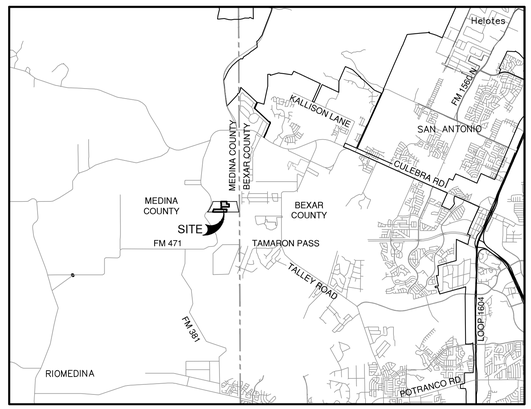
MANGOLD TRACT-UNIT 2

SAN ANTONIO, TEXAS

CIVIL CONSTRUCTION PLANS

Sheet List Table

Sheet Number	Sheet Title
C0.00	COVER SHEET
C1.00	MASTER DRAINAGE PLAN (ULTIMATE DEVELOPMENT)
C1.01	OVERALL DRAINAGE PLAN (PROPOSED CONDITIONS)
C1.02	DRAIN "C1A" PLAN & PROFILE STA. 1+26.00 TO END
C1.03	DRAIN "D" PLAN & PROFILE STA. 2+05.00 TO 6+20.00
C1.04	DRAIN "D" PLAN & PROFILE STA. 6+20.00 TO 10+60.00
C1.05	DRAIN "D" PLAN & PROFILE STA. 10+60.00 TO 14+00.00
C1.06	DRAIN "D" PLAN & PROFILE STA. 14+00.00 TO 17+60.00
C1.07	DRAIN "D" PLAN & PROFILE STA. 17+60.00 TO 20+80.00
C1.08	DRAIN "D1A" PLAN & PROFILE STA 1+02.00 TO END
C1.09	DRAIN "D1B" & "C1B" PLAN & PROFILE DRAIN "D1B" PLAN & PROFILE STA 1+02.50 TO END DRAIN "C1B" PLAN & PROFILE STA 1+02.50 TO END
C1.10	DRAIN "D3A" PLAN AND PROFILE STA 1+02.50 TO END
C1.11	INTERCEPTOR DRAIN "E1" PLAN & PROFILE STA. 1+31.39 TO 5+40.00
C1.12	INTERCEPTOR DRAIN "E1" PLAN & PROFILE STA. 5+40.00 TO 9+80.00
C1.13	INTERCEPTOR DRAIN "E1" PLAN & PROFILE STA. 9+80.00 TO END
C1.14	INTERCEPTOR DRAIN "E2" PLAN & PROFILE STA. 1+13.35 TO 5+40.00
C1.15	INTERCEPTOR DRAIN "E2" PLAN & PROFILE STA. 5+40.00 TO 9+80.00
C1.16	INTERCEPTOR DRAIN "E2" PLAN & PROFILE STA. 9+80.00 TO END
C1.17	DRAINAGE DETAILS
C1.18	DRAINAGE DETAILS
C1.19	DRAINAGE DETAILS
C1.20	DRAINAGE DETAILS
C2.00	HABY HILL PLAN & PROFILE STA. 6+41.91 TO END
C2.01	HABY HOLLOW PLAN & PROFILE STA. 0+66.88 TO 7+50.00
C2.02	HABY HOLLOW PLAN & PROFILE STA. 7+50.00 TO END
C2.03	CASTRO TOWN ROAD PLAN & PROFILE STA. 1+45.00 TO END
C2.04	BAKERY ROAD PLAN & PROFILE STA. 2+49.73 TO END MANGOLD HILL PLAN & PROFILE STA. 1+15.00 TO END
C2.05	FLATROCKS ROAD PLAN & PROFILE STA. 6+75.80 TO END
C2.06	STREET DETAILS
C2.07	STREET DETAILS
C2.08	STREET DETAILS



LOCATION MAP

NOT-TO-SCALE

PREPARED FOR:

JEN TEXAS 33 LLC
8023 VANTAGE DRIVE, SUITE 220
SAN ANTONIO, TX 78230

DECEMBER 2025

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

Sheet List Table

Sheet Number	Sheet Title
C3.00	OVERALL SIGNAGE PLAN
C3.01	OVERALL SIGNAGE PLAN
C3.02	OVERALL SIGNAGE DETAILS
C3.03	OVERALL SIGNAGE DETAILS
C4.00	OVERALL SANITARY SEWER PLAN
C4.01	OVERALL SANITARY SEWER PLAN
C4.02	SANITARY SEWER LINE 'F' PLAN & PROFILE STA. 1+00.00 TO 11+00.00
C4.03	SANITARY SEWER LINE 'F' PLAN & PROFILE STA. 11+00.00 TO END
C4.04	SANITARY SEWER LINE 'E' PLAN & PROFILE STA. 1+00.00 TO 10+00.00
C4.05	SANITARY SEWER LINE 'E' PLAN & PROFILE STA. 10+00.00 TO END
C4.06	SANITARY SEWER LINE 'L' PLAN & PROFILE STA. 1+00.00 TO END
C4.07	SANITARY SEWER LINE 'G' & 'K' PLAN & PROFILE LINE 'G' STA. 1+00.00 TO END LINE 'K' STA. 1+00.00 TO END
C4.08	SANITARY SEWER DETAILS
C4.09	SANITARY SEWER DETAILS
C5.00	OVERALL WATER DISTRIBUTION PLAN
C5.01	OVERALL WATER DISTRIBUTION PLAN
C5.02	OVERALL WATER DETAILS
C5.03	OVERALL WATER DETAILS
C6.00	OVERALL UTILITY PLAN
C6.01	OVERALL UTILITY PLAN
C6.02	OVERALL UTILITY PLAN
C7.00	OVERALL GRADING PLAN (SHEET INDEX)
C7.01	OVERALL GRADING PLAN
C7.02	OVERALL GRADING PLAN
C7.03	OVERALL GRADING PLAN
C8.00	STORM WATER POLLUTION PREVENTION PLAN (INDEX SHEET)
C8.01	STORM WATER POLLUTION PREVENTION PLAN (1 OF 3)
C8.02	STORM WATER POLLUTION PREVENTION PLAN (2 OF 3)
C8.03	STORM WATER POLLUTION PREVENTION PLAN (3 OF 3)
C8.04	STORM WATER POLLUTION PREVENTION PLAN DETAILS
C8.05	STORM WATER POLLUTION PREVENTION PLAN DETAILS

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
12/5/25

SEWER (MEDIO - FAR WEST SEWERSHED - MEDIO CREEK WRC)

Developer's Name: JEN TEXAS 33 LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's 114 Total Acreage 28.28
Total Linear Footage of Pipe: 4,115 LF-8" PVC Plat No. 25-11800082
Number of Lots 114 SAWS JOB NO. 25-1537

WATER (SAWS PRESSURE ZONE 1170)

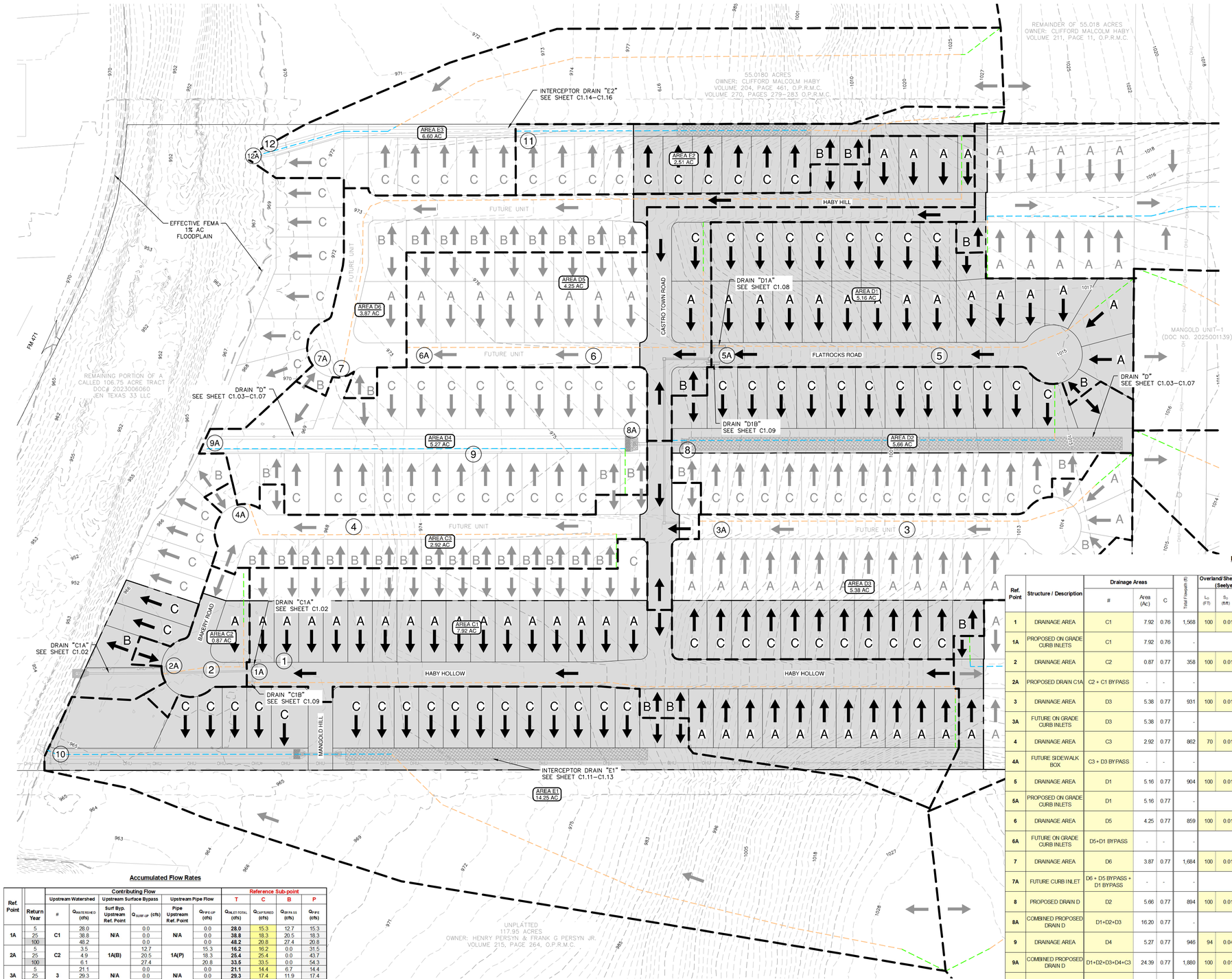
Developer's Name: JEN TEXAS 33, LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's 116 Total Acreage 28.28
Total Linear Footage of Pipe: 294 LF-2" PVC, 4,781 LF-8" PVC Plat No. 25-11800082
Number of Lots 114 SAWS JOB NO. 25-1044

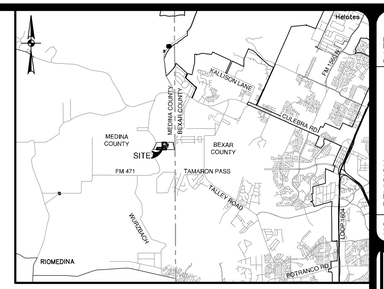
SHEET C0.00

PLAT NO. 25-11800082 PD JOB NO. 12537-12 MANGOLD TRACT - UNIT 2

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LOCATION MAP

NOT–TO–SCALE

0' 100' 200' 300'

SCALE: 1"= 100'

MASTER DRAINAGE LEGEND

- PROJECT LIMITS
- EXISTING CONTOUR — 690
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- POST–PROJECT 1% AC UD FLOODPLAIN
- OVERLAND/SHEET FLOW PATH
- SHALLOW CONCENTRATED FLOW PATH
- CHANNELIZED FLOW PATH
- DRAINAGE AREA BOUNDARY
- FHA LOT GRADING TYPE — A,B,C
- PROPOSED DIRECTION OF FLOW
- DRAINAGE CALCULATION POINT — 11
- DRAINAGE AREA — AREA 0.01 AC

Master Drainage Plan Calculations
(Ultimate Development)

Ref. Point	Structure / Description	Drainage Areas #	Area (Ac.)	C	Total Flowpath (ft)	Overland/Sheet Flow (Seelye) L_O (FT)	S_O (ft/ft)	T_t* (MINS)	Shallow Concentrated Flow - 1"* L_{SC} (FT)	Condition**	Slope (ft/ft)	V_{SC} (FPS)	T_{SC}** (MIN)	Shallow Concentrated Flow - 2"* L_{SC} (FT)	Condition**	Slope (ft/ft)	V_{SC} (FPS)	T_{SC}** (MIN)	Channelized Flow** L_{CH} (FT)	V_{CH} (FPS)	T_{CH}** (MIN)	T_C = or	Rational Method Q=CiA IDF Curve: CoSA_A14_P43 Return Year	Intensity (in/hr)	Q (cfs)
1	DRAINAGE AREA	C1	7.92	0.76	1,568	100	0.01	14	24	U	0.01	1.6	0.2	1,444	S	0.03	4.9	4.9	-	-	-		19	5	4.66	28.0
																							19	25	6.45	38.8
																							19	100	8.00	48.2
1A	PROPOSED ON GRADE CURB INLETS	C1	7.92	0.76	-	Reference Accumulated Flow Rate Table																	0	5	-	15.3
																							0	25	-	18.3
																							0	100	-	20.8
2	DRAINAGE AREA	C2	0.87	0.77	358	100	0.01	14	81	U	0.01	1.6	0.8	177	S	0.01	2.8	1.0	-	-	-		15	5	5.28	3.5
																							15	25	7.32	4.9
																							15	100	9.12	6.1
2A	PROPOSED DRAIN C1A	C2 + C1 BYPASS	-	-	-	Reference Accumulated Flow Rate Table																	0	5	-	31.5
																							0	25	-	43.7
																							0	100	-	54.3
3	DRAINAGE AREA	D3	5.38	0.77	931	100	0.01	14	65	U	0.01	1.6	0.7	766	S	0.05	6.0	2.1	-	-	-		16	5	5.10	21.1
																							16	25	7.07	29.3
																							16	100	8.79	36.4
3A	FUTURE ON GRADE CURB INLETS	D3	5.38	0.77	-	Reference Accumulated Flow Rate Table																	0	5	-	14.4
																							0	25	-	17.4
																							0	100	-	19.4
4	DRAINAGE AREA	C3	2.92	0.77	862	70	0.01	13	792	S	0.01	2.8	4.7						-	-	-		17	5	4.94	11.1
																							17	25	6.84	15.4
																							17	100	8.50	19.1
4A	FUTURE SIDEWALK BOX	C3 + D3 BYPASS	-	-	-	Reference Accumulated Flow Rate Table																	0	5	-	17.8
																							0	25	-	27.3
																							0	100	-	36.1
5	DRAINAGE AREA	D1	5.16	0.77	904	100	0.01	14	70	U	0.01	1.6	0.7	734	S	0.05	6.0	2.0	-	-	-		16	5	5.10	20.3
																							16	25	7.07	28.1
																							16	100	8.79	34.9
5A	PROPOSED ON GRADE CURB INLETS	D1	5.16	0.77	-	Reference Accumulated Flow Rate Table																	0	5	-	18.7
																							0	25	-	23.3
																							0	100	-	26.8
6	DRAINAGE AREA	D5	4.25	0.77	859	100	0.01	14	155	U	0.02	2.3	1.1	604	S	0.02	4.0	2.5	-	-	-		17	5	4.94	16.2
																							17	25	6.84	22.4
																							17	100	8.50	27.8
6A	FUTURE ON GRADE CURB INLETS	D5+D1 BYPASS	-	-	-	Reference Accumulated Flow Rate Table																	0	5	-	15.2
																							0	25	-	19.3
																							0	100	-	22.5
7	DRAINAGE AREA	D6	3.87	0.77	1,684	100	0.01	14	29	U	0.01	1.6	0.3	1,555	S	0.04	5.6	4.6	-	-	-		18	5	4.80	14.3
																							18	25	6.63	19.8
																							18	100	8.24	24.6
7A	FUTURE CURB INLET	D6 + D5 BYPASS + D1 BYPASS	-	-	-	Reference Accumulated Flow Rate Table																	0	5	-	16.9
																							0	25	-	27.7
																							0	100	-	33.0
8	PROPOSED DRAIN D	D2	5.66	0.77	894	100	0.01	14	14	U	0.01	1.6	0.1						-	-	-		15	5	5.28	23.0
																							15	25	7.32	31.9
																							15	100	9.12	39.7
8A	COMBINED PROPOSED DRAIN D	D1+D2+D3	16.20	0.77	-	Reference Accumulated Flow Rate Table																	0	5	-	56.1
																							0	25	-	72.6
																							0	100	-	86.0
9	DRAINAGE AREA	D4	5.27	0.77	946	94	0.04	11				-	-						-	-	-		14	5	5.47	22.2
																							14	25	7.60	30.8
																							14	100	9.48	38.5
9A	COMBINED PROPOSED DRAIN D	D1+D2+D3+D4+C3	24.39	0.77	1,880	100	0.01	14	50	U	0.01	1.6	0.5						-	-	-		22	5	4.33	81.3
																							22	25	5.98	112.3
																							22	100	7.41	139.2
10	PROPOSED DRAIN E1	E1	14.25	0.62	1,932	100	0.01	14	1,130	U	0.08	4.6	4.1						-	-	-		19	5	4.66	41.2
																							19	25	6.45	57.0
																							19	100	8.00	70.7
11	PROPOSED DRAIN E2	E2	2.51	0.71	996	100	0.01	14	308	U	0.07	4.3	1.2						-	-	-		16	5	5.10	9.1
																							16	25	7.07	12.6
																							16	100	8.79	15.7
12	DRAINAGE AREA	E3	6.60	0.58	1,589	100	0.01	14	1,179	U	0.07	4.3	4.6						-	-	-		20	5	4.54	17.4
																							20	25	6.28	24.0
																							20	100	7.79	29.8
12A	COMBINED PROPOSED DRAIN E2	E2+E3	9.11	0.62	1,552	100	0.01	14	308	U	0.07	4.3	1.2						-	-	-		21	5	4.43	25.0
																							21	25	6.12	34.6
																							21	100	7.59	42.9

Rational Method Time of Concentration
*Seelye Chart or TR-55 Eqn. 3-3
**As Calculated using Mannings or TR-55 Figure 3-1 or 6 ft/s

$$T_o = \frac{(0.007(nL)^{0.8})}{(P_2^{0.5} s^{0.4})} \times 60$$

From TR-55 Figure 3-1**

$$v = \frac{k}{n} R^{2/3} s_o^{1/2}$$

$$k = 1.486\ ft^{1/3}/s$$

S: For Streets: n = 0.016, R = 0.2 (Adapted from Mannings)
P: For Paved: n = 0.025, R = 0.2
U: For Unpaved: n = 0.05, R = 0.4
D: For Default: v = 6 fps

Accumulated Flow Rates

Ref. Point	Return Year	Contributing Flow: Upstream Watershed #	$Q_{WATERSHED}$ (cfs)	Upstream Surface Bypass: Surf Byp. Upstream Ref. Point	$Q_{SURF-UP}$ (cfs)	Upstream Pipe Flow: Pipe Upstream Ref. Point	$Q_{PIPE-UP}$ (cfs)	Reference Sub-point: T $Q_{INLET-TOTAL}$ (cfs)	C $Q_{SUCP/SURED}$ (cfs)	B Q_{BYPASS} (cfs)	P Q_{PIPE} (cfs)
1A	5	C1	28.0	N/A	0.0	N/A	0.0	**28.0**	15.3	12.7	15.3
	25		38.8		0.0		0.0	**38.8**	18.3	20.5	18.3
	100		48.2		0.0		0.0	**48.2**	20.8	27.4	20.8
2A	5	C2	3.5	1A(B)	12.7	1A(P)	15.3	**16.2**	16.2	0.0	31.5
	25		4.9		20.5		18.3	**25.4**	25.4	0.0	43.7
	100		6.1		27.4		20.8	**33.5**	33.5	0.0	54.3
3A	5	3	21.1	N/A	0.0	N/A	0.0	**21.1**	14.4	6.7	14.4
	25		29.3		0.0		0.0	**29.3**	17.4	11.9	17.4
	100		36.4		0.0		0.0	**36.4**	19.4	17.0	19.4
4A	5	4	11.1	3A(B)	6.7	N/A	0.0	**17.8**	17.8	-	17.8
	25		15.4		11.9		0.0	**27.3**	27.3	-	27.3
	100		19.1		17.0		0.0	**36.1**	36.1	-	36.1
5A	5	5	20.3	N/A	0.0	N/A	0.0	**20.3**	18.7	1.6	18.7
	25		28.1		0.0		0.0	**28.1**	23.3	4.8	23.3
	100		34.9		0.0		0.0	**34.9**	26.8	8.1	26.8
6A	5	6	16.2	5A(B)	1.6	N/A	0.0	**17.8**	15.2	2.6	15.2
	25		22.4		4.8		0.0	**27.2**	19.3	7.9	19.3
	100		27.8		8.1		0.0	**35.9**	22.5	13.4	22.5
7A	5	7	14.3	6A(B)	2.6	6A(P)	15.2	**16.9**	16.9	0.0	16.9
	25		19.8		7.9		19.3	**27.7**	27.7	0.0	27.7
	100		24.6		13.4		22.5	**38.0**	38.0	0.0	38.0
8A	5	8	23.0	N/A	0.0	3A(P) + 5A(P)	33.1	**56.1**	-	-	-
	25		31.9		0.0		40.7	**72.6**	-	-	-
	100		39.7		0.0		46.3	**86.0**	-	-	-

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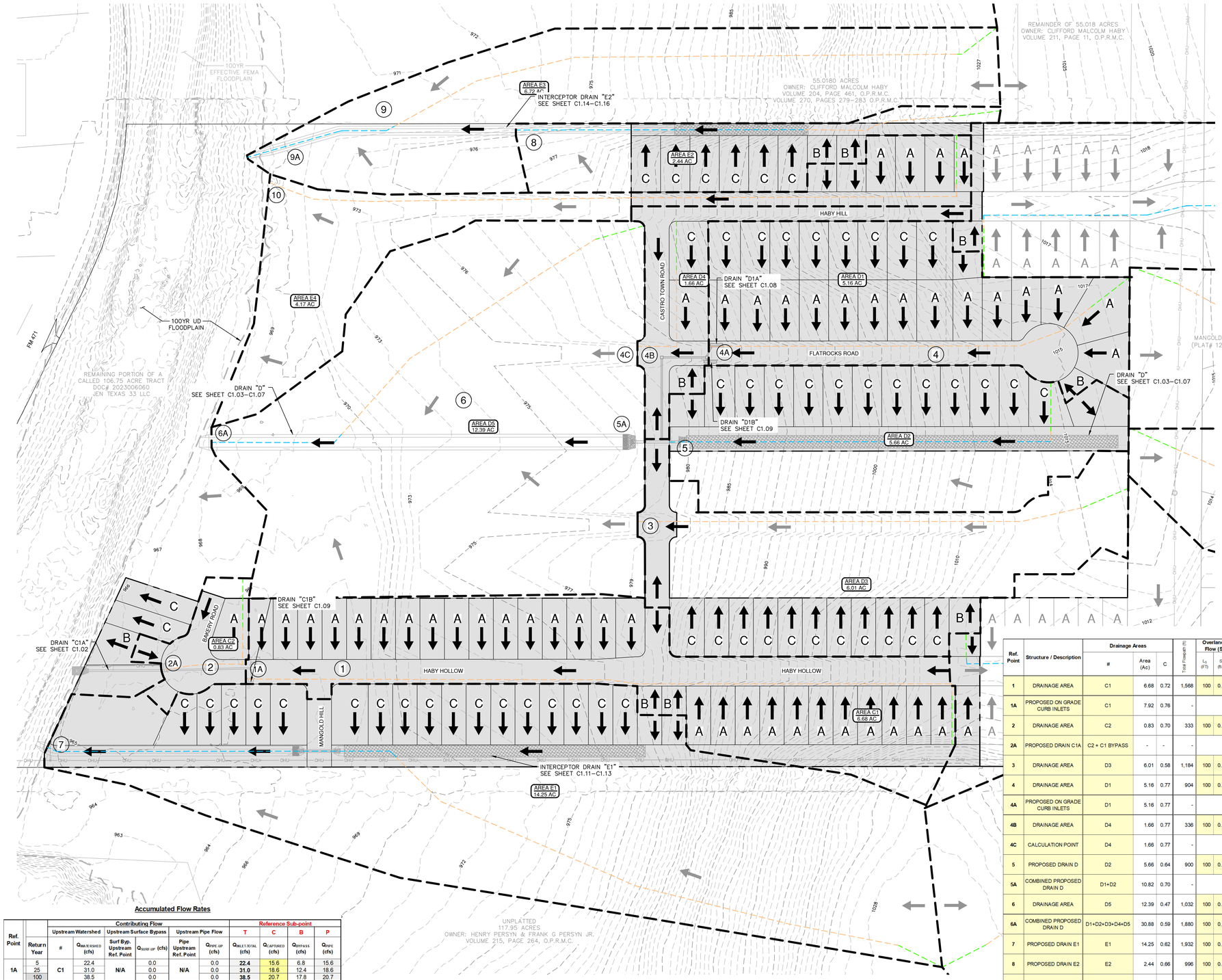
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BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

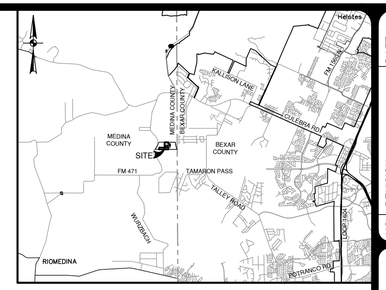
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

MASTER DRAINAGE PLAN
ULTIMATE CONDITIONS

PLAT NO. 25-11800082
JOB NO. 12537–12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.00





LOCATION MAP

NOT-TO-SCALE

0' 100' 200' 300'

SCALE: 1"= 100'

MASTER DRAINAGE LEGEND

PROJECT LIMITS	
EXISTING CONTOUR	690
EFFECTIVE FEMA 1% AC FLOODPLAIN	
POST-PROJECT 1% AC UD FLOODPLAIN	
OVERLAND/SHEET FLOW PATH	
SHALLOW CONCENTRATED FLOW PATH	
CHANNELIZED FLOW PATH	
DRAINAGE AREA BOUNDARY	
FHA LOT GRADING TYPE	A,B,C
PROPOSED DIRECTION OF FLOW	
DRAINAGE CALCULATION POINT	11
DRAINAGE AREA	AREA 0.01 AC

Accumulated Flow Rates

Ref. Point	Return Year	Contributing Flow: Upstream Watershed #	$Q_{WATERSHED}$ (cfs)	Upstream Surface Bypass: Surf Byp. Upstream Ref. Point	$Q_{SURF\ BP}$ (cfs)	Upstream Pipe Flow: Pipe Upstream Ref. Point	$Q_{PIPE\ UP}$ (cfs)	Reference Sub-point: T	C	B	P
1A	5	C1	22.4	N/A	0.0	N/A	0.0	**22.4**	15.6	6.8	15.6
	25		31.0		0.0		0.0	**31.0**	18.6	12.4	18.6
	100		38.5		0.0		0.0	**38.5**	20.7	17.8	20.7
2A	5	C2	3.1	1A(B)	6.8	1A(P)	15.6	**9.9**	9.9	0.0	25.5
	25		4.3		12.4		18.6	**16.7**	16.7	0.0	35.3
	100		5.3		17.8		20.7	**23.1**	23.1	0.0	43.8
4A	5	4	20.3	N/A	0.0	N/A	0.0	**20.3**	20.1	0.2	20.1
	25		28.1		0.0		0.0	**28.1**	27.8	0.3	27.8
	100		34.9		0.0		0.0	**34.9**	33.4	1.5	33.4
4C	5	4B	6.5	4A(B)	0.2	N/A	0.0	**6.7**	-	-	-
	25		9.0		0.3		0.0	**9.3**	-	-	-
	100		11.2		1.5		0.0	**12.7**	-	-	-
5A	5	5	19.1	N/A	0.0	4A(P)	20.1	**46.9**	-	-	-
	25		26.5		0.0		27.8	**54.3**	-	-	-
	100		33.0		0.0		33.4	**66.4**	-	-	-

Proposed Conditions Calculations

Ref. Point	Structure / Description	Drainage Areas: #	Area (Ac)	C	Total Flowpath (ft)	Overland/Sheet Flow (Seelye): L_C (FT)	S_O (ft/ft)	T_C* (MIN)	Shallow Concentrated Flow - 1**: L_{SC} (FT)	Condition***	Slope (ft/ft)	V_{SC} (FPS)	T_{SC}** (MIN)	Shallow Concentrated Flow - 2**: L_{SC} (FT)	Condition***	Slope (ft/ft)	V_{SC} (FPS)	T_{SC}** (MIN)	Channelized Flow**: L_{CH} (FT)	V_{CH} (FPS)	T_{CH}** (MIN)	$T_{C\text{-}TOT}$	Rational Method Q=CIA IDF Curve: CoSA_A14_P43: Return Year	Intensity (in/hr)	Q (cfs)
1	DRAINAGE AREA	C1	6.68	0.72	1,568	100	0.01	14	24	U	0.01	1.6	0.2	1,444	S	0.03	4.9	4.9	-	-	-	19	5	4.66	22.4
																						19	25	6.45	31.0
																						19	100	8.00	38.5
1A	PROPOSED ON GRADE CURB INLETS	C1	7.92	0.76	-	Reference Accumulated Flow Rate Table																0	5	-	15.6
																						0	25	-	18.6
																						0	100	-	20.7
2	DRAINAGE AREA	C2	0.83	0.70	333	100	0.01	14	76	U	0.01	1.6	0.8	157	S	0.01	2.8	0.9	-	-	-	15	5	5.28	3.1
																						15	25	7.32	4.3
																						15	100	9.12	5.3
2A	PROPOSED DRAIN C1A	C2 + C1 BYPASS	-	-	-	Reference Accumulated Flow Rate Table																0	5	-	25.5
																						0	25	-	35.3
																						0	100	-	43.8
3	DRAINAGE AREA	D3	6.01	0.58	1,184	100	0.01	14	143	U	0.01	1.6	1.5	941	S	0.05	6.3	2.5	-	-	-	17	5	4.94	17.2
																						17	25	6.84	23.8
																						17	100	8.50	29.6
4	DRAINAGE AREA	D1	5.16	0.77	904	100	0.01	14	81	U	0.01	1.6	0.8	723	S	0.05	6.3	1.9	-	-	-	16	5	5.10	20.3
																						16	25	7.07	28.1
																						16	100	8.79	34.9
4A	PROPOSED ON GRADE CURB INLETS	D1	5.16	0.77	-	Reference Accumulated Flow Rate Table																0	5	-	20.1
																						0	25	-	27.8
																						0	100	-	33.4
4B	DRAINAGE AREA	D4	1.66	0.77	336	100	0.01	14	156	U	0.01	1.6	1.6	80	S	0.01	2.8	0.5	-	-	-	16	5	5.10	6.5
																						16	25	7.07	9.0
																						16	100	8.79	11.2
4C	CALCULATION POINT	D4	1.66	0.77	-	Reference Accumulated Flow Rate Table																0	5	-	6.7
																						0	25	-	9.3
																						0	100	-	12.7
5	PROPOSED DRAIN D	D2	5.66	0.64	900	100	0.01	14	20	U	0.01	1.6	0.2						-	-	780	8.3	1.6	15	5	5.28	19.1
																						15	25	7.32	26.5
																						15	100	9.12	33.0
5A	COMBINED PROPOSED DRAIN D	D1+D2	10.82	0.70	-	Reference Accumulated Flow Rate Table																0	5	-	46.9
																						0	25	-	54.3
																						0	100	-	66.4
6	DRAINAGE AREA	D5	12.39	0.47	1,032	100	0.03	12	659	U	0.01	1.6	6.8						-	-	273	3.7	1.2	20	5	4.54	26.4
																						20	25	6.28	36.6
																						20	100	7.79	45.4
6A	COMBINED PROPOSED DRAIN D	D1+D2+D3+D4+D5	30.88	0.59	1,880	100	0.01	14	50	U	0.02	2.3	0.4						-	-	1,730	3.7	7.8	22	5	4.33	78.9
																						22	25	5.98	109.0
																						22	100	7.41	135.0
7	PROPOSED DRAIN E1	E1	14.25	0.62	1,932	100	0.01	14	1,130	U	0.08	4.6	4.1						-	-	702	7.8	1.5	19	5	4.66	41.2
																						19	25	6.45	57.0
																						19	100	8.00	70.7
8	PROPOSED DRAIN E2	E2	2.44	0.66	996	100	0.01	14	308	U	0.08	4.6	1.1						-	-	588	7.1	1.4	16	5	5.10	9.2
																						16	25	7.07	11.4
																						16	100	8.79	14.2
9	DRAINAGE AREA	E3	6.72	0.55	1,589	100	0.01	14	1,179	U	0.07	4.3	4.6						-	-	310	2.7	1.9	20	5	4.54	16.8
																						20	25	6.28	23.2
																						20	100	7.79	28.8
9A	COMBINED PROPOSED DRAIN E2	E2+E3	9.16	0.58	1,552	100	0.01	14	308	U	0.07	4.3	1.2						-	-	1,144	3.0	6.4	21	5	4.43	23.5
																						21	25	6.12	32.5
																						21	100	7.59	40.3
10	DRAINAGE AREA	E4	4.17	0.61	1,528	100	0.04	11	763	U	0.07	4.3	3.0	665	S	0.05	6.3	1.8	-	-	-	15	5	5.28	13.4
																						15	25	7.32	18.6
																						15	100	9.12	23.2

Rational Method Time of Concentration
*Seelye Chart or TR-55 Eqn. 3-3
**As Calculated using Mannings or TR-55 Figure 3-1 or 6 ft/s

$$T_o = \frac{\left(0.007(n\cdot L)^{0.8}\right)}{(P_2^{0.5}\cdot s^{0.4})} \cdot 60$$

From TR-55 Figure 3-1**

$$v = \frac{k}{n} R^{2/3} S_o^{1/2}$$

$$k = 1.486\ ft^{1/3}/s$$

S: For Streets: n = 0.018, R = 0.2 (Adapted from Mannings)
P: For Paved: n = 0.025, R = 0.2
U: For Unpaved: n = 0.05, R = 0.4
D: For Default: v = 6 fps

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
1/12/26

PAPE-DAWSON
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

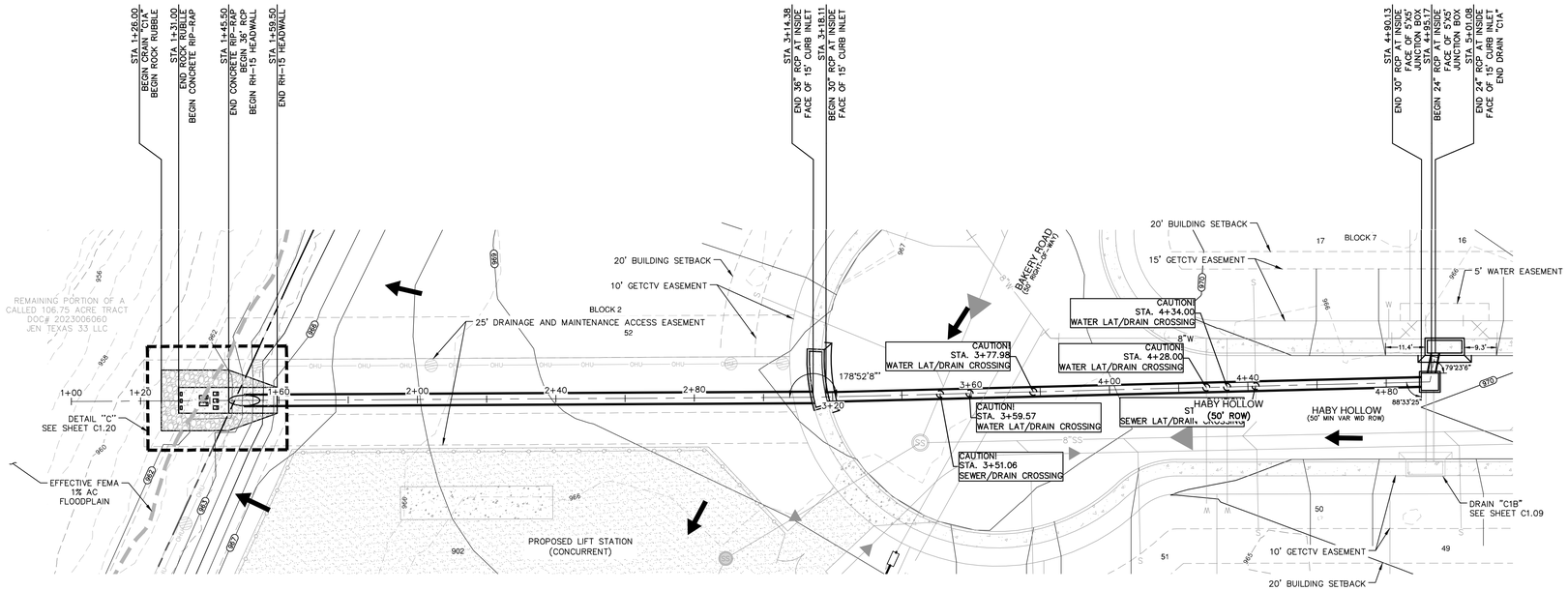
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

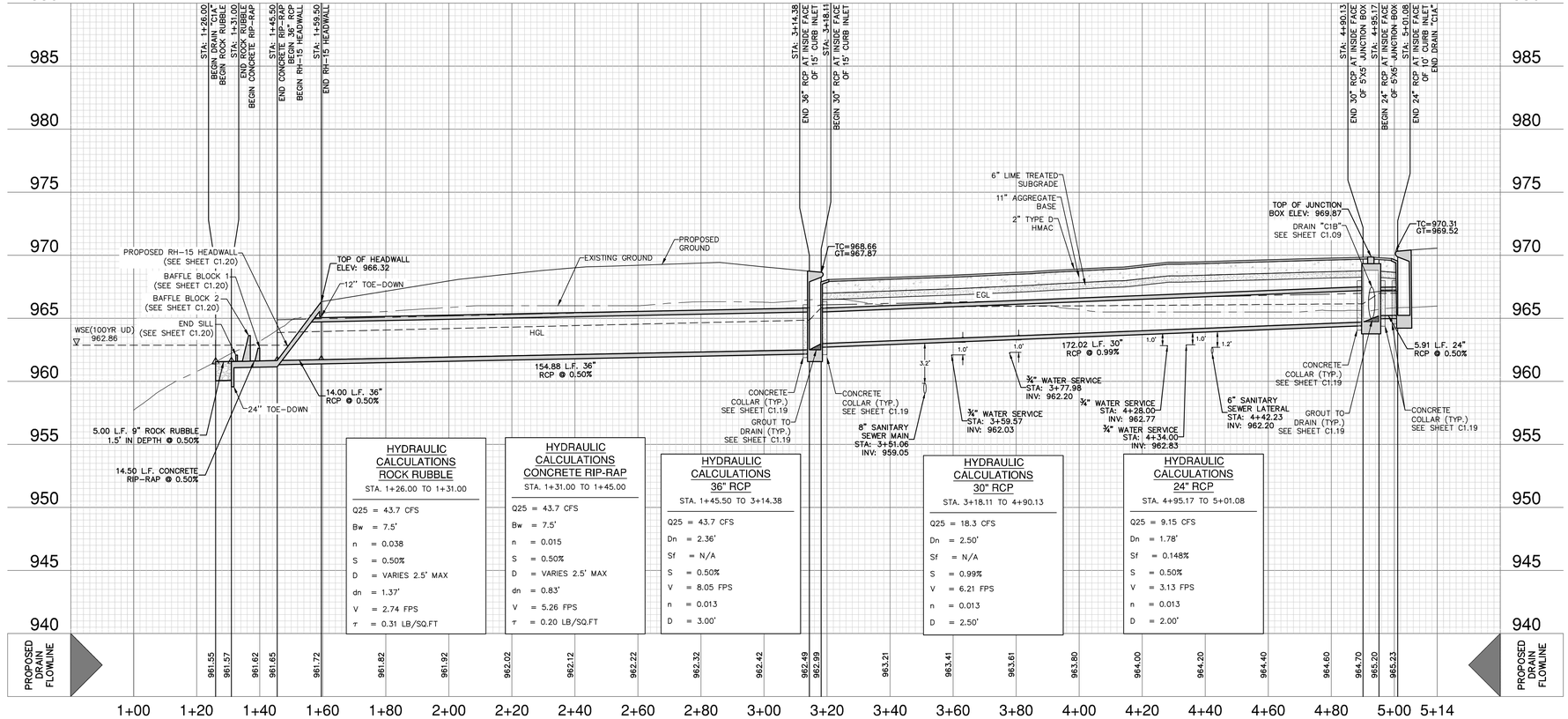
OVERALL DRAINAGE PLAN
PROPOSED CONDITIONS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.01

Date: Jan 13, 2026, 8:46am User ID: clofner
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HYDRAULIC CALCULATIONS ROCK RUBBLE

STA. 1+26.00 TO 1+31.00

Q25	= 43.7 CFS
Bw	= 7.5'
n	= 0.038
S	= 0.50%
D	= VARIES 2.5' MAX
dn	= 1.37'
V	= 2.74 FPS
τ	= 0.31 LB/SQ.FT

HYDRAULIC CALCULATIONS CONCRETE RIP-RAP

STA. 1+31.00 TO 1+45.00

Q25	= 43.7 CFS
Bw	= 7.5'
n	= 0.015
S	= 0.50%
D	= VARIES 2.5' MAX
dn	= 0.83'
V	= 5.26 FPS
τ	= 0.20 LB/SQ.FT

HYDRAULIC CALCULATIONS 36" RCP

STA. 1+45.50 TO 3+14.38

Q25	= 43.7 CFS
Dn	= 2.36'
Sf	= N/A
S	= 0.50%
V	= 8.05 FPS
n	= 0.013
D	= 3.00'

HYDRAULIC CALCULATIONS 30" RCP

STA. 3+18.11 TO 4+90.13

Q25	= 18.3 CFS
Dn	= 2.50'
Sf	= N/A
S	= 0.99%
V	= 6.21 FPS
n	= 0.013
D	= 2.50'

HYDRAULIC CALCULATIONS 24" RCP

STA. 4+95.17 TO 5+01.08

Q25	= 9.15 CFS
Dn	= 1.78'
Sf	= 0.148%
S	= 0.50%
V	= 3.13 FPS
n	= 0.013
D	= 2.00'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

SCALE: 1"= 20' (0' 20' 40' 60')

HYDRAULIC CALCULATIONS–DRAIN "C1A"

Q_{25} = 25.4 CFS

$Q_{25} = CA\sqrt{2gh}$ (ORIFICE FLOW EQN.)

A = L(0.44), h = 0.52, g = 32.2, c = 0.7

$$L = \frac{25.4 \text{ CFS}}{(0.7)\ (0.52)\ \sqrt{2\ (32.2)\ (0.52)}}$$

L = 12.06 FT USE 1 ~ 15 FT CURB INLET

CHECK WITH WEIR FORMULA

$$h = \left(\frac{Q}{(CL)}\right)^{2/3} = \left(\frac{25.4}{(3.087)\ (15)}\right)^{2/3} = 0.67 \text{ FT.}$$

h = 0.67 < 0.79 OK

OPEN EARTHEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE & GRADING NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
3. REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
4. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
5. EARTHEN CHANNELS WILL BE VEGETATED BY SEEDING OR SODDING. 85% OF THE CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.
6. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH OF "D" AS SHOWN IN THE PROFILE.

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 ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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!!

CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

NO.	REVISION	DATE

STATE OF TEXAS — BRUNA F. SPENGLER — 127547 — LICENSED PROFESSIONAL ENGINEER — 12/1/25

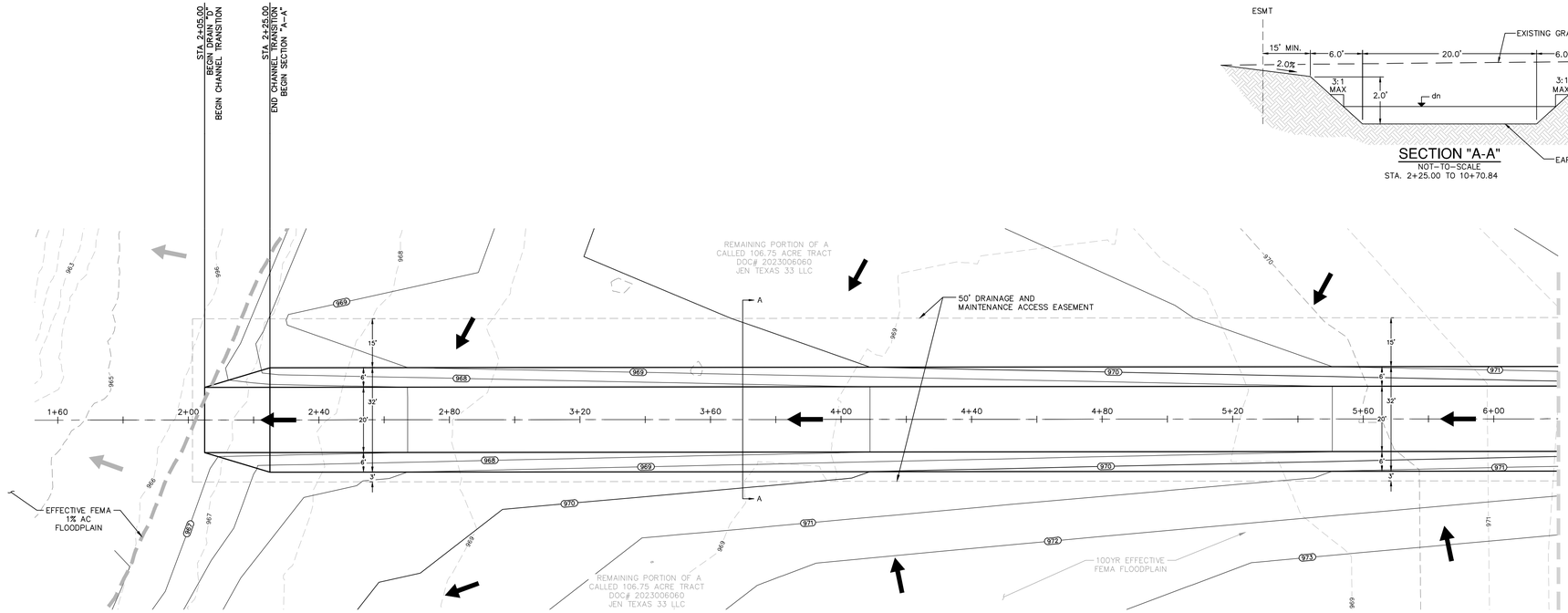
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

DRAIN "C1A" PLAN & PROFILE
STA. 1+26.00 TO END

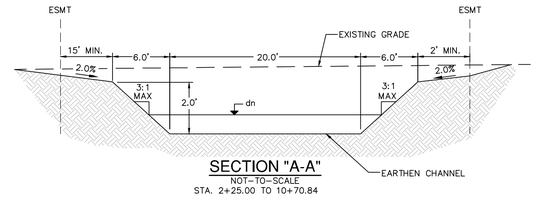
PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.02

Date: Dec 01, 2025, 2:24pm User ID: clofrer
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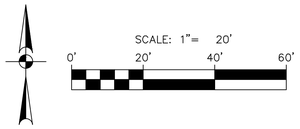


DRAIN "D"
STA. 2+05.00 TO 6+20.00

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

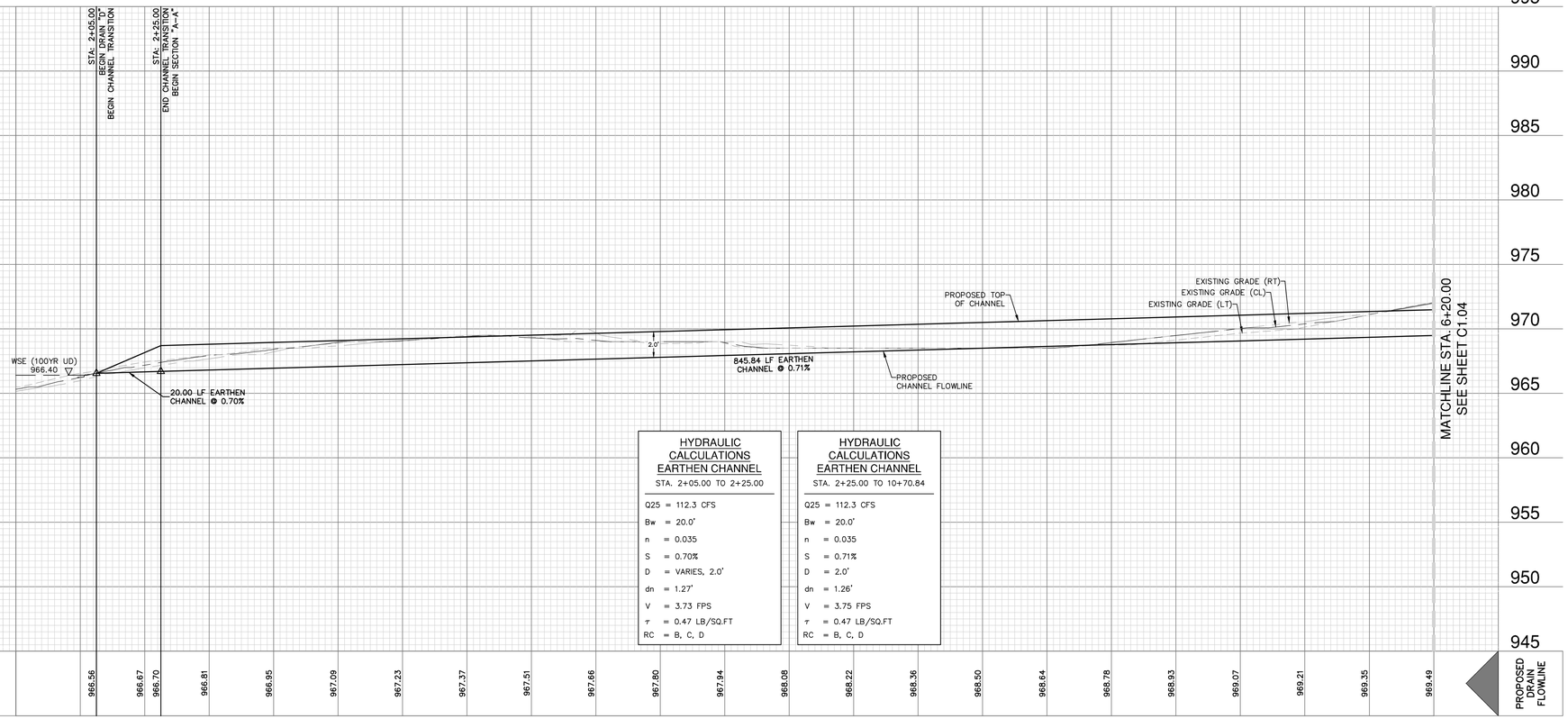


SECTION "A-A"
NOT-TO-SCALE
STA. 2+25.00 TO 10+70.84



DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW



HYDRAULIC CALCULATIONS EARTHEN CHANNEL STA. 2+05.00 TO 2+25.00	
Q25	= 112.3 CFS
Bw	= 20.0'
n	= 0.035
S	= 0.70%
D	= VARIES, 2.0'
dn	= 1.27'
V	= 3.73 FPS
τ	= 0.47 LB/SQ.FT
RC	= B, C, D

HYDRAULIC CALCULATIONS EARTHEN CHANNEL STA. 2+25.00 TO 10+70.84	
Q25	= 112.3 CFS
Bw	= 20.0'
n	= 0.035
S	= 0.71%
D	= 2.0'
dn	= 1.26'
V	= 3.75 FPS
τ	= 0.47 LB/SQ.FT
RC	= B, C, D

OPEN EARTHEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE & GRADING NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
3. REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
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5. EARTHEN CHANNELS WILL BE VEGETATED BY SEEDING OR SODDING. 85% OF THE CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.
6. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH OF "D" AS SHOWN IN THE PROFILE.

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 ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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!!

CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

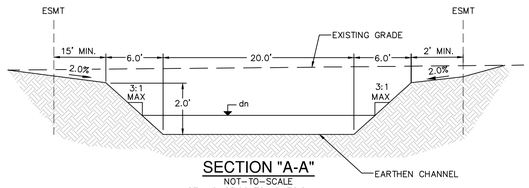
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

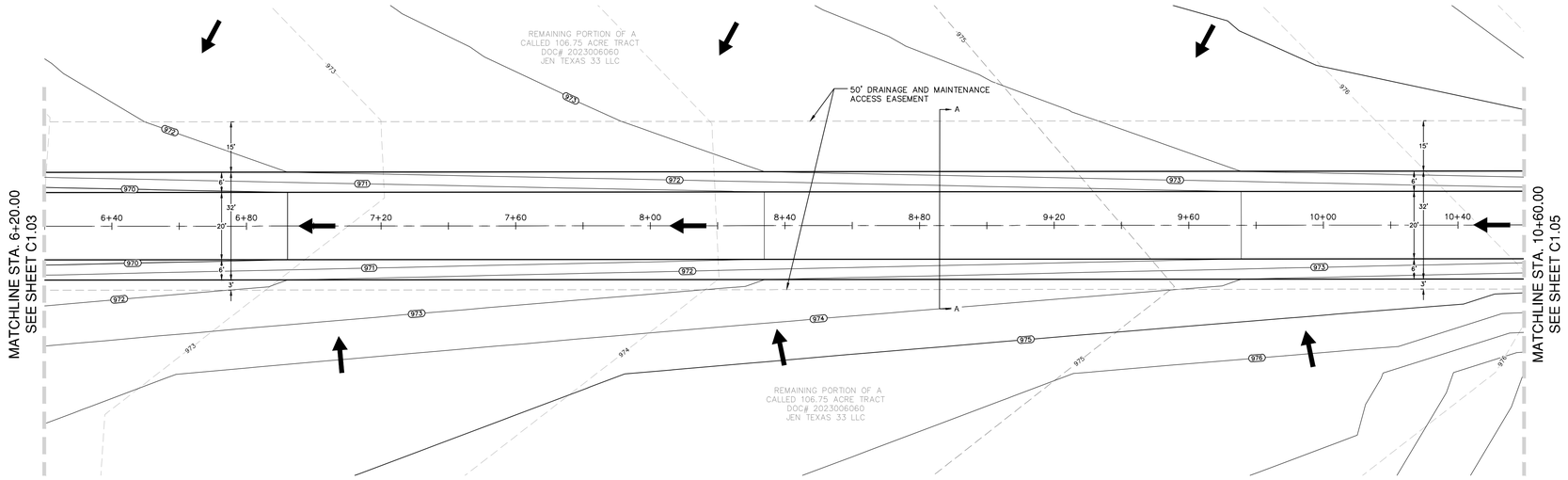
DRAIN "D" PLAN & PROFILE
STA. 2+05.00 TO 6+20.00

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.03

Date: Oct 28, 2025, 12:09pm User ID: clafever
File: P:\125\37\12\Design\Civil\DR-D 1253712.dwg
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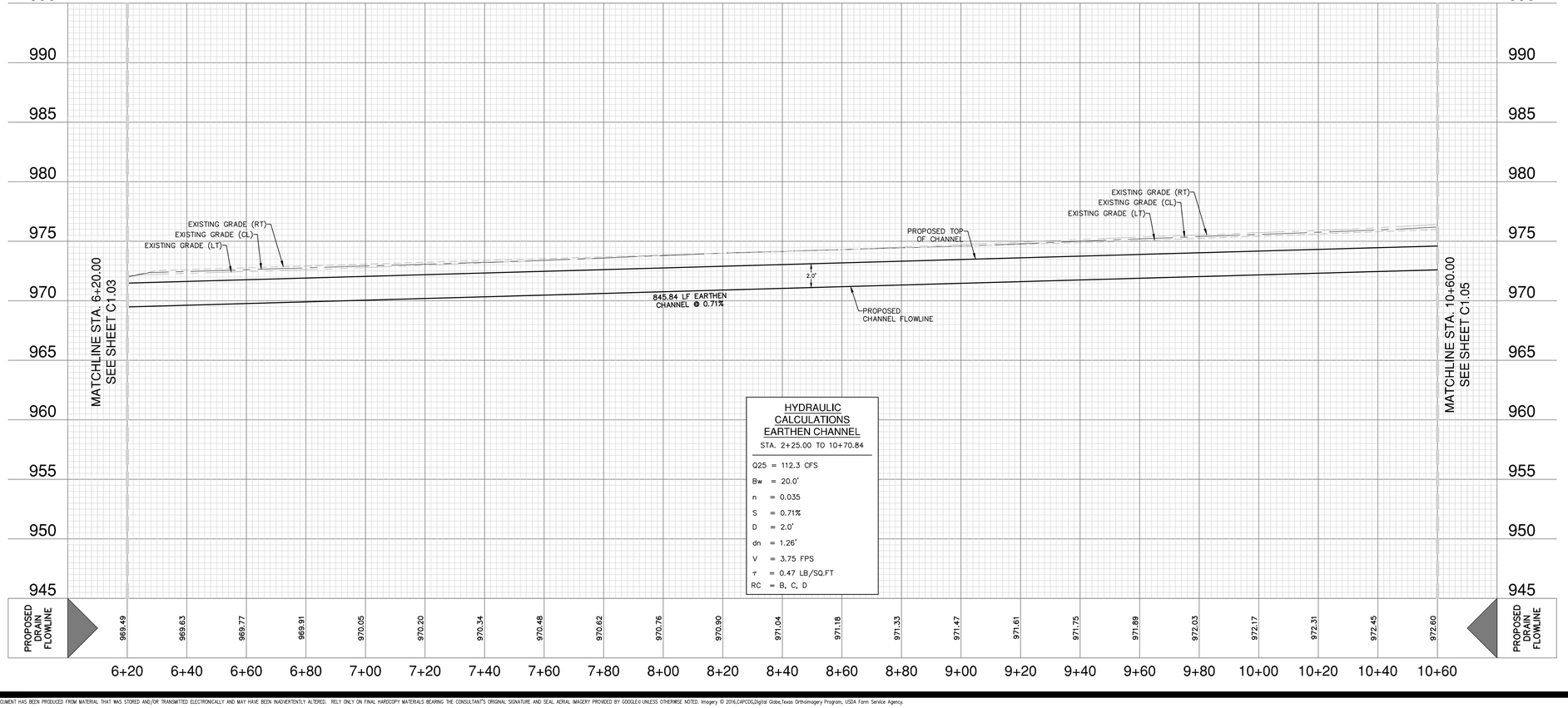


SECTION "A-A"
NOT-TO-SCALE
STA. 2+25.00 TO 10+70.84



DRAIN "D"
STA. 6+20.00 TO 10+60.00

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



HYDRAULIC CALCULATIONS EARTHEN CHANNEL	
STA. 2+25.00 TO 10+70.84	
Q25	= 112.3 CFS
Bw	= 20.0'
n	= 0.035
S	= 0.71%
D	= 2.0'
dn	= 1.26'
V	= 3.75 FPS
τ	= 0.47 LB/SQ.FT
RC	= B, C, D

SCALE: 1"= 20'
0' 20' 40' 60'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

OPEN EARTHEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE & GRADING NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
3. REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
4. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
5. EARTHEN CHANNELS WILL BE VEGETATED BY SEEDING OR SODDING. 85% OF THE CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.
6. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH OF "D" AS SHOWN IN THE PROFILE.

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 ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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!!

CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

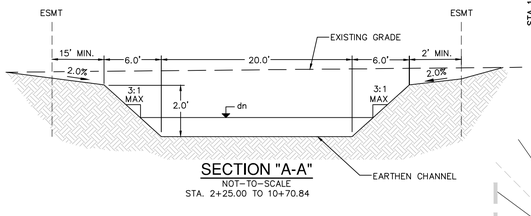
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2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
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SAN ANTONIO, TEXAS

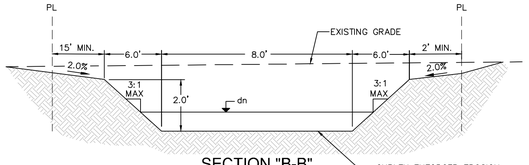
DRAIN "D" PLAN & PROFILE
STA. 6+20.00 TO 10+60.00

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.04

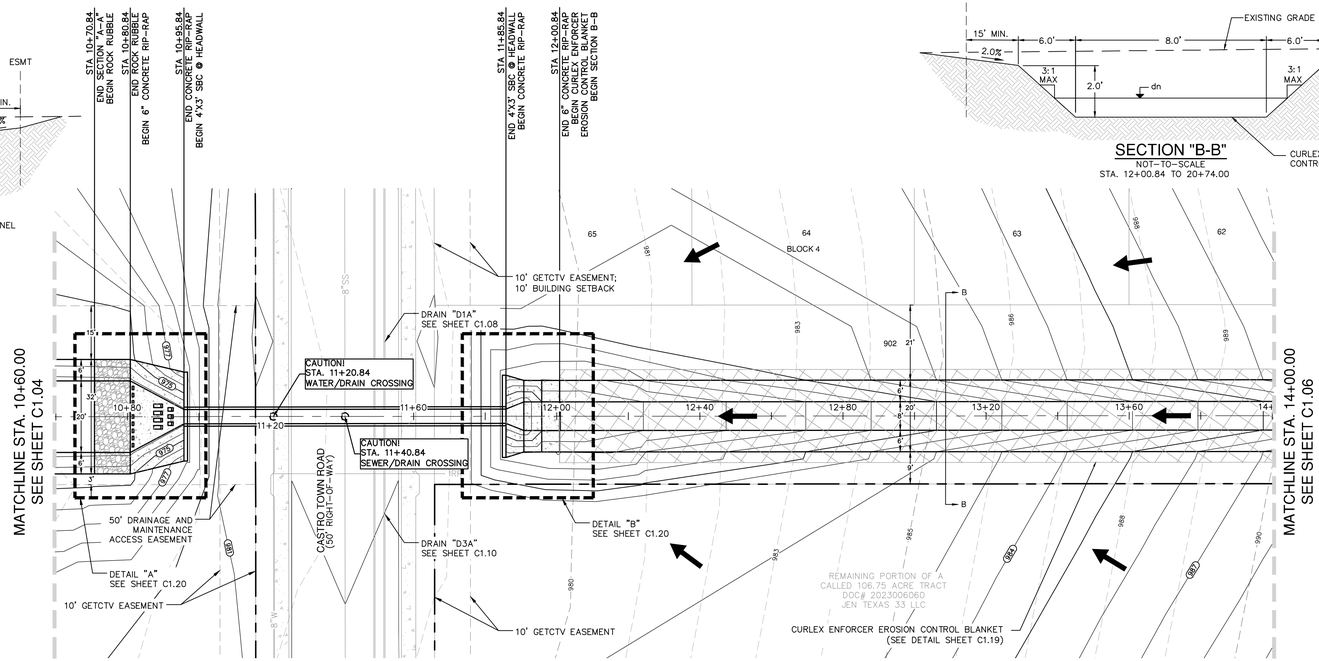
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SECTION "A-A"
NOT-TO-SCALE
STA. 2+25.00 TO 10+70.84



SECTION "B-B"
NOT-TO-SCALE
STA. 12+00.84 TO 20+74.00



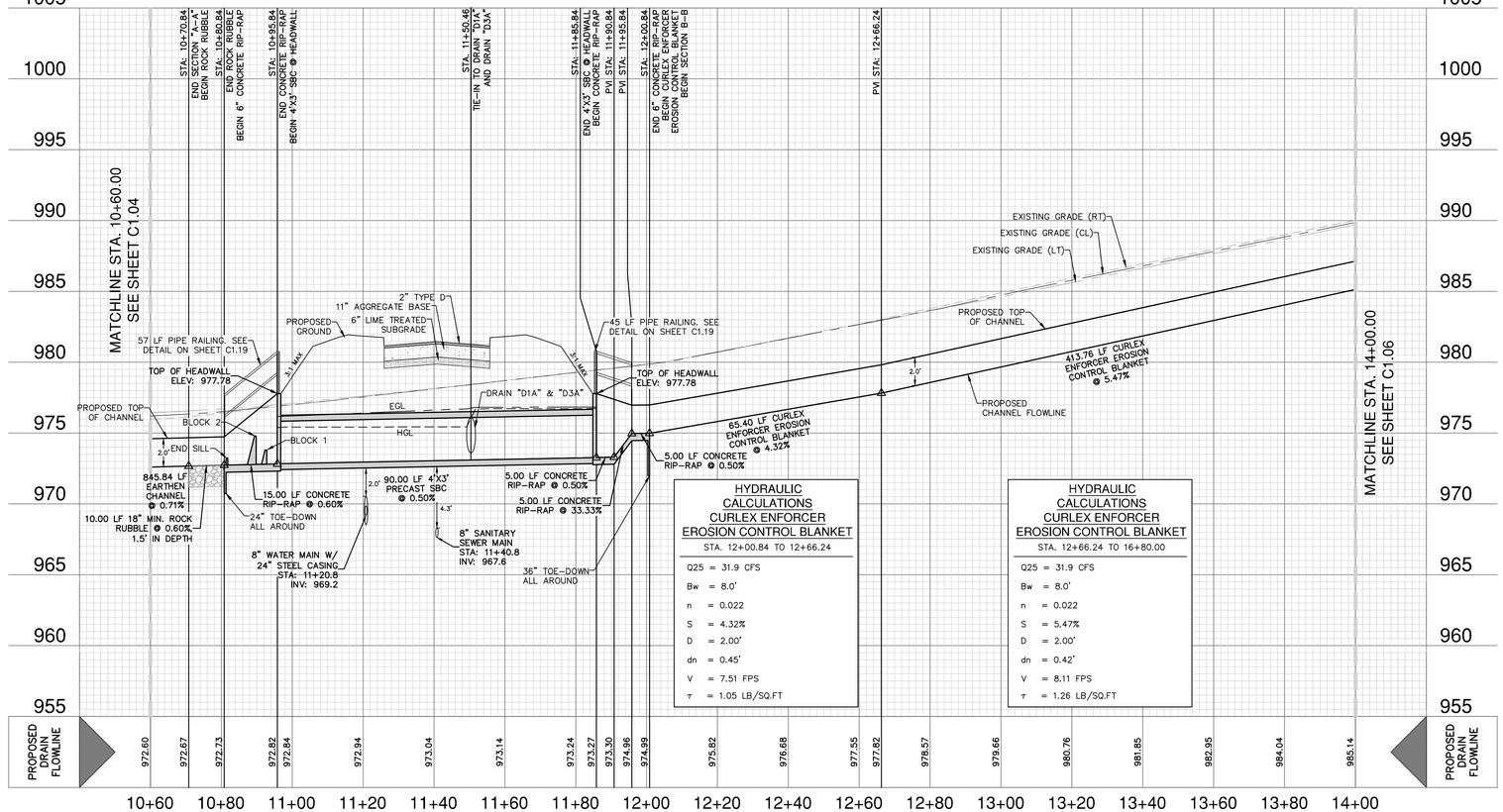
SCALE: 1"= 20'
0' 20' 40' 60'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR — 690
- PROPOSED CONTOUR — 690
- PROPOSED WATER — W
- PROPOSED SEWER — SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

DRAIN "D"
STA. 10+60.00 TO 14+00.00

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



HYDRAULIC CALCULATIONS EARTHEN CHANNEL
STA. 2+25.00 TO 10+70.84

Q25	= 112.3 CFS
Bw	= 20.0'
n	= 0.035
S	= 0.71%
D	= 2.0'
dn	= 1.26'
V	= 3.75 FPS
τ	= 0.47 LB/SQ.FT
RC	= B, C, D

HYDRAULIC CALCULATIONS ROCK RUBBLE
STA. 10+70.84 TO 10+80.84

Q25	= 72.6 CFS
Bw	= 20.0'
n	= 0.035
S	= 0.60%
D	= 2.00'
dn	= 1.03'
V	= 3.06 FPS
τ	= 0.34 LB/SQ.FT

HYDRAULIC CALCULATIONS CONCRETE RIP-RAP
STA. 10+80.84 TO 10+95.84

Q25	= 72.6 CFS
Bw	= 20.0'
n	= 0.015
S	= 0.60%
D	= 2' MIN.
dn	= 0.63'
V	= 5.29 FPS
τ	= 0.21 LB/SQ.FT

HYDRAULIC CALCULATIONS 4'X3' SBC
STA. 10+95.84 TO 11+50.46

Q25	= 72.6 CFS
Dn	= 2.59'
Sf	= N/A
S	= 0.50%
V	= 7.77 FPS
n	= 0.013
D	= 3.00'

HYDRAULIC CALCULATIONS 4'X3' SBC
STA. 10+95.84 TO 11+50.46

Q25	= 31.9 CFS
Dn	= 3.00'
Sf	= 0.066%
S	= 0.50%
V	= 2.66 FPS
n	= 0.013
D	= 3.00'

HYDRAULIC CALCULATIONS CONCRETE RIP-RAP
STA. 11+85.84 TO 11+90.84

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.015
S	= 0.50%
D	= 2' MIN.
dn	= 0.68'
V	= 4.71 FPS
τ	= 0.17 LB/SQ.FT

HYDRAULIC CALCULATIONS CONCRETE RIP-RAP
STA. 11+90.84 TO 11+95.84

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.015
S	= 33.33%
D	= 2' MIN.
dn	= 0.20'
V	= 18.59 FPS
τ	= 3.85 LB/SQ.FT

HYDRAULIC CALCULATIONS CONCRETE RIP-RAP
STA. 11+95.84 TO 12+00.84

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.015
S	= 0.50%
D	= 2.00'
dn	= 0.68'
V	= 4.71 FPS
τ	= 0.17 LB/SQ.FT

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET
STA. 12+00.84 TO 12+66.24

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.022
S	= 4.32%
D	= 2.00'
dn	= 0.45'
V	= 7.51 FPS
τ	= 1.05 LB/SQ.FT

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET
STA. 12+66.24 TO 16+80.00

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.022
S	= 5.47%
D	= 2.00'
dn	= 0.42'
V	= 8.11 FPS
τ	= 1.26 LB/SQ.FT

OPEN EARTHEN CHANNEL NOTE:
CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

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CAUTION!!
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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

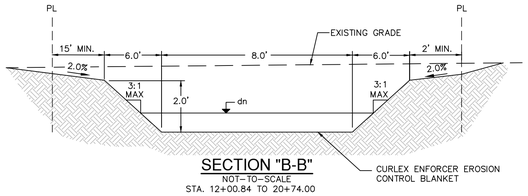
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

DRAIN "D" PLAN & PROFILE
STA. 10+60.00 TO 14+00.00

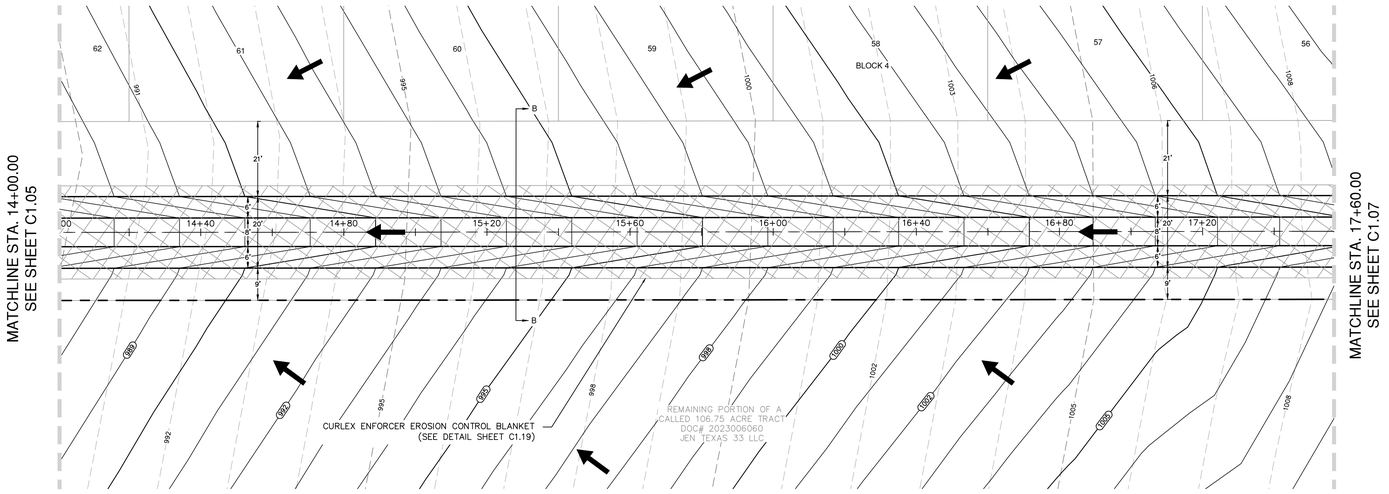
PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.05

Date: Oct 28, 2025, 12:01pm User ID: clafner
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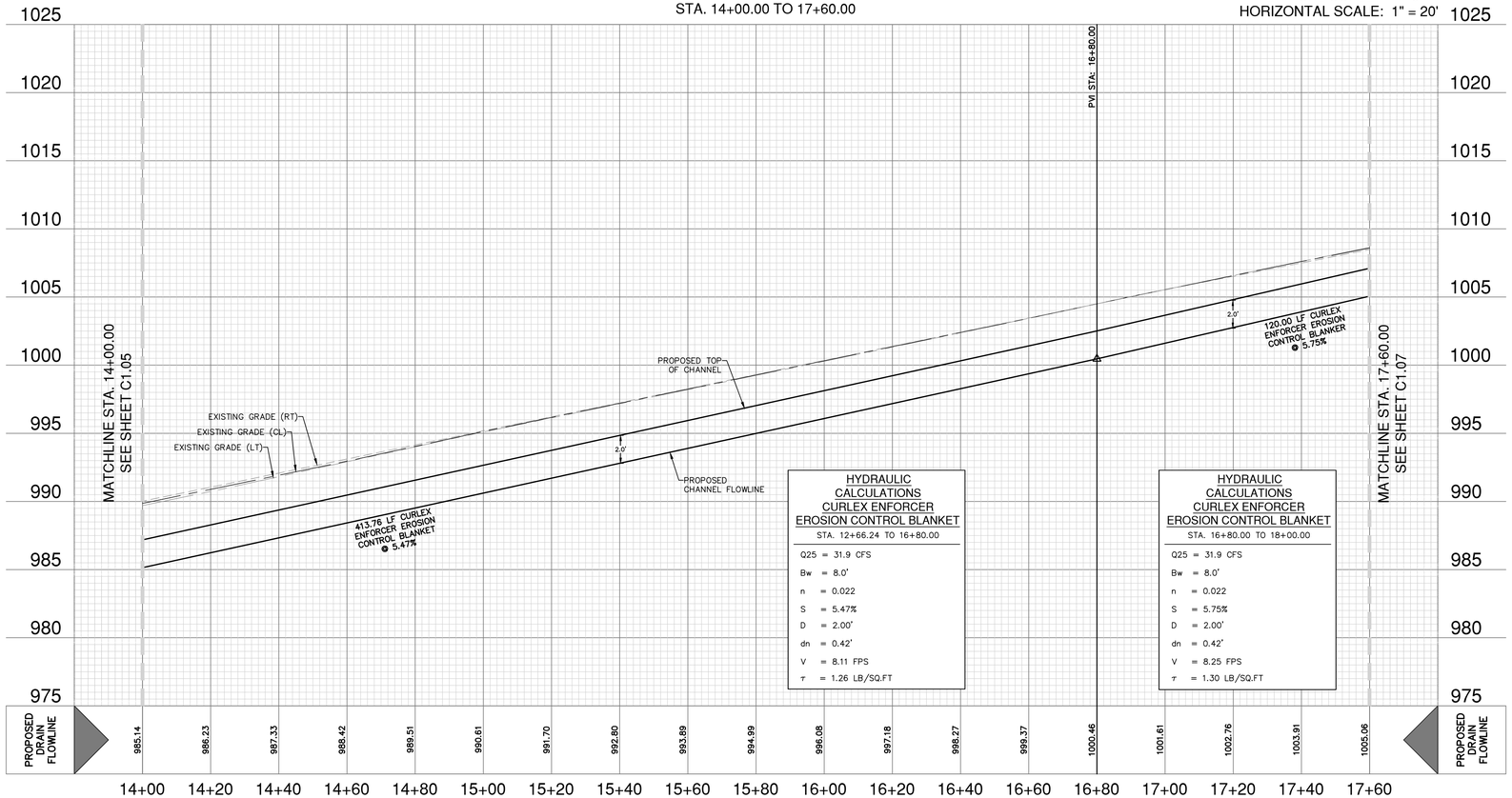


SECTION "B-B"
NOT-TO-SCALE
STA. 12+00.84 TO 20+74.00



DRAIN "D"
STA. 14+00.00 TO 17+60.00

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



HYDRAULIC CALCULATIONS
CURLEX ENFORCER
EROSION CONTROL BLANKET
STA. 12+66.24 TO 16+80.00

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.022
S	= 5.47%
D	= 2.00'
dn	= 0.42'
V	= 8.11 FPS
τ	= 1.26 LB/SQ.FT

HYDRAULIC CALCULATIONS
CURLEX ENFORCER
EROSION CONTROL BLANKET
STA. 16+80.00 TO 18+00.00

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.022
S	= 5.75%
D	= 2.00'
dn	= 0.42'
V	= 8.25 FPS
τ	= 1.30 LB/SQ.FT

SCALE: 1"= 20'
0' 20' 40' 60'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

OPEN EARTHEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE & GRADING NOTES:

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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

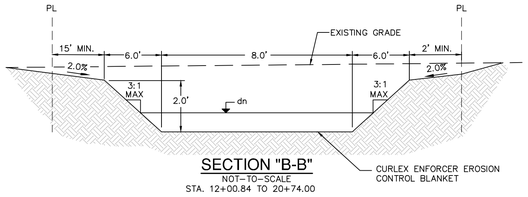
PAPE-DAWSON
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MANGOLD UNIT-2
SAN ANTONIO, TEXAS

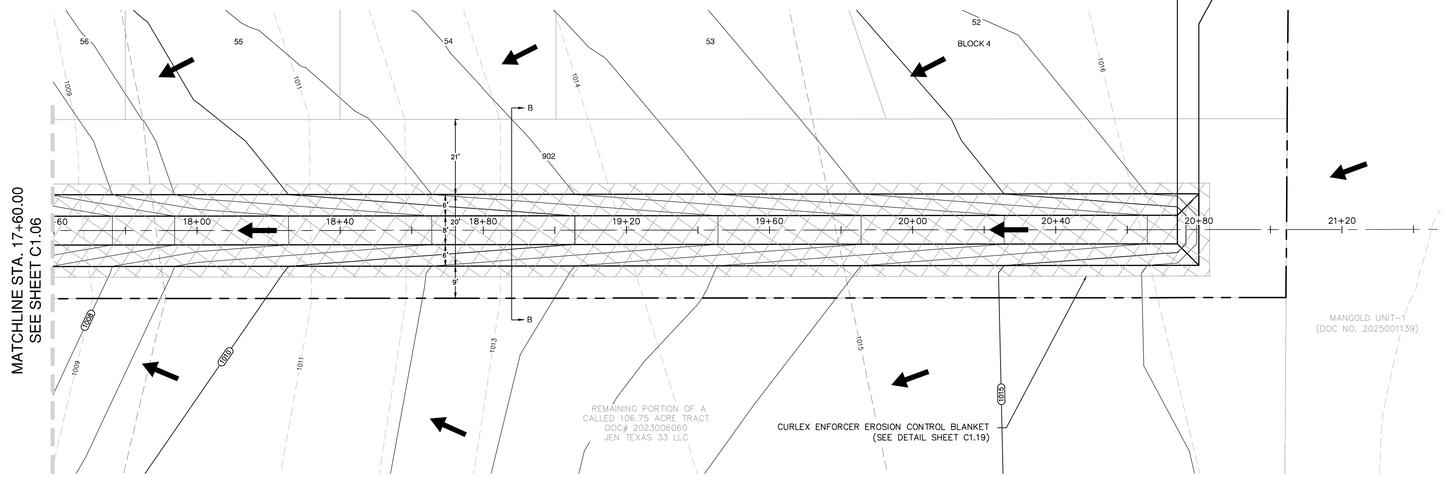
DRAIN "D" PLAN & PROFILE
STA. 14+00.00 TO 17+60.00

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.06

Date: Oct 28, 2025, 3:21pm User ID: clodner
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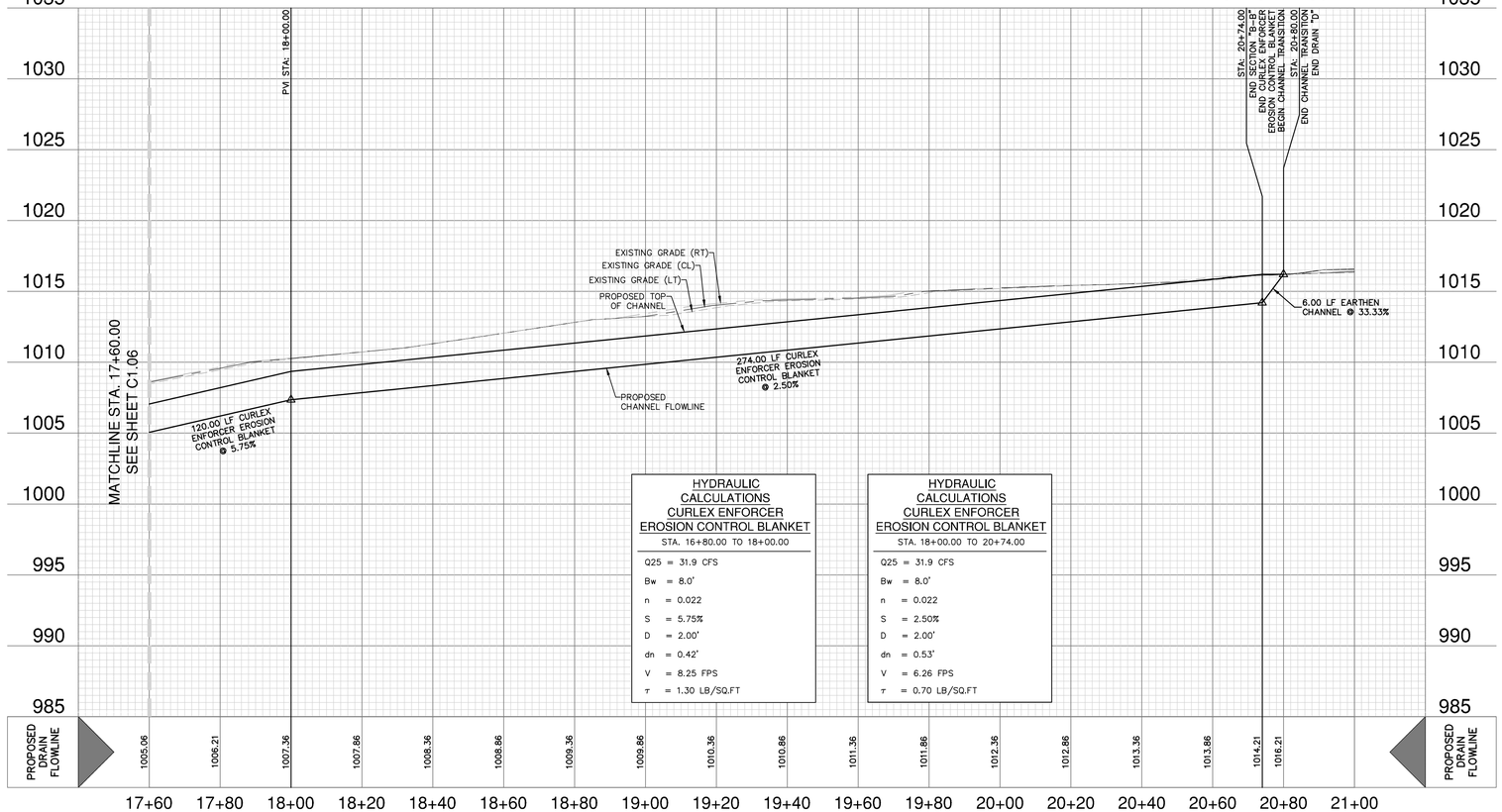


SECTION "B-B"
NOT-TO-SCALE
STA. 12+00.84 TO 20+74.00



DRAIN "D"
STA. 17+60.00 TO 20+80.00

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



HYDRAULIC CALCULATIONS
CURLEX ENFORCER
EROSION CONTROL BLANKET
STA. 16+80.00 TO 18+00.00

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.022
S	= 5.75%
D	= 2.00'
dn	= 0.42'
V	= 8.25 FPS
τ	= 1.30 LB/SQ.FT

HYDRAULIC CALCULATIONS
CURLEX ENFORCER
EROSION CONTROL BLANKET
STA. 18+00.00 TO 20+74.00

Q25	= 31.9 CFS
Bw	= 8.0'
n	= 0.022
S	= 2.50%
D	= 2.00'
dn	= 0.53'
V	= 6.26 FPS
τ	= 0.70 LB/SQ.FT

SCALE: 1" = 20'
0' 20' 40' 60'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

OPEN EARTHEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE & GRADING NOTES:

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
3. REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
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NO. REVISION | DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

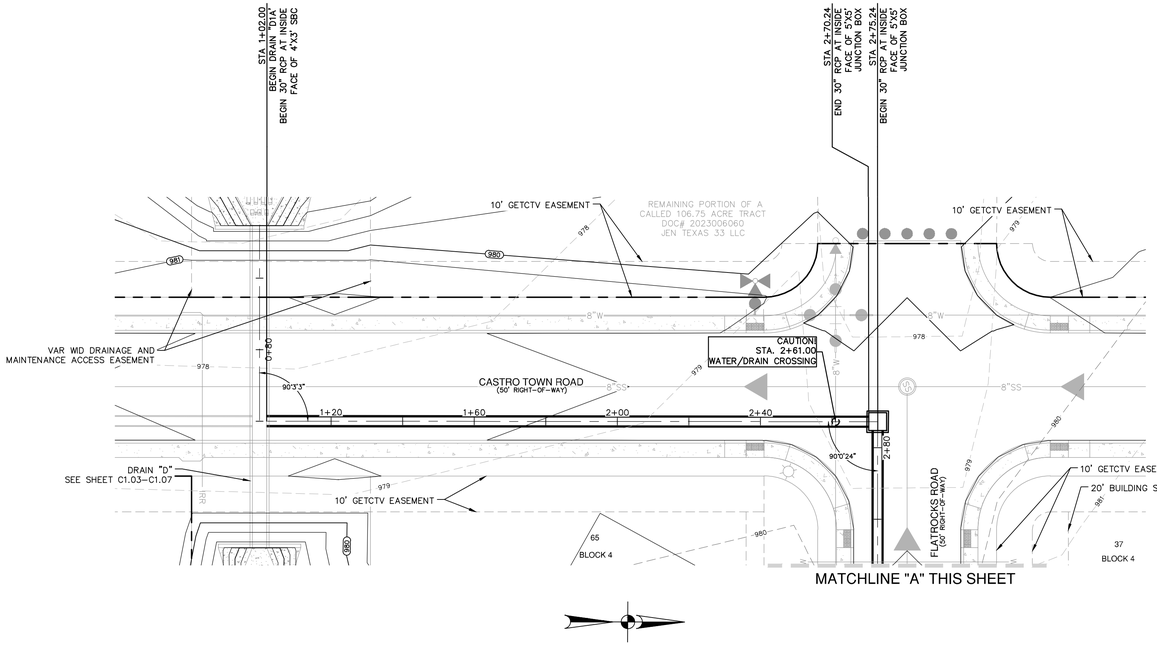
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

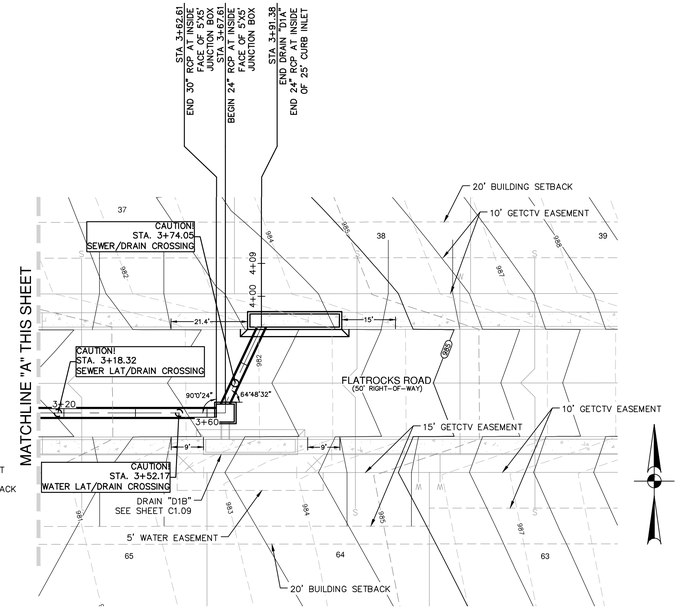
DRAIN "D" PLAN & PROFILE
STA. 17+60.00 TO 20+80.00

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.07

Date: Oct 28, 2025, 12:02pm User ID: clafner
File: P:\125\37\12\Design\Civil\DR-D 125712.dwg

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

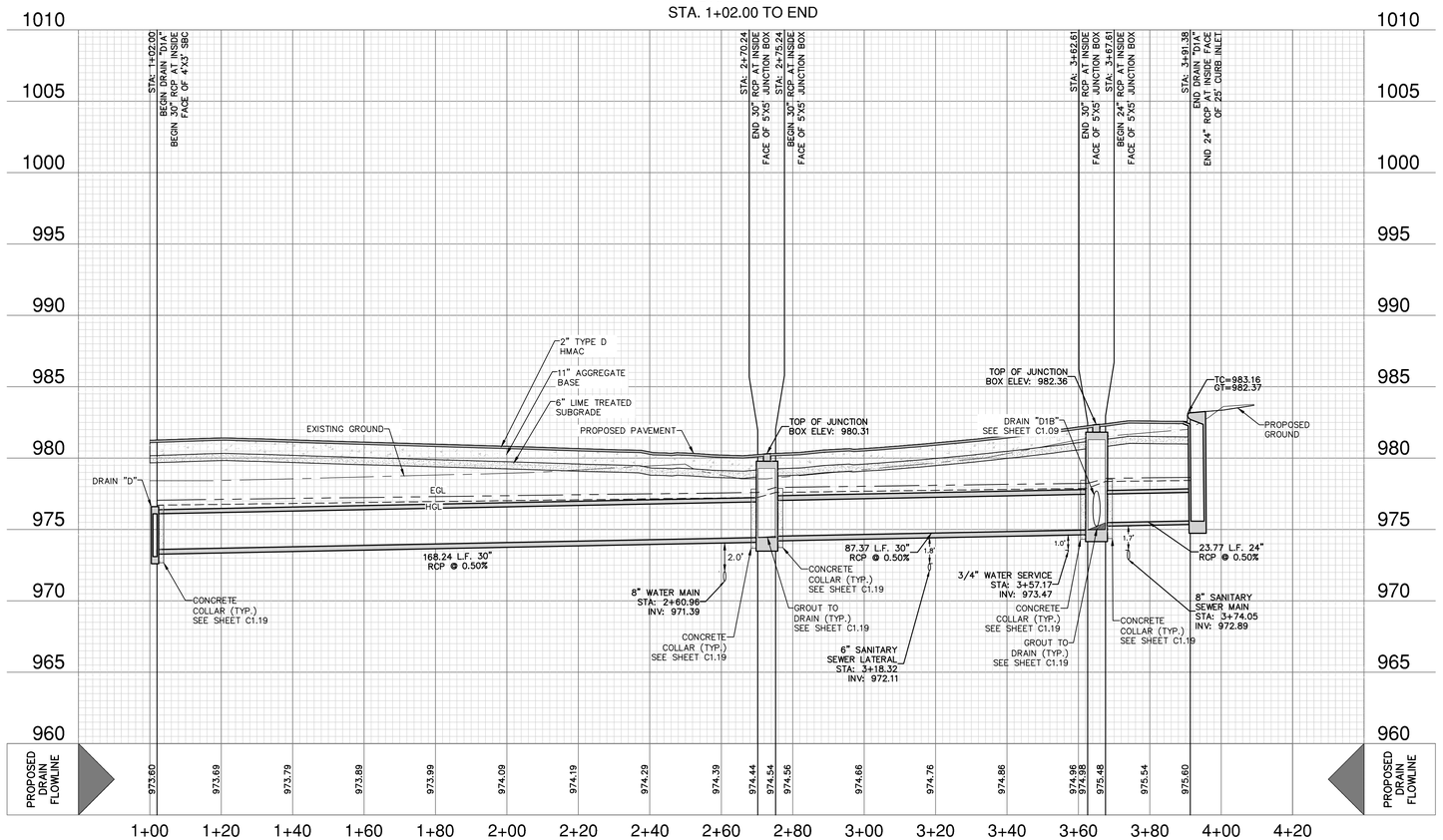
SCALE: 1"= 20'

0' 20' 40' 60'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

DRAIN "D1A"
STA. 1+02.00 TO END



HYDRAULIC CALCULATIONS 30" RCP
STA. 1+02.50 TO 2+70.25

Q25 = 23.32 CFS
Dn = 2.50'
Sf = 0.323%
S = 0.50%
V = 4.75 FPS
n = 0.013
D = 2.50'

HYDRAULIC CALCULATIONS 30" RCP
STA. 2+75.25 TO 3+62.61

Q25 = 23.32 CFS
Dn = 2.50'
Sf = 0.323%
S = 0.50%
V = 4.75 FPS
n = 0.013
D = 2.50'

HYDRAULIC CALCULATIONS 24" RCP
STA. 3+18.00 TO 4+90.13

Q25 = 11.66 CFS
Dn = 2.00'
Sf = 0.38
S = 0.50%
V = 3.71 FPS
n = 0.013
D = 2.00'

DRAINAGE & GRADING NOTES:

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CAUTION!!

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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

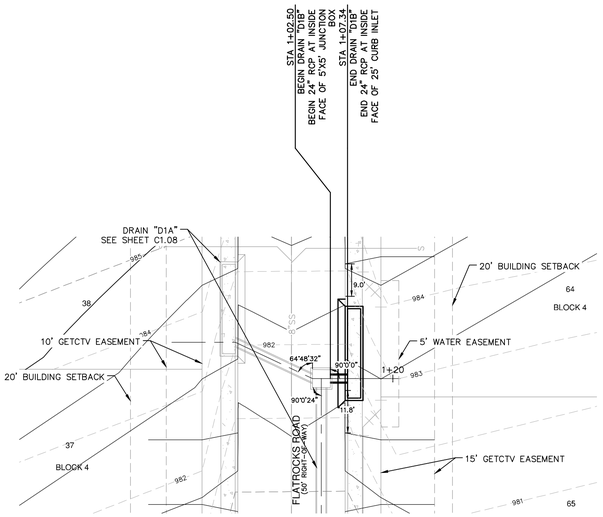
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

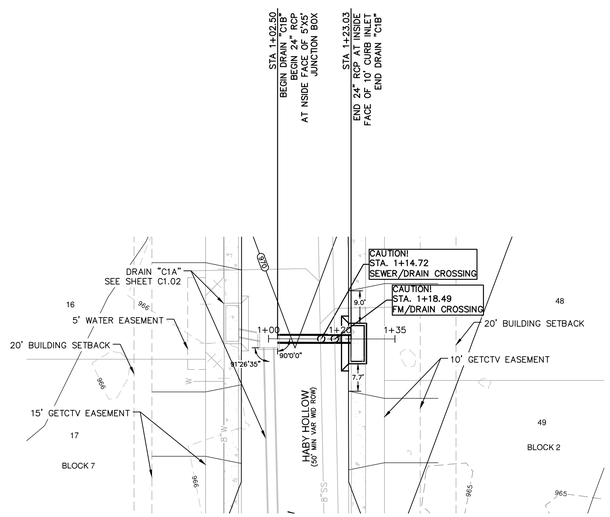
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

DRAIN "D1A" PLAN & PROFILE
STA 1+02.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.08

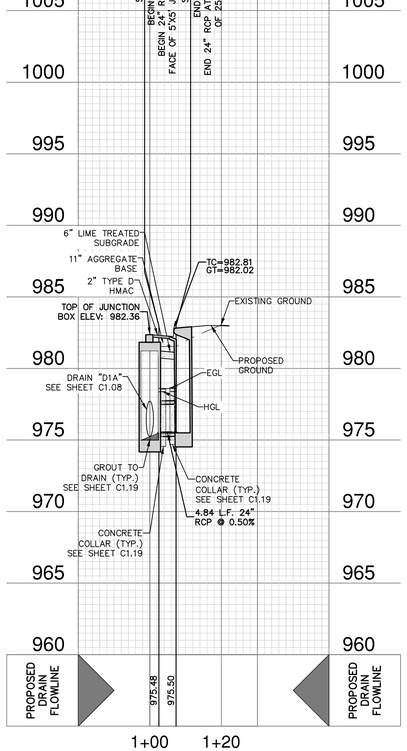
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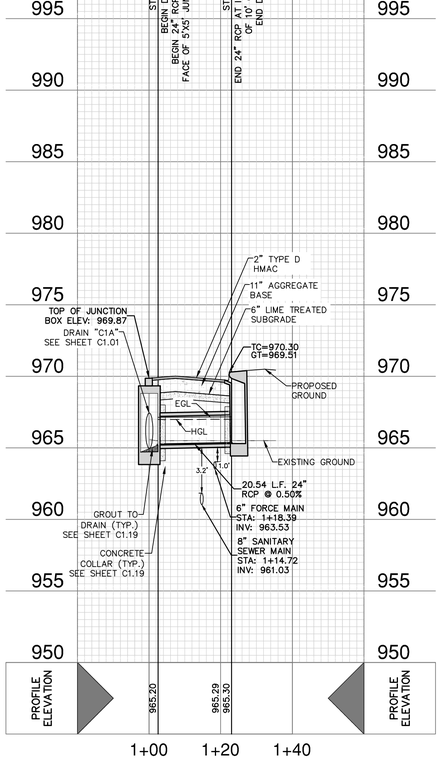


VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 20'

DRAIN "D1B"
STA. 1+02.50 TO END



DRAIN "C1B"
STA. 1+02.50 TO END



HYDRAULIC CALCULATIONS
24" RCP
STA. 1+02.50 TO 1+07.34

Q25	= 11.66 CFS
Dn	= 2.00'
Sf	= 0.266%
S	= 0.50%
V	= 3.71 FPS
n	= 0.013
D	= 2.00'

HYDRAULIC CALCULATIONS
24" RCP
STA. 1+02.50 TO 1+23.04

Q25	= 9.15 CFS
Dn	= 1.78'
Sf	= 0.154%
S	= 0.50%
V	= 3.21 FPS
n	= 0.013
D	= 2.00'

SCALE: 1"= 20'

0' 20' 40' 60'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR — 690
- PROPOSED CONTOUR — 690
- PROPOSED WATER — W
- PROPOSED SEWER — SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

DRAINAGE & GRADING NOTES:

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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

DRAIN "D1B" & "C1B" PLAN & PROFILE
DRAIN "C1B" PLAN & PROFILE STA 1+02.50 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.09

Date: Oct 28, 2025, 12:04pm User ID: cfaltner
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SCALE: 1"= 20'

0' 20' 40' 60'

DRAINAGE LEGEND

PROJECT LIMITS

EFFECTIVE FEMA 1% AC FLOODPLAIN

EXISTING CONTOUR 690

PROPOSED CONTOUR 690

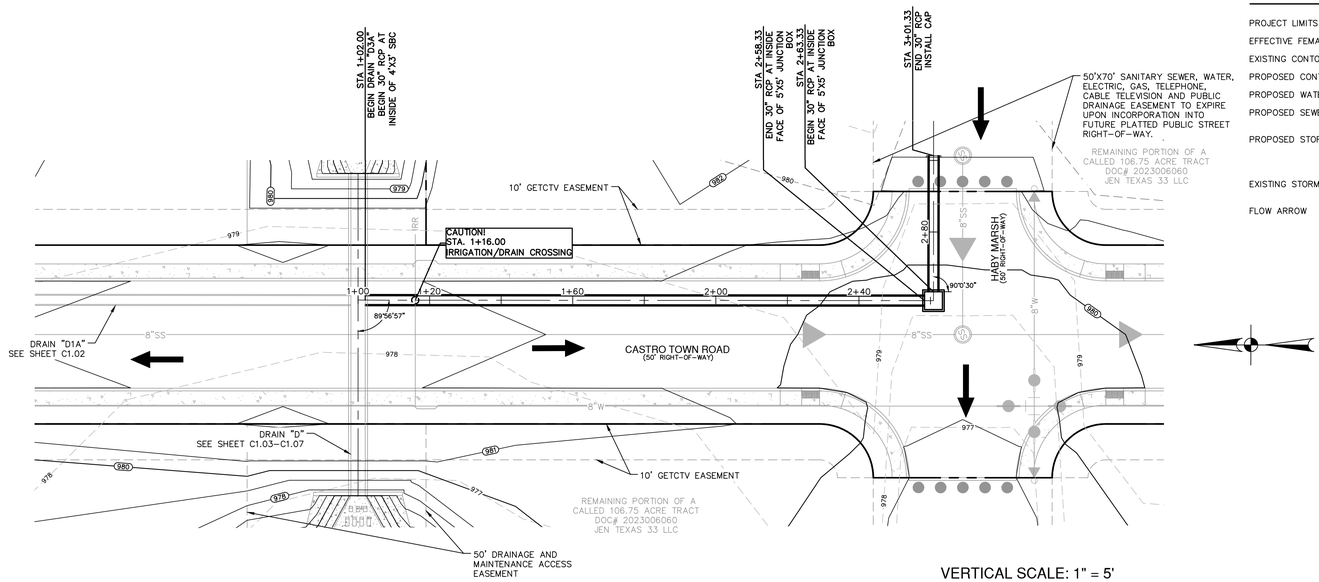
PROPOSED WATER W

PROPOSED SEWER SS

PROPOSED STORM DRAIN

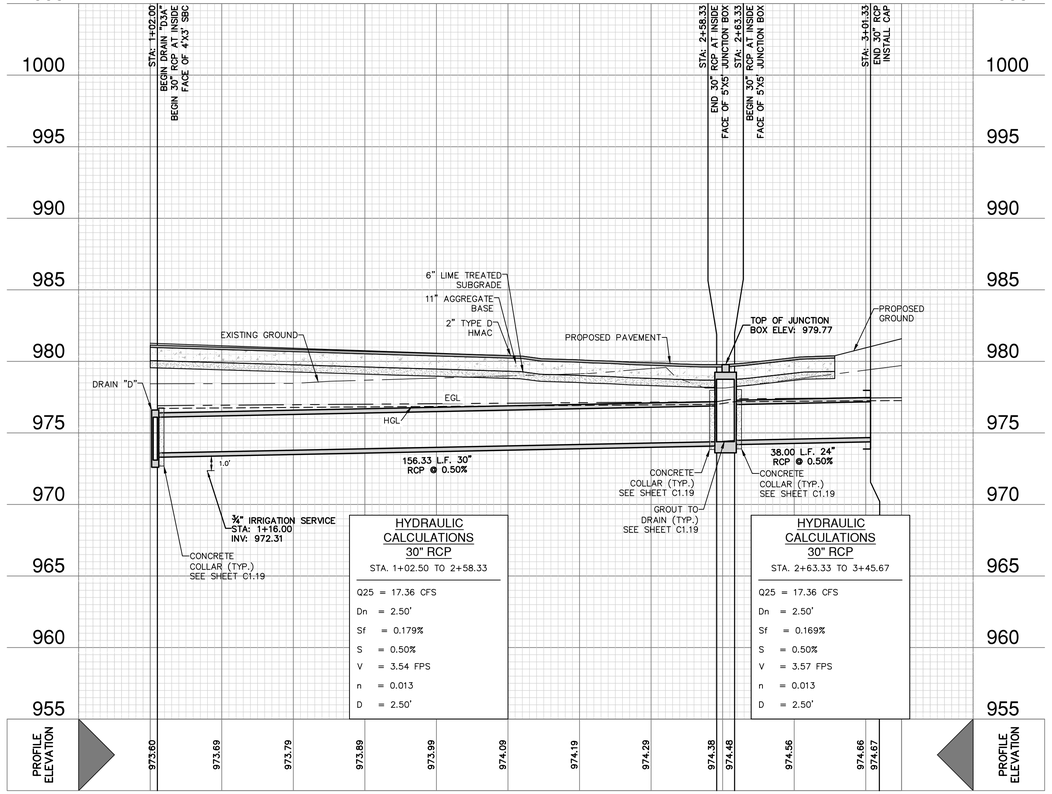
EXISTING STORM DRAIN

FLOW ARROW



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

DRAIN "D3A"
STA. 1+02.00 TO END



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STATE OF TEXAS
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127547
LICENSED
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Bruna Spengler
10/23/25

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2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
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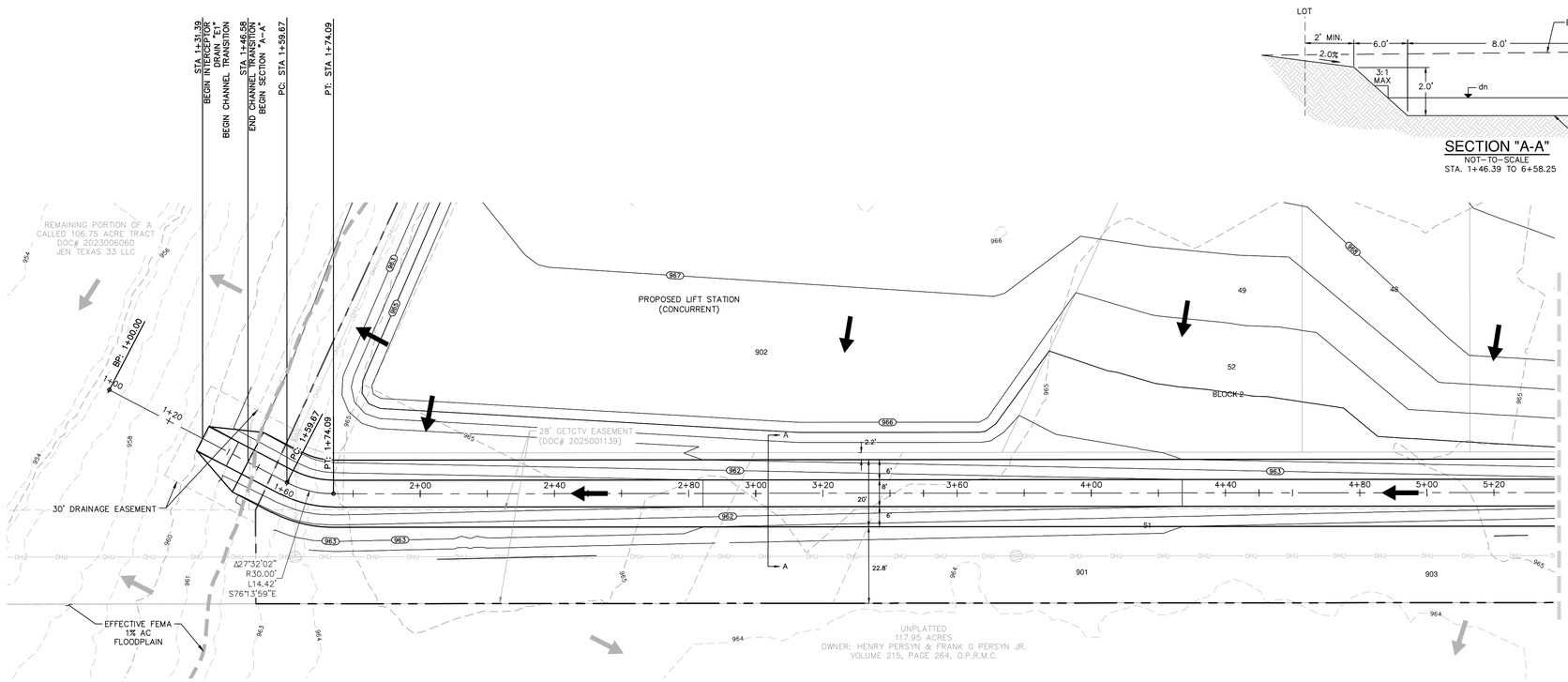
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

DRAIN "D3A" PLAN AND PROFILE
STA 1+02.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.10

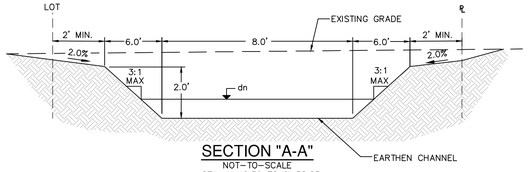
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INTERCEPTOR DRAIN "E1"
STA. 1+31.39 TO 5+40.00

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

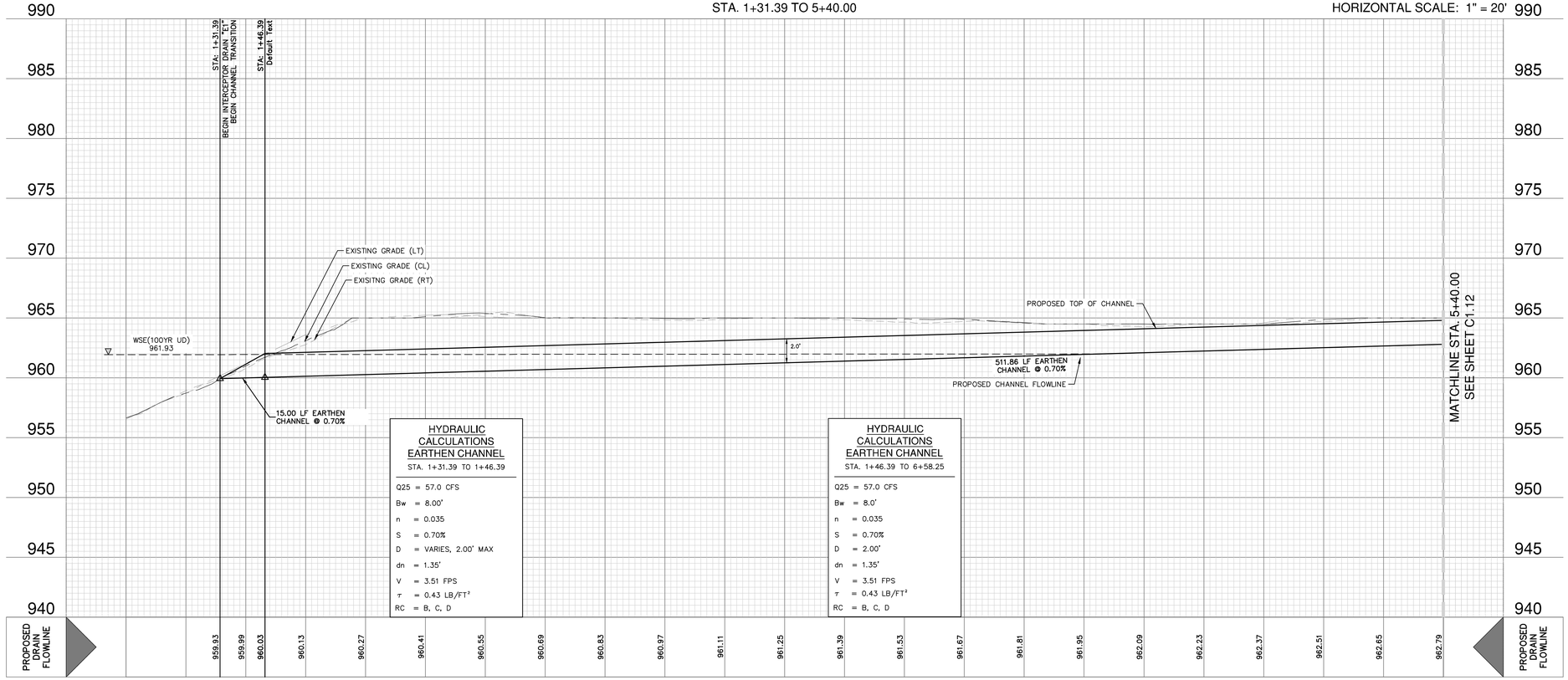


SECTION "A-A"
NOT-TO-SCALE
STA. 1+46.39 TO 6+58.25

SCALE: 1"= 20'
0' 20' 40' 60'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR — 690
- PROPOSED CONTOUR — 690
- PROPOSED WATER — W
- PROPOSED SEWER — SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW



HYDRAULIC CALCULATIONS EARTHEN CHANNEL
STA. 1+31.39 TO 1+46.39

Q25	= 57.0 CFS
Bw	= 8.00'
n	= 0.035
S	= 0.70%
D	= VARIES, 2.00' MAX
dn	= 1.35'
V	= 3.51 FPS
τ	= 0.43 LB/FT^2
RC	= B, C, D

HYDRAULIC CALCULATIONS EARTHEN CHANNEL
STA. 1+46.39 TO 6+58.25

Q25	= 57.0 CFS
Bw	= 8.0'
n	= 0.035
S	= 0.70%
D	= 2.00'
dn	= 1.35'
V	= 3.51 FPS
τ	= 0.43 LB/FT^2
RC	= B, C, D

OPEN EARTHEN CHANNEL NOTE:
CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE & GRADING NOTES:
1. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
3. REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
4. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
5. EARTHEN CHANNELS WILL BE VEGETATED BY SEEDING OR SODDING. 85% OF THE CHANNEL SURFACE MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.
6. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH OF "D" AS SHOWN IN THE PROFILE.

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 ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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!!
CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

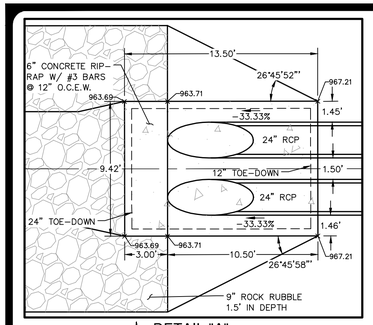
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

INTERCEPTOR DRAIN "E1" PLAN & PROFILE
STA. 1+31.39 TO 5+40.00

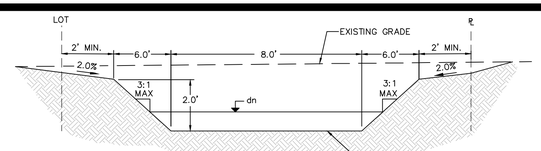
PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.11

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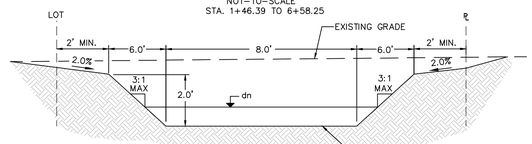
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DETAIL "A"
SCALE: 1" = 5'



SECTION "A-A"
NOT-TO-SCALE
STA. 1+46.39 TO 6+58.25

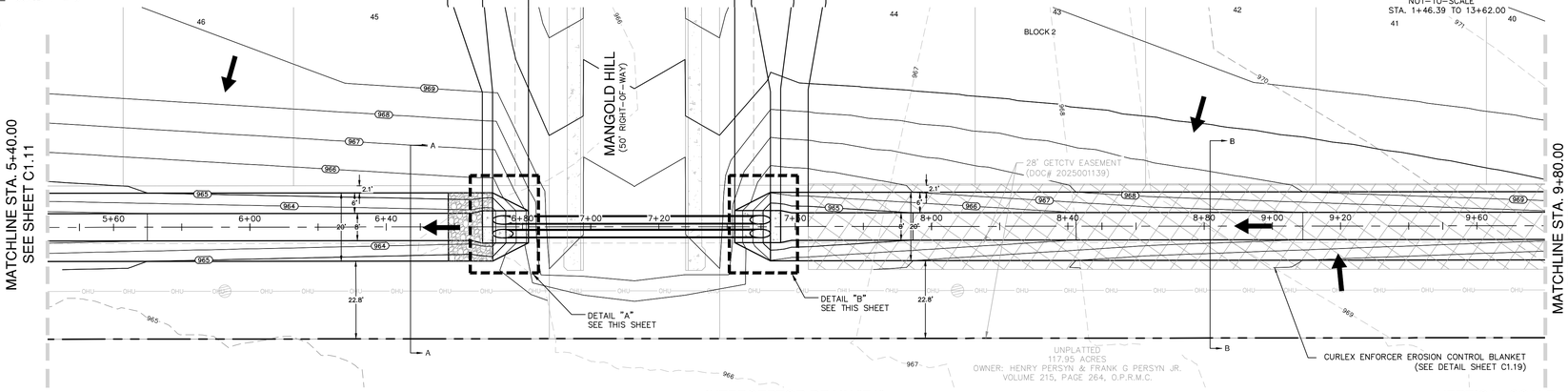


SECTION "B-B"
NOT-TO-SCALE
STA. 1+46.39 TO 13+62.00

SCALE: 1"= 20'
0' 20' 40' 60'

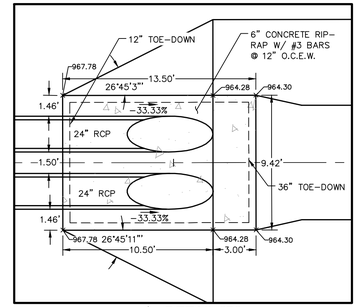
DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR — 690
- PROPOSED CONTOUR — 690
- PROPOSED WATER — W
- PROPOSED SEWER — SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

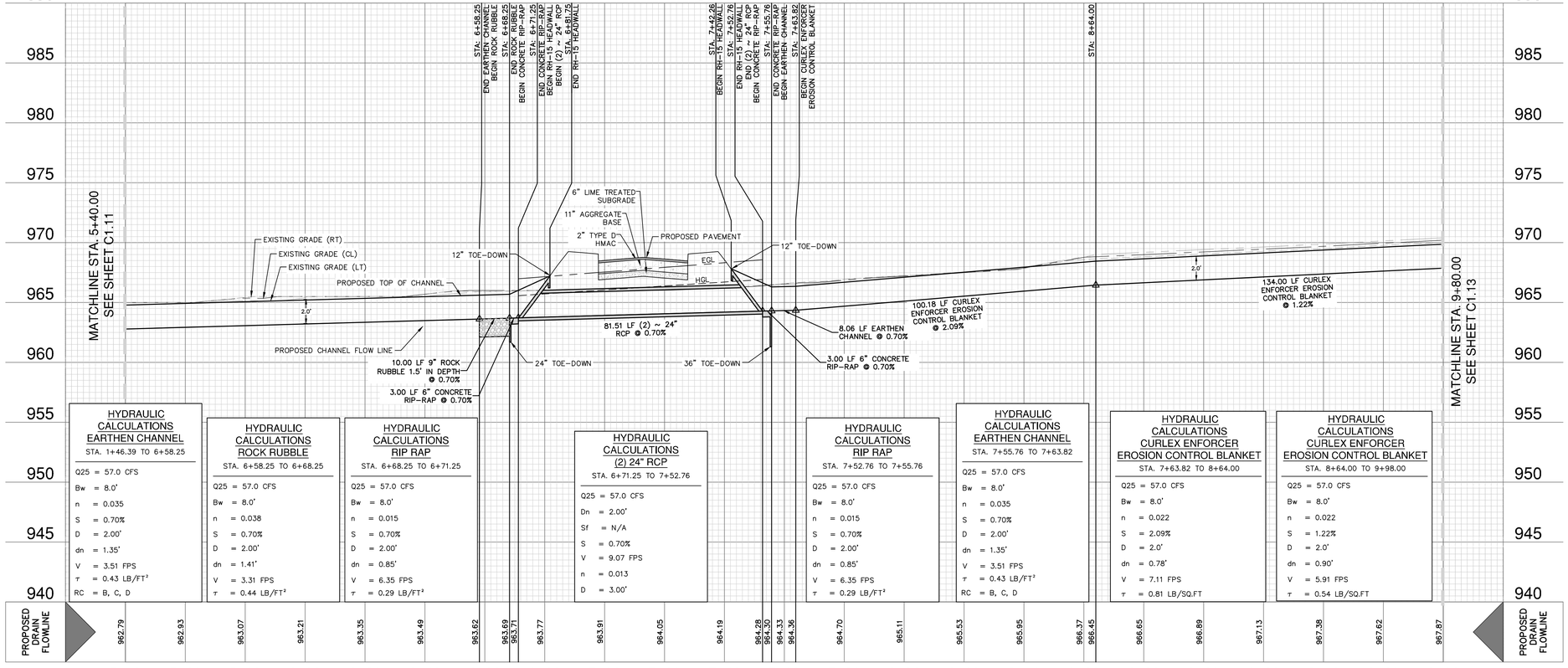


INTERCEPTOR DRAIN "E1"
STA. TO 5+40.00 TO 9+80.00

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



DETAIL "B"
SCALE: 1" = 5'



HYDRAULIC CALCULATIONS EARTHEN CHANNEL
STA. 1+46.39 TO 6+58.25

Q25 = 57.0 CFS
Bw = 8.0'
n = 0.035
S = 0.70%
D = 2.00'
dn = 1.35'
V = 3.51 FPS
τ = 0.43 LB/FT²
RC = B, C, D

HYDRAULIC CALCULATIONS ROCK RUBBLE
STA. 6+58.25 TO 6+68.25

Q25 = 57.0 CFS
Bw = 8.0'
n = 0.038
S = 0.70%
D = 2.00'
dn = 1.41'
V = 3.31 FPS
τ = 0.44 LB/FT²

HYDRAULIC CALCULATIONS RIP RAP
STA. 6+68.25 TO 6+71.25

Q25 = 57.0 CFS
Bw = 8.0'
n = 0.015
S = 0.70%
D = 2.00'
dn = 0.85'
V = 6.35 FPS
τ = 0.29 LB/FT²

HYDRAULIC CALCULATIONS (2) 24" RCP
STA. 6+71.25 TO 7+52.76

Q25 = 57.0 CFS
Dn = 2.00'
Sf = N/A
S = 0.70%
V = 9.07 FPS
n = 0.013
D = 3.00'

HYDRAULIC CALCULATIONS RIP RAP
STA. 7+52.76 TO 7+55.76

Q25 = 57.0 CFS
Bw = 8.0'
n = 0.015
S = 0.70%
D = 2.00'
dn = 0.85'
V = 6.35 FPS
τ = 0.29 LB/FT²

HYDRAULIC CALCULATIONS EARTHEN CHANNEL
STA. 7+55.76 TO 7+63.82

Q25 = 57.0 CFS
Bw = 8.0'
n = 0.035
S = 0.70%
D = 2.00'
dn = 1.35'
V = 3.51 FPS
τ = 0.43 LB/FT²
RC = B, C, D

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET
STA. 7+63.82 TO 8+64.00

Q25 = 57.0 CFS
Bw = 8.0'
n = 0.022
S = 2.09%
D = 2.0'
dn = 0.78'
V = 7.11 FPS
τ = 0.81 LB/SQ.FT

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET
STA. 8+64.00 TO 9+98.00

Q25 = 57.0 CFS
Bw = 8.0'
n = 0.022
S = 1.22%
D = 2.0'
dn = 0.90'
V = 5.91 FPS
τ = 0.54 LB/SQ.FT

OPEN EARTHEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE & GRADING NOTES:

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3. REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
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CAUTION!!

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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

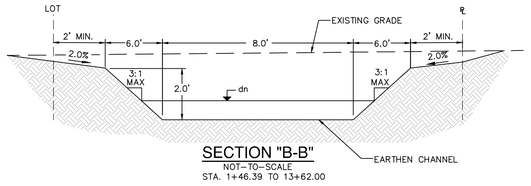
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

INTERCEPTOR DRAIN "E1" PLAN & PROFILE
STA. 5+40.00 TO 9+80.00

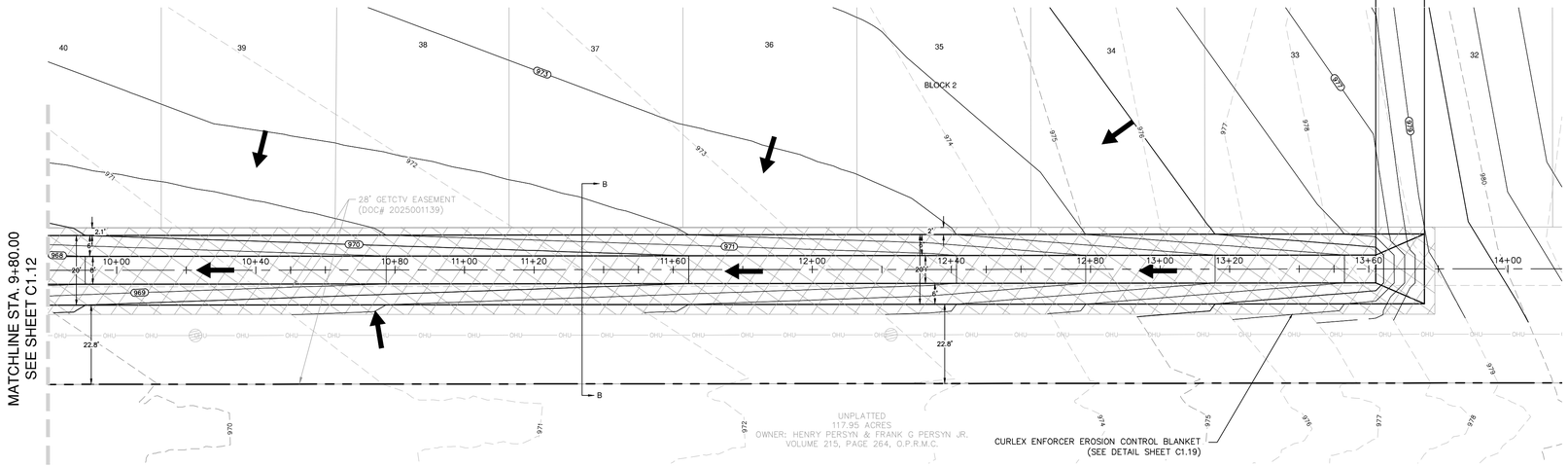
PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.12

Date: Oct 28, 2025, 12:06pm User ID: cdaher
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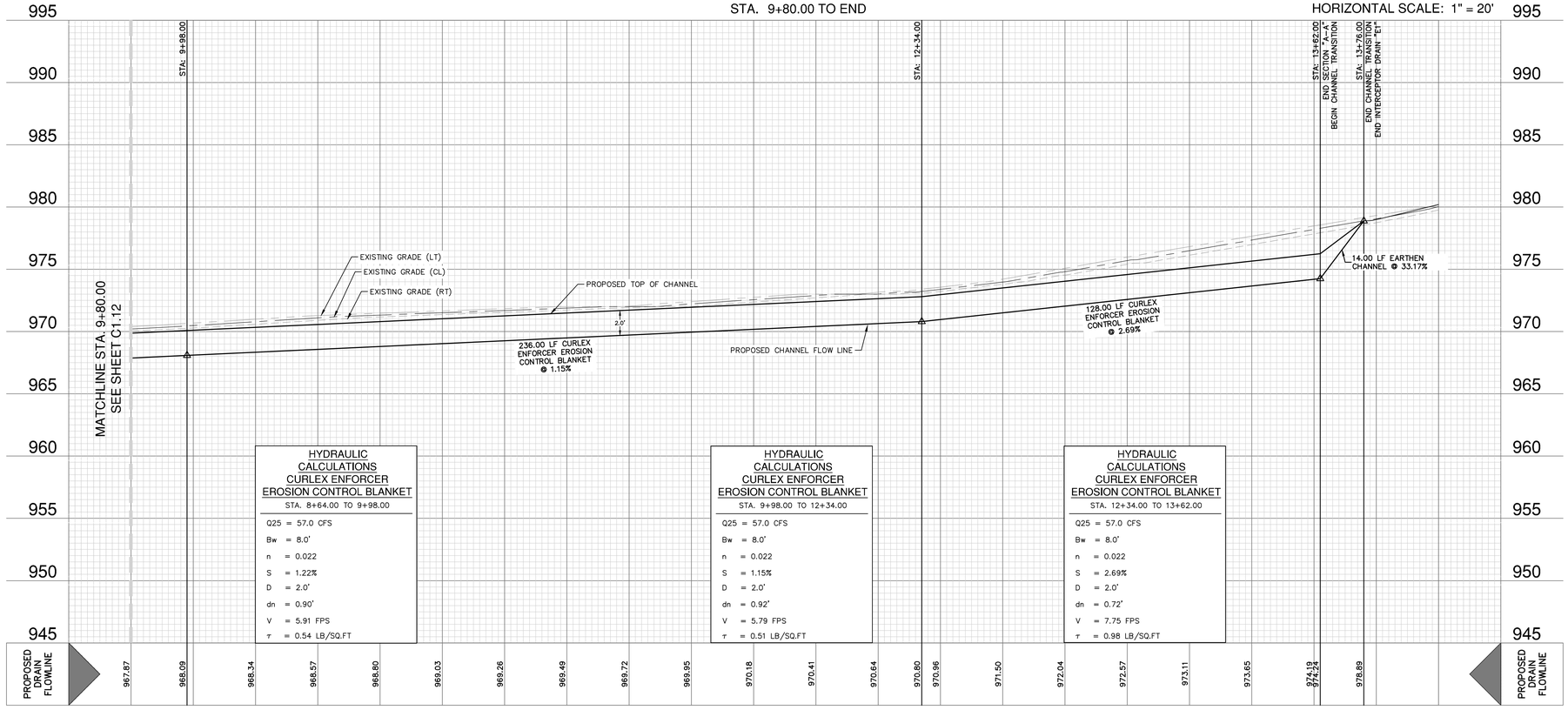


SECTION "B-B"
NOT-TO-SCALE
STA. 1+46.39 TO 13+62.00



INTERCEPTOR DRAIN "E1"
STA. 9+80.00 TO END

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



HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET STA. 8+64.00 TO 9+98.00	
Q25	= 57.0 CFS
Bw	= 8.0'
n	= 0.022
S	= 1.22%
D	= 2.0'
dn	= 0.90'
V	= 5.91 FPS
τ	= 0.54 LB/SQ.FT

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET STA. 9+98.00 TO 12+34.00	
Q25	= 57.0 CFS
Bw	= 8.0'
n	= 0.022
S	= 1.15%
D	= 2.0'
dn	= 0.92'
V	= 5.79 FPS
τ	= 0.51 LB/SQ.FT

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET STA. 12+34.00 TO 13+62.00	
Q25	= 57.0 CFS
Bw	= 8.0'
n	= 0.022
S	= 2.69%
D	= 2.0'
dn	= 0.72'
V	= 7.75 FPS
τ	= 0.98 LB/SQ.FT



DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

OPEN EARTHEN CHANNEL NOTE:

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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

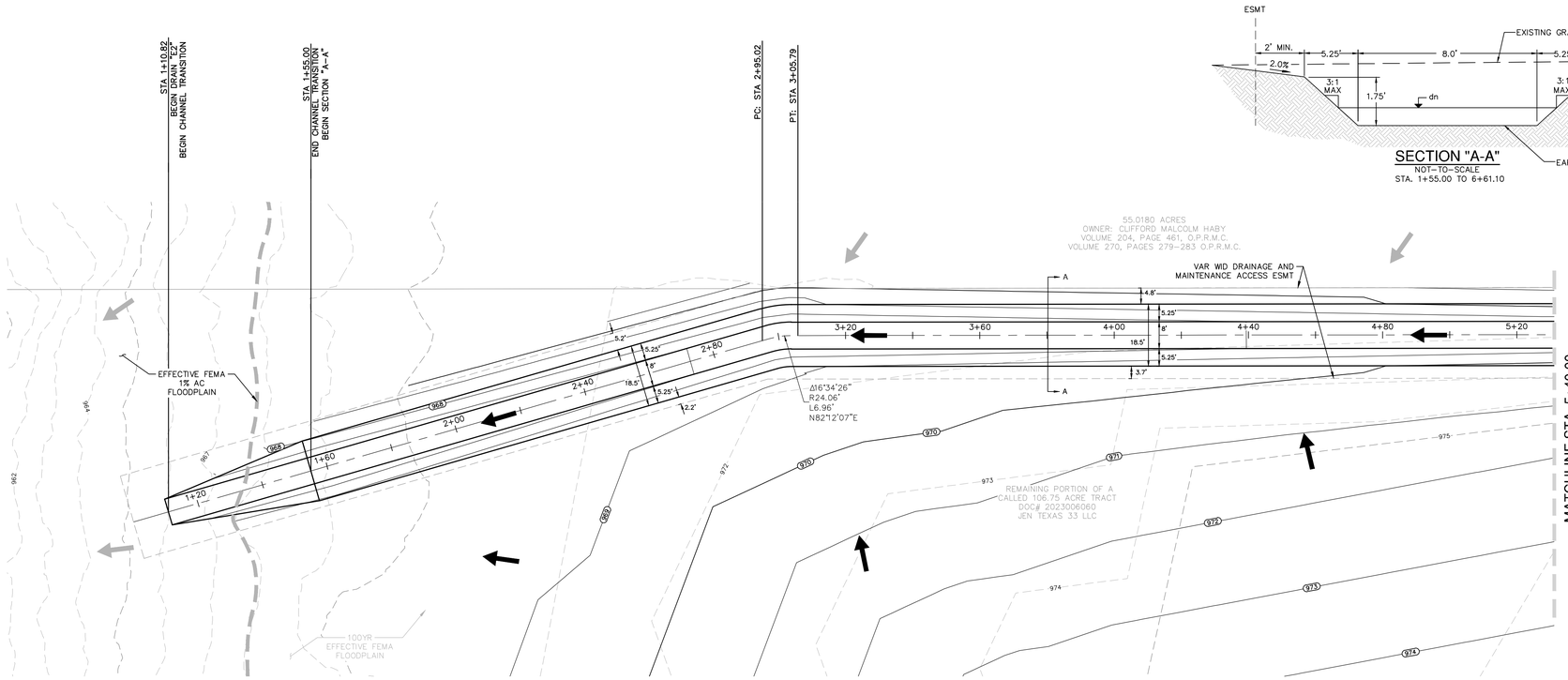
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

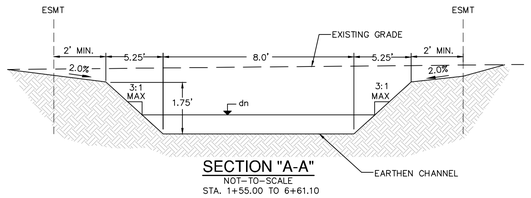
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

INTERCEPTOR DRAIN "E1" PLAN & PROFILE
STA. 9+80.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.13

Date: Oct 28, 2025, 12:06pm User ID: clafner
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SECTION "A-A"
NOT-TO-SCALE
STA. 1+55.00 TO 6+61.10

