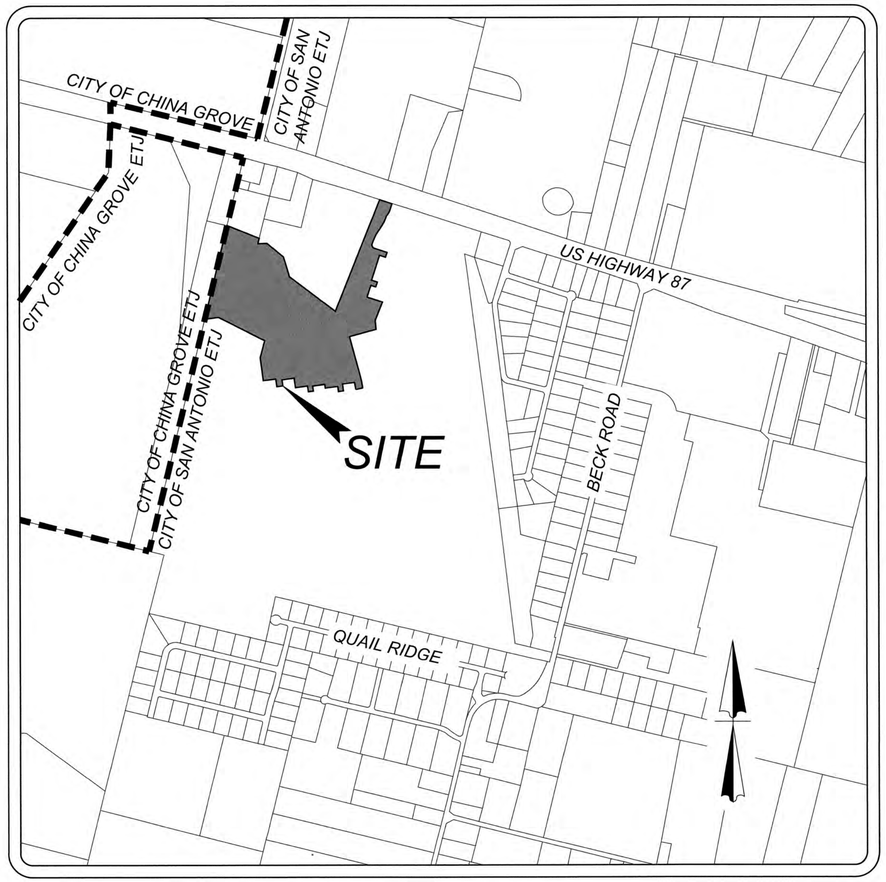
GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

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

SHEET INDEX



LOCATION MAP
NOT-TO-SCALE

SHEET INDEX

SHEET REVISION LOG

DATE	SHEET NO.	REVISION NO.	DESCRIPTION
4/18/2022	5.0	1	REVISED CURB RETURN STATIONS

OWNER INFORMATION
MEH HOLDING COMPANY LTD
5210 THOUSAND OAKS, STE. 1318
SAN ANTONIO, TX 78233

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
6/23/2023

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

JOB NO.: 205-43-04

PLAT NO. 21-11800645

SHEET 0.0

Date: Jun 23, 2023, 4:11pm User ID: CLinney
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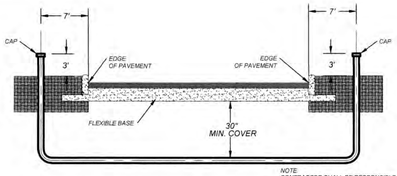

