"	N/A	3' - 6"	3' - 7"		
27"	1.0	1' - 8"	N/A	3' - 10"	3' - 11"	3 or more pipe culverts	3 1/2" Std (4.000" O.D.)
30"	1.1	1' - 10"	N/A	4' - 2"	4' - 4"	2 or more pipe culverts	
33"	1.2	1' - 11"	4' - 2"	4' - 5"	4' - 8"	All pipe culverts	
36"	1.3	2' - 1"	4' - 5"	4' - 9"	5' - 1"	All pipe culverts	4" Std (4.500" O.D.)
42"	1.5	2' - 4"	4' - 11"	5' - 5"	5' - 10"		
48"	1.7	2' - 7"	5' - 5"	6' - 0"	6' - 7"	All pipe culverts	5" Std (5.563" O.D.)
54"	2.0	3' - 0"	5' - 11"	6' - 9"	7' - 6"		
60"	2.2	3' - 3"	6' - 5"	7' - 4"	8' - 3"		
66"	2.4	3' - 3"	6' - 11"	7' - 10"	8' - 9"		
72"	2.7	3' - 4"	7' - 5"	8' - 5"	9' - 4"		

(1) The proper installation of the first cross pipe is critical for vehicle safety. Place the top of the first cross pipe no more than 6" above the flow line.

(2) Provide cross pipes, except the first bottom pipe, of the size shown in the table. Provide a 3 1#2" standard pipe (4" O.D.) for the first bottom pipe.

(3) Install the third cross pipe from the bottom of the culvert using a bolted connection. Ensure that riprap concrete does not flow into the cross pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, install all other cross pipes using the bolted connection details.

(4) Match cross slope as shown elsewhere in the plans. Cross slope of 6:1 or flatter is required for vehicle safety.

(5) Riprap placed beyond the limits shown will be paid for as concrete riprap in accordance with Item 432, "Riprap".

(6) Quantities shown are for one end of one reinforced concrete pipe (RCP) culvert. For multiple pipe culverts or for corrugated metal pipe (CMP) culverts, quantities will need to be adjusted. Riprap quantities are for contractor's information only.

MATERIAL NOTES:

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

Provide cross pipes that meet the requirements of ASTM A53 (Type E or S, Gr B), ASTM A500 (Gr B), or API 5LX52.

Provide ASTM A307 bolts and nuts.

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

GENERAL NOTES:

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

Safety end treatments (SET) shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the cross pipes.

Construct concrete riprap and all necessary inverts in accordance with the requirements of Item 432, "Riprap".

Payment for riprap and toewall is included in the Price Bid for each Safety End Treatment.

Texas Department of Transportation

Bridge Division Standard

SAFETY END TREATMENT

FOR 12" DIA TO 72" DIA
PIPE CULVERTS
TYPE II ~ PARALLEL DRAINAGE

SETP-PD

FILE:	setppdse-20.dgn	DN: GAF	CK: CAT	DW: JRP	CK: GAF
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS					
		DIST	COUNTY		SHEET NO.

NOTE: THE MINIMUM REQUIRED PSI CONCRETE IS 4000 PSI

CUDEENGINEERS.COM
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

TXDOT SAFETY END TREATMENT PARALLEL DRAINAGE 12" TO 72"

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

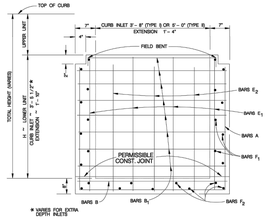
DATE	NOTE ADDED
06-26-2024	1. 2. 3. 4. 5. 6. 7. 8. 9.

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

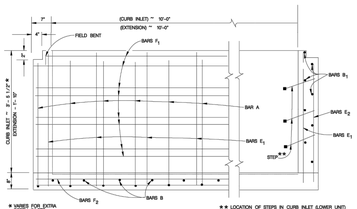
C44

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



* VARIES FOR EXTRA DEPTH INLETS

SECTION A–A



* VARIES FOR EXTRA DEPTH INLETS

** LOCATION OF STEPS IN CURB INLET (LOWER UNIT) ONLY WILL BE DETERMINED BY THE LOCATION OF RING COVER PLACEMENT. STEPS @ 15" O.C.

SECTION B–B

REINFORCING STEEL

LOWER UNIT 10' X 3' – 8" (TYPE I)

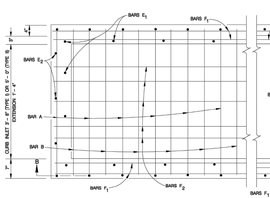
BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	4'-4"
B_1	VARIES	#4	12"	4'-8"
E_1	20	#4	18"±	VARIES
E_2	6	#4	18"±	VARIES
F_1	VARIES	#4	12"±	10'-10"
F_2	9	#4	----	10'-10"

LOWER UNIT 10' X 5' – 0" (TYPE II)

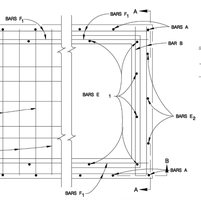
BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	5'-10"
B_1	VARIES	#4	12"	5'-10"
E_1	22	#4	18" ±	VARIES
E_2	6	#4	18"±	VARIES
F_1	VARIES	#4	12"±	10'-10"
F_2	11	#4	----	10'-10"

GENERAL NOTES

1. 5' INLETS AND 5' EXTENSIONS MUST BE IN ACCORDANCE WITH THE LATEST TXDOT CURB INLET TYPE "C" AND EXTENSION TYPE E (L=3).
2. TYPE C-8 INLET TO BE USED ONLY WHEN STORM DRAIN PIPE IS IN-LINE WITH CURB INLET AND APPROVED BY THE ENGINEER.
3. QUANTITIES SHOWN ARE FOR CONTRACTORS INFORMATION ONLY.
4. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
5. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
6. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 1 1/2".
7. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A-615, GRADE 60 REQUIREMENTS.
8. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3 /4".
9. DEPRESSION SLAB SHALL RECEIVE A WOOD FLOAT FINISH.
10. FACE OF INLET TO CONFORM TO FACE OF CURB LINE.
11. ALL BARS INTERCEPTING MANHOLE RING & COVER SHALL BE CUT OR BENT.
12. PAYMENT FOR ALL EXCAVATION, BACK-FILLING, CONCRETE, REINFORCING STEEL, RING AND COVER, CURB ARMOR AND STEPS SHALL BE INCLUDED IN THE UNIT COST OF ITEM 459 "STORM SEWER JUNCTION BOXES AND INLETS".
13. CAST IRON MANHOLE RING AND COVER TO BE PLACED NEXT TO OUTLET PIPE, EXCEPT FOR VERTICAL OUTLET PIPE IN WHICH CASE MANHOLE RING AND COVER WILL BE OFFSET.
14. GALVANIZED BOLTS, NUTS, WASHERS, PLATES AND GASKETS ARE SUBSIDIARY TO INLETS.
15. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MEANS TO LIFT AND PLACE THE INLETS, WHEN USING PRECAST UNITS.
16. ALL BARS AT PIPE BLOCKOUT LOCATIONS SHALL BE CUT OR BENT.
17. ALL LOWER UNITS SHALL RECEIVE INVERT MORTAR SHAPING.
18. PIPE BLOCKOUTS IN INLET WALLS SHOULD NOT EXCEED 9" BEYOND THE OUTER SHELL OF THE PIPE, TAKING INTO ACCOUNT THE SKEW OF THE PIPE AS NECESSARY. CONSTRUCTION JOINT MAY BE PAIRED A MAXIMUM OF 9".

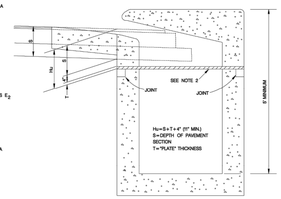


FLOOR STEEL



WALL STEEL

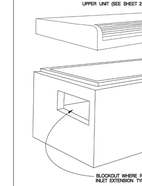
PLAN

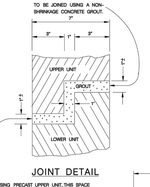


PHASE CONSTRUCTION

NOTES FOR PHASE CONSTRUCTION (WHEN DIRECTED BY THE ENGINEER):

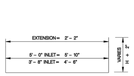
1. THE CURB INLET AND EXTENSION SHALL BE CONSTRUCTED TO A DEPTH "H2" BELOW THE INLET AND EXTENSION GUTTER LINE ELEVATION.
2. CAP THE CURB INLET AND EXTENSION WITH A STEEL PLATE APPROVED BY THE ENGINEER AND CONSTRUCT THE ROADWAY OVER THE PLATE.
3. AFTER THE ROADWAY IS COMPLETED, SAW CUT TO THE FINAL HMAC OVERLAY, SAW CUT THE PAVEMENT, REMOVE THE PLATE AND COMPLETE THE UPPER PORTION OF THE CURB INLET AND /OR EXTENSION.



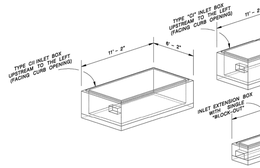


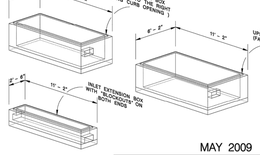
JOINT DETAIL

WHEN USING PRECAST UPPER UNIT, THIS SPACE IS FOR MAKING MINOR HORIZONTAL AND VERTICAL ADJUSTMENTS TO ACCOMODATE A FIT BETWEEN THE UPPER AND LOWER UNIT THAT ALLOWS FOR A MATCH LINE AND GRADE BETWEEN THE ROADWAY CURB AND THE UPPER UNIT OF THE INLET.



BARS A
(LOWER UNIT)





CONCRETE INLET BOX CONFIGURATIONS (LOWER UNITS)

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

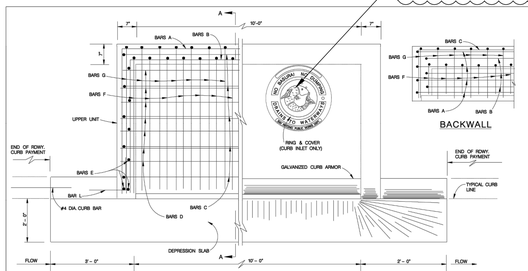
SHEET 1 OF 3

% SUBMITTAL	PROJECT NO.:	DATE:

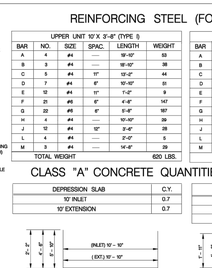
DRWN. BY:V. VASQUEZ DSGN. BY:L.E. MALTOS, P.E. CHKD. BY:R.S. HOSSENI, P.E. SHEET NO.: ___ OF ___

CONTRACTOR TO USE CITY OF BOERNE APPROVED MANHOLE LID COVER

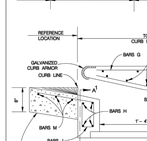
1



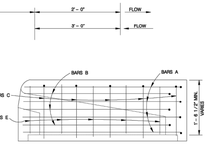
PLAN



MANHOLE LID & RING DETAIL (ITEM 409)



SECTION A–A

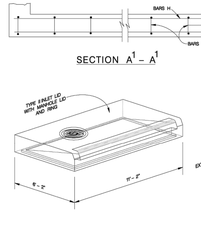


END WALL

NOTES FOR MANHOLE LID AND RING

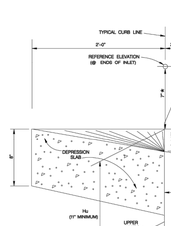
1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT."
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOW BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 350 LBS.

SEE SHEET 1 OF 3 FOR GENERAL NOTES.

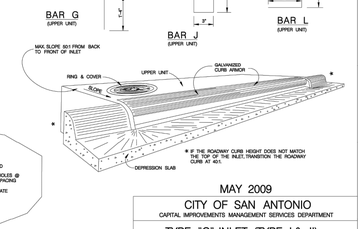


SECTION $A^1 - A^1$

CONCRETE INLET LID CONFIGURATIONS (UPPER UNITS)



INLET OPENING DETAIL



MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

SHEET 2 OF 3

% SUBMITTAL	PROJECT NO.:	DATE:

DRWN. BY:V. VASQUEZ DSGN. BY:L.E. MALTOS, P.E. CHKD. BY:R.S. HOSSENI, P.E. SHEET NO.: ___ OF ___

REINFORCING STEEL (FOR Hu = 11")

UPPER UNIT 10' X 3'-8" (TYPE I)

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	----	10'-10"	53
B	3	#4	----	10'-10"	38
C	5	#4	11"	13'-2"	44
D	7	#4	6"	10'-10"	51
E	12	#4	11"	1'-2"	9
F	21	#6	6"	5'-8"	147
G	22	#5	6"	5'-8"	187
H	4	#4	----	10'-10"	29
J	12	#4	12"	3'-8"	28
L	4	#4	----	2'-0"	5
M	9	#4	----	14'-8"	29
TOTAL WEIGHT					620 LBS.

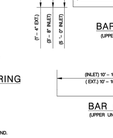
UPPER UNIT 10' X 5' (TYPE II)

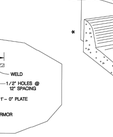
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	----	22'-0"	90
B	3	#4	----	21'-6"	43
C	7	#4	11"	13'-2"	62
D	11	#4	6"	10'-10"	80
E	16	#4	11"	1'-2"	13
F	21	#6	6"	5'-8"	179
G	22	#5	6"	7'-0"	231
H	4	#4	----	10'-10"	29
J	12	#4	12"	3'-8"	28
L	4	#4	----	2'-0"	5
M	3	#4	----	14'-8"	29
TOTAL WEIGHT					759 LBS.

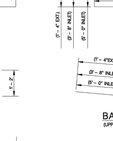
CLASS "A" CONCRETE QUANTITIES (FOR Hu = 11")

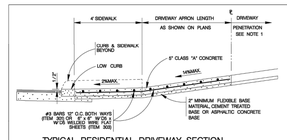
DEPRESSION SLAB	C.Y.
10' INLET	0.7
10' EXTENSION	0.7

UPPER UNIT (ONLY)	C.Y.
10' X 3'-8" CURB INLET	1.9
10' X 5'-0" CURB INLET	2.7
10' EXTENSION	1.0



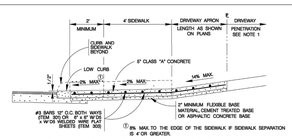






TYPICAL RESIDENTIAL DRIVEWAY SECTION

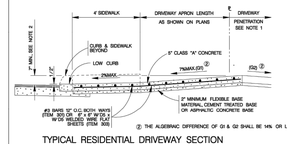
WITH SIDEWALK ABUTTING CURB
ITEM 503.1



① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

TYPICAL RESIDENTIAL DRIVEWAY SECTION

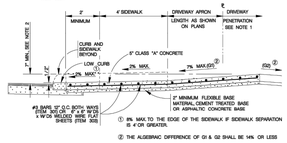
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1



② THE ALGEBRAIC DIFFERENCE OF G1 & G2 SHALL BE 14% OR LESS

TYPICAL RESIDENTIAL DRIVEWAY SECTION

WHERE PROPERTY IS LOWER THAN STREET & SIDEWALK IS ABUTTING CURB
ITEM 503.1

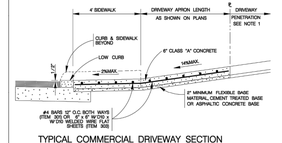


① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

② THE ALGEBRAIC DIFFERENCE OF G1 & G2 SHALL BE 14% OR LESS

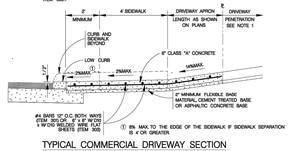
TYPICAL RESIDENTIAL DRIVEWAY SECTION

WHERE PROPERTY IS LOWER THAN STREET & SIDEWALK IS SEPARATED FROM CURB
ITEM 503.1



TYPICAL COMMERCIAL DRIVEWAY SECTION

WITH SIDEWALK ABUTTING CURB
ITEM 503.2



① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

TYPICAL COMMERCIAL DRIVEWAY SECTION

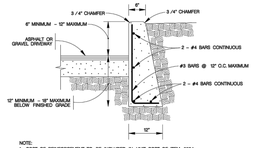
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2

CONCRETE DRIVEWAY NOTES

1. DRIVEWAY PENETRATION REFERS TO A PORTION OF THE DRIVEWAY THAT MAY BE NECESSARY TO RECONSTRUCT WITHIN PRIVATE PROPERTY TO COMPLY WITH A MAXIMUM DRIVEWAY SLOPE. THIS PORTION OF THE DRIVEWAY SHALL BE PAID FOR UNDER THE FOLLOWING ITEMS AS MAY APPLY:
   A.) CONCRETE DRIVEWAY PAD FOR UNDER ITEM NO. 503.1 OR 503.3.
   B.) ASPHALTIC CONCRETE DRIVEWAY PAD FOR UNDER ITEM NO.503.4 AND SHALL INCLUDE A MINIMUM OF 1" ASPHALT TYPE "D" & 6" FLEXIBLE BASE
   C.) GRAVEL DRIVEWAY PAD FOR UNDER ITEM NO. 503.5 AND SHALL INCLUDE A MINIMUM OF 6" FLEXIBLE BASE
2. 7" MINIMUM HEIGHT WILL NOT NECESSARILY OCCUR AT THE PROPERTY LINE. IT MAY OCCUR WITHIN THE RIGHT OF WAY OR WITHIN THE DRIVEWAY PENETRATION ON PRIVATE PROPERTY.
3. THE PROPOSED DRIVEWAY SHOULD MATCH THE EXISTING WIDTH AT THE PROPERTY LINE BUT UNLESS AUTHORIZED BY THE CITY TRAFFIC ENGINEER, THE WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:

TYPE	MINIMUM	MAXIMUM
RESIDENTIAL	10'	20'
COMMERCIAL – ONE WAY	12'	20'
COMMERCIAL – TWO WAY	24'	30'

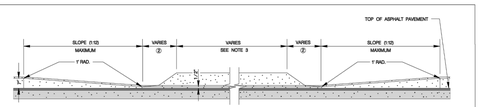
4. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB.
5. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM THE BACK OF CURB OR, AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
6. DUMMY JOINTS PARALLEL TO THE CURB SHALL BE PLACED WHERE THE SIDEWALK MEETS THE DRIVEWAY. DUMMY JOINTS PERPENDICULAR TO THE CURB, AND WITHIN THE BOUNDARIES OF THE PARALLEL DUMMY JOINTS, SHALL BE PLACED AT INTERVALS EQUAL TO THE WIDTH OF THE SIDEWALK.
7. A MINIMUM OF TWO ROUND AND SMOOTH DOWEL BARS 3 /4" IN DIAMETER AND 18" IN LENGTH SHALL BE SPACED 18" APART AT EACH EXPANSION JOINT.
8. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE. WHERE SIDEWALKS CROSS DRIVEWAYS, SIDEWALK CROSS SLOPE SHALL NOT EXCEED 2%.
9. SIDEWALK RAMP SURFACE SHALL BE BRUSH FINISHED.



NOTES:
1. COST OF REINFORCEMENT TO BE INCLUDED IN UNIT COST OF ITEM 307.1.
2. CONCRETE RETAINING WALL COMBINATION TYPE SHALL BE USED FOR CONCRETE DRIVEWAYS.

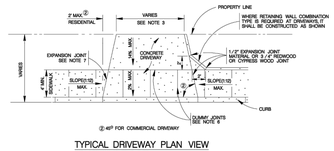
DRIVEWAY – CONCRETE RETAINING WALL

ON COMPACTED SUBGRADE
ITEM 307.1



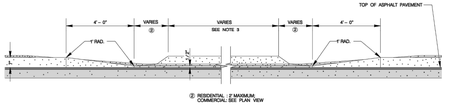
CURB PROFILE AT DRIVEWAY

WITH SIDEWALK ABUTTING CURB



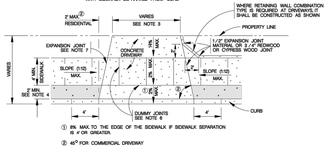
TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK ABUTTING CURB



CURB PROFILE AT DRIVEWAY

WITH SIDEWALK SEPARATED FROM CURB



TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK SEPARATED FROM CURB

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

CONCRETE DRIVEWAY STANDARDS

% SUBMITTAL	PROJECT NO.:	DATE:

DRWN. BY:V. VASQUEZ DSGN. BY:_____ CHKD. BY:R.S. HOSSENI, P.E. SHEET NO.: ___ OF ___

CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

CURB INLET DETAILS

DATE
09/13/2022

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
2021-11-12	MODIFIED MANHOLE LID COVER DETAIL

A 1 2 3 4 5 6 7 8 9

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
10/09/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C45

CUDEENGINEERS.COM

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REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

C:\03481.008\02-Drawings\C45 CURB INLET DETAILS.dwg 2022/09/13 3:33pm chrisgallardo

CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS

I. WHERE A SEWER MAIN CROSSES OVER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE (9) FEET, ALL PORTIONS OF THE SEWER MAIN WITHIN NINE (9) FEET OF THE WATER LINE SHALL BE CONSTRUCTED USING 150 PSI PRESSURE RATED PIPE AT LEAST EIGHTEEN (18) FEET IN LENGTH MAY BE CENTERED ON THE WATER MAIN IN LIEU OF PIPE CONNECTION REQUIREMENTS (NO SEPARATE PAY ITEM)

II. WHERE SEMI-RIGID OR RIGID SEWER MAIN CROSSES UNDER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE FEET BUT GREATER THAN TWO FEET, THE INITIAL BACKFILL SHALL BE CEMENT STABILIZED SAND (TWO OR MORE BAGS OF CEMENT PER CUBIC YARD OF SAND) FOR ALL SECTIONS OF THE SEWER WITHIN NINE FEET OF THE WATER MAIN.

III. WHERE A SEWER MAIN CROSSES UNDER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN TWO FEET, THE SEWER MAIN SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI WITHIN NINE FEET OF THE WATER MAIN, SHALL BE PLACED NO CLOSER THAN SIX (6") INCHES BETWEEN OUTER DIAMETERS, AND SHALL BE JOINED WITH PRESSURE RING GASKET CONNECTIONS OR CORROSION PROTECTED MECHANICAL COUPLING DEVISES OR A CAST IRON OR DUCTILE IRON MATERIAL. A SECTION OF PSI PRESSURE RATE PIPE OF A LENGTH GREATER THAN EIGHTEEN (18) FEET MAY BE CENTERED ON THE WATER MAIN IN LIEU OF PIPE CONNECTION REQUIREMENTS. (NO SEPARATE PAY ITEM).

IV. WHERE A SEWER MAIN PARALLELS A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE FEET, THE SEWER MAIN SHALL BE BELOW THE WATER MAIN, SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI FOR BOTH PIPE AND JOINTS FOR A DISTANCE OF NINE FEET BEYOND THE POINT OF CONFLICT, SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE BETWEEN OUTER DIAMETERS OF TWO FEET VERTICALLY AND FOUR FEET HORIZONTALLY, AND SHALL BE JOINED WITH PRESSURE RING GASKET CONNECTIONS OR CORROSION PROTECTED MECHANICAL COUPLING DEVICES OF A CAST IRON OF DUCTILE IRON MATERIALS.

V. SANITARY SEWER MANHOLES SHALL NOT BE INSTALLED ANY CLOSER THAN NINE FEET TO WATER MAINS.

VI. PLAN AND PROFILE MUST SHOW TYPE OF CROSSING AND MATERIAL TO USE.

NON-EDWARDS AQUIFER RECHARGE ZONE SANITARY SEWER SYSTEM GENERAL NOTES

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS PROJECT SHALL BE APPROVED BY THE CITY OF BOERNE AND COMPLY WITH:
   A. CURRENT "CITY OF BOERNE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (JANUARY, 2011)
   B. TEXAS NATURAL RESOURCE CONSERVATION COMMISSION'S DESIGN CRITERIA FOR SEWERAGE SYSTEMS [30 TAC 217]
2. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE CITY OF BOERNE PUBLIC WORKS DEPARTMENT AT 1-830-248-8511, 48 HOURS PRIOR TO EXCAVATION.
3. CONTRACTOR TO CONTACT 1-800-344-8377, 48 HOURS PRIOR TO COMMENCING WORK FOR MARKING UNDERGROUND UTILITIES
4. THE CONTRACTOR SHALL MAINTAIN SERVICE TO EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION.
5. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION AND KENDALL COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT.
6. ALL WORK IN PUBLIC STREETS SHALL BE COORDINATED WITH AND APPROVED BY CITY OF BOERNE PUBLIC WORKS DEPARTMENT AND SHALL BE DONE IN ACCORDANCE WITH CITY OF BOERNE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
7. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.181, THE CITY OF BOERNE MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROJECT AND WORK AROUND GAS VALVES THAT ARE IN THE PROJECT AREAS.
8. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM COMPLETE INSTALLATION OF THE SANITARY SEWER LINES.

   THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:
   1. PULL MANDREL.
   2. PERFORM AIR TEST.
   3. PULL WIPER (AFTER STREET HAS BEEN ASPHALTED IN NEW SUBDIVISIONS).

MANHOLES:

9. ALL MANHOLES SHALL BE CONSTRUCTED SO THAT TOP OF THE RING IS AT LEAST FOUR (4) INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND EXCEPT WHEN LOCATED IN TXDOT R.O.W. IN TXDOT ROW AREAS, THE MANHOLE RING SHALL BE FLUSH WITH NATURAL GROUND.
10. ALL MANHOLES IN THE STREET AND 100 YEAR FLOODPLAIN AREAS SHALL HAVE WATERTIGHT RINGS AND COVERS IN ACCORDANCE WITH THE MOST CURRENT CITY OF BOERNE STANDARD SPECIFICATIONS FOR CONSTRUCTION.
11. ON ANY MANHOLES TO BE ABANDONED, THE RINGS AND COVER SHALL BE SALVAGED IN ACCORDANCE WITH THE MOST CURRENT CITY OF BOERNE STANDARD SPECIFICATIONS FOR CONSTRUCTION: PREPARATION OF RIGHT-OF-WAY. THE HOLE SHOULD BE BACKFILL TO THE SATISFACTION OF THE INSPECTOR. ALL PUBLIC MANHOLES WILL BE VACUUM TESTED AS PER 02515 3.2.

PIPING:

12. THE KIND AND DESCRIPTION OF THE PIPE CONDUIT IS SHOWN ON THE PLANS, (IF PVC, "SDR" AND ASTW/ANSI DESIGNATIONS, CLASS).
13. THE USE OF ASBESTOS CEMENT PIPE WILL BE PROHIBITED UNDER THIS CONTRACT. ALL DUCTILE IRON PIPE USED IN THIS SYSTEM SHALL BE CORROSION PROTECTED ON BOTH THE INTERIOR AND EXTERIOR SURFACES. ALL CORROSION PROTECTION SHALL BE APPLIED AND INSTALLED IN SUCH A MANNER AS TO MAINTAIN A CONTINUOUSLY PROTECTED SURFACE AFTER FINAL PIPE INSTALLATION.
14. ALL PVC SEWER PIPE WITH OVER 14 FEET OF COVER SHALL BE EXTRA STRENGTH, SDR 26 MINIMUM PIPE STIFFNESS OF 115 PSI.
15. ALL SEWER PIPES SHALL BE GOVERNED BY THE CITY OF BOERNE STANDARD SPECIFICATIONS FOR CONSTRUCTION (JANUARY 2011)
16. SEWER PIPE CONNECTIONS TO PRE-CAST MANHOLES WILL BE COMPRESSION JOINTS AS APPROVED BY CITY OF BOERNE MECHANICAL JOINT "BOOT TYPE" CONNECTIONS ALONE WILL NOT BE ALLOWED. "BOOT TYPE" JOINTS MAY BE USED IN CONJUNCTION WITH COMPRESSION JOINTS AS APPROVED BY CITY OF BOERNE. SEWER PIPE CONNECTIONS TO MONOLITHIC MANHOLES SHALL BE REVIEWED AND APPROVED BY CITY OF BOERNE. CITY OF BOERNE MUST APPROVE ANY CHANGES FROM THESE METHODS.
17. ALL PIPE TRENCHING, BEDDING AND BACKFILL SHALL BE DONE IN ACCORDANCE WITH APPROPRIATE ASTM/ANSI SPECIFICATIONS (REFERENCE 30 TAC 217.54; ASTM C12, (ANSI A106.2) OR ASTM D-2321 (ANSI K65.171).
18. WHEN SEWER LATERALS ARE TO BE CONNECTED TO EXISTING SEWER MAINS AND NO STUB-OUT HAS BEEN EARLIER PROVIDED, THE CONNECTION MUST BE MADE WITH AN APPROVED SERVICE SADDLE AS PER CITY OF BOERNE STANDARD SPECIFICATIONS FOR CONSTRUCTION.
19. ALL RESIDENTIAL SEWER SERVICE LATERALS SHALL BE EXTENDED TO AT LEAST THE PROPERTY LINE AND CAPPED AND SEALED.
20. WHERE REQUIRED, CONCRETE ENCASEMENT SHALL BE PLACED FOR FULL WIDTH OF THE TRENCH TO A PLANE 8" ABOVE THE TOP OF THE PIPE, WITH PAY LIMITS AS SHOWN ON THE STANDARD DETAIL SHEET.
21. A MINIMUM OF 3 FEET OF COVER IS TO BE MAINTAINED OVER THE SANITARY SEWER MAIN AND LATERALS AT SUBGRADE, OTHERWISE CONCRETE ENCASEMENT WILL BE REQUIRED.

BLASTING:

22. NO BLASTING WILL BE ALLOWED.

TESTING:

23. ALL SEWER LINES MUST BE TESTED IN ACCORDANCE WITH THE FOLLOWING;

A. 30 TAC 217.54 (b)(1) OR THE CITY OF BOERNE STANDARD SPECIFICATIONS FOR CONSTRUCTION 3.09 & 3.10 OF SECTION 025.30: DEFLECTION TEST FOR FLEXIBLE AND SEMI-RIGID PIPE CONDUCTED AFTER FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS.
B. 30 TAC 217.57 (a)(1) & 217.57 (a)(2) OR THE CITY OF BOERNE STANDARD SPECIFICATIONS INFILTRATION AND/OR EXFILTRATION AND/OR LOW-PRESSURE AIR TEST.
C. 30 TAC 217.58 OR THE CITY OF BOERNE STANDARD SPECIFICATIONS. ALL MANHOLES AND WET WELLS MUST BE TESTED SEPARATELY AND INDEPENDENTLY OF THE COLLECTION LINES.

24. SEWER LINES SHALL BE TESTED FROM MANHOLE TO MANHOLE.
25. SANITARY SEWER MAIN CONNECTIONS MADE DIRECTLY TO EXISTING MANHOLES WILL REQUIRE SUCCESSFUL TESTING OF THE MANHOLE IN ACCORDANCE WITH THE CITY OF BOERNE STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
26. AFTER CONSTRUCTION, TESTING WILL BE DONE BY TV CAMERA BY THE CITY OF BOERNE FORCES AND OBSERVED BY INSPECTOR, WASTEWATER ENGINEERING PERSONNEL, AND CONTRACTOR AS CAMERA IS RUN THROUGH THE LINES. ANY ABNORMALITIES, SUCH AS BROKEN PIPE OR MISALIGNED JOINTS, MUST BE REPLACED BY THE CONTRACTOR AT HIS EXPENSE.
27. A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO THE CITY OF BOERNE PUBLIC WORKS DEPARTMENT.
28. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EVACUATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATION. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTORS INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
29. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NO PERMANENTLY PLACE ANY WASTE MATERIALS IN THE 100-YER FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT. WASTE MATERIALS SHALL BE REMOVED FROM TXDOT NOW DAILY.
30. WATER JETTING THE BACKFILL WILL NOT BE PERMITTED. SANITARY SEWER TRENCHES SUBJECT TO TRAFFIC SHALL CONFORM TO THE CITY OF BOERNE STANDARD SPECIFICATIONS FOR CONSTRUCTION.
31. WHERE THE MINIMUM 9-FOOT SEPARATION DISTANCE BETWEEN SEWER LINE AND WATER LINE/MAINS CANNOT BE MAINTAINED, THE INSTALLATION OF SEWER LINES SHALL BE IN STRICT ACCORDANCE WITH TEXAS NATURAL RESOURCE CONSERVATION COMMISSION'S RULES (30 TAC 217.53 (d) & 30 TAC 290.44 (e)).
32. THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION AND ENVIRONMENTAL PROTECTION AGENCY (EPA) REQUIRE EROSION AND SEDIMENTATION CONTROL FOR CONSTRUCTION OF SEWER COLLECTION SYSTEMS. DEVELOPER OR AUTHORIZED REPRESENTATIVE SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL AS NOTES ON THE PROJECTS PLAN AND PROFILE SHEETS.
33. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AFTER FINAL ACCEPTANCE OF THE PROJECT BY THE CITY OF BOERNE PUBLIC WORKS AND TXDOT.
34. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON PLANS BUT NOT INCLUDED ON THE BID SCHEDULE. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED UNDER THE PAY ITEM TO WHICH IT RELATES.
35. THE DEVELOPER DEDICATES THE SANITARY SEWER MAINS UPON COMPLETION BY THE DEVELOPER AND ACCEPTANCE BY THE CITY OF BOERNE. THE CITY OF BOERNE WILL OWN AND MAINTAIN SAID WORK COMPLETED BY THE CONTRACTOR, WHICH HAS NOT RECEIVED A WORK ORDER OR THE CONSENT OF THE CITY OF BOERNE CONSTRUCTION INSPECTION DIVISION WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.
36. OWNER PAYS DIRECTLY FOR ALL INITIAL (PASSING) DENSITY TEXT.

SEWER GENERAL NOTES

1. ALL CONSTRUCTION AND MATERIALS SHALL BE IN STRICT CONFORMANCE WITH CITY OF BOERNE REQUIREMENTS.
2. ALL PIPE TRENCHING, BEDDING AND BACKFILL SHALL BE DONE IN ACCORDANCE WITH SPECIFICATIONS SECTION 30 TAC 217.54.
3. MANHOLE RINGS AND COVERS SHALL BE NEENAH FOUNDRY, DEETER FOUNDRY, ALAMO IRON WORKS, EAST JORDAN IRON WORKS, OR EQUAL. WHEN WATER TIGHT MANHOLE RINGS AND COVERS ARE SPECIFIED, THEY SHALL PROVIDE A-77 O.R. WATER TIGHT OR EQUAL AND MEET THE REQUIREMENTS OF SECTION 02515 1.2 OR THE CITY OF BOERNE STANDARD SPECIFICATIONS.
4. ALL MANHOLES SHALL BE PRECAST, INCLUDING BASES, "CHARLOTTES CONCRETE" OR APPROVED EQUAL WITH GASKETS ACCORDING TO ASTM C891.
5. MATERIAL FOR SANITARY SEWER PIPE MUST BE THE SAME FROM MANHOLE TO MANHOLE. CHANGES IN TYPE OF PIPE MAY BE MADE ONLY AT MANHOLES OR SPECIAL STRUCTURES, EXCEPT AS DIRECTED BY THE ENGINEER AND WHERE APPLICABLE APPROVED BY THE DIRECTOR OF PUBLIC WORKS.
6. ALL SEWER PIPE WITH LESS THAN THREE FEET (3) OF COVER SHALL BE CONCRETE ENCASED.
7. CONES, RISERS AND BASE MUST CONFORM TO ASTM C-478.
8. JOINTS BETWEEN MANHOLE SECTIONS MUST HAVE RUBBER GASKETS PER ASTM C-443.
9. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 150 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT WATER MAIN.
10. PIPE TYPE DESIGNATIONS ARE SDR 26 AND SHALL BE FROM THE FOLLOWING MANUFACTURERS OR APPROVED EQUALS: J-M MANUFACTURING, CERTAINTEED CORPORATION, NORTH AMERICAN PIPE CORPORATION, I PEX INC., DIAMOND PLASTIC CORPORATION, FREEDOM PLASTICS, NATURAL PIPE AND PLASTICS, OR NORTHERN PIPE PRODUCTS. GASKET JOINTS AND ELECTROMETRIC SEALS SHALL CONFORM TO ASTM D3034 AND ASTM F477, RESPECTIVELY.
11. IN ORDER TO MINIMIZE EROSION AND SEDIMENTATION RESULTING FROM THE PROPOSED UTILITY INSTALLATION, THE PROJECT WILL BE RE-VEGETATED IN ACCORDANCE WITH TXDOT. THE OWNER AND CONTRACTOR WILL BE PROVIDED WITH A COPY OF TXDOT'S SPECIAL PROVISION FOR UTILITY PERMIT DATED 6/2001 AND TXDOT'S SPECIAL SPECIFICATION 10327 FURNISHING AND PLACING COMPOST, AT THE TIME OF BIDDING.
12. CONTRACTOR TO NOTIFY TXDOT INSPECTOR FOR THIS AREA 48 HOURS PRIOR TO STARTING CONSTRUCTION. (TXDOT BOERNE MAINTENANCE OFFICE 830-816-2430).
13. USE BEDDING AND INITIAL BACKFILL MATERIALS AS APPROVED BY THE CITY OF BOERNE AND CONFORM TO ASTM C33 GRADING AS SHOWN IN SECTION 02221 2.1C OF THE CITY OF BOERNE STANDARD SPECIFICATIONS.
14. COMPACT SECONDARY BACKFILL TO 98% MAX DRY DENSITY. CONTRACTOR TO PERFORM DENSITY TESTING AT INTERVALS OF 500' PER 6" LIFT OF SECONDARY BACKFILL FOR UTILITIES IN TXDOT ROW (TXDOT REQUIREMENT) AND PER 8' LIFT OF SECONDARY BACKFILL FOR UTILITIES IN ALL OTHER AREAS (CITY OF BOERNE REQUIREMENT). REPORTS TO BE PROVIDED TO CITY OF BOERNE PUBLIC WORKS DEPARTMENT. REPORTS OF TEST RESULTS TO BE PROVIDED TO TXDOT FOR WORK WITHIN TXDOT ROW.
15. CONTRACTOR TO CONTACT 1-800-344-8377 48 HOURS PRIOR TO COMMENCING WORK FOR MARKING UNDERGROUND CONDUITS.

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CORLEY FARMS UNIT 4

SANITARY SEWER GENERAL NOTES

DATE
01/30/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
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9.	

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C46

P:\03481.008\2 Drawings\CAD SAN\ANG\SHEETS\SEWER GENERAL NOTES.dwg 2/9/2024 8:50:28 AM by bhoward

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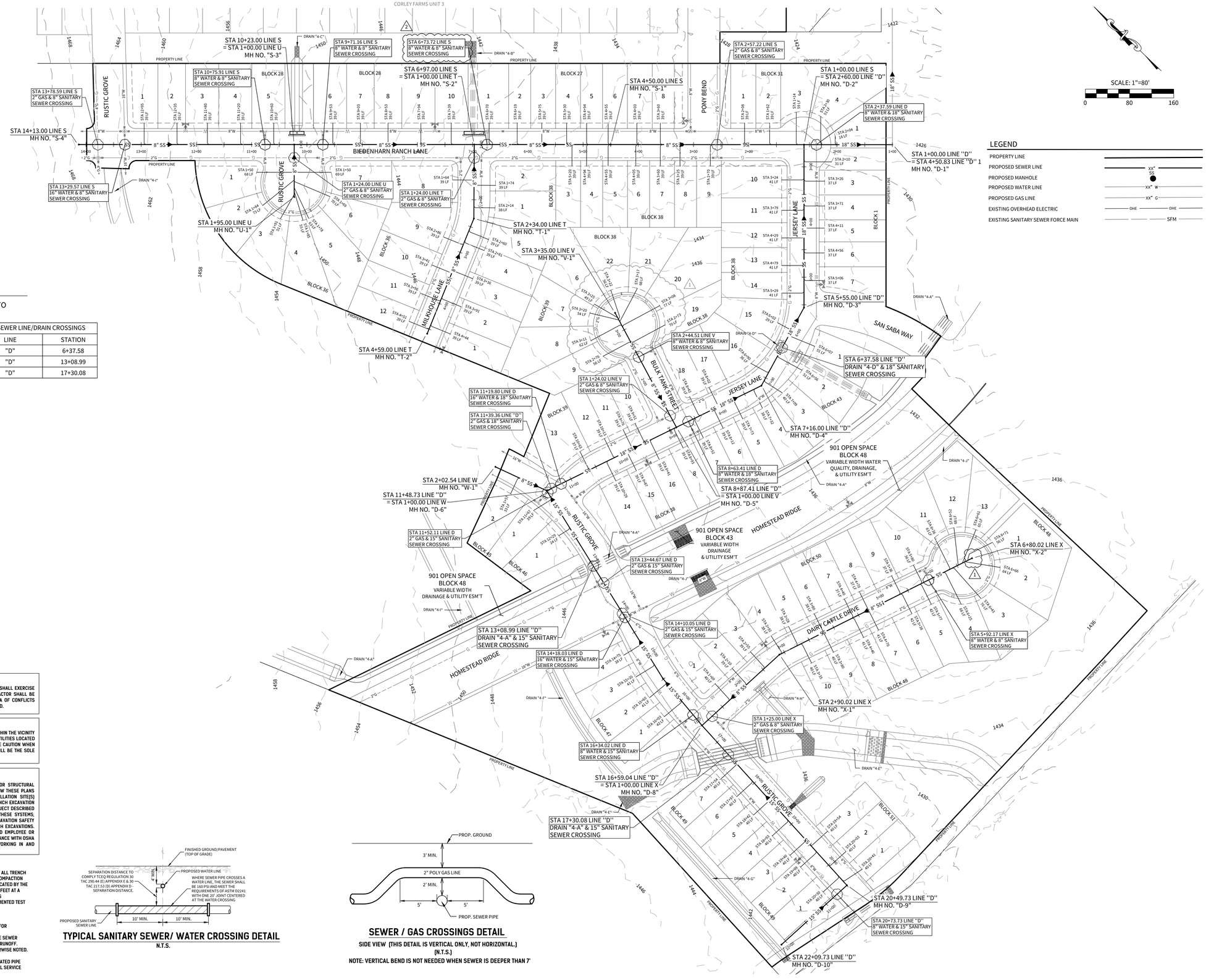

BENCHMARK BM-1

BENCHMARK TO BE SET BY ENGINEER PRIOR TO CONSTRUCTION.

