

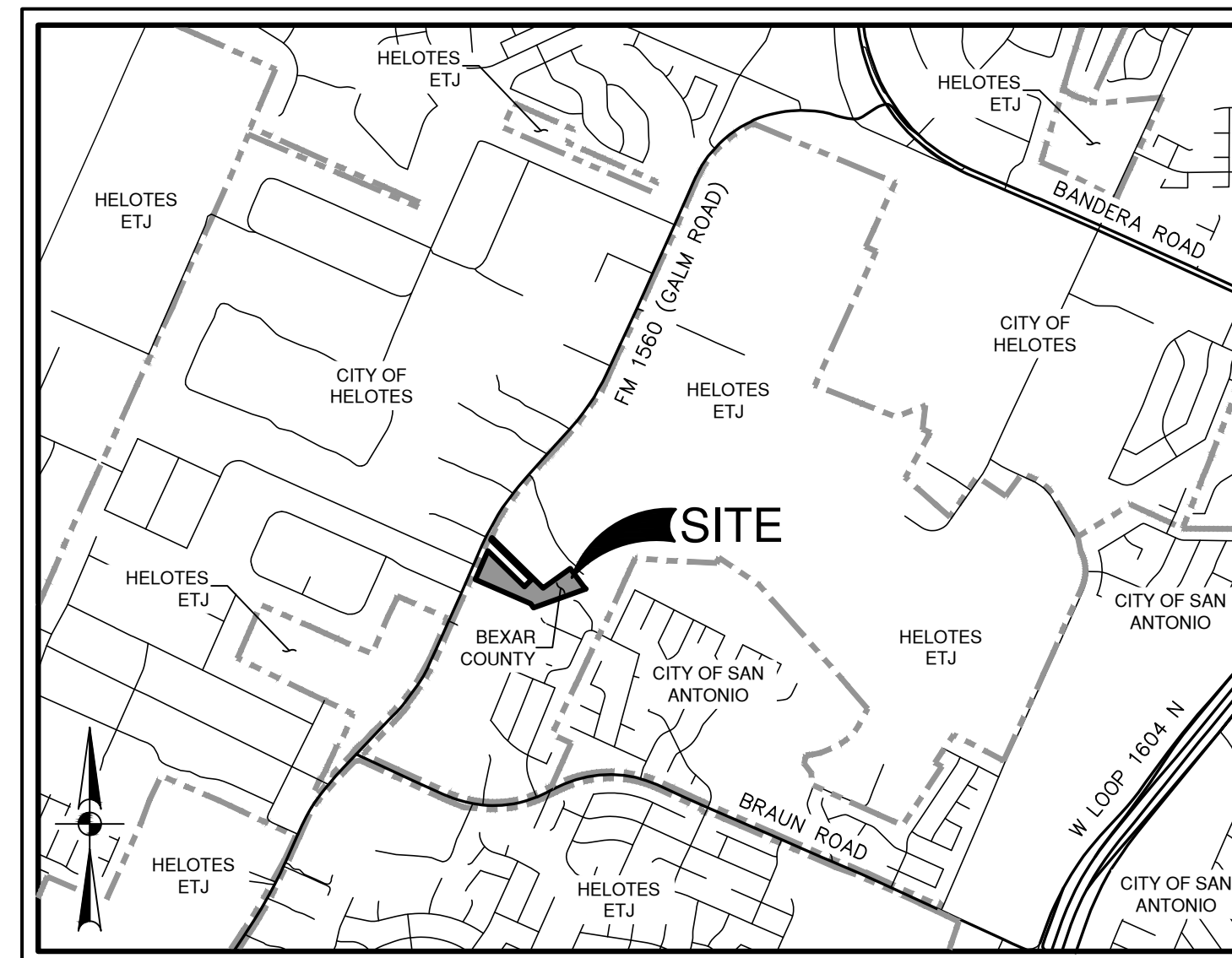
APOLLO OAKS

BEXAR COUNTY, TEXAS

CIVIL CONSTRUCTION PLANS

SHEET INDEX

Sheet Description	Sheet No.
COVER SHEET	C0.00
EXISTING CONDITIONS OVERALL DRAINAGE PLAN	C1.00
ULTIMATE DEVELOPMENT OVERALL DRAINAGE PLAN	C1.01
DRAIN "A" ~ STA. 1+00.00 TO STA. 8+00.00	C1.02
DRAIN "A" ~ STA. 8+00.00 TO END	C1.03
DRAIN "B" ~ STA. 1+00.00 TO STA. 4+00.00	C1.04
DRAIN "B" ~ STA. 4+00.00 TO END	C1.05
DRAIN "C" ~ STA. 1+00.00 TO END	C1.06
DRAIN "D" ~ STA. 1+00.00 TO END	C1.07
DRAIN "E" ~ STA. 1+00.00 TO END	C1.08
DRAIN "F" ~ STA. 1+00.00 TO END	C1.09
DRAIN DETAILS	C1.10
DRAIN DETAILS	C1.11
DRAIN DETAILS	C1.12
DRAIN DETAILS	C1.13
DRAIN DETAILS	C1.14
DRAIN DETAILS	C1.15
APOLLO OAKS DRIVE ~ STA. 1+00.00 TO STA. 10+00.00	C2.00
APOLLO OAKS DRIVE ~ STA. 10+00.00 TO END	C2.01
APOLLO GROVE ~ STA. 1+00.00 TO END	C2.02
STREET DETAILS	C2.10
STREET DETAILS	C2.11
OVERALL SIGNAGE PLAN	C3.00
SIGNAGE DETAILS	C3.10
SIGNAGE DETAILS	C3.11
OVERALL WATER DISTRIBUTION PLAN	C4.00
WATER DISTRIBUTION PLAN DETAILS	C4.10
WATER DISTRIBUTION PLAN NOTES	C4.11
OVERALL SANITARY SEWER PLAN	C5.00
SANITARY SEWER LINE A PLAN & PROFILE	C5.01
SANITARY SEWER LINE B & C PLAN & PROFILE	C5.02
SANITARY SEWER DETAILS	C5.10
SANITARY SEWER NOTES	C5.11
OVERALL UTILITY PLAN	C6.00
STORM WATER POLLUTION PREVENTION PLAN	C8.00
STORM WATER POLLUTION PREVENTION PLAN DETAILS	C8.10

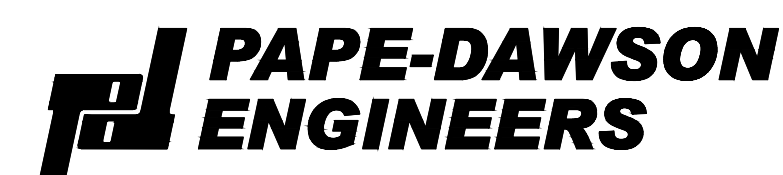


LOCATION MAP
NOT-TO-SCALE

PREPARED FOR:

15S CP1 APOLLO OAKS US FUND, LP
603 E BROADWAY ST
PROSPER, TX 75078

MARCH 2026



2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10022800



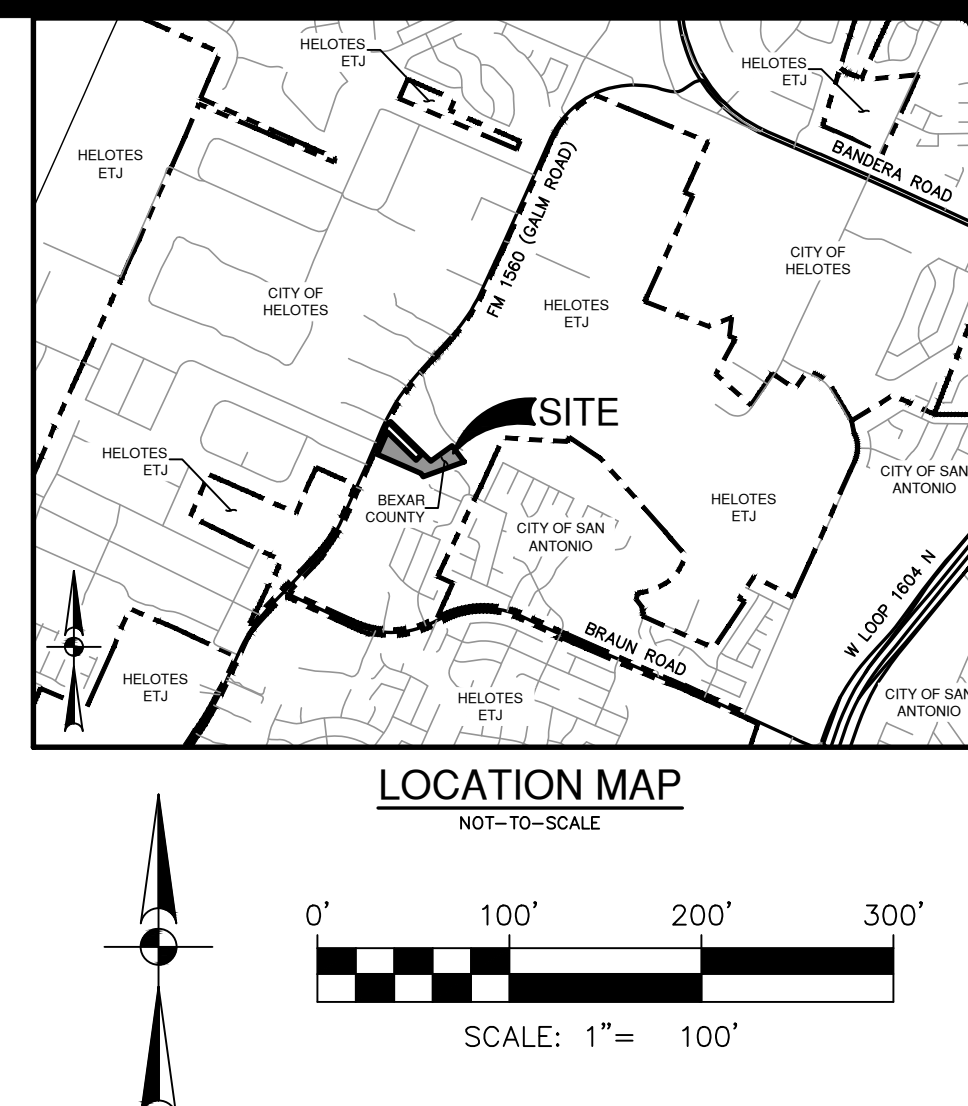
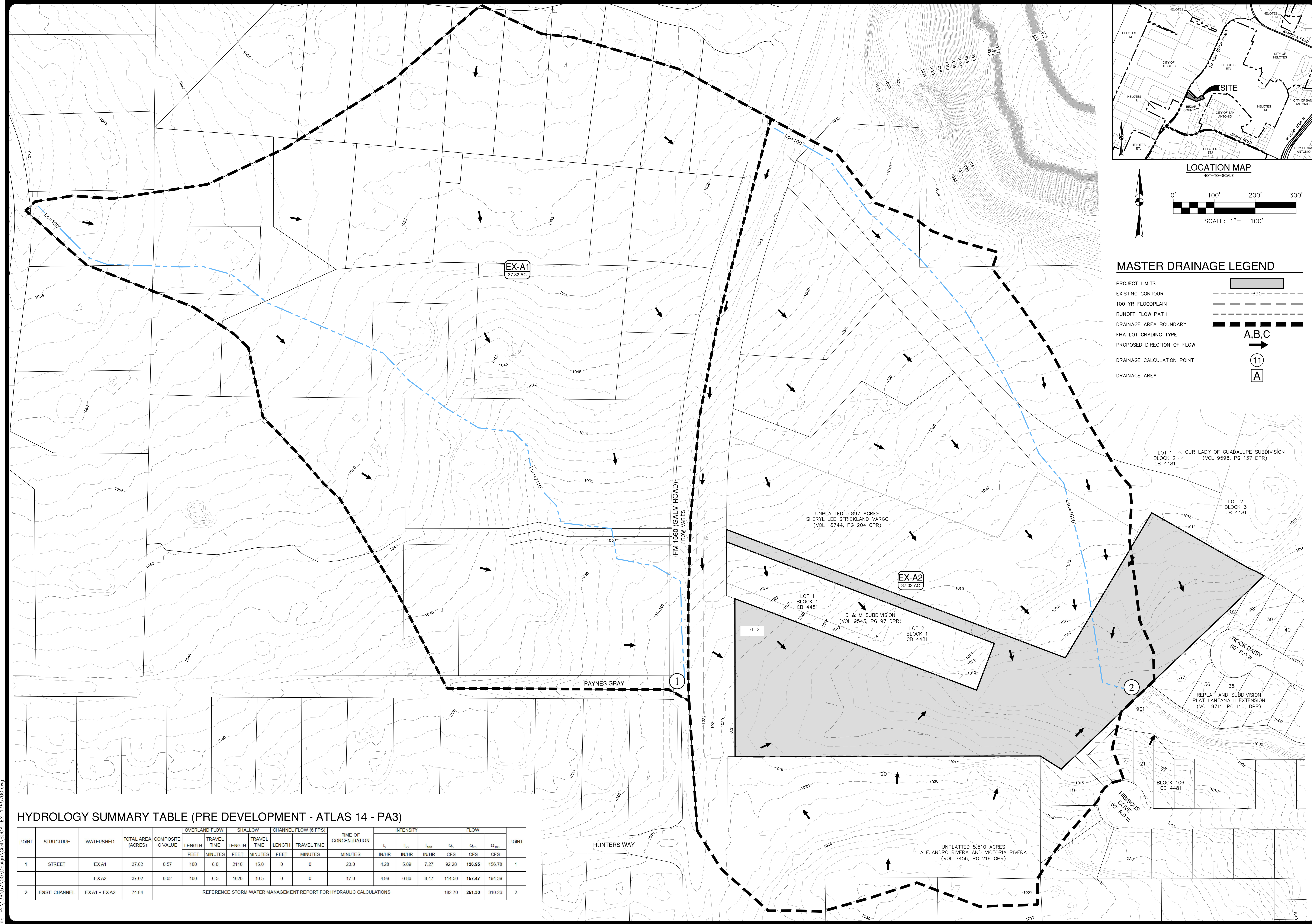
Jon Adame
3-5-26

WATER (SAWS PRESSURE ZONE 8)

DEVELOPER'S NAME: 15S CP1 APOLLO OAKS US FUND, LP
ADDRESS: 603 E BROADWAY ST
CITY: PROSPER STATE: TX ZIP: 75078
PHONE# (210)-771-0861 FAX# (210)-771-0861
SAWS BLOCK MAP# 084-824 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
TOTAL LINEAR FOOTAGE OF PIPE: 17' 38.3" PLAT NO. CP202506
NUMBER OF LOTS 29 DUPLICATIONS 6 TRIPLEX SAWS JOB NO. 25-1039

SEWER (UPPER-WEST SEWERSHED-LEON CREEK)

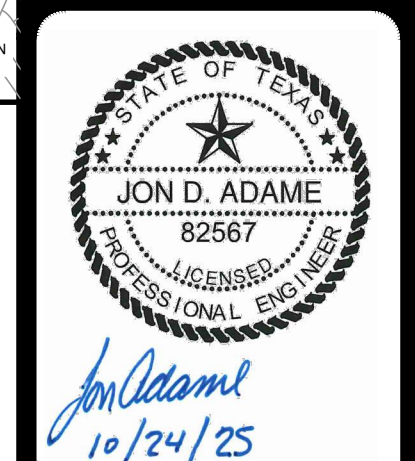
DEVELOPER'S NAME: 15S CP1 APOLLO OAKS US FUND, LP
ADDRESS: 603 E BROADWAY ST
CITY: PROSPER STATE: TX ZIP: 75078
PHONE# (210)-771-0861 FAX# (210)-771-0861
SAWS BLOCK MAP# 084-824 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
TOTAL LINEAR FOOTAGE OF PIPE: 8" 1,534 LF PLAT NO. CP202506
NUMBER OF LOTS 29 DUPLICATIONS 6 TRIPLEX SAWS JOB NO. 25-1532



MASTER DRAINAGE LEGEND

PROJECT LIMITS	690
100 YR FLOODPLAIN	---
RUNOFF FLOW PATH	→
DRAINAGE AREA BOUNDARY	---
FHA LOT GRADING TYPE	A, B, C
PROPOSED DIRECTION OF FLOW	→
DRAINAGE CALCULATION POINT	⑪
DRAINAGE AREA	A

DATE	
NO.	
REVISION	



PAPE-DAWSON ENGINEERS
 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #479 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 EXISTING CONDITIONS OVERALL DRAINAGE PLAN

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	OCTOBER 2025
DESIGNER	CB
CHECKED	JA
DRAWN	CB
SHEET	C1.00

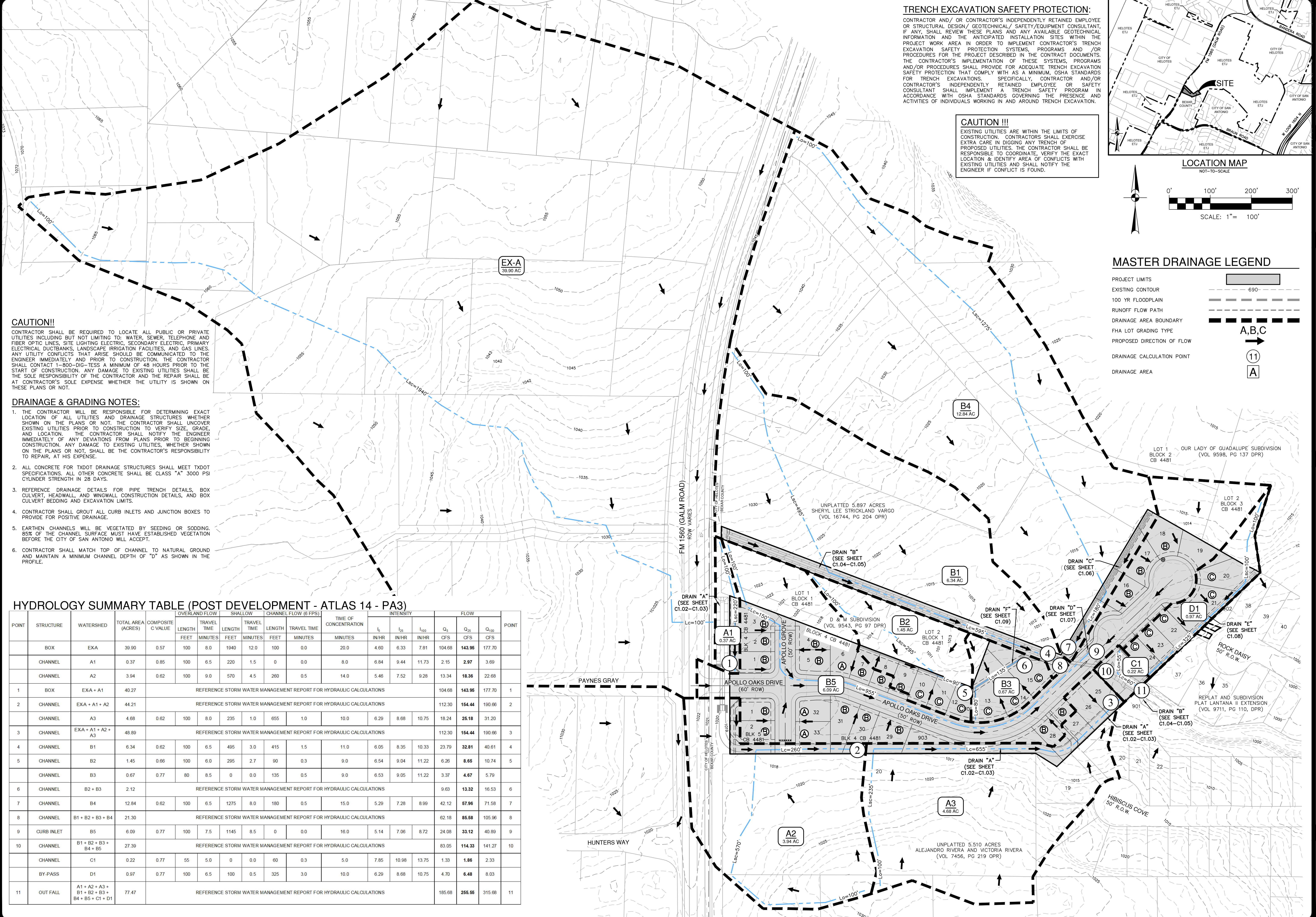
HYDROLOGY SUMMARY TABLE (PRE DEVELOPMENT - ATLAS 14 - PA3)

POINT	STRUCTURE	WATERSHED	TOTAL AREA (ACRES)	COMPOSITE C VALUE	OVERLAND FLOW				SHALLOW CHANNEL FLOW (6 FPS)				TIME OF CONCENTRATION (MINUTES)	INTENSITY			FLOW			POINT
					LENGTH		TRAVEL TIME		LENGTH		TRAVEL TIME			I ₁	I ₂	I ₃	Q ₁	Q ₂	Q ₃	
					FEET	MINUTES	FEET	MINUTES	FEET	MINUTES	FEET	MINUTES		IN/HR	IN/HR	IN/HR	CFS	CFS	CFS	
1	STREET	EXA1	37.82	0.57	100	8.0	2110	15.0	0	0	23.0	4.28	5.89	7.27	62.28	126.95	156.78	1		
		EXA2	37.02	0.62	100	6.5	1620	10.5	0	0	17.0	4.99	6.86	8.47	114.50	167.47	194.39			
2	EXIST. CHANNEL	EXA1 + EXA2	74.84												182.70	251.30	310.26	2		

REFERENCE: STORM WATER MANAGEMENT REPORT FOR HYDRAULIC CALCULATIONS

Date: Oct 24, 2025, 4:24pm User: jda Design: C:\Users\jda\OneDrive - Pape-Dawson Engineers\Documents\Atlas 14 - PA3\Atlas 14 - PA3.dwg

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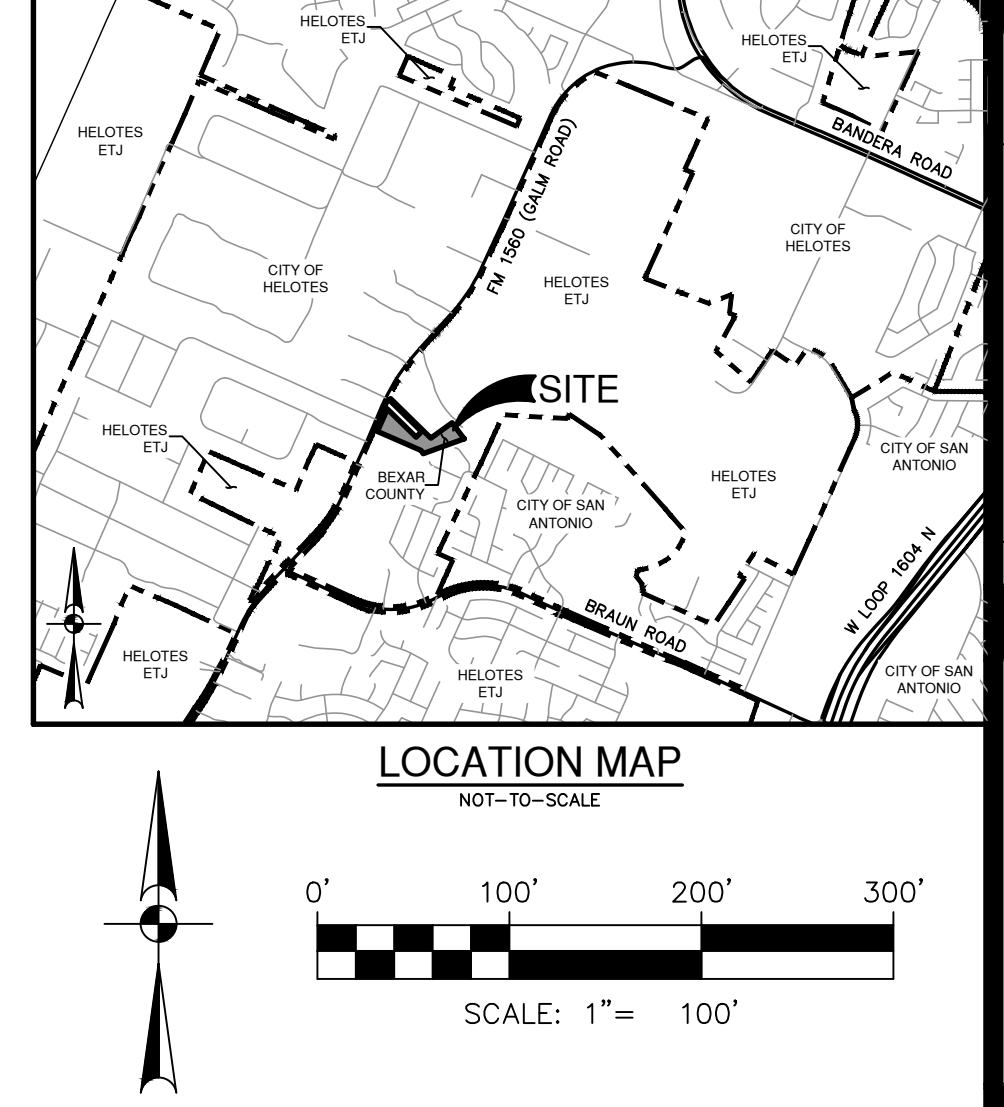


TRENCH EXCAVATION SAFETY PROTECTION:

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CAUTION !!!

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



MASTER DRAINAGE LEGEND

- PROJECT LIMITS
- EXISTING CONTOUR
- 100 YR FLOODPLAIN
- RUNOFF FLOW PATH
- DRAINAGE AREA BOUNDARY
- FHA LOT GRADING TYPE
- PROPOSED DIRECTION OF FLOW A, B, C
- DRAINAGE CALCULATION POINT 11
- DRAINAGE AREA A

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-TEST 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.

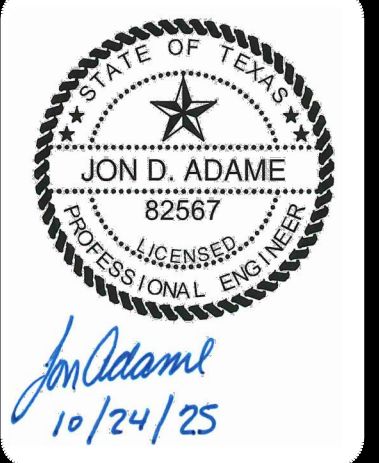
DRAINAGE & GRADING NOTES:

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.

HYDROLOGY SUMMARY TABLE (POST DEVELOPMENT - ATLAS 14 - PA3)

POINT	STRUCTURE	WATERSHED	TOTAL AREA (ACRES)	COMPOSITE C-VALUE	OVERLAND FLOW		SHALLOW		CHANNEL FLOW (6 FPS)		INTENSITY		FLOW			POINT		
					LENGTH FEET	TRAVEL TIME MINUTES	LENGTH FEET	TRAVEL TIME MINUTES	LENGTH FEET	TRAVEL TIME MINUTES	I ₁ IN/HR	I ₂ IN/HR	I ₃ IN/HR	Q ₅ CFS	Q ₁₀ CFS		Q ₂₅ CFS	
	BOX	EXA	39.90	0.57	100	8.0	1940	12.0	100	0.0	20.0	4.60	6.33	7.81	104.68	143.95	177.70	1
	CHANNEL	A1	0.37	0.85	100	6.5	220	1.5	0	0.0	8.0	6.84	9.44	11.73	2.15	2.97	3.69	
	CHANNEL	A2	3.94	0.62	100	9.0	570	4.5	260	0.5	14.0	5.46	7.52	9.28	13.34	18.36	22.68	
1	BOX	EXA + A1	40.27												104.68	143.95	177.70	1
	CHANNEL	EXA + A1 + A2	44.21												112.30	154.44	190.66	2
	CHANNEL	A3	4.68	0.62	100	8.0	235	1.0	655	1.0	10.0	6.29	8.68	10.75	18.24	25.18	31.20	
3	CHANNEL	EXA + A1 + A2 + A3	48.89												112.30	154.44	190.66	3
4	CHANNEL	B1	6.34	0.62	100	6.5	495	3.0	415	1.5	11.0	6.05	8.35	10.33	23.79	32.81	40.61	4
5	CHANNEL	B2	1.45	0.66	100	6.0	295	2.7	90	0.3	9.0	6.54	9.04	11.22	6.26	8.65	10.74	5
	CHANNEL	B3	0.67	0.77	80	8.5	0	0.0	135	0.5	9.0	6.53	9.05	11.22	3.37	4.67	5.79	
6	CHANNEL	B2 + B3	2.12												9.63	13.32	16.53	6
7	CHANNEL	B4	12.84	0.62	100	6.5	1275	8.0	180	0.5	15.0	5.29	7.28	8.99	42.12	57.96	71.58	7
8	CHANNEL	B1 + B2 + B3 + B4	21.30												62.18	85.68	105.96	8
9	CURB INLET	B5	6.09	0.77	100	7.5	1145	8.5	0	0.0	16.0	5.14	7.06	8.72	24.08	33.12	40.89	9
10	CHANNEL	B1 + B2 + B3 + B4 + B5	27.39												83.05	114.33	141.27	10
	CHANNEL	C1	0.22	0.77	55	5.0	0	0.0	60	0.3	5.0	7.85	10.98	13.75	1.33	1.86	2.33	
	BY-PASS	D1	0.97	0.77	100	6.5	100	0.5	325	3.0	10.0	6.29	8.68	10.75	4.70	6.48	8.03	
11	OUT FALL	A1 + A2 + A3 + B1 + B2 + B3 + B4 + B5 + C1 + D1	77.47												185.68	255.65	315.68	11

NO.	REVISION	DATE



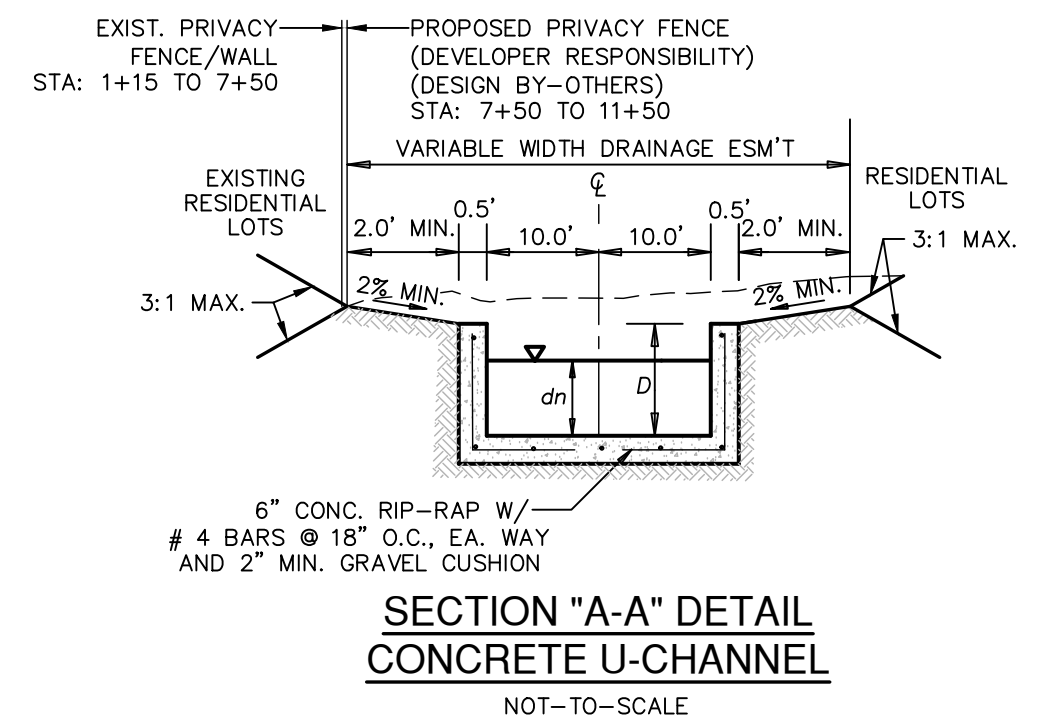
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TEXAS ENGINEERING FIRM #479 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
BEXAR COUNTY, TEXAS
ULTIMATE DEVELOPMENT OVERALL DRAINAGE PLAN

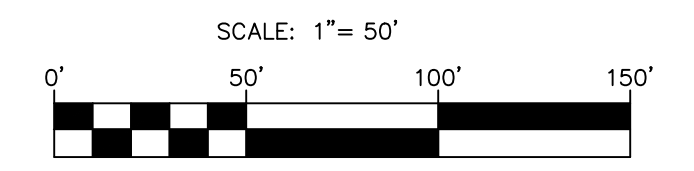
PLAT NO. CP202506
JOB NO. 13657-00
DATE OCTOBER 2025
DESIGNER CB
CHECKED JA DRAWN CB
SHEET C1.01

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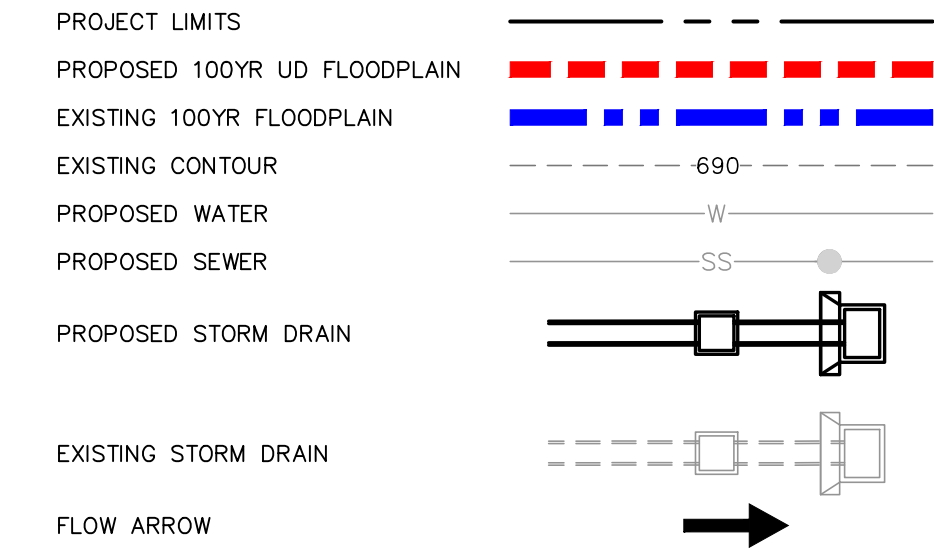
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HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 1+12.88 TO 1+36.53	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 1+36.53 TO 3+50.00	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 3+50.00 TO 10+77.77
Q25 = 154.44 CFS	Q25 = 154.44 CFS	Q25 = 154.44 CFS
Bw = 2.0'	Bw = 2.0'	Bw = 2.0'
n = 0.015	n = 0.015	n = 0.015
s = 0.70%	s = 4.00%	s = 0.69%
D = 1.50'	D = 1.50'	D = 1.50'
dn = 1.00'	dn = 0.59'	dn = 1.00'
V = 7.72 fps	V = 13.09 fps	V = 7.72 fps



DRAINAGE LEGEND



KEY LEGEND:

- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (B) VARIABLE WIDTH DRAINAGE EASEMENT
- (C) 16' WATER EASEMENT
- (D) 4' SIDEWALK
- (E) 4' DEVELOPER SIDEWALK
- (F) 21' WATER, ELEC, GAS, TELE, CATV AND ACCESS ESMT (VOL 9711, PG 110 DPR)

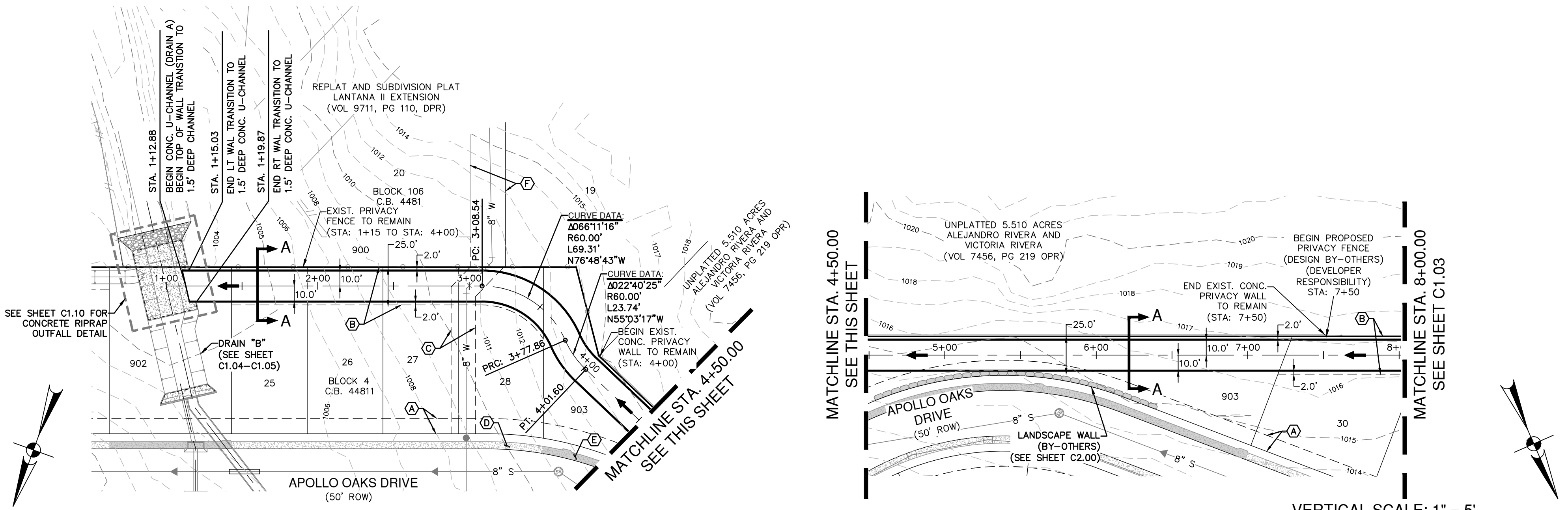
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NO. REVISION: _____

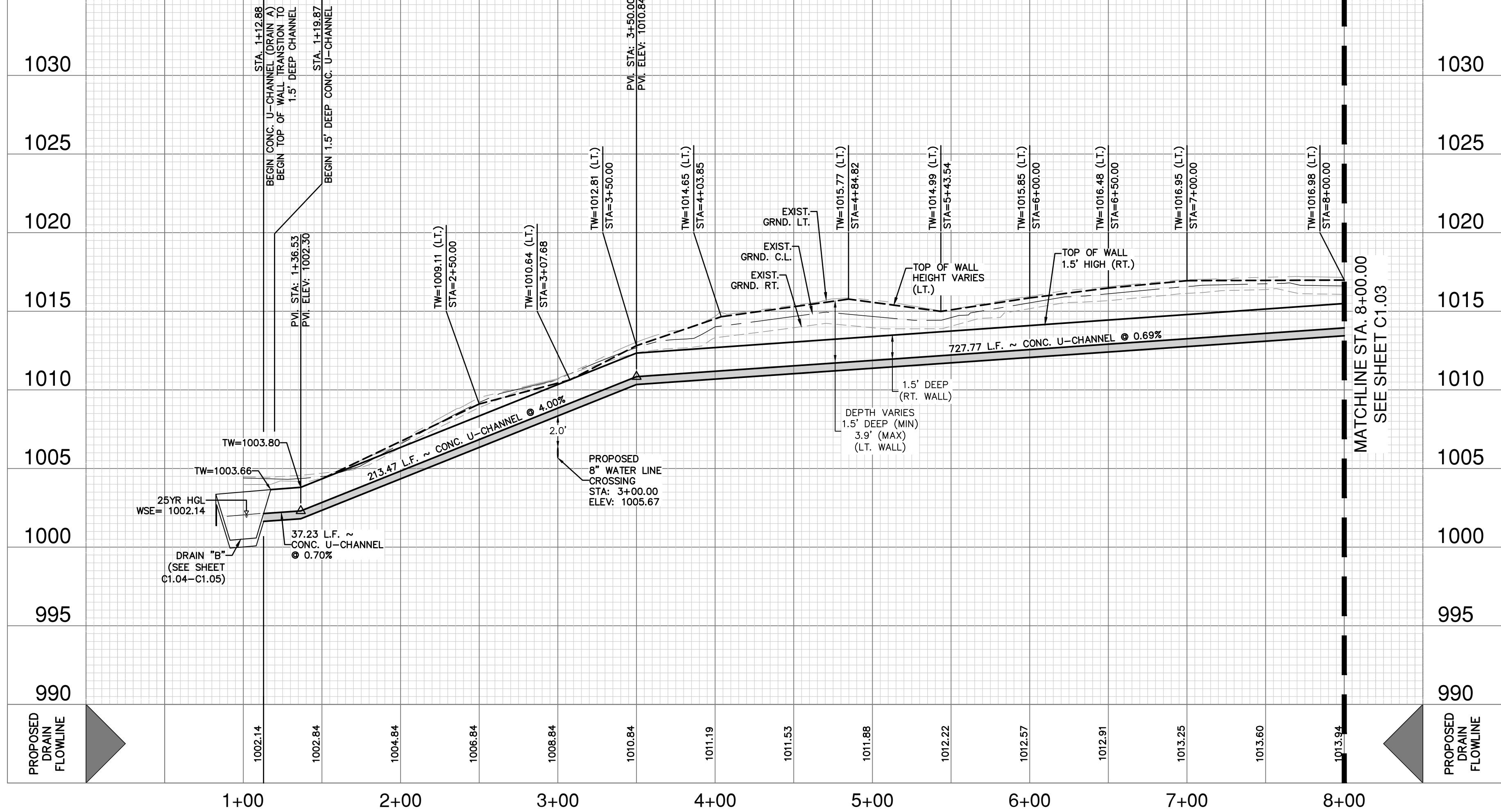
Jon D. Adame
10/24/25

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DRAIN "A" ~ STA. 1+00.00 TO STA. 8+00.00
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 20'



OPEN CHANNEL NOTE:
CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 - "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.10 AND SUPPLIED RETARDATION CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE CONSTRUCTION NOTES:

- ALL SINGLE BOX CULVERTS (SBC) AND ALL MULTIPLE BOX CULVERTS (MBC) SHALL BE PRECAST. (SEE SHEETS C1.13-C1.14 FOR PRECAST CONSTRUCTION DETAILS.)

DRAINAGE & GRADING NOTES:

- A BEXAR COUNTY ROW PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY ROW. 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.
- 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.
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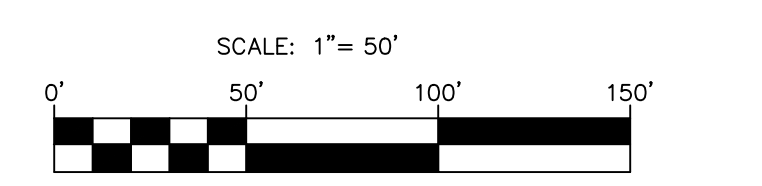
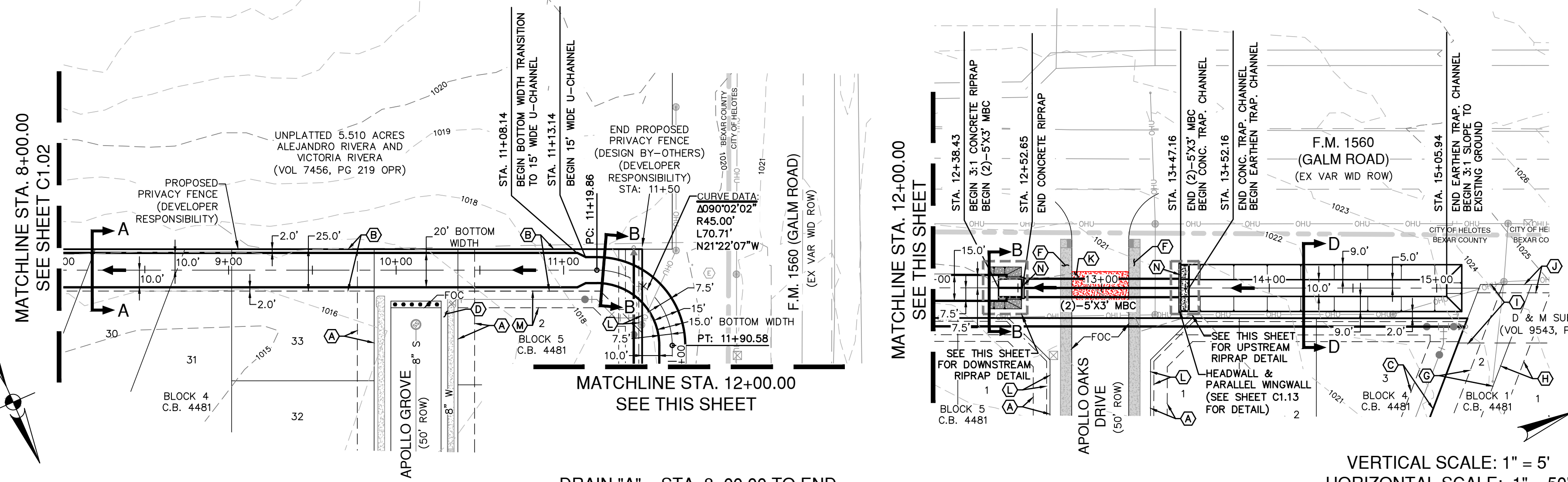
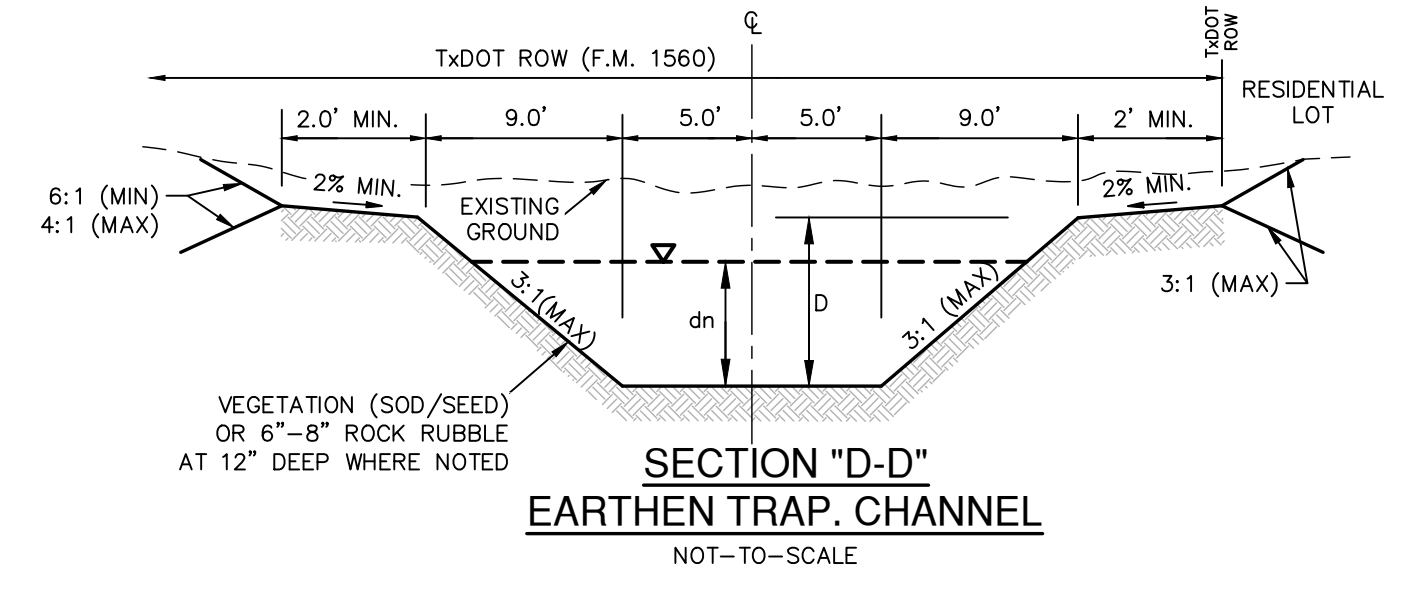
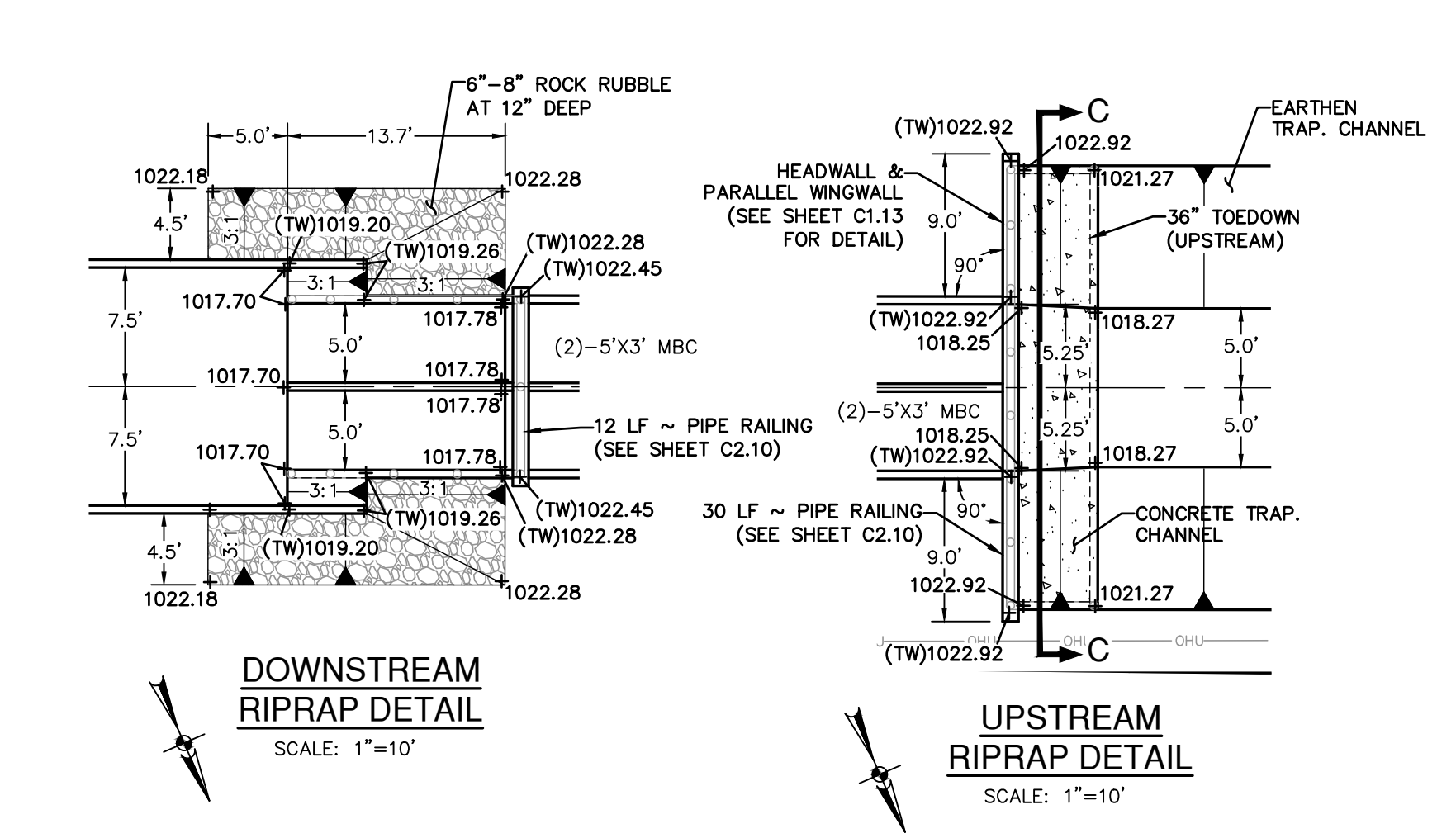
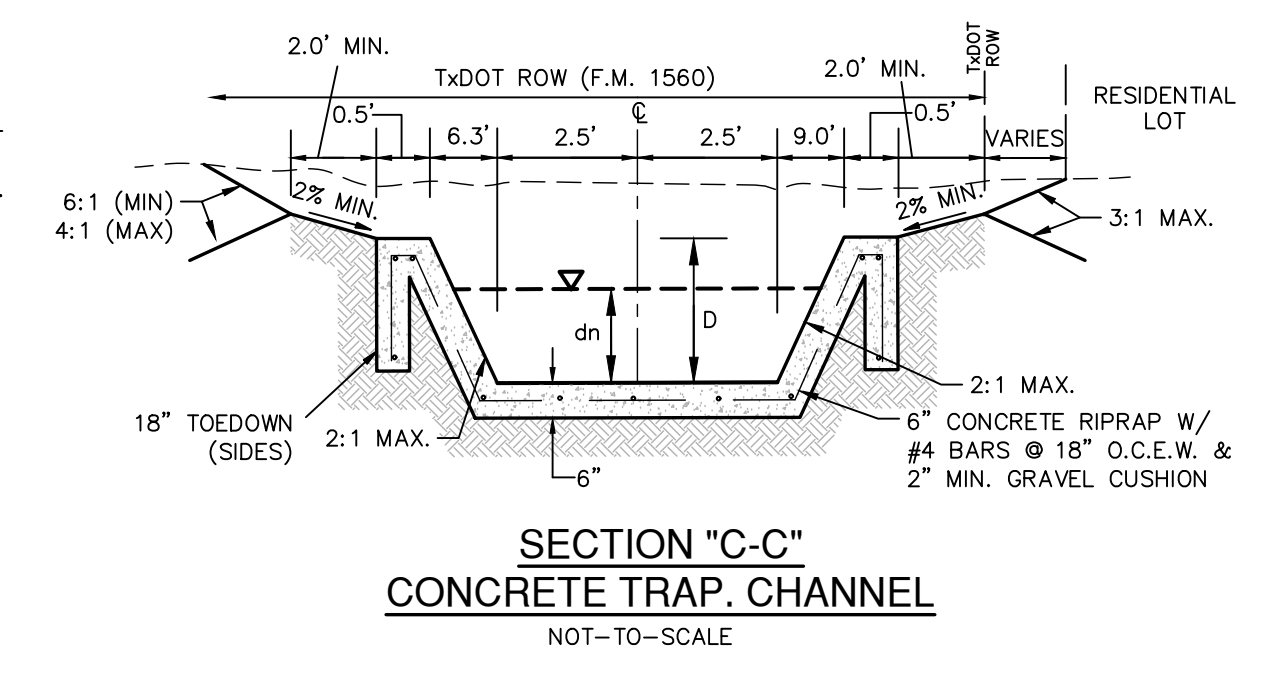
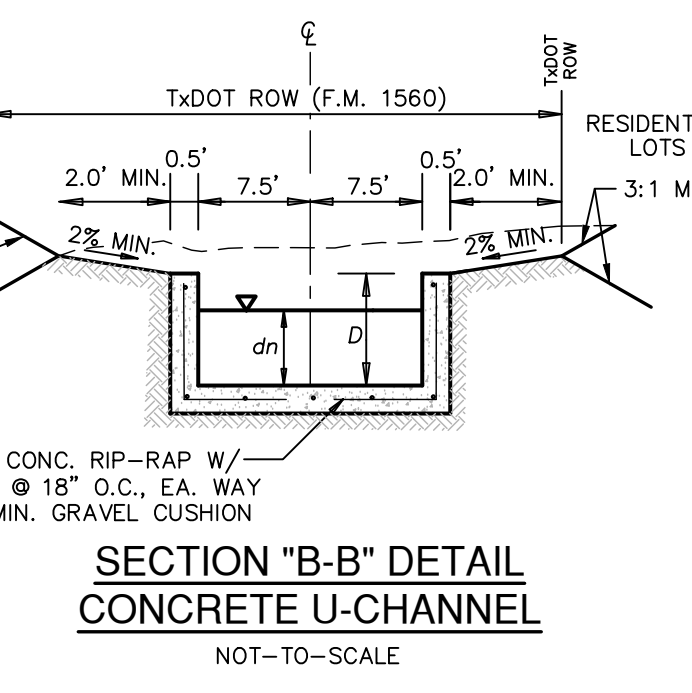
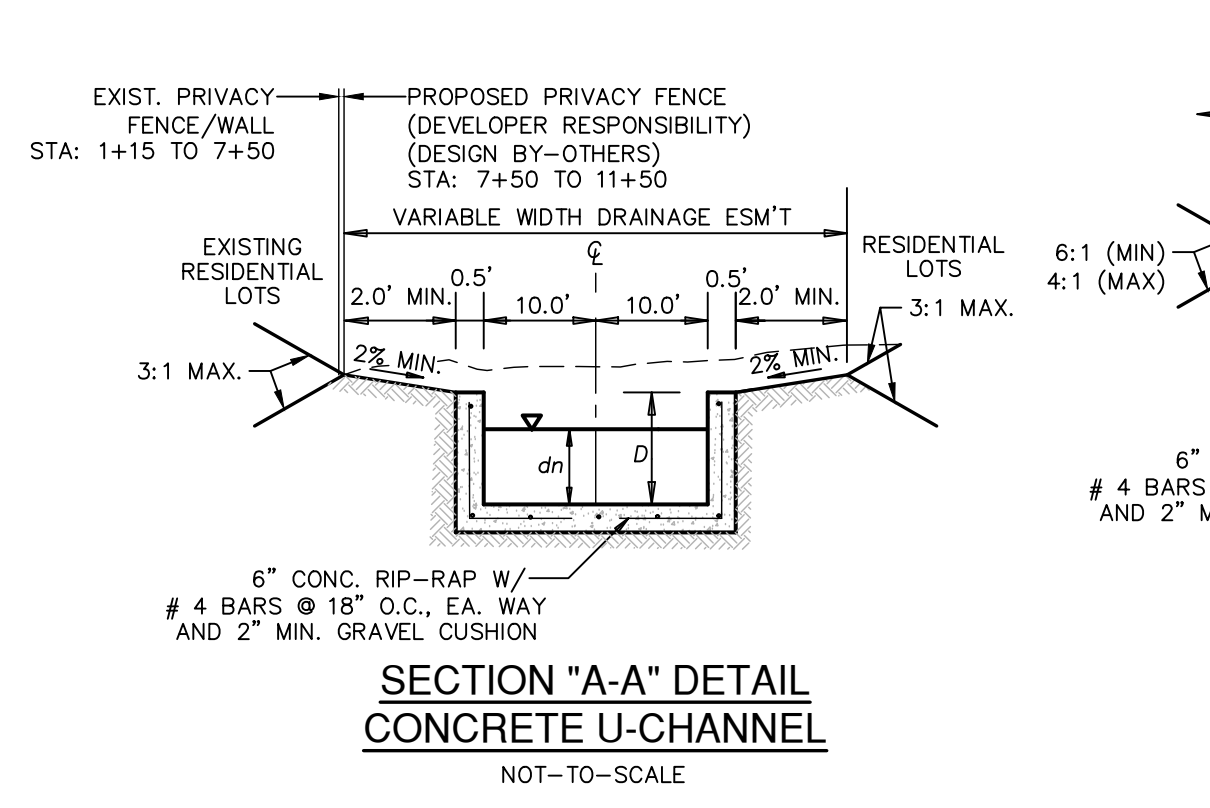
APOLLO OAKS
BEXAR COUNTY, TEXAS

DRAIN "A" ~ STA. 1+00.00 TO STA. 8+00.00
DRAIN PLAN & PROFILE

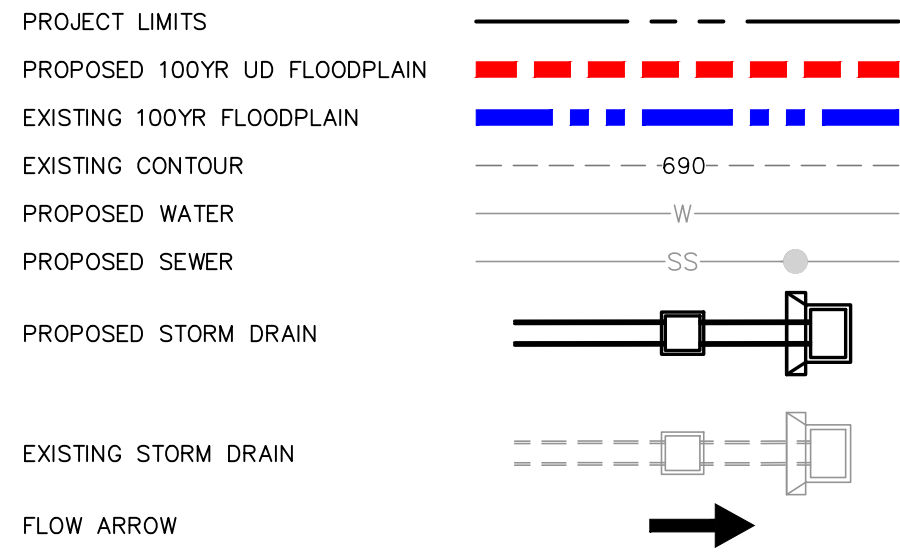
PLAT NO. CP202506
JOB NO. 13657-00
DATE: OCTOBER 2025
DESIGNER: CB
CHECKED: JA DRAWN: CB
SHEET: C1.02

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DRAINAGE LEGEND



KEY LEGEND:

- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (B) VARIABLE WIDTH DRAINAGE EASEMENT
- (C) VARIABLE WIDTH WATER EASEMENT
- (D) 4' SIDEWALK
- (E) 4' DEVELOPER SIDEWALK
- (F) 6' DEVELOPER SIDEWALK
- (G) 16' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
- (H) 12' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
- (I) 50' BUILDING SETBACK LINE (VOL. 9543, PG. 97, DPR)
- (J) 20' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
- (K) MODIFIED PAVEMENT SECTION (SEE SHEET C2.10)
- (L) 1 VEHICLE NON-ACCESS EASEMENT (NOT-TO-SCALE)
- (M) 10' WATER ESMT
- (N) 40' L.F. ~ PIPE RAILING (SEE SHEET C2.10 FOR DETAIL)

OPEN CHANNEL NOTE:
CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 - "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.10 AND SUPPLIED RETARDATION CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE CONSTRUCTION NOTES:

1. ALL SINGLE BOX CULVERTS (SBC) AND ALL MULTIPLE BOX CULVERTS (MBC) SHALL BE PRECAST. (SEE SHEETS C1.13-C1.14 FOR PRECAST CONSTRUCTION DETAILS.)

DRAINAGE & GRADING NOTES:

1. A BEXAR COUNTY ROW PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY ROW. 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.
2. 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.
3. ALL CONCRETE FOR TxDOT DRAINAGE STRUCTURES SHALL MEET TxDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
4. REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
5. CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE POSITIVE DRAINAGE.
6. 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.
7. CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH OF "D" AS SHOWN IN THE PROFILE.

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.

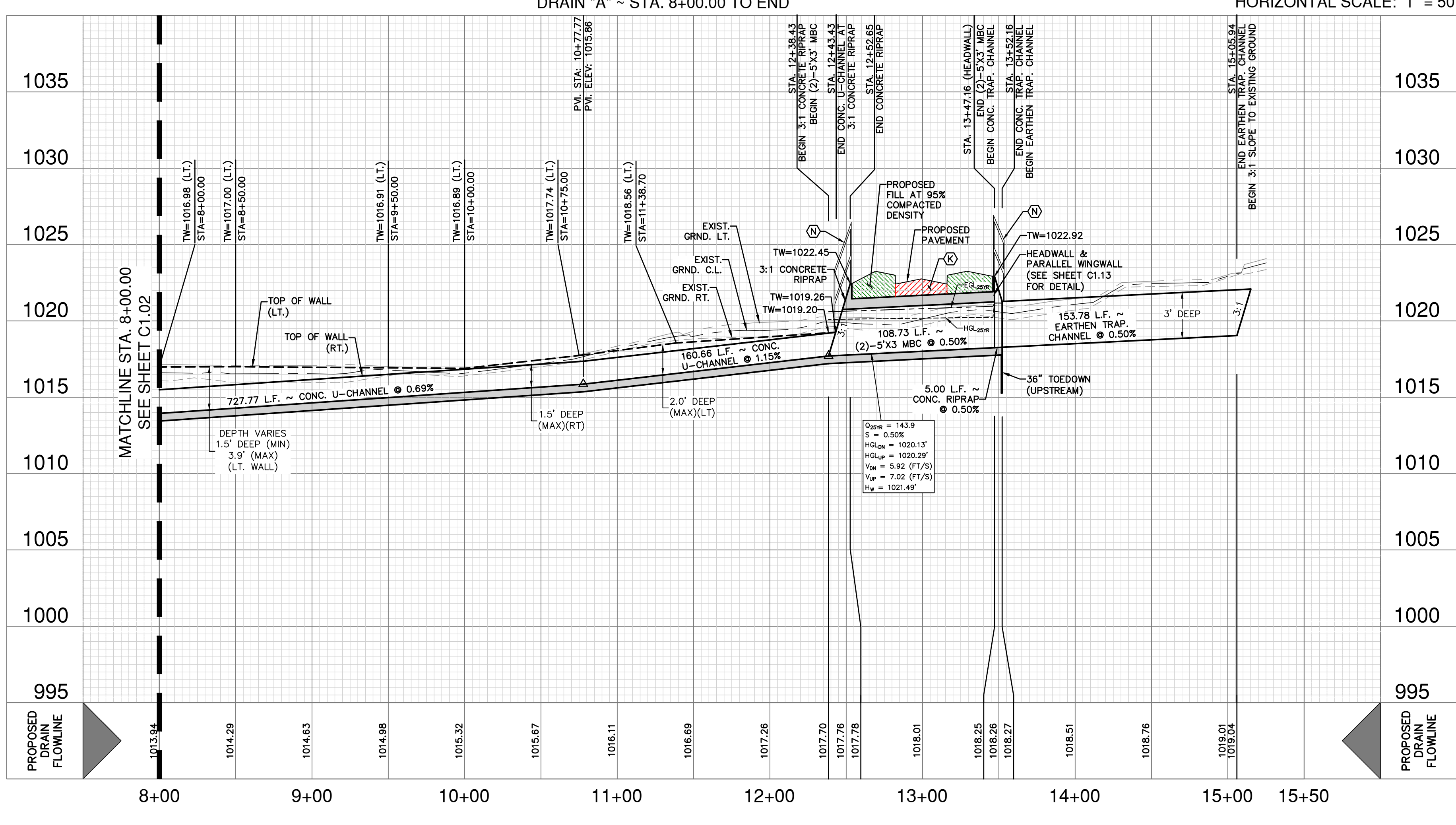
TRENCH EXCAVATION SAFETY PROTECTION:

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HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 10+77.77 TO 10+77.77	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 10+77.77 TO 11+08.14
Q25 = 154.44 CFS	Q25 = 154.44 CFS
Bw = 20'	Bw = 20'
n = 0.015	n = 0.015
S = 0.69%	S = 1.15%
D = 1.50'	D = 1.50'
dn = 1.00'	dn = 0.86'
V = 7.72 fps	V = 8.98 fps

HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION B-B) STA. 11+08.14 TO 12+38.43	HYDRAULIC CALCULATIONS CONC. TRAP CHANNEL (SECTION C-C) STA. 13+47.16 TO 13+52.16
Q25 = 143.95 CFS	Q25 = 143.95 CFS
Bw = 15'	Bw = 10'
n = 0.015	n = 0.015
S = 1.15%	S = 0.50%
D = 1.50'	D = 3.00'
dn = 0.99'	dn = 1.40'
V = 9.69 fps	V = 7.24 fps

HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION D-D) STA. 13+52.16 TO 15+05.94
Q25 = 143.95 CFS
Bw = 10'
n = 0.035
S = 0.50%
D = 3.00'
dn = 2.19'
V = 3.97 fps
$\tau_d = 0.47 \text{ LB/FT}^2$
RC = B,C,D



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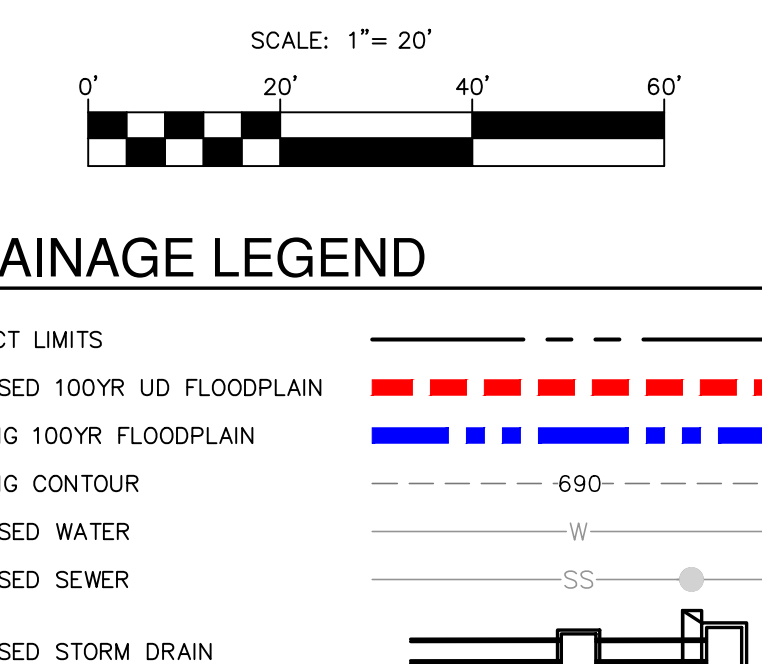
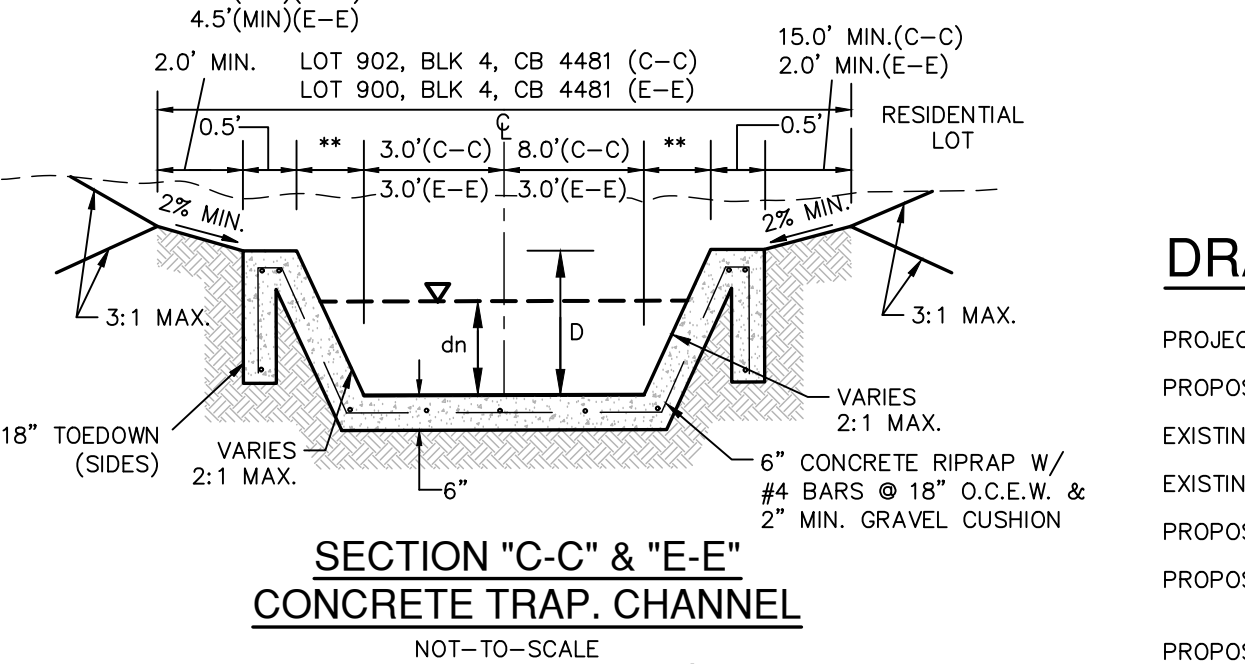
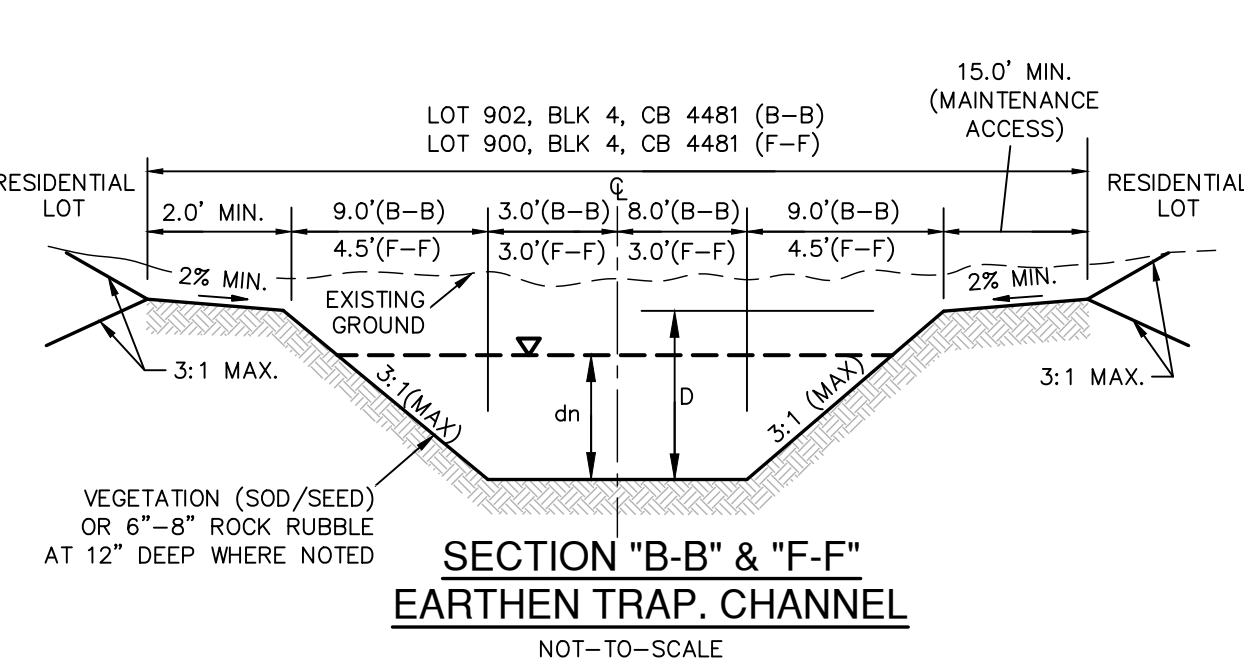
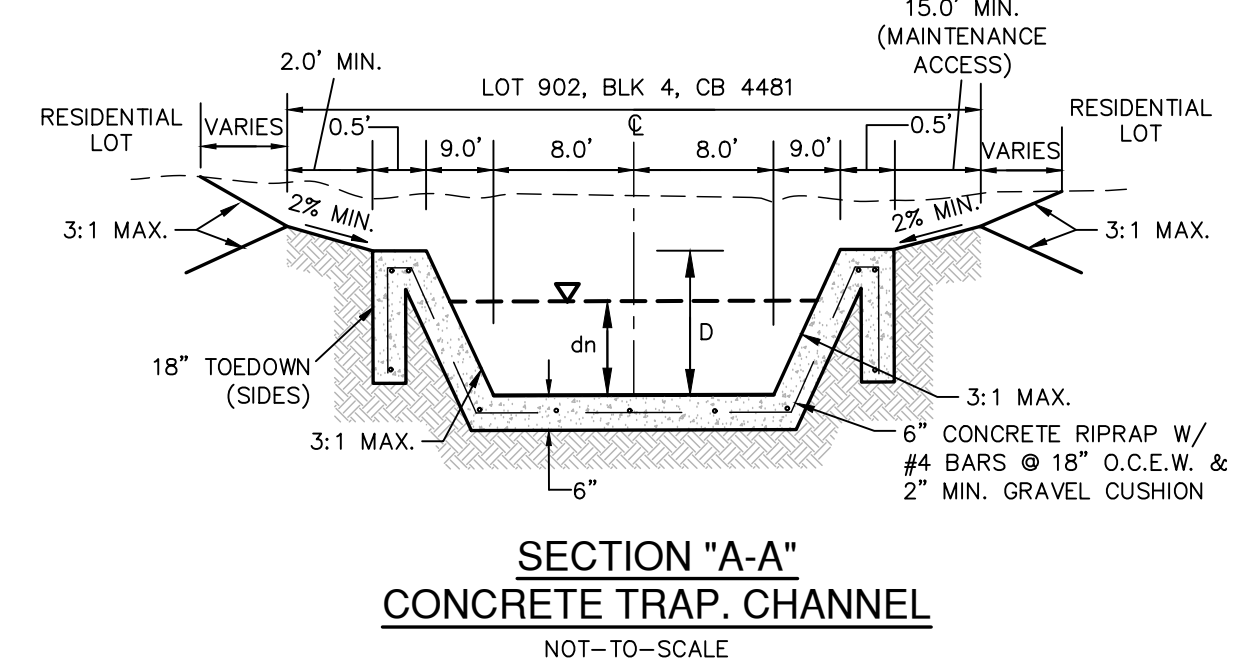
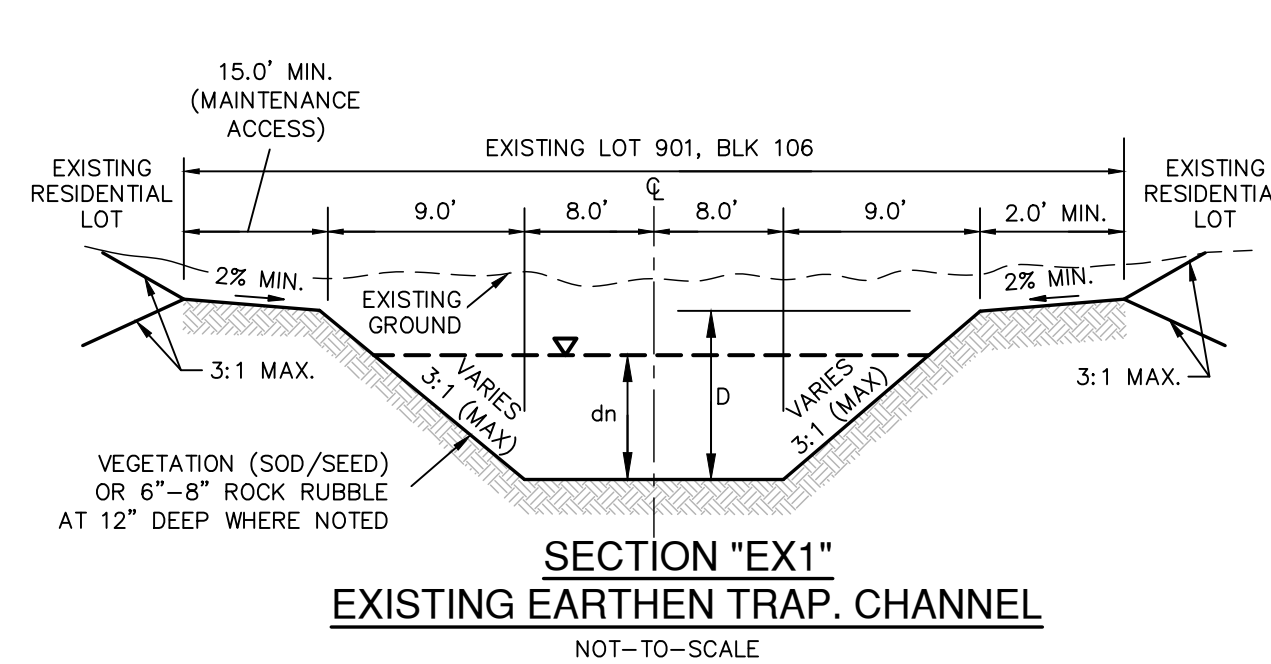
DATE: _____
 NO. REVISION: _____

 Jon Adame
 10/24/25

PAPE-DAWSON ENGINEERS
 2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #479 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 DRAIN "A" ~ STA. 8+00.00 TO END
 DRAIN PLAN & PROFILE

PLAT NO. CP202506
 JOB NO. 13657-00
 DATE OCTOBER 2025
 DESIGNER CB
 CHECKED JA DRAWN CB
 SHEET C1.03

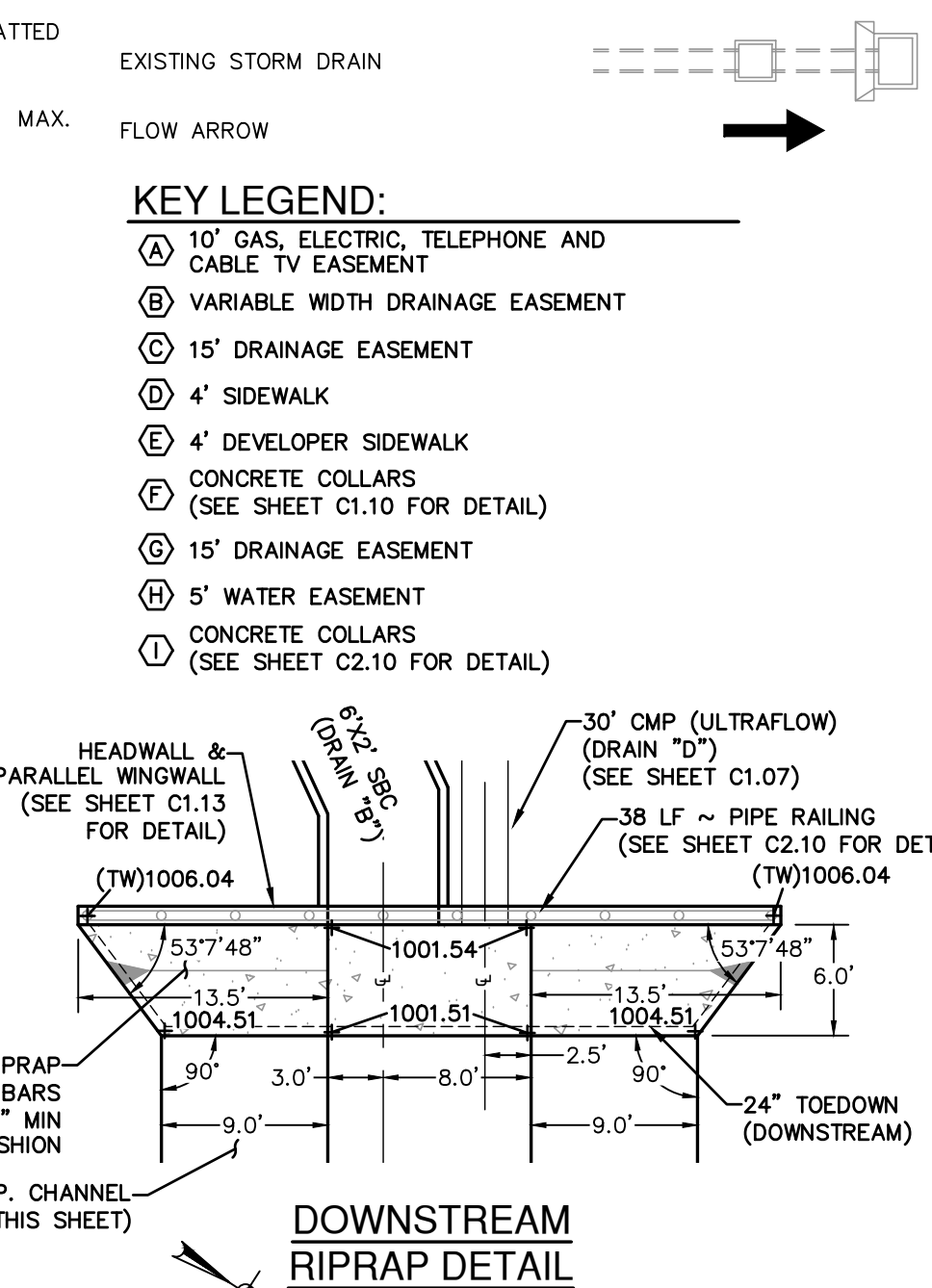
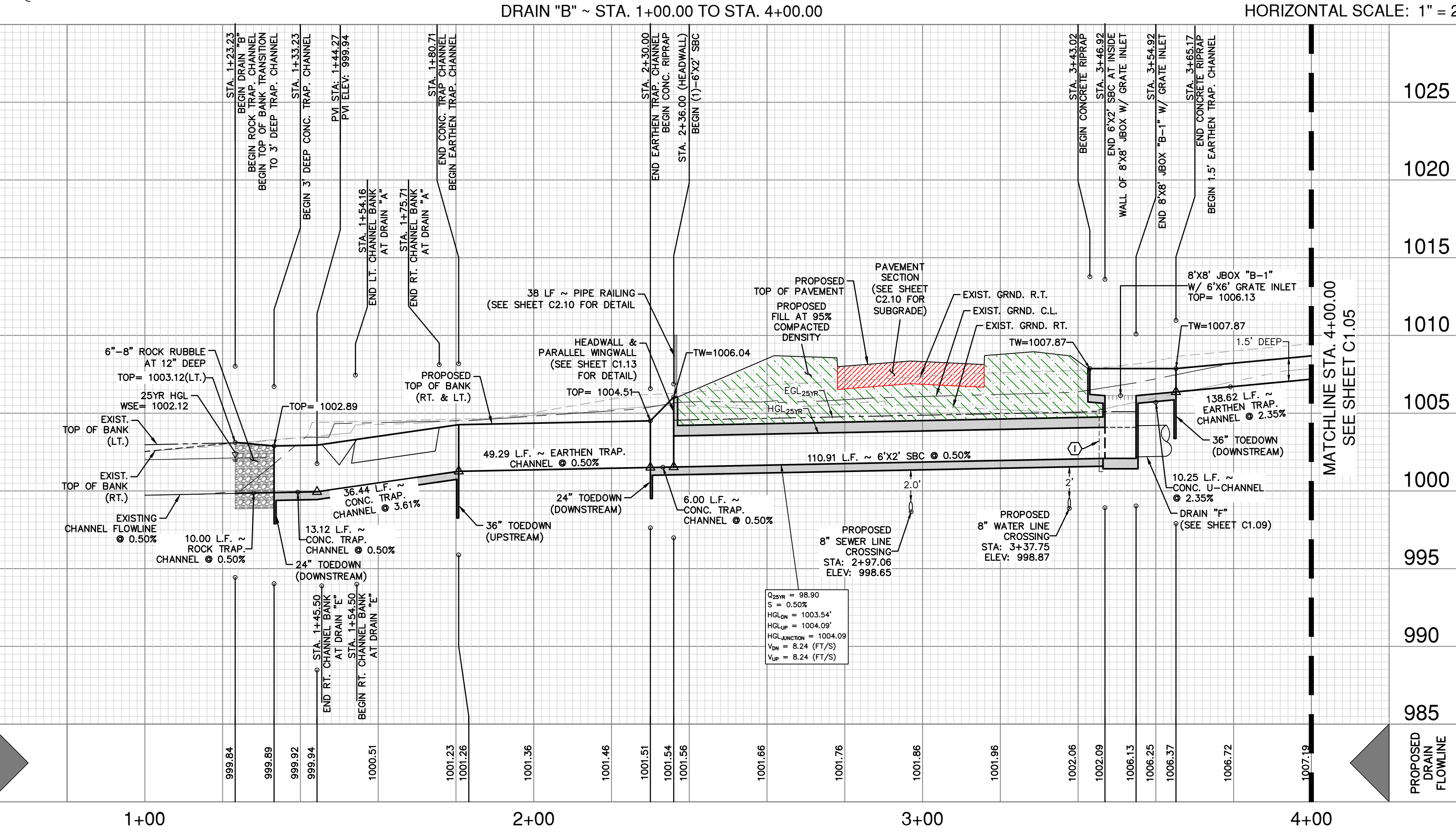
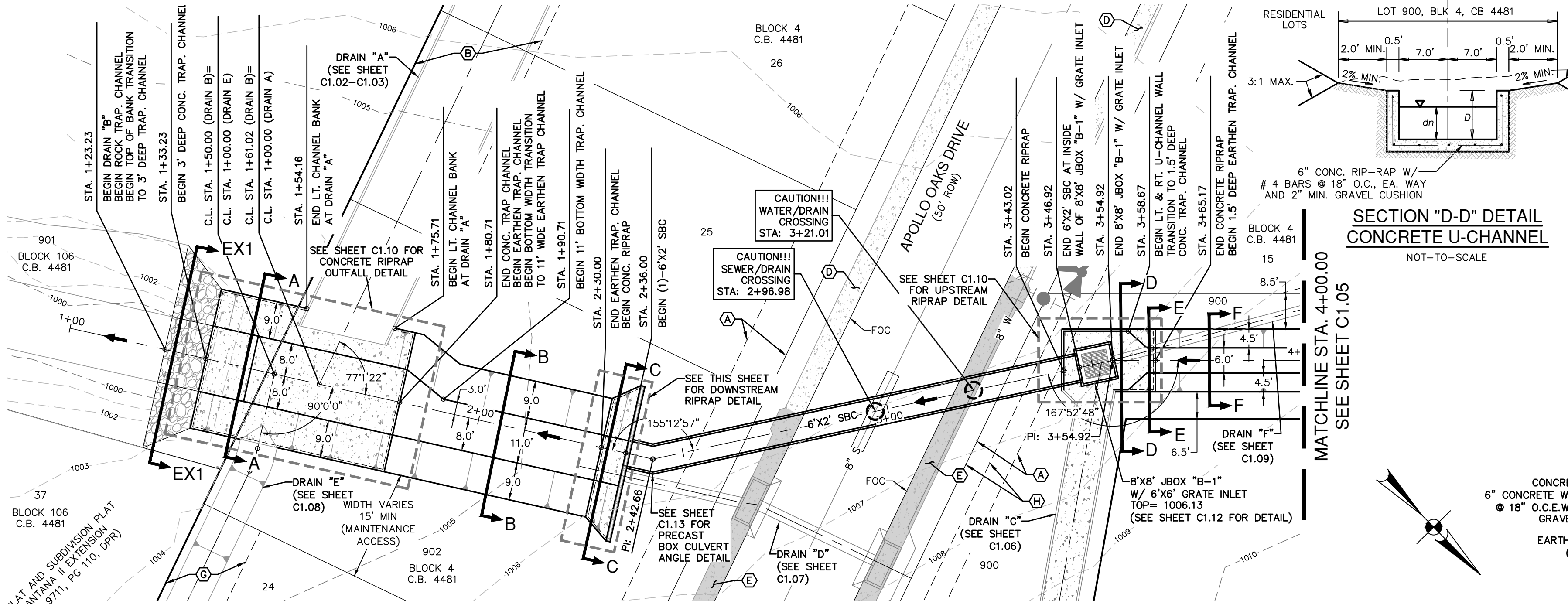


HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION EX1-EX1) STA. 1+23.23 TO 1+33.23	HYDRAULIC CALCULATIONS CONC. TRAP CHANNEL (SECTION A-A) STA. 1+33.23 TO 1+44.27	HYDRAULIC CALCULATIONS CONC. TRAP CHANNEL (SECTION A-A) STA. 1+44.27 TO 1+80.71
Q25 = 255.55 CFS	Q25 = 255.55 CFS	Q25 = 255.55 CFS
Bw = 16'	Bw = 16'	Bw = 16'
n = 0.035	n = 0.015	n = 0.015
S = 0.50%	S = 0.50%	S = 3.61%
D = 3.00'	D = 3.00'	D = 3.00'
dn = 2.28'	dn = 1.54'	dn = 088'
V = 4.09 fps	V = 8.05 fps	V = 15.58 fps
$\tau_b = 0.50 \text{ LB/FT}^2$ RC = ROCK D50=6IN.		

HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION B-B) STA. 1+80.71 TO 2+30.00	HYDRAULIC CALCULATIONS CONC. TRAP CHANNEL (SECTION C-C) STA. 2+30.00 TO 2+36.00	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION D-D) STA. 3+43.02 TO 3+65.17
Q25 = 114.33 CFS	Q25 = 114.33 CFS	Q25 = 85.58 CFS
Bw = 11'	Bw = 11'	Bw = 11'
n = 0.035	n = 0.015	n = 0.015
S = 0.50%	S = 0.50%	S = 2.35%
D = 3.00'	D = 3.00'	D = 1.50'
dn = 1.87'	dn = 1.22'	dn = 0.60'
V = 3.68 fps	V = 6.97 fps	V = 10.19 fps
$\tau_b = 0.42 \text{ LB/FT}^2$ RC = B.C.D		

HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION F-F) STA. 3+65.17 TO 4+03.79
Q25 = 32.81 CFS
Bw = 6'
n = 0.035
S = 0.50%
D = 1.50'
dn = 0.82'
V = 4.73 fps
$\tau_b = 0.91 \text{ LB/FT}^2$ RC = B.C.D

HYDRAULIC CALCULATIONS GRATE INLET
Q25 = 85.58 CFS
$Q_{25} = 0.5 \times c \times A_n \times (2 \times g \times H)^{1/2}$
c = 0.7
A _n = 0.8 × A _g
USE 6'X6' GRATE INLET
A _g = 16 SF
A _n = 0.8(16) = 12.8 SF
$85.58 = 0.5(0.7)(12.8) \sqrt{2(32.2)H}^{1/2}$
H = 0.28 FT



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10/24/25

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2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10038600

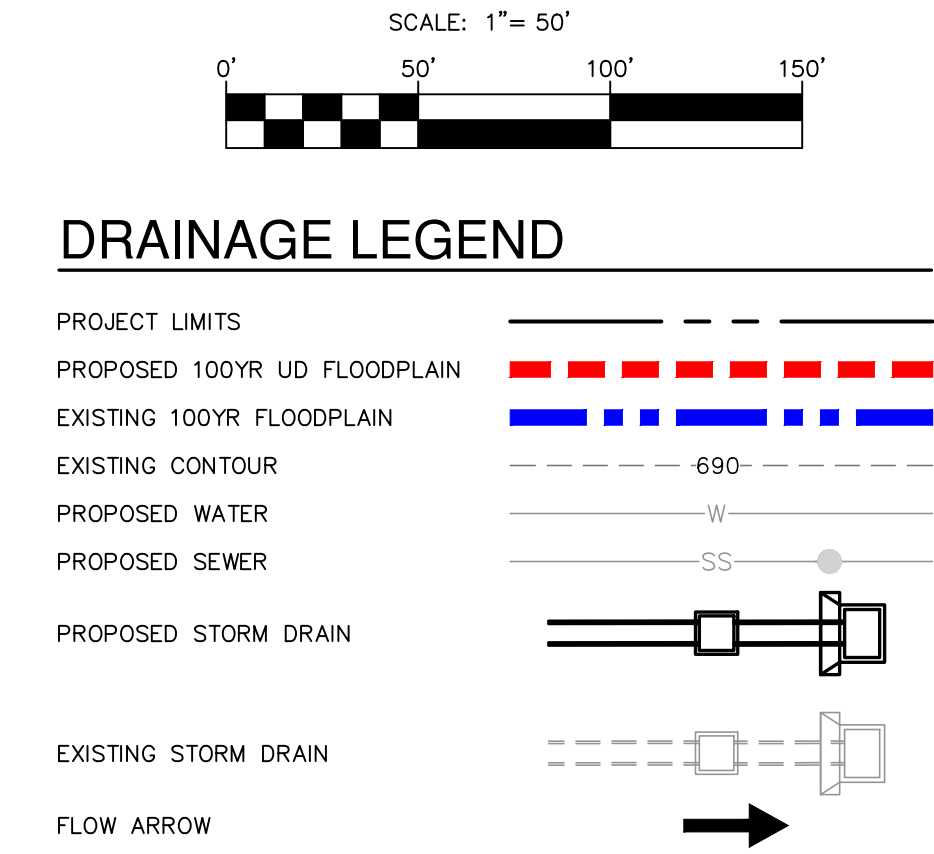
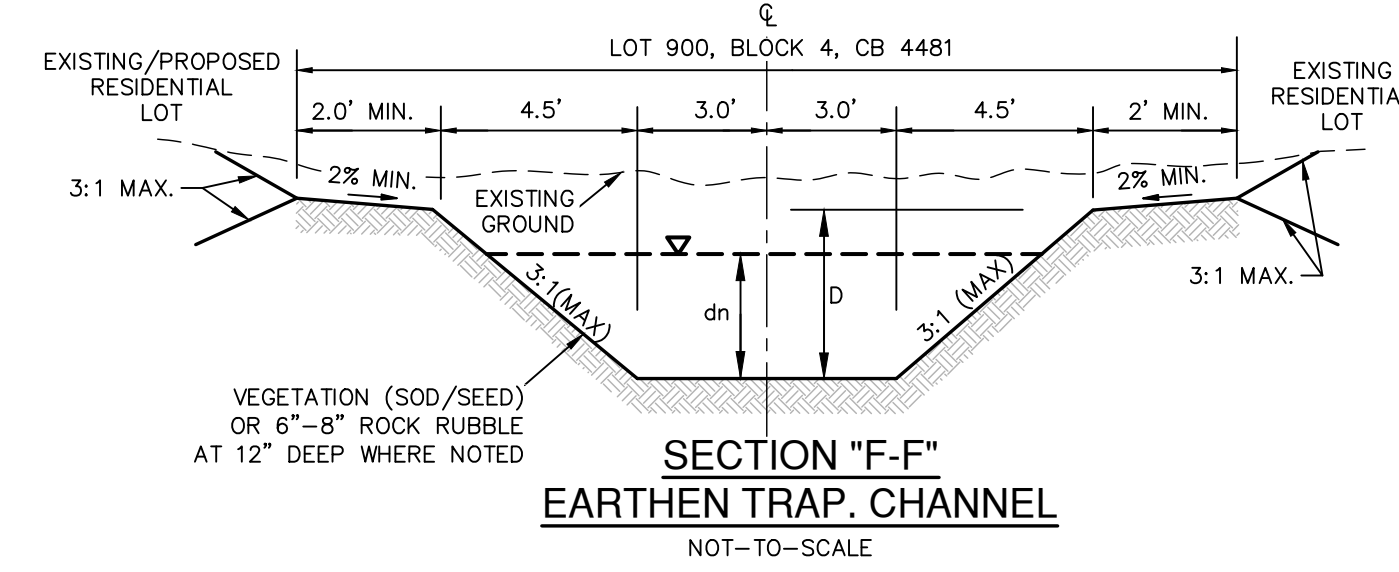
APOLLO OAKS
BEXAR COUNTY, TEXAS

DRAIN "B" ~ STA. 1+00.00 TO STA. 4+00.00
DRAIN PLAN & PROFILE

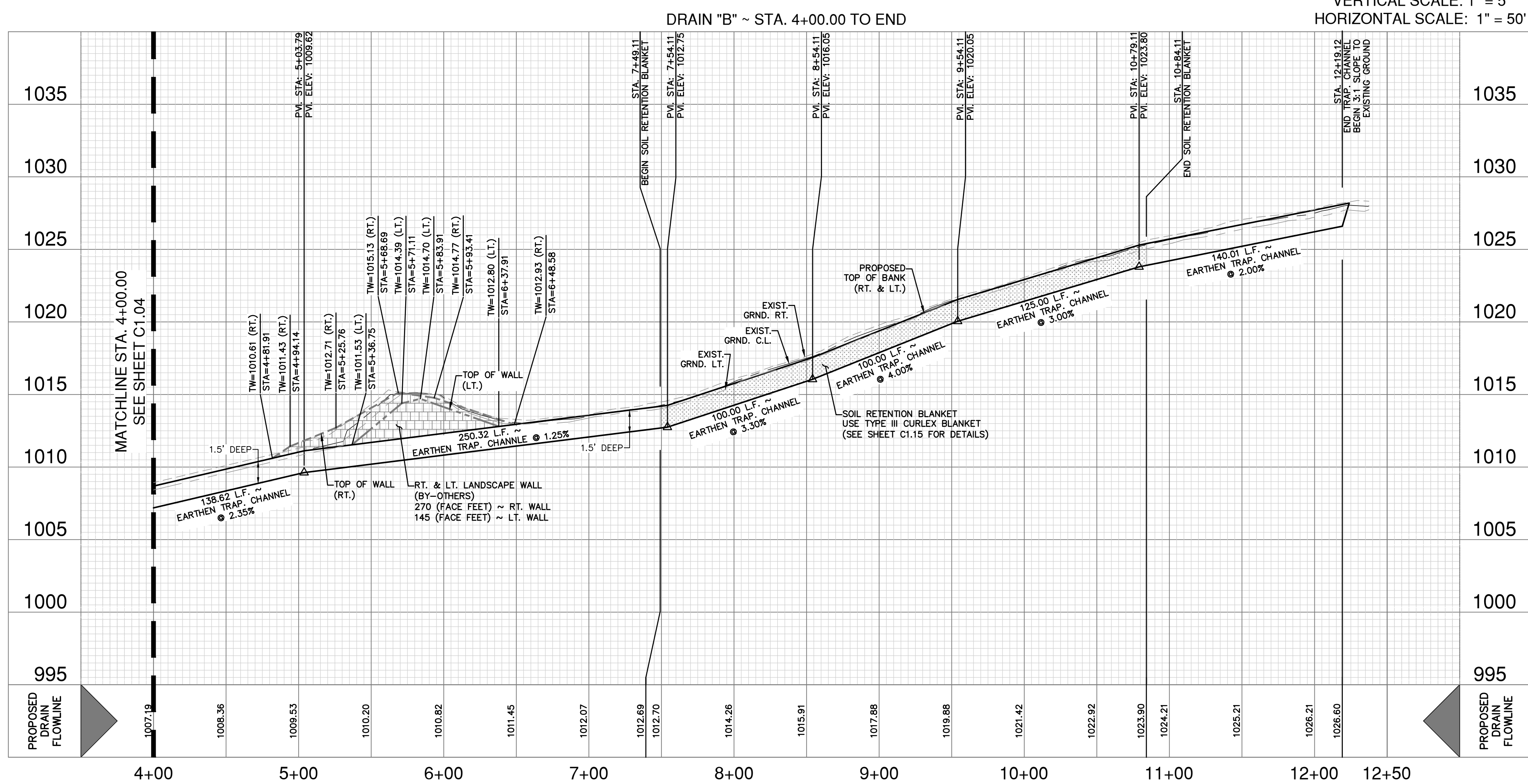
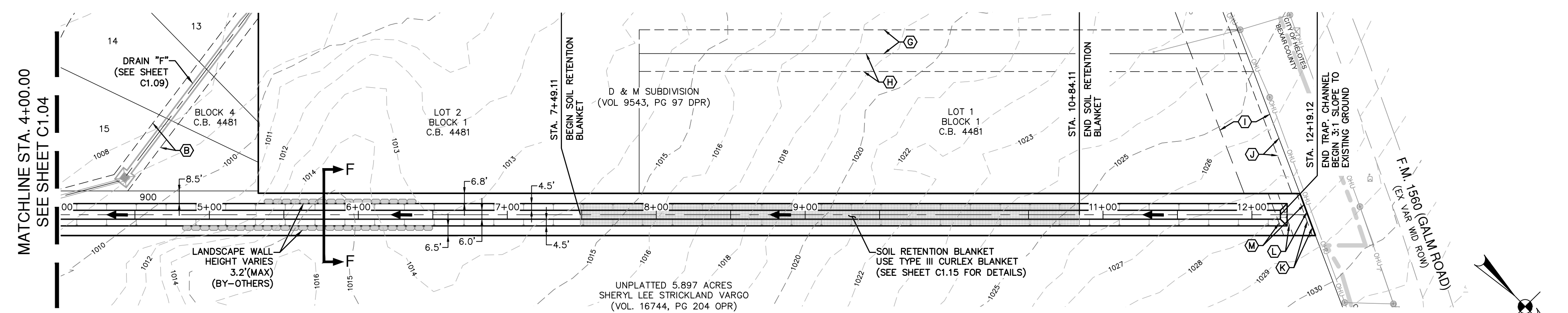
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HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION F-F) STA. 3+45.17 TO 5+03.79	HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION F-F) STA. 5+03.79 TO 7+54.11	HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION F-F) STA. 7+54.11 TO 8+54.11	HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION F-F) STA. 8+54.11 TO 9+54.11	HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION F-F) STA. 9+54.11 TO 10+79.11	HYDRAULIC CALCULATIONS EARTH TRAP CHANNEL (SECTION F-F) STA. 10+79.11 TO 12+19.12
Q25 = 32.81 CFS	Q25 = 32.81 CFS	Q25 = 32.81 CFS	Q25 = 32.81 CFS	Q25 = 32.81 CFS	Q25 = 32.81 CFS
Bw = 6'	Bw = 6'	Bw = 6'	Bw = 6'	Bw = 6'	Bw = 6'
n = 0.035	n = 0.035	n = 0.035	n = 0.035	n = 0.035	n = 0.035
S = 2.35%	S = 1.25%	S = 3.30%	S = 4.00%	S = 3.00%	S = 2.00%
D = 1.50'	D = 1.50'	D = 1.50'	D = 1.50'	D = 1.50'	D = 1.50'
dn = 0.82'	dn = 0.98'	dn = 0.75'	dn = 0.71'	dn = 0.77'	dn = 0.86'
V = 4.73 fps	V = 3.74 fps	V = 5.30 fps	V = 5.68 fps	V = 5.13 fps	V = 4.45 fps
$\tau_d = 0.91 \text{ LB/FT}^2$ RC= B,C,D	$\tau_d = 0.56 \text{ LB/FT}^2$ RC= B,C,D	$\tau_d = 1.18 \text{ LB/FT}^2$ RC= B,C,D	$\tau_d = 1.37 \text{ LB/FT}^2$ RC= B,C,D	$\tau_d = 1.09 \text{ LB/FT}^2$ RC= B,C,D	$\tau_d = 0.81 \text{ LB/FT}^2$ RC= B,C,D



- KEY LEGEND:**
- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
 - (B) VARIABLE WIDTH DRAINAGE EASEMENT
 - (C) VARIABLE WIDTH WATER EASEMENT
 - (D) 4' SIDEWALK
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 - (F) 6' DEVELOPER SIDEWALK
 - (G) 16' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
 - (H) 12' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
 - (I) 50' BUILDING SETBACK LINE (VOL. 9543, PG. 97, DPR)
 - (J) 20' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
 - (K) 1' VEHICLE NON-ACCESS EASEMENT (NOT-TO-SCALE)
 - (L) 14' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT
 - (M) 20' WATER EASEMENT



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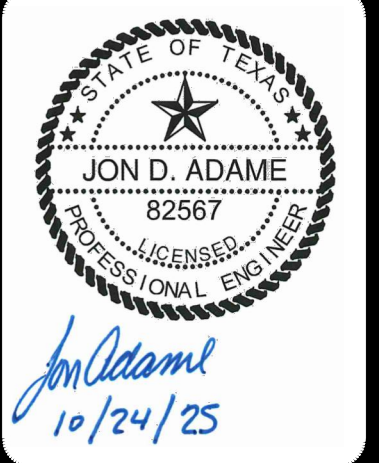
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CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN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

DATE	NO.	REVISION



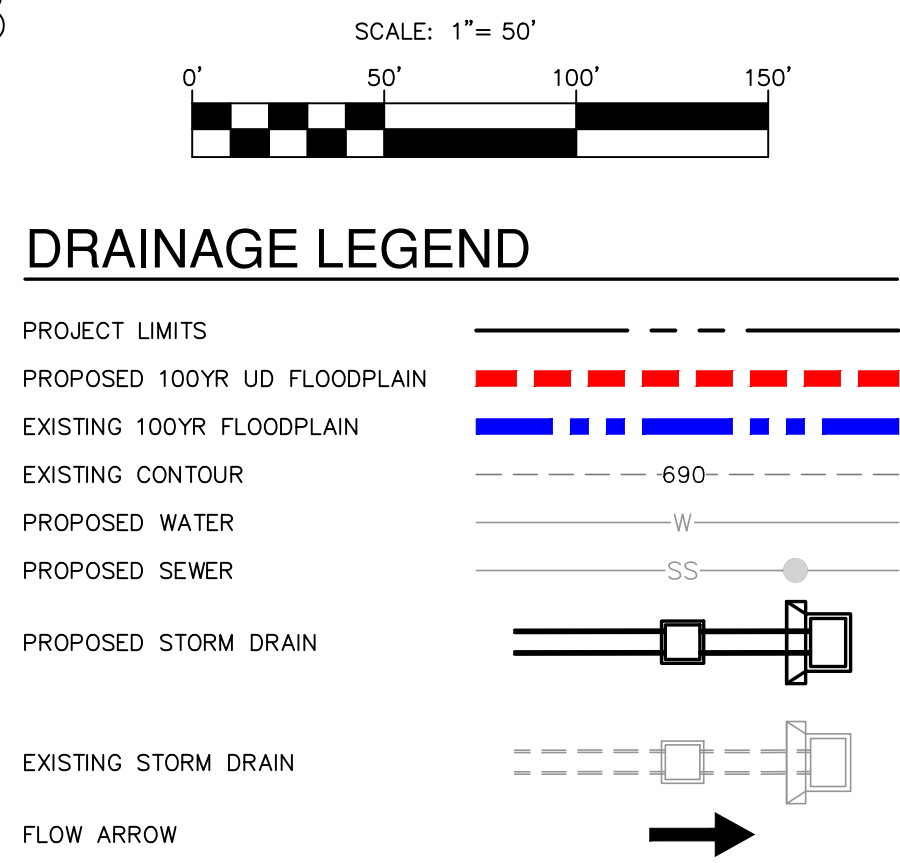
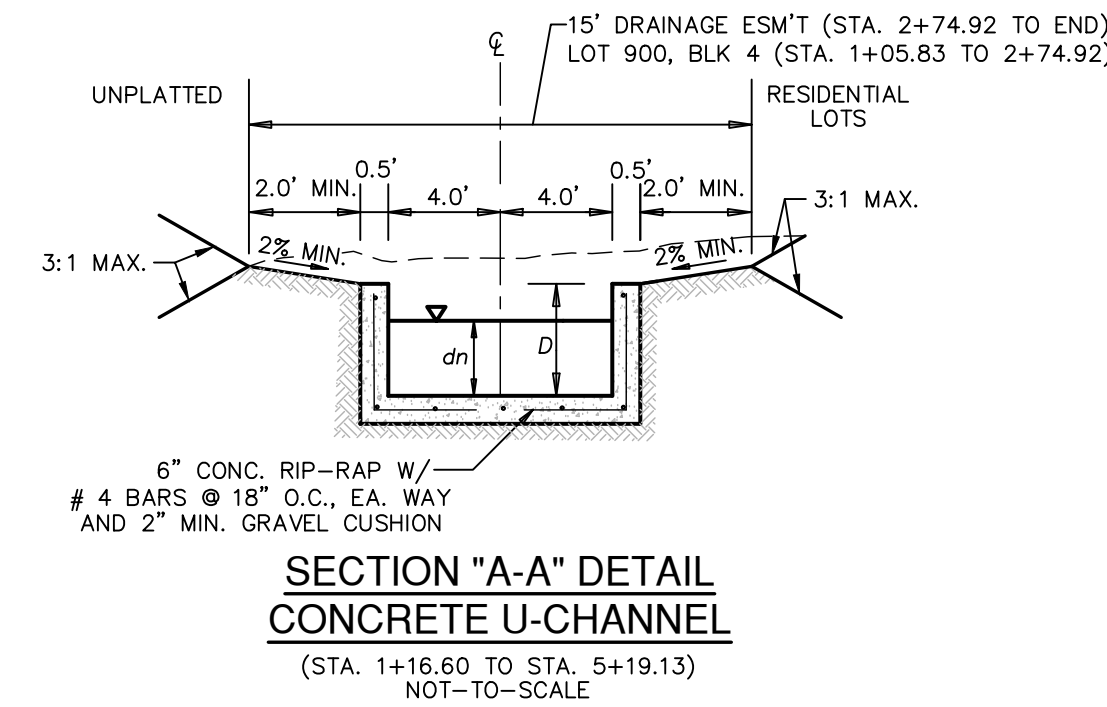
PAPE-DAWSON ENGINEERS
2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #008800

APOLLO OAKS
BEXAR COUNTY, TEXAS
DRAIN "B" ~ STA. 4+00.00 TO END
DRAIN PLAN & PROFILE

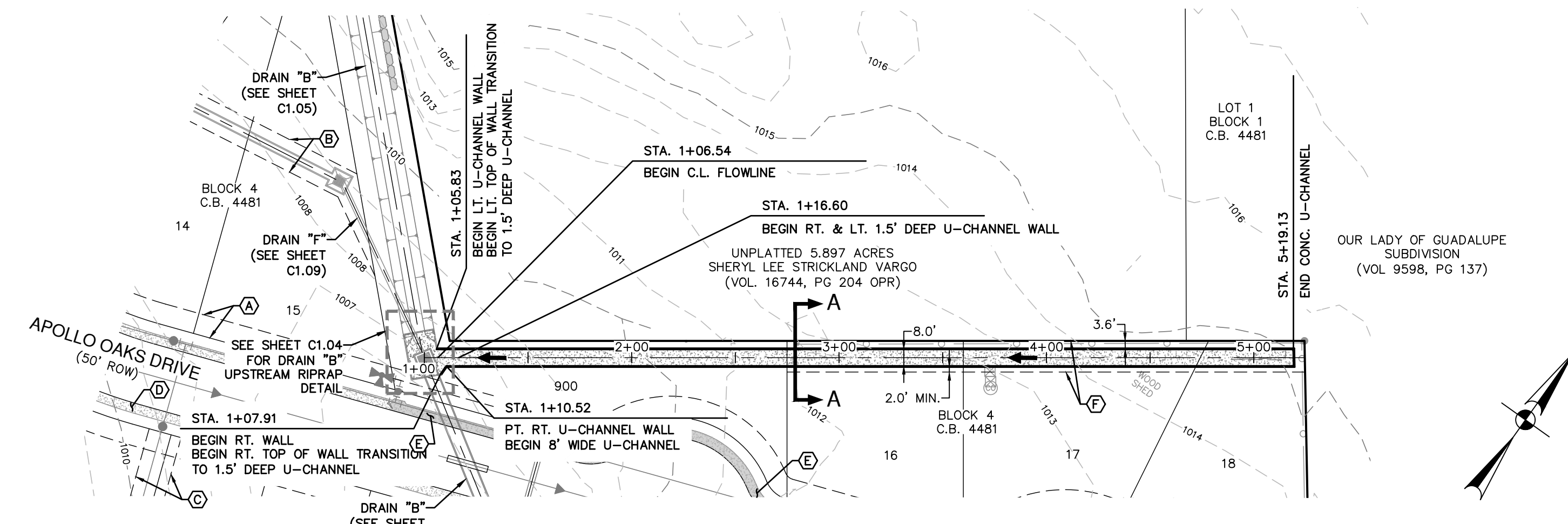
PLAT NO.	CP202506
JOB NO.	13657-00
DATE	OCTOBER 2025
DESIGNER	CB
CHECKED	JA DRAWN CB
SHEET	C1.05

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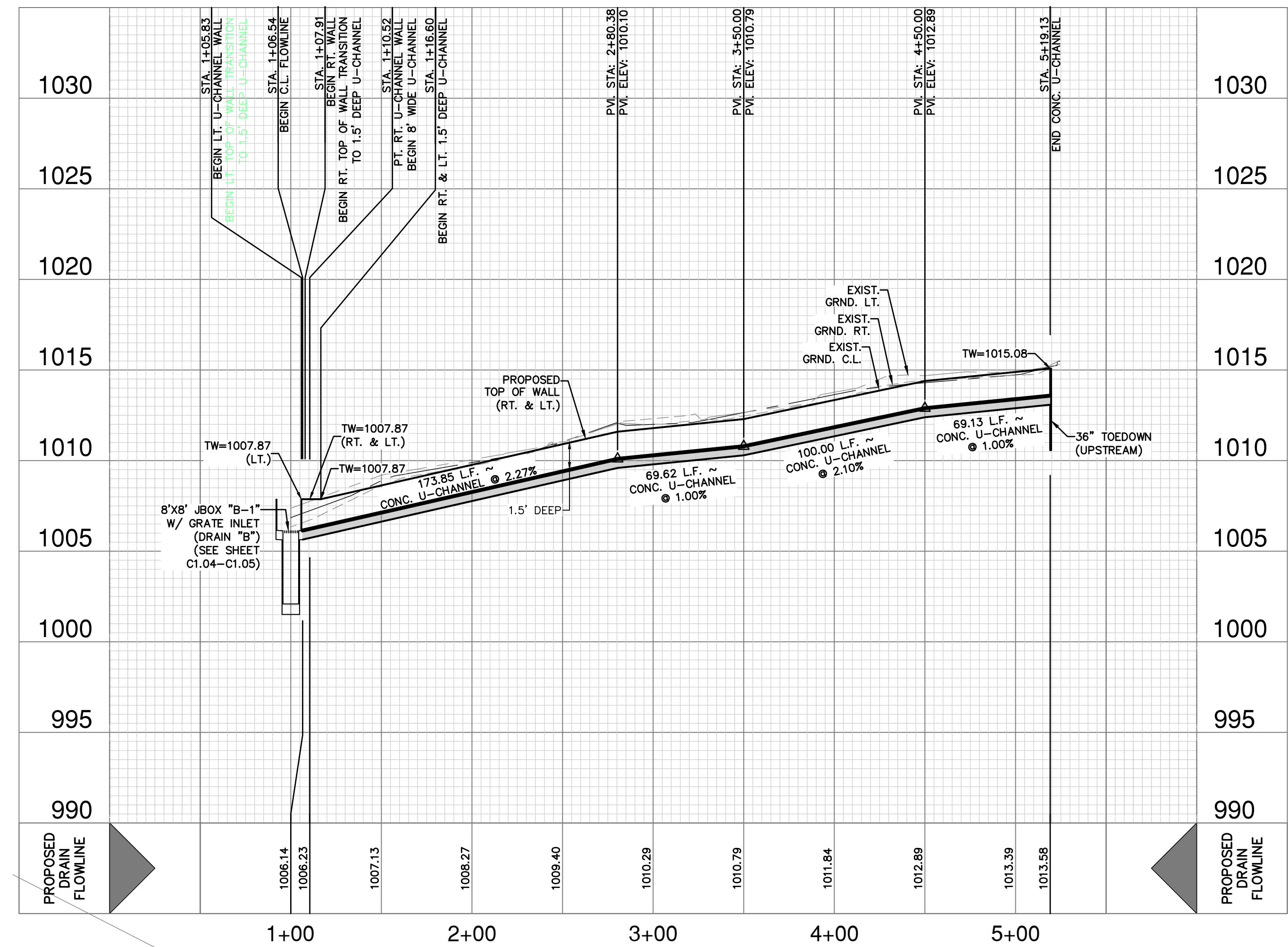
HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 1+16.60 TO 2+80.38	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 2+80.38 TO 3+50.00	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 3+50.00 TO 4+50.00	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 4+50.00 TO 5+19.13
Q25 = 57.96 CFS	Q25 = 57.96 CFS	Q25 = 57.96 CFS	Q25 = 57.96 CFS
Bw = 8'	Bw = 8'	Bw = 8'	Bw = 8'
n = 0.015	n = 0.015	n = 0.015	n = 0.015
S = 2.27%	S = 1.00%	S = 2.10%	S = 1.00%
D = 1.50'	D = 1.50'	D = 1.50'	D = 1.50'
dn = 0.70'	dn = 0.90'	dn = 0.71'	dn = 0.90'
V = 10.35 fps	V = 8.05 fps	V = 10.20 fps	V = 8.05 fps



- KEY LEGEND:**
- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
 - (B) VARIABLE WIDTH DRAINAGE EASEMENT
 - (C) 16' WATER EASEMENT
 - (D) 4' SIDEWALK
 - (E) 4' DEVELOPER SIDEWALK
 - (F) 15' DRAINAGE EASEMENT



DRAIN "C" ~ STA. 1+00.00 TO END
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'



OPEN CHANNEL NOTE:
CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 - "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.10 AND SUPPLIED RETARDATION CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE CONSTRUCTION NOTES:

- ALL SINGLE BOX CULVERTS (SBC) AND ALL MULTIPLE BOX CULVERTS (MBC) SHALL BE PRECAST. (SEE SHEETS C1.13-C1.14 FOR PRECAST CONSTRUCTION DETAILS.)

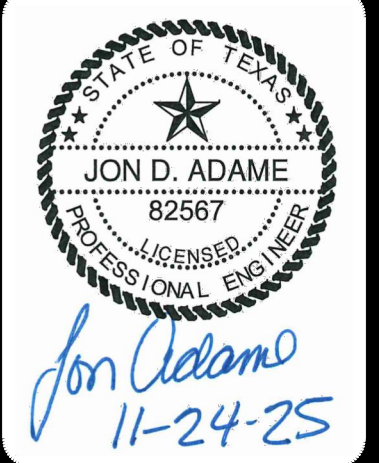
DRAINAGE & GRADING NOTES:

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- ALL CONCRETE FOR TxDOT DRAINAGE STRUCTURES SHALL MEET TxDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
- REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
- CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
- 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.
- CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH OF "D" AS SHOWN IN THE PROFILE.

CAUTION!!
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DATE	
NO.	REVISION

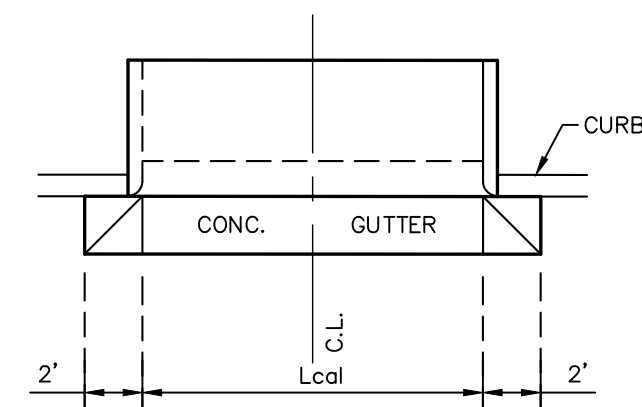


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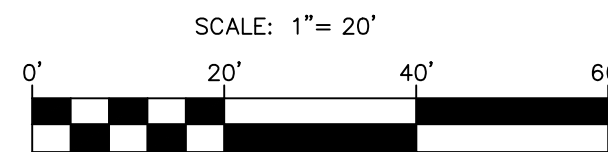
APOLLO OAKS
BEXAR COUNTY, TEXAS
DRAIN "C" ~ STA. 1+00.00 TO END
DRAIN PLAN & PROFILE

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	NOVEMBER 2025
DESIGNER	CB
CHECKED	JA DRAWN CB
SHEET	C1.06

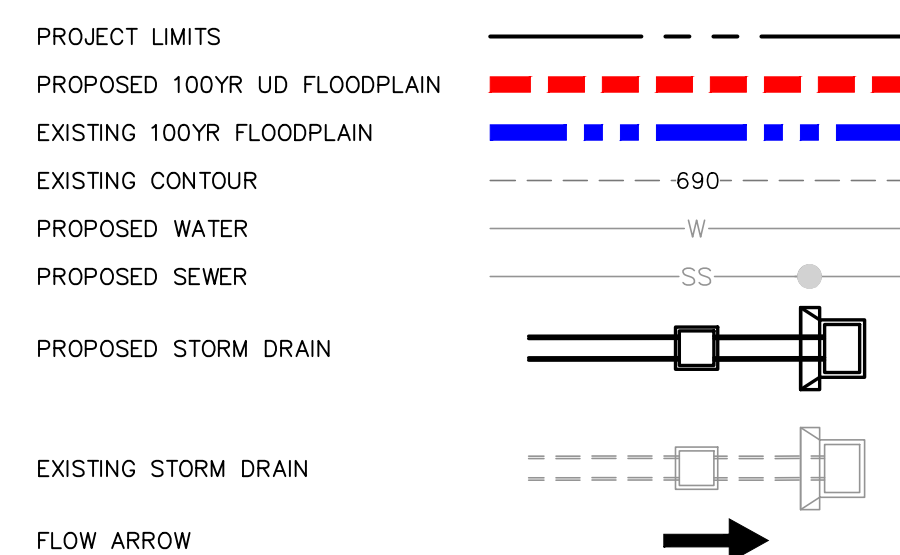
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TYPICAL DRAINAGE CURB OPENING
NOT-TO-SCALE



DRAINAGE LEGEND



KEY LEGEND:

- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (B) VARIABLE WIDTH DRAINAGE EASEMENT
- (C) 4' SIDEWALK
- (D) 4' DEVELOPER SIDEWALK
- (E) CONCRETE COLLARS (SEE SHEET C1.10 FOR DETAIL)
- (F) 5' WATER EASEMENT

HYDRAULIC CALCULATIONS CURB INLET "D-1" & "D-2" OPENING (DRAIN "D")	
Q25	= 33.12 CFS (16.56 CFS EACH INLET)
Bw	= C x L x h ^{3/2} (MIR EQ.)
C	= 3.087
h	= 0.79 FT
C	= $\frac{Q}{C \times h^{3/2}}$
Lcd	= $\frac{16.56 \text{ CFS}}{(3.087)(0.79 \text{ FT})^{3/2}}$
Lcd	= 7.64 FT
L	= USE (1)-10' CURB INLET EACH SIDE

OPEN CHANNEL NOTE:

CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 - "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.10 AND SUPPLIED RETARDATION CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE CONSTRUCTION NOTES:

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DRAINAGE & GRADING NOTES:

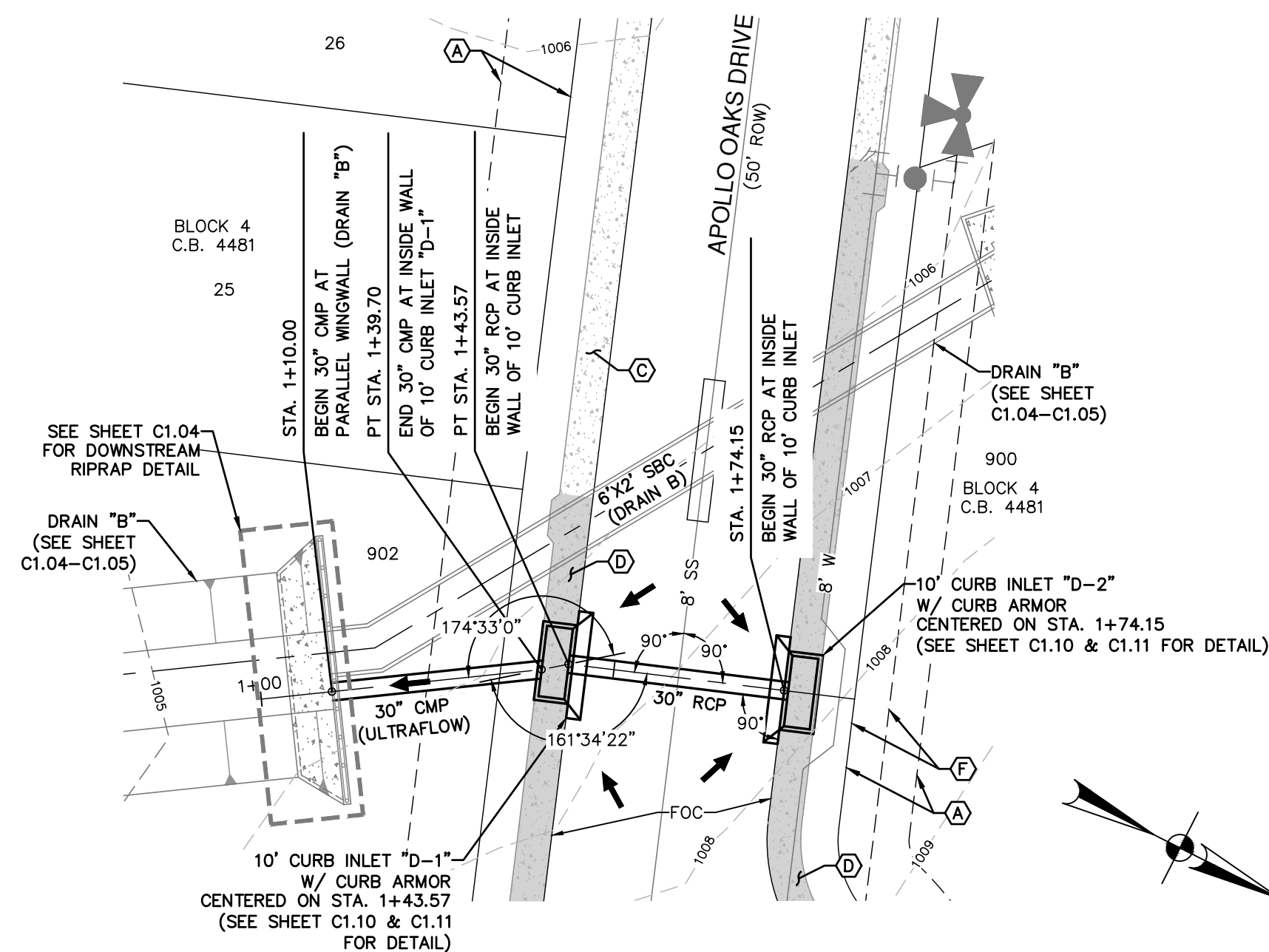
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CAUTION!!

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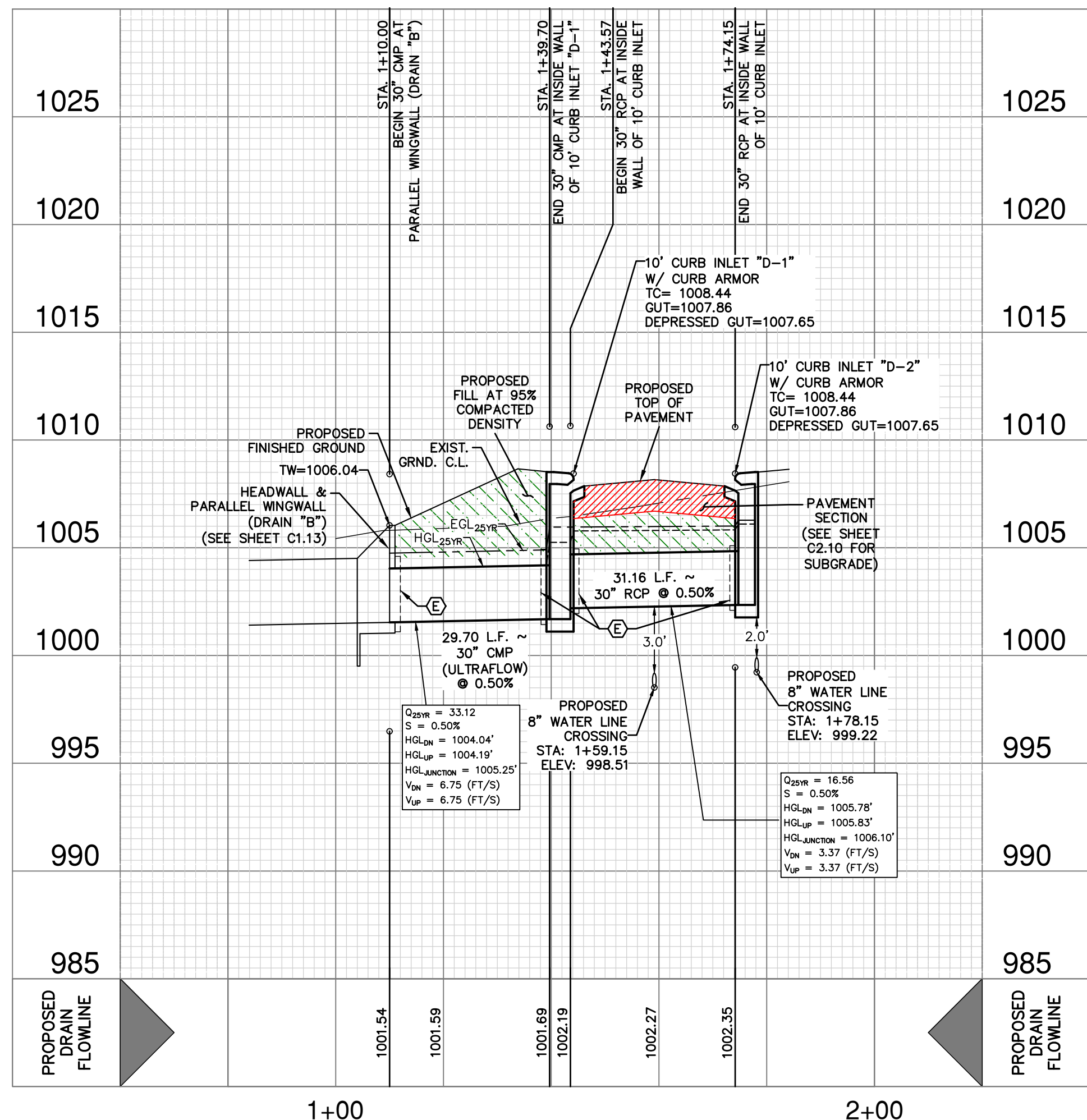
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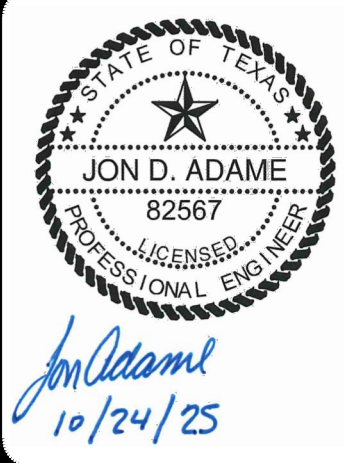


DRAIN "D" ~ STA. 1+00.00 TO END

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



DATE	NO.	REVISION

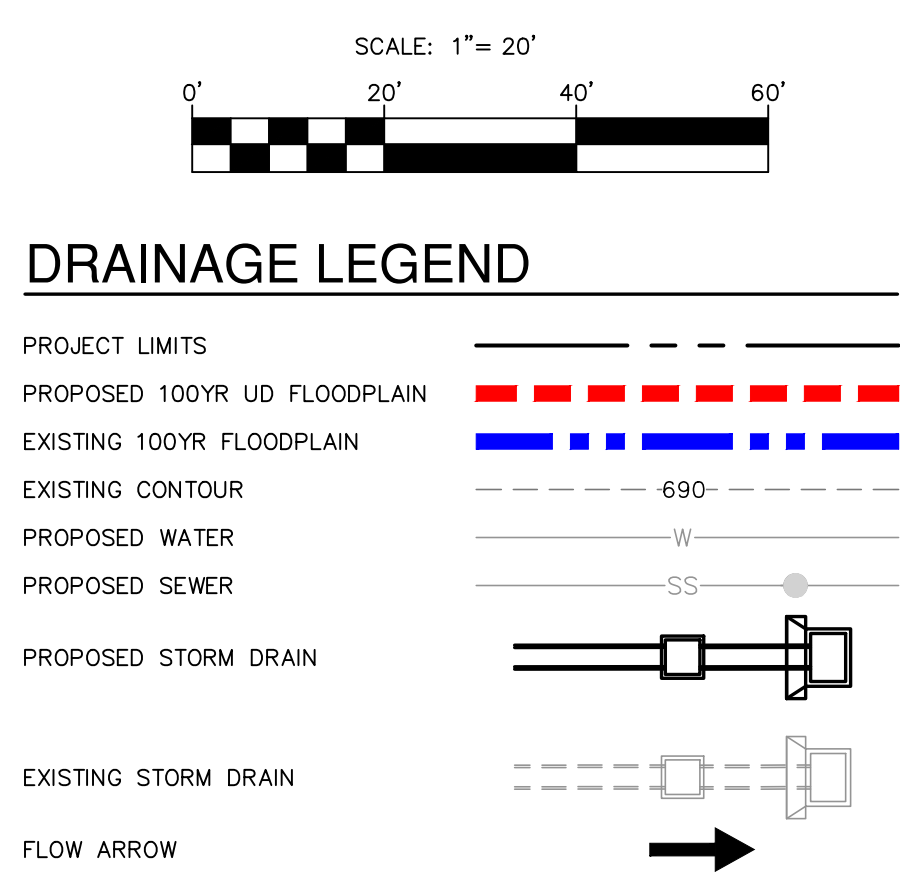
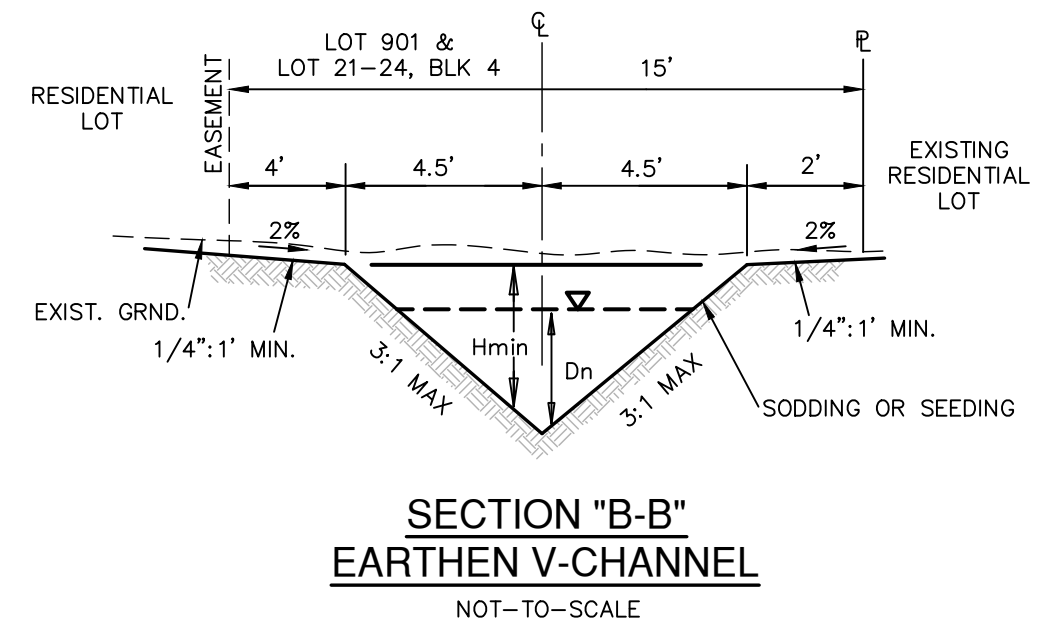
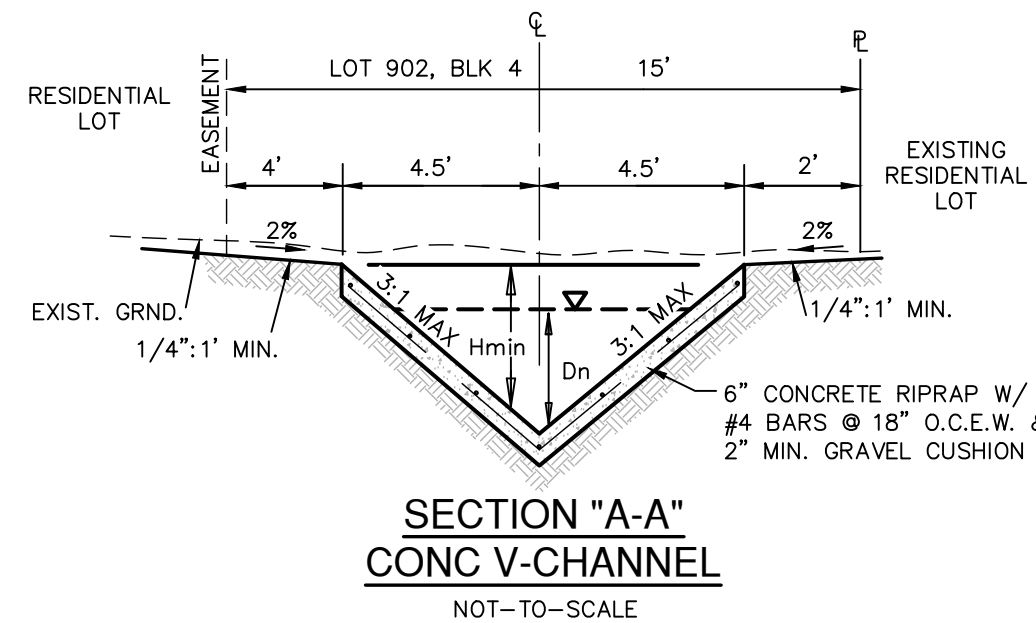


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TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008800

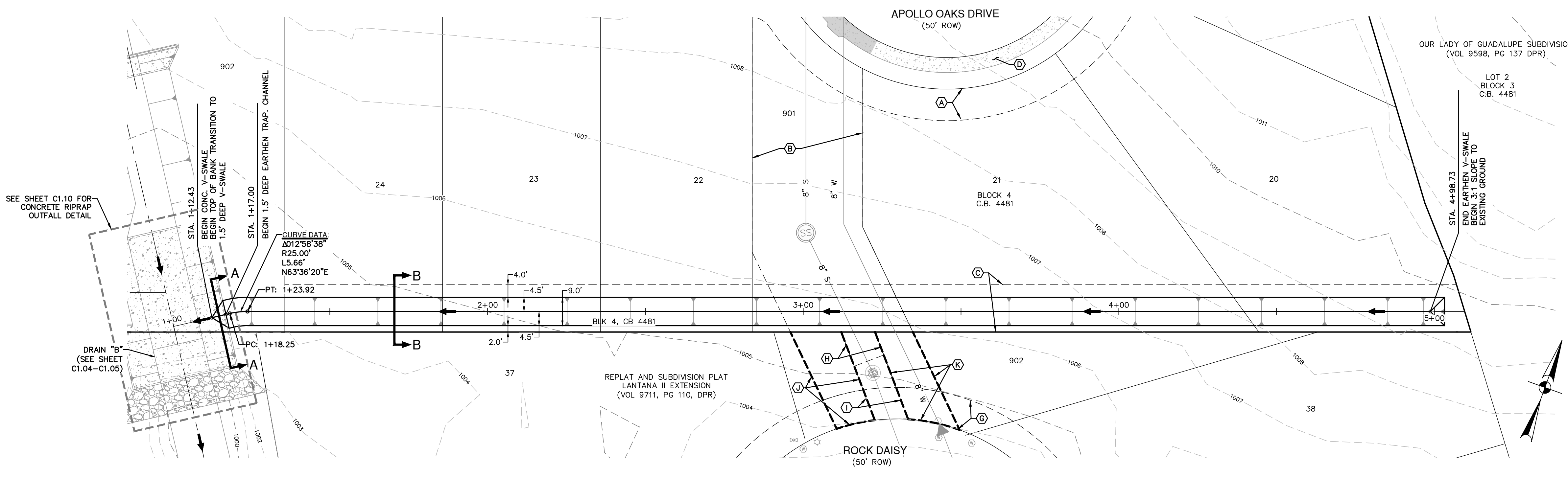
APOLLO OAKS
BEXAR COUNTY, TEXAS
DRAIN "D" ~ STA. 1+00.00 TO END
DRAIN PLAN & PROFILE

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	OCTOBER 2025
DESIGNER	CB
CHECKED	JA DRAWN CB
SHEET	C1.07

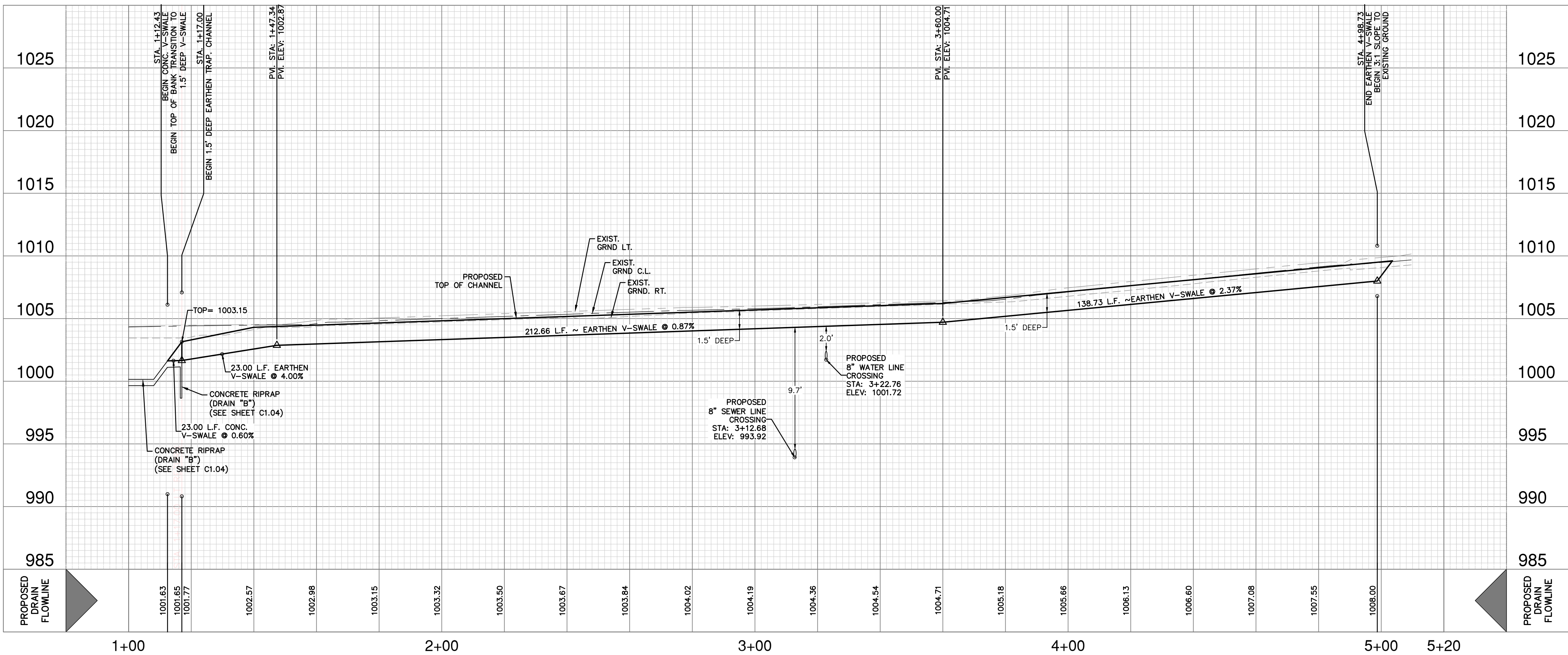
HYDRAULIC CALCULATIONS CONC. V-CHANNEL (SECTION A-A) STA. 1+12.43 TO 1+17.00	HYDRAULIC CALCULATIONS EARTH V-CHANNEL (SECTION B-B) STA. 1+17.00 TO 1+47.34	HYDRAULIC CALCULATIONS EARTH V-CHANNEL (SECTION B-B) STA. 1+47.34 TO 3+60.00	HYDRAULIC CALCULATIONS EARTH V-CHANNEL (SECTION B-B) STA. 3+60.00 TO END
Q25 = 6.48 CFS	Q25 = 6.48 CFS	Q25 = 6.48 CFS	Q25 = 6.48 CFS
Bw = 0'	Bw = 0'	Bw = 0'	Bw = 0'
n = 0.015	n = 0.035	n = 0.035	n = 0.035
S = 0.60%	S = 4.00%	S = 0.87%	S = 2.37%
D = 1.50'	D = 1.50'	D = 1.50'	D = 1.50'
dn = 0.75'	dn = 0.73'	dn = 0.97'	dn = 0.80'
V = 3.84 fps	V = 4.05 fps	V = 2.30 fps	V = 3.38 fps
	$\tau_d = 0.86 \text{ LB/FT}^2$ RC= B,C,D	$\tau_d = 0.25 \text{ LB/FT}^2$ RC= B,C,D	$\tau_d = 0.56 \text{ LB/FT}^2$ RC= B,C,D



- KEY LEGEND:**
- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
 - (B) 35' SANITARY SEWER AND WATER EASEMENT
 - (C) 15' DRAINAGE EASEMENT
 - (D) 4' SIDEWALK
 - (E) 4' DEVELOPER SIDEWALK
 - (F) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT (VOL 9711, PG 110, DPR)
 - (G) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
 - (H) 10' PERMANENT SANITARY SEWER EASEMENT (DOC NO 20250003397)
 - (I) 20'X10' SANITARY SEWER EASEMENT (VOL 9711, PG 110 DPR)
 - (J) VAR WIDTH SANITARY SEWER EASEMENT (OFF-LOT)
 - (K) VAR WIDTH WATER EASEMENT (OFF-LOT)



DRAIN "E" ~ STA. 1+00.00 TO END
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 20'



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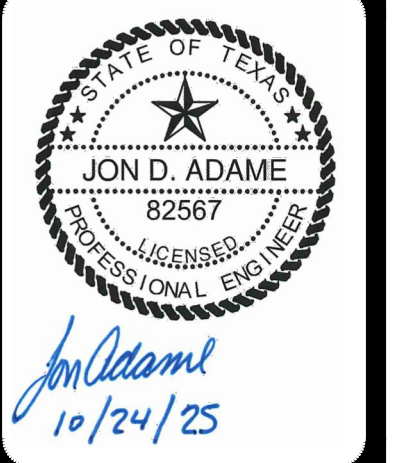
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DATE	
NO.	REVISION

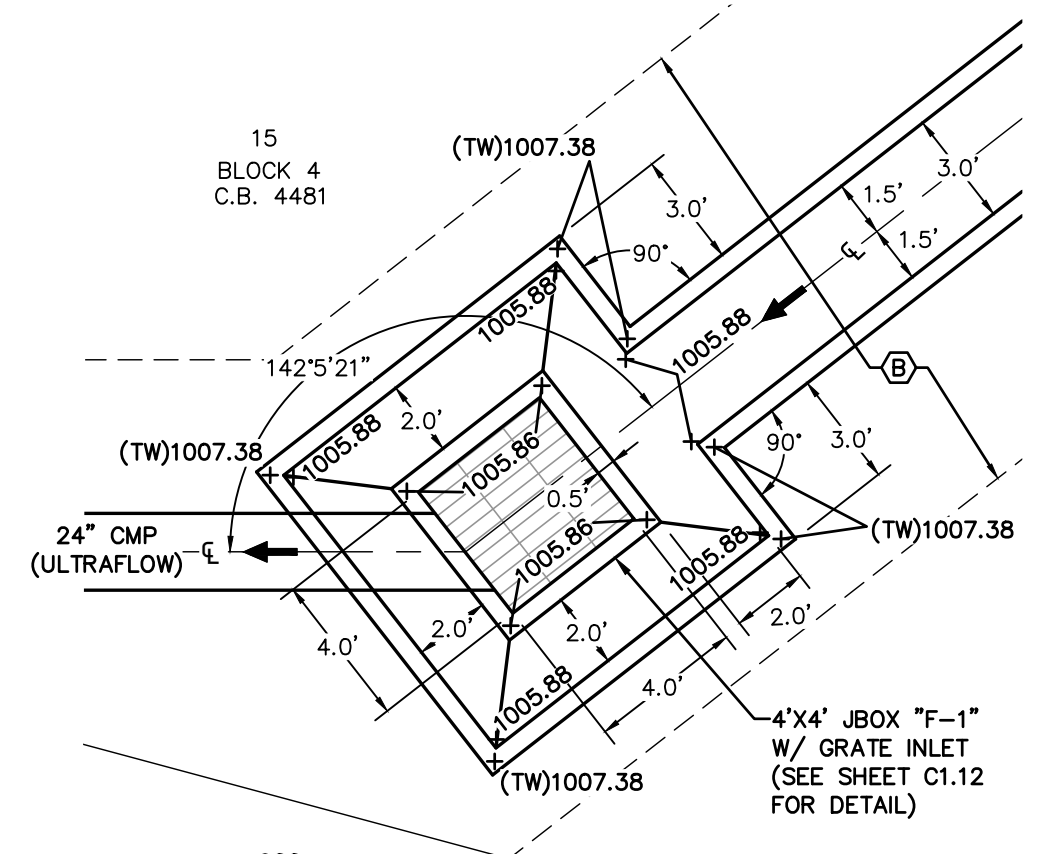


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TEXAS ENGINEERING FIRM #479 | TEXAS SURVEYING FIRM #1008900

APOLLO OAKS
BEXAR COUNTY, TEXAS
DRAIN "E" ~ STA. 1+00.00 TO END
DRAIN PLAN & PROFILE

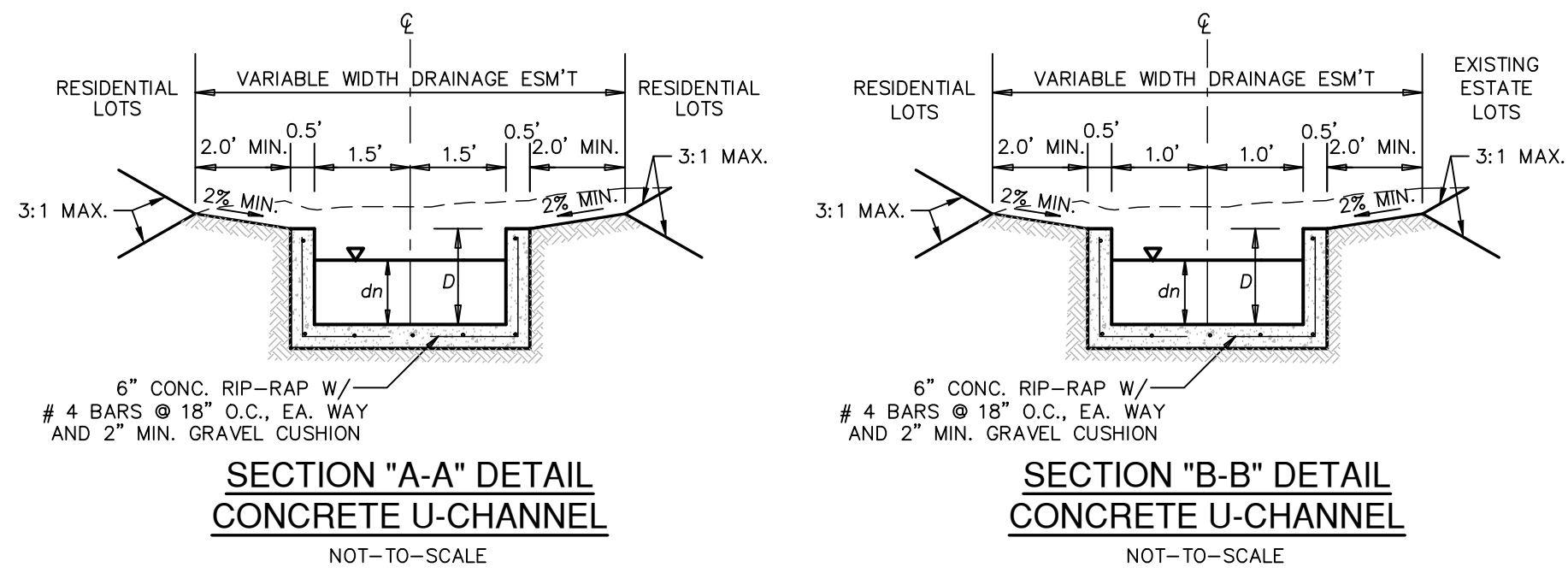
PLAT NO.	CP202506
JOB NO.	13657-00
DATE	OCTOBER 2025
DESIGNER	CB
CHECKED	JA DRAWN CB
SHEET	C1.08

Notes: Oct 24, 2025, 4:27pm User: JD: pape@pape.com
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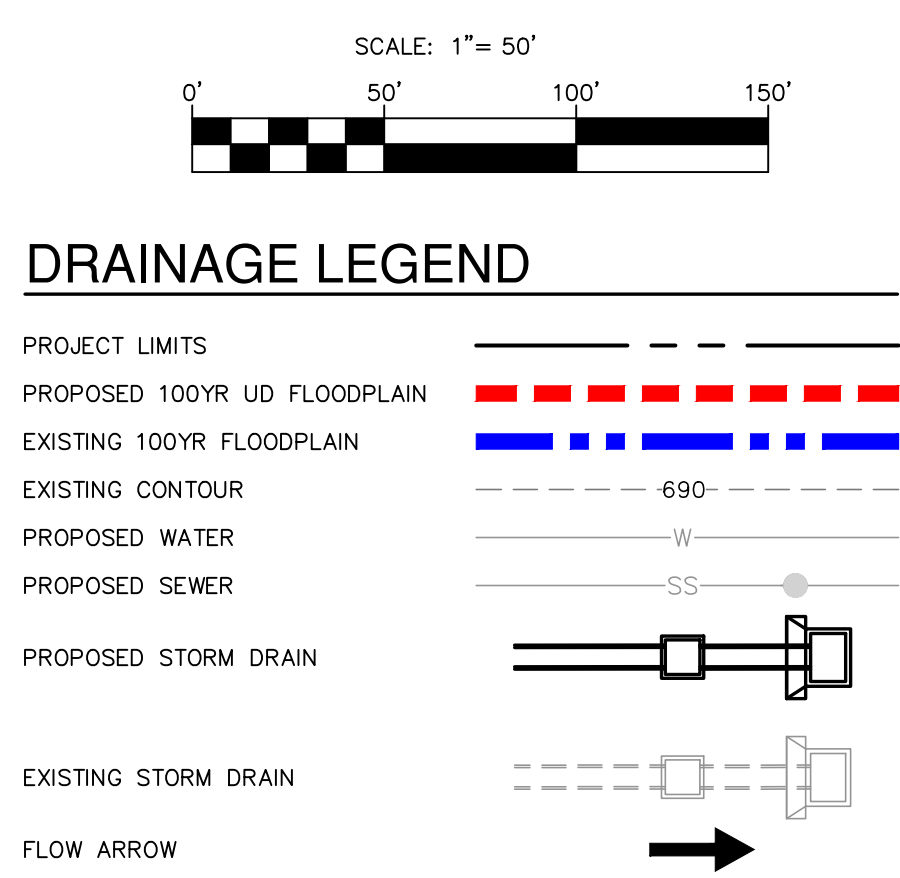
**GRATE INLET RIPRAP
DETAIL (DRAIN "F")**
SCALE: 1"=5'

HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION A-A) STA. 1+94.19 TO 3+28.21	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION B-B) STA. 3+28.21 TO 5+00.00	HYDRAULIC CALCULATIONS CONC. U-CHANNEL (SECTION B-B) STA. 5+00.00 TO END
Q25 = 13.32 CFS	Q25 = 13.32 CFS	Q25 = 13.32 CFS
Bw = 3'	Bw = 2'	Bw = 2'
n = 0.015	n = 0.015	n = 0.015
S = 1.57%	S = 1.37%	S = 2.60%
D = 1.50'	D = 1.50'	D = 1.50'
dn = 0.93'	dn = 0.94'	dn = 0.74'
V = 4.77 fps	V = 7.09 fps	V = 9.00 fps



**SECTION "A-A" DETAIL
CONCRETE U-CHANNEL**
NOT-TO-SCALE

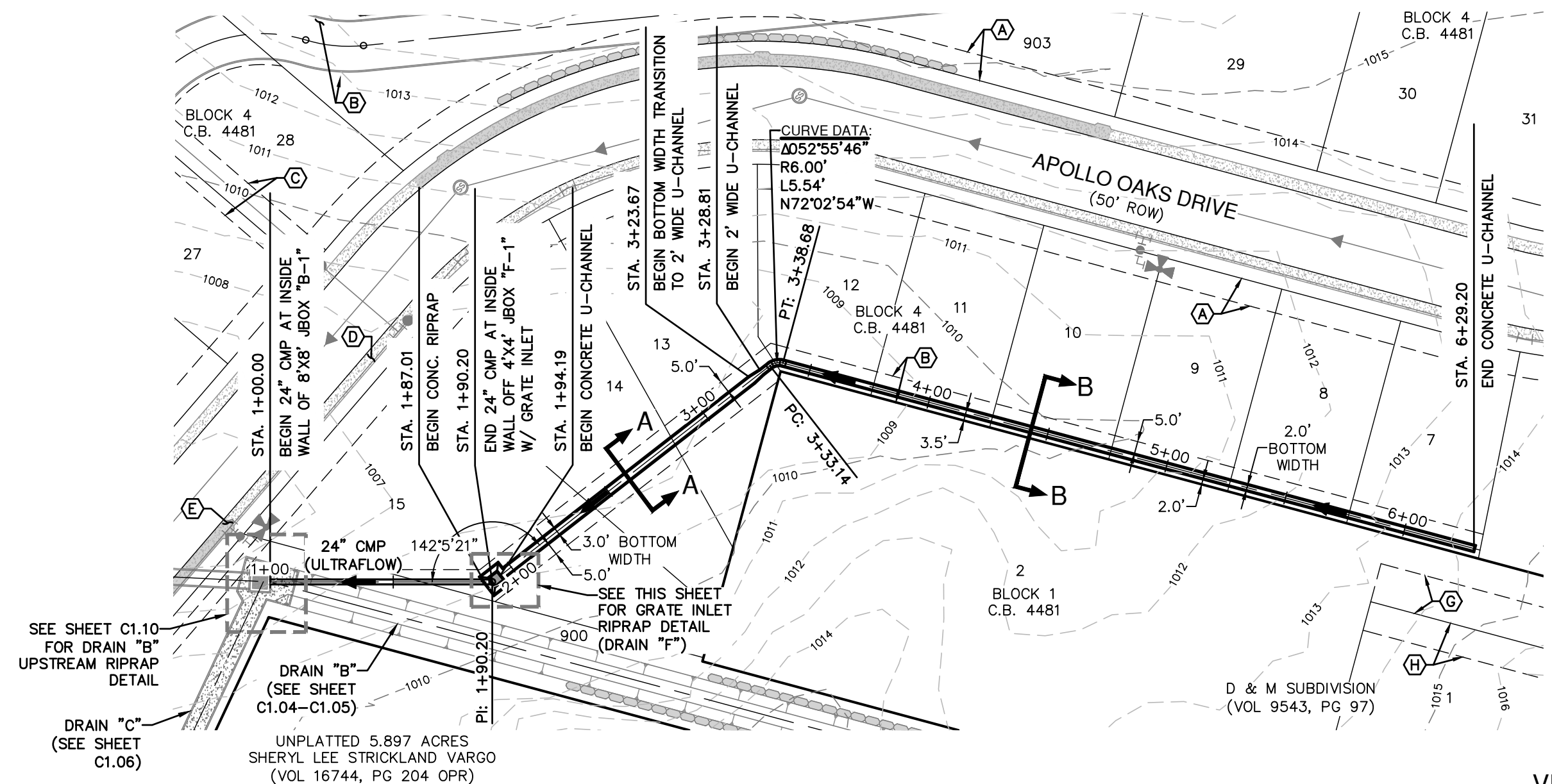
**SECTION "B-B" DETAIL
CONCRETE U-CHANNEL**
NOT-TO-SCALE



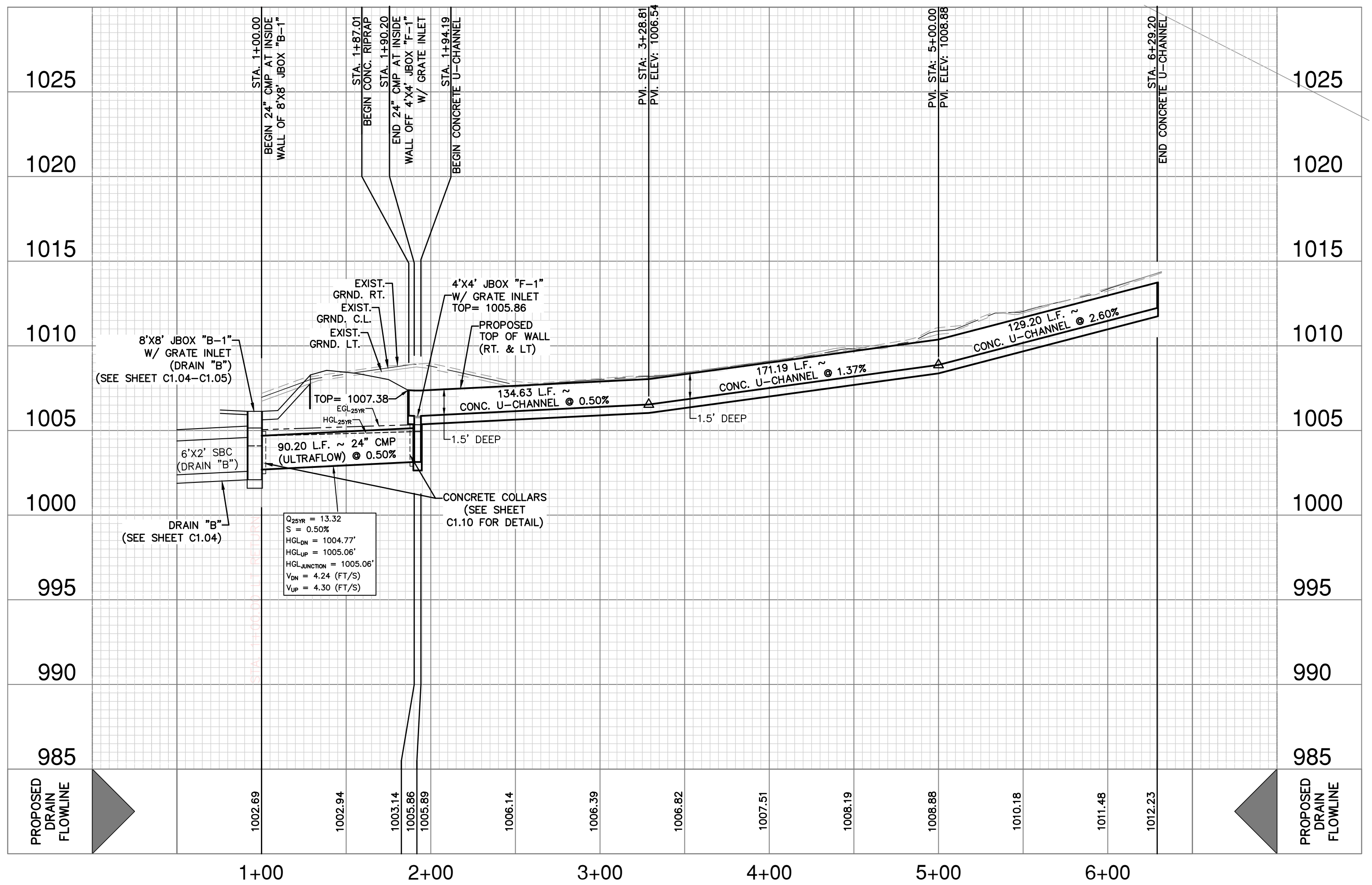
- KEY LEGEND:**
- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
 - (B) VARIABLE WIDTH DRAINAGE EASEMENT
 - (C) 16' WATER EASEMENT
 - (D) 4' SIDEWALK
 - (E) 4' DEVELOPER SIDEWALK
 - (F) 6' DEVELOPER SIDEWALK
 - (G) 16' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
 - (H) 12' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)

**HYDRAULIC CALCULATIONS
GRATE INLET**

Q ₂₅ = 13.32 CFS
Q ₂₅ = 0.5 x c x An x (2 x g x H) ^{1/2}
c = 0.7
An = 0.8 x Ag
USE 4'x4' GRATE INLET
Ag = 16 SF
An = 0.8(16) = 12.8 SF
13.32 = 0.5(0.7)(12.8)[2(32.2)H] ^{1/2}
H = 0.03 FT



DRAIN "F" ~ STA. 1+00.00 TO END
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'



OPEN CHANNEL NOTE:
CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 - "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.10 AND APPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS-SECTIONS.

