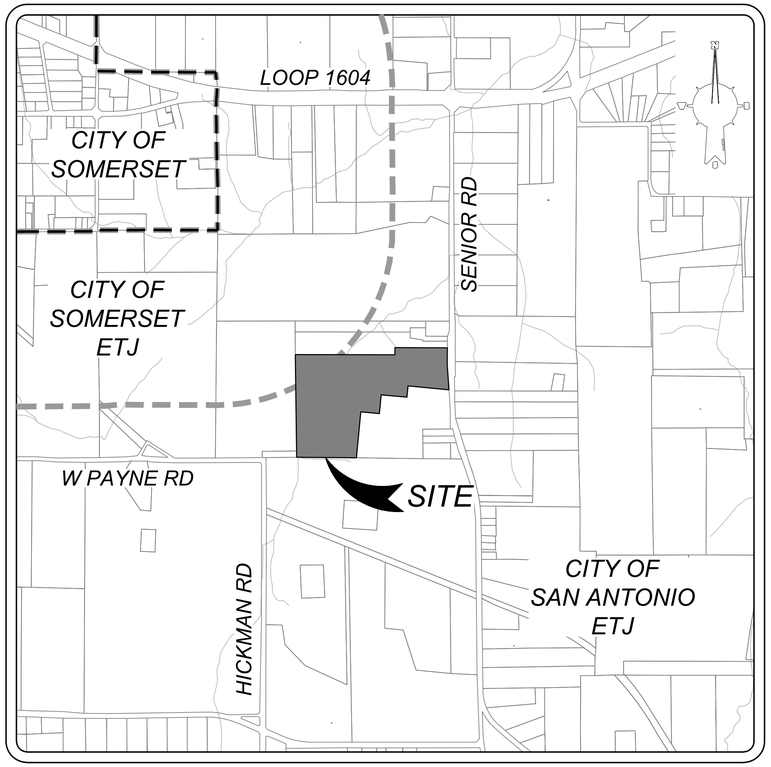
STREET, DRAINAGE, WATER, SANITARY SEWER, AND UTILITY IMPROVEMENTS

FOR

J&M DEVELOPMENT

VARGA TRACT SUBDIVISION

BEXAR COUNTY, TEXAS



LOCATION MAP

N.T.S.

I HEREBY CERTIFY THAT I AM THE OWNER OF RECORD OF THE SITE HEREIN DEPICTED AND THAT I CONCUR WITH THE SUBMISSION.

OWNER _____ DATE _____

APPROVED BY THE PLANNING BOARD OF THE TOWNSHIP OF "ENTER NAME" AT THE REGULAR MEETING OF _____.
DATE

CHAIRMAN _____ DATE _____

SECRETARY _____ DATE _____

ENGINEER _____ DATE _____

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142566
LICENSED
PROFESSIONAL ENGINEER

2/26/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design

SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14309
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER:	DRAWING NAME:
1116-01-01	CV11160101

SHEET TITLE:
COVER SHEET

SHEET NUMBER:
0.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

By: SCRUZ
Civil\CV11160101.dwg\0.0

TRENCH EXCAVATION SAFETY PROTECTION

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

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DRY UTILITY CONDUIT NOTE:

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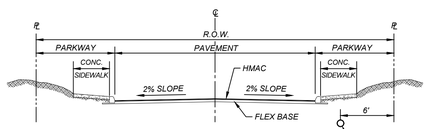
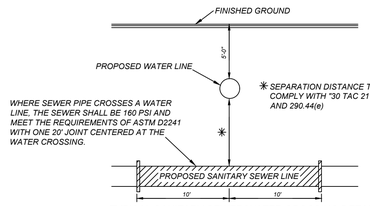
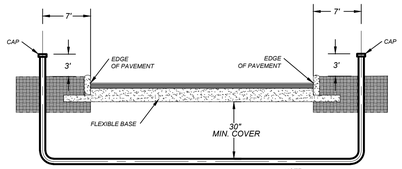


TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	4'

TYPICAL STREET SECTION
N.T.S.



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



TYPICAL CONDUIT DETAIL
NOT-TO-SCALE

NOTE:
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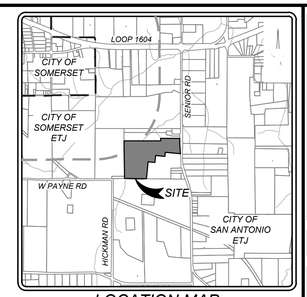
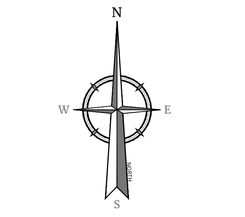
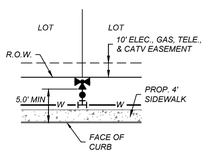


LOCATION MAP
N.T.S.



LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	MAIN
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	MAIN
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. E
EXISTING WATER MAIN	=	E.W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING OVERHEAD ELECTRIC W/POWER POLE	=	OHE
EXISTING GUY WIRE/OVERHEAD ELECTRIC	=	OHE



TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

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TBPE Firm#: F-14309
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: OU11160101

SHEET TITLE:
OVERALL UTILITY PLAN (1 OF 3)

SHEET NUMBER:
1.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Civil\OU11160101.dwg\1.0 By: SDUERWALL

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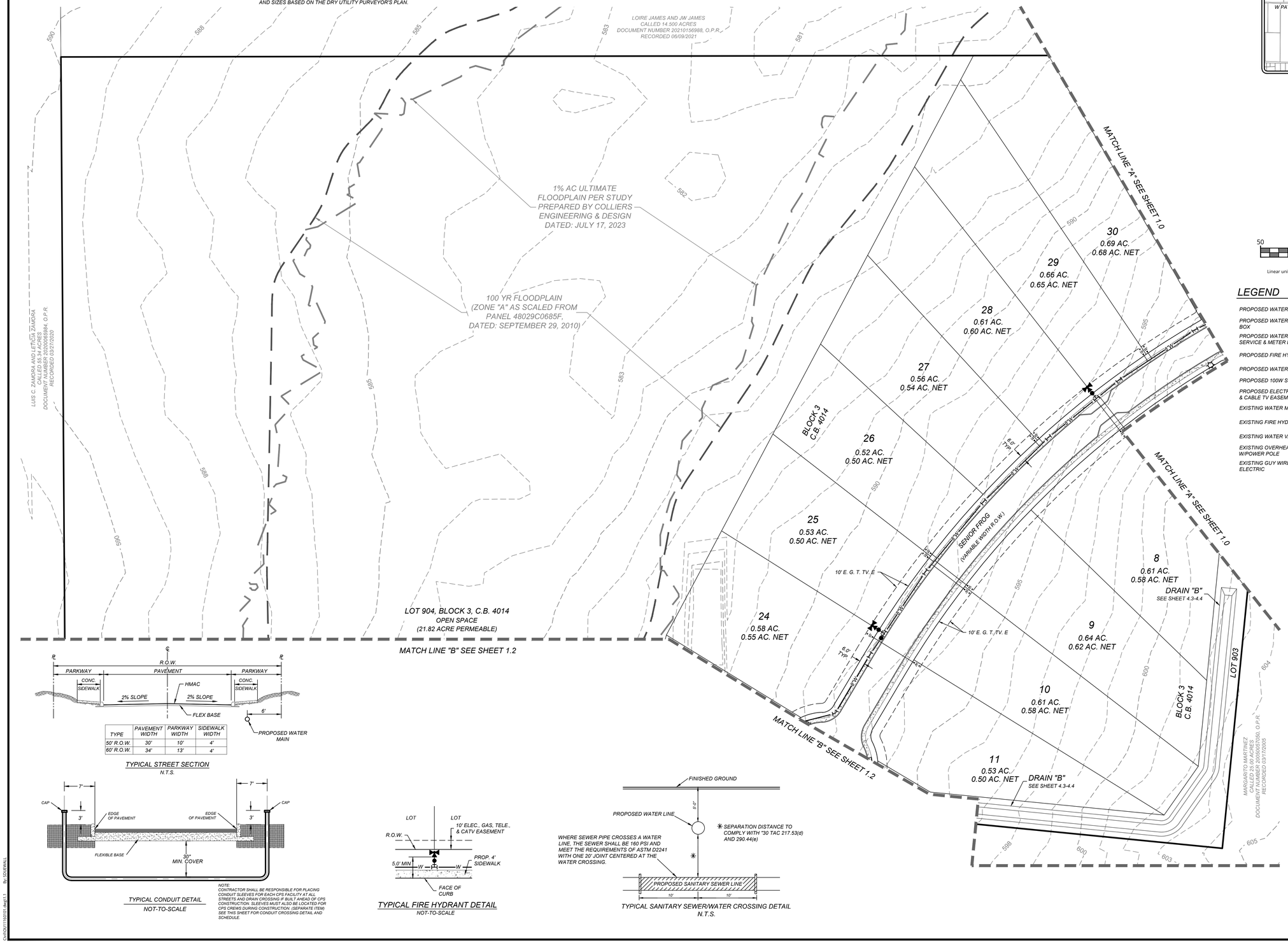

TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
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TYPICAL STREET SECTION
N.T.S.

TYPICAL CONDUIT DETAIL
NOT-TO-SCALE

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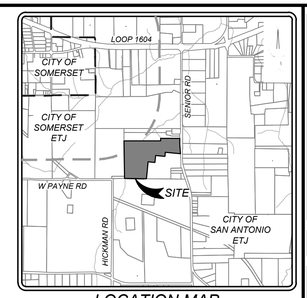
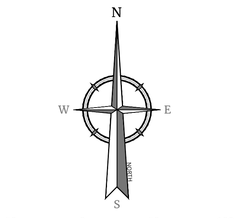
TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

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



LOCATION MAP
N.T.S.



50 0 50 100

SCALE : 1" = 50'

Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

LEGEND

PROPOSED WATER MAIN	W
PROPOSED WATER SERVICE & METER BOX	
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	IRRIGATION
PROPOSED FIRE HYDRANT	
PROPOSED WATER VALVE	
PROPOSED 100W STREETLIGHT	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	E. G. T. TV. E
EXISTING WATER MAIN	E.W
EXISTING FIRE HYDRANT	
EXISTING WATER VALVE	
EXISTING OVERHEAD ELECTRIC W/POWER POLE	OHE
EXISTING GUY WIRE/OVERHEAD ELECTRIC	OHE

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3421 Paesanos Parkway
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Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01

DRAWING NAME: OU11160101

SHEET TITLE: OVERALL UTILITY PLAN (2 OF 3)

SHEET NUMBER: 1.1

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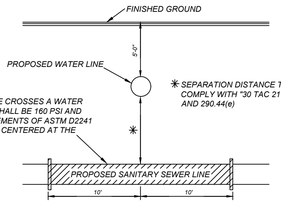
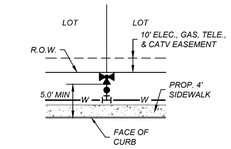
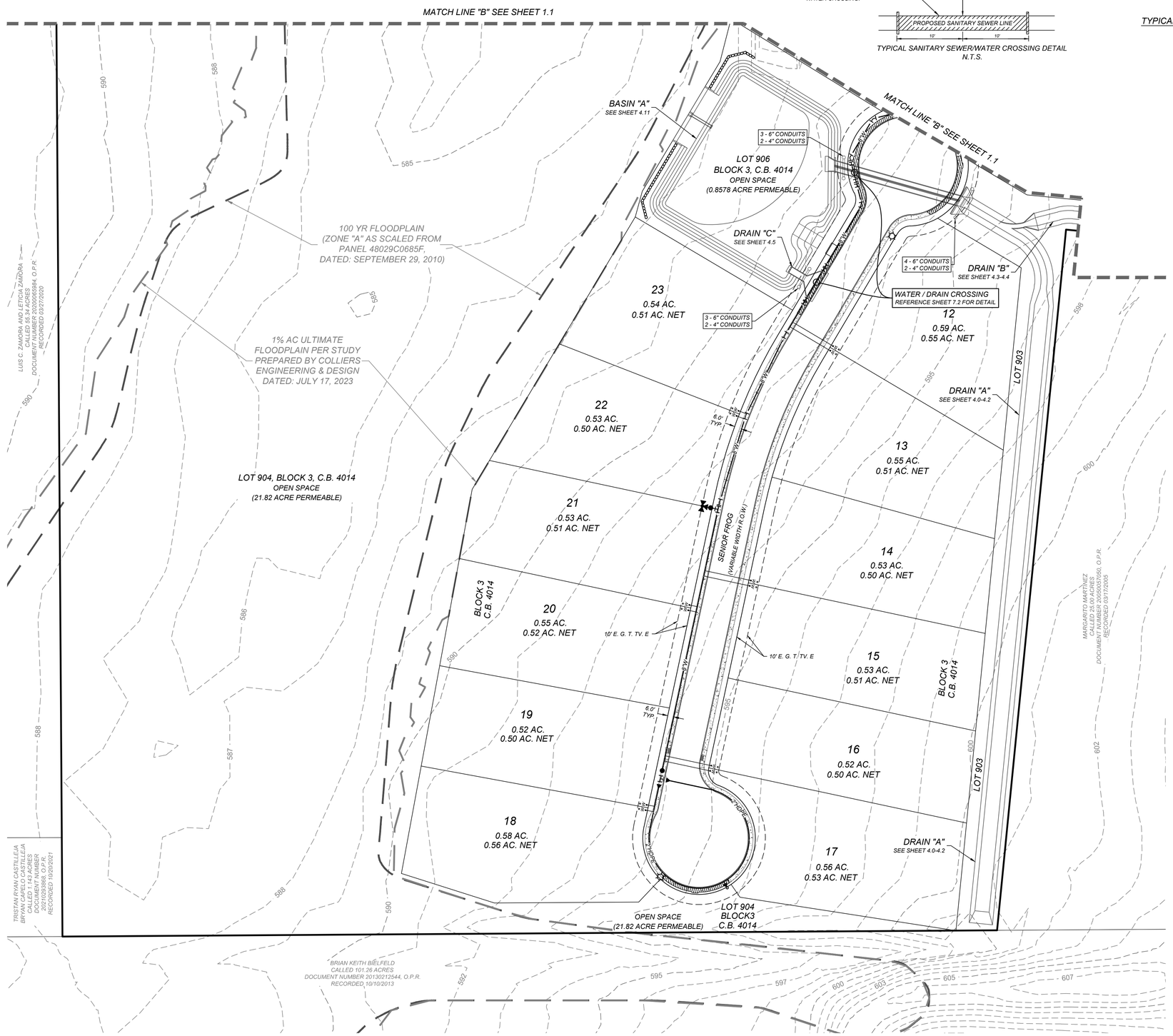
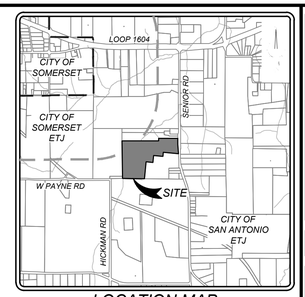


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.



TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE





LOCATION MAP
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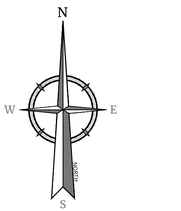
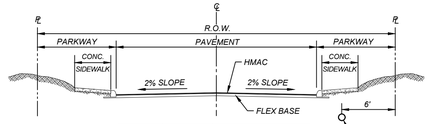


SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	WMR
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. E
EXISTING WATER MAIN	=	E W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING OVERHEAD ELECTRIC W/POWER POLE	=	OHE OHE
EXISTING GUY WIRE/OVERHEAD ELECTRIC	=	OHE



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TYPICAL STREET SECTION
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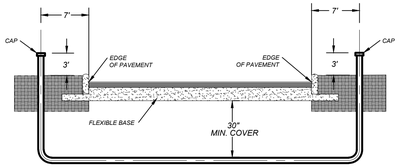

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Formerly Known as KFW

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
3/18/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14809
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: OU11160101

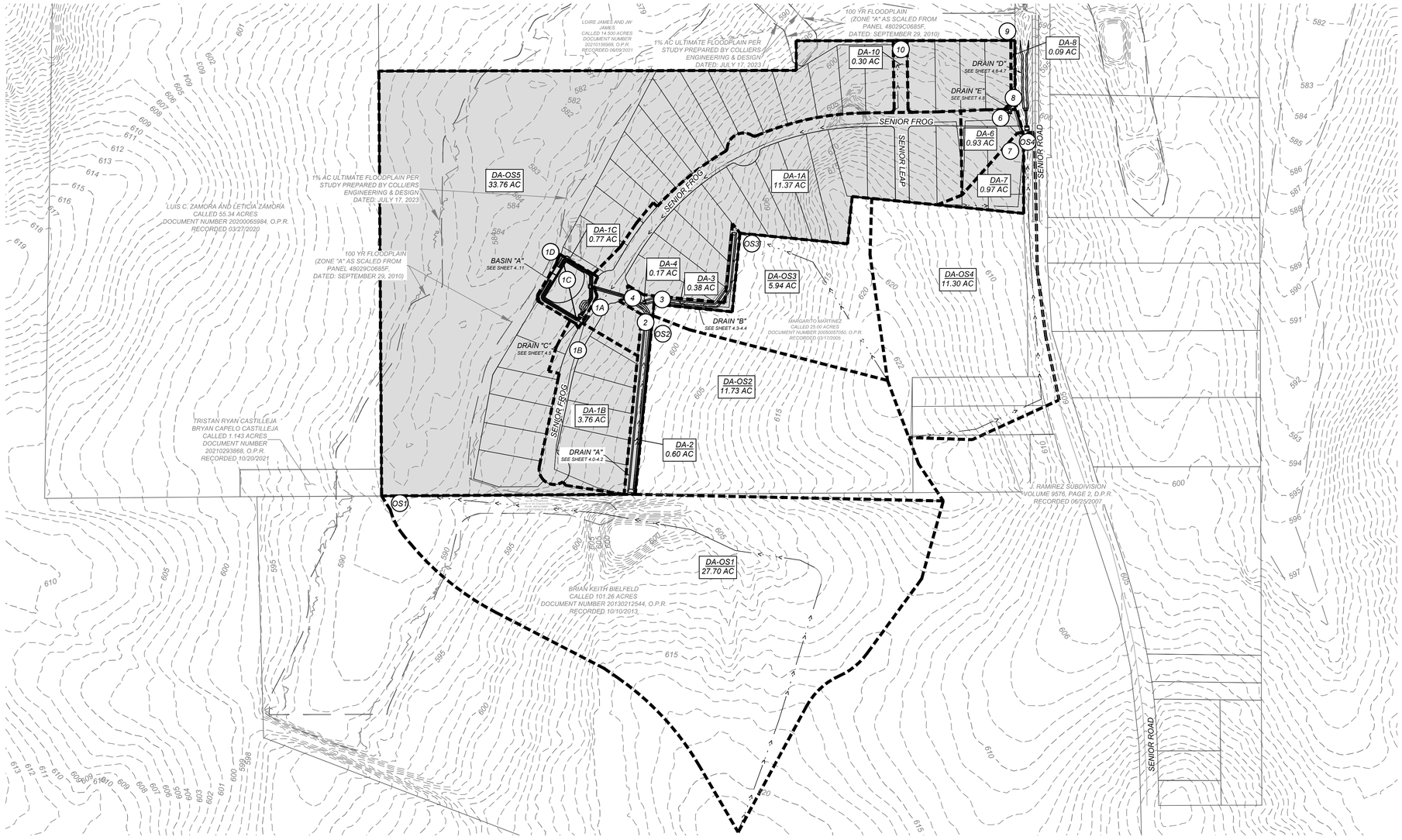
SHEET TITLE:
OVERALL UTILITY PLAN
(3 OF 3)

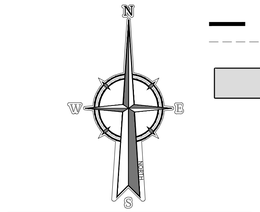
SHEET NUMBER:
1.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilOU1116\0100.dwg\1.2 By:ABEL MONTALVO

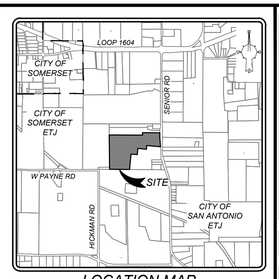
Ultimate Conditions															
Study Point	AREA	(Acres)	C	Tovrl (min)		Tsc (min)	Tch (min)	Ttot (min)	I5 (in/hr)	I25 (in/hr)	I100 (in/hr)	Q5 (ft3/s)	Q25 (ft3/s)	Q100 (ft3/s)
1A	DA-1A	11.37	0.62	13.00		1.00	5.00	19	4.602	6.343	7.927	32.44	44.71	55.88
1B	DA-1B	3.76	0.62	17.00		1.00	1.00	19	4.602	6.343	7.927	10.73	14.79	18.48
	DA-1C	0.77	0.62											
1C	PT.1A + PT.1B + DA-1C	15.90	0.62	HMS DETENTION POND "A" CALCULATIONS OUTFLOW										
	DA-2	0.60	0.62											
2	PT.OS2 + DA2	12.33	0.72	26.00	CARRYOVER FROM PT.OS2	0.00	2.00	28	3.790	5.200	6.475	33.42	45.85	57.09
	DA-3	0.38	0.62											
3	PT.OS3 + DA3	6.26	0.71	23.00	CARRYOVER FROM PT.OS3	0.00	2.00	25	4.012	5.508	6.864	17.93	24.62	30.68
	DA-4	0.17	0.62											
4	PT.2 + PT.3 + DA4	18.76	0.71	28.00	CARRYOVER FROM PT2	1.00	0.00	29	3.724	5.108	6.359	49.87	68.40	85.16
	DA-5	0.19	0.62											
5	PT.4 + DA-5	18.95	0.71	17.00	CARRYOVER FROM PT.4	1.00	1.00	19	4.602	6.343	7.927	62.17	85.69	107.09
6	DA-6	0.93	0.62	17.00		1.00	1.00	19	4.602	6.343	7.927	2.65	3.66	4.57
7	DA-7	0.97	0.62	17.00		1.00	1.00	19	4.602	6.343	7.927	2.77	3.81	4.77
	DA-8	0.09	0.62											
8	PT.OS4 + PT.6 + DA8	13.18	0.70	26.00	CARRYOVER FROM PT.OS4	0.00	1.00	27	3.860	5.297	6.597	35.86	49.21	61.29
9	PT.8	13.18	0.62	27.00		0.00	0.00	27	3.860	5.297	6.597	31.54	43.29	53.91
10	DA-10	0.30	0.96	19.00		2.00	0.00	21	4.376	6.022	7.516	1.26	1.73	2.16
OS-1	DA-OS1	27.46	0.72	20.00		7.00	4.00	31	3.599	4.936	6.143	71.16	97.59	121.45
OS-2	DA-OS2	11.73	0.72	19.00		7.00	0.00	26	3.934	5.400	6.727	33.22	45.60	56.81
OS-3	DA-OS3	5.88	0.72	19.00		4.00	0.00	23	4.182	5.747	7.167	17.70	24.33	30.34
	DA-OS4	11.19	0.72											
OS-4	PT.7+ DAOS4	12.16	0.71	19.00		5.00	2.00	26	3.934	5.400	6.727	34.06	46.75	58.24





LEGEND

- STUDY POINT
- DRAINAGE AREA BOUNDARY
- EXISTING CONTOURS
- FLOW ARROW
- PROPOSED UNIT



LOCATION MAP
N.T.S.

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2/26/24

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FOR

VARGA TRACT SUBDIVISION PLAT# 23-11800270

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC
PROJECT NUMBER: 1116-01-01	DRAWING NAME: MD11160101		

SHEET TITLE:
MASTER DRAINAGE PLAN

SHEET NUMBER:
2.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

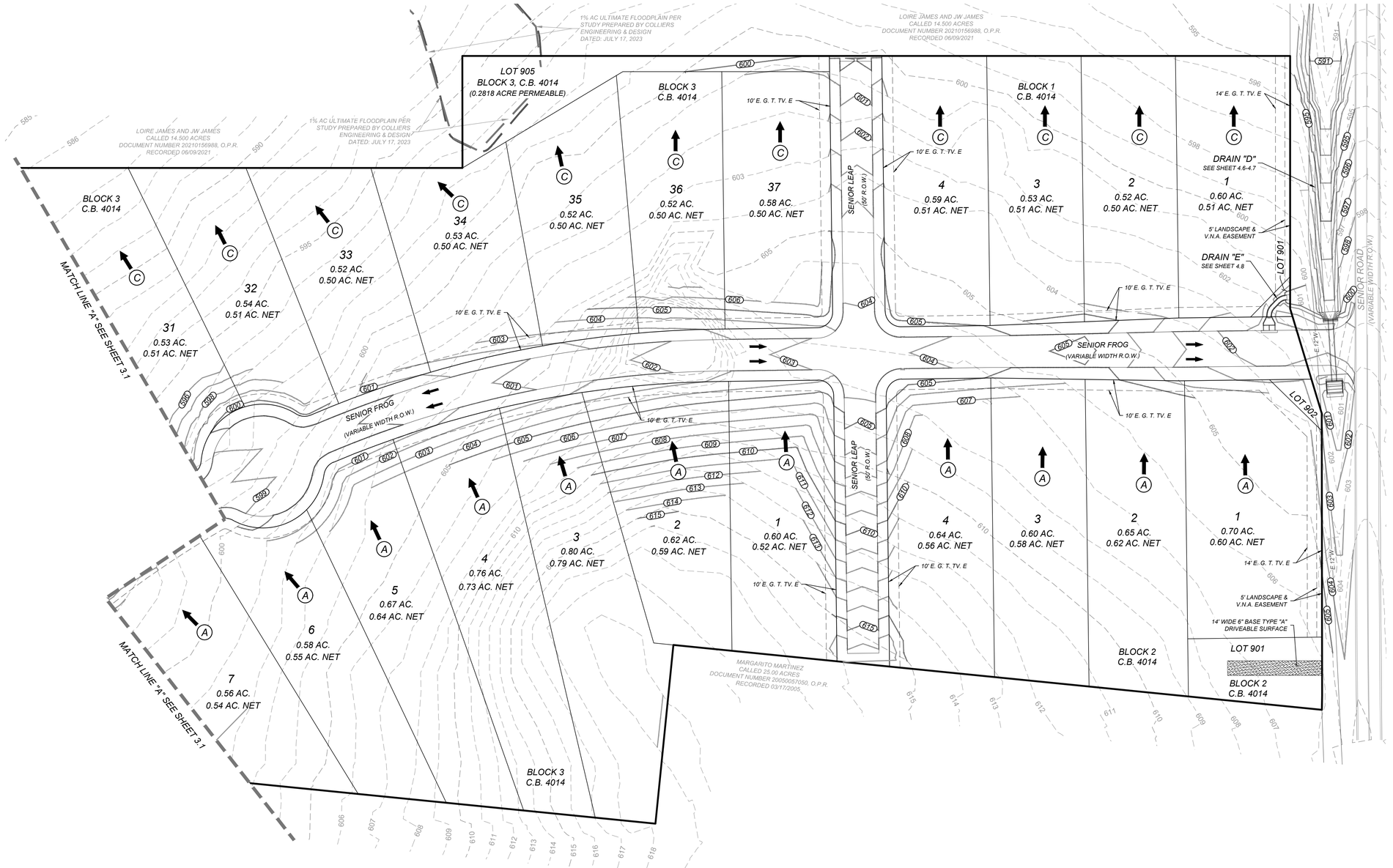
CivilMD11160101.dwg\2.0 By: SCRUZ

GENERAL NOTES:

1. *ELEVATION SHOWN ON FOUNDATION IS FOR FINISHED FLOOR.*
2. *CONTRACTOR SHALL PROVIDE OWNER ALL NECESSARY DENSITY TESTS FOR FILL LOTS AS REQUIRED BY HUD SPECIFICATIONS.*
3. *HOME BUILDER SHALL REFER TO THE APPROVED SUBDIVISION PLAT TO CONFIRM ALL BUILDING SETBACKS PRIOR TO ANY FOUNDATION WORK.*
4. *AS SOON AS PRACTICAL HOME BUILDER SHALL ESTABLISH VEGETATION (HYDROMULCH, SEEDING, SODDING, ETC...) TO PREVENT EROSION FROM OCCURRING.*
5. *CONTRACTOR SHALL CONTACT ENGINEER REGARDING ANY QUESTIONS ON THE INTENT OF THIS PLAN.*
6. *POSITIVE DRAINAGE SHALL BE MAINTAINED ON ALL SURFACE AREAS WITHIN THE SCOPE OF THIS PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM ALL BUILDING FOUNDATIONS AND TOWARDS THE PROPER DRAINAGE EASEMENT OR STREET RIGHT OF WAY ACCORDING TO THE MASTER DRAINAGE PLAN FOR THE PROJECT. CONTRACTOR SHOULD TAKE PRECAUTIONS NOT TO ALLOW PONDING OF WATER.*
7. *ALL ELEVATIONS AND CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVEMENT, CURBS, AND SIDEWALKS MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.*
8. *GRADING PLAN IS INTENDED FOR USE IN LOT GRADING ONLY. CONTRACTOR SHOULD REFER TO CONSTRUCTION DRAWINGS FOR ALL OTHER GRADES, INCLUDING, BUT NOT LIMITED TO, CHANNELS, ROADS, AND DETENTION PONDS.*
9. *CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ALL SWALES.*

COUNTY FINISHED FLOOR ELEVATION - RELATIVE TO FLOOD PLAIN:
FINISHED FLOOR ELEVATIONS FOR STRUCTURES ON LOTS CONTAINING FLOOD PLAIN OR ADJACENT TO THE FLOOD PLAIN SHALL BE IN COMPLIANCE WITH THE FLOOD PLAIN REGULATION IN EFFECT AT THE TIME OF CONSTRUCTION. CONTACT BEXAR COUNTY PUBLIC WORKS FOR MORE INFORMATION. (F-142(a) & (b)(1))

NOTE: THE MINIMUM FINISHED FLOOR ELEVATIONS HAVE BEEN REVISED TO BE A MINIMUM OF 1' ABOVE THE ULTIMATE 100 YEAR WATER SURFACE ELEVATION BASED UPON THE HEC-RAS OUTPUT TABLES FOUND WITHIN THE CLOMR. IN INSTANCES WHERE OUR LOTS ARE CONSIDERABLY HIGHER THAN THE 100 YEAR WATER SURFACE ELEVATION, THE FINISHED FLOOR WAS SET BASED UPON THE LOW CORNER OF THE PAD PER OUR PROPOSED LOT GRADING SURFACE.



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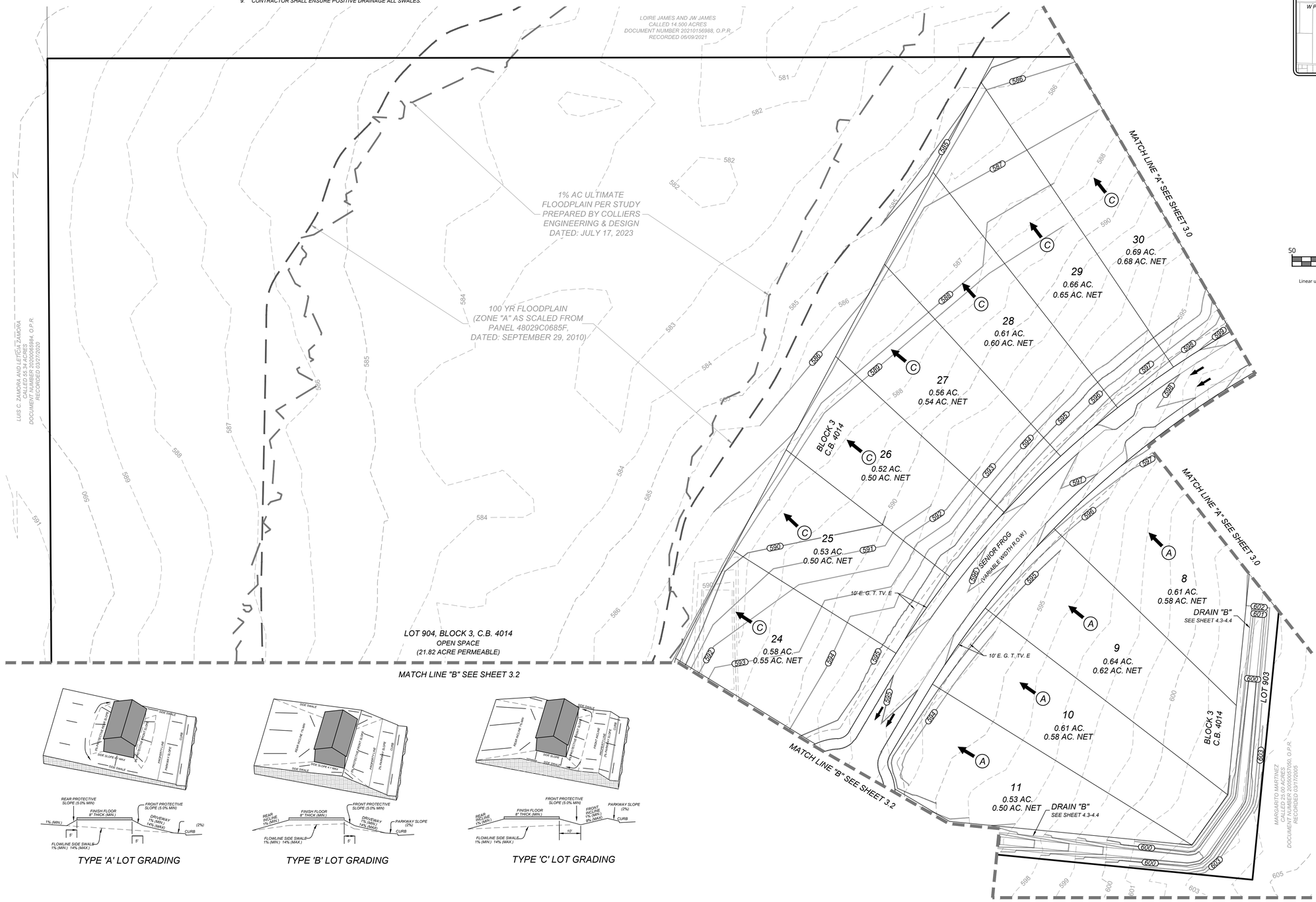
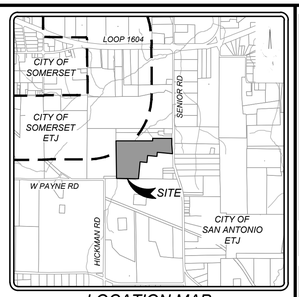
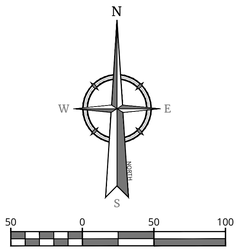




LOCATION MAP
N.T.S.



50 0 50 100
SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

TYPE 'A' LOT GRADING

TYPE 'B' LOT GRADING

TYPE 'C' LOT GRADING

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: GR11160101

SHEET TITLE:
OVERALL GRADING PLAN

SHEET NUMBER:
3.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Civil\GR11160101.dwg\3.1 By: SDUEWALL

GENERAL NOTES:

1. ELEVATION SHOWN ON FOUNDATION IS FOR FINISHED FLOOR.
2. CONTRACTOR SHALL PROVIDE OWNER ALL NECESSARY DENSITY TESTS FOR FILL LOTS AS REQUIRED BY HUD SPECIFICATIONS.
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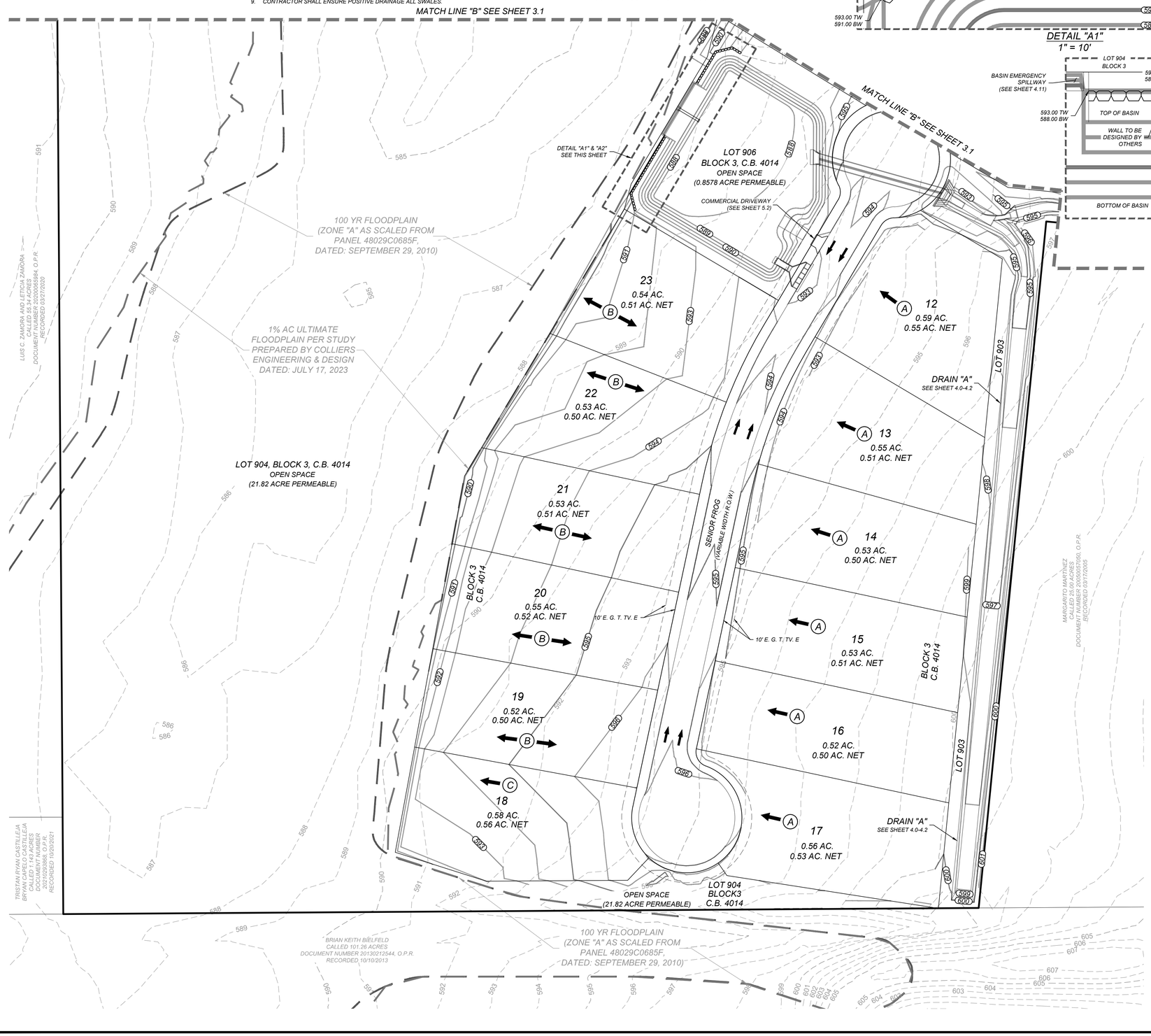
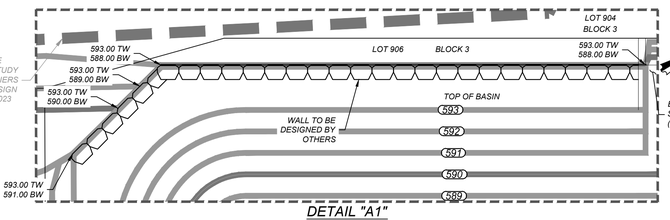
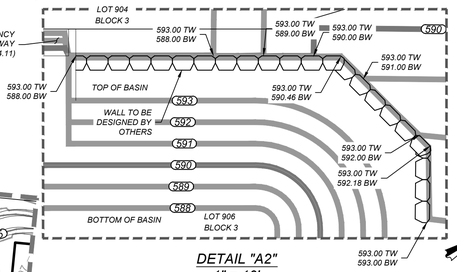
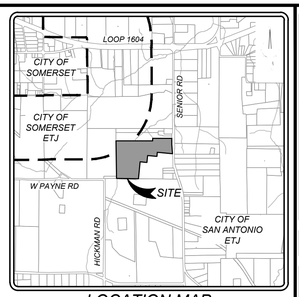




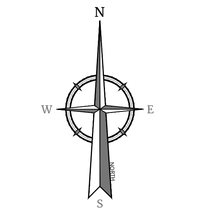
DETAIL "A1"
1" = 10'



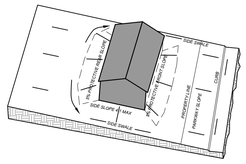
DETAIL "A2"
1" = 10'



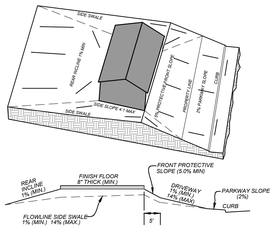
LOCATION MAP
N.T.S.



