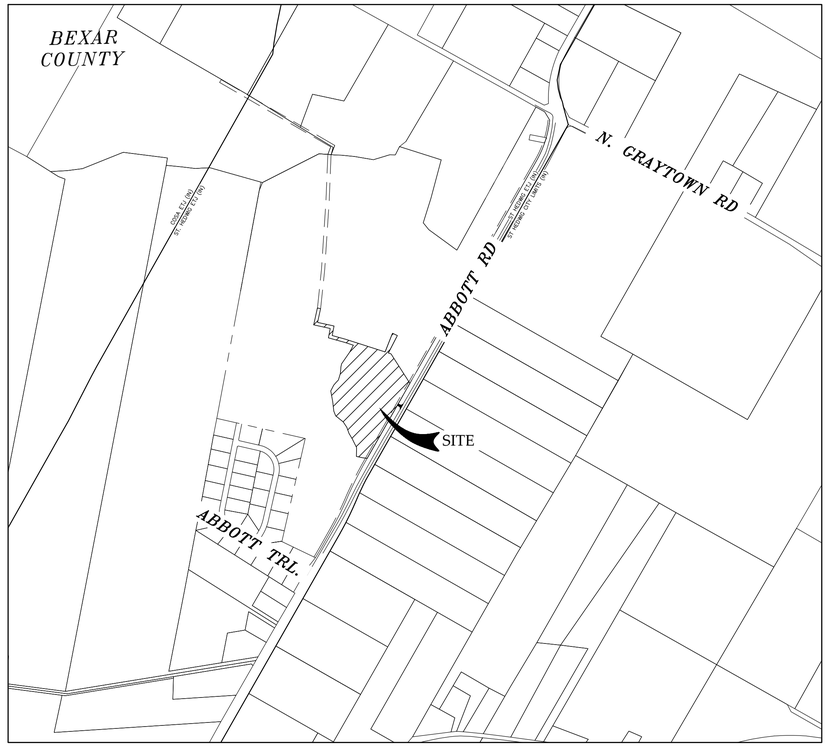
ROSE VALLEY SOUTH - UNIT 1
CONSTRUCTION PLANS
BEXAR COUNTY, TEXAS

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CIVIL SHEET INDEX

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SANITARY SEWER – ON-SITE Z (STA. 1+00 – END)	C3.4
SANITARY SEWER – ON-SITE A (STA. 1+00 – STA. 3+45.08)	C3.5
SANITARY SEWER – ON-SITE L (STA. 1+00 – END)	C3.6
SANITARY SEWER – ON-SITE I (STA. 1+00 – END)	C3.7
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LOCATION MAP
N. T. S.

CIVIL SHEET INDEX

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WATER DETAILS (2 OF 3)	W2.1
WATER DETAILS (3 OF 3)	W2.2

1. 2025-OCT-08 ADDED CPS DRIVEWAY CULVERTS AND UPDATED GRADING SGL

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED PROFESSIONAL ENGINEER
10/8/2025
F-9155

OWNER:
LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

OCT. 2025

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

C0.0
JOB NO: 23-3159H
PLAT NO: CP202412

PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

Date: Oct 09, 2025, 4:36pm User ID: CAD1-2022
File: N:\Projects\2023\23-3159G-Abbott Rd Lennar\Civil\23-3159G-COVER SHEET.dwg

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INTERNAL DRAINAGE AREAS CALCULATION SUMMARY - RATIONAL METHOD

DRAINAGE AREA	ACRES	OVERLAND FLOW			SHALLOW CONCENTRATED			CHANNEL FLOW			OVERALL		STORM EVENT	i	Q
		LENGTH (ft)	SLOPE (%)	T_c (min)	LENGTH (ft)	SLOPE (%)	T_c (min)	LENGTH (ft)	VELOCITY (ft/s)	T_c (min)	T_c (min)	C_w	(yrs)	(in/hr)	(cfs)
DRAIN B CP1 (ENTRANCE CULVERT CROSSING)	28.72	100	2	8.81	1780	2.5	11.63	385	6	1.1	22	0.67	5	4.38	84.32
													25	**6.03**	**115.98**
													100	7.44	143.20
DRAIN A CP2	4.20	100	2	13.53	71	2	0.52	613	6	1.7	16	0.84	5	5.14	18.12
													25	**7.06**	**24.92**
													100	8.72	30.76

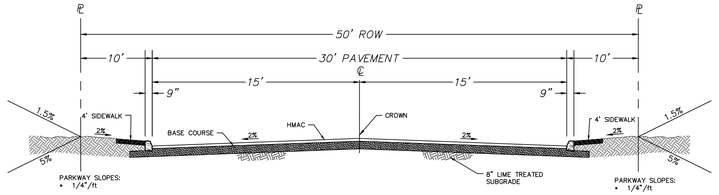
EXISTING VS PROPOSED/ULTIMATE DRAINAGE AREAS CALCULATION SUMMARY - RATIONAL METHOD

DRAINAGE AREA	ACRES	OVERLAND FLOW			SHALLOW CONCENTRATED			CHANNEL FLOW			OVERALL		STORM EVENT	i	Q
		LENGTH (ft)	SLOPE (%)	T_c (min)	LENGTH (ft)	SLOPE (%)	T_c (min)	LENGTH (ft)	VELOCITY (ft/s)	T_c (min)	T_c (min)	C_w	(yrs)	(in/hr)	(cfs)
ABBOTT RD ROW U1 DOWNSTREAM END CP3 EXISTING	31.00	100	2	8.81	1780	2.5	11.63	885	6	2.5	23	0.67	5	4.28	88.91
													25	**5.89**	**122.31**
													100	7.27	151.05
ABBOTT RD ROW U1 DOWNSTREAM END CP3 PROPOSED / ULTIMATE	31.00	100	2	8.81	1780	2	11.63	885	6	2.5	23	0.69	5	4.28	91.50
													25	**5.89**	**125.88**
													100	7.27	155.46

NOTES:
1) TIME OF CONCENTRATION (Tc) CALCULATED USING HYDRAFLOW HYDROGRAPHS TR-55 METHOD. DETAILED TR-55 CALCULATIONS CAN BE FOUND IN THE DRAINAGE REPORT.
2) RAINFALL INTENSITIES DERIVED FROM NOAA ATLAS 14 PRECIPITATION DATA FOR BEXAR COUNTY PA-3.
3) WEIGHTED RUNOFF COEFFICIENTS WERE TAKEN FROM THE COSA STORMWATER DESIGN CRITERIA MANUAL TABLE 5.5.3A. PER TABLE 5.5.3A, A RUNOFF COEFFICIENT RANGING FROM TO 0.49 – 0.53 WAS USED FOR ALL EXISTING/UNDEVELOPED AREAS. A PROPOSED WEIGHTED RUNOFF COEFFICIENT EQUAL TO 0.84 WAS USED FOR ON-SITE AREAS.

CP2 STREET AND ROW CALCULATIONS (ROSE SHORE)	
CP2 Q_{25}	**18.12 cfs**
Normal Depth @0.5% SLOPE	0.44 ft
Velocity @0.5% SLOPE	2.41 fps
Normal Depth @2.75% SLOPE	0.32 ft
Velocity @2.75% SLOPE	4.11 fps
CP2 Q_{25}	**24.92 cfs**
Normal Depth @0.5% SLOPE	0.47 ft
Velocity @0.5% SLOPE	2.6 fps
Normal Depth @2.75% SLOPE	0.34 ft
Velocity @2.75% SLOPE	4.37 fps

STREET CAPACITY CHECKS (ROSE SHORE)		
STREET CAPACITY @ TOP OF CURB & 0.5% SLOPE	41	cfs
Resultant Velocity	3.18	fps
STREET CAPACITY @ ROW & 0.5% SLOPE	74.86	cfs
Resultant Velocity	2.98	fps
STREET CAPACITY @ TOP OF CURB & 2.75% SLOPE	95.81	cfs
Resultant Velocity	7.37	fps
STREET CAPACITY @ ROW & 2.75% SLOPE	175.6	cfs
Resultant Velocity	6.99	fps

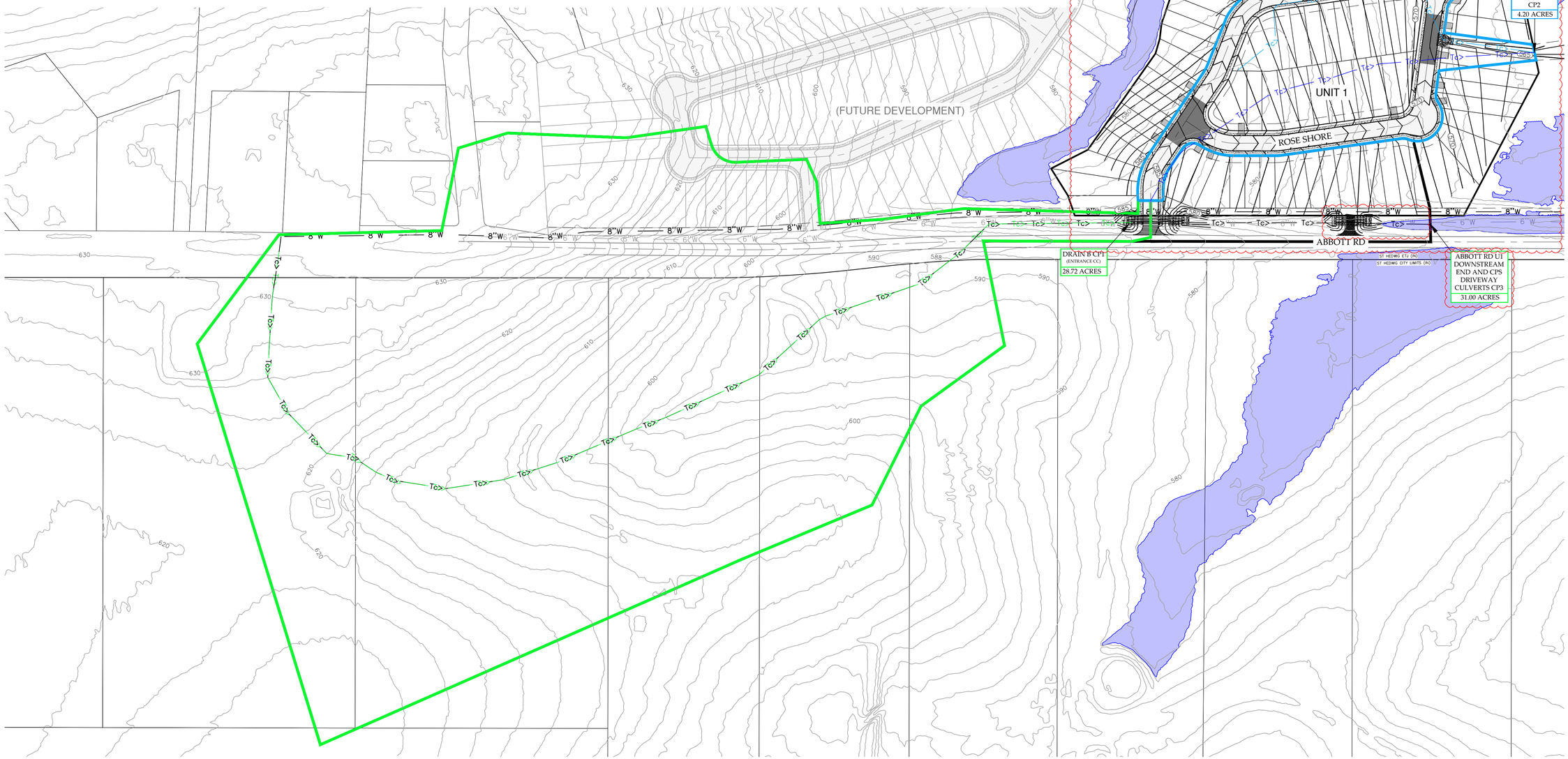


RESIDENTIAL STREET
TYPICAL STREET SECTION (50' R.O.W.)
(NOT TO SCALE)

DRAIN A BOUNDARY
DRAIN A PR/ULT Tc FLOW PATH
DRAIN A EX Tc FLOW PATH
DRAIN B BOUNDARY
DRAIN B Tc FLOW PATH
ABBOTT RD U1 DOWNSTREAM END
ABBOTT RD U1 DOWNSTREAM END Tc FLOW PATH
PROPERTY BOUNDARY
EXISTING 5' CONTOUR
EXISTING 1' CONTOUR
PROPOSED 5' CONTOUR
PROPOSED 1' CONTOUR
EOP
LOT LINE

EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY

SCALE OF FEET
1" = 100'



ROSE VALLEY SOUTH - UNIT 1
INTERNAL DRAINAGE

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/9/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CP5 DRIVEWAY CULVERTS AND UPDATED STORM SEWER SIZING. ADJUSTED FOR UPDATED FLOODPLAIN LIMITS.	SGL

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C1.0
PLAT NO. CP202412

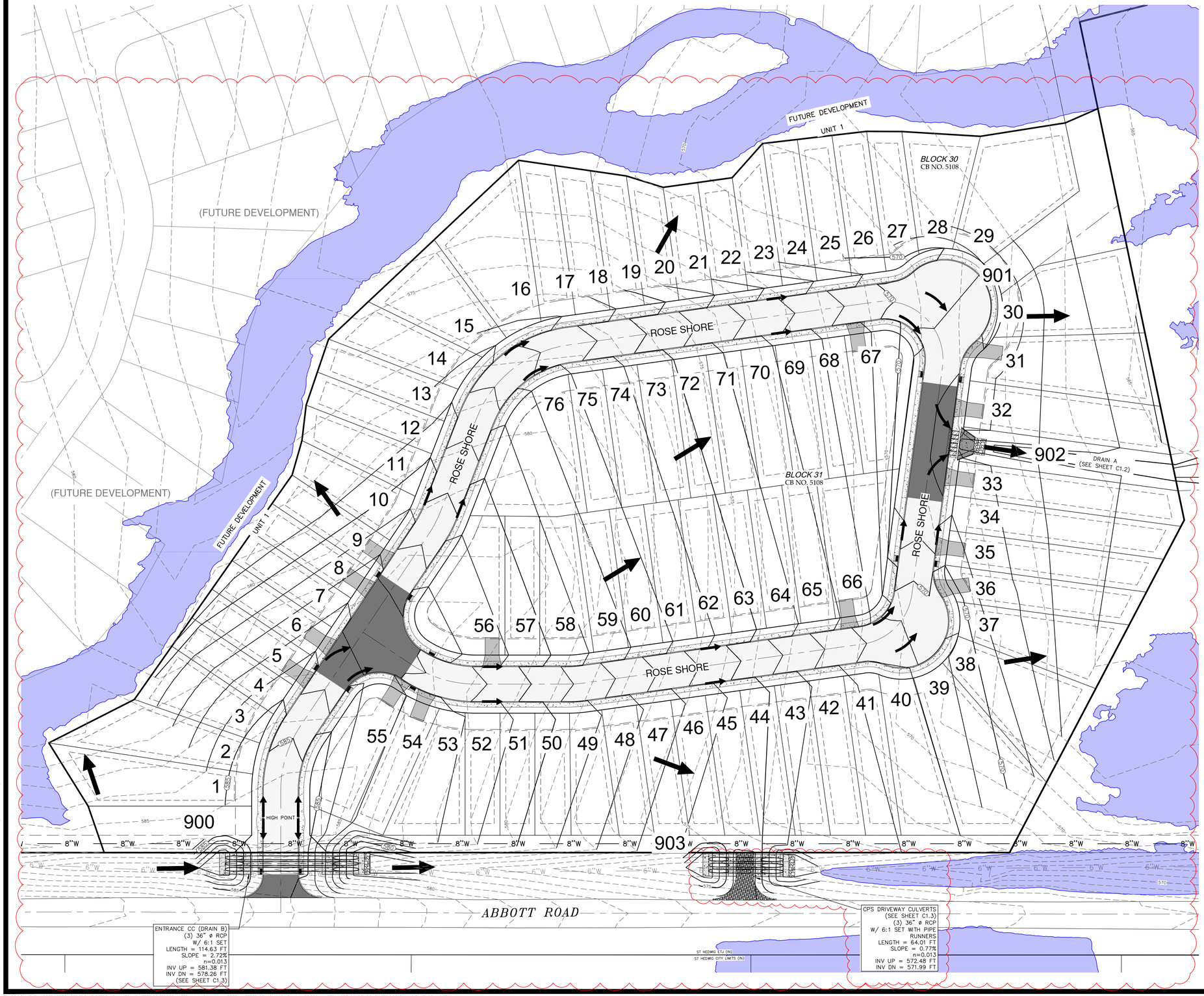
RAKOWITZ ENGINEERING & SURVEYING
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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Date: Oct 09, 2025, 4:36pm User ID: CAD1-2022
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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025



40 0 40 80

SCALE OF FEET
1" = 40'

LEGEND

- PROPERTY BOUNDARY
- 650 EXISTING 5' CONTOUR
- EXISTING 1' CONTOUR
- 655 PROPOSED 5' CONTOUR
- PROPOSED 1' CONTOUR
- EOP
- LOT LINE
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- PROPOSED FLOW ARROW
- WASHOUT CROWN

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
DRAINAGE OVERVIEW

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/9/2025
F-9155

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS AND UPDATED STORM SEWER GEOMETRY ADJUSTED FOR UPDATED FLOODPLAIN LIMITS.	SGL

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C1.1

PLAT NO: CP202412

Date: Oct 09, 2025, 4:36pm User ID: CADT-2022
File: N:\Projects\2023\23-3159\G Abbott Rd Lennar\Civil\23-3159G Drainage Overview.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

$$Q = CL(h)^{3/2}$$

Q_{25}	24.92	*cfs*
C	3.087	
h	0.792	*ft*
L	11.5	*LF*
20.0 LF OPENING IN SIDEWALK BOX FOR DRAIN A		

Permissible Shear Stresses for Various Linings

Protective Cover	($lb./sq.ft.$)	t_p (N/m^2)
Retardance Class A Vegetation (See the "Retardation Class for Lining Materials" table above)	3.70	177
Retardance Class B Vegetation (See the "Retardation Class for Lining Materials" table above)	2.10	101
Retardance Class C Vegetation (See the "Retardation Class for Lining Materials" table above)	1.00	48
Retardance Class D Vegetation (See the "Retardation Class for Lining Materials" table above)	0.60	29
Retardance Class E Vegetation (See the "Retardation Class for Lining Materials" table above)	0.35	17
Woven Paper	0.15	7
Jute Net	0.45	22
Single Fiberglass	0.60	29
Double Fiberglass	0.85	41
Straw W/Net	1.45	69
Curled Wood Mat	1.55	74
Synthetic Mat	2.00	96
Gravel, D_{50} = 1 in. or 25 mm	0.40	19
Gravel, D_{50} = 2 in. or 50 mm	0.80	38
Rock, D_{50} = 6 in. or 150 mm	2.50	120
Rock, D_{50} = 12 in. or 300 mm	5.00	239
6-in. or 50-mm Gabions	35.00	1675
4-in. or 100-mm Gaxtreb	10.00	479
Soil Cement (8% cement)	>45	>2154
Dyed w/out Grass	>7	>333
Petterflex w/out Grass	>32	>1532
Armorflex w/out Grass	12-20	574-957
Erikamat w/3-in or 75-mm Asphalt	13-16	622-766
Erikamat w/1-in. or 25 mm Asphalt	>5	>239
Armorflex Class 30 with longitudinal and lateral cables, no grass	>34	>1628
Dyed 100, longitudinal cables, cells filled with mortar	>12	>574
Concrete construction blocks, granular filter underlayer	>20	>957
Wedge-shaped blocks with drainage slot	>25	>1197

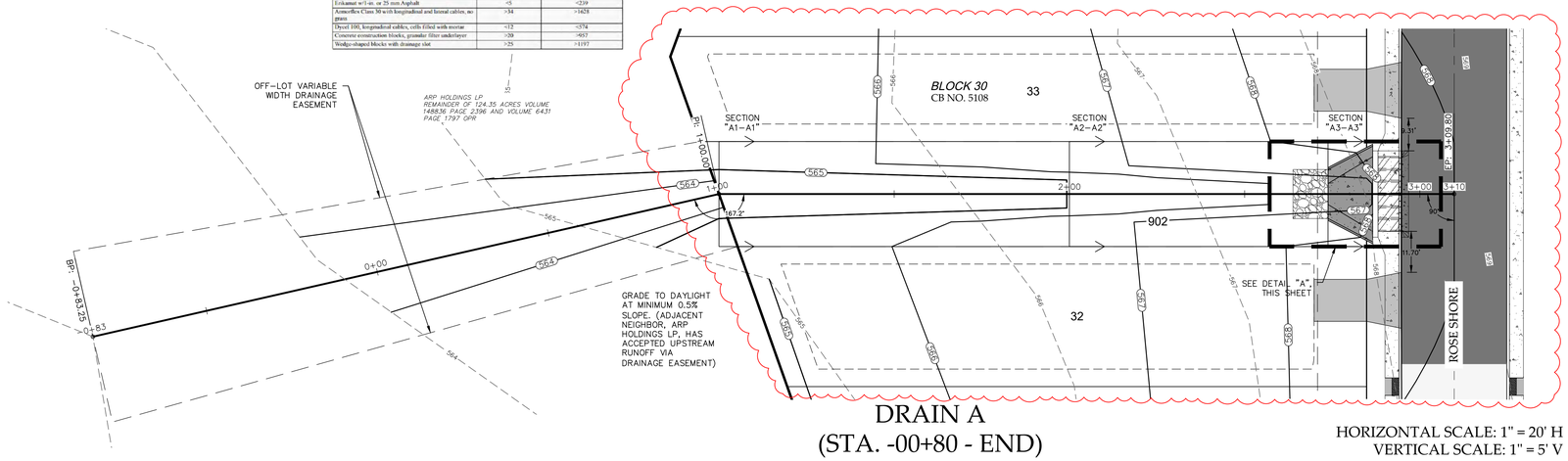
OPEN EARTHEN CHANNEL NOTE:

- CONTRACTOR SHALL REFERENCE TABLE 9.3.8.1 – "RETARDATION CLASS FOR LINING MATERIALS" PROVIDED ON SHEET C1.4 AND SUPPLIED RETARDANCE CLASS (RC) FOR CHOICE OF COVER WITHIN OPEN EARTHEN CHANNEL CROSS SECTIONS. CALCULATIONS CAN BE FOUND IN THE STORMWATER MANAGEMENT PLAN REPORT FOR ROSE VALLEY SOUTH – UNIT 1.
- DRAIN A USES RC B,C,D LINING MATERIALS.

STANDARD NOTES:

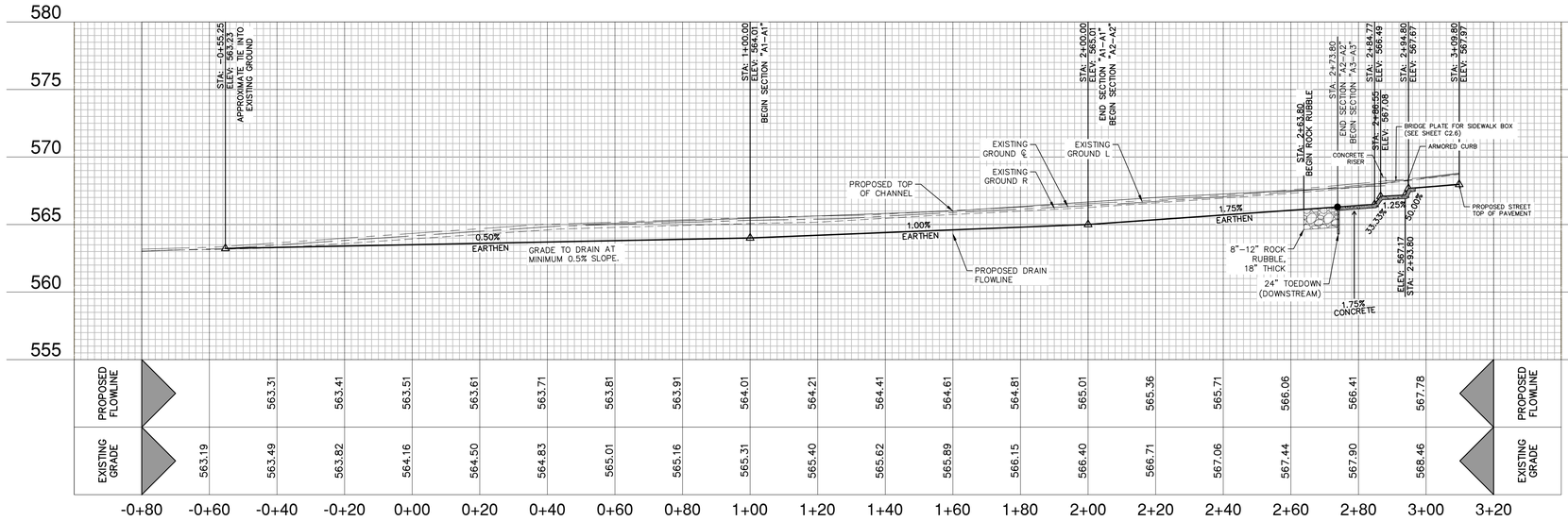
- IMPROVED EARTHEN CHANNELS AND DETENTION PONDS WILL BE VEGETATED BY SEEDING OR SIDING. EIGHTY FIVE PERCENT (85%) OF THE CHANNEL SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT THE CHANNEL FOR MAINTENANCE.
- ALL CONCRETE LINING SHALL DEVELOP A MIN. COMPRESSIVE STRENGTH OF 3,000 PSI IN 28 DAYS.
- FOR NORMAL CONDITIONS, THE CONCRETE LINING SHALL BE A MINIMUM OF FIVE (5) INCHES THICK AND REINFORCED WITH NO. 3 ROUND BARS @12 INCHES ON CENTER EACH WAY. WHERE SURCHARGE, NATURE OF GROUND, HEIGHT AND STEEPNESS OF SLOPE, ETC, BECOME CRITICAL, DESIGN SHALL BE IN ACCORDANCE WITH LATEST STRUCTURAL STANDARDS. ALL CONCRETE LINING SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN THREE THOUSAND (3,000) POUNDS PER SQUARE INCH IN TWENTY–EIGHT (28) DAYS. THE DEPTH OF ALL TOE DOWNS SHALL BE 36 INCHES UPSTREAM, 24 INCHES DOWNSTREAM, AND 18 INCHES FOR SIDE SLOPES. THE CITY'S CONSTRUCTION INSPECTOR MAY PERMIT AN 18" TOE DOWN IN ROCK SUBGRADE IN LIEU OF THE ABOVE TOE DOWN REQUIREMENTS. THE HORIZONTAL DIMENSIONS OF TOE DOWNS SHALL NOT BE LESS THAN SIX (6) INCHES.

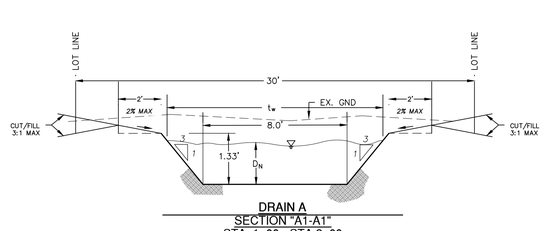
NOTE:
CONTRACTOR SHALL BEGIN MEASURES TO ESTABLISH VEGETATION IMMEDIATELY AFTER CONSTRUCTION OF EARTHEN DRAIN SECTIONS TO MITIGATE CHANNEL EROSION. CONTRACTOR SHALL USE HYDRO–MULCH SEEDING, SOD LINING, OR OTHER APPROVED METHODS.



DRAIN A
(STA. -00+80 - END)

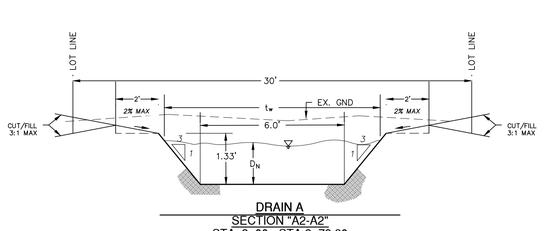
HORIZONTAL SCALE: 1" = 20' H
VERTICAL SCALE: 1" = 5' V





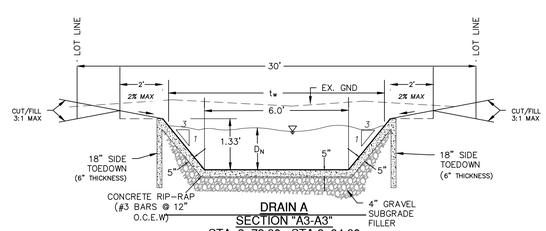
DRAIN A
SECTION "A1-A1"
STA. 1+00 - STA 2+00
NOT–TO–SCALE

FREQUENCY	Q(CFS)	SLOPE	D_N (ft)	V (fps)	t_w (ft)
25–YR	24.92	1.00%	0.78	3.09	12.68



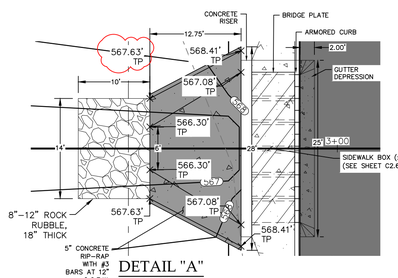
DRAIN A
SECTION "A2-A2"
STA. 2+00 - STA 2+73.80
NOT–TO–SCALE

FREQUENCY	Q(CFS)	SLOPE	D_N (ft)	V (fps)	t_w (ft)
25–YR	24.92	1.75%	0.77	3.89	10.62

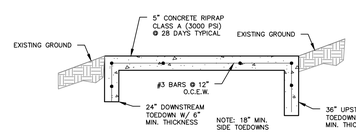


DRAIN A
SECTION "A3-A3"
STA. 2+73.80 - STA 2+94.80
NOT–TO–SCALE

FREQUENCY	Q(CFS)	SLOPE	D_N (ft)	V (fps)	t_w (ft)
25–YR	24.92	1.75%	0.48	6.98	8.88



DETAIL "A"
1":10'



CONCRETE RIP-RAP DETAIL (TYP.)
NOT–TO–SCALE

SCALE OF FEET
1" = 20'
20 0 20 40

LEGEND
- PROPERTY BOUNDARY
- SITE LINE
- ROAD CENTERLINE
- 650 EXISTING 1' CONTOUR
- 650 PROPOSED 1' CONTOUR
- WASHOUT CROWN

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
DRAIN A
(STA. -00+80 - END)
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY
1	2025–OCT–08	ADJUSTED SPOT GRADE WITHIN DETAIL "A" AND GRADING INTO LOTS 32 & 33	CTA

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C1.2
PLAT NO: CP202412

Date: Oct 09, 2025, 4:36pm User ID: CAD1-2022
File N:\Projects\2023\23-3159G Abbott Rd Lennar\Civil\23-3159G Drain P&P.dwg

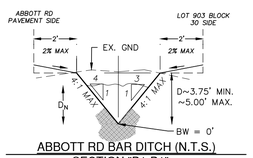
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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

BEXAR COUNTY R.O.W. NOTE:
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN THE BEXAR COUNTY R.O.W.

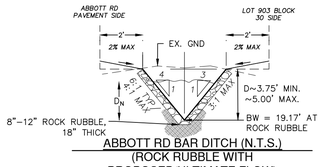
20 0 20 40
SCALE OF FEET
1" = 20'

LEGEND
- PROPERTY BOUNDARY
- SITE LINE
- ROAD CENTERLINE
- 650 EXISTING 1' CONTOUR
- 650 PROPOSED 1' CONTOUR
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- WASHOUT CROWN



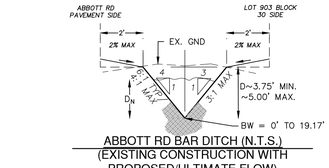
ABBOTT RD BAR DITCH (N.T.S.)
SECTION "B1-B1"
AT U1 EXIT
NOT-TO-SCALE

	FREQUENCY	Q(CFS)	SLOPE	D_N (ft)	V (fps)	t_w (ft)
EXISTING	25-YR	122.31	1.60%	1.98	5.26	23.32
PROPOSED/ULTIMATE	25-YR	125.88	1.60%	2.00	5.31	23.53



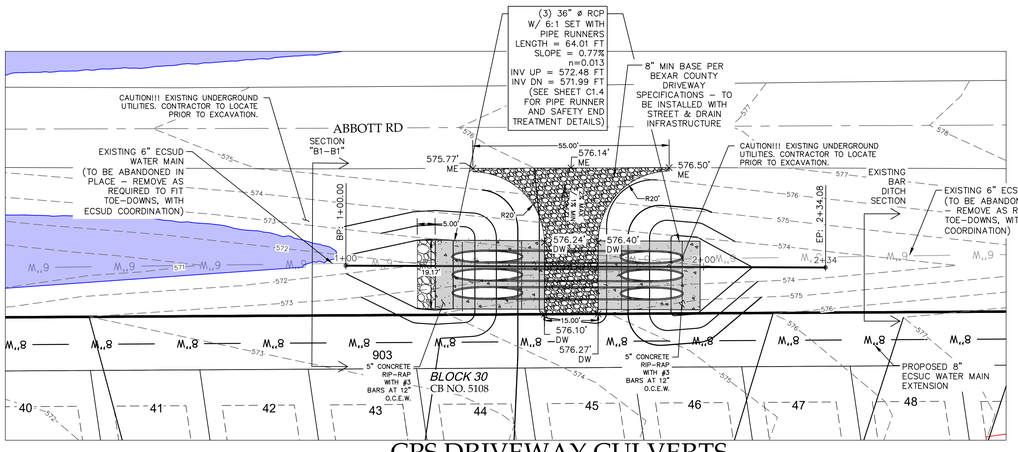
ABBOTT RD BAR DITCH (N.T.S.)
(ROCK RUBBLE WITH PROPOSED/ULTIMATE FLOW)
STA. 1+20 - STA 1+25
NOT-TO-SCALE

	FREQUENCY	Q(CFS)	SLOPE	D_N (ft)	V (fps)	t_w (ft)
DOWNSTREAM	25-YR	125.88	1.00%	2.51	4.44	22.59



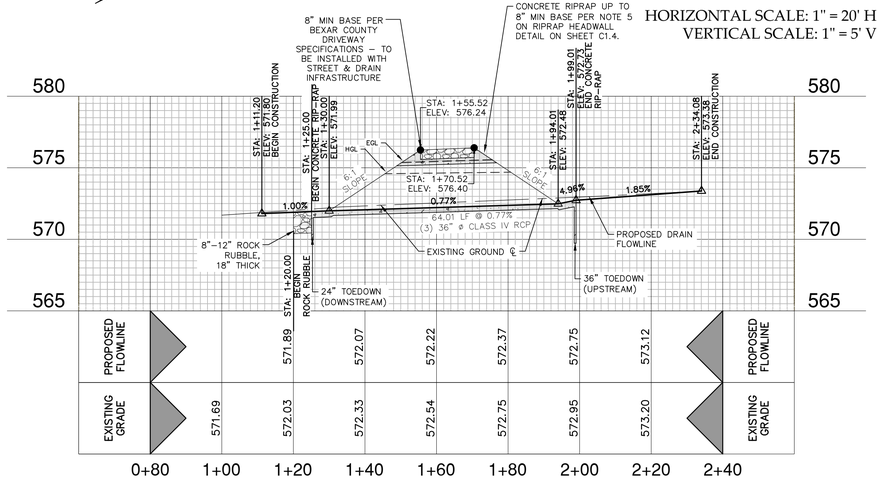
ABBOTT RD BAR DITCH (N.T.S.)
(EXISTING CONSTRUCTION WITH PROPOSED/ULTIMATE FLOW)
STA 1+00 - 1+20 &
STA. 1+98.23 - END
NOT-TO-SCALE

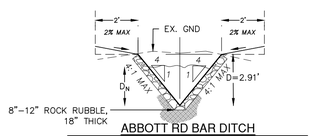
	FREQUENCY	Q(CFS)	SLOPE	D_N (ft)	V (fps)	t_w (ft)
DOWNSTREAM	25-YR	125.88	1.00%	2.43	4.74	21.87
UPSTREAM	25-YR	125.88	1.85%	2.17	5.94	19.53



CPS DRIVEWAY CULVERTS
(STA. 1+00 - END)

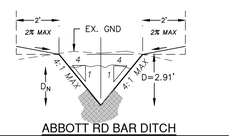
HORIZONTAL SCALE: 1" = 20' H
VERTICAL SCALE: 1" = 5' V





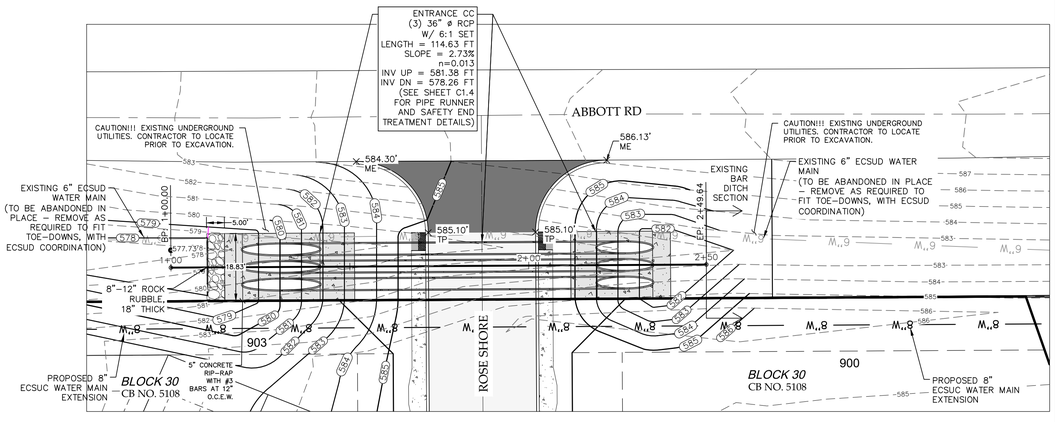
ABBOTT RD BAR DITCH
(ROCK RUBBLE WITH PROPOSED/ULTIMATE FLOW)
STA. 1+10 - STA 1+15
NOT-TO-SCALE

	FREQUENCY	Q(CFS)	SLOPE	D_N (ft)	V (fps)	t_w (ft)
DOWNSTREAM	25-YR	115.98	2.63%	2.02	6.21	18.64



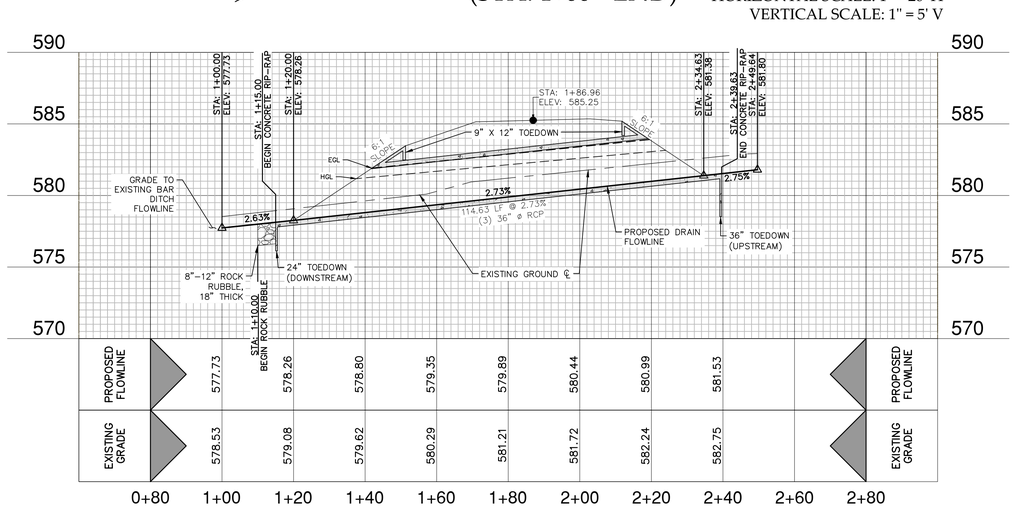
ABBOTT RD BAR DITCH
(EXISTING CONSTRUCTION WITH PROPOSED/ULTIMATE FLOW)
STA. 1+00 - STA 1+10
STA. 2+39.63 - END
NOT-TO-SCALE

	FREQUENCY	Q(CFS)	SLOPE	D_N (ft)	V (fps)	t_w (ft)
DOWNSTREAM	25-YR	115.98	2.63%	1.96	6.60	18.08
UPSTREAM	25-YR	115.98	2.75%	1.94	6.74	17.89



DRAIN B (ROSE SHORE ENTRANCE CC)
(STA. 1+00 - END)

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



RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
DRAIN B & CPS DRIVEWAY
CULVERTS STA. 1+00 - END
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/8/2025

REV	DATE	DESCRIPTION	BY
1:	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS AND UPDATED GRADING.	SGL

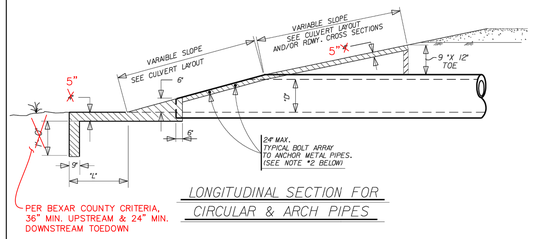
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C1.3
PLAT NO: CP202412

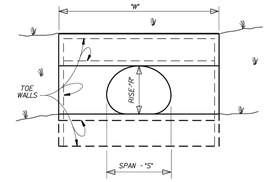
Date: Oct 09, 2025, 8:36am User ID: CAD1.2022
File: N:\Projects 2023\23-3159G Abbott Rd Lennar\Civil\23-3159G Drain PkP.dwg

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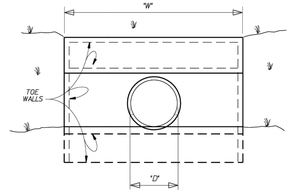
PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025



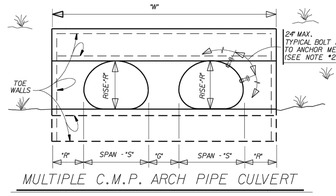
LONGITUDINAL SECTION FOR CIRCULAR & ARCH PIPES



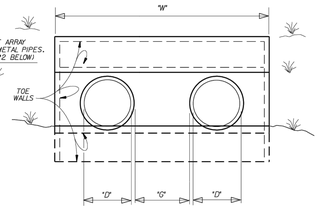
SINGLE C.M.P. ARCH PIPE CULVERT



SINGLE CIRCULAR PIPE CULVERT
(CMP or RCP)



MULTIPLE C.M.P. ARCH PIPE CULVERT



MULTIPLE CIRCULAR PIPE CULVERT
(CMP or RCP)

DIMENSIONS FOR CIRCULAR (CMP and RCP) PIPE CULVERTS

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

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

DIMENSIONS FOR C.M.P. ARCH PIPE CULVERTS

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

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

NOTES:

1.) FOR RIPRAP QUANTITIES AND SLOPES, SEE CULVERT LAYOUT SHEET. CONCRETE SHALL BE CLASS B UNLESS OTHERWISE SHOWN IN THE PLANS.

2.) ALL METAL PIPES (CIRCULAR AND/OR ARCH) SHALL HAVE 5/8"X 6' GALVANIZED BOLTS WITH 2 HEX NUTS AT 24" CENTERS TO ANCHOR THE PIPE TO THE CONCRETE. THIS WORK WILL BE SUBSIDIARY TO THE RIPRAP HEADWALL.

3.) FOR CONCRETE ARCH PIPES, THE CMP ARCH PIPE CULVERT DIMENSIONS WILL HAVE TO BE ADJUSTED FOR THE PIPE WALL THICKNESS.

4.) FOR PIPES LARGER THAN SHOWN, USE THE CLEAR DISTANCE BETWEEN PIPES SHOWN IN ITEMS 460 AND/OR 464.

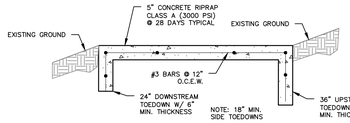
5.) IF THE SIDES OF THE HEADWALL IS ADJACENT TO A RIPRAP SLOPE AND IF THE TOP OF THE HEADWALL IS ADJACENT TO THE ROADWAY FOUNDATION OR RIPRAP SLOPE. THE SIDE AND TOP TOE WALLS MAY BE EUMINATED IF APPROVED BY THE ENGINEER.

SAN ANTONIO DISTRICT STANDARD
RIPRAP HEADWALL

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FED.RD. DIV. NO.	PROJECT NO.	SHEET NO.
6		
STATE	STATE DISTRICT	COUNTY
TEXAS	SAT	
CONT.	SECT.	JOB	HIGHWAY NO.

10/95



CONCRETE RIP-RAP DETAIL (TYP.)

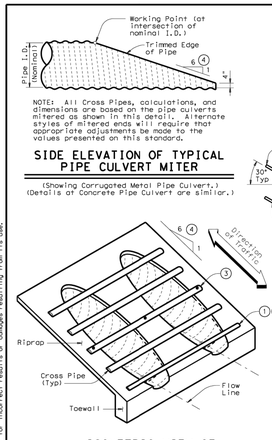
NOT-TO-SCALE

Permissible Shear Stresses for Various Linings

Protective Cover	(lb./sq.ft.)	t_p (N/m^2)
Retardance Class A Vegetation (See the "Retardation Class for Lining Materials" table above)	3.70	177
Retardance Class B Vegetation (See the "Retardation Class for Lining Materials" table above)	2.10	101
Retardance Class C Vegetation (See the "Retardation Class for Lining Materials" table above)	1.00	48
Retardance Class D Vegetation (See the "Retardation Class for Lining Materials" table above)	0.60	29
Retardance Class E Vegetation (See the "Retardation Class for Lining Materials" table above)	0.35	17
Woven Paper	0.15	7
Jute Net	0.45	22
Single Fiberglass	0.60	29
Double Fiberglass	0.85	41
Straw W/Net	1.45	69
Curled Wood Mat	1.55	74
Synthetic Mat	2.00	96
Gravel, D_{50} = 1 in. or 25 mm	0.40	19
Gravel, D_{50} = 2 in. or 50 mm	0.80	38
Rock, D_{50} = 6 in. or 150 mm	2.50	120
Rock, D_{50} = 12 in. or 300 mm	5.00	239
6-in. or 50-mm Gabions	35.00	1675
4-in. or 100-mm Geoweb	10.00	479
Soil Cement (8% cement)	>45	>2154
Dycel w/out Grass	>7	>335
Petraflex w/out Grass	>32	>1532
Armorflex w/out Grass	12-20	574-957
Erikamat w/3-in or 75-mm Asphalt	13-16	622-766
Erikamat w/1-in. or 25 mm Asphalt	<5	<239
Armorflex Class 30 with longitudinal and lateral cables, no grass	>34	>1628
Dycel 100, longitudinal cables, cells filled with mortar	<12	<574
Concrete construction blocks, granular filter underlayer	>20	>957
Wedge-shaped blocks with drainage slot	>25	>1197

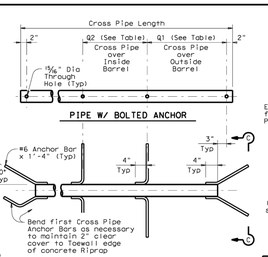
Retardation Class for Lining Materials

Retardance Class	Cover	Condition
A	Weeping Lovegrass	Excellent stand, tall (average 30 in. or 760 mm)
	Yellow Bluestem Ischaemum	Excellent stand, tall (average 36 in. or 915 mm)
B	Kudzu	Very dense growth, uncut
	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
	Weeping lovegrass	Good Stand, tall (average 24 in. or 610 mm)
	Lespedeza sericea	Good stand, not woody, tall (average 19 in. or 480 mm)
	Alfalfa	Good stand, uncut (average 11 in or 280 mm)
	Weeping lovegrass	Good stand, unmowed (average 13 in. or 330 mm)
	Kudzu	Dense growth, uncut
	Blue gamma	Good stand, uncut (average 13 in. or 330 mm)
C	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 redtop, Italian ryegrass, and common lespedeza)	Good stand, uncut (6-8 in. or 150-200 mm)
	Centipedegrass	Very dense cover (average 6 in. or 150 mm)
	Kentucky bluegrass	Good stand, headed (6-12 in. or 150-305 mm)
D	Bermuda grass	Good stand, cut to 2.5 in. or 65 mm
	Common lespedeza	Excellent stand, uncut (average 4.5 in. or 115 mm)
	Buffalo grass	Good stand, uncut (3-6 in. or 75-150 mm)
	Grass-legume mixture: fall, spring (orchard grass Italian ryegrass, and common lespedeza	Good Stand, uncut (4-5 in. or 100-125 mm)
	Lespedeza sericea	After cutting to 2 in. or 50 mm (very good before cutting)
E	Bermuda grass	Good stand, cut to 1.5 in. or 40 mm
	Bermuda grass	Burned stubble



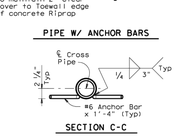
SIDE ELEVATION OF TYPICAL PIPE CULVERT MITER

(Showing Corrugated Metal Pipe Culvert.)
(Details at Concrete Pipe Culvert are similar.)



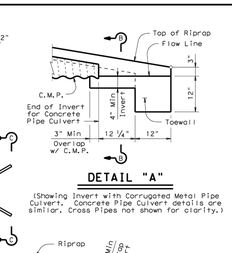
PIPE W/ BOLTED ANCHOR

PIPE W/ ANCHOR BARS



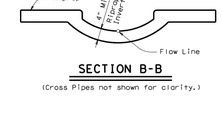
SECTION C-C

CROSS PIPE DETAILS



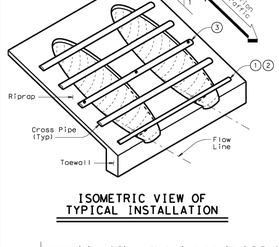
DETAIL "A"

(Showing Invert with Corrugated Metal Pipe Culvert. Concrete Pipe Culvert details are similar. Cross Pipes not shown for clarity.)



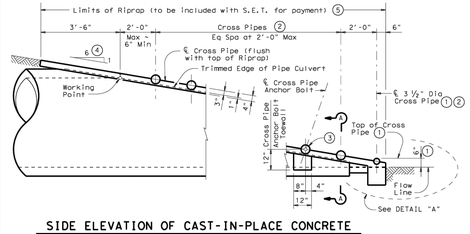
SECTION B-B

(Cross Pipes not shown for clarity.)



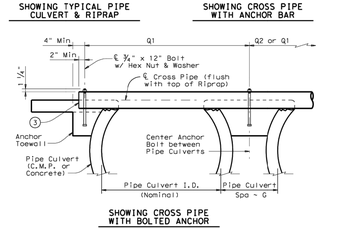
ISOMETRIC VIEW OF TYPICAL INSTALLATION

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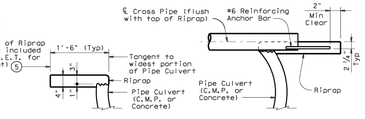
SIDE ELEVATION OF CAST-IN-PLACE CONCRETE

(Showing Concrete Pipe Culvert.)
(Details at Corrugated Metal Pipe Culvert are similar.)



