PUNTA VERDE SUBDIVISION UNIT 1

SAN ANTONIO, TEXAS

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

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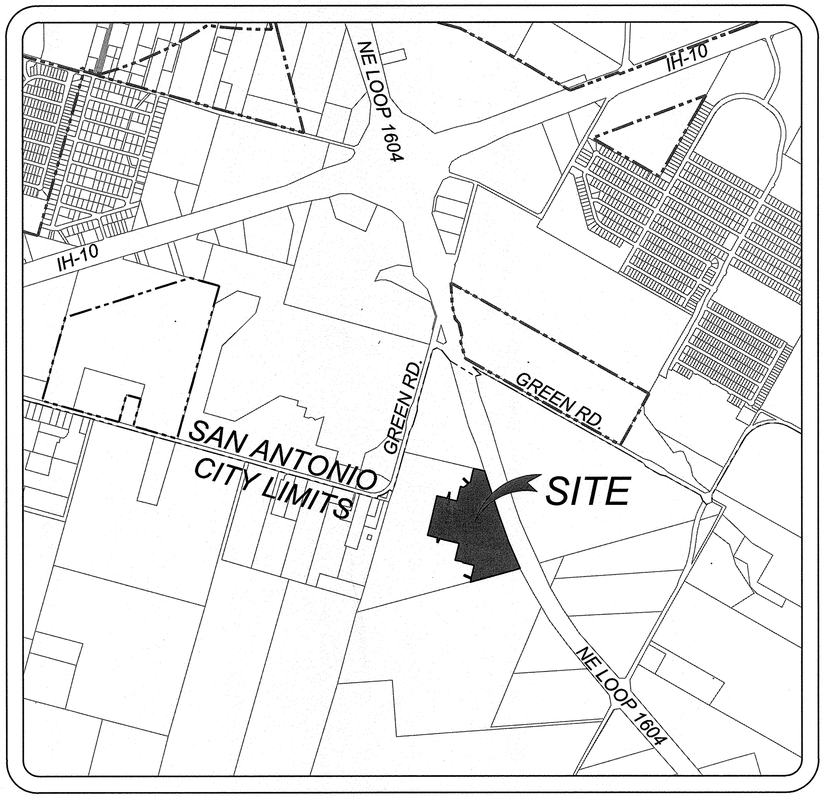

LOCATION MAP
N.T.S.

OWNER/DEVELOPER
GREEN ROAD 1604 PARTNERS, LLC.
13750 SAN PEDRO AVENUE, SUITE B10
SAN ANTONIO, TEXAS 78232
(210) 490 - 7272

STATE OF TEXAS
MICHAEL B. RICHARDS
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10/28/20

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Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

JOB NO.: 479-09-01

PLAT NO.21-11800683

SHEET 0.0

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Date: Oct 28, 2020, 11:56am User ID: tthompson
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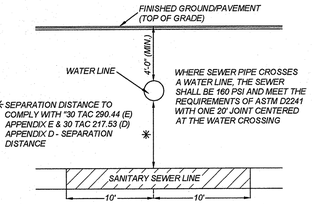
COMPACTION NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS & SARA INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 INCH LOOSE LIFT PER 400 LINEAR FEET AT A MINIMUM. PERMITS AND/OR WILL NOT BE ACCEPTED AND FINALIZED BY SAWS & SARA WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

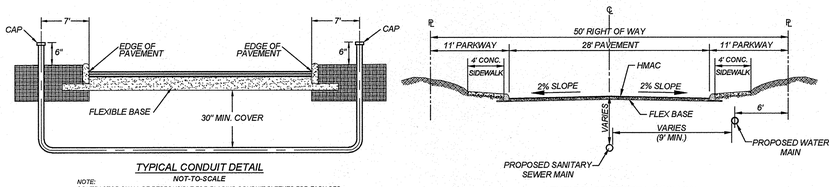
TRENCH EXCAVATION SAFETY PROTECTION
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK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



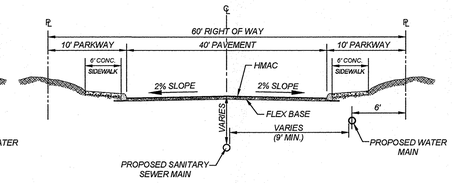
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE

TYPICAL CONDUIT DETAIL
NOT-TO-SCALE

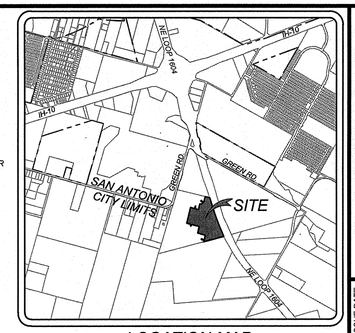
NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH CPS FACILITY AT ALL STREETS AND DRAIN CROSSING IF BUILT AHEAD OF CPS CONSTRUCTION. SLEEVES MUST ALSO BE LOCATED FOR CPS CREWS DURING CONSTRUCTION. (SEPERATE ITEM) SEE THIS SHEET FOR CONDUIT CROSSING DETAIL AND SCHEDULE.



TYPICAL 50' STREET SECTION
N.T.S.

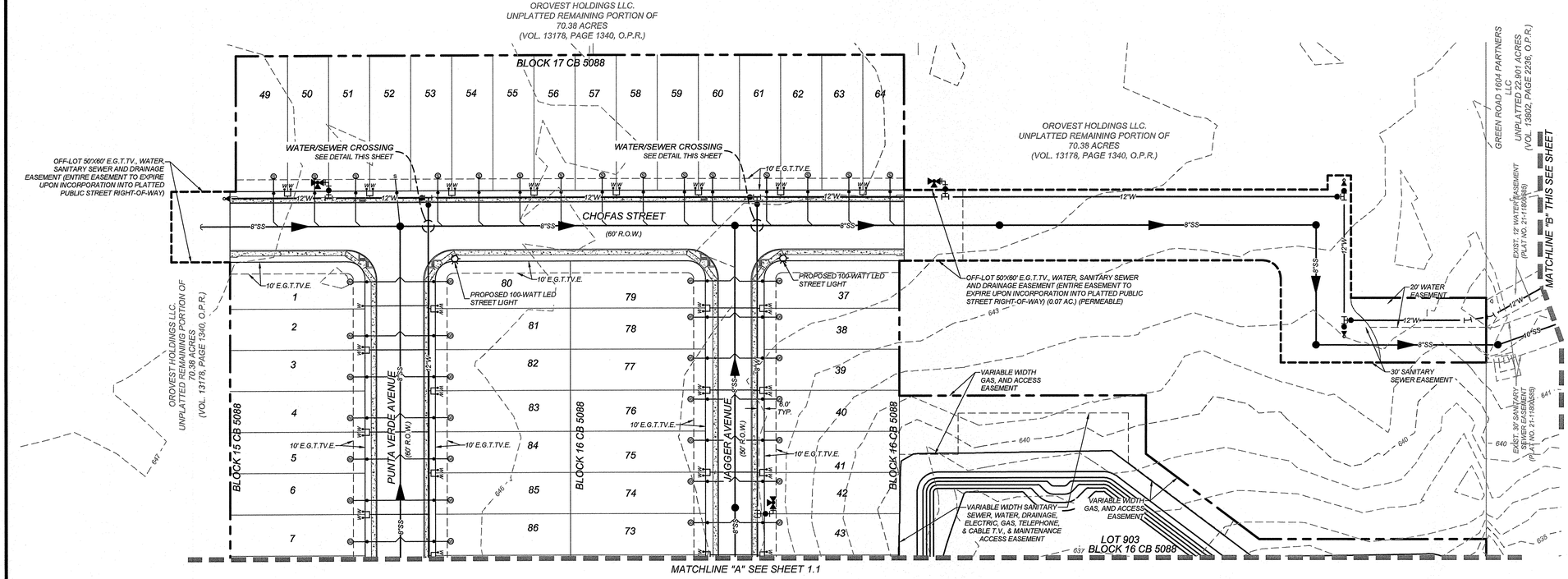


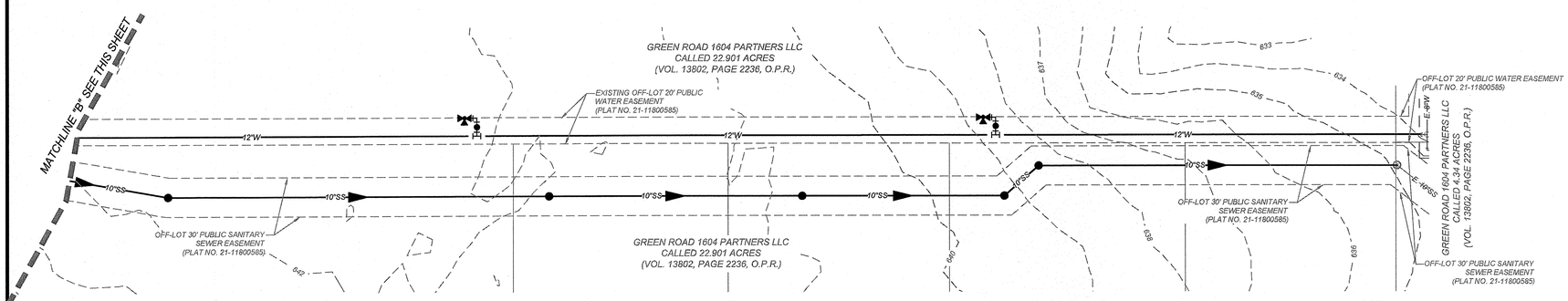
TYPICAL 60' STREET SECTION
N.T.S.

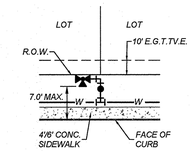


LOCATION MAP
N.T.S.

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







TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER SERVICE & METER BOX WITH PRESSURE REDUCING VALVE	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & 5/8" METER BOX	=	IRR W
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED 250W STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	SS
PROPOSED SANITARY SEWER LATERAL WITH VERTICAL STACK	=	SS
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. E
PROPOSED VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.
EXISTING WATER MAIN	=	E.W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	E.SS
EXISTING SANITARY SEWER MANHOLE	=	
EXISTING OVERHEAD ELECTRIC W/POWER POLE	=	OHE OHE
EXISTING GUY WIRE/OVERHEAD ELECTRIC	=	OHE

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TBPE Firm #: 9513 • TBPLS Firm #: 10122800

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

OVERALL UTILITY PLAN (SHT 1 OF 2)

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
1.0

Date: Oct 28, 2022, 10:32am User ID: tthompson
File: N:\479\09\01\Design\Civil\00479090l.dwg

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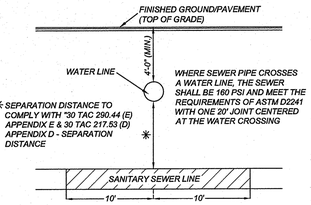
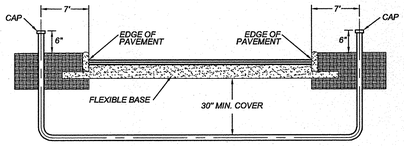


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE



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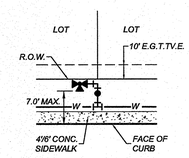
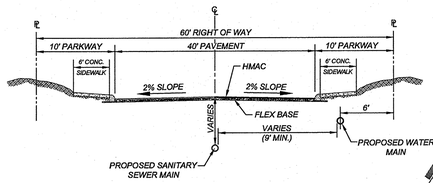
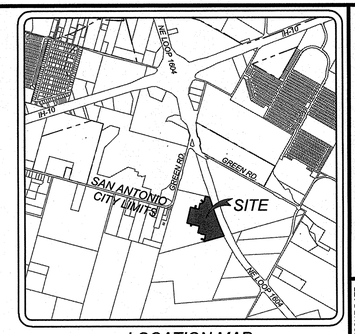


TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE



TYPICAL 60' STREET SECTION
N.T.S.



LOCATION MAP
N.T.S.

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

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER SERVICE & METER BOX WITH PRESSURE REDUCING VALVE	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & 5/8" METER BOX	=	3/4"IRR
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED 250W STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	
PROPOSED SANITARY SEWER LATERAL WITH VERTICAL STACK	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. E
PROPOSED VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.
EXISTING WATER MAIN	=	E.W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	E.SS
EXISTING SANITARY SEWER MANHOLE	=	
EXISTING OVERHEAD ELECTRIC W/POWER POLE	=	OHE
EXISTING GUY WIRE/OVERHEAD ELECTRIC	=	OHE

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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

REVISIONS

ISSUE DATE

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
1/11/23

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
OVERALL UTILITY PLAN (SHT 2 OF 2)

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
1.1

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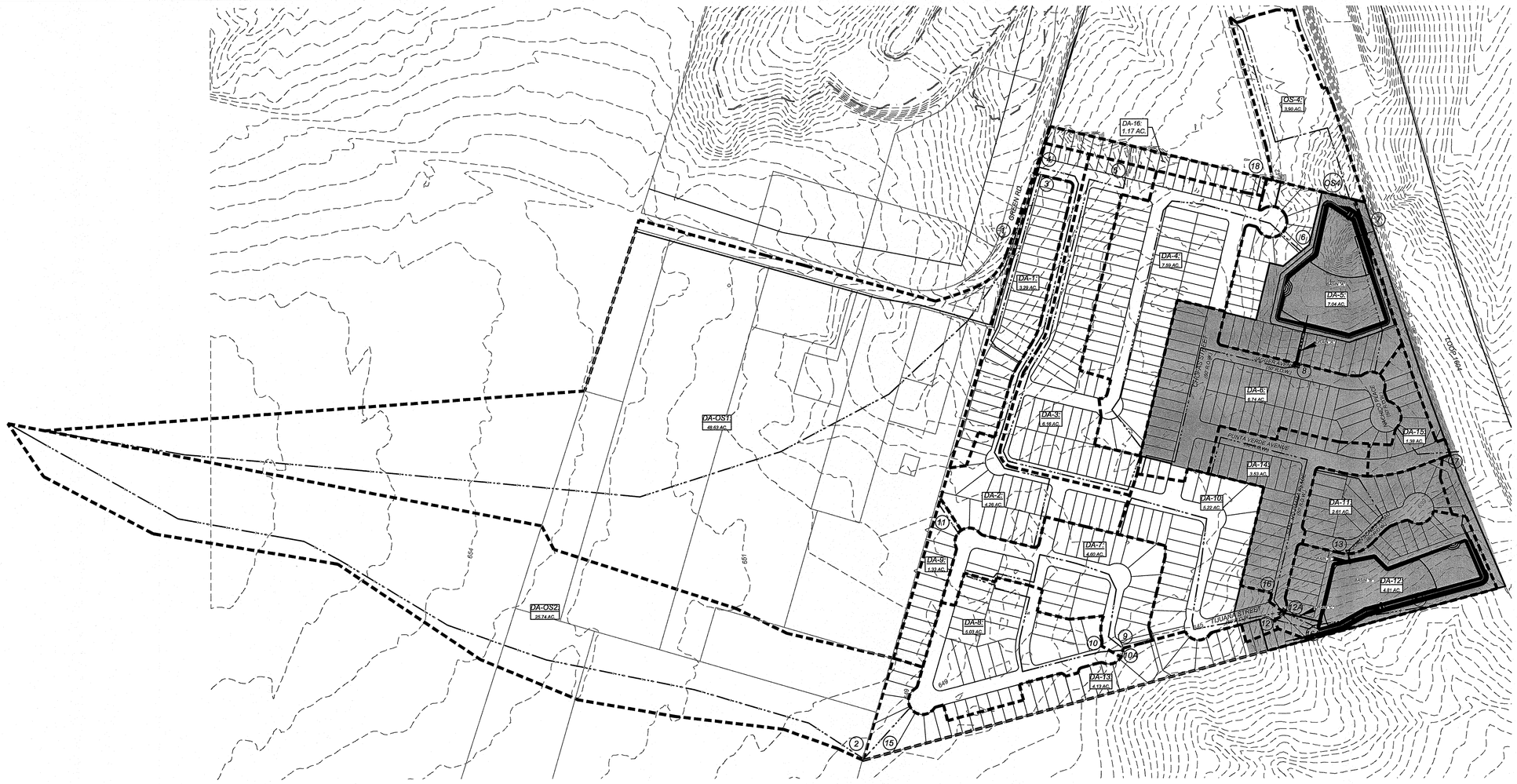

Study Point	Area	Acres	C	T_{ovrl} (min)	Carryover	T_{sc} (min)	T_{ch} (min)	T_{tot} (min)	I_5 (in/hr)	I_{25} (in/hr)	I_{100} (in/hr)	Q_5 (ft^3/s)	Q_{25} (ft^3/s)	Q_{100} (ft^3/s)
OS-4	OS-4	3.90	0.96	20.00		6	0	26	3.98	5.49	6.80	14.90	20.54	25.44
1	DA OS-1	48.63	0.68	20.00		29	8	57	2.53	3.52	4.39	83.57	116.33	145.27
2	DA OS-2	25.74	0.68	20.00		29	6	55	2.59	3.61	4.50	45.40	63.12	78.73
3	DA-1	3.29	0.77	10.00		1	2	13	5.66	7.89	9.85	14.34	19.98	24.96
4	DA-2	4.26	0.77	10.00		2	4	16	5.10	7.07	8.79	16.73	23.18	28.84
5	DA-3	6.16	0.77	10.00		1	5	16	5.10	7.07	8.79	24.20	33.51	41.70
6	DA-4	7.59	0.77	10.00		1	4	15	5.28	7.32	9.12	30.86	42.78	53.27
7	DA-5	7.04	0.77	10.00		1	1	12	5.86	8.19	10.24	31.79	44.37	55.50
8	DA-6	6.74	0.77	10.00		1	3	14	5.47	7.60	9.48	28.38	39.44	49.20
9	DA-7	4.60	0.77	10.00		2	2	14	5.47	7.60	9.48	19.37	26.92	33.58
10	DA-8	5.03	0.77	10.00		2	2	14	5.47	7.60	9.48	21.18	29.44	36.72
10A	DA-7 & DA-8	9.63	0.77	10.00	FROM DA-7	2	1	13	5.66	7.89	9.85	41.98	58.49	73.07
11	DA-9	1.33	0.77	10.00		2	2	14	5.47	7.60	9.48	5.60	7.78	9.71
12	DA-10	5.22	0.77	10.00		1	3	14	5.47	7.60	9.48	21.98	30.55	38.10
12A	DA-10 & DA-14	8.75	0.77	10.00	FROM DA-10	1	3	14	5.47	7.60	9.48	36.84	51.21	63.87
13	DA-11	2.61	0.77	10.00		2	0	12	5.86	8.19	10.24	11.78	16.45	20.58
14	DA-12	4.81	0.77	10.00		1	1	12	5.86	8.19	10.24	21.72	30.32	37.92
15	DA-13	4.13	0.77	10.00		2	0	12	5.86	8.19	10.24	18.65	26.03	32.56
16	DA-14	3.53	0.77	10.00		1	3	14	5.47	7.60	9.48	14.86	20.66	25.77
16A	DA-7, DA-8, DA-10, DA-14	18.38	0.77	10.00	FROM DA-7	2	4	16	5.10	7.07	8.79	72.19	100.00	124.41
17	DA-15	1.38	0.77	10.00		0	0	10	6.30	8.82	11.05	6.69	9.37	11.75
18	DA-16	1.17	0.77	10.00		0	0	10	6.30	8.82	11.05	5.68	7.95	9.96

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REVISIONS | ISSUE DATE

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

MASTER DRAINAGE PLAN

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
2.0

Date: Oct 28, 2022, 10:36am User ID: fthompson
File: N:\+79\08\01\Design\Civil\MD+479080l.dwg

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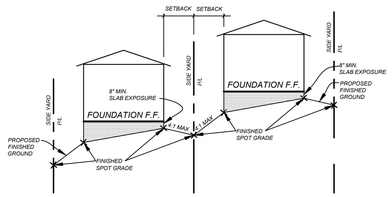


TYPICAL SIDE YARD GRADING
N.T.S.

LEGEND

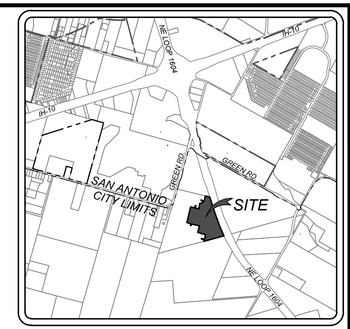
E, G, T, & TV. E. = GAS, ELECTRIC, TELEPHONE, CABLE T.V. EASEMENT

= FLOW ARROW

(A) = LOT GRADE TYPE

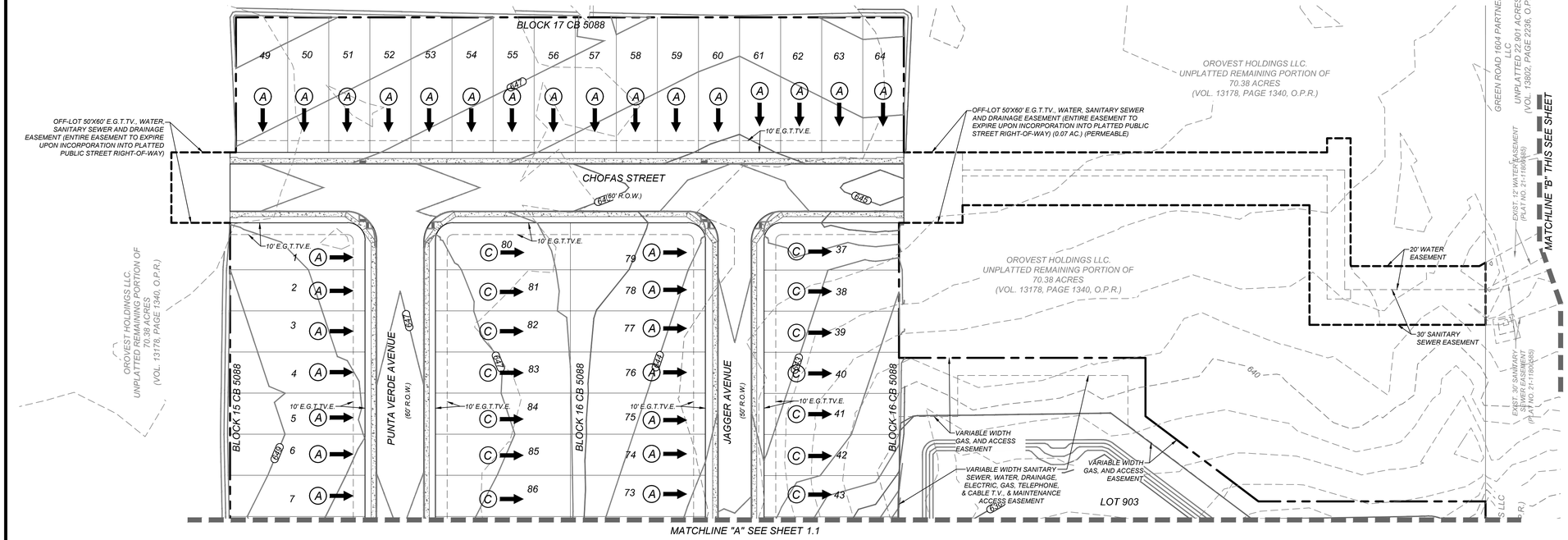
= PROPOSED DRIVEWAY LOCATION

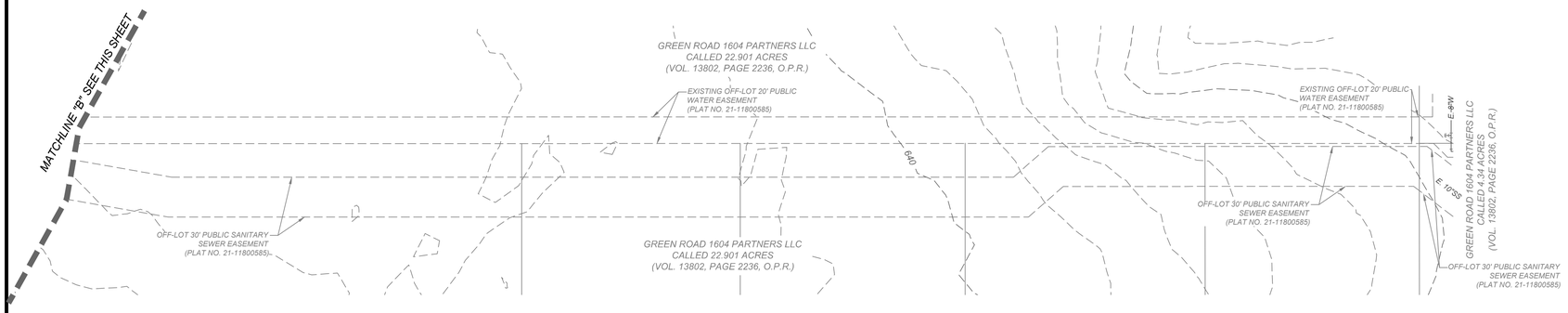
H.P. = HIGH POINT

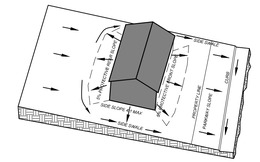


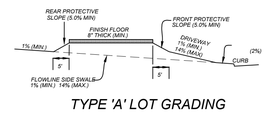
LOCATION MAP
N.T.S.

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

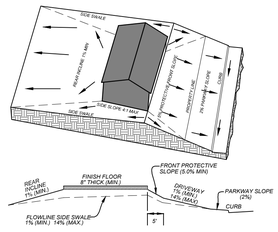




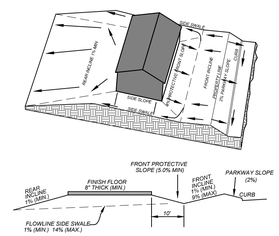




TYPE 'A' LOT GRADING



TYPE 'B' LOT GRADING



TYPE 'C' LOT GRADING

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.

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX, 78231
Phone: (210) 979-8444 Fax: (210) 979-8441
TBPE Firm # 9513 - TBPLS Firm # 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

OVERALL GRADING PLAN (SHT 1 OF 2)

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
3.0

Date: Oct 13, 2023, 4:11pm User ID: mrichards
File: N:\479\09\01\Civil\Design Civil\SHEET\479090101.dwg

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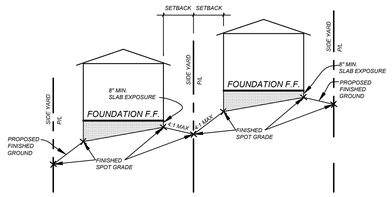


TYPICAL SIDE YARD GRADING
N.T.S.

LEGEND

E, G, T, & TV. E. = GAS, ELECTRIC, TELEPHONE, CABLE T.V. EASEMENT

= FLOW ARROW

(A) = LOT GRADE TYPE

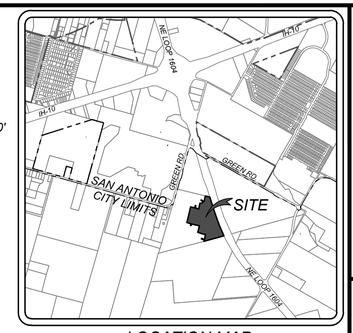
= PROPOSED DRIVEWAY LOCATION

H.P. = HIGH POINT

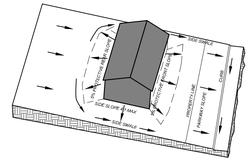
SCALE : 1"=50'

0' 50' 150'

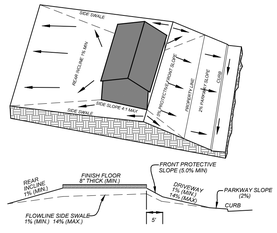
100'



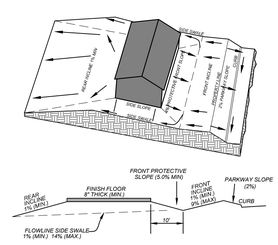
LOCATION MAP
N.T.S.



TYPE 'A' LOT GRADING



TYPE 'B' LOT GRADING



TYPE 'C' LOT GRADING

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
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TBPE Firm # 9513 - TBPLS Firm # 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
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LICENSED PROFESSIONAL ENGINEER

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
OVERALL GRADING PLAN (SHT 2 OF 2)

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
3.1

Date: Oct 13, 2023, 4:17pm User ID: mrichards
File: N:\479\09\01\Design\Civil\479090101.dwg

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TRENCH EXCAVATION SAFETY PROTECTION

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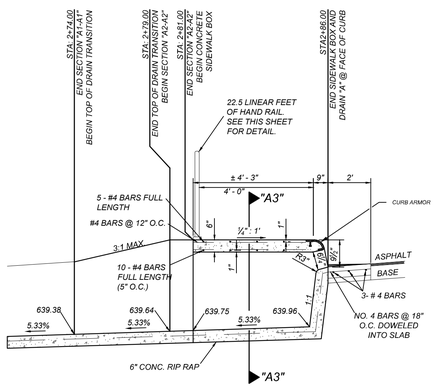
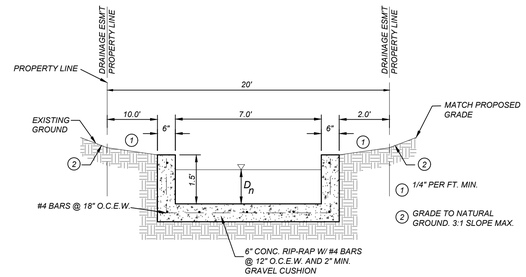
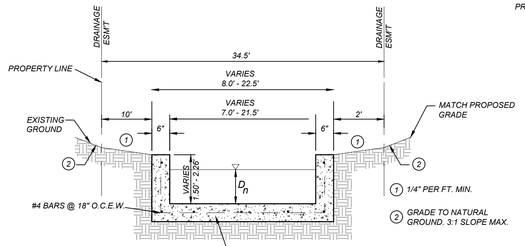


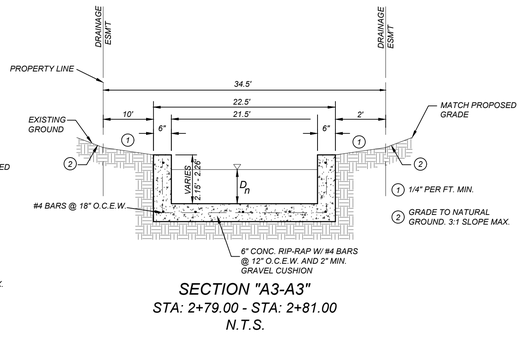
SIDEWALK BOX DETAIL
N.T.S.



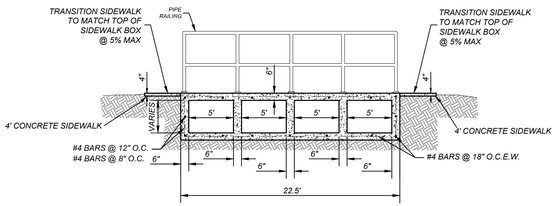
SECTION "A1-A1"
STA: 1+40.00 - STA: 2+74.00
N.T.S.



SECTION "A2-A2"
STA: 2+74.00 - STA: 2+79.00
N.T.S.



SECTION "A3-A3"
STA: 2+79.00 - STA: 2+81.00
N.T.S.



SECTION "A4-A4"
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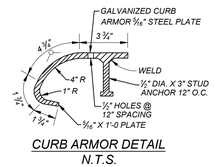
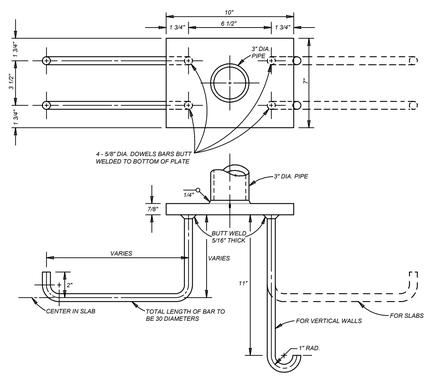
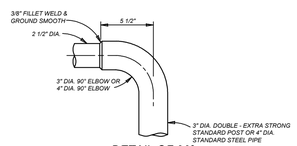


CURB ARMOR DETAIL
N.T.S.

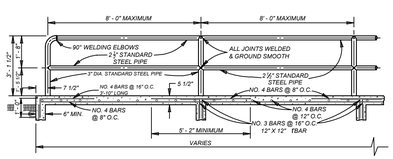


PIPE ANCHORAGE DETAILS
N.T.S.

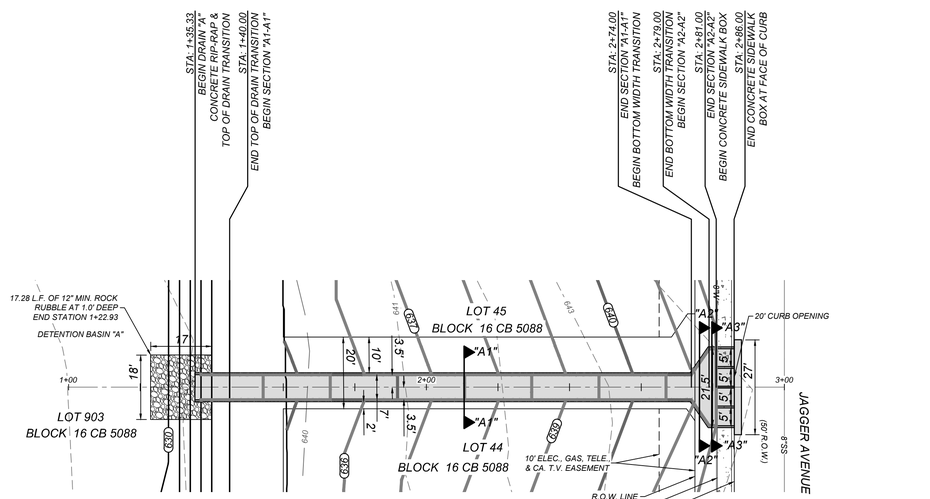


DETAIL OF 90° WELDING ELBOWS
N.T.S.

* 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.



CURB OPENING HYDRAULIC CALCULATION

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

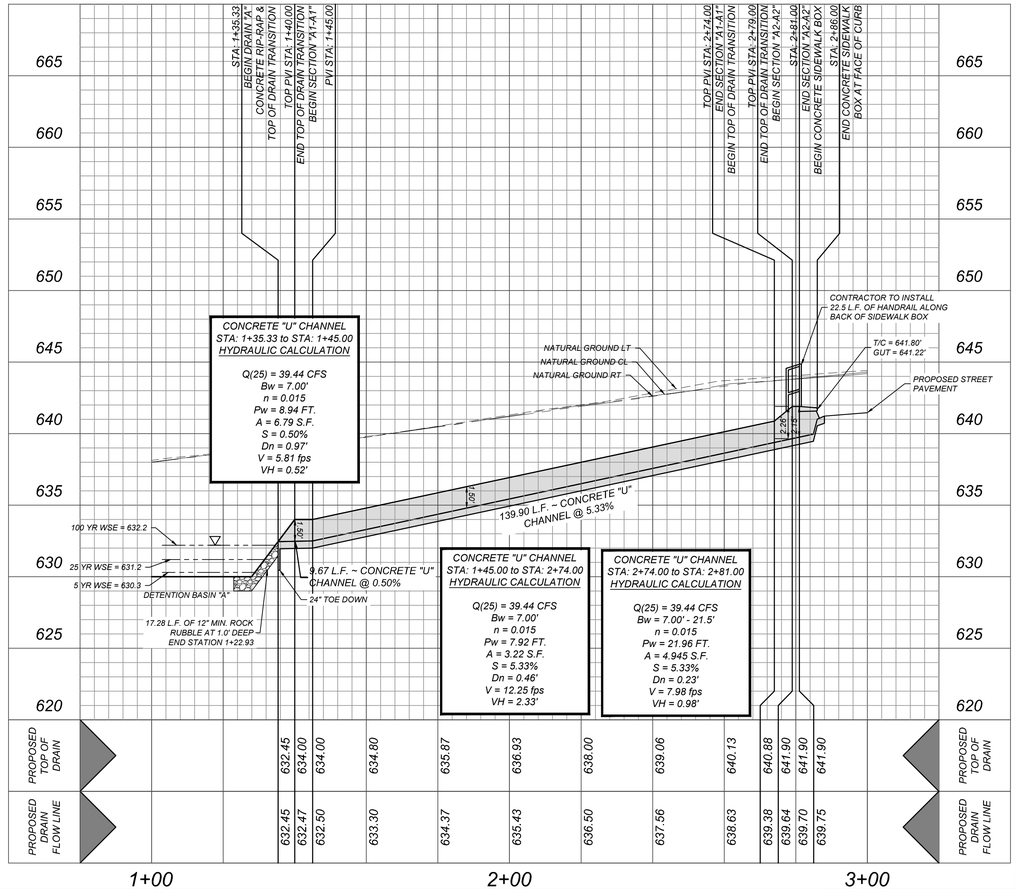
$$L = \frac{39.44}{(3.087)\ (0.79)^{3/2}}$$

$$L = 18.19 \text{ L.F.}$$

∴ USE 20.00 L.F. CURB OPENING

DRAIN "A"
STA: 1+35.33 - END

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



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Phone: (210) 979-8444 • Fax: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
STEPHAN MORENO
144886
LICENSED
PROFESSIONAL ENGINEER
11/15/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
DRAIN "A" PLAN & PROFILE

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 4.0

Date: Nov 15, 2022, 10:11pm User ID: smoreno
File: N:\479 Qst\Qst\Design Cnst\Drains\DR479QS01.dwg

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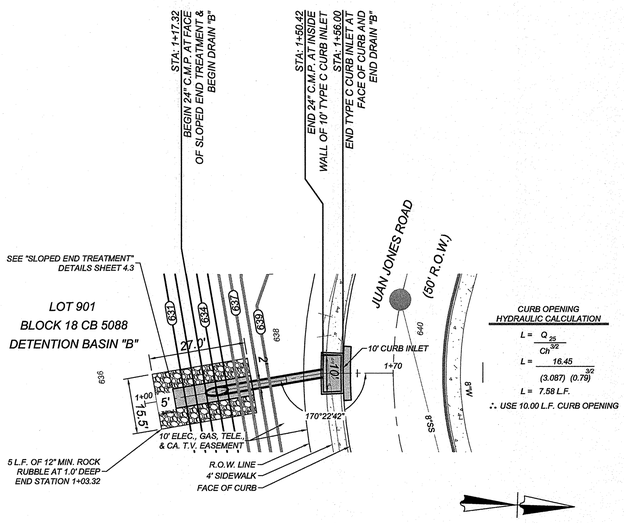
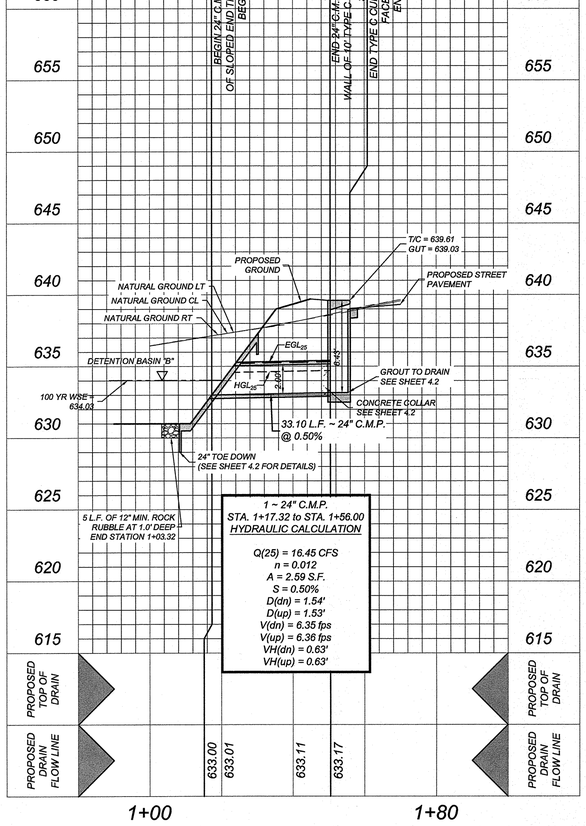


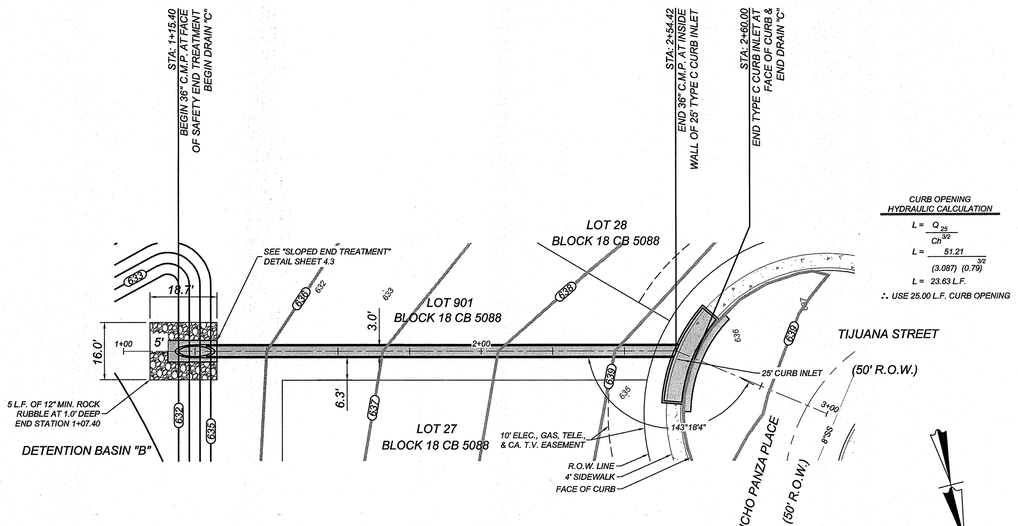
DRAIN "B"
STA: 1+17.32 TO END

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



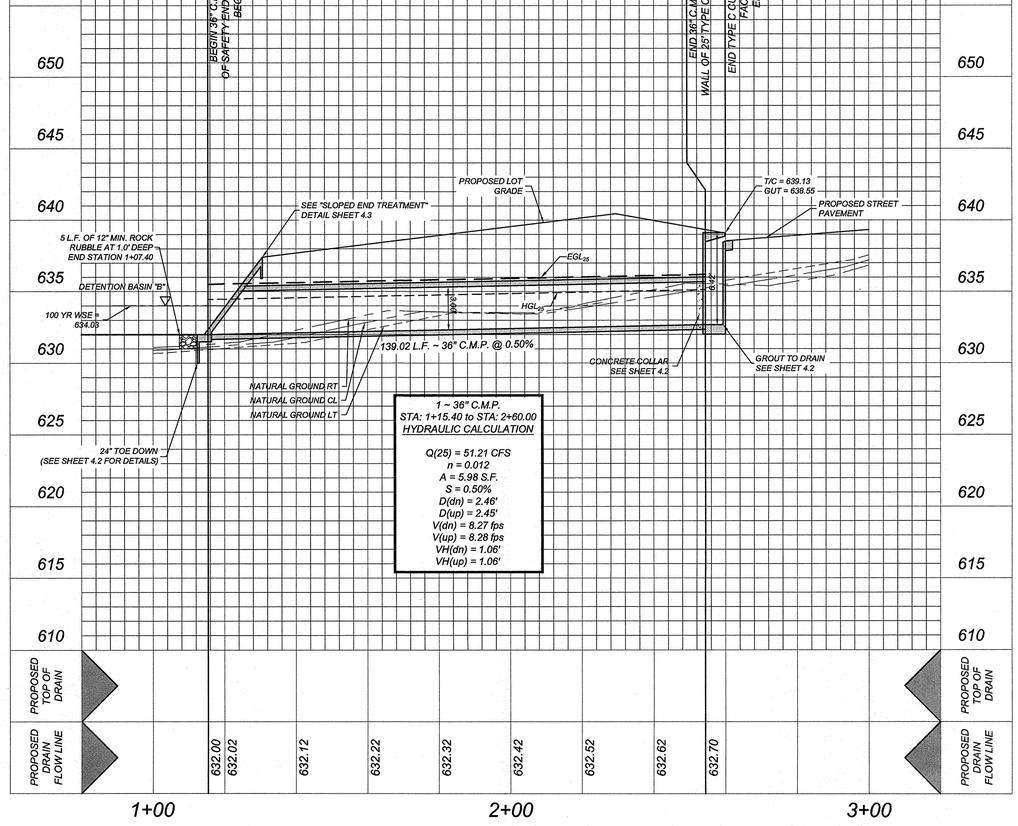
1 ~ 24" C.M.P.
STA. 1+17.32 to STA. 1+56.00
HYDRAULIC CALCULATION

Q(25) = 16.45 CFS
n = 0.012
A = 2.59 S.F.
S = 0.50%
D(dn) = 1.54'
D(up) = 1.53'
V(dn) = 6.35 fps
V(up) = 6.36 fps
VH(dn) = 0.63'
VH(up) = 0.63'



DRAIN "C"
STA: 1+15.40 TO END

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



1 ~ 36" C.M.P.
STA: 1+15.40 to STA: 2+60.00
HYDRAULIC CALCULATION

Q(25) = 51.21 CFS
n = 0.012
A = 5.98 S.F.
S = 0.50%
D(dn) = 2.46'
D(up) = 2.45'
V(dn) = 8.27 fps
V(up) = 8.28 fps
VH(dn) = 1.06'
VH(up) = 1.06'

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ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

DRAIN "B" & DRAIN "C" PLAN & PROFILE

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
4.1

Date: Oct 28, 2022, 3:24pm User ID: fthompson
File: N:\479\09\01\Design\Civil\Drains\DR4790901.dwg

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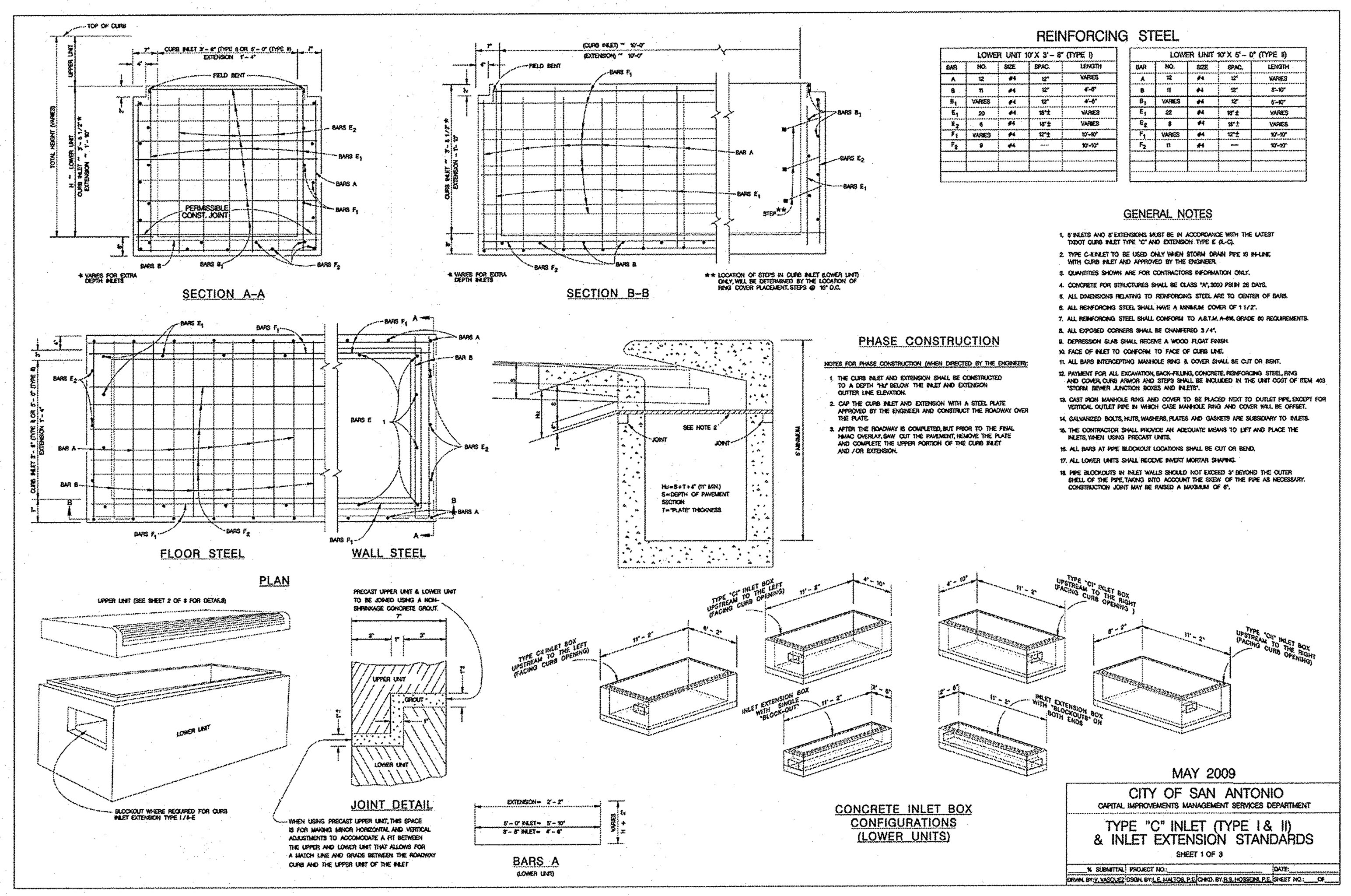

