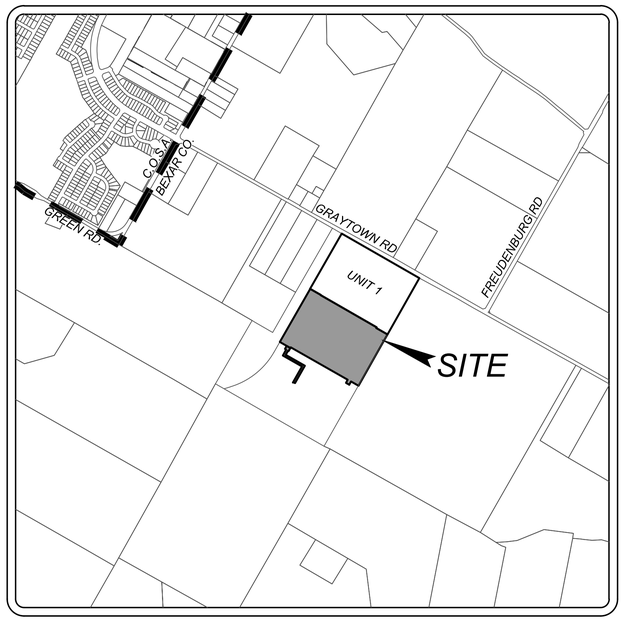
FISCHER GARDENS UNIT 2

BEXAR COUNTY, TX

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



LOCATION MAP
NOT-TO-SCALE

SA GIVEN TO FLY, LLC
6812 WEST AVENUE, SUITE 100
SAN ANTONIO, TX 78213
PHONE: 210-701-8337

RESIDENTIAL LOTS = 148

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers
Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
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TBPE Firm#: F-14909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	CV3146001

SHEET TITLE: COVER SHEET

SHEET NUMBER: 1.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\314\60\01\DESIGN\CIVIL\CV3146001.DWG By:DYLAN.FOERSTER 5/15/2024 2:41 PM

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.

DRY UTILITY CONDUIT NOTE:

CONDUIT LOCATIONS SHOWN ON PLAN ARE FOR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO INSTALL PROPOSED CONDUITS IN ACCORDANCE WITH DRY UTILITY PURVEYOR'S SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYOR'S PLAN.

COMPACTION NOTE:

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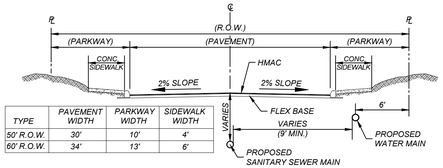
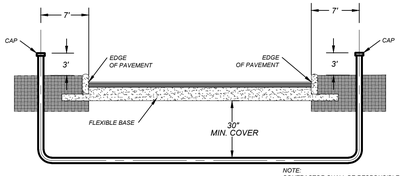


TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	6'

TYPICAL STREET SECTION
N.T.S.



TYPICAL CONDUIT DETAIL
NOT-TO-SCALE

NOTE:
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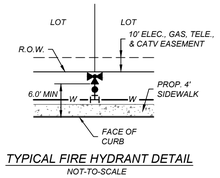
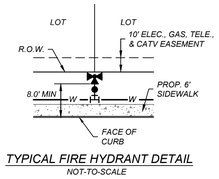
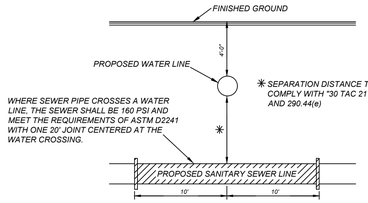


TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE



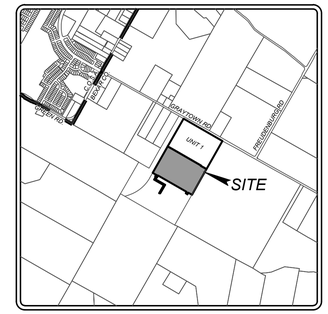
TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE



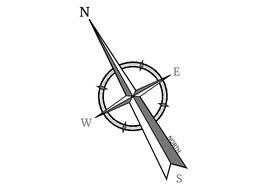
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

LEGEND

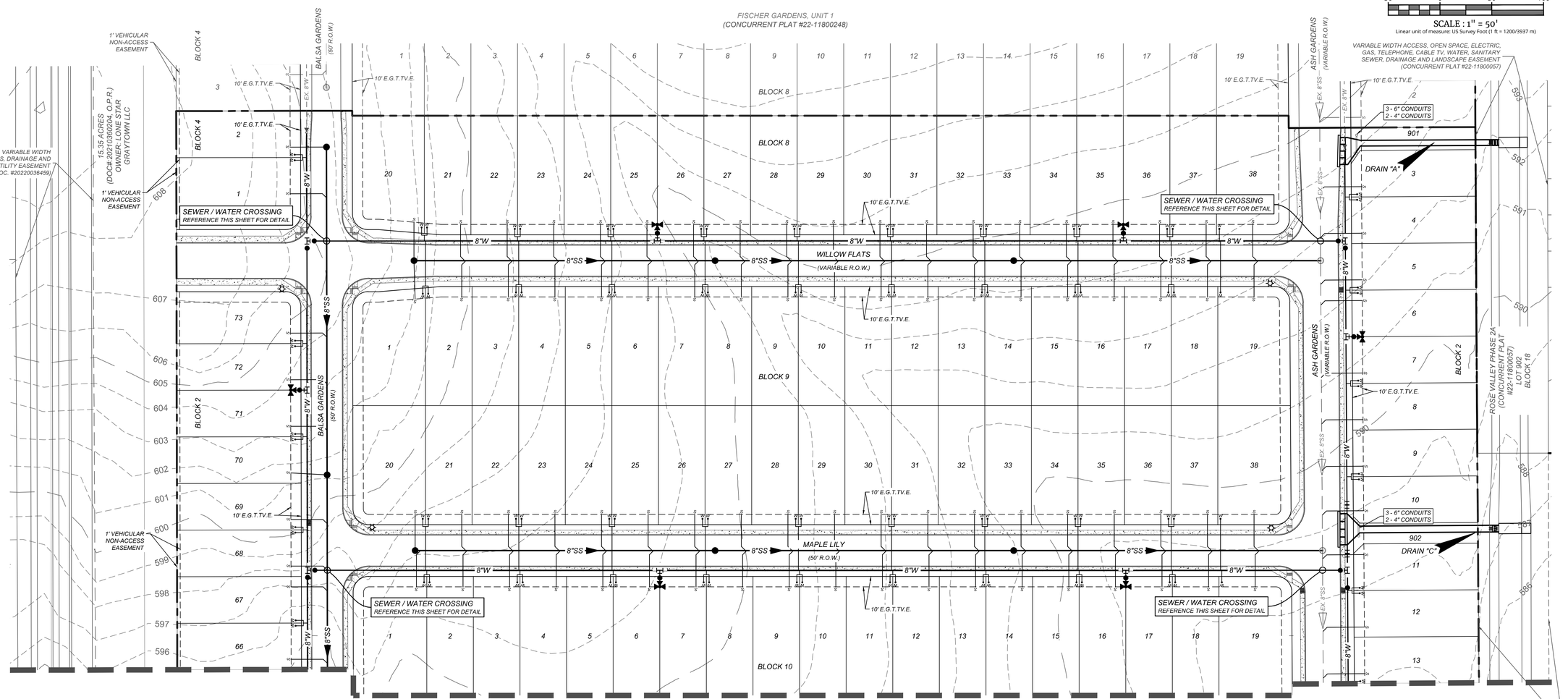
PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	IRR
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	S
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. 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



LOCATION MAP
NOT-TO-SCALE



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



RESIDENTIAL LOTS = 148

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REV	DATE	DRAWN BY	DESCRIPTION

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5/15/2024

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PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
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TBPE Firm#: F-14909
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: OU3146001

SHEET TITLE:
OVERALL UTILITY PLAN (SHEET 1 OF 2)

SHEET NUMBER: 2.1

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K:\314\60\01\DESIGN\CIVIL\OU3146001.DWG By: DYLAN.FOERSTER 5/15/2024 2:43 PM

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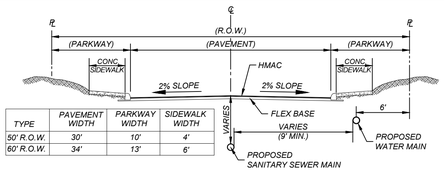
BEXAR COUNTY R.O.W. NOTE:

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



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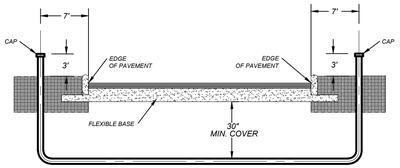

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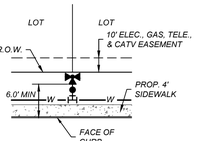
LEGEND

PROPOSED WATER MAIN	=	*W*
PROPOSED WATER SERVICE & METER BOX	=	*W M*
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	*W IRR*
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	*SS*
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	*S*
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	*E. G. T. TV. 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*

LOCATION MAP
NOT-TO-SCALE



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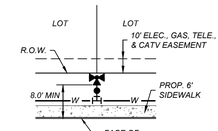

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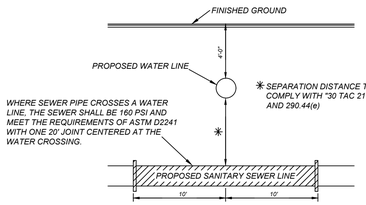

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
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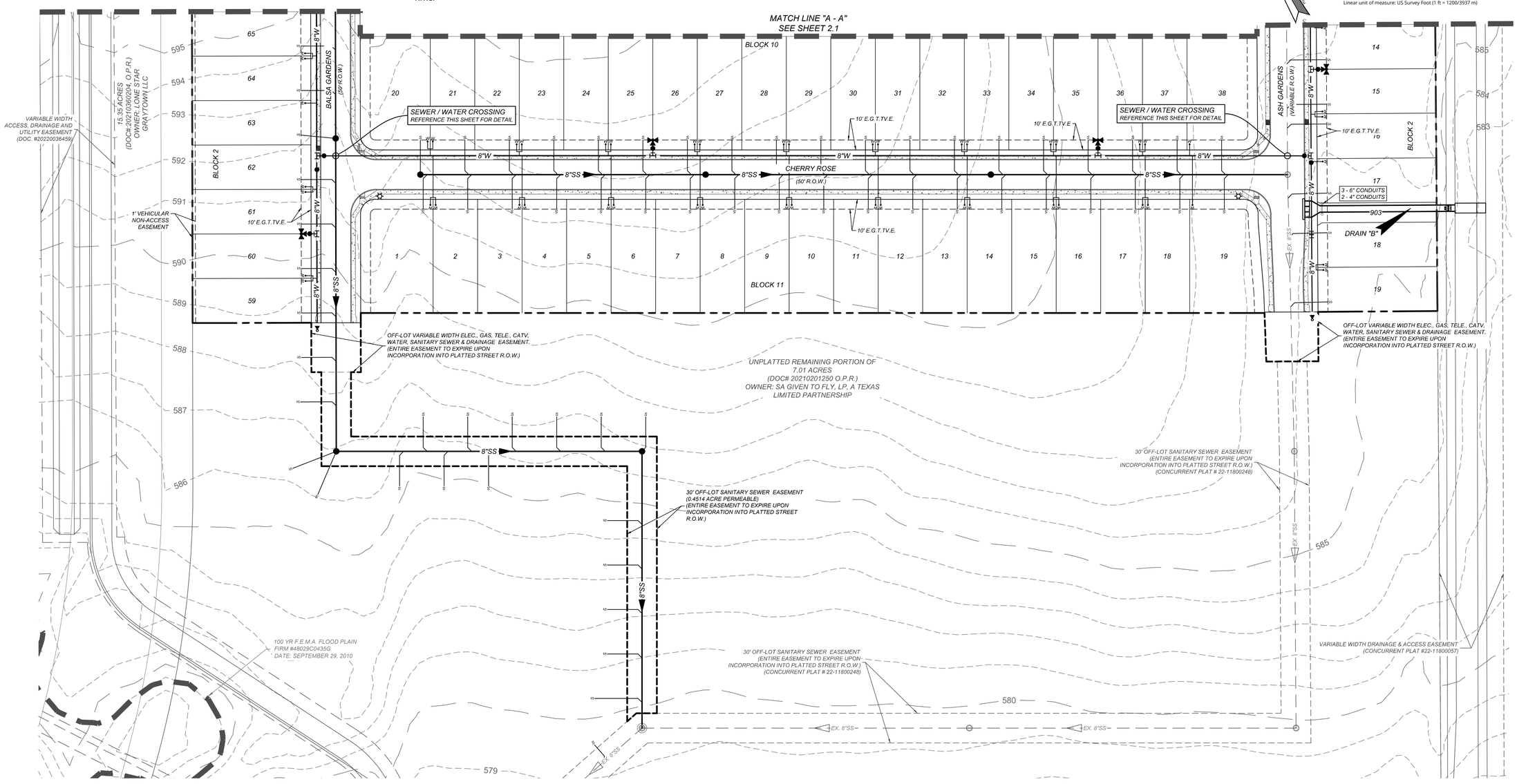

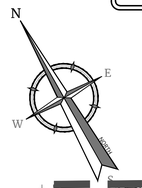

50 0 50 100

SCALE : 1" = 50'

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

RESIDENTIAL LOTS = 148

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	OU3146001

SHEET TITLE:
OVERALL UTILITY PLAN (SHEET 2 OF 2)

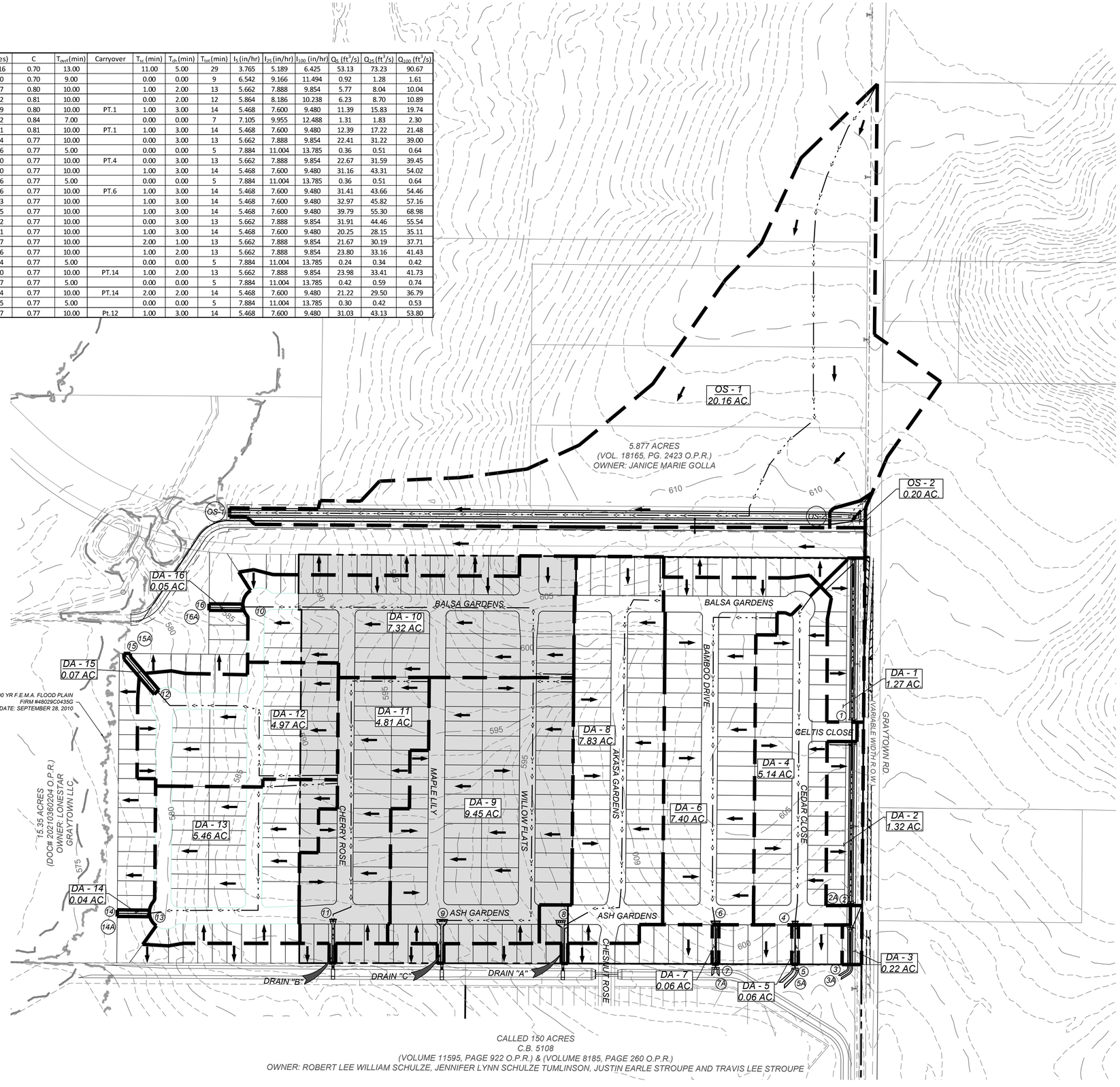
SHEET NUMBER:
2.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\314\60\01\DESIGN\CIVIL\OU3146001.DWG By:DYLAN.FOERSTER 5/15/2024 2:43 PM

Ultimate Conditions:

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-1	OS-1, OS-2	20.16	0.70	13.00		11.00	5.00	29	3.765	5.189	6.425	53.13	73.23	90.67
OS-2	OS-2	0.20	0.70	9.00		0.00	0.00	9	6.542	9.166	11.494	0.92	1.28	1.61
1	DA-1	1.27	0.80	10.00		1.00	2.00	13	5.662	7.888	9.854	5.77	8.04	10.04
2	DA-2	1.32	0.81	10.00		0.00	2.00	12	5.864	8.186	10.238	6.23	8.70	10.89
2A	DA-1, DA-2	2.59	0.80	10.00	PT.1	1.00	3.00	14	5.468	7.600	9.480	11.39	15.83	19.74
3	DA-3	0.22	0.84	7.00		0.00	0.00	7	7.105	9.955	12.488	1.31	1.83	2.30
3A	DA-1, DA-2, DA-3	2.81	0.81	10.00	PT.1	1.00	3.00	14	5.468	7.600	9.480	12.39	17.22	21.48
4	DA-4	5.14	0.77	10.00		0.00	3.00	13	5.662	7.888	9.854	22.41	31.22	39.00
5	DA-5	0.06	0.77	5.00		0.00	0.00	5	7.884	11.004	13.785	0.36	0.51	0.64
5A	DA-4, DA-5	5.20	0.77	10.00	PT.4	0.00	3.00	13	5.662	7.888	9.854	22.67	31.59	39.45
6	DA-6	7.40	0.77	10.00		1.00	3.00	14	5.468	7.600	9.480	31.16	43.31	54.02
7	DA-7	0.06	0.77	5.00		0.00	0.00	5	7.884	11.004	13.785	0.36	0.51	0.64
7A	DA-6, DA-7	7.46	0.77	10.00	PT.6	1.00	3.00	14	5.468	7.600	9.480	31.41	43.66	54.46
8	DA-8	7.83	0.77	10.00		1.00	3.00	14	5.468	7.600	9.480	32.97	45.82	57.16
9	DA-10	9.45	0.77	10.00		1.00	3.00	14	5.468	7.600	9.480	39.79	55.30	68.98
10	DA-10	7.32	0.77	10.00		0.00	3.00	13	5.662	7.888	9.854	31.91	44.46	55.54
11	DA-11	4.81	0.77	10.00		1.00	3.00	14	5.468	7.600	9.480	20.25	28.15	35.11
12	DA-12	4.97	0.77	10.00		2.00	1.00	13	5.662	7.888	9.854	21.67	30.19	37.71
13	DA-13	5.46	0.77	10.00		1.00	2.00	13	5.662	7.888	9.854	23.80	33.16	41.43
14	DA-14	0.04	0.77	5.00		0.00	0.00	5	7.884	11.004	13.785	0.24	0.34	0.42
14A	DA-13, DA-14	5.50	0.77	10.00	PT.14	1.00	2.00	13	5.662	7.888	9.854	23.98	33.41	41.73
15	DA-15	0.07	0.77	5.00		0.00	0.00	5	7.884	11.004	13.785	0.42	0.59	0.74
15A	DA-12, DA-15	5.04	0.77	10.00	PT.14	2.00	2.00	14	5.468	7.600	9.480	21.22	29.50	36.79
16	DA-16	0.05	0.77	5.00		0.00	0.00	5	7.884	11.004	13.785	0.30	0.42	0.53
16A	DA-10, DA-16	7.37	0.77	10.00	Pt.12	1.00	3.00	14	5.468	7.600	9.480	31.03	43.13	53.80



RESIDENTIAL LOTS = 148

LOCATION MAP
NOT-TO-SCALE

SCALE : 1"= 150'

0' 150' 300'

LEGEND

- ① STUDY POINT
- DRAINAGE AREA BOUNDARY
- 802 EXISTING CONTOURS
- PROPOSED UNIT
- FLOW ARROW

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

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

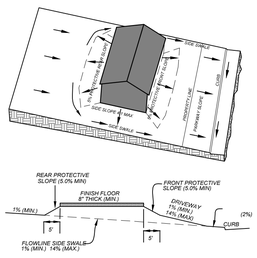
PROJECT NUMBER:	DRAWING NAME:
314-60-01	MD3146001

SHEET TITLE: MASTER DRAINAGE PLAN

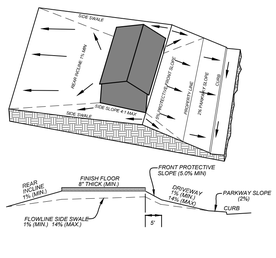
SHEET NUMBER: 3.1

N:\314\60\01\DESIGN\CIVIL\MD3146001.DWG By:DYLAN.FORSTER 5/15/2024 2:44 PM

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



TYPE 'A' LOT GRADING



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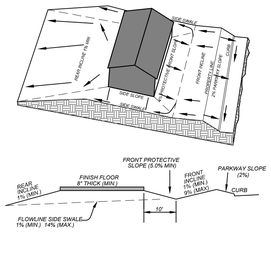
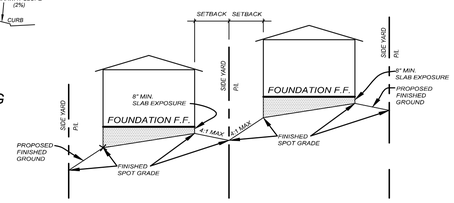


TYPE 'C' LOT GRADING



TYPICAL SIDE YARD GRADING
N.T.S.

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.*
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9. *CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ALL SWALES.*

SCALE : 1"=50'

0' 50' 150'

100'

LEGEND

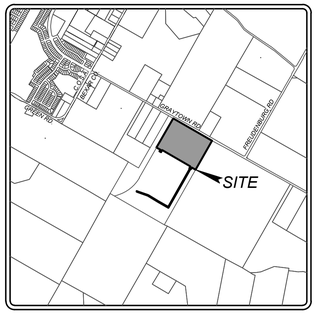
E, G, T, & TV. E. = GAS, ELECTRIC, TELEPHONE, CABLE T.V. EASEMENT

= FLOW ARROW

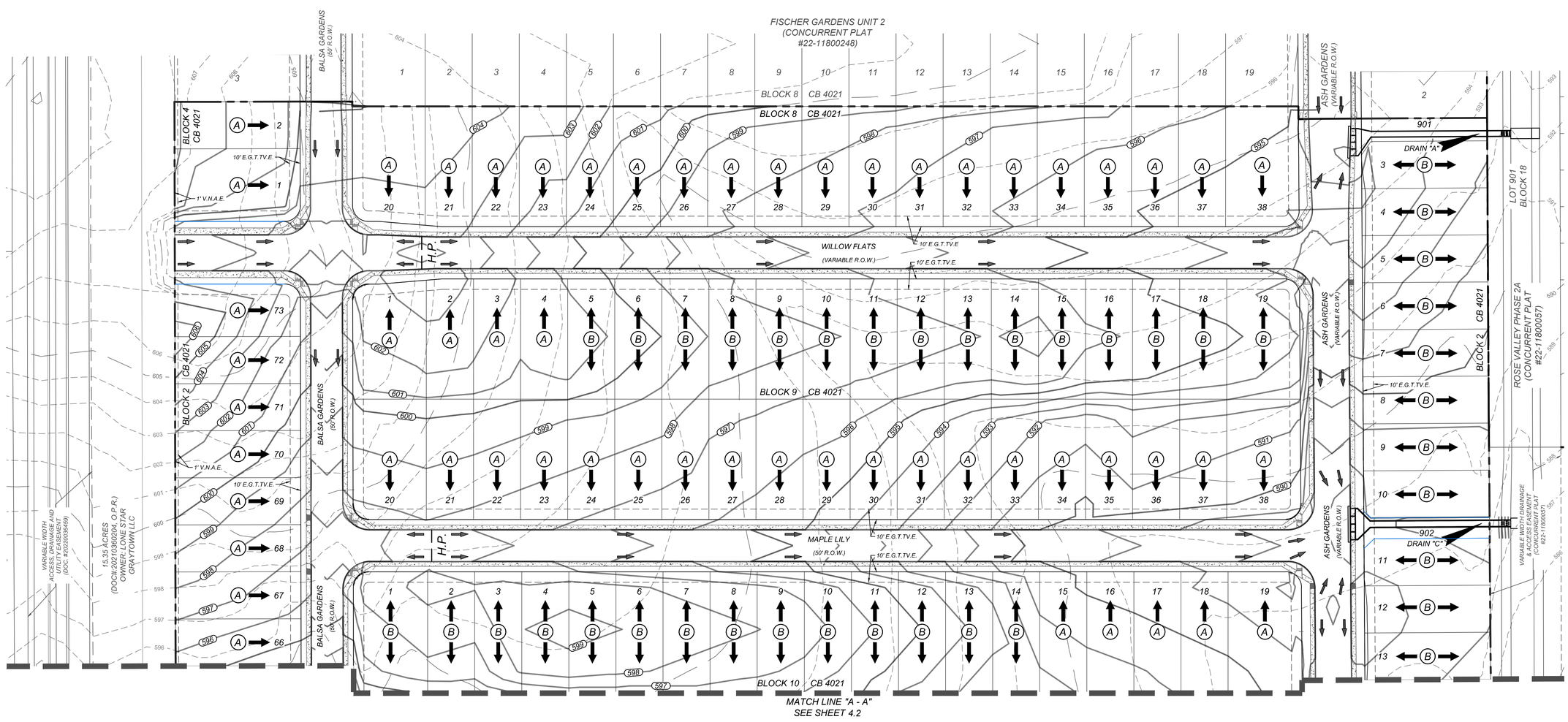
(A) = LOT GRADE TYPE

= PROPOSED DRIVEWAY LOCATION

H.P. = HIGH POINT



LOCATION MAP
NOT-TO-SCALE



MATCH LINE "A - A"
SEE SHEET 4.2

RESIDENTIAL LOTS = 148

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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 · TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

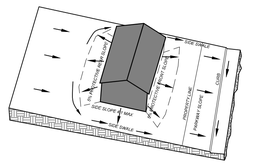
PROJECT NUMBER:	DRAWING NAME:
314-60-01	GR3146001

SHEET TITLE:
OVERALL GRADING
PLAN (SHEET 1 OF 2)

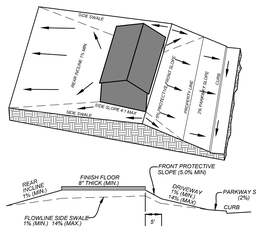
SHEET NUMBER:
4.1

K:\31\4\60\01\DESIGN\CIVIL\GR3146001.DWG By: DYLAN.FORSTER 5/15/2024 2:46 PM

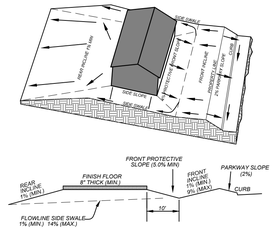
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



TYPE 'A' LOT GRADING



TYPE 'B' LOT GRADING



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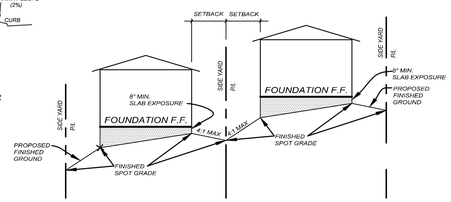

TYPICAL SIDE YARD GRADING
N.T.S.

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0' 50' 150'

100'

LEGEND

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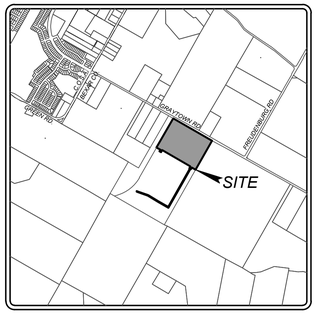
= FLOW ARROW

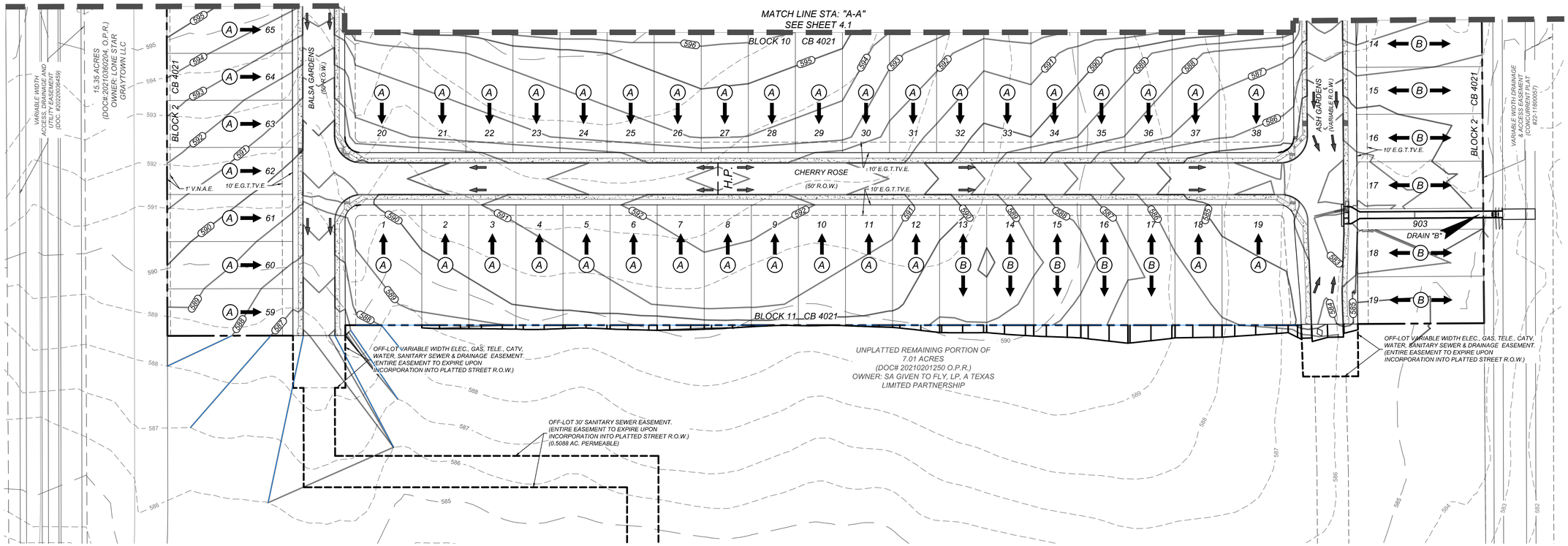
(A) = LOT GRADE TYPE

= PROPOSED DRIVEWAY LOCATION

H.P. = HIGH POINT



LOCATION MAP
NOT-TO-SCALE



RESIDENTIAL LOTS = 148

N:\314-60\01\DESIGN\CIVIL\GR3146001.DWG By: DYLAN.FOERSTER 5/15/2024 2:47 PM

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

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	GR3146001

SHEET TITLE:
OVERALL GRADING PLAN (SHEET 2 OF 2)

SHEET NUMBER:
4.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

NOTE:

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

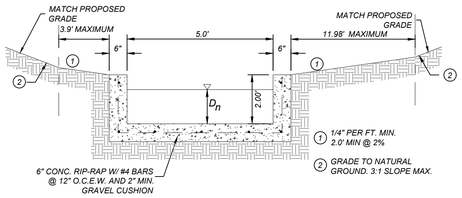
2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.

TRENCH EXCAVATION SAFETY PROTECTION

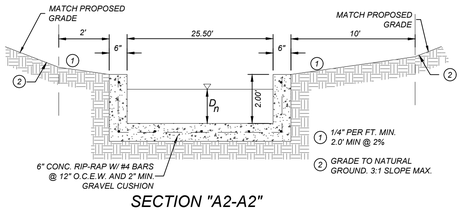
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S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

CAUTION!!:

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



SECTION "A1-A1"
STA: 1+16.09 - STA: 2+43.91
N.T.S.



SECTION "A2-A2"
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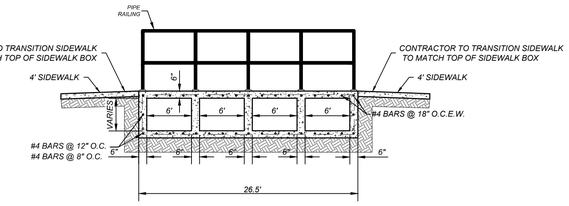

SECTION "A-A"
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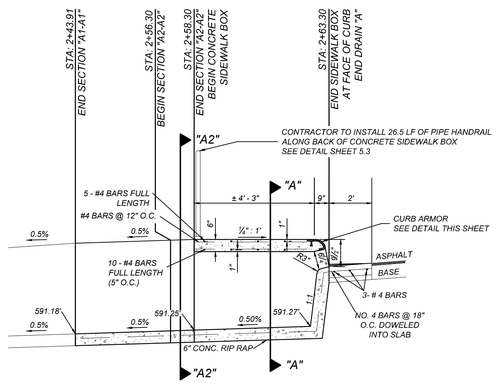
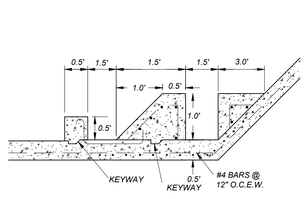
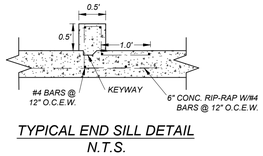


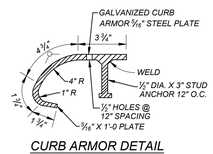
SIDEWALK BOX DETAIL
N.T.S.



TYPICAL BAFFLE BLOCK DETAIL
N.T.S.
SECTION A3-A3



TYPICAL END SILL DETAIL
N.T.S.



CURB ARMOR DETAIL
N.T.S.

BAFFLE BLOCK CALCULATIONS
(ST. ANTHONY FALLS METHOD)

Q25 = 45.82 CFS
BOTTOM WIDTH UPSTREAM = 5.0 FT
BOTTOM WIDTH DOWNSTREAM = 5.0 FT
Y1 = 0.36' (DEPTH BEFORE JUMP)
Y2 = 3.62' (DEPTH AFTER JUMP)

WIDTH OF BLOCKS = 0.75(Y1) = 0.27 FT. (USE 0.5 FT.)
SPACE BETWEEN BLOCKS = 0.75(Y1) = 0.27 FT. (USE 1.0 FT.)
HEIGHT OF BLOCKS = Y1 = 0.36 FT. (USE 1.0 FT.)
OF BLOCKS ACROSS BOTTOM = 5

% OF FLOOR COVERED WITH BLOCKS = 5 (0.5 FT) / 5 FT = 50.0%
(% MUST BE BETWEEN 40% AND 55%)

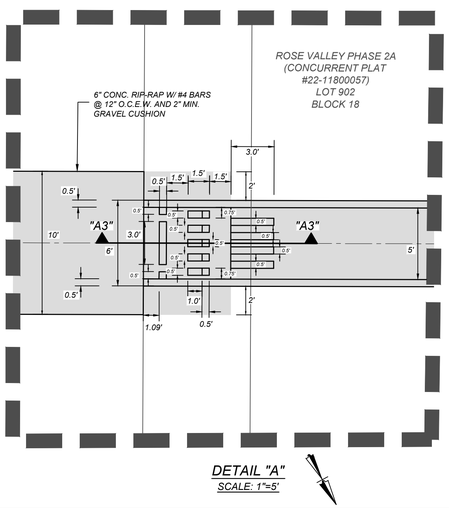
DEPTH OF TAILWATER (Y2)
FROUDE NUMBER BEFORE JUMP = F1 = 7.477
FROUDE NUMBER AFTER JUMP = F2 = 0.217

LENGTH OF BASIN = LB = 4.5(Y2)/F1^0.76 = 3.53 FT. (USE 13.62 FT.)