SHOWING CROSS PIPE WITH BOLTED ANCHOR

SECTION A-A



SHOWING TYPICAL PIPE CULVERT & RIPRAP

SHOWING CROSS PIPE WITH ANCHOR BAR

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

(1) The proper installation of the first Cross Pipe is critical for vehicle safety. The top of the first Cross Pipe must be placed at no more than 6" above the flow line.

(2) Size of Cross Pipes, except the first bottom pipe, shall be as shown in the PIPE SIZE table. The first bottom pipe shall be 3 1/2" Standard Pipe (4" O.D.).

(3) The third Cross Pipe from the bottom of the Culvert shall always be installed using a bolted connection. Care shall be taken to ensure that Riprap concrete does not flow into the Cross Pipe so as to permit disassembly of the bolted connection to allow cleanout access. At the Contractor's option, all other Cross Pipes may also be installed using the bolted connection details.

(4) Match Cross Slope as shown elsewhere in the plans. Cross Slope of 6% or flatter is required for vehicle safety.

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

(6) Quantities shown are for one end of one reinforced Concrete Pipe Culvert. For multiple pipe culverts or for Corrugated Metal Pipe Culverts, quantities will need to be adjusted. Riprap quantities are for Contractor's information only.

GENERAL NOTES:

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

Safety End Treatments shown herein are intended for use in those installations where out of control vehicles are likely to traverse the openings approximately perpendicular to the Cross Pipes.

Riprap and all necessary inverts shall be Concrete Riprap conforming to the requirements of Item 432, "Riprap".

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

Cross Pipes shall conform to the requirements of ASTM A53 (Type E or S, Grade B), ASTM A500 (Grade B), or API 5LX52.

Bolts and nuts shall conform to ASTM A307.

All steel components, except concrete reinforcing, shall be galvanized after fabrication. Galvanizing damaged during transport or construction shall be repaired in accordance with the specifications.

Texas Department of Transportation
Bridge Division

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

SETP-PD

FILE:	setpdpa.dgn	DN: CAT	CK: CAT	DW: JRP	CK: CAT
©TxDOT May 2005		DISTRICT	FEDERAL AID PROJECT		SHEET
REVISIONS		COUNTY	CONTROL	SECT	JOB	HIGHWAY

STRUCTURE DESIGN
ARMOR_STDS\DPMDWALL.dgn

DISTRIBUTION: ACCI

Date: Oct 09, 2025, 4:37am User ID: CAD1.2022
File: N:\Projects\2023\23-3159D Abbott Rd Lemar\Civil\23-3159D Drainage Details.dwg

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Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
DRAINAGE DETAILS

BEXAR COUNTY, TEXAS

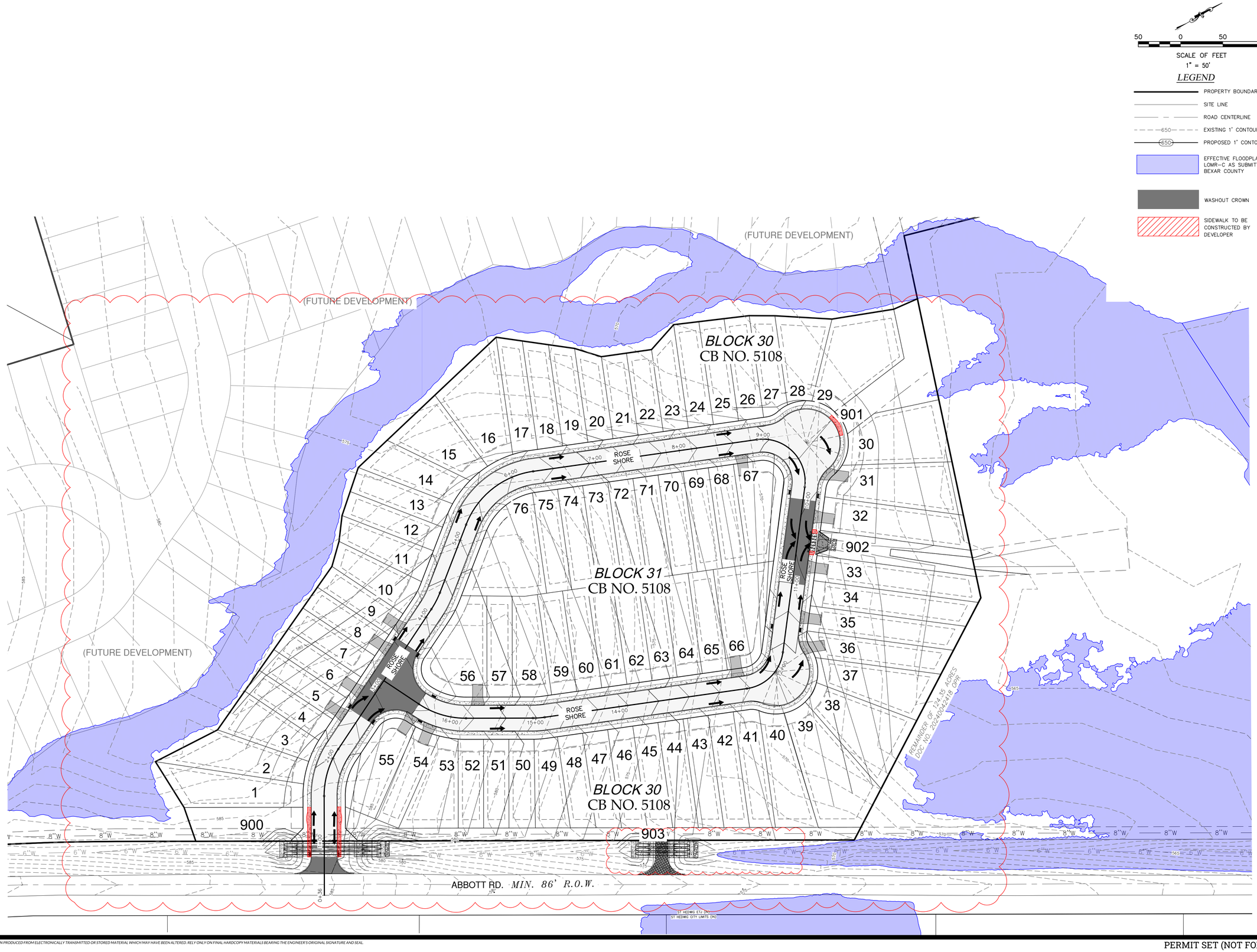
RAKOWITZ ENGINEERING, PLLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C1.4
PLAT NO: CP202412

PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025



RAKOWITZ
Engineering & Surveying

Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
OVERALL ROAD LAYOUT

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/8/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED DPS DRIVEWAY CULVERTS AND UPDATED GRADING. ROADWAY ADJUSTED FOR UPDATED FLOODPLAIN LIMITS.	SGL

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

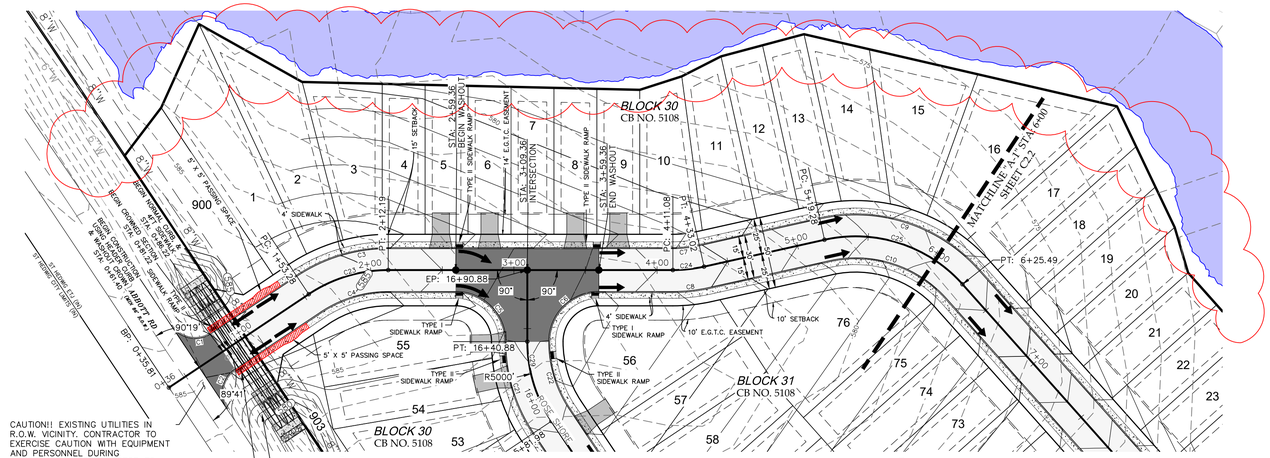
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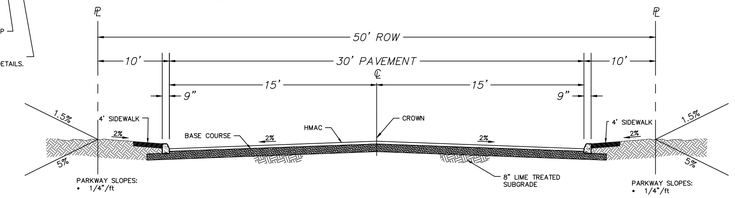
PLAT NO: CP202412

Date: Oct 09, 2025, 4:37pm User ID: CAD1-2022
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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025





RESIDENTIAL STREET
TYPICAL STREET SECTION (50' R.O.W.)
(NOT TO SCALE)

NOTES:
1. EXISTING TOPOGRAPHIC CONTOURS DERIVED FROM ON THE GROUND SURVEY DATA WITHIN THE LIMITS OF THE PROPOSED ROADWAY CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. CONTRACTOR SHALL REVEGETATE RIGHT-OF-WAY TO REDUCE EROSION AS PER BEXAR COUNTY SPECIFICATIONS.
3. CONTRACTOR TO SALVAGE & STOCKPILE 4 INCHES OF EXISTING TOPSOIL FOR FINAL DRESSING OF RIGHT-OF-WAY PRIOR TO SEEDING.
4. CONTRACTOR TO FOLLOW GEOTECH REPORT FOR PROPER PAVEMENT CONSTRUCTION.
5. TESTING TO BE PROVIDED BY OWNER'S QUALIFIED AGENT TO ASSURE COMPLIANCE TO SPECIFICATIONS OUTLINED IN GEOTECH REPORT.

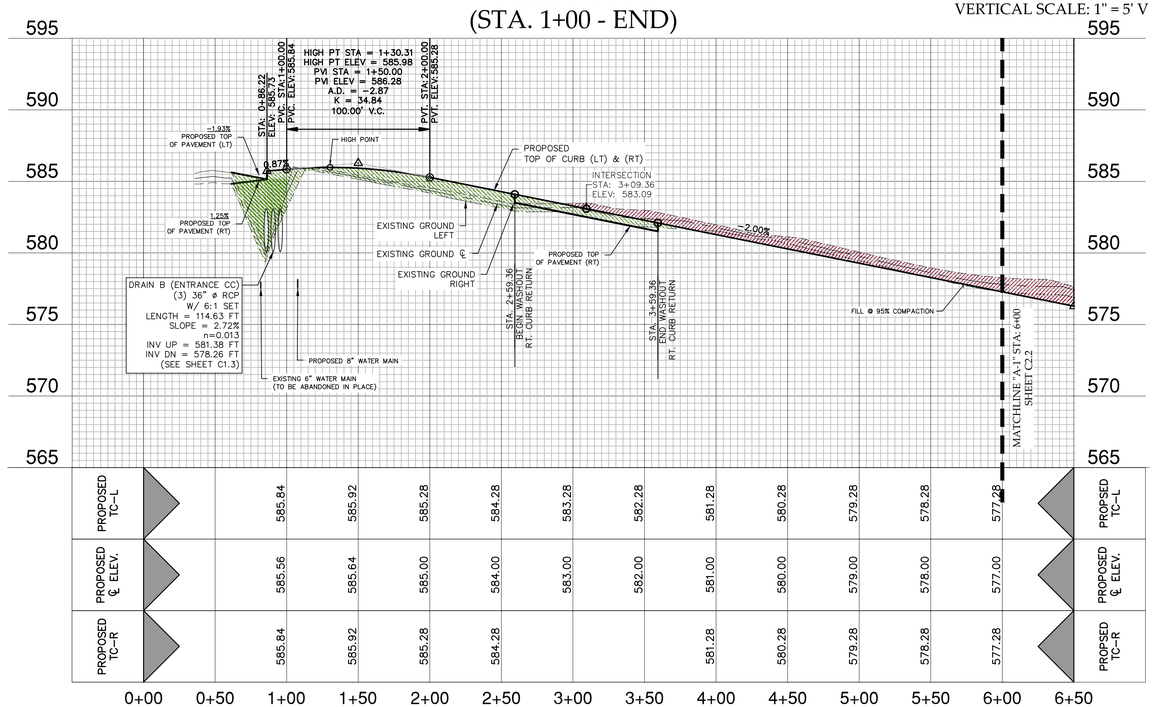
- SUBGRADE TO BE TESTED PER TEX-114-E D698 @ 95% DENSITY, 1 PER 10,000 SQ. FT.
- BASE TO BE PLACED IN MAXIMUM 8" THICK LOOSE LIFTS, COMPACTED, & TESTED PER TEX-113-E @ 95% DENSITY, 1 PER 5,000 SQ FT.

NOTE:
EROSION CONTROL MEASURES SUCH AS FLAT BOTTOM DITCHES, GRASS RETARDS, ROCK FILTER DAMS, AND SILT SCREENS SHALL BE UTILIZED AS NEEDED TO CONTROL SOIL EROSION IN BAR DITCHES.

BEXAR COUNTY R.O.W. NOTE
A BEXAR COUNTY R.O.W. PERMIT MUST BE OBTAINED PRIOR TO WORKING WITHIN EXISTING BEXAR COUNTY R.O.W.

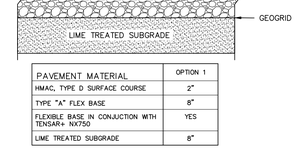
ROSE SHORE
(STA. 1+00 - END)

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



PROPOSED TC-L		585.84	585.92	585.28	584.28	583.28	582.28	581.28	580.28	579.28	578.28	577.28	PROPOSED TC-L
PROPOSED ℄ ELEV.		585.56	585.64	585.00	584.00	583.00	582.00	581.00	580.00	579.00	578.00	577.00	PROPOSED ℄ ELEV.
PROPOSED TC-R		585.84	585.92	585.28	584.28			581.28	580.28	579.28	578.28	577.28	PROPOSED TC-R
	0+00	0+50	1+00	1+50	2+00	2+50	3+00	3+50	4+00	4+50	5+00	5+50	6+00	6+50

CURVE TABLE					
CURVE	RADIUS	DELTA	CHORD BEARING	CHORD	LENGTH
C1	20.00'	090°00'15"	S15°21'50"E	28.29'	31.42'
C2	20.00'	089°59'45"	S74°38'10"W	28.28'	31.41'
C3	115.00'	033°45'03"	S43°29'26"E	66.77'	67.74'
C4	85.00'	033°45'03"	N43°29'26"W	49.35'	50.07'
C5	35.00'	090°00'00"	N18°23'06"E	49.50'	54.98'
C6	35.00'	090°00'04"	N71°36'54"W	49.50'	54.98'
C7	85.00'	012°34'05"	S32°53'57"E	18.61'	18.64'
C8	115.00'	012°34'05"	N32°53'57"W	25.17'	25.23'
C9	115.00'	060°51'20"	S08°45'19"E	116.48'	122.14'
C10	85.00'	060°51'20"	N08°45'19"W	86.10'	90.28'
C21	115.00'	033°45'01"	N46°30'34"E	66.77'	67.74'
C22	85.00'	033°45'01"	S46°30'33"W	49.35'	50.07'
C23	100.00'	033°45'03"	N43°29'26"W	58.06'	58.91'
C24	100.00'	012°34'05"	N32°53'57"W	21.89'	21.94'
C25	100.00'	060°51'20"	N08°45'19"W	101.29'	106.21'



PAVEMENT MATERIAL	OPTION 1
HMAC, TYPE D SURFACE COURSE	2"
TYPE "A" FLEX BASE	8"
FLEXIBLE BASE IN CONJUCTION WITH TENSAR+ NX750	YES
LIME TREATED SUBGRADE	8"

PROPOSED PAVEMENT SECTION

REFERENCE GEOTECH REPORT 0312-3441 PREPARED BY INTERTEK PSI, DATED JANUARY 30, 2025 FOR PAVEMENT MATERIALS AND CONSTRUCTION REQUIREMENTS. CONTRACTOR SHALL MEET OR EXCEED ALL PAVING RECOMMENDATIONS. ADDITIONAL PAVEMENT SECTIONS ARE AVAILABLE IN THE GEOTECH REPORT. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.

50 0 50 100
SCALE OF FEET
1" = 50'

LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- ROAD CENTERLINE
- 650 EXISTING 1' CONTOUR
- 650 PROPOSED 1' CONTOUR
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- WASHOUT CROWN
- SIDEWALK TO BE CONSTRUCTED BY DEVELOPER

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
ROSE SHORE STA. 1+00 - 6+00

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	UPDATED GRADING, BOUNDARY ADJUSTED FOR UPDATED FLOODPLAIN LIMITS.	SGL

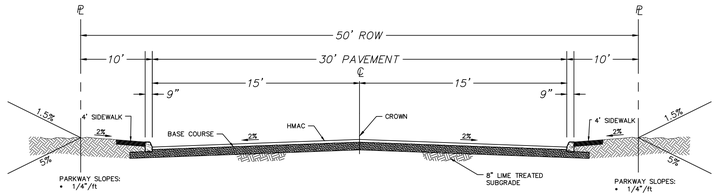
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C2.1
PLAT NO: CP202412

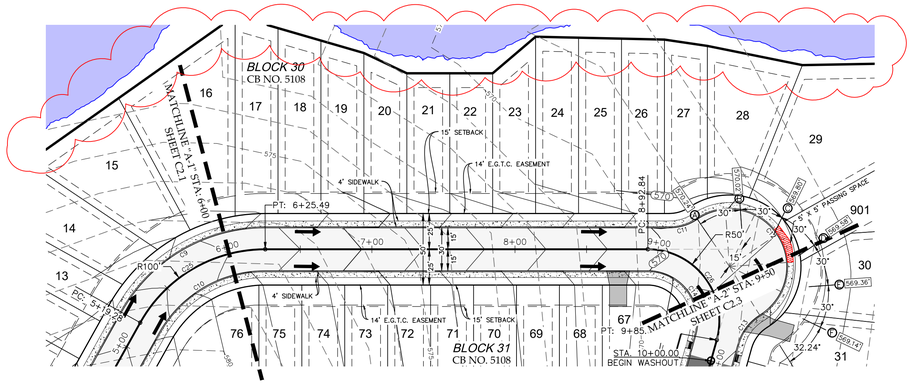
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RESIDENTIAL STREET
TYPICAL STREET SECTION (50' R.O.W.)
(NOT TO SCALE)



50 0 50 100
SCALE OF FEET
1" = 50'

LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- ROAD CENTERLINE
- 650 EXISTING 1' CONTOUR
- 650 PROPOSED 1' CONTOUR
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- WASHOUT CROWN
- 568.65 PROPOSED TOP OF CURB IN KNUCKLE
- SIDEWALK TO BE CONSTRUCTED BY DEVELOPER

CURVE TABLE					
CURVE	RADIUS	DELTA	CHORD BEARING	CHORD	LENGTH
C9	115.00'	060°51'20"	S08°45'19"E	116.48'	122.14'
C10	85.00'	060°51'20"	N08°45'19"W	86.10'	90.28'
C11	35.00'	034°05'58"	S04°37'21"W	20.52'	20.83'
C12	40.00'	182°14'16"	S78°41'30"W	79.98'	127.23'
C13	35.00'	042°31'31"	N31°27'07"W	25.38'	25.98'
C14	35.00'	105°36'48"	N74°28'44"E	55.76'	64.52'
C25	100.00'	060°51'20"	N08°45'19"W	101.29'	106.21'
C26	50.00'	105°36'48"	N74°28'44"E	79.66'	92.16'

NOTES:
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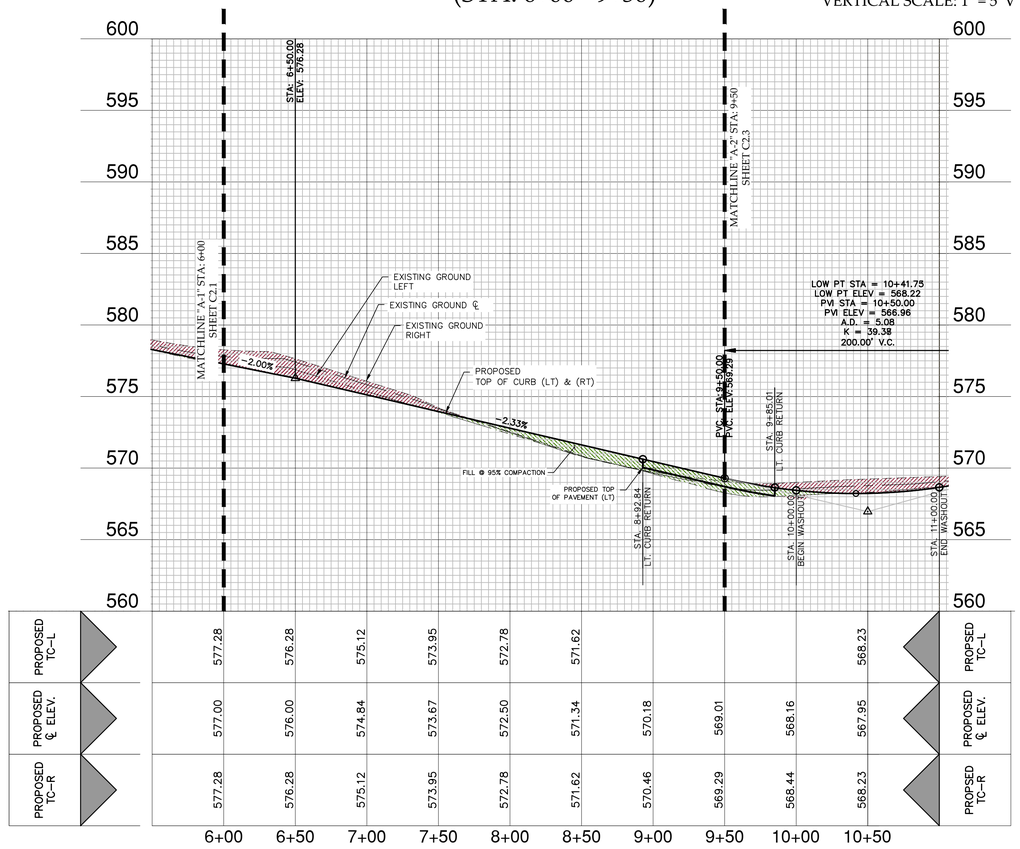
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NOTE:
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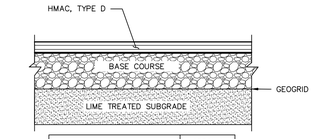
BEXAR COUNTY R.O.W. NOTE
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ROSE SHORE
(STA. 6+00 - 9+50)

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



	6+00	6+50	7+00	7+50	8+00	8+50	9+00	9+50	10+00	10+50
PROPOSED TC-L	577.28	576.28	575.12	573.95	572.78	571.62			568.23	PROPSED TC-L
PROPOSED ℄ ELEV.	577.00	576.00	574.84	573.67	572.50	571.34	570.18	569.01	568.16	567.95	PROPOSED ℄ ELEV.
PROPOSED TC-R	577.28	576.28	575.12	573.95	572.78	571.62	570.46	569.29	568.44	568.23	PROPSED TC-R



PAVEMENT MATERIAL	OPTION 1
HMAC, TYPE D SURFACE COURSE	2"
TYPE "A" FLEX BASE	8"
FLEXIBLE BASE IN CONJUCTION WITH TENSAR+ NX750	YES
LIME TREATED SUBGRADE	8"

PROPOSED PAVEMENT SECTION

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ROSE VALLEY SOUTH - UNIT 1
ROSE SHORE STA. 6+00 - 9+50

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
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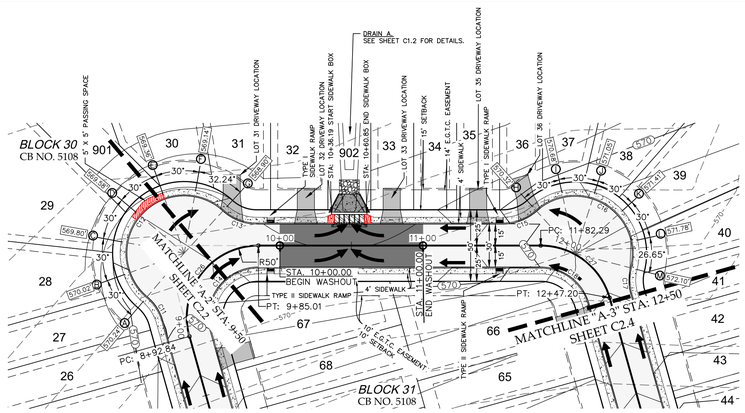
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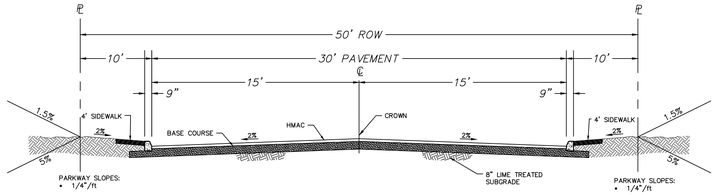
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C2.2
PLAT NO: CP202412

PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

Date: Oct 09, 2025, 4:37pm User ID: CAD1-2022
File: N:\Projects\2023\23-3159\Abbott I-R\Lennar\Civil\23-3159D Road Plans.dwg
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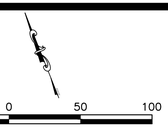
RESIDENTIAL STREET
TYPICAL STREET SECTION (50' R.O.W.)
(NOT TO SCALE)

NOTES:
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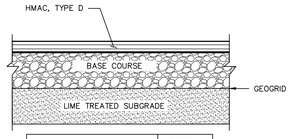


LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- ROAD CENTERLINE
- 650 EXISTING 1' CONTOUR
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- WASHOUT CROWN
- 568.65 PROPOSED TOP OF CURB IN KNUCKLE
- SIDEWALK TO BE CONSTRUCTED BY DEVELOPER

CURVE TABLE

CURVE	RADIUS	DELTA	CHORD BEARING	CHORD	LENGTH
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C13	35.00'	042°31'31"	N31°27'07"W	25.38'	25.98'
C14	35.00'	105°36'48"	N74°28'44"E	55.76'	64.52'
C15	35.00'	042°12'15"	N73°48'59"W	25.20'	25.78'
C16	40.00'	146°38'54"	N21°35'40"W	76.64'	102.38'
C17	35.00'	030°03'27"	N36°42'04"E	18.15'	18.36'
C18	35.00'	074°23'12"	S15°31'16"E	42.32'	45.44'
C26	50.00'	105°36'48"	N74°28'44"E	79.66'	92.16'
C27	50.00'	074°23'12"	S15°31'16"E	60.45'	64.91'



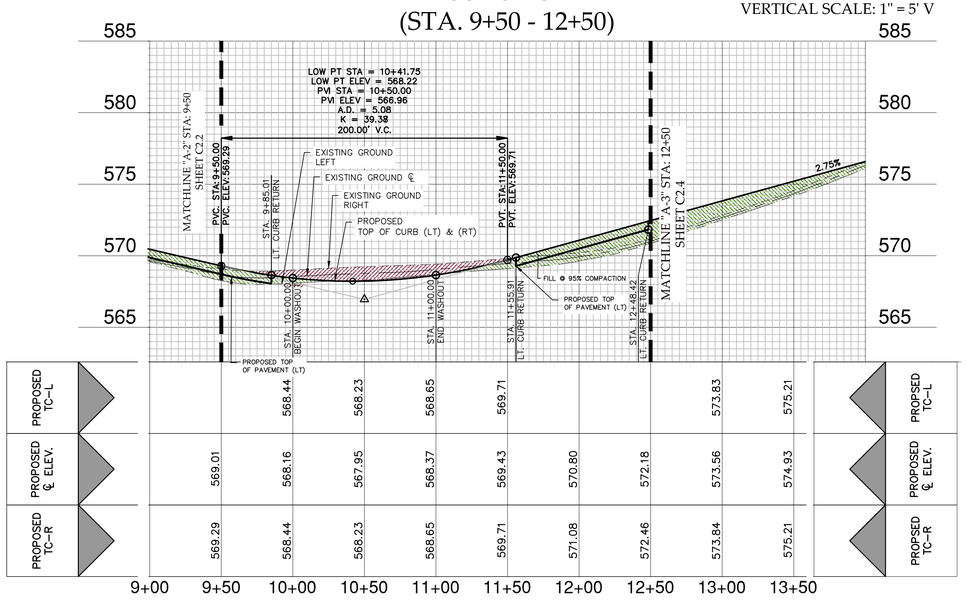
PAVEMENT MATERIAL	OPTION 1
HMAC, TYPE D SURFACE COURSE	2"
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ROSE SHORE
(STA. 9+50 - 12+50)

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



	9+00	9+50	10+00	10+50	11+00	11+50	12+00	12+50	13+00	13+50
PROPOSED TC-L		568.44	568.23	568.65	569.71				573.83	575.21
PROPOSED ℄ ELEV.	569.01	568.16	567.95	568.37	569.43	570.80	572.18	573.56	574.93	
PROPOSED TC-R	569.29	568.44	568.23	568.65	569.71	571.08	572.46	573.84	575.21	

RAKOWITZ
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ROSE VALLEY SOUTH - UNIT 1
ROSE SHORE STA. 9+50 - 12+50

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/8/2025

REV	DATE	DESCRIPTION	BY

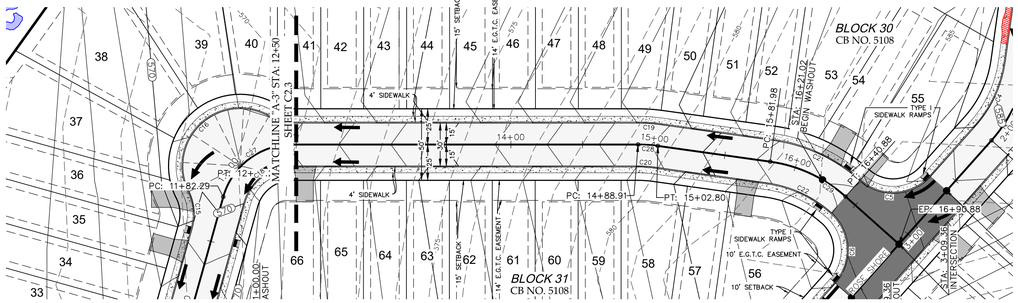
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
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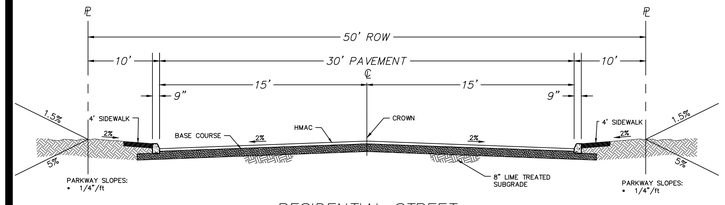
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PLAT NO: CP202412

PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

Date: Oct 09, 2025, 4:38pm User ID: CAD1.2022
File: N:\Projects\2023\23-3159G Abbott Rd Lennar\Civil\23-3159G Road Plans.dwg

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RESIDENTIAL STREET
TYPICAL STREET SECTION (50' R.O.W.)
(NOT TO SCALE)

NOTES:
1. EXISTING TOPOGRAPHIC CONTOURS DERIVED FROM ON THE GROUND SURVEY DATA WITHIN THE LIMITS OF THE PROPOSED ROADWAY CONSTRUCTION. THE CONTRACTOR SHALL VERIFY THE EXISTING CONDITIONS PRIOR TO CONSTRUCTION AND NOTIFY ENGINEER OF ANY DISCREPANCIES.
2. CONTRACTOR SHALL REVEGETATE RIGHT-OF-WAY TO REDUCE EROSION AS PER BEXAR COUNTY SPECIFICATIONS.
3. CONTRACTOR TO SALVAGE & STOCKPILE 4 INCHES OF EXISTING TOPSOIL FOR FINAL DRESSING OF RIGHT-OF-WAY PRIOR TO SEEDING.
4. CONTRACTOR TO FOLLOW GEOTECH REPORT FOR PROPER PAVEMENT CONSTRUCTION.
5. TESTING TO BE PROVIDED BY OWNER'S QUALIFIED AGENT TO ASSURE COMPLIANCE TO SPECIFICATIONS OUTLINED IN GEOTECH REPORT.

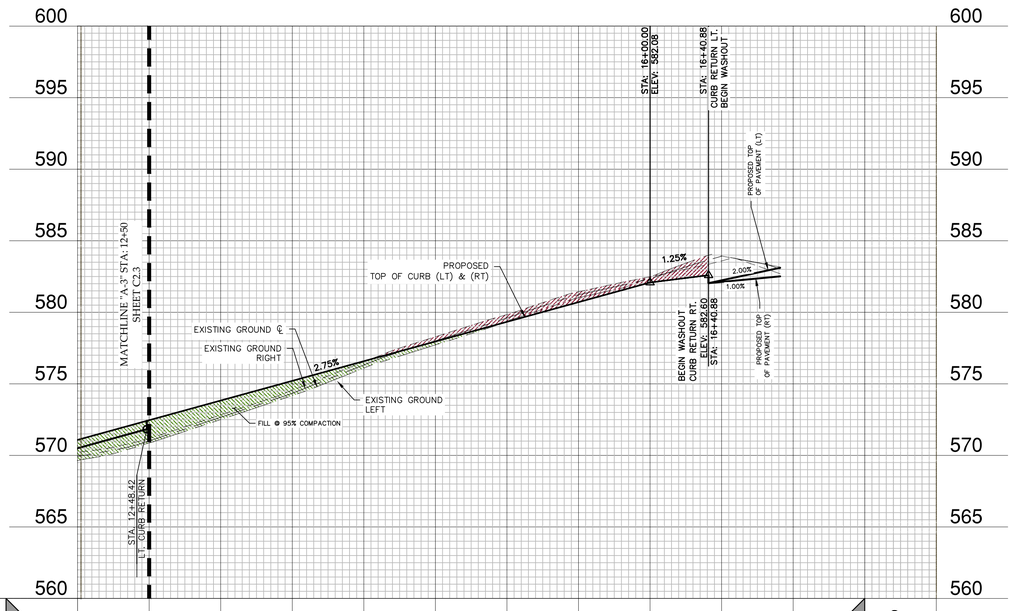
- SUBGRADE TO BE TESTED PER TEX-114-E D698 @ 95% DENSITY, 1 PER 10,000 SQ. FT.
- BASE TO BE PLACED IN MAXIMUM 8" THICK LOOSE LIFTS, COMPACTED, & TESTED PER TEX-113-E @ 95% DENSITY, 1 PER 5,000 SQ FT.

NOTE:
EROSION CONTROL MEASURES SUCH AS FLAT BOTTOM DITCHES, GRASS RETARDS, ROCK FILTER DAMS, AND SILT SCREENS SHALL BE UTILIZED AS NEEDED TO CONTROL SOIL EROSION IN BAR DITCHES.

BEXAR COUNTY R.O.W. NOTE
A BEXAR COUNTY R.O.W. PERMIT MUST BE OBTAINED PRIOR TO WORKING WITHIN EXISTING BEXAR COUNTY R.O.W.

ROSE SHORE
(STA. 12+50 - END)

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



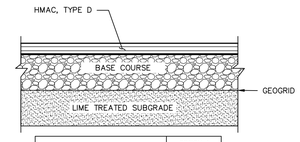


LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- ROAD CENTERLINE
- 650 EXISTING 1' CONTOUR
- 650 PROPOSED 1' CONTOUR
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- WASHOUT CROWN
- 568.65 PROPOSED TOP OF CURB IN KNUCKLE
- SIDEWALK TO BE CONSTRUCTED BY DEVELOPER

CURVE TABLE

CURVE	RADIUS	DELTA	CHORD BEARING	CHORD	LENGTH
C4	85.00'	033°45'03"	N43°29'26"W	49.35'	50.07'
C5	35.00'	090°00'00"	N18°23'06"E	49.50'	54.98'
C6	35.00'	090°00'04"	N71°36'54"W	49.50'	54.98'
C16	40.00'	146°38'54"	N21°35'40"W	76.64'	102.38'
C17	35.00'	030°03'27"	N36°42'04"E	18.15'	18.36'
C18	35.00'	074°23'12"	S15°31'16"E	42.32'	45.44'
C19	115.00'	007°57'42"	N25°39'12"E	15.97'	15.98'
C20	85.00'	007°57'42"	S25°39'12"W	11.80'	11.81'
C21	115.00'	033°45'01"	N46°30'34"E	66.77'	67.74'
C22	85.00'	033°45'01"	S46°30'33"W	49.35'	50.07'
C27	50.00'	074°23'12"	S15°31'16"E	60.45'	64.91'
C28	100.00'	007°57'42"	S25°39'12"W	13.88'	13.90'
C29	100.00'	033°45'01"	S46°30'33"W	58.06'	58.91'



PAVEMENT MATERIAL	OPTION 1
HMAC, TYPE D SURFACE COURSE	2"
TYPE "A" FLEX BASE	8"
FLEXIBLE BASE IN CONJUCTION WITH TENSAR+ NX750	YES
LIME TREATED SUBGRADE	8"

PROPOSED PAVEMENT SECTION

REFERENCE GEOTECH REPORT 0312-3441 PREPARED BY INTERTEK PSI, DATED JANUARY 30, 2025 FOR PAVEMENT MATERIALS AND CONSTRUCTION REQUIREMENTS. CONTRACTOR SHALL MEET OR EXCEED ALL PAVING RECOMMENDATIONS. ADDITIONAL PAVEMENT SECTIONS ARE AVAILABLE IN THE GEOTECH REPORT. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE SHORE STA. 12+50 - END

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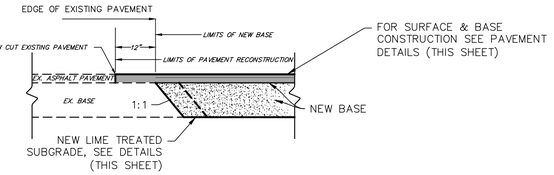
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PLAT NO. CP202412

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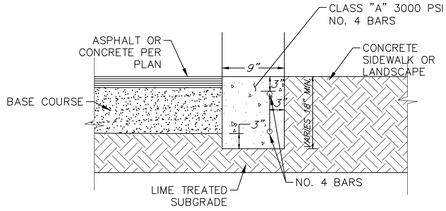
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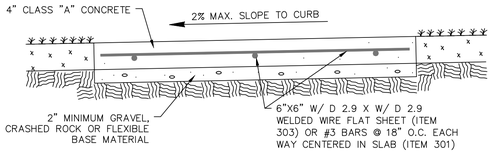
PAVEMENT JUNCTION DETAIL

N.T.S.



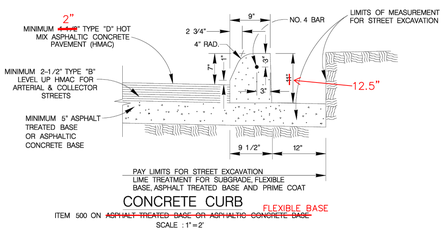
HEADER CURB DETAIL

NOT-TO-SCALE



CONCRETE SIDEWALK SECTION

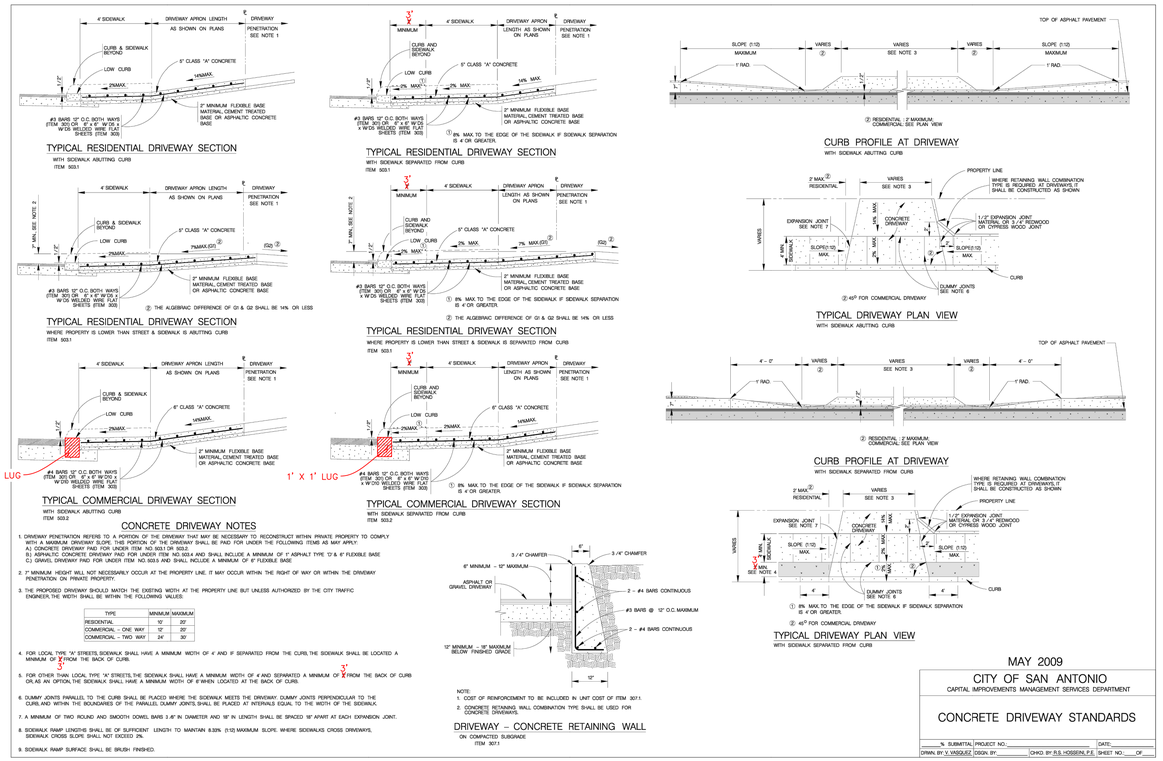
(NOT TO SCALE)



CONCRETE CURB

ITEM 500 ON ~~ASPHALT TREATED BASE OR ASPHALTIC CONCRETE BASE~~ FLEXIBLE BASE

SCALE : 1"=2'



CONCRETE DRIVEWAY NOTES

1. DRIVEWAY PENETRATION REFERS TO A PORTION OF THE DRIVEWAY THAT MAY BE NECESSARY TO RECONSTRUCT WITHIN PRIVATE PROPERTY TO COMPLY WITH A MAXIMUM DRIVEWAY SLOPE. THIS PORTION OF THE DRIVEWAY SHALL BE PAID FOR UNDER THE FOLLOWING ITEMS AS MAY APPLY:
   A.) CONCRETE DRIVEWAY PAD FOR UNDER ITEM NO. 503.1 OR 503.2
   B.) ASPHALTIC CONCRETE DRIVEWAY PAD FOR UNDER ITEM NO.503.4 AND SHALL INCLUDE A MINIMUM OF 1" ASPHALT TYPE 'D' & 4" FLEXIBLE BASE
   C.) GRAVEL DRIVEWAY PAD FOR UNDER ITEM NO.503.5 AND SHALL INCLUDE A MINIMUM OF 6" FLEXIBLE BASE
2. 2" MINIMUM HEIGHT WILL NOT NECESSARILY OCCUR AT THE PROPERTY LINE. IT MAY OCCUR WITHIN THE RIGHT OF WAY OR WITHIN THE DRIVEWAY PENETRATION ON PRIVATE PROPERTY.
3. THE PROPOSED DRIVEWAY SHOULD MATCH THE EXISTING WIDTH AT THE PROPERTY LINE BUT UNLESS AUTHORIZED BY THE CITY TRAFFIC ENGINEER,THE WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:

TYPE	MINIMUM	MAXIMUM
RESIDENTIAL	10'	20'
COMMERCIAL – ONE WAY	12'	25'
COMMERCIAL – TWO WAY	24'	30'

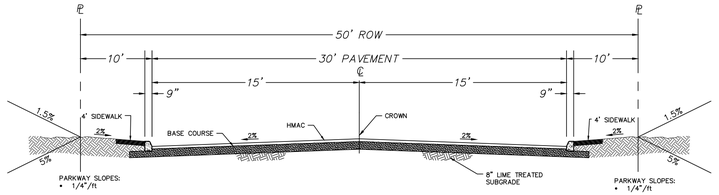
4. FOR LOCAL TYPE "A" STREETS,SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB,THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB.
5. FOR OTHER THAN LOCAL TYPE "A" STREETS,THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4'AND SEPARATED A MINIMUM OF 2' FROM THE BACK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

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

CONCRETE DRIVEWAY STANDARDS

N. SUBMITTAL	PROJECT NO.:	DATE:
DRWN. BY: V. VASQUEZ	DSGN. BY:	CHKD. BY: R.S. HOSSEINI, P.E.	SHEET NO.: ___ OF ___

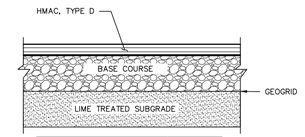


RESIDENTIAL STREET

TYPICAL STREET SECTION (50' R.O.W.)

(NOT TO SCALE)

ROSE SHORE: STA. 1+00 – END



PAVEMENT MATERIAL	OPTION 1
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- LIME TREATMENT OF SUBGRADE TO A DEPTH OF 8 INCHES WILL BE REQUIRED FOR SUBGRADE WITH A PI GREATER THAN 20. TREATMENT WILL REQUIRE APPLICATION RATE OF ABOUT 22.8 POUNDS PER SQUARE YARD FOR 8-INCHES OF TREATMENT
- TENSAR+ NX750 GEOGRID TO BE INSTALLED PER THE TENSAR INTERAX INSTALLATION GUIDE FOUND AT TENSARCORP.COM

ROSE SHORE: STA. 1+00 – END

TABLE 4.6: PAVEMENT DESIGN AND CONSTRUCTION RECOMMENDATIONS

Minimum Undercut Depth	6 inches or as needed to remove roots
Reuse Excavated Soils	Must be free of roots and debris and meet material requirements of intended use
Exposed Subgrade Treatment	**Proof-roll with rubber-tired vehicle weighing at least 20 tons. A representative of the Geotechnical Engineer should be present during proof-roll.**
Proof-Rolled Pumping and Rutting Areas	Excavate to firmer materials and replace with compacted general or select fill under direction of a representative of the Geotechnical Engineer
General Fill	Materials free of roots, debris, and other deleterious materials with a maximum rock size of 4 inches with a CBR greater than 3
Minimum General Fill Thickness	As required to achieve grade
Maximum General Fill Loose Lift Thickness	9 Inches
Flexible Base	TxDOT Item 247, Type A, Grade 1-2
Maximum Flexible Base Loose Lift Thickness	9 Inches
Lime Treated Subgrade	COSA Standard Specifications for Construction Item 108 Lime Treated Subgrade
Hot Mix Asphaltic Concrete	TxDOT Item 340, Type D

TABLE 4.7: COMPACTION AND TESTING RECOMMENDATIONS FOR PAVEMENT AREAS

Location	Material	Density Test Method	Soil Type	Percent Compaction	Optimum Moisture Content	Testing Frequency
Pavement Areas	Subgrade, General Fill Soil, Low PI Material	Tex-114-E	PI ≥ 25	94% to 98%	0 to +4%	1 per 10,000 SF; min. 3 tests
			PI < 25	≥ 95%	0 to +4%	
	Flexible Base Material	TEX-113-E	COSA Item 200	≥ 95%	±3%	1 per 5,000 SF; min. 3 per lift

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
ROAD DETAILS
(1 OF 2)
BEXAR COUNTY, TEXAS

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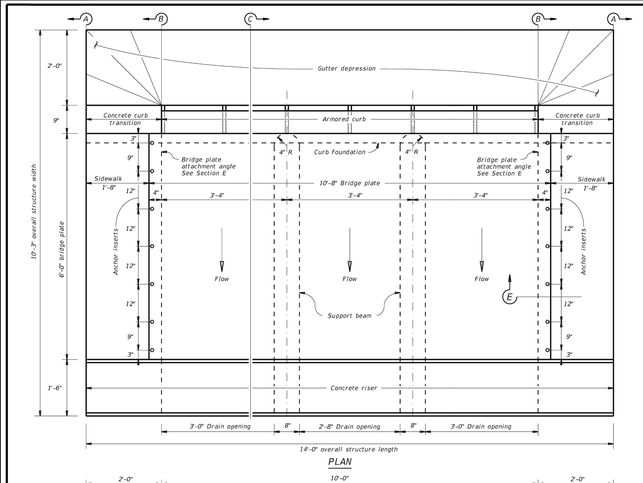
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PLAT NO: CP202412

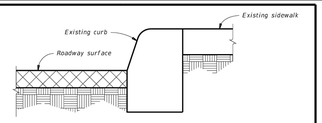
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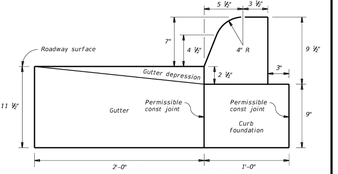
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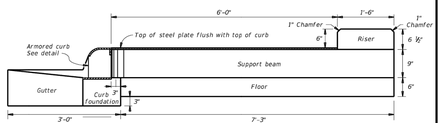
PLAN



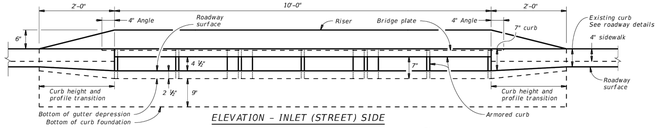
SECTION A



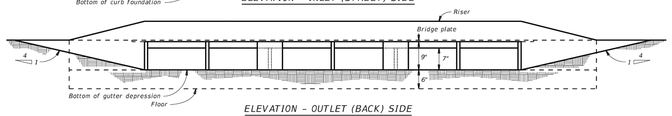
SECTION B DIMENSIONS



SECTION C DIMENSIONS



ELEVATION – INLET (STREET) SIDE



ELEVATION – OUTLET (BACK) SIDE

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

Contractor is responsible for verifying all dimensions and quantities in the field before beginning work.