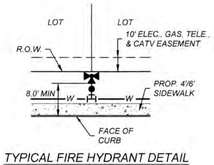

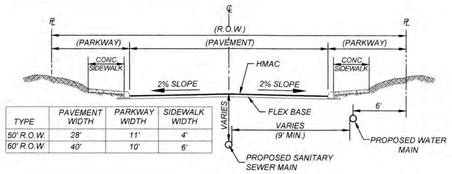

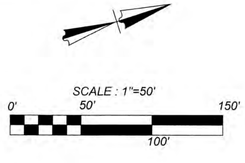

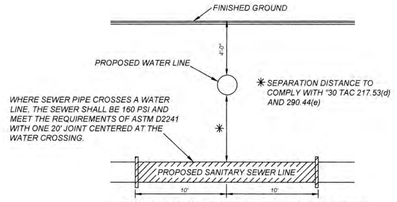

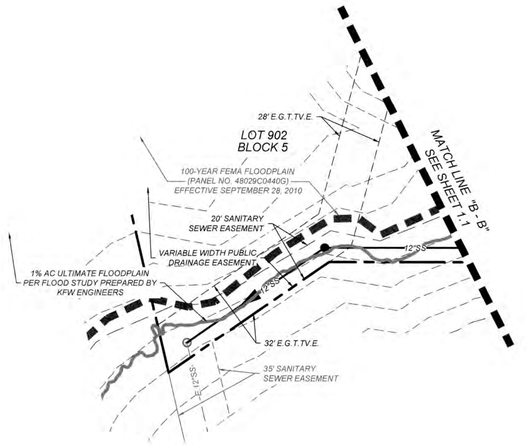

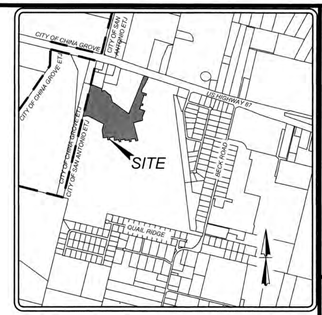

COMPACTION NOTE:

THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS 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.

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.

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 FIRE HYDRANT DETAIL

NOT-TO-SCALE

TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	28'	11'	4'
60' R.O.W.	40'	10'	6'

TYPICAL STREET SECTION

N.T.S.

LOCATION MAP
NOT-TO-SCALE

WHERE SEWER PIPE CROSSES A WATER LINE, THE SEWER SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT THE WATER CROSSING.

✱ SEPARATION DISTANCE TO COMPLY WITH "30 TAC 217.53(d) AND 290.44(e)

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

LEGEND

PROPOSED WATER MAIN	=	— W —
PROPOSED WATER SERVICE & METER BOX	=	W W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	¾IRR
PROPOSED FIRE HYDRANT	=	⧓
PROPOSED WATER VALVE	=	● ●
PROPOSED 100W STREETLIGHT	=	☼
PROPOSED 250W STREETLIGHT	=	☼o
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— — ● — —OHE—
EXISTING GUY WIRE/OVERHEAD ELECTRIC	=	— — ▷ — — — —OHE— —

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ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER