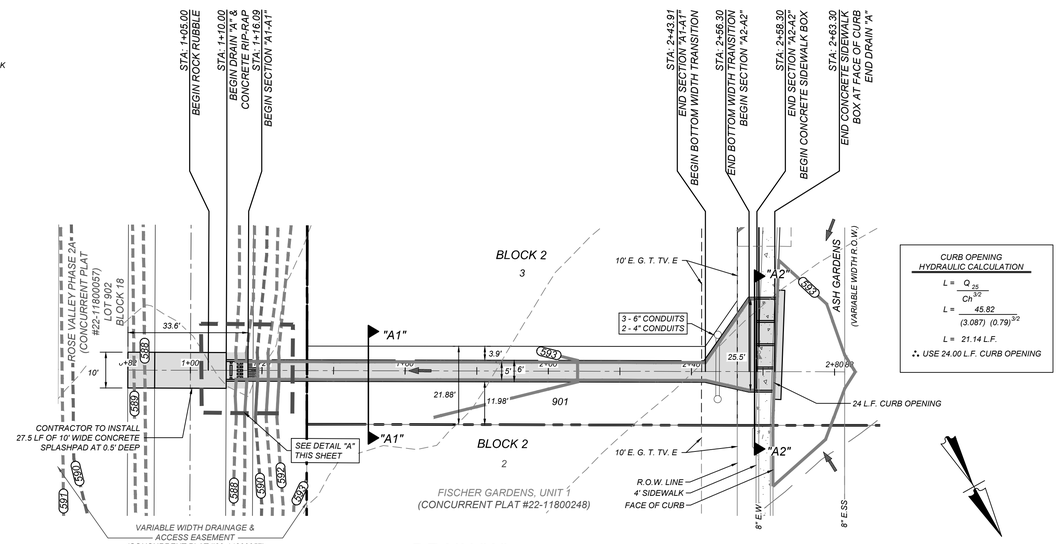
DISTANCE TO FLOOR BLOCKS = LB/3 = 1.18 FT. (USE 1.50 FT.)

HEIGHT OF MAX TAILWATER DEPTH:
Z = Y2/3 = 1.13 FT.
Y2' = 0.85 * Y2 = 2.87
H = Z + Y2' = 4.00 FT.

VELOCITY AFTER JUMP:
V = Q/A
A = Y2 * [(B + T) / 2]
A = 3.62 * [(5 + 5) / 2] = 18.10 SQ. FT.
V = 45.82/18.10 = 2.53 F.P.S.



DETAIL "A"
SCALE: 1"=5'



DRAIN "A"
STA: 1+10.00 TO END

CURB OPENING HYDRAULIC CALCULATION

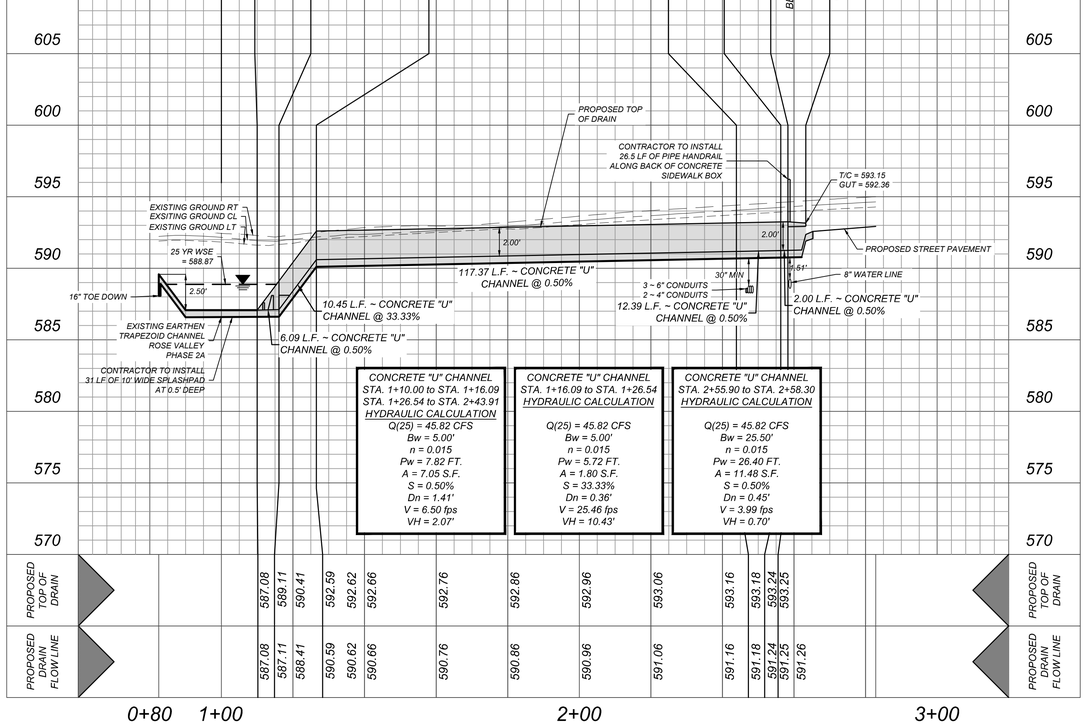
$L = \frac{Q_{25}}{Ch^{3/2}}$

$L = \frac{45.82}{(3.087)\ (0.79)^{3/2}}$

L = 21.14 L.F.

∴ USE 24.00 L.F. CURB OPENING

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



CONCRETE "U" CHANNEL
STA. 1+10.00 to STA. 1+16.09
STA. 1+26.54 to STA. 2+43.91
HYDRAULIC CALCULATION
Q(25) = 45.82 CFS
Bw = 5.00'
n = 0.015
Pw = 7.82 FT.
A = 7.05 S.F.
S = 0.50%
Dn = 1.41'
V = 6.50 fps
VH = 2.07'

CONCRETE "U" CHANNEL
STA. 1+16.09 to STA. 1+26.54
HYDRAULIC CALCULATION
Q(25) = 45.82 CFS
Bw = 5.00'
n = 0.015
Pw = 5.72 FT.
A = 1.80 S.F.
S = 33.33%
Dn = 0.36'
V = 25.46 fps
VH = 10.43'

CONCRETE "U" CHANNEL
STA. 2+55.90 to STA. 2+58.30
HYDRAULIC CALCULATION
Q(25) = 45.82 CFS
Bw = 25.50'
n = 0.015
Pw = 26.40 FT.
A = 11.48 S.F.
S = 0.50%
Dn = 0.45'
V = 3.99 fps
VH = 0.70'

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

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: DR3146001

SHEET TITLE: DRAIN "A" PLAN AND PROFILE

SHEET NUMBER: 5.1

N:\314\60\01\DESIGN\CIVIL\DRAINS\DR3146001.DWG By: DYLAN.FORSTER 5/15/2024 2:49 PM

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

NOTE:

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

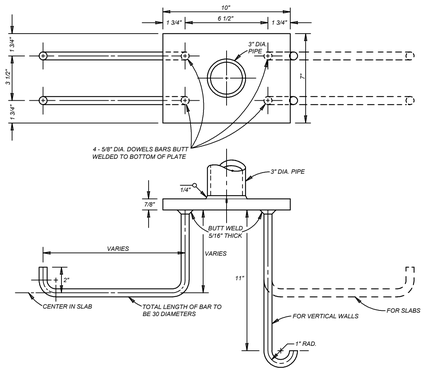
2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.

TRENCH EXCAVATION SAFETY PROTECTION

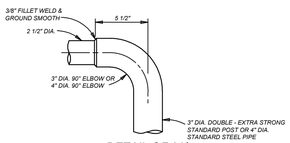
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S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

CAUTION!!:

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

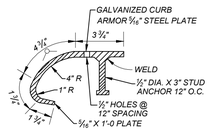


PIPE ANCHORAGE DETAILS
N.T.S.

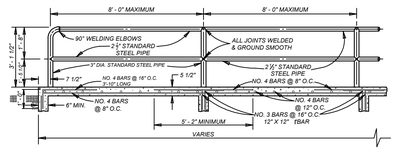


DETAIL OF 90° WELDING ELBOWS
N.T.S.

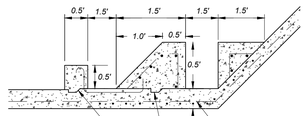
* A NEAT END SECTION, SATISFACTORY TO THE ENGINEER, FROM SUBMITTED SHOP DRAWINGS, MAY BE USED IN LIEU OF THE 90° WELDING ELBOW SHOWN.



CURB ARMOR DETAIL
N.T.S.

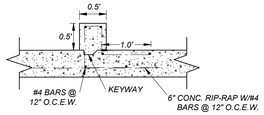


TYPICAL SIDEWALK BRIDGE & SIDEWALK PIPE RAILING SECTION
N.T.S.

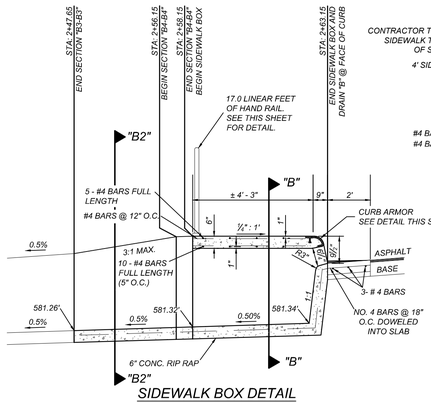


TYPICAL BAFFLE BLOCK DETAIL
N.T.S.

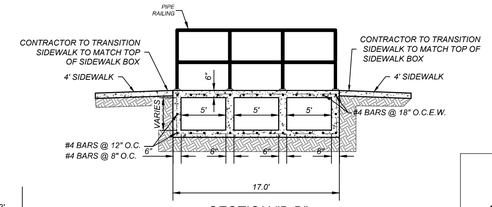
SECTION B3-B3



TYPICAL END SILL DETAIL
N.T.S.

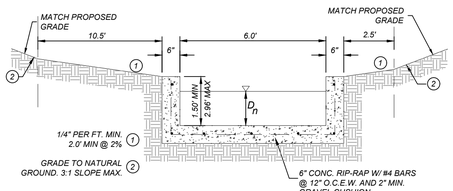


SIDEWALK BOX DETAIL
N.T.S.

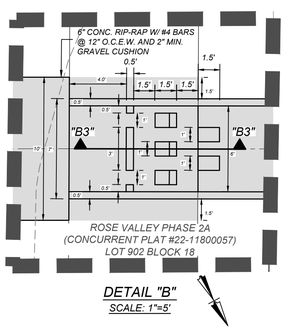


SECTION "B-B"
N.T.S.

SECTION "B2-B2"
STA: 2+56.15 - STA: 2+58.15
N.T.S.



SECTION "B1-B1"
STA: 1+29.60 - STA: 2+47.65
N.T.S.



DETAIL "B"
SCALE: 1"=5'

BAFFLE BLOCK CALCULATIONS
(ST. ANTHONY FALLS METHOD)

Q25 = 28.15 CFS
BOTTOM WIDTH UPSTREAM = 6.0 FT
BOTTOM WIDTH DOWNSTREAM = 6.0 FT
Y1 = 0.23' (DEPTH BEFORE JUMP)
Y2 = 2.315' (DEPTH AFTER JUMP)

WIDTH OF BLOCKS = 0.75(Y1) = 0.17 FT. (USE 1.0 FT.)
SPACE BETWEEN BLOCKS = 0.75(Y1) = 0.17 FT. (USE 1.0 FT.)
HEIGHT OF BLOCKS = Y1 = 0.23 FT. (USE 0.5 FT.)
OF BLOCKS ACROSS BOTTOM = 3

% OF FLOOR COVERED WITH BLOCKS = 3 (1.0 FT) / 6 FT = 50.0%
(% MUST BE BETWEEN 40% AND 55%)

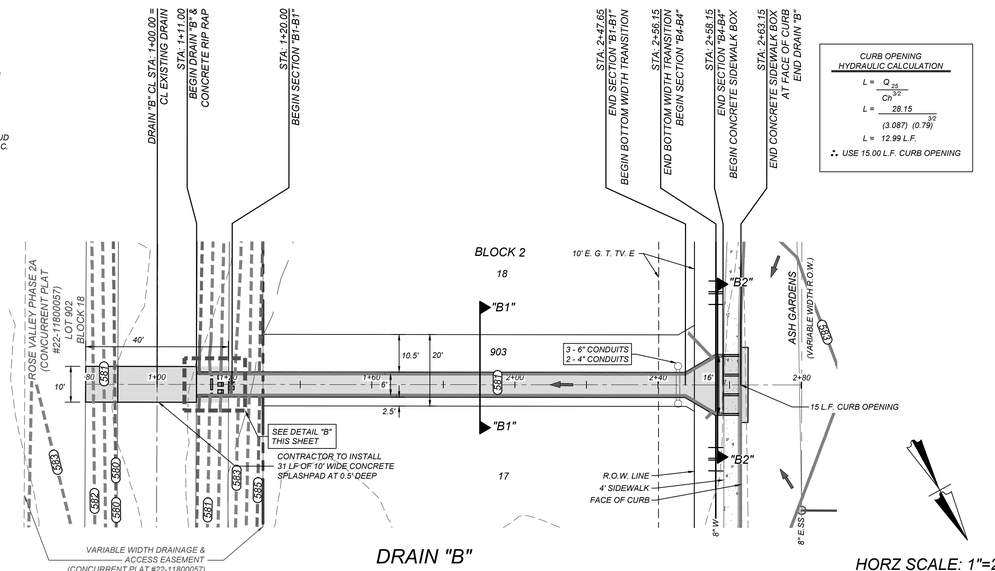
DEPTH OF TAILWATER (Y2)
FROUDE NUMBER BEFORE JUMP = F1 = 7.496
FROUDE NUMBER AFTER JUMP = F2 = 0.217

LENGTH OF BASIN = LB = 4.5(Y2)/F1^0.76 = 2.25 FT. (USE 5.0 FT.)

DISTANCE TO FLOOR BLOCKS = LB/3 = 0.75 FT. (USE 1.0 FT.)

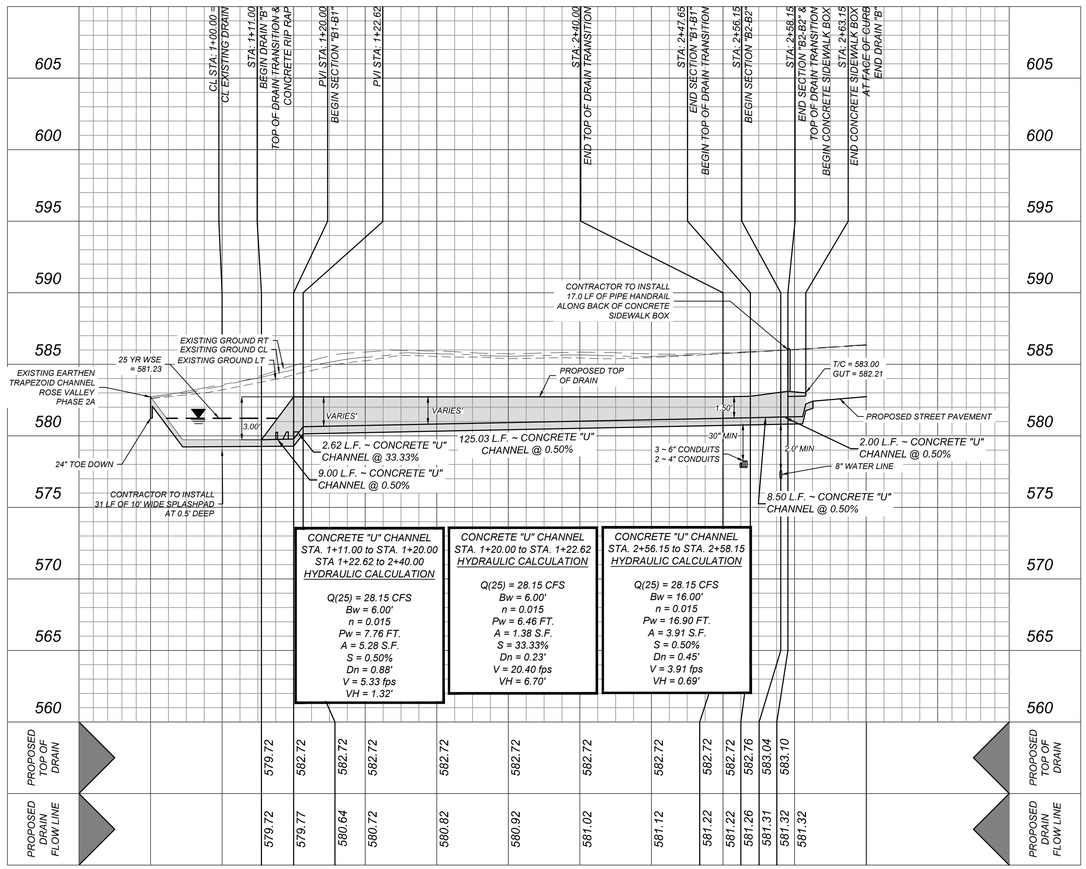
HEIGHT OF MAX TAILWATER DEPTH:
Z = Y2/2 = 0.77 FT.
Y2' = 0.85 * Y2 = 1.97
H = Z + Y2' = 4.00 FT.

VELOCITY AFTER JUMP:
V = Q/A
A = Y2 * [(B + T) / 2]
A = 2.315' * [(6 + 6) / 2] = 13.89 SQ. FT.
V = 28.15/13.89 = 2.03 F.P.S.



DRAIN "B"
STA: 1+11.00 TO END

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



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

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 · TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: DR3146001

SHEET TITLE: DRAIN "B" PLAN AND PROFILE

SHEET NUMBER: 5.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\314\60\01\DESIGN\CIVIL\DRAINS\DR3146001.DWG By:DYLAN.FISHER 5/13/2024 2:50 PM

NOTE:

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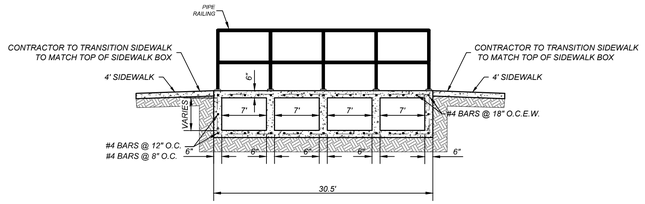
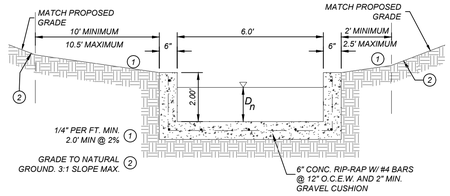


SECTION "C-C"
N.T.S.



SECTION "C1-C1"
STA: 1+17.09 - STA: 2+45.43
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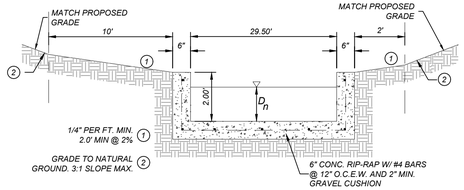
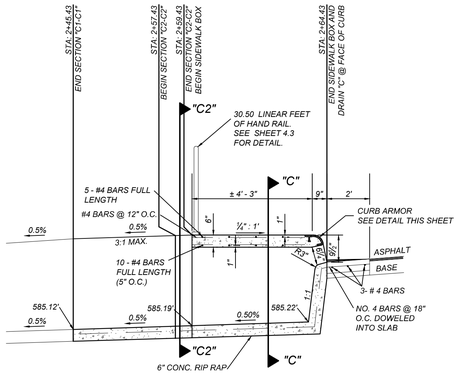
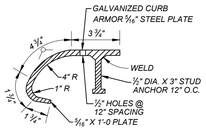


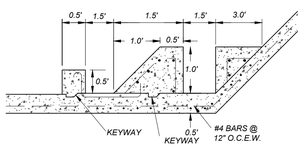
SECTION "C2-C2"
STA: 2+57.43 - STA: 2+59.43
N.T.S.



SIDEWALK BOX DETAIL
N.T.S.



CURB ARMOR DETAIL
N.T.S.



TYPICAL BAFFLE BLOCK DETAIL
N.T.S.
SECTION C3-C3

BAFFLE BLOCK CALCULATIONS (ST. ANTHONY FALLS METHOD)

Q25 = 55.30 CFS
BOTTOM WIDTH UPSTREAM = 6.0 FT
BOTTOM WIDTH DOWNSTREAM = 6.0 FT
Y1 = 0.35' (DEPTH BEFORE JUMP)
Y2 = 3.71' (DEPTH AFTER JUMP)

WIDTH OF BLOCKS = 0.75(Y1) = 0.26 FT. (USE 1 FT.)
SPACE BETWEEN BLOCKS = 0.75(Y1) = 0.26 FT. (USE 1.00 FT.)
HEIGHT OF BLOCKS = Y1 = 0.35 FT. (USE 1.0 FT.)
OF BLOCKS ACROSS BOTTOM = 3

% OF FLOOR COVERED WITH BLOCKS = 3 (1.00 FT) / 6 FT = 50.0%
(% MUST BE BETWEEN 40% AND 55%)

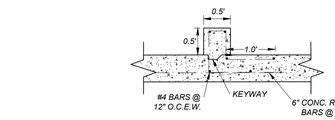
DEPTH OF TAILWATER (Y2)
FROUDE NUMBER BEFORE JUMP = F1 = 7.844
FROUDE NUMBER AFTER JUMP = F2 = 0.228

LENGTH OF BASIN = LB = 4.5(Y2)/F1^0.76 = 3.49 FT. (USE 14.71 FT.)

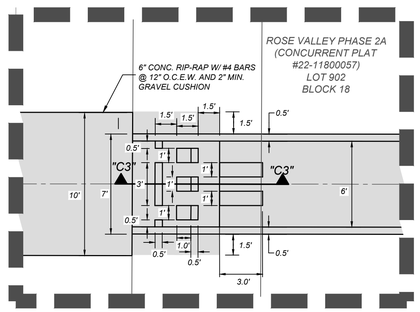
DISTANCE TO FLOOR BLOCKS = LB/3 = 1.16 FT. (USE 1.5 FT.)

HEIGHT OF MAX TAILWATER DEPTH:
Z = Y2/3 = 1.24 FT.
Y2' = 0.85 * Y2 = 3.15 FT
H = Z + Y2' = 4.39 FT.

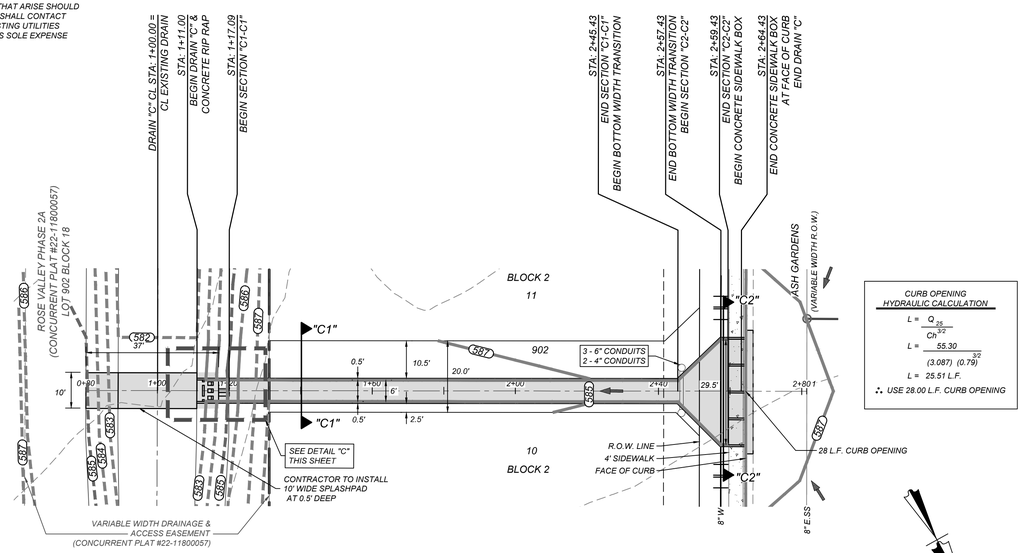
VELOCITY AFTER JUMP:
V = Q/A
A = Y2 * [(B + T) / 2]
A = 3.71' * [(4 + 6) / 2] = 18.55 SQ. FT.
V = 55.30/18.55 = 2.98 F.P.S.



TYPICAL END SILL DETAIL
N.T.S.



DETAIL "C"
SCALE: 1"=5'



CURB OPENING HYDRAULIC CALCULATION

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

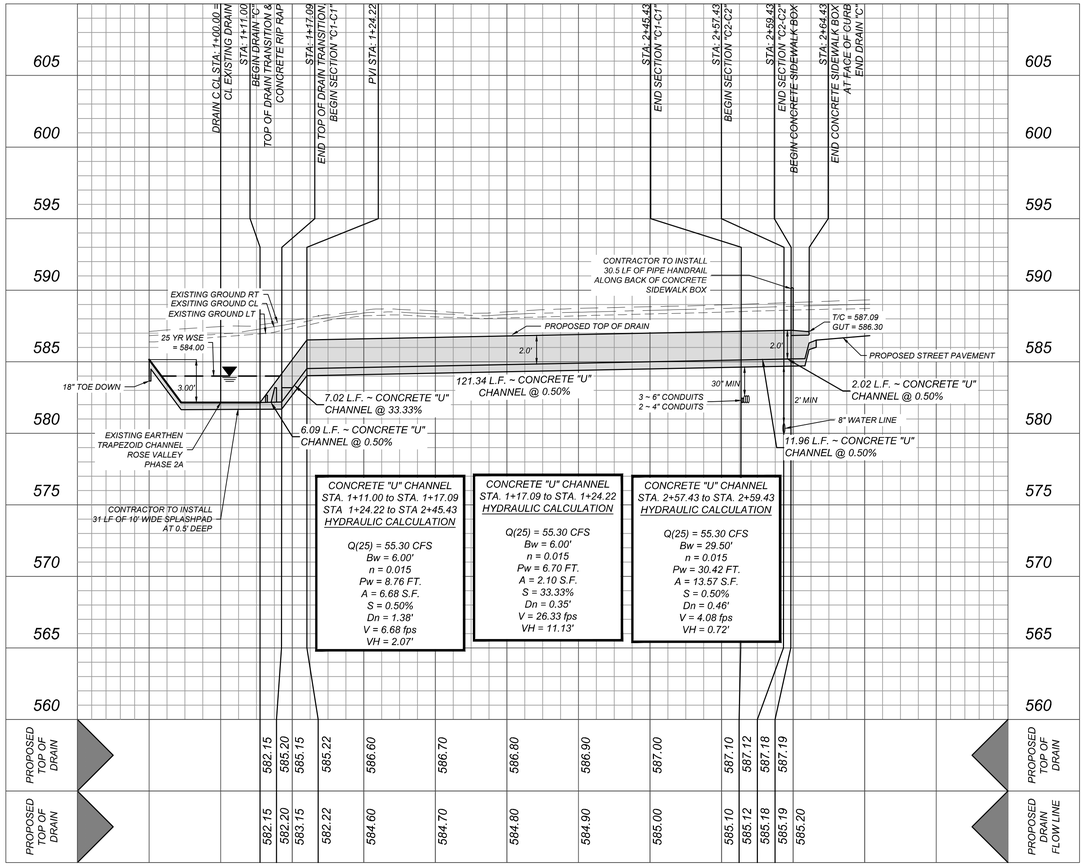
$L = \frac{55.30}{(3.087)\ (0.79)^{3/2}}$

L = 25.51 L.F.

∴ USE 28.00 L.F. CURB OPENING

DRAIN "C"
STA: 1+11.00 TO END

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



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 · TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: DR314601

SHEET TITLE: DRAIN "C" PLAN AND PROFILE

SHEET NUMBER: 5.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\314\60\01\DESIGN\CIVIL\DRAINS\DR314601.DWG By:DYLAN.FORSTER 5/15/2024 2:51 PM

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!!:

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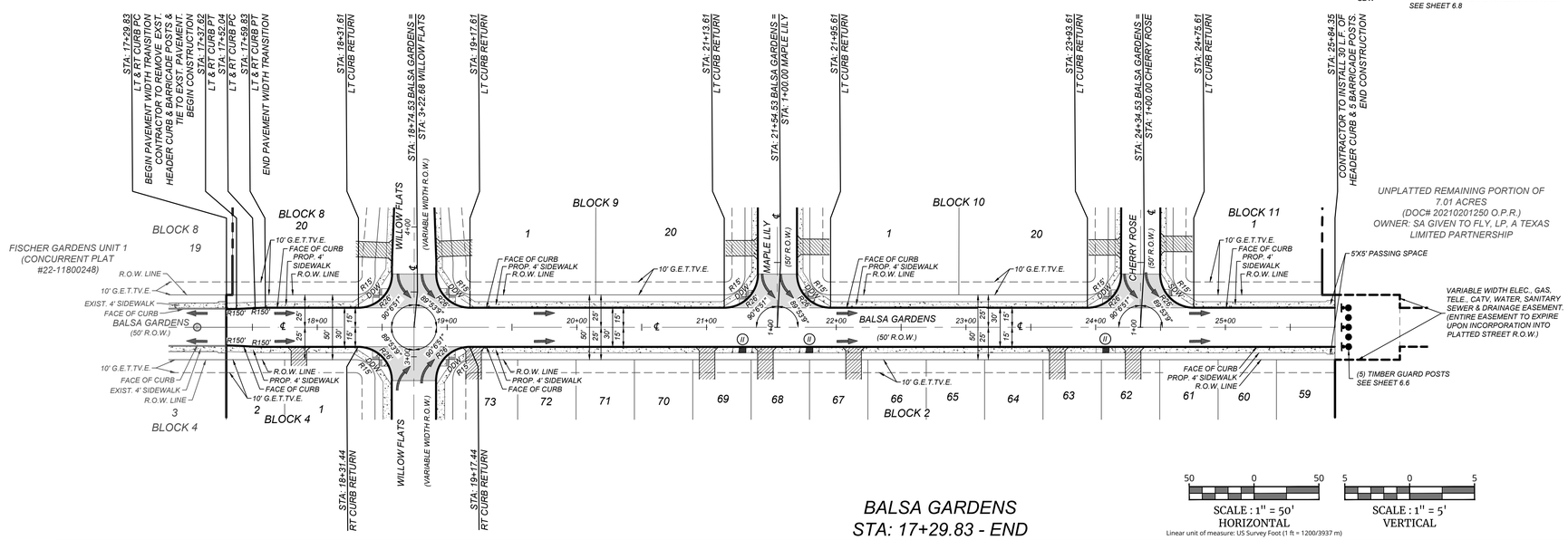
BEXAR COUNTY R.O.W. NOTE

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.TV.E.	=	GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
	=	FLOW ARROW
	=	WASHOUT CROWN
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 6.8
DDW	=	DUAL DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 6.8
SDW	=	SINGLE DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 6.8
	=	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

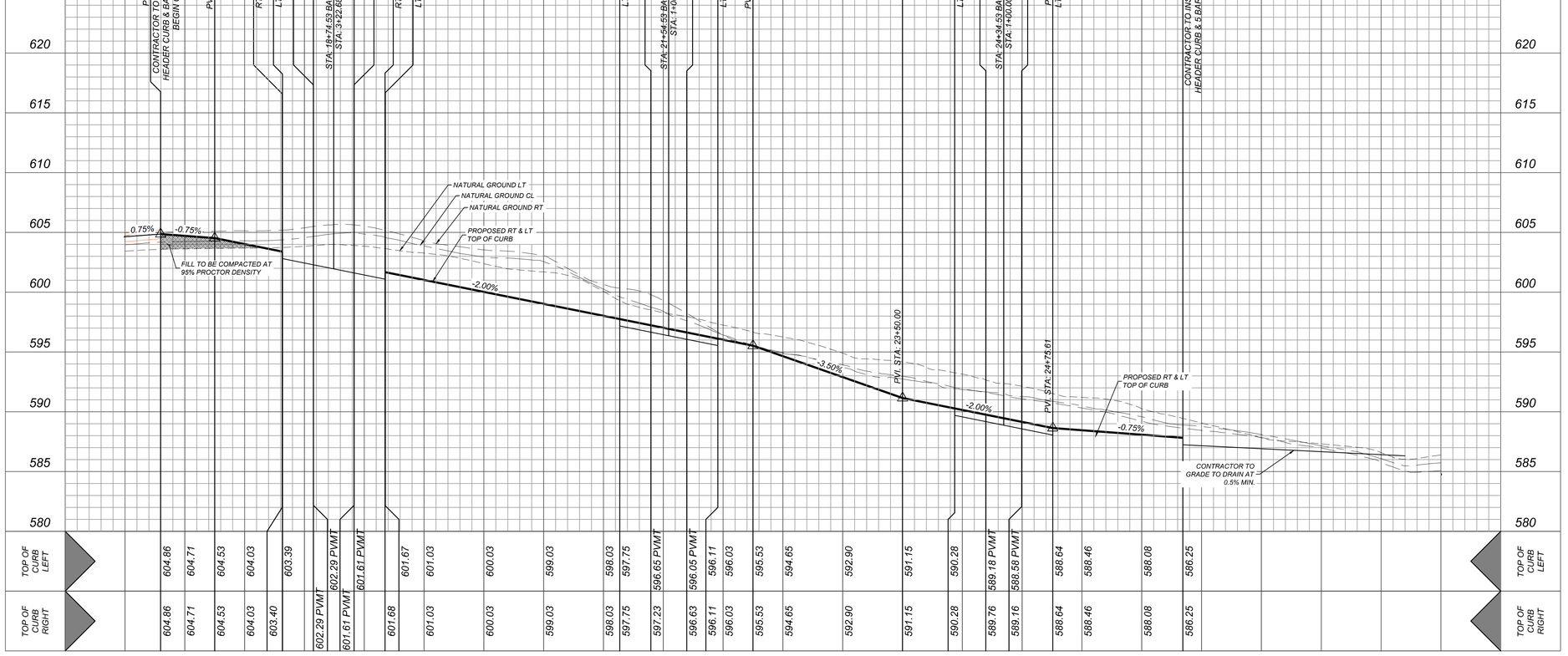


BALSA GARDENS
STA: 17+29.83 - END

SCALE : 1" = 50' HORIZONTAL

SCALE : 1" = 5' VERTICAL

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



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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01

DRAWING NAME: ST3146001

SHEET TITLE: BALSA GARDENS PLAN & PROFILE

SHEET NUMBER: 6.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\3146001\02DSK\DVG\ST#FILES\ST3146001.DWG By: DYLAN.FOESTER 5/15/2024 2:51 PM

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- = WASHOUT CROWN
- = WHEELCHAIR RAMP TYPE II SEE SHEET 6.8
- DDW = DUAL DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 6.8
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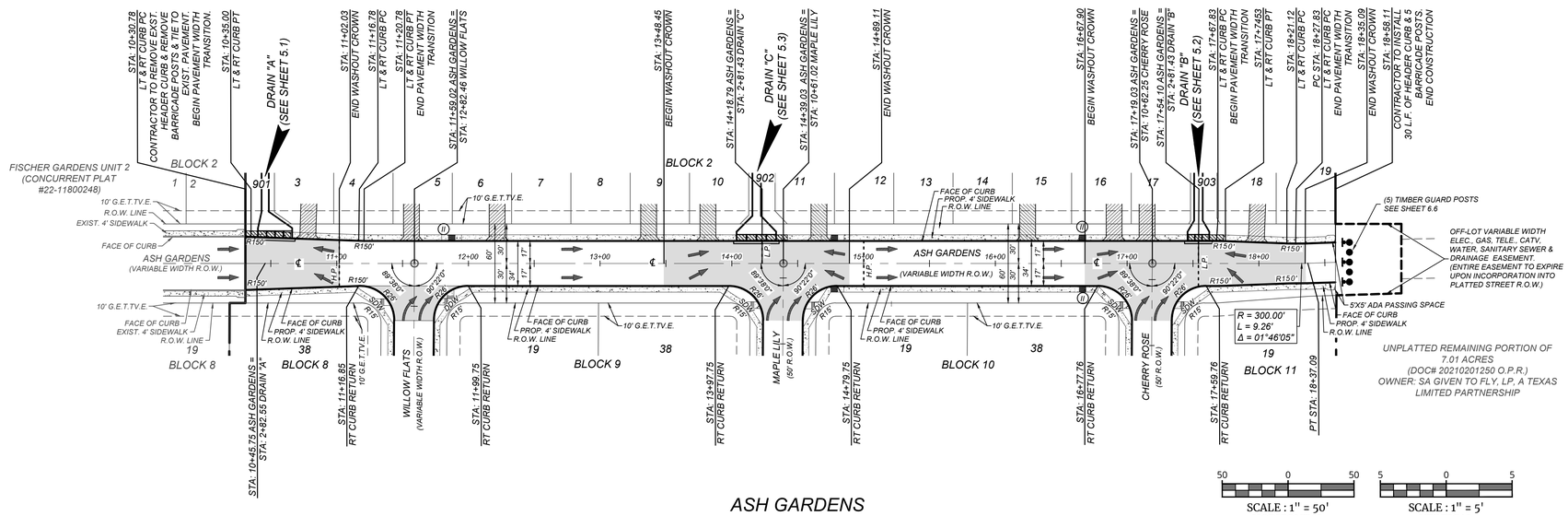
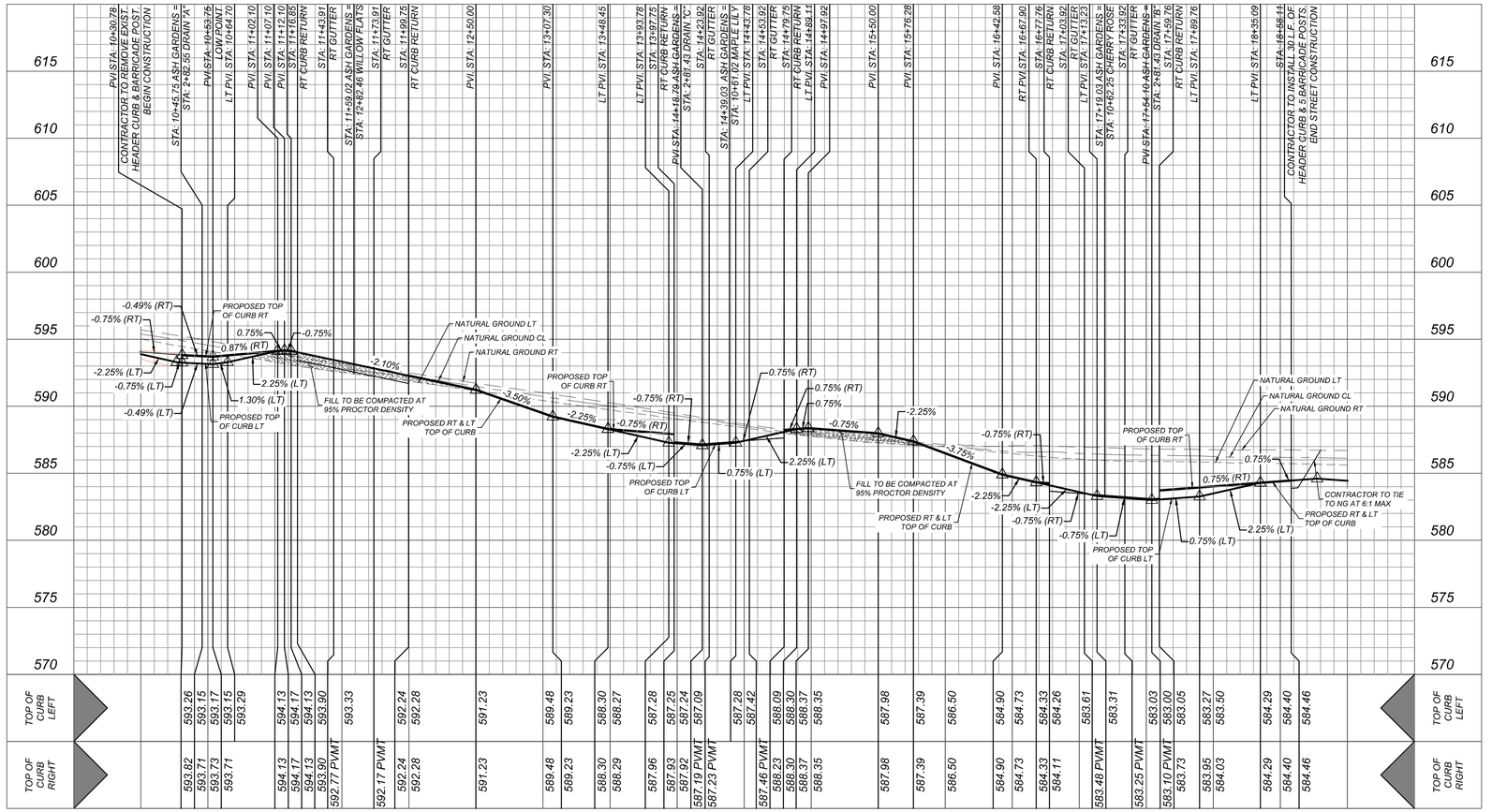