DRAINAGE CONSTRUCTION NOTES:

- ALL SINGLE BOX CULVERTS (SBC) AND ALL MULTIPLE BOX CULVERTS (MBC) SHALL BE PRECAST. (SEE SHEETS C1.13-C1.14 FOR PRECAST CONSTRUCTION DETAILS.)

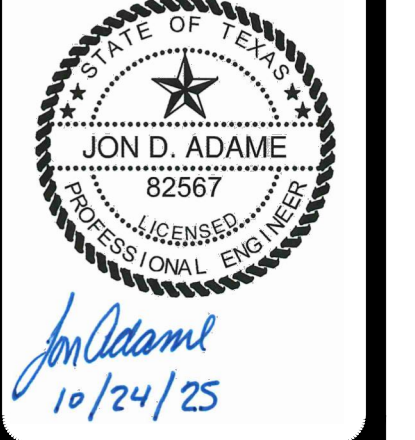
DRAINAGE & GRADING NOTES:

- A BEXAR COUNTY ROW PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY ROW. 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.
- 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.
- ALL CONCRETE FOR TxDOT DRAINAGE STRUCTURES SHALL MEET TxDOT SPECIFICATIONS. ALL OTHER CONCRETE SHALL BE CLASS "A" 3000 PSI CYLINDER STRENGTH IN 28 DAYS.
- REFERENCE DRAINAGE DETAILS FOR PIPE TRENCH DETAILS, BOX CULVERT, HEADWALL, AND WINGWALL CONSTRUCTION DETAILS, AND BOX CULVERT BEDDING AND EXCAVATION LIMITS.
- CONTRACTOR SHALL GROUT ALL CURB INLETS AND JUNCTION BOXES TO PROVIDE FOR POSITIVE DRAINAGE.
- 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.
- CONTRACTOR SHALL MATCH TOP OF CHANNEL TO NATURAL GROUND AND MAINTAIN A MINIMUM CHANNEL DEPTH OF "D" AS SHOWN IN THE PROFILE.

CAUTION!!
CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES 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.

DATE	NO.	REVISION



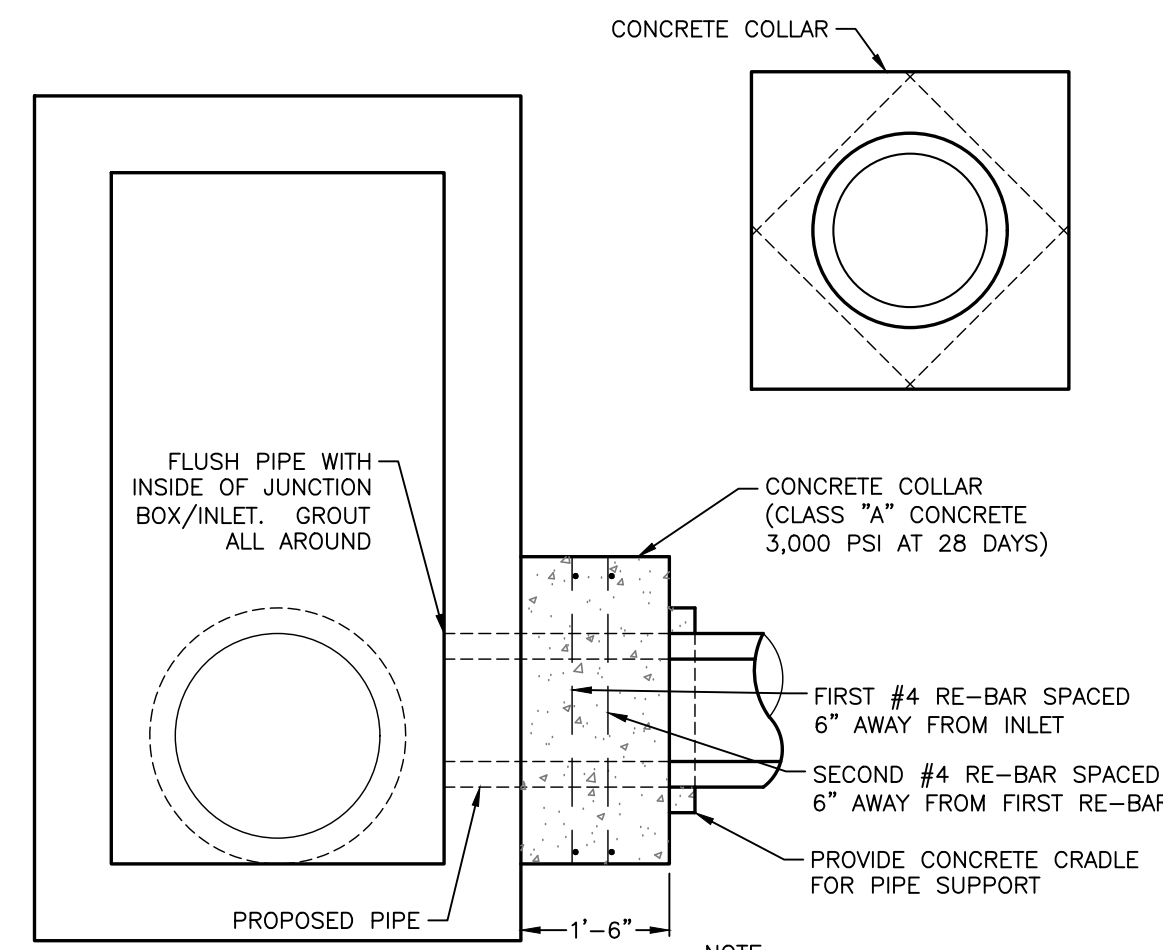
**PAPE-DAWSON
ENGINEERS**
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #479 | TEXAS SURVEYING FIRM #1008800

**APOLLO OAKS
BEXAR COUNTY, TEXAS**
DRAIN "F" ~ STA. 1+00.00 TO END
DRAIN PLAN & PROFILE

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	OCTOBER 2025
DESIGNER	CB
CHECKED	JA DRAWN CB
SHEET	C1.09

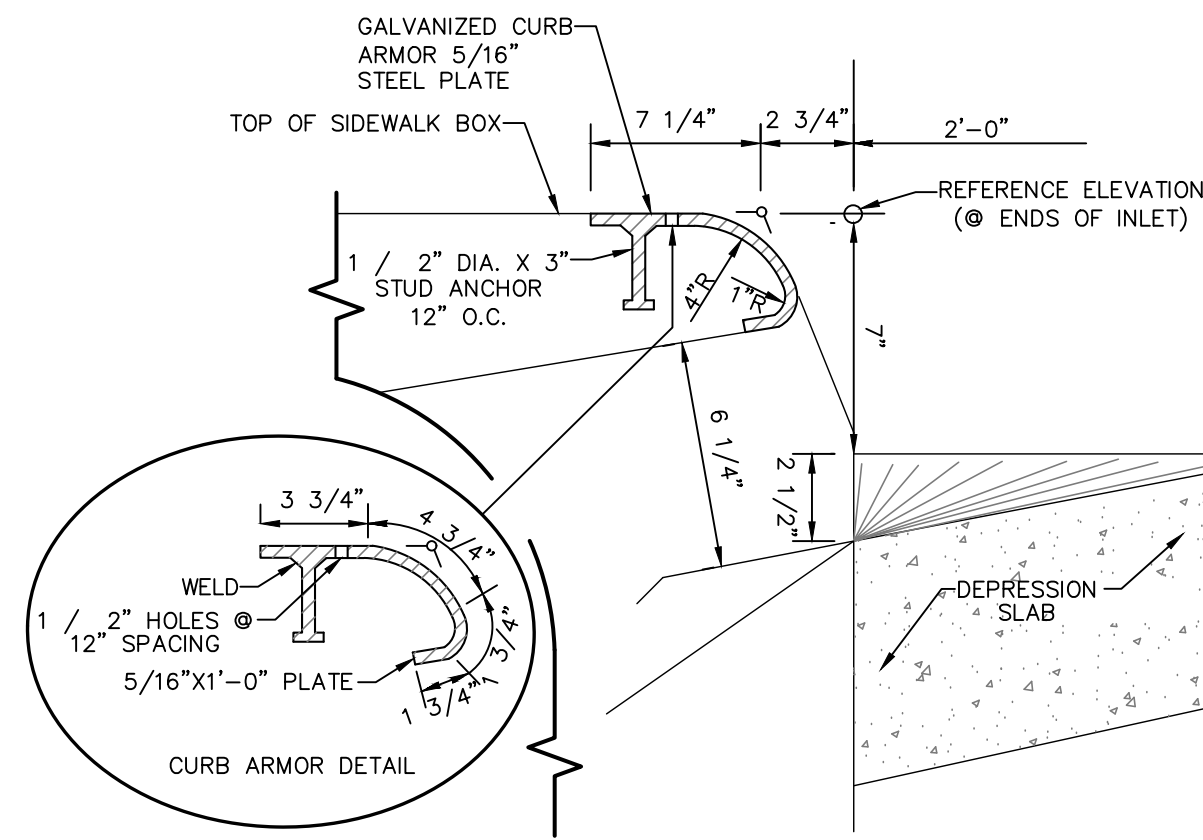
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CONCRETE COLLAR DETAIL

NOT-TO-SCALE

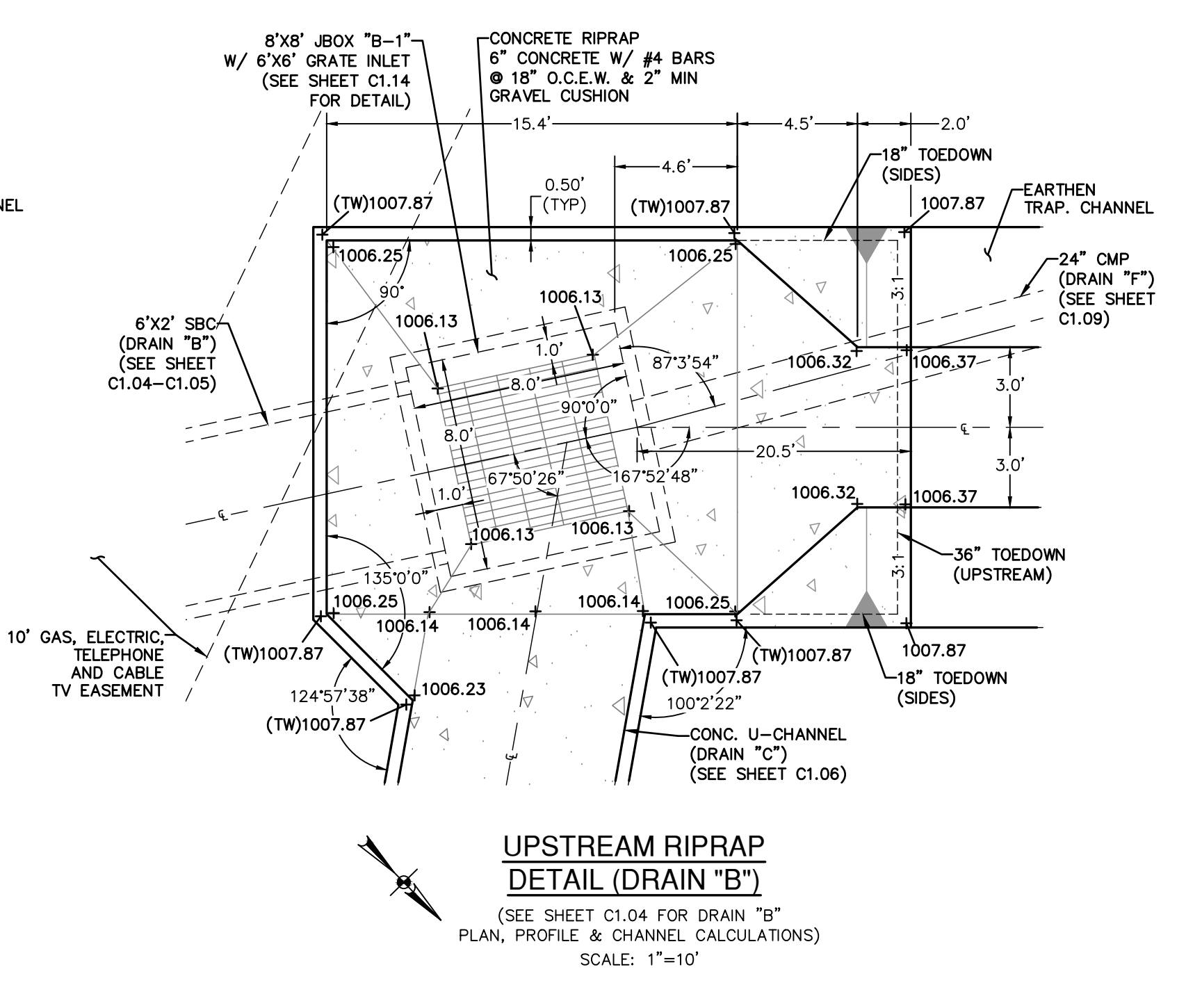
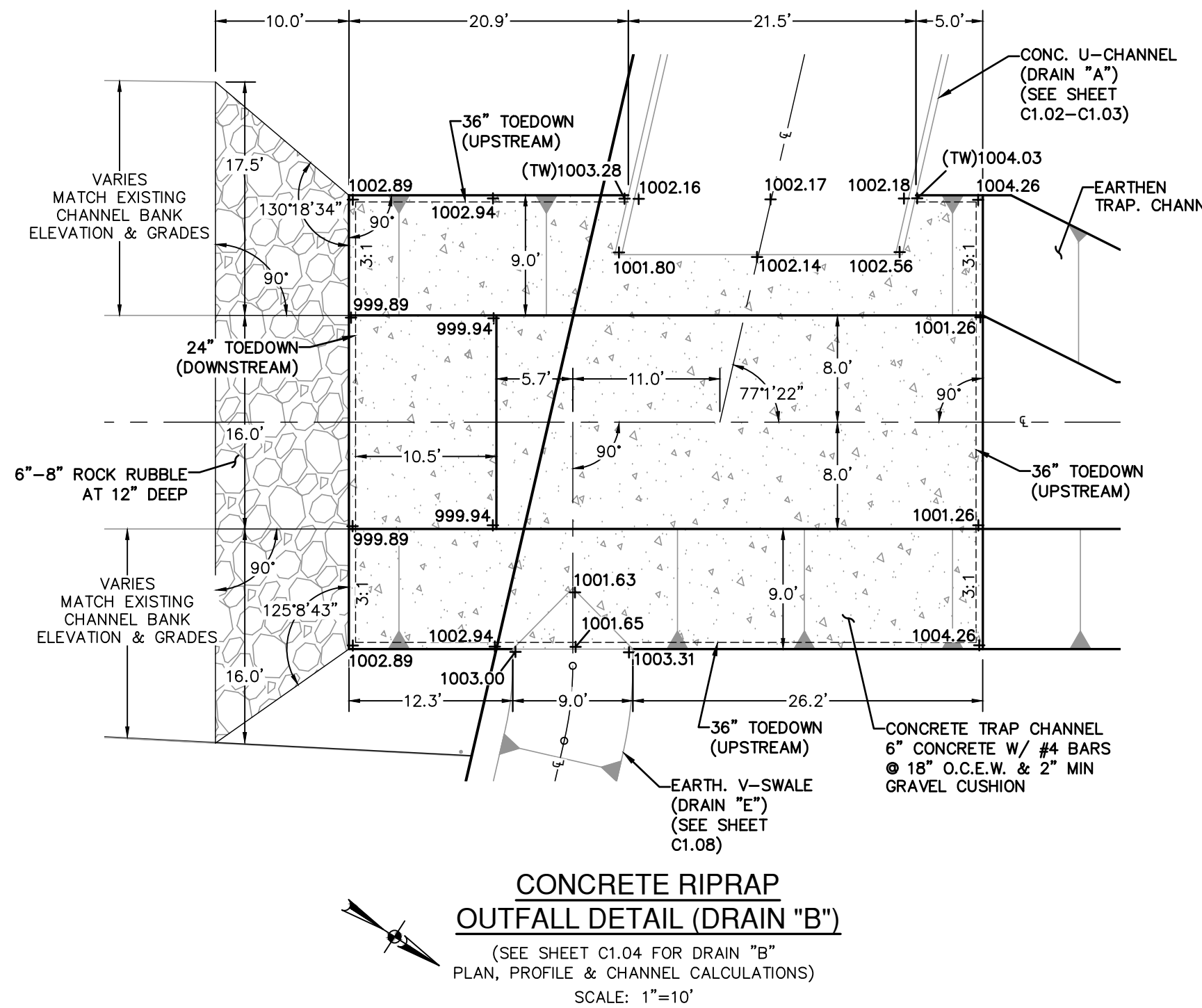
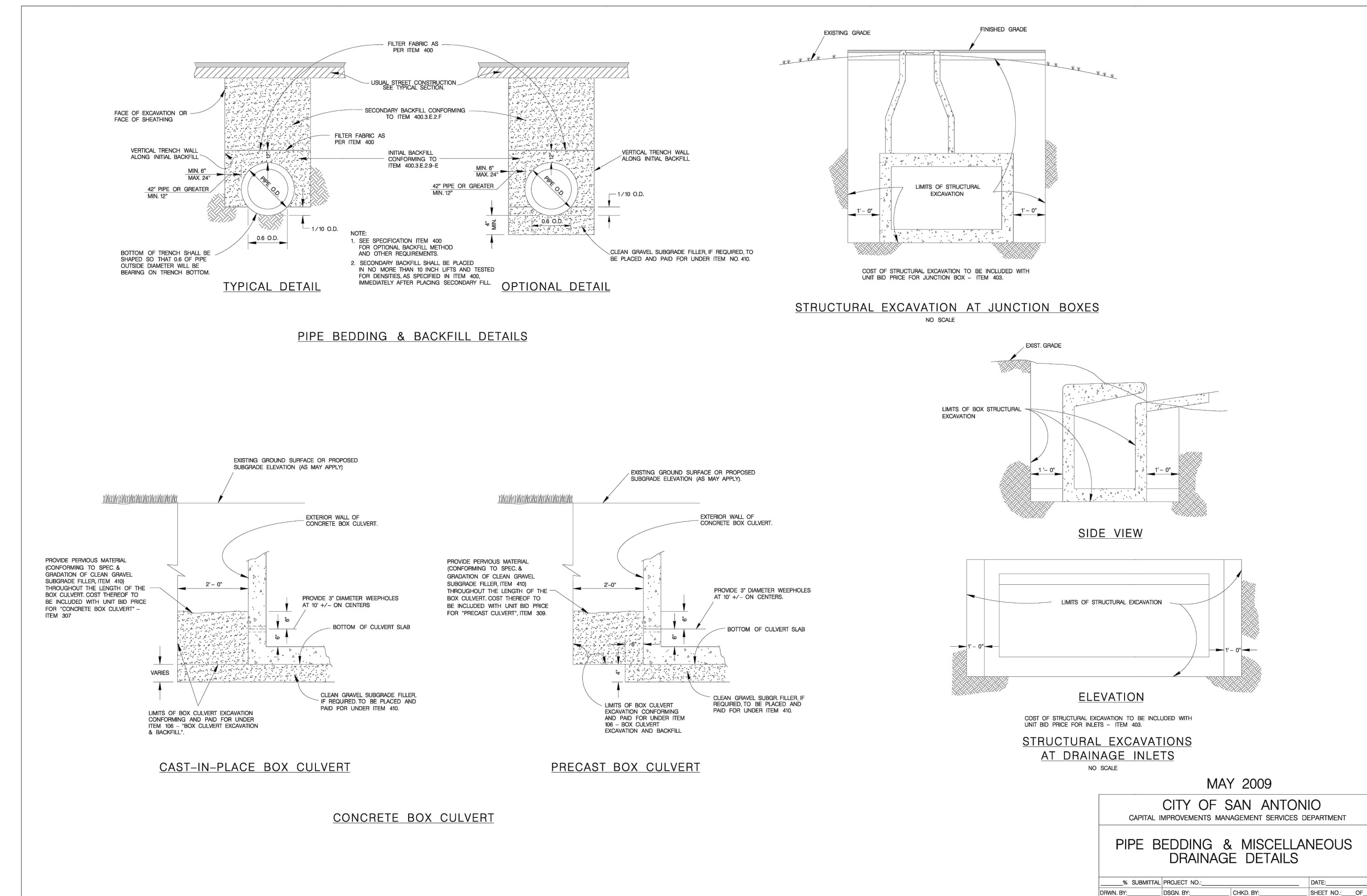


CURB ARMOR DETAIL

NOT-TO-SCALE

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

Retardance Class	Permissible Shear Stress (t) (lbs./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 480mm)
		Alfalfa	Good stand, uncut (Average 11 in. or 280mm)
		Blue gamma	Good stand, uncut (Average 11 in. or 280mm)
C	1.1	Crabgrass	Fair stand, uncut (10-to-48 in. or 55-to-1220 mm)
		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 rectop, 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)
D	0.6	Kentucky bluegrass	Good stand, headed (6-12 in. or 150-305 mm)
		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)
E	0.35	Lespedeza sericea	After cutting to 2 in. or 50 mm (very good before cutting)
		Bermuda grass	Good stand, cut to 1.5 in. or 40 mm
		Bermuda grass	Burned Stubble
		2.5	Rbck D50 = 6 in. or 150 mm
		5.0	Rbck D50 = 12 in. or 300 mm
2.5	Type III Curlex Soil Retention Blanket		



DATE: _____

NO. REVISION: _____

STATE OF TEXAS
 JON D. ADAME
 82567
 PROFESSIONAL ENGINEER
Jon Adame
 10/24/25

PAPE-DAWSON ENGINEERS

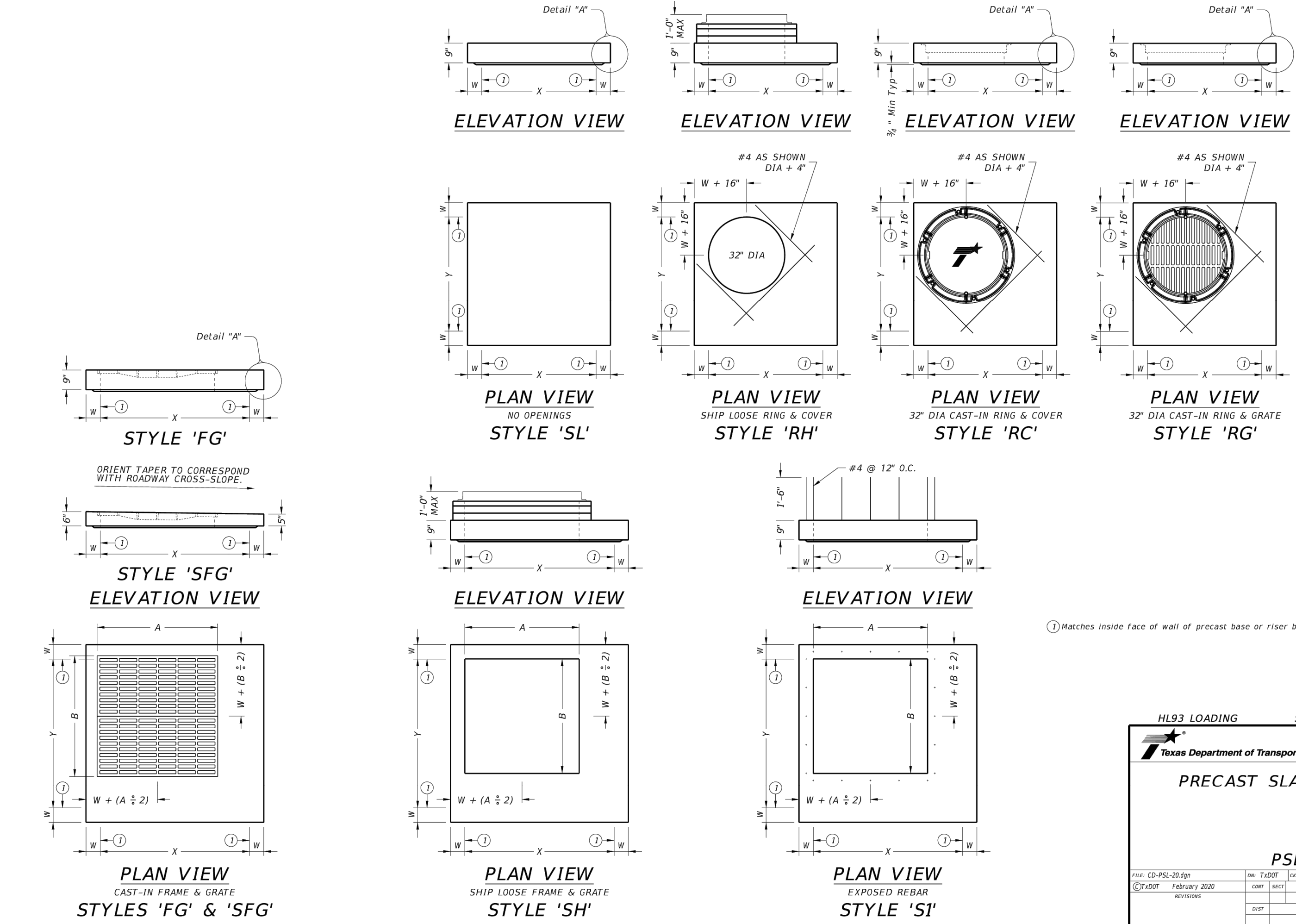
2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #479 | TEXAS SURVEYING FIRM #10028800

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 DRAIN DETAILS

PLAT NO. CP202506
 JOB NO. 13657-00
 DATE OCTOBER 2025
 DESIGNER -
 CHECKED - DRAWN -
 SHEET C1.10

Note: Oct 24, 2025, 4:27pm User: jda-ace/efig/ncz
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HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
 Bridge Division
PRECAST SLAB LID

PSL

Rev.	CD-PSL-20.0g	Rev.	CD-PSL-20.0g	Rev.	CD-PSL-20.0g	Rev.	CD-PSL-20.0g
DATE	FEBRUARY 2020	DATE	FEBRUARY 2020	DATE	FEBRUARY 2020	DATE	FEBRUARY 2020
BY		BY		BY		BY	
CHECKED		CHECKED		CHECKED		CHECKED	
DESIGN		DESIGN		DESIGN		DESIGN	
COUNTY		COUNTY		COUNTY		COUNTY	
SHEET NO.		SHEET NO.		SHEET NO.		SHEET NO.	

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 DATE: _____
 TITLE: _____

Size	MAX DEPTH = 15 ft. to top of BASE SLAB												MAX DEPTH = 25 ft. to top of BASE SLAB													
	Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)						Base Slab			Base Unit or Riser Walls			Below Grade Slab (w/PJB) Reducing Slab (w/PB)							
X x Y	Short Span Rebar Area	Long Span Rebar Area	Thickness	Short Span Rebar Area	Long Span Rebar Area	Thickness	RWS x RWL or ID	Dshort	Dlong	TS	Short Span Rebar Area	Long Span Rebar Area	Thickness	Short Span Rebar Area	Long Span Rebar Area	Thickness	RWS x RWL or ID	Dshort	Dlong	TS	Min Height (See Note 3)	Max HOLE DIA (See Note 2)	Max V.D. DIA (See Note 2)			
Precast Junction Box (PJB)																										
3x3	0.23	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	3.5	36	36
4x4	0.29	0.29	6	0.24	0.24	6	N/A	0.41	0.41	9	0.47	0.47	6	0.38	0.38	6	N/A	0.41	0.41	9	4.5	48	48			
3x5	0.29	0.18	6	0.19	0.35	6	N/A	0.48	0.48	9	0.39	0.18	6	0.23	0.59	6	N/A	0.48	0.48	9	3.5	36/60	36/60			
4x5	0.36	0.18	6	0.22	0.34	6	N/A	0.42	0.42	9	0.53	0.26	6	0.39	0.59	6	N/A	0.42	0.42	9	4.5	48/60	48/60			
5x5	0.36	0.36	6	0.34	0.34	6	N/A	0.43	0.43	9	0.62	0.62	6	0.59	0.59	6	N/A	0.43	0.43	9	5.5	60	60			
5x6	0.27	0.27	9	0.34	0.45	6	N/A	0.48	0.48	9	0.47	0.45	9	0.38	0.54	8	N/A	0.48	0.48	9	5.5	60/72	60/72			
6x6	0.27	0.27	9	0.45	0.45	6	N/A	0.56	0.56	9	0.52	0.52	9	0.54	0.54	8	N/A	0.56	0.56	9	6.5	72	72			
8x8	0.46	0.46	9	0.51	0.51	8	N/A	0.45	0.45	12	0.87	0.87	9	0.59	0.59	10	N/A	0.45	0.45	12	8.5	96	72			
Precast Base (PB)																										
3x3	0.23	0.23	6	0.19	0.19	6	N/A	N/A	N/A	N/A	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	3.5	36	36			
4x4	0.29	0.29	6	0.24	0.24	6	N/A	N/A	N/A	N/A	0.47	0.47	6	0.38	0.38	6	N/A	N/A	N/A	N/A	4.5	48	48			
3x5	0.29	0.18	6	0.19	0.35	6	3x3	0.30	0.34	9	0.39	0.18	6	0.23	0.59	6	3x3	0.40	0.40	9	3.5	36/60	36/60			
4x5	0.36	0.18	6	0.22	0.34	6	3x3	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	3x3	0.46	0.37	9	4.5	48/60	48/60			
4x5	0.36	0.18	6	0.22	0.34	6	4x4	0.30	0.30	9	0.53	0.26	6	0.39	0.59	6	4x4	0.39	0.39	9	4.5	48/60	48/60			
4x5	0.36	0.18	6	0.22	0.34	6	48"	0.39	0.39	9	0.53	0.26	6	0.39	0.59	6	48"	0.47	0.47	9	4.5	48/60	48/60			
4x5	0.36	0.18	6	0.22	0.34	6	3x5	0.33	0.40	9	0.53	0.26	6	0.39	0.59	6	3x5	0.48	0.48	9	4.5	48/60	48/60			
5x5	0.36	0.36	6	0.34	0.34	6	3x3	0.34	0.34	9	0.62	0.62	6	0.59	0.59	6	3x3	0.53	0.53	9	5.5	60	60			
5x5	0.36	0.36	6	0.34	0.34	6	4x4	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	4x4	0.64	0.64	9	5.5	60	60			
5x5	0.36	0.36	6	0.34	0.34	6	48"	0.36	0.36	9	0.62	0.62	6	0.59	0.59	6	48"	0.64	0.64	9	5.5	60	60			
5x5	0.36	0.36	6	0.34	0.34	6	3x5	0.34	0.40	9	0.62	0.62	6	0.59	0.59	6	3x5	0.53	0.53	9	5.5	60	60			
5x6	0.31	0.31	9	0.34	0.45	6	3x3	0.34	0.34	9	0.47	0.45	9	0.38	0.54	8	3x3	0.61	0.50	9	5.5	60/72	60/72			
5x6	0.27	0.27	9	0.34	0.45	6	4x4	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	4x4	0.74	0.57	9	5.5	60/72	60/72			
5x6	0.29	0.29	9	0.34	0.45	6	48"	0.36	0.45	9	0.47	0.45	9	0.38	0.54	8	48"	0.74	0.57	9	5.5	60/72	60/72			
5x6	0.29	0.29	9	0.34	0.45	6	3x5	0.45	0.45	9	0.47	0.45	9	0.38	0.54	8	3x5	0.61	0.61	9	5.5	60/72	60/72			
6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	4x4	0.87	0.87	9	6.5	72	72			
6x6	0.29	0.29	9	0.45	0.45	6	48"	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	48"	0.87	0.87	9	6.5	72	72			
6x6	0.29	0.29	9	0.45	0.45	6	3x5	0.45	0.45	9	0.52	0.52	9	0.54	0.54	8	3x5	0.87	0.87	9	6.5	72	72			
8x8	0.52	0.52	9	0.51	0.51	8	3x3	0.61	0.61	12	0.91	0.91	9	0.70	0.70	10	3x3	0.85	0.85	12	8.5	96	72			
8x8	0.52	0.52	9	0.51	0.51	8	4x4	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	4x4	1.01	1.01	12	8.5	96	72			
8x8	0.52	0.52	9	0.51	0.51	8	48"	0.70	0.70	12	0.87	0.87	9	0.70	0.70	10	48"	1.01	1.01	12	8.5	96	72			
8x8	0.52	0.52	9	0.51	0.51	8	3x5	0.70	0.85	12	0.87	0.87	9	0.70	0.70	10	3x5	1.01	1.01	12	8.5	96	72			

** unless otherwise indicated.

- FABRICATION NOTES:**
- Maximum spacing of reinforcement is 8".
 - At manufacturer's option, provide cast or cored holes or thin wall panels (KO) to the maximum diameter shown for each. When no penetration is required, it is acceptable to provide a wall with no sectional reduction.
- GENERAL NOTES:**
- Precast junction box consists of base slab, base unit, risers (as required), and below grade slab. See sheet PJB for details.
 - Precast base consists of base slab, base unit, risers (as required), reducing slab (as required), and reduced risers (as required). See sheet PB for details.
 - Min Height shown is for stock base units. Use stock base units whenever practical. Smaller height base units can be used in special installation circumstances, when noted elsewhere in the plans. Absolute minimum height of base units is 2'-0".

HL93 LOADING

Texas Department of Transportation
 Bridge Division
DESIGN DATA FOR PRECAST BASE AND JUNCTION BOX

PDD

Rev.	CD-PDD-20.0g	Rev.	CD-PDD-20.0g	Rev.	CD-PDD-20.0g	Rev.	CD-PDD-20.0g
DATE	FEBRUARY 2020	DATE	FEBRUARY 2020	DATE	FEBRUARY 2020	DATE	FEBRUARY 2020
BY		BY		BY		BY	
CHECKED		CHECKED		CHECKED		CHECKED	
DESIGN		DESIGN		DESIGN		DESIGN	
COUNTY		COUNTY		COUNTY		COUNTY	
SHEET NO.		SHEET NO.		SHEET NO.		SHEET NO.	

DATE: _____

NO. REVISION: _____

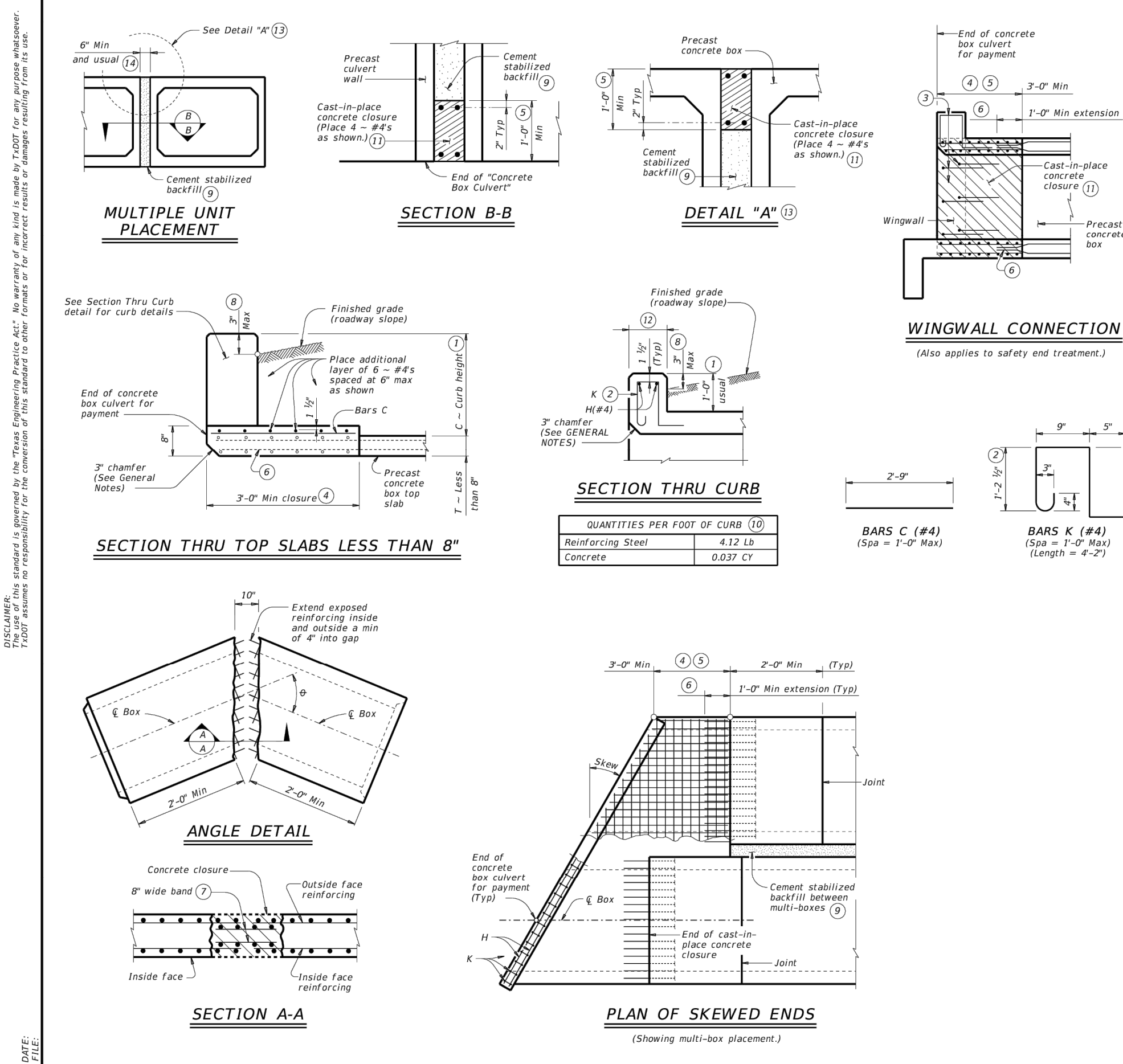
Jon Adame
10/24/25

PAPE-DAWSON ENGINEERS

2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #479 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 DRAIN DETAILS

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	OCTOBER 2025
DESIGNER	-
CHECKED	-
DRAWN	-
SHEET	C1.12



1) 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0", refer to 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.

2) For curbs less than 1'-0" high, 1/2" Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.

3) Extend curb, wingwall, or safety end treatment reinforcing into concrete closure. Bend or trim, as necessary, any reinforcing that does not fit into closure area.

4) Provide a 3'-0" Min cast-in-place concrete closure. Break back boxes in the field or cast box short. Provide bands of reinforcing in the closure that are the same size and spacing as in the precast box section. Provide #4 longitudinal reinforcement spaced at 12 inches Max within the closure. Except where shown otherwise, construct the cast-in-place closure flush with the inside and outside faces of the precast box section.

5) For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 2'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.

6) Extend precast box reinforcing a minimum of 1'-0" into concrete closure (TYP).

7) Place bands of reinforcing matching the inside and outside face reinforcing in the gaps of the top and bottom slabs. Place a band matching the outside face reinforcing of the wall in the gaps of the walls placed in the outside face only. Tack weld the bands to the exposed reinforcing at each point of contact.

8) 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.

9) Cement stabilized backfill between boxes is considered part of the box culvert for payment.

10) All curb concrete and reinforcing is considered part of the box culvert for payment.

11) Any additional concrete and reinforcing required for the closures will be considered subsidiary to the box culvert for payment.

12) 1'-0" typical 2'-0" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.

13) For multiple unit placement with overlap, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide ASTM A108A welded wire reinforcement.
 Provide Class C concrete (f_c = 3600 psi) for the closures.
 Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill" for Structures.
 Any additional concrete required for the closures will be considered subsidiary to the box culvert.

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications. Refer to the Single Box Culverts Precast (SCP) standard sheets for details and notes not shown.
 Chamfer the bottom edge of the top slab closure 3 inches at culvert closure ends.

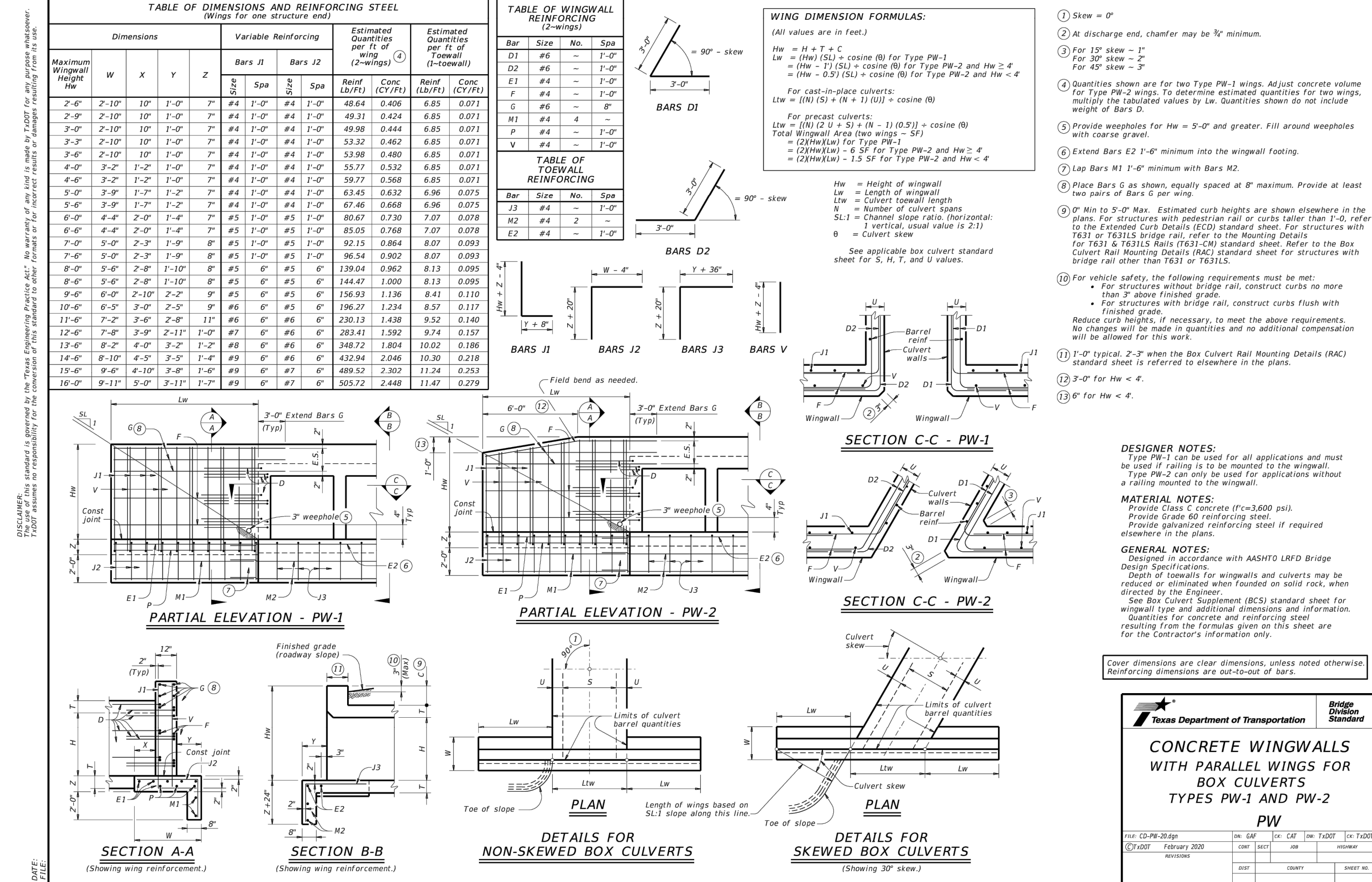
Cover dimensions are clear dimensions, unless noted otherwise. Reinforcing bar dimensions are out-to-out of bars.

HL93 LOADING

Texas Department of Transportation
 Bridge Division
BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

REV	DATE	BY	CHK	DESCRIPTION
1	02/20/20	MS	MS	ISSUED FOR CONSTRUCTION



Texas Department of Transportation
 Bridge Division
CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

REV	DATE	BY	CHK	DESCRIPTION
1	02/20/20	MS	MS	ISSUED FOR CONSTRUCTION

TABLE OF ESTIMATED CURB QUANTITIES

Curb Height "C"	Conc (CY/Ft)	Rein Steel (Lb/Ft)
1'-0"	0.037	10.4
1'-6"	0.056	14.5
2'-0"	0.074	18.6
2'-6"	0.093	18.0
3'-0"	0.111	19.0
3'-6"	0.130	21.3
4'-0"	0.148	22.4
4'-6"	0.167	24.8
5'-0"	0.185	25.9

CONSTRUCTION NOTES:
 Adjust reinforcing steel as necessary to provide 1 1/2" cover. For vehicle safety, top of the curb must not project more than 3" above the finished grade.

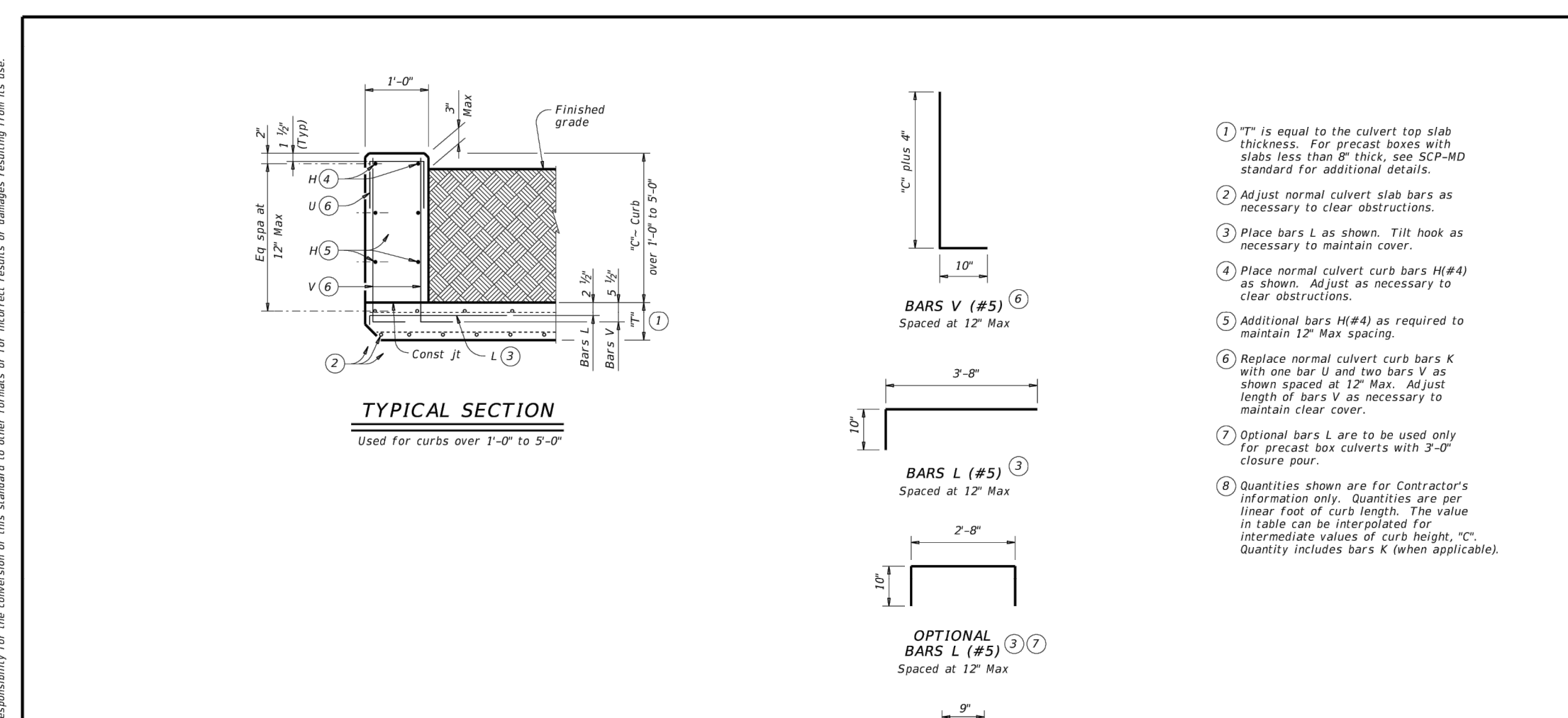
MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 Provide Class "C" concrete (f_c = 3600 psi) minimum for curbs.
 Provide bar laps, where required, as follows:
 • Uncoated or galvanized - #4 = 1'-8" Min
 • Galvanized - #4 = 1'-8" Min

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications.
 These extended curb details have sufficient strength to allow for future retrofit of Type T631 or T631LS railing. These details are suitable for use with P811, P822 and P83 type rails. These details are not suitable for the mounting of other rail types. For new construction using T631 or T631LS railing, use the T631-CM standard.
 This Curb is considered as part of the Box Culvert for payment.
 Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are out-to-out of bar.

Texas Department of Transportation
 Bridge Division
EXTENDED CURB DETAILS FOR BOX CULVERTS WITH CURBS OVER 1'-0" TO 5'-0" TALL

ECD

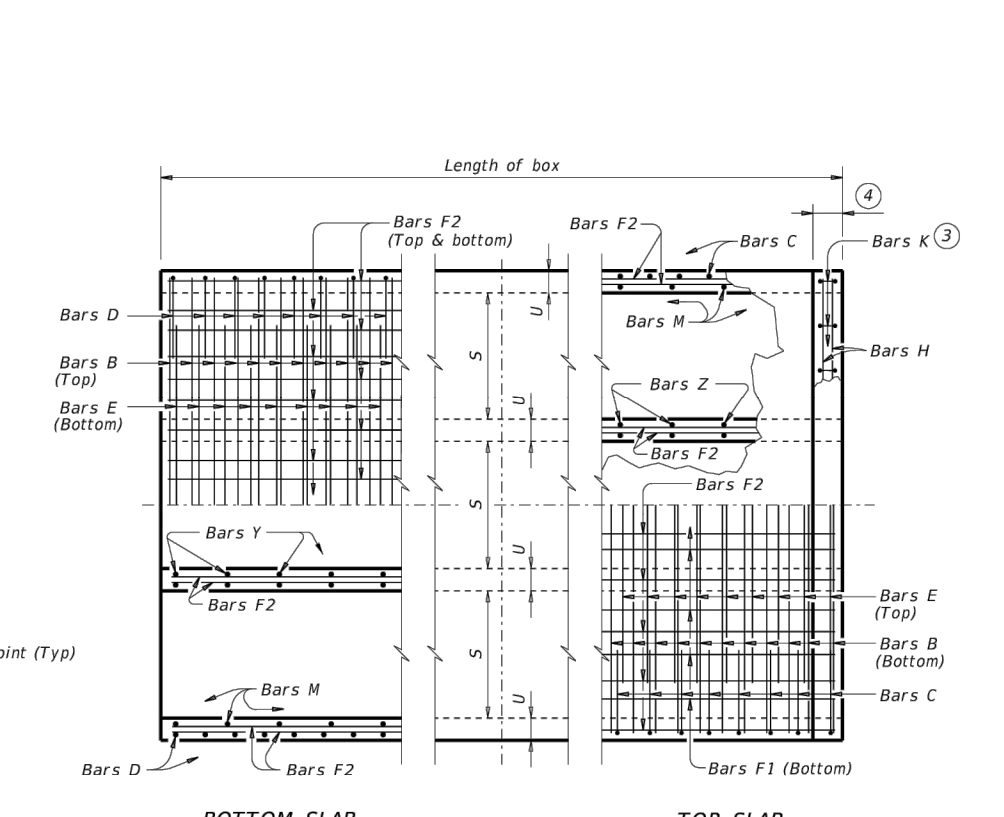
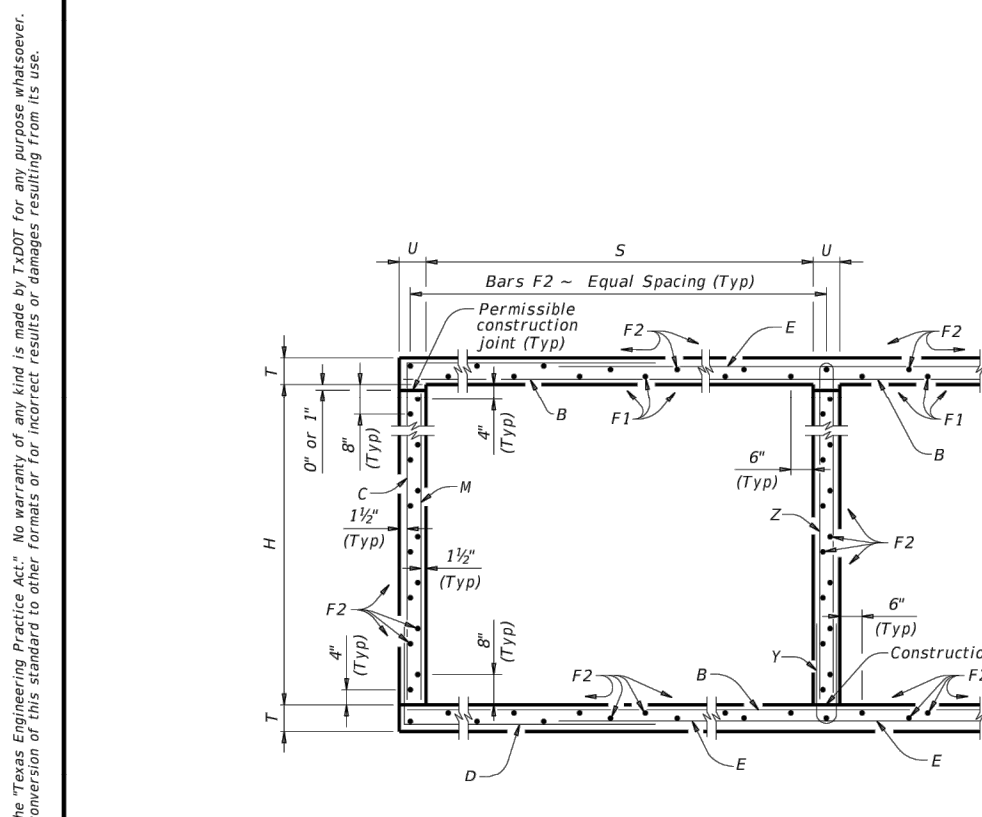
REV	DATE	BY	CHK	DESCRIPTION
1	02/20/20	MS	MS	ISSUED FOR CONSTRUCTION



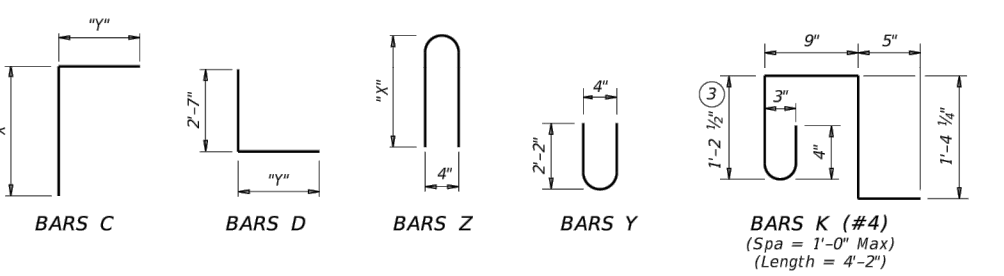
STATE OF TEXAS
 JON D. ADAMS
 82567
 PROFESSIONAL ENGINEER
 J. Adams
 10/24/25

PAPE-DAWSON ENGINEERS
 2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008900

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 DRAIN DETAILS



H	"K"	"Y"
2'-0"	2'-6 1/2"	3'-0 1/2"
3'-0"	3'-6 1/2"	3'-6 1/2"
4'-0"	4'-6 1/2"	3'-6 1/2"
5'-0"	5'-6 1/2"	3'-6 1/2"



- 1" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 7'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with 7'-0" or 7'-6" high curbs, refer to the Reinforcing Details for T631 & T631S rails (T631-CD) standard sheet. Refer to the Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631S.
- 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.
- For curbs less than 1'-0" high, 1# Bars K or reduce bar height as necessary to maintain cover. For curbs less than 2" high, Bars C and D may be reversed, and Bars Y and Z may be reversed.
- 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

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

Example conversion: Replacing Bars B or D with #4 WWR
 Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.375 sq. in. per ft.
 If 2005 wire is used to meet the 0.375 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.375 sq. in. per ft.) x (12 in. per ft.) = 4.80" Max spacing. Required bar length for the provided D306 wire is 2'-3" (the minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

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

MATERIAL NOTES:
 Provide Grade 60 reinforcing steel.
 Provide galvanized reinforcing steel if required elsewhere in the plans.
 Provide Class C concrete (f'c = 3,600 psi) for culverts barrel and curb, and the following exceptions, provide Class S concrete (f'c = 4,000 psi) for top slabs or:
 • culverts with overlay;
 • culverts with 1-in. concrete surface treatment, or
 • culverts with the top slab as the final riding surface.
 Provide 2" max. aggregate, unless otherwise specified.
 • Uncoated or galvanized - #4 = 1'-8" Min
 • Uncoated or galvanized - #6 = 2'-6" Min

GENERAL NOTES:
 Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
 See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-ND) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.
 Cover dimensions are clear dimensions, unless noted otherwise.
 Reinforcing bar dimensions shown are cut-to-end-of-bar.

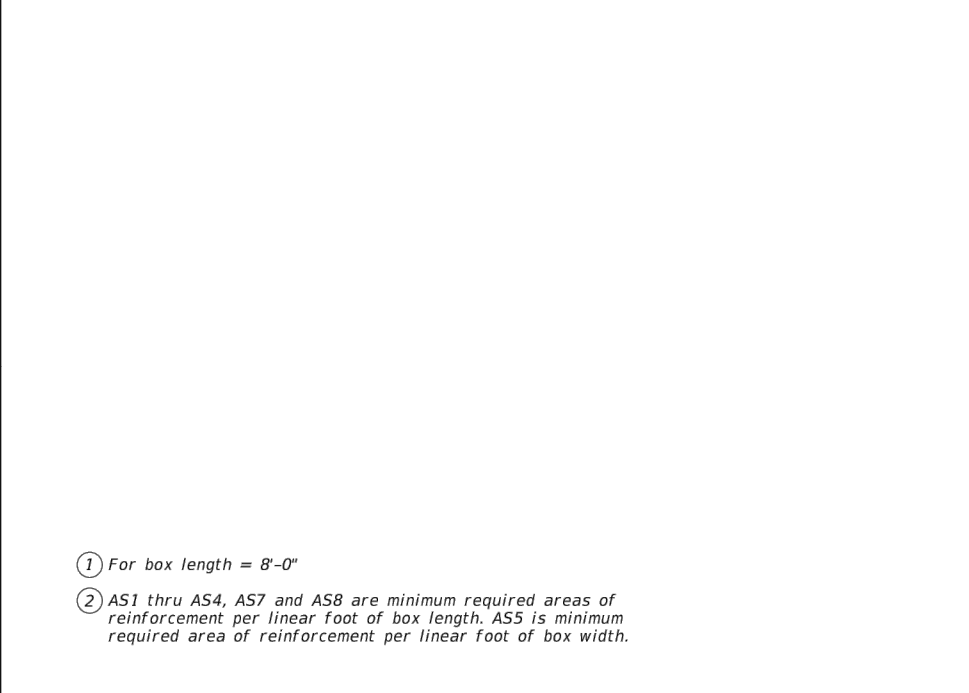
HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation
 Bridge Division Standard

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

MAX CD-SCPS-20slaps
 (2) FDOT February 2006
 REV: 2010
 SHEET NO. 1001880

SECTION DIMENSIONS	Fill Height (ft.)	M (ft.)	REINFORCING (sq. in. / ft.) ⁽²⁾								Lift (ft.)
			AS1	AS2	AS3	AS4	AS5	AS7	AS8		
5 2 8 7 6 < 2	< 2	< 2	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.8	
5 2 6 6 6 < 3	4.4	2.22	0.20	0.16	0.14	-	-	-	-	5.1	
5 2 6 6 6 < 3	5.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	6.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	7.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	8.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	9.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	10.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	11.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	12.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	13.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	14.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	15.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	16.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	17.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	18.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	19.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 2 6 6 6 < 3	20.4	2.16	0.14	0.14	0.14	0.14	-	-	-	5.1	
5 4 8 7 6 < 2	< 2	< 2	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2	
5 4 6 6 6 < 2	4.3	4.3	0.16	0.27	0.22	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	5.3	4.3	0.14	0.19	0.18	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	6.3	4.3	0.14	0.18	0.18	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	7.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	8.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	9.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	10.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	11.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	12.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	13.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	14.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	15.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	16.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	17.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	18.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	19.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 4 6 6 6 < 2	20.3	4.3	0.14	0.23	0.24	0.14	-	-	-	6.3	
5 5 8 7 6 < 2	< 2	< 2	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8	
5 5 6 6 6 < 2	4.3	4.3	0.14	0.20	0.22	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	5.3	4.3	0.14	0.21	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	6.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	7.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	8.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	9.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	10.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	11.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	12.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	13.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	14.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	15.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	16.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	17.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	18.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	19.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	
5 5 6 6 6 < 2	20.3	4.3	0.14	0.19	0.20	0.14	-	-	-	6.8	



SECTION DIMENSIONS	Fill Height (ft.)	M (ft.)	REINFORCING (sq. in. / ft.) ⁽²⁾								Lift (ft.)
			AS1	AS2	AS3	AS4	AS5	AS7	AS8		
6 2 8 7 7 < 2	< 2	< 2	0.23	0.27	0.19	0.17	0.19	0.19	0.17	7.2	
6 2 7 7 7 < 2	4.3	4.3	0.25	0.21	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	5.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	6.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	7.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	8.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	9.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	10.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	11.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	12.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	13.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	14.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	15.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	16.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	17.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	18.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	19.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 2 7 7 7 < 2	20.3	4.3	0.20	0.17	0.17	0.17	-	-	-	6.8	
6 3 8 7 7 < 2	< 2	< 2	0.20	0.31	0.22	0.17	0.19	0.19	0.17	7.9	
6 3 7 7 7 < 2	4.3	4.3	0.21	0.24	0.19	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	5.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	6.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	7.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	8.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	9.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	10.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	11.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	12.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	13.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	14.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	15.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	16.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	17.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	18.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	19.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 3 7 7 7 < 2	20.3	4.3	0.17	0.18	0.17	0.17	-	-	-	7.5	
6 4 8 7 7 < 2	< 2	< 2	0.19	0.34	0.25	0.17	0.19	0.19	0.17	8.6	
6 4 7 7 7 < 2	4.3	4.3	0.19	0.27	0.21	0.17	-	-	-	8.2	
6 4 7 7 7 < 2	5.3	4.3	0.17	0.21	0.19	0.17	-	-	-	8.2	
6 4 7 7 7 < 2	6.3	4.3	0.17	0.21	0.19	0.17	-	-	-	8.2	
6 4 7 7 7 < 2	7.3	4.3	0.17	0.21	0.19	0.17	-	-	-	8.2	
6 4 7 7 7 < 2	8.3	4.3	0.17	0.21	0.19	0.17	-	-	-	8.2	
6 4 7 7 7 < 2	9.3	4.3	0.17	0.21	0.19	0.17	-	-	-	8.2	
6 4 7 7 7 < 2	10.3	4.3	0.17	0.21	0.19	0.17	-	-	-	8.2	
6 4 7 7 7 < 2	11.3	4.3	0.17	0.21	0.19	0.17	-	-	-	8.2	
6 4 7 7 7 < 2	12.3	4.3	0.17	0.21	0.19	0.17	-	-	-	8.2	
6 4 7 7 7 <											

PRODUCT DATA SHEET
CURLEX® ENFORCER®

DESCRIPTION
Curlex Enforcer is a biocomposite Turf Reinforcement Mat (TRM) that consists of a specific cut of naturally seed free Great Lakes Aspen curled wood excelsior with 80% six-inch fibers or greater fiber length. It is of consistent thickness with fibers evenly distributed throughout the entire area of the blanket. The top and bottom of each blanket is covered with extra heavy duty black net. Curlex Enforcer is also available as QuickGRASS® (green pigment). Curlex Enforcer shall be manufactured in the U.S.A.

Curlex Enforcer has a design soil loss ratio (event-based RUSLE C factor) of .022 and is typically suitable for slopes up to 5H:1V. Curlex Enforcer is rated for channel flows up to 11 ft/s (3.4 m/s); 3.25 lb/ft² (156 Pa) shear stress unvegetated or 17 ft/s (5.2 m/s); 10.0 lb/ft² (480 Pa) shear stress vegetated.

PHYSICAL PROPERTIES
Curlex Enforcer measurements at time of manufacturing:

Width	8.0 ft (2.4 m)
Length	67.5 ft (20.6 m)
Area	60.0 yd² (50.2 m²)
Weight*	75.0 lb (34.1 kg)
Fiber Count	≈12,000 per yd²
Fiber Length (80% min.)	≈14,400 per m²
Mass per Unit Area (± 10%)	≥6.0 in (≈15.2 cm)
Net Openings	1.25 lb/yd² (0.68 kg/m²)
	0.75 in x 1.0 in (19.1 mm x 25.4 mm)

TYPICAL INDEX VALUES

Index Property	Test Method	Value
Thickness	ASTM D 6525	0.419 in (10.64 mm)
Light Penetration	ASTM D 6567	12.7%
Resiliency	ASTM D 1777/ECTC	55%
Mass per Unit Area	ASTM D 6475	0.98 lb/yd² (0.532 kg/m²)
MD-Tensile Strength Max.	ASTM D 6818	612.0 lb/ft (8.93 kN/m)
TD-Tensile Strength Max.	ASTM D 6818	460.5 lb/ft (6.72 kN/m)
MD-Elongation	ASTM D 6818	19.5%
TD-Elongation	ASTM D 6818	27.3%
Swell	ECTC Procedure	33%
Water Absorption	ASTM D 1117/ECTC	170%
UV Stability	ASTM D 4355 (1,000 hr)	90% minimum
Bench-Scale Rain Splash	ASTM D 7101	SLR = 10.24 @ 2 in/hr ^{be}
Bench-Scale Rain Splash	ASTM D 7101	SLR = 10.51 @ 4 in/hr ^{be}
Bench-Scale Rain Splash	ASTM D 7101	SLR = 10.86 @ 6 in/hr ^{be}
Bench-Scale Shear	ASTM D 7207	3.55 lb/ft² @ 0.5 in soil loss ^c
Germination Improvement	ASTM D 7322	486%

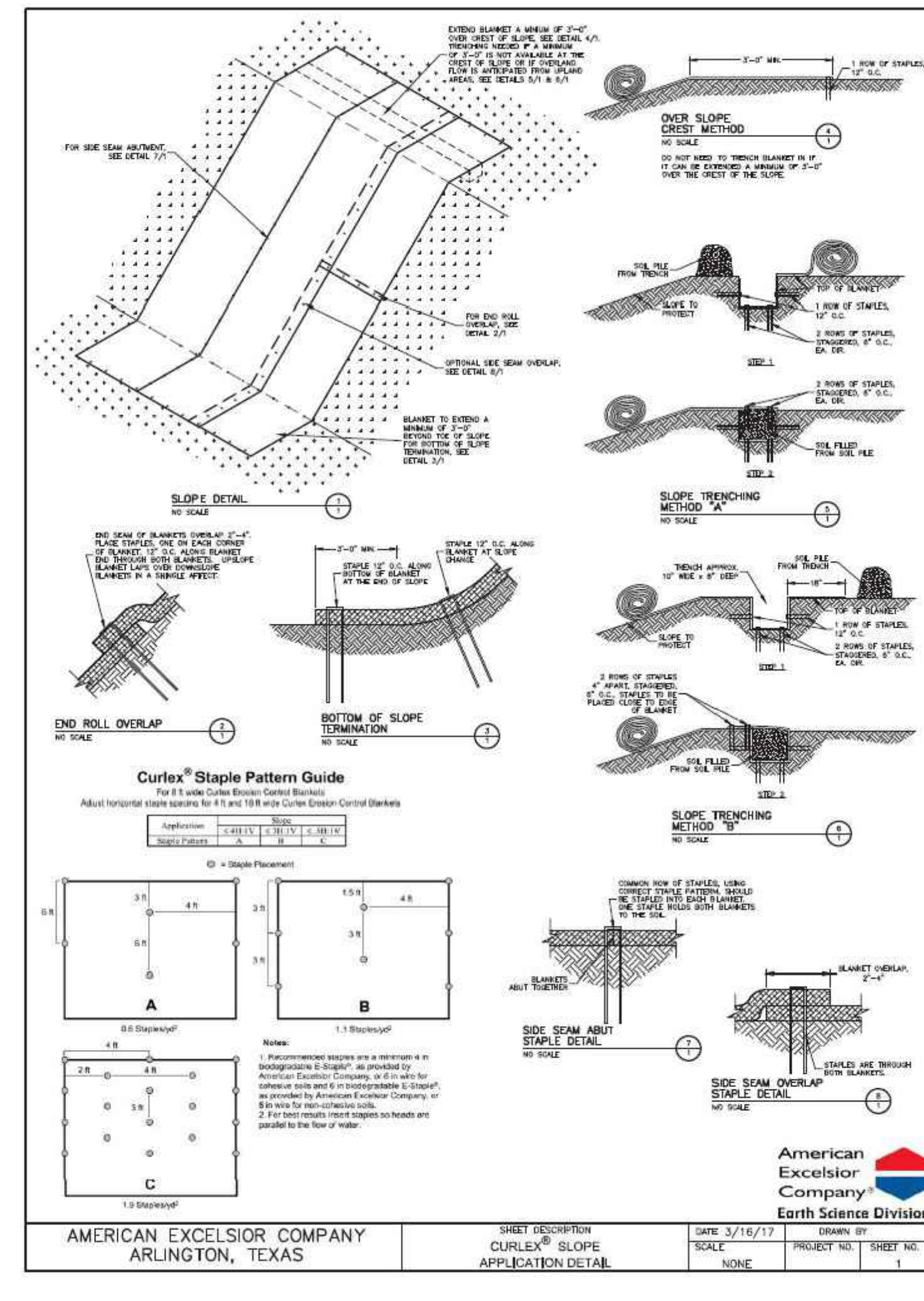
* Weight is based on a dry fiber weight basis at time of manufacture. Baseline moisture content of Great Lakes Aspen excelsior is 22%.

^b SLR is the Soil Loss Ratio, as reported by NTPEP/AASHTO. ^c Bench-scale index values should not be used for design purposes.



850 Avenue H East | Arlington, Texas 76011
Phone 1-800-777-SOIL | Fax 817-385-3585 | www.curlex.com

W0516R1116



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), 40 yd² (4' x 90'), 80 yd² (8' x 90'), 160 yd² (16' x 90')
 - Roll Sizes: 40 yd² (4' x 90'), 80 yd² (8' x 90'), 160 yd² (16' x 90')
 - 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), 60 yd² (8' x 67.5')
 - 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), 44.4 yd² (8' x 50')
 - Roll Sizes: 44.4 yd² (8' x 50')
 - Weight*: 1.62 lb/yd²
 - Netting: Heavy Duty Black or FibreNet™, top and bottom

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" single 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 guarantee 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.

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

American Excelsior Company Earth Science Division

Curlex® Blankets
Heavy Duty Excelsior Erosion Control Blankets

Product Description
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.