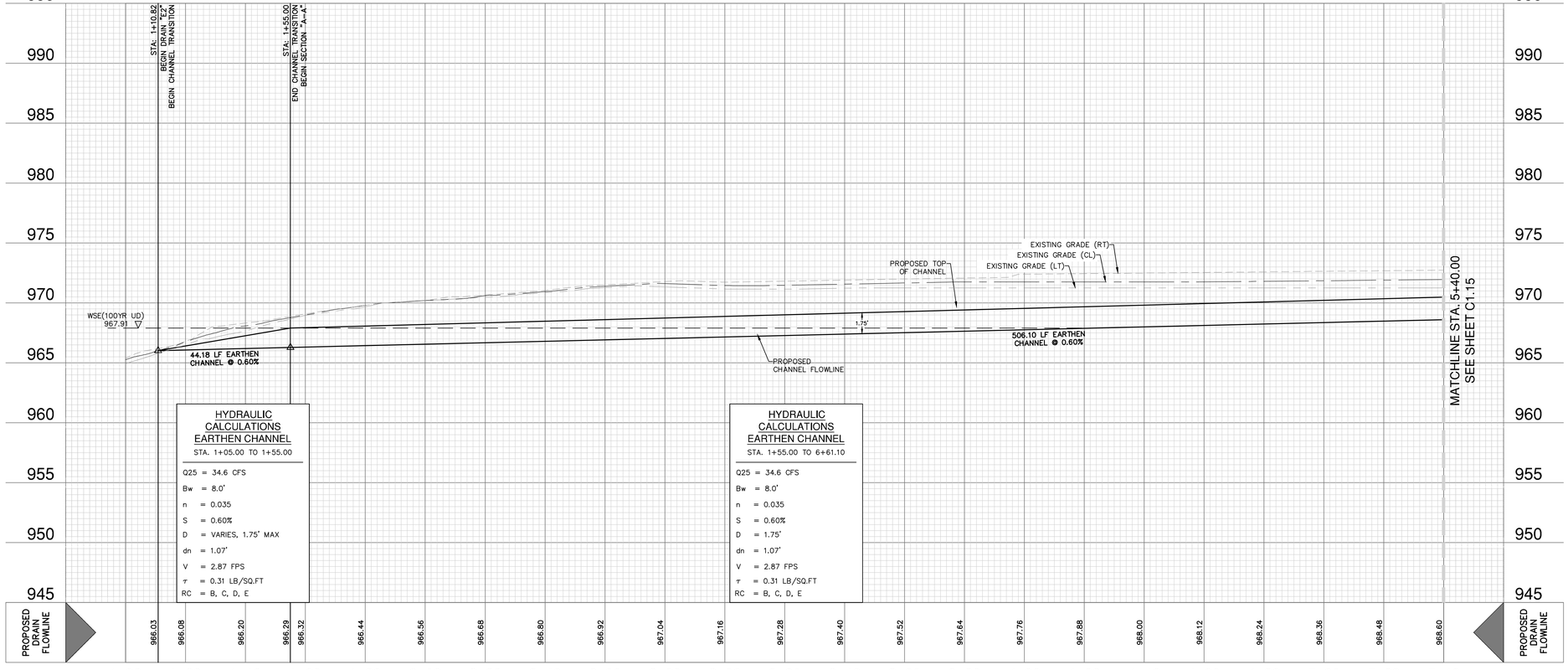
SCALE: 1" = 20'
0' 20' 40' 60'

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

INTERCEPTOR DRAIN "E2"
STA. 1+13.35 TO 5+40.00

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



OPEN EARTHEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE & GRADING NOTES:

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2. ALL CONCRETE FOR TXDOT DRAINAGE STRUCTURES SHALL MEET TXDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
3. REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
4. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

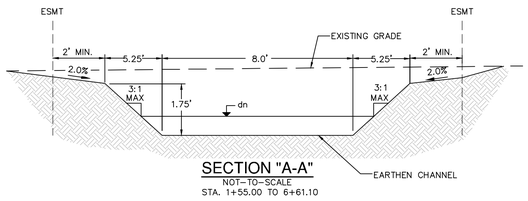
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

INTERCEPTOR DRAIN "E2" PLAN & PROFILE
STA. 1+13.35 TO 5+40.00

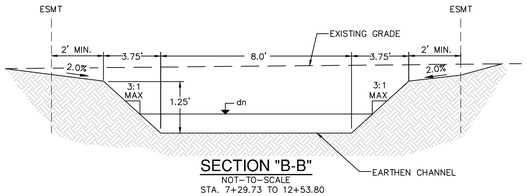
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JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.14

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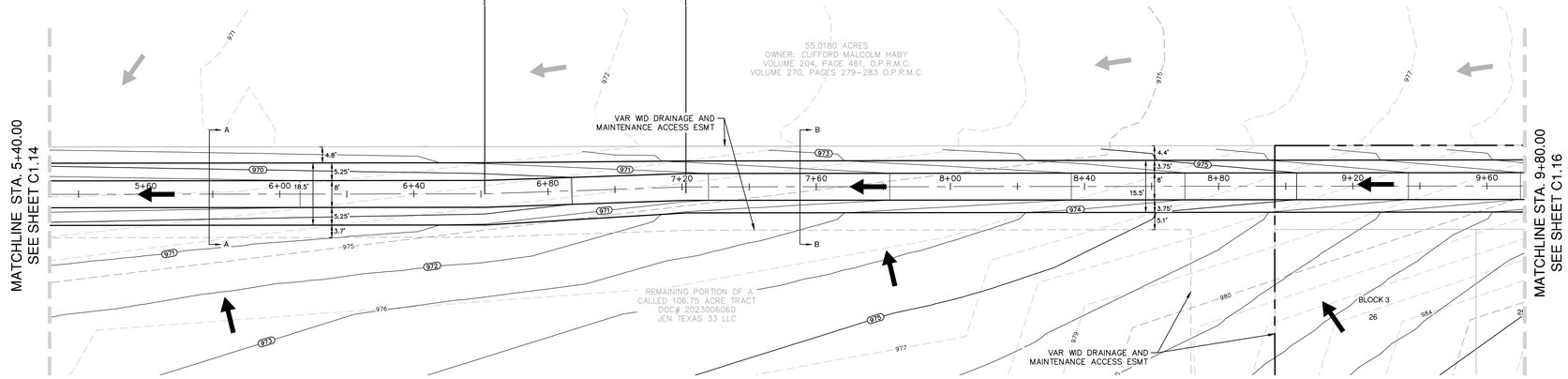
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SECTION "A-A"
NOT-TO-SCALE
STA. 1+55.00 TO 6+61.10

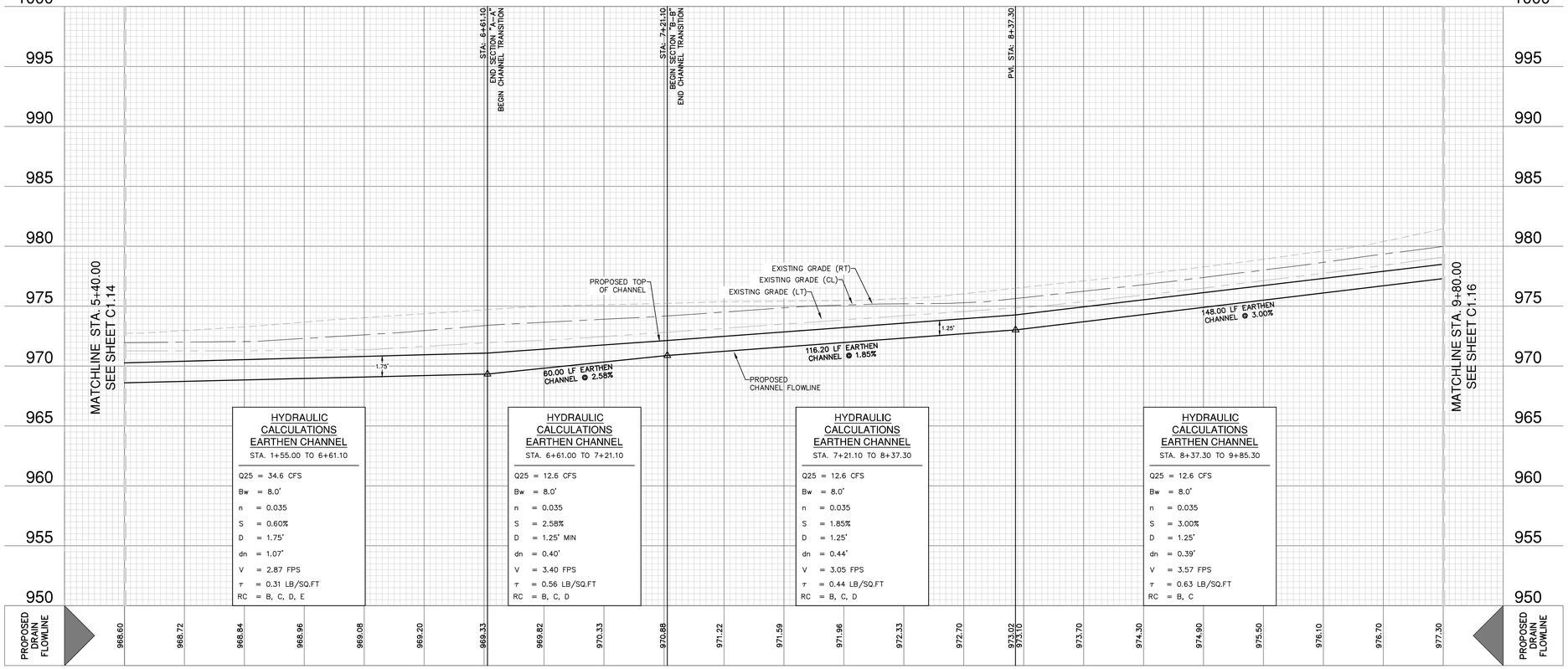


SECTION "B-B"
NOT-TO-SCALE
STA. 7+29.73 TO 12+53.80



INTERCEPTOR DRAIN "E2"
STA. TO 5+40.00 TO 9+80.00

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



HYDRAULIC CALCULATIONS EARTHEN CHANNEL STA. 1+55.00 TO 6+61.10	
Q25	= 34.6 CFS
Bw	= 8.0'
n	= 0.035
S	= 0.60%
D	= 1.75'
dn	= 1.07'
V	= 2.87 FPS
τ	= 0.31 LB/SQ.FT
RC	= B, C, D, E

HYDRAULIC CALCULATIONS EARTHEN CHANNEL STA. 6+61.00 TO 7+21.10	
Q25	= 12.6 CFS
Bw	= 8.0'
n	= 0.035
S	= 2.58%
D	= 1.25' MIN
dn	= 0.40'
V	= 3.40 FPS
τ	= 0.56 LB/SQ.FT
RC	= B, C, D

HYDRAULIC CALCULATIONS EARTHEN CHANNEL STA. 7+21.10 TO 8+37.30	
Q25	= 12.6 CFS
Bw	= 8.0'
n	= 0.035
S	= 1.85%
D	= 1.25'
dn	= 0.44'
V	= 3.05 FPS
τ	= 0.44 LB/SQ.FT
RC	= B, C, D

HYDRAULIC CALCULATIONS EARTHEN CHANNEL STA. 8+37.30 TO 9+85.30	
Q25	= 12.6 CFS
Bw	= 8.0'
n	= 0.035
S	= 3.00%
D	= 1.25'
dn	= 0.39'
V	= 3.57 FPS
τ	= 0.63 LB/SQ.FT
RC	= B, C

DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR (690)
- PROPOSED CONTOUR (690)
- PROPOSED WATER (W)
- PROPOSED SEWER (SS)
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

OPEN EARTHEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.20 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

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127547
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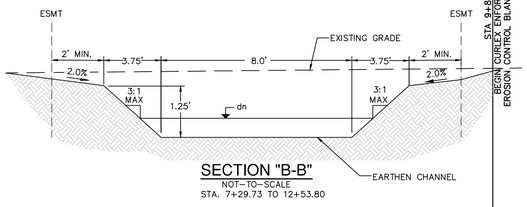
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MANGOLD UNIT-2
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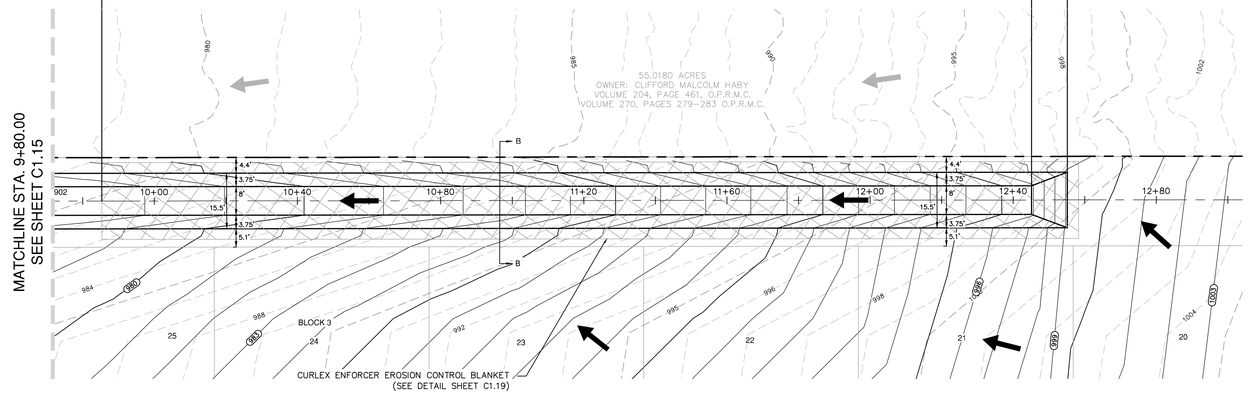
INTERCEPTOR DRAIN "E2" PLAN & PROFILE
STA. 5+40.00 TO 9+80.00

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.15

Date: Oct 28, 2025, 12:08pm User ID: cfaster
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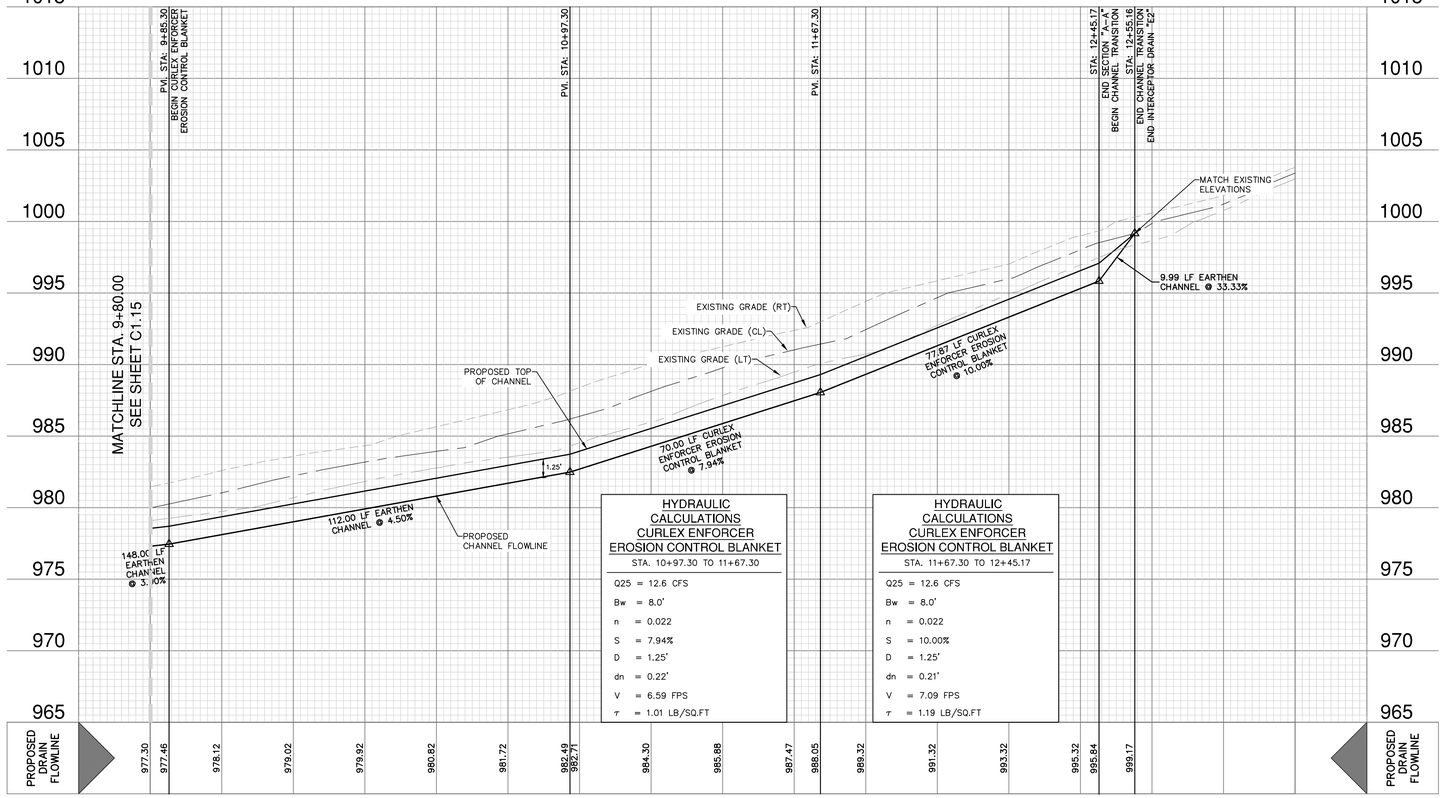


SECTION "B-B"
NOT-TO-SCALE
STA. 7+29.73 TO 12+53.80



INTERCEPTOR DRAIN "E2"
STA. 9+80.00 TO END

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



HYDRAULIC CALCULATIONS EARTHEN CHANNEL STA. 8+37.30 TO 9+85.30	
Q25	= 12.6 CFS
Bw	= 8.0'
n	= 0.035
S	= 3.00%
D	= 1.25'
dn	= 0.39'
V	= 3.57 FPS
τ	= 0.63 LB/SQ.FT
RC	= B, C

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET STA. 9+85.30 TO 10+97.30	
Q25	= 12.6 CFS
Bw	= 8.0'
n	= 0.022
S	= 4.50%
D	= 1.25'
dn	= 0.34'
V	= 4.07 FPS
τ	= 0.85 LB/SQ.FT

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET STA. 10+97.30 TO 11+67.30	
Q25	= 12.6 CFS
Bw	= 8.0'
n	= 0.022
S	= 7.94%
D	= 1.25'
dn	= 0.22'
V	= 6.59 FPS
τ	= 1.01 LB/SQ.FT

HYDRAULIC CALCULATIONS CURLEX ENFORCER EROSION CONTROL BLANKET STA. 11+67.30 TO 12+45.17	
Q25	= 12.6 CFS
Bw	= 8.0'
n	= 0.022
S	= 10.00%
D	= 1.25'
dn	= 0.21'
V	= 7.09 FPS
τ	= 1.19 LB/SQ.FT



DRAINAGE LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR 690
- PROPOSED CONTOUR 690
- PROPOSED WATER W
- PROPOSED SEWER SS
- PROPOSED STORM DRAIN
- EXISTING STORM DRAIN
- FLOW ARROW

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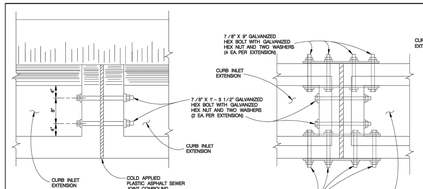
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

INTERCEPTOR DRAIN "E2" PLAN & PROFILE
STA. 9+80.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.16

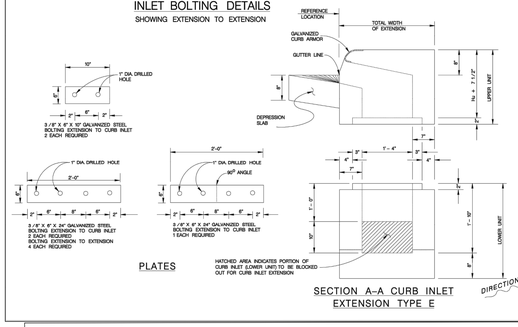
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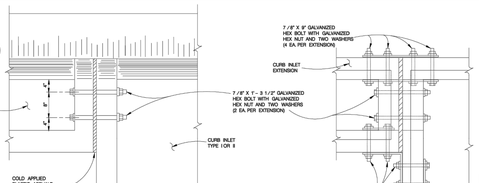
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INLET BOLTING DETAILS

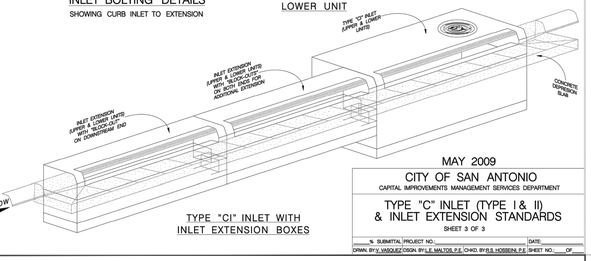
SHOWING EXTENSION TO EXTENSION





INLET BOLTING DETAILS

SHOWING CURB INLET TO EXTENSION



TYPE "CI" INLET WITH INLET EXTENSION BOXES

UPPER UNIT EXTENSION (FOR Hu = 11")					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	15' - 2"	41
B	3	#4	—	14' - 2"	38
C	3	#4	11"	13' - 2"	26
D	3	#4	6"	10' - 10"	22
E	8	#4	11"	1 1/2 - 2"	6
F	21	#6	6"	2' - 1"	63
G	22	#6	6"	3' - 4"	110
H	4	#4	—	10' - 10"	29
J	12	#4	12"	2' - 6"	28
L	4	#4	—	2' - 0"	5
M	3	#4	—	14' - 8"	29
REINFORCING STEEL				LBS.	397
CLASS "A" CONCRETE				C.Y.	1.0

LOWER UNIT EXTENSION					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	12	#4	12"	6' - 2"	49
B	11	#4	12"	2' - 2"	16
B_1	3	#4	12"	2' - 2"	4
E_1	18	#4	18" ±	2' - 3"	27
E_2	4	#4	18" ±	2' - 1"	6
F_1	16	#4	12" ±	10' - 10"	116
F_2	5	#4	—	10' - 10"	36
REINFORCING STEEL				LBS.	254
CLASS. "A" CONCRETE				C.Y.	1.4

GENERAL NOTES

1. WHEN INLET EXTENSIONS ARE REQUIRED FOR ON GRADE INLETS THE EXTENSION(S) SHALL BE PLACED ON THE UPSTREAM END OF THE INLET.
2. FOR CURB INLET EXTENSION REINFORCING STEEL, NOTES & VARIOUS OTHER APPLICABLE DETAILS NOT FOUND ON THIS SHEET, REFER TO SHEETS 1 & 2.

MAY 2009

CITY OF SAN ANTONIO

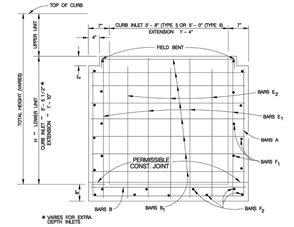
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

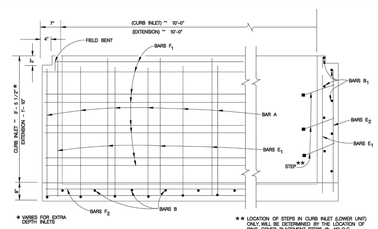
TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

SHEET 3 OF 3

% SUBMITTAL	PROJECT NO.:	DATE:

DRAWN BY: V. VASQUEZ DESIGN BY: L.E. MALTOS, P.E. CHKD. BY: B.S. HOSSEINI, P.E. SHEET NO.: OF





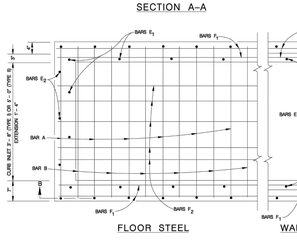
REINFORCING STEEL

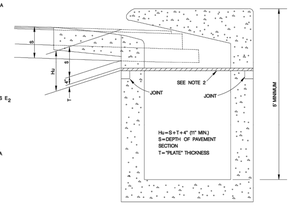
LOWER UNIT 10' X 3'- 8" (TYPE I)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	12	#4	12"	VARIES	
B	11	#4	12"	4'-6"	
B_1	VARIES	#4	12"	4'-6"	
E_1	20	#4	18" ±	VARIES	
E_2	6	#4	18" ±	VARIES	
F_1	VARIES	#4	12" ±	10'-10"	
F_2	5	#4	—	10'-10"	

LOWER UNIT 10' X 5'- 0" (TYPE II)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
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	8	#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 (IL-C).
2. TYPE C-9 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 403 "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 3' BEYOND THE OUTER SHELL OF THE PIPE, TAKING INTO ACCOUNT THE SKEW OF THE PIPE AS NECESSARY. CONSTRUCTION JOINT MAY BE INSIED A MAXIMUM OF 6".

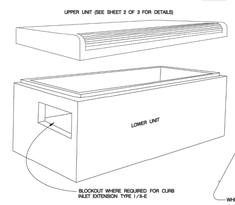


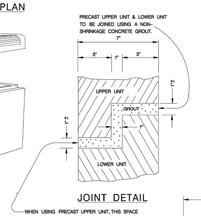


PHASE CONSTRUCTION

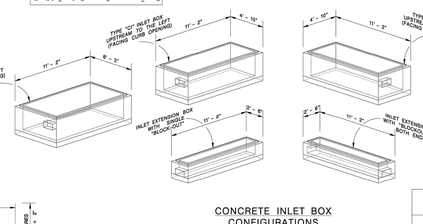
NOTES FOR PHASE CONSTRUCTION (WHEN DIRECTED BY THE ENGINEER):

1. THE CURB INLET AND EXTENSION SHALL BE CONSTRUCTED TO A DEPTH 1%" 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, BUT PRIOR TO THE FINAL HMAC OVERLAY, SAW CUT THE PAVEMENT, REMOVE THE PLATE AND COMPLETE THE UPPER PORTION OF THE CURB INLET AND /OR EXTENSION.









MAY 2009

CITY OF SAN ANTONIO

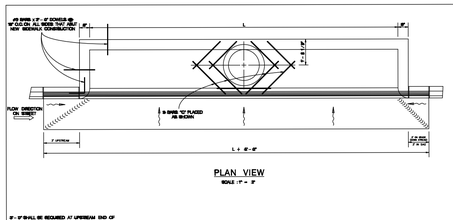
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

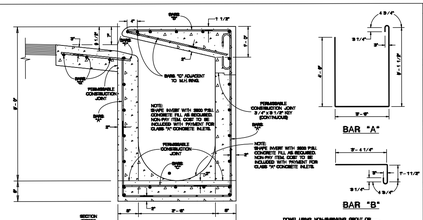
TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

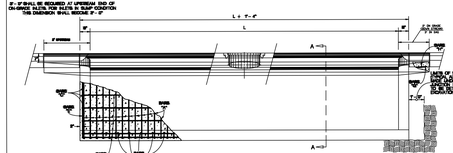
SHEET 1 OF 3

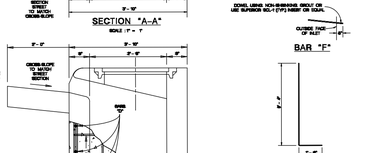
% SUBMITTAL	PROJECT NO.:	DATE:

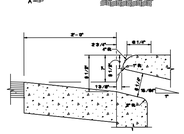
DRAWN BY: V. VASQUEZ DESIGN BY: L.E. MALTOS, P.E. CHKD. BY: B.S. HOSSEINI, P.E. SHEET NO.: OF

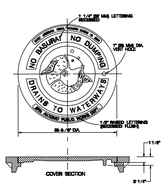






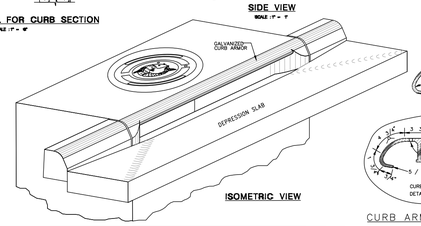


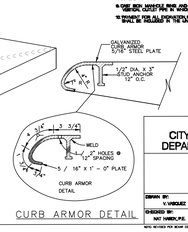




NOTES FOR MANHOLE LID AND RING

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 H 5-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.





JANUARY 2005

STANDARD PLANS

CITY OF SAN ANTONIO, TEXAS

DEPARTMENT OF PUBLIC WORKS

TYPE "C" INLET DETAILS

DRAWN BY:	DATE	REVISIONS	SCALE:	SEE ABOVE
V. VASQUEZ			DATE:	
CHECKED BY:			SHEET:	OF
NAT HARDY, P.E.				

NOTE: REVISED PER BEXAR COUNTY COMMENTS

REINFORCING STEEL (FOR Hu=11")

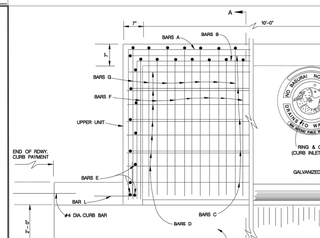
UPPER UNIT 10' X 3'-8" (TYPE I)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	15'-10"	53
B	3	#4	—	14'-10"	38
C	5	#4	11"	13'-2"	44
D	7	#4	6"	10'-10"	51
E	12	#4	11"	1'-2"	9
F	21	#6	6"	4'-8"	147
G	22	#6	6"	5'-8"	187
H	4	#4	—	10'-10"	29
J	12	#4	12"	3'-6"	28
L	4	#4	—	2'-0"	5
M	3	#4	—	14'-8"	29
TOTAL WEIGHT					620 LBS.

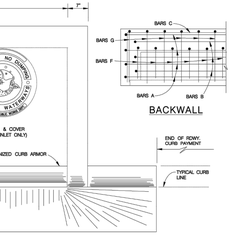
UPPER UNIT 10' X 5' (TYPE II)					
BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	15'-10"	60
B	3	#4	—	21'-8"	43
C	7	#4	11"	13'-2"	62
D	11	#4	6"	10'-10"	91
E	16	#4	11"	1'-2"	13
F	21	#6	6"	6'-8"	179
G	22	#6	6"	7'-8"	221
H	4	#4	—	10'-10"	29
J	12	#4	12"	3'-6"	28
L	4	#4	—	2'-0"	5
M	3	#4	—	14'-8"	29
TOTAL WEIGHT					759 LBS.

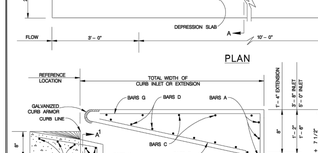
CLASS "A" CONCRETE QUANTITIES (FOR Hu = 11")

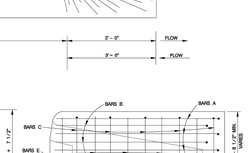
DEPRESSION SLAB	C.Y.
10' INLET	0.7
10' EXTENSION	0.7

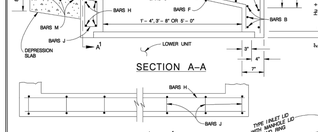
UPPER UNIT (ONLY)	C.Y.
10' X 3'-8" CURB INLET	1.9
10' X 5'-0" CURB INLET	2.7
10' EXTENSION	1.0

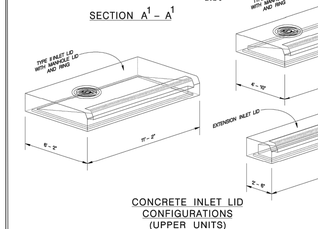


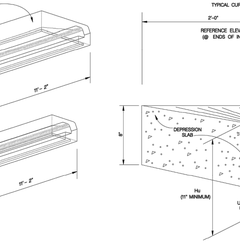


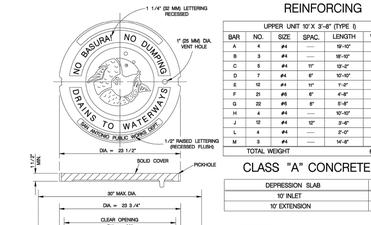








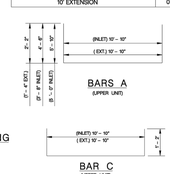


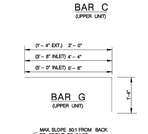


NOTES FOR MANHOLE LID AND RING

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2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.

SEE SHEET 1 OF 3 FOR GENERAL NOTES.





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:

DRAWN BY: V. VASQUEZ DESIGN BY: L.E. MALTOS, P.E. CHKD. BY: B.S. HOSSEINI, P.E. SHEET NO.: OF

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

PAPE-DAWSON ENGINEERS

2000 NW LOOP 410 | SAN ANTONIO, TX. 78213 | 210.375.9000

TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #100288-00

MANGOLD UNIT-2

SAN ANTONIO, TEXAS

DRAINAGE DETAILS

PLAT NO. 25-11800082

JOB NO. 12537-12

DATE APRIL 2025

DESIGNER JS

CHECKED CB DRAWN BR

SHEET C1.17

Date: Apr 10, 2025, 9:58am User ID: jsamora
File: P:\125\37\12\Design\Civil\DR-D1 1253712.dwg

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TABLE OF DIMENSIONS AND REINFORCING STEEL
(Wings for one structure end)

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

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DATE ISSUED:

TABLE OF WINGWALL REINFORCING (2-wings)

Bar	Size	No.	Spa
D1	#6	–	1'-0"
D2	#6	–	1'-0"
E1	#4	–	1'-0"
E2	#4	–	1'-0"
G	#6	–	8"
M1	#4	4	–
P	#4	–	1'-0"
V	#4	–	1'-0"

TABLE OF TOEWALL REINFORCING

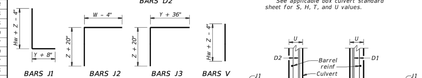
Bar	Size	No.	Spa
J3	#4	–	1'-0"
E2	#4	–	1'-0"



BARS D1



BARS D2



BARS J1 BARS J2 BARS J3 BARS V

WING DIMENSION FORMULAS:
(All values are in feet.)

Hw = H + T + C
Lw = (Hw) (SL) + cosine (B) for Type PW-1
= (Hw - T) (SL) + cosine (B) for Type PW-2 and Hw ≥ 4'
= (Hw - 0.5') (SL) + cosine (B) for Type PW-2 and Hw < 4'

For cast-in-place culverts:
Ltw = (1/4) (S) + (N + 1) (U)) + cosine (B)

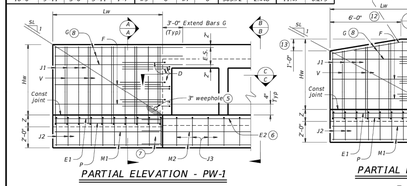
For precast culverts:
Ltw = ((N) (2 U + S) + (N - 1) (0.5)) + cosine (B)
Total Wingwall Area (two wings – SY)
= (2)(Hw)(Lw) for Type PW-1
= (2)(Hw)(Lw) - 6 SF for Type PW-2 and Hw ≥ 4'
= (2)(Hw)(Lw) - 1.5 SF for Type PW-2 and Hw < 4'

Hw = Height of wingwall
Lw = Length of wingwall
Ltw = Culvert toewall length
N = Number of culvert spans
SL:1 = Channel slope ratio, (horizontal: 1 vertical, usual value is 2:1)
θ = Culvert skew

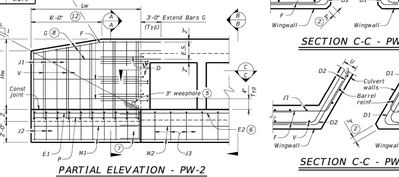
See applicable box culvert standard sheet for S, H, T, and U values.

1) Skew = 0°
2) At discharge end, chamfer may be ¾" minimum.
3) For 15° skew – 1"
For 30° skew – 2"
For 45° skew – 3"
4) Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
5) Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
6) Extend Bars E2 1'-6" minimum into the wingwall footing.
7) Lap Bars M1 1'-6" minimum with Bars M2.
8) Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
9) 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 Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
10) 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.

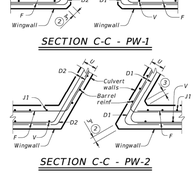
Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11) 1'-0" typical, 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
12) 3'-0" for Hw < 4'.
13) 6" for Hw < 4'.



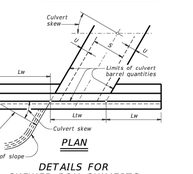
PARTIAL ELEVATION - PW-1



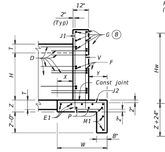
PARTIAL ELEVATION - PW-2



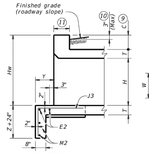
SECTION C-C - PW-1



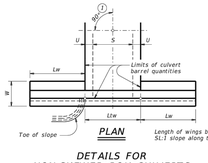
SECTION C-C - PW-2



SECTION A-A
(Showing wing reinforcement.)



SECTION B-B
(Showing wing reinforcement.)



PLAN
DETAILS FOR NON-SKEWED BOX CULVERTS

PLAN
DETAILS FOR SKEWED BOX CULVERTS
(Showing 30° skew.)

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

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.

GENERAL NOTES:
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.
Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

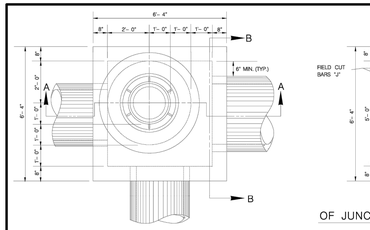
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing dimensions are out-to-out of bars.

Texas Department of Transportation — Bridge Division Standard

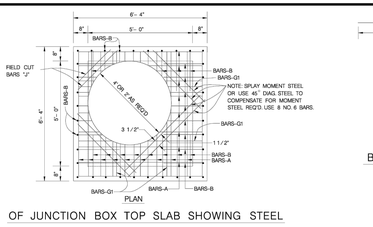
CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

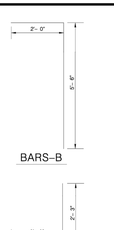
File: CD-PW-20.dgn	DN: CAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.



PLAN



PLAN
OF JUNCTION BOX TOP SLAB SHOWING STEEL



BARS-B
BARS-C

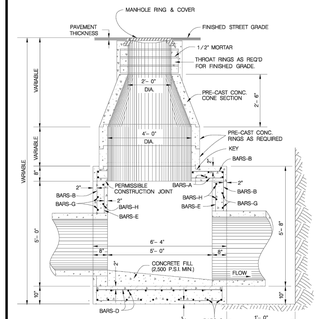
SCHEDULE FOR REINFORCING STEEL

SHAPE	BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
STRAIGHT	A	18	4	9" O.C.	6'- 1"	73
⌐	B	36	5	8" O.C.	7'- 6"	282
L	C	36	5	8" O.C.	4'- 9"	160
STRAIGHT	D	18	4	9" O.C.	6'- 1"	73
STRAIGHT	E	20	3	12" O.C.	4'- 11"	37
STRAIGHT	G	20	4	12" O.C.	6'- 1"	81
STRAIGHT	ℓ_4	8	4	AS SHOWN	6'- 1"	33
STRAIGHT	H	24	3	12" O.C.	5'- 5"	49
STRAIGHT	J	8	6	3 12" O.C.	4'- 11"	59
					TOTAL	847 lbs.

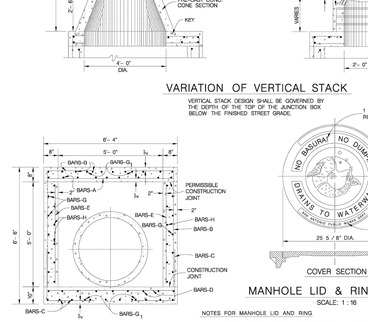
CLASS "A" CONCRETE – 5.03 CU. YDS.
(DOES NOT EXCLUDE MANHOLE OPENINGS OR PIPE OPENING)

★ NOTE: BAR SIZE AND SPACING BASED ON SPANS AS SHOWN – ANY REVISIONS TO THESE SPANS SHALL INCLUDE A RE-DESIGN ON STEEL REQD.

1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A" 3,000 P.S.I. AT 28 DAYS.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
3. REINFORCING STEEL SHALL BE NEW BILLET STEEL, INTERMEDIATE GRADE, ASTM A-15. THE DEFORMATION SHALL CONFORM TO ASTM A-305.
4. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD-CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
7. INVERT OF JUNCTION BOX TO BE SHAPED WITH CONCRETE FILL (2,500 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE. COST SUBSIDIARY TO CLASS "A" CONCRETE (JUNCTION BOXES).
8. PAYMENT FOR ALL EXCAVATION, BACKFILLING, CONCRETE, REINFORCING STEEL, VERTICAL STACK, RING AND COVER SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 – "STORM SEWER JUNCTION BOXES AND INLETS".



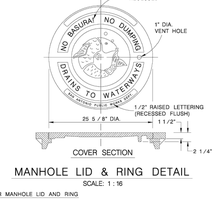
SECTION A–A



SECTION B–B

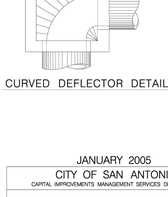
VARIATION OF VERTICAL STACK

VERTICAL STACK DESIGN SHALL BE GOVERNED BY THE DEPTH OF THE TOP OF THE JUNCTION BOX BELOW THE FINISHED STREET GRADE.



MANHOLE LID & RING DETAIL
SCALE: 1 : 16

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 LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.

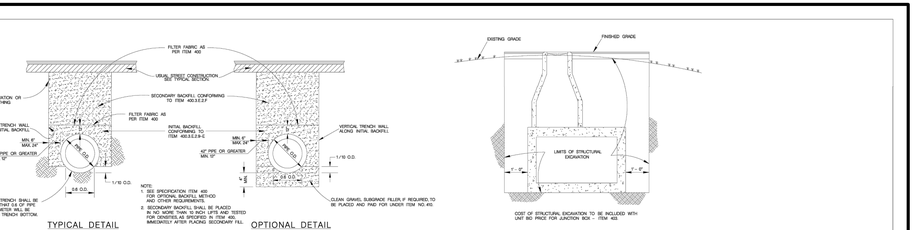


CURVED DEFLECTOR DETAIL

JANUARY 2005
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

5'x5'x5' JUNCTION BOX STANDARDS

% SUBMITTAL	PROJECT NO.	DATE
DRWN. BY	DSGN. BY	CHKD. BY	SHEET NO.	OF

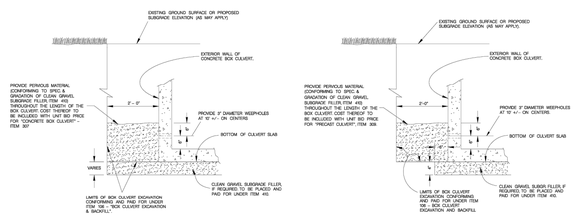


TYPICAL DETAIL OPTIONAL DETAIL

PIPE BEDDING & BACKFILL DETAILS

COST OF STRUCTURAL EXCAVATION TO BE INCLUDED WITH UNIT BID PRICE FOR JUNCTION BOX – ITEM 403.

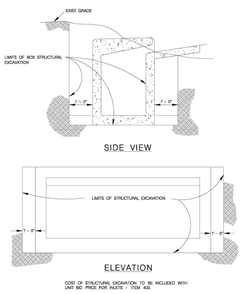
STRUCTURAL EXCAVATION AT JUNCTION BOXES
NO SCALE



CAST-IN-PLACE BOX CULVERT

PRECAST BOX CULVERT

CONCRETE BOX CULVERT



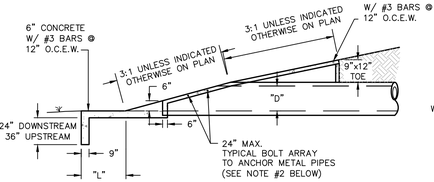
COST OF STRUCTURAL EXCAVATION TO BE INCLUDED WITH UNIT BID PRICE FOR INLETS – ITEM 432.

STRUCTURAL EXCAVATIONS AT DRAINAGE INLETS
NO SCALE

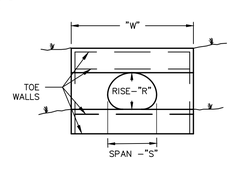
MAY 2009
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

PIPE BEDDING & MISCELLANEOUS DRAINAGE DETAILS

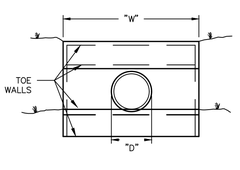
% SUBMITTAL	PROJECT NO.	DATE
DRWN. BY	DSGN. BY	CHKD. BY	SHEET NO.	OF



LONGITUDINAL SECTION FOR CIRCULAR & ARCH PIPES
NOT–TO–SCALE



SINGLE C.M.P. ARCH PIPE CULVERT
NOT–TO–SCALE

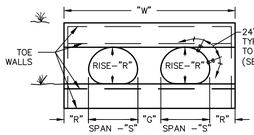


SINGLE CIRCULAR PIPE CULVERT
(CMP OR RCP)
NOT–TO–SCALE

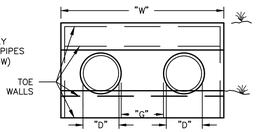
DIMENSIONS FOR CIRCULAR (CMP AND RCP) PIPE CULVERT

"D" INSIDE DIA. OF PIPE	"L"	"G"		SINGLE	DOUBLE	TRIPLE	QUADRUPLE
		CGM	RCP	"W"			
18"	2'–0"	1'–2"	0'–9"	4'–6"	7'–2"	9'–10"	12'–6"
21"	2'–6"	1'–3"	0'–10"	5'–3"	8'–4"	11'–4"	13'–4"
24"	3'–0"	1'–5"	0'–11"	6'–0"	9'–5"	12'–10"	16'–3"
30"	4'–0"	1'–8"	1'–1"	7'–6"	11'–8"	15'–10"	20'–0"
36"	5'–0"	1'–11"	1'–3"	9'–0"	13'–11"	18'–10"	23'–9"
42"	6'–0"	2'–2"	1'–5"	10'–6"	16'–2"	21'–10"	27'–6"
48"	7'–0"	2'–5"	1'–7"	12'–0"	18'–5"	24'–10"	31'–3"
54"	8'–0"	2'–10"	1'–11"	13'–6"	20'–10"	28'–2"	35'–6"
60"	9'–0"	3'–2"	2'–0"	15'–0"	23'–2"	31'–4"	39'–6"

"G" IS MEASURED BETWEEN THE OTHER SURFACES OF THE PIPES.



MULTIPLE C.M.P. ARCH PIPE CULVERT
NOT–TO–SCALE



MULTIPLE CIRCULAR PIPE CULVERT
(CMP OR RCP)
NOT–TO–SCALE

DIMENSIONS FOR C.M.P. ARCH PIPE CULVERTS

DESIGN SIZE	APPROX. ARCH DIM.		"L"	"G"	SINGLE	DOUBLE	TRIPLE	QUADRUPLE
	RISE "R"	SPAN "S"			"W"			
2	21"	15"	2'–0"	1'–2"	4'–3"	7'–2"	10'–1"	13'–0"
3	28"	20"	3'–0"	1'–6"	5'–8"	9'–5"	13'–2"	16'–11"
4	35"	24"	4'–0"	1'–8"	6'–11"	11'–6"	16'–1"	20'–8"
5	42"	29"	5'–0"	1'–11"	8'–4"	13'–9"	19'–2"	24'–7"
6	49"	33"	6'–0"	2'–2"	9'–7"	15'–10"	22'–1"	28'–4"
7	57"	38"	7'–0"	2'–5"	11'–1"	18'–3"	25'–5"	32'–7"
8	64"	43"	8'–0"	2'–10"	12'–5"	20'–8"	28'–10"	37'–0"
9	71"	47"	9'–0"	3'–2"	13'–9"	22'–10"	31'–11"	41'–0"

BASED ON 2–2/3" X 1/2" CORRUGATION
"G" IS MEASURED BETWEEN THE OTHER SURFACES OF THE PIPES.

NOTES:
1. CONCRETE SHALL BE CLASS "A" 3000 PSI
2. ALL METAL PIPES (CIRCULAR AND/OR ARCH) SHALL HAVE 5/8" X 6" GALVANIZED BOLTS WITH 2 HEX NUTS AT 24" CENTERS TO ANCHOR THE PIPE TO THE CONCRETE. THIS WILL BE SUBSIDIARY TO THE RIPRAP HEADWALL.
3. FOR CONCRETE ARCH PIPES THE CMP ARCH PIPE CULVERT DIMENSIONS WILL HAVE TO BE ADJUSTED FOR THE PIPE WALL THICKNESS.
4. FOR PIPES LARGER THAN SHOWN, USE THE CLEAR DISTANCE BETWEEN PIPES SHOWN IN TXDOT ITEMS 460 AND/OR 464.
5. IF THE SIDES OF THE HEADWALL IS ADJACENT TO A RIPRAP SLOPE AND IF THE TOP OF THE HEADWALL IS ADJACENT TO THE ROADWAY FOUNDATION OR RIPRAP SLOPE, THE SIDE AND TOP TOE WALLS MAY BE ELIMINATED IF APPROVED BY THE ENGINEER.

RH-15 HEADWALL

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

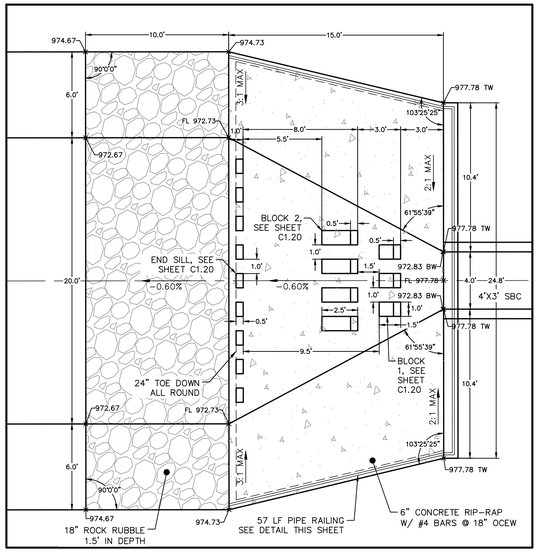
PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX. 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #100288-00

MANGOLD UNIT-2
SAN ANTONIO, TEXAS
DRAINAGE DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE APRIL 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.18

Date: Apr 10, 2025, 9:58am User ID: jasmora
File: P:\125\37\12\Design\Civil\DR-DT 12537712.dwg

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DETAIL "A"
SCALE: 1" = 5'

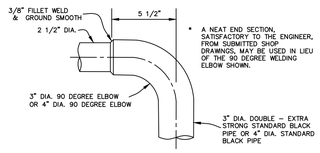
CURLEX® EROSION CONTROL BLANKETS
INSTALLATION GUIDELINES

BEFORE INSTALLING CURLEX BLANKETS, THE SEEDBED SHALL BE INSPECTED BY THE OWNER'S REPRESENTATIVE TO ENSURE IT HAS BEEN PROPERLY COMPACTED AND FINE GRADED TO REMOVE ANY EXISTING RILLS. IT SHALL BE FREE OF OBSTRUCTIONS, SUCH AS TREE ROOTS, PROJECTIONS SUCH AS. STONES, AND OTHER FOREIGN OBJECTS. THE CONTRACTOR SHALL PROCEED WHEN SATISFACTORY CONDITIONS ARE PRESENT. AFTER THE AREA HAS BEEN PROPERLY SHAPED, SEEDED, FERTILIZED, AND COMPACTED, REMOVE THE CURLEX PROTECTIVE COVER. NEXT, LOCATE THE START OF THE ROLL, MAKING SURE THE ROLL IS FACING TOWARD THE AREA TO BE COVERED, AND THEN ROLL OUT THE PRODUCT. THE PRODUCT SHALL BE ROLLED OUT FLAT, EVEN, AND SMOOTH WITHOUT STRETCHING THE MATERIAL THEN ANCHORED TO THE SUBGRADE.

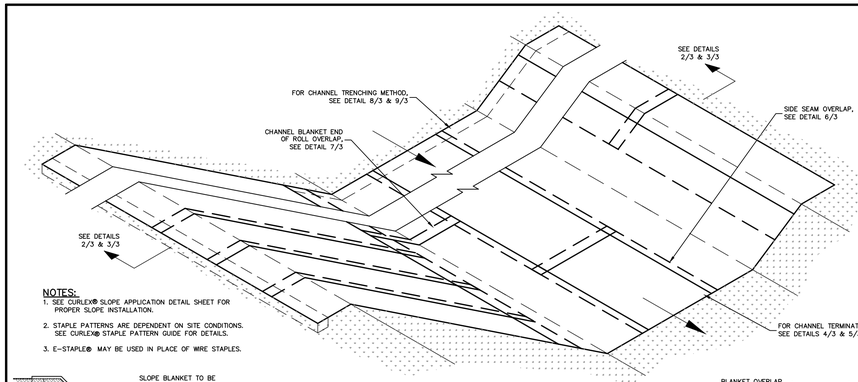
SLOPES: IT IS RECOMMENDED THE BLANKETS BE INSTALLED VERTICALLY ON THE SLOPE; HOWEVER, ON SHORT SLOPES IT MAY BE MORE PRACTICAL TO INSTALL HORIZONTALLY ACROSS THE WIDTH OF THE APPLICATION WHEN AGREED UPON BY THE ENGINEER PRIOR TO INSTALLATION. IF MORE THAN ONE WIDTH IS REQUIRED, SIMPLY ABUT THE EDGES OF THE VERTICALLY INSTALLED BLANKETS TOGETHER AND SECURE THEM WITH A COMMON ROW OF STAPLES. OVERLAPPING ADJACENT SIDES OF CURLEX BLANKETS IS NOT REQUIRED WHEN INSTALLED VERTICALLY ON SLOPES. CURLEX BLANKETS SHALL BE TRENCHED AT THE HEAD OF THE SLOPE IF THE BLANKET CANNOT BE EXTENDED THREE FEET OVER THE SLOPE CREST OR IF OVERLAND FLOW IS ANTICIPATED FROM UPSLOPE AREAS.

CHANNELS: CURLEX BLANKETS SHALL BE CENTERED TO OFFSET A SEAM IN THE MIDDLE OF THE WATERWAY. THEY SHALL BE INSTALLED IN THE SAME DIRECTION AS THE WATER FLOW. THE ADJOINING BLANKETS SHALL BE INSTALLED AWAY FROM THE CENTER OF CHANNEL AND OVERLAPPED. CURLEX BLANKET INSTALLATION SHOULD CONTINUE UP THE SIDE SLOPES THREE FEET ABOVE THE ANTICIPATED HIGH WATER ELEVATION. FLANKS EXPOSED TO RUNOFF, OR SHEET FLOW, MUST BE PROTECTED BY A CHECK SLOT OR TRENCHED. CURLEX BLANKETS SHALL BE TRENCHED AT THE START OF THE CHANNEL. CURLEX BLANKETS SHALL BE ANCHORED USING A STAGGERED STAPLE PATTERN AT END OF ROLL OVERLAPS AND END OF ROLL TERMINATIONS.

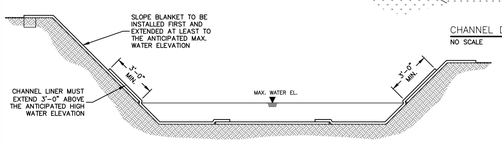
Slopes:	≤ .5H:1V
C factor:	.022
Shear Stress:	3.25 lbs/ft² (156 Pa) unvegetated
	10.0 lbs/ft² (480 Pa) vegetated
Velocity:	11 ft/sec (3.4 m/sec) unvegetated
	17 ft/sec (5.2 m/sec) vegetated



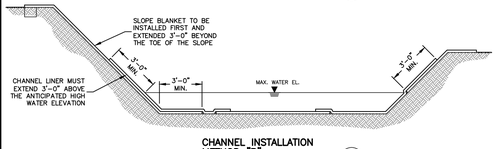
DETAIL OF 90 WELDING ELBOWS
NOT-TO-SCALE



NOTES:
1. SEE CURLEX® SLOPE APPLICATION DETAIL SHEET FOR PROPER SLOPE INSTALLATION.
2. STAPLE PATTERNS ARE DEPENDENT ON SITE CONDITIONS. SEE CURLEX® STAPLE PATTERN GUIDE FOR DETAILS.
3. E-STAPLE® MAY BE USED IN PLACE OF WIRE STAPLES.

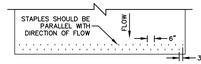


CHANNEL INSTALLATION METHOD "A" (3/3)
NOT TO SCALE

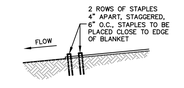


CHANNEL INSTALLATION METHOD "B" (3/3)
NOT TO SCALE

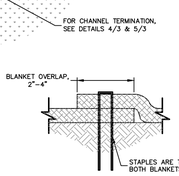
CHANNEL DETAIL (1/3)
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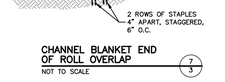
CHANNEL TERMINATION PLAN (4/3)
NOT TO SCALE



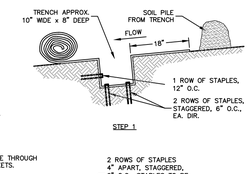
CHANNEL TERMINATION (5/3)
NOT TO SCALE



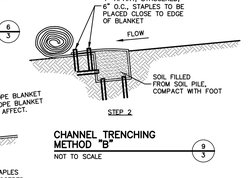
SIDE SEAM OVERLAP STAPLE DETAIL (6/3)
NOT TO SCALE



CHANNEL BLANKET END OF ROLL OVERLAP (7/3)
NOT TO SCALE



CHANNEL TRENCHING METHOD "A" (8/3)
NOT TO SCALE



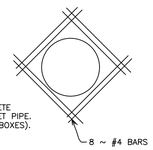
CHANNEL TRENCHING METHOD "B" (9/3)
NOT TO SCALE

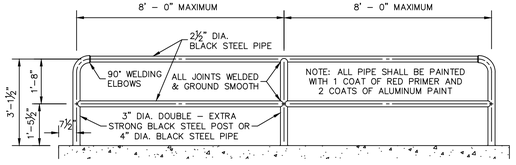
NO.	BY	DATE	REVISIONS
			PROJECT MANAGER
			CHECKED BY
			APPROVED BY

SHEET DESCRIPTION
CURLEX® CHANNEL APPLICATION DETAIL

1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A," 3,000 P.S.I. AT 28 DAYS.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
3. REINFORCING STEEL SHALL BE NEW BILLET STEEL, INTERMEDIATE GRADE, ASTM. A-15. THE DEFORMATION SHALL CONFORM TO ASTM. A-305.
4. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD-CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
7. INVERT OF JUNCTION BOX TO BE SHAPED WITH CONCRETE FILL (3,000 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE. COST SUBSIDIARY TO CLASS "A" CONCRETE (JUNCTION BOXES).

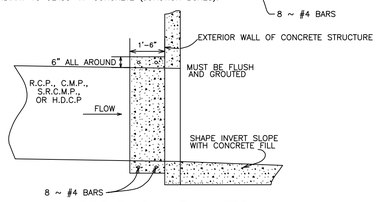
CONCRETE COLLAR DETAIL
(NOT TO SCALE)



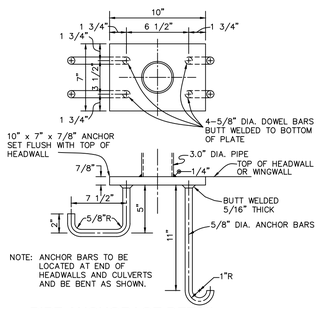


NOTE: ALL CONSTRUCTION OF HANDRAIL SHALL FOLLOW THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.

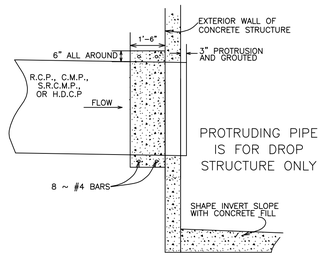
PIPE RAILING DETAIL
NOT-TO-SCALE



PIPE FLUSH WITH INVERT



PIPE ANCHORAGE DETAIL
NOT-TO-SCALE



JANUARY 2006

STANDARD PLANS CITY OF SAN ANTONIO, TEXAS DEVELOPMENT SERVICES		
CONCRETE COLLAR DETAIL		
ANDREW VORTER, P.E.	DATE	REVISIONS
SAM BENT, P.E.		

SCALE: SEE ABOVE
DATE: 19 JANUARY 2006
SHEET: 1 OF 1

American Excelsior Company®
Earth Science Division

Curlex® Blankets
Heavy Duty Excelsior Erosion Control Blankets

SUGGESTED SPECIFICATIONS

Choosing the Right Heavy Duty Curlex Product

Heavy Duty Excelsior Blankets are available in various fiber weights and netting combinations to match the appropriate job site requirements. Eighty percent of the Curlex fibers are six-inches or longer with consistent thickness and are evenly distributed over its entire area. Both the top and bottom side of the blankets are covered with black, extruded plastic mesh designed to provide strength beyond the service life of standard blankets. Curlex Excelsior blankets are naturally seed free and do not contain any chemical additives or foreign matter.

Curlex III Specifications

Recommended Use:	Slopes to 1H:1V, channel bottom applications, Shear stress 120 Pa (2.5 lb/ft²) (unvegetated)
Roll Sizes:	40 yd² (4'x90'), 80 yd² (8'x90'), 160 yd² (16'x90')
Weight*:	0.98 lb/yd²
Netting:	Black or FibreNet™, top and bottom
Color:	Natural Aspen or QuickGRASS Green

Curlex Enforcer Specifications

Recommended Use:	Slopes to .5H:1V, channel bottom applications, Shear stress 156 Pa (3.25 lb/ft²) (unvegetated), 480 Pa (10.0 lb/ft²) (vegetated)
Roll Sizes:	60 yd² (8'x 67.5')
Weight*:	1.25 lb/yd²
Netting:	Extra Heavy Duty Black, top and bottom
Color:	Natural Aspen or QuickGRASS Green

Curlex HV Specifications

Recommended Use:	Slopes to .75H:1V, channel bottom applications, Shear stress 156 Pa (3.25 lb/ft²) (unvegetated),
Roll Sizes:	44.4 yd² (8'x 50')
Weight*:	1.62 lb/yd²
Netting	Heavy Duty Black or FibreNet™, top and bottom

*Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen Excelsior is 22%.





Installation

Before installing Curlex blankets, the seedbed shall be inspected by the Owner's Representative to ensure it has been properly compacted and fine graded to remove any existing rills. It shall be free of obstructions, such as tree roots, projections such as stones, and other foreign objects. Grass seed shall match soil conditions to allow for maximum germination, dense vegetation, and a structural root system. Contractor shall proceed when satisfactory conditions are present. After the area has been properly shaped, seeded, fertilized, and compacted, locate the start of the roll, making sure the roll is facing toward the area to be covered, and then roll out the blanket. Blankets shall be rolled out flat, even, and smooth without stretching the material then anchored to the subgrade.

Slopes: It is recommended that the blankets be installed in the same direction as the water flow; however, on short slopes it may be more practical to install horizontally across the width of the application. If more than one width is required, simply abut the edges together and secure the blankets with a common row of biodegradable staples, steel staples, or stakes. Overlapping of Curlex excelsior blankets is not required or recommended. An exception is waterway slopes.

Channels: Curlex blankets shall be centered to offset a seam in the middle of the waterway. They shall be installed in the same direction as the water flow. The adjoining blankets shall be installed away from the center of channel and concentrated water flow. They shall be secured by a common row of staples. It is usually not necessary to overlap Curlex blankets; however, a 2" shingle type installation shall be used in waterway slopes applications. Curlex blanket installation should continue up the side slopes 3' above the anticipated high water elevation. Flanks exposed to runoff, or sheet flow, must be protected by a check slot or trenched. Curlex blankets shall be trenched at the start of the channel and anchored using a staggered staple pattern at end of roll overlaps and end of roll terminations.

Disclaimer: Curlex III, Curlex Enforcer, and Curlex HV is a system for erosion control and re-vegetation on slopes and channels. American Excelsior Company (AEC) believes that the information contained herein to be reliable and accurate for use in erosion control and re-vegetation applications. However, since physical conditions vary from job site to job site and even within a given job site, AEC makes no performance guarantees and assumes no obligation or liability for the reliability or accuracy of information contained herein for the results, safety, or suitability of using Curlex, or for damages occurring in connection with the installation of any erosion control product whether or not made by AEC or its affiliates, except as separately and specifically made in writing by AEC. These specifications are subject to change without notice.

MADE IN THE U.S.A.

If you would like to receive more information or consult with one of our Customer Care Center Specialists, please call us toll free at (888-352-9582)
PDF download specifications available in the Technical Support Library at www.curlex.com

Product Description

Curlex® Blankets
Heavy Duty Excelsior Erosion Control Blankets

Heavy Duty Curlex Blankets, for long-term protection against wind and water erosion, are a natural choice in place of stone or riprap in swales, ditch bottoms, and on long, steep slopes.

Material Characteristics

Curlex III
0.98 lb/yd² of Great Lakes Aspen Excelsior Wood Fibers and two layers of netting designed to provide protection for grass seed and topsoil from wind and water erosion for up to 36 months, while simultaneously promoting ideal growing conditions.



Curlex Enforcer
1.25 lb/yd² of Great Lakes Aspen Excelsior Wood Fibers and two layers of extra heavy duty UV stabilized netting designed to provide permanent service life and reinforcement between established vegetation and root systems on slopes and in channel bottoms. Curlex Enforcer is a biocomposite turf reinforcement mat (TRM).

Curlex High Velocity
1.62 lb/yd² of Great Lakes Aspen Excelsior Wood Fibers and two layers of heavy duty netting designed to provide extended protection for grass seed and topsoil from wind and water erosion for approximately 36+ months, while simultaneously promoting ideal growing conditions on steep, long slopes and/or in channel applications.

Curlex heavy duty excelsior blankets are available individually wrapped or in master packs to allow for mechanical unloading and stacking.



Performance Capabilities

Curlex heavy duty blankets can handle wind and water shear even on steep slopes. These heavy duty blankets provide long-term protection in critical areas where vegetation requires additional time and protection to develop.

Curlex III

Channels	Shear Stress:	120 Pa (2.5 lb/ft²) (unvegetated)
Slopes	Grade:	up to 1H:1V

Curlex Enforcer

Channels	Shear Stress:	156 Pa (3.25 lb/ft²) (unvegetated) 480 Pa (10.0 lb/ft²) (vegetated)
Slopes	Grade:	up to .50H:1V

Curlex HV

Channels	Shear Stress:	156 Pa (3.25 lb/ft²) (unvegetated)
Slopes	Grade:	up to .75H:1V



Typical Applications

Channel bottoms, swales, steep slopes, let down structures, drop structures, and other areas associated with concentrated water flow exceeding the performance capability and service life of a standard biodegradable blanket.