SCALE : 1" = 50' HORIZONTAL

SCALE : 1" = 5' VERTICAL

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

ASH GARDENS
STA: 10+30.78 - END



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FOR

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BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01

DRAWING NAME: ST3146001

SHEET TITLE: ASH GARDENS PLAN & PROFILE

SHEET NUMBER: 6.2

N:\314\60\01\DESIGN\CIVIL\SITE\ST3146001.DWG By:DYLAN.FORESTER 5/15/2024 2:52 PM

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BEXAR COUNTY R.O.W. NOTE

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LEGEND

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- = FLOW ARROW
- = WASHOUT CROWN
- = WHEELCHAIR RAMP TYPE Ii SEE SHEET 6.8
- DDW = DUAL DIRECTIONAL WHEELCHAIR RAMP SEE SHEET 6.8
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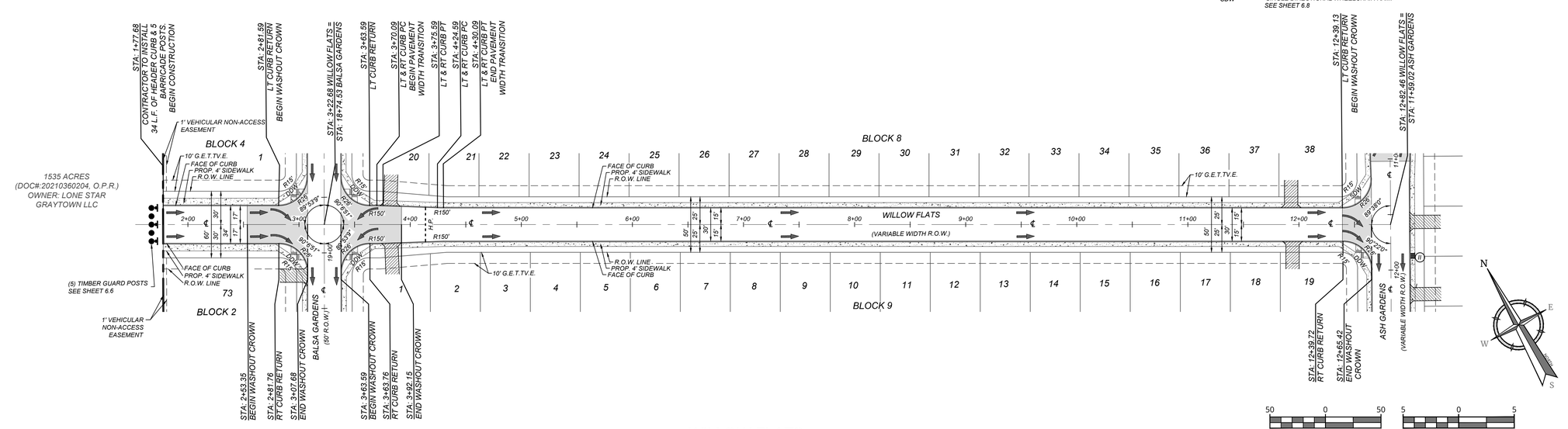
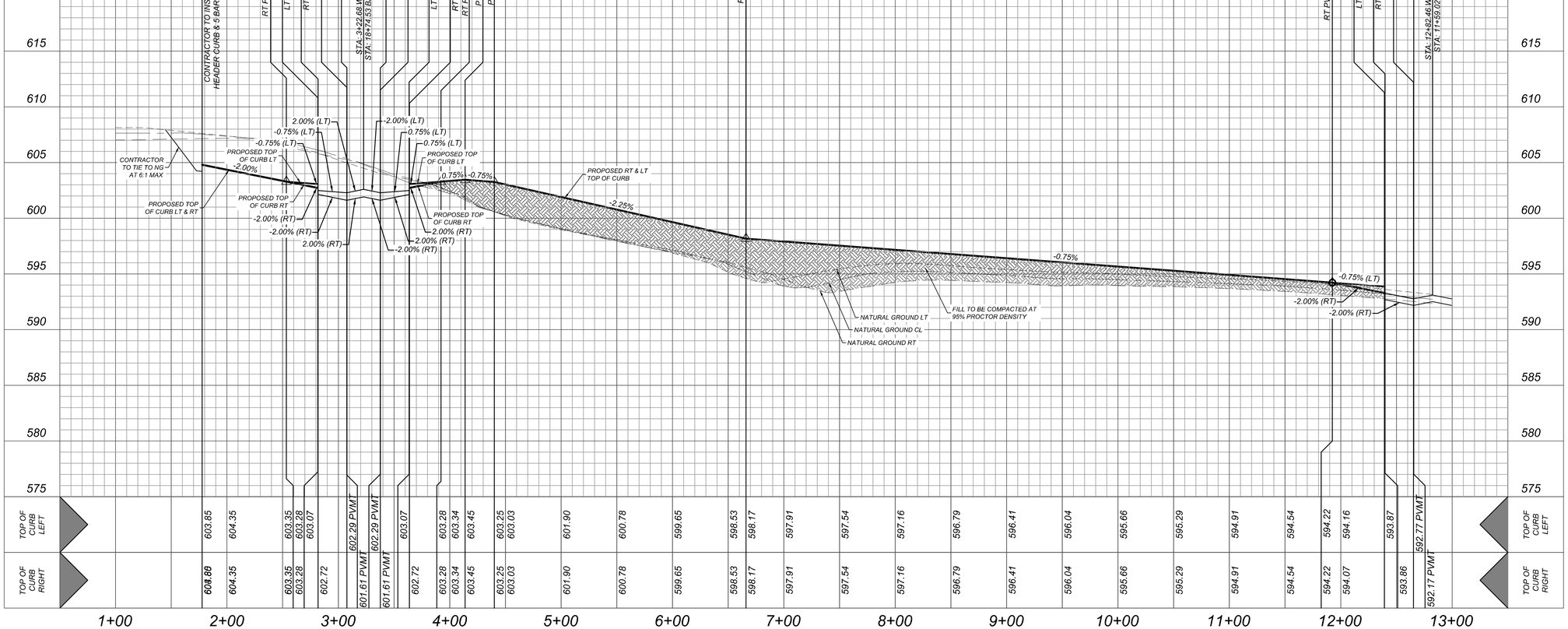


SCALE : 1" = 50' HORIZONTAL

SCALE : 1" = 5' VERTICAL

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

WILLOW FLATS
STA: 1+77.68 - END



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5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
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TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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SAN ANTONIO (KFW)
3421 Paesanos Parkway
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COLLIERS ENGINEERING & DESIGN, INC
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: ST3146001-2

SHEET TITLE: WILLOW FLATS PLAN & PROFILE

SHEET NUMBER: 6.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\314-60\07-DESIGN\CIVIL\STREETS\ST3146001-2.DWG By: DYLAN.FORESTER 5/15/2024 2:53 PM

TRENCH EXCAVATION SAFETY PROTECTION

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LEGEND

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G.E.T.TV.E.	=	GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
	=	FLOW ARROW
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(#)	=	WHEELCHAIR RAMP TYPE ii SEE SHEET 6.8
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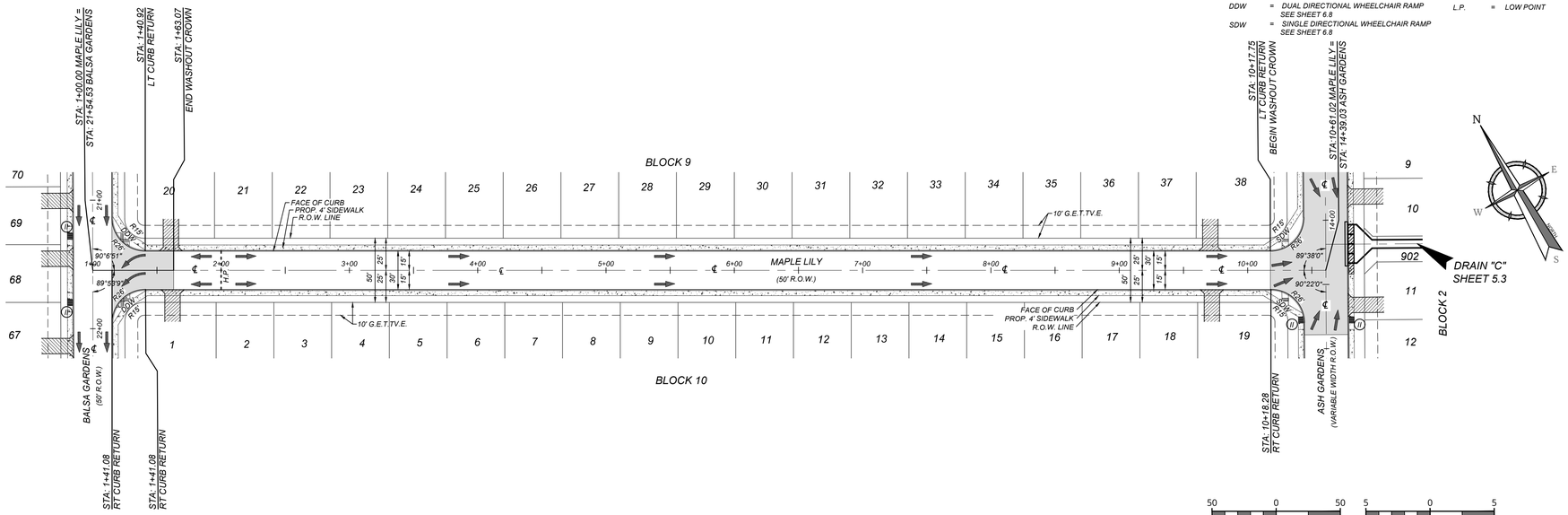
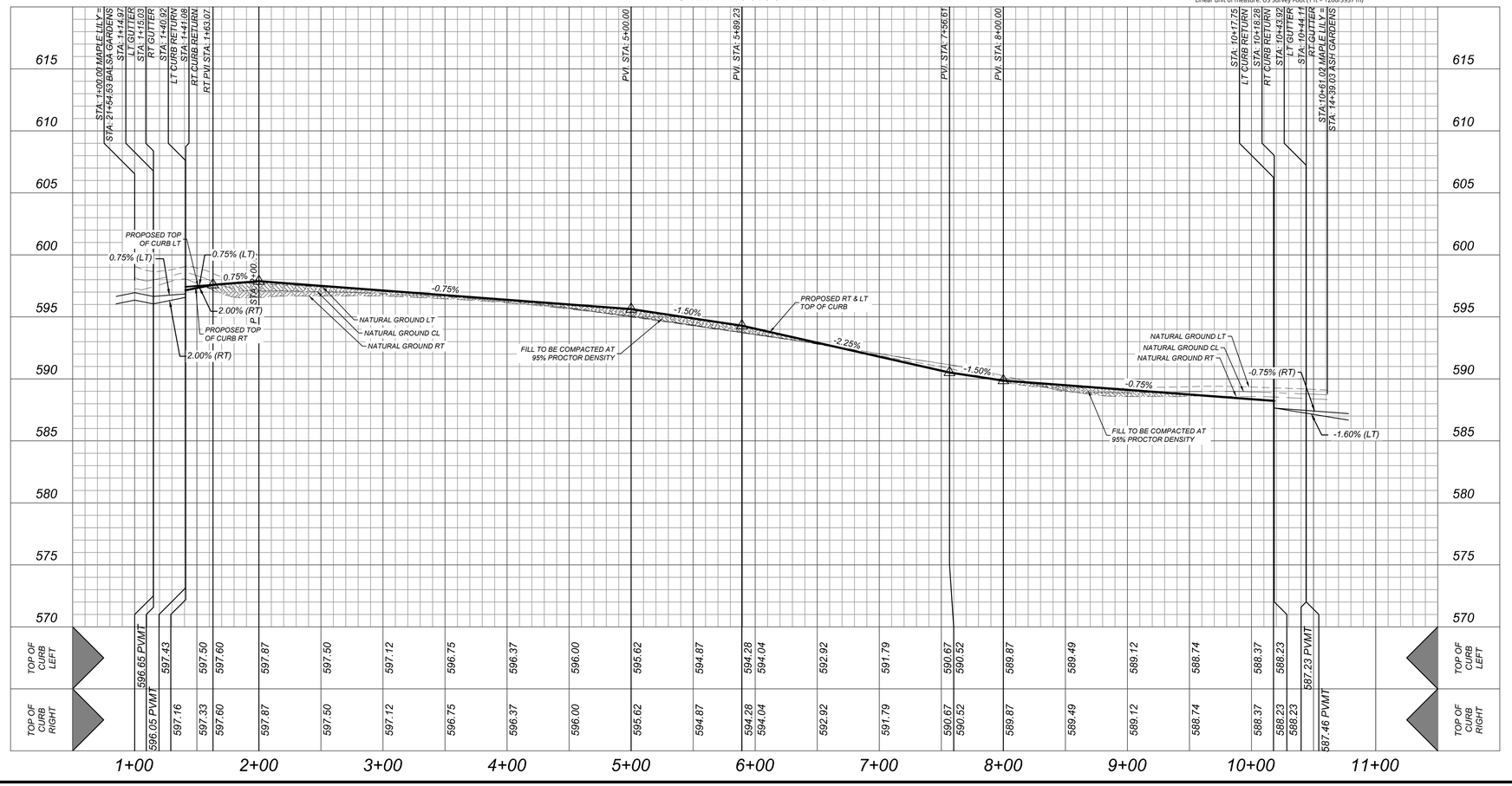


SCALE : 1" = 50'
HORIZONTAL
Linear unit of measure: US Survey Foot (1 ft = 1200/3937 m)

SCALE : 1" = 5'
VERTICAL

MAPLE LILY
STA: 1+00.00 - END



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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	ST3146001-2

SHEET TITLE:
MAPLE LILY PLAN & PROFILE

SHEET NUMBER:
6.4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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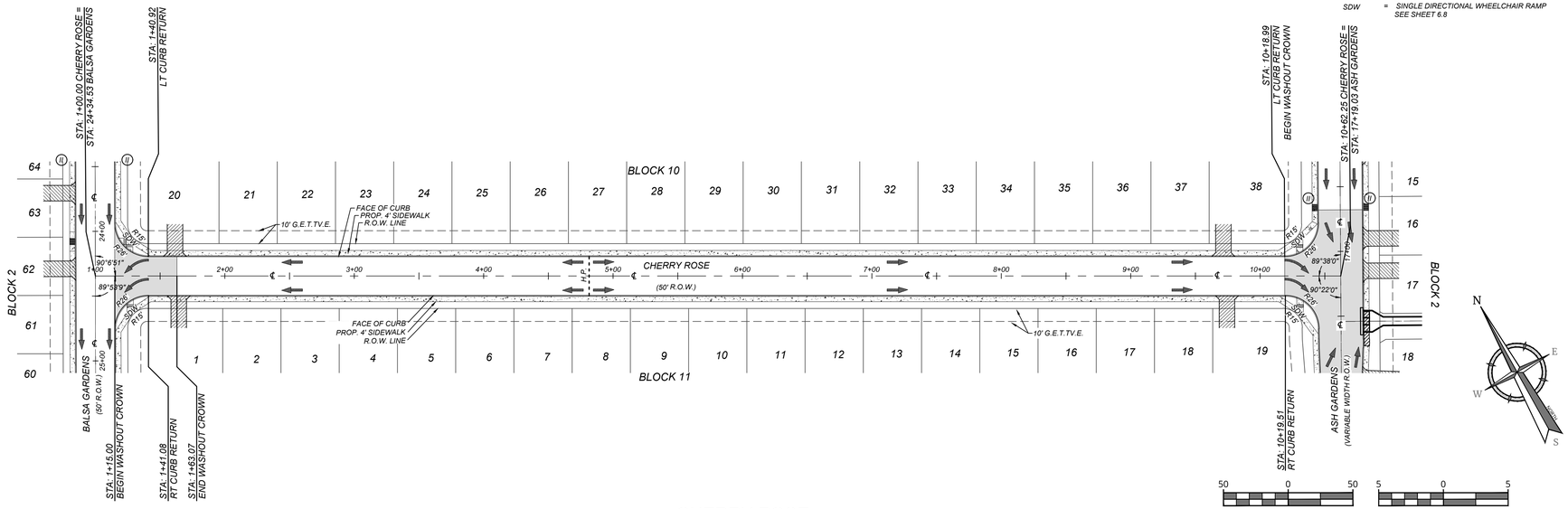
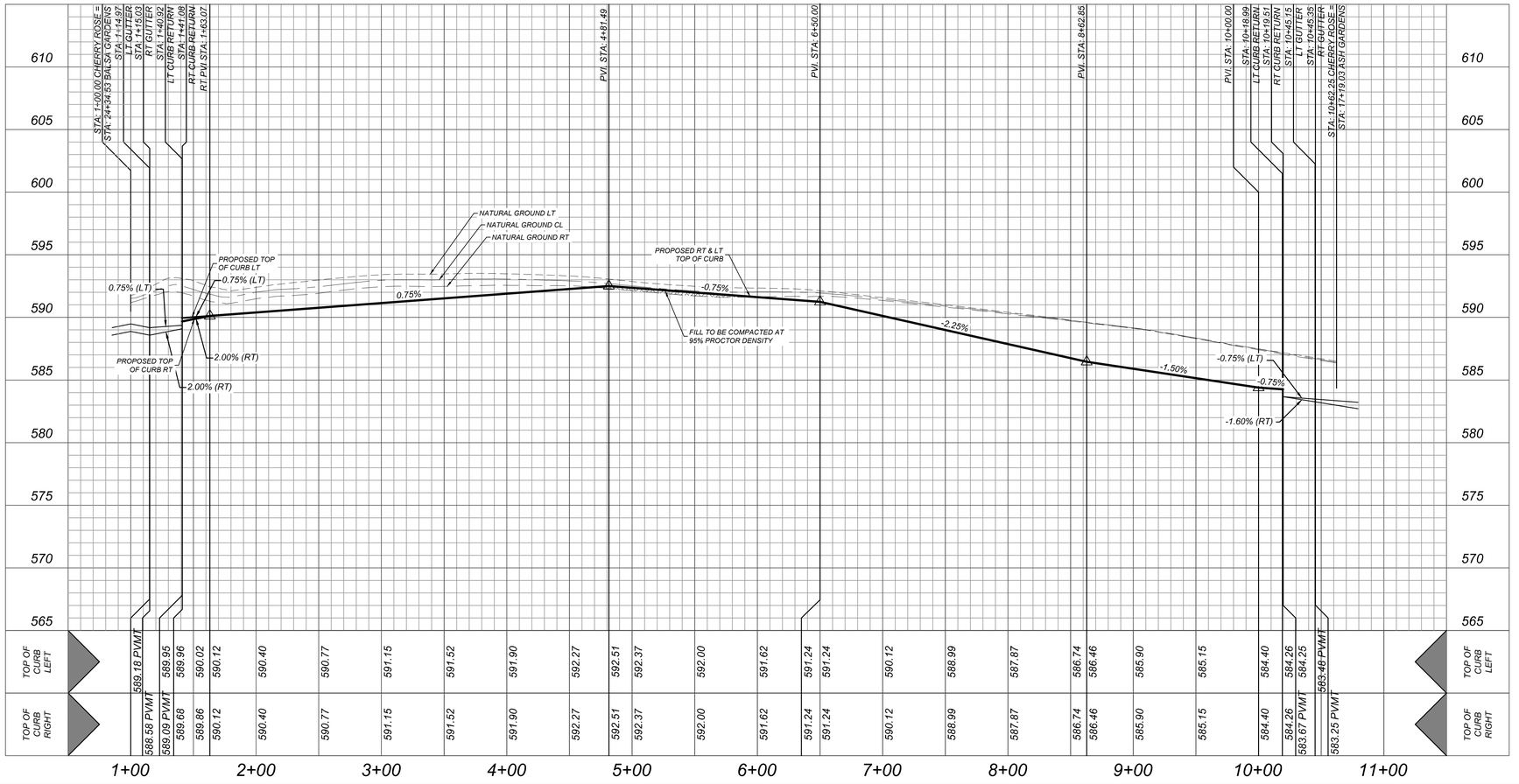
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- = PROPOSED DRIVEWAY LOCATION
- H.P. = HIGH POINT
- L.P. = LOW POINT



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

SCALE : 1" = 5'
VERTICAL

CHERRY ROSE
STA: 1+00.00 - END



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

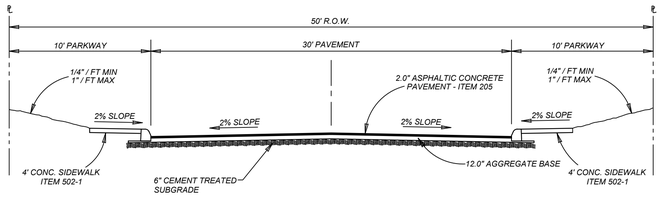
PROJECT NUMBER:	DRAWING NAME:
314-60-01	ST3146001-2

SHEET TITLE:
CHERRY ROSE PLAN & PROFILE

SHEET NUMBER:
6.5

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\314600\07\DESIGN\CIVIL\STREETS\ST3146001-2.DWG By: DYLAN.FOERSTER 5/15/2024 2:54 PM

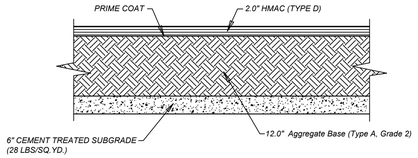


TYPICAL LOCAL "A" STREET SECTION

NOT TO SCALE

BALSA GARDENS STA: 17+29.83 TO END
WILLOW FLATS STA: 4+30.09 TO END
MAPLE LILY STA: 1+00.00 TO END
CHERRY ROSE STA: 1+00.00 TO END

Pavement Section
2.0" HMAC Type "D"
12.0" Aggregate Base (Type A, Grade 2)
6.0" Cement Treated Subgrade
(6% Per Dry Weight) (28 LBS/SQ.YD.)
Total: 20.0"
Structural No: 2.56
CBR: 5.0



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

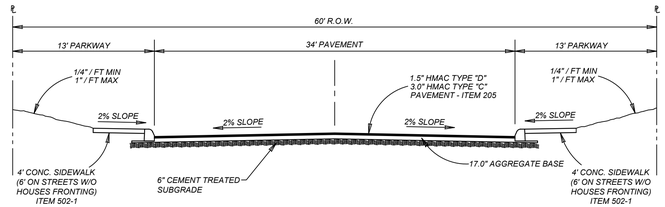
DETAIL FOR ALL LOCAL TYPE A

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY TTL, INC. PROJECT NO. 0023090292O.00 DATED 11/16/23.

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.

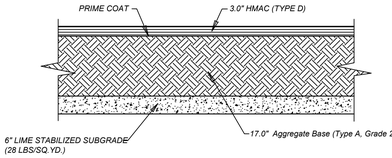


TYPICAL LOCAL "B" STREET SECTION

NOT TO SCALE

WILLOW FLATS STA: 1+77.68 TO 4+30.09
ASH GARDENS STA: 10+30.78 TO END

Pavement Section
1.5" HMAC Type "D"
3.0" HMAC Type "C"
17.0" Aggregate Base (Type A, Grade 2)
6.0" Cement Treated Subgrade
(28 LBS/SQ.YD.) (6% Per Dry Weight)
Total: 26.0"
Structural No: 4.43
CBR: 5.0



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. 0023090292O.00 DATED 11/16/23.

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

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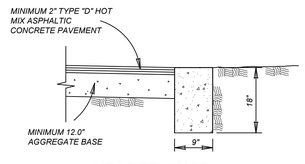
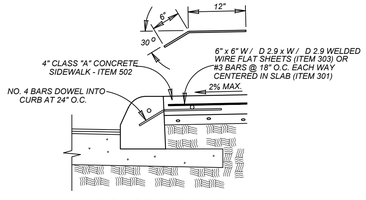


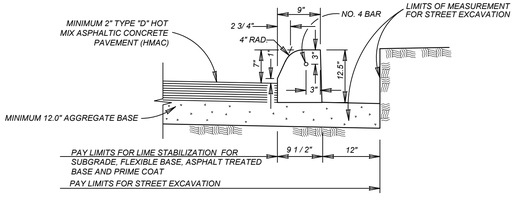
HEADER CURB

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

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

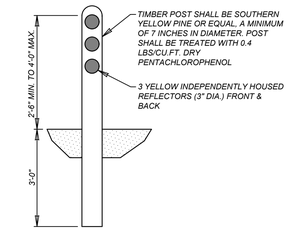
1. *AFTER INITIAL MIXING THE SOIL-LIME MIXTURE SHALL MELLOW FOR A PERIOD OF TWO TO THREE (2 - 3) DAYS. MAINTAIN MOISTURE DURING MELLOWING;*
2. *AFTER MELLOWING AND FINAL MIXING, THE PULVERIZATION SHALL BE CHECKED USING THE FOLLOWING CRITERIA (REMOVE NON-SLAKING AGGREGATES RETAINED ON THE ¾" INCH SIEVE 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 5.0 OR GREATER*
- *SHOULD NOT HAVE GRAVELS LARGER THAN 3 INCH IN SIZE*
- *SHOULD HAVE THE "LIME PERCENTAGE/APPLICATION RATE" RE-RUN PRIOR TO INSTALLATION*
- *PI SHOULD BE LESS THAN 20*

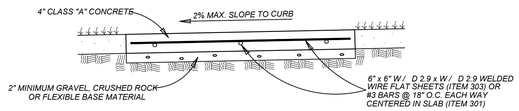
GENERAL NOTES:

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.*



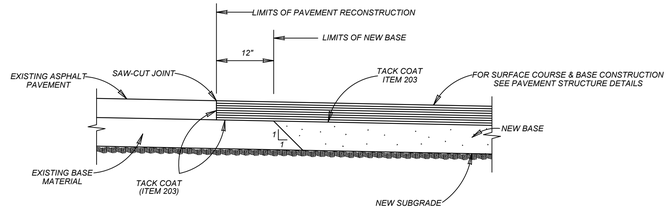
TIMBER GUARD POST DETAIL

NOT-TO-SCALE



CONCRETE SIDEWALK SECTION

ITEM 502
NOT TO SCALE



PAVEMENT JUNCTION DETAILS

NOT TO SCALE

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REV	DATE	DRAWN BY	DESCRIPTION

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111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

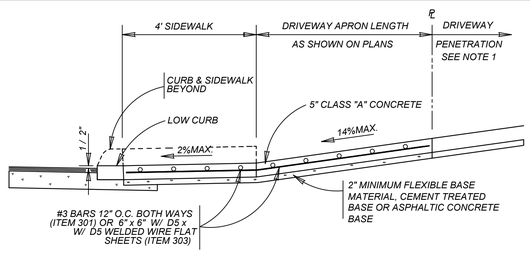
PROJECT NUMBER:	DRAWING NAME:
314-60-01	STDT3146001

SHEET TITLE:
TYPICAL STREET DETAILS

SHEET NUMBER:
6.6

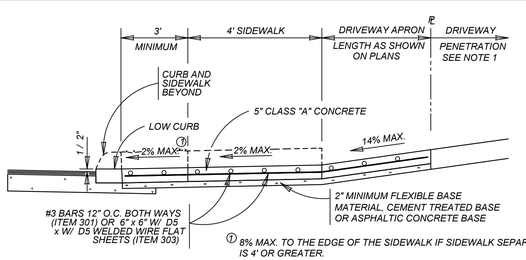
N:\314\60\01\05\CIVIL\CIVIL\STREETS\STDT3146001.DWG By: DYLAN.FOERSTER 5/15/2024 2:54 PM

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



TYPICAL RESIDENTIAL DRIVEWAY SECTION

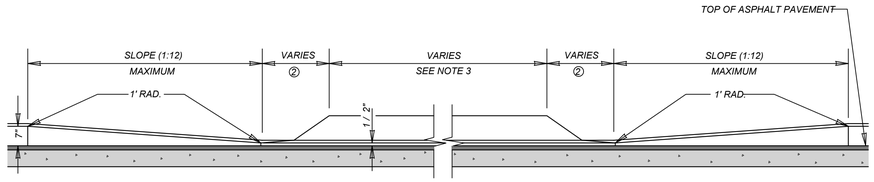
WITH SIDEWALK ABUTTING CURB
ITEM 503.1



TYPICAL RESIDENTIAL DRIVEWAY SECTION

WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1

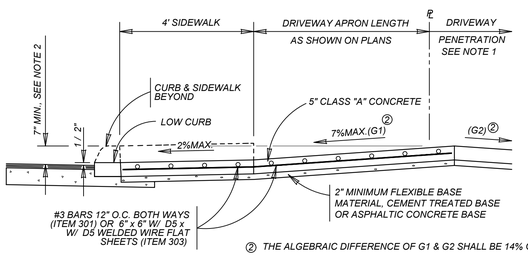
① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.



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

CURB PROFILE AT DRIVEWAY

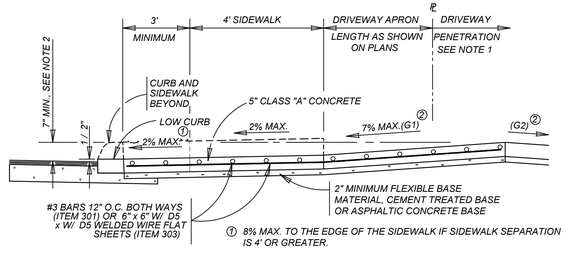
WITH SIDEWALK ABUTTING CURB



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

TYPICAL RESIDENTIAL DRIVEWAY SECTION

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

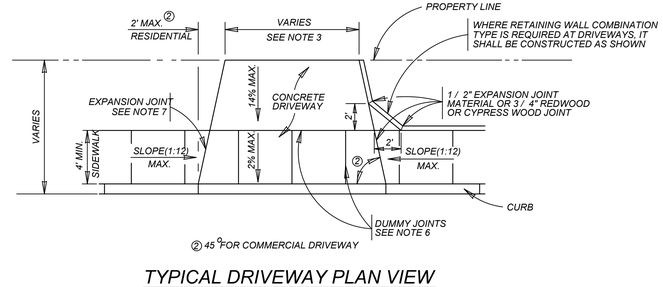


① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

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

TYPICAL RESIDENTIAL DRIVEWAY SECTION

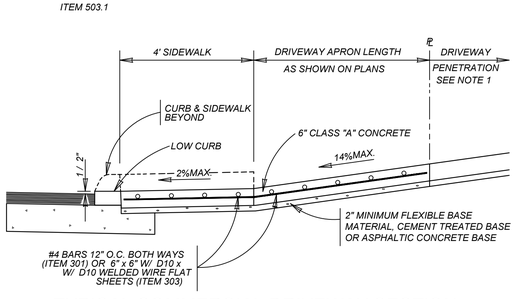
WHERE PROPERTY IS LOWER THAN STREET & SIDEWALK IS SEPARATED FROM CURB
ITEM 503.1



② 45° FOR COMMERCIAL DRIVEWAY

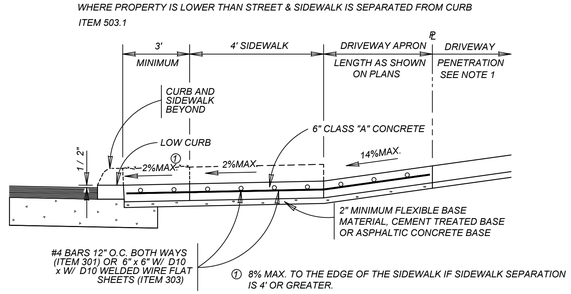
TYPICAL DRIVEWAY PLAN VIEW

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

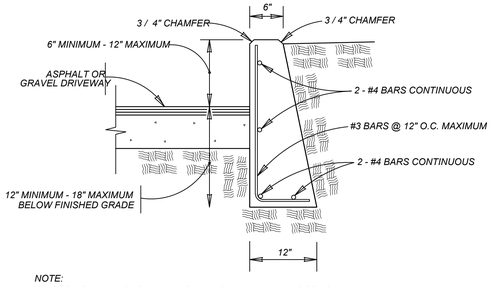
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2

CONCRETE DRIVEWAY NOTES

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

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

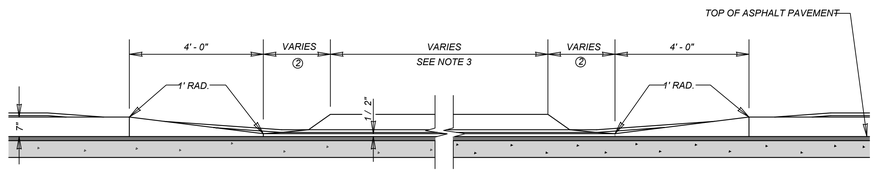
4. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 3' FROM THE BACK OF CURB.
5. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 3' FROM THE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



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

DRIVEWAY - CONCRETE RETAINING WALL

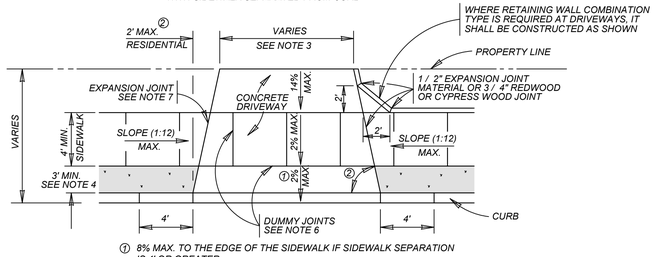
ON COMPACTED SUBGRADE
ITEM 307.1



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

CURB PROFILE AT DRIVEWAY

WITH SIDEWALK 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

MAY 2009

CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

CONCRETE DRIVEWAY STANDARDS

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

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TEXAS LICENSED PROFESSIONAL ENGINEER
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FISCHER GARDENS UNIT 2
PLAT #24-11800144

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BEXAR COUNTY
TEXAS

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TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	STDT3146001

SHEET TITLE:
CONCRETE DRIVEWAY DETAILS

SHEET NUMBER:
6.7

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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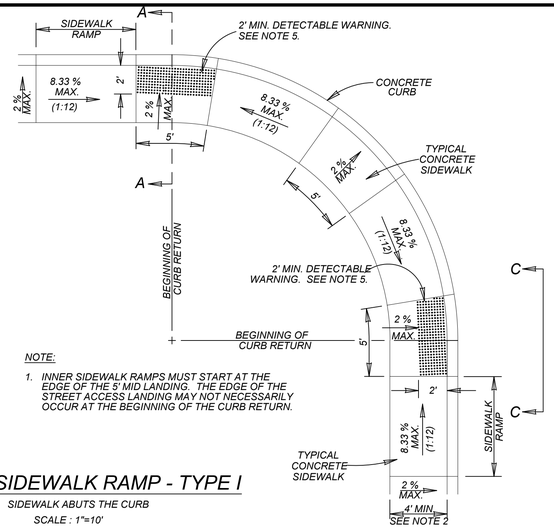