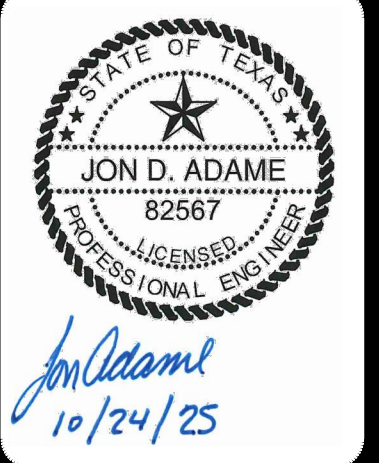
- PERFORMANCE CAPABILITIES**
- Curlex heavy duty blankets can handle wind and water shear even on steep slopes. These heavy duty blankets provide long-term protection in critical areas where vegetation requires additional time and protection to develop.
- Curlex III**
Channels Shear Stress: 120 Pa (2.5 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 .5H: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, led 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



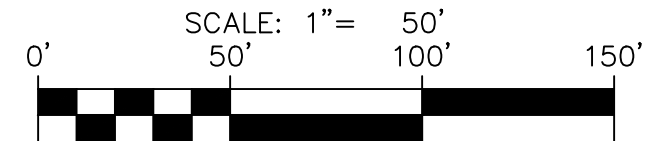
DATE	
NO.	
REVISION	



PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
BEXAR COUNTY, TEXAS
DRAIN DETAILS

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	OCTOBER 2025
DESIGNER	-
CHECKED	- DRAWN -
SHEET	C1.15



STREET LEGEND

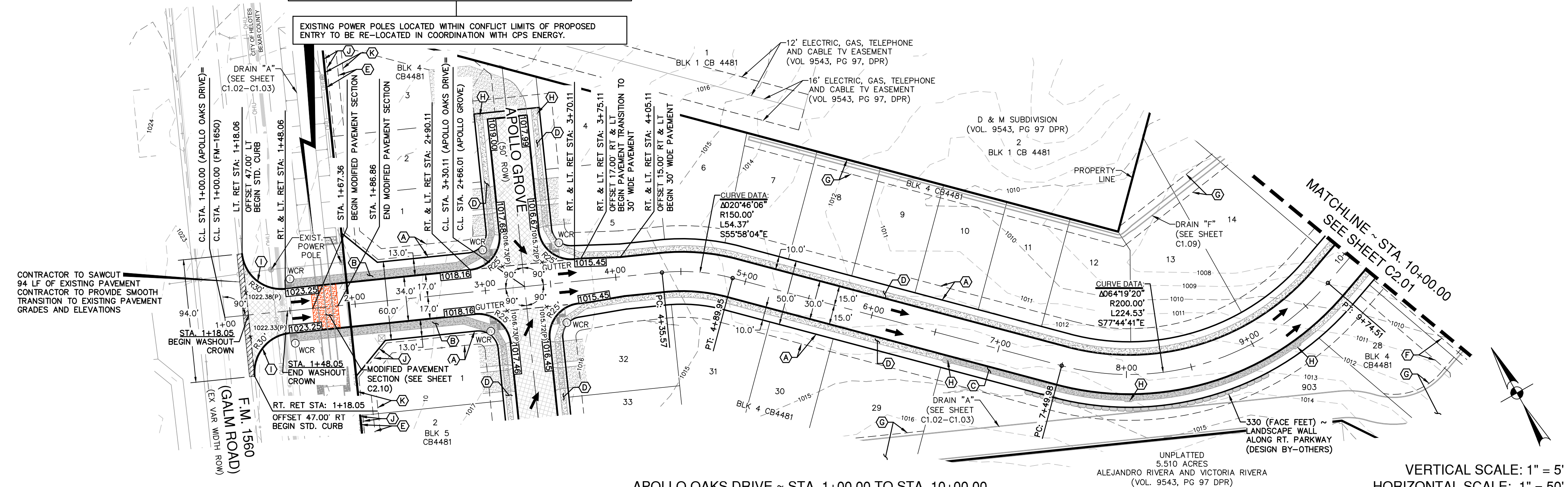
PROJECT LIMITS	---
MAINTAIN GUTTER	→
EXISTING CONTOUR	---
WHEELCHAIR RAMP	⊕
CENTERLINE	CL
RADIUS POINT	RP
POINT OF CURVATURE	PC
POINT OF TANGENCY	PT
RETURN	RET
DRAINAGE FLOW ARROW	→
TOP OF CURB SPOT ELEVATION	857.30
PAVEMENT ELEVATION	857.00(P) x
WASHOUT CROWN SECTION	---
SIDEWALK (DEVELOPER'S RESPONSIBILITY)	---
SIDEWALK (HOMEOWNER'S RESPONSIBILITY)	---
DRIVEWAY	---

KEY LEGEND:

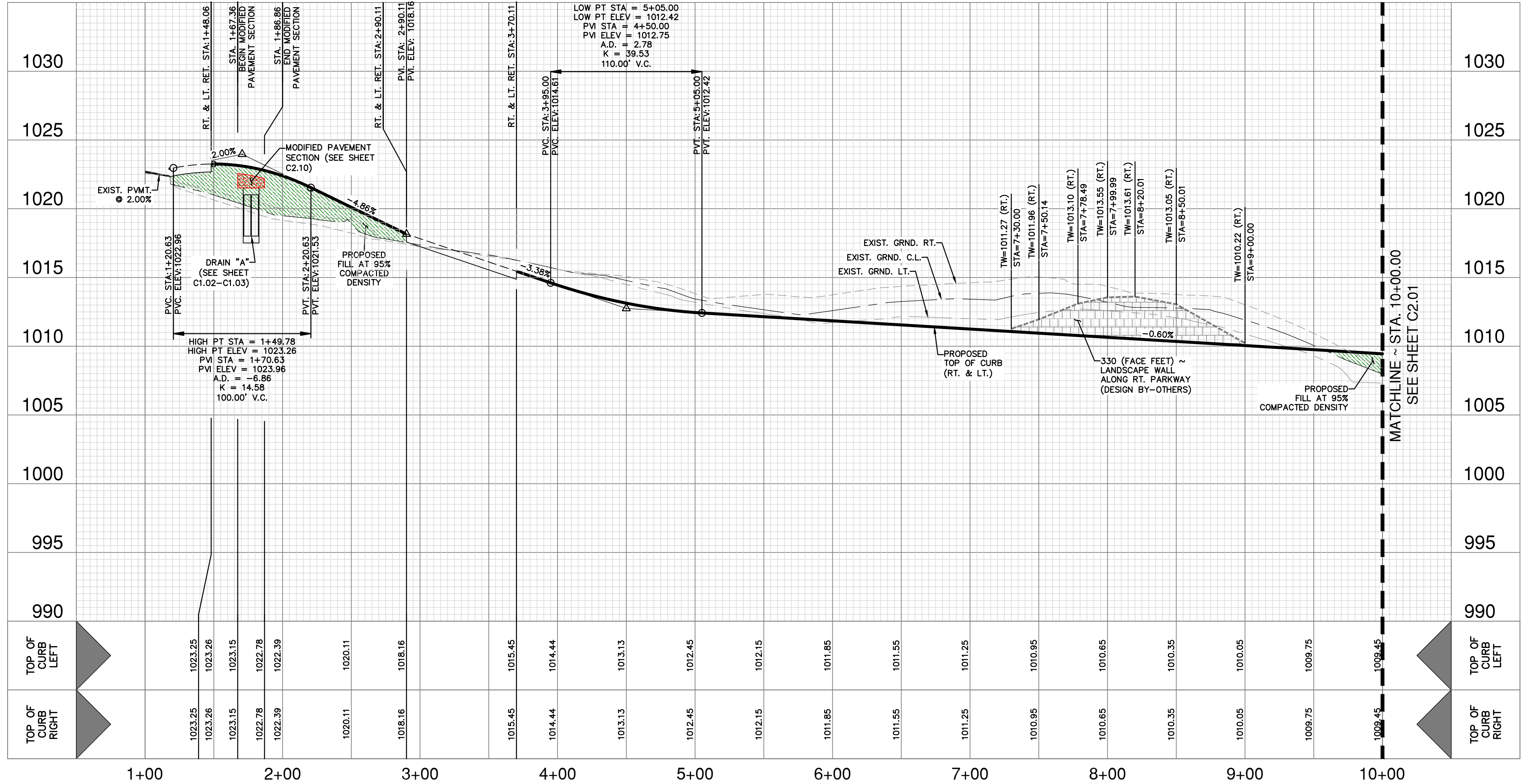
- (A) 10' ELEC., GAS, TELE., & CA. T.V. EASEMENT
- (B) 6' DEVELOPER SIDEWALK
- (C) 4' DEVELOPER SIDEWALK
- (D) 4' SIDEWALK
- (E) 10' WATER EASEMENT
- (F) 16' WATER EASEMENT
- (G) VARIABLE WIDTH DRAINAGE EASEMENT
- (H) 5' ADA PASSING SPACE
- (I) 7' STANDARD CURB
- (J) 1' VEHICLE NON-ACCESS EASEMENT (NOT-TO-SCALE)
- (K) 14' ELEC., GAS, TELE., & CA. T.V. EASEMENT

CAUTION!!
EXISTING UTILITIES ARE LOCATED WITHIN THE LIMITS OF THE CONSTRUCTION OF THIS PROJECT. THE CONTRACTOR SHALL EXERCISE EXTRA CARE IN DIGGING ANY TRENCH FOR PROPOSED UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING, VERIFYING THE EXACT LOCATION AND IDENTIFYING ANY AREAS OF CONFLICTS WITH EXISTING UTILITIES AND WILL NOTIFY THE ENGINEER IMMEDIATELY IF CONFLICTS ARE FOUND.

EXISTING POWER POLES LOCATED WITHIN CONFLICT LIMITS OF PROPOSED ENTRY TO BE RE-LOCATED IN COORDINATION WITH OPS ENERGY.



APOLLO OAKS DRIVE ~ STA. 1+00.00 TO STA. 10+00.00
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'



TxDOT ROW NOTES:

A TxDOT ROW PERMIT MUST BE OBTAINED BEFORE WORKING IN TxDOT ROW. 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.

SIDEWALK NOTE:

THE CONSTRUCTION OF SIDEWALKS ADJACENT TO ALL 900 SERIES LOTS WILL BE THE RESPONSIBILITY OF THE DEVELOPER AS SHOWN ON THE OVERALL SIGNAGE PLAN (SHEET C3.00). REFER TO SHEET C3.00 FOR LOCATIONS OF SIDEWALK CONSTRUCTION WHERE SIDEWALKS ARE NOT SHOWN

STREET SELECT FILL NOTE:

ANY FILL PLACED TO RAISE THE GRADE SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER. APPROVED FILL MATERIAL SHOULD BE FREE OF DELETERIOUS MATERIAL WITH A MINIMUM CBR VALUE OF 5.0 AND A MAXIMUM PLASTICITY INDEX VALUE OF 45. THE GRAVEL SIZE SHOULD NOT EXCEED 3 INCHES IN DIAMETER. USE CRUSHED LESTONITE WITH LL < 40, PI = 5 - 20, AND < 30% PASSING NO. 200 SIEVE. MAX PARTICLE SIZE: 3 INCHES. PLACE IN 6-INCH COMPACTED LIFTS AND COMPACT AS DESCRIBED IN THE VERTICAL MOVEMENTS SECTION. EACH LIFT MUST BE TESTED AND APPROVED BY THE GEOTECH ENGINEER (INTEC). THE MATERIAL SHOULD BE PLACED AS PER APPLICABLE BEXAR COUNTY GUIDELINES. CONTRACTOR TO VERIFY EXACT SPECIFICATIONS WITH THE PROJECT GEOTECHNICAL ENGINEERING REPORT.

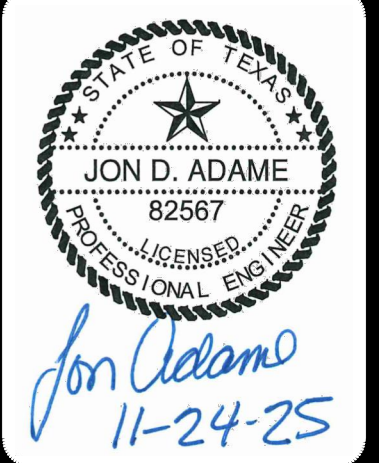
WHEEL CHAIR NOTE:

WHEEL CHAIR RAMPS (WCR) TO BE CENTERED ON STATION NOTED BELOW. ELEVATION SHOWN ARE TOP OF CURB AND NOT GUTTER

STREET NOTES:

- CONTRACTOR SHALL MATCH EXISTING PAVEMENT AT TIE-IN. IF EXISTING PAVEMENT ELEVATION DIFFERS SIGNIFICANTLY, CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO CONTINUING WORK.
- SIDEWALKS SHALL BE CONSTRUCTED 3'-FT FROM THE BACK OF CURB FOR ALL LOCATIONS WHERE THE SIDEWALK IS SHOWN OFFSET. REFER TO STREET DETAIL SHEET FOR SIDEWALK AND RAMP DETAILS.
- 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.
- 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.
- 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).

DATE	
NO.	REVISION



PAPE-DAWSON ENGINEERS
2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #008800

APOLLO OAKS
BEXAR COUNTY, TEXAS

APOLLO OAKS DRIVE ~ STA. 1+00.00 TO STA. 10+00.00
STREET PLAN & PROFILE

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	NOVEMBER 2025
DESIGNER	CB
CHECKED	JA DRAWN CB
SHEET	C2.00

Notes: Nov 24, 2025, 3:24pm, User: J. Adame, File: P:\13657\13657.dwg (Design) (Civil) STA: 1-3525700.dwg

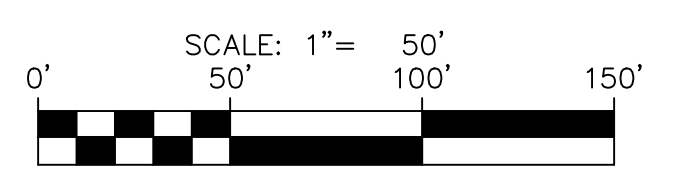
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PAPE-DAWSON ENGINEERS
 2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 APOLLO OAKS DRIVE ~ STA. 10+00.00 TO END
 STREET PLAN & PROFILE

PLAT NO. CP202506
 JOB NO. 13657-00
 DATE OCTOBER 2025
 DESIGNER CB
 CHECKED JA DRAWN CB
 SHEET C2.01

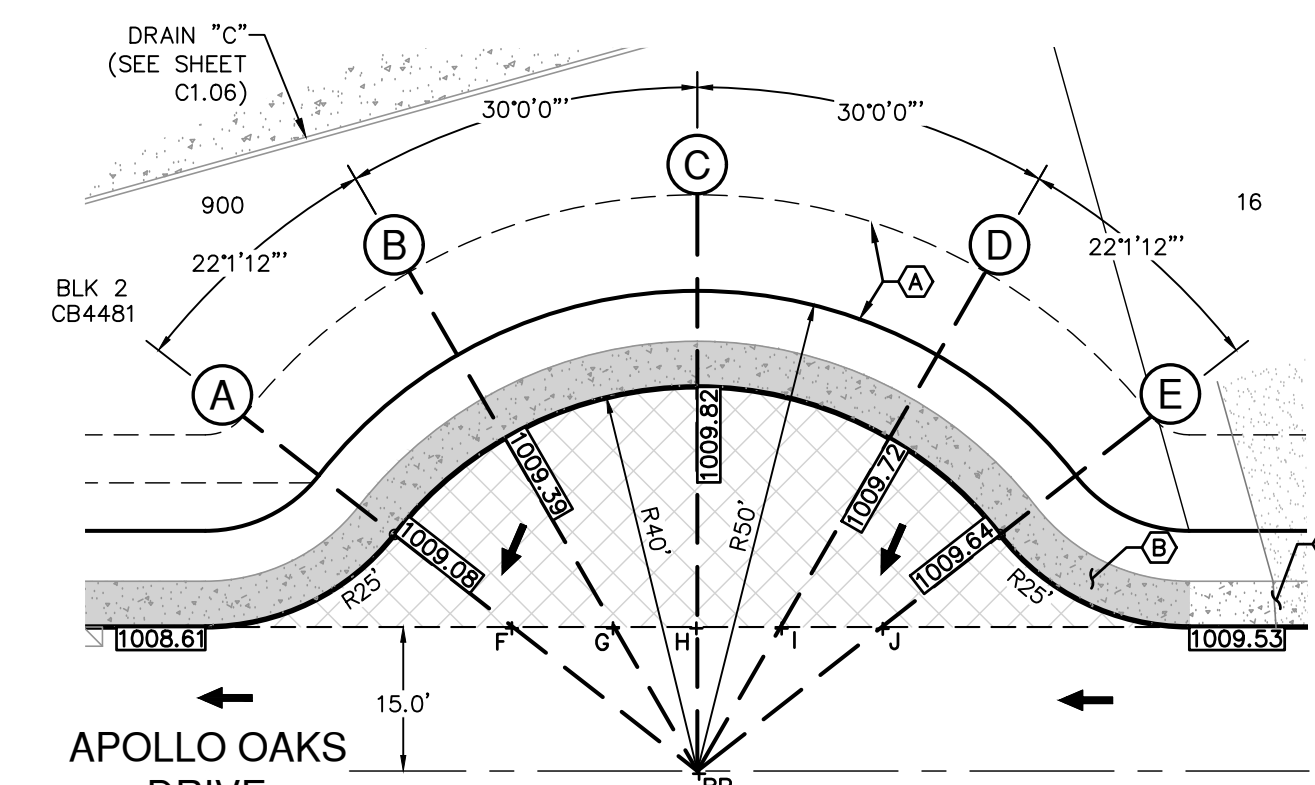


STREET LEGEND

- 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) x
- WASHOUT CROWN SECTION: [Pattern]
- SIDEWALK (DEVELOPER'S RESPONSIBILITY): [Pattern]
- SIDEWALK (HOMEOWNER'S RESPONSIBILITY): [Pattern]
- DRIVEWAY: [Pattern]

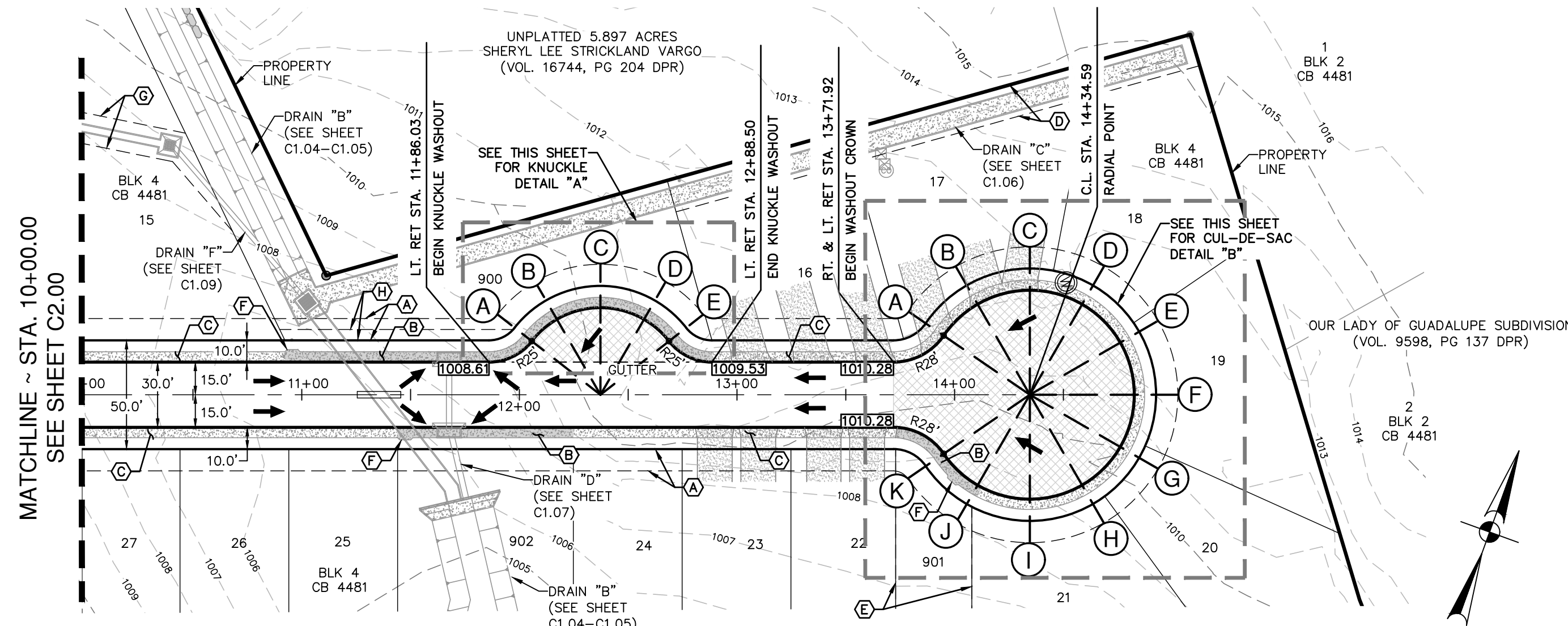
KEY LEGEND:

- (A) 10' ELEC., GAS, TELE, & CA. T.V. EASEMENT
- (B) 4' DEVELOPER SIDEWALK
- (C) 4' SIDEWALK
- (D) 15' DRAINAGE EASEMENT
- (E) 35' SANITARY SEWER AND WATER EASEMENT
- (F) 5' ADA PASSING SPACE
- (G) VARIABLE WIDTH DRAINAGE EASEMENT
- (H) 5' WATER EASEMENT

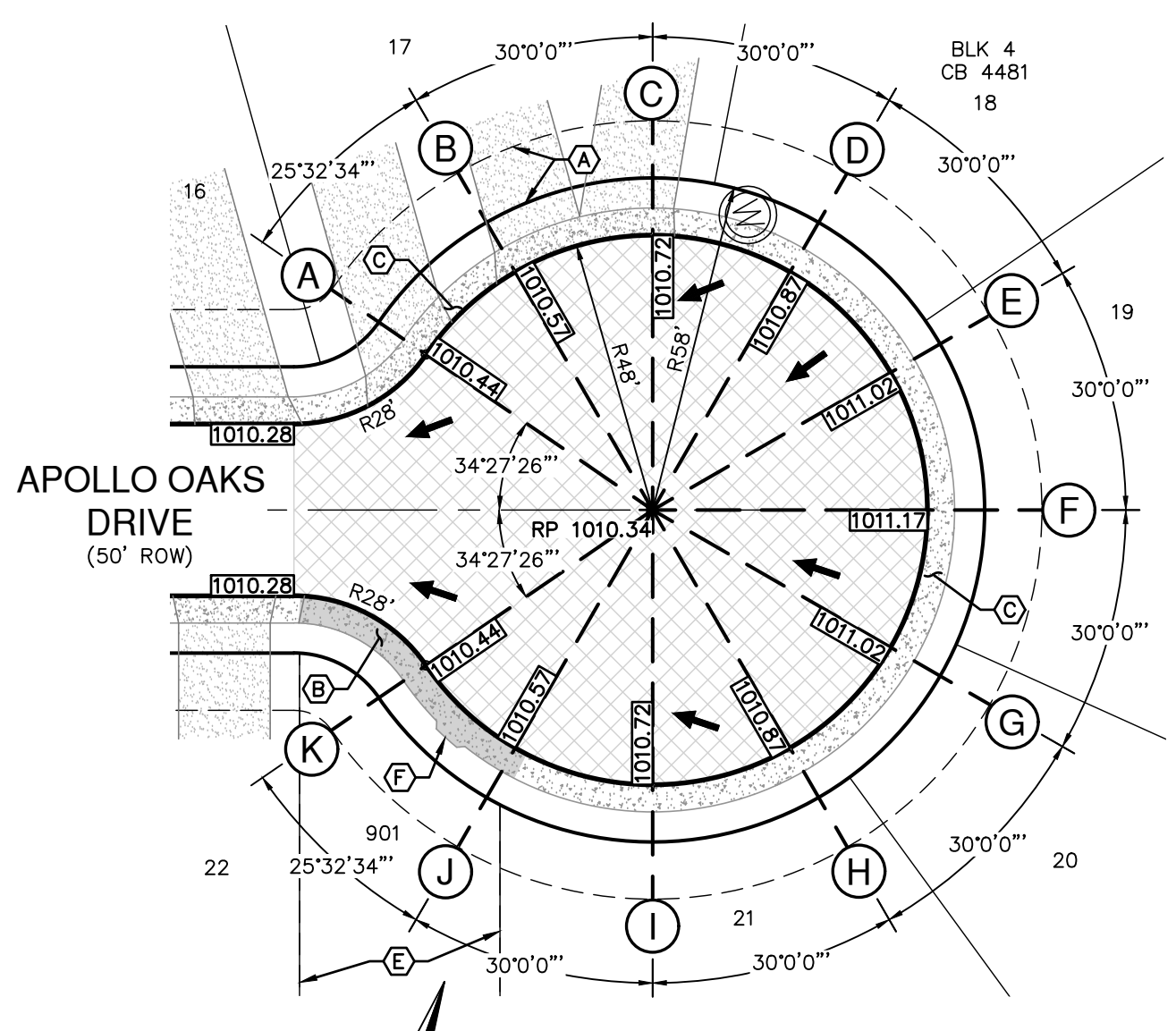


KNUCKLE DETAIL "A"
 SCALE: 1" = 20'

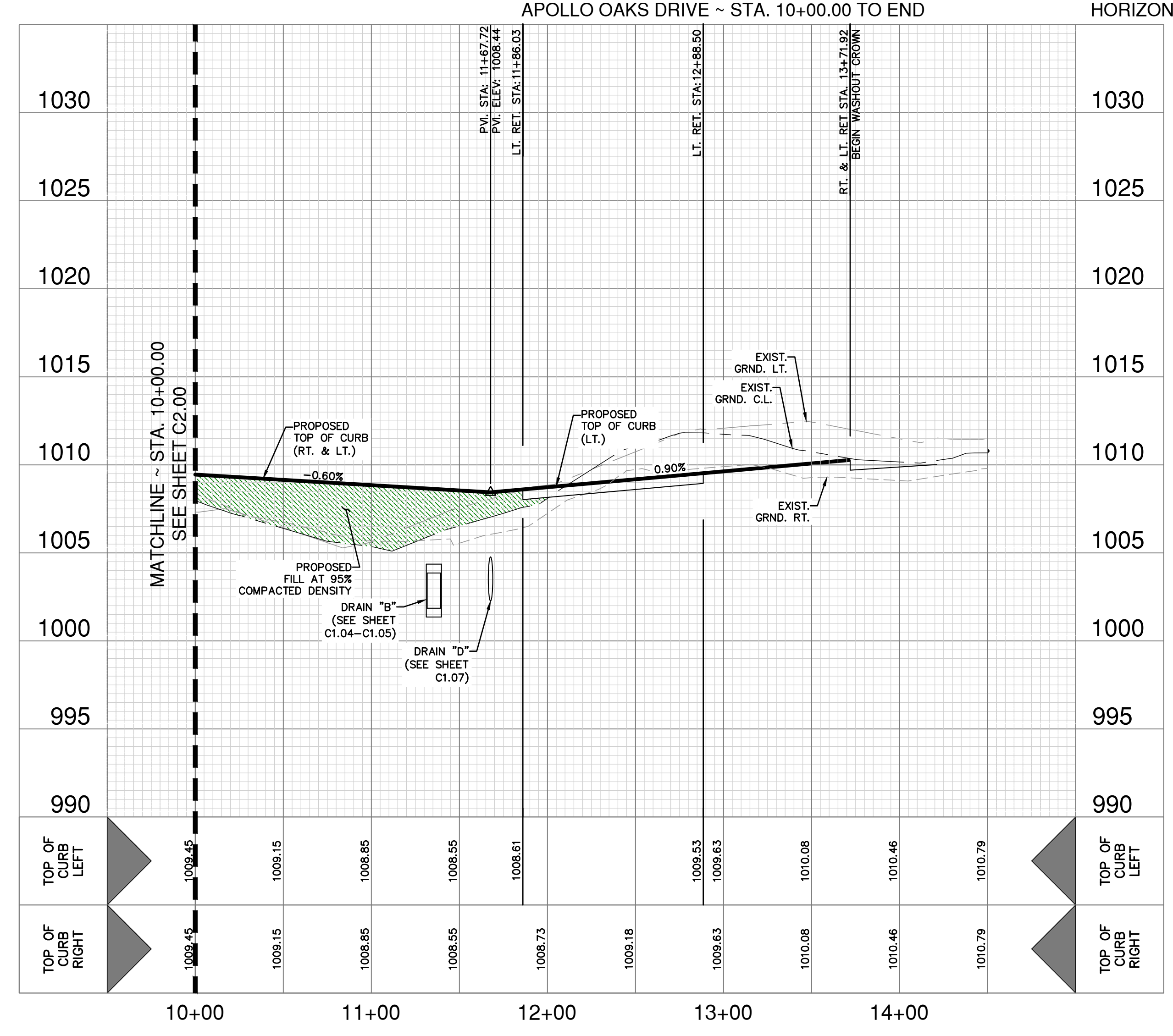
PAVEMENT ELEVATIONS	
F	1008.85
G	1008.91
H	1008.96
I	1009.01
J	1009.08



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

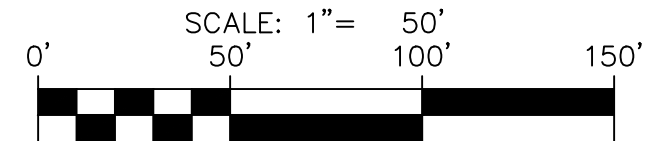


CUL-DE-SAC DETAIL "B"
 SCALE: 1" = 30'



- TxDOT ROW NOTES:**
 A TxDOT ROW PERMIT MUST BE OBTAINED BEFORE WORKING IN TxDOT ROW. 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.
- SIDEWALK NOTE:**
 THE CONSTRUCTION OF SIDEWALKS ADJACENT TO ALL 900 SERIES LOTS WILL BE THE RESPONSIBILITY OF THE DEVELOPER AS SHOWN ON THE OVERALL SIGNAGE PLAN (SHEET C3.00). REFER TO SHEET C3.00 FOR LOCATIONS OF SIDEWALK CONSTRUCTION WHERE SIDEWALKS ARE NOT SHOWN.
- STREET SELECT FILL NOTE:**
 ANY FILL PLACED TO RAISE THE GRADE SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER. APPROVED FILL MATERIAL SHOULD BE FREE OF DELETERIOUS MATERIAL WITH A MINIMUM CBR VALUE OF 5.0 AND A MAXIMUM PLASTICITY INDEX VALUE OF 45. THE GRAVEL SIZE SHOULD NOT EXCEED 3 INCHES IN DIAMETER. USE CRUSHED Limestone WITH LL < 40, PI = 5 - 20, AND < 30% PASSING NO. 200 SIEVE. MAX PARTICLE SIZE: 3 INCHES. PLACE IN 6-INCH COMPACTED LIFTS AND COMPACT AS DESCRIBED IN THE VERTICAL MOVEMENTS SECTION. EACH LIFT MUST BE TESTED AND APPROVED BY THE GEOTECH ENGINEER (INTEC). THE MATERIAL SHOULD BE PLACED AS PER APPLICABLE BEXAR COUNTY GUIDELINES. CONTRACTOR TO VERIFY EXACT SPECIFICATIONS WITH THE PROJECT GEOTECHNICAL ENGINEERING REPORT.
- WHEEL CHAIR NOTE:**
 WHEEL CHAIR RAMPS (WCR) TO BE CENTERED ON STATION NOTED BELOW. ELEVATION SHOWN ARE TOP OF CURB AND NOT GUTTER.
- STREET NOTES:**
- CONTRACTOR SHALL MATCH EXISTING PAVEMENT AT TIE-IN. IF EXISTING PAVEMENT ELEVATION DIFFERS SIGNIFICANTLY, CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO CONTINUING WORK.
 - SIDEWALKS SHALL BE CONSTRUCTED 3-FT FROM THE BACK OF CURB FOR ALL LOCATIONS WHERE THE SIDEWALK IS SHOWN OFFSET. REFER TO STREET DETAIL SHEET FOR SIDEWALK AND RAMP DETAILS.
 - 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.
 - 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.
 - 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).

Notes: Oct 24, 2025, 4:29pm, User: jca, Project: Apollo Oaks, Sheet: C2.01
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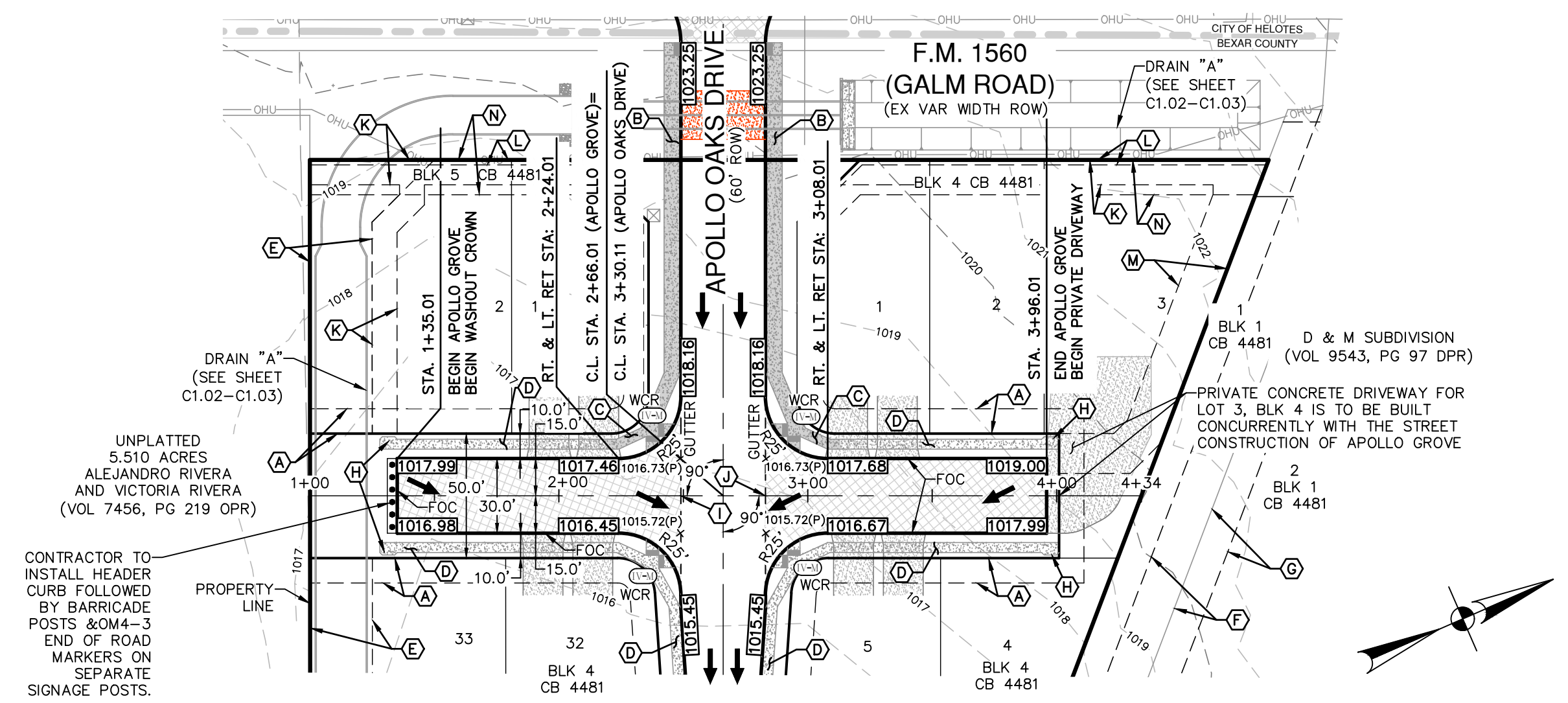


STREET LEGEND

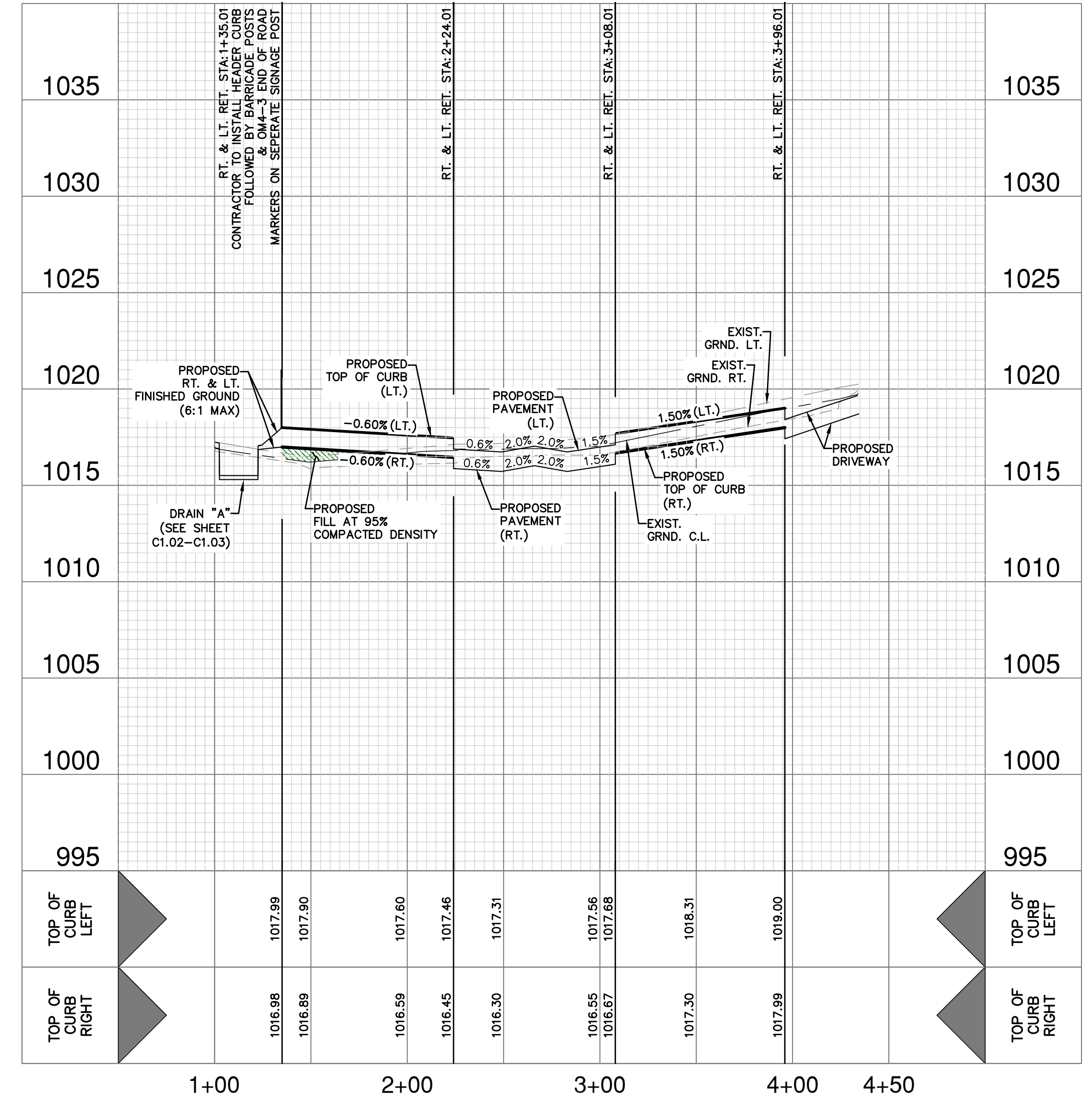
- PROJECT LIMITS: ---
- MAINTAIN GUTTER: --->---
- EXISTING CONTOUR: - - - - - 970
- WHEELCHAIR RAMP: ⊕
- CENTERLINE: CL
- RADIUS POINT: RP
- POINT OF CURVATURE: PC
- POINT OF TANGENCY: PT
- RETURN: RET
- DRAINAGE FLOW ARROW: →
- TOP OF CURB SPOT ELEVATION: [857.30]
- PAVEMENT ELEVATION: 857.00(P) ×
- WASHOUT CROWN SECTION: [Pattern]
- SIDEWALK (DEVELOPER'S RESPONSIBILITY): [Pattern]
- SIDEWALK (HOMEOWNER'S RESPONSIBILITY): [Pattern]
- DRIVEWAY: [Pattern]

KEY LEGEND:

- (A) 10' ELEC., GAS, TELE., & CA. T.V. EASEMENT
- (B) 6' DEVELOPER SIDEWALK
- (C) 4' DEVELOPER SIDEWALK
- (D) 4' SIDEWALK
- (E) VARIABLE WIDTH DRAINAGE EASEMENT
- (F) 16' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- (G) 12' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- (H) 5' ADA PASSING SPACE
- (I) STA: 2+49.01 END WASHOUT CROWN
- (J) STA: 2+83.01 BEGIN WASHOUT CROWN
- (K) 10' WATER EASEMENT
- (L) 1' VEHICULAR NON ACCESS EASEMENT (NOT TO SCALE)
- (M) VARIABLE WIDTH WATER EASEMENT
- (N) 14' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT



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



TxDOT ROW NOTES:

A TxDOT ROW PERMIT MUST BE OBTAINED BEFORE WORKING IN TxDOT ROW. 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.

SIDEWALK NOTE:

THE CONSTRUCTION OF SIDEWALKS ADJACENT TO ALL 900 SERIES LOTS WILL BE THE RESPONSIBILITY OF THE DEVELOPER AS SHOWN ON THE OVERALL SIGNAGE PLAN (SHEET C3.00). REFER TO SHEET C3.00 FOR LOCATIONS OF SIDEWALK CONSTRUCTION WHERE SIDEWALKS ARE NOT SHOWN

STREET SELECT FILL NOTE:

ANY FILL PLACED TO RAISE THE GRADE SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER. APPROVED FILL MATERIAL SHOULD BE FREE OF DELETERIOUS MATERIAL WITH A MINIMUM CBR VALUE OF 5.0 AND A MAXIMUM PLASTICITY INDEX VALUE OF 45. THE GRAVEL SIZE SHOULD NOT EXCEED 3 INCHES IN DIAMETER. USE CRUSHED Limestone WITH LL < 40, PI = 5 - 20, AND < 30% PASSING NO. 200 SIEVE. MAX PARTICLE SIZE: 3 INCHES. PLACE IN 6-INCH COMPACTED LIFTS AND COMPACT AS DESCRIBED IN THE VERTICAL MOVEMENTS SECTION. EACH LIFT MUST BE TESTED AND APPROVED BY THE GEOTECH ENGINEER (INTEC). THE MATERIAL SHOULD BE PLACED AS PER APPLICABLE BEXAR COUNTY GUIDELINES. CONTRACTOR TO VERIFY EXACT SPECIFICATIONS WITH THE PROJECT GEOTECHNICAL ENGINEERING REPORT.

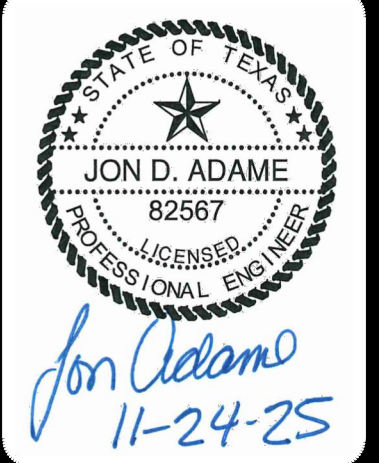
WHEEL CHAIR NOTE:

WHEEL CHAIR RAMPS (WCR) TO BE CENTERED ON STATION NOTED BELOW. ELEVATION SHOWN ARE TOP OF CURB AND NOT GUTTER

STREET NOTES:

- CONTRACTOR SHALL MATCH EXISTING PAVEMENT AT TIE-IN. IF EXISTING PAVEMENT ELEVATION DIFFERS SIGNIFICANTLY, CONTRACTOR SHALL NOTIFY THE ENGINEER PRIOR TO CONTINUING WORK.
- SIDEWALKS SHALL BE CONSTRUCTED 3'-FT FROM THE BACK OF CURB FOR ALL LOCATIONS WHERE THE SIDEWALK IS SHOWN OFFSET. REFER TO STREET DETAIL SHEET FOR SIDEWALK AND RAMP DETAILS.
- 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.
- 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.
- 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).

DATE	
NO.	REVISION



PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028600

APOLLO OAKS
BEXAR COUNTY, TEXAS
APOLLO GROVE ~ STA. 1+00.00 TO END
STREET PLAN & PROFILE

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	NOVEMBER 2025
DESIGNER	CB
CHECKED	JA DRAWN CB
SHEET	C2.02

Notes: Nov 24, 2025, 3:09pm, User: JD, File: P:\1565\157\100\Design\Civil\STA1-1-25\2500.dwg

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL. AERIAL IMAGERY PROVIDED BY GOOGLE® UNLESS OTHERWISE NOTED. Imagery © 2016, CAPCO Digital, Giba, Texas Orthology Program, USDA Farm Service Agency.

PAVEMENT SECTION DETAIL										
STREET NAME	STATION	TYPE "D" HMAc	TYPE "C" HMAc	CONCRETE	AGGREGATE BASE	SUBGRADE	GEOGRID	STREET TYPE	CBR	STRUCTURAL NUMBER
APOLLO OAKS DRIVE	1+18.06 TO 1+67.36	3.00"	-	-	20.50"	6.0"	NO	LOCAL B	2.5	4.67
APOLLO OAKS DRIVE	1+67.36 TO 1+86.86	**3.00"	**3.00"	-	CULVERT	BOX CULVERT	NO	LOCAL B	20.0	4.64
APOLLO OAKS DRIVE	1+86.86 TO 4+05.11	3.00"	-	-	20.50"	6.0"	NO	LOCAL B	2.5	4.67
APOLLO OAKS DRIVE	4+05.11 TO END	2.00	-	-	9.50"	6.0"	NO	LOCAL A	2.5	2.69
APOLLO GROVE	1+35.01 TO END	2.00	-	-	9.50"	6.0"	NO	LOCAL A	2.5	2.69

*STREET TRANSITIONS FROM STREET CLASSIFICATIONS OF DIFFERING PAVEMENT WIDTHS SHALL BE CONSTRUCTED WITH PAVEMENT SECTION OF STREET CLASSIFICATION WITH WIDER PAVEMENT SECTION.

**COVER OVER CULVERT WILL VARY. RECOMMENDED MINIMUM TYPE "C" ASPHALT THICKNESS OF 2 INCHES AND MINIMUM TYPE "D" THICKNESS OF 2 INCHES. MAXIMUM TYPE "D" THICKNESS OF 3 INCHES IS RECOMMENDED. REFERENCE GEOTECH REPORT FOR MINIMUM FLEXIBLE PAVEMENT RECOMMENDATION OVER DIRECT TRAFFIC RATED MULTI-BOX CULVERT.

GENERAL NOTES:

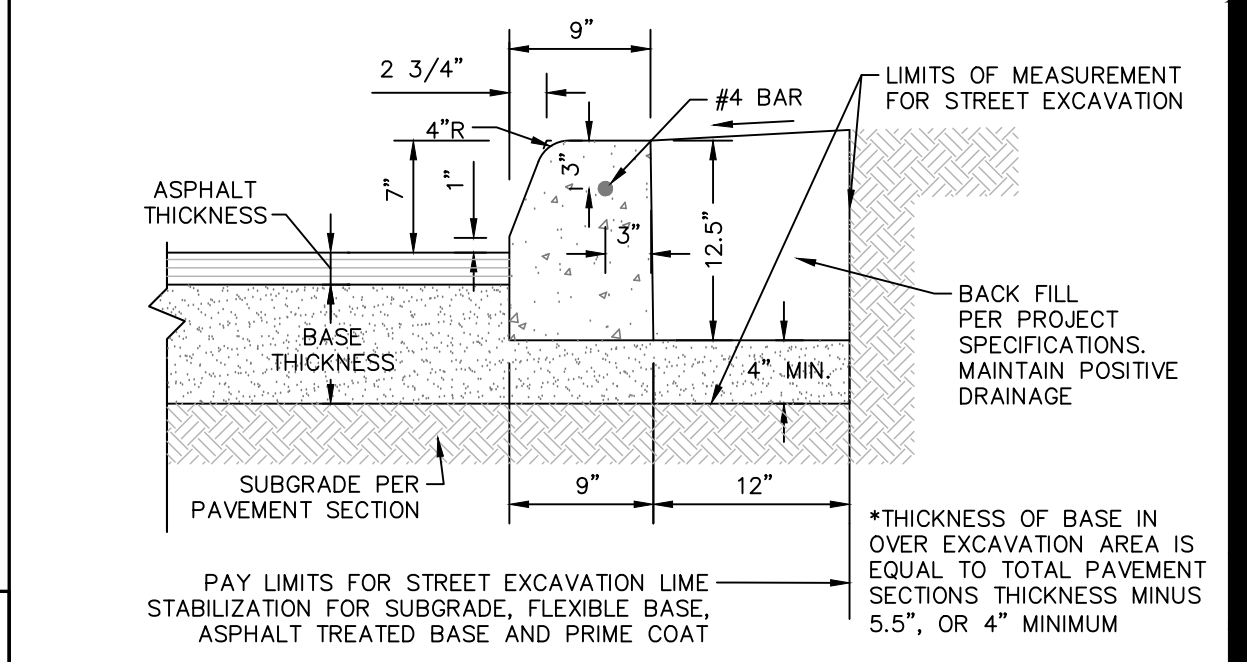
- CONTRACTOR SHALL REFERENCE THE PROJECT GEOTECHNICAL REPORT PREPARED BY **INTEC OF SAN ANTONIO, L.P.**, (ATTN. MURALI SUBRAMANIAM, PH.D., P.E.) DATED **AUGUST 05, 2025**.
- CONTRACTOR SHALL REFERENCE THE GEOTECHNICAL ADDENDUM (MODIFIED SECTION OVER BOX CULVERT) PREPARED BY **INTEC OF SAN ANTONIO, L.P.**, (ATTN. MURALI SUBRAMANIAM, PH.D., P.E.) DATED **AUGUST 15, 2025**.
- CONTRACTOR SHALL CONSULT WITH THE PROJECT GEOTECHNICAL ENGINEER TO VERIFY THE SUBGRADE CONDITION PRIOR TO PLACING ANY BASE MATERIAL. GEOTECHNICAL ENGINEER SHALL DETERMINE THE SUBGRADE CONDITION AND IF LIME STABILIZATION IS REQUIRED.
- GEOTECHNICAL ENGINEER SHOULD VERIFY THE STREET SUBGRADE AT THE TIME OF CONSTRUCTION PRIOR TO PLACEMENT OF AGGREGATE BASE.
- THE FLEXIBLE BASE COURSE SHOULD BE CRUSHED LIMESTONE CONFORMING TO TXDOT STANDARD SPECIFICATIONS, ITEM 247, TYPE A, GRADE 1-2.
- 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.
- 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 PROJECT GEOTECHNICAL ENGINEER MUST BE CONSULTED TO DETERMINE IF ADDITIONAL CBR TESTING AND THICKER PAVEMENT SECTIONS ARE REQUIRED.
- WHERE PAVEMENT SUBGRADE IS LOCATED WITHIN 2- FEET OF THE EXISTING GROUND SURFACE (STRATUM I 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.
- THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING ALL MATERIAL TESTING WITH THE PROJECT GEOTECHNICAL ENGINEER. TESTING SHALL BE PAID FOR BY THE OWNER/DEVELOPER.
- ANY FILL PLACED TO RAISE THE GRADE SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER. APPROVED FILL MATERIAL SHOULD BE FREE OF DELETERIOUS MATERIAL WITH A MINIMUM CBR VALUE OF 5.0 AND A MAXIMUM PLASTICITY INDEX VALUE OF 45. THE GRAVEL SIZE SHOULD NOT EXCEED 3 INCHES IN DIAMETER. USE CRUSHED LIMESTONE WITH LL < 40, PI = 5 - 20, AND < 30% PASSING NO. 200 SIEVE. MAX PARTICLE SIZE: 3 INCHES. PLACE IN 6-INCH COMPACTED LIFTS AND COMPACT AS DESCRIBED IN THE VERTICAL MOVEMENTS SECTION. EACH LIFT MUST BE TESTED AND APPROVED BY THE GEOTECH ENGINEER (INTEC). THE MATERIAL SHOULD BE PLACED AS PER APPLICABLE BEAR COUNTY GUIDELINES. CONTRACTOR TO VERIFY EXACT SPECIFICATIONS WITH THE PROJECT GEOTECHNICAL ENGINEERING REPORT.
- A TXDOT AND/OR BEAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN THE TXDOT AND/OR BEAR COUNTY ROW. 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.

LIME STABILIZATION NOTES:

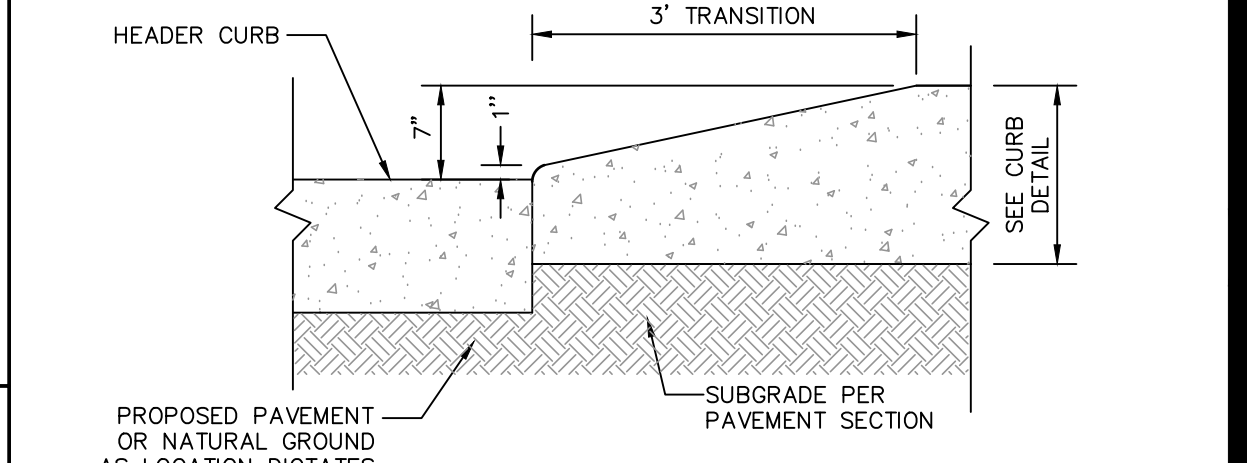
- FOR LIME STABILIZATION CONSTRUCTION VERIFICATION THE FOLLOWING SHALL BE CONDUCTED ON THE FIELD:
- AFTER INITIAL MIXING THE SOIL-LIME MIXTURE SHALL MELLOW FOR A PERIOD OF TWO TO THREE (2-3) DAYS. MAINTAIN MOISTURE DURING MELLOWING.
 - AFTER MELLOWING AND FINAL MIXING, THE PULVERIZATION SHALL BE CHECKED USING THE FOLLOWING CRITERIA (REMOVE NON-SLAKING AGGREGATES RETAINED ON THE 1/2 INCH SIEVE FROM THE SAMPLE):
 - MINIMUM PASSING 1/2 SIEVE: 100
 - MINIMUM PASSING 3/8 SIEVE: 85
 - MINIMUM PASSING NO. 4 SIEVE: 60
 - SAMPLE SOIL-LIME MIXTURE FOR DETERMINATION OF MAXIMUM DRY DENSITY (MDD), IN THE LABORATORY. MDD 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 BEAR COUNTY FLEXIBLE PAVEMENT DESIGN CRITERIA GUIDE FOR MIXTURE DESIGN.
 - COMPACT AND CHECK FIELD DENSITY (MINIMUM OF 95% OF MDD REQUIRED).
 - CURE FOR AN ADDITIONAL 2 TO 5 DAYS (TOTAL MELLOWING AND CURING TIME SHOULD TOTAL AT LEAST 5 DAYS).
 - VERIFY DEPTH OF LIME STABILIZED LAYER TO DEPTH AS NOTED ON PLAN TO WITHIN +/- 1.0 INCH.

GEOTECHNICAL REPORT NOTES:

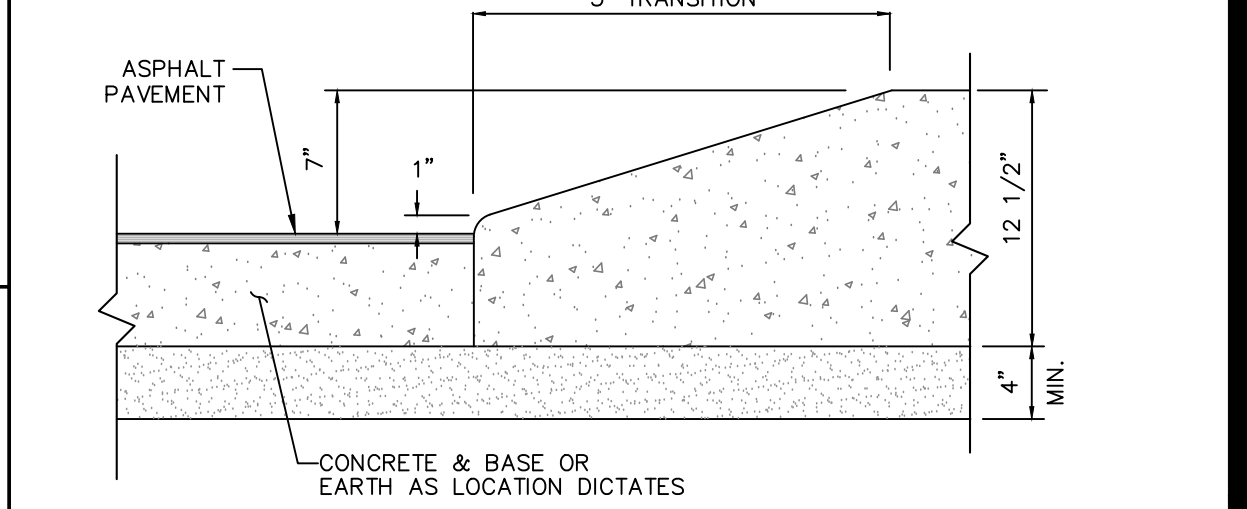
- ANY FILL PLACED TO RAISE THE GRADE SHOULD BE APPROVED BY THE GEOTECHNICAL ENGINEER. APPROVED FILL MATERIAL SHOULD BE FREE OF DELETERIOUS MATERIAL WITH A MINIMUM CBR VALUE OF 5.0 AND A MAXIMUM PLASTICITY INDEX VALUE OF 45. THE GRAVEL SIZE SHOULD NOT EXCEED 3 INCHES IN DIAMETER. THE MATERIAL SHOULD BE PLACED AS PER APPLICABLE BEAR COUNTY GUIDELINES.
- BASED ON THE SOILS ENCOUNTERED IN THE BORINGS, THE GEOTECH ENGINEER ANTICIPATES THE FINAL PAVEMENT SUBGRADE PLASTICITY INDEX (PI) VALUES TO BE LESS THAN OR EQUAL TO 20 OR GREATER THAN 20.
- AS PER BEAR COUNTY REQUIREMENTS, SUBGRADE STABILIZATION IS REQUIRED IF THE FINAL SUBGRADE PLASTICITY INDEX VALUES ARE GREATER THAN 20.
- SUBGRADE STABILIZED WITH LIME. AN APPLICATION RATE OF 30 LBS PER SQ YARD FOR 6 INCH DEPTH OF MAY BE USED. THE GEOTECH ENGINEER RECOMMENDS THAT THE APPLICATION RATE BE DETERMINED AT THE TIME OF CONSTRUCTION.
- SOIL SULFATE CONTENT SHOULD BE TESTED PRIOR TO LIME APPLICATION.
- FIELD MIXED LIME SAMPLES SHOULD BE TESTED FOR COMPRESSIVE STRENGTH. A MINIMUM COMPRESSIVE STRENGTH VALUE OF 160 PSI IS REQUIRED.
- SUBGRADE MAY BE STABILIZED WITH CEMENT IN- LIEU OF LIME. CEMENT APPLICATION RATE SHOULD BE DETERMINED AT THE TIME OF CONSTRUCTION WITH THE GEOTECH ENGINEER.
- AS PER BEAR COUNTY REQUIREMENTS, SUBGRADE STABILIZATION IS NOT NEEDED IF THE FINAL SUBGRADE PLASTICITY INDEX VALUES ARE LESS THAN EQUAL TO 20.
- FINAL PAVEMENT SUBGRADE SHOULD BE VERIFIED BY THE GEOTECH ENGINEER AT THE TIME OF CONSTRUCTION.
- A DESIGN CALIFORNIA BEARING RATIO VALUE OF 2.5 WAS USED. THE CALIFORNIA BEARING RATIO FOR STRATUM II SOILS WERE ALSO PERFORMED AND IS HIGHER THAN 5.0.
- INPUT PARAMETERS USED IN PAVEMENT SECTION CALCULATIONS ARE SHOWN IN THE GEOTECHNICAL REPORT, TABLE NO. 3 (SUMMARY TABLE B). PLEASE CALL THE GEOTECHNICAL ENGINEER TO PROVIDE PAVEMENT RECOMMENDATIONS, IF NEEDED, FOR DIFFERENT INPUT VALUES.
- IF REPETITIVE TRUCK OR HEAVY TRUCK TRAFFIC IS ANTICIPATED, PLEASE CONTACT THE GEOTECHNICAL ENGINEER FOR REVISED PAVEMENT RECOMMENDATIONS.
- PAVEMENT SECTION RECOMMENDATIONS ARE BASED ON A SUBGRADE CBR VALUE OF 2.5. THE PAVEMENT RECOMMENDATIONS ARE NOT BASED ON THE SHRINK/SWELL CHARACTERISTICS OF THE UNDERLYING SOILS. THE PAVEMENT CAN EXPERIENCE CRACKING AND DEFORMATION DUE TO SHRINKAGE AND SWELLING CHARACTERISTICS OF THE SOILS AS DESCRIBED IN THE VERTICAL MOVEMENTS SECTION OF THE GEOTECHNICAL REPORT. USE OF GEOGRID WILL HELP REDUCE THE SHRINK/SWELL RELATED REFLECTIVE CRACKING.
- IF WATER IS ALLOWED TO GET UNDERNEATH THE ASPHALT/CONCRETE OR IF MOISTURE CONTENT OF THE BASE OR SUBGRADE CHANGES SIGNIFICANTLY, THEN PAVEMENT DISTRESS WILL OCCUR. MOISTURE PENETRATION UNDERNEATH THE ASPHALT PAVEMENT SURFACE SHOULD BE REDUCED. ONE OF THE FOLLOWING METHODS SHOULD BE USED:
 - DEEPER CURBS, SUCH AS CURBS EXTENDING A MINIMUM OF 3 INCHES INTO SUBGRADE.
 - COMPACTED CLAYS BACKFILLED AGAINST THE CURBS.
- IN ADDITION, WATER SHOULD NOT BE ALLOWED TO GET UNDERNEATH THE PAVEMENT SECTION AT THE TIME OF HOME CONSTRUCTION.
- SUBGRADE DELINEATION: AT THE TIME OF CONSTRUCTION, THE FINAL PAVEMENT SUBGRADE SHOULD BE VERIFIED/DELINEATED BY THE GEOTECHNICAL ENGINEER.



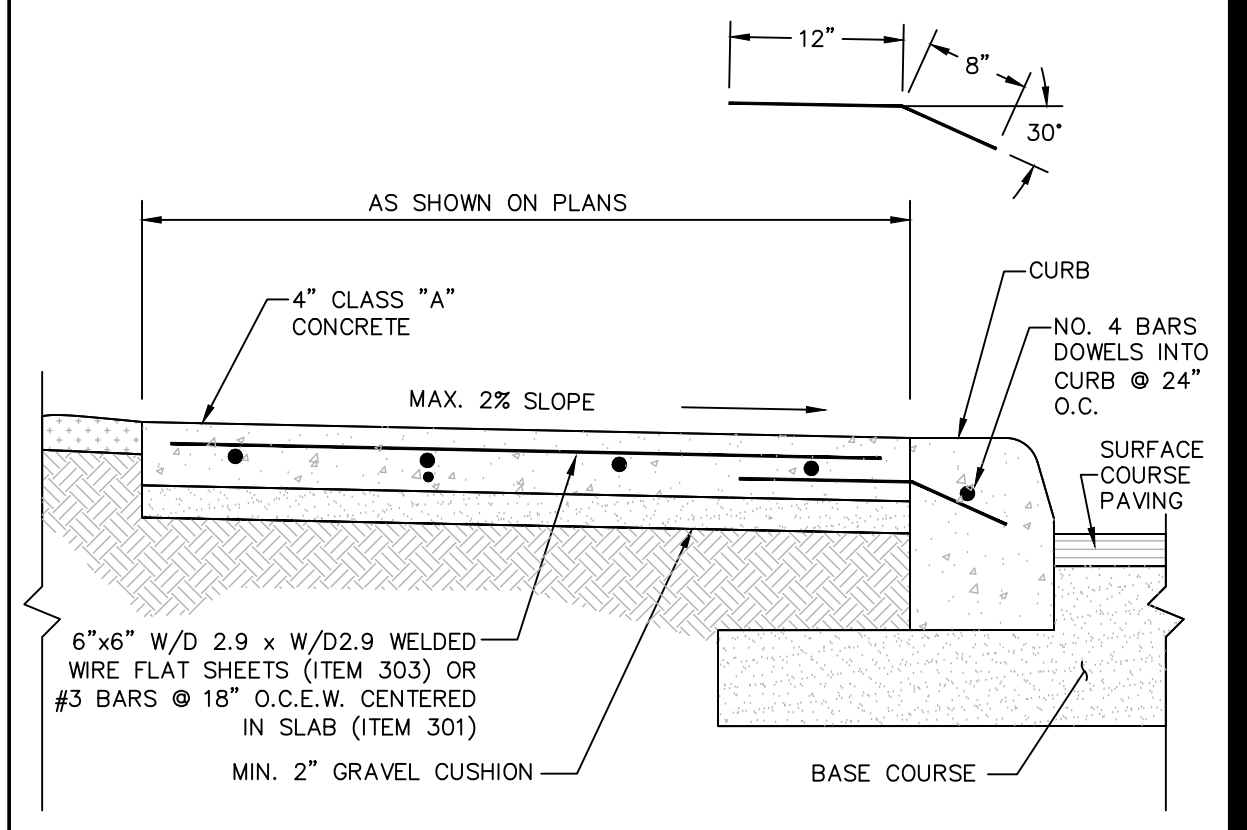
CONCRETE CURB DETAIL
NOT-TO-SCALE



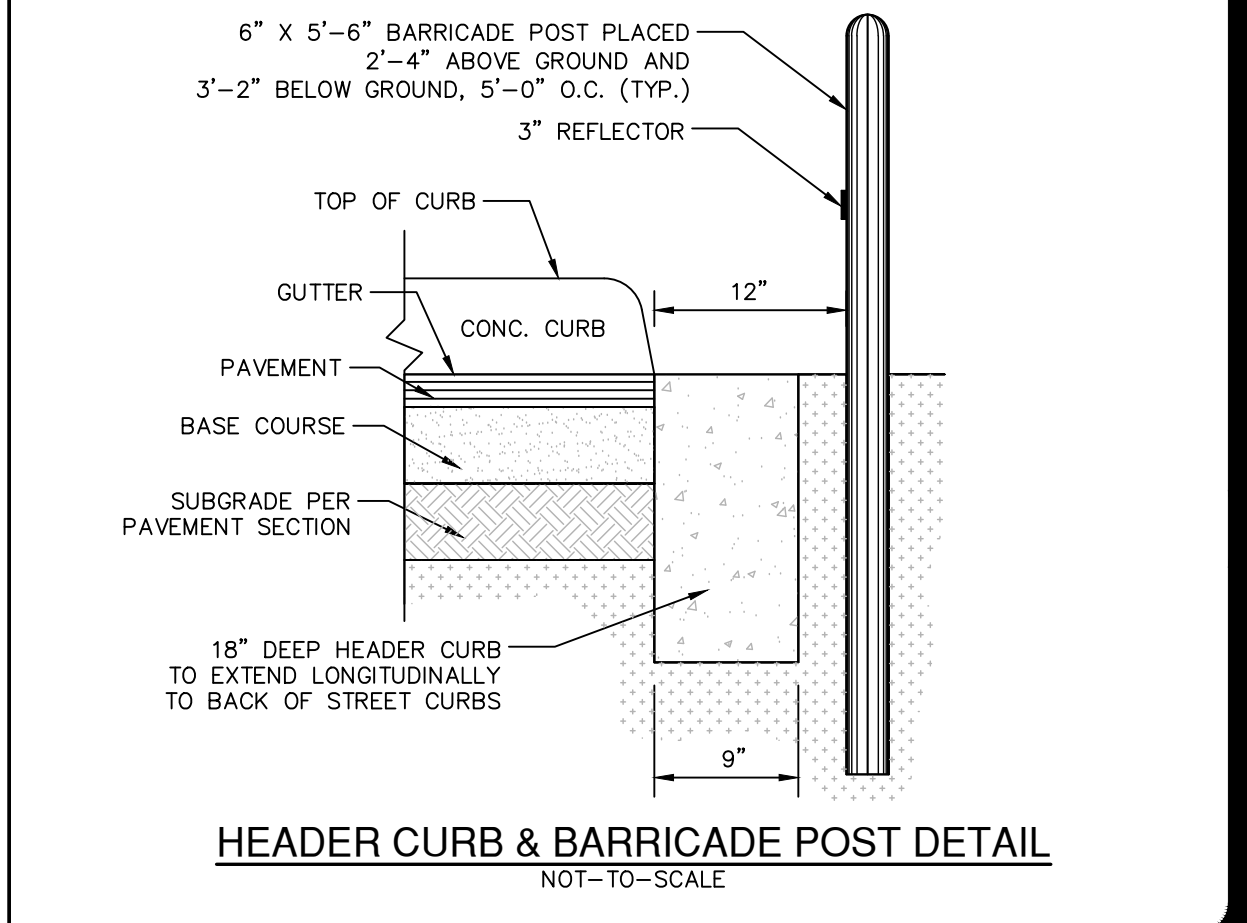
CURB TRANSITION DETAIL (FROM HEADER CURB TO STANDARD CURB)
NOT-TO-SCALE



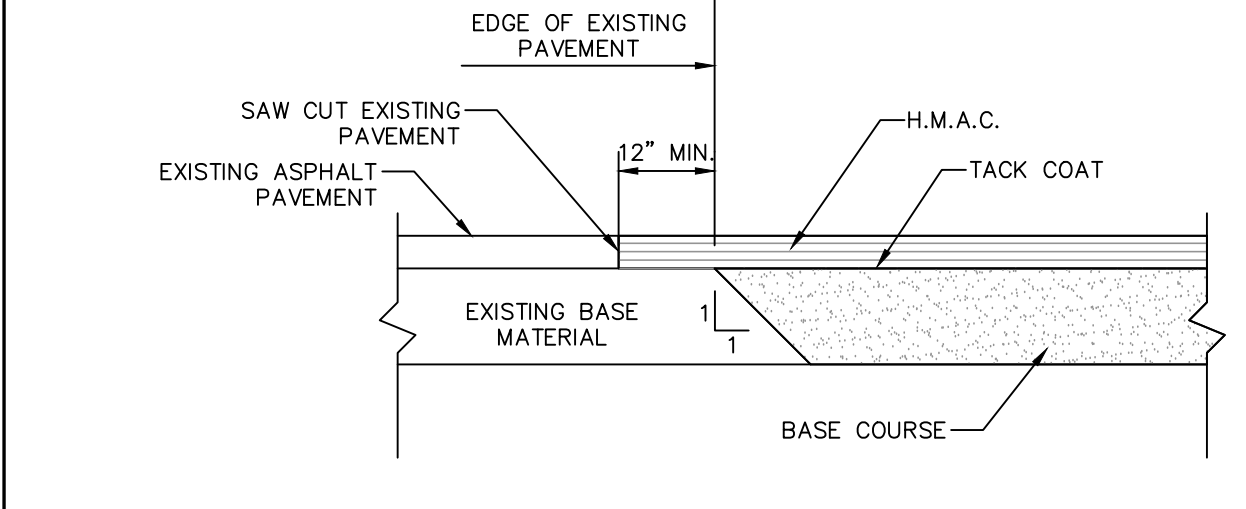
CURB TRANSITION DETAIL (FROM PAVEMENT TO STANDARD CURB)
NOT-TO-SCALE



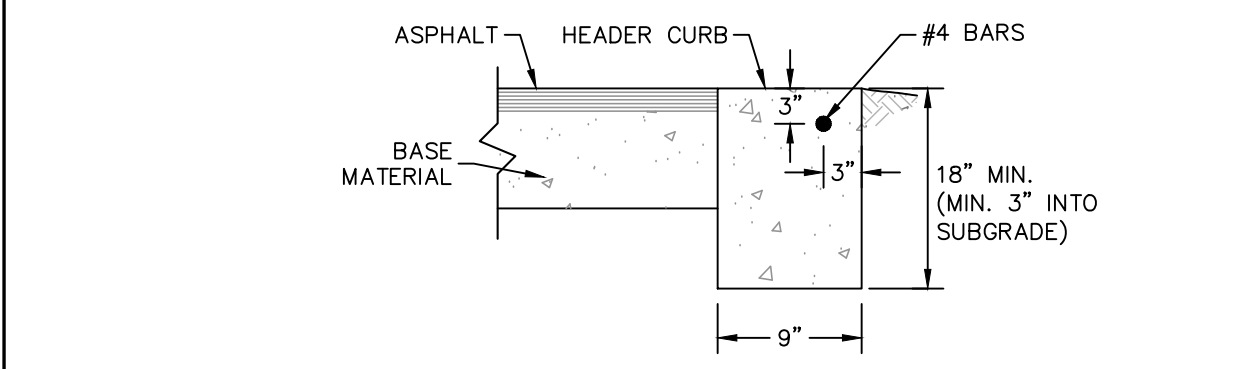
SIDEWALK DETAIL
NOT-TO-SCALE



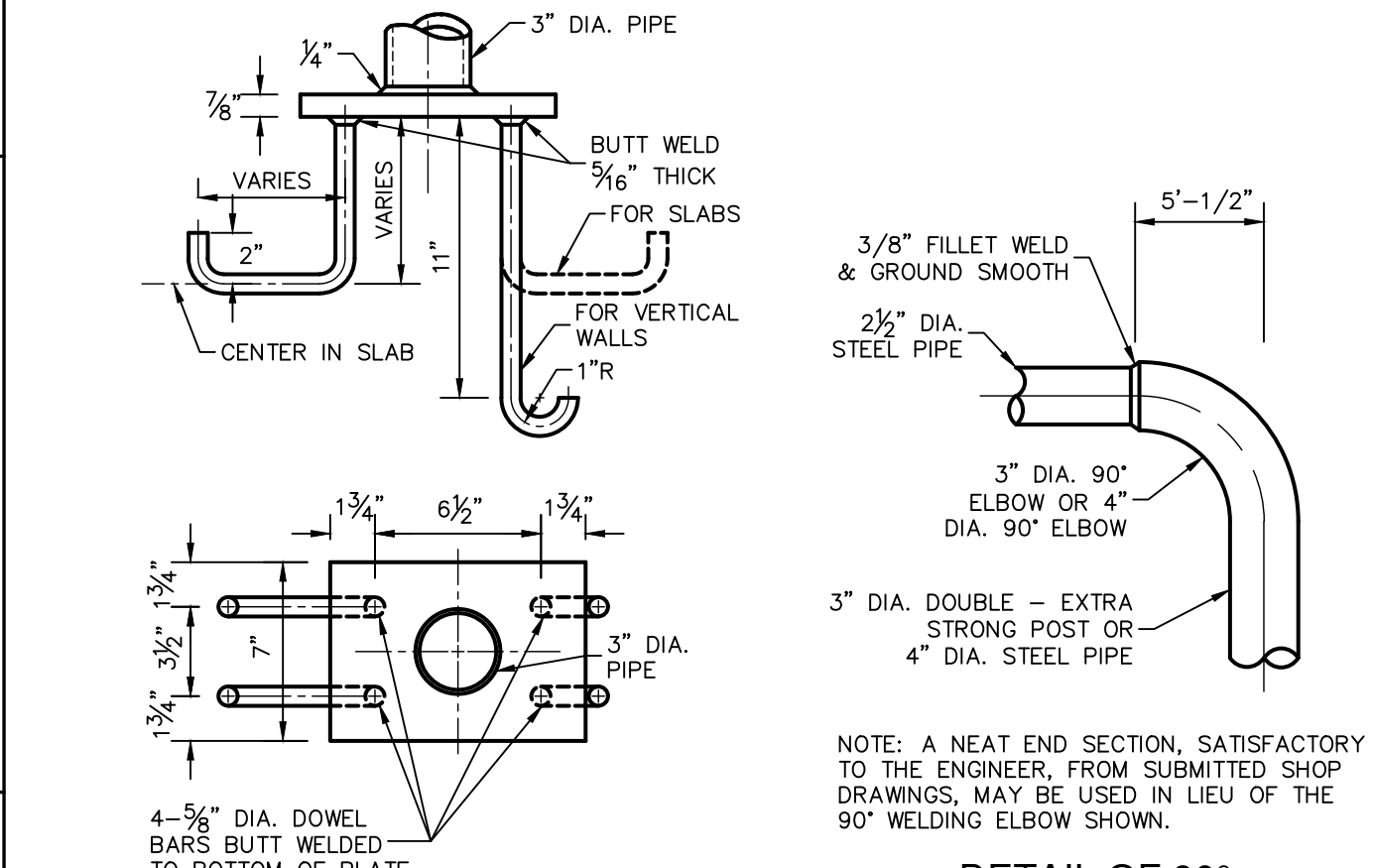
HEADER CURB & BARRICADE POST DETAIL
NOT-TO-SCALE



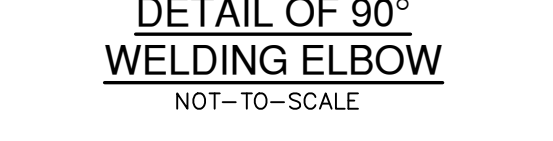
ASPHALT/ASPHALT JUNCTURE DETAIL
NOT-TO-SCALE



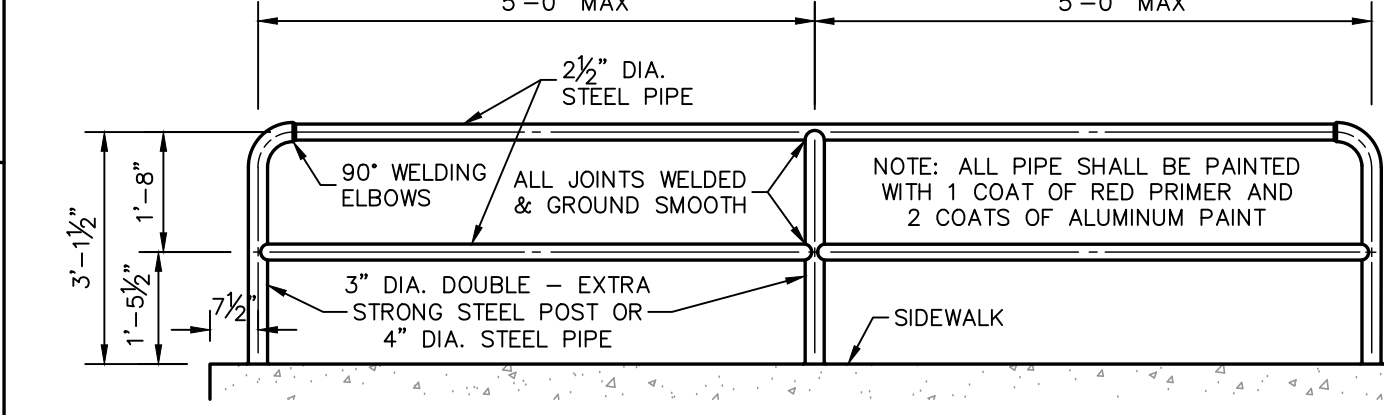
HEADER CURB DETAIL
NOT-TO-SCALE



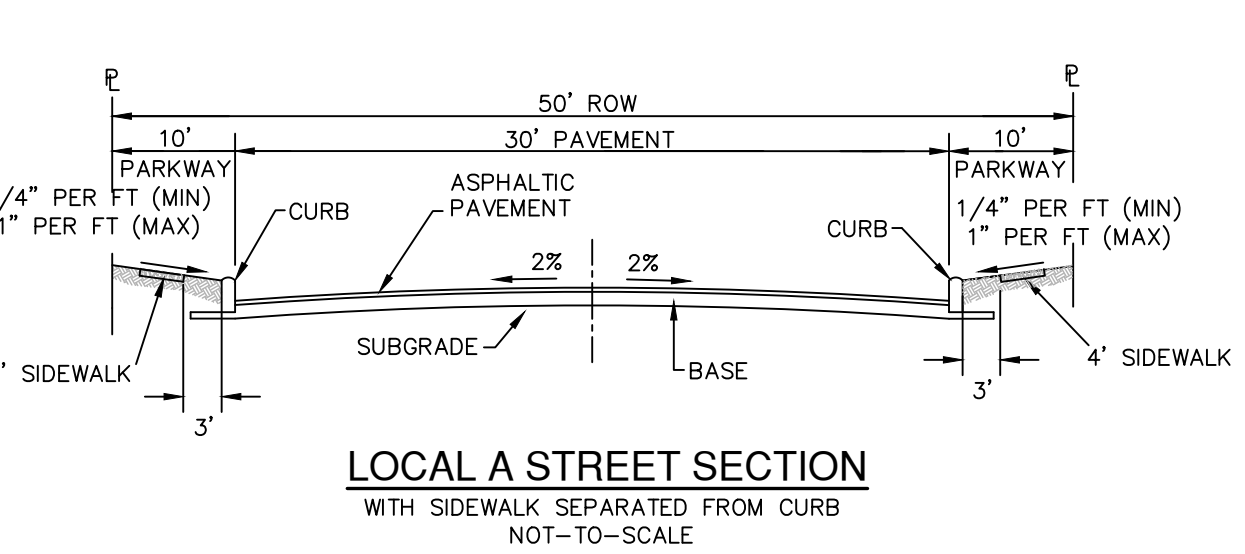
PIPE ANCHORAGE DETAIL
NOT-TO-SCALE



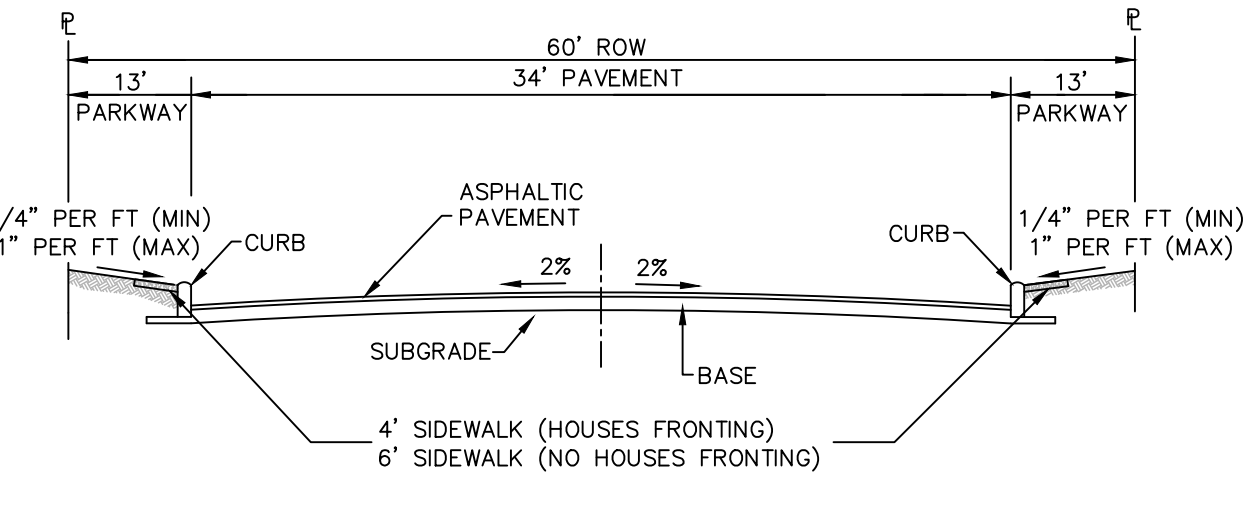
DETAIL OF 90\"/>



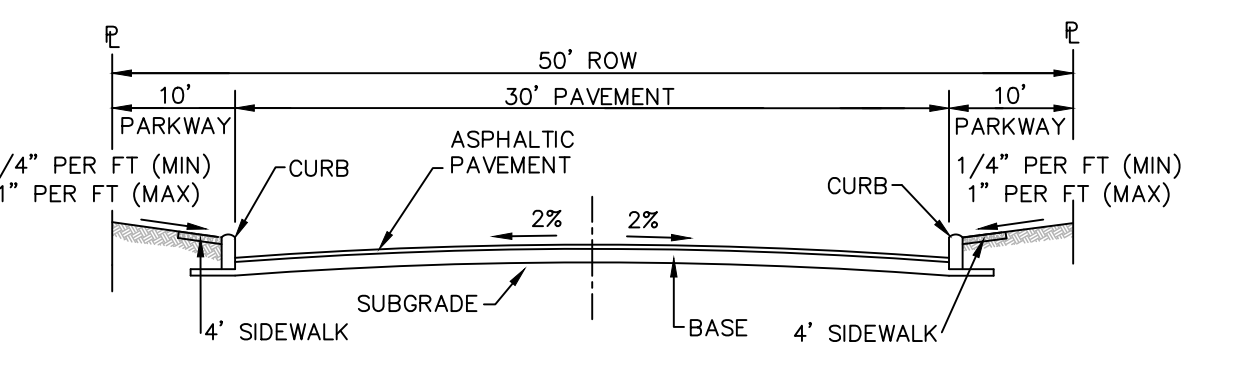
PIPE RAILING DETAIL
NOT-TO-SCALE



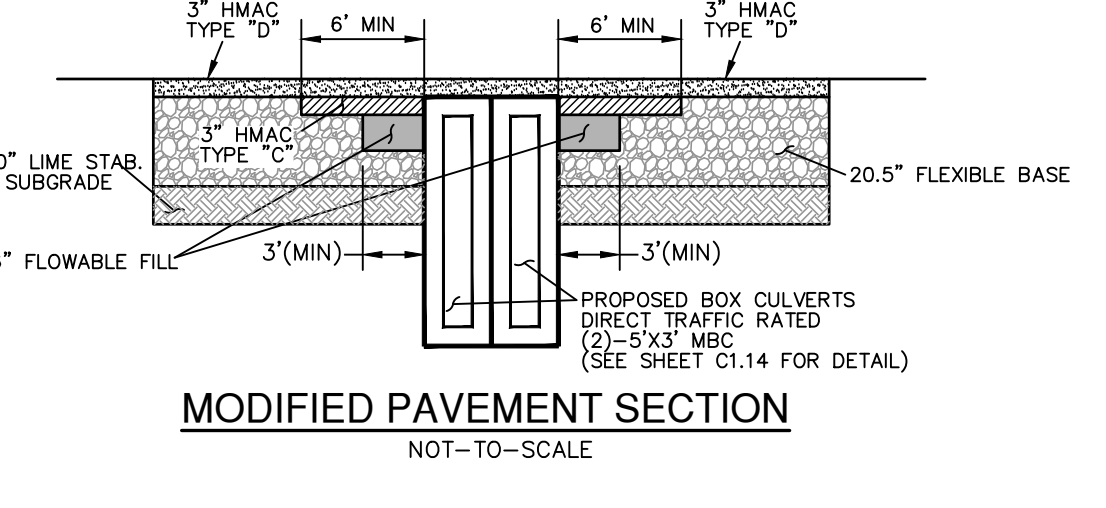
LOCAL A STREET SECTION WITH SIDEWALK SEPARATED FROM CURB
NOT-TO-SCALE



LOCAL B STREET SECTION
NOT-TO-SCALE



LOCAL A STREET SECTION
NOT-TO-SCALE

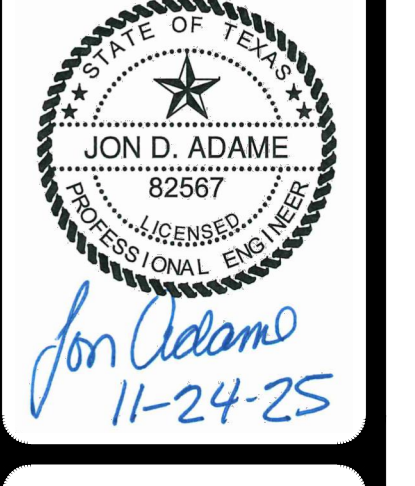


MODIFIED PAVEMENT SECTION
NOT-TO-SCALE

***REFERENCE THIS SHEET FOR PAVEMENT SECTION DETAIL FOR PAVEMENT AND FLEXIBLE BASE THICKNESS.

NOTE: CONTRACTOR SHALL OBTAIN A LETTER FROM DRAINAGE BOX/PIPE MANUFACTURER CONFIRMING THE PROPOSED DRAINAGE BOX/PIPE CAN HANDLE ANTICIPATED TRAFFIC LOAD PRIOR TO FINAL INSPECTION.