American Excelsior Company®
Earth Science Division
Arlington, Texas (800) 777-SOIL • www.curlex.com

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NO.	REVISION	DATE

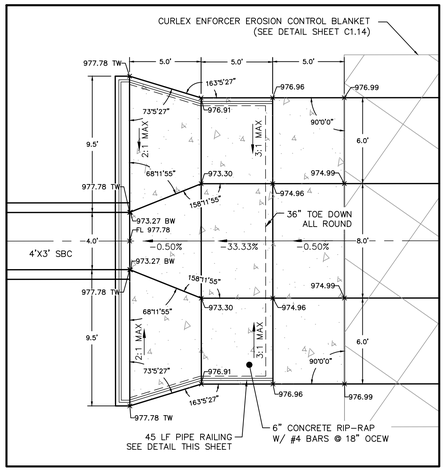
STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

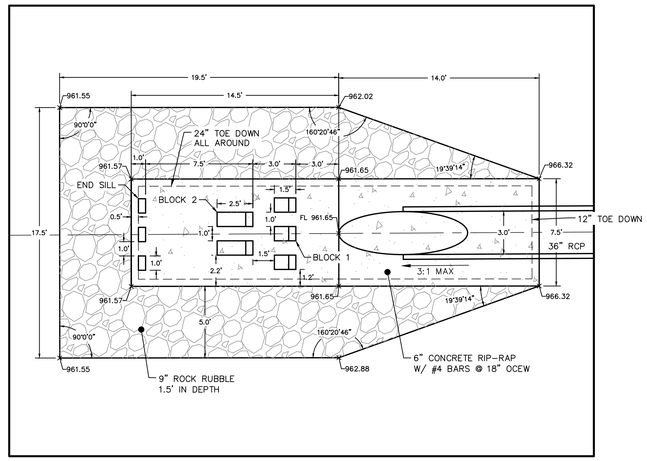
MANGOLD UNIT-2
SAN ANTONIO, TEXAS
DRAINAGE DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE APRIL 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.19

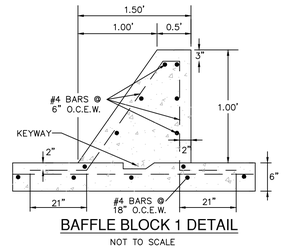
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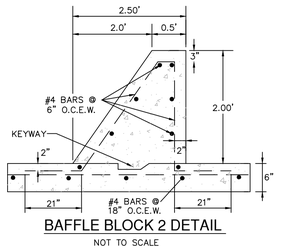
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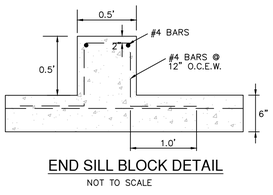
DETAIL "C"
SCALE: 1" = 5'



BAFFLE BLOCK 1 DETAIL
NOT TO SCALE



BAFFLE BLOCK 2 DETAIL
NOT TO SCALE



END SILL BLOCK DETAIL
NOT TO SCALE

Table 9.3.8.1 - Retardation Class for Lining Materials
(Source TXDOT - Hydraulic Design Manual, Chapter 7, Section 3 - Roadside Channel Design)

Retardance Class	Permissible Shear Stress (τ) (lb./sq.ft.)	Cover	Condition
B	2.1	Bermuda grass	Good stand, tall (average 12 in. or 305 mm)
		Native Grass Mixture little bluestem, bluestem, blue gamma, other short and long stem midwest grasses	Good stand, unmowed
		Lespedeza sericea	Good stand, not woody, tall (average 19 in. or 480 mm)
		Alfalfa	Good stand, uncut (average 11 in. or 280 mm)
		Blue gamma	Good stand, uncut (average 13 in. or 330 mm)
		Crabgrass	Fair stand, uncut (10-to-48 in. or 55-to-1220 mm)
C	1.1	Bermuda grass	Good stand, mowed (average 6 in. or 150 mm)
		Common lespedeza	Good stand, uncut (average 11 in. or 280 mm)
		Grass-legume mixture: summer (orchard grass redtop, Italian ryegrass, and common lespedeza)	Good stand, uncut (6-8 in. or 150-200 mm)
		Centipede grass	Very dense cover (average 6 in. or 150 mm)
		Kentucky bluegrass	Good stand, headed (6-12 in. or 150 mm)
D	0.6	Bermuda grass	Good stand, cut to 2.5 in. or 65 mm
		Common lespedeza	Excellent stand, uncut (average 4.5 in. or 115 mm)
		Buffalo grass	Good stand, uncut (3-6 in. or 75-150 mm)
		Grass-legume mixture: fall, spring (orchard grass, Italian ryegrass, and common lespedeza)	Good stand, uncut (4-5 in. or 100-125 mm)
		Lespedeza sericea	After cutting to 2 in. or 50 mm (very good before cutting)
E	0.35	Bermuda grass	Good stand, cut to 1.5 in. or 40 mm
		Bermuda grass	Burned stubble

NO.	REVISION	DATE

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX. 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

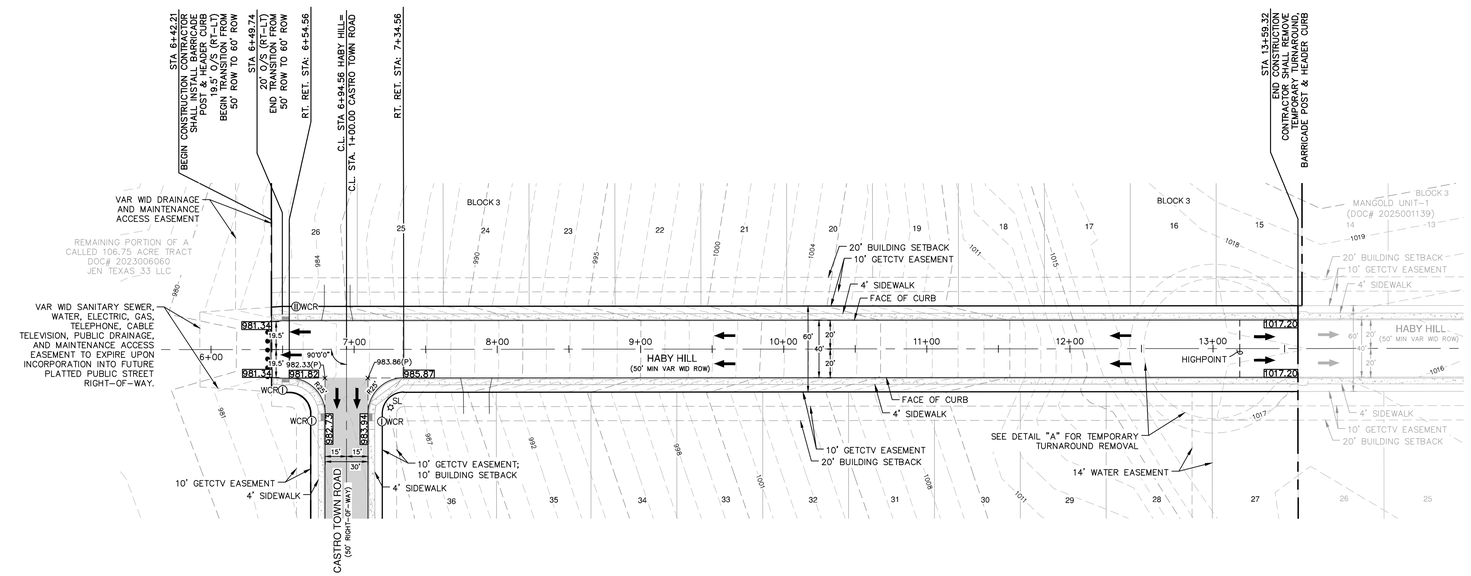
STATE OF TEXAS
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LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

DRAINAGE DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE APRIL 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C1.20

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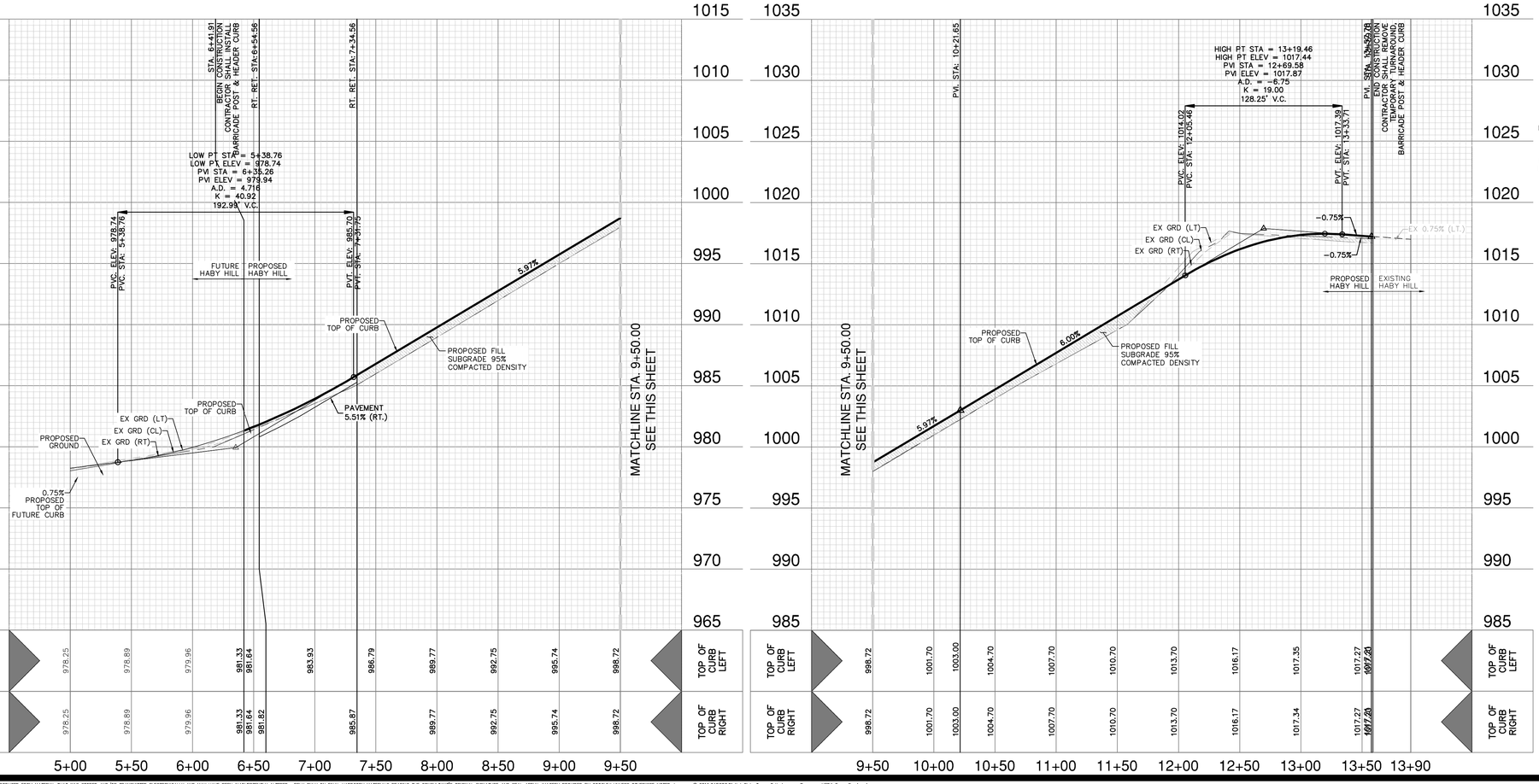
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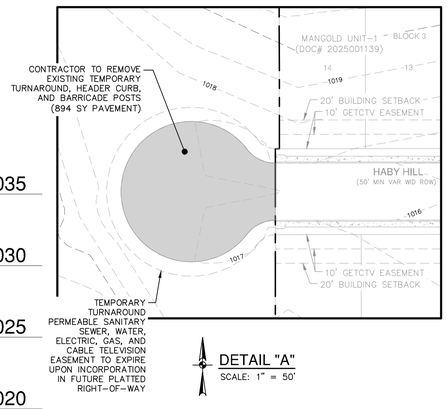
STREET LEGEND

PROJECT LIMITS	
MAINTAIN GUTTER	
EXISTING CONTOUR	970
WHEELCHAIR RAMP	
CENTERLINE	CL
RADIUS POINT	RP
POINT OF CURVATURE	PC
POINT OF TANGENCY	PT
RETURN	RET
DRAINAGE FLOW ARROW	
TOP OF CURB SPOT ELEVATION	857.30
PAVEMENT ELEVATION	857.00(P) ×
WASHOUT CROWN SECTION	
SIDEWALK (SEE SHEETS C3.00-C3.01 FOR DEVELOPER/HOMEBUILDER RESPONSIBILITY)	
DRIVEWAY	
STREET LIGHTS	SL

HABY HILL
STA. 6+41.91 TO END

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





DETAIL "A"
SCALE: 1" = 50'

STREET NOTES:

1. CONTRACTOR SHALL MATCH EXISTING PAVEMENT AT TIE-IN. IF EXISTING PAVEMENT ELEVATION DIFFERS SIGNIFICANTLY, CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO CONTINUING WORK.
2. NO PERMANENT STRUCTURES HIGHER THAN 3 FEET, AND LOWER THAN 8 FEET ABOVE THE PAVEMENT, INCLUDING STRUCTURES, WALLS, FENCES, AND VEGETATION, SHALL BE CONSTRUCTED OR ALLOWED WITHIN THE CLEAR VISION EASEMENT. CONTRACTOR SHALL GRADE AREAS WITHIN CLEAR VISION EASEMENTS SUCH THAT THE ELEVATION WITHIN THE CLEAR VISION EASEMENT IS NOT HIGHER THAN 3 FEET ABOVE THE ADJACENT TOP OF PAVEMENT.
3. DRIVEWAYS SHOWN ON THIS PLAN ARE FOR THE SOLE PURPOSE OF INDICATING A POTENTIAL CONFLICT WITH CURB RAMP, DRAINAGE INFRASTRUCTURE, OR OTHER CONFLICT. DRIVEWAY LOCATION IS SUBJECT TO CHANGE BASED ON HOME SELECTION AND FINAL LOT DESIGN.
4. CHANGES IN THE SIDEWALK LOCATION FOR A MAXIMUM LINEAR DISTANCE OF TWO HUNDRED (200) FEET ARE PERMITTED TO BE APPROVED BY THE FIELD INSPECTOR WITHOUT AMENDING THE STREET PLAN OR UTILITY LAYOUT PER UDC SECTION 35-506 (Q)(6).

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

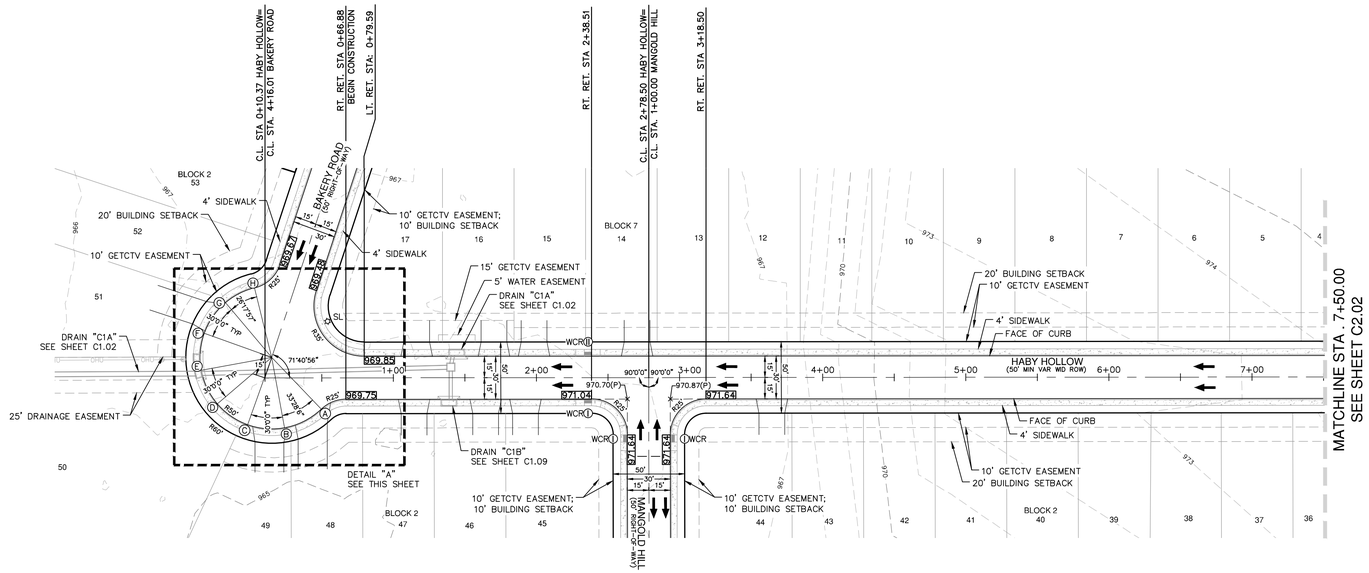
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

HABY HILL PLAN & PROFILE
STA. 6+41.91 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C2.00

Date: Oct 28, 2025, 12:09pm User ID: clafrer
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SCALE: 1"= 50'

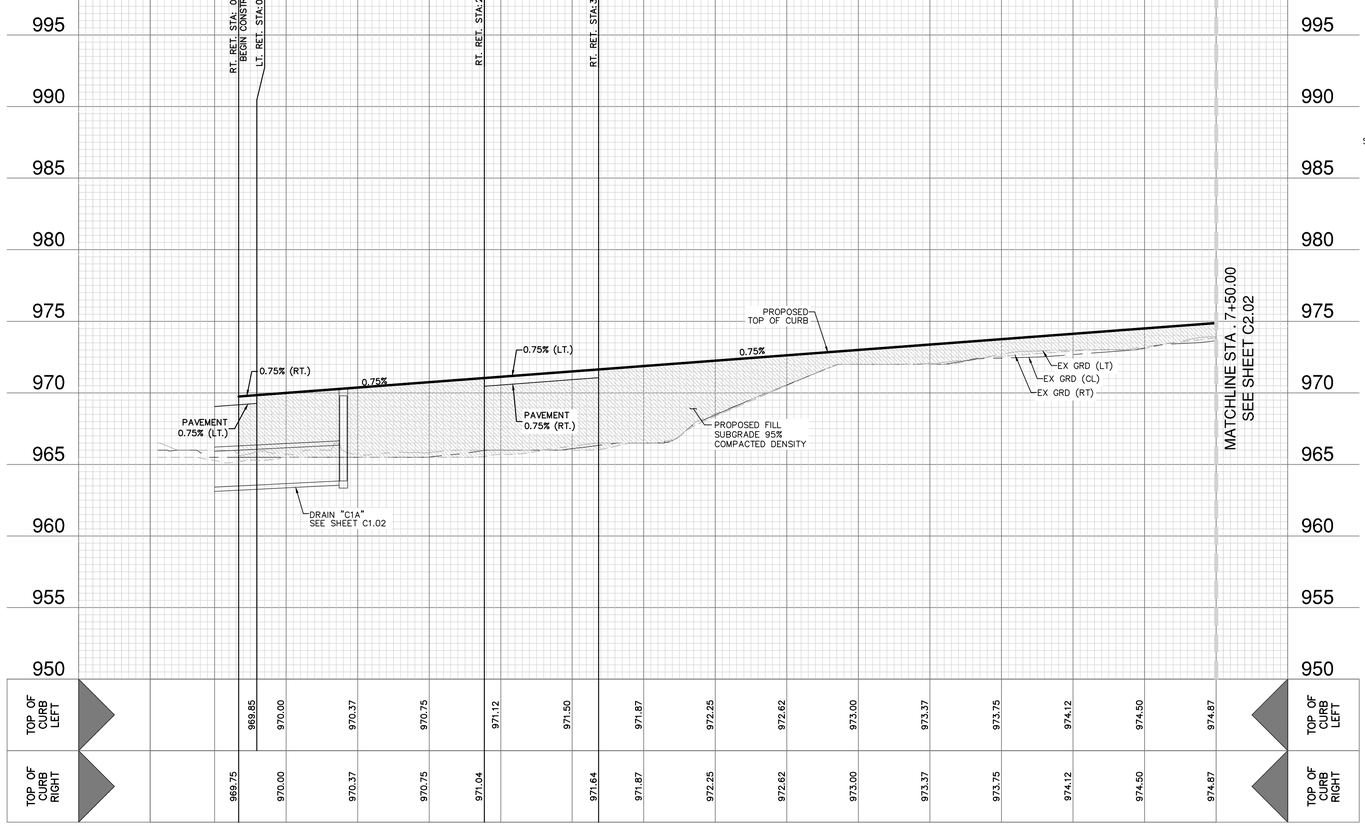
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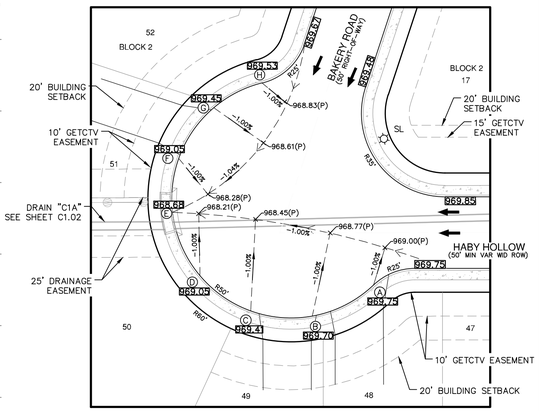
STREET LEGEND

PROJECT LIMITS	
MAINTAIN GUTTER	
EXISTING CONTOUR	970
WHEELCHAIR RAMP	
CENTERLINE	CL
RADIUS POINT	RP
POINT OF CURVATURE	PC
POINT OF TANGENCY	PT
RETURN	RET
DRAINAGE FLOW ARROW	
TOP OF CURB SPOT ELEVATION	857.30
PAVEMENT ELEVATION	857.00(P) ×
WASHOUT CROWN SECTION	
SIDEWALK (SEE SHEETS C3.00–C3.01 FOR DEVELOPER/HOMEBUILDER RESPONSIBILITY)	
DRIVEWAY	
STREET LIGHTS	SL

HABY HOLLOW
STA. 0+66.88 TO 7+50.00

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





DETAIL "A"
SCALE: 1" = 30'

STREET NOTES:

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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
12/1/25

PAPE–DAWSON
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

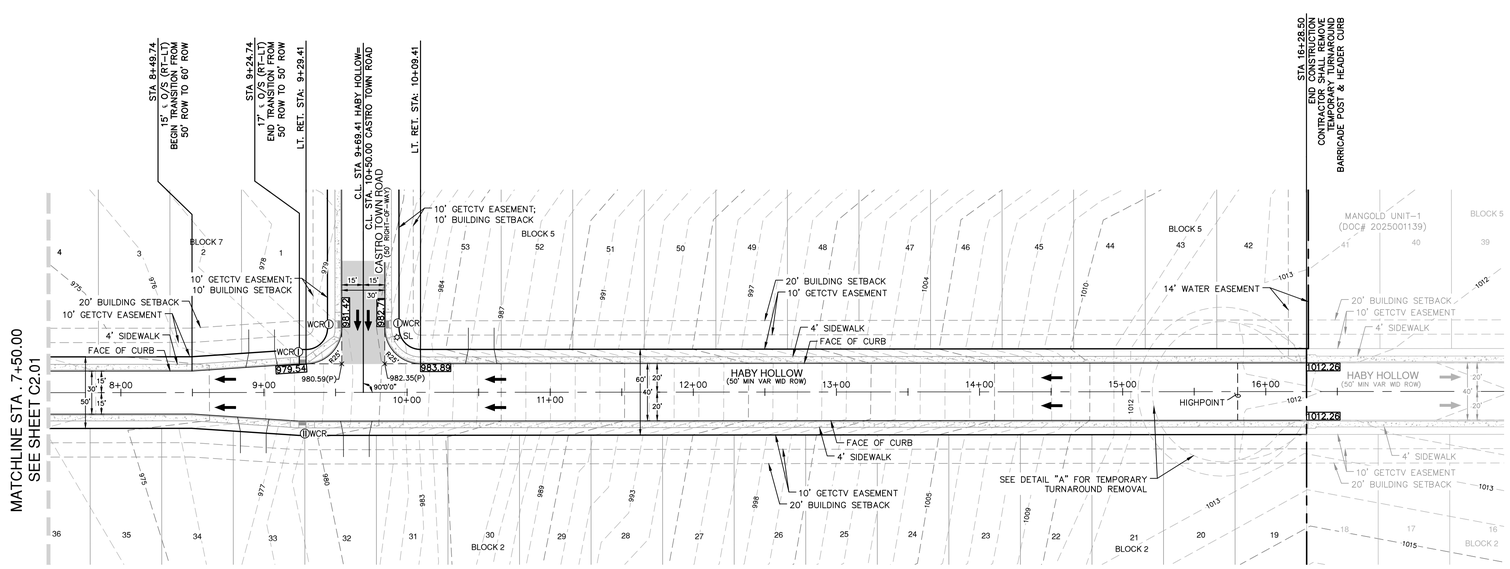
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

HABY HOLLOW PLAN & PROFILE
STA. 0+66.88 TO 7+50.00

PLAT NO. 25-11800082
JOB NO. 12537–12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C2.01

Date: Dec 01, 2025, 2:25pm User ID: cladner
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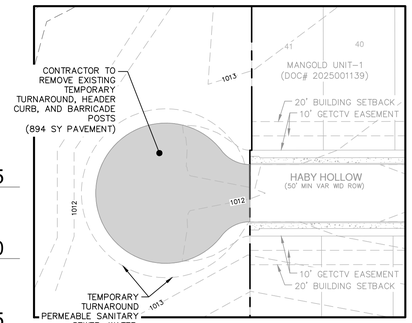
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SCALE: 1"= 50'
0' 50' 100' 150'

STREET LEGEND

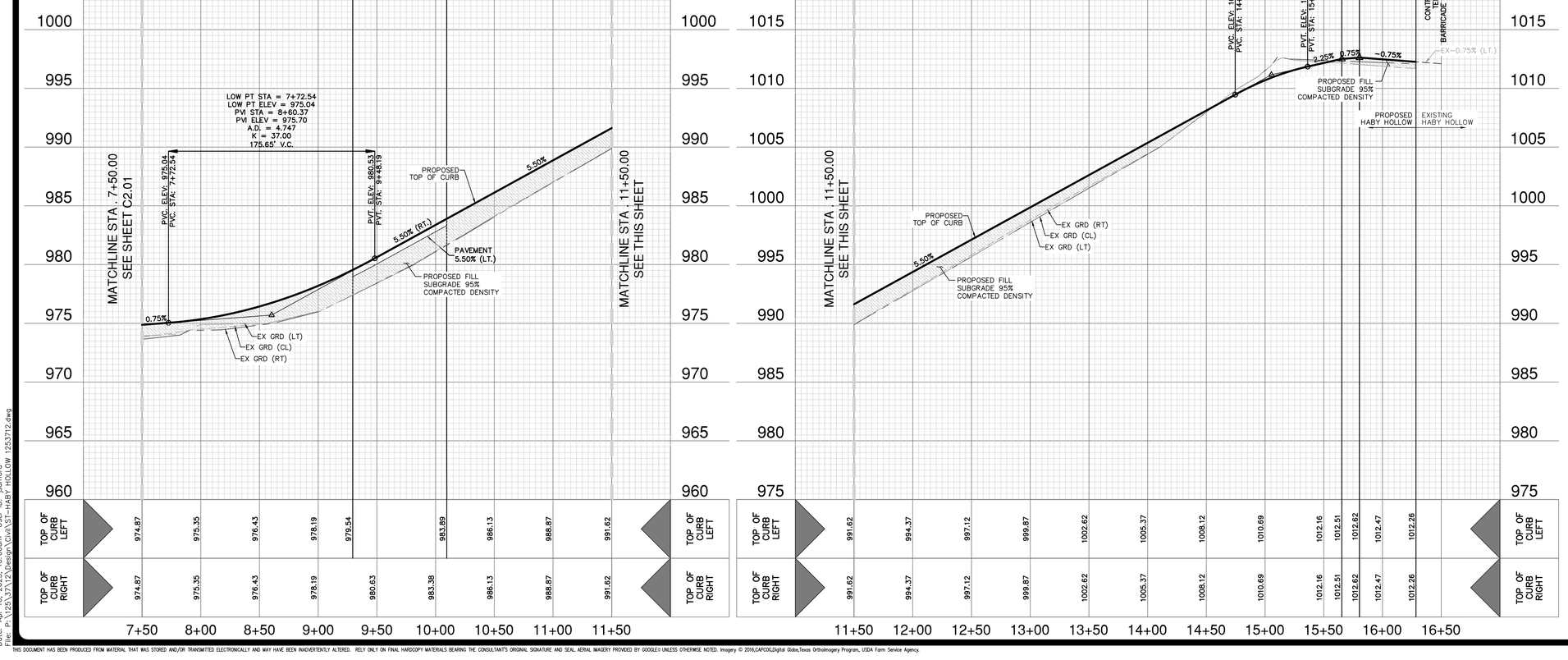
PROJECT LIMITS	
MAINTAIN GUTTER	
EXISTING CONTOUR	970
WHEELCHAIR RAMP	
CENTERLINE	CL
RADIUS POINT	RP
POINT OF CURVATURE	PC
POINT OF TANGENCY	PT
RETURN	RET
DRAINAGE FLOW ARROW	
TOP OF CURB SPOT ELEVATION	857.30
PAVEMENT ELEVATION	857.00(P) ×
WASHOUT CROWN SECTION	
SIDEWALK (SEE SHEETS C3.00–C3.01 FOR DEVELOPER/HOMEBUILDER RESPONSIBILITY)	
DRIVEWAY	
STREET LIGHTS	SL



DETAIL "A"
SCALE: 1" = 50'

HABY HOLLOW
STA. 7+50.00 TO END

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



STREET NOTES:

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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

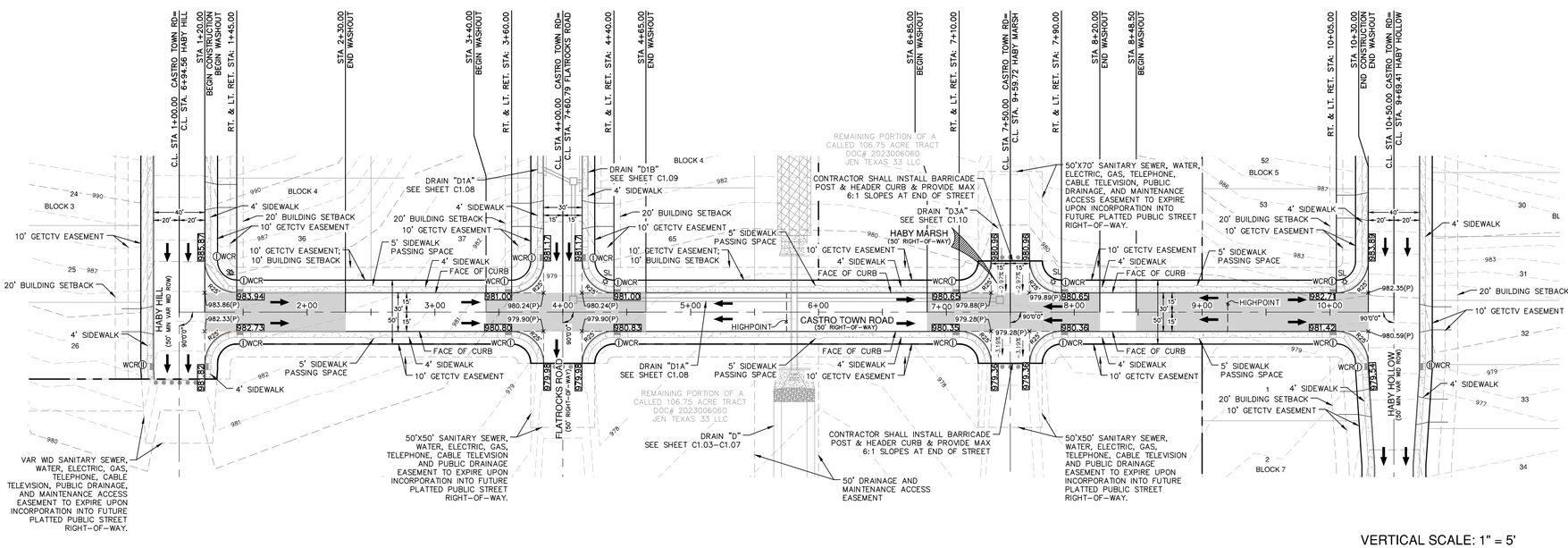
PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

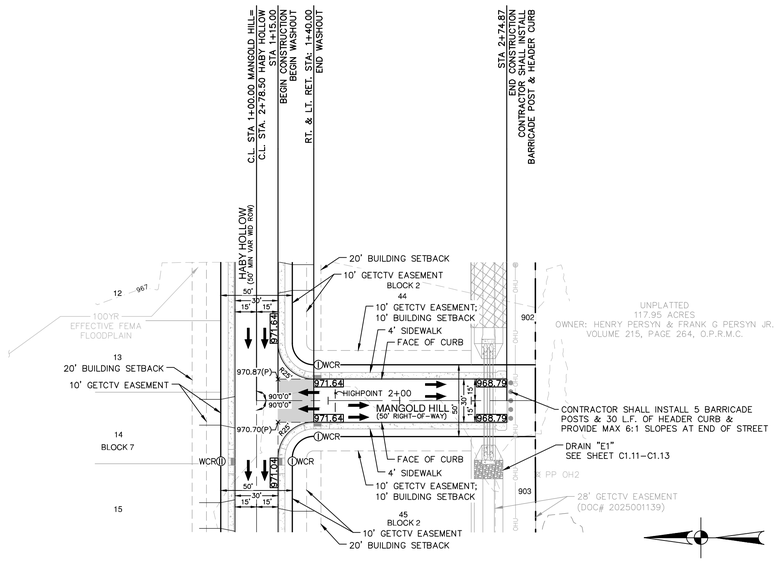
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

HABY HOLLOW PLAN & PROFILE
STA. 7+50.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE APRIL 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C2.02

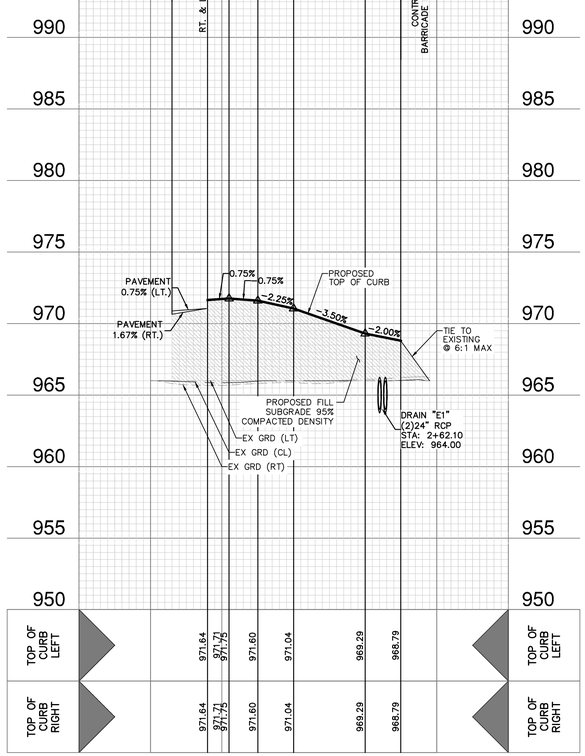
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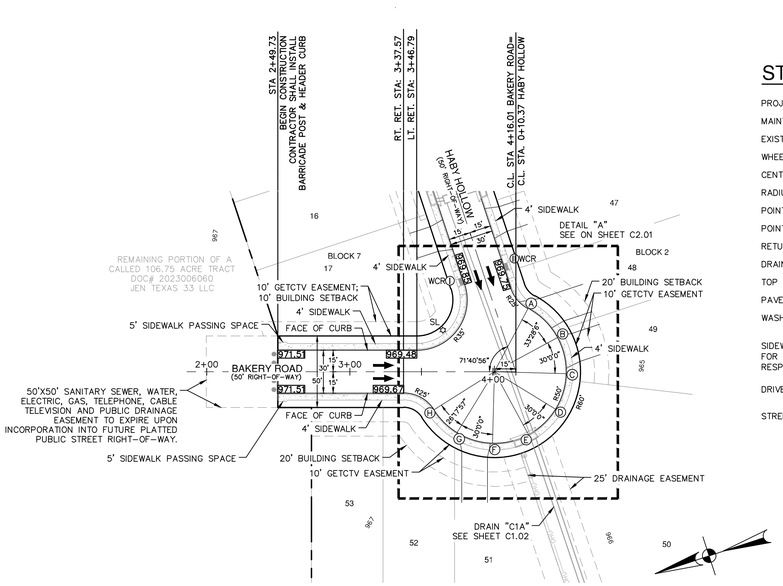

SCALE: 1"= 50'
0' 50' 100' 150'
STREET LEGEND
PROJECT LIMITS
MAINTAIN GUTTER
EXISTING CONTOUR
WHEELCHAIR RAMP
CENTERLINE
RADIUS POINT
POINT OF CURVATURE
POINT OF TANGENCY
RETURN
DRAINAGE FLOW ARROW
TOP OF CURB SPOT ELEVATION
PAVEMENT ELEVATION
WASHOUT CROWN SECTION
SIDEWALK (SEE SHEETS C3.00–C3.01 FOR DEVELOPER/HOMEBUILDER RESPONSIBILITY)
DRIVEWAY
STREET LIGHTS
CASTRO TOWN ROAD
(50' RIGHT-OF-WAY)
HABY MARSH
(50' RIGHT-OF-WAY)
HABY HILL
(50' MIN VAR WID ROW)
HABY HOLLOW
(50' MIN VAR WID ROW)
FLATROCKS ROAD
(50' RIGHT-OF-WAY)
REMAINING PORTION OF A CALLED 106.75 ACRE TRACT DOC# 2023006060 JEN TEXAS 33 LLC
VAR WID SANITARY SEWER, WATER, ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION, PUBLIC DRAINAGE, AND MAINTENANCE ACCESS EASEMENT TO EXPIRE UPON INCORPORATION INTO FUTURE PLATTED PUBLIC STREET RIGHT–OF–WAY.
50'X50' SANITARY SEWER, WATER, ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION AND PUBLIC DRAINAGE EASEMENT TO EXPIRE UPON INCORPORATION INTO FUTURE PLATTED PUBLIC STREET RIGHT–OF–WAY.
50'X70' SANITARY SEWER, WATER, ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION, PUBLIC DRAINAGE, AND MAINTENANCE ACCESS EASEMENT TO EXPIRE UPON INCORPORATION INTO FUTURE PLATTED PUBLIC STREET RIGHT–OF–WAY.
CONTRACTOR SHALL INSTALL BARRICADE POST & HEADER CURB & PROVIDE MAX 6:1 SLOPES AT END OF STREET
50' DRAINAGE AND MAINTENANCE ACCESS EASEMENT
DRAIN "D1A" SEE SHEET C1.08
DRAIN "D1B" SEE SHEET C1.09
DRAIN "D3A" SEE SHEET C1.10
DRAIN "D" SEE SHEET C1.03–C1.07
DRAIN "D3" SEE SHEET C1.10
STA 1+00.00 CASTRO TOWN RD= C.L. STA. 1+00.00
C.L. STA. 6+94.56 HABY HILL
BEGIN CONSTRUCTION
STA 1+20.00 BEGIN WASHOUT
RT. & LT. RET. STA: 1+45.00
STA 2+30.00 END WASHOUT
STA 3+40.00 BEGIN WASHOUT
RT. & LT. RET. STA: 3+60.00
C.L. STA. 4+30.00 CASTRO TOWN RD= C.L. STA. 7+60.79 FLATROCKS ROAD
RT. & LT. RET. STA: 4+40.00
STA 4+65.00 END WASHOUT
STA 6+85.00 BEGIN WASHOUT
RT. & LT. RET. STA: 7+10.00
C.L. STA 7+50.00 CASTRO TOWN RD= C.L. STA. 9+59.72 HABY MARSH
RT. & LT. RET. STA: 7+90.00
STA 8+20.00 END WASHOUT
STA 8+48.50 BEGIN WASHOUT
RT. & LT. RET. STA: 10+05.00
STA 10+30.00 END CONSTRUCTION
END WASHOUT
C.L. STA 10+50.00 CASTRO TOWN RD= C.L. STA. 9+69.41 HABY HOLLOW
BLOCK 3
BLOCK 4
BLOCK 5
BLOCK 7
4' SIDEWALK
20' BUILDING SETBACK
10' GETCTV EASEMENT
10' GETCTV EASEMENT; 10' BUILDING SETBACK
5' SIDEWALK PASSING SPACE
FACE OF CURB
HIGHPOINT
20' BUILDING SETBACK
10' GETCTV EASEMENT
4' SIDEWALK
5' SIDEWALK PASSING SPACE
4' SIDEWALK
20' BUILDING SETBACK
10' GETCTV EASEMENT
4' SIDEWALK
20' BUILDING SETBACK
10' GETCTV EASEMENT
4' SIDEWALK
20' BUILDING SETBACK
10' GETCTV EASEMENT
4' SIDEWALK
5' SIDEWALK PASSING SPACE



MANGOLD HILL
STA. 1+15.00 TO END

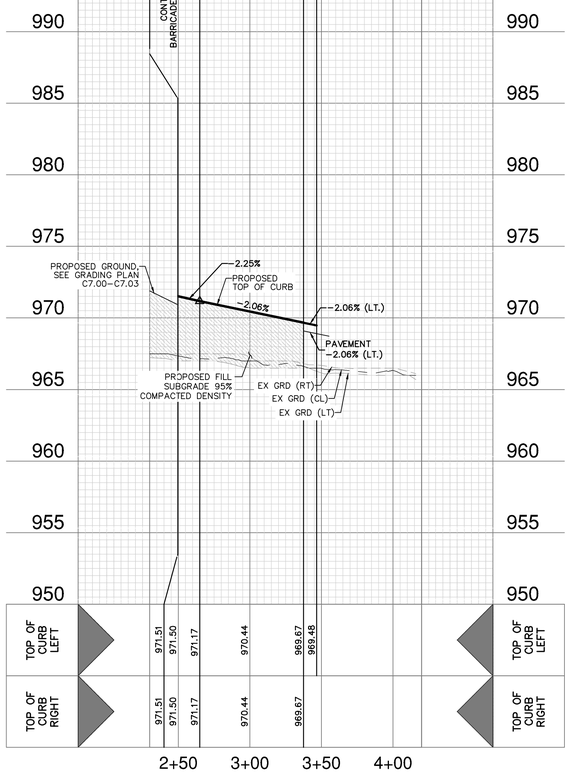
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'





BAKERY ROAD
STA. 2+49.73 TO END

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



STREET LEGEND

PROJECT LIMITS	
MAINTAIN GUTTER	
EXISTING CONTOUR	970
WHEELCHAIR RAMP	
CENTERLINE	CL
RADIUS POINT	RP
POINT OF CURVATURE	PC
POINT OF TANGENCY	PT
RETURN	RET
DRAINAGE FLOW ARROW	
TOP OF CURB SPOT ELEVATION	857.30
PAVEMENT ELEVATION	857.00(P) ×
WASHOUT CROWN SECTION	
SIDEWALK (SEE SHEETS C3.00–C3.01 FOR DEVELOPER/HOMEBUILDER RESPONSIBILITY)	
DRIVEWAY	
STREET LIGHTS	SL

STREET NOTES:

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DATE
NO. REVISION

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE–DAWSON
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

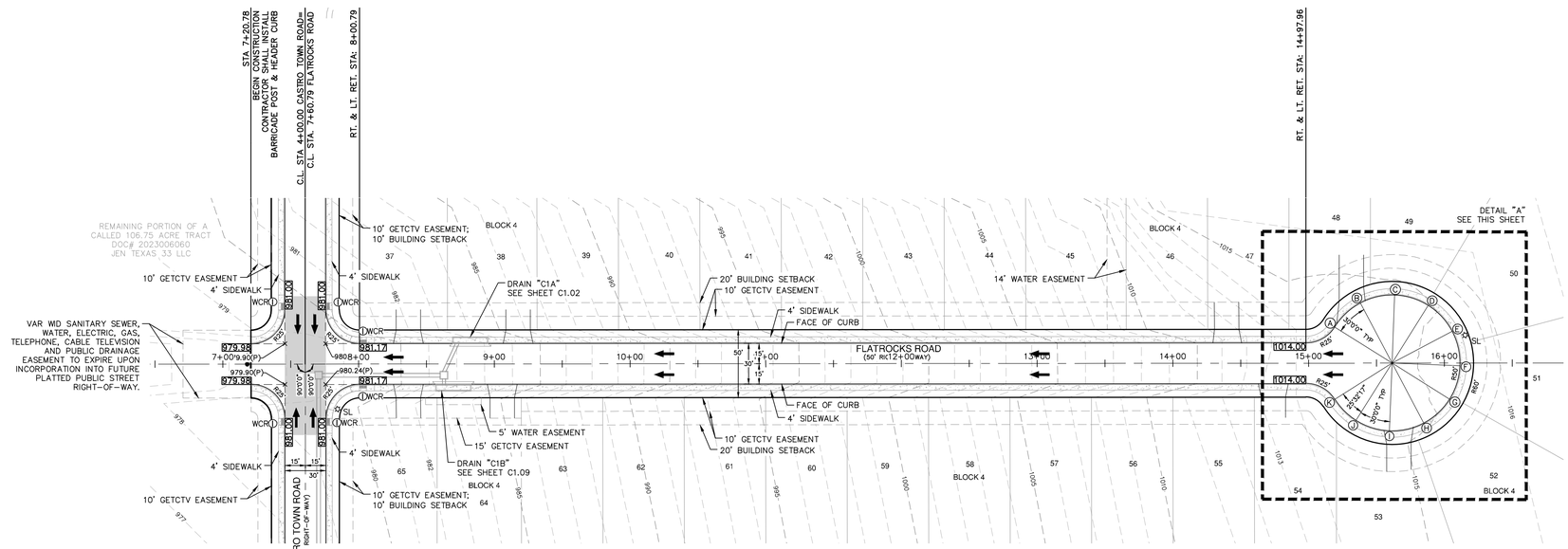
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

BAKERY ROAD PLAN & PROFILE STA. 2+49.73 TO END
MANGOLD HILL PLAN & PROFILE STA. 1+15.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C2.04

Date: Oct 28, 2025, 12:11pm User ID: cladner
File: P:\125\37\12\Design\Civil\ST-BAKERY 125312.dwg

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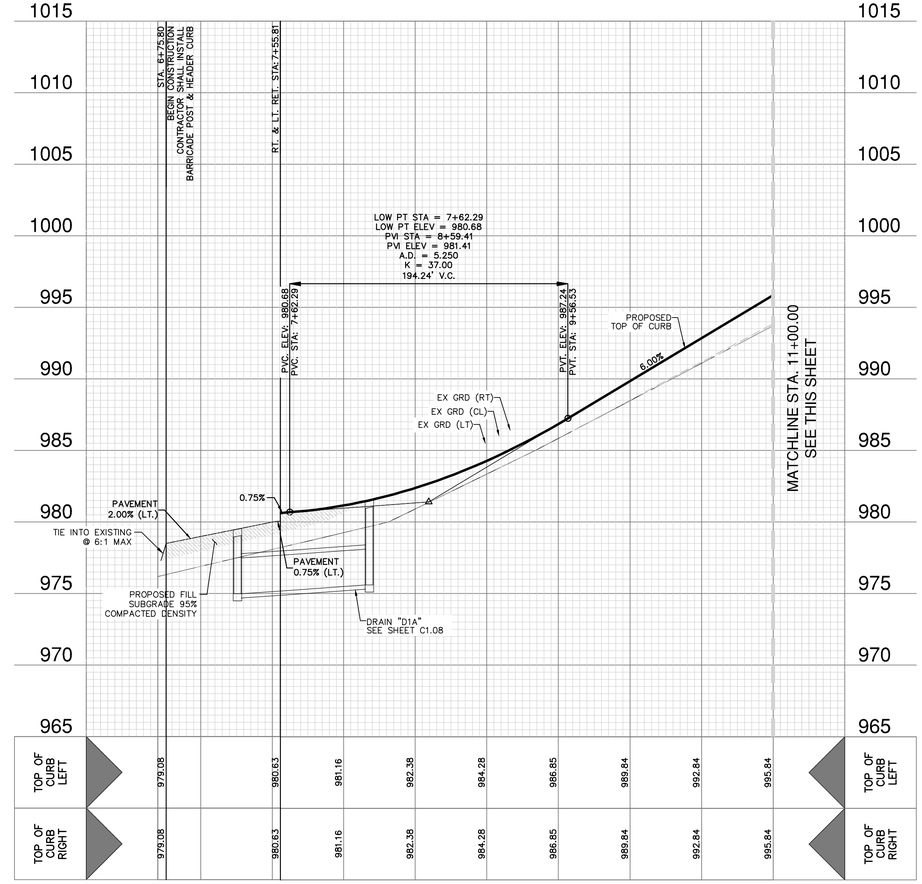
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0' 50' 100' 150'

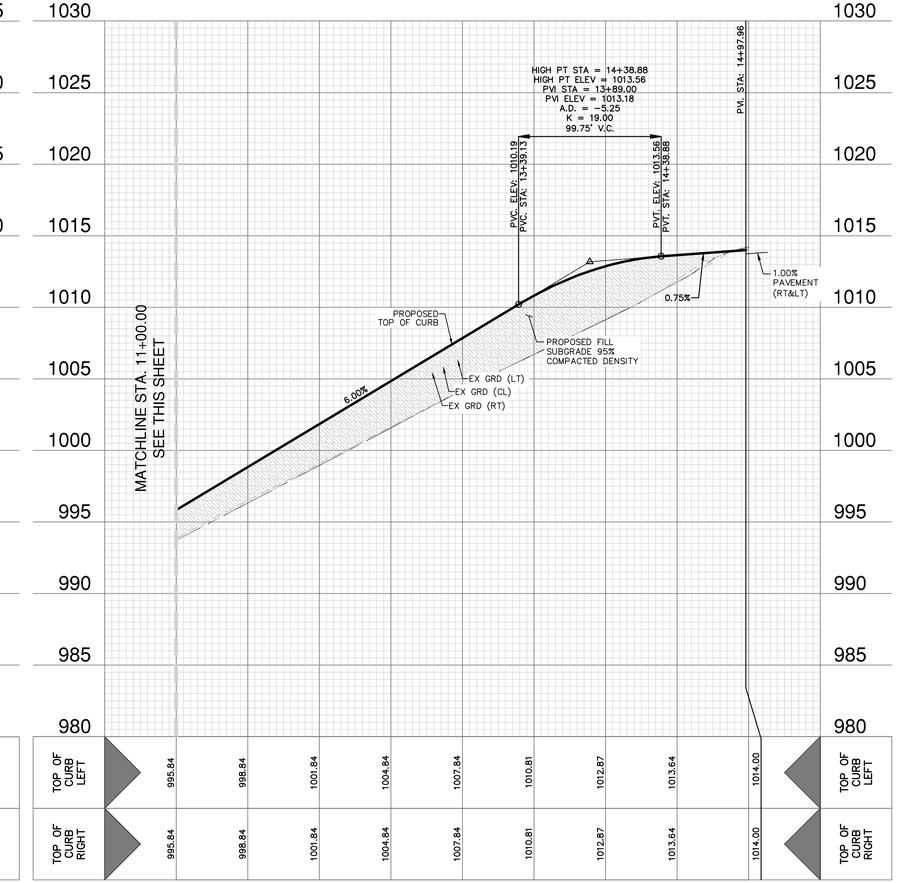
STREET LEGEND

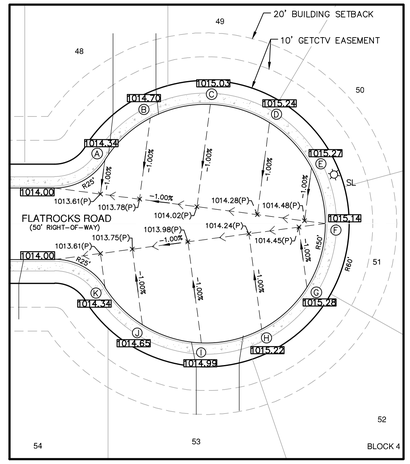
PROJECT LIMITS	
MAINTAIN GUTTER	
EXISTING CONTOUR	970
WHEELCHAIR RAMP	
CENTERLINE	CL
RADIUS POINT	RP
POINT OF CURVATURE	PC
POINT OF TANGENCY	PT
RETURN	RET
DRAINAGE FLOW ARROW	
TOP OF CURB SPOT ELEVATION	857.30
PAVEMENT ELEVATION	857.00(P) ×
WASHOUT CROWN SECTION	
SIDEWALK (SEE SHEETS C3.00–C3.01 FOR DEVELOPER/HOMEBUILDER RESPONSIBILITY)	
DRIVEWAY	
STREET LIGHTS	SL

FLATROCKS ROAD
STA. 6+75.80 TO END

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







DETAIL "A"
SCALE: 1" = 30'

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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
12/1/25

PAPE–DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

FLATROCKS ROAD PLAN & PROFILE
STA. 6+75.80 TO END

PLAT NO. 25-11800082
JOB NO. 12537–12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C2.05

Date: Dec 01, 2025, 2:26pm User ID: clofner
File: P:\12537\371212\Design\Civil\ST–FLATROCKS 125371 2.dwg
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PAVEMENT SECTION DETAIL

STREET NAME	STATION	TYPE "D" HMAC	TYPE "C" HMAC	TYPE "B" HMAC	AGGREGATE BASE	LIME OR CEMENT STABILIZED SUBGRADE	GEOGRID (TENSAR TRIAX TX5)	CBR	STRUCTURAL NUMBER	
HABY HILL (LOCAL B)	6+41.91 TO END	1.5"	2.5"	–	18.5"	8"	NO	2.0	1.5(0.44) = 0.66 2.5(0.44) = 1.10 18.5(0.14) = 2.59 8(0.08) = 0.64	4.99
BAKERY ROAD (LOCAL A)	2+49.73 TO END	2.0"	–	–	11.0"	6"	NO	2.0	2(0.44) = 0.88 11(0.14) = 1.54 6(0.08) = 0.48	2.90
CASTRO TOWN ROAD (LOCAL A)	1+45.00 TO END	2.0"	–	–	11.0"	6"	NO	2.0	2(0.44) = 0.88 11(0.14) = 1.54 6(0.08) = 0.48	2.90
HABY HOLLOW (LOCAL B)	8+49.74 TO END	1.5"	2.5"	–	18.5"	8"	NO	2.0	1.5(0.44) = 0.66 2.5(0.44) = 1.10 18.5(0.14) = 2.59 8(0.08) = 0.64	4.99
HABY HOLLOW (LOCAL A)	0+66.88 TO 8+49.74	2.0"	–	–	11.0"	6"	NO	2.0	2(0.44) = 0.88 11(0.14) = 1.54 6(0.08) = 0.48	2.90
HABY MARSH (LOCAL A)	1+20.04 TO END	2.0"	–	–	11.0"	6"	NO	2.0	2(0.44) = 0.88 11(0.14) = 1.54 6(0.08) = 0.48	2.90
FLATROCKS ROAD (LOCAL A)	6+75.80 TO END	2.0"	–	–	11.0"	6"	NO	2.0	2(0.44) = 0.88 11(0.14) = 1.54 6(0.08) = 0.48	2.90
MANGOLD HILL (LOCAL A)	1+15.00 TO END	2.0"	–	–	11.0"	6"	NO	2.0	2(0.44) = 0.88 11(0.14) = 1.54 6(0.08) = 0.48	2.90

GENERAL NOTES:

1. CONTRACTOR SHALL REFERENCE THE PROJECT PAVEMENT DESIGN REPORT PREPARED BY INTEGRATED TESTING AND ENGINEERING COMPANY OF SAN ANTONIO, L.P. (INTEC) DATED JULY 6, 2022 (S221269–P).
2. CONTRACTOR SHALL RETAIN A GEOTECHNICAL ENGINEER TO VERIFY THE SUB GRADE CONDITION PRIOR TO PLACING ANY BASE MATERIAL. GEOTECHNICAL ENGINEER SHALL DETERMINE THE SUB GRADE CONDITION AND IF LIME STABILIZATION IS REQUIRED.
3. GEOTECHNICAL ENGINEER SHOULD VERIFY THE STREET SUBGRADE AT THE TIME OF CONSTRUCTION PRIOR TO PLACEMENT OF AGGREGATE BASE.
4. THE FLEXIBLE BASE COURSE SHOULD BE CRUSHED LIMESTONE CONFORMING TO TXDOT STANDARD SPECIFICATIONS, ITEM 247, TYPE A, GRADES 1 OR 2.
5. THE MOISTURE CONTENT OF THE FILL SHOULD BE MAINTAINED WITHIN THE RANGE OF OPTIMUM WATER CONTENT TO 3 PERCENTAGE POINTS ABOVE THE OPTIMUM WATER CONTENT UNTIL PERMANENTLY COVERED.
6. IN THE EVENT THAT THE CLAY FILL USED IS DIFFERENT THAN THE EXISTING SUBGRADE, THE RECOMMENDATIONS IN THE GEOTECHNICAL REPORT COULD BE INVALIDATED AND THE DESIGN ENGINEER MUST BE CONSULTED TO DETERMINE IF ADDITIONAL CBR TESTING AND THICKER PAVEMENT SECTIONS ARE REQUIRED.
7. WHERE PAVEMENT SUBGRADE IS LOCATED WITHIN 2–FEET OF THE EXISTING GROUND SURFACE (STRATUM 1 CLAYS), MOISTURE CONDITIONED SUBGRADE WILL BE REQUIRED. GEOTECHNICAL ENGINEER SHOULD VERIFY THE STREET SUBGRADE AT THE TIME OF CONSTRUCTION PRIOR TO PLACEMENT OF AGGREGATE BASE TO DETERMINE WHERE THE MOISTURE CONDITIONED SUBGRADE IS NEEDED. REFERENCE GEOTECHNICAL ENGINEERING REPORT FOR MORE INFORMATION.
8. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL MATERIAL TESTING WITH THE PROJECT GEOTECHNICAL ENGINEER. TESTING SHALL BE PAID FOR BY THE OWNER.
9. FILL MATERIAL SHOULD BE NATIVE ON–SITE MATERIAL, FREE OF DELETERIOUS MATERIAL WITH A MINIMUM CBR VALUE OF 2 AND A MAXIMUM PI VALUE OF 60. THE GRAVEL SIZE SHOULD NOT EXCEED 3 INCHES IN DIAMETER. LIME OR CEMENT APPLICATION RATES SHOULD BE RE–EVALUATED FOR THE FILL MATERIAL. THE MATERIAL SHOULD BE PLACED AS PER APPLICABLE CITY OR COUNTY GUIDELINES. CONTRACTOR TO VERIFY EXACT SPECIFICATIONS WITH PROJECT GEOTECHNICAL ENGINEERING REPORT.
10. CONTRACTOR SHALL COORDINATE A TRAFFIC CONTROL PLAN FOR ALL WORK WITHIN THE ROW. ADDITIONAL WARNING SIGNS MAY BE RECOMMENDED BY THE ENGINEER ONCE THE ROADWAYS ARE CONSTRUCTED.

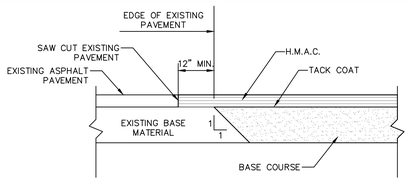
SUBGRADE NOTES:

1. BASED ON THE THICKNESS OF THE CLAYS ENCOUNTERED IN THE BORINGS, WE ANTICIPATE THE FINAL PAVEMENT SUBGRADE PLASTICITY INDEX VALUE TO BE GREATER THAN 20. AS PER BEXAR COUNTY/ CITY OF SAN ANTONIO REQUIREMENTS, SUBGRADE STABILIZATION IS NEEDED WHEN THE PLASTICITY INDEX VALUES ARE GREATER THAN 20.
2. IF THE PAVEMENT SUBGRADE PLASTICITY INDEX VALUES ARE GREATER THAN 20, THEN:
   - 2.1. THE SUBGRADE SHOULD BE STABILIZED TO A DEPTH OF 6 OR 8 INCHES USING 7.5 PERCENT LIME CONTENT OR 8 PERCENT CEMENT CONTENT.
   - 2.2. THE SUBGRADE SOILS SHOULD BE TESTED FOR SOIL SULFATE CONTENT PRIOR TO STABILIZATION. IF THE SOIL SULFATE CONTENT IS HIGH, AN ALTERNATE PROCEDURE WILL BE NEEDED.
     - 2.2.1. LIME APPLICATION RATE OF 33.0 LBS PER SQ YARD FOR 6–INCH DEPTH OF STABILIZATION IS RECOMMENDED.
     - 2.2.2. LIME APPLICATION RATE OF 44.0 LBS PER SQ YARD FOR 8–INCH DEPTH OF STABILIZATION IS RECOMMENDED.
     - 2.2.3. CEMENT APPLICATION RATE OF 36.0 LBS PER SQ YARD FOR 6–INCH DEPTH OF STABILIZATION IS RECOMMENDED.
     - 2.2.3. CEMENT APPLICATION RATE OF 48.0 LBS PER SQ YARD FOR 8–INCH DEPTH OF STABILIZATION IS RECOMMENDED.
3. APPROVED FILL MATERIAL SHOULD BE USED TO RAISE THE GRADE. THE FILL SHOULD BE FREE OF DELETERIOUS MATERIAL WITH A MINIMUM CBR VALUE OF 2.0. LIME APPLICATION RATES SHOULD BE RE–EVALUATED AND TESTED FOR SULFATE CONTENT PRIOR TO USE OF THE FILL MATERIAL. THE MATERIAL SHOULD BE PLACED AS PER APPLICABLE CITY OR COUNTY GUIDELINES.
4. THE SUBGRADE SHOULD BE PROOF ROLLED TO IDENTIFY SOFT AREAS BEFORE STABILIZATION.

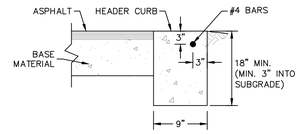
LIME NOTES:

FOR LIME STABILIZATION CONSTRUCTION VERIFICATION THE FOLLOWING SHALL BE CONDUCTED ON THE FIELD:

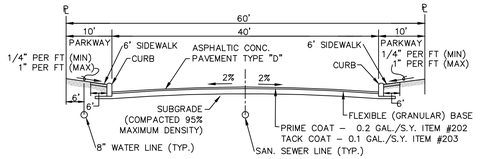
1. AFTER INITIAL MIXING THE SOIL–LIME MIXTURE SHALL MELLOW FOR A PERIOD OF TWO TO THREE (2–3) DAYS. MAINTAIN MOISTURE DURING MELLOWING.
2. AFTER MELLOWING AND FINAL MIXING, THE PULVERIZATION SHALL BE CHECKED USING THE FOLLOWING CRITERIA (REMOVE NON–SLAKING AGGREGATES RETAINED ON THE ¾ INCH SIEVE FROM THE SAMPLE):
   - MINIMUM PASSING 1½" SIEVE 100
   - MINIMUM PASSING ¾" SIEVE 85
   - MINIMUM PASSING NO. 4 SIEVE 60
3. SAMPLE SOIL–LIME MIXTURE FOR DETERMINATION OF MAXIMUM DRY DENSITY (MDD). IN THE LABORATORY, MOLD SPECIMENS TO 95% OF MDD AT OPTIMUM MOISTURE CONTENT AND VERIFY UCS TO BE AT LEAST 160 PSI IN ACCORDANCE WITH PROCEDURE OUTLINED IN THE BEXAR COUNTY FLEXIBLE PAVEMENT DESIGN CRITERIA GUIDE FOR MIXTURE DESIGN.
4. COMPACT AND CHECK FIELD DENSITY (MINIMUM OF 95% OF MDD REQUIRED).
5. CURE FOR AN ADDITIONAL 2 TO 5 DAYS (TOTAL MELLOWING AND CURING TIME SHOULD TOTAL AT LEAST 5 DAYS).
6. VERIFY DEPTH OF LIME STABILIZED LAYER TO DEPTH AS NOTED ON PLAN TO WITHIN +/– 1.0 INCH.



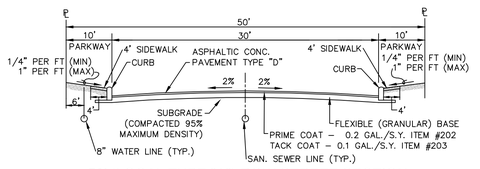
ASPHALT/ASPHALT JUNCTURE DETAIL
NOT–TO–SCALE



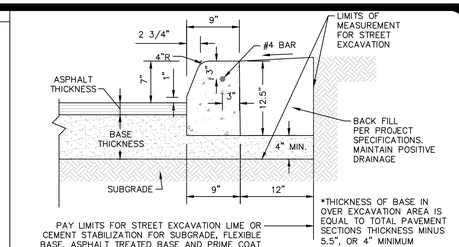
HEADER CURB DETAIL
NOT–TO–SCALE



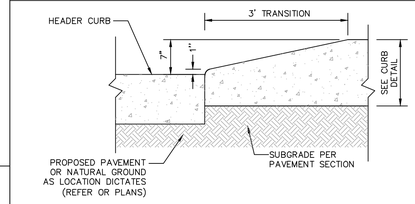
60' (LOCAL TYPE "B") ROW STREET SECTION
NOT–TO–SCALE



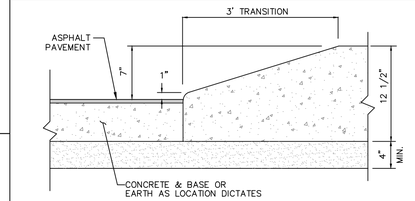
50' (LOCAL TYPE "A") ROW STREET SECTION
NOT–TO–SCALE



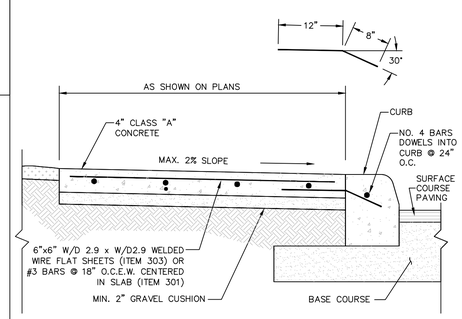
CONCRETE CURB DETAIL
NOT–TO–SCALE



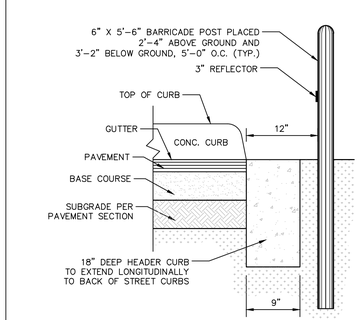
CURB TRANSITION DETAIL
(FROM HEADER CURB TO STANDARD CURB
NOT–TO–SCALE



CURB TRANSITION DETAIL
(FROM PAVEMENT TO STANDARD CURB)
NOT–TO–SCALE



SIDEWALK DETAIL
NOT–TO–SCALE



HEADER CURB & BARRICADE POST DETAIL
NOT–TO–SCALE

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
12/1/25

PAPE–DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT–2
SAN ANTONIO, TEXAS
STREET DETAILS

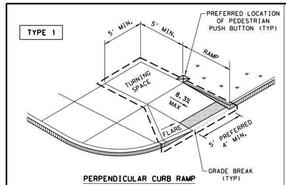
PLAT NO. 25-11800082
JOB NO. 12537–12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C2.06

Date: Dec 01, 2025, 2:26pm User ID: cbather
File: P:\125\37\12\Design\Civil\STDT 1253712.dwg

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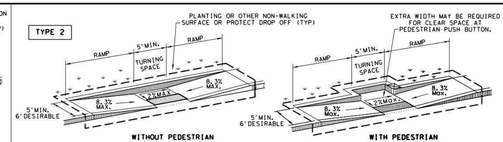
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TYPE 1



PERPENDICULAR CURB RAMP

TYPE 2

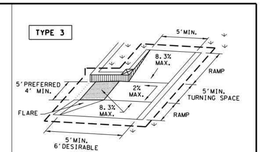


WITHOUT PEDESTRIAN PUSH BUTTON

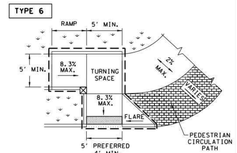
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

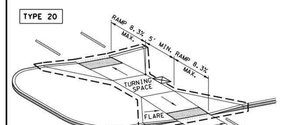


TYPE 6



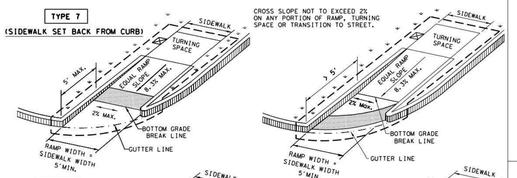
COMBINATION CURB RAMPS

TYPE 20

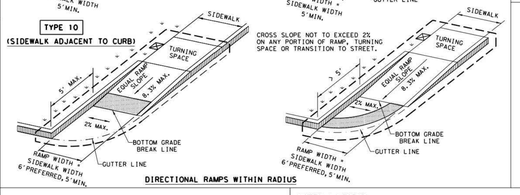


CURB RAMPS AT MEDIAN ISLANDS

TYPE 7
(SIDEWALK SET BACK FROM CURB)

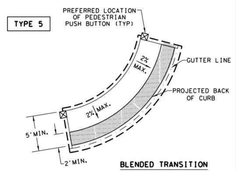


TYPE 10
(SIDEWALK ADJACENT TO CURB)



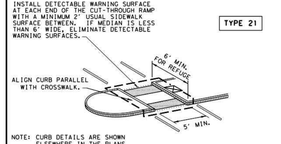
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 5



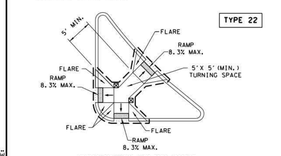
BLENDED TRANSITION
(FLUSH LANDING)

TYPE 21

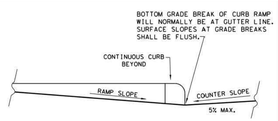


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

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

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	CK:	DW:	CK:	CK: PW & JC
TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
DIST	COUNTY				SHEET NO.