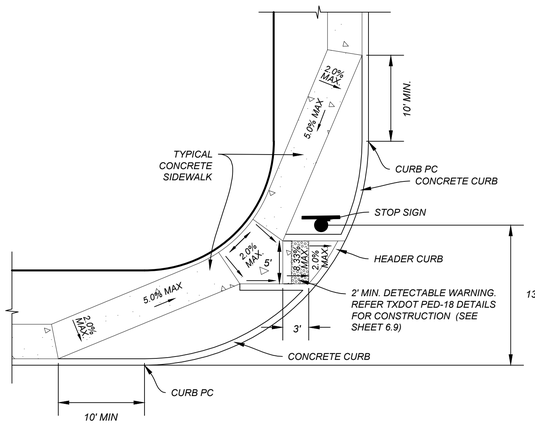
TYPICAL SIDEWALK RAMP - TYPE I

SIDEWALK ABUTS THE CURB

SCALE : 1"=10'

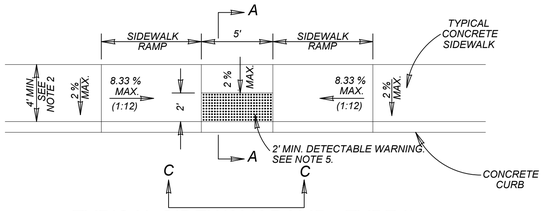
NOTE:

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



SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SDWCR)

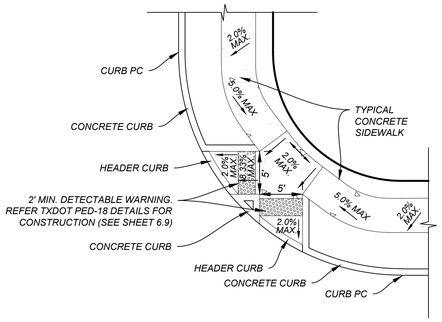
NOT TO SCALE



TYPICAL SIDEWALK RAMP - TYPE II

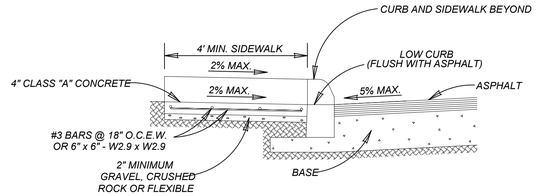
USED AT TEE INTERSECTIONS WHERE SIDEWALK ABUTS CURB

SCALE : 1"=10'



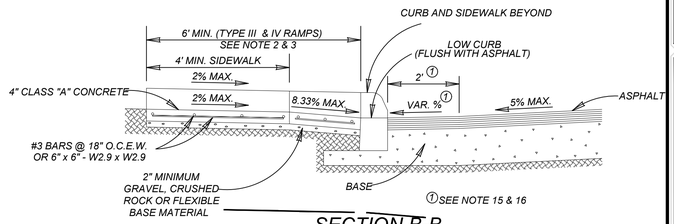
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (DDWCR)

NOT TO SCALE



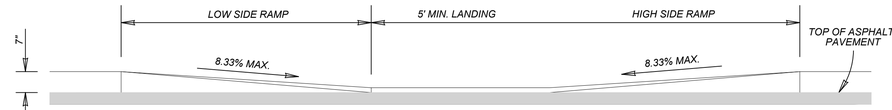
SECTION A-A

SCALE : 1"=4'



SECTION B-B

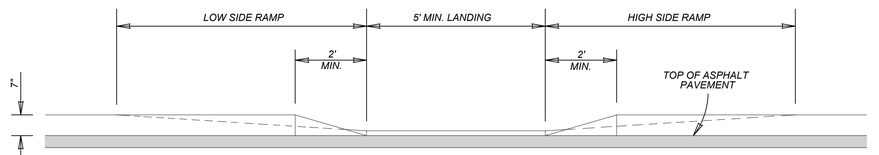
SCALE : 1"=4'



SECTION C-C

CURB PROFILE WHERE SIDEWALK ABUTS CURB

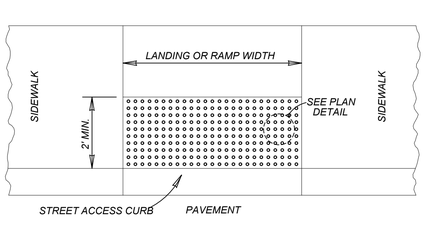
SCALE : 1"=4'



SECTION D-D

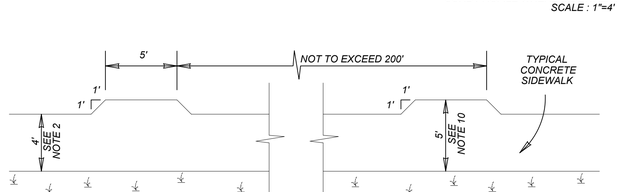
CURB PROFILE WHERE SIDEWALK IS SEPARATED FROM CURB

SCALE : 1"=4'



DETECTABLE WARNING SURFACE

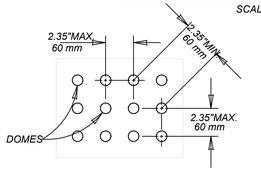
SCALE : 1"=4'



SIDEWALK PASSING SPACE

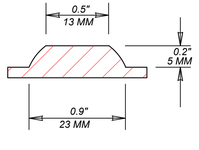
SCALE : 1"=10'

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"



PLAN DETAIL

NO SCALE



DOME SECTION

NO SCALE

NOTE:

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

GENERAL NOTES

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

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LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

WHEELCHAIR RAMP STANDARDS

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

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: STDT3146001

SHEET TITLE: WHEELCHAIR RAMP DETAILS

SHEET NUMBER: 6.8

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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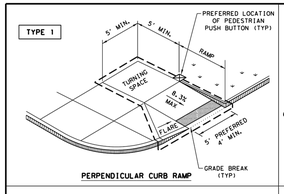
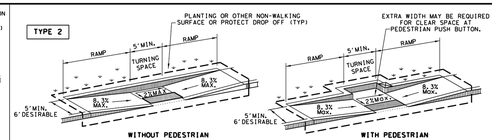
DATE:
FILE:

TYPE 1



PERPENDICULAR CURB RAMP
GRADE BREAK (TYP.)

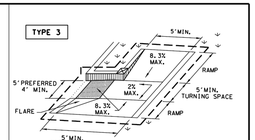
TYPE 2



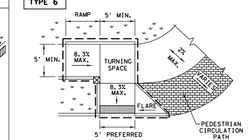
WITHOUT PEDESTRIAN PUSH BUTTON
WITH PEDESTRIAN PUSH BUTTON

PARALLEL CURB RAMP

TYPE 3

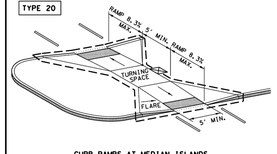


TYPE 6



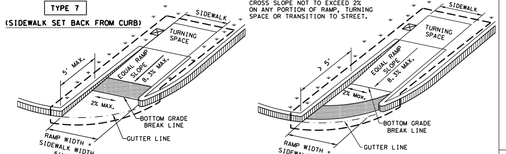
COMBINATION CURB RAMPS

TYPE 20

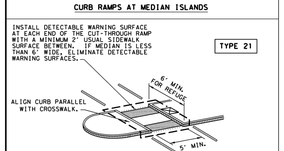


CURB RAMPS AT MEDIAN ISLANDS

TYPE 7
(SIDEWALK SET BACK FROM CURB)

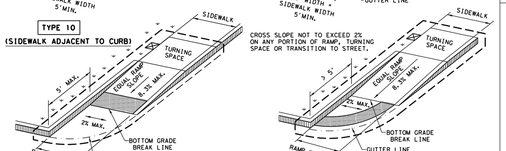


TYPE 21



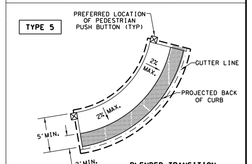
NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 10
(SIDEWALK ADJACENT TO CURB)



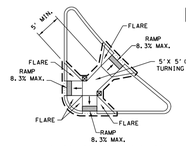
DIRECTIONAL RAMPS WITHIN RADIUS

TYPE 5

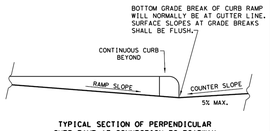


BLENDED TRANSITION
(FLUSH LANDING)

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: VP	CK: KM	CK: PK & JG
©TxDOT: MARCH, 2002	CONT: 3657	SECT:	JOB:		HIGHWAY
REVISED 06-2005 REVISIONS					
REVISED 05-2012	DIST:	COUNTY:			SHEET NO.:
REVISED 07-2014					

DATE:
FILE:

GENERAL NOTES

CURB RAMPS

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

DETECTABLE WARNING MATERIAL

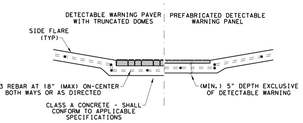
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material adjacent to unpainted 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.

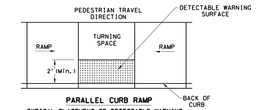
SIDEWALKS

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.

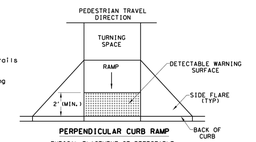


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

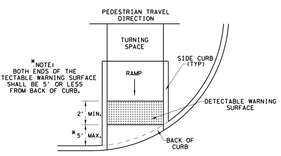
DETECTABLE WARNING SURFACE DETAILS



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.



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

SHEET 2 OF 4

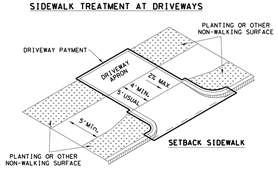
Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

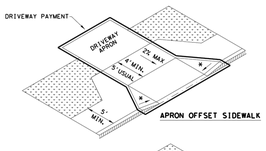
PED-18

FILE: ped18	DN: TxDOT	CK:	DW: VP	CK: KM	CK: PK & JG
©TxDOT: MARCH, 2002	CONT: 3657	SECT:	JOB:		HIGHWAY
REVISED 06-2005 REVISIONS					
REVISED 05-2012	DIST:	COUNTY:			SHEET NO.:
REVISED 07-2014					

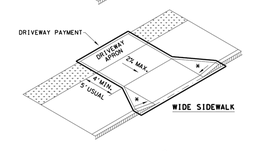
SIDEWALK TREATMENT AT DRIVEWAYS



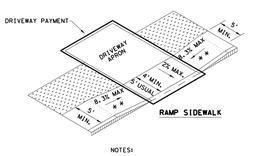
SETBACK SIDEWALK



APRON OFFSET SIDEWALK

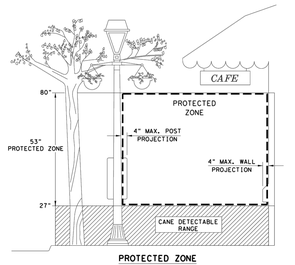


WIDE SIDEWALK



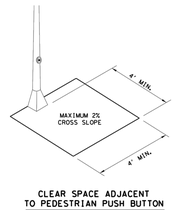
RAMP SIDEWALK

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

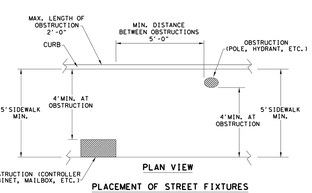


PROTECTED ZONE

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

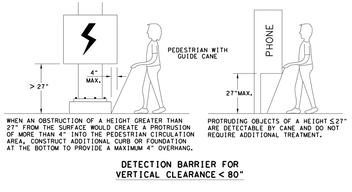


CLEAR SPACE ADJACENT TO PEDESTRIAN PUSH BUTTON



PLAN VIEW
PLACEMENT OF STREET FIXTURES

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



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

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

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation | Design Division Standard

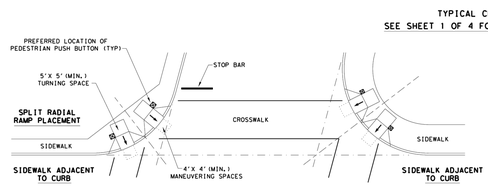
PEDESTRIAN FACILITIES CURB RAMPS

PED-18

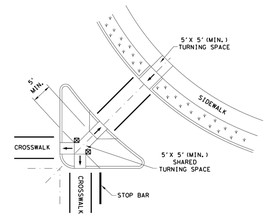
FILE: ped18	DN: TxDOT	CK:	DW: VP	CK: KM	CK: PK & JG
©TxDOT: MARCH, 2002	CONT: 3657	SECT:	JOB:		HIGHWAY
REVISED 06-2005 REVISIONS					
REVISED 05-2012	DIST:	COUNTY:			SHEET NO.:
REVISED 07-2014					

TYPICAL CROSSING LAYOUTS

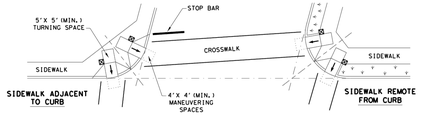
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



SKEWED INTERSECTION WITH "LARGE" RADIUS

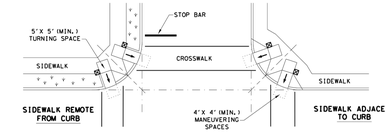


AT INTERSECTION W/FREE RIGHT TURN & ISLAND



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: VP	CK: KM	CK: PK & JG
©TxDOT: MARCH, 2002	CONT: 3657	SECT:	JOB:		HIGHWAY
REVISED 06-2005 REVISIONS					
REVISED 05-2012	DIST:	COUNTY:			SHEET NO.:
REVISED 07-2014					

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

REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: STDT3146001

SHEET TITLE:
TXDOT PED-18 DETAILS

SHEET NUMBER:
6.9

N:\314600\01DESIGN\CIVIL\STREETS\STDT3146001.DWG By:DYLAN.FOERSTER 5/15/2024 2:55 PM

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

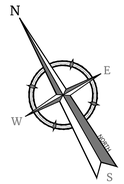
BEXAR COUNTY R.O.W. NOTE:

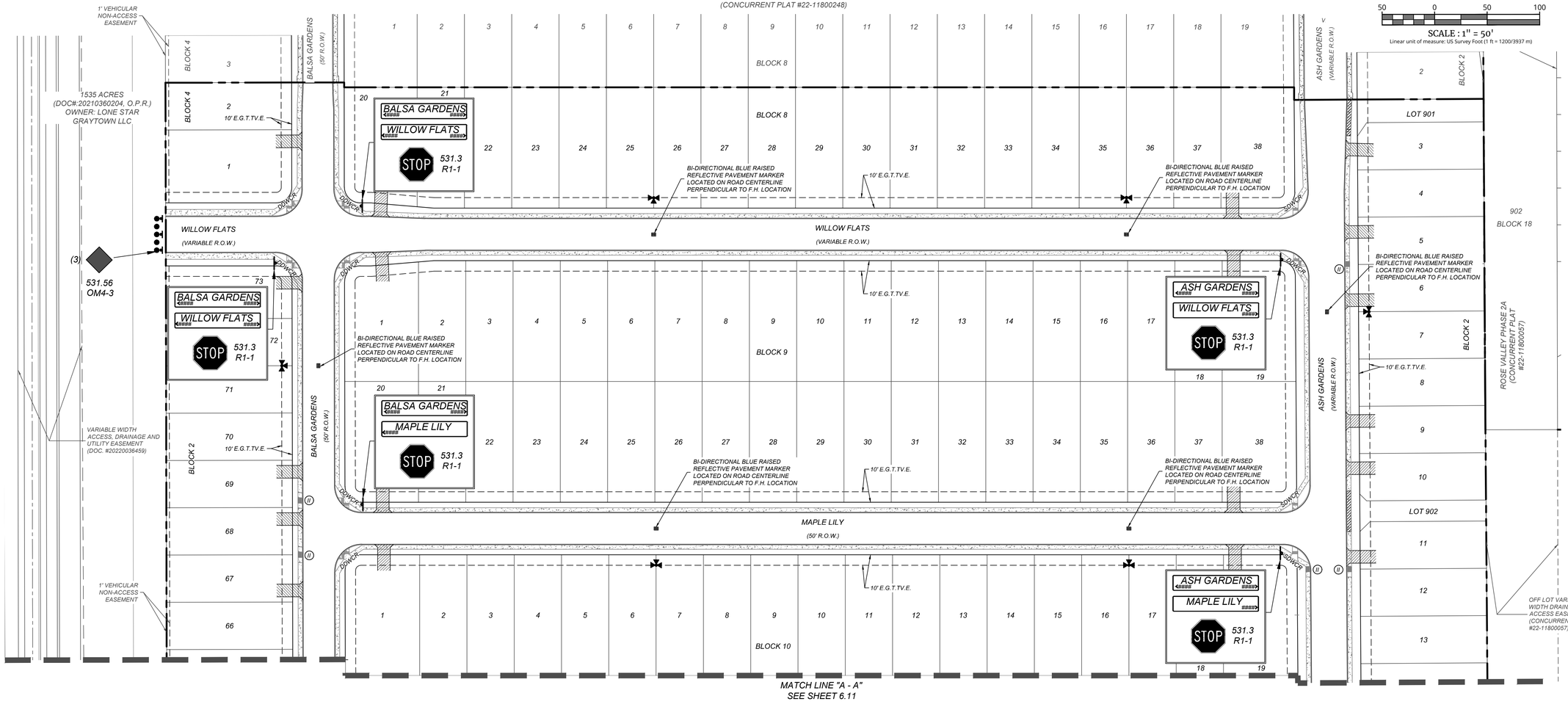
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN THE BEXAR COUNTY RIGHT OF WAY.

LEGEND

C.B	=	COUNTY BLOCK
E.G.T.C.E.	=	GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 6.8
SDWCR	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 6.8
DDWCR	=	DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 6.8
	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	=	PROPOSED DRIVEWAY LOCATION

LOCATION MAP
NOT-TO-SCALE





50 0 50 100

SCALE : 1" = 50'

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

RESIDENTIAL LOTS = 148

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STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2 PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	TS3146001

SHEET TITLE:
TRAFFIC SIGNAGE AND PEDESTRIAN ACCESS PLAN (SHEET 1 OF 2)

SHEET NUMBER:
6.10

N:\314\60\01\DESIGN\CIVIL\STREETS\TS3146001.DWG By: DYLAN.FOERSTER 5/15/2024 2:56 PM

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BEXAR COUNTY R.O.W. NOTE:

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V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
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SDWCR	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 6.8
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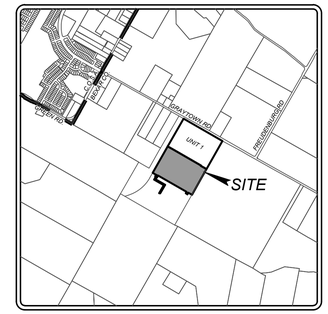
	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	=	PROPOSED DRIVEWAY LOCATION



LOCATION MAP
NOT-TO-SCALE

N E S W

50 0 50 100

SCALE : 1" = 50'

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

MATCH LINE "A - A"
SEE SHEET 6.10

1535 ACRES
(DOC#:20210360204, O.P.R.)
OWNER: LONE STAR
GRAYTOWN LLC

BALSA GARDENS
(50' R.O.W.)

BALSA GARDENS
CHERRY ROSE
STOP 531.3 R1-1

CHERRY ROSE
(50' R.O.W.)

ASH GARDENS
(VARIABLE R.O.W.)

ASH GARDENS
CHERRY ROSE
STOP 531.3 R1-1

BLOCK 2
BLOCK 10
BLOCK 11

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

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

5' X 5' ADA PASSING SPACE

(3) 531.56 OM4-3

VARIABLE WIDTH ACCESS, DRAINAGE AND UTILITY EASEMENT (DOC. #20220036459)

OFF-LOT VARIABLE WIDTH ELEC., GAS, TELE., CATV, WATER, SANITARY SEWER & DRAINAGE EASEMENT. (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED STREET R.O.W.)

UNPLATTED REMAINING PORTION OF
7.01 ACRES
(DOC# 20210201250 O.P.R.)
OWNER: SA GIVEN TO FLY, LP, A TEXAS
LIMITED PARTNERSHIP

30' OFF-LOT SANITARY SEWER EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED STREET R.O.W.)

30' OFF-LOT SANITARY SEWER EASEMENT (ENTIRE EASEMENT TO EXPIRE UPON INCORPORATION INTO PLATTED STREET R.O.W.) (CONCURRENT PLAT # 22-11800248)

OFF LOT VARIABLE WIDTH DRAINAGE & ACCESS EASEMENT (CONCURRENT PLAT #22-11800057)

RESIDENTIAL LOTS = 148

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 · TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

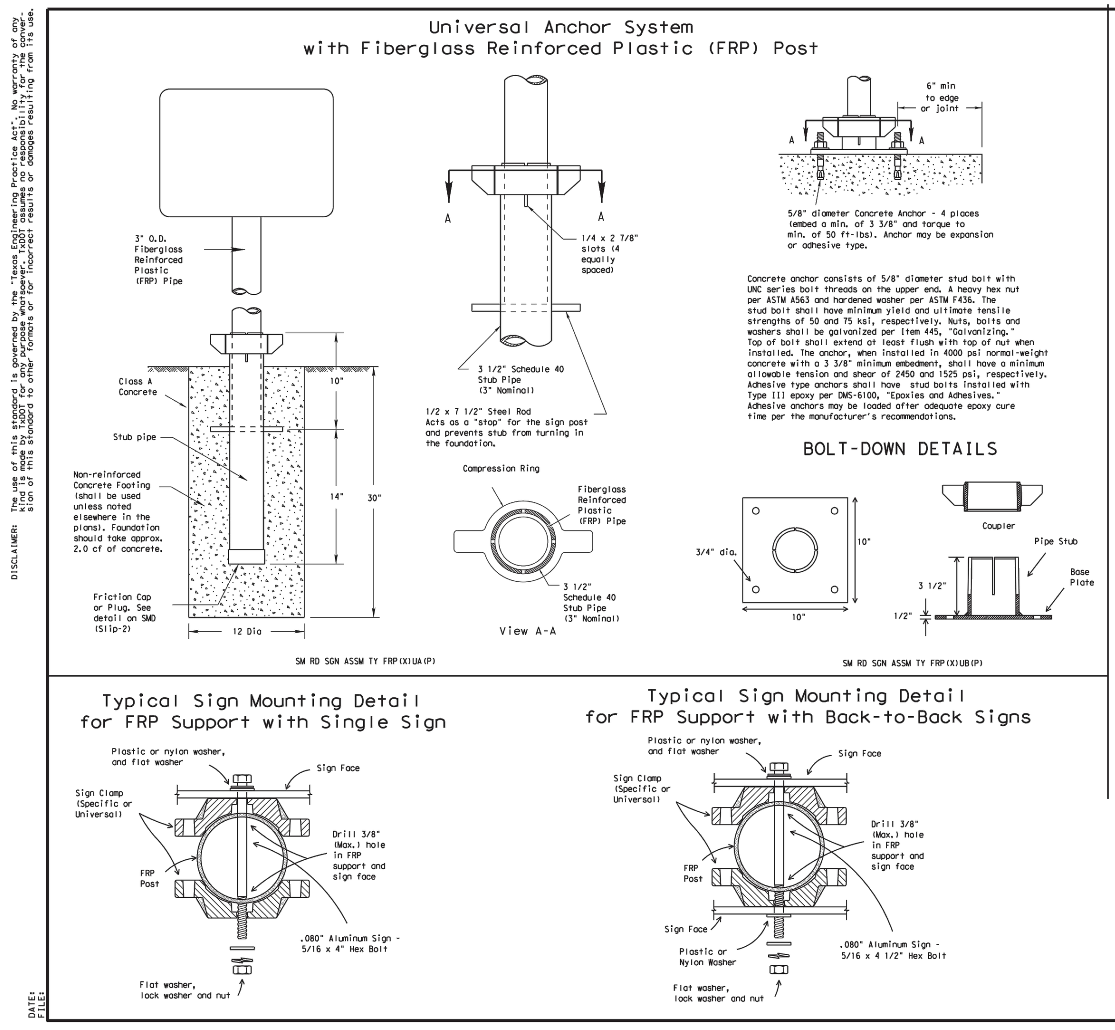
Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	TS3146001

SHEET TITLE:
TRAFFIC SIGNAGE AND PEDESTRIAN ACCESS PLAN (SHEET 2 OF 2)

SHEET NUMBER:
6.11



GENERAL NOTES:

1. FRP sign supports for a single type sign support may be used for signs up to and including 16 square feet. Dual post installation may be used for signs up to and including 32 square feet.
2. All nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing."
3. See the Traffic Operations Division website for detailed drawings of sign clamps. The website address is: http://www.txdot.gov/publications/traffic.htm

FRP POST REQUIREMENTS

1. Materials shall conform to the requirements of Departmental Material Specification DMS-4410 and will be furnished in a yellow or gray color as specified elsewhere in the plans.
2. Thickness of FRP sign support is 0.125" + 0.031", - 0.0".
3. FRP sign supports are prequalified by the Traffic Operations Division. Prequalification procedures are obtained by writing: Texas Department of Transportation, Traffic Operations Division, 125 East 11th Street, Austin, Texas 78701-2483

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURES

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

BOLT DOWN SIGN SUPPORT

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

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS UNIVERSAL ANCHOR SYSTEM WITH FRP POST

SMD(FRP)-08

© TxDOT July 2002 — 9-08 — 26F

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

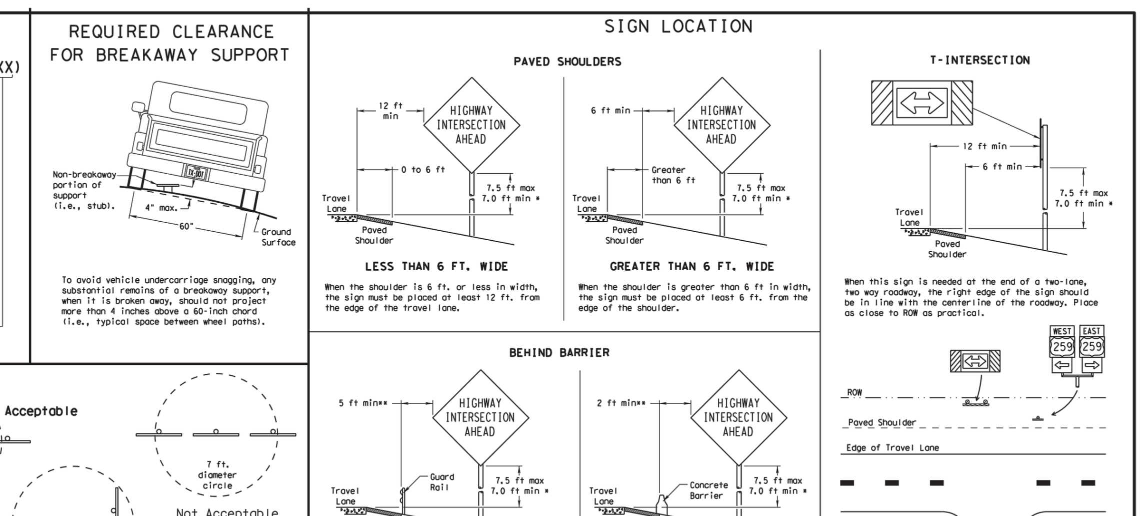
SM RD SGN ASSM TY XXXXX(X)XX(X-XXXX)

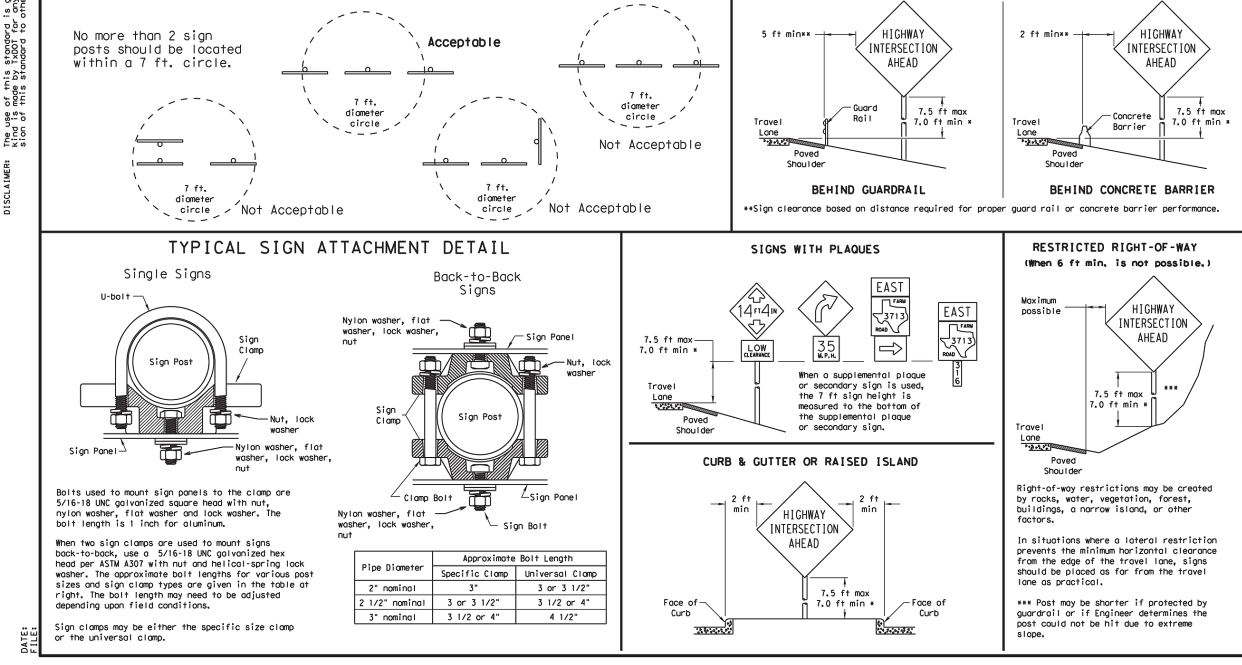
Post Type
- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thin-Walled Tubing (see SMD(TWT))
- 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
- S80 = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

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))
- WS = Wedge Anchor Steel - (see SMD(TWT))
- WP = Wedge Anchor Plastic (see SMD(TWT))
- SA = Slipbase - Concreted (see SMD(SLIP-1) to (SLIP-3))
- SB = Slipbase - Bolted Down (see SMD(SLIP-1) to (SLIP-3))

Sign Mounting Designation
- P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
- T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
- U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
- IF REQUIRED
- 1EXT 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))





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

* Signs 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

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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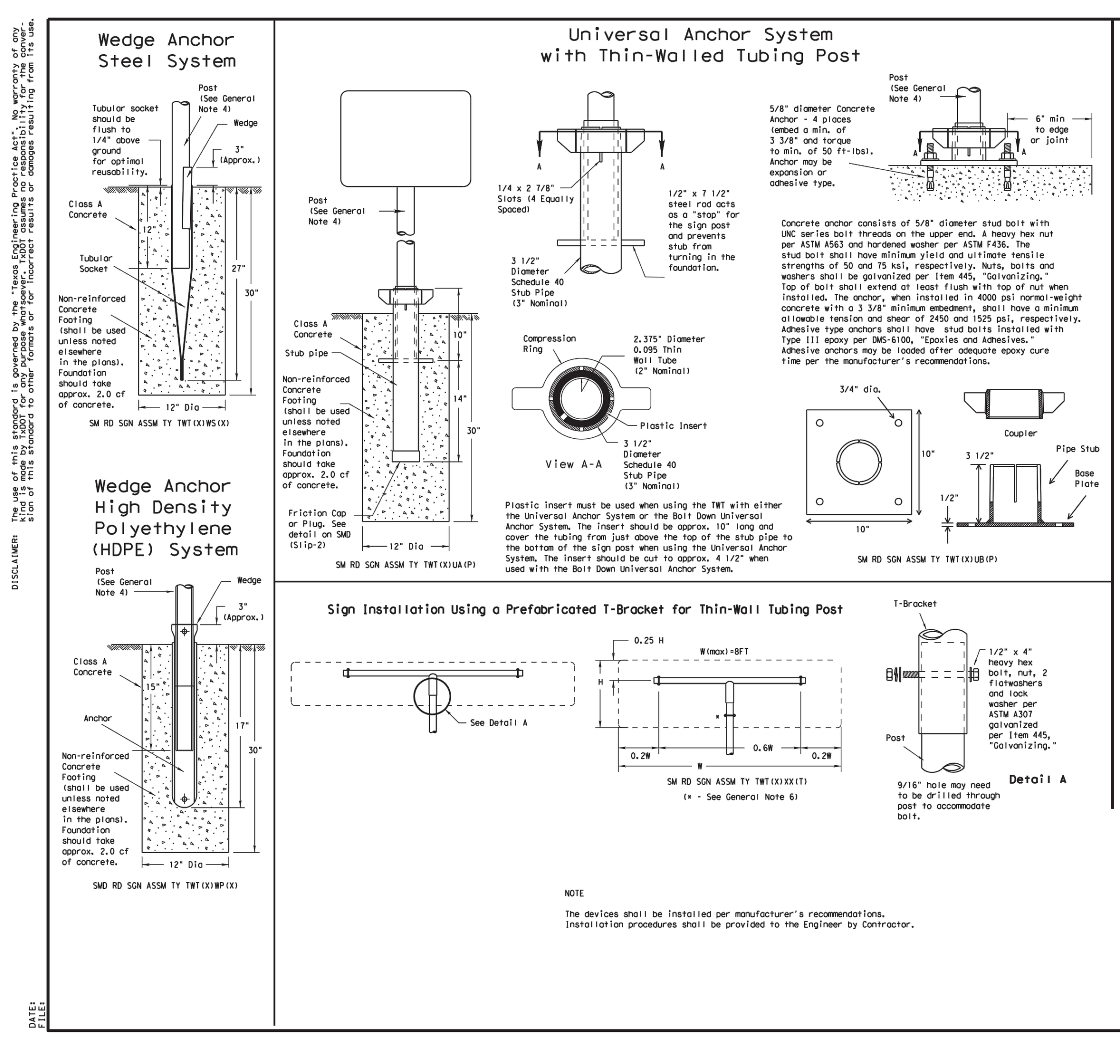

GENERAL NOTES:

1. The Wedge Anchor System and the Universal Anchor System with thin wall tubing post may be used to support up to 10 square feet of sign area.
2. The tubular socket, wedge and prefabricated T-bracket shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to the approval of the TxDOT Traffic Standards Engineer.
3. Except for posts (13 BWG Tubing), clamps, nuts and bolts, all components shall be prequalified. A list of prequalified vendors may be obtained from the Material Producer List web page. The website address is: http://www.txdot.gov/business/producer_list.htm
4. Material used as post with this system shall conform to the following specifications: 13 BWG Tubing (2.375" outside diameter) (TWT) 0.095" nominal wall thickness. Seamless or electric-resistance welded steel tubing. Steel shall be HSLAS Gr 55 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; 18% minimum elongation in 2". Wall thickness (uncoated) shall be within the range of .083" to .099". Outside diameter (uncoated) shall be within the range of 2.369" to 2.381". 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.
5. Sign blanks shall be the sizes and shapes shown on the plans.
6. Additional sign clamp required on the "T-bracket" post for 24" high signs. Place clamp at least 3" above bottom of sign when possible.
7. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.
8. See the Traffic Operations Division website for detailed drawings of sign clamps and Wedge Anchor System components. The website address is: http://www.txdot.gov/publications/traffic.htm

WEDGE ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
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. Place concrete into hole until it is approximately flush with the ground. Concrete shall be Class A.
3. Insert tubular socket into concrete until top of socket is approximately 1/4 " above the concrete footing.
4. Plumb the socket. Allow a minimum 4 days for concrete to set, unless otherwise directed by Engineer..
5. Attach the sign to the sign post.
6. Insert the sign post into socket and align sign face with roadway.
7. Drive the wedge into the socket to secure post. This will leave approximately 3 inches of the wedge exposed.

UNIVERSAL ANCHOR SYSTEM INSTALLATION PROCEDURE

1. Dig foundation hole. Where solid rock is encountered at ground level, the foundation shall be a minimum depth of 18". When solid rock is encountered below ground level, the foundation shall extend in the solid rock a minimum depth of 18" or provide a minimum foundation depth of 30". If solid rock is encountered, the socket/stub may be reduced in length as required to a minimum length of 18". Any material removed from the socket/stub shall be from the bottom and the clearance requirements given on SMD(GEN) must be followed. The inner surfaces of the socket/stub must remain free of concrete or other debris.
2. Insert base post in hole to depths shown and backfill hole with concrete.
3. Level and plumb the base post using a torpedo level and allow concrete adequate time to set. The bottom of the slots provided in the stub pipe shall remain above the top of the concrete foundation.
4. Attach the sign to the sign post.
5. Install plastic insert around bottom of post.
6. Insert sign post into base post. Lower until the post comes to rest on steel rod.
7. Seat compression ring using a hammer. Typically, the top of compression ring will be approximately level with top of stub post when optimally installed.
8. Check sign post by hand to ensure it is unable to turn. If loose, increase the tightening of the compression ring.

NOTE

The devices shall be installed per manufacturer's recommendations. Installation procedures shall be provided to the Engineer by Contractor.