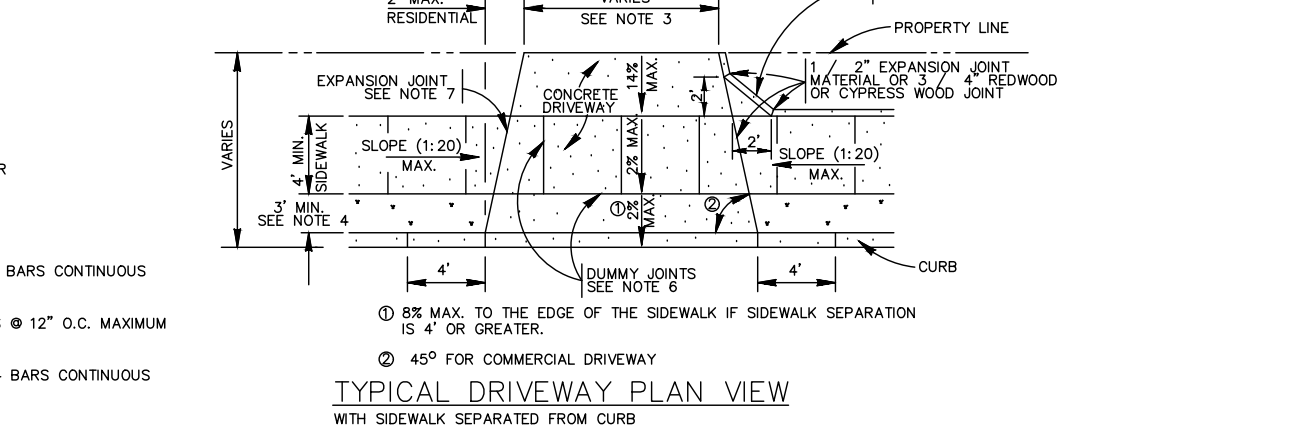
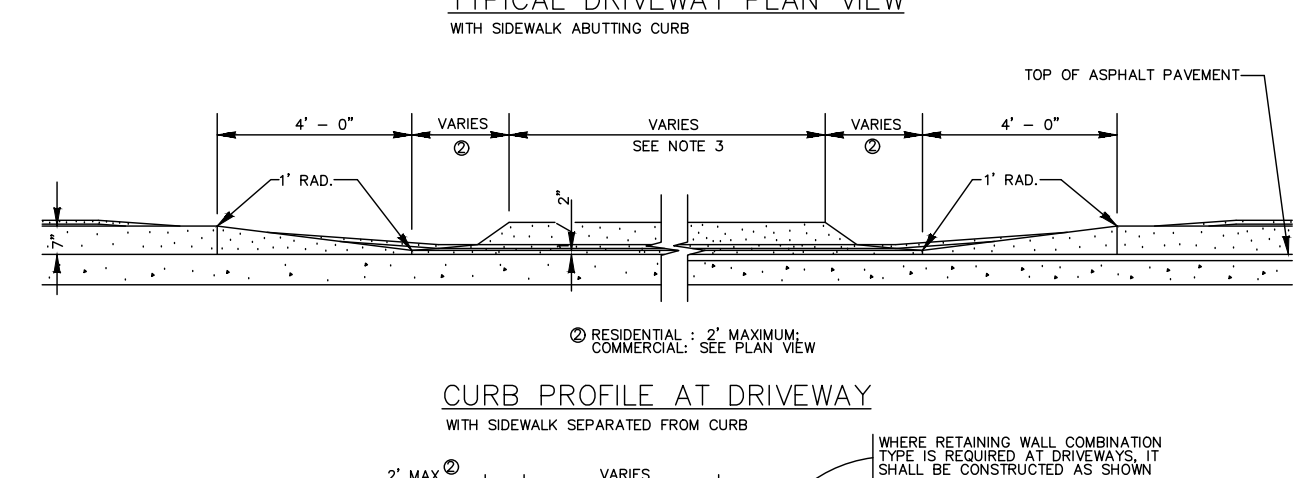
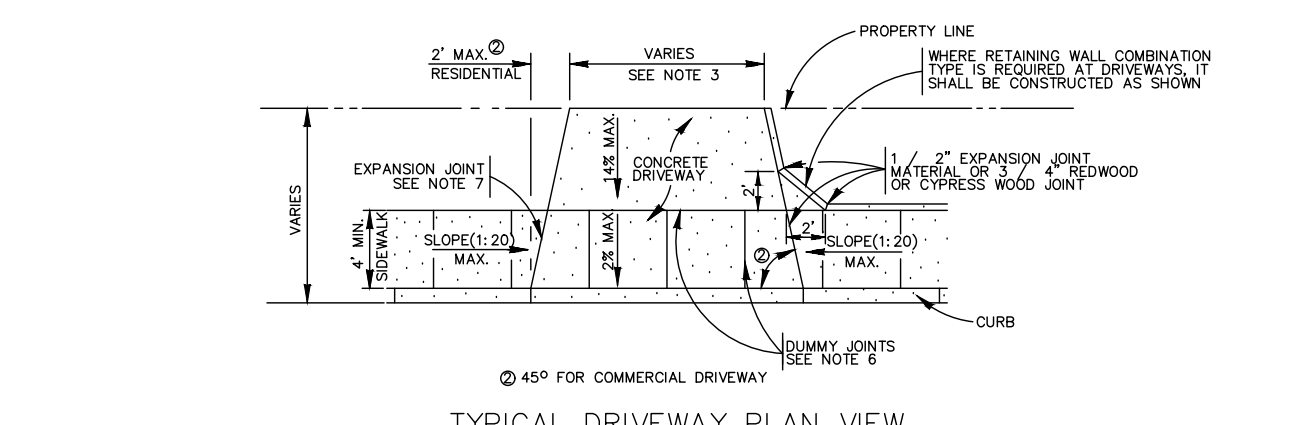
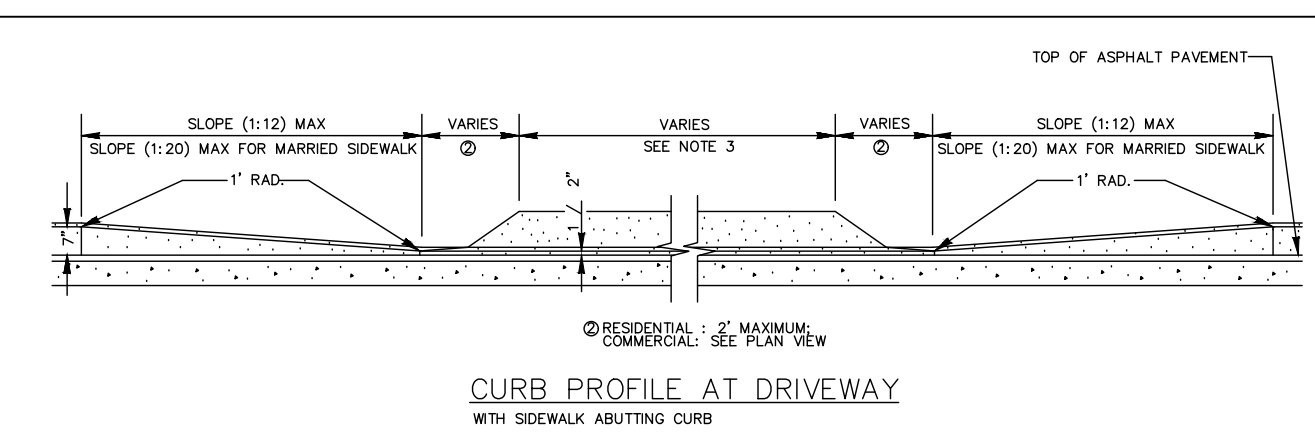
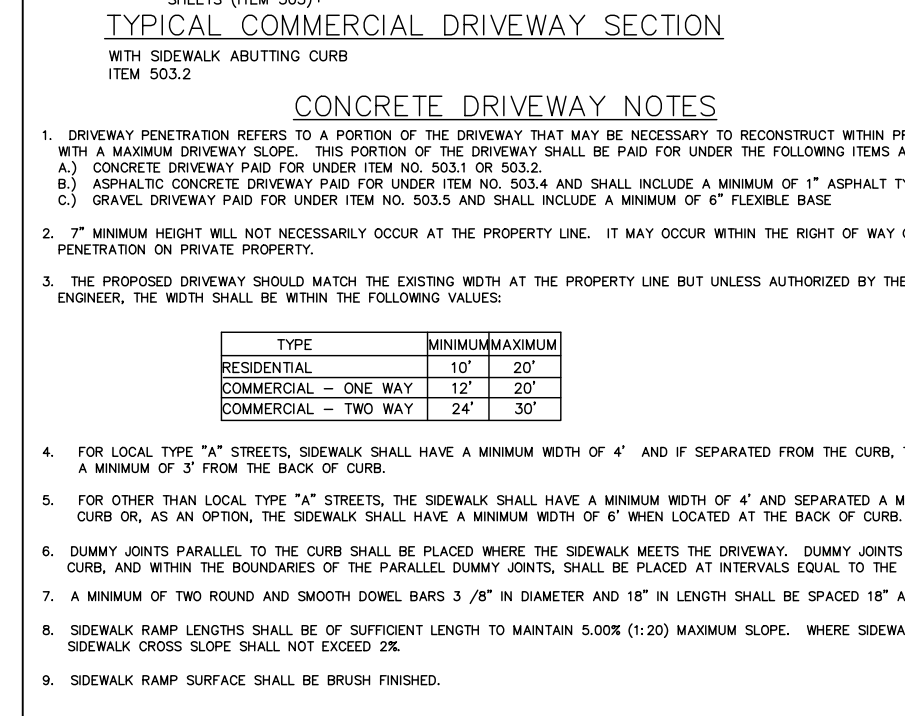
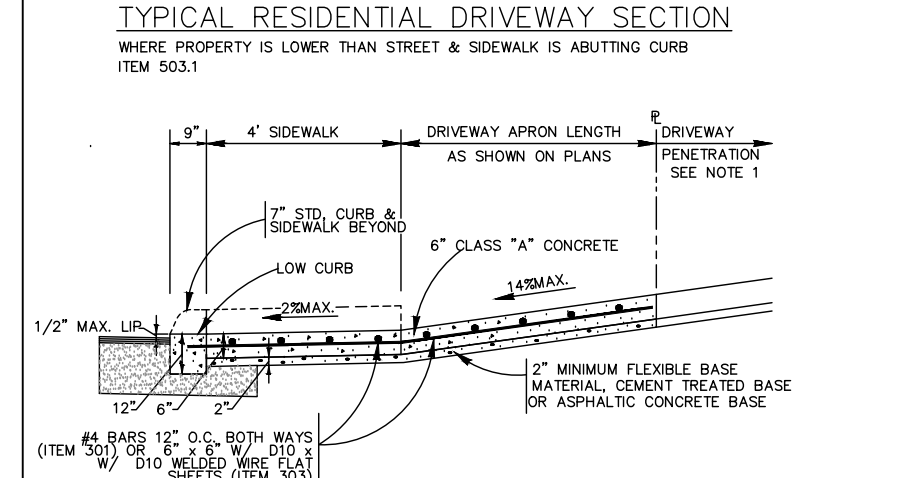
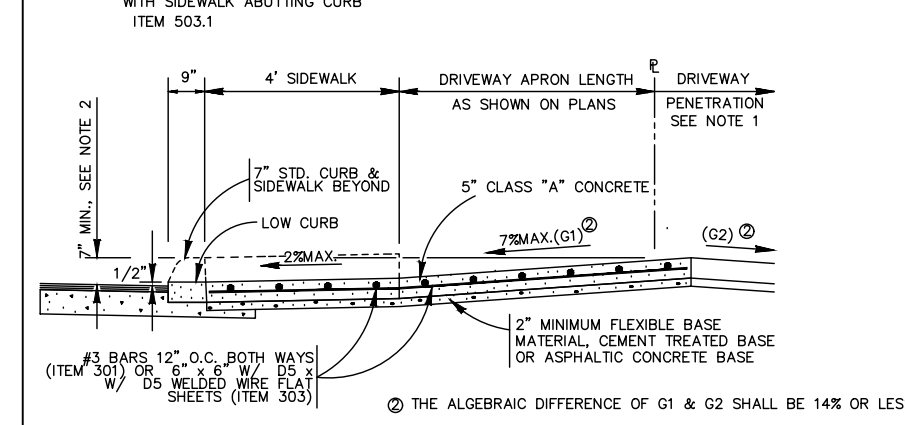
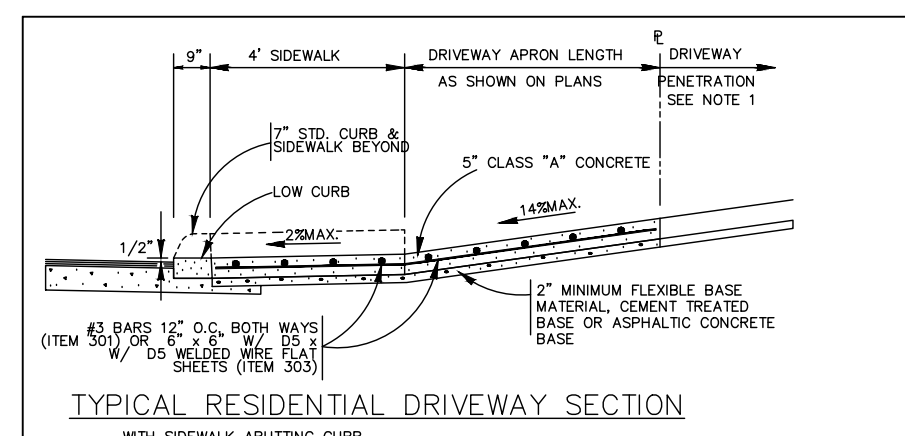
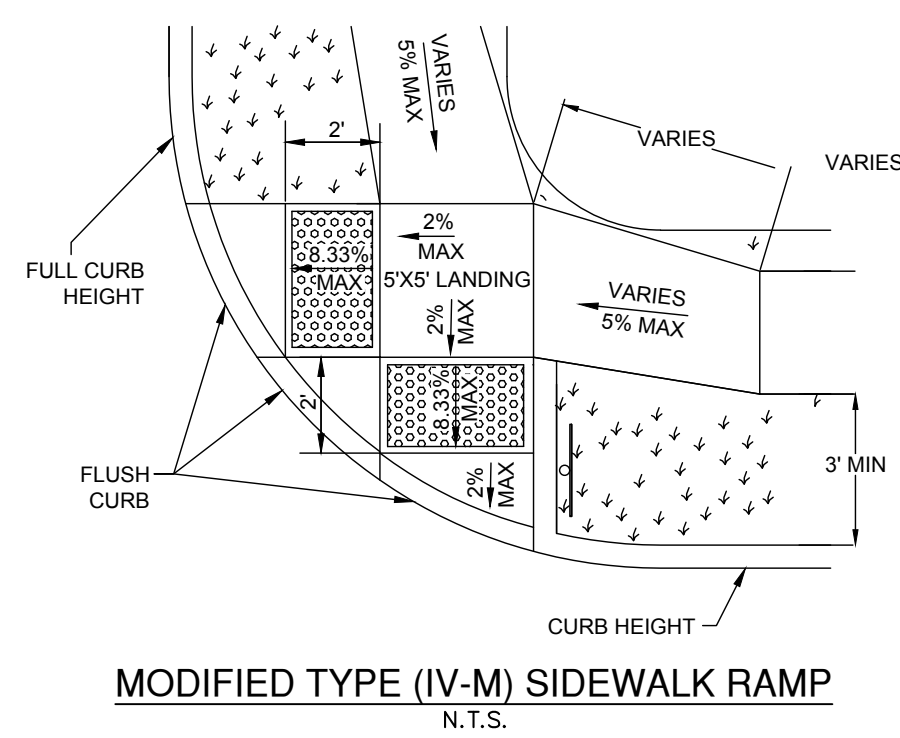
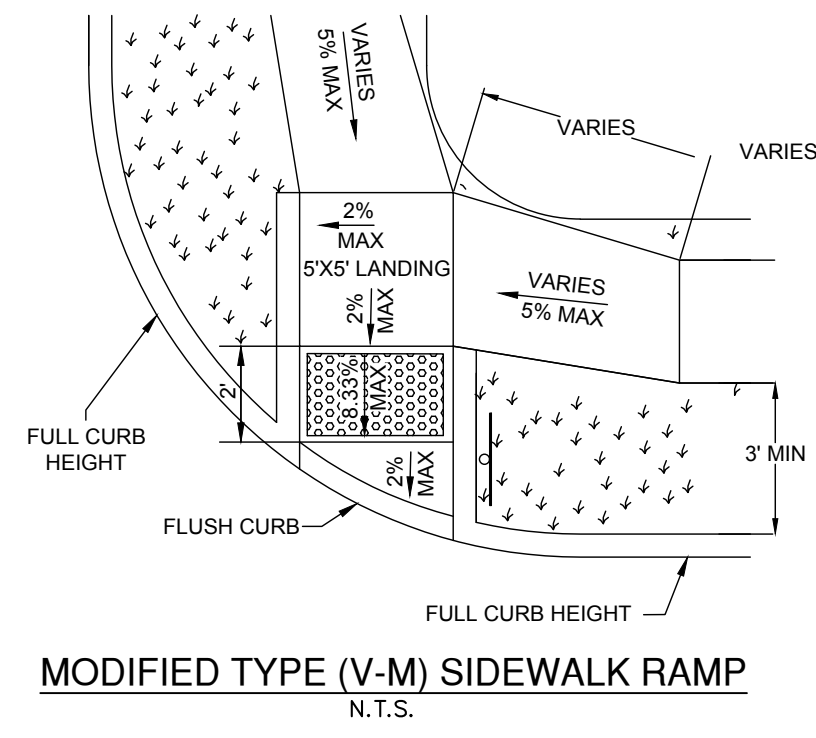
DATE	NO.	REVISION



PAPE-DAWSON ENGINEERS
2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10058900

APOLLO OAKS
BEXAR COUNTY, TEXAS
STREET DETAILS

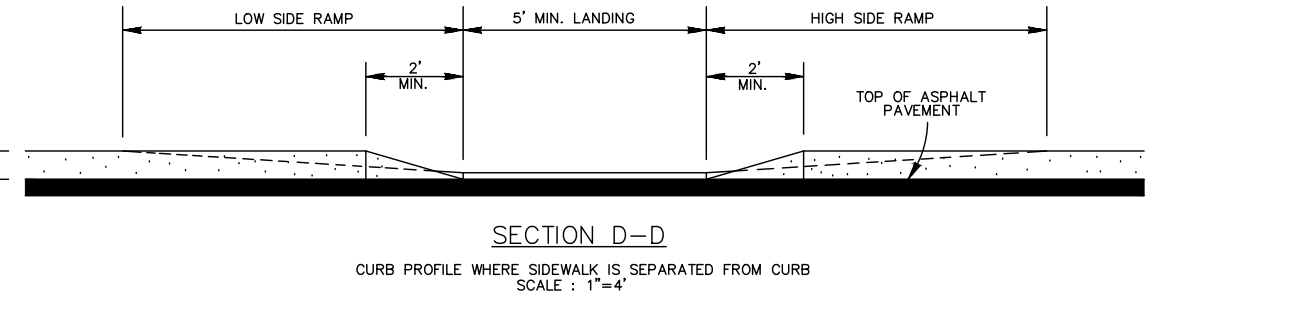
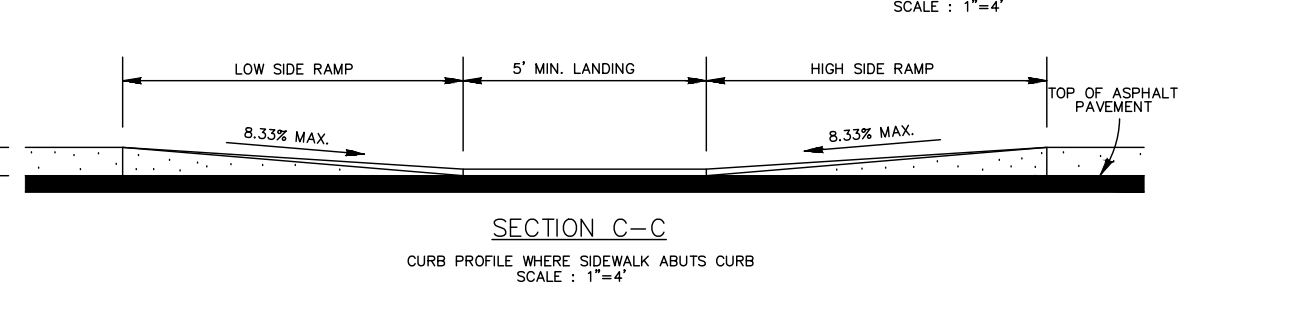
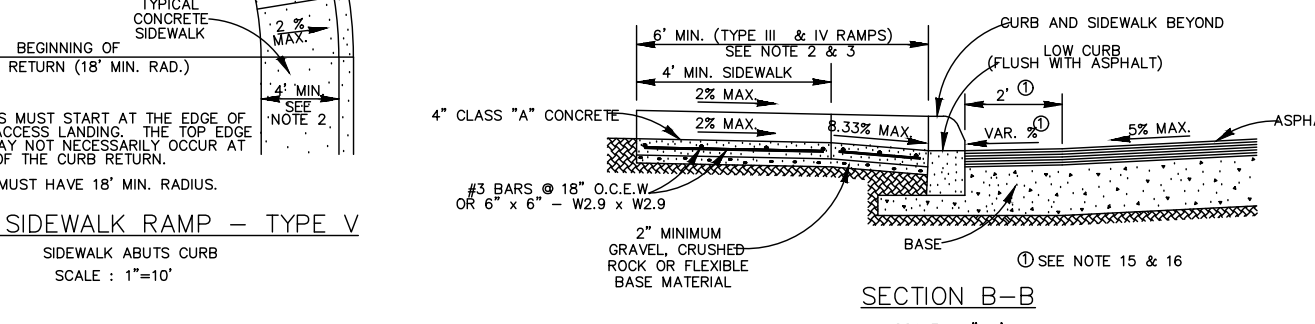
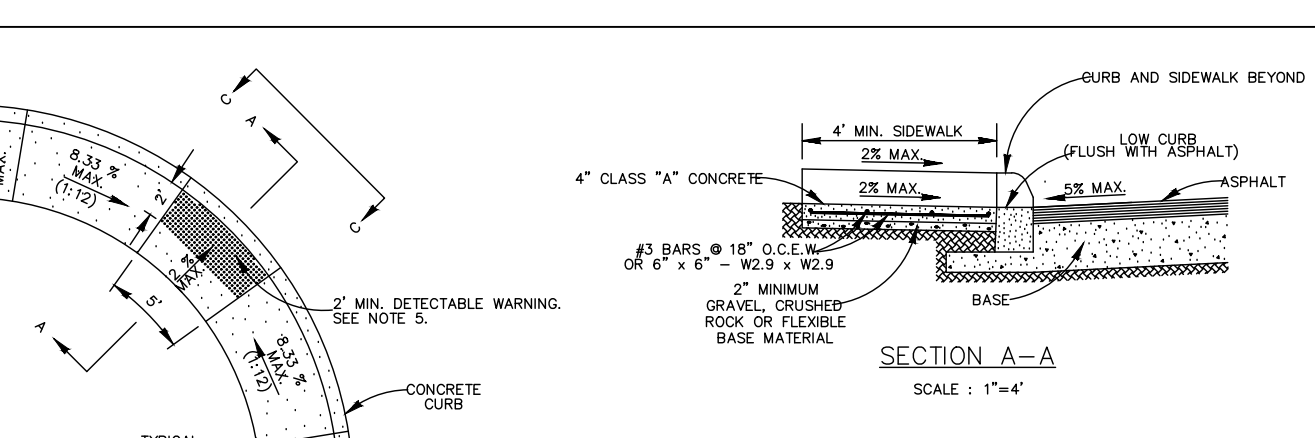
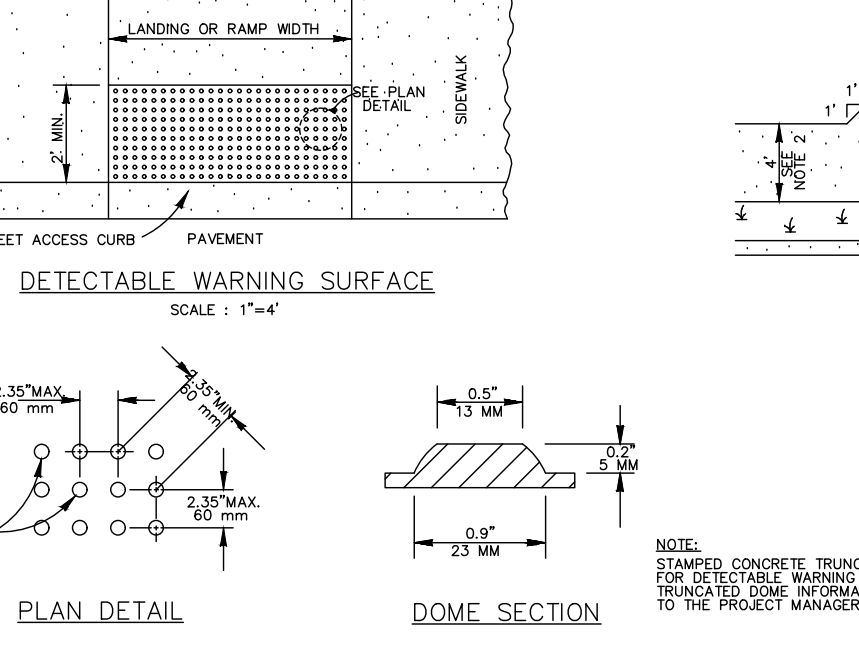
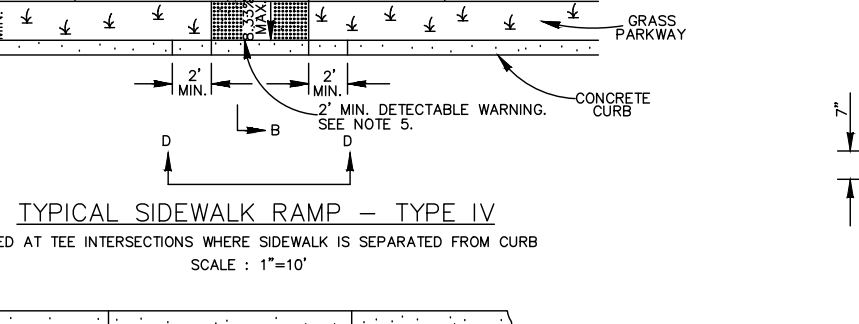
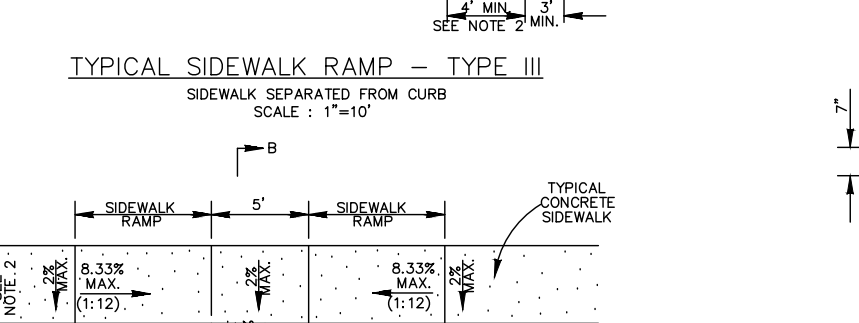
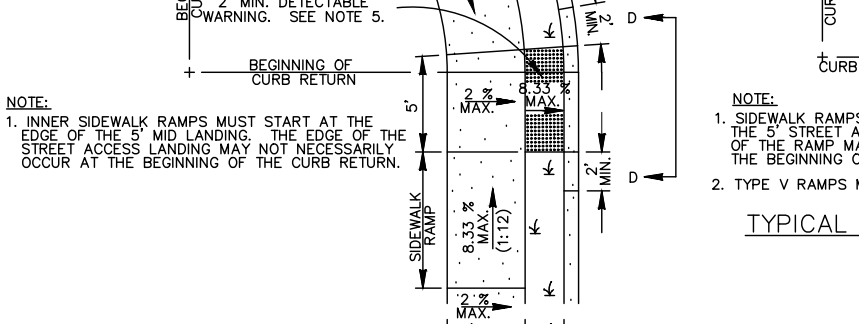
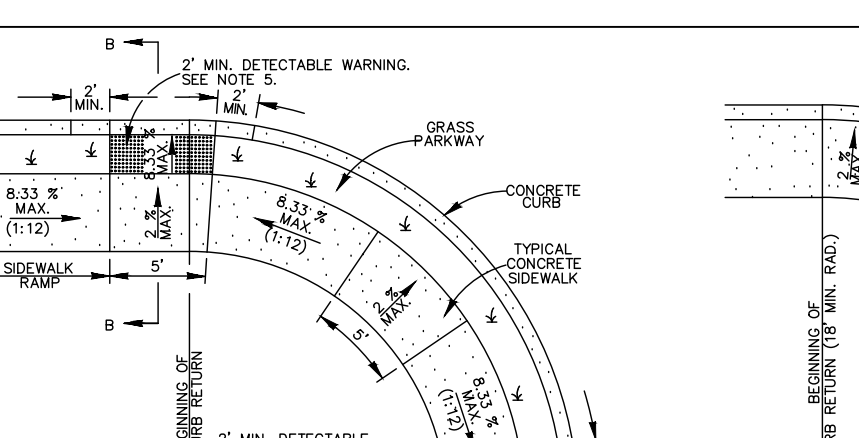
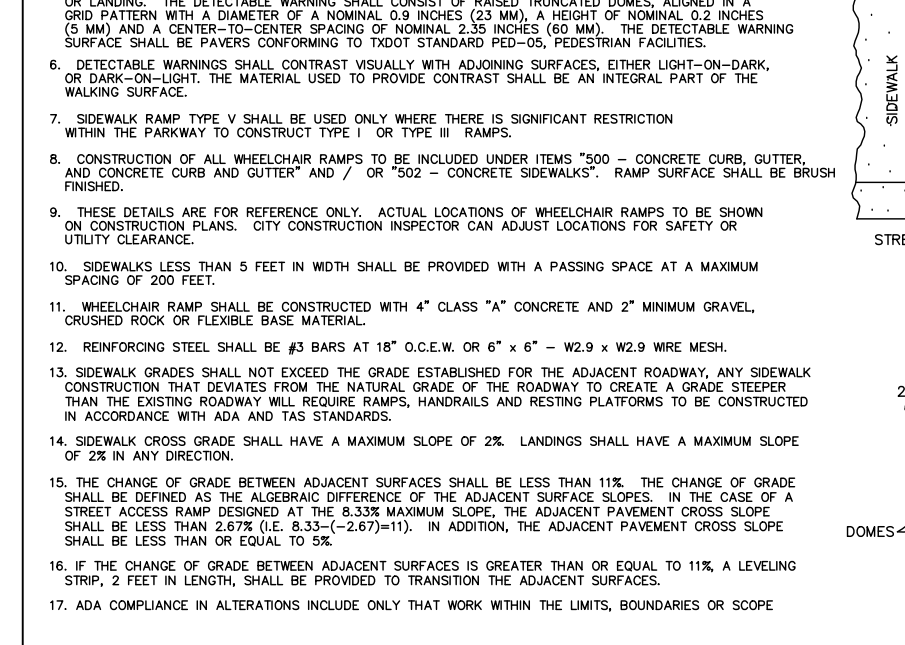
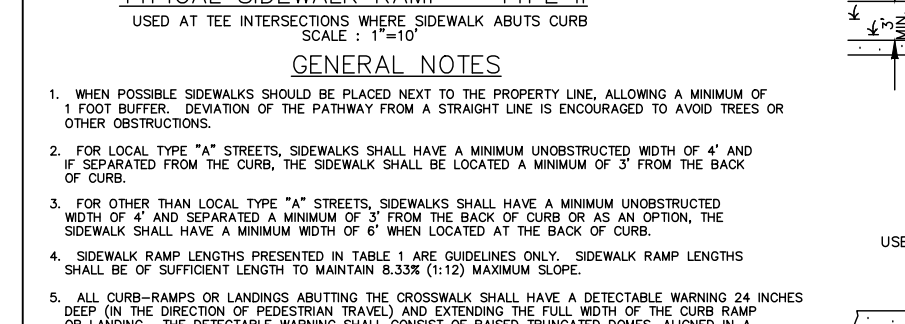
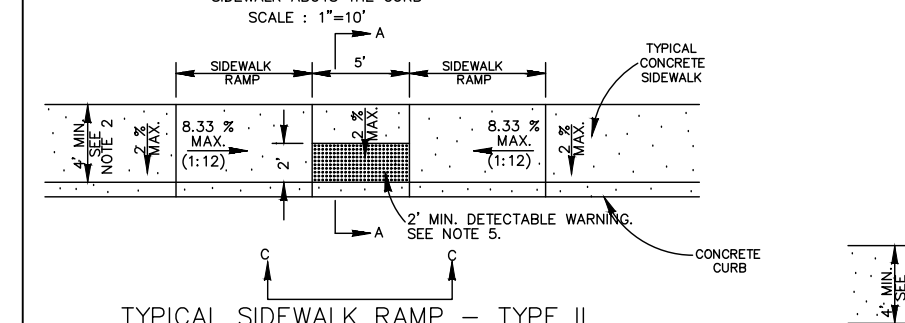
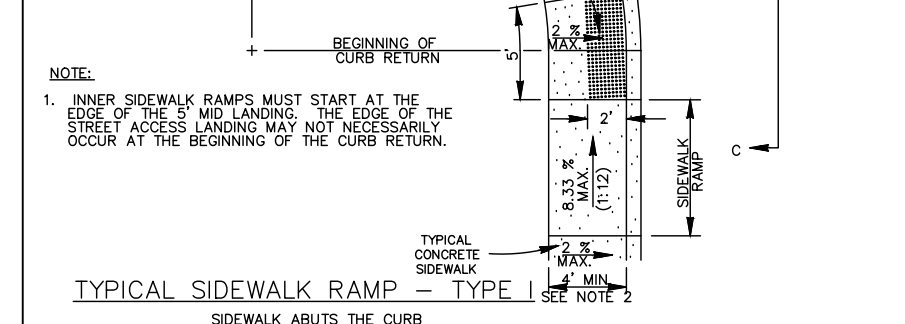
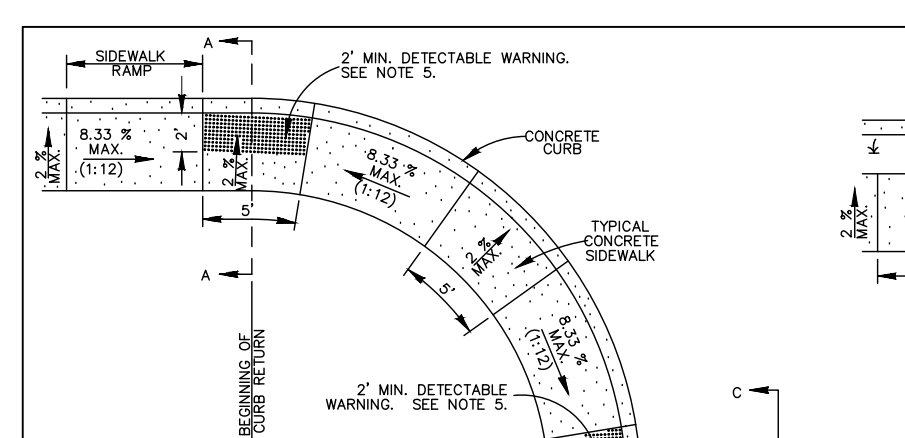
PLAT NO.	CP202506
JOB NO.	13657-00
DATE	NOVEMBER 2025
DESIGNER	-
CHECKED	-
DRAWN	-
SHEET	C2.10



JANUARY 2024

CONCRETE DRIVEWAY STANDARDS

DATE: _____
DRAWN BY: _____
CHECKED BY: _____
DESIGNED BY: _____



GENERAL NOTES

- WHEN POSSIBLE, SIDEWALKS SHOULD BE PLACED NEXT TO THE PROPERTY LINE, ALLOWING A MINIMUM OF 1 FOOT BETWEEN SEPARATION OF THE SIDEWALK FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TRENCHES OR OBSTRUCTIONS.
- 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.
- 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.
- SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN SLOPE (1:20) MAXIMUM SLOPE.
- ALL CURB-RAMPS OR LANDINGS ABUTTING THE DRIVEWAY SHALL HAVE A DETECTABLE WARNING 24 INCHES DEEP (IN THE DIRECTION OF PEDESTRIAN TRAVEL) AND EXTENDING THE FULL WIDTH OF THE CURB RAMP OR LANDINGS. THE DETECTABLE WARNING SHALL BE CONSTRUCTED WITHIN THE DRIVEWAY OR LANDINGS AND A CENTER-TO-CENTER SPACING OF MINIMUM 1.55 INCHES (1/2\"/>

DETECTABLE WARNING SURFACE
SCALE: 1"=4'

PLAN DETAIL

DOMES SECTION

WHEELCHAIR PASSING SPACE
SCALE: 1"=10'

**TABLE 1
SIDEWALK RAMP LENGTH (1:12)**

OUTLET SLOPE	SIDEWALK RAMP LENGTH (1:12)	
	LOW SIDE	HIGH SIDE
1%	5'-6"	7'-2"
2%	5'-0"	6'-4"
3%	4'-6"	10'-0"
4%	4'-2"	12'-6"
5%	3'-10"	16'-8"

NOTE: STAMPED CONCRETE TRUNCATED DOMES WILL NOT BE ALLOWED TO BE USED FOR CURB DETECTABLE WARNING OR WHEELCHAIR PASSING SPACE. CONTRACTORS MUST SUBMIT FROM CURB DETECTABLE WARNING OR WHEELCHAIR PASSING SPACE TO THE PROJECT MANAGER FOR APPROVAL AT LEAST 10 DAYS PRIOR TO INSTALLATION.

DATE: _____

NO. REVISION: _____

STATE OF TEXAS
JON D. ADAME
82567
PROFESSIONAL ENGINEER

10/24/25

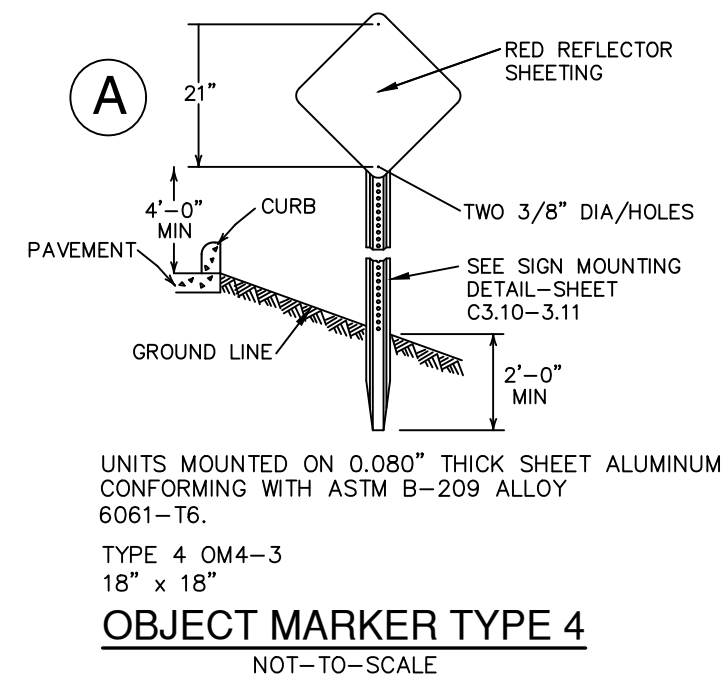
PAPE-DAWSON ENGINEERS

2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #479 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
BEXAR COUNTY, TEXAS

STREET DETAILS

PLAT NO. CP202506
JOB NO. 13657-00
DATE OCTOBER 2025
DESIGNER _____
CHECKED _____ DRAWN _____
SHEET C2.11

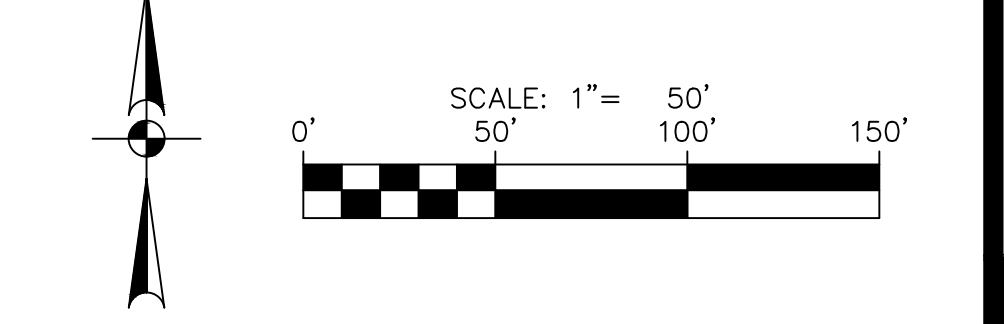
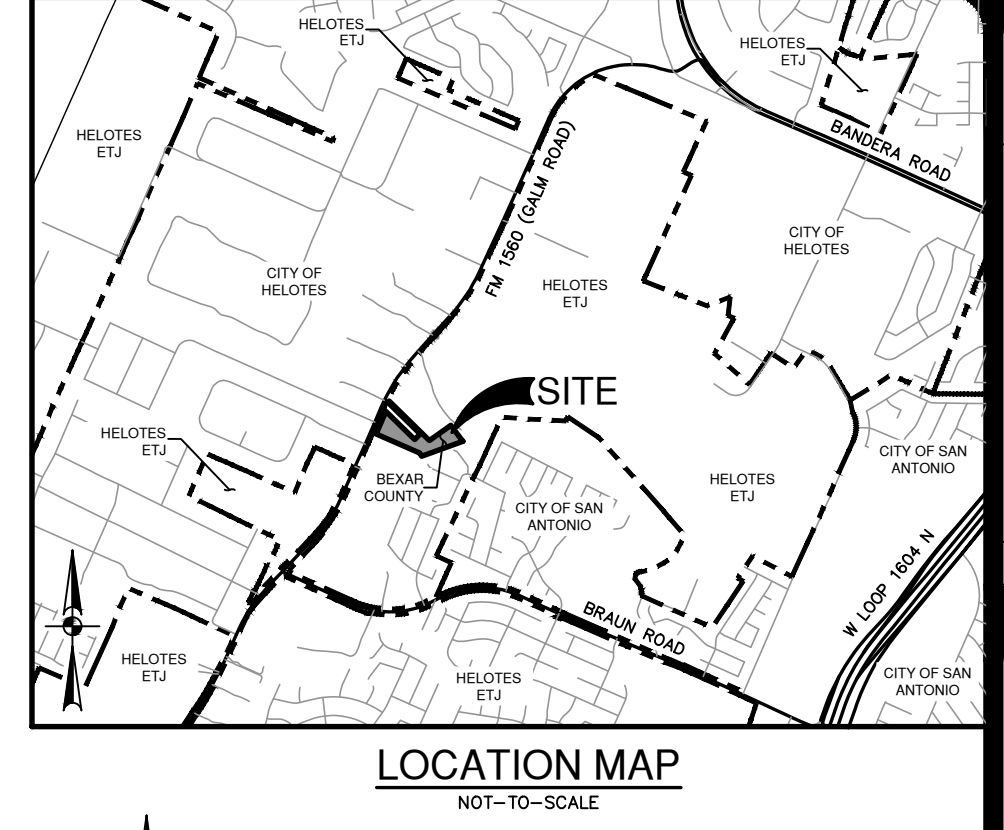


UNITS MOUNTED ON 0.080" THICK SHEET ALUMINUM CONFORMING WITH ASTM B-209 ALLOY 6061-T6.
TYPE 4 OM4-3
18" x 18"
OBJECT MARKER TYPE 4
NOT-TO-SCALE

SYMBOL	ITEM NUMBER	SYMBOL	ITEM NUMBER
	UNIT BOUNDARY		W14-2 30"x30"
	PROPOSED DRIVEWAY		531.54
	TRAFFIC FLOW ARROW		531.56
	SIDEWALK (HOMEBUILDER RESPONSIBILITY)		END OF ROAD MARKER OM4-3 NO SEPARATE PAY ITEM
	SIDEWALK (SITWORK CONTRACTOR RESPONSIBILITY)		531.3
	TYPE II BLUE RAISED PAVEMENT MARKERS - NO SEPARATE PAY ITEM (N.T.S.)		R1-1 30"x30"
	Street Name		R1-1 36"x36"
			(EXISTING) W2-BR 30"x30"
			(EXISTING) W16-80P 15"x30"
			MAINTENANCE SIGN (24"x18")

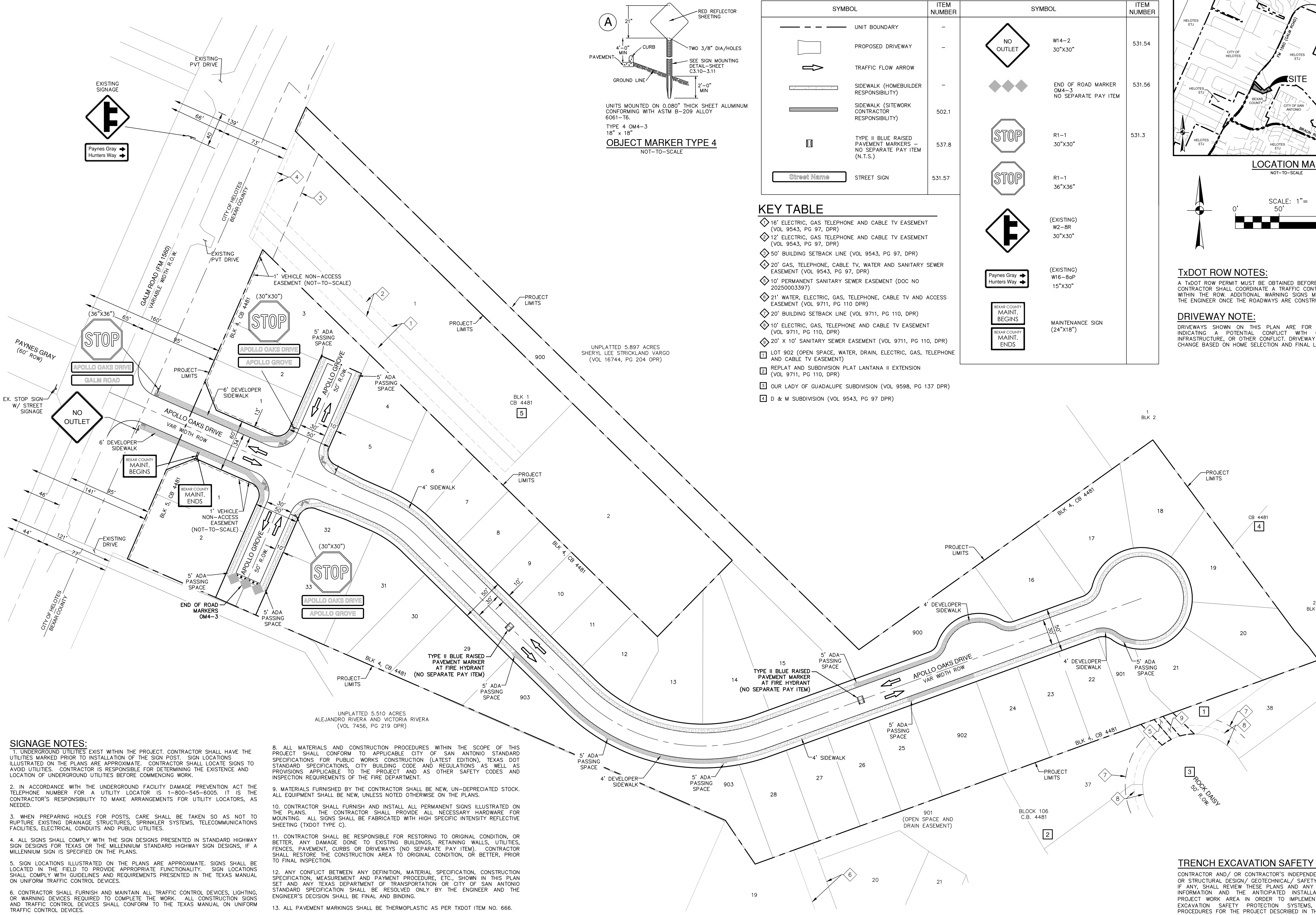
KEY TABLE

- 16' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- 12' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- 50' BUILDING SETBACK LINE (VOL 9543, PG 97, DPR)
- 20' GAS, TELEPHONE, CABLE TV, WATER AND SANITARY SEWER EASEMENT (VOL 9543, PG 97, DPR)
- 10' PERMANENT SANITARY SEWER EASEMENT (DOC NO 20250003397)
- 21' WATER, ELECTRIC, GAS, TELEPHONE, CABLE TV AND ACCESS EASEMENT (VOL 9711, PG 110 DPR)
- 20' BUILDING SETBACK LINE (VOL 9711, PG 110, DPR)
- 10' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL 9711, PG 110, DPR)
- 20' x 10' SANITARY SEWER EASEMENT (VOL 9711, PG 110, DPR)
- LOT 902 (OPEN SPACE, WATER, DRAIN, ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT)
- REPLAT AND SUBDIVISION PLAT LANTANA II EXTENSION (VOL 9711, PG 110, DPR)
- OUR LADY OF GUADALUPE SUBDIVISION (VOL 9598, PG 137 DPR)
- D & M SUBDIVISION (VOL 9543, PG 97 DPR)



TxDOT ROW NOTES:
A TxDOT ROW PERMIT MUST BE OBTAINED BEFORE WORKING IN TxDOT ROW. 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.

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.



- SIGNAGE NOTES:**
- UNDERGROUND UTILITIES EXIST WITHIN THE PROJECT. CONTRACTOR SHALL HAVE THE UTILITIES MARKED PRIOR TO INSTALLATION OF THE SIGN POST. SIGN LOCATIONS ILLUSTRATED ON THE PLANS ARE APPROXIMATE. CONTRACTOR SHALL LOCATE SIGNS TO AVOID UTILITIES. CONTRACTOR IS RESPONSIBLE FOR DETERMINING THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES BEFORE COMMENCING WORK.
 - IN ACCORDANCE WITH THE UNDERGROUND FACILITY DAMAGE PREVENTION ACT THE TELEPHONE NUMBER FOR A UTILITY LOCATOR IS 1-800-545-6005. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE ARRANGEMENTS FOR UTILITY LOCATORS, AS NEEDED.
 - WHEN PREPARING HOLES FOR POSTS, CARE SHALL BE TAKEN SO AS NOT TO RUPTURE EXISTING DRAINAGE STRUCTURES, SPRINKLER SYSTEMS, TELECOMMUNICATIONS FACILITIES, ELECTRICAL CONDUITS AND PUBLIC UTILITIES.
 - ALL SIGNS SHALL COMPLY WITH THE SIGN DESIGNS PRESENTED IN STANDARD HIGHWAY SIGN DESIGNS FOR TEXAS OR THE MILLENNIUM STANDARD HIGHWAY SIGN DESIGNS, IF A MILLENNIUM SIGN IS SPECIFIED ON THE PLANS.
 - SIGN LOCATIONS ILLUSTRATED ON THE PLANS ARE APPROXIMATE. SIGNS SHALL BE LOCATED IN THE FIELD TO PROVIDE APPROPRIATE FUNCTIONALITY. SIGN LOCATIONS SHALL COMPLY WITH GUIDELINES AND REQUIREMENTS PRESENTED IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
 - CONTRACTOR SHALL FURNISH AND MAINTAIN ALL TRAFFIC CONTROL DEVICES, LIGHTING, OR WARNING DEVICES REQUIRED TO COMPLETE THE WORK. ALL CONSTRUCTION SIGNS AND TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
 - THREE (3) COPIES OF EQUIPMENT SUBMITTALS FOR ALL TRAFFIC SIGN COMPONENTS SHALL BE SENT TO THE ENGINEER. SUBMITTALS SHALL CONSIST OF THE APPROPRIATE COMBINATION OF CATALOG SHEETS, MATERIAL LISTS, MANUFACTURER'S BROCHURES, TECHNICAL BULLETINS, SPECIFICATIONS, DIAGRAMS, OR PRODUCT SAMPLES NECESSARY TO DESCRIBE A SYSTEM, PRODUCT, OR ITEM. SPECIFIC ITEM NUMBERS AND PRODUCT CODES WILL BE CLEARLY IDENTIFIED WHEN MULTIPLE PRODUCTS ARE LISTED ON THE SAME SHEET.

- ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS PROJECT SHALL CONFORM TO APPLICABLE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION (LATEST EDITION), TEXAS DOT STANDARD SPECIFICATIONS, CITY BUILDING CODE AND REGULATIONS AS WELL AS PROVISIONS APPLICABLE TO THE PROJECT AND AS OTHER SAFETY CODES AND INSPECTION REQUIREMENTS OF THE FIRE DEPARTMENT.
- MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE NEW, UN-DEPRECIATED STOCK. ALL EQUIPMENT SHALL BE NEW, UNLESS NOTED OTHERWISE ON THE PLANS.
- CONTRACTOR SHALL FURNISH AND INSTALL ALL PERMANENT SIGNS ILLUSTRATED ON THE PLANS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY HARDWARE FOR MOUNTING. ALL SIGNS SHALL BE FABRICATED WITH HIGH SPECIFIC INTENSITY REFLECTIVE SHEETING (TxDOT TYPE C).
- CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ORIGINAL CONDITION, OR BETTER, ANY DAMAGE DONE TO EXISTING BUILDINGS, RETAINING WALLS, UTILITIES, FENCES, PAVEMENT, CURBS OR DRIVEWAYS (NO SEPARATE PAY ITEM). CONTRACTOR SHALL RESTORE THE CONSTRUCTION AREA TO ORIGINAL CONDITION, OR BETTER, PRIOR TO FINAL INSPECTION.
- ANY CONFLICT BETWEEN ANY DEFINITION, MATERIAL SPECIFICATION, CONSTRUCTION SPECIFICATION, MEASUREMENT AND PAYMENT PROCEDURE, ETC., SHOWN IN THIS PLAN SET AND ANY TEXAS DEPARTMENT OF TRANSPORTATION OR CITY OF SAN ANTONIO STANDARD SPECIFICATION SHALL BE RESOLVED ONLY BY THE ENGINEER AND THE ENGINEER'S DECISION SHALL BE FINAL AND BINDING.
- ALL PAVEMENT MARKINGS SHALL BE THERMOPLASTIC AS PER TxDOT ITEM NO. 666.

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.

DATE: _____
NO. REVISION: _____

STATE OF TEXAS
JON D. ADAME
82567
PROFESSIONAL ENGINEER
Jon Adame
10/24/25

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1009800

APOLLO OAKS
BEXAR COUNTY, TEXAS
OVERALL SIGNAGE PLAN

PLAT NO. CP202506
JOB NO. 13657-00
DATE OCTOBER 2025
DESIGNER JF
CHECKED CR DRAWN JF
SHEET C3.00

Date: Oct 24, 2025, 4:29pm User: j.d.adame File: P:\13657\200\Drawings\CP202506-C3.00.dwg

THIS DOCUMENT HAS BEEN PRODUCED FROM MATERIAL THAT WAS STORED AND/OR TRANSMITTED ELECTRONICALLY AND MAY HAVE BEEN INADVERTENTLY ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE CONSULTANT'S ORIGINAL SIGNATURE AND SEAL. AERIAL IMAGERY PROVIDED BY GOOGLE/UNLESS OTHERWISE NOTED. Imagery © 2016, CAPOCO, Digital Globe, Texas Orthology Program, USDA Farm Service Agency.

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to descriptive and illustrative sheets)

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

Post Type
FR = Fiberglass Reinforced Plastic Pipe (see SMD(FR))
TW = Thin-Walled Tubing (see SMD(TW))
TBWG = 10 BWC Tubing (see SMD(SLIP-1) to (SLIP-3))
SB = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)
Anchor Type
UA - Universal Anchor - Corroded (see SMD(UA)) and (TW1)
UB - Universal Anchor - Bolted down (see SMD(UB)) and (TW1)
WA - Wedge Anchor Steel - (see SMD(WA))
WA - Wedge Anchor Plastic - (see SMD(WA))
SA - Sillpost - Corroded (see SMD(SLIP-1) to (SLIP-3))
SB - Sillpost - Bolted down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
P = Prefabricated (see SMD(SLIP-1) to (SLIP-3), (TW1), (FRP))
T = Prefabricated (see SMD(SLIP-1) to (SLIP-3), (TW1))
U = Prefabricated (see SMD(SLIP-1) to (SLIP-3))
E = Extended (see SMD(SLIP-1) to (SLIP-3))
EXT or EXT - Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TW1))
BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
W = 1/2" x 1/2" x 1/2" Wind 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 shall 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 shall be placed at least 6 ft. from the edge of the shoulder.

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

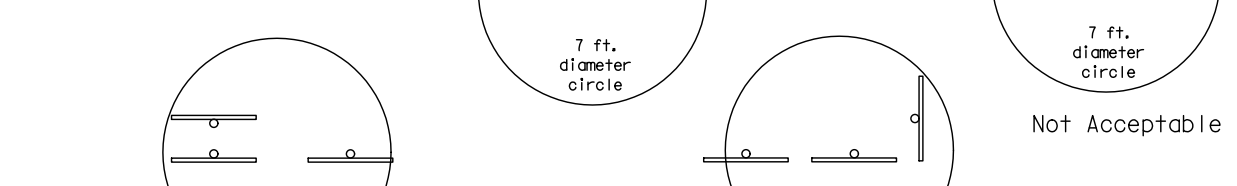
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



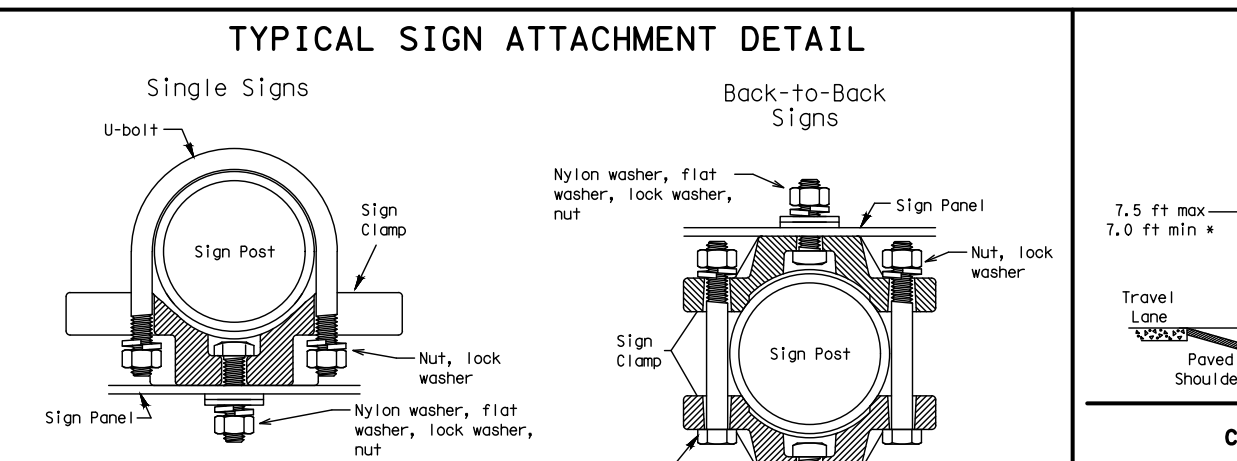
GENERAL NOTES
1. Slip base shall be permanently marked to indicate manufacturer, method, design, and location of marking one subject to approval of the TxDOT Traffic Standards Division.
2. Material used on post with this system shall conform to the following specifications:
a. 1/2" nominal wall thickness
b. Seamless or electric-resistance welded steel tubing or pipe
c. Steel shall be MIL-STD-883C or 35 per ASTM A1011 or ASTM A1008
d. 50,000 PSI minimum yield strength
e. 20,000 PSI minimum tensile strength
f. 0.14" nominal wall thickness
g. Outside diameter (uncoated) shall be within the range of 0.122" to 0.138"
h. Wall thickness (uncoated) shall be within the range of 0.042" to 0.048"
i. Outside diameter (uncoated) shall be within the range of 2.867" to 2.883"
j. Galvanized steel tubing per ASTM A513, except outside diameter weld seam per ASTM B883.
k. Schedule 80 Pipe (ASTM A53) galvanized
l. 0.216" nominal wall thickness
m. Seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
n. 46,000 PSI minimum yield strength
o. 20,000 PSI minimum tensile strength
p. 0.125" minimum wall thickness
q. Wall thickness (uncoated) shall be within the range of 0.248" to 0.264"
r. Outside diameter (uncoated) shall be within the range of 2.895" to 2.899"
s. Galvanized per ASTM A133
3. See the Traffic Operations Division website for detailed drawings of sign slabs and Texas Universal Triangular Slipbase System components. The website address is: <http://www.tdot.gov/traffic/operations/>
4. Sign supports shall not be applied except where shown. Sign support posts shall not be applied.

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. The Engineer may permit borings of concrete less than 2 cubic yards to be mixed with a portable, motor-driven concrete mixer. For small placements less than 3 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
2. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub 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.
3. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
4. 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 roadway (i.e., edge of the closest lane) when slip base is below the edge of pavement or 7 to 7.5 feet above slip base when the slip base is above the edge of the roadway. 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-1) for clearances based on sign types.

No more than 2 sign posts should be located within a 7 ft. circle.



TYPICAL SIGN ATTACHMENT DETAIL



Boils used to mount sign panels to the clamp are 5/16-18 UNC galvanized hex nuts with lock washers and lock washers. The bolt length is 1 inch for aluminum.

When two sign panels are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex nut per ASTM A307 with nut and lock washer/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.

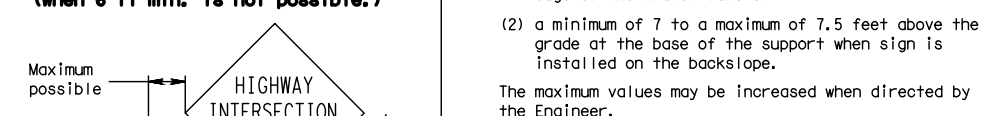
Sign clamps may be either the specific size clamp or the universal clamp.

SIGNS WITH PLAQUES



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

RESTRICTED RIGHT-OF-WAY (When 6 ft min. is not possible.)

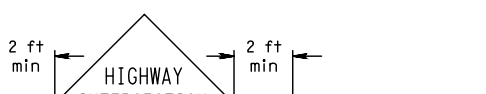


Maximum possible sign height. Right-of-way restrictions may be created by rocks, water, vegetation, forest, buildings, or narrow islands, or other factors.

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 should not be fit due to extreme slope.

CURB & GUTTER OR RAISED ISLAND

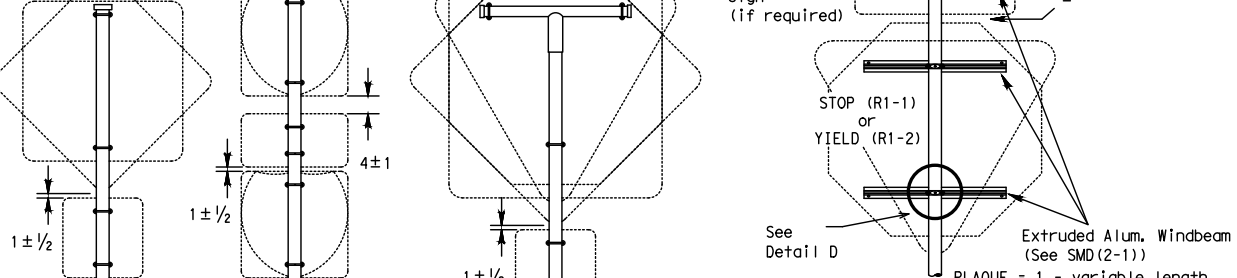


SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

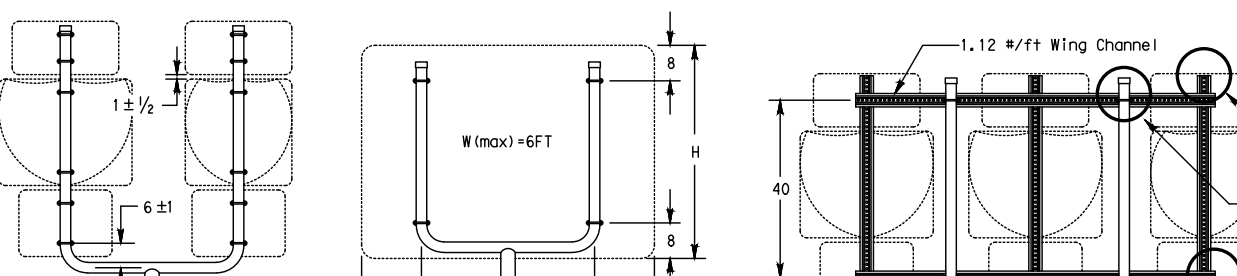
SMD (GEN) - 08

Table with columns: DATE, REVISION, BY, CHECKED, DESIGNED, DRAWN, SHEET NO. Includes a revision table and a signature block for the Texas Department of Transportation Traffic Operations Division.