SEWER/WATER LINE CROSSINGS	
LINE	STATION
"D"	2+37.59
"D"	8+63.41
"D"	11+19.80
"D"	11+19.80
"D"	14+18.03
"D"	16+34.02
"D"	20+73.73
"S"	6+73.72 (2)
"S"	9+71.16
"S"	10+75.91
"S"	13+29.57
"V"	2+44.51
"X"	5+92.17

SEWER LINE/DRAIN CROSSINGS	
LINE	STATION
"D"	6+37.58
"D"	13+08.99
"D"	17+30.08

SEWER/GAS LINE CROSSINGS	
"D"	11+39.36
"D"	13+08.99
"D"	13+44.67
"D"	14+10.05
"S"	2+57.22
"S"	13+78.59
"T"	1+24.00
"U"	1+24.00
"V"	1+24.02
"X"	1+25.00

CAUTION!!

EXISTING UTILITIES ARE WITHIN THE LIMITS OF CONSTRUCTION. CONTRACTORS SHALL EXERCISE EXTRA CARE IN DIGGING ANY TRENCH FOR PROPOSED UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE, VERIFY THE EXACT LOCATION & IDENTIFY AREA OF CONFLICTS WITH EXISTING UTILITIES AND SHALL NOTIFY THE ENGINEER IF CONFLICT IS FOUND.

CAUTION!!

THE CONTRACTOR SHALL BE AWARE THAT OVERHEAD ELECTRIC LINES EXIST WITHIN THE VICINITY OF THE SITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TEST WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE INSPECTOR/TEST ADMINISTER, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
2. ALL 18" SANITARY SEWER PIPE SHALL BE SDR-26 PS115 ASTM F679.
3. MANHOLE OPENING INCREASED TO 30" AS PER TAC CHAPTER 217.55.
4. REFERENCE STREET DETAIL SHEET AND GEOTECHNICAL ENGINEERING REPORT FOR PAVEMENT DESIGN INFORMATION.
5. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPGRADIENT SIDE OF THE SEWER TRENCH THUS ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.
6. ALL LATERALS SHALL BE INSTALLED AT A MINIMUM 2.0% SLOPE UNLESS OTHERWISE NOTED.
7. BENCHMARK TO BE SET BY ENGINEER PRIOR TO THE START OF CONSTRUCTION.
8. ALL SEWER LATERALS TO BE INSTALLED WITH A MINIMUM 150 PSI PRESSURE RATED PIPE AND EMBEDDED IN CEMENT STABILIZED SAND AT ALL WATER MAIN AND LATERAL SERVICE CROSSINGS PER 30 TAC CHAPTER 290.44(e)

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

SEWER / GAS CROSSINGS DETAIL

SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.)
(N.T.S.)

NOTE: VERTICAL BEND IS NOT NEEDED WHEN SEWER IS DEEPER THAN 7'

LEGEND

PROPERTY LINE	
PROPOSED SEWER LINE	XX" SS
PROPOSED MANHOLE	
PROPOSED WATER LINE	XX" W
PROPOSED GAS LINE	XX" G
EXISTING OVERHEAD ELECTRIC	OHE OHE
EXISTING SANITARY SEWER FORCE MAIN	SFM

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CORLEY FARMS UNIT 4

OVERALL SANITARY SEWER PLAN

DATE
07/16/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02-08-2024	REVISED MH STYLE TO BE MORE TO SCALE & ADDED SEWER LINE AND SEWER/WATER CROSSING.
2.	07-15-2024	REVISED WATER LINE AND SEWER/WATER CROSSING.
3.		
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9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL
ENGINEER
07/16/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

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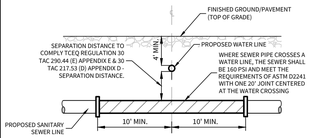

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

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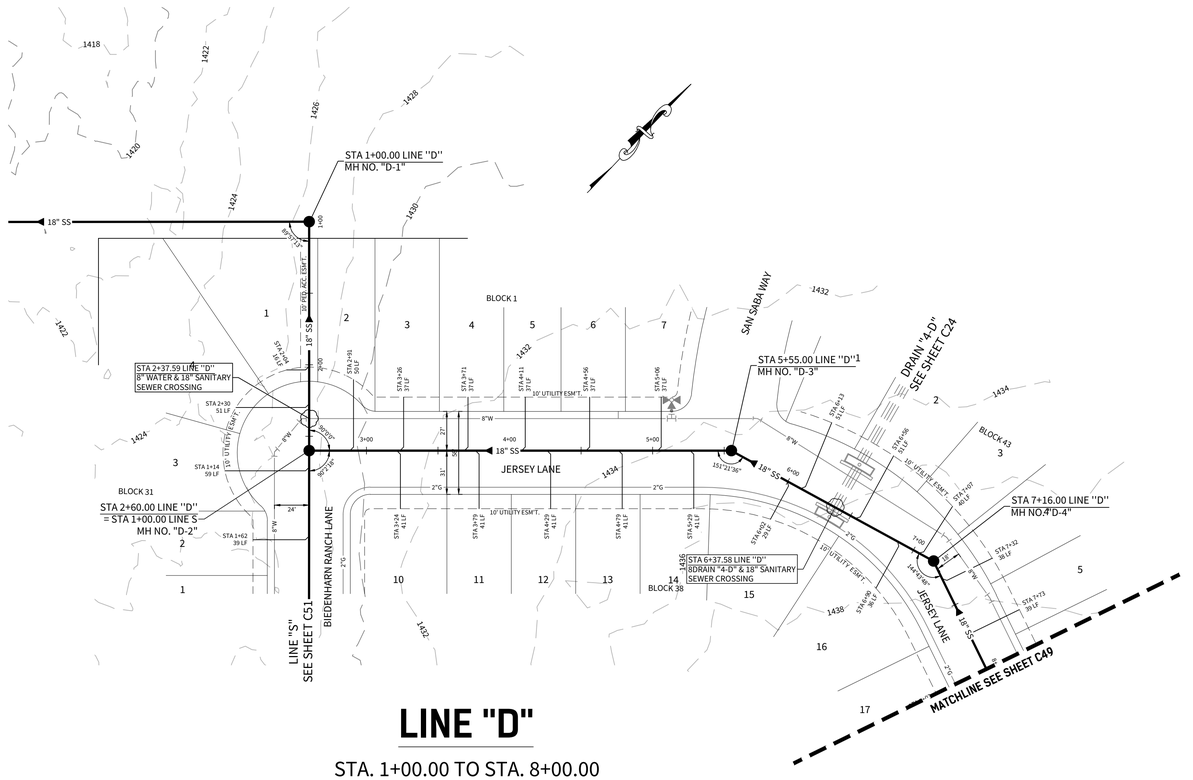

LINE "D"

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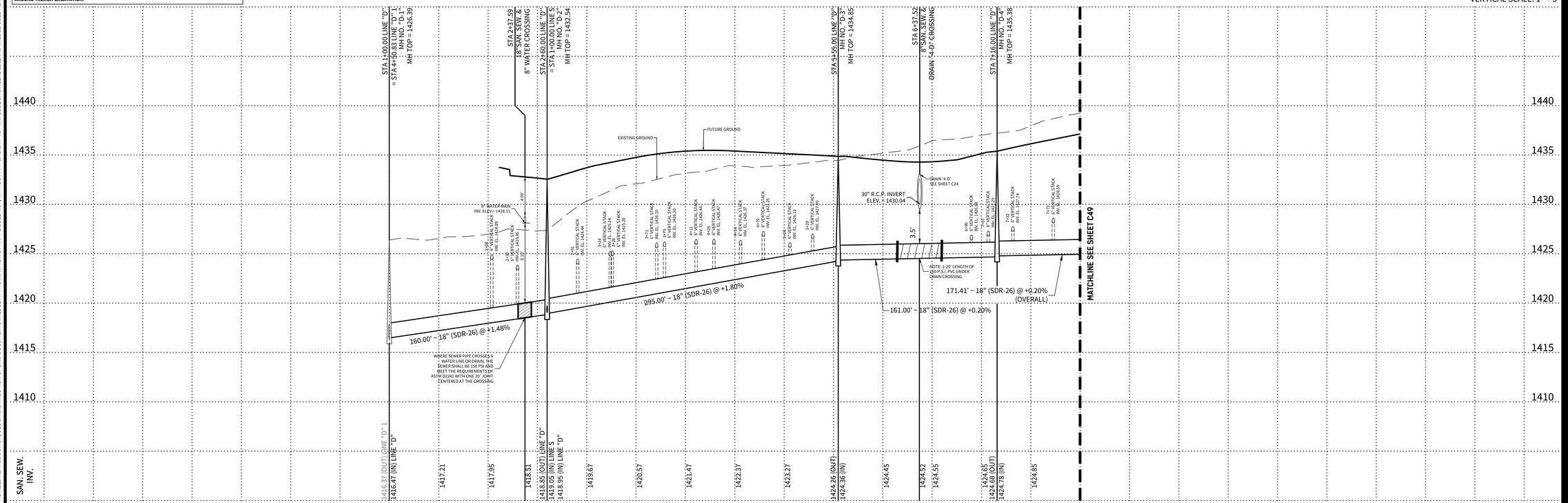
HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

SANITARY SEWER PLAN & PROFILE LINE "D"

DATE
01/31/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	A	1	2	3	4	5	6	7	8	9

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
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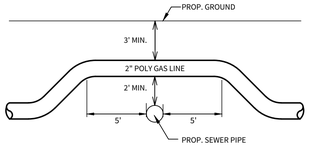
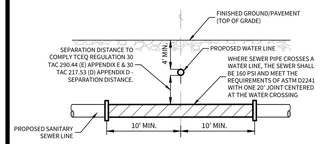
P:\03481\000\3-Drawings\C48 SANITARY SEWER PLAN & PROFILE LINE "D".dwg 2/6/2024 11:13:13 pm by chunt



SEWER / GAS CROSSINGS DETAIL

SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) (N.T.S.)

NOTE: VERTICAL BEND IS NOT NEEDED WHEN SEWER IS DEEPER THAN 7'



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

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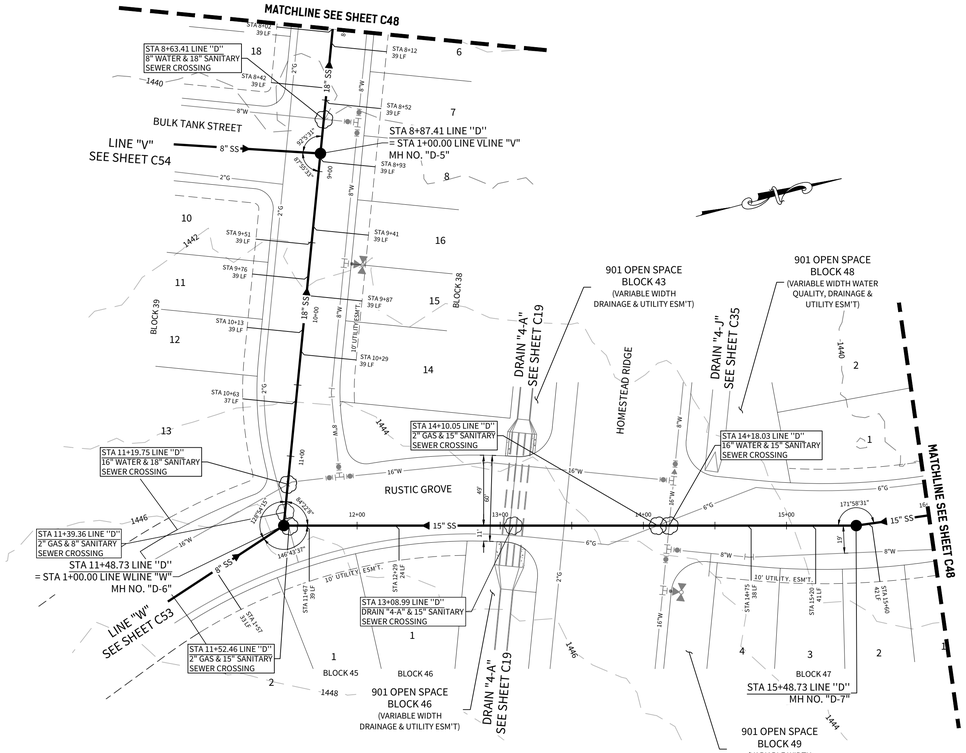
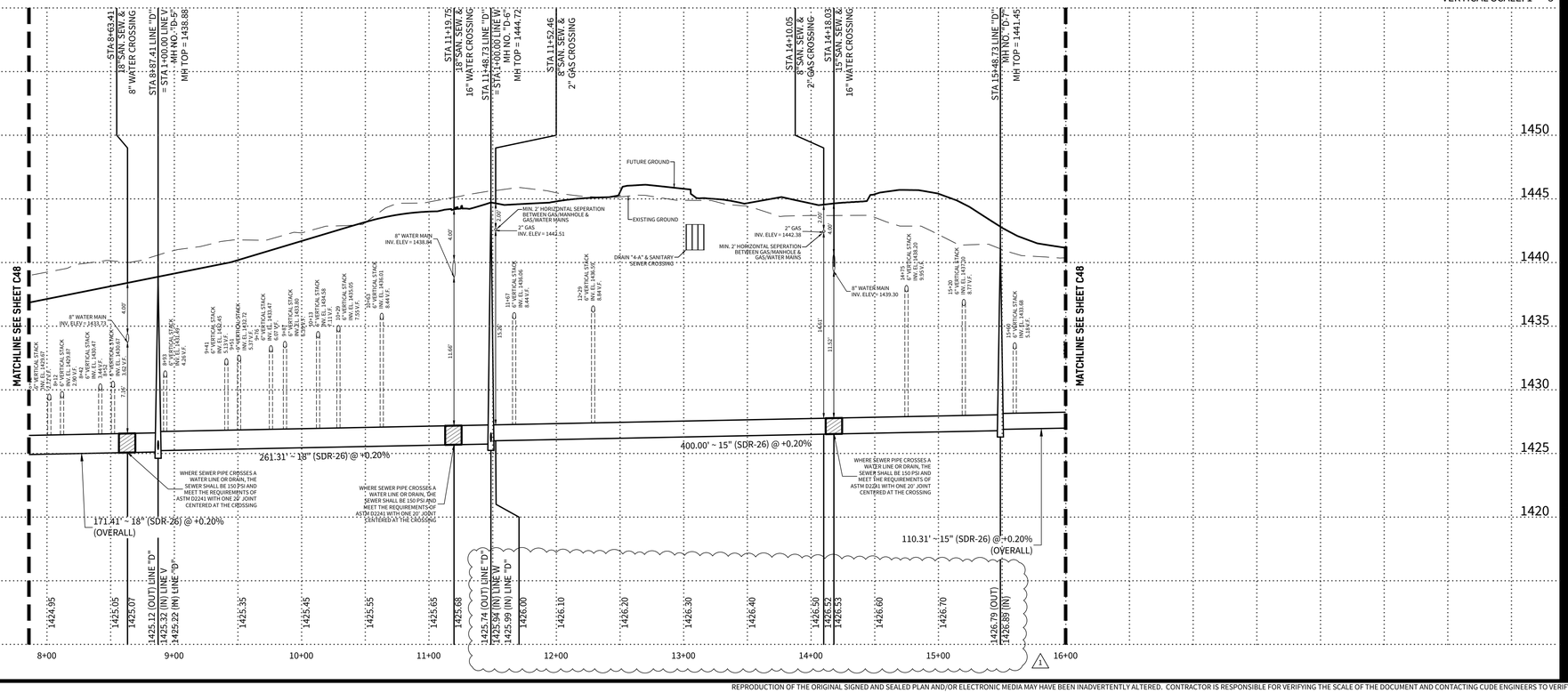


LINE "D"

STA. 8+00.00 TO STA. 16+00.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CORLEY FARMS UNIT 4

SANITARY SEWER PLAN & PROFILE LINE "D"

DATE 07/16/2024

PROJECT NO. 03481.008

DRAWN BY CG/ED/AG/JR/RC/LW

CHECKED BY CA/XV/JC/AL

REVISIONS

	DATE	
1.	07.15.2024	REVISED SEWER DESIGN
2.		
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9.		

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
07/16/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO. 22-1190

C49

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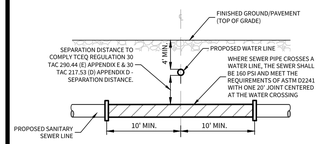

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

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2. ALL 18" SANITARY SEWER PIPE SHALL BE SDR-26 PS115 ASTM F679.
3. ALL LATERALS SHALL BE INSTALLED AT A MINIMUM 2.0% SLOPE UNLESS OTHERWISE NOTED.

CAUTION!!

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CAUTION!!

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TRENCH EXCAVATION PROTECTION

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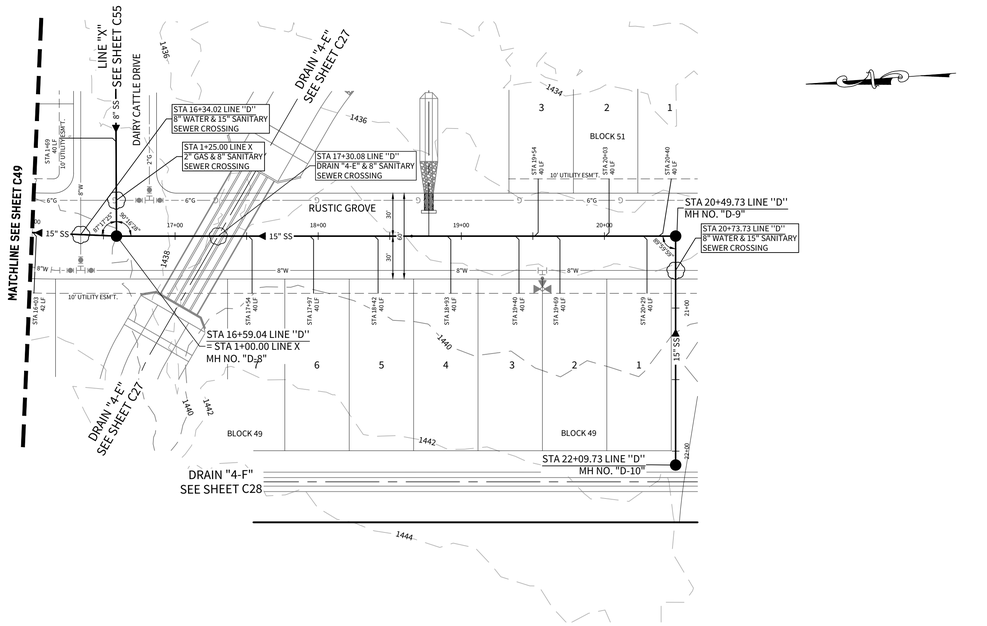
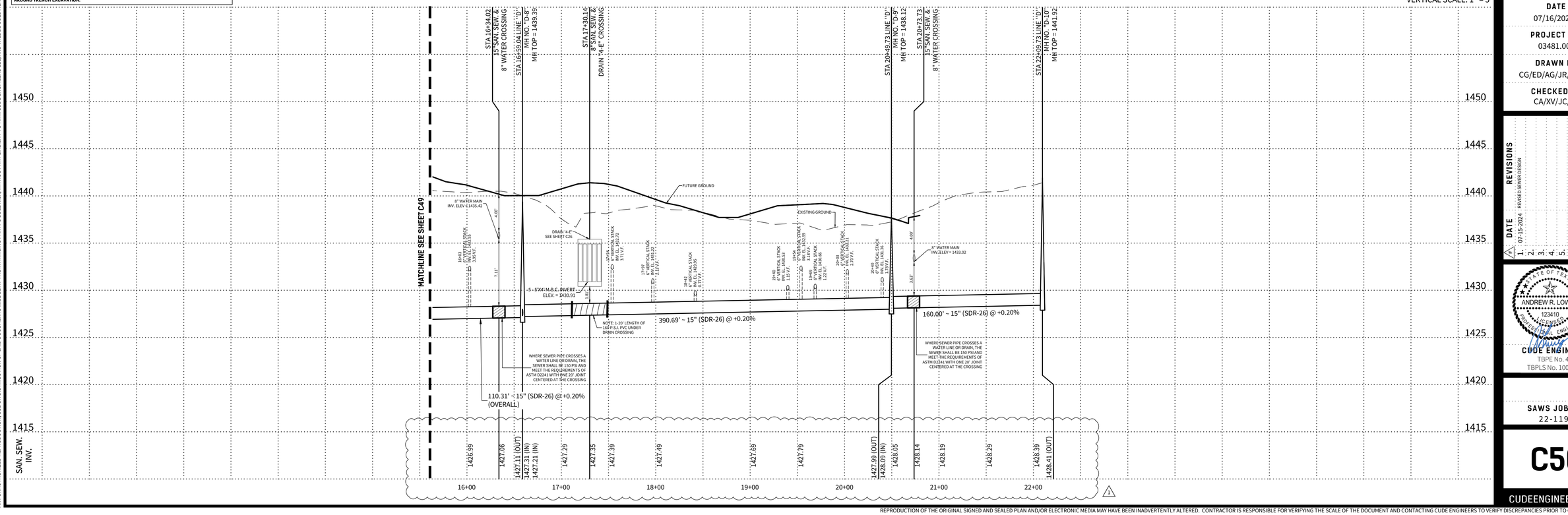


LINE "D"

STA. 16+00.00 TO STA. 22+09.73

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

SANITARY SEWER PLAN & PROFILE LINE "D"

DATE 07/16/2024

PROJECT NO. 03481.008

DRAWN BY CG/ED/AG/JR/RC/LW

CHECKED BY CA/XV/JC/AL

REVISIONS

DATE	REVISED SEWER DESIGN
07-15-2024	1 2 3 4 5 6 7 8 9

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
07/16/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO. 22-1190

C50

CUDEENGINEERS.COM

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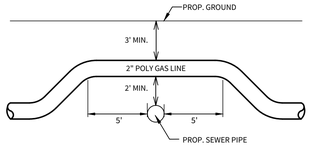
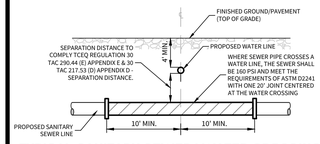


SEWER / GAS CROSSINGS DETAIL

SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) (N.T.S.)

NOTE: VERTICAL BEND IS NOT NEEDED WHEN SEWER IS DEEPER THAN 7'



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

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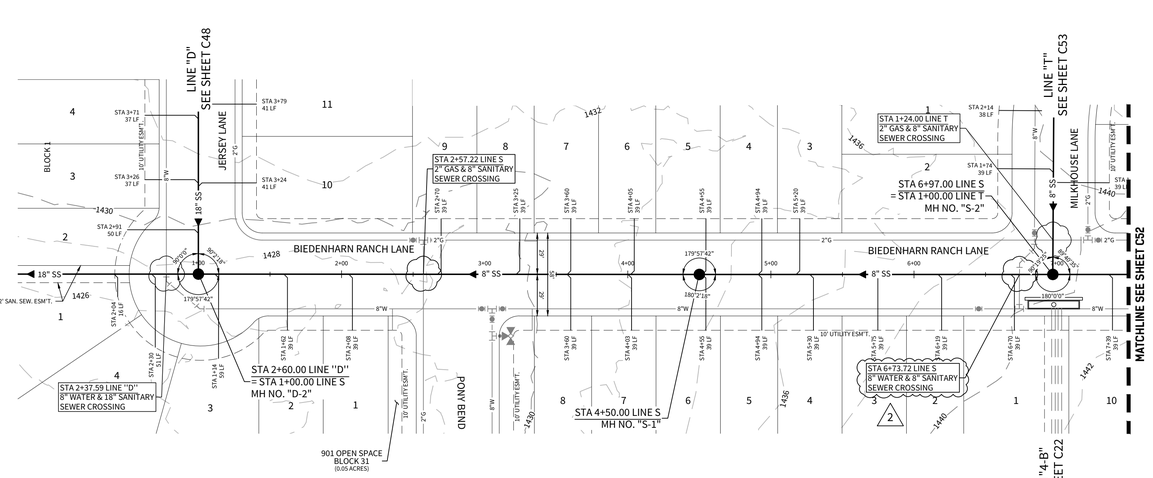
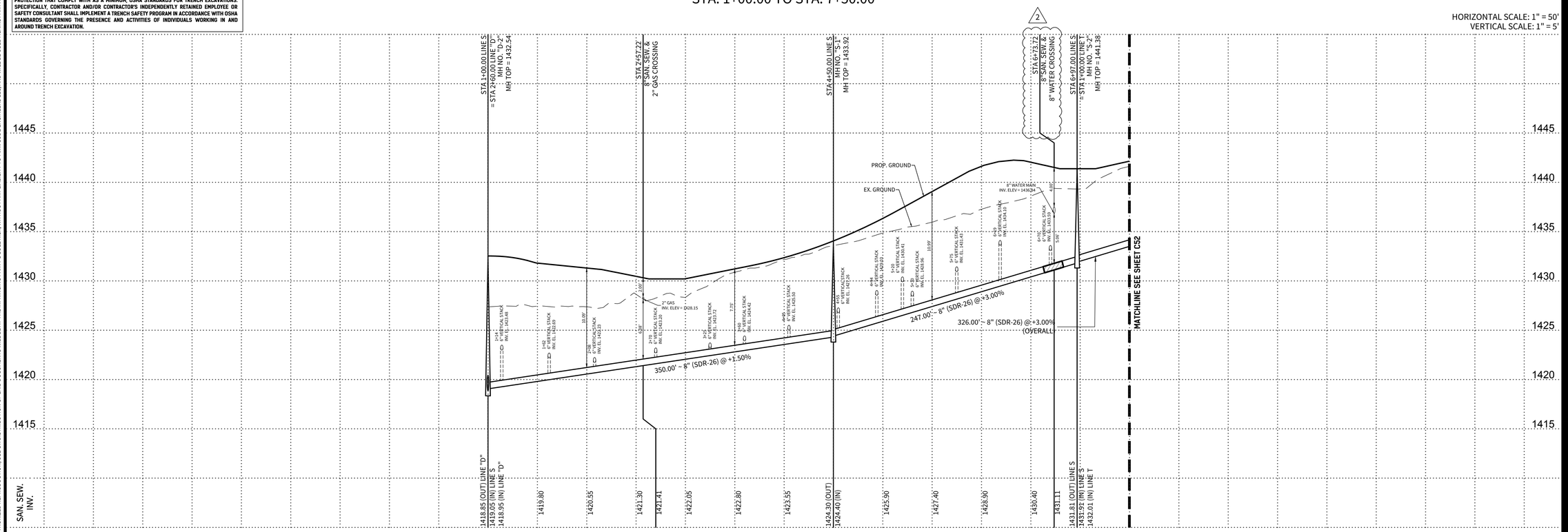


LINE S

STA. 1+00.00 TO STA. 7+50.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

SANITARY SEWER PLAN & PROFILE LINE "S"

DATE
07/16/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	
2024-07-15	1. REVISED SEWER & WATER CROSSING

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
07/16/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C51

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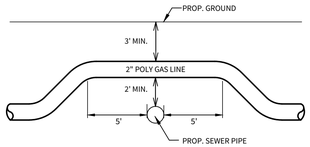

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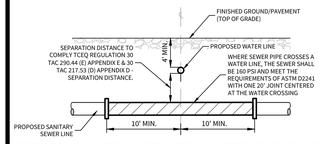

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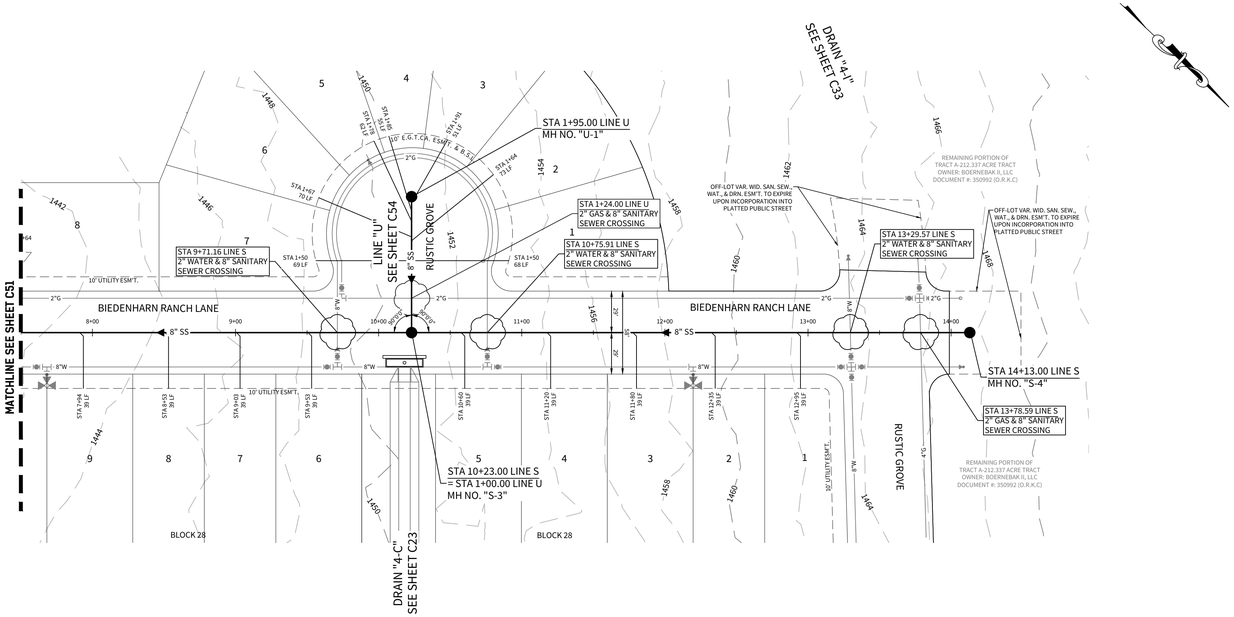
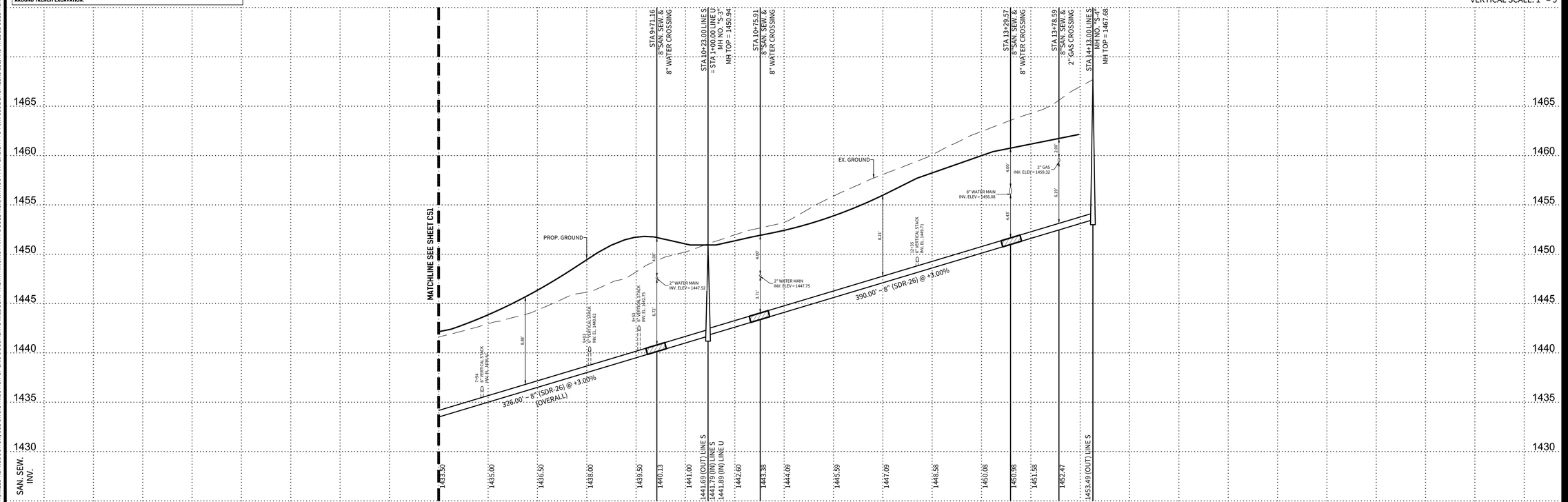


LINE S

STA. 7+50.00 TO STA. 14+13.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

SANITARY SEWER PLAN & PROFILE LINE "S"

DATE
01/30/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	1	2	3	4	5	6	7	8	9
A									

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C52

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P:\03481\000\2-Drawings\C52-SANITARY SEWER PLAN & PROFILE LINE "S".dwg 2024/01/30 10:00am bhunt

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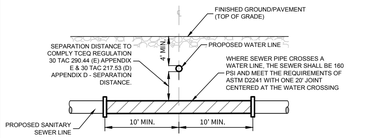

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

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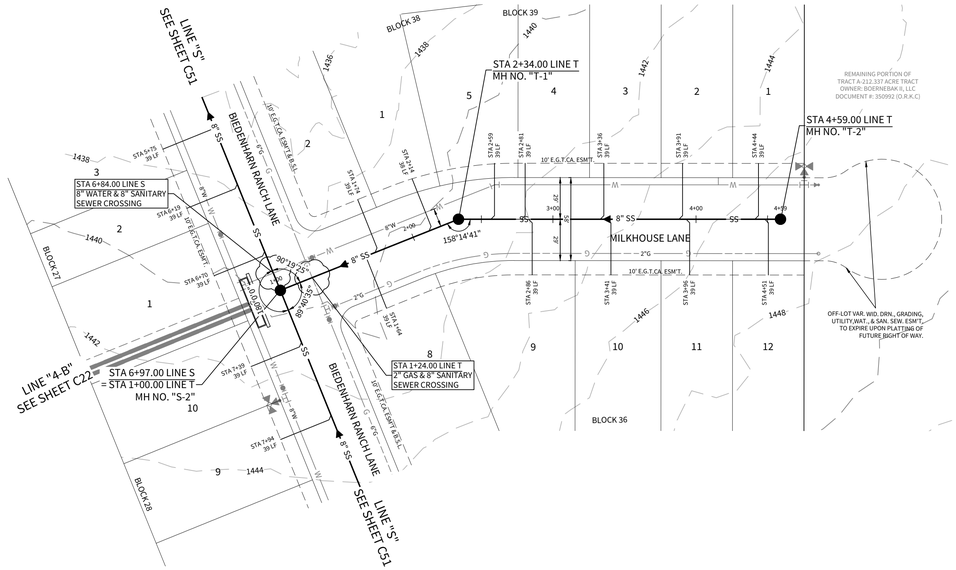
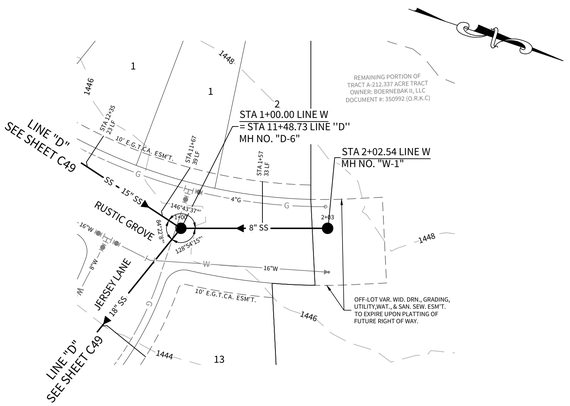


LINE T

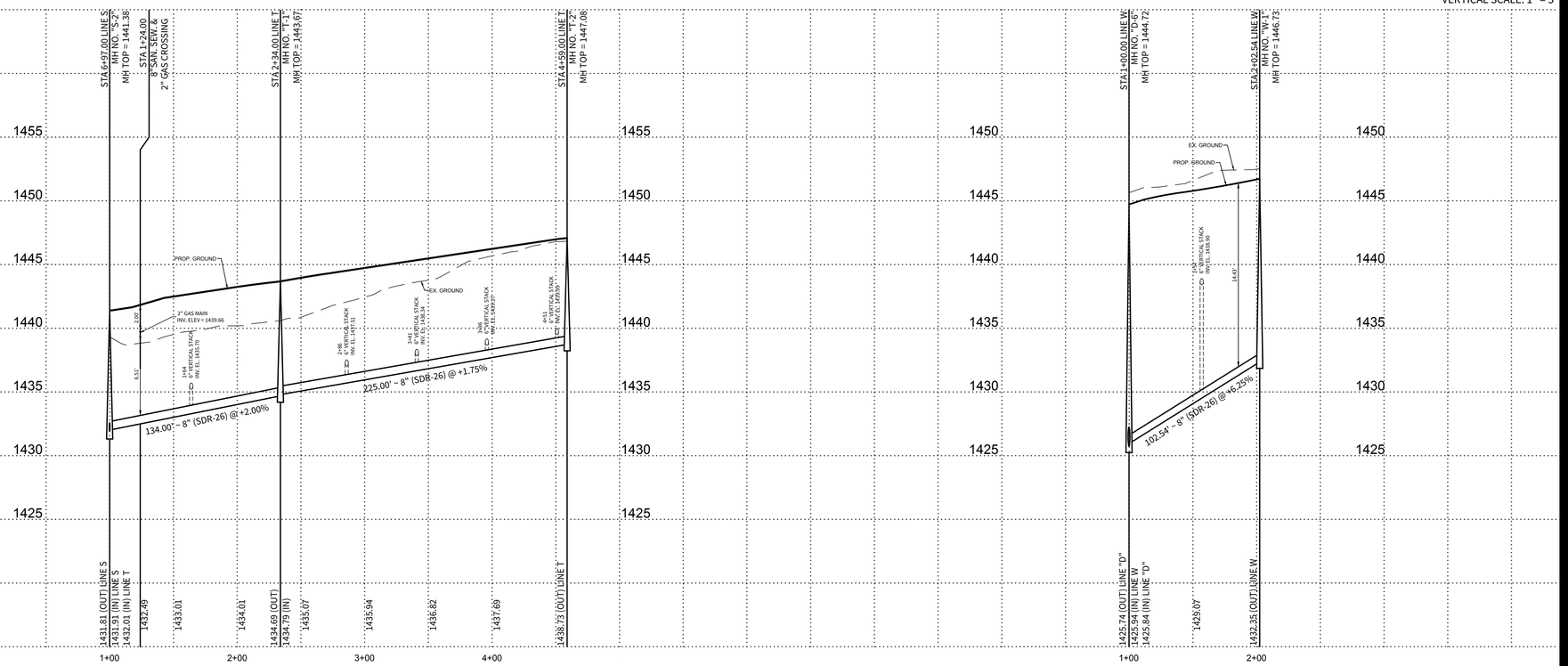
STA. 1+00.00 TO STA. 4+59.00



LINE W

STA. 1+00.00 TO STA. 2+02.54

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CUDE ENGINEERS

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San Antonio, Texas 78231
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CORLEY FARMS UNIT 4

SANITARY SEWER PLAN & PROFILE LINE "T" & "W"

DATE
01/30/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	1	2	3	4	5	6	7	8	9

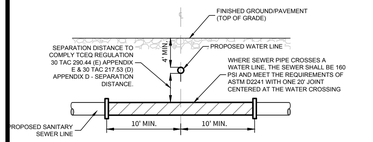
STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C53

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TEST WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE CITY OF BOERNE INSPECTOR/TEST ADMINISTER, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY CITY OF BOERNE WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
2. ALL 18" SANITARY SEWER PIPE SHALL BE SDR-26 PS115 ASTM F679.
3. ALL LATERALS SHALL BE INSTALLED AT A MINIMUM 2.0% SLOPE UNLESS OTHERWISE NOTED.

CAUTION!!

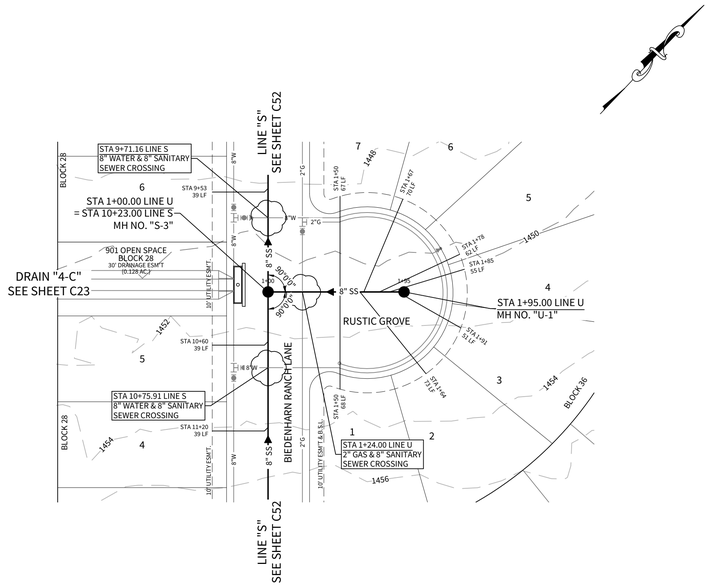
EXISTING UTILITIES ARE WITHIN THE LIMITS OF CONSTRUCTION. CONTRACTORS SHALL EXERCISE EXTRA CARE IN DIGGING ANY TRENCH FOR PROPOSED UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE, VERIFY THE EXACT LOCATION & IDENTIFY AREA OF CONFLICTS WITH EXISTING UTILITIES AND SHALL NOTIFY THE ENGINEER IF CONFLICT IS FOUND.