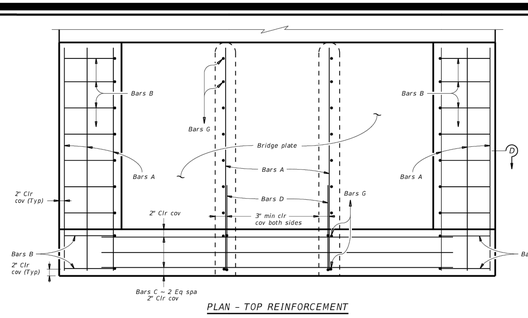
SHEET 1 OF 3

Texas Department of Transportation
San Antonio District (Structural Design)
Prepared by and for the use of TxDOT

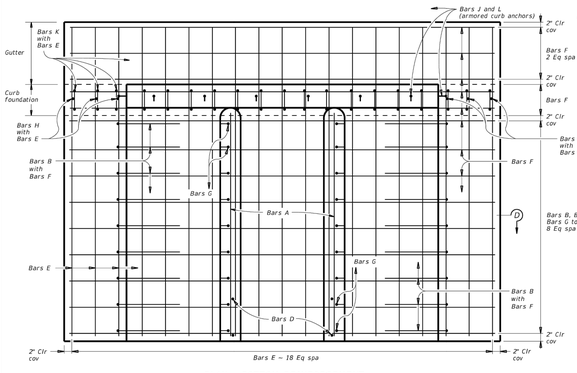
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SIDEWALK BRIDGE
SAN ANTONIO DISTRICT STANDARD

DN: BCL	CK:	FILENAME: SA District Sidewalk Bridge.dgn	
DW: SRF	CK:	ORIGINAL DRAWING DATE: January 2020	
DIST	COUNTY	FEDERAL AID PROJECT NO.	
SAT	6		COUNTY
CONTROL	SECTION	JOB	SHEET NO.
0000	00	000	000
REVISIONS:			ROUTE



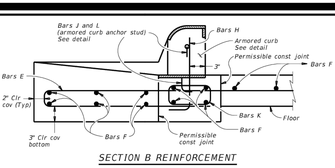
PLAN – TOP REINFORCEMENT



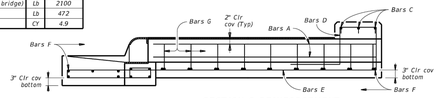
PLAN – BOTTOM REINFORCEMENT

TABLE OF ESTIMATED QUANTITIES
For Contractor information only.

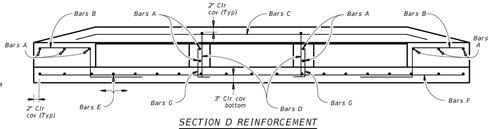
Bar	No.	Size	Length	Weight
A	10	#4	7'-2"	48
B	18	#4	4'-2"	52
C	3	#4	11'-4"	23
D	2	#4	5'-6"	8
E	19	#4	12'-10"	163
F	14	#4	13'-8"	128
G	18	#4	1'-6"	18
H	6	#4	1'-10"	8
I	6	#4	0'-8"	3
J	2	#4	0'-9"	1
K	19	#3	2'-6"	18
L	6	#4	0'-5"	2
Struct. steel (Misc. non bridge)			Lb	2100
Reinforcing Steel			Lb	472
Class "C" Concrete			CY	4.9



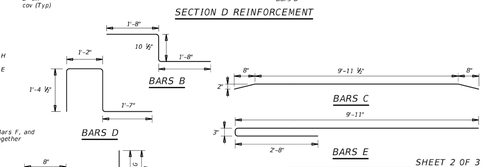
SECTION B REINFORCEMENT



SECTION C REINFORCEMENT



SECTION D REINFORCEMENT



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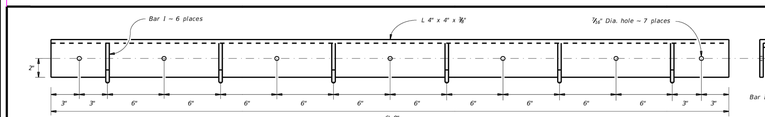
SHEET 2 OF 3

Texas Department of Transportation
San Antonio District (Structural Design)
Prepared by and for the use of TxDOT

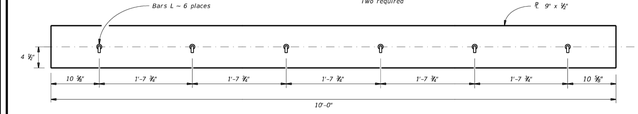
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SIDEWALK BRIDGE
SAN ANTONIO DISTRICT STANDARD

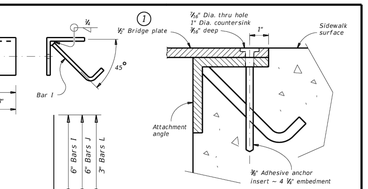
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DW: SRF	CK:	ORIGINAL DRAWING DATE: January 2020	
DIST	COUNTY	FEDERAL AID PROJECT NO.	
SAT	6		COUNTY
CONTROL	SECTION	JOB	SHEET NO.
0000	00	000	000
REVISIONS:			ROUTE



BRIDGE PLATE ATTACHMENT ANGLE



FLOOR PLATE



SECTION E

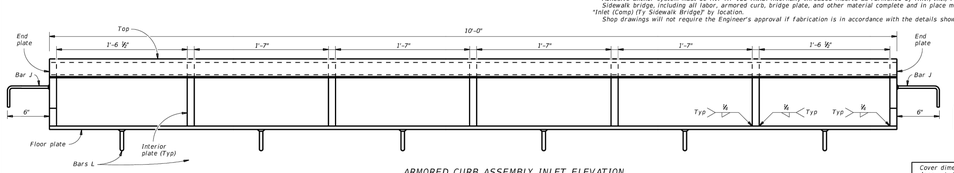
BARS I, J, AND L

APPROVED SLIP RESISTANT PLATE	
Product	Manufacturer Website
Algrip™, Steel	www.algrip.com
Mebac® #3, Steel	www.harscoikg.com
SlipNOT® Grade 2, Steel	www.slipnot.com

1 Provide cover plates fabricated with a product from this list. No exceptions are permitted.

GENERAL NOTES:

Provide Class A concrete (f'c = 3000 psi).
Provide Grade 60 reinforcing steel.
Structural steel components must be Grade A36.
All exposed edges of the armored curb must receive a ½" bevel.
All structural steel components must be galvanized after fabrication in accordance with Item 445, "Galvanizing".
Galvanizing damaged during transport or construction must be repaired in accordance with the Specification.
The bridge plate must be hot-dip galvanized slip resistant steel (see table). Checker or diamond plate is not allowed, nor are slip resistant tapes, films, or non-metallic coatings.
Adhesive anchor system must be HIT HY 150 H.I.S. internally threaded inserts as furnished by Hilti, Inc., Tulsa, OK, or approved equivalent.
Sidewalk bridge, including all labor, armored curb, bridge plate, and other material complete and in place must be paid for under Item 465, "Inlet (Comp) (T) Sidewalk Bridge" by location.
Shop drawings will not require the Engineer's approval if fabrication is in accordance with the details shown.



ARMORED CURB ASSEMBLY INLET ELEVATION

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

Contractor is responsible for verifying all dimensions and quantities in the field before beginning work.

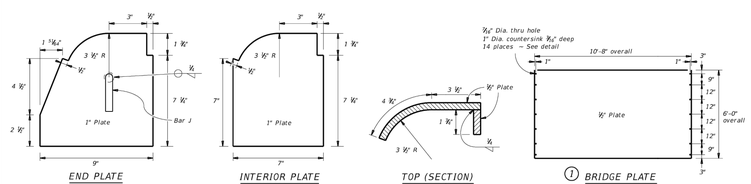
SHEET 3 OF 3

Texas Department of Transportation
San Antonio District (Structural Design)
Prepared by and for the use of TxDOT

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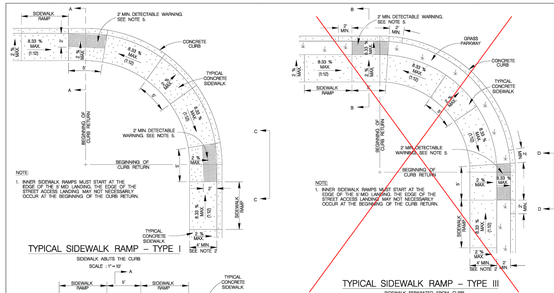
SIDEWALK BRIDGE
SAN ANTONIO DISTRICT STANDARD

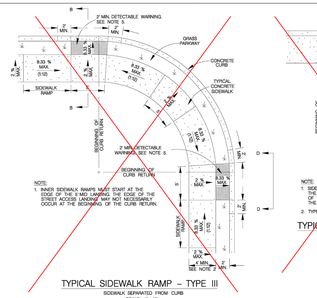
DN: BCL	CK:	FILENAME: SA District Sidewalk Bridge.dgn	
DW: SRF	CK:	ORIGINAL DRAWING DATE: January 2020	
DIST	COUNTY	FEDERAL AID PROJECT NO.	
SAT	6		COUNTY
CONTROL	SECTION	JOB	SHEET NO.
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REVISIONS:			ROUTE

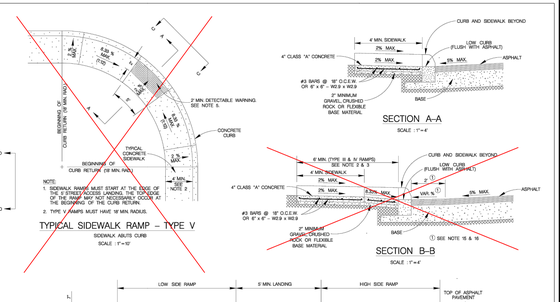


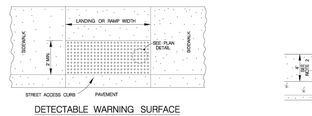
GENERAL NOTES

1. WHEN POSSIBLE SIDEWALKS SHOULD BE PLACED NEXT TO THE PROPERTY LINE ALLOWING A MINIMUM OF 1 FOOT BUFFER. DONATION OF THE PAVEMENT FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TREES OR OTHER OBSTRUCTIONS.
2. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND BE SEPARATED FROM THE CURB. THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB.
3. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 5' FROM THE BACK OF CURB OR AN OPTIONAL THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 8' WHEN LOCATED AT THE BACK OF CURB.
4. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
5. ALL CURB RAMPS OR LANDINGS ABUTTING THE CROSSWALK SHALL HAVE A DETECTABLE WARNING 24 INCHES DEEP (IN THE DIRECTION OF PEDESTRIAN TRAVEL) AND EXTENDING THE FULL WIDTH OF THE CURB RAMP OR LANDING. THE DETECTABLE WARNING SHALL CONSIST OF RAISED TRUNCATED DOMES IN A SQUARE OR A GRID PATTERN WITH A DIAMETER OF A NOMINAL 0.9 INCHES (23 MM), A HEIGHT OF NOMINAL 0.2 INCHES (5 MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.34 INCHES (60 MM). THE DETECTABLE WARNING SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
6. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
7. SIDEWALK RAMP TYPE V SHALL BE USED ONLY WHERE THERE IS SIGNIFICANT RESTRICTION WITHIN THE PARKWAY TO CONSTRUCT TYPE I OR TYPE III RAMPS.
8. CONSTRUCTION OF ALL WHEELCHAIR RAMPS TO BE INCLUDED UNDER ITEMS "500 – CONCRETE CURB, GUTTER, AND CONCRETE CURB AND GUTTER" AND / OR "505 – CONCRETE SIDEWALKS". RAMP SURFACE SHALL BE BRUSH FINISHED.
9. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF WHEELCHAIR RAMPS, TO BE SHOWN ON CONSTRUCTION PLANS. CITY CONSTRUCTION INSPECTOR CAN ADJUST LOCATIONS FOR SAFETY OR UTILITY CLEARANCE.
10. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET.
11. WHEELCHAIR RAMP SHALL BE CONSTRUCTED WITH 4" CLASS "A" CONCRETE AND 2" MINIMUM GRAVEL, CRUSHED ROCK OR FLEXIBLE BASE MATERIAL.
12. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C.E.W. OR 6" x 6" – W2.9 x W2.9 WIRE MESH.
13. SIDEWALK GRADES SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY. ANY SIDEWALK GRADES THAT EXCEED 5% SHALL BE CONSIDERED A RAMP AND SHALL BE DESIGNED AS SUCH. WHERE GRADES DIFFER FROM THE EXISTING ROADWAY WILL REQUIRE RAMPS, HANDRAILS AND, RESTING PLATFORMS TO BE CONSTRUCTED IN ACCORDANCE WITH ADA AND TAS STANDARDS.
14. SIDEWALK CROSS GRADE SHALL HAVE A MAXIMUM SLOPE OF 2% LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
15. THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES SHALL BE LESS THAN 11%. THE CHANGE OF GRADE SHALL BE DEFINED AS THE ALGEBRAIC DIFFERENCE OF THE ADJACENT SURFACE SLOPES. IN THE CASE OF A STREET ACCESS RAMP DESIGNED AT THE 8.33% MAXIMUM SLOPE, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN 2.67%. (I.E. 8.33–(-5.67)=11). IN ADDITION, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN OR EQUAL TO 3%.
16. IF THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES IS GREATER THAN OR EQUAL TO 11%, A LEVELING STRIP 2' FEET IN LENGTH SHALL BE PROVIDED TO TRANSITION THE ADJACENT SURFACES.
17. ADA COMPLIANCE IN ALTERATIONS INCLUDE ONLY THAT WORK WITHIN THE LIMITS, BOUNDARIES OR SCOPE OF A PLANNED PROJECT.









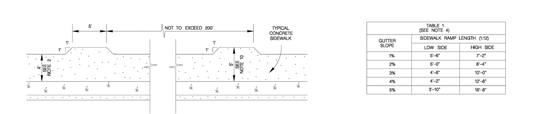
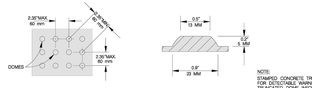


TABLE 1 (SEE NOTE 4)		
GUTTER SLOPE	SIDEWALK RAMP LENGTH (1:12)	
	LOW SIDE	HIGH SIDE
1%	5'-6"	7'-0"
2%	5'-0"	8'-4"
3%	4'-6"	10'-0"
4%	4'-2"	12'-6"
5%	3'-10"	16'-8"



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

MAY 2009
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

WHEELCHAIR RAMP STANDARDS

% SUBMITTAL PROJECT NO.	DATE:
DRWN. BY: S. YESQUEZ	CHKD. BY: B.S. HOSSEINI, P.E.

SHEET NO. ___ OF ___

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
ROAD DETAILS
(2 OF 2)
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/9/2025
F-9155

BY	DESCRIPTION	DATE	REV

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C2.6
PLAT NO: CP202412

PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

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Date: Oct 09, 2025, 4:38pm User ID: CADI-2022
File: N:\Projects\2023\23-3159G-Abbott Rd Lennar\Civil\23-3159G Road Details.dwg

INTERSECTION SIGHT DISTANCE CALCULATION
INTERSECTION CASE B1 (LEFT TURN) – PASSENGER CAR

40 MPH DESIGN SPEED FOR ABBOTT RD PER 2023 UDC
(SECONDARY ARTERIAL PER 2025 COSA MAJOR THOROUGHFARE PLAN)

ISD = 1.47 * V_{MAJOR} * t_g

t_g (PASSENGER CARS) = 7.5

ISD = 1.47 * 40 MPH * 7.5 SEC.

ISD = 445 FT

INTERSECTION SIGHT DISTANCE CALCULATION
INTERSECTION CASE B1U (LEFT TURN ULTIMATE) – PASSENGER CAR

40 MPH DESIGN SPEED FOR ABBOTT RD PER 2023 COSA UDC
(SECONDARY ARTERIAL PER 2025 COSA MAJOR THOROUGHFARE PLAN)

ISD = 1.47 * V_{MAJOR} * t_g

t_g (PASSENGER CARS) = 8.0

ISD = 1.47 * 40 MPH * 8.0 SEC.

ISD = 475 FT

NOTE: ACTUAL ULTIMATE CONDITIONS ARE UNKNOWN AND THERE ARE NO CURRENT PROJECTS LISTED ON THE BEXAR COUNTY PUBLIC WORKS CAPITAL IMPROVEMENT PROJECTS MAP FOR THIS PORTION OF ABBOTT RD. ULTIMATE LANE LINES AND CENTERLINE LAYOUT AT REQUEST OF BEXAR COUNTY DEVELOPMENT SERVICES.

INTERSECTION SIGHT DISTANCE CALCULATION
INTERSECTION CASE B2 (RIGHT TURN PROPOSED/ULTIMATE) – PASSENGER CAR

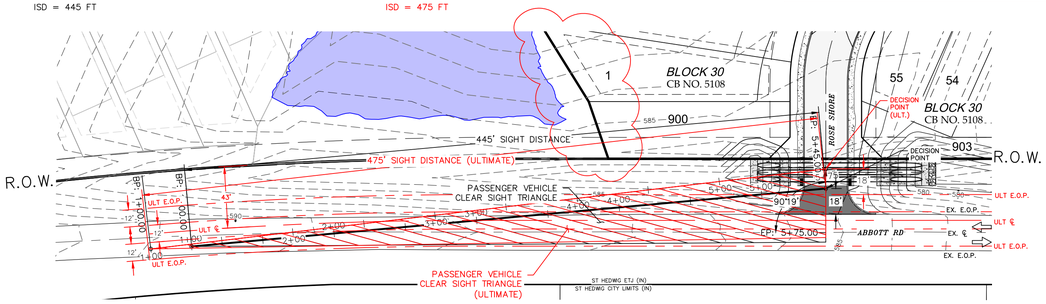
40 MPH DESIGN SPEED FOR ABBOTT RD PER 2023 UDC
(SECONDARY ARTERIAL PER 2025 COSA MAJOR THOROUGHFARE PLAN)

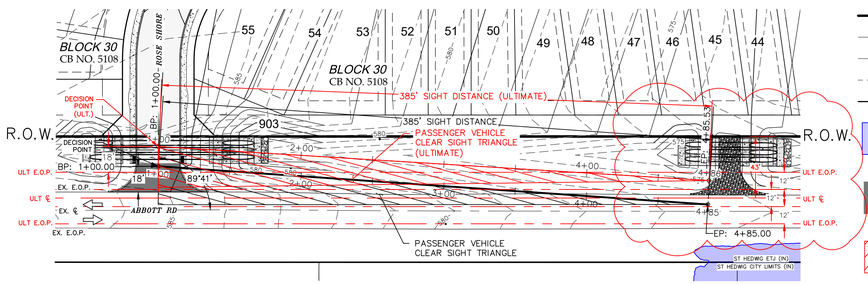
ISD = 1.47 * V_{MAJOR} * t_g

t_g (PASSENGER CARS) = 6.5

ISD = 1.47 * 40 MPH * 6.5 SEC.

ISD = 385 FT





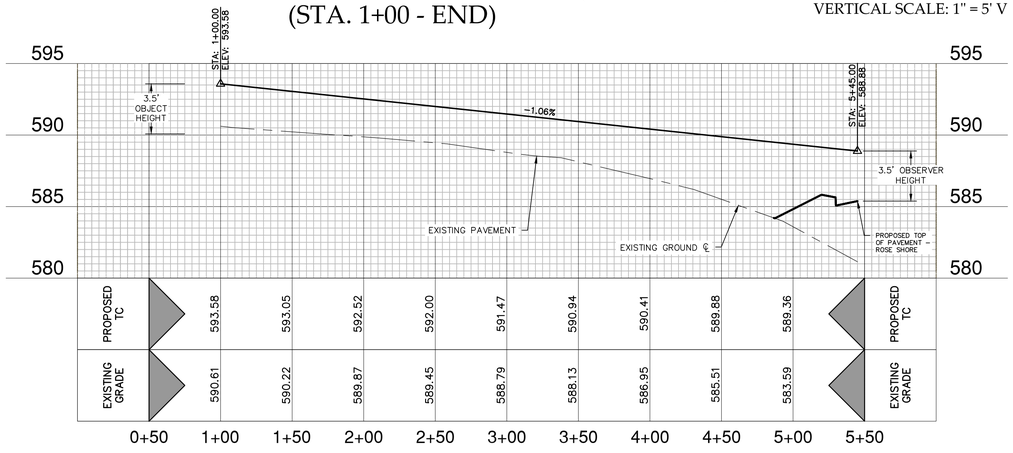
50 0 50 100
SCALE OF FEET
1" = 50'

LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- ROAD CENTERLINE
- 650 EXISTING 1' CONTOUR
- 650 PROPOSED 1' CONTOUR
- EFFECTIVE FLOODPLAIN PER LOMR–C AS SUBMITTED TO BEXAR COUNTY
- WASHOUT CROWN
- ULTIMATE CONDITIONS

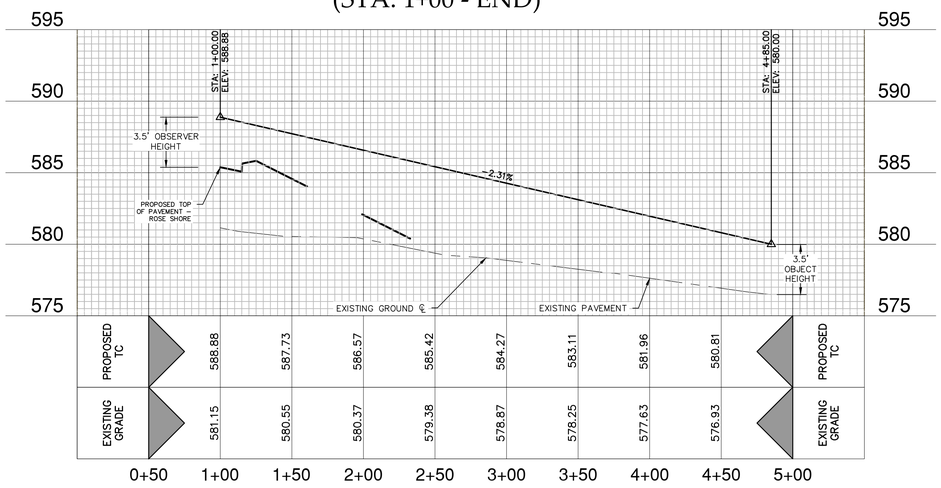
LEFT TURN - VERTICAL SIGHT DISTANCE (PROPOSED) (STA. 1+00 - END)

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



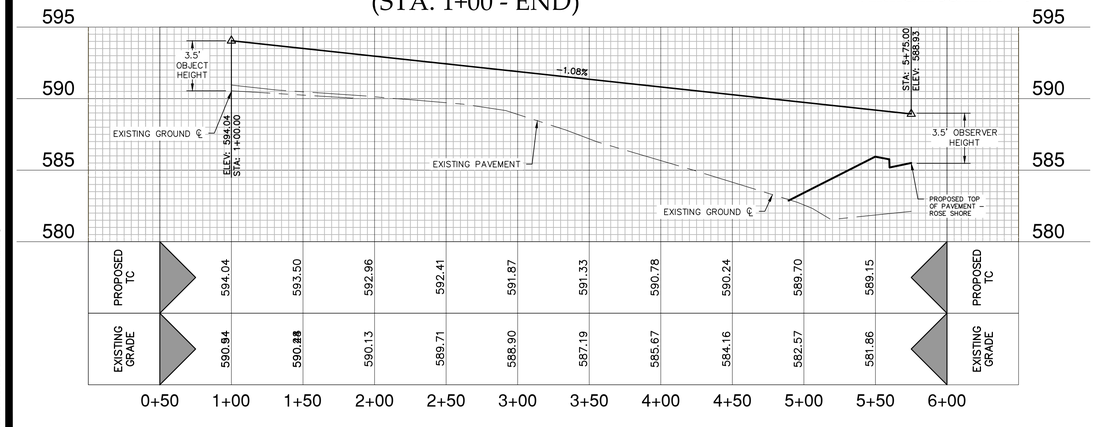
RIGHT TURN - VERTICAL SIGHT DISTANCE (PROPOSED) (STA. 1+00 - END)

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



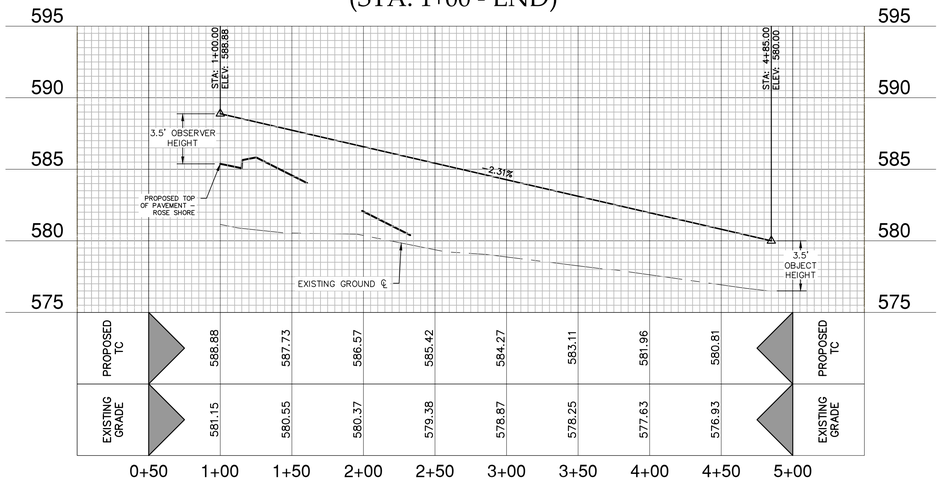
LEFT TURN - VERTICAL SIGHT DISTANCE (ULTIMATE) (STA. 1+00 - END)

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



RIGHT TURN - VERTICAL SIGHT DISTANCE (ULTIMATE) (STA. 1+00 - END)

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



RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4040

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ROSE VALLEY SOUTH - UNIT 1
ROSE SHORE
VEHICLE SIGHT DISTANCE
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/8/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS AND UPDATED GRADING BOUNDARY ADJUSTED FOR UPDATED FLOODPLAIN LIMITS.	SGL

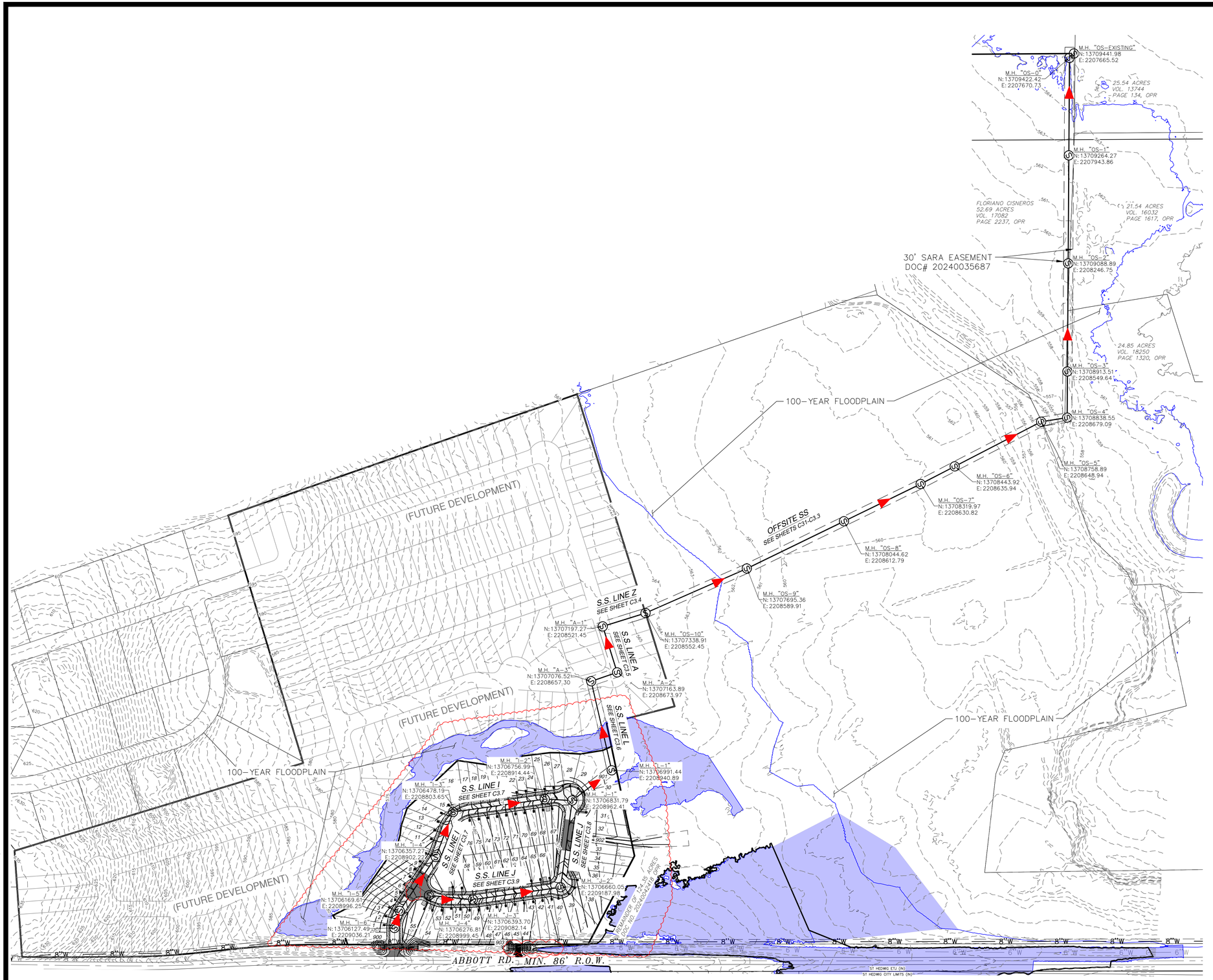
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C2.7
PLAT NO: CP202412

Date: Oct 09, 2025, 4:39pm User ID: CADT.2022
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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

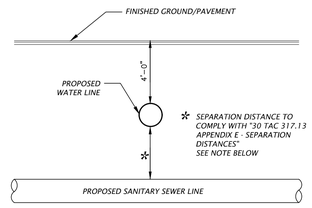


100 0 100 200

SCALE OF FEET
1" = 100'

LEGEND

- PROPERTY BOUNDARY
- RIGHT-OF-WAY
- SITE LINE
- PAVEMENT LIMITS
- DRAINAGE EASEMENT
- 650 EXISTING 1' CONTOUR
- PROPOSED SEWER LINE
- PROPOSED SEWER TIE-IN
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY



NOTE:
WHERE WASTEWATER AND WATER LINES ARE PARALLEL, THEY SHOULD BE INSTALLED NO CLOSER THAN 9'. IF A 9' SEPARATION IS NOT POSSIBLE, THE FOLLOWING GUIDELINES APPLY:
A. IF PARALLEL WASTEWATER AND WATER LINES ARE INSTALLED CLOSER THAN 9' TO ONE ANOTHER, THE WASTEWATER LINE SHALL BE CONSTRUCTED OF SDR 26 PRESSURE RATED PVC. HORIZONTAL SEPARATION SHALL BE A MINIMUM OF 4'. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF 2'. THE WASTEWATER LINE SHALL BE BELOW THE WATER LINE IF AT ALL POSSIBLE.
B. WHERE A WASTEWATER LINE CROSSES A WATER LINE, A VERTICAL SEPARATION OF 2' SHALL BE MAINTAINED IF POSSIBLE. IF NOT, AN ABSOLUTE MINIMUM 6" SEPARATION MUST BE MAINTAINED AND THE WASTEWATER LINE SHALL BE ENCASED IN CEMENT STABILIZED SAND FOR 18 LF CENTERED ON THE WATER LINE. THE WASTEWATER LINE SHALL BE BELOW THE WATER LINE IF AT ALL POSSIBLE.
C. WHERE A WASTEWATER LINE CROSSES OVER A WATER LINE. THE WASTEWATER LINE SHALL BE CONSTRUCTED OF SDR 26 PRESSURE RATED PVC PIPE, AND ONE LENGTH OF THE PRESSURE WASTEWATER PIPE SHALL BE CENTERED ON THE WATER LINE. ADDITIONALLY, IF THE VERTICAL SEPARATION IS LESS THAN 2', THE WASTEWATER LINE SHALL BE ENCASED IN CEMENT STABILIZED SAND AS DESCRIBED ABOVE.

TYPICAL WATER/SANITARY SEWER CROSSING DETAIL

NOT TO SCALE

GENERAL NOTES:
1. LOCATION OF EXISTING UTILITIES BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION PRIOR TO INSTALLING ONSITE FACILITIES. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN SHOWN AND ACTUAL LOCATIONS.
2. CONTRACTOR TO USE SAN ANTONIO RIVER AUTHORITY SPECIFICATIONS.
3. CONTRACTOR SHALL BE RESPONSIBLE FOR TAPPING PUBLIC SEWER MAINS.
4. ALL SANITARY MAINS AND SERVICES ARE SDR 26 PVC IN SIZE SHOWN.
5. MANHOLES SHALL BE CONSTRUCTED SO THAT THE TOP RING IS LOCATED 4" ABOVE FINISHED GRADE OF THE SURROUNDING GROUND, EXCEPT WHEN LOCATED IN PAVED AREAS. IN PAVED AREAS THE MANHOLE RING SHALL BE FLUSH WITH THE PAVEMENT SURFACE.
6. ALL MANHOLES SHALL BE WATER TIGHT.
7. ALL SERVICE LATERALS TO EXTEND A MINIMUM OF 5' INTO PROPOSED LOT.
8. CLEANOUTS TO BE LOCATED OUTSIDE OF DRIVEWAY AND SIDEWALKS. CONTRACTOR TO PREDETERMINE DRIVEWAY LOCATIONS FOR EACH LOT.

GRAVITY SEWER MAIN NOTE:
ALL GRAVITY SEWER PIPE SHALL BE SDR 26 PVC PIPE.

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

UNDERGROUND UTILITIES
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION & ELEVATION OF EXISTING UTILITIES SHOWN ON THE PLANS ARE OBTAINED FROM UTILITY COMPANY RECORDS AND WHERE POSSIBLE, FIELD MEASUREMENTS. THE PROVIDED INFORMATION IS NOT TO BE RELIED ON AS EXACT OR COMPLETE. THE CONTRACTOR RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES & SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY 48 HOURS PRIOR TO ANY EXCAVATION AND REQUEST EXACT FIELD LOCATIONS OF UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ANY RELOCATION OR DAMAGE TO UTILITIES, WHETHER SHOWN ON THESE PLANS OR NOT.

OVERHEAD ELECTRIC
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT OVERHEAD ELECTRIC LINES MAY BE IN THE VICINITY OF SOME OR ALL OF THE WORK AREAS. THE CONTRACTOR SHOULD EXERCISE CAUTION IN THESE AREAS WITH CONSTRUCTION EQUIPMENT AND CONSTRUCTION PERSONNEL. THE CONTRACTOR IS RESPONSIBLE FOR ANY RELOCATION OR DAMAGE TO EXISTING ELECTRIC LINES, WHETHER SHOWN ON THESE PLANS OR NOT.

VERTICAL STACK NOTE:
ALL 6" SERVICES DEEPER THAN 8.5' SHALL USE A VERTICAL STACK.

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ROSE VALLEY SOUTH - UNIT 1
SANITARY SEWER
OVERALL LAYOUT
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KIETHER
105343
LICENSED
PROFESSIONAL ENGINEER
10/16/2025
F-9155

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED DPS DRIVEWAY CULVERTS AND REMOVED MANHOLE IN FRONT OF LOT 6 ADJUSTED BOUNDARY FOR UPDATED FLOODPLAIN LIMITS	CTA

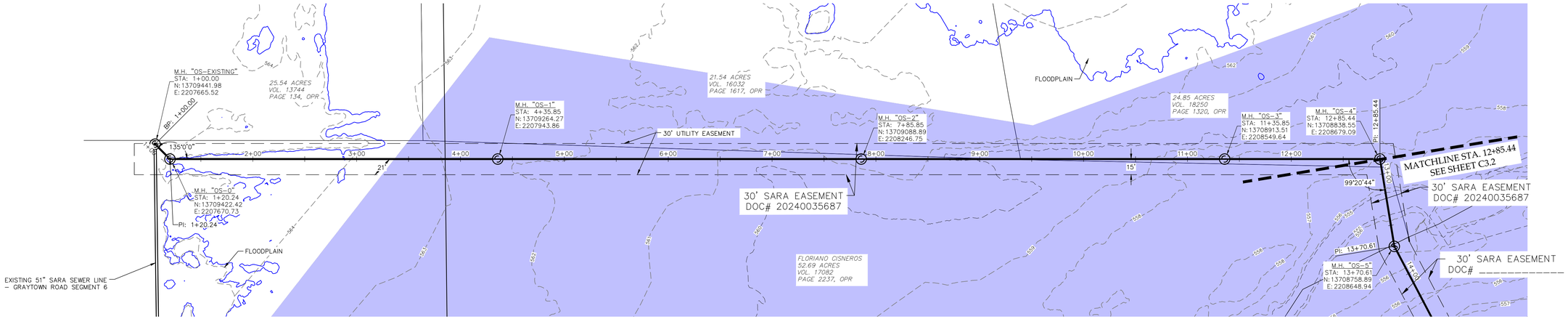
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C3.0
PLAT NO: CP202412

Date: Oct 16, 2025, 5:27pm User ID: CAD1 2022
File: N:\Projects\2023\23-3159G Abbott Rd Leman\Civil\23-3159G Sewer Planning

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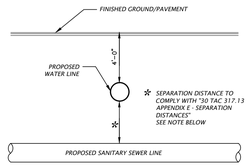
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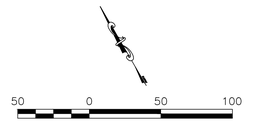
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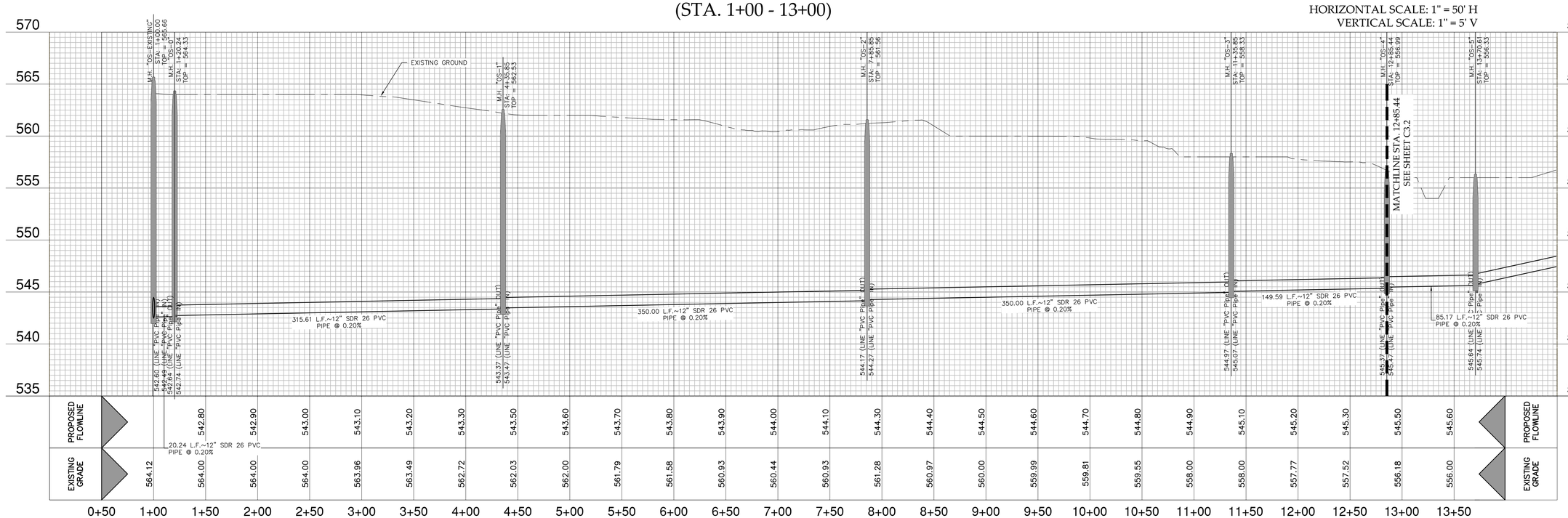


LEGEND

- PROPERTY BOUNDARY
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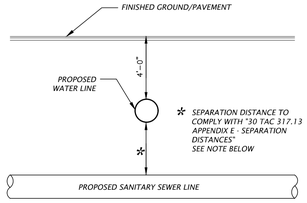
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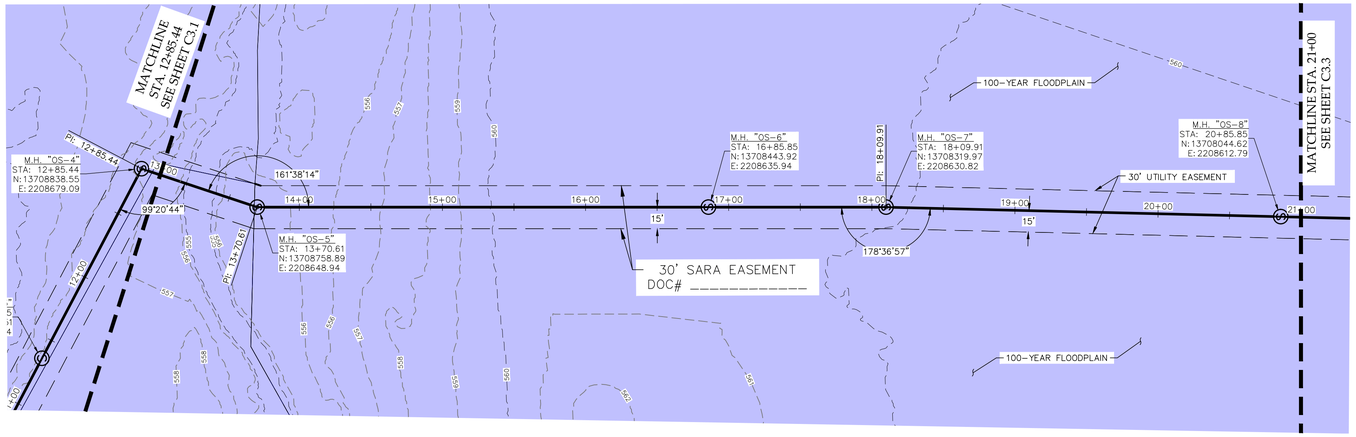
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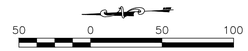
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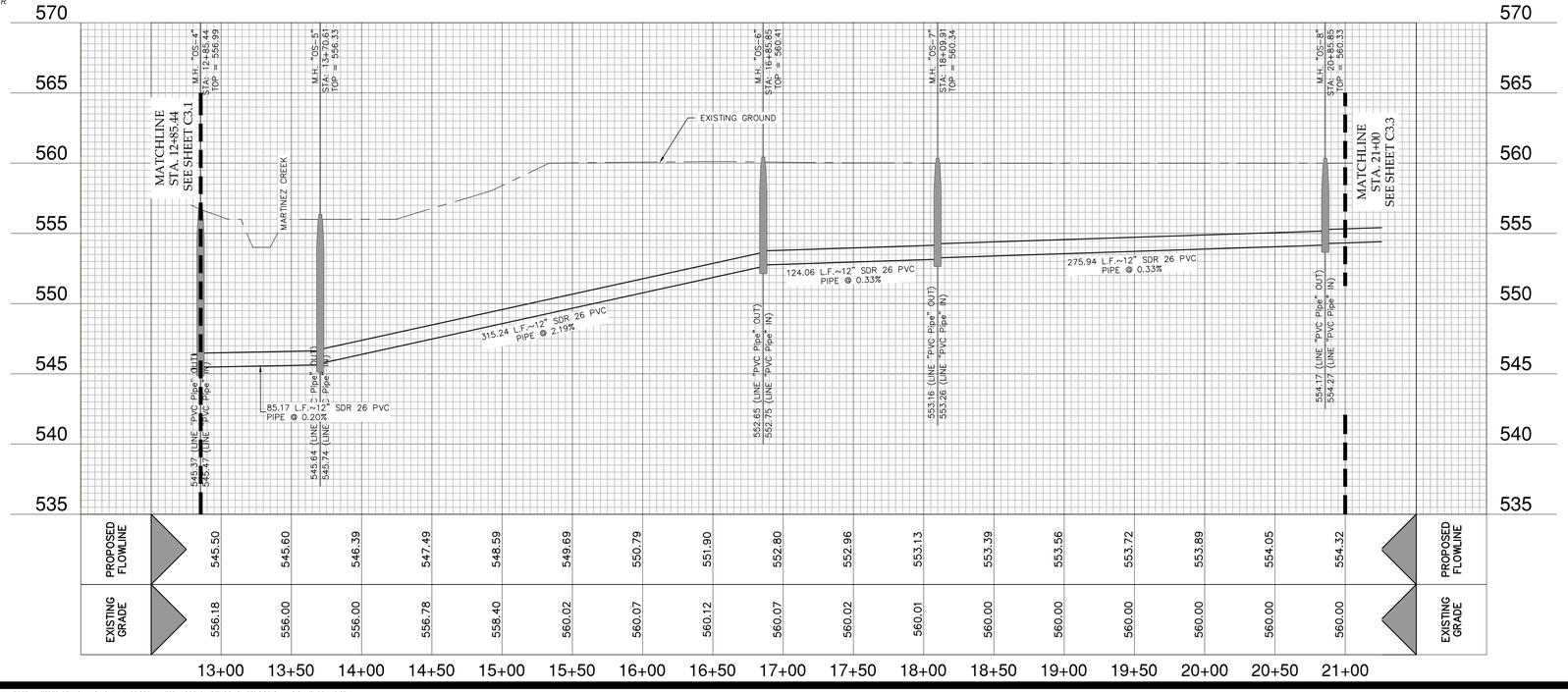
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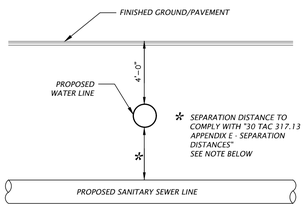
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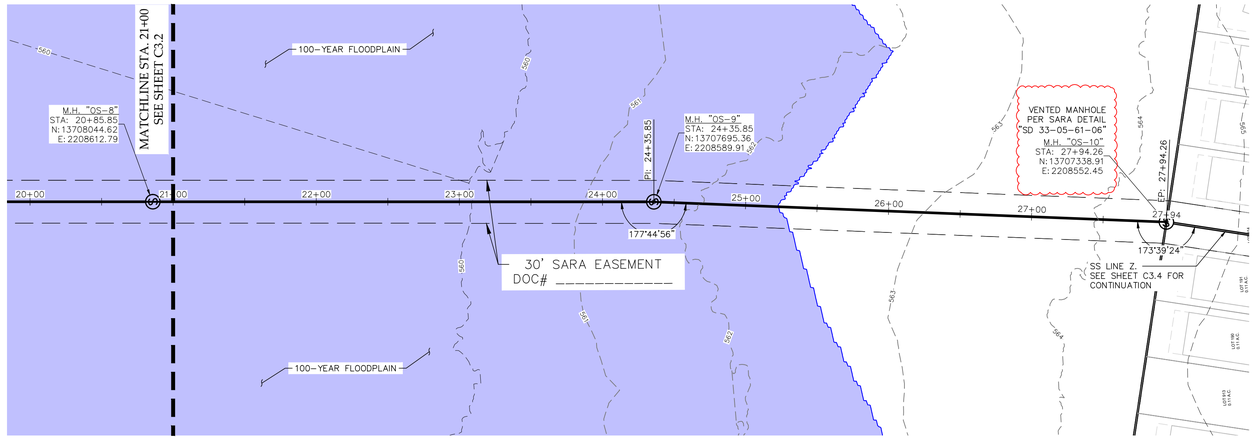
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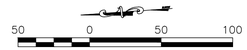
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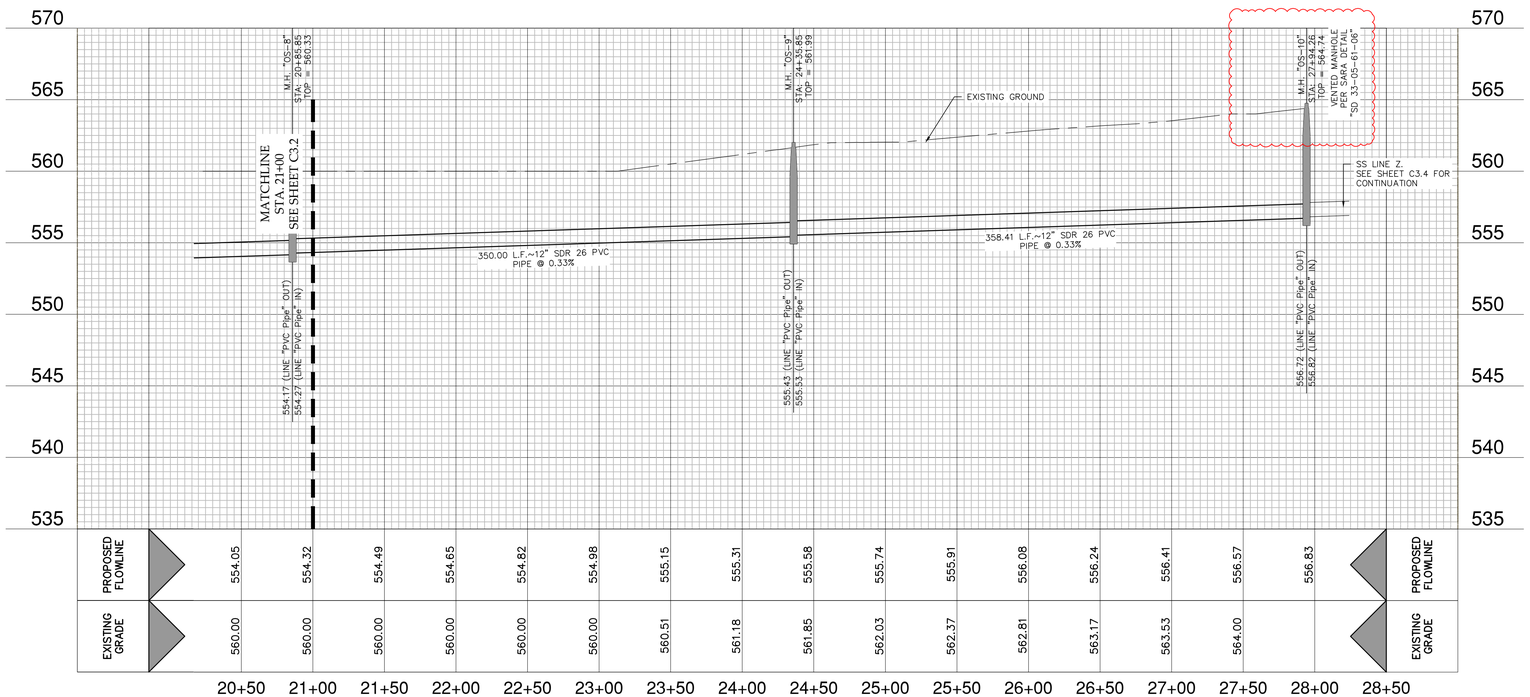
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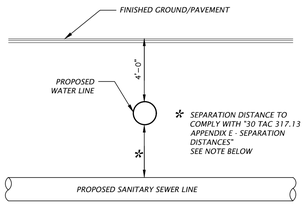
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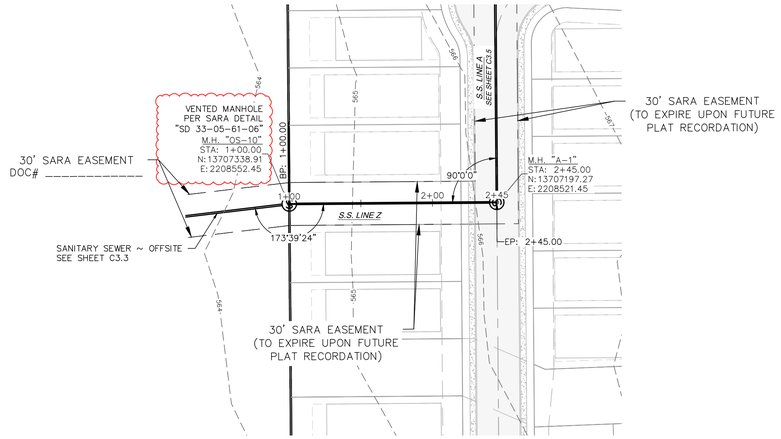
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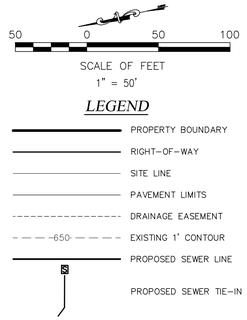
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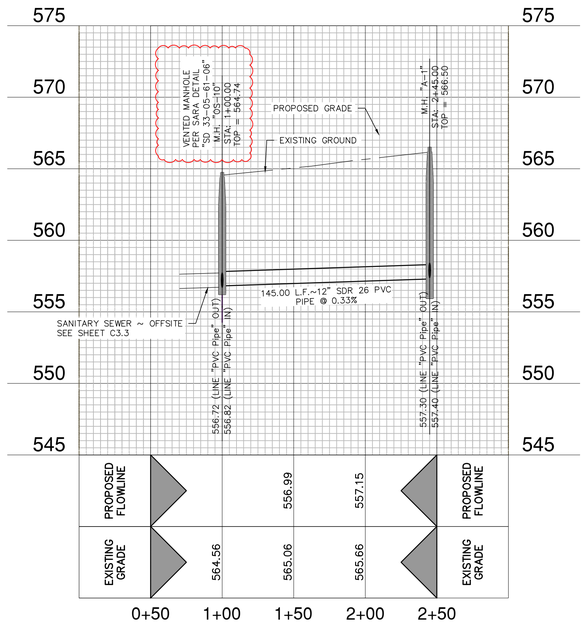