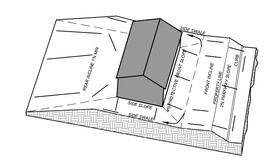
SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)



TYPE 'A' LOT GRADING



TYPE 'B' LOT GRADING



TYPE 'C' LOT GRADING

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER:	DRAWING NAME:
1116-01-01	GR11160101

SHEET TITLE:
OVERALL GRADING PLAN

SHEET NUMBER:
3.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

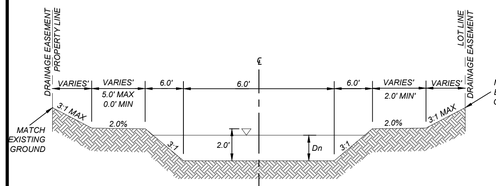
CivilGR11160101.dwg|3.2 By: CCRUZ

TRENCH EXCAVATION SAFETY PROTECTION

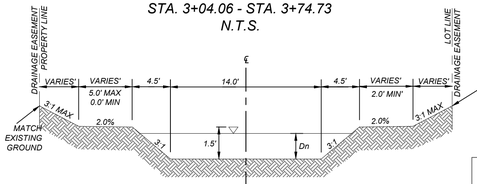
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S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

CAUTION!!:

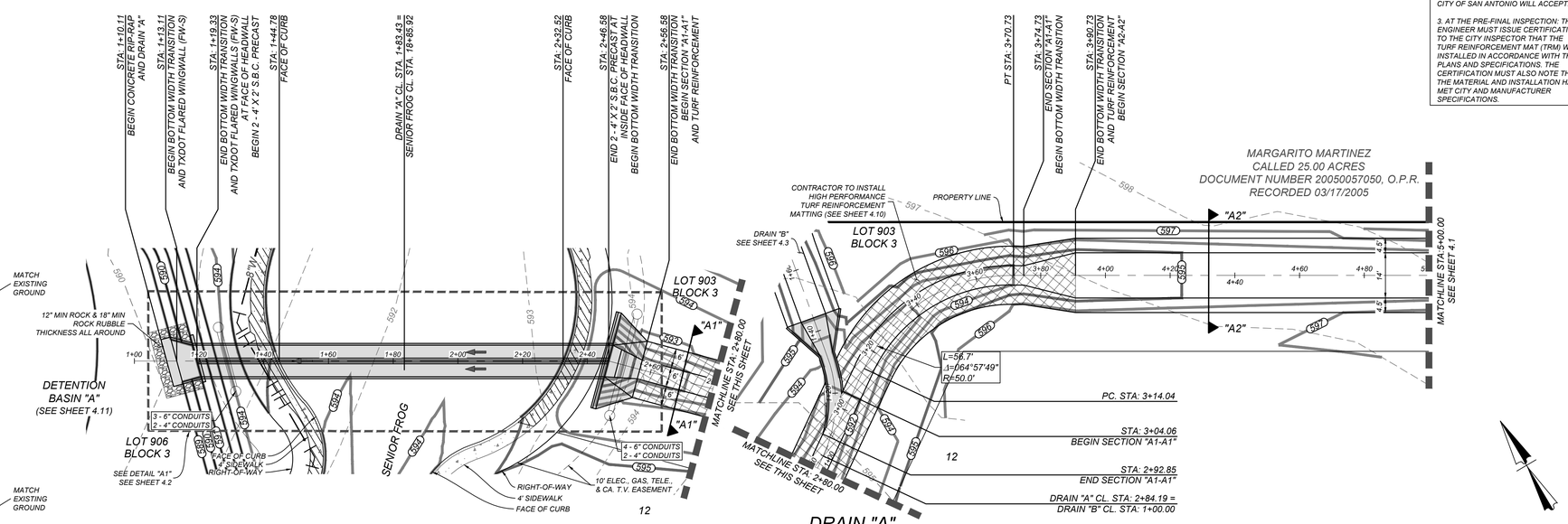
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT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



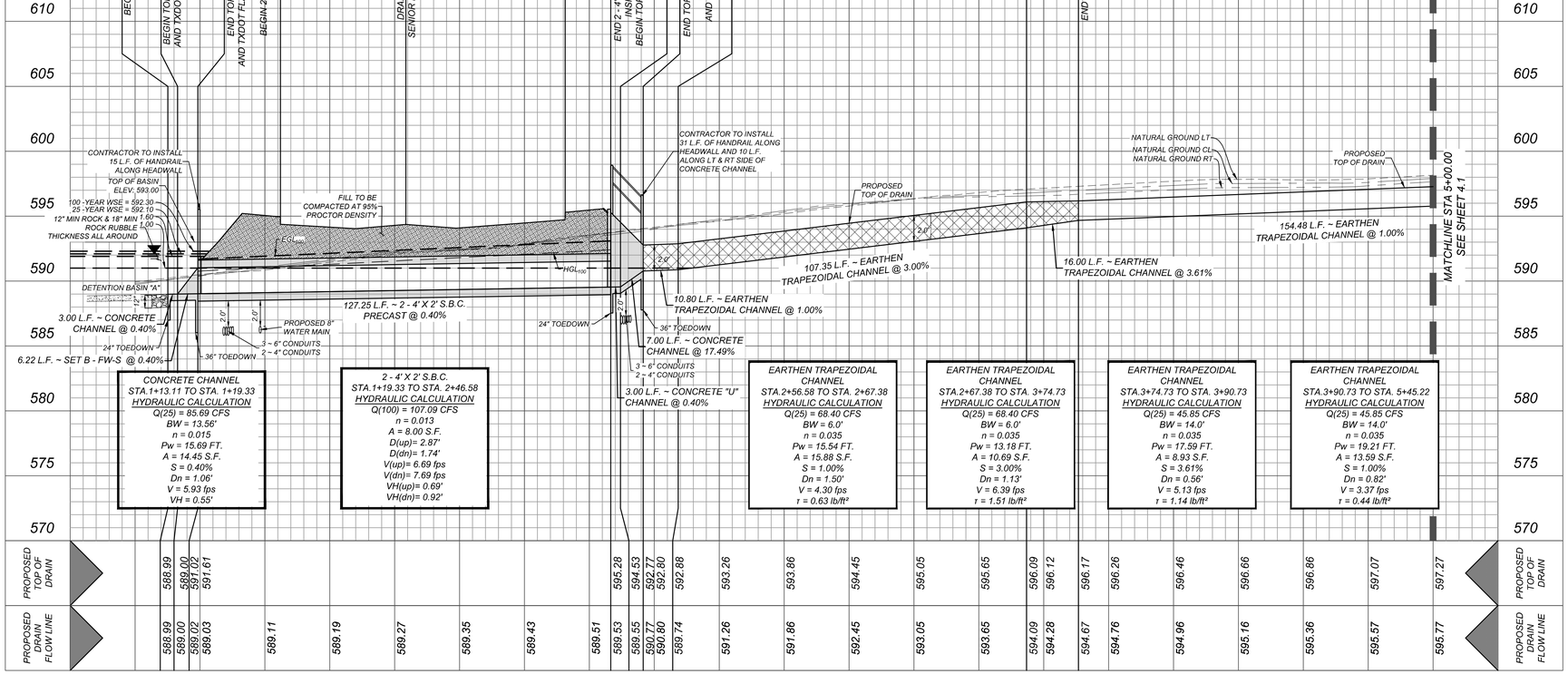
SECTION "A1-A1"
STA. 2+56.58 - STA. 2+92.85
STA. 3+04.06 - STA. 3+74.73
N.T.S.



SECTION "A2-A2"
STA. 3+90.73 - STA. 9+86.79
N.T.S.



HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



CHANNEL LINING:

AREA'S EXCEEDING CITY OF SAN ANTONIO PERMISSIBLE SHEAR STRESS WILL BE REINFORCED WITH PROPOSED TURF REINFORCEMENT MAT (TRM) AS APPROVED BY CITY OF SAN ANTONIO STANDARD SPECIFICATIONS UNDER CONSTRUCTION ITEM 554.

NOTE:

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2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
3/18/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
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San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: DR11160101 - A

SHEET TITLE:
DRAIN "A" PLAN & PROFILE STA. 1+00.00 TO STA. 5+00.00

SHEET NUMBER: 4.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\n\Dropzone\DR11160101 - A.dwg\4.0 By: ABIELMONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES 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.

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CHANNEL LINING:

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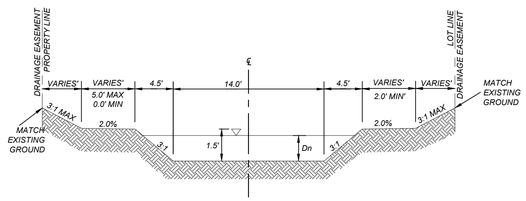

SECTION "A2-A2"
STA. 3+90.73 - STA. 9+89.58
N.T.S.

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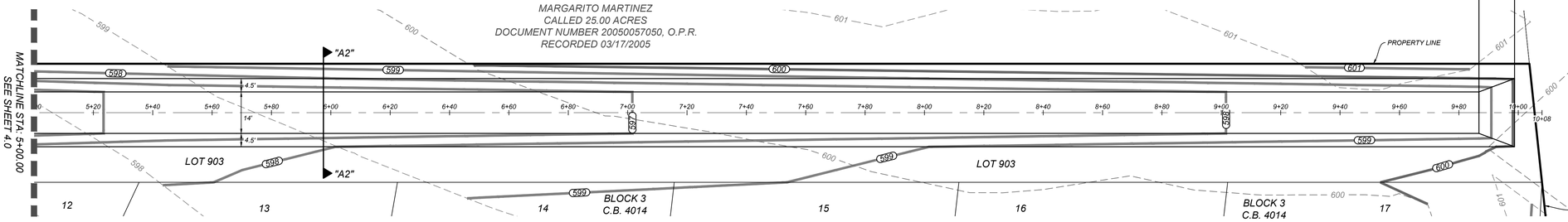
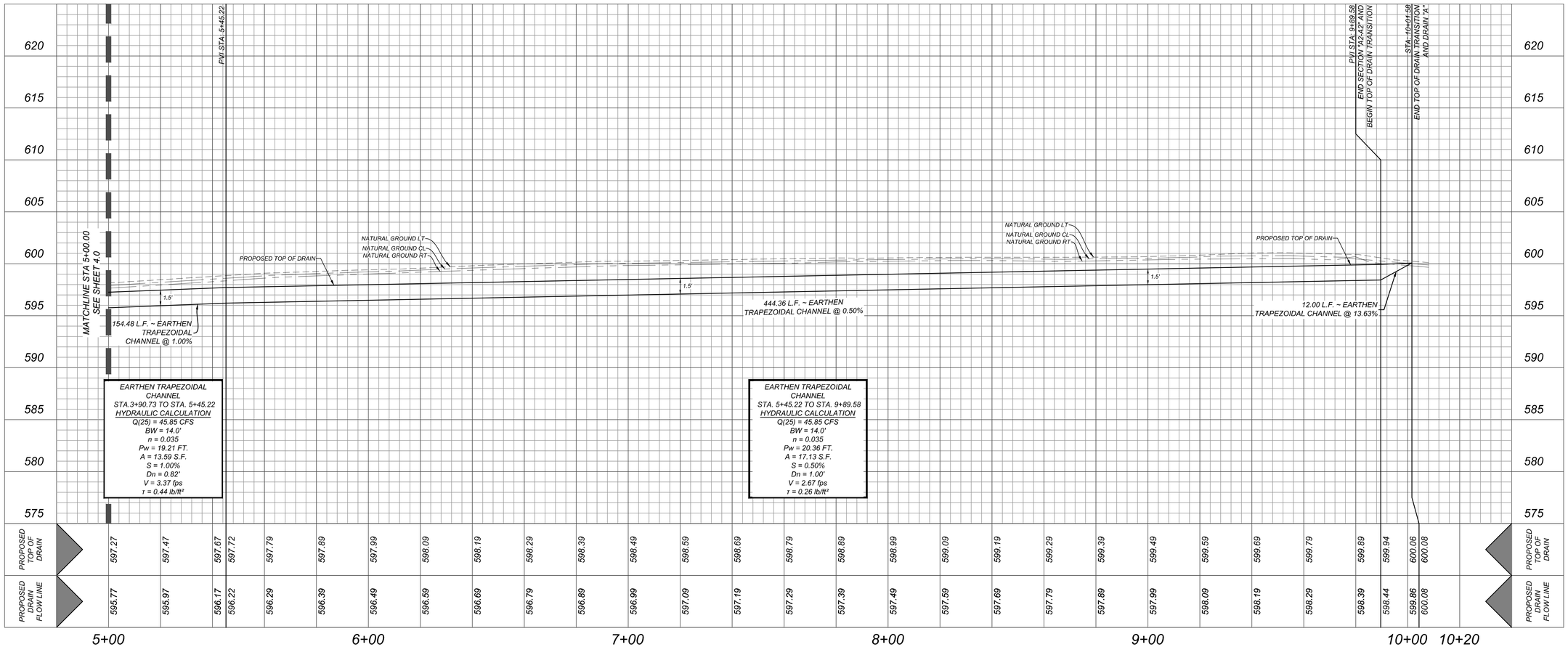


DRAIN "A"
STA. 5+00.00 TO END

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



EARTHEN TRAPEZOIDAL CHANNEL
STA.3+90.73 TO STA. 5+45.22
HYDRAULIC CALCULATION
Q(25) = 45.85 CFS
BW = 14.0'
n = 0.035
Pw = 19.21 FT.
A = 13.59 S.F.
S = 1.00%
Dn = 0.82'
V = 3.37 fps
τ = 0.44 lb/ft²

EARTHEN TRAPEZOIDAL CHANNEL
STA. 5+45.22 TO STA. 9+89.58
HYDRAULIC CALCULATION
Q(25) = 45.85 CFS
BW = 14.0'
n = 0.035
Pw = 20.36 FT.
A = 17.13 S.F.
S = 0.50%
Dn = 1.00'
V = 2.67 fps
τ = 0.26 lb/ft²

| | | |

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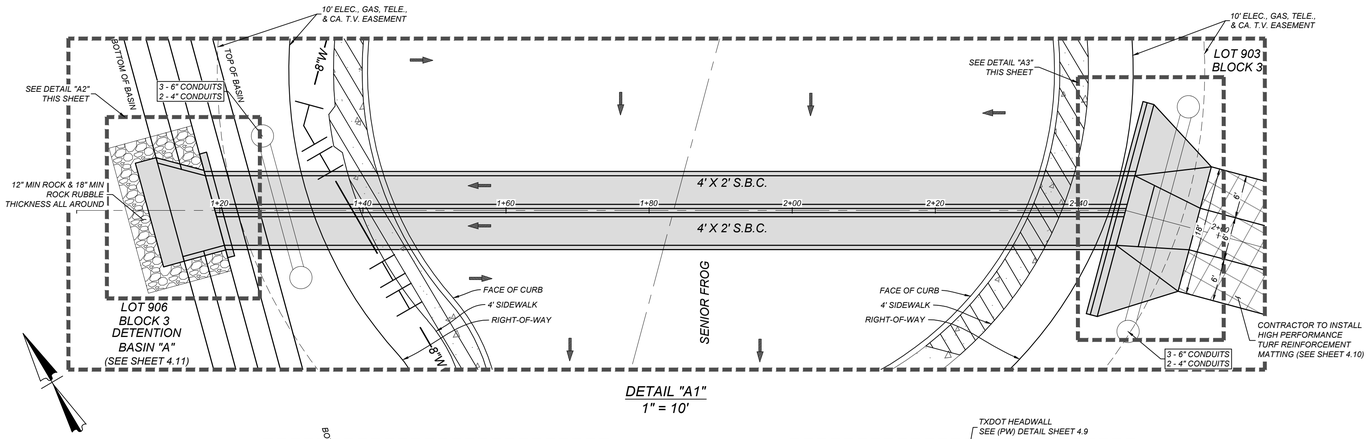
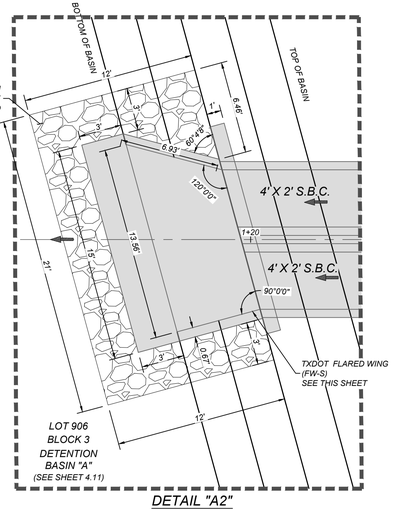
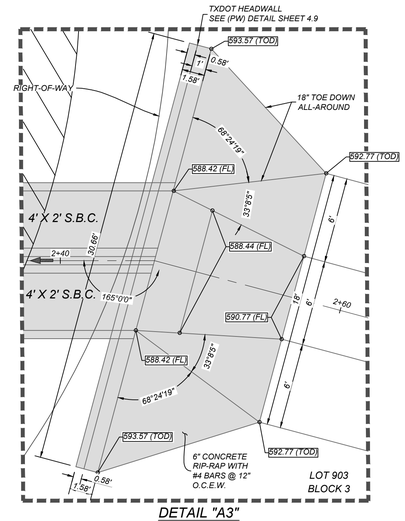


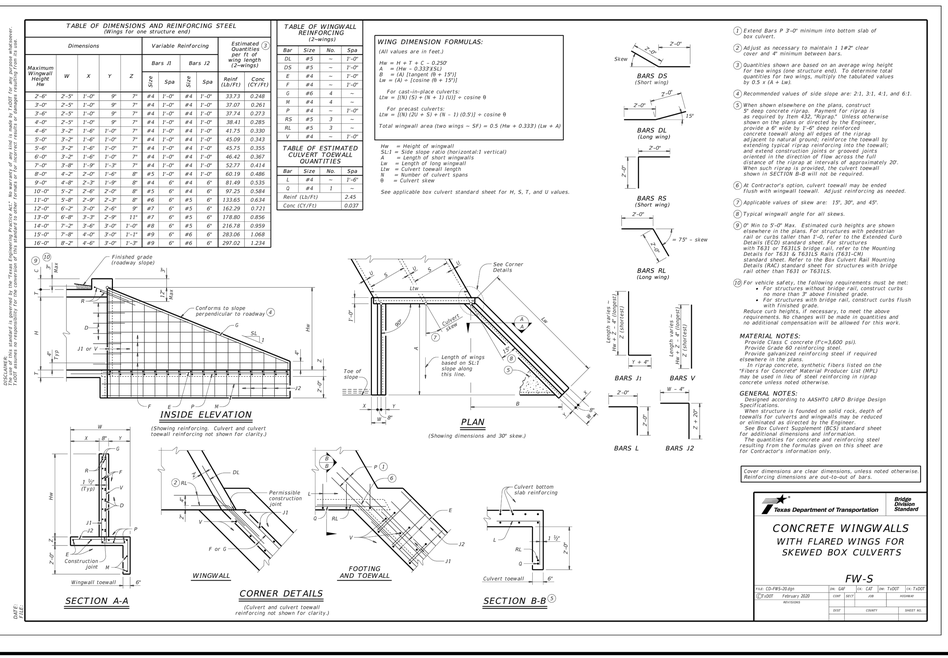
DETAIL "A1"
1" = 10'



DETAIL "A2"
1" = 10'



DETAIL "A3"
1" = 10'



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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED PROFESSIONAL ENGINEER

3/19/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER:	DRAWING NAME:
1116-01-01	DR11160101 - A

SHEET TITLE:

DRAIN "A" DETAILS

SHEET NUMBER:

4.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilDrains\DR11160101 - A.dwg\4.2 By: ABEL.MONTALVO

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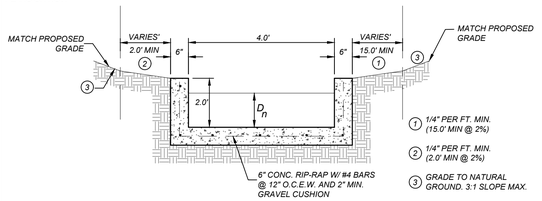
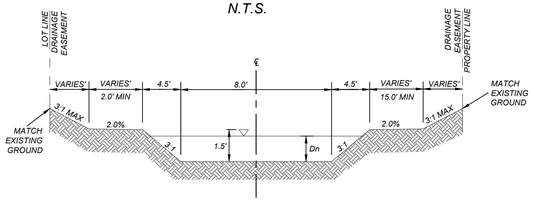
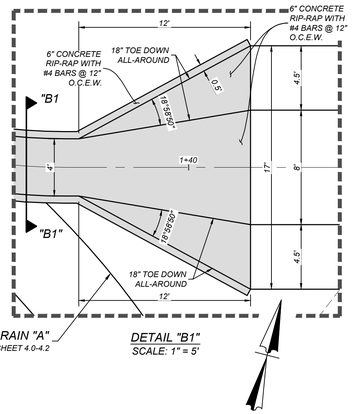


SECTION "B1-B1"
STA. 1+30.13 - STA. 1+32.33
N.T.S.



SECTION "B2-B2"
STA. 1+44.33 - STA. 6+85.16
N.T.S.



DRAIN "A"
SEE SHEET 4.0-4.2

DETAIL "B1"
SCALE: 1" = 5'

CHANNEL LINING:

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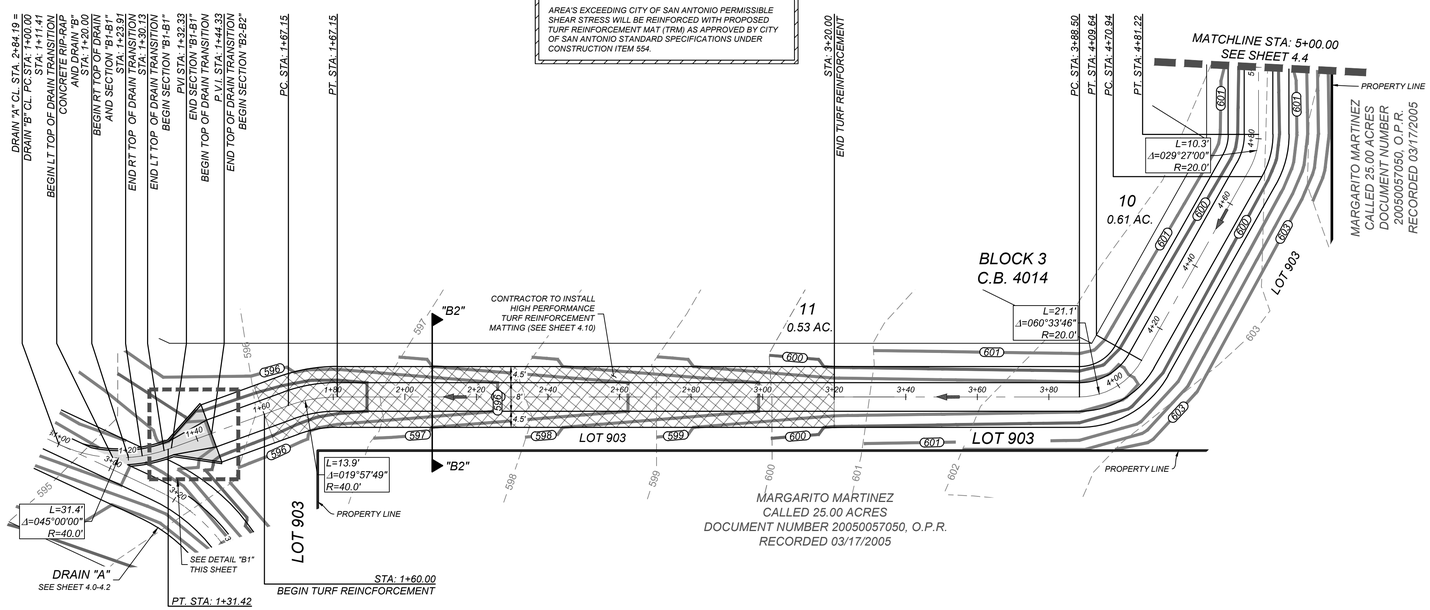
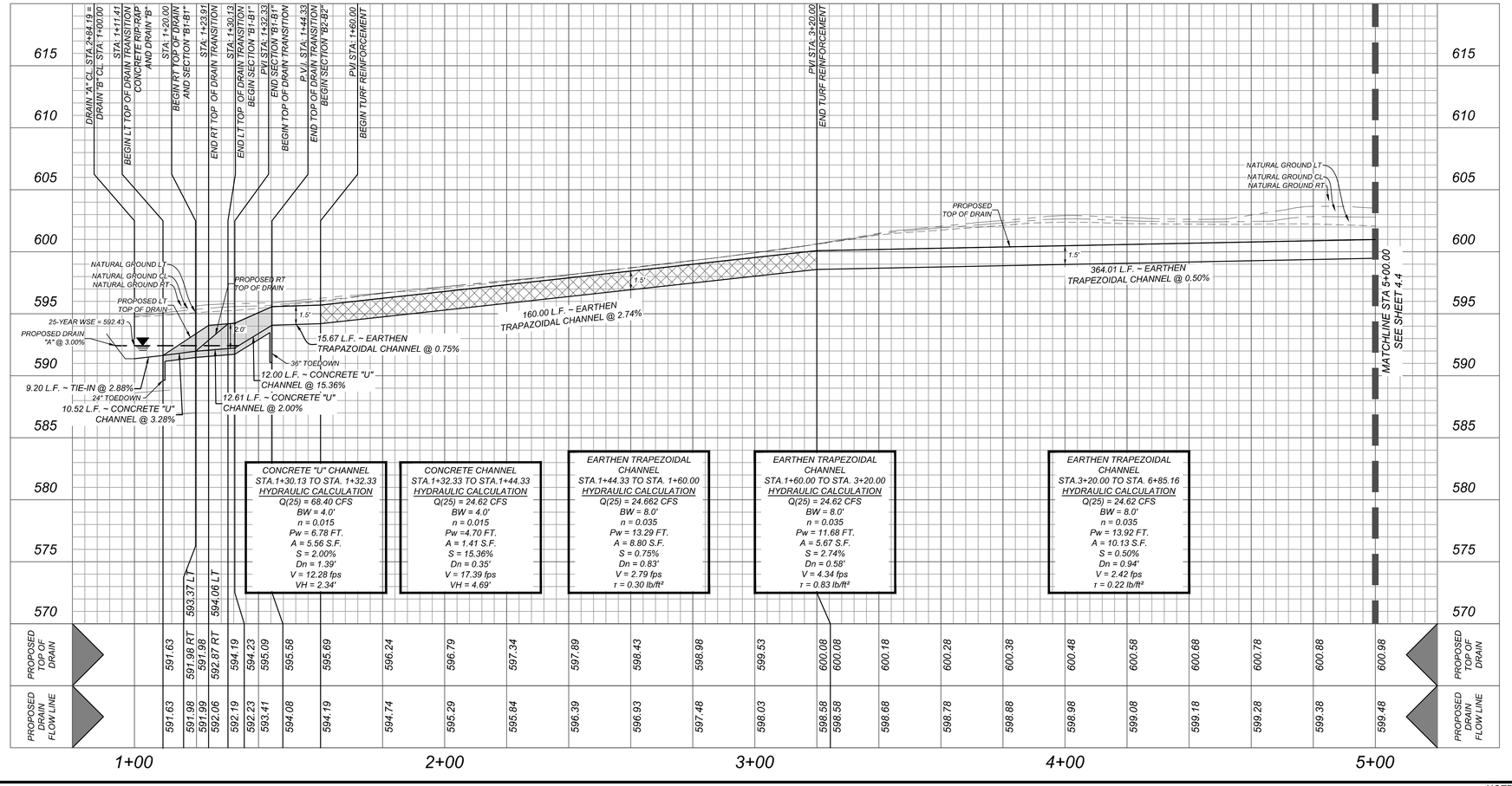


DRAIN "B"
STA. 1+00.00 TO STA. 5+00.00

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



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TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: DR11160101 - B

SHEET TITLE:
DRAIN "B" PLAN & PROFILE STA. 1+00.00 TO STA. 5+00.00

SHEET NUMBER: 4.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilDocs/sms/DR11160101 - B.dwg/4.3 By: ABEL MONTALVO

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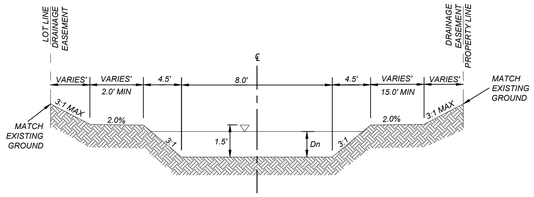

SECTION "B2-B2"
STA. 1+44.33 - STA. 6+85.16
N.T.S.

CHANNEL LINING:

AREA'S EXCEEDING CITY OF SAN ANTONIO PERMISSIBLE SHEAR STRESS WILL BE REINFORCED WITH PROPOSED TURF REINFORCEMENT MAT (TRM) AS APPROVED BY CITY OF SAN ANTONIO STANDARD SPECIFICATIONS UNDER CONSTRUCTION ITEM 554.

NOTE:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.

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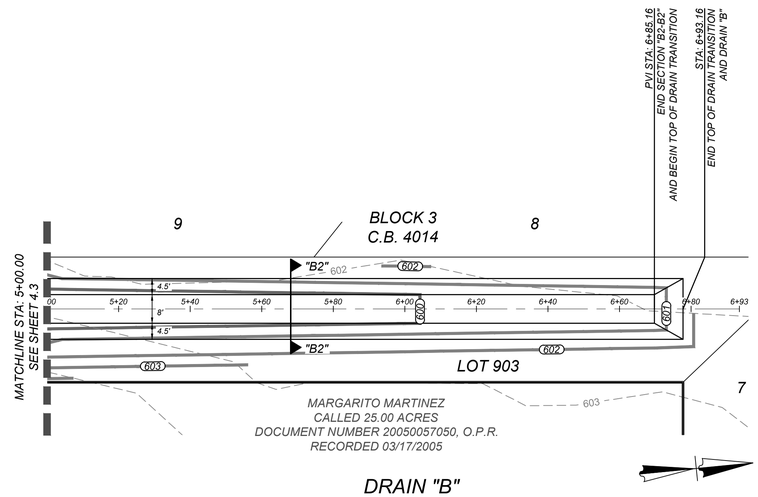
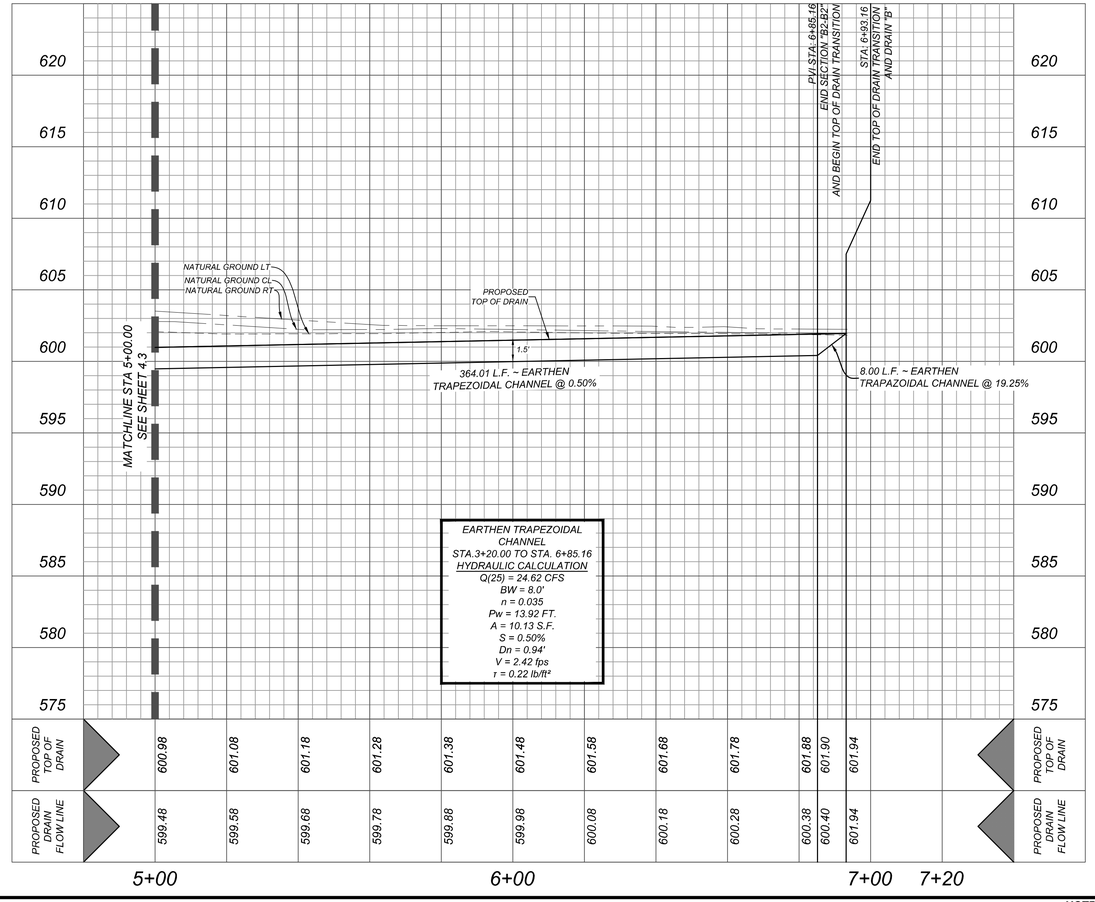


DRAIN "B"
STA. 5+00.00 TO END

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



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Formerly Known as KFW

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
3/18/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: DR11160101 - B

SHEET TITLE:
DRAIN "B" PLAN & PROFILE
STA. 5+00.00 TO END

SHEET NUMBER: 4.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Civil\Drawn\DR11160101 - B.dwg\4.4 By: ABEL.MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES 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.

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BAFFLE BLOCK CALCULATIONS
(ST. ANTHONY FALLS METHOD

Q25 = 44.71 CFS
BOTTOM WIDTH UPSTREAM = 7.0 FT
BOTTOM WIDTH DOWNSTREAM = 6.0 FT
Y1 = 1.18' (DEPTH BEFORE JUMP)
Y2 = 1.22' (DEPTH AFTER JUMP)

WIDTH OF BLOCKS = 0.75(Y1) = 0.89 FT. (USE 1.0 FT.)
SPACE BETWEEN BLOCKS = 0.75(Y1) = 0.89 FT. (USE 1.0 FT.)
HEIGHT OF BLOCKS = Y1 = 1.18 FT. (USE 1.25 FT.)
 # OF BLOCKS ACROSS BOTTOM = 3

*% OF FLOOR COVERED WITH BLOCKS = [3 (1.0 FT) / 7.0] * 100 = 43%*
(% MUST BE BETWEEN 40% AND 55%)

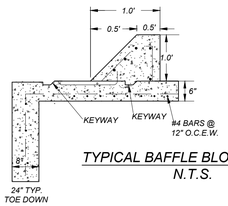
DEPTH OF TAILWATER (Y2)
FROUDE NUMBER BEFORE JUMP = F1 = 1.02 FROUDE NUMBER AFTER JUMP = F2 = 0.97

LENGTH OF BASIN = LB = 4.5(Y2)/F1^0.76 = 5.41 FT. (USE 10.00 FT.)

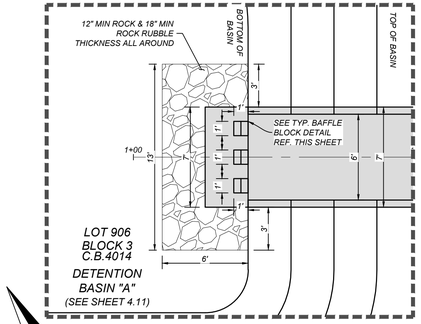
DISTANCE TO FLOOR BLOCKS = LB/3 = 1.80 FT (USE 8.0 FT.)

HEIGHT OF MAX TAILWATER DEPTH:
Z = Y2/3 = 0.41 FT.
*Y2' = 0.85 * Y2 = 0.35'*
H = Z + Y2' = 0.76 FT.

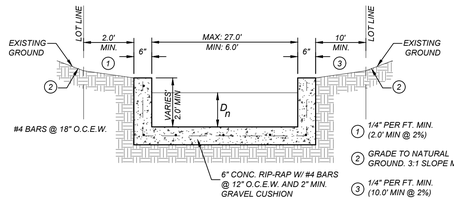
VELOCITY AFTER JUMP:
V = Q/A
*A = Y2 * BOTTOM WIDTH*
*A = 1.22 * 7 = 8.54 SQ. FT.*
V = 44.71 / 8.54 = 5.24 F.P.S.



TYPICAL BAFFLE BLOCK DETAIL
N.T.S.



DETAIL "C1"
1" = 5'



SECTION "C1-C1"
STA. 1+20.00 - STA. 1+35.00
N.T.S.