DATE:
FILE:

GENERAL NOTES

CURB RAMPS

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

DETECTABLE WARNING MATERIAL

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

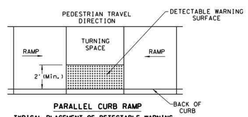
DETECTABLE WARNING PAVERS (IF USED)

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

SIDEWALKS

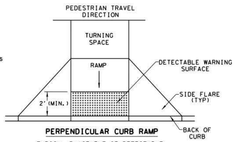
27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items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

DETECTABLE WARNING SURFACE DETAILS



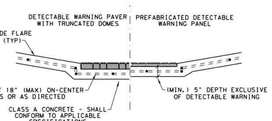
PARALLEL CURB RAMP

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

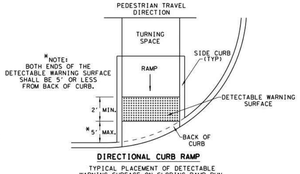


PERPENDICULAR CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS



*NOTE: BOTH ENDS OF THE DETECTABLE WARNING SURFACE SHALL BE 5' OR LESS FROM BACK OF CURB.

DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation — Design Division Standard

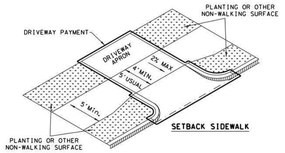
PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

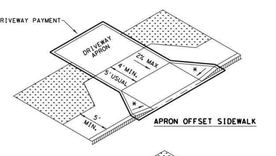
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TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
DIST	COUNTY				SHEET NO.

DATE:
FILE:

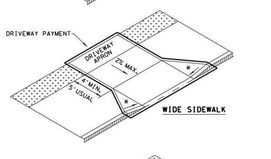
SIDEWALK TREATMENT AT DRIVEWAYS



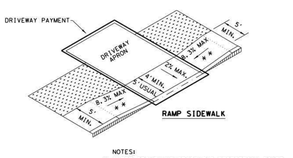
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



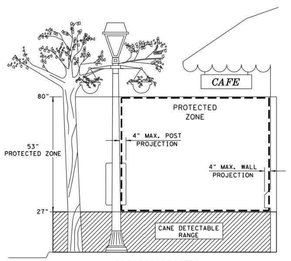
WIDE SIDEWALK



RAMP SIDEWALK

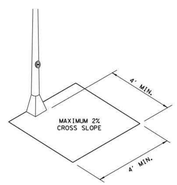
NOTES:
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

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

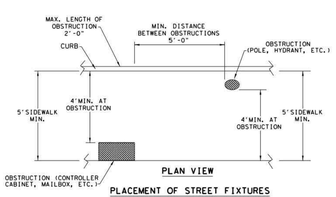


PROTECTED ZONE

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



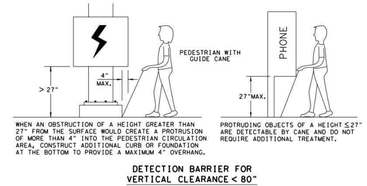
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



PLAN VIEW

PLACEMENT OF STREET FIXTURES

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



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

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

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation — Design Division Standard

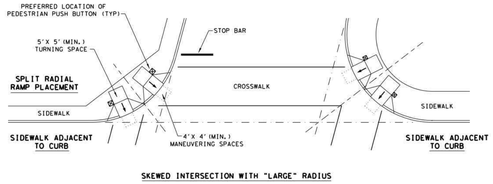
PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

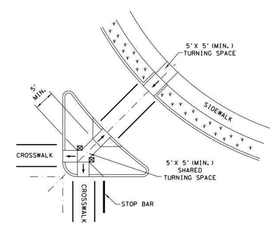
FILE: ped18	DN:TxDOT	CK:	DW:	CK:	CK: PW & JC
TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
DIST	COUNTY				SHEET NO.

DATE:
FILE:

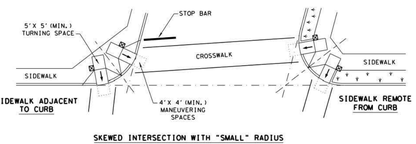
TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



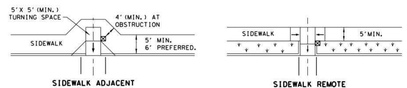
SKEWED INTERSECTION WITH "LARGE" RADIUS



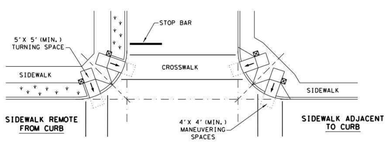
AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



SKEWED INTERSECTION WITH "SMALL" RADIUS



MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

LEGEND:

SHOWS DOWNWARD SLOPE.

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

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

SHEET 4 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	CK:	DW:	CK:	CK: PW & JC
TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
DIST	COUNTY				SHEET NO.

DATE:
FILE:

NO. REVISION — DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
12/1/25

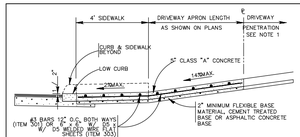
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS
STREET DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C2.07

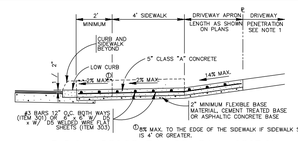
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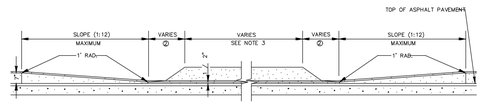
TYPICAL RESIDENTIAL DRIVEWAY SECTION

WITH SIDEWALK ABUTTING CURB
ITEM 503.1



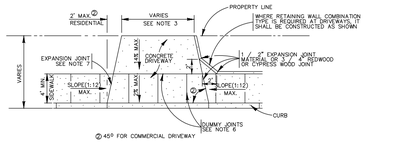
TYPICAL RESIDENTIAL DRIVEWAY SECTION

WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1



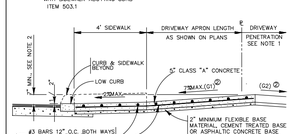
CURB PROFILE AT DRIVEWAY

WITH SIDEWALK ABUTTING CURB



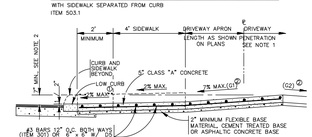
TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK ABUTTING CURB



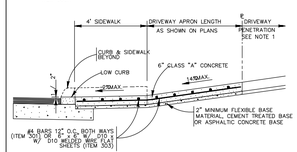
TYPICAL RESIDENTIAL DRIVEWAY SECTION

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



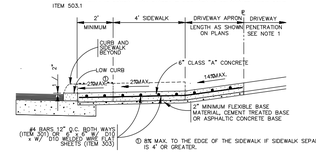
TYPICAL RESIDENTIAL DRIVEWAY SECTION

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



TYPICAL COMMERCIAL DRIVEWAY SECTION

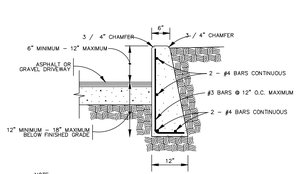
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2

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 PAID FOR UNDER ITEM NO. 503.1 OR 503.2.
   B.) ASPHALTIC CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 503.4 AND SHALL INCLUDE A MINIMUM OF 1" ASPHALT TYPE 'D' & 6" FLEXIBLE BASE
   C.) GRAVEL DRIVEWAY PAID FOR UNDER ITEM NO. 503.5 AND SHALL INCLUDE A MINIMUM OF 6" FLEXIBLE BASE
2. 1" 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 3' 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 3' 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 /8" 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 A 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.



NOTE:
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

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

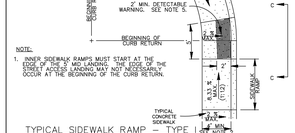
CONCRETE DRIVEWAY STANDARDS

% SUBMITTAL	PROJECT NO.	DATE
DRWN. BY: JL/JM/JD/KP	DSGN. BY	CHK'D. BY: RJL/KOSSER/ P.E.	SHEET NO. OF



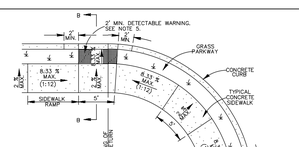
TYPICAL SIDEWALK RAMP – TYPE I

SIDEWALK ABUTS THE CURB
SCALE : 1"=10'



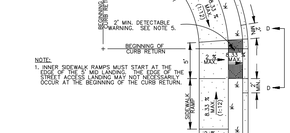
TYPICAL SIDEWALK RAMP – TYPE II

USED AT TEE INTERSECTIONS WHERE SIDEWALK ABUTS CURB
SCALE : 1"=10'



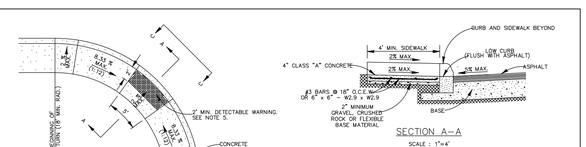
TYPICAL SIDEWALK RAMP – TYPE III

SIDEWALK SEPARATED FROM CURB
SCALE : 1"=10'



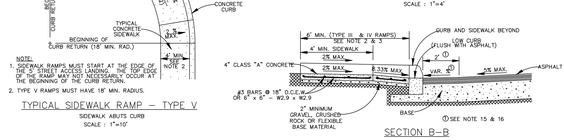
TYPICAL SIDEWALK RAMP – TYPE IV

USED AT TEE INTERSECTIONS WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1"=10'



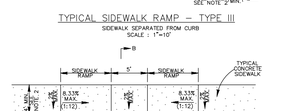
SECTION A–A

SCALE : 1"=4'



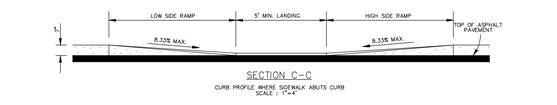
SECTION B–B

SCALE : 1"=4'



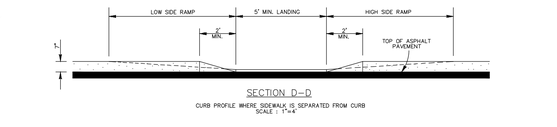
DETECTABLE WARNING SURFACE

SCALE : 1"=4'



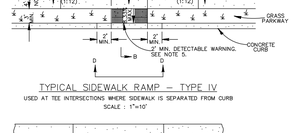
SECTION C–C

CURB PROFILE WHERE SIDEWALK ABUTS CURB
SCALE : 1"=4'



SECTION D–D

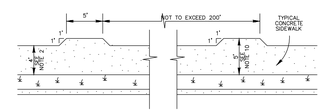
CURB PROFILE WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1"=4'



PLAN DETAIL

DOME SECTION

NOTE:
STAMPED CONCRETE TRUNCATED DOMES WILL NOT BE ALLOWED TO BE USED.
FOR DETECTABLE WARNING ON WHEELCHAIR RAMPS, CONTRACTOR MUST SUBMIT TRUNCATED DOME PRODUCT INFORMATION TO ALL AS LEAST 30 DAYS PRIOR TO THE PROJECT MANAGER FOR APPROVAL AT LEAST 30 DAYS PRIOR TO INSTALLATION.



SIDEWALK PASSING SPACE

SCALE : 1"=10'

TABLE 1 (SEE NOTE 4)		
GUTTER SLOPE	SIDEWALK RAMP LENGTH (1:12)	
	LOW SIDE	HIGH SIDE
1%	5'–0"	7'–2"
2%	5'–0"	8'–4"
3%	4'–8"	10'–0"
4%	4'–2"	12'–6"
5%	3'–10"	16'–8"

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

WHEELCHAIR RAMP STANDARDS

PROJECT NO.	DATE
DSGN. BY	CHK'D. BY: RJL/KOSSER/ P.E.	SHEET NO.

GENERAL NOTES

1. WHEN POSSIBLE, SIDEWALKS SHOULD BE PLACED NEXT TO THE PROPERTY LINE, ALLOWING A MINIMUM OF 4' WIDTH FOR THE PRESERVATION OF THE PATHWAY FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TREES OR OTHER OBSTRUCTIONS.
2. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 3' FROM THE BACK OF CURB.
3. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 3' 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.
4. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
5. ALL CURB-RAMPS OR LANDINGS ABUTTING THE CROSSWALK SHALL HAVE A DETECTABLE WARNING 24 INCHES DEEP ON THE DIRECTION OF PEDESTRIAN TRAVEL) AND EXTENDING THE FULL WIDTH OF THE CURB RAMP OR LANDING. THE DETECTABLE WARNING SHALL CONSIST OF RAISED, TRUNCATED DOMES, ALIGNED IN A GRID PATTERN WITH A DIAMETER OF A NOMINAL 0.9 INCHES (23 MM), A HEIGHT OF NOMINAL 0.2 INCHES (5 MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 INCHES (60 MM). THE DETECTABLE WARNING SURFACE SHALL BE PAVERS CONFORMING TO TXDOT STANDARD PED-18, PEDESTRIAN FACILITIES.
6. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
7. SIDEWALK RAMP TYPE V SHALL BE USED ONLY WHERE THERE IS SIGNIFICANT RESTRICTION WITHIN THE PARKWAY TO CONSTRUCT TYPE I OR TYPE III RAMPS.
8. CONSTRUCTION OF ALL WHEELCHAIR RAMPS TO BE INCLUDED UNDER ITEMS "500 – CONCRETE CURB, GUTTER, AND CONCRETE CURB AND GUTTER" AND / OR "502 – CONCRETE SIDEWALKS". RAMP SURFACE SHALL BE BRUSH FINISHED.
9. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF WHEELCHAIR RAMPS TO BE SHOWN ON CONSTRUCTION PLANS. CITY CONSTRUCTION INSPECTOR CAN ADJUST LOCATIONS FOR SAFETY OR UTILITY CLEARANCE.
10. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET.
11. WHEELCHAIR RAMP SHALL BE CONSTRUCTED WITH 4" CLASS "A" CONCRETE AND 2" MINIMUM GRAVEL, CRUSHED ROCK OR FLEXIBLE BASE MATERIAL.
12. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C.E.W. OR 6" x 6" – W2.9 x W2.9 WIRE MESH.
13. SIDEWALK GRADES SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY, ANY SIDEWALK GRADES THAT EXCEED THE GRADE OF THE ROADWAY SHALL GRADE OF THE ROADWAY TO CREATE A GRADE DIFFERENT THAN THE EXISTING ROADWAY WILL REQUIRE RAMPS, HANDRAILS AND RESTING PLATFORMS TO BE CONSTRUCTED IN ACCORDANCE WITH ADA AND TAS STANDARDS.
14. SIDEWALK CROSS GRADE SHALL HAVE A MAXIMUM SLOPE OF 2%. LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
15. THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES SHALL BE LESS THAN 11%. THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES IS GREATER THAN OR EQUAL TO 11% BUT LESS THAN 13% SHALL BE USED FOR A STREET ACCESS RAMP DESIGNED AT THE 8.33% MAXIMUM SLOPE. THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN 2.61% (I.E. 8.33–(–2.67)=11). IN ADDITION, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN OR EQUAL TO 5%.
16. IF THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES IS GREATER THAN OR EQUAL TO 11% A LEVELING STRIP, 2 FEET IN LENGTH, SHALL BE PROVIDED TO TRANSITION THE ADJACENT SURFACES.
17. ADA COMPLIANCE IN ALTERATIONS INCLUDE ONLY THAT WORK WITHIN THE LIMITS, BOUNDARIES OR SCOPE

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
12/1/25

PAPE–DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

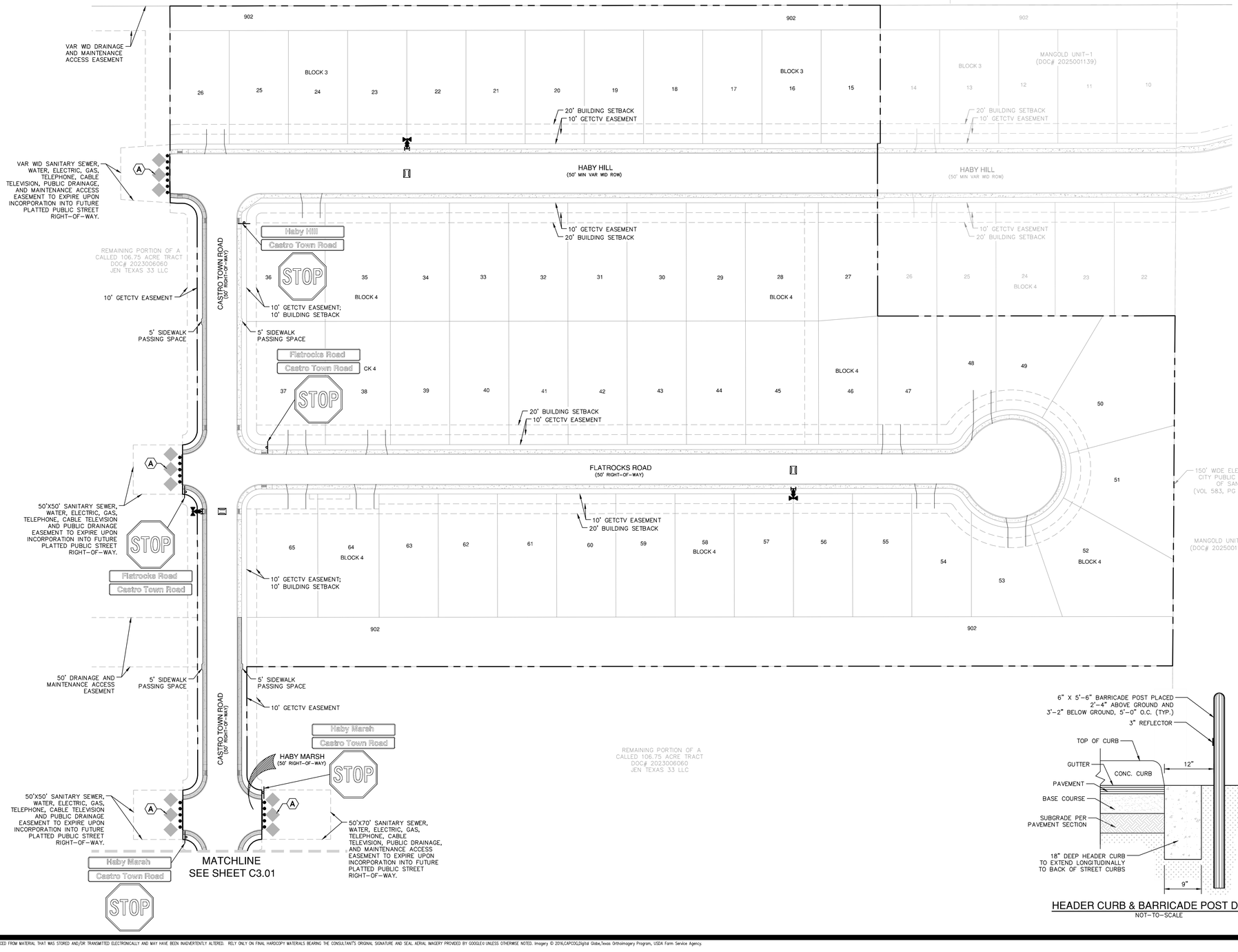
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

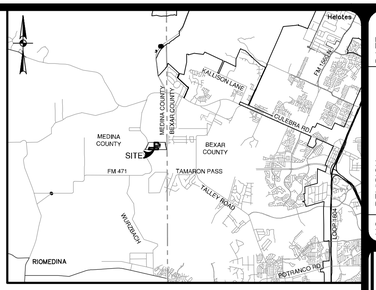
STREET DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C2.08

Date: Dec 01, 2025, 2:26pm User ID: clafrer
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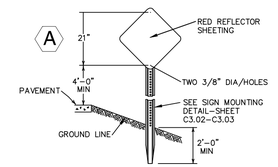




LOCATION MAP
NOT-TO-SCALE

SCALE: 1"= 50'
0' 50' 100' 150'

SYMBOL		ITEM NUMBER
	UNIT BOUNDARY	
	CURB INLET	
	PROPOSED DRIVEWAY	
	SIDEWALK (HOMEBUILDER RESPONSIBILITY)	
	SIDEWALK (SITEWORK CONTRACTOR RESPONSIBILITY)	
	TYPE II BLUE RAISED PAVEMENT MARKERS – NO SEPARATE PAY ITEM (N.T.S.)	
	END OF ROAD MARKER OM4-3	
	HEADER CURB W/ BARRICADE POSTS	
Street Name	STREET SIGN	531.57
STOP	R1-1 30"X30"	531.3



UNITS MOUNTED ON 0.080" THICK SHEET ALUMINUM CONFORMING WITH ASTM B-209 ALLOY 6061-T6.

TYPE 4 OM4-3
18" x 18"

OBJECT MARKER TYPE 4
NOT-TO-SCALE

HEADER CURB & BARRICADE POST DETAIL
NOT-TO-SCALE

DRIVEWAY NOTE:
DRIVEWAYS SHOWN ON THIS PLAN ARE FOR THE SOLE PURPOSE OF INDICATING A POTENTIAL CONFLICT WITH CURB RAMP, DRAINAGE INFRASTRUCTURE, OR OTHER CONFLICT. DRIVEWAY LOCATION IS SUBJECT TO CHANGE BASED ON HOME SELECTION AND FINAL LOT DESIGN.

TRENCH EXCAVATION SAFETY PROTECTION:
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NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
12/1/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

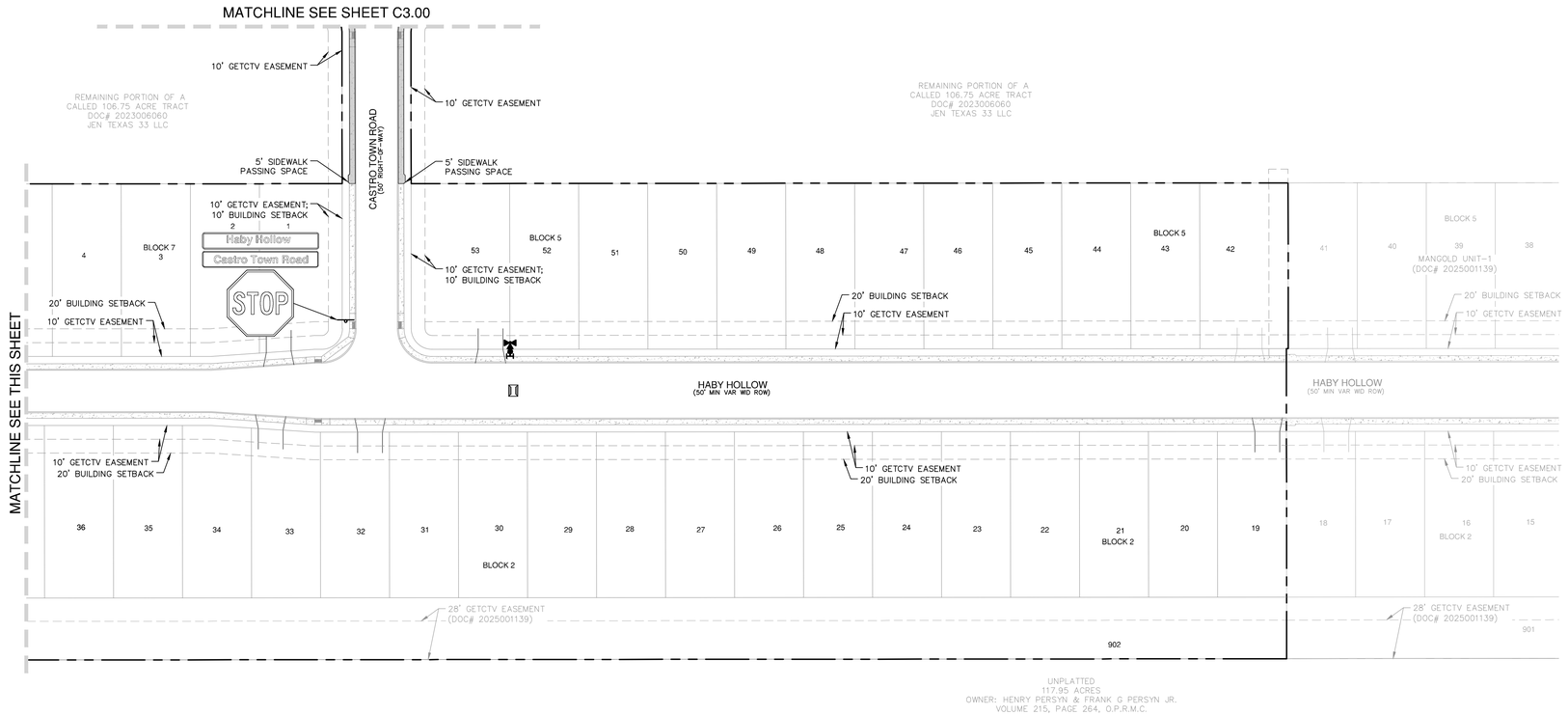
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

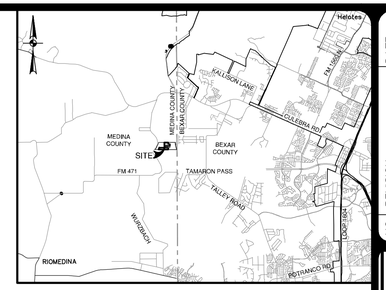
OVERALL SIGNAGE PLAN

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C3.00

Date: Dec 01, 2025, 2:27pm User ID: clodher
File: P:\125\37\12\Design\Civil\SS 125712.dwg

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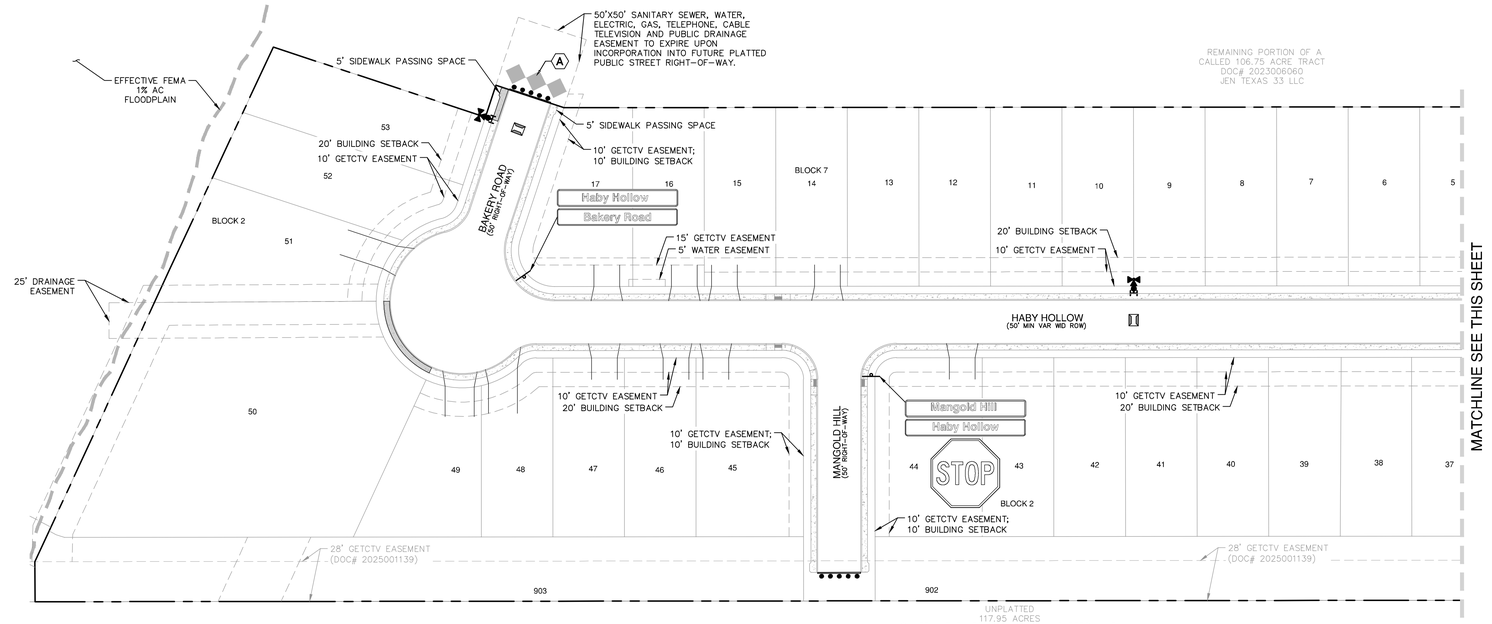


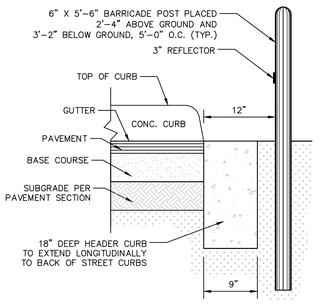


LOCATION MAP
NOT-TO-SCALE

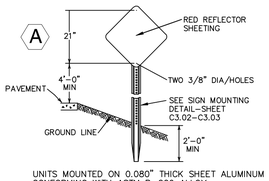
SCALE: 1"= 50'
0' 50' 100' 150'

SYMBOL		ITEM NUMBER
	UNIT BOUNDARY	
	CURB INLET	
	PROPOSED DRIVEWAY	
	SIDEWALK (HOMEBUILDER RESPONSIBILITY)	
	SIDEWALK (SITEWORK CONTRACTOR RESPONSIBILITY)	
	TYPE II BLUE RAISED PAVEMENT MARKERS – NO SEPARATE PAY ITEM (N.T.S.)	
	END OF ROAD MARKER OM4-3	
	HEADER CURB W/ BARRICADE POSTS	
Street Name	STREET SIGN	531.57
STOP	R1-1 30"X30"	531.3





HEADER CURB & BARRICADE POST DETAIL
NOT-TO-SCALE



UNITS MOUNTED ON 0.080" THICK SHEET ALUMINUM CONFORMING WITH ASTM B-209 ALLOY 6061-T6.

TYPE 4 OM4-3
18" x 18"

OBJECT MARKER TYPE 4
NOT-TO-SCALE

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

OVERALL SIGNAGE PLAN

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C3.01

Date: Dec 01, 2025, 2:27pm User ID: clodner
File: P:\125\37\12\Design\Civil\SS 125712.dwg

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DATE: FILE:

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

Post Type

FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
TWT = Thin-Walled Tubing (see SMD(TWT))
10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
SR0 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

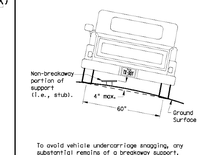
Anchor Type

UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
WS = Wedge Anchor Steel - (see SMD(TWT))
WP = Wedge Anchor Plastic (see SMD(TWT))
SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

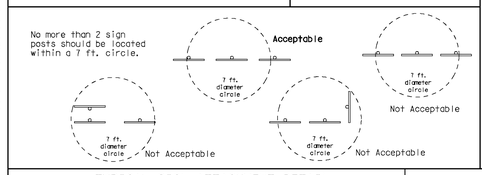
Sign Mounting Designation

P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
IF REQUIRED:
TEXT or (EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
BW = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
WC = 1.12 M/M Wing Channel (see SMD(SLIP-1) to (SLIP-3))
EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT

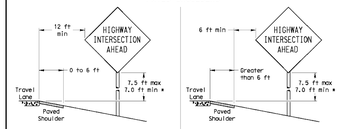


To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).



SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.

GREATER THAN 6 FT. WIDE

When the shoulder is greater than 6 ft in width, the sign must be placed at least 6 ft. from the edge of the shoulder.

BEHIND BARRIER

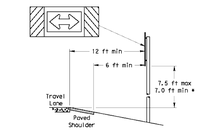


BEHIND GUARDRAIL

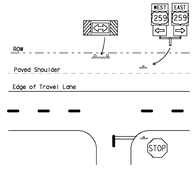
BEHIND CONCRETE BARRIER

**Sign clearance based on distance required for proper guard rail or concrete barrier performance.

T-INTERSECTION



When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



* Signs shall be mounted using the following condition that results in the greatest sign elevation:

(1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or

(2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.

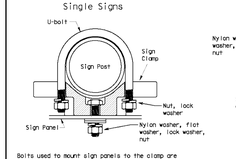
The maximum values may be increased when directed by the Engineer.

See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.

The website address is:
http://www.txdot.gov/publications/traffic.htm

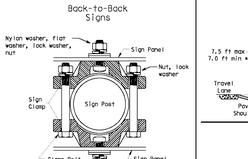
TYPICAL SIGN ATTACHMENT DETAIL

Single Signs



Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

Back-to-Back Signs

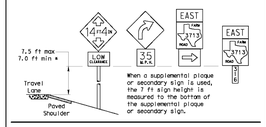


When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 with nut and helical-spring lock washer. The approximate bolt lengths for various post sizes and sign clamp types are given in the table at right. The bolt length may need to be adjusted depending upon field conditions.

Sign clamps may be either the specific size clamp or the universal clamp.

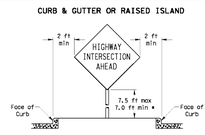
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES



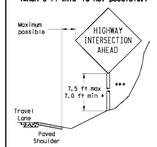
When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a lateral restriction prevents the minimum horizontal clearance from the edge of the travel lane, signs should be placed as far from the travel lane as practical.

*** Post may be shorter if protected by guardrail or if Engineer determines the post could not be hit due to extreme slope.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

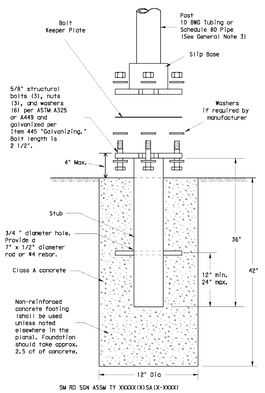
© TxDOT July 2022 REVISIONS	9-08		DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
			FED.RD. DIV.NO.		STATE	
			6			
			CONT.	SECT.	JOB	HIGHWAY
			DISTRICT		COUNTY	
			SHEET No.			

264

DATE: FILE:

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TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. http://www.txdot.gov/business/producer_list.htm The devices shall be installed per manufacturers' recommendations. Installation procedures shall be provided to the Engineer by Contractor.

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" outside diameter)
   0.134" nominal wall thickness
   Seamless or electric-resistance welded steel tubing or pipe
   Steel shall be HSLAS GF 55 per ASTM A1011 or ASTM A1008
   Other steels may be used if they meet the followings:
   55,000 PSI minimum yield strength
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
   Galvanization per ASTM A123 or ASTM A653 G210. For precasted steel tubing (ASTM A653), recoat tube outside diameter weld seam by retrail2ng with zinc wire per ASTM B833.
   Schedule 80 Pipe (2.875" outside diameter)
   0.276" nominal wall thickness
   Steel tubing per ASTM A500 Gr C
   Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the followings:
   46,000 PSI minimum yield strength
   62,000 PSI minimum tensile strength
   21% minimum elongation in 2"
   Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
   Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
   Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is:
   http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation

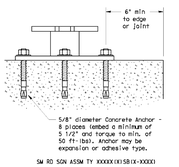
1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe and of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the traveleay (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the traveleay. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

CONCRETE ANCHOR



SM RD SGN ASSM TY XXXXX(X)SB(X-XXXX)

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per SMG-6100, "Epoxies and Adhesives." Adhesive anchors may be loaded after adequate epoxy cure time per the manufacturer's recommendations. Top of bolt shall extend at least flush with top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete with a 5 1/2" minimum embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

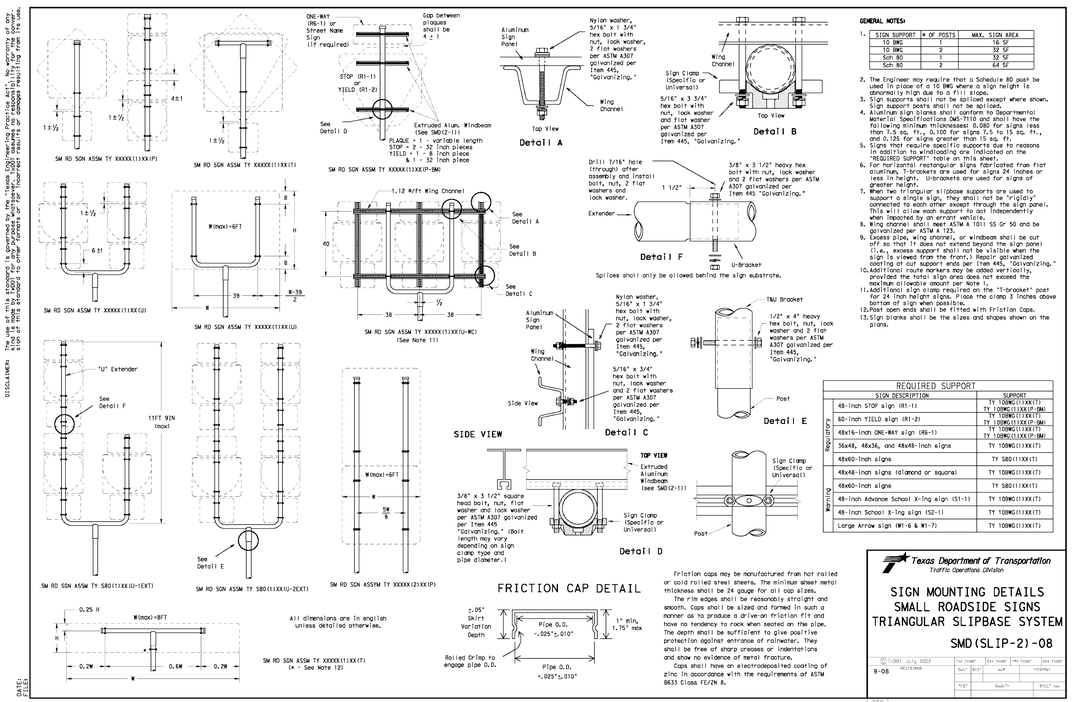
SMD(SLIP-1)-08

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			FED.RD. DIV.NO.		STATE	
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			CONT.	SECT.	JOB	HIGHWAY
			DISTRICT		COUNTY	
			SHEET No.			

263

DATE: FILE:

DISCLAIMER: The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by the Texas Department of Transportation for any purpose whatsoever. The Texas Department of Transportation assumes no responsibility for errors or omissions that may appear in other standards or for incorrect results or damages resulting from its use.



GENERAL NOTES:

1. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
2. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
3. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
4. Signs fabricated from rectangular sheets fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
5. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
6. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
7. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
8. Additional sign clamps may be added vertically. Additional sign clamps may not exceed the maximum allowable amount per Note 7.
9. Additional sign clamp required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
10. Post open ends shall be fitted with friction Caps.
11. Sign blanks shall be the sizes and shapes shown on the plans.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY SB0(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY SB0(1)XX(T)
	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

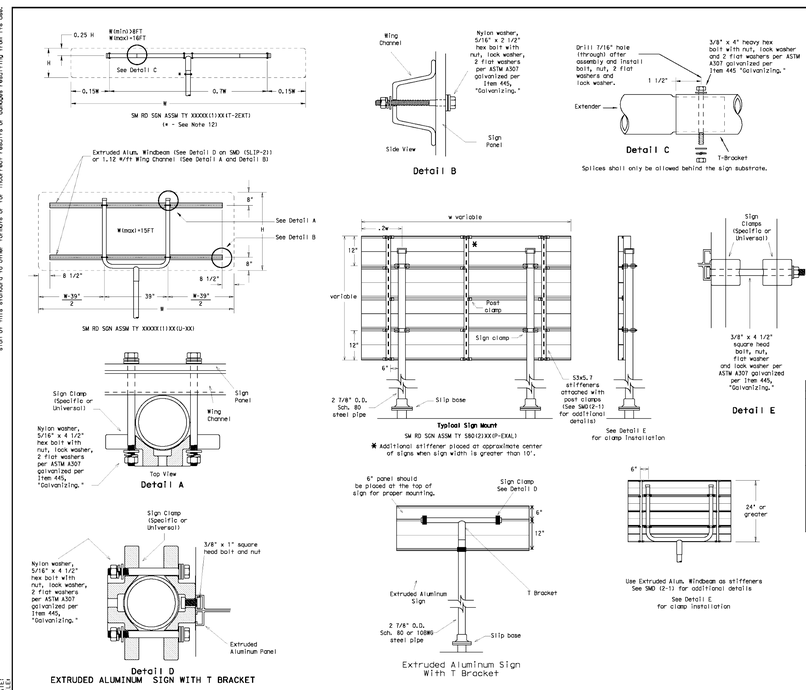
Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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			DISTRICT		COUNTY	
			SHEET No.			

262



GENERAL NOTES:

1. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
2. The Engineer may require that a Schedule 80 post be used in place of a 10 BWG where a sign height is abnormally high due to a fill slope.
3. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
4. Aluminum sign blanks shall conform to Departmental Material Specifications DMS-7110 and shall have the following minimum thicknesses: 0.080 for signs less than 7.5 sq. ft., 0.100 for signs 7.5 to 15 sq. ft., and 0.125 for signs greater than 15 sq. ft.
5. Signs that require specific supports due to reasons in addition to windloading are indicated on the "REQUIRED SUPPORT" table on this sheet.
6. Signs fabricated from rectangular sheets fabricated from flat aluminum, T-brackets are used for signs 24 inches or less in height. U-brackets are used for signs of greater height.
7. When two triangular slipbase supports are used to support a single sign, they shall not be "rigidly" connected to each other except through the sign panel. This will allow each support to act independently when impacted by an errant vehicle.
8. Wing channel shall meet ASTM A 1011 SS Gr 50 and be galvanized per ASTM A 123.
9. Excess pipe, wing channel, or windbeam shall be cut off so that it does not extend beyond the sign panel (i.e., excess support shall not be visible when the sign is viewed from the front.) Repair galvanized coating at cut support ends per Item 445, "Galvanizing."
10. Sign blanks shall be the sizes and shapes shown on the plans.
11. Additional sign clamps required on the "T-bracket" post for 24 inch height signs. Place the clamp 3 inches above bottom of sign when possible.
12. Post open ends shall be fitted with friction Caps.

REQUIRED SUPPORT		
	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW)
	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BW)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY SB0(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
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	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

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			DISTRICT		COUNTY	
			SHEET No.			

265

NO. | REVISION | DATE

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX. 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

OVERALL SIGNAGE DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE APRIL 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C3.02

Date: Apr 10, 2025, 10:04am User ID: jsamora
File: P:\125\37\12\Design\Civil\SGD1 1253712.dwg

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GENERAL NOTES

1.) THE EXISTING SIGNS LOCATED ON THE JOBSITE ARE THE PROPERTY OF THE CITY OF SAN ANTONIO. THROUGHOUT THE PERIOD OF THE CONTRACT, THE CONTRACTOR SHALL PROTECT THESE SIGNS SUCH THAT THEY ARE NOT DAMAGED IN THE COURSE OF CONSTRUCTION ACTIVITY. SUCH PROTECTION SHALL INCLUDE THE PERIOD AFTER SIGNS ARE REMOVED FROM INSTALLATION AND STORED BY THE CONTRACTOR OR DELIVERED TO TRAFFIC OPERATIONS. THE ASSISTANT TRAFFIC SUPERINTENDENT (207-7765) MUST BE NOTIFIED 48 HOURS IN ADVANCE PRIOR TO DELIVERY.

2.) AFTER SIGNS ARE REMOVED FROM INSTALLATION AND ARE BEING STORED BY THE CONTRACTOR, THE CONTRACTOR SHALL CONTACT THE TRAFFIC OPERATIONS SECTION OF THE PUBLIC WORKS DEPARTMENT (207-7765) AND ARRANGE FOR A CONVENIENT TIME TO DELIVER CITY SIGNS AND POLES.

3.) PRIOR TO THE START OF CONSTRUCTION, ALL EXISTING SIGNS WITHIN THE AREA OF CONSTRUCTION WILL BE INVENTORIED AND DOCUMENTED JOINTLY BY THE TRAFFIC ENGINEERING (207-7720) CONSTRUCTION INSPECTION AND THE CONTRACTOR. THIS DOCUMENT WILL BE JOINTLY SIGNED BY BOTH PARTIES REFLECTING THE SIGN TYPE, SIGN SIZE, SIGN CONDITION, SIGN LOCATION, REFLECTIVITY ADEQUACY, ETC. THE CONTRACTOR IS HELD ACCOUNTABLE FOR THESE SIGNS THROUGHOUT THE PROJECT AND AT THE PROJECTS COMPLETION.

4.) ALL GROUND MOUNTED SHALL USE HIGH INTENSITY REFLECTIVE SHEETING.

5.) ALL OVERHEAD SIGNS SHALL USE DIAMOND GRADE REFLECTIVE SHEETING.

6.) ALL BLANKS TO BE ALUMINUM ALLOY NO. 5052-H38.

7.) "T" DENOTES THICKNESS OF SIGN BLANKS.

8.) ALL HOLES SHALL BE 3/8 " DIAMETER DRILLED OR PUNCHED AS SHOWN ON EACH BLANK DETAIL AND SHALL BE FREE OF BURRS AND/OR ROUGH EDGES.

9.) SIGN BLANK CORNERS TO BE ROUNDED AS SHOWN ON EACH DETAIL.

10.) ALL SIGN BLANK TO BE ETCHED, DEGREASED, AND HAVE AN ALODINE FINISH PRIOR TO APPLICATION OF LEGENDS.

11.) ALL DETAILS ARE NOT TO SCALE.

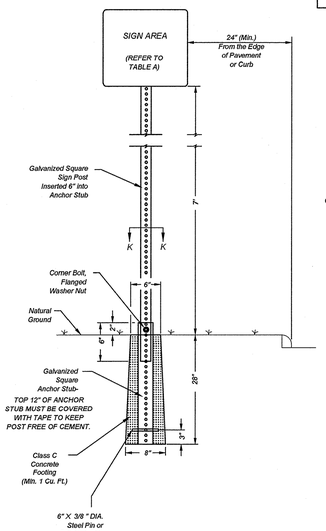
12.) ALL DIMENSIONS ARE IN INCHES.

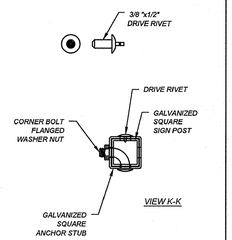
13.) ALL SIGNS SHALL BE MANUFACTURED AND INSTALLED IN CONFORMANCE TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVISES AND STANDARD HIGHWAY SIGNS (FHWA) LATEST EDITION.

14.) REINSTALLATION OF PREVIOUSLY EXISTING SIGNS, WHERE REQUIRED BY THE CITY TRAFFIC ENGINEER, SHALL BE AT THE CONTRACTOR'S EXPENSE.

TYPICAL GROUND SIGN INSTALLATION

TYPE "U" MOUNT
PERFORATED SQUARE METAL TUBING (DRIVEABLE)





METAL TUBING	SIGN AREA	
	< 10 SQ. FT.	> 10 SQ. FT.
GALVANIZED SQUARE SIGN POST (Perforated)	1-3/4" x 1-3/4" (14 Guage)	2" x 2" (12 Guage)
GALVANIZED SQUARE ANCHOR STUB (Perforated)	2" X 2" (14 Guage)	2-1/4" x 2-1/4" (14 Guage)

TABLE A

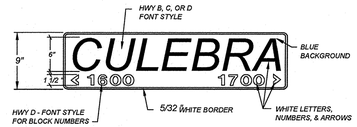
NO.	REVISION	BY:	DATE:
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CITY OF SAN ANTONIO
TRAFFIC ENGINEERING DIVISION
DEPARTMENT OF PUBLIC WORKS

TRAFFIC SIGN STANDARDS
GENERAL NOTES AND GROUND SIGN MOUNTING
TE-SGN(1)-06

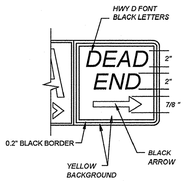
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DRWN:FG	APVD:ENM	DATE: 2.6.06		1 OF 4
RVSD:	APVD:	DATE:		SCALE: NOT TO SCALE

THE ORIGINAL OF THIS DRAWING WAS SIGNED AND SEALED BY EDWARD N. MERY, P.E., # 58698 ON 02.06.06 AND IS ON FILE WITH THE TRAFFIC ENGINEERING DIVISION OF THE PUBLIC WORKS DEPARTMENT, CITY OF SAN ANTONIO.



9" D3 - STREET NAME SIGN





NEW 9" D3 w/ DEAD END OR NO OUTLET SIGNAGE

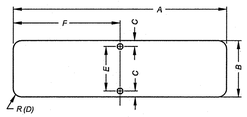
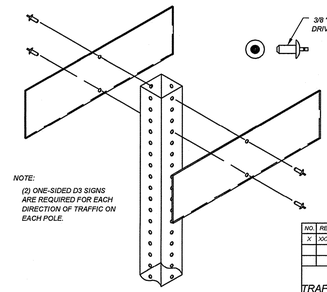


TABLE - D3 SIGNS

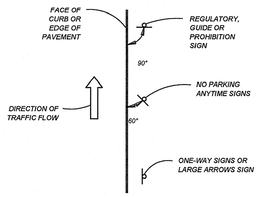
A	B	C	D	E	F	T
24"	9"	1/2"	3/4"	8"	12"	0.125"
30"	9"	1/2"	3/4"	8"	15"	0.125"
36"	9"	1/2"	3/4"	8"	18"	0.125"
42"	9"	1/2"	3/4"	8"	21"	0.125"
48"	9"	1/2"	3/4"	8"	24"	0.125"
54"	9"	1/2"	3/4"	8"	27"	0.125"

NOTE: A 30" LONG OR GREATER PLATE SHALL BE USED WHEN A "DEAD END" OR "NO OUTLET" SUPPLEMENT IS REQUIRED.



D3 SIGN TO POLE INSTALLATION

HEIGHT	9" (228 mm)
LENGTH	24" (600mm) MIN. 54 (1350mm) MAX. 6" (150mm) INCREMENTS OF LENGTH
THICKNESS	0.125" (3mm)
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209) GOLD CHROMATE FINISH
SIGN FACE MATERIALS	BLUE FILM OVER HIGH INTENSITY FP-85, SECTION 718 AND L-S-300C
LEGENDS AND SYMBOLS	SERIES D (USUAL) SERIES C OR B FOR MAXIMUM LENGTH SIGN BLANK, IF NECESSARY
COLOR	WHITE LEGEND ON BLUE BACKGROUND
LETTER TRACKING	10%



TYPICAL GROUND MOUNTED SIGN PLACEMENT

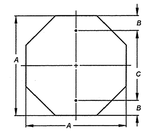
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NO.	REVISION	BY:	DATE:
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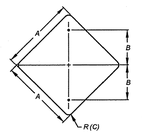
CITY OF SAN ANTONIO
TRAFFIC ENGINEERING DIVISION
DEPARTMENT OF PUBLIC WORKS

TRAFFIC SIGN STANDARDS
D3 STREET NAME SIGN AND SIGN MOUNTING
TE-SGN(2)-06

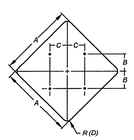
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DRWN:FG	APVD:ENM	DATE: 2.6.06		2 OF 4
RVSD:	APVD:	DATE:		SCALE: NOT TO SCALE



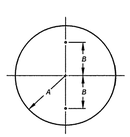
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30	3	24	0.080
36	3	30	0.100



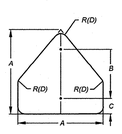
A	B	C	T
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24	12	1 1/2	0.080
30	15	1 7/8	0.080
36	18	2 1/4	0.100



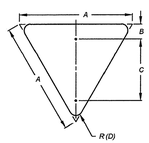
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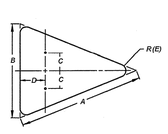
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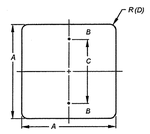
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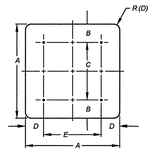
A	B	C	D	T
36	2	24	2	0.100



A	B	C	D	E	T
40	30	1 1/2	12	1 7/8	0.100
48	36	9	15	2 1/4	0.100

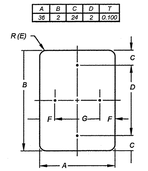


A	B	C	D	T
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24	3	18	1 1/2	0.080
30	3	24	1 7/8	0.080

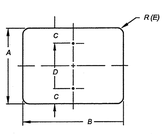


A	B	C	D	E	F	T
48	6	36	9	30	3	0.100

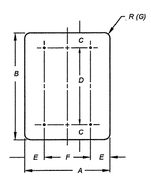
THE ORIGINAL OF THIS DRAWING WAS SIGNED AND SEALED BY EDWARD N. MERY, P.E., # 58698 ON 02.06.06 AND IS ON FILE WITH THE TRAFFIC ENGINEERING DIVISION OF THE PUBLIC WORKS DEPARTMENT, CITY OF SAN ANTONIO.



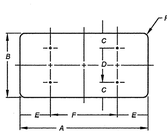
A	B	C	D	E	F	G	T
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12	36	3	30	1 1/2	1 1/2	9	0.080
18	24	1 1/2	21	1 1/2	1 1/2	15	0.080
24	30	3	24	1 1/2	3	18	0.080
24	36	3	30	1 1/2	3	18	0.080
24	48	6	36	1 7/8	3	18	0.080
30	36	3	30	1 7/8	3	24	0.080



A	B	C	D	E	T
6	12	1	4	1/4	0.080
5	18	1	4	1/4	0.080
20	36	1 1/2	17	1 1/2	0.080



A	B	C	D	E	F	G	T
5	7 3/4	1/2	5 3/4	1/2	4	1/4	0.100
48	60	6	48	9	30	3	0.100



A	B	C	D	E	F	G	T
48	24	2	20	2	44	1 7/8	0.100
48	30	3	30	3	42	2 1/4	0.100
60	24	2	20	2	56	1 1/2	0.100
60	36	3	30	3	54	2 1/4	0.100
48	30	3	24	3	42	1 7/8	0.100
60	30	3	24	3	54	1 7/8	0.100

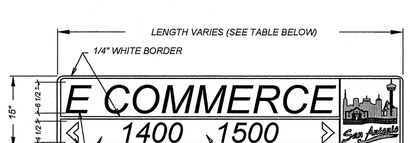
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NO.	REVISION	BY:	DATE:
X	XXX	X	XXX

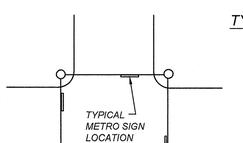
CITY OF SAN ANTONIO
TRAFFIC ENGINEERING DIVISION
DEPARTMENT OF PUBLIC WORKS

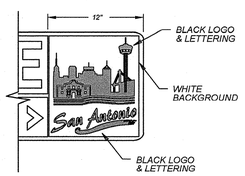
TRAFFIC SIGN STANDARDS
GROUND MOUNTED SIGN SIZES
TE-SGN(3)-06

DSND:ENM	APVD:JDF	DATE: 1.30.06		SHT. NO.
DRWN:FG	APVD:ENM	DATE: 2.6.06		3 OF 4
RVSD:	APVD:	DATE:		SCALE: NOT TO SCALE



15" METRO - STREET NAME SIGNS



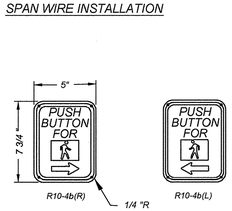


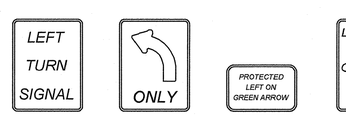
15" METRO w/ CITY SKY LINE

HEIGHT	15" (381 mm)
LENGTH	48" (1200 mm) MIN. 72" (1800 mm) MAX.** 1" (300mm) INCREMENTS OF LENGTH
THICKNESS	0.125" (3mm)
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209) GOLD CHROMATE FINISH
SIGN FACE MATERIALS	BLUE FILM OVER DIAMOND GRADE FP-85, SECTION 718 AND L-S-300C
LEGENDS AND SYMBOLS	SERIES D (USUAL) SERIES C OR B FOR MAXIMUM LENGTH SIGN BLANK, IF NECESSARY
COLOR	WHITE LEGEND ON BLUE BACKGROUND
LETTER TRACKING	17% (USUAL) 10% (MIN.)

** SIGN PLATE LONGER THAN 72" MUST BE APPROVED BY THE CITY TRAFFIC ENGINEER

* DIAMOND GRADE SHEETING 5052-H38 ALUMINUM SUBSTRATE





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NO.	REVISION	BY:	DATE:
X	XXX	X	X

CITY OF SAN ANTONIO
TRAFFIC ENGINEERING DIVISION
DEPARTMENT OF PUBLIC WORKS

TRAFFIC SIGN STANDARDS
METRO STREET NAME SIGN AND SIGN PLACEMENT
TE-SGN(4)-06

DSND:ENM	APVD:JDF	DATE: 1.30.06		SHT. NO.
DRWN:FG	APVD:ENM	DATE: 2.6.06		4 OF 4
RVSD:	APVD:	DATE:		SCALE: NOT TO SCALE

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

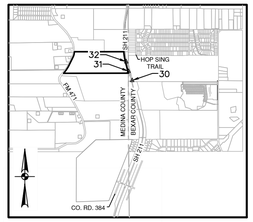
MANGOLD UNIT-2
SAN ANTONIO, TEXAS
OVERALL SIGNAGE DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE APRIL 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C3.03

Date: Apr 10, 2025, 10:04am User ID: jsamora
File: P:\125\37\12\Design\Civil\SGD1 1253712.dwg

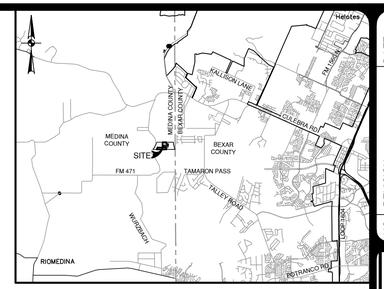
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BENCHMARK CONTROL POINTS				
Point #	Northing	Easting	Elevation	Full Description
30	13,729,104.61	2,030,988.18	988.66	SET MAG NAIL (TRAV)
31	13,729,665.57	2,030,773.39	991.90	SET I.R. REDCAP (TRAV)
32	13,730,246.91	2,030,623.82	994.69	SET I.R. REDCAP (TRAV)



BENCHMARK LOCATION MAP

NOT-TO-SCALE



LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SEWER LEGEND

PROJECT LIMITS

EXISTING WATER — W

EXISTING SEWER — SS — MANHOLE

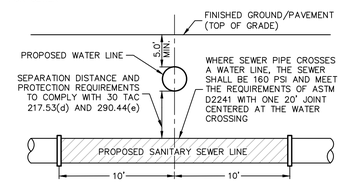
PROPOSED SEWER — S

PROPOSED WATER — FIRE HYDRANT — W

PROPOSED SEWER LATERAL — S

PROPOSED SEWER LATERAL TO TIE INTO EXISTING SEWER MANHOLE — S

FINISHED FLOOR ELEVATION FOR SEWER — FF = XXXX.XX



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

FINISHED FLOOR NOTES:

1. THE FINISHED FLOOR ELEVATIONS (FF) REPRESENT THE MINIMUM POSSIBLE FLOOR ELEVATION TO PROVIDE SANITARY SEWER SERVICE TO EACH LOT. ACTUAL FINISHED FLOOR ELEVATIONS FOR EACH LOT ARE TO BE DETERMINED BY THE BUILDER AND SHALL TAKE INTO CONSIDERATION AS-BUILT CONDITIONS FOR FOUND SEWER SERVICES AND ACTUAL LATERAL PLACEMENT. IT IS THE BUILDER'S SOLE RESPONSIBILITY TO DETERMINE ACTUAL FINISHED FLOOR ELEVATIONS FOR EACH LOT PRIOR TO THE START OF HOME FOUNDATION CONSTRUCTION TAKING INTO CONSIDERATION SITE DRAINAGE, STREET ACCESS AND SANITARY SEWER SERVICE ELEVATIONS.

2. THE MINIMUM SANITARY SEWER LATERAL GRADES WERE BASED UPON THE MINIMUM FINISHED FLOOR ELEVATIONS FOR THE LOTS LOCATED ON THE DOWNHILL SIDES OF THE PROPOSED ROADWAYS.

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 ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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!!

CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

SEWER (MEDIO - FAR WEST SEWERSHED - MEDIO CREEK WRC)

Developer's Name: JEN TEXAS 33 LLC

Address: 8023 VANTAGE DRIVE, SUITE 220

City: SAN ANTONIO State: TEXAS ZIP: 78230

Phone# 210-849-1447 FAX#

SAWS Block Map# 064-600 Total EDU's 114 Total Acreage 28.28

Total Linear Footage of Pipe: 4,115 LF-8" PVC Plat No. 25-11800082

Number of Lots 114 SAWS JOB NO. 25-1537

NO.	REVISION	DATE
1	REMOVED IRRIGATION METER	09/26/24

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
12/5/25

PAPE-DAWSON
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

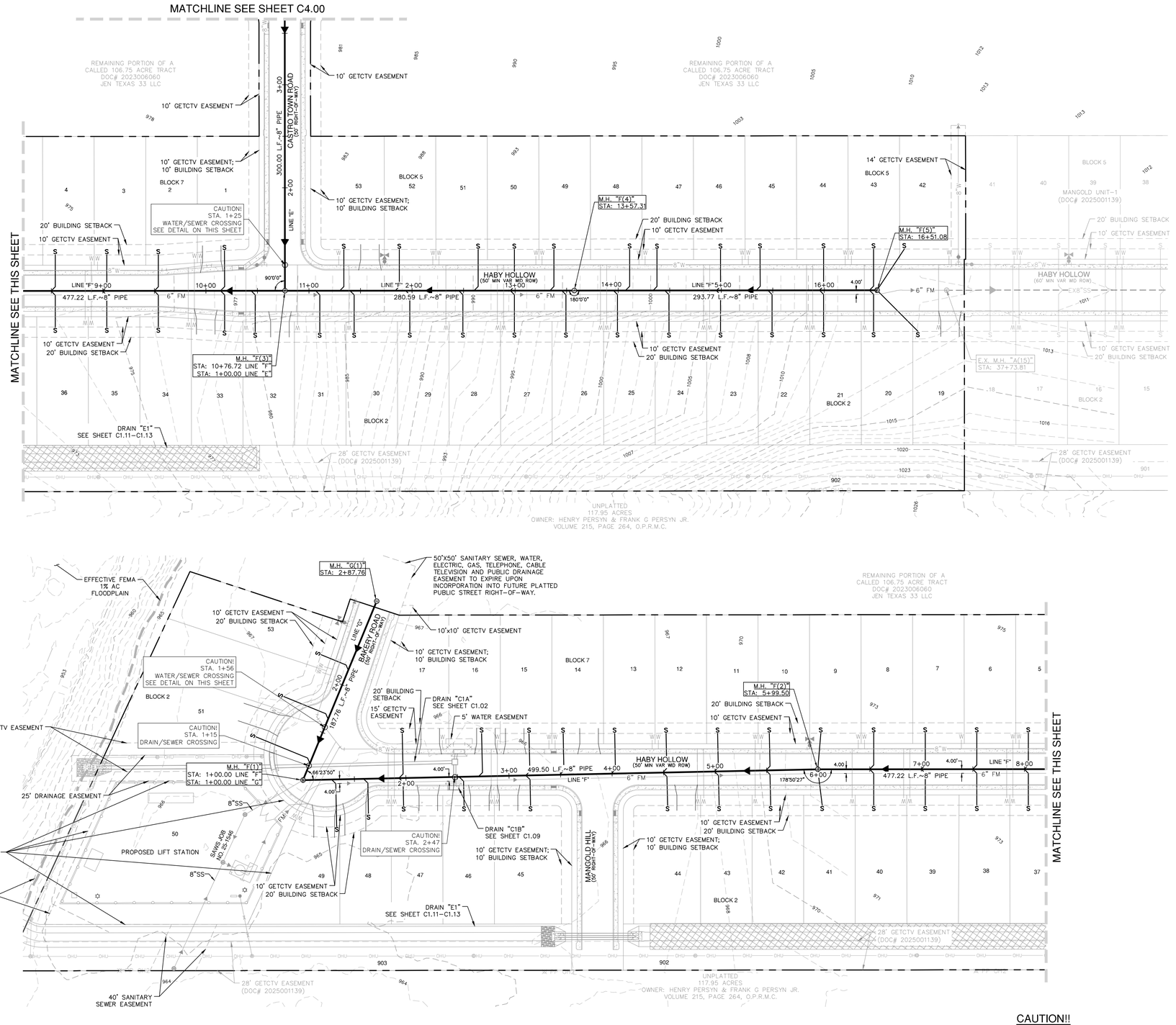
OVERALL SANITARY SEWER PLAN

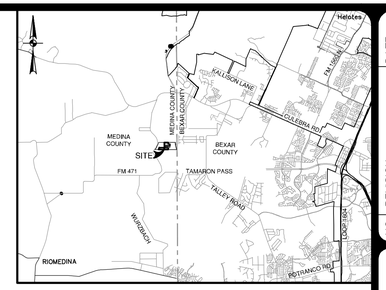
PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.00

MATCHLINE SEE SHEET C4.01

Date: Dec 05, 2025, 2:37pm User ID: clafrer
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LOCATION MAP

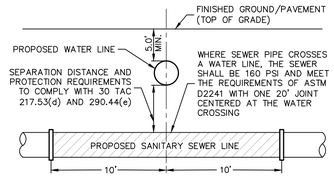
NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SEWER LEGEND

- PROJECT LIMITS
- EXISTING WATER
- EXISTING SEWER
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED SEWER LATERAL
- PROPOSED SEWER LATERAL TO TIE INTO EXISTING SEWER MANHOLE
- FINISHED FLOOR ELEVATION FOR SEWER (FF = XXXX.XX)



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

FINISHED FLOOR NOTES:

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SEWER (MEDIO - FAR WEST SEWERSHED - MEDIO CREEK WRC)

Developer's Name: JEN TEXAS 33 LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's 114 Total Acreage 28.28
Total Linear Footage of Pipe: 4,115 LF-8" PVC Plat No. 25-11800082
Number of Lots 114 SAWS JOB NO. 25-1537

NO.	REVISION	DATE

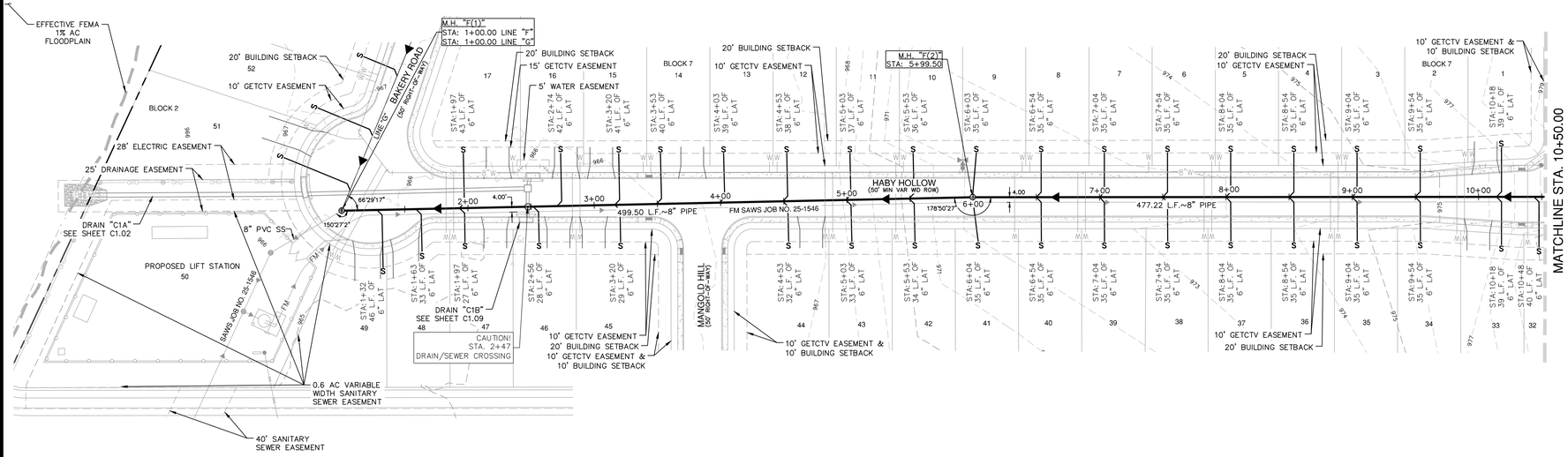
STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
1/12/26

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS
OVERALL SANITARY SEWER PLAN

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.01

Date: Jan 12, 2026, 10:43am User ID: clodner
File: P:\125\37\12\Design\Civil\OSS 125712.dwg
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SCALE: 1"= 50'

0' 50' 100' 150'

SEWER LEGEND

- PROJECT LIMITS
- EXISTING WATER
- EXISTING SEWER
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED SEWER LATERAL
- FINISHED FLOOR ELEVATION FOR SEWER

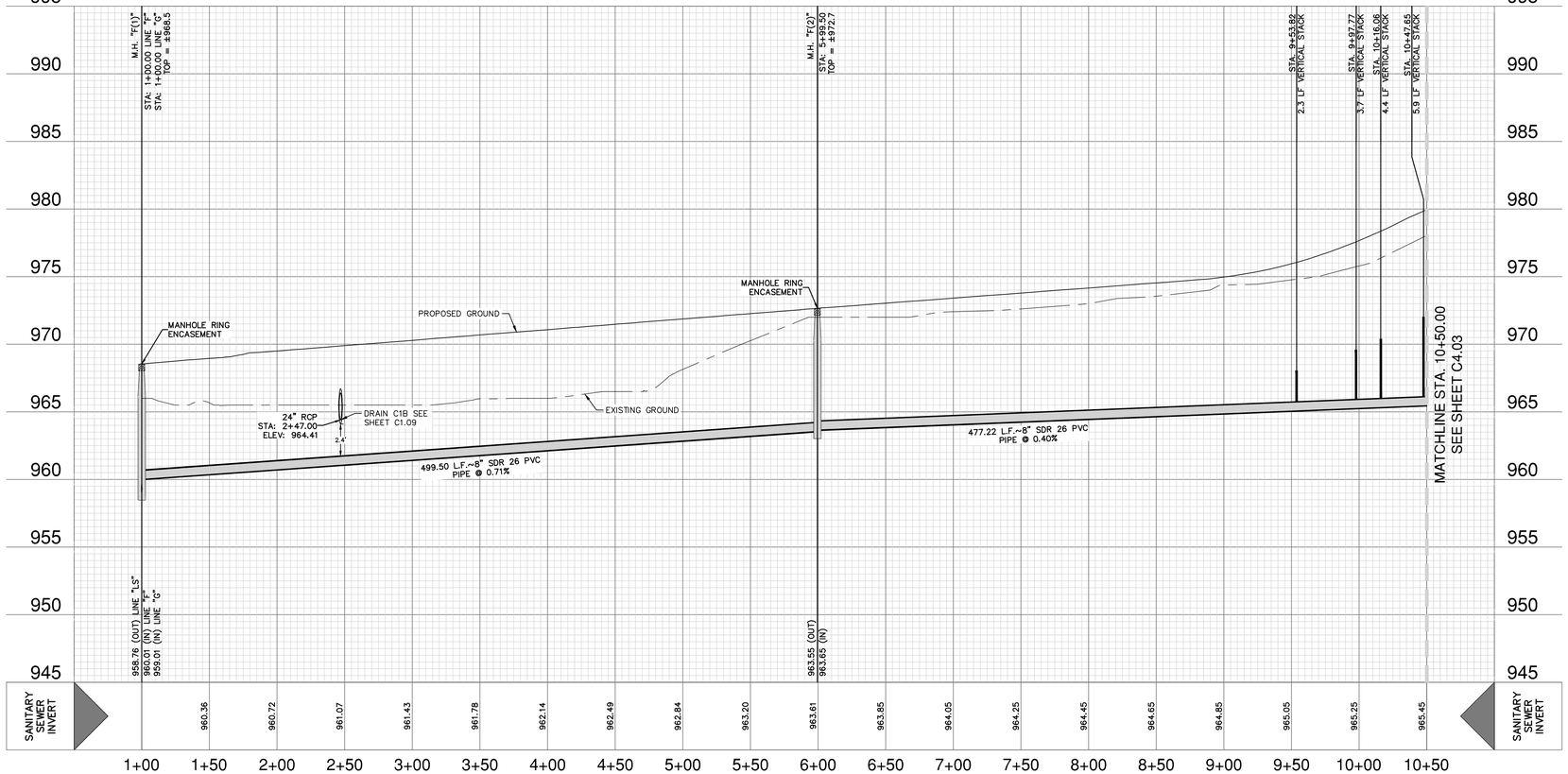
MANHOLE

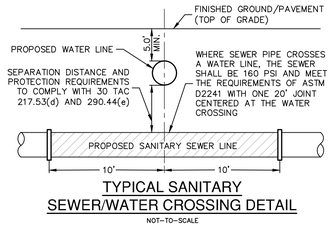
FIRE HYDRANT

FF = XXXX.XX

SANITARY SEWER LINE "F"
STA. 1+00.00 TO 10+50.00

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





TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

CAUTION!!