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SANITARY SEWER ~ ON-SITE LINE (Z)
(STA. 1+00 - END)

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RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
SANITARY SEWER (Z)
STA. 1+00 TO END
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KITCHEN
103040
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/16/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-16	SPECIFIED VENTED MANHOLE	CTA

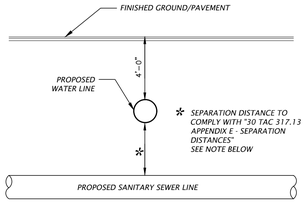
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C3.4
PLAT NO: CP202412

PERMIT SET (NOT FOR CONSTRUCTION): 10/16/2025

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Date: Oct 16, 2025, 5:28pm User ID: CAD1.2022
File: N:\Projects\2023\23-3159G Abbott Rd Lennar\Civil\23-3159G Sewer Plan.dwg



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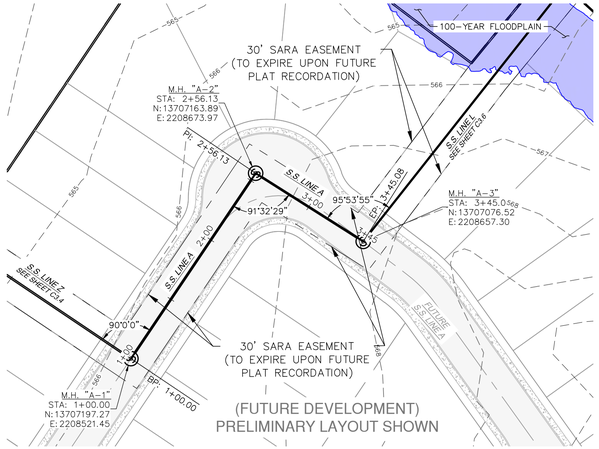
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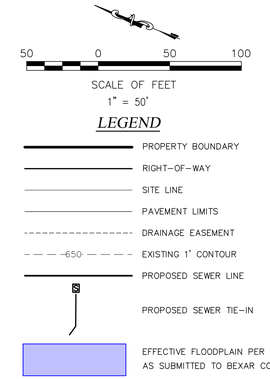
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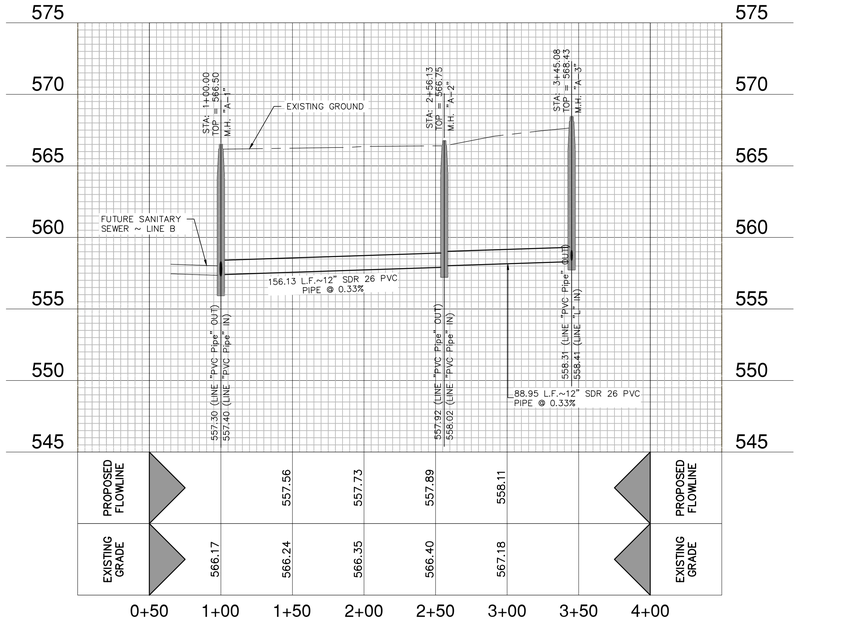


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ROSE VALLEY SOUTH - UNIT 1
SANITARY SEWER (A)
STA. 1+00 TO 3+45.08
BEXAR COUNTY, TEXAS

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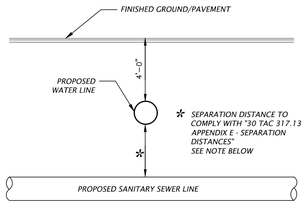
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DESIGNER	CT
CHECKED	BK
DRAWN	CT

C3.5
PLAT NO: CP202412

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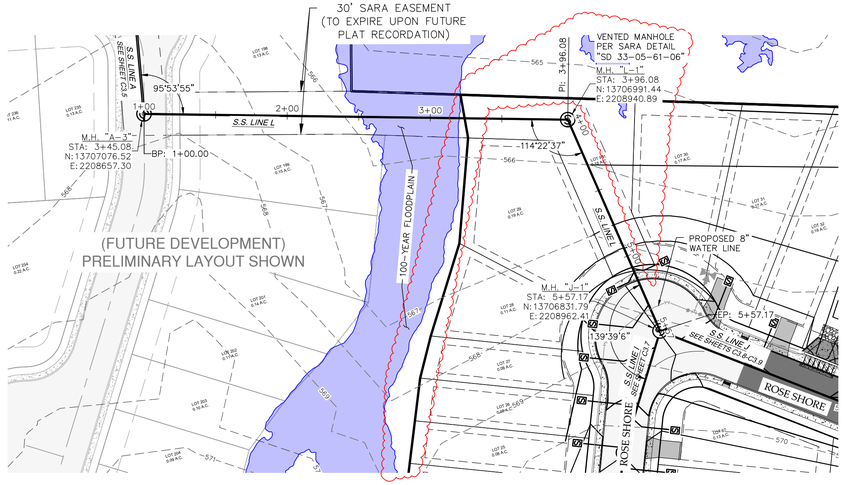
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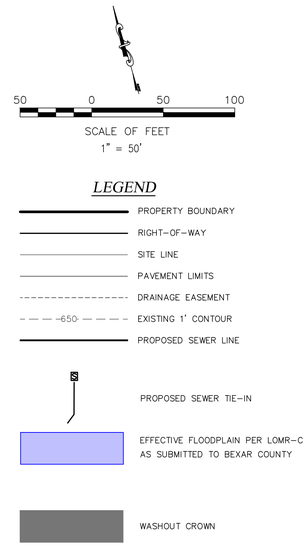
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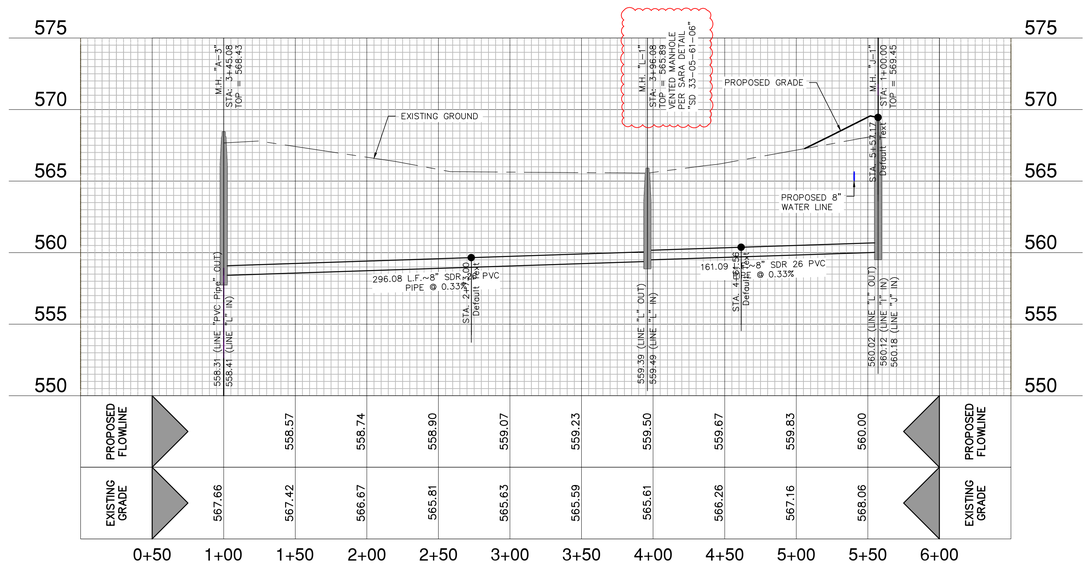


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STATE OF TEXAS
BRADLEY A. KITCHER
103043
LICENSED
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REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADJUSTED BOUNDARY FOR UPDATED FLOODPLAIN LIMITS	CTA
2.	2025-OCT-16	SPECIFIED VENTED MANHOLE	CTA

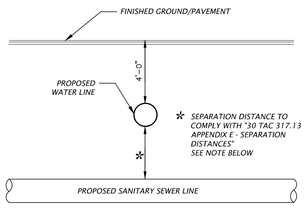
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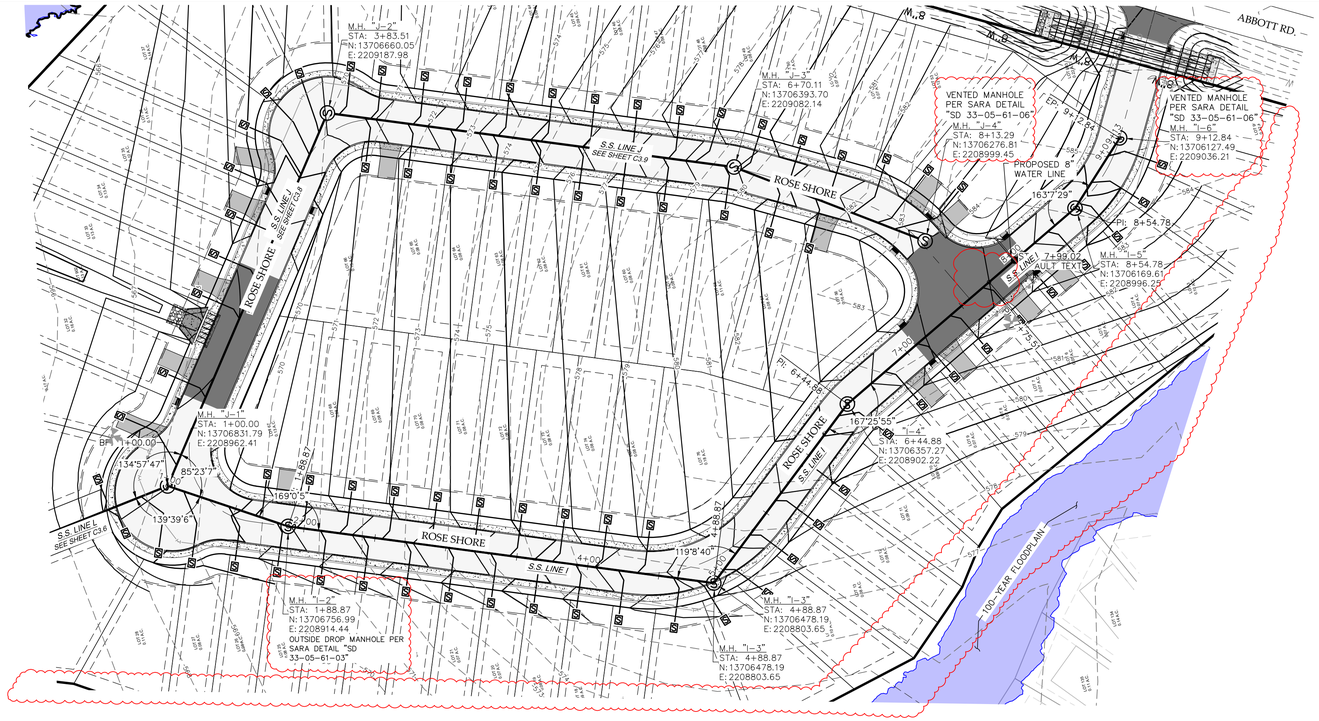
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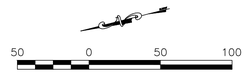
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VERTICAL STACK NOTE:
ALL 6" SERVICES DEEPER THAN 8.5' SHALL USE A VERTICAL STACK.





LEGEND

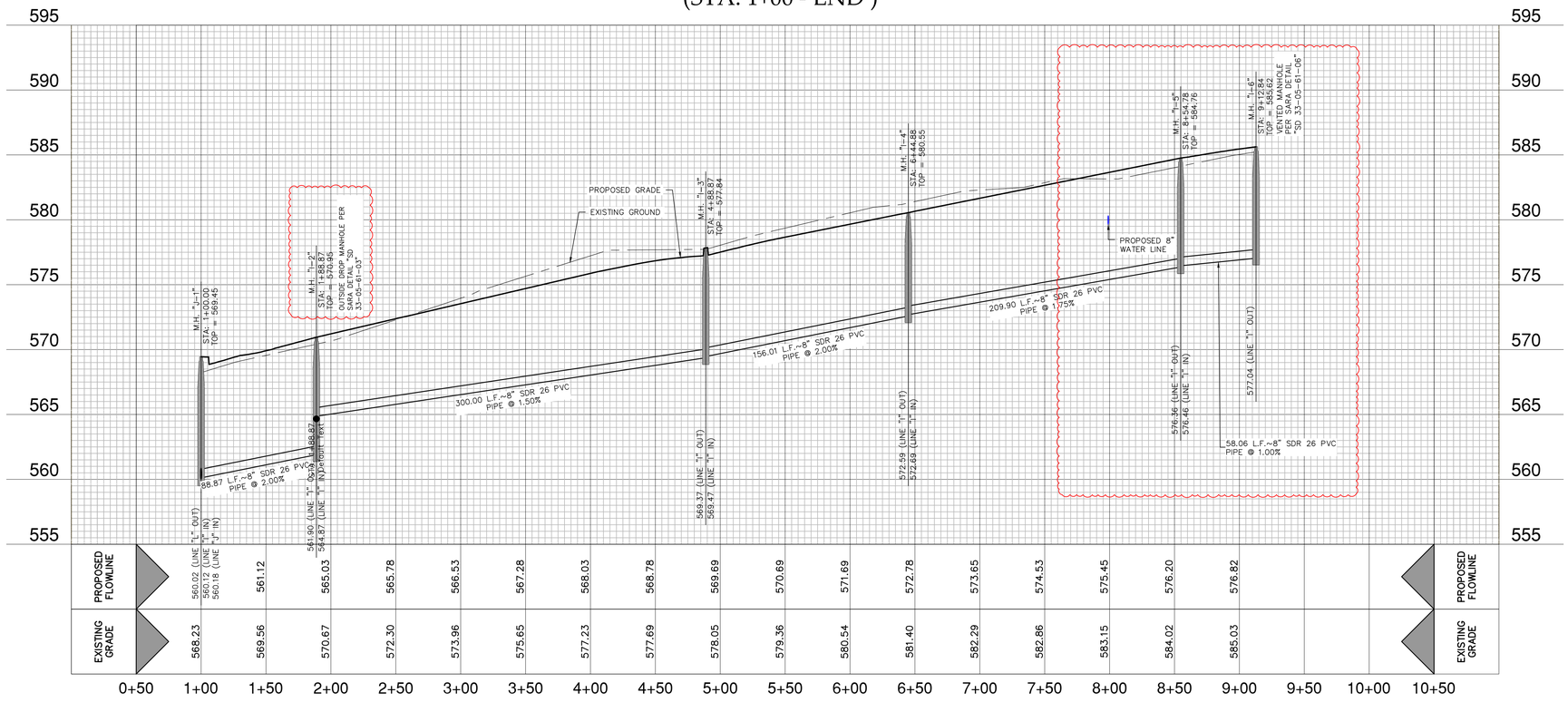
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GENERAL NOTES:
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GRAVITY SEWER MAIN NOTE:
ALL GRAVITY SEWER PIPE SHALL BE SDR 26 PVC PIPE.

SANITARY SEWER ~ ON-SITE (I)
(STA. 1+00 - END)

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



RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
SANITARY SEWER ON-SITE (I)
STA. 1+00 TO END
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105043
LICENSED PROFESSIONAL ENGINEER
F-9155
10/16/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	REMOVED MANHOLE IN FRONT OF LOT 6 ADJUSTED BOUNDARY FOR UPDATED FLOODPLAIN LIMITS	CTA CTA
1.	2025-OCT-16	SPECIFIED VENTED MANHOLE AND OUTER DROP MANHOLE	CTA

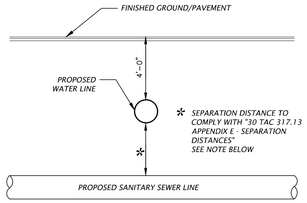
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C3.7
PLAT NO: CP202412

Date: Oct 16, 2025, 5:29pm User ID: CAD1 2022
File: N:\Projects\2023\23-3159\z Abbott Rd Lennar\Civil\23-3159G Sewer Plan.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/16/2025



NOTE:
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TYPICAL WATER/SANITARY SEWER CROSSING DETAIL

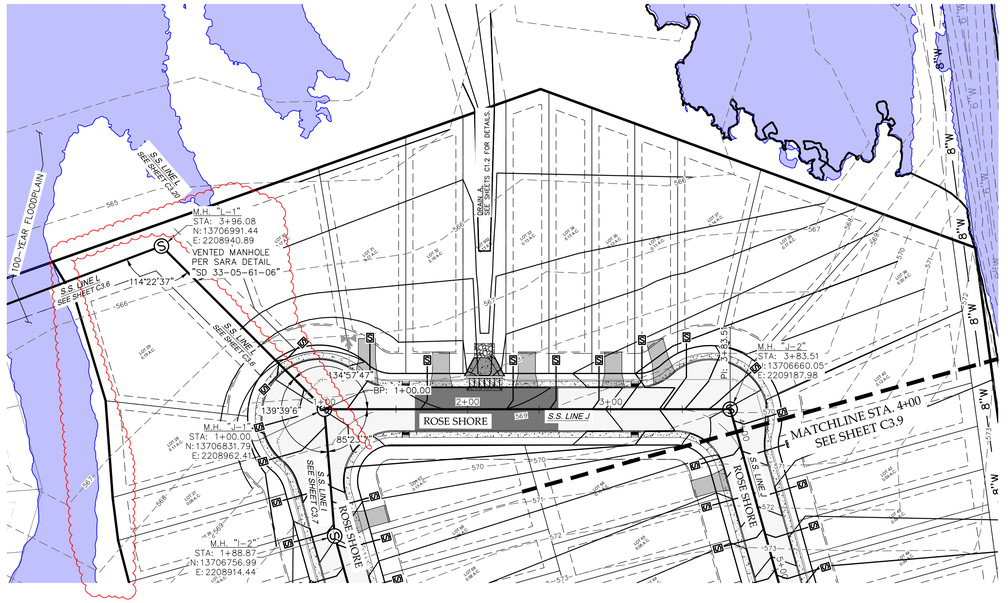
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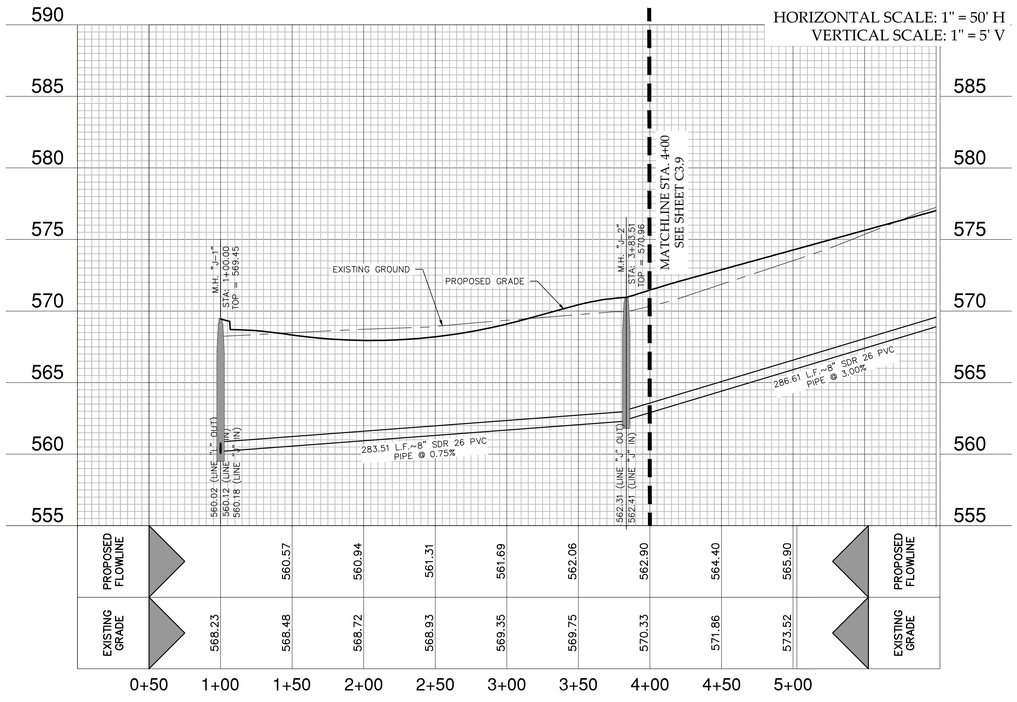
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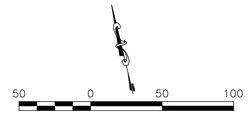
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SANITARY SEWER ~ ON-SITE (J)
(STA. 1+00 - 4+00)





LEGEND

- PROPERTY BOUNDARY
- RIGHT-OF-WAY
- SITE LINE
- PAVEMENT LIMITS
- DRAINAGE EASEMENT
- 650 EXISTING 1' CONTOUR
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Texas Registered Engineering Firm F-9155
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830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
SANITARY SEWER ON-SITE (J)
STA. 1+00 TO 4+00
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KITCHER
103043
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/16/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADJUSTED BOUNDARY FOR UPDATED FLOODPLAIN LIMITS	CTA
2.	2025-OCT-16	SPECIFIED VENTED MANHOLE	CTA

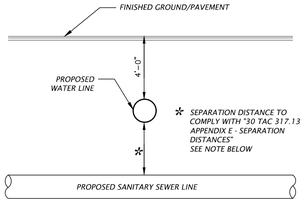
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C3.8
PLAT NO: CP202412

Date: Oct 16, 2025, 3:29pm User ID: CAD1.2022
File: N:\Projects\2023\23-3159G Abbott Rd Lennar\Civil\23-3159G Sewer Plan.dwg

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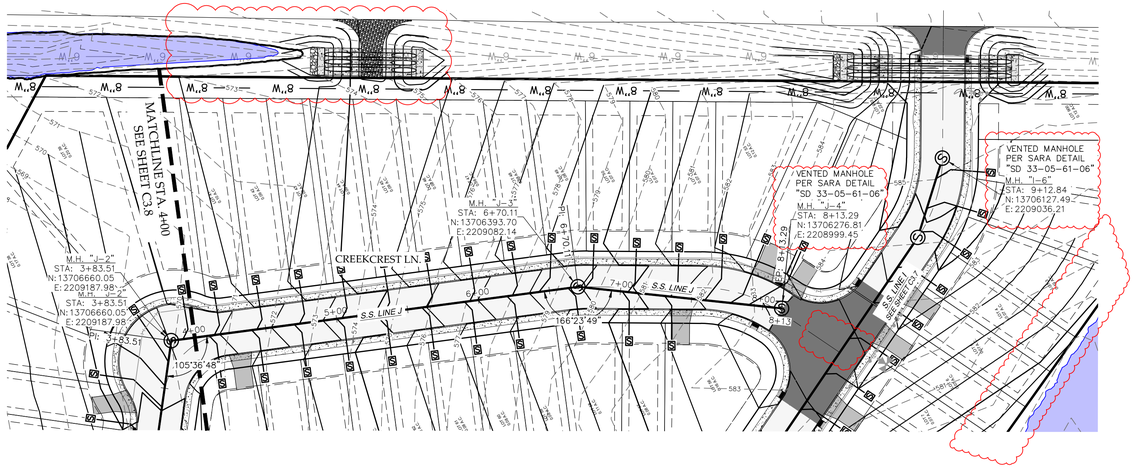
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50 0 50 100
SCALE OF FEET
1" = 50'

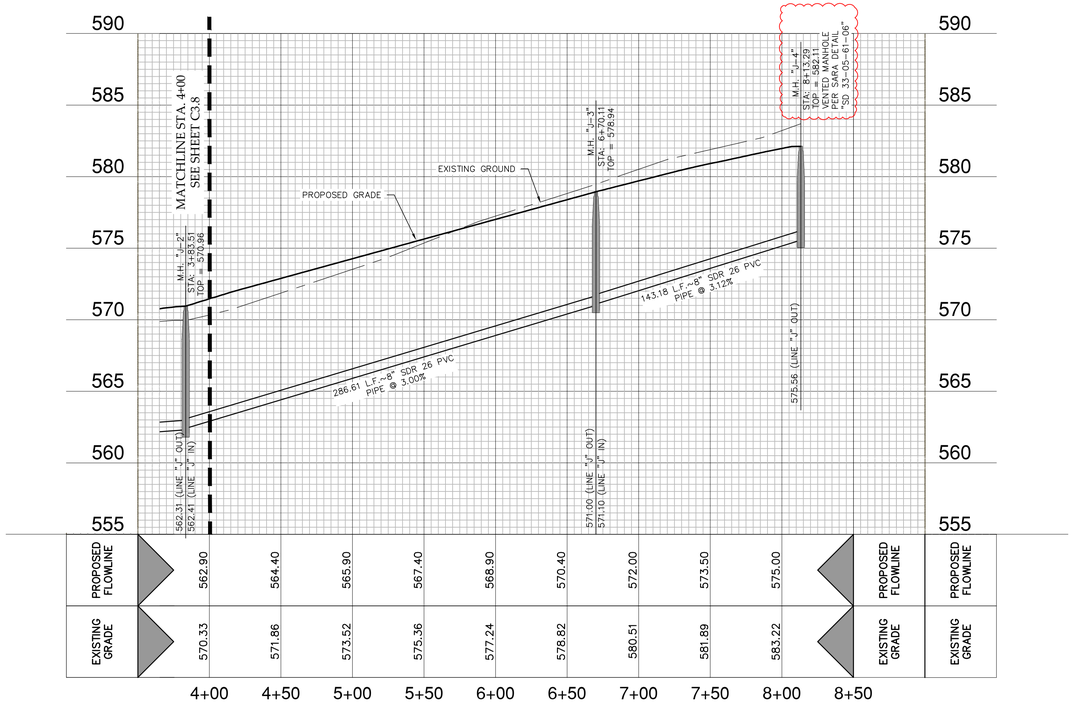
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SANITARY SEWER ~ ON-SITE (J)
(STA. 4+00 - END)

HORIZONTAL SCALE: 1" = 50' H
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STA. 4+00 TO END
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105343
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/16/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS AND REMOVED MANHOLE IN FRONT OF LOT 6	CTA
2.	2025-OCT-16	ADJUSTED BOUNDARY FOR UPDATED FLOODPLAIN LIMITS SPECIFIED VENTED MANHOLE	CTA

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C3.9
PLAT NO: CP202412

Date: Oct 16, 2025, 5:29pm User ID: CADD 2022
File: N:\Projects\2023\23-3159\G Abbott Rd Lennar\Civil\23-3159G Sewer Plan.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/16/2025

GENERAL NOTES:

1. SAN ANTONIO RIVER AUTHORITY (RIVER AUTHORITY) STANDARD SPECIFICATIONS AND STANDARD DETAILS ARE PROVIDED FOR DESIGN AND CONSTRUCTION OF SEWER COLLECTION SYSTEMS MANAGED BY THE RIVER AUTHORITY.
2. AT ANY TIME, THESE STANDARD SPECIFICATIONS AND DETAILS MAY BE ALTERED OR SUPERSEDED BY THE GENERAL CONDITIONS, SUPPLEMENTAL CONDITIONS, PLANS OR PROJECT SPECIFICATIONS WITHIN THE CONTRACT DOCUMENT PER DIRECTION FROM THE RIVER AUTHORITY.
3. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE RIVER AUTHORITY AND COMPLY WITH THE CONTRACT DOCUMENTS AND THE FOLLOWING AS APPLICABLE:
   3.1. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30, PART 1, CHAPTER 217.
   3.2. CURRENT TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT), "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND BRIDGES".
   3.3. CURRENT RIVER AUTHORITY "STANDARD SPECIFICATIONS FOR SANITARY SEWER CONSTRUCTION".
   3.4. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION". CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL".
4. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE RIVER AUTHORITY INSPECTIONS DIVISION AT (210) 302-4200 FORTY EIGHT (48) HOURS PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL ALSO PROVIDE PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO ANY EXCAVATION OR CONSTRUCTION. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD BEFORE START OF PROJECT.
5. WORK SHALL NOT BE PERFORMED ON SATURDAYS, SUNDAYS, FEDERAL HOLIDAYS, RIVER AUTHORITY HOLIDAYS, BEFORE 7:30 AM, OR AFTER 4:30 PM, UNLESS PRIOR APPROVAL IS GRANTED BY THE RIVER AUTHORITY ENGINEER. REQUEST TO PERFORM WORK DURING THESE TIMES MUST BE EMAILED 48 HOURS IN ADVANCE TO UTILITIESDEVELOPMENT@SARIVERAUTHORITY.ORG.
6. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR IN THE PLANS BUT NOT INCLUDED IN THE BID SCHEDULE. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED UNDER THE PAY ITEM WHICH IT RELATES TO.
7. WORK COMPLETED BY CONTRACTOR WHICH HAS NOT RECEIVED A WORK ORDER OR THE CONSENT OF RIVER AUTHORITY WILL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTOR.
8. LOCATIONS AND DEPTHS 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 48 HOURS PRIOR TO CONSTRUCTION REGARDLESS OF ILLUSTRATION ON THE PLANS. 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 RIVER AUTHORITY. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING UTILITIES AND REPAIRS WILL BE AT CONTRACTOR'S EXPENSE.
9. CERTAIN PORTIONS OF THE PROJECT MAY PARALLEL AND/OR CROSS EXISTING UTILITIES, AND CONTRACTOR IS REQUIRED TO PROTECT THESE UTILITIES. ADDITIONAL SUPPORTIVE SHORING MAY BE REQUIRED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT ALL PERSONNEL ON SITE, EXISTING UTILITIES, AND FINISHED WORK THROUGHOUT THE PROJECT. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGES, AND REPAIRS WILL BE AT CONTRACTOR'S FULL EXPENSE.
10. WHERE WATER LINES AND NEW SEWER LINES ARE INSTALLED WITH A SEPARATION DISTANCE LESS THAN 9 FEET (I.E. WATER LINES CROSSING WASTEWATER LINES, WATER LINES PARALLELING WASTEWATER LINES OR WATER LINES NEXT TO MANHOLES), THE INSTALLATION MUST MEET THE REQUIREMENTS OF 30 TAC 217 AND 30 TAC 290.
11. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.161, CPS MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND VALVES THAT ARE IN THE PROJECT AREAS.
12. A SAFE OVERHEAD CLEARANCE MUST BE MAINTAINED BETWEEN ALL OVERHEAD EQUIPMENT AND PERSONNEL. THE CONTRACTOR SHALL NOTIFY CPS AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION IN THE VICINITY OF CPS OVERHEAD LINES. CONTRACTOR SHALL MAINTAIN CPS RECOMMENDED CLEARANCE REQUIREMENTS.
13. ALL WORK IN THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) RIGHT-OF-WAY SHALL PROCEED DURING WORKING HOURS AGREED UPON BY RIVER AUTHORITY AND TXDOT INSPECTORS.
14. BEFORE THE START OF ANY CONSTRUCTION, CONTRACTOR SHALL FULLY DOCUMENT THE SITE WITH PHOTOS AND DIGITAL VIDEO WITH ONE COPY SUBMITTED TO RIVER AUTHORITY PRIOR TO STARTING WORK. THE PRE-CON SITE VIDEO SHALL PROVIDE ACCURATE DOCUMENTATION OF EXISTING CONDITIONS.
15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ORIGINAL OR BETTER CONDITION AS A RESULT OF DAMAGE DONE DURING THE PROJECT CONSTRUCTION.
16. ANY AND ALL FENCING, INCLUDING ELECTRIC FENCE, WHETHER OR NOT IDENTIFIED ON THE PLANS, MUST BE MAINTAINED AT ALL TIMES. ANY AND ALL DAMAGES DIRECTLY ATTRIBUTED TO THE CONTRACTOR MUST BE REPLACED TO EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE RIVER AUTHORITY INSPECTOR. GATES, OR GAPS IN THE FENCING IF APPROVED, MUST BE PROVIDED AT ALL LOCATIONS WHERE THE SEWER LINE EASEMENT CROSSES FENCING. FENCING REQUIRED TO MAINTAIN LIVESTOCK MUST BE MAINTAINED AT ALL TIMES. ALL GATES SHALL BE APPROVED PRIOR TO INSTALLATION.
17. CONTRACTOR MUST AVOID DAMAGE TO ADJACENT LAND OUTSIDE THE IDENTIFIED CONSTRUCTION LIMITS OR EASEMENTS. ANY CLAIMS DIRECTLY ATTRIBUTED TO THE CONTRACTOR RESULTING FROM STRAYING BEYOND THE CONSTRUCTION LIMITS MUST BE SETTLED BY THE CONTRACTOR TO THE SATISFACTION OF RIVER AUTHORITY AND THE APPROPRIATE LANDOWNER.
18. CONTRACTOR MUST MAINTAIN ACCESS FOR PRIVATE INDIVIDUALS AND BUSINESSES AT ALL TIMES. IF NORMAL ACCESS IS DAMAGED DURING CONSTRUCTION, THE CONTRACTOR MUST REPLACE THE ACCESS TO EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY RIVER AUTHORITY.
19. CONTRACTOR MUST COMPLY WITH TEXAS GOVERNMENT CODE SECTION 2166.303 UNIFORM TRENCH SAFETY CONDITIONS.
20. CONTRACTOR SHALL NOT BACKFILL ANY TRENCHES UNTIL INSPECTION CAN BE CONDUCTED BY THE RIVER AUTHORITY. NO OPEN TRENCHES SHALL BE PERMITTED OVERNIGHT. ALL ENDS OF OPEN PIPE SHALL BE PLUGGED OVERNIGHT.
21. CONTRACTOR SHALL HAVE THE LATEST APPROVED COPY OF PLANS AND SPECIFICATIONS ON SITE AT ALL TIMES FOR REFERENCE.
22. NO TREES SHALL BE REMOVED AS PART OF THIS PROJECT UNLESS OTHERWISE SPECIFIED IN THE PLANS.
23. FOR PORTIONS OF THE CONSTRUCTION THAT ARE WITHIN THE LIMITS OF THE 100-YEAR FLOODPLAIN, THE CONTRACTOR IS REQUIRED TO KEEP THE CHANNEL CLEAR OF POTENTIAL OBSTRUCTIONS TO FLOOD FLOWS. POTENTIAL OBSTRUCTIONS INCLUDE HEAVY CONSTRUCTION EQUIPMENT, TEMPORARY ROADS ACROSS CHANNEL, EXCAVATED MATERIAL, STOCKPILED DEBRIS, AND ALL OTHER ITEMS DEEMED UNACCEPTABLE BY RIVER AUTHORITY. UNDER THREATENING WEATHER CONDITIONS AND WHERE FLOODING IS LIKELY, OBSTRUCTIONS SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR AT NO ADDITIONAL COST TO RIVER AUTHORITY. THE CONTRACTOR ASSUMES ALL RISK FOR UNFINISHED WORK. NO EQUIPMENT OR MATERIALS SHALL BE STOCKPILED IN THE 100-YEAR FLOODPLAIN OVERNIGHT.
24. NO WASTE MATERIAL SHALL BE PLACED IN EXISTING DRAINAGE AREAS THAT WILL BLOCK OR ALTER FLOW LIMITS OR NATURAL DRAINAGE.
25. IF A THREATENED OR ENDANGERED PLANT OR ANIMAL SPECIES AND/OR CULTURAL/ARCHAEOLOGICAL RESOURCES ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY THE APPROPRIATE PERSONNEL.

SEWER NOTES:

26. THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT NO SANITARY SEWER OVERFLOW (SSO) OCCURS AS A RESULT OF THE WORK. ALL PERSONNEL RESPONSIBLE FOR SSO PREVENTION AND CONTROL SHALL BE TRAINED ON THE PROPER RESPONSE. SHOULD AN SSO OCCUR, THE CONTRACTOR SHALL:
   26.1. IDENTIFY THE SOURCE OF THE SSO AND ATTEMPT TO ELIMINATE ANY ADDITIONAL SPILLAGE.
   26.2. NOTIFY RIVER AUTHORITY CONSTRUCTION INSPECTIONS DIVISION AT (210) 302-4200 AND ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.
   26.3. CONTAIN SEWAGE FROM THE SSO TO PREVENT CONTAMINATION OF WATERWAYS.
   26.4. CLEAN UP THE SPILL AREA AND REMOVE CONTAMINATED MATERIALS.
   26.5. DISINFECT THE AREA OF THE SPILL THE PROPER MIXTURE OF HTH CHLORINE AND WATER.
   26.6. CLEAN THE AFFECTED SEWER LINE AND REMOVE ANY DEBRIS.
   26.7. IDENTIFY AND TRAIN PERSONNEL RESPONSIBLE FOR SPILLAGE PREVENTION AND CONTROL.
   26.8. NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ AND RIVER AUTHORITY.
27. THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING OF SEWAGE AROUND EACH SEGMENT OF PIPE TO BE REPLACED. CONTRACTOR SHALL HAVE STANDBY PUMPS AVAILABLE TO BYPASS FLOW IN CASE PRIMARY PUMP FAILS. THE CONTRACTOR SHALL PROVIDE A SEQUENCE OF BYPASS PUMPING FOR REVIEW AND APPROVAL BY RIVER AUTHORITY. THE CONTRACTOR SHALL ALSO PROVIDE A DETAILED SKETCH SHOWING THE LOCATION OF BYPASS PUMPING; SPECIFICATIONS FOR THE PUMPING EQUIPMENT; AND TYPE, SIZE, CAPACITY AND NUMBER OF PUMPS REQUIRED TO HANDLE THE PEAK WET WEATHER FLOW.
28. CONTRACTOR WILL MAINTAIN SERVICE TO ALL EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR WILL CLEAN ALL DEBRIS, GRAVEL, DIRT, ETC. OUT OF MANHOLES AND FIX ANY STOPPAGES CAUSED BY DEBRIS DURING CONSTRUCTION AT CONTRACTOR'S EXPENSE. ANY DAMAGE TO EXISTING MANHOLES OR SEWER MAIN WILL BE CORRECTED AT CONTRACTOR'S EXPENSE. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT DAMAGE TO EXISTING OR NEW RINGS, COVERS, OR CONES FROM EQUIPMENT AND MATERIALS USED OR TAKEN THROUGH THE WORK AREA. IF AN EXISTING OR NEW MANHOLE COVER, RING, OR CONE IS DAMAGED BY THE CONTRACTOR, IT SHALL BE REPLACED AS DIRECTED BY THE RIVER AUTHORITY INSPECTOR. MANHOLES WILL NEED TO BE RESEALED WITH RIVER AUTHORITY APPROVED SEALANT. IF SEAL COATING IS COMPROMISED, CONTRACTOR WILL HAVE MANHOLE RECOATED AND RESEAL ALL LEAKS AT CONTRACTOR EXPENSE.
29. CONTRACTOR TO ENSURE ALL PLUGS USED TO PLUG SEWER LINES WHILE TESTING THE PROJECT ARE LABELED, MARKED OR TAGGED. THE CONTRACTOR SHALL RECORD HOW MANY PLUGS ARE BEING USED, AS WELL AS THE LOCATION AND IDENTIFICATION OF EACH PLUG. CONTRACTOR WILL REPORT TO PROJECT INSPECTOR OF ANY LOST OR UNRESTRAINED PLUGS. CONTRACTOR SHALL ONLY BE ALLOWED TO USE SCREW TYPE PLUG ON PROJECT.
30. CONTRACTOR WILL BE HELD LIABLE FOR ANY DAMAGE TO SEWER COLLECTION SYSTEM, WASTEWATER TREATMENT EQUIPMENT, STOPPAGES, OVER-FLOWS, OR BACKUPS INTO HOMES CAUSED BY LOST OR RUNAWAY SEWER PLUGS.
31. RIVER AUTHORITY IS NOT RESPONSIBLE FOR ANY ABNORMALITIES ON STUB OUT, INVERT, GRADE OR SLOPE FOR ANY EXISTING MANHOLE TIE-IN OR SERVICE LATERALS. CONTRACTOR SHALL BE RESPONSIBLE FOR RE-CONSTRUCTION, IF NECESSARY.

MANHOLE NOTES:

32. ALL MANHOLES SHALL BE CONSTRUCTED PER LATEST DETAILED DRAWINGS AND SPECIFICATIONS, UNLESS AN EXCEPTION IS NOTED.
33. PENETRATION INTO THE MANHOLE WILL BE CORE DRILLED. ANY DAMAGE TO EXISTING MANHOLE WILL BE REPAIRED AT CONTRACTOR'S EXPENSE. IF EXISTING SEWER MANHOLE SEAL COATING IS COMPROMISED, ALL OF THE MANHOLE WILL BE RESEALED AND RECOATED PER CURRENT SPECIFICATIONS AND APPROVED PRODUCT LIST.
34. IF ANY EXISTING MANHOLES CONNECTED WITH THIS PROJECT ARE FOUND TO HAVE INFILTRATION, THE MANHOLES SHALL BE SEALED AND TESTED AT CONTRACTORS EXPENSE.
35. UPON REQUEST FROM THE RIVER AUTHORITY, CONTRACTOR SHALL PROVIDE SAMPLE VERIFYING PROPER INSTALLATION OF FLOWABLE BACKFILL, INCLUDING, BUT NOT LIMITED TO CORE SAMPLES.

SANITARY SEWER PIPING:

36. THE TYPE AND DESCRIPTION OF THE PIPE IS SHOWN ON THE PLANS. REFER TO RIVER AUTHORITY SPECIFICATIONS AND APPROVED PRODUCT LIST.
37. SIZES AND GRADES FOR SANITARY SEWER SHALL BE AS REQUIRED BY THE RIVER AUTHORITY ENGINEER.
38. NO SANITARY SEWERS, OTHER THAN LATERALS AND FORCE MAINS, SHALL BE LESS THAN EIGHT (8) INCH IN DIAMETER.

SEWER SERVICE LATERALS:

39. WHEN SEWER LATERALS ARE TO BE CONNECTED TO EXISTING SEWER MAINS AND NO STUB-OUT HAS BEEN PROVIDED, THE CONNECTION MUST BE CONDUCTED PER THE LATEST RIVER AUTHORITY STANDARD DETAILS AND APPROVED PRODUCT LIST. REFER TO THE RIVER AUTHORITY APPROVED PRODUCTS LIST FOR ACCEPTABLE FITTINGS AND CONNECTIONS.
40. ALL RESIDENTIAL SERVICE LATERALS SHALL BE SDR 26 PVC WITH RATING OF 115 PSI OR 160 PSI, DETERMINED BY RIVER AUTHORITY SPECIFICATION. LINE SHALL BE EXTENDED TO THE PROPERTY LINE AND CAPPED AND SEALED. ATTACH SEWER BURIAL TAPE TO THE END OF ALL SEWER LATERALS AND BRING UP TO THE GROUND LEVEL FOR MARKER (GREEN). (SEE HOUSE LATERALS DETAILS).
41. UPON REQUEST FROM THE SAN ANTONIO RIVER AUTHORITY, CONTRACTOR SHALL PROVIDE SAMPLE VERIFYING PROPER INSTALLATION OF FLOWABLE BACKFILL, INCLUDING, BUT NOT LIMITED TO CORE SAMPLES.

SANITARY SEWER PIPING:

42. THE TYPE AND DESCRIPTION OF THE PIPE IS SHOWN ON THE PLANS. REFER TO LATEST RIVER AUTHORITY SPECIFICATIONS AND APPROVED PRODUCT LIST FOR MATERIALS, STIFFNESS, AND TYPE.
43. SIZES AND GRADES FOR SANITARY SEWER SHALL BE AS REQUIRED BY THE RIVER AUTHORITY ENGINEER.
44. NO SANITARY SEWERS, OTHER THAN LATERALS AND FORCE MAINS, SHALL BE LESS THAN EIGHT (8) INCH IN DIAMETER.

SANITARY SEWER TESTING:

45. TESTING SHALL NOT BE CONDUCTED UNTIL ALL OTHER UTILITIES TO CONTRACTOR'S EXPENSE. ANY DAMAGE TO EXISTING MANHOLES OR SEWER MAIN WILL BE CORRECTED AT CONTRACTOR'S EXPENSE. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT DAMAGE TO EXISTING OR NEW RINGS, COVERS, OR CONES FROM EQUIPMENT AND MATERIALS USED OR TAKEN THROUGH THE WORK AREA. IF AN EXISTING OR NEW MANHOLE COVER, RING, OR CONE IS DAMAGED BY THE CONTRACTOR, IT SHALL BE REPLACED AS DIRECTED BY THE RIVER AUTHORITY INSPECTOR. MANHOLES WILL NEED TO BE RESEALED WITH RIVER AUTHORITY APPROVED SEALANT. IF SEAL COATING IS COMPROMISED, CONTRACTOR WILL HAVE MANHOLE RECOATED AND RESEAL ALL LEAKS AT CONTRACTOR EXPENSE.
46. TESTING SHALL BE CONDUCTED PER LATEST RIVER AUTHORITY SPECIFICATIONS AND SHALL NOT BEGIN WITHOUT 48 HOURS NOTICE TO RIVER AUTHORITY INSPECTOR.
47. A COPY OF ALL TESTING REPORTS, INCLUDING BACKFILL COMPACTION, SHALL BE FORWARDED TO THE RIVER AUTHORITY IMMEDIATELY.
48. DENSITY TESTING WILL BE REQUIRED ON ALL SANITARY SEWER TRENCHES INCLUDING SERVICE LATERALS. TESTING FOR SERVICE LATERALS TO BE IDENTIFIED BY RIVER AUTHORITY INSPECTOR AT RANDOM. DENSITY TESTING FOR SERVICE LATERALS SHALL NOT EXCEED 25% OF TOTAL NUMBER OF LATERALS.

EXCAVATION:

49. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/ GEOTECHNICAL/ SAFETY/ EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTORS TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIALLY, CONTRACTOR AND/OR CONTRACTORS INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
50. IF A SAFETY VIOLATION IS NOTED BY A RIVER AUTHORITY INSPECTOR, THE RIVER AUTHORITY RESERVES THE RIGHT TO STOP WORK.
51. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION.
52. CONTRACTOR IS RESPONSIBLE FOR UPDATING AND MAINTAINING ALL FIELD UTILITY MARKINGS.