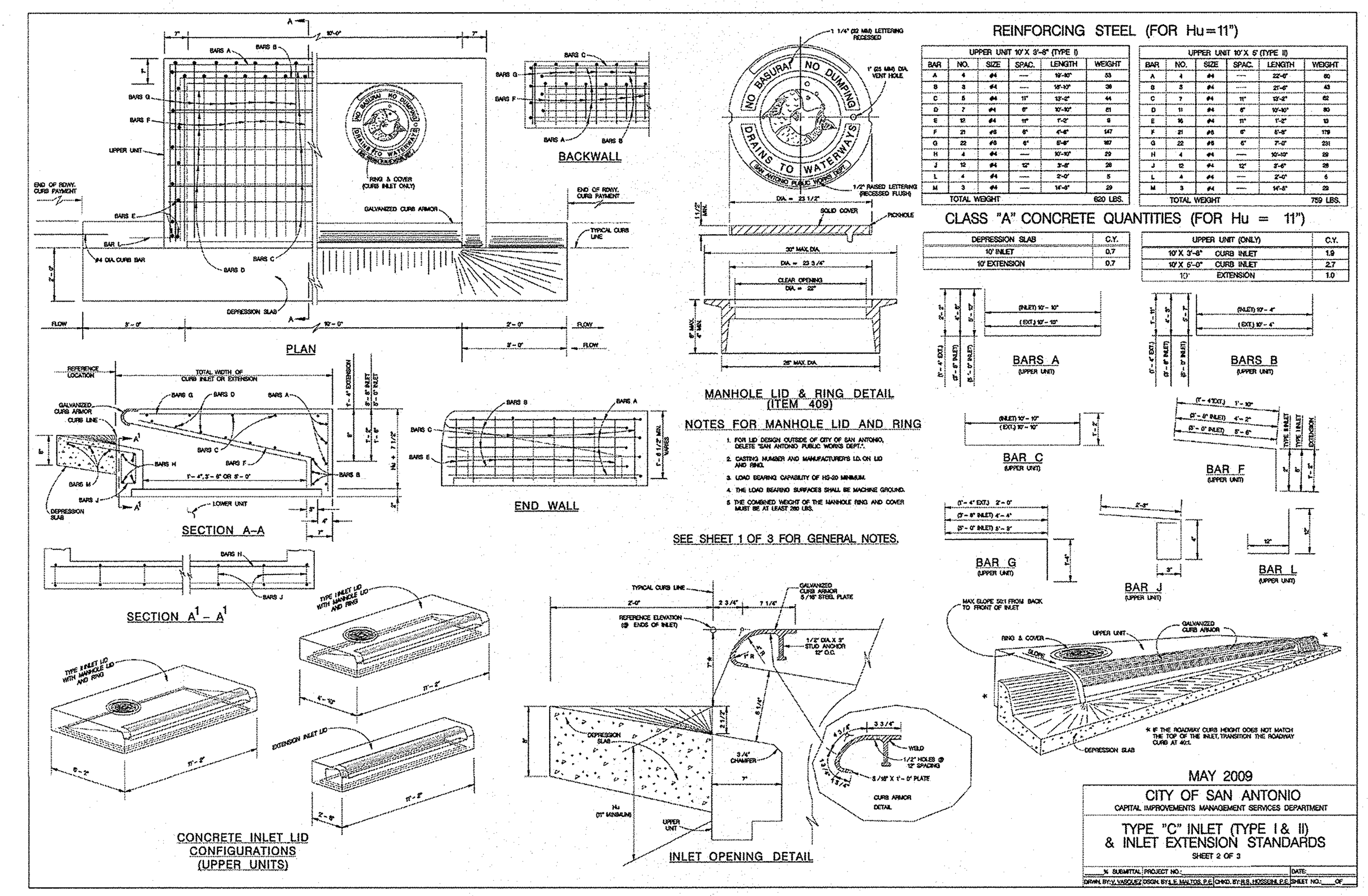

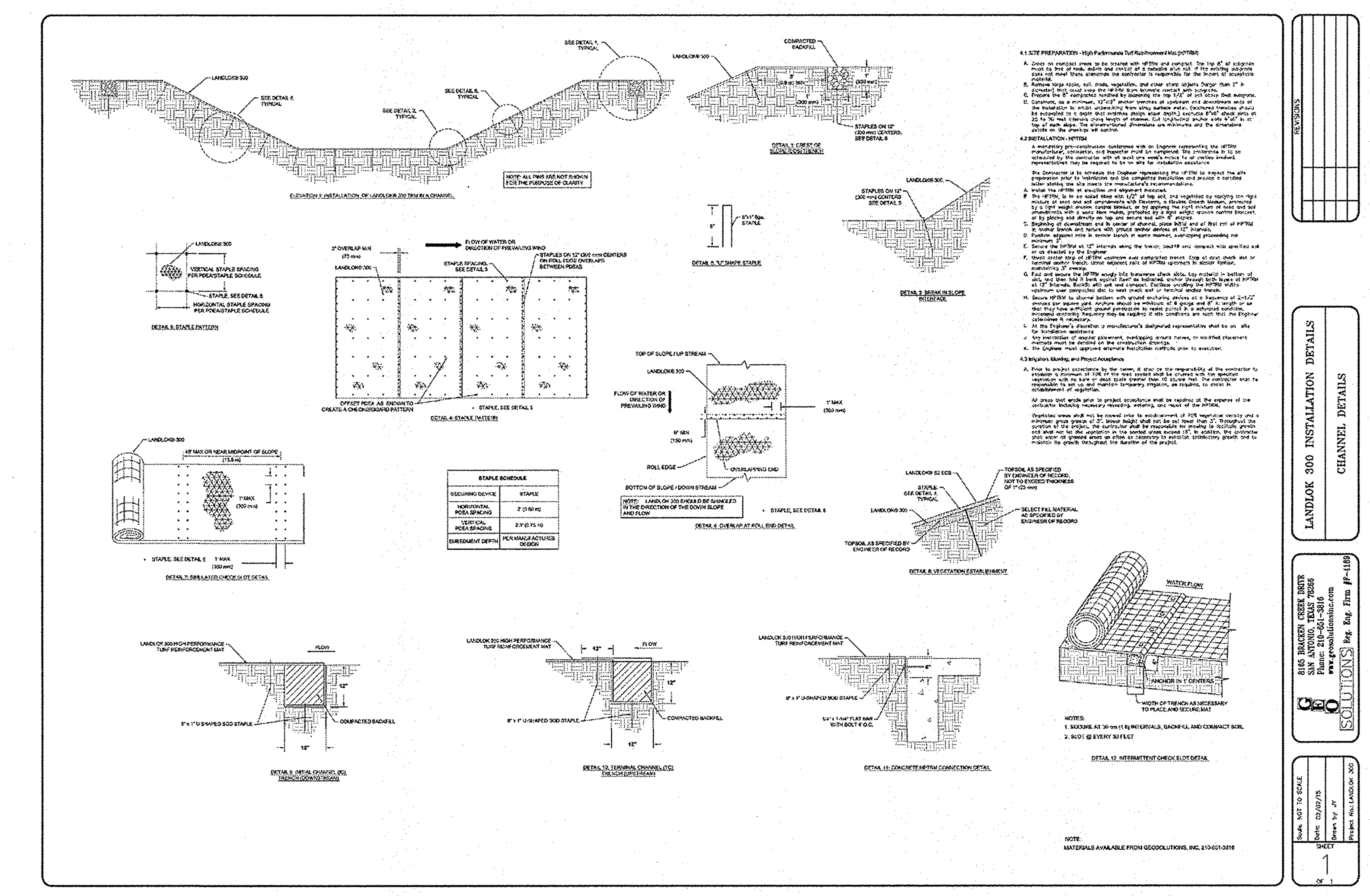

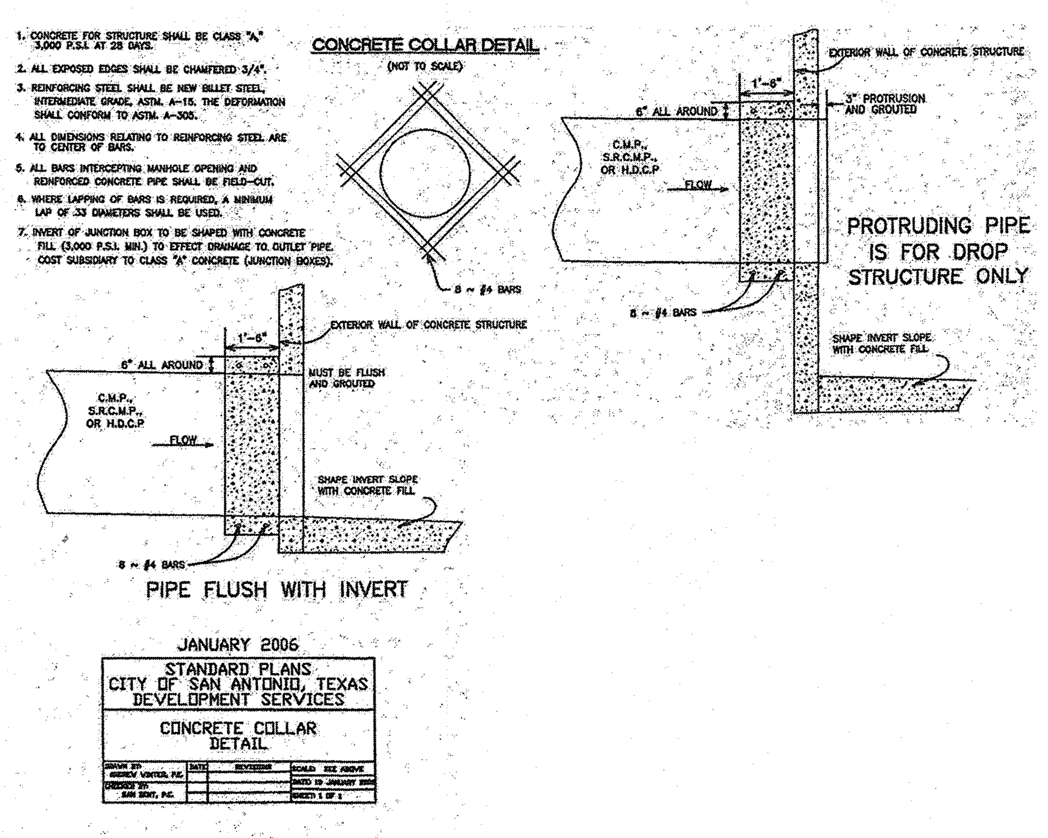

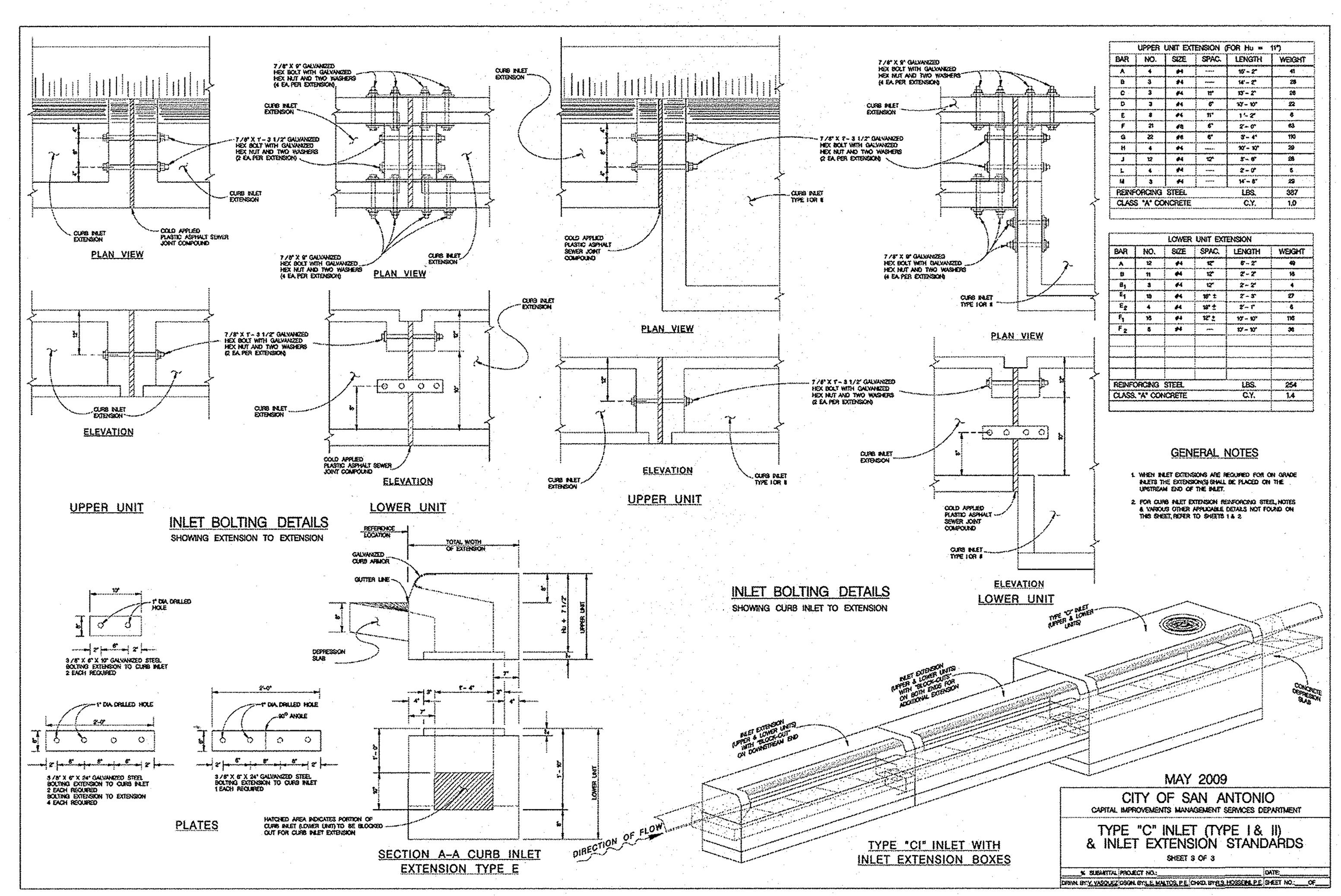

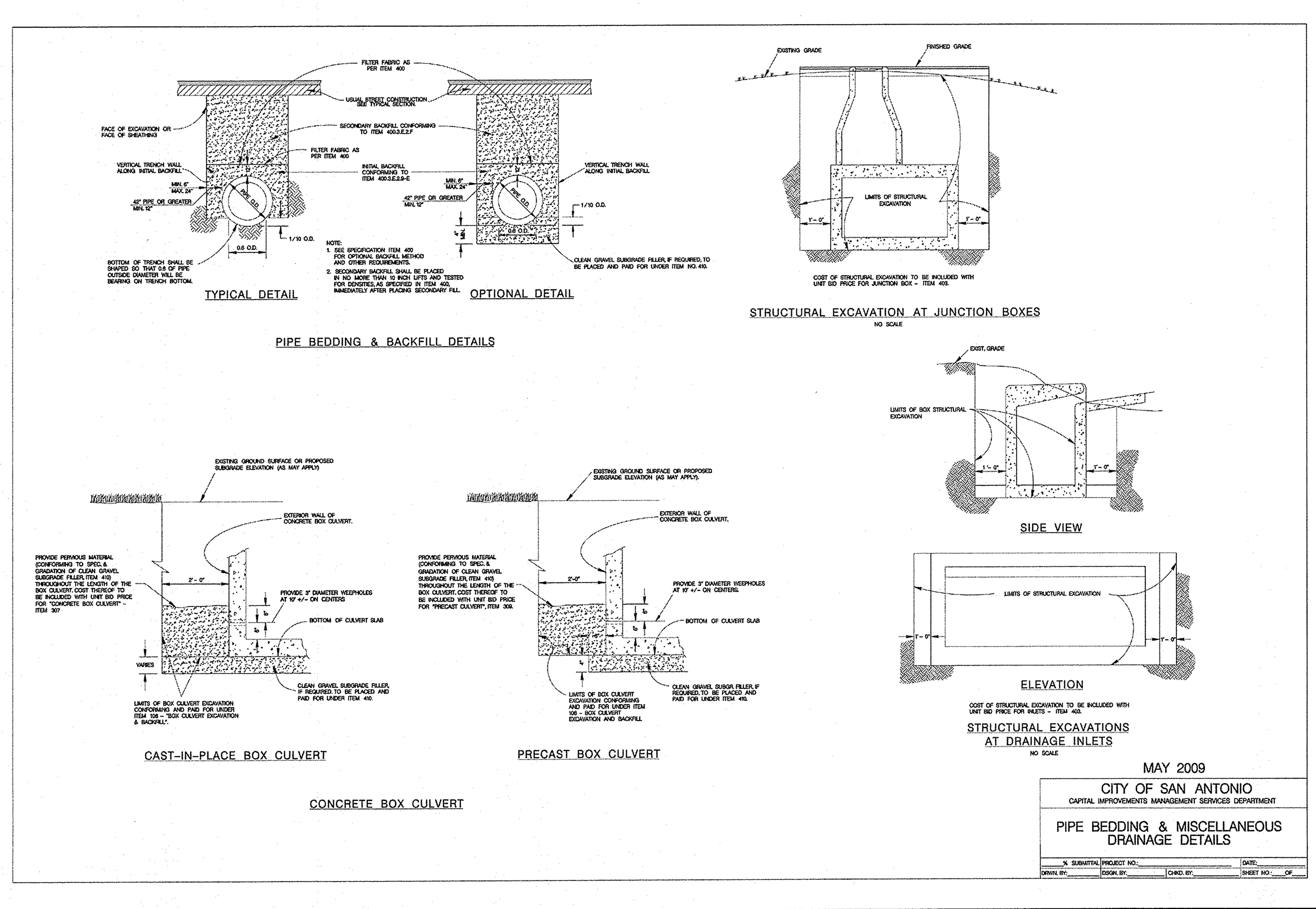

LANDLOK®
BY PROPEX

Product Data
LANDLOK 300®

LANDLOK 300® turf reinforcement mat (TRM) is a three-dimensional, lofty, woven polypropylene geotextile that is available in green or tan which is specially designed for erosion control applications on steep slopes and vegetated waterways. The matrix is composed of polypropylene monofilament yarns ***featuring X3® technology*** woven into a uniform configuration of resilient pyramid-like projections. The material exhibits very high interlock and reinforcement capacity with both soil and root systems, demonstrates superior UV resistance, and enhances seedling emergence.

LANDLOK 300® conforms to the property values listed below[1] and is manufactured at a Propex facility having achieved ISO 9001:2000 certification. Propex performs internal Manufacturing Quality Control (MQC) tests that have been accredited by the Geosynthetic Accreditation Institute – Laboratory Accreditation Program (GAI-LAP). This product is NTPEP approved for AASHTO standards.

		MARV[2]	
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)	225,000 mg-cm (avg)
ENDURANCE			
UV Resistance % Retained 3000 hrs	ASTM D-4355	90%	90%
PERFORMANCE			
Velocity[3] (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

NOTES:

1. The property values listed are effective 04/2011 and are subject to change without notice.
2. MARV indicates minimum average roll value calculated as the typical minus two standard deviations. Statistically, it yields a 97.7% degree of confidence that any sample taken during quality assurance testing will exceed the value reported.
3. Maximum permissible velocity and shear stress has been obtained through vegetated testing programs featuring specific soil types, vegetation classes, flow conditions, and failure criteria. These conditions may not be relevant to every project nor are they replicated by other manufacturers. Please contact Propex for further information.
4. Calculated as typical values from large-scale flexible channel lining test programs with a flow depth of 6 to 12 inches.

Propex™ Geotextile Systems

TESTED. PROVEN. TRUSTED.
www.geotextile.com

Propex Operating Company, LLC · 6025 Lee Highway, Suite 425 · PO Box 22788 · Chattanooga, TN 37422
ph 423 899 0444 · ph 800 621 1273 · fax 423 899 7619

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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
DRAIN DETAILS (SHEET 1 OF 2)

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
4.2

Date: Oct 28, 2022, 11:55am User ID: fthompson
File: N:\479\09\01\Design\Civil\Drains\DR4790901.dwg

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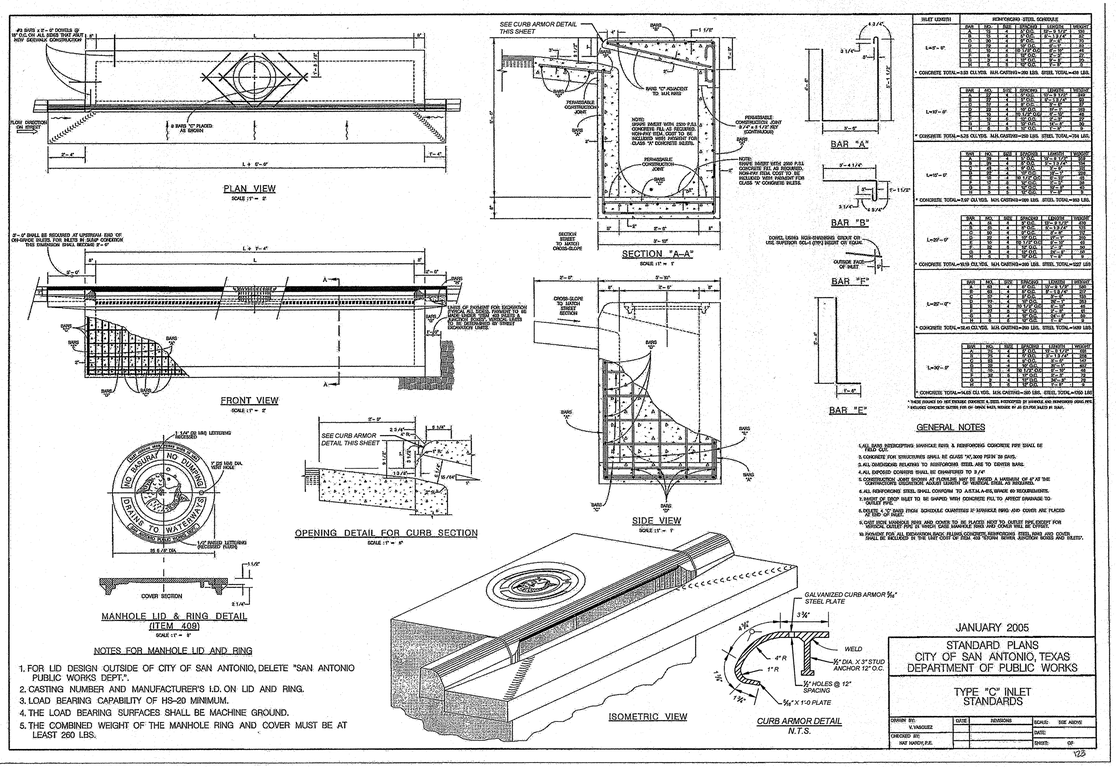
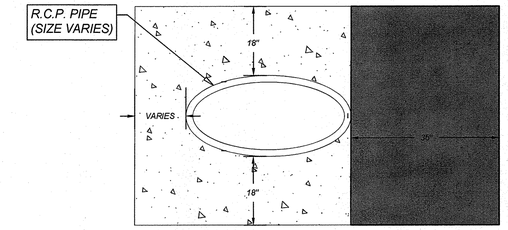
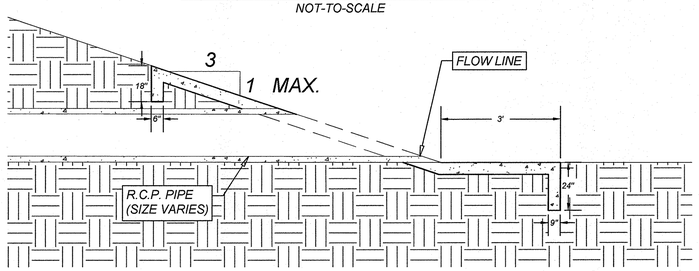




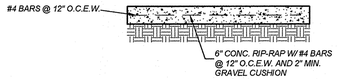
SLOPED END TREATMENT (TOP VIEW)

NOT-TO-SCALE



SLOPED END TREATMENT (SECTION)

NOT-TO-SCALE



REBAR SPACING DETAIL FOR SLOPED & SAFETY END TREATMENTS

N.T.S.

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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
STEPHAN MORENO
144886
LICENSED
PROFESSIONAL ENGINEER
11/23/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
DRAIN DETAILS (SHEET 2 OF 2)

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
4.3

Date: Nov 23, 2022, 2:04pm User ID: smoreno
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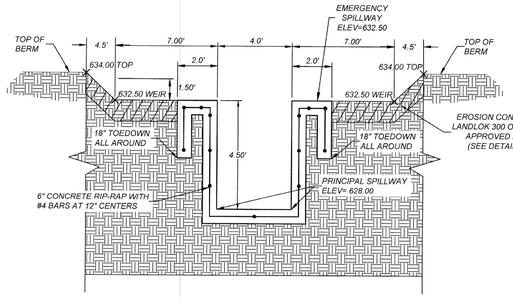


SECTION "C-C"
NOT-TO-SCALE

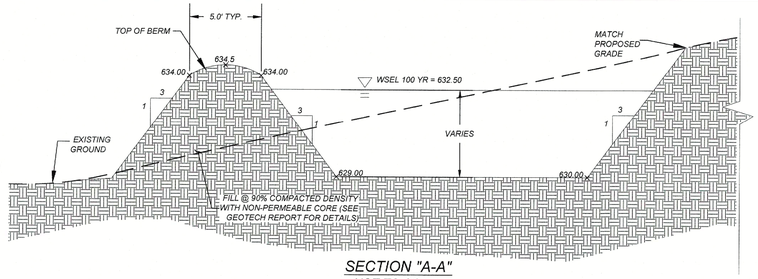
EMERGENCY SPILLWAY CALCULATION

$$L = \frac{Q_{100}}{CH^{3/2}}$$

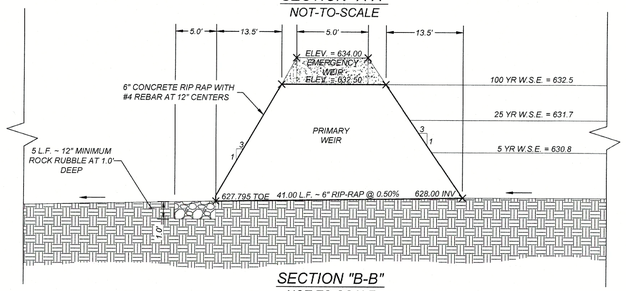
$$L = \frac{90.50}{(3.087)(1.5)^{3/2}}$$

$$L_{REQ.} = 15.95 \text{ FEET}$$

$$L_{USED} = 16.00 \text{ FEET}$$



SECTION "A-A"
NOT-TO-SCALE



SECTION "B-B"
NOT-TO-SCALE

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 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.

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 BEXAR COUNTY WILL ACCEPT.

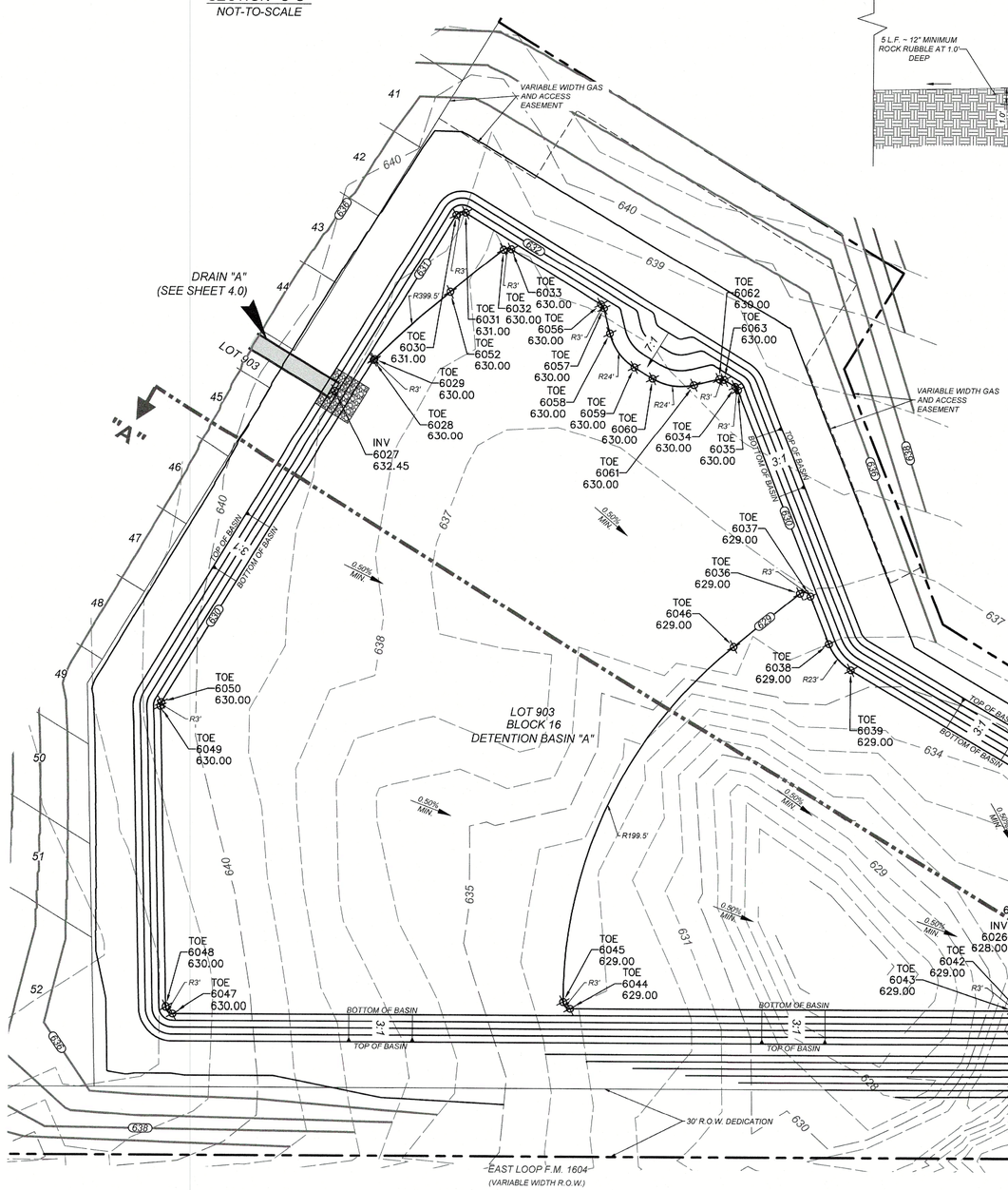
CAUTION!!! THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS 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.

LEGEND

- FLOW ARROW
- 706 — EXISTING CONTOURS
- 707 — PROPOSED CONTOURS
- PROPERTY LINE
- SCALE : 1" = 30' (0' 30' 90' 60')
- POINT # 707.00 TOE — PROPOSED SPOT ELEVATION (TOE OF SLOPE)
- POINT # 707.00 INV — PROPOSED SPOT ELEVATION (INVERT OF OUTFALL STRUCTURE)
- EROSION CONTROL MATTING

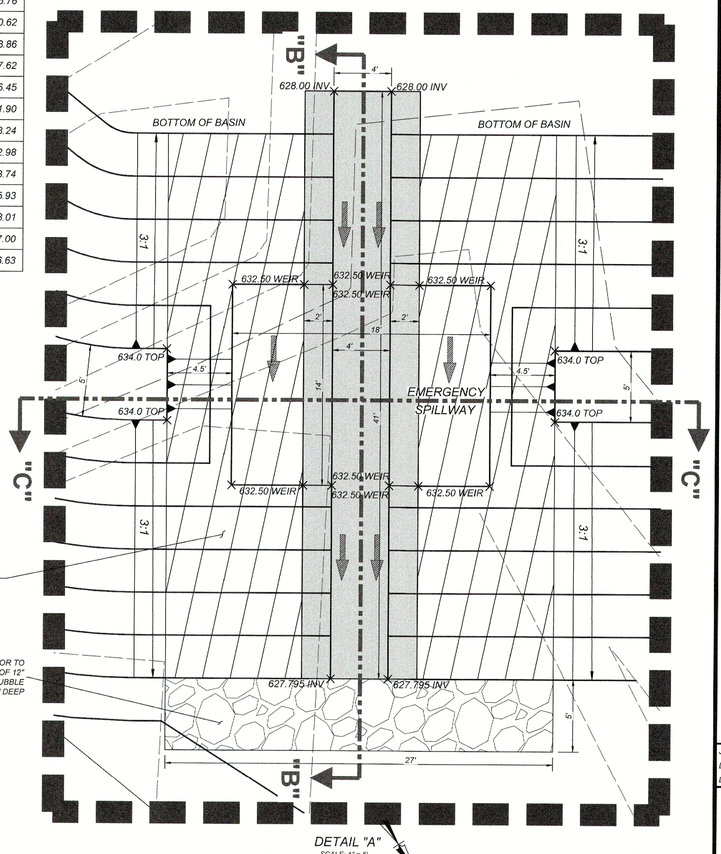
STAGE(FT)	STORAGE (FT^3)	ELEVATION	DISCHARGE (CFS)
0	0	628.0	0
1.00	13,068	629.0	11.2
2.00	74,052	630.0	30.3
3.00	165,528	631.0	53.9
4.00	270,072	632.0	84.1
4.50	317,988	632.5	98.5

PROPOSED DISCHARGE									
Q5	=	49.00		WSEL5	=	630.8		VEL5	=	4.38
Q25	=	73.10		WSEL25	=	631.7		VEL25	=	4.94
Q100	=	98.50		WSEL100	=	632.5		VEL100	=	5.47



Point Table			
Point #	Elevation	Northing	Easting
6025	628.00	13715357.44	2195232.40
6026	628.00	13715355.26	2195235.75
6027	632.45	13714979.04	2195085.15
6028	630.00	13714991.07	2195066.83
6029	630.00	13714991.30	2195066.19
6030	631.00	13715005.29	2194994.52
6031	631.00	13715008.91	2194992.31
6032	630.00	13715029.83	2195002.48
6033	630.00	13715033.04	2195001.20
6034	630.00	13715145.70	2195027.93
6035	630.00	13715147.32	2195028.94
6036	629.00	13715201.45	2195105.44
6037	629.00	13715206.28	2195105.17
6038	629.00	13715220.53	2195122.46
6039	629.00	13715233.29	2195130.28
6040	629.00	13715398.76	2195167.00
6041	629.00	13715400.63	2195171.57
6042	629.00	13715350.13	2195249.12

Point Table			
Point #	Elevation	Northing	Easting
6043	629.00	13715348.55	2195250.34
6044	629.00	13715162.82	2195310.71
6045	629.00	13715159.04	2195308.81
6046	629.00	13715181.07	2195136.74
6047	630.00	13714997.47	2195367.62
6048	630.00	13714993.71	2195365.76
6049	630.00	13714949.73	2195240.62
6050	630.00	13714949.62	2195238.86
6052	630.00	13715013.46	2195027.62
6053	627.80	13715390.71	2195256.45
6056	630.00	13715078.08	2195011.90
6057	630.00	13715079.94	2195013.24
6058	630.00	13715085.95	2195022.98
6059	630.00	13715100.84	2195033.74
6060	630.00	13715110.10	2195035.93
6061	630.00	13715128.23	2195033.01
6062	630.00	13715137.97	2195027.00
6063	630.00	13715140.24	2195026.63



DETAIL "A"
SCALE: 1" = 5'

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ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/4/23

PUNTA VERDE SUBDIVISION UNIT 1
DETENTION BASIN "A" PLAN & PROFILE
BEXAR COUNTY, TEXAS

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 4.4

Date: Oct 04, 2023, 1:20pm User ID: tthompson
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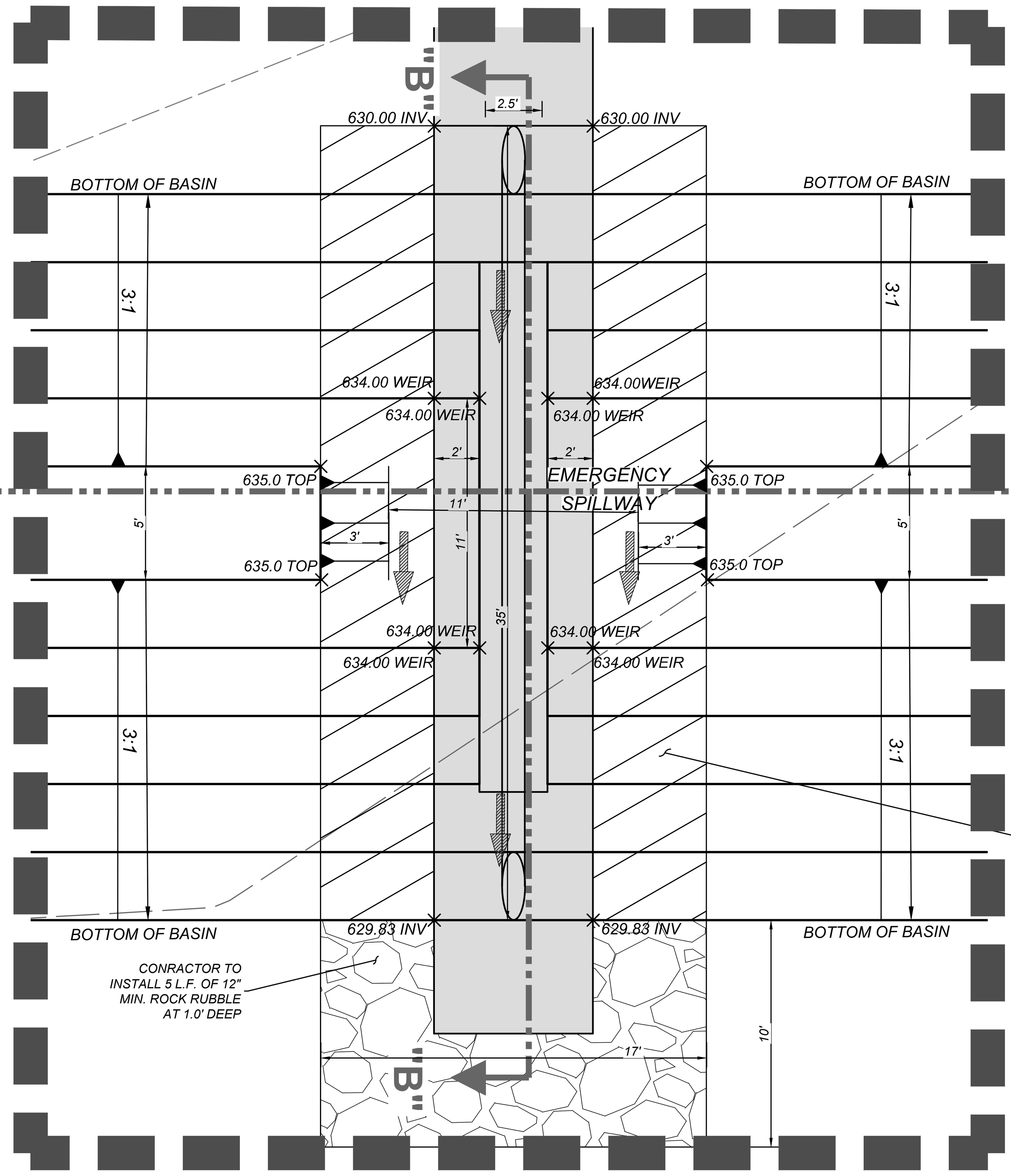
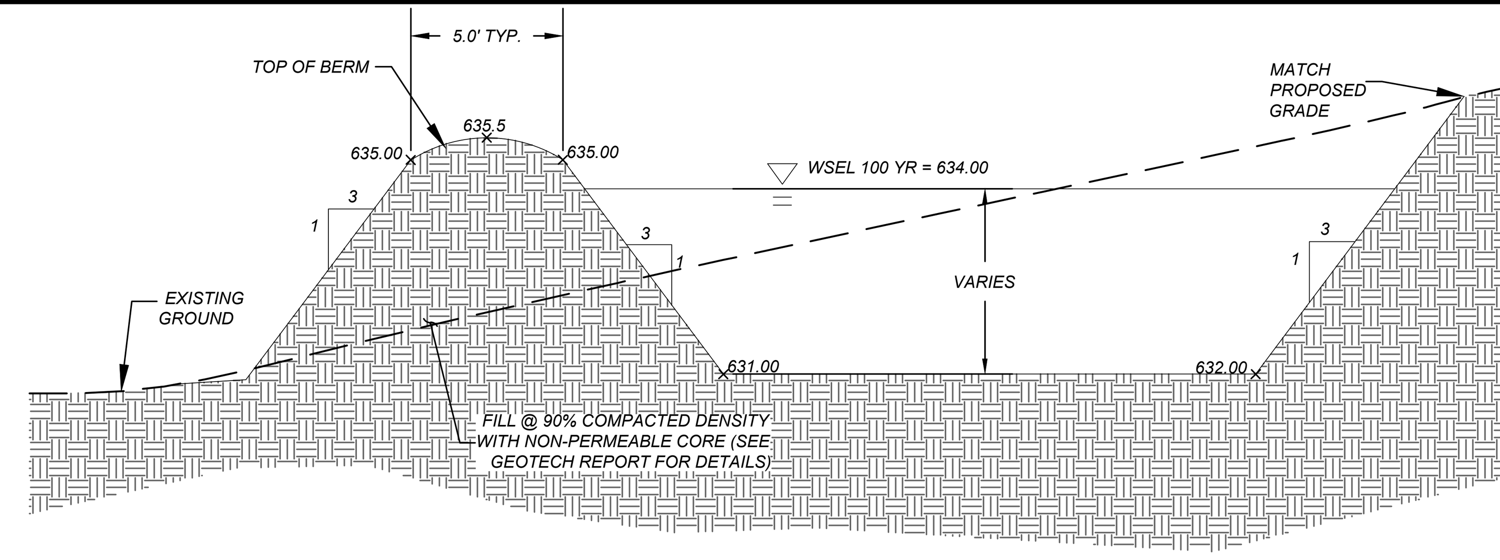
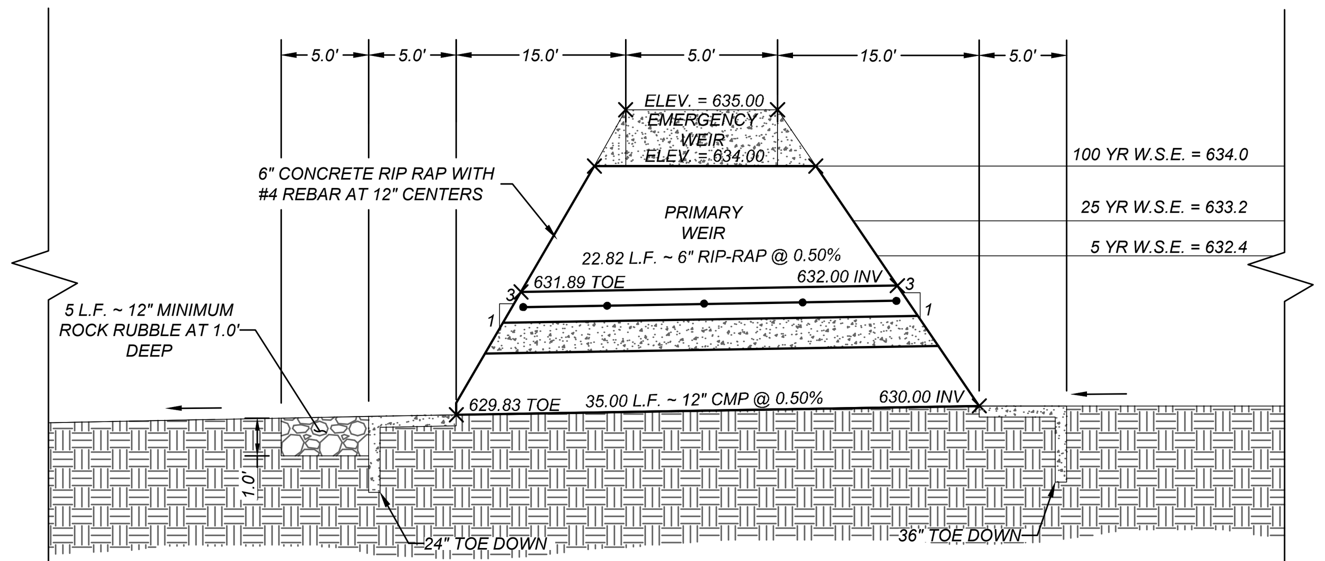


DETAIL "B"
SCALE: 1" = 5'



SECTION "A-A"
NOT-TO-SCALE



SECTION "B-B"
NOT-TO-SCALE

Point Table			
Point #	Elevation	Northing	Easting
6001	631.00	13714042.67	2195547.54
6002	631.00	13714046.22	2195549.21
6003	633.00	13714139.06	2195241.17
6004	632.00	13713924.54	2195138.58
6005	632.00	13713906.48	2195134.24
6006	632.00	13713902.88	2195137.94
6007	631.00	13713923.56	2195202.91
6008	631.00	13713923.84	2195203.59
6009	631.00	13713971.78	2195289.42
6010	631.00	13713975.00	2195297.35
6011	630.00	13713991.79	2195347.94
6012	630.00	13713993.62	2195354.69
6013	632.00	13714081.47	2195702.48
6014	632.00	13714085.55	2195704.46

Point Table			
Point #	Elevation	Northing	Easting
6015	632.00	13714205.35	2195652.98
6016	632.00	13714206.98	2195649.20
6017	631.00	13714144.00	2195488.86
6018	631.00	13714144.57	2195485.85
6019	631.00	13714106.96	2195382.09
6020	631.00	13714110.48	2195366.35
6021	631.00	13714148.74	2195328.23
6022	631.00	13714149.57	2195325.52
6023	631.00	13714123.33	2195195.61
6024	631.00	13714124.30	2195197.29
6054	629.82	13713959.84	2195363.83
6055	629.82	13713958.01	2195357.07
6064	631.00	13713915.11	2195161.67
6065	631.00	13713913.37	2195165.22

Point Table			
Point #	Elevation	Northing	Easting
6066	631.00	13714113.09	2195187.26
6067	631.00	13714111.98	2195186.73
6068	632.00	13714123.43	2195186.40
6069	632.00	13714125.67	2195188.74
6070	632.00	13714202.09	2195635.70
6071	632.00	13714200.54	2195634.01
6072	632.00	13714192.67	2195630.32
6073	632.00	13714183.89	2195620.72
6074	632.00	13714180.65	2195611.78
6075	632.00	13714181.23	2195598.78
6076	632.00	13714184.92	2195590.91
6077	632.00	13714185.02	2195588.62

<u>TRENCH EXCAVATION SAFETY PROTECTION</u>

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

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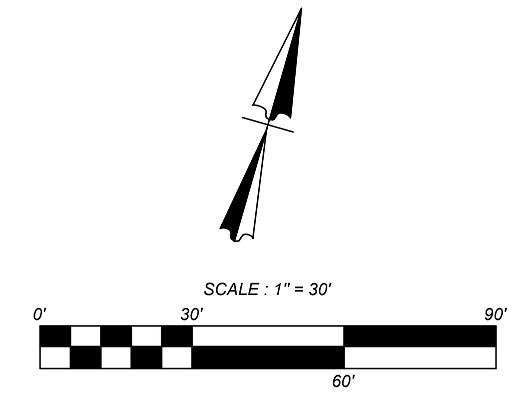
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

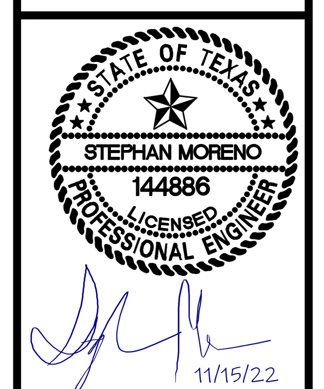
ISSUE DATE

REVISIONS



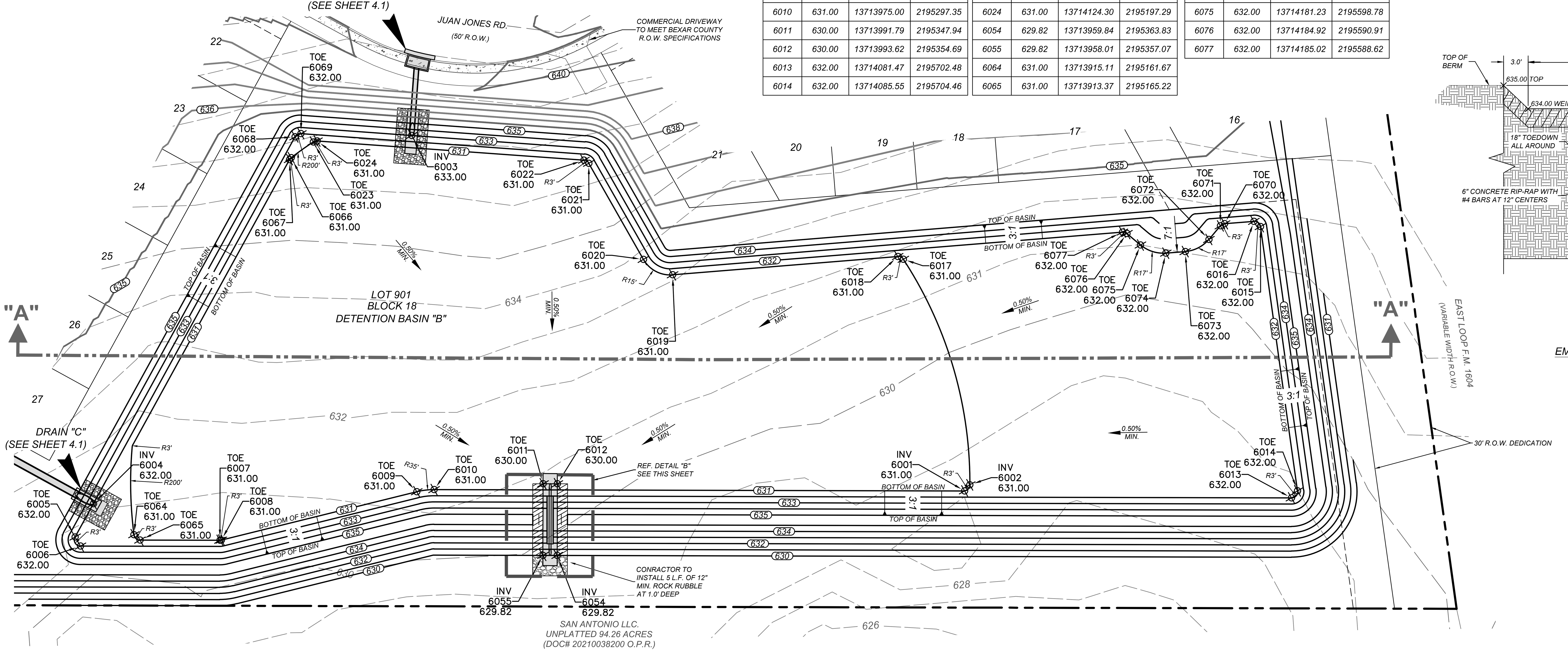
LEGEND

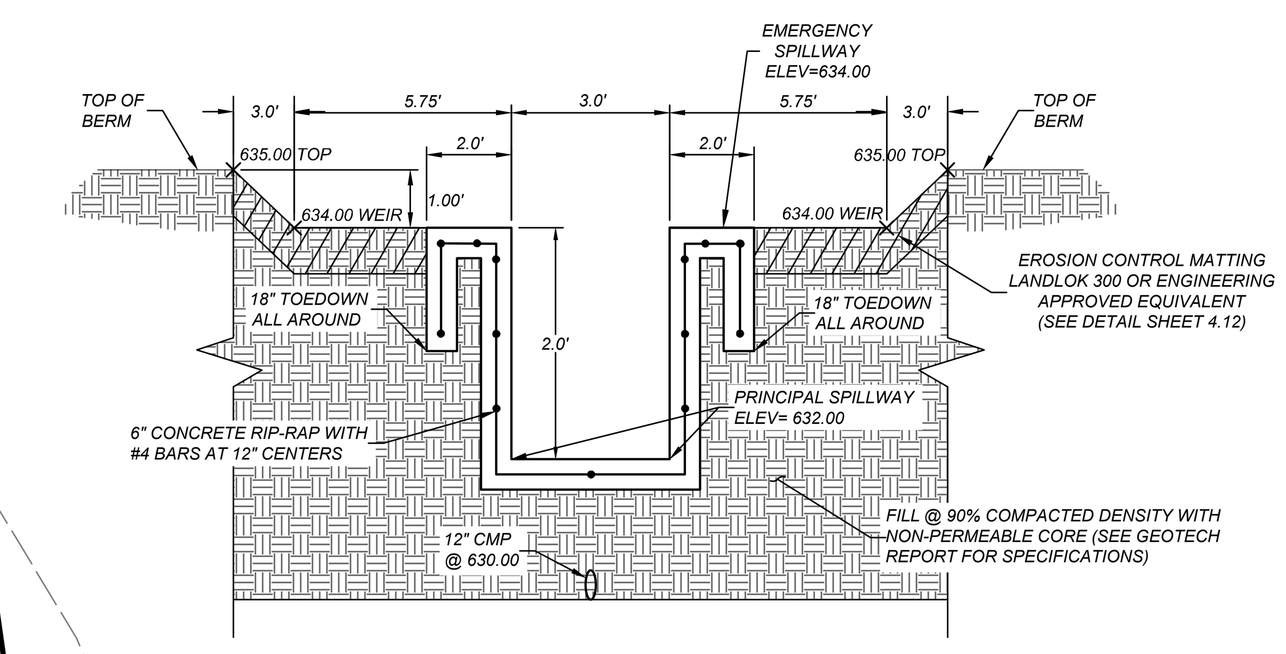
FLOW ARROW	
—706—	EXISTING CONTOURS
(707)	PROPOSED CONTOURS
	PROPERTY LINE
POINT # 707.00 TOE	PROPOSED SPOT ELEVATION (TOE OF SLOPE)
POINT # 707.00 INV	PROPOSED SPOT ELEVATION (INVERT OF OUTFALL STRUCTURE)
	EROSION CONTROL MATTING



STAGE(FT)	STORAGE (SQFT)	ELEVATION	DISCHARGE (CFS)
0	0	630.0	0
1.00	21,780	631.0	3.3
2.00	87,120	632.0	5.6
3.00	165,528	633.0	15.4
3.50	252,648	634.0	30.9

PROPOSED DISCHARGE										
Q5	=	8.40		WSEL5	=	632.4		VEL5	=	4.23
Q25	=	18.20		WSEL25	=	633.2		VEL25	=	4.15
Q100	=	30.90		WSEL100	=	634.0		VEL100	=	4.55





SECTION "C-C"
NOT-TO-SCALE

<u>EMERGENCY SPILLWAY CALCULATION</u>

$$L = \frac{Q_{100}}{CH^{3/2}}$$

$$L = \frac{41.80}{(3.087)(1.5)^{3/2}}$$

$L_{REQ.}$ = 13.54 FEET

L_{USED} = 14.00 FEET

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

DETENTION BASIN "B" PLAN & PROFILE

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
4.5

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TRENCH EXCAVATION SAFETY PROTECTION

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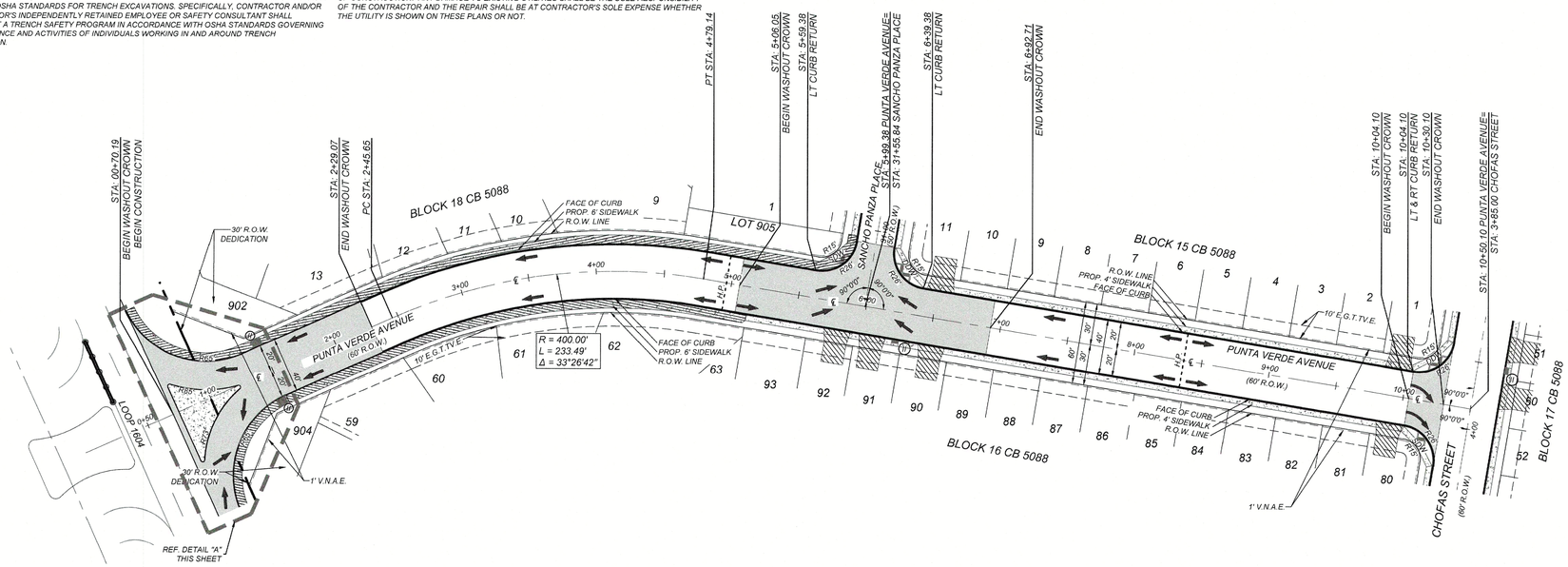
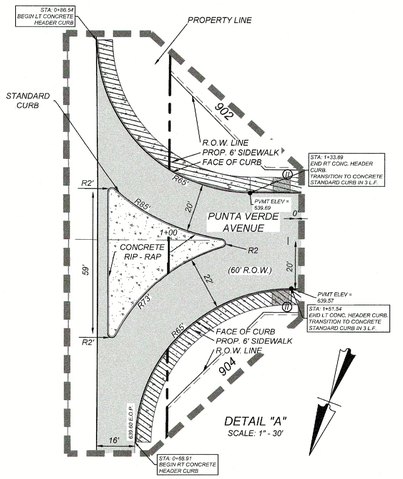
BEXAR COUNTY R.O.W. NOTE

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



LEGEND

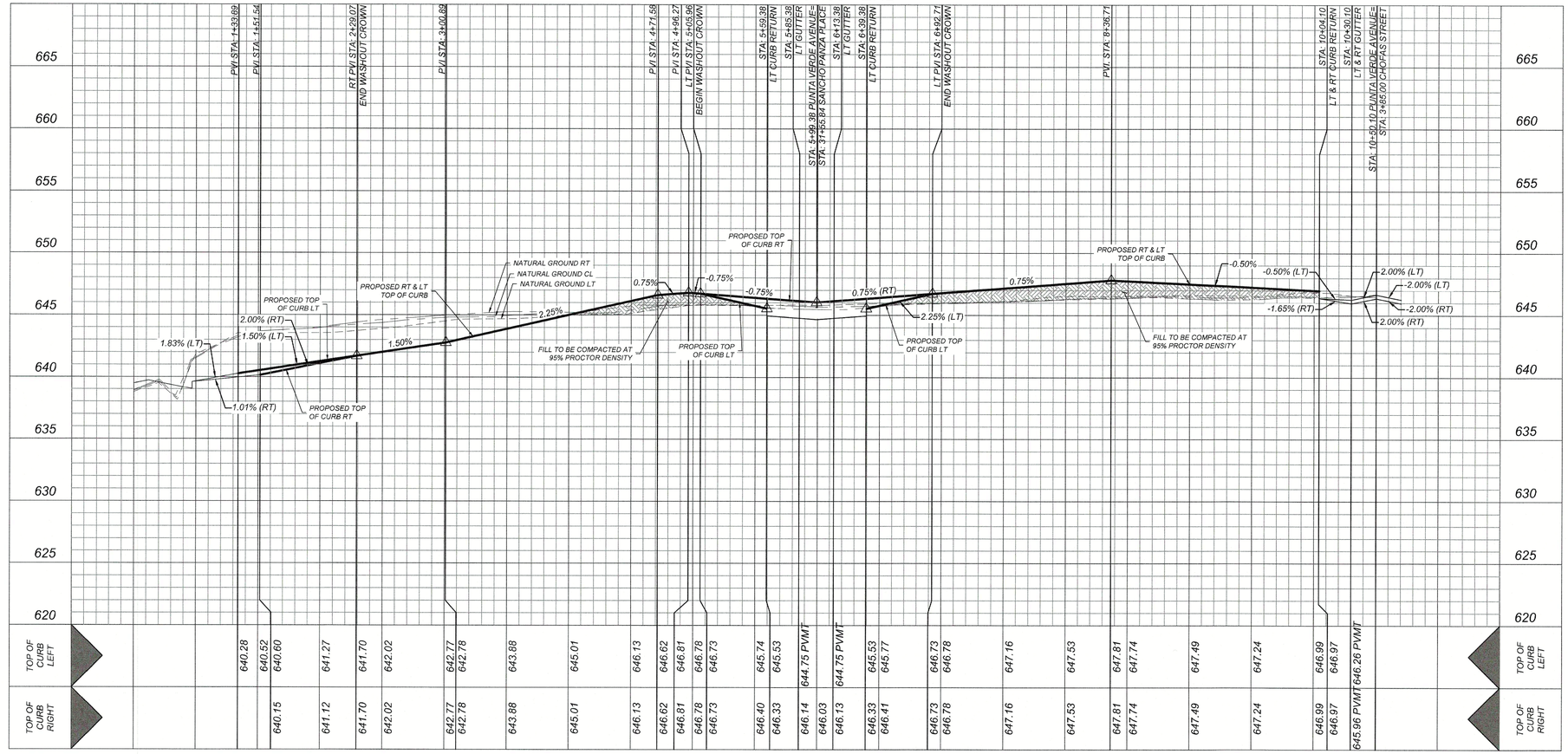
R.O.W.	=	RIGHT OF WAY		=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
G.E.T.TV.E.	=	GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT		=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	=	FLOW ARROW		=	PROPOSED DRIVEWAY LOCATION
	=	WASHOUT CROWN	H.P.	=	HIGH POINT
(I)	=	WHEELCHAIR RAMP TYPE I SEE SHEET 5.8	L.P.	=	LOW POINT
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.8	V200.00	=	PROPOSED TOP OF CURB ELEVATION
SDW	=	SINGLE DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 5.8			
DDW	=	DUAL DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 5.8			



STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/4/23

PUNTA VERDE AVENUE
STA: 1+00.00 - END

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



PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
PUNTA VERDE AVENUE PLAN & PROFILE

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.0

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200 • San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

Date: Oct 04, 2023, 1:23pm User ID: Rthompson
File: N:\479\09\01\Design Civil\STREETS\S1479090101.dwg

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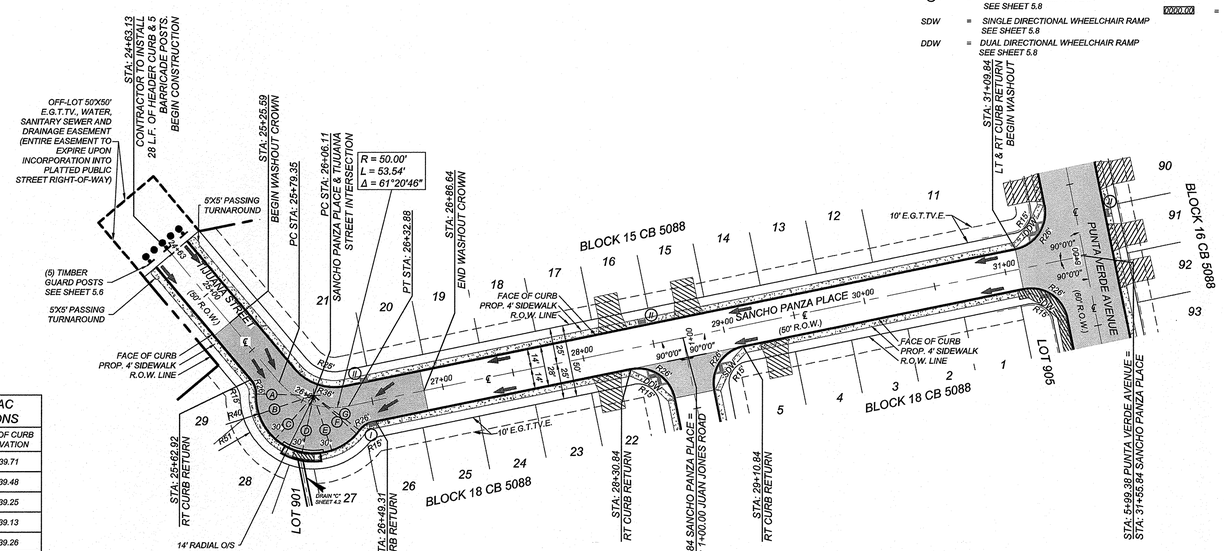
BEXAR COUNTY R.O.W. NOTE

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

LEGEND

- R.O.W. = RIGHT OF WAY
- G.E.T.T.V.E. = GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
- = FLOW ARROW
- = WASHOUT CROWN
- (1) = WHEELCHAIR RAMP TYPE I SEE SHEET 5.8
- (II) = WHEELCHAIR RAMP TYPE II SEE SHEET 5.8
- SDW = SINGLE DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 5.8
- DDW = DUAL DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 5.8
- = SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- = PROPOSED DRIVEWAY LOCATION
- H.P. = HIGH POINT
- L.P. = LOW POINT
- 000.00 = PROPOSED TOP OF CURB ELEVATION