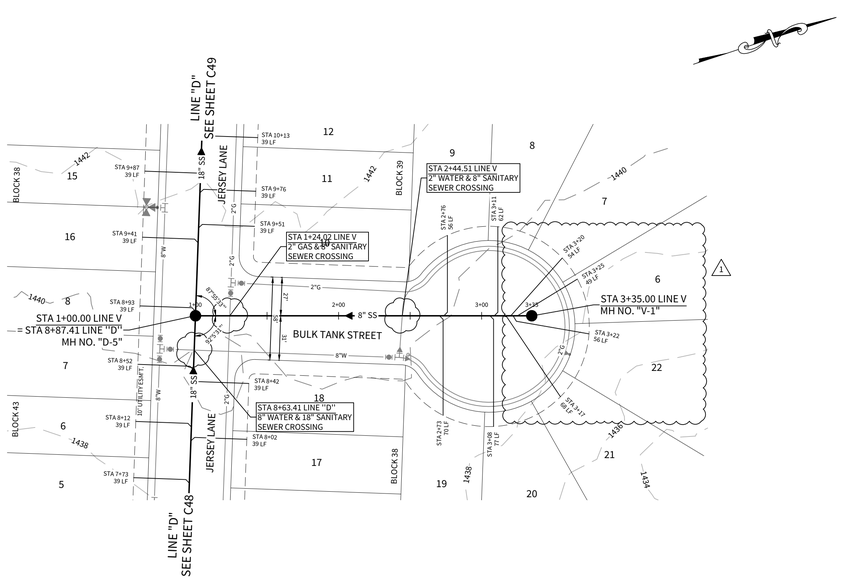
CAUTION!!

THE CONTRACTOR SHALL BE AWARE THAT OVERHEAD ELECTRIC LINES EXIST WITHIN THE VICINITY OF THE SITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.





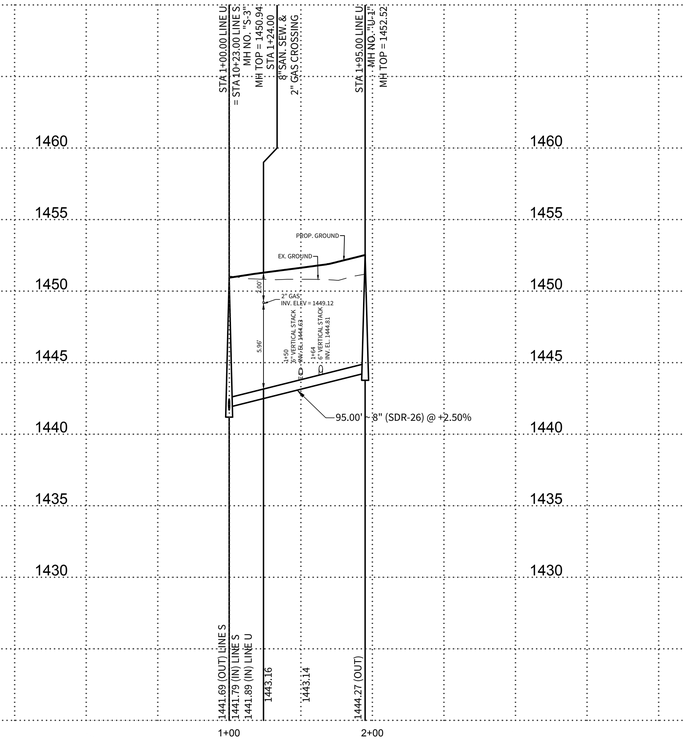
LINE U

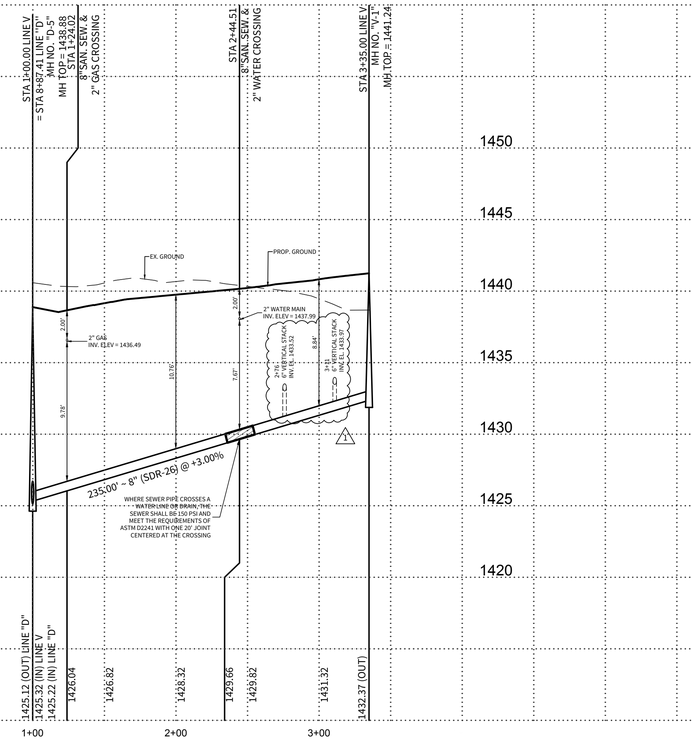
STA. 1+00.00 TO STA. 1+95.00

LINE V

STA. 1+00.00 TO STA. 3+35.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'





SAN. SEW.
INV.

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CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

SANITARY SEWER PLAN & PROFILE LINE "U" & "V"

DATE
05/08/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

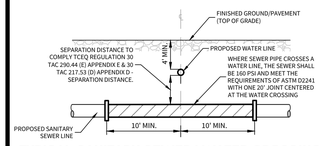
	DATE	
1	02-08-2024	REVISED SAN. SEW. LATERAL LOCATIONS

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED
PROFESSIONAL ENGINEER
05/08/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C54

P:\03481\002-Drawings\C54-SANITARY-SEWER-PLAN & PROFILE LINE "U & V".dwg 2024/05/08 11:55am EDGarcia



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

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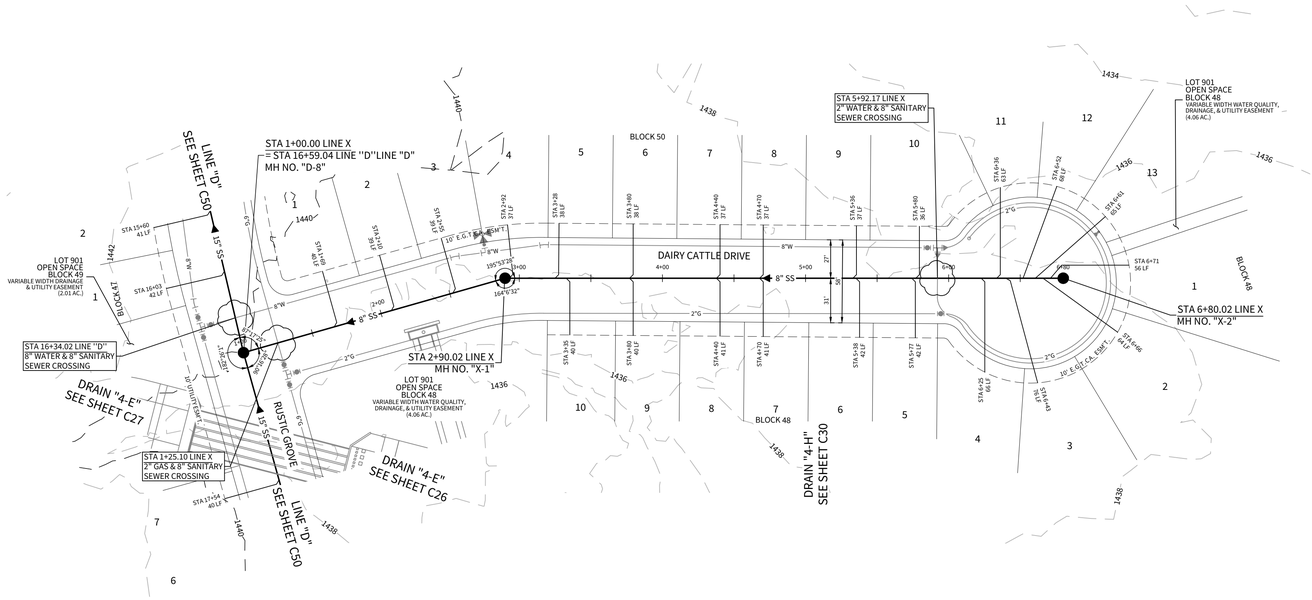
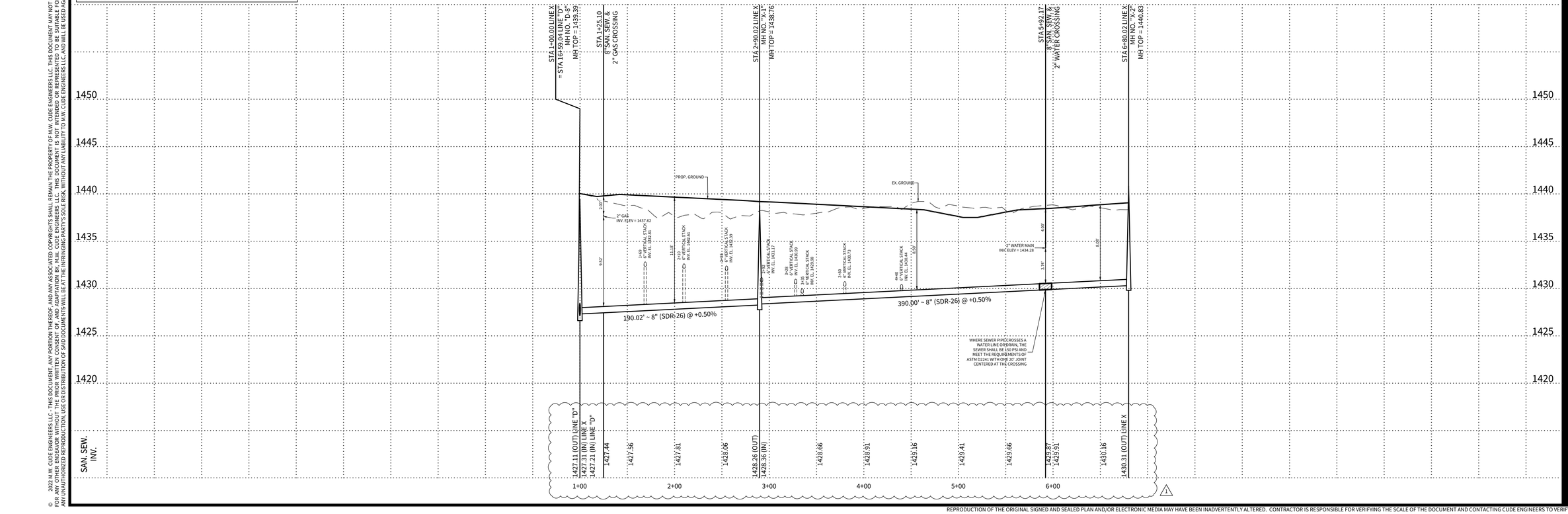


LINE X

STA. 1+00.00 TO STA. 6+80.02

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



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CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

SANITARY SEWER PLAN & PROFILE LINE "X"

DATE
07/16/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	07-15-2024	REVISED SEWER DESIGN
2.		
3.		
4.		
5.		
6.		
7.		
8.		
9.		

ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
07/16/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C55

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

P:\03481\008\3 Drawings\C55 SANITARY SEWER PLAN & PROFILE LINE "X".dwg,2024/07/16 11:33am,ESchultz

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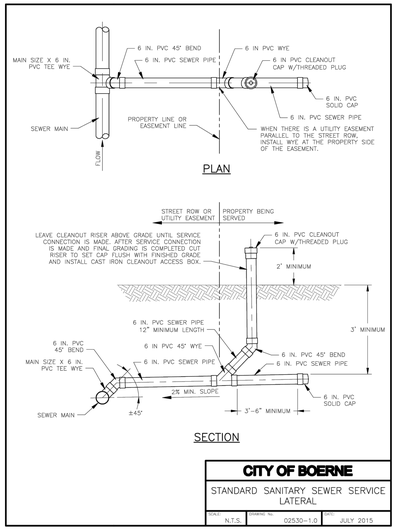
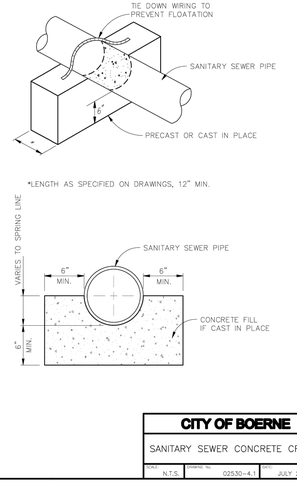


CITY OF BOERNE

STANDARD SANITARY SEWER SERVICE LATERAL

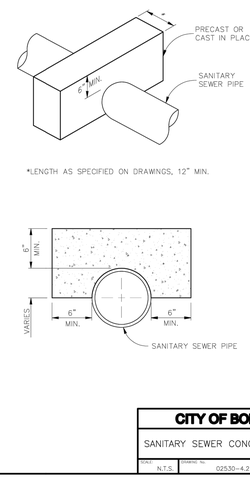
SCALE:	DRAWING No.	REV.
N.T.S.	02530-1.0	JULY 2015



CITY OF BOERNE

SANITARY SEWER CONCRETE CRADLE

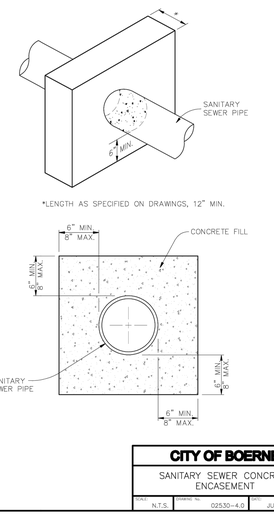
SCALE:	DRAWING No.	REV.
N.T.S.	02530-4.1	JULY 2015



CITY OF BOERNE

SANITARY SEWER CONCRETE SADDLE

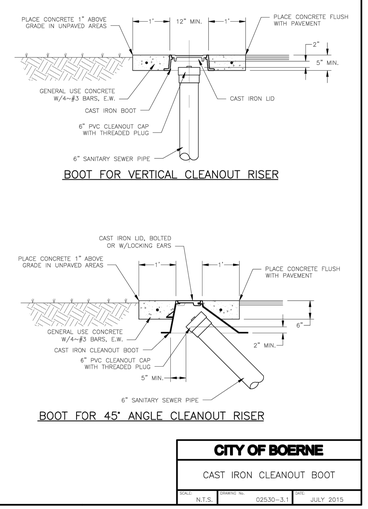
SCALE:	DRAWING No.	REV.
N.T.S.	02530-4.2	JULY 2015



CITY OF BOERNE

SANITARY SEWER CONCRETE ENCASEMENT

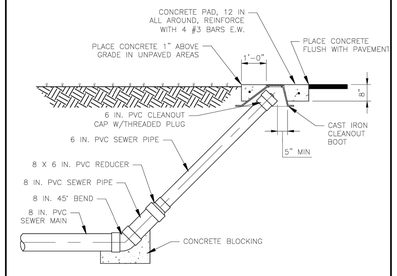
SCALE:	DRAWING No.	REV.
N.T.S.	02530-4.0	JULY 2015



CITY OF BOERNE

CAST IRON CLEANOUT BOOT

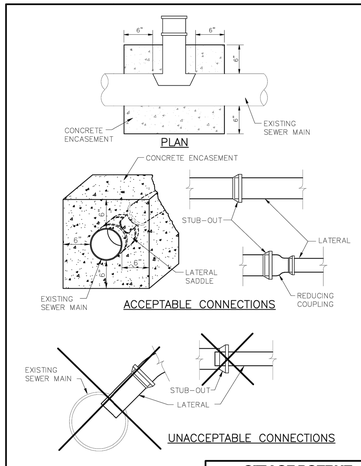
SCALE:	DRAWING No.	REV.
N.T.S.	02530-3.1	JULY 2015



CITY OF BOERNE

END OF SEWER CLEANOUT

SCALE:	DRAWING No.	REV.
N.T.S.	02530-3.0	JULY 2015

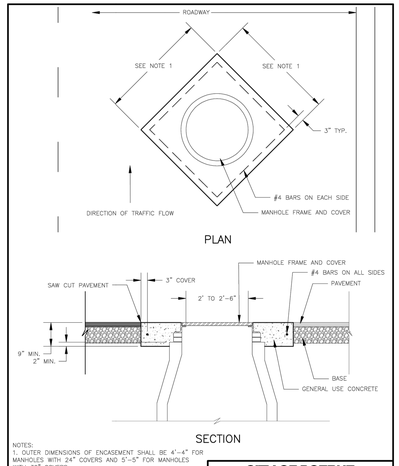


NOTE:
CONNECT THE SADDLE TO THE EXISTING MAIN PERMANENTLY USING CLAMPS AS RECOMMENDED BY THE MANUFACTURER.

CITY OF BOERNE

SANITARY SEWER SERVICE SADDLE CONNECTION

SCALE:	DRAWING No.	REV.
N.T.S.	02530-1.2	JULY 2015

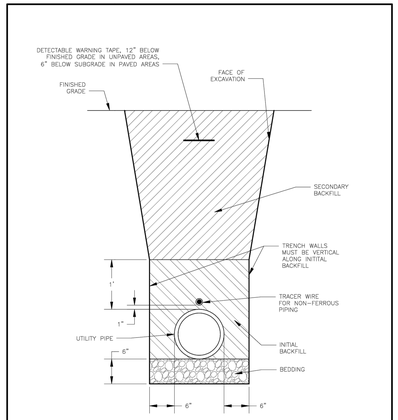


NOTES:
1. OUTER DIMENSIONS OF ENCASEMENT SHALL BE 4'-4" FOR MANHOLES WITH 24" COVERS AND 5'-5" FOR MANHOLES WITH 30" COVERS.
2. IN PAVED AREAS, SET TOP OF FRAME TO MATCH PAVEMENT GRADES AND FINISH CONCRETE FLUSH WITH TOP OF FRAME.
3. IN UNPAVED AREAS, SET TOP OF FRAME 1" TO 2" ABOVE FINISHED GRADE AND FINISH CONCRETE FLUSH WITH FINISHED GRADE.
4. CONSTRUCT CONCRETE RING ENCASEMENT ON ALL MANHOLES.

CITY OF BOERNE

MANHOLE RING ENCASEMENT

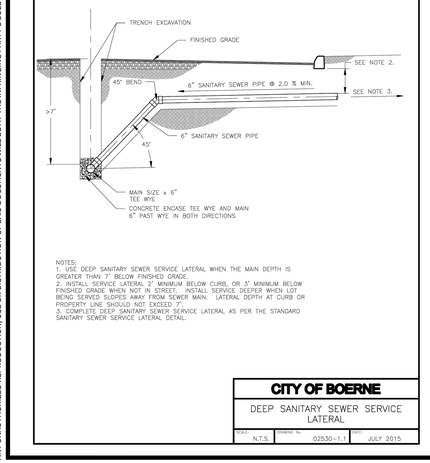
SCALE:	DRAWING No.	REV.
N.T.S.	02530-2.2	JULY 2015



CITY OF BOERNE

UTILITY PIPE TRENCH

SCALE:	DRAWING No.	REV.
N.T.S.	02221-1.0	JULY 2015

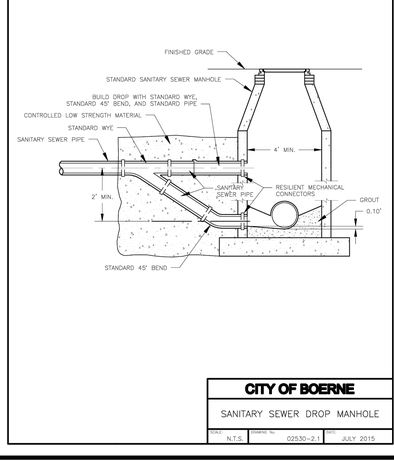


NOTES:
1. USE DEEP SANITARY SEWER SERVICE LATERAL WHEN THE MAIN DEPTH IS GREATER THAN 7' BELOW FINISHED GRADE.
2. INSTALL SERVICE LATERAL 2' MINIMUM BELOW CURB, OR 3' MINIMUM BELOW FINISHED GRADE WHEN NOT IN STREET. INSTALL SERVICE DEEPER WHEN LOT BEING SERVED SLOPES AWAY FROM SEWER MAIN. LATERAL DEPTH AT CURB OR PROPERTY LINE SHOULD NOT EXCEED 7'.
3. COMPLETE DEEP SANITARY SEWER SERVICE LATERAL AS PER THE STANDARD SANITARY SEWER SERVICE LATERAL DETAIL.

CITY OF BOERNE

DEEP SANITARY SEWER SERVICE LATERAL

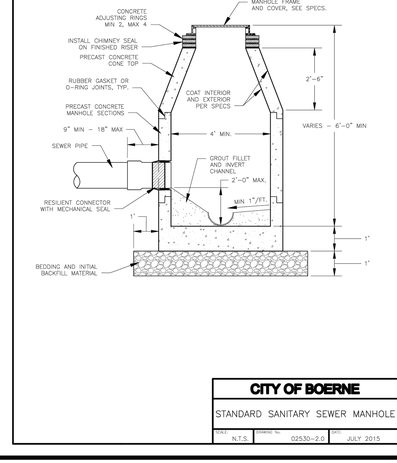
SCALE:	DRAWING No.	REV.
N.T.S.	02530-1.1	JULY 2015



CITY OF BOERNE

SANITARY SEWER DROP MANHOLE

SCALE:	DRAWING No.	REV.
N.T.S.	02530-2.1	JULY 2015



CITY OF BOERNE

STANDARD SANITARY SEWER MANHOLE

SCALE:	DRAWING No.	REV.
N.T.S.	02530-2.0	JULY 2015

CUDEENGINEERS.COM

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San Antonio, Texas 78231
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CORLEY FARMS UNIT 4

SANITARY SEWER STANDARD DETAILS

DATE
01/30/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

A	1	2	3	4	5	6	7	8	9
DATE									

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
ON 02/09/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C56

CUDEENGINEERS.COM

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LEGEND

- W/W — = 3/4" PROPOSED WATER SERVICE WITH 5/8" METER
- W/W — = 3/4" EXISTING WATER SERVICE WITH 5/8" METER
- 3/4" IRRIG. — = 3/4" IRRIGATION SERVICE WITH 3/4" METER
- XXX L.F. - XX" PVC-C900 — = PROPOSED WATER MAIN
- = EXISTING WATER MAIN
- = EXISTING SANITARY SEWER
- X X — = JOINT RESTRAINT
- = JOINT RESTRAINT ENTIRE LENGTH
- = PROPOSED SEWER LINE AND MANHOLE

THRUST BLOCKING NOTE

ANCHORAGE/ THRUST BLOCKING AND JOINT RESTRAINTS SHALL BE DONE IN ACCORDANCE WITH SAWS STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION (ITEM NO. 839)

TRENCH EXCAVATION PROTECTION

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PRESSURE ZONE 12

Developer's Name	PULTE HOMES OF TEXAS, L.P.		
Developer's Address	1718 DRY CREEKWAY, SUITE 120		
City	SAN ANTONIO	**State** TEXAS	**Zip** 78259
Phone #	(210) 496-1985	**Fax #**	(210) 496-0449
SAWS Block Map #	XXX-XXX	**Total EDU's** 125	**Total Acreage** 35.80
Total Linear Footage of Pipe	16" W - 1,567 L.F. / 8" W - 4,363 L.F. / 2" W - 1,096 L.F.	**Plat No.**	N/A (CORLEY FARMS UNIT 4 PLAT)
Number of Lots	119	**SAWS Job No.**	22-1190

SAWS CONSTRUCTION NOTES
COUNTER PERMIT AND GENERAL CONSTRUCTION PERMIT *REVISED JULY 2022*

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SAN ANTONIO WATER SYSTEM (SAWS) AND COMPLY WITH THE PLANS, SPECIFICATIONS, GENERAL CONDITIONS AND WITH THE FOLLOWING AS APPLICABLE
   A. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30 PART 1 CHAPTER 217 AND "PUBLIC DRINKING WATER", TAC TITLE 30 PART 1 CHAPTER 290.
   B. CURRENT TXDOT "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".
   C. CURRENT "SAN ANTONIO WATER SYSTEM STANDARD SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION".
   D. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION".
   E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL" (UECM).
2. THE CONTRACTOR SHALL NOT PROCEED WITH ANY PIPE INSTALLATION WORK UNTIL THEY OBTAIN A COPY OF THE APPROVED COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP) FROM THE CONSULTANT AND HAS BEEN NOTIFIED BY SAWS CONSTRUCTION INSPECTION DIVISION TO PROCEED WITH THE WORK AND HAS ARRANGED A MEETING WITH THE INSPECTOR AND CONSULTANT FOR THE WORK REQUIREMENTS. WORK COMPLETED BY THE CONTRACTOR WITHOUT AN APPROVED COUNTER PERMIT AND/OR A GCP WILL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTORS AND/OR THE DEVELOPER.
3. THE CONTRACTOR SHALL OBTAIN THE SAWS STANDARD DETAILS FROM THE SAWS WEBSITE, HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPECS. UNLESS OTHERWISE NOTED WITHIN THE DESIGN PLANS.
4. THE CONTRACTOR IS TO MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT (210) 233-2973, ON NOTIFICATION PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO BEGINNING ANY WORK.
5. LOCATION AND DEPTH OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 1 WEEK PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES AT LEAST 1-2 WEEKS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS FACILITIES. THE FOLLOWING CONTACT INFORMATION ARE SUPPLIED FOR VERIFICATION PURPOSES:
   - SAWS UTILITY LOCATES: HTTP://WWW.SAWS.ORG/SERVICE/LOCATES
   - COSA DRAINAGE (210) 207-0724 OR (210) 207-6026
   - COSA TRAFFIC SIGNAL OPERATIONS (210) 206-8480
   - COSA TRAFFIC SIGNAL DAMAGES (210) 207-3951
   - TEXAS STATE WIDE ONE CALL LOCATOR 1-800-545-6005 OR 811
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION IF DAMAGES ARE MADE AS A RESULT OF THE PROJECT'S CONSTRUCTION.
8. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) AND/OR BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS.
9. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
10. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.
11. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTWORKREQ@SAWS.ORG.
    WEEKEND WORK: CONTRACTORS ARE REQUIRED TO NOTIFY THE SAWS INSPECTION CONSTRUCTION DEPARTMENT 48 HOURS IN ADVANCE TO REQUEST WEEKEND WORK. REQUEST SHOULD BE SENT TO CONSTWORKREQ@SAWS.ORG.
    ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.
12. COMPACTION NOTE (ITEM 804): THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING THE COMPACTION REQUIREMENTS ON ALL TRENCH BACKFILL AND FOR PAYING FOR THE TESTS PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED, OR AS INDICATED BY THE SAWS INSPECTOR AND/OR THE TEST ADMINISTRATOR, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.
13. A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO SAWS CONSTRUCTION INSPECTION DIVISION.

WATER SECTION

1. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT LEAST ONE WEEK IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO THE TIE-INS; THIS IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY.
   - FOR WATER MAINS 12" OR HIGHER: SAWS EMERGENCY OPERATIONS CENTER (210) 233-2014
2. ASBESTOS CEMENT (AC) PIPE, ALSO KNOWN AS TRANSITE PIPE WHICH IS KNOWN TO CONTAIN ASBESTOS- CONTAINING MATERIAL (ACM), MAY BE LOCATED WITHIN THE PROJECT LIMITS. SPECIAL WASTE MANAGEMENT PROCEDURES AND HEALTH AND SAFETY REQUIREMENTS WILL BE APPLICABLE WHEN REMOVAL AND/OR DISTURBANCE OF THIS PIPE OCCURS. SUCH WORK IS TO BE MADE UNDER SPECIAL SPECIFICATION ITEM NO. 3000, "SPECIAL SPECIFICATION FOR HANDLING ASBESTOS CEMENT PIPE".
3. VALVE REMOVAL: WHERE THE CONTRACTOR IS TO ABANDON A WATER MAIN, THE CONTROL VALVE LOCATED ON THE ABANDONING BRANCH WILL BE REMOVED AND REPLACED WITH A CAP/PLUG. (NSPI)
4. SUITABLE ANCHORAGE/THRUST BLOCKING OR JOINT RESTRAINT SHALL BE PROVIDED AT ALL OF THE FOLLOWING MAIN LOCATIONS: DEAD ENDS, PLUGS, CAPS, TEES, CROSSES, VALVES, AND BENDS, IN ACCORDANCE WITH THE STANDARD DRAWINGS DD-839 SERIES AND ITEM NO. 839, IN THE SAWS STANDARD SPECIFICATIONS FOR CONSTRUCTION.
5. ALL VALVES SHALL READ "OPEN RIGHT".
6. PRVS REQUIRED: CONTRACTOR TO VERIFY THAT NO PORTION OF THE TRACT IS BELOW GROUND ELEVATION OF 1425 FEET WHERE THE STATIC PRESSURE WILL NORMALLY EXCEED 80 PSI. AT ALL SUCH LOCATIONS WHERE THE GROUND LEVEL IS BELOW 1425 FEET, THE DEVELOPER OR BUILDER SHALL INSTALL AT EACH LOT, ON THE CUSTOMER'S SIDE OF THE METER, AN APPROVED TYPE PRESSURE REGULATOR IN CONFORMANCE WITH THE PLUMBING CODE OF THE CITY OF SAN ANTONIO. NO DUAL SERVICES ALLOWED FOR ANY LOT(S) IF "PRV IS/ARE REQUIRED FOR SUCH LOT(S), ONLY SINGLE SERVICE CONNECTIONS SHALL BE ALLOWED. "NOTE: A PRESSURE REGULATOR IS ALSO KNOWN AS A PRESSURE REDUCING VALVE (PRV).
7. PIPE DISINFECTION WITH DRY HTH FOR PROJECTS LESS THAN 800 LINEAR FEET. (ITEM NO. 847.3): MAINS SHALL BE DISINFECTED WITH DRY HTH WHERE SHOWN IN THE CONTRACT DOCUMENTS OR AS DIRECTED BY THE INSPECTOR, AND SHALL NOT EXCEED A TOTAL LENGTH OF 800 FEET. THIS METHOD OF DISINFECTION WILL ALSO BE FOLLOWED FOR MAIN REPAIRS. THE CONTRACTOR SHALL UTILIZE ALL APPROPRIATE SAFETY MEASURE TO PROTECT HIS PERSONNEL DURING DISINFECTION OPERATIONS.
8. BACKFLOW PREVENTION DEVICES:
   - ALL IRRIGATION SERVICES WITHIN RESIDENTIAL AREAS ARE REQUIRED TO HAVE BACKFLOW PREVENTION DEVICES.
   - ALL COMMERCIAL BACKFLOW PREVENTION DEVICES MUST BE APPROVED BY SAWS PRIOR TO INSTALLATION.
9. FINAL CONNECTION TO THE EXISTING WATER MAIN SHALL NOT BE MADE UNTIL THE WATER MAIN HAS BEEN PRESSURE TESTED, CHLORINATED, AND SAWS HAS RELEASED THE MAIN FOR TIE-IN AND USE.
10. DIVISION VALVES: DIVISION VALVES SHOWN ON PLANS OR NOT SHOWN ON PLANS BUT FOUND IN THE FIELD SHALL ONLY BE OPERATED BY SAWS DISTRIBUTION AND COLLECTION STAFF AND ONLY WITH PRIOR WRITTEN APPROVAL OF THE SAWS DIRECTOR OF PRODUCTION AND OPERATIONS AND PROPER COORDINATION WITH ALL SAWS DEPARTMENTS. CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO THE INSPECTOR A MINIMUM OF TWO WEEKS IN ADVANCE TO START THE COORDINATION PROCESS AND WILL BE INFORMED BY THE INSPECTOR WHEN THE DIVISION VALVE WILL BE OPERATED BY THE SAWS DISTRIBUTION AND COLLECTION STAFF. THE DIVISION VALVE CAN ONLY BE OPERATED BY SAWS DISTRIBUTION AND COLLECTION STAFF MEMBER NOT THE INSPECTOR OR THE CONTRACTOR. OPERATION OF A DIVISION VALVE WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE SAWS DISTRIBUTION AND COLLECTION STAFF WILL CONSTITUTE A MATERIAL BREACH OF ANY WRITTEN SAWS CONTRACT OR PERMIT IN ADDITION TO SUBJECTING THE CONTRACTOR TO LIABILITY FOR ANY AND ALL FINES, FEES, OR OTHER DAMAGES, DIRECT OR CONSEQUENTIAL, THAT MAY ARISE FROM OR BE CAUSED BY THE OPERATION OF THE VALVE WITHOUT PRIOR WRITTEN PERMISSION. PLEASE BE INFORMED THAT THE APPROVAL OF THE OPERATION OR OPENING OR CLOSING OF A DIVISION VALVE CAN TAKE SEVERAL WEEKS FOR APPROVAL. DIVISION VALVES WILL ALSO HAVE A VALVE LID LABELED DIVISION VALVE AND A LOCKING MECHANISM INSTALLED WITH A KEY. THE LOCK AND KEY MECHANISM WILL BE PAID FOR BY THE CONTRACTOR BUT WILL BE INSTALLED BY SAWS DISTRIBUTION AND COLLECTION STAFF.
11. ALL METERS SHALL BE 5/8", UNLESS OTHERWISE NOTED.
12. ALL PIPES SHALL BE C-900, CLASS 235 DR 18, UNLESS OTHERWISE NOTED.

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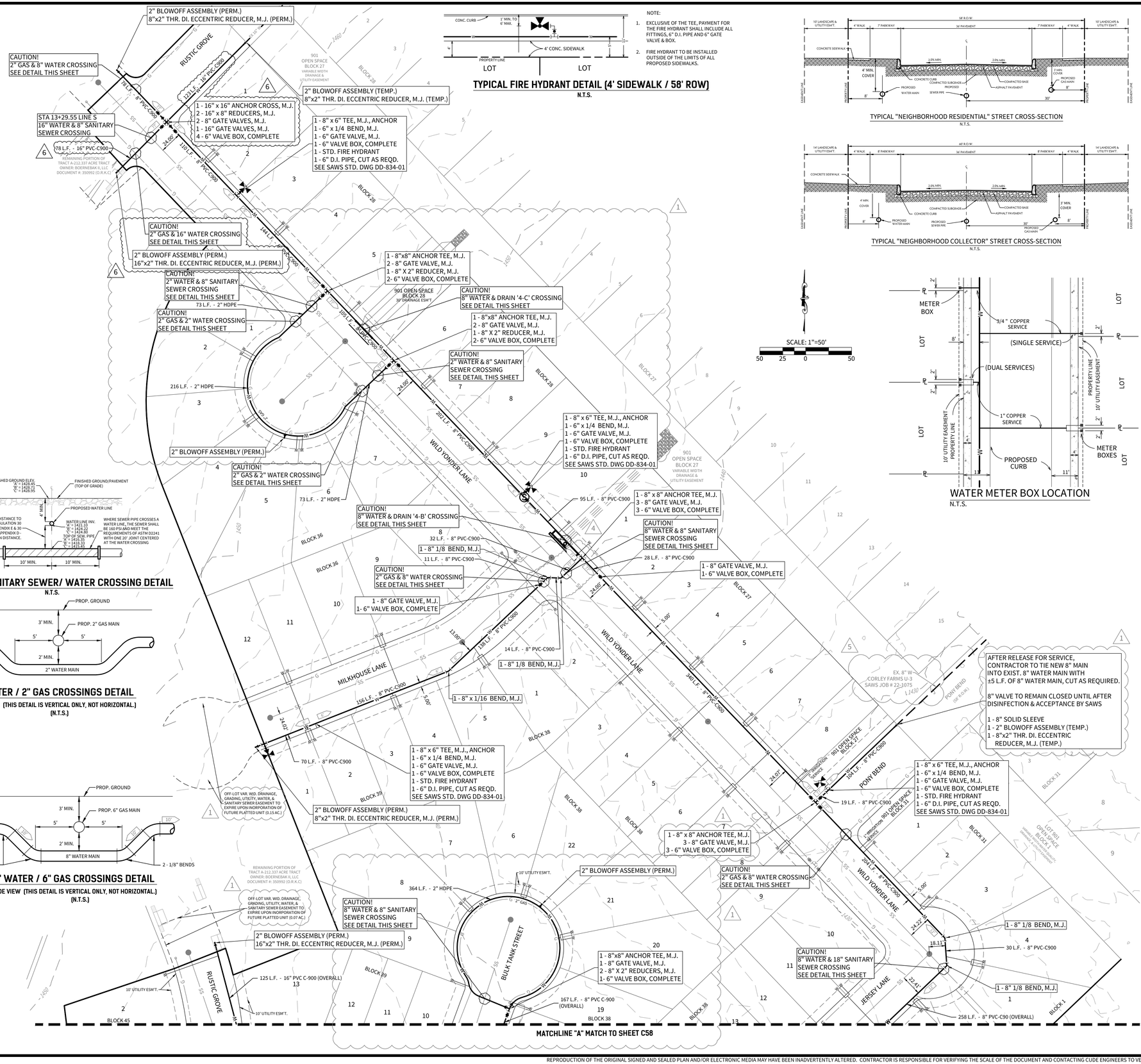


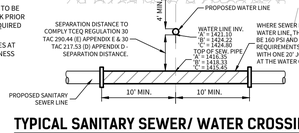
NOTE:
1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 58' ROW)
N.T.S.

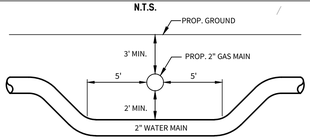
TYPICAL "NEIGHBORHOOD RESIDENTIAL" STREET CROSS-SECTION
N.T.S.

TYPICAL "NEIGHBORHOOD COLLECTOR" STREET CROSS-SECTION
N.T.S.

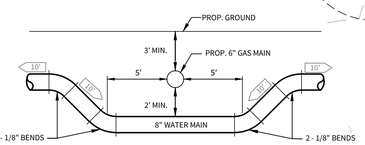
WATER METER BOX LOCATION
N.T.S.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.



2" WATER / 2" GAS CROSSINGS DETAIL
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.)
(N.T.S.)



8" WATER / 6" GAS CROSSINGS DETAIL
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.)
(N.T.S.)

AFTER RELEASE FOR SERVICE, CONTRACTOR TO TIE NEW 8" MAIN INTO EXIST. 8" WATER MAIN WITH ±5 L.F. OF 8" WATER MAIN, CUT AS REQUIRED.

8" VALVE TO REMAIN CLOSED UNTIL AFTER DISINFECTION & ACCEPTANCE BY SAWS

1 - 8" SOLID SLEEVE
1 - 2" BLOWOFF ASSEMBLY (TEMP.)
1 - 8"x2" THR. DI. ECCENTRIC REDUCER, M.J. (TEMP.)

CUDEENGINEERS.COM
CUDE ENGINEERS
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

WATER DISTRIBUTION PLAN

DATE
08/26/2025

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	2022-10-13	SAWS COMMENTS
2.	2023-02-15	SAWS COMMENTS
3.	2023-05-16	SAWS COMMENTS
4.	2024-07-15	COA COMMENT TO MOVE WATER TIE
5.	2025-04-09	SAWS COMMENTS
6.	2025-05-08	UPDATED WATER CROSSING
7.		
8.		
9.		

STATE OF TEXAS — ANDREW R. LOWRY — 123410 — LICENSED PROFESSIONAL ENGINEER — 08/29/2025

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

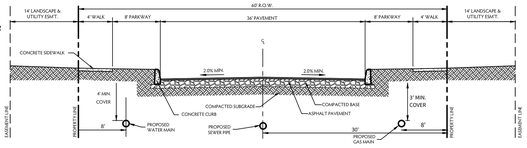
C57

CUDEENGINEERS.COM
REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

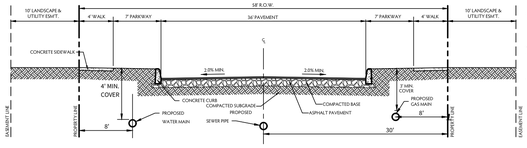
P:\03481\000\2-Drawings\CS\1 WATERDISTRIBUTION\PLANS\Proj 22-1190.dwg 2:33pm 11/3/2025

LEGEND

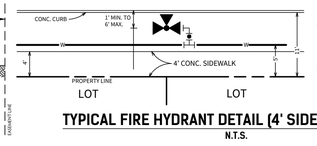
- = 3/4" PROPOSED WATER SERVICE WITH 5/8" METER
- = 3/4" EXISTING WATER SERVICE WITH 5/8" METER
- 3/4" IRRIG. = 3/4" IRRIGATION SERVICE WITH 3/4" METER
- XXX L.F. - XX" PVC C-900 = PROPOSED WATER MAIN
- = EXISTING WATER MAIN
- = EXISTING SANITARY SEWER
- X" X" = JOINT RESTRAINT
- = JOINT RESTRAINT ENTIRE LENGTH
- = PROPOSED SEWER LINE AND MANIFOLE



TYPICAL "NEIGHBORHOOD COLLECTOR" STREET CROSS-SECTION
N.T.S.



TYPICAL "NEIGHBORHOOD RESIDENTIAL" STREET CROSS-SECTION
N.T.S.



NOTE:
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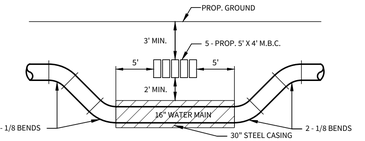
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 58' ROW)
N.T.S.



16" WATER / DRAIN "E" CROSSINGS DETAIL
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.)