SAN ANTONIO RIVER AUTHORITY
100 & CLOVERLEAF STREET
SAN ANTONIO, TEXAS 78210

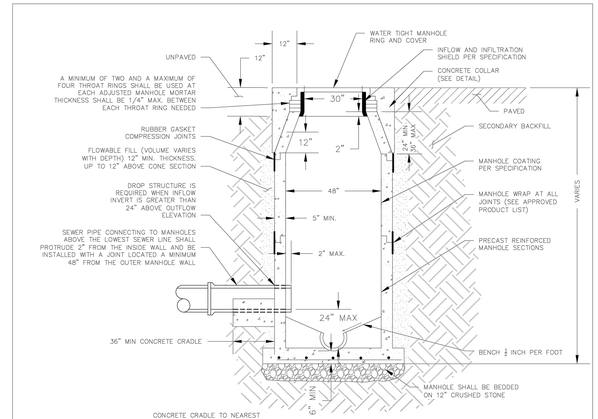
DESIGNED BY:	
DRAWN BY:	
CHECKED BY:	
APPROVED BY:	
DATE:	

NO.	DATE	REVISION

REVISED 5/31/2024

GENERAL NOTES

SHEET 1 OF 1

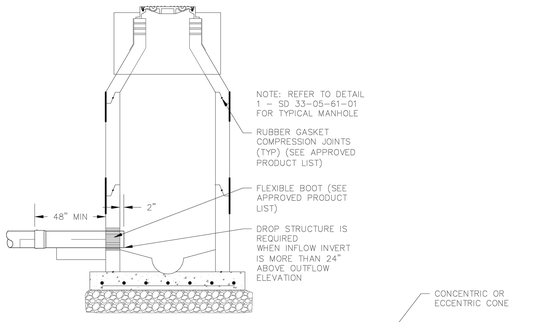


GENERAL NOTES:

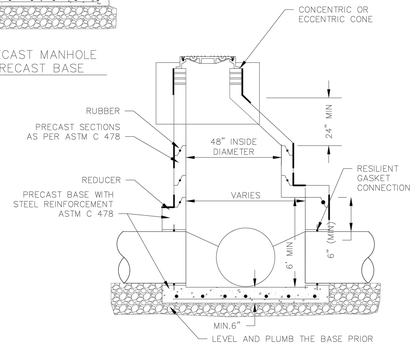
1. STEPS SHALL NOT BE INSTALLED IN ANY MANHOLE.
2. SANITARY SEWER PIPE MATERIAL MUST BE THE SAME FROM MANHOLE TO MANHOLE. CHANGES IN TYPE OF PIPE SHALL ONLY BE MADE AT MANHOLES, OR SPECIAL STRUCTURES, EXCEPT AS APPROVED BY THE RIVER AUTHORITY.
3. ADAPTORS AND CONCRETE COLLARS SHALL BE USED AS DIRECTED BY THE RIVER AUTHORITY.
4. WATERTIGHT MANHOLE RINGS AND COVERS SHALL BE IN ACCORDANCE WITH THE APPROVED PRODUCT LIST.
5. THE MINIMUM ANGLE OF FLOW FOR A CONNECTING SEWER TO THE DIRECTION OF FLOW DEFINED BY A COLLECTION SYSTEM IS 90 DEGREES.

MANHOLE FLOOR PLAN

SAN ANTONIO RIVER AUTHORITY	PRECAST MANHOLE PRECAST BASE TYPICAL DETAIL	APPROVED: APRIL 2012	REVISED: MAY 2024
		SD 33-05-61-01	SHEET 1 OF 28

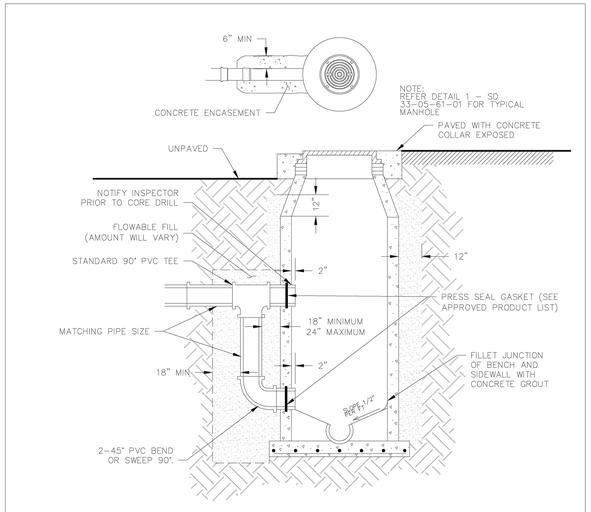


PRECAST MANHOLE
PRECAST BASE



PRECAST MANHOLE ON PRECAST BASE
FOR PIPE SIZES 24" AND LARGER

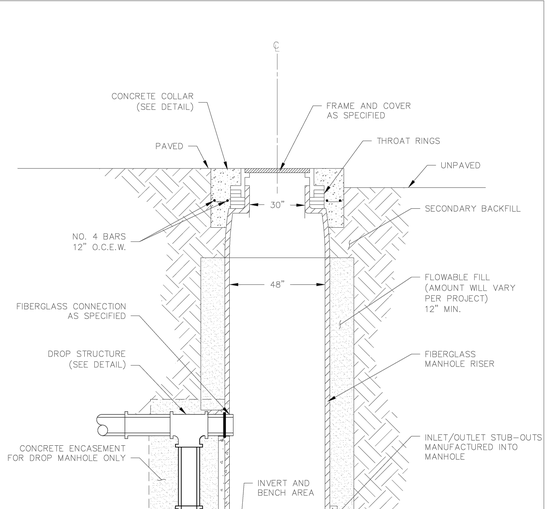
SAN ANTONIO RIVER AUTHORITY	PRECAST MANHOLES	APPROVED: APRIL 2012	REVISED: MAY 2024
		SD 33-05-61-02	SHEET 2 OF 28



NOTES:

1. PRICE FOR DROP FITTINGS AND ENCASEMENT TO BE INCLUDED WITH THE PRICE OF MANHOLE.
2. CONCRETE FOR DROP STRUCTURES SHALL BE FORMED ON ALL SIDES.
3. ALL MANHOLE PENETRATIONS SHALL BE MADE BY CORE DRILLING, AND INSPECTOR SHALL BE NOTIFIED PRIOR TO WORK BEING PERFORMED.
4. ALL INTERIOR COATING SHALL BE REPAIRED AS NECESSARY.
5. DROP STRUCTURES SHALL BE APPROVED, IN WRITING, BY RIVER AUTHORITY.

SAN ANTONIO RIVER AUTHORITY	OUTSIDE DROP MANHOLE	APPROVED: APRIL 2012	REVISED: MAY 2024
		SD 33-05-61-03	SHEET 3 OF 28



SAN ANTONIO RIVER AUTHORITY	TYPICAL FIBERGLASS MANHOLE DETAIL	APPROVED: APRIL 2012	REVISED: MAY 2024
		SD 33-05-61-04	SHEET 4 OF 28

ROSE VALLEY SOUTH - UNIT 1
SAN ANTONIO RIVER AUTHORITY - SEWER NOTES & DETAILS
BEXAR COUNTY, TEXAS

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105243
LICENSED PROFESSIONAL ENGINEER
F-9155
10/16/2025

REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

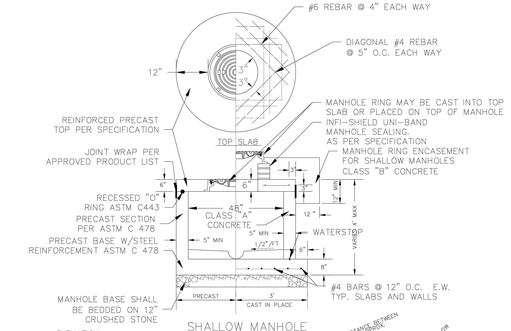
C3.10

PLAT NO: CP202412

Date: Oct 16, 2025, 5:29pm User ID: CAD1-2022
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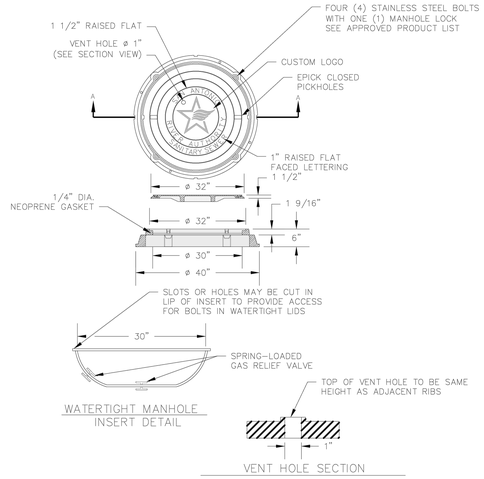
THIS DOCUMENT HAS BEEN PRODUCED FROM ELECTRONICALLY TRANSMITTED OR STORED MATERIAL WHICH MAY HAVE BEEN ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE ENGINEER'S ORIGINAL SIGNATURE AND SEAL.

PERMIT SET (NOT FOR CONSTRUCTION): 10/16/2025



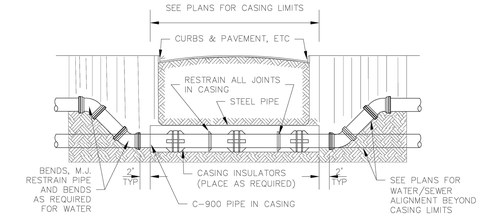
MAX PIPE SIZE OD		
MANHOLE DIA	0° TO 45° DEFL.	45° DEFL.
5 FT	42"	32"
6 FT	51"	38"
8 FT	73 1/2"	50"

SAN ANTONIO RIVER AUTHORITY	MISCELLANEOUS MANHOLE DETAILS	APPROVED APRIL 2012	REVISED MAY 2024
		SD 33-05-61-05	SHEET 5 OF 28



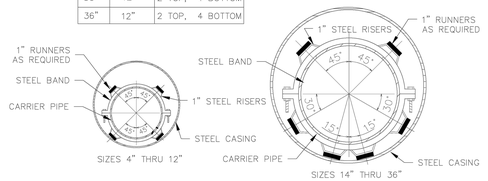
NOTE:
1. MANHOLE RING ENCASEMENT (COLLAR) REQUIRED ON ALL MANHOLES. SEE DETAIL.

SAN ANTONIO RIVER AUTHORITY	VENTED MANHOLE RING AND COVER	APPROVED APRIL 2012	REVISED MAY 2024
		SD 33-05-61-06	SHEET 6 OF 28

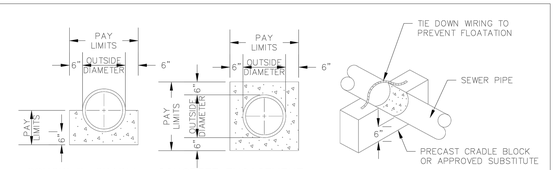


SIZE	BAND WIDTH	NO.RUNNERS PER TIE
8"	8"	2 TOP, 2 BOTTOM
12"	8"	2 TOP, 2 BOTTOM
16"	8"	2 TOP, 4 BOTTOM
20"	8"	2 TOP, 4 BOTTOM
24"	8"	2 TOP, 4 BOTTOM
30"	12"	2 TOP, 4 BOTTOM
36"	12"	2 TOP, 4 BOTTOM

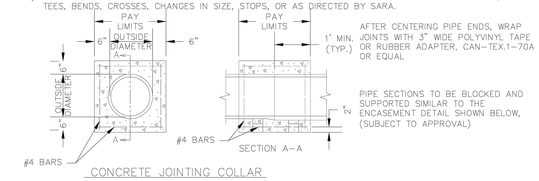
NOTES:
1. FITTINGS SHALL BE PAID FOR BY SEPARATE ITEM. JOINT RESTRAINTS SHALL BE APPROVED AS SPECIFIED IN STANDARD MATERIAL SPECIFICATION ITEM NO. 800
2. CASING INSULATORS IN ACCORDANCE TO STANDARD MATERIAL SPECIFICATION NO. 800 CONTRACTOR SHALL DETERMINE ENTRY AND EXIT PIT
3. PIT LOCATIONS. NOT SHOWN.

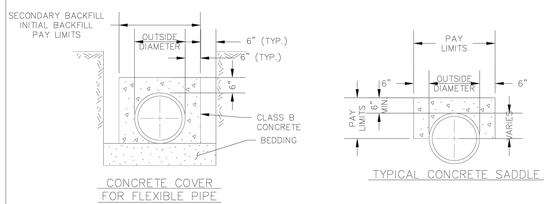


SAN ANTONIO RIVER AUTHORITY	INSTALLATION OF PIPE IN BORE	APPROVED APRIL 2012	REVISED MAY 2024
		SD 33-05-07-01	SHEET 7 OF 28



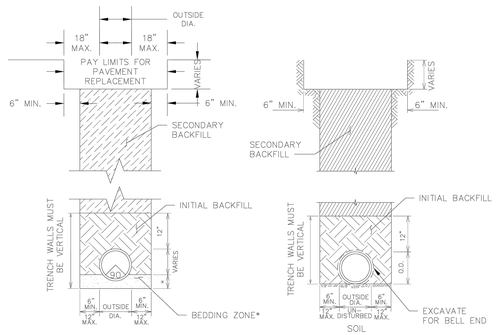
NOTES:
1) ALL CONCRETE ENCASEMENT SHALL BE POURED AT A PLANE 6" ABOVE THE PIPE BETWEEN EXCAVATED TRENCH WALLS.
2) ALL SEWER PIPE WITH LESS THAN 3' OF COVER TO SUBGRADE SHALL BE CONCRETE ENCASED.
3) ALL FORCE MAINS SHALL BE PROVIDED WITH THRUST BLOCKS, WHERE CHANGES IN DIRECTION OCCUR, AT TEES, BENDS, CROSSES, CHANGES IN SIZE, STOPS, OR AS DIRECTED BY SARA.





TO BE USED WHEREVER TRENCH WIDTH IS GREATER THAN TWO FEET (2') PLUS O.D.

SAN ANTONIO RIVER AUTHORITY	TYPICAL CONCRETE DETAILS	APPROVED APRIL 2012	REVISED MAY 2024
		SD 33-06-08-01	SHEET 8 OF 28



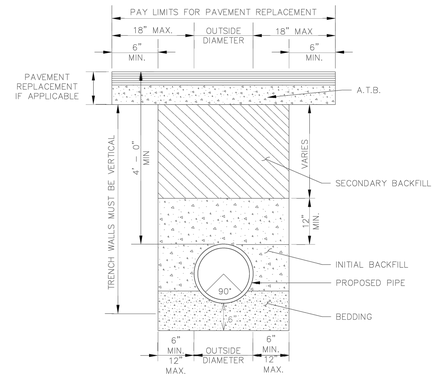
* SEWER GRAVEL 12" MIN. OR 1/8 O.D. OF THE PIPE, WHICHEVER IS GREATER AS DIRECTED BY THE RIVER AUTHORITY

1) RIGID PIPE – UNSTABLE OR UNACCEPTABLE CONDITIONS FLEXIBLE PIPE – ALL CONDITIONS

* IN AREAS OF OVER EXCAVATION, ENCASEMENT SHALL EXTEND FROM TRENCH WALL TO TRENCH WALL. PAY LIMITS SHALL NOT EXCEED 12" MAX. AS SHOWN ON DETAIL. ADDITIONAL ENCASEMENT SHALL BE INCIDENTAL.

2) RIGID PIPE – EXISTING STABLE BEDDING CONDITIONS

SAN ANTONIO RIVER AUTHORITY	SANITARY SEWER TRENCH DETAIL	APPROVED APRIL 2012	REVISED MAY 2024
		SD 33-05-05-01	SHEET 9 OF 28



SAN ANTONIO RIVER AUTHORITY	TYPICAL UTILITY TRENCH DETAIL	APPROVED APRIL 2012	REVISED MAY 2024
		SD 33-05-05-02	SHEET 10 OF 28

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Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
SAN ANTONIO RIVER AUTHORITY - SEWER DETAILS
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105240
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/16/2025

REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

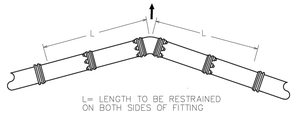
C3.11

PLAT NO: CP202412

Date: Oct 16, 2025, 5:30pm User ID: CAD1-2022
File: N:\Projects\2023\23-3159G Abbott Rd Lennar\Civil\23-3159G SARA SEWER DETAILS AND NOTES.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/16/2025



L= LENGTH TO BE RESTRAINED
ON BOTH SIDES OF FITTING

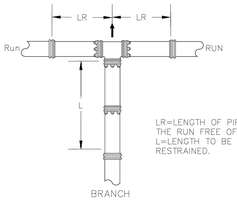
PIPE SIZE (INCH)	BEND ANGLE (DEG)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 150 psi
6	90	23	17
6	45	9	7
6	22.5	5	3
6	11.25	2	2
8	90	30	22
8	45	12	9
8	22.5	6	4
8	11.25	3	2
12	90	43	32
12	45	18	13
12	22.5	8	6
12	11.25	4	3

RESTRAINED LENGTH DESIGN
RESTRAINED LENGTH CALCULATIONS ARE FOR P.V.C PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. THE NATIVE SOIL MATERIAL IS ASSUMED TO BE INORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 4 FEET.

NOTE:
THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTH SHALL BE DESIGNED BY A LICENSED ENGINEER BASED UPON THE CONDITIONS ENCOUNTERED DURING THE INSTALLATION.

SAN ANTONIO RIVER AUTHORITY	RESTRAINED LENGTHS FOR HORIZONTAL BENDS	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-01	SHEET 11 OF 28

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 BY A LICENSED ENGINEER BASED UPON THE CONDITIONS ENCOUNTERED DURING THE INSTALLATION.



LR=LENGTH OF PIPE ALONG THE RUN FREE OF JOINTS.
L=LENGTH TO BE RESTRAINED.

RESTRAINED LENGTH FOR TEES

PIPE SIZE (inch)	BRANCH SIZE (inch)	LENGTH OF RUN (ft.)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 150 psi
6	4	0	42	31
6	4	5	7	1
6	4	10	1	1
6	6	0	59	44
6	6	5	35	20
6	6	10	11	1
8	4	0	42	31
8	4	5	1	1
8	6	0	59	44
8	6	5	28	13
8	6	10	1	1
8	8	0	77	58
8	8	5	53	34
8	8	10	30	11
8	8	15	6	1

RESTRAINED LENGTH FOR TEES (CONT'D)

PIPE SIZE (inch)	BRANCH SIZE (inch)	LENGTH OF RUN (ft.)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 150 psi
12	4	0	42	31
12	4	5	1	1
12	6	0	59	44
12	6	5	13	1
12	6	10	1	1
12	8	0	77	58
12	8	5	42	23
12	8	10	7	1
12	8	15	1	1
12	12	0	109	82
12	12	5	86	59
12	12	10	63	35
12	12	15	39	12

SAN ANTONIO RIVER AUTHORITY	RESTRAINED LENGTHS FOR TEES	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-02	SHEET 12 OF 28



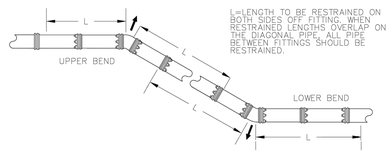
L=LENGTH TO BE RESTRAINED

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

RESTRAINED LENGTH DESIGN
RESTRAINED LENGTH CALCULATIONS ARE FOR P.V.C PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. THE NATIVE SOIL MATERIAL IS ASSUMED TO BE INORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 4 FEET.

NOTE: THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTH SHALL BE DESIGNED BASED UPON THE CONDITIONS ENCOUNTERED DURING THE INSTALLATION.

SAN ANTONIO RIVER AUTHORITY	RESTRAINED LENGTHS FOR DEAD END/ INLINE VALVES	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-04	SHEET 13 OF 28



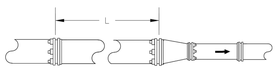
L=LENGTH TO BE RESTRAINED ON BOTH SIDES OFF FITTING. WHEN RESTRAINED LENGTHS OVERLAP ON THE DIAGONAL PIPE, ALL PIPE BETWEEN FITTINGS SHOULD BE RESTRAINED.

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

RESTRAINED LENGTH DESIGN
RESTRAINED LENGTH CALCULATIONS ARE FOR P.V.C PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. THE NATIVE SOIL MATERIAL IS ASSUMED TO BE INORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 4 FEET.

NOTE: THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTH SHALL BE DESIGNED BY A LICENSED ENGINEER BASED UPON THE CONDITIONS ENCOUNTERED DURING THE INSTALLATION.

SAN ANTONIO RIVER AUTHORITY	RESTRAINED LENGTHS FOR VERTICAL OFFSETS	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-04	SHEET 14 OF 28



L=LENGTH TO BE RESTRAINED

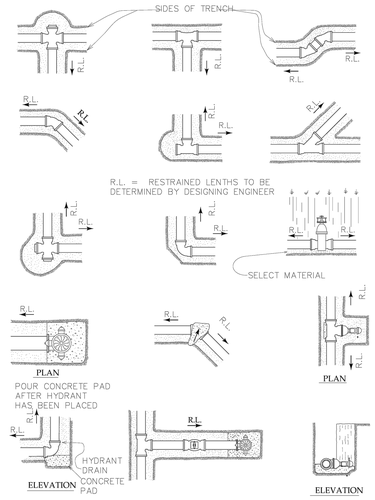
PIPE SIZE (inch)	SMALL SIZE (inch)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 200 psi	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE = 150 psi
6	4	30	23
8	4	55	42
8	6	32	24
12	4	95	71
12	6	80	60
12	8	58	43

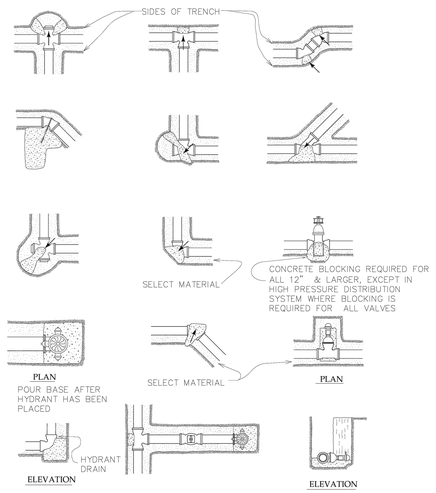
RESTRAINED LENGTH DESIGN

RESTRAINED LENGTH CALCULATIONS ARE FOR P.V.C PIPE BEDDED IN COMPACTED GRANULAR MATERIAL EXTENDING TO THE TOP OF THE PIPE. THE NATIVE SOIL MATERIAL IS ASSUMED TO BE INORGANIC CLAY OF HIGH PLASTICITY. DEPTH OF BURY IS ASSUMED TO BE 4 FEET.

NOTE: THESE CALCULATIONS ARE PROVIDED FOR REFERENCE. THE RESTRAINED LENGTH SHALL BE DESIGNED BY A LICENSED ENGINEER BASED UPON THE CONDITIONS ENCOUNTERED DURING THE INSTALLATION.

SAN ANTONIO RIVER AUTHORITY	RESTRAINED LENGTHS FOR REDUCERS	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-05	SHEET 15 OF 28


SIDES OF TRENCH
R.L.
R.L.
R.L.



NOTE:
ALL NEW PRESSURIZED PIPELINES SHALL USE RESTRAINED JOINTS ONLY. THIS DETAIL IS TO ACCOMODATE EXISTING PRESSURED PIPELINES AS DIRECTED.

SAN ANTONIO RIVER AUTHORITY	RESTRAINED LENGTHS FOR VERTICAL OFFSETS	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-04	SHEET 17 OF 28

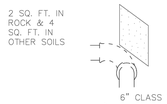
THRUST BLOCKING DESIGN

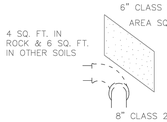


ON BASIS OF 200 PSI WATER PRESSURE USED FOR TESTS, THE BLOCKING REQUIRED FOR TWO TYPES OF SOILS ARE NOTED BELOW. IN ONE CASE, A SOIL PRESSURE OF 5000 PSI IS USED FOR ROCK EXCAVATION AND FOR SOILS OTHER THAN ROCK A 3000 PSI BEARING SOIL PRESSURE IS USED. THE DISTRIBUTION ON SYSTEM IS DESIGNED TO OPERATE WITH A MAXIMUM WATER PRESSURE OF 175 PSI. ALL CALCULATIONS APPLY TO A.C. PIPE CLASS 200 AND DUCTILE IRON PIPE CLASS 2. PVC PIPE CLASS 200 (SDR 13.5)

SQUARE FEET OF BLOCKING REQUIRED FOR ROCK EXCAVATION

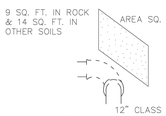
SIZE PIPE	TEES & DEAD ENDS	90° BENDS	45° BENDS	22°.1/2 BENDS
6"	2	2	1	1
8"	3	4	2	1
12"	6	9	5	2
16"	11	15	8	4





SQUARE FEET OF BLOCKING REQUIRED FOR OTHER THAN ROCK EXCAVATION

SIZE PIPE	TEES & DEAD ENDS	90° BENDS	45° BENDS	22°.1/2 BENDS
6"	3	4	2	1
8"	4	6	4	2
12"	10	14	8	4
16"	18	25	14	7



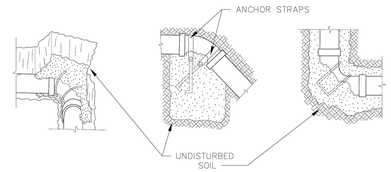
BLOCKING AREA FOR 200 PSI TESTS & 175 PSI WORKING PRESSURES.

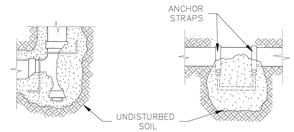
ANCHORAGE AND BLOCKING SHALL BE PROVIDED IN A MANNER AS INDICATED BY DD-839-01 AND DD-839-02 IN ACCORDANCE WITH SECTION 5.4 ANCHORING BLOCKING STANDARD SPECIFICATIONS FOR WATER WORKS CONSTRUCTION EXCEPT THAT 2500 PSI WILL BE REQUIRED.

TRANSIT 2500 PSI CONCRETE MIX SHALL BE USED HOWEVER FOR SMALL VOLUME REQUIREMENTS CONCRETE MIXED AT JOB SITE WILL BE ACCEPTABLE ONLY IF A CONCRETE MIXER IS USED, ALL AGGREGATE SHALL BE CLEAN AND THE FIELD MIX SHALL BE IN THE RATIO OF 1:3:4 AND CONTAIN NOT LESS THAN 4 SACKS OF CEMENT PER cu. YD.

NOTE:
ALL NEW PRESSURIZED PIPELINES SHALL USE RESTRAINED JOINTS ONLY. THIS DETAIL IS TO ACCOMODATE EXISTING PRESSURED PIPELINES AS DIRECTED.

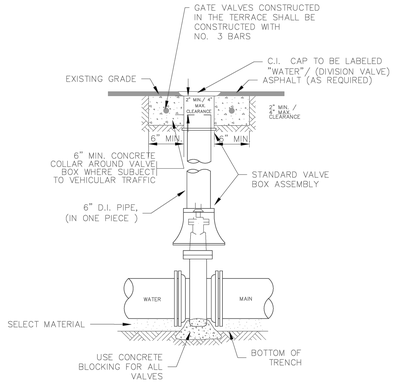
SAN ANTONIO RIVER AUTHORITY	THRUST BLOCKS FOR HIGH PRESSURE SYSTEM	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-08	SHEET 18 OF 28



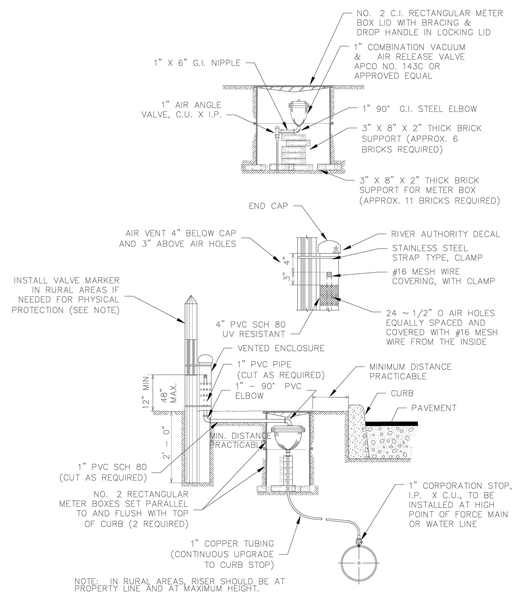


NOTE:
ALL NEW SEWER SYSTEMS SHALL USE RESTRAINED JOINTS ONLY. THIS DETAIL IS TO ACCOMODATE EXISTING PRESSURE SEWER SYSTEMS UNLESS INDICATED OTHERWISE. ALL CONCRETE USED FOR THRUST BLOCKING SHALL HAVE A MINIMUM CONCRETE STRENGTH OF 3500 PSI

SAN ANTONIO RIVER AUTHORITY	THRUST BLOCKS FOR HIGH PRESSURE SYSTEM	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-09	SHEET 19 OF 28

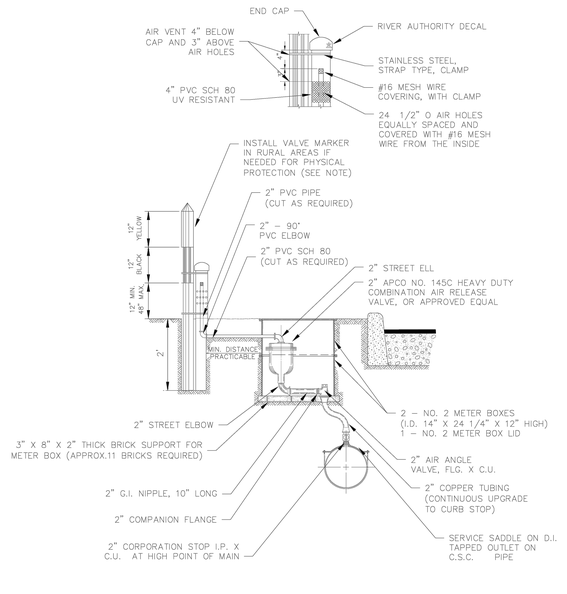


SAN ANTONIO RIVER AUTHORITY	NON-GEARED GATE VALVE WITH VALVE BOX AND EXTENSION	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-10	SHEET 20 OF 28



NOTE: IN RURAL AREAS, RISER SHOULD BE AT PROPERTY LINE AND AT MAXIMUM HEIGHT.

SAN ANTONIO RIVER AUTHORITY	INSTALLATION OF 1" AIR RELEASE VALVE	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-11	SHEET 21 OF 28



NOTE: IN RURAL AREAS, RISER SHOULD BE AT PROPERTY LINE AND AT MAXIMUM HEIGHT.

SAN ANTONIO RIVER AUTHORITY	INSTALLATION OF 2" AIR RELEASE VALVE	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-12	SHEET 22 OF 28

RAKOWITZ
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Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
SAN ANTONIO RIVER AUTHORITY - SEWER DETAILS
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KITCHER
105043
LICENSED PROFESSIONAL ENGINEER
F-9155
10/16/2025

REV	DATE	DESCRIPTION	BY

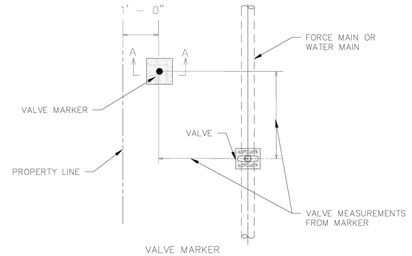
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C3.13
PLAT NO: CP202412

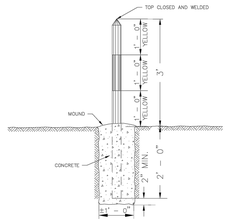
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PERMIT SET (NOT FOR CONSTRUCTION): 10/16/2025

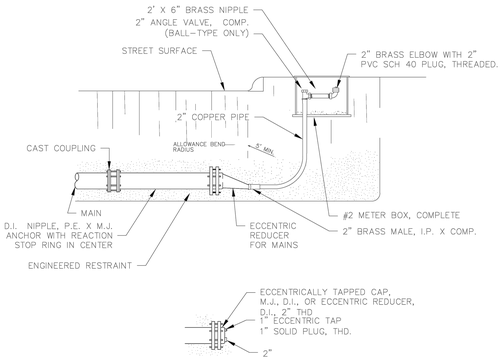


VALVE MARKER



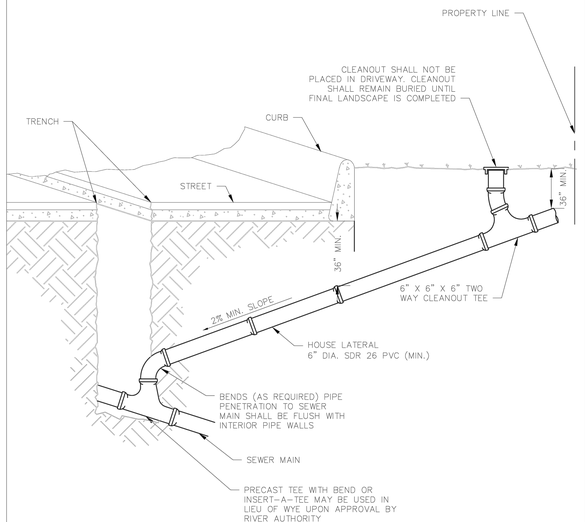
NOTES:
1. VALVE MARKER IS 3" STEEL PIPE PAINTED AS SHOWN
2. VALVE MEASUREMENTS SHALL BE REFERENCED TO MARKER
3. SARA DECAL SHALL BE NOTED ON THE MARKER AND FACING THE DIRECTION OF THE VALVE.

SAN ANTONIO RIVER AUTHORITY	VALVE MARKER	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-13	SHEET 23 OF 28



NOTE:
1. EXCEPT AS DIRECTED BY THE ENGINEER, ANTI CORROSION EMBEDMENT SHALL BE PROVIDED FOR ALL DUCTILE-IRON PIPE FITTINGS, AND VALVES, AND AT ALL VALVE FITTINGS, OR OUTLETS FOR NON-FERROUS OR REINFORCED CONCRETE STEEL CYLINDER PIPE. THE EMBEDDING MATERIAL SHOULD BE MODIFIED GRADE 5 GRAVEL WASHED SAND.

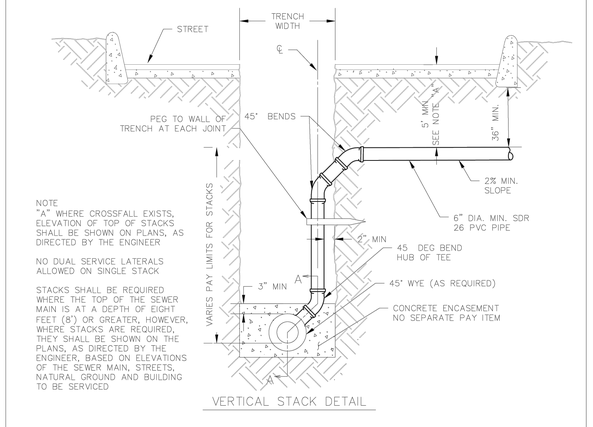
SAN ANTONIO RIVER AUTHORITY	2" PERMANENT BLOW-OFF ASSEMBLY	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-14	SHEET 24 OF 28



NOTES:

1. A MINIMUM OF 36" OF COVER FROM GRADE IS REQUIRED. IF 36" OF COVER CANNOT BE OBTAINED, THEN CONCRETE ENCASEMENT WILL BE REQUIRED.
2. DEPTH AND GRADE OF SERVICE LATERALS AS SHOWN, ARE TYPICAL AND NOT TO SCALE. ACTUAL DEPTH, ALIGNMENT AND GRADE OF SERVICE LATERALS SHALL BE DETERMINED BY THE ENGINEER BASED ON THE ELEVATIONS OF THE SEWER MAIN, STREET, NATURAL GROUND AND BUILDING TO BE SERVICED.

SAN ANTONIO RIVER AUTHORITY	HOUSE LATERAL DETAIL	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-15	SHEET 25 OF 28

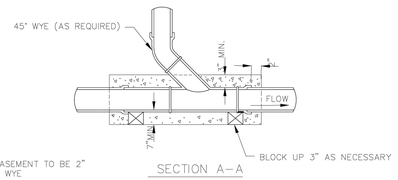


NOTE
"A" WHERE CROSSFALL EXISTS, ELEVATION OF TOP OF STACKS SHALL BE SHOWN ON PLANS, AS DIRECTED BY THE ENGINEER

NO DUAL SERVICE LATERALS ALLOWED ON SINGLE STACK

STACKS SHALL BE REQUIRED WHERE THE TOP OF THE SEWER MAIN IS AT A DEPTH OF EIGHT FEET (8') OR GREATER, HOWEVER, WHERE STACKS ARE REQUIRED, THEY SHALL BE SHOWN ON THE PLANS, AS DIRECTED BY THE ENGINEER, BASED ON ELEVATIONS OF THE SEWER MAIN, STREETS, NATURAL GROUND AND BUILDING TO BE SERVICED

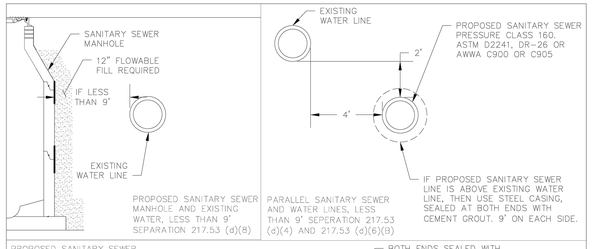
VERTICAL STACK DETAIL



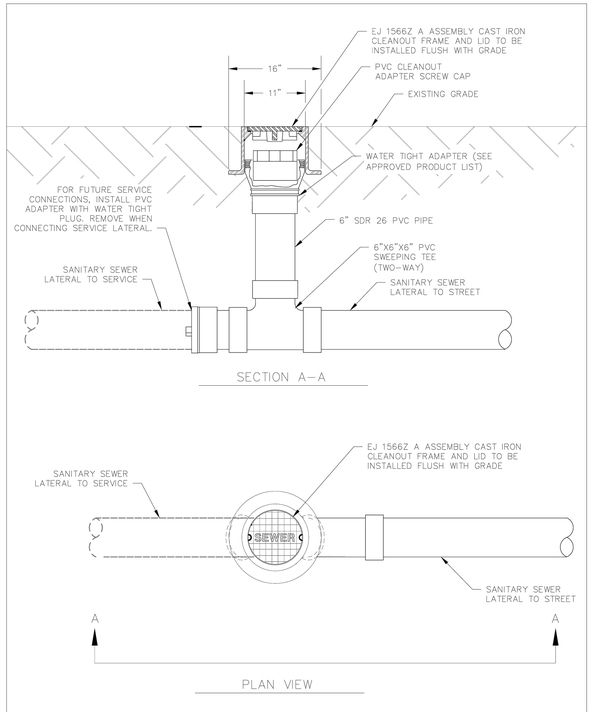
NOTE:
CONCRETE ENCASEMENT TO BE 2" PAST JOINT OF WYE

SECTION A-A

SAN ANTONIO RIVER AUTHORITY	VERTICAL STACK DETAIL	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-16	SHEET 26 OF 28



SAN ANTONIO RIVER AUTHORITY	TCEQ WASTEWATER SEPARATION REQUIREMENTS	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-31-00-17	SHEET 27 OF 28



SAN ANTONIO RIVER AUTHORITY	STANDARD CLEANOUT DETAIL	APPROVED	REVISED
		APRIL 2012	MAY 2024
		SD 33-05-61-01	SHEET 28 OF 28

ROSE VALLEY SOUTH - UNIT 1
SAN ANTONIO RIVER AUTHORITY - SEWER DETAILS
BEXAR COUNTY, TEXAS

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105240
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/16/2025

BY	DESCRIPTION	DATE	REV

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C3.14
PLAT NO: CP202412

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Date: Oct 16, 2025, 5:30pm User ID: CAD1-2022
File: N:\Projects\2023\23-3159G SARA Abbott Rd Lennar\Civil\23-3159G SARA SEWER DETAILS AND NOTES.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/16/2025

NOTE:
CONTRACTOR SHALL BEGIN MEASURES TO ESTABLISH VEGETATION IMMEDIATELY AFTER CONSTRUCTION OF EARTHEN DRAIN SECTIONS, BAR DITCHES AND DETENTION PONDS TO MITIGATE CHANNEL EROSION. CONTRACTOR SHALL USE HYDRO-MULCH SEEDING, SOD LINING, OR OTHER APPROVED METHODS.

GENERAL NOTES:
1. CONTRACTOR IS RESPONSIBLE FOR LOCATING ALL UNDERGROUND CABLES AND UTILITIES PRIOR TO EXCAVATION. CONTRACTOR IS ALSO RESPONSIBLE FOR ANY DAMAGE TO THE EXISTING UTILITIES.
2. LOCATION OF ALL EXISTING UTILITIES IS BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES.

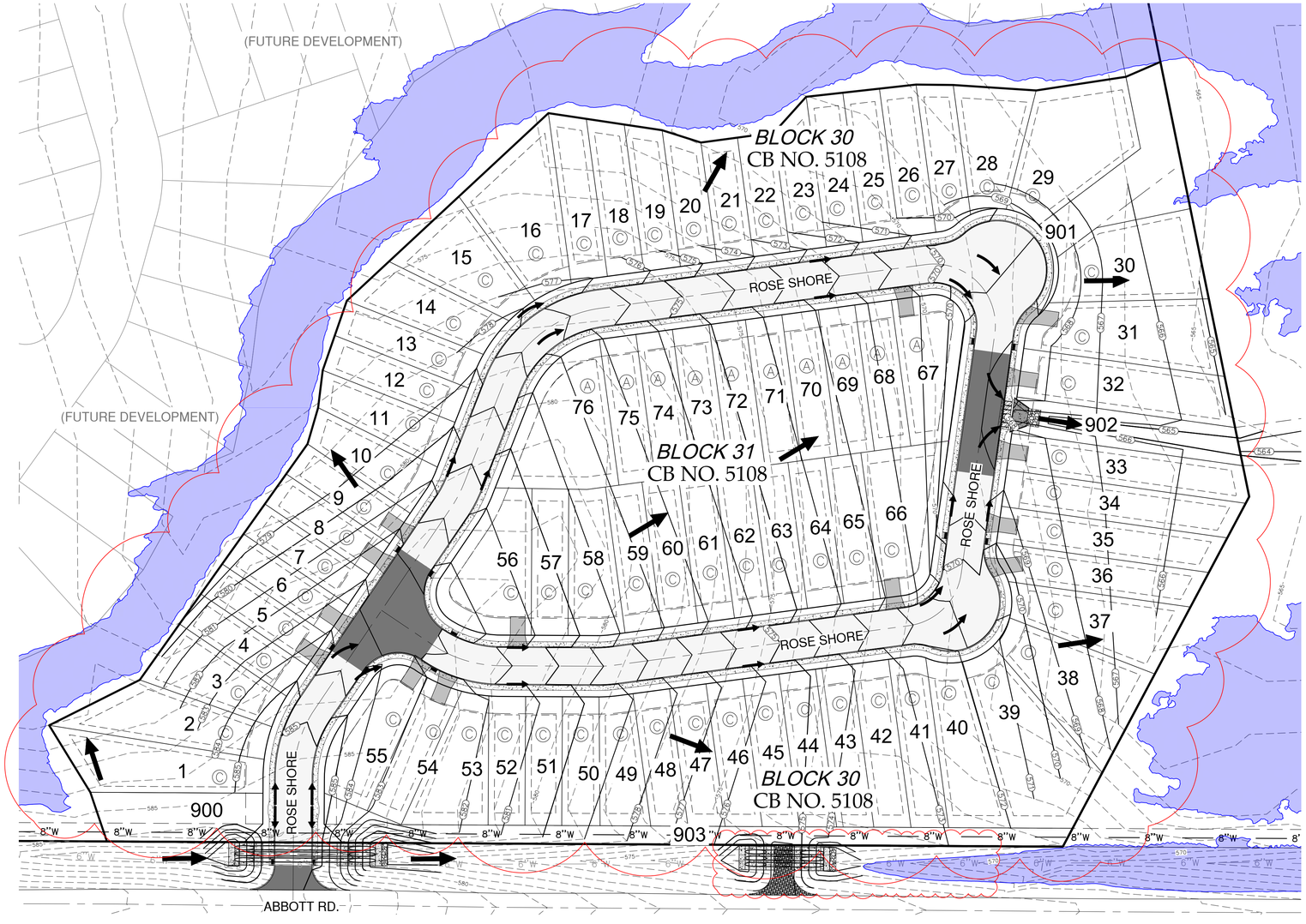
FILL COMPACTION NOTE:

FILL MATERIAL REQUIRED TO ACHIEVE SPECIFIED GRADES FOR DETENTION POND EMBANKMENT, DRAINAGE CHANNEL EMBANKMENT AND/OR BAR DITCH EMBANKMENT SHALL BE COMPACTED IN PLACE IN 6" LIFTS AT 95% MAXIMUM DENSITY.

FILL MATERIAL UTILIZED TO DRESS AND FINISH GRADE LOTS SHALL BE PLACED IN 12" LIFTS AT 90% MAXIMUM DENSITY.

GRADING NOTES:
1. ALL MATERIALS AND PROCEDURES WITHIN THIS SCOPE OF WORK WHERE NOTE SPECIFICALLY COVERED IN THE SPECIFICATIONS OR GEOTECHNICAL REPORT SHALL CONFORM TO ALL APPLICABLE CITY, COUNTY, AND TXDOT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION.
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 CONTOUR SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVING, BASE, GRASS, TOPSOIL, AND MULCH IS TO 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 ARCHITECTS PLAN IF APPLICABLE. AT A MINIMUM, CONTRACTOR SHALL HYDROMULCH DISTURBED AREAS AND SOD DRAINAGE SWALES.
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 WASHED OFFSITE OR INTO EXISTING DRAINAGE SYSTEMS. (SEE SWPPP PLANS & TPDES BOOK).
11. THE CONTRACTOR SHALL OBTAIN GRADES SHOWN HEREON WITHIN +/- ONE-TENTH FOOT (0.10').
12. IN PROPOSED PAVING AREAS, IT IS INTENDED THAT THE MINIMUM GRADE IS 1%. ALL EARTHEN SLOPES SHALL BE A MAXIMUM OF 3:1 AND A MINIMUM OF 1% UNLESS SHOWN OTHERWISE.
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 OF ANY DAMAGE DONE TO EXISTING TREES, BUILDING, UTILITIES, FENCES, PAVEMENT, CURBS, OR DRIVEWAYS. (NO SEPARATE PAY ITEMS)
15. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING NEAR UTILITIES, GAS LINES, SEWER, OR EXISTING APPURTENANCES. PRIOR TO PERFORMING ANY EXCAVATION, THE 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 THE 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 THE SCOPE OF THE PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM BUILDING FOUNDATIONS. THE 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 PROPER PERMIT.
20. CONTRACTOR IS CAUTIONED THAT ROCK BOULDERS MAY BE ENCOUNTERED AS EXPERIENCED ON OTHER PROJECTS IN THE AREA AND CONTRACTOR IS RESPONSIBLE FOR EXCAVATION/REMOVAL AT THEIR EXPENSE.

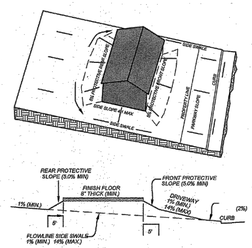
BEXAR COUNTY R.O.W. NOTE:
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN THE BEXAR COUNTY R.O.W.



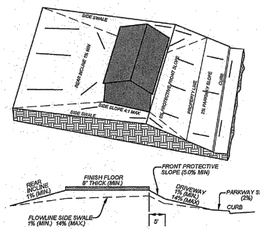
50 0 50 100
SCALE OF FEET
1" = 50'

LEGEND

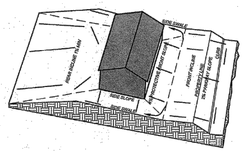
- PROPERTY BOUNDARY
- SITE LINE
- ROAD CENTERLINE
- EXISTING 1' CONTOUR
- 650 PROPOSED 1' CONTOUR
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- WASHOUT CROWN
- A B C LOT GRADE TYPE
- FLOW DIRECTION ARROW
- 476.86 PC PROPOSED GRADING SPOT ELEVATION



TYPE 'A' LOT GRADING



TYPE 'B' LOT GRADING



TYPE 'C' LOT GRADING

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
OVERALL GRADING PLAN
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/9/2025
F-9155

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS AND UPDATED GRADING ADJUSTED BOUNDARY FOR UPDATED FLOODPLAIN LIMITS	SGL

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C4.0
PLAT NO: CP202412

Date: Oct 09, 2025, 4:41pm User ID: CAD1-2022
File: N:\Projects\2023\23-3159\Abbott Rd\Lennar\Civil\23-3159O Overall Grading Plan.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

GENERAL NOTES:

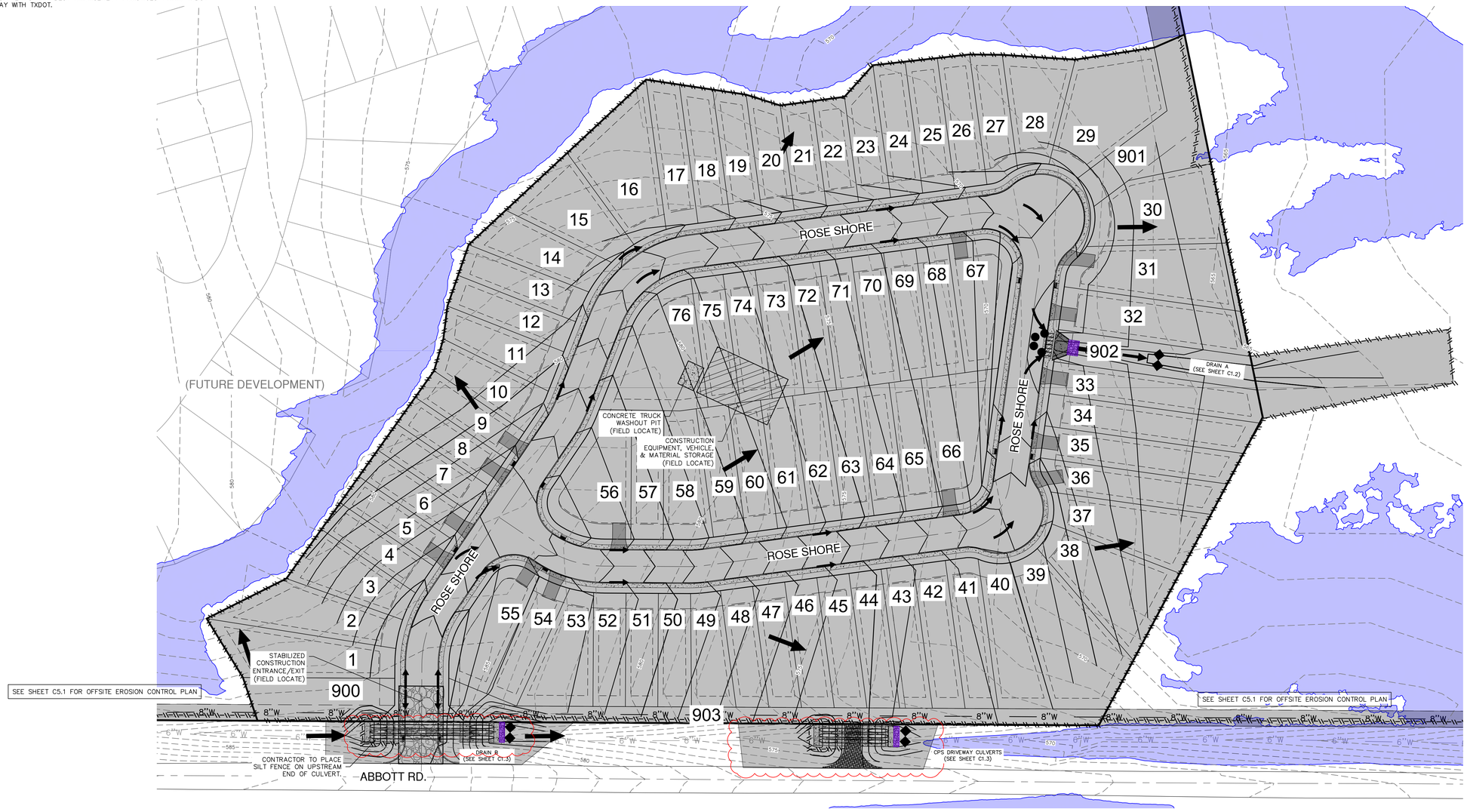
1. DO NOT DISTURB VEGETATED AREAS (TREES, GRASS, WEEDS, BRUSH, ETC.) ANY MORE THAN NECESSARY FOR CONSTRUCTION.
2. CONSTRUCTION ENTRANCE/EXIT LOCATION, CONCRETE WASH-OUT PIT, AND CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD TO BE DETERMINED IN THE FIELD.
3. STORM WATER POLLUTION PREVENTION CONTROLS 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. STORM WATER POLLUTION PREVENTION STRUCTURES SHOULD BE CONSTRUCTED WITHIN THE SITE BOUNDARIES. SOME OF THESE FEATURES MAY BE SHOWN OUTSIDE THE SITE BOUNDARIES FOR VISUAL CLARITY.
7. AS SOON AS PRACTICAL, ALL DISTURBED SOIL THAT WILL NOT BE COVERED BY IMPERVIOUS COVER SUCH AS PARKWAY AREAS, EASEMENTS, EMBANKMENT SLOPES, ETC WILL BE STABILIZED PER APPLICABLE PROJECT SPECIFICATIONS.
8. BEST MANAGEMENT PRACTICES MAY BE INSTALLED IN STAGES TO COINCIDE WITH THE DISTURBANCE OF UPGRADIENT AREAS.
9. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN STAGED ONCE THE WATERSHED FOR THAT PORTION CONTROLLED BY THE BEST MANAGEMENT PRACTICES HAS BEEN STABILIZED IN ACCORDANCE WITH TPDES REQUIREMENTS.
10. 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.
11. 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.
12. SHADED AREA DENOTED LIMITS OF DISTURBED AREAS. OTHER AREAS WITHIN THE PROJECT LIMITS, WITH THE EXCEPTION OF A CONSTRUCTION EQUIPMENT AND MATERIAL STORAGE YARD, ARE NOT PART OF THIS TPDES STORM WATER POLLUTION PREVENTION PLAN (SWP3) AND WILL NOT BE DISTURBED BY CIVIL CONSTRUCTION ACTIVITIES.
13. PRIOR TO BEGINNING CONSTRUCTION, CONTRACTOR SHALL COORDINATE PLACEMENT OF TEMPORARY BEST MANAGEMENT PRACTICES WITHIN TXDOT RIGHT-OF-WAY WITH TXDOT.