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SEWER (MEDIO - FAR WEST SEWERSHED - MEDIO CREEK WRC)

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Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's 114 Total Acreage 28.28
Total Linear Footage of Pipe: 4,115 LF-8" PVC Plat No. 25-11800082
Number of Lots 114 SAWS JOB NO. 25-1537

NO. REVISION | DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
1/12/26

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

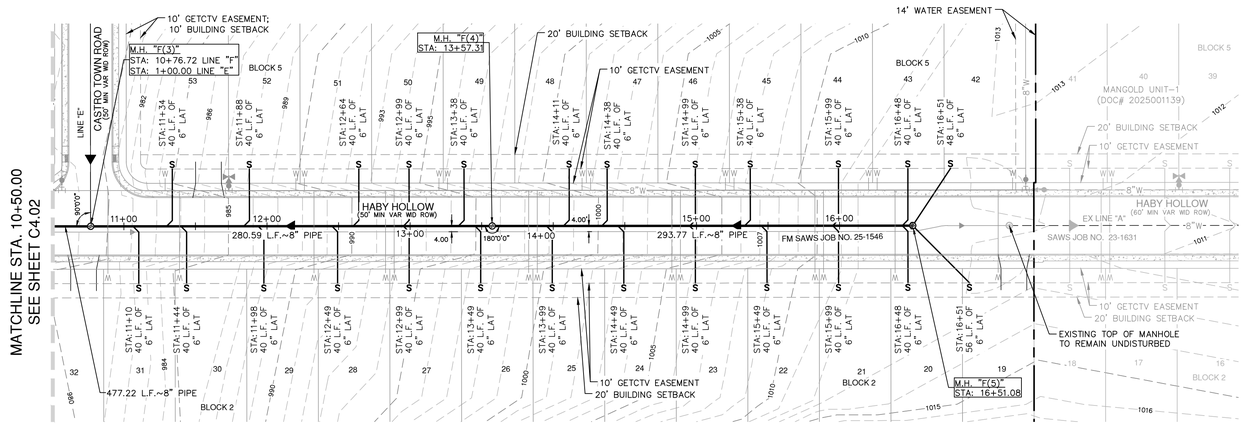
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

SANITARY SEWER LINE 'F' PLAT & PROFILE
STA. 1+00.00 TO 11+00.00

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.02

Date: Jan 12, 2026, 10:44am User ID: clafler
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SCALE: 1"= 50'

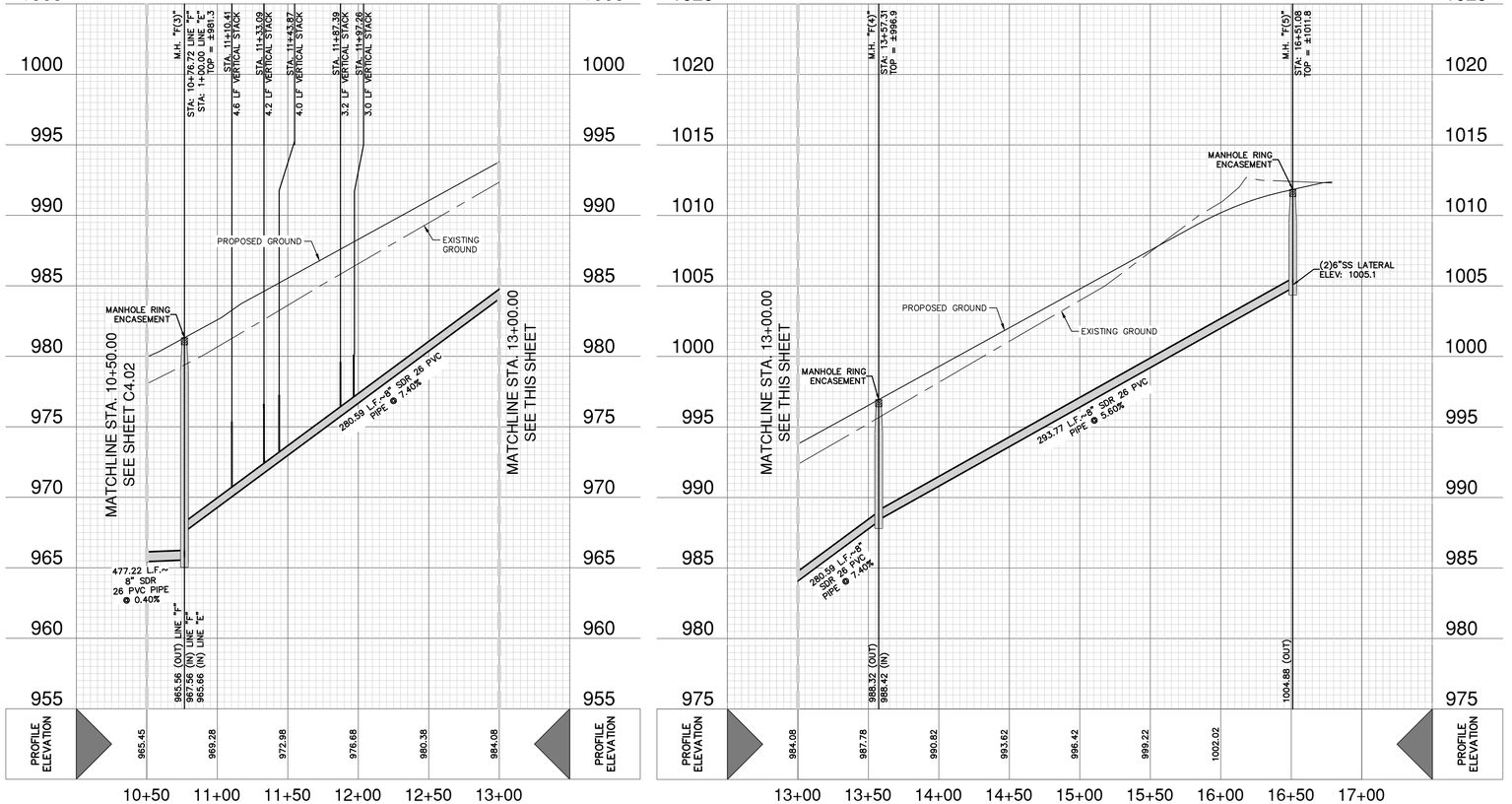
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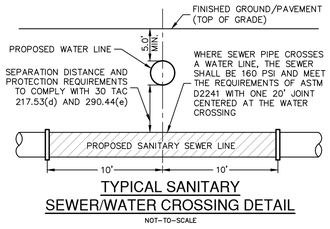
SEWER LEGEND

- PROJECT LIMITS
- EXISTING WATER
- EXISTING SEWER
- PROPOSED SEWER
- MANHOLE
- PROPOSED WATER
- FIRE HYDRANT
- PROPOSED SEWER LATERAL
- FINISHED FLOOR ELEVATION FOR SEWER (FF = XXXX.XX)

SANITARY SEWER LINE "F"
STA. 10+50.00 TO END

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





TYPICAL SANITARY
SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE

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Bruna Spengler
12/5/25

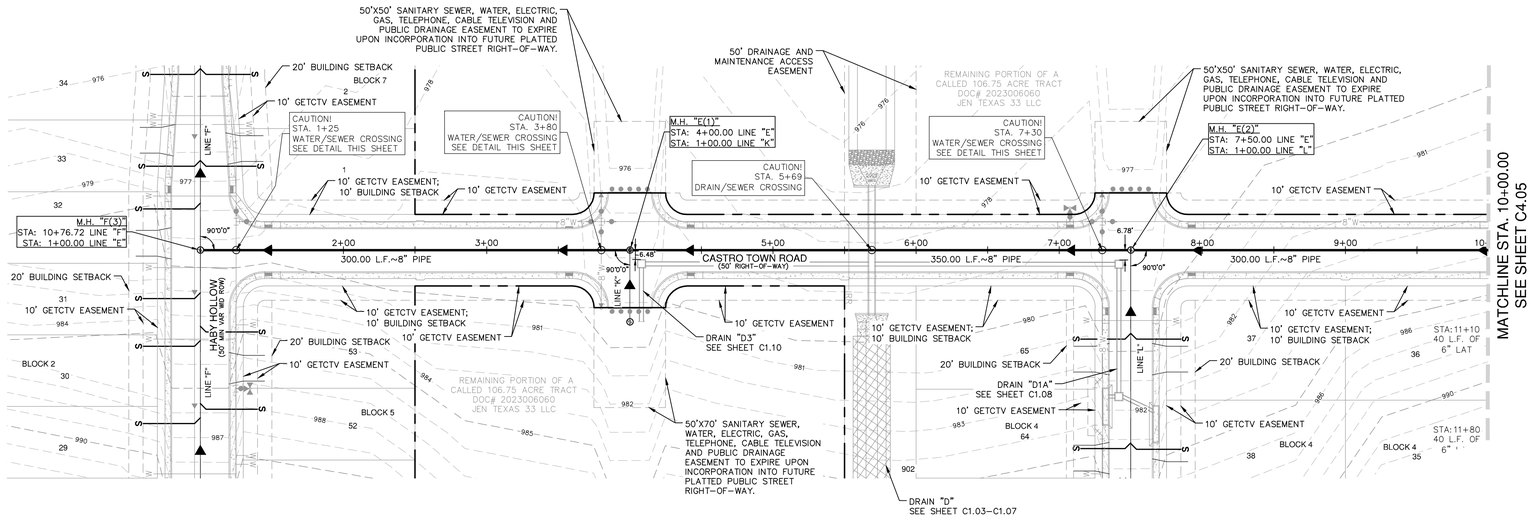
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

SANITARY SEWER LINE 'F' PLAT & PROFILE
STA. 10+50.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.03

Date: Dec. 05, 2025, 2:59pm User ID: cloftner
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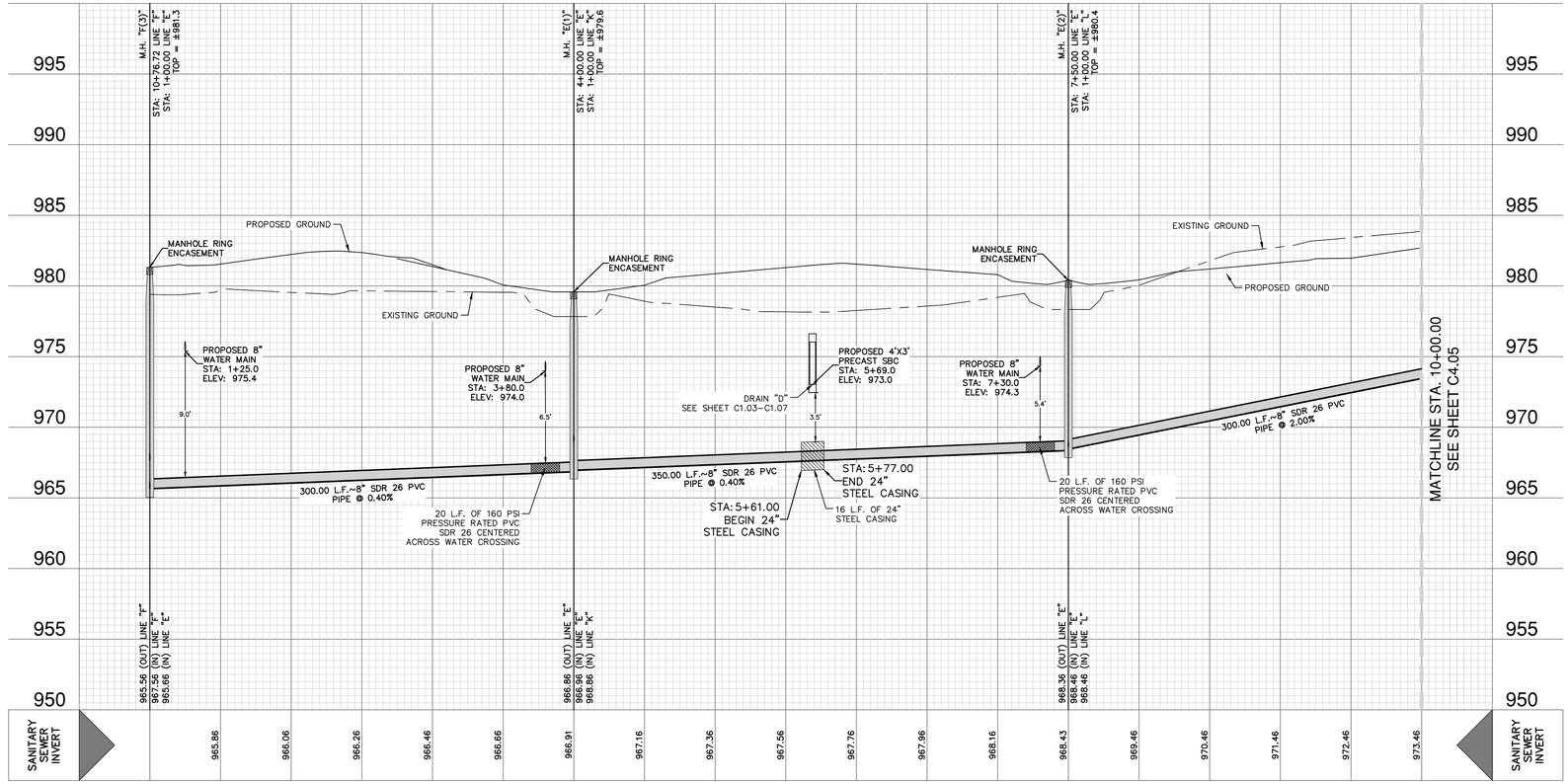
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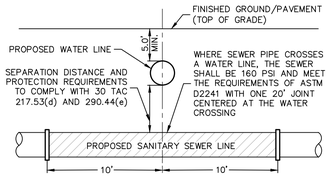
SEWER LEGEND

- PROJECT LIMITS
- EXISTING WATER
- EXISTING SEWER
- PROPOSED SEWER
- PROPOSED WATER
- PROPOSED SEWER LATERAL
- PROPOSED SEWER LATERAL TO TIE INTO EXISTING SEWER MANHOLE
- FINISHED FLOOR ELEVATION FOR SEWER — FF = XXXX.XX
- FORCED MAIN, SEE "MANGOLD LIFT STATION AND FORCED MAIN" PLANS. — FM

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

SANITARY SEWER LINE "E"
STA. 1+00.00 TO 10+00.00





TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE

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127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
11/5/25

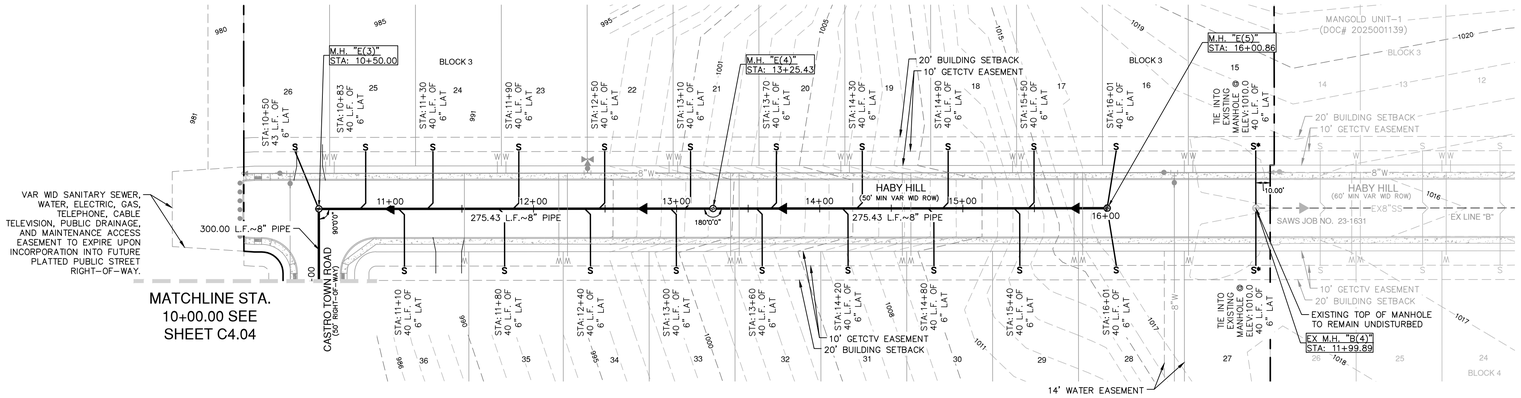
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS

SANITARY SEWER LINE 'E' PLAN & PROFILE
STA. 1+00.00 TO 10+00.00

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.04

Date: Nov 11, 2025, 8:31am User ID: clodner
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SCALE: 1"= 50'

0' 50' 100' 150'

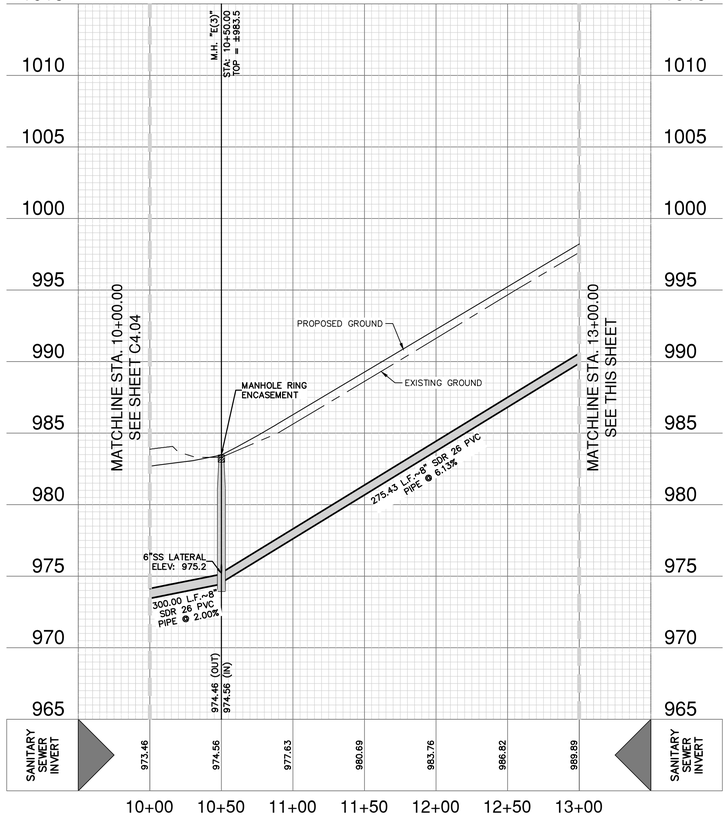
SEWER LEGEND

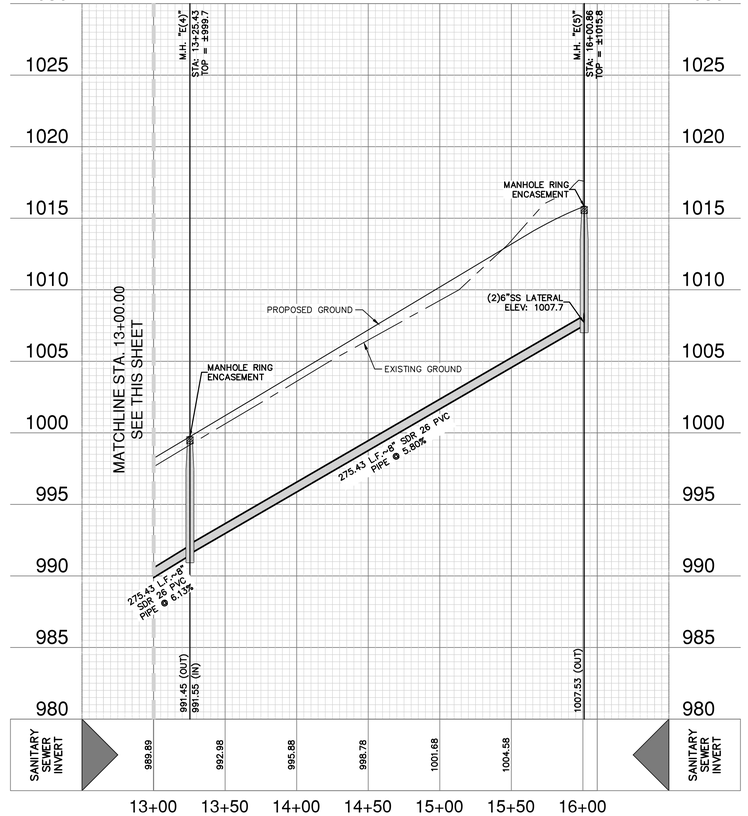
- PROJECT LIMITS
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- PROPOSED SEWER
- MANHOLE
- PROPOSED WATER
- FIRE HYDRANT
- PROPOSED SEWER LATERAL
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- FINISHED FLOOR ELEVATION FOR SEWER (FF = XXXX.XX)

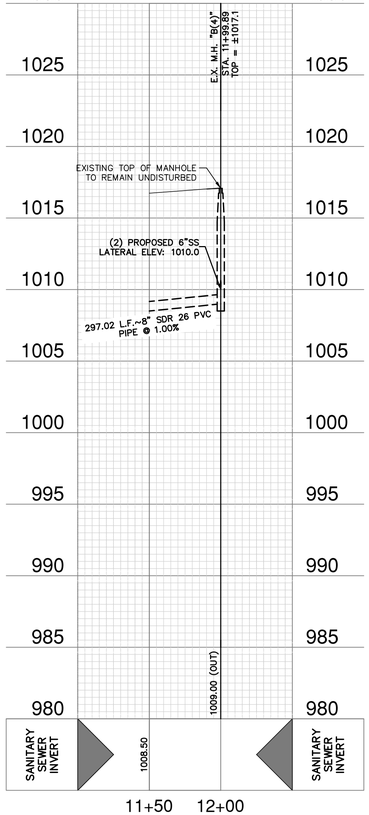
SANITARY SEWER LINE "E"
STA. 10+00.00 TO END

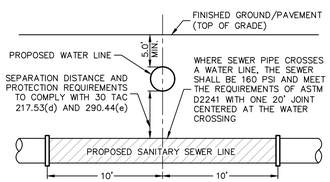
EXISTING SANITARY SEWER LINE "B"
STA. 11+50.00 TO END

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









TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

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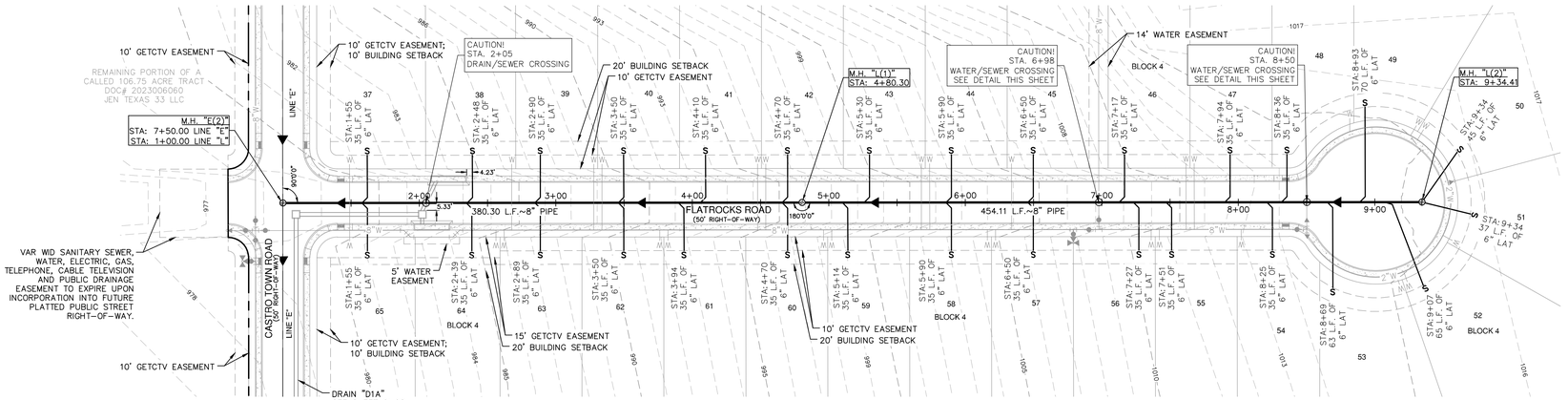
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
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MANGOLD UNIT-2
SAN ANTONIO, TEXAS

SANITARY SEWER LINE 'E' PLAN & PROFILE
STA. 10+00.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.05

Date: Dec 05, 2025, 2:55pm User ID: clafler
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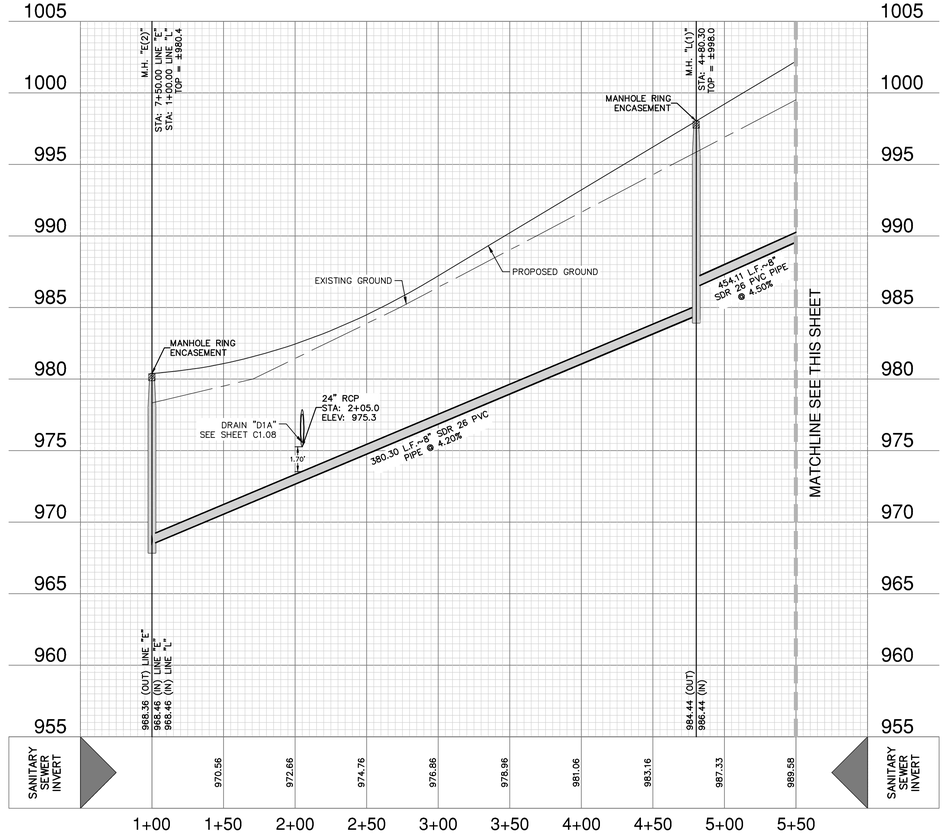
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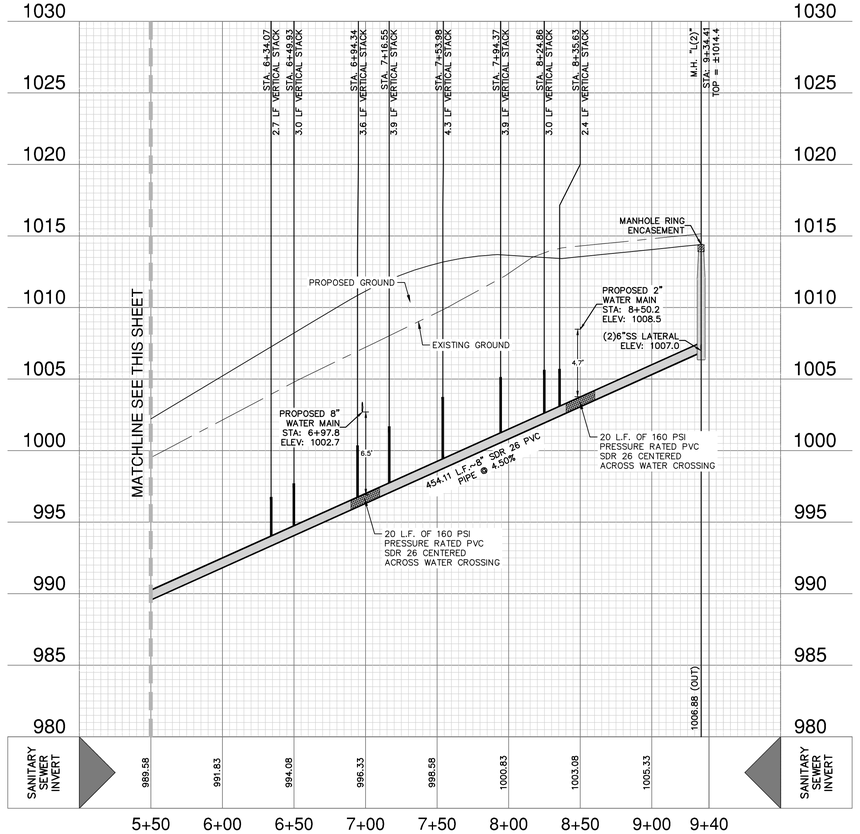
SEWER LEGEND

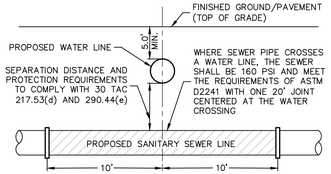
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- PROPOSED SEWER LATERAL
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SANITARY SEWER LINE "L"
STA. 1+00.00 TO END

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







TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

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2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

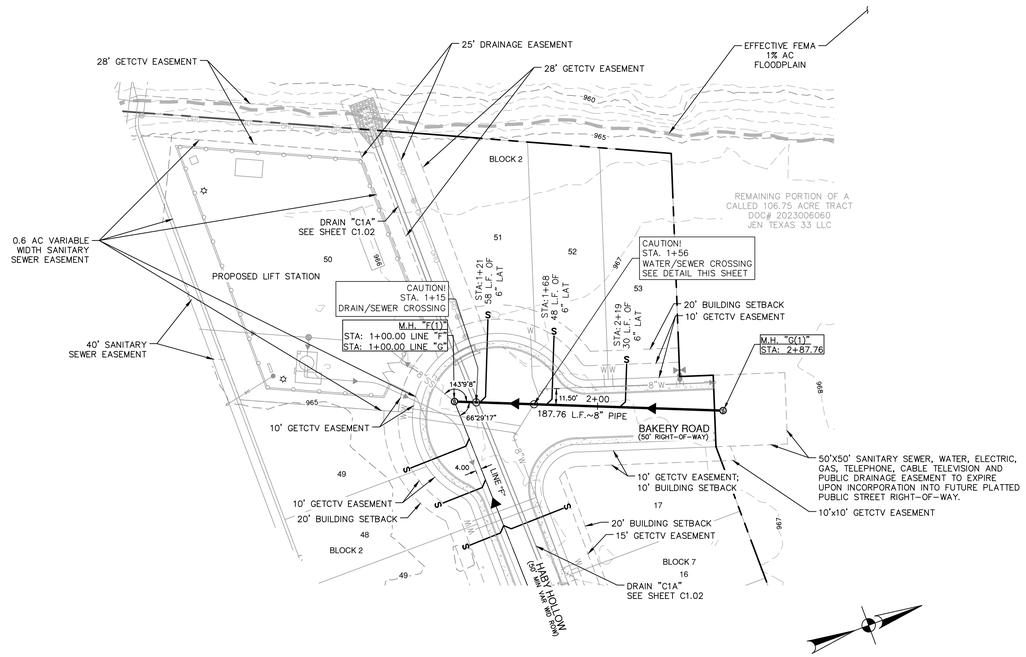
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

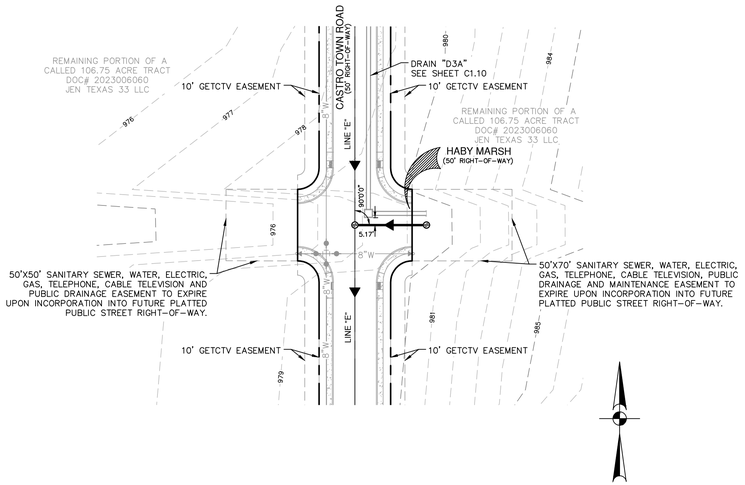
SANITARY SEWER LINE 'L' PLAT & PROFILE
STA. 1+00.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.06

Date: Nov 11, 2025, 8:32am User ID: clafrer
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SCALE: 1"= 50'

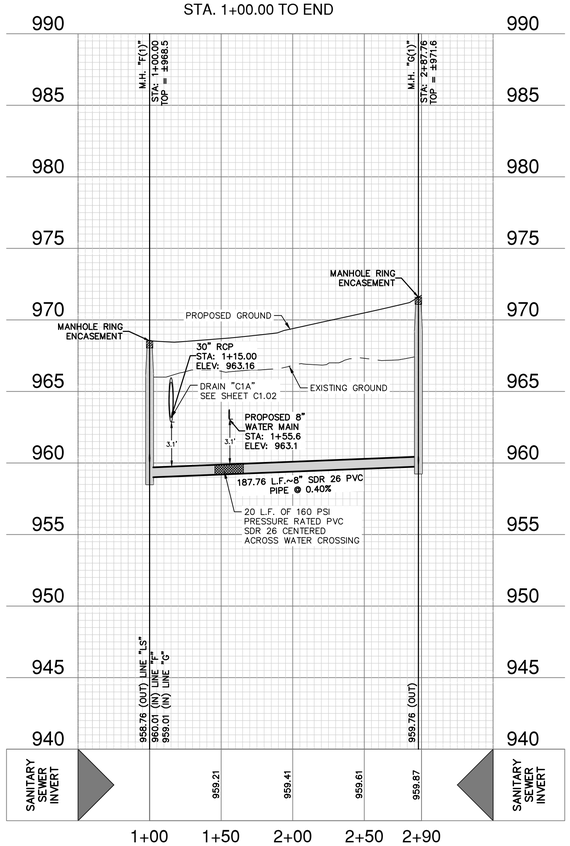
0' 50' 100' 150'

SEWER LEGEND

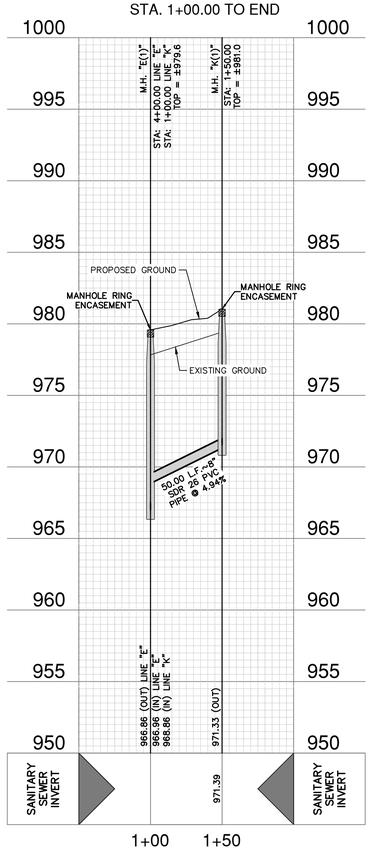
- PROJECT LIMITS
- EXISTING WATER (W)
- EXISTING SEWER (SS) MANHOLE (S)
- PROPOSED SEWER
- PROPOSED WATER — FIRE HYDRANT (W) — VALVE (W)
- PROPOSED SEWER LATERAL (S)
- FINISHED FLOOR ELEVATION FOR SEWER — FF = XXXX.XX
- FORCED MAIN, SEE "MANGOLD LIFT STATION AND FORCED MAIN" PLANS. — FM

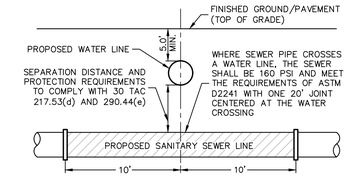
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'

SANITARY SEWER LINE "G"
STA. 1+00.00 TO END



SANITARY SEWER LINE "K"
STA. 1+00.00 TO END





TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

CAUTION!!

CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

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 ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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.

SEWER (MEDIO - FAR WEST SEWERSHED - MEDIO CREEK WRC)

Developer's Name: JEN TEXAS 33 LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's 114 Total Acreage 28.28
Total Linear Footage of Pipe: 4,115 LF-8" PVC Plat No. 25-11800082
Number of Lots 114 SAWS JOB NO. 25-1537

NO.	REMSION	DATE
1	REMOVED IRRIGATION METER	09/26/24

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
1/12/26

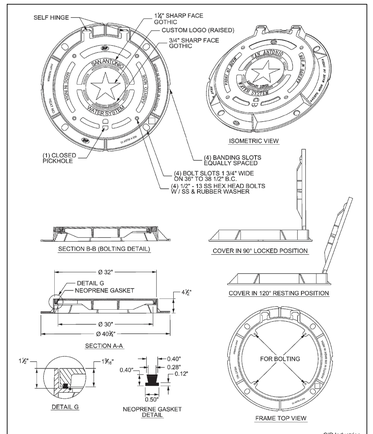
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS
SANITARY SEWER LINE 'G' & 'K' PLAN & PROFILE
LINE 'G' STA. 1+00.00 TO END
LINE 'K' STA. 1+00.00 TO END

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.07

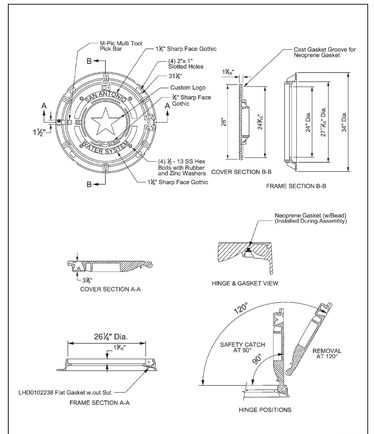
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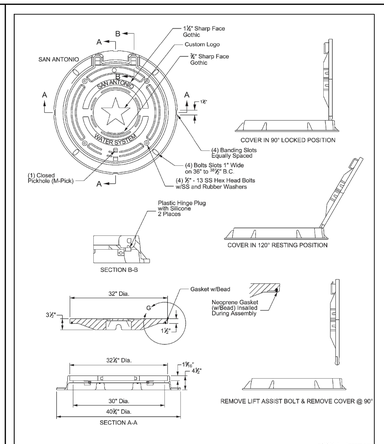
SJP Industries

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	30" MANHOLE RING AND COVER DETAIL		AUG 2019
		DD 852-07	SHEET 1 OF 5



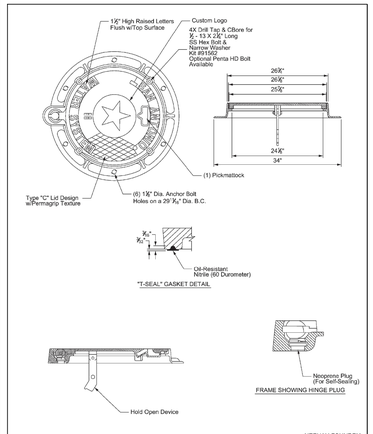
ERGO Assembly

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	MANHOLE RING AND COVER DETAIL	MARCH 2008	AUG 2019
		DD 852-07	SHEET 2 OF 5



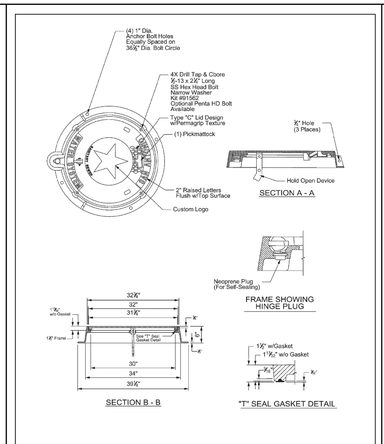
ERGO XL Assembly

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	MANHOLE RING AND COVER DETAIL	MARCH 2008	AUG 2019
		DD 852-07	SHEET 3 OF 5



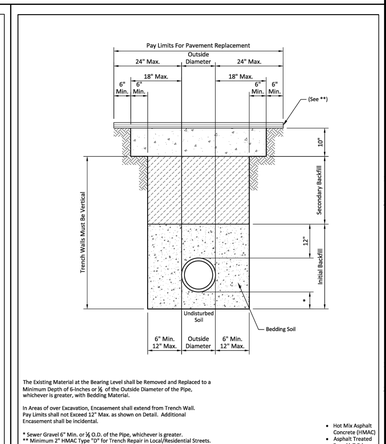
NEENAH FOUNDRY

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	MANHOLE RING AND COVER DETAIL	MARCH 2008	AUG 2019
		DD 852-07	SHEET 4 OF 5



NEENAH FOUNDRY

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	MANHOLE RING AND COVER DETAIL	MARCH 2008	AUG 2019
		DD 852-07	SHEET 5 OF 5



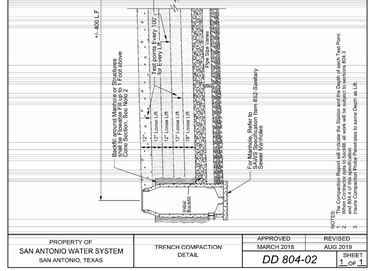
The Existing Material at the Bearing Level shall be Removed and Replaced to a Minimum Depth of 6-inches or ¼ of the Outside Diameter of the Pipe, whichever is greater, with Bedding Material.

In Areas of over Excavation, Encasement shall extend from Trench Wall. Pay Limits shall not Exceed 12" Max. as shown on Detail. Additional Encasement shall be incidental.

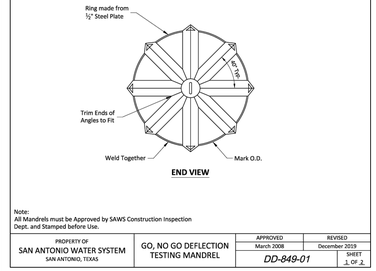
* Sewer Gravel 6" Min. or ¼ O.D. of the Pipe, whichever is greater.
** Minimum 2" HMAC Type "D" for Trench Repair in Local/Residential Streets.
** Minimum 3" HMAC Type "C" for Trench Repair in Collector/Arterial Streets.

- Hot Mix Asphalt Concrete (HMAC)
- Asphalt Treated Base (A.T.B.)

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	SANITARY SEWER PIPE LAID IN TRENCH		AUG 2019
		DD-804-01	SHEET 1 OF 1



PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TRENCH COMPACTION DETAIL	MARCH 2018	AUG 2019
		DD 804-02	SHEET 1 OF 1



Note:
All Mandrels must be Approved by SAWS Construction Inspection Dept. and Stamped before Use.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	GO, NO GO DEFLECTION TESTING MANDREL	March 2008	December 2019
		DD-849-01	SHEET 1 OF 2

SIZE	A	B*	PVC (SDR -26)	PVC (SDR -26)
			MANDREL O.D.	RING O.D.
6"	4.0"	4.5"	5.50	4.79
8"	5.5"	6"	7.37	6.66
10"	7.0"	7.5"	9.21	8.50
12"	8.0"	9"	10.96	10.25
15"	10.0"	11"	13.42	12.71
18"	12.0"	13.5"	———	———
21"	14.0"	16"	———	———
24"	16.0"	18"	———	———
27"	18.0"	20"	———	———

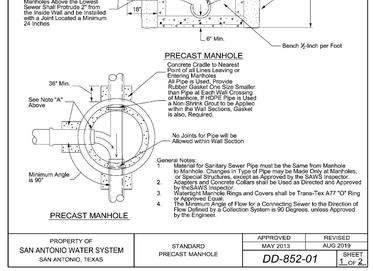
*Minimum Length

CHART

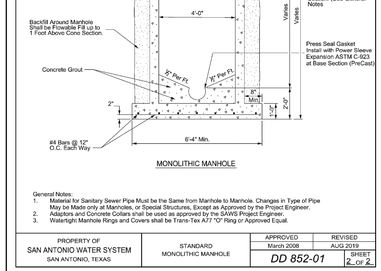
Notes:
PVC Pipes and Fittings 6" to 15" in Diameter shall Conform to ASTM D-2241
PVC Pipes and Fittings 18" to 27" in Diameter shall Conform to ASTM F-679

This information is provided as a reference. All deflection testing shall be done in accordance with TCEQ Capter 217.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	GO, NO GO DEFLECTION TESTING MANDREL CHART	March 2008	December 2019
		DD-849-01	SHEET 2 OF 2

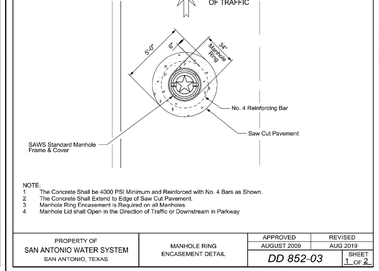


PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	STANDARD PRECAST MANHOLE	MAY 2013	AUG 2019
		DD-852-01	SHEET 1 OF 2



General Notes:
1. 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 Approved by the Project Engineer.
2. Adaptors and Concrete Collars shall be used as approved by the SAWS Project Engineer.
3. Watertight Manhole Rings and Covers shall be Trans-Tex A77 "O" Ring or Approved Equal.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	STANDARD MONOLITHIC MANHOLE	March 2008	AUG 2019
		DD 852-01	SHEET 2 OF 2



NOTE:
1. The Concrete Shall be 4000 PSI Minimum and Reinforced with No. 4 Bars as Shown.
2. The Concrete Shall Extend to Edge of Saw Cut Pavement.
3. Manhole Ring Encasement is Required on all Manholes.
4. Manhole Lid shall Open in the Direction of Traffic or Downstream in Parkway

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	MANHOLE RING ENCASEMENT DETAIL	AUGUST 2009	AUG 2019
		DD 852-03	SHEET 1 OF 2

HOUSE LATERAL DETAIL

Note:
A minimum of 3' of cover to subgrade is necessary, otherwise concrete encasement will be required.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	HOUSE LATERAL DETAIL (IN THE E.A.R.Z.)	March 2008	December 2018
		DD-854-EARZ	SHEET 1 OF 1

Note:
The saddle shall be permanently bonded to the existing main by the use of compounds or clamps as recommended by the manufacturer.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	LATERAL CONNECTION	March 2008	December 2018
		DD-854-03	SHEET 1 OF 1

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL CONCRETE DETAILS	MARCH 2008	AUG 2019
		DD 858-02	SHEET 1 OF 1

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL VERTICAL STACK DETAIL	MARCH 2008	AUG 2019
		DD 860-01	SHEET 1 OF 1

NOTE: Price for Drop Fittings and Encasement to be Included with the Price of Manhole.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	DROP MANHOLE DETAIL	MARCH 2008	AUG 2019
		DD-852-08	SHEET 1 OF 1

SEWER (MEDIO - FAR WEST SEWERSHED - MEDIO CREEK WRC)

Developer's Name: JEN TEXAS 33 LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map#: 064-600 Total EDU's: 114 Total Acreage: 28.28
Total Linear Footage of Pipe: 4,115 LF-8" PVC Plat No.: 25-11800082
Number of Lots: 114 SAWS JOB NO.: 25-1537

DATE

NO.	REVISION

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
11/5/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS
SANITARY SEWER DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.08

Date: Nov 11, 2025, 8:39am User ID: cfarrer
File: P:\125\37\12\Design\Civil\SSDT 125712.dwg

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SAWS CONSTRUCTION NOTES

(LAST REVISED JANUARY 2022)

SAWS 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 (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.

SAWS SEWER NOTES

1. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOW (SSO) OCCURS AS A RESULT OF THEIR WORK. ALL CONTRACTOR PERSONNEL RESPONSIBLE FOR SSO PREVENTION AND CONTROL SHALL BE TRAINED ON PROPER RESPONSE. SHOULD AN SSO OCCUR, THE CONTRACTOR SHALL:

   A. IDENTIFY THE SOURCE OF THE SSO AND NOTIFY SAWS EMERGENCY OPERATIONS CENTER (EOC) IMMEDIATELY AT (210) 233-2014. PROVIDE THE ADDRESS OF THE SPILL AND AN ESTIMATED VOLUME OR FLOW.
   B. ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.
   C. CONTAIN SEWAGE FROM THE SSO TO THE EXTENT OF PREVENTING A POSSIBLE CONTAMINATION OF WATERWAYS.
   D. CLEAN UP SPILL SITE (RETURN CONTAINED SEWAGE TO THE COLLECTION SYSTEM IF POSSIBLE) AND PROPERLY DISPOSE OF CONTAMINATED SOIL/MATERIALS.
   E. CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.
   F. MEET ALL POST-SSO REQUIREMENTS AS PER THE EPA CONSENT DECREE, INCLUDING LINE CLEANING AND TELEVISING THE AFFECTED SEWER MAINS (AT SAWS DIRECTION) WITHIN 24 HOURS.

   SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND TO SAWS SATISFACTION, THEY WILL BE RESPONSIBLE FOR ALL COSTS INCURRED BY SAWS, INCLUDING ANY FINES FROM EPA, TCEQ AND/OR ANY OTHER FEDERAL, STATE OR LOCAL AGENCIES.

   NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ AND SAWS.

2. IF BYPASS PUMPING IS REQUIRED, THE CONTRACTOR SHALL PERFORM SUCH WORK IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION FOR WATER AND SANITARY SEWER CONSTRUCTION, ITEM NO. 864, "BYPASS PUMPING".

3. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT (210) 233-2973 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.

4. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241, TAC 217.53 AND TCEQ 290.44(E)(4)(B). CONTRACTOR SHALL CENTER A 20' JOINT OF 160 PSI PRESSURE RATED PVC AT THE PROPOSED WATER CROSSING.

5. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS. (NSPI)

6. SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER: ALL SPILLS, OVERFLOWS, OR DISCHARGES OF WASTEWATER, RECYCLED WATER, PETROLEUM PRODUCTS, OR CHEMICALS MUST BE REPORTED IMMEDIATELY TO THE SAWS INSPECTOR ASSIGNED TO THE COUNTER PERMIT OR GENERAL CONSTRUCTION PERMIT (GCP). THIS REQUIREMENT APPLIES TO EVERY SPILL, OVERFLOW, OR DISCHARGE REGARDLESS OF SIZE.

7. MANHOLE AND ALL PIPE TESTING (INCLUDING THE TV INSPECTION) MUST BE PERFORMED AND PASSED PRIOR TO FINAL FIELD ACCEPTANCE BY SAWS CONSTRUCTION INSPECTION DIVISION, AS PER THE SAWS SPECIFICATIONS FOR WATER AND SANITARY SEWER CONSTRUCTION.

8. ALL PVC PIPE OVER 14 FEET OF COVER SHALL BE EXTRA STRENGTH WITH MINIMUM PIPE STIFFNESS OF 115 PSI.

PROJECT SEWER NOTES

1. ALL RESIDENTIAL SEWER SERVICE LATERALS ARE 6" DIA. AND SHALL BE EXTENDED TO 10' PAST THE PROPERTY LINE AND CAPPED AND SEALED. CONTRACTOR SHALL INSTALL A 2" X 4" STAKE, FOUR (4) FEET LONG, TWO (2) FEET DEEP INTO THE GROUND AT THE END OF EACH SERVICE. NO SEPARATE PAY ITEM.
2. CONTRACTOR TO INSTALL CLEANOUTS AT THE END OF ALL SEWER LATERALS, PER LATERAL DETAIL SHEET C4.08.
3. NO VERTICAL STACKS ALLOWED FOR ANY LOTS UNLESS OTHERWISE SPECIFIED BY THE ENGINEER.
4. ALL 6" SEWER LATERALS WILL BE SET AT 2% GRADE FROM THE MAIN TO THE PROPERTY LINE.
5. WHEN HORIZONTAL DISTANCE BETWEEN SEWER PIPES AND WATER MAIN IS LESS THAN 9 FOOT OF SEPARATION, SEWER MAIN SHALL BE INSTALLED WITH 160 PSI (MIN) PRESSURE PIPE AND FITTINGS IN ACCORDANCE WITH SAWS CONSTRUCTION CRITERIA FOR CONSTRUCTION OF SEWER MAINS IN THE VICINITY OF WATER MAINS.
6. CONTRACTOR SHALL ENSURE THAT MANHOLES OUTSIDE OF PAVED AREAS ARE SET WITH TOP ELEVATIONS 6" ABOVE FINISHED GRADE WITH CONCRETE RING ENCASEMENT.
7. ALL SEWER PIPES SHALL BE 8" PVC (SDR 26), UNLESS OTHERWISE NOTED.
8. CONTRACTOR IS TO VERIFY EXISTING INVERT OF EXISTING SANITARY SEWER MAINS AND ALERT ENGINEER IMMEDIATELY OF ANY DIFFERENCE FROM INVERT SHOWN ON PLANS.
9. CONTRACTOR SHALL PROTECT ALL EXISTING FENCES. ANY FENCE DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT THEIR EXPENSE.
10. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES AND DRAINAGE STRUCTURES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION TO VERIFY SIZE, GRADE, AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO REPAIR, AT HIS EXPENSE.
11. CONCRETE RING ENCASEMENT TO BE INSTALLED ON ALL MANHOLES AND, WITHIN LIMITS OF PAVEMENT, BE INSTALLED TO THE TOP OF THE BASE LAYER WITH A MINIMUM OF 2" OF ASPHALT ON TOP OF THE RING ENCASEMENT.
12. MANHOLE OPENING INCREASED TO 30" AS PER TAC CHAPTER 217.55.
13. ALL SEWER PIPE LATERALS SHALL BE SDR 26 (CLASS 160) PVC PIPE.
14. IF THE GIVEN TOP OF MANHOLE ELEVATION DOES NOT AGREE ON ACTUAL GROUND SURFACE OR FINISH PAVEMENT, THE CONTRACTOR SHALL ADJUST ELEVATIONS SUCH THAT THE TOP OF MANHOLE SHALL BE 0.5' ABOVE EXISTING GROUND, OR FLUSH TO FINISH ASPHALT PAVEMENT.
15. ALL MANHOLES CONSTRUCTED OVER THE EDWARDS AQUIFER RECHARGE ZONE SHOULD BE WATERTIGHT.

SEWER (MEDIO - FAR WEST SEWERSHED - MEDIO CREEK WRC)

Developer's Name: JEN TEXAS 33 LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's 114 Total Acreage 28.28
Total Linear Footage of Pipe: 4,115 LF-8" PVC Plat No. 25-11800082
Number of Lots 114 SAWS JOB NO. 25-1537

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
11/5/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

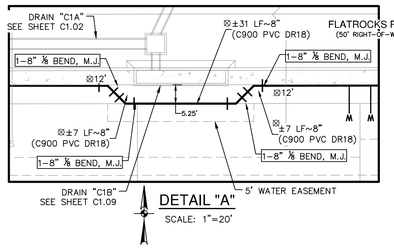
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

SANITARY SEWER NOTES

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C4.09

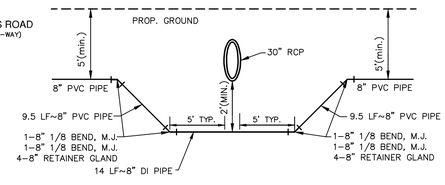
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DETAIL "A"

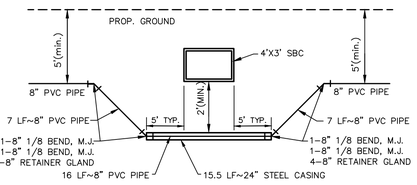
SCALE: 1"=20'



NOTE: ALL RETAINER GLANDS SHALL BE MEG-A-LUG TYPE

WATER/DRAIN CROSSING DETAIL "B"

NOT TO SCALE



NOTE: ALL RETAINER GLANDS SHALL BE MEG-A-LUG TYPE

WATER/DRAIN CROSSING DETAIL "C"

NOT TO SCALE

55.0180 ACRES
OWNER: CLIFFORD MALCOLM HABY
VOLUME 204, PAGE 461, O.P.R.M.C.
VOLUME 270, PAGES 279-283 O.P.R.M.C.

REMAINDER OF 55.018 ACRES
OWNER: CLIFFORD MALCOLM HABY
VOLUME 211, PAGE 11, O.P.R.M.C.

DRAIN "E2"
SEE SHEET C1.14-C1.16

25' DRAINAGE AND MAINTENANCE ACCESS EASEMENT

1-8"X8" ANCHOR TEE, M.J.
2-8" GATE VALVE, M.J.
2-6" VALVE BOX, COMPLETE

1-8"X6" ANCHOR TEE, M.J.
1-STD. FIRE HYDRANT ASSEMBLY
1-6" GATE VALVE, M.J.
1-6" VALVE BOX, COMPLETE
1-6" ¼ BEND, M.J.
1-STD. FIRE HYDRANT
6" D.I. PIPE, CUT AND RESTRAIN AS REQUIRED (SEE SAWS STD DWG DD-834-01)

FOR CHLORINATION INJECTION:
2-1" CORPORATION STOP, C.C.XI.P.
2-1" COPPER TUBING, CUT AS REQ'D
2-1¼" SOLID CAP, THD.
SEE SAWS STD. DWG DD-847-01 & TABLE 847-1

⊠±67 LF~8"
(C900 PVC DR18)
BLOCK 3

MANGOLD UNIT-1
(DOC# 2025001139)

1 - 8" M.J. X 2" THR. D.I. ECCENTRIC REDUCER (PERM.)
1 - 2" BLOWOFF (PERM.)
(SEE SAWS STD. DRAWING DD-844-02, SHEET 3 OF 5)

±208 LF~8"
(C900 PVC DR18)

±410 LF~8"
(C900 PVC DR18)

20' BUILDING SETBACK
10' GETCTV EASEMENT

1-8"X8" ANCHOR TEE, M.J.
2-8" GATE VALVE, M.J.
2-6" VALVE BOX, COMPLETE

CONTRACTOR SHALL TIE TO EXISTING 8" POTABLE WATER MAIN (SAWS JOB NO. 23-1161) AFTER DISINFECTION & ACCEPTANCE BY SAWS.
1-8" SOLID SLEEVE, M.J.

20' BUILDING SETBACK
10' GETCTV EASEMENT

VAR WID SANITARY SEWER, WATER, ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION AND PUBLIC DRAINAGE EASEMENT TO EXPIRE UPON INCORPORATION INTO FUTURE PLATTED PUBLIC STREET RIGHT-OF-WAY.

⊠±32 LF~8"
(C900 PVC DR18)

HABY HILL
(50' MIN VAR WD ROW)

10' GETCTV EASEMENT
20' BUILDING SETBACK

1-8"X2" ECCENTRIC REDUCER M.J.
1-2" TEMPORARY BLOW-OFF ASSEMBLY
(SEE SAWS STD. DETAIL: DD-844-01)

14' WATER EASEMENT

10' GETCTV EASEMENT

10' GETCTV EASEMENT;
10' BUILDING SETBACK

REMAINING PORTION OF A CALLED 106.75 ACRE TRACT
DOC# 2023006060
JEN TEXAS 33 LLC

±345 LF~8"
(C900 PVC DR18)

BLOCK 4

1-8"X8" CROSS, M.J.
4-8" GATE VALVE, M.J.
4-6" VALVE BOXES, COMPLETE

1 - 8" M.J. X 2" THR. D.I. ECCENTRIC REDUCER (PERM.)
1 - 2" BLOWOFF (PERM.)
(SEE SAWS STD. DRAWING DD-844-02, SHEET 3 OF 5)

CAUTION!!!
WATER/SEWER CROSSING
(SEE SAWS SPEC. ITEM No. 812)

CAUTION!!!
WATER/DRAIN CROSSING
(SEE DETAIL "B" ON THIS SHEET)

±111 LF~8"
(C900 PVC DR18)

20' BUILDING SETBACK
10' GETCTV EASEMENT

CAUTION!!!
WATER/SEWER CROSSING
(SEE SAWS SPEC. ITEM No. 812)

1-8"X8" ANCHOR TEE, M.J.
1-8" GATE VALVE, M.J.
1-6" VALVE BOX, COMPLETE
2-8"X2" REDUCER, M.J.

CAUTION!!!
WATER/SEWER CROSSING
(SEE SAWS SPEC. ITEM No. 812)

R5.00'
±4 LF ~ 2"
(HDPE DR 9)

R55.00'
±117 LF ~ 2"
(HDPE DR 9)

±13 LF~2"
(HDPE DR 9)

±45 LF~2"
(HDPE DR 9)

±3 LF~2"
(HDPE DR 9)

1 - 2" BLOWOFF (PERM.)
(SEE SAWS STD. DRAWING DD-844-02, SHEET 3 OF 5)

150' WIDE ELECTRIC EASEMENT
CITY PUBLIC SERVICE BOARD
OF SAN ANTONIO
(VOL 583, PG 188-193 OPRMC)

MANGOLD UNIT-1
(DOC# 2025001139)

50'X50' SANITARY SEWER, WATER, ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION AND PUBLIC DRAINAGE EASEMENT TO EXPIRE UPON INCORPORATION INTO FUTURE PLATTED PUBLIC STREET RIGHT-OF-WAY.