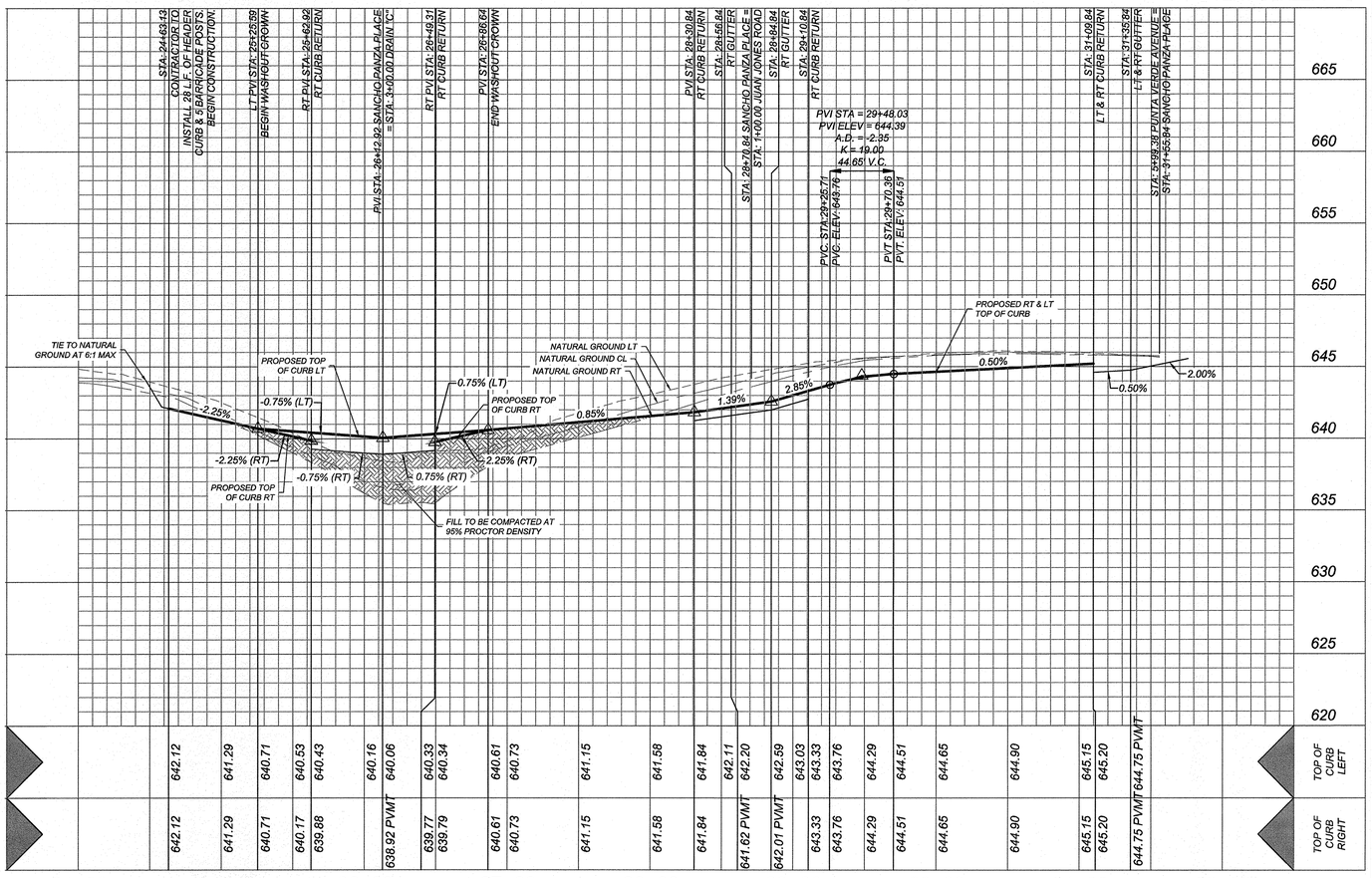


CULDESAC ELEVATIONS

STATION	TOP OF CURB ELEVATION
A	639.71
B	639.48
C	639.25
D	639.13
E	639.26
F	639.55
G	639.61

TIJUANA STREET/SANCHO PANZA PLACE
STA: 24+63.13 - END

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



KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: (210) 979-8444 Fax: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
STEPHAN MORENO
144886
LICENSED
PROFESSIONAL ENGINEER
11/8/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
TIJUANA STREET & SANCHO PANZA PLACE PLAN & PROFILE

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.1

Date: Nov 18, 2022, 4:15pm User ID: smoreno
File: N:\479\09\01\Design\Civil\STREETS\S14790901.dwg

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BEXAR COUNTY R.O.W. NOTE

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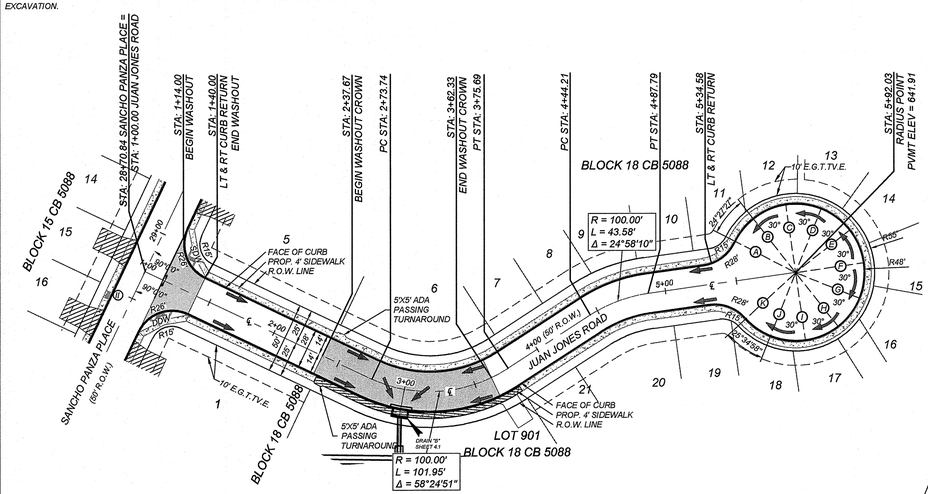
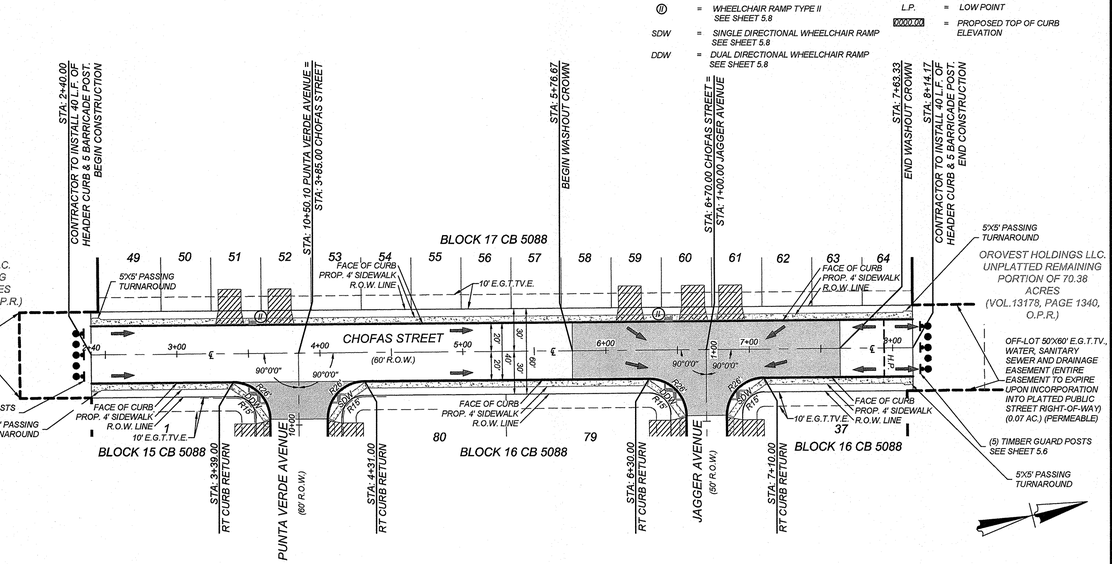
CULDESAC ELEVATIONS

STATION	TOP OF CURB ELEVATION
A	641.54
B	641.68
C	641.86
D	642.03
E	642.20
F	642.37
G	642.20
H	642.03
I	641.86
J	641.68
K	641.54



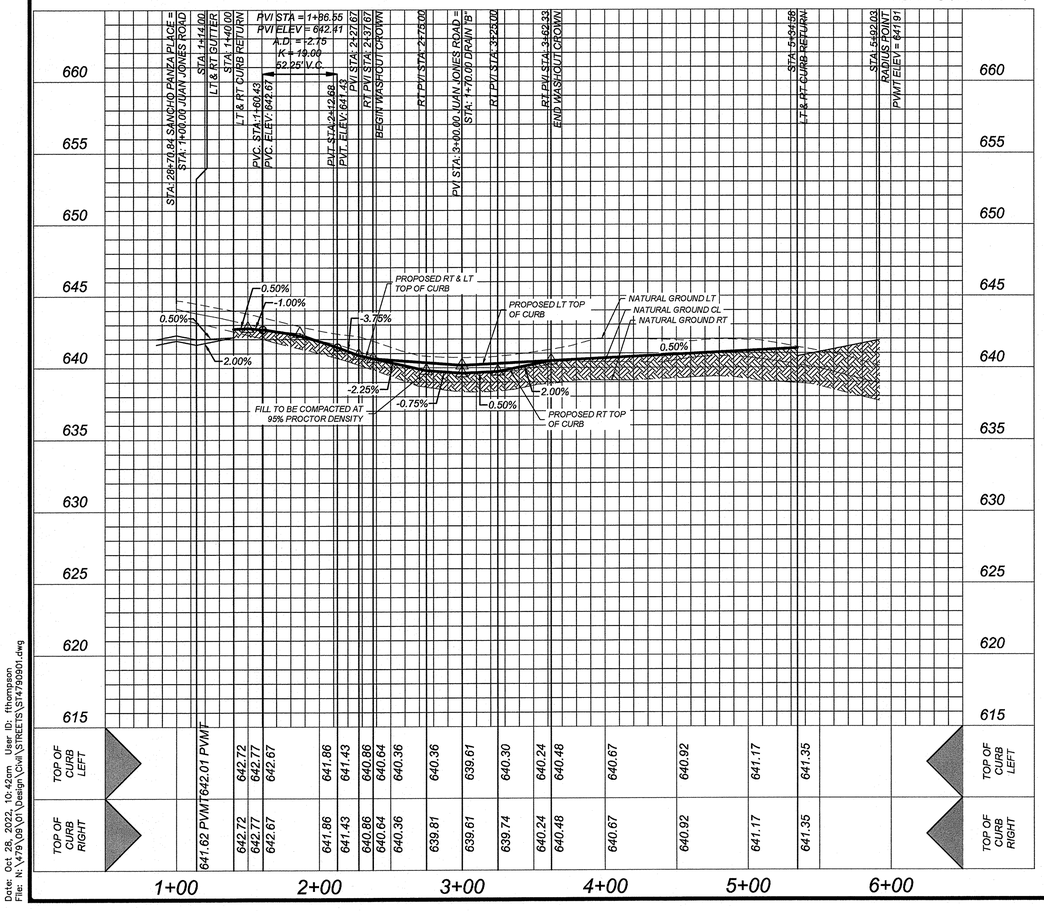


LEGEND

R.O.W. G.E.T.TV.E.	= RIGHT OF WAY GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT		= SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
	= FLOW ARROW		= SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	= WASHOUT CROWN		= PROPOSED DRIVEWAY LOCATION
Ⓘ	= WHEELCHAIR RAMP TYPE I SEE SHEET 5.8	H.P.	= HIGH POINT
Ⓘ	= WHEELCHAIR RAMP TYPE II SEE SHEET 5.8	L.P.	= LOW POINT
SDW	= SINGLE DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 5.8	XXXX.XX	= PROPOSED TOP OF CURB ELEVATION
DDW	= DUAL DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 5.8		

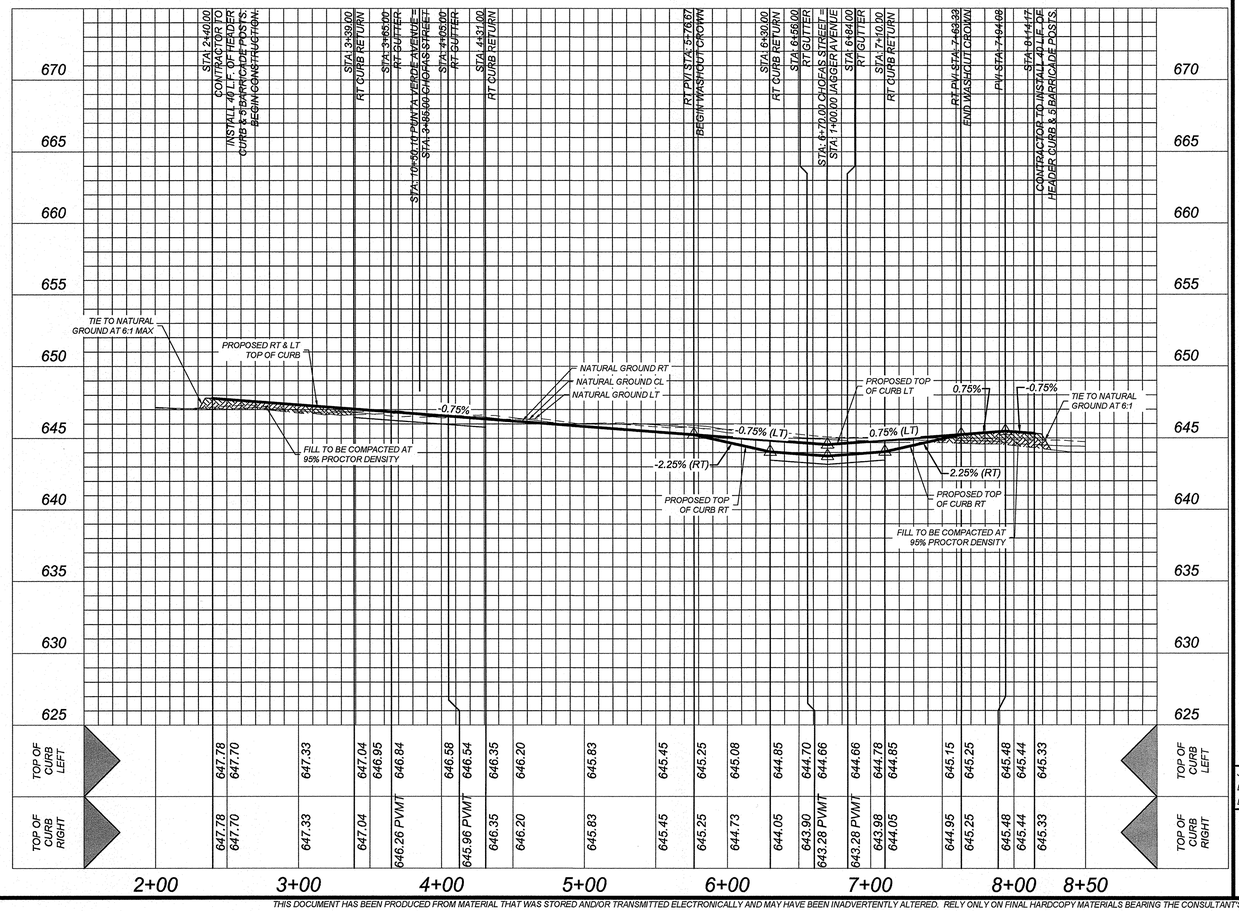
JUAN JONES ROAD
STA: 1+00.00 - END

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



CHOFAS STREET
STA: 2+40.00 - STA: 8+14.17

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



KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX. 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
JUAN JONES ROAD & CHOFAS STREET PLAN & PROFILE
BEXAR COUNTY, TEXAS

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.2

Date: Oct. 28, 2022, 10:42am User ID: fthompson
File: N:\479\09\01\Design\Civil\STREETS\ST479091.dwg

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LEGEND

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- = FLOW ARROW
- = WASHOUT CROWN
- = WHEELCHAIR RAMP TYPE I SEE SHEET 5.8
- = WHEELCHAIR RAMP TYPE II SEE SHEET 5.8
- SDW = SINGLE DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 5.8
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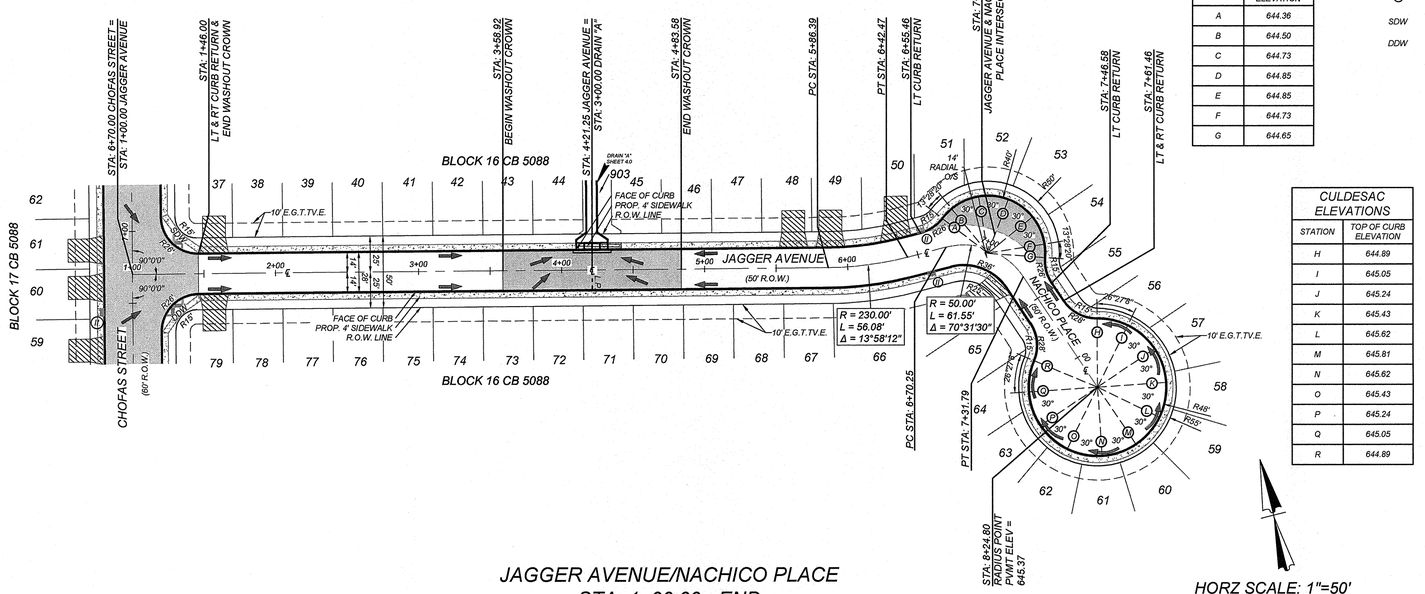
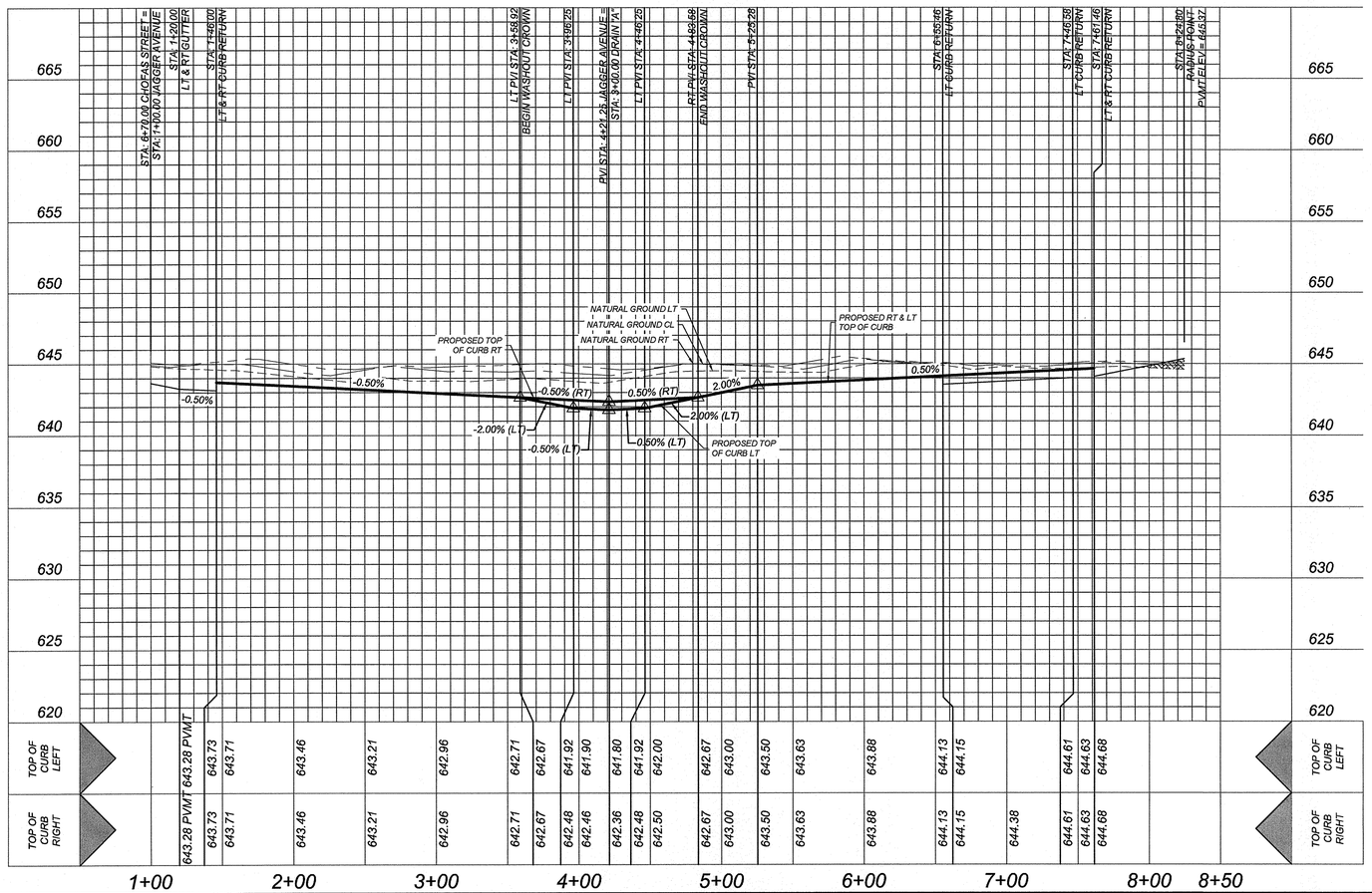
- = PROPOSED DRIVEWAY LOCATION
- H.P. = HIGH POINT
- L.P. = LOW POINT
- XXXX.XX = PROPOSED TOP OF CURB ELEVATION

CULDESAC ELEVATIONS	
STATION	TOP OF CURB ELEVATION
A	644.36
B	644.50
C	644.73
D	644.85
E	644.85
F	644.73
G	644.65

CULDESAC ELEVATIONS	
STATION	TOP OF CURB ELEVATION
H	644.89
I	645.05
J	645.24
K	645.43
L	645.62
M	645.81
N	645.62
O	645.43
P	645.24
Q	645.05
R	644.89



JAGGER AVENUE/NACHICO PLACE
STA: 1+00.00 - END



KFW
ENGINEERS + SURVEYING
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REVISIONS | ISSUE DATE

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

JAGGER AVENUE & NACHICO PLACE

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.3

Date: Oct 28, 2022, 10:43am User ID: rthompson
File: N:\479\06\01\Design\Civil\STREETS\ST4790901.dwg

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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 DUCT BANKS, 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.

NOTES:

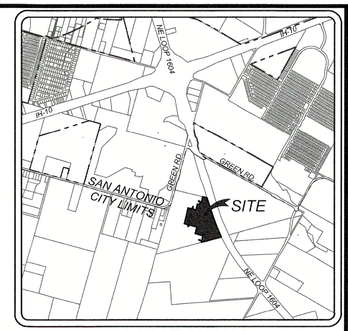
1. ADJUST TOP OF EXISTING VALVE BOXES TO MATCH PROPOSED GRADING.
2. EXISTING VEGETATED AREAS DISTURBED BY CONTRACTOR SHALL BE REVEGETATED IN COMPLIANCE WITH ITEM 164, "SEEDING FOR CONTROL" AS SPECIFIED IN THE 2004 TXDOT SPECIFICATIONS FOR CONSTRUCTION AND MAINTENANCE OF HIGHWAYS, STREETS, AND BRIDGES.
3. ALL TRAFFIC CONTROL SHALL BE IN ACCORDANCE WITH THE 2006 TEXAS MANUAL ON UNIFORM CONTROL DEVICES (TMUTCD).
4. RIGHT TURN ARROW AND "ONLY" SHALL BE PLACED AT 200' ON CENTER.

LEGEND

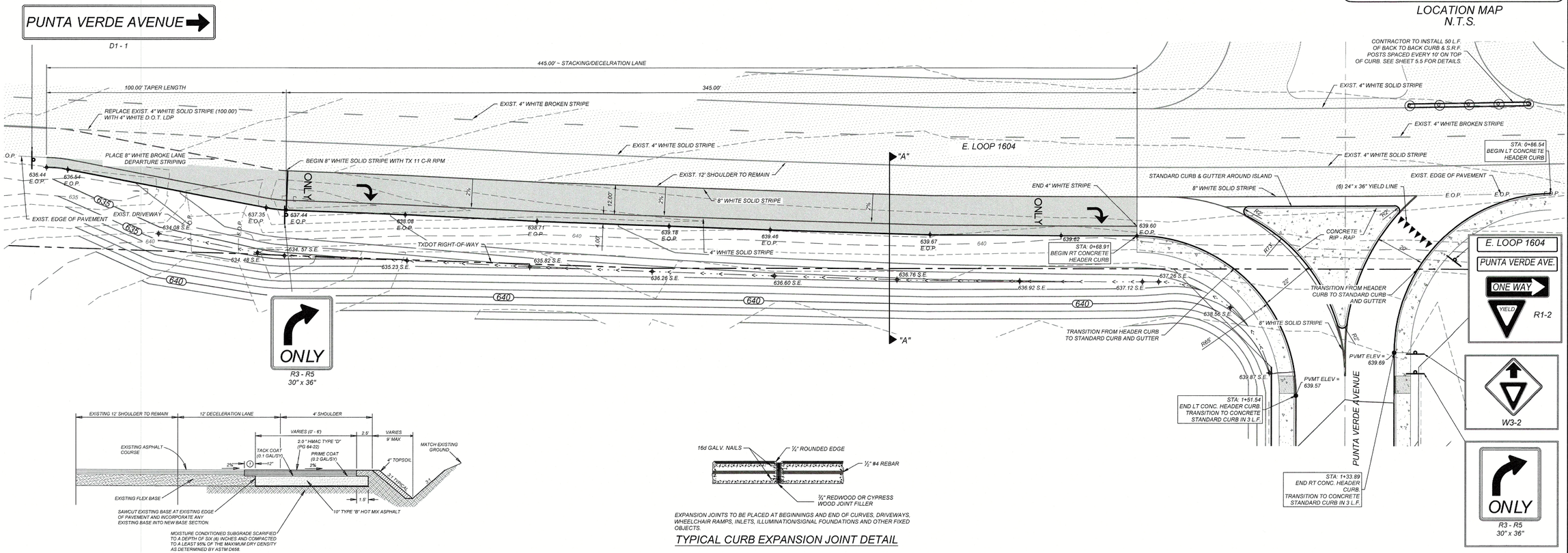
EXISTING EDGE OF PAVEMENT = E.O.P.
EXIST. PAVEMENT =
PROPOSED PAVEMENT =
BAR DITCH CENTERLINE =
PROPOSED 6' SIDEWALK =

SEE SHEETS 5.12 - 5.13 FOR PAVEMENT MARKING DETAILS.

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



LOCATION MAP
N.T.S.

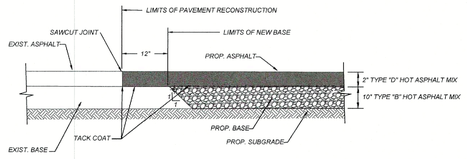


DECELERATION LANE
SECTION "A - A"

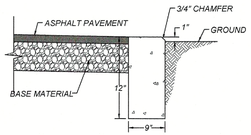
① SEE PAVEMENT JUNCTION DETAIL THIS SHEET.

EXPANSION JOINTS TO BE PLACED AT BEGINNINGS AND END OF CURVES, DRIVEWAYS, WHEELCHAIR RAMPS, INLETS, ILLUMINATION/SIGNAL FOUNDATIONS AND OTHER FIXED OBJECTS.

TYPICAL CURB EXPANSION JOINT DETAIL



PAVEMENT JUNCTION AND RIGHT TURN LANE PAVEMENT STRUCTURE
(NOT TO SCALE)



HEADER CURB

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone#: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/4/23

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

DECELERATION LANE PLAN

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
5.4

Date: Oct 04, 2023, 2:20pm User ID: fthomson
File: N:\479\09\01\Design\Civil\STREETS\ST479091 - DECEL LANE.dwg

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REFLECTOR UNIT SIZES FOR DELINEATORS AND OBJECT MARKERS

	SIZE 1	SIZE 2	SIZE 3	SIZE 4
DEVICE				
SHEETING	Yellow, White or Red Type B or C reflective sheeting			
NOTE	1. Size 1 and 4 - Direct applied reflective sheeting for use on flexible post (flat). 2. Size 2 and 3 - For use on wing channel (WC) post only. Use approved metal, plastic or fiberglass backplate with 17/64" mounting holes.			

DELINEATORS

	SINGLE		DOUBLE	
DEVICE	1-Size 2 reflector unit	1-Size 1 reflector unit	2-Size 2 reflector units	2-Size 1 reflector units
SHEETING	Yellow, White or Red Type B or C Reflective Sheeting			
POST TYPE	WC	YFLX, WFLX	WC	YFLX, WFLX
MOUNT TYPE	GND	GND, SRF	GND	GND, SRF

D & OM DESCRIPTIVE CODES

INSTL DEL ASSM (D-XX)SZ X (XXXX)XXX(XX)

NUMBER OF REFLECTORS
S = Single
D = Double

COLOR OF REFLECTORS
W = White
Y = Yellow
R = Red

REFLECTOR UNIT SIZE
1 or 2

TYPE OF POST OR DELINEATOR
WC = Wing Channel Post
YFLX = Yellow Flexible Post
WFLX = White Flexible Post
BRF = Barrier Reflector

TYPE OF MOUNT
GND = Embedded (drivable or set in concrete)
CTB = Concrete Barrier Mount
GF1 or GF2 = Guard Fence Attachment
SRF = Surface Mount

DIRECTION
If Required
BI = Bi-Directional
BR = Bi-Directional with red on back

INSTL OM ASSM (OM-XX) (XXXX)XXX(XX)

TYPE OF OBJECT MARKER
1, 2, 3, or 4

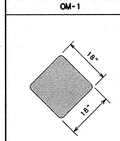
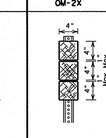
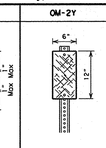
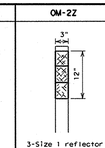
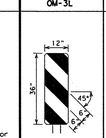
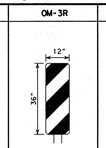
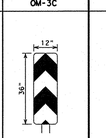
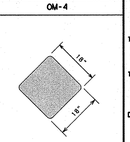
NUMBER OF REFLECTORS OR DIRECTION
X = 1-Size 2 reflector units (Type 2 only)
Y = 1-Size 1 reflector unit (Type 2 only)
Z = 2-Size 1 or 1-Size 4 reflector units(Type 2 only)
L = Left Side (Type 3 Object Marker only)
R = Right Side (Type 3 Object Marker only)
C = Center (Type 3 Object Marker only)

TYPE OF POST
WC = Wing Channel Post
WFLX = White Flexible Post
TWT = Thin Walled Tubing

TYPE OF MOUNT
GND = Embedded (drivable)
SRF = Surface Mount
WAS = Wedge Anchor Steel
WAP = Wedge Anchor Plastic

DIRECTION
If Required
BI = Bi-Directional

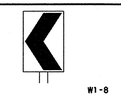
OBJECT MARKERS

	Type 1 (OM-1)	Type 2 (OM-2)			Type 3 (OM-3)			Type 4 (OM-4)
	OM-1	OM-2X	OM-2Y	OM-2Z	OM-3L	OM-3R	OM-3C	OM-4
DEVICE		 3-Size 2 reflector units	 1-Size 3 reflector unit	 3-Size 1 reflector units or 1-Size 4 reflector unit				
SHEETING	Yellow-Type B_{FL} or C_{FL} Sheeting	Yellow - Type B or C Sheeting			Alternating acrylic black and retroflective yellow - Type B_{FL} or C_{FL} Sheeting			Red -Type B_{FL} or C_{FL} Sheeting
POST TYPE	TWT	WC	WC	WFLX	TWT			TWT
MOUNT TYPE	WAS, WAP	GND	GND	GND, SRF	WAS, WAP			WAS, WAP

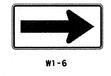
BARRIER REFLECTORS (BRF)

	GF1	GF2	CTB
DEVICE			
	1. Barrier reflectors shall meet the requirements of DMS 8600. 2. Approved Barrier Reflectors are listed on the "Barrier Reflectors" Material Producer List at: www.txdot.gov.		
SHEETING	Yellow, White, Red		
NOTE	1. Reflective sheeting shall have a minimum dimension of 3 inches and minimum surface area of 9 square inches.		

CHEVRONS

	W1-8			
DEVICE				
SIZE (W x L)	18"x 24" (Conventional)	24"x 30" (Conventional Oversize)	30"x 36" (Expressway)	36" x 48" (Freeway)
MOUNTING HEIGHT	4'-0" or 7'-0"		7'-0" Only	
NOTE	1. CHEVRON (W1-8) signs and ONE DIRECTION LARGE ARROW (W1-6) Signs shall be installed per Sign Mounting Details (SMD) Standard Sheets and paid under Item 644 (Small Roadside Sign Assemblies). 2. When there is a need to increase conspicuity, the Texas version of the ONE DIRECTION LARGE ARROW sign (W1-9T) may be used instead of the ONE DIRECTION LARGE ARROW (W1-6).			

ONE DIRECTION LARGE ARROW

	W1-6	
DEVICE		
SIZE (W x L)	48" x 24" (Conventional)	60" x 30" (Expressway & Freeway)
MOUNTING HEIGHT	7'-0"	

NOTE:
Delineator and object marker substrates and sign substrates shall be 0.080" Aluminum sign blank to conform to ASTM B-209 Alloy 6061-T6 or approved alternative.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER MATERIAL DESCRIPTION
D & OM(1)-20

FILE: dom1-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS				
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20				

20A

DEPARTMENTAL MATERIAL SPECIFICATIONS

FLEXIBLE DELINEATOR & OBJECT MARKER POSTS (EMBEDDED & SURFACE MOUNT TYPES)	DMS-4400
SIGN FACE MATERIALS	DMS-8300
DELINEATORS, OBJECT MARKERS AND BARRIER REFLECTORS	DMS-8600

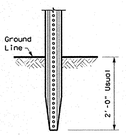
DISCLAIMER:
The use of this standard is governed by the "Texas Engineering Practice Act". No warranty of any kind is made by TxDOT for any purpose whatsoever. TxDOT assumes no responsibility for the conversion of this standard to other formats or for incorrect results or damages resulting from its use.

DATE:
FILE:

POST TYPE AND SUPPORT FOUNDATION DETAILS

WING CHANNEL (WC)

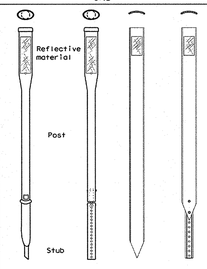
GND



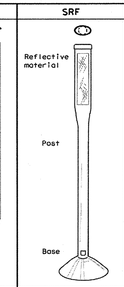
NOTES
1. Embedded Wing Channel (WC) post option may be used for Type 2 Object Markers and Delineators only.
2. 1.12 lbs/ft steel per ASTM A 1011 SS Gr. 50, or ASTM A499.

FLEXIBLE POSTS (YFLX, WFLX)

GND



SRF

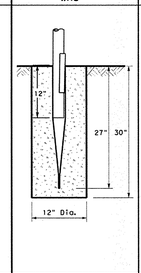


EMBEDDED | SURFACE MOUNT

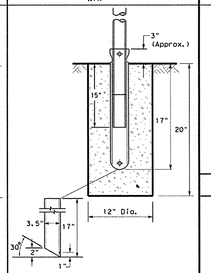
NOTES
1. See "Flexible Delineator and Object Marker Posts" Material Producer List for approved devices.
2. Install per manufacturer's recommendations.
3. Post length may vary to meet field conditions.
4. When using yellow delineators with flexible posts to separate opposing direction of travel, such as centerline or median use, the flexible posts shall be yellow.

WEDGE ANCHOR SYSTEMS

WAS



WAP



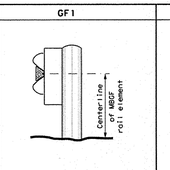
STEEL | PLASTIC

NOTE
1. Install per manufacturer's recommendations.

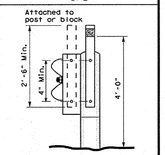
TYPE OF BARRIER MOUNTS

GUARD FENCE ATTACHMENT

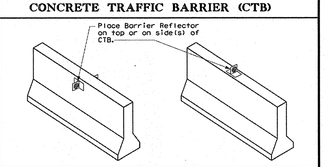
GF1



GF2

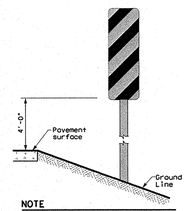


CONCRETE TRAFFIC BARRIER (CTB)



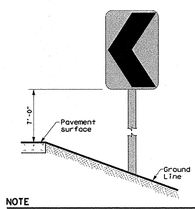
GENERAL NOTES
1. Place delineators on a section of roadway at a consistent distance from the edge of pavement.
2. Where a restriction prevents consistent placement from the pavement edge, place the affected object markers in line with the innermost edge of the obstruction.
3. When Type 2 object markers and delineators are more than 8'-0" from the edge of the pavement, it may not be possible to maintain a height of approximately 4'-0". If this is the case, place the object marker or delineator as close to the desired height as possible.
4. Install all delineators, object markers and barrier reflectors in accordance with the manufacturer's recommendation.
5. Barrier reflectors should be installed a minimum of 18 inches above the edge of the pavement surface.
6. Diagonal stripes on Type 3 object markers shall slope down toward the intended travel lane.

TYPES 1, 3, AND 4 OBJECT MARKERS AND CHEVRONS



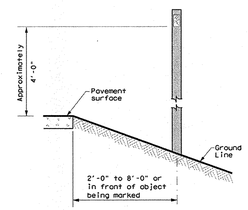
NOTE
Mounting at 4 feet to the bottom of the chevron is permitted for chevrons that will not exceed a height of 6'-6" to the top of the chevron (sizes 24" x 30" and smaller)

CHEVRONS AND ONE DIRECTION LARGE ARROW SIGN



NOTE
Chevrons 30" x 36" and larger shall be mounted at a height of 7' to the bottom of the chevron. Chevron sign and ONE DIRECTION LARGE ARROW sign (W1-9T) shall be installed per SMD standard sheets and paid under Item 644.

DELINEATORS AND TYPE 2 OBJECT MARKERS



See general notes 1, 2 and 3.

Texas Department of Transportation — Traffic Safety Division Standard

DELINEATOR & OBJECT MARKER INSTALLATION
D & OM(2)-20

FILE: dom2-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
©TxDOT August 2004	CONT	SECT	JOB	HIGHWAY
REVISIONS				
10-09 3-15	DIST	COUNTY		SHEET NO.
4-10 7-20				

20B

KFW ENGINEERS + SURVEYING
3421 Pleasanton Pkwy, Suite 200, San Antonio, TX. 78221
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE:

REVISIONS:

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

TXDOT LANE DELINEATOR DETAILS

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
5.5

Date: Oct 28, 2022, 10:45am User ID: fthompson
File: N:\479\08\01\Design\Civil\STREETS\ST479090I — DECEL LANE.dwg

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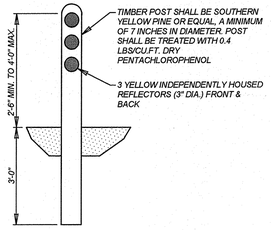
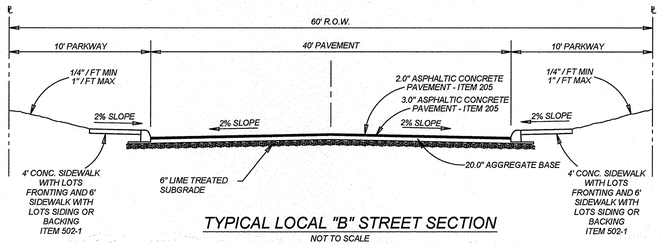


TIMBER GUARD POST DETAIL

NOT-TO-SCALE



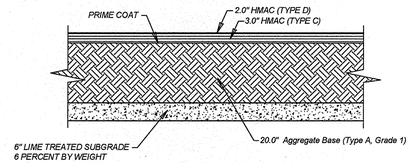
TYPICAL LOCAL "B" STREET SECTION

NOT TO SCALE

USE LOCAL "B" STREET SECTION FOR ALL STREETS IN THIS PROJECT.

PUNTA VERDE AVENUE STA: 1+00.00 TO END
CHOFAS STREET STA: 2+40.00 - 8+14.17

Pavement Section
2.0" HMAC Type "D"
3.0" HMAC Type "C"
20.0" Aggregate Base (Type A, Grade 1)
6.0" Lime Treated Subgrade(6% by weight 35lbs/S.Y.)
Total: 31.0"
Structural No: 4.97
CBR: 2.0



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

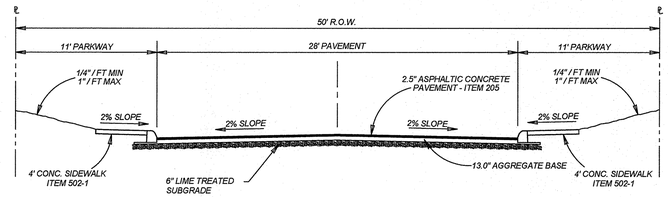
DETAIL FOR ALL LOCAL TYPE B

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY TTL, INC. PROJECT NO. 00210902427.03 DATED 11/14/2022

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. CONTRACTOR MAY LEAVE VERTICAL CUT BANKS AT R.O.W. LINE AND MEDIANS PROVIDED PROJECT GEOTECHNICAL ENGINEER DETERMINES ROCK IS COMPETENT TO STAND ON ITS OWN.



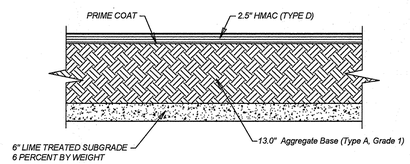
TYPICAL LOCAL "A" STREET SECTION

NOT TO SCALE

USE LOCAL "A" STREET SECTION FOR ALL STREETS IN THIS PROJECT.

JAGGER AVENUE / NACHICO PLACE STA: 1+46.00 TO END
TIJUANA STREET / SANCHO PANZA PLACE STA: 24+63.13 - 31+09.84
JUAN JONES ROAD STA: 1+00.00 TO END

Pavement Section
2.5" HMAC Type "D"
13.0" Aggregate Base (Type A, Grade 1)
6.0" Lime Treated Subgrade(6% by weight 35 lbs/S.Y.)
Total: 21.5"
Structural No: 2.88
CBR: 2.0



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE A

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY TTL, INC. PROJECT NO. 00210902427.03 DATED 11/14/2022

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

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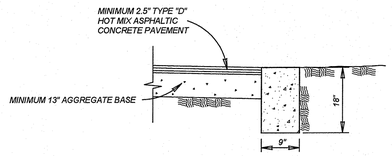
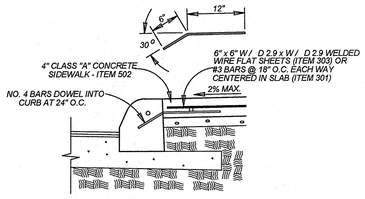


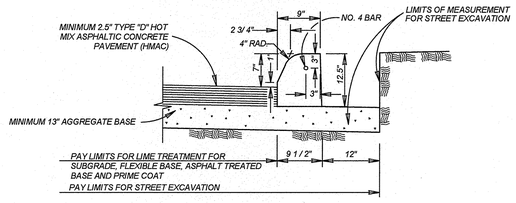
HEADER CURB

ITEM 500 ON SAND OR GRAVEL
NOT TO SCALE



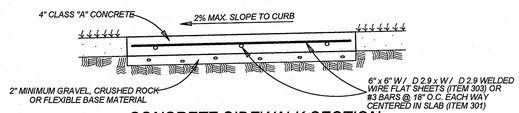
CONCRETE SIDEWALK ABUTTING CURB SECTION

ITEM 502
NOT TO SCALE



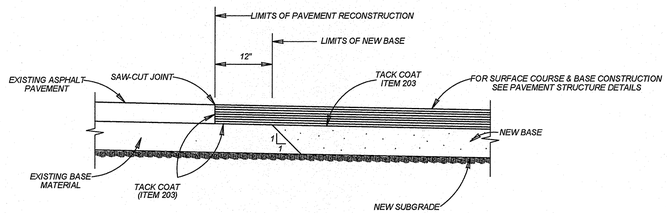
CONCRETE CURB

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



CONCRETE SIDEWALK SECTION

ITEM 502
NOT TO SCALE



PAVEMENT JUNCTION DETAILS

NOT TO SCALE

GENERAL NOTES:

1. THE SUBGRADE SOILS SHOULD BE TESTED FOR SOLUBLE SULPHATE CONTENT PRIOR TO INSTALLATION OF THE LIME OR CEMENT.

2. THE APPLICATION RATE OF LIME SHALL BE DETERMINED BASED ON LABORATORY TESTING AND SHALL BE THE LOWEST PERCENTAGE OF LIME THAT PROVIDES AN UNCONFINED COMPRESSIVE STRENGTH (UCS) AT 7-DAYS OF AT LEAST 160 PSI IN ACCORDANCE WITH ASTM D5102 STANDARD TEST METHODS FOR UNCONFINED COMPRESSIVE STRENGTH OF COMPACTED SOIL-LIME MIXTURES (PROCEDURE B) (IN ADDITION, CURING SHOULD OCCUR FOR 7 DAYS AT 40° AND SPECIMENS SHOULD BE SUBJECT TO 24-HR CAPILLARY SOAK PRIOR TO TESTING.

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 ½" 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 2.0 OR GREATER
- SHOULD NOT HAVE GRAVELS LARGER THAN 2.5 INCH IN SIZE
- SHOULD HAVE THE "LIME PERCENTAGE/APPLICATION RATE" RE-RUN PRIOR TO INSTALLATION
- PI SHOULD BE LESS THAN 20

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 8513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
STEPHAN MORENO
144886
LICENSED PROFESSIONAL ENGINEER
11/23/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

TYPICAL STREET DETAILS

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.6

Date: Nov 23, 2022, 2:27pm User ID: smoreno
File: N:\479\09\01\Design\Civil\STREETS\STD1479090l.dwg

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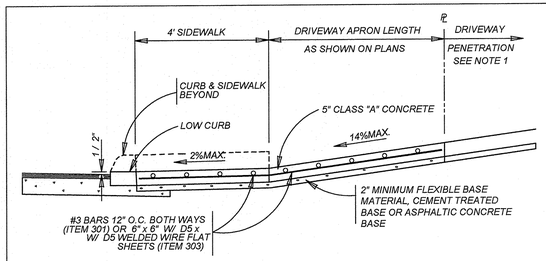
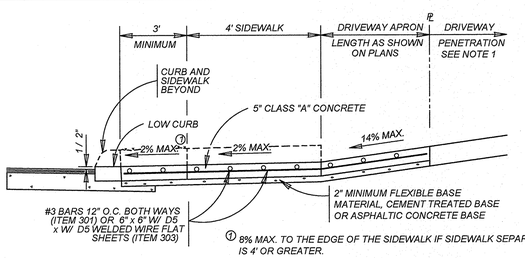


TYPICAL RESIDENTIAL DRIVEWAY SECTION

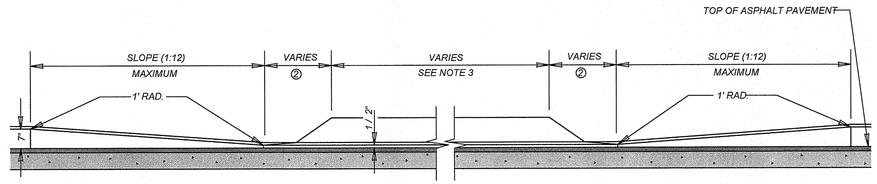
WITH SIDEWALK ABUTTING CURB
ITEM 503.1



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

TYPICAL RESIDENTIAL DRIVEWAY SECTION

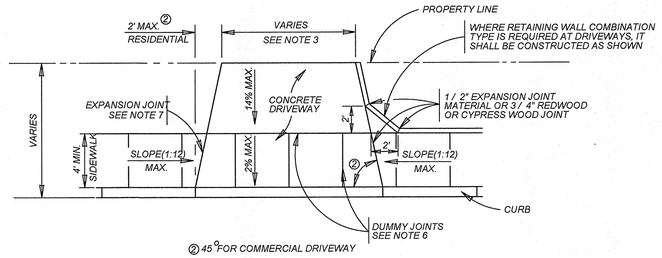
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1



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

CURB PROFILE AT DRIVEWAY

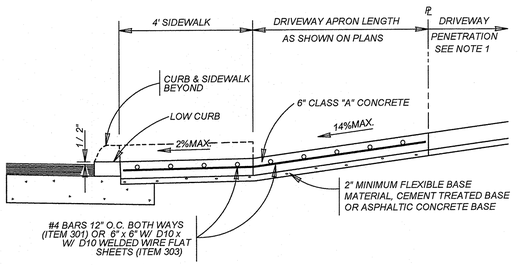
WITH SIDEWALK ABUTTING CURB



② 45° FOR COMMERCIAL DRIVEWAY

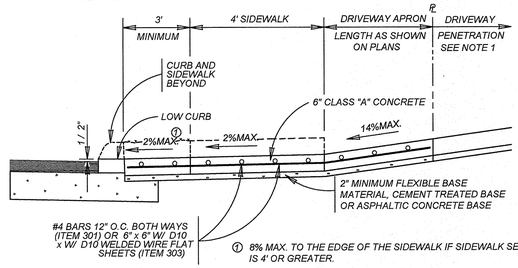
TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK ABUTTING CURB



TYPICAL COMMERCIAL DRIVEWAY SECTION

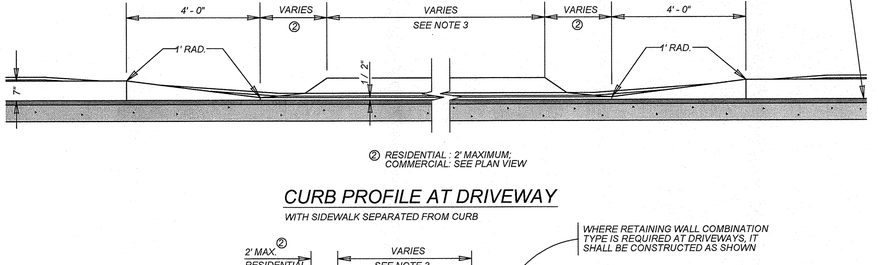
WITH SIDEWALK ABUTTING CURB
ITEM 503.2



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

TYPICAL COMMERCIAL DRIVEWAY SECTION

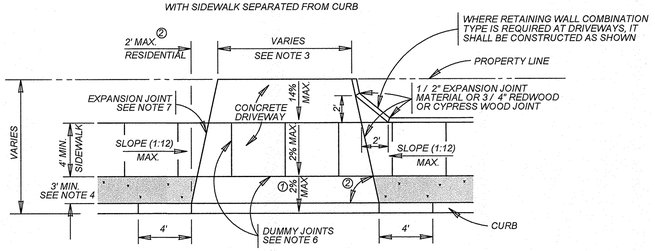
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2



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° FOR COMMERCIAL DRIVEWAY

TYPICAL DRIVEWAY PLAN VIEW

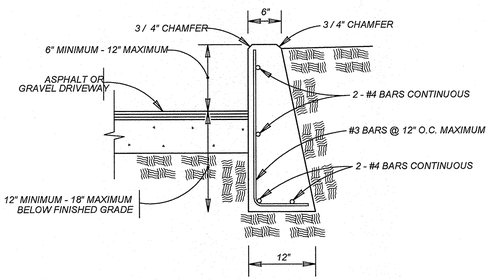
WITH SIDEWALK SEPARATED FROM CURB

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

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

KFW
ENGINEERS + SURVEYING
4121 Broadway, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

REVISIONS | ISSUE DATE

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
05/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

CONCRETE DRIVEWAY DETAILS

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.7

Date: Oct 28, 2022, 10:46am User ID: Thompson
File: N:\479 (Job Nº)\01 Design (Dirs)\STREETS\STD\479090l.dwg

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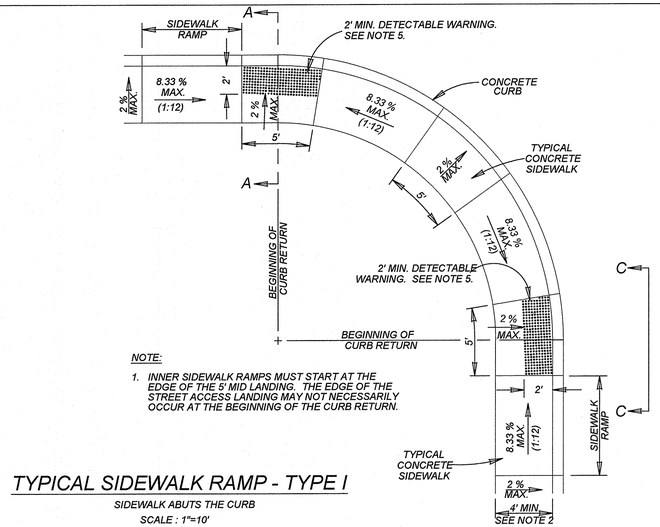
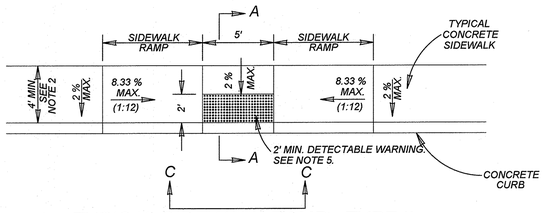


NOTE:

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.

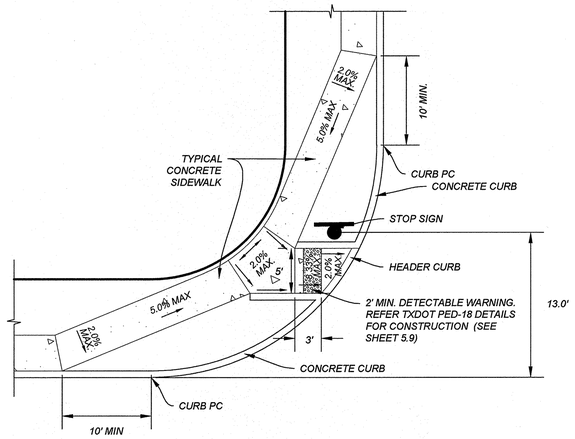
TYPICAL SIDEWALK RAMP - TYPE I

SIDEWALK ABUTS THE CURB
SCALE : 1"=10'



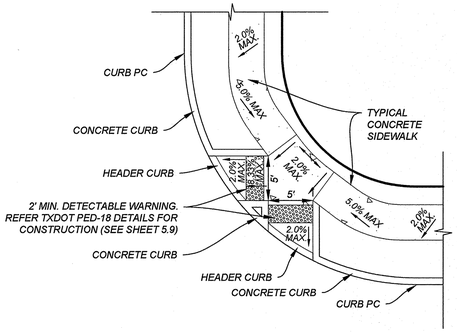
TYPICAL SIDEWALK RAMP - TYPE II

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



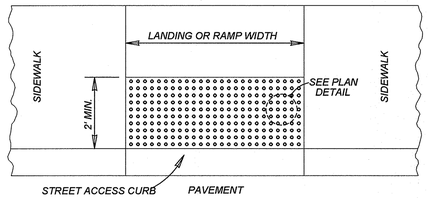
SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SDWCR)

NOT TO SCALE



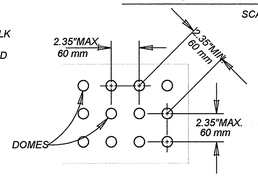
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (DDWCR)

NOT TO SCALE



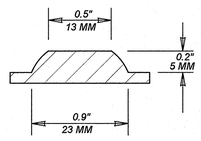
DETECTABLE WARNING SURFACE

SCALE : 1"=4'



PLAN DETAIL

NO SCALE

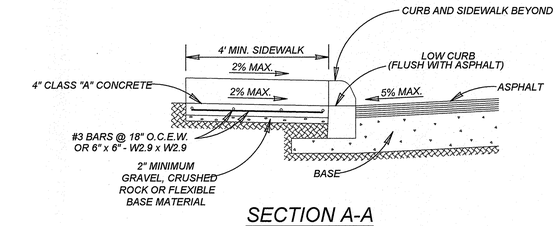


DOME SECTION

NO SCALE

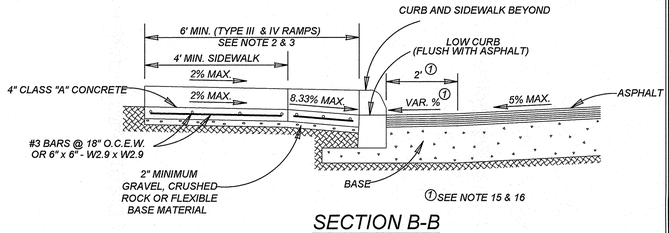
GENERAL NOTES

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-05, 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.



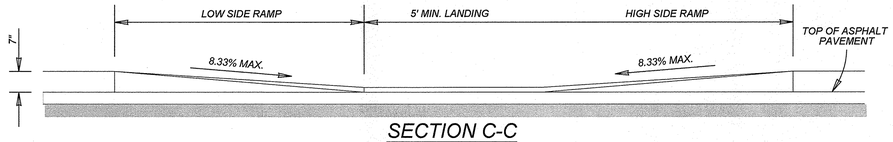
SECTION A-A

SCALE : 1"=4'



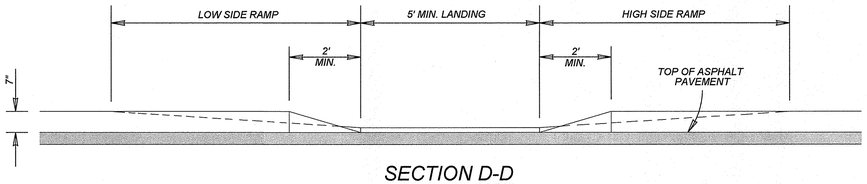
SECTION B-B

SCALE : 1"=4'



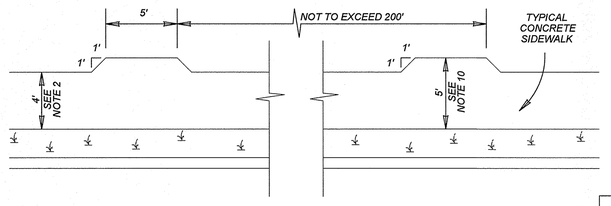
SECTION C-C

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.