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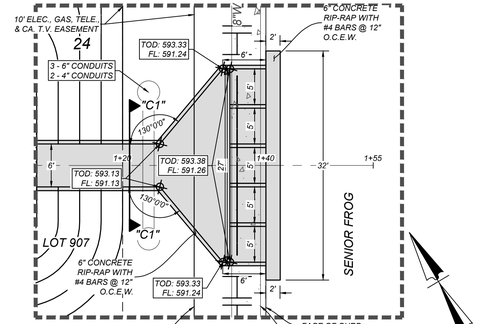
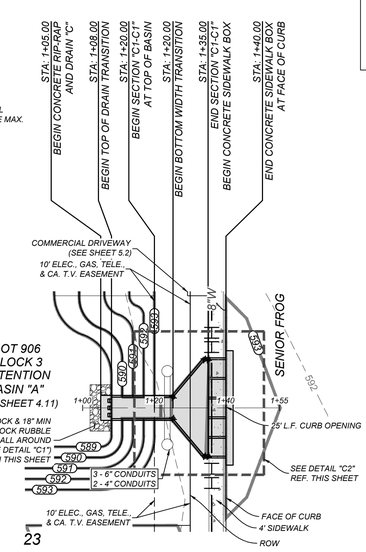


DETAIL "C2"
1" = 10'



CURB OPENING HYDRAULIC CALCULATION

$$L = \frac{Q_{25}}{Cn^{\frac{3}{2}}}$$

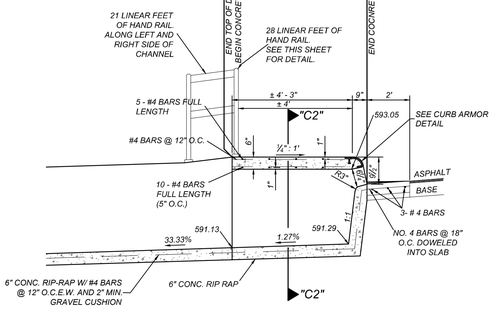
$$L = \frac{44.71}{(3.087)\ (0.79)^{\frac{3}{2}}}$$

$$L = 20.63 \text{ L.F.}$$

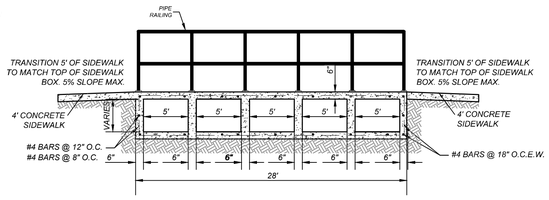
∴ *USE 25.0 L.F. CURB OPENING*

DRAIN "C"
STA. 1+00.00 TO END

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



SIDEWALK BOX DETAIL
N.T.S.



SECTION "C2-C2"
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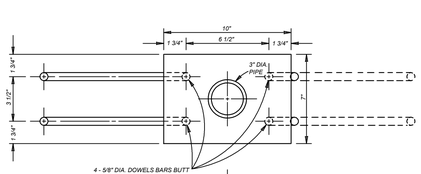
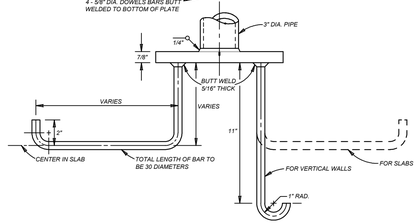
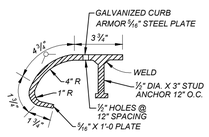
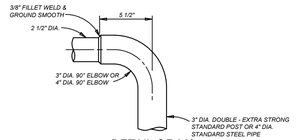




PIPE ANCHORAGE DETAILS
N.T.S.

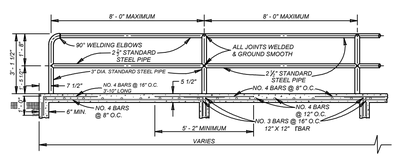


CURB ARMOR DETAIL
N.T.S.



DETAIL OF 90° WELDING ELBOWS
N.T.S.

* *A NEAT END SECTION, SATISFACTORY TO THE ENGINEER, FROM SUBMITTED SHOP DRAWINGS, MAY BE USED IN LIEU OF THE 90° WELDING ELBOW SHOWN.*



TYPICAL SIDEWALK BRIDGE & SIDEWALK PIPE RAILING SECTION
N.T.S.

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
3/18/24

PRELIMINARY

FOR

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TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: DR111601101 - B

SHEET TITLE: DRAIN "C" PLAN & PROFILE STA. 1+00.00 TO END

SHEET NUMBER: 4.5

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\n\Dr.com\DR111601101 - B.dwg\4.5 By: SCRUZ

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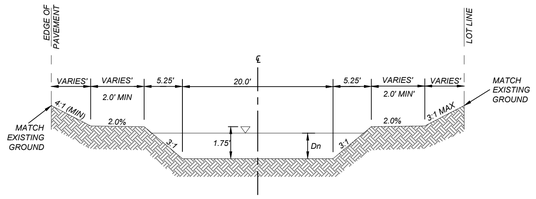
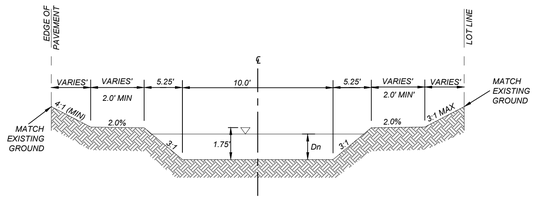


SECTION "D1-D1"
STA. 2+46.02 - STA. 2+52.02
N.T.S.



SECTION "D2-D2"
STA. 2+62.02 - STA.4+54.51
N.T.S.

BEXAR COUNTY R.O.W. NOTE

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

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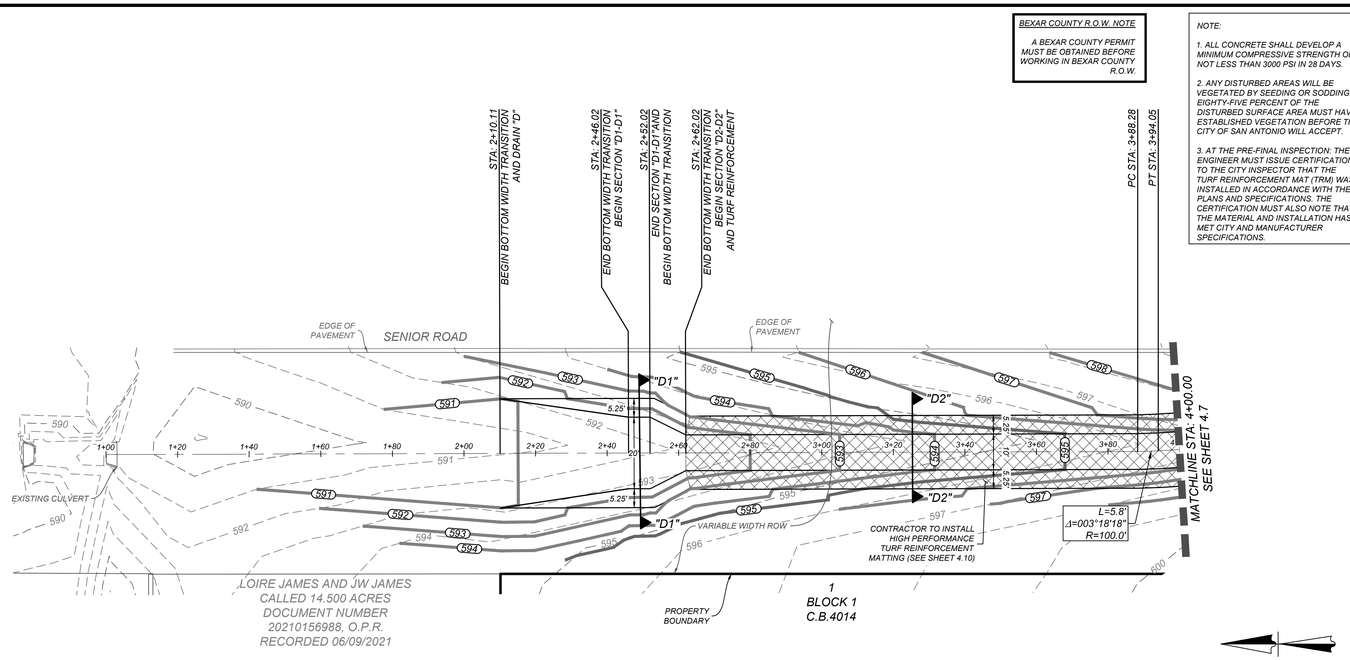

DRAIN "D"
STA. 1+00.00 TO STA. 4+00.00

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'

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REV	DATE	DRAWN BY	DESCRIPTION

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SERVANDO CRUZ
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LICENSED PROFESSIONAL ENGINEER
3/18/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

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TEXAS

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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14809
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: DR11160101 - D_E

SHEET TITLE:
DRAIN "D" PLAN & PROFILE
STA. 1+00.00 TO STA. 4+00.00

SHEET NUMBER: 4.6

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\KFD\Jobs\DR11160101 - D_E.dwg4.6 By: ABEL.MONTALVO

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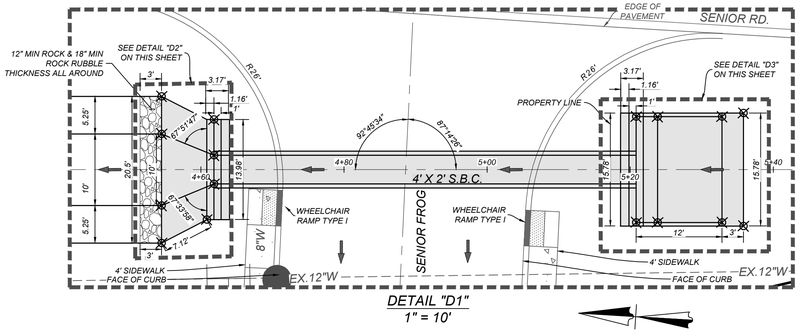
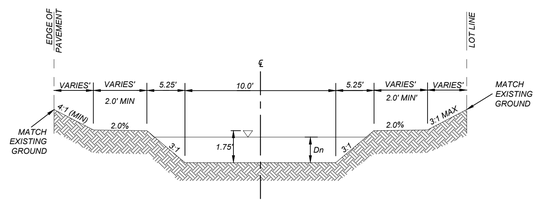
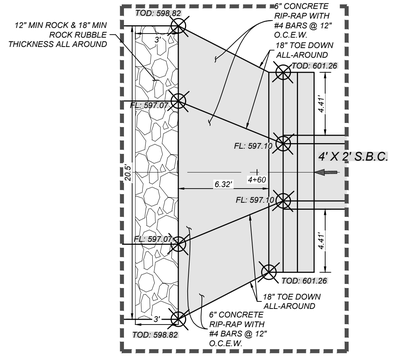


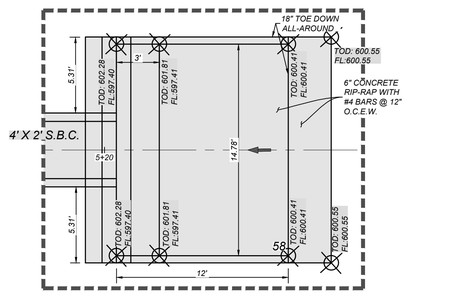
DETAIL "D1"
1" = 10'



SECTION "D2-D2"
STA. 2+62.02 - STA.4+54.51
N.T.S.



DETAIL "D2"
1" = 5'



DETAIL "D3"
1" = 5'

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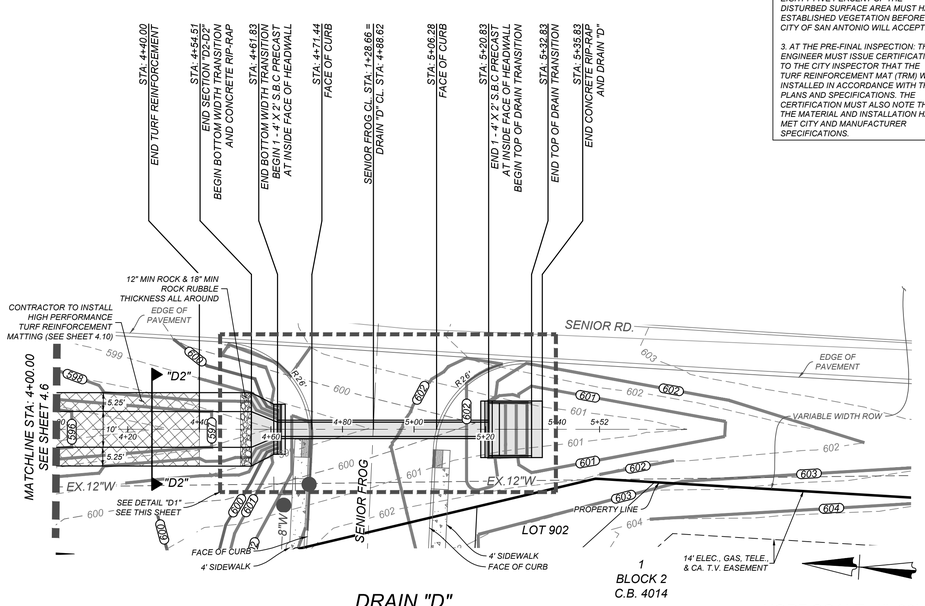
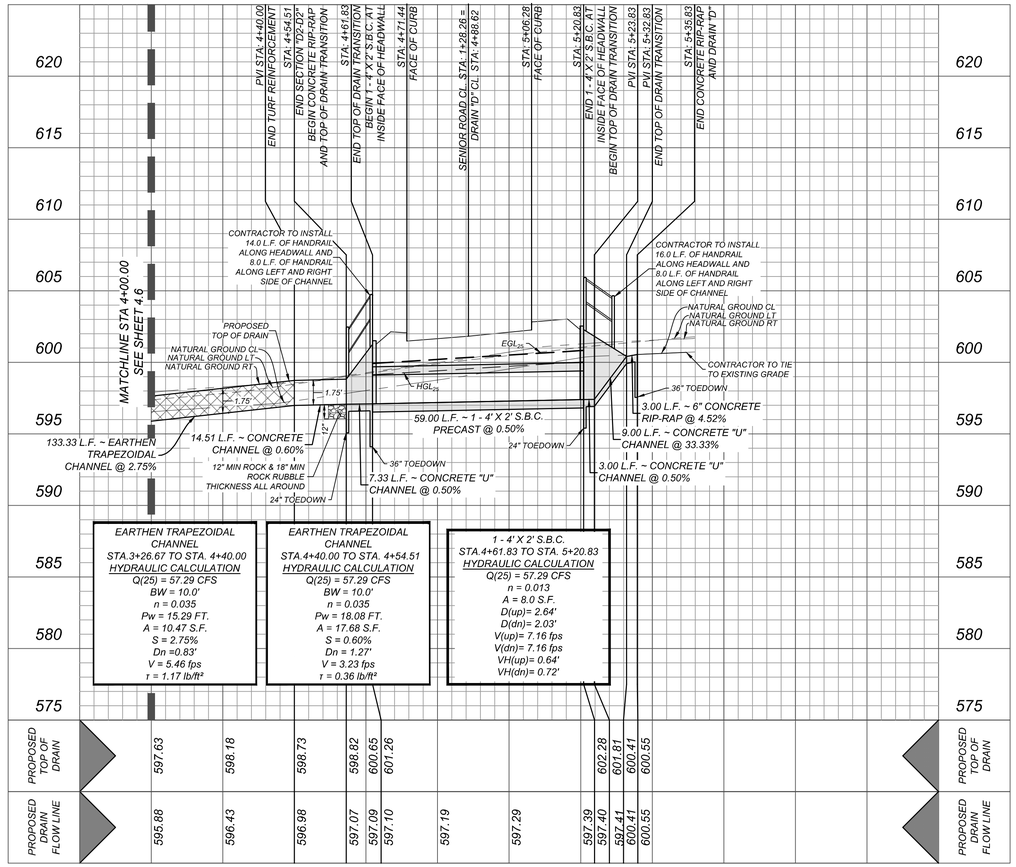


DRAIN "D"
STA.4+00.00 TO END

HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED PROFESSIONAL ENGINEER
3/18/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: DR11160101 - D_E

SHEET TITLE:
DRAIN "D" PLAN & PROFILE STA. 4+00.00 TO END

SHEET NUMBER: 4.7

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Civil\Drawings\DR11160101 - D_E.dwg(4.7 By: ABEL MONTALVO

TRENCH EXCAVATION SAFETY PROTECTION

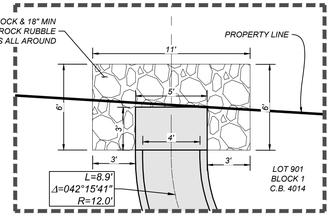
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S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

CAUTION!!:

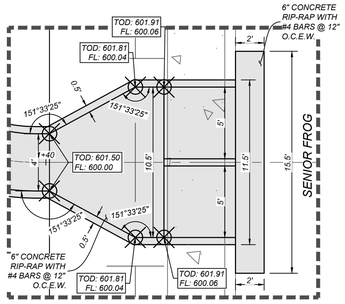
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT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

BEXAR COUNTY R.O.W. NOTE

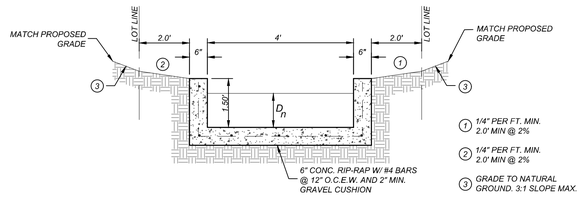
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.



DETAIL "E1"
1" = 5'



DETAIL "E2"
1" = 5'

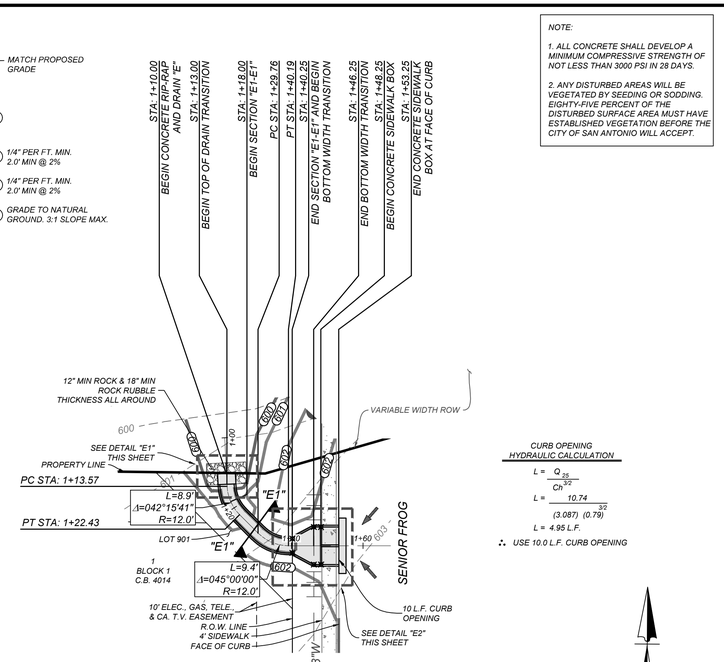


1. 1/4" PER FT. MIN. 2.0' MIN @ 2%
2. 1/4" PER FT. MIN. 2.0' MIN @ 2%
3. GRADE TO NATURAL GROUND. 3:1 SLOPE MAX.

SECTION "E1-E1"
STA. 1+21.50 - STA. 4+60.11
N.T.S.

NOTE:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.
2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.



CURB OPENING HYDRAULIC CALCULATION

$L = \frac{Q_{25}}{Ch^{3/2}}$

$L = \frac{10.74}{(3.087)\ (0.79)^{3/2}}$

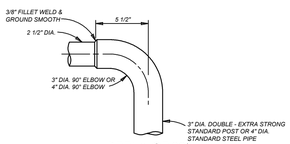
$L = 4.95$ L.F.

∴ USE 10.0 L.F. CURB OPENING

DRAIN "E"
STA. 1+00.00 TO END

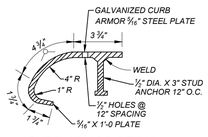
HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'

SIDEWALK BOX DETAIL
N.T.S.

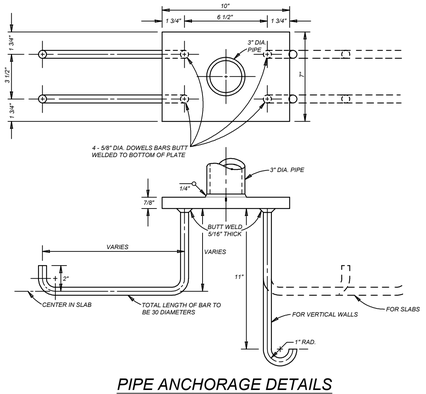


DETAIL OF 90° WELDING ELBOWS
N.T.S.

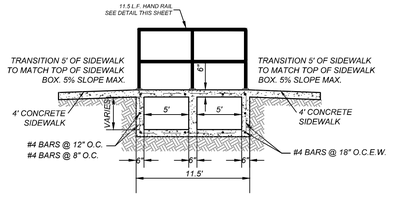
* A NEAT END SECTION, SATISFACTORY TO THE ENGINEER, FROM SUBMITTED SHOP DRAWINGS, MAY BE USED IN LIEU OF THE 90° WELDING ELBOW SHOWN.



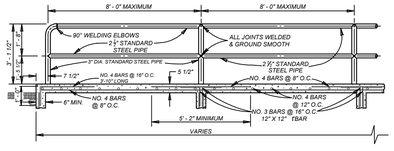
CURB ARMOR DETAIL
N.T.S.



PIPE ANCHORAGE DETAILS
N.T.S.



SECTION "E2-E2"
N.T.S.



TYPICAL SIDEWALK BRIDGE & SIDEWALK PIPE RAILING SECTION
N.T.S.

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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED PROFESSIONAL ENGINEER
9/21/23

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14809
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: DR11160101 - D_E

SHEET TITLE: DRAIN "E" PLAN & PROFILE STA. 1+00.00 TO END

SHEET NUMBER: 4.8

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

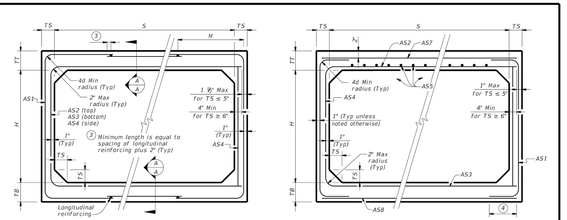
CivilDocs/projects/DR11160101 - D_E.dwg/4.8 By: SCRUZ

BOX DATA

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

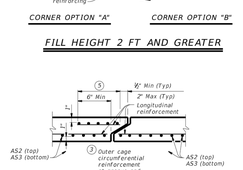
① For box length = 8'-0"

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



CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT 2 FT AND GREATER



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

CORNER OPTION "A" CORNER OPTION "B"

FILL HEIGHT LESS THAN 2 FT

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

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

GENERAL NOTES:
Designs shown conform to ASTM C1577. Refer to ASTM C1577 for information or details not shown.
See Box Culverts Precast Miscellaneous Details (SCP-MD) standard sheet for details and notes not shown.
In lieu of furnishing the designs shown on this sheet, the contractor may furnish an alternate design that is equal to or exceeds the box design for the design fill height in the table. Submit shop plans for alternate designs in accordance with Item "Precast Concrete Structural Members (Fabrication)".

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

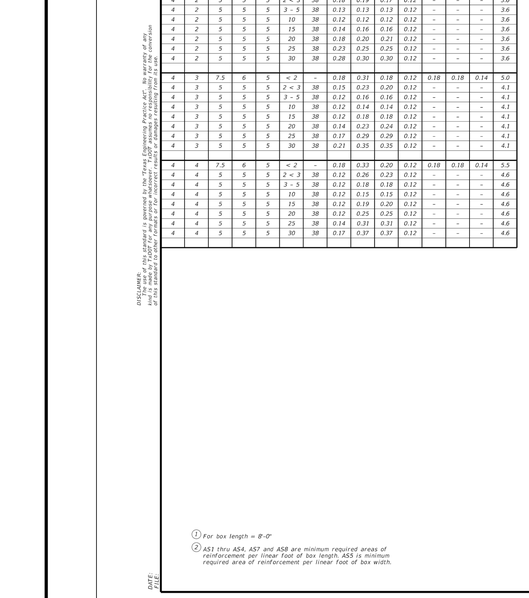
SINGLE BOX CULVERTS PRECAST 4'-0" SPAN

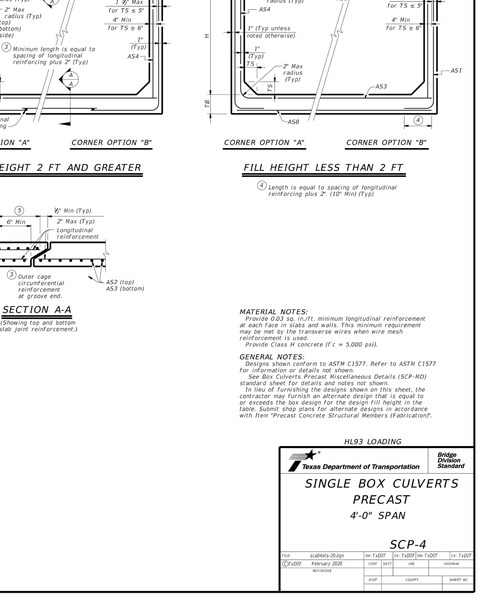
SCP-4

FILE:	scp04dn-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No liability of any kind is assumed by the Texas Department of Transportation for any reuse of this standard or for any incorrect results or damages resulting from its use.

DATE:
FILE:





MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

PIPE BEDDING & MISCELLANEOUS DRAINAGE DETAILS

N. SUBMITTAL PROJECT NO.:		DATE:
DRWN. BY:	DSGN. BY:	CHKD. BY:	SHEET NO.:	OF:

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

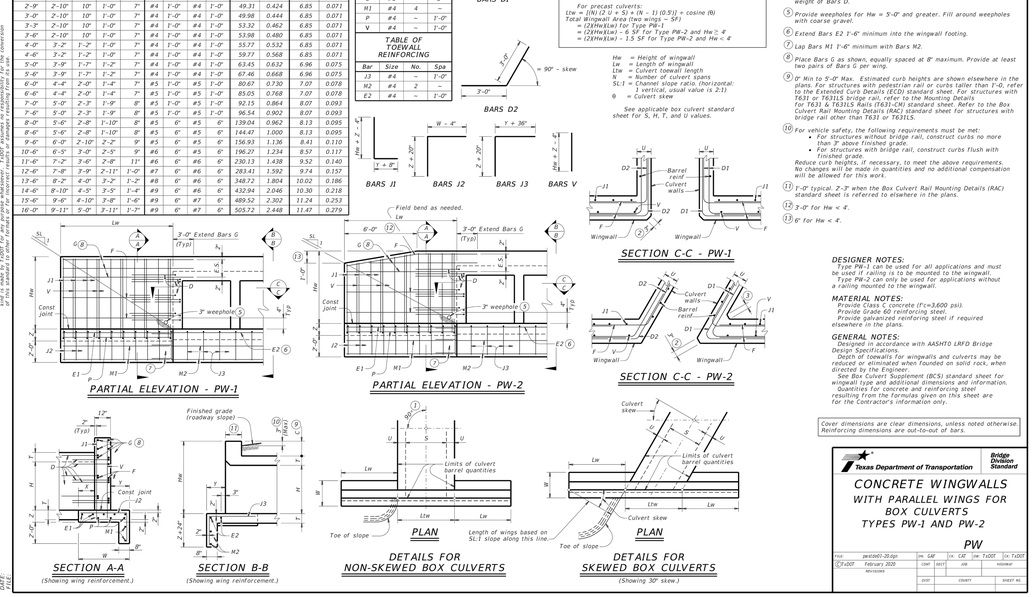
Maximum Wingwall Height Hw	Dimensions W	X	Y	Z	Variable Reinforcing Bars J1 Size	Bars J1 Spa	Bars J2 Size	Bars J2 Spa	Estimated Quantities per ft of Roadway (2-wings) ④ Reinf (Lb/Ft)	Conc (CY/Ft)	Estimated Quantities per ft of Toewall (1-toewall) Reinf (Lb/Ft)	Conc (CY/Ft)
2'-6"	2'-10"	10"	1'-0"	7"	#4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

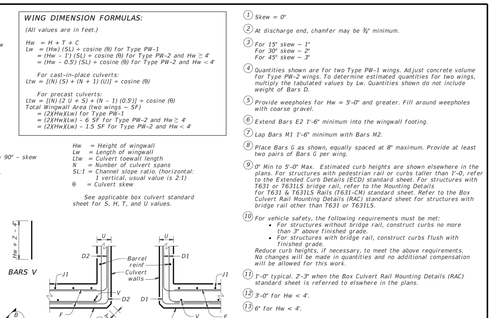
TABLE OF WINGWALL REINFORCING
(2-wings)

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

TABLE OF TOEWALL REINFORCING

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





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

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

For cast-in-place culverts:
Ltw = [(N) (S) + (N + 1) (U)] + cosine (θ)

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

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

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

① Skew = 0°
② At discharge end, chamber may be ½" minimum.
③ For 15° skew − 1'
For 30° skew − 2'
For 45° skew − 3'
④ Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.
⑤ Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.
⑥ Extend Bars E2 1'-6" minimum into the wingwall footing.
⑦ Lap Bars M1 1'-6" minimum with Bars M2.
⑧ Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.
⑨ 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0", refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
⑩ For vehicle safety, the following requirements must be met:
• For structures without bridge rail, construct curbs no more than 3" above finished grade.
• For structures with bridge rail, construct curbs flush with finished grade.
Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
⑪ 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
⑫ For multiple unit placement with overlay, with 1 to 2 course surface treatment, or with the top slab as the final riding surface, provide wall closure as shown in Detail "A".
⑬ This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 416, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide ASTM A1064 welded wire reinforcement.
Provide Class C concrete (f'_c = 3,600 psi) for the closures.
Provide cement stabilized backfill meeting the requirements of Item 400, "Excavation and Backfill for Structures."
Any additional concrete required for the closures will be considered subsidiary to the box culvert.

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

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

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

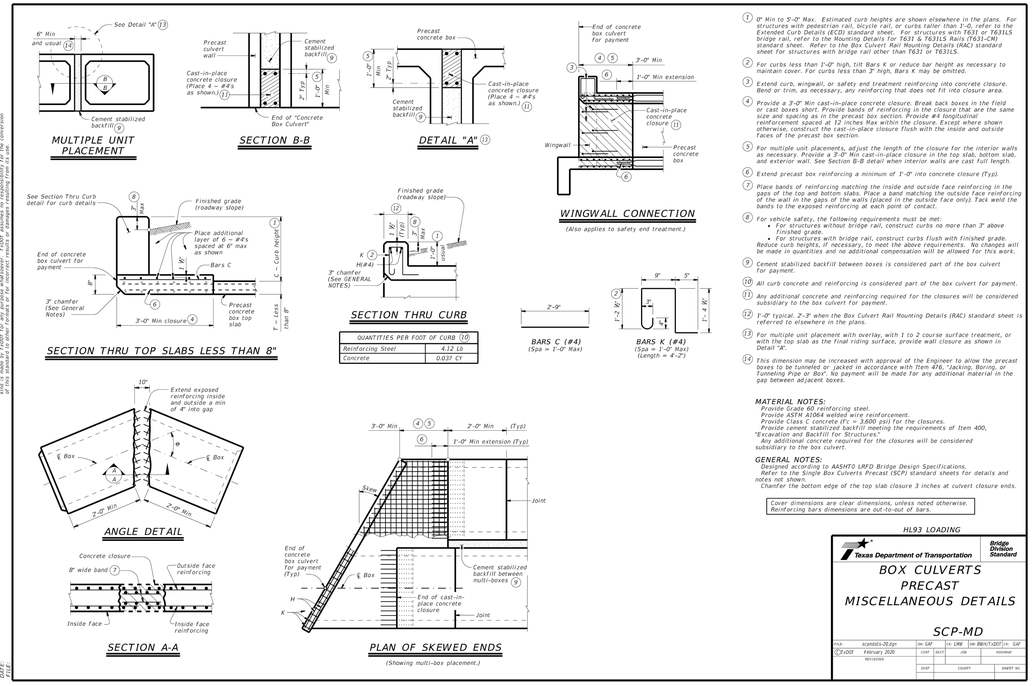
CONCRETE WINGWALLS WITH PARALLEL WINGS FOR BOX CULVERTS TYPES PW-1 AND PW-2

PW

FILE:	pwsta01-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No liability of any kind is assumed by the Texas Department of Transportation for any reuse of this standard or for any incorrect results or damages resulting from its use.

DATE:
FILE:



QUANTITIES PER FOOT OF CURB (10)	
Reinforcing Steel	4.12 Lb
Concrete	0.037 CY

HL93 LOADING

Texas Department of Transportation | Bridge Division Standard

BOX CULVERTS PRECAST MISCELLANEOUS DETAILS

SCP-MD

FILE:	scpmd01-20.dgn	DN: GAF	CK: LRW	DW: BENITEZDOT	CK: GAF
©TxDOT	February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS		DIST	COUNTY		SHEET NO.

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DATE:
FILE:

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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
9/4/23

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION PLAT# 23-11800270

SAN ANTONIO BEXAR COUNTY TEXAS

Colliers Engineering & Design

SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC
PROJECT NUMBER: 1116-01-01	DRAWING NAME: DT11160101		

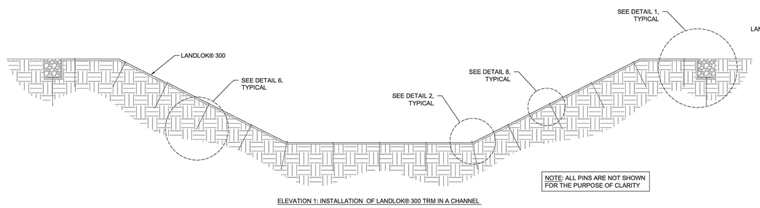
SHEET TITLE:
DRAINAGE PLAN DETAIL SHEET

SHEET NUMBER:
4.9

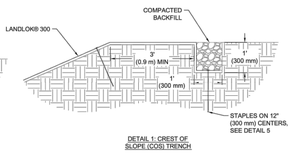
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\eRDrawings\DT11160101.dwg\4.9 By: SCRUZ

PROPERTY	TEST METHOD	ENGLISH	METRIC
ORIGIN OF MATERIALS			
% U.S. Manufactured Inputs		100%	100%
% U.S. Manufactured		100%	100%
PHYSICAL			
Mass/Unit Area	ASTM D-6566	7.5 oz/yd²	254.3 g/m²
Thickness	ASTM D-6525	0.25 in	6.35 mm
Light Penetration (% Passing)	ASTM D-6567	50% (Max)	50%
Color	Visual	Green or Tan	
MECHANICAL			
Tensile Strength (Grab)	ASTM D-6818	2000 x 1800 lb/ft	29.2 x 26.3 kN/m
Elongation	ASTM D-6818	50% (max)	50% (max)
Resiliency	ASTM D-6524	70%	70%
Flexibility	ASTM D-6575	0.195 in-lb (avg)	10.8 mg-cm (avg)
ENDURANCE			
UV Resistance % Retained 3000 hrs	ASTM D-4355	90%	90%
PERFORMANCE			
Velocity[2] (Vegetated)	Large Scale	20 ft/sec	6.10 m/sec
Shear Stress[3] (Vegetated)	Large Scale	12 lb/ft²	575 Pa
Manning's "n"[4] (Unvegetated)	Calculated	0.030	0.030
Seedling Emergence[4]	ECTC Draft Method #4	-	-
ROLL SIZES		8.5 ft x 106 ft	2.6 m x 32.3 m

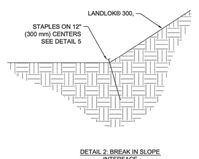


ELEVATION 1: INSTALLATION OF LANDLOK® 300 TRM IN A CHANNEL

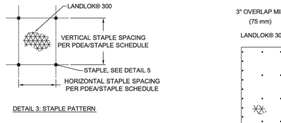


DETAIL 1: CREST OF SLOPE (COS) TRENCH

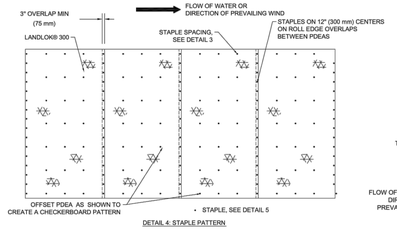
DETAIL 5: "U" SHAPE STAPLE



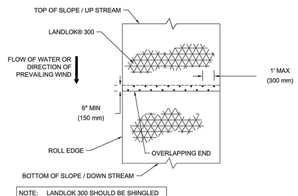
DETAIL 2: BREAK IN SLOPE INTERFACE



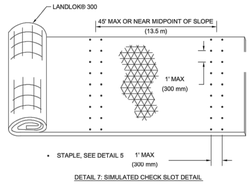
DETAIL 3: STAPLE PATTERN



DETAIL 4: STAPLE PATTERN

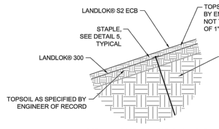


DETAIL 6: OVERLAP AT ROLL END DETAIL

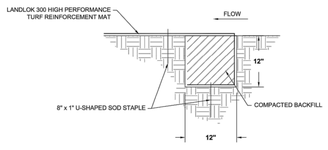


DETAIL 7: SIMULATED CHECK SLOT DETAIL

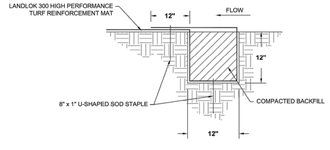
STAPLE SCHEDULE	
SECURING DEVICE	STAPLE
HORIZONTAL PDEA SPACING	2' (0.60 m)
VERTICAL PDEA SPACING	2.5' (0.75 m)
EMBEDMENT DEPTH	PER MANUFACTURES DESIGN



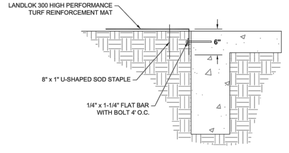
DETAIL 8: VEGETATION ESTABLISHMENT



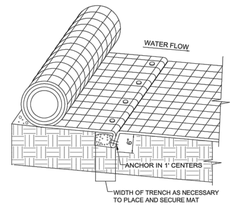
DETAIL 9: INITIAL CHANNEL (IC) TRENCH (DOWNSTREAM)



DETAIL 10: TERMINAL CHANNEL (TC) TRENCH (UPSTREAM)



DETAIL 11: CONCRETE/HPTRM CONNECTION DETAIL



NOTES:
1. SECURE AT 30 cm (1 ft) INTERVALS, BACKFILL AND COMPACT SOIL
2. SLOT @ EVERY 30 FEET

DETAIL 12: INTERMITTENT CHECK SLOT DETAIL

4.1 SITE PREPARATION - High Performance Turf Reinforcement Mat (HPTRM)

A. Grade an compact areas to be treated with HPTRM and compact. The top 8" of subgrade must be free of rock, debris and consist of a cohesive olive soil. If the existing subgrade does not meet these standards the contractor is responsible for the import of acceptable material.
B. Remove large rocks, soil, clods, vegetation, and other sharp objects (larger than 2" in diameter) that could keep the HPTRM from intimate contact with subgrade.
C. Prepare the 8" compacted seedbed by loosening the top 1/2" of soil above final subgrade.
D. Construct, as a minimum, 12"x12" anchor trenches at upstream and downstream ends of the installation to inhibit undermining from stray surface water. (anchored trenches should be excavated to a depth that matches design scour depth.) excavate 6"x6" check slots at 25 to 30 feet intervals along length of channel. Cut longitudinal anchor slots 6"x6" in at top of each slope. The aforementioned dimensions are minimums and the dimensions details on the drawings will control.

4.2 INSTALLATION - HPTRM

A mandatory pre-construction conference with an Engineer representing the HPTRM manufacturer, contractor, and inspector must be completed. The conference is to be scheduled by the contractor with at least one week's notice to all parties involved. representatives may be required to be on site for installation assistance.