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS WEDGE & UNIVERSAL ANCHOR WITH THIN WALL TUBING POST

SMD(TWT)-08

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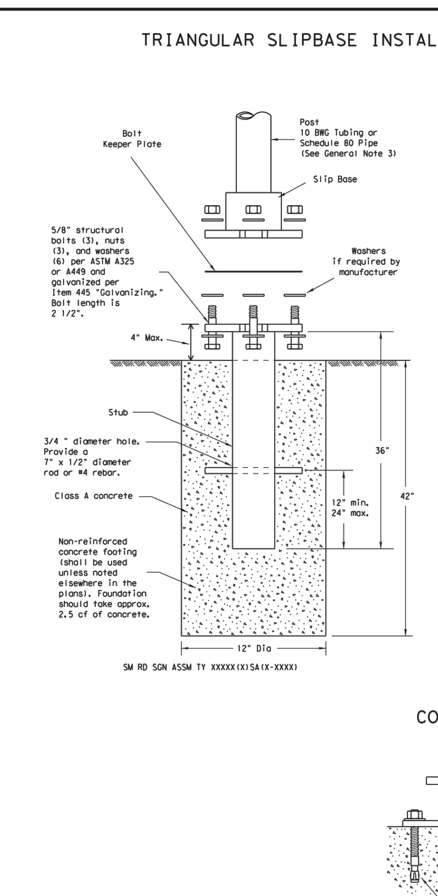
TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



NOTE

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

GENERAL NOTES:

1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications: 10 BWG Tubing (2.875" outside diameter) 0.134" nominal wall thickness. Seamless or electric-resistance welded steel tubing or pipe. Steel shall be HSLAS Gr 55 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 2.867" to 2.883". 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

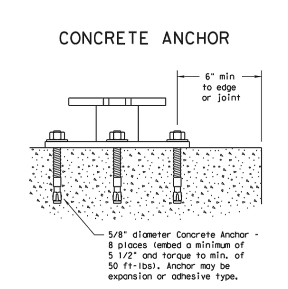
Foundation

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 end 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 travelway (i.e., edge of the closest lane) when slip plate is below the edge of pavement or 7 to 7.5 feet above slip plate when the slip plate is above the edge of the travelway. The cut shall be plumb and 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



Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. Heavy hex nut per ASTM A563, and hardened washer per ASTM F436. The stud bolt shall have a minimum yield and ultimate tensile strength of 50 and 75 KSI, respectively. Nuts, bolts and washers shall be galvanized per Item 445, "Galvanizing." Adhesive type anchors shall have stud bolts installed with Type III epoxy per 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 embedment, shall have a minimum allowable tension and shear of 3900 and 3100 psi, respectively.

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-1)-08

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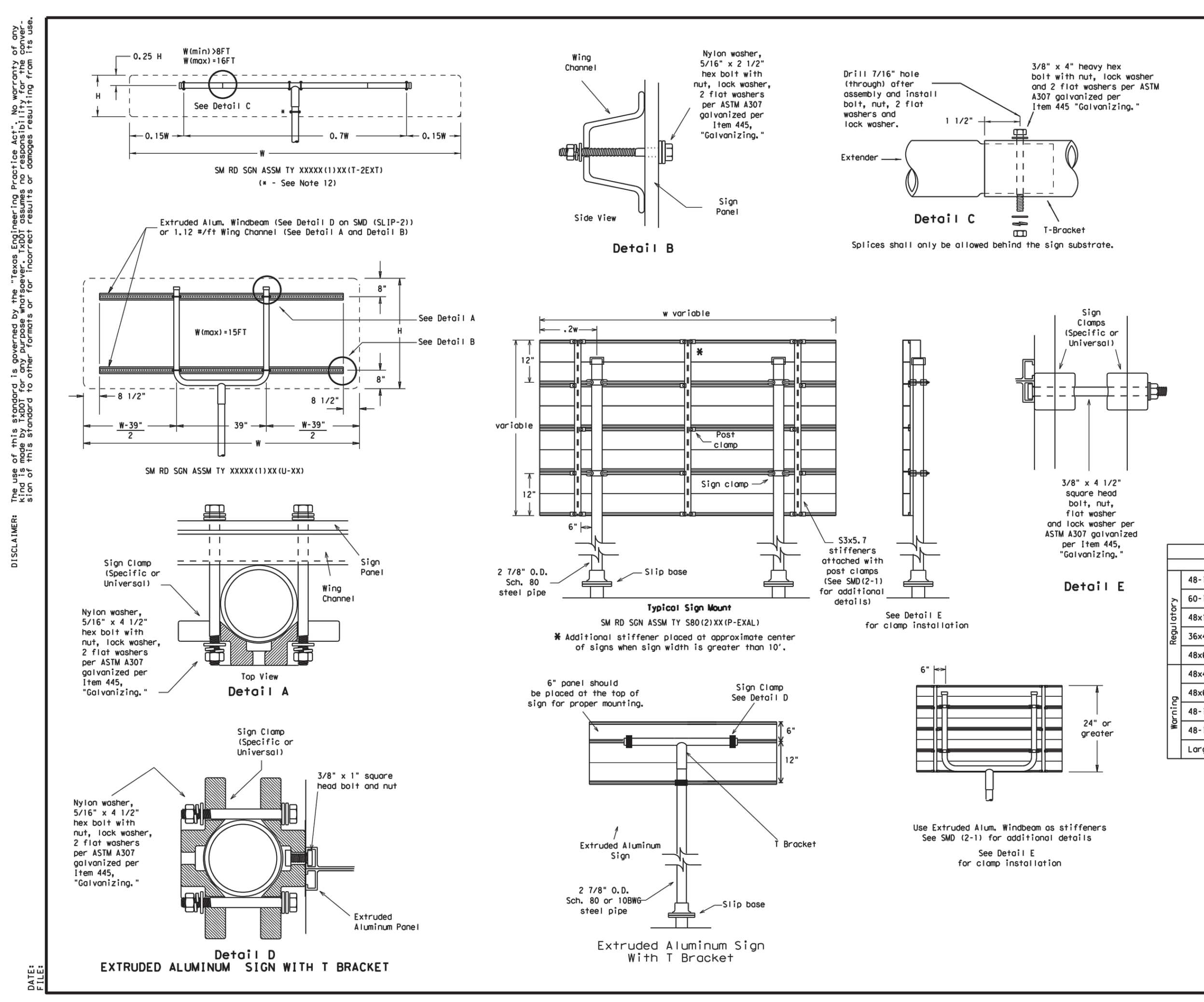

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

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

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Regulatory	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
Warning	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
Warning	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
Warning	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-3)-08

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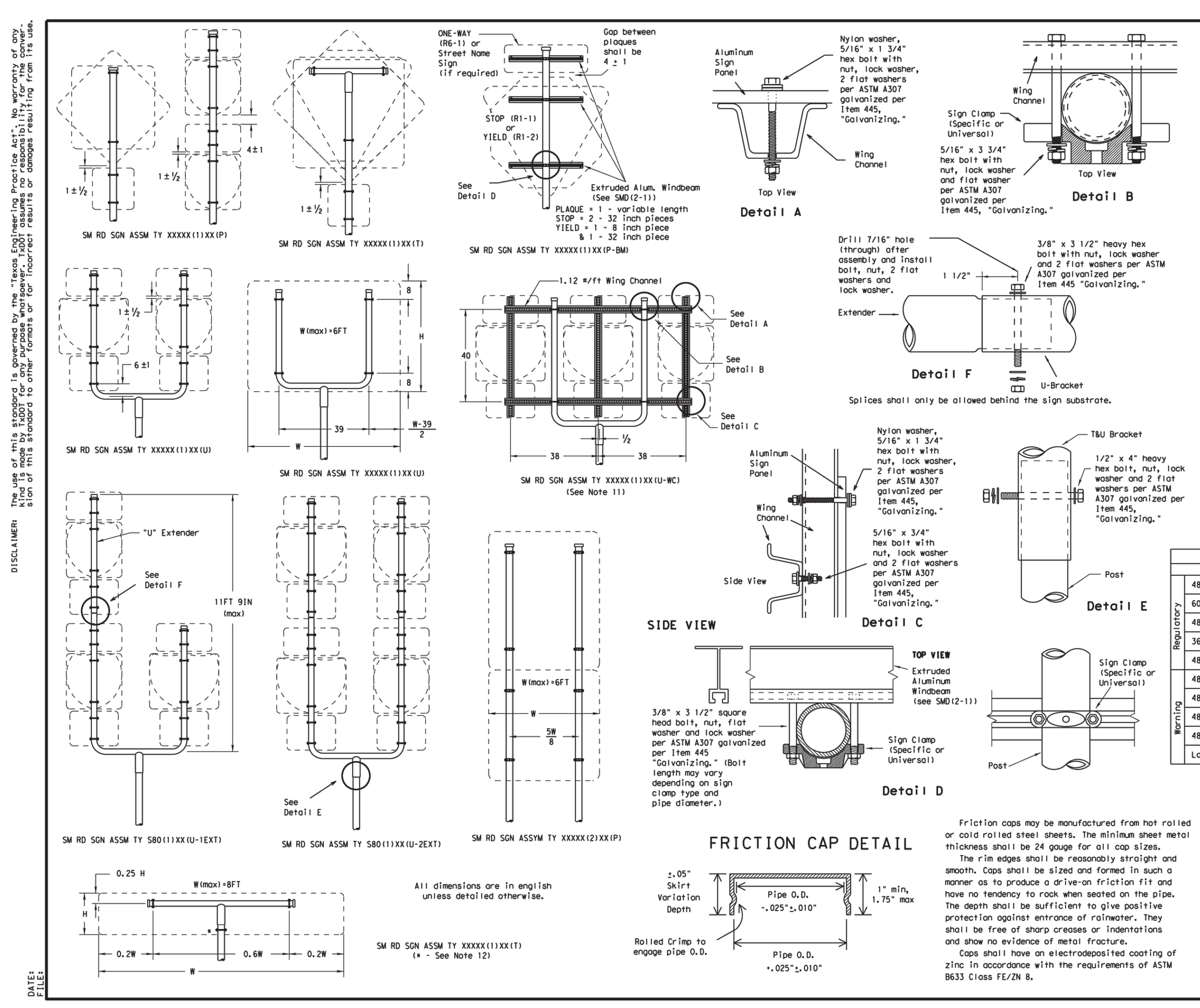

Friction caps may be manufactured from hot rolled or cold rolled steel sheets. The minimum sheet metal thickness shall be 24 gauge for all cap sizes.

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

Caps shall have an electrodeposited coating of zinc in accordance with the requirements of ASTM B633 Class FE/ZN 8.

GENERAL NOTES:

1.

SIGN SUPPORT	# OF POSTS	MAX. SIGN AREA
10 BWG	1	16 SF
10 BWG	2	32 SF
Sch 80	1	32 SF
Sch 80	2	64 SF

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

REQUIRED SUPPORT

	SIGN DESCRIPTION	SUPPORT
Regulatory	48-inch STOP sign (R1-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	60-inch YIELD sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
Regulatory	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
Regulatory	48x60-inch signs	TY S80(1)XX(T)
Warning	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
Warning	48x60-inch signs	TY S80(1)XX(T)
Warning	48-inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
Warning	48-inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
Warning	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

Texas Department of Transportation — Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2 PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

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		MS	CG

PROJECT NUMBER: 314-60-01 — DRAWING NAME: TSDT3146001

SHEET TITLE: TRAFFIC SIGNAGE & PEDESTRIAN ACCESS PLANS DETAILS

SHEET NUMBER: 6.12

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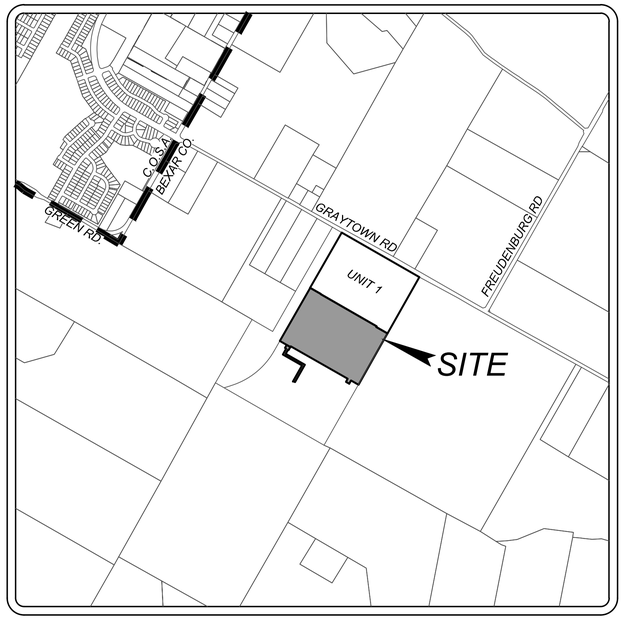
FISCHER GARDENS UNIT 2

BEXAR COUNTY, TX

SANITARY SEWER IMPROVEMENTS

SHEET INDEX	
SHEET TITLE	SHEET NO.
SANITARY SEWER COVER SHEET	7.1
OVERALL SEWER PLAN (SHEET 1 OF 2)	7.2
OVERALL SEWER PLAN (SHEET 2 OF 2)	7.3
LINE 'F' PLAN & PROFILE	7.4
LINE 'G' PLAN & PROFILE	7.5
LINE 'H' PLAN & PROFILE	7.6
LINE 'I' PLAN & PROFILE (SHEET 1 OF 2)	7.7
LINE 'I' PLAN & PROFILE (SHEET 2 OF 2)	7.8
SANITARY SEWER NOTES	7.9
SANITARY SEWER DETAILS	7.10



LOCATION MAP
NOT-TO-SCALE

SA GIVEN TO FLY, LLC
6812 WEST AVENUE, SUITE 100
SAN ANTONIO, TX 78213
PHONE: 210-701-8337

SAN ANTONIO RIVER AUTHORITY

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

RESIDENTIAL LOTS = 148

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STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR
FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

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		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	SSCV3146001

SHEET TITLE:
SANITARY SEWER
COVER SHEET

SHEET NUMBER:
7.1

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

CAUTION!!!: 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.

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 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 WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

SEWER NOTES:

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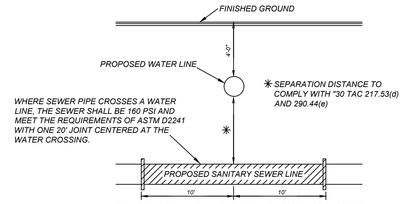
3. PIPE TYPE DESIGNATIONS ARE SDR 26.
4. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
5. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER.

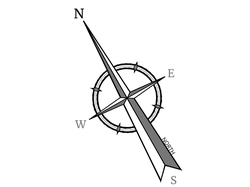


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

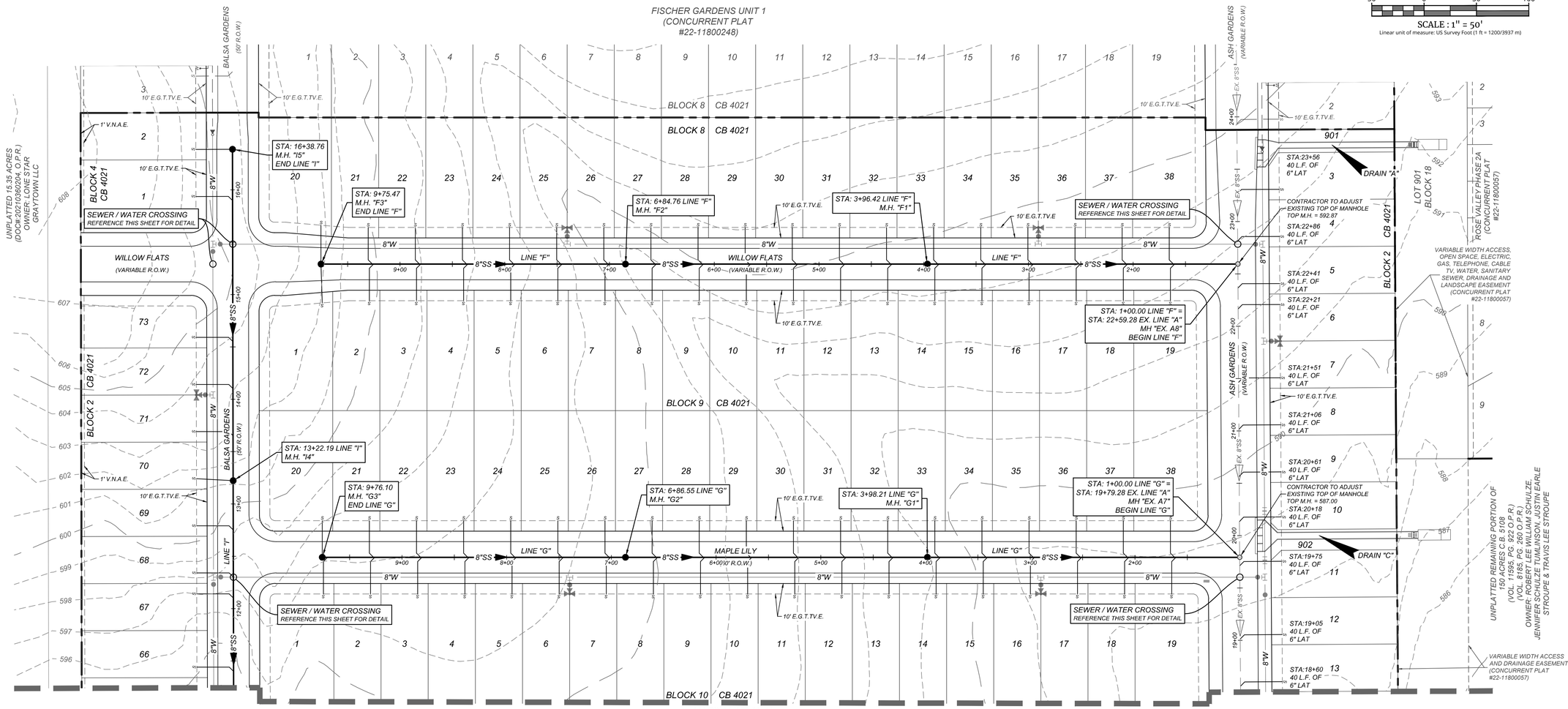
LEGEND

- PROPOSED WATER MAIN = W
- PROPOSED WATER SERVICE & METER BOX = W
- PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX = IRR
- PROPOSED FIRE HYDRANT =
- PROPOSED WATER VALVE =
- PROPOSED 100W STREETLIGHT =
- PROPOSED SANITARY SEWER MAIN = SS
- PROPOSED SANITARY SEWER MANHOLE =
- PROPOSED SANITARY SEWER LATERAL =
- PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT = E. G. T. TV. 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

LOCATION MAP
NOT-TO-SCALE



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



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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: OS3146001

SHEET TITLE:
OVERALL SEWER PLAN
(SHEET 1 OF 2)

SHEET NUMBER:
7.2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\3146\001\DESIGN\CIVIL\SEWER\OS3146001.DWG By: DYLAN.FOERSTER 5/15/2024 2:58 PM

TRENCH EXCAVATION SAFETY PROTECTION

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

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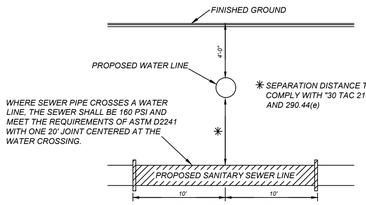
4. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
5. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER.



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

LEGEND

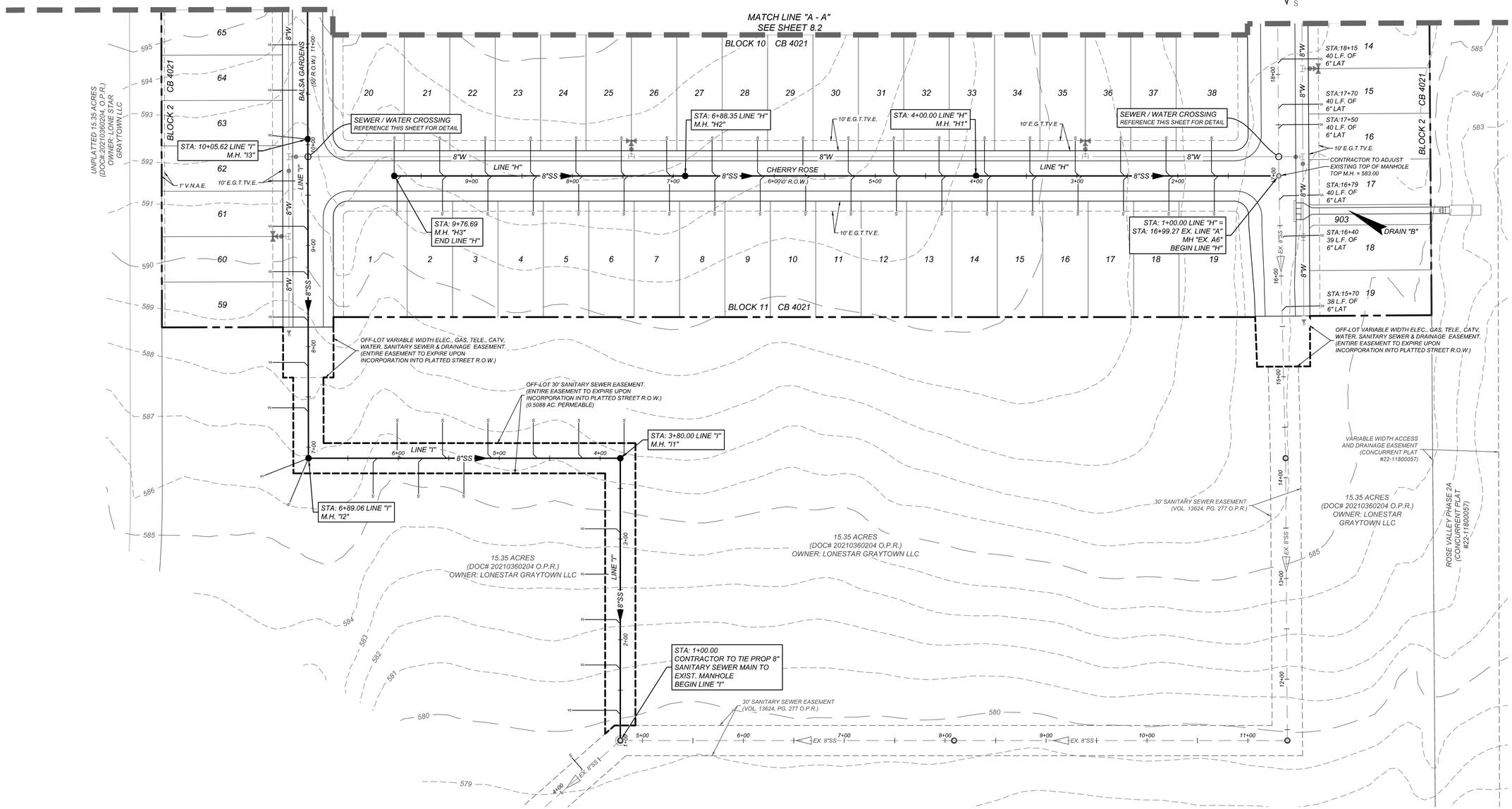
PROPOSED WATER MAIN	W
PROPOSED WATER SERVICE & METER BOX	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	W
PROPOSED FIRE HYDRANT	
PROPOSED WATER VALVE	
PROPOSED 100W STREETLIGHT	
PROPOSED SANITARY SEWER MAIN	SS
PROPOSED SANITARY SEWER MANHOLE	
PROPOSED SANITARY SEWER LATERAL	S
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	E. G. T. TV. 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

LOCATION MAP
NOT-TO-SCALE

N E S W

50 0 50 100

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



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CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 · TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	DS3146001

SHEET TITLE:
OVERALL SEWER PLAN
(SHEET 2 OF 2)

SHEET NUMBER:
7.3

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TRENCH EXCAVATION SAFETY PROTECTION

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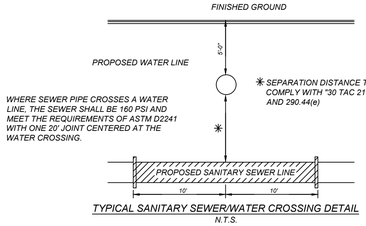

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

SEWER NOTES:

1. *ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO RIVER AUTHORITY (S.A.R.A.) STANDARD SPECIFICATION.*
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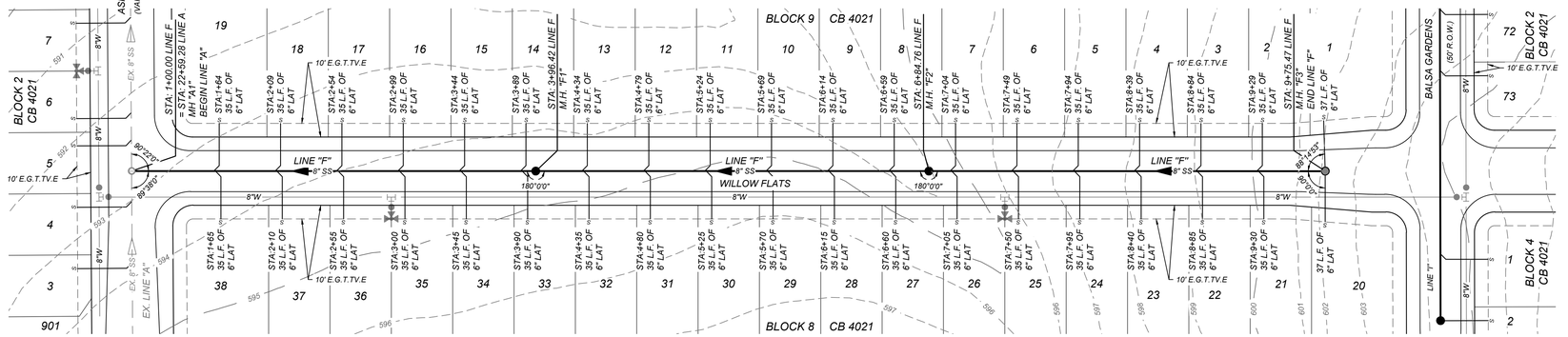
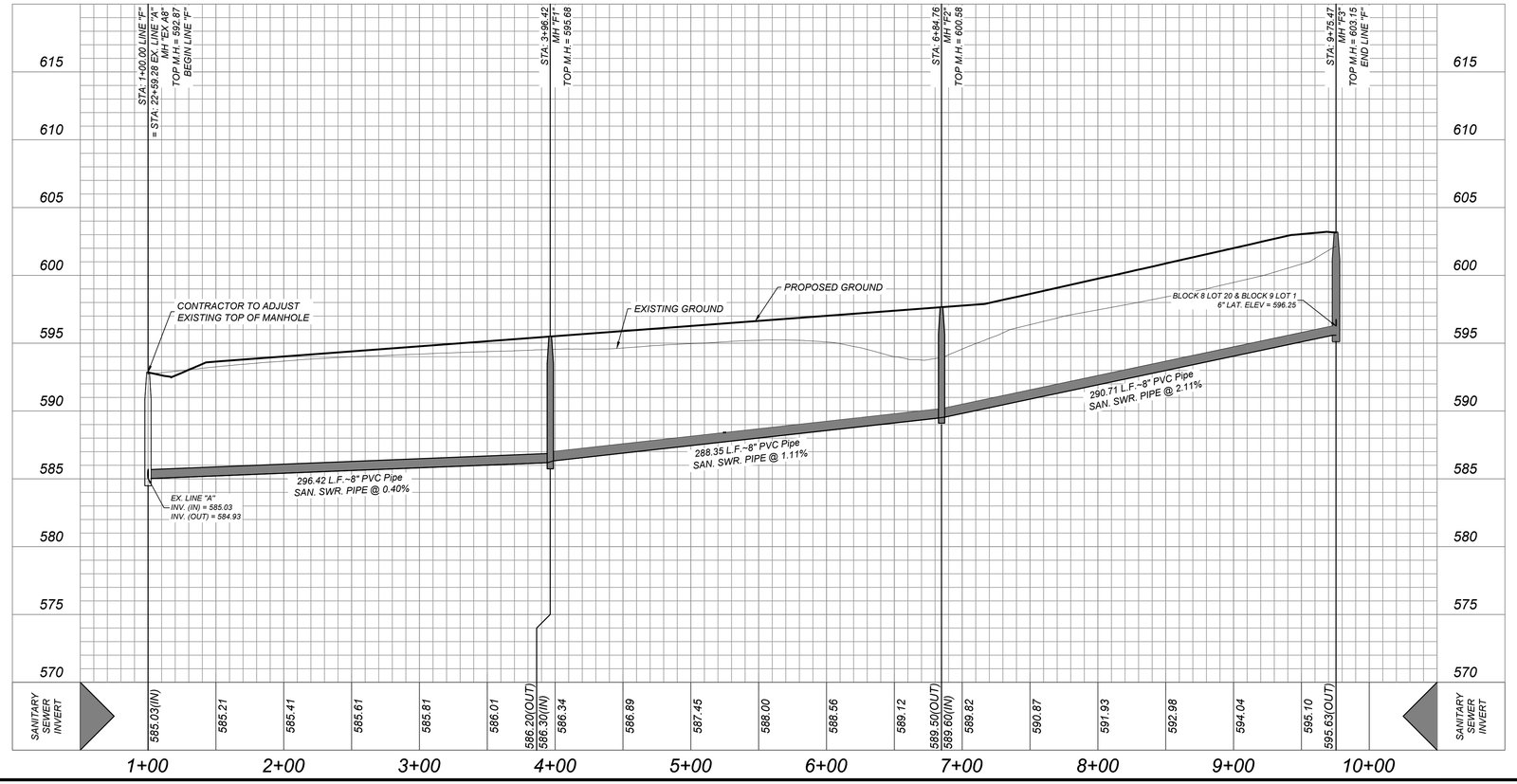
3. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
4. *SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.*
5. *ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER.*



LINE "F"
STA: 1+00.00 TO END

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



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LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 · TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	LINE F

SHEET TITLE:
LINE 'F' PLAN & PROFILE

SHEET NUMBER:
7.4

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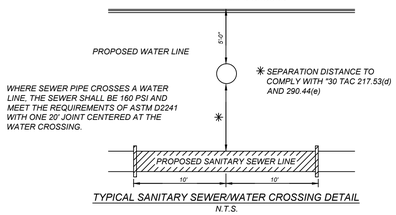

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

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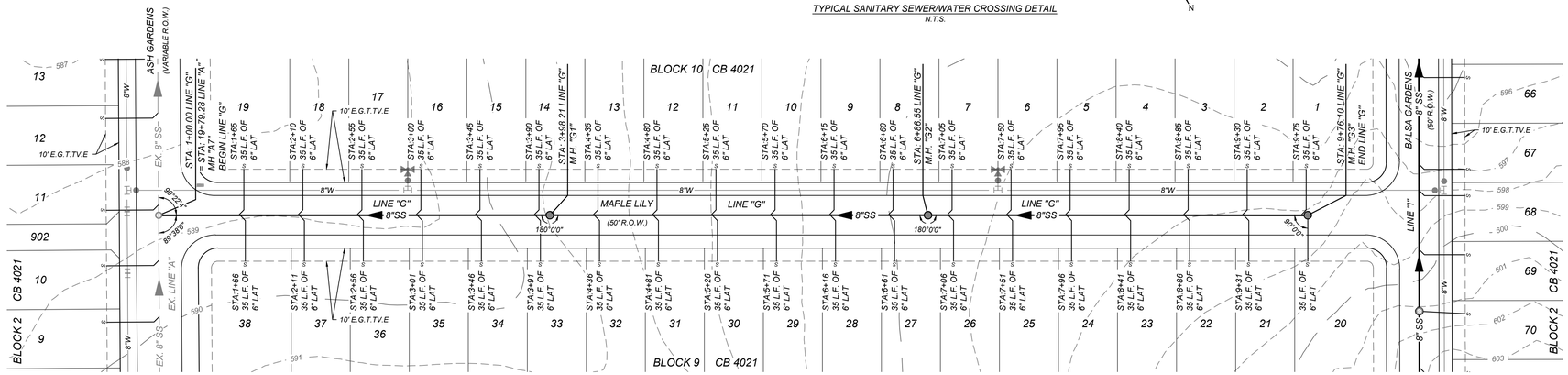
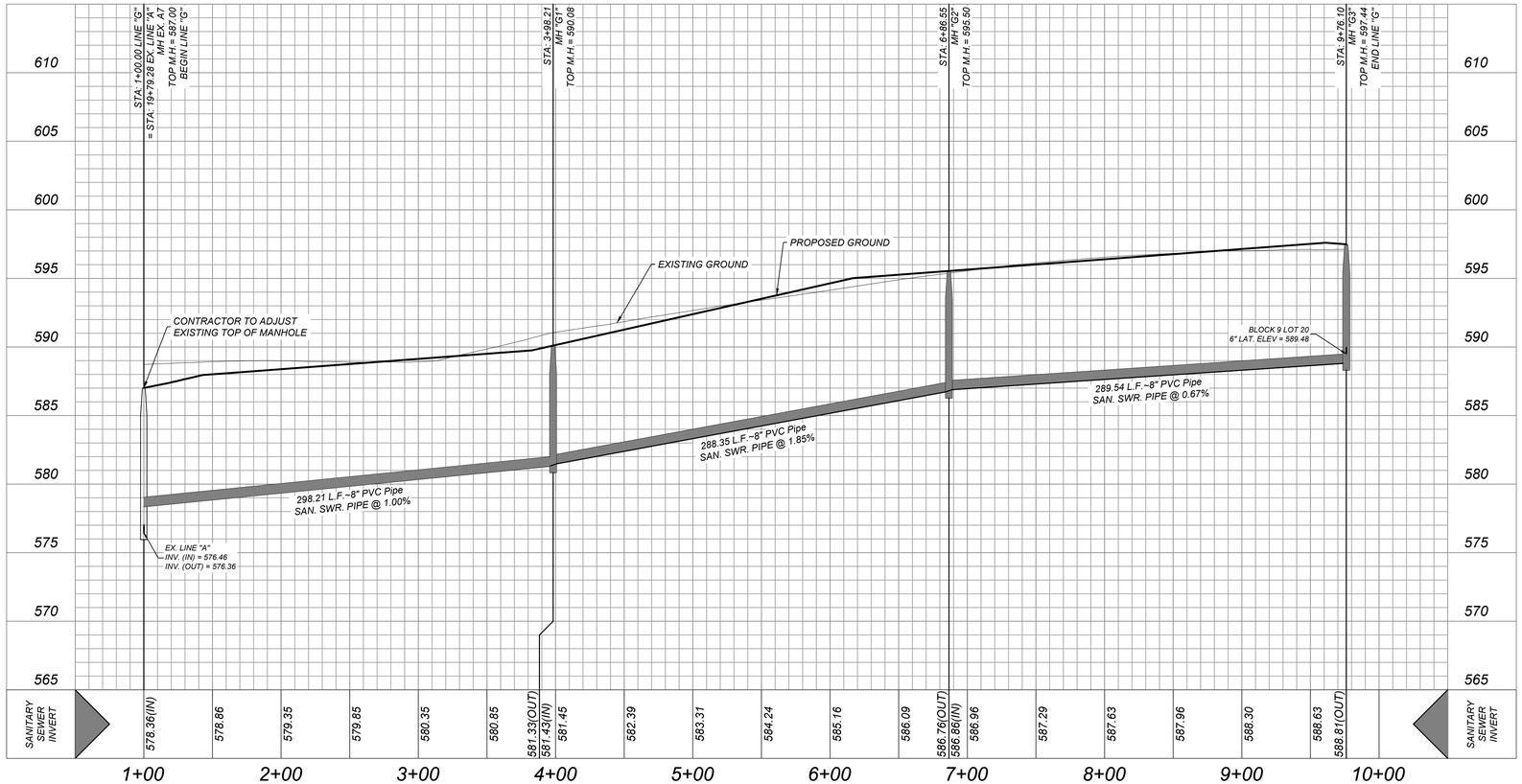


LINE "G"
STA: 1+00.00 TO END

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



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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01

DRAWING NAME: LINE G

SHEET TITLE: LINE 'G' PLAN & PROFILE

SHEET NUMBER: 7.5

N:\314\60\01\05\DSK\CIVIL\SEWER\LINE G.DWG By: DYLAN.FOERSTER 5/15/2024 3:23 PM

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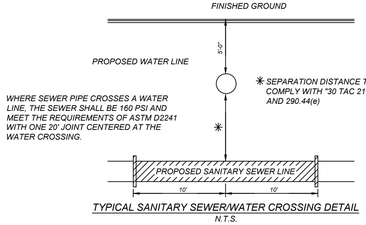
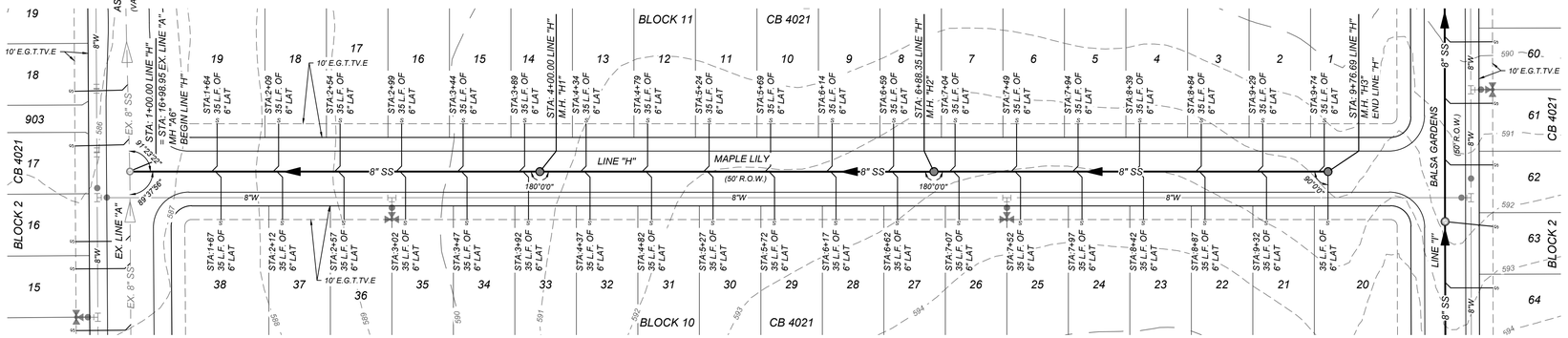


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

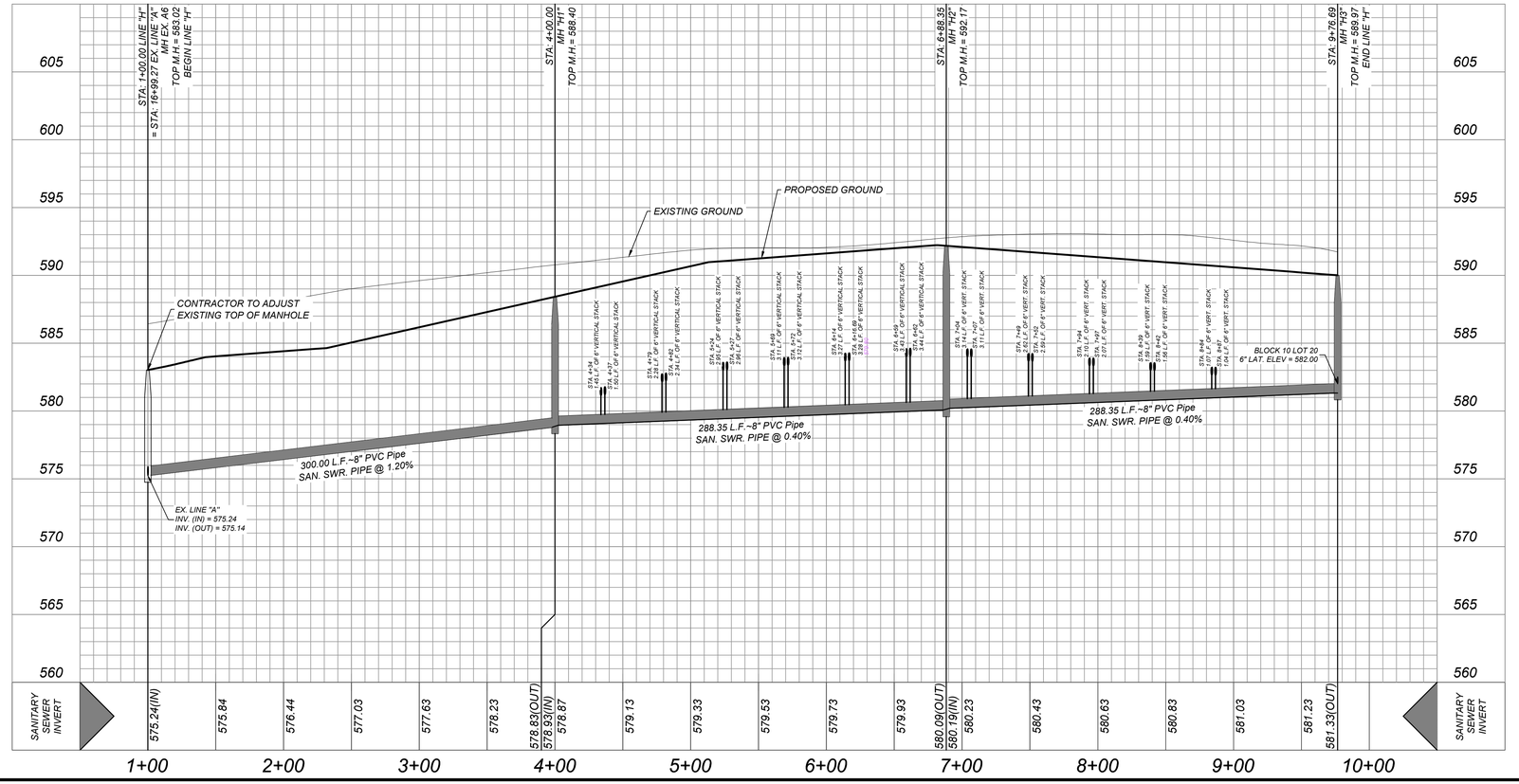
SEWER NOTES:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO RIVER AUTHORITY (S.A.R.A.) STANDARD SPECIFICATION.
2. SEWER PIPE WHERE WATER LINE CROSSES SHALL BE MEET THE REQUIREMENTS OF ASTM D2241. CONTRACTOR SHALL CENTER A 20 FOOT JOINT OF 160 P.S.I. PRESSURE RATED P.V.C. AT THE PROPOSED WATER CROSSING (NO SEPARATE PAY ITEM).
3. PIPE TYPE DESIGNATIONS ARE SDR 26.
4. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
5. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER.