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____

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200 • San Antonio, Texas 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 8515 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/23/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
WHEELCHAIR RAMP DETAILS

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.8

Date: Oct 28, 2022, 10:47am User ID: fthompson
File: N:\479\09\01\Design\Civil\STREETS\STD\1479090I.dwg

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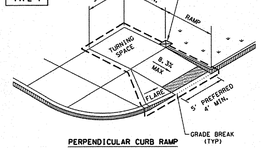
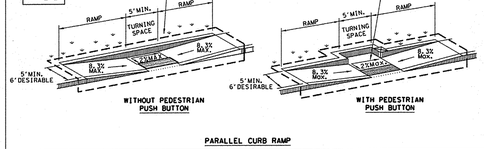
TYPE 1



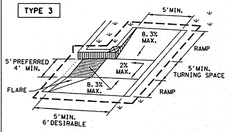
PERPENDICULAR CURB RAMP

TYPE 2

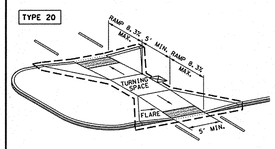


PARALLEL CURB RAMP

TYPE 3



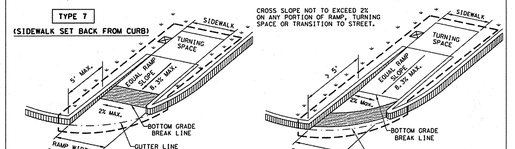
TYPE 20



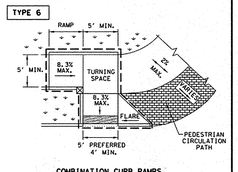
CURB RAMPS AT MEDIAN ISLANDS

TYPE 7

(SIDEWALK SET BACK FROM CURB)



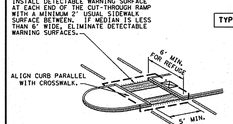
TYPE 6



COMBINATION CURB RAMPS

TYPE 21

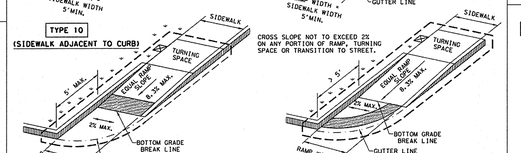
INSTALL DETECTABLE WARNING SURFACE ON FACE OF CURB THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.



NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

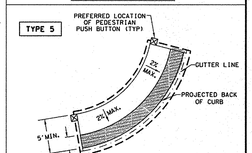
TYPE 10

(SIDEWALK ADJACENT TO CURB)



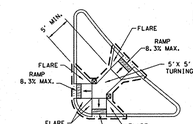
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 5

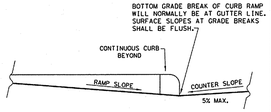


BLENDED TRANSITION (FLUSH LANDING)

TYPE 22



COMBINATION ISLAND RAMPS



TYPICAL SECTION OF PERPENDICULAR CURB RAMP AT CONNECTION TO ROADWAY

NOTES / LEGEND:

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

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

DETECTABLE WARNING SURFACE

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE.

GUTTER LINE

GRADE BREAK

RAMP LIMITS OF PAYMENT

SHEET 1 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	CK:	DW:	CK:
© TxDOT: MARCH, 2002	CONT:	SECT:	JOB:	HIGHWAY:
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	DIST:	COUNTY:		SHEET NO.

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DATED:
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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, right reflective value and texture may be found in the latest draft of the Proposed Guidelines for Pedestrian Facilities in the Public Right of Way (PROWAG) as published by the U.S. Architectural and Transportation Barriers Compliance Board (Access Board).
9. To serve as a pedestrian refuge area, the median should be a minimum of 6' wide, measured from back of curbs. Medians should be designed to provide accessible passage over or through them.
10. Small channelization islands, which do not provide a minimum 5'x 5' landing at the top of curb ramps, shall be cut through level with the surface of the street.
11. Crosswalk dimensions, crosswalk markings and stop bar locations shall be as shown elsewhere in the plans. At intersections where crosswalk markings are not required, curb ramps shall align with theoretical crosswalks unless otherwise directed.
12. Provide curb ramps to connect the pedestrian access route at each pedestrian street crossing. Handrails are not required on curb ramps.
13. Curb ramps and landings shall be constructed and paid for in accordance with Item 531 "Sidewalks".
14. Place concrete at a minimum depth of 5" for ramps, flares and landings, unless otherwise directed.
15. Furnish and install No. 3 reinforcing steel bars at 18" o.c. both ways, unless otherwise directed.
16. Provide a smooth transition where the curb ramps connect to the street.
17. Curbs shown on sheet 1 within the limits of payment are considered part of the curb ramp for payment, whether it is concrete curb, gutter, or combined curb and gutter.
18. Existing features that comply with applicable standards may remain in place unless otherwise shown on the plans.

DETECTABLE WARNING MATERIAL

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

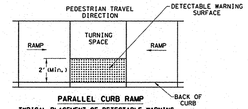
DETECTABLE WARNING PAVERS (IF USED)

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

SIDEWALKS

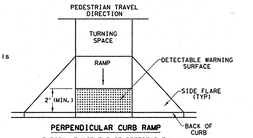
27. Provide clear ground space at operable parts, including pedestrian push buttons. Operable parts shall be placed within unobstructed reach range specified in PROWAG section R406.
28. Place traffic signal or illumination poles, ground boxes, controller boxes, signs, drainage facilities and other items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

DETECTABLE WARNING SURFACE DETAILS



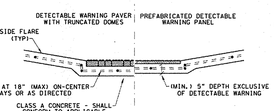
PARALLEL CURB RAMP

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

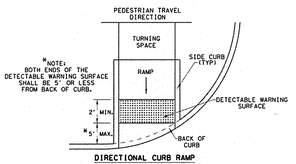


PERPENDICULAR CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.



SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS



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

DIRECTIONAL CURB RAMP

TYPICAL PLACEMENT OF DETECTABLE WARNING SURFACE ON SLOPING RAMP RUN.

SHEET 2 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

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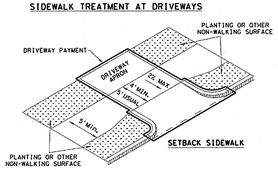
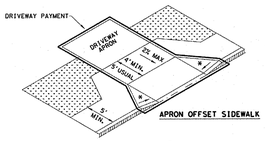
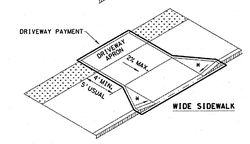
SIDEWALK TREATMENT AT DRIVEWAYS



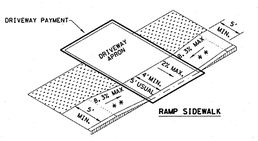
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



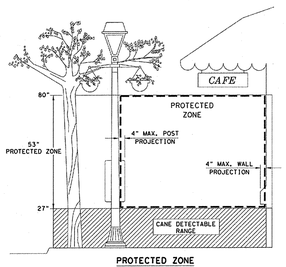
WIDE SIDEWALK



RAMP SIDEWALK

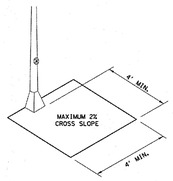
NOTES:
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

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

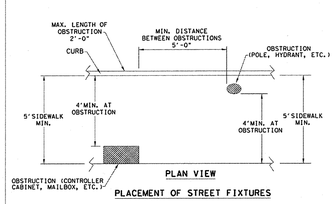


PROTECTED ZONE

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



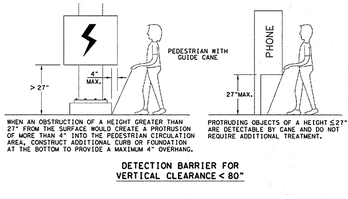
CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



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.



DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	CK:	DW:	CK:
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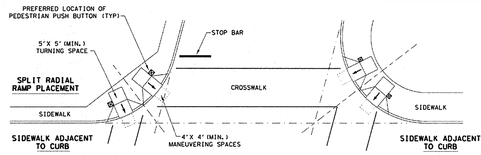
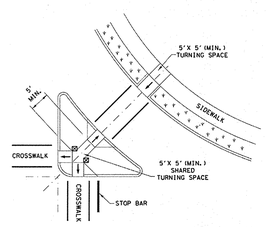
TYPICAL CROSSING LAYOUTS

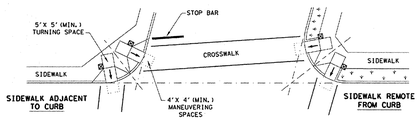
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



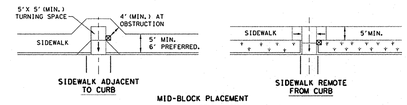
SKEWED INTERSECTION WITH "LARGE" RADIUS



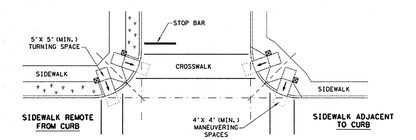
AT INTERSECTION W/FREE RIGHT TURN & ISLAND



SKEWED INTERSECTION WITH "SMALL" RADIUS



MID-BLOCK PLACEMENT PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

LEGEND:

SHOWS DOWNWARD SLOPE.

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

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

SHEET 4 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

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

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TBPE Firm #: 8613 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

TXDOT PEDESTRIAN CURB RAMP DETAIL

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
5.9

Date: Oct 28, 2022, 10:47am User ID: thompson
File: N:\479\09\01\Design\Civil\STREETS\STD74790901.dwg

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TRENCH EXCAVATION SAFETY PROTECTION

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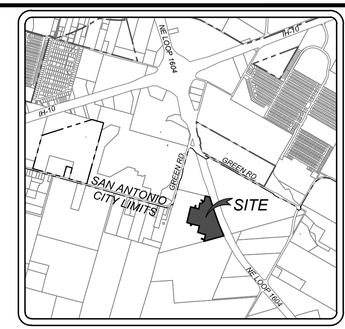
LEGEND

- (I) = WHEELCHAIR RAMP TYPE I SEE SHEET 5.8
- (II) = WHEELCHAIR RAMP TYPE II SEE SHEET 5.8
- SDW = SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.8
- DDW = DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.8
- = SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- = PROPOSED DRIVEWAY LOCATION



LOCATION MAP
N.T.S.

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

OROVEST HOLDINGS LLC.
UNPLATTED REMAINING PORTION OF
70.38 ACRES
(VOL. 13178, PAGE 1340, O.P.R.)

BLOCK 17 CB 5088
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

OFF-LOT 50'X60' E.G.T.TV., WATER, SANITARY SEWER AND DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET RIGHT-OF-WAY)

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

10' E.G.T.TV.E.

CHOFAS STREET
(60' R.O.W.)

(3) 531.56 OM4-3

SDW DDW

BLOCK 15 CB 5088
1 2 3 4 5 6 7

PUNTA VERDE AVENUE
(60' R.O.W.)

BLOCK 16 CB 5088
80 79 78 77 76 75 74 73
81 82 83 84 85 86

PUNTA VERDE AVENUE
PUNTA VERDE AVENUE
CHOFAS STREET
STOP 531.3 R1-1

NO OUTLET W14-2a 531.60
CHOFAS STREET
JAGGER AVENUE
STOP 531.3 R1-1

JAGGER AVENUE
(60' R.O.W.)

BLOCK 16 CB 5088
37 38 39 40 41 42 43

OFF-LOT 50'X60' E.G.T.TV., WATER, SANITARY SEWER AND DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET RIGHT-OF-WAY) (0.07 AC.) (PERMEABLE)

OROVEST HOLDINGS LLC.
UNPLATTED REMAINING PORTION OF
70.38 ACRES
(VOL. 13178, PAGE 1340, O.P.R.)

GREEN ROAD 1604 PARTNERS LLC
CALLED 22.901 ACRES
(VOL. 13802, PAGE 2236, O.P.R.)

20' WATER EASEMENT

30' SANITARY SEWER EASEMENT

EXIST. 12" WATER EASEMENT (PLAT NO. 21-11800585)

EXIST. 30' SANITARY SEWER EASEMENT (PLAT NO. 21-11800585)

MATCHLINE "B" THIS SEE SHEET

VARIABLE WIDTH GAS, AND ACCESS EASEMENT

VARIABLE WIDTH SANITARY SEWER, WATER, DRAINAGE, ELECTRIC, GAS, TELEPHONE, & CABLE T.V., & MAINTENANCE ACCESS EASEMENT

VARIABLE WIDTH GAS, AND ACCESS EASEMENT

LOT 903

MATCHLINE "A" SEE SHEET 5.11

MATCHLINE "B" SEE THIS SHEET

GREEN ROAD 1604 PARTNERS LLC
CALLED 22.901 ACRES
(VOL. 13802, PAGE 2236, O.P.R.)

EXISTING OFF-LOT 20' PUBLIC WATER EASEMENT (PLAT NO. 21-11800585)

OFF-LOT 30' PUBLIC SANITARY SEWER EASEMENT (PLAT NO. 21-11800585)

GREEN ROAD 1604 PARTNERS LLC
CALLED 4.34 ACRES
(VOL. 13802, PAGE 2236, O.P.R.)

E 48"SS

E 8"W

OFF-LOT 30' PUBLIC SANITARY SEWER EASEMENT (PLAT NO. 21-11800585)

GREEN ROAD 1604 PARTNERS LLC
CALLED 22.901 ACRES
(VOL. 13802, PAGE 2236, O.P.R.)

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: (210) 979-8444 • Fax: (210) 979-8441
TBPE Firm # 9513 • TBPLS Firm # 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
STEPHAN MORENO
144886
LICENSED
PROFESSIONAL ENGINEER
11/15/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
TRAFFIC SIGNAGE & PEDESTRIAN ACCESSIBILITY PLAN (SHT 1 OF 2)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
5.10

Date: Nov 15, 2022, 10:38pm User ID: smoreno
File: N:\479\09\01\Design\Civil\STREETS\Cad\479090901.dwg

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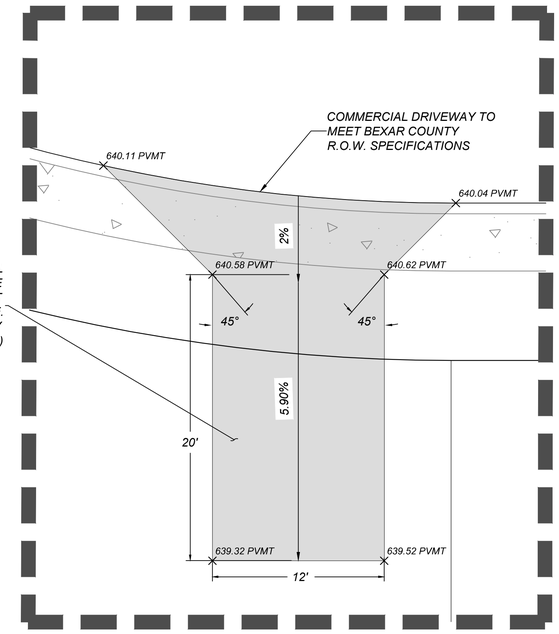

DETAIL "A"
SCALE: 1" = 5'

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

LEGEND

- (I) = WHEELCHAIR RAMP TYPE I SEE SHEET 5.8
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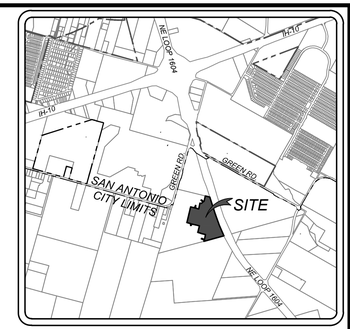
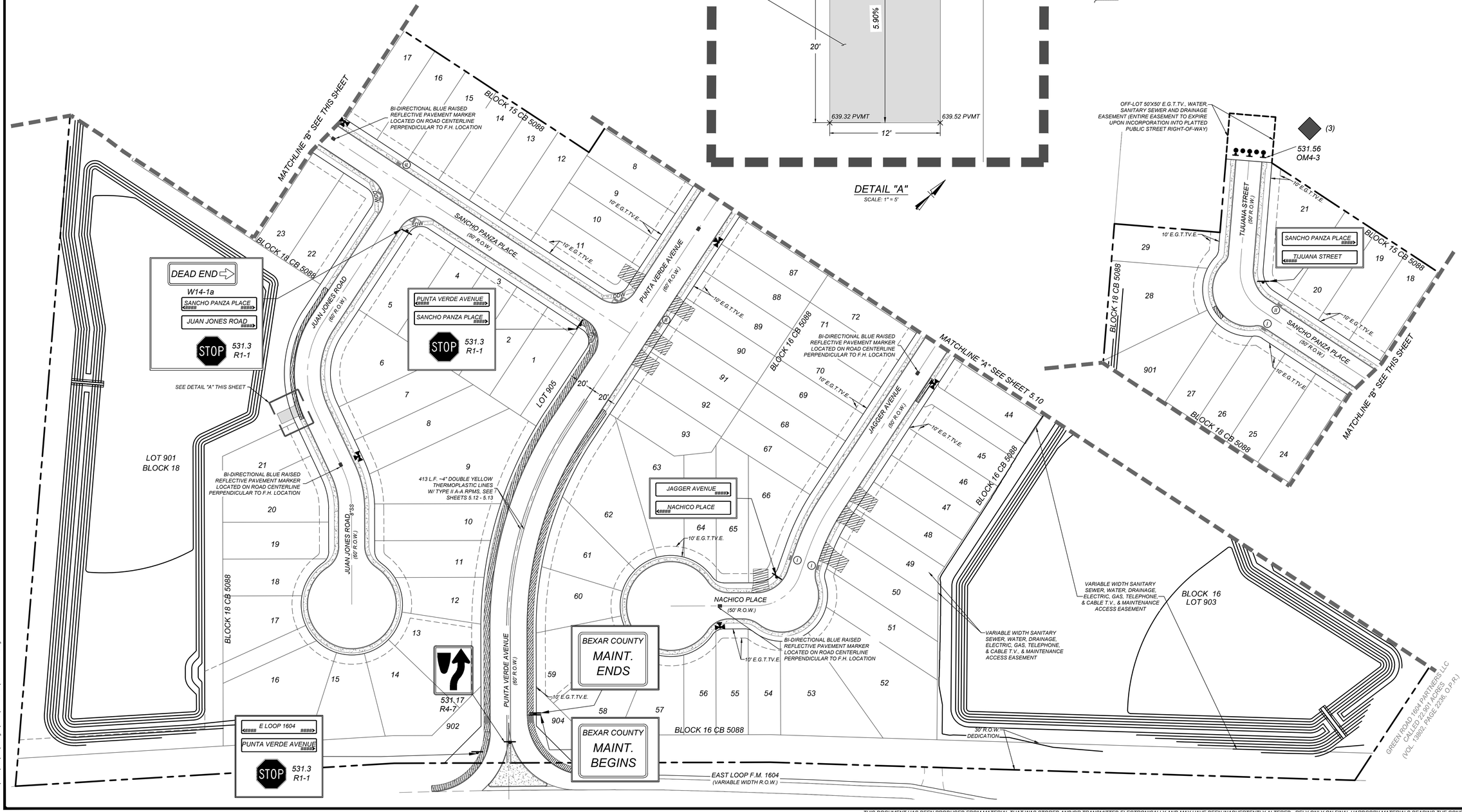


LOCATION MAP
N.T.S.



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Phone: 210.979.8444 • Fax: 210.979.8441
TBPE Firm # 9513 • TBPLS Firm # 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
STEPHAN MORENO
144886
LICENSED PROFESSIONAL ENGINEER
11/15/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
TRAFFIC SIGNAGE & PEDESTRIAN ACCESSIBILITY PLAN (SHT 2 OF 2)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.11

Date: Nov 15, 2022, 10:39pm User ID: smoreno
File: N:\479\09\01\Design\Civil\SHEETS\05-479090901.dwg

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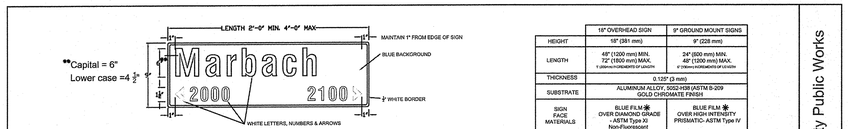
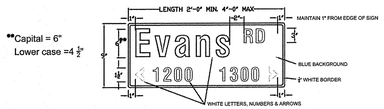
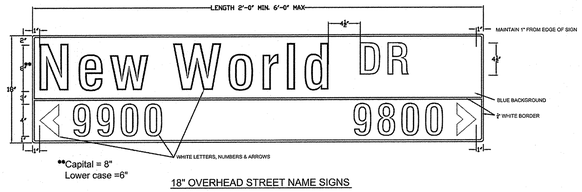


9" GROUND MOUNT STREET NAME SIGNS



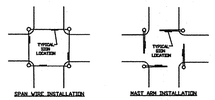
9" GROUND MOUNT STREET NAME SIGNS
WITH STREET DESIGNATION



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. 6" (300mm) INCREMENTS OF LENGTH	24" (600 mm) MIN. 48" (1200 mm) MAX. 6" (300mm) 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

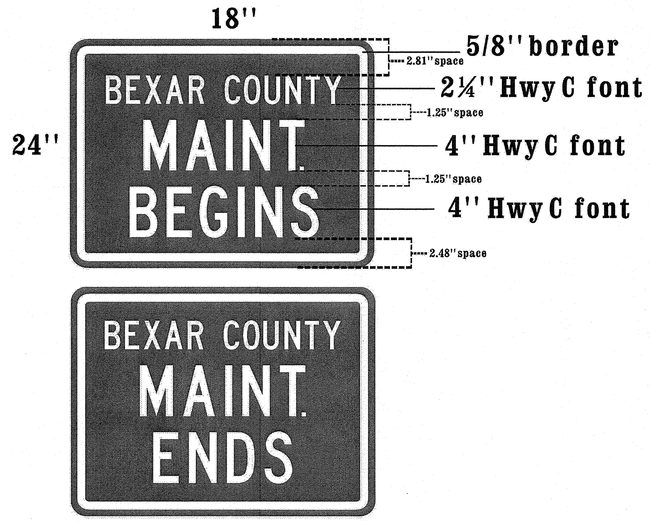
MAST ARM INSTALLATION

SIGN FACE MATERIALS SHALL CONFORM TO:

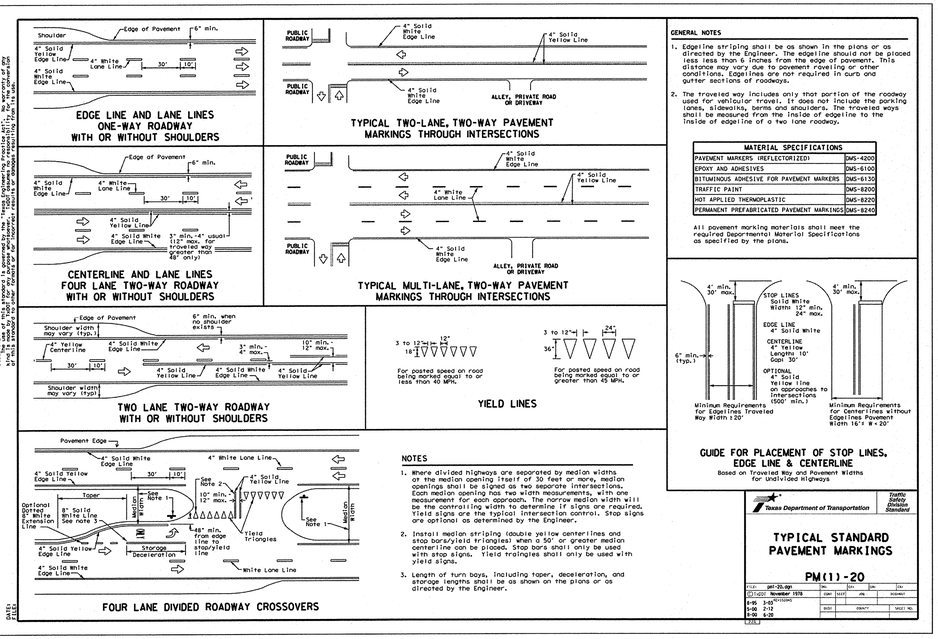
1. STANDARD SPECIFICATIONS FOR CONSTRUCTION OF ROADS & BRIDGES ON FEDERAL HIGHWAY PROJECTS - FP-03 U.S. CUSTOMARY UNITS SECTION 718
2. GENERAL SERVICES ADMINISTRATION FEDERAL SPECIFICATIONS L-S-300C
3. ASTM D 4956 - 09e1

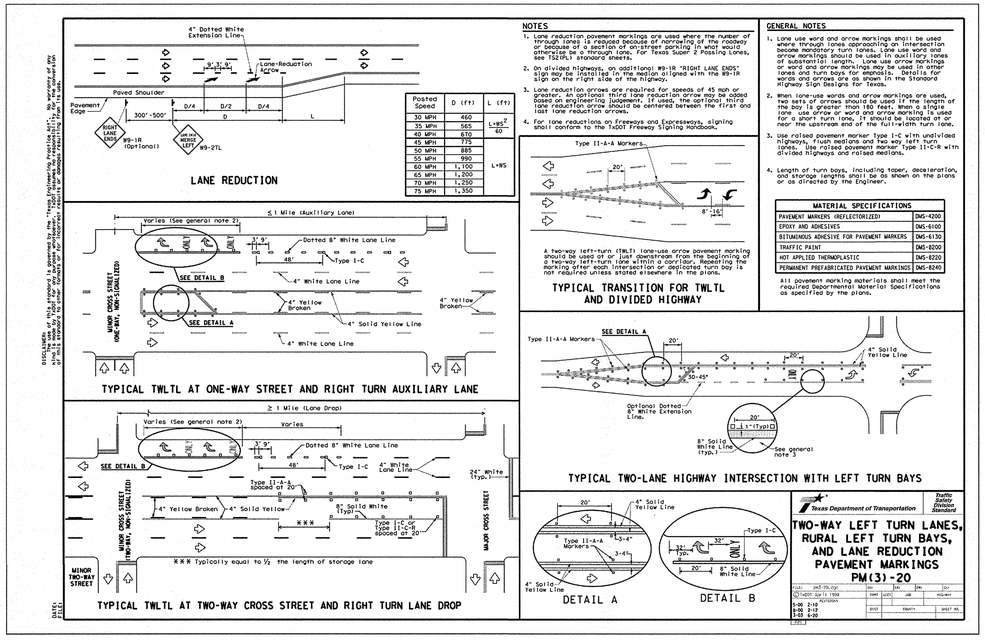
Bexar County Public Works

Street Name Sign Details



18"x 24"
White Prismatic Background
Green Overlay Film
Hwy C lettering





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10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

TRAFFIC SIGNAGE DETAILS (SHEET 1 OF 3)

PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
5.12

Date: Oct 28, 2022, 10:49am User ID: rthompson
File: N:\479\09\01\Design\Civil\STREETS\TSD14790901.dwg

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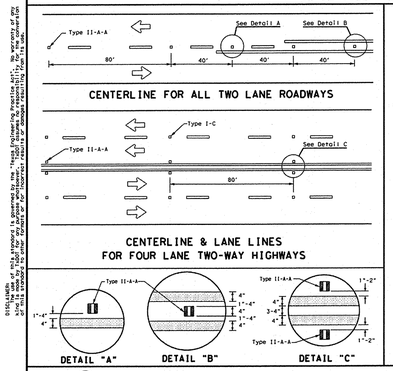
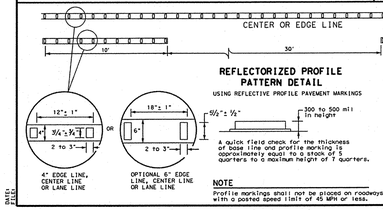
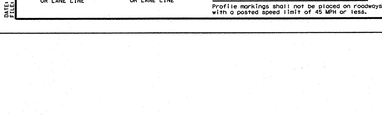
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

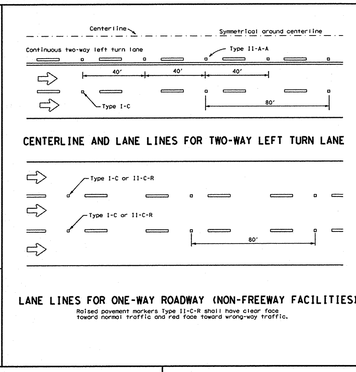


CENTERLINE FOR ALL TWO LANE ROADWAYS

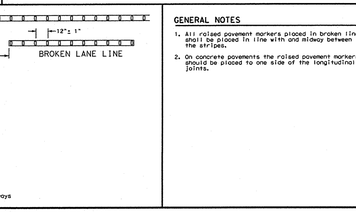


CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY HIGHWAYS





CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

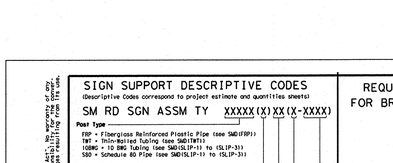


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.

REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS



A quick field check for the thickness of base line and profile marking is approximately equal to a stack of 5 quarters to a maximum height of 7 quarters.

NOTE

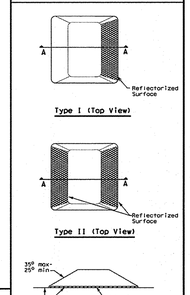
Profile markings shall not be placed on roadways with a posted speed limit of 45 MPH or less.

GENERAL NOTES

1. All raised pavement markers placed in broken lines shall be placed in line with and midway between the stripes.
2. On concrete pavements the raised pavement markers should be placed to one side of the longitudinal joints.

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

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



RAISED PAVEMENT MARKERS

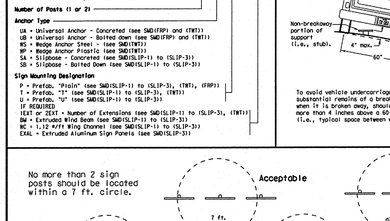
Texas Department of Transportation — Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS PM(2)-20

FILE:	pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT April 1997		CONT	SECT	JOB	HIGHWAY
4-92 2-10 5-00 2-12 8-00 5-20	REVISIONS	DIST	COUNTY		SHEET NO.

26B

TYPICAL SIGN ATTACHMENT DETAIL



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

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

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

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

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

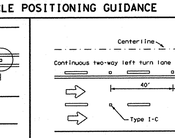
Post Type
- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thin-Walled Tubing (see SMD(TWT))
- 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
- S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

Number of Posts (1 or 2)

Anchor Type
- UA = Universal Anchor - Concreted (see SMD(FRP) and (TWT))
- UB = Universal Anchor - Bolted down (see SMD(FRP) and (TWT))
- BS = Wedge Anchor Steel (see SMD(TWT))
- BA = Wedge Anchor Stainless Steel (see SMD(TWT))
- SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
- P = Prefab, "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
- T = Prefab, "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
- U = Prefab, "U" (see SMD(SLIP-1) to (SLIP-3))
- IF = DELETED
- IEXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
- BM = Extruded Wind Beam (see SMD(SLIP-1) to (SLIP-3))
- WC = 1.12 #/ft Wing Channel (see SMD(SLIP-1) to (SLIP-3))
- EXAL = Extruded Aluminum Sign Panels (see SMD(SLIP-3))

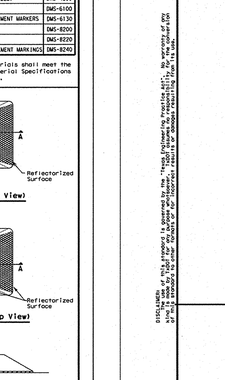
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



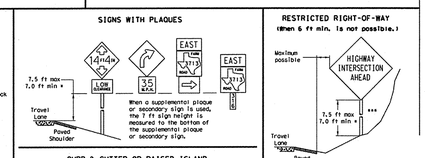
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

SIGN LOCATION

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



- Signs shall be mounted using the following condition that results in the greatest sign elevation:
  - (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
  - (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on the backslope.
- The maximum values may be increased when directed by the Engineer.
- See the Traffic Operations Division website for detailed drawings of sign clamps, Triangular Slipbase System components and Wedge Anchor System components.
- The website address is: http://www.txdot.gov/publications/traffic.htm



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

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

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

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

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS SMD(GEN)-08

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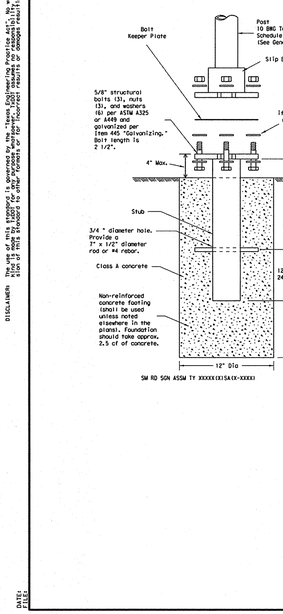
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

26A

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

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

GENERAL NOTES:

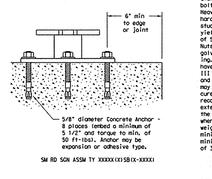
1. Slip base shall be permanently marked to indicate manufacturer, Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   - 10 BWG Tubing (2.375" outside diameter)
     - 0.134" nominal wall thickness
     - Seamless or electric-resistance welded steel tubing or pipe
     - Steel shall be WELAS Gr 70 per ASTM A1011 or ASTM A1008
     - Other steels may be used if they meet the following:
       - 55,000 PSI minimum yield strength
       - 70,000 PSI minimum tensile strength
       - 20% minimum elongation in 2"
     - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
     - Outside diameter (uncoated) shall be within the range of 2.857" to 2.893"
     - Galvanization per ASTM A123 or ASTM A653 G210. For precoated steel tubing (ASTM A653), recoat tube outside diameter weld seam by metallizing with zinc wire per ASTM B833.
   - Schedule 80 Pipe (2.875" outside diameter)
     - 0.276" nominal wall thickness
     - Steel tubing per ASTM A500 Gr C
     - Other seamless or electric-resistance welded steel tubing or pipe with equivalent outside diameter and wall thickness may be used if they meet the following:
       - 46,000 PSI minimum yield strength
       - 62,000 PSI minimum tensile strength
       - 21% minimum elongation in 2"
     - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
     - Outside diameter (uncoated) shall be within the range of 2.855" to 2.895"
     - Galvanization per ASTM A123
3. See the Traffic Operations Division website for detailed drawings of sign clamps and Texas Universal Triangular Slipbase System components. The website address is: http://www.txdot.gov/publications/traffic.htm
4. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

ASSEMBLY PROCEDURE

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

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

CONCRETE ANCHOR



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

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

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM SMD(SLIP-1)-08

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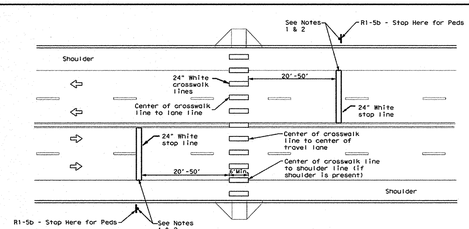
26B

NOTES:

1. Use stop bars with "Stop Here for Pedestrians" signs at unsignalized mid block cross walks.
2. Use stop bars with "Stop Here on Red" signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.



UNSIGNALIZED MID BLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

GENERAL NOTES

1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6' clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be omitted.
3. For divided roadways, adjustments in spacing of the crosswalk lines should be made in the median so that the crosswalk lines are maintained in their proper location across the travel portion of the roadway.
4. At skewed crosswalks, the crosswalk lines are to remain parallel to the lane lines.
5. Each crosswalk shall be a minimum of 6' wide.
6. The High-Visibility Longitudinal Crosswalk is the preferred crosswalk pattern on State Highways. Other crosswalk patterns as shown in the "Texas Manual on Uniform Traffic Control Devices" may be used. All crosswalk designs and dimension shall comply with the "Texas Manual on Uniform Traffic Control Devices."
7. Final placement of Stop Bar and Crosswalk shall be approved by the Engineer in the field.

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.

Texas Department of Transportation — Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS PM(4)-22

FILE:	pm4-22.dgn	DN:	CK:	DW:	CK:
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3-22	REVISIONS	DIST	COUNTY		SHEET NO.

26D

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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

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STATE OF TEXAS
MICHAEL B. RICHARDS
121665
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10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

TRAFFIC SIGNAGE DETAILS (SHEET 2 OF 3)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.13

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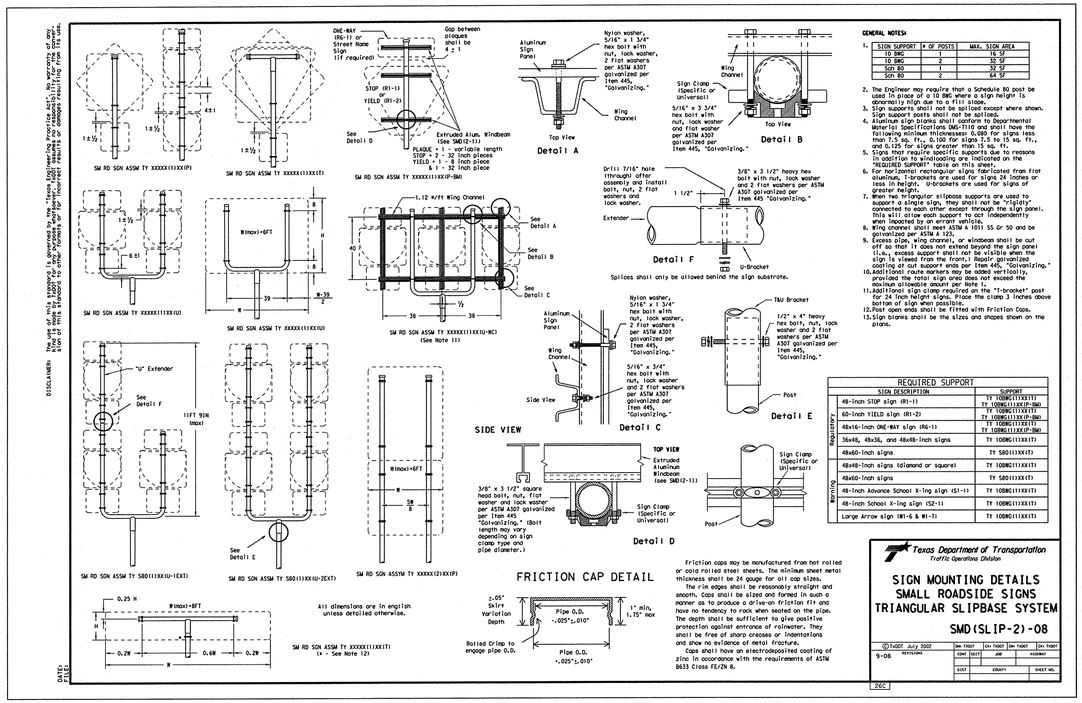

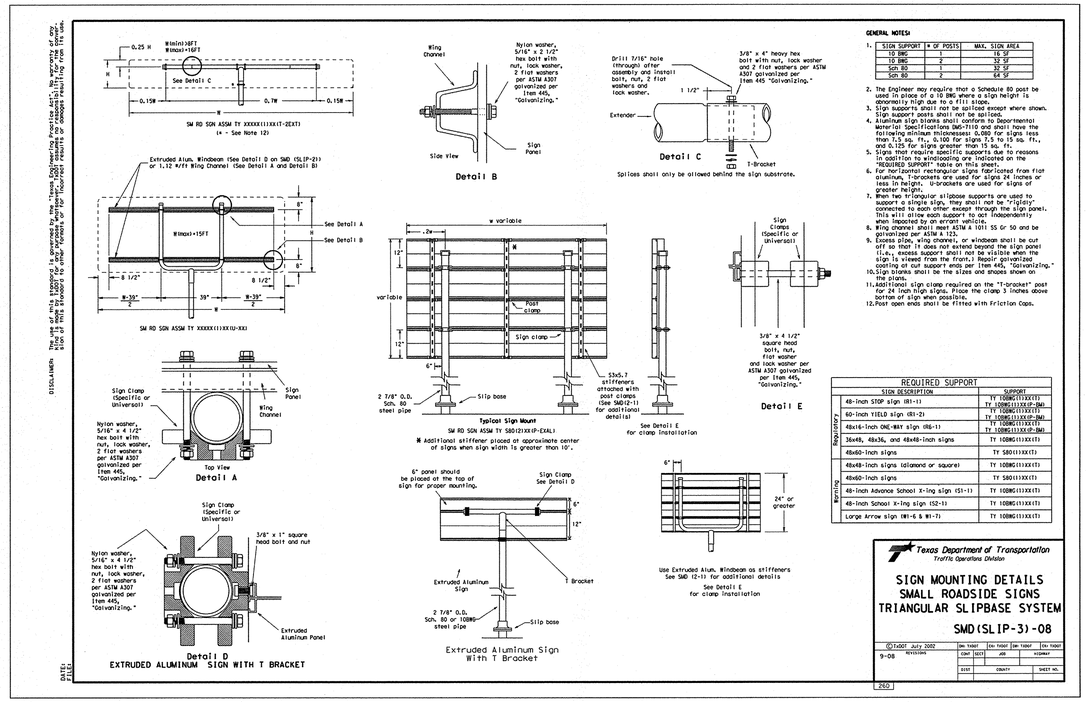

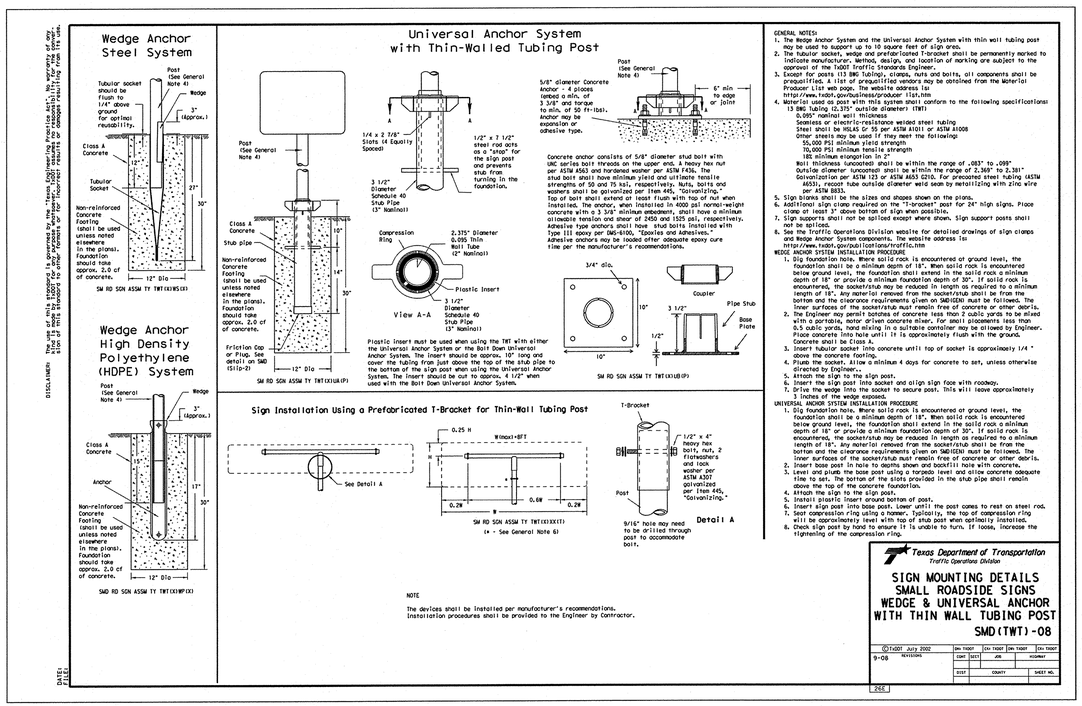

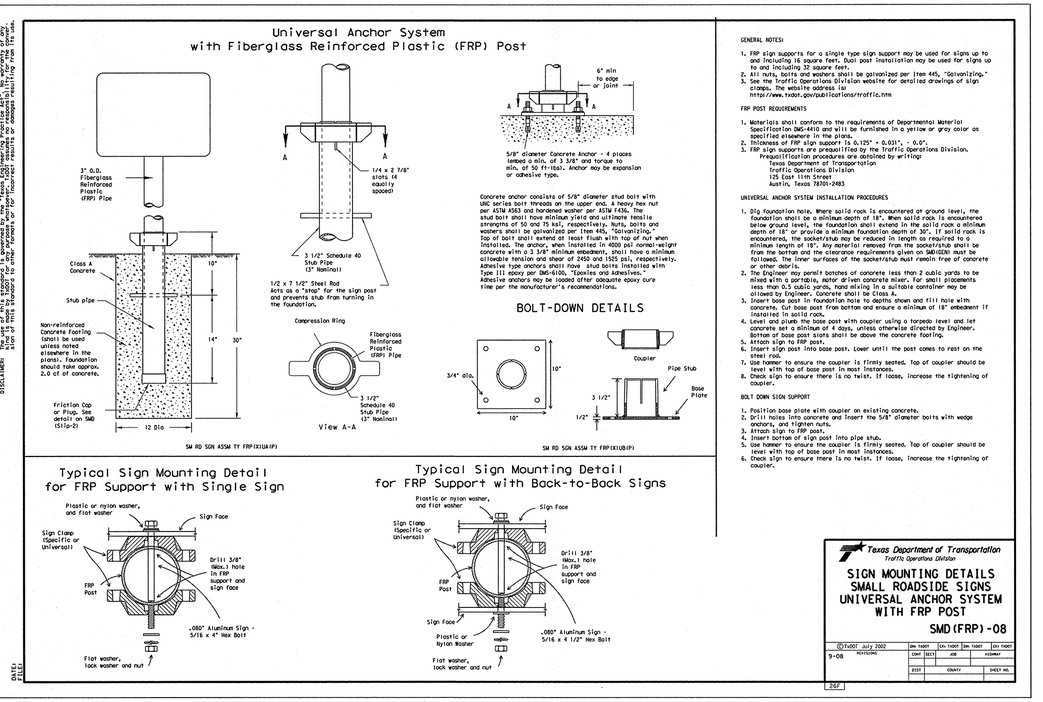

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TBPE Firm #: 1615 • TBPLS Firm #: 10122300

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STATE OF TEXAS
MICHAEL B RICHARDS
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LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
TRAFFIC SIGNAGE DETAILS (SHEET 3 OF 3)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 5.14

Date: Oct 28, 2022, 10:50am User ID: fthompson
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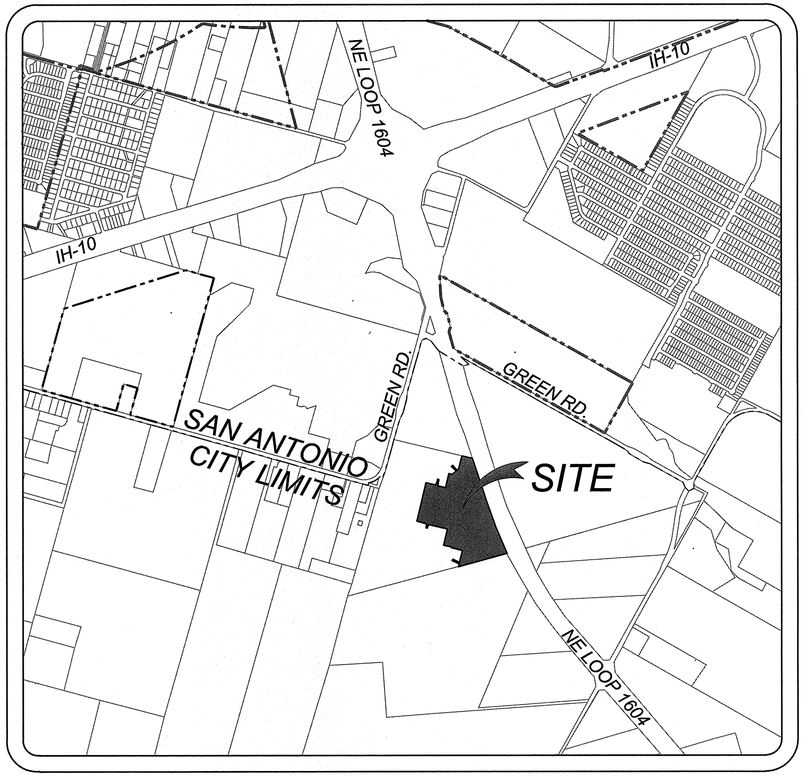
PUNTA VERDE SUBDIVISION UNIT 1

BEXAR COUNTY, TEXAS

SANITARY SEWER IMPROVEMENTS



LOCATION MAP
N.T.S.

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SANITARY SEWER GENERAL NOTES	6.1
SANITARY SEWER GENERAL NOTES	6.2
OVERALL SANITARY SEWER PLAN (SHT 1 OF 2)	6.3
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SANITARY SEWER DETAIL SHEET	6.11

OWNER/DEVELOPER:
GREEN ROAD 1604 PARTNERS, LLC
13750 SAN PEDRO AVENUE, SUITE B10
SAN ANTONIO, TEXAS 78232
(210) 490-7272

SAN ANTONIO RIVER AUTHORITY
100 E. GUENTHER STREET
P.O. BOX 839980
SAN ANTONIO, TEXAS 78283-9980

STATE OF TEXAS
MICHAEL B. RICHARDS
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SAN ANTONIO RIVER AUTHORITY
SANITARY SEWER SYSTEM GENERAL NOTES

The standard specifications and drawing (DD) are provided as a technical resource for engineering professionals for use in design and construction of sewer collection systems projects managed and contracted by the San Antonio River Authority.

At any time these specifications and drawing may be altered or superseded by the general conditions, specific conditions, or drawing within the bid documents issued for each project.

December 9, 2010 - Revise Interceptors Testing
November 2, 2010 - Revise Sewer Pipe SDR 35 to SDR-26 ASTM 115 PSI
September 8, 2010 - Infiltration I/I Coating
July 30, 2009 - Revise Items 10, 11, 13, 14,14B
January 28, 2010 - Revise Sewer Service Laterals (Item 21A, Item 1, 2, 3)
January 22, 2010 - Revise Sewer Line Location (Item 23A, Item 1, 2, 3, 4, 5, 6, 7, 8)
June 11, 2010 -Update Note 11A -Gator Wrap

GENERAL: THE OWNER, DEVELOPER, ENGINEERING FIRM SHALL SUBMIT TO THE SAN ANTONIO RIVER AUTHORITY (SARA) ENGINEER, FOR APPROVAL, TWO (2) COPIES OF ALL PLATS, PLANS AND PROFILES, PLUMBING LAYOUT, WHICH HAVE BEEN DESIGNED AND THE DRAWINGS SEALED BY A REGISTERED PROFESSIONAL ENGINEER. WHEN APPROVED, ONE (1) COPY WILL BE RETURNED TO THE OWNER DEVELOPER, ENGINEERING FIRM, SO MARKED. THE OWNER WILL BE REQUIRED TO MAKE ALL CHANGES INDICATED BY THE SARA ENGINEER, AND RETURN WITH ALL CHANGES, CORRECTIONS, BACK TO SARA FOR APPROVAL.

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY THE SARA AND COMPLY WITH:

   A. CURRENT SARA TECHNICAL SPECIFICATIONS FOR UTILITIES CONSTRUCTION.

   B. TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ), FORMERLY TEXAS NATURAL RESOURCE CONSERVATION COMMISSION (TNRCC), DESIGN CRITERIA FOR SEWAGE SYSTEMS 31 TAC 317.1, 31 TAC 317.2 AND 31 TAC 317.3., 30 TAC & 213, 30 TAC&217.

2. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE SARA INSPECTIONS DIVISION AT (210) 302-4210 OR (210) 663-8561 -- 48 HOURS PRIOR TO ANY EXCAVATION. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD BEFORE ANY EXCAVATION, OR START OF PROJECT.

3. WORK SHALL NOT BE PERFORMED ON SATURDAYS, SUNDAYS OR HOLIDAYS BEFORE 7:30 A.M., OR AFTER 4:30 P.M., UNLESS PRIOR APPROVAL IS GRANTED BY THE SARA ENGINEER. A LETTER WILL NEED TO BE FAXED TO (210) 661-9324 FOR ENGINEER APPROVAL (48) HOURS IN ADVANCE.

   A. THE LOCATIONS AND DEPTHS OF EXISTING UTILITIES TO INCLUDE SURFACE LATERALS, SHOWN IN THESE PLANS ARE APPROXIMATEONLY. IT SHALL BE THE CONTRACTORS RESPONSIBILITY TO LOCATE (POT. HOLE, VERITY LOCATION, ELEVATIONS OF ALL) UTILITYSERVICE LINES 48 HOURS PRIOR TO EXCAVATION AND TO PROTECT THE SAME DURING CONSTRUCTION. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGES OF EXISTING UTILITIES AND REPAIRS WILL BE AT CONTRACTORS EXPENSE.

SAN ANTONIO WATER SYSTEM (WATER)	704-7817		
DRAINAGE	207-5048 1 (800) 828-5127		
CITY PUBLIC SERVICE	973-3500		
TIME WARNER	352-4872		
VALERO ENERGY CO.	349-7555		
SARA (INSPECTIONS)	210-302-4210 or	210- 663-8561	

EXISTING MANHOLES /SEWER

4. CONTRACTOR WILL MAINTAIN SERVICE TO ALL EXISTING SANITARY SEWERS AT ALL TIMES DURING CONSTRUCTION. CONTRACTOR WILL MARK, CLEAN ALL DEBRIS, GRAVEL, DIRT, ETC. OUT OF MANHOLES AND ANY STOPPAGES CAUSED BY DEBRIS DURING CONSTRUCTION. CONTRACTOR WILL UNPLUG STOPPAGE AT CONTRACTOR'S EXPENSE. ANY DAMAGE TO EXISTING MANHOLES OR SEWER MAIN WILL BE CORRECTED AT CONTRACTOR'S EXPENSE. CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PREVENT DAMAGE TO EXISTING OR NEW RINGS, COVERS, OR CONES FROM EQUIPMENT AND MATERIALS USED OR TAKEN THROUGH THE WORK AREA. IF AN EXISTING OR NEW MANHOLE COVER, RING, OR CONE IS DAMAGED BY THE CONTRACTOR IT SHALL BE REPLACED AS DIRECTED BY THE SARA INSPECTOR. MANHOLES WILL NEED TO BE RESEALED WITH THE SARA APPROVED SEALING. IF SEAL COATING IS BROKEN, CONTRACTOR WILL HAVE MANHOLE RECOATED. RESEAL ALL LEAKS AT CONTRACTOR EXPENSE.

   A. CONTRACTOR TO ENSURE ALL PLUGS USED TO PLUG SEWER LINES, WHILE TESTING THE PROJECT (SUCH AS AIR PLUGS, SCREW TYPE PLUGS, ETC.) ARE LABELED, MARKED OR TAGGED. PROJECT INSPECTOR WILL RECORD HOW MANY PLUGS ARE BEING USED, LOCATION AND I.D., WITHIN COLLECTION SYSTEM. CONTRACTOR WILL REPORT TO PROJECT INSPECTOR OF ANY LOST OR UNRESTRAINED PLUGS INTO SEWER COLLECTION SYSTEM.

   B. CONTRACTOR WILL BE HELD LIABLE FOR ANY DAMAGES TO SEWER COLLECTION SYSTEM STOPPAGES, OVER-FLOWS, BACKUP INTO HOMES CAUSED BY LOST RUN AWAY SEWER PLUGS THAT WERE USED ON THAT PROJECT OR OUTFALL LINE WASTEWATER TREATMENT PLANTS.

   C. CONTRACTOR WILL ALSO BE RESPONSIBLE FOR ANY DAMAGE TO WASTEWATER TREATMENT APPARATUS, SUCH AS SCREW PUMPS, ETC, CAUSED BY LOST OR RUN AWAY SEWER PLUGS. CONTRACTOR WILL BE HELD LIABLE FOR DAMAGES, AS WELL AS COST OF REPAIRS.

5. ALL WORK IN THE TEXAS HIGHWAY DEPARTMENT AND BEXAR COUNTY RIGHT OF WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT.

6. ALL WORK ON PUBLIC STREETS SHALL BE COORDINATED WITH AND APPROVED BY THE BEXAR COUNTY PUBLIC WORKS DEPARTMENT TRAFFIC DIVISION AND STREET ENGINEER

7. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.161, CITY PUBLIC SERVICE MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND VALVES THAT ARE IN THE PROJECTED AREAS.

8. NO TESTING WILL BE PERFORMED PRIOR TO 30 DAYS FROM THE COMPLETE INSTALLATION OF THE SANITARY SEWER LINES.

   THE FOLLOWING SEQUENCE WILL BE STRICTLY ADHERED TO:

   A. PULL MANDREL- AFTER 30 DAYS OF INSTALLATION
   B. PERFORM AIR TEST
   C. PULL WIPER (AFTER STREET HAS BEEN ASPHALTED IN NEW SUBDIVISIONS)
   D. VACUUM TEST ALL MANHOLES WITHIN THE PROJECT
   E. CCTV- ALL NEW LINE - PAN /TILL ALL SERVICE LATERALS TO 6"X6" CLEAN OUT .FLOOD ALL LINES BEFOR CCTV, SUMMIT DVD

9. CONTRACTOR SHALL SUBMIT FILED COPY PLANS AND PROFILES SHOWING AS-BUILT WORK AT END OF PROJECT, CCTV DVD AND COMPACTION DENSITY REPORTS FOR MAIN SEWER LINE AND ALL SERVICE LATERALS TRENCHS. WARRANTY LETTERS ON MATERIALS, WORKMANSHIP FOR 24 MONTHS AFTER FINAL ACCEPTANCE.

MANHOLES

10. ALL MANHOLES SHALL BE CONSTRUCTED SO THAT THE TOP OF THE RING IS AT LEAST FOUR (4) INCHES ABOVE THE FINISHED GRADE OF THE SURROUNDING GROUND EXCEPT WHEN LOCATED IN PAVED AREAS. IN PAVED AREAS THE MANHOLE RING SHALL BE FLUSH WITH THE PAVEMENT. ALL NEW INSTALLED MANHOLES WILL BE WITH A 30" INCH OPENING, MINIMUM, WITH THE SARA LOGO ON THE COVER. EVERY THIRD MANHOLE COVER WILL HAVE A 1" HOLE FOR A VENT.