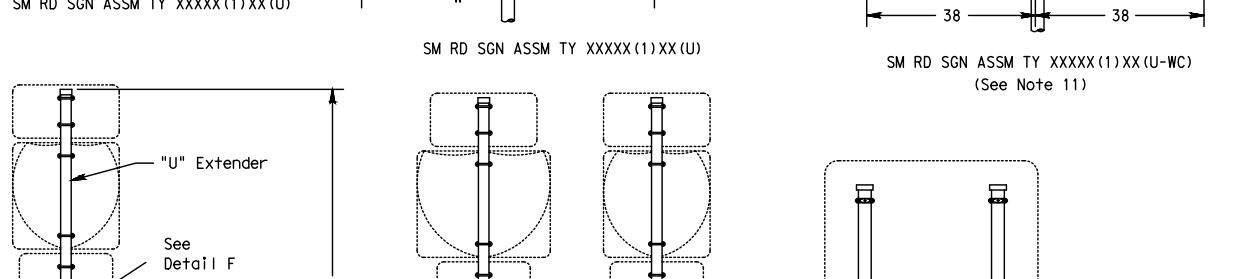
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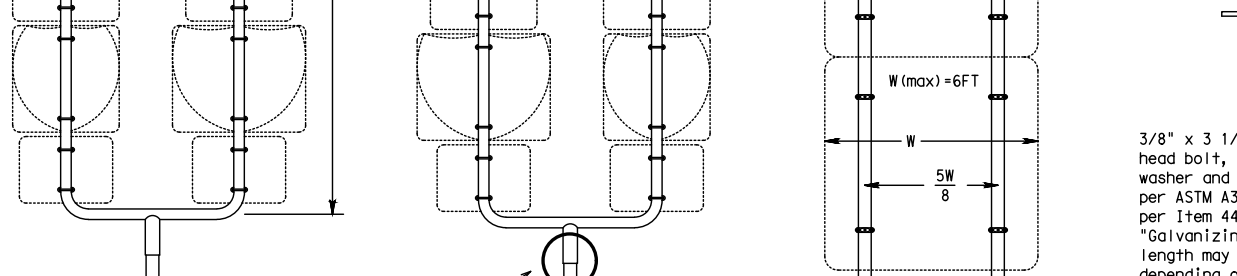
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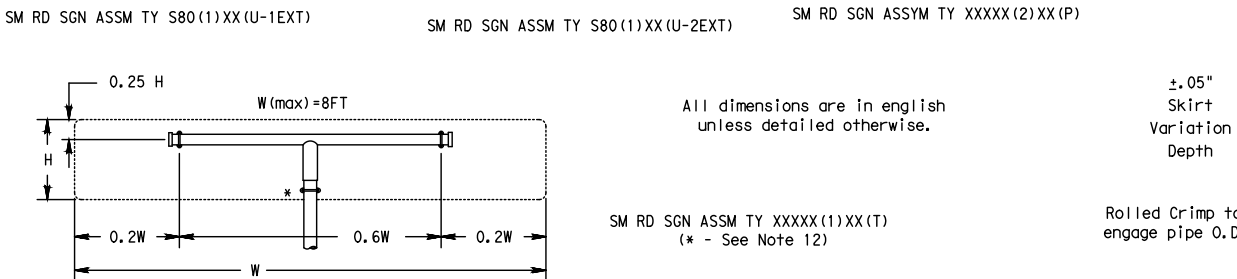
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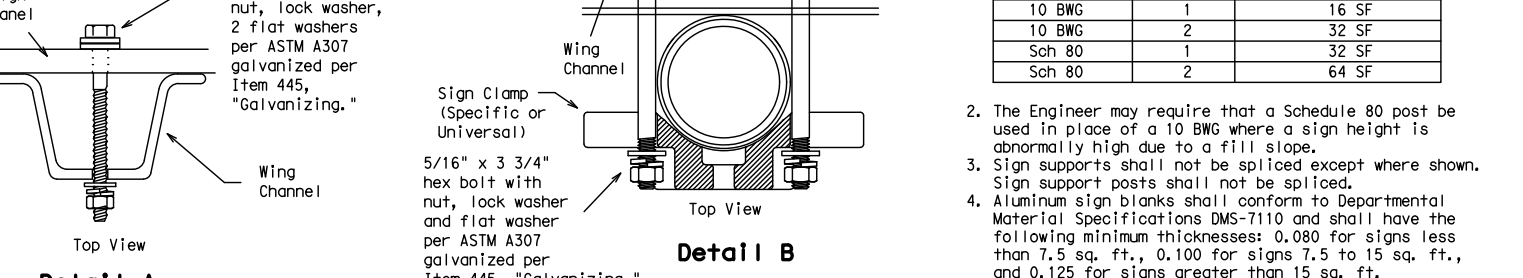
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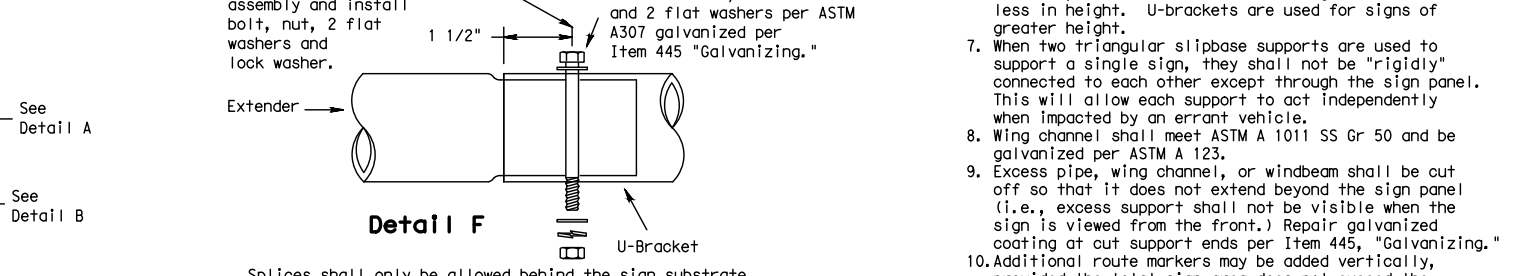
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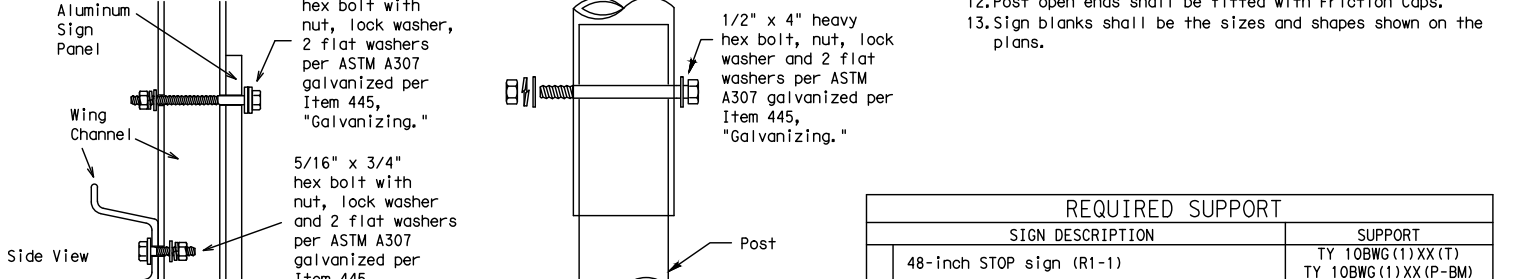
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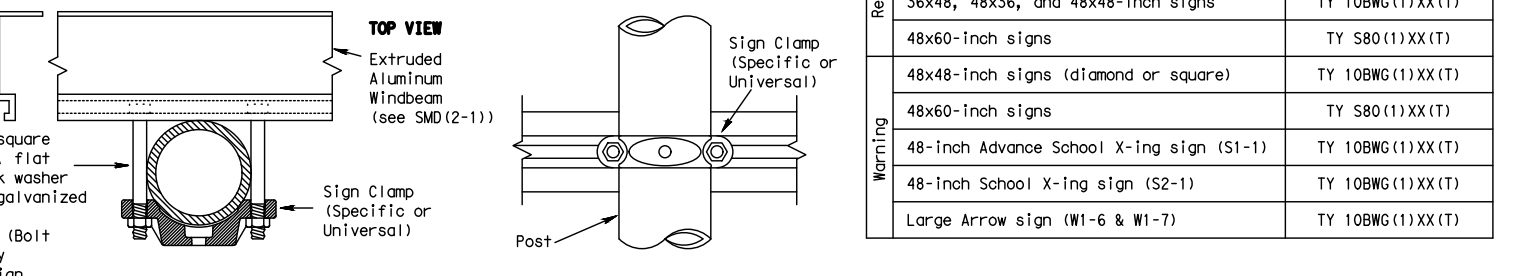
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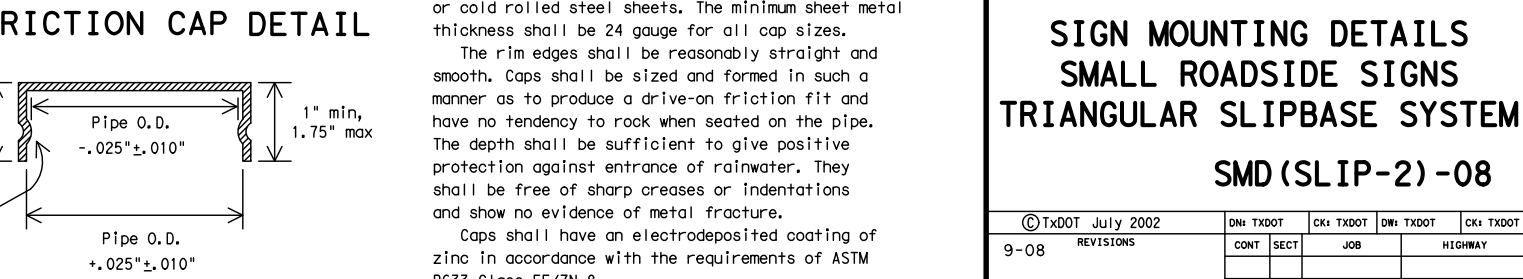
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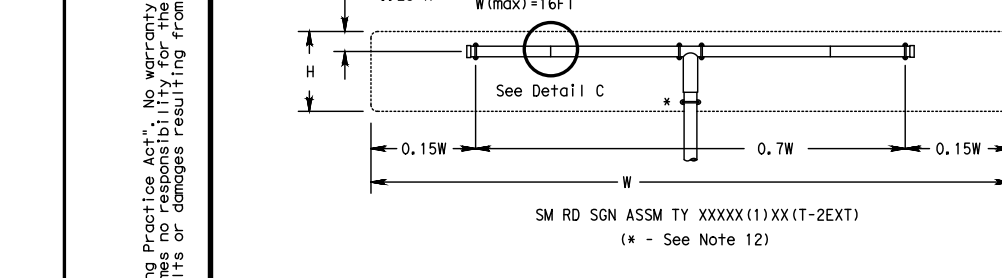
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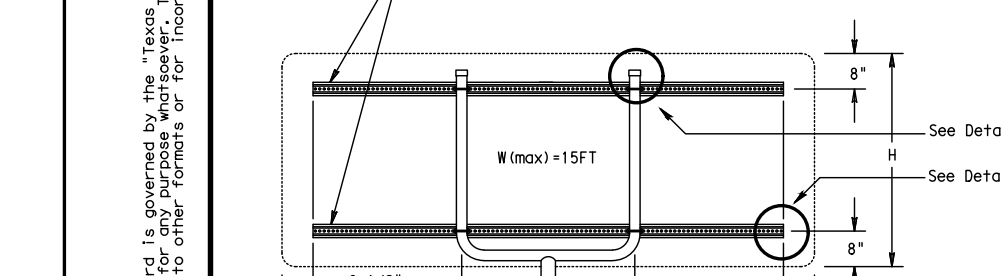
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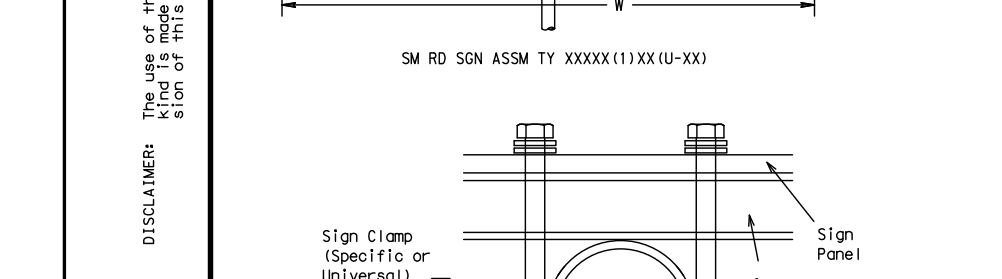
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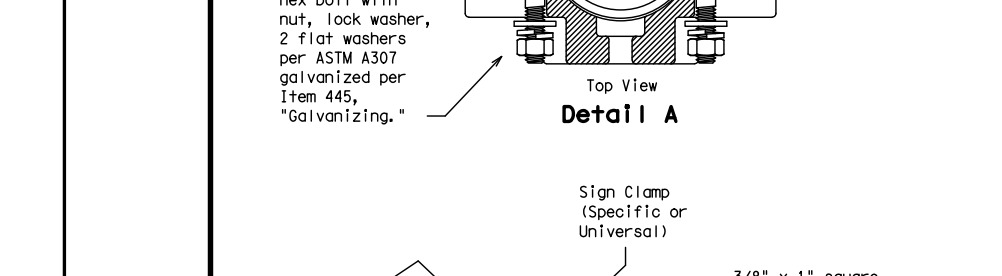
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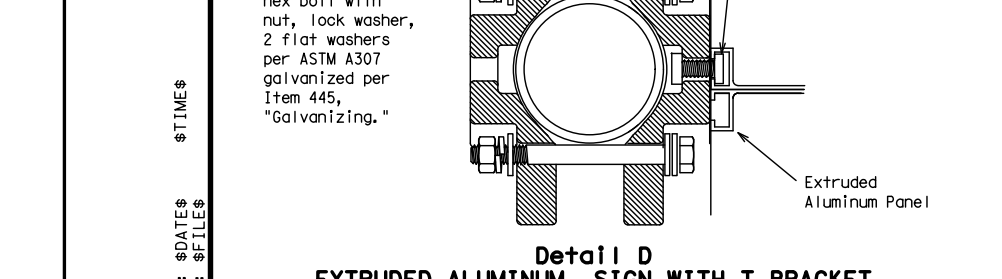
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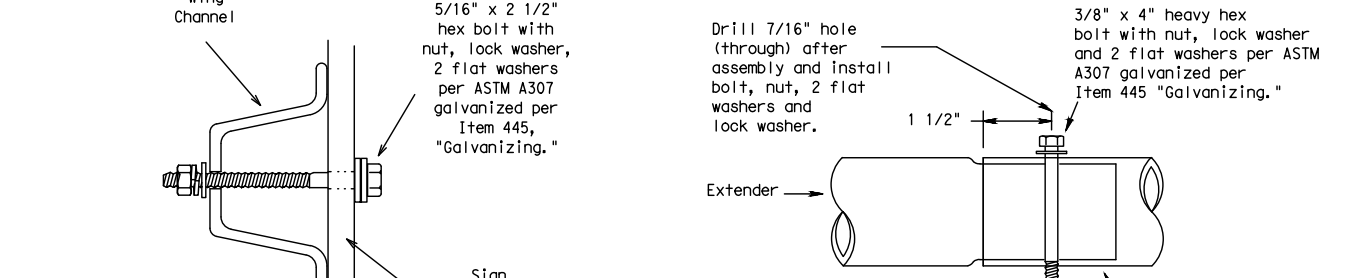
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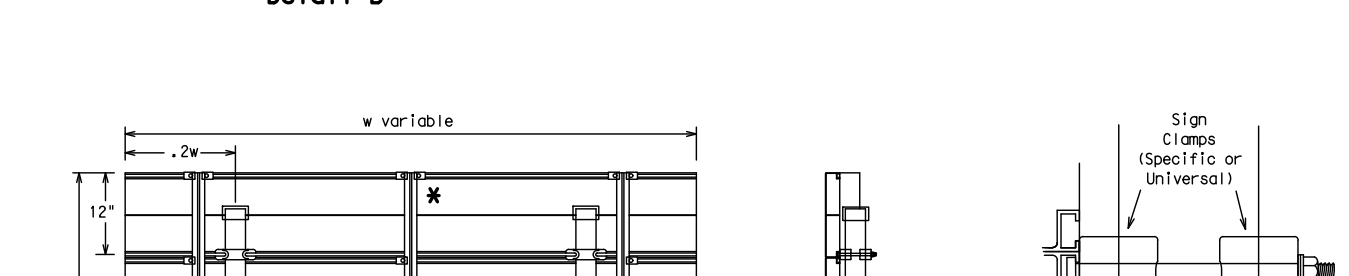
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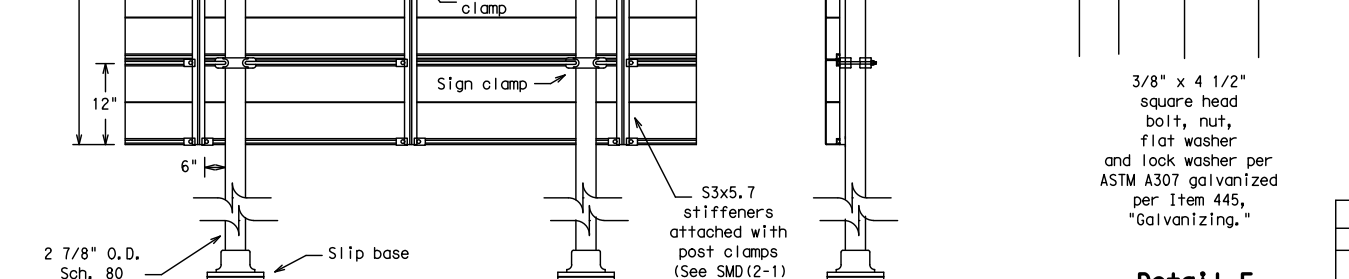
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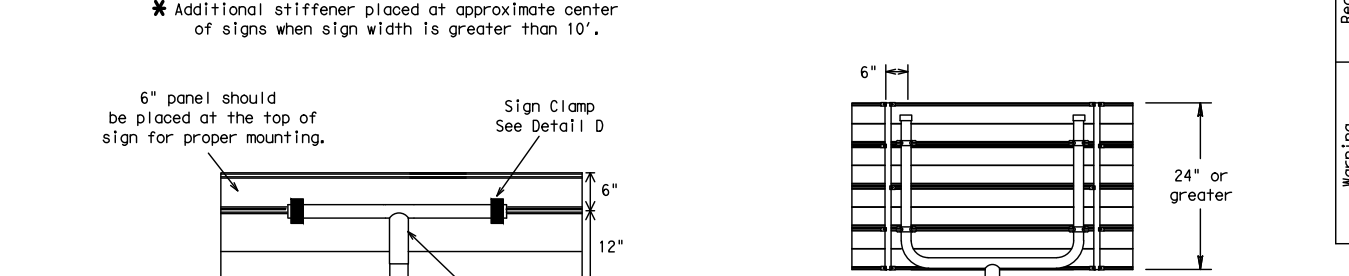
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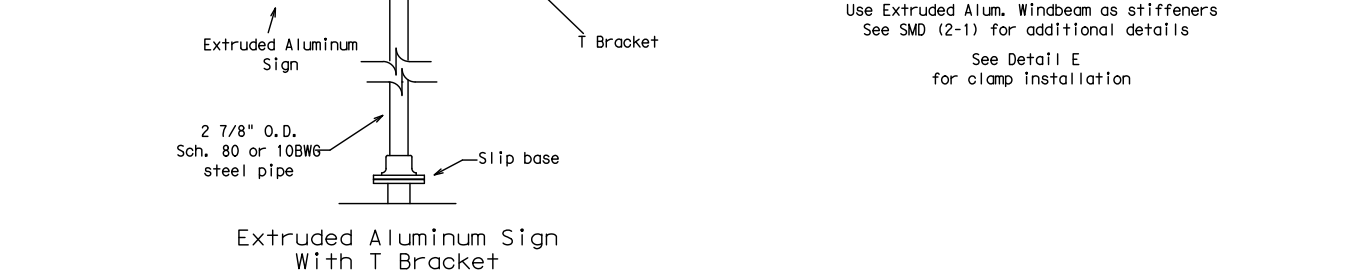
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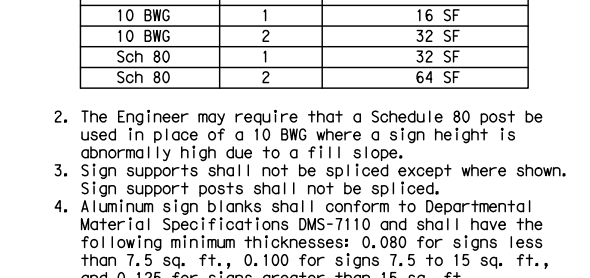
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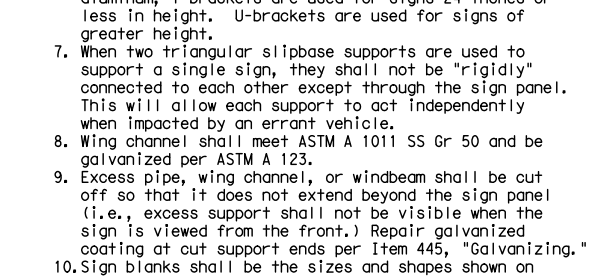
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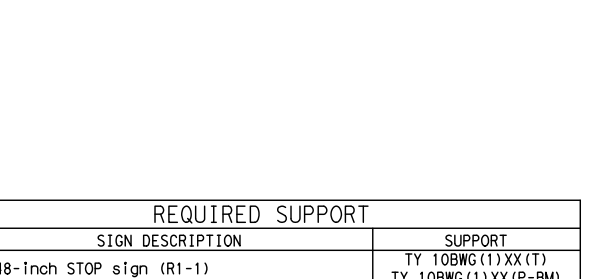
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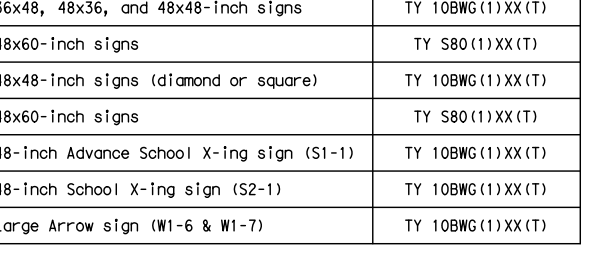
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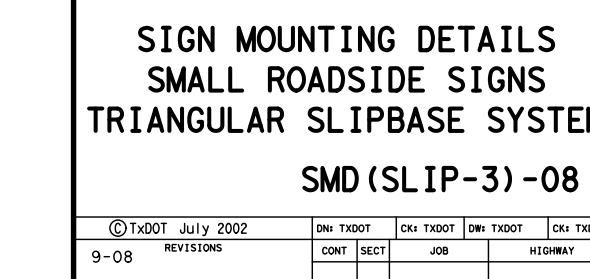
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SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)



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



Professional Engineer seal for JON D. ADAME, License No. 82567, State of Texas. Includes contact information for PAPE-DAWSON ENGINEERS and APOLLO OAKS SIGNAGE DETAILS.

Wedge Anchor Steel System

Wedge Anchor High Density Polyethylene (HDPE) System

Universal Anchor System with Thin-Walled Tubing Post

Sign Installation Using a Prefabricated T-Bracket for Thin-Wall Tubing Post

Typical Sign Mounting Detail for FRP Support with Single Sign

Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs

GENERAL NOTES:

- The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
- The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer, method, design, and location of marking on subject to the approval of the TxDOT Traffic Operations Engineer.
- Except for posts (13 (800) Tubing), diameters, nuts and bolts, all components shall be prefabricated. A list of prefabricated items may be obtained from the Material Procurement List web page. The website address is: <http://www.txdot.gov/procurement/procurementlist/>
- Material used on post with this system shall conform to the following specifications:
 - 13 (800) Tubing (2.315" outside diameter) (TWT)
 - 0.095" nominal wall thickness
 - Seamless or electrically welded steel tubing
 - Steel shall be A513 Gr 55 per ASTM A1011 or ASTM A1008
 - Outside diameter (uncoated) shall be within the range of 2.300" to 2.310"
 - Galvanization per ASTM 123 or ASTM A653 D110. For pre-coated steel tubing (ASTM A653), repeat tube outside diameter weld seam by restitching with zinc wire per ASTM A653.
- Sign bolts shall be the size and shape shown on the plans.
- Additional sign clamp required on the T-bracket post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
- Sign supports shall not be applied where shown. Sign support posts shall not be applied.
- See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: <http://www.txdot.gov/operations/traffic.htm>

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub must extend in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(OX) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer.
- Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
- Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
- Insert the sign to the sign post.
- Form the socket. Make a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
- Insert the sign post into socket and align sign face with roadway.
- Drive the wedge into the socket to secure post. This will leave approximately 2 inches of the wedge.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub must extend in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(OX) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer.
- Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
- Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
- Insert the sign to the sign post.
- Form the socket. Make a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
- Insert the sign post into socket and align sign face with roadway.
- Drive the wedge into the socket to secure post. This will leave approximately 2 inches of the wedge.

CONCRETE ANCHOR SYSTEM INSTALLATION PROCEDURE

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub must extend in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(OX) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- The Engineer may permit batches of concrete less than 2 cubic yards to be mixed with a portable, motor driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer.
- Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
- Insert tubular socket into concrete until top of socket is approximately 1/4" above the concrete footing.
- Insert the sign to the sign post.
- Form the socket. Make a minimum 4 days for concrete to set, unless otherwise directed by Engineer.
- Insert the sign post into socket and align sign face with roadway.
- Drive the wedge into the socket to secure post. This will leave approximately 2 inches of the wedge.

CONCRETE ANCHOR SYSTEM INSTALLATION PROCEDURES

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub must extend in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(OX) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- 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.
- Insert base post in foundation hole to depth shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
- Level and plumb the base post with coupler using a torqued level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer.
- Insert bottom of sign post into pipe stub.
- Attach sign to FRP post.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

BOLT-DOWN DETAILS

1. Position base plate with coupler on existing concrete.
 2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
 3. Attach sign to FRP post.
 4. Insert bottom of sign post into pipe stub.
 5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
 6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

BOLT-DOWN SIGN SUPPORT

- Position base plate with coupler on existing concrete.
- Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
- Attach sign to FRP post.
- Insert bottom of sign post into pipe stub.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division
SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST
SMD(TWT)-08

DATE: 9-08 REVISED: 9-08
 DRAWN: [] CHECKED: [] DESIGNED: []
 SHEET NO. 285

Universal Anchor System with Fiberglass Reinforced Plastic (FRP) Post

Typical Sign Mounting Detail for FRP Support with Single Sign

Typical Sign Mounting Detail for FRP Support with Back-to-Back Signs

GENERAL NOTES:

- FRP sign supports for a single type sign support may be used for signs up to and including 18 square feet. Dual post installation may be used for signs up to and including 32 square feet.
- All bolts, nuts and washers shall be galvanized per Item 445, "Galvanizing".
- See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: <http://www.txdot.gov/operations/traffic.htm>

FRP POST REQUIREMENTS

- Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
- Thickness of FRP sign support is 1/2" ± 0.031" - 0.0".
- FRP sign supports are prefabricated by the Traffic Operations Division. Prefabrication procedures are obtained by writing:
 - Texas Department of Transportation
 - Traffic Operations Division
 - 125 East 11th Street
 - Austin, Texas 78701-2483

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

- Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub must extend in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(OX) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
- 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.
- Insert base post in foundation hole to depth shown and fill hole with concrete. Cut base post from bottom and ensure a minimum of 18" embedment if installed in solid rock.
- Level and plumb the base post with coupler using a torqued level and let concrete set a minimum of 4 days, unless otherwise directed by Engineer.
- Insert bottom of sign post into pipe stub.
- Attach sign to FRP post.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

BOLT-DOWN DETAILS

1. Position base plate with coupler on existing concrete.
 2. Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
 3. Attach sign to FRP post.
 4. Insert bottom of sign post into pipe stub.
 5. Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
 6. Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

BOLT-DOWN SIGN SUPPORT

- Position base plate with coupler on existing concrete.
- Drill holes into concrete and insert the 5/8" diameter bolts with wedge anchors, and tighten nuts.
- Attach sign to FRP post.
- Insert bottom of sign post into pipe stub.
- Use hammer to ensure the coupler is firmly seated. Top of coupler should be level with top of base post in most instances.
- Check sign to ensure there is no twist. If loose, increase the tightening of coupler.

TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division
SIGN MOUNTING DETAILS
SMALL ROADSIDE SIGNS
UNIVERSAL ANCHOR SYSTEM WITH FRP POST
SMD(FRP)-08

DATE: 9-08 REVISED: 9-08
 DRAWN: [] CHECKED: [] DESIGNED: []
 SHEET NO. 286

Street Name Sign Details

	18" OVERHEAD SIGN	9" GROUND MOUNT SIGNS
HEIGHT	18" (381 mm)	9" (228 mm)
LENGTH	48" (1200 mm) MIN. 72" (1800 mm) MAX. 1" (25.4 mm) INCREMENTS OF LENGTH	24" (600 mm) MIN. 48" (1200 mm) MAX. 1" (25.4 mm) INCREMENTS OF LENGTH
THICKNESS	0.125" (3 mm)	
SUBSTRATE	ALUMINUM ALLOY, 5052-H32 (ASTM B-209) COLOR: CHROMATE FINISH	
SIGN FACE MATERIALS	BLUE FILM OVER DIAMOND-GRIT - ASTM Type XI Non-Fluorescent	BLUE FILM OVER BRILLIANTLY PRISMATIC-ASTM Type IV
LEGENDS AND SYMBOLS	SEE SERIES B OR C IF NAME OTHERWISE EXCEEDS MAXIMUM SIGN LENGTH	
COLOR	WHITE LEGEND ON BLUE BACKGROUND	
LETTER TRACKING	17% (USUAL) 10% (MIN.)	10%

*** ACRYLIC ELECTRONIC CUTTABLE FILM**

SPAN WIRE INSTALLATION

MAST ARM INSTALLATION

SIGN FACE MATERIALS SHALL CONFORM TO:

- STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS & BRIDGES ON FEDERAL HIGHWAY PROJECTS - FD-303 U.S. CUSTOMARY UNITS SECTION 718
- GENERAL SERVICES ADMINISTRATION FEDERAL SPECIFICATIONS L-S-300C
- ASTM D 4955 - 09a1

TEXAS DEPARTMENT OF TRANSPORTATION
Traffic Operations Division
Street Name Sign Details

DATE: 9-08 REVISED: 9-08
 DRAWN: [] CHECKED: [] DESIGNED: []
 SHEET NO. 287

DATE: _____

NO. REVISION: _____

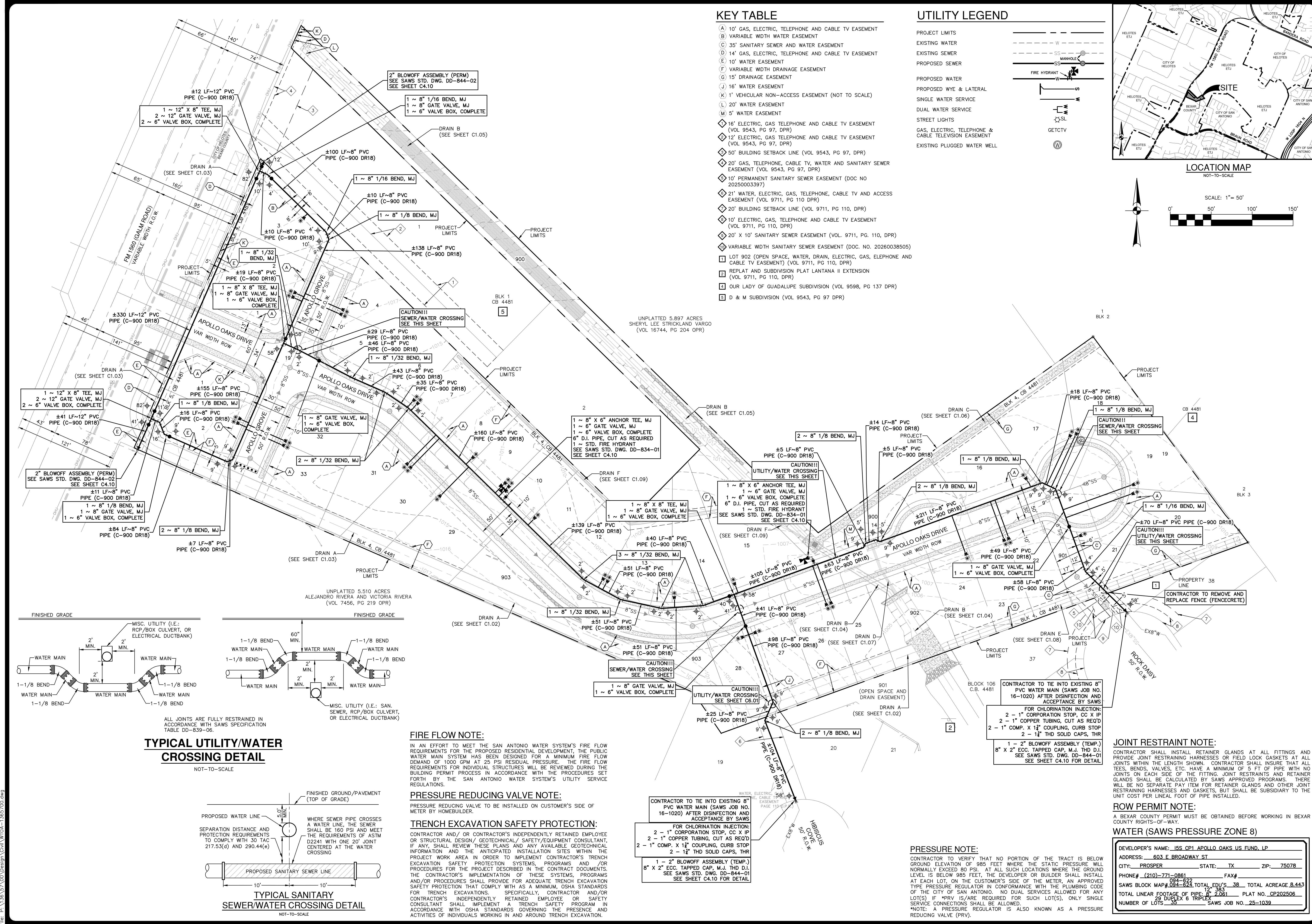
JON D. ADAME
LICENSED PROFESSIONAL ENGINEER
82567

DATE: 9-17-25
 BY: Jm Adams

PAPE-DAWSON ENGINEERS
2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
BEXAR COUNTY, TEXAS
SIGNAGE DETAILS

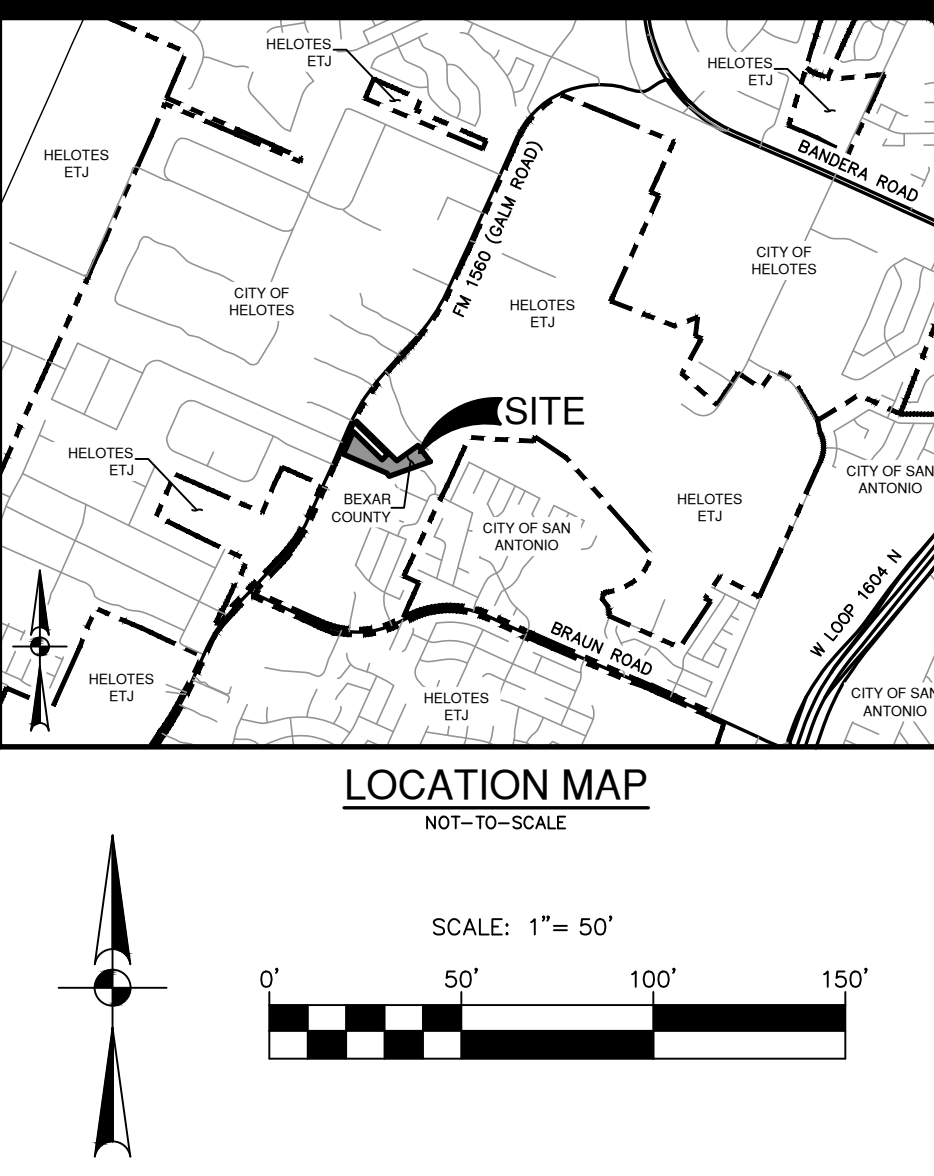
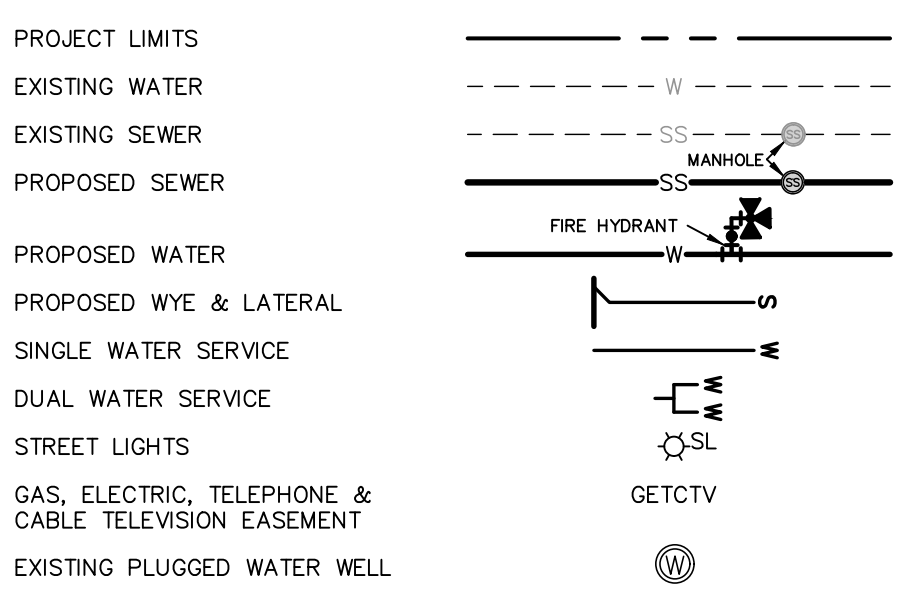
PLAT NO. CP202506
 JOB NO. 13657-00
 DATE SEPTEMBER 2025
 DESIGNER CR
 CHECKED JA DRAWN JF
 SHEET C3.11



KEY TABLE

- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (B) VARIABLE WIDTH WATER EASEMENT
- (C) 35' SANITARY SEWER AND WATER EASEMENT
- (D) 14' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (E) 10' WATER EASEMENT
- (F) VARIABLE WIDTH DRAINAGE EASEMENT
- (G) 15' DRAINAGE EASEMENT
- (J) 16' WATER EASEMENT
- (K) 1' VEHICULAR NON-ACCESS EASEMENT (NOT TO SCALE)
- (L) 20' WATER EASEMENT
- (M) 5' WATER EASEMENT
- ◇ 16' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- ◇ 12' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- ◇ 50' BUILDING SETBACK LINE (VOL 9543, PG 97, DPR)
- ◇ 20' GAS, TELEPHONE, CABLE TV, WATER AND SANITARY SEWER EASEMENT (VOL 9543, PG 97, DPR)
- ◇ 10' PERMANENT SANITARY SEWER EASEMENT (DOC NO 2025003397)
- ◇ 21' WATER, ELECTRIC, GAS, TELEPHONE, CABLE TV AND ACCESS EASEMENT (VOL 9711, PG 110, DPR)
- ◇ 20' BUILDING SETBACK LINE (VOL 9711, PG 110, DPR)
- ◇ 10' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL 9711, PG 110, DPR)
- ◇ 20' X 10' SANITARY SEWER EASEMENT (VOL. 9711, PG. 110, DPR)
- ◇ VARIABLE WIDTH SANITARY SEWER EASEMENT (DOC. NO. 20260038505)
- LOT 902 (OPEN SPACE, WATER, DRAIN, ELECTRIC, GAS, ELEPHONE AND CABLE TV EASEMENT) (VOL. 9711, PG. 110, DPR)
- REPLAT AND SUBDIVISION PLAT LANTANA II EXTENSION (VOL. 9711, PG. 110, DPR)
- OUR LADY OF GUADALUPE SUBDIVISION (VOL. 9598, PG. 137 DPR)
- D & M SUBDIVISION (VOL. 9543, PG. 97 DPR)

UTILITY LEGEND



DATE: _____

NO. REVISION: _____

Jon Adame
3-5-24

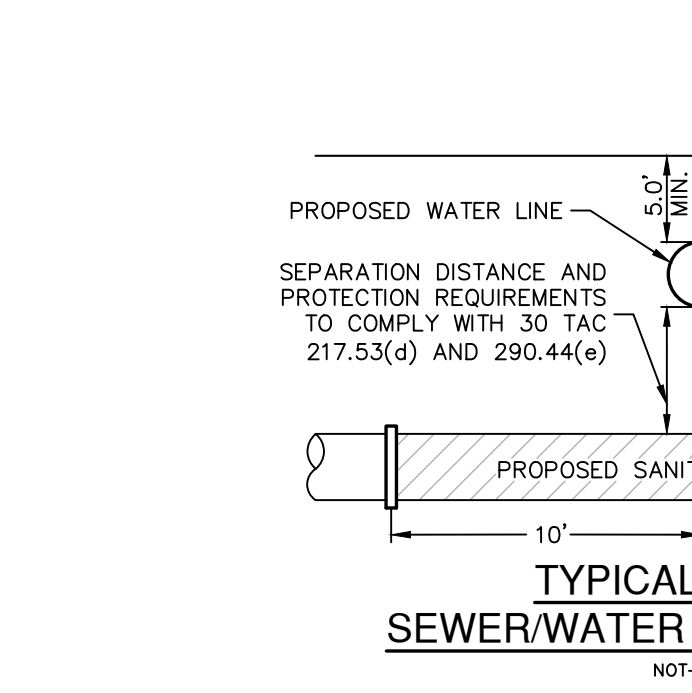
PAPE-DAWSON ENGINEERS

2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10038600

APOLLO OAKS
BEXAR COUNTY, TEXAS
OVERALL WATER DISTRIBUTION PLAN

TYPICAL UTILITY/WATER CROSSING DETAIL

NOT-TO-SCALE



FIRE FLOW NOTE:

IN AN EFFORT TO MEET THE SAN ANTONIO WATER SYSTEM'S FIRE FLOW REQUIREMENTS FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, THE PUBLIC WATER MAIN SYSTEM HAS BEEN DESIGNED FOR A MINIMUM FIRE FLOW DEMAND OF 1000 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 SAN ANTONIO WATER SYSTEM'S UTILITY SERVICE REGULATIONS.

PRESSURE REDUCING VALVE NOTE:

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

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.

CONTRACTOR TO TIE INTO EXISTING 8" PVC WATER MAIN (SAWS JOB NO. 16-1020) AFTER DISINFECTION AND ACCEPTANCE BY SAWS

FOR CHLORINATION INJECTION:
2 - 1" CORPORATION STOP, CC X IP
2 - 1" COPPER TUBING, CUT AS REQ'D
2 - 1" COMP. X 1 1/2" COUPLING, CURB STOP
2 - 1 1/2" THD SOLID CAPS, THR

1 - 2" BLOWOFF ASSEMBLY (TEMP.)
8" X 2" ECC. TAPPED CAP, M.J. THD D.I.
SEE SAWS STD. DWG. DD-844-01
SEE SHEET C4.10 FOR DETAIL

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 PRRV 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.

ROW PERMIT NOTE:

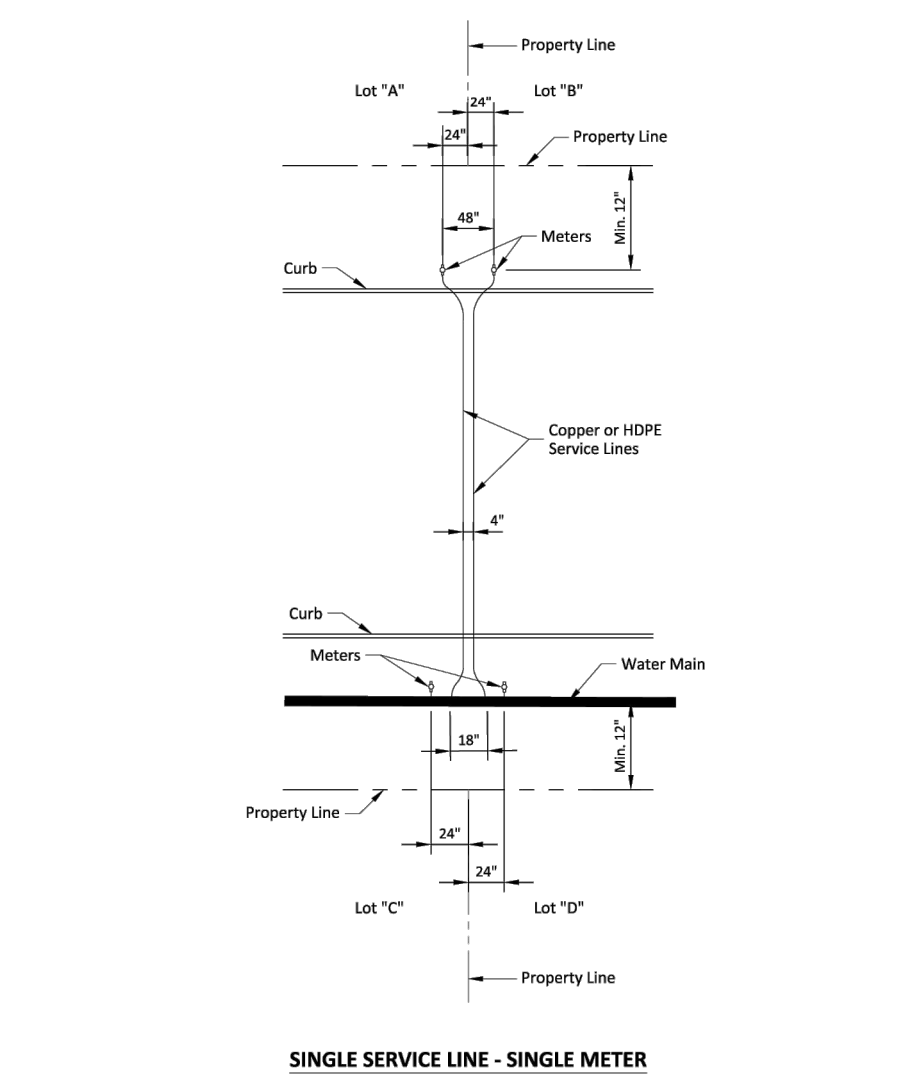
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY RIGHTS-OF-WAY.

WATER (SAWS PRESSURE ZONE 8)

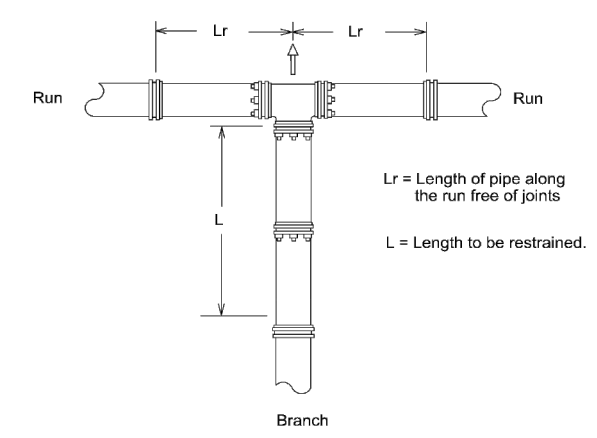
DEVELOPER'S NAME: JSS CP1 APOLLO OAKS US FUND, LP
ADDRESS: 603 E BROADWAY ST
CITY: PROSPER STATE: TX ZIP: 75078
PHONE# (210)-771-0861 FAX#
SAWS BLOCK MAP# 094-824 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
TOTAL LINEAR FOOTAGE OF PIPE 8,206 PLAT NO. CP202506
NUMBER OF LOTS 35 SAWS JOB NO. 25-1039

PLAT NO. CP202506
JOB NO. 13657-00
DATE NOVEMBER 2025
DESIGNER CR
CHECKED JA DRAWN JF
SHEET C4.00

Drawn: Mr. G.E. 09/26/24, 8:49am, User ID: ccaef@pape.com
File: P:\13657\CP202506\Design\Civil\WCD-1365700.dwg



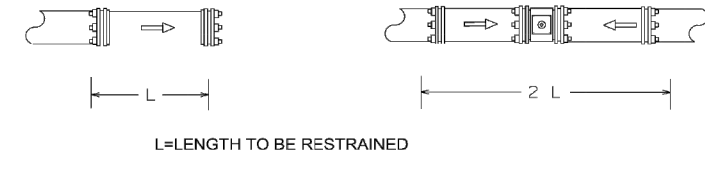
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	TYPICAL NEW DEVELOPMENT SERVICE ARRANGEMENT	APPROVED MARCH 2008 DD-824-05	REVISED DECEMBER 2009
		SHEET 1 OF 3	



PIPE BRANCH SIZE (INCH)	LENGTH OF RUN (INCH)	RESTRAINED LENGTH (INCH) TEST PRESSURE = 200 PSI	RESTRAINED LENGTH (INCH) TEST PRESSURE = 150 PSI
6	4	42	31
6	4	10	1
6	4	11	1
6	6	36	20
6	6	11	4
6	4	42	31
8	6	56	44
8	6	5	1
8	6	10	1
8	6	36	20
8	6	11	4
8	8	53	34
8	8	10	1
8	8	15	6

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.

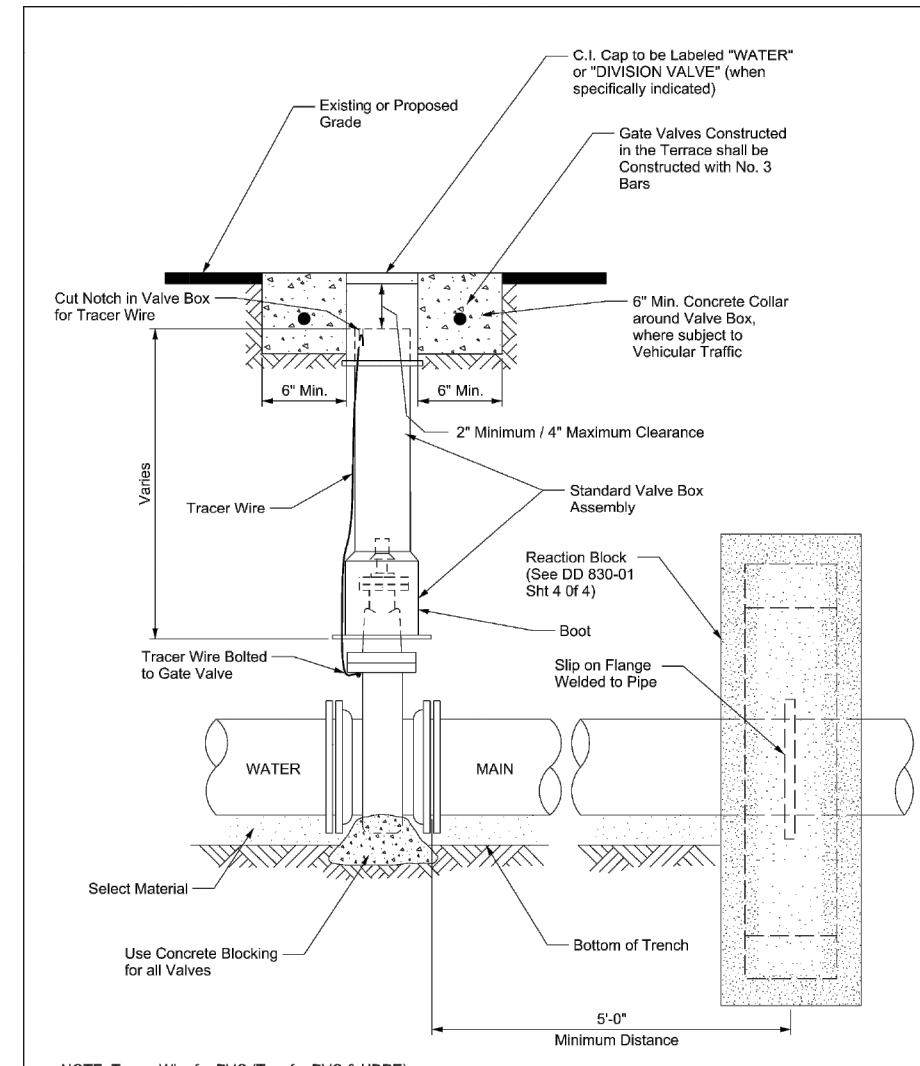
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR TEES	APPROVED MARCH 2008 DD-839-04	REVISED AUG 2019
		SHEET 1 OF 2	



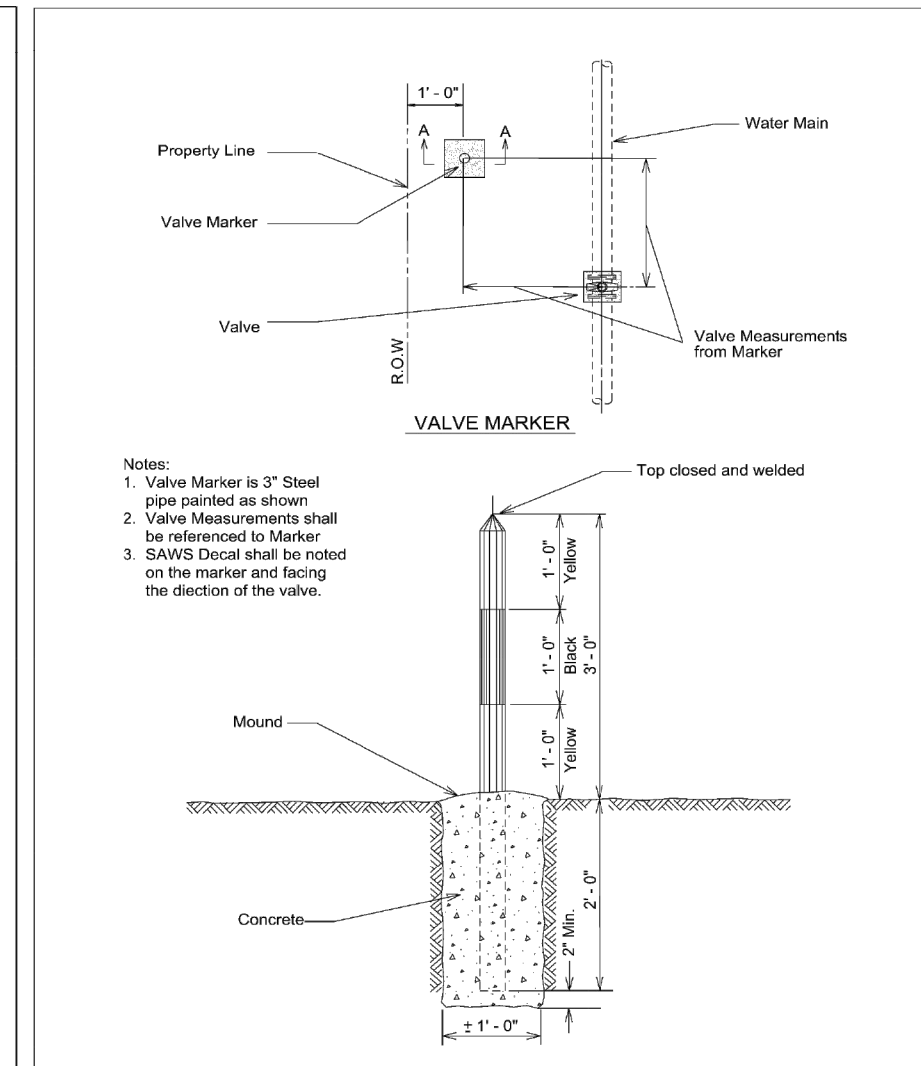
PIPE SIZE (INCH)	RESTRAINED LENGTH (INCH) TEST PRESSURE = 200 PSI	RESTRAINED LENGTH (INCH) TEST PRESSURE = 150 PSI
6	56	44
6	77	58
8	50	39
8	100	82

RESTRAINED LENGTH DESIGN
 Restrained length calculations are for P.V.C. pipe bedded in compacted granular material extending to the top of the pipe. The native soil material is assumed to be inorganic clay of high plasticity. Depth of bury is assumed to be 4 feet.
 Note: These calculations are provided for reference. The restrained length shall be designed based upon the conditions encountered during the installation.

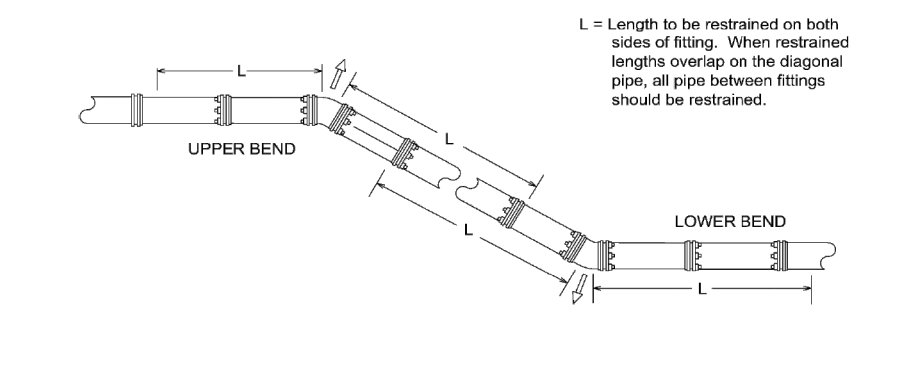
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR DEAD ENDS / IN LINE VALVES	APPROVED MARCH 2008 DD-839-05	REVISED AUG 2019
		SHEET 1 OF 3	



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



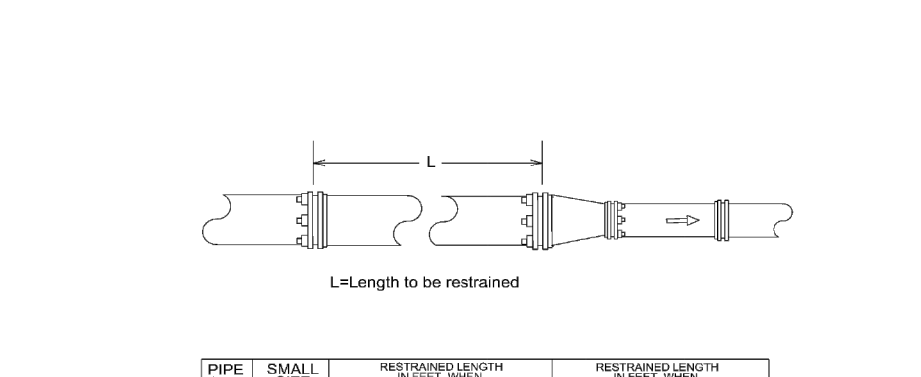
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	VALVE MARKER	APPROVED MARCH 2008 DD-828-04	REVISED AUG 2019
		SHEET 1 OF 1	



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
6	45	5	24	8
6	22.5	5	12	4
6	11.25	5	6	2
6	45	10	24	8
6	22.5	10	12	4
6	11.25	10	6	2
8	45	5	32	11
8	22.5	5	16	5
8	11.25	5	8	2
8	45	10	32	11
8	22.5	10	16	5
8	11.25	10	8	2
12	45	5	48	16
12	22.5	5	24	8
12	11.25	5	12	4
12	45	10	48	16
12	22.5	10	24	8
12	11.25	10	12	4

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.

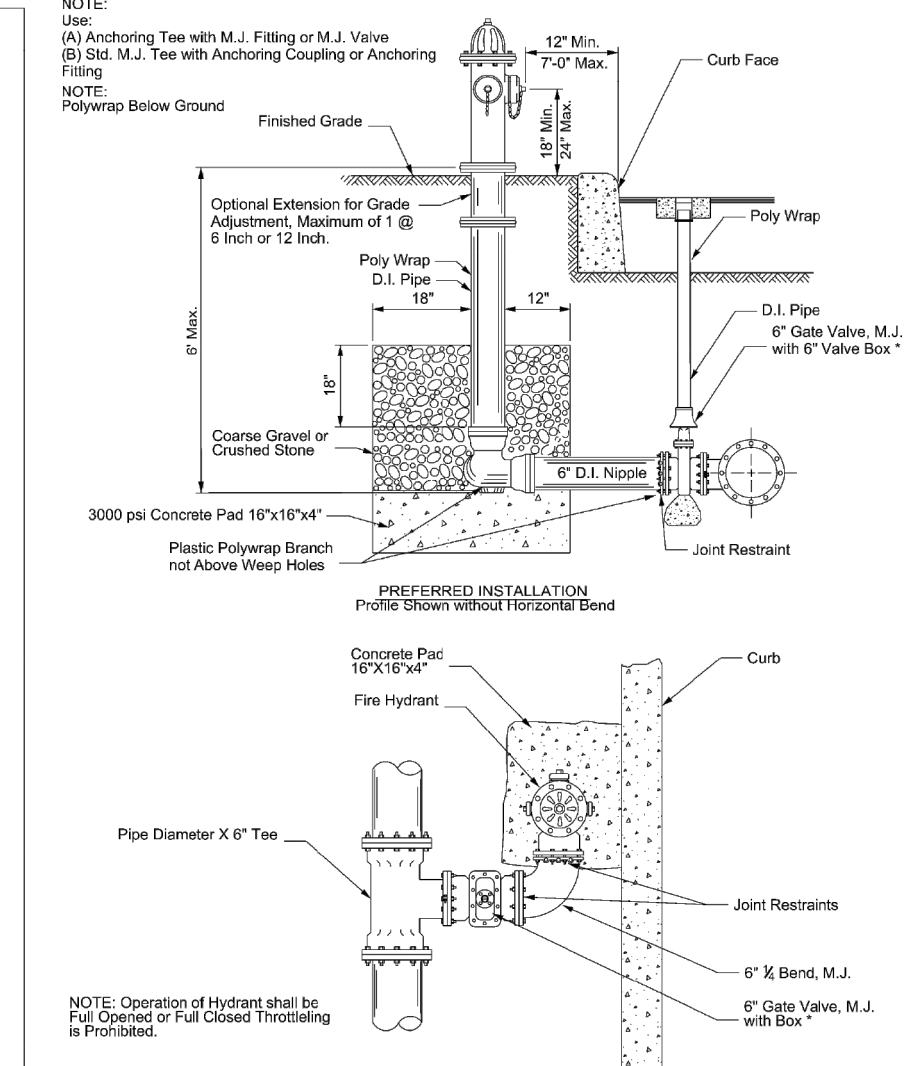
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS VERTICAL OFFSETS	APPROVED MARCH 2008 DD-839-06	REVISED AUG 2019
		SHEET 1 OF 1	



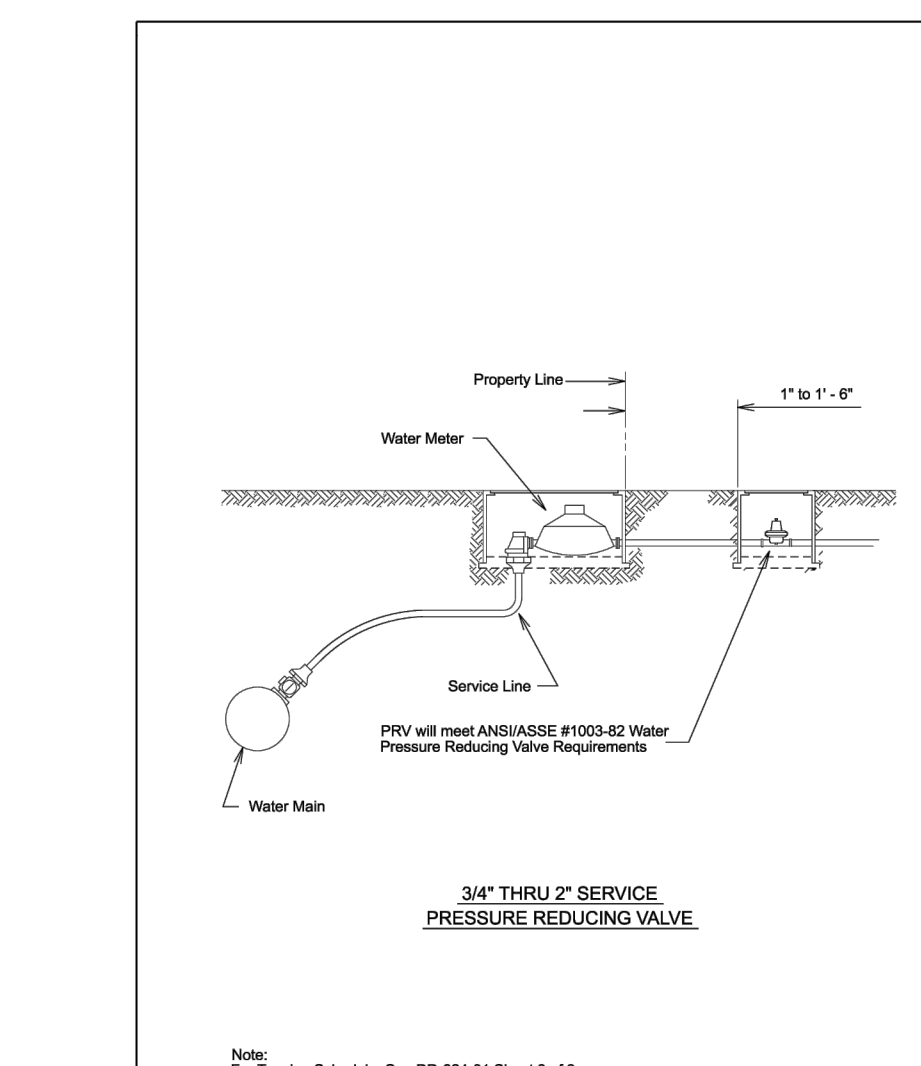
PIPE SIZE (INCH)	REDUCER SIZE (INCH)	RESTRAINED LENGTH (INCH) TEST PRESSURE = 200 PSI	RESTRAINED LENGTH (INCH) TEST PRESSURE = 150 PSI
6	4	30	23
6	4	55	42
6	6	32	24
6	6	60	45
6	8	80	60
6	8	98	73

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.

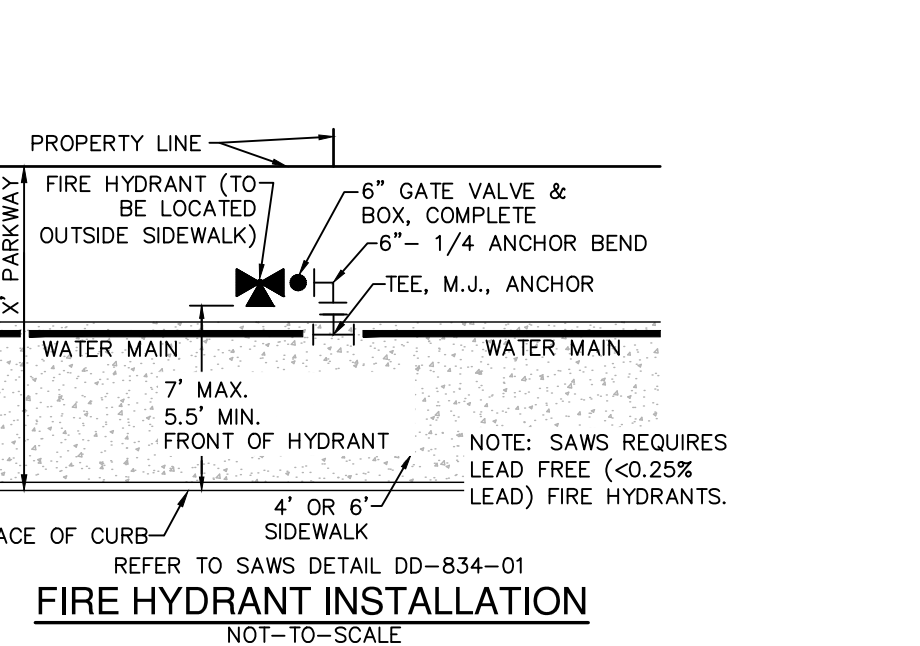
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	RESTRAINED LENGTHS FOR REDUCERS	APPROVED MARCH 2008 DD-839-07	REVISED AUG 2019
		SHEET 1 OF 1	



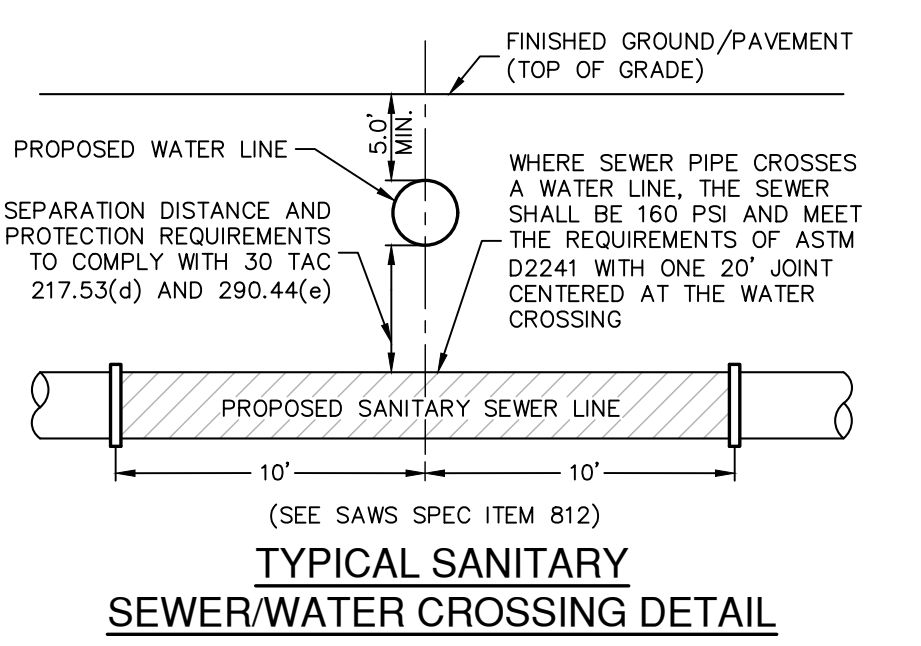
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	FIRE HYDRANT INSTALLATION (JOINT RESTRAINT)	APPROVED MAY 2013 DD-834-01	REVISED AUG 2019
		SHEET 1 OF 3	



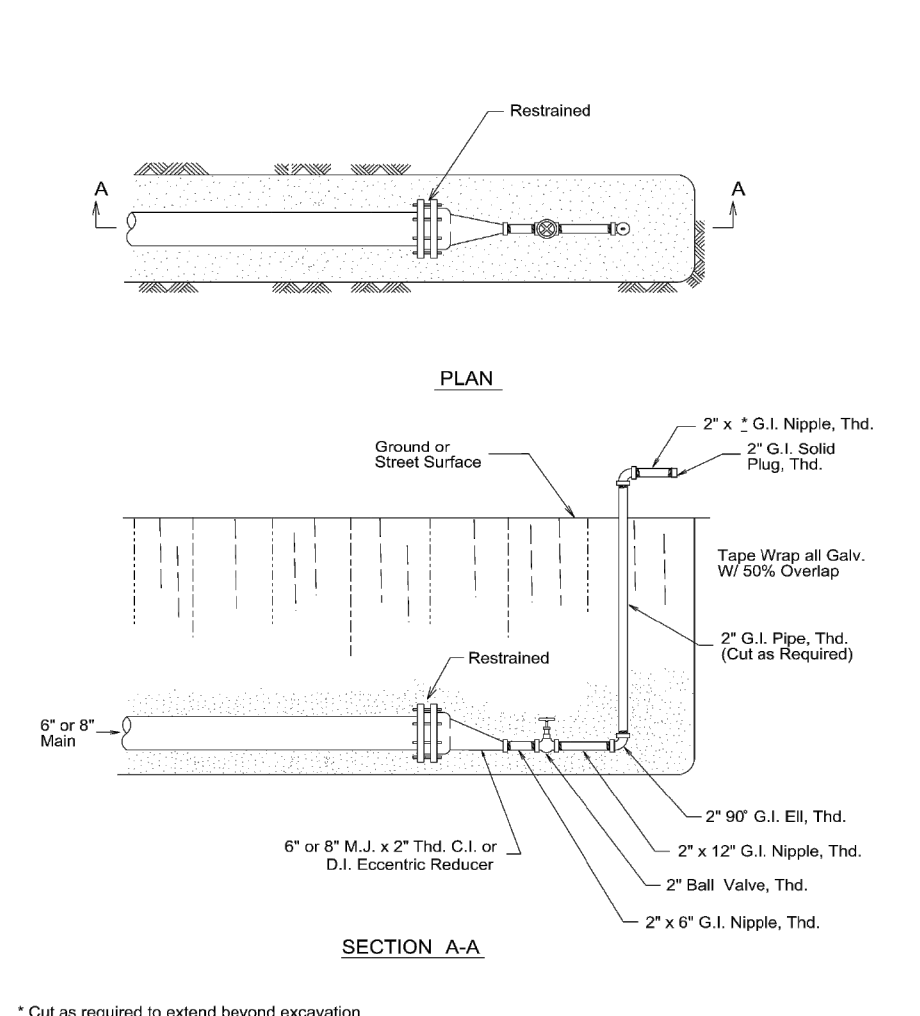
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	SERVICE INSTALLATION WITH PRESSURE REDUCING VALVE	APPROVED MARCH 2008 DD-833-03	REVISED APRIL 2014
		SHEET 1 OF 1	



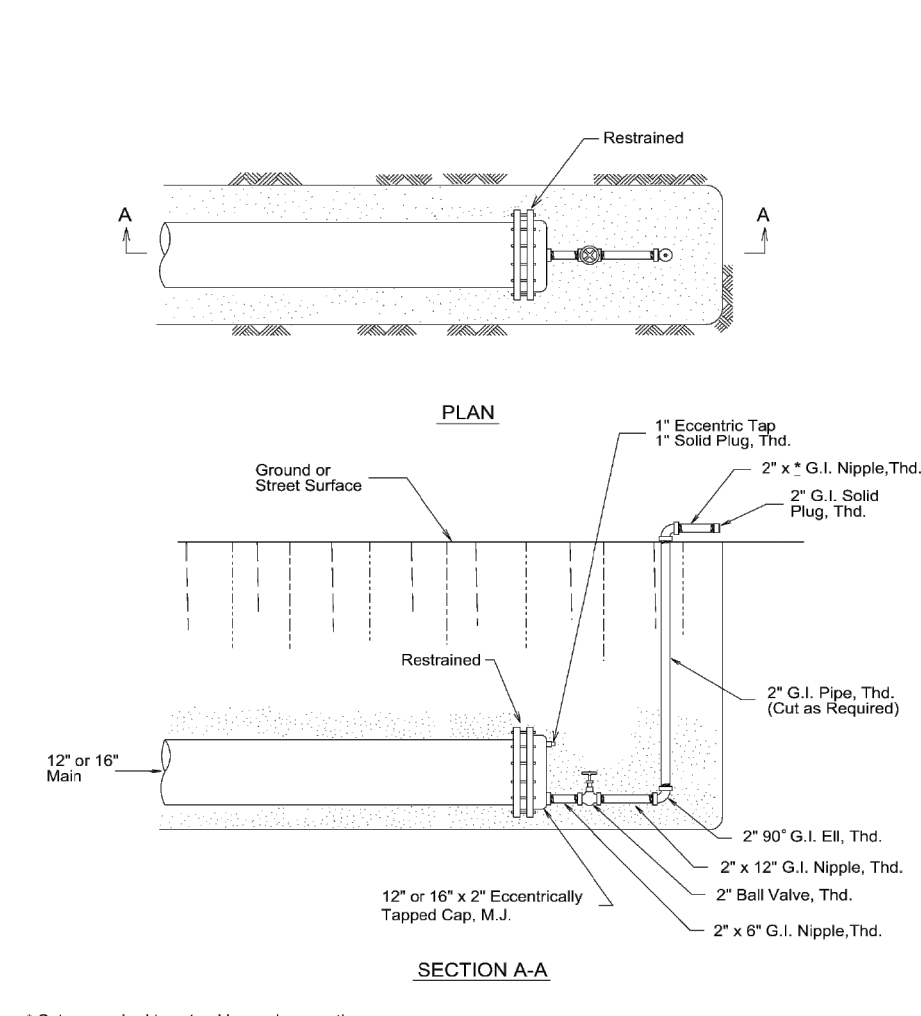
FIRE HYDRANT INSTALLATION
 NOT TO SCALE
 REFER TO SAWS DETAIL DD-834-01



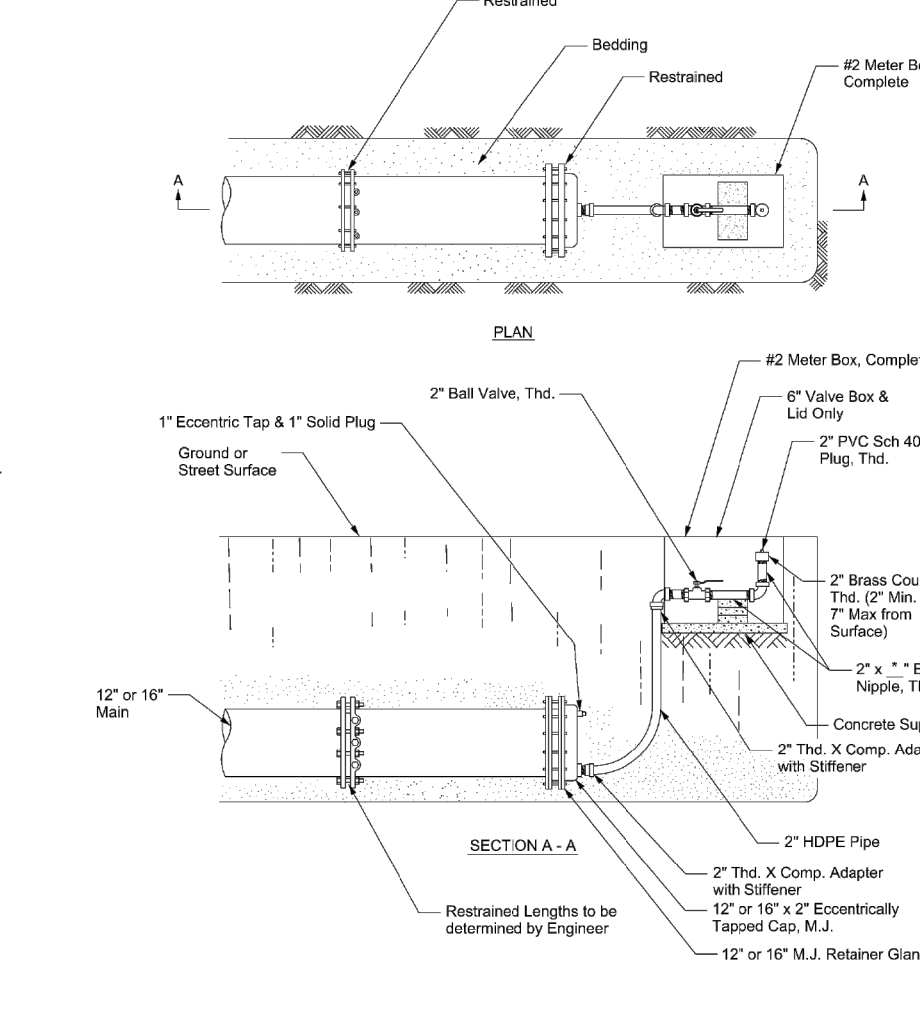
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
 NOT TO SCALE
 (SEE SAWS SPEC ITEM 812)



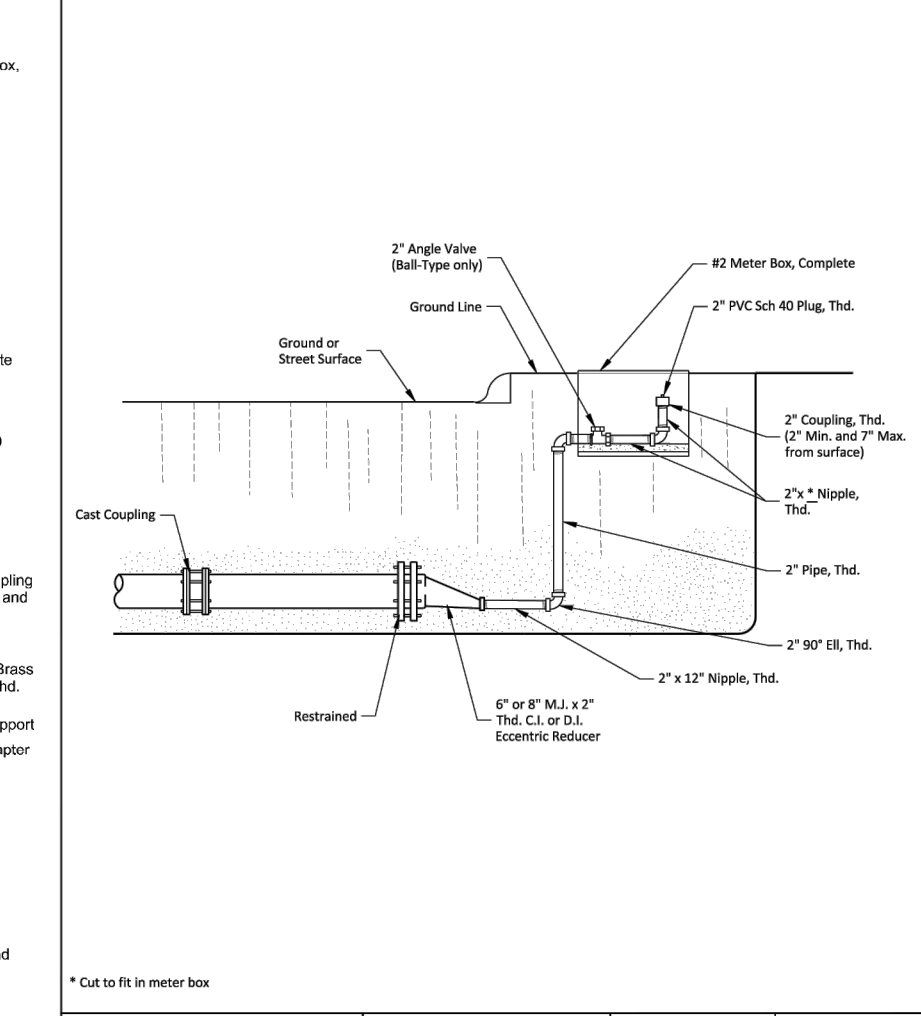
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" TEMPORARY BLOW-OFF ASSEMBLY ON 12" & 16" MAINS	APPROVED MARCH 2008 DD-844-01	REVISED AUG 2019
		SHEET 1 OF 4	



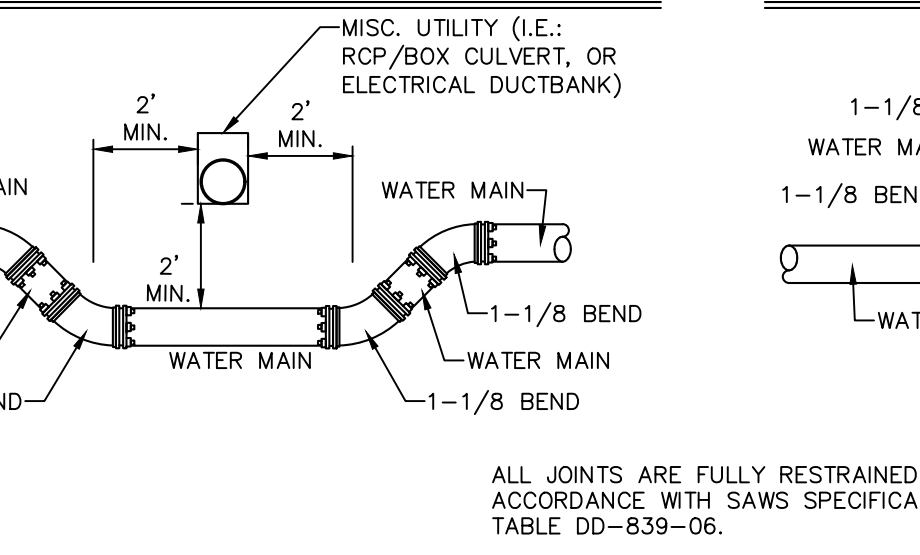
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" PERMANENT BLOW-OFF ASSEMBLY ON 12" & 16" MAINS	APPROVED MARCH 2008 DD-844-02	REVISED AUG 2019
		SHEET 1 OF 3	



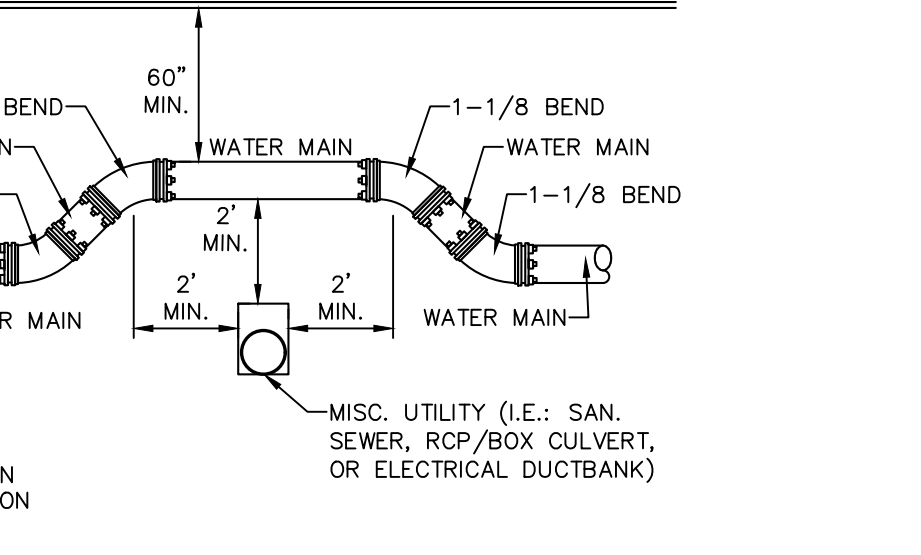
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" PERMANENT BLOW-OFF ASSEMBLY ON 12" & 16" MAINS	APPROVED MARCH 2008 DD-844-02	REVISED AUG 2019
		SHEET 1 OF 3	



PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	2" PERMANENT BLOW-OFF ASSEMBLY ON 12" & 16" MAINS	APPROVED MARCH 2008 DD-844-02	REVISED AUG 2019
		SHEET 3 OF 3	



TYPICAL UTILITY/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
 ALL JOINTS ARE FULLY RESTRAINED IN ACCORDANCE WITH SAWS SPECIFICATION TABLE DD-839-06.