LINE "H"
STA: 1+00.00 TO END

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



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

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 · TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: LINE H

SHEET TITLE: LINE 'H' PLAN & PROFILE

SHEET NUMBER: 7.6

N:\314\60\01\DESIGN\CIVIL\SEWER\LINE H.DWG By: DYLAN.FOERSTER 5/15/2024 3:24 PM

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

TRENCH EXCAVATION SAFETY PROTECTION

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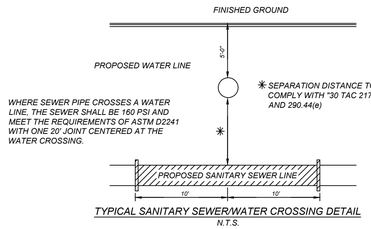

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.

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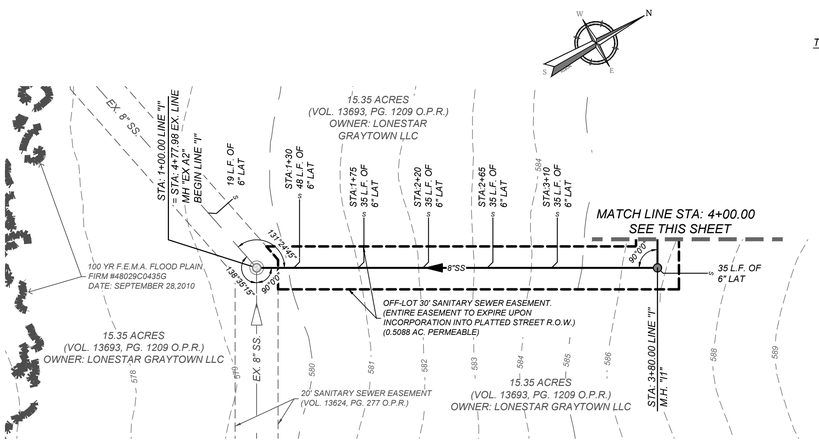
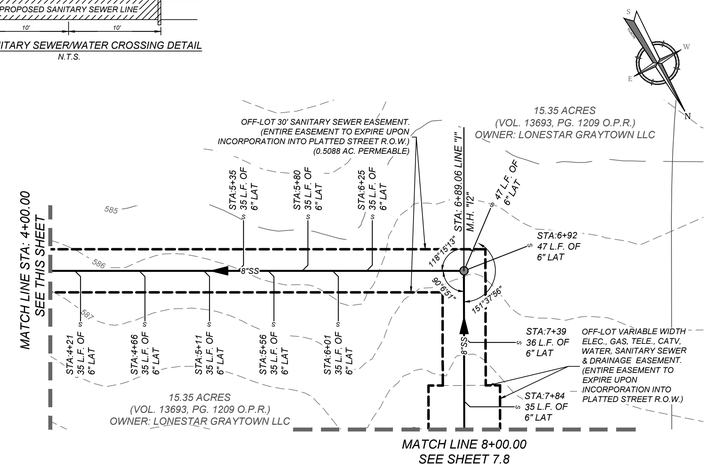
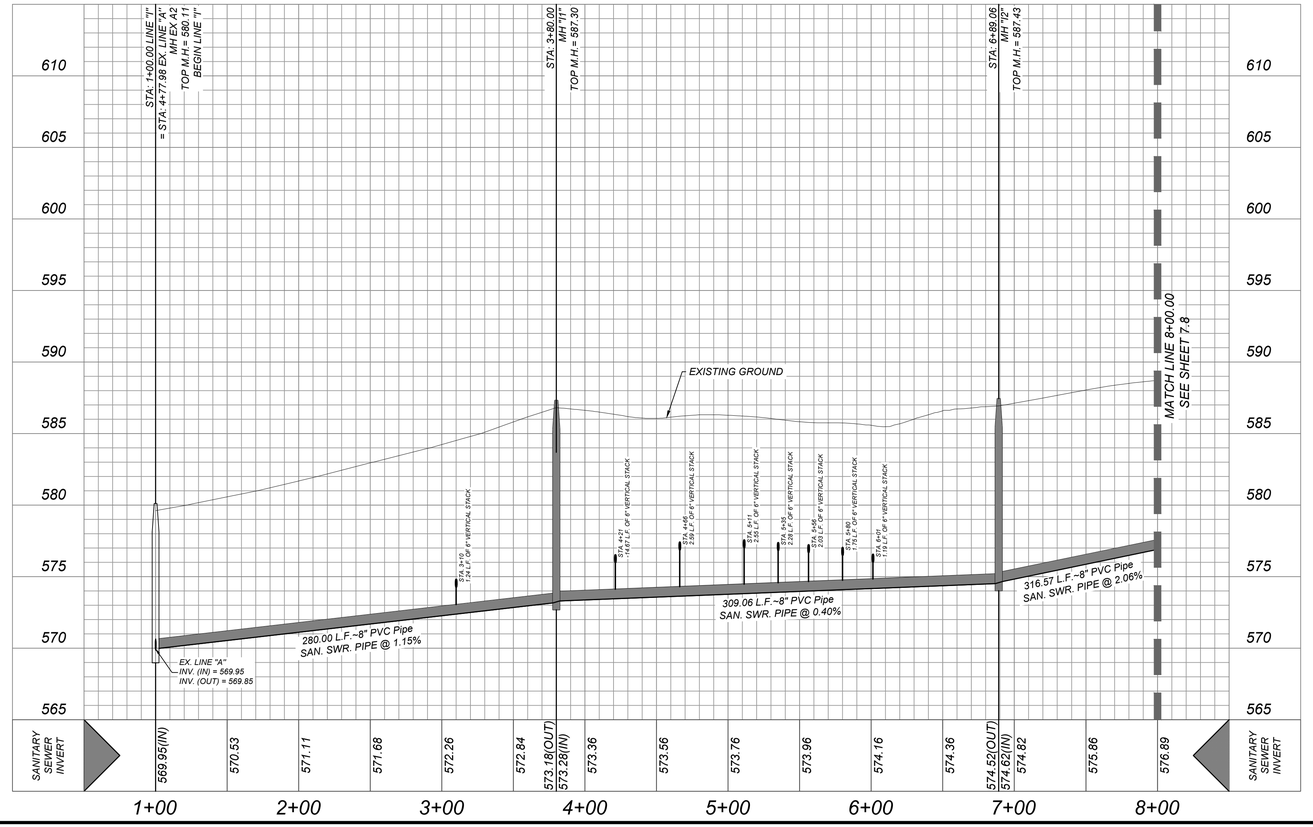




LINE "I"
STA: 1+00.00 TO 8+00.00

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



RESIDENTIAL LOTS = 148

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SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: LINE I

SHEET TITLE: LINE 'I' PLAN & PROFILE (SHEET 1 OF 2)

SHEET NUMBER: 7.7

N:\314\60\01\05\CIVIL\SEWER\LINE I.DWG By ABROWNE 5/15/2024 5:23 PM

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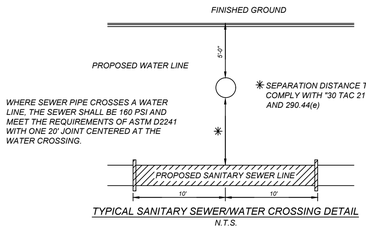

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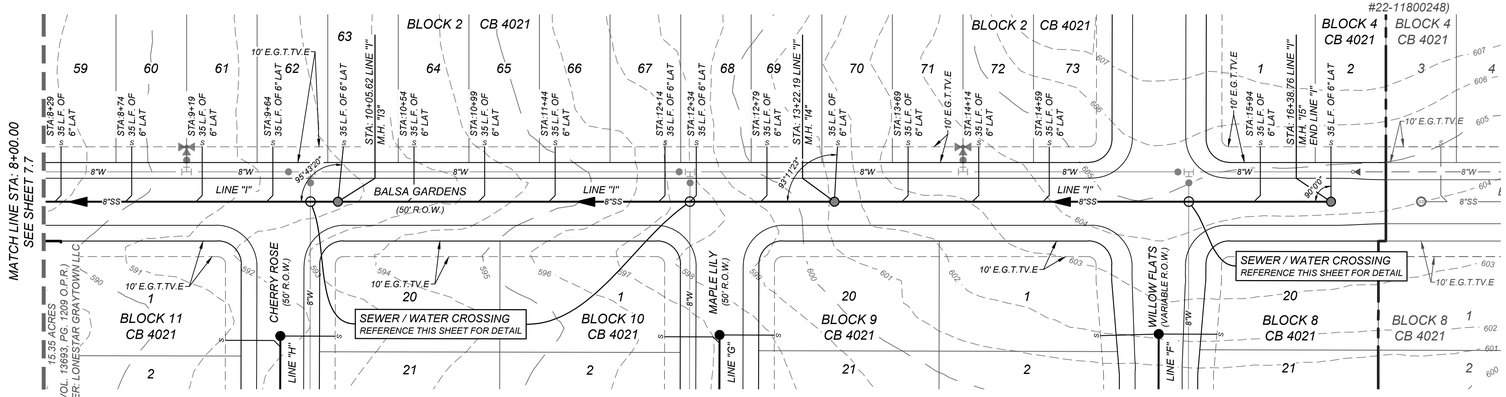
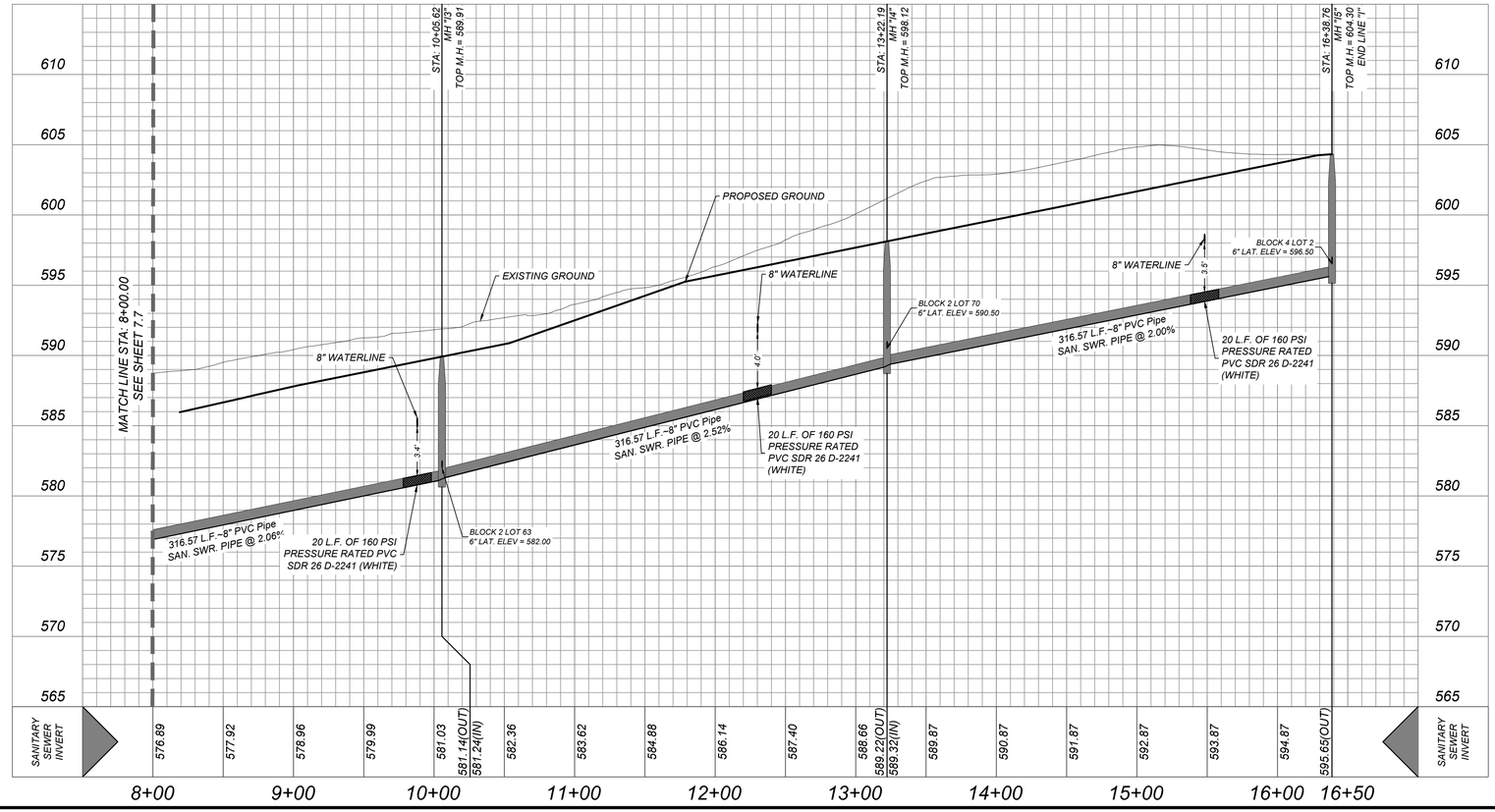


LINE "I"
STA: 8+00.00 TO END

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



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CLAYTON J. LINNEY
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TBPE Firm#: F-14909
TBPLS Firm#: 10194550

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: LINE I

SHEET TITLE: LINE 'I' PLAN & PROFILE (SHEET 2 OF 2)

SHEET NUMBER: 7.8

N:\314\60\01\05\CIVIL\SEWER\LINE I.DWG By DYLAN.FOERSTER 5/15/2024 3:24 PM

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

GENERAL NOTES:

1. SAN ANTONIO RIVER AUTHORITY (RIVER AUTHORITY) STANDARD SPECIFICATIONS AND STANDARD DETAILS ARE PROVIDED FOR DESIGN AND CONSTRUCTION OF SEWER COLLECTION SYSTEMS MANAGED AND CONTRACTED BY THE RIVER AUTHORITY.

2. AT ANY TIME, THESE STANDARD SPECIFICATIONS AND DETAILS MAY BE ALTERED OR SUPERSEDED BY THE GENERAL CONDITIONS, SUPPLEMENTAL CONDITIONS, PLANS OR PROJECT SPECIFICATIONS WITHIN THE CONTRACT DOCUMENT PER DIRECTION FROM THE RIVER AUTHORITY.

3. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE APPROVED BY RIVER AUTHORITY AND COMPLY WITH THE CONTRACT DOCUMENTS AND THE FOLLOWING AS APPLICABLE:

3.1. CURRENT TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) "DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEM", TEXAS ADMINISTRATIVE CODE (TAC) TITLE 30, PART 1, CHAPTER 217.

3.2. CURRENT TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT), "STANDARD SPECIFICATIONS FOR CONSTRUCTION OF HIGHWAYS, STREETS AND DRAINAGE".

3.3. CURRENT RIVER AUTHORITY "STANDARD SPECIFICATIONS FOR SANITARY SEWER CONSTRUCTION".

3.4. CURRENT CITY OF SAN ANTONIO "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION". CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL".

4. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE RIVER AUTHORITY INSPECTIONS DIVISION AT (210) 302-4200 FORTY EIGHT (48) HOURS PRIOR TO ANY EXCAVATION. CONTRACTOR SHALL ALSO PROVIDE PROCEDURES THAT WILL BE USED TO NOTIFY AFFECTED RESIDENTS AND/OR PROPERTY OWNERS 48 HOURS PRIOR TO ANY EXCAVATION OR CONSTRUCTION. A PRE-CONSTRUCTION CONFERENCE SHALL BE HELD BEFORE ANY EXCAVATION OR START OF PROJECT.

5. WORK SHALL NOT BE PERFORMED ON SATURDAYS, SUNDAYS, FEDERAL HOLIDAYS, RIVER AUTHORITY HOLIDAYS, BEFORE 7:30 AM, OR AFTER 4:30 PM, UNLESS PRIOR APPROVAL IS GRANTED BY THE RIVER AUTHORITY ENGINEER. REQUEST TO PERFORM WORK DURING THESE TIMES MUST BE EMAILED 48 HOURS IN ADVANCE TO UTILITIESDEVELOPMENT@SARIVERAUTHORITY.ORG.

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

7. WORK COMPLETED BY CONTRACTOR WHICH HAS NOT RECEIVED A WORK ORDER OR THE CONSENT OF RIVER AUTHORITY WILL BE SUBJECT TO REMOVAL AND REPLACEMENT AT THE EXPENSE OF THE CONTRACTOR.

8. LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 48 HOURS PRIOR TO CONSTRUCTION REGARDLESS OF ILLUSTRATION ON THE PLANS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO RIVER AUTHORITY. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING UTILITIES AND REPAIRS WILL BE AT CONTRACTOR'S EXPENSE.

THE FOLLOWING CONTACT INFORMATION IS SUPPLIED FOR VERIFICATION PURPOSES:

EAST CENTRAL SPECIAL UTILITY DISTRICT	210-649-2383
CITY OF SAN ANTONIO DRAINAGE	210-207-5048
CITY PUBLIC SERVICE (CPS)	210-973-3500
CITY OF CONVERSE (PUBLIC WORKS)	210-659-9513
TIME WARNER	210-352-4872
VALERO ENERGY CO.	210-349-7555
RIVER AUTHORITY INSPECTIONS	210-302-4200
TEXAS 811	800-344-8377
SAN ANTONIO WATER SYSTEM (SAWS)	210-233-3500

9. CERTAIN PORTIONS OF THE PROJECT MAY PARALLEL AND/OR CROSS EXISTING UTILITIES, AND CONTRACTOR IS REQUIRED TO PROTECT THESE UTILITIES. ADDITIONAL SUPPORTIVE SHORING MAY BE REQUIRED. IT IS THE CONTRACTOR'S RESPONSIBILITY TO PROTECT HIS WORKERS, EXISTING UTILITIES, AND FINISHED WORK THROUGHOUT THE PROJECT. CONTRACTOR WILL BE RESPONSIBLE FOR ANY DAMAGES AND REPAIRS WILL BE AT CONTRACTORS EXPENSE.

10. WHERE WATER LINES AND NEW SEWER LINES ARE INSTALLED WITH A SEPARATION DISTANCE LESS THAN 9 FEET (I.E. WATER LINES CROSSING WASTEWATER LINES, WATER LINES PARALLELING WASTEWATER LINES OR WATER LINES NEXT TO MANHOLES), THE INSTALLATION MUST MEET THE REQUIREMENTS OF 30 TAC 217 AND 30 TAC 290.

11. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.161, CPS MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND VALVES THAT ARE IN THE PROJECT AREAS.

12. AN APPROPRIATELY SAFE OVERHEAD CLEARANCE MUST BE MAINTAINED BETWEEN ALL OVERHEAD EQUIPMENT AND PERSONNEL. THE CONTRACTOR SHALL NOTIFY CPS AT LEAST 48 HOURS PRIOR TO ANY CONSTRUCTION IN THE VICINITY OF CPS OVERHEAD LINES. CONTRACTOR SHALL MAINTAIN CPS RECOMMENDED CLEARANCE REQUIREMENTS.

13. ALL WORK IN THE TEXAS DEPARTMENT OF TRANSPORTATION (TXDOT) RIGHT-OF-WAY SHALL PROCEED DURING WORKING HOURS AGREED UPON BY RIVER AUTHORITY AND TXDOT INSPECTORS.

14. BEFORE THE START OF ANY CONSTRUCTION, THE PROJECT SITE MUST BE VIDEO RECORDED BY THE CONTRACTOR WITH ONE COPY SUBMITTED TO RIVER AUTHORITY. THE PRE-CON SITE VIDEO WILL PROVIDE ACCURATE DOCUMENTATION OF EXISTING CONDITIONS.

15. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ORIGINAL OR BETTER CONDITION AS A RESULT OF DAMAGE DONE DURING THE PROJECT CONSTRUCTION.

16. ANY AND ALL FENCING, INCLUDING ELECTRIC FENCE, WHETHER OR NOT IDENTIFIED ON THE PLANS, MUST BE MAINTAINED AT ALL TIMES. ANY AND ALL DAMAGES DIRECTLY ATTRIBUTED TO THE CONTRACTOR MUST BE REPLACED TO EQUAL OR BETTER CONDITIONS AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE RIVER AUTHORITY INSPECTOR. 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.

17. CONTRACTOR MUST AVOID DAMAGE TO ADJACENT LAND OUTSIDE THE IDENTIFIED CONSTRUCTION LIMITS. ANY CLAIMS DIRECTLY ATTRIBUTED TO THE CONTRACTOR RESULTING FROM HIS STRAYING BEYOND THE CONSTRUCTION LIMITS MUST BE SETTLED BY THE CONTRACTOR TO THE SATISFACTION OF RIVER AUTHORITY AND THE APPROPRIATE LANDOWNER.

18. CONTRACTOR MUST MAINTAIN ACCESS FOR PRIVATE INDIVIDUALS AND BUSINESSES AT ALL TIMES. IF NORMAL ACCESS IS DAMAGED DURING CONSTRUCTION, THE CONTRACTOR MUST REPLACE THE ACCESS TO EQUAL OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY RIVER AUTHORITY.

19. CONTRACTOR MUST COMPLY WITH TEXAS GOVERNMENT CODE SECTION 2166.303 UNIFORM TRENCH SAFETY CONDITIONS.

20. CONTRACTOR SHALL 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 ENDS OF OPEN PIPE SHALL BE PLUGGED OVERNIGHT.

21. NO TREES SHALL BE REMOVED AS PART OF THIS PROJECT UNLESS OTHERWISE SPECIFIED IN THE PLANS.

22. FOR PORTIONS OF THE CONSTRUCTION THAT ARE WITHIN THE LIMITS OF THE 100-YEAR FLOODPLAIN, THE CONTRACTOR IS REQUIRED TO KEEP THE CHANNEL CLEAR OF POTENTIAL OBSTRUCTIONS TO FLOOD FLOWS. POTENTIAL OBSTRUCTIONS INCLUDE HEAVY CONSTRUCTION EQUIPMENT, TEMPORARY ROADS ACROSS CHANNEL, EXCAVATED MATERIAL, STOCKPILED DEBRIS, AND ALL OTHER ITEMS DEEMED UNACCEPTABLE BY RIVER AUTHORITY. UNDER THREATENING WEATHER CONDITIONS AND WHERE FLOODING IS LIKELY, OBSTRUCTIONS SHALL BE IMMEDIATELY REMOVED BY THE CONTRACTOR AT NO ADDITIONAL COST TO RIVER AUTHORITY. THE CONTRACTOR ASSUMES ALL RISK FOR UNFINISHED WORK. NO EQUIPMENT OR MATERIALS SHALL BE STOCKPILED IN THE 100-YEAR FLOODPLAIN.

23. NO WASTE MATERIAL SHALL BE PLACED IN EXISTING DRAINAGE LOWS THAT WILL BLOCK OR ALTER FLOW LIMITS, NATURAL DRAINAGE, OR PLACED WITHIN THE LIMITS OF EXISTING FLOODPLAIN.

24. IF A THREATENED OR ENDANGERED PLANT OR ANIMAL SPECIES AND/OR CULTURAL/ARCHAEOLOGICAL RESOURCES ARE ENCOUNTERED DURING CONSTRUCTION, THE CONTRACTOR SHALL STOP WORK IMMEDIATELY AND NOTIFY THE APPROPRIATE PERSONNEL.

SEWER NOTES:

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

25.1. IDENTIFY THE SOURCE OF THE SSO AND ATTEMPT TO ELIMINATE ANY ADDITIONAL SPILLAGE.
25.2. NOTIFY RIVER AUTHORITY CONSTRUCTION INSPECTIONS DIVISION AT 210-302-4216 OR 210-219-0130.
25.3. ATTEMPT TO ELIMINATE THE SOURCE OF THE SSO.
25.4. CONTAIN SEWAGE FROM THE SSO TO PREVENT CONTAMINATION OF WATERWAYS.
25.5. CLEAN UP THE SPILL SITE AND REMOVE CONTAMINATED MATERIALS.
25.6. DISINFECT THE AREA OF THE SPILL WITH A MIXTURE OF HTH CHLORINE AND WATER.
25.7. CLEAN THE AFFECTED SEWER LINE AND REMOVE ANY DEBRIS.
25.8. IDENTIFY AND TRAIN PERSONNEL RESPONSIBLE FOR SPILLAGE PREVENTION AND CONTROL.
25.9. NO SEPARATE MEASUREMENT OR PAYMENT SHALL BE MADE FOR THIS WORK. ALL WORK SHALL BE DONE ACCORDING TO GUIDELINES SET BY THE TCEQ AND RIVER AUTHORITY.

26. TIE-INS OR SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE RIVER AUTHORITY INSPECTOR AT LEAST ONE WEEK IN ADVANCE OF THE SHUTDOWN. CONTRACTOR SHALL PROVIDE A SEQUENCE OF WORK AS RELATED TO TIE-INS AT NO ADDITIONAL COST TO RIVER AUTHORITY OR THE PROJECT.

27. ELEVATIONS OF THE TOP OF MANHOLES AND INVERTS ARE FOR REFERENCE ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR THE TOPS OF MANHOLES AND INVERTS TO MATCH THE FINISHED GRADE OF THE PROJECT IMPROVEMENTS (NSPI).

28. THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING OF SEWAGE AROUND EACH SEGMENT OF PIPE TO BE REPLACED. CONTRACTOR SHALL HAVE STANDBY PUMPS AVAILABLE TO BYPASS FLOW IN CASE PRIMARY PUMP FAILS. THE CONTRACTOR SHALL PROVIDE A SEQUENCE OF BYPASS PUMPING FOR REVIEW AND APPROVAL BY RIVER AUTHORITY. THE CONTRACTOR SHALL ALSO PROVIDE A DETAILED SKETCH SHOWING THE LOCATION OF BYPASS PUMPING; SPECIFICATIONS FOR THE PUMPING EQUIPMENT; AND TYPE, SIZE, CAPACITY AND NUMBER OF PUMPS REQUIRED TO HANDLE THE PEAK WET WEATHER FLOW.

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

30. 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. THE CONTRACTOR SHALL RECORD HOW MANY PLUGS ARE BEING USED, AS WELL AS THE LOCATION AND IDENTIFICATION OF EACH PLUG. CONTRACTOR WILL REPORT TO PROJECT INSPECTOR OF ANY LOST OR UNRESTRAINED PLUGS.

31. CONTRACTOR WILL BE HELD LIABLE FOR ANY DAMAGE TO SEWER COLLECTION SYSTEM, STOPPAGES, OVER-FLOWS, OR BACKUPS INTO HOMES CAUSED BY LOST OR RUNAWAY SEWER PLUGS.

32. CONTRACTOR WILL BE HELD RESPONSIBLE FOR ANY DAMAGE TO WASTEWATER TREATMENT EQUIPMENT CAUSED BY LOST OR RUNAWAY SEWER PLUGS. CONTRACTOR WILL BE HELD LIABLE FOR REPAIRS.

33. RIVER AUTHORITY IS NOT RESPONSIBLE FOR ANY ABNORMALITIES ON STUB OUT, INVERT, GRADE OR SLOPE FOR ANY EXISTING MANHOLE TIE-IN OR SERVICE LATERAL

MANHOLE NOTES:

34. THERE SHALL BE 400 FEET MAXIMUM SPACE BETWEEN MANHOLES TO PROVIDE ACCESS FOR CLEANING. A 16-FOOT WIDE GATE WITH A LOCK SHALL ALSO BE SUPPLIED AND INSTALLED BY THE CONTRACTOR FOR ACCESSING THE SANITARY SEWER LINE.

35. 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 IN UNPAVED AREAS. IN PAVED AREAS, THE MANHOLE RING SHALL BE FLUSH WITH THE PAVEMENT.

36. EVERY THIRD MANHOLE COVER WILL HAVE A 1" HOLE FOR A VENT.

37. EACH MANHOLE SHALL HAVE TWO LOCKS INSTALLED TO PREVENT REMOVAL.

38. ALL MANHOLES SHALL HAVE A 30" OPENING, WATERTIGHT RINGS AND COVERS, WITH THE RIVER AUTHORITY LOGO AND I/I BARRIER.

39. NEW MANHOLE PROTECTIVE COATING LINER MUST BE APPLIED TO ALL MANHOLES. APPLICATION PROCEDURES SHALL BE IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATION AND PER THE FOLLOWING SPECIFICATIONS:

39.1. CONTRACTOR WILL BE RESPONSIBLE FOR MANHOLE SAFETY AND CONFINED SPACE ENTRY SET BY OCCUPATIONAL SAFETY AND HEALTH STANDARDS, 29 CFR 1910.146 APP. E.
39.2. THE CONTRACTOR SHALL NOTIFY THE RIVER AUTHORITY UTILITIES INSPECTIONS DEPARTMENT A MINIMUM OF 48 HOURS IN ADVANCE OF THE START OF ANY FIELD SURFACE PREPARATION WORK.
39.3. ALL NEW MANHOLES AND THE EXISTING MANHOLE THAT THE PROPOSED SEWER LINE WILL TIE-IN TO SHALL HAVE THE INTERIOR WALL PREPPED AS PER MANUFACTURER'S RECOMMENDATIONS AND COATED WITH A RIVER AUTHORITY APPROVED PRODUCT.
39.4. FOR ALL MANHOLES, APPLY THE CEMENTITIOUS COATING FIRST, FOLLOWED BY THE EPOXY COATING. LAFARGE SEWPERCOAT 200 HR PRODUCT IS THE ONLY APPROVED PRODUCT WHICH COMBINES THE CEMENTITIOUS AND EPOXY COATINGS, UNLESS OTHERWISE LISTED IN THE APPROVED PRODUCT LIST.
39.5. CEMENTITIOUS COATING WITH REQUIRED ONE-INCH-THICK APPLICATION:SEE RIVER AUTHORITY APPROVED PRODUCT SHEET.
39.6. EPOXY COATING: WITH SPECIFIED THICKNESS APPLICATION: SEE RIVER AUTHORITY APPROVED PRODUCT SHEET.
39.7. SPRAY WALL POLYURETHANE SYSTEM REQUIRED THICKNESS 150 MILS
39.8. CONTRACTOR SHALL SUBMIT WARRANTY LETTER ON MANHOLE PROTECTIVE COATING FOR 10 YEARS AFTER FINAL ACCEPTANCE OF PROTECTIVE COATINGS.

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

41. PENETRATION INTO THE MANHOLE WILL BE CORE DRILLED. ANY DAMAGE TO EXISTING MANHOLE WILL BE REPAIRED AT CONTRACTOR'S EXPENSE. IF EXISTING SEWER MANHOLE SEAL COATING IS COMPROMISED, ALL OF THE MANHOLE WILL BE RESEALED.

42. IF ANY EXISTING MANHOLES CONNECTED WITH THIS PROJECT LEAK, THEY SHALL BE SEALED BY THE CONTRACTOR.

43. 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. STUB-OUTS SHALL BE PLUGGED.

44. MANHOLE COVER INSERTS ARE SHOWN IN RIVER AUTHORITY APPROVED PRODUCT SHEET. INSERTS 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.

45. BEFORE BACK FILLING/COMPACTION/CONCRETE ENCASEMENT, ALL MANHOLE JOINT SECTION RISERS, CONE SECTIONS AND GRADE RING SHALL BE WRAPPED WITH INFI-SHIELD GATOR WRAP SEALING SYSTEMS, BUTYL ADHESIVE SEALANT WITH A MINIMUM THICKNESS OF 30 MILS. JOINT SEALANT MUST MEET ASTM C923. MASTIC MUST MEETS ASTM C 990 OR BE APPROVED BY THE RIVER AUTHORITY ENGINEER.

46. 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 POLYETHYLENE 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.

47. A MINIMUM OF TWO AND A MAXIMUM OF FOUR THROAT RINGS WILL BE USED AT EACH MANHOLE FOR ADJUSTMENT.

48. DROP MANHOLES SHALL BE REQUIRED WHEN THE INFLOW ELEVATION IS MORE THAN 24 INCHES ABOVE THE OUTFLOW ELEVATION. DROP SHALL BE LOCATED OUTSIDE THE MANHOLE WITH THE FLOWLINE ELEVATION LOCATED BETWEEN THE CENTER LINE AND TOP OF SEWER LINE.

49. THERE SHALL BE CONCRETE ENCASEMENT 18 INCHES AROUND MANHOLE RING, AND 28 INCHES AROUND THE GATOR WRAP SEALING SYSTEM. CONCRETE ENCASEMENT SHALL BE CIRCULAR, FORMED LEVEL, AND HAVE A SMOOTH OR BROOM FINISH. SEE SPECIFICATIONS.

50. SEWER PIPE CONNECTIONS TO PRECAST MANHOLES SHALL BE APPROVED BY RIVER AUTHORITY. 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 RIVER AUTHORITY ENGINEER.

51. 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 A106.2) OR ASTM D-2321 (ANSI K65.171)]. ALL COMPACTION SHALL BE TO 98% DENSITY. THERE SHALL BE ONE RANDOM DENSITY TEST PER LIFT FOR EVERY 400 FEET. ALL TESTING SHALL BE IN COMPLIANCE WITH CURRENT TXDOT SPECIFICATIONS.

52. A SAND MIGRATION PREVENTION COLLAR SHALL BE INSTALLED WHEN TRANSITIONING FROM SELECT INITIAL BACKFILL TO OPTIONAL SELECT INITIAL BACKFILL. A 2-FOOT LONG CLASS B CONCRETE 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.

SANITARY SEWER PIPING:

52. THE TYPE AND DESCRIPTION OF THE PIPE CONDUIT IS SHOWN ON THE PLANS. REFER TO RIVER AUTHORITY SPECIFICATIONS FOR MATERIALS, STIFFNESS, AND TYPE.