11. ALL MANHOLES SHALL BE WITH A 30" OPENING, HAVE WATERTIGHT RING AND COVERS, WITH THE SARA LOGO, I/I BARRIER, IN ACCORDANCE WITH THE SARA TECHNICAL SPECIFICATIONS FOR UTILITIES CONSTRUCTION. ON PRIVATE PROPERTY, MANHOLE RING AND COVER SHALL BE TYPICAL MANHOLE COVER WATER TIGHT.

    A. BEFORE BACK FILLING/COMPACTION/CONCRETE ENCASTMENT
    ALL MANHOLE JOINT SECTION RISERS, CONE SECTIONS AND GRADE RING SHALL BE WRAPPED WITH GATOR WRAP SEALING SYSTEMS, BUTYL ADHESIVE SEALANT WITH A MINIMUM THICKNESS OF 30 MILS, INFI-SHIELD WRAPPED WITH RISER-WRAP SEALING SYSTEM, GATOR WRAP
    MATERIAL: RUBBER MEETS ASTM C923/MASTIC MEETS ASTM C 990 OR APPROVE BY THE SARA ENGINEER SUBSTITUTION ON OUTSIDE FOR I/I, GROUND WATER TABLE.

12. IF CONCRETE THROAT RINGS ARE TO BE INSTALLED THEY MUST BE USED IN CONJUNCTION WITH A UV STABILIZED POLYETHYLENE LINER AND I/I BARRIER. I/I BARRIER MUST MEET THE FOLLOWING ASTM STANDARDS: ASTM D-790/1505 DENSITY OF POLYETHLENE MATERIALS, ASTM D-1238 MELT FLOW INDEX, ASTM 638 TENSILE STRENGTH@ YIELD (50 mm/mm), ASTM 790 FLEXURAL MODULUS, ASTM 648 HEAT DEFLECTION TEMPERATURE @IGEPAL, ASTM 1693 EsCR,100% IGEPAL /10% IGEPAL. A MINIMUM OF TWO AND A MAXIMUM OF FOUR THROAT RINGS WILL BE USED AT EACH MANHOLE FOR ADJUSTMENT.

13. INFILTRATION DISHES WILL BE REQUIRED IN MANHOLES WHERE APPLICABLE (I.E, SUCH AS LOW DRAINAGE AREAS) AND EVERY THIRD MANHOLE SHALL BE VENTED. 30" MANHOLE COVER WITH 1" INCH HOLE CENTER OF COVER WHERE APPLICABLE/OR WATER TIGHT /BOLT DOWN.

    Note: Manhole cover inserts shall be FRW industries, Inc., "Inflow Protector-Cover" "Preco Industries. Ltd.", "Sewer Guard", or approved equal, and shall be installed in strict accordance with the manufacturer's recommendations. The contractor shall be responsible for making the necessary field measurements for the manufacturer prior to production.

    A. ALL MANHOLES MUST HAVE 350-400 FEET SPACING BETWEEN MANHOLES TO PROVIDE ACCESS TO SEWER LINES FOR CLEANING, ON THE SARA PUBLIC SEWER EASEMENT. A 16 FOOT GATE WITH LOCK WILL BE PROVIDE BY CONTRACTOR FOR ACCESS TO CLEANING AND MAINTAIN SEWER LINES.

    B. DROP MANHOLES SHALL BE REQUIRED WHEN THE INFLOW ELEVATION IS MORE THAN TWENTY-FOUR (24) INCHES ABOVE THE OUTFLOW ELEVATION. DROP SHALL BE LOCATED OUTSIDE THE MANHOLE WITH ITS FLOWLINE ELEVATION LOCATED BETEEN THE CENTER LINE AND TOP OF SEWER LINE.

14. ALL MANHOLES WILL BE CONCRETE ENCASTMENT 1 FOOT AROUND RING, 28-INCH DEEP AFTER GATOR WRAP SEALING SYSTEM HAS BEEN APPLIED.

15. NEW MANHOLE PROTECTIVE COATING, LINER IS FOR THE PURPOSE OF I/I INFILTRATION BECAUSE OF HIGH WATER TABLE. APPLICATION PROCEDURES ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND PER THE FOLLOWING SPECIFICATIONS:

    A. MANHOLE PROTECTIVE COATING: CONTRACTOR WILL BE RESPONSIBLE FOR MANHOLES ON PROJECT SAFETY ASSESSMENT; CONFINED SPACE ENTRY SET BY OCCUPATIONAL SAFETY AND HEALTH STANDARDS, 29 CFR 1910.146 APP. E.

    B. THE CONTRACTOR, SHALL NOTIFY THE SARA, UTILITIES INSPECTIONS DEPARTMENT WITH A MINIMUM OF 2 DAYS ADVANCE NOTICE OF THE START OF ANY FIELD SURFACE PREPARATION WORK OF COATING APPLICATION WORK OF MANHOLES.

    C. ALL NEW MANHOLES IN NEW DEVELOPMENTS SHALL BE 30" OPENING, WATERTIGHT AND THE INTERIOR WALL COATED WITH A SARA APPROVED SEWER STRUCTURE FOR ALL MANHOLES. APPLY A COMBINATION OF BOTH PRODUCTS WITH THE CEMENTITIOUS COATING FIRST, FOLLOWED BY THE EPOXY COATING LAFARGE SEWPERCOAT 2000 HR REGULAR, WITH THE REQUIRED ONE-INCH THICK APPLICATION. THIS IS THE ONLY PRODUCT YET APPROVED WHICH SATISFIES THE REQUIREMENT OF APPLYING THE COMBINATION OF BOTH THE CEMENTITIOUS COATING AND EPOXY COATING

    APPROVED MATERIALS ARE AS FOLLOWS:

    CEMENTITIOUS COATING WITH REQUIRED ONE-INCH THICK APPLICATION

    - PERMACAST CR - 5000
    - STRONG-SEAL MS-2C
    - STANDARD CEMENT MATERIAL INC PELINER
    - QUADEX ALUMINALINER

    EPOXY COATING: WITH SPECIFIED THICKNESS APPLICATION.

    * RAVEN 405 SERIES HIGH BUILD EPOXY LINER REQUIRED THICKNESS 125 MILS

    * SPRAY WALL POLURETHANE SYSTEM REQUIRED THICKNESS 150 MILS

    D. WARRANTY LETTER ON MANHOLE PROTECTIVE COATING FOR 10 YEARS AFTER FINAL ACCEPTANCE OF PROTECTIVE COATINGS CONTRACTOR IS NOT RELIEVED OF ITS RESPONSIBILITIES UNDER THE CONTRACT DOCUMENTS.

    i. ANY CONNECTIONS TO EXISTING MANHOLES WILL REQUIRE A 36-INCH CRADLE TO SUPPORT INCOMING PIPE. A RUBBER GASKET WILL ALSO BE REQUIRED (CENTERED AT MANHOLE WALL) WITH GROUTING AT INTERIOR AND EXTERIOR PENETRATIONS.

    PENETRATION INTO MANHOLE WILL BE CORE DRILLED. ANY DAMAGE EXITING MANHOLE WILL BE REPLACED AT CONTRACTOR'S EXPENSE. IF COATING SEAL IS BROKEN, THE MANHOLE WILL BE RECOATED WITH THE SAME MATERIALS. IF EXISTING SEWER MANHOLE SEAL COATING IS BROKEN, ALL OF MANHOLE WILL BE RESEALED WITH SAME MATERIALS.

    ii. ANY AND ALL EXISTING MANHOLES WITHIN CONSTRUCTION PROJECT THAT TIE IN, ARE DONE BY CONTRACTOR TO STUB-OUT ADJUSTMENT, RECONSTRUCTION, OR LEAKING. MANHOLE WILL BE COAT SEALED AT CONTRACTOR'S EXPENSE.

    iii. MANHOLES WITH STUB-OUTS (8") INCH OR LARGER MUST BE LOCATED AT THE END OF ALL SEWER LINES THAT MAY BE EXTENDED IN THE FUTURE. MANHOLES PLACED AT THE END OF THE WASTEWATER COLLECTION SYSTEM PIPES THAT MAY BE EXTENDED IN THE FUTURE MUST INCLUDE PIPE STUB-OUTS WITH PLUGS.

PIPING

******* NEW NOTE *******

16. THE KIND AND DESCRIPTION OF THE PIPE CONDUIT IS SHOWN ON THE PLANS (IF PVC, SDR AND ASTM/ANSI DESIGNATION CLASS). AS SDR 26 PVC, ASTM D-3034 WITH A MINIMUM STIFFNESS OF 115 PSI TEXAS ADMINISTRATIVE CODE (TAC) RILES TO INCLUDE 30 TAC & 213, OR ANY REVISIONS THERE TO APPLICABLE TECQ, 30 TAC 7 217, FOR ALL NEW DEVELOPMENT.

17. THE USE OF ASBESTOS CEMENT PIPE WILL BE PROHIBITED UNDER THIS CONTRACT. ALL DUCTILE IRON PIPE USED IN THIS SYSTEM SHALL BE CORROSION PROTECTED ON BOTH THE INTERIOR AND EXTERIOR SURFACES. ALL CORROSION PROTECTION SHALL BE APPLIED AND INSTALLED IN SUCH A MANNER AS TO MAINTAIN A CONTINUOUSLY PROTECTED SURFACE AFTER FINAL PIPE INSTALLATION.

18. ALL PVC SEWER PIPE WITH OVER 14 FEET OF COVER SHALL BE EXTRA STRENGTH; MINIMUM PIPE STIFFNESS OF 150 PSI.

19. ALL SEWER PIPES SHALL HAVE COMPRESSION OR MECHANICAL JOINTS.

20. SEWER PIPE CONNECTIONS TO PRECAST MANHOLES SHALL BE APPROVED BY THE SARA. THIS CONNECTION SHALL USE A FLEXIBLE "BOOT" TYPE CONNECTOR SUCH AS THE PSX POSITIVE SEAL SYSTEM OR ENGINEER APPROVED EQUAL AND COMPLY WITH ASTM C-923. SEWER PIPE CONNECTIONS TO MONOLITHIC MANHOLES WILL BE AS SHOWN ON THE STANDARD DETAIL SHEET. ANY CHANGES IN THESE METHODS MUST BE APPROVED BY SARA ENGINEER.

21. ALL PIPE TRENCHING, BEDDING AND BACKFILL SHALL BE DONE IN ACCORDANCE WITH APPROPRIATE ASTM/ANSI SPECIFICATIONS [REFERENCE 31 TAC 317.2(A)(5)(A); ASTM C-12 (ANSI A108.2) OR ASTM D-2321 (ANSI K65.171)]. All compaction @ 98% density tests across the board, 1 random density test per lift for every 400 feet.

    A. SAND MIGRATION PREVENTION COLLAR WHEN CHANGING THE INITIAL BACKFILL FROM SELECT INITIAL BACKFILL TO OPTIONAL SELECT INITIAL BACKFILL A TWO (2) FOOT LONG CLASS D CONCRETE ENCASEMENT OR FIRMLY COMPACTED, CONSOLIDATED CLAY ENCASEMENT BETWEEN THE TWO SHALL BE PROVIDED FOR THE ENTIRE HEIGHT OF THE INITIAL BACKFILL, EVERY 180 FEET ALONG PIPE AND 20 FEET FROM WALL OF MANHOLE IN EACH DIRECTION.

    B. SEWER LINE LOCATION:

    i. SEWER LINES SHALL BE SIZED AND EXTENDED THROUGH THE LIMITS OF A DEVELOPMENT TO SERVE ADJACENT PROPERTY, WITH MANHOLE AND STUB-OUT AT END OF SEWER LINE.

    a. IN PHASED CONSTRUCTION OF THOROUGHFARES, THE SEWER LINE SHALL BE EXTENDED THE ENTIRE LENGTH OF THOROUGHFARE BEING CONSTRUCTED.

    ii. NO PUBLIC SEWER LINE SHALL BE LOCATED NEARER THAN FIVE (5) FEET FROM ANY TREE.

    iii. SIZES AND GRADES FOR SANITARY SEWER SHALL BE AS REQUIRED BY THE SARA ENGINEER AND CONSIDERATION SHALL BE GIVEN AS TO POSSIBLE EXTENSIONS FOR FUTURE DEVELOPMENT. NO SANITARY SEWERS, OTHER THAN LATERALS AND FORCE MAINS, SHALL BE LESS THAN EIGHT (8) INCH IN DIAMETER.

22. WHEN SEWER LATERALS ARE TO BE CONNECTED TO EXISTING SEWER MAINS AND NO STUB-OUT HAS BEEN EARLIER PROVIDED, THE CONNECTION MUST BE MADE WITH AN APPROVED SERVICE SADDLE AS PER 31 TAC 313.5(C) (7). NEW INVERT TO BE BUILT, SMOOTH CHANNEL FOR NEW PIPE/SLOPE AT 2 % FLOW.

23. ALL RESIDENTIAL SERVICE LATERALS SHALL BE SDR 26 PVC WITH RATING OF 115 PSI, BE EXTENDED TO THE PROPERTY LINE AT (6 x 6) CAPPED AND SEALED. ATTACH SEWER BURIAL TAPE TO THE END OF ALL SEWER LATERALS AND BRING UP TO THE GROUND LEVEL FOR MARKER (GREEN). (SEE HOUSE LATERALS DETAILS).

    A. SEWER SERVICE LATERALS. THE SIZES AND LOCATIONS OF LATERALS SHALL BE DESIGNATED AS FOLLOWS UNLESS OTHERWISE DIRECTED BY THE SARA ENGINEER:

    i. IN GENERAL FOR SINGLE FAMILY DWELLING, THE LATERAL SIZE SHALL BE A FOUR (4) INCH MINIMUM. HOUSE LATERALS SHALL BE INSTALLED CENTER OF THE LOT AND SHALL HAVE A TEN (10) FOOT SEPARATION FROM THE WATER SERVICE. THE SERVICE SHALL THEN BE EXTENDED AT A FORTY-FIVE (45) DEGREE ANGLE TO FOUR (4) FEET ABOVE THE FINISHED GRADE AND CAPPED. USE SEWER BURIAL TAPE TO MARK ALL SEWER SERVICE LATERALS.

    ii. MULTIPLE UNITS, APARTMENTS, LOCAL RETAIL AND COMMERCIAL SIX (6) INCH MINIMUM, MANUFACTURING AND INDUSTRIAL - EIGHT (8) INCH MINIMUM,OR LARGER AS REQUIRED.

    iii.

    TRAPS AND INTERCEPTORS (FOG - TECQ)

    UNIFORM PLUMBING CODE, CITY OF SAN ANTONIO BUILDING INSPECTIONS DEPARTMENT. ALL COMMERCIAL BUILINGS WILL HAVE TRAPS (FOG -TECQ).

    OIL SEPARATORS

    WHICH INCLUDE OIL SEPARATOR- GASOLINE SERVICE STATIONS, CAR WASHES, GARAGES, DRY CLEANERS, CHEMICAL PLANTS, GAS PLANTS, HIDE PROCESSORS, TESTING LABORATORIES, OR ANY PLACE WHERE OIL OR SOLVENTS MAY BE INTRODUCED INTO THE SANITARY SEWER SYSTEM.THE SIZING CRITERIA FOR OIL SEPARATORS SHALL BE BASED ON THE G.P.M. RATE OF ALL FIXTURES, APPLIANCE OR APPURTENANCE, DRAINING INTO SEWER SYSTEM.

    SAND INTERCEPTORS

    SAND INTERCEPTORS SHALL BE INSTALLED IN THE SEWER SYSTEM OF THE FOLLOWING ESTABLISHMENTS, GARAGES, CAR WASHES, SERVICE STATIONS, OR ANY PLACE OF BUSINESS WHERE HEAVY SOLIDS MAY BE INTRODUCED INTO THE SANITARY SEWER SYSTEM. THE SIZING CRITERIA FOR A SAND INTERCEPTOR SHALL BE BASED ON THE REQUIRED G.P.M. x 12 MINUTE RETENTION TIMES TO OBTAIN THE TANK SIZE IN GALLONS CAPACITY.

    AUTOMATIC CAR WASHES

    WITH HIGH PRESSURE SPRAYS AND /OR BRUSHES INSTALL A 50 G.P.M. INTERCEPTOR.MINIMUM, FOR A 4-BAY VEHICLE WASH, THE SIZE OF THE INTERCEPTOR SHALL INCREASE 10 G.P.M. FOR EACH ADDITIONAL WASH BAY OVER 4. SINGLE BAY OR PORTABLE WASHER TYPE VEHICLE WASHES SHALL INSTALL A 20 GPM INTERCEPTOR MINIMUM.

    NEUTRALIZING DEVICES

    IN NO CASE SHALL CORROSIVE LIQUIDS, SPENT ACIDS, OR OTHER HARMFUL CHEMICALS WHICH MIGHT DESTROY OR INJURE A DRAIN, SEWER, SOIL, OR WASTE PIPE, OR WHICH MIGHT CREATE NOXIOUS OR TOXIC FUMES, DISCHARGE INTO THE SANITARY SEWER SYSTEM WITHOUT BEING THOROUGHLY NEUTRALIZED BY PASSING THROUGH A PROPERLY CONSTRUCTED AND ACCEPTABLE NEUTRALIZING DEVICE. SUCH DEVICE SHALL BE PROVIDED WITH A SUFFICIENT INTAKE OF NEUTRALIZING MEDIUM, CONSISTING OF LIMESTONE OR MARBLE CHIPS, SO AS TO MAKE ITS CONTENTS NON-INJURIOUS BEFORE BEING DISCHARGED INTO THE SANITARY SEWER SYSTEM.

NO.	REVISION	DATE	BY

DESIGNED BY: INIT
DRAWN BY: INIT
CHECKED BY: INIT
APPROVED BY: INIT
DATE: MONTH,YEAR FILE: NAME

SAN ANTONIO RIVER AUTHORITY
Water Brings Us Together

SAN ANTONIO RIVER AUTHORITY
100 E. GUENTHER STREET
P.O. BOX 839980
SAN ANTONIO, TEXAS 78283-9980

PROJECT NAME
TITLE 1
TITLE 2

DRAWING TYPE

AA1

SHEET
OF

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: (210) 979-8444 Fax: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

SANITARY SEWER GENERAL NOTES

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
6.1

Date: Oct 28, 2022, 10:53am User ID: fthompson
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LINT TRAPS

PUBLIC AND PRIVATE WASHATERIAS AND COMMERCIAL LAUNDRIES SHALL INSTALL A LINT TRAP EQUIPPED WITH A CONVENIENTLY LOCATED AND EASILY REMOVABLE WIRE BASKET OR OTHER SIMILAR DEVICE THAT WILL PREVENT THE STRINGS, RAGS, BUTTONS, OR OTHER PROHIBITED MATERIAL FROM ENTERING THE SANITARY SEWER SYSTEM. THE BASKET OR OTHER SIMILAR DEVICE SHALL PREVENT PASSAGE TO THE SANITARY SEWER SYSTEM OF SOLIDS GREATER THAN ½" INCH IN DIAMETER. THE LINT TRAP SIZE SHALL BE BASED ON THE TOTAL G.P.M. OF ALL FIXTURES, APPLIANCES AND APPURTENANCES DRAINING TO IT IN LIEU OF A LINT TRAP,A LINT INTERCEPTOR MAY BE INSTALLED.THE INTERCEPTOR SHALL BE SIZED AND DESIGNED BY A TEXAS REGISTERED ENGINEER WITH HIS SEAL AND SIGNATURE ON THE DRAWINGS.

SILVER RECOVERY UNITS

SILVER RECOVERY UNITS SHALL BE INSTALLED IN WASTE LINE(S) LEADING FROM X- RAY PROCESSING, PHOTOGRAPHIC PROCESSING, AND /OR ANY PROCEDURES IN ESTABLISHMENT SUCH AS MEDICAL LABS, DENTAL LABS, PHOTO FINISHERS, PRINTERS, GRAPHIC ARTS PRODUCTION FACILITIES, HOSPITAL, FACILITIES, VETERINARY HOSPITALS, OR OTHER ESTABLISHMENTS WHERE SILVER MAY BE INTRODUCED INTO THE SANITARY SEWER SYSTEM.

SOLIDS INTERCEPTORS

SOLIDS INTERCEPTORS SHALL BE INSTALLED WHEN PRE-TREATMENT OF WASTE STREAMS IS NECESSARY TO PREVENT SOLIDS GREATER THAN ½" IN DIAMTER, WHICH MAY CAUSE LINE STOPPAGE FROM ENTERING THE SANITARY SEWER SYSTEM.

INTERCEPTORS

a. INTERCEPTORS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE DESIGN APPROVED BY THE SAN ANTONIO RIVER AUTHORITY CONSISTING OF A MINIMUM OF TWO COMPARTMENTS WITH FITTINGS DESIGNED FOR GREASE RETENTION AND PROVIDE FOR A MINIMUM OF TWELVE (12) MINUTES RETENTION.

b. THERE SHALL BE AN ADEQUATE NUMBER OF MANHOLES TO PROVIDE ACCESS FOR CLEANING ALL AREAS OF AN INTERCEPTOR, ONE MANHOLE PER TRAP COMPARTMENT. MANHOLE COVERS SHALL BE GAS TIGHT IN CONSTRUCTION HAVING A MINIMUM OPENING DIMENSION OF 20 INCH INCHES (0.5 M).

c. IN AREAS WHERE TRAFFIC MAY EXIST THE INTERCEPTOR SHALL BE DESIGNED TO HAVE ADEQUATE REINFORCMENT AND COVER.

d. ALL INTERCEPTORS SHALL HAVE THE SIZE OF THE INTERCEPTOR (IN GALLON PER MINUTE OR GALLON CAPACITY) PERMANENTLY AFFIXED TO THE DEVICE.

e. ALL CONCRETE UTILIZED IN THE CONSTRUCTION OF INTERCEPTOR SHALL HAVE A MINIMUM STRENGTH OF 3000 PSI.

f. AN EFFLUENT SAMPLING WELL ON ALL INTERCEPTORS SHALL BE REQUIRED. THE SAMPLE WELL SHALL HAVE A RISER A MINIMUM OF 6" INCHES IN DIAMETER AND SHALL BE INSTALLED AFTER THE CONFLUENCE OF ALL WASTE STREAMS FROM THE FACILITY AND PRIOR TO DISCHARGING INTO SANITARY SEWER COLLECTION SYSTEM. THE WELL SHALL BE PERPENDICULAR TO THE EFFLUENT LATERAL TO ALLOW VISUAL OBSERVATION OF THE FLOW STREAM AND PROVIDE FOR SAMPLING OF WASTE WATER.

WATER TIGHT TESTING (24 HOURS)

g. ALL INTERCEPTORS SHALL BE WATER TESTED OUT AT JOB SITE AFTER BEING INSTALLED (PLUG BOTH ENDS AND FILL TO TOP OF INTERCEPTOR). INTERCEPTOR SHALL SHOW NO LEAKAGE FROM SECTION SEAMS, PINHOLES, OR OTHER IMPERFECTIONS. ANY LEAKAGE IS CAUSE FOR REJECTION. WHEN LEAKAGE OCCURS, ADDITIONAL WATER TESTING SHALL BE MADE. AFTER CORRECTING MEASURE TEST, REPORTS SHALL SHOW TOTAL NUMBER OF INTERCEPTERS TESTED. WHEN LEAKAGE OCCURS CORRECTIVE MEASURES TAKEN SHALL BE REPORTED BY THE SARA INSPECTORS. SARA INSPECTORS SHALL RECORD IN DAILY LOG WITH PROJECT NAME, DATE IT WAS TESTED AND COMPLETED.

B. MANHOLES WILL BE REQUIRED ON SIX (6) INCH AND LARGER LATERALS WHERE THEY CONNECT TO THE MAIN.

A. LATERALS WILL NOT BE ATTACHED TO SEWER MAINS THAT ARE DEEPER THAN TWELVE (12) FEET.

B. FITTINGS ARE NOT PERMITTED ON LATERALS BETWEEN THE WYE AND THE PROPERTY LINE.

C. DEEP CUT OR DROP CONNECTIONS SHALL NOT BE PERMITTED.

F. A MINIMUM OF ONE (1) LATERAL PER BUILDING SHALL BE REQUIRED. ALSO, A MINIMUM OF ONE (1) LATERAL PER RESIDENTIAL LOT SHALL BE REQUIRED. DUPLEXES SHALL HAVE TWO (2) LATERALS THAT SHALL BE INDEPENDENTLY ATTACHED TO THE MAIN.

G. ALL SEWER LATERAL CROSSING WATER MAINS SHALL CONFORM TO THE REQUIREMENTS OF THE TCEQ CHAPTER 317 (DESIGN CRITERIA FOR SEWERAGE SYSTEMS) LATEST REVISION, SDR 26 150 PSI, OR DUCT IRON PIPE, CONCRETE ENCASMENT.

24. WHERE REQUIRED CONCRETE ENCASEMENT SHALL BE PLACED FOR FULL WIDTH OF THE TRENCH TO A PLAIN SIX (6) INCHES ABOVE THE TOP OF THE PIPE WITH PAY UNITS AS SHOWN ON THE STANDARD DETAIL SHEET.

25. A MINIMUM OF FOUR (4) FEET OF COVER IS TO BE MAINTAINED OVER THE SANITARY SEWER MAIN AND LATERALS AT GRADE, OTHERWISE CONCRETE ENCASEMENT IS REQUIRED.

26. WHERE POROUS MATERIAL INCLUDING "SUBGRADE FILLER" IS USED FOR BACKFLL IN THE BEDDING AND INITIAL BACKFILL ZONES, SEEPAGE RETAINERS ARE REQUIRED AT AN APPROXIMATE OF 180 FEET. RETAINERS SHALL CONSIST OF CLASS "D" CONCRETE ENCASEMENT OR FIRMLY COMPACTED. CONSOLIDATED CLAY ENCASEMENT, THE RETAINERS SHALL EXTEND FROM THE BOTTOM OF THE TRENCH TO THE TOP OF THE GRANULAR MATERIAL FOR THE ENTIRE TRENCH WIDTH. ENCASEMENT SHALL BE 24 INCHES LONG. NO EXTRA PAY ITEM.

BLASTING

27. WHEN ALLOWABLE, BLASTING SHALL BE PERFORMED IN ACCORDANCE WITH THE ABOVE CRITERIA ESTABLISHED BY THE NATIONAL FIRE PROTECTION ASSOCIATION 312 TAC 313.5(C) (6).

28. BLASTING SEWER LINE EXCAVATION MUST BE DONE IN SUCH A MANNER AS TO MINIMIZE THE FRACTURING OF ROCK BEYOND THE REQUIRED EXCAVATION. THE CONTRACTOR SHALL CONSIDER THE ELEVATION OF THE EXISTING SANITARY SEWER MAIN IN RELATION TO THE BLASTING CHARGE AND RELATIVE DIRECTION OF EXISTING AND PROPOSED TRENCHES. BLASTING WITHIN SUCH AREAS SHALL BE ACCOMPLISHED ONLY BY QUALIFIED BLASTING CONTRACTORS WHO HOLD BLASTING LICENSES FROM A QUALIFIED AGENCY SUCH AS THE SAN ANTONIO FIRE DEPARTMENT IN BEXAR COUNTY. ANY DAMAGE TO EXISTING SANITARY SEWERS RESULTING FROM BLASTING SHALL BE REPAIRED AND RESTORED BY THE CONTRACTOR AT HIS OWN EXPENSE.

29. NO BLASTING SHALL BE PERFORMED WITHIN 75 FEET OF EXISTING UTILITIES.

TESTING

30. ALL SEWER LINES MUST BE TESTED IN ACCORDANCE WITH THE FOLLOWING:

A. 317.2(A)(5)(B); DEFLECTION TEST FOR FLEXIBLE AND SEMI-RIGID PIPE CONDUCTED AFTER FINAL BACKFILL HAS BEEN IN PLACED AT LEAST 30 DAYS.

B. 317.2(A)(4)(A) & (B) OR SARA SPECIFICATIONS INFILTRATION AND OR EXFILTRATION AND OR LOW-PRESSURE AIR TEST.

C. 313.5(C)(10)(C) OR SARA SPECIFICATIONS: ALL MANHOLES AND WET WELLS MUST BE TESTED SEPARATELY AND INDEPENDENTLY OF THE COLLECTION LINES.

D. IN THE EVENT THAT TESTING REQUIREMENTS CONFLICT, THE LATEST TCEQ DESIGN CRITERIA SHALL BE USED.

31. SEWER LINES SHALL BE TESTED FROM MANHOLE TO MANHOLE.

32. SANITARY SEWER CONNECTIONS MADE DIRECTLY TO EXISTING MANHOLES WHICH REQUIRE PENETRATION INTO THE MANHOLE WILL BE CORE DRILLED. ANY DAMAGE TO EXISTING MANHOLE WILL BE REPLACED AT CONTRACTOR'S EXPENSE AND WILL REQUIRE SUCCESSFUL TESTING OF THE EXISTING MANHOLE IN ACCORDANCE WITH THE SARA SPECIFICATIONS. THEY MUST HAVE A PROTECTIVE COATING WITH SEWPERCOAT, RAVEN 405, SAUEREISEN 210, SPRAY WALL, OR APPROVED EQUIVALENT BY THE ENGINEER, COATING WILL BE MINIMUM OF 200 MILS THICKNESS DEPENDING ON EXISTING CONDITIONS, TO PREVENT INFRASTRUCTURE INFILTRATION, FOLLOW MANUFACTURER'S RECOMMENDATION ON PROTECTIVE COATING.

33. AFTER CONSTRUCTION, TESTING WILL BE DONE BY PAN/TILT TV CAMERA BY THE CONTRACTOR AND OBSERVED BY THE INSPECTOR, WASTEWATER ENGINEERING PERSONNEL AND CONTRACTOR AS CAMERA IS RUN THROUGH THE LINES. PAN/TILT ALL 6" SERVICE LATERALS TO 6"X6" STUB-OUT. VIDEOS MUST INCLUDE SUBDIVISION NAME, MANHOLE NUMBER, SERVICE LATERAL STATION NUMBER, FLOW DIRECTION, LOCATION ANY ABNORMALITIES, SUCH AS BROKEN PIPE OR MISALIGNED, JOINT, GRAVEL, DIRT, MUST BE CLEANED OUT, REPLACE AT CONTRACTOR'S EXPENSE. NEW SEWER SYSTEM WILL BE FLOODED WITH H2O BEFORE BEING TV. ALL SEWER LINES MUST BE PRESSURE CLEANED TO INCLUDE SERVICE LATERALS 6" INCH TO STUB-OUT. ALL VIDEOS SHALL BE SUBMITTED IN DVD FORMAT WITH WRITTEN REPORTS.

34. A COPY OF ALL TESTING REPORTS INCLUDING BACKFILL COMPACTION TESTS SHALL BE FORWARDED TO THE SARA.

A. DENSITY TEST WILL BE REQUIRED ON ALL SANITARY SEWER TRENCHES INCLUDING SERVICE LATERALS. SERVICE LATERALS TO BE CHOSEN RANDOMLY BY FIELD INSPECTOR. DENSITIES ON SERVICE LATERAL SHALL NOT EXCEED 25% OF TOTAL NUMBER OF SERVICE.

EXCAVATION

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

36. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NOT PERMANENTLY PLACE ANY WASTE MATERIALS IN THE 100 YEAR FLOODPLAIN WITHOUT AN APPROVED FLOODPLAIN PERMIT.

37. WATER JETTING THE BACKFILL WITHIN A STREET WILL NOT BE PERMITTED. SANITARY SEWER TRENCHES SUBJECT TO TRAFFIC SHALL CONFORM TO SARA SPECIFICATIONS.

WATERLINE CROSSING

38. WHERE THE MINIMUM 9 FOOT SEPARATION DISTANCE BETWEEN SEWER LINES AND WATERLINES, MAINS CANNOT BE MAINTAINED. THE INSTALLATION OF SEWER LINES SHALL BE IN STRICT ACCORDANCE WITH THE TCEQ RULES (31 TAC 317.3 APPENDIX E), SDR 26 ASTM 150 PSI OR CONCRETE ENCASTMENT DUCT IRON.

EROSION AND SEDIMENTATION

39. THE TCEQ AND THE ENVIRONMENTAL PROTECTION AGENCY (EPA) REQUIRE EROSION AND SEDIMENTATION CONTROL FOR CONSTRUCTION OF SEWER COLLECTION SYSTEMS. DEVELOPER OR AUTHORIZED REPRESENTATIVE SHALL PROVIDE EROSION AND SEDIMENTATION CONTROL AS NOTED ON THE PROJECTS PLAN AND PROFILE SHEETS.

40. ALL TEMPORARY EROSION AND SEDIMENTATION CONTROLS SHALL BE REMOVED BY THE CONTRACTOR AT FINAL ACCEPTANCE OF THE PROJECT BY THE SARA.

SUPPLEMENTING

41. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS BUT NOT INCLUDED ON THE BID SCHEDULE. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED UNDER PAY ITEM 10 WHICH IT RELATES TO.

42. UNLESS THE DEVELOPMENT IS PRIVATELY OWNED, THE DEVELOPER DEDICATES THE SANITARY SEWER MAIN AND MANHOLES TO THE SARA, UPON COMPLETION BY THE DEVELOPER AND FINAL ACCEPTANCE BY THE SARA. SARA WILL OWN AND MAINTAIN SAID SANITARY SEWER MAINS AND MANHOLES WHICH ARE LOCATED WITHIN THIS PARTICULAR SUBDIVISION.

43. WORK COMPLETED BY CONTRACTOR WHICH HAS NOT RECEIVED A WORK ORDER OR THE CONSENT OF THE SARA CONSTRUCTION INSPECTION DIVISION WILL BE SUBJECT TO REMOVAL AND REPLACEMENT BY AND AT THE EXPENSE OF THE CONTRACTOR.

44. SARA IS NOT TO BE RESPONSIBLE FOR ANY ABNORMALITIES ON STUB OUT, INVERT, GRADE OR SLOPE FOR ANY EXISTING MANHOLE TIE IN OR SERVICE LATERAL TIE IN.

45. ENGINEER, DEVELOPER AND BUILDER, WILL HAVE PLUMBER AND CONTRACTOR WITH BID PRICE ON NEW INSTALLATION OF ALL 4" INCH SEWER SERVICE LATERALS TO COMPLY WITH TRENCH SAFETY (OSHA) SHORING PROTECTION ON ALL NEW INSTALLATION OF 4" INCH SEWER SERVICE LATERALS. SARA WILL NOT BE HELD RESPONSIBLE FOR ANY INJURIES OR DEATH CAUSED BY TRENCH FAILURE, OR A WRONG OR DAMAGE DONE TO A PERSON OR TO HIS PROPERTY. OSHA GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.

46. ALL 4" INCH SEWER SERVICE LATERALS WILL BE HYDRAULIC TESTED AND OR LOW AIR PRESSURE TESTED. ALL 4" INCH SEWER SERVICE LATERALS WILL BE TELEVISED (TV) FROM 4" INCH CLEAN OUT AT OUTSIDE EACH RESIDENCE TO 6" X 6" CLEAN OUT. CONTRACTOR AND PLUMBER WILL SUBMIT REPORTS AND/OR VIDEOS TO SARA, WITH THE FOLLOWING INFORMATION: SUBDIVISION NAME, LOT NUMBER, BLOCK NUMBER, STATION NUMBER, STREET NAME AND ADDRESS OF EACH SEWER SERVICE LATERAL.

PLUMBER WILL BE PROVIDED PLAN/PROFILE BY ENGINEER/BUILDER. PLUMBER WILL WORK CLOSELY WITH THE SARA PROJECT INSPECTOR ON DAILY TESTING AND TELEVISION BY MAKING ARRANGEMENTS 48 HOURS IN ADVANCE. SEWER SERVICE LATERALS THAT HAVE NOT BEEN INSPECTED OR APPROVED AND/OR COVERED UP, WILL HAVE TO BE RE-DUG AT CONTRACTOR/PLUMBER EXPENSE AND RE-INSPECTED.

A. A PROPERTY LINE CLEANOUT (6"x 6") SHALL BE INSTALLED FOR RESIDENTIAL SERVICES. CLEANOUTS IN THE SIDEWALK OR DRIVEWAY SHALL HAVE A CAST IRON BOOT. CLEANOUT NOT LOCATED IN A SIDEWALK OR DRIVEWAY SHALL BE LOCATED ON A REINFORCED CONCRETE PAD A MINIMUM OF TWELVE (12") INCHES BY TWELVE (12"). INCHES BY SIX (6") INCHES THICK. ALL PROPERTY LINE CLEANOUTS SHALL INCLUDE A LID WITH SEWER IN GREEN COLOR.

47. N1 FENCING: ANY AND ALL FENCING, INCLUDING ELECTRIC FENCE, WHETHER OR NOT IDENTIFIED ON THE PLANS, MUST BE MAINTAINED AT ALL TIMES. ANY AND ALL DAMAGES DIRECTLY ATTRIBUTED TO THE CONTRACTOR MUST BE REPLACED TO EQUAL OR BETTER CONDITIONS AT THE CONTRACTORS EXPENSE AND AS APPROVED BY THE PROJECT MANAGER. GAPS IN THE FENCING MUST BE PROVIDED AT ALL LOCATIONS WHERE THE SEWER LINE EASEMENT CROSSES FENCING. FENCING REQUIRED TO MAINTAIN LIVESTOCK MUST BE MAINTAINED AT ALL TIMES.

48. N2 DAMAGE TO ADJACENT LAND: THE CONTRACTOR MUST AVOID DAMAGE TO ADJACENT LAND OUTSIDE THE IDENTIFIED CONSTRUCTION LIMITS. ANY AND ALL CLAIMS DIRECTLY ATTRIBUTED TO THE CONTRACTOR RESULTING FROM HIS STRAYING BEYOND THE CONSTRUCTION LIMITS MUST BE SETTLED BY THE CONTRACTOR TO THE SATISFACTION OF THE ENGINEER WITH THE APPROPRIATE LANDOWNER

49. N3 PROPERTY OWNER ACCESS: THE CONTRACTOR MUST MAINTAIN ACCESS FOR PRIVATE INDIVIDUALS AT ALL TIMES. IF NORMAL ACCESS IS DAMAGED DURING CONSTRUCTION THE CONTRACTOR MUST REPLACE THE ACCESS TO EQUAL OR BETTER CONDITIONS AT THE CONTRACTORS EXPENSE, AS APPROVED BY THE ENGINEER.

50. N4 CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL UTILITIES WHETHER OR NOT SHOWN ON THE PLANS. SHOULD THE CONTRACTOR DAMAGE ANY UTILITIES THE CONTRACTOR WILL BE RESPONSIBLE FOR ALL COSTS TO REPAIR THE UTILITIES TO THEIR ORIGINAL CONDITION. CONTRACTOR IS SOLELY RESPONSIBLE FOR LOST REVENUE, LOSSES ETC. CLAMED BY UTILITY COMPANIES DUE TO CONTRACTORS WORK. CONTRACTOR SHALL NOTIFY SARA AND IMPACTED UTILITY COMPANIES 48 HRS. PRIOR TO BEGINNING WORK. CONTRACTOR SHALL VERIFY THE LOCATION OF UTILITIES AND REPORT ANY DISCREPANCIES TO THE ENGINEER.

51. N5 CLEARING PERMANENT EASEMENTS: THE LIMITS OF BOTH THE EXISTING AND PARALLEL SEWER LINES PERMANENT EASEMENTS, AS DELINEATED IN THESE PLANS, MUST BE CLEARED IN ACCORDANCE WITH THE SPECIFICATION. THE CONTRACTOR MAY BE DIRECTED BY THE ENGINEER TO PROTECT AND AVOID CERTAIN TREES WITHIN THE LIMITS OF THE PERMANENT AND TEMPORARY CONSTRUCTION EASEMENTS. ALL BRUSH MUST BE REMOVED FROM SITE, NO BRUSH PILES TO REMAIN AFTER CONSTRUCTION. BURNING OF BRUSH OR TRASH WILL NOT BE ACCEPTABLE.

52. N7 CONTRACTOR SHALL PROVIDE APPROPRIATE SAFE ACCESS AND BARRICADE WORK AT ALL TIMES TO PROTECT THE PUBLIC. THIS INCLUDES SUBSTANTIAL BARRICADES AROUND ALL TRENCHES, BORE PITS, OPEN EXCAVATIONS, EQUIPMENT ETC. THE SITE MUST BE LEFT IN A SECURE SAFE CONDITION AT NIGHT. IT IS THE CONTRACTORS RESPONSIBILITY TO TAKE NECESSARY PRECAUTIONS TO PROTECT THE PUBLIC THROUGHOUT THE DURATION OF THE PROJECT.

53. N14 SHOULD CONTRACTOR SELECT A TRENCH EXCAVATION PROCEDURE THAT EXTENDS THE LIMITS OF SEEDING OR PAVING AND FINAL SITE PREPARATION (I.E. SLOPE BACK PROTECTION SYSTEM) HE WILL BE RESPONSIBLE FOR MEETING PLAN AND SPECIFICATION REQUIREMENTS TO THE NEW LIMITS AT NO ADDITIONAL COST TO SARA.

54. N16 WARNING: NOTE THAT CERTAIN PORTIONS OF THE PROJECT MAY PARALLEL AND /OR CROSS EXISTING UTILITIES. THE CONTRACTORS WILL BE REQUIRED TO PROTECT EXISTING UTILITIES. ADDITIONAL SUPPORTIVE SHORING MAY BE REQUIRED. IT IS SPECIFICALLY THE CONTRACTORS RESPONSIBILITY TO PROTECT HIS WORKERS, EXISTING UTILITIES, AND FINISHED WORK THROUGHOUT THE JOB.

55. N 17 OVERHEAD ELECTRIC, CITY PUBLIC SERVICE (CPS) AN APPROPRIATELY SAFE OVERHEAD CLEARANCE MUST BE MAINTAINED BETWEEN ALL EQUIPMENT AND PERSONNEL. THE CONTRACTOR SHALL NOTIFY CITY PUBLIC SERVICE AT 353-2700 AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION IN THE VICINITY OF THE CPS OVERHEAD ELECTRIC LINE CONTRACTOR SHALL MAINTAIN CPS RECOMMENDED CLEARANCE REQUIREMENTS.

56. N 23 BYPASS PUMPING: THE CONTRACTOR IS RESPONSIBLE FOR ALL BYPASS PUMPING REQUIRED TO COMPLETE THE WORK. BYPASS PUMPS SHALL BE ADEQUATE TO HANDLE PEAK FLOW EVENTS DURING STORM EVENTS. CONTRACTOR SHALL HAVE STANDBY PUMPS AVAILABLE TO BYPASS FLOW IN CASE PRIMARY PUMP FAILS, CONTRACTOR WILL BE SOLELY RESPONSIBLE FOR ALL COSTS FOR CLEANUP OF AN UNAUTHORIZED DISCHARGE AND ANY ASSOCIATED FINES.

57. N26 CONTRACTOR SHALL BACKFILL ALL OPEN TRENCHES AT THE END OF THE DAY. CONTRACTOR SHALL NOT INSTALL MORE PIPE THAN CAN BE COVERED. NO OPEN TRENCHES WILL BE PERMITTED OVERNIGHT ALL END OF OPEN PIPE WILL BE PLUGGED OVER NIGHT.

58. N33 THE PROJECT AREA MAY BE SUBJECT TO ARCHEOLOGICAL MONITORING. SHOULD THE CONTRACTOR ENCOUNTER ANY ARCHEOLOGICAL DEPOSITS DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL STOP ALL WORK IN THE AREA OF THE DEPOSITS AND IMMEDIATELY CALL THE PROJECT MANAGER.

59. N37 CONTRACTOR TO NOTE THAT PORTIONS OF THE CONSTRUCTION ARE WITHIN THE LIMITS OF THE 100 YEAR FLOODPLAIN. THE CONTRACTOR IS REQUIRED TO KEEP THE CHANNEL CLEAR OF POTENTIAL OBSTRUCTIONS TO FLOOD FLOWS. POTENTIAL OBSTRUCTIONS INCLUDE HEAVY CONSTRUCTION EQUIPMENT, TEMPORARY ROADS ACROSS CHANNEL, EXCAVATED MATERIAL, STOCKPILED DEBRIS, ETC. UNDER THREATENING WEATHER CONDITIONS WHERE FLOODING IS LIKELY, OBSTRUCTIONS SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR AT NO ADDITIONAL COST TO SARA. THE CONTRACTOR ASSUMES ALL RISK FOR UNFINISHED WORK.

NO.	REVISION	DATE	BY

DESIGNED BY: INIT
DRAWN BY: INIT
CHECKED BY: INIT
APPROVED BY: INIT
DATE: MONTH,YEAR FILE: NAME

SAN ANTONIO RIVER AUTHORITY
Water Brings Us Together

SAN ANTONIO RIVER AUTHORITY
100 E. GUENTHER STREET
P.O. BOX 839980
SAN ANTONIO, TEXAS 78283-9980

PROJECT NAME
TITLE 1
TITLE 2
DRAWING TYPE

AA1

SHEET
OF

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE
REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

SANITARY SEWER GENERAL NOTES

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
6.2

Date: Oct 28, 2022, 10:53am User ID: tthompson
File: N:\479\09\01\Design\Civil\SEWER\SS_NOTES_4790901.dwg

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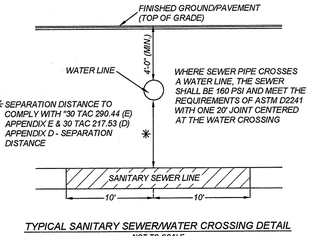
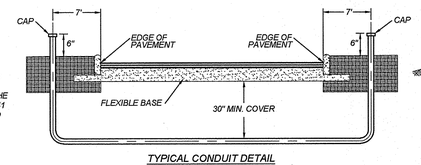


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE



TYPICAL CONDUIT DETAIL
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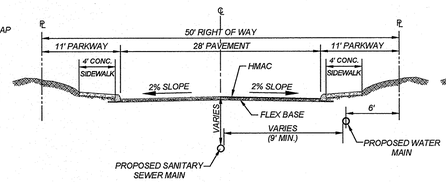

TYPICAL 50' STREET SECTION
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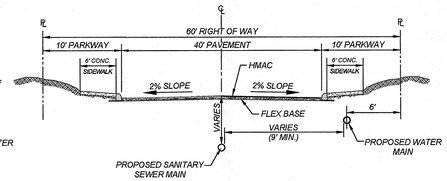

TYPICAL 60' STREET SECTION
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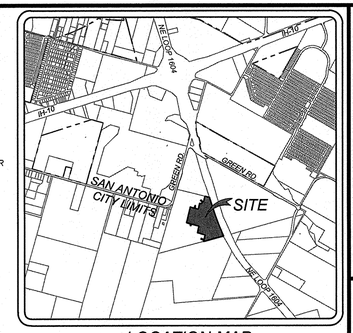

LOCATION MAP
N.T.S.

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

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	
PROPOSED WATER SERVICE & METER BOX WITH PRESSURE REDUCING VALVE	=	
PROPOSED WATER 3/4" IRRIGATION SERVICE & 5/8" METER BOX	=	
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED 250W STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	
PROPOSED SANITARY SEWER LATERAL WITH VERTICAL STACK	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. E
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EXISTING WATER MAIN	=	E.W
EXISTING FIRE HYDRANT	=	
EXISTING WATER VALVE	=	
EXISTING SANITARY SEWER MAIN	=	E.SS
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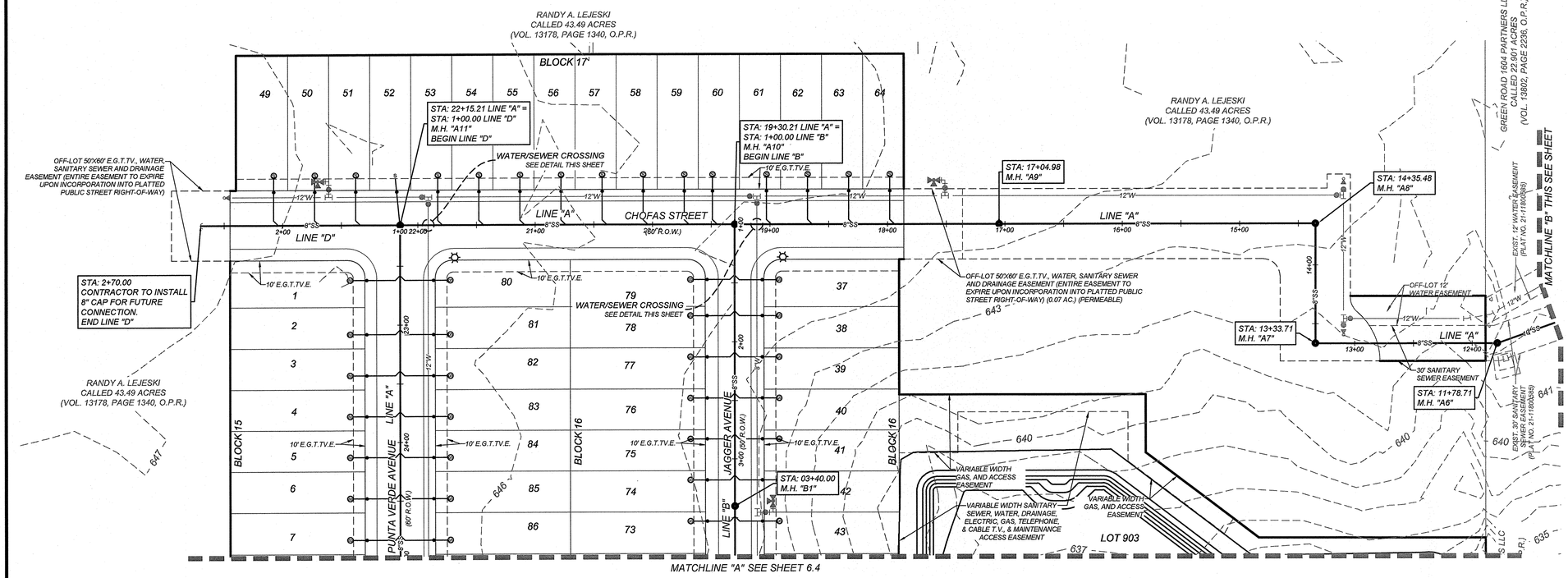
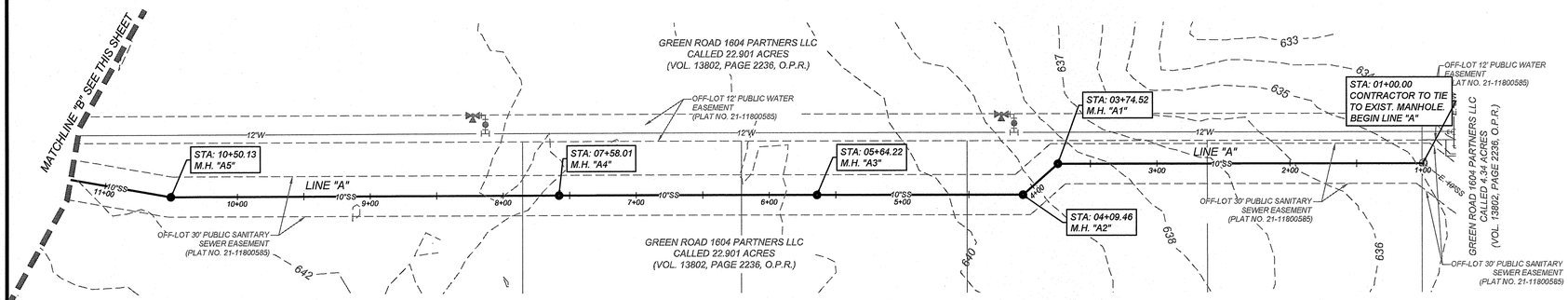
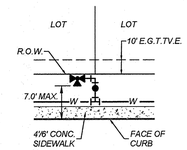
EXISTING GUY WIRE/OVERHEAD ELECTRIC	=	OHE







TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: 210.979.8444 Fax: 210.979.8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

OVERALL SANITARY SEWER PLAN (SHT 1 OF 2)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
6.3

Date: Oct 28, 2022, 10:56am User ID: tthompson
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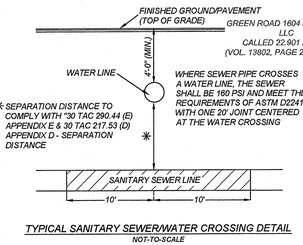
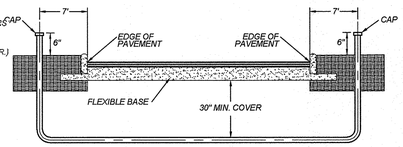


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE



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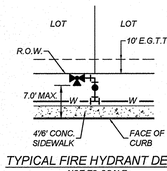

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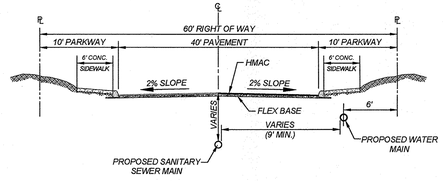

TYPICAL 60' STREET SECTION
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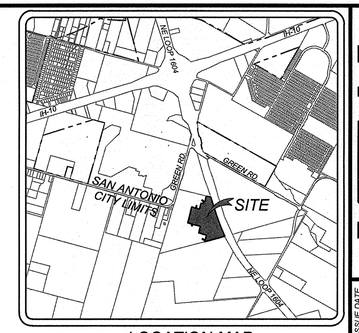

LOCATION MAP
N.T.S.

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

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER SERVICE & METER BOX WITH PRESSURE REDUCING VALVE	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & 5/8" METER BOX	=	W
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED 250W STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	
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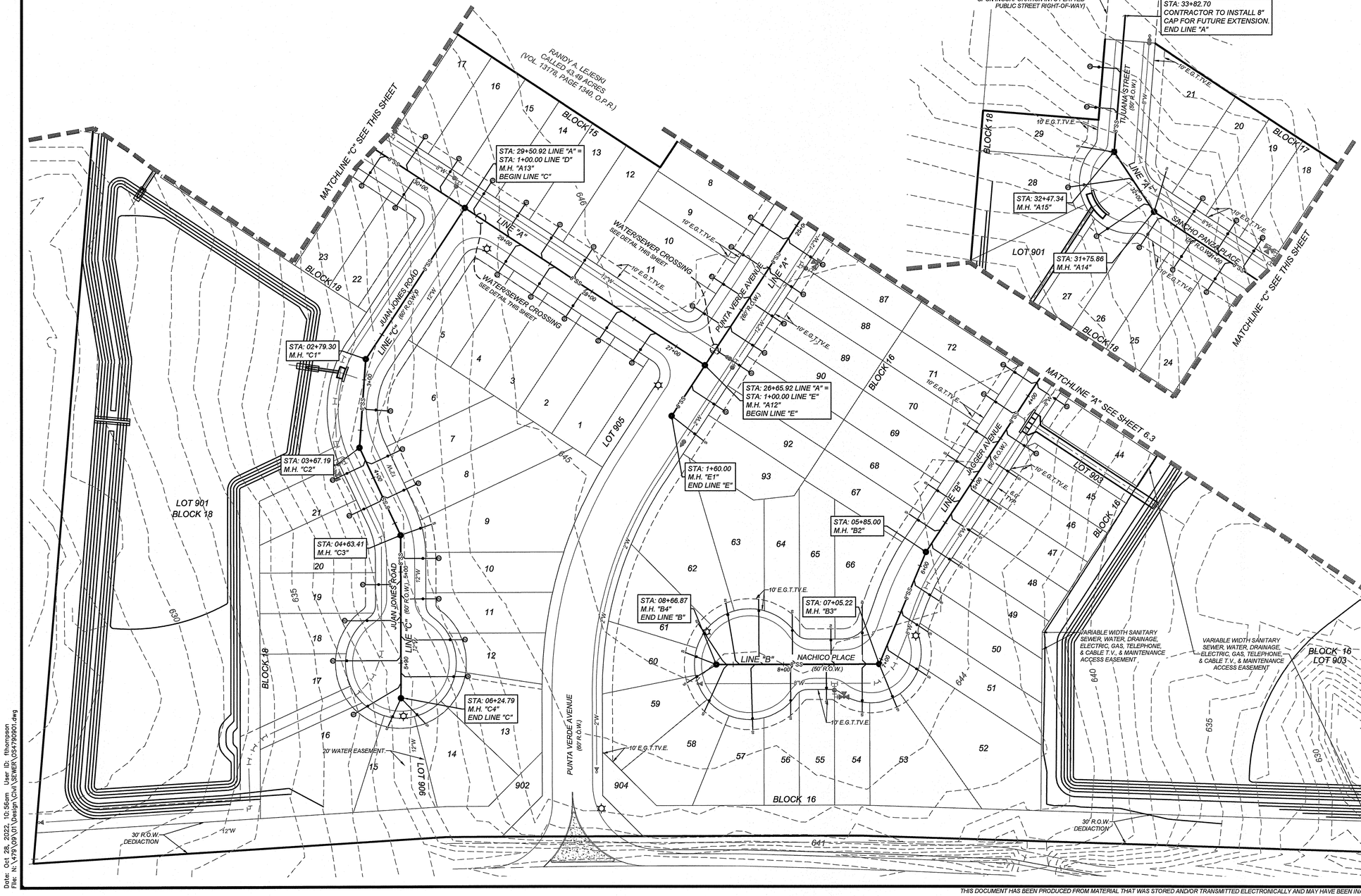

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MICHAEL B. RICHARDS
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BEXAR COUNTY, TEXAS
OVERALL SANITARY SEWER PLAN (SHT 2 OF 2)

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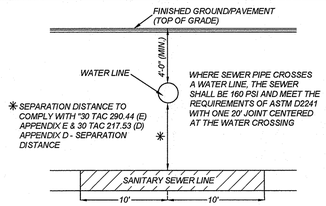
2. PIPE TYPE DESIGNATIONS ARE SDR 21.
3. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
4. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER. SEE SHEET 6.11 FOR DETAILS.