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

FLOODPLAIN STAKING:
1. FLOODPLAIN TO BE STAKED.

BEXAR COUNTY R.O.W. NOTE:
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN THE BEXAR COUNTY R.O.W.

SEE SHEET C5.1 FOR OFFSITE EROSION CONTROL PLAN



50 0 50 100

SCALE OF FEET
1" = 50'

LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- PAVEMENT LIMITS
- CENTERLINE
- FLOODPLAIN
- EXISTING FLOW ARROW
- PROPOSED FLOW ARROW
- SILT FENCE (±14,635 LF)
- ROCK BERM
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIAL STORAGE
- CONCRETE WASH-OUT PIT
- 8"-12" ROCK RUBBLE
- GRAVEL FILTER BAGS
- DISTURBANCE AREA

NOTE: STATE LAW REQUIRES THE SUBMITTAL OF A NOTICE OF INTENT (NOI) TO TCEQ FOR FOR ALL CONSTRUCTION DISTURBANCES GREATER THAN 1 ACRE, AND ADDITIONAL MEASURES FOR PROJECT DISTURBANCES GREATER THAN 5 ACRES. THIS IS THE RESPONSIBILITY OF THE CONTRACTOR.

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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.

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
EROSION CONTROL PLAN
ONSITE
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED FLOODPLAIN STAKING NOTE, ADDITIONAL ROCK BERMS PER COUNTY INSTRUCTION, AND ADJUSTED AREA OF DISTURBANCE TO ACCOUNT FOR CPS DRIVEWAY. UPDATED FLOODPLAIN LIMITS, & DRAIN B UPDATE.	CTA

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C5.0
PLAT NO: CP202412

Date: Oct 09, 2025, 4:41pm User ID: CAD1-2022
File: N:\Projects\2023\23-3159\Abbott Rd\Lennar\Civil\23-3159G Erosion Control Plan.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

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7. AS SOON AS PRACTICAL, ALL DISTURBED SOIL THAT WILL NOT BE COVERED BY IMPERVIOUS COVER SUCH AS PARKWAY AREAS, EASEMENTS, EMBANKMENT SLOPES, ETC WILL BE STABILIZED PER APPLICABLE PROJECT SPECIFICATIONS.
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FLOODPLAIN STAKING:
1. FLOODPLAIN TO BE STAKED.

TYP. WATER DETAIL
NOT TO SCALE

TYP. SEWER DETAIL
NOT TO SCALE

BEXAR COUNTY R.O.W. NOTE:
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN THE BEXAR COUNTY R.O.W.



250 0 250 500
SCALE OF FEET
1" = 250'

LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- PAVEMENT LIMITS
- CENTERLINE
- FLOODPLAIN
- EXISTING FLOW ARROW
- PROPOSED FLOW ARROW
- SILT FENCE (±14,635 LF)
- ROCK BERM
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIAL STORAGE
- CONCRETE WASH-OUT PIT
- 8"-12" ROCK RUBBLE
- GRAVEL FILTER BAGS
- DISTURBANCE AREA

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NOTE:
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RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
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ROSE VALLEY SOUTH - UNIT 1
EROSION CONTROL PLAN
OFFSITE
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/9/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED FLOODPLAIN STAKING NOTE, ADDITIONAL EROSION CONTROL PER COUNTY INSTRUCTION, AND ADJUSTED AREA OF DISTURBANCE TO ACCOUNT FOR CPS DRIVEWAY & DRAIN D UPDATE.	CTA

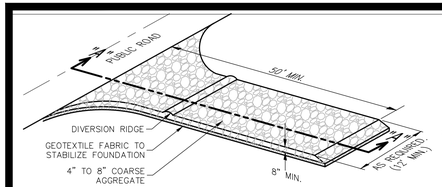
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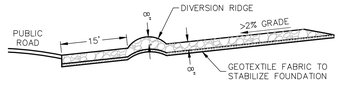
Date: Oct 09, 2025, 4:41pm User ID: CAD1-2022
File: N:\Projects\2023\23-3159G Abbott Rd Lennar\Civil\23-3159G Erosion Control Planning

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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025



SCHEMATIC OF TEMPORARY CONSTRUCTION ENTRANCE/EXIT



SECTION "A-A" OF A CONSTRUCTION ENTRANCE/EXIT

MATERIALS

1. THE AGGREGATE SHOULD CONSIST OF 4–INCH TO 8–INCH WASHED STONE OVER A STABLE FOUNDATION AS SPECIFIED IN THE PLAN.

2. THE AGGREGATE SHOULD BE PLACED WITH A MINIMUM THICKNESS OF 8–INCHES.

3. THE GEOTEXTILE FABRIC SHOULD BE DESIGNED SPECIFICALLY FOR USE AS A SOIL FILTRATION MEDIA WITH AN APPROXIMATE WEIGHT OF 6 OZ/YD^2, A MULLEN BURST RATING OF 140 LB/IN^2, AND AN EQUIVALENT OPENING SIZE GREATER THAN A NUMBER 50 SIEVE.

4. IF A WASHING FACILITY IS REQUIRED, A LEVEL AREA WITH A MINIMUM OF 4–INCH DIAMETER WASHED STONE OR COMMERCIAL ROCK SHOULD BE INCLUDED IN THE PLANS. DIVERT WASTEWATER TO A SEDIMENT TRAP OR BASIN.

INSTALLATION

1. AVOID CURVES ON PUBLIC ROADS AND STEEP SLOPES. REMOVE VEGETATION AND OTHER OBJECTIONABLE MATERIAL FROM THE FOUNDATION AREA. GRADE CROWN FOUNDATION FOR POSITIVE DRAINAGE.

2. THE MINIMUM WIDTH OF THE ENTRANCE/EXIT SHOULD BE 12 FEET OR THE FULL WIDTH OF EXIT ROADWAY, WHICHEVER IS GREATER.

3. THE CONSTRUCTION ENTRANCE SHOULD BE AT LEAST 50 FEET LONG.

4. IF THE SLOPE TOWARD THE ROAD EXCEEDS 2%, CONSTRUCT A RIDGE, 6–INCHES TO 8–INCHES HIGH WITH 3:1 (H:V) SIDE SLOPES, ACROSS THE FOUNDATION APPROXIMATELY 15 FEET FROM THE ENTRANCE TO DIVERT RUNOFF AWAY FROM THE PUBLIC ROAD.

5. PLACE GEOTEXTILE FABRIC AND GRADE FOUNDATION TO IMPROVE STABILITY, ESPECIALLY WHERE WET CONDITIONS ARE ANTICIPATED.

6. PLACE STONE TO DIMENSIONS AND GRADE SHOWN ON PLANS. LEAVE SURFACE SMOOTH AND SLOPE FOR DRAINAGE.

7. DIVERT ALL SURFACE RUNOFF AND DRAINAGE FROM THE STONE PAD TO A SEDIMENT TRAP OR BASIN.

8. INSTALL PIPE UNDER PAD AS NEEDED TO MAINTAIN PROPER PUBLIC ROAD DRAINAGE.

COMMON TROUBLE POINTS

1. INADEQUATE RUNOFF CONTROL–SEDIMENT WASHES ONTO PUBLIC ROAD.

2. STONE TOO SMALL OR GEOTEXTILE FABRIC ABSENT, RESULTS IN MUDDY CONDITION AS STONE IS PRESSED INTO SOIL.

3. PAD TOO SHORT FOR HEAVY CONSTRUCTION TRAFFIC–EXTEND PAD BEYOND THE MINIMUM 50–FOOT LENGTH AS NECESSARY.

4. PAD NOT FLARED SUFFICIENTLY AT ROAD SURFACE, RESULTS IN MUD BEING TRACKED ON TO ROAD AND POSSIBLE DAMAGE TO ROAD.

5. UNSTABLE FOUNDATION – USE GEOTEXTILE FABRIC UNDER PAD AND/OR IMPROVE FOUNDATION DRAINAGE.

INSPECTION AND MAINTENANCE GUIDELINES

1. THE ENTRANCE SHOULD BE MAINTAINED IN A CONDITION, WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS–OF–WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.

2. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS–OF–WAY SHOULD BE REMOVED IMMEDIATELY BY CONTRACTOR.

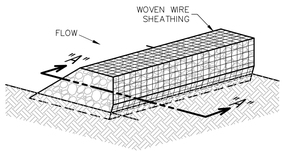
3. WHEN NECESSARY, WHEELS SHOULD BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHT–OF–WAY.

4. WHEN WASHING IS REQUIRED, IT SHOULD BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

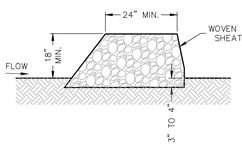
5. ALL SEDIMENT SHOULD BE PREVENTED FROM ENTERING ANY STORM DRAIN, DITCH OR WATER COURSE BY USING APPROVED METHODS.

STABILIZED CONSTRUCTION ENTRANCE/EXIT DETAIL

NOT–TO–SCALE



ISOMETRIC PLAN VIEW



SECTION "A-A"

ROCK BERMS

THE PURPOSE OF A ROCK BERM IS TO SERVE AS A CHECK DAM IN AREAS OF CONCENTRATED FLOW, TO INTERCEPT SEDIMENT–LADEN RUNOFF, DETAIN THE SEDIMENT AND RELEASE THE WATER IN SHEET FLOW. THE ROCK BERM SHOULD BE USED WHEN THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 5 ACRES. ROCK BERMS ARE USED IN AREAS WHERE THE VOLUME OF RUNOFF IS TOO GREAT FOR A SILT FENCE TO CONTAIN. THEY ARE LESS EFFECTIVE FOR SEDIMENT REMOVAL THAN SILT FENCES, PARTICULARLY FOR FINE PARTICLES, BUT ARE ABLE TO WITHSTAND HIGHER FLOWS THAN A SILT FENCE. AS SUCH, ROCK BERMS ARE OFTEN USED IN AREAS OF CHANNEL FLOWS (DITCHES, GULLIES, ETC.). ROCK BERMS ARE MOST EFFECTIVE AT REDUCING BED LOAD IN CHANNELS AND SHOULD NOT BE SUBSTITUTED FOR OTHER EROSION AND SEDIMENT CONTROL MEASURES FARTHER UP THE WATERSHED.

INSPECTION AND MAINTENANCE GUIDELINES

1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE.

2. REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT IN AN APPROVED MANNER THAT WILL NOT CAUSE ANY ADDITIONAL SILTATION.

3. REPAIR ANY LOOSE WIRE SHEATHING.

4. THE BERM SHOULD BE RESHAPED AS NEEDED DURING INSPECTION.

5. THE BERM SHOULD BE REPLACED WHEN THE STRUCTURE CEASES TO FUNCTION AS INTENDED DUE TO SILT ACCUMULATION AMONG THE ROCKS, WASHOUT, CONSTRUCTION TRAFFIC DAMAGE, ETC.

6. THE ROCK BERM SHOULD BE LEFT IN PLACE UNTIL ALL UPSTREAM AREAS ARE STABILIZED AND ACCUMULATED SILT REMOVED.

MATERIALS

1. THE BERM STRUCTURE SHOULD BE SECURED WITH A WOVEN WIRE SHEATHING HAVING MAXIMUM OPENING OF 1 INCH AND A MINIMUM WIRE DIAMETER OF 20 GAUGE GALVANIZED AND SHOULD BE SECURED WITH SHOAT RINGS.

2. CLEAN, OPEN GRADED 3–INCH TO 5–INCH DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5–INCH TO 8–INCH DIAMETER ROCKS MAY BE USED.

INSTALLATION

1. LAY OUT THE WOVEN WIRE SHEATHING PERPENDICULAR TO THE FLOW LINE. THE SHEATHING SHOULD BE 20 GAUGE WOVEN WIRE MESH WITH 1 INCH OPENINGS.

2. BERM SHOULD HAVE A TOP WIDTH OF 2 FEET MINIMUM WITH SIDE SLOPES BEING 2:1 (H:V) OR FLATTER.

3. PLACE THE ROCK ALONG THE SHEATHING AS SHOWN IN THE DIAGRAM TO A HEIGHT NOT LESS THAN 18".

4. WRAP THE WIRE SHEATHING AROUND THE ROCK AND SECURE WITH TIE WIRE SO THAT THE ENDS OF THE SHEATHING OVERLAP AT LEAST 2 INCHES, AND THE BERM RETAINS ITS SHAPE WHEN WALKED UPON.

5. BERM SHOULD BE BUILT ALONG THE CONTOUR AT ZERO PERCENT GRADE OR AS NEAR AS POSSIBLE.

6. THE ENDS OF THE BERM SHOULD BE TIED INTO EXISTING UPSLOPE GRADE AND THE BERM SHOULD BE BURIED IN A TRENCH APPROXIMATELY 3 TO 4 INCHES DEEP TO PREVENT FAILURE OF THE CONTROL.

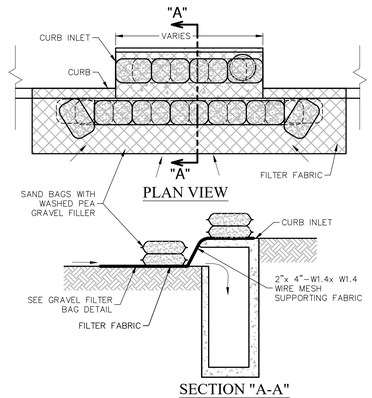
COMMON TROUBLE POINTS

1. INSUFFICIENT BERM HEIGHT OR LENGTH (RUNOFF QUICKLY ESCAPES OVER THE TOP OR AROUND THE SIDES OF BERM).

2. BERM NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND ONE SIDE).

ROCK BERM DETAIL

NOT–TO–SCALE



SECTION "A-A"

GENERAL NOTES

1. CONTRACTOR TO INSTALL 2"x4"–W1.4xW1.4 WIRE MESH SUPPORTING FILTER FABRIC OVER THE INLET OPENING. FABRIC MUST BE SECURED TO WIRE BACKING WITH CLIPS OR WIRE TIES AT THIS LOCATION. SAND BAGS FILLED WITH WASHED PEA GRAVEL SHOULD BE PLACED ON TOP OF WIRE MESH ON TOP OF THE INLET AS SHOWN ON THIS DETAIL TO HOLD WIRE MESH IN PLACE. SANDBAGS FILLED WITH WASHED PEA GRAVEL SHOULD ALSO BE PLACED ALONG THE GUTTER AS SHOWN ON THIS DETAIL TO HOLD WIRE MESH IN PLACE. SAND BAGS TO BE STACKED TO FORM A CONTINUOUS BARRIER AROUND INLETS.

2. THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT RUNOFF FROM FLOWING BETWEEN THE BAGS.

INSPECTION AND MAINTENANCE GUIDELINES

1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.

2. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MANNER THAT IT WILL NOT ERODE.

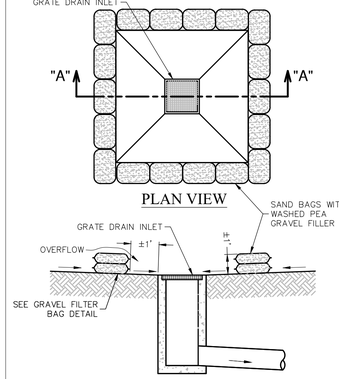
3. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE AND CURB.

4. INSPECT FILTER FABRIC AND PATCH OR REPLACE IF TORN OR MISSING.

5. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

BAGGED GRAVEL CURB INLET PROTECTION DETAIL

NOT–TO–SCALE



SECTION "A-A"

GENERAL NOTES

1. THE SANDBAGS SHOULD BE FILLED WITH WASHED PEA GRAVEL AND STACKED TO FORM A CONTINUOUS BARRIER ABOUT 1 FOOT HIGH AROUND INLETS.

2. THE BAGS SHOULD BE TIGHTLY ABUTTED AGAINST EACH OTHER TO PREVENT RUNOFF FROM FLOWING BETWEEN THE BAGS.

INSPECTION AND MAINTENANCE GUIDELINES

1. INSPECTION SHOULD BE MADE WEEKLY AND AFTER EACH RAINFALL. REPAIR OR REPLACEMENT SHOULD BE MADE PROMPTLY AS NEEDED BY THE CONTRACTOR.

2. REMOVE SEDIMENT WHEN BUILDUP REACHES A DEPTH OF 3 INCHES. REMOVED SEDIMENT SHOULD BE DEPOSITED IN A SUITABLE AREA AND IN SUCH A MATTER THAT IT WILL NOT ERODE.

3. CHECK PLACEMENT OF DEVICE TO PREVENT GAPS BETWEEN DEVICE AND CURB.

4. INSPECT FILTER FABRIC AND PATCH OR REPLACE IF TORN OR MISSING.

5. STRUCTURES SHOULD BE REMOVED AND THE AREA STABILIZED ONLY AFTER THE REMAINING DRAINAGE AREA HAS BEEN PROPERLY STABILIZED.

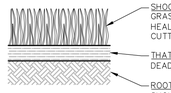
BAGGED GRATE INLET PROTECTION DETAIL

NOT–TO–SCALE

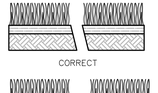


LAY SOD IN A STAGGERED PATTERN. BUTT THE STRIPS TIGHTLY AGAINST EACH OTHER. DO NOT LEAVE SPACES AND DO NOT OVERLAP. A SHARPENED MASON'S TROWEL IS A HANDY TOOL FOR TUCKING DOWN THE ENDS AND TRIMMING PIECES.

BUTTING – ANGLED ENDS CAUSED BY THE AUTOMATIC SOD CUTTER MUST BE MATCHED CORRECTLY.



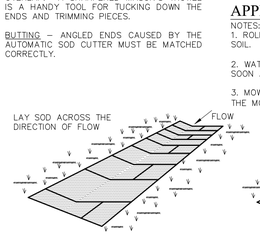
APPEARANCE OF GOOD SOD

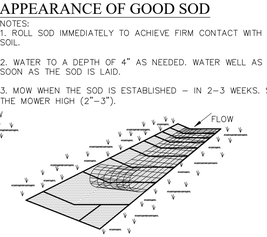


NOTES:
1. ROLL SOD IMMEDIATELY TO ACHIEVE FIRM CONTACT WITH THE SOIL.

2. WATER TO A DEPTH OF 4" AS NEEDED. WATER WELL AS SOON AS THE SOD IS LAID.

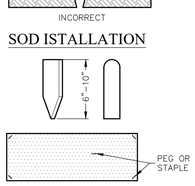
3. MOW WHEN THE SOD IS ESTABLISHED – IN 2–3 WEEKS. SET THE MOWER HIGH (2"–3").





IN CRITICAL AREAS, SECURE SOD WITH NETTING. USE STAPLES.

SOD ISTALLATION



USE PEGS OR STAPLES TO FASTEN SOD FIRMLY – AT THE ENDS OF STRIPS AND IN THE CENTER, OR EVERY 3–4 FEET IF THE STRIPS ARE LONG. WHEN READY TO MOW, DRIVE PEGS OR STAPLES FLUSH WITH THE GROUND.

MATERIALS

1. SOD SHOULD BE MACHINE CUT AT A UNIFORM SOIL THICKNESS OF 3/4" INCH (± 1/4" INCH) AT THE TIME OF CUTTING. THIS THICKNESS SHOULD EXCLUDE SHOOT GROWTH AND THATCH.

2. PIECES OF SOD SHOULD BE CUT TO THE SUPPLIER'S STANDARD WIDTH AND LENGTH, WITH A MAXIMUM ALLOWABLE DEVIATION IN ANY DIMENSION OF 5%. TORN OR UNEVEN PADS SHOULD NOT BE ACCEPTABLE.

3. STANDARD SIZE SECTIONS OF SOD SHOULD BE STRONG ENOUGH TO SUPPORT THEIR OWN WEIGHT AND RETAIN THEIR SIZE AND SHAPE WHEN SUSPENDED FROM A FIRM GRASP ON ONE END OF THE SECTION.

4. SOD SHOULD BE HARVESTED, DELIVERED, AND INSTALLED WITHIN A PERIOD OF 36 HOURS.

SITE PREPARATION

1. PRIOR TO SOIL PREPARATION, AREAS TO BE SODDED SHOULD BE BROUGHT TO FINAL GRADE IN ACCORDANCE WITH THE APPROVED PLAN.

2. THE SURFACE SHOULD BE CLEARED OF ALL TRASH, DEBRIS AND OF ALL ROOTS, BRUSH, WIRE, GRADE STAKES AND OTHER OBJECTS THAT WOULD INTERFERE WITH PLANTING, FERTILIZING OR MAINTENANCE OPERATIONS.

3. FERTILIZE ACCORDING TO SOIL TESTS. FERTILIZER NEEDS CAN BE DETERMINED BY A SOIL TESTING LABORATORY OR REGIONAL RECOMMENDATIONS CAN BE MADE BY COUNTY AGRICULTURAL EXTENSION AGENTS. FERTILIZER SHOULD BE WORKED INTO THE SOIL TO A DEPTH OF 3 INCHES WITH A DISC, SPRINGTOOTH HARROW OR OTHER SUITABLE EQUIPMENT. ON SLOPING LAND, THE FINAL HARROWING OR DISCING OPERATION SHOULD BE ON THE CONTOUR.

INSTALLATION IN CHANNELS

1. SOD STRIPS IN WATERWAYS SHOULD BE LAID PERPENDICULAR TO THE DIRECTION OF FLOW. CARE SHOULD BE TAKEN TO BUTT ENDS OF STRIPS TIGHTLY (SEE FIGURE ABOVE).

2. AFTER ROLLING OR TAMPING, SOD SHOULD BE PEGGED OR STAPLED TO RESIST WASHOUT DURING THE ESTABLISHMENT PERIOD. MESH OR OTHER NETTING MAY BE PEGGED OVER THE SOD FOR EXTRA PROTECTION IN CRITICAL AREAS.

GENERAL INSTALLATION (VA. DEPT. OF CONSERVATION, 1992)

1. SOD SHOULD NOT BE CUT OR LAID IN EXCESSIVELY WET OR DRY WEATHER. SOD ALSO SHOULD NOT BE LAID ON SOIL SURFACES THAT ARE FROZEN.

2. DURING PERIODS OF HIGH TEMPERATURE, THE SOIL SHOULD BE LIGHTLY IRRIGATED IMMEDIATELY PRIOR TO LAYING THE SOD, TO COOL THE SOIL AND REDUCE ROOT BURNING AND DIEBACK.

3. THE FIRST ROW OF SOD SHOULD BE LAID IN A STRAIGHT LINE WITH SUBSEQUENT ROWS PLACED PARALLEL TO AND BUTTING TIGHTLY AGAINST EACH OTHER. LATERAL JOINTS SHOULD BE STAGGERED TO PROMOTE MORE UNIFORM GROWTH AND STRENGTH. CARE SHOULD BE EXERCISED TO ENSURE THAT SOD IS NOT STRETCHED OR OVERLAPPED AND THAT ALL JOINTS ARE BUTTED TIGHT IN ORDER TO PREVENT VOIDS WHICH WOULD CAUSE DRYING OF THE ROOTS (SEE FIGURE ABOVE).

4. ON SLOPES 3:1 OR GREATER, OR WHEREVER EROSION MAY BE A PROBLEM, SOD SHOULD BE LAID WITH STAGGERED JOINTS AND SECURED BY STAPLING OR OTHER APPROVED METHODS. SOD SHOULD BE INSTALLED WITH THE LENGTH PERPENDICULAR TO THE SLOPE (ON CONTOUR).

5. AS SODDING OF CLEARLY DEFINED AREAS IS COMPLETED, SOD SHOULD BE ROLLED OR TAMPED TO PROVIDE FIRM CONTACT BETWEEN ROOTS AND SOIL.

6. AFTER ROLLING, SOD SHOULD BE IRRIGATED TO A DEPTH SUFFICIENT THAT THE UNDERSIDE OF THE SOD PAD AND THE SOIL 4 INCHES BELOW THE SOD IS THOROUGHLY WET.

7. UNTIL SUCH TIME A GOOD ROOT SYSTEM BECOMES DEVELOPED, IN THE ABSENCE OF ADEQUATE RAINFALL, WATERING SHOULD BE PERFORMED AS OFTEN AS NECESSARY TO MAINTAIN MOIST SOIL TO A DEPTH OF AT LEAST 4 INCHES.

8. THE FIRST MOWING SHOULD NOT BE ATTEMPTED UNTIL THE SOD IS FIRMLY ROOTED, USUALLY 2–3 WEEKS. NOT MORE THAN ONE THIRD OF THE GRASS LEAF SHOULD BE REMOVED AT ANY ONE CUTTING.

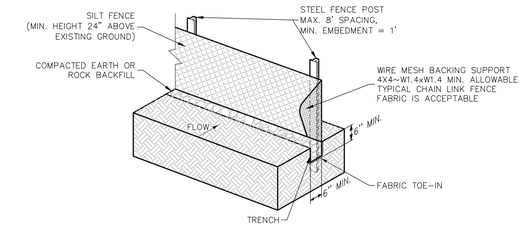
INSPECTION AND MAINTENANCE GUIDELINES

1. SOD SHOULD BE INSPECTED WEEKLY AND AFTER EACH RAIN EVENT TO LOCATE AND REPAIR ANY DAMAGE.

2. DAMAGE FROM STORMS OR NORMAL CONSTRUCTION ACTIVITIES SUCH AS TIRE RUTS OR DISTURBANCE OF SWALE STABILIZATION SHOULD BE REPAIRED AS SOON AS PRACTICAL.

SOD INSTALLATION DETAIL

NOT–TO–SCALE



ISOMETRIC PLAN VIEW

SILT FENCE

A SILT FENCE IS A BARRIER CONSISTING OF GEOTEXTILE FABRIC SUPPORTED BY METAL POSTS TO PREVENT SOIL AND SEDIMENT LOSS FROM A SITE. WHEN PROPERLY USED, SILT FENCES CAN BE HIGHLY EFFECTIVE AT CONTROLLING SEDIMENT FROM DISTURBED AREAS. THEY CAUSE RUNOFF TO POND, ALLOWING HEAVIER SOLIDS TO SETTLE OUT. IF NOT PROPERLY INSTALLED, SILT FENCES ARE NOT LIKELY TO BE EFFECTIVE.

THE PURPOSE OF A SILT FENCE IS TO INTERCEPT AND DETAIN WATER–BORN SEDIMENT FROM UNPROTECTED AREAS OF A LIMITED EXTENT. SILT FENCE IS USED DURING THE PERIOD OF CONSTRUCTION NEAR THE PERIMETER OF A DISTURBED AREA TO INTERCEPT SEDIMENT WHILE ALLOWING WATER TO PERCOLATE THROUGH. THIS FENCE SHOULD REMAIN IN PLACE UNTIL THE DISTURBED AREA IS PERMANENTLY STABILIZED. SILT FENCE SHOULD NOT BE USED WHERE THERE IS A CONCENTRATION OF WATER IN A CHANNEL OR DRAINAGE WAY. IF CONCENTRATED FLOW OCCURS AFTER INSTALLATION, CORRECTIVE ACTION MUST BE TAKEN SUCH AS PLACING A ROCK BERM IN THE AREAS OF CONCENTRATED FLOW.

SILT FENCING WITHIN THE SITE MAY BE TEMPORARILY MOVED DURING THE DAY TO ALLOW CONSTRUCTION ACTIVITY PROVIDED IT IS REPLACED AND PROPERLY ANCHORED TO THE GROUND AT THE END OF THE DAY. SILT FENCES ON THE PERIMETER OF THE SITE OR AROUND DRAINAGE WAYS SHOULD NOT BE MOVED AT ANY TIME.

MATERIALS

1. SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE, OR POLYAMIDE WOVEN OR NON–WOVEN FABRIC. THE FABRIC SHOULD BE 36 INCHES, WITH A MINIMUM UNIT WEIGHT OF 4.5 OZ/YD, MULLEN BURST STRENGTH EXCEEDING 190 LB/IN2, ULTRAVIOLET STABILITY EXCEEDING 70%, AND MINIMUM APPARENT OPENING SIZE OF U.S. SIEVE NUMBER 30.

2. FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR Y–BAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM WEIGHT 1.25 LB/FT, AND BRINDELL HARDNESS EXCEEDING 140.

3. WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.

INSTALLATION

1. STEEL POSTS, WHICH SUPPORT THE SILT FENCE, SHOULD BE INSTALLED ON A SLIGHT ANGLE TOWARD THE ANTICIPATED RUNOFF SOURCE. POSTS MUST BE EMBEDDED A MINIMUM OF 1–FOOT DEEP AND SPACED NOT MORE THAN 8 FEET ON CENTER. WHERE WATER CONCENTRATES, THE MAXIMUM SPACING SHOULD BE 6 FEET.

2. LAY OUT FENCING DOWN–SLOPE OF DISTURBED AREA, FOLLOWING THE CONTOUR AS CLOSELY AS POSSIBLE. THE FENCE SHOULD BE SITED SO THAT THE MAXIMUM DRAINAGE AREA IS ¼ ACRE/100 FEET OF FENCE.

3. THE TOE OF THE SILT FENCE SHOULD BE TRENCHED IN WITH A SPADE OR MECHANICAL TRENCHER, SO THAT THE DOWN–SLOPE FACE OF THE TRENCH IS FLAT AND PERPENDICULAR TO THE LINE OF FLOW. WHERE FENCE CANNOT BE TRENCHED IN (E.G., PAVEMENT OR ROCK OUTCROP), WEIGHT FABRIC FLAP WITH 3 INCHES OF PEA GRAVEL ON UPHILL SIDE TO PREVENT FLOW FROM SEEPING UNDER FENCE.

4. THE TRENCH MUST BE A MINIMUM OF 6 INCHES DEEP AND 6 INCHES WIDE TO ALLOW FOR THE SILT FENCE FABRIC TO BE LAID IN THE GROUND AND BACKFILLED WITH COMPACTED MATERIAL.

5. SILT FENCE SHOULD BE SECURELY FASTENED TO EACH STEEL SUPPORT POST OR TO WOVEN WIRE, WHICH IS IN TURN ATTACHED TO THE STEEL FENCE POST. THERE SHOULD BE A 3–FOOT OVERLAP, SECURELY FASTENED WHERE ENDS OF FABRIC MEET.

6. SILT FENCE SHOULD BE REMOVED WHEN THE SITE IS COMPLETELY STABILIZED SO AS NOT TO BLOCK OR IMPEDE STORM FLOW OR DRAINAGE.

COMMON TROUBLE POINTS

1. FENCE NOT INSTALLED ALONG THE CONTOUR CAUSING WATER TO CONCENTRATE AND FLOW OVER THE FENCE.

2. FABRIC NOT SEATED SECURELY TO GROUND (RUNOFF PASSING UNDER FENCE).

3. FENCE NOT INSTALLED PERPENDICULAR TO FLOW LINE (RUNOFF ESCAPING AROUND SIDES).

4. FENCE TREATING TOO LARGE AN AREA, OR EXCESSIVE CHANNEL FLOW (RUNOFF OVERTOPS OR COLLAPSES FENCE).

INSPECTION AND MAINTENANCE GUIDELINES

1. INSPECT ALL FENCING WEEKLY, AND AFTER RAINFALL.

2. REMOVE SEDIMENT WHEN BUILDUP REACHES 6 INCHES.

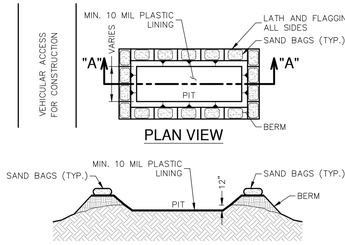
3. REPLACE TORN FABRIC OR INSTALL A SECOND LINE OF FENCING PARALLEL TO THE TORN SECTION.

4. REPLACE OR REPAIR SECTIONS CRUSHED OR COLLAPSED IN THE COURSE OF CONSTRUCTION ACTIVITY. IF A SECTION OF FENCE IS OBSTRUCTING VEHICULAR ACCESS, CONSIDER RELOCATING IT TO A SPOT WHERE IT WILL PROVIDE EQUAL PROTECTION, BUT WILL NOT OBSTRUCT VEHICLES. A TRIANGULAR FILTER DIKE MAY BE PREFERABLE TO A SILT FENCE AT COMMON VEHICLE ACCESS POINTS.

5. WHEN CONSTRUCTION IS COMPLETE, THE SEDIMENT SHOULD BE DISPOSED OF IN A MANNER THAT WILL NOT CAUSE ADDITIONAL SILTATION AND THE PRIOR LOCATION OF THE SILT FENCE SHOULD BE REVEGETATED. THE FENCE ITSELF SHOULD BE DISPOSED OF IN AN APPROVED LANDFILL.

SILT FENCE DETAIL

NOT–TO–SCALE



SECTION "A-A"

GENERAL NOTES

1. DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.

2. WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.

3. WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORM WATER RUNOFF.

4. LOCATE WASHOUT AREA AT LEAST 50 FEET FROM SENSITIVE FEATURES, STORM DRAINS, OPEN DITCHES OR WATER BODIES.

5. TEMPORARY CONCRETE WASHOUT FACILITY SHOULD BE CONSTRUCTED WITH SUFFICIENT QUANTITY AND VOLUME TO CONTAIN ALL LIQUID AND CONCRETE WASTE GENERATED BY WASHOUT OPERATIONS.

MATERIALS

PLASTIC LINING MATERIAL SHOULD BE A MINIMUM OF 10 MIL IN POLYETHYLENE SHEETING AND SHOULD BE FREE OF HOLES, TEARS, OR OTHER DEFECTS THAT COMPROMISE THE IMPERMEABILITY OF THE MATERIAL.

MAINTENANCE

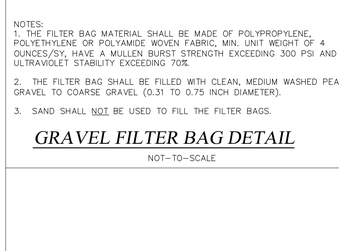
1. WHEN TEMPORARY CONCRETE WASHOUT FACILITIES ARE NO LONGER REQUIRED FOR THE WORK, THE HARDENED CONCRETE SHOULD BE REMOVED AND DISPOSED OF.

2. MATERIALS USED TO CONSTRUCT TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE REMOVED FROM THE SITE OF THE WORK AND DISPOSED OF.

3. HOLES, DEPRESSIONS OR OTHER GROUND DISTURBANCES CAUSED BY THE REMOVAL OF THE TEMPORARY CONCRETE WASHOUT FACILITIES SHOULD BE BACKFILLED AND REPAIRED.

CONCRETE TRUCK WASHOUT PIT DETAIL

NOT–TO–SCALE



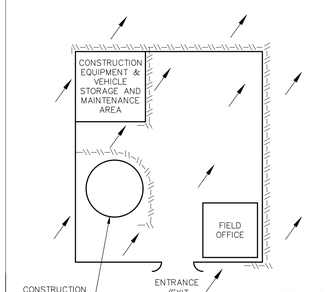
NOTES:
1. THE FILTER BAG MATERIAL SHALL BE MADE OF POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN FABRIC, MIN. UNIT WEIGHT OF 4 OUNCES/SY, HAVE A MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRAVIOLET STABILITY EXCEEDING 70%.

2. THE FILTER BAG SHALL BE FILLED WITH CLEAN, MEDIUM WASHED PEA GRAVEL TO COARSE GRAVEL (0.31 TO 0.75 INCH DIAMETER).

3. SAND SHALL NOT BE USED TO FILL THE FILTER BAGS.

GRAVEL FILTER BAG DETAIL

NOT–TO–SCALE



CONSTRUCTION STAGING AREA

NOT–TO–SCALE

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Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
EROSION CONTROL PLAN
DETAILS

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C5.2
PLAT NO: CP202412

Date: Oct 09, 2025, 4:41pm User ID: CAD1.2022
File: N:\Projects\2023\23-3159G Abbott Rd Lennar\Civil\23-3159G Erosion Control Plan.dwg

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(FUTURE DEVELOPMENT)

BLOCK 30
CB NO. 5108

BLOCK 31
CB NO. 5108

BLOCK 30
CB NO. 5108

ROSE SHORE 50' ROW

ROSE SHORE 50' ROW

ROSE SHORE 50' ROW

ROSE SHORE 50' ROW

ABBOTT ROAD
MIN. 86' ROW

16 17 18 19 20 21 22 23 24 25 26 27 28 29 901

15 14 13 12 11 10 9 8 7 6 5 4 3 2 1 900

76 75 74 73 72 71 70 69 68 67

56 57 58 59 60 61 62 63 64 65 66

55 54 53 52 51 50 49 48 47 46 45 44 43 42 41 40 39 38 37 36 35 34 33 902 32 31 30 903

5' X 5' PASSING SPACE

5' X 5' PASSING SPACES

STOP
Rose Shore
Rose Shore

CONTRACTOR TO FURNISH & INSTALL "STOP SIGN"& "ROAD NAME" SIGNS. LOCATE NO LESS THAN 6' FROM FACE OF CURB TO SIGN EDGE & 7' IN HEIGHT ABOVE ROAD GRADE.

W14-2A, 36" x 9"
531.60
NO OUTLET
STOP R1-30, 30" X 30"
531.3
Rose Shore
Abbott Rd

CONTRACTOR TO FURNISH & INSTALL "STOP SIGN", "ROAD NAME", & "NO OUTLET ->" SIGNS. LOCATE NO LESS THAN 6' FROM FACE OF CURB TO SIGN EDGE & 7' IN HEIGHT ABOVE ROAD GRADE.

SPEED LIMIT 30
R2-1, 24" X 30"
531.6

CONTRACTOR TO FURNISH & INSTALL "SPEED LIMIT 30" SIGN. LOCATE NO LESS THAN 8' FROM EDGE OF PAVEMENT TO SIGN EDGE & 7' IN HEIGHT ABOVE ROAD GRADE.

CONTRACTOR TO REMOVE ~70' OF DOUBLE YELLOW LINE STRIPING IN FRONT OF THE PROPOSED ROSE SHORE DRIVEWAY.

DRAIN A
(SEE SHEET C1.2)

DRAIN B
(SEE SHEET C1.3)

CPS DRIVEWAY CULVERTS
(SEE SHEET C1.3)

ST HEDWIG ETJ (N)
ST HEDWIG CITY LIMITS (N)

40 0 40 80
SCALE OF FEET
1" = 40'

LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- PAVEMENT LIMITS
- CENTERLINE
- STOP — STOP SIGN R1-1, 30" X 30" 531.3
- SPEED LIMIT 30 — SPEED LIMIT 30 SIGN R2-1, 24" X 30" 531.6
- Street Name — STANDARD COUNTY STREET NAME SIGN D3-4T 531.57
- NO OUTLET → — NO OUTLET SIGN WITH ARROW, 36" X 9" W14-2A 531.60
- TYPE II BLUE RAISED PAVEMENT MARKER
- FIRE HYDRANT
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- WASHOUT CROWN
- SIDEWALK TO BE CONSTRUCTED BY DEVELOPER

BEXAR COUNTY R.O.W. NOTE
A BEXAR COUNTY R.O.W. PERMIT MUST BE OBTAINED PRIOR TO WORKING WITHIN EXISTING BEXAR COUNTY R.O.W.

SIGNAGE NOTES:

1. CONTACT BEXAR COUNTY PUBLIC WORKS / 9-1-1-ADDRESSING FOR APPROVAL OF SIGNAGE.
2. UNDERGROUND UTILITIES EXIST WITHIN THE PROJECT. CONTRACTOR SHALL HAVE THE UTILITIES MARKED PRIOR TO INSTALLATION OF THE SIGN POSTS. 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.
3. IN ACCORDANCE WITH THE UNDERGROUND FACILITY DAMAGE PREVENTION ACT, THE TELEPHONE NUMBER FOR A UTILITY LOCATOR IS 1-800-344-8377. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAKE ARRANGEMENTS FOR UTILITY LOCATORS, AS NEEDED.
4. WHEN PREPARING HOLES FOR POSTS, CARE SHALL BE TAKEN SO AS NOT TO RUPTURE EXISTING DRAINAGE STRUCTURES, TELECOMMUNICATION FACILITIES, ELECTRICAL CONDUITS, & PUBLIC UTILITIES.
5. ALL SIGNS SHALL COMPLY WITH THE SIGN DESIGNS PRESENTED IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
6. LOCATIONS ILLUSTRATED ON THE PLANS ARE APPROXIMATE. PLACEMENT OF SIGNS SHALL BE AT PROPERTY LINES AND SHALL BE LOCATED IN THE FIELD TO PROVIDE APPROPRIATE FUNCTIONALITY. SIGN LOCATIONS SHALL COMPLY WITH THE GUIDELINES AND REQUIREMENTS PRESENTED IN THE TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES.
7. 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.
8. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS PROJECT SHALL CONFORM TO APPLICABLE CITY AND COUNTY STANDARDS FOR PUBLIC WORKS CONSTRUCTION, TXDOT SPECIFICATIONS AS WELL AS PROVISIONS APPLICABLE TO THE PROJECT AND AS OTHER SAFETY CODES AND INSPECTION REQUIREMENTS OF THE FIRE DEPARTMENT.
9. MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE NEW, UN-DEPRECIATED STOCK. ALL EQUIPMENT SHALL BE NEW, UNLESS NOTED OTHERWISE ON THE PLANS.
10. CONTRACTOR SHALL FURNISH AND INSTALL ALL PERMANENT SIGNS ILLUSTRATED ON THE PLANS. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY HARDWARE FOR MOUNTING. ALL SIGNS WITH A WHITE BACKGROUND SHALL BE FABRICATED WITH ENGINEER GRADE REFLECTIVE SHEETING (TXDOT TYPE A). ALL SIGNS WITH NON-WHITE BACKGROUNDS SHALL BE FABRICATED WITH HIGH SPECIFIC INTENSITY REFLECTIVE SHEETING (TXDOT TYPE C).
11. CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ORIGINAL CONDITION, OR BETTER, ANY DAMAGE DONE TO EXISTING UTILITIES, FENCES, DRIVEWAYS, PAVEMENT (NO SEPARATE PAY ITEM). CONTRACTOR SHALL RESTORE CONSTRUCTION AREA TO ORIGINAL CONDITION, OR BETTER, PRIOR TO FINAL INSPECTION.
12. SIGNS SHALL NOT IMPEDE DRAINAGE FLOW. CONTRACTOR TO ADJUST LOCATIONS AS NEEDED OR NOTIFY ENGINEER OF DISCREPANCY.

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Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
SIGNAGE PLAN

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/8/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS BOUNDARY ADJUSTED FOR UPDATED FLOODPLAIN LIMITS	SGL

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

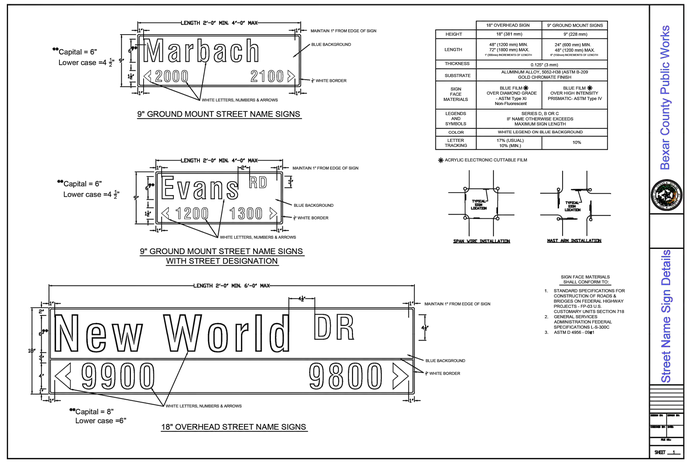
C6.0

PLAT NO: CP202412

Date: Oct 09, 2025, 4:42pm User ID: CAD1.2022
File: N:\Projects\2023\23-3159G Abbott Rd Lennar\Civil\23-3159G SIGNAGE PLAN.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025



	18" OVERHEAD SIGN	9" GROUND MOUNT SIGNS
HEIGHT	18" (381 mm)	9" (228 mm)
LENGTH	48" (1200 mm) MIN. 72" (1800 mm) MAX. (7' (2134m) MAXIMUM PER SIGN)	24" (600 mm) MIN. 48" (1200 mm) MAX. (7' (2134m) MAXIMUM PER SIGN)
THICKNESS	0.125" (3 mm)	
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209 GOLD CHROMATIC FINISH	
SIGN FACE MATERIALS	BLUE FILM ✱ OVER DIAMOND GRADE - ASTM Type XI Non-Fluorescent	BLUE FILM ✱ OVER HIGH INTENSITY PRISMATIC- ASTM Type IV
LEGENDS AND SYMBOLS	SERIES D, E OR C 8" MAX 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:

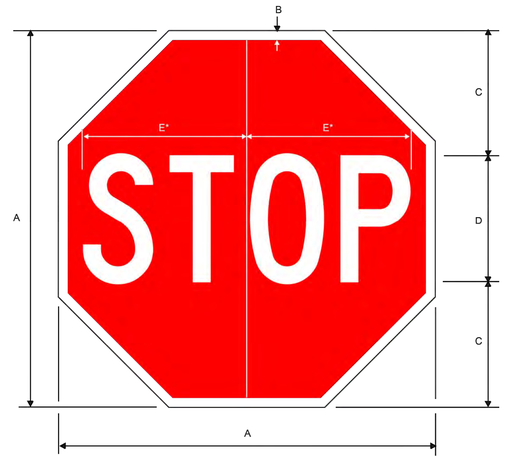
1. STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS & BRIDGES ON FEDERAL HIGHWAY PROJECTS FP-14 CUSTOMARY UNITS SECTION 718
2. GENERAL SERVICES ADMINISTRATION FEDERAL SPECIFICATIONS L-S-300C
3. ASTM D 4956 -15a✱

Bexar County Public Works

Street Name Sign Details

SHEET 1

Standard Highway Sign Designs for Texas



R1-1

* Reduce spacing 40%

A	B	C	D	E
18	.375	6	6C	7.75
30	.75	10	10C	12.5
36	.875	12	12C	15
48	1.25	16	16C	20

COLORS: LEGEND - WHITE
BACKGROUND - RED

March 2017 | 1-1 | 2012 Edition - Revision 2

Standard Highway Sign Designs for Texas



R2-1

* Optically space numerals about centerline.