53. THE USE OF ASBESTOS CEMENT PIPE WILL BE PROHIBITED UNDER THIS CONTRACT.

54. 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.

55. SEE SPECIFICATIONS FOR PVC SEWER PIPE WITH OVER 14 FEET OF COVER.

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

57. SEWER PIPE CONNECTIONS TO PRECAST MANHOLES SHALL BE APPROVED BY THE RIVER AUTHORITY. 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 RIVER AUTHORITY ENGINEER.

58. ALL PIPE TRENCHING, BEDDING AND BACKFILL SHALL BE CONDUCTED IN ACCORDANCE WITH RIVER AUTHORITY SPECIFICATIONS. COMPACTION SHALL BE 98% DENSITY; TESTING WILL BE REQUIRED PER LIFT EVERY 400 FEET.

59. SAND MIGRATION PREVENTION COLLAR WHEN CHANGING THE INITIAL BACKFILL FROM SELECT INITIAL BACKFILL TO OPTIONAL SELECT INITIAL BACKFILL. A TWO (2) FOOT LONG CLASS B 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.

SEWER LINE LOCATION:

60. 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.

61. IN PHASED CONSTRUCTION OF THOROUGHFARES, THE SEWER LINE SHALL BE EXTENDED THE ENTIRE LENGTH OF PROPOSED THOROUGHFARE.

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

63. SIZES AND GRADES FOR SANITARY SEWER SHALL BE AS REQUIRED BY THE RIVER AUTHORITY 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.

SEWER SERVICE LATERALS

64. 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.

65. INSERTA-TEE TYPE FITTINGS WILL BE ALLOWABLE. THE MANUFACTURER SHALL COMPLY WITH THOSE IN THE RIVER AUTHORITY APPROVED PRODUCTS LIST.

66. 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).

THE SIZES AND LOCATIONS OF LATERALS SHALL BE DESIGNATED AS FOLLOWS UNLESS OTHERWISE DIRECTED BY THE RIVER AUTHORITY ENGINEER:

67. 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.

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

TRAPS AND INTERCEPTORS (FOG - TECQ)

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

OIL SEPARATORS

70. 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

71. 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

72. 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

73. 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.

LINT TRAPS

74. 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

75. 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

76. 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

77. 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.

78. 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).

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

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

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

82. 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 WASTEWATER.

WATERTIGHT TESTING (24 HOURS):

83. 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 RIVER AUTHORITY INSPECTORS. RIVER AUTHORITY INSPECTORS SHALL RECORD IN DAILY LOG WITH PROJECT NAME, DATE IT WAS TESTED AND COMPLETED.

83.1. MANHOLES WILL BE REQUIRED ON SIX (6) INCH AND LARGER LATERALS WHERE THEY CONNECT TO THE MAIN.
83.2. LATERALS WILL NOT BE ATTACHED TO SEWER MAINS THAT ARE DEEPER THAN TWELVE (12) FEET.
83.3. FITTINGS ARE NOT PERMITTED ON LATERALS BETWEEN THE WYE AND THE PROPERTY LINE.
83.4. DEEP CUT OR DROP CONNECTIONS SHALL NOT BE PERMITTED.
83.5. 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.
83.6. 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.

84. 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.

85. 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.

86. 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

87. BLASTING SHALL NOT BE ACCEPTABLE.

TESTING

88. TESTING SHALL NOT BE CONDUCTED UNTIL ALL OTHER UTILITIES WITHIN THE VICINITY OF THE SANTIARY SEWER ARE FULLY INSTALLED.

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), AS APPLICABLE
D. VACUUM TEST ALL MANHOLES WITHIN THE PROJECT
E. CCTV- ALL OF THE NEW LINES AND PAN/TILT ALL SERVICE LATERALS TO 6"X6" CLEAN OUT. CONTRACTOR SHALL FLOOD ALL LINES BEFORE CCTV.

AT END OF PROJECT, CONTRACTOR SHALL SUBMIT FIELD COPY PLAN AND PROFILES SHOWING AS-BUILT WORK, CCTV DVD, AND COMPACTION DENSITY REPORTS FOR MAIN SEWER LINES AND ALL SERVICE LATERALS. CONTRACTOR SHALL ALSO ISSUE WARRANTY LETTERS FOR MATERIAL AND WORKMANSHIP FOR 12 MONTHS AFTER FINAL ACCEPTANCE.

89. 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 RIVER AUTHORITY SPECIFICATIONS INFILTRATION AND OR EXFILTRATION AND OR LOW-PRESSURE AIR TEST.

C. 313.5(C)(10)(C) OR RIVER AUTHORITY 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.

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

91. 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 RIVER AUTHORITY SPECIFICATIONS. THEY MUST HAVE A PROTECTIVE COATING SPECIFIED IN THE RIVER AUTHORITY APPROVED PRODUCTS LIST, COATING WILL BE MINIMUM OF 200 MILS THICKNESS DEPENDING ON EXISTING CONDITIONS, TO PREVENT INFRASTRUCTURE INFILTRATION, FOLLOW MANUFACTURER'S RECOMMENDATION ON PROTECTIVE COATING.

92. 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.

93. A COPY OF ALL TESTING REPORTS INCLUDING BACKFILL COMPACTION TESTS SHALL BE FORWARDED TO THE RIVER AUTHORITY.

94. 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

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

96. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NOT PERMANENTLY PLACE ANY

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
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TBPE Firm#: F-14909
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		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	SSDT3146001

SHEET TITLE:
SANITARY SEWER NOTES

SHEET NUMBER:
7.9

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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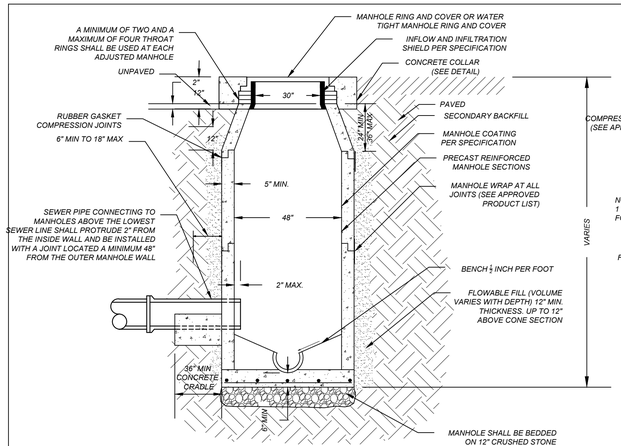
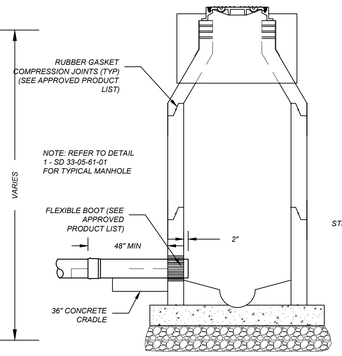
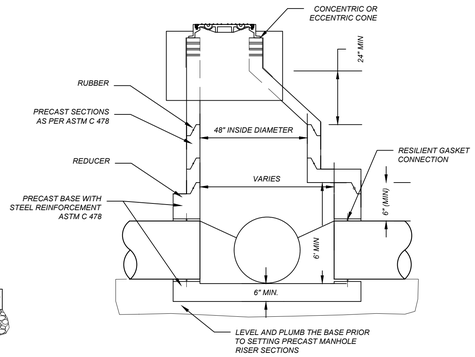


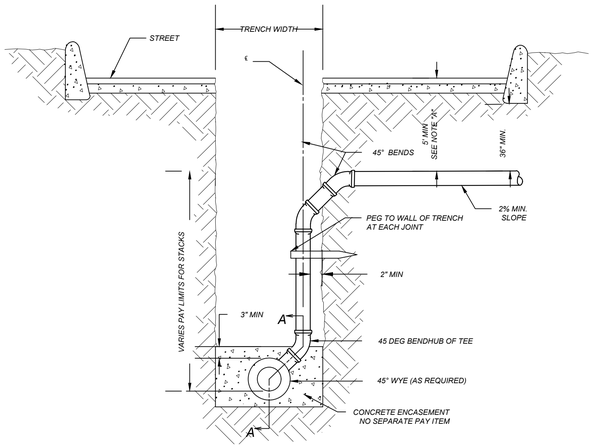
PRECAST MANHOLE



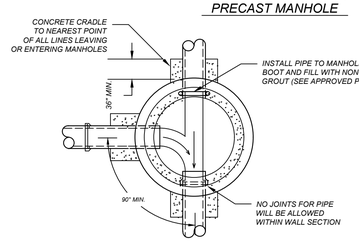
PRECAST MANHOLE PRECAST BASE



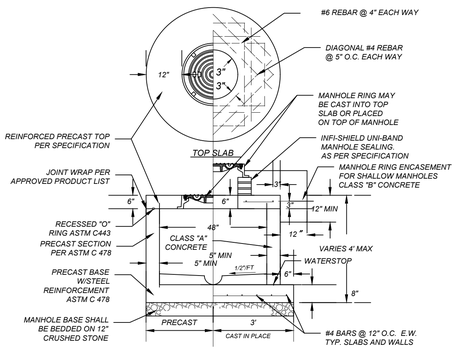
PRECAST MANHOLE ON PRECAST BASE FOR PIPE SIZES 24" AND LARGER



VERTICAL STACK DETAIL

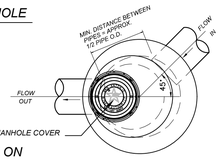


MANHOLE FLOOR PLAN



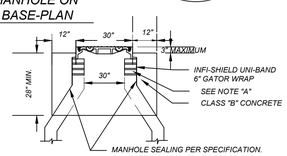
SHALLOW MANHOLE

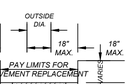
MAX PIPE SIZE OD		
MANHOLE DIA	0° To 45° > DEFL.	45° DEFL.
5 FT	42"	32"
6 FT	51"	38"
8 FT	73 1/2"	50"



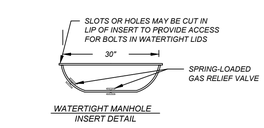
PRECAST MANHOLE ON PRECAST BASE-PLAN

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



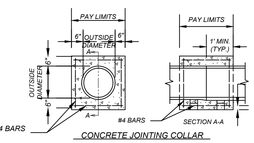


NOTE: REFER DETAIL 1 - SD 33-05-61-01 FOR TYPICAL MANHOLE



SUPPORT FOR ENCASEMENT OR CRADLE

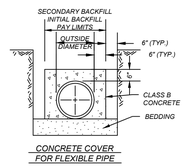
NOTES:
1) ALL CONCRETE ENCASEMENT SHALL BE POURED AT A PLANE 6" ABOVE THE PIPE BETWEEN EXCAVATED TRENCH WALLS.
2) ALL SEWER PIPE WITH LESS THAN 3' OF COVER TO SUBGRADE SHALL BE CONCRETE ENCASED.
3) ALL FORCE MAINS SHALL BE PROVIDED WITH THRUST BLOCKS, WHERE CHANGES IN DIRECTION OCCUR, AT TEES, BENDS,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



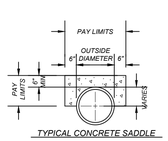
AFTER CENTERING PIPE ENDS, WRAP JOINTS WITH 3" WIDE POLYVINYL TAPE OR RUBBER ADAPTER, CAN-TEX 1-70A OR EQUAL

PIPE SECTIONS TO BE BLOCKED AND SUPPORTED SIMILAR TO THE ENCASEMENT DETAIL SHOWN BELOW, (SUBJECT TO APPROVAL)

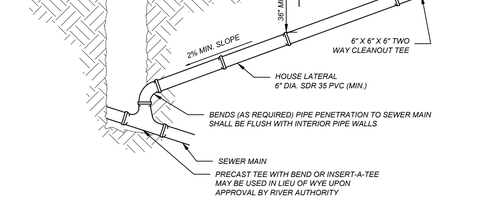
CONCRETE JOINTING COLLAR



CONCRETE COVER FOR FLEXIBLE PIPE

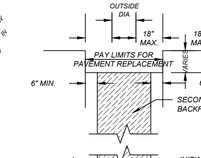


TYPICAL CONCRETE SADDLE



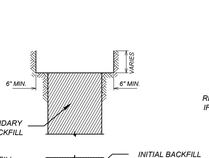
NOTES:

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



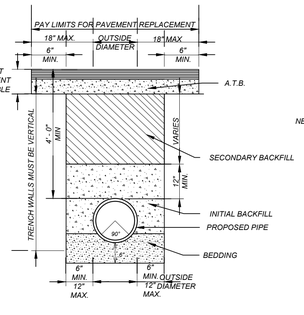
* SEWER GRAVEL 12" MIN. OR 1/8 O.D. OF THE PIPE, WHICHEVER IS GREATER AS DIRECTED BY THE RIVER AUTHORITY

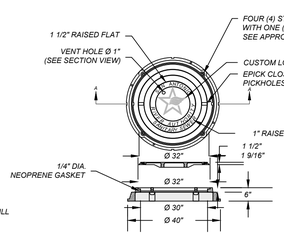
1) RIGID PIPE - UNSTABLE OR UNACCEPTABLE CONDITIONS FLEXIBLE PIPE - ALL CONDITIONS



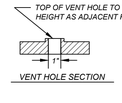
* IN AREAS OF OVER EXCAVATION, ENCASEMENT SHALL EXTEND FROM TRENCH WALL TO TRENCH WALL. PAY LIMITS SHALL NOT EXCEED 12" MAX. AS SHOWN ON DETAIL. ADDITIONAL ENCASEMENT SHALL BE INCIDENTAL.

2) RIGID PIPE - EXISTING STABLE BEDDING CONDITIONS



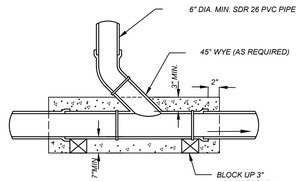


WATERTIGHT MANHOLE INSERT DETAIL



VENT HOLE SECTION

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



SECTION A-A

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CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

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		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: SSDT3146001

SHEET TITLE: SANITARY SEWER DETAILS

SHEET NUMBER: 7.10

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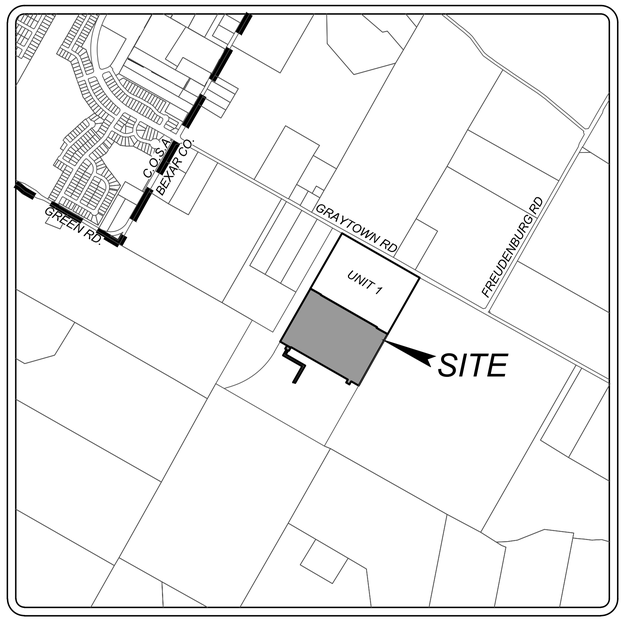
FISCHER GARDENS UNIT 2

BEXAR COUNTY, TX

WATER IMPROVEMENTS



LOCATION MAP
NOT-TO-SCALE

INDEX	
SHEET TITLE	SHEET NUMBER
WATER IMPROVEMENTS COVER SHEET	8.1
WATER DISTRIBUTION PLAN (SHEET 1 OF 2)	8.2
WATER DISTRIBUTION PLAN (SHEET 2 OF 2)	8.3
WATER DETAILS (SHEET 1 OF 5)	8.4
WATER DETAILS (SHEET 2 OF 5)	8.5
WATER DETAILS (SHEET 3 OF 5)	8.6
WATER DETAILS (SHEET 4 OF 5)	8.7
WATER DETAILS (SHEET 5 OF 5)	8.8

SA GIVEN TO FLY, LLC
6812 WEST AVENUE, SUITE 100
SAN ANTONIO, TX 78213
PHONE: 210-701-8337

RESIDENTIAL LOTS = 148

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		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	OWCV3146001

SHEET TITLE:
WATER IMPROVEMENTS
COVER SHEET

SHEET NUMBER:
8.1

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NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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.

PRESSURE REDUCING VALVE (PRV) NOTE:

CONTRACTOR TO VERIFY THAT NO PORTION OF THE TRACT IS BELOW GROUND ELEVATION OF 895 FEET WHERE THE STATIC PRESSURE WILL NORMALLY EXCEED 80 PSI. AT ALL SUCH LOCATIONS WHERE THE GROUND LEVEL IS BELOW 895 FEET, THE DEVELOPER OR BUILDER SHALL INSTALL AT EACH LOT, ON THE CUSTOMER'S SIDE OF THE METER, AN APPROVED TYPE PRESSURE REGULATOR IN CONFORMANCE WITH THE PLUMBING CODE OF THE CITY OF SAN ANTONIO. NO DUAL SERVICES ALLOWED FOR ANY LOT(S) IF *PRV IS / ARE REQUIRED FOR SUCH LOT(S). ONLY SINGLE SERVICE CONNECTIONS SHALL BE ALLOWED. WATER SERVICES WHERE PRV'S REQUIRED ARE DESIGNATED BY AN ASTERISK (*).

*NOTE: A PRESSURE REGULATOR IS ALSO KNOWN AS A PRESSURE REDUCING VALVE(PRV)

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.

COMPACTION NOTE:

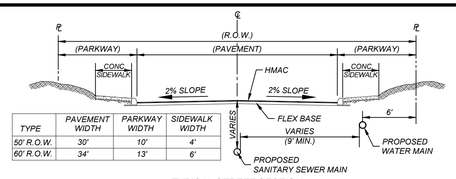
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 INCH LOOSE LIFT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

JOINT RESTRAINT NOTE:

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

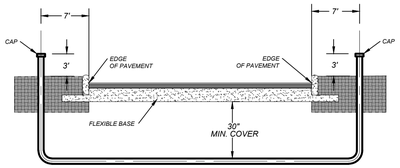
TRENCH EXCAVATION SAFETY PROTECTION

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



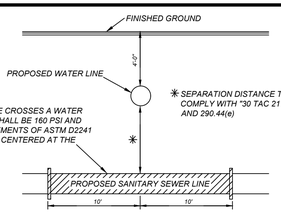
TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	6'

TYPICAL STREET SECTION
N.T.S.

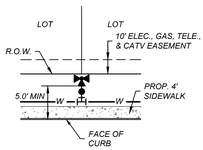


TYPICAL CONDUIT DETAIL
NOT-TO-SCALE

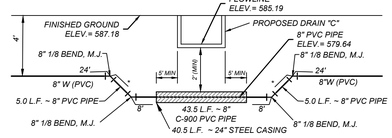
NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH CPS FACILITY AT ALL STREETS AND DRAIN CROSSING IF BUILT AHEAD OF CPS CONSTRUCTION. SLEEVES MUST ALSO BE LOCATED FOR CPS CREWS DURING CONSTRUCTION. (SEPARATE ITEM) SEE THIS SHEET FOR CONDUIT CROSSING DETAIL AND SCHEDULE



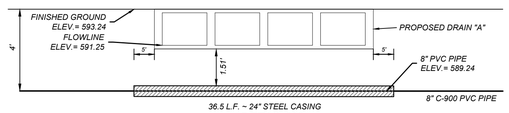
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.



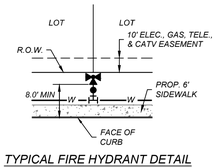
TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE



DETAIL "B"
VERTICAL OFFSET
N.T.S



DETAIL "A"
DRAIN CROSSING
N.T.S

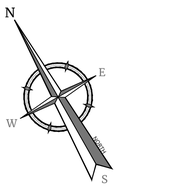


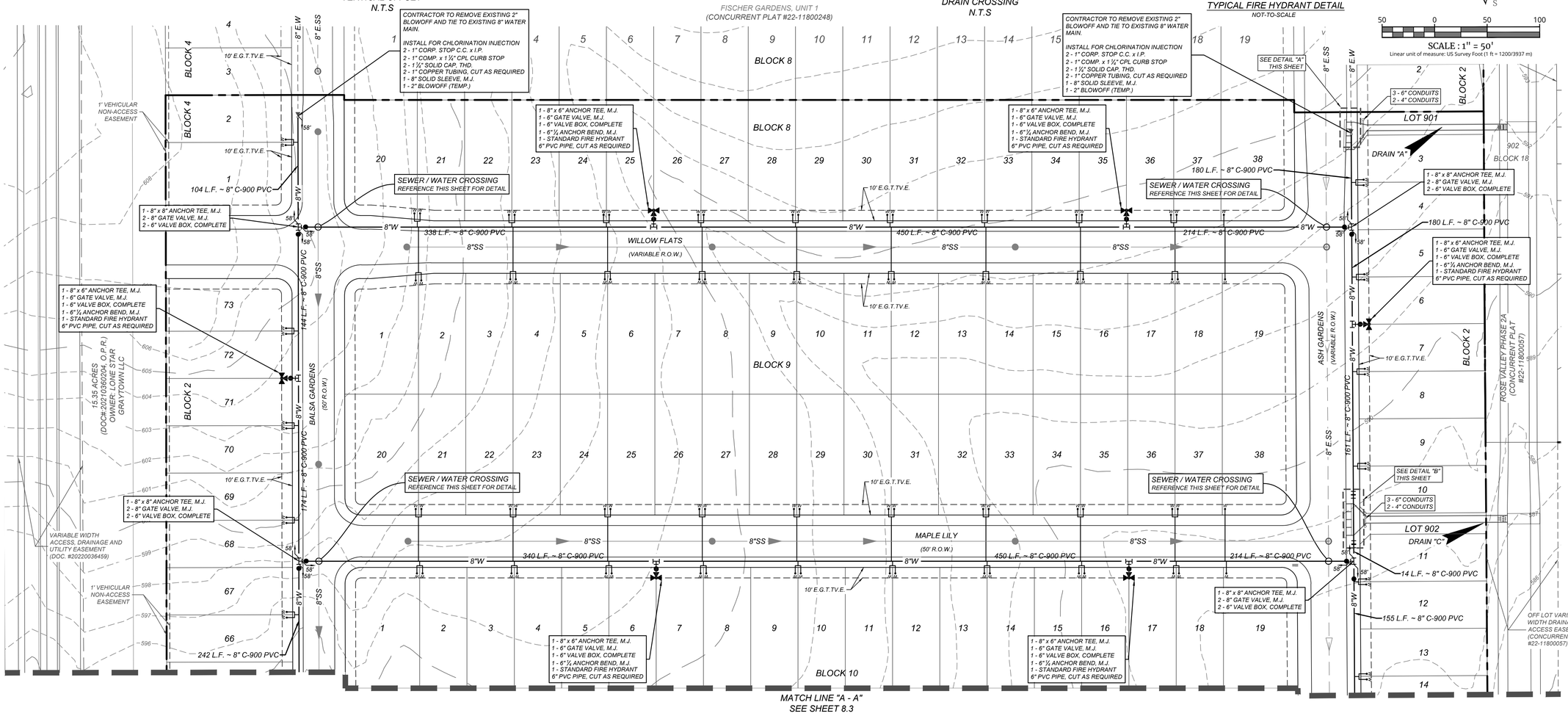
TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	W
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. 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

LOCATION MAP
NOT-TO-SCALE





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

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REV	DATE	DESCRIPTION	DRAWN BY

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	OW3146001

SHEET TITLE:
WATER DISTRIBUTION PLAN (SHEET 1 OF 2)

SHEET NUMBER:
8.2

N:\3146\02\10\DESIGN\CIVIL\WATER\OW3146001.DWG By: DYLAN.FORSTER 5/15/2024 3:56 PM

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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.

PRESSURE REDUCING VALVE (PRV) NOTE:

CONTRACTOR TO VERIFY THAT NO PORTION OF THE TRACT IS BELOW GROUND ELEVATION OF 895 FEET WHERE THE STATIC PRESSURE WILL NORMALLY EXCEED 80 PSI. AT ALL SUCH LOCATIONS WHERE THE GROUND LEVEL IS BELOW 895 FEET, THE DEVELOPER OR BUILDER SHALL INSTALL AT EACH LOT, ON THE CUSTOMER'S SIDE OF THE METER, AN APPROVED TYPE PRESSURE REGULATOR IN CONFORMANCE WITH THE PLUMBING CODE OF THE CITY OF SAN ANTONIO. NO DUAL SERVICES ALLOWED FOR ANY LOT(S) IF *PRV IS / ARE REQUIRED FOR SUCH LOT(S). ONLY SINGLE SERVICE CONNECTIONS SHALL BE ALLOWED. WATER SERVICES WHERE PRV'S REQUIRED ARE DESIGNATED BY AN ASTERISK (*).

*NOTE: A PRESSURE REGULATOR IS ALSO KNOWN AS A PRESSURE REDUCING VALVE(PRV)

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.

COMPACTION NOTE:

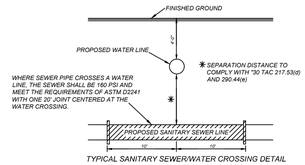
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAVING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 INCH LOOSE LIFT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

JOINT RESTRAINT NOTE:

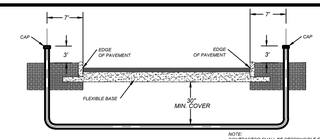
CONTRACTOR SHALL INSTALL RETAINER GLANDS AT ALL FITTINGS AND PROVIDE JOINT RESTRAINING HARNESS OR FIELD LOCK GASKETS AT ALL JOINTS WITHIN THE LENGTH SHOWN. CONTRACTOR SHALL INSURE THAT ALL TEES, BENDS, VALVES, ETC. HAVE A MINIMUM OF 5 FT OF PIPE WITH NO JOINTS ON EACH SIDE OF THE FITTING. JOINT RESTRAINTS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

TRENCH EXCAVATION SAFETY PROTECTION

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



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



TYPICAL CONDUIT DETAIL
NOT-TO-SCALE

NOTE:
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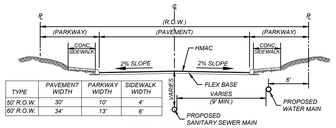
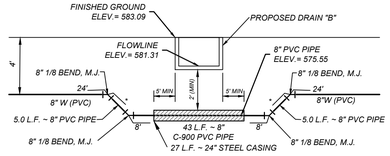
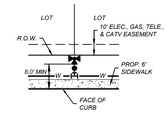


TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	30'	10'	4'
60' R.O.W.	34'	13'	6'

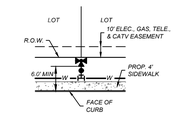
TYPICAL STREET SECTION
N.T.S.



DETAIL "C"
VERTICAL OFFSET



TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

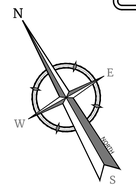


TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

LEGEND

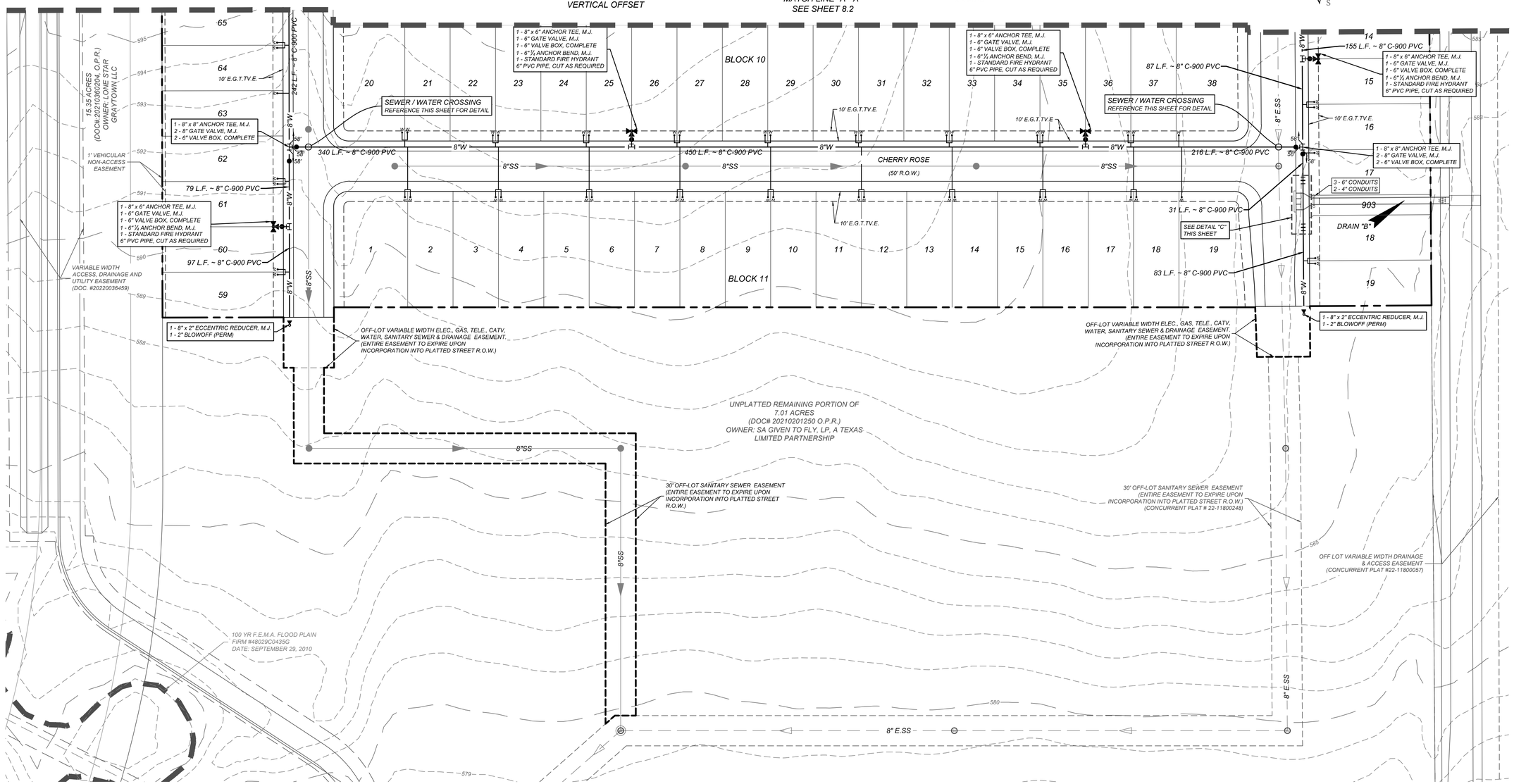
PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	IRRIG
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
PROPOSED 100W STREETLIGHT	=	
PROPOSED SANITARY SEWER MAIN	=	SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	S
PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT	=	E. G. T. TV. 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

LOCATION MAP
NOT-TO-SCALE



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

MATCH LINE "A - A"
SEE SHEET 8.2



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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	GW3146001

SHEET TITLE:
WATER DISTRIBUTION PLAN
(SHEET 2 OF 2)

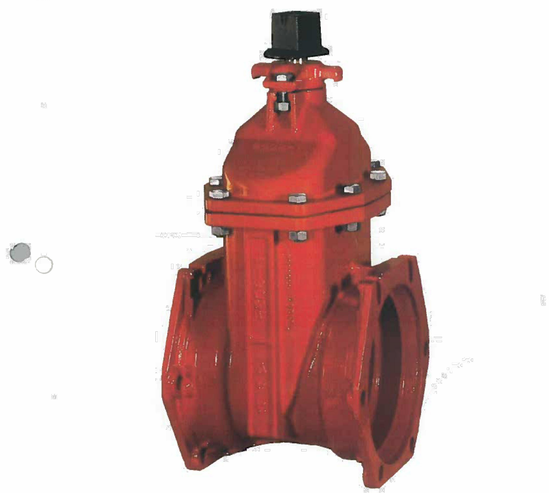
SHEET NUMBER:
8.3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\3146\001\DESIGN\CIVIL\WATER\GW3146001.DWG By:DYLAN.FORSTER 5/15/2024 3:07 PM

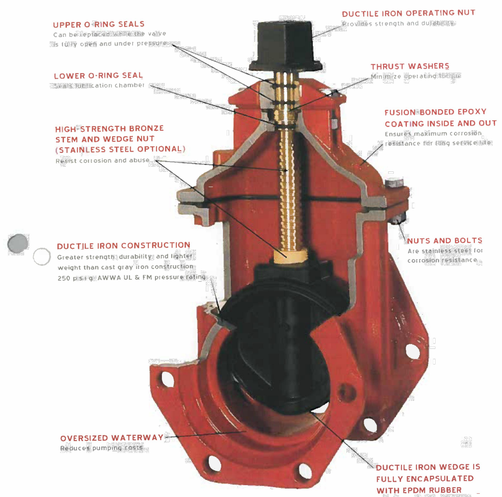
AMERICAN FLOW CONTROL

2" – 12" SERIES 2500 RESILIENT WEDGE GATE VALVE



2" – 12" SERIES 2500 RESILIENT WEDGE GATE VALVE

CONSTRUCTION



THE RIGHT WAY 1

2" – 12" SERIES 2500 RESILIENT WEDGE GATE VALVE

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, in 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.

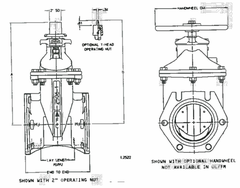
All valves shall be the AMERICAN Flow Control **Series 2500 or 2500-1 Resilient Wedge Gate Valves**.

THE RIGHT WAY 2

2" – 12" SERIES 2500 RESILIENT WEDGE GATE VALVE

DRAWING/DIMENSIONS

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



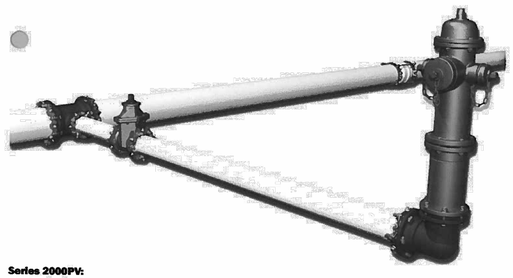
QUANTITY							
2"	2-1/2"	3"	4"	6"	8"	10"	12"
☐ NRS with 2" Sq. Oper. Nut			☐ NRS with T-Head Oper. Nut				
☐ NRS with Handwheel			☐ Post Indicator Valve (PIV)				
☐ OS & Y							
Actuator: (Check One)							
☐ NRS with Enclosed Miter Gearing							
☐ 2" Sq. Oper. Nut Parallel to Waterway							
☐ 2" 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	24.06	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.

THE RIGHT WAY 3



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.

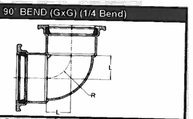
The design of the 2000PV incorporates the gripping mechanism into the design of the mechanical joint gland and utilizes a simple two part assembly process. The first step involves assembling the joint the same as any standard mechanical joint. The assembly procedure we recommend is that established in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

HARCO DUCTILE IRON IPS GASKETED FITTINGS
DESIGN DATA

CROSSOVER RING

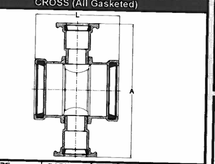
SIZE	PART No.	A	L	WT. (approx.)
3	82103	3.6	6.6	3.1
4	82104	4.6	7.7	4.6
6	82106	6.7	10.0	7.5

90° BEND (GxG) (1/4 Bend)



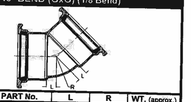
SIZE	PART No.	L	R	WT. (approx.)
1½	80020	1.1	1.1	4.4
2	80120	1.4	1.4	5.9
2½	80220	1.6	1.6	7.1
3	80320	2.0	2.0	10.2
4	80420	2.5	2.5	15.1
6	80620	3.5	3.5	26.7
8	80820	wt.5	4.5	42.0
10	81020	5.6	5.6	67.0
12	81220	6.7	6.7	99.0
14	81420	7.8	7.8	164.7
16	81620	9.0	9.0	203.2
18	81820			482.0

CROSS (All Gasketed)



SIZE	PART No.	A	L	WT. (approx.)
2½ x 2½ x 1¼ x 1¼	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	21.9	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	79
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

45° BEND (GxG) (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			259.0

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

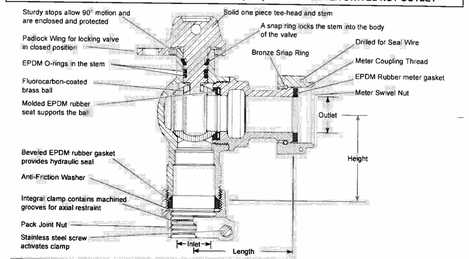
HARCO
THE HARRINGTON CORPORATION
P.O. BOX 10335 • LYNCHBURG VIRGINIA 24506 • PLANT 3721 COHEN PLACE • LYNCHBURG VIRGINIA 24501
PHONE: (434) 845-7094 • FAX: (434) 845-8562 • E-mail: sales@harcofittings.com

Form XXX – 12/03/2002_r.3

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"	2-1/64"	1-7/8"	2.2	BA43-33VW	
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"	4-19/64"	2-7/32"	2.4	BA43-343W	✓
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.