The Contractor is to schedule the Engineer representing the HPTRM to inspect the site preparation prior to installation and the completed installation and provide a certified letter stating the site meets the manufacture's recommendations.

A. Install the HPTRM at elevation and alignment indicated.
B. The HPTRM, is to be soiled filled with 1/2" of top soil, and vegetated by applying the right mixture of seed and soil amendments with Flexterra, a Flexible Growth Medium, protected by a light weight erosion control blanket, or by applying the right mixture of seed and soil amendments with a wood fiber mulch, protected by a light weight erosion control blanket, or by placing sod directly on top and secure sod with 8" staples.
C. Beginning at downstream end in center of channel, place initial end of first roll of HPTRM in anchor trench and secure with ground anchor devices at 12" intervals.
D. Position adjacent rolls in anchor trench in same manner, overlapping proceeding roll minimum 3".
E. Secure the HPTRM at 12" intervals along the trench, backfill and compact with specified soil or as directed by the Engineer.
F. Unroll center strip of HPTRM upstream over compacted trench. Stop at next check slot or terminal anchor trench. Unroll adjacent rolls of HPTRM upstream in similar fashion, maintaining 3" overlap.
G. Fold and secure the HPTRM snugly into transverse check slots. Lay material in bottom of slot and fold back on itself. Fold back against itself as indicated, anchor through both layers of HPTRM at 12" intervals. Backfill with soil and compact. Continue unrolling the HPTRM widths upstream over compacted slot to next check slot or terminal anchor trench.
H. Secure HPTRM to channel bottom with ground anchoring devices at a frequency of 2-1/2" anchors per square yard. Anchors should be minimum of 8 gauge and 8" in length or so that they have sufficient ground penetration to resist pullout in a saturated condition. Increased anchoring frequency may be required if site conditions are such that the Engineer determines it necessary.
I. At the Engineer's discretion a manufacturer's designated representative shall be on site for installation assistance.
J. Any installation of angular placement, overlapping around curves, or modified placement methods must be detailed on the construction drawings.
K. The Engineer must approved alternate installation methods prior to execution.

4.3 Irrigation, Mowing, and Project Acceptance

A. Prior to project acceptance by the owner, it shall be the responsibility of the contractor to establish a minimum of 70% of the area seeded shall be covered with the specified vegetation with no bare or dead spots greater than 10 square feet. The contractor shall be responsible to set up and maintain temporary irrigation, as required, to assist in establishment of vegetation.

All areas that erode prior to project acceptance shall be repaired at the expense of the contractor including necessary reseeding, watering, and repair of the HPTRM.

Vegetated areas shall not be mowed prior to establishment of 70% vegetative density and a minimum grass growth of 3". Mower height shall not be set lower than 3". Throughout the duration of the project, the contractor shall be responsible for mowing to facilitate growth and shall not let the vegetation in the seeded areas exceed 18". In addition, the contractor shall water all grassed areas as often as necessary to establish satisfactory growth and to maintain its growth throughout the duration of the project.

NOTE:
MATERIALS AVAILABLE FROM GEOSOLUTIONS, INC. 210-651-3816

REVISIONS

LANDLOK 300 INSTALLATION DETAILS
CHANNEL DETAILS

8165 BRACKEN CREEK DRIVE
SAN ANTONIO, TEXAS 78266
Phone: 210-651-3816
www.geosolutionsinc.com
GEO SOLUTIONS Reg. Eng. Firm #F-4189

Scale: NOT TO SCALE
Date: 02/02/15
Drawn by: JY
Project No.: LANDLOK 300
SHEET 1 OF 1

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9/4/23

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
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SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
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TBPE Firm#: F-14909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

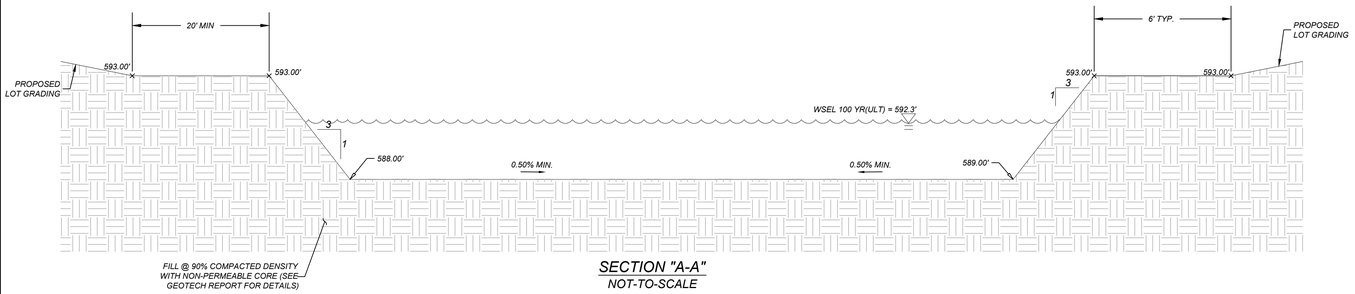
PROJECT NUMBER: 1116-01-01
DRAWING NAME: DT11160101

SHEET TITLE:
TURF REINFORCEMENT MAT DETAIL

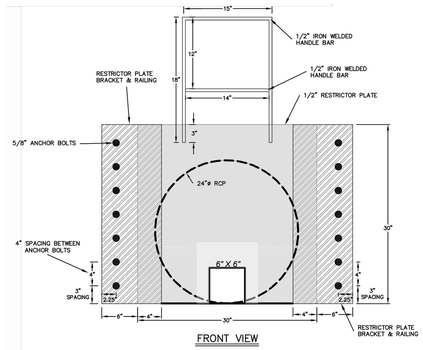
SHEET NUMBER:
4.10

CadDrawing\DT11160101.dwg4.10 By: SD/JR/WALL

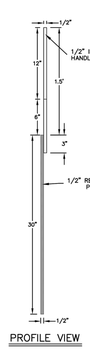
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



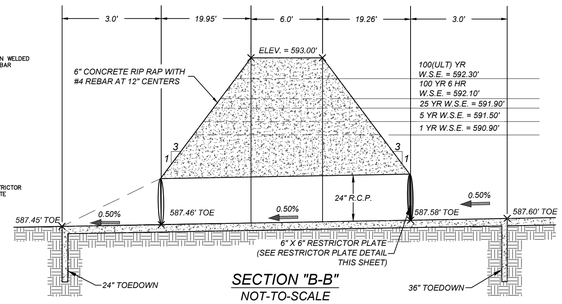
SECTION "A-A"
NOT-TO-SCALE



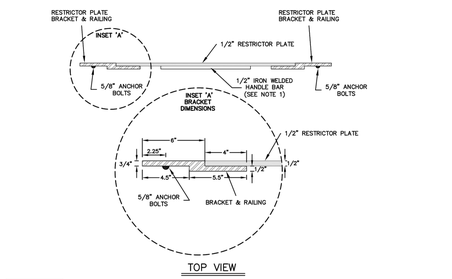
FRONT VIEW



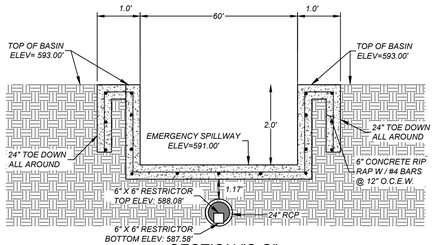
PROFILE VIEW



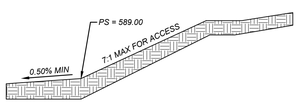
SECTION "B-B"
NOT-TO-SCALE



RESTRICTOR PLATE & BRACKET RAILING DETAIL N.T.S.



SECTION "C-C"
EMERGENCY OVERFLOW WEIR
NOT-TO-SCALE



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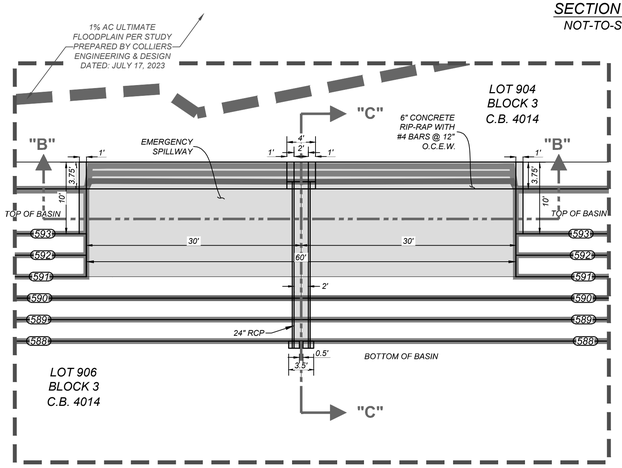


DETAIL "A"
SCALE: 1" = 10'

EMERGENCY SPILLWAY CALCULATION

$L = Q^{req}(ULT) / CH^{3/2}$

$L = 240.2 \text{ cfs} / (3.087)(2.0)^{3/2}$

$L_{REQ} = 27.51$ FEET

$L_{USED} = 60$ FEET

CONCRETE CHANNEL OUTFALL

HYDRAULIC CALCULATION
Q(25) = 133.7 CFS
Bw = 60'
n = 0.015
Pw = 61.02 FT.
A = 30.60 S.F.
S = 0.50%
Dn = 0.51'
V = 4.38 fps
VH = 0.30'

NOTE:

1. ALL CONCRETE SHALL DEVELOP A MINIMUM COMPRESSIVE STRENGTH OF NOT LESS THAN 3000 PSI IN 28 DAYS.

2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.

3. ALL EARTHEN CHANNELS MUST NOT EXCEED 3:1 SIDE SLOPES (MAX).

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

TRENCH EXCAVATION SAFETY PROTECTION

CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES 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.

DETENTION BASIN NOTES:

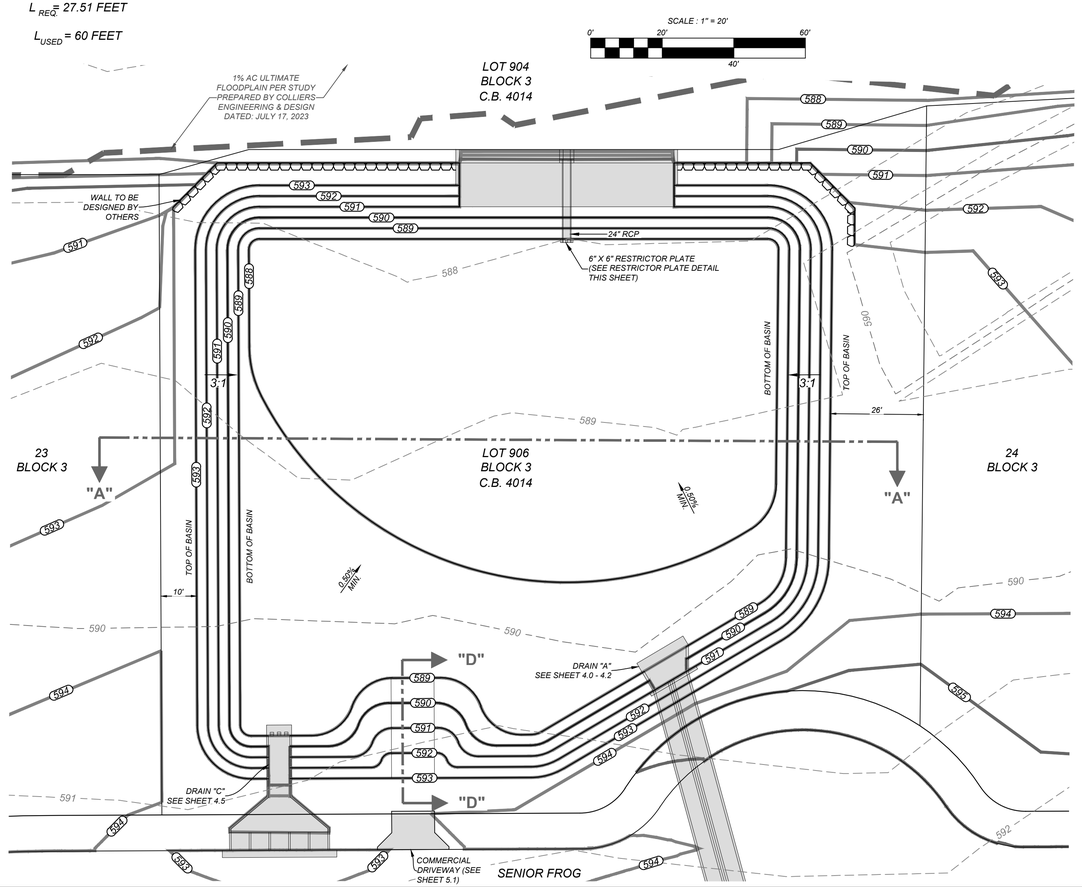
1. CONTRACTOR SHALL PHASE CONSTRUCTION AND/OR PROVIDE NECESSARY BMPs TO MITIGATE INTERIM CONDITIONS RUNOFF DURING CONSTRUCTION DUE TO CLEARING, GRADING, SUBGRADE PREPARATION, PAVING, BUILDINGS, ETC., AND TO PREVENT ADVERSE IMPACTS TO OTHER PROPOERTY, STRUCTURES, AND INFRASTRUCTURE DURING CONSTRUCTION.

2. DETENTION POND EXCAVATION AND/OR EMBANKMENT NECESSARY FOR PROVIDING STORAGE MUST BE SUBSTANTIALLY COMPLETE PRIOR TO CITY INSPECTION OF STREET SUBGRADE, CURB, FLEX BASE, AND PAVEMENT WITHIN THE WATERSHED DRAINING TO THE DETENTION POND.

PROPOSED DISCHARGE						
Q1	=	2.2		WSEL1	=	590.90
Q5	=	68.3		WSEL5	=	591.50
Q25	=	133.7		WSEL25	=	591.90
Q100 (6HR)	=	183.7		WSEL100	=	592.10
Q100	=	186.80		WSEL100	=	592.10
Q100 (ult)	=	240.2		WSEL100	=	592.30

LEGEND

- FLOW ARROW
- —706— EXISTING CONTOURS
- 707 PROPOSED CONTOURS
- PROPERTY LINE
- POINT # 707.00 TOE — PROPOSED SPOT ELEVATION (TOE OF SLOPE)
- POINT # 707.00 INV — PROPOSED SPOT ELEVATION (INVERT OF CHANNEL)



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED PROFESSIONAL ENGINEER
4/2/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: BA11160101

SHEET TITLE: DETENTION BASIN "A"

SHEET NUMBER: 4.11

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Civil\Dwgs\BA11160101.dwg(4.11) By: ABEL.MONTALVO

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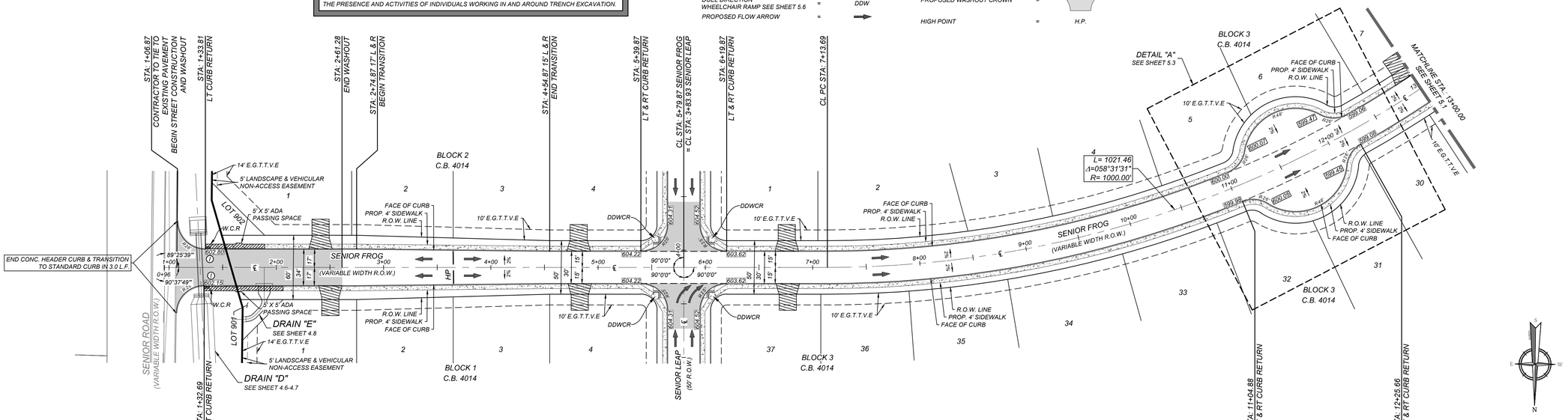
LEGEND

GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT	=	G.E.T.T.V.E.	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=
WHEELCHAIR RAMP TYPE "I" SEE SHEET 5.6	=	Ⓘ	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.6	=	Ⓘ	PROPOSED DRIVEWAY LOCATIONS	=
SINGLE DIRECTION WHEELCHAIR RAMP SEE SHEET 5.6	=	SDW		
DUEL DIRECTION WHEELCHAIR RAMP SEE SHEET 5.6	=	DDW	PROPOSED WASHOUT CROWN	=
PROPOSED FLOW ARROW	=		HIGH POINT	= H.P.

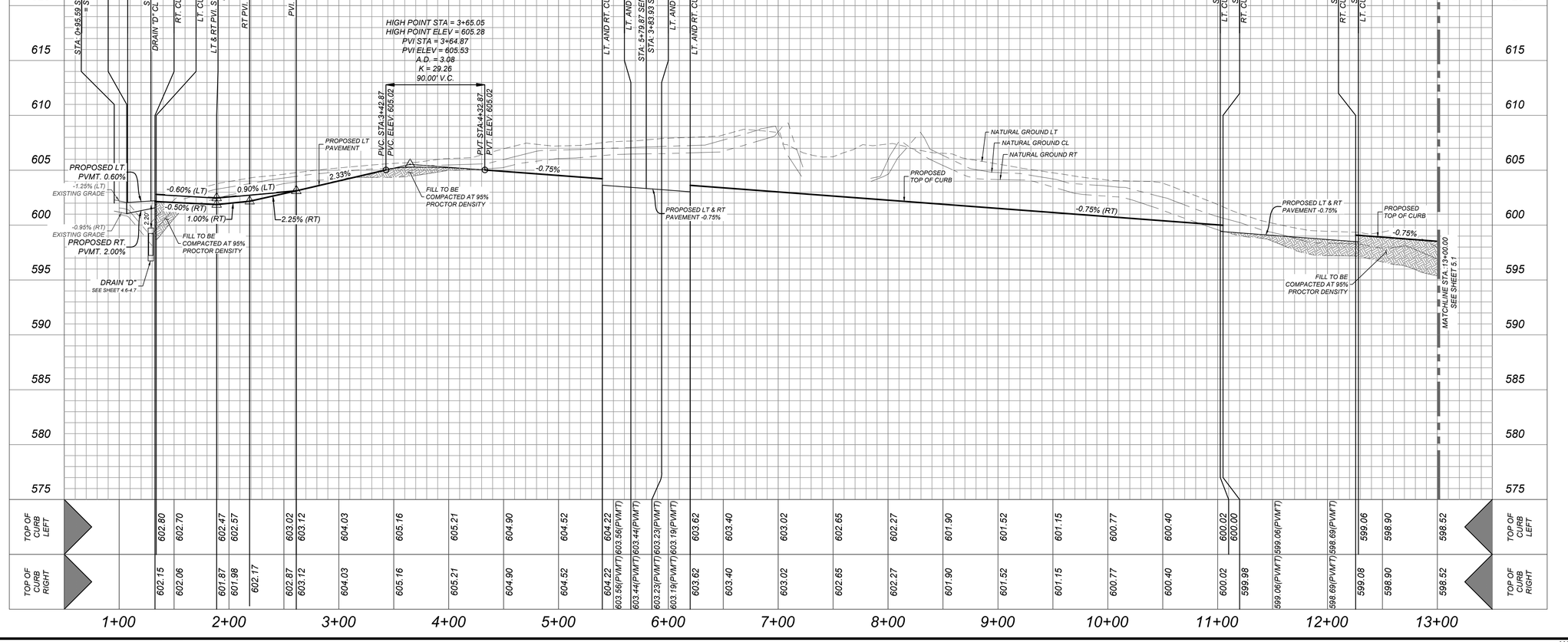
BEXAR COUNTY R.O.W. NOTE:

A BEXAR COUNY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.



SENIOR FROG
STA: 1+00.00 - 13+00.00

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED PROFESSIONAL ENGINEER

2/26/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14809
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: STPP11160101

SHEET TITLE:
SENIOR FROG PLAN & PROFILE
STA. 1+00.00 TO 13+00.00

SHEET NUMBER:
5.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilSTREETSSTPP11160101.dwg/S3 By: DSUEWALL

CAUTION!!:
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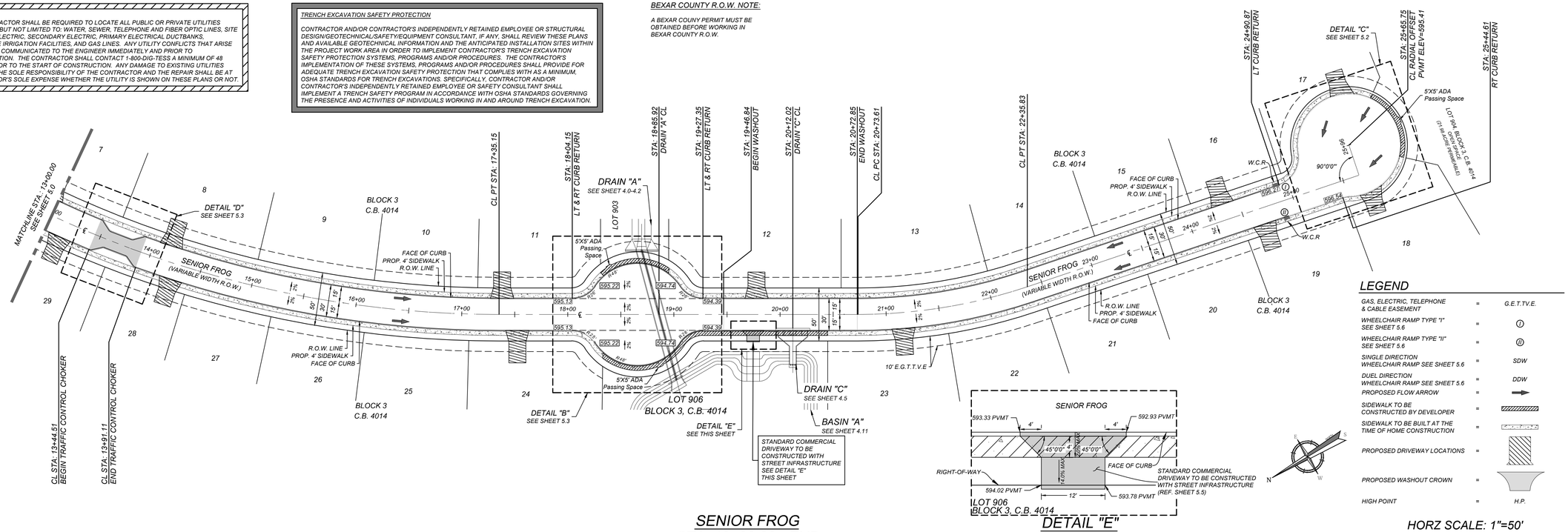


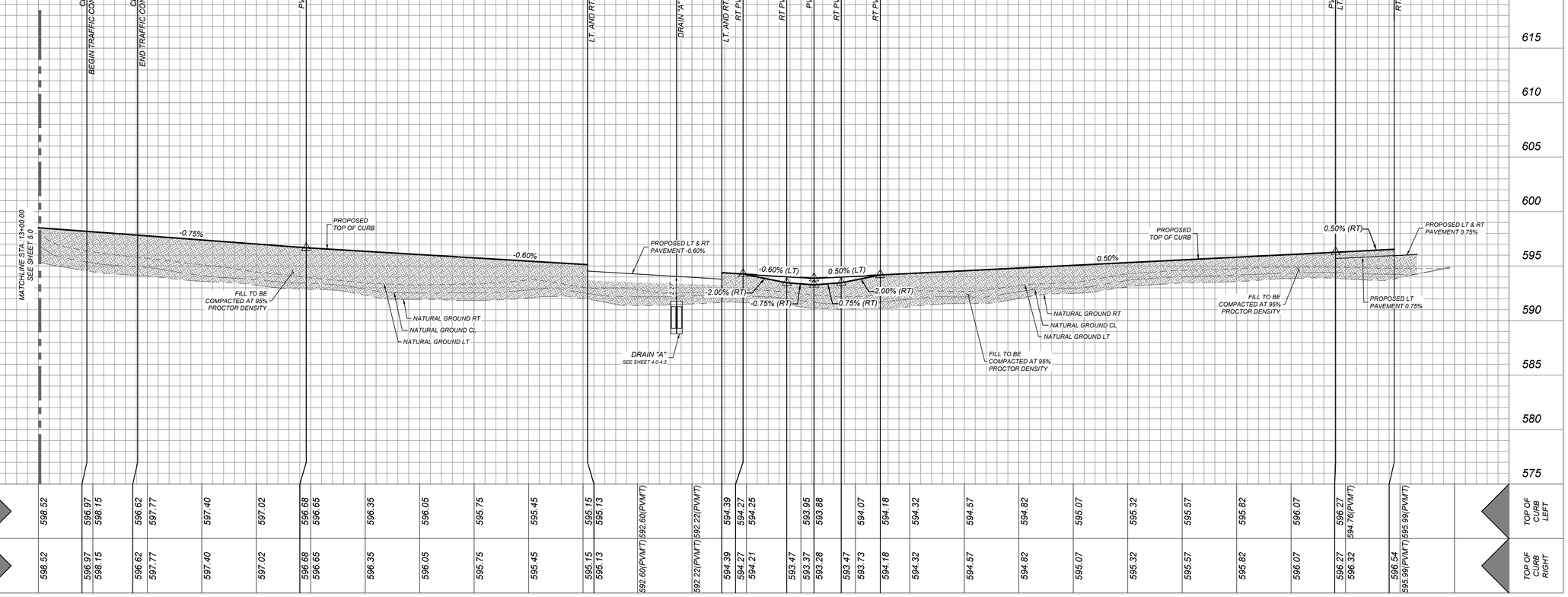
LEGEND

GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT	=	G.E.T.TV.E.
WHEELCHAIR RAMP TYPE "I" SEE SHEET 5.6	=	Ⓘ
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.6	=	Ⓘ
SINGLE DIRECTION WHEELCHAIR RAMP SEE SHEET 5.6	=	SDW
DUEL DIRECTION WHEELCHAIR RAMP SEE SHEET 5.6	=	DDW
PROPOSED FLOW ARROW	=	
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	
HIGH POINT	=	H.P.

SENIOR FROG
STA: 13+00.00 - END

DETAIL "E"
SCALE : 1" =10'

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



	13+00	14+00	15+00	16+00	17+00	18+00	19+00	20+00	21+00	22+00	23+00	24+00	25+00	26+00
TOP OF CURB LEFT	598.52	596.97	596.62	597.40	597.02	596.68	596.65	596.35	596.05	595.75	595.45	595.15	595.13	592.60(PVMT)	592.22(PVMT)	594.39	594.27	594.25	593.95	593.88	594.07	594.18	594.32	594.57	594.82	595.07	595.32	595.57	595.82	596.07	596.27	594.76(PVMT)	595.99(PVMT)	TOP OF CURB LEFT
TOP OF CURB RIGHT	598.52	596.97	596.62	597.40	597.02	596.68	596.65	596.35	596.05	595.75	595.45	595.15	595.13	592.60(PVMT)	592.22(PVMT)	594.39	594.27	594.21	593.47	593.37	593.28	593.47	593.73	594.18	594.32	594.57	594.82	595.07	595.32	595.57	595.82	596.07	596.27	596.32	596.54	595.99(PVMT)	TOP OF CURB RIGHT

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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
3/18/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: STPP11160101

SHEET TITLE:
SENIOR FROG PLAN & PROFILE STA. 13+00.00 TO END

SHEET NUMBER:
5.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\civil\STREETS\STPP11160101.dwg\S1 By: ABEL.MONTALVO

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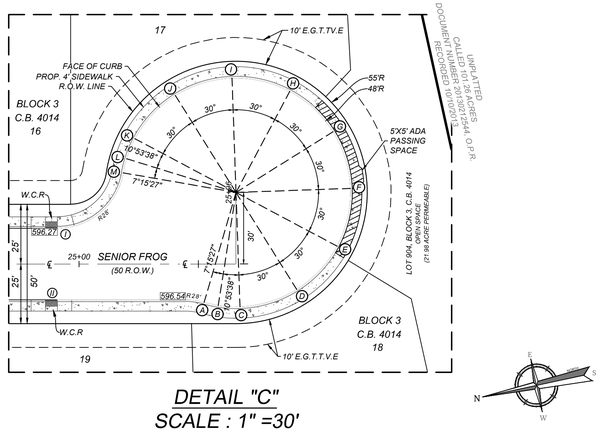
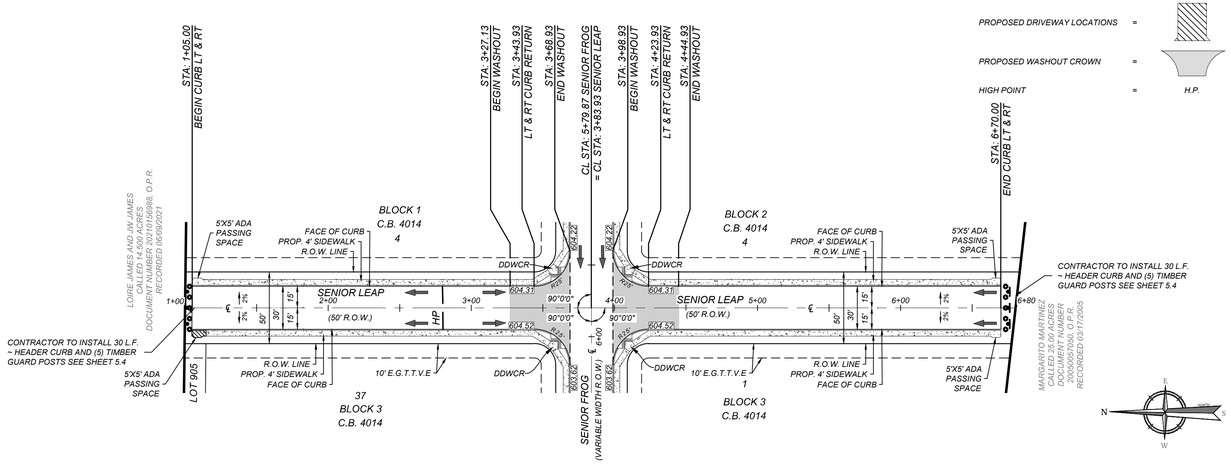


DETAIL "C"
SCALE : 1" =30'



BEXAR COUNTY R.O.W. NOTE:

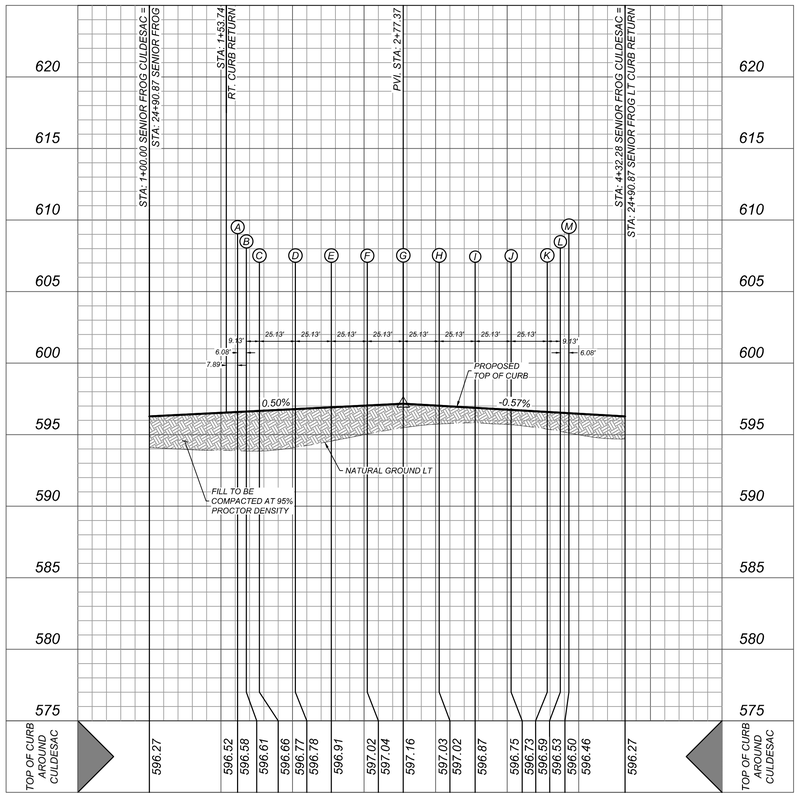
A BEXAR COUNY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

LEGEND

GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT	=	G.E.T.TV.E.
WHEELCHAIR RAMP TYPE "I" SEE SHEET 5.6	=	I
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.6	=	II
SINGLE DIRECTION WHEELCHAIR RAMP SEE SHEET 5.6	=	SDW
DUEL DIRECTION WHEELCHAIR RAMP SEE SHEET 5.6	=	DDW
PROPOSED FLOW ARROW	=	
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	
HIGH POINT	=	H.P.

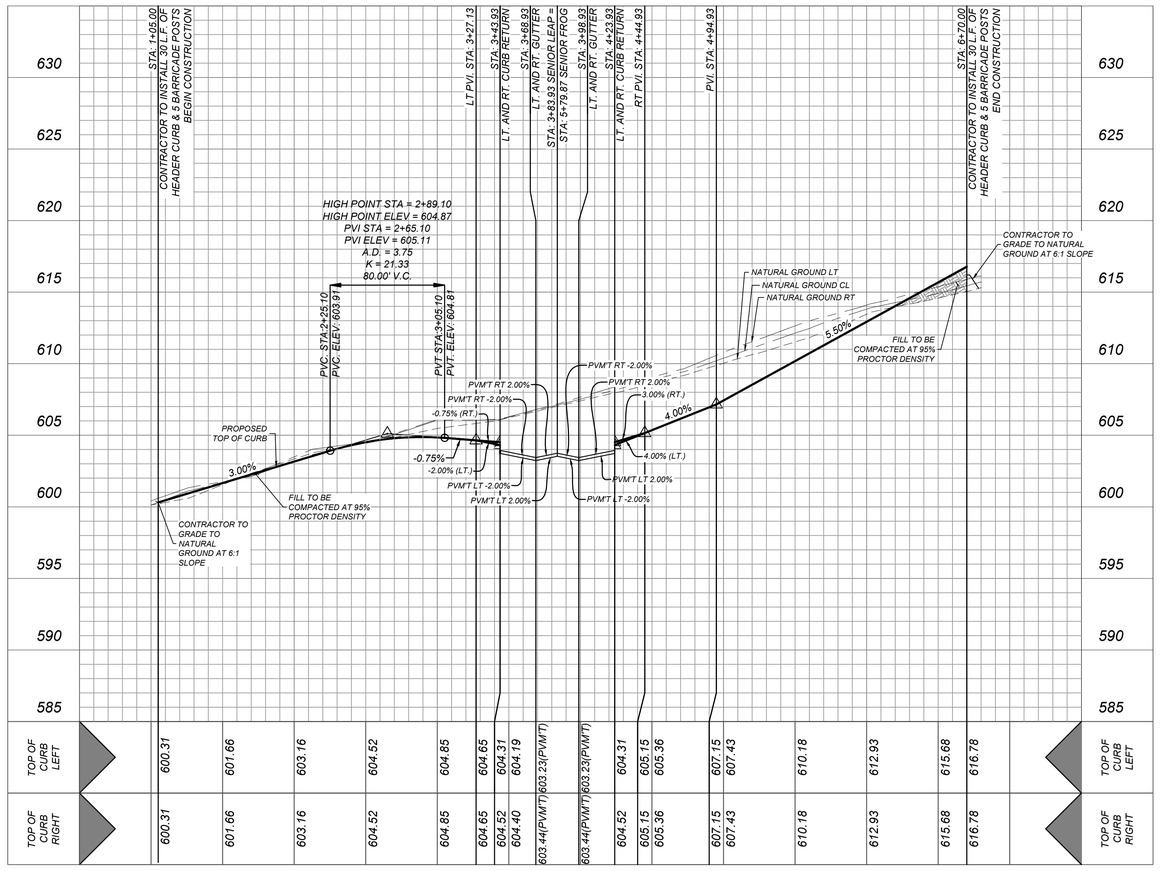
CUL-DE-SAC DETAIL

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



SENIOR LEAP
STA: 1+00.00 - END

HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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REV	DATE	DESCRIPTION	DRAWN BY

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
3/18/24

PRELIMINARY

FOR

VARGA TRACT
SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

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SAN ANTONIO (KFW)
3421 Paesanos Parkway
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Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: STPP11160101

SHEET TITLE:
SENIOR LEAP PLAN & PROFILE
STA. 1+00.00 TO END

SHEET NUMBER: 5.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilSTREETSSTPP11160101.dwg By: ABEL.MONTALVO

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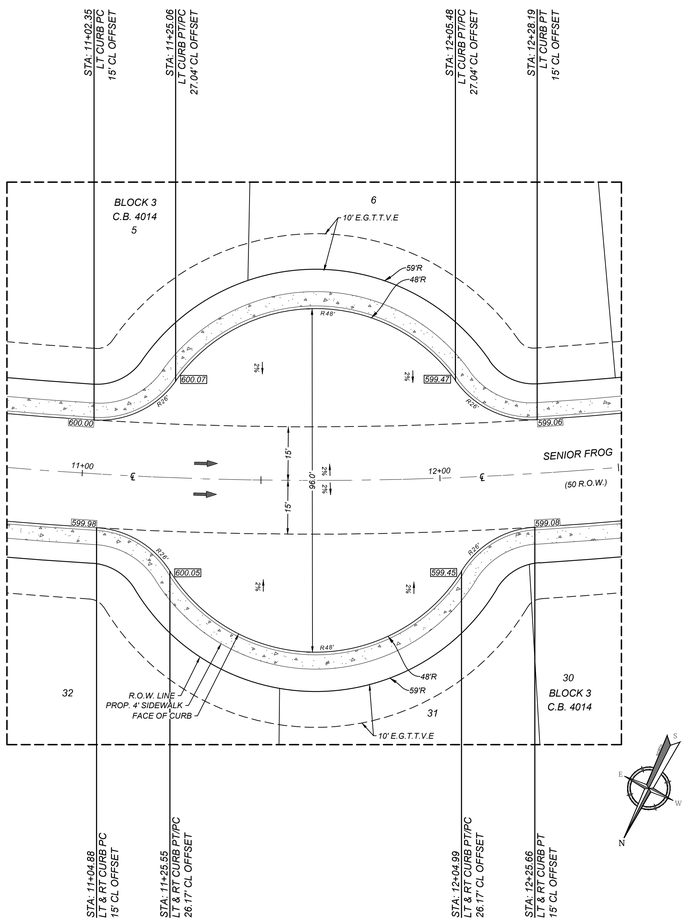
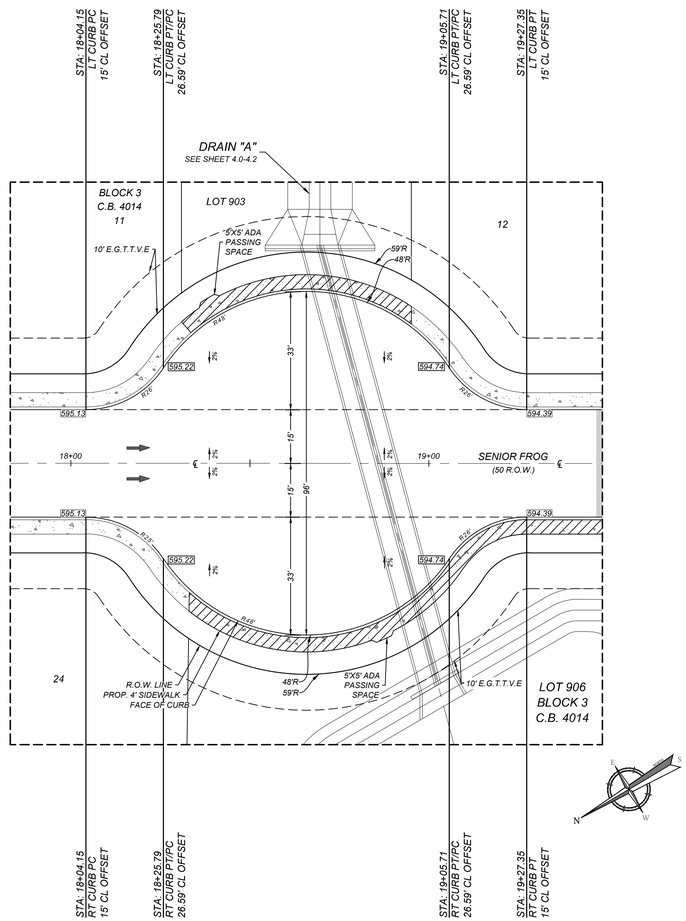
LEGEND

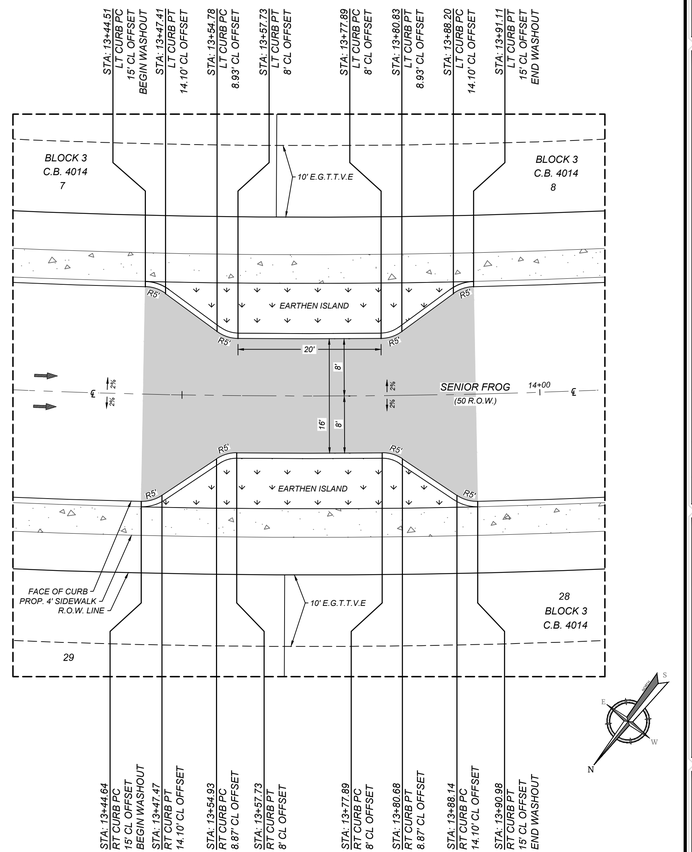
GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT	=	G.E.T.T.V.E.
WHEELCHAIR RAMP TYPE "I" SEE SHEET 5.6	=	Ⓘ
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.6	=	Ⓘⓘ
SINGLE DIRECTION WHEELCHAIR RAMP SEE SHEET 5.6	=	SDW
DUEL DIRECTION WHEELCHAIR RAMP SEE SHEET 5.6	=	DDW
PROPOSED FLOW ARROW	=	
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	
HIGH POINT	=	H.P.