A	B	C	D	E	F	G	H	J	K	L
18	24	0.375	0.625	3	3 E	2	8 E	7.052	5.491	1.5
24	30	0.375	0.625	4	4 E	2	10 E	9.403	7.321	1.5
30	36	0.5	0.75	4.5	5 E	2.5	12 E	11.754	9.151	1.875
36	48	0.625	0.875	6	6 E	5	14 E	14.105	10.981	2.25
48	60	0.75	1.25	8	8 E	6	16 E	18.806	14.642	3

COLORS: LEGEND - BLACK
BACKGROUND - WHITE

2012 Edition - Revision 2 | 1-10 | March 2017

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Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
SIGNAGE DETAILS

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/9/2025
F-9155

REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

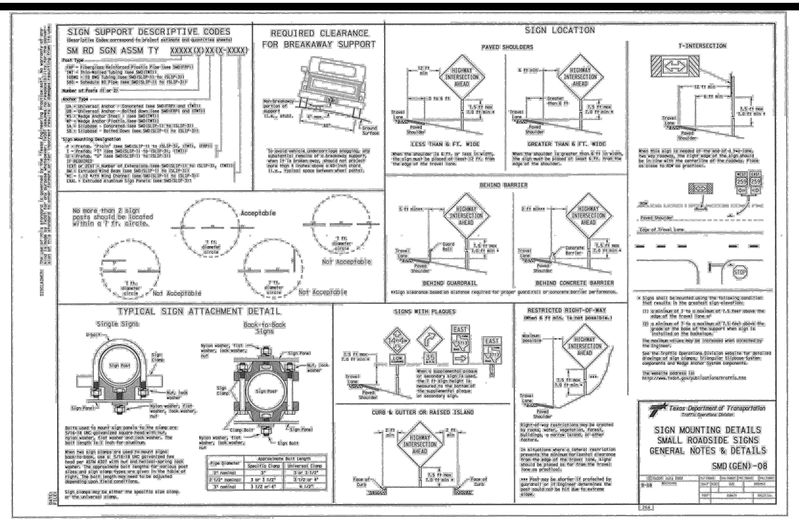
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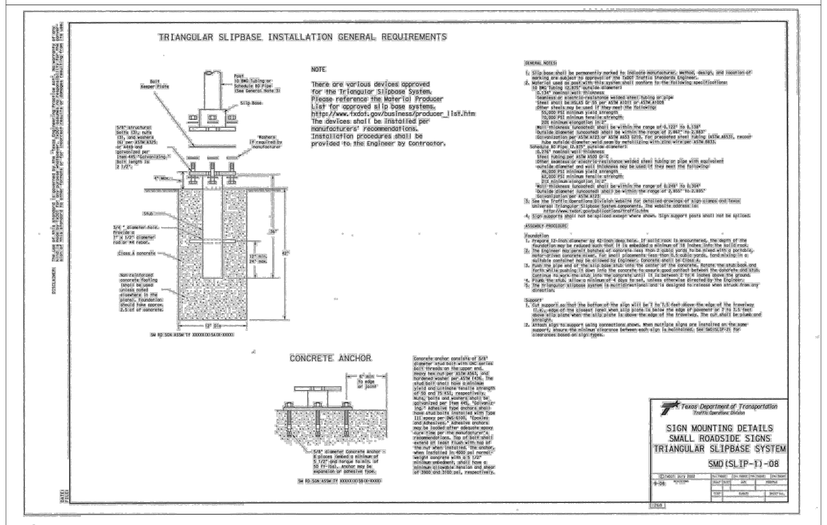
PLAT NO: CP202412

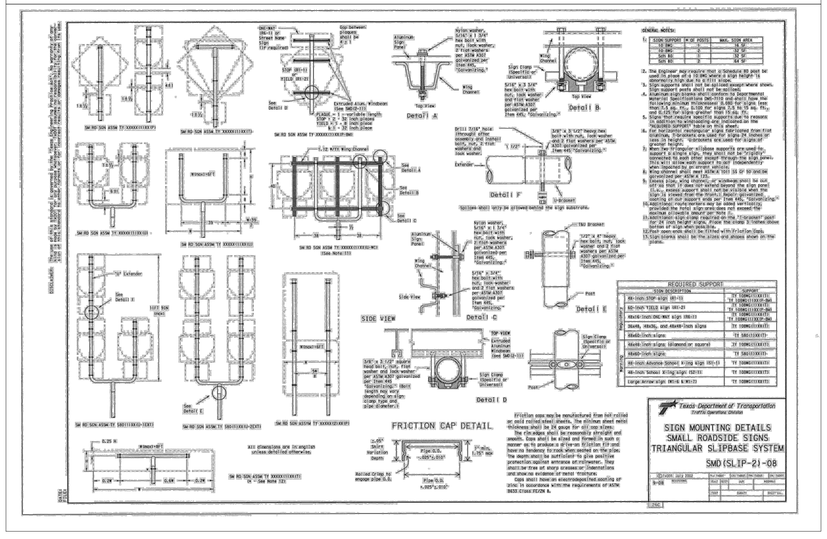
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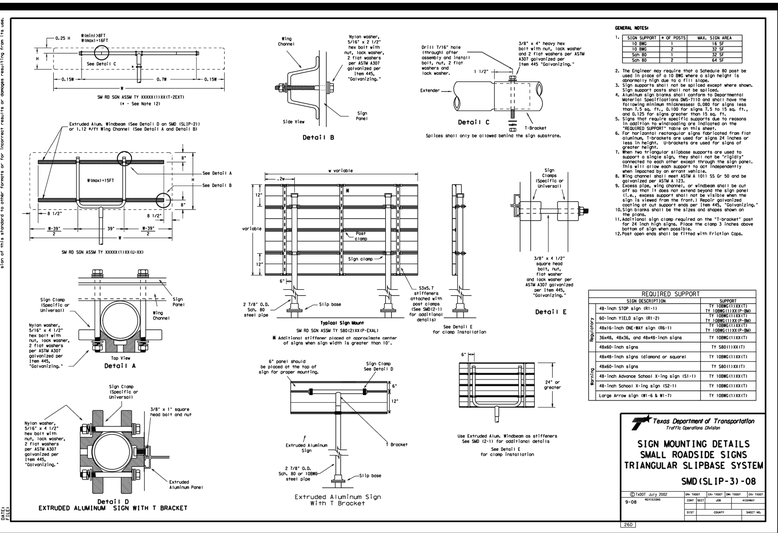
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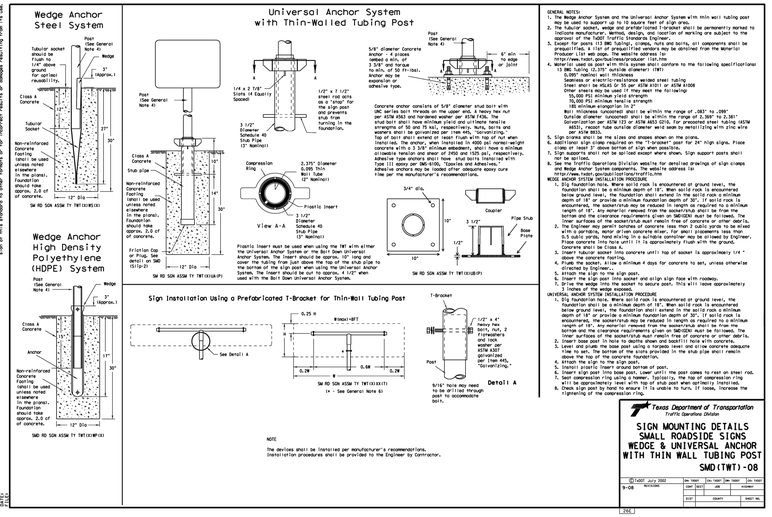
PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

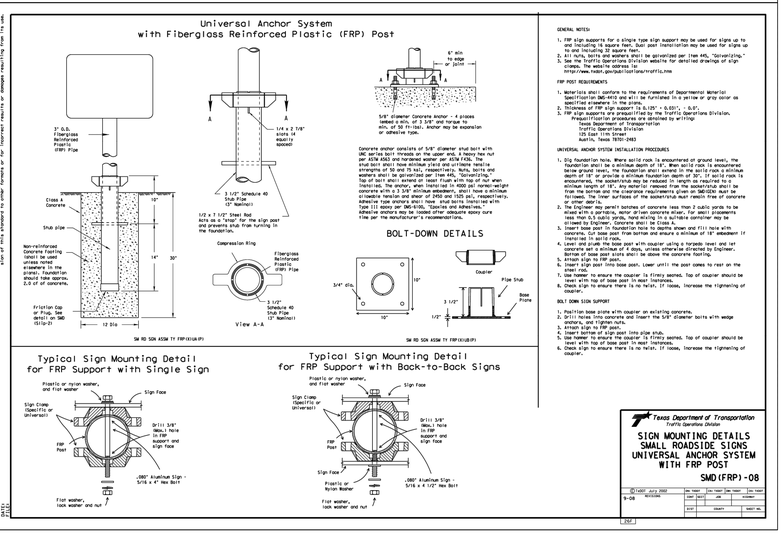












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ROSE VALLEY SOUTH - UNIT 1
SIGN MOUNTING DETAILS

BEXAR COUNTY, TEXAS



REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

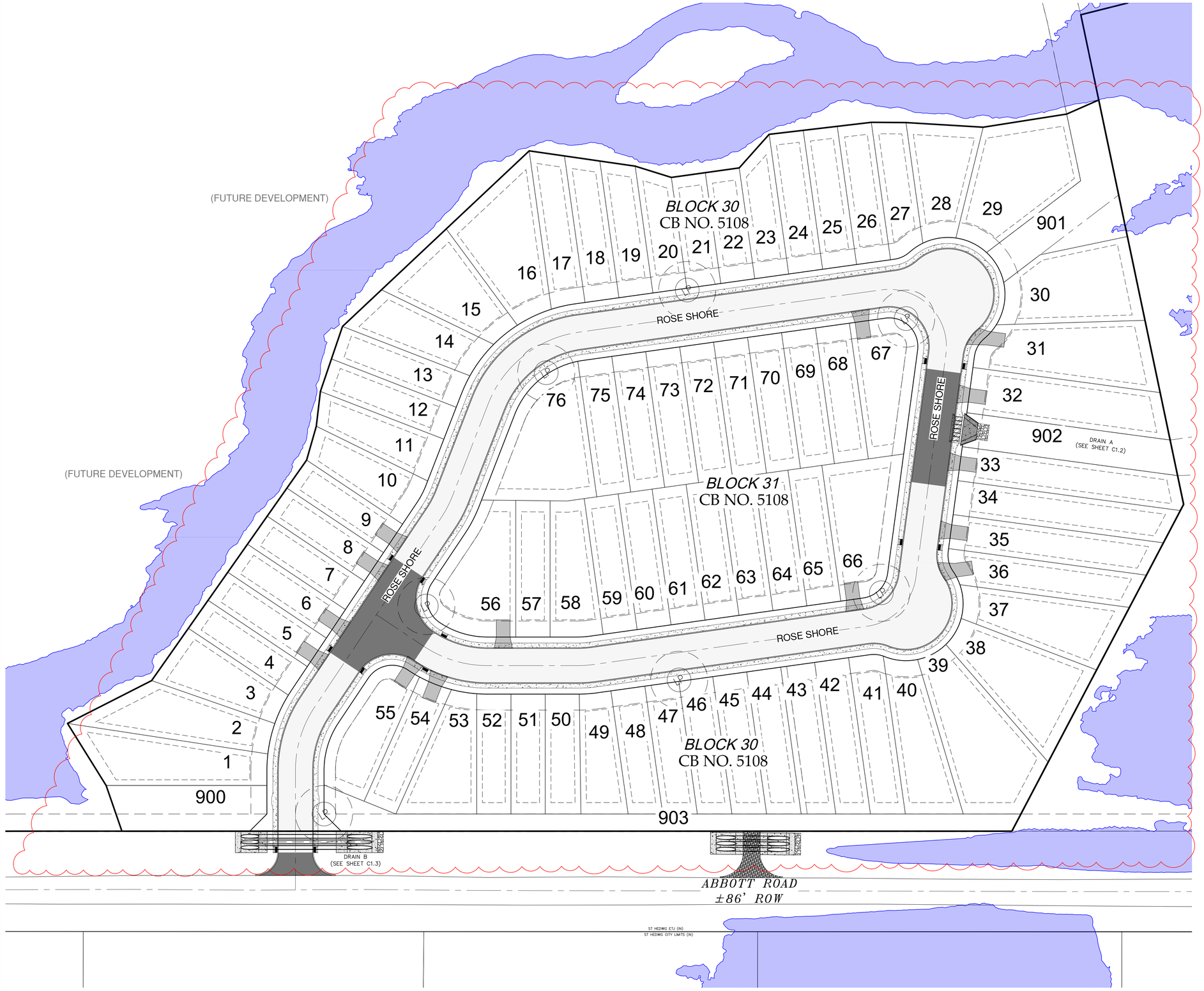
C6.2

PLAT NO: CP202412

Date: Oct 09, 2025, 4:42pm User ID: CAD1.2022
File N:\Projects\2023\23-3159\Abbott Rd Lennar\Civil\23-3159S SIGNAGE PLAN.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025



40 0 40 80

SCALE OF FEET
1" = 40'

LEGEND

- PROPERTY BOUNDARY
- SITE LINE
- PAVEMENT LIMITS
- CENTERLINE
- LP — PROPOSED LIGHT POLE
- APPROXIMATE LIGHT POLE COVERAGE (25' RADIUS TYP.)

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ROSE VALLEY SOUTH - UNIT 1
STREETLIGHT PLAN

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/9/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	RELOCATION AND REDUCED NUMBER OF STREETLIGHTS PER CPS FEEDBACK, ADDED DRAIN A AND B CLOSE-UPS, AND UPDATED BOUNDARY PER UPDATED FLOODPLAIN LIMITS	CTA

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

C7.0

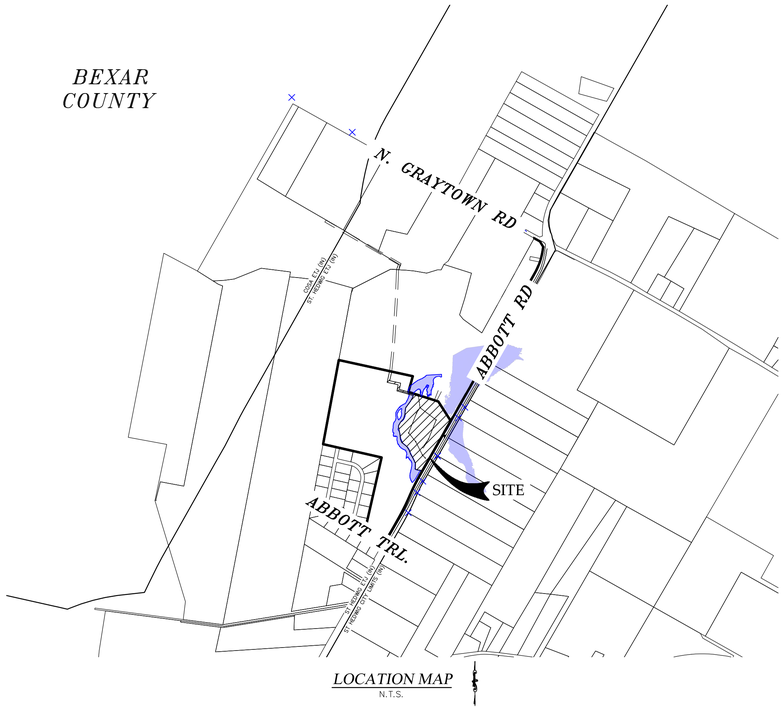
PLAT NO: CP202412

Date: Oct 09, 2025, 4:42pm User ID: CAD1-2022
File: N:\Projects\2023\23-3159\Abbott Rd\Lennar\Civil\23-3159S Streetlight Plan.dwg

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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

ROSE VALLEY SOUTH - UNIT 1
WATER PLANS
BEXAR COUNTY, TEXAS



LOCATION MAP
N.T.S.

WATER DISTRIBUTION PLANS - SHEET INDEX

Description	Sheet No.
COVER SHEET	W0.0
OVERALL WATER DISTRIBUTION PLAN	W1.0
OFFSITE WATER MAIN EXTENSION (1 OF 3)	W1.1
OFFSITE WATER MAIN EXTENSION (2 OF 3)	W1.2
OFFSITE WATER MAIN EXTENSION (3 OF 3)	W1.3
ONSITE WATER PLAN	W1.4
ECSUD DETAILS (1 OF 3)	W2.0
WATER DETAILS (2 OF 3)	W2.1
WATER DETAILS (3 OF 3)	W2.2

WATER SYSTEM
EAST CENTRAL
SPECIAL UTILITY DISTRICT

OWNER:
LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TX 78216

OCT. 2025

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED PROFESSIONAL ENGINEER
10/8/2025
F-9155

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

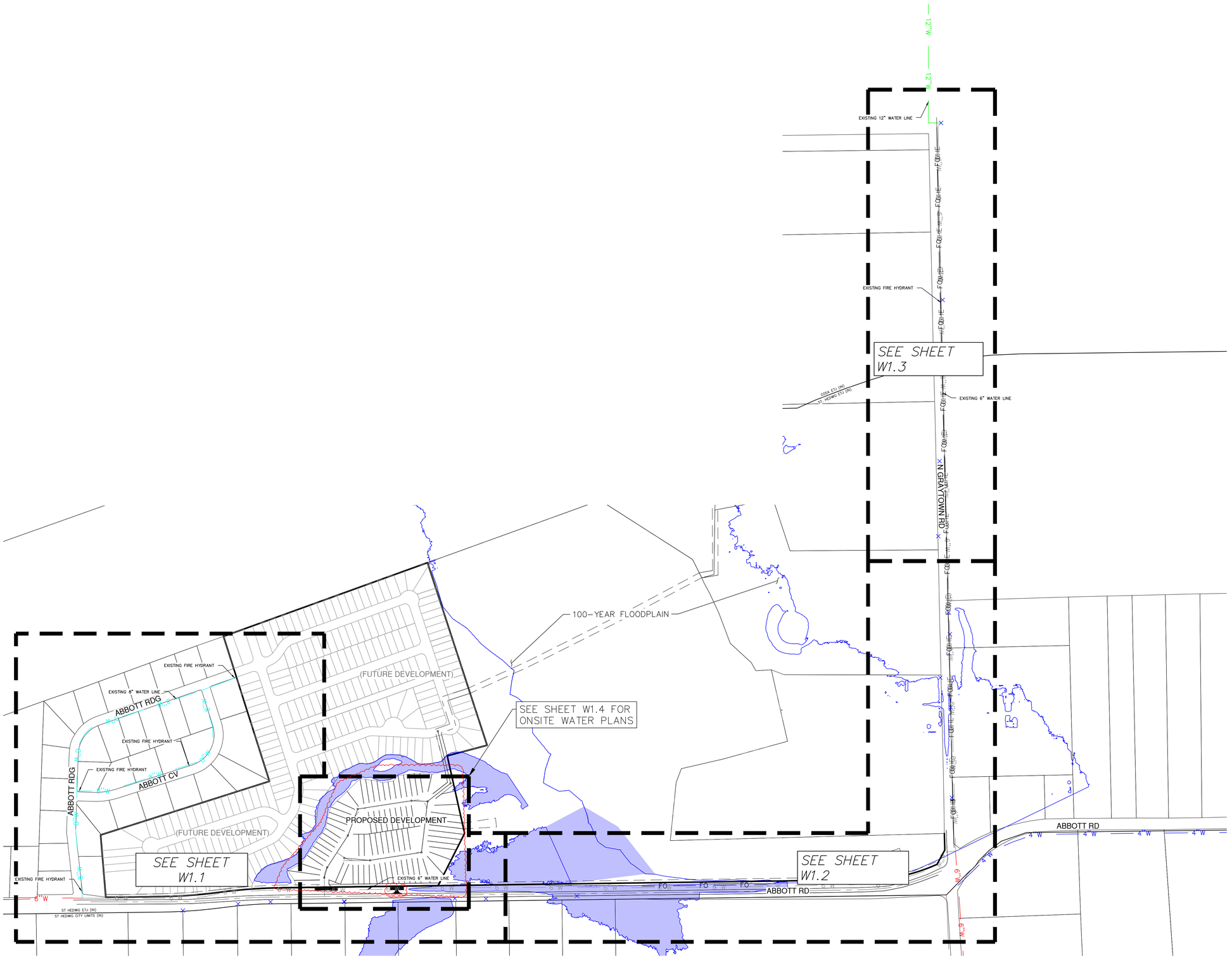
W0.0
JOB NO: 23-3159H

PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

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BEXAR COUNTY R.O.W. NOTE:
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN THE BEXAR COUNTY R.O.W.

ROSE VALLEY SOUTH - UNIT 1
OVERALL WATER DISTRIBUTION PLAN
BEXAR COUNTY, TEXAS

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/9/2025

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS AND UPDATED BOUNDARY PER REVISED FLOODPLAIN LIMITS	CTA

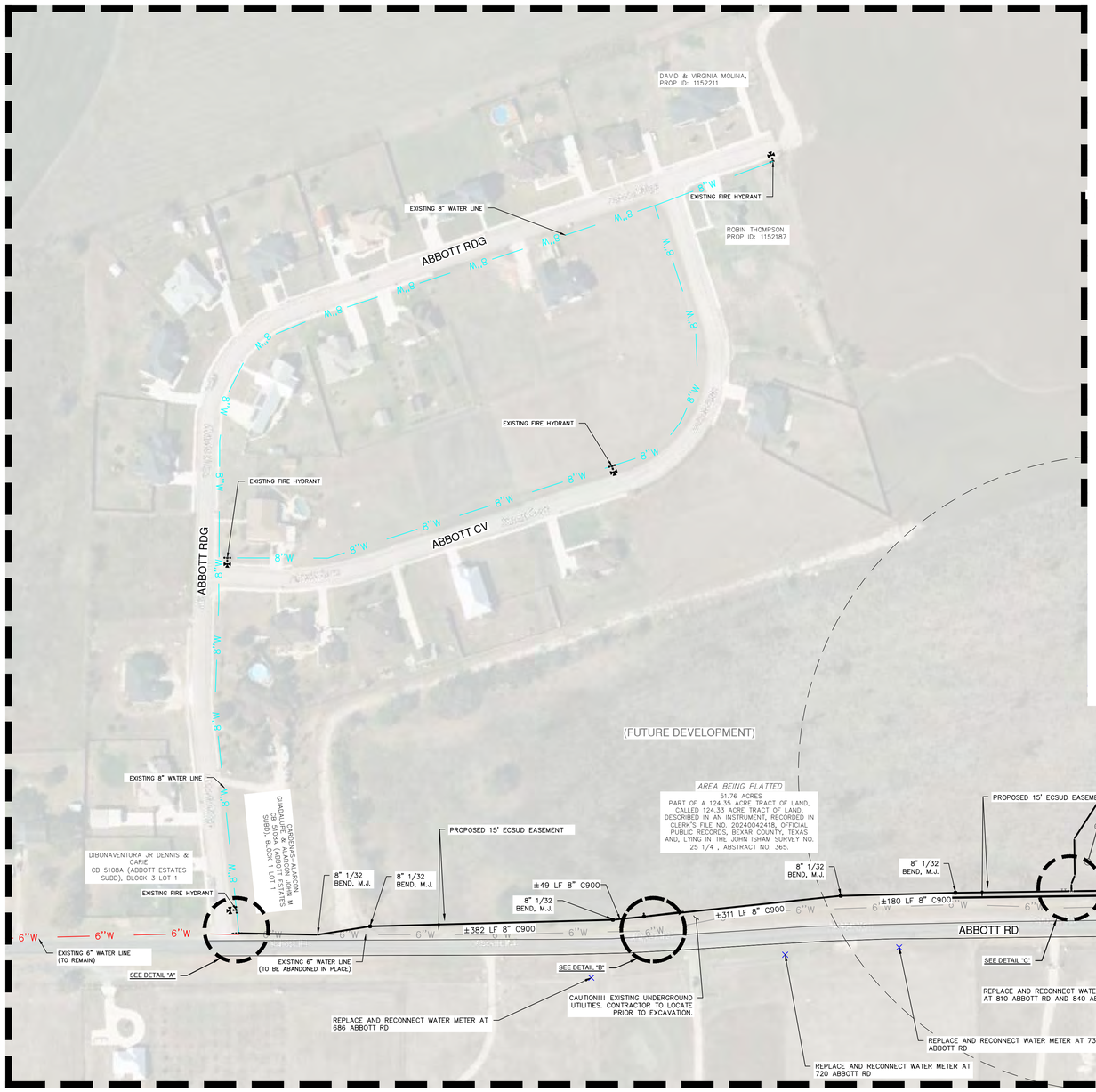
JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

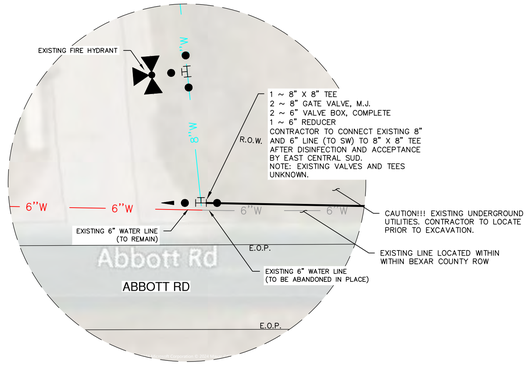
W1.0
PLAT NO: CP202412

Date: Oct 09, 2025, 4:43pm User ID: CAD1-2022
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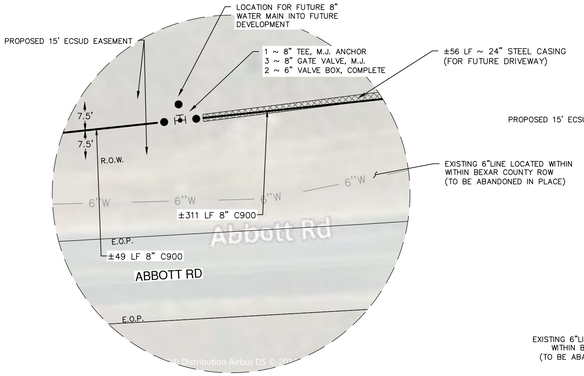
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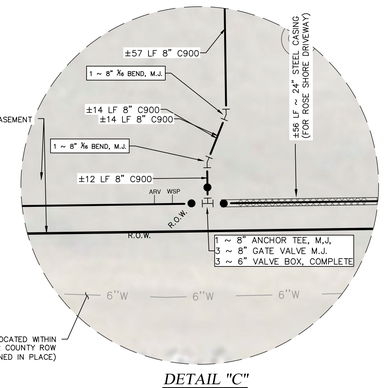




DETAIL "A"
NOT TO SCALE



DETAIL "B"
NOT TO SCALE



DETAIL "C"
NOT TO SCALE

*NOTE:
CONTRACTOR TO VERIFY EXISTING WATER SERVICES AND RECONNECT TO NEW WATER MAIN. CONTRACTOR TO CALL 811 FOR UTILITY LOCATES PRIOR TO EXCAVATION.

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100 0 100 200
SCALE OF FEET
1" = 100'

LEGEND

- PROPERTY BOUNDARY
- 6"W — EXISTING 6" WATER MAIN (TO REMAIN)
- 6"W — EXISTING 6" WATER MAIN (TO BE ABANDONED IN PLACE)
- 8"W — EXISTING 8" WATER MAIN
- 12"W — EXISTING 12" WATER MAIN
- EASEMENT
- FO — FO — EXISTING FIBER OPTIC
- OHE — OHE — EXISTING ELECTRIC
- x — x — EXISTING FENCE
- PROPOSED 8" WATER MAIN (OFFSITE)
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- WSP — WATER SAMPLING PORT
- ARV — AIR RELEASE VALVE

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Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
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ROSE VALLEY SOUTH - UNIT 1
OFFSITE WATER MAIN
EXTENSION (1 OF 3)
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS	CTA

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

W1.1
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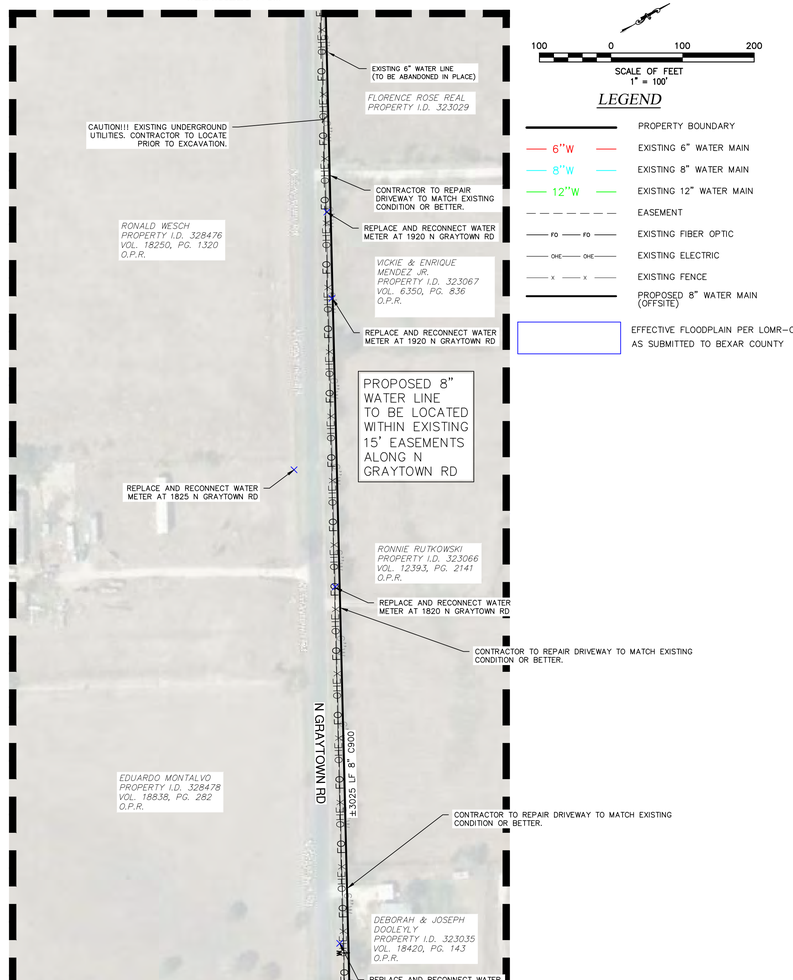
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DETAIL "D"
NOT TO SCALE

MATCHLINE
SEE SHEET W1.3



100 0 100 200
SCALE OF FEET
1" = 100'

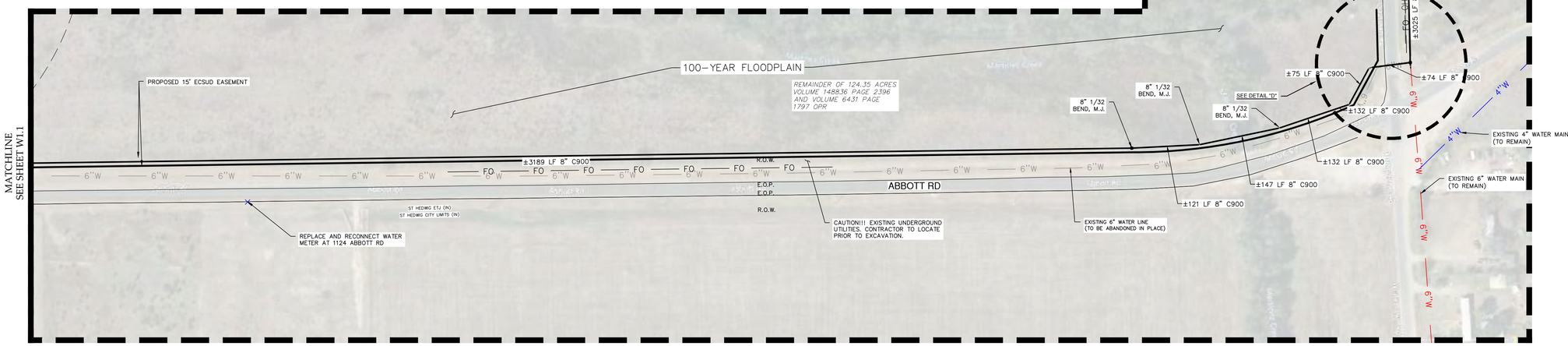
LEGEND

- PROPERTY BOUNDARY
- 6"W — EXISTING 6" WATER MAIN
- 8"W — EXISTING 8" WATER MAIN
- 12"W — EXISTING 12" WATER MAIN
- EASEMENT
- FO — FO — EXISTING FIBER OPTIC
- OHE — OHE — EXISTING ELECTRIC
- x — x — EXISTING FENCE
- PROPOSED 8" WATER MAIN (OFFSITE)
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY

BEXAR COUNTY R.O.W. NOTE:
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MATCHLINE
SEE SHEET W1.1



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830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
OFFSITE WATER MAIN
EXTENSION (2 OF 3)
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/9/2025
F-9155

REV	DATE	DESCRIPTION	BY

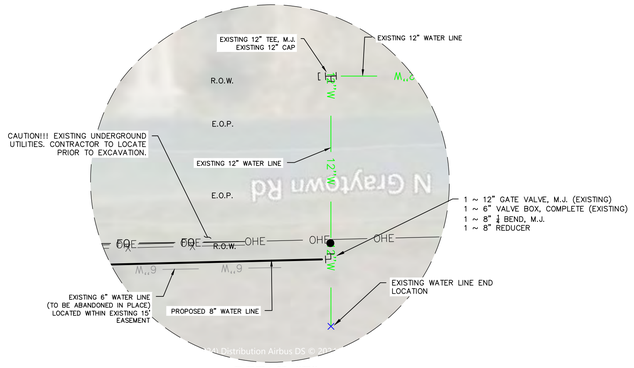
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DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

W1.2
PLAT NO: CP202412

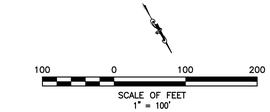
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DETAIL "E"
NOT TO SCALE

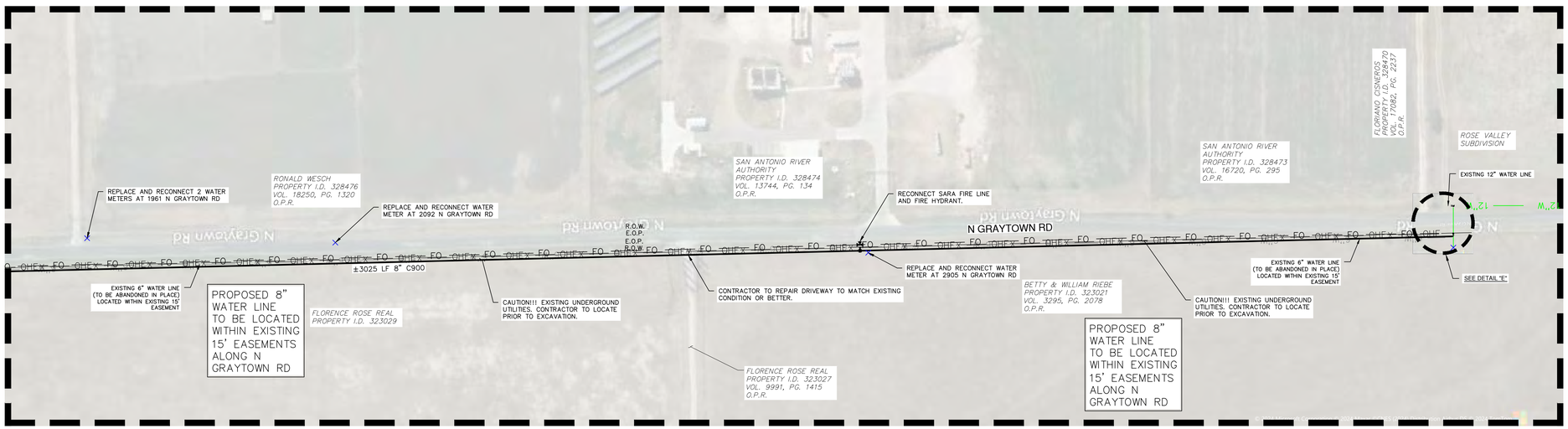


LEGEND

- PROPERTY BOUNDARY
- 6"W — EXISTING 6" WATER MAIN
- 8"W — EXISTING 8" WATER MAIN
- 12"W — EXISTING 12" WATER MAIN
- EASEMENT
- FO — FO — EXISTING FIBER OPTIC
- OHE — OHE — EXISTING ELECTRIC
- x — x — EXISTING FENCE
- PROPOSED 8" WATER MAIN (OFFSITE)

BEXAR COUNTY R.O.W. NOTE:
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*NOTE:
CONTRACTOR TO VERIFY EXISTING WATER SERVICES AND RECONNECT TO NEW WATER MAIN. CONTRACTOR TO CALL 811 FOR UTILITY LOCATES PRIOR TO EXCAVATION.



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ROSE VALLEY SOUTH - UNIT 1
OFFSITE WATER MAIN
EXTENSION (3 OF 3)
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
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10/9/2025
F-9155

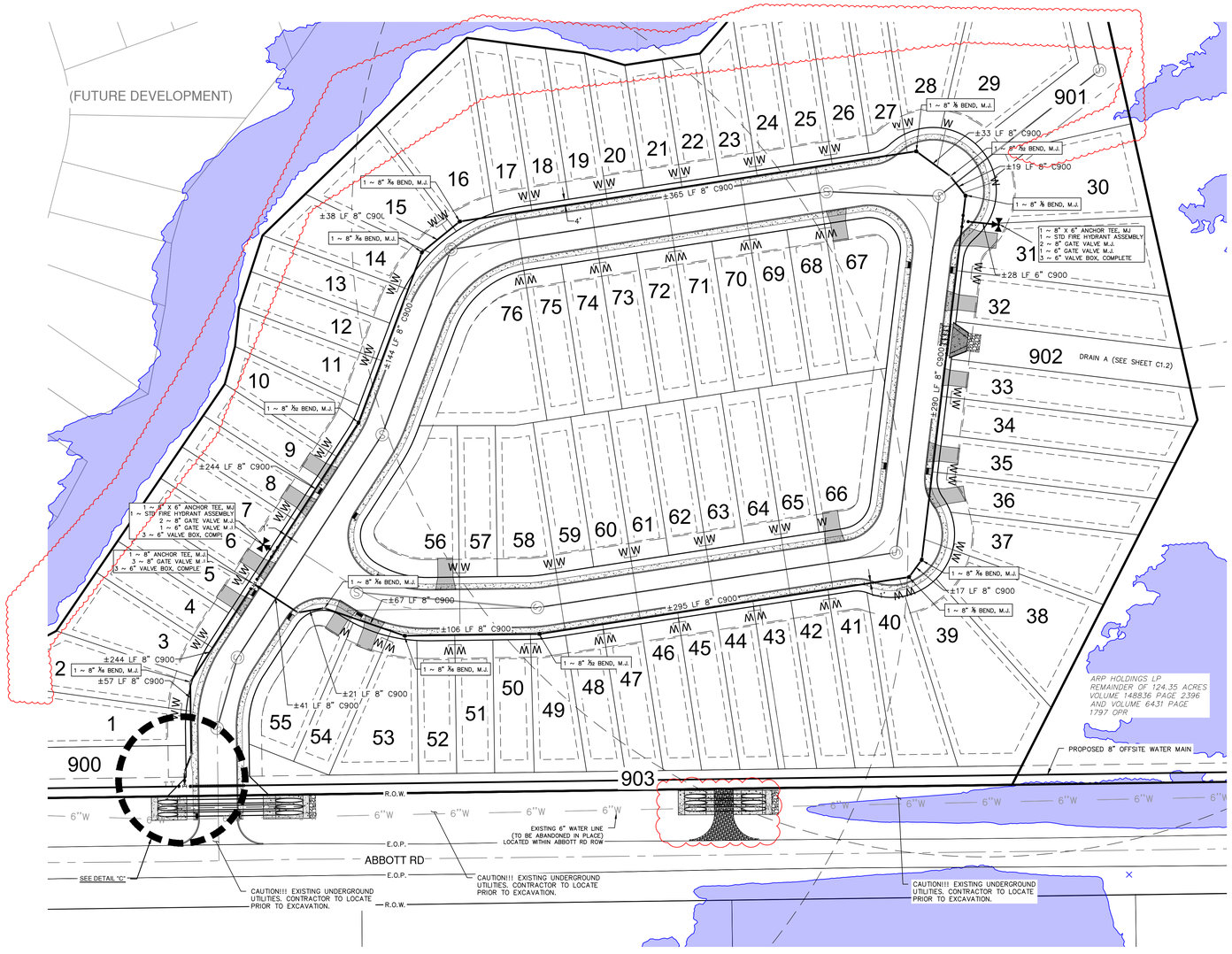
REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

W1.3
PLAT NO: CP202412

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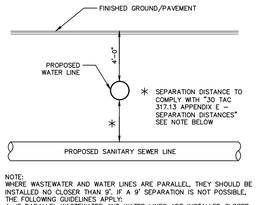


50 0 50 100
SCALE OF FEET
1" = 50'

LEGEND

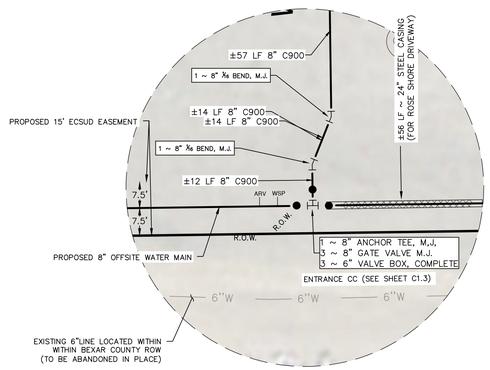
- PROPERTY BOUNDARY
- 6"W — EXISTING 6" WATER MAIN (TO REMAIN)
- 6"W — EXISTING 6" WATER MAIN (TO BE ABANDONED IN PLACE)
- 8"W — EXISTING 8" WATER MAIN
- 12"W — EXISTING 12" WATER MAIN
- EASEMENT
- FO — FO — EXISTING FIBER OPTIC
- OHE — OHE — EXISTING ELECTRIC
- X — X — EXISTING FENCE
- PROPOSED 8" WATER MAIN (OFFSITE)
- FIRE HYDRANT 500' RADIUS
- EFFECTIVE FLOODPLAIN PER LOMR-C AS SUBMITTED TO BEXAR COUNTY
- S — S — PROPOSED SEWER
- WSP — WATER SAMPLING PORT
- ARV — AIR RELEASE VALVE

GENERAL NOTES:
1. LOCATION OF EXISTING UTILITIES BASED ON BEST AVAILABLE INFORMATION. CONTRACTOR TO VERIFY HORIZONTAL AND VERTICAL LOCATION PRIOR TO INSTALLING ONSITE FACILITIES. CONTRACTOR TO NOTIFY ENGINEER OF ANY DISCREPANCIES BETWEEN SHOWN AND ACTUAL LOCATIONS.
2. CONTRACTOR TO USE EAST CENTRAL SPECIAL UTILITY DISTRICT SPECIFICATIONS UNLESS DIRECTED OTHERWISE BY BEXAR COUNTY. (SEE SHEETS W2.0 AND W2.1)
3. CONTRACTOR SHALL BE RESPONSIBLE FOR TAPPING PUBLIC WATER MAINS. CONTACT EAST CENTRAL SPECIAL UTILITY DISTRICT FOR DETAILS.

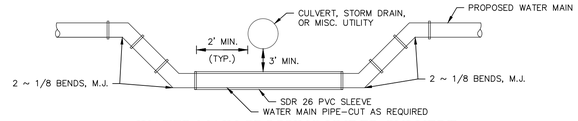


NOTE:
WHERE WASTEWATER AND WATER LINES ARE PARALLEL, THEY SHOULD BE INSTALLED NO CLOSER THAN 9'. IF A 9' SEPARATION IS NOT POSSIBLE, THE FOLLOWING GUIDELINES APPLY:
A. IF PARALLEL WASTEWATER AND WATER LINES ARE INSTALLED CLOSER THAN 9' TO ONE ANOTHER, THE WASTEWATER LINE SHALL BE CONSTRUCTED OF SDR 26 PRESSURE RATED PVC. HORIZONTAL SEPARATION SHALL BE A MINIMUM OF 4'. THE VERTICAL SEPARATION SHALL BE A MINIMUM OF 2'. THE WASTEWATER LINE SHALL BE BELOW THE WATER LINE IF AT ALL POSSIBLE.
B. WHERE A WASTEWATER LINE CROSSES A WATER LINE, A VERTICAL SEPARATION OF 2' SHALL BE MAINTAINED IF POSSIBLE. IF NOT, AN ABSOLUTE MINIMUM 6" SEPARATION MUST BE MAINTAINED AND THE WASTEWATER LINE SHALL BE ENCASED IN CEMENT STABILIZED SAND FOR 18 LF CENTERED ON THE WATER LINE. THE WASTEWATER LINE SHALL BE BELOW THE WATER LINE IF AT ALL POSSIBLE.
C. WHERE A WASTEWATER LINE CROSSES OVER A WATER LINE. THE WASTEWATER LINE SHALL BE CONSTRUCTED OF SDR 26 PRESSURE RATED PVC PIPE, AND ONE LENGTH OF THE PRESSURE WASTEWATER PIPE SHALL BE CENTERED ON THE WATER LINE. ADDITIONALLY, IF THE VERTICAL SEPARATION IS LESS THAN 2', THE WASTEWATER LINE SHALL BE ENCASED IN CEMENT STABILIZED SAND AS DESCRIBED ABOVE.

TYPICAL WATER/SANITARY SEWER CROSSING DETAIL
NOT TO SCALE



DETAIL "C"
NOT TO SCALE



WATER MAIN CROSSING UNDER CULVERT
N.T.S.

BEXAR COUNTY R.O.W. NOTE:
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*NOTE:
CONTRACTOR TO VERIFY EXISTING WATER SERVICES AND RECONNECT TO NEW WATER MAIN. CONTRACTOR TO CALL 811 FOR UTILITY LOCATES PRIOR TO EXCAVATION.

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

UNDERGROUND UTILITIES
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION & ELEVATION OF EXISTING UTILITIES SHOWN ON THE PLANS ARE OBTAINED FROM UTILITY COMPANY RECORDS AND WHERE POSSIBLE, FIELD MEASUREMENTS. THE PROVIDED INFORMATION IS NOT TO BE RELIED ON AS EXACT OR COMPLETE. THE CONTRACTOR RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES & SHALL NOTIFY THE APPROPRIATE UTILITY COMPANY 48 HOURS PRIOR TO ANY EXCAVATION AND REQUEST EXACT FIELD LOCATIONS OF UTILITIES. THE CONTRACTOR IS RESPONSIBLE FOR ANY RELOCATION OR DAMAGE TO UTILITIES, WHETHER SHOWN ON THESE PLANS OR NOT.

OVERHEAD ELECTRIC
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT OVERHEAD ELECTRIC LINES MAY BE IN THE VICINITY OF SOME OR ALL OF THE WORK AREAS. THE CONTRACTOR SHOULD EXERCISE CAUTION IN THESE AREAS WITH CONSTRUCTION EQUIPMENT AND CONSTRUCTION PERSONNEL. THE CONTRACTOR IS RESPONSIBLE FOR ANY RELOCATION OR DAMAGE TO EXISTING ELECTRIC LINES, WHETHER SHOWN ON THESE PLANS OR NOT.

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ROSE VALLEY SOUTH - UNIT 1
ONSITE WATER PLAN

BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY
1.	2025-OCT-08	ADDED CPS DRIVEWAY CULVERTS AND UPDATED BOUNDARY PER REVISED FLOODPLAIN LIMITS	CTA

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

W1.4

PLAT NO: CP202412

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PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

TESTING OF PRESSURE PIPELINES

1.0 DESCRIPTION

This item shall govern the furnishing of all labor, materials, tools, equipment and related items required to perform hydrostatic testing of Ductile Iron and Polyvinyl Chloride (PVC) pressure pipelines for integrity and leakage.

2.0 MATERIALS

Not applicable.

3.0 CONSTRUCTION METHODS

A. For Ductile Iron Pipe, make hydrostatic pressure and leakage tests on entire pipeline in accordance with AWWA Standard C600-99, Section 5.2.

B. For PVC Pipe, make hydrostatic pressure and leakage tests on entire pipeline in accordance with AWWA Standard C605-94, Section 7.3.

C. Furnish all labor equipment, including test pump with regulated by-pass starters and gauges required for conducting pipeline tests. Furnish equipment and necessary piping as required to transport water used in testing from source to test location.

D. Schedule time and sequence of testing, subject to observation and approval by the Owner or Owner's Representative. Provide adequate labor, tools and equipment to operate valves and to locate and repair leaks discovered during the initial filling of the pipeline prior to actual testing or during the course of the tests.

E. After the pipe has been laid and backfilled and the backfill has been jetted or otherwise consolidated, subject all newly laid pipe or valved section thereof to the hydrostatic pressure specified below for the particular type of pipe. The duration of each pressure test shall be at least four hours, unless otherwise specified or noted on the plans. Disconnect all meters, fixtures, devices or appliances which are connected to the pipeline system and which might be damaged if subjected to the specified test pressure. Cap or plug the ends of the branch lines during the testing procedures.

F. Fill each valved (capped or plugged) section of pipe slowly with water and expel all air. If permanent air vents are not located at all high points, install corporation or blow-off cocks at such points so that the air can be expelled as filling takes place. After verification that all air has been expelled, close the cocks and keep the pipe filled until tested. Examine uncovered pipe, fittings, valves, hydrants and joints while under test pressure. Visible leaks shall be stopped, regardless of the allowable leakage specified. Repair defective pipe, fittings, valves or hydrants discovered during testing. Replacement shall be with sound material. Repeat the test until specified requirements are achieved.

G. Where any section of a pipeline is proved with concrete thrust blocking, do not make hydrostatic pressure test until at least five days have elapsed after installation of the blocking.

H. Pressure/Leakage Tests

1. The duration of the hydrostatic test shall be a minimum of four (4) hours.
2. The pipeline shall be tested so that the pressure at the highest point in the test section is not less than 200 psi.
3. The maximum allowable leakage is the number of gallons per hour as determined by the following formulae.

a. For Ductile Iron Pipe:

$$L = \frac{SD\sqrt{P}}{133,200}$$

Where:
L = allowable leakage, in gallons per hour
S = length of pipe tested, in feet
D= nominal diameter of the pipe, in inches
P = 200, in psig

b. For PVC Pipe:

$$L = \frac{SD\sqrt{P}}{7,400}$$

Where:
L = allowable leakage, in gallons per hour
S = length of pipe in the length of pipeline tested
D= nominal diameter of the pipe, in inches
P = 200, in psig

H. Final Acceptance

1. No pipe installation will be accepted until known leaks have been repaired, whether or not leakage is within allowable limits. Locate and repair leaks at no additional cost to the Owner.
2. The Contractor will certify that all required pressure and leakage tests have been successfully completed before the pipeline is accepted.

I. Special Project Requirements

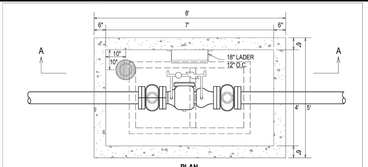
Water Source. Obtaining water for testing purposes shall be the responsibility of the Contractor. The Contractor shall provide all equipment and labor required to transport water from the source to the test point.

4.0 MEASUREMENT AND PAYMENT

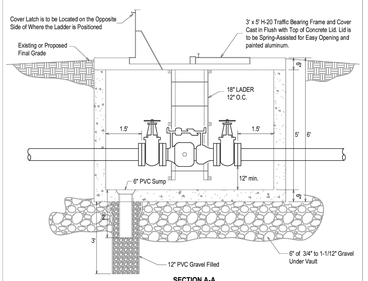
No direct measurement or payment will be made for the work to be done or the equipment to be furnished under this item, but shall be considered subsidiary to the particular items of work for which unit prices are required in the proposal.