⊠±20 LF~8"
(C900 PVC DR18)

1-8"X6" ANCHOR TEE, M.J.
1-STD. FIRE HYDRANT ASSEMBLY
1-6" GATE VALVE, M.J.
1-6" VALVE BOX, COMPLETE
1-6" ¼ BEND, M.J.
1-STD. FIRE HYDRANT
6" D.I. PIPE, CUT AND RESTRAIN AS REQUIRED (SEE SAWS STD DWG DD-834-01)

⊠±23 LF~8"
(C900 PVC DR18)

DETAIL "A"
SEE THIS SHEET

FLATROCKS ROAD
(50' RIGHT-OF-WAY)

±445 LF~8"
(C900 PVC DR18)

10' GETCTV EASEMENT
20' BUILDING SETBACK

1-8"X6" ANCHOR TEE, M.J.
1-STD. FIRE HYDRANT ASSEMBLY
1-6" GATE VALVE, M.J.
1-6" VALVE BOX, COMPLETE
1-6" ¼ BEND, M.J.
1-STD. FIRE HYDRANT
6" D.I. PIPE, CUT AND RESTRAIN AS REQUIRED (SEE SAWS STD DWG DD-834-01)

1-8"X8" ANCHOR TEE, M.J.
2-8" GATE VALVE, M.J.
2-6" VALVE BOX, COMPLETE

⊠±152 LF~8"
(C900 PVC DR18)

±11 LF~2"
(HDPE DR 9)

±45 LF~2"
(HDPE DR 9)

±3 LF~2"
(HDPE DR 9)

R5.00'
±3 LF ~ 2"
(HDPE DR 9)

R55.00'
±149 LF ~ 2"
(HDPE DR 9)

±21 LF~8"
(C900 PVC DR18)

MANGOLD UNIT-1
(DOC# 2025001139)

10' GETCTV EASEMENT
20' BUILDING SETBACK

CASTRO TOWN ROAD
(50' RIGHT-OF-WAY)

DRAIN "D1A"
SEE SHEET C1.08

10' GETCTV EASEMENT
WATER/DRAIN CROSSING
(SEE DETAIL "C" ON THIS SHEET)

50' DRAINAGE AND MAINTENANCE ACCESS EASEMENT

±327 LF~8"
(C900 PVC DR18)

DRAIN "D"
SEE SHEET C1.03-C1.07

IRR

10' GETCTV EASEMENT;
10' BUILDING SETBACK

DRAIN "D3A"
SEE SHEET C1.10

CAUTION!!!
WATER/SEWER CROSSING
(SEE SAWS SPEC. ITEM No. 812)

⊠ ±60 LF~8"
(C900 PVC DR18)

HABY MARSH
(50' RIGHT-OF-WAY)

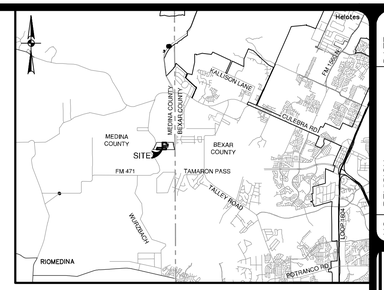
1 - 8" M.J. X 2" THR. D.I. ECCENTRIC REDUCER (PERM.)
1 - 2" BLOWOFF (PERM.)
(SEE SAWS STD. DRAWING DD-844-02, SHEET 3 OF 5)

50'X70' SANITARY SEWER, WATER, ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION AND PUBLIC DRAINAGE EASEMENT TO EXPIRE UPON INCORPORATION INTO FUTURE PLATTED PUBLIC STREET RIGHT-OF-WAY.

REMAINING PORTION OF A CALLED 106.75 ACRE TRACT
DOC# 2023006060
JEN TEXAS 33 LLC

50'X50' SANITARY SEWER, WATER, ELECTRIC, GAS, TELEPHONE, CABLE TELEVISION AND PUBLIC DRAINAGE EASEMENT TO EXPIRE UPON INCORPORATION INTO FUTURE PLATTED PUBLIC STREET RIGHT-OF-WAY.

MATCHLINE SEE SHEET C5.01



LOCATION MAP

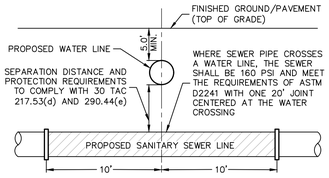
NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

WATER LEGEND

PROJECT LIMITS	
EXISTING WATER	FIRE HYDRANT
EXISTING SEWER	MANHOLE
PROPOSED SEWER	
PROPOSED WATER	FIRE HYDRANT
PROPOSED 3/4" SINGLE SERVICE WITH 5/8" METER	
PROPOSED 1" DUAL SERVICE WITH 5/8" METER	
SINGLE IRRIGATION SERVICE 3/4" WITH 5/8" METER	IRR
JOINT RESTRAINT	
FORCED MAIN. SEE "MANGOLD LIFT STATION AND FORCED MAIN" PLANS.	FM



(SEE SAWS SPEC ITEM 812)

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

PRESSURE REDUCING VALVE NOTE:

PRESSURE REDUCING VALVE TO BE INSTALLED ON CUSTOMER'S SIDE OF METER BY HOMEBUILDER.

PRESSURE NOTE:

CONTRACTOR TO VERIFY THAT NO PORTION OF THE TRACT IS BELOW GROUND ELEVATION OF 985 FEET WHERE THE STATIC PRESSURE WILL NORMALLY EXCEED 80 PSI. AT ALL SUCH LOCATIONS WHERE THE GROUND LEVEL IS BELOW 985 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).

JOINT RESTRAINT NOTE:

CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOINT RESTRAINING HARNESSES OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL INSURE THAT ALL TEES, BENDS, VALVES, ETC. HAVE A MINIMUM OF 5 FT OF PIPE WITH NO JOINTS ON EACH SIDE OF THE FITTING. JOINT RESTRAINTS AND RETAINER GLANDS SHALL BE CALCULATED BY SAWS APPROVED PROGRAMS. THERE WILL BE NO SEPARATE PAY ITEM FOR RETAINER GLANDS AND OTHER JOINT RESTRAINING HARNESSES AND GASKETS, BUT SHALL BE SUBSIDIARY TO THE UNIT COST PER LINEAL FOOT OF PIPE INSTALLED.

TRENCH EXCAVATION SAFETY PROTECTION:

CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL BE REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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.

WATER (SAWS PRESSURE ZONE 1170)

FIRE FLOW NOTE:

IN AN EFFORT TO MEET THE CITY OF SAN ANTONIO'S FIRE FLOW REQUIREMENTS FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, THE PUBLIC WATER MAIN SYSTEM HAS BEEN DESIGNED FOR A MINIMUM FIRE FLOW DEMAND OF 1500 GPM AT 25 PSI RESIDUAL PRESSURE. THE FIRE FLOW REQUIREMENTS FOR INDIVIDUAL STRUCTURES WILL BE REVIEWED DURING THE BUILDING PERMIT PROCESS IN ACCORDANCE WITH THE PROCEDURES SET FORTH BY THE CITY OF SAN ANTONIO DIRECTOR OF DEVELOPMENT SERVICES DEPARTMENT AND THE SAN ANTONIO FIRE DEPARTMENT FIRE MARSHAL.

Developer's Name:	JEN TEXAS 33, LLC
Address:	8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO	State: TEXAS ZIP: 78230
Phone#	210-849-1447 FAX#
SAWS Block Map#	064-600 Total EDU's 116 Total Acreage 28.28
Total Linear Footage of Pipe:	294 LF~2" PVC, 4,781 LF~8" PVC Plat No. 25-11800082
Number of Lots	114 SAWS JOB NO. 25-1044

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
12/1/25

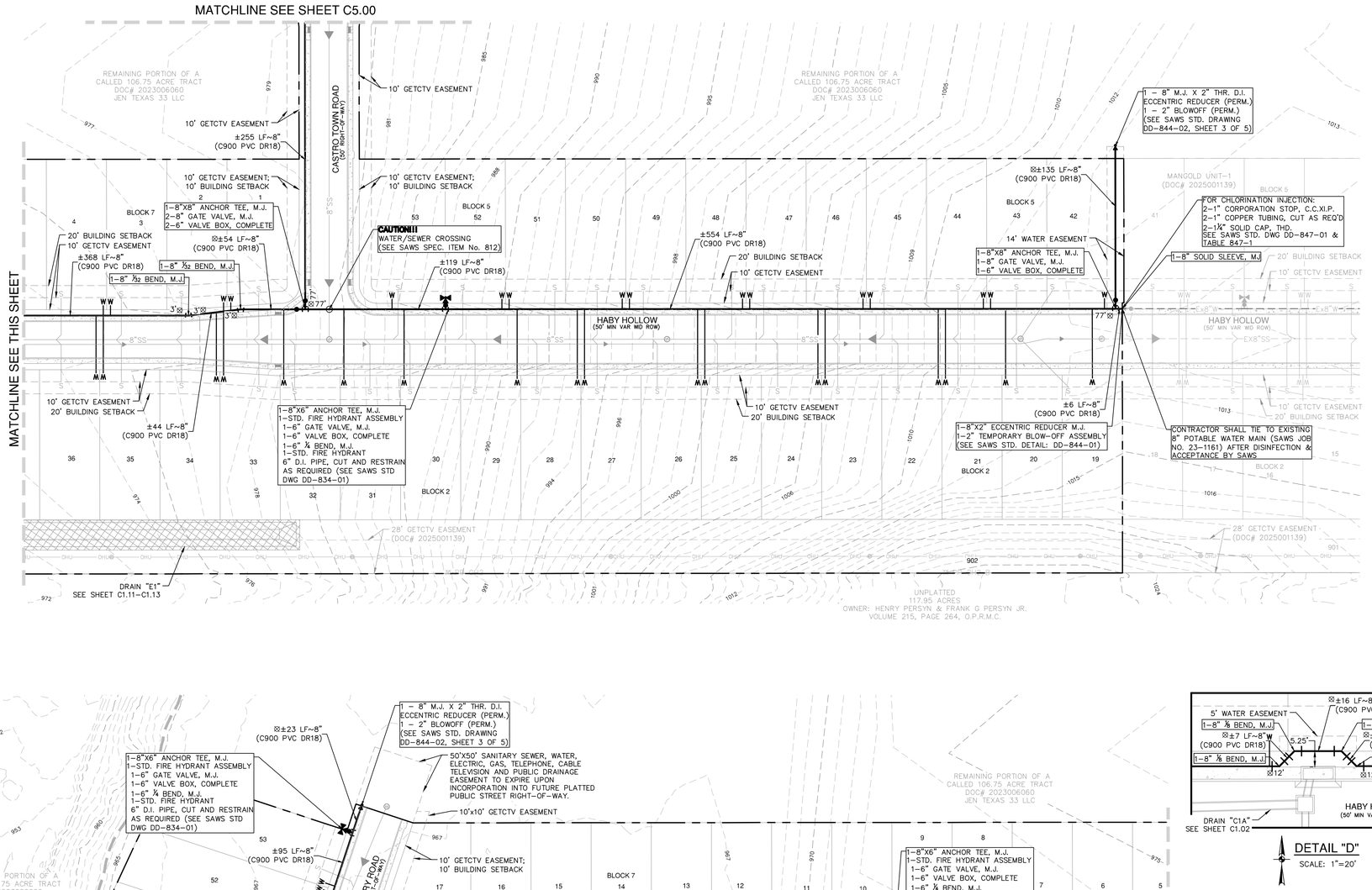
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

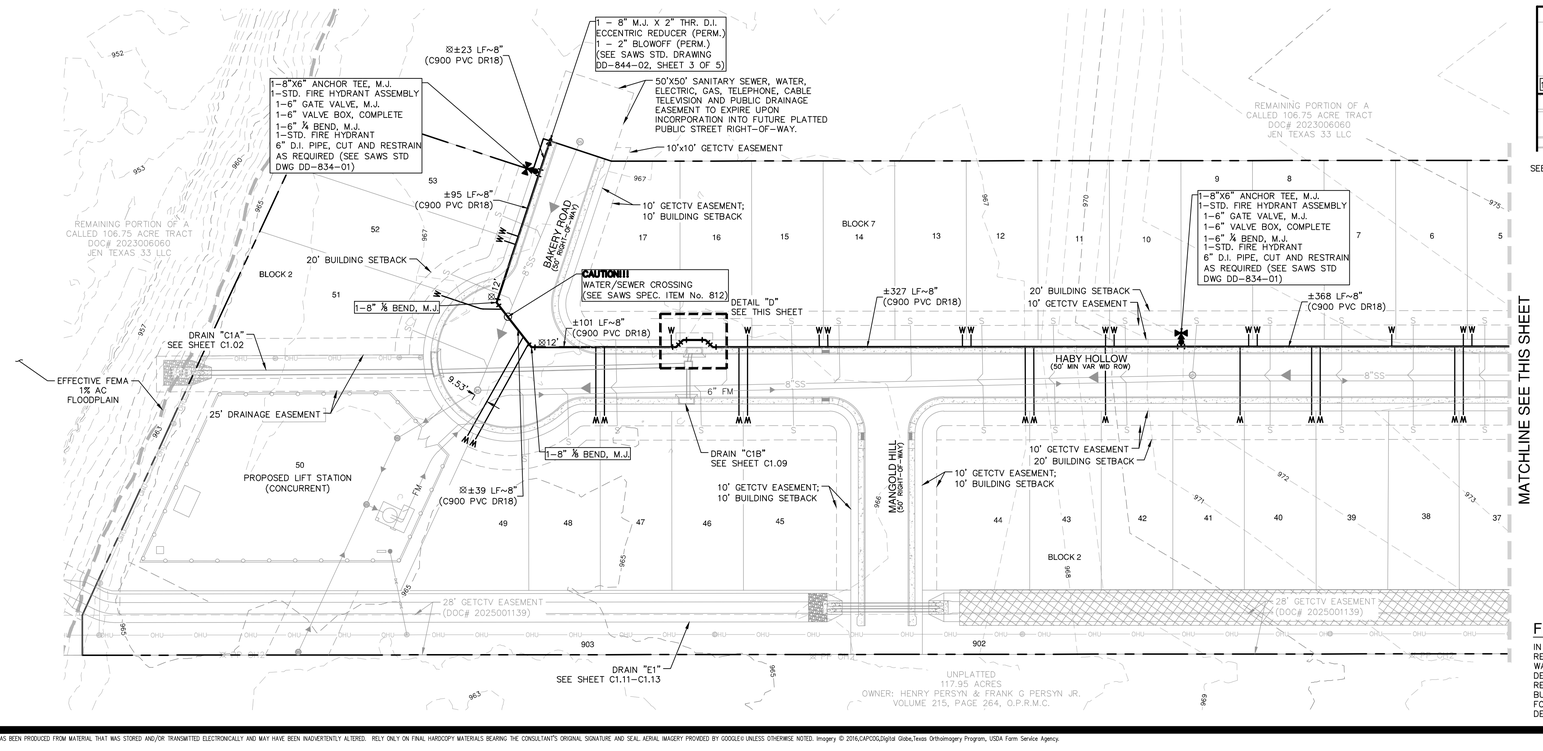
MANGOLD UNIT-2
SAN ANTONIO, TEXAS
OVERALL WATER DISTRIBUTION PLAN

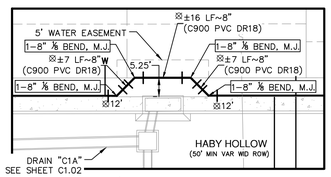
PLAT NO.	25-11800082
JOB NO.	12537-12
DATE	OCTOBER 2025
DESIGNER	JS
CHECKED	CB DRAWN BR
SHEET	C5.00

Date: Dec 01, 2025, 2:29pm User ID: clodner
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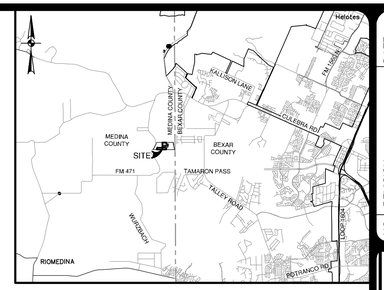




DETAIL "D"
SCALE: 1"=20'

FIRE FLOW NOTE:

IN AN EFFORT TO MEET THE CITY OF SAN ANTONIO'S FIRE FLOW REQUIREMENTS FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, THE PUBLIC WATER MAIN SYSTEM HAS BEEN DESIGNED FOR A MINIMUM FIRE FLOW DEMAND OF 1750 GPM AT 25 PSI RESIDUAL PRESSURE. THE FIRE FLOW REQUIREMENTS FOR INDIVIDUAL STRUCTURES WILL BE REVIEWED DURING THE BUILDING PERMIT PROCESS IN ACCORDANCE WITH THE PROCEDURES SET FORTH BY THE CITY OF SAN ANTONIO DIRECTOR OF DEVELOPMENT SERVICES DEPARTMENT AND THE SAN ANTONIO FIRE DEPARTMENT FIRE MARSHAL.



LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

WATER LEGEND

PROJECT LIMITS

EXISTING WATER — FIRE HYDRANT — W

EXISTING SEWER — MANHOLE — SS

PROPOSED SEWER — SS

PROPOSED WATER — FIRE HYDRANT — W

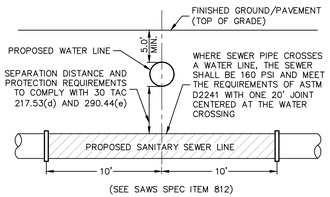
PROPOSED 3/4" SINGLE SERVICE WITH 5/8" METER — W

PROPOSED 1" DUAL SERVICE WITH 5/8" METER — W W

SINGLE IRRIGATION SERVICE 3/4" WITH 5/8" METER — IRR

JOINT RESTRAINT ⊠

FORCED MAIN, SEE "MANGOLD LIFT STATION AND FORCED MAIN" PLANS. FM



(SEE SAWS SPEC ITEM 812)

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL

NOT-TO-SCALE

PRESSURE REDUCING VALVE NOTE:

PRESSURE REDUCING VALVE TO BE INSTALLED ON CUSTOMER'S SIDE OF METER BY HOMEBUILDER.

PRESSURE NOTE:

CONTRACTOR TO VERIFY THAT NO PORTION OF THE TRACT IS BELOW GROUND ELEVATION OF 985 FEET WHERE THE STATIC PRESSURE WILL NORMALLY EXCEED 80 PSI. AT ALL SUCH LOCATIONS WHERE THE GROUND LEVEL IS BELOW 985 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).

JOINT RESTRAINT NOTE:

CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOINT RESTRAINING HARNESSES OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL INSURE THAT ALL TEES, BENDS, VALVES, ETC. HAVE A MINIMUM OF 5 FT OF PIPE WITH NO JOINTS ON EACH SIDE OF THE FITTING. JOINT RESTRAINTS AND RETAINER GLANDS SHALL BE CALCULATED BY SAWS APPROVED PROGRAMS. THERE WILL BE NO SEPARATE PAY ITEM FOR RETAINER GLANDS AND OTHER JOINT RESTRAINING HARNESSES AND GASKETS, BUT SHALL BE SUBSIDIARY TO THE UNIT COST PER LINEAL FOOT OF PIPE INSTALLED.

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 ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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.

WATER (SAWS PRESSURE ZONE 1170)

Developer's Name: JEN TEXAS 33, LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's 116 Total Acreage 28.28
Total Linear Footage of Pipe: 284 LF-2" PVC, 4,781 LF-8" PVC Plat No. 25-11800082
Number of Lots 114 SAWS JOB NO. 25-1044

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
12/1/25

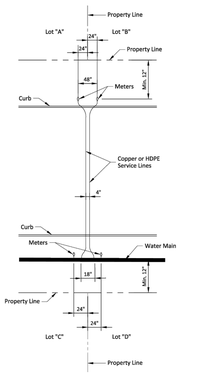
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD UNIT-2
SAN ANTONIO, TEXAS
OVERALL WATER DISTRIBUTION PLAN

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C5.01

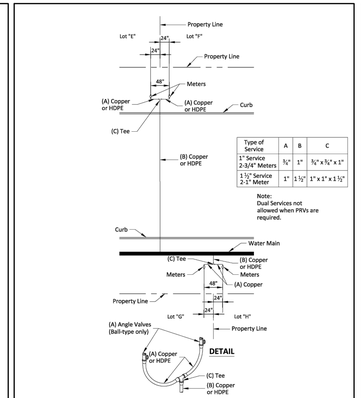
Date: Dec 01, 2025, 2:30pm User ID: clopher
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SINGLE SERVICE LINE - SINGLE METER

PROPERTY OF	TYPICAL	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	NEW DEVELOPMENT SERVICE ARRANGEMENT	March 2008	December 2018
		DD-824-05	SHEET 3 OF 3

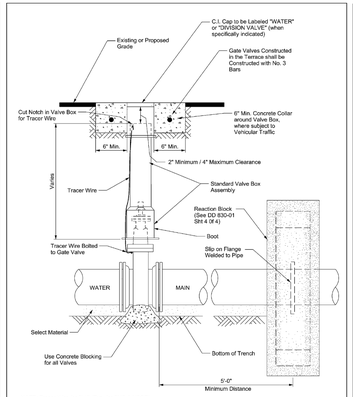


Type of Service	A	B	C
1" Service 2-3/4" Meters	¾"	1"	¾" x ¾" x 1"
1 ½" Service 2-1" Meter	1"	1½"	1" x 1" x 1 ½"

Note:
Dual Services not allowed when PRVs are required.

SINGLE SERVICE LINE - DUAL METER

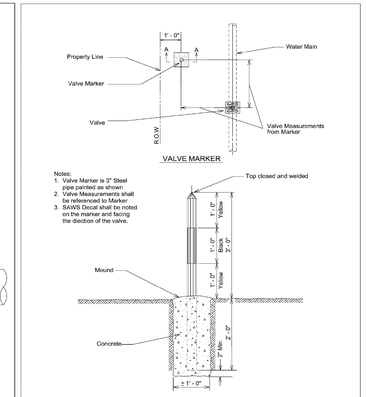
PROPERTY OF	TYPICAL	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	SERVICE ARRANGEMENT	March 2008	December 2018
		DD-824-05	SHEET 2 OF 3



NOTE: Tracer Wire for PVC (Typ. for PVC & HDPE)
NOTE: All Concrete to be 3,000 psi

Note: For all work associated with Recycled Water Valves, refer to DD 110-10, Sht. 1 of 1

PROPERTY OF	INSTALLATION OF NON-GEARED GATE VALVE WITH VALVE BOX AND EXTENSION	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		MARCH 2008	AUG 2019
		DD 828-01	SHEET 1 OF 1



VALVE MARKER

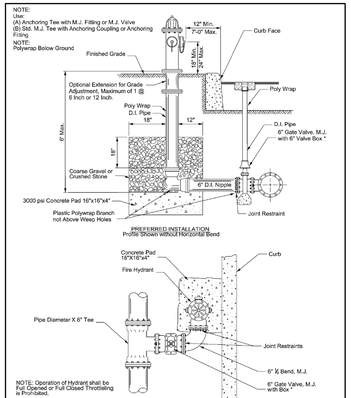
Notes:
1. Valve Marker is 3" Steel pipe painted as shown
2. Valve Measurements shall be referenced to Marker
3. SAWS Decal shall be noted on the marker and facing the diection of the valve.

SECTION A-A.

PROPERTY OF	VALVE MARKER	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		MARCH 2008	AUG 2019
		DD-828-04	SHEET 1 OF 1

NOTE:
Use:
(A) Anchoring Tee with M.J. Fitting or M.J. Valve
(B) Std. M.J. Tee with Anchoring Coupling or Anchoring Fitting

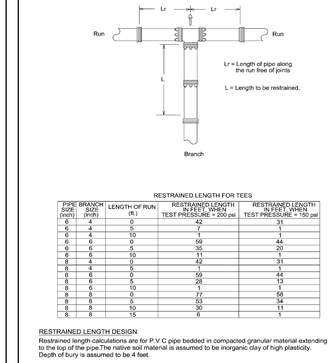
NOTE:
Polywrap Below Ground



NOTE: Operation of Hydrant shall be Full Opened or Full Closed Throttleing is Prohibited.

* Resilient Seat

PROPERTY OF	FIRE HYDRANT INSTALLATION (JOINT RESTRAINT)	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		MAY 2013	AUG 2019
		DD-834-01	SHEET 1 OF 3



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	4	0	42	31
6	4	5	7	1
6	4	10	7	1
6	6	0	59	44
6	6	5	27	20
6	6	10	11	1
8	4	0	42	31
8	4	5	1	1
8	6	0	59	44
8	6	5	28	13
8	6	10	1	1
8	8	0	77	58
8	8	5	53	34
8	8	10	30	11
8	8	15	6	1

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.

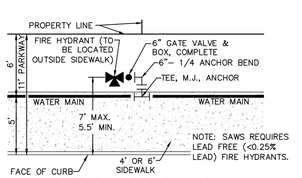
PROPERTY OF	RESTRAINED LENGTHS FOR TEES	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		March 2008	AUG 2019
		DD-839-04	SHEET 1 OF 2

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

NO.	REVISION	DATE

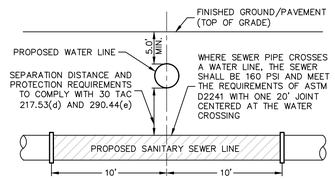
STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
11/5/25

MANGOLD UNIT-2
SAN ANTONIO, TEXAS
OVERALL WATER DETAILS

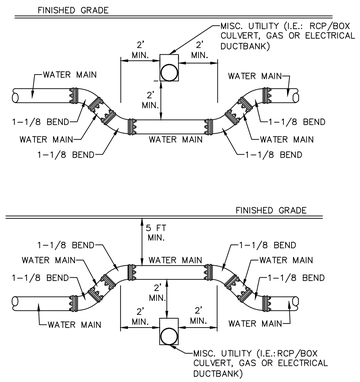


REFER TO SAWS DETAIL DD-834-01

FIRE HYDRANT INSTALLATION
NOT–TO–SCALE

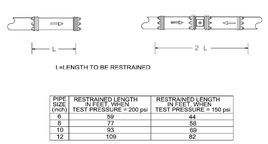


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT–TO–SCALE



ALL JOINTS ARE FULLY RESTRAINED IN ACCORDANCE WITH SAWS SPECIFICATION TABLE DD–839–06.

TYPICAL UTILITY/WATER CROSSING DETAIL
NOT–TO–SCALE



L=LENGTH TO BE RESTRAINED

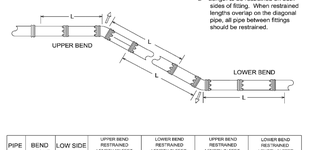
PIPE SIZE (inch)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 150 psi
6	59	44
8	77	58
10	93	69
12	109	82

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 provide for reference. The restrained length shall be designed based upon the conditions encountered during the installation.

PROPERTY OF	RESTRAINED LENGTHS FOR DEAD ENDS / INLINE VALVES	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		MARCH 2008	AUG 2019
		DD-839-05	SHEET 1 OF 1

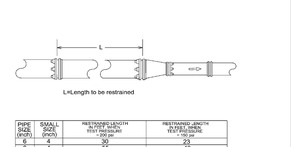


PIPE SIZE (inch)	BEND ANGLE (deg.)	LOW SIDE DEPTH	UPPER BEND RESTRAINED LENGTH IN FEET TEST PRESSURE = 200 psi	LOWER BEND RESTRAINED LENGTH IN FEET TEST PRESSURE = 200 psi	UPPER BEND RESTRAINED LENGTH IN FEET TEST PRESSURE = 150 psi	LOWER BEND RESTRAINED LENGTH IN FEET TEST PRESSURE = 150 psi
6	45	5	24	8	18	6
6	22.5	5	12	4	9	3
6	11.25	5	5	2	4	1
6	45	10	24	5	18	4
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	2
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	RESTRAINED LENGTHS VERTICAL OFFSETS	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		March 2008	AUG 2019
		DD-839-06	SHEET 1 OF 1

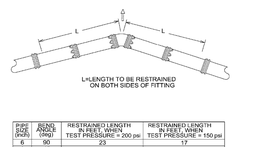


PIPE SIZE (inch)	SMALL SIZE (inch)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 150 psi
6	4	30	23
8	4	55	42
8	6	32	24
12	4	95	73
12	6	60	60
12	8	58	43

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. Th restrained length shall be designed based upon the conditions encountered during the installation.

PROPERTY OF	RESTRAINED LENGTHS FOR REDUCERS	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		MARCH 2008	MAY 2013
		DD-839-07	SHEET 1 OF 1

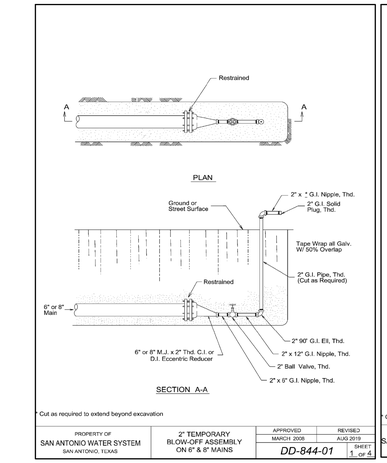


PIPE SIZE (inch)	BEND ANGLE (deg)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 150 psi
6	90	23	17
6	45	9	7
6	22.5	5	3
6	11.25	2	2
8	90	30	22
8	45	12	9
8	22.5	6	4
8	11.25	3	2
12	90	43	32
12	45	18	13
12	22.5	8	5
12	11.25	4	3

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.

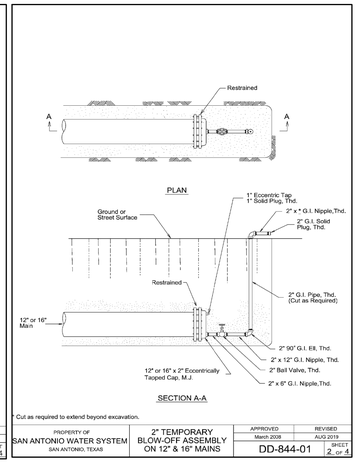
Note:
These calculations are provided for reference. The restrained length shall be designed based upon the conditions encountered during the installation.

PROPERTY OF	RESTRAINED LENGTHS FOR HORIZONTAL BENDS	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		March 2008	AUG 2019
		DD-839-08	SHEET 1 OF 1



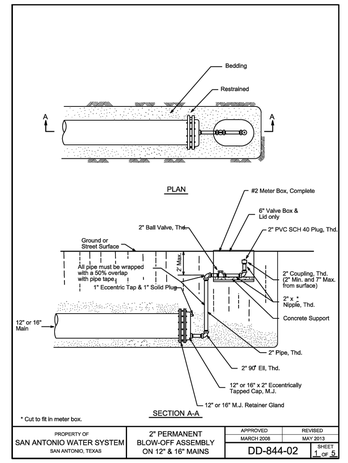
* Cut as required to extend beyond excavation

PROPERTY OF	2" TEMPORARY BLOW-OFF ASSEMBLY ON 6" & 8" MAINS	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		MARCH 2008	AUG 2019
		DD-844-01	SHEET 1 OF 4



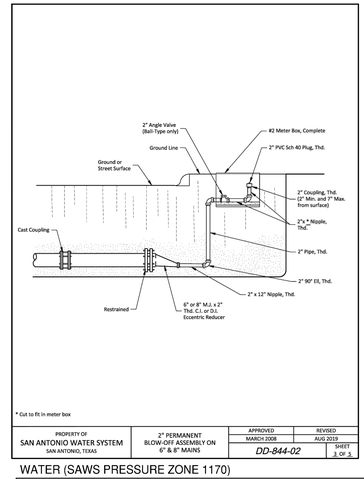
* Cut as required to extend beyond excavation.

PROPERTY OF	2" TEMPORARY BLOW-OFF ASSEMBLY ON 12" & 16" MAINS	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		March 2008	AUG 2019
		DD-844-01	SHEET 2 OF 4



* Cut to fit in meter box.

PROPERTY OF	2" PERMANENT BLOW-OFF ASSEMBLY ON 12" & 16" MAINS	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		MARCH 2008	MAY 2013
		DD-844-02	SHEET 3 OF 4



* Cut to fit in meter box

PROPERTY OF	2" PERMANENT BLOW-OFF ASSEMBLY ON 6" & 8" MAINS	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS		MARCH 2008	AUG 2019
		DD-844-02	SHEET 3 OF 3

WATER (SAWS PRESSURE ZONE 1170)

Developer's Name: JEN TEXAS 33, LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210–849–1447 FAX#
SAWS Block Map# 064–600 Total EDU's 116 Total Acreage 28.28
Total Linear Footage of Pipe: 294 LF–2" PVC; 4,781 LF–8" PVC Plat No. 25–11800082
Number of Lots 114 SAWS JOB NO. 25–1044

PLAT NO. 25-11800082
JOB NO. 12537–12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C5.02

Date: Nov 11, 2025, 8:41am User ID: clafrer
File: P:\125\37\12\Design\Civil\WTDT 125712.dwg

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SAWS CONSTRUCTION NOTES

(LAST REVISED JANUARY 2022)

SAWS 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 DIVISON 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.

SAWS WATER NOTES

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 985 FEET WHERE THE STATIC PRESSURE WILL NORMALLY EXCEED 80 PSI. AT ALL SUCH LOCATIONS WHERE THE GROUND LEVEL IS BELOW 985 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.

PROJECT WATER NOTES

1. MACHINE CHLORINATION BY THE S.A.W.S.
2. ALL 8", 12" AND 16" PIPE SHALL BE P.V.C. C-900 CLASS 235 DR 18.
3. ALL MAINS SHALL BE HYDROSTATICALLY TESTED BY THE CONTRACTOR, AS PROVIDED FOR IN THE SPECIAL CONDITIONS.
4. THE WATER LINES WILL BE SET FROM THE STREET HUBS BEFORE THIS CONTRACT BEGINS. STREET CUT SHEETS WILL BE SUPPLIED TO THE CONTRACTOR. THERE SHOULD BE NO ADDITIONAL STAKES REQUIRED, AND IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO INSPECT THE SITE AND VERIFY THAT ALL STAKES REQUIRED FOR HIS WORK ARE IN PLACE AT THE TIME THE CONSTRUCTION BEGINS. IF ANY STAKES ARE MISSING THE ENGINEER SHOULD BE NOTIFIED IMMEDIATELY. AFTER CONSTRUCTION BEGINS, ALL CONSTRUCTION STAKES, MARKS, ETC., SHALL BE CAREFULLY PRESERVED BY THE CONTRACTOR, AND IN CASE OF DESTRUCTION OR REMOVAL BY THE CONTRACTOR, HIS EMPLOYEE OR ANY OTHER MEANS, SUCH STAKES, MARKS, ETC., SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
5. THE CONTRACTOR SHALL FURNISH THE ENGINEER WITH ALL THE FINAL MEASUREMENTS, TAPS AND LENGTH OF SERVICE CONNECTIONS.
6. THE LOT CORNERS WILL BE SET BY THE ENGINEER FOR INSTALLATION OF ALL WATER SERVICES. THESE LOT CORNERS SHALL BE CAREFULLY PRESERVED BY THE CONTRACTOR SO THE METER BOXES CAN BE SET IN PHASE II. ANY LOT CORNER DESTROYED OR REMOVED BY THE CONTRACTOR, HIS EMPLOYEES, OR BY ANY OTHER MEANS SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
7. STREETS WILL HAVE BEEN EXCAVATED DOWN TO SUBGRADE AND THE PARKWAY WILL BE CUT DOWN TO TOP OF CURB BY THE STREET CONTRACTOR, PRIOR TO CONSTRUCTION OF THE WATER MAINS. IT WILL BE THE UTILITY CONTRACTOR'S RESPONSIBILITY TO PROVIDE A PAD FOR HIS EQUIPMENT.
8. WATER METER BOXES IF APPLICABLE SHALL BE INSTALLED NINE FEET FROM FACE OF CURB TO CENTER OF THE METER BOX.
9. ALL GARBAGE OR SPOIL MATERIAL FROM THIS WORK SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR, AT HIS EXPENSE.
10. FINAL CONNECTION TO THE EXISTING WATER MAIN SHALL NOT BE MADE UNTIL WATER MAIN HAS BEEN PRESSURE TESTED, CHLORINATED AND THE S.A.W.S. RELEASES THE MAIN FOR TIE-IN AND USE.
11. UNIT PRICE BID FOR "STANDARD FIRE HYDRANT ASSEMBLY" SHALL INCLUDE FIRE HYDRANT, 6-INCH GATE VALVE AND 6-INCH VALVE BOX COMPLETE, ANCHOR BEND, AND ALL 6-INCH DI PIPE REQUIRED (DI PIPE REQUIRED SHALL INCLUDE ALL PIPE FROM THE TEE ON THE MAIN LINE TO THE FIRE HYDRANT).
12. WHEN SEWER LINES ARE INSTALLED IN THE VICINITY OF WATER MAINS, SUCH INSTALLATION SHALL BE IN STRICT ACCORDANCE WITH THE TEXAS NATURAL RESOURCE CONSERVATION COMMISSION "RULES AND REGULATIONS FOR PUBLIC WATER SYSTEMS" (1988 OR ANY REVISIONS THERETO).
13. A CLEAR SPACE SHALL BE PROVIDED AROUND ALL FIRE HYDRANTS. THIS AREA SHOULD HAVE A MINIMUM DIAMETER OF 3.0' AND BE CLEAN OF VERTICAL OBSTRUCTIONS, VALVES, AND METER BOXES.
14. SAWS REQUIRES LEAD FREE (< 0.25%) FIRE HYDRANTS.
15. UNLESS OTHERWISE NOTED ALL SERVICES SHALL BE 3/4" WITH 5/8" METER.

WATER (SAWS PRESSURE ZONE 1170)

Developer's Name: JEN TEXAS 33, LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's 116 Total Acreage 28.28
Total Linear Footage of Pipe: 294 LF-2" PVC; 4,781 LF-8" PVC Plot No. 25-11800082
Number of Lots, 114 SAWS JOB NO. 25-1044

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
11/5/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

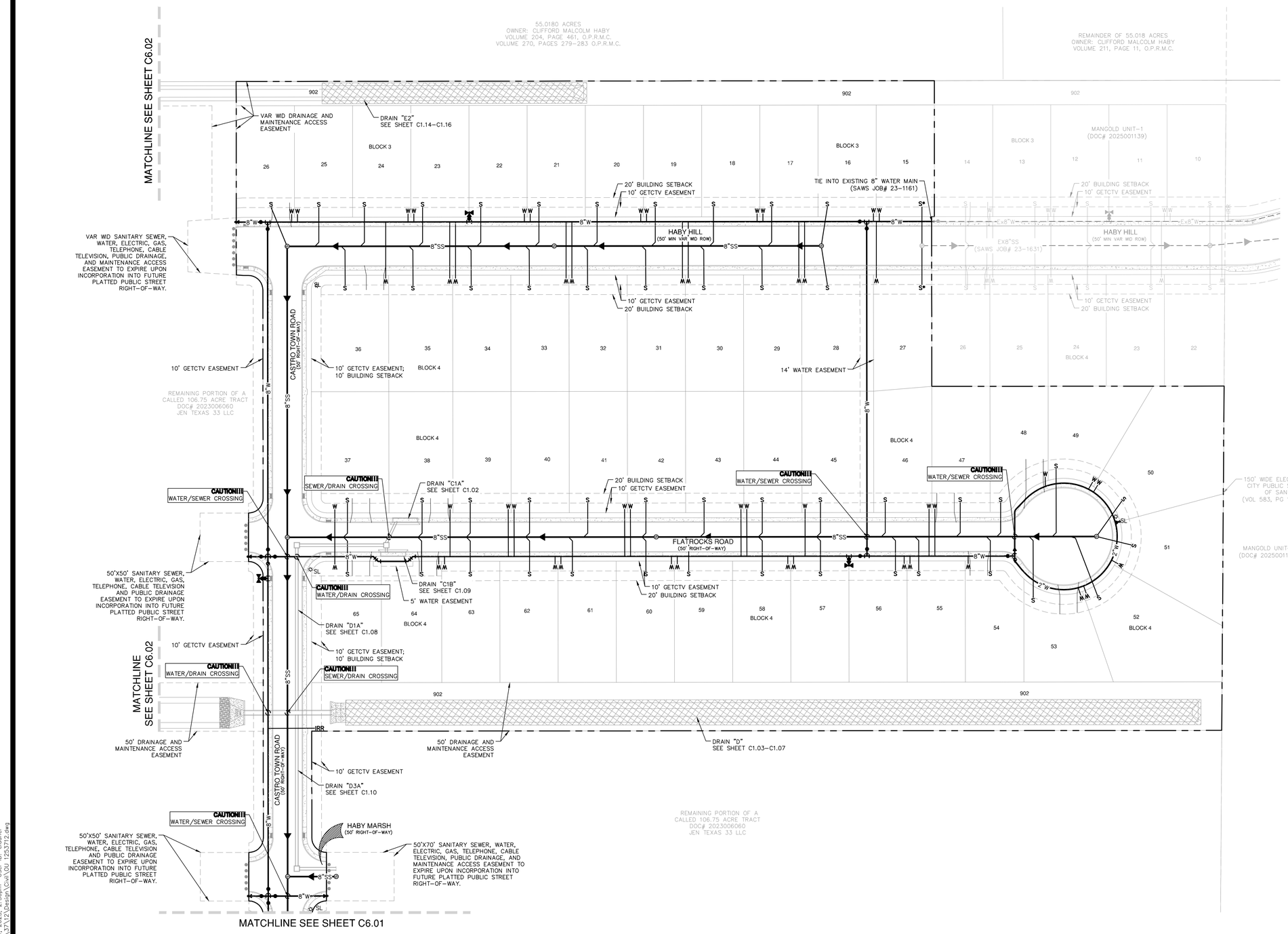
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

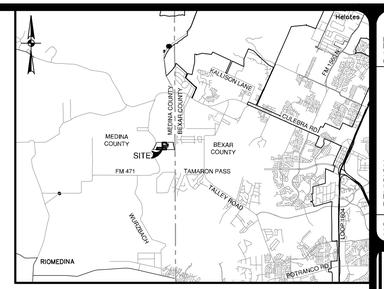
OVERALL WATER NOTES

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C5.03

Date: Nov 11, 2025, 8:41am User ID: clodher
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LOCATION MAP

NOT–TO–SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

UTILITY LEGEND

PROJECT LIMITS	
EXISTING WATER	W
EXISTING SEWER	SS
PROPOSED SEWER	SS MANHOLE
PROPOSED WATER	W FIRE HYDRANT
PROPOSED WYE & LATERAL	
SINGLE WATER SERVICE	
IRRIGATION SERVICE 3/4" W/5/8" METER	IRR
DUAL WATER SERVICE	
STREET LIGHTS	SL
GAS, ELECTRIC, TELEPHONE & CABLE TELEVISION EASEMENT	GETCTV
VARIABLE WIDTH RIGHT–OF–WAY	VAR WID ROW
VEHICULAR NON–ACCESS EASEMENT	VNAE
FORCED MAIN. SEE "MANGOLD LIFT STATION AND FORCED MAIN" PLANS.	FM

CONDUIT NOTES:

1. CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
2. CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 36 INCHES BELOW PROPOSED FINISHED GRADE. SCHEDULE 80 TO BE USED FOR CPS CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
3. ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
4. ALL CONDUIT SLEEVES TO BE USED FOR ELECTRIC, GAS, OR TELECOMMUNICATION UTILITY CROSSINGS SHALL BE INSTALLED TO MEET OR EXCEED DESIGN REQUIREMENTS FOR THE UTILITY AGENCY WHICH THEY ARE SERVING, INCLUDING BUT NOT LIMITED TO THE DEPTH, TRENCH PLACEMENT, AND PROXIMITY TO OTHER UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING AND INSTALLING THE CONDUIT SLEEVES TO MEET THESE SPECIFICATIONS INCLUDING COORDINATING WITH THE UTILITY AGENCY FOR ANY REQUIRED INSPECTIONS

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CAUTION!!

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STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
12/1/25

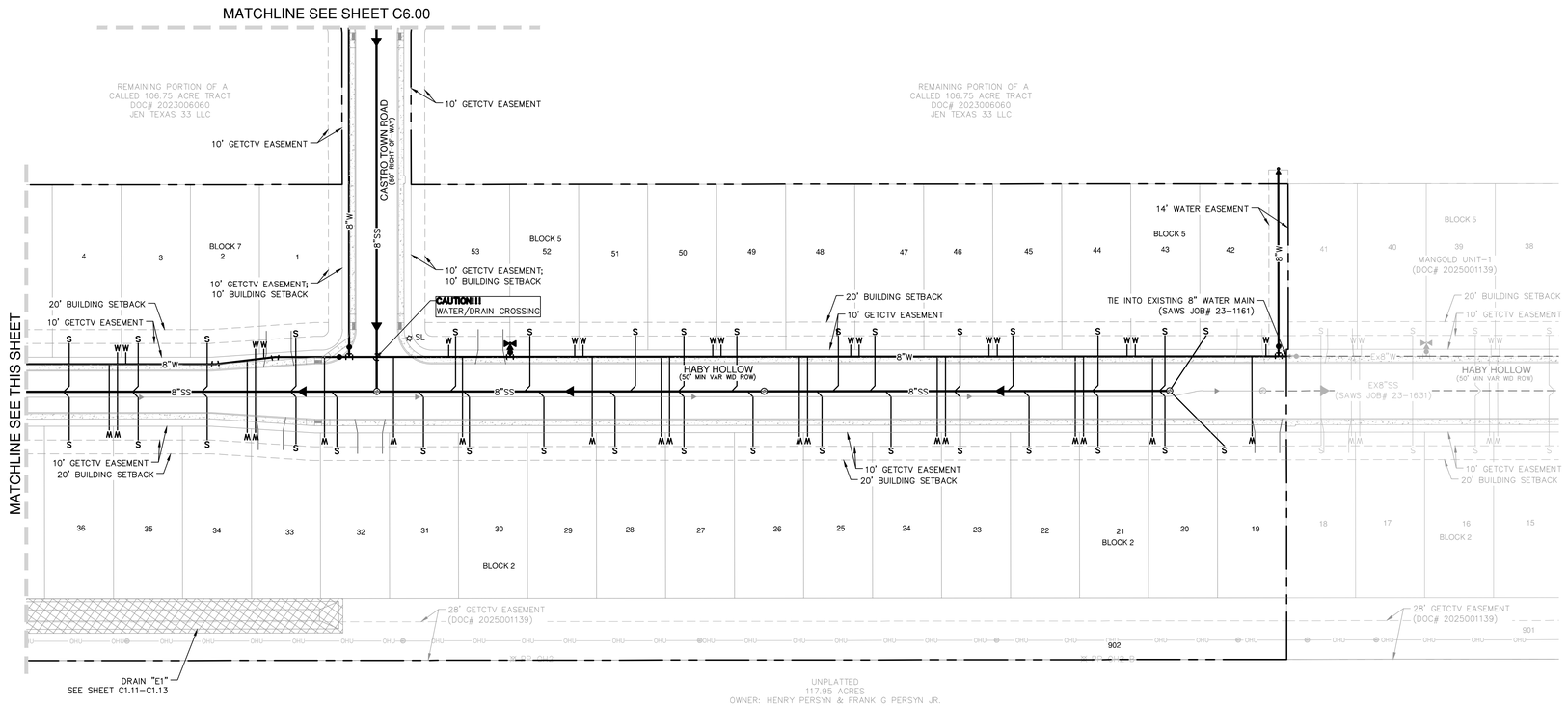
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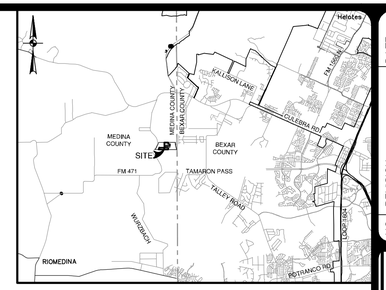
MANGOLD UNIT–2
SAN ANTONIO, TEXAS
OVERALL UTILITY PLAN

PLAT NO. 25-11800082
JOB NO. 12537–12
DATE OCTOBER 2025
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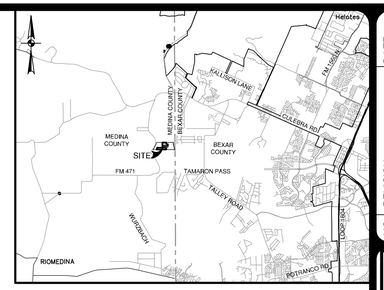
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

OVERALL UTILITY PLAN

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
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EXISTING SEWER	SS
PROPOSED SEWER	SS MANHOLE
PROPOSED WATER	W FIRE HYDRANT
PROPOSED WYE & LATERAL	S
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CONDUIT NOTES:

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2. CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 36 INCHES BELOW PROPOSED FINISHED GRADE. SCHEDULE 80 TO BE USED FOR CPS CONDUITS, ALL OTHER CONDUITS ARE SCHEDULE 40.
3. ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
4. ALL CONDUIT SLEEVES TO BE USED FOR ELECTRIC, GAS, OR TELECOMMUNICATION UTILITY CROSSINGS SHALL BE INSTALLED TO MEET OR EXCEED DESIGN REQUIREMENTS FOR THE UTILITY AGENCY WHICH THEY ARE SERVING, INCLUDING BUT NOT LIMITED TO THE DEPTH, TRENCH PLACEMENT, AND PROXIMITY TO OTHER UTILITIES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING AND INSTALLING THE CONDUIT SLEEVES TO MEET THESE SPECIFICATIONS INCLUDING COORDINATING WITH THE UTILITY AGENCY FOR ANY REQUIRED INSPECTIONS

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 ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES 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!!

CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT ARISE SHOULD BE COMMUNICATED TO THE ENGINEER IMMEDIATELY AND PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR AND THE REPAIR SHALL BE AT CONTRACTOR'S SOLE EXPENSE WHETHER THE UTILITY IS SHOWN ON THESE PLANS OR NOT.

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

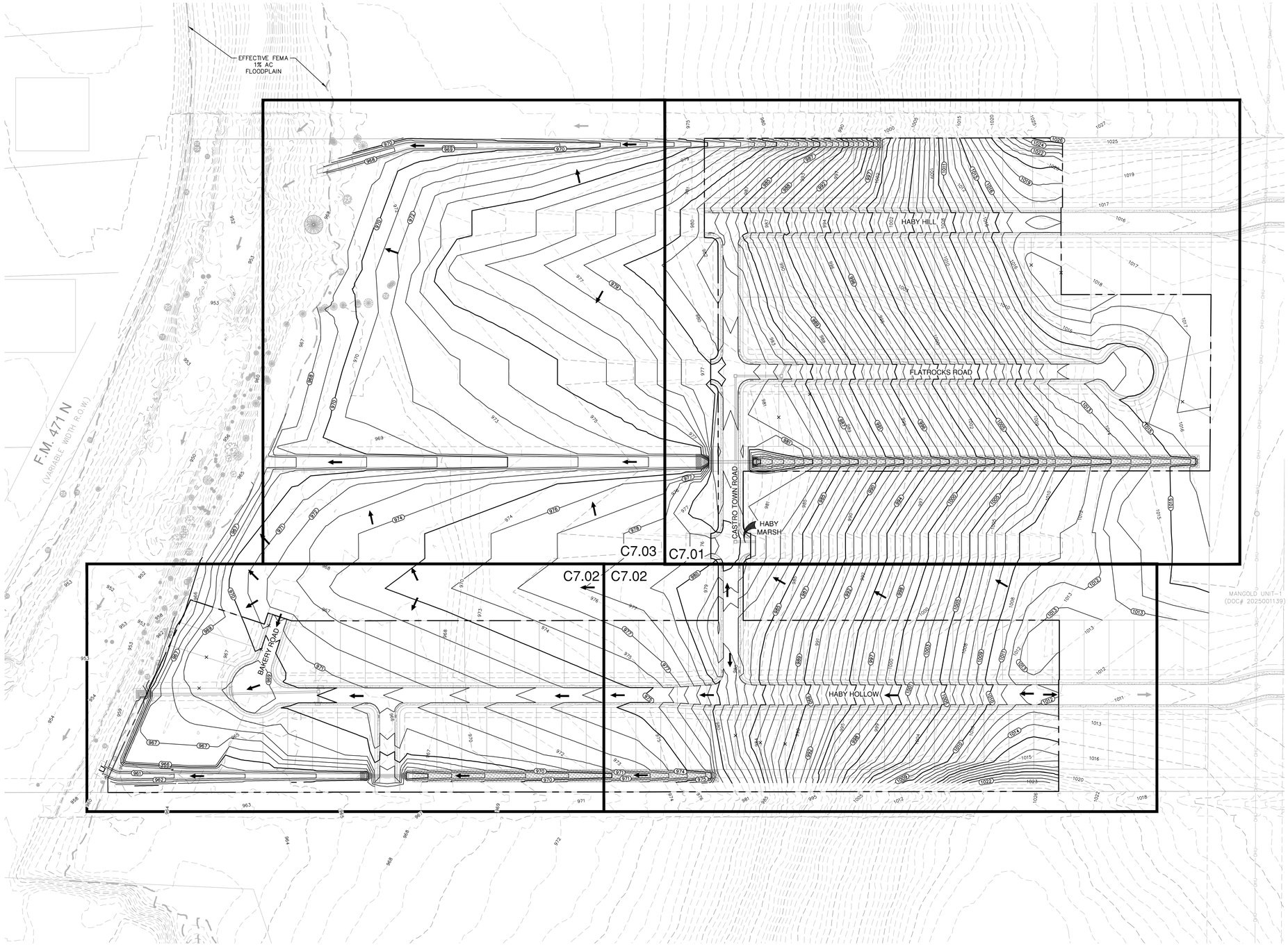
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

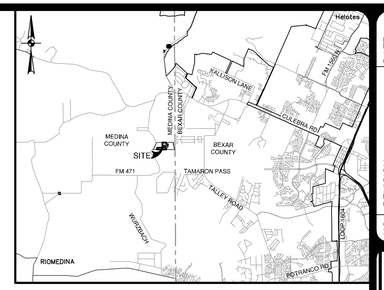
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

OVERALL UTILITY PLAN

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C6.02

Date: Oct 28, 2025, 12:19pm User ID: clohrer
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LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 100'

0' 100' 200' 300'

GRADING LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR — 976
- PROPOSED CONTOUR — 970
- FLOW ARROW (EXISTING)
- FLOW ARROW (PROPOSED)
- MINIMUM FINISHED FLOOR ELEVATION — FF = XXXX.XX
- TREES TO REMAIN

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9. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE STABILIZATION. ALL DISTURBED AREAS SHALL BE REVEGETATED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND TPDES/SWPPP REQUIREMENTS. REFERENCE THE LANDSCAPE ARCHITECT'S PLAN, IF APPLICABLE.

10. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS (USE OF SILT FENCES, ETC.) TO KEEP DRAINAGE AND SILT FROM WASHING ONTO ADJACENT PROPERTY, STREETS, OR DRAINAGE WAYS. CONTRACTOR SHALL IMMEDIATELY REMOVE SILT/DEBRIS WHICH WASHES OFFSITE OR INTO EXISTING STORM DRAIN SYSTEMS. (SEE SWPPP PLANS & TPDES BOOK).

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12. IN PROPOSED PAVING AREAS, STREET DESIGN PLANS SHALL CONTROL. ALL EARTHEN SLOPES SHALL BE A MAXIMUM OF 3:1 AND A MINIMUM OF 1.0% UNLESS OTHERWISE SHOWN.

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19. NO WORK SHALL BE PERFORMED IN A PUBLIC RIGHT-OF-WAY WITHOUT A PERMIT.

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
12/1/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

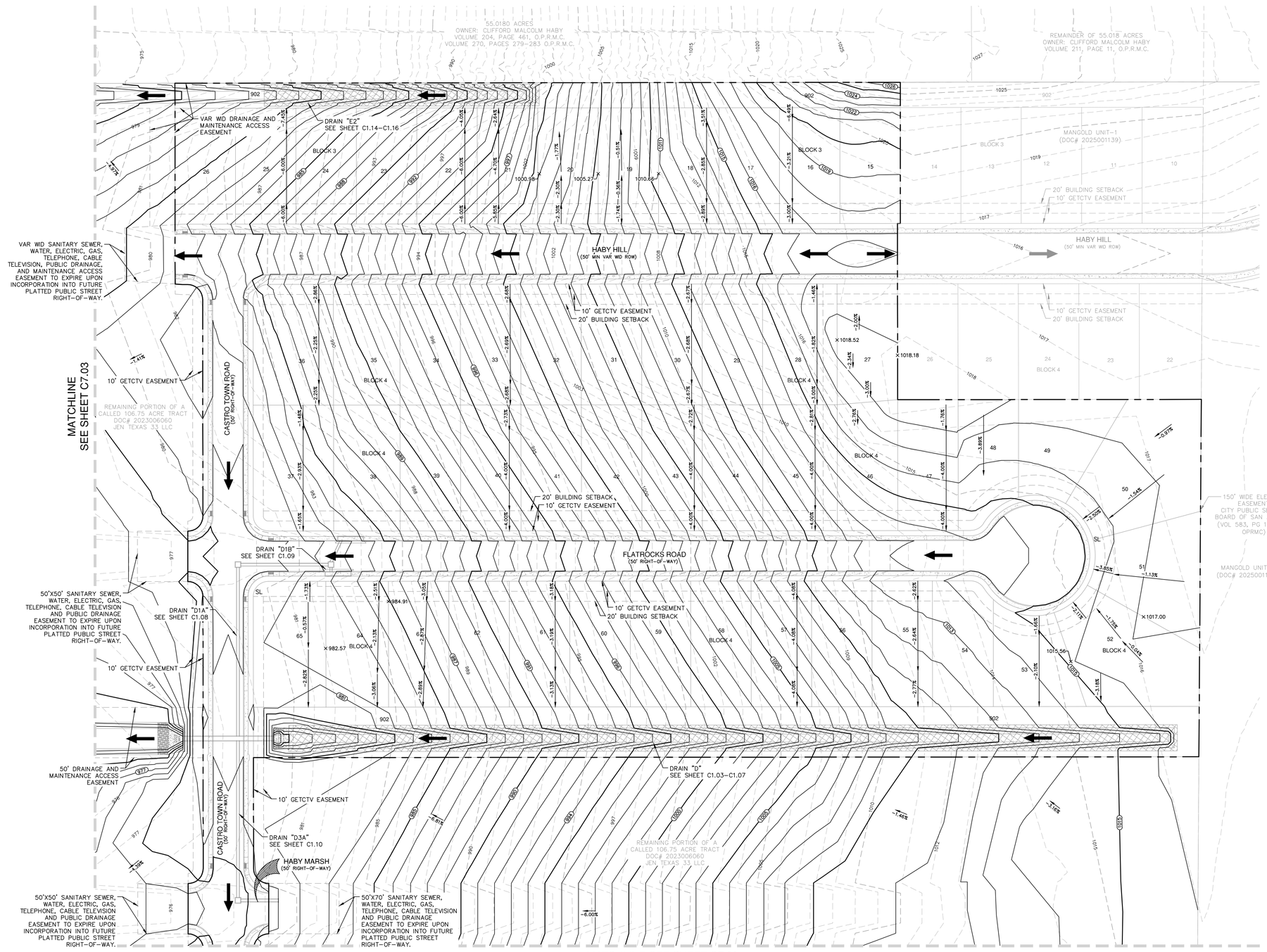
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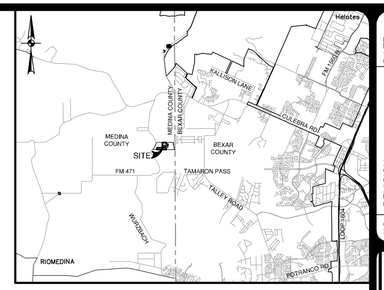
OVERALL GRADING PLAN
(SHEET INDEX)

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C7.00

Date: Dec 01, 2025, 2:32pm User ID: clafner
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LOCATION MAP

NOT-TO-SCALE

SCALE: 1" = 50'

0' 50' 100' 150'

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- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR (976)
- PROPOSED CONTOUR (970)
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STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
12/1/25

NO.	REVISION	DATE

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

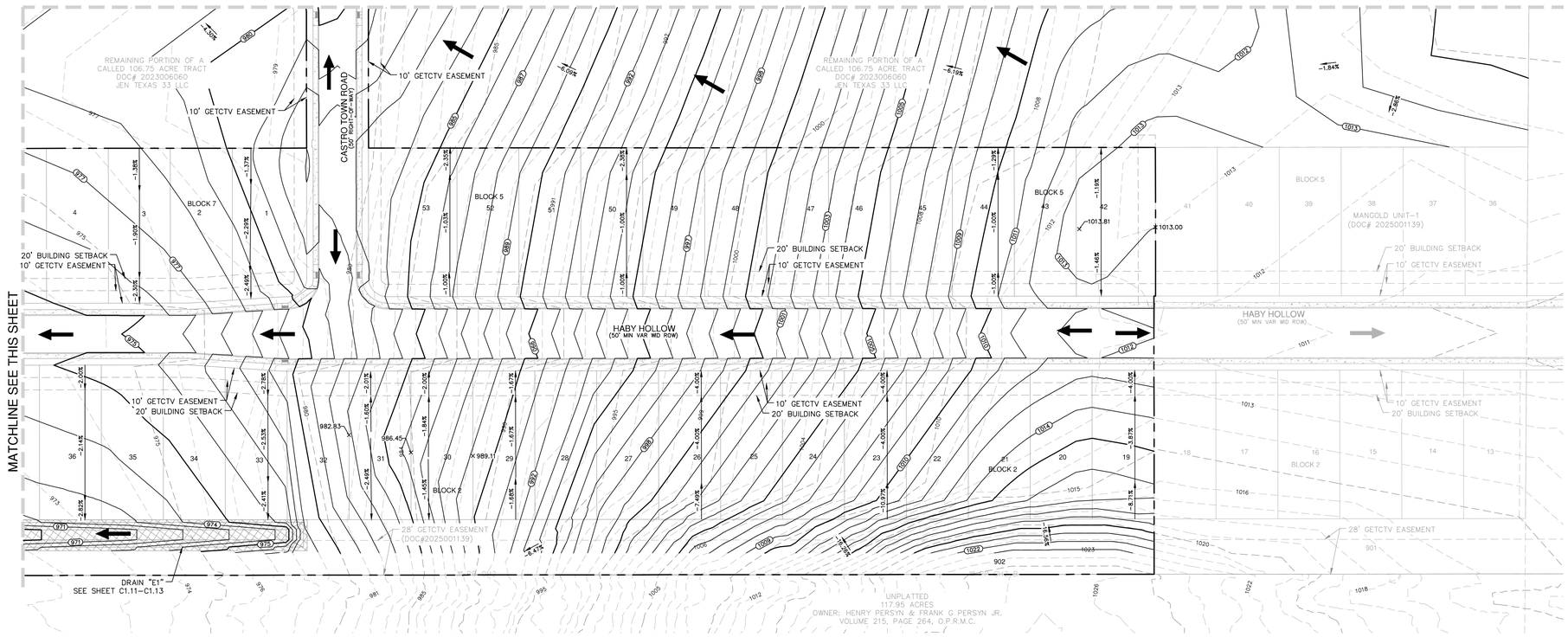
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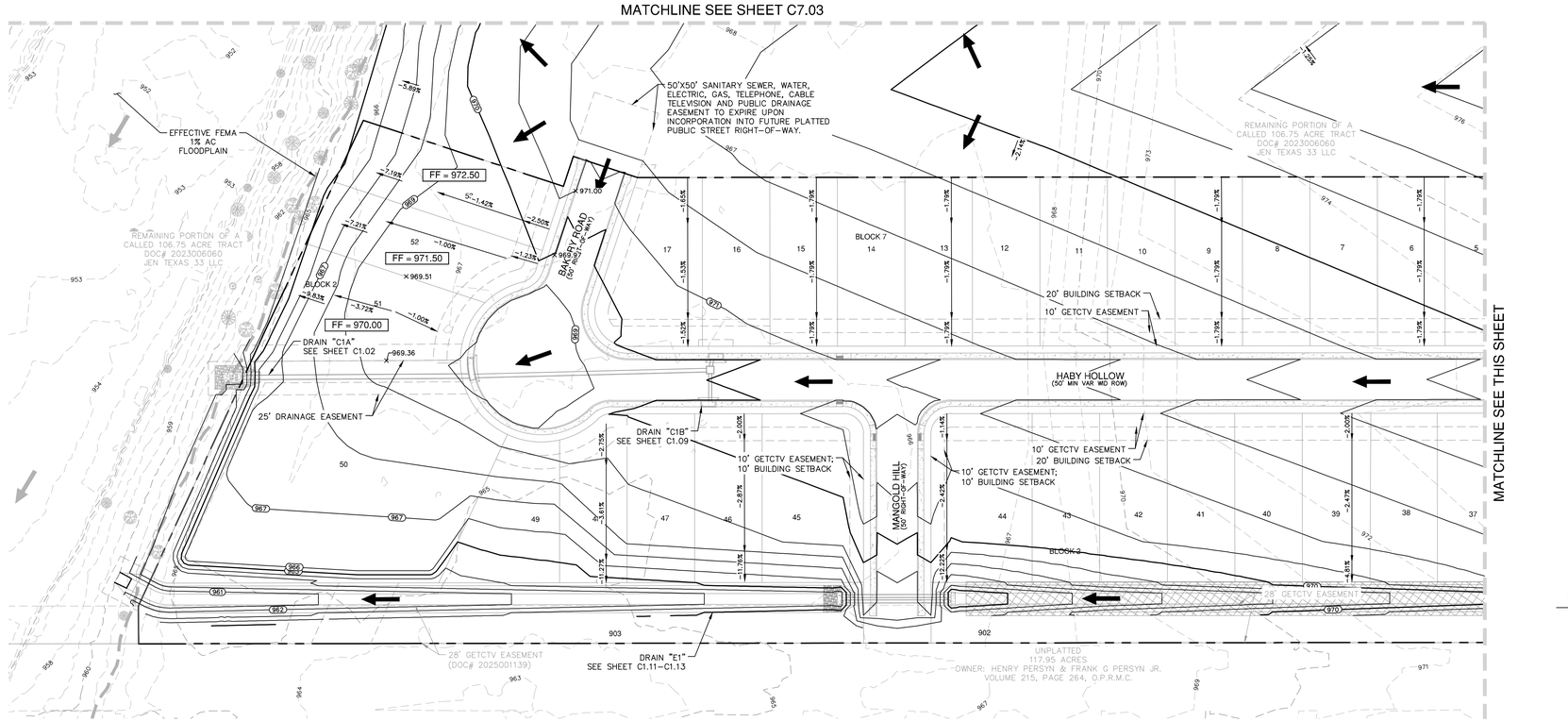
OVERALL GRADING PLAN

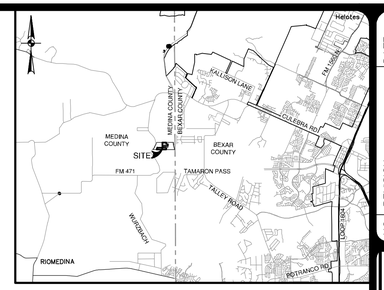
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JOB NO. 12537-12
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LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

GRADING LEGEND

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- EFFECTIVE FEMA 1% AC FLOODPLAIN
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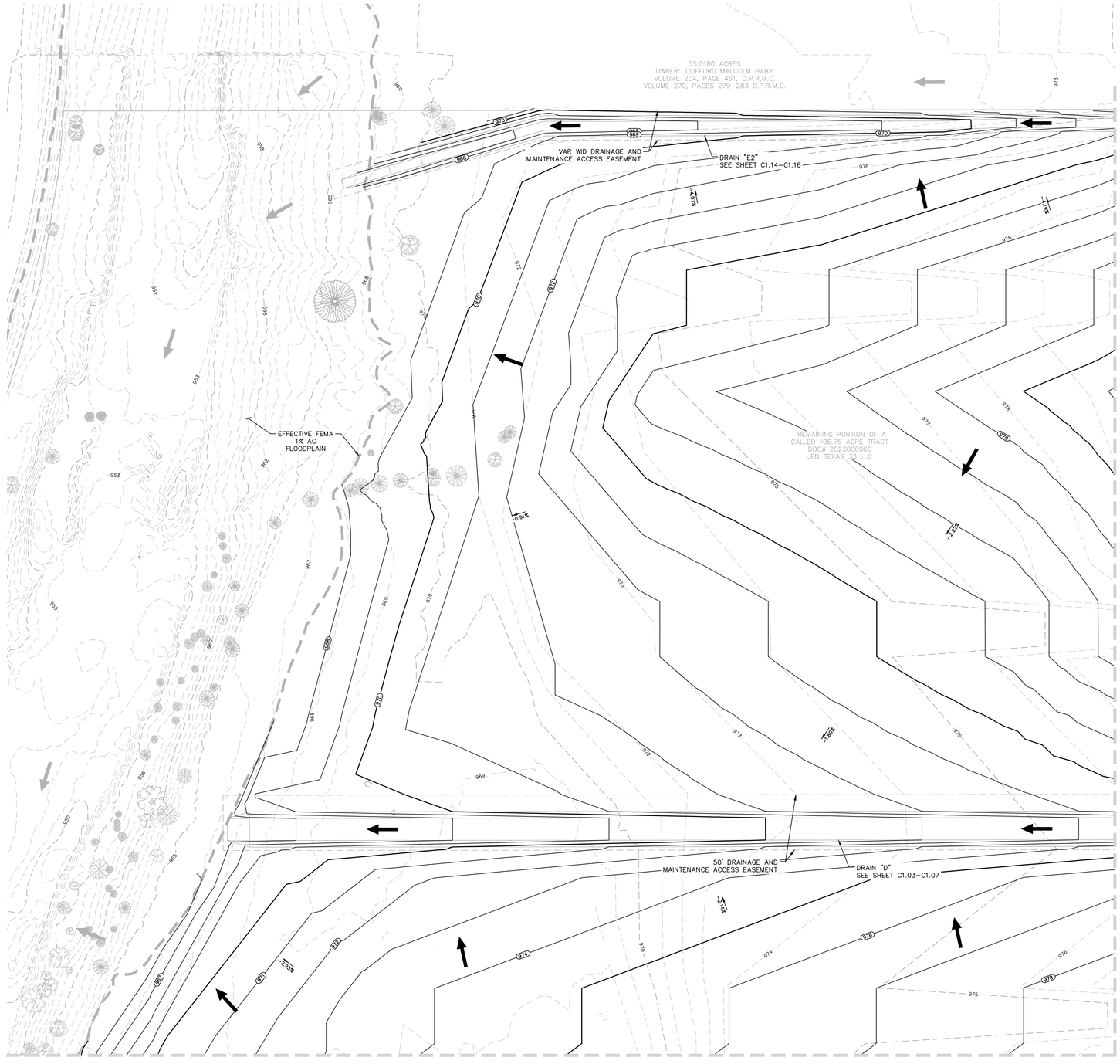
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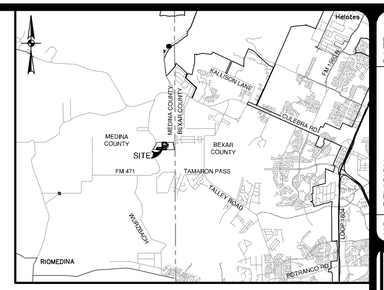
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LOCATION MAP

NOT–TO–SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

GRADING LEGEND

- PROJECT LIMITS
- EFFECTIVE FEMA 1% AC FLOODPLAIN
- EXISTING CONTOUR — 976
- PROPOSED CONTOUR — 970
- FLOW ARROW (EXISTING)
- FLOW ARROW (PROPOSED)
- MINIMUM FINISHED FLOOR ELEVATION — FF = XXXX.XX
- TREES TO REMAIN

GRADING NOTES:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THIS SCOPE OF WORK WHERE NOT SPECIFICALLY COVERED IN THE SPECIFICATIONS OR GEOTECHNICAL REPORT SHALL CONFORM TO ALL APPLICABLE CITY, COUNTY AND TXDOT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION).