THRUST BLOCKING NOTE

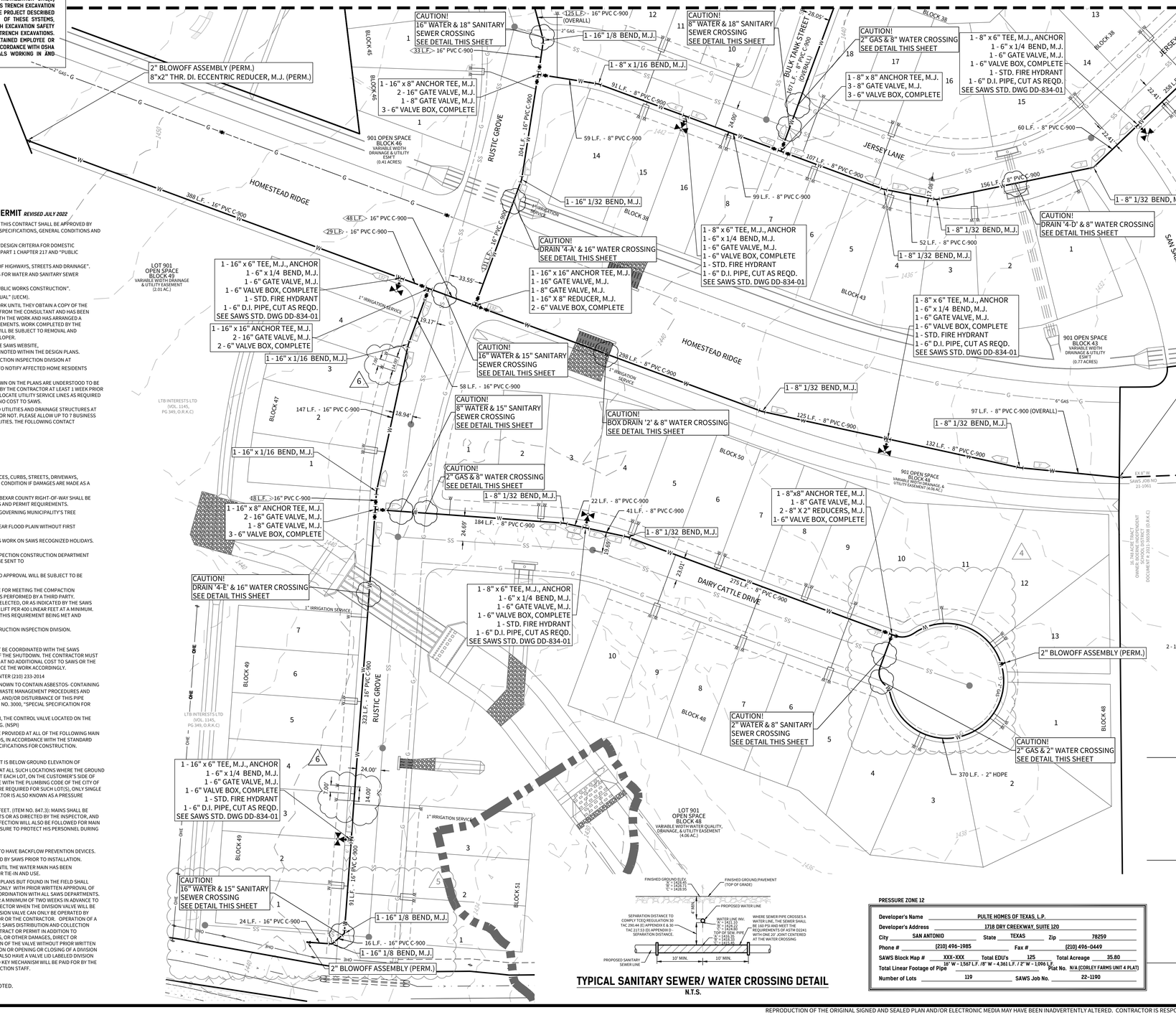
ANCHORAGE/ THRUST BLOCKING AND JOINT RESTRAINTS SHALL BE DONE IN ACCORDANCE WITH SAWS STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION (ITEM NO. 839)

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

MATCHLINE "A" MATCH TO SHEET C57

SCALE: 1"=50'
50 25 0 50


2" BLOWOFF ASSEMBLY (PERM.)
8"x2" THR. DI. ECCENTRIC REDUCER, M.J. (PERM.)
1 - 16" x 8" ANCHOR TEE, M.J.
2 - 16" GATE VALVE, M.J.
1 - 8" GATE VALVE, M.J.
3 - 6" VALVE BOX, COMPLETE
901 OPEN SPACE BLOCK 46 VARIABLE WIDTH DRAINAGE & UTILITY ESMT (0.41 ACRES)
HOMESTEAD RIDGE
RUSTIC GROVE
JERSEY LANE
SAN SABA WAY
DAIRY CATTLE DRIVE
BULK TANK STREET
LOT 901 OPEN SPACE BLOCK 49 VARIABLE WIDTH DRAINAGE & UTILITY EASEMENT (2.01 AC.)
LOT 901 OPEN SPACE BLOCK 48 VARIABLE WIDTH WATER QUALITY, DRAINAGE, & UTILITY EASEMENT (4.06 AC.)
901 OPEN SPACE BLOCK 43 VARIABLE WIDTH DRAINAGE & UTILITY ESMT (0.77 ACRES)
901 OPEN SPACE BLOCK 49 VARIABLE WIDTH DRAINAGE & UTILITY EASEMENT (4.06 AC.)
LTB INTERESTS LTD (VOL. 1145, PG 349, O.R.K.C)
16.744 ACRE TRACT OWNER: BOERNE INDEPENDENT SCHOOL DISTRICT DOCUMENT # 2021-160508 (O.R.K.C)
CAUTION! 16" WATER & 18" SANITARY SEWER CROSSING SEE DETAIL THIS SHEET
CAUTION! 8" WATER & 18" SANITARY SEWER CROSSING SEE DETAIL THIS SHEET
CAUTION! 2" GAS & 8" WATER CROSSING SEE DETAIL THIS SHEET
CAUTION! DRAIN '4-A' & 16" WATER CROSSING SEE DETAIL THIS SHEET
CAUTION! DRAIN '4-A' & 8" WATER CROSSING SEE DETAIL THIS SHEET
CAUTION! 16" WATER & 15" SANITARY SEWER CROSSING SEE DETAIL THIS SHEET
CAUTION! 8" WATER & 15" SANITARY SEWER CROSSING SEE DETAIL THIS SHEET
CAUTION! BOX DRAIN '2' & 8" WATER CROSSING SEE DETAIL THIS SHEET
CAUTION! 2" GAS & 8" WATER CROSSING SEE DETAIL THIS SHEET
CAUTION! DRAIN '4-E' & 16" WATER CROSSING SEE DETAIL THIS SHEET
CAUTION! 2" WATER & 8" SANITARY SEWER CROSSING SEE DETAIL THIS SHEET
CAUTION! 2" GAS & 2" WATER CROSSING SEE DETAIL THIS SHEET
1 - 16" x 6" TEE, M.J., ANCHOR 1 - 6" x 1/4 BEND, M.J. 1 - 6" GATE VALVE, M.J. 1 - 6" VALVE BOX, COMPLETE 1 - STD. FIRE HYDRANT 1 - 6" D.I. PIPE, CUT AS REQD. SEE SAWS STD. DWG DD-834-01
1 - 16" x 16" ANCHOR TEE, M.J. 1 - 16" GATE VALVE, M.J. 1 - 8" GATE VALVE, M.J. 1 - 16" X 8" REDUCER, M.J. 2 - 6" VALVE BOX, COMPLETE
1 - 8" x 6" TEE, M.J., ANCHOR 1 - 6" x 1/4 BEND, M.J. 1 - 6" GATE VALVE, M.J. 1 - 6" VALVE BOX, COMPLETE 1 - STD. FIRE HYDRANT 1 - 6" D.I. PIPE, CUT AS REQD. SEE SAWS STD. DWG DD-834-01
1 - 8" x 8" ANCHOR TEE, M.J. 3 - 8" GATE VALVE, M.J. 3 - 6" VALVE BOX, COMPLETE
1 - 8"x8" ANCHOR TEE, M.J. 1 - 8" GATE VALVE, M.J. 2 - 8" X 2" REDUCERS, M.J. 1- 6" VALVE BOX, COMPLETE
1 - 8" x 6" TEE, M.J., ANCHOR 1 - 6" x 1/4 BEND, M.J. 1 - 6" GATE VALVE, M.J. 1 - 6" VALVE BOX, COMPLETE 1 - STD. FIRE HYDRANT 1 - 6" D.I. PIPE, CUT AS REQD. SEE SAWS STD. DWG DD-834-01

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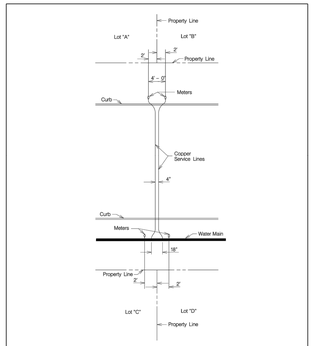
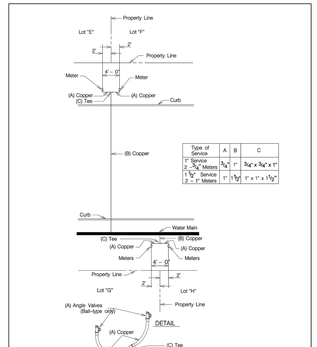


SINGLE SERVICE LINE – SINGLE METER

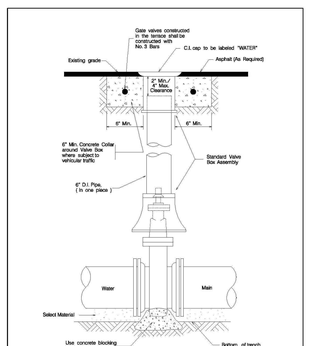
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL SERVICE ARRANGEMENT	March 2006	
		DD–824–05	SHEET 1 of 3



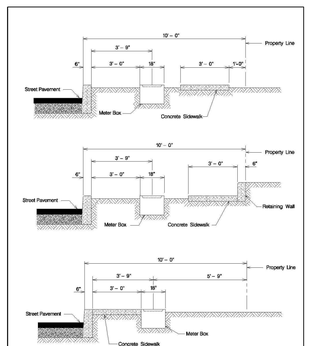
Type of Service	A	B	C
1" Service 2 – ¾" Meters	¾"	1"	¾"x"x¾"x1"
1 ½" Service 2 – 1" Meters	1"	1½"	1"x1"x1½"

SINGLE SERVICE LINE – DUAL METER

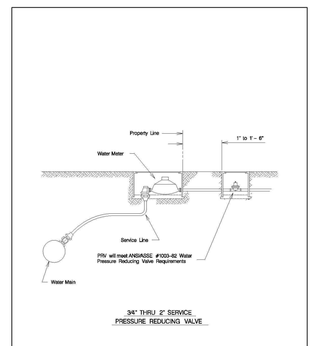
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL SERVICE ARRANGEMENT	March 2006	
		DD–824–05	SHEET 2 of 3



PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	INSTALLATION OF NON-GEARED GATE VALVE WITH VALVE BOX AND EXTENSION	March 2006	
		DD–828–01	SHEET 1 of 1



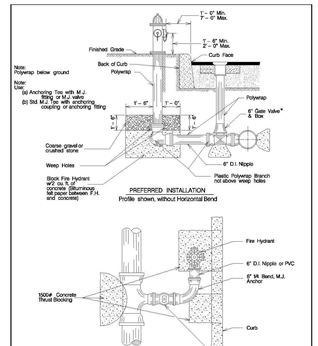
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL METER BOX LOCATION (RESIDENTIAL)	March 2006	
		DD–833–01	SHEET 1 of 1



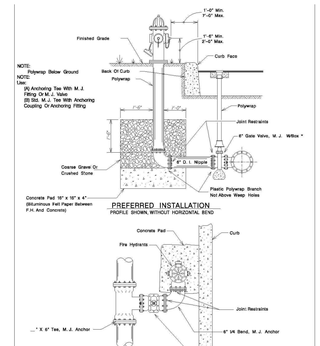
¾" THRU 2" SERVICE
PRESSURE REDUCING VALVE

Note:
For Tapping Schedule, See DD-30-00 Sheet 3 of 3

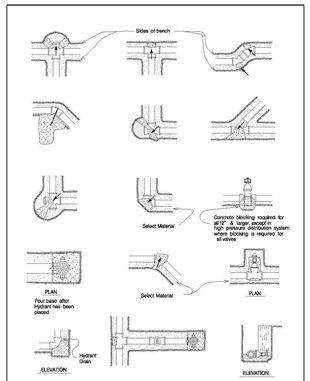
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	SERVICE INSTALLATION WITH PRESSURE REDUCING VALVE	March 2006	
		DD–833–03	SHEET 1 of 1



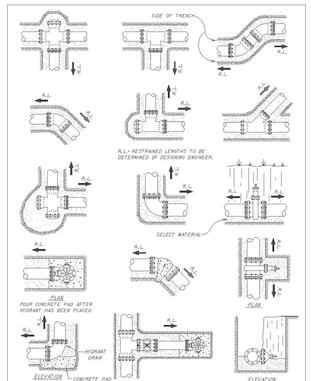
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	FIRE HYDRANT INSTALLATION	March 2006	June 2009
		DD–834–01	SHEET 1 of 2



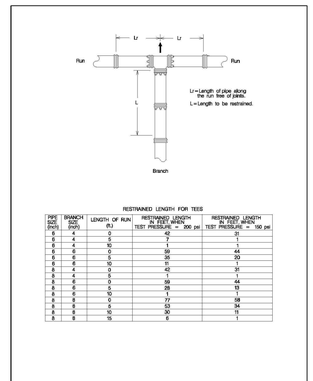
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	FIRE HYDRANT INSTALLATION (JOINT RESTRAINT)	March 2006	June 2009
		DD–834–01	SHEET 2 of 2



PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	THRUST BLOCKS FOR FITTINGS (WATER ONLY)	March 2006	
		DD–839–01	SHEET 1 of 2



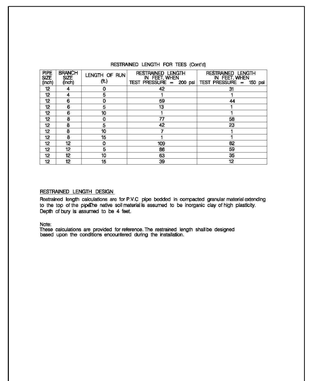
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	JOINT RESTRAINTS FOR FITTINGS (WATER ONLY)	MARCH 2008	
		DD-839-01	SHEET 2 OF 2



RESTRAINED LENGTH FOR TEES

PIPE SIZE (INCH)	BRANCH SIZE (INCH)	LENGTH OF RUN (ft.)	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 150 psi
6	6	0	42	31
6	4	0	7	1
6	4	10	1	1
6	6	0	58	44
6	6	10	17	7
8	8	10	91	67
8	4	0	43	31
8	4	5	1	1
8	6	0	59	44
8	6	5	26	19
8	6	10	1	1
8	8	0	77	58
8	8	5	52	34
8	8	10	30	15
8	8	15	9	1

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR TEES	March 2006	
		DD–839–04	SHEET 1 of 2



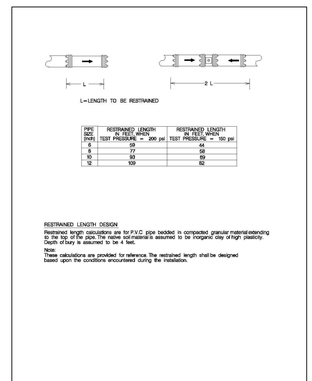
RESTRAINED LENGTH FOR TEES (Cont'd)

PIPE SIZE (INCH)	BRANCH SIZE (INCH)	LENGTH OF RUN (ft.)	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 150 psi
12	6	0	42	31
12	4	5	1	1
12	6	0	59	44
12	6	5	13	1
12	6	10	1	1
12	8	0	77	58
12	8	5	42	33
12	8	10	7	1
12	8	15	1	1
12	12	0	100	82
12	12	5	86	69
12	12	10	63	35
12	12	15	39	12

RESTRAINED LENGTH DESIGN:
Restrained length calculations are for P.V.C. pipe bedded in compacted granular material extending to the top of the pipe.The native soil material is assumed to be inorganic clay of high plasticity. Depth of bury is assumed to be 4 feet.

Note:
These calculations are provided for reference. The restrained length shall be designed based upon the conditions encountered during the installation.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR TEES	March 2006	
		DD–839–04	SHEET 2 of 2



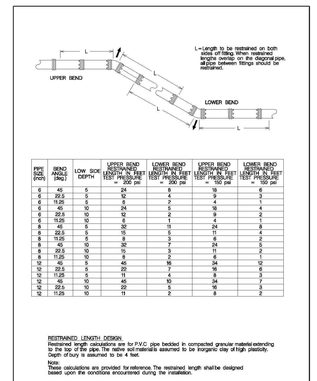
L=LENGTH TO BE RESTRAINED

PIPE SIZE (INCH)	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 150 psi
6	42	31
8	77	58
10	93	69
12	109	82

RESTRAINED LENGTH DESIGN:
Restrained length calculations are for P.V.C. pipe bedded in compacted granular material extending to the top of the pipe. The native soil material is assumed to be inorganic clay of high plasticity. Depth of bury is assumed to be 4 feet.

Note:
These calculations are provided for reference. The restrained length shall be designed based upon the conditions encountered during the installation.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR DEAD ENDS /INLINE VALVES	March 2006	
		DD–839–05	SHEET 1 of 1

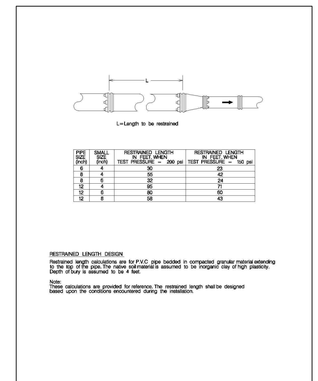


PIPE SIZE (INCH)	ANGLE (DEG.)	LOW SIDE DEPTH	UPPER BEND LENGTH IN FEET WHEN TEST PRESSURE = 200 psi	LOWER BEND LENGTH IN FEET WHEN TEST PRESSURE = 200 psi	UPPER BEND LENGTH IN FEET WHEN TEST PRESSURE = 150 psi	LOWER BEND LENGTH IN FEET WHEN TEST PRESSURE = 150 psi
6	45	5	24	5	18	4
6	22.5	5	12	4	9	3
6	11.25	5	6	3	5	2
6	45	10	24	2	18	1
6	22.5	10	12	2	9	2
6	11.25	10	6	1	4	1
8	45	5	32	11	24	8
8	22.5	5	15	5	11	4
8	11.25	5	8	3	6	2
8	45	10	32	7	24	5
8	22.5	10	15	3	11	3
8	11.25	10	8	2	6	1
12	45	5	45	16	34	12
12	22.5	5	22	7	16	6
12	11.25	5	11	4	8	3
12	45	10	45	10	34	7
12	22.5	10	22	5	16	3
12	11.25	10	11	2	8	2

RESTRAINED LENGTH DESIGN:
Restrained length calculations are for P.V.C. pipe bedded in compacted granular material extending to the top of the pipe. The native soil material is assumed to be inorganic clay of high plasticity. Depth of bury is assumed to be 4 feet.

Note:
These calculations are provided for reference. The restrained length shall be designed based upon the conditions encountered during the installation.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR VERTICAL OFFSETS	March 2006	
		DD–839–06	SHEET 1 of 1

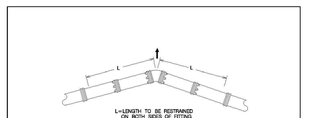


PIPE SIZE (INCH)	SMALL SIZE (INCH)	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 150 psi
6	4	30	23
8	4	50	38
8	6	95	74
12	4	90	60
12	8	58	43

RESTRAINED LENGTH DESIGN:
Restrained length calculations are for P.V.C. pipe bedded in compacted granular material extending to the top of the pipe. The native soil material is assumed to be inorganic clay of high plasticity. Depth of bury is assumed to be 4 feet.

Note:
These calculations are provided for reference. The restrained length shall be designed based upon the conditions encountered during the installation.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR REDUCERS	March 2006	
		DD–839–07	SHEET 1 of 1



L=LENGTH TO BE RESTRAINED
ON BOTH SIDES OF FITTING

PIPE SIZE (INCH)	BEND ANGLE	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 150 psi
6	90	58	44
6	45	24	18
6	22.5	12	9
6	11.25	6	4
8	90	77	58
8	45	32	24
8	22.5	15	11
8	11.25	8	6
12	90	43	32
12	45	18	13
12	22.5	8	6
12	11.25	4	3

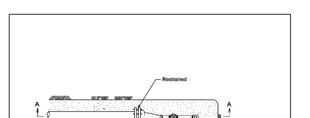
RESTRAINED LENGTH DESIGN:
Restrained length calculations are for P.V.C. pipe bedded in compacted granular material extending to the top of the pipe.The native soil material is assumed to be inorganic clay of high plasticity. Depth of bury is assumed to be 4 feet.

Note:
These calculations are provided for reference. The restrained length shall be designed based upon the conditions encountered during the installation.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR HORIZONTAL BENDS	March 2006	
		DD–839–08	SHEET 1 of 1

* Cut to fit in meter box.

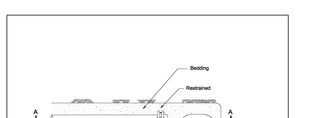
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" PERMANENT BLOW-OFF ASSEMBLY ON 6" & 8" MAINS	MARCH 2008	APRIL 2014
		DD–844–02	SHEET 3 of 5



SECTION A-A

* Cut as required to extend beyond excavation

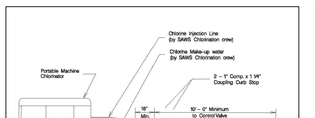
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" TEMPORARY BLOW-OFF ASSEMBLY ON 6" & 8" D.I. MAINS	March 2008	
		DD–844–01	SHEET 1 of 2



SECTION A-A

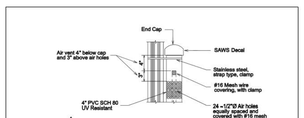
* Cut to fit in meter box.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" PERMANENT BLOW-OFF ASSEMBLY ON 12" & 16" MAINS	March 2008	APRIL 2014
		DD–844–02	SHEET 4 of 5



Note:
2 – 1 ¼" Solid Cap, Thd.to be installed on Corporation Stop after chlorination

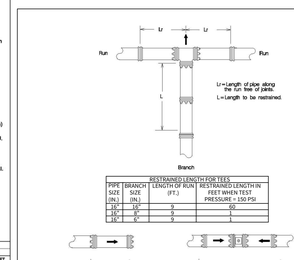
PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	STANDARD CHLORINATION INSTALLATION	March 2006	
		DD–847–01	SHEET 1 of 1



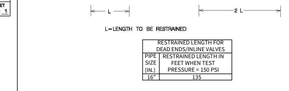
Note: In rural areas, riser should be at Property Line and at maximum height.

* Per direction from Inspector.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	INSTALLATION OF 2" AIR RELEASE VALVE	MARCH 2008	APRIL 2014
		DD–846–02	SHEET 1 of 1

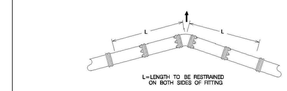


RESTRAINED LENGTH FOR TEES			
PIPE SIZE (IN.)	BRANCH SIZE (IN.)	LENGTH OF RUN (FT.)	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 150 PSI
16"	16"	9	60
16"	8"	9	1
16"	6"	9	1



L=LENGTH TO BE RESTRAINED

RESTRAINED LENGTH FOR DEAD ENDS/INLINE VALVES	
PIPE SIZE (IN.)	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 150 PSI
16"	135



L=LENGTH TO BE RESTRAINED
ON BOTH SIDES OF FITTING

RESTRAINED LENGTH FOR HORIZONTAL BENDS		
PIPE SIZE (IN.)	BEND ANGLE (DEG.)	RESTRAINED LENGTH IN FEET WHEN TEST PRESSURE = 150 PSI
16"	45	15
16"	22.5	8
16"	11.25	4

NOTE:
1. RESTRAINED LENGTH CALCULATIONS ARE DUCTILE IRON PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. THE NATIVE SOIL MATERIALS IS ASSUMED TO BE ORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 5 FT.
2. THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTH SHALL BE DESIGNED BASED UPON THE CONDITIONS ENCOUNTERED DURING THE INSTALLATION.

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

CAUTION NOTE:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TEST WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTER, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

NOTE: SAWS PRESSURE ZONE 12

1 SCALE: NONE

JOINT RESTRAINT TABLES (16" WATER MAIN)

CUDEENGINEERS.COM

EST. 1980 CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

WATER DISTRIBUTION STANDARD DETAILS

DATE
09/13/2022

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	A	1	2	3	4	5	6	7	8	9

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024

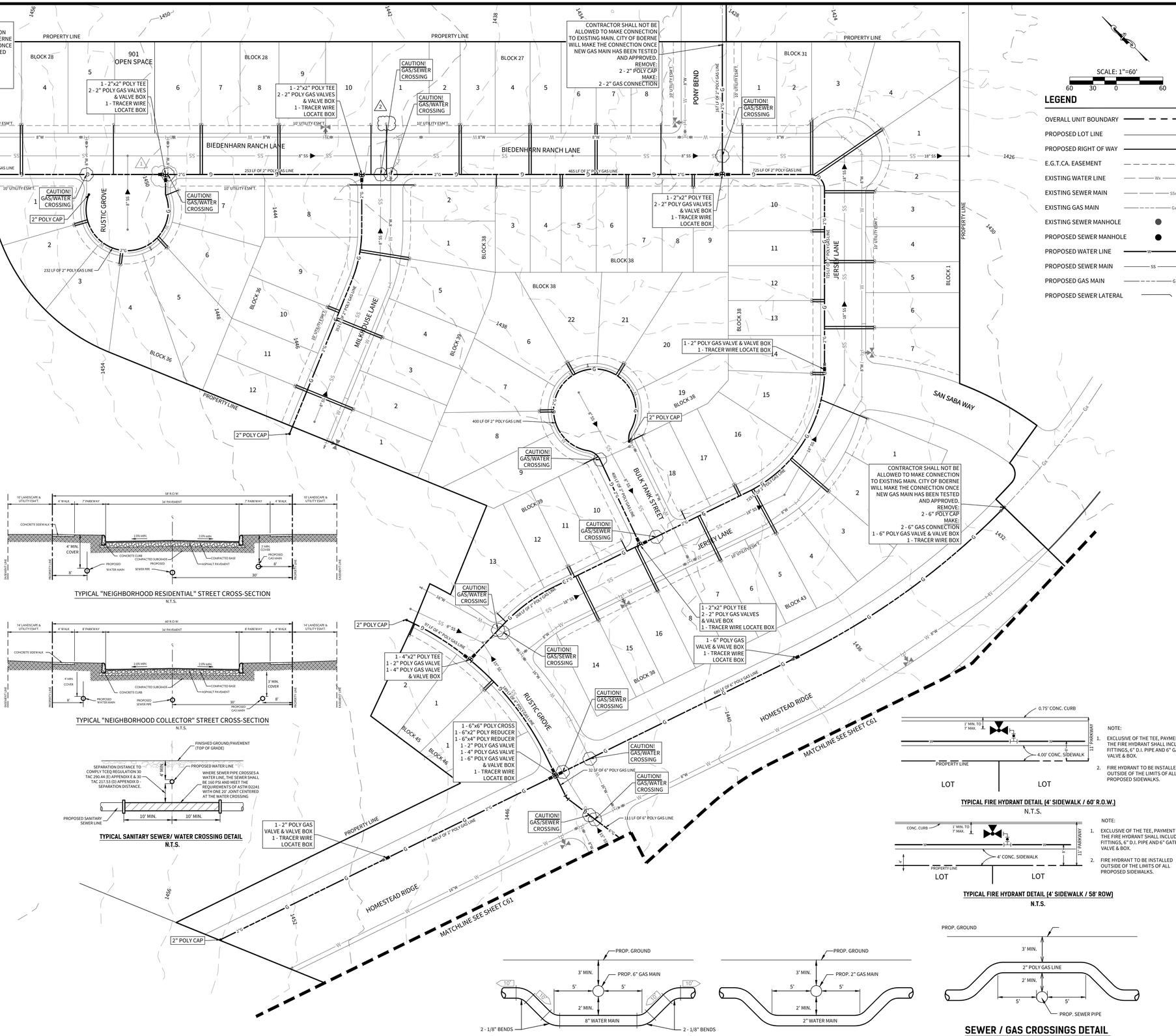
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

C59

CUDEENGINEERS.COM

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.

J:\03481\000\Drawings\Civil\WATER DISTRIBUTION STANDARD DETAILS.dwg, 2/9/2024 10:13:53 AM, cgilbert



THRUST BLOCKING NOTE

ANCHORAGE/ THRUST BLOCKING AND JOINT RESTRAINTS SHALL BE DONE IN ACCORDANCE WITH SAWS STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION (ITEM NO. 839)

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

SAWS CONSTRUCTION NOTES
COUNTER PERMIT AND GENERAL CONSTRUCTION PERMIT *REVISED JULY 2017*

GENERAL SECTION

1. All materials and construction procedures within the scope of this contract shall be approved by the San Antonio Water System (SAWS) and comply with the Plans, Specifications, General Conditions and with the following as applicable:

A. Current Texas Commission on Environmental Quality (TCEQ) "Design Criteria for Domestic Wastewater System", Texas Administrative Code (TAC) Title 30 Part 1 Chapter 217 and "Public Drinking Water", TAC Title 30 Part 1 Chapter 290.

B. Current TXDOT "Standard Specifications for Construction of Highways, Streets and Drainage".

C. Current "San Antonio Water System Standard Specifications for Water and Sanitary Sewer Construction".

D. Current City of San Antonio "Standard Specifications for Public Works Construction".

E. Current City of San Antonio "Utility Excavation Criteria Manual" (UECM).

2. The contractor shall not proceed with any pipe installation work until they obtain a copy of the approved Counter Permit or General Construction Permit (GCP) from the consultant and has been notified by SAWS Construction Inspection Division to proceed with the work and has arranged a meeting with the inspector and consultant for the work requirements. Work completed by the contractor without an approved Counter Permit and/or a GCP will be subject to removal and replacement at the expense of the contractors and/or the developer.

3. The Contractor shall obtain the SAWS Standard Details from the SAWS website, http://www.saws.org/business_center/specs. Unless otherwise noted within the design plans.

4. The Contractor is to make arrangements with the SAWS Construction Inspection Division at 233-2973, on notification procedures that will be used to notify affected home residents and/or property owners 48 hours prior to beginning any work.

5. Location and depth of existing utilities and service laterals shown on the plans are understood to be approximate. Actual locations and depths must be field verified by the Contractor at least 1 week prior to construction. It shall be the Contractor's responsibility to locate utility service lines as required for construction and to protect them during construction at no cost to SAWS.

6. The Contractor shall verify the exact location of underground utilities and drainage structures at least 1-2 weeks prior to construction whether shown on plans or not. Please allow up to 7 business days for locates requesting pipe location markers on SAWS facilities. The following contact information are supplied for verification purposes:

- ☐ SAWS Utility Locates: http://www.saws.org/Service/Locates
- ☐ COSA Drainage (210) 207-0724 or (210) 207-6026
- ☐ COSA Traffic Signal Operations (210) 206-8480
- ☐ COSA Traffic Signal Damages (210) 207-3951

Texas State Wide One Call Locator 1-800-545-6005 or 811

7. The Contractor shall be responsible for restoring existing fences, curbs, streets, driveways, sidewalks, landscaping and structures to its original or better condition if damages are made as a result of the project's construction.

8. All work in Texas Department of Transportation (TxDOT) and/or Bexar County right-of-way shall be done in accordance with respective construction specifications and permit requirements.

9. The Contractor shall comply with City of San Antonio or other governing municipality's tree ordinances when excavating near trees.

10. The Contractor shall not place any waste materials in the 100-year Flood Plain without first obtaining an approved Flood Plain Permit.

11. Holiday Work: Contractors will not be allowed to perform SAWS work on SAWS recognized holidays. Request should be sent to constworkreq@saws.org.

Weekend Work: Contractors are required to notify the SAWS Inspection Construction Department 48 hours in advance to request weekend work. Request should be sent to constworkreq@saws.org.

Any and all SAWS utility work installed without holiday/weekend approval will be subject to be uncovered for proper inspection.

12. Compaction note (Item 804): The contractor shall be responsible for meeting the compaction requirements on all trench backfill and for paying for the tests performed by a third party. Compaction tests will be done at one location point randomly selected, or as indicated by the SAWS Inspector and/or the test administrator, per each 12-inch loose lift per 400 linear feet at a minimum. This project will not be accepted and finalized by SAWS without this requirement being met and verified by providing all necessary documented test results.

13. A copy of all testing reports shall be forwarded to SAWS Construction Inspection Division. Water Section

WATER SECTION

1. Prior to tie-ins, any shutdowns of existing mains of any size must be coordinated with the SAWS Construction Inspection Division at least one week in advance of the shutdown. The Contractor must also provide a sequence of work as related to the tie-ins; this is at no additional cost to SAWS or the project and it is the responsibility of the Contractor to sequence the work accordingly. For water mains 12" or higher: SAWS Emergency Operations Center (210) 233-2014

2. Asbestos Cement (AC) pipe, also known as transite pipe which is known to contain asbestoscontaining material (ACM), may be located within the project limits. Special waste management procedures and health and safety requirements will be applicable when removal and/or disturbance of this pipe occurs. Such work is to be made under Special Specification Item No. 3000, "Special Specification for Handling Asbestos Cement Pipe".

3. Valve removal: Where the contractor is to abandon a water main, the control valve located on the abandoning branch will be removed and replaced with a cap/plug. (NSPI)

4. Suitable anchorage/thrust blocking or joint restraint shall be provided at all of the following main locations: dead ends, plugs, caps, tees, crosses, valves, and bends, in accordance with the Standard Drawings DD-839 Series and Item No. 839, in the SAWS Standard Specifications for Construction.

5. All valves shall read "open right".

6. PRVs Required: Contractor to verify that no portion of the tract is below ground elevation of XXXX feet where the static pressure will normally exceed 80 PSI. At all such locations where the ground level is below XXXX feet, the Developer or Builder shall install at each lot, on the customer's side of the meter, an approved type pressure regulator in conformance with the Plumbing Code of the City of San Antonio. No dual services allowed for any lot(s) if *PRV is/are required for such lot(s), only single service connections shall be allowed. *Note: A pressure regulator is also known as a pressure reducing valve (PRV).

7. Pipe Disinfection with Dry HTH for Projects less than 800 linear feet. (Item No. 847.3): Mains shall be disinfected with dry HTH where shown in the contract documents or as directed by the Inspector, and shall not exceed a total length of 800 feet. This method of disinfection will also be followed for main repairs. The Contractor shall utilize all appropriate safety measure to protect his personnel during disinfection operations.

8. Backflow Prevention Devices:

- ☐ All irrigation services within residential areas are required to have backflow prevention devices.
- ☐ All commercial backflow prevention devices must be approved by SAWS prior to installation.

9. Final connection to the existing water main shall not be made until the water main has been pressure tested, chlorinated, and SAWS has released the main for tie-in and use.

10. All meters shall be 5/8", unless otherwise noted.

11. All pipes shall be C-900, CLASS 235 DR 18, unless otherwise noted.

TYPICAL "NEIGHBORHOOD RESIDENTIAL" STREET CROSS-SECTION
N.T.S.

TYPICAL "NEIGHBORHOOD COLLECTOR" STREET CROSS-SECTION
N.T.S.

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 60' R.O.W.)
N.T.S.

NOTE:
1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 58' ROW)
N.T.S.

NOTE:
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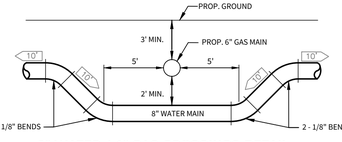
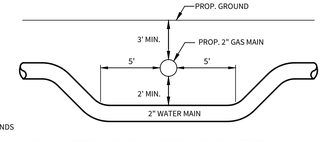
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.



6" WATER / 6" GAS CROSSINGS DETAIL
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.)
(N.T.S.)



2" WATER / 2" GAS CROSSINGS DETAIL
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.)
(N.T.S.)

SEWER / GAS CROSSINGS DETAIL
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.)
(N.T.S.)
NOTE: VERTICAL BEND IS NOT NEEDED WHEN SEWER IS DEEPER THAN 7'

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CUDEENGINEERS.COM
4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

NATURAL GAS DISTRIBUTION PLAN

DATE
07/16/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	REVISIONS
02-08-2024	ADDED GAS VALVE TO TEE
07-15-2024	REVISED GAS SERVICE

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
07/16/2024
CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C60

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THRUST BLOCKING NOTE

ANCHORAGE/ THRUST BLOCKING AND JOINT RESTRAINTS SHALL BE DONE IN ACCORDANCE WITH SAWS STANDARDS AND SPECIFICATIONS FOR CONSTRUCTION (ITEM NO. 839)

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

SAWS CONSTRUCTION NOTES
COUNTER PERMIT AND GENERAL CONSTRUCTION PERMIT *REVISED JULY 2017*

GENERAL SECTION

1. All materials and construction procedures within the scope of this contract shall be approved by the San Antonio Water System (SAWS) and comply with the Plans, Specifications, General Conditions and with the following as applicable:

A. Current Texas Commission on Environmental Quality (TCEQ) "Design Criteria for Domestic Wastewater System", Texas Administrative Code (TAC) Title 30 Part 1 Chapter 217 and "Public Drinking Water", TAC Title 30 Part 1 Chapter 290.

B. Current TXDOT "Standard Specifications for Construction of Highways, Streets and Drainage".

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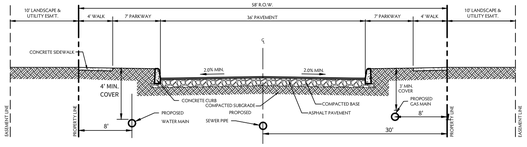
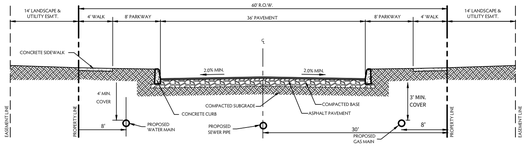
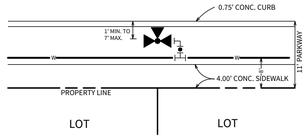


TYPICAL "NEIGHBORHOOD RESIDENTIAL" STREET CROSS-SECTION
N.T.S.



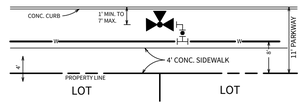
TYPICAL "NEIGHBORHOOD COLLECTOR" STREET CROSS-SECTION
N.T.S.

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.



NOTE:
1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 60' R.O.W.)
N.T.S.



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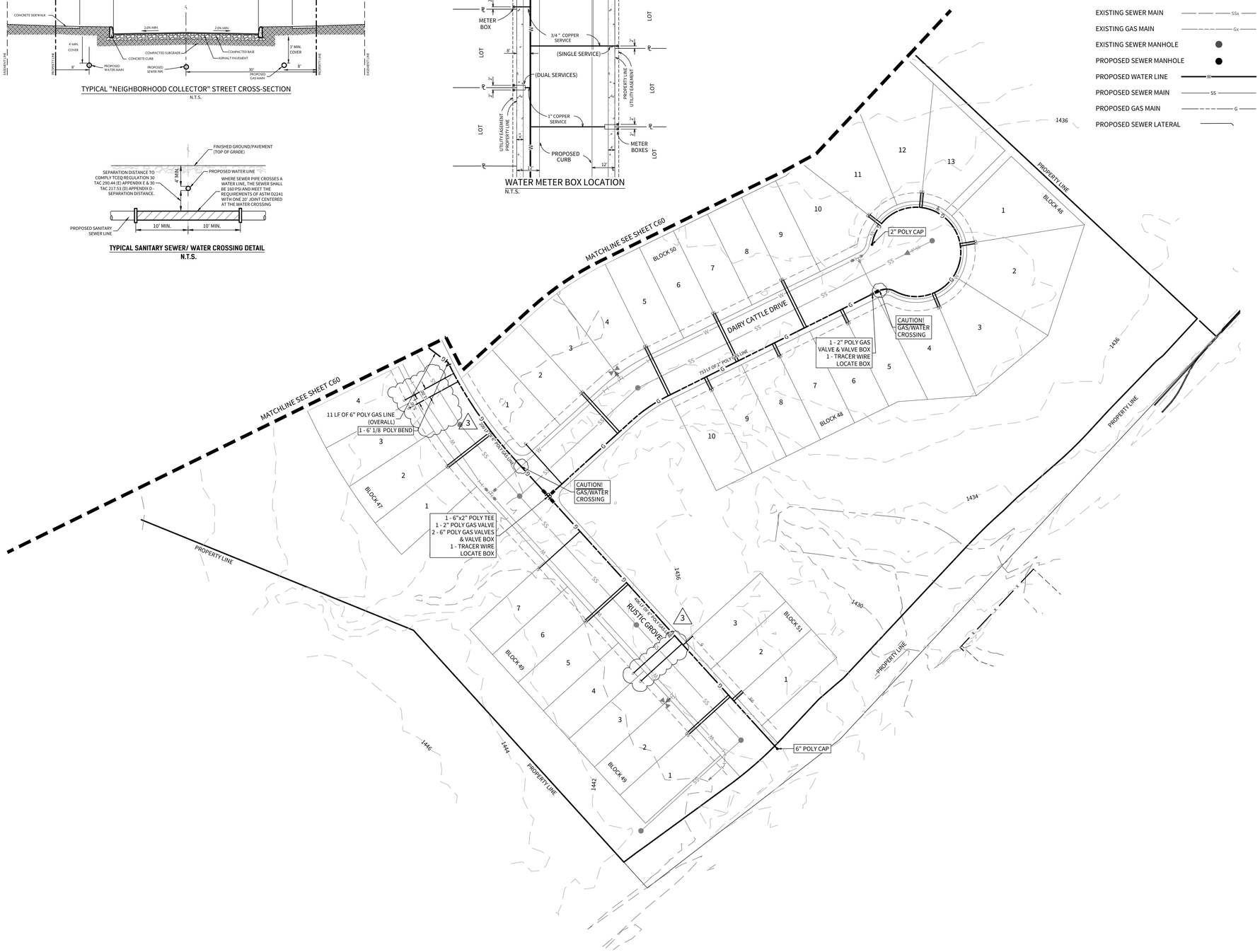
TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 58' ROW)
N.T.S.