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

TRENCH EXCAVATION SAFETY PROTECTION
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MANHOLE NOTE:
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CAUTION!!
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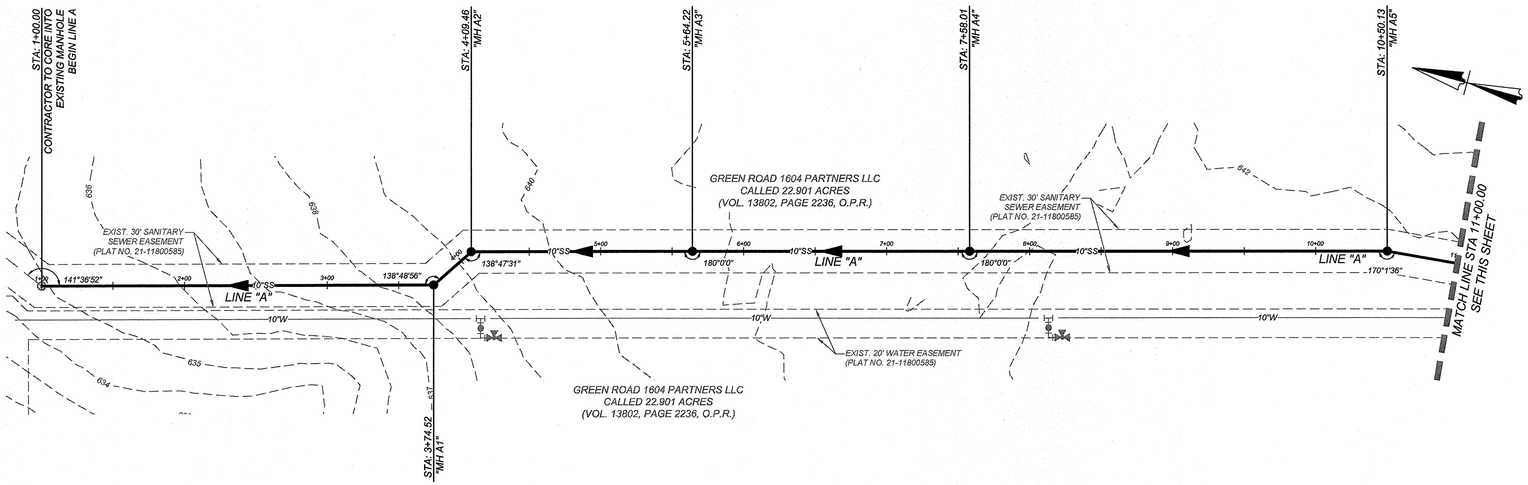
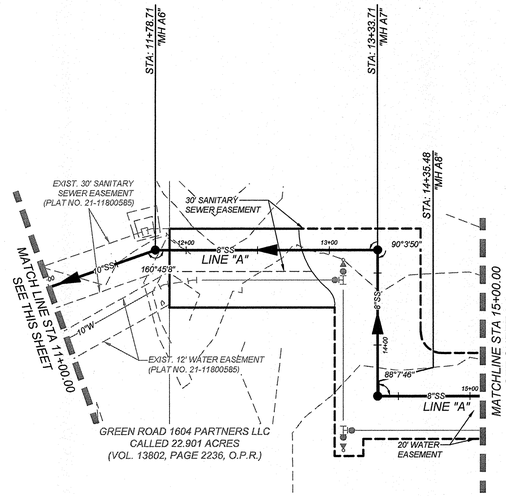
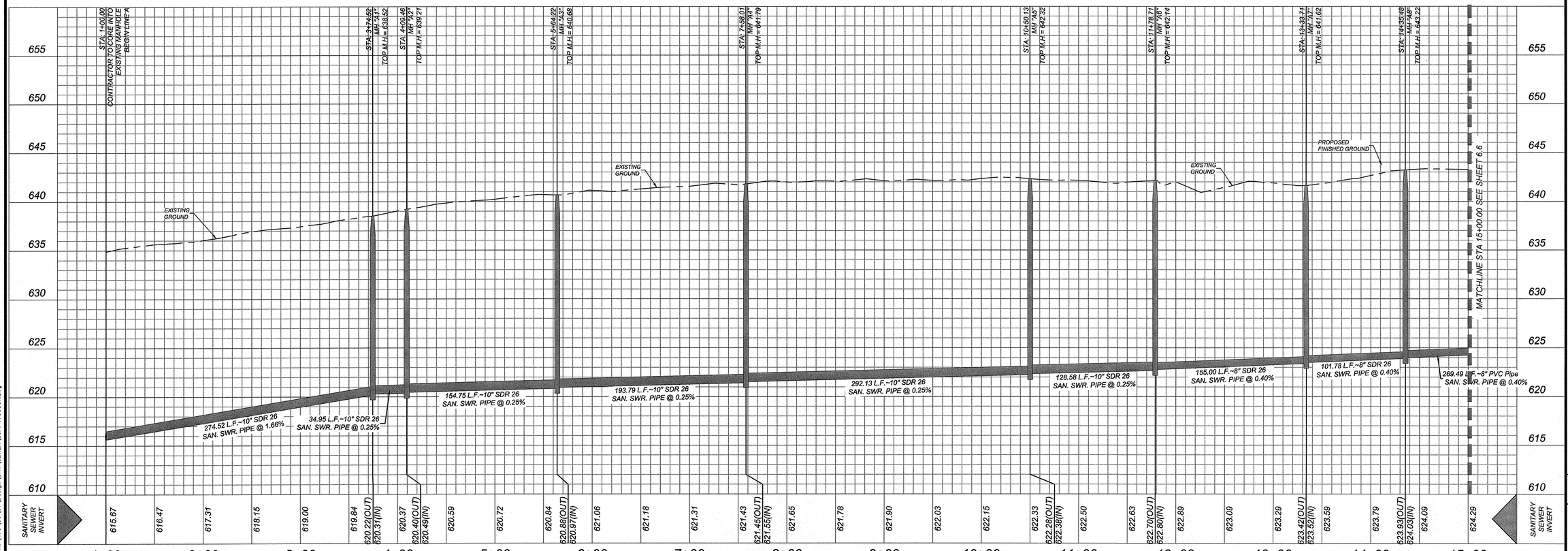




LINE "A"
STA: 1+00.00 - 15+00.00

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



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TBPE Firm #: 9513 - TBPLS Firm #: 10123900

ISSUE DATE
REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
SEWER LINE "A" PLAN & PROFILE (SHEET 1 OF 3)

PLAT NO. 21-11800683
JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR
SHEET NUMBER: 6.5

Date: Oct 28, 2022, 11:32am User ID: fthompson
File: N:\479\DATA\01 Design\Civil SEWER\SSPP\479090l.dwg

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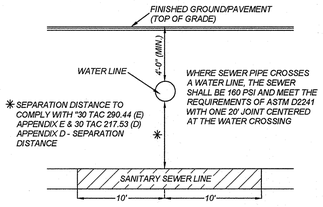

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE

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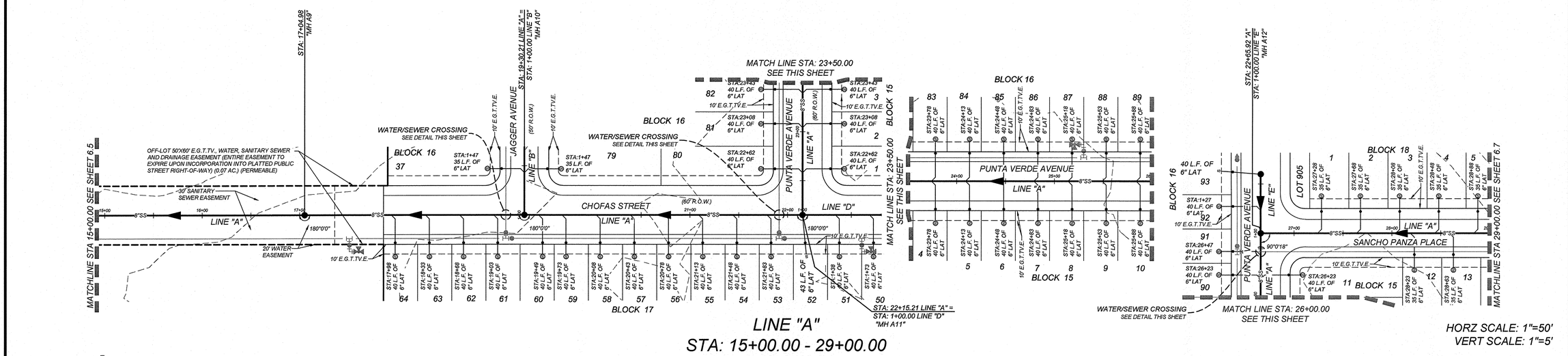
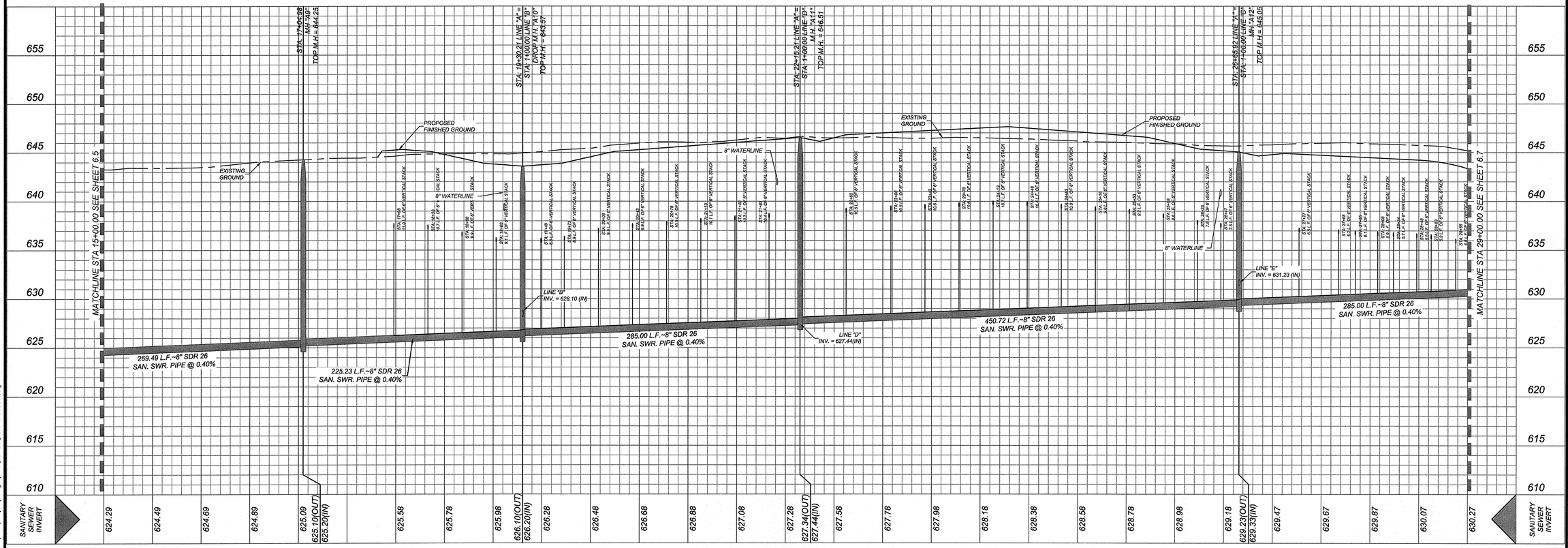


LINE "A"
STA: 15+00.00 - 29+00.00



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TBPE Firm #: 9513 • TBPLS Firm #: 10124300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
SEWER LINE "A" PLAN & PROFILE (SHEET 2 OF 3)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 6.6

Date: Oct 28, 2022, 11:33am User ID: tthompson
File: N:\479\09\01\Design\Civil\SEWER\SSPP479090l.dwg

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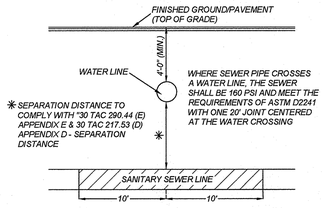

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE

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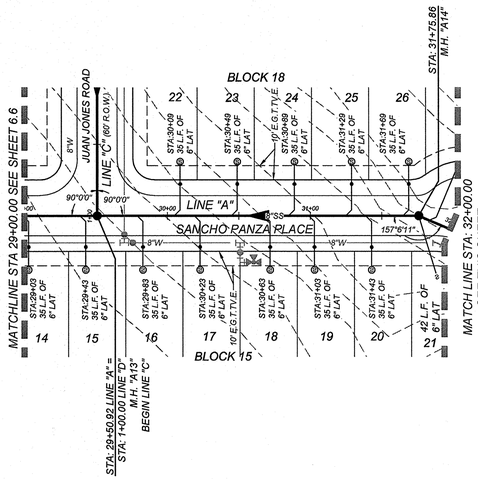

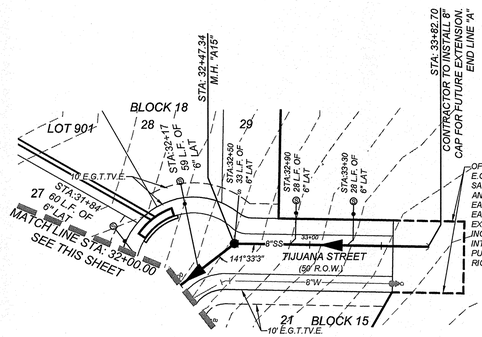

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HORZ SCALE: 1"=50'
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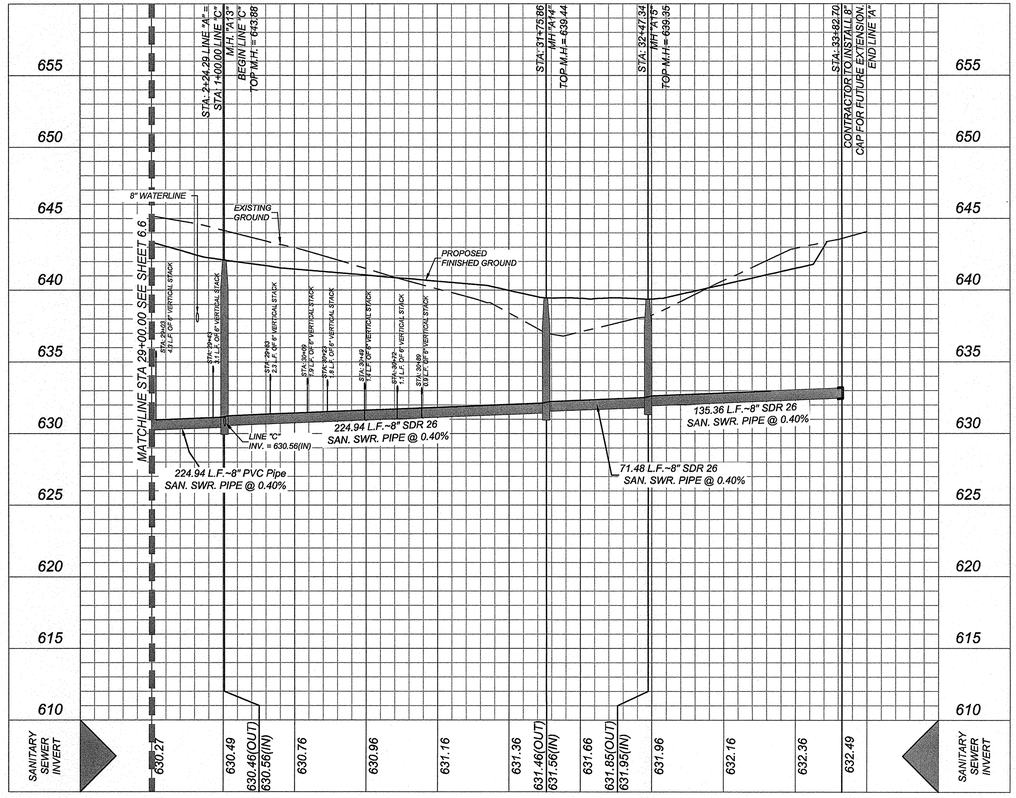

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TBPE Firm #: 8515 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
12/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
SEWER LINE "A" PLAN & PROFILE
(SHEET 3 OF 3)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
6.7

Date: Oct 28, 2022, 11:34am User ID: fthompson
File: N:\479\09\01\Design\Civil\SEWER\SSPP4790901.dwg

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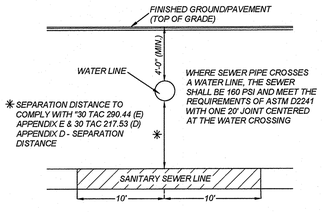

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
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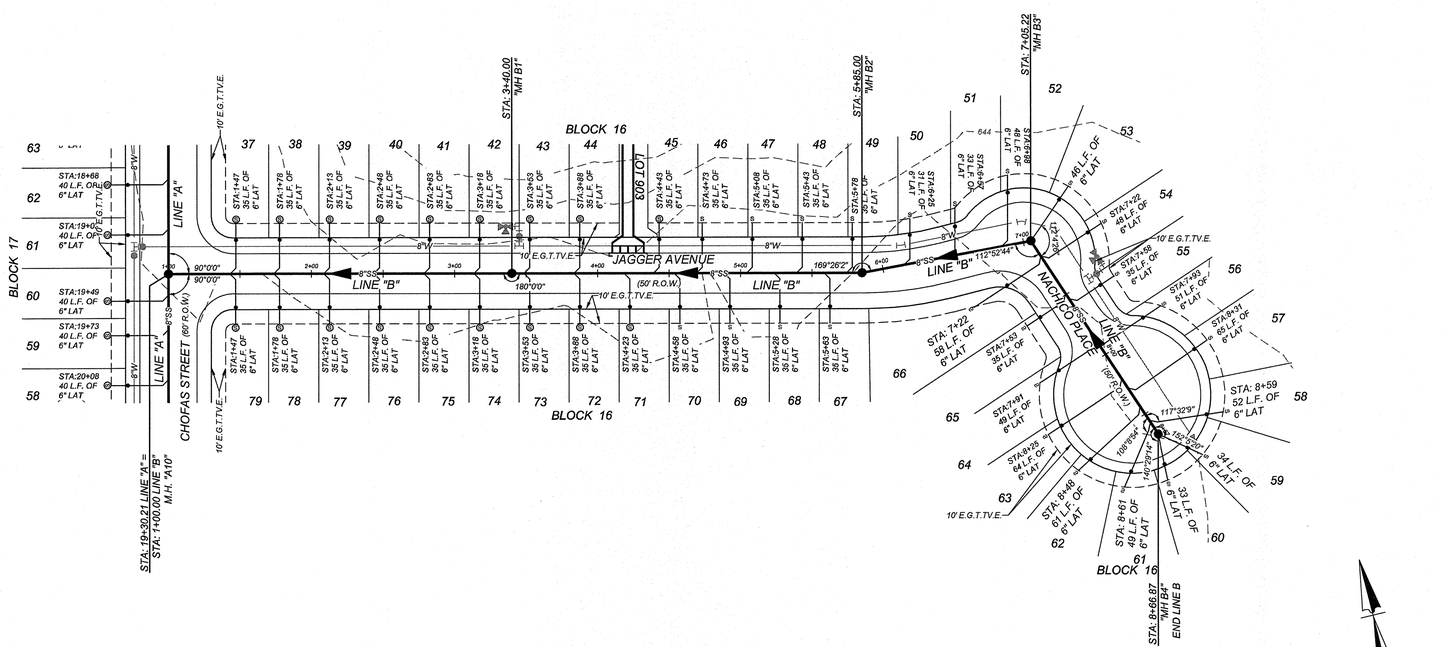

LINE "B"
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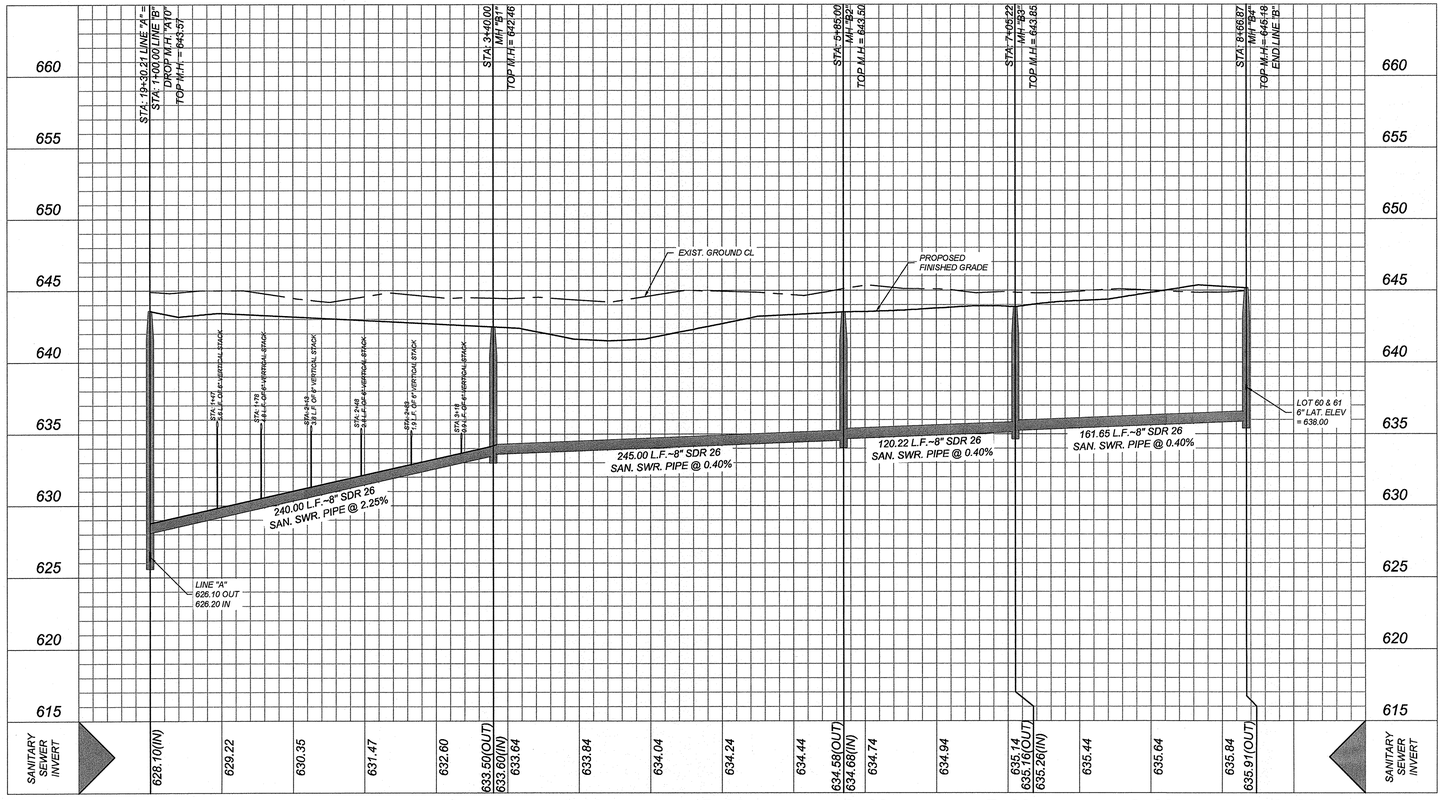
HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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ISSUE DATE
REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
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10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
SEWER LINE "B" STA: 1+00.00 TO END

PLAT NO. 21-11800683
JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR
SHEET NUMBER: 6.8

Date: Oct 28, 2022, 11:03am User ID: tthompson
File: N:\479\09\01\Design\Civil\SEWER\SSFP479001.dwg

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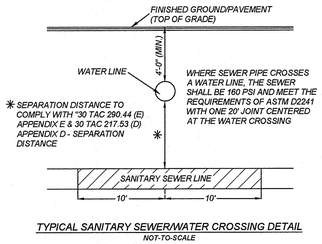
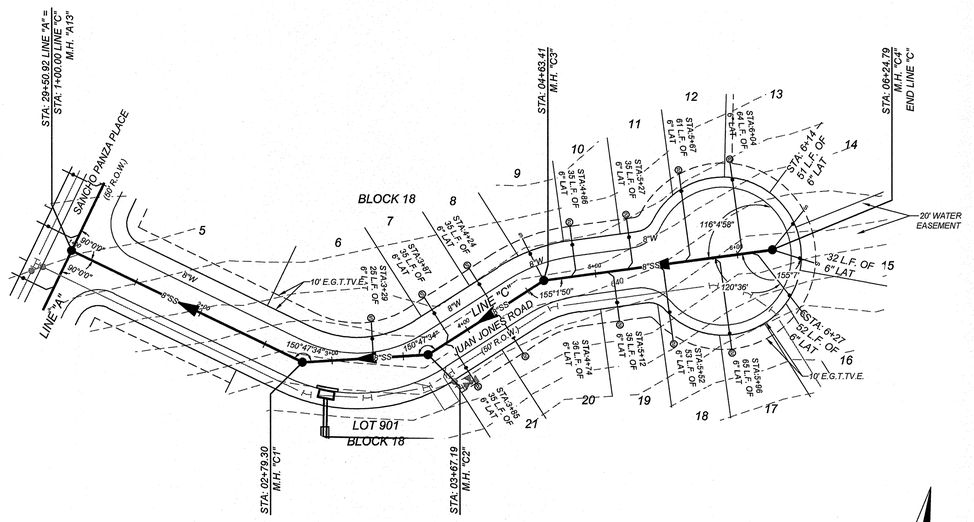
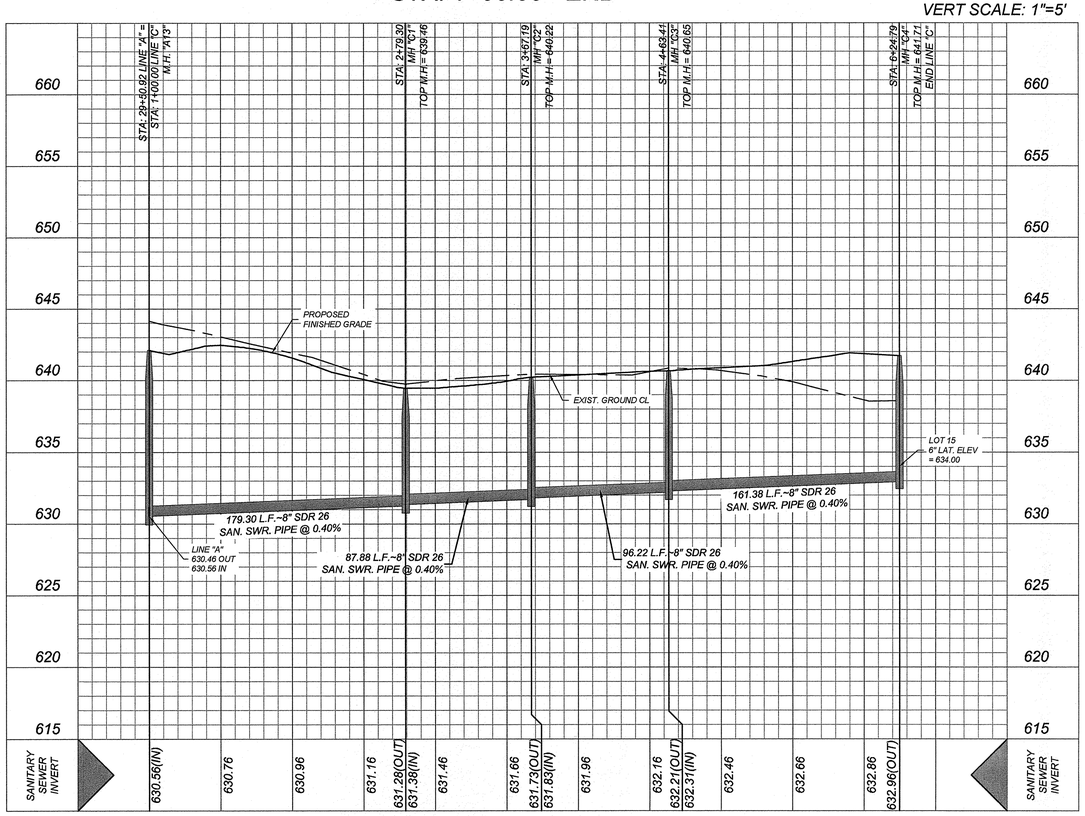


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE



LINE "C"
STA: 1+00.00 - END

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



KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122500

ISSUE DATE
REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
SEWER LINE "D" PLAN & PROFILE

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
6.9

Date: Oct 28, 2022, 11:36am User ID: tthompson
File: N:\479\09\01\Design\Civil\SEWER\SSPP+479090l.dwg

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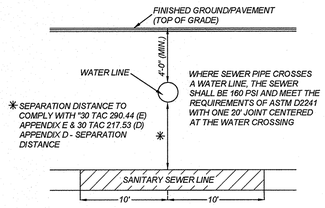
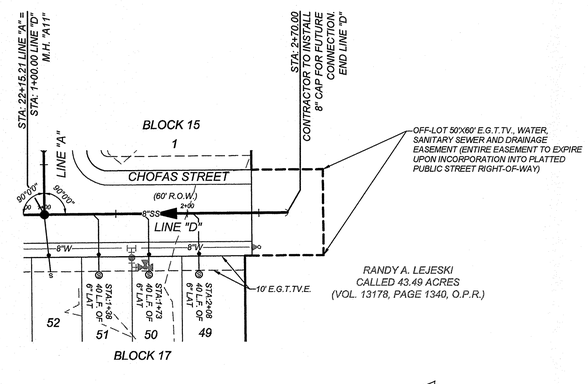
NOTE:

1. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE MEET THE REQUIREMENTS OF ASTM D2241. CONTRACTOR SHALL CENTER A 20 FOOT JOINT OF 200 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER CROSSING (NO SEPARATE PAY ITEM). REFERENCE SHEET 6.1-6.2, SANITARY SEWER GENERAL NOTES.
2. PIPE TYPE DESIGNATIONS ARE SDR 21.
3. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
4. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER. SEE SHEET 6.11 FOR DETAILS.



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



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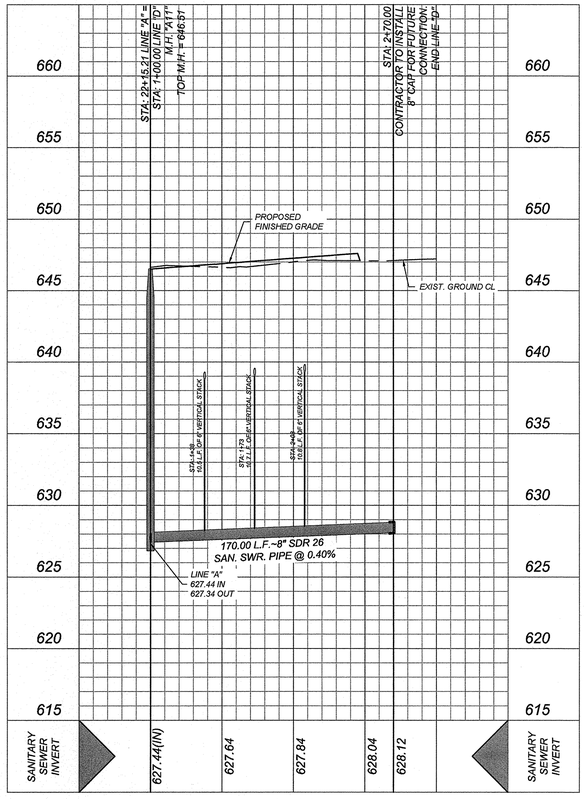
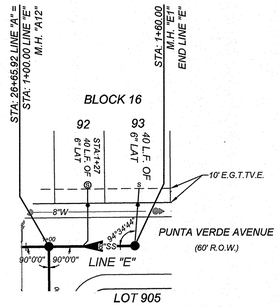
VERT SCALE: 1"=5'





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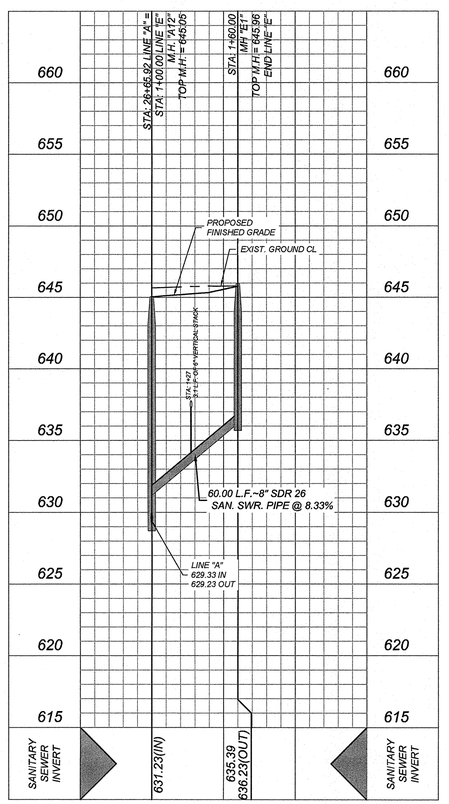

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TBPE Firm #: 8513 • TBPLS Firm #: 10122300

ISSUE DATE
REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
SEWER LINE "E" AND LINE "F" PLAN & PROFILE

PLAT NO. 21-11800683
JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR
SHEET NUMBER: 6.10

Date: Oct 28, 2022, 11:38am User ID: tthompson
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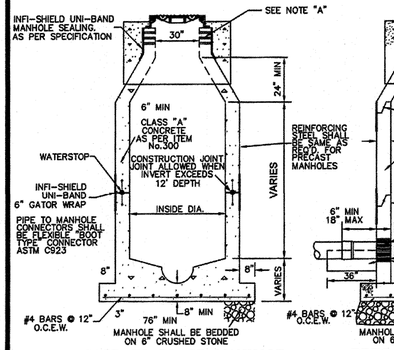
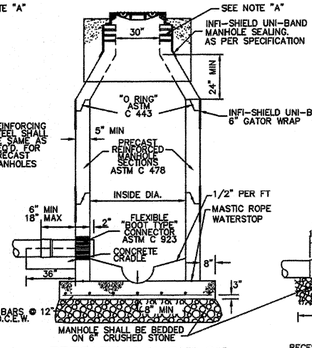
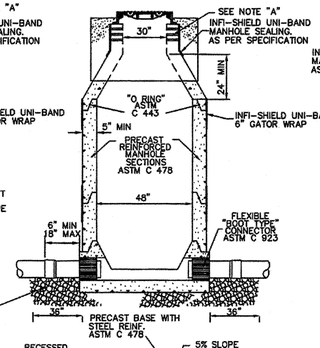


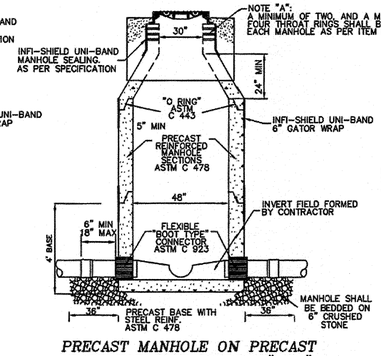
CAST-IN-PLACE MANHOLE



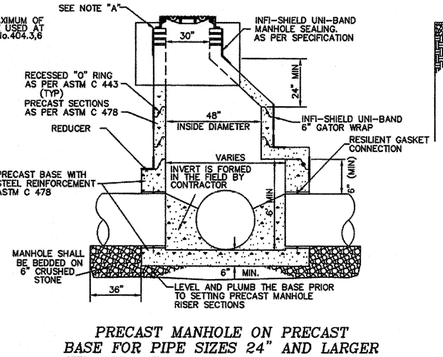
PRECAST MANHOLE ON CAST-IN-PLACE BASE



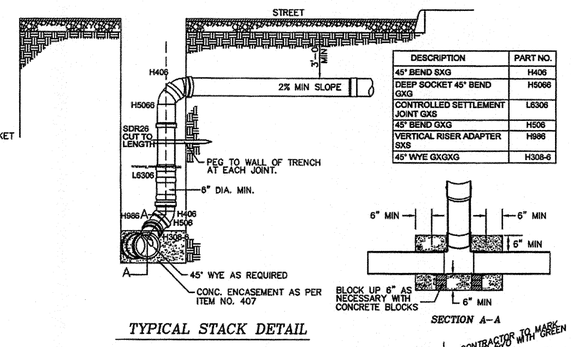
PRECAST MANHOLE ON PRECAST BASE FOR PIPE SIZES 8"-12"



PRECAST MANHOLE ON PRECAST BASE FOR PIPE SIZES 15"-24"



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

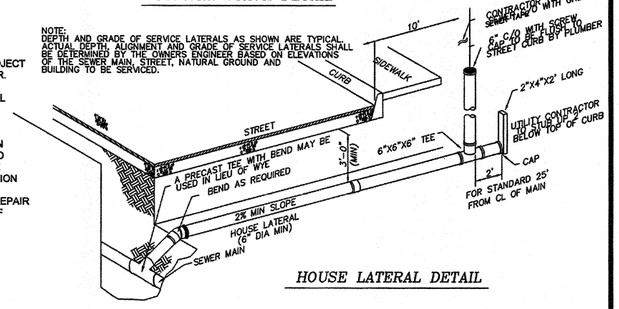


TYPICAL STACK DETAIL

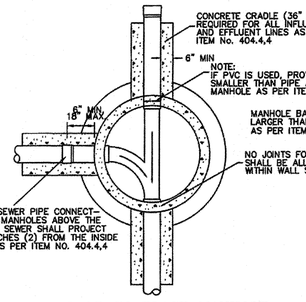
Sanitary Sewer General Notes:

ALL NEW EXISTING SANITARY SEWER MAINS AND MANHOLES IN THIS PROJECT ARE TO REMAIN ACTIVE AND SHALL BE PROTECTED BY THE CONTRACTOR. ALL LINES AND MANHOLES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED OR RECONSTRUCTED BY THE CONTRACTOR AT NO ADDITIONAL COST. NOTIFY SARA'S UTILITIES INSPECTORS AT (210) 219-0130 OR (210) 287-0606 PRIOR TO ENCASING.

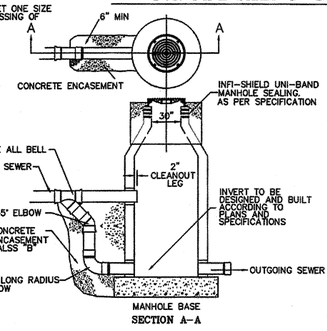
THE EXISTING CONDITIONS OF SEWER MAINS AND MANHOLES HAVE BEEN DOCUMENTED BY SARA. A PRE-CONSTRUCTION VIDEO OF THE LINES AND PHYSICAL SURVEY OF THE MANHOLES WILL BE USED TO DETERMINE THE PRE-EXISTING CONDITION OF THE SEWER SYSTEM. IF POST CONSTRUCTION INSPECTION WORK SHOWS PORTIONS OF SANITARY SEWER MAINS OR MANHOLES DAMAGED BY THE CONTRACTOR, THE CONTRACTOR SHALL REPAIR OR REPLACE THE SEWER MAIN AT THEIR EXPENSE, TO THE APPROVAL OF SARA'S INSPECTORS OR ENGINEER.



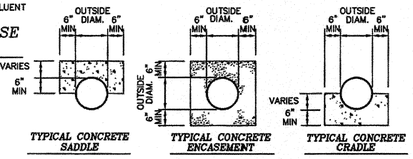
HOUSE LATERAL DETAIL



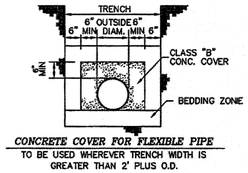
CAST-IN-PLACE MANHOLE BASE PLAN



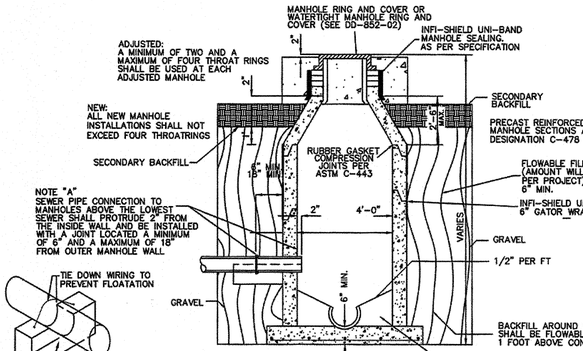
OUTSIDE DROP MANHOLE



TYPICAL CONCRETE SADDLE | TYPICAL CONCRETE ENCASEMENT | TYPICAL CONCRETE CRADLE

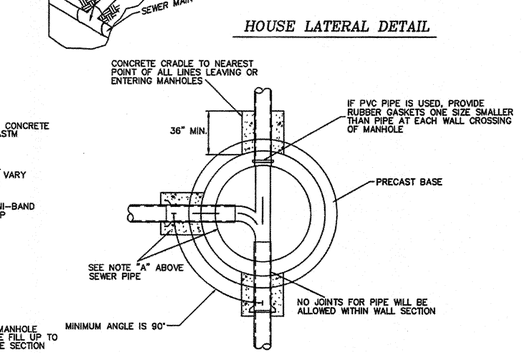


CONCRETE COVER FOR FLEXIBLE PIPE
TO BE USED WHEREVER TRENCH WIDTH IS GREATER THAN 2' PLUS O.D.

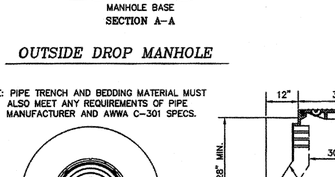


TYPICAL SUPPORT FOR ENCASEMENT CRADLE

PRECAST MANHOLE ON PRECAST BASE

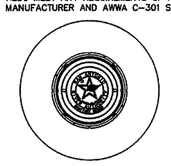


MANHOLE FLOOR PLAN

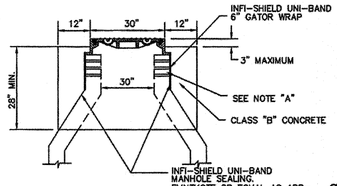


SHALLOW MANHOLE

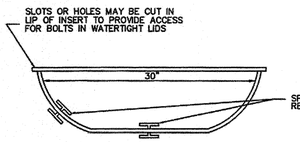
NOTE: PIPE TRENCH AND BEDDING MATERIAL MUST ALSO MEET ANY REQUIREMENTS OF PIPE MANUFACTURER AND AWWA C-301 SPECS.



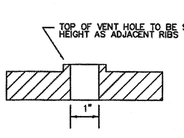
MANHOLE RING ENCASEMENT DETAIL



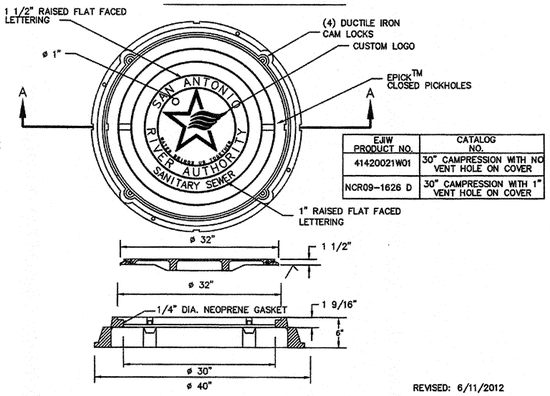
CONCRETE ENCASEMENT, CRADLES, SADDLES, AND COLLAR DETAILS



WATERTIGHT MANHOLE INSERT DETAIL



VENT HOLE DETAIL SECTION A-A

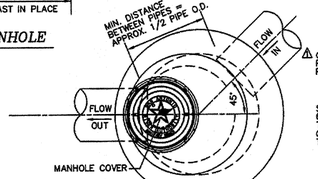


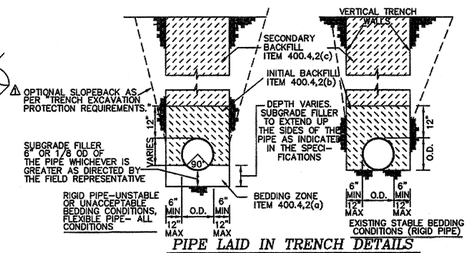
EJW PRODUCT NO.	CATALOG NO.
414200021W01	30" CAMPRESSION WITH NO VENT HOLE ON COVER
NCR09-1626 D	30" CAMPRESSION WITH 1" VENT HOLE ON COVER

REVISED: 6/11/2012

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

PRECAST MANHOLE ON PRECAST BASE-PLAN





PIPE LAID IN TRENCH DETAILS

NOTE:

NO.	REVISION	DATE	BY

DESIGNED BY: _____
DRAWN BY: WTG/XM/RVD
CHECKED BY: WTG
APPROVED BY: _____
DATE: _____ FILE: MANHOLE_STANDARDS

SAN ANTONIO RIVER AUTHORITY
Water Brings Us Together

SAN ANTONIO RIVER AUTHORITY
100 E. GUENTHER STREET
P.O. BOX 839980
SAN ANTONIO, TEXAS 78283-9980

STANDARD SANITARY SEWER DETAILS

SHEET ___ OF ___

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Date: Oct 28, 2022, 11:05am User ID: tthompson
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REVISIONS | ISSUE DATE

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS

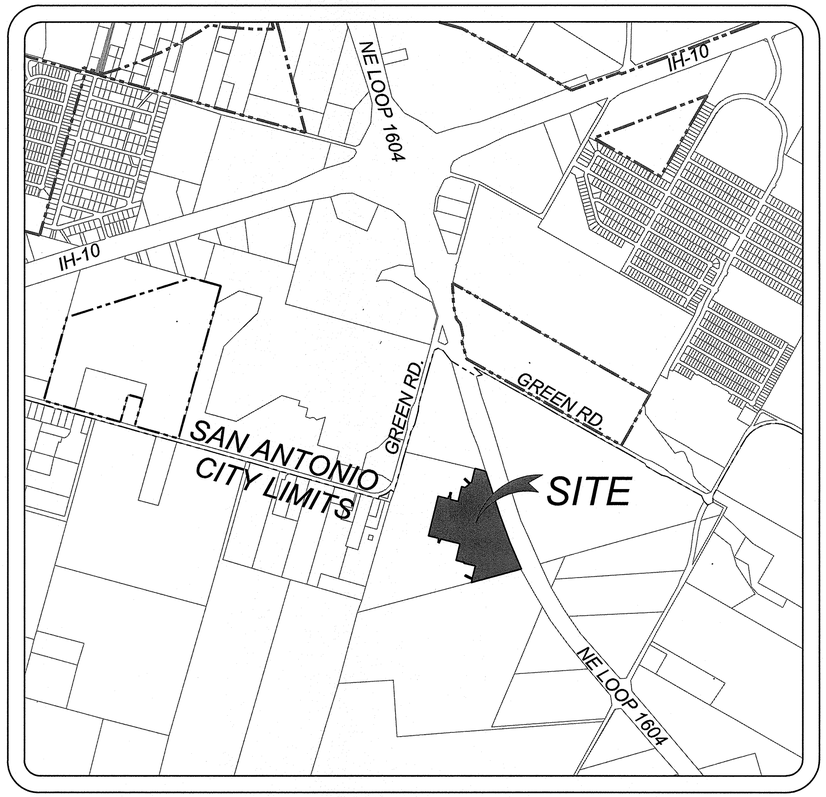
SANITARY SEWER DETAIL SHEET

PLAT NO. 21-11800683
JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR
SHEET NUMBER: 6.11

PUNTA VERDE SUBDIVISION UNIT 1

BEXAR COUNTY, TEXAS

WATER IMPROVEMENTS



LOCATION MAP
N.T.S.

INDEX

Sheet Title	Sheet Number
WATER IMPROVEMENTS	7.0
OVERALL WATER PLAN (SHT 1 OF 2)	7.1
OVERALL WATER PLAN (SHT 2 OF 2)	7.2
WATER DETAILS (SHEET 1 OF 5)	7.3
WATER DETAILS (SHEET 2 OF 5)	7.4
WATER DETAILS (SHEET 3 OF 5)	7.5
WATER DETAILS (SHEET 4 OF 5)	7.6
WATER DETAILS (SHEET 5 OF 5)	7.7

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

SHEET REVISION LOG

DATE	SHEET NO.	REVISION NO.	DESCRIPTION

OWNER/DEVELOPER:
GREEN ROAD 1604 PARTNERS, LLC
13750 SAN PEDRO AVENUE, SUITE B10
SAN ANTONIO, TEXAS 78232
(210) 490-7272

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

JOB NO. - 479-09-01

PLAT NO. : 21-11800683

SHEET 7.0

Date: Oct 28, 2022, 11:11am User ID: Bthompson
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WATER PLAN NOTES:
1. *ALL VALVES SHALL READ "OPEN RIGHT"*
2. *ALL PVC PIPE SHALL BE C-900 CLASS 150.*

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 1,500 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!!!
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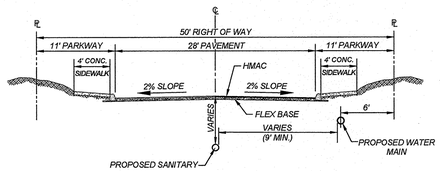
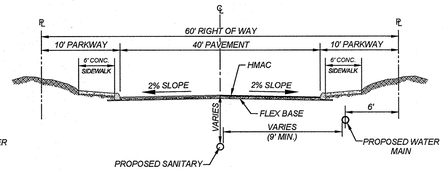
NOTE:
PRESSURE REDUCING VALVES TO BE THE RESPONSIBILITY OF THE HOME BUILDER WHERE REQUIRED

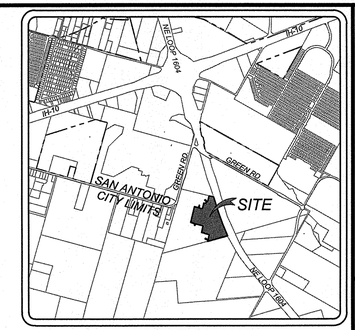
NOTE:
CONTRACTOR SHALL COORDINATE WITH EAST CENTRAL WATER DISTRICT TO VERIFY THE LOCATION OF ISOLATION VALVES. OPERATION OF ISOLATION VALVES SHALL ONLY BE MADE WITH THE APPROVAL AND PRESENCE OF EAST CENTRAL WATER DISTRICT PERSONNEL



TYPICAL 50' STREET SECTION
N.T.S.



TYPICAL 60' STREET SECTION
N.T.S.



LOCATION MAP
N.T.S.

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

OROVEST HOLDINGS LLC. UNPLATTED REMAINING PORTION OF 70.38 ACRES (VOL. 13178, PAGE 1340, O.P.R.)

1 ~ 12"X6" TEE, M.J. ANCHOR
1 ~ 6" GATE VALVE, M.J.
1 ~ 6" VALVE BOX COMPLETE
1 ~ 1/4 ANCHOR BEND, M.J.
6" D.I. NIPPLE
1~STANDARD FIRE HYDRANT

BLOCK 17 CB 5088
49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64

85 L.F. ~ 12" C-900 PVC
1 ~ 12"X12" TEE, M.J. ANCHOR
2 ~ 12" GATE VALVE, M.J.
2 ~ 6" VALVE BOX COMPLETE
1 ~ 12"X12" TEE, M.J. ANCHOR
1 ~ 12" GATE VALVE, M.J.
1 ~ 6" GATE VALVE, M.J.
2 ~ 6" VALVE BOX COMPLETE
10' E.G.T.TV.E.
1 ~ 2" BLOWOFF (PERM.)
1 ~ 12" X 2" D.I. ECCENTRIC REDUCER
OFF-LOT 50'X60' E.G.T.TV., WATER, SANITARY SEWER AND DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET RIGHT-OF-WAY)
6.0' TYP.
280 L.F. ~ 12" C-900 PVC
CHOFAS STREET
(60' R.O.W.)
160 L.F. ~ 12" C-900 PVC
89 L.F. ~ 12" C-900 PVC
8"SS
58'
5'

1 ~ 12"X6" TEE, M.J. ANCHOR
1 ~ 6" GATE VALVE, M.J.
1 ~ 6" VALVE BOX COMPLETE
1 ~ 1/4 ANCHOR BEND, M.J.
6" D.I. NIPPLE
1~STANDARD FIRE HYDRANT
340 L.F. ~ 12" C-900 PVC
105 L.F. ~ 12" C-900 PVC
1 ~ 2" BLOWOFF (PERM.)
1 ~ 12" X 2" D.I. ECCENTRIC REDUCER
OROVEST HOLDINGS LLC. UNPLATTED REMAINING PORTION OF 70.38 ACRES (VOL. 13178, PAGE 1340, O.P.R.)
GREEN ROAD 1604 PARTNERS LLC UNPLATTED 22.901 ACRES (VOL. 13802, PAGE 2236, O.P.R.)
1 ~ 12"X12" TEE, M.J. ANCHOR
2 ~ 12" GATE VALVE, M.J.
2 ~ 6" VALVE BOX COMPLETE
1 - 12" 1/16 BEND, M.J.
20 L.F. ~ 12" C-900 PVC
1 - 12" 1/32 BEND, M.J.
20' WATER EASEMENT
EXIST. 12' WATER EASEMENT (PLAT NO. 21-11800585)
MATCHLINE "B" THIS SHEET

WATER/SEWER CROSSING
SEE DETAIL THIS SHEET
10' E.G.T.TV.E.
1 2 3 4 5 6 7
80 81 82 83 84 85 86
79 78 77 76 75 74 73
BLOCK 15 CB 5088
PUNTA VERDE AVENUE
(60' R.O.W.)
339 L.F. ~ 12" C-900 PVC
JAGGER AVENUE
(60' R.O.W.)
269 L.F. ~ 8" C-900 PVC
BLOCK 16 CB 5088
37 38 39 40 41 42 43
OROVEST HOLDINGS LLC. UNPLATTED REMAINING PORTION OF 70.38 ACRES (VOL. 13178, PAGE 1340, O.P.R.)
1 ~ 8"X6" TEE, M.J. ANCHOR
1 ~ 6" GATE VALVE, M.J.
1 ~ 6" VALVE BOX COMPLETE
1 ~ 1/4 ANCHOR BEND, M.J.
6" D.I. NIPPLE
1~STANDARD FIRE HYDRANT
VARIABLE WIDTH GAS, AND ACCESS EASEMENT
VARIABLE WIDTH SANITARY SEWER, WATER, DRAINAGE, ELECTRIC, GAS, TELEPHONE, & CABLE T.V., & MAINTENANCE ACCESS EASEMENT
VARIABLE WIDTH GAS, AND ACCESS EASEMENT
1 ~ 12"X12" TEE, M.J. ANCHOR
2 ~ 12" GATE VALVE, M.J.
2 ~ 6" VALVE BOX COMPLETE
1 ~ 2" BLOWOFF (PERM.)
1 ~ 12" X 2" D.I. ECCENTRIC REDUCER
30' SANITARY SEWER EASEMENT
105 L.F. ~ 12" C-900 PVC
EXIST. 30' SANITARY SEWER EASEMENT (PLAT NO. 21-11800585)
640 641 647 646 635 637

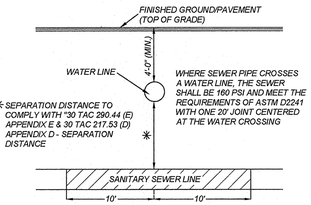
MATCHLINE "A" SEE SHEET 7.2

MATCHLINE "B" SEE THIS SHEET
1 ~ 12"X6" TEE, M.J. ANCHOR
1 ~ 6" GATE VALVE, M.J.
1 ~ 6" VALVE BOX COMPLETE
1 ~ 1/4 ANCHOR BEND, M.J.
6" D.I. NIPPLE
1~STANDARD FIRE HYDRANT
GREEN ROAD 1604 PARTNERS LLC CALLED 22.901 ACRES (VOL. 13802, PAGE 2236, O.P.R.)
EXISTING OFF-LOT 20' PUBLIC WATER EASEMENT (PLAT NO. 21-11800585)
357 L.F. ~ 12" C-900 PVC
397 L.F. ~ 12" C-900 PVC
333 L.F. ~ 12" C-900 PVC
10"SS
EXIST. 30' SANITARY SEWER EASEMENT (PLAT NO. 21-11800585)
GREEN ROAD 1604 PARTNERS LLC CALLED 22.901 ACRES (VOL. 13802, PAGE 2236, O.P.R.)
1 ~ 12"X6" TEE, M.J. ANCHOR
1 ~ 6" GATE VALVE, M.J.
1 ~ 6" VALVE BOX COMPLETE
1 ~ 1/4 ANCHOR BEND, M.J.
6" D.I. NIPPLE
1~STANDARD FIRE HYDRANT
EXISTING OFF-LOT 20' PUBLIC WATER EASEMENT (PLAT NO. 21-11800585)
EXIST. 30' SANITARY SEWER EASEMENT (PLAT NO. 21-11800585)
GREEN ROAD 1604 PARTNERS LLC CALLED 4.34 ACRES (VOL. 13802, PAGE 2236, O.P.R.)
OFF-LOT 30' PUBLIC SANITARY SEWER EASEMENT (PLAT NO. 21-11800585)
633 634 635 636 638 640 642

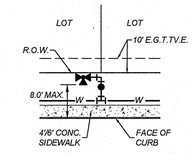
CONTRACTOR TO REMOVE EXISTING BLOWOFF (PERM.) AND TIE NEW 12" PVC PIPE TO EXIST. 8" PVC PIPE AFTER DISINFECTION BY CONTRACTOR AND ACCEPTANCE BY ECSUD
INSTALL FOR CHLORINATION INJECTION
2 - 1" CORP. STOP C.C. X I.P.
2 - 1" COMP. X 1 ½" CPL. CURB STOP
2 - 1 ½" SOLID CAP, THD.
2 - 1" COPPER TUBING, CUT AS REQ.
CONTRACTOR SHALL PROVIDE A 2" JUMPER CONNECTION TO LOAD NEW MAIN
1 - 2" BLOWOFF (TEMP.)
1 - 12" SOLID SLEEVE M.J.