East Central Steel — TESTING FOR PRESSURE PIPELINES

APPROVED	REVISED
JULY 2022	
DET-100-Ø1	SHEET 1 OF 1



PLAN

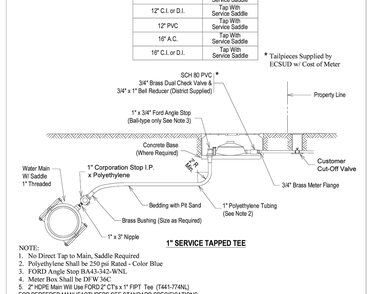


SECTION A-A

East Central Steel — 6" DOUBLE CHECK DETECTOR ASSEMBLY WITH 5'x8' CONCRETE VAULT BOX

APPROVED	REVISED
JULY 2022	
DET-808-Ø1	SHEET 1 OF 1

PIPE TAPPING SCHEDULE	
PIPE DIAMETER	SERVICE SIZE 1"
6" A.C.	Tap With Service Saddle
6" C.I. or D.I.	Tap With Service Saddle
8" A.C.	Tap With Service Saddle
8" C.I. or D.I.	Tap With Service Saddle
8" PVC	Tap With Service Saddle
10" A.C.	Tap With Service Saddle
10" C.I. or D.I.	Tap With Service Saddle
10" PVC	Tap With Service Saddle
12" A.C.	Tap With Service Saddle
12" C.I. or D.I.	Tap With Service Saddle
12" PVC	Tap With Service Saddle
16" A.C.	Tap With Service Saddle
16" C.I. or D.I.	Tap With Service Saddle



* Tailpieces Supplied by ECSUD w/ Cost of Meter

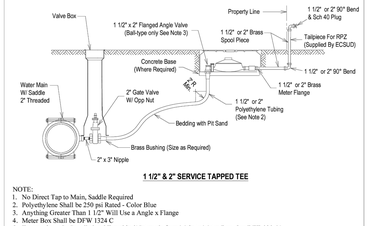
1" SERVICE TAPPED TEE

NOTE:
1. No Direct Tap to Main, Saddle Required
2. Polyethylene Shall be 250 psi Rated - Color Blue
3. FORD Angle Stop BA43-3-G-WNL
4. Meter Box Shall be DFW 36C
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT Tee (T441-774NL)
FOR PERFERED MANUFACTURERS SEE STANDARD SPECIFICATIONS

East Central Steel — 1" SERVICE INSTALLATION TAPPING SCHEDULE

APPROVED	REVISED
FEBRUARY 2025	
DET-824-Ø1	SHEET 1 OF 1

PIPE TAPPING SCHEDULE		
PIPE DIAMETER	SERVICE SIZE 1 1/2"	2"
6" A.C.	Tap With Service Saddle	Tap With Service Saddle
6" C.I. or D.I.	Tap With Service Saddle	Tap With Service Saddle
8" A.C.	Tap With Service Saddle	Tap With Service Saddle
8" C.I. or D.I.	Tap With Service Saddle	Tap With Service Saddle
8" PVC	Tap With Service Saddle	Tap With Service Saddle
10" A.C.	Tap With Service Saddle	Tap With Service Saddle
10" C.I. or D.I.	Tap With Service Saddle	Tap With Service Saddle
10" PVC	Tap With Service Saddle	Tap With Service Saddle
12" A.C.	Tap With Service Saddle	Tap With Service Saddle
12" C.I. or D.I.	Tap With Service Saddle	Tap With Service Saddle
12" PVC	Tap With Service Saddle	Tap With Service Saddle
16" A.C.	Tap With Service Saddle	Tap With Service Saddle
16" C.I. or D.I.	Tap With Service Saddle	Tap With Service Saddle



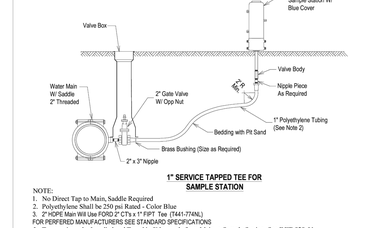
1 1/2" & 2" SERVICE TAPPED TEE

NOTE:
1. No Direct Tap to Main, Saddle Required
2. Polyethylene Shall be 250 psi Rated - Color Blue
3. Anything Greater Than 1 1/2" Will Use a Angle x Flange
4. Meter Box Shall be DFW 1324 C
5. Tracer wire to be Installed and Taped in 8' Intervals from Main to Meter Box. See DET-828-01

East Central Steel — 1 1/2" & 2" SERVICE INSTALLATION TAPPING SCHEDULE

APPROVED	REVISED
FEBRUARY 2025	
DET-824-Ø2	SHEET 2 OF 2

PIPE TAPPING SCHEDULE	
PIPE DIAMETER	SERVICE SIZE 1"
6" A.C.	Tap With Service Saddle
6" C.I. or D.I.	Tap With Service Saddle
8" A.C.	Tap With Service Saddle
8" C.I. or D.I.	Tap With Service Saddle
8" PVC	Tap With Service Saddle
10" A.C.	Tap With Service Saddle
10" C.I. or D.I.	Tap With Service Saddle
10" PVC	Tap With Service Saddle
12" A.C.	Tap With Service Saddle
12" C.I. or D.I.	Tap With Service Saddle
12" PVC	Tap With Service Saddle
16" A.C.	Tap With Service Saddle
16" C.I. or D.I.	Tap With Service Saddle

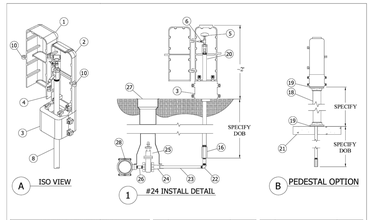


1" SERVICE TAPPED TEE FOR SAMPLE STATION

NOTE:
1. No Direct Tap to Main, Saddle Required
2. Polyethylene Shall be 250 psi Rated - Color Blue
3. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT Tee (T441-774NL)
FOR PERFERED MANUFACTURERS SEE STANDARD SPECIFICATIONS
5. Tracer wire to be Installed and Taped in 8' Intervals from Main to Sample Station. See DET-828-01

East Central Steel — 1" SERVICE INSTALLATION TAPPING SCHEDULE FOR SAMPLE STATIONS ONLY

APPROVED	REVISED
FEBRUARY 2025	
DET-824-Ø3	SHEET 1 OF 1



GENERAL SPECIFICATIONS	
MAXIMUM OPERATING PRESSURE:	200 PSI
STATION MATERIALS:	303, 304, 316, & 18-8 STAINLESS STEEL, BUNA-N
ENCLOSURE MATERIAL: ENCLOSURE COLOR:	CAST 319 ALUMINUM #6 LT.
WETTED MATERIALS:	BUNA-N RUBBER, 303, 304, 316 & 18-8 STAINLESS STEEL
DEPTH OF BURY: WEIGHT:	36" - 42" -51 LBS @ 7' DOB
ADDITIONAL PEDESTAL WEIGHT:	~38 LBS FOR 3' PEDESTAL
CUSTOM LOGO: NSF CERT:	

ITEM	DESCRIPTION	NOTES
1	#8 FRONT DOOR (COVER A)	
2	#8 REAR DOOR (COVER B)	
3	#8 BASE	2 PIECES
4	1/2" UNTHREADED NOZZLE	
5	OPERATING HANDLE	
6	DRAIN HOSE BARB	
7	DRAIN	
8	18-8 BARREL	
9	18-8, OPERATING ROD	NOT SHOWN
10	LOCKING HOLE	
11	VALVE CORE	NOTE 3
12	VALVE SEAT CARRIER	NOTE 3
13	OPERATING SCREW	NOTE 3
14	SEAT O-RING	NOTE 3

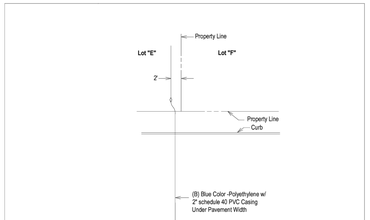
ITEM	DESCRIPTION	NOTES
15	WATER PATH	
16	VALVE BODY	
17	INLET HOLES	
18	PEDESTAL	
19	PEDESTAL GASKET	
20	PACKING NUT	
21	CONCRETE	
22	3/4" S. 90° ELBOW	
23	3/4" S. PIPE	AS REQ.
24	BRASS BUSHING	2" x 3"
25	2" GATE VALVE W/ OPP NUT	
26	2" x 3" NIPPLE	BRASS
27	VALVE BOX	
28	SADDLE CLAMP	2" THREAD

Sampling Station shall be ____ buoy, with a 1" FIP inlet, and 1/2" unbreaded blow off and sampling bibb.
Station shall be enclosed in a lockable, cast aluminum box with hinged openings.
When open, the station shall require no key for operation, and all water flow shall pass thru an all stainless steel waterway. All operational components shall be of stainless steel and serviceable / replaceable from above ground with no digging or excavation needed.
The operating screw shall be located underground and inside of the valve body. The operating screw, when turned via the handle, shall raise and lower a valve seat carrier, for controlling the flow of water through the hydrant. The station shall utilize an o-ring for sealing of the valve core to valve seat carrier to shut off the flow of water. The operating rod shall be supported on both ends, via the packing nut and the valve seat carrier to prevent the station from vibrating/pushing under high pressures and to ensure proper operation.
When open, the water shall flow through the 6 openings of the valve seat carrier, up and around the valve core, up the stand pipe and out through the nozzle.
The operating rod shall be hollow. A secondary drain port shall be located on the hollow operating rod, underneath the handle and when open shall allow for evacuation of any water remaining inside the station, via pump or compressed air blow off, to prevent freezing.
The station shall be model #24 as manufactured by Kupferle Water Solutions, St. Louis MO. 63102 or approved equal.

Notes:
1.) The color shall be Blue, check with the manufacturer for color options, and specify accordingly.
2.) When installed on or with concrete, Kupferle recommends the use of a gasket or barrier between the enclosure/pedestal and the concrete surface. when purchasing the station, if concrete install is specified on the order Kupferle will provide said gasket. the enclosure clamp on the bottom of the enclosure base will fit inside a 4" pvc pipe.
3.) Prolonged exposure to strong chlorides which can be present in concrete, cleaning agents, and sometime even potable water can lead to possible enclosure corrosion. regular maintenance and drying the station after use are the best methods for optimal station longevity.
4.) In corrosive solids the buried pipe should be prepped for additional resistance to corrosion. Kupferle recommends spraying all underground piping and fittings with bituminous spray tar, allowing proper time to dry, and then wrapping the parts.

East Central Steel — #24 SAMPLING STATION SPEC SHEET

APPROVED	REVISED
FEBRUARY 2025	
DET-824-Ø4	SHEET 1 OF 1

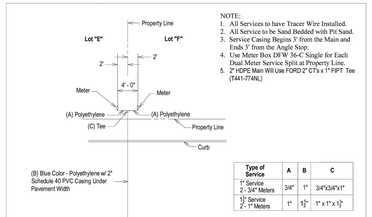


NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Begins 3' from the Main and Ends 3' from the Angle Stop.
4. Use Meter Box DFW 36-C for Single Services
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT Tee (T441-774NL)

SINGLE SERVICE LINE - SINGLE METER

East Central Steel — TYPICAL SERVICE ARRANGEMENT

APPROVED	REVISED
FEBRUARY 2025	
DET-824-Ø5	SHEET 1 OF 4



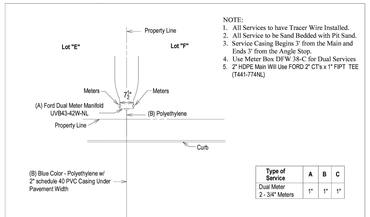
NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Begins 3' from the Main and Ends 3' from the Angle Stop.
4. Use Meter Box DFW 36-C for Single Services
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT TEE (T441-774NL)

Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4"x3/4"x1"
1½" Service 2 - 1" Meters	1"	1½"	1" x 1" x 1½"

SINGLE SERVICE LINE - DUAL METER

East Central Steel — TYPICAL RURAL SERVICE ARRANGEMENT

APPROVED	REVISED
FEBRUARY 2025	
DET-824-Ø5	SHEET 2 OF 4



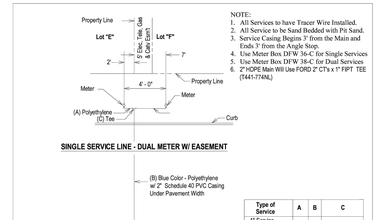
NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Begins 3' from the Main and Ends 3' from the Angle Stop.
4. Use Meter Box DFW 38-C for Dual Services
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT TEE (T441-774NL)

Type of Service	A	B	C
Dual Meter 2 - 3/4" Meters	1"	1"	1"

SINGLE SERVICE LINE - DUAL METER

East Central Steel — TYPICAL HIGH DENSITY RESIDENTIAL SERVICE ARRANGEMENT

APPROVED	REVISED
FEBRUARY 2025	
DET-824-Ø5	SHEET 3 OF 4



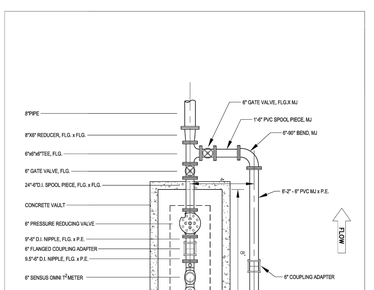
NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Begins 3' from the Main and Ends 3' from the Angle Stop.
4. Use Meter Box DFW 38-C for Dual Services
5. 2" HDPE Main Will Use FORD 2" CT's x 1" FIPT TEE (T441-774NL)

Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4"x3/4"x1"
1½" Service 2 - 1" Meters	1"	1½"	1" x 1" x 1½"

SINGLE SERVICE LINE W/ EASEMENT

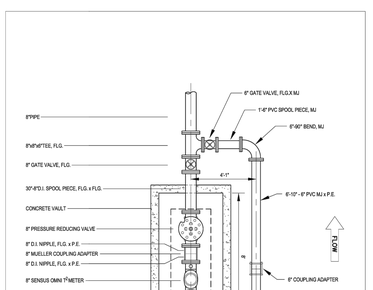
East Central Steel — TYPICAL SERVICE ARRANGEMENT

APPROVED	REVISED
FEBRUARY 2025	
DET-824-Ø5	SHEET 4 OF 4



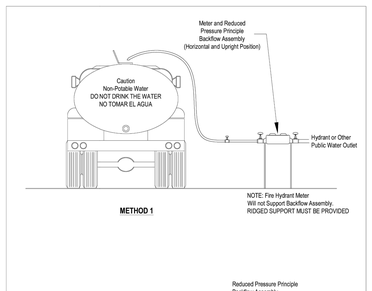
East Central Steel — 6" TURBO METER DETAIL WITH 4'x8' CONCRETE VAULT BOX

APPROVED	REVISED
JULY 2022	
DET-825-Ø1	SHEET 1 OF 1



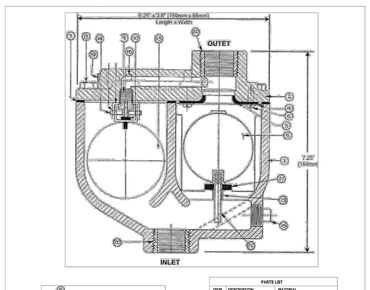
East Central Steel — 8" TURBO METER DETAIL WITH 4'x8' CONCRETE VAULT BOX

APPROVED	REVISED
JULY 2022	
DET-825-Ø2	SHEET 1 OF 1



East Central Steel — BACKFLOW PREVENTION PREVENTION FOR WATER HAULING EQUIPMENT AND/OR MIXING TANKS

APPROVED	REVISED
FEBRUARY 2025	
DET-826-Ø1	SHEET 1 OF 1



PARTS LIST		
ITEM	DESCRIPTION	MATERIAL
1	BODY	CAST IRON, ASTM A126-B
2	COVER	CAST IRON, ASTM A126-B
3	SEAT (Air Vacuum)	BUNA-N RUBBER
4	SUPPORT, SEAT	316 STAINLESS STEEL
5	FLOAT BALL (Air Vacuum)	316 STAINLESS STEEL
6	SEAT SCREWS	18-8 STAINLESS STEEL
7	COVER GASKET	ARMSTRONG CS-301
8	COVER BOLTS	ZINC PLATED STEEL (Standard) 316 STAINLESS STEEL (Optional)
9	ORIFICE	316 STAINLESS STEEL
10	ORIFICE BUTTON	BUNA-N RUBBER
11	LEVERAGE BRACKET	316 STAINLESS STEEL
12	FLOAT ARM	316 STAINLESS STEEL
13	FLOAT BALL (Air Release)	18-8 STAINLESS STEEL
14	SPRING PIN	302 STAINLESS STEEL
15	PIPE PLUG	STEEL
16	SPRING PIN	302 STAINLESS STEEL
17	LOCK WASHER	18-8 STAINLESS STEEL
18	FLOAT SCREW	18-8 STAINLESS STEEL
19	PIPE PLUG	STEEL
20	REDUCING BUSHING *	STEEL
21	GUIDE DISC	EPDM RUBBER
22	GUIDE BODY	COMPOSITE
23	GUIDE BEARING	LOW FRICTION POLYMER

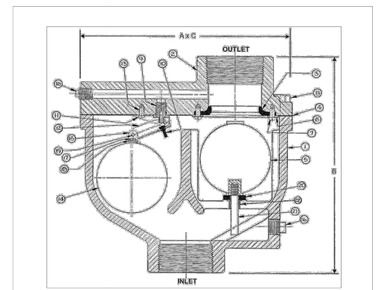
* NOTE: ITEM 20 USED ON 2" AND 3" SIZE ONLY

FIGURE 940 COMBINATION AIR VALVES ARE MANUFACTURED AND TESTED IN ACCORDANCE WITH AWWA C512

FIGURE NUMBER	SIZE (INLET & OUTLET)	AIR RELEASE ORIFICE	MAX WORKING PRESSURE	WEIGHT
940-H	2" [2 OR ¾" NPT]	⅛" (3.0mm)	300 PSI (2068 KPa)	15 lb (6.8 kg)

GA INDUSTRIES, a VAG Brand COMPACT KINETIC COMBINATION AIR VALVE FIGURE 945-H

APPROVED	REVISED
FEBRUARY 2025	
DET-827-Ø1	SHEET 1 OF 1



PARTS LIST		
ITEM	DESCRIPTION	MATERIAL
1	BODY	CAST IRON, ASTM A126-B
2	COVER	CAST IRON, ASTM A126-B
3	SEAT	BUNA-N RUBBER
4	COVER GASKET	ARMSTRONG CS-301
5	FLOAT BALL (Air Vacuum)	316 STAINLESS STEEL
6	SEAT FOLLOWER	316 STAINLESS STEEL
7	SEAT SCREWS	18-8 STAINLESS STEEL
8	COVER BOLTS	ZINC PLATED STEEL (Standard) 316 STAINLESS STEEL (Optional)
9	ORIFICE	316 STAINLESS STEEL
10	ORIFICE BUTTON	BUNA-N RUBBER
11	LEVERAGE BRACKET	316 STAINLESS STEEL
12	FLOAT ARM	316 STAINLESS STEEL
13	LOCATING SCREW	18-8 STAINLESS STEEL
14	FLOAT BALL (Air Release)	316 STAINLESS STEEL
15	PIVOT LINK	316 STAINLESS STEEL
16	PIVOT PIN	316 STAINLESS STEEL
17	FLOAT SCREW	18-8 STAINLESS STEEL
18	LOCK WASHER	18-8 STAINLESS STEEL
19	SPRING PIN	302 STAINLESS STEEL
20	CUSHION	EPDM RUBBER
21	FLOAT GUIDE	UHMWPE
22	GUIDE BEARING	LOW FRICTION POLYMER

FIGURE 940 COMBINATION AIR VALVES ARE MANUFACTURED AND TESTED IN ACCORDANCE WITH AWWA C512

FIGURE NUMBER	MAX WORKING PRESSURE	AIR RELEASE ORIFICE	INLET	OUTLET	A (Length)	B (Height)	C (Width)	WEIGHT
940-H	300 PSI (2068 KPa)	⅛" (3.0mm)	2"NPT	2"NPT	9.00" (229mm)	4.75" (121mm)	30 lb (13.6 kg)	

GA INDUSTRIES, a VAG Brand 2" - COMPACT KINETIC COMBINATION AIR VALVE FIGURE 945-H

APPROVED	REVISED
FEBRUARY 2025	
DET-827-Ø2	SHEET 2 OF 2

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Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

ROSE VALLEY SOUTH - UNIT 1
WATER DETAILS
(1 OF 3)
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
F-9155
10/9/2025

REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

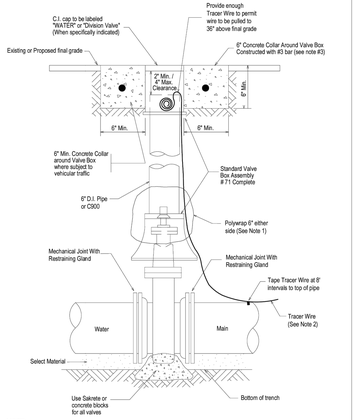
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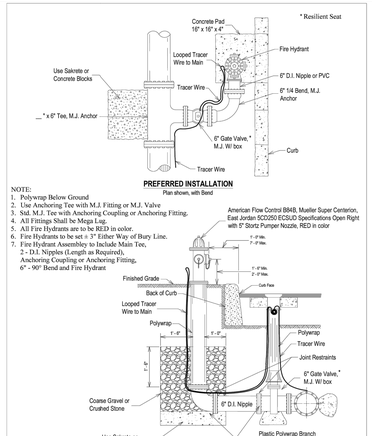
THIS DOCUMENT HAS BEEN PRODUCED FROM ELECTRONICALLY TRANSMITTED OR STORED MATERIAL WHICH MAY HAVE BEEN ALTERED. RELY ONLY ON FINAL HARDCOPY MATERIALS BEARING THE ENGINEER'S ORIGINAL SIGNATURE AND SEAL.

PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025



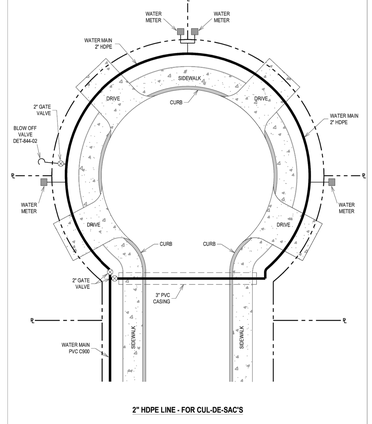
NOTE:
1. Polywrap C-900 or D.I. Pipe to Bost 6" on Either Side.
2. Tracer Wire to be Outside the Pipe Till Valve Box Top Section.
3. Min. 18" Concrete Form Tube Centered Around Valve Box for Concrete Collar W/ #3 Bar.

East Central Steel	INSTALLATION OF NON-GEARED GATE VALVE WITH VALVE BOX AND EXTENSION	APPROVED	REVISED
		JULY 2022	
		DET-828-Ø1	SHEET 1 OF 1



NOTE:
1. Polywrap Below Ground
2. Use Anchoring Tee with M.J. Fitting or M.J. Valve
3. Std. M.J. Tee with Anchoring Coupling or Anchoring Fitting.
4. All Fittings Shall be Mega Lug.
5. All Fire Hydrants are to be RED in color.
6. Fire Hydrants to be set ± 3" Either Way of Bury Line.
7. Fire Hydrant Assembley to Include Main Tee, 2 - D.I. Nipples (Length as Required), Anchoring Coupling or Anchoring Fitting, 6" - 90° Bend and Fire Hydrant

East Central Steel	FIRE HYDRANT INSTALLATION	APPROVED	REVISED
		FEBRUARY 2025	
		DET-834-Ø1	SHEET 1 OF 1

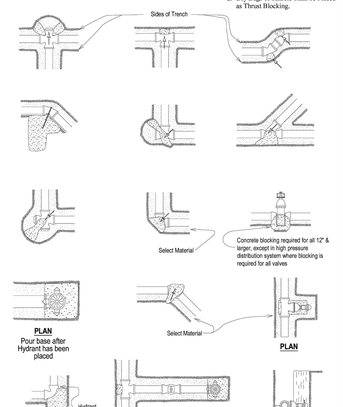


2" HDPE LINE - FOR CUL-DE-SAC'S

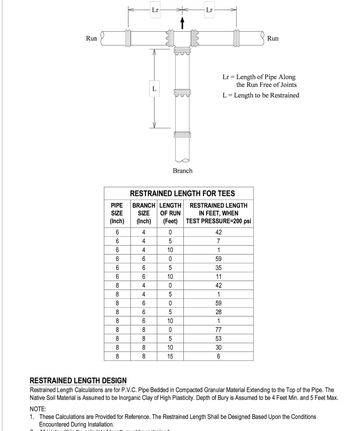
NOTE:
1. 2" HDPE Main Will Use FORD 2" CTs x 1" FIPT Tee (T441-774NL)

East Central Steel	TYPICAL CUL-DE-SAC LAYOUT WITH 2" HDPE WATER LINE	APPROVED	REVISED
		FEBRUARY 2025	
		DET-835-Ø1	SHEET 1 OF 1

NOTE:
1. All Fittings Shall be Mega Lug
2. Dry Bags of Sakrete Shall be Placed as Thrust Blocking.



East Central Steel	THRUST BLOCKS FOR FITTINGS (WATER ONLY)	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-Ø1	SHEET 1 OF 1



PIPE SIZE (Inch)	BRANCH SIZE (Inch)	LENGTH OF RUN (Feet)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	4	0	42
6	4	5	7
6	4	10	1
6	6	0	59
6	6	5	35
6	6	10	11
8	4	0	42
8	4	5	1
8	6	0	59
8	6	5	28
8	6	10	1
8	8	0	77
8	8	5	53
8	8	10	30
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 Min. and 5 Feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS FOR TEES INSTALLED ON 6" TO 8" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-02	SHEET 1 OF 4

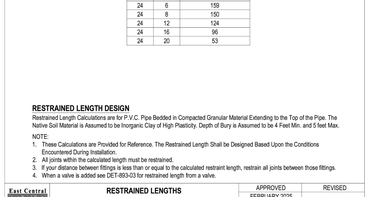


PIPE SIZE (Inch)	BRANCH SIZE (Inch)	LENGTH OF RUN (Feet)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
12	4	0	42
12	4	5	1
12	6	0	59
12	6	5	13
12	6	10	1
12	8	0	77
12	8	5	42
12	8	10	7
12	8	15	1
12	12	0	109
12	12	5	86
12	12	10	63
12	12	15	39

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 Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS VERTICAL OFFSETS INSTALLED ON 16" THRU 24" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-04	SHEET 2 OF 2

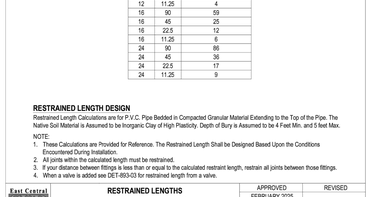


PIPE SIZE (Inch)	BRANCH SIZE (Inch)	LENGTH OF RUN (Feet)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
16	6	0	50
16	6	5	2
16	6	10	1
16	6	15	1
16	8	0	64
16	8	5	28
16	8	10	1
16	8	15	1
16	12	0	94
16	12	5	69
16	12	10	45
16	12	15	21
16	16	0	117
16	16	5	97
16	16	10	78
16	16	15	59

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 Min. and 5 feet Max..

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS FOR TEES INSTALLED ON 16" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-02	SHEET 3 OF 4

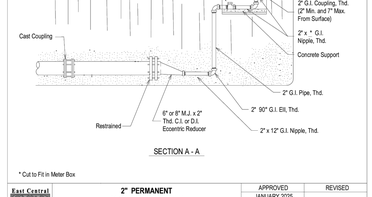


PIPE SIZE (Inch)	BRANCH SIZE (Inch)	LENGTH OF RUN (Feet)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
24	6	0	50
24	6	5	1
24	6	10	1
24	6	15	1
24	8	0	64
24	8	5	7
24	8	10	1
24	8	15	1
24	12	0	94
24	12	5	56
24	12	10	18
24	12	15	1
24	16	0	117
24	16	5	87
24	16	10	57
24	16	15	27
24	20	0	145
24	20	5	121
24	20	10	97
24	20	15	73
24	24	0	172
24	24	5	152
24	24	10	133
24	24	15	113

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 Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS FOR HORIZONTAL BENDS ON 6" THRU 24" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-06	SHEET 1 OF 1

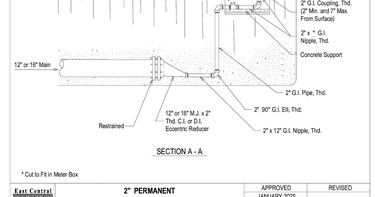


PIPE SIZE (Inch)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	59
8	77
10	93
12	109
16	117
20	145
24	172

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 Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS FOR DEAD ENDS / INLINE VALVES ON 6" THRU 24" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-03	SHEET 1 OF 1



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

RESTRAINED LENGTH DESIGN
Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS VERTICAL OFFSETS INSTALLED ON 6" THRU 12" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-04	SHEET 1 OF 2

PIPE SIZE (Inch)	BEND ANGLE (deg.)	LOW SIDE DEPTH	UPPER BEND RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi	LOWER BEND RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
16	45	5	70	22
16	22.5	5	34	11
16	11.25	5	17	6
16	45	10	70	14
16	22.5	10	34	7
16	11.25	10	17	4
24	45	5	102	32
24	22.5	5	49	16
24	11.25	5	25	8
24	45	10	102	21
24	22.5	10	49	10
24	11.25	10	25	5

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 Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS VERTICAL OFFSETS INSTALLED ON 16" THRU 24" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-04	SHEET 2 OF 2

L = Length to be Restrained

PIPE SIZE (Inch)	SMALL SIZE (Inch)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	4	30
8	4	55
8	6	32
12	4	95
12	6	80
12	8	58
16	6	97
16	8	83
16	12	43
24	6	159
24	8	150
24	12	124
24	16	96
24	20	53

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 Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS FOR REDUCERS ON 6" THRU 24" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-05	SHEET 1 OF 1

PIPE SIZE (Inch)	BEND ANGLE (deg)	RESTRAINED LENGTH IN FEET, WHEN TEST PRESSURE=200 psi
6	90	23
6	45	9
6	22.5	5
6	11.25	2
8	90	30
8	45	12
8	22.5	6
8	11.25	3
12	90	43
12	45	18
12	22.5	8
12	11.25	4
16	90	59
16	45	25
16	22.5	12
16	11.25	6
24	90	86
24	45	36
24	22.5	17
24	11.25	9

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 Min. and 5 feet Max.

NOTE:
1. These Calculations are Provided for Reference. The Restrained Length Shall be Designed Based Upon the Conditions Encountered During Installation.
2. All joints within the calculated length must be restrained.
3. If your distance between fittings is less than or equal to the calculated restraint length, restrain all joints between those fittings.
4. When a valve is added see DET-893-03 for restrained length from a valve.

East Central Steel	RESTRAINED LENGTHS FOR HORIZONTAL BENDS ON 6" THRU 24" MAINS	APPROVED	REVISED
		FEBRUARY 2025	
		DET-839-06	SHEET 1 OF 1

* Cut to Fit in Meter Box

East Central Steel	2" PERMANENT BLOW-OFF ASSEMBLY ON 6" AND 8" MAINS	APPROVED	REVISED
		JANUARY 2025	
		DET-844-02	SHEET 1 OF 2

* Cut to Fit in Meter Box

East Central Steel	2" PERMANENT BLOW-OFF ASSEMBLY ON 12" AND 16" MAINS	APPROVED	REVISED
		JANUARY 2025	
		DET-844-02	SHEET 2 OF 2

Date: Oct 09, 2025, 4:43pm User ID: CAD1.2022
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RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
Texas Registered Surveying Firm 101812-00
830-281-4060

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ROSE VALLEY SOUTH - UNIT 1
WATER DETAILS
(2 OF 3)
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105040
LICENSED
PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

W2.1
PLAT NO: CP202412

PERMIT SET (NOT FOR CONSTRUCTION): 10/08/2025

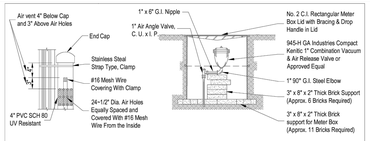
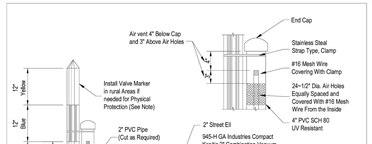


TABLE 1 - Enlarged Pipe Riser for Potable Mains 6" and Larger

D, Nominal Diameter of Main, In.	Minimum d, In.	Minimum h, In.	Comments
6	6.0	6.0	6" MJ x 6" MJ x 6" FLG DI TEE
8	8.0	8.0	8" MJ x 8" MJ x 6" FLG DI TEE
12	12.0	12.0	12" MJ x 12" MJ x 12" FLG DI TEE
16	12.0	9.6	16" MJ x 16" MJ x 12" FLG DI TEE
24	18.0	14.4	24" MJ x 24" MJ x 18" FLG DI TEE
30	18.0	18.0	30" MJ x 30" MJ x 18" FLG DI TEE
36	24.0	21.6	36" MJ x 36" MJ x 24" FLG DI TEE
42	24.0	25.2	42" MJ x 42" MJ x 24" FLG DI TEE
48	24.0	28.8	48" MJ x 48" MJ x 24" FLG DI TEE
54	30.0	32.4	Welded-on FLG Outlet
60	36.0	36.0	Welded-on FLG Outlet
66	24.0	23.1	Welded-on FLG Outlet
72	24.0	25.2	Welded-on FLG Outlet

Air Collection Traps in Air Valve Piping Notes:
1. Dimensions Derived from AWWA Manual 2nd Edition: Chapter 6 M51 Air Valves: Air-Release, Air/Vacuum & Combination

		APPROVED	REVISED
East Central SLO	INSTALLATION OF 1" AIR RELEASE VALVE	FEBRUARY 2025	
		DET-846-Ø1	SHEET 1 of 1



Note: In Rural Areas, Riser Should Be at Property Line and at Maximum Height.

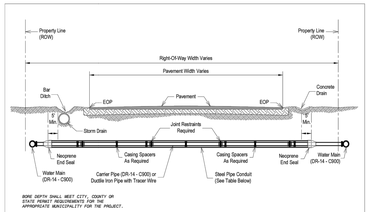
* Per Direction from Inspector

TABLE 1 - Enlarged Pipe Riser for Potable Mains 6" and Larger

D, Nominal Diameter of Main, In.	Minimum d, In.	Minimum h, In.	Comments
6	6.0	6.0	6" MJ x 6" MJ x 6" FLG DI TEE
8	8.0	8.0	8" MJ x 8" MJ x 6" FLG DI TEE
12	12.0	12.0	12" MJ x 12" MJ x 12" FLG DI TEE
16	12.0	9.6	16" MJ x 16" MJ x 12" FLG DI TEE
24	18.0	14.4	24" MJ x 24" MJ x 18" FLG DI TEE
30	18.0	18.0	30" MJ x 30" MJ x 18" FLG DI TEE
36	24.0	21.6	36" MJ x 36" MJ x 24" FLG DI TEE
42	24.0	25.2	42" MJ x 42" MJ x 24" FLG DI TEE
48	24.0	28.8	48" MJ x 48" MJ x 24" FLG DI TEE
54	30.0	32.4	Welded-on FLG Outlet
60	36.0	36.0	Welded-on FLG Outlet
66	24.0	23.1	Welded-on FLG Outlet
72	24.0	25.2	Welded-on FLG Outlet

Air Collection Traps in Air Valve Piping Notes:
1. Dimensions Derived from AWWA Manual 2nd Edition: Chapter 6 M51 Air Valves: Air-Release, Air/Vacuum & Combination

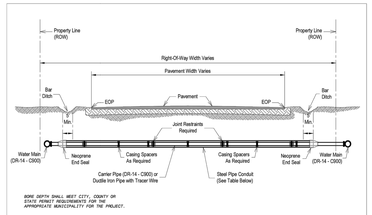
		APPROVED	REVISED
East Central SLO	INSTALLATION OF 2" AIR RELEASE VALVE	FEBRUARY 2025	
		DET-846-Ø2	SHEET 1 of 1



CARRIER PIPE SIZE	CASING PIPE SIZE	CASING PIPE THICKNESS
6"	18"	0.375"
8"	20"	0.375"
12"	24"	0.375"
16"	30"	0.375"
20"	36"	0.438"
24"	42"	0.438"
30"	48"	1/2"
36"	54"	9/16"

SECTION THROUGH PIPE IN CONDUIT

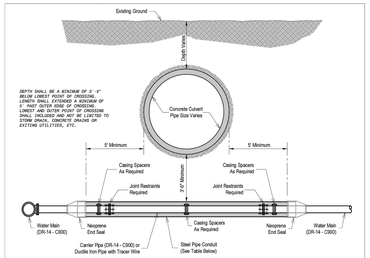
		APPROVED	REVISED
East Central SLO	TYPICAL BORE CROSSING UNDER ROAD	FEBRUARY 2025	
		DET-847-Ø1	SHEET 1 of 3



CARRIER PIPE SIZE	CASING PIPE SIZE	CASING PIPE THICKNESS
6"	18"	0.375"
8"	20"	0.375"
12"	24"	0.375"
16"	30"	0.375"
20"	36"	0.438"
24"	42"	0.438"
30"	48"	1/2"
36"	54"	9/16"

SECTION THROUGH PIPE IN CONDUIT

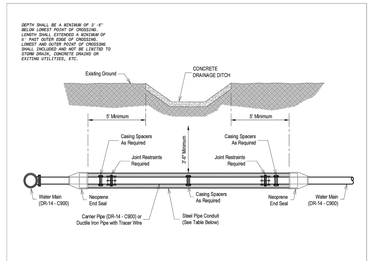
		APPROVED	REVISED
East Central SLO	TYPICAL ROAD BORE DETAIL	FEBRUARY 2025	
		DET-847-Ø1	SHEET 1 of 3



CARRIER PIPE SIZE	CASING PIPE SIZE	CASING PIPE THICKNESS
6"	18"	0.375"
8"	20"	0.375"
12"	24"	0.375"
16"	30"	0.375"
20"	36"	0.438"
24"	42"	0.438"
30"	48"	1/2"
36"	54"	9/16"

SECTION THROUGH PIPE IN CONDUIT

		APPROVED	REVISED
East Central SLO	TYPICAL BORE CROSSING UNDER CONCRETE CULVERT / STORM SEWER	FEBRUARY 2025	
		DET-847-Ø1	SHEET 2 of 3



CARRIER PIPE SIZE	CASING PIPE SIZE	CASING PIPE THICKNESS
6"	18"	0.375"
8"	20"	0.375"
12"	24"	0.375"
16"	30"	0.375"
20"	36"	0.438"
24"	42"	0.438"
30"	48"	1/2"
36"	54"	9/16"

SECTION THROUGH PIPE IN CONDUIT

		APPROVED	REVISED
East Central SLO	TYPICAL BORE CROSSING UNDER DITCH WITH CONCRETE BOTTOM	FEBRUARY 2025	
		DET-847-Ø1	SHEET 3 of 3

GENERAL NOTES

1. ALL VALVES SHALL REMAIN CLOSED UNTIL MAINS HAVE BEEN DISINFECTED, FLUSHED, AND RELEASED FOR PUBLIC USE BY THE ENGINEER.
2. EXISTING UTILITIES SHOWN ARE TAKEN FROM VARIOUS UTILITY COMPANY RECORDS. CONTRACTORS SHALL VERIFY THE EXACT LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO BEGINNING CONSTRUCTION. CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING UTILITIES AND DRAINAGE STRUCTURES DURING CONSTRUCTION.
3. ALL EXCAVATION SHALL BE UNCLASSIFIED REGARDLESS OF MATERIAL ENCOUNTERED.
4. BIDDERS ARE NOTIFIED TO MAKE SUBSURFACE INVESTIGATIONS AS THEY DEEM NECESSARY. NO ADDITIONAL PAYMENT WILL BE MADE FOR WATER, SAND, GRAVEL OR OTHER UNSTABLE CONDITIONS ENCOUNTERED IN EXCAVATIONS.
5. DETOUR OF TRAFFIC AROUND WORK ACTIVITIES, MAINTENANCE OF TRAFFIC CONTROL SIGNS, AND FLAGMEN ARE THE CONTRACTOR'S RESPONSIBILITY. NO SEPARATE PAYMENT WILL BE MADE.
6. THE CONTRACTOR SHALL PROTECT ALL OPEN EXCAVATIONS AND EQUIPMENT FROM CHILDREN, PEDESTRIANS, AND VEHICLES IN THE AREA.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION OF ALL FENCES IN THE WORK AREA TO THEIR ORIGINAL CONDITION PRIOR TO COMPLETION OF THE CONTRACT. THIS SHALL APPLY TO ALL FENCES IN THE WORK AREA WHETHER THEY ARE SHOWN ON THE PLANS OR NOT.
8. CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES, MARKS, ETC. ANY CONSTRUCTION STAKES, MARKS, ETC., DESTROYED OR REMOVED BY THE CONTRACTOR OR HIS EMPLOYEES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL CONFER WITH EACH INDIVIDUAL PROPERTY OWNER AS TO THE LOCATION OF EACH INDIVIDUAL METER BOX.
10. CONTRACTOR SHALL DISINFECT ALL NEW WATER MAINS BEFORE TYING INTO EXISTING WATER MAINS.
11. ALL VALVES SHALL BE PERMANENTLY MARKED BY THE USE OF A VALVE MARKER. NO SEPARATE PAY ITEM.
12. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
13. CONTRACTOR SHALL MAINTAIN FENCING FOR THE CONTAINMENT OF LIVESTOCK DURING CONSTRUCTION. ALL FENCES REMOVED FOR CONSTRUCTION SHALL BE REPLACED. ALL REQUIRED FENCING SHALL BE INCIDENTAL TO CONSTRUCTION AND NOT A SEPARATE PAY ITEM.
14. ALL DRIVEWAYS, INCLUDING DRAIN PIPES, CULVERTS AND HEADWALLS, DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR TO EQUAL OR BETTER THAN PRECONSTRUCTION CONDITION. ASPHALT DRIVES ARE NOT ALLOWED TO BE CUT WITHOUT OWNERS PERMISSION. INSTALLATION OF WATER MAINS CROSSING CONCRETE DRIVES WILL BE BORED. ALL DRAIN PIPE, CULVERT AND HEADWALL REPAIR SHALL BE INCIDENTAL TO CONSTRUCTION AND NOT A SEPARATE PAY ITEM. DRIVEWAY PAVEMENT REPAIR SHALL BE PAID FOR AS PER ITEM NO. 02950, "CUTTING AND PATCHING ASPHALT PAVEMENT, ASPHALT DRIVES, CONCRETE DRIVES, OR GRAVEL ROADS AND DRIVES". PAYMENT FOR BORES UNDER CONCRETE DRIVES DRIVES SHALL BE PAID FOR AS PER ITEM 02445 "BORING AND CASING PIPE UNDER HIGHWAYS, RAILROADS, OR OTHER AREAS".
15. LOCATIONS OF COMBINATION AIR VALVES WHERE SHOWN ON PLANS ARE APPROXIMATE. FINAL LOCATIONS TO BE ADJUSTED IN FIELD AT TIME OF CONSTRUCTION AT THE DIRECTION OF THE ENGINEER.
16. ALL WORK SHALL BE SCHEDULED TO TAKE PLACE ON MONDAY THROUGH FRIDAY, DURING NORMAL WORK HOURS. CONTRACTOR SHALL NOTIFY MWSC 48 HOURS PRIOR TO SERVICE SHUT OFF AFFECTING CUSTOMERS. SERVICE SHALL NOT BE SHUT OFF FOR MORE THAN EIGHT (8) HOURS AT A TIME.
17. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PROPERTY, INCLUDING, BUT NOT LIMITED TO, FENCES, PAVEMENT, DRIVEWAYS, LAWNS, CULVERTS, AND TREES, AT NO COST TO THE OWNER.
18. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL AT ALL CULVERT, STREAM AND DRAINAGE SWALES CROSSINGS. EROSION CONTROL MEASURES SHALL INCLUDE AS A MINIMUM SILT FENCES. SILT FENCES SHALL BE INSTALLED PRIOR TO DISTURBANCE OF THE WORK AREAS AND SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION OF THE DISTURBED AREAS UPSTREAM. EROSION CONTROL SHALL BE COORDINATED WITH THE ENGINEER.
19. THE CONTRACTOR SHALL REMOVE AND REPLACE ANY MAILBOXES, TRAFFIC OR ROAD SIGNS ENCOUNTERED. NO SEPARATE PAY ITEM.
20. CONTRACTOR SHALL SUBMIT TO ENGINEER PROPOSED CONSTRUCTION SEQUENCE PRIOR TO BEGINNING CONSTRUCTION.
21. ALL FITTINGS ARE TO BE DUCTILE IRON, MECHANICAL JOINT TYPE, UNLESS OTHERWISE NOTED ON PLANS.
22. ALL THRUST BLOCKS SHALL BE INSPECTED BY OWNER AND/OR ENGINEER PRIOR TO BACKFILLING.
23. ALL EXISTING VALVES SHOWN ON PLANS TO BE ABANDONED, SHALL HAVE BOXES REMOVED AND SHALL BE BACKFILLED ACCORDING TO SPECIFICATIONS. NO SEPARATE PAY ITEM.
24. CONTRACTOR SHALL CONTAIN ALL CONSTRUCTION AND STAGING WITHIN EXISTING UTILITY EASEMENTS, UNLESS OTHER ARRANGEMENTS ARE MADE WITH OWNER AND/OR TxDOT.
25. WHERE THE NEW WATER MAIN SHOWN ON THE PLANS REQUIRES CROSSING AN EXISTING WATER MAIN OR OTHER UTILITY, THE CONTRACTOR SHALL VERTICALLY DEFLECT THE PROPOSED WATER MAIN. DEFLECTION SHALL BE IN ACCORDANCE WITH THE PIPE MANUFACTURE'S RECOMMENDATIONS. FITTINGS ARE NOT PERMISSIBLE, UNLESS OTHERWISE SHOWN ON THE PLANS. NO SEPARATE PAY ITEM.
26. WATER MAINS SHALL BE INSTALLED WITH 48" MINIMUM COVER OVER THE TOP OF THE PIPE AND A MAXIMUM DEPTH OF BURY OF 60", UNLESS OTHERWISE NOTED ON THE PLANS OR DIRECTED BY THE ENGINEER.
27. CONTRACTOR TO PROVIDE POSITIVE DRAINAGE AWAY FROM ALL CONCRETE FOUNDATIONS, VAULT BOXES AND OVERFLOW BOXES THROUGHOUT THE PROJECT SITE.
28. BUY AMERICAN STANDARDS SHALL BE ADHERED TO CONCERNING ALL STEEL OR IRON BASED MATERIALS.
29. ALL GATE VALVES SHALL "OPEN RIGHT".
30. AN AIR RELEASE VALVE SHALL BE INSTALLED AT THE HIGHEST ELEVATION POINT(S) OF THE WATER DISTRIBUTION SYSTEM LOCATED WITHIN A DEVELOPMENT. THE EXACT LOCATION SHALL BE COORDINATED IN THE FIELD AND VERIFIED AGAINST THE FINAL GRADING PLAN. INSTALLATION SHALL BE IN ACCORDANCE WITH THE ECSUD STANDARDS AND THE MANUFACTURER'S RECOMMENDATIONS. PROVIDE A VALVE BOX OR APPROVED ENCLOSURE FOR ACCESS AND MAINTENANCE.
31. A MINIMUM OF ONE (1) WATER SAMPLE STATION SHALL BE INSTALLED WITHIN A DEVELOPMENT TO ALLOW FOR ROUTINE WATER QUALITY MONITORING. THE SAMPLE STATION SHALL BE LOCATED NEAR THE SUBDIVISION ENTRANCE OFF A WATER MAIN IN A PUBLICLY ACCESSIBLE AREA, OR AT A REPRESENTATIVE LOCATION APPROVED BY ECSUD. THE STATION SHALL BE INSTALLED PER ECSUD STANDARDS, MANUFACTURER 'S SPECIFICATIONS AND IN COMPLIANCE WITH ALL APPLICABLE HEALTH AND SAFETY REGULATIONS. COORDINATE FINAL LOCATION WITH ECSUD PRIOR TO INSTALLATION. ALL COMPONENTS SHALL BE SUITABLE FOR POTABLE WATER USE, AND THE STATION SHALL BE PROTECTED FROM FREEZING, TAMPERING, AND OTHER ENVIRONMENTAL FACTORS.
32. WHEN INSTALLING A CUT–IN TEE TO TIE INTO AN EXISTING WATER MAIN, MECHANICAL BELL JOINT RESTRAINTS SHALL BE PROVIDED ON ALL ADJACENT EXISTING PIPE JOINTS TO PREVENT SEPARATION DUE TO THRUST FORCES. RESTRAINTS SHALL BE INSTALLED ON A MINIMUM OF ONE FULL LENGTH OF PIPE ON EACH SIDE OF THE NEW TEE, OR AS REQUIRED BY ECSUD STANDARDS. ALL RESTRAINT DEVICES SHALL BE COMPATIBLE WITH THE EXISTING PIPE MATERIAL AND PRESSURE CLASS, AND INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. COORDINATE WITH ECSUD FOR FINAL APPROVAL OF RESTRAINT TYPE AND EXTENT.
33. ALL CONNECTIONS TO EXISTING WATER MAINS SHALL BE PERFORMED USING THE HIGH TEST HYPOCHLORITE (HTH) METHOD IN ACCORDANCE WITH AWWA C651 DISINFECTION PROCEDURES. THE HTH METHOD SHALL INVOLVE THE APPLICATION OF A CHLORINE SOLUTION DIRECTLY TO ALL INTERIOR SURFACES OF THE NEW FITTINGS, PIPE, AND APPURTENANCES IMMEDIATELY PRIOR TO INSTALLATION. THIS INCLUDES SWABBING OR SPRAYING WITH A MINIMUM 1% CHLORINE SOLUTION. NO OTHER DISINFECTION METHOD WILL BE ACCEPTED FOR TIE–INS. ALL WORK SHALL BE PERFORMED UNDER THE SUPERVISION OF ECSUD AND IN COMPLIANCE WITH THEIR STANDARDS. PROPER FLUSHING AND BACTERIOLOGICAL TESTING SHALL FOLLOW PRIOR TO PLACING THE MAIN INTO SERVICE.

RAKOWITZ
Engineering & Surveying
Texas Registered Engineering Firm F-9155
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ROSE VALLEY SOUTH - UNIT 1
WATER DETAILS
(3 OF 3)
BEXAR COUNTY, TEXAS

RAKOWITZ ENGINEERING, LLC
STATE OF TEXAS
BRADLEY A. KOETHER
105048
LICENSED
PROFESSIONAL ENGINEER
10/8/2025
F-9155

REV	DATE	DESCRIPTION	BY

JOB NO.	23-3159H
DATE	OCT. 2025
DESIGNER	CT
CHECKED	BK
DRAWN	CT

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PLAT NO: CP202412

Date: Oct 09, 2025, 4:43pm User ID: CAD1.2022
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