WATER METER BOX LOCATION
N.T.S.



SCALE: 1"=60'
60 30 0 60

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING WATER LINE — Wx
- EXISTING SEWER MAIN — SSx
- EXISTING GAS MAIN — Gx
- EXISTING SEWER MANHOLE
- PROPOSED SEWER MANHOLE
- PROPOSED WATER LINE — W
- PROPOSED SEWER MAIN — SS
- PROPOSED GAS MAIN — G
- PROPOSED SEWER LATERAL

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CUDEENGINEERS.COM
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4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

NATURAL GAS DISTRIBUTION PLAN

DATE
08/27/2025

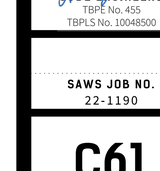
PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	1. 20220721	2. 20230403	3. 20230426	4. 20230525	5.	6.	7.	8.	9.
A	REVISED GAS SERVICE LOCATIONS	ADDED GAS MAINS	REVISED GAS SERVICES						



CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C61

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P:\03481\008\2 Drawings\GAS\NATURAL GAS DISTRIBUTION PLAN.dwg 2025/08/27 4:58pm rclowries

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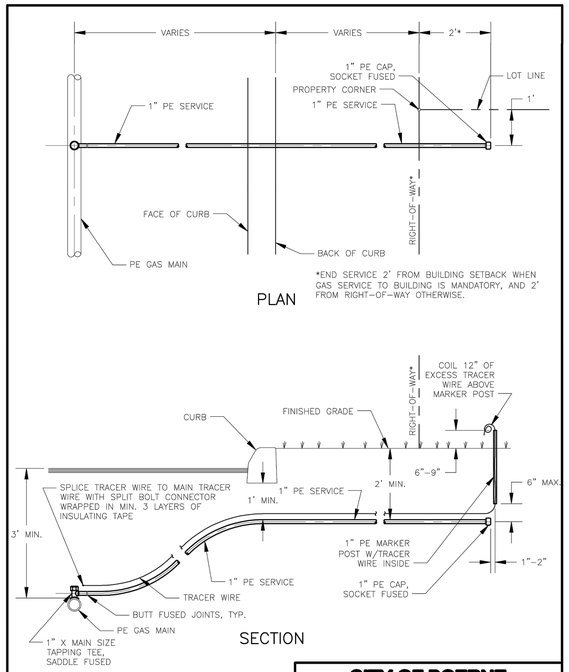
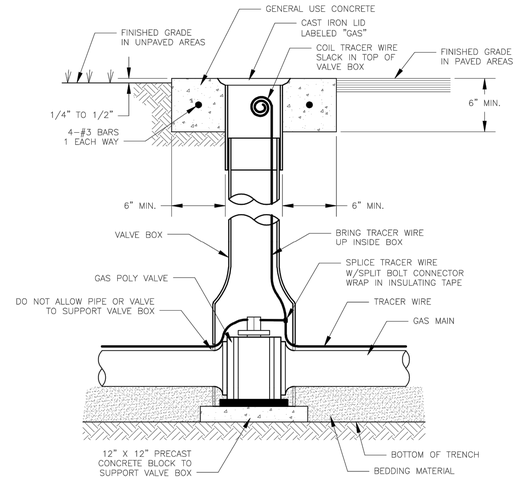


*END SERVICE 2' FROM BUILDING SETBACK WHEN GAS SERVICE TO BUILDING IS MANDATORY, AND 2' FROM RIGHT-OF-WAY OTHERWISE.

CITY OF BOERNE

GAS SERVICE

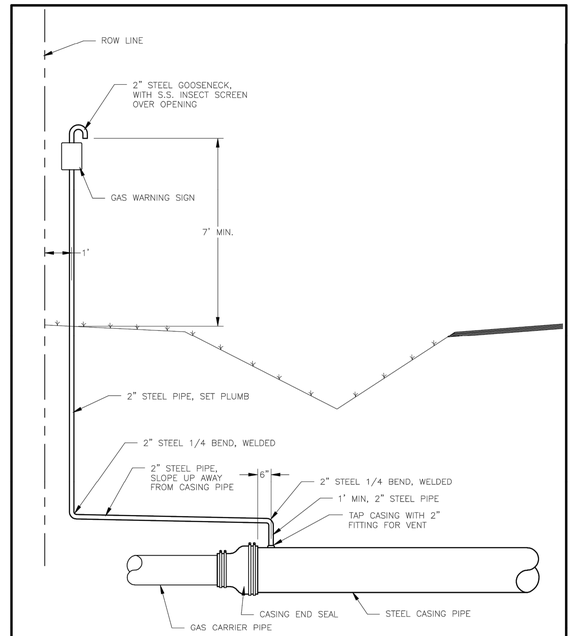
SCALE:	DRAWING No.	DATE:
N.T.S.	02560-1.3	JULY 2015



CITY OF BOERNE

GAS VALVE AND VALVE BOX

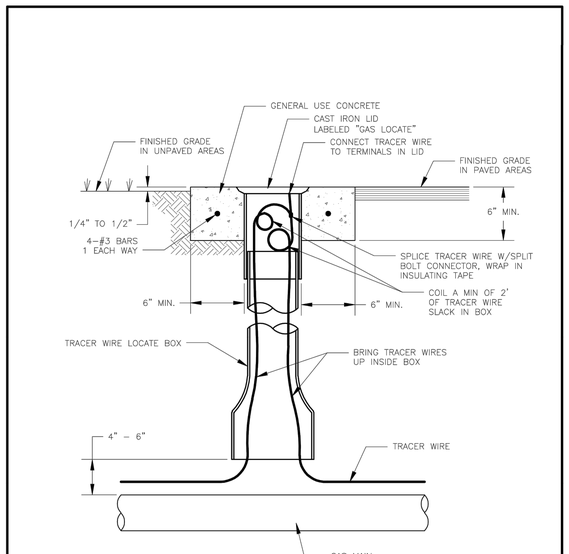
SCALE:	DRAWING No.	DATE:
N.T.S.	02560-1.0	JULY 2015



CITY OF BOERNE

CASING VENT FOR GAS MAIN UNDERCROSSING

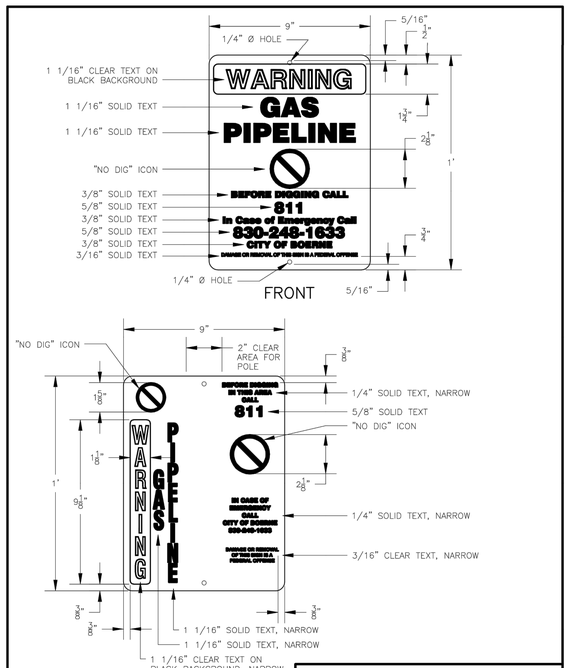
SCALE:	DRAWING No.	DATE:
N.T.S.	02224-1.1	JULY 2015



CITY OF BOERNE

TRACER WIRE LOCATE BOX

SCALE:	DRAWING No.	DATE:
N.T.S.	02560-1.2	JULY 2015



NOTE: MOUNT SIGN ON STEEL POST, 5'-6" ABOVE FINISHED GRADE.

CITY OF BOERNE

GAS WARNING SIGN

SCALE:	DRAWING No.	DATE:
N.T.S.	02560-1.1	JULY 2015

CUDEENGINEERS.COM

CUDE ENGINEERS

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

NATURAL GAS DISTRIBUTION STANDARD DETAILS

DATE
09/13/2022

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

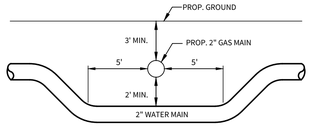
DATE	1	2	3	4	5	6	7	8	9

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

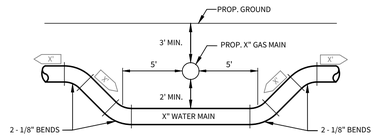
C62

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



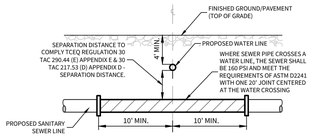
2" WATER / 2" GAS CROSSINGS DETAIL

SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) (N.T.S.)



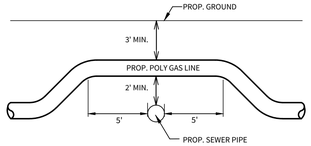
WATER / GAS CROSSINGS DETAIL

SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) (N.T.S.)



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

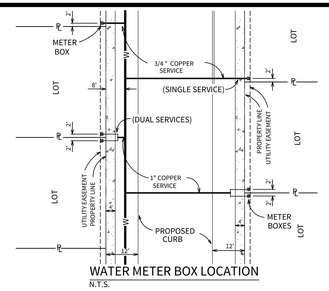
N.T.S.



SEWER / GAS CROSSINGS DETAIL

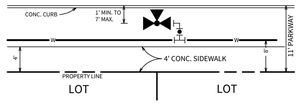
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) (N.T.S.)

NOTE: VERTICAL BEND IS NOT NEEDED WHEN SEWER IS DEEPER THAN 7'



WATER METER BOX LOCATION

N.T.S.



NOTE:

1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 58' ROW)

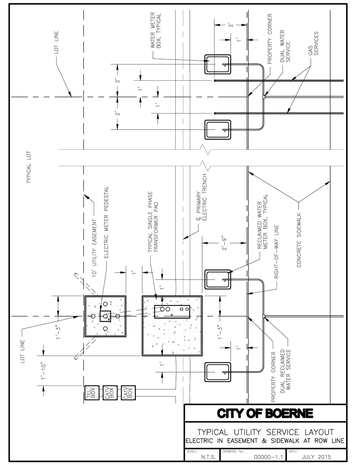
N.T.S.

NOTE:

1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 60' R.O.W.)

N.T.S.



CITY OF BOERNE TYPICAL UTILITY SERVICE LAYOUT

N.T.S.

LEGEND

- OVERALL UNIT BOUNDARY
- PROPOSED LOT LINE
- PROPOSED RIGHT OF WAY
- E.G.T.CA. EASEMENT
- EXISTING WATER LINE — Wx —
- EXISTING SEWER MAIN — SSx —
- EXISTING GAS MAIN — Gx —
- EXISTING SEWER MANHOLE
- EXISTING FIRE HYDRANT
- PROPOSED SEWER MANHOLE
- PROPOSED WATER LINE — W —
- PROPOSED SEWER MAIN — SS —
- PROPOSED GAS MAIN — G —
- PROPOSED SEWER LATERAL
- PROPOSED GAS SERVICE
- PROPOSED SINGLE 3/4" WATER SERVICE WITH 5/8" METER
- PROPOSED DUAL 3/4" WATER SERVICE WITH 5/8" METER
- PROPOSED FIRE HYDRANT
- PROPOSED LIGHT POLE

BENCHMARK BM-1

BENCHMARK TO BE SET BY ENGINEER PRIOR TO CONSTRUCTION.

NOTES:

1. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL. COMPACTION TEST WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE DISTRICT INSPECTOR. PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY THE DISTRICT WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS..
2. CONTRACTOR TO MAINTAIN A MINIMUM 1' VERTICAL SEPARATION DISTANCE BETWEEN OF THE BOTTOM PROPOSED WATER MAIN AND TOP OF PROPOSED SANITARY SEWER MAIN AT WATER AND SANITARY SEWER CROSSINGS.
3. ALL LATERALS SHALL BE INSTALLED AT A MINIMUM 2.0% SLOPE UNLESS OTHERWISE NOTED.
4. CONTRACTOR TO REFERENCE SANITARY SEWER, WATER, AND GAS PLANS FOR ALL UTILITY CROSSINGS CALLED OUT ON THIS SHEET.

CAUTION!!

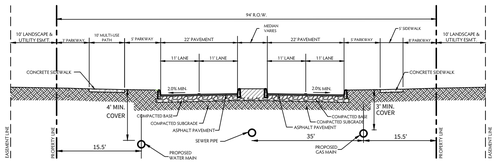
EXISTING UTILITIES ARE WITHIN THE LIMITS OF CONSTRUCTION. CONTRACTORS SHALL EXERCISE EXTRA CARE IN DIGGING ANY TRENCH FOR PROPOSED UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE, VERIFY THE EXACT LOCATION & IDENTIFY AREA OF CONFLICTS WITH EXISTING UTILITIES AND SHALL NOTIFY THE ENGINEER IF CONFLICT IS FOUND.

CAUTION!!

THE CONTRACTOR SHALL BE AWARE THAT OVERHEAD ELECTRIC LINES EXIST WITHIN THE VICINITY OF THE SITE. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO HAVE THESE UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION. THE CONTRACTOR SHALL USE EXTREME CAUTION WHEN WORKING IN THIS AREA. ANY DAMAGE DONE TO THESE EXISTING FACILITIES WILL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR TO REPAIR.

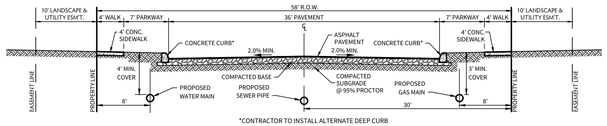
TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.



TYPICAL "PRIMARY COLLECTOR" STREET CROSS SECTION

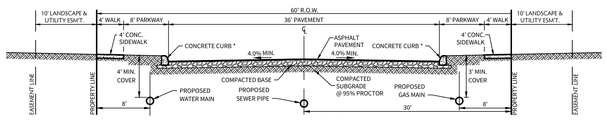
N.T.S.



*CONTRACTOR TO INSTALL ALTERNATE DEEP CURB WHERE RESIDENTIAL LOT FRONTAGE EXISTS, SEE CITY OF BOERNE CONCRETE CURB DETAIL 02502-2.0

TYPICAL "RESIDENTIAL LOCAL" STREET CROSS SECTION

N.T.S.



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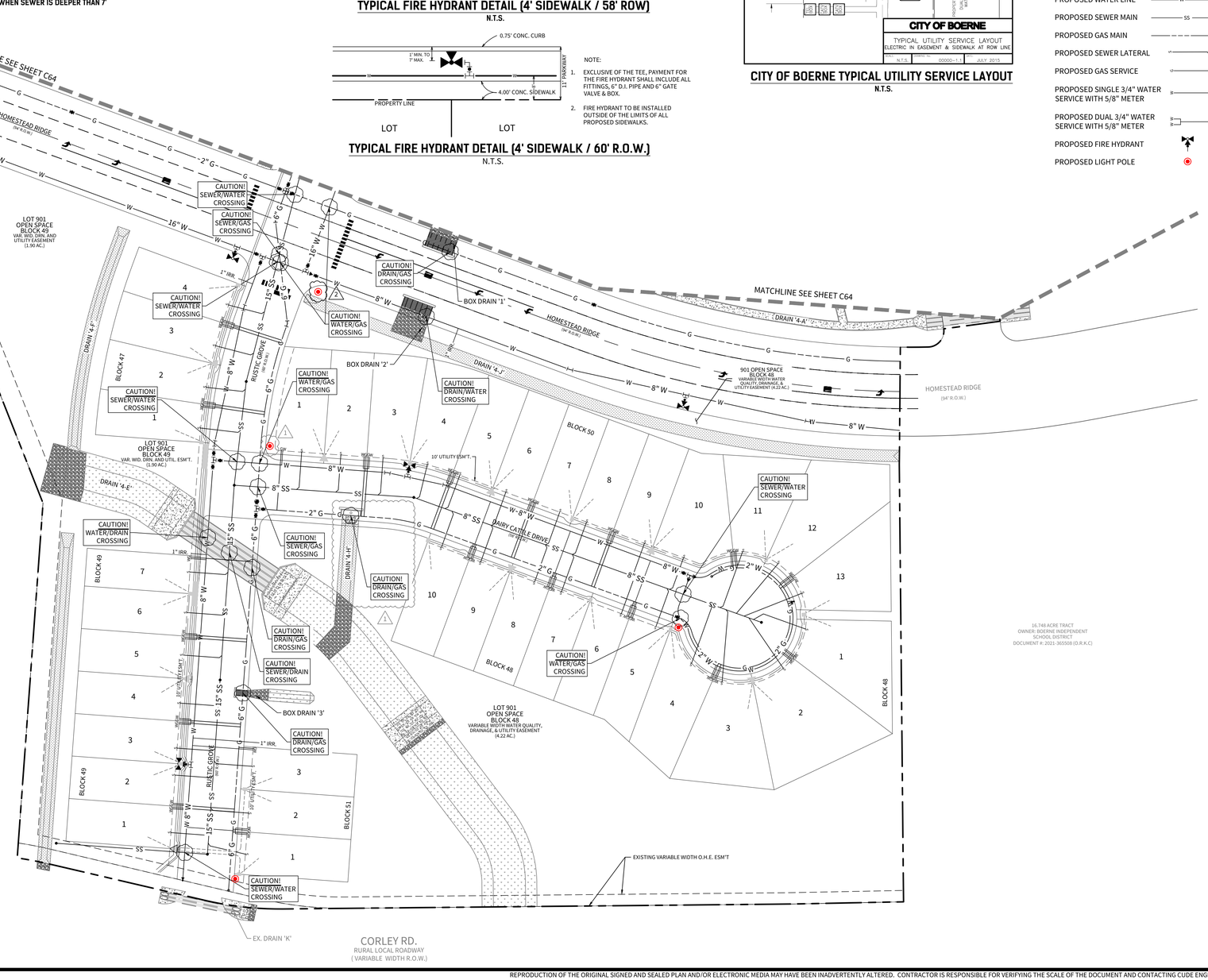
TYPICAL "RESIDENTIAL COLLECTOR" STREET CROSS SECTION

N.T.S.



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San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

UTILITY LAYOUT PLAN

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

	DATE	
1.	02-08-2024	ADDED DRAIN LINE WORK/CROSSINGS & BOX DRAIN NOTES
2.	06-26-2024	ADDED LIGHT POLE
3.		
4.		
5.		
6.		
7.		
8.		
9.		

STATE OF TEXAS
ANDREW R. LOWRY
125410
LICENSED
PROFESSIONAL ENGINEER
06/27/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

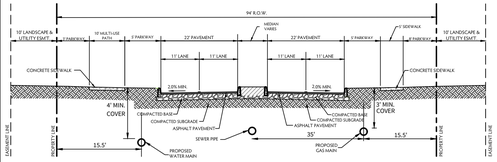
SAWS JOB NO.
22-1190

C63

CUDEENGINEERS.COM

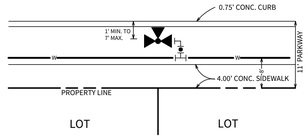
P:\03481\000\2-Drawings\CAD\UTILITY LAYOUT.dwg 6/24/2024 7:38am EDSantos

REPRODUCTION OF THE ORIGINAL SIGNED AND SEALED PLAN AND/OR ELECTRONIC MEDIA MAY HAVE BEEN INADVERTENTLY ALTERED. CONTRACTOR IS RESPONSIBLE FOR VERIFYING THE SCALE OF THE DOCUMENT AND CONTACTING CUDE ENGINEERS TO VERIFY DISCREPANCIES PRIOR TO CONSTRUCTION.



TYPICAL "PRIMARY COLLECTOR" STREET CROSS SECTION

N.T.S.



NOTE:

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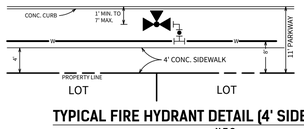
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 60' R.O.W.)

N.T.S.



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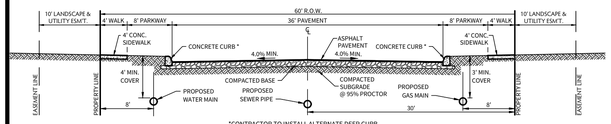
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 58' ROW)

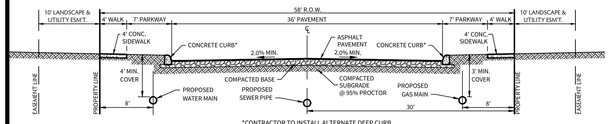
N.T.S.



*CONTRACTOR TO INSTALL ALTERNATE DEEP CURB WHERE RESIDENTIAL LOT FRONTAGE EXISTS. SEE CITY OF BOERNE CONCRETE CURB DETAIL 02502-2.0

TYPICAL "RESIDENTIAL COLLECTOR" STREET CROSS SECTION

N.T.S.



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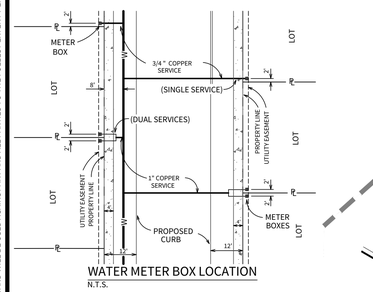
TYPICAL "RESIDENTIAL LOCAL" STREET CROSS SECTION

N.T.S.



WATER METER BOX LOCATION

N.T.S.

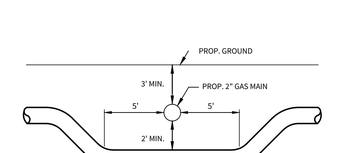
SEPARATION DISTANCE TO COMPLY TCEQ REGULATION 30 TAC 290.44 (E) APPENDIX E & 30 TAC 217.53 (D) APPENDIX D - SEPARATION DISTANCE.

TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

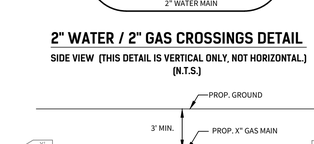
2" WATER / 2" GAS CROSSINGS DETAIL

SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) (N.T.S.)



WATER / GAS CROSSINGS DETAIL

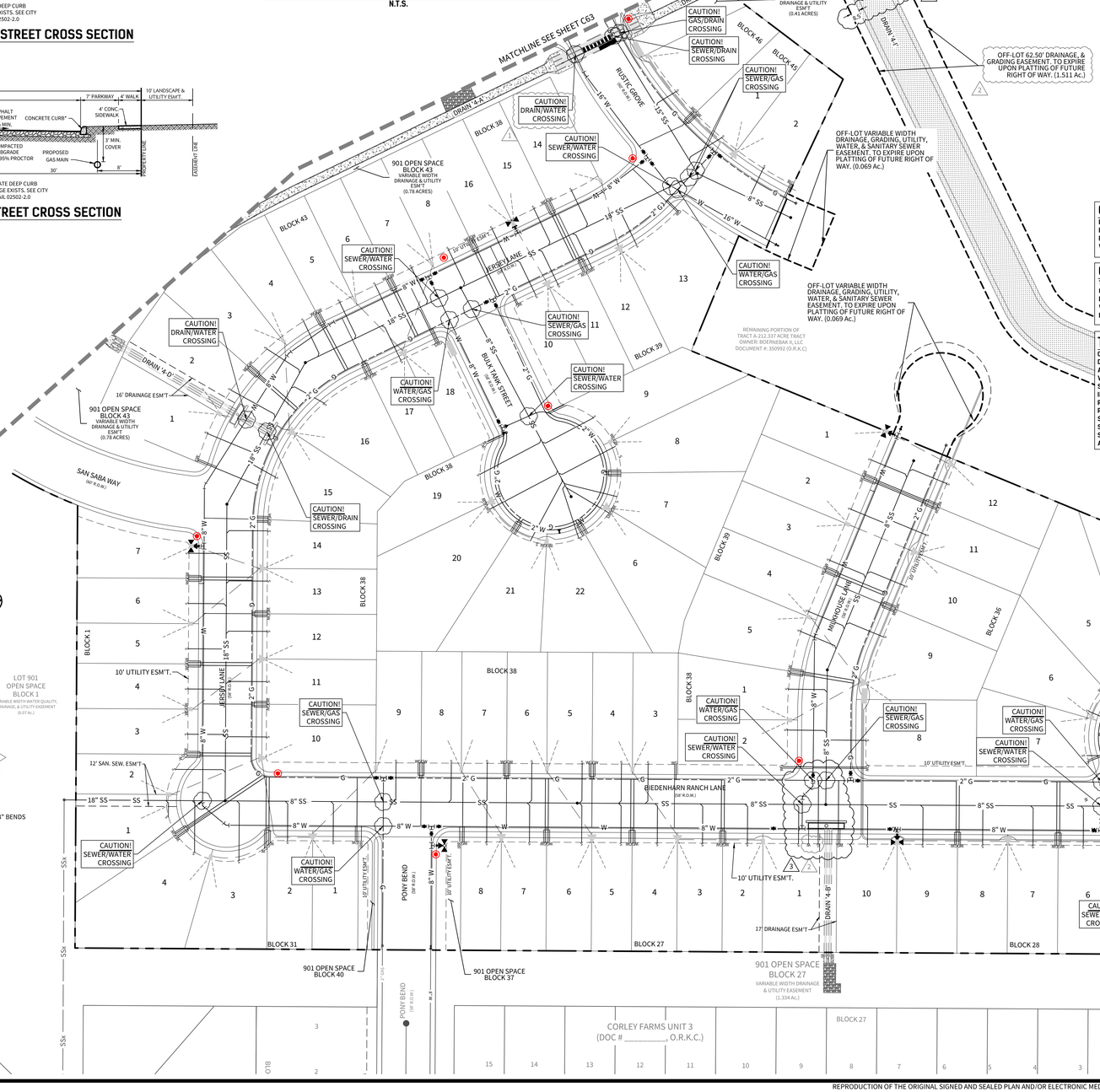
SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) (N.T.S.)



SEWER / GAS CROSSINGS DETAIL

SIDE VIEW (THIS DETAIL IS VERTICAL ONLY, NOT HORIZONTAL.) (N.T.S.)

NOTE: VERTICAL BEND IS NOT NEEDED WHEN SEWER IS DEEPER THAN 7'


MATCHLINE SEE SHEET C63
DRAIN 'A-3'
DRAIN 'A-4'
DRAIN 'A-5'
DRAIN 'A-6'
DRAIN 'A-7'
DRAIN 'A-8'
901 OPEN SPACE BLOCK 46 VARIABLE WIDTH DRAINAGE & UTILITY ESM'T (0.41 ACRES)
901 OPEN SPACE BLOCK 43 VARIABLE WIDTH DRAINAGE & UTILITY ESM'T (0.78 ACRES)
901 OPEN SPACE BLOCK 40
901 OPEN SPACE BLOCK 37
901 OPEN SPACE BLOCK 27 VARIABLE WIDTH DRAINAGE & UTILITY EASEMENT (1.334 Ac.)
901 OPEN SPACE BLOCK 35 30' DRAINAGE ESM'T (0.08 AC.)
LOT 901 OPEN SPACE BLOCK 1 VARIABLE WIDTH WATER QUALITY, DRAINAGE, & UTILITY EASEMENT (6.07 Ac.)
REMAINING PORTION OF TRACT A 212.337 ACRE TRACT OWNER: BOERNEBAK II, LLC DOCUMENT #: 350992 (O.R.K.C)
OFF-LOT 62.50' DRAINAGE, & GRADING EASEMENT. TO EXPIRE UPON PLATTING OF FUTURE RIGHT OF WAY. (1.511 Ac.)
OFF-LOT VARIABLE WIDTH DRAINAGE, GRADING, UTILITY, WATER, & SANITARY SEWER EASEMENT. TO EXPIRE UPON PLATTING OF FUTURE RIGHT OF WAY. (0.069 Ac.)
OFF-LOT 58' x 50' DRAINAGE, GRADING, UTILITY, WATER, & SANITARY SEWER EASEMENT. TO EXPIRE UPON PLATTING OF FUTURE RIGHT OF WAY. (0.067 Ac.)
CAUTION! GAS/DRAIN CROSSING
CAUTION! SEWER/DRAIN CROSSING
CAUTION! SEWER/GAS CROSSING
CAUTION! DRAIN/WATER CROSSING
CAUTION! SEWER/WATER CROSSING
CAUTION! SEWER/GAS CROSSING
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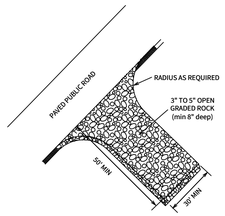
CAUTION! WATER/GAS CROSSING
CAUTION! SEWER/GAS CROSSING
CAUTION! WATER/GAS CROSSING
CAUTION! SEWER/WATER

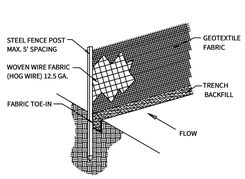


STABILIZED CONSTRUCTION EXIT NOTES:

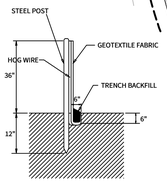
1. WHEN NECESSARY, WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ON PUBLIC ROADWAY.
2. THE EXIT SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC ROADWAYS. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND, AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED, OR TRACKED ONTO PUBLIC ROADWAYS MUST BE REMOVED IMMEDIATELY.

1 TEMPORARY CONSTRUCTION ENTRANCE/EXIT

N.T.S.



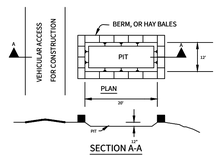
SILT FENCE DETAIL



SECTION DETAIL

2 STANDARD SILT FENCE

N.T.S.



GENERAL NOTES:

- Detail above illustrates minimum dimensions. Pit can be increased in size depending on expected frequency of use. construction traffic.
- If hay bales are used, they shall be placed in accordance with details shown on Exhibit for hay bales.

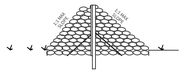
Washout pit shall be located in an area easily accessible to

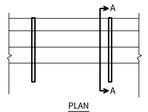
Washout pit shall not be located in areas subject to inundation from storm water runoff.

- Washout pit shall be lined with a 10-mil thick polyethylene sheeting free of holes, tears and other defects.

3 CONCRETE TRUCK WASHOUT PIT

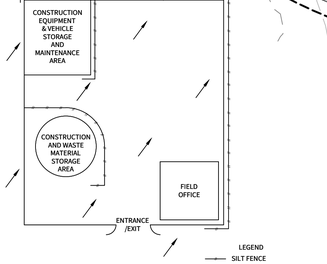
N.T.S.





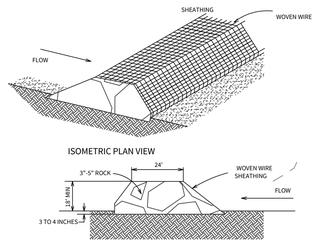
5 ROCK BERM W/ SILT FENCE DETAIL

N.T.S.



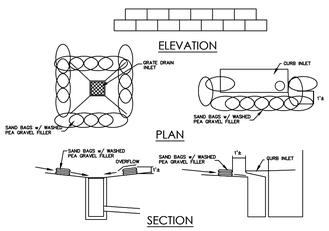
4 TYP. CONSTRUCTION STAGING AREA

N.T.S.



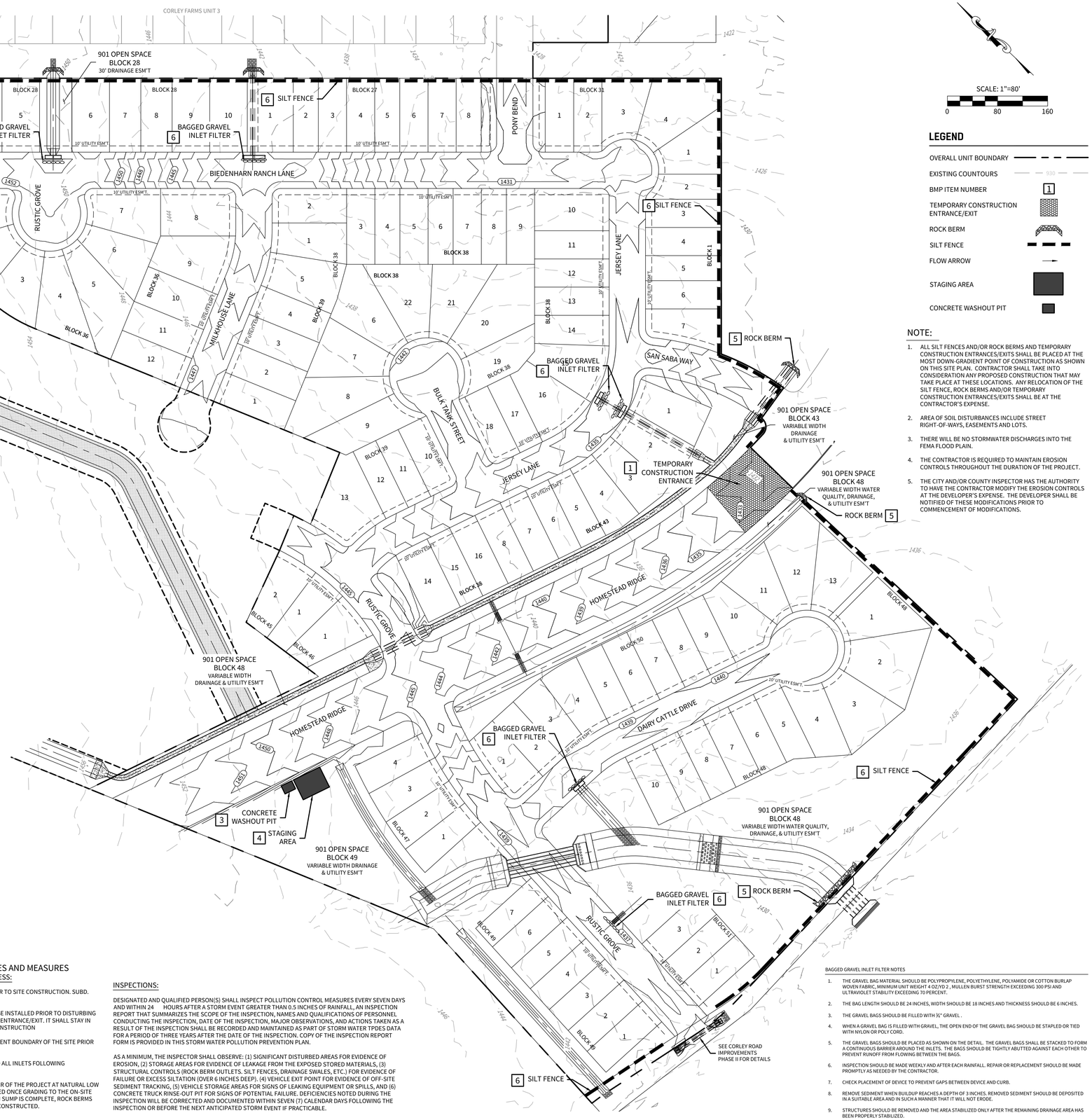
ROCK BERM

N.T.S.



6 BAGGED GRAVEL INLET FILTER NOTES

N.T.S.



LEGEND

- OVERALL UNIT BOUNDARY
- EXISTING COUNTOURS
- BMP ITEM NUMBER
- TEMPORARY CONSTRUCTION ENTRANCE/EXIT
- ROCK BERM
- SILT FENCE
- FLOW ARROW
- STAGING AREA
- CONCRETE WASHOUT PIT

NOTE:

1. ALL SILT FENCES AND/OR ROCK BERMS AND TEMPORARY CONSTRUCTION ENTRANCES/EXITS SHALL BE PLACED AT THE MOST DOWN-GRADIENT POINT OF CONSTRUCTION AS SHOWN ON THIS SITE PLAN. CONTRACTOR SHALL TAKE INTO CONSIDERATION ANY PROPOSED CONSTRUCTION THAT MAY TAKE PLACE AT THESE LOCATIONS. ANY RELOCATION OF THE SILT FENCE, ROCK BERMS AND/OR TEMPORARY CONSTRUCTION ENTRANCES/EXITS SHALL BE AT THE CONTRACTOR'S EXPENSE.
2. AREA OF SOIL DISTURBANCES INCLUDE STREET RIGHT-OF-WAYS, EASEMENTS AND LOTS.
3. THERE WILL BE NO STORMWATER DISCHARGES INTO THE FEMA FLOOD PLAIN.
4. THE CONTRACTOR IS REQUIRED TO MAINTAIN EROSION CONTROLS THROUGHOUT THE DURATION OF THE PROJECT.
5. THE CITY AND/OR COUNTY INSPECTOR HAS THE AUTHORITY TO HAVE THE CONTRACTOR MODIFY THE EROSION CONTROLS AT THE DEVELOPER'S EXPENSE. THE DEVELOPER SHALL BE NOTIFIED OF THESE MODIFICATIONS PRIOR TO COMMENCEMENT OF MODIFICATIONS.

TEMPORARY BEST MANAGEMENT PRACTICES AND MEASURES

SEQUENCE OF INSTALLATION DURING CONSTRUCTION PROCESS:

1. STORM WATER MANAGEMENT FACILITIES MUST BE INSTALLED PRIOR TO SITE CONSTRUCTION. SUBD. ORD. 6.01.003

2. THE TEMPORARY CONSTRUCTION ENTRANCE/EXIT (ITEM 2) SHALL BE INSTALLED PRIOR TO DISTURBING ANY SOIL EXCEPT AT THE LOCATION OF THE TEMPORARY CONSTRUCTION ENTRANCE/EXIT. IT SHALL STAY IN PLACE AND BE MAINTAINED UNTIL THE END OF THE INFRASTRUCTURE CONSTRUCTION

3. SILT FENCE (ITEM 4) SHALL BE INSTALLED ALONG THE DOWN-GRADIENT BOUNDARY OF THE SITE PRIOR TO ANY DISTURBANCE OF THE SITE AS SHOWN ON THE SITE PLAN.

4. BAGGED GRAVEL INLET FILTERS (ITEM 6) SHALL BE PLACED AROUND ALL INLETS FOLLOWING INSTALLATION.

5. ROCK BERMS (ITEM 5) SHALL BE INSTALLED AROUND THE PERIMETER OF THE PROJECT AT NATURAL LOW POINTS FOLLOWING ROUGH GRADING OF THE SITE AND SHALL BE REMOVED ONCE GRADING TO THE ON-SITE STORMWATER DRAINAGE SYSTEM WITH BAGGED GRAVEL INLET FILTERS IN SUMP IS COMPLETE, ROCK BERMS WILL ALSO BE UTILIZED AT THE OUTLET OF THE POND WHILE IT IS BEING CONSTRUCTED.

INSPECTIONS:

DESIGNATED AND QUALIFIED PERSON(S) SHALL INSPECT POLLUTION CONTROL MEASURES EVERY SEVEN DAYS AND WITHIN 24 HOURS AFTER A STORM EVENT GREATER THAN 0.5 INCHES OF RAINFALL, AN INSPECTION REPORT THAT SUMMARIZES THE SCOPE OF THE INSPECTION, NAMES AND QUALIFICATIONS OF PERSONNEL CONDUCTING THE INSPECTION, DATE OF THE INSPECTION, MAJOR OBSERVATIONS, AND ACTIONS TAKEN AS A RESULT OF THE INSPECTION SHALL BE RECORDED AND MAINTAINED AS PART OF STORM WATER TPDES DATA FOR A PERIOD OF THREE YEARS AFTER THE DATE OF THE INSPECTION. COPY OF THE INSPECTION REPORT FORM IS PROVIDED IN THIS STORM WATER POLLUTION PREVENTION PLAN.

AS A MINIMUM, THE INSPECTOR SHALL OBSERVE: (1) SIGNIFICANT DISTURBED AREAS FOR EVIDENCE OF EROSION, (2) STORAGE AREAS FOR EVIDENCE OF LEAKAGE FROM THE EXPOSED STORED MATERIALS, (3) STRUCTURAL CONTROLS (ROCK BERM OUTLETS. SILT FENCES, DRAINAGE SWALES, ETC.) FOR EVIDENCE OF FAILURE OR EXCESS SILTATION (OVER 6 INCHES DEEP). (4) VEHICLE EXIT POINT FOR EVIDENCE OF OFF-SITE SEDIMENT TRACKING, (5) VEHICLE STORAGE AREAS FOR SIGNS OF LEAKING EQUIPMENT OR SPILLS, AND (6) CONCRETE TRUCK RINSE-OUT PIT FOR SIGNS OF POTENTIAL FAILURE. DEFICIENCIES NOTED DURING THE INSPECTION WILL BE CORRECTED AND DOCUMENTED WITHIN SEVEN (7) CALENDAR DAYS FOLLOWING THE INSPECTION OR BEFORE THE NEXT ANTICIPATED STORM EVENT IF PRACTICABLE.

BAGGED GRAVEL INLET FILTER NOTES

1. THE GRAVEL BAG MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE, POLYAMIDE OR COTTON BURLAP WOVEN FABRIC, MINIMUM UNIT WEIGHT 4 OZ/YD 2 , MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRAVIOLET STABILITY EXCEEDING 70 PERCENT.
2. THE BAG LENGTH SHOULD BE 24 INCHES, WIDTH SHOULD BE 18 INCHES AND THICKNESS SHOULD BE 6 INCHES.
3. THE GRAVEL BAGS SHOULD BE FILLED WITH 3/4" GRAVEL .
4. WHEN A GRAVEL BAG IS FILLED WITH GRAVEL, THE OPEN END OF THE GRAVEL BAG SHOULD BE STAPLED OR TIED WITH NYLON OR POLY CORD.
5. THE GRAVEL BAGS SHOULD BE PLACED AS SHOWN ON THE DETAIL. THE GRAVEL BAGS SHALL BE STACKED TO FORM A CONTINUOUS BARRIER AROUND THE INLETS. THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT RUNOFF FROM FLOWING BETWEEN THE BAGS.
6. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.
7. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE AND CURB.
8. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.
9. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

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CORLEY FARMS UNIT 4

STORM WATER POLLUTION PREVENTION PLAN

DATE
01/31/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	A	1	2	3	4	5	6	7	8	9

STATE OF TEXAS
JAVIER CASTELLO
122170
LICENSED
PROFESSIONAL ENGINEER
02/09/2024

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

C65

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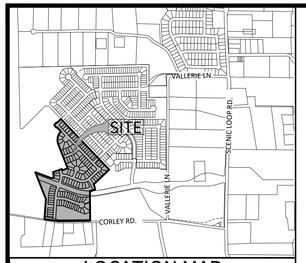


LOCATION MAP
N.T.S.