LEGEND

PROPOSED WATER MAIN	8"W
PROPOSED WATER SERVICE & METER BOX	W
PROPOSED WATER SERVICE & METER BOX WITH PRESSURE REDUCING VALVE	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & 5/8" METER BOX	W
PROPOSED FIRE HYDRANT	
PROPOSED SANITARY SEWER MAIN	8"SS
PROPOSED SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER LATERAL	
PROPOSED WATER VALVE	
PROPOSED SANITARY SEWER LATERAL WITH VERTICAL STACK	
ELECTRIC, GAS, TELE., & CABLE TV EASEMENT	E.G.T.TV.E.
VEHICULAR NON-ACCESS EASEMENT	V.N.A.E.
EXISTING WATER MAIN	E 8"W
EXISTING FIRE HYDRANT	
EXISTING WATER VALVE	
EXISTING SANITARY SEWER MAIN	E 8"SS
EXISTING SANITARY SEWER MANHOLE	
EXISTING STREETLIGHT (UG, 250 WATT)	



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



TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE
REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
OVERALL WATER PLAN (SHT 1 OF 2)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
7.1

Date: Apr 12, 2022, 4:52pm User ID: amorenо
File: N:\479\09\01\Design\Civil\WATER\09479090101.dwg

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

TRENCH EXCAVATION SAFETY PROTECTION
CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGNG/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 150.*

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 1,500 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.

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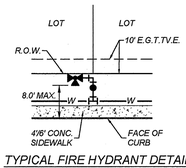
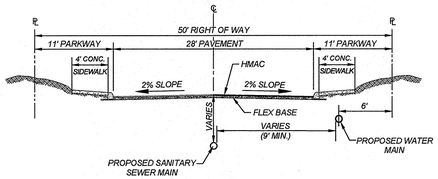
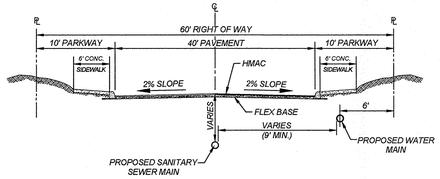


TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE



TYPICAL 50' STREET SECTION
N.T.S.



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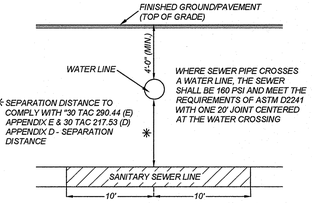
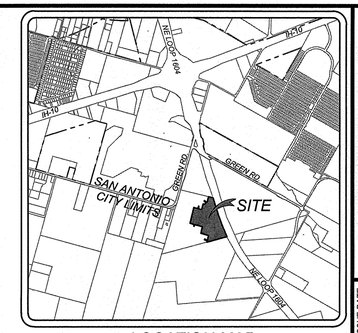


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
NOT-TO-SCALE



LOCATION MAP
N.T.S.

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

LEGEND

PROPOSED WATER MAIN	8"W
PROPOSED WATER SERVICE & METER BOX	
PROPOSED WATER SERVICE & METER BOX WITH PRESSURE REDUCING VALVE	
PROPOSED WATER 3/4" IRRIGATION SERVICE & 5/8" METER BOX	
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EXISTING WATER MAIN	E.8"W
EXISTING FIRE HYDRANT	
EXISTING WATER VALVE	
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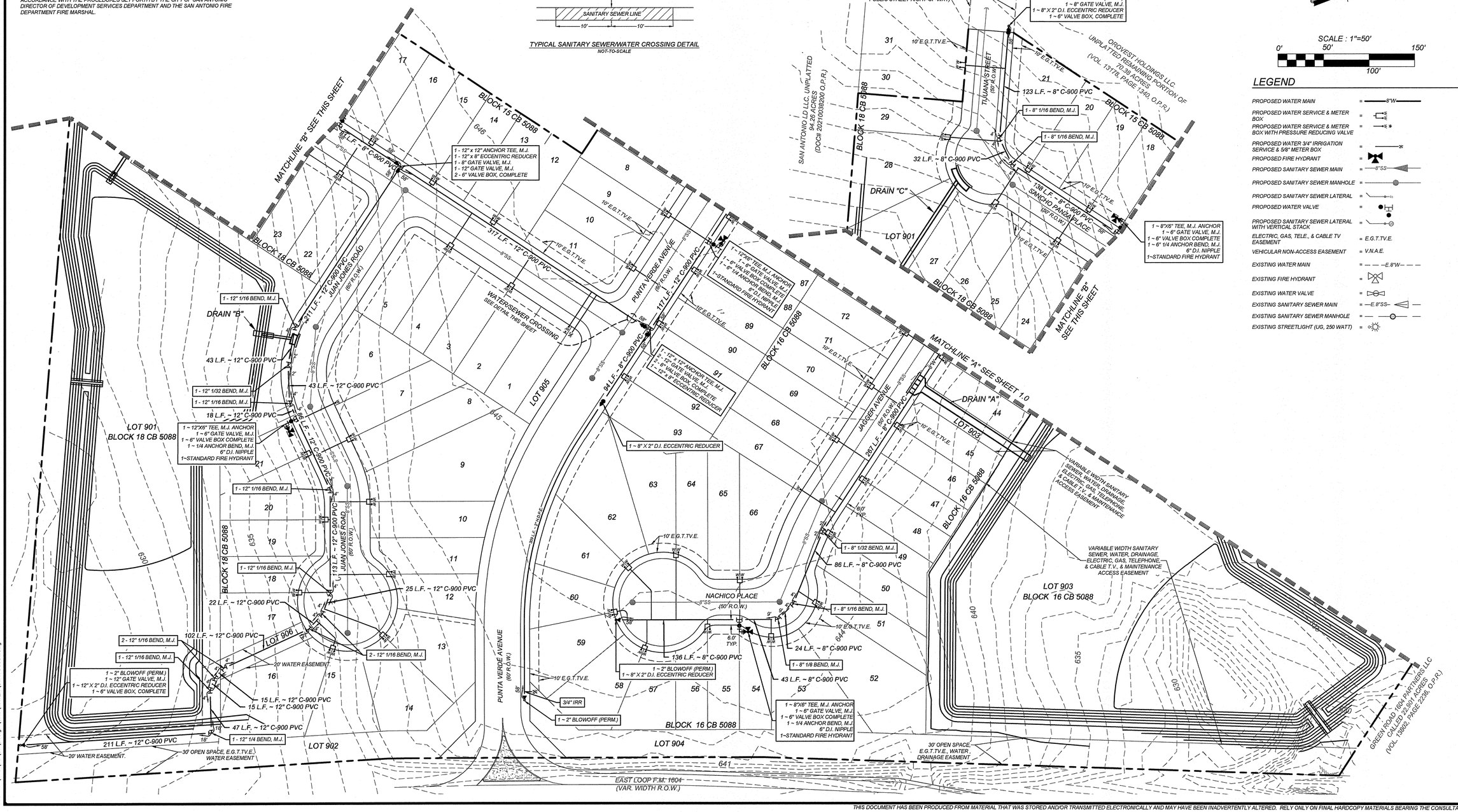
EXISTING SANITARY SEWER MANHOLE	
EXISTING STREETLIGHT (UG, 250 WATT)	



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ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
OVERALL WATER PLAN (SHT 2 OF 2)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
7.2

Date: Apr 12, 2022, 4:53pm User ID: amoreno
File: N:\479\09\01\Design\Civil\WATER\DW479090l.dwg

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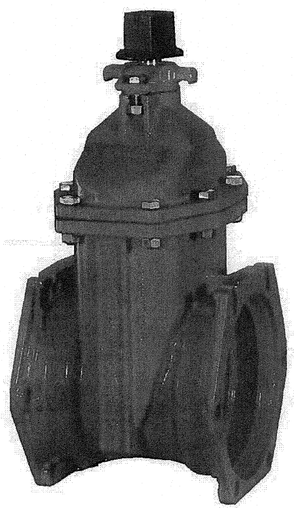
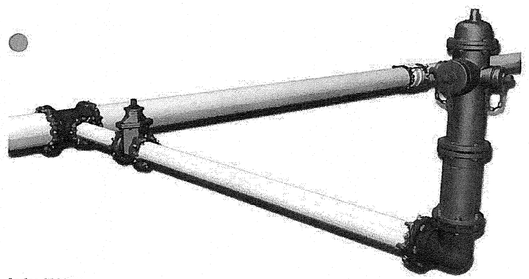
AMERICAN FLOW CONTROL

2" – 12" SERIES 2500 RESILIENT WEDGE GATE VALVE





Series 2000PV:
Mechanical Joint Restraint Gland for use With AWWA C900 or IPS Outside Diameter PVC Pipe

The 2000PV MEGALUG Mechanical Joint Restraint is the fastest and most economical method of restraining PVC pipe to mechanical joints. Now the need for costly concrete thrust blocks and corrodible steel tie rods is eliminated. It can be used in straight alignment or at the preset deflection recommended for mechanical joints.

The 2000PV was the first PVC joint restraint to be tested to UNI-B-13, Underwriters Laboratories, and Factory Mutual.

Tested to and meets the requirements of ASTM F 1674-96 "Standard" Test Method for joint restraint products use with PVC pipe through 24 inch size.

UL Listed in the four through twelve inch sizes for joining UL Listed ductile iron fittings to UL Listed, Class 150 PVC pressure pipe. The maximum allowable joint deflection is five degrees.

Factory Mutual approved for use on DR18 PVC pipe in four through twelve inch sizes.

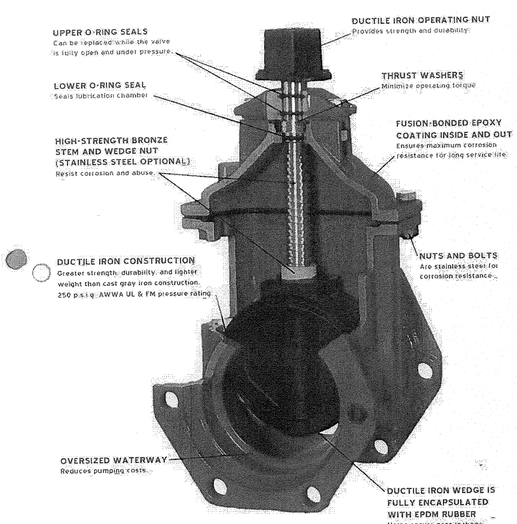
FM APPROVED UL ASTM F1674 AWWA MEMBER

The 2000PV MEGALUG Concept

EBAA Iron started manufacturing joint restraint products for PVC pipe in the early 1980s. The testing of early prototypes of various configurations of restraints on large diameter PVC pipe indicated that a restraint device must be capable of consistently and reliably gripping the pipe. If not, the restraint can slip under pressure, resulting in a sudden impact, and cause the pipe to burst. Armed with this background knowledge and an appreciation for the capabilities of PVC pipe, EBAA purposefully deviated from what many in the industry once considered to be the 'only' way to grip PVC pipe. This led to development of the Series 2000PV MEGALUG Mechanical Joint Restraint for PVC pipe.

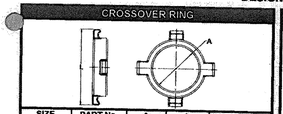
The design of the 2000PV incorporates the gripping mechanism into the design of the mechanical joint gland and utilizes a simple two part assembly process. The first step involves assembling the joint the same as any standard mechanical joint. The assembly procedure we recommend is that established in AWWA C600. The second is the actuation of the restraint.

CONSTRUCTION



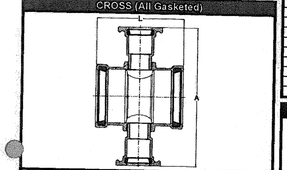
HARCO DUCTILE IRON IPS GASKETED FITTINGS
DESIGN DATA

CROSSOVER RING



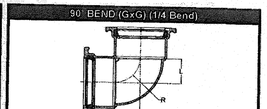
SIZE	PART No.	A	L	WT. (approx.)
3	82103	3.6	6.6	3.1
4	82104	4.6	7.7	4.6
6	82106	6.7	10.0	7.5

CROSS (All Gasketed)



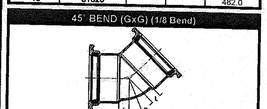
SIZE	PART No.	A	L	WT. (approx.)
2½ x 2½ x 1½ x 1½	802150303	14.2	6.5	16
2½ x 2½ x 2 x 2	802150404	13.3	6.5	17
3 x 3 x 2 x 2	803150404	12.6	8.5	21
3 x 3 x 2½ x 2½	803150505	14.6	9.0	24
4 x 4 x 2 x 2	804150404	14.3	10.9	21.7
4 x 4 x 2½ x 2½	804150505	15.7	10.9	22.4
4 x 4 x 3 x 3	804150606	16.2	10.9	22.3
6 x 6 x 2 x 2	806150404	15.7	10.2	40
6 x 6 x 2½ x 2½	806150505	17.7	10.2	41
6 x 6 x 3 x 3	806150606	18.3	11.8	44
8 x 8 x 2 x 2	808150404	18.7	12.0	51
8 x 8 x 2½ x 2½	808150505	19.8	12.0	54
8 x 8 x 3 x 3	808150606	20.4	12.0	57
10 x 10 x 2 x 2	810150404	20.8	12.6	71
10 x 10 x 2½ x 2½	810150505	21.8	12.6	73
10 x 10 x 3 x 3	810150606	22.6	12.6	76
12 x 12 x 2 x 2	812150404	22.0	13.2	76
12 x 12 x 2½ x 2½	812150505	24.0	13.2	82
12 x 12 x 3 x 3	812150606	24.6	13.2	85

90° BEND (GxG) (1/4 Bend)



SIZE	PART No.	L	R	WT. (approx.)
1½	80020	1.1	1.1	4.4
2	80120	1.4	1.4	5.9
2½	80220	1.6	1.6	7.1
3	80320	2.0	2.0	10.2
4	80420	2.5	2.5	15.1
6	80620	3.5	3.5	26.7
8	80820	v4.5	4.5	42.0
10	81020	5.6	5.6	67.0
12	81220	6.7	6.7	99.0
14	81420	7.8	7.8	164.7
16	81620	9.0	9.0	203.2
18	81820			482.0

45° BEND (G x G) (1/8 Bend)



SIZE	PART No.	L	R	WT. (approx.)
1½	80022	1.9	1.9	7.5
2	80122	0.6	1.5	5.4
2½	80222	0.7	1.7	6.6
3	80322	0.9	2.2	8.6
4	80422	1.1	2.7	13.3
6	80622	1.5	3.6	22.6
8	80822	1.9	4.7	35.1
10	81022	2.2	5.4	55.4
12	81222	2.6	6.4	73.1
14	81422	3.3	8.1	161.4
16	81622	3.8	9.0	203.8
18	81822			209.0

NOTES:
- All lay lengths & weights are approximate and are subject to change without notice.
- Fabricated fitting configurations may vary.

CALL FOR OTHER SIZES, CONFIGURATIONS & GASKET MATERIALS

HARCO

THE HARRINGTON CORPORATION
P.O. BOX 10335 • LYNCHBURG VIRGINIA 24506 • PLANT 3721 COHEN PLACE • LYNCHBURG VIRGINIA 24501
PHONE: (434) 845-7094 • FAX: (434) 845-8562 • E-mail: sales@harcofittings.com

Form XXX – 12/03/2003 – 3

FEATURES/SPECIFICATIONS

FEATURES

The AMERICAN Series 2500 Ductile Iron 250 p.s.i.g. AWWA Resilient Wedge Gate Valve is designed for use in drinking water, sewage and fire protection systems as well as irrigation and backflow control systems.

Triple O-ring Stem Seals
Sealing the lubrication chamber is a series of three O-ring stem seals. The O-rings help to isolate the lubrication chamber.

Thrust Washers
Two thrust washers are used. One is located above and one is located below the thrust collar. These thrust washers provide easy operation.

Ductile Iron Construction
The ductile iron body, bonnet and wedge provide strength and a pressure rating that meets or exceeds the requirements of AWWA C515. The tensile strength of ductile iron is more than twice that of cast iron. This added strength makes the Series 2500 more durable and rated at 250 p.s.i.g. This strength and higher pressure rating is provided in a compact, lightweight and easy-to-handle ductile iron valve.

Fusion-Bonded Epoxy
The Series 2500 valve is epoxy coated on the interior and the exterior. The fusion-bonded epoxy coating is applied prior to assembly. The bolt holes and body-to-bonnet flange surfaces are fully epoxy coated.

O-ring Style Gaskets
The body-to-bonnet and stuffing box cover seals are pressure-energized O-rings. This reduces the need for excessive bolt loading, which is required by designs that use flat gaskets. The O-rings are reusable, which reduces downtime during any needed repair.

The Series 2500 Resilient Wedge Gate Valve is furnished in configurations that are Listed by Underwriters Laboratories, Inc. and Approved by Factory Mutual Research Corp.

The Series 2500 Ductile Iron Resilient Wedge Gate Valve has these standard features:

- UL Listed-FM Approved
- Seat Tested at 375 p.s.i.g.
- Shell Tested at 500 p.s.i.g.
- Fusion-Bonded Epoxy Coating Complies With ANSI/AWWA C550
- CL250# Raised Face Flanges Available
- 250 p.s.i.g. AWWA UL and FM Pressure Rating
- Fully Rubber-Encapsulated Wedge
- Triple O-ring Stem Seals
- Thrust Washers
- Smooth larger than nominal Waterway
- 100% Leak-Tight Closure
- 4" and larger sizes Certified to NSF/ANSI standard 61
- Complies with AWWA C515
- Ductile Iron Body, Bonnet, Wedge, Operating Nut and Stuffing Box

SPECIFICATIONS

Valves 2" -12" in size shall be of a resilient wedge design. The valve shall have a cold water rated working pressure of 250 p.s.i.g. All cast ferrous components shall be ductile iron and shall be manufactured in compliance with the latest edition of AWWA/ANSI C515. The valve shall also be Listed by Underwriters Laboratories, Incorporated, and Approved by Factory Mutual, as applicable configurations. The valve design shall be lightweight, easy to handle, and constructed with wall thickness per Table 2, of AWWA/ANSI C515. Heavy wall and/or cast gray-iron bodies are not acceptable. The valve shall have a smooth and oversize waterway and have the marking "DI," or "Ductile Iron" cast on onto the body. The valve wedge shall be constructed of ductile iron and provided with protective wedge guide covers in sizes 4"-12". All wedges 3" and smaller shall be constructed of bronze. All wedges shall be fully encapsulated with EPDM rubber.

Valve stems shall be sealed by three O-rings. Two of the O-rings shall reside above the thrust collar. The O-rings shall be replaceable under full working pressure and with the valve in the full open position. O-rings set in a cartridge shall not be allowed. The valve shall also be equipped with thrust washers above and below the stem thrust collar for reduction of operating torque.

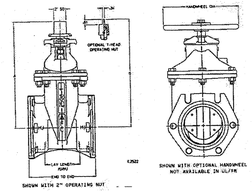
All exterior valve body bolting shall be type 304 stainless steel and shall be provided with hexagonal heads, with dimensions conforming to ANSI B18.2.1. Metric size and/or socket head cap screws or bolts, are not allowed. The operating nut shall be 2" square and shall be constructed of ductile iron fitted to a square tapered stem to help ensure even valve operating input torque. All body gaskets shall be of the pressure energized O-ring style design.

All internal and external ferrous surfaces of the valve body and bonnet shall have a fusion-bonded epoxy coating, complying with AWWA/ANSI C550. The coating shall be electrostatically applied prior to assembly and shall be Certified to ANSI/NSF Standard 61.

All valves shall be the AMERICAN Flow Control **Series 2500 or 2500-1 Resilient Wedge Gate Valves.**

DRAWING/DIMENSIONS

ES 2500 – STANDARD NRS DIMENSIONS
2"-12" SIZES2



QUANTITY							
2"	2-1/2"	3"	4"	6"	8"	10"	12"

☐ NRS with 2" Sq. Oper. Nut ☐ NRS with T-Head Oper Nut
☐ NRS with Handwheel ☐ Post Indicator Valve (PIV)
☐ OS & Y

Actuator: (Check One)
☐ NRS with Enclosed Miter Gearing
☐ 2" Sq. Oper. Nut Parallel to Waterway
☐ 2" Sq. Oper. Nut Perpendicular to Waterway
☐ Handwheel Perpendicular to Waterway

Open Direction:	☐ Left (C.C.W.) ☐ Right (C.W.)
Stem Material:	☐ Bronze (Standard) ☐ Stainless (Optional)
End Connections:	
Mechanical Joint Accessories:	☐ Yes ☐ No
UL Listed, FM Approved:	☐ Yes ☐ No
Other Requirements (List on a separate sheet):	

See notes at bottom of page.

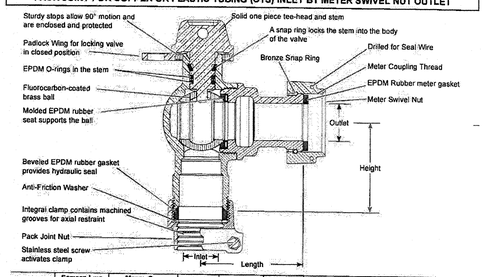
DIMENSION	VALVE SIZE							
	Series 2500			Series 2500-1				
	2"	2-1/2"	3"	4"	6"	8"	10"	12"
A	9.25	11.03	11.84	13.91	17.12	20.47	24.05	27.59
B	10.22	12.00	N/A	N/A	N/A	N/A	N/A	N/A
End to End – MJ/MJ	8.25	N/A	8.62	10.00	10.50	11.50	12.50	13.50
Lay Length – MJ/MJ	3.25	N/A	3.62	5.00	5.50	6.50	7.50	8.50
End to End – FL/FL (Class 125)	7.00	7.50	8.00	9.00	10.50	11.50	13.00	14.00
End to End – FL/FL (Class 250)	N/A	N/A	11.12	12.00	15.88	16.50	18.00	19.75
End to End – TY/TY	N/A	N/A	N/A	13.00	15.88	17.50	18.75	19.75
End to End – FL/MJ (Class 125)	N/A	N/A	8.31	9.50	10.50	12.38	13.62	14.38
End to End – FL/TY (Class 125)	N/A	N/A	N/A	11.00	13.19	14.50	15.88	16.88
End to End – PVC/PVC	10.75	11.12	11.38	13.00	15.88	17.50	N/A	N/A
End to End – Threaded	6.25	7.38	7.38	N/A	N/A	N/A	N/A	N/A
Handwheel Diameter	8.06	8.00	8.00	10.00	12.00	14.00	15.50	15.50
No. of Turns to Open	9	11	13	14	20	26	32	38

1. 3" through 12" valves meet or exceed requirements of ANSI/AWWA C515.
2. 2-1/2" through 12" valves may be ordered in configurations which are Listed by Underwriter's Laboratories, Inc. and Approved by Factory Mutual Research.
3. 2" through 12" valves have 250 p.s.i.g. AWWA rated working pressure.
4. 2-1/2" through 12" valves have 250 p.s.i.g. UL and FM rated working pressure.
5. Fusion-bonded epoxy coating meets or exceeds requirements of ASME/AWWA C550.
6. Flanged ends are in accordance with ANSI/AWWA C110/A21.10 (ASME B16.1, Class 125).
7. Threaded ends are in accordance with ASME B16.4, Class 125.
8. Mechanical joint ends are in accordance with ANSI/AWWA C111/A21.11.
9. "tyton" ends and push-on ends are in accordance with ANSI/AWWA C111/A21.11 for use on cast iron (CI) size ductile iron pipe.
10. PVC ends are suitable for use on steel (IPS) sizes of PVC or steel pipe.
11. **MAINTENANCE:** Each valve should be operated through a full cycle and returned to its normal position. This should be done on a time schedule that is designed to prevent a buildup of tuberculation or other deposits that could render the valve inoperable or prevent a tight shutoff. It is recommended this be done once a year.

SUBMITTAL INFORMATION

Angle Ball Meter Valves - *(BA43-3xxW style)*

PACK JOINT FOR COPPER OR PLASTIC TUBING (CTS) INLET BY METER SWIVEL NUT OUTLET



Valve Size	Service Line Size Inlet	Meter Size Outlet	Length	Height	Approx. Wt. Lbs	Part Number	✓ Submitted Item(s)
3/4"	3/4"	5/8" x 3/4" & 3/4"	2-19/64"	1-7/8"	2.2	BA43-332W	
3/4"	3/4"	1"	1-63/64"	1-7/8"	2.4	BA43-334W	
3/4"	1"	5/8" x 3/4" & 3/4"	2-19/64"	2-7/32"	2.4	BA43-342W	✓
3/4"	1"	1"	1-63/64"	2-7/32"	2.5	BA43-344W	

Note: Ford recommends using insert stiffeners with plastic pipe or tubing.

FEATURES
- All brass conforms to AWWA Standard C800 (ASTM B-62 and ASTM B-584, UNS NO C83600 - 85-5-5-5)
- Ends are integral or secured with adhesive to prevent unintentional disassembly
- Hole for attaching handle is provided in tee-head
- 300 PSI working pressure
- Padlock Wing for locking valve in closed position
- Conforms to AWWA C700 for Meter threads

Note: Recommended for inlet side shut-off
Optional full 360° tee-head rotation. Insert "R" into part number.

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.

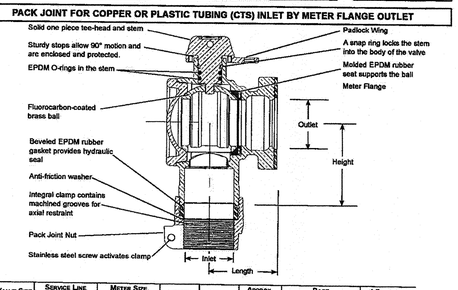
FORD **The Ford Meter Box Company, Inc.**
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com
11/24/10

Submitted By:

SUBMITTAL INFORMATION

Angle Ball Flange Meter Valves - *(BFA43-xxxW-NL style)*

PACK JOINT FOR COPPER OR PLASTIC TUBING (CTS) INLET BY METER FLANGE OUTLET



Valve Size	Service Line Size Inlet	Meter Size Outlet	Length	Height	Approx. Wt. Lbs	Part Number	✓ Submitted Item(s)
1-1/2"	1-1/2"	1-1/2"	2-1/2"	3-13/32"	7.8	BFA43-666W-NL	
2"	2"	2"	2-13/16"	3-5/8"	10.8	BFA43-777W-NL	

Note: Ford recommends using insert stiffeners with plastic pipe or tubing.

FEATURES
- All brass that comes in contact with potable water conforms to AWWA Standard C800 (UNS No. C89833)
- The product has the letters "NL" cast into the main body for lead-free identification
- Certified to NSF/ANSI Standard 61 and NSF/ANSI Standard 372 where applicable
- Brass components that do not come in contact with potable water conform to AWWA Standard C800 (ASTM B62 and ASTM B584, UNS No. C83600, 85-5-5-5)
- Padlock Wing for locking valve in closed position
- Hole for attaching handle is provided in the tee head
- 300 PSI working pressure
- Includes EPDM drop-in style meter gasket
- Suitable for customer side shut off (outlet side of meter) up to 300 PSI
- Slotted holes are standard on 2" Flanged Meter Valves, allowing 1-1/2" Flange Meter connection

Optional: Full 360° tee head rotation. Insert "R" into the part number. Example: BFA43-777WR-NL
Meter support brackets. Insert "-MSB" into the part number
Example: BFA43-777W-MSB-NL

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.

FORD **The Ford Meter Box Company, Inc.**
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
www.fordmeterbox.com
03/28/14

Submitted By:

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 8513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
WATER DETAILS (SHEET 1 OF 5)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 7.3

Date: Oct 28, 2022, 11:13am User ID: tthompson
File: N:\479\09\01\Design\Civil\WATER\DT0W479090l.dwg

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MUELLER® 2360 SERIES RESILIENT WEDGE GATE VALVE

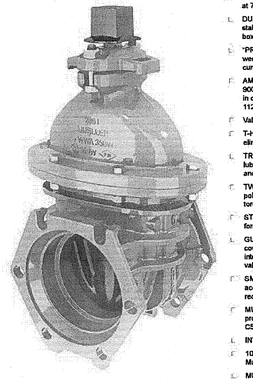
Mueller Co. **10.1**

Rev. 4-14

MUELLER 2300 Series Resilient Wedge Gate Valves

Mueller Resilient Wedge Gate Valves have features to make them easier to operate, preserve sealing capability, and interior coating integrity for many years of reliable service. In addition to popular end connection options, Mueller brand RW valves can be ordered with Mueller's exclusive AquaGrip® System that incorporates an o-ring sealed compression connection and integral pipe restraint in one "ready to use" easy and quick to install package.

Mueller 4" – 12" 2361 Series Resilient Wedge Gate Valve Features



- 350 PSIG MAXIMUM WORKING PRESSURE – Hydrostatically tested at 700 psig.
- DUAL-PURPOSE LIFTING LUGS – new dual-purpose lifting lugs provide stability for the valve box. Accomodates strap or hooks; provides valve box alignment, eliminating need for valve box adapter.
- "PRESSURE ASSIST" WEDGE GEOMETRY – unique "pressure assist" wedge geometry needs equal or less torque to seal at 350 psig than current valves require at 250 psi.
- AMERICAN MADE QUALITY – factory in Chattanooga, TN with ISO 9001 certification. Certified to ANSI/NSF 61. Manufactured and tested in compliance with ANSI/AWWA Standard C515. UL 262 Listed and FM 1120/1130 Approved.
- Valve body, bonnet, disc, stuffing box, and op nut – Ductile iron
- T-HEAD BOLT RETENTION – improved T-head bolt retention feature eliminates need for anti-rotation bolts
- TRIPLE O-RING SEALS – two above thrust collar and one below, retain lubricant in this critical area. Top two are replaceable with valve fully open and under pressure. Fourth O-ring serves as dirt seal.
- TWO ANTI-FRICTION WASHERS WITH LUBRICATION – made of polymer, one above and one below the thrust collar, reduce operating torque to open or close valve.
- STEM – forged manganese bronze bar stock is upset, then machined to form a thrust collar for superior strength in this critical area.
- GUIDE CAP BEARINGS – made of polymer and snapped over rubber covered wedge guides, provide bearing surfaces that protect both wedge and interior body coating from wear and aid in easy operation – even the largest valves installed horizontally. Rollers, tracks or scrapers are not needed.
- SMOOTH, OVERSIZED FLOW WAY – full, round, unobstructed flow way accommodates full size cutters, provides superior flow characteristics and reduces pumping costs.**
- MUELLER PRO-GARD™ FUSION EPOXY COATING – 10 mils* thick protects all inside and outside iron surfaces, and complies with AWWA C550.
- INTEGRAL LEGS – stands upright for easier handling and storage.
- 10-YEAR LIMITED WARRANTY – assured reliability (see separate Mueller Warranty document for terms).
- MUELLER VALVES ARE DESIGNED FOR POTABLE WATER APPLICATIONS.

*Nominal
**16" valve requires 1/2" undersized cutter, 54" valve requires 48" cutter

Mueller 14" – 54" 2361 Series Resilient Wedge Gate Valve Features

In addition to all the features of the smaller 2361 series valves, large size Mueller 2361 series RW valves offer these features:

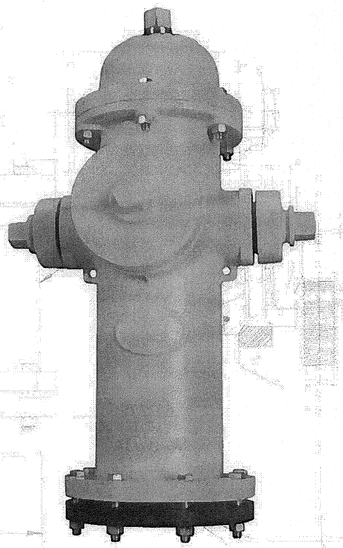
- STEM – 16"-54" manganese bronze casting with integral thrust collar.

SIZE	AWWA C515 WORKING PRESSURE	UL WORKING PRESSURE	FM WORKING PRESSURE
14"-16"	250	250	250
18"-24"	250	175*	-
30"-48"	250	-	-
54"	250‡	-	-

‡ AWWA C515 does not recognize valves larger than 48"
* UL Listed without gearing

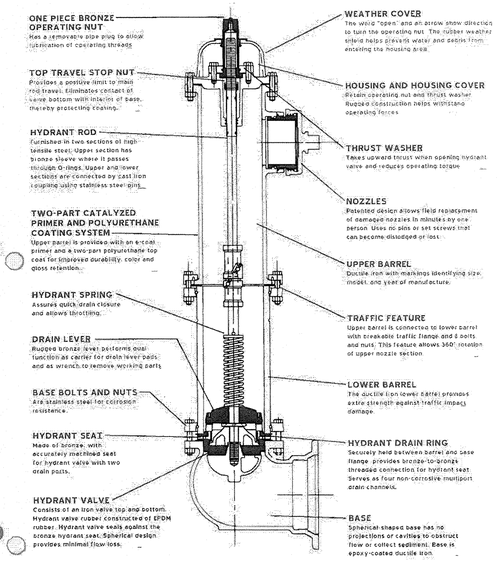
Double-Disc Style gate valves follow the RW valve pages.

EC Specs

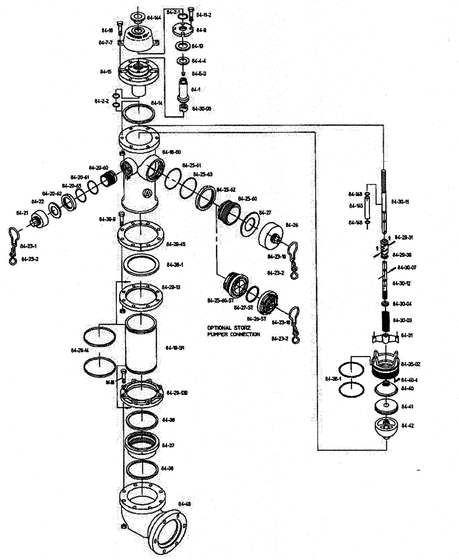


CONSTRUCTION

LY COMPLIES WITH AWWA C502 AND IS AVAILABLE IN NFIGURATIONS WHICH ARE UL LISTED AND FM APPROVED



EXPLODED DRAWINGS



PARTS LIST

DWG NO.	QTY.	DESCRIPTION	MATERIAL
84-1	1	Operating Nut	Bronze
84-2-1	1	Cover O-ring	Buna-N
84-2-2	2	Housing O-ring	Buna-N
84-4-4	1	Thrust Washer	Nylatron
84-5-3	1	Pipe Plug	Stainless Steel
84-7-7	1	Weather Cover	Gray Iron
84-9	1	Housing Cover	Gray Iron
84-11-2	4	Housing Cover Cap Screw	Plated Steel
84-13	1	Housing Cover Gasket	Fiber
84-14	1	Housing Gasket	Composition Rubber
84-15	1	Housing	Ductile Iron
84-16	6	Housing Bolt and Nut	See Note 4
84-18-60	1	Upper Barrel	Ductile Iron
84-19-ER	1	Lower Barrel	Ductile Iron
84-20-60	2	Hose Nozzle	Bronze
84-20-61	2	Hose Nozzle Seal	Buna-N
84-20-62	2	Hose Nozzle Retainer	Ductile Iron
84-20-63	2	Hose Nozzle Retainer Washer	Teflon
84-21	2	Hose Cap	Gray Iron
84-22	2	Hose Cap Gasket	Rubber
84-23-1	1 Per Nozzle	Hose Cap Chain	Steel
84-23-2	1 Per Nozzle	S-Hook	Steel
84-23-18	1 Per Nozzle	Pumper Cap Chain	Steel
84-25-60	1 or 0	Pumper Nozzle	Bronze
84-25-60	1	Storz Nozzle	Bronze/Aluminum
84-25-61	1 Per Nozzle	Pumper Nozzle Seal	Buna-N
84-25-62	1 Per Nozzle	Pumper Nozzle Retainer	Ductile Iron
84-25-63	1	Pumper Nozzle Retainer Washer	Teflon
84-26	1 Per Nozzle	Pumper Cap	Gray Iron
84-26-ST	1	Storz Nozzle Cap	Aluminum
84-27	1 Per Nozzle	Pumper Cap Gasket	Rubber
84-27-ST	1	Storz Cap Gasket	Rubber
84-29-13	2	Barrel Flange	Ductile Iron
84-29-13B	1	Base Flange	Ductile Iron
84-29-14	2	Snap Ring	Stainless Steel
84-29-30	1	Rod Coupling	Gray Iron
84-29-31	2	Coupling Clip Pins	Stainless
84-29-45	1	Breakable Flange	Gray Iron
84-30-03	1	Hydrant Spring	Spring Steel
84-30-04	1	Spring Plate	Steel
84-30-06	1	Travel Stop Nut	Bronze (See Note 9)
84-30-07	1	Spring Plate Pin	Stainless
84-30-11	1	Upper Hydrant Rod	Steel
84-30-12	1	Lower Hydrant Rod	Steel
84-31	1	Drain Lever	Bronze (See Note 9)
84-35-02	1	Hydrant Seat	Bronze (See Note 9)
84-36-1	2	Seat O-ring	Buna-N
84-37	1	Drain Ring	Bronze (See Note 9)
84-38	2	Drain Ring Gasket	Composition Fiber
84-38-1	1	Barrel Gasket	Composition Fiber
84-39	8	Base Bolt and Nut	Stainless Steel
84-39-9	8	Barrel Bolt and Nut	Plated Steel
84-40	1	Hydrant Valve Top	Gray Iron
84-40-4	1	Cervis & Cup Pin	Stainless Steel
84-41	1	Hydrant Valve	Rubber
84-42	1	Hydrant Valve Bottom	Ductile Iron
84-46-2	1	Flanged Base	Ductile Iron
84-46-5	1	Mechanical Joint Base	Ductile Iron
84-46-TY	1	Tyton Base	Ductile Iron
84-144	1	Weather Shield	Rubber
84-145	1	Rod Sleeve	Bronze
84-146	2	Sleeve O-ring	Buna-N

NOTES

1. Size and shape of nut on operating nut and cap, threading on nozzles and caps, and the direction of opening made to specifications.
2. Cap chains are not furnished unless specified.
3. All gray iron is ASTM A126 class B.
4. Bolts and nuts are steel ASTM A307 above grade & stainless steel below grade.
5. Working pressure 250 p.s.i.g., test pressure 500 p.s.i.g.
6. Hydrant conforms to AWWA specifications C502.
7. Upper barrel can be rotated 360°.
8. Listed by Underwriters Laboratory, Inc. and Approved by Factory Mutual Research Corporation in allowable configurations at 200 p.s.i.g. in allowable configurations.
9. Bronze in contact with water contains less than 16 percent zinc.
10. Nominal turns to open is 19-1/2.

SUBMITTAL DATA

Depth of trench or bury			
Size and type of base connection	4" M.J.	6" FLG & Tyton AC	8" M.J. FLG
Direction to open	Left (CCW)	Right (CW)	
Paint color			
Number of hose nozzles	2		
Hose nozzle size			
Steamer nozzle	YES	NO	
Steamer nozzle size			
Nozzle cap chains	YES	NO	
City specified	San Antonio, TX		
UL-FM	YES	NO	

AMERICAN Flow Control strongly recommends that you follow routine maintenance on the hydrant as outlined in AWWA Manual M-17 for installation. Field testing and Maintenance of Fire Hydrants, the ease of operation and the frequency of repair depends on the condition of the water system and the maintenance given. Dirt, gravel and other foreign material in the hydrant may prevent a total closure or cleaning properly which may result in damage to the hydrant main valve. Under most operating conditions AMERICAN Flow Control recommends semi-annual lubrication and inspection of fire hydrants.

FEATURES/BENEFITS/SPECIFICATION

FEATURES

AMERICAN Flow Control's American-Darling **5-1/4" B-84-B-5** hydrant incorporates more than 80 years of experience in design, manufacture, and field experience. This means dependable and efficient operation when needed.

Introduced in 1984, the **B-84-B-5** hydrant is rated at 250 p.s.i.g. and is shell tested at 500 p.s.i.g. This hydrant meets or exceeds all requirements of AWWA C502 for dry-barrel hydrants.

The **B-84-B-5** hydrant is loaded with the features you expect from a high-quality fire hydrant. The all bronze seat and drain ring ensure that the **B-84-B-5** hydrant is easily repaired by just one person.

Optional UL-FM

The **B-84-B-5** hydrant is Listed by Underwriters Laboratories, Inc., as meeting their standard UL 246, latest edition. The Factory Mutual Research Corporation has Approved the **B-84-B-5**. Both Underwriters Laboratories and Factory Mutual Research Corporation require that we consistently manufacture and test our hydrants in full compliance with their stringent requirements. Our facilities are subject to periodic inspections to ensure we are in compliance with their standards.

The B-84-B-5 hydrant has these standard features:

- Upper barrel is furnished with an E-Coat primer and a two-part polyurethane top coat for durability, gloss and color retention
- Ductile iron upper and lower barrels and base
- Easy 360° rotation of nozzle section
- 250 p.s.i.g rated working pressure
- Shell tested to 500 p.s.i.g
- Lubrication chamber
- Stainless steel bolting below grade
- Bronze-to-bronze seating
- Short, lightweight disassembly wrench
- Travel stop nut located in top of hydrant
- Positive compression, fast closing drains

BENEFITS

Spring-Loaded Multiport Drains

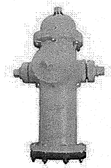
There are two drain ports and four drain outlets as a standard feature on the B-84-B-5 hydrant. The rod spring helps assure drains close after approximately three turns of the operating nut. This important safety feature helps prevent wash-outs.

Lubrication Chamber

Seals operating threads from water and debris. Proper maintenance required.

Top Travel Stop Nut

Helps prevent stem buckling and damage to bronze components which may occur if excessive torque is applied in the full open position.



SPECIFICATIONS

Fire hydrants shall meet or exceed AWWA C502, latest revision. Rated working pressure shall be 250 p.s.i.g., test pressure shall be 500 p.s.i.g., and hydrants shall include the following specific design criteria:

The main valve closure shall be of the compression type. Traffic feature to be designed for easy 360° rotation of nozzle section during field installation.

The main valve opening shall not be less than 5-1/4" and be designed so that removal of all working parts can be accomplished without excavating. The bronze seat shall be threaded into mating threads of bronze. The draining system of the hydrant shall be bronze and positively activated by the main operating rod. Hydrant drains shall close completely after no more than three turns of the operating nut. There shall be a minimum of two internal ports and four drain port outlets to the exterior of the hydrant. Drain shutoff to be by direct compression closure. Sliding drains are not permitted.

Hydrant barrels shall be made of ductile iron.

External surfaces above grade shall be factory coated with Electrodeposition (E-coat) epoxy primer and catalyzed two-part polyurethane topcoating.

Friction loss not to exceed 3.0 p.s.i.g. at 1000 gpm through 4-1/2" pumper nozzle. Hydrants shall be equal to AMERICAN Flow Control's **American-Darling 5-1/4" B-84-B-5.**

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 4043 • TBPLS Firm #: 10124500

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
WATER DETAILS (SHEET 2 OF 5)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 7.4

Date: Oct. 28, 2022, 11:14am User ID: fthompson
File: K:\479\Drawings\Civil\WATER\DTDW479S01.dwg

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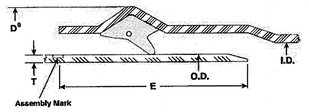
JM Eagle *Building essentials for a better tomorrow™*

ULTRA BLUE™ PVCO

IPS 200 PSI
ASTM F-1483

SUBMITTAL AND DATA SHEET

PIPE SIZE (IN)	APPROX. BELL O.D. (IN)	AVERAGE O.D. (IN)	MIN. T. (IN)	APPROX. I.D. (IN)	STOP LINE DISTANCE MIN. E (IN)	APPROX. WEIGHT (LBS/FT)	APPROX. WEIGHT (LBS/JNT)
Pressure Rating 200							
6	8 1/8	6.625	0.182	6.24	4 1/2	2.5	51
8	10 1/4	8.625	0.236	8.13	4 1/2	4.2	84
10	12 1/4	10.750	0.295	10.13	5 1/2	6.4	127
12	14 3/4	12.750	0.349	12.02	5 1/2	8.9	179



I.D. : Inside Diameter
O.D. : Outside Diameter
T. : Wall Thickness
D° : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot

Product Standard: ASTM F1483
Pipe Compound: ASTM D1784 Cells Class 12454
Gasket: ASTM F477
Integral Bell Joint: ASTM D3139
Certifications: ANSI/NSF Standard 61
Pipe Length: 20 feet laying length
Installation: AWWA C605
JM Eagle™ Installation Guide

JM Eagle *Building essentials for a better tomorrow™*

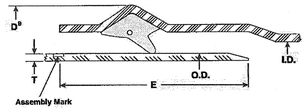
ULTRA BLUE™ PVCO

AWWA C909 PIPE

SUBMITTAL AND DATA SHEET

PIPE SIZE (IN)	APPROX. BELL O.D. (IN)	AVERAGE O.D. (IN)	MIN. T. (IN)	APPROX. ID (IN)	STOP LINE DISTANCE MIN. E (IN)	APPROX. WEIGHT (LBS/FT)	APPROX. WEIGHT (LBS/JNT)
Pressure Class 235*							
6	8.53	6.90	0.221	6.43	5 3/4	3.21	69
8	10.83	9.05	0.290	8.44	6 1/2	5.50	117
10	13.43	11.10	0.356	10.35	7 1/4	8.36	169
12	15.72	13.20	0.423	12.31	7 3/4	11.87	239
Pressure Class 165							
16	20.05	17.40	0.395	16.56	9½	14.51	300

* UL 1285 Listed — 6"-12" PC 235
* Check for availability.



I.D. : Inside Diameter
O.D. : Outside Diameter
T. : Wall Thickness
D° : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot

Product Standard: ANSI/AWWA C909
UL1285 6"-12" PC 235
Pipe Compound: ASTM D1784 Cells Class 12454
Gasket: ASTM F477,
Integral Bell Joint: ASTM D3139
Certifications: ANSI/NSF Standard 61
UL1285 6"-12" PC 235
Pipe Length: 20 feet laying length
Installation: AWWA C605
JM Eagle™ Installation Guide

QUALITY • PERFORMANCE • LONGEVITY
50-YEAR WARRANTY on JM Eagle Plastic Pipe
GUARANTEED

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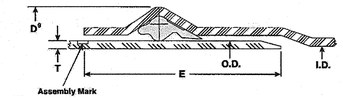
BLUE BRUTE™

SUBMITTAL AND DATA SHEET

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	MIN. E (IN)	APPROX. D° (IN)	APPROX. WEIGHT (LBS/FT)
PRESSURE CLASS 165 psi (DR 25)						
4	4.80	4.39	0.192	5.25	5.57	1.9
6	6.90	6.31	0.276	6.40	8.00	3.9
8	9.05	8.28	0.362	7.05	10.50	6.7
10	11.10	10.16	0.444	8.20	12.88	10.1
12	13.20	12.08	0.528	8.80	15.31	14.4
PRESSURE CLASS 235 psi (DR 18)*						
4	4.80	4.23	0.267	5.25	5.67	2.6
6	6.90	6.09	0.383	6.40	8.43	5.3
8	9.05	7.98	0.503	7.05	11.06	9.2
10	11.10	9.79	0.617	8.20	13.57	13.9
12	13.20	11.65	0.733	8.80	16.13	19.7
PRESSURE CLASS 305 psi (DR 14)*						
4	4.80	4.07	0.343	5.25	6.17	3.2
6	6.90	5.86	0.493	6.40	8.87	6.7
8	9.05	7.68	0.646	7.05	11.63	11.6
10	11.10	9.42	0.793	8.20	14.27	17.6
12	13.20	11.20	0.943	8.80	16.97	25.1

Consult JM Eagle™ for CSA and other listing availability prior to shipment.
Note: *FM Approvals Pressure Class 150 psi for DR 18 and 200 psi for DR 14.
* Contact your JM eagleTM sales representative for location availability.



I.D. : Inside Diameter
O.D. : Outside Diameter
T. : Wall Thickness
D° : Bell Outside Diameter
E : Distance between Assembly Mark to the end of spigot

Product Standard: ANSI/AWWA C900
Pipe Compound: ASTM D1784 Cells Class 12454
Gasket: ASTM F477
Integral Bell Joint: ASTM D3139
Certifications: ANSI/NSF Standard 61
UL Standard 1285
Pipe Length: 20 feet laying length
Installation: AWWA C605
JM Eagle™ Installation Guide

JM Eagle™ also manufactures this pipe in green for sewer force main applications and purple, specifically for reclaimed water systems. This pipe is made to the same requirements as our standard products. The only difference is that the pigment used is green or purple. These products will not be marked with UL or NSF listing marks. Additionally, the green pipe will be marked "Forced Sewer" and the purple pipe will be marked: "Reclaimed Water... Do Not Drink."

QUALITY • PERFORMANCE • LONGEVITY
50-YEAR WARRANTY on JM Eagle Plastic Pipe
GUARANTEED

JM Eagle *Building essentials for a better tomorrow™*

BIG BLUE™

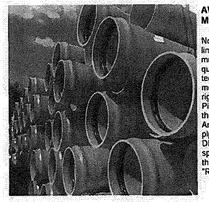
SUBMITTAL AND DATA SHEET

PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	E_1 (IN)	E_2 (IN)	APPROX. D° (IN)	APPROX. WEIGHT (LBS/FT)
Rated psi 305 (DR 14)							
16	17.40	14.85	1.242	8 ½	9 ½	21.68	43.77
Rated 235 psi (DR 18)							
14	15.30	13.50	0.850	7 1/8	8 1/8	19.00	26.75
16	17.40	15.35	0.967	8 ½	9 ⅝	21.62	34.86
18	19.50	17.20	1.083	8 3/8	9 1/8	24.22	48.95
20	21.60	19.06	1.200	9	1 0 1/8	26.85	54.22
24	25.80	22.76	1.433	10	11 2/8	32.06	77.97
30	32.00	28.23	1.778	11 7/8	13 1/8	37.81	117.82
Rated 200 psi (DR 21)*							
14	15.30	13.75	0.729	7 1/8	8 1/8	18.22	23.07
16	17.40	15.64	0.829	8 ⅛	9 ⅛	20.72	30.04
18	19.50	17.53	0.929	8 3/8	9 1/8	23.22	37.27
20	21.60	19.42	1.029	9	10 1/8	25.72	46.71
24	25.80	23.19	1.229	10	11 2/8	30.72	67.53
30	32.00	28.77	1.524	11 7/8	13 1/8	38.10	103.71
36	38.30	34.43	1.824	12 3/8	14 1/8	45.60	152.16
Rated 165 psi (DR 25)							
14	15.30	14.00	0.612	7 1/8	8 1/8	17.94	19.48
16	17.40	15.92	0.696	8 ⅛	9 ⅛	20.41	25.38
18	19.50	17.85	0.780	8 3/8	9 1/8	22.87	31.99
20	21.60	19.77	0.864	9	10 1/8	25.34	39.48
24	25.80	23.61	1.032	10	11 2/8	30.27	56.98
30	32.00	29.29	1.280	11 7/8	13 1/8	37.12	88.49
36	38.30	35.05	1.532	12 3/8	14 1/8	44.43	128.41
42	44.50	40.73	1.780	14 1/8	16 3/8	51.85	176.02
48*	50.80	46.49	2.032	14 7/8	17 3/8	58.93	231.22
Rated 125 psi (DR 32.5)*							
14	15.30	14.30	0.471	7 1/8	8 1/8	17.48	15.14
16	17.40	16.27	0.535	8 4/8	9 4/8	19.88	19.63
18	19.50	18.23	0.600	8 3/8	9 1/8	23.30	24.75
20	21.60	20.19	0.665	9	10 1/8	24.38	30.54
24	25.80	24.12	0.794	10	11 2/8	29.47	44.11
30	32.00	29.91	0.985	11 7/8	13 1/8	36.55	68.45
36	38.30	35.80	1.178	12 3/8	14 1/8	43.10	99.22
42	44.50	41.60	1.369	14 1/8	16 3/8	50.93	135.49
48	50.80	47.49	1.563	14 7/8	17 3/8	57.61	178.49

Revised 03/01/14. This information may have been updated. Please download the latest version at www.jmeagle.com

North American Pipe Corporation
www.northamericanpipe.com

Product Description:



AWWA C-905
Municipal Water Pipe

North American Pipe's AWWA C-905 PVC product line is manufactured to meet the needs of modern municipal water distribution systems. With top quality raw materials and modern processing technology North American Pipe's C-905 pipe meets all industry standards in addition to our own rigorous quality control standards. North American Pipe's C-905 pipe utilizes Reiber style gaskets throughout the entire product offering. North American Pipe produces a broad range of CIOD pipe in DR-14, DR-18, DR-21, DR-25, DR-32.5, DR-41 and DR-51 classifications. Whether specifying or installing our pipe you can be assured that North American Pipe will provide the pipe "Right, On Time, All the Time".

This product is made in accordance with the following specifications:

AWWA C905	ASTM D1784	ASTM D3139
ASTM F477	ANSI/NSF 14	ANSI/NSF 61
PPI TR-3	UL 1285	

Short Form Specification
for North American Pipe Corporation
AWWA C-905 Municipal Water Pipe

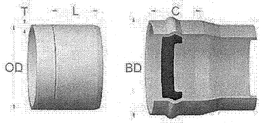
Water main transmission pipe shall be made in accordance with AWWA C905 from a compound conforming to a cell classification of 12454 as defined by ASTM D1784. Integral bells shall incorporate gaskets meeting the requirements of ASTM F477 and be locked into the bell. The assembled joint shall meet the requirements of ASTM D3139. The laying length of the pipe shall be 20 feet. The pipe and gasket must be tested and approved for contact with potable water in accordance with ANSI/NSF 61. The pipe and gasket shall be listed by Underwriters Laboratory.

Rev: 10/09

2801 Post Oak Blvd. | Suite 600 | Houston | TX | 77056
Phone: 713-840-7423 Toll Free 800-999-7423 Fax: 713-552-0087

North American Pipe Corporation™

AWWA C900-07: Municipal Water *Pipe*



PIPE SIZE	OUTSIDE DIA. - NOM. (OD)	*APPROX. BELL DIA. (BD)	**APPROX. BELL DEPTH (C)	INSERT MARK (L)
4"	4.80	6.50	5.00	3.88
6"	6.90	9.25	5.75	5.13
8"	9.05	11.75	7.00	6.13
10"	11.10	14.25	7.25	6.63
12"	13.20	16.75	8.00	7.38

MINIMUM WALL THICKNESS (T)	PC 165 DR 25 (T)	PC 235 DR 18 (T)	PC 305 DR 14 (T)
4"	.192	.267	.343
6"	.276	.383	.493
8"	.362	.503	.646
10"	.444	.617	.793
12"	.528	.733	.943

Note: These dimensions are for estimating purposes only * Dimension given for Approx. Bell Diameter (BD) is for highest pressure class
** Nominal depth, depth will vary by pressure class

Rev: 04/2013

Right, On Time, All the Time.

www.northamericanpipe.com

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Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122600

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
WATER DETAILS (SHEET 3 OF 5)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 7.5

Date: Oct 28, 2022, 11:15am User ID: rthompson
File: N:\479\09\01\Design\Civil\WATER\PTDW479090l.dwg

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ADS POTABLE WATER SERVICE TUBING (CTS)

ADS Potable water service tubing (CTS) is a leader in today's potable water service market. Its flexibility and durability distinguish it from the competition and make it ideal for a variety of applications.

ADS CTS tubing is strong and resistant to many common causes of damage such as vibrations, surface loads and pressure surges.

APPLICATIONS:
Residential & Commercial Water Service
Well/Pump Water Systems
Municipal Service Lines
Farm & Ranch Water Systems

FEATURES:
- Material conforms to ASTM D3350 requirements
- Certified to meet NSF 14/61 standard
- Durable plastic material stands the test of time
- Flexibility makes it ideal for a variety of projects
- Strength withstands weather and the human element
- Incremental footage markers printed every 2 feet throughout each coil length
- Light weight
- Chemically resistant
- Consistent outside diameter regardless of wall thickness or pressure rating

BENEFITS:
- Resistant to rot or corrosion
- Fast and easy to install
- Easy installation provides cost-efficiency
- Flexible lengths can be installed in uneven terrain
- Available in many lengths

ADS Service: **ADS representatives are committed to providing you with the answers to all your questions, including specifications, and installation and more.**

ADS PolyFlex

The Most Advanced Name in Drainage Systems

ADS POTABLE WATER SERVICE TUBING (CTS) PIPE SPECIFICATIONS

SCOPE
This specification describes ADS Potable Water Service Tubing (CTS) pipe SDR 9 for use in potable water service applications.

PIPE REQUIREMENTS
ADS potable water service tubing shall meet the requirements of ASTM D2737, AWWA C901 and NSF Standards 14 and 61. Pipe dimensions shall meet Copper Tubing Size (CTS) standards.

MATERIAL PROPERTIES
Tubing material shall be high-density polyethylene conforming with the minimum requirements of cell classification 345464E as defined and described in ASTM D3350. The resin shall have a material designation code of PE3608 (formerly PE3408) by the Plastic Pipe Institute.

DISINFECTION/MAINTENANCE
The active chlorine content of disinfecting solutions shall not exceed 12%. All disinfecting solution must be flushed from all lines within the system. Industry accepted procedures, like ANSI/AWWA C651 Disinfecting Water Mains, should be followed for both new and repaired potable water lines.

INSTALLATION
Installation is similar to other flexible tubing/pipe products. Methods including direct bury, plowing or pulling are applicable per local, state or federal guidelines for the application.