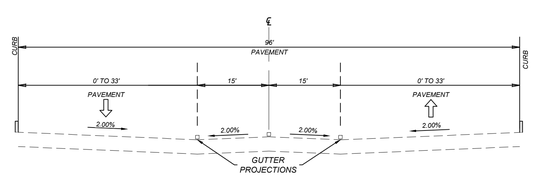
DETAIL "A"
SCALE : 1" =20'



DETAIL "B"
SCALE : 1" =20'



DETAIL "D"
SCALE : 1" =10'



SENIOR FROG TURNAROUND
CROSS SECTION
N.T.S

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER

2/26/24

PRELIMINARY

FOR

VARGA TRACT
SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

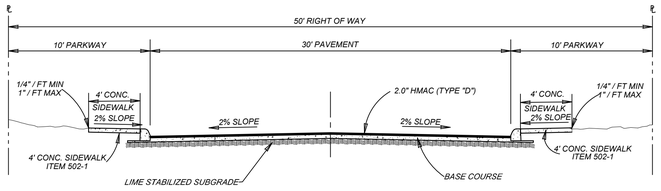
PROJECT NUMBER:	DRAWING NAME:
1116-01-01	STPP11160101

SHEET TITLE:
SENIOR FROG
ROUNDABOUT DETAIL

SHEET NUMBER:
5.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

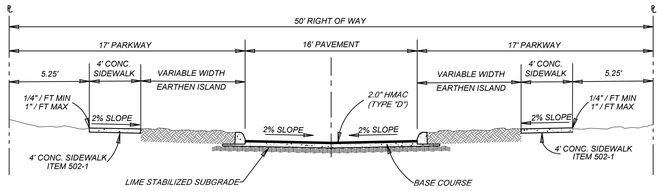
C:\vn\STREETS\STPP11160101.dwg(5.3 By: SDLEWALL



TYPICAL LOCAL "A" STREET SECTION

NOT TO SCALE

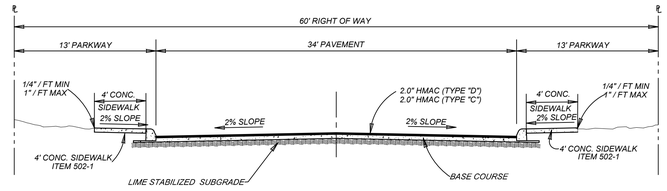
SENIOR FROG: STA. 4+54.87 - 13+44.51
SENIOR FROG: STA. 13+90.98 - END
SENIOR LEAP: STA: 1+00.00 - END



TYPICAL LOCAL "A" STREET SECTION

NOT TO SCALE

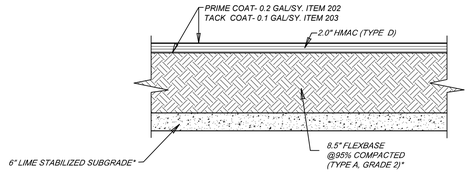
SENIOR FROG: STA. 13+44.51 - 13+90.98



TYPICAL LOCAL "B" STREET SECTION

NOT TO SCALE

SENIOR FROG: STA. 1+06.87 - 4+54.87



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE A

FLEXIBLE PAVEMENT SYSTEM (DARK BROWN CLAY SUBGRADE)

Pavement Section
2.0" HMAC (TYPE "D")
8.5" FLEXBASE COURSE (TYPE "A" GRADE 2)
6.0" LIME STABILIZED SUBGRADE (27 LBS/SY)
Total: 16.5"
Structural No: 2.55
C.B.R = 3.0

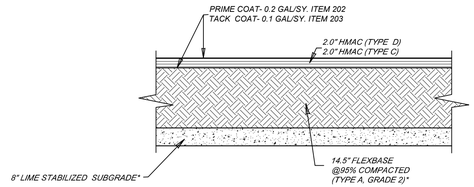
InTEC PROJECT NO. S231175 AUGUST 02, 2023

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY InTEC REPORT NO. S231175 DATED AUGUST 02, 2023

2. REFERENCE PROJECT GEOTECHNICAL REPORT AND PROJECT SPECIFICATION FOR ADDITIONAL REQUIREMENTS AND ALTERNATE PAVEMENT SECTIONS.

3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.

4. THERE SHALL BE NO SUBSTITUTION OF LIME.



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE B

FLEXIBLE PAVEMENT SYSTEM (DARK BROWN CLAY SUBGRADE)

Pavement Section
2.0" HMAC (TYPE "D")
2.0" HMAC (TYPE "C")
14.5" FLEXBASE COURSE (TYPE "A" GRADE 2)
8.0" LIME STABILIZED SUBGRADE (36 LBS/SY)
Total: 26.5"
Structural No: 4.43
C.B.R = 3.0

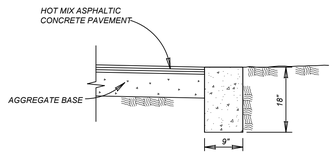
InTEC PROJECT NO. S231175 AUGUST 02, 2023

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY InTEC REPORT NO. S231175 DATED AUGUST 02, 2023

2. REFERENCE PROJECT GEOTECHNICAL REPORT AND PROJECT SPECIFICATION FOR ADDITIONAL REQUIREMENTS AND ALTERNATE PAVEMENT SECTIONS.

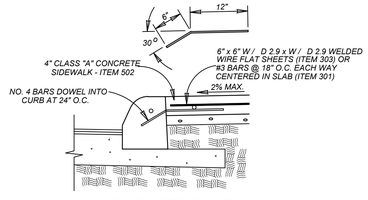
3. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING MATERIAL TESTING. TESTING TO BE PAID BY OWNER.

4. THERE SHALL BE NO SUBSTITUTION OF LIME.



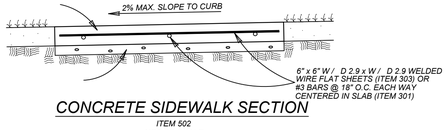
HEADER CURB

ITEM 500 ON SAND OR GRAVEL
NOT TO SCALE



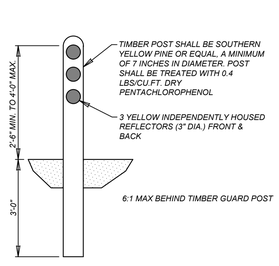
CONCRETE SIDEWALK ABUTTING CURB SECTION

ITEM 502
NOT TO SCALE



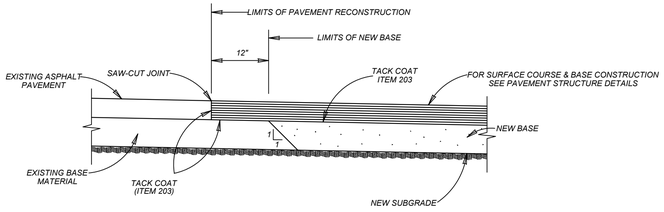
CONCRETE SIDEWALK SECTION

ITEM 502
NOT TO SCALE



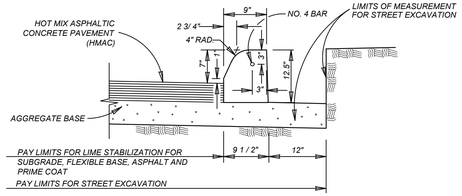
TIMBER GUARD POST DETAIL

NOT-TO-SCALE



PAVEMENT JUNCTION DETAILS

NOT TO SCALE



CONCRETE CURB

ITEM 500 ON ASPHALT TREATED BASE OR ASPHALTIC CONCRETE BASE
NOT TO SCALE

FOR CONSTRUCTION VERIFICATION THE FOLLOWING SHALL BE CONDUCTED IN THE FIELD:

1. *AFTER INITIAL MIXING THE SOIL-LIME MIXTURE SHALL MELLOW FOR A PERIOD OF TWO TO THREE (2 - 3) DAYS. MAINTAIN MOISTURE DURING MELLOWING;*
2. *AFTER MELLOWING AND FINAL MIXING, THE PULVERIZATION SHALL BE CHECKED USING THE FOLLOWING CRITERIA (REMOVE NON-SLAKING AGGREGATES RETAINED ON THE ¾ INCH SIEVE FROM THE SAMPLE):*

MINIMUM PASSING 1 ¾" SIEVE	100
MINIMUM PASSING ¾" SIEVE	85
MINIMUM PASSING NO. 4 SIEVE	60

3. *SAMPLE SOIL-LIME MIXTURE FOR DETERMINATION OF MAXIMUM DRY DENSITY (MDD). IN THE LABORATORY. MOLD SPECIMENS TO 95% OF MDD AT OPTIMUM MOISTURE CONTENT AND VERIFY UCS TO BE AT LEAST 160 PSI IN ACCORDANCE WITH PROCEDURE OUTLINED ABOVE FOR MIXTURE DESIGN.*
4. *COMPACT AND CHECK FIELD DENSITY (MINIMUM OF 95% OF MDD REQUIRED)*
5. *CURE FOR AN ADDITIONAL 2 TO 5 DAYS (TOTAL MELLOWING AND CURING TIME SHOULD TOTAL AT LEAST 5 DAYS).*
6. *VERIFY DEPTH OF LIME STABILIZED LAYER TO DEPTH AS NOTED ON PLAN TO WITHIN ± 1.0 INCH.*

NOTES:
ANY FILL USED TO RAISE THE SUBGRADE:
- *SHOUD NOT CONTAIN ANY DELETERIOUS MATERIAL.*
- *SHOULD HAVE A CBR VALUE OF 3.0 OR GREATER*
- *SHOULD NOT HAVE GRAVELS LARGER THAN 3 INCH IN SIZE*
- *PSI SHOULD BE LESS THAN 20*

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
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PROFESSIONAL ENGINEER
3/18/24

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FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

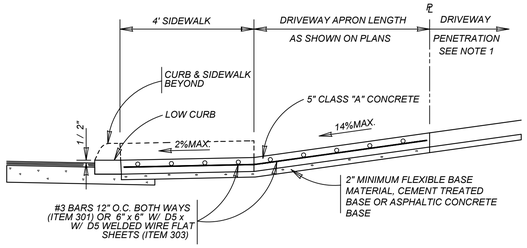
PROJECT NUMBER:	DRAWING NAME:
1116-01-01	STDT11160101

SHEET TITLE:
STREET DETAIL SHEET

SHEET NUMBER:
5.4

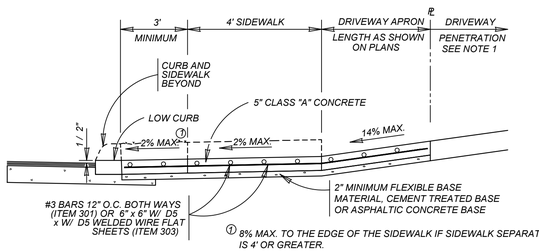
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\wk\STREETS\STDT11160101.dwg, 5.4 By: ABEL.MONTALVO



TYPICAL RESIDENTIAL DRIVEWAY SECTION

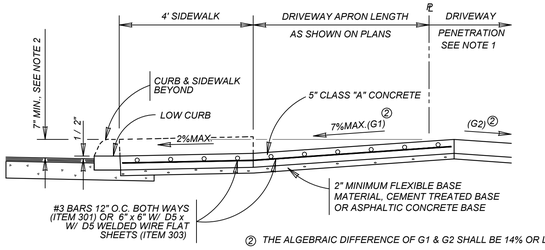
WITH SIDEWALK ABUTTING CURB
ITEM 503.1



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

TYPICAL RESIDENTIAL DRIVEWAY SECTION

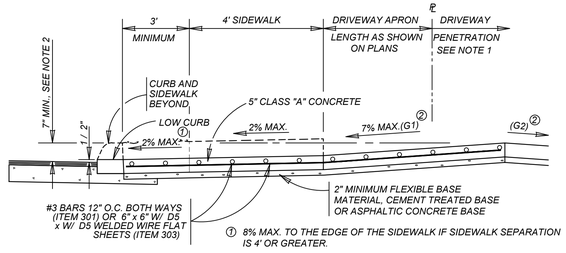
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1



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

TYPICAL RESIDENTIAL DRIVEWAY SECTION

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

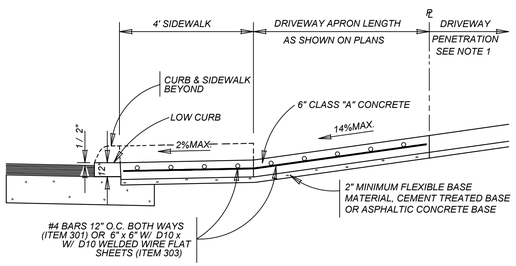


① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

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

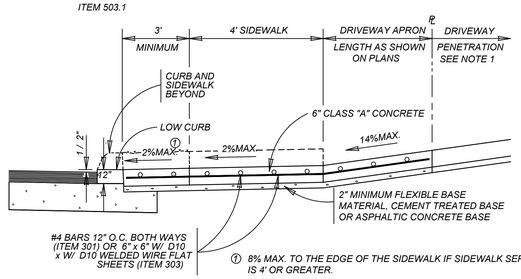
TYPICAL RESIDENTIAL DRIVEWAY SECTION

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



TYPICAL COMMERCIAL DRIVEWAY SECTION

WITH SIDEWALK ABUTTING CURB
ITEM 503.2



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

TYPICAL COMMERCIAL DRIVEWAY SECTION

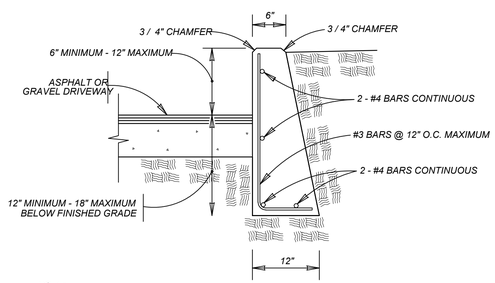
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2

CONCRETE DRIVEWAY NOTES

1. DRIVEWAY PENETRATION REFERS TO A PORTION OF THE DRIVEWAY THAT MAY BE NECESSARY TO RECONSTRUCT WITHIN PRIVATE PROPERTY TO COMPLY WITH A MAXIMUM DRIVEWAY SLOPE. THIS PORTION OF THE DRIVEWAY SHALL BE PAID FOR UNDER THE FOLLOWING ITEMS AS MAY APPLY:
   A.) CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 503.1 OR 503.2.
   B.) ASPHALTIC CONCRETE DRIVEWAY PAID FOR UNDER ITEM NO. 503.4 AND SHALL INCLUDE A MINIMUM OF 1" ASPHALT TYPE 'D' & 6" FLEXIBLE BASE
   C.) GRAVEL DRIVEWAY PAID FOR UNDER ITEM NO. 503.5 AND SHALL INCLUDE A MINIMUM OF 6" FLEXIBLE BASE
2. 7" MINIMUM HEIGHT WILL NOT NECESSARILY OCCUR AT THE PROPERTY LINE. IT MAY OCCUR WITHIN THE RIGHT OF WAY OR WITHIN THE DRIVEWAY PENETRATION ON PRIVATE PROPERTY.
3. THE PROPOSED DRIVEWAY SHOULD MATCH THE EXISTING WIDTH AT THE PROPERTY LINE BUT UNLESS AUTHORIZED BY THE CITY TRAFFIC ENGINEER, THE WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:

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

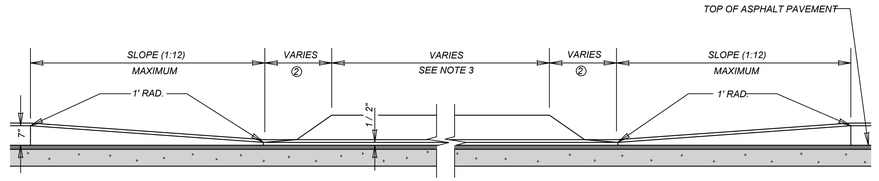
4. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 3' FROM THE BACK OF CURB.
5. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 3' FROM THE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



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

DRIVEWAY - CONCRETE RETAINING WALL

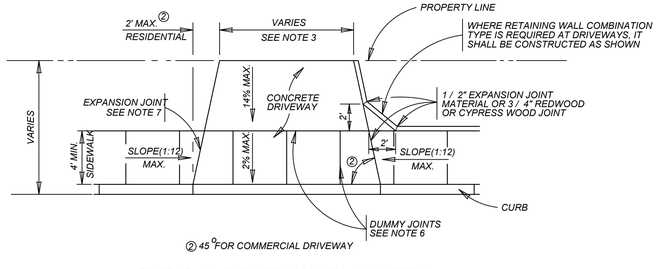
ON COMPACTED SUBGRADE
ITEM 307.1



② RESIDENTIAL : 2' MAXIMUM;
COMMERCIAL: SEE PLAN VIEW

CURB PROFILE AT DRIVEWAY

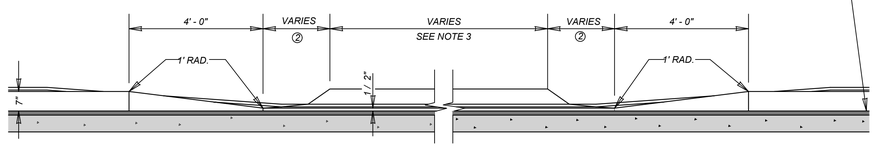
WITH SIDEWALK ABUTTING CURB



② 45 º FOR COMMERCIAL DRIVEWAY

TYPICAL DRIVEWAY PLAN VIEW

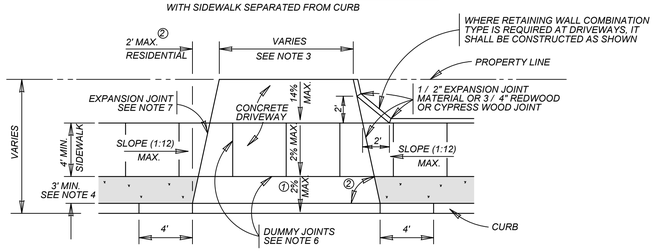
WITH SIDEWALK ABUTTING CURB



② RESIDENTIAL : 2' MAXIMUM;
COMMERCIAL: SEE PLAN VIEW

CURB PROFILE AT DRIVEWAY

WITH SIDEWALK SEPARATED FROM CURB



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

② 45 º FOR COMMERCIAL DRIVEWAY

TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK SEPARATED FROM CURB

MAY 2009

CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

CONCRETE DRIVEWAY STANDARDS

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

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
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LICENSED
PROFESSIONAL ENGINEER
3/18/24

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FOR
VARGA TRACT SUBDIVISION
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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

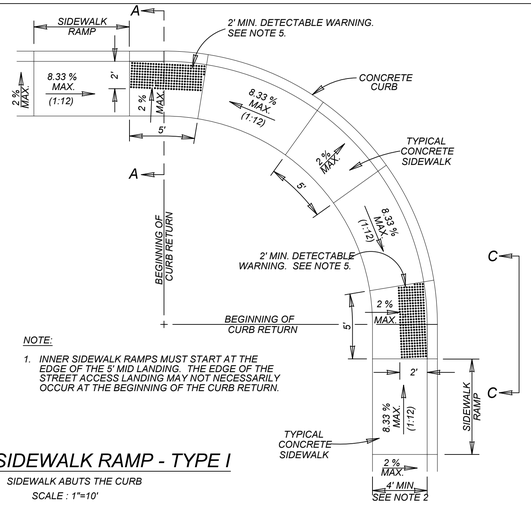
PROJECT NUMBER: 1116-01-01
DRAWING NAME: STDT11160101

SHEET TITLE: CONCRETE DRIVEWAY DETAILS

SHEET NUMBER: 5.5

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivSTREETS\STDT11160010.dwg\5.5 By: ABEL MONTALVO

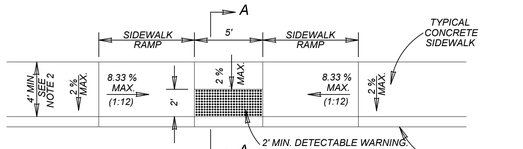


TYPICAL SIDEWALK RAMP - TYPE I

SIDEWALK ABUTS THE CURB
SCALE : 1"=10'

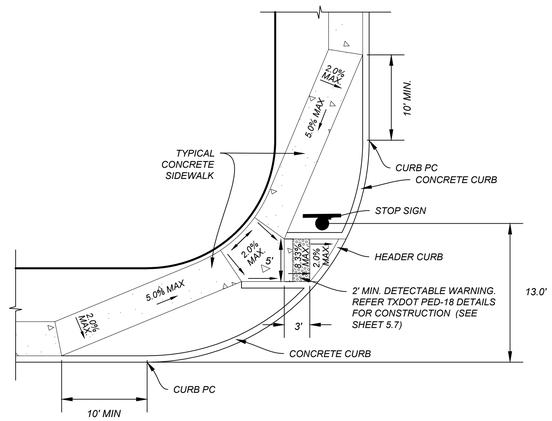
NOTE:

1. INNER SIDEWALK RAMPS MUST START AT THE EDGE OF THE 5' MID LANDING. THE EDGE OF THE STREET ACCESS LANDING MAY NOT NECESSARILY OCCUR AT THE BEGINNING OF THE CURB RETURN.



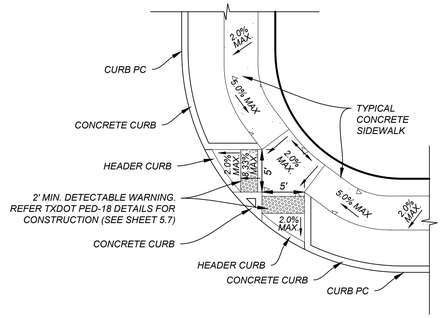
TYPICAL SIDEWALK RAMP - TYPE II

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



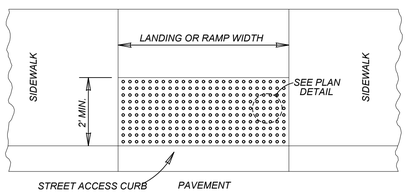
SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SDWCR)

NOT TO SCALE



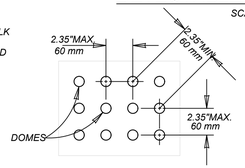
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (DDWCR)

NOT TO SCALE



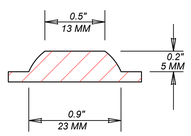
DETECTABLE WARNING SURFACE

SCALE : 1"=4'



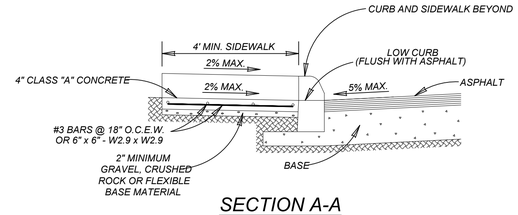
PLAN DETAIL

NO SCALE



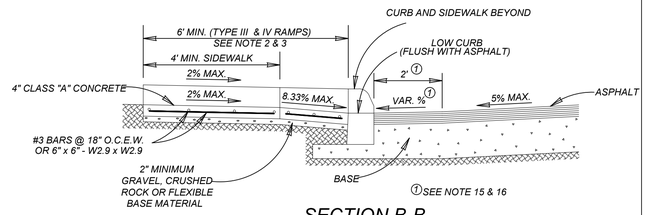
DOME SECTION

NO SCALE



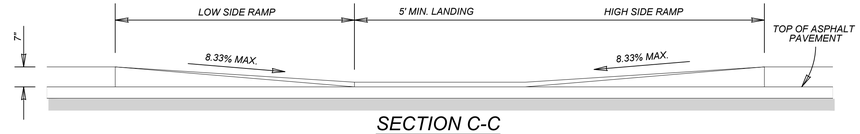
SECTION A-A

SCALE : 1"=4'



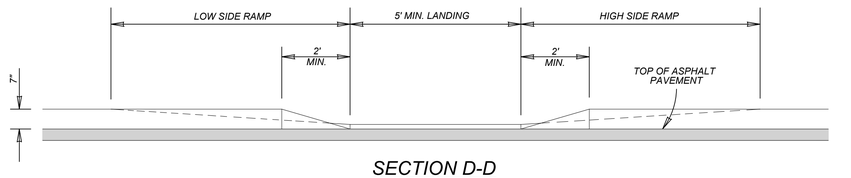
SECTION B-B

SCALE : 1"=4'



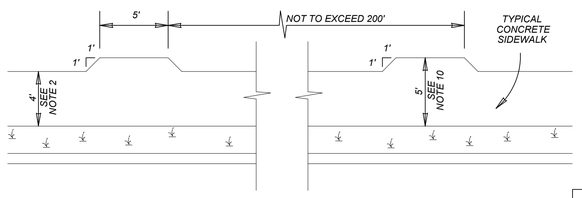
SECTION C-C

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



SECTION D-D

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



SIDEWALK PASSING SPACE

SCALE : 1"=10'

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

GENERAL NOTES

1. WHEN POSSIBLE SIDEWALKS SHOULD BE PLACED NEXT TO THE PROPERTY LINE, ALLOWING A MINIMUM OF 1 FOOT BUFFER. DEVIATION OF THE PATHWAY FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TREES OR OTHER OBSTRUCTIONS.
2. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 3' FROM THE BACK OF CURB.
3. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 3' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
4. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
5. ALL CURB-RAMPS OR LANDINGS ABUTTING THE CROSSWALK SHALL HAVE A DETECTABLE WARNING 24 INCHES DEEP (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, ALIGNED IN A GRID PATTERN WITH A DIAMETER OF A NOMINAL 0.9 INCHES (23 MM), A HEIGHT OF NOMINAL 0.2 INCHES (5 MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 INCHES (60 MM). THE DETECTABLE WARNING SURFACE SHALL BE PAVERS CONFORMING TO TXDOT STANDARD PED-18, PEDESTRIAN FACILITIES.
6. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
7. SIDEWALK RAMP TYPE V SHALL BE USED ONLY WHERE THERE IS SIGNIFICANT RESTRICTION WITHIN THE PARKWAY TO CONSTRUCT TYPE I OR TYPE III RAMPS.
8. CONSTRUCTION OF ALL WHEELCHAIR RAMPS TO BE INCLUDED UNDER ITEMS "500 - CONCRETE CURB, GUTTER, AND CONCRETE CURB AND GUTTER" AND / OR "502 - CONCRETE SIDEWALKS". RAMP SURFACE SHALL BE BRUSH
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
10. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM
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 CONSTRUCTION THAT DEVIATES FROM THE NATURAL GRADE OF THE ROADWAY TO CREATE A GRADE STEEPER THAN THE EXISTING ROADWAY WILL REQUIRE RAMPS, HANDRAILS AND RESTING PLATFORMS TO BE CONSTRUCTED IN ACCORDANCE WITH ADA AND TAS STANDARDS.
14. SIDEWALK CROSS GRADE SHALL HAVE A MAXIMUM SLOPE OF 2%. LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
15. THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES SHALL BE LESS THAN 11%. THE CHANGE OF GRADE 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-(-2.67)=11). IN ADDITION, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN OR EQUAL TO 5%.
16. IF THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES IS GREATER THAN OR EQUAL TO 11%, A LEVELING STRIP, 2 FEET IN LENGTH, SHALL BE PROVIDED TO TRANSITION THE ADJACENT SURFACES.
17. ADA COMPLIANCE IN ALTERATIONS INCLUDE ONLY THAT WORK WITHIN THE LIMITS, BOUNDARIES OR SCOPE OF A PLANNED PROJECT.

MAY 2009

CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

WHEELCHAIR RAMP STANDARDS

% SUBMITTAL	PROJECT NO.:	DATE:
DRWN. BY: V. VASQUEZ	DSGN. BY:	CHKD. BY: R.S. HOSSEINI, P.E.

SHEET NO.: OF

Colliers Engineering & Design
www.colliersengineering.com

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Formerly Known as KFW

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142566
LICENSED PROFESSIONAL ENGINEER
9/4/23

PRELIMINARY

FOR
VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

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AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: STDT11160101

SHEET TITLE: WHEELCHAIR RAMP DETAILS

SHEET NUMBER: 5.6

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\MSTREETS\STDT11160\10.dwg5.6 By: SDUEWALL

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DATE:
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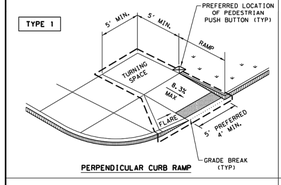
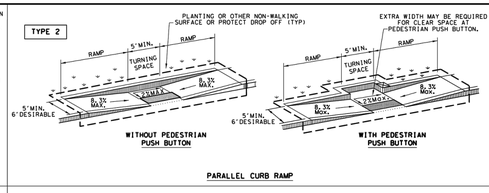
TYPE 1



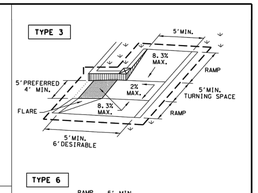
PERPENDICULAR CURB RAMP

TYPE 2

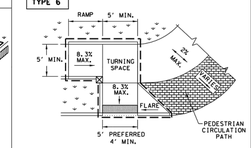


PARALLEL CURB RAMP

TYPE 3

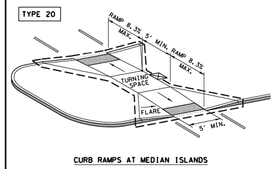


TYPE 6



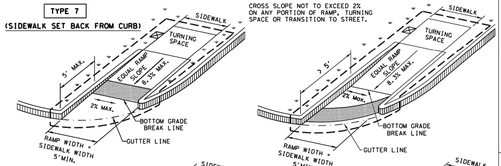
COMBINATION CURB RAMPS

TYPE 20

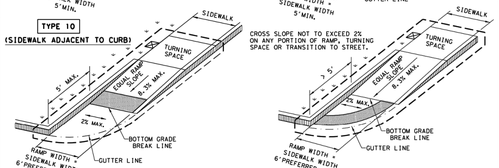


CURB RAMPS AT MEDIAN ISLANDS

TYPE 7
(SIDEWALK SET BACK FROM CURB)

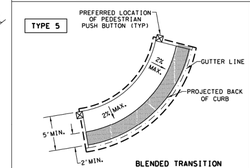


TYPE 10
(SIDEWALK ADJACENT TO CURB)



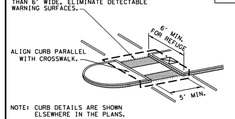
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 5



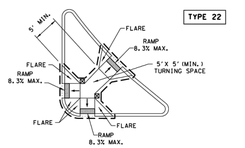
BLENDED TRANSITION
(FLUSH LANDING)

TYPE 21

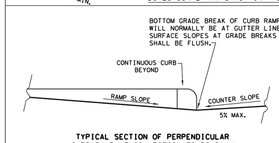


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

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

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	DW:VP	CK:KM	CK:PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
REVISED 08-2003	DIST	COUNTY		SHEET NO.
REVISED 05-2014				

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DATE:
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GENERAL NOTES

CURB RAMPS

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

DETECTABLE WARNING MATERIAL

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

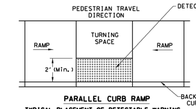
DETECTABLE WARNING PAVERS (IF USED)

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

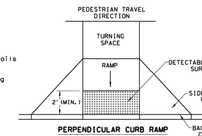
SIDEWALKS

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

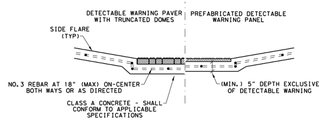
DETECTABLE WARNING SURFACE DETAILS



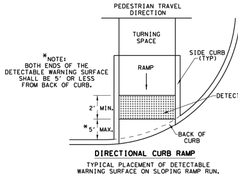
PARALLEL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON LANDING AT STREET EDGE.



PERPENDICULAR CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS



DIRECTIONAL CURB RAMP
TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	DW:VP	CK:KM	CK:PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
REVISED 08-2003	DIST	COUNTY		SHEET NO.
REVISED 05-2014				

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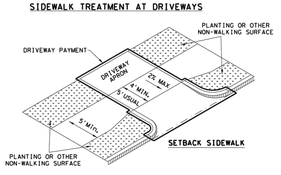
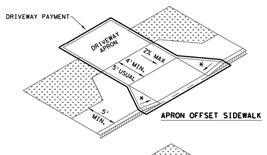
DATE:
FILE:

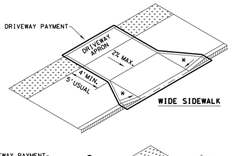
SIDEWALK TREATMENT AT DRIVEWAYS



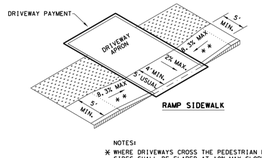
SETBACK SIDEWALK



APRON OFFSET SIDEWALK

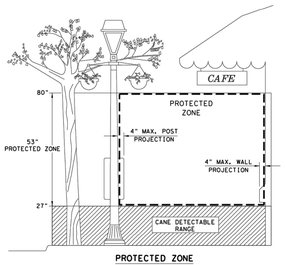


WIDE SIDEWALK



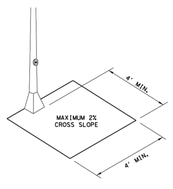
RAMP SIDEWALK

NOTES:
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.
** IF CURB HEIGHT IS GREATER THAN 6 INCHES, USE GRADE LESS THAN OR EQUAL TO 5%, HANDRAIL AND DETECTABLE WARNING ARE NOT REQUIRED.

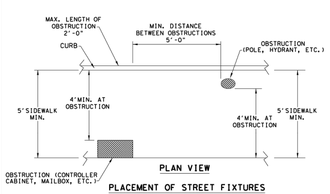


PROTECTED ZONE

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



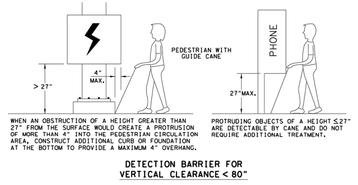
CLEAR SPACE ADJACENT
TO PEDESTRIAN PUSH BUTTON



PLAN VIEW

PLACEMENT OF STREET FIXTURES

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



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

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

DETECTION BARRIER FOR
VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	DW:VP	CK:KM	CK:PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS				
REVISED 08-2003	DIST	COUNTY		SHEET NO.
REVISED 05-2014				

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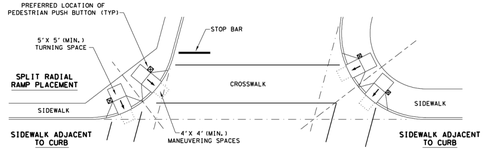
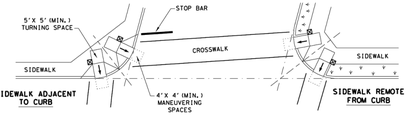
DATE:
FILE:

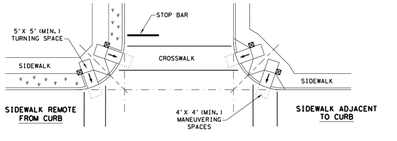
TYPICAL CROSSING LAYOUTS
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



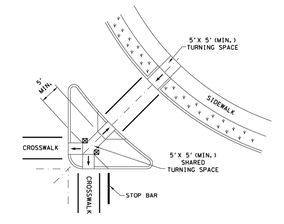
SKEWED INTERSECTION WITH "LARGE" RADIUS



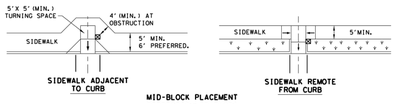
SKEWED INTERSECTION WITH "SMALL" RADIUS



NORMAL INTERSECTION WITH "SMALL" RADIUS



AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



SIDEWALK ADJACENT TO CURB
SIDEWALK REMOTE FROM CURB

MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS

LEGEND:

SHOWS DOWNWARD SLOPE.