LEGEND

- PROPOSED CONTOUR — 1000
- EXISTING CONTOUR — 1000
- PROPOSED ELEVATION — x 1000.00
- TYPE OF LOT GRADING — A, B, OR C
- SWALE FLOW LINE (ONLY LOT FOR PRIVATE LOT GRADING)
- BLOCK RETAINING WALL
- LIMITS OF GRADING
- GRADE BREAK
- BUILDING PAD (60')
- BUILDING PAD (65')
- BUILDING PAD (70')
- BUILDING PAD (75')

NOTE:

LOT GRADING BASE ON SLABS BEING 20' BEHIND FRONT PROPERTY LINE.

MINIMUM SLAB EXPOSURE IS 1.0'

TYPICAL PADS SIZES ARE 30' X 80' UNLESS NOTED OTHERWISE ON PLAN.

CONTOURS SHOWN ON STREET ARE TO STREET SUBGRADE ELEVATIONS.

GENERAL SPECIFICATIONS FOR SITE PREPARATION

1. General Description
This item shall consist of all clearing and grubbing, demolition, preparation of land to be filled, filling of the land, spreading, compaction testing and inspection of the fill, and all subsidiary work necessary to complete the grading of the cut and fill areas to conform with the lines, grades and slopes as shown on the approved plans.

2. Clearing the Area to be Filled
All timber, logs, trees, brush and rubbish shall be removed from the site.

3. Scarifying the Area to be Filled
All organic matter shall be removed from the surface upon which the fill is to be placed, and the surface shall then be disked or scarified to a minimum depth of six inches (6"), all surface ruts or other uneven features will be leveled prior to field density testing. Where fills are made on hillsides or slopes, the slope of the original ground upon which the fill is to be placed shall be disked or scarified. Where the slope ratio of the original ground is steeper than 5 horizontal to 1 vertical, the bank shall be stepped or benched. Ground slopes which are flatter than 5 to 1 shall be benched when considered necessary by the Geotechnical Engineer.

4. Compacting the Area to be Filled
Following the clearing and disking or scarifying of the fill area, it shall be bladed until it is uniform and free from large clods. The area shall be brought to the adequate moisture content and compacted (typically) to not less than ninety percent (90%) of maximum density in accordance with the current ASTM D 1557 Compaction Procedure, or 95% of maximum density in accordance with the current THD–TEX–113–E Compaction Procedure.

5. Fill Materials
The materials used shall be free from organic matter and other deleterious substances, such as trees, brush and rubbish.

6. Depth and Mixing of Fill Layers
The selected fill material shall be placed in level, uniform layers which, when compacted, shall have a density conforming to that stipulated above. Each layer shall be thoroughly mixed during the spreading to ensure uniformity of material in each layer. Compacted layer thickness may vary depending on the compaction equipment of demonstrated capability. The maximum loose depth for any material shall not exceed twelve inches (12"). For testing requirements of fill material, see density testing.

7. Rock
When fill material includes rock, the maximum rock size shall be as approved by the Geotechnical Engineer. No large rocks shall be allowed to nest and all voids must be filled with small stones or soil and adequately compacted. No large rocks will be permitted within eighteen inches (18") of the finished grade.

8. Compaction of Fill Layer
Compaction equipment shall be capable of compacting the fill to the specified density. Compaction shall be accomplished while the fill material is at or near the appropriate moisture content. Compaction of each layer shall be continuous over the entire structural area (beneath proposed structures).

9. Compaction of Slopes
The faces of fill slopes shall be compacted. Compacting operations shall be continued until the slope faces are stable but not too dense for planting on the slopes. Compaction of the slope faces may be done progressively in increments of three to five feet (3' to 5') in fill height as this fill progresses or after the fill has been brought to its total height.

10. Moisture Content
The fill material shall be compacted at the appropriate moisture content specified for the soils being used. Appropriate moisture content is defined, typically, as optimum moisture content; however, for expansive soils it may be greater than optimum moisture content, and other moisture contents may be necessary to produce the desired results with certain soils.

11. Density Tests
Field density tests shall be performed on layers of fill when the fill is being placed as directed by the Geotechnical Engineer. The maximum fill height between density testing shall be eighteen inches (18"). All testing shall be requested by the contractor to meet the contractor's construction schedule. Notification by the contractor to conduct tests shall be at least the day before. This notification shall include the fill area location (Lot and Block), the lift or height of fill and approximate desired time of testing. When these tests indicate that the density of any layer of fill or portion thereof is below the required density, the particular layer or portion shall be reworked and retested at the expense of the contractor unless the contractor can show evidence that circumstances beyond his control required the retesting. Generally, the specific testing will be as follows and conducted by Geotechnical Engineer.

A. The land to be filled (prepared subgrade) shall be prepared and tested at a frequency as determined by the Geotechnical Engineer.
B. The first lift of compacted fill (generally 8 to 12-in.) shall be tested as determined by the Geotechnical Engineer. Any areas supporting the proposed structures requiring fill shall be tested for density compliance.
C. Fills shall be tested a maximum of each eighteen inches (18") of fill.
D. Test results will be provided by the field technician to the contractor when possible; however, all test results are to be reviewed by the Geotechnical Engineer for compliance. The engineer will notify the contractor of all test results.

12. Cut/Fill Lots
Areas involving cut on one portion and fill on another portion of a specific lot shall be prepared to a minimum depth of 6-in. and will be the same material classification at the same compaction and moisture content. A minimum of two (2) field density tests shall be required on each cut/fill lot for the purpose of determining uniformity of the area supporting the proposed structures.

NOTES:

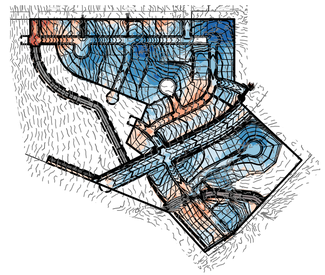
1. STREET PAVEMENT CONTOURS SHOWN. REFERENCE GEOTECH REPORT FOR PAVEMENT SECTIONS.
2. HOUSE PADS SHALL HAVE A MINIMUM 20' FRONTAGE, 15' REAR AND 5' SIDE SETBACK UNLESS NOTED OTHERWISE. CONTRACTOR SHALL REFER TO THE SUBDIVISION PLAT TO VERIFY ALL SETBACKS PRIOR TO CONSTRUCTION.
3. MINIMUM SLAB EXPOSURE IS 1.0'.
4. TYPICAL PAD SIZES IS 40' X 80' UNLESS NOTED OTHERWISE ON PLAN.
5. MAXIMUM REAR SETBACK SLOPE = 15%
6. HOUSE PAD SWALES TO BE CONSTRUCTED WITH HOME BUILDING.
7. CONTRACTOR SHALL ENSURE THAT POSITIVE DRAINAGE IS MAINTAINED AWAY FROM ALL HOUSE PADS. NO WATER PONDING SHALL BE ALLOWED.

DENSITY TEST FREQUENCY

NOT TO SCALE

* DENSITY TEST REQUIRED ON ALL LIFTS PER CITY OF BOERNE SPECIFICATIONS SECTION 02200(3.7)

SCALE: 1"=80'
0 80 160



CUT & FILL HEAT MAP
N.T.S.

Elevations Table			
Number	Minimum Elevation	Maximum Elevation	Color
1	-9999.000	-5.000	
2	-5.000	-3.000	
3	-3.000	-1.000	
4	-1.000	0.000	
5	0.000	1.000	
6	1.000	3.000	
7	3.000	5.000	
8	5.000	999999.000	

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CORLEY FARMS UNIT 4

OVERALL GRADING PLAN

REVISIONS

DATE	1	2	3	4	5	6	7	8	9

DATE
06/27/2024

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

STATE OF TEXAS
ANDREW R. LOWRY
123410
LICENSED PROFESSIONAL ENGINEER
06/27/2024

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TBPE No. 455
TBPLS No. 10048500

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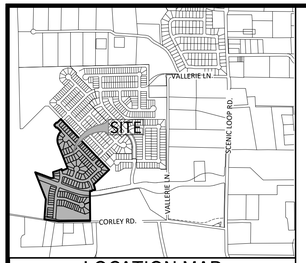
P:\03481\Docs\2-Drawings\Civil_SUBDIVISION\Grading\C-Plan Aug 2024\Sht01 Rodgers Docsetts



LOCATION MAP
N.T.S.

SCALE: 1"=100'
0 100 200

CONDUIT LEGEND

PRIMARY CROSSING
2 ~ 6" SCH. 80 BEC ELEC. CONDUIT TO BE INSTALLED BY BEC
2 ~ 4" SCH. 40 AT&T & SPECTRUM

PRIMARY CROSSING
4 ~ 6" SCH. 80 BEC ELEC. CONDUIT TO BE INSTALLED BY BEC
2 ~ 4" SCH. 40 AT&T & SPECTRUM

2 ~ 6" SCH. 80 BEC ELEC. CONDUIT TO BE INSTALLED BY BEC

SECONDARY CROSSING
1 ~ 6" SCH. 80 BEC ELEC. CONDUIT TO BE INSTALLED BY BEC
2 ~ 6" SCH. 80 CITY OF BOERNE GAS
1 ~ 2" SCH. 40 AT&T
1 ~ 3" SCH. 40 SPECTRUM

1 ~ 8" SCH. 80 CITY OF BOERNE GAS

1 ~ 6" SCH. 80 CITY OF BOERNE GAS

1 ~ 4" SCH. 80 CITY OF BOERNE GAS

IRRIGATION
3 ~ 4" SCH. 40

LEGEND

PROPERTY LINE
PROPOSED SEWER LINE — XX" SS
EXISTING SEWER LINE — EX. XX" SS
PROPOSED WATER LINE — X" W
EXISTING WATER LINE — EX. X" W
PROPOSED MANHOLE
EXISTING MANHOLE
PROPOSED LIGHT POLE
EXISTING STANDARD FIRE HYDRANT
PROPOSED STANDARD FIRE HYDRANT

NOTES

THE LOCATIONS AND DEPTHS OF ALL EXISTING UTILITIES, INCLUDING SERVICE LATERALS AND DRAINAGE STRUCTURES SHOWN ON THE PLANS ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION AND DEPTHS OF UNDERGROUND UTILITIES AT LEAST 48 HOURS PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT, AND TO PROTECT THE SAME DURING CONSTRUCTION.

KC WCID #3A	233-2010
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-545-6005
BANDERA ELECTRIC COOPERATIVE	"
AT&T	"
TIME WARNER CABLE	"
VALERO ENERGY CO.	"
CITY OF BOERNE	"

AT&T AND SPECTRUM LINES TO GO IN JOINT TRENCH WITH BEC LOTS WITH CONFLICTING TRANSFORMER / SECONDARY ENCLOSURE ELECTRIC SERVICE AND WATER METER LOCATION SHALL HAVE WATER METER PLACED 5' FROM PROPERTY LINE WHERE THE CONFLICT OCCURS.

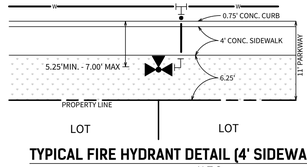
NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TEST WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTER, PER EACH 12-INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

TRENCH EXCAVATION PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

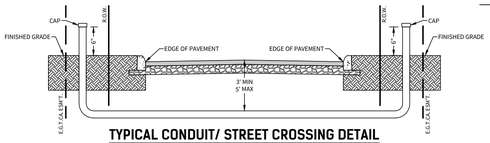
* CONDUIT ONLY TO BE INSTALLED IF:

1.) **STREET BASE AND DRAINAGE COMPLETION PRECEDES CPS UTILITY LINE INSTALLATION.**



NOTE:
1. EXCLUSIVE OF THE TEE, PAYMENT FOR THE FIRE HYDRANT SHALL INCLUDE ALL FITTINGS, 6" D.I. PIPE AND 6" GATE VALVE & BOX.
2. FIRE HYDRANT TO BE INSTALLED OUTSIDE OF THE LIMITS OF ALL PROPOSED SIDEWALKS.

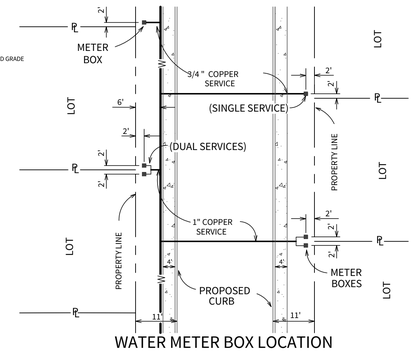
TYPICAL FIRE HYDRANT DETAIL (4' SIDEWALK / 50' R.O.W.)
N.T.S.



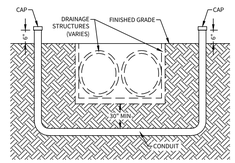
TYPICAL CONDUIT/ STREET CROSSING DETAIL
N.T.S.

NOTES

CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH CPS FACILITY AT ALL STREETS AND DRAIN CROSSING IF BUILT AHEAD OF CPS CONSTRUCTION. SLEEVES MUST ALSO BE LOCATED FOR CPS CREWS DURING CONSTRUCTION. (SEPARATE ITEM)



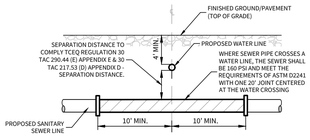
WATER METER BOX LOCATION
N.T.S.



TYPICAL CONDUIT/ DRAIN CROSSING DETAIL
N.T.S.

NOTES

CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH CPS FACILITY AT ALL STREETS AND DRAIN CROSSING IF BUILT AHEAD OF CPS CONSTRUCTION. SLEEVES MUST ALSO BE LOCATED FOR CPS CREWS DURING CONSTRUCTION. (SEPARATE ITEM)



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL
N.T.S.

CUDEENGINEERS.COM

4122 Pond Hill Road, Suite 101
San Antonio, Texas 78231
P:(210) 681.2951 F: (210) 523.7112

CORLEY FARMS UNIT 4

CONDUIT PLAN

DATE
02/20/2025

PROJECT NO.
03481.008

DRAWN BY
CG/ED/AG/JR/RC/LW

CHECKED BY
CA/XV/JC/AL

REVISIONS

DATE	1	2	3	4	5	6	7	8	9
A									

CUDE ENGINEERS
TBPE No. 455
TBPLS No. 10048500

SAWS JOB NO.
22-1190

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BANDERA ELECTRIC COOPERATIVE, INC.

CORLEY FARMS UNIT 4

GENERAL DRAWINGS

E0	PROJECT COVER SHEET AND DRAWING LIST
E1	DRAWING KEY MAP
E2	UNDERGROUND ELECTRICAL DISTRIBUTION LAYOUT (SHEET 1 OF 3)
E3	UNDERGROUND ELECTRICAL DISTRIBUTION LAYOUT (SHEET 2 OF 3)
E4	UNDERGROUND ELECTRICAL DISTRIBUTION LAYOUT (SHEET 3 OF 3)
E5	TRENCH DETAILS
E6	CONDUIT CONFIGURATION DETAILS
E7	THREE PHASE SECTIONALIZING CABINET DETAILS (TYPE 1)
E8	SINGLE PHASE SECTIONALIZING CABINET DETAILS
E9	SINGLE PHASE TRANSFORMER DETAILS
E10	SECONDARY PEDESTAL AND EQUIPMENT ORIENTATION DETAILS
E11	SWITCHGEAR DETAILS
E12	THREE PHASE RISER DETAILS

REV LIST:

1 REVISION 1: E0, E1, E2, E3, E4

REVISION 2: E1, E2, E4, E11

REVISION 3: E1, E2

ISSUED: 09-02-22
FOR CONSTRUCTION

STATE OF TEXAS
CHRISTOPHER T. HARPER
106036
LICENSED
PROFESSIONAL ENGINEER

Digitally signed by Chris Harper
DN: cn=Chris Harper, o=Schneider Engineering, LTD., email=charper@se-texas.com, c=US
Date: 2024.06.27 16:42:01 -05'00'

NO	DATE	REVISION	BY	CHK	APPD
3	06-27-24	ADDED ST.LT. #14	HPS	CTH	CTH
2	04-15-24	REVISION 2	GLS	CTH	CTH
1	03-18-24	REVISION 1	CJB	CTH	CTH

	DATE	BY
DRWN	05-31-22	CJB
CHK	09-02-22	CTH
APPD	09-02-22	CTH

WWW.SE-TEXAS.COM
TEXAS REGISTRATION NUMBER F-1594

SCHNEIDER ENGINEERING

BANDERA ELECTRIC COOPERATIVE, INC.

CORLEY FARMS UNIT 4, WO 522946

PROJECT COVER SHEET AND DRAWING LIST

SCALE FOR 34 x 22 DWG: N.T.S.

DRAWING NO. E0

22BEC32 R000000000527

09/02/2022 2:47 PM * hsadd * N:\BEC\22BEC32-R000000000527 Corley Farms Unit 4 WO 522946\Drawings\Plan View\E0-Project Cover Sheet-Drawing List.dwg

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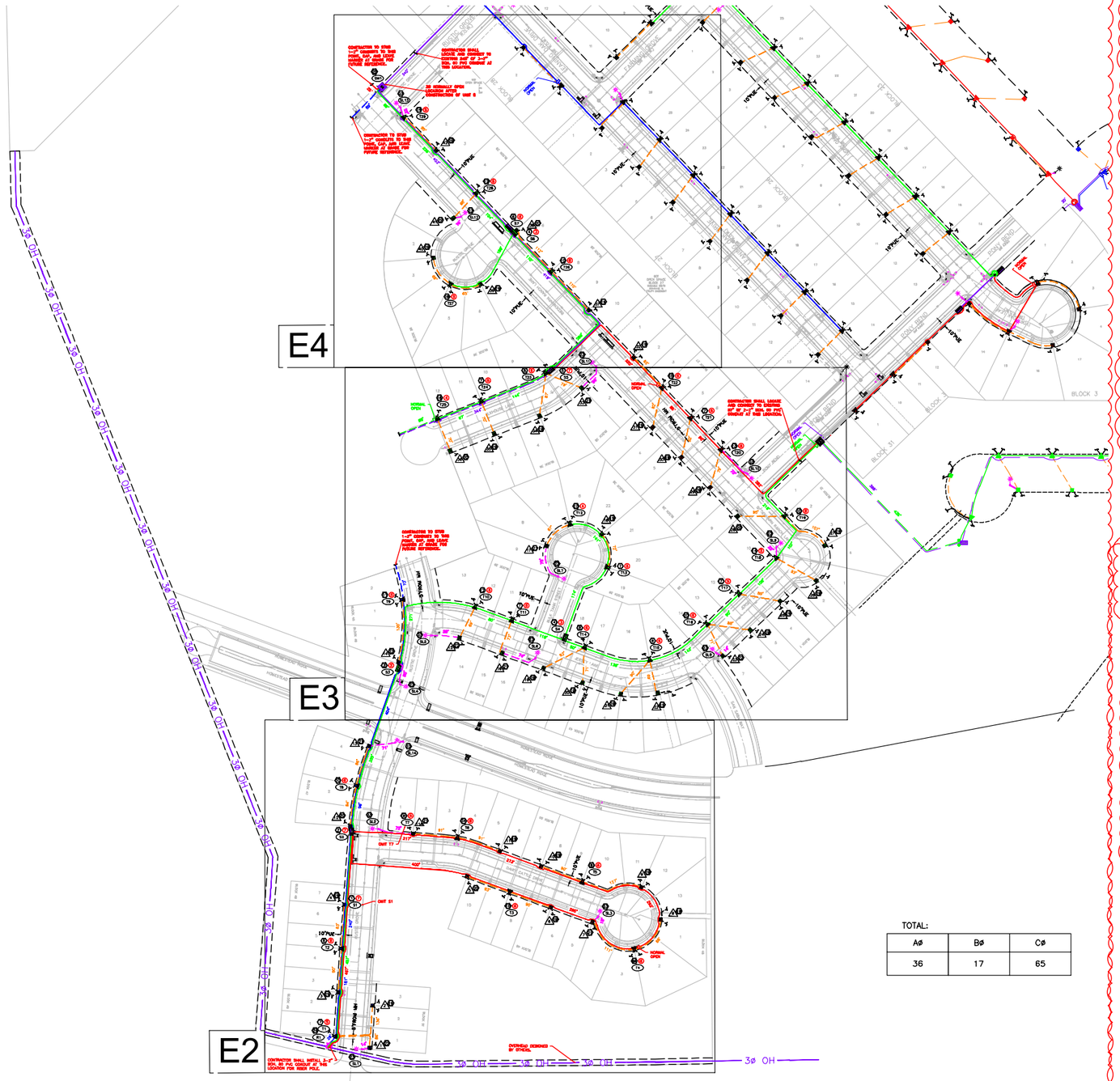
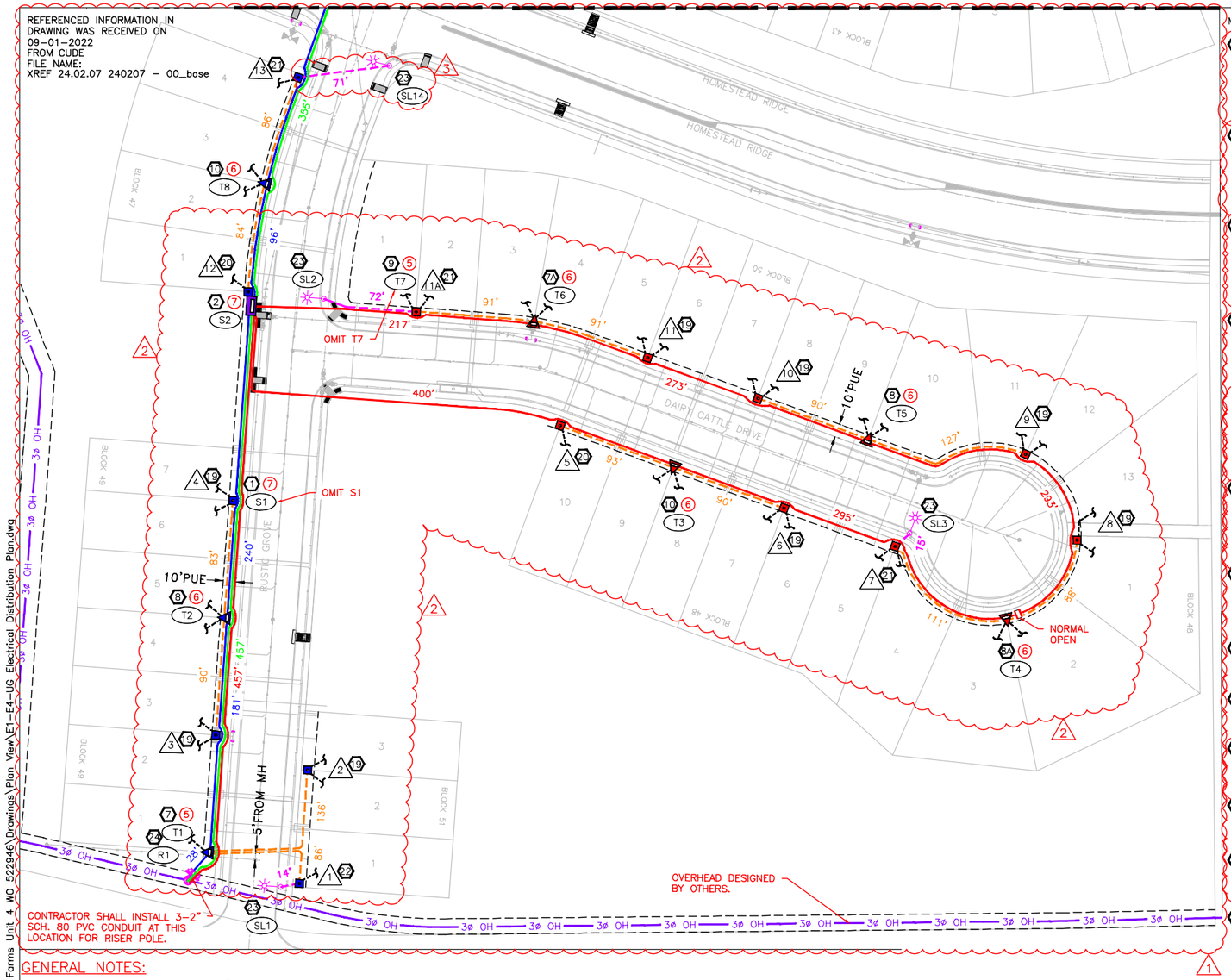
FROM CUDE
FILE NAME:
XREF 24.02.07 240207 - 00_base


E4
E3
E2
3ø OH
CONTRACTOR TO STAB 1-1/4" CONDUIT IN THE HOUSE, CUT, AND LEAVE 24" STUB OUT FOR FUTURE USE.
CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITIES PRIOR TO DIGGING AT THE TIE-IN POINT. NOTIFY ENGINEER OF ANY CONFLICTS.
NORMALLY OPEN LOCATION OF SWITCH 5
CONTRACTOR TO STUB 1-1/4" CONDUIT IN THE HOUSE, CUT, AND LEAVE 24" STUB OUT FOR FUTURE USE.
CONTRACTOR SHALL LOCATE AND VERIFY ALL EXISTING UTILITIES PRIOR TO DIGGING AT THE TIE-IN POINT. NOTIFY ENGINEER OF ANY CONFLICTS.
CONTRACTOR TO STUB 1-1/4" CONDUIT IN THE HOUSE, CUT, AND LEAVE 24" STUB OUT FOR FUTURE USE.
CONTRACTOR SHALL INSTALL 2-2" SCH. 80 PVC CONDUIT AT THIS LOCATION FOR RISER POLE.
OVERHEAD REMOVED BY OTHERS
NORMALLY OPEN
ONE S1
ONE T7
ONE T4
10TPHE
1/0 AL
BLOCK 3
BLOCK 31
BLOCK 1
EASY BEND
EASY BEND DRIVE
EASY BEND COURT
EASY BEND CIRCLE
HOUSE
HOUSE NO. 2
HOUSE NO. 3
HOUSE NO. 4
HOUSE NO. 5
HOUSE NO. 6
HOUSE NO. 7
HOUSE NO. 8
HOUSE NO. 9
HOUSE NO. 10
HOUSE NO. 11
HOUSE NO. 12
HOUSE NO. 13
HOUSE NO. 14
HOUSE NO.

REFERENCED INFORMATION IN
DRAWING WAS RECEIVED ON
09-01-2022
FROM CUDE
FILE NAME:
XREF 24.02.07 240207 - 00_base



MATCHLINE TO E3

1. ADD: S1 (OMIT)
   1-3ø SECTIONALIZING BOX W/ PAD (UM4-200, UM1-2J)
   3-3 POINT JUNCTIONS (200 AMP) (UM6-21)
   7-L.B. ELBOWS (1/0) (UM6-1/0)
   4-FAULT INDICATORS (UM6-4)
   2-INSULATED CAPS (UM6-10)
   7-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
   1-3ø GROUNDING ASSEMBLY (UM48-2)

2. ADD: S2
   1-3ø SECTIONALIZING BOX W/ PAD (UM4-200, UM1-2J)
   3-3 POINT JUNCTIONS (200 AMP) (UM6-21)
   7-L.B. ELBOWS (1/0) (UM6-1/0)
   3-FAULT INDICATORS (UM6-4)
   2-INSULATED CAPS (UM6-10)
   7-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
   1-3ø GROUNDING ASSEMBLY (UM48-2)

7. ADD: T1
   1-1ø TRANSFORMER 75 KVA W/ PAD (UG7-75, UM1-5C)
   2-L.B. ELBOWS (1/0) (UM6-1/0)
   1-FAULT INDICATOR (UM6-4)
   2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
   3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
   1-1ø GROUNDING ASSEMBLY (UM48-1)

7A. ADD: T6
   1-1ø TRANSFORMER 100 KVA W/ PAD (UG7-100, UM1-5C)
   2-L.B. ELBOWS (1/0) (UM6-1/0)
   1-FAULT INDICATOR (UM6-4)
   2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
   4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
   1-1ø GROUNDING ASSEMBLY (UM48-1)

8. ADD: T2, T5
   1-1ø TRANSFORMER 100 KVA W/ PAD (UG7-100, UM1-5C)
   2-L.B. ELBOWS (1/0) (UM6-1/0)
   1-FAULT INDICATOR (UM6-4)
   2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
   4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
   1-1ø GROUNDING ASSEMBLY (UM48-1)

8A. ADD: T4 (NORMALLY OPEN)
   1-1ø TRANSFORMER 100 KVA W/ PAD (UG7-100, UM1-5C)
   2-L.B. ELBOWS (1/0) (UM6-1/0)
   1-L.A. ELBOW (UM6-34)
   1-PARKING STAND (UM6-37)
   1-FAULT INDICATOR (UM6-4)
   2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
   4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
   1-1ø GROUNDING ASSEMBLY (UM48-1)

9. ADD: T7 (OMIT)
   1-1ø TRANSFORMER 50 KVA W/ PAD (UG7-50, UM1-5C)
   2-L.B. ELBOWS (1/0) (UM6-1/0)
   1-FAULT INDICATOR (UM6-4)
   2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
   2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
   1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")
   1-1ø GROUNDING ASSEMBLY (UM48-1)

10. ADD: T3, T8
   1-1ø TRANSFORMER 75 KVA W/ PAD (UG7-75, UM1-5C)
   2-L.B. ELBOWS (1/0) (UM6-1/0)
   1-FAULT INDICATOR (UM6-4)
   2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
   4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
   1-1ø GROUNDING ASSEMBLY (UM48-1)

19. ADD: 2, 3, 4, 6, 8, 9, 10, 11
   1-SECONDARY PEDESTAL (UK5)
   1-SECONDARY CONNECTOR BLOCKS (UJ3)
   3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)

20. ADD: 5, 12
   1-SECONDARY PEDESTAL (UK5)
   1-SECONDARY CONNECTOR BLOCKS (UJ3)
   2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)

21. ADD: 7, 11A, 13
   1-SECONDARY PEDESTAL (UK5)
   1-SECONDARY CONNECTOR BLOCKS (UJ3)
   3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
   1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")

22. ADD: 1
   1-SECONDARY PEDESTAL (UK5)
   1-SECONDARY CONNECTOR BLOCKS (UJ3)
   2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
   1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")

23. ADD: SL1, SL2, SL3, SL14
   1-ST. LT. STANDARD
   1-ST. LT. LAMP
   1-ST. LT. BALLAST
   1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")

24. ADD: R1
   1-UC1

TRIP SETTINGS:
THE RECOMMENDED SETTINGS FOR THE S&C TRIPSAVER II'S AT THE RISER POLE ARE BELOW. IT IS RECOMMENDED THAT THE BED PURCHASE THE TRIPSAVER WITH THE 200-AMP, 6.3 KA RATING DUE TO THE HIGH SOURCE IMPEDANCE AT MENGER CREEK.

INITIAL TRIP: MICROPROCESSOR RECLOSER EMULATED DEVICE, S&C 113 CURVE, 200 AMP MINIMUM TRIP, TIME MULTIPLIER = 0.7. DO NOT ENABLE EQUENCE COORDINATION. ONE TRIP TO LOCKOUT, DO NOT NEED ADDITIONAL TEST (NO ADDITIONAL CURVES).

FOR THE NR CURVE SETTINGS, USE A 200AMP TRIP SECTIONALIZING SETTINGS = SECTIONALIZING MODE DISABLED (SO IT DOES NOT ACT LIKE A SECTIONALIZER)

LABELS

S#	SECTIONALIZING BOX NO.
SW#	SWITCHGEAR NO.
T#	TRANSFORMER NO.
R#	RISER NO.
SL#	STREETLIGHT NO.
X	SECONDARY PEDESTAL NO.

SYMBOLS

	POLE	RISER	TRANSFORMER
PROPOSED	●	⊕	⋈
EXISTING	●	⊕	⋈
REMOVAL	●	⊕	⋈

NEW 200A 1ø SECTIONALIZING BOX
A PHASE B PHASE C PHASE

EXISTING EQUIPMENT (COLOR PER PHASE)
JBOX XFMR SEC PED

NEW 200A 3ø SECTIONALIZING PAD

NEW 1ø TRANSFORMER
A PHASE B PHASE C PHASE

(#) NUMBER OF CONDUITS EXITING

S EXISTING 3ø SWITCHGEAR

S PROPOSED 200A 3ø SWITCHGEAR

STREET LIGHT

SECONDARY PEDESTAL
A PHASE B PHASE C PHASE

BOLLARD

LEGEND

AØ / BØ / CØ	PRIMARY: 1/0 AL W/ FULL CONCENTRIC JACKETED NEUTRAL, 25 kV, XLPE, 260 MIL INSUL. IN 2" MIN. PVC SCH. 80, ELECT. CONDUIT
3Ø 200 AMP	PRIMARY: 4/0 AL W/ ONE THIRD CONCENTRIC JACKETED NEUTRAL, 25 kV, XLPE, 260 MIL INSUL. IN 3 – 2" MIN. PVC SCH. 80, ELECT. CONDUIT
3Ø	3Ø OVERHEAD CONDUCTOR
100'	3Ø CONDUIT POINT TO POINT DISTANCE
100'	1Ø, PHASE A CONDUIT POINT TO POINT DISTANCE
100'	1Ø, PHASE B CONDUIT POINT TO POINT DISTANCE
100'	1Ø, PHASE C CONDUIT POINT TO POINT DISTANCE
100'	EMPTY CONDUIT POINT TO POINT DISTANCE
	VACANT 3Ø(EMPTY) 3-2" CONDUIT OR AS SPECIFIED
	VACANT AØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
	VACANT BØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
	VACANT CØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
	EXISTING VACANT (EMPTY) 2" CONDUIT OR AS SPECIFIED
	EXISTING 3Ø OVERHEAD LINE
	ELECTRICAL UTILITY EASEMENT
	350 MCM AL, 600V, TRIPLEX IN 3" MIN. PVC SCH 80, ELECT. CONDUIT
	STREET LIGHT CABLE, 600V, #2 COPPER (2EA.) AND #10 CU EQUIP GRD, INSTALLED IN 1" PVC SCH 80 ELECT. CONDUIT OR AS SPECIFIED

GENERAL NOTES:

1. ALL PRIMARY CONDUIT SHALL BE 2" SCHEDULE 80 PVC.
2. CONSTRUCTION SHALL TAG AND CODE CABLE IN THE FIELD TO IDENTIFY PHASES.
3. CONTRACTOR TO STUB UP SPARE TEL. AND CATV NEXT TO METER PEDS AS REQUIRED BY RESPECTIVE UTILITIES.
4. ALL PRIMARY CABLE SHALL BE 1/0 AL or 4/0 AL, 25 kV.
5. ALL PAD-MOUNTED ENCLOSURES INCLUDING TRANSFORMERS, SHALL BE GROUNDED IN SUCH A MANNER THAT TWO SEPARATE CONNECTIONS EXIST BETWEEN THE ENCLOSURE AND THE GROUND ROD(S). IF METER PEDESTALS, TRANSFORMERS, AND SECTIONALIZING BOXES ARE WITHIN 10 FEET OF EACH OTHER A #2 CU. SOLID BARE WIRE SHALL TIE ALL GROUND RODS TOGETHER.
6. SECTIONALIZING BOXES, TRANSFORMERS, EASEMENTS, CABLE, AND WIRE ARE NOT SHOWN TO SCALE IN THIS DRAWING.
7. EASEMENTS TO BE DEDICATED BY DEVELOPER TO COVER ALL ELECTRIC FACILITIES.
8. ALL ELECTRIC STREET CROSSINGS AND SERVICE EXTENSION TRENCHES TO INCLUDE TEL. & CATV.
9. IF ANY ELECTRIC FACILITIES ARE SUSCEPTIBLE TO DAMAGE FROM VEHICULAR TRAFFIC, BOLLARDS SHALL BE PLACED AROUND THE EQUIPMENT TO PREVENT DAMAGE.
10. FOR ANY PAD LOCATED IN DRAINAGE EASEMENT OR EROSION PRONE AREAS, CONTRACTOR SHALL BUILD UP PAD SITE AND REINFORCE WITH CONCRETE TO PREVENT EROSION.
11. TRANSFORMER AND SECONDARY SERVICE SIZE EVALUATION SHOULD BE PERFORMED AT THE TIME OF EACH SERVICE REQUEST.
12. 3" SECONDARY CONDUITS STUBBED OUT OF SECONDARY EQUIPMENT, TOWARDS THE LOTS, SHALL BE 5' INTO EACH INDIVIDUAL LOT, CAPPED, AND MARKED AT GRADE LEVEL FOR FUTURE SERVICE.
13. CONTRACTOR NOT TO EXCEED 360 DEGREES IN BENDS PER CONDUIT SEGMENT.
14. ELECTRICAL FACILITIES SHALL BE INSTALLED A MINIMUM OF 4 FEET FROM FIRE HYDRANTS.

ISSUED: 09-02-22
FOR CONSTRUCTION

STATE OF TEXAS
CHRISTOPHER T. HARPER
106036
LICENSED
PROFESSIONAL ENGINEER

Digitally signed by Chris Harper
DN: cn=Chris Harper, o=Schneider Engineering, LTD., email=charper@se-texas.com, c=US
Date: 2024.06.27 16:44:04 -05'00'

NO	DATE	REVISION	BY	CHK	APPD
3	06-27-24	ADDED ST.LT. #14	HPS	CTH	CTH
2	04-15-24	UPDATE EQUIPMENT & KEYNOTES	GLS	CTH	CTH
1	03-18-24	UPDATE EQUIPMENT, SPANS, & KEYNOTES	CJB	CTH	CTH

	DATE	BY
DRWN	05-31-22	CJB
CHK	09-02-22	CTH
APPD	09-02-22	CTH

WWW.SE-TEXAS.COM
TEXAS REGISTRATION NUMBER F-1594

SCHNEIDER ENGINEERING

BANDERA ELECTRIC COOPERATIVE, INC.

CORLEY FARMS UNIT 4, WO 522946

UNDERGROUND ELECTRICAL DISTRIBUTION LAYOUT
(SHEET 1 OF 3)

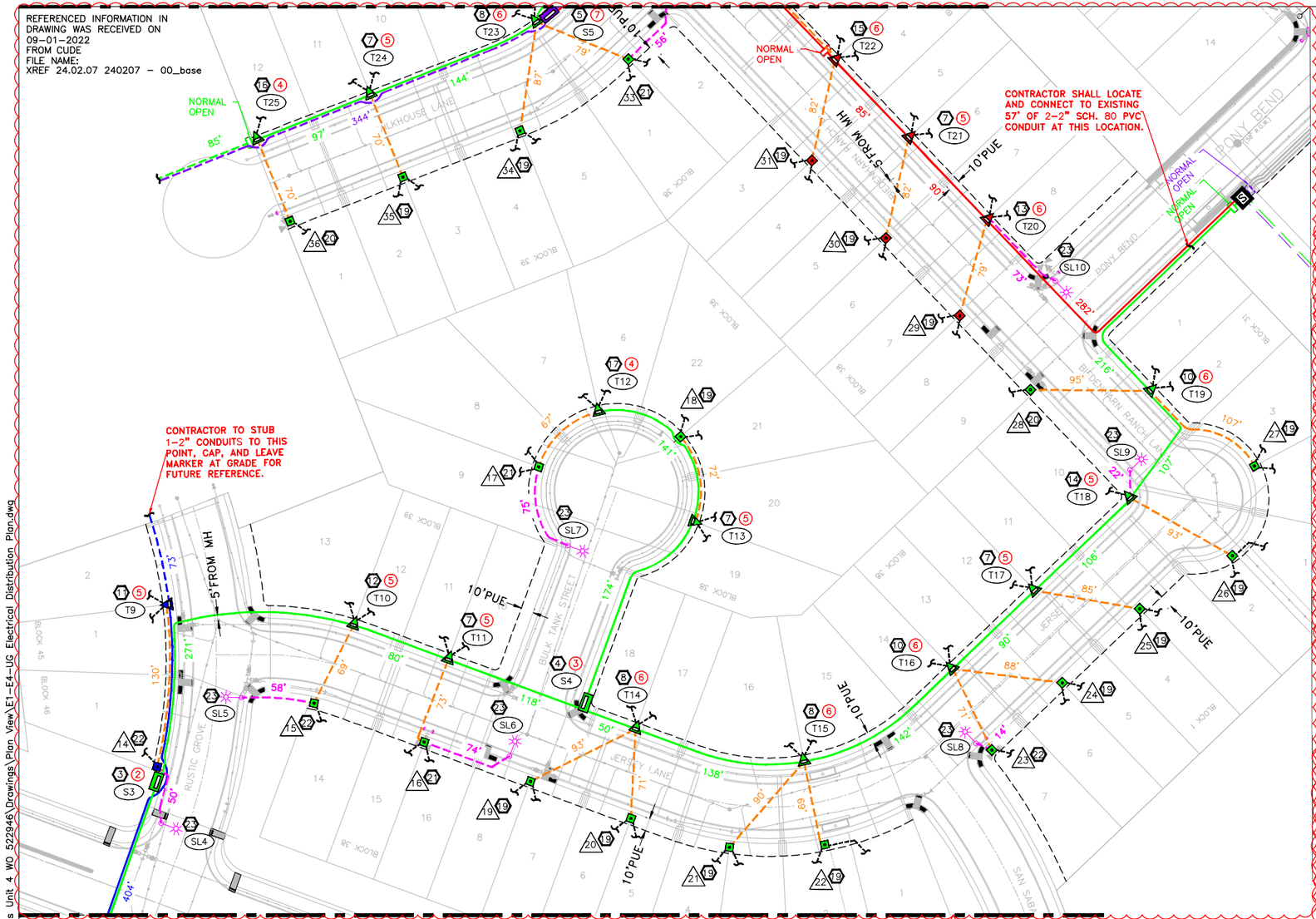
SCALE FOR 34 x 22 DWG: 1" = 50'

DRAWING NO. E2

09/02/2022 2:47 PM * hsadd * N:\BEC\22BEC32-R000000000527 Corley Farms Unit 4 WO 522946\Drawings\Plan View\E1-E4-UG Electrical Distribution Plan.dwg

22BEC32 R000000000527

REFERENCED INFORMATION IN DRAWING WAS RECEIVED ON 09-01-2022
FROM CUDE
FILE NAME:
XREF 24.02.07 240207 - 00_base



GENERAL NOTES:

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13. CONTRACTOR NOT TO EXCEED 360 DEGREES IN BENDS PER CONDUIT SEGMENT.
14. ELECTRICAL FACILITIES SHALL BE INSTALLED A MINIMUM OF 4 FEET FROM FIRE HYDRANTS.