2. SITE PREPARATION, GRADING, EXCAVATION AND FILL SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT GEOTECHNICAL REPORT AND SPECIFICATIONS.

3. ALL SELECT FILL MATERIAL PROVIDED SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACING AND COMPACTING.

4. ALL ELEVATIONS AND PROPOSED CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVING, BASE, GRASS, TOPSOIL, AND MULCH MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.

5. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF ANY QUESTIONS THAT MAY ARISE CONCERNING THE INTENT, PLACEMENT, OR LIMITS OF DIMENSIONS OR GRADES NECESSARY FOR CONSTRUCTION OF THIS PROJECT.

6. THE CONTRACTOR SHALL VERIFY THE SUITABILITY OF ALL EXISTING AND PROPOSED SITE CONDITIONS INCLUDING GRADES AND DIMENSIONS BEFORE COMMENCEMENT OF CONSTRUCTION. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY OF ANY DISCREPANCIES.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ACQUIRING ALL PERMITS, TESTS, APPROVALS AND ACCEPTANCES REQUIRED TO COMPLETE CONSTRUCTION OF THIS PROJECT.

8. THE CONTRACTOR SHALL REMOVE TOP SOIL, GRASS, ROOTS, DEBRIS, ETC. AND DISPOSE OFF SITE THOSE MATERIALS NOT SUITABLE FOR EMBANKMENT AND TOPSOIL. CLEAN STRIPPINGS AND TOPSOIL MAY BE STOCKPILED ON SITE FOR REUSE IN A LOCATION SPECIFIED BY THE OWNER.

9. THE SITE CONTRACTOR SHALL BE RESPONSIBLE FOR SITE STABILIZATION. ALL DISTURBED AREAS SHALL BE REVEGETATED IN ACCORDANCE WITH PROJECT SPECIFICATIONS AND TPDES/SWPPP REQUIREMENTS. REFERENCE THE LANDSCAPE ARCHITECT'S PLAN, IF APPLICABLE.

10. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS (USE OF SILT FENCES, ETC.) TO KEEP DRAINAGE AND SILT FROM WASHING ONTO ADJACENT PROPERTY, STREETS, OR DRAINAGE WAYS. CONTRACTOR SHALL IMMEDIATELY REMOVE SILT/DEBRIS WHICH WASHES OFFSITE OR INTO EXISTING STORM DRAIN SYSTEMS. (SEE SWPPP PLANS & TPDES BOOK).

11. THE CONTRACTOR SHALL OBTAIN GRADES SHOWN HEREON WITHIN +/– ONE–TENTH (0.10) FOOT.

12. IN PROPOSED PAVING AREAS, STREET DESIGN PLANS SHALL CONTROL. ALL EARTHEN SLOPES SHALL BE A MAXIMUM OF 3:1 AND A MINIMUM OF 1.0% UNLESS OTHERWISE SHOWN.

13. THE CONTRACTOR SHALL PROVIDE A SMOOTH TRANSITION BETWEEN EXISTING SITE AND PROPOSED IMPROVEMENTS.

14. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL, OR BETTER, CONDITION ANY DAMAGE DONE TO EXISTING TREES, BUILDINGS, UTILITIES, FENCES, PAVEMENT, CURBS, OR DRIVEWAYS (NO SEPARATE PAY ITEMS).

15. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION IN WORKING NEAR UTILITIES, GAS LINES, SEWER, OR EXISTING APPURTENANCES. PRIOR TO PERFORMING ANY EXCAVATION, CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND ASSURE HIMSELF THAT ALL UTILITIES HAVE BEEN ADEQUATELY LOCATED AND IDENTIFIED. THE ENGINEER SHALL BE NOTIFIED IF ANY UTILITY CONFLICTS ARE DISCOVERED.

16. UTILITIES SHOWN ON THE PLANS ARE FROM INFORMATION SOURCES AVAILABLE AT THE TIME OF DESIGN BUT MAY NOT REPRESENT ALL EXISTING UTILITIES ON SITE. THE CONTRACTOR WILL BE RESPONSIBLE FOR DETERMINING EXACT LOCATION OF ALL UTILITIES WHETHER SHOWN ON THE PLANS OR NOT. THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES PRIOR TO CONSTRUCTION AND VERIFY SIZE, GRADE AND LOCATION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY DEVIATIONS FROM PLANS PRIOR TO BEGINNING CONSTRUCTION. ANY DAMAGE TO EXISTING UTILITIES, WHETHER SHOWN ON THE PLANS OR NOT, SHALL BE THE CONTRACTORS RESPONSIBILITY TO REPAIR, AT HIS OWN EXPENSE.

17. POSITIVE DRAINAGE SHALL BE MAINTAINED THROUGHOUT THE SCOPE OF THE PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM ALL BUILDING FOUNDATIONS. CONTRACTOR SHOULD TAKE PRECAUTIONS NOT TO ALLOW ANY PONDING OF WATER.

18. FOR FILL PLACEMENT ON HILL SIDES OR STEEP SLOPE AREAS, THE CONTRACTOR SHALL REFERENCE THE PROJECT SPECIFICATIONS AND GEOTECHNICAL REPORT FOR SPECIAL INSTRUCTIONS REGARDING BENCHING.

19. NO WORK SHALL BE PERFORMED IN A PUBLIC RIGHT–OF–WAY WITHOUT A PERMIT.

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE–DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

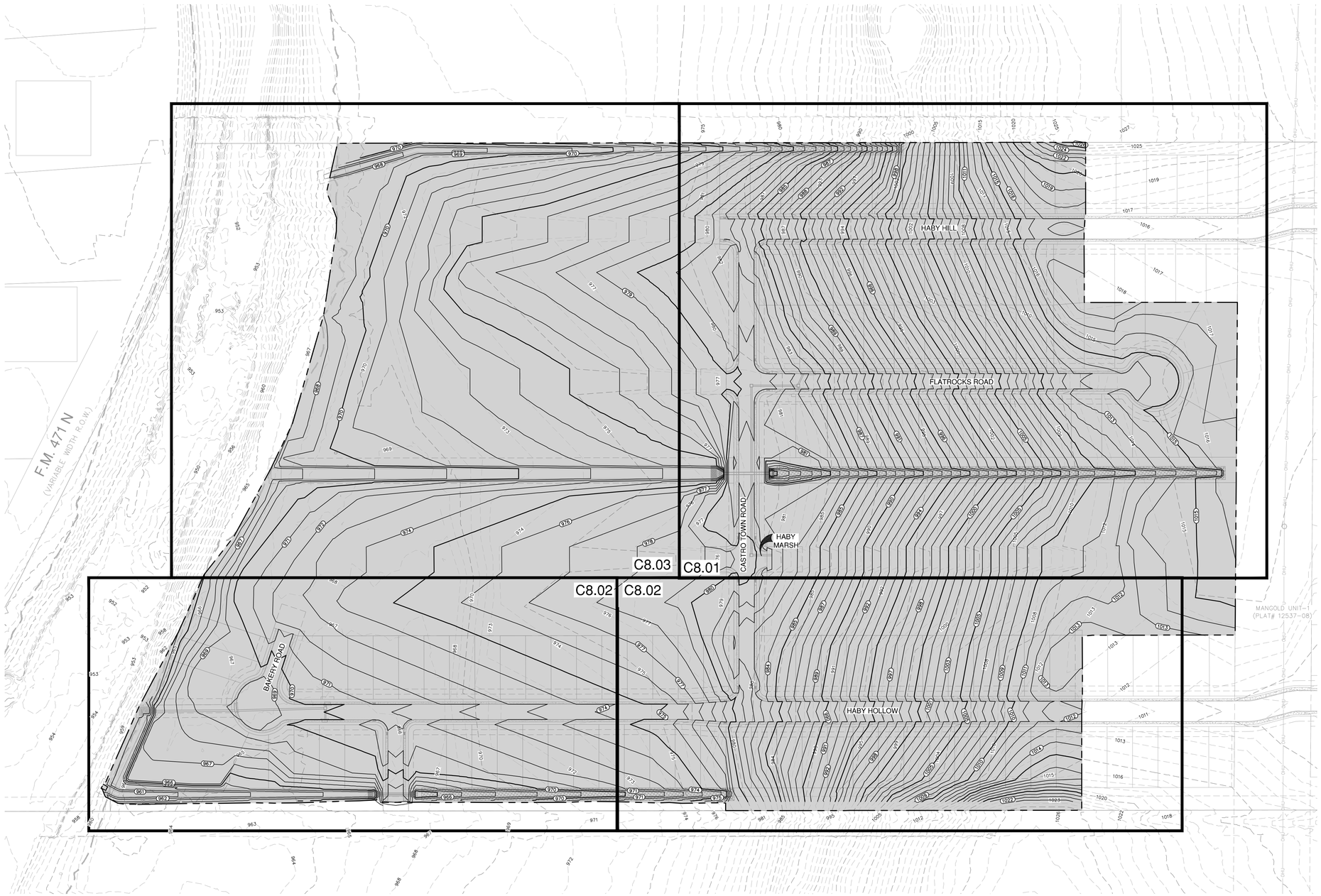
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

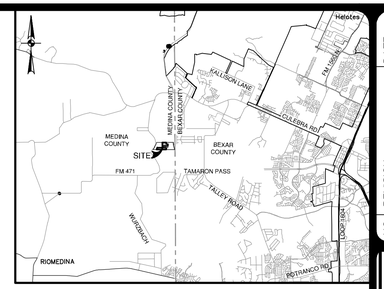
OVERALL GRADING PLAN

PLAT NO. 25-11800082
JOB NO. 12537–12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C7.03

Date: Oct 28, 2025, 12:21pm User ID: clodner
File: P:\125\37\12\Design\Civil\GR 1253712.dwg

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LOCATION MAP

NOT-TO-SCALE

SCALE: 1" = 100' / 0' 100' 200' 300'

SWPPP LEGEND

- PROJECT LIMITS
- EXISTING CONTOUR (976)
- PROPOSED CONTOUR (970)
- FLOW ARROW (EXISTING)
- FLOW ARROW (PROPOSED)
- SILT FENCE
- ROCK BERM
- GRAVEL FILTER BAGS
- GRATE INLET PROTECTION
- SEDIMENT CONTROL ROLLS
- LIMITS OF DISTURBED AREA
- STABILIZED CONSTRUCTION ENTRANCE/EXIT (FIELD LOCATE)
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA (FIELD LOCATE)
- CONCRETE TRUCK WASH-OUT PIT (FIELD LOCATE)
- FHA LOT GRADING TYPE — A,B,C

GENERAL NOTES

1. DO NOT DISTURB VEGETATED AREAS (TREES, GRASS, WEEDS, BRUSH, ETC.) ANY MORE THAN NECESSARY FOR CONSTRUCTION.

2. CONSTRUCTION ENTRANCE/EXIT LOCATION, CONCRETE WASH-OUT PIT, AND CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD TO BE DETERMINED IN THE FIELD.

3. STORM WATER POLLUTION PREVENTION CONTROLS MAY NEED TO BE MODIFIED IN THE FIELD TO ACCOMPLISH THE DESIRED EFFECT. ALL MODIFICATIONS ARE TO BE NOTED ON THIS EXHIBIT AND SIGNED AND DATED BY THE RESPONSIBLE PARTY.

4. RESTRICT ENTRY/EXIT TO THE PROJECT SITE TO DESIGNATED LOCATIONS BY USE OF ADEQUATE FENCING, IF NECESSARY.

5. ALL STORM WATER POLLUTION PREVENTION CONTROLS ARE TO BE MAINTAINED AND IN WORKING CONDITIONS AT ALL TIMES.

6. FOR A COMPLETE LISTING OF TEMPORARY STORM WATER POLLUTION PREVENTION CONTROLS REFER TO THE TPDES STORM WATER POLLUTION PREVENTION PLAN.

7. STORM WATER POLLUTION PREVENTION STRUCTURES SHOULD BE CONSTRUCTED WITHIN THE SITE BOUNDARIES. SOME OF THESE FEATURES MAY BE SHOWN OUTSIDE THE SITE BOUNDARIES ON THIS PLAN FOR VISUAL CLARITY.

8. AS SOON AS PRACTICAL, ALL DISTURBED SOIL THAT WILL NOT BE COVERED BY IMPERVIOUS COVER SUCH AS PARKWAY AREAS, EASEMENT AREAS, EMBANKMENT SLOPES, ETC. WILL BE STABILIZED PER APPLICABLE PROJECT SPECIFICATIONS.

9. BEST MANAGEMENT PRACTICES MAY BE INSTALLED IN STAGES TO COINCIDE WITH THE DISTURBANCE OF UPGRADIENT AREAS.

10. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN STAGES ONCE THE WATERSHED FOR THAT PORTION CONTROLLED BY THE BEST MANAGEMENT PRACTICES HAS BEEN STABILIZED IN ACCORDANCE WITH TPDES REQUIREMENTS.

11. UPON COMPLETION OF THE PROJECT, INCLUDING SITE STABILIZATION, AND BEFORE FINAL PAYMENT IS ISSUED, CONTRACTOR SHALL REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES, PAYING SPECIAL ATTENTION TO ROCK BERMS IN DRAINAGE FEATURES.

12. WHERE VEGETATED FILTER STRIPS ARE INDICATED, CONTRACTOR SHALL VERIFY THAT SUFFICIENT VEGETATION EXISTS, OTHERWISE CONTRACTOR SHALL PLACE SILT FENCING IN LIEU OF VEGETATED FILTER STRIP.

13. SHADED AREA ▭ DENOTES LIMITS OF DISTURBED AREAS. OTHER AREAS WITHIN THE PROJECT LIMITS, WITH THE EXCEPTION OF A CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD, ARE NOT A PART OF THIS TPDES STORM WATER POLLUTION PREVENTION PLAN (SWP3) AND WILL NOT BE DISTURBED BY CIVIL CONSTRUCTION ACTIVITIES.

14. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL COORDINATE PLACEMENT OF TEMPORARY BEST MANAGEMENT PRACTICES WITHIN TXDOT RIGHT-OF-WAY WITH TXDOT.

15. CPS ENERGY WILL FUNCTION AS A SECONDARY OPERATOR ON THIS PROJECT AND WILL BE INSTALLING ELECTRIC UTILITIES FOR ON-SITE CONSTRUCTION AND OFF-SITE FEED TO THE PROJECT.

SWP3 MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE TPDES-STORM WATER POLLUTION PREVENTION PLAN (SWP3) REGULATIONS.

THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF THE SWP3 ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.

EXHIBIT 2

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
12/1/25

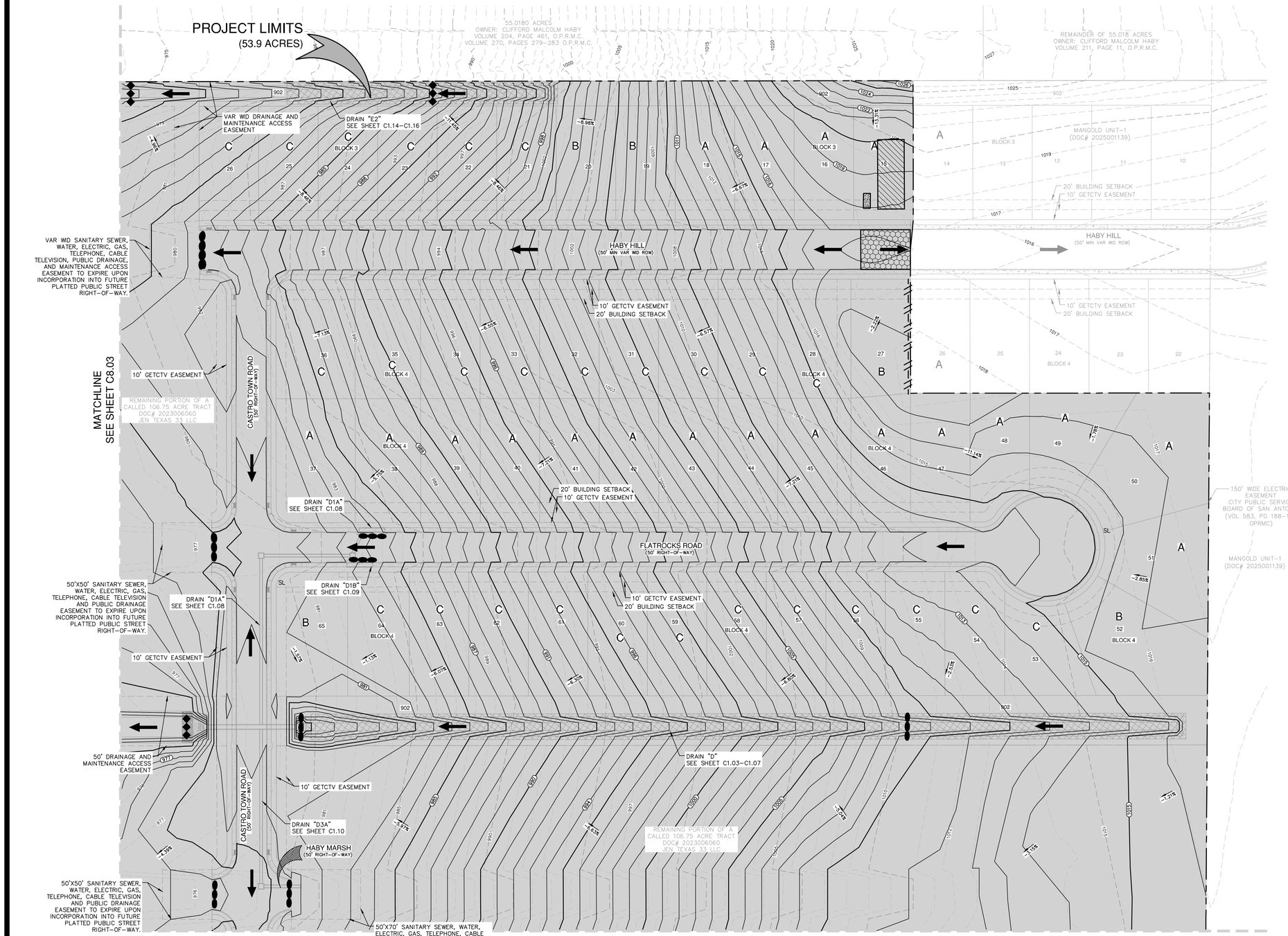
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

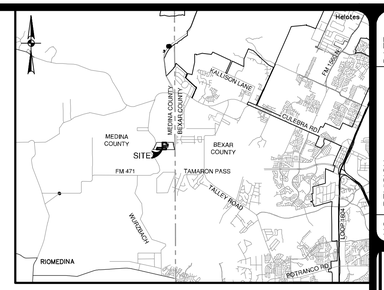
MANGOLD UNIT-2
SAN ANTONIO, TEXAS
STORM WATER POLLUTION PREVENTION PLAN (INDEX SHEET)

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C8.00

Date: Dec 01, 2025, 2:33pm User ID: clodner
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LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SWPPP LEGEND

PROJECT LIMITS	
EXISTING CONTOUR	976
PROPOSED CONTOUR	976
FLOW ARROW (EXISTING)	
FLOW ARROW (PROPOSED)	
SILT FENCE	
ROCK BERM	
GRAVEL FILTER BAGS	
GRATE INLET PROTECTION	
SEDIMENT CONTROL ROLLS	
LIMITS OF DISTURBED AREA	
STABILIZED CONSTRUCTION ENTRANCE/EXIT (FIELD LOCATE)	
CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA (FIELD LOCATE)	
CONCRETE TRUCK WASH-OUT PIT (FIELD LOCATE)	
FHA LOT GRADING TYPE	A,B,C

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SWP3 MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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EXHIBIT 2

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
12/1/25

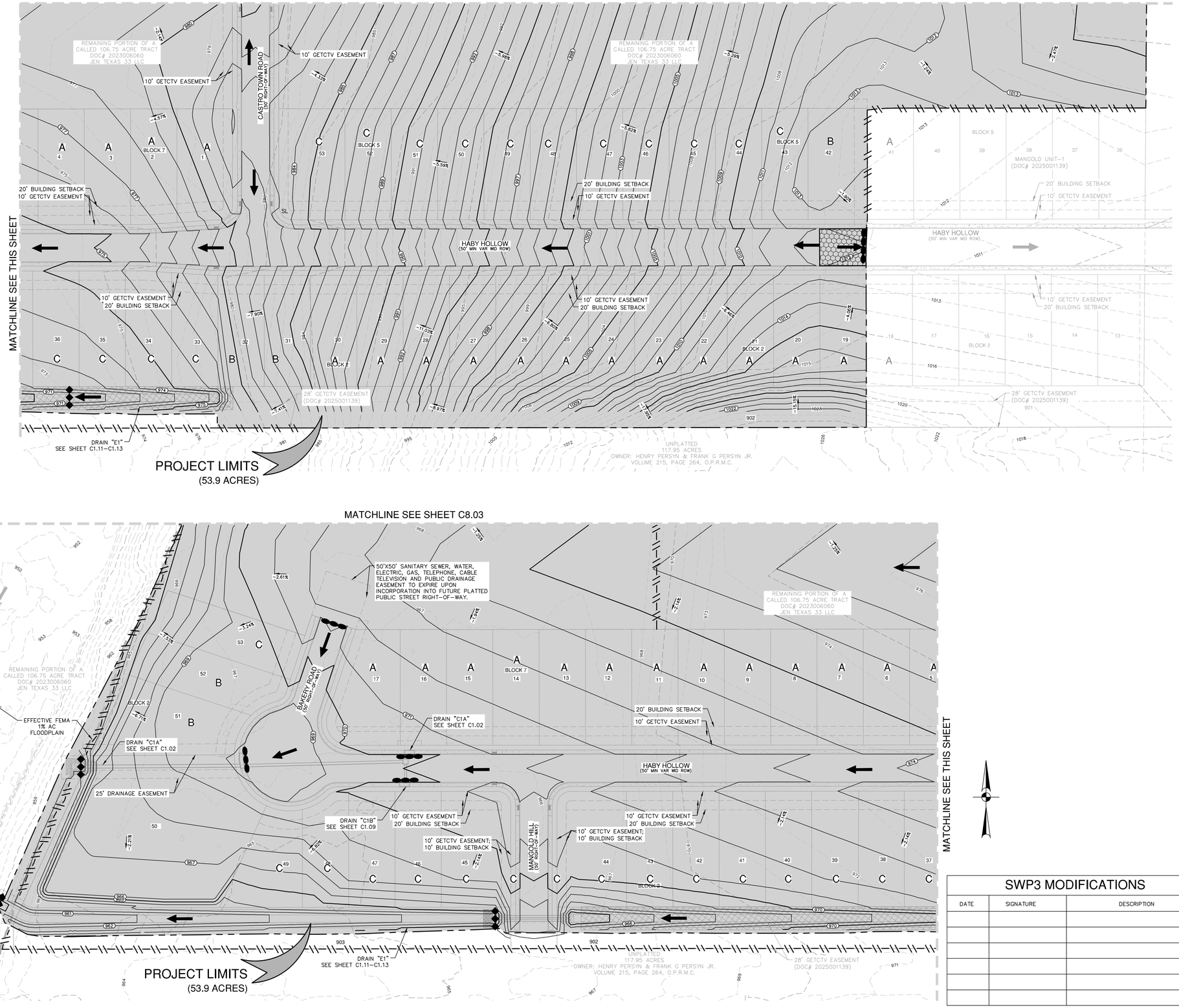
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2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

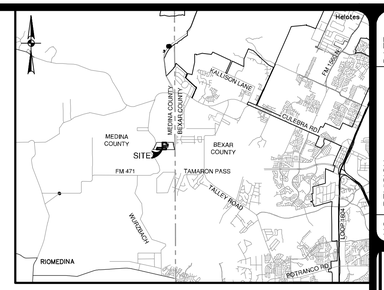
MANGOLD UNIT-2
SAN ANTONIO, TEXAS
STORM WATER POLLUTION PREVENTION PLAN
(1 OF 3)

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C8.01

Date: Dec 01, 2025, 2:33pm User ID: clodner
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LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SWPPP LEGEND

- PROJECT LIMITS
- EXISTING CONTOUR (976)
- PROPOSED CONTOUR (970)
- FLOW ARROW (EXISTING)
- FLOW ARROW (PROPOSED)
- SILT FENCE
- ROCK BERM
- GRAVEL FILTER BAGS
- GRATE INLET PROTECTION
- SEDIMENT CONTROL ROLLS
- LIMITS OF DISTURBED AREA
- STABILIZED CONSTRUCTION ENTRANCE/EXIT (FIELD LOCATE)
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA (FIELD LOCATE)
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- FHA LOT GRADING TYPE — A,B,C

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SWP3 MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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EXHIBIT 2

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED PROFESSIONAL ENGINEER
12/1/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

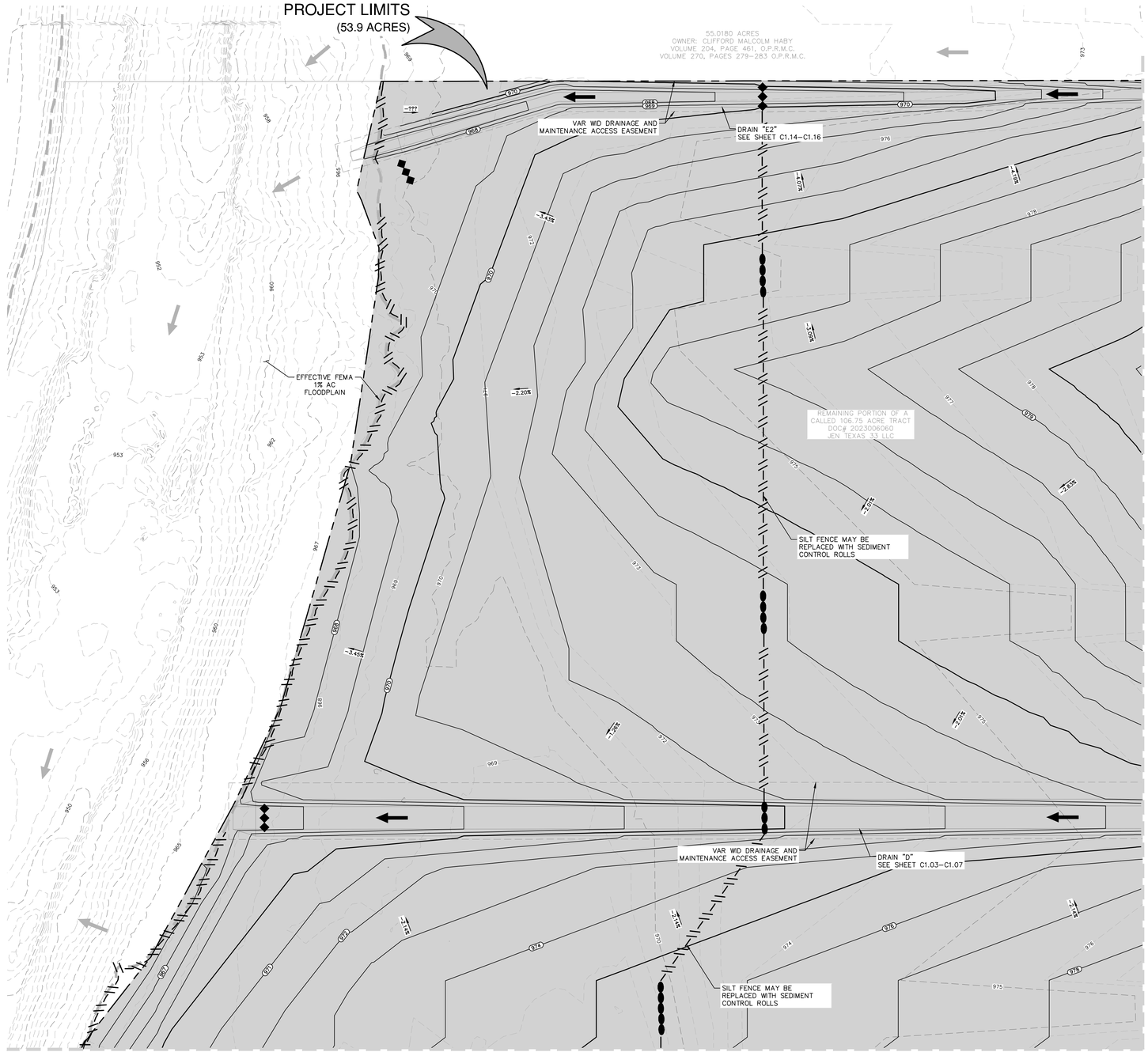
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

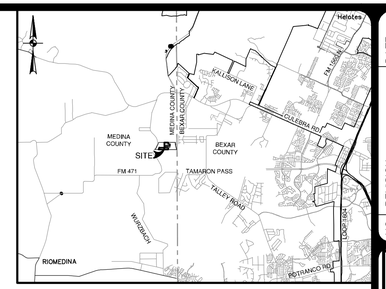
STORM WATER POLLUTION PREVENTION PLAN (2 OF 3)

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C8.02

Date: Dec 01, 2025, 2:33pm User ID: cloehner
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LOCATION MAP

NOT-TO-SCALE

SCALE: 1"= 50'

0' 50' 100' 150'

SWPPP LEGEND

- PROJECT LIMITS
- EXISTING CONTOUR — 976
- PROPOSED CONTOUR — 970
- FLOW ARROW (EXISTING)
- FLOW ARROW (PROPOSED)
- SILT FENCE
- ROCK BERM
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- LIMITS OF DISTURBED AREA
- STABILIZED CONSTRUCTION ENTRANCE/EXIT (FIELD LOCATE)
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA (FIELD LOCATE)
- CONCRETE TRUCK WASH-OUT PIT (FIELD LOCATE)
- FHA LOT GRADING TYPE — A,B,C

GENERAL NOTES

1. DO NOT DISTURB VEGETATED AREAS (TREES, GRASS, WEEDS, BRUSH, ETC.) ANY MORE THAN NECESSARY FOR CONSTRUCTION.

2. CONSTRUCTION ENTRANCE/EXIT LOCATION, CONCRETE WASH-OUT PIT, AND CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD TO BE DETERMINED IN THE FIELD.

3. STORM WATER POLLUTION PREVENTION CONTROLS MAY NEED TO BE MODIFIED IN THE FIELD TO ACCOMPLISH THE DESIRED EFFECT. ALL MODIFICATIONS ARE TO BE NOTED ON THIS EXHIBIT AND SIGNED AND DATED BY THE RESPONSIBLE PARTY.

4. RESTRICT ENTRY/EXIT TO THE PROJECT SITE TO DESIGNATED LOCATIONS BY USE OF ADEQUATE FENCING, IF NECESSARY.

5. ALL STORM WATER POLLUTION PREVENTION CONTROLS ARE TO BE MAINTAINED AND IN WORKING CONDITIONS AT ALL TIMES.

6. FOR A COMPLETE LISTING OF TEMPORARY STORM WATER POLLUTION PREVENTION CONTROLS REFER TO THE TPDES STORM WATER POLLUTION PREVENTION PLAN.

7. STORM WATER POLLUTION PREVENTION STRUCTURES SHOULD BE CONSTRUCTED WITHIN THE SITE BOUNDARIES. SOME OF THESE FEATURES MAY BE SHOWN OUTSIDE THE SITE BOUNDARIES ON THIS PLAN FOR VISUAL CLARITY.

8. AS SOON AS PRACTICAL, ALL DISTURBED SOIL THAT WILL NOT BE COVERED BY IMPERVIOUS COVER SUCH AS PARKWAY AREAS, EASEMENT AREAS, EMBANKMENT SLOPES, ETC. WILL BE STABILIZED PER APPLICABLE PROJECT SPECIFICATIONS.

9. BEST MANAGEMENT PRACTICES MAY BE INSTALLED IN STAGES TO COINCIDE WITH THE DISTURBANCE OF UPGRADIENT AREAS.

10. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN STAGES ONCE THE WATERSHED FOR THAT PORTION CONTROLLED BY THE BEST MANAGEMENT PRACTICES HAS BEEN STABILIZED IN ACCORDANCE WITH TPDES REQUIREMENTS.

11. UPON COMPLETION OF THE PROJECT, INCLUDING SITE STABILIZATION, AND BEFORE FINAL PAYMENT IS ISSUED, CONTRACTOR SHALL REMOVE ALL SEDIMENT AND EROSION CONTROL MEASURES, PAYING SPECIAL ATTENTION TO ROCK BERMS IN DRAINAGE FEATURES.

12. WHERE VEGETATED FILTER STRIPS ARE INDICATED, CONTRACTOR SHALL VERIFY THAT SUFFICIENT VEGETATION EXISTS, OTHERWISE CONTRACTOR SHALL PLACE SILT FENCING IN LIEU OF VEGETATED FILTER STRIP.

13. SHADED AREA ▭ DENOTES LIMITS OF DISTURBED AREAS. OTHER AREAS WITHIN THE PROJECT LIMITS, WITH THE EXCEPTION OF A CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD, ARE NOT A PART OF THIS TPDES STORM WATER POLLUTION PREVENTION PLAN (SWP3) AND WILL NOT BE DISTURBED BY CIVIL CONSTRUCTION ACTIVITIES.

14. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL COORDINATE PLACEMENT OF TEMPORARY BEST MANAGEMENT PRACTICES WITHIN TXDOT RIGHT-OF-WAY WITH TXDOT.

15. CPS ENERGY WILL FUNCTION AS A SECONDARY OPERATOR ON THIS PROJECT AND WILL BE INSTALLING ELECTRIC UTILITIES FOR ON-SITE CONSTRUCTION AND OFF-SITE FEED TO THE PROJECT.

SWP3 MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

THE ENGINEERING SEAL HAS BEEN AFFIXED TO THIS SHEET ONLY FOR THE PURPOSE OF DEMONSTRATING COMPLIANCE WITH THE TPDES-STORM WATER POLLUTION PREVENTION PLAN (SWP3) REGULATIONS.

THIS SHEET HAS BEEN PREPARED FOR PURPOSES OF THE SWP3 ONLY. ALL OTHER CIVIL ENGINEERING RELATED INFORMATION SHOULD BE ACQUIRED FROM THE APPROPRIATE SHEET IN THE CIVIL IMPROVEMENT PLANS.

EXHIBIT 2

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
10/23/25

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

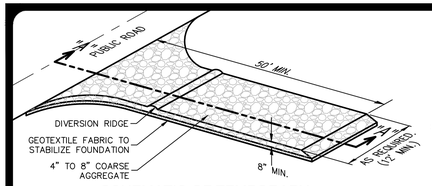
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

STORM WATER POLLUTION PREVENTION PLAN
(3 OF 3)

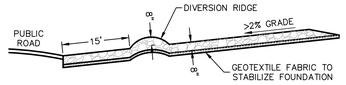
PLAT NO. 25-11800082
JOB NO. 12537-12
DATE OCTOBER 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C8.03

Date: Oct 28, 2025, 12:23pm User ID: cfoster
File: P:\125\37\12\Design\Civil\SWPPP 125712.dwg

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SCHEMATIC OF TEMPORARY CONSTRUCTION ENTRANCE/EXIT



SECTION "A-A" OF A CONSTRUCTION ENTRANCE/EXIT

MATERIALS
1. THE AGGREGATE SHOULD CONSIST OF 4–INCH TO 8–INCH WASHED STONE OVER A STABLE FOUNDATION AS SPECIFIED IN THE PLAN.

2. THE AGGREGATE SHOULD BE PLACED WITH A MINIMUM THICKNESS OF 8–INCHES.

3. THE GEOTEXTILE FABRIC SHOULD BE DESIGNED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH AN APPROXIMATE WEIGHT OF 6 OZ/YD^2, A MULLEN BURST RATING OF 140 LB/IN^2, AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.

4. IF A WASHING FACILITY IS REQUIRED, A LEVEL AREA WITH A MINIMUM OF 4–INCH DIAMETER WASHED STONE OR COMMERCIAL ROCK SHOULD BE INCLUDED IN THE PLANS. DIVERT WASTEWATER TO A SEDIMENT TRAP OR BASIN.

INSTALLATION
1. AVOID CURVES ON PUBLIC ROADS AND STEEP SLOPES. REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FOUNDATION FOR POSITIVE DRAINAGE.

2. THE MINIMUM WIDTH OF THE ENTRANCE/EXIT SHOULD BE 12 FEET OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.

3. THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG.

4. IF THE SLOPE TOWARD THE ROAD EXCEEDS 2%, CONSTRUCT A RIDGE, 6–INCHES TO 8–INCHES HIGH WITH 3:1 (H:V) SIDE SLOPES, ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE ENTRANCE TO DIVERT RUNOFF AWAY FROM THE PUBLIC ROAD.

5. PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE STABILITY, ESPECIALLY WHERE WET CONDITIONS ARE ANTICIPATED.

6. PLACE STONE TO DIMENSIONS AND GRADE SHOWN ON PLANS. LEAVE SURFACE SMOOTH AND SLOPE FOR DRAINAGE.

7. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN.

8. INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.

COMMON TROUBLE POINTS
1. INADEQUATE RUNOFF CONTROL–SEDIMENT WASHES ONTO PUBLIC ROAD.

2. STONE TOO SMALL OR GEOTEXTILE FABRIC ABSENT, RESULTS IN MUDDY CONDITION AS STONE IS PRESSED INTO SOIL.

3. PAD TOO SHORT FOR HEAVY CONSTRUCTION TRAFFIC–EXTEND PAD BEYOND THE MINIMUM 50–FOOT LENGTH AS NECESSARY.

4. PAD NOT FLARED SUFFICIENTLY AT ROAD SURFACE, RESULTS IN MUD BEING TRACKED ON TO ROAD AND POSSIBLE DAMAGE TO ROAD.

5. UNSTABLE FOUNDATION – USE GEOTEXTILE FABRIC UNDER PAD AND/OR IMPROVE FOUNDATION DRAINAGE.

INSPECTION AND MAINTENANCE GUIDELINES
1. THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

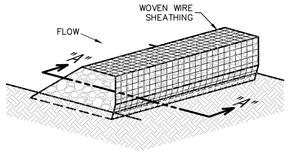
2. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.

3. WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.

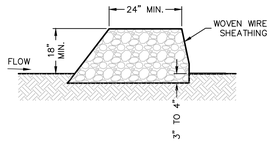
4. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

5. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL
NOT–TO–SCALE



ISOMETRIC PLAN VIEW



SECTION "A-A"

ROCK BERMS
THE PURPOSE OF A ROCK BERM IS TO SERVE AS A CHECK DAM IN AREAS OF CONCENTRATED FLOW, TO INTERCEPT SEDIMENT–LADEN RUNOFF, DETAIN THE SEDIMENT AND RELEASE THE WATER IN SHEET FLOW. THE ROCK BERM SHOULD BE USED WHEN THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 5 ACRES. ROCK BERMS ARE USED IN AREAS WHERE THE VOLUME OF RUNOFF IS TOO GREAT FOR A SILT FENCE TO CONTAIN. THEY ARE LESS EFFECTIVE FOR SEDIMENT REMOVAL THAN SILT FENCES, PARTICULARLY FOR FINE PARTICLES, BUT ARE ABLE TO WITHSTAND HIGHER FLOWS THAN A SILT FENCE. AS SUCH, ROCK BERMS ARE OFTEN USED IN AREAS OF CHANNEL FLOWS (DITCHES, GULLIES, ETC.). ROCK BERMS ARE MOST EFFECTIVE AT REDUCING BED LOAD IN CHANNELS AND SHOULD NOT BE SUBSTITUTED FOR OTHER EROSION AND SEDIMENT CONTROL MEASURES FARTHER UP THE WATERSHED.

INSPECTION AND MAINTENANCE GUIDELINES
1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.

2. REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER THAT WILL NOT CAUSE ANY ADDITIONAL SILTATION.

3. REPAIR ANY LOOSE WIRE SHEATHING.

4. THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.

5. THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

6. THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

MATERIALS
1. THE BERM STRUCTURE SHOULD BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM OPENING OF 1 INCH AND A MINIMUM WIRE DIAMETER OF 20 GAUGE GALVANIZED AND SHOULD BE SECURED WITH SHOAT RINGS.

2. CLEAN, OPEN GRADED 3–INCH TO 5–INCH DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5–INCH TO 8–INCH DIAMETER ROCKS MAY BE USED.

INSTALLATION
1. LAY OUT THE WOVEN WIRE SHEATHING PERPENDICULAR TO THE FLOW LINE. THE SHEATHING SHOULD BE 20 GAUGE WOVEN WIRE MESH WITH 1 INCH OPENINGS.

2. BERM SHOULD HAVE A TOP WIDTH OF 2 FEET MINIMUM WITH SIDE SLOPES BEING 2:1 (H:V) OR FLATTER.

3. PLACE THE ROCK ALONG THE SHEATHING AS SHOWN IN THE DIAGRAM TO A HEIGHT NOT LESS THAN 18".

4. WRAP THE WIRE SHEATHING AROUND THE ROCK AND SECURE WITH TIE WIRE SO THAT THE ENDS OF THE SHEATHING OVERLAP AT LEAST 2 INCHES, AND THE BERM RETAINS ITS SHAPE WHEN WALKED UPON.

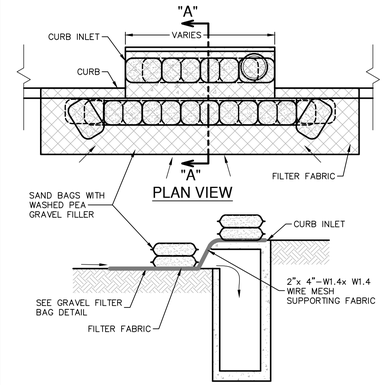
5. BERM SHOULD BE BUILT ALONG THE CONTOUR AT ZERO PERCENT GRADE OR AS NEAR AS POSSIBLE.

6. THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.

COMMON TROUBLE POINTS
1. INSUFFICIENT BERM HEIGHT OR LENGTH (RUNOFF QUICKLY ESCAPES OVER THE TOP OR AROUND THE SIDES OF BERM).

2. BERM NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND ONE SIDE).

ROCK BERM DETAIL
NOT–TO–SCALE



PLAN VIEW

SECTION "A-A"

GENERAL NOTES
1. CONTRACTOR TO INSTALL 2"x4"–W1.4xW1.4 WIRE MESH SUPPORTING FILTER FABRIC OVER THE INLET OPENING. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR WIRE TIES AT THIS LOCATION. SAND BAGS FILLED WITH WASHED PEA GRAVEL SHOULD BE PLACED ON TOP OF WIRE MESH ON TOP OF THE INLET AS SHOWN ON THIS DETAIL TO HOLD WIRE MESH IN PLACE. SANDBAGS FILLED WITH WASHED PEA GRAVEL SHOULD ALSO BE PLACED ALONG THE GUTTER AS SHOWN ON THIS DETAIL TO HOLD WIRE MESH IN PLACE. SAND BAGS TO BE STACKED TO FORM A CONTINUOUS BARRIER AROUND INLETS.

2. THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT RUNOFF FROM FLOWING BETWEEN THE BAGS.

INSPECTION AND MAINTENANCE GUIDELINES
1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.

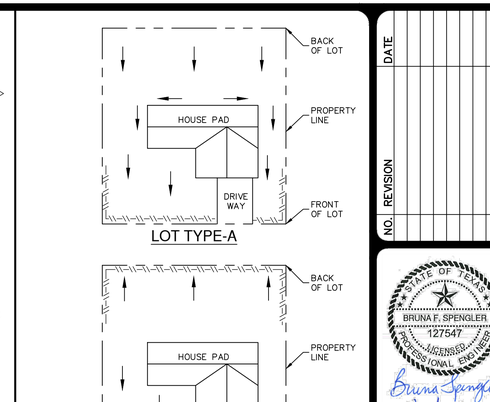
2. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.

3. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE AND CURB.

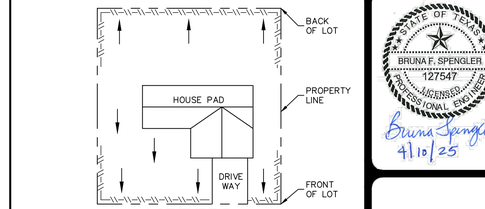
4. INSPECT FILTER FABRIC AND PATCH OR REPLACE IF TORN OR MISSING.

5. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

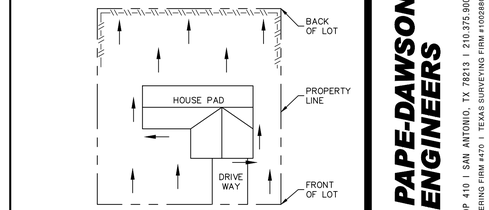
BAGGED GRAVEL CURB INLET PROTECTION DETAIL
NOT–TO–SCALE



LOT TYPE-A



LOT TYPE-B

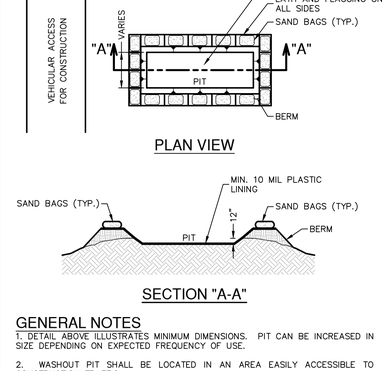


LOT TYPE-C

NOTE: SILT FENCE TO BE INSTALLED PER THESE DETAILS AND LOCATED ON THE DOWNGRADIENT SIDE OF EACH LOT LINE OR LIMITS OF CLEARING AS GENERALLY SHOWN ON THE OVERALL SITE PLAN.

LEGEND
SILT FENCE
DRAINAGE FLOW

TYPICAL HOUSE LOT LAYOUTS
NOT–TO–SCALE



PLAN VIEW

SECTION "A-A"

GENERAL NOTES
1. DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.

2. WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.

3. WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORM WATER RUNOFF.

4. LOCATE WASHOUT AREA AT LEAST 50 FEET FROM SENSITIVE FEATURES, STORM DRAINS, OPEN DITCHES OR WATER BODIES.

5. TEMPORARY CONCRETE WASHOUT FACILITY SHOULD BE CONSTRUCTED WITH SUFFICIENT QUANTITY AND VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.

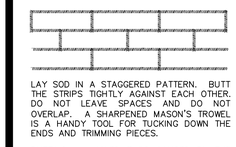
MATERIALS
PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MIL IN POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL.

MAINTENANCE
1. WHEN TEMPORARY CONCRETE WASHOUT FACILITIES ARE NO LONGER REQUIRED FOR THE WORK, THE HARDENED CONCRETE SHOULD BE REMOVED AND DISPOSED OF.

2. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF.

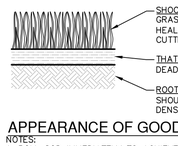
3. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCES CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE BACKFILLED AND REPAIRED.

CONCRETE TRUCK WASHOUT PIT DETAIL
NOT–TO–SCALE

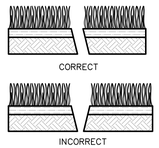


LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.

BUTTING – ANGLED ENDS CAUSED BY THE AUTOMATIC SOD CUTTER MUST BE MATCHED CORRECTLY.



APPEARANCE OF GOOD SOD

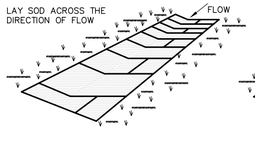


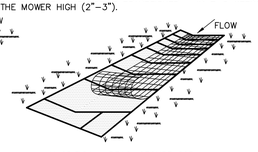
SOD INSTALLATION

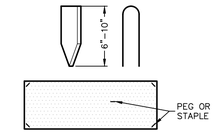
NOTES:
1. ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE SOIL.

2. WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS LAID.

3. MOW WHEN THE SOD IS ESTABLISHED – IN 2–3 WEEKS. SET THE MOWER HIGH (2"–3").







USE PEGS OR STAPLES TO FASTEN SOD FIRMLY – AT THE ENDS OF STRIPS AND IN THE CENTER, OR EVERY 3–4 FEET IF THE STRIPS ARE LONG. WHEN READY TO MOW, DRIVE PEGS OR STAPLES FLUSH WITH THE GROUND.

MATERIALS
1. SOD SHOULD BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4" INCH (± 1/4" INCH) AT THE TIME OF CUTTING. THIS THICKNESS SHOULD EXCLUDE SHOOT GROWTH AND THATCH.

2. PIECES OF SOD SHOULD BE CUT TO THE SUPPLIER'S STANDARD WIDTH AND LENGTH, WITH A MAXIMUM ALLOWABLE DEVIATION IN ANY DIMENSION OF 5%. TORN OR UNEVEN PADS SHOULD NOT BE ACCEPTABLE.

3. STANDARD SIZE SECTIONS OF SOD SHOULD BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED FROM A FIRM GRASP ON ONE END OF THE SECTION.

4. SOD SHOULD BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS.

SITE PREPARATION
1. PRIOR TO SOIL PREPARATION, AREAS TO BE SODDED SHOULD BE BROUGHT TO FINAL GRADE IN ACCORDANCE WITH THE APPROVED PLAN.

2. THE SURFACE SHOULD BE CLEARED OF ALL TRASH, DEBRIS AND OF ALL ROOTS, BRUSH, WIRE, GRADE STAKES AND OTHER OBJECTS THAT WOULD INTERFERE WITH PLANTING, FERTILIZING OR MAINTENANCE OPERATIONS.

3. FERTILIZE ACCORDING TO SOIL TESTS. FERTILIZER NEEDS CAN BE DETERMINED BY A SOIL TESTING LABORATORY OR REGIONAL RECOMMENDATIONS CAN BE MADE BY COUNTY AGRICULTURAL EXTENSION AGENTS. FERTILIZER SHOULD BE WORKED INTO THE SOIL TO A DEPTH OF 3 INCHES WITH A DISC, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT. ON SLOPING LAND, THE FINAL HARROWING OR DISCING OPERATION SHOULD BE ON THE CONTOUR.

INSTALLATION IN CHANNELS
1. SOD STRIPS IN WATERWAYS SHOULD BE LAID PERPENDICULAR TO THE DIRECTION OF FLOW. CARE SHOULD BE TAKEN TO BUTT ENDS OF STRIPS TIGHTLY (SEE FIGURE ABOVE).

2. AFTER ROLLING OR TAMPING, SOD SHOULD BE PEGGED OR STAPLED TO RESIST WASHOUT DURING THE ESTABLISHMENT PERIOD. MESH OR OTHER NETTING MAY BE PEGGED OVER THE SOD FOR EXTRA PROTECTION IN CRITICAL AREAS.

GENERAL INSTALLATION (VA. DEPT. OF CONSERVATION, 1992)
1. SOD SHOULD NOT BE CUT OR LAID IN EXCESSIVELY WET OR DRY WEATHER. SOD ALSO SHOULD NOT BE LAID ON SOIL SURFACES THAT ARE FROZEN.

2. DURING PERIODS OF HIGH TEMPERATURE, THE SOIL SHOULD BE LIGHTLY IRRIGATED IMMEDIATELY PRIOR TO LAYING THE SOD, TO COOL THE SOIL AND REDUCE ROOT BURNING AND DIEBACK.

3. THE FIRST ROW OF SOD SHOULD BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO AND BUTTING TIGHTLY AGAINST EACH OTHER. LATERAL JOINTS SHOULD BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. CARE SHOULD BE EXERCISED TO ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE DRYING OF THE ROOTS (SEE FIGURE ABOVE).

4. ON SLOPES 3:1 OR GREATER, OR WHEREVER EROSION MAY BE A PROBLEM, SOD SHOULD BE LAID WITH STAGGERED JOINTS AND SECURED BY STAPLING OR OTHER APPROVED METHODS. SOD SHOULD BE INSTALLED WITH THE LENGTH PERPENDICULAR TO THE SLOPE (ON CONTOUR).

5. AS SODDING OF CLEARLY DEFINED AREAS IS COMPLETED, SOD SHOULD BE ROLLED OR TAMPED TO PROVIDE FIRM CONTACT BETWEEN ROOTS AND SOIL.

6. AFTER ROLLING, SOD SHOULD BE IRRIGATED TO A DEPTH SUFFICIENT THAT THE UNDERSIDE OF THE SOD PAD AND THE SOIL 4 INCHES BELOW THE SOD IS THOROUGHLY WET.

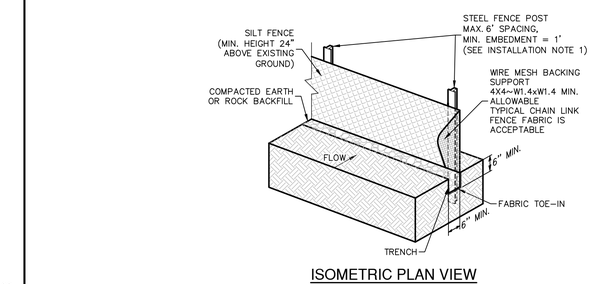
7. UNTIL SUCH TIME A GOOD ROOT SYSTEM BECOMES DEVELOPED, IN THE ABSENCE OF ADEQUATE RAINFALL, WATERING SHOULD BE PERFORMED AS OFTEN AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF AT LEAST 4 INCHES.

8. THE FIRST MOWING SHOULD NOT BE ATTEMPTED UNTIL THE SOD IS FIRMLY ROOTED, USUALLY 2–3 WEEKS. NOT MORE THAN ONE THIRD OF THE GRASS LEAF SHOULD BE REMOVED AT ANY ONE CUTTING.

INSPECTION AND MAINTENANCE GUIDELINES
1. SOD SHOULD BE INSPECTED WEEKLY AND AFTER EACH RAIN EVENT TO LOCATE AND REPAIR ANY DAMAGE.

2. DAMAGE FROM STORMS OR NORMAL CONSTRUCTION ACTIVITIES SUCH AS TIRE RUTS OR DISTURBANCE OF SWALE STABILIZATION SHOULD BE REPAIRED AS SOON AS PRACTICAL.

SOD INSTALLATION DETAIL
NOT–TO–SCALE



ISOMETRIC PLAN VIEW

SILT FENCE
A SILT FENCE IS A BARRIER CONSISTING OF GEOTEXTILE FABRIC SUPPORTED BY METAL POSTS TO PREVENT SOIL AND SEDIMENT LOSS FROM A SITE, WHEN PROPERLY USED, SILT FENCES CAN BE HIGHLY EFFECTIVE AT CONTROLLING SEDIMENT FROM DISTURBED AREAS. THEY CAUSE RUNOFF TO POND, ALLOWING HEAVIER SOLIDS TO SETTLE OUT. IF NOT PROPERLY INSTALLED, SILT FENCES ARE NOT LIKELY TO BE EFFECTIVE.

THE PURPOSE OF A SILT FENCE IS TO INTERCEPT AND DETAIN WATER–BORN SEDIMENT FROM UNPROTECTED AREAS OF A LIMITED EXTENT. SILT FENCE IS USED DURING THE PERIOD OF CONSTRUCTION NEAR THE PERIMETER OF A DISTURBED AREA TO INTERCEPT SEDIMENT WHILE ALLOWING WATER TO PERCOLATE THROUGH. THIS FENCE SHOULD REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED. SILT FENCE SHOULD NOT BE USED WHERE THERE IS A CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY. IF CONCENTRATED FLOW OCCURS AFTER INSTALLATION, CORRECTIVE ACTION MUST BE TAKEN SUCH AS PLACING A ROCK BERM IN THE AREAS OF CONCENTRATED FLOW.

SILT FENCING WITHIN THE SITE MAY BE TEMPORARILY MOVED DURING THE DAY TO ALLOW CONSTRUCTION ACTIVITY PROVIDED IT IS REPLACED AND PROPERLY ANCHORED TO THE GROUND AT THE END OF THE DAY. SILT FENCES ON THE PERIMETER OF THE SITE OR AROUND DRAINAGE WAYS SHOULD NOT BE MOVED AT ANY TIME.

MATERIALS
1. SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE, OR POLYAMIDE WOVEN OR NONWOVEN FABRIC. THE FABRIC SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD, MULLEN BURST STRENGTH EXCEEDING 190 LB/IN2, ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NUMBER 30.

2. FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y–BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM WEIGHT 1.25 LB/FT, AND BRINDELL HARDNESS EXCEEDING 140.

3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.

INSTALLATION
1. STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 1–FOOT DEEP AND SPACED NOT MORE THAN 8 FEET ON CENTER. WHERE WATER CONCENTRATES, THE MAXIMUM SPACING SHOULD BE 6 FEET.

2. LAY OUT FENCING DOWN–SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS ¼ ACRE/100 FEET OF FENCE.

3. THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN–SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP), WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.

4. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

5. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHOULD BE A 3–FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

6. SILT FENCE SHOULD BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

COMMON TROUBLE POINTS
1. FENCE NOT INSTALLED ALONG THE CONTOUR CAUSING WATER TO CONCENTRATE AND FLOW OVER THE FENCE.

2. FABRIC NOT SEATED SECURELY TO GROUND (RUNOFF PASSING UNDER FENCE).

3. FENCE NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND SIDES).

4. FENCE TREATING TOO LARGE AN AREA, OR EXCESSIVE CHANNEL FLOW (RUNOFF OVERTOPS OR COLLAPSES FENCE).

INSPECTION AND MAINTENANCE GUIDELINES
1. INSPECT ALL FENCING WEEKLY, AND AFTER RAINFALL.

2. REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.

3. REPLACE TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.

4. REPLACE OR REPAIR SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DIKE MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.

5. WHEN CONSTRUCTION IS COMPLETE, THE SEDIMENT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTATION AND THE PRIOR LOCATION OF THE SILT FENCE SHOULD BE REVEGETATED. THE FENCE ITSELF SHOULD BE DISPOSED OF IN AN APPROVED LANDFILL.

SILT FENCE DETAIL
NOT–TO–SCALE

LEGEND
SILT FENCE
FLOW ARROWS

CONSTRUCTION STAGING AREA
NOT–TO–SCALE

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EXHIBIT 3

NO.	REVISION	DATE

STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

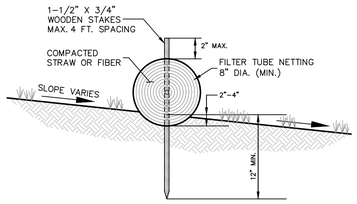
MANGOLD UNIT-2
SAN ANTONIO, TEXAS

STORM WATER POLLUTION PREVENTION PLAN DETAILS

PLAT NO. 25-11800082
JOB NO. 12537-12
DATE APRIL 2025
DESIGNER JS
CHECKED CB DRAWN BR
SHEET C8.04

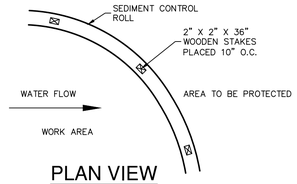
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CROSS-SECTION

NOT-TO-SCALE



PLAN VIEW

NOT-TO-SCALE

SEDIMENT CONTROL ROLLS

SEDIMENT CONTROL ROLLS ARE ELONGATED TUBES OF COMPACTED STRAW AND/OR OTHER FIBERS THAT ARE INSTALLED ALONG CONTOURS OR AT THE BASE OF SLOPES TO HELP REDUCE SOIL EROSION AND RETAIN SEDIMENT. THEY FUNCTION BY SHORTENING SLOPE LENGTH, REDUCING RUNOFF WATER VELOCITY, TRAPPING DISLODGED SOIL PARTICLES AND REDUCING THE EFFECTS OF SLOPE STEEPNESS.

MATERIALS

CORE MATERIAL: CORE MATERIALS SHALL BE BIODEGRADABLE NAD NOXIOUS WEED FREE. MATERIAL MAY BE COMPOST, MULCH, ASPEN EXCELSIOR WOOD FIBERS, CHIPPED SITE VEGETATION, AGRICULTURAL RICE OR WHEAT STRAW, COCONUT FIBER, OR OTHER 100% BIODEGRADABLE FIBERS.
CONTAINMENT MESH: CONTAINMENT MESH SHALL BE 100% BIODEGRADABLE, PHOTODEGRADABLE OR RECYCLABLE SUCH AS BURLAP TWINE, UV PHOTODEGRADABLE PLASTIC OR POLYESTER.
USE BIODEGRADABLE OR PHOTODEGRADABLE MESH WHEN WATTLE WILL REMAIN IN PLACE AS PART OF A VEGETATIVE SYSTEM. USE RECYCLABLE MESH FOR TEMPORARY INSTALLATIONS.
WATTLES SHALL HAVE A MINIMUM DIAMETER OF 8 INCHES AND A MAXIMUM DIAMETER OF 20 INCHES.
NO MORE THAN 5% OF THE FILL MATERIAL SHALL BE PERMITTED TO ESCAPE FROM THE CONTAINING MESH. MESH SHALL BE 0.5" X 0.5" HIGH DENSITY POLYETHYLENE AND ETHYLY VINYL ACETATE AND CONTAIN ULTRA-VIOLET INHIBITORS. WATTLE ENDS SHALL BE TIED CLOSED.

SEDIMENT CONTROL ROLLS IN A TEMPORARY EROSION CONTROL APPLICATION

WHEN NO LONGER REQUIRED FOR THE INTENDED PURPOSE, TEMPORARY ROLLS SHALL BE REMOVED FROM THE SITE. AS AN OPTION, THE STRAW ROLLS MAY BE SLIT DOWN THE LENGTH OF THE NETTING AND THE STRAW MAY BE USED ON SLOPES OR OTHER AREAS.

TRENCHES, DEPRESSIONS OR ANY OTHER GROUND DISTURBANCES CAUSED BY THE REMOVAL OF THE TEMPORARY STRAW ROLLS SHALL BE BACKFILLED AND REPAIRED WITH THE EXCESS SEDIMENT CAPTURED BY THE ROLLS, PRIOR TO SPREADING THE STRAW OR OTHER FINAL EROSION CONTROL PROTECTION.

SEDIMENT CONTROL ROLLS IN A PERMANENT EROSION CONTROL APPLICATION

LEAVE ROLLS AS INSTALLED TO PHOTODEGRADE OR BIODEGRADE OVER TIME AS NATIVE AND APPLIED VEGETATION ULTIMATELY STABILIZE THE REPAIRED SITE.

INSTALLATION

1. REMOVE ALL ROCKS, CLODS, VEGETATION OR OTHER OBSTRUCTIONS SO THAT THE INSTALLED ROLLS WILL HAVE DIRECT CONTACT WITH THE SOIL.

2. A SMALL TRENCH, 2-4 INCHES IN DEPTH SHOULD BE EXCAVATED ON THE SLOPE CONTOUR AND PERPENDICULAR TO WATER FLOW. SOIL FROM THE EXCAVATION SHOULD BE PLACED UPSLOPE NEXT TO THE TRENCH.

3. INSTALL THE ROLLS IN THE TRENCH, INSURING THAT NO GAPS EXIST BETWEEN THE SOIL AND THE BOTTOM OF THE ROLL. ROLL SHOULD BE LAPPED 6" MINIMUM TO PREVENT SEDIMENT PASSING THROUGH THE FIELD JOINT.

4. WOODEN STAKES SHOULD BE USED TO FASTEN THE ROLLS TO THE SOIL. WHEN CONDITIONS WARRANT, A STRAIGHT METAL BAR CAN BE USED TO DRIVE A "PILOT HOLE" THROUGH THE ROLL AND INTO THE SOIL.

5. WOODEN STAKES SHOULD BE PLACED 6" FROM THE ROLL END ANGLED TOWARDS THE ADJACENT ROLL AND SPACED AT 4 FEET CENTERS LEAVING LESS THAN 1-2 INCHES OF STAKE EXPOSED ABOVE THE ROLL. ALTERNATELY, STAKES MAY BE PLACED ON EACH SIDE OF THE ROLL TYNG ACROSS WITH WITH A NATURAL FIBER TWINE OR STAKING IN A CROSSING MANNER ENSURING DIRECT SOIL CONTACT AT ALL TIMES.

6. TERMINAL ENDS OF ROLLS MAY BE "DOG LEGGED" UP SLOPE TO ENSURE CONTAINMENT AND PREVENT CHANNELING OF SEDIMENT.

7. BACKFILL THE UPSLOPE LENGTH OF THE ROLL WITH THE EXCAVATED SOIL AND COMPACT.

8. CARE SHALL BE TAKEN DURING INSTALLATION SO AS TO AVOID DAMAGE OCCURRING TO THE ROLL AS A RESULT OF THE INSTALLATION PROCESS. SHOULD THE ROLL BE DAMAGED DURING INSTALLATION, A WOODEN STAKE SHALL BE PLACED EITHER SIDE OF THE DAMAGED AREA TERMINATING THE LOG SEGMENT.

INSPECTION AND MAINTENANCE

1. THE SEDIMENT CONTROL ROLLS SHALL BE INSPECTED AFTER INSTALLATION TO INSURE THAT THEY ARE TRENCHED-IN AND THAT NO GAPS EXIST UNDER THE ROLLS OR BETWEEN ADJACENT ENDS OF THE ROLLS.

2. ROLLS SHALL BE INSPECTED AFTER SIGNIFICANT RAINFALL EVENTS. RILLS OR GULLIES UPSLOPE OF THE ROLL AND ANY UNDERCUTTING IS TO BE REPAIRED.

SEDIMENT CONTROL ROLLS

NOT-TO-SCALE

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STATE OF TEXAS
BRUNA F. SPENGLER
127547
LICENSED
PROFESSIONAL ENGINEER
Bruna Spengler
4/10/25

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MANGOLD UNIT-2
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