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

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

SHEET 4 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN:TxDOT	DW:VP	CK:KM	CK:PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED PROFESSIONAL ENGINEER

9/4/23

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: STDT1160101

SHEET TITLE:
TXDOT PED-18 DETAILS

SHEET NUMBER:
5.7

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\wk\STREETS\STDT1160101.dwg\5.7 By: SDUDWALL

NOTES:
1) WITHIN THE CITY'S EXTRATERRITORIAL JURISDICTION, STREET NAME SIGNS SHALL BE INSTALLED AT ALL INTERSECTIONS WITHIN AND ABUTTING THE SUBDIVISION. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.

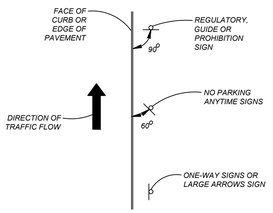
2) REGULATORY AND WARNING TRAFFIC SIGNS SHALL BE INSTALLED WITHIN AND ABUTTING THE SUBDIVISION IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)," AS REQUIRED BY THE CITY'S DEVELOPMENT SERVICES DEPARTMENT OR COUNTY'S DEPARTMENT OF PUBLIC WORKS. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE CITY'S DEVELOPMENT SERVICES DEPARTMENT OR COUNTY'S DEPARTMENT OF PUBLIC WORKS. WARNING AND REGULATORY SIGNS SHALL NOT BE ACCEPTED BY THE CITY UNTIL THE STREET HAS BEEN ACCEPTED FOR MAINTENANCE BY THE CITY.

TRENCH EXCAVATION SAFETY PROTECTION

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

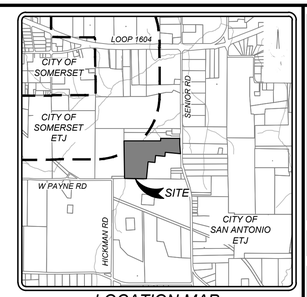
BEXAR COUNTY R.O.W. NOTE:

A BEXAR COUNY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

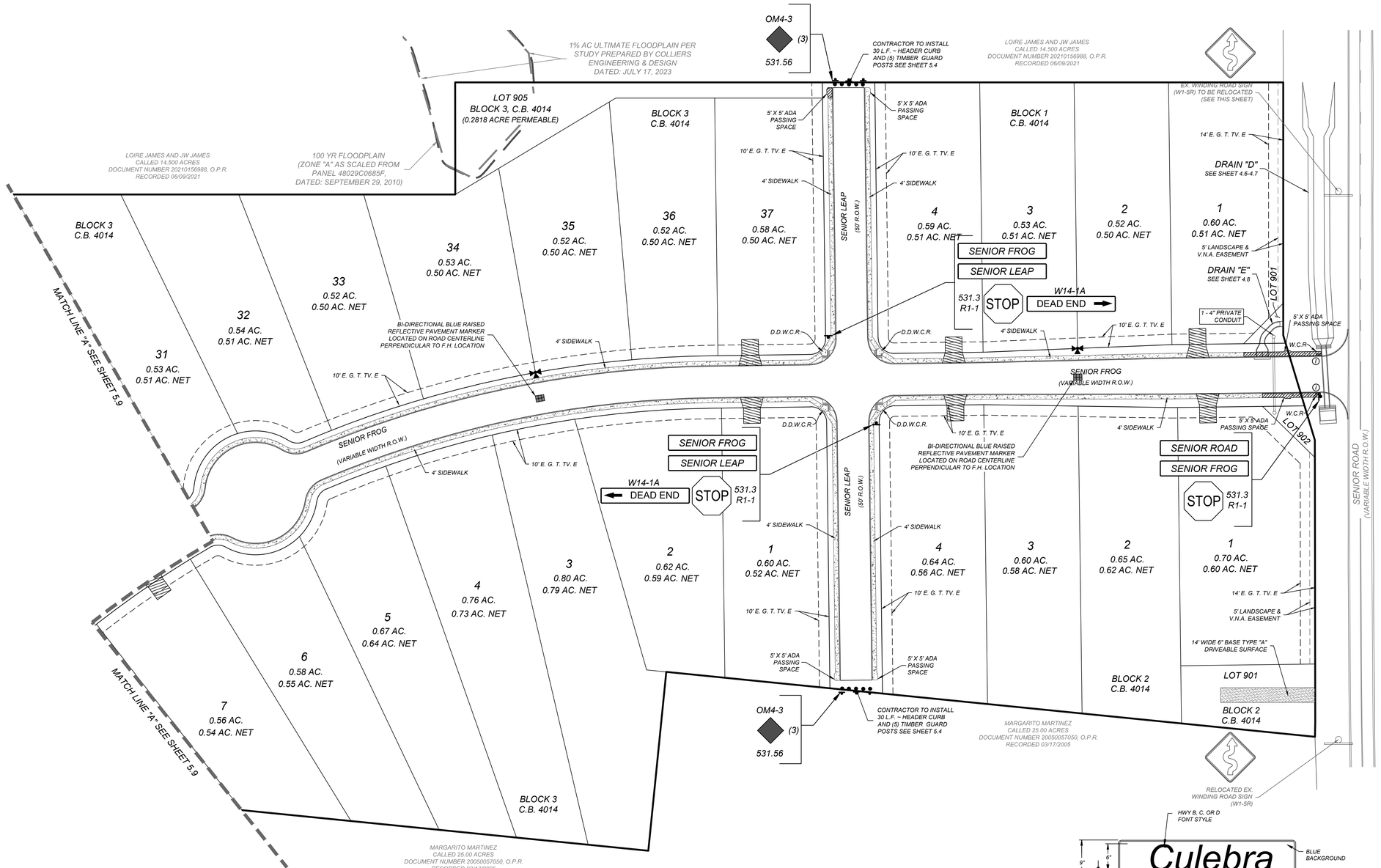


TYPICAL GROUND MOUNTED SIGN PLACEMENT

SYMBOL		ITEM NUMBER
STOP	R1-1 30" X 30"	531.3
STREET NAME #####	STANDARD COSA STREET NAME SIGN STD X 9	531.57
	OM4-3 END-OF-ROADWAY MARKER	531.56
	W11-2 PEDESTRIAN CROSSING 30" X 30"	531.51
DEAD END	W14-1A 36" X 6"	531.58



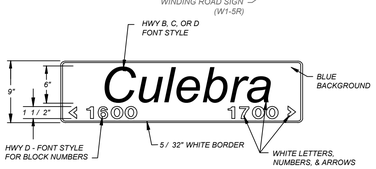
LOCATION MAP
N.T.S.



N
W E
S
50 0 50 100
SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

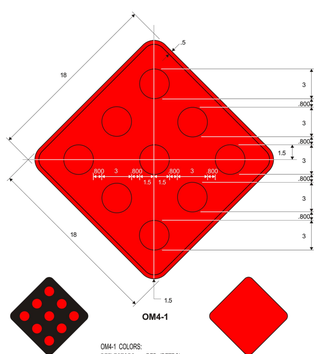
LEGEND

E.G.T.TV.E.	=	ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
W.C.R.	=	WHEELCHAIR RAMPS SEE SHEET 5.6
(I)	=	WHEELCHAIR RAMP TYPE I SEE SHEET 5.6
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.6
S.D.W.C.R.	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.6
D.D.W.C.R.	=	DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.6
	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER.
	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION



9" STREET NAME SIGN

Standard Highway Sign Designs for Texas



OM4-2

OM4-3

OM4-2 COLORS:
REFLECTORS — RED
BACKGROUND — BLACK

OM4-3 COLORS:
SIGN PANEL — RED

OM4-1 COLORS:
REFLECTORS — RED (RETRO)
BACKGROUND — RED
BORDER — RED (RETRO)

2012 Edition - Revision 3 | 10-4 | June 2020

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DESCRIPTION	DRAWN BY	DATE	REV

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
2/26/24

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FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: TS111160101

SHEET TITLE:
TRAFFIC SIGNAGE AND SIDEWALK PLAN

SHEET NUMBER:
5.8

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilSTREETS\TS111601\01.dwg|5.8 By: SDVERWALL

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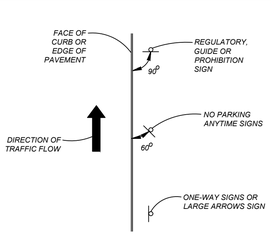
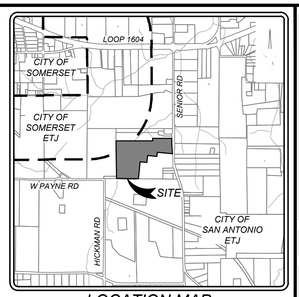


TYPICAL GROUND MOUNTED SIGN PLACEMENT



LOCATION MAP
N.T.S.

LUIS C. ZAMORA AND LETICIA ZAMORA
CALLED 55.34 ACRES
DOCUMENT NUMBER 20200065984, O.P.R.
RECORDED 03/27/2020

LOIRE JAMES AND JW JAMES
CALLED 14.500 ACRES
DOCUMENT NUMBER 20210156988, O.P.R.
RECORDED 06/09/2021

1% AC ULTIMATE FLOODPLAIN PER STUDY PREPARED BY COLLIERS ENGINEERING & DESIGN DATED: JULY 17, 2023

100 YR FLOODPLAIN (ZONE "A" AS SCALED FROM PANEL 48029C0685F, DATED: SEPTEMBER 29, 2010)

LOT 904, BLOCK 3, C.B. 4014
OPEN SPACE
(21.82 ACRE PERMEABLE)

MATCH LINE "B" SEE SHEET 5.10

MATCH LINE "A" SEE SHEET 5.8

30
0.69 AC.
0.68 AC. NET

29
0.66 AC.
0.65 AC. NET

28
0.61 AC.
0.60 AC. NET

27
0.56 AC.
0.54 AC. NET

26
0.52 AC.
0.50 AC. NET

25
0.53 AC.
0.50 AC. NET

24
0.58 AC.
0.55 AC. NET

BLOCK 3
C.B. 4014

BI-DIRECTIONAL BLUE RAISED REFLECTIVE PAVEMENT MARKER LOCATED ON ROAD CENTERLINE PERPENDICULAR TO F.H. LOCATION

4' SIDEWALK

SENOR FROG
(VARIABLE WIDTH R.O.W.)

10' E. G. T. TV. E

8
0.61 AC.
0.58 AC. NET

DRAIN "B"
SEE SHEET 4.3-4.4

9
0.64 AC.
0.62 AC. NET

10
0.61 AC.
0.58 AC. NET

11
0.53 AC.
0.50 AC. NET

LOT 903

MARGARITO MARTINEZ
CALLED 25.00 ACRES
DOCUMENT NUMBER 20050057650, O.P.R.
RECORDED 02/17/2005

N

SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

LEGEND

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V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
W.C.R.	=	WHEELCHAIR RAMPS SEE SHEET 5.6
(I)	=	WHEELCHAIR RAMP TYPE I SEE SHEET 5.6
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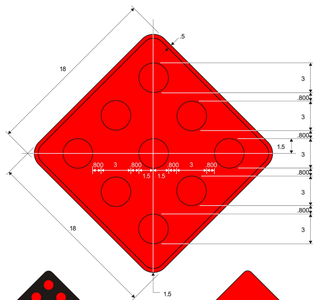
Standard Highway Sign Designs for Texas



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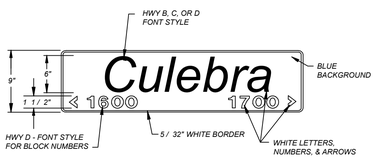
	W11-2 PEDESTRIAN CROSSING 30" X 30"	531.51
DEAD END	W14-1A 36" X 8"	531.58



9" STREET NAME SIGN

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER

2/26/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: TS11160101

SHEET TITLE: TRAFFIC SIGNAGE AND SIDEWALK PLAN

SHEET NUMBER: 5.9

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilSTREETS\TS11160101.dwg[5.9 By: SDWERWALL

NOTES:
1) WITHIN THE CITY'S EXTRATERRITORIAL JURISDICTION, STREET NAME SIGNS SHALL BE INSTALLED AT ALL INTERSECTIONS WITHIN AND ABUTTING THE SUBDIVISION. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE COUNTY DEPARTMENT OF PUBLIC WORKS.

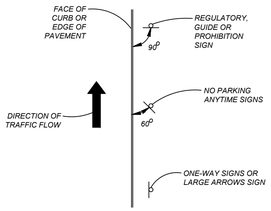
2) REGULATORY AND WARNING TRAFFIC SIGNS SHALL BE INSTALLED WITHIN AND ABUTTING THE SUBDIVISION IN ACCORDANCE WITH THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (TMUTCD)," AS REQUIRED BY THE CITY'S DEVELOPMENT SERVICES DEPARTMENT OR COUNTY'S DEPARTMENT OF PUBLIC WORKS. SUCH SIGNS SHALL BE MANUFACTURED AND INSTALLED BY THE SUBDIVIDER IN ACCORDANCE TO SPECIFICATIONS OF, AND SUBJECT TO PLAN REVIEWS AND INSPECTIONS BY THE CITY'S DEVELOPMENT SERVICES DEPARTMENT OR COUNTY'S DEPARTMENT OF PUBLIC WORKS. WARNING AND REGULATORY SIGNS SHALL NOT BE ACCEPTED BY THE CITY UNTIL THE STREET HAS BEEN ACCEPTED FOR MAINTENANCE BY THE CITY.

TRENCH EXCAVATION SAFETY PROTECTION

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

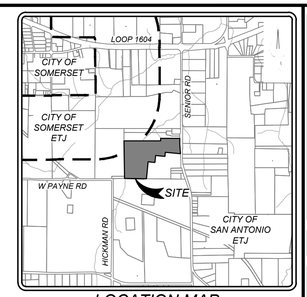
BEXAR COUNTY R.O.W. NOTE:

A BEXAR COUNY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

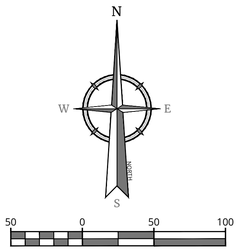


TYPICAL GROUND MOUNTED SIGN PLACEMENT

SYMBOL		ITEM NUMBER
STOP	R1-1 30" X 30"	531.3
STREET NAME #####	STANDARD COSA STREET NAME SIGN STD X 9	531.57
	OM4-3 END-OF-ROADWAY MARKER	531.56
	W11-2 PEDESTRIAN CROSSING 30" X 30"	531.51
DEAD END	W14-1A 36" X 8"	531.58

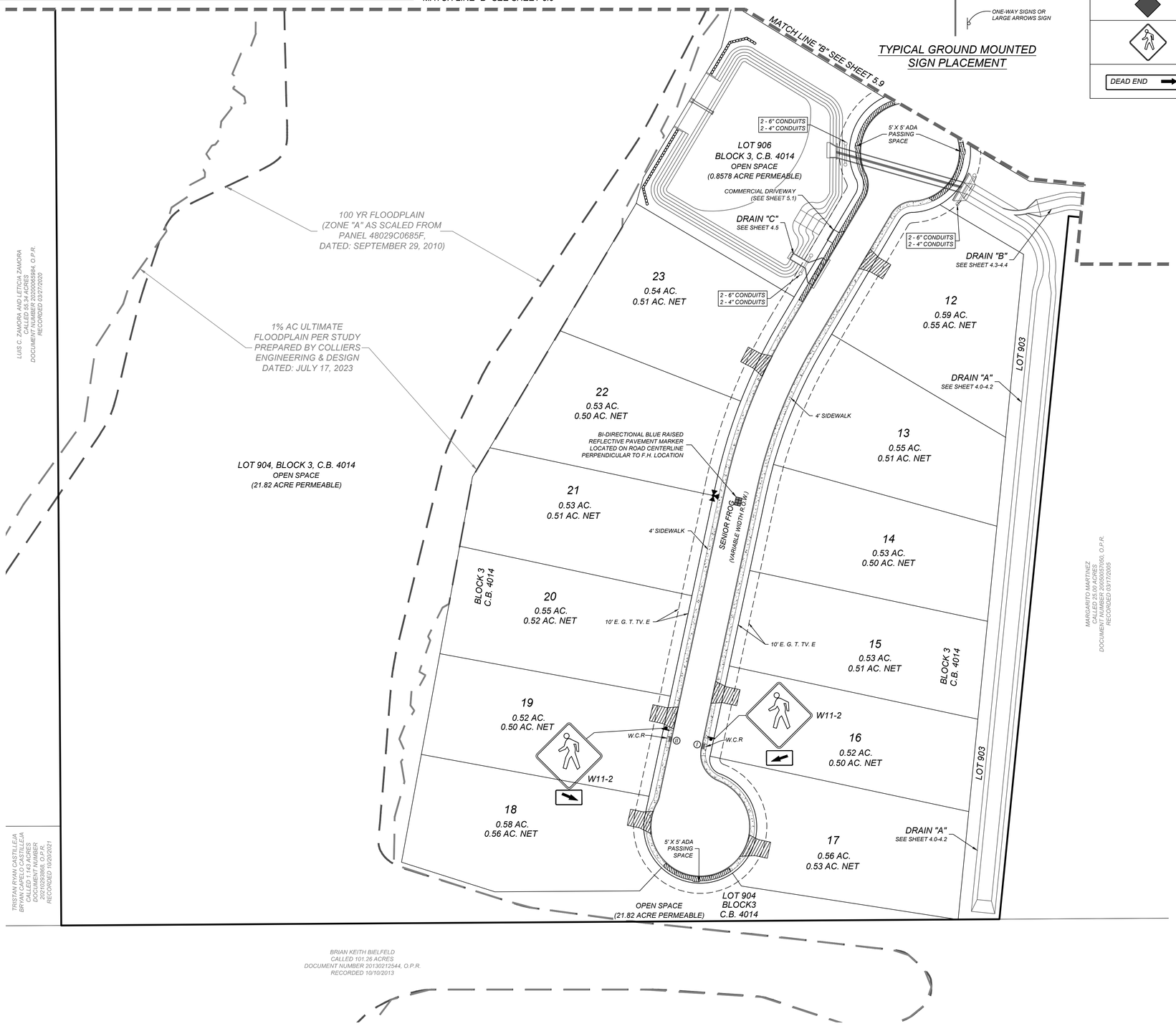


LOCATION MAP
N.T.S.



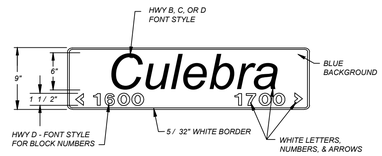
SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

MATCH LINE "B" SEE SHEET 5.9

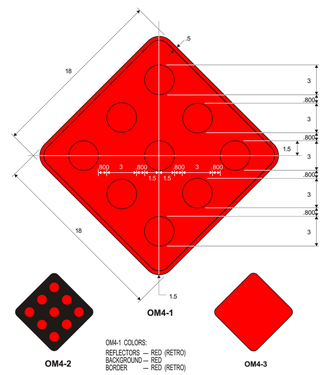


LEGEND

E.G.T.TV.E.	=	ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
W.C.R.	=	WHEELCHAIR RAMPS SEE SHEET 5.6
Ⓘ	=	WHEELCHAIR RAMP TYPE I SEE SHEET 5.6
Ⓘ Ⓘ	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.6
S.D.W.C.R.	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.6
D.D.W.C.R.	=	DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.6
	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER.
	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION



9" STREET NAME SIGN



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LICENSED
PROFESSIONAL ENGINEER
3/19/24

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FOR

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PLAT# 23-11800270

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER:	DRAWING NAME:
1116-01-01	TS11160101

SHEET TITLE:
TRAFFIC SIGNAGE AND SIDEWALK PLAN

SHEET NUMBER:
5.10

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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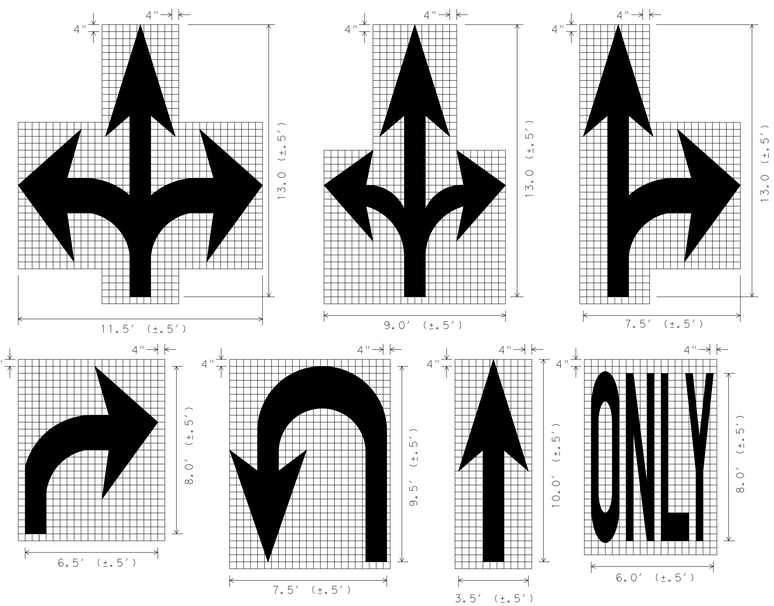

GENERAL NOTES:

1. Minimum 8 foot white markings should be used, unless otherwise noted. If message consists of more than one word, it should be placed with first word nearest the driver.
2. These details are standard size for normal installations. sizes may be reduced approximately one-third for low speed urban conditions; larger sizes may be needed for freeways, above average speed conditions or other critical locations.
3. The longitudinal space between markings should be at least four times the height of the markings, on low speed roads, but should not exceed ten times the height under any condition.
4. Markings considered appropriate for use when warranted include the followings
   - A. Regulatory
     - STOP
     - RIGHT (LEFT) TURN ONLY
     - 25 MPH
     - SYMBOL ARROWS
   - B. Warning
     - STOP AHEAD
     - SIGNAL AHEAD
     - SCHOOL
     - SCHOOL X-ING
     - PED X-ING
     - R X R (see RDFM standard)
   - C. Guide
     - US XXX
     - ROUTE XXX
     - STATE XXX
     - Other words or symbols may be necessary under certain conditions
5. Uncontrolled use of pavement markings can result in driver confusion. Word and symbol markings should be no more than three lines.
6. The word "STOP" shall not be used on the pavement unless accompanied by a Stop line and Stop sign. The word "STOP" shall not be placed on the pavement in advance to a stop line, unless every vehicle is required to stop at all times.
7. Pavement markings should generally be no more than one lane in width, with School messages being the exception. For details of School and School crossing pavement markings, refer to Part XII of the "Texas Manual on Uniform Traffic Control Devices".
8. Spacing between letters should be approximately 4 inches. The width of letters may vary depending on the width of the travel lanes.
9. Lane-Use arrow markings may be used to convey either guidance or mandatory messages. Arrows used to convey a mandatory movement must be accompanied by standard signs and the pavement marking word "ONLY".
10. Pavement markings are to be located as specified elsewhere in the plans.

SPACING BETWEEN LINES OF PAVEMENT MARKINGS	
MPH	SPACING
≤ 45	MINIMUM 4 TIMES THE LETTER HEIGHT
> 45	MINIMUM - 4 TIMES THE LETTER HEIGHT MAXIMUM - 10 TIMES THE LETTER HEIGHT

Texas Department of Transportation
Traffic Operations Division

STANDARD PAVEMENT MARKINGS (ARROWS)

PM(6)-01

©TxDOT March 2001	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

22H

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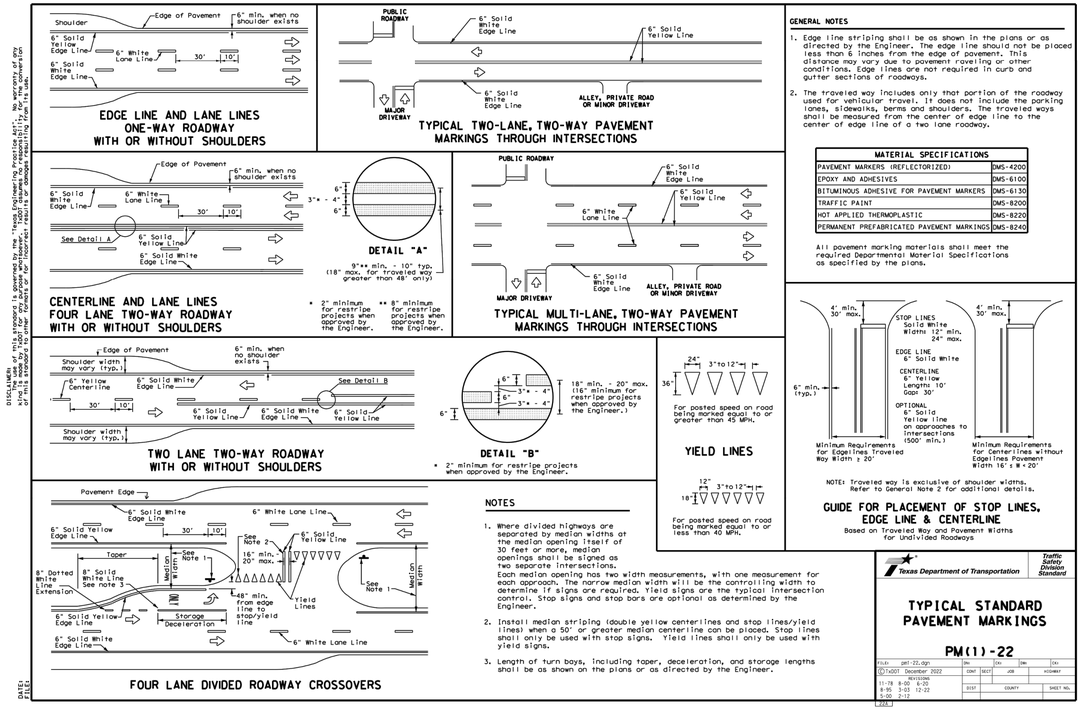
DATE:
FILE:



GENERAL NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions. Edge lines are not required in curb and gutter sections of roadways.
2. The traveled way includes only that portion of the roadway used for vehicular travel. It does not include the parking lanes, sidewalks, berms and shoulders. The traveled ways shall be measured from the center of edge line to the center of edge line of a two lane roadway.

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

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

NOTE: Traveled way is exclusive of shoulder widths. Refer to General Note 2 for additional details.

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

NOTES

1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling width to determine if signs are required. Yield signs are the typical intersection control. Stop signs and stop bars are optional as determined by the Engineer.
2. Install median striping (double yellow centerlines and stop lines/yield lines) when a 50' or greater median centerline can be placed. Stop lines shall only be used with stop signs. Yield lines shall only be used with yield signs.
3. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

Texas Department of Transportation — Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

PM(1)-22

FILE: pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 11-78 8-00 6-20; 8-95 3-03 12-22; 5-00 2-12	DIST	COUNTY		SHEET NO.

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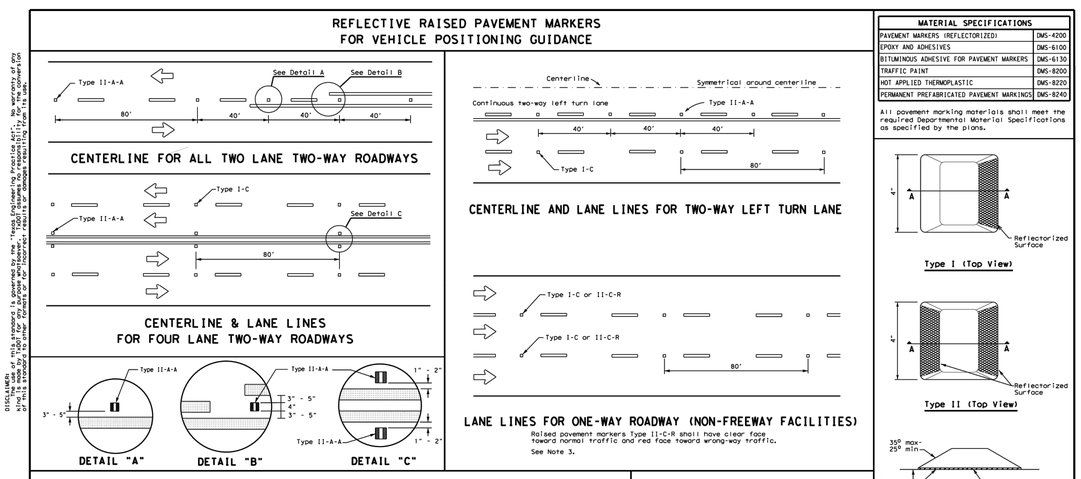
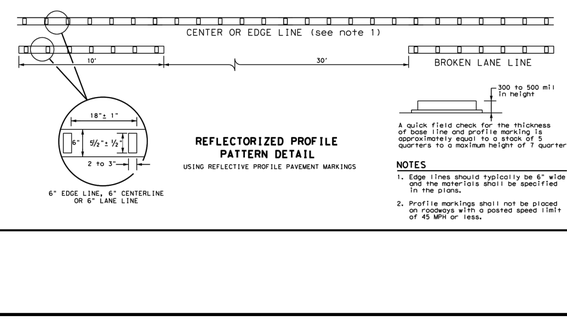


MATERIAL SPECIFICATIONS	
PAVEMENT MARKERS (REFLECTORIZED)	DMS-4200
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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

RAISED PAVEMENT MARKERS



GENERAL NOTES

1. All raised pavement markers placed along broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.
3. Use raised pavement marker Type I-C with undivided roadways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.

NOTES

1. Edge lines should typically be 6" wide and the materials shall be specified in the plans.
2. Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

Texas Department of Transportation — Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS

PM(2)-22

FILE: pm2-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-77 8-00 6-20; 4-92 2-10 12-22; 5-00 2-12	DIST	COUNTY		SHEET NO.

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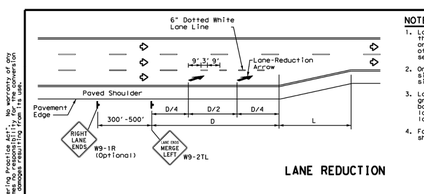
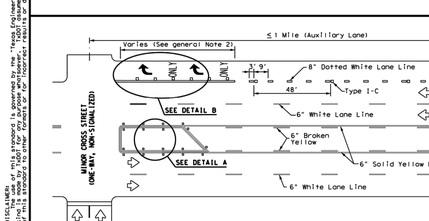
DATE:
FILE:

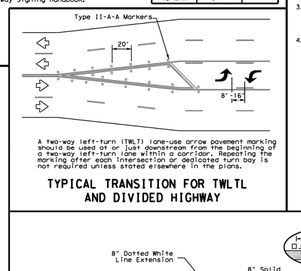


NOTES

1. Lane reduction pavement markings are used where the number of through lanes is reduced because of narrowing of the roadway or because of a section of on-street parking in what would otherwise be a through lane. For Texas Super 2 Passing Lanes, see TS2(PL) standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (W9-1R) sign may be installed in the median aligned with the W9-1R sign on the right side of the highway.
3. Lane reduction arrows are required for speeds of 45 mph or greater. An optional third lane reduction arrow may be added based on engineering judgement. If used, the optional third arrow (W9-2TL) should be centered between the first and last lane reduction arrows.
4. For lane reductions on Freeways and Expressways, signing shall conform to the TxDOT Freeway Signing Handbook.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	L= WS²/60
35 MPH	565	
40 MPH	670	
45 MPH	775	
50 MPH	885	L=WS
55 MPH	990	
60 MPH	1,100	
65 MPH	1,200	
70 MPH	1,250	
75 MPH	1,350	





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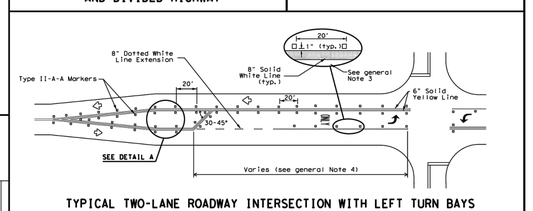
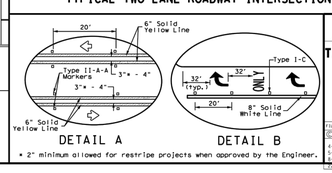
EPOXY AND ADHESIVES	DMS-6100
BITUMINOUS ADHESIVE FOR PAVEMENT MARKERS	DMS-6130
TRAFFIC PAINT	DMS-8200
HOT APPLIED THERMOPLASTIC	DMS-8220
PERMANENT PREFABRICATED PAVEMENT MARKINGS	DMS-8240

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





* 2" minimum allowed for restripe projects when approved by the Engineer.

Texas Department of Transportation — Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES, RURAL LEFT TURN BAYS, AND LANE REDUCTION PAVEMENT MARKINGS

PM(3)-22

FILE: pm3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS 4-98 3-03 6-20; 5-00 2-12 12-22; 8-00 2-12	DIST	COUNTY		SHEET NO.

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DATE:
FILE:

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SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
9/4/23

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

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BEXAR COUNTY
TEXAS

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COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC
PROJECT NUMBER: 1116-01-01	DRAWING NAME: TSDT1160101		

SHEET TITLE:
PAVEMENT MARKING DETAILS

SHEET NUMBER:
5.11

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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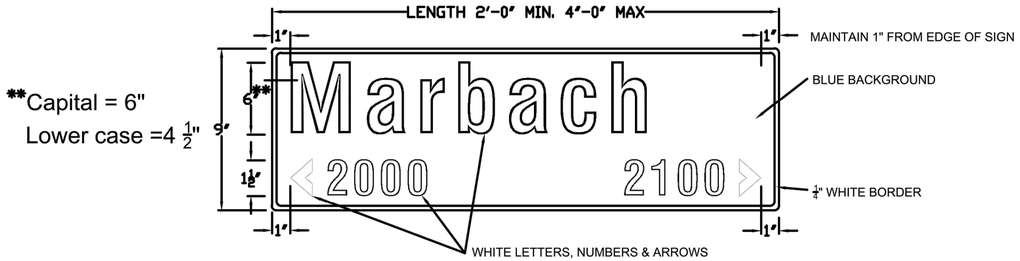
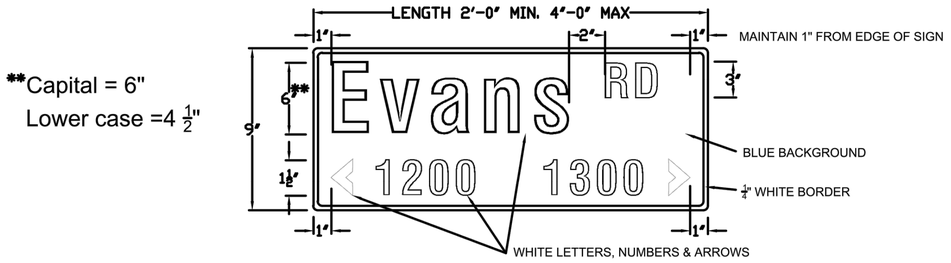
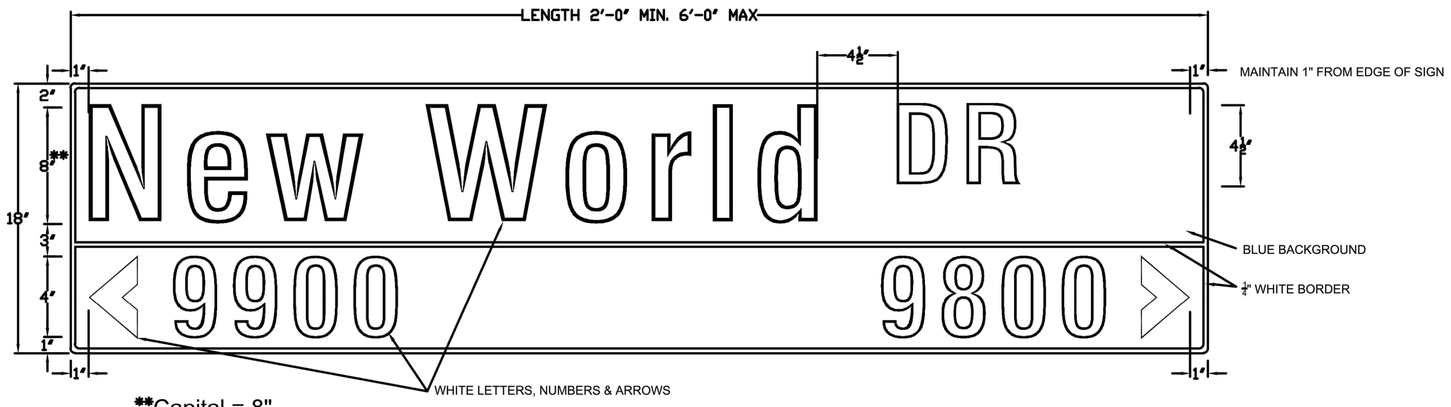


9" GROUND MOUNT STREET NAME SIGNS



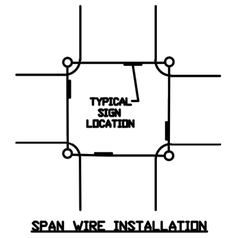
9" GROUND MOUNT STREET NAME SIGNS
WITH STREET DESIGNATION



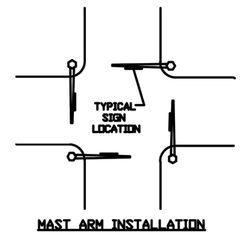
18" OVERHEAD STREET NAME SIGNS

	18" OVERHEAD SIGN	9" GROUND MOUNT SIGNS
HEIGHT	18" (381 mm)	9" (228 mm)
LENGTH	48" (1200 mm) MIN. 72" (1800 mm) MAX. 1' (300mm) INCREMENTS OF LENGTH	24" (600 mm) MIN. 48" (1200 mm) MAX. 6" (150mm) INCREMENTS OF LENGTH
THICKNESS	0.125" (3 mm)	
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209 GOLD CHROMATE 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, B OR C IF NAME OTHERWISE EXCEEDS MAXIMUM SIGN LENGTH	
COLOR	WHITE LEGEND ON BLUE BACKGROUND	
LETTER TRACKING	17% (USUAL) 10% (MIN.)	10%

✳ ACRYLIC ELECTRONIC CUTTABLE FILM



SPAN WIRE INSTALLATION



MAST ARM INSTALLATION

SIGN FACE MATERIALS
SHALL CONFORM TO:

1. STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS & BRIDGES ON FEDERAL HIGHWAY PROJECTS - FP-03 U.S. CUSTOMARY UNITS SECTION 718
2. GENERAL SERVICES ADMINISTRATION FEDERAL SPECIFICATIONS L-S-300C
3. ASTM D 4956 - 09e1

Bexar County Public Works

Street Name Sign Details

DESIGN BY: | DRAWN BY:
CHECKED BY: | DATE:
FILE NO.:
SHEET 1

Colliers
Engineering & Design
www.colliersengineering.com

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Formerly Known as KFW

811 PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE
FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER

9/4/23

PRELIMINARY

FOR
VARGA TRACT
SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: TSDT11160101

SHEET TITLE: SIGN MOUNTING DETAILS

SHEET NUMBER: 5.12

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

C:\wk\STREETS\TSDT11160101.dwg\5.12 By: SDHERWALL

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type

- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TS = Tubular Steel (see SMD(SLIP-1))
- TUBING = 10 GMC Tubing (see SMD(SLIP-1) Fig 10,SLIP-3))
- SCH = Schedule 80 Pipe (see SMD(SLIP-1) Fig 10,SLIP-3))

Number of Posts 01 or 25

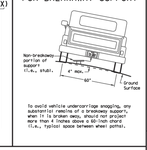
Anchor Type

- UA = Universal Anchor = Concreted (see SMD(FRP) and (TWT))
- UB = Universal Anchor = Bolted down (see SMD(FRP) and (TWT))
- BU = Wedge Anchor Steel = (see SMD(TWT))
- BD = Wedge Anchor High Density = (see SMD(TWT))
- SA = Slipbase = Concreted (see SMD(SLIP-1) fig 10,SLIP-3))
- SB = Slipbase = Bolted Down (see SMD(SLIP-1) fig 10,SLIP-3))

Sign Mounting Designation

- P = Prefab, "Plate" (see SMD(SLIP-1) fig 10,SLIP-3), (TWT), (FRP))
- T = Prefab, "T" (see SMD(SLIP-1) fig 10,SLIP-3), (TWT))
- X = Extruded Aluminum Panel (see SMD(SLIP-1) fig 10,SLIP-3))
- (EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) fig 10,SLIP-3), (TWT))
- EA = Extruded Wind Beam (see SMD(SLIP-1) fig 10,SLIP-3))
- WC = 1-1/2 Ø"H Wing Channel (see SMD(SLIP-1) fig 10,SLIP-3))
- EAL = Extruded Aluminum Sign Panel (see SMD(SLIP-1) fig 10,SLIP-3))

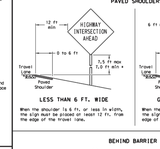
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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

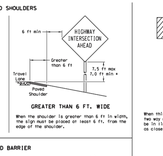
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

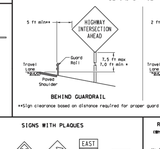
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



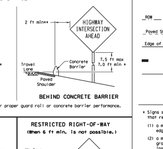
GREATER THAN 6 FT. WIDE

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

BEHIND BARRIER



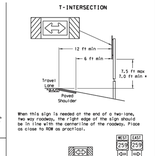
BEHIND GUARDRAIL



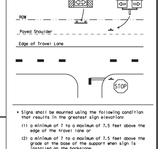
BEHIND CONCRETE BARRIER

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

T-INTERSECTION



When this sign is needed on the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Provide as close to 90Ø as possible.