WATER (SAWS PRESSURE ZONE 8)

DEVELOPER'S NAME: INVEST 5S, LLC
 ADDRESS: 22202 CIELO VISTA
 CITY: SAN ANTONIO STATE: TX ZIP: 78255
 PHONE# (540) 305-4056 FAX#
 SAWS BLOCK MAP# 084-822 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
 TOTAL LINEAR FOOTAGE OF PIPE 8,206 PLAT NO. CP202506
 NUMBER OF LOTS 35 SAWS JOB NO. 25-1039

NO.	REVISION

STATE OF TEXAS
 JON D. ADAMS
 82567
 PROFESSIONAL ENGINEER
 9-4-25

PAPE-DAWSON ENGINEERS
 2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1003800

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 WATER DISTRIBUTION PLAN DETAILS

PLAT NO. CP202506
 JOB NO. 13657-00
 DATE SEPTEMBER 2025
 DESIGNER
 CHECKED - DRAWN -
 SHEET C4.10

SAWS CONSTRUCTION NOTES
(LAST REVISED JANUARY 2022)

SAWS GENERAL SECTION

- 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).
- 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.
- 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.
- 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.
- 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.
- 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 PIPERS 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) 207-0026
 - 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
- 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.
- ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) AND/OR BEAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT REQUIREMENTS.
- THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
- THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.

HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS. REQUEST SHOULD BE SENT TO CONSTWKRREQ@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 CONSTWKRREQ@SAWS.ORG.
- ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT HOLIDAY/WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION.
- 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.
- A COPY OF ALL TESTING REPORTS SHALL BE FORWARDED TO SAWS CONSTRUCTION INSPECTION DIVISION.

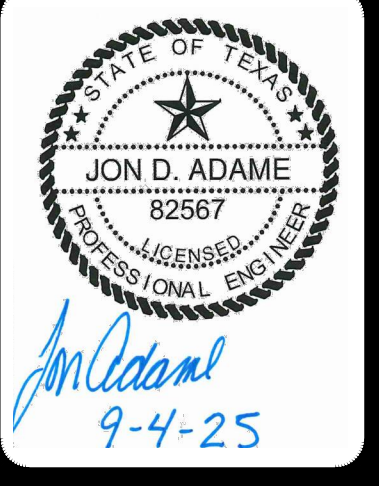
SAWS WATER NOTES

- 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
- 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".
- 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. (NSP)
- 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.
- ALL VALVES SHALL READ "OPEN RIGHT".
- PRVS REQUIRED: CONTRACTOR TO VERIFY THAT NO PORTION OF THE TRACT IS BELOW GROUND ELEVATION OF 920 FEET WHERE THE STATIC PRESSURE WILL NORMALLY EXCEED 80 PSI. AT ALL SUCH LOCATIONS WHERE THE GROUND LEVEL IS BELOW 920 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).
- 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.
- 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.
- 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.
- 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

- MACHINE CHLORINATION BY THE S.A.W.S.
- ALL 8" AND 12" PIPE SHALL BE P.V.C. C-900 CLASS 235 DR 18.
- ALL MAINS SHALL BE HYDROSTATICALLY TESTED BY THE CONTRACTOR, AS PROVIDED FOR IN THE SPECIAL CONDITIONS.
- 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.
- THE CONTRACTOR SHALL FURNISH THE ENGINEER WITH ALL THE FINAL MEASUREMENTS, TAPS AND LENGTH OF SERVICE CONNECTIONS.
- 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.
- 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.
- WATER METER BOXES IF APPLICABLE SHALL BE INSTALLED NINE FEET FROM FACE OF CURB TO CENTER OF THE METER BOX.
- ALL GARBAGE OR SPOIL MATERIAL FROM THIS WORK SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR, AT HIS EXPENSE.
- 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.
- 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).
- 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).
- 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.
- SAWS REQUIRES LEAD FREE (< 0.25%) FIRE HYDRANTS.
- UNLESS OTHERWISE NOTED ALL SERVICES SHALL BE 3/4" WITH 5/8" METER.

NO.	REVISION	DATE



PAPE-DAWSON
ENGINEERS

2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008860

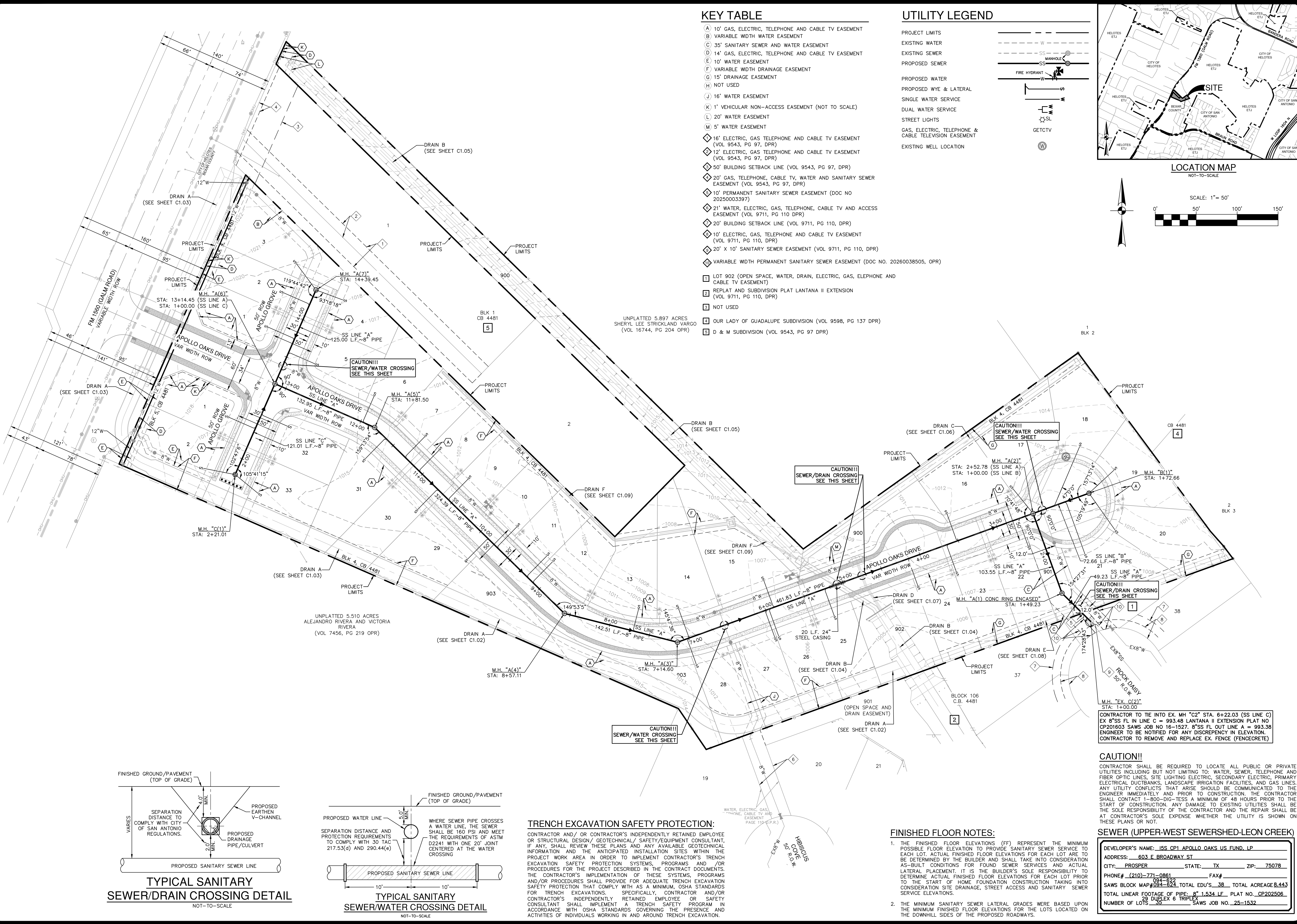
APOLLO OAKS
BEXAR COUNTY, TEXAS

WATER DISTRIBUTION PLAN NOTES

WATER (SAWS PRESSURE ZONE 8)

DEVELOPER'S NAME: INVEST 5S, LLC
ADDRESS: 22202 CIELO VISTA
CITY: SAN ANTONIO STATE: TX ZIP: 78255
PHONE# (540) 305-4056 FAX#
SAWS BLOCK MAP# 094-822 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
TOTAL LINEAR FOOTAGE OF PIPE: 8' 2.061' PLAT NO. CP202506
NUMBER OF LOTS: 35 SAWS JOB NO. 25-1039

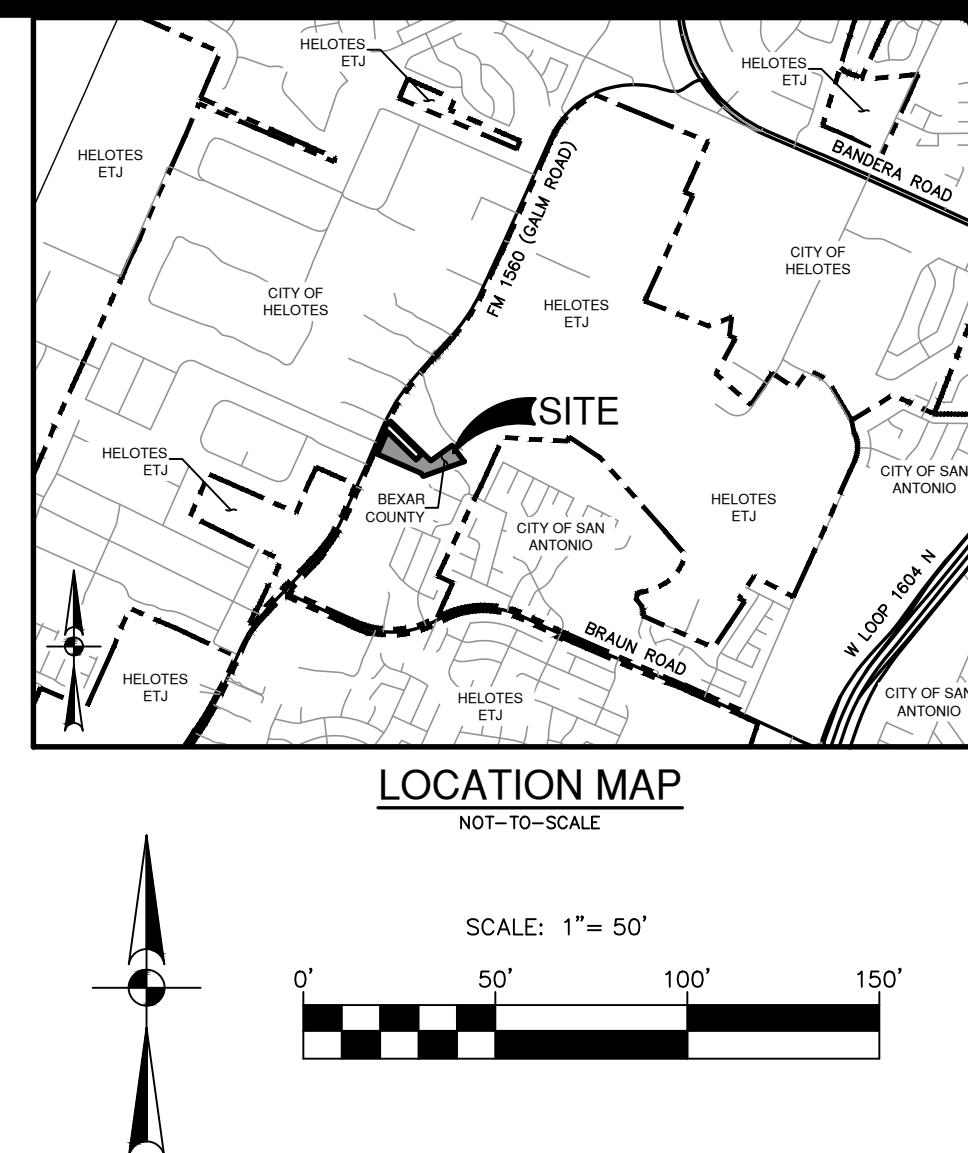
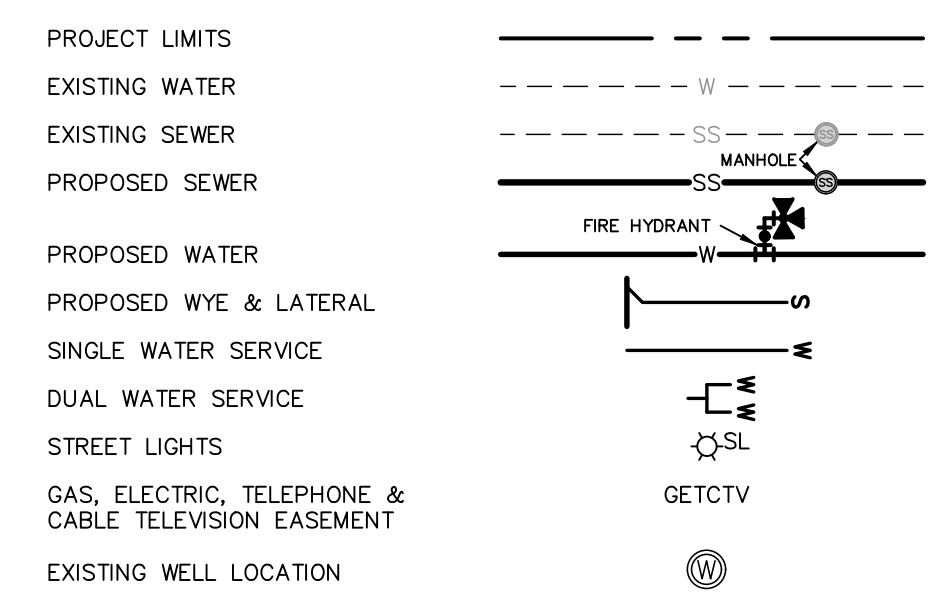
PLAT NO.	CP202506
JOB NO.	13657-00
DATE	SEPTEMBER 2025
DESIGNER	-
CHECKED	- DRAWN -
SHEET	C4.11



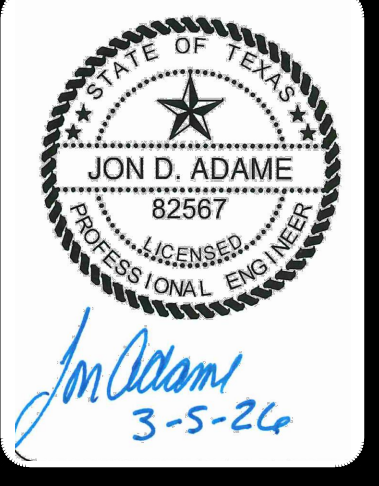
KEY TABLE

- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (B) VARIABLE WIDTH WATER EASEMENT
- (C) 35' SANITARY SEWER AND WATER EASEMENT
- (D) 14' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (E) 10' WATER EASEMENT
- (F) VARIABLE WIDTH DRAINAGE EASEMENT
- (G) 15' DRAINAGE EASEMENT
- (H) NOT USED
- (J) 16' WATER EASEMENT
- (K) 1' VEHICULAR NON-ACCESS EASEMENT (NOT TO SCALE)
- (L) 20' WATER EASEMENT
- (M) 5' WATER EASEMENT
- ◇ 16' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
- ◇ 12' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL. 9543, PG. 97, DPR)
- ◇ 50' BUILDING SETBACK LINE (VOL. 9543, PG. 97, DPR)
- ◇ 20' GAS, TELEPHONE, CABLE TV, WATER AND SANITARY SEWER EASEMENT (VOL. 9543, PG. 97, DPR)
- ◇ 10' PERMANENT SANITARY SEWER EASEMENT (DOC NO. 20250003397)
- ◇ 21' WATER, ELECTRIC, GAS, TELEPHONE, CABLE TV AND ACCESS EASEMENT (VOL. 9711, PG. 110, DPR)
- ◇ 20' BUILDING SETBACK LINE (VOL. 9711, PG. 110, DPR)
- ◇ 10' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL. 9711, PG. 110, DPR)
- ◇ 20' X 10' SANITARY SEWER EASEMENT (VOL. 9711, PG. 110, DPR)
- ◇ VARIABLE WIDTH PERMANENT SANITARY SEWER EASEMENT (DOC NO. 20260038505, OPR)
- LOT 902 (OPEN SPACE, WATER, DRAIN, ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT)
- REPLAT AND SUBDIVISION PLAT LANTANA II EXTENSION (VOL. 9711, PG. 110, DPR)
- NOT USED
- OUR LADY OF GUADALUPE SUBDIVISION (VOL. 9598, PG. 137 DPR)
- D & M SUBDIVISION (VOL. 9543, PG. 97 DPR)

UTILITY LEGEND

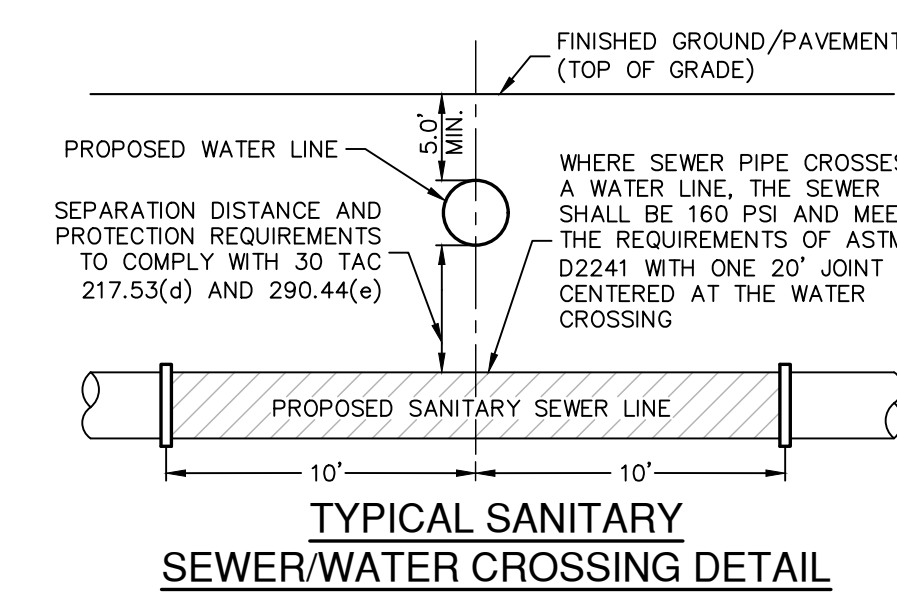
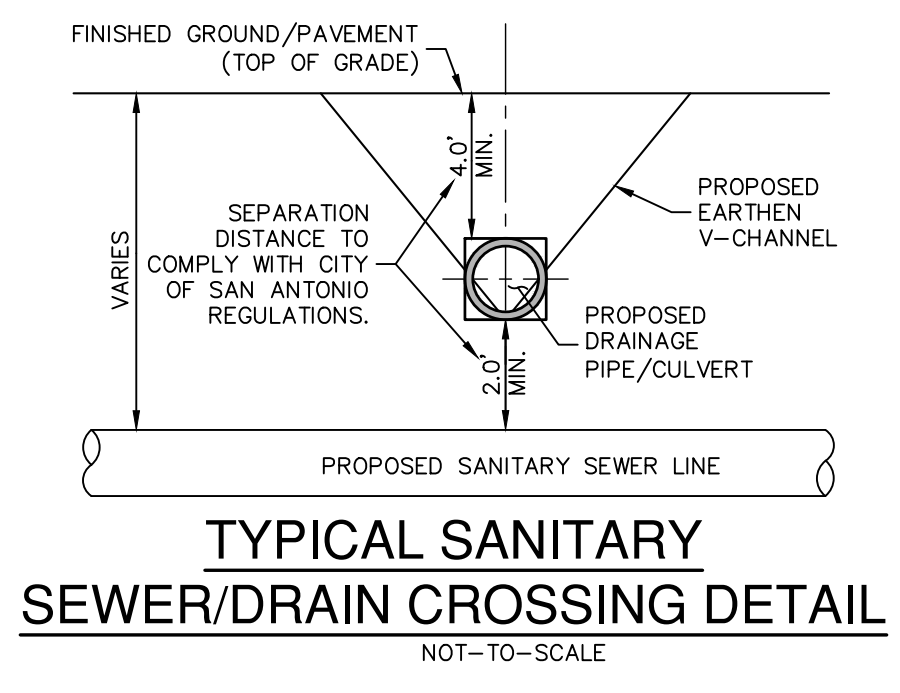


NO.	REVISION	DATE



PAPE-DAWSON ENGINEERS
 2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10038600

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 OVERALL SANITARY SEWER PLAN



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.

FINISHED FLOOR NOTES:

- 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.
- 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.

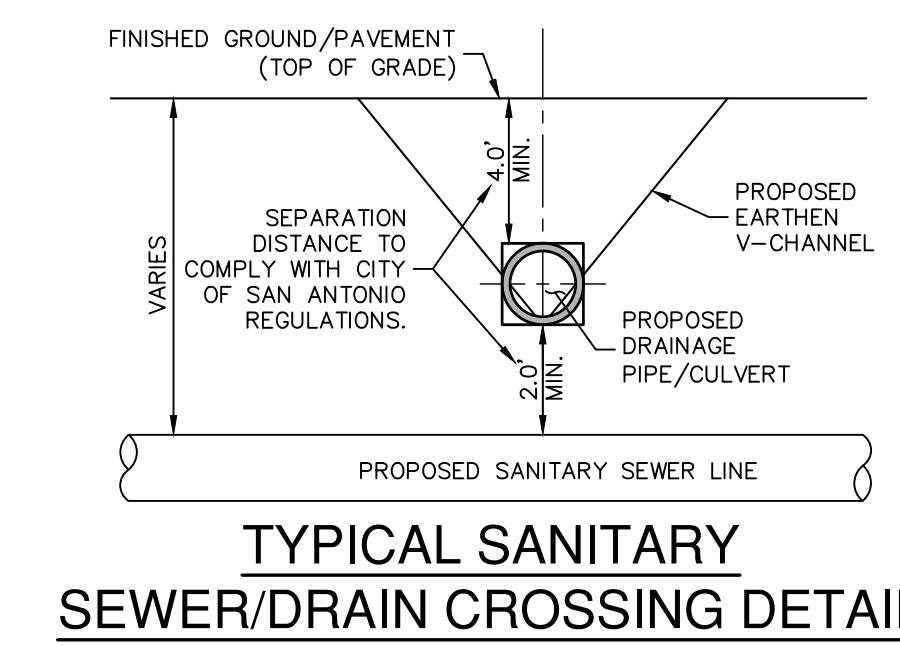
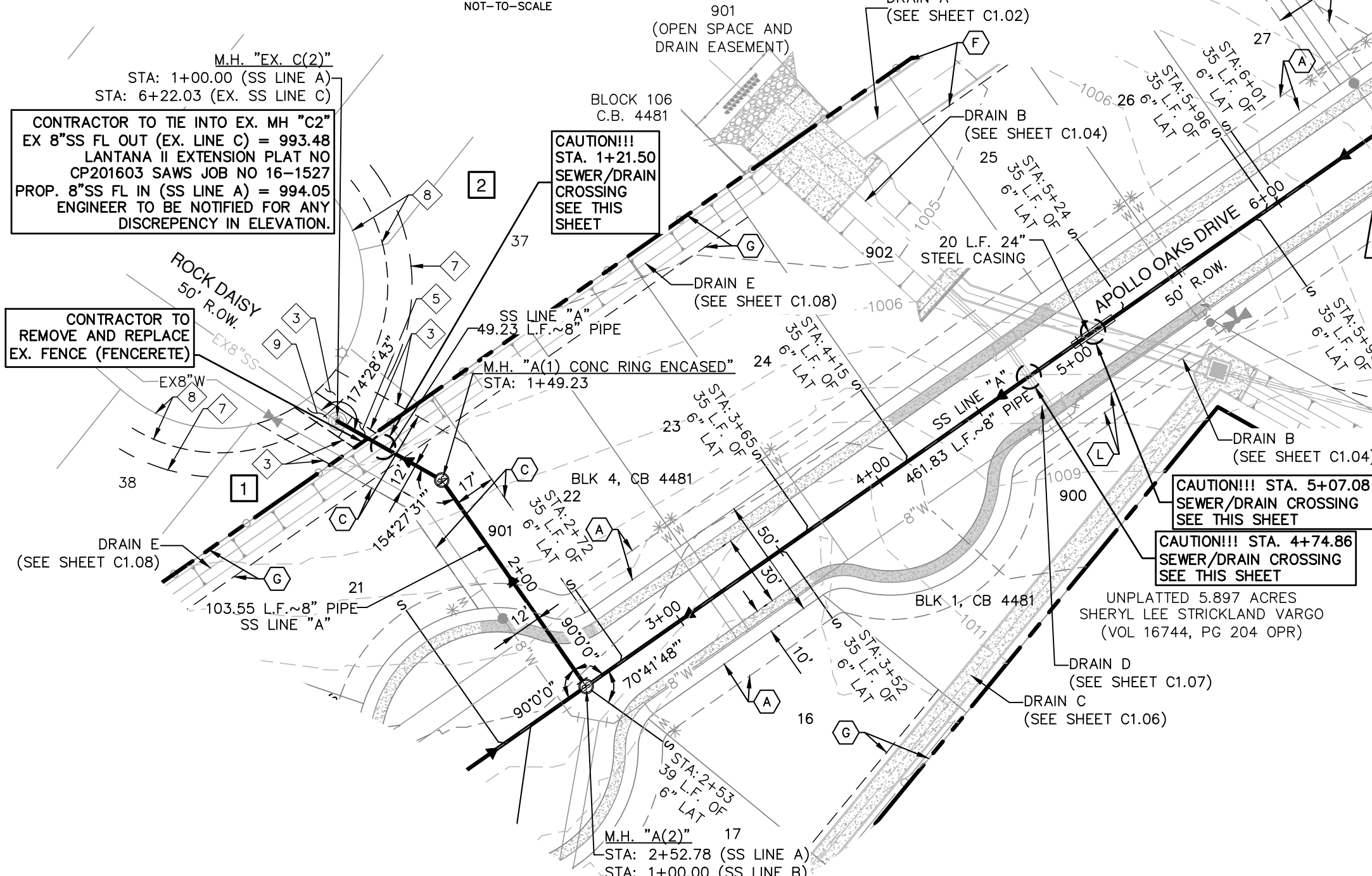
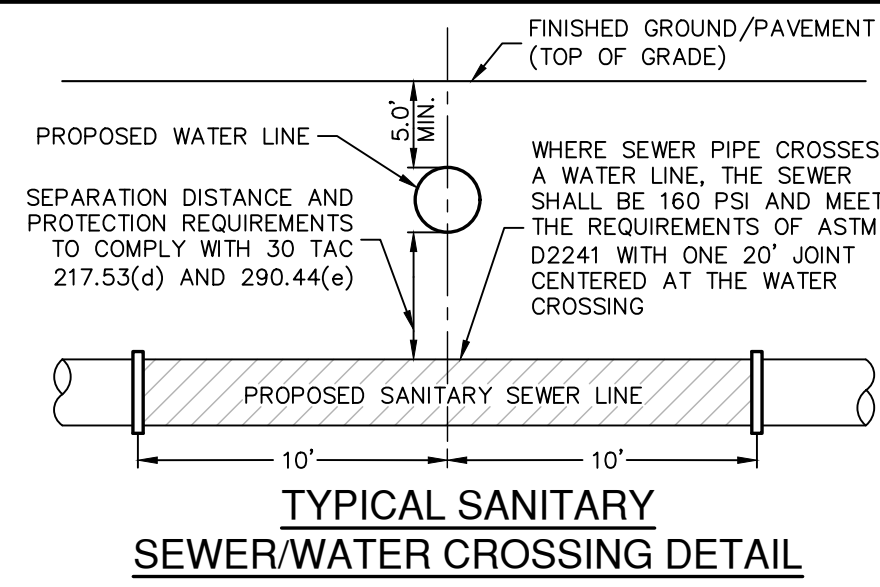
CAUTION!!!
 CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITING TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE, IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS 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 (UPPER-WEST SEWERSHED-LEON CREEK)

DEVELOPER'S NAME: JSS CP1 APOLLO OAKS US FUND LP
ADDRESS: 603 E BROADWAY ST
CITY: PROSPER STATE: TX ZIP: 75078
PHONE# (210)-771-0861 FAX#
SAWS BLOCK MAP# 094-822 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
TOTAL LINEAR FOOTAGE OF PIPE: 8" 1,534 LF PLAT NO. CP202508
NUMBER OF LOTS 35 SAWS JOB NO. 25-1532

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	NOVEMBER 2025
DESIGNER	CR
CHECKED	JA DRAWN
SHEET	C5.00

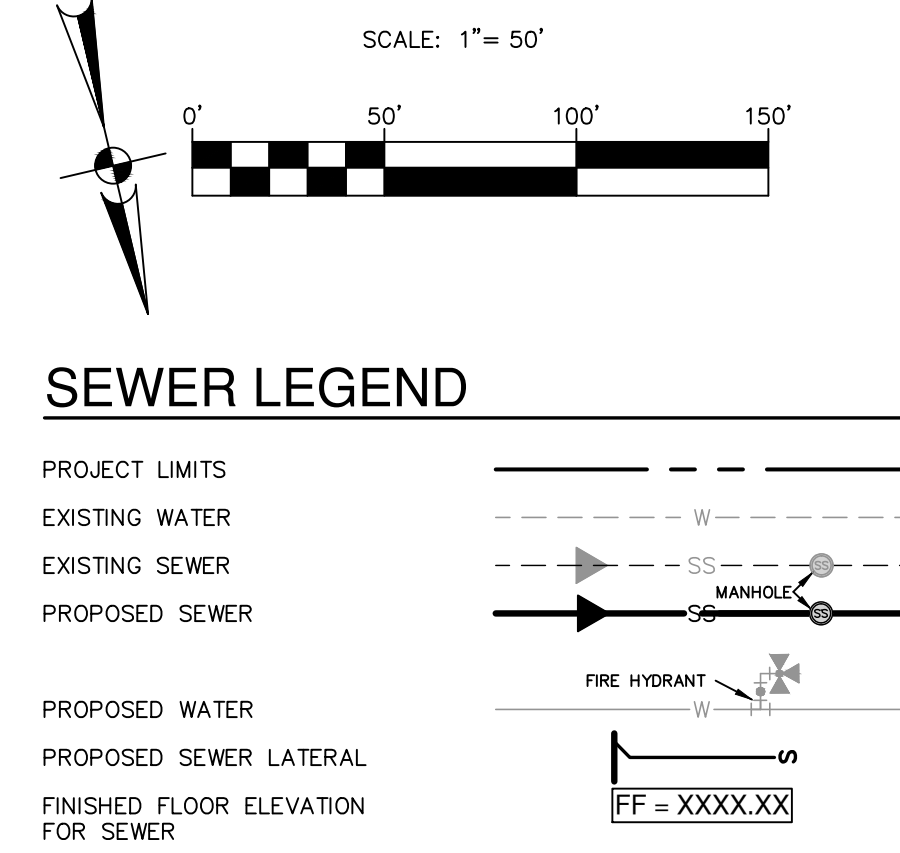
Date: Mar 05, 2025 @ 10:09 AM User: JD - JSS\jld
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SANITARY SEWER LINE "A"
STA. 1+00.00 TO END

KEY TABLE

A) 10' GAS, ELEC, TEL AND CATV ESMT	◇ 16' ELEC, GAS TEL AND CA TV ESMT (VOL 9543, PG 97, DPR)
B) VAR WIDTH WATER ESMT	◇ 12' ELEC, GAS TEL AND CA TV ESMT (VOL 9543, PG 97, DPR)
C) 35' SAN SWR AND WATER ESMT	◇ VARIABLE WIDTH PERMANENT SANITARY SEWER EASEMENT (DOC NO. 20260038505, OPR)
D) NOT USED	◇ NOT USED
E) 10' WATER ESMT	◇ 10' PERM SAN SWR ESMT (DOC NO 2025003397)
F) VAR WIDTH DRAINAGE ESMT	◇ 21' WATER, ELEC, GAS, TEL, CATV AND ACCESS ESMT (VOL 9711, PG 110, DPR)
G) 15' DRAINAGE ESMT	◇ 10' ELEC, GAS, TEL AND CATV ESMT (VOL 9711, PG 110, DPR)
H) NOT USED	◇ 20'X10' SAN SWR ESMT (VOL 9711, PG 110, DPR)
I) 16' WATER ESMT	◇ LOT 902 (OPEN SPACE, WATER, DRAIN, ELEC, GAS, AND CATV EASEMENT)
J) 1' VEH NON-ACCES ESMT (N.T.S.)	◇ REPLAT AND SUBDIVISION PLAT LANTANA II EXTENSION (VOL 9711, PG 110, DPR)
K) 5' WATER ESMT	◇ NOT USED
	◇ OUR LADY OF GUADALUPE SUBDIVISION (VOL 9598, PG 137, DPR)
	◇ D & M SUBDIVISION (VOL 9543, PG 97, DPR)



TRENCH EXCAVATION SAFETY PROTECTION:

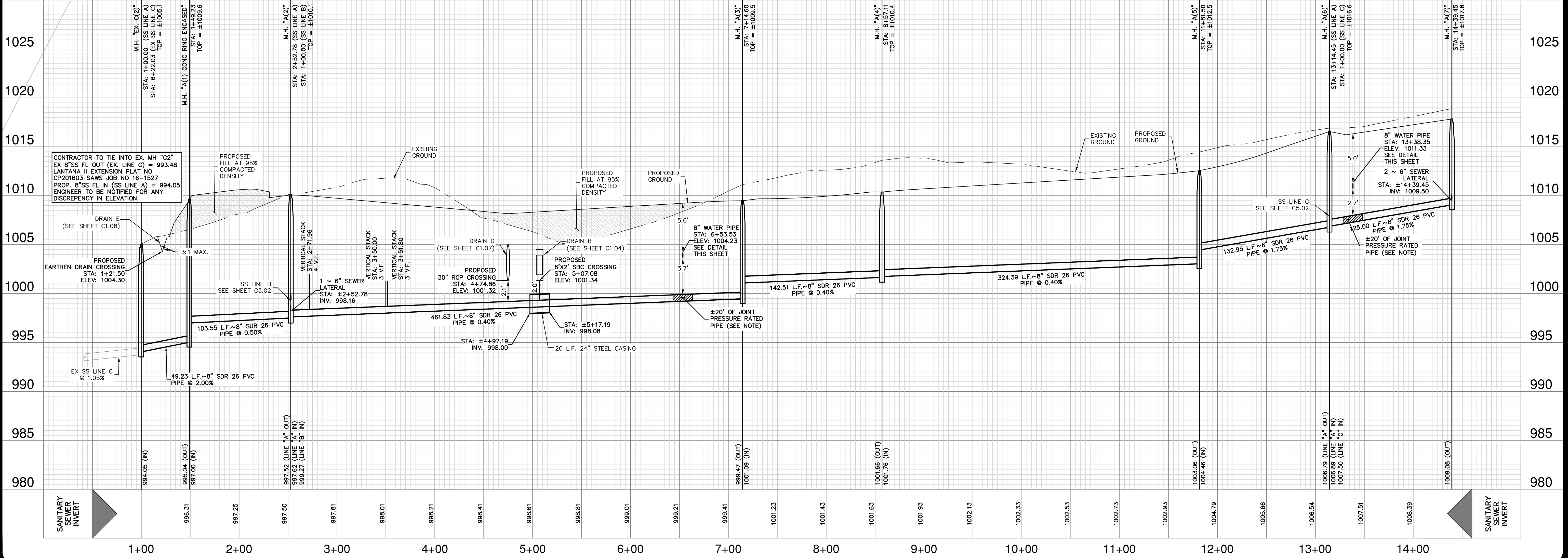
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE, GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S 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-TEST 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 (UPPER-WEST WERSHED-LEON CREEK)

DEVELOPER'S NAME: ISS CP1 APOLLO OAKS US FUND, LP
 ADDRESS: 603 F BROADWAY ST
 CITY: PROSPER STATE: TX ZIP: 75078
 PHONE# (210)-771-0861 FAX#
 SAWS BLOCK MAP# 094-824 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
 TOTAL LINEAR FOOTAGE OF PIPE: 8' 1,534 LF. PLAT NO. CP202506
 NUMBER OF LOTS 39 DUPLEX 6 TRIPLEX 29 SAWS JOB NO. 25-1532



DATE _____

NO. REVISION _____

PAPE-DAWSON ENGINEERS

2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10038800

APOLLO OAKS
 BEXAR COUNTY, TEXAS

SANITARY SEWERLINE A PLAN & PROFILE
 STA. 1+00.00 TO END

PLAT NO. CP202506
 JOB NO. 13657-00
 DATE NOVEMBER 2025
 DESIGNER CR
 CHECKED JA DRAWN JF

SHEET C5.01

Drawn: Mrc. G.S. 2/2/25 @ 14:44 User: ID: BMS/ajl/lin
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KEY TABLE

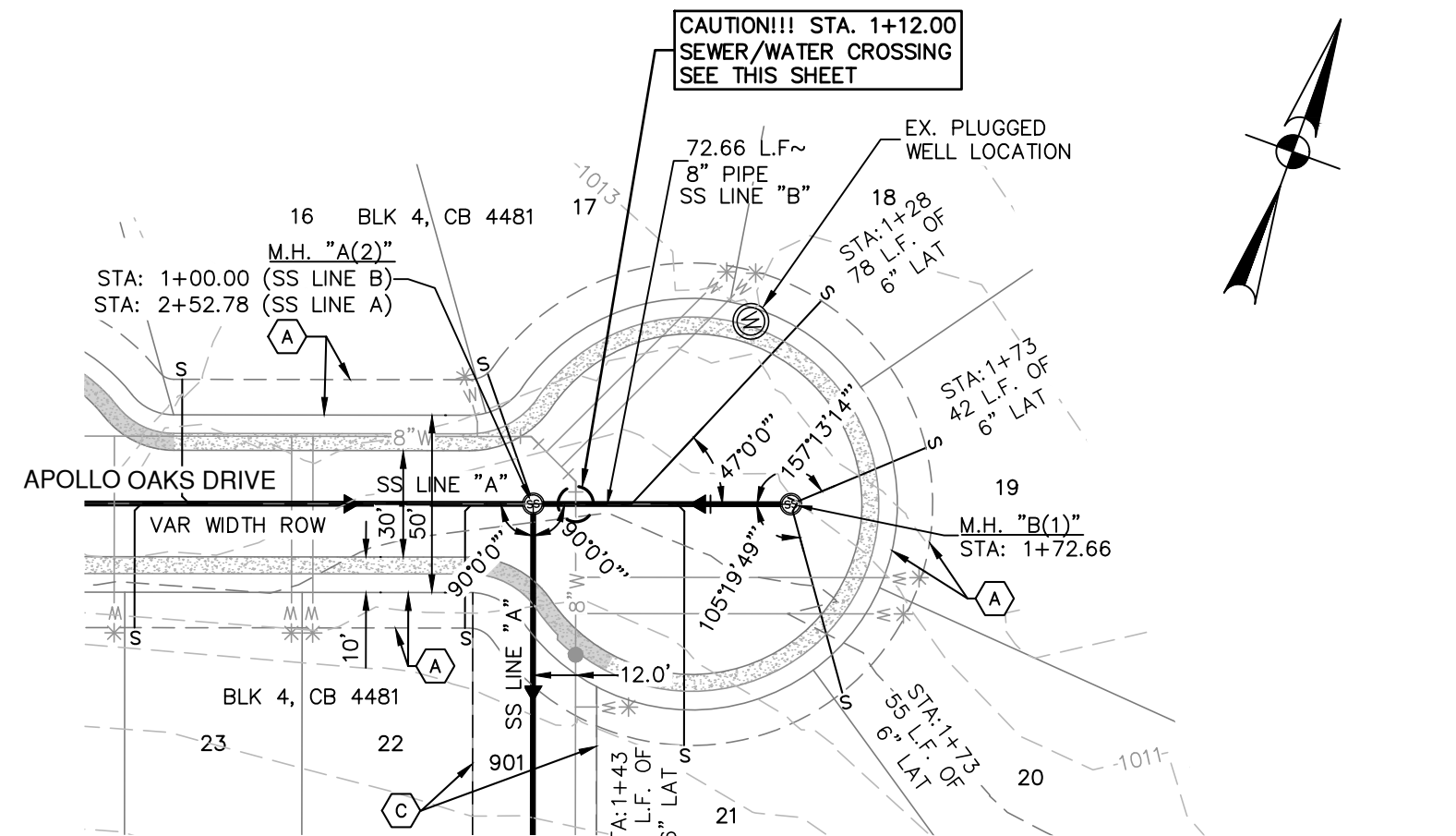
(A) 10" GAS, ELEC, TEL AND CATV ESMT	◇ 16" ELEC, GAS TEL AND CA TV ESMT (VOL 9543, PG 97, DPR)
(B) VAR WIDTH WATER ESMT	◇ 12" ELEC, GAS TEL AND CA TV ESMT (VOL 9543, PG 97, DPR)
(C) 35" SAN SWR AND WATER ESMT	◇ NOT USED
(D) NOT USED	◇ NOT USED
(E) 10" WATER ESMT	◇ 10' PERM SAN SWR ESMT (DOC NO 20250003397)
(F) VAR WIDTH DRAINAGE ESMT	◇ 21" WATER, ELEC, GAS, TEL, CATV AND ACCESS ESMT (VOL 9711, PG 110 DPR)
(G) 15" DRAINAGE ESMT	◇ 20' BLDG SETBACK (VOL 9711, PG 110, DPR)
(H) VAR WIDTH SAN SWR AND WATER ESMT (OFF-LOT)	◇ 10' ELEC, GAS, TEL AND CATV ESMT (VOL 9711, PG 110, DPR)
(J) 16" WATER ESMT	◇ 20'X10' SAN SWR ESMT (VOL 9711, PG 110, DPR)
(K) 1' VEH NON-ACCES ESMT (N.T.S.)	□ LOT 902 (OPEN SPACE, WATER, DRAIN, ELEC, GAS, AND CATV EASEMENT)
	□ REPLAT AND SUBDIVISION PLAT LANTANA II EXTENSION (VOL 9711, PG 110, DPR)
	□ NOT USED
	□ OUR LADY OF GUADALUPE SUBDIVISION (VOL 9598, PG 137 DPR)
	□ D & M SUBDIVISION (VOL 9543, PG 97 DPR)

SCALE: 1" = 50'



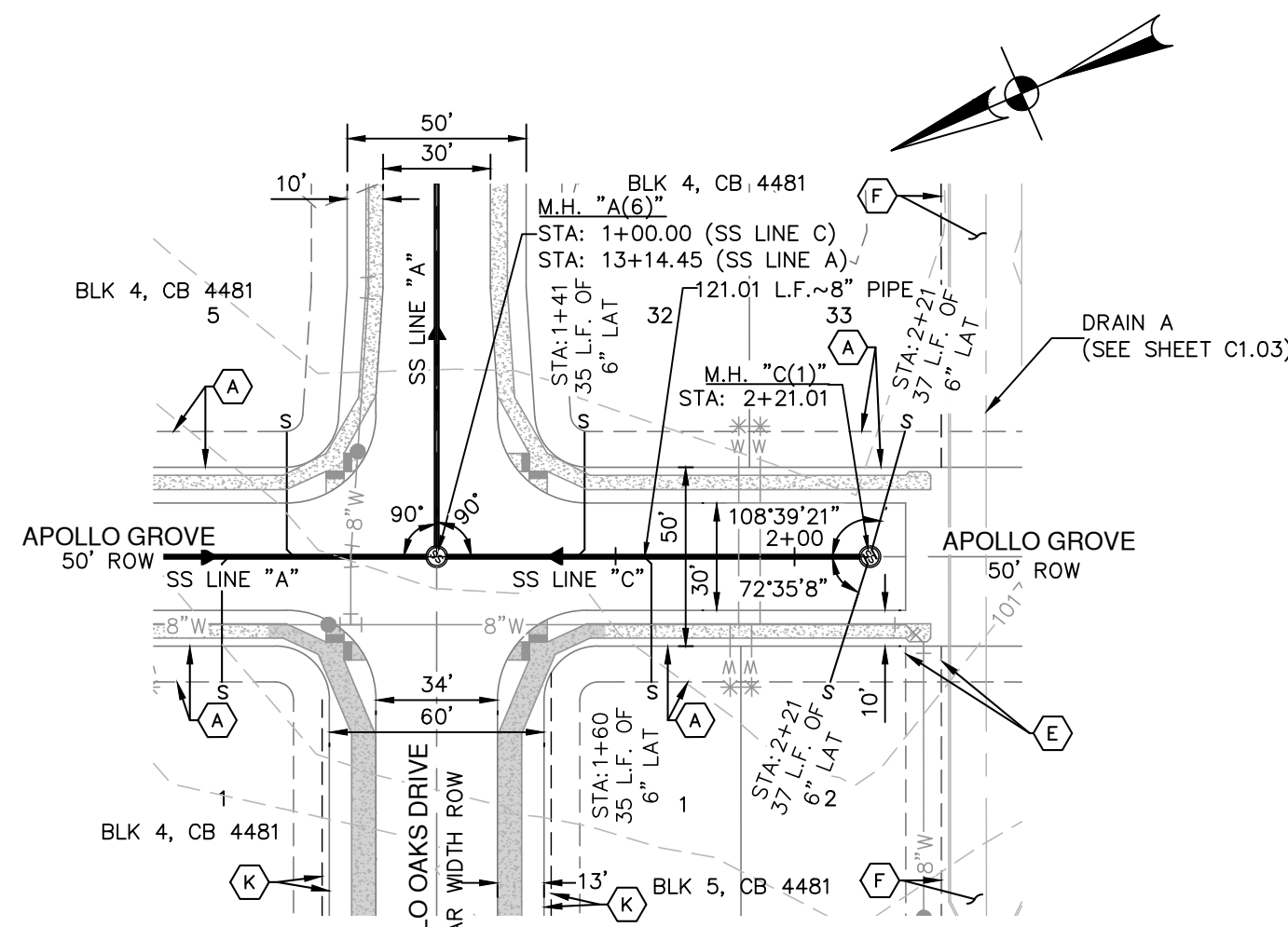
SEWER LEGEND

PROJECT LIMITS	---
EXISTING WATER	---
EXISTING SEWER	---
PROPOSED SEWER	---
PROPOSED WATER	---
PROPOSED SEWER LATERAL	---
FINISHED FLOOR ELEVATION FOR SEWER	FF = XXXX.XX



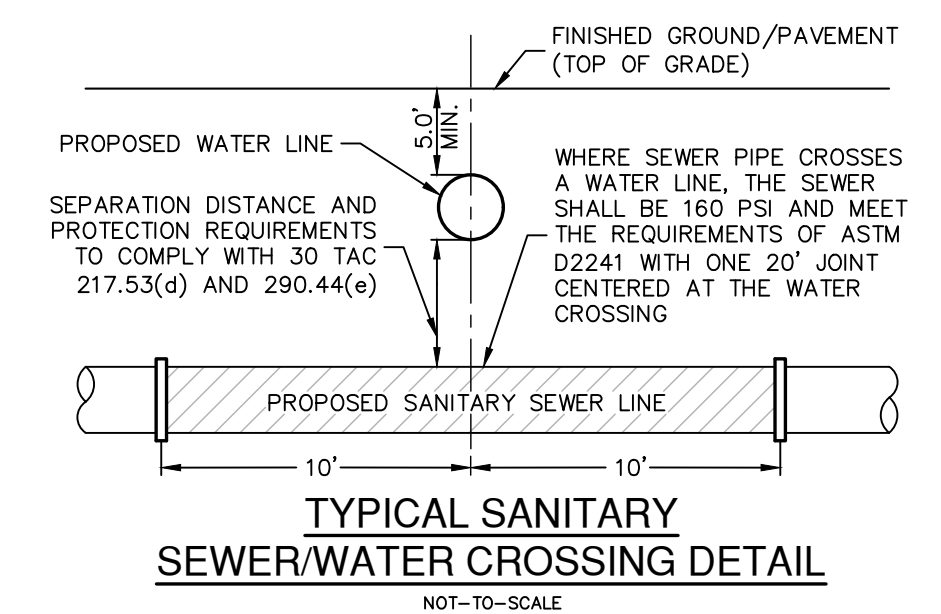
SANITARY SEWER LINE "B"
STA. 1+00.00 TO END
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'

1025	M.H. "A(2)" STA: 1+00.00 (SS LINE B) STA: 2+52.78 (SS LINE A) TOP = ±1010.1	1025
1020		1020
1015		1015
1010		1010
1005	PROPOSED GROUND EXISTING GROUND 8" WATER PIPE STA: 1+12.00 ELEV: 1005.17 SEE DETAIL THIS SHEET VERTICAL STACK STA: 1+27.74 STA: 1+42.64 2.1' V.F. 1 ~ 6" SEWER LATERAL STA: ±1+72.66 INV: 1000.64 72.66 L.F. ~ 8" SDR 26 PVC PIPE @ 0.75% ±20' OF JOINT PRESSURE RATED PIPE (SEE NOTE)	1005
1000	SS LINE A SEE SHEET C5.01	1000
995		995
990		990
985	987.52 (LINE "A" OUT) 987.62 (LINE "A" IN) 989.27 (LINE "B" IN) 989.82 (OUT)	985
980	SANITARY SEWER INVERT	980
1+00		2+00



SANITARY SEWER LINE "C"
STA. 1+00.00 TO END
VERTICAL SCALE: 1" = 5'
HORIZONTAL SCALE: 1" = 50'

1030	M.H. "A(6)" STA: 1+00.00 (SS LINE C) STA: 13+14.45 (SS LINE A) TOP = ±1016.8	1030
1025		1025
1020		1020
1015	PROPOSED GROUND EXISTING GROUND 2 ~ 6" SEWER LATERAL STA: ±2+21.01 INV: 1008.34 121.01 L.F. ~ 8" SDR 26 PVC PIPE @ 0.30%	1015
1010		1010
1005	SS LINE A SEE SHEET C5.01	1005
1000		1000
995		995
990		990
985	1006.79 (LINE "A" OUT) 1007.50 (LINE "C" IN) 1007.86 (OUT)	985
1+00		2+50



CAUTION!!
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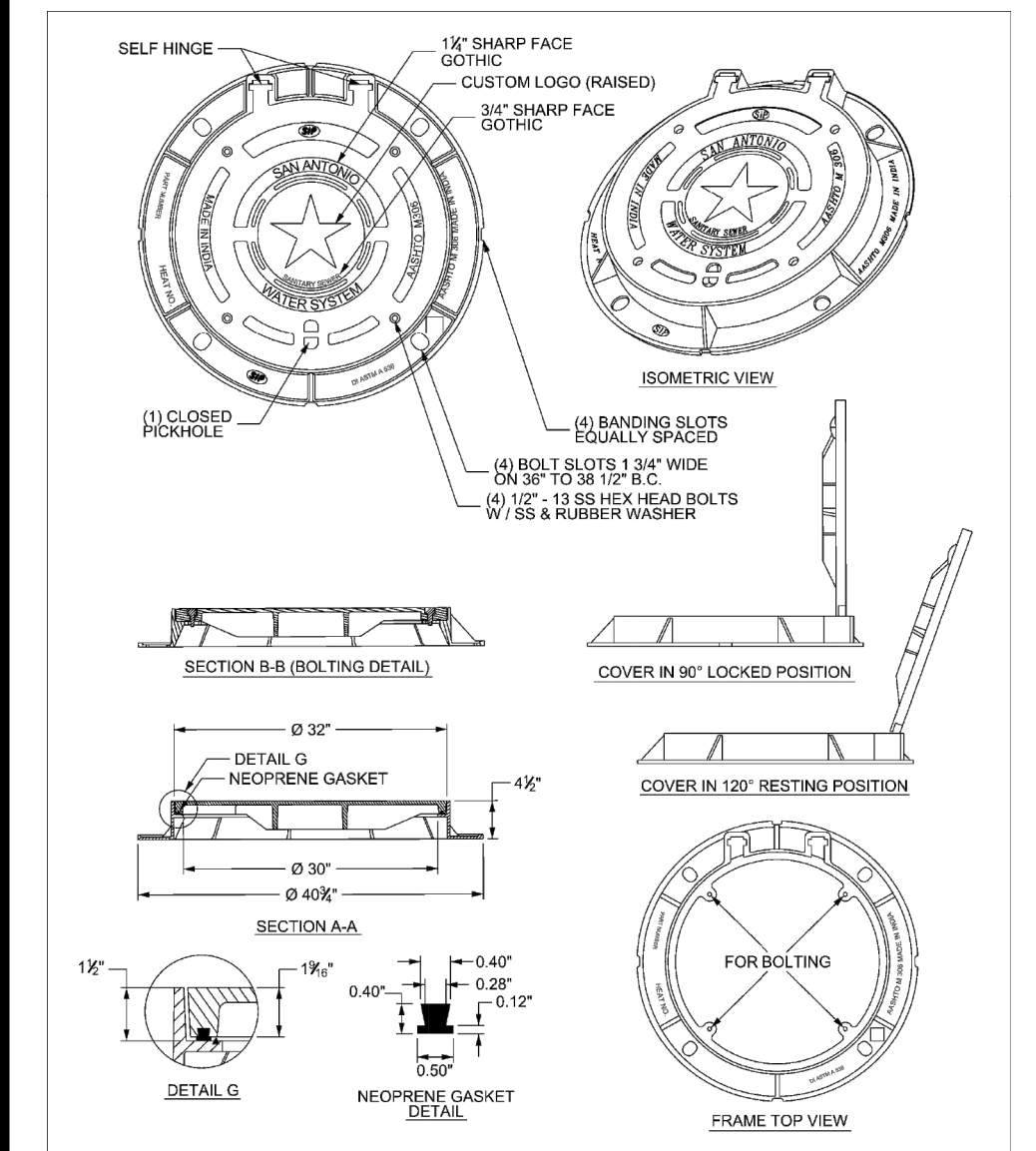
SEWER (UPPER-WEST SEWERSHED-LEON CREEK)

DEVELOPER'S NAME: INVEST 5S, LLC
ADDRESS: 22202 CIELO VISTA
CITY: SAN ANTONIO STATE: TX ZIP: 78255
PHONE# (540) 305-4056 FAX# 094-822
SAWS BLOCK MAP# 094-822 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
TOTAL LINEAR FOOTAGE OF PIPE: 8' 1,534 LF PLAT NO. CP202506
NUMBER OF LOTS 35 SAWS JOB NO. 25-1532

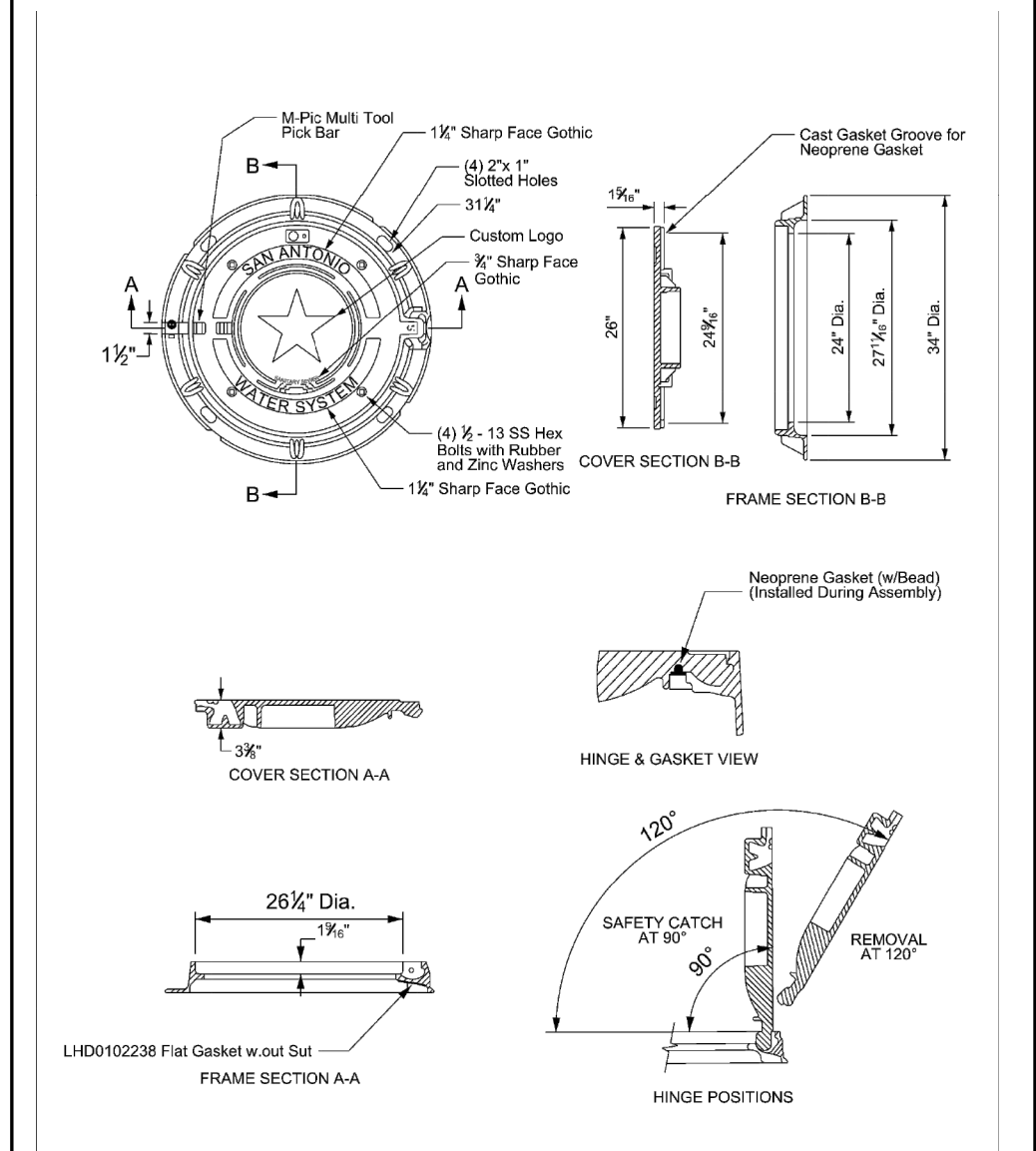
PAPE-DAWSON ENGINEERS
 2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #1008800

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 SANITARY SEWER LINE B & C PLAN & PROFILE
 LINE B - STA. 1+00.00 TO END
 LINE C - STA. 1+00.00 TO END

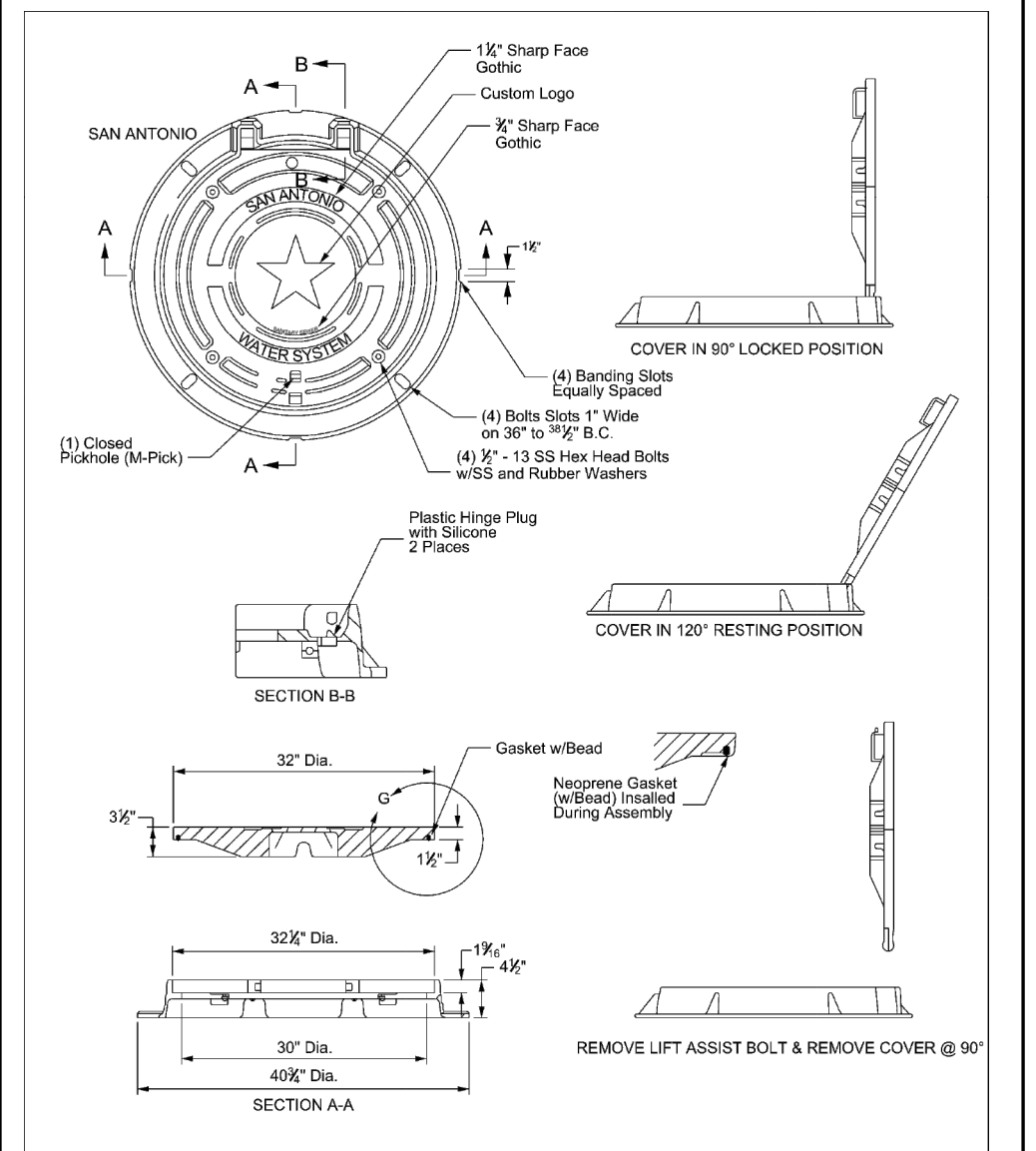
PLAT NO.	CP202506
JOB NO.	13657-00
DATE	SEPTEMBER 2025
DESIGNER	CR
CHECKED	JA DRAWN
SHEET	C5.02



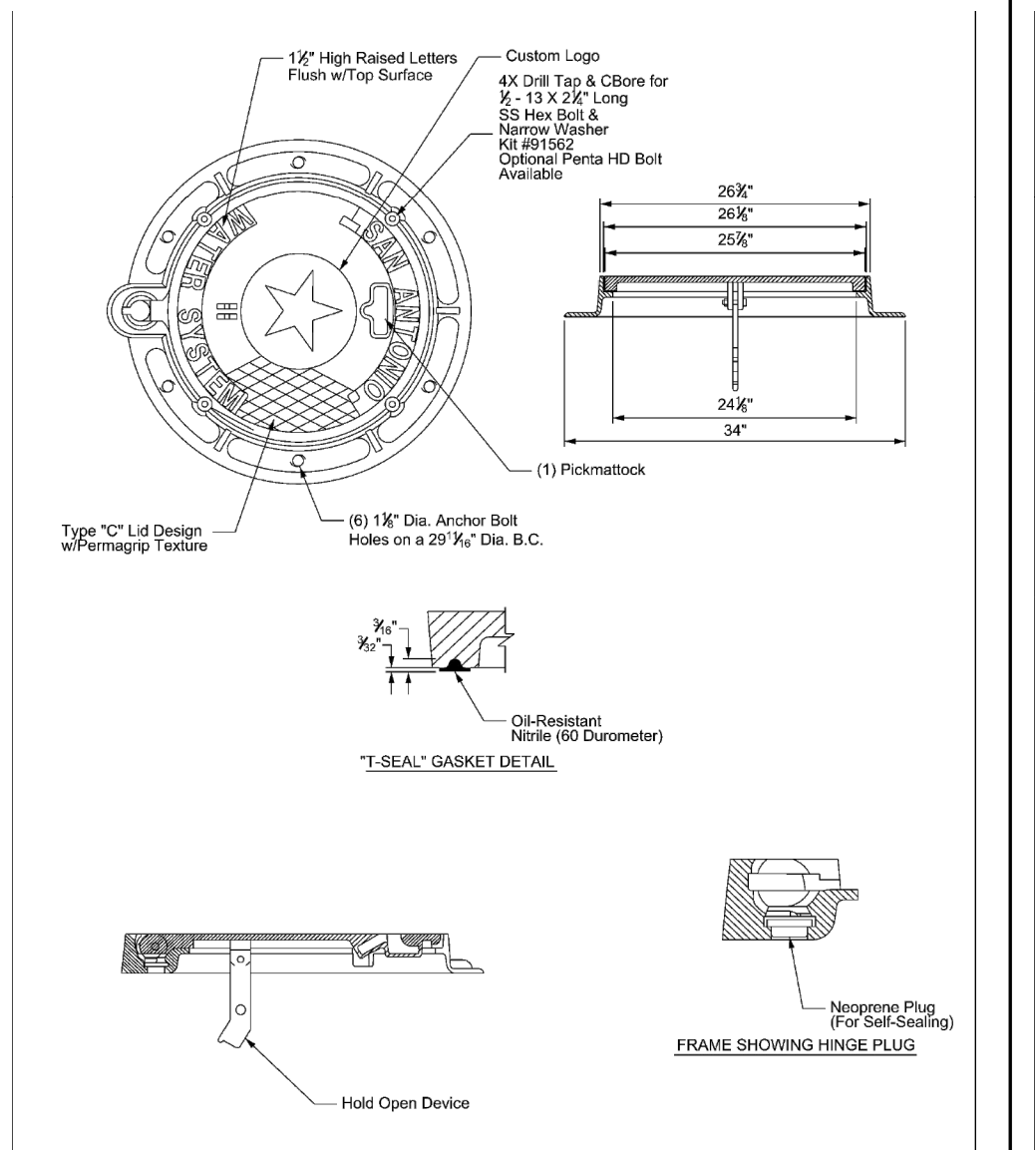
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SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 852-07	1 OF 5



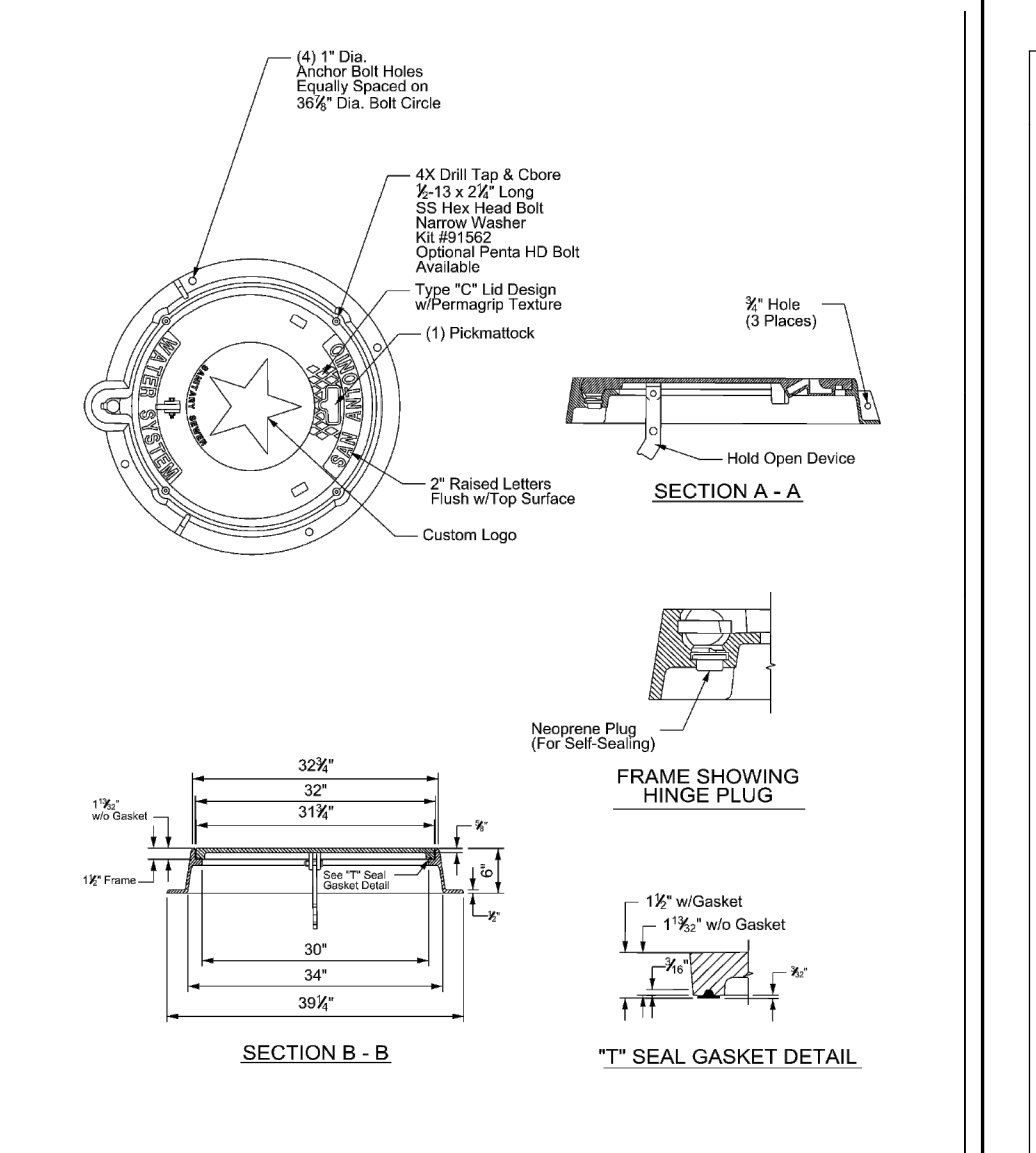
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SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 852-07	2 OF 5



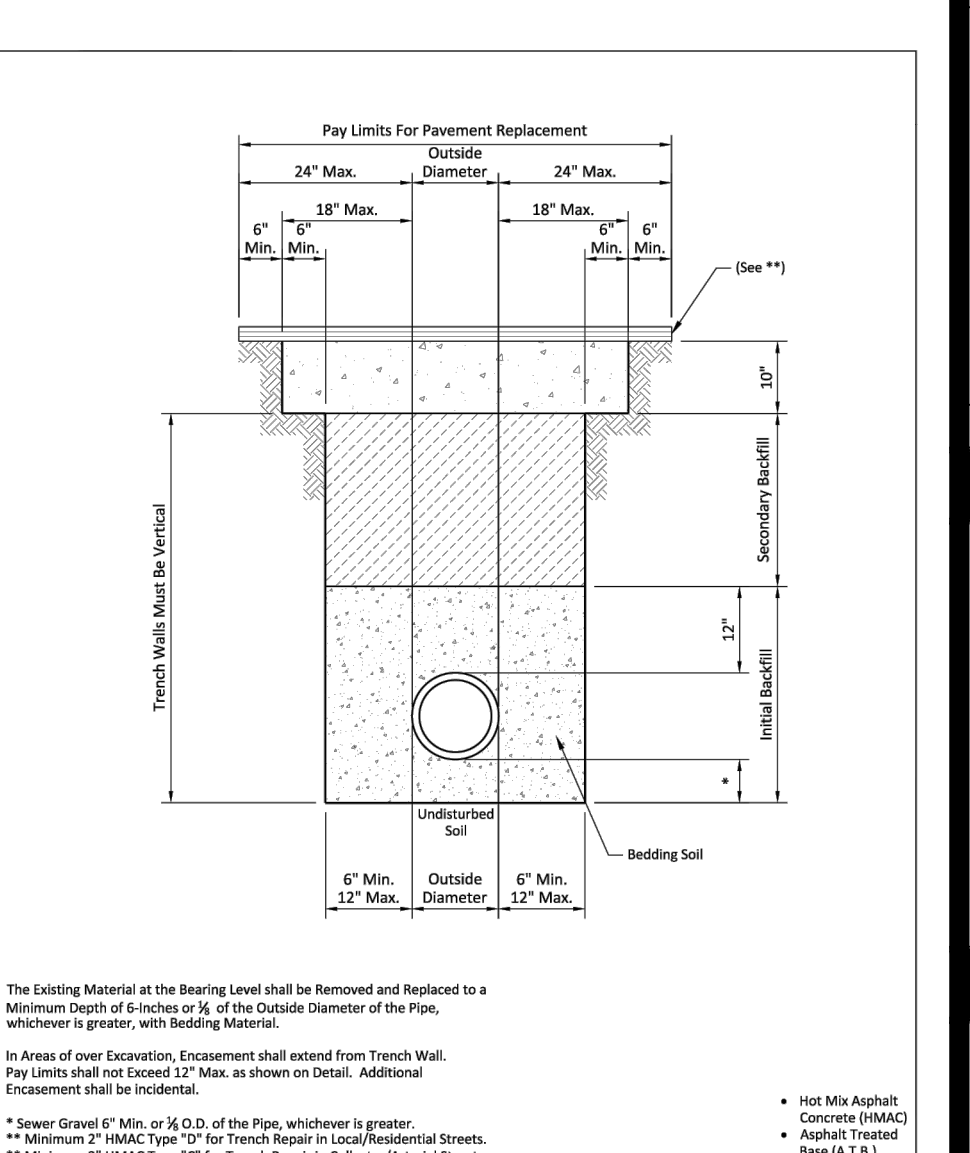
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SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 852-07	3 OF 5



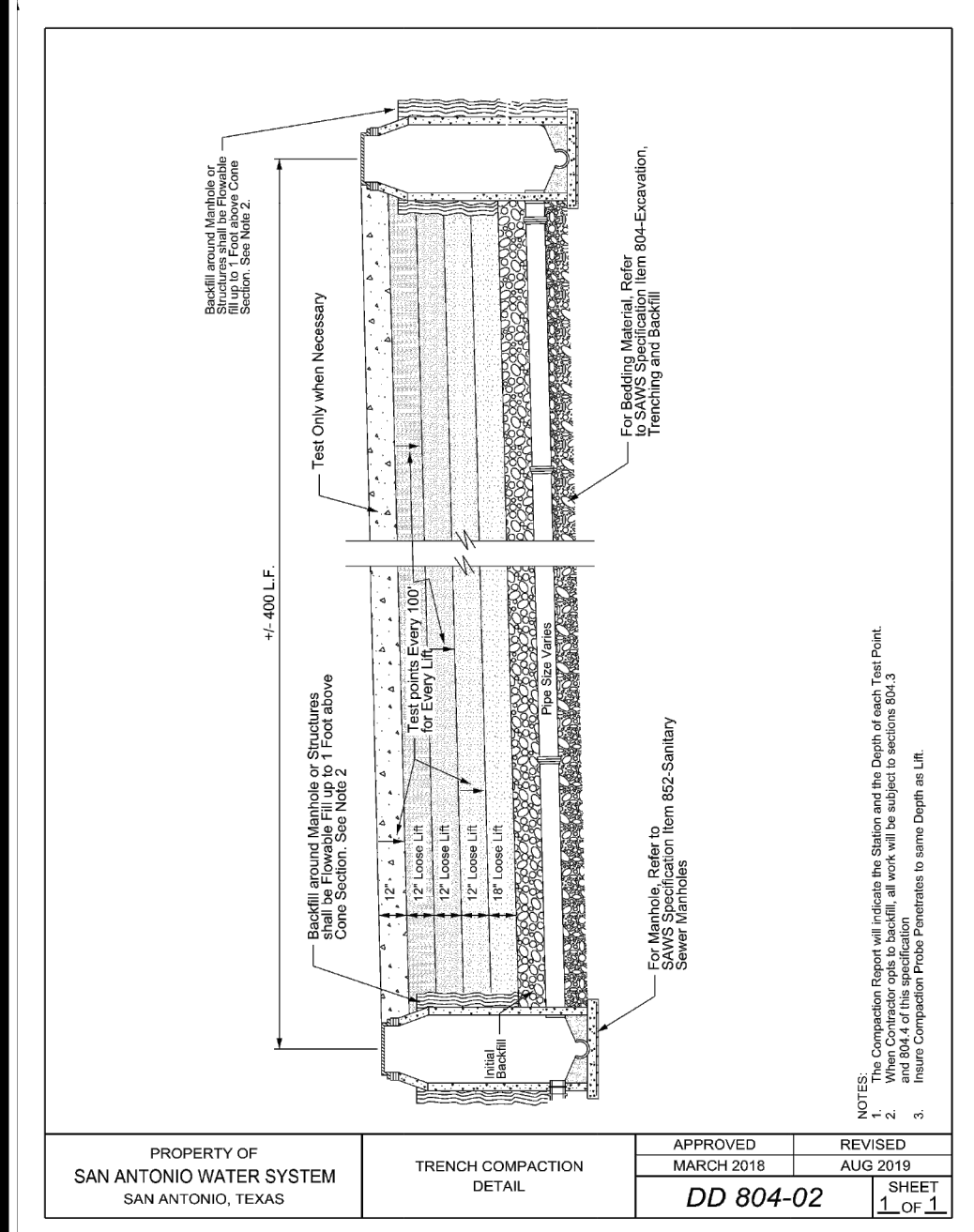
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SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 852-07	4 OF 5



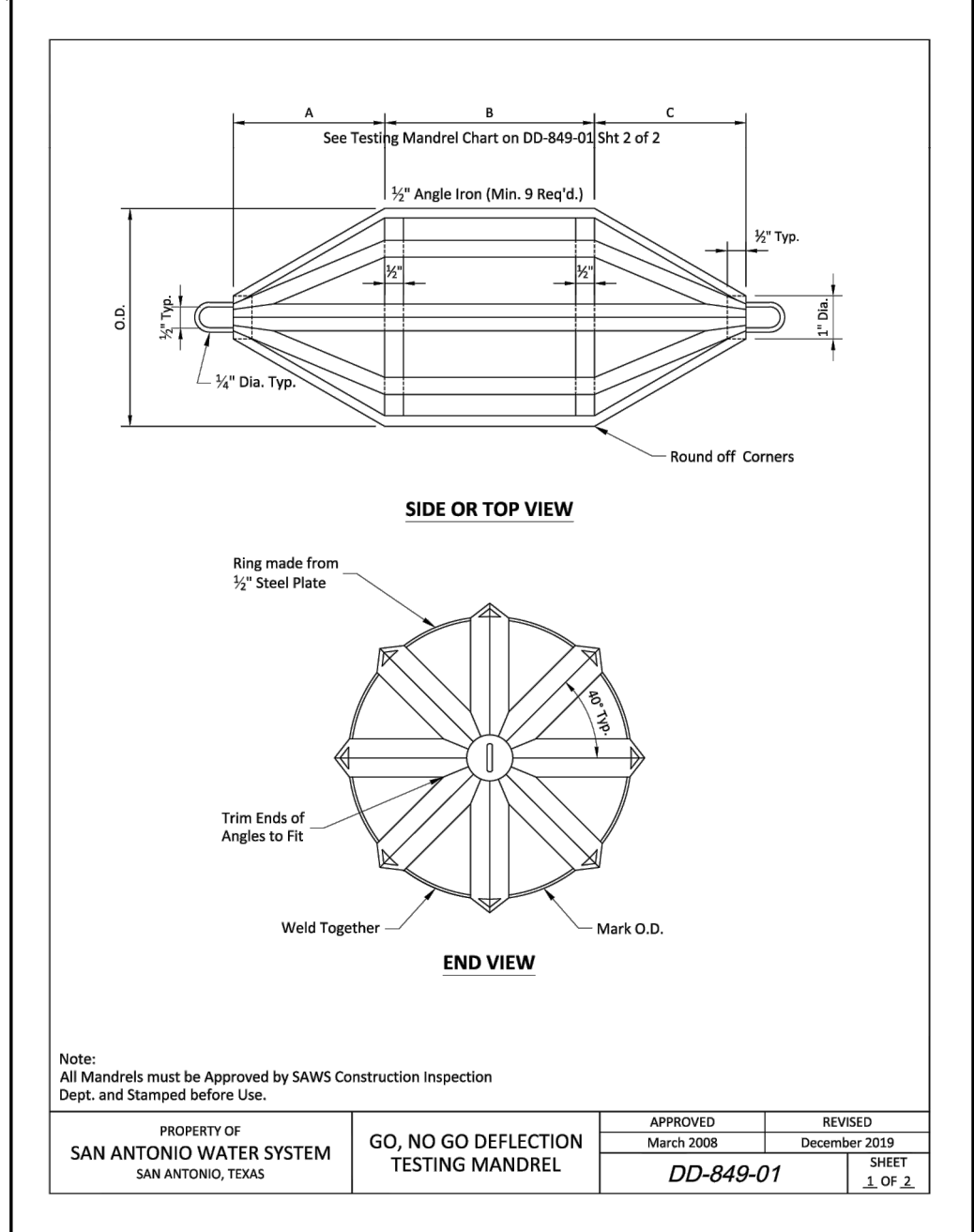
PROPERTY OF	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 852-07	5 OF 5



PROPERTY OF	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD-804-01	1 OF 1



PROPERTY OF	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 804-02	1 OF 1



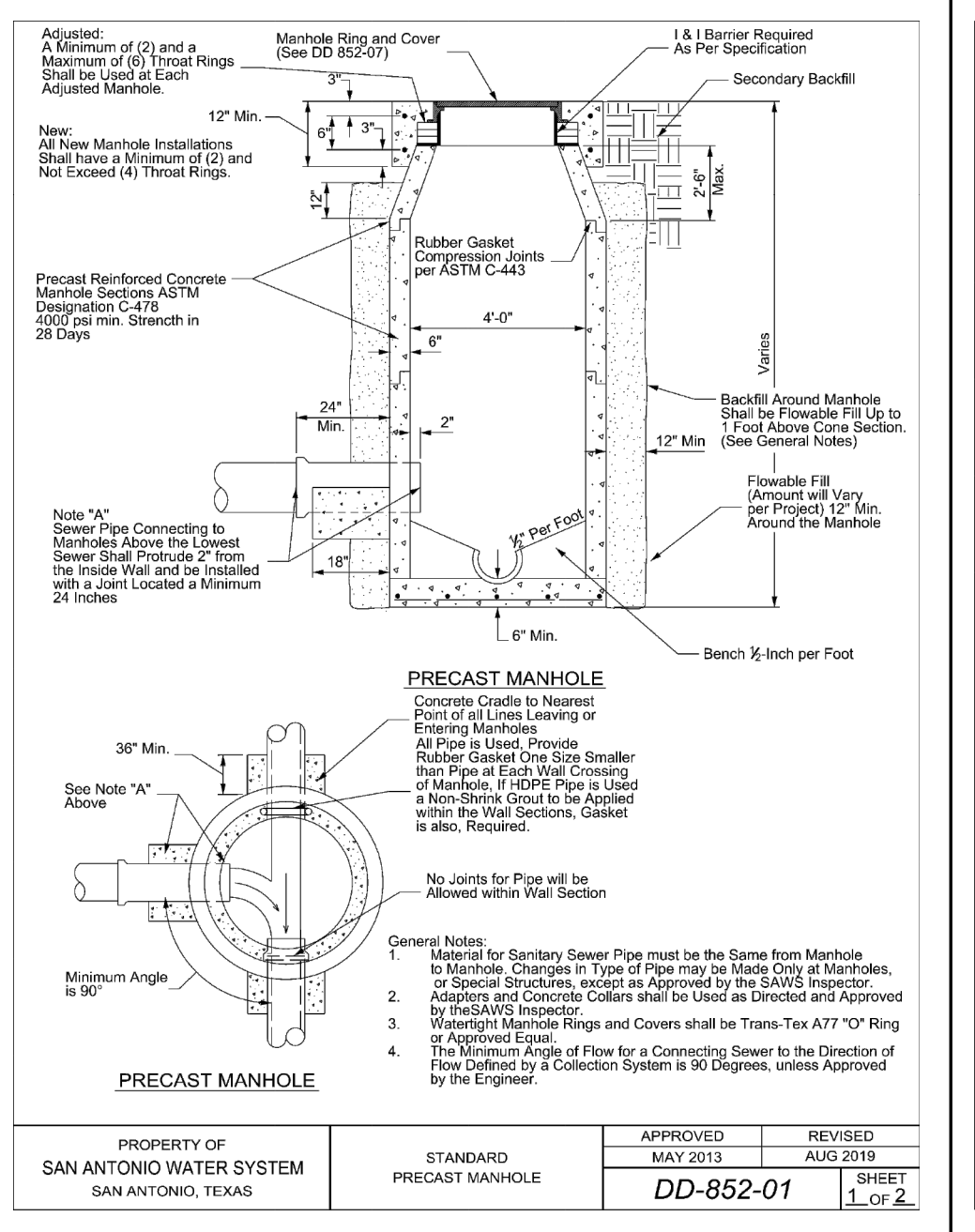
PROPERTY OF	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM	MARCH 2008	DECEMBER 2019
SAN ANTONIO, TEXAS	DD-849-01	1 OF 2

SIZE	A	B*	PVC (SDR -26)	PVC (SDR -26)
6"	4.0"	4.5"	5.50	4.79
8"	5.5"	6"	7.37	6.66
10"	7.0"	7.5"	9.23	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"		

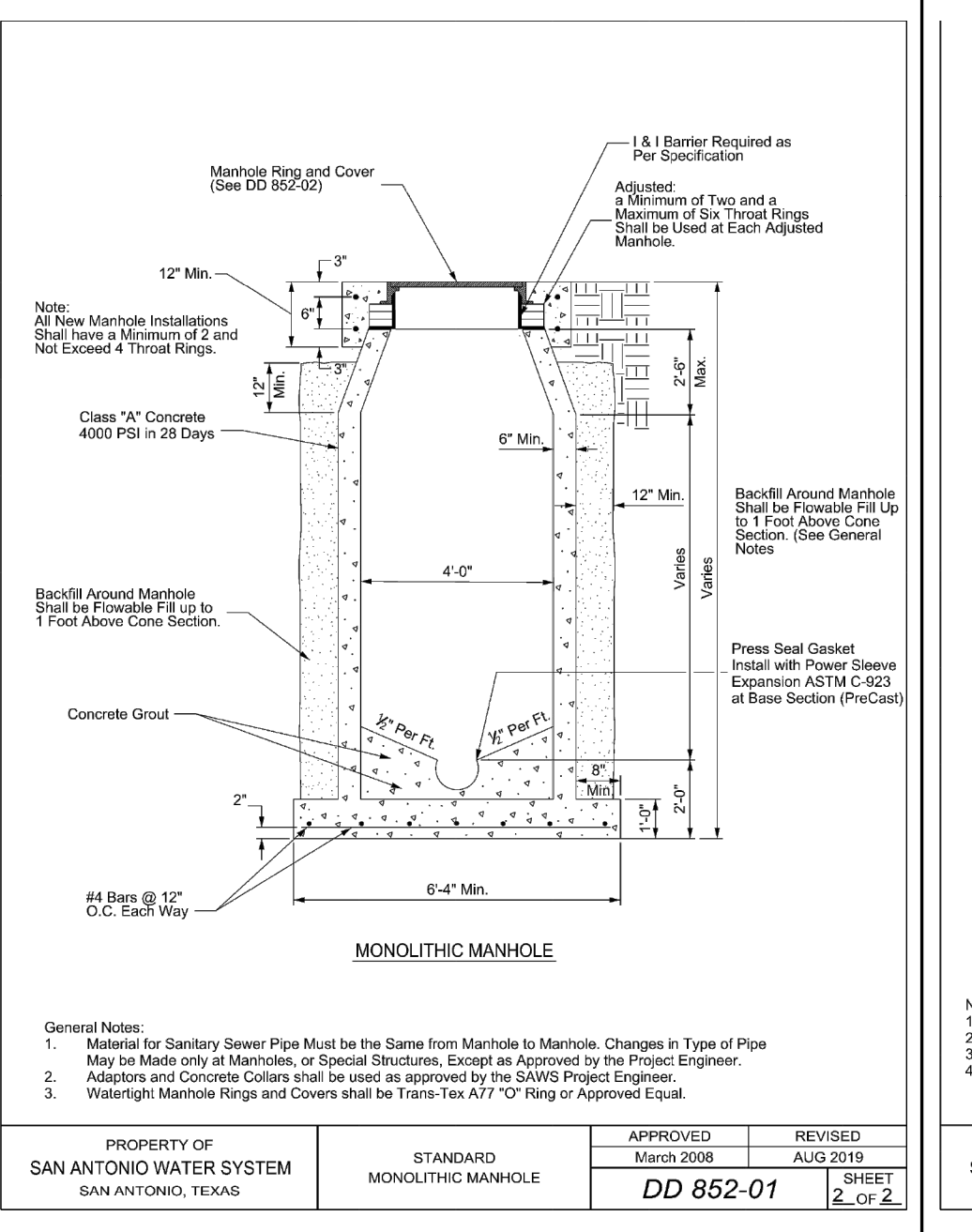
*Minimum Length

Notes:
 PVC Pipes and Fittings 6" to 15" in Diameter shall Conform to ASTM D-2411
 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 TESS Chapter 117.