ISSUED: 09-02-22
FOR CONSTRUCTION

(A) EXISTING: SWO
1-3ø SWITCHGEAR
2-3ø 600 AMP SWITCHES
2-3ø 200 AMP VFI
6-L.B. ELBOWS (4/0) (UM6-4/0)
3-L.B. ELBOWS (1/0) (UM6-1/0)
3-INSULATED CAPS (UM6-10)
6-FAULT INDICATORS (UM6-4)
11-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
2-3ø VFI COMPARTMENTS
1-3ø GROUNDING ASSEMBLY (UM48-2)

REMOVE:
2-INSULATED CAPS (UM6-10)

ADD:
2-L.B. ELBOWS (1/0) (UM6-1/0)
(C⌀ TO REMAIN OPEN)

(3) ADD: S3
1-1ø SECTIONALIZING BOX W/ PAD (UM3-14, UM1-5J)
1-4 POINT JUNCTION (200 AMP) (UM6-22)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-INSULATED CAPS (UM6-10)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(4) ADD: S4
1-1ø SECTIONALIZING BOX W/ PAD (UM3-14, UM1-5J)
1-4 POINT JUNCTION (200 AMP) (UM6-22)
3-L.B. ELBOWS (1/0) (UM6-1/0)
2-FAULT INDICATORS (UM6-4)
1-INSULATED CAP (UM6-10)
3-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(5) ADD: S5
1-3ø SECTIONALIZING BOX W/ PAD (UM4-200, UM1-2J)
3-3 POINT JUNCTIONS (200 AMP) (UM6-21)
3-L.B. ELBOWS (4/0) (UM6-4/0)
1-L.B. ELBOW (1/0) (UM6-1/0)
1-FAULT INDICATORS (UM6-4)
2-INSULATED CAPS (UM6-10)
7-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
1-3ø GROUNDING ASSEMBLY (UM48-2)

(7) ADD: T11, T13, T17, T21, T24
1-1ø TRANSFORMER 75 KVA W/ PAD (UG7-75, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(8) ADD: T14, T15, T23
1-1ø TRANSFORMER 100 KVA W/ PAD (UG7-100, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(10) ADD: T16, T19
1-1ø TRANSFORMER 75 KVA W/ PAD (UG7-75, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(11) ADD: T9
1-1ø TRANSFORMER 50 KVA W/ PAD (UG7-50, UM1-5C)
1-L.B. ELBOW (1/0) (UM6-1/0)
1-L.A. ELBOW (UM6-34)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(12) ADD: T10
1-1ø TRANSFORMER 50 KVA W/ PAD (UG7-50, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(13) ADD: T20
1-1ø TRANSFORMER 75 KVA W/ PAD (UG7-75, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")
1-1ø GROUNDING ASSEMBLY (UM48-1)

(14) ADD: T18
1-1ø TRANSFORMER 50 KVA W/ PAD (UG7-50, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")
1-1ø GROUNDING ASSEMBLY (UM48-1)

(15) ADD: T22 (NORMALLY OPEN)
1-1ø TRANSFORMER 100 KVA W/ PAD (UG7-100, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-L.A. ELBOW (UM6-34)
1-PARKING STAND (UM6-37)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(16) ADD: T25 (NORMALLY OPEN)
1-1ø TRANSFORMER 50 KVA W/ PAD (UG7-50, UM1-5C)
1-L.B. ELBOW (1/0) (UM6-1/0)
1-L.A. ELBOW (UM6-34)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(17) ADD: T12
1-1ø TRANSFORMER 75 KVA W/ PAD (UG7-75, UM1-5C)
1-L.B. ELBOW (1/0) (UM6-1/0)
1-L.A. ELBOW (UM6-34)
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

(18) ADD: 18, 19, 20, 21, 22, 24, 25, 26, 27, 29, 30, 31, 34, 35
1-SECONDARY PEDESTAL (UK5)
1-SECONDARY CONNECTOR BLOCKS (UJ3)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)

(20) ADD: 28, 36
1-SECONDARY PEDESTAL (UK5)
1-SECONDARY CONNECTOR BLOCKS (UJ3)
2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)

(21) ADD: 16, 17, 33
1-SECONDARY PEDESTAL (UK5)
1-SECONDARY CONNECTOR BLOCKS (UJ3)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")

(22) ADD: 14, 15, 23
1-SECONDARY PEDESTAL (UK5)
1-SECONDARY CONNECTOR BLOCKS (UJ3)
2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")

(23) ADD: SL4, SL5, SL6, SL7, SL8, SL9, SL10
1-ST. LT. STANDARD
1-ST. LT. LAMP
1-ST. LT. BALLAST
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")

LABELS

- S# SECTIONALIZING BOX NO.
- SW# SWITCHGEAR NO.
- T# TRANSFORMER NO.
- R# RISER NO.
- SL# STREETLIGHT NO.
- X SECONDARY PEDESTAL NO.

SYMBOLS

	POLE	RISER	TRANSFORMER
PROPOSED	●	●	⋈
EXISTING	●	⊗	⋈
REMOVAL	●	⊗	⋈

NEW 200A 1ø SECTIONALIZING BOX
A PHASE B PHASE C PHASE

EXISTING EQUIPMENT (COLOR PER PHASE)
JBOX XFMR SEC PED

NEW 200A 3ø SECTIONALIZING PAD

NEW 1ø TRANSFORMER
A PHASE B PHASE C PHASE

(#) NUMBER OF CONDUITS EXITING

S EXISTING 3ø SWITCHGEAR

S PROPOSED 200A 3ø SWITCHGEAR

STREET LIGHT

SECONDARY PEDESTAL
A PHASE B PHASE C PHASE

BOLLARD

LEGEND

- AØ BØ CØ — PRIMARY: 1/0 AL W/ FULL CONCENTRIC JACKETED NEUTRAL, 25 kV, XLPE, 260 MIL INSUL. IN 2" MIN. PVC SCH. 80, ELECT. CONDUIT
- 3Ø 200 AMP — PRIMARY: 4/0 AL W/ ONE THIRD CONCENTRIC JACKETED NEUTRAL, 25 kV, XLPE, 260 MIL INSUL. IN 3 - 2" MIN. PVC SCH. 80, ELECT. CONDUIT
- 100' - 3Ø CONDUIT POINT TO POINT DISTANCE
- 100' - 1Ø, PHASE A CONDUIT POINT TO POINT DISTANCE
- 100' - 1Ø, PHASE B CONDUIT POINT TO POINT DISTANCE
- 100' - 1Ø, PHASE C CONDUIT POINT TO POINT DISTANCE
- 100' - EMPTY CONDUIT POINT TO POINT DISTANCE
- VACANT 3Ø(EMPTY) 3-2" CONDUIT OR AS SPECIFIED
- VACANT AØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
- VACANT BØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
- VACANT CØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
- EXISTING VACANT (EMPTY) 2" CONDUIT OR AS SPECIFIED
- EXISTING 3Ø OVERHEAD LINE
- ELECTRICAL UTILITY EASEMENT
- 350 MCM AL, 600V, TRIPLEX IN 3" MIN. PVC SCH 80, ELECT. CONDUIT
- STREET LIGHT CABLE, 600V, #2 COPPER (2EA.) AND #10 CU EQUIP GRD, INSTALLED IN 1" PVC SCH 80 ELECT. CONDUIT OR AS SPECIFIED

NO	DATE	REVISION	BY	CHK	APPD
1	03-18-24	UPDATE EQUIPMENT, SPANS, & KEYNOTES	CJB	CTH	CTH

	DATE	BY
DRWN	05-31-22	CJB
CHK	09-02-22	CTH
APPD	09-02-22	CTH

STATE OF TEXAS
CHRISTOPHER T. HARPER
106036
LICENSED PROFESSIONAL ENGINEER

Digitally signed by Chris Harper
DN: cn=Chris Harper, o=Schneider Engineering, LTD, email=charper@se-texas.com, c=US
Date: 2024.06.27 16:44:32 -05'00'

WWW.SE-TEXAS.COM
TEXAS REGISTRATION NUMBER F-1594

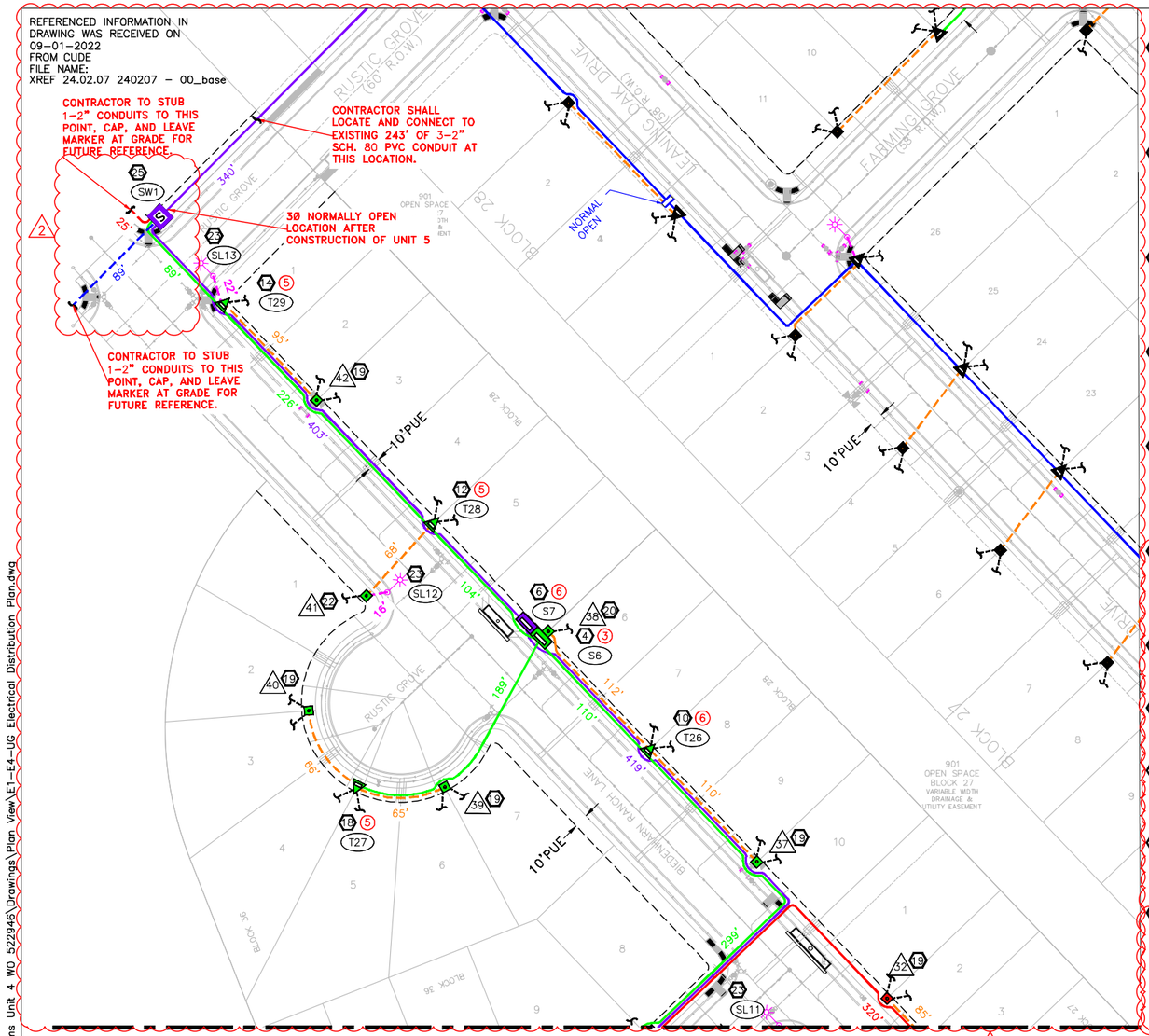
SCHNEIDER ENGINEERING

BANDERA ELECTRIC COOPERATIVE, INC.
CORLEY FARMS UNIT 4, WO 522946
UNDERGROUND ELECTRICAL DISTRIBUTION LAYOUT
(SHEET 2 OF 3)

SCALE FOR 34 x 22 DWG 1" = 50'
DRAWING NO. E3

09/02/2022 2:47 PM * hsadd * N:\BEC\22BEC32-R000000000527 Corley Farms Unit 4 WO 522946\Drawings\Plan View\E1-E4-UG Electrical Distribution Plan.dwg

22BEC32 R000000000527



4 ADD: S6
1-1ø SECTIONALIZING BOX W/ PAD (UM3-14, UM1-5J)
1-4 POINT JUNCTION (200 AMP) (UM6-22)
3-L.B. ELBOWS (1/0) (UM6-1/0)
2-FAULT INDICATORS (UM6-4)
1-INSULATED CAP (UM6-10)
3-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
1-1ø GROUNDING ASSEMBLY (UM48-1)

6 ADD: S7
1-3ø SECTIONALIZING BOX W/ PAD (UM4-200, UM1-2J)
3-3 POINT JUNCTIONS (200 AMP) (UM6-21)
6-L.B. ELBOWS (4/0) (UM6-4/0)
3-FAULT INDICATORS (UM6-4)
3-INSULATED CAPS (UM6-10)
6-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
1-3ø GROUNDING ASSEMBLY (UM48-2)

10 ADD: T26
1-1ø TRANSFORMER 75 KVA W/ PAD (UG7-75, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

12 ADD: T28
1-1ø TRANSFORMER 50 KVA W/ PAD (UG7-50, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

14 ADD: T29
1-1ø TRANSFORMER 50 KVA W/ PAD (UG7-50, UM1-5C)
2-L.B. ELBOWS (1/0) (UM6-1/0)
1-FAULT INDICATOR (UM6-4)
2-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")
1-1ø GROUNDING ASSEMBLY (UM48-1)

16 ADD: T27
1-1ø TRANSFORMER 100 KVA W/ PAD (UG7-100, UM1-5C)
1-L.B. ELBOW (1/0) (UM6-1/0)
1-L.A. ELBOW (UM6-34)
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2)
4-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-1ø GROUNDING ASSEMBLY (UM48-1)

18 ADD: 32, 37, 39, 40, 42
1-SECONDARY PEDESTAL (UK5)
1-SECONDARY CONNECTOR BLOCKS (UJ3)
3-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)

20 ADD: 38
1-SECONDARY PEDESTAL (UK5)
1-SECONDARY CONNECTOR BLOCKS (UJ3)
2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)

22 ADD: 41
1-SECONDARY PEDESTAL (UK5)
1-SECONDARY CONNECTOR BLOCKS (UJ3)
2-3" 90° SWEEPS SCH 80 PVC (UM50-SW-3)
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")

24 ADD: SL11, SL12, SL13
1-ST. LT. STANDARD
1-ST. LT. LAMP
1-ST. LT. BALLAST
1-2" 90° SWEEP SCH 80 PVC (UM50-SW-2-24")

26 ADD: SW1
1-3ø SWITCHGEAR W/ PAD
1-3ø 600 AMP SWITCH
2-3ø 200 AMP VFIs
3-D.B. ELBOWS (4/0)
3-L.B. ELBOWS (4/0) (UM6-4/0)
1-L.B. ELBOW (1/0) (UM6-1/0)
2-INSULATED CAPS (UM6-10)
4-FAULT INDICATORS (UM6-4)
9-2" 90° SWEEPS SCH 80 PVC (UM50-SW-2)
2-3ø VFI COMPARTMENTS
1-3ø GROUNDING ASSEMBLY (UM48-2)

VFI SETTINGS:
THE RECOMMENDED SETTINGS FOR THE G&W VACUUM INTERRUPTER SWITCHGEAR THAT WILL COORDINATE DIRECTLY WITH THE UPLINE S&C TRIPSAVER II'S ARE (ASSUMING A 500:1 CT IS USED): MINIMUM TRIP-100 AMP USING THE CO-11 RELAY #1 CURVE SETTING.

THE RECOMMENDED SETTINGS FOR THE KYLE SHRUBLINE VFI TO BE USED ON THE SINGLE-PHASE TAPS THAT WILL DIRECTLY COORDINATE WITH THE UPLINE TRIPSAVER II OR THE UPLINE G&W VACUUM INTERRUPTER SWITCHGEAR ARE: COOPER TRI-PHASE CONTROL, MINIMUM TRIP-70 AMP USING THE EF CURVE MODULE.

MATCHLINE TO E3

LABELS

- S# SECTIONALIZING BOX NO.
- SW# SWITCHGEAR NO.
- T# TRANSFORMER NO.
- R# RISER NO.
- SL# STREETLIGHT NO.
- X SECONDARY PEDESTAL NO.

SYMBOLS

	POLE	RISER	TRANSFORMER
PROPOSED	●	●	
EXISTING	●	●	
REMOVAL	●	●	

NEW 200A 1ø SECTIONALIZING BOX
A PHASE B PHASE C PHASE

EXISTING EQUIPMENT (COLOR PER PHASE)
JBOX XFMR SEC PED

NEW 200A 3ø SECTIONALIZING PAD

NEW 1ø TRANSFORMER
A PHASE B PHASE C PHASE

(#) NUMBER OF CONDUITS EXITING

S EXISTING 3ø SWITCHGEAR

S PROPOSED 200A 3ø SWITCHGEAR

STREET LIGHT

SECONDARY PEDESTAL
A PHASE B PHASE C PHASE

BOLLARD

LEGEND

- AØ BØ CØ — PRIMARY: 1/0 AL W/ FULL CONCENTRIC JACKETED NEUTRAL, 25 kV, XLPE, 260 MIL INSUL. IN 2" MIN. PVC SCH. 80, ELECT. CONDUIT
- 3Ø 200 AMP — PRIMARY: 4/0 AL W/ ONE THIRD CONCENTRIC JACKETED NEUTRAL, 25 kV, XLPE, 260 MIL INSUL. IN 3 - 2" MIN. PVC SCH. 80, ELECT. CONDUIT
- 100' – 3Ø CONDUIT POINT TO POINT DISTANCE
- 100' – 1Ø, PHASE A CONDUIT POINT TO POINT DISTANCE
- 100' – 1Ø, PHASE B CONDUIT POINT TO POINT DISTANCE
- 100' – 1Ø, PHASE C CONDUIT POINT TO POINT DISTANCE
- 100' – EMPTY CONDUIT POINT TO POINT DISTANCE
- VACANT 3Ø(EMPTY) 3-2" CONDUIT OR AS SPECIFIED
- VACANT AØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
- VACANT BØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
- VACANT CØ(EMPTY) 2" CONDUIT OR AS SPECIFIED
- EXISTING VACANT (EMPTY) 2" CONDUIT OR AS SPECIFIED
- EXISTING 3Ø OVERHEAD LINE
- ELECTRICAL UTILITY EASEMENT
- 350 MCM AL, 600V, TRIPLEX IN 3" MIN. PVC SCH 80, ELECT. CONDUIT
- STREET LIGHT CABLE, 600V, #2 COPPER (2EA.) AND #10 CU EQUIP GRD, INSTALLED IN 1" PVC SCH 80 ELECT. CONDUIT OR AS SPECIFIED

GENERAL NOTES:

1. ALL PRIMARY CONDUIT SHALL BE 2" SCHEDULE 80 PVC.
2. CONSTRUCTION SHALL TAG AND CODE CABLE IN THE FIELD TO IDENTIFY PHASES.
3. CONTRACTOR TO STUB UP SPARE TEL. AND CATV NEXT TO METER PEDS AS REQUIRED BY RESPECTIVE UTILITIES.
4. ALL PRIMARY CABLE SHALL BE 1/0 AL or 4/0 AL, 25 kV.
5. ALL PAD-MOUNTED ENCLOSURES INCLUDING TRANSFORMERS, SHALL BE GROUNDED IN SUCH A MANNER THAT TWO SEPARATE CONNECTIONS EXIST BETWEEN THE ENCLOSURE AND THE GROUND ROD(S). IF METER PEDESTALS, TRANSFORMERS, AND SECTIONALIZING BOXES ARE WITHIN 10 FEET OF EACH OTHER A #2 CU. SOLID BARE WIRE SHALL TIE ALL GROUND RODS TOGETHER.
6. SECTIONALIZING BOXES, TRANSFORMERS, EASEMENTS, CABLE, AND WIRE ARE NOT SHOWN TO SCALE IN THIS DRAWING.
7. EASEMENTS TO BE DEDICATED BY DEVELOPER TO COVER ALL ELECTRIC FACILITIES.
8. ALL ELECTRIC STREET CROSSINGS AND SERVICE EXTENSION TRENCHES TO INCLUDE TEL. & CATV.
9. IF ANY ELECTRIC FACILITIES ARE SUSCEPTIBLE TO DAMAGE FROM VEHICULAR TRAFFIC, BOLLARDS SHALL BE PLACED AROUND THE EQUIPMENT TO PREVENT DAMAGE.
10. FOR ANY PAD LOCATED IN DRAINAGE EASEMENT OR EROSION PRONE AREAS, CONTRACTOR SHALL BUILD UP PAD SITE AND REINFORCE WITH CONCRETE TO PREVENT EROSION.
11. TRANSFORMER AND SECONDARY SERVICE SIZE EVALUATION SHOULD BE PERFORMED AT THE TIME OF EACH SERVICE REQUEST.
12. 3" SECONDARY CONDUITS STUBBED OUT OF SECONDARY EQUIPMENT, TOWARDS THE LOTS, SHALL BE 5' INTO EACH INDIVIDUAL LOT, CAPPED, AND MARKED AT GRADE LEVEL FOR FUTURE SERVICE.
13. CONTRACTOR NOT TO EXCEED 360 DEGREES IN BENDS PER CONDUIT SEGMENT.
14. ELECTRICAL FACILITIES SHALL BE INSTALLED A MINIMUM OF 4 FEET FROM FIRE HYDRANTS.

ISSUED: 09-02-22
FOR CONSTRUCTION

STATE OF TEXAS
CHRISTOPHER T. HARPER
106036
LICENSED
PROFESSIONAL ENGINEER

Digitally signed by Chris Harper
DN: cn=Chris Harper, o=Schneider Engineering, LTD., email=charper@se-texas.com, c=US
Date: 2024.06.27 16:45:01 -05'00'

NO	DATE	REVISION	BY	CHK	APPD
2	04-15-24	UPDATE EQUIPMENT & KEYNOTES	GLS	CTH	CTH
1	03-18-24	UPDATE EQUIPMENT, SPANS, & KEYNOTES	CJB	CTH	CTH

	DATE	BY
DRWN	05-31-22	CJB
CHK	09-02-22	CTH
APPD	09-02-22	CTH

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TEXAS REGISTRATION NUMBER F-1594

SCHNEIDER ENGINEERING

BANDERA ELECTRIC COOPERATIVE, INC.
CORLEY FARMS UNIT 4, WO 522946

UNDERGROUND ELECTRICAL DISTRIBUTION LAYOUT
(SHEET 3 OF 3)

SCALE FOR 34 x 22 DWG 1" = 50'
DRAWING NO. E4

22BEC32 R000000000527

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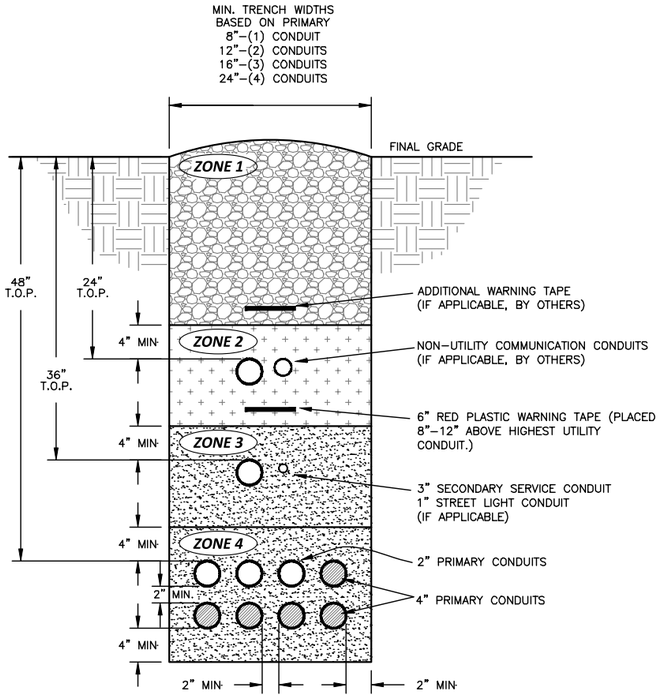


ZONE 1

FINAL BACKFILL ZONE
UNLESS OTHERWISE SPECIFIED, **CLEAN NATIVE MATERIAL** MAYBE UTILIZED FOR BACKFILL IN THIS ZONE.

ZONE 2

COMMUNICATION CONDUIT ZONE
(IF APPLICABLE/BY OTHERS)
THIS TRENCH ZONE IS RESERVED FOR COMMUNICATION CONDUITS AND LOW VOLTAGE APPLICATIONS THAT WILL NOT OWNED BY THE UTILITY. UNLESS OTHERWISE SPECIFIED BY THE OTHERS, **CLEAN NATIVE MATERIAL** MAYBE UTILIZED FOR BACKFILL IN THIS ZONE.

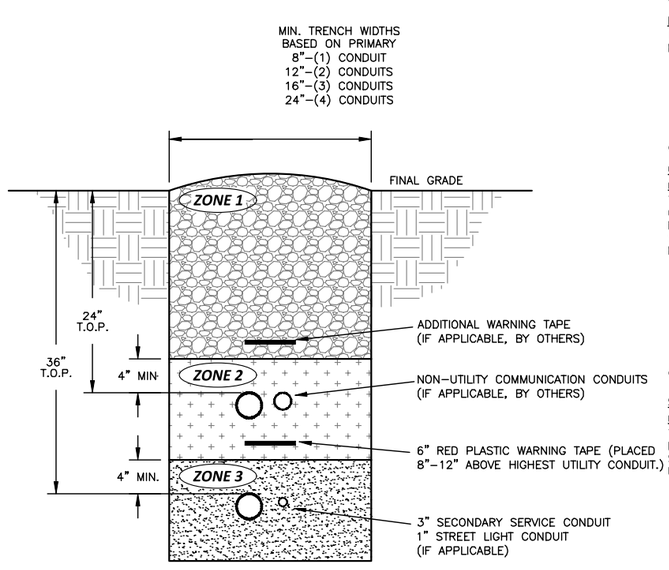
ZONE 3

SECONDARY CONDUIT ZONE
(IF APPLICABLE)
THIS TRENCH ZONE IS RESERVED FOR UTILITY OWNED LOW VOLTAGE CABLE INCLUDING SECONDARY AND STREET LIGHTING CONDUIT. **BEDDING SAND** SHALL BE UTILIZED FOR BACKFILL MATERIAL IN THIS ZONE.

ZONE 4

PRIMARY CONDUIT ZONE
THIS TRENCH ZONE IS RESERVED FOR UTILITY OWNED HIGH VOLTAGE CABLE INCLUDING ALL PRIMARY CONDUITS. **BEDDING SAND** SHALL BE UTILIZED FOR BACKFILL MATERIAL IN THIS ZONE.

PRIMARY TRENCH DETAIL (48" T.O.P.)



ZONE 1

FINAL BACKFILL ZONE
UNLESS OTHERWISE SPECIFIED, **CLEAN NATIVE MATERIAL** MAYBE UTILIZED FOR BACKFILL IN THIS ZONE.

ZONE 2

COMMUNICATION CONDUIT ZONE
(IF APPLICABLE/BY OTHERS)
THIS TRENCH ZONE IS RESERVED FOR COMMUNICATION CONDUITS AND LOW VOLTAGE APPLICATIONS THAT WILL NOT OWNED BY THE UTILITY. UNLESS OTHERWISE SPECIFIED BY THE OTHERS, **CLEAN NATIVE MATERIAL** MAYBE UTILIZED FOR BACKFILL IN THIS ZONE.

ZONE 3

SECONDARY CONDUIT ZONE
(IF APPLICABLE)
THIS TRENCH ZONE IS RESERVED FOR UTILITY OWNED LOW VOLTAGE CABLE INCLUDING SECONDARY AND STREET LIGHTING CONDUIT. **BEDDING SAND** SHALL BE UTILIZED FOR BACKFILL MATERIAL IN THIS ZONE.

SECONDARY JOINT-TRENCH DETAIL (36" T.O.P.)

EMBEDMENT/BACKFILL MATERIAL

CLEAN NATIVE MATERIAL – SHALL CONSIST OF ON–SITE TRENCH EXCAVATIONS SO LONG AS IT IS FREE FROM ROCKS OR CLAY CLODS OVER 3" AVG. DIAMETER, TRASH AND ANY ORGANIC MATERIAL. NATIVE MATERIAL SHALL BE COMPACTED TO 92% STANDARD PROCTOR, WHEN TESTED IN ACCORDANCE WITH ASTM 698. NOTE THAT THE UTILITY STILL RESERVES THE RIGHT TO REQUIRE SAND BEDDING AT THEIR DISCRETION.

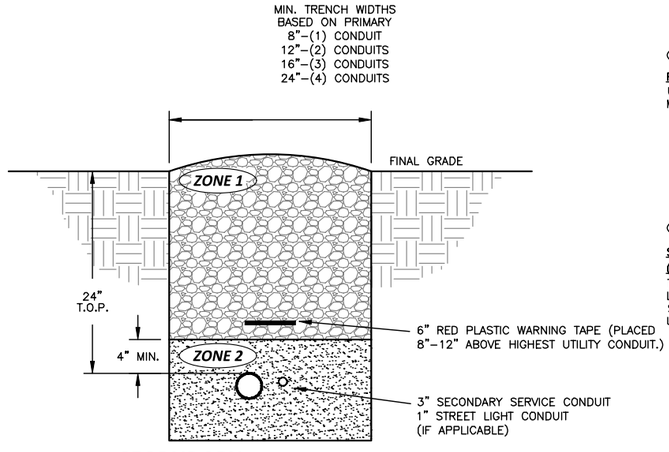
SAND BEDDING – WHEN REQUIRED BY UTILITY, BACKFILL SHALL CONSIST OF CLEAN PIT RUN SAND OR ROCK FINES GRADED AS SPECIFIED BELOW.(SUBMITTAL REQUIRED) COMPACTION TESTING WILL NOT BE REQUIRED FOR THIS MATERIAL, ALTHOUGH COMPACTION EFFORT MUST BE APPLIED. THIS CAN BE BY HAND OR MECHANICAL COMPACTION METHODS.

SIEVE NO.	% BY WEIGHT PASSING
4	100
40	60–100
100	30–70
200	0–8

LIMESTONE BASE – SHALL BE TX DOT TYPE A GRADE 1 OR 2 LIMESTONE BASE MATERIAL AND SHALL BE COMPACTED TO 95% MODIFIED PROCTOR WHEN TESTED IN ACCORDANCE WITH ASTM 1557.

GENERAL NOTES

1. ALL UTILITY CONDUITS SHALL BE SCHEDULE 80 PVC.
2. TO DETERMINE THE NUMBER AND AMOUNT OF CONDUITS FOR ZONES 3 AND 4 REFER TO THE APPROVED "FOR CONSTRUCTION" DRAWINGS.
3. THIS DRAWING IS A JOINT UTILITY TRENCH SECTION. ANY UNUSED UTILITY ZONES SHALL BE BACKFILLED AND COMPACTED WITH NATIVE MATERIAL, UNLESS OTHERWISE SPECIFIED.
4. WHERE TRENCH IS LOCATED BELOW A ROADWAY, ALL ZONES SPECIFYING NATIVE MATERIAL SHALL BE SUBSTITUTED WITH LIMESTONE BASE.
5. WHERE TRENCH CROSSES EITHER ABOVE ANOTHER UTILITY OR DRAINAGE LINE, CONTRACTOR SHALL INSTALL A MIN. 4" THICK 3,000 PSI CONCRETE CAP WITH RED DYE POWDER COATING ABOVE THE HIGHEST ELECTRIC UTILITY CONDUIT EXTENDING 5' IN EITHER DIRECTION OF THE CROSSING.
6. IT IS THE RESPONSIBILITY OF THE PROPERTY OWNER AND/OR CONTRACTOR TO COORDINATE WITH THE APPROPRIATE UTILITY FOR SIZE AND NUMBER OF COMMUNICATIONS CONDUITS.
7. A MIN. OF 12" AND 24" VERTICAL SEPARATION SHALL BE MAINTAINED BETWEEN NON–UTILITY LINES AND UTILITY OWNED SECONDARY AND PRIMARY CONDUITS, RESPECTIVELY.
8. AS DETERMINED BY UTILITY, THERE ARE INSTANCES WHERE CONCRETE ENCASEMENT (4" MIN. SURROUNDING ALL PIPES) OR CONCRETE CAPPING (6" MIN. COVER) OF ELECTRICAL CONDUIT WILL BE REQUIRED. CONCRETE SHALL HAVE A MIN. STRENGTH OF 3,000 PSI WITH RED DYE POWDER. THE RED DYE CAN EITHER BE MIXED INTEGRAL OR APPLIED TO TOP OF WET CONCRETE AT THE TIME OF PLACEMENT.



ZONE 1

FINAL BACKFILL ZONE
UNLESS OTHERWISE SPECIFIED, **CLEAN NATIVE MATERIAL** MAYBE UTILIZED FOR BACKFILL IN THIS ZONE.

ZONE 2

SECONDARY CONDUIT ZONE
(IF APPLICABLE)
THIS TRENCH ZONE IS RESERVED FOR UTILITY OWNED LOW VOLTAGE CABLE INCLUDING SECONDARY AND STREET LIGHTING CONDUIT. **BEDDING SAND** SHALL BE UTILIZED FOR BACKFILL MATERIAL IN THIS ZONE.

SECONDARY NON-JOINT TRENCH DETAIL (24" T.O.P.)

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FOR CONSTRUCTION

STATE OF TEXAS
CHRISTOPHER T. HARPER
106036
LICENSED
PROFESSIONAL ENGINEER

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	DATE	BY
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BANDERA ELECTRIC COOPERATIVE, INC.

CORLEY FARMS UNIT 4, WO 522946

TRENCH DETAILS

SCALE FOR 34 x 22 DWG: N.T.S.

DRAWING NO. E5

22BEC32 R000000000527

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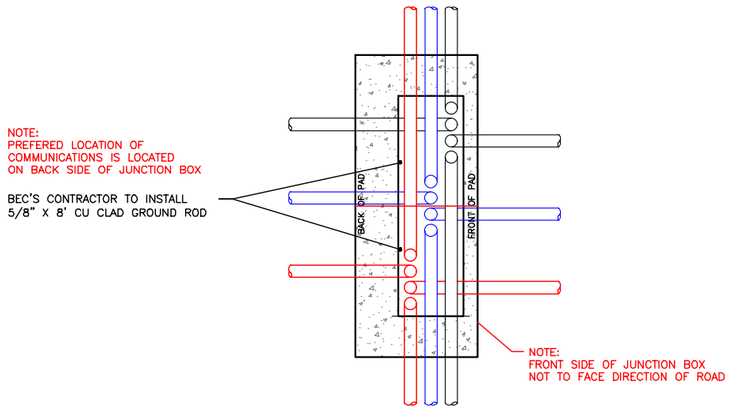
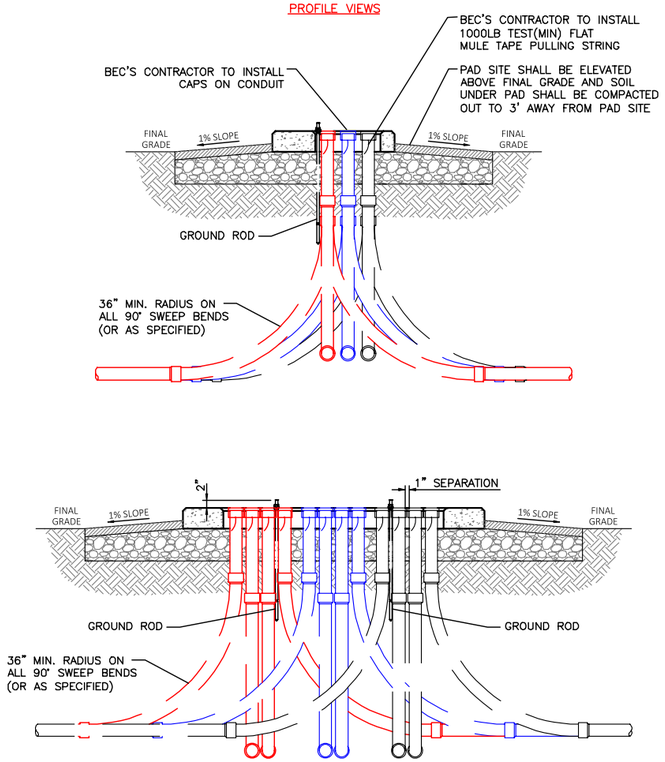
PLAN VIEW
3ø JUNCTION BOX PAD

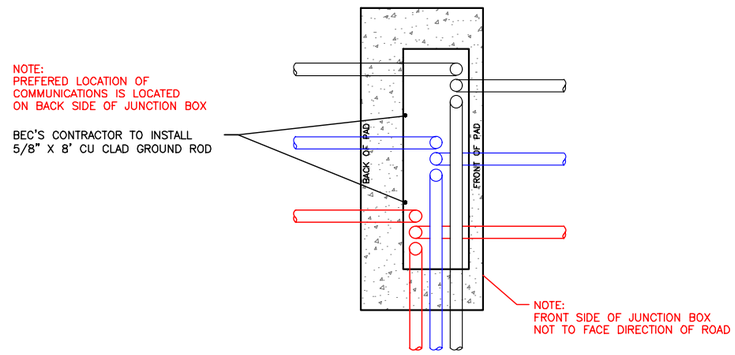


PROFILE VIEWS

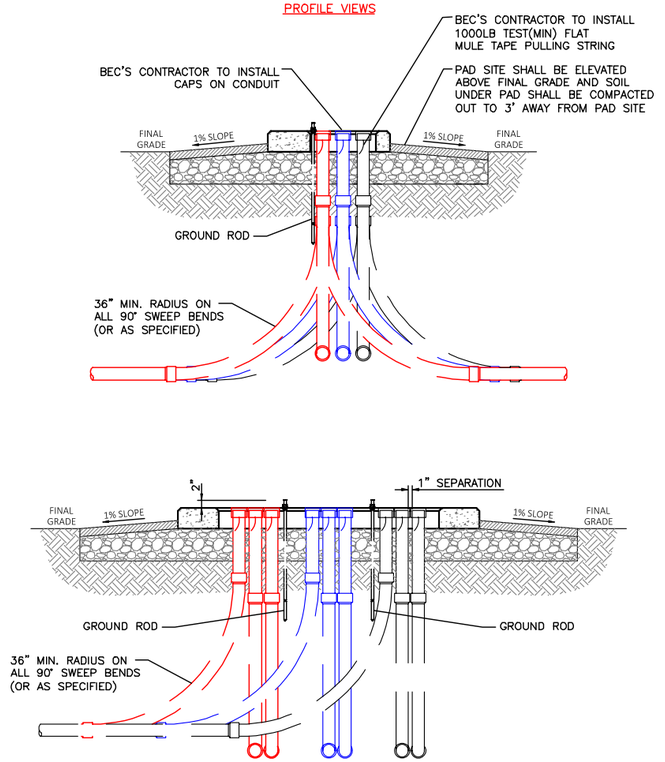


TYPICAL THREE PHASE J-BOX
CONDUIT CONFIGURATION(TWELVE PRIMARY STUB-UPS)

PLAN VIEW
3ø JUNCTION BOX PAD



PROFILE VIEWS



TYPICAL THREE PHASE J-BOX
CONDUIT CONFIGURATION(NINE PRIMARY STUB-UPS)

ISSUED: 09-02-22
FOR CONSTRUCTION

STATE OF TEXAS
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CORLEY FARMS UNIT 4, WO 522946

CONDUIT
CONFIGURATION DETAILS

SCALE FOR 34 x 22 DWG
N.T.S.