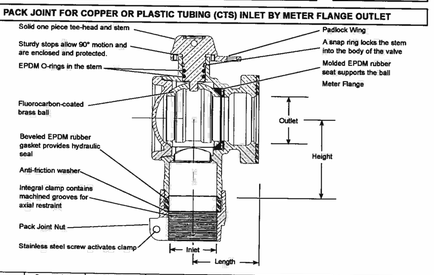
FORD
The Ford Meter Box Company, Inc.
P.O. Box 443, Wabash, Indiana U.S.A. 46992-0443
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com
11/24/10

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

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FORD
The Ford Meter Box Company, Inc.
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Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
www.fordmeterbox.com
03/28/14

Submitted By:

Colliers Engineering & Design
www.colliersengineering.com

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Formerly Known as KFW

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5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR
FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: OWDT3146001

SHEET TITLE: WATER DETAILS (SHEET 1 OF 5)

SHEET NUMBER: 8.4

N:\314-60\01\05\CAD\CIVIL\WATER\OWDT3146001.DWG By: DYLAN.FOSTER 5/15/2024 3:07 PM

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

MUELLER® 2360 SERIES RESILIENT WEDGE GATE VALVE

Mueller Co.

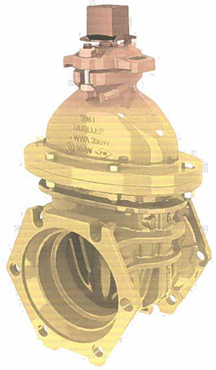
10.1

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.

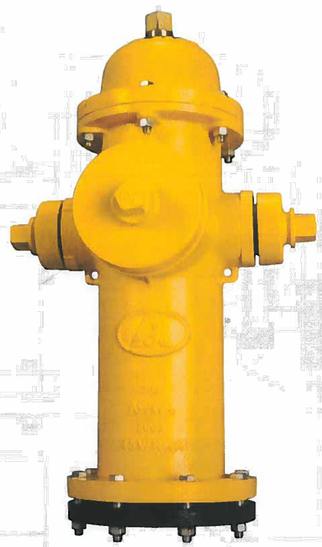
- STEM – 16"-54" manganese bronze casting with integral thrust collar.

SIZE	AWWA C515 WORKING PRESSURE	UL WORKING PRESSURE	FM WORKING PRESSURE
14"-16"	250	250	350
18"-24"	350	175*	-
30"-48"	250	-	-
54"	2501	-	-

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

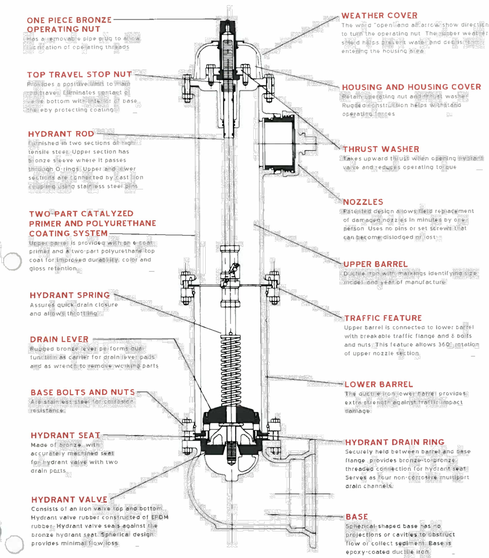
Double-Disc Style gate valves follow the RW valve pages.

EC Specs



CONSTRUCTION

FULLY COMPLIES WITH AWWA C502 AND IS AVAILABLE IN CONFIGURATIONS WHICH ARE UL LISTED AND FM APPROVED.



ONE PIECE BRONZE OPERATING NUT
Has a hexagonal base easy to allow operation of operating threads.

TOP TRAVEL STOP NUT
Provides a positive limit to main rod travel; eliminates contact of the bottom with the top of base, the easy protecting coating.

HYDRANT ROD
Furnished in two sections of high tensile steel. Upper section has bronze sleeve where it passes through O-rings. Upper and lower sections are connected by a stainless coupling using stainless steel pins.

TWO-PART CATALYZED PRIMER AND POLYURETHANE COATING SYSTEM
Upper barrel is provided with an E-coat primer and a two-part polyurethane top coat for increased durability, color and gloss retention.

HYDRANT SPRING
Assures quick stream closure and allows free rotation.

DRAIN LEVER
Rugged bronze lever performs dual function as carrier for drain valve pads and as wrench to remove working parts.

BASE BOLTS AND NUTS
All bolts are steel for strength and resistance.

HYDRANT SEAT
Made of bronze, with accurately machined seat for hydrant valve with two drain pads.

HYDRANT VALVE
Consists of an iron valve top and bottom. Hydrant valve rubber constructed of EPDM rubber. Hydrant valve seals against the bronze hydrants seat. Spherical design provides minimal flow loss.

WEATHER COVER
The weather operations attached to show direction to turn the operating nut. The rubber weather shield helps prevents water and debris from entering the housing area.

HOUSING AND HOUSING COVER
Retain operating nut and thrust washer. Rugged construction helps withstand operating forces.

THRUST WASHER
Takes upward thrust when opening hydrant valve and reduces operating torque.

NOZZLES
Patented design allows field replacement of damaged nozzles in minutes by one person. Uses no pins or set screws that can become dislodged or lost.

UPPER BARREL
Ductile iron with markings identifying size, model and year of manufacture.

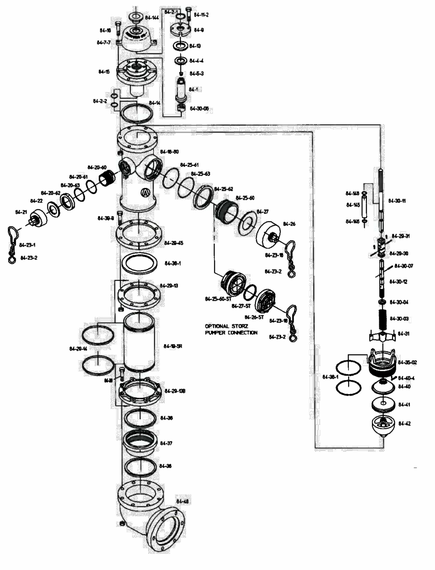
TRAFFIC FEATURE
Upper barrel is connected to lower barrel with breakable traffic flange and 8 bolts and nuts. This feature allows 360° rotation of upper nozzle section.

LOWER BARREL
The ductile iron lower barrel provides extra protection against earth loads damage.

HYDRANT DRAIN RING
Securely held between barrel and base flange, provides bronze-to-bronze, threaded connection for hydrant seat. Serves as four non-corrosive main port drain channels.

BASE
Spherical shaped base has no projections or cavities to obstruct flow or collect sediment. Base is epoxy-coated ductile iron.

EXPLODED DRAWINGS



PARTS LIST

DF 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-SR	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 Dip 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	Clevis & Clip 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" (or 4") M.J. 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 fire hydrants as outlined in AWWA Manual M 17 for hydrostatic, field testing and Maintenance of Fire Hydrants. The ease of operation and the frequency of repair depends on the condition of the valves system and the maintenance given. Dirt, gravel and other foreign material in the hydrant may prevent it from closing or draining 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 Underwriter's 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 bucking 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**.

Colliers Engineering & Design
www.colliersengineering.com

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Formerly Known as KFW ENGINEERING & SURVEYING

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

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: OWDT3146001

SHEET TITLE: WATER DETAILS (SHEET 2 OF 5)

SHEET NUMBER: 8.5

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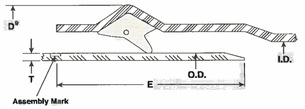
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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

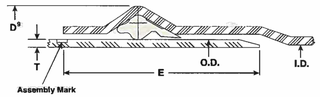
Product Standard: ANSI/AWWA C909
UL1285 6"-12" PC 235
Pipe Compound: ASTM D1784 Cells Class 12454
Gasket: ASTM F477
Integral Bell Joint: ASTM D3139
Certifications: ANSI/NSF Standard 61
UL1285 6"-12" PC 235
Pipe Length: 20 feet laying length
Installation: AWWA C605
JM Eagle™ Installation Guide

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	5.87	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."

BIG BLUE™

SUBMITTAL AND DATA SHEET

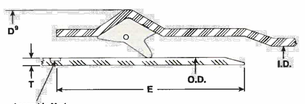
PIPE SIZE (IN)	AVERAGE O.D. (IN)	NOM. I.D. (IN)	MIN. T. (IN)	E_1 (IN)	E_2 (IN)	APPROX. D° (IN)	APPROX. WEIGHT (LBS/FT)
Rated psi 305 (DR 14)							
16	17.40	14.85	1.242	8 ½	9 ½	21.68	43.77
Rated 235 psi (DR 16)							
14	15.30	13.50	0.850	7 1/8	8 1/8	19.00	26.75
16	17.40	15.35	0.967	8 ½	9 4/8	21.62	34.86
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	10 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 4/8	9 4/8	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 4/8	9 4/8	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	39.46
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

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

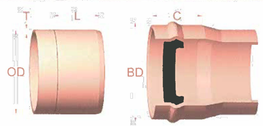


I.D. Inside Diameter
O.D. Outside Diameter
T Wall Thickness
D° Bell Outside Diameter
E Distance between Assembly Mark to the end of spigot

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

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	3.38
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

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 Rieber 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 F477
PPI TR-3

ASTM D1784
ANSI/NSF 14
UL 1285

ASTM D3139
ANSI/NSF 61

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: 11/2013

2801 Post Oak Blvd. | Suite 600 | Houston | TX | 77056
Phone: 713-840-7473 Toll Free 800-999-7473 Fax: 713-552-0087

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www.colliersengineering.com

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Formerly Known as KFW

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

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: OWDT3146001

SHEET TITLE: WATER DETAILS (SHEET 3 OF 5)

SHEET NUMBER: 8.6

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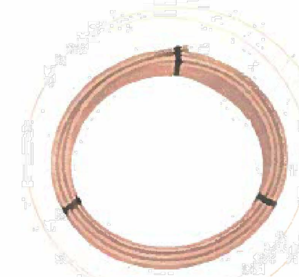
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

ADS POTABLE WATER SERVICE TUBING (CTS)

ADS PolyFlex



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.

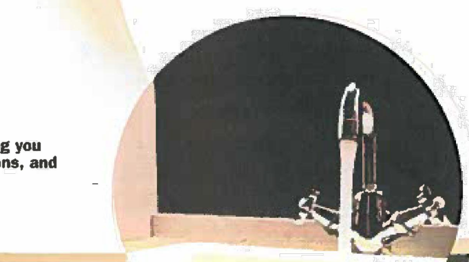
ADS CTS tubing is strong and resistant to many common causes of damage such as vibrations, surface loads and pressure surges.

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.**



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) 3608 CTS	¾"	1"	1¼"	1 ½"	2"
Outside Diameter (mm)	0.875 ±0.004 (22.2 ±0.10)	1.125 ±0.005 (28.6 ±0.13)	1.375 ±0.005 (34.9 ±0.13)	1.625 ±0.006 (41.3 ±0.15)	2.125 ±0.006 (54.0 ±0.51)
Wall Thickness (mm)	0.097 +0.01 (2.5 +0.25)	0.125 +0.012 (3.2 +0.30)	0.153 +0.015 (3.9 +0.38)	0.181 +0.018 (4.6 +0.46)	0.236 +0.024 (6.0 +0.61)
Pressure Rating @ 73° F, psi (kPa)	200 (1379)	200 (1379)	200 (1379)	200 (1379)	200 (1379)
Weight gm/ft (gm/m)	46 ±2 (151 ±7)	78 ±3 (256 ±10)	125 ±4 (410 ±13)	162 ±4 (531 ±13)	275 ±5 (902 ±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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4640 Trueman Blvd., Hilliard, OH 43026
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- 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 CLAMPS GRIP

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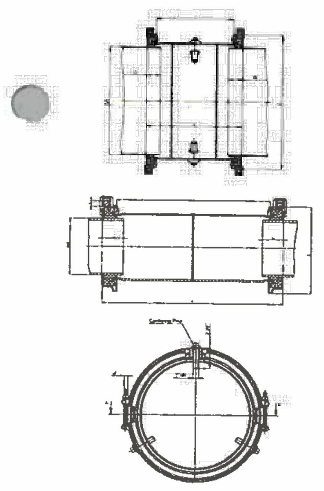

PRODUCT SPECIFICATIONS

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	Reference Number	NPS (inch)	Overal Range (inch)	Range Before removal of inner layer (inch)	Range After removal of inner layer (inch)	D (inch)	[illegible] (inch)	I (inch)	Nuts and Bolts (mm)	Torque for Bolts (Ft-Lbs)	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"	3.46-4.33	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	20190638260	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	42
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"	15.00-17.10	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" LR	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.

⚠ WARNING

⚠ WARNING — NATURAL GAS

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KRAUSZ Repair the past. Connect the future.

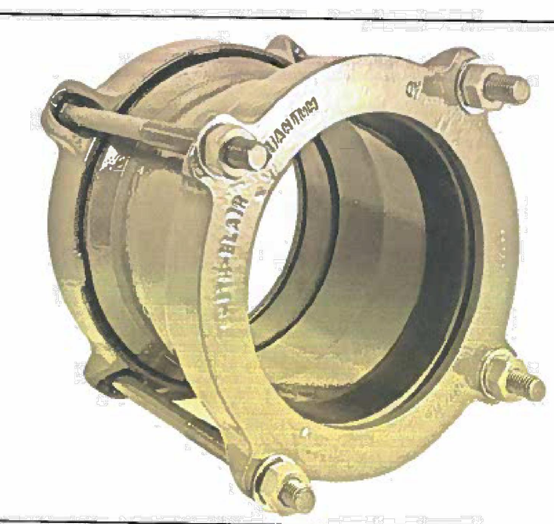
*The Hymax Trademark and Patent is property of Krausz Industries Ltd. Note: To extend product life in corrosive environments, poly-wrapping and/or cathodic protection of the coupling is recommended.
Note: All Stainless Steel Bolts are coated with a Dry Anti-Seize Lubricant that prevents galling. Use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

BR0003 Version A

Smith-Blair
A SENSUS COMPANY

Clamp and Coupling Products CC-460 03/11

Quantum® Coupling
Wide-Range



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.

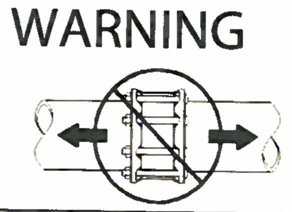
The Quantum also provides for misalignment and settlement deflection (3° per end) and makes a leak-resistant joint that allows for limited line movement due to expansion and contraction.

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.

Smith-Blair

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 - 9.85	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

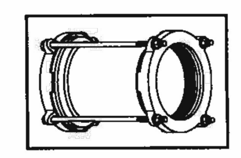
WARRANTY:
Smith-Blair warrants its products only against defects in materials and workmanship. Smith-Blair's liability and customer's exclusive remedy under this warranty, or any warranty, extends for a period of one (1) year from the date of Smith-Blair's shipment and is expressly limited to repayment 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) 643-9705 • (870) 773-5127 Fax: (800) 648-6792 • (870) 773-5212 Website: www.smith-blair.com

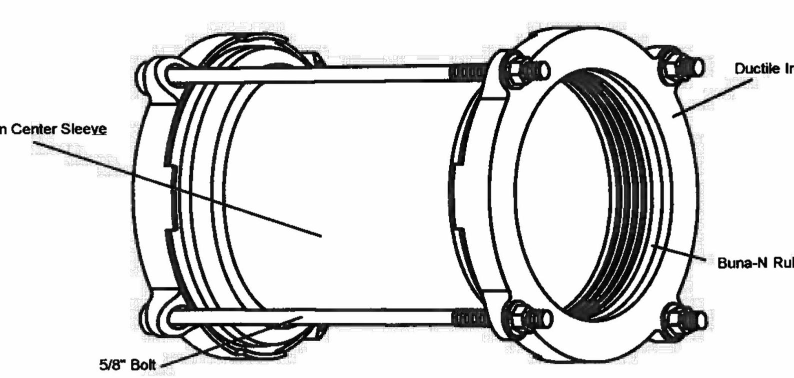
SWP/5000/0311

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"	36	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:

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5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

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		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	OWDT3146001

SHEET TITLE:
WATER DETAILS (SHEET 4 OF 5)

SHEET NUMBER:
8.7

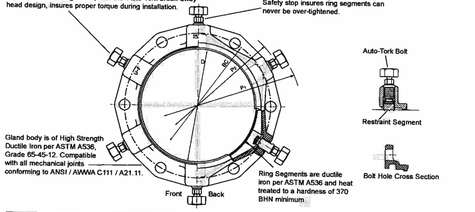
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\314\60\01\DESIGN\CIVIL\WATER\OWDT3146001.DWG By: DYLAN.FOERSTER 5/15/2024 3:08 PM

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**		BC	D	Pressure Rating			✓ Submitted Item(s)
						C900 C909	IPS			C900	C909	ASTM D2241	
										DR-18	DR-14	PC-255	SDR-26 SDR-21
3"	3.50"	UFR1500-3-U	4	9	11.50"	9.00"	8.19"	4.06"		-	-	-	160 PSI 200 PSI
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"	6.65"-6.90"	UFR1500-6-U	6	14	15.13"	11.60"	11.65"	9.50"	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"	9.10"	235 PSI	305 PSI	235 PSI	160 PSI 200 PSI
10"	10.75"-11.10"	UFR1500-10-U	8	25	19.38"	16.00"	15.85"	14.00"	11.20"	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.
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

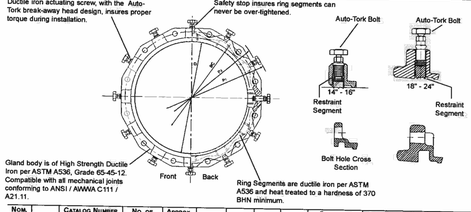
03/01/12

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	27.38	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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Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com

10/16/13

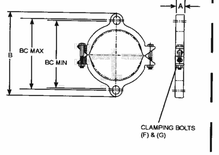
Submitted By:

SUBMITTAL INFORMATION

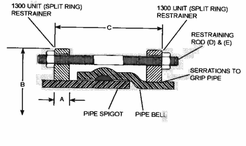
Uni-Flange Restraint *(UFR1390-C-x-U style)*

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		A	B Approx	C Max	Restraining Rods		Clamping Bolts		BC Max	BC Min	✓ Submitted Items
	OD	Catalog No.				No. D	Size E	No. F	Size G			
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

09/13/13

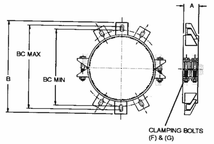
Submitted By:

SUBMITTAL INFORMATION

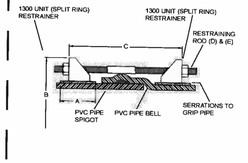
Restrainer *(UFR1390-C-xx-U style)*

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		A	B Approx	C Max	Restraining Rods		Clamping Bolts		BC Max	BC Min	Approx. Wt. Lbs.	✓Submitted Item(s)
	OD	Catalog No.				Qty. D	Size E	Qty. F	Size G				
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"	263	
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"	48-1/4"	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.

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.

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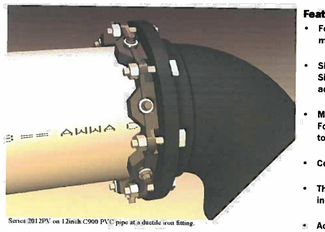
Phone: 260-563-3171 / Fax: 800-826-3487
Overseas Fax: 260-563-0167
http://www.fordmeterbox.com

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.

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

Features and Applications:

- **For restraining plain and 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.

3414-T

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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.

1200TT Series
12" Ribbed Standard Rectangular Box
- Original design
- Uses 1200 Series Lid
- Overlapping lid (3-1/2") 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
DFW1200.LID	12X17 RECT STD BLACK LID	2.20	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

1300 Series
12" Ribbed Rectangular Box
- Original design
- Uses 1200 Series Lid
- Overlapping lid (1-1/4") 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	48.80

01/2014 Rev-PVOT: 5
Made in the U.S.A. ♻ Responsible Recycler
For other sizes, colors, and options, please contact our Customer Service Department at 1.800.806.1212

www.dfwplasticsinc.com

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 $1.85
E	Rebar Installed	Add $2.25
K	Plastic Key Lock	Add $5.00
M	Magnet Detector	Add $2.10
N	Houston Key Lock	Add $5.00
R	Plastic Reader	Add $ 1.40
T	Molded Touch Read Hole	Add $ 1.30
U	Small AMR Pad Locator	Add $ 3.15
Z	Drilled Touch Read Hole	Add $2.10

Lid Options

Item No.	Item Description	Base Price
DFW1091.LID	6X9 ECONO BLACK LID "WATER"	2.90
DFW1000.LID	9X15 RECT BLACK LID	9.20
DFW1100.LID	10X12 ROUND BLACK LID	6.65
DFW1200.LID	12X17 RECT STD BLACK LID	16.75
DFW1500.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				
EJ32131020	12" STD EJ DOMESTIC CAST IRON SOLID LID FOR 1200TT	12.00	90	50.75
EJ32401525	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
LC1419DFW	12" STD OVERLAPPING SOLID CAST IRON LID FOR 1200/1300 BODY	14.00	1	50.50

01/2014 Rev-PVOT: 5
Made in the U.S.A. ♻ Responsible Recycler
For other sizes, colors, and options, please contact our Customer Service Department at 1.800.806.1212

www.dfwplasticsinc.com

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www.colliersengineering.com

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Formerly Known as KFW ENGINEERS & SURVEYING

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REV	DESCRIPTION	DRAWN BY	DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER: 314-60-01
DRAWING NAME: OWDT3146001

SHEET TITLE: WATER DETAILS (SHEET 5 OF 5)

SHEET NUMBER: 8.8

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

N:\314\60\01\DSIGN\CIVIL\WATER\OWDT3146001.DWG By: DYLAN.FOERSTER 5/15/2024 3:59 PM

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 ARE 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.

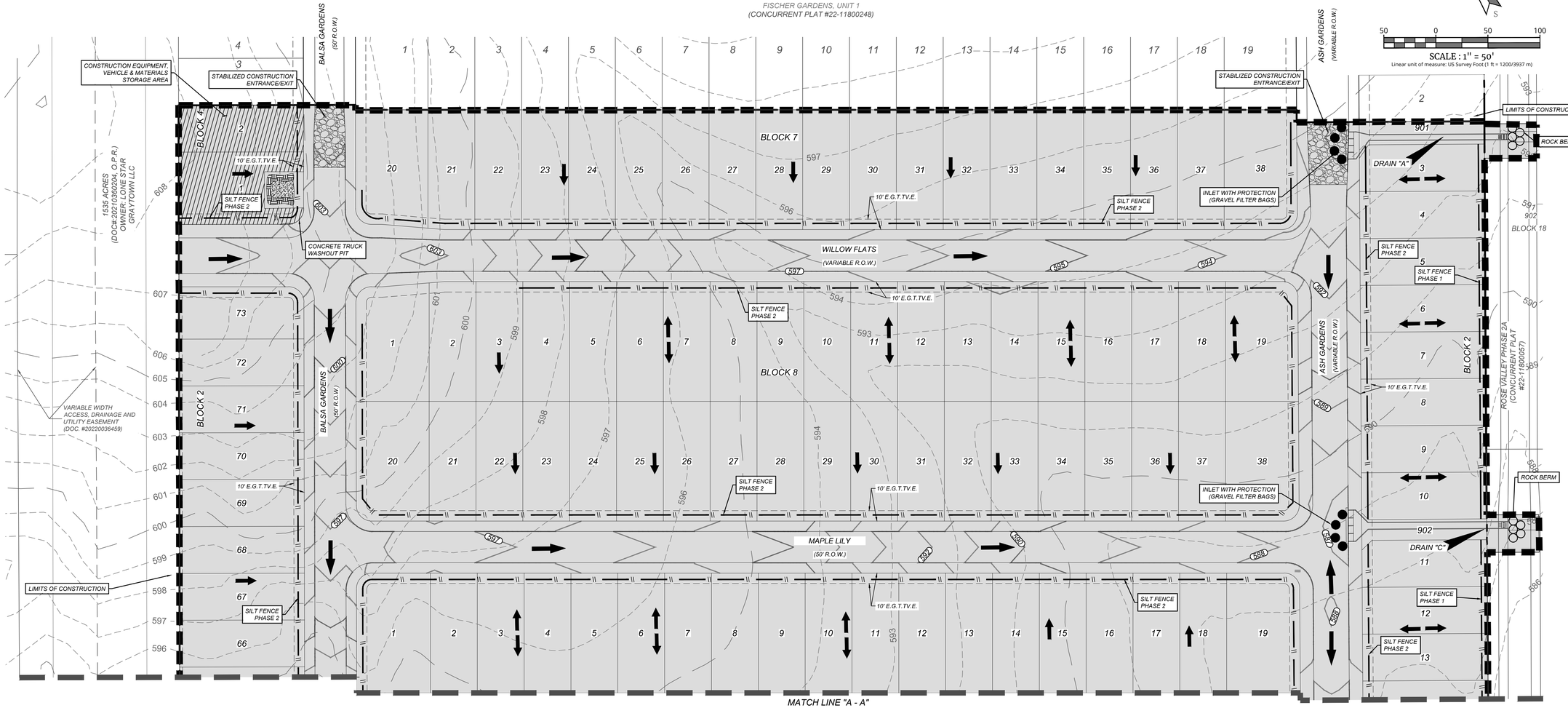
COORDINATION NOTE:

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.

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
NOT-TO-SCALE



N
E
W
S

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

RESIDENTIAL LOTS = 148

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REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	SW3P3146001

SHEET TITLE:
STORMWATER POLLUTION PREVENTION PLAN (SHEET 1 OF 2)

SHEET NUMBER:
9.1

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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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.

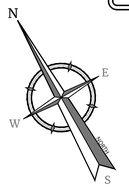
COORDINATION NOTE:

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.

LEGEND

- LIMITS OF CONSTRUCTION
- EXISTING CONTOURS (570)
- PROPOSED CONTOURS (1008)
- 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)

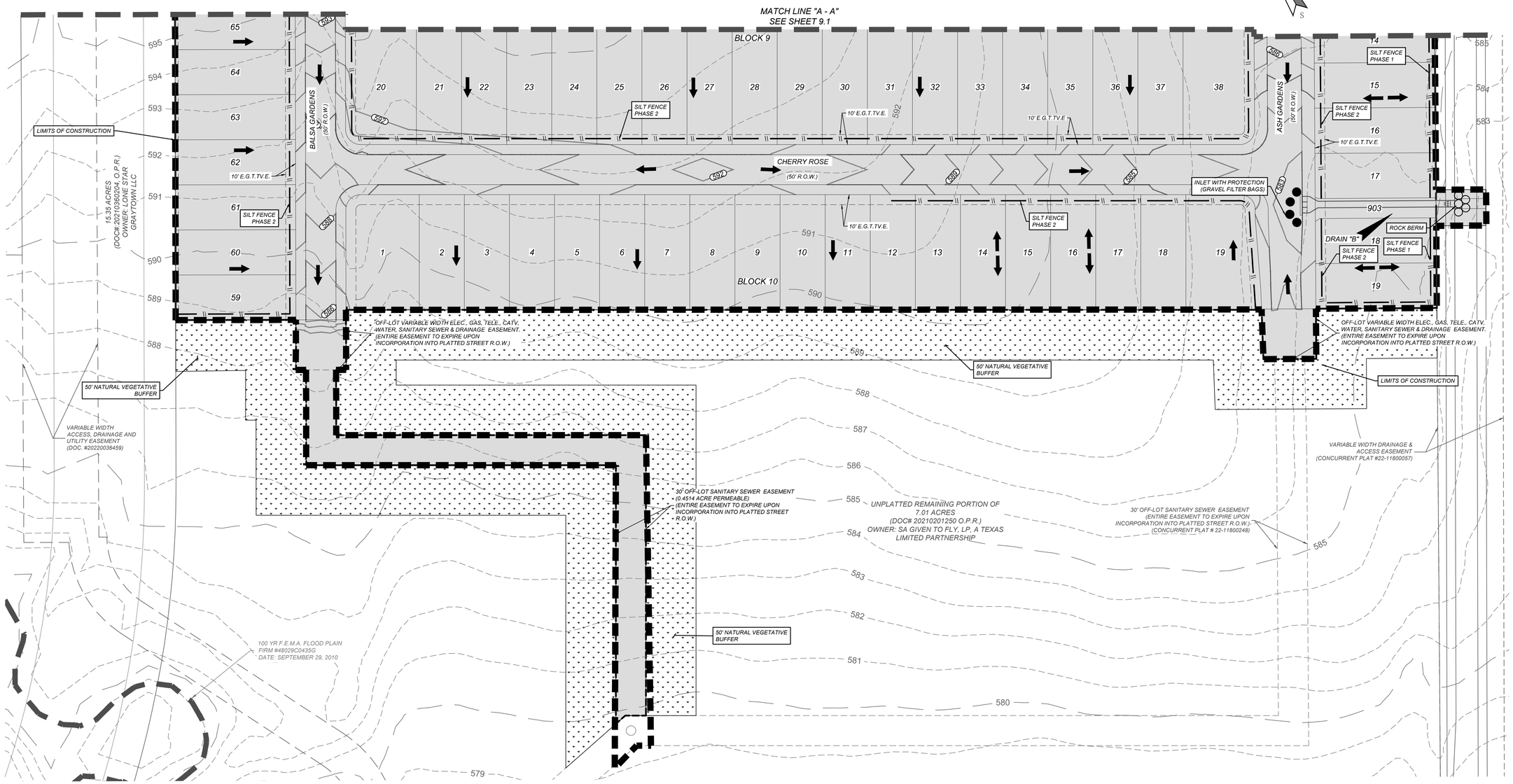
LOCATION MAP
NOT-TO-SCALE



50 0 50 100

SCALE : 1" = 50'

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



RESIDENTIAL LOTS = 148

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NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

Colliers Engineering & Design

www.colliersengineering.com

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

REV	DATE	DRAWN BY	DESCRIPTION

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER

5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS
UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

Colliers Engineering & Design
SAN ANTONIO (KFW)
3421 Paesanos Parkway
San Antonio, TX 78231
Phone: 210.979.8444
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909
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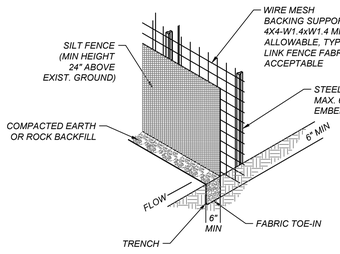
PROJECT NUMBER:	DRAWING NAME:
314-60-01	SWP3P146001

SHEET TITLE:
STORMWATER POLLUTION PREVENTION PLAN (SHEET 2 OF 2)

SHEET NUMBER:
9.2



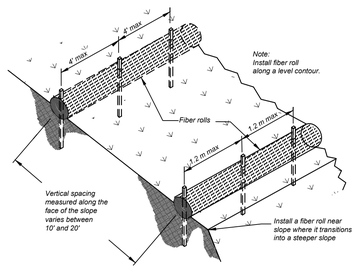
ISOMETRIC PLAN VIEW

SILT FENCE

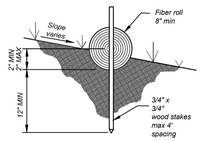
Materials:
(1) Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd. mullen burst strength exceeding 190 lb/in2, ultraviolet stability exceeding 70%, and minimum apparent opening 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/l 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.



TYPICAL FIBER ROLL INSTALLATION
N.T.S.



ENTRENCHMENT DETAIL
N.T.S.

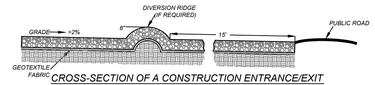
THE MATERIAL, INSTALLATION, INSPECTION, AND MAINTENANCE OF FIBER ROLLS WILL BE PER THE MANUFACTURE'S SPECIFICATIONS AND SHALL ALSO COMPLY WITH THE TEXAS COMMISSION OF ENVIRONMENTAL QUALITY CURRENT "TECHNICAL GUIDANCE ON BEST MANAGEMENT PRACTICES" AS NOTED BELOW.

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.

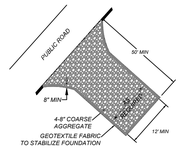
FIBER ROLL



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.

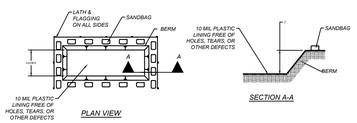


TEMPORARY CONSTRUCTION ENTRANCE/EXIT

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.

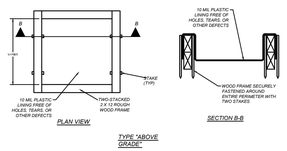
Inspection and Maintenance Guidelines:
(1) The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used 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



PLAN VIEW — SECTION A-A

TYPE "BELOW GRADE"



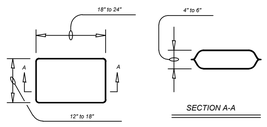
PLAN VIEW — SECTION B-B

TYPE "ABOVE GRADE"

GENERAL NOTES:

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

CONCRETE TRUCK WASHOUT PIT

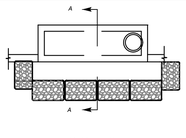


SECTION A-A

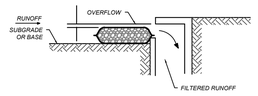
GENERAL NOTES:

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

GRAVEL FILTER BAG DETAIL



PLAN VIEW

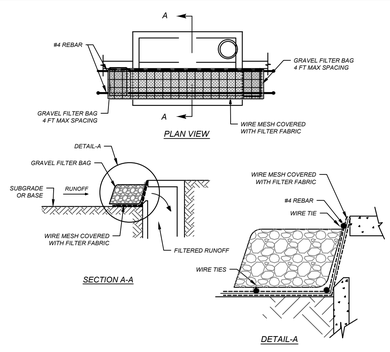


SECTION A-A

GENERAL NOTES:

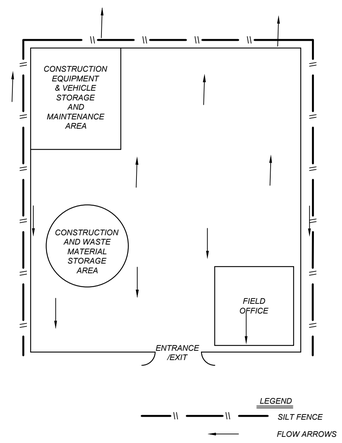
- *ALL STORM DRAINAGE SYSTEMS INLETS SHOULD FILTER RUNOFF BEFORE THE WATER IS DISCHARGED INTO STREAMS OR ONTO ADJACENT PROPERTIES, UNLESS TREATMENT IS PROVIDED ELSEWHERE.*
- *IF NO ADDITIONAL DOWNSTREAM TREATMENT EXISTS, THE MAXIMUM DRAINAGE AREA TRIBUTARY TO AN AREA DRAIN INSTALLED WITH A GRAVEL FILTER 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

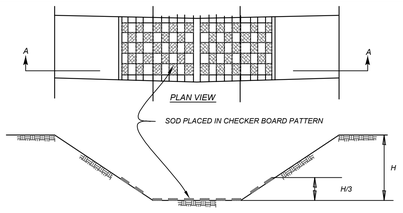


PLAN VIEW — SECTION A-A — DETAIL-A

CURB INLET PROTECTION (ALTERNATE)



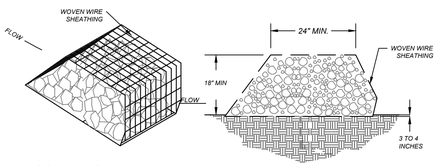
TYPICAL CONSTRUCTION STAGING AREA



PLAN VIEW — SECTION A-A

- *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



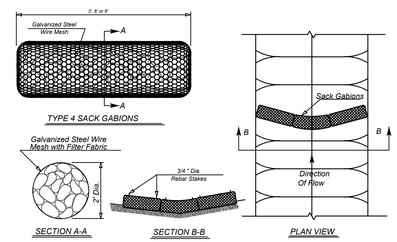
ISOMETRIC PLAN VIEW — CROSS SECTION

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 18".
(4) Wrap the wire sheathing around the rock and secure with tie wire so that the ends of the sheathing overlap at least 2 inches, air! the berm retains its shape when walked upon.
(5) Berm should be built along the contour at zero percent grade or as near as possible.
(6) The ends of the berm should be tied into existing upslope grade and the berm should be buried in a trench approximately 3 to 4 inches deep to prevent failure of the control.

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



TYPE 4 SACK GABIONS — SECTION A-A — SECTION B-B — PLAN VIEW

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 150 GALLONS PER MINUTE PER SQUARE FOOT OF FRONTAL AREA.*
- *STONE SIZE: #4"-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 RESILTATION. CONTAMINATED SEDIMENT MUST BE REMOVED AND DISPOSED OF OFF-SITE IN ACCORDANCE WITH APPLICABLE REGULATIONS.*

TYPE 4 SACK GABIONS

RESIDENTIAL LOTS = 148

N:\314-60\01\DESIGN\CIVIL\SW3PDT3146001.DWG By: DYLAN.FOERSTER 5/15/2024 3:11 PM

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

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STATE OF TEXAS — CLAYTON J. LINNEY — 111543 — LICENSED PROFESSIONAL ENGINEER
5/15/2024

CLAYTON J. LINNEY
TEXAS LICENSED PROFESSIONAL ENGINEER
LICENSE NUMBER: 111543
COLLIERS ENGINEERING & DESIGN, INC.
TBPE Firm#: F-14909 - TBPLS Firm#: 10194550

PRELIMINARY

FOR

FISCHER GARDENS UNIT 2
PLAT #24-11800144

SAN ANTONIO
BEXAR COUNTY
TEXAS

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

SCALE:	DATE:	DRAWN BY:	CHECKED BY:
		MS	CG

PROJECT NUMBER:	DRAWING NAME:
314-60-01	SW3PDT3146001

SHEET TITLE:
STORMWATER POLLUTION PROTECTION PLAN DETAILS

SHEET NUMBER:
9.3