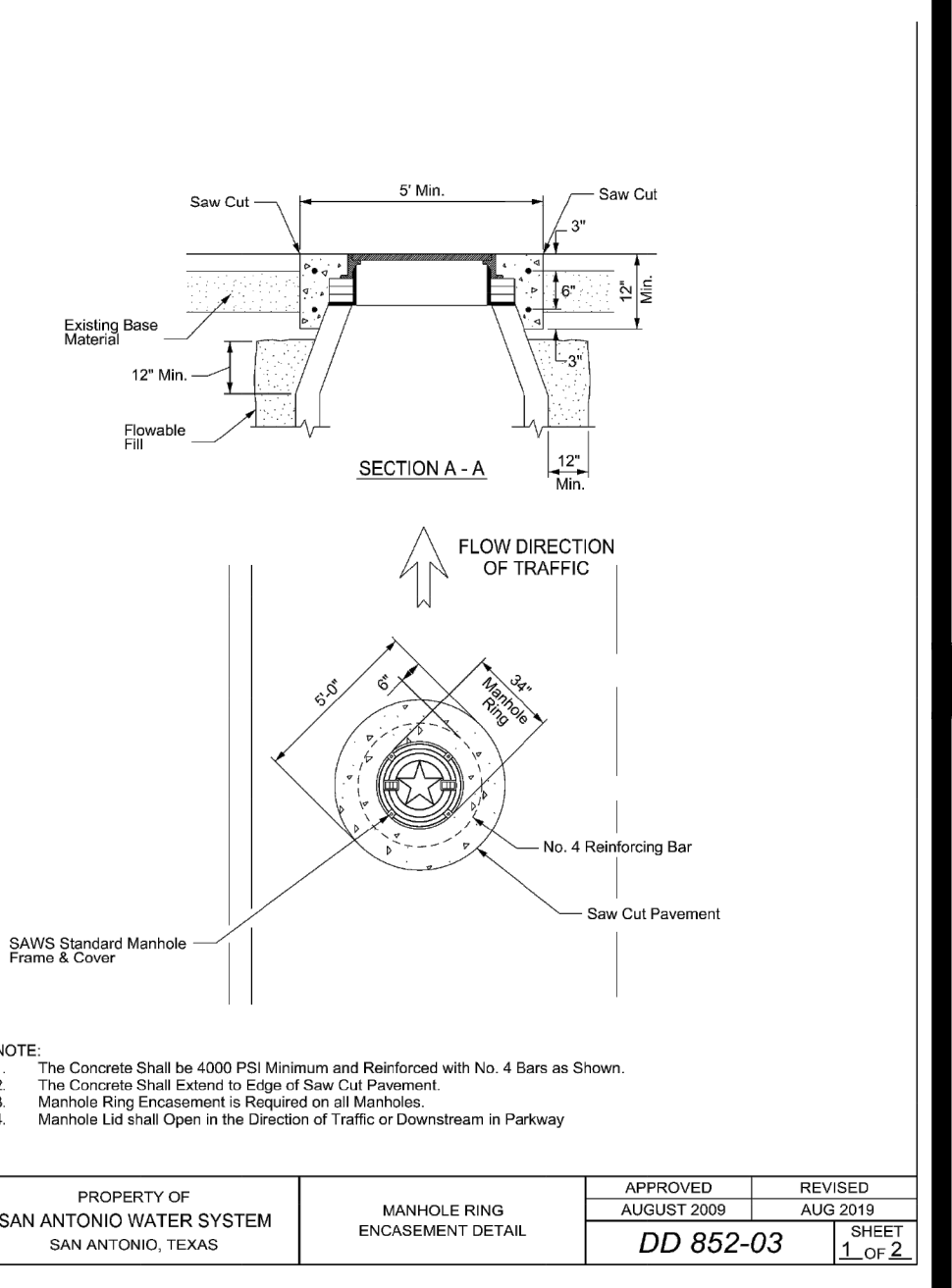
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SAN ANTONIO, TEXAS	DD-849-01	2 OF 2



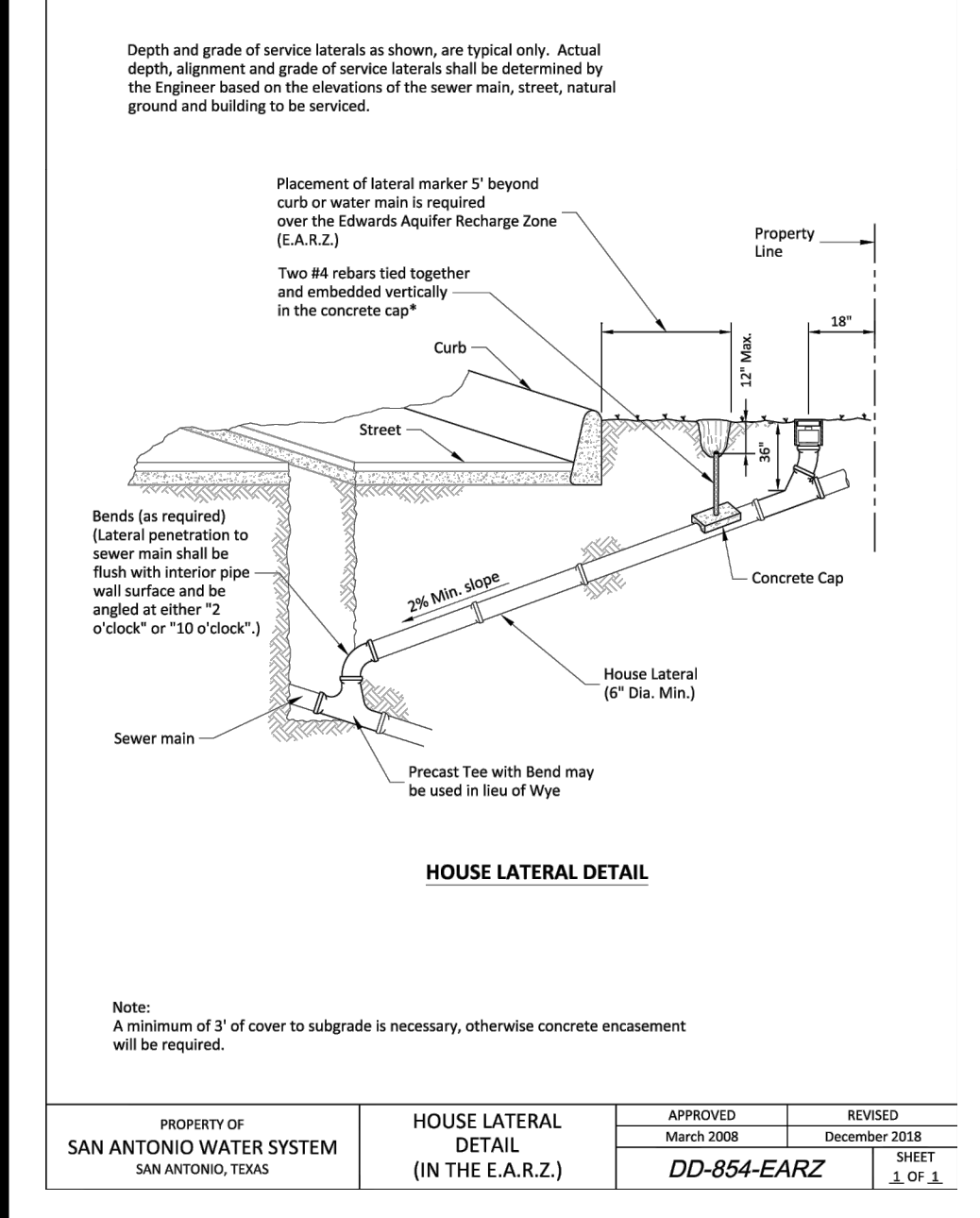
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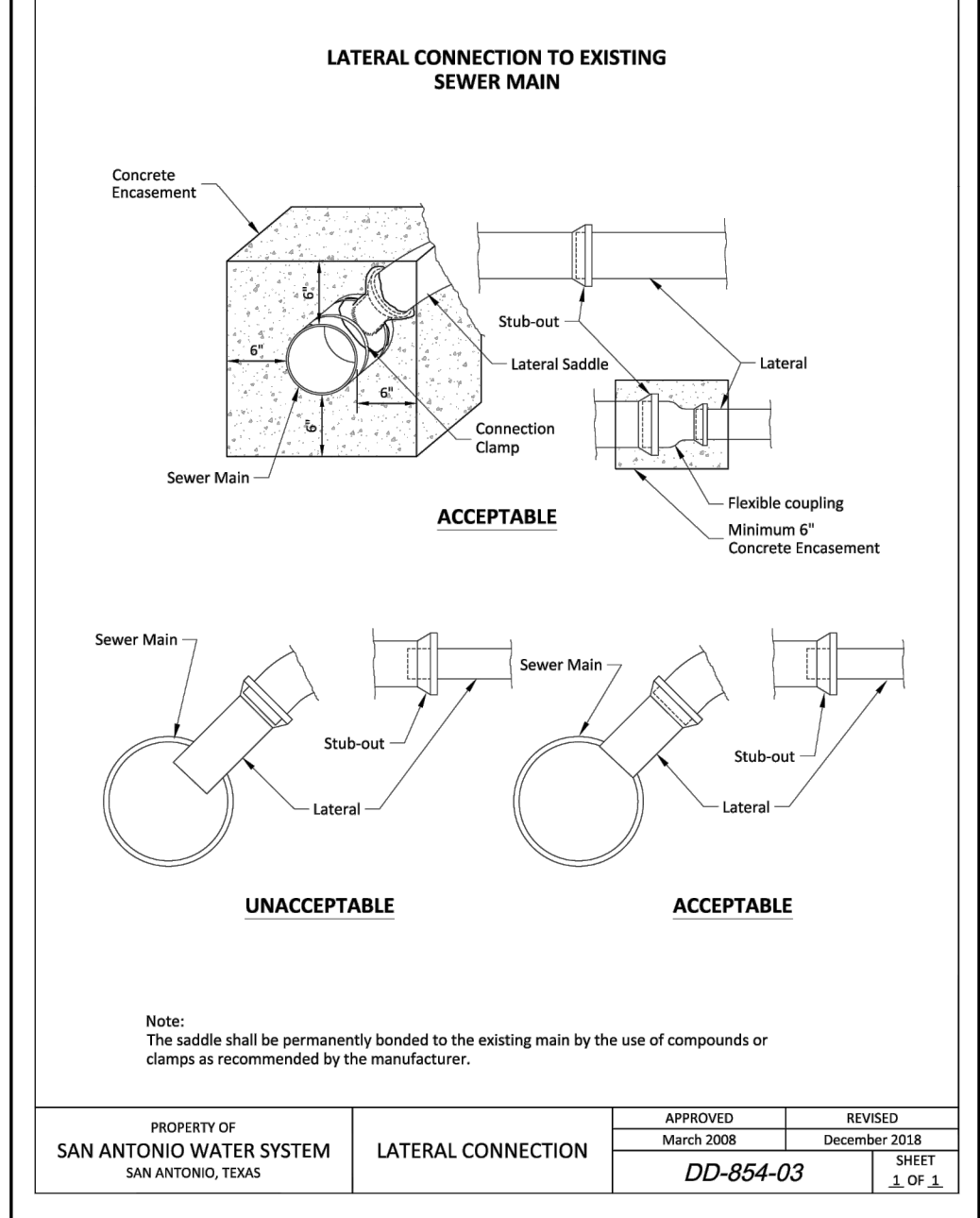
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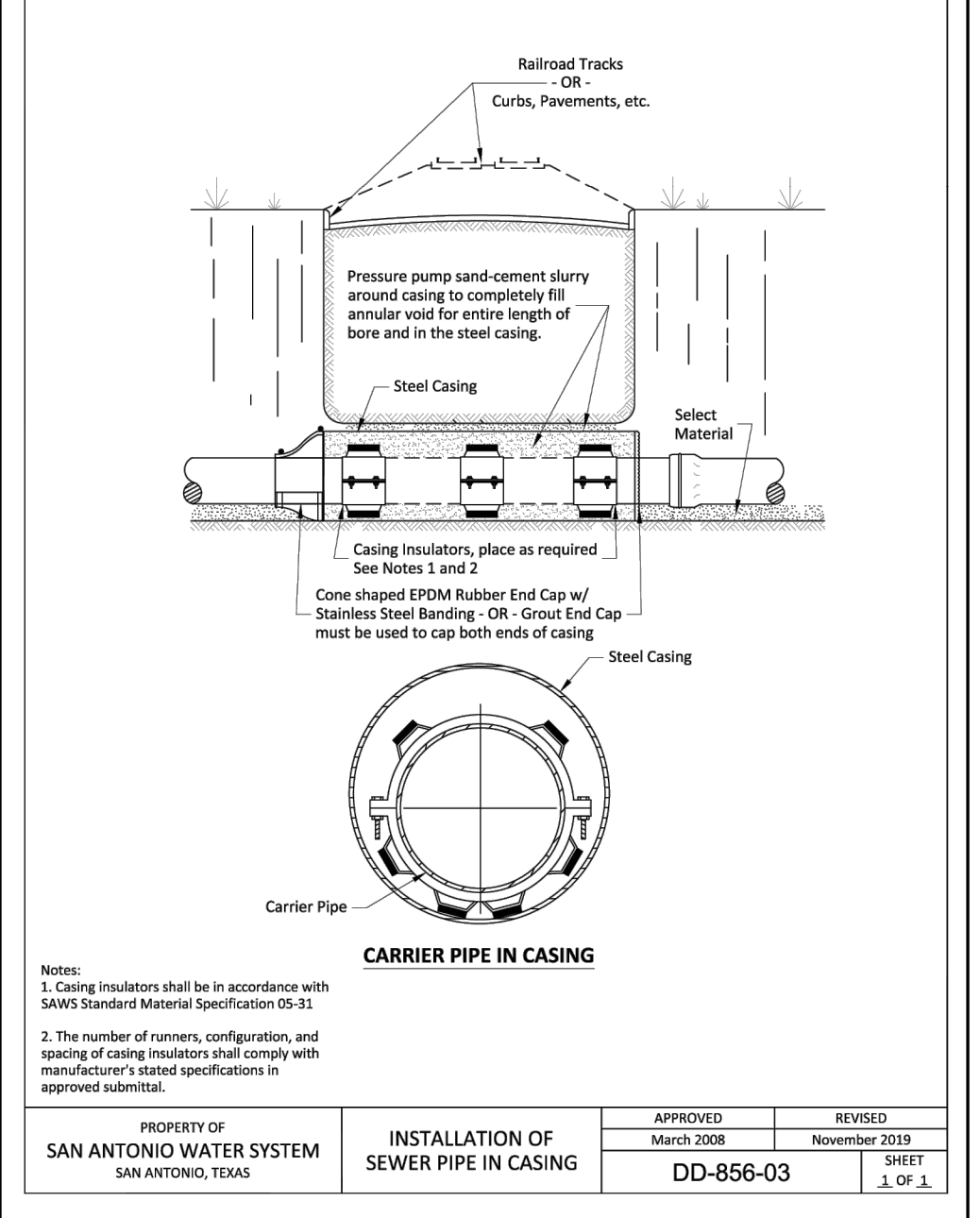
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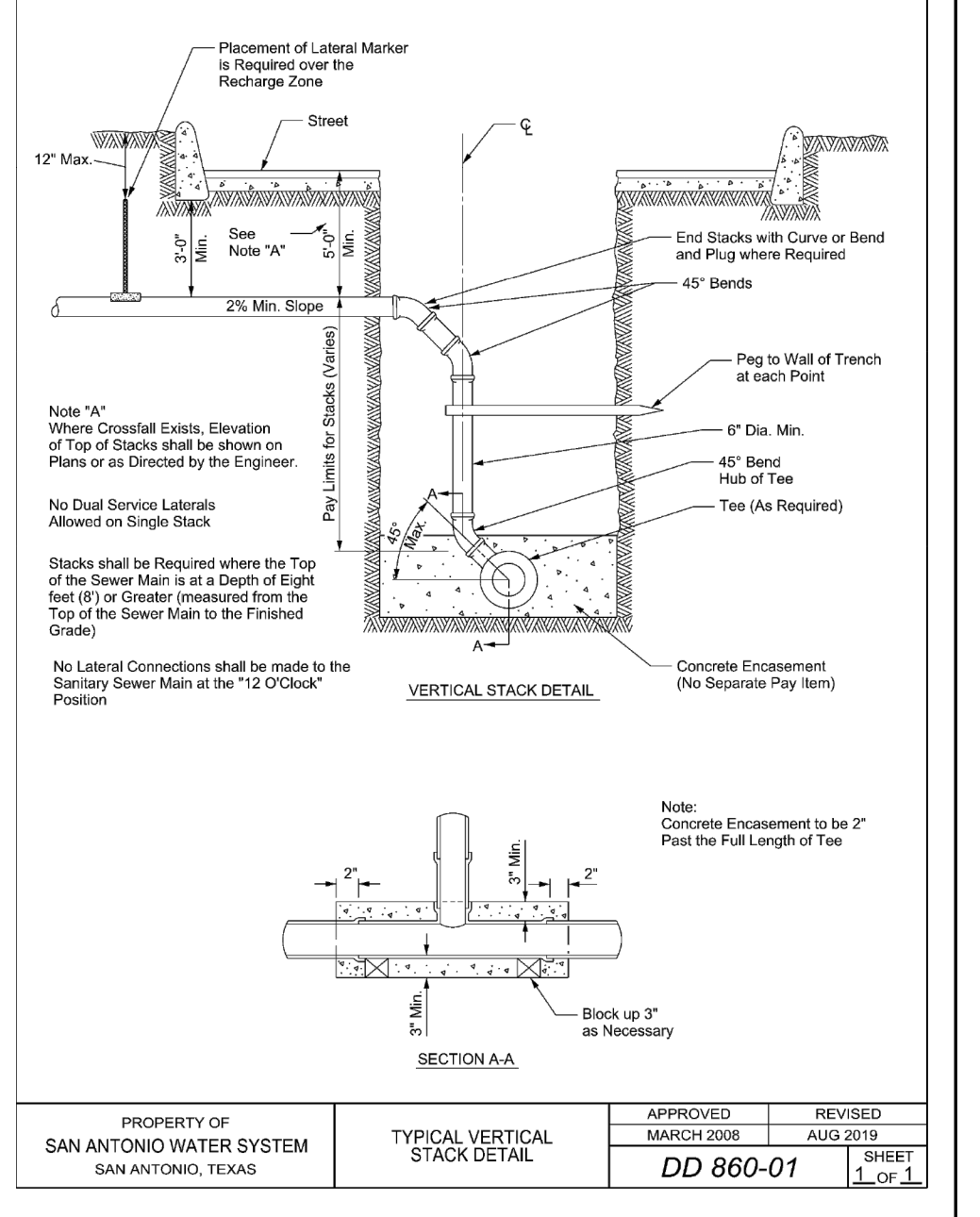
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SAN ANTONIO, TEXAS	DD-854-EARZ	1 OF 1



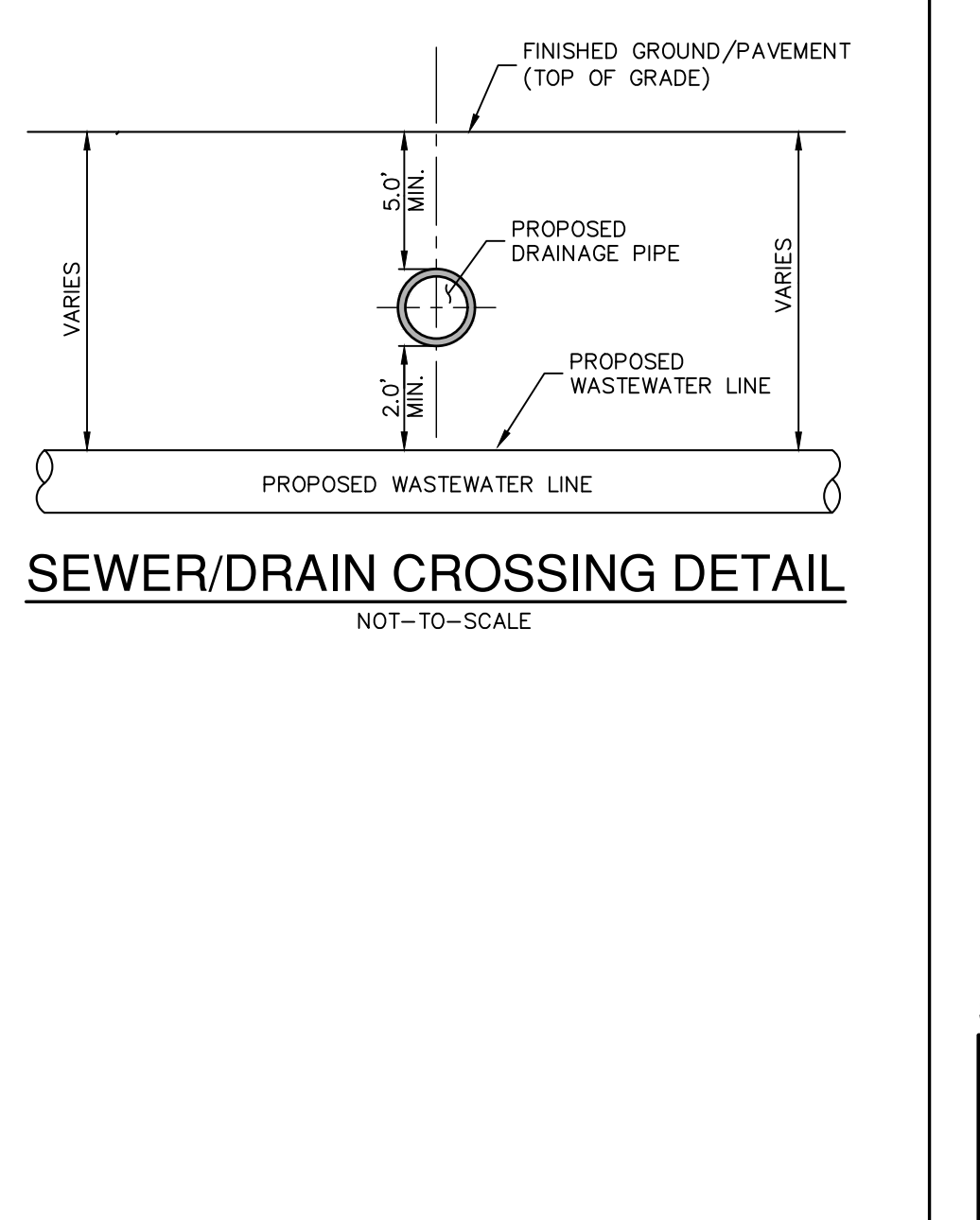
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SAN ANTONIO, TEXAS	DD-854-03	1 OF 1



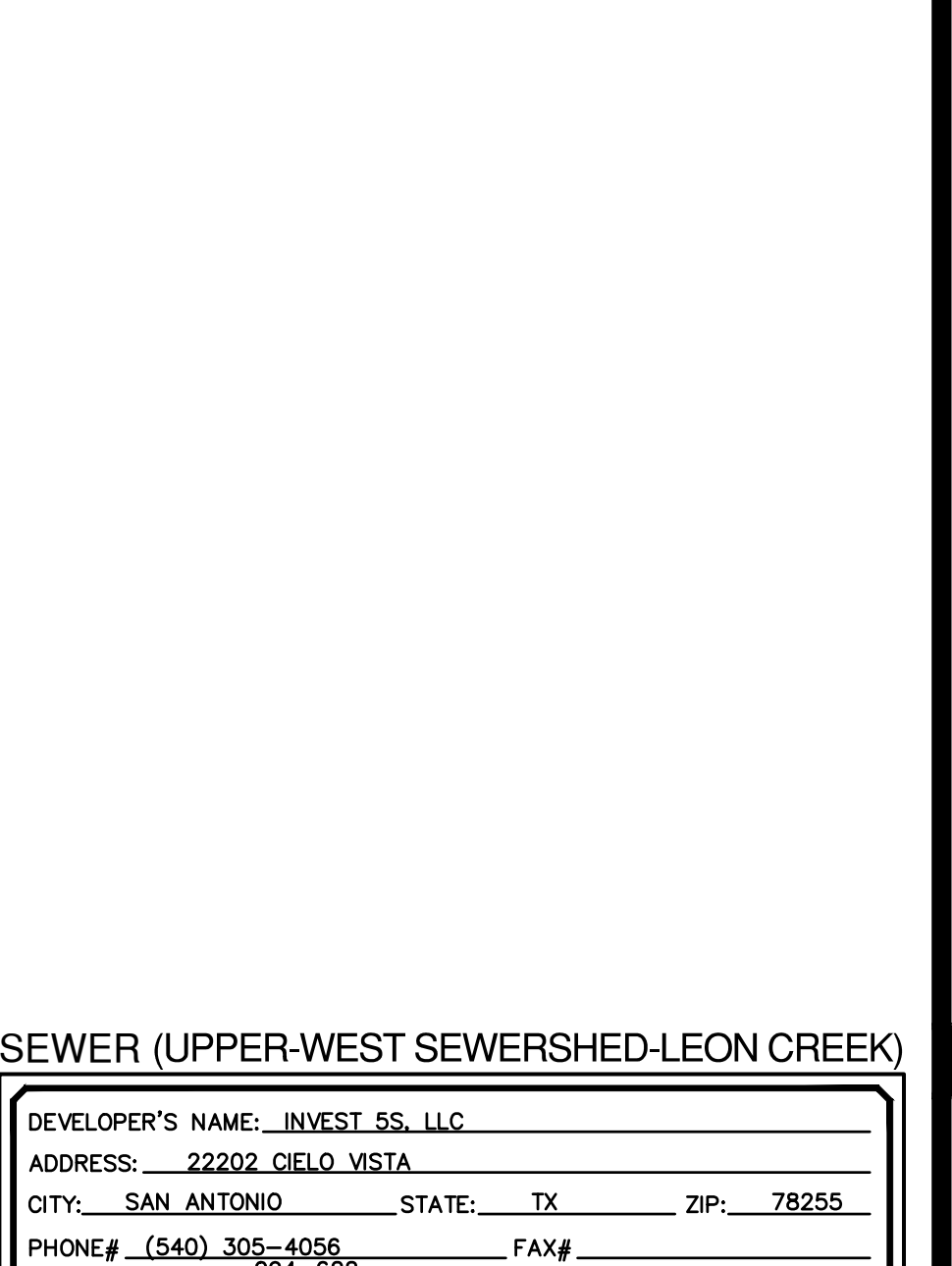
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SAN ANTONIO, TEXAS	DD-856-03	1 OF 1



PROPERTY OF	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 860-01	1 OF 1



PROPERTY OF	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 860-01	1 OF 1



PROPERTY OF	APPROVED	REVISED
SAN ANTONIO WATER SYSTEM	MARCH 2008	AUG 2019
SAN ANTONIO, TEXAS	DD 860-01	1 OF 1

DATE

NO. REVISION

STATE OF TEXAS
 JON D. ADAME
 82567
 PROFESSIONAL ENGINEER
 J. Adame
 9-4-25

PAPE-DAWSON ENGINEERS
 2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
 TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008900

APOLLO OAKS
 BEXAR COUNTY, TEXAS
 SANITARY SEWER DETAILS

PLAT NO. CP202506
 JOB NO. 13657-00
 DATE SEPTEMBER 2025
 DESIGNER CR
 CHECKED JA DRAWN JF
 SHEET C5.10

Date: Sep 04, 2025, 3:16pm User: J. Adame File: P:\13657\13657.dwg

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 SYSTEMS"; 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](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](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 TELEVISIONING 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 230.14C(1)(E). CONTRACTOR SHALL CENTER A 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 GAPPED 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 C5.10.

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 ENCASUREMENT.

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 ENCASUREMENT 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 ENCASUREMENT.

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.

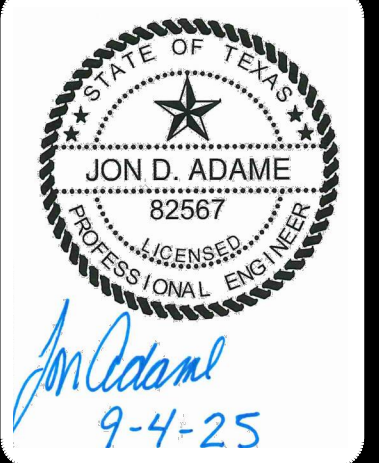
14. IF THE GIVEN TOP OF MANHOLE ELEVATION DOES NOT AGREE ON ACTUAL GROUND SURFACE OR FINISH PAVEMENT, THE CONTRACTOR SHALL ADJUST ELEVATIONS SUCH THAT THE TOP OF MANHOLE SHALL BE 0.5' ABOVE EXISTING GROUND, OR FLUSH TO FINISH ASPHALT PAVEMENT.

15. ALL MANHOLES CONSTRUCTED OVER THE EDWARDS AQUIFER RECHARGE ZONE SHOULD BE WATERTIGHT.

SEWER (UPPER-WEST SEWERSHED-LEON CREEK)

DEVELOPER'S NAME: INVEST 5S, LLC
ADDRESS: 22202 CIELO VISTA
CITY: SAN ANTONIO STATE: TX ZIP: 78255
PHONE# (540) 305-4056 FAX# 094-822
SAWS BLOCK MAP# 094-822 TOTAL EDU'S 38 TOTAL ACREAGE 8.443
TOTAL LINEAR FOOTAGE OF PIPE: 8' 1,534 LF PLAT NO. CP202506
NUMBER OF LOTS 35 DUPLICATIONS 6 TRIPLEX SAWS JOB NO. 25-1532

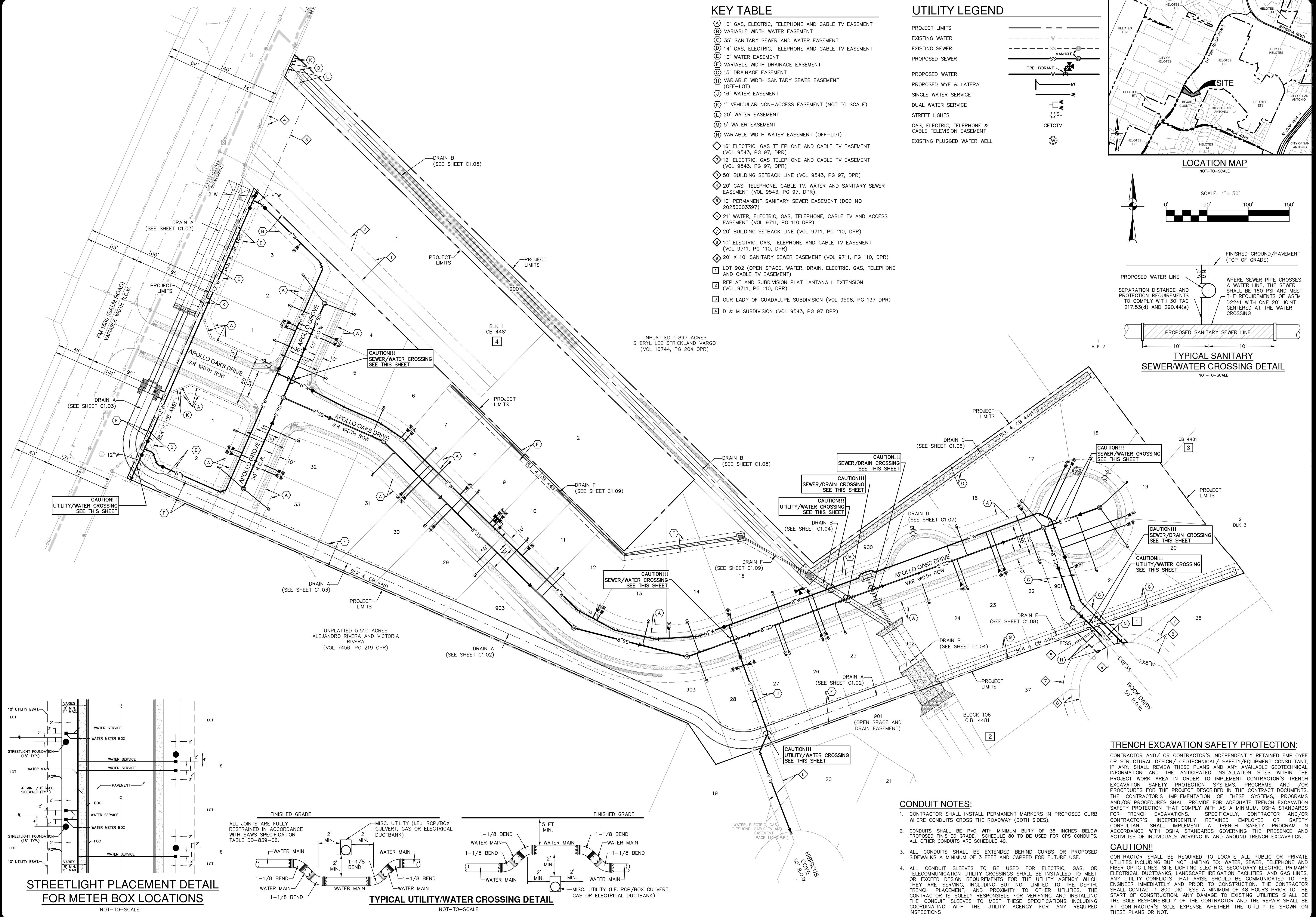
NO.	REVISION	DATE



PAPE-DAWSON ENGINEERS
2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008800

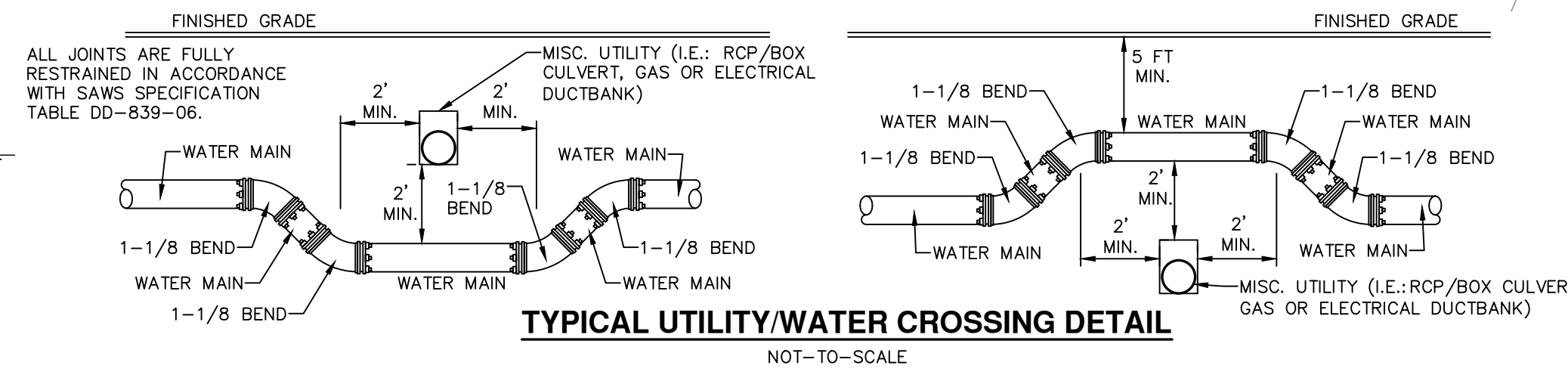
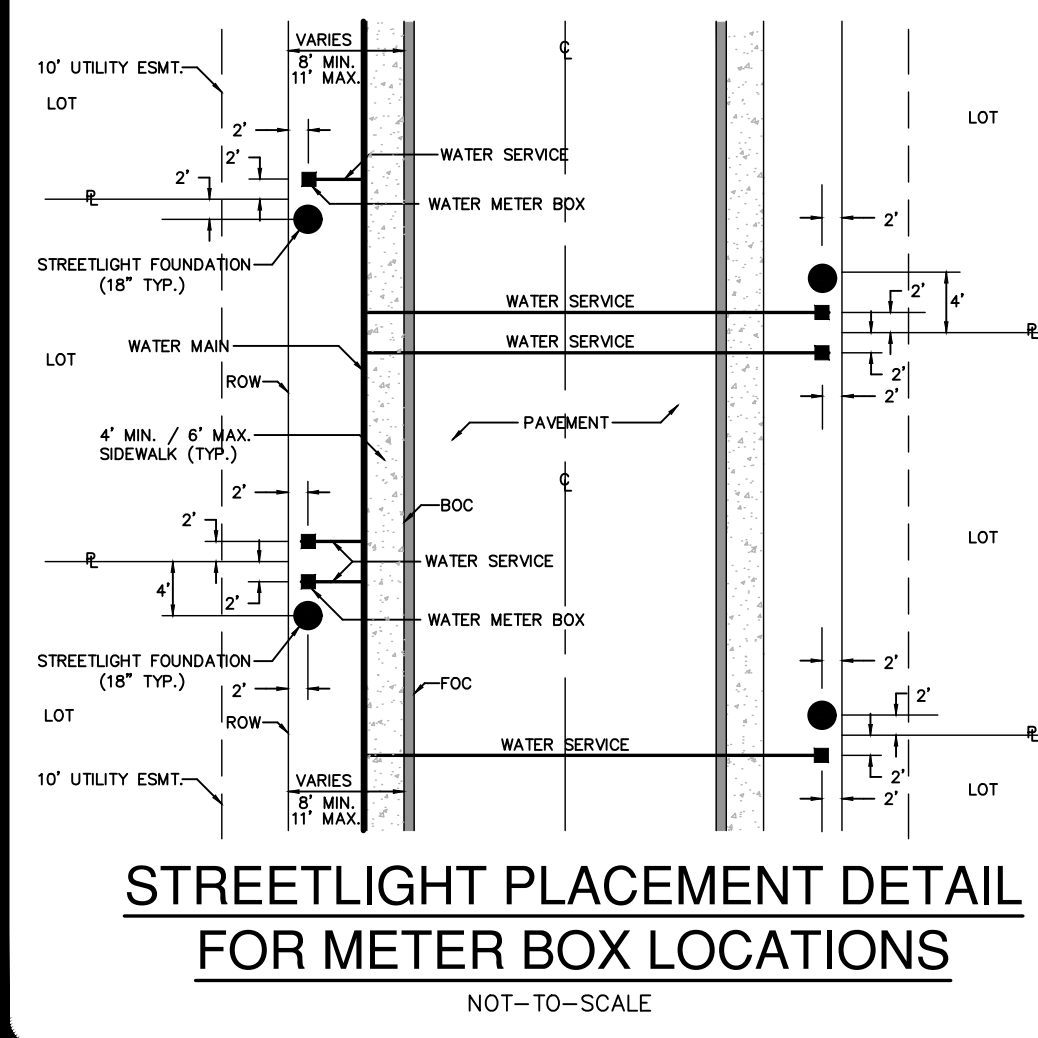
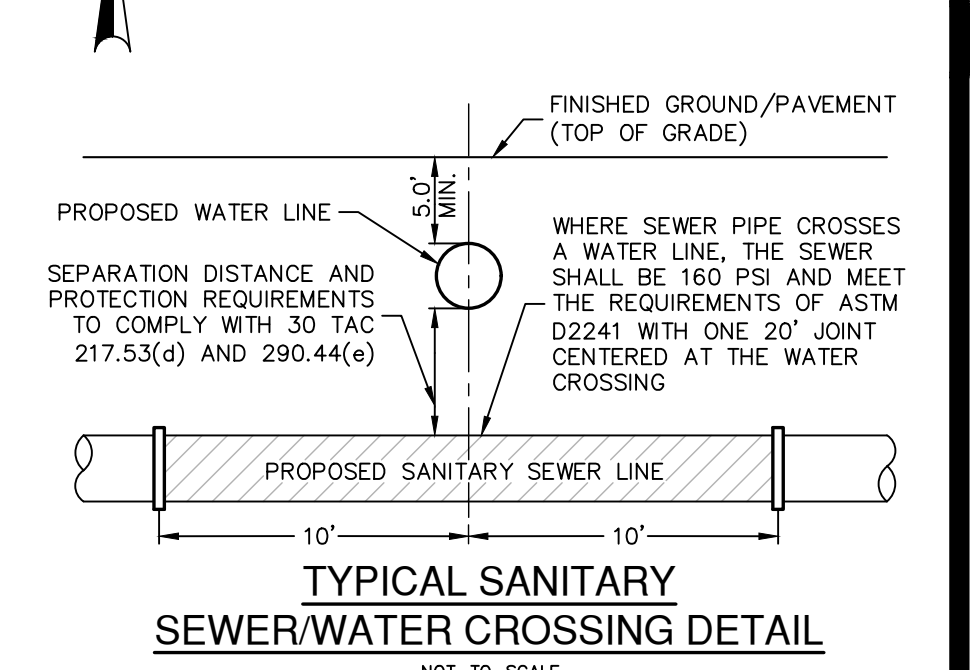
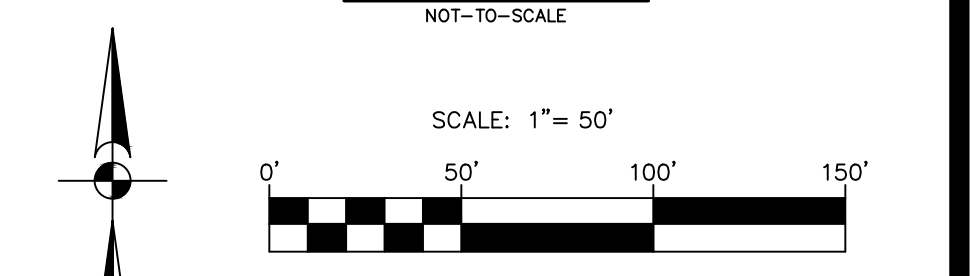
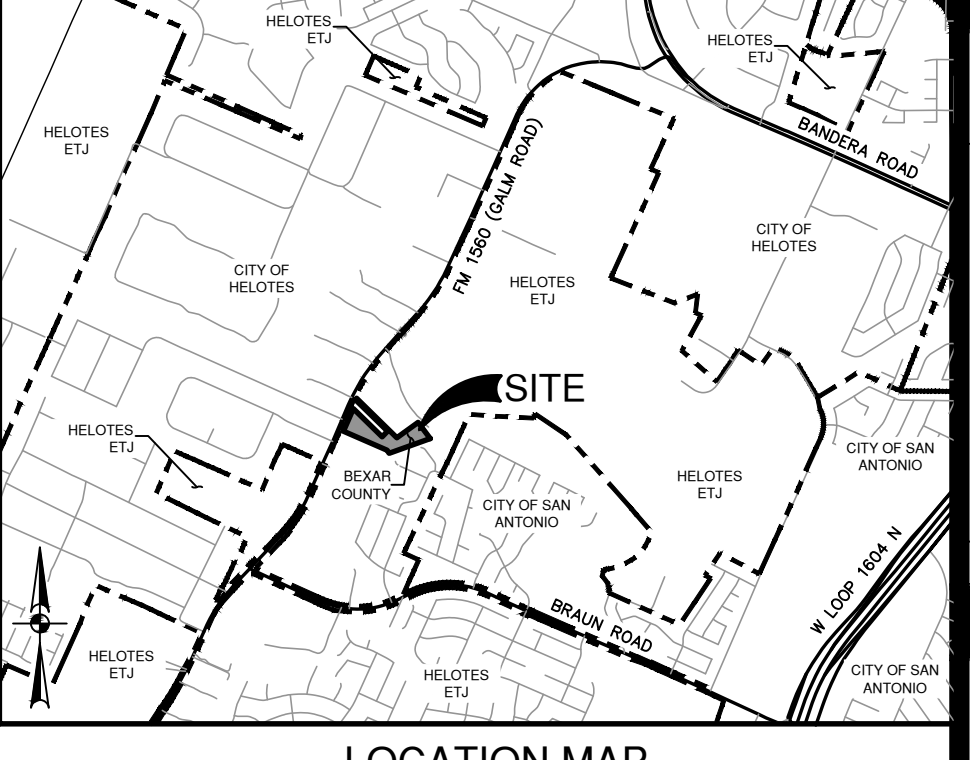
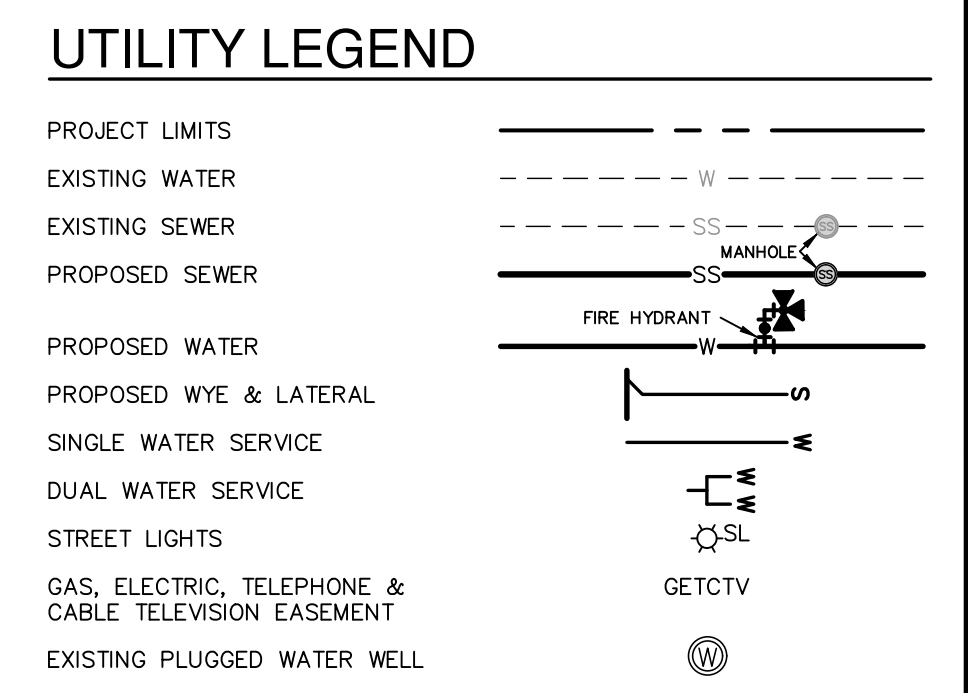
APOLLO OAKS
BEXAR COUNTY, TEXAS
SANITARY SEWER NOTES

PLAT NO.	CP202506	
JOB NO.	13657-00	
DATE	SEPTEMBER 2025	
DESIGNER	CR	
CHECKED	JA DRAWN	JF
SHEET	C5.11	



KEY TABLE

- (A) 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (B) VARIABLE WIDTH WATER EASEMENT
- (C) 35' SANITARY SEWER AND WATER EASEMENT
- (D) 14' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- (E) 10' WATER EASEMENT
- (F) VARIABLE WIDTH DRAINAGE EASEMENT
- (G) 15' DRAINAGE EASEMENT
- (H) VARIABLE WIDTH SANITARY SEWER EASEMENT (OFF-LOT)
- (J) 16' WATER EASEMENT
- (K) 1' VEHICULAR NON-ACCESS EASEMENT (NOT TO SCALE)
- (L) 20' WATER EASEMENT
- (M) 5' WATER EASEMENT
- (N) VARIABLE WIDTH WATER EASEMENT (OFF-LOT)
- (O) 16' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- (P) 12' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- (Q) 50' BUILDING SETBACK LINE (VOL 9543, PG 97, DPR)
- (R) 20' GAS, TELEPHONE, CABLE TV, WATER AND SANITARY SEWER EASEMENT (VOL 9543, PG 97, DPR)
- (S) 10' PERMANENT SANITARY SEWER EASEMENT (DOC NO 20250003397)
- (T) 21' WATER, ELECTRIC, GAS, TELEPHONE, CABLE TV AND ACCESS EASEMENT (VOL 9711, PG 110 DPR)
- (U) 20' BUILDING SETBACK LINE (VOL 9711, PG 110, DPR)
- (V) 10' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL 9711, PG 110, DPR)
- (W) 20' X 10' SANITARY SEWER EASEMENT (VOL 9711, PG 110, DPR)
- (X) LOT 902 (OPEN SPACE, WATER, DRAIN, ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT)
- (Y) REPLAT AND SUBDIVISION PLAT LANTANA II EXTENSION (VOL 9711, PG 110, DPR)
- (Z) OUR LADY OF GUADALUPE SUBDIVISION (VOL 9598, PG 137 DPR)
- (AA) D & M SUBDIVISION (VOL 9543, PG 97 DPR)



CONDUIT NOTES:

- CONTRACTOR SHALL INSTALL PERMANENT MARKERS IN PROPOSED CURB WHERE CONDUITS CROSS THE ROADWAY (BOTH SIDES).
- CONDUITS SHALL BE PVC WITH MINIMUM BURY OF 36 INCHES BELOW PROPOSED FINISHED GRADE. SCHEDULE 80 TO BE USED FOR CPVC CONDUITS. ALL OTHER CONDUITS ARE SCHEDULE 40.
- ALL CONDUITS SHALL BE EXTENDED BEHIND CURBS OR PROPOSED SIDEWALKS A MINIMUM OF 3 FEET AND CAPPED FOR FUTURE USE.
- 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.

DATE	
NO.	REVISION
PAPE-DAWSON ENGINEERS 2000 HW LOOP 410 SAN ANTONIO, TX 78213 210.375.9000 TEXAS ENGINEERING FIRM #470 TEXAS SURVEYING FIRM #10038800	
APOLLO OAKS BEXAR COUNTY, TEXAS OVERALL UTILITY PLAN	
PLAT NO.	CP202506
JOB NO.	13657-00
DATE	SEPTEMBER 2025
DESIGNER	CR
CHECKED	JA DRAWN
SHEET	C6.00

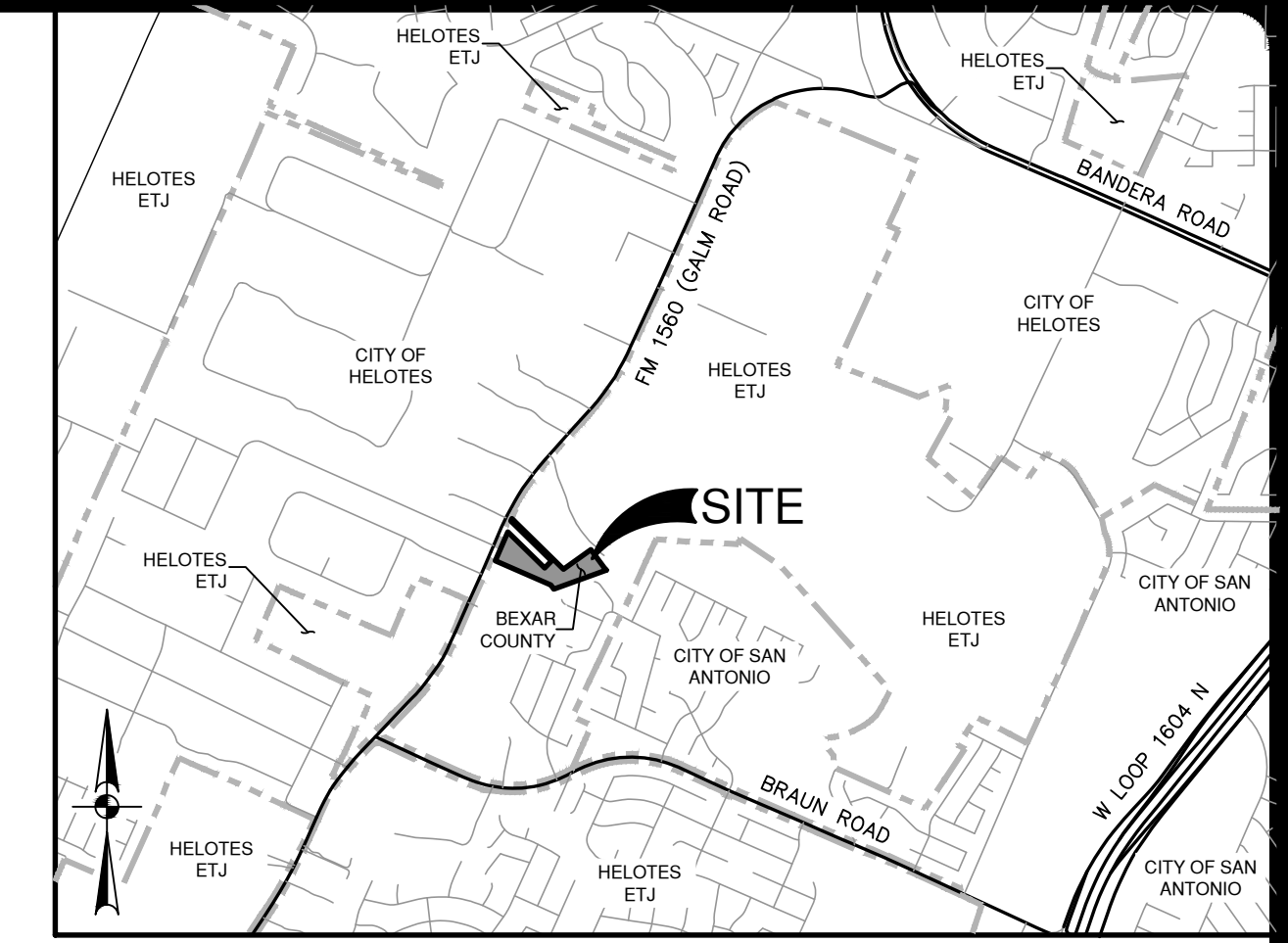
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GRADING NOTES:

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 APURTEANCES. 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.

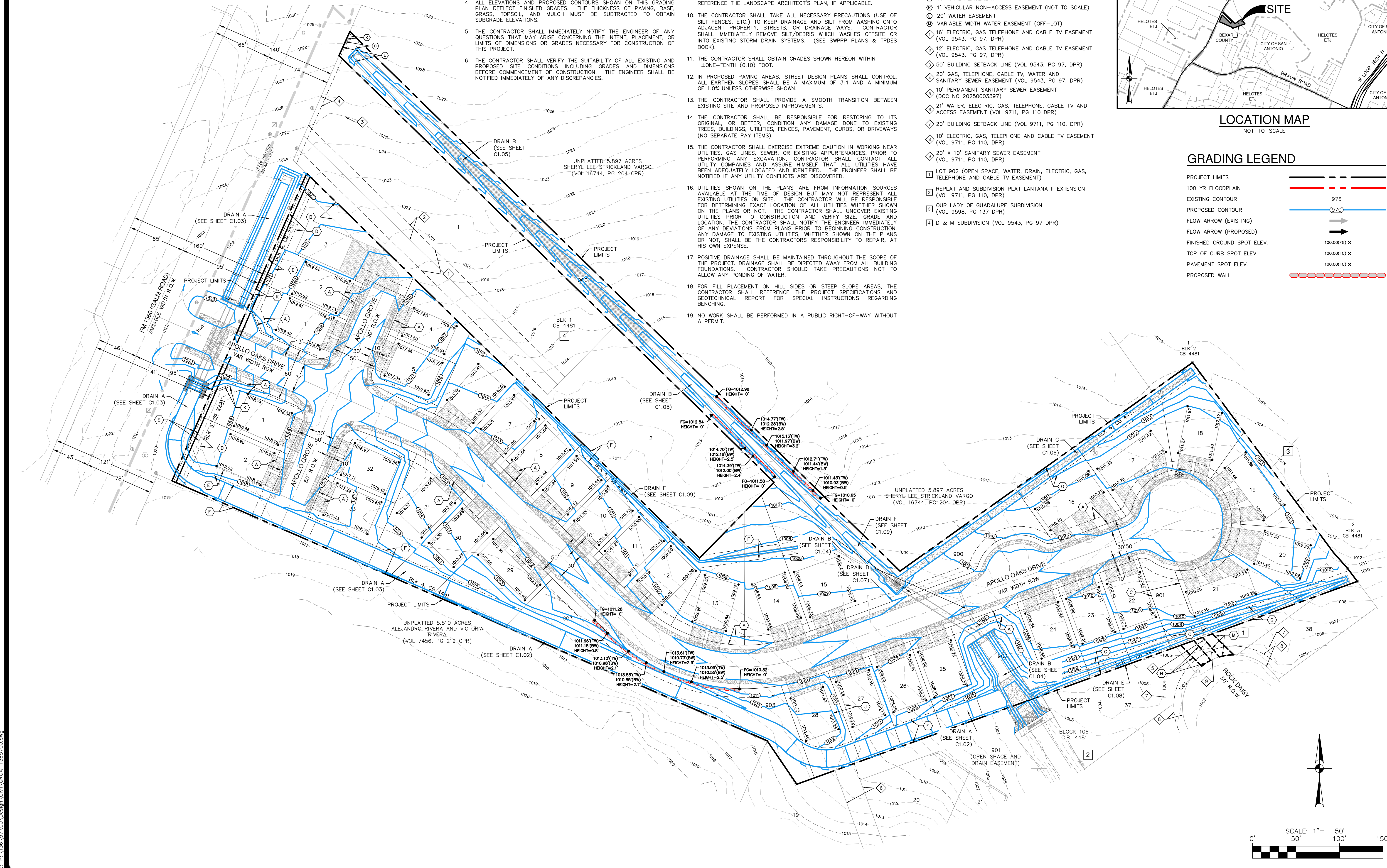
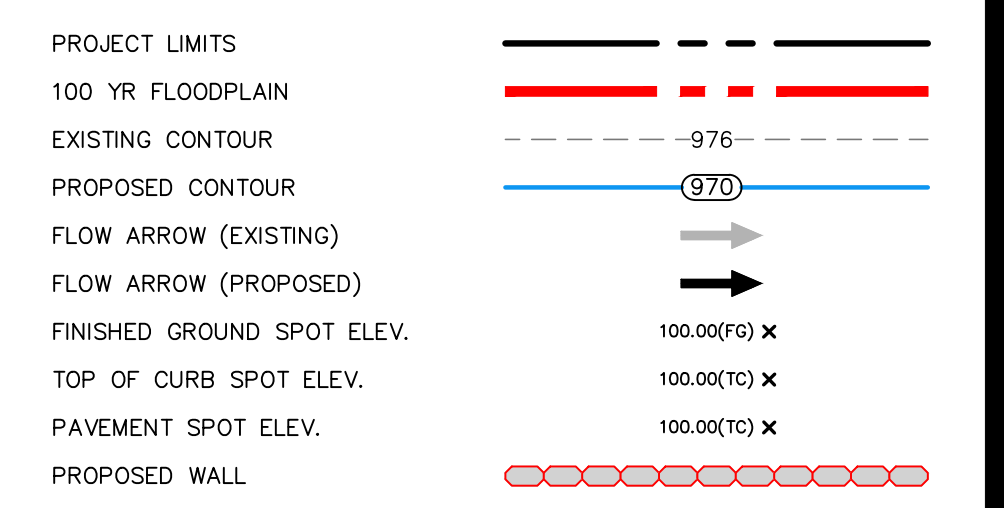
KEY TABLE

- Ⓐ 10' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- Ⓑ VARIABLE WIDTH WATER EASEMENT
- Ⓒ 35' SANITARY SEWER AND WATER EASEMENT
- Ⓓ 14' GAS, ELECTRIC, TELEPHONE AND CABLE TV EASEMENT
- Ⓔ 10' WATER EASEMENT
- Ⓕ VARIABLE WIDTH DRAINAGE EASEMENT
- Ⓖ 15' DRAINAGE EASEMENT
- Ⓗ VARIABLE WIDTH SANITARY SEWER EASEMENT (OFF-LOT)
- Ⓘ 16' WATER EASEMENT
- Ⓚ 1' VEHICULAR NON-ACCESS EASEMENT (NOT TO SCALE)
- Ⓛ 20' WATER EASEMENT
- Ⓜ VARIABLE WIDTH WATER EASEMENT (OFF-LOT)
- Ⓝ 16' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- Ⓟ 12' ELECTRIC, GAS TELEPHONE AND CABLE TV EASEMENT (VOL 9543, PG 97, DPR)
- Ⓡ 50' BUILDING SETBACK LINE (VOL 9543, PG 97, DPR)
- Ⓢ 20' GAS, TELEPHONE, CABLE TV, WATER AND SANITARY SEWER EASEMENT (VOL 9543, PG 97, DPR)
- Ⓣ 10' PERMANENT SANITARY SEWER EASEMENT (DOC NO 2025003397)
- Ⓤ 21' WATER, ELECTRIC, GAS, TELEPHONE, CABLE TV AND ACCESS EASEMENT (VOL 9711, PG 110, DPR)
- Ⓡ 20' BUILDING SETBACK LINE (VOL 9711, PG 110, DPR)
- Ⓢ 10' ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT (VOL 9711, PG 110, DPR)
- Ⓣ 20' X 10' SANITARY SEWER EASEMENT (VOL 9711, PG 110, DPR)
- 1 [] LOT 902 (OPEN SPACE, WATER, DRAIN, ELECTRIC, GAS, TELEPHONE AND CABLE TV EASEMENT)
- 2 [] REPLAT AND SUBDIVISION PLAT LANTANA II EXTENSION (VOL 9711, PG 110, DPR)
- 3 [] OUR LADY OF GUADALUPE SUBDIVISION (VOL 9598, PG 137 DPR)
- 4 [] D & M SUBDIVISION (VOL 9543, PG 97 DPR)

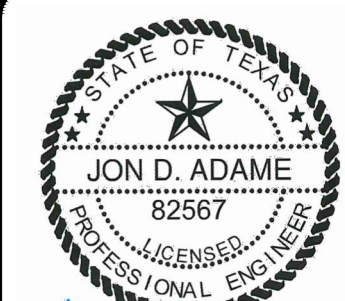


LOCATION MAP
NOT-TO-SCALE

GRADING LEGEND



DATE	NO.	REVISION



J. Adame
9-4-25

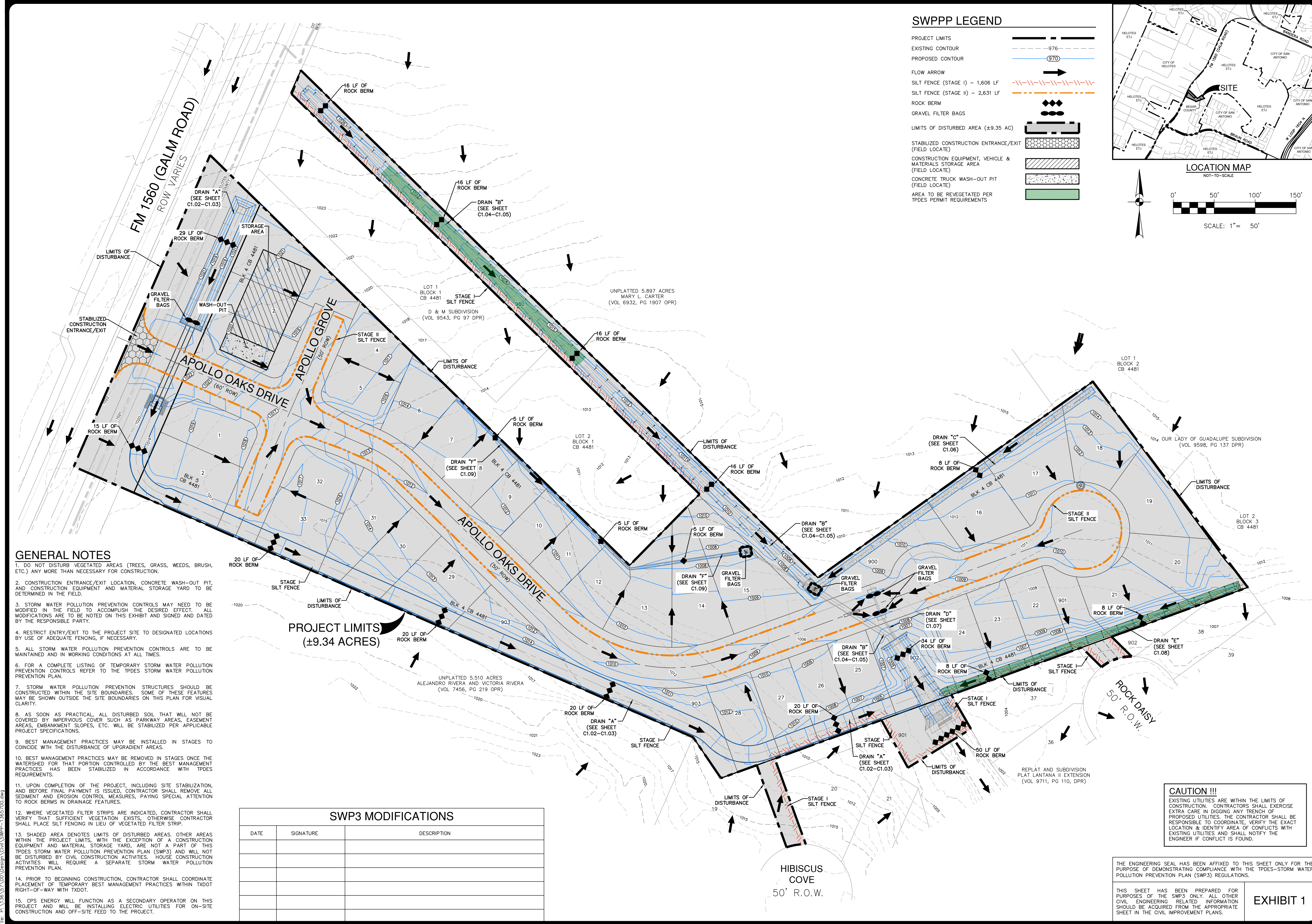
PAPE-DAWSON ENGINEERS
2000 HW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #079 | TEXAS SURVEYING FIRM #1038800

APOLLO OAKS
BEXAR COUNTY, TEXAS

GRADING PLAN

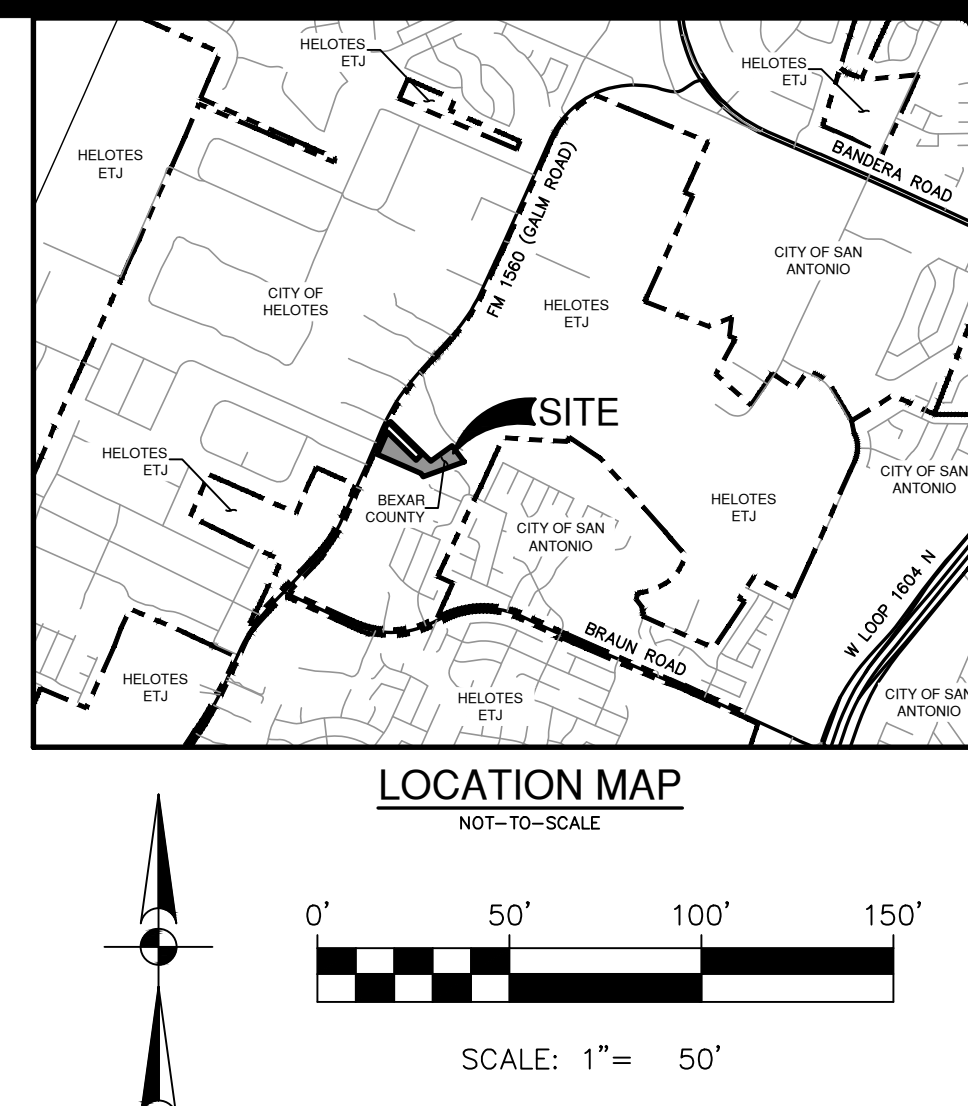
PLAT NO. CP202506
JOB NO. 13657-00
DATE SEPTEMBER 2025
DESIGNER CB
CHECKED JA DRAWN CB
SHEET C7.00

Note: Sep 04, 2025, 3:17pm, User: JD, File: P:\16157\16157\02\Design\Chil\G04-1365700.dwg
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SWPPP LEGEND

- PROJECT LIMITS
- EXISTING CONTOUR
- PROPOSED CONTOUR
- FLOW ARROW
- SILT FENCE (STAGE I) - 1,606 LF
- SILT FENCE (STAGE II) - 2,631 LF
- ROCK BERM
- GRAVEL FILTER BAGS
- LIMITS OF DISTURBED AREA (±9.35 AC)
- STABILIZED CONSTRUCTION ENTRANCE/EXIT (FIELD LOCATE)
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA (FIELD LOCATE)
- CONCRETE TRUCK WASH-OUT PIT (FIELD LOCATE)
- AREA TO BE REVEGETATED PER TPDES PERMIT REQUIREMENTS



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. HOUSE CONSTRUCTION ACTIVITIES WILL REQUIRE A SEPARATE STORM WATER POLLUTION PREVENTION PLAN.
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.

PROJECT LIMITS
(±9.34 ACRES)

SWP3 MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

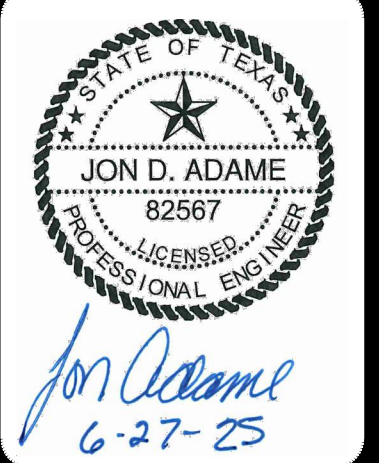
CAUTION !!!
EXISTING UTILITIES ARE WITHIN THE LIMITS OF CONSTRUCTION. CONTRACTORS SHALL EXERCISE EXTRA CARE IN DIGGING ANY TRENCH OF PROPOSED UTILITIES. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE, VERIFY THE EXACT LOCATION & IDENTIFY AREA OF CONFLICTS WITH EXISTING UTILITIES AND SHALL NOTIFY THE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

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 1

NO.	REVISION	DATE



PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #1008800

APOLLO OAKS
BEXAR COUNTY, TEXAS
STORM WATER POLLUTION PREVENTION PLAN

PLAT NO.	CP202506
JOB NO.	13657-00
DATE	JUNE 2025
DESIGNER	CR
CHECKED	JA DRAWN
SHEET	C8.00

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