	SDR 9 (200 psi) 3808 CTS									
	¾"		1"		1¼"		1 ½"		2"	
Outside Diameter (min)	0.875 (22.2	±0.004 ±0.10)	1.125 (28.6	±0.005 ±0.13)	1.375 (34.9	±0.005 ±0.13)	1.625 (41.3	±0.006 ±0.15)	2.125 (54.0	±0.006 ±0.51)
Wall Thickness (min)	0.097 (2.5	+0.01 +0.25)	0.125 (3.2	+0.012 +0.30)	0.153 (3.9	+0.015 +0.38)	0.181 (4.6	+0.018 +0.46)	0.236 (6.0	+0.024 +0.61)
Pressure Rating @ 73°F (23°C) psi (kPa)	200 (1379)		200 (1379)		200 (1379)		200 (1379)		200 (1379)	
Weight g/m (g/ft)	46 (151	±2 ±7)	78 (256	±3 ±10)	125 (410	±4 ±13)	162 (531	±4 ±13)	275 (902	±5 ±16)

For more information on ADS CTS pipe and other ADS products, please contact our Customer Service Representatives at 1-800-821-6710

ADS "Terms and Conditions of Sale" are available on the ADS website, www.ads-pipe.com
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The Most Advanced Name in Drainage Systems

Advanced Drainage Systems, Inc
4640 Trueman Blvd. Hilliard, OH 43026
1-800-821-6710 www.ads-pipe.com

461 Standard Coupling
Meets AWWAC219 Standards

Nom. Size (in.)	O.D. Range (in.)	With Epoxy Coated Alloy Bolts & Nuts Catalog Number	With Stainless Steel Bolts & Nuts Catalog Number	Sleeve Length (in.)	5/8" Bolt Quantity	Laying Length (in.)	Wt. (lbs.)
1 1/2	1.81 - 2.28	461-01810228-000	461-01810228-031	4	2	10.5	8.2
2	2.34 - 2.85	461-02340285-000	461-02340285-031	4	2	10.5	10
2 1/2	2.84 - 3.35	461-02840335-000	461-02840335-031	4	2	10.5	10
3	3.46 - 4.21	461-03460421-000	461-03460421-031	5	4	10.5	15
4	4.46 - 5.60	461-04460560-000	461-04460560-031	5.5	4	10.5	26
6	6.54 - 7.65	461-06540765-000	461-06540765-031	6	4	10.5	33
8	8.54 - 9.80	461-08540985-000	461-08540985-031	6	4	10.5	44
10	10.65 - 12.20	461-10651220-000	461-10651220-031	7.5	8	13.5	72
12	12.75 - 14.40	461-12751440-000	461-12751440-031	7.5	8	13.5	89

462 12" Long Sleeve Coupling
Meets AWWAC219 Standards

Nom. Size (in.)	O.D. Range (in.)	With Epoxy Coated Alloy Bolts & Nuts Catalog Number	With Stainless Steel Bolts & Nuts Catalog Number	Sleeve Length (in.)	5/8" Bolt Quantity	Laying Length (in.)	Wt. (lbs.)
4	4.46 - 5.60	462-04460560-000	462-04460560-031	12	4	17	31.4
6	6.54 - 7.65	462-06540765-000	462-06540765-031	12	4	17	42.3
8	8.54 - 9.85	462-08540985-000	462-08540985-031	12	4	17	55.3
10	10.65 - 12.20	462-10651220-000	462-10651220-031	12	8	17	73.0
12	12.75 - 14.40	462-12751440-000	462-12751440-031	12	8	17	87.0

WARRANTY:
Smith-Blair warrants its products only against defects in materials and workmanship. Smith-Blair's liability and customer's exclusive remedy under this warranty, or any warranty, extends for a period of one (1) year from the date of Smith-Blair's shipment and is expressly limited to repayment of the purchase price, repair, or replacement, at Smith-Blair's option, during said period, upon proof satisfactory to Smith-Blair and upon customer's returning and prepaying all charges on such products to factory or warehouse designated by Smith-Blair. THIS WARRANTY IS MADE EXPRESSLY IN LIEU OF ALL OTHER WARRANTIES, EXPRESS, IMPLIED, OR STATUTORY, WITH RESPECT TO QUALITY, MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE.

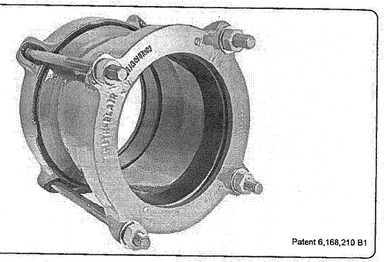
Physical Address	Mailing Address	Inside Sales:
Smith-Blair, Inc. 30 Globe Ave. Texarkana, AR 71854	Smith-Blair, Inc. P.O. Box 5337 Texarkana, TX 75505	Ph: (800) 643-8705 - (870) 773-5127 Fax: (800) 648-6792 - (870) 773-5212 Website: www.smith-blair.com

6WP/5000/0311

Smith-Blair
A SERVUS COMPANY

Clamp and Coupling Products CC-460 03/11

Quantum® Coupling
Wide-Range



NSF/ANSI 61
NSF/ANSI 372

Patent 6,168,210 B1

The Smith-Blair Quantum® Coupling accommodates up to 1.65-inches of Pipe O.D. differential with a single flange and gasket.

The Quantum's tough ductile iron sleeve and follower flanges provide the tensile strength and corrosion resistance that is necessary for couplings to withstand the punishment they must endure during installation and throughout their long lives.

The coupling's 5/8" bolts are quick and easy to install because no disassembly is required.

The Quantum also provides for misalignment and settlement deflection (3° per end) and makes a leak-resistant joint that allows for limited line movement due to expansion and contraction.

The Quantum coupling comes standard with fusion bonded NSF 61 approved epoxy coating. Smith-Blair's Flexi-Coat® epoxy system maintains superior flexibility as the product is installed on the pipe. Additionally, this durable epoxy coating provides superior corrosion protection over a wide temperature range and can be shipped with minimal damage.

With a 250 PSI working pressure and all cast ductile parts, the Quantum® is the proven answer for WIDE rangeability couplings.

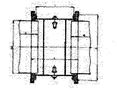
WARNING

THESE PRODUCTS DO NOT RESTRAIN AXIAL PIPE OR PRODUCT MOVEMENT

Material Specifications

Sleeve:	High Strength Ductile Iron ASTM A536
Flanges:	High Strength Ductile Iron ASTM A536
Gasket:	Nitrile (Buna-N) NSF 61 approved
Coating:	Fusion Bonded Flexi-Coat® Epoxy per AWWA C213
Bolts:	HSLA steel per ANSI A21.11 (AWWA C111) with Flexi-Coat epoxy finish. Stainless Steel optional
Nuts:	Heavy Hex HSLA steel per ANSI A21.11 with Fluoropolymer Coating (to prevent galling).

Material specifications subject to change.



PRODUCT SPECIFICATIONS

1. Hymax 2000 meets or exceeds all specifications of AWWA Standard C219, NSF-61 and NSF-372.
2. Center Ring - ASTM A 53 Grade A steel.
3. End Rings - ASTM A 795 Steel.
   14"-16" - Ductile iron casting ASTM A536 grade 60-40-18
4. Gaskets - EPDM compounded for water and sewerage, meets international standards for contact with drinking water NSF-61 and NSF-372.
   Working Temperature:
   for continuous operations: -20°F up to +180°F.
   for short time operations: up to +215°F.
5. Bolts and Nuts - Type 304 stainless steel.
   Rolled thread and anti-galling coating.
6. Bridge - Type 304 stainless steel.
7. Coating - 100% Fusion-bonded epoxy for enhanced corrosion protection. Meets NSF-61 and NSF-372 standards
   Average thickness 14 Mil.
   Working Temperature:
   above ground applications: up to +125°F.
   under ground applications: up to +150°F.
8. G = Min. Pipe insertion of 4 inch.
9. Deflection up to 4° per side.

Part Number	Retainer Number	DN (inch)	Overall Length (inch)	Flange Length (minimum-maximum) (inch)	Flange OD (minimum-maximum) (inch)	D (inch)	L (inch)	Bolt Circle (inch)	Bolts Qty	Working Pressure (PSI)	Approx. Weight (lbs)
862-56-0041-16	20100213260	1.5"	1.61-2.13	1.61-1.97	1.96-2.13	Ø3.9	7.6	10.0	2-M12	35	260	7
862-56-0054-16	20100303260	2"	2.10-3.03	2.10-2.60	2.56-3.03	Ø5.2	7.6	10.5	2-M12	50	260	8
862-56-0088-16	20140433260	3"	3.46-4.37	3.46-3.90	3.86-4.33	Ø6.7	11.6	14.5	2-M12	50	260	14
862-56-0108-16C	20150563260	4"	4.25-5.63	4.25-5.00	4.92-5.63	Ø8.7	11.6	14.5	2-M14	65	260	21
862-56-0130-16	20150683260	5"	5.12-6.38	5.12-5.75	5.71-6.38	Ø9.5	15.9	19.0	2-M14	65	260	28
862-56-0163-16	20190768260	6"	6.42-7.68	6.42-7.05	7.01-7.68	Ø10.8	15.9	19.0	2-M14	65	260	32
862-56-0190-16	20190874260	7"	7.48-8.74	7.48-8.11	8.07-8.74	Ø11.7	15.9	19.0	2-M14	65	260	36
862-56-0217-16	20190984260	8"	8.54-9.84	8.54-9.17	9.13-9.84	Ø12.9	15.9	19.0	2-M14	65	260	47
862-56-0272-16	20191200260	10"	10.70-12.00	10.70-11.37	11.33-12.00	Ø15.0	15.9	19.0	2-M14	65	260	50
862-56-0278-16	20191226260	10" o.s.	10.96-12.26	10.96-11.63	11.59-12.26	Ø15.3	15.9	19.0	2-M14	65	260	53
862-56-0315-16	20191366260	12"	12.40-13.66	12.40-13.03	12.99-13.66	Ø16.6	15.9	19.0	2-M14	65	260	54
862-56-0334-16	20191441260	12" o.s.	13.15-14.41	13.15-13.78	13.74-14.41	Ø17.3	15.9	19.0	2-M14	65	260	56
862-56-0378-16P	20191710260	14"	15.00-16.10	15.00-16.10	16.02-17.10	Ø21.0	14.6	18.0	4-M16	150	260	107
862-56-0434-16P	20191920260	16"	17.10-19.20	17.10-18.19	18.11-19.20	Ø23.2	14.6	18.0	4-M16	150	260	123
862-56-0488-16P	20192130232	18"	19.20-21.30	19.20-20.29	20.21-21.30	Ø25.3	14.6	18.0	4-M16	150	232	132
862-56-0497-16P	20192170232	20" LB	19.60-21.70	19.60-20.69	20.61-21.70	Ø25.6	14.6	18.0	4-M16	150	232	136
862-56-0540-16P	20192335232	20"	21.25-23.35	21.25-22.35	22.27-23.35	Ø27.3	14.6	18.0	4-M16	150	232	141
862-56-0606-16P	20192595232	24"	23.85-25.95	23.85-24.96	24.88-25.95	Ø29.1	14.6	18.0	4-M16	150	232	158
862-56-0624-16P	20192670232	24" o.s.	24.60-26.70	24.60-25.67	25.59-26.70	Ø30.6	14.6	18.0	4-M16	150	232	163

For more information about HYMAX and other Krausz products visit us at: **www.krauszusa.com**
For ordering information or to speak with a Krausz representative please contact us at: **855-457-2879 or 855-4KRAUSZ.**

Krausz USA
331 SW 57th Avenue
Ocala, Florida 34474
info@krauszusa.com

www.krauszusa.com

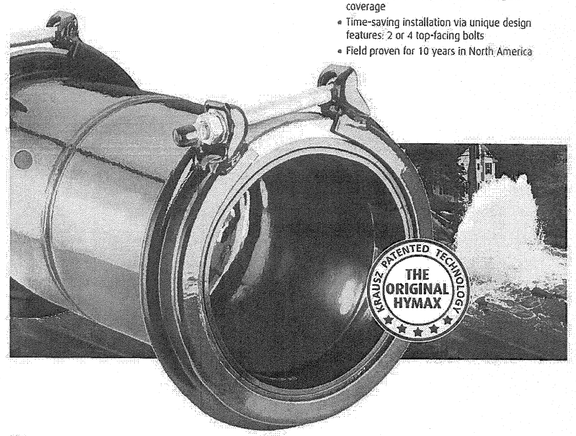
*The Hymax Trademark and Patent is property of Krausz Industries Ltd. Note: To extend product life in corrosive environments, polywrapping and/or cathodic protection of the coupling is recommended. Note: All Stainless Steel Bolts are coated with a Dry Anti-Seize Lubricant that prevents galling. Use of any additional anti-type lubricant on the bolts will void the warranty of the product.

KRAUSZ Repair the past. Connect the future.

JKR003 Version A

HYMAX®
LONG BODY 1.5"-24"
KEEP THE FLOW GOING

- Market-leading coupling; combining reliability and ease of use
- Uniquely addressing the widest range of coverage
- Time-saving installation via unique design features: 2 or 4 top-facing bolts
- Field proven for 10 years in North America

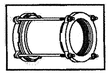


COUPLINGS

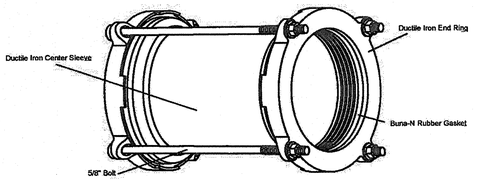
KRAUSZ Repair the past. Connect the future.

SUBMITTAL INFORMATION

Ductile Iron Wide Range Transition Coupling - *(FC2W-xx-L12 style)*



4" - 12" STYLE FC2W-L12 COUPLINGS FOR JOINING PIPES WITH DIFFERENT O.D.'S



Nominal Pipe Size	Range (inches)	Range (mm)	Bolt Diameter	Number of Bolts	Sleeve Length	Approx. Wt. Lbs	Part Number	√ Submitted Item(s)
3"	2.50 - 4.29	63.5 - 109.0	5/8"	3	12"	38	FC2W-3-L12	
4"	3.96 - 5.60	100.6 - 142.2	5/8"	4	12"	45	FC2W-4-L12	
6"	6.23 - 7.60	158.2 - 193.0	5/8"	4	12"	56	FC2W-6-L12	
8"	8.40 - 9.75	213.3 - 247.6	5/8"	4	12"	69	FC2W-8-L12	
10"	10.75 - 12.12	273.0 - 307.8	5/8"	6	12"	90	FC2W-10-L12	
12"	12.75 - 14.38	323.8 - 365.25	5/8"	6	12"	109	FC2W-12-L12	

Pipes smaller than the published range may be joined using the FC2W coupling at a reduced pressure rating. Contact Ford Meter Box for details.

FEATURES

- Center Sleeve: Ductile Iron per ASTM A536 (65-45-12)
- End Rings: Ductile Iron per ASTM A536 (65-45-12)
- Bolts and nuts: High strength low alloy steel per ASTM A242 and AWWA C111
  Bolts have an oval neck beneath the head, which rests within the end ring to prevent bolts from rotating while tightening.
  Optional stainless steel bolts and nuts are available
- Coating: Black, fusion bonded epoxy applied per AWWA C213
- Gasket: Buna-N rubber per ASTM D2000
- 250 psi rated working water pressure

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.

FORD **The Ford Meter Box Company, Inc.**
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com 09/12/13

Submitted By:

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 Fax #: (210) 979-8441
TBPE Firm #: 8813 - TBPLS Firm #: 10028200

ISSUE DATE
REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
WATER DETAILS (SHEET 4 OF 5)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 7.6

Date: Oct. 28, 2022, 11:16am User ID: tthompson
File: N:\479_09\01\Design\Civil\WATER\DTOW479D901.dwg

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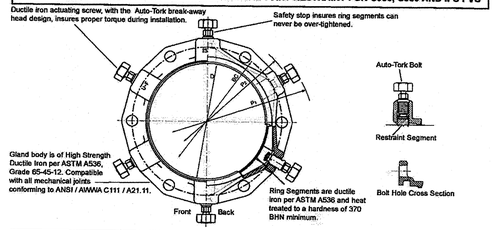
SUBMITTAL INFORMATION

Mechanical Joint Retainer *(UFR1500-x-U style)*

3" - 12" SERIES UFR1500 CIRCLE-LOCK MECHANICAL JOINT RESTRAINT FOR C900, C909 AND IPS PVC



Nom. Pipe Size	O.D.	Catalog Number	No. of Restraint Segments	Approx. Weight (Lbs.)	P1*	P2** C900 / C909	P2** IPS	BC	D	Pressure Ratings C900 DR-18	Pressure Ratings C909 DR-14	Pressure Ratings ASTM D2241 PC-255	Pressure Ratings ASTM D2241 SDR-26	Pressure Ratings ASTM D2241 SDR-21	✓ Submitted Item(s)
3"	3.50"	UFR1500-3-U	4	9	11.50"		9.00"	6.19"	4.08"						
4"	4.50"-4.80"	UFR1500-4-U	4	10	13.00"	9.40"	9.25"	7.50"	4.90"	235 PSI	305 PSI	-	160 PSI	200 PSI	
6"	6.63"-6.90"	UFR1500-6-U	6	14	15.13"	11.60"	11.50"	9.55"	7.00"	235 PSI	305 PSI	235 PSI	160 PSI	200 PSI	
8"	8.63"-9.05"	UFR1500-8-U	6	18	17.25"	13.75"	13.60"	11.75"	9.15"	235 PSI	305 PSI	235 PSI	160 PSI	200 PSI	
10"	10.75"-11.10"	UFR1500-10-U	8	25	19.38"	16.00"	15.80"	14.00"	11.30"	235 PSI	305 PSI	235 PSI	160 PSI	200 PSI	
12"	12.75"-13.20"	UFR1500-12-U	8	29	21.50"	18.00"	17.85"	16.25"	13.30"	235 PSI	305 PSI	235 PSI	160 PSI	200 PSI	

*Maximum O.D. of gland on pipe before Auto-Tork heads are removed (as shipped).
**Maximum O.D. of gland on pipe after Auto-Tork heads are removed.

FEATURES

- Fits C900, C909 and ASTM D2241 IPS PVC
- Full circle contact and support of the pipe wall
- "Auto-Tork" actuating screws with heads specially designed to twist off at the correct installation torque, leaving a hex head in case future system maintenance or removal is required
- Restraining segments are mechanically retained in pockets
- Series 1500 eliminates the need to pour expensive and time consuming concrete thrust blocks
- UL/FM approved, 4"-12" nominal size C900 PVC, for use on listed and approved PVC pipe
- Gland, screws and segments are black epoxy coated using the e-coat process
- Gland colored red for identification purposes
- Ductile iron castings are manufactured, assembled, inspected and packaged in the U.S.A.

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.

The Ford Meter Box Company, Inc.
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Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com

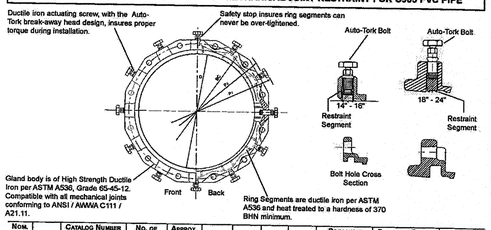
03/01/12

Submitted By:

SUBMITTAL INFORMATION

Mechanical Joint Retainer *(UFR1500-C-xx-U style)*

14" - 24" SERIES UFR1500-C CIRCLE LOCK MECHANICAL JOINT RESTRAINT FOR C905 PVC PIPE



Nom. Pipe Size	O.D.	Catalog Number AWWA C-905 PVC Pipe	No. of Restraint Segments	Approx. Weight (Lbs.)	P1*	P2**	BC	D	Pressure Rating C-905 DR-18	Pressure Rating Awwa C-905 DR-25	✓Submitted Item(s)
14"	15.30	UFR1500-C-14-U	10	47	23.62	22.72	18.75	15.44	235 PSI	165 PSI	
16"	17.40	UFR1500-C-16-U	12	63	26.18	25.28	21.0	17.54	235 PSI	165 PSI	
18"	19.50	UFR1500-C-18-U	12	70	28.28	27.36	23.25	19.64	235 PSI	165 PSI	
20"	21.60	UFR1500-C-20-U	14	96	30.38	29.48	25.5	21.74	235 PSI	165 PSI	
24"	25.80	UFR1500-C-24-U	16	126	34.58	33.68	30.0	25.94	235 PSI	165 PSI	

*Maximum O.D. of gland on pipe before Auto-Tork heads are removed (as shipped).
**Maximum O.D. of gland on pipe after Auto-Tork heads are removed.

FEATURES

- Full circle contact and support of the pipe wall. The Series 1500 can be used on any thickness class of AWWA C-905 PVC pipe without any point loading.
- "Auto-Tork" actuating screws with heads specially designed to twist off at the correct installation torque, leaving a hex head in case future system maintenance or removal is required.
- Restraining segments are mechanically retained in pockets.
- Series 1500 eliminates the need to pour expensive and time consuming concrete thrust blocks.
- Gland, screws and segments are black epoxy coated using the e-coat process
- Gland colored red for identification purposes
- Ductile iron castings are manufactured, assembled, inspected and packaged in the U.S.A.

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Overseas Fax: 260-563-0167
http://www.fordmeterbox.com

10/16/13

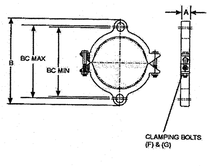
Submitted By:

SUBMITTAL INFORMATION

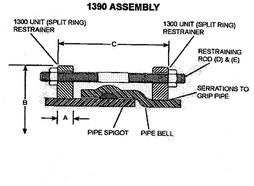
Uni-Flange Restraint *(UFR1390-C-x-U style)*

SERIES 1390-C RESTRAINT DEVICE FOR C900 PVC AND DUCTILE IRON PIPE BELL JOINTS CAST SIZES 4" - 12"

1300 SPLIT RESTRAINER



1390 ASSEMBLY



Nom. Pipe Size	PVC Pipe with DI Pipe OD Style 1390-C OD	Catalog No.	A	B Approx	C Max	Restraining Rods No. D	Restraining Rods Size E	Clamping Bolts No. F	Clamping Bolts Size G	BC Max	BC Min	✓ Submitted Items
4"	4.80	UFR1390-C-4-U	1-1/8"	9-1/8"	12"	2	3/4" x 17"	4	5/8" x 3-1/2"	7.50"	7.14"	
6"	6.90	UFR1390-C-6-U	1-1/8"	11-1/8"	13"	2	3/4" x 17"	4	5/8" x 3-1/2"	9.50"	9.14"	
8"	9.05	UFR1390-C-8-U	1-1/4"	14-5/8"	15"	2	3/4" x 17"	4	3/4" x 4"	12.98"	11.36"	
10"	11.10	UFR1390-C-10-U	1-3/8"	16-5/8"	16"	4	3/4" x 24"	4	7/8" x 5"	15.00"	13.50"	
12"	13.20	UFR1390-C-12-U	1-3/8"	19-1/4"	18"	4	3/4" x 24"	4	7/8" x 5"	17.62"	15.62"	

FEATURES

- 4" - 12" Sizes: Cast Ductile Iron per ASTM A536 Grade 65-45-12.
- 360° contact and support of the pipe wall.
- Restraining rods are high strength, low alloy steel per ANSI / AWWA C111 / A21.11.
- Rated at full rated pressure of any class of PVC Pipe, minimum 2:1 safety factor.
- Ductile Iron Pipe shall have the following pressure ratings: 4" through 8" = 250 PSI
  10" and 12" = 200 PSI.
- Castings are manufactured in the United States of America.
- Black e-coat epoxy coating

The Ford Meter Box Company considers the information in this submittal form to be correct at the time of publication. Item and option availability, including specifications, are subject to change without notice. Please verify that your product information is current.

The Ford Meter Box Company, Inc.
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com

08/13/13

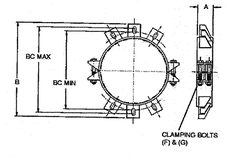
Submitted By:

SUBMITTAL INFORMATION

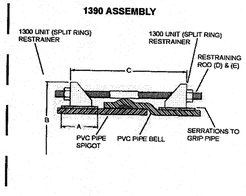
Restrainer *(UFR1390-C-xx-U style)*

SERIES 1390-C RESTRAINT DEVICE FOR C905 PVC PIPE BELL AND SPIGOT JOINTS CAST SIZES 14" - 36"

1300 SPLIT RESTRAINER



1390 ASSEMBLY



Nom. Pipe Size	PVC Pipe with DI Pipe OD Style 1390-C OD	Catalog No.	A	B Approx	C Max	Restraining Rods Qty. D	Restraining Rods Size E	Clamping Bolts Qty. F	Clamping Bolts Size G	BC Max	BC Min	Approx. Wt. Lbs.	✓Submitted Item(s)
14"	15.30	UFR1390-C-14-U	4"	22-1/2"	24"	6	3/4" x 30"	8	7/8" x 7"	20.50"	18.50"	136	
16"	17.40	UFR1390-C-16-U	4"	24-9/16"	28"	6	3/4" x 30"	8	7/8" x 7"	22.50"	20.50"	147	
18"	19.50	UFR1390-C-18-U	5"	26-11/16"	28"	8	3/4" x 30"	8	1" x 7"	24.75"	22.75"	206	
20"	21.60	UFR1390-C-20-U	5"	29-3/16"	28"	8	3/4" x 36"	8	1-1/8" x 5-1/2"	27.00"	25.00"	283	
24"	25.80	UFR1390-C-24-U	5"	33-7/8"	28"	12	3/4" x 36"	8	1-1/8" x 5-1/2"	31.50"	29.50"	406	
30"	32.00	UFR1390-C-30-U	7"	40-7/8"	38"	12	1" x 48"	12	1-1/8" x 9"	38.18"	36.18"	600	
36"	38.30	UFR1390-C-36-U	7"	46-1/4"	38"	12	1" x 48"	12	1-1/8" x 9"	45.50"	44.00"	675	

FEATURES

- 14" - 36" Sizes: Cast Ductile Iron per ASTM A536 Grade 65-45-12
- Side Clamping Bolts and Nuts
- Rods (included) - High strength, low alloy steel per ANSI / AWWA C111/A21.11
- Rated at full rated pressure of any class of C905 PVC Pipe, minimum 2:1 safety factor
- Casting manufactured in the U.S.A.

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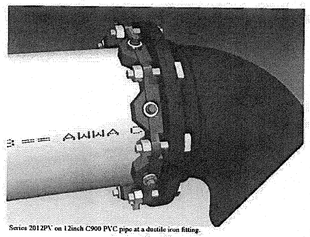
http://www.fordmeterbox.com

01/31/14

Submitted By:

EBAA IRON INC. Series 2000PV

Mechanical Joint Restraint for PVC Pipe



Series 2012PV on 12inch C900 PVC pipe at a ductile iron fitting.

Features and Applications:

- For restraining plain end PVC pipe at mechanical joint fittings and appurtenances
- Sizes 3 inch through 36 inch
  Sizes 42 inch through 48 inch accommodated by Series 2200
- MEGA-BOND® Restraint Coating System
  For more information on MEGA-BOND, refer to www.ebaa.com
- Constructed of ASTM A536 Ductile Iron
- The mechanical joint follower gland is incorporated into the restraint
- Accommodates full deflection of the mechanical joint on which it is used
- Heavy duty thick wall design
- Support Products Available:
  - Split mechanical Joint style available for 3 inch through 12 inch
    EBAA Series 2000SV
  - Solid restraint ring harness available for C905 PVC pipe bells
    EBAA Series 2800
  - Split restraint ring harness available for C900 and C905 PVC pipe bells and PVC fittings
    EBAA Series 1500, 1600 and 2500
- All 2000PV and related restraint products can be furnished as packaged accessories complete with appropriate restraint, gasket, lubrication and bolting hardware

For use on water or wastewater pipelines subject to hydrostatic pressure and tested in accordance with either AWWA C600 or ASTM D2774.

Nominal Pipe Size	Series Number	Shipping Weight
3	2003PV	7.0
4	2004PV	8.8
6	2006PV	12.1
8	2008PV	16.3
10	2010PV	26.0
12	2012PV	31.4
14	2014PV	47.6
16	2016PV	52.8
18	2018PV	61.8
20	2020PV	70.9
24	2024PV	92.9
30	2030PV	128.5
36	2036PV	161.3
42	2242*	652.0
48	2248*	711.1

* Restraint for pipe size 42 inch and greater, please refer to Series 2200 Brochure found at www.ebaa.com

U.S. Patent No.
4627775 4896903 5071175

0614-7

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Mechanical Joint Restraint for AWWA PVC Pipe Sample Specification

(The text of the specification below can be downloaded as a Microsoft® Word Doc from our website www.ebaa.com)

Restraint devices for mechanical joint fittings and appurtenances conforming to either ANSI/AWWA C111/A21.11 or ANSI/AWWA C153/A2153, shall conform to the follow:

Design
Restraint devices for nominal pipe sizes 3 inch through 36 inch shall consist of multiple gripping wedges incorporated into a follower gland meeting the applicable requirements of ANSI/AWWA C110/A21.10.
The devices shall have a working pressure rating equal to that found in the most current product brochure. Ratings are for water pressure and must include a minimum safety factor of 2:1 in all sizes.

Material
Gland body, wedges and wedge actuating components shall be cast from grade 65-45-12 ductile iron material in accordance with ASTM A536.

Three (3) test bars shall be incrementally poured per production shift as per Underwriter's Laboratory (U.L.) Specifications and ASTM A536. Testing for tensile, yield and elongation shall be done in accordance with ASTM E8. Chemical and nodularity tests shall be performed as recommended by the Ductile Iron Society, on a per ladle basis.

Traceability
An identification number consisting of year, day, plant and shift (YYDDD) (plant designation) (Shift number), shall be cast into each gland body.
All physical and chemical test results shall be recorded such that they can be accessed via the identification number on the casting. These Material Traceability Records (MTR's) are to be made available, in hard copy, to the purchaser that requests such documentation and submits his gland body identification number.
Production pieces that are too small to accommodate individual numbering, such as fasteners and wedges, shall be controlled in segregate inventory until such time as all quality control tests are passed. These component parts may then be released to a general inventory for final assembly and packaging.
All components shall be manufactured and assembled in the United States. The purchaser shall, with reasonable notice, have the right to plant visitation at his/her expense.

Installation
Mechanical joint restraint shall require conventional tools and installation procedures per AWWA C600, while retaining full mechanical joint deflection during assembly.
Proper actuation of the gripping wedges shall be ensured with torque limiting twist off nuts.

Approvals
Mechanical Joint Restraints shall be Listed by Underwriters Laboratories in the 4 inch through 12 inch sizes.
Mechanical Joint Restraints shall be Factory Mutual Approved in the 4 inch through 12 inch sizes.
Mechanical Joint Restraints, 4 inch through 24 inch, shall meet or exceed the requirements of ASTM F1674 of the latest revision.
Mechanical joint restraint shall be Series 2000PV produced by EBAA Iron Inc. or approved equal.

MEGA-BOND® Restraint Coating System
All wedge assemblies and related parts shall be processed through a phosphate wash, rinse and drying operation prior to coating application. The coating shall consist of a minimum of two coats of liquid thermoset epoxy coating with heat cure to follow each coat.

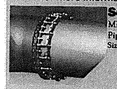
All casting bodies shall be surface pretreated with a phosphate wash, rinse and sealer before drying. The coating shall be electrostatically applied and heat cured. The coating shall be a polyester based powder to provide corrosion, impact and UV resistance.

The coating system shall be MEGA-BOND by EBAA Iron, Inc. or approved equal. Requests for approved equal must submit coating material and process details for review prior to bid.

For more information regarding MEGA-BOND, refer to the MEGA-BOND brochure or visit www.ebaa.com.

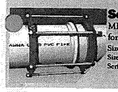
Support Products

for more information concerning these products, please consult the catalog or www.ebaa.com



Series 2200
MEGALUG® Restraint for C905 PVC Pipe at Mechanical Joint Fittings
Sizes 42 and 48 inch

Series 2500
MEGALUG® Restraint for C900 and C905 PVC Pipe at PVC Fittings
Sizes 4 inch through 48

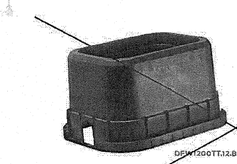


Series 2800
MEGALUG® Restraint Harness for C905 PVC Pipe
Sizes 14 inch through 48
Sizes 4 through 12 accommodated by either Series 1500 or 1600

Series 2000SV
Split MEGALUG® Restraint for existing C900 PVC Pipe at Ductile Iron Fittings
Sizes 4 inch through 12

Series A | Meter and Valve Boxes & Lids

DFW.



DFW1200TT.12.BODY

1200TT Series
12" Ribbed Standard Rectangular Box
- Original design
- Uses 1200 Series Lid
- Overlapping lid (T-lid) overlaps top edge of body
- Body built with double ledge to support lid in two places instead of one
- Ridge in the middle of the box adds additional support to side walls
- Body has extra ribbing to support top ledge and bottom base
- Body built with bolt down option
- Inside Dimensions: 18-1/2" x 13-1/2"
- Lid Options:
  A, C, D, E, K, M, N, R, T, U, Z, Colors

Item No.	Item Description	Unit Wgt	Pallet Qty	Base Price
DFW1200T.LID	12X17 RECT STD BLACK LID	2.25	216	16.75
DFW1200TT.12.BODY	13X18X12 TT RECT BLACK BOX	7.20	54	26.10
SOLID BLACK ASSEMBLED				
DFW1200TT.12.1	13X18X12 TT RECT MBOX W/ BLACK LID	9.45	54	42.85

DFW1300.12.1

1300 Series
12" Ribbed Rectangular Box
- Original design
- Uses 1200 Series Lid
- Overlapping lid (T-lid) sits in body like a drop-in lid
- Body built with double ledge to support lid in two places instead of one
- Ridge in the middle of the box adds additional support to side walls
- Body has extra ribbing to support top ledge and bottom base
- Body built with bolt down option
- Inside dimensions: 19" x 13"
- Lid Options:
  A, C, D, E, K, M, N, R, T, U, Z, Colors

Item No.	Item Description	Unit Wgt	Pallet Qty	Base Price
DFW1200.LID	12X17 RECT STD BLACK LID	2.25	216	16.75
DFW1300.12.BODY	13X18X12 RECT STD BLACK BOX	7.40	54	26.10
SOLID BLACK ASSEMBLED				
DFW1300.12.1	13X18X12 RECT STD MBOX W/ BLACK LID	9.65	54	42.85
EXAMPLE OF BLACK BODY WITH BLACK AMR PAD LOCATOR LID				
DFW1300.12.1A	13X18X12 RECT STD MBOX W/ BLACK AMR LID	9.85	54	46.80

Series A | Price List Key

DFW.

To create List Price, use the Base Price on Black Body & Solid Black Lid in each category and add the desired style and or color to the Base Price.

Color Key	Color	Cost Body Only	Cost Lid Only
1	Black	$ 0.00	$ 0.00
2	Green	$ 0.90	$ 0.85
3	Blue	$ 0.90	$ 0.85
4	Gray	$ 1.70	$ 1.65
5	Purple	$ 1.45	$ 1.40
6	Sand	$ 1.70	$ 1.65
7	Red	N/A	$ 6.85

Option Key	Option Description	Cost
A	AMR Pad Locator	Add $5.95
C	Cast Iron Reader	Add $5.70
D	Bolt Down (Add to Body Only)	Add $1.95
E	Rebar Installed	Add $2.25
K	Plastic Key Lock	Add $5.00
M	Magnet Detector	Add $23.10
N	Houston Key Lock	Add $5.00
R	Plastic Reader	Add $ 1.40
T	Molded Touch Read Hole	Add $ 1.35
U	Small AMR Pad Locator	Add $3.15
Z	Drilled Touch Read Hole.	Add $23.10

Lid Options |

Item No.	Item Description	Base Price
DFW109.1.LID	6X9 ECONO BLACK LID "WATER"	2.90
DFW1000.1.LID	9X15 RECT BLACK LID	9.20
DFW1100.1.LID	10X12 ROUND BLACK LID	6.65
DFW1200.1.LID	12X17 RECT STD BLACK LID	16.75
DFW1500.1.LID	16X22 RECT JUMBO BLACK LID	27.60

Marking	Lid Color
Water Meter or Water	Black, Blue, Gray, Red
Medidor de Agua	Black
ICV	Green, Sand, Cal Green
Potable	Black, Blue
Reclaim Water No Beber	Purple
Sewer	Black, Green
Gas	Black, Green
Electric	Gray

Accessories & Individual Parts |

ACCESSORIES & INDIVIDUAL PARTS		Unit Wgt	Pallet Qty	Base Price
DFW4X7.1	4X7 BLACK PLASTIC READER ONLY	0.20	1000	10.75
DFW4X7-1C	4X7 CAST IRON READER ONLY	2.00	1000	12.85
DFW4X7.2	4X7 GREEN PLASTIC READER ONLY	0.20	1000	11.60
DFW4X7.3	4X7 BLUE PLASTIC READER ONLY	0.20	1000	12.40
DFW4X7.5	4X7 PURPLE PLASTIC READER ONLY	0.20	1000	12.20
CAST IRON LIDS				
EJ.32.13.1020	12" STD EJ DOMESTIC CAST IRON SOLID LID FOR 1200TT	12.00	90	50.75
EJ.32.401525	12" JUMBO DOMESTIC CAST IRON SOLID LID FOR 1500/1600	30.00	18	136.85
LC2514DFW	CAST IRON LID W/CAST IRON READ FOR 1200/1300 BODY	14.00	1	55.25
LC225	12" STD BLACK CAST IRON LID WITH CI READER FOR 1200TT BODY	18.00	1	63.96
LC528T	CAST IRON LID W/2" TOUCH READ HOLE FOR 1200TT BODY	14.00	1	47.75
LC528W	12" SOLID CAST IRON LID FOR 1200TT BODY	14.00	1	45.10
LC1419DEW	12" STD OVERLAPPING SOLID CAST IRON LID FOR 1200/1300 BODY	14.00	1	50.50

KFW ENGINEERS + SURVEYING
3421 Pleasanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 8813 • TBPLS Firm #: 10124200

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
WATER DETAILS (SHEET 5 OF 5)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 7.7

Date: Oct. 28, 2022, 11:17am User ID: tthompson
File: N:\479\09\01\Design\Civil\WATER\DTDW479090l.dwg

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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.

PROJECT COMPLETION:

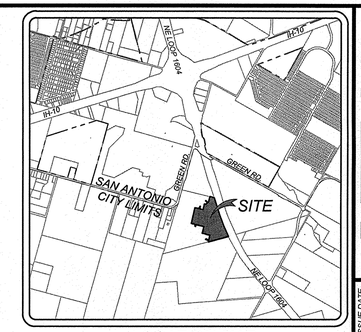
1. ALL DISTURBED AREAS ARES NOT COVERED BY IMPERVIOUS COVER ARE TO BE STABILIZED PER THE SWPPP AND PROJECT SPECIFICATIONS PRIOR TO REMOVAL OF ANY BMP'S AND/OR PRIOR TO FILING A NOTICE OF TERMINATION (NOT).
2. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN PHASES IF ALL UPGRADIENT AREAS HAVE BEEN STABILIZED 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:

1. THIS EXHIBIT IS TO BE USED FOR THE PURPOSES OF STORMWATER POLLUTION PREVENTION ONLY. ALL OTHER CIVIL ENGINEERING INFORMATION SHOULD BE OBTAINED FROM THE APPROPRIATE CONSTRUCTION DOCUMENTS.
2. THE PURPOSE OF THE SIGNATURE AND SEAL OF THE ENGINEER ON THIS DOCUMENT IS TO DEMONSTRATE COMPLIANCE WITH THE TPDES STORMWATER POLLUTION PREVENTION PLAN REGULATIONS ONLY.
3. ALL OWNERS/OPERATORS ARE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH THE STORMWATER POLLUTION PREVENTION PLAN AND COMPLYING WITH THE REGULATIONS CONTAINED WITHIN IT.

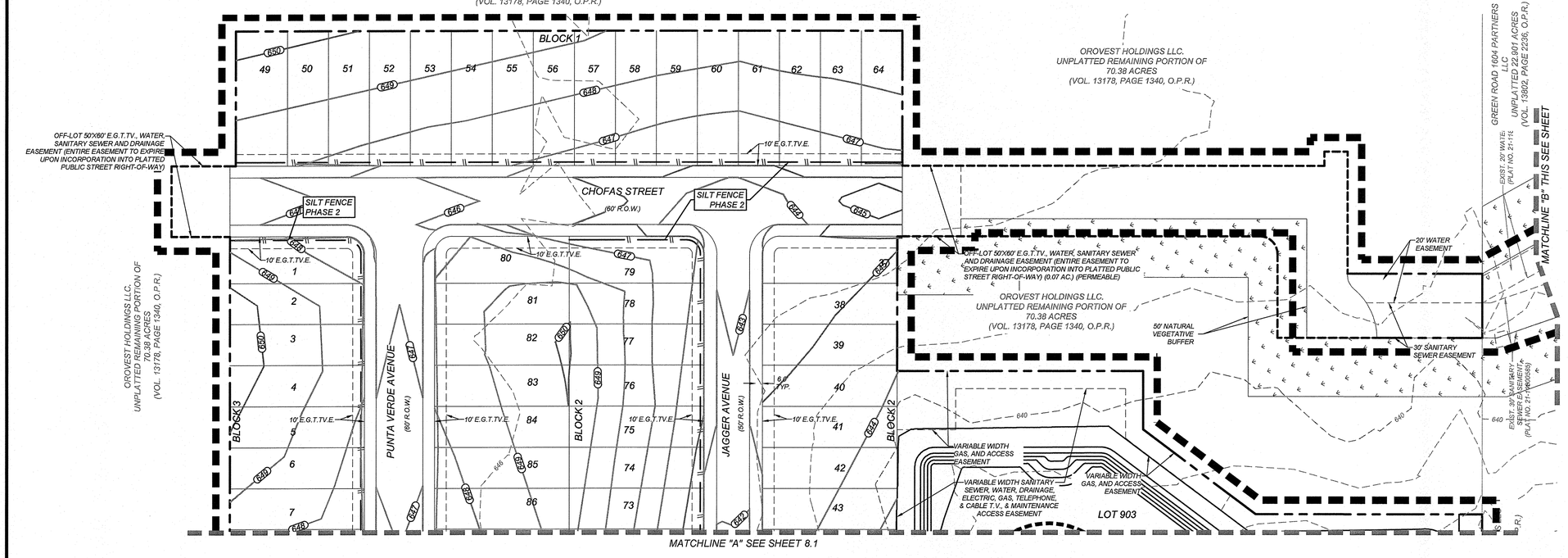
COORDIINATION NOTE:

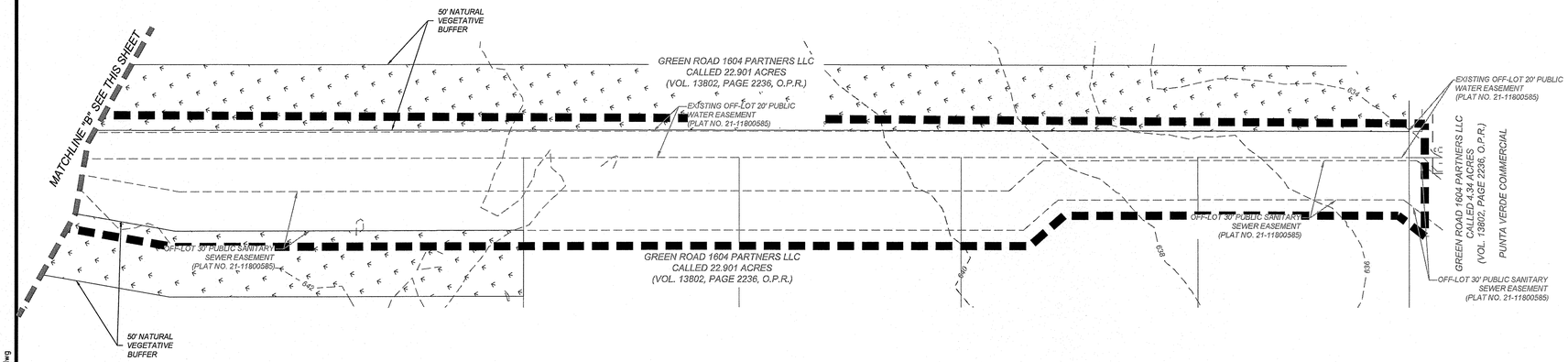
1. CONTACT TIME WARNER TO COORDINATE CABLE TV SERVICE: (210) 244-0500
2. CONDUIT FOR ELECTRICAL SERVICE. CONFIRM REQUIREMENTS AND COORDINATE WITH CPS FOR INSPECTION. (210) 353-2246.
3. CONTACT AT&T TO COORDINATE TELEPHONE SERVICE. 1-800-449-7928.
4. CONTRACTOR TO COORDINATE WITH CPS PRIOR TO CONSTRUCTION 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.

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





LEGEND

- LIMITS OF CONSTRUCTION
- 570 — EXISTING CONTOURS
- 1008 — PROPOSED CONTOURS
- FLOW ARROW
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.
- CONCRETE TRUCK WASHOUT PIT
- DISTURBED AREA
- ROCK BERM
- SILT FENCE PHASE 1 (SILT FENCE PHASE 2 ALONG THE FRONT OF LOTS TO BE INSTALLED AFTER PAVING)
- NATURAL VEGETATIVE BUFFER
- INLET WITH PROTECTION (GRAVEL FILTERS BAGS)

SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122600

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED
PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
STORM WATER POLLUTION PREVENTION PLAN (SHT 1 OF 2)

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
8.0

Date: Oct 28, 2022, 11:18am User ID: tthompson
File: N:\479\09\01\Design\Civil\SW3P\479090l.dwg

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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.

PROJECT COMPLETION:

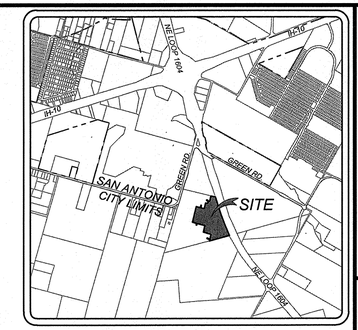
1. ALL DISTURBED AREAS ARES NOT COVERED BY IMPERVIOUS COVER ARE TO BE STABILIZED PER THE SWPPP AND PROJECT SPECIFICATIONS PRIOR TO REMOVAL OF ANY BMP'S AND/OR PRIOR TO FILING A NOTICE OF TERMINATION (NOT).
2. BEST MANAGEMENT PRACTICES MAY BE REMOVED IN PHASES IF ALL UPGRADIENT AREAS HAVE BEEN STABILIZED 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:

1. THIS EXHIBIT IS TO BE USED FOR THE PURPOSES OF STORMWATER POLLUTION PREVENTION ONLY. ALL OTHER CIVIL ENGINEERING INFORMATION SHOULD BE OBTAINED FROM THE APPROPRIATE CONSTRUCTION DOCUMENTS.
2. THE PURPOSE OF THE SIGNATURE AND SEAL OF THE ENGINEER ON THIS DOCUMENT IS TO DEMONSTRATE COMPLIANCE WITH THE TPDES STORMWATER POLLUTION PREVENTION PLAN REGULATIONS ONLY.
3. ALL OWNERS/OPERATORS ARE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH THE STORMWATER POLLUTION PREVENTION PLAN AND COMPLYING WITH THE REGULATIONS CONTAINED WITHIN IT.

LEGEND

- LIMITS OF CONSTRUCTION
- 570 — EXISTING CONTOURS
- 1008 — PROPOSED CONTOURS
- FLOW ARROW
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.
- CONCRETE TRUCK WASHOUT PIT
- DISTURBED AREA
- ROCK BERM
- SILT FENCE PHASE 1 (SILT FENCE PHASE 2 ALONG THE FRONT OF LOTS TO BE INSTALLED AFTER PAVING)
- NATURAL VEGETATIVE BUFFER
- INLET WITH PROTECTION (GRAVEL FILTERS BAGS)



LOCATION MAP
N.T.S.

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

OFF-LOT 50'X50' E.G.T.TV., WATER SANITARY SEWER AND DRAINAGE EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET RIGHT-OF-WAY)

PROPOSED 100-WATT LED STREET LIGHT

JUANA STREET (60' R.O.W.)

BLOCK 15 CB 5088

BLOCK 18 CB 5088

SILT FENCE PHASE 2

INLET WITH PROTECTION (GRAVEL FILTER BAGS)

DRAIN "C"

SANCHO PANZA PLACE (60' R.O.W.)

LOT 901

MATCHLINE "B" SEE THIS SHEET

MATCHLINE "A" SEE SHEET 8.0

ROCK BERM

DRAIN "B"

JUAN JONES ROAD (60' R.O.W.)

CONCRETE TRUCK WASHOUT PIT

PUNTA VERDE AVENUE (60' R.O.W.)

CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA

DETENTION BASIN "B"

LOT 901
BLOCK 18 CB 5088

SILT FENCE PHASE 1

BLOCK 16 CB 5088

JAGGER AVENUE (60' R.O.W.)

NACHICO PLACE (50' R.O.W.)

STABILIZED CONSTRUCTION ENTRANCE/EXIT

DRAIN "A"

WETLAND ACCORDING TO WETLAND MAPPER AND DEEMED NON-JURISDICTIONAL

VARIABLE WIDTH SANITARY SEWER, WATER, DRAINAGE, ELECTRIC, GAS, TELEPHONE, & CABLE T.V., & MAINTENANCE ACCESS EASEMENT

LOT 903
BLOCK 16 CB 5088

DETENTION BASIN "A"

30' R.O.W. DEDICATION

GREEN ROAD 16M PARTNERS, LLC
CALLED 23.801 ACRES
(VOL. 13892, PAGE 2236, O.P.R.)

10' E.G.T.TV.E.

SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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.

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 Fax #: (210) 979-8441
TBPE Firm #: 9513 TBPLS Firm #: 10124300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
STORM WATER POLLUTION PREVENTION PLAN (SHT 2 OF 2)

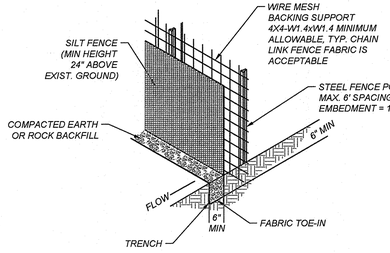
PLAT NO.
21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER:
8.1

Date: Oct 28, 2022, 11:18am User ID: tthompson
File: N:\479\09\01\Design\Civil\SW3P\479090l.dwg

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



ISOMETRIC PLAN VIEW

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/ft2, and Brindell hardness exceeding 140.

(3) Woven wire backing to support the fabric should be galvanized 2' x 4" welded wire, 12 gauge minimum.

Installation:

(1) Steel posts, which support the silt fence, should be installed on a slight angle toward the anticipated runoff source. Post must be embedded a minimum of 1- foot deep and spaced not more than 8 feet on center. Where water concentrates, the maximum spacing should be 6 feet.

(2) Lay out fencing down-slope of disturbed area, following the contour as closely as possible. The fence should be sited so that the maximum drainage area is ¼ acre/i 00 feet of fence.

(3) The toe of the silt fence should be trenched in with a spade or mechanical trencher, so that the down- slope face of the trench is flat and perpendicular to the line of flow. Where fence cannot be trenched in (e.g., pavement or rock outcrop), weight fabric flap with 3 inches of pea gravel on uphill side to prevent flow from seeping under fence.

(4) The trench must be a minimum of 6 inches deep and 6 inches wide to allow for the silt fence fabric to be laid in the ground and backfilled with compacted material.

(5) Silt fence should be securely fastened to each steel support post or to woven wire, which is in turn attached to the steel fence post. There should be a 3-foot overlap, securely fastened where ends of fabric meet.

(6) Silt fence should be removed when the site is completely stabilized so as not to block or impede stone flow or drainage.

Inspection and Maintenance Guidelines:

(1) Inspect all fencing weekly, and after any rainfall.

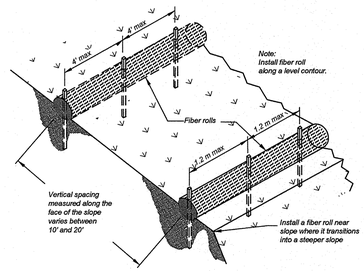
(2) Remove sediment when buildup reaches 6 inches.

(3) Replace any torn fabric or install a second line of fencing parallel to the torn section.

(4) Replace or repair any sections crushed or collapsed in the course of construction activity. If a section of fence is obstructing vehicular access, consider relocating it to a spot where it will provide equal protection, but will not obstruct vehicles. A triangular filter dike may be preferable to a silt fence at common vehicle access points.

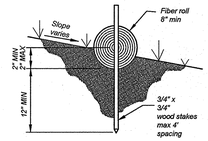
(5) When construction is complete, the sediment should be disposed of in a manner that will not cause additional siltation and the prior location of the silt fence should be revegetated. The fence itself should be disposed of in an approved landfill.

SILT FENCE



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 installation 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.

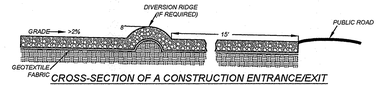
Inspection and Maintenance Guidelines:

(1) Inspect prior to forecast rain, daily during extended rain events, after rain events, and 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

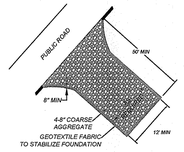
Materials:

(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.

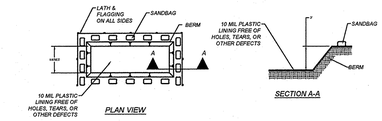
(2) All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.

(3) When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.

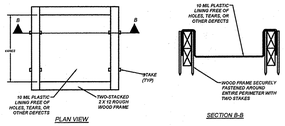
(4) When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.

(5) All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

STABILIZED CONSTRUCTION ENTRANCE / EXIT



TYPE "BELOW GRADE"

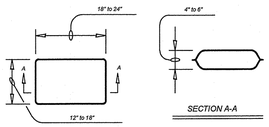


TYPE "ABOVE GRADE"

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.*

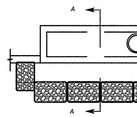
CONCRETE TRUCK WASHOUT PIT



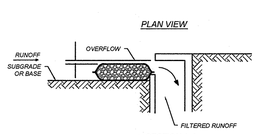
GENERAL NOTES:

- *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

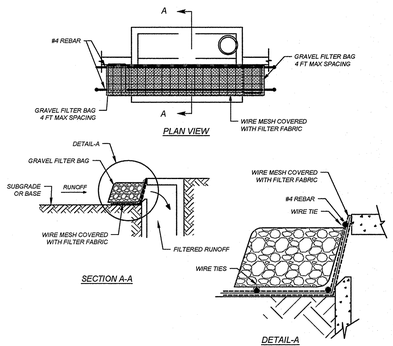


SECTION A-A

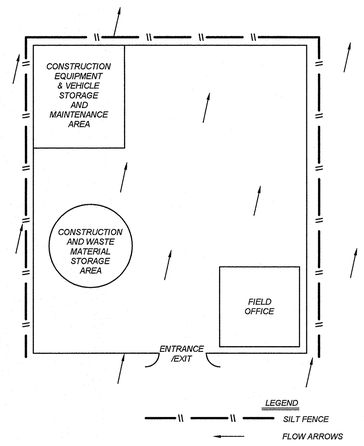
GENERAL NOTES:

- *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.*

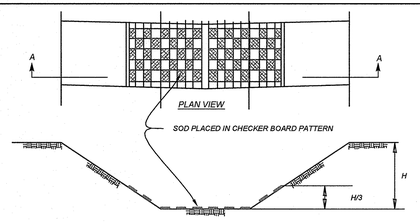
CURB INLET PROTECTION GRAVEL FILTER BAGS



CURB INLET PROTECTION (ALTERNATE)

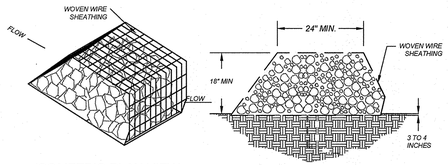


TYPICAL CONSTRUCTION STAGING AREA



CHANNEL TO BE STABILIZED WITH SOD PLACED IN A CHECKER BOARD PATTERN TON THE CHANNEL BOTTOM AND ON THE SIDES UP TO 1/3 THE DEPTH OF CHANNEL.

CHANNEL LINING



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 16".

(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, ant 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 and after each rainfall by the responsible party. For installations in streambeds, additional daily inspections should be made.

(2) Remove sediment and other debris when buildup reaches 6 inches and dispose of the accumulated silt in an approved manner that will not cause any additional siltation.

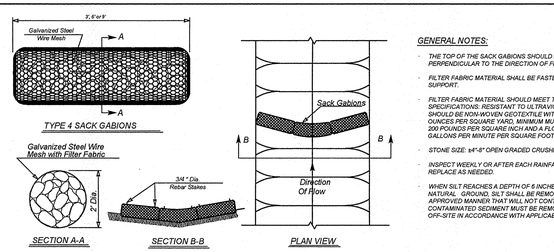
(3) Repair any loose wire sheathing.

(4) The berm should be reshaped as needed during inspection.

(5) The berm should be replaced when the structure ceases to function as intended due to silt accumulation among the rocks, washout, construction traffic damage, etc.

(6) The rock berm should be left in place until all upstream areas are stabilized and accumulated silt removed.

ROCK BERM



GENERAL NOTES:

- *THE TOP OF THE SACK GABIONS SHOULD BE LEVEL AND ORIENTED PERPENDICULAR TO THE DIRECTION OF FLOW.*
- *FILTER FABRIC MATERIAL SHALL BE FASTENED TO WOVEN WIRE SUPPORT.*
- *FILTER FABRIC MATERIAL SHOULD MEET THE FOLLOWING SPECIFICATIONS: RESISTANT TO ULTRAVIOLET LIGHT, FABRIC SHOULD BE NON-WOVEN GEOTEXTILE WITH MINIMUM WEIGHT OF 3.5 OUNCES PER SQUARE YARD, MINIMUM MULLEN BURST STRENGTH OF 200 POUNDS PER SQUARE INCH AND A FLOW THRU RATE OF 120 GALLONS PER MINUTE PER SQUARE FOOT OF FRONTAL AREA.*
- *STONE SIZE: 6"-8" OPEN GRADED CRUSHED LIMESTONE.*
- *INSPECT WEEKLY OR AFTER EACH RAINFALL EVENT AND REPAIR OR REPLACE AS NEEDED.*
- *WHEN SILT REACHES A DEPTH OF 6 INCHES OR MORE ABOVE NATURAL GROUND, SILT SHALL BE REMOVED AND DISPOSED IN AN APPROVED MANNER THAT WILL NOT CONTRIBUTE TO REGULTATION. CONTAMINATED SEDIMENT MUST BE REMOVED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH APPLICABLE REGULATIONS.*

TYPE 4 SACK GABIONS

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
MICHAEL B. RICHARDS
121665
LICENSED PROFESSIONAL ENGINEER
10/28/22

PUNTA VERDE SUBDIVISION UNIT 1
BEXAR COUNTY, TEXAS
STORM WATER POLLUTION PREVENTION PLAN DETAILS

PLAT NO. 21-11800683

JOB NO. 479-09-01
DATE: FEBUARY 2022
DRAWN: WDS CHECKED: MR

SHEET NUMBER: 8.2

Date: Oct 28, 2022, 11:19am User ID: fthompson
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