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

(1) a minimum of 7 ft to a maximum of 5.5 feet above the edge of the travel lane or

(2) a minimum of 7 ft to a maximum of 5.5 feet above the grade of the base of the support when sign is to be placed on the back slope.

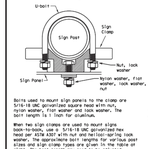
The maximum values may be increased when directed by the Engineer.

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

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

TYPICAL SIGN ATTACHMENT DETAIL

Single Signs

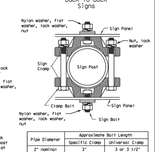


Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized hex head bolts with nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

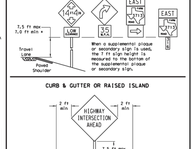
Sign clamps may be either the specific slide clamp or the universal clamp.

Back-to-Back Signs

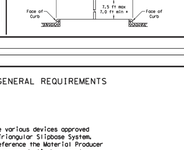


Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

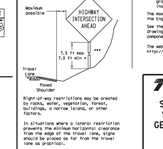


CURB & GUTTER OR RAISED ISLAND



RESTRICTED RIGHT-OF-WAY

(When 6 ft min. is not possible.)



Alternative sign restrictions may be created by roadside ditches, vegetation, forest, buildings, a narrow island, or other factors.

In situations where a concrete restriction prevents the minimum horizontal clearance from being met, the sign post or support should be placed as far from the travel lane as practical.

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

Texas Department of Transportation
Traffic Operations Division

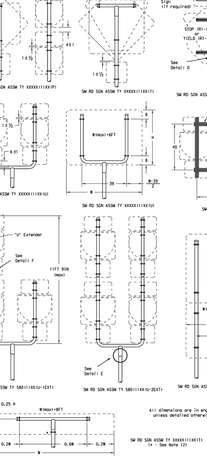
SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

©TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

154

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



SM RD SGN ASSM TY XXXXX(10)SLIP-XXXX

NOTE

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

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Engineering Section.
2. Material used as post with this system shall conform to the following specifications:
   - 10 GMC Tubing (2.875" outside diameter)
     - 0.134" nominal wall thickness
     - Seamless or electric-resistance welded steel tubing or pipe
     - Steel shall be ASTM A500 or ASTM A1011 or ASTM A1085
     - Other sheets may be used if they meet the following:
       - 55,000 PSI minimum yield strength
       - 75,000 PSI minimum tensile strength
       - 25% minimum elongation in 2"
   - Schedule 80 Pipe (2.875" outside diameter)
     - Outside diameter tunsolerant shall be within the range of 2.867" to 2.885"
     - Galvanization per ASTM A123 or ASTM A653 G210, for prepainted steel tubing (ASTM A653), recoat with paint meeting TxDOT specifications by dry-blasting with zinc dust per ASTM D6513.
   - Schedule 80 Pipe (2.875" outside diameter)
     - 0.276" nominal wall thickness
     - Steel tubing per ASTM A500 Gr B
     - Other seamless or electric-resistance welded steel tubing or pipe with equivalent chemical, physical, and mechanical properties may be used if they meet the following:
       - 46,000 PSI minimum yield strength
       - 63,000 PSI minimum tensile strength
       - 25% minimum elongation in 2"
     - Wall thickness tunsolerant shall be within the range of 0.248" to 0.304"
     - Outside diameter tunsolerant shall be within the range of 2.855" to 2.895"
   - Aluminum Pipe (3" Nominal)
     - Seamless or electric-resistance welded aluminum tubing or pipe with equivalent chemical, physical, and mechanical properties may be used if they meet the following:
       - 35,000 PSI minimum yield strength
       - 38,000 PSI minimum tensile strength
       - 10% minimum elongation in 2"
     - Wall thickness tunsolerant shall be within the range of 0.300" to 0.330"
     - Outside diameter tunsolerant shall be within the range of 3.855" to 3.895"
3. See the Traffic Operations Division website for detailed drawings of slip clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

Foundation

1. Prepare 12-inch diameter by 42-inch deep hole. If solid rock is encountered, the depth of the foundation may be reduced such that it is embedded a minimum of 18 inches into the solid rock.
2. Place the bolt keeper plate in the bottom of the hole. Set the slip base in the hole with the four anchor-bolt holes concentric about the post. For small properties less than 0.5 cubic yards, hand-mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximately 1/4 " above the concrete footing. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

Support

1. Cut support so that the bottom of the sign will be 7 to 7.5 feet above the edge of the travelway (i.e., edge of the closest lane when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and square.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-3) for clearances based on sign types.

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     - Other sheets may be used if they meet the following:
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       - 25% minimum elongation in 2"
   - Schedule 80 Pipe (2.875" outside diameter)
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3. Insert tubular socket into concrete until top of socket is approximately 1/4 " above the concrete footing. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
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CONCRETE ANCHOR

SM RD SGN ASSM TY XXXXX(10)SLIP-XXXX

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end, a heavy hex nut and 5/8" ASTM A563 and hardened washer per ASTM F436. The stub bolt shall have a minimum 3 3/4" embedment, a minimum depth of 10 and 11 ksi, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive anchors shall be installed and cured per the manufacturer's recommendations. Top of bolt shall extend at least 1 inch above the top of the nut when installed. The anchor, when installed in 4000 psi normal-weight concrete, shall have a minimum ultimate embedment, shall have a minimum allowable tension and shear of 3900 and 3100 pst, respectively.

FRICTION CAP DETAIL

Friction caps may be manufactured from hot rolled steel, cold rolled steel, or powdered metal. Powdered metal caps shall be 24 gauge for all size sizes.

The rim edges shall be reasonably straight and smooth. Caps shall be sized and formed in such a manner as to produce a drive-on friction fit and have no tendency to rock when seated on the pipe. The depth shall be sufficient to give positive friction engagement. Interior surfaces of caps shall be free of sharp grooves or indentations and show no evidence of metal fracture.

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN A.

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

©TxDOT July 2002	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

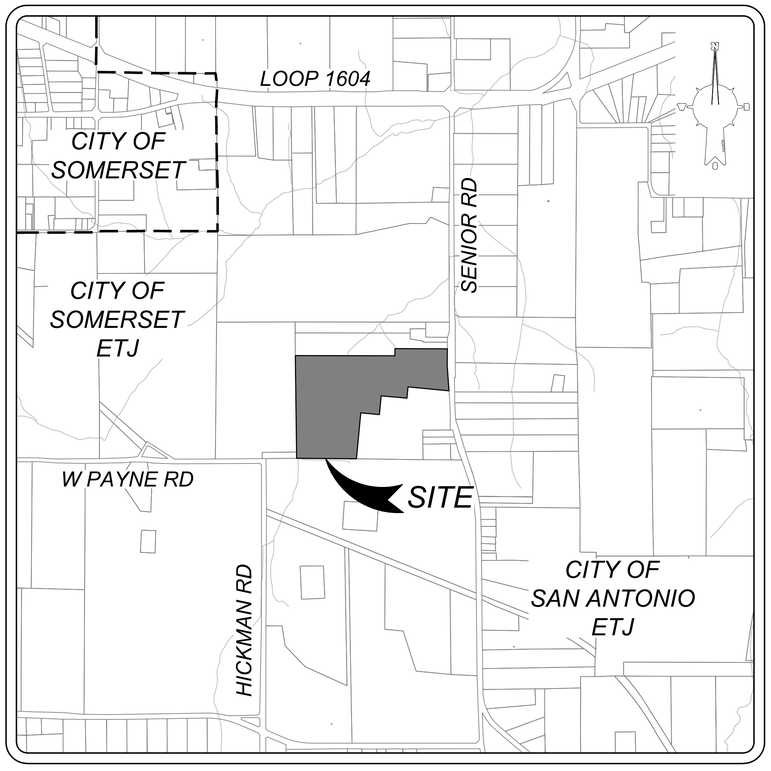
155

ONE-WAY Sign Panel Straight Name Sign 1/2" required
Gap between sign panels shall be 2 ± 1"
STOP (R1-1)
YIELD (R1-2)
See Detail D
Extruded Alum. Windbeam (See SMD(EA)-11)
PLAQUE = variable length 1'-0" x 1'-0" sign plaque 1 inch thick 6 in = 1'-0" sign plaque
Aluminum Sign Panel
Nylon washer, 5/16" x 3 1/4" hex bolt with nut, lock washer, 2 Flat washers per ASTM A307 galvanized per Item 445, "Galvanizing."
Sign Clamp (Specific or Universal)
5/16" x 3 3/4" hex bolt with nut, lock washer and flat washer per ASTM A307 galvanized per Item 445, "Galvanizing."
Wing Channel
Top View
Detail A
Detail B
Detail C
Detail D
Detail E
Detail F
Detail G
Detail H
Detail I
Detail J
SM RD SGN ASSM TY XXXXX(11)SLIP-XXXX
SM RD SGN ASSM TY XXXXX(11)EA(T)
SM RD SGN ASSM TY XXXXX(11)WC(T)
SM RD SGN ASSM TY XXXXX(11)WC(2T)
SM RD SGN ASSM TY SMD(11)SLIP-(2EXT)
SM RD SGN ASSM TY SMD(11)SLIP-(3EXT)
SM RD SGN ASSM TY XXXXX(11)X(2EXT)
SM RD SGN ASSM TY XXXXX(11)X(3EXT)
SM RD SGN ASSM TY XXXXX(11)X(T)
SIDE VIEW
TOP VIEW
Extruded Aluminum Sign Panel
Slide View
Post
Sign Clamp (Specific or Universal)
Wedge
Pilot
Plate
Bolt
Nut
Washer
Pilot Hole
Plate Hole
Post Hole
Pilot Hole
Plate Hole
Post Hole
Bolt
Nut
Washer
Plate
Wedge
Post
Pilot
Plate
Bolt
Nut
Washer

WATER IMPROVEMENTS
FOR
J&M DEVELOPMENT
VARGA TRACT SUBDIVISION
BEXAR COUNTY, TEXAS

INDEX OF SHEETS

SHT. No.	DESCRIPTION	LATEST REVISION
7.0	WATER COVER SHEET	--
7.1	OVERALL WATER PLAN	--
7.2	OVERALL WATER PLAN	--
7.3	OVERALL WATER PLAN	--



LOCATION MAP

N.T.S.

I HEREBY CERTIFY THAT I AM THE OWNER OF RECORD OF THE SITE HEREIN DEPICTED AND THAT I CONCUR WITH THE SUBMISSION.

OWNER _____ DATE _____

APPROVED BY THE PLANNING BOARD OF THE TOWNSHIP OF "ENTER NAME" AT THE REGULAR MEETING OF _____.
DATE

CHAIRMAN _____ DATE _____

SECRETARY _____ DATE _____

ENGINEER _____ DATE _____

GENERAL INFORMATION

SAWS CONSTRUCTION NOTES
COUNTER PERMIT AND GENERAL CONSTRUCTION PERMIT
January 2022

General Section

1. *All materials and construction procedures within the scope of this contract shall be approved by the San Antonio Water System (SAWS) and comply with the Plans, Specifications, General Conditions and with the following as applicable:*
   - *A. Current Texas Commission on Environmental Quality (TCEQ) "Design Criteria for Domestic Wastewater System", Texas Administrative Code (TAC) Title 30 Part 1 Chapter 217 and "Public Drinking Water", TAC Title 30 Part 1 Chapter 290.*
   - *B. Current TXDOT "Standard Specifications for Construction of Highways, Streets and Drainage".*
   - *C. Current "San Antonio Water System Standard Specifications for Water and Sanitary Sewer Construction".*
   - *D. Current City of San Antonio "Standard Specifications for Public Works Construction".*
   - *E. Current City of San Antonio "Utility Excavation Criteria Manual" (UECM).*
2. *The contractor shall not proceed with any pipe installation work until they obtain a copy of the approved Counter Permit or General Construction Permit (GCP) from the consultant and has been notified by SAWS Construction Inspection Division to proceed with the work and has arranged a meeting with the inspector and consultant for the work requirements. Work completed by the contractor without an approved Counter Permit and/or a GCP will be subject to removal and replacement at the expense of the contractors and/or the developer.*
3. *The Contractor shall obtain the SAWS Standard Details from the SAWS website, http://www.saws.org/business_center/specs. Unless otherwise noted within the design plans.*
4. *The Contractor is to make arrangements with the SAWS Construction Inspection Division at (210) 233-2973, on notification procedures that will be used to notify affected home residents and/or property owners 48 hours prior to beginning any work.*
5. *Location and depth of existing utilities and service laterals shown on the plans are understood to be approximate. Actual locations and depths must be field verified by the Contractor at least 1 week prior to construction. It shall be the Contractor's responsibility to locate utility service lines as required for construction and to protect them during construction at no cost to SAWS.*
6. *The Contractor shall verify the exact location of underground utilities and drainage structures at least 1-2 weeks prior to construction whether shown on plans or not. Please allow up to 7 business days for locates requesting pipe location markers on SAWS facilities. The following contact information are supplied for verification purposes:*
   - *SAWS Utility Locates: http://www.saws.org/Service/Locates*
   - *COSA Drainage (210) 207-0724 or (210) 207-6026*
   - *COSA Traffic Signal Operations (210) 206-8480*
   - *COSA Traffic Signal Damages (210) 207-3951*
   - *Texas State Wide One Call Locator 1-800-545-6005 or 811*
7. *The Contractor shall be responsible for restoring existing fences, curbs, streets, driveways, sidewalks, landscaping and structures to its original or better condition if damages are made as a result of the project's construction.*
8. *All work in Texas Department of Transportation (TxDOT) and/or Bexar County right-of-way shall be done in accordance with respective construction specifications and permit requirements.*
9. *The Contractor shall comply with City of San Antonio or other governing municipality's tree ordinances when excavating near trees.*
10. *The Contractor shall not place any waste materials in the 100-year Flood Plain without first obtaining an approved Flood Plain Permit.*
11. *Holiday Work: Contractors will not be allowed to perform SAWS work on SAWS recognized holidays. Request should be sent to constworkreq@saws.org. Weekend Work: Contractors are required to notify the SAWS Inspection Construction Department 48 hours in advance to request weekend work. Request should be sent to constworkreq@saws.org.*
    Any and all SAWS utility work installed without holiday/weekend approval will be subject to be uncovered for proper inspection.
12. *Compaction note (Item 804): The contractor shall be responsible for meeting the compaction requirements on all trench backfill and for paying for the tests performed by a third party. Compaction tests will be done at one location point randomly selected, or as indicated by the SAWS Inspector and/or the test administrator, per each 12-inch loose lift per 400 linear feet at a minimum. This project will not be accepted and finalized by SAWS without this requirement being met and verified by providing all necessary documented test results.*
13. *A copy of all testing reports shall be forwarded to SAWS Construction Inspection Division.*

Water Section

1. *Prior to tie-ins, any shutdowns of existing mains of any size must be coordinated with the SAWS Construction Inspection Division at least one week in advance of the shutdown. The Contractor must also provide a sequence of work as related to the tie-ins; this is at no additional cost to SAWS or the project and it is the responsibility of the Contractor to sequence the work accordingly.*
   - *For water mains 12" or higher: SAWS Emergency Operations Center (210) 233-2014*
2. *Asbestos Cement (AC) pipe, also known as transite pipe which is known to contain asbestos containing material (ACM), may be located within the project limits. Special waste management procedures and health and safety requirements will be applicable when removal and/or disturbance of this pipe occurs. Such work is to be made under Special Specification Item No. 3000, "Special Specification for Handling Asbestos Cement Pipe".*
3. *Valve removal: Where the contractor is to abandon a water main, the control valve located on the abandoning branch will be removed and replaced with a cap/plug. (NSPI)*
4. *Suitable anchorage/thrust blocking or joint restraint shall be provided at all of the following main locations: dead ends, plugs, caps, tees, crosses, valves, and bends, in accordance with the Standard Drawings DD-839 Series and Item No. 839, in the SAWS Standard Specifications for Construction.*
5. *All valves shall read "open right".*
6. *PRVs Required: Contractor to verify that no portion of the tract is below ground elevation of 645 feet where the static pressure will normally exceed 80 PSI. At all such locations where the ground level is below 645 feet, the Developer or Builder shall install at each lot, on the customer's side of the meter, an approved type pressure regulator in conformance with the Plumbing Code of the City of San Antonio. No dual services allowed for any lot(s) if "PRV is/are required for such lot(s), only single service connections shall be allowed. "Note: A pressure regulator is also known as a pressure reducing valve (PRV).*
7. *Pipe Disinfection with Dry HTH for Projects less than 800 linear feet. (Item No. 847.3): Mains shall be disinfected with dry HTH where shown in the contract documents or as directed by the Inspector, and shall not exceed a total length of 800 feet. This method of disinfection will also be followed for main repairs. The Contractor shall utilize all appropriate safety measure to protect his personnel during disinfection operations.*
8. *Backflow Prevention Devices:*
   - *All irrigation services within residential areas are required to have backflow prevention devices.*
   - *All commercial backflow prevention devices must be approved by SAWS prior to installation.*
9. *Final connection to the existing water main shall not be made until the water main has been pressure tested, chlorinated, and SAWS has released the main for tie-in and use.*
10. *Division Valves: Division Valves shown on plans or not shown on plans but found in the field shall only be operated by SAWS Distribution and Collection staff and only with prior written approval of the SAWS Director of Production and Operations and proper coordination with all SAWS departments. Contractor shall provide written notification to the inspector a minimum of two weeks in advance to start the coordination process and will be informed by the Inspector when the division valve will be operated by the SAWS Distribution and Collection staff. The Division Valve can only be operated by SAWS Distribution and Collection staff member not the inspector or the contractor. Operation of a Division Valve without the express prior written approval of the SAWS Distribution and Collection staff will constitute a material breach of any written SAWS contract or permit in addition to subjecting the Contractor to liability for any and all fines, fees, or other damages, direct or consequential, that may arise from or be caused by the operation of the valve without prior written permission. Please be informed that the approval of the operation or opening or closing of a division valve can take several weeks for approval. Division Valves will also have a valve lid labeled Division Valve and a locking mechanism installed with a key. The lock and key mechanism will be paid for by the contractor but will be installed by SAWS Distribution and Collection staff.*

SAWS PRESSURE ZONE 830 HGL

DEVELOPER'S NAME: J&M DEVELOPMENT		
DEVELOPER'S ADDRESS: 6538 ECKHERT RD		
CITY: SAN ANTONIO	*STATE: TEXAS*	*ZIP: 78240*
PHONE#: (210) 979-8444	*FAX#:*	*TOTAL ACREAGE: 54.47 ACRES*
SAWS BLOCK MAP#: 118502	*2,375 LF ~ 8" C-900 329 LF ~ 2" HDPE*	*TOTAL EDU'S: 46.5*
TOTAL LINEAR FOOTAGE OF PIPE:	*51 LF ~ 8" D.I.*	*PLAT NO.: 23-11800270*
NUMBER OF LOTS: 45	*SAWS JOB#: 23-1123*	

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER

2/26/24

PRELIMINARY

FOR
VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER:	DRAWING NAME:
1116-01-01	CVW11160101

SHEET TITLE:
WATER COVER SHEET

SHEET NUMBER:
7.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CadWATER\CVW11160101.dwg72.0 By:STEWALL

TRENCH EXCAVATION SAFETY PROTECTION

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

WATER PLAN NOTES:

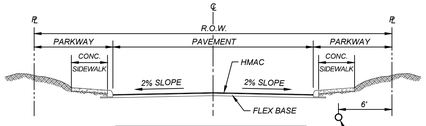
1. ALL VALVES SHALL READ "OPEN RIGHT"
2. ALL PVC PIPE SHALL BE C-900 CLASS 235, DR 18.

FIRE FLOW NOTE:

IN AN EFFORT TO MEET THE CITY OF SAN ANTONIO'S FIRE FLOW REQUIREMENTS FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, THE PUBLIC WATER MAIN SYSTEM HAS BEEN DESIGNED FOR A MINIMUM FIRE FLOW DEMAND OF 1,000 GPM AT 25 PSI RESIDUAL PRESSURE. THE FIRE FLOW REQUIREMENTS FOR INDIVIDUAL STRUCTURES WILL BE REVIEWED DURING THE BUILDING PERMIT PROCESS IN ACCORDANCE WITH THE PROCEDURES SET FORTH BY THE CITY OF SAN ANTONIO DIRECTOR OF DEVELOPMENT SERVICES DEPARTMENT AND THE SAN ANTONIO FIRE DEPARTMENT FIRE MARSHAL.

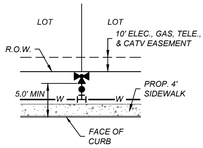
CAUTION!!!
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS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

NOTE:
PRESSURE REDUCING VALVES TO BE THE RESPONSIBILITY OF THE HOME BUILDER WHERE REQUIRED

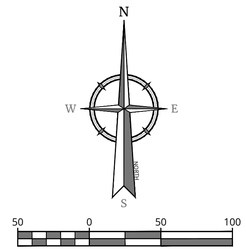


TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	4'

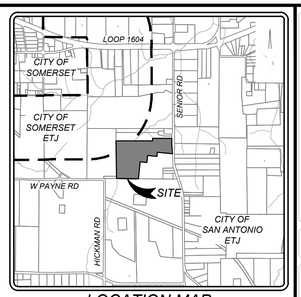
TYPICAL STREET SECTION
N.T.S.



TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE



Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)



LOCATION MAP
N.T.S.

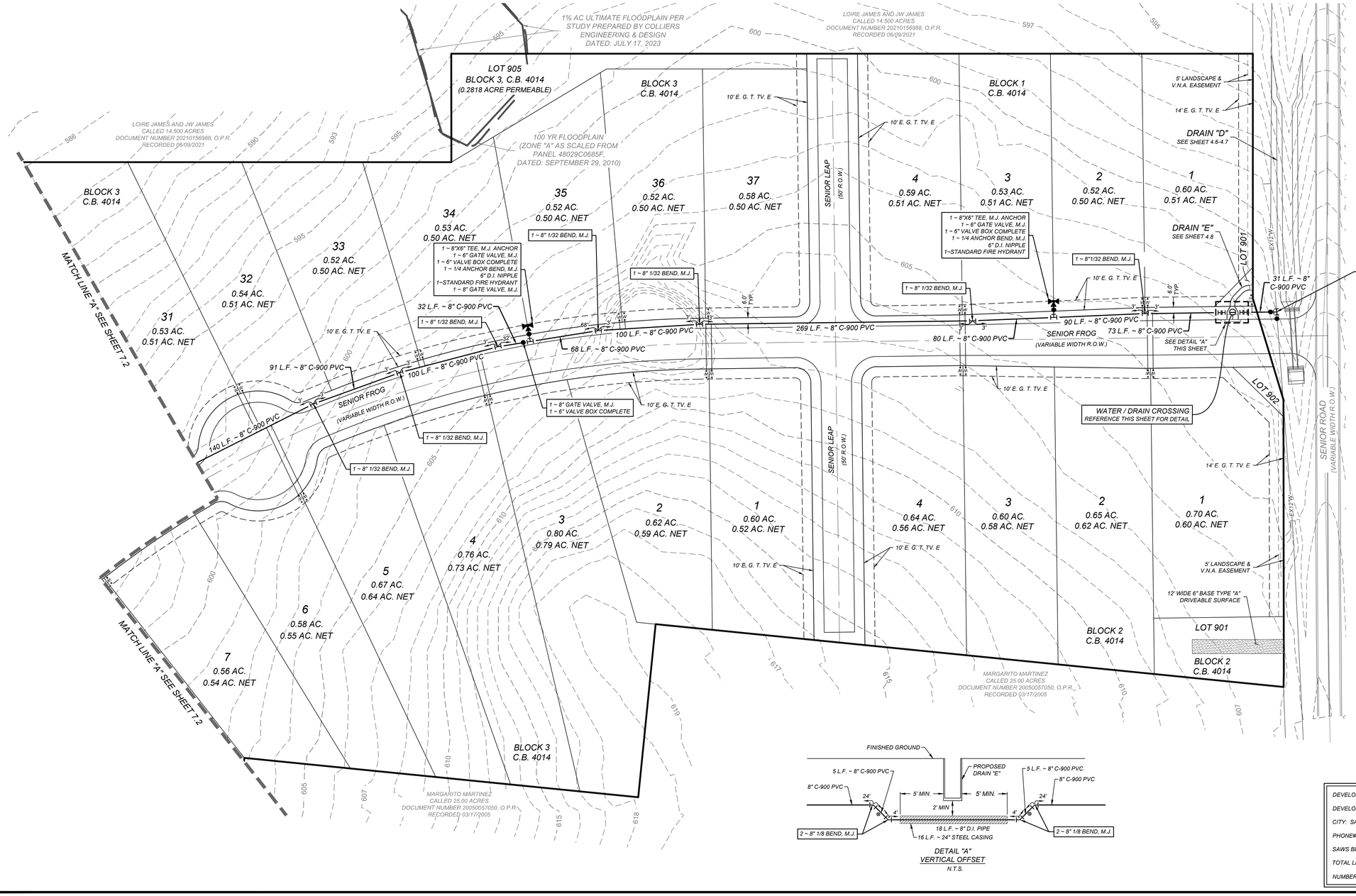
LEGEND

PROPOSED WATER MAIN	W
PROPOSED WATER 3/4" SERVICE & 5/8" METER BOX	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & 3/4" METER BOX	IRRW
PROPOSED FIRE HYDRANT	
PROPOSED WATER VALVE	
PROPOSED 100W STREETLIGHT	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	E. G. T. TV. E
EXISTING WATER MAIN	E.W
EXISTING FIRE HYDRANT	
EXISTING WATER VALVE	
EXISTING OVERHEAD ELECTRIC W/POWER POLE	OHE
EXISTING GUY WIRE/OVERHEAD ELECTRIC	OHE

CONCTRACTOR SHALL TIE IN NEW 8" PVC PIPE TO EXISTING 12" PVC PIPE AFTER DISINFECTION BY CONTRACTOR AND ACCEPTANCE BY SAWS.

FOR CHLORINATION INJECTION
2 ~ 1" CORP STOP C.C. X I.P.
2 ~ 1" COMP X 1½ CPL. CURB STOP
2 ~ 1" COPPER TUBING, CUT AS REQUIRED
2 ~ 1½ " THD. SOLID CAPS, THR
CONTRACTOR SHALL PROVIDE A 2" JUMPER CONNECTION TO LOAD NEW MAIN

1 ~ 8"X12" CUT IN TEE, M.J.
1 ~ 8" GATE VALVE, M.J.
1 ~ 12" GATE VALVE, M.J.
2 ~ 6" VALVE BOX COMPLETE
1 ~ MACHINE CLORINATION
1~BLOWOFF (TEMP.)



DETAIL "A"
VERTICAL OFFSET
N.T.S.

SAWS PRESSURE ZONE 830 HGL

DEVELOPER'S NAME: J&M DEVELOPMENT		
DEVELOPER'S ADDRESS: 6538 ECKHERT RD		
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78240
PHONE#: (210) 979-8444	FAX#:	TOTAL ACREAGE: 54.47 ACRES
SAWS BLOCK MAP#: 118502	2,375 LF ~ 8" C-900 329 LF ~ 2" HDPE	TOTAL EDU'S: 46.5
TOTAL LINEAR FOOTAGE OF PIPE:	51 LF ~ 8" D.I.	PLAT NO.: 23-11800270
NUMBER OF LOTS: 45	SAWS JOB#: 23-1123	

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FOR

VARGA TRACT SUBDIVISION PLAT# 23-11800270

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: OW11160101

SHEET TITLE: OVERALL WATER PLAN

SHEET NUMBER: 7.1

By: CDUENAS
CivilWATER\OW11160101.dwg\7.1

TRENCH EXCAVATION SAFETY PROTECTION

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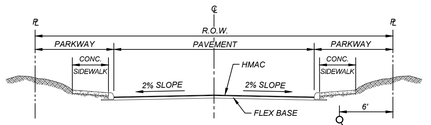

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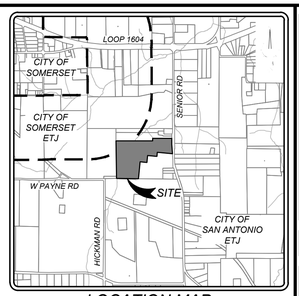
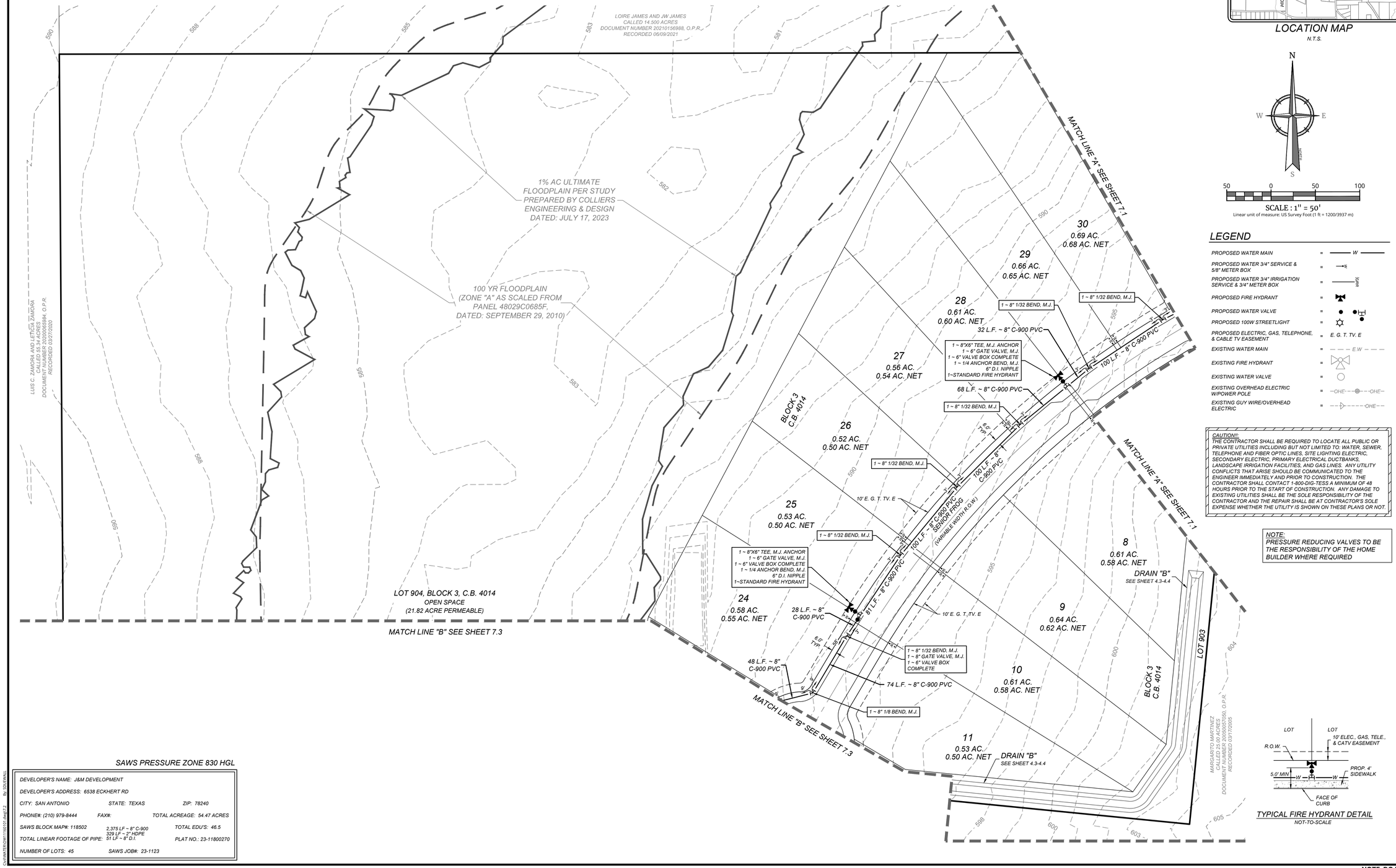
N.T.S.



LOCATION MAP
N.T.S.



SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER 3/4" SERVICE & 5/8" METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & 3/4" METER BOX	=	IWM
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. E
EXISTING WATER MAIN	=	E.W
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EXISTING WATER VALVE	=	
EXISTING OVERHEAD ELECTRIC W/POWER POLE	=	OHE
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PRESSURE REDUCING VALVES TO BE THE RESPONSIBILITY OF THE HOME BUILDER WHERE REQUIRED

TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

SAWS PRESSURE ZONE 830 HGL

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DEVELOPER'S ADDRESS: 6538 ECKHERT RD		
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78240
PHONE#: (210) 979-8444	FAX#:	TOTAL ACREAGE: 54.47 ACRES
SAWS BLOCK MAP#: 118502	2,375 LF ~ 8" C-900 329 LF ~ 2" HDPE	TOTAL EDU'S: 46.5
TOTAL LINEAR FOOTAGE OF PIPE:	51 LF ~ 8" D.I.	PLAT NO.: 23-11800270
NUMBER OF LOTS: 45	SAWS JOB#: 23-1123	

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PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

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TBPE Firm#: F-14909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: OW11160101

SHEET TITLE:
OVERALL WATER PLAN

SHEET NUMBER:
7.2

By: SDURWALL
CadWATER\OW11160101.dwg7.2

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2. *ALL PVC PIPE SHALL BE C-900 CLASS 235, DR 18.*

FIRE FLOW NOTE:

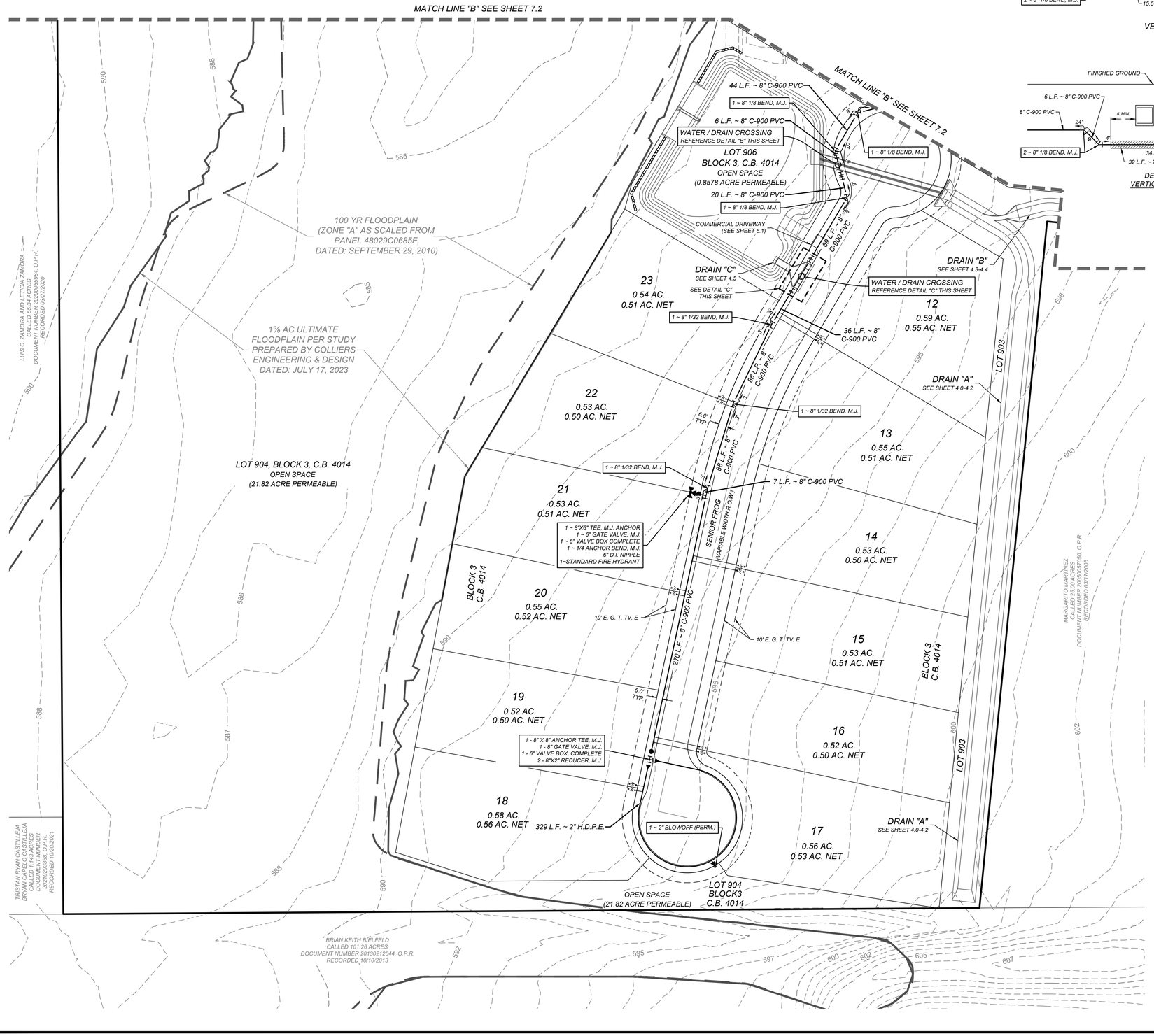
IN AN EFFORT TO MEET THE CITY OF SAN ANTONIO'S FIRE FLOW REQUIREMENTS FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, THE PUBLIC WATER MAIN SYSTEM HAS BEEN DESIGNED FOR A MINIMUM FIRE FLOW DEMAND OF 1,000 GPM AT 25 PSI RESIDUAL PRESSURE. THE FIRE FLOW REQUIREMENTS FOR INDIVIDUAL STRUCTURES WILL BE REVIEWED DURING THE BUILDING PERMIT PROCESS IN ACCORDANCE WITH THE PROCEDURES SET FORTH BY THE CITY OF SAN ANTONIO DIRECTOR OF DEVELOPMENT SERVICES DEPARTMENT AND THE SAN ANTONIO FIRE DEPARTMENT FIRE MARSHAL.