DRAWING NO.
E6

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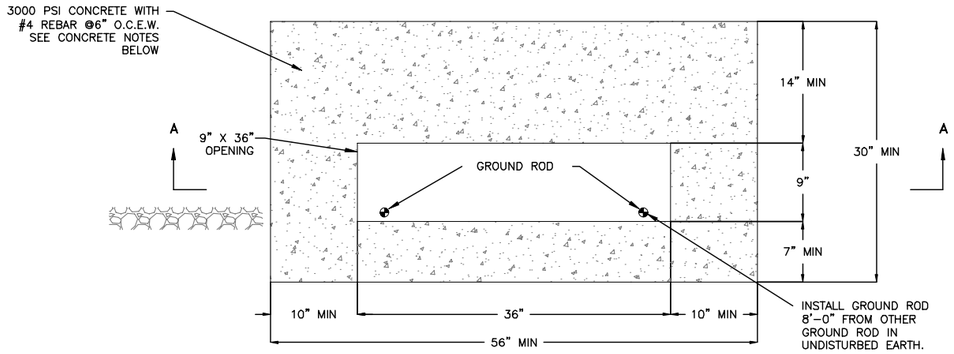
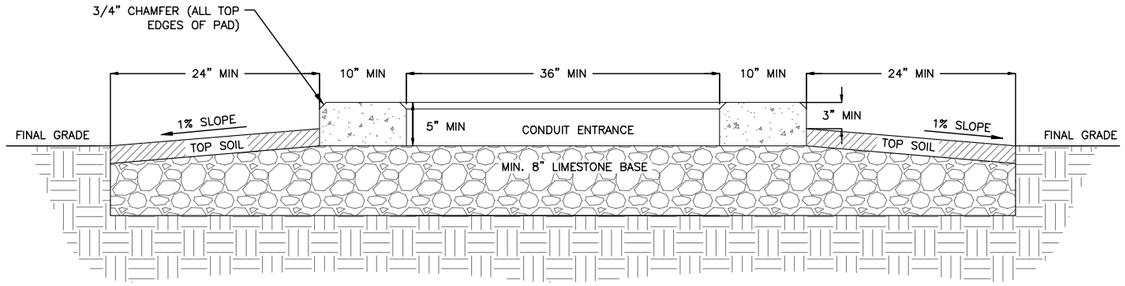


PLAN VIEW



SECTION A-A

CONCRETE NOTES:

1. FOUNDATIONS MAY BE PRECAST OR CAST-IN-PLACE. ALL FOUNDATIONS SHALL MEET THE MINIMUM CONSTRUCTION REQUIREMENTS LISTED BELOW. PRECAST FOUNDATIONS SHALL BE "BLOCK CONCRETE COMPANY NO.BCC56305JBS" OR PREAPPROVED EQUAL.
2. FOUNDATION SHALL NOT BE LESS THAN 5" IN THICKNESS.
3. CONCRETE SHALL HAVE A MIN. 28-DAY COMPRESSIVE STRENGTH OF 3,000 PSI WHEN TESTED IN ACCORDANCE WITH ASTM C39.
4. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
5. STEEL REINFORCING SHALL BE A #4 REBAR AT 6" O.C.E.W. ENDING 2" FROM OUTSIDE EDGE AND CONDUIT OPENING.

GENERAL NOTES:

1. DIMENSIONS SHOWN HERE ARE FOR A 3-PHASE TYPE 1 SECTIONALIZING CABINET.
2. FOUNDATION ASSEMBLIES INCLUDE PAD PREPARATION, BACKFILL, LIMESTONE BASE, COMPACTION, FOUNDATION, DRAINAGE AND TOP SOIL WHEN REQUIRED.
3. BACKFILL OF TRENCHING BELOW PROPOSED PAD SHALL BE IN ACCORDANCE WITH TRENCH DETAILS, UNLESS OTHERWISE SPECIFIED.
4. TOP OF PAD SHALL BE A MIN. OF 3" ABOVE FINAL GRADE AND BEC'S CONTRACTOR SHALL ENSURE A MIN. OF 1% SLOPE AWAY FROM PAD IN ALL DIRECTIONS.
5. LIMESTONE BASE – SHALL BE TX-DOT TYPE A GRADE 1 OR 2 LIMESTONE BASE MATERIAL AND SHALL BE COMPACTED TO INDUSTRY STANDARDS.
6. INSTALL GROUND ROD AT CONDUIT ENTRANCE.
7. EQUIPMENT SHALL BE SECURED TO PAD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

3Ø SECTIONALIZING CABINET FOUNDATION (TYPE 1/UM1-2J)

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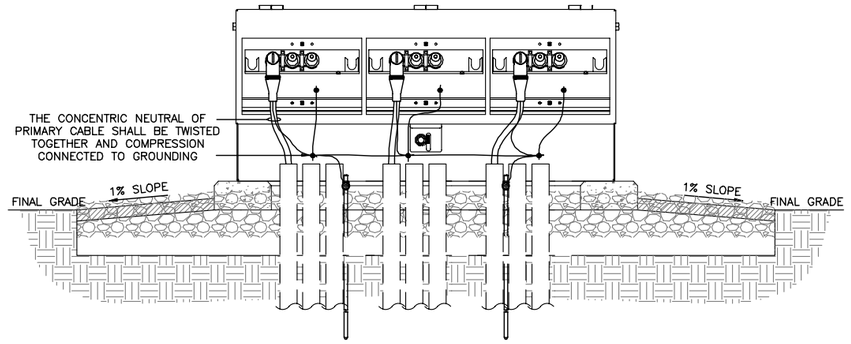

SECTIONALIZING CABINETS					
Description	Unit	Dimensions			Trinetics Catalog No.
		W	D	H	
3Ø Sectionalizing Cabinet (Type 1)	UM33-T1	48	22	30	CC348-22TH
3Ø Sectionalizing Cabinet (Type 2)	UM33-T2	66	22	30	CC366-22TH

GENERAL NOTES:

1. NOMENCLATURE FOR 3-PHASE SECTIONALIZING CABINETS IS UM33-T1 FOR "TYPE 1" AND UM33-T2 FOR "TYPE 2".
2. SECTIONALIZING CABINETS SHALL BE 12-GAUGE METAL, TOP HINGED , POWDER COATED AND BE LOCKABLE WITH PENTA-HEAD LATCH.
3. CABINETS SHALL ALSO BE RATED FOR A MIN. OF 25 KV AND 600 A EQUIPMENT.
4. THIS UNIT SHALL INCLUDE THE DELIVERY, INSTALLATION, MOUNTING, COMPLETE AND IN-PLACE.
5. FOUNDATION, BACKFILL AND DRAINAGE SHALL BE IN ACCORDANCE WITH 3ø SECTIONALIZING CABINET FOUNDATION DETAIL.
6. INSTALL GROUND ROD WITH THIS PIECE OF EQUIPMENT AS PER THE FOUNDATION DRAWINGS.
7. EQUIPMENT SHALL BE SECURED TO PAD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

3Ø SECTIONALIZING CABINET (TYPE 1) (UM4-200)

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BANDERA ELECTRIC COOPERATIVE, INC.

CORLEY FARMS UNIT 4, WO 522946

THREE PHASE SECTIONALIZING CABINET DETAILS (TYPE 1)

SCALE FOR 34 x 22 DWG: N.T.S.

DRAWING NO. E7

22BEC32 R000000000527

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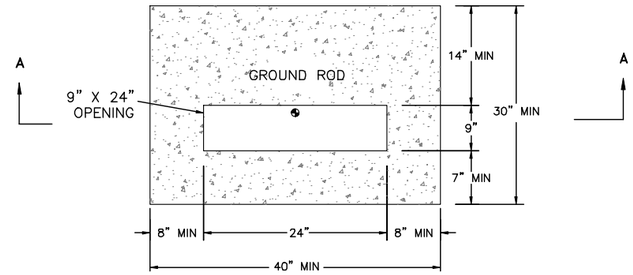
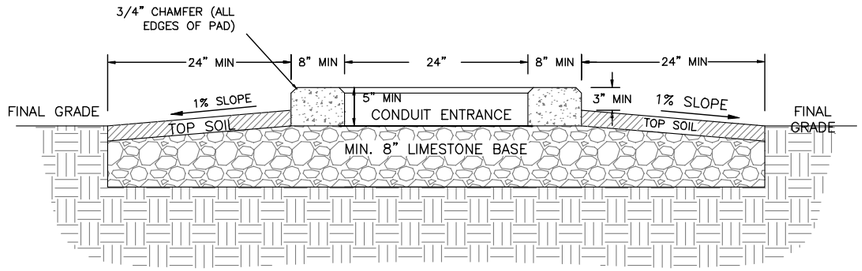
E7-3Ø Junction Box-Type 1 Details.dwg



PLAN VIEW



SECTION A-A

CONCRETE NOTES

1. FOUNDATIONS MAY BE PRECAST OR CAST–IN–PLACE. ALL FOUNDATIONS SHALL MEET THE MINIMUM CONSTRUCTION REQUIREMENTS LISTED BELOW. PRECAST FOUNDATIONS SHALL BE "BLOCK CONCRETE COMPANY NO.BCC38265PSP" OR PREAPPROVED EQUAL.
2. FOUNDATION SHALL NOT BE LESS THAN 5" IN THICKNESS.
3. CONCRETE SHALL HAVE A MIN. 28–DAY COMPRESSIVE STRENGTH OF 3,000 PSI WHEN TESTED IN ACCORDANCE WITH ASTM C39.
4. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
5. STEEL REINFORCING SHALL BE A #4 REBAR AT 6" O.C.E.W. ENDING 2" FROM OUTSIDE EDGE AND CONDUIT OPENING.

GENERAL NOTES

1. DIMENSIONS SHOWN HERE ARE FOR A 1–PHASE SECTIONALIZING CABINET.
2. FOUNDATION ASSEMBLIES INCLUDE PAD PREPARATION, BACKFILL, LIMESTONE BASE, COMPACTION, FOUNDATION, DRAINAGE AND TOP SOIL WHEN REQUIRED.
3. BACKFILL OF TRENCHING BELOW PROPOSED PAD SHALL BE IN ACCORDANCE WITH TRENCH DETAILS, UNLESS OTHERWISE SPECIFIED.
4. TOP OF PAD SHALL BE A MIN. OF 3" ABOVE FINAL GRADE AND BEC'S CONTRACTOR SHALL ENSURE A MIN. OF 1% SLOPE AWAY FROM PAD IN ALL DIRECTIONS.
5. LIMESTONE BASE – SHALL BE TX–DOT TYPE A GRADE 1 OR 2 LIMESTONE BASE MATERIAL AND SHALL BE COMPACTED TO INDUSTRY STANDARDS.
6. INSTALL GROUND ROD AT CONDUIT ENTRANCE.
7. EQUIPMENT SHALL BE SECURED TO PAD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

1Ø SECTIONALIZING CABINET FOUNDATION (UM1-5J)

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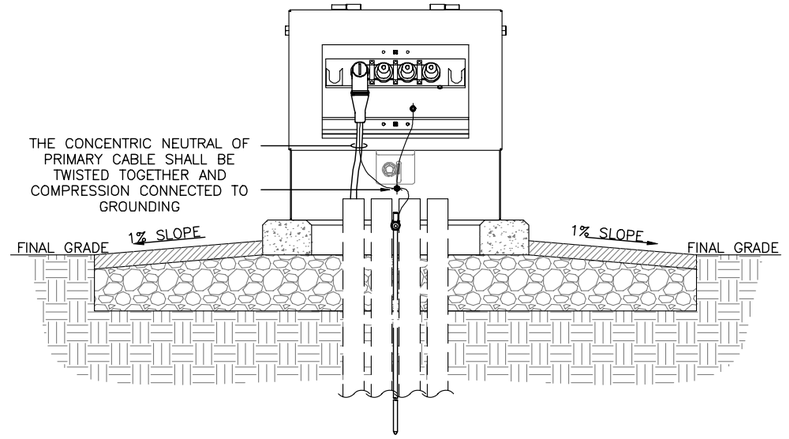

SECTIONALIZING CABINETS					
Description	Unit	Dimensions			Trinetics Catalog No.
		W	D	H	
1Ø Sectionalizing Cabinet	UM33	30	18	30	CW330-18TH

GENERAL NOTES

1. SECTIONALIZING CABINETS SHALL BE 12–GAUGE METAL, TOP HINGED, POWDER–COATED, AND BE LOCKABLE WITH PENTA–HEAD LATCH.
2. CABINETS SHALL ALSO BE RATED FOR A MIN. OF 25 kV AND 600 AMP EQUIPMENT.
3. THIS UNIT SHALL INCLUDE THE DELIVERY, INSTALLATION, MOUNTING, COMPLETE AND IN–PLACE.
4. FOUNDATION, BACKFILL AND DRAINAGE SHALL BE IN ACCORDANCE WITH 1Ø SECTIONALIZING CABINET FOUNDATION DETAIL.
5. INSTALL GROUND ROD WITH THIS PIECE OF EQUIPMENT AS PER THE FOUNDATION DRAWINGS.
6. EQUIPMENT SHALL BE SECURED TO PAD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

1Ø SECTIONALIZING CABINET (UM3-14)

STATE OF TEXAS
CHRISTOPHER T. HARPER
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CORLEY FARMS UNIT 4, WO 522946

SINGLE PHASE SECTIONALIZING CABINET DETAILS

SCALE FOR 34 x 22 DWG: N.T.S.

DRAWING NO. E8

22BEC32 R000000000527

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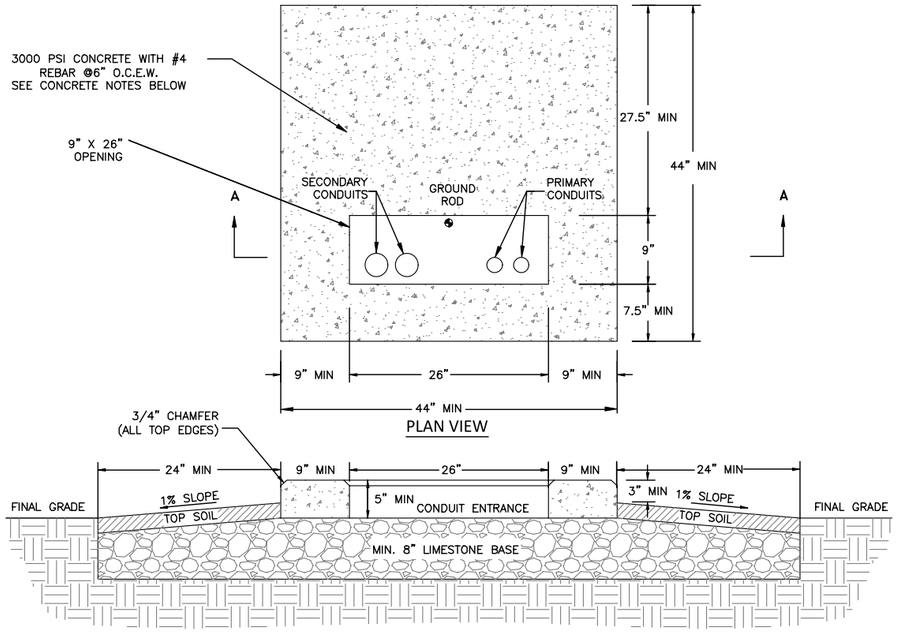

PLAN VIEW

SECTION A-A

1Ø TRANSFORMER PAD FOUNDATION (25-100 kVA)

CONCRETE NOTES

1. FOUNDATIONS MAY BE PRECAST OR CAST–IN–PLACE. ALL FOUNDATIONS SHALL MEET THE MINIMUM CONSTRUCTION REQUIREMENTS LISTED BELOW. PRECAST FOUNDATIONS SHALL BE "BLOCK CONCRETE COMPANY NO.BCC44445TP" OR PREAPPROVED EQUAL.
2. FOUNDATION SHALL NOT BE LESS THAN 5" IN THICKNESS.
3. CONCRETE SHALL HAVE A MIN. 28–DAY COMPRESSIVE STRENGTH OF 3,000 PSI WHEN TESTED IN ACCORDANCE WITH ASTM C39.
4. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60.
5. STEEL REINFORCING SHALL BE A #4 REBAR AT 6" O.C.E.W. ENDING 2" FROM OUTSIDE EDGE AND CONDUIT OPENING.

GENERAL NOTES

1. DIMENSIONS SHOWN HERE ARE FOR A 1–PHASE PAD MOUNT TRANSFORMER, 100 kVA OR SMALLER.
2. FOUNDATION ASSEMBLIES INCLUDE PAD PREPARATION, BACKFILL, LIMESTONE BASE, COMPACTION, FOUNDATION, DRAINAGE AND TOP SOIL WHEN REQUIRED.
3. BACKFILL OF TRENCHING BELOW PROPOSED PAD SHALL BE IN ACCORDANCE WITH TRENCH DETAILS, UNLESS OTHERWISE SPECIFIED.
4. TOP OF PAD SHALL BE A MIN. OF 3" ABOVE FINAL GRADE AND BEC'S CONTRACTOR SHALL ENSURE A MIN. OF 1% SLOPE AWAY FROM PAD IN ALL DIRECTIONS.
5. LIMESTONE BASE – SHALL BE TX–DOT TYPE A GRADE 1 OR 2 LIMESTONE BASE MATERIAL AND SHALL BE COMPACTED TO INDUSTRY STANDARDS.
6. INSTALL GROUND ROD AT CONDUIT ENTRANCE.
7. EQUIPMENT SHALL BE SECURED TO PAD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

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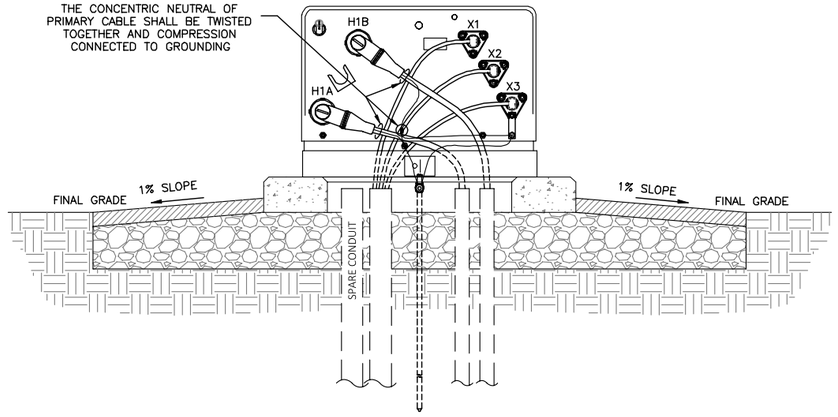

1 Ø PAD MOUNT TRANSFORMERS	
Description	Unit
25kVA-1Ø Pad Mount XFMR (120/240V)	UG7-25
37.5kVA-1Ø Pad Mount XFMR (120/240V)	UG7-37.5
50kVA-1Ø Pad Mount XFMR (120/240V)	UG7-50
75kVA-1Ø Pad Mount XFMR (120/240V)	UG7-75
100kVA-1Ø Pad Mount XFMR (120/240V)	UG7-100
167kVA-1Ø Pad Mount XFMR (120/240V)	UG7-167
200kVA-1Ø Pad Mount XFMR (120/240V)	UG7-200

GENERAL NOTES

1. NOMENCLATURE FOR 1–PHASE TRANSFORMERS IS AS FOLLOWS:

   EXAMPLE – "UG7–100"
   - "U" OR "V" DESIGNATES 7.2/12.5KV OR 14.4/24.9KV, RESPECTIVELY.
   - "G7" DESIGNATES 1–PHASE PAD MOUNT TRANSFORMER.
   - "–100–" REPRESENTS THE THE KVA RATING OF THE TRANSFORMER.

2. TRANSFORMER ASSEMBLIES INCLUDE SECONDARY BUSHINGS, SEC. SPADES, LOAD BREAK ELBOWS, INSULATING CAPS, INSULATED STANDOFF BRACKETS, DELIVERY, SET, COMPLETE AND IN–PLACE
3. FOUNDATION, BACKFILL AND DRAINAGE SHALL BE IN ACCORDANCE WITH 1ø TRANSFORMER FOUNDATION DETAIL.
4. INSTALL GROUND ROD AT CONDUIT ENTRANCE.
5. EQUIPMENT SHALL BE SECURED TO PAD IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

1Ø PADMOUNT TRANSFORMERS (25-250kVA)

STATE OF TEXAS
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CORLEY FARMS UNIT 4, WO 522946

SINGLE PHASE TRANSFORMER DETAILS

SCALE FOR 34 x 22 DWG: N.T.S.

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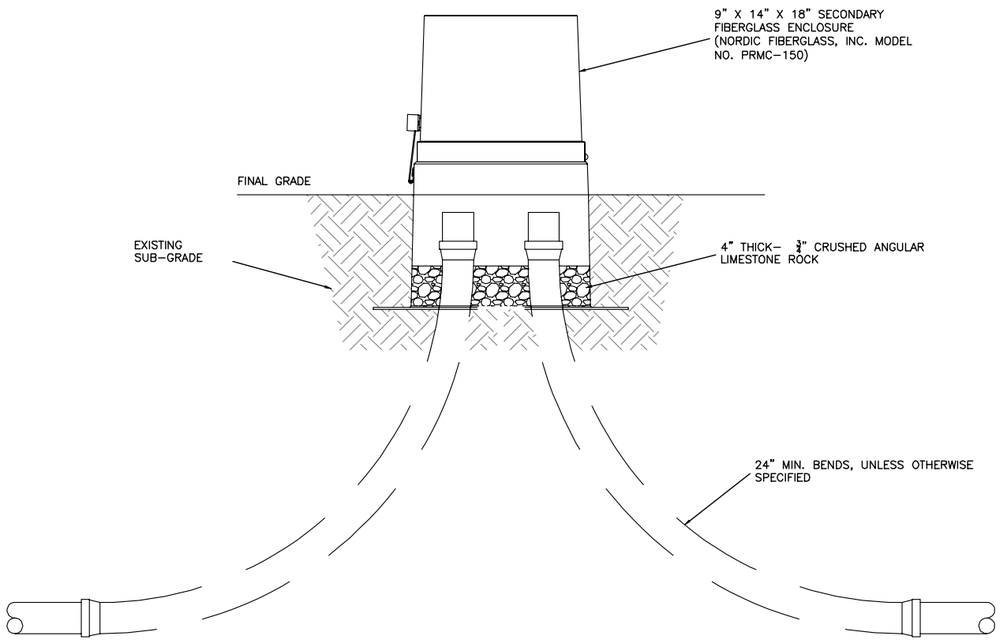


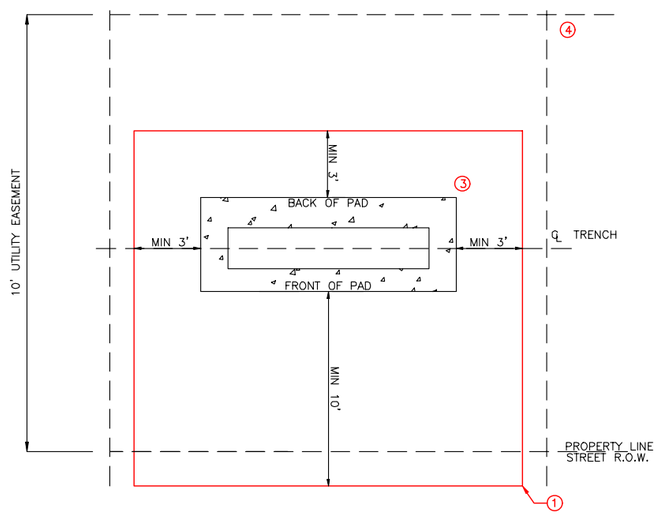
GENERAL NOTES

1. BEC'S CONTRACTOR SHALL ENSURE POSITIVE 1% MIN. DRAINAGE AWAY FROM THIS PEDESTAL IN ALL DIRECTIONS.
2. EQUIPMENT SHALL BE ANCHORED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.

SECONDARY PEDESTAL (ABOVE GROUND)

ITEM	EST QTY	UNIT	
1	1	EA	SECONDARY PEDESTAL (ABOVE GROUND)
2	3	EA	CONNECTOR FLOOD SEAL #12-350 MCM (4-POSITION)

PLAN VIEW



TYPICAL UTILITY ASSIGNMENT EQUIPMENT ORIENTATION/ SAFE ZONE DETAIL

GENERAL NOTES:

1. BEC'S CONTRACTOR SHALL MAINTAIN A 3 FOOT MINIMUM SAFE ZONE AROUND THE EQUIPMENT PAD AND A 10 FOOT MINIMUM SAFE ZONE ACROSS FRONT OF THE EQUIPMENT PAD, CLEAR OF ANY PEDESTALS OR EQUIPMENT BY OTHERS (NO COMMUNICATION PEDESTALS).
2. ANY PIECE OF EQUIPMENT WITHIN 10' OF A JUNCTION BOX / TRANSFORMER SHALL HAVE A #2 BARE COPPER WIRE TYING THAT PIECE OF EQUIPMENT'S GROUND ROD TO THE JUNCTION BOX / TRANSFORMER'S GROUND ROD AND EFFECTIVELY BONDING THE TWO CABINETS.
3. PREFERRED LOCATION OF COMMUNICATIONS IS ON BACK SIDE OF EQUIPMENT PAD.
4. DETAIL IS TO BE USED FOR FUSES, VACUUM FAULT INTERRUPTERS, AND JUNCTION BOXES

ISSUED: 09-02-22
FOR CONSTRUCTION

STATE OF TEXAS
CHRISTOPHER T. HARPER
106036
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PROFESSIONAL ENGINEER

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SECONDARY PEDESTAL AND TYPICAL EQUIPMENT ORIENTATION DETAILS

SCALE FOR 34 x 22 DWG: N.T.S.

DRAWING NO. E10

22BEC32 R000000000527

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DWG. No.: 166290024AT0

SHEET 1 of 1

FINAL REVIEW	
LEVEL 1	

REVISIONS				
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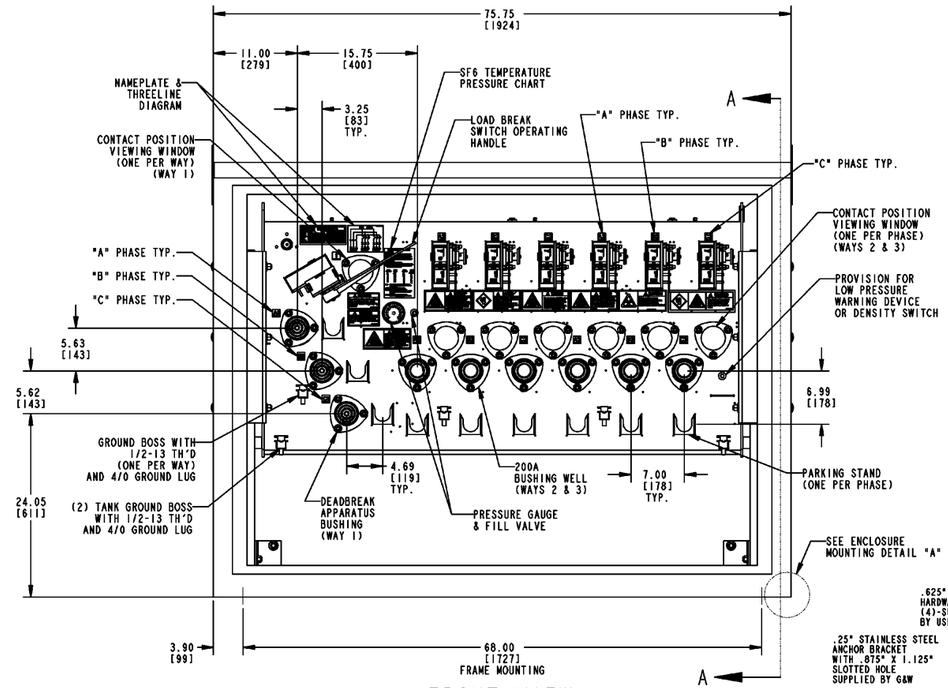
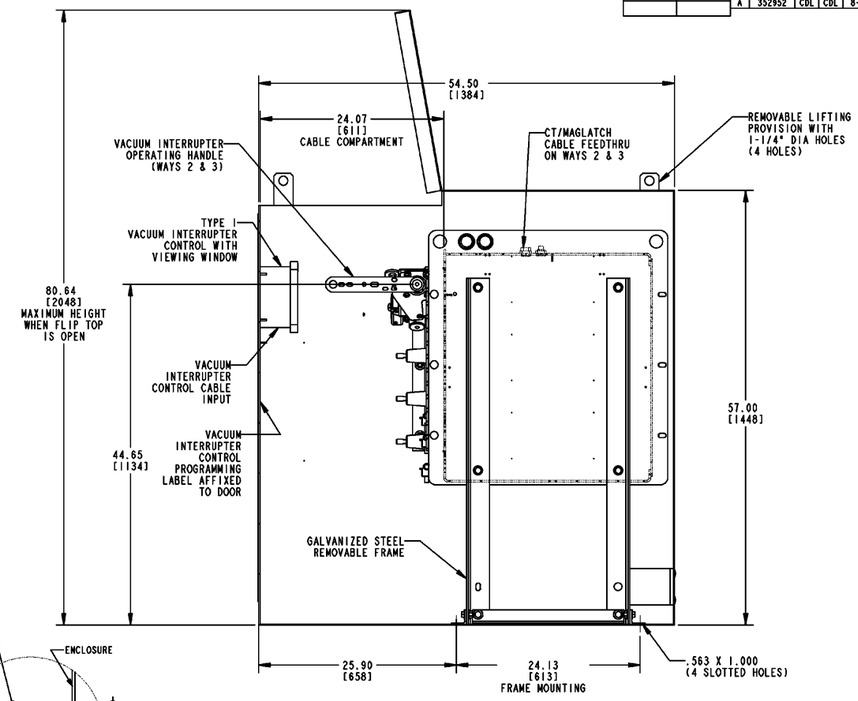
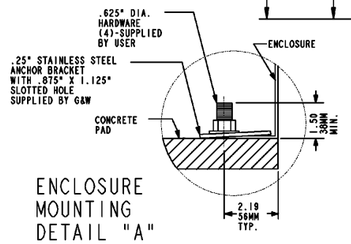
A	352952	CDL	CDL	8-16-17



FRONT VIEW

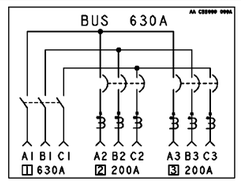


SECTION A-A



ENCLOSURE MOUNTING DETAIL "A"

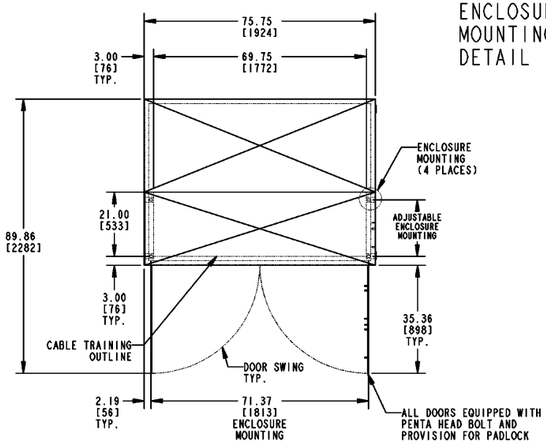
SWITCH ELECTRICAL INFORMATION SEE NOTES FOR LIMITATIONS		
	WAY 1	WAYS 2 & 3
RATED VOLTAGE (MAXIMUM)	27 KV	27 KV
IMPULSE LEVEL (BIL)	125 KV	125 KV
CONTINUOUS CURRENT, RMS SYM	SEE THREE LINE	
INTERRUPTING CURRENT, RMS SYM	630 AMP	12.5 KA SYM
1 MINUTE WITHSTAND, 60 HZ AC	40 KV	40 KV
15 MINUTE WITHSTAND, DC	78 KV	78 KV
MOMENTARY CURRENT, RMS ASYM	40 KA	
MAKING CURRENT, RMS ASYM	40 KA	
SHORT-TIME WITHSTAND RATING (1 SEC. DURATION), RMS SYM	25 KA	



THREE LINE DIAGRAM

ORIENTATION AS SEEN FROM OPERATOR SIDE

WEIGHT WITH GAS APPROX.	2300 LBS / 1045 KG
GAS REQUIRED APPROX.	19 LBS / 9 KG
SHIPPING WEIGHT APPROX	2700 LBS / 1227 KG



PLAN VIEW - SHOWING MAXIMUM DIMENSIONS WHEN ENCLOSURE DOORS ARE OPEN.

NOTES:
1. ALL WAYS EQUIPPED WITH INTERNAL SPRING OPERATORS AND EXTERNAL PROVISIONS FOR PADLOCKING IN ALL POSITIONS.
2. 1/4" MILD STEEL TANK, WELDED CONSTRUCTION. PAINTED ASA 70 LIGHT GRAY.
3. GALVANIZED STEEL ENCLOSURE FINISHED PADMOUNT GREEN MUNSELL 7GY3.29/1.5. ENCLOSURE IS DESIGNED PER APPLICABLE SECTIONS OF ANSI/IEEE C37.74 AND C57.12.28. DRAWING IS TYPICAL AND SHOWS OVERALL DIMENSIONS ONLY. CONSTRUCTION DETAILS MAY VARY FROM THOSE DEPICTED.
4. WHEN ELBOWS, INSERTS, AND ANY OTHER ACCESSORIES ARE CONNECTED TO THE SWITCH, THE RATINGS OF EACH CONNECTED ASSEMBLY WILL BE THAT OF THE LOWEST RATED COMPONENT OF THE ASSEMBLY.
5. MOUNTING INFORMATION: THE FRAME OF THE SWITCH MUST BE ANCHORED TO THE PAD. THE FRAME IS EQUIPPED WITH (4) SLOTTED ANCHORING HOLES, EACH MEASURING 9/16" X 1". THE LOCATIONS OF THESE HOLES, REFERRED TO AS "FRAME MOUNTING" ARE SHOWN IN THE FRONT VIEW AND SECTION A-A. THE PAD MOUNT ENCLOSURE SHOULD BE SECURED TO THE PAD TO PROVIDE IT WITH ADDITIONAL STABILITY. EACH PAD MOUNT ENCLOSURE IS SHIPPED WITH 4 SECURING BRACKETS THAT ARE TO BE USED FOR THIS PURPOSE. THE SECURING BRACKETS CAN BE INSTALLED ANYWHERE ALONG THE INNER EDGE OF THE ENCLOSURE. SEE ENCLOSURE MOUNTING DETAIL "A" AND THE PLAN VIEW FOR MORE DETAILS ABOUT SECURING THE PAD MOUNT ENCLOSURE TO THE PAD.
6. 200 AMP RATED BUSHING WELLS WILL REDUCE THE ELECTRICAL RATINGS OF THE SWITCH TO 200 AMP CONTINUOUS CURRENT AND 10KA SYM. FOR 10 CYCLES.
OPTIONS:
-- SWITCH IS EQUIPPED WITH INTERNAL 500:1 CURRENT TRANSFORMERS ON WAYS 2 & 3.
-- WAYS 2 & 3 INCLUDE A TYPE I VACUUM INTERRUPTER CONTROL FOR OVERCURRENT PROTECTION. THE CONTROL IS HOUSED IN A NEMA 4X ENCLOSURE WITH VIEWING WINDOW.
-- CUSTOMER IS RESPONSIBLE FOR ENTERING PROTECTION SETTINGS INTO THE CONTROL BEFORE ENERGIZING.

ENTRANCES	BUSHING ELECTRICAL CHARACTERISTICS	IEEE 386 INTERFACE
WAY 1	27KV 630A DEADBREAK APPARATUS BUSHING	INTERFACE 11
WAY 2	27KV 200A BUSHING WELL	INTERFACE 3
WAY 3	27KV 200A BUSHING WELL	INTERFACE 3

PRINT IDENTIFICATION

DATE _____ G&W NO. _____

CUSTOMER _____

ORDER NO. _____

☐ FOR RECORD ITEM NO. ____

☐ FOR APPROVAL-NO MORE WORK TO BE DONE UNTIL APPROVAL IS RECEIVED

* ALL PRIMARY DIMENSIONS ARE IN INCHES.
ALL SECONDARY DIMENSIONS ARE IN MILLIMETERS.

ALL DRAWING CHANGES MUST BE MADE ON CAD. ANY MANUAL CHANGES WILL VOID DRAWING.

PV131-386-12-7F

PV131-386-12-7F

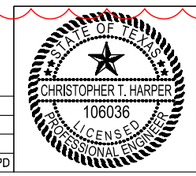
G&W ELECTRIC Co.

CAT. NO.: PV131-386-12-7F			DRAWING NO.	REV
ENG/DES: CDL	CDL	DATE: May-22-17	166290024AT0	A
APP'D BY: AD		DATE: May-22-17	SCALE:	SHEET: 1 of 1

NAME:CLARK OBJECT:166290024AT0_1 DATE:16-Aug-17 13:00:50

DO NOT SCALE DRAWING | DRAWN WITH AUTOCAD LAST CHECKED Mon May 22 2017 13:14:34 GMT-0400

ISSUED: 09-02-22
FOR CONSTRUCTION



Digitally signed by Chris Harper
DN: cn=Chris Harper, o=Schneider Engineering, LTD., email=charper@se-texas.com, c=US
Date: 2024.06.27 16:48:27 -05'00'

	DATE	BY
DRWN	05-31-22	CJB
CHK	09-02-22	CTH
APPD	09-02-22	CTH

WWW.SE-TEXAS.COM
TEXAS REGISTRATION NUMBER F-1594

SCHNEIDER ENGINEERING

BANDERA ELECTRIC COOPERATIVE, INC.

CORLEY FARMS UNIT 4, WO 522946

SWITCHGEAR DETAILS

SCALE FOR 34 x 22 DWG N.T.S.

DRAWING NO. E11

NO	DATE	REVISION	BY	CHK	APPD	NO	DATE	REVISION	BY	CHK	APPD
2	04-15-24	UPDATE EQUIPMENT & KEYNOTES	GLS	CTH	CTH						

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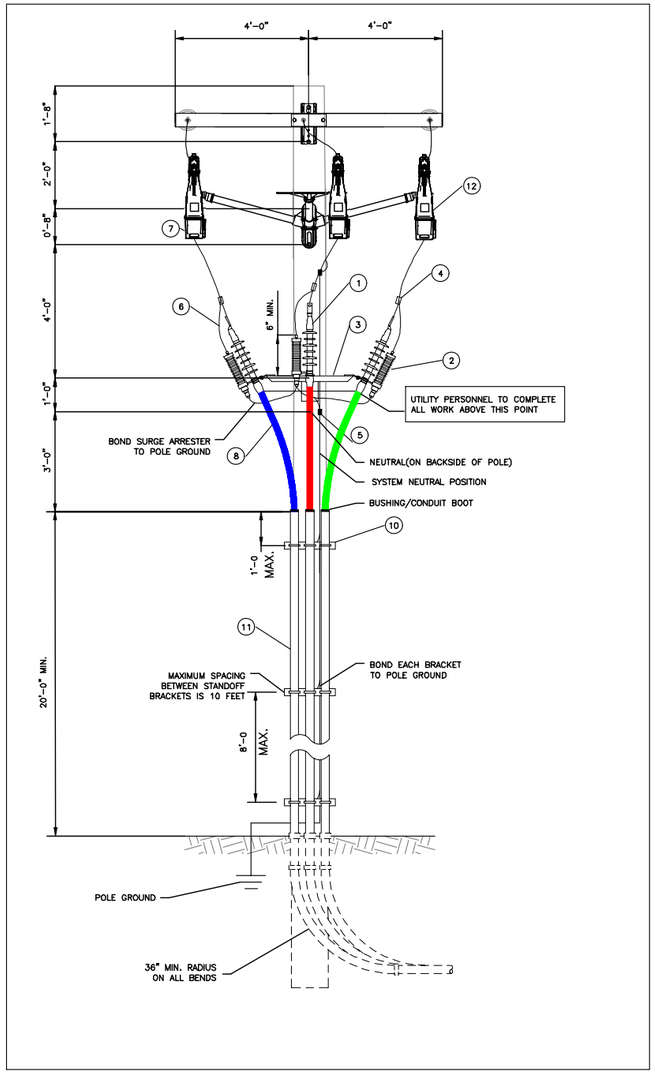

TYPICAL 3 PHASE RISER

ITEM	EST QTY	UNIT	DESCRIPTION OF ITEMS TO BE INSTALLED PER RISER POLE
1	3	EA	25 kV CABLE TERMINATORS FOR 4/0 AL CABLE
2	3	EA	DISTRIBUTION CLASS ARRESTER FOR RISER POLE
3	1	EA	HEAVY DUTY 3 PHASE BRACKET FOR MTG. ARRESTERS & TERMINATORS
4	3	EA	CABLE TO CABLE TEE, BRONZE, CONNECTORS
5	1	EA	COPPER COMPRESSION GROUND CONNECTOR FOR CONCENTRIC
6	–	FT	#2 CU STRAND BARE WIRE FOR JUMPERS AND GROUNDING
7	–	FT	BARE WIRE FOR JUMPERS (MATCH OVERHEAD CONDUCTOR)
8	–	FT	PRIMARY CABLE 4/0 AL URD 25 kV JACKETED CABLE
9	3	EA	OVER CURRENT PROTECTION (TO BE DETERMINED BY BEC)
10	3	EA	CONDUIT STANDOFF BRACKET
11	–	FT	CONDUIT, 3" SCH. 80 SUNLIGHT RESISTANT P.V.C.
12	3	EA	TRIP SAVER II CUTOUT–MOUNTED RECLOSER

ISSUED: 09-02-22
FOR CONSTRUCTION

STATE OF TEXAS
CHRISTOPHER T. HARPER
106036
LICENSED
PROFESSIONAL ENGINEER

Digitally signed by Chris Harper
DN: cn=Chris Harper, o=Schneider Engineering, LTD., email=charper@se-texas.com, c=US
Date: 2024.06.27 16:48:59 -05'00'

NO	DATE	REVISION	BY	CHK	APPD	NO	DATE	REVISION	BY	CHK	APPD

	DATE	BY
DRWN	05–31–22	CJB
CHK	09–02–22	CTH
APPD	09–02–22	CTH

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SCHNEIDER ENGINEERING

BANDERA ELECTRIC COOPERATIVE, INC.
CORLEY FARMS UNIT 4, WO 522946

THREE PHASE
RISER DETAILS

SCALE FOR 34 x 22 DWG
N.T.S.

DRAWING NO.
E12

22BEC32 R000000000527

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