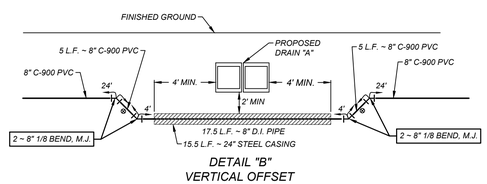
CAUTION!!!

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

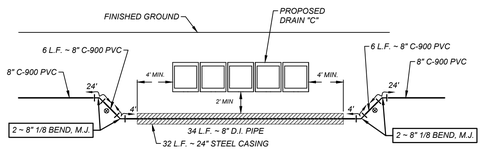
NOTE:

PRESSURE REDUCING VALVES TO BE THE RESPONSIBILITY OF THE HOME BUILDER WHERE REQUIRED





DETAIL "B"
VERTICAL OFFSET
N.T.S.



DETAIL "C"
VERTICAL OFFSET
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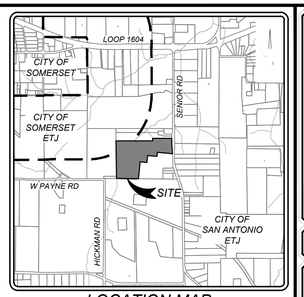
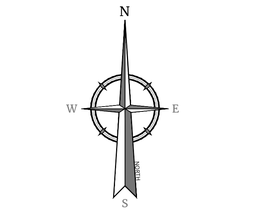


LOCATION MAP
N.T.S.

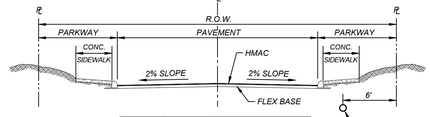


SCALE : 1" = 50'
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER 3/4" SERVICE & 5/8" METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & 3/4" METER BOX	=	IRRW
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. E
EXISTING WATER MAIN	=	E.W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING OVERHEAD ELECTRIC W/POWER POLE	=	OHE
EXISTING GUY WIRE/OVERHEAD ELECTRIC	=	OHE

TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE



TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	4'

TYPICAL STREET SECTION
N.T.S.

SAWS PRESSURE ZONE 830 HGL

DEVELOPER'S NAME: J&M DEVELOPMENT			
DEVELOPER'S ADDRESS: 6538 ECKHERT RD			
CITY: SAN ANTONIO	STATE: TEXAS	ZIP: 78240	
PHONE#: (210) 979-8444	FAX#:	TOTAL ACREAGE: 54.47 ACRES	
SAWS BLOCK MAP#: 118502	2,375 LF ~ 8" C-900 329 LF ~ 2" HDPE	TOTAL EDU'S: 46.5	
TOTAL LINEAR FOOTAGE OF PIPE:	51 LF ~ 8" D.I.	PLAT NO.: 23-11800270	
NUMBER OF LOTS: 45	SAWS JOB#: 23-1123		

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FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED
PROFESSIONAL ENGINEER
3/19/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: OW11160101

SHEET TITLE: OVERALL WATER PLAN

SHEET NUMBER: 7.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilWATEROW1116010.dwg7.3 By: SCRUZ

PROJECT COMPLETION:

1. ALL DISTURBED AREAS ARES NOT COVERED BY IMPERVIOUS COVER ARE TO BE STABILIZED PER THE SWPPP AND PROJECT SPECIFICATIONS PRIOR TO REMOVAL OF ANY BMP'S AND/OR PRIOR TO FILING A NOTICE OF TERMINATION (NOT).
2. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN PHASES IF ALL UPGRADIENT AREAS HAVE BEEN STABILIZED PER SWPPP AND PROJECT SPECIFICATIONS. THIS PHASING SHOULD BE NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
3. CONTRACTOR TO ENSURE THEY HAVE MET ALL REQUIREMENTS OF THE SWPPP BEFORE FILING A NOTICE OF TERMINATION (NOT).

GENERAL:

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3. ALL OWNERS/OPERATORS ARE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH THE STORMWATER POLLUTION PREVENTION PLAN AND COMPLYING WITH THE REGULATIONS CONTAINED WITHIN IT.

INSTALLATION:

1. ALL OPERATORS SHALL SUBMIT A NOTICE OF INTENT (NOI) AT LEAST 48 HOURS IN ADVANCE AND ALL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO ENSURE THAT STRUCTURAL BMP'S ARE INSTALLED WITHIN THE LIMITS OF THE SITE BOUNDARY.
3. CONTRACTOR MAY INSTALL THE BEST MANAGEMENT PRACTICES IN PHASES THAT COINCIDE WITH THE DISTURBANCE OF UP GRADIENT AREAS. THIS PHASING SHOULD BE NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
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MAINTENANCE AND INSPECTION:

1. CONTRACTOR SHOULD LIMIT CONSTRUCTION ACTIVITIES TO ONLY THOSE AREAS SHOWN TO BE DISTURBED ON THIS PLAN. IF ADDITIONAL VEGETATED AREAS ARE DISTURBED, THEY SHOULD BE PROTECTED WITH APPROPRIATE BEST MANAGEMENT PRACTICES UNTIL THE AREAS HAVE BEEN STABILIZED AS PER THE SPECIFICATIONS OF THE SWPPP. THE AREAS OF THIS ADDITIONAL SOIL DISTURBANCE AND THE MEASURES USED SHOULD BE SHOWN ON THE SITE PLAN AND NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
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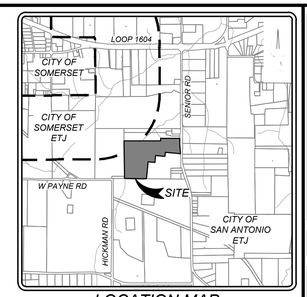
3. LOCATION OF CONSTRUCTION ENTRANCE/EXIT, CONCRETE WASHOUT PIT, AND EQUIPMENT AND STORAGE ARE TO BE FIELD DETERMINED. LOCATIONS SHALL BE UPDATED ON THIS PLAN.

BEXAR COUNTY R.O.W. NOTE:

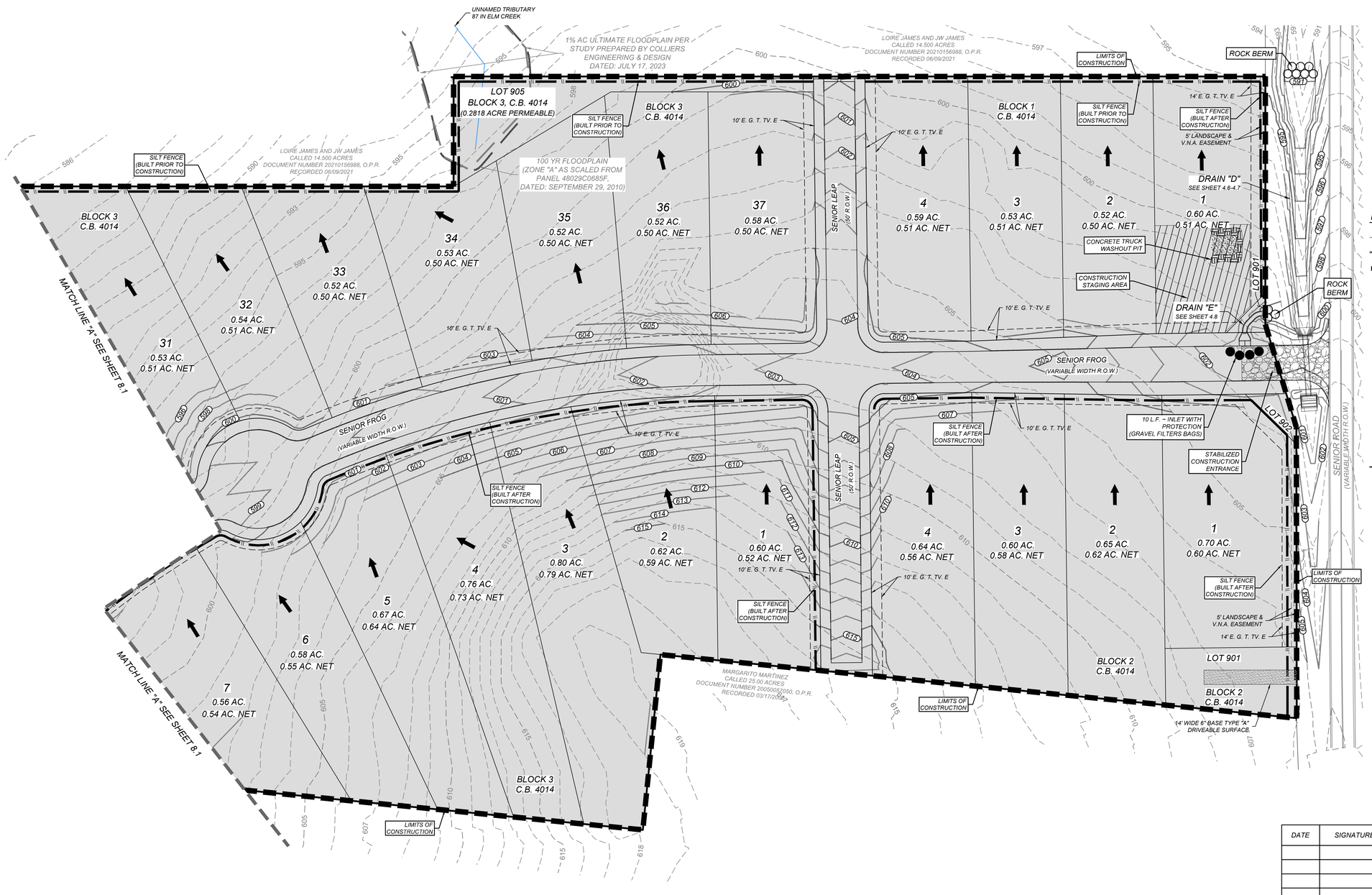
A BEXAR COUNY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

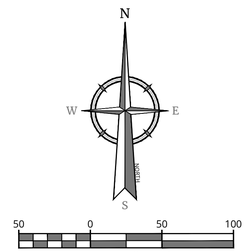
COORDINATION NOTE:

1. CONTACT TIME WARNER TO COORDINATE CABLE TV SERVICE. (210) 244-0500
2. CONDUIT FOR ELECTRICAL SERVICE, CONFIRM REQUIREMENTS AND COORDINATE WITH CPS FOR INSPECTION. (210) 353-2246.
3. CONTACT AT&T TO COORDINATE TELEPHONE SERVICE. 1-800-449-7928.
4. CONTRACTOR TO COORDINATE WITH CPS PRIOR TO CONSTRUCTION TO PLAN ELECTRIC SERVICE.
5. CONTRACTOR TO COORDINATE WITH SAWS TO PLAN WATER AND SANITARY SEWER SERVICES (210) 704-7297
6. CONTRACTOR SHALL CONTACT 1-800-DIG-TESS A MINIMUM OF 48 HOURS PRIOR TO THE START OF CONSTRUCTION.



LOCATION MAP
N.T.S.





LEGEND

- EXISTING CONTOURS
- PROPOSED CONTOURS
- LIMITS OF CONSTRUCTION
- FLOW ARROW
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.
- CONCRETE TRUCK WASHOUT PIT
- DISTURBED AREA
- ROCK BERM
- SILT FENCE (PHASE 2 TO BE INSTALLED AFTER PAVING)
- NATURAL VEGETATIVE BUFFER
- INLET WITH PROTECTION (GRAVEL FILTERS BAGS)
- EARTHEN CHECK BERM

SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED PROFESSIONAL ENGINEER
2/26/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

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San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194500

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER:	DRAWING NAME:
1116-01-01	SWPPP11160101

SHEET TITLE:
STORMWATER POLLUTION PREVENTION PLAN

SHEET NUMBER:
8.0

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

By: SCruEWALL
Civil\SWPPP\11160101.dwg\8.0

PROJECT COMPLETION:

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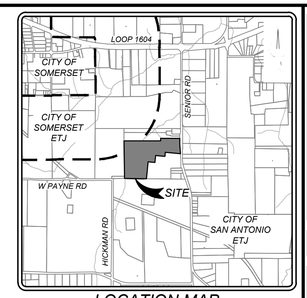
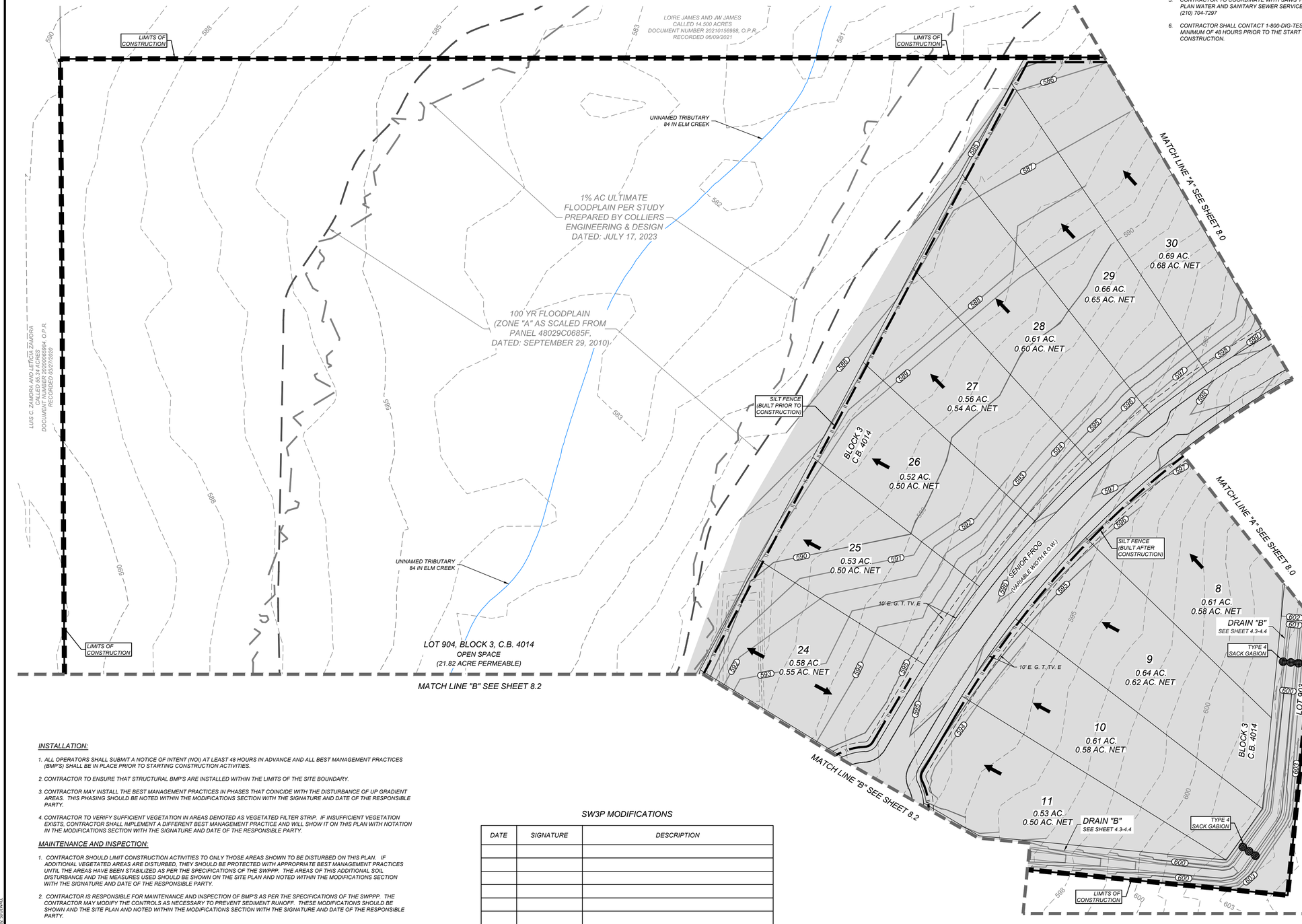
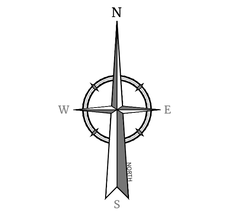


LOCATION MAP
N.T.S.





LEGEND

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SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
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LICENSED
PROFESSIONAL ENGINEER
2/26/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
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Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: SWPPP11160101

SHEET TITLE: STORMWATER POLLUTION PREVENTION PLAN

SHEET NUMBER: 8.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Civil\SWPPP\11601\01.dwg/8.1 By: SDURSWALL

PROJECT COMPLETION:

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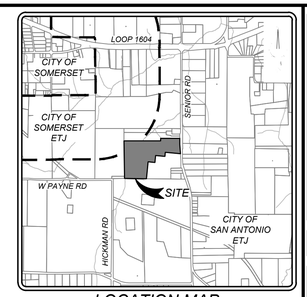
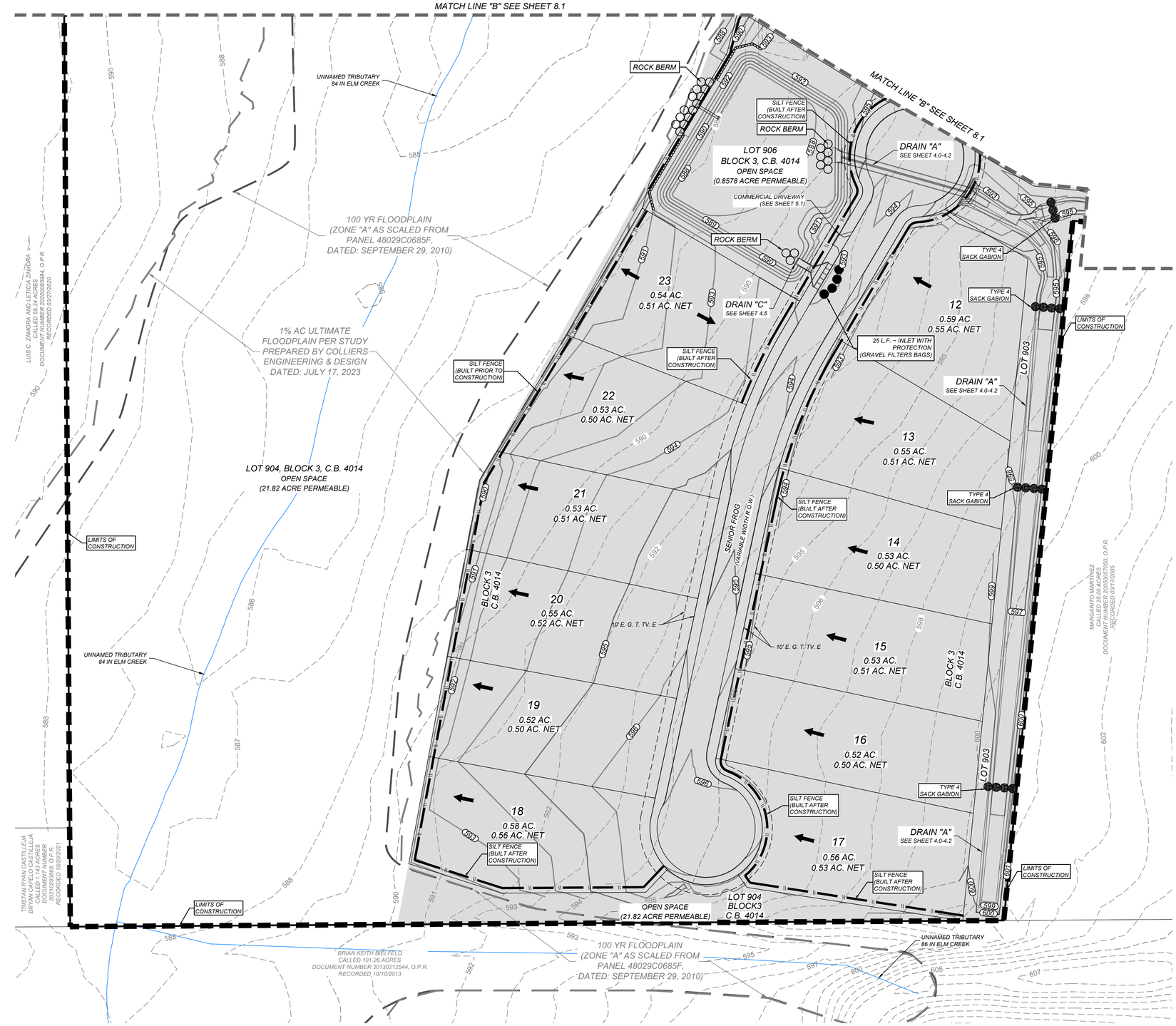
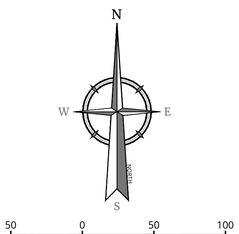


LOCATION MAP
N.T.S.





LEGEND

- 680 — EXISTING CONTOURS
- 680 — PROPOSED CONTOURS
- LIMITS OF CONSTRUCTION
- FLOW ARROW
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.
- CONCRETE TRUCK WASHOUT PIT
- DISTURBED AREA
- ROCK BERM
- SILT FENCE (PHASE 2 TO BE INSTALLED AFTER PAVING)
- NATURAL VEGETATIVE BUFFER
- INLET WITH PROTECTION (GRAVEL FILTERS BAGS)
- EARTHEN CHECK BERM

INSTALLATION:

1. ALL OPERATORS SHALL SUBMIT A NOTICE OF INTENT (NOI) AT LEAST 48 HOURS IN ADVANCE AND ALL BEST MANAGEMENT PRACTICES (BMP'S) SHALL BE IN PLACE PRIOR TO STARTING CONSTRUCTION ACTIVITIES.
2. CONTRACTOR TO ENSURE THAT STRUCTURAL BMP'S ARE INSTALLED WITHIN THE LIMITS OF THE SITE BOUNDARY.
3. CONTRACTOR MAY INSTALL THE BEST MANAGEMENT PRACTICES IN PHASES THAT COINCIDE WITH THE DISTURBANCE OF UP GRADIENT AREAS. THIS PHASING SHOULD BE NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
4. CONTRACTOR TO VERIFY SUFFICIENT VEGETATION IN AREAS DENOTED AS VEGETATED FILTER STRIP. IF INSUFFICIENT VEGETATION EXISTS, CONTRACTOR SHALL IMPLEMENT A DIFFERENT BEST MANAGEMENT PRACTICE AND WILL SHOW IT ON THIS PLAN WITH NOTATION IN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.

MAINTENANCE AND INSPECTION:

1. CONTRACTOR SHOULD LIMIT CONSTRUCTION ACTIVITIES TO ONLY THOSE AREAS SHOWN TO BE DISTURBED ON THIS PLAN. IF ADDITIONAL VEGETATED AREAS ARE DISTURBED, THEY SHOULD BE PROTECTED WITH APPROPRIATE BEST MANAGEMENT PRACTICES UNTIL THE AREAS HAVE BEEN STABILIZED AS PER THE SPECIFICATIONS OF THE SWPPP. THE AREAS OF THIS ADDITIONAL SOIL DISTURBANCE AND THE MEASURES USED SHOULD BE SHOWN ON THE SITE PLAN AND NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
2. CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND INSPECTION OF BMP'S AS PER THE SPECIFICATIONS OF THE SWPPP. THE CONTRACTOR MAY MODIFY THE CONTROLS AS NECESSARY TO PREVENT SEDIMENT RUNOFF. THESE MODIFICATIONS SHOULD BE SHOWN AND THE SITE PLAN AND NOTED WITHIN THE MODIFICATIONS SECTION WITH THE SIGNATURE AND DATE OF THE RESPONSIBLE PARTY.
3. LOCATION OF CONSTRUCTION ENTRANCE/EXIT, CONCRETE WASHOUT PIT, AND EQUIPMENT AND STORAGE ARE TO BE FIELD DETERMINED. LOCATIONS SHALL BE UPDATED ON THIS PLAN.

SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
SERVANDO CRUZ
142566
LICENSED PROFESSIONAL ENGINEER
3/19/24

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION
PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER: 1116-01-01
DRAWING NAME: SWPPP11160101

SHEET TITLE: STORMWATER POLLUTION PREVENTION PLAN

SHEET NUMBER: 8.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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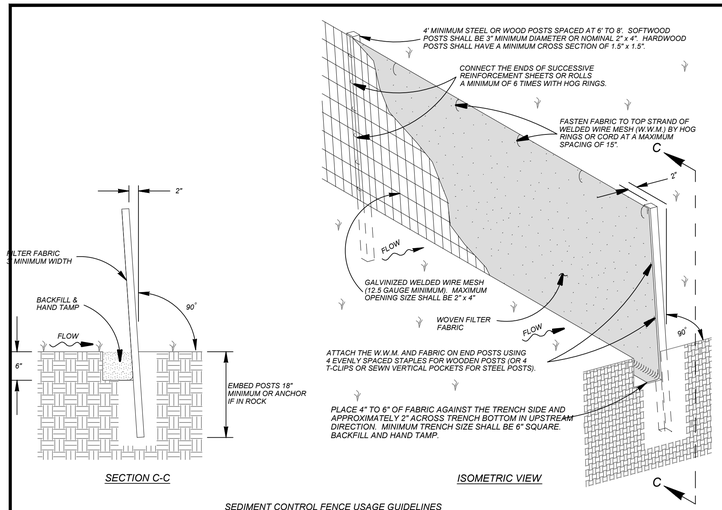


SECTION C-C

ISOMETRIC VIEW

SEDIMENT CONTROL FENCE USAGE GUIDELINES

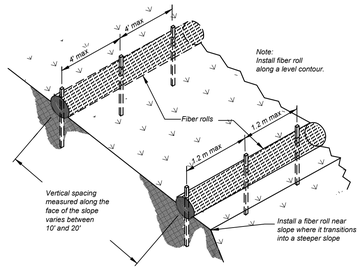
A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUN-OFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

SEDIMENT CONTROL FENCE SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 100 GPM / FT SQUARED. SEDIMENT CONTROL FENCE IS NOT RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA LARGER THAN 2 ACRES.

GENERAL NOTES

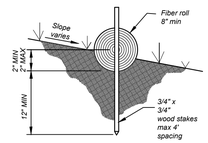
1. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

TEMPORARY SEDIMENT CONTROL FENCE



TYPICAL FIBER ROLL INSTALLATION

N.T.S.



ENTRENCHMENT DETAIL

N.T.S.

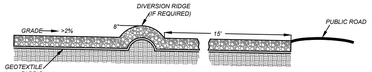
THE MATERIAL, INSTALLATION, INSPECTION, AND MAINTENANCE OF FIBER ROLLS WILL BE PER THE MANUFACTURE'S SPECIFICATIONS AND SHALL ALSO COMPLY WITH THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY CURRENT "TECHNICAL GUIDANCE ON BEST MANAGEMENT PRACTICES" AS NOTED BELOW.

Material:
(1) Core material: Core material should be biodegradable or recyclable. Material may be compost, mulch, aspen wood fibers, chipped site vegetation, agricultural rice or wheat straw, coconut fiber, 100% recyclable fibers, or similar materials.
(2) Containment Mesh: Containment mesh should be 100% biodegradable, photodegradable or recyclable such as burlap, twine, UV photodegradable plastic, polyester, or similar material. When the fiber role will remain in place as part of a vegetative system use biodegradable or photodegradable mesh. For temporary installaton recyclable mesh is recommended.

Implementation:
(1) Locate fiber rolls on level contours spaced as follows:
Slope inclination of 4:1 (H:V) or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.
Slope inclination between 4:1 and 2:1 (H:V): Fiber Rolls should be placed at a maximum interval of 15 ft. (a closer spacing is more effective).
Slope inclination 2:1 (H:V) or greater: Fiber Rolls should be placed at a maximum interval of 10 ft. (a closer spacing is more effective).
(2) Turn the ends of the fiber roll up slope to prevent runoff from going around the roll.
(3) Stake fiber rolls into a 2 to 4 in. deep trench with a width equal to the diameter of the fiber roll.
(4) Drive stakes at the end of each fiber roll and spaced 4 ft maximum on center.
(5) Use wood stakes with a nominal classification of 0.75 by 0.75 in. and minimum length of 24 in.
(6) If more than one fiber roll is placed in a row, the rolls should be overlapped, not abutted.

Inspection and Maintenance Guidelines:
(1) Inspect weekly.
(2) Repair or replace split, torn, unraveling, or slumping fiber rolls.
(3) If the fiber roll is used as a sediment capture device, or as an erosion control device to maintain sheet flows, sediment that accumulates behind the role must be periodically removed in order to maintain its effectiveness. Sediment should be removed when the accumulation reaches one-half the designated sediment storage depth, usually one-half the distance between the top of the fiber roll and the adjacent ground surface. Sediment removed during maintenance may be incorporated into earthwork on the site or disposed of at an appropriate location.

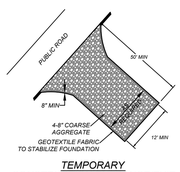
FIBER ROLL



CROSS-SECTION OF A CONSTRUCTION ENTRANCE/EXIT

Materials:

(1) The aggregate should consist of 4 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/yd2, a mullen burst rating of 140 lb/in2, 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 rack should be included in the plans. Divert wastewater to a sediment trap or basin.

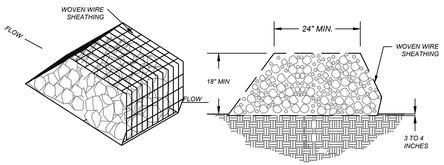


TEMPORARY CONSTRUCTION ENTRANCE/EXIT

Installation: (North Carolina, 1993)
(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 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.

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



ISOMETRIC PLAN VIEW

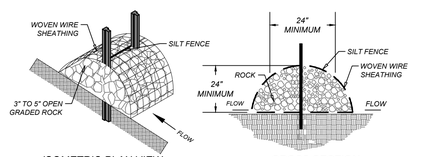
CROSS SECTION

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- to 5-inch diameter rock should be used, except in areas where high velocities or large volumes of flow are expected, where 5- 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 Figure 1-28), 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. air 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.

Inspection and Maintenance Guidelines:
(1) Inspection should be made weekly 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.

ROCK BERM



ISOMETRIC PLAN VIEW

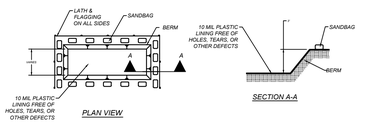
CROSS SECTION

MATERIALS:
(1) SILT FENCE MATERIAL SHOULD BE POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN OR NONWOVEN FABRIC. THE FABRIC WIDTH 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 NO. 30.
(2) FENCE POSTS SHOULD BE MADE OF HOT ROLLED STEEL, AT LEAST 4 FEET LONG WITH TEE OR YBAR CROSS SECTION, SURFACE PAINTED OR GALVANIZED, MINIMUM NOMINAL WEIGHT 1.25 LB/FL2, AND BRINDELL HARDNESS EXCEEDING 140. REBAR (EITHER #5 OR #6) MAY ALSO BE USED TO ANCHOR THE BERM.
(3) WOVEN WIRE BACKING TO SUPPORT THE FABRIC SHOULD BE GALVANIZED 2" X 4" WELDED WIRE, 12 GAUGE MINIMUM.
(4) 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.
(5) CLEAN, OPEN GRADED 3- TO 5-INCH DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5- 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) INSTALL THE SILT FENCE ALONG THE CENTER OF THE PROPOSED BERM PLACEMENT, AS WITH A NORMAL SILT FENCE DESCRIBED IN SECTION 2.4.3.
(3) PLACE THE ROCK ALONG THE SHEATHING ON BOTH SIDES OF THE SILT FENCE AS SHOWN IN THE DIAGRAM (FIGURE 1-29), TO A HEIGHT NOT LESS THAN 24 INCHES. CLEAN, OPEN GRADED 3- 5" DIAMETER ROCK SHOULD BE USED, EXCEPT IN AREAS WHERE HIGH VELOCITIES OR LARGE VOLUMES OF FLOW ARE EXPECTED, WHERE 5- TO 8-INCH DIAMETER ROCK MAY BE USED.
(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 REMAINS ITS SHAPE WHEN WALKED UPON.
(5) THE HIGH SERVICE ROCK BERM SHOULD BE REMOVED WHEN THE SITE IS REVEGETATED OR OTHERWISE STABILIZED OR IT MAY REMAIN IN PLACE AS A PERMANENT BMP IF DRAINAGE IS ADEQUATE.

INSPECTION AND MAINTENANCE GUIDELINES:
(1) INSPECTION SHOULD BE MADE WEEKLY BY THE RESPONSIBLE PARTY. FOR INSTALLATIONS IN STREAMBEDS, ADDITIONAL DAILY INSPECTIONS SHOULD BE MADE ON ROCK BERM.
(2) REMOVE SEDIMENT AND OTHER DEBRIS WHEN BUILDUP REACHES 6 INCHES AND DISPOSE OF THE ACCUMULATED SILT OF IN AN APPROVED MANNER.
(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.

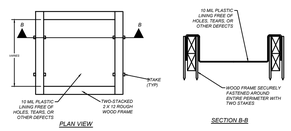
HIGH SERVICE ROCK BERM



PLAN VIEW

SECTION A-A

TYPE "BELOW GRADE"



PLAN VIEW

SECTION B-B

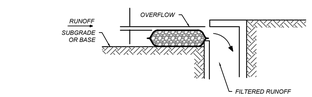
TYPE "ABOVE GRADE"

GENERAL NOTES:

- DETAIL ABOVE ILLUSTRATES MINIMUM DIMENSIONS. PIT CAN BE INCREASED IN SIZE DEPENDING ON EXPECTED FREQUENCY OF USE.
- WASHOUT PIT SHALL BE LOCATED IN AN AREA EASILY ACCESSIBLE TO CONSTRUCTION TRAFFIC.
- WASHOUT PIT SHALL NOT BE LOCATED IN AREAS SUBJECT TO INUNDATION FROM STORM WATER RUNOFF AND AT LEAST 50 FEET FROM SENSITIVE FEATURES, STORM DRAINS, OPEN DITCHES, STREETS, OR STREAMS.

CONCRETE TRUCK WASHOUT PIT

PLAN VIEW



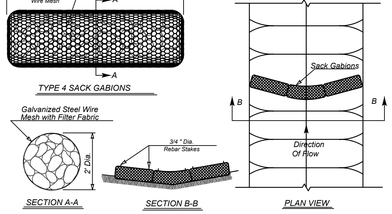
SECTION A-A

GENERAL NOTES:

- ALL STORM DRAINAGE SYSTEMS INLETS SHOULD FILTER RUNOFF BEFORE THE WATER IS DISCHARGED INTO STREAMS OR ONTO ADJACENT PROPERTIES, UNLESS TREATMENT IS PROVIDED ELSEWHERE.
- IF NO ADDITIONAL DOWNSTREAM TREATMENT EXISTS, THE MAXIMUM DRAINAGE AREA TRIBUTARY TO AN AREA DRAIN INSTALLED WITH A GRAVEL FILTER SHOULD BE ONE ACRE.
- ALL CURB INLET GRAVEL FILTERS SHOULD BE INSPECTED AND REPAIRED AFTER EACH RUNOFF EVENT. SEDIMENT SHOULD BE REMOVED WHEN MATERIAL IS WITHIN THREE INCHES OF THE TOP OF THE CONCRETE BLOCKS. PERIODICALLY, THE GRAVEL SHOULD BE RAKED TO INCREASE INFILTRATION AND FILTERING OF RUNOFF WATERS.

CURB INLET PROTECTION GRAVEL FILTER BAGS

TYPE 4 SACK GABIONS

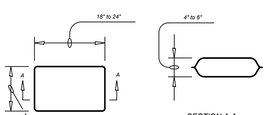


SECTION A-A

SECTION B-B

PLAN VIEW

TYPE 4 SACK GABIONS

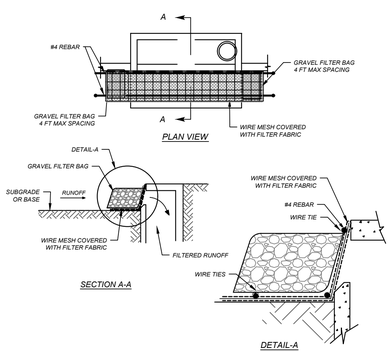


SECTION A-A

GENERAL NOTES:

- THE FILTER BAG MATERIAL SHALL BE MADE OF POLYPROPYLENE, POLYETHYLENE OR POLYAMIDE WOVEN FABRIC. MIN UNIT WEIGHT OF 4 OUNCES/SY, MULLEN BURST STRENGTH EXCEEDING 300 PSI AND ULTRAVIOLET STABILITY EXCEEDING 70%.
- THE FILTER BAG SHALL BE FILLED WITH CLEAN, MEDIUM TO COARSE GRAVEL (0.31 TO 0.75 INCH DIAMETER).

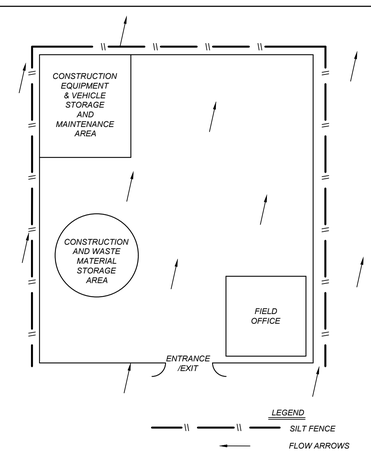
GRAVEL FILTER BAG DETAIL



PLAN VIEW

SECTION A-A

CURB INLET PROTECTION (ALTERNATE)



TYPICAL CONSTRUCTION STAGING AREA

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142566
LICENSED
PROFESSIONAL ENGINEER
9/4/23

PRELIMINARY

FOR

VARGA TRACT SUBDIVISION PLAT# 23-11800270

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	5/23/2023	SD	SC

PROJECT NUMBER:	DRAWING NAME:
1116-01-01	SWPPP-DT11160101

SHEET TITLE:
STORM WATER POLLUTION PREVENTION DETAILS

SHEET NUMBER:
8.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

CivilSWPPP-DT1116010.dwg/8.3 By: DZUEWALL