8/10/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

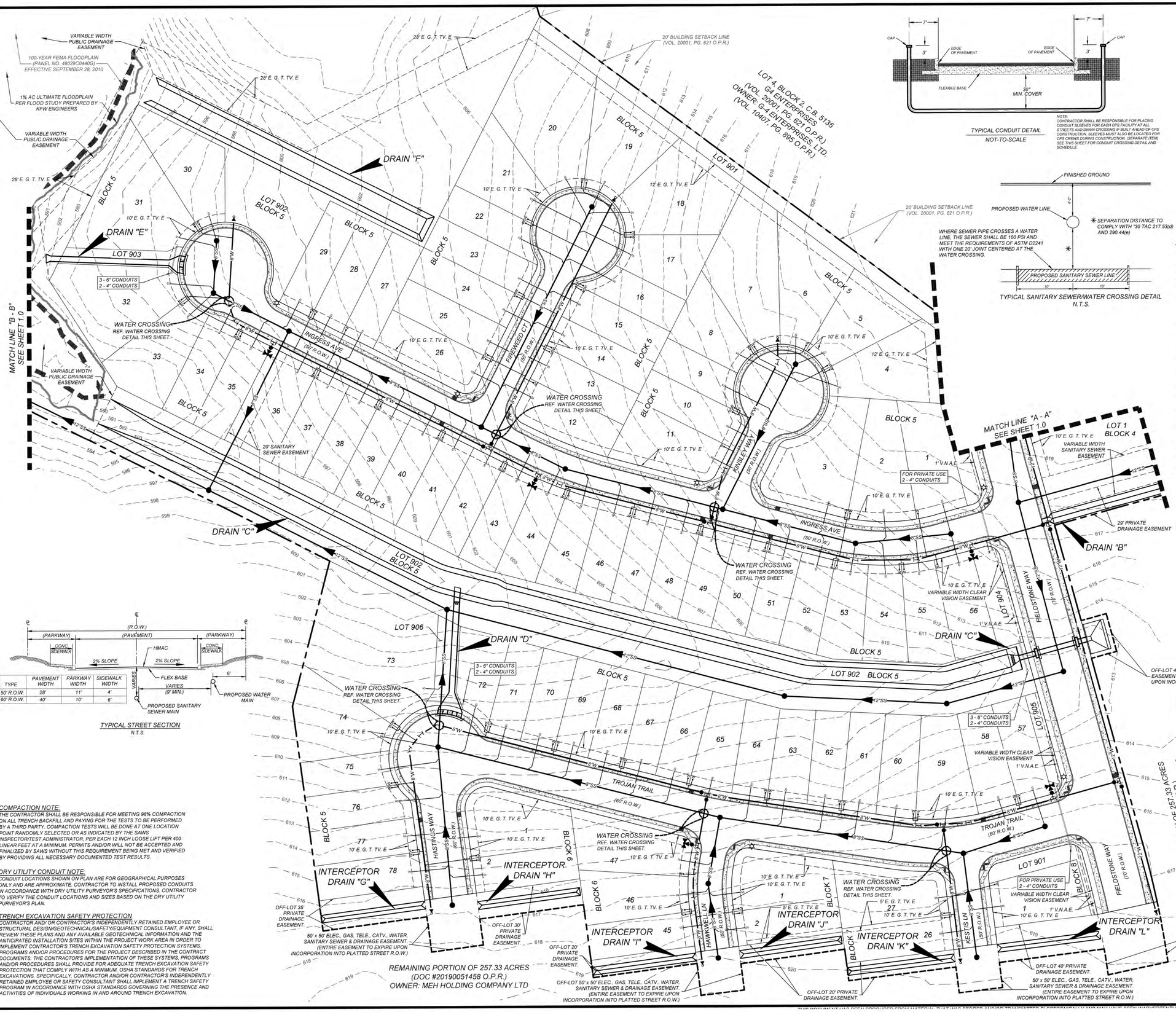
OVERALL UTILITY PLAN (SHEET 1 OF 2)

PLAT NO.
21-11800645

JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:

1.0



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TYPICAL STREET SECTION
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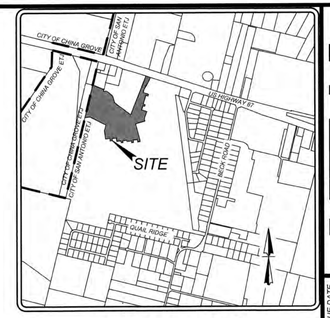
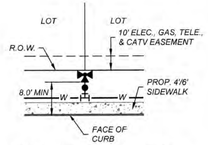


LOCATION MAP
NOT-TO-SCALE

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 250W 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



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TBPE Firm #: 8513 • TBPLS Firm #: 10123300

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
3/10/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

OVERALL UTILITY PLAN (SHEET 2 OF 2)

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
1.1

LOCATION MAP
NOT-TO-SCALE

SCALE : 1"=300'
0' 300' 900'
600'

LEGEND

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

Proposed Conditions:

Study Point	AREA	(Acres)	C	T_{conf}(min)		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)
1	A-1	4.22	0.75	9.00		3	1	13	5.61	7.82	9.76	17.76	24.75	30.89
2	A-2	3.59	0.75	9.00		3	1	13	5.61	7.82	9.76	15.11	21.05	26.28
3	A-3	3.09	0.75	9.00		4	0	13	5.61	7.82	9.76	13.01	18.12	22.62
4	PT. 3 + A-4	12.73	0.76	10.00	CARRYOVER FROM PT. 3	3	1	14	5.42	7.53	9.39	52.56	72.94	91.00
	A-4	9.64	0.77											
5	A-5	10.98	0.75	9.00		4	3	16	5.06	6.99	8.71	41.70	57.54	71.70
6	A-6	11.92	0.75	9.00		6	2	17	4.91	6.76	8.42	43.86	60.46	75.27
7	A-7	13.01	0.75	9.00		8	2	19	4.63	6.37	7.93	45.21	62.20	77.35
8	PT. 6 + A-8	14.94	0.75	10.00	CARRYOVER FROM PT. 4	7	0	17	4.91	6.76	8.42	54.98	75.77	94.34
	A-8	3.02	0.75											
9	A-9	5.89	0.75	9.00		4	2	15	5.24	7.24	9.03	23.15	31.98	39.88
10	A-10	7.12	0.75	9.00		5	1	15	5.24	7.24	9.03	27.98	38.66	48.21
11	A-11	8.06	0.75	9.00		5	1	15	5.24	7.24	9.03	31.68	43.77	54.57
12	PT. 11 + A-12	10.04	0.75	10.00	CARRYOVER FROM PT. 9	5	2	17	4.91	6.76	8.42	36.94	50.92	63.40
	A-12	1.98	0.75											
13	PT. 10+ PT. 11	17.16	0.75	10.00	CARRYOVER FROM PT. 10	7	0	17	4.91	6.76	8.42	63.14	87.03	108.36
14	A-14	6.28	0.82	9.00		6	2	17	4.91	6.76	8.42	25.12	34.62	43.11
15	A-15	7.57	0.75	9.00		6	2	17	4.91	6.76	8.42	27.86	38.39	47.80
16	A-16	6.44	0.75	9.00		5	1	15	5.24	7.24	9.03	25.31	34.97	43.60
17	A-17	9.00	0.75	9.00		4	0	13	5.61	7.82	9.76	37.88	52.77	65.88
18	PT. 14+ PT. 15 + A-18	21.42	0.77	10.00	CARRYOVER FROM PT. 12	7	3	20	4.51	6.21	7.71	74.38	102.24	127.08
	A-18	7.57	0.75											
19	A-19	5.12	0.75	9.00		4	0	13	5.61	7.82	9.76	21.55	30.02	37.48
20	PT. 17 + PT. 18 + PT. 19 + A-20	40.29	0.75	10.00	CARRYOVER FROM PT. 16	10	2	22	4.30	5.91	7.34	130.02	178.48	221.67
	A-20	4.75	0.75											
21	A-21	3.96	0.75	9.00		4	1	14	5.42	7.53	9.39	16.11	22.35	27.89
22	A-22	4.40	0.75	9.00		4	1	14	5.42	7.53	9.39	17.89	24.83	30.98
23	A-23	4.21	0.75	9.00		4	1	14	5.42	7.53	9.39	17.12	23.76	29.65
24	PT. 16 + A-24	10.32	0.75	10.00	CARRYOVER FROM PT. 14	5	2	17	4.91	6.76	8.42	37.98	52.34	65.17
	A-24	3.88	0.75											
25	PT. 23 + PT.24	14.53	0.75	10.00	CARRYOVER FROM PT. 22	7	0	17	4.91	6.76	8.42	53.47	73.69	91.75
26	PT. 22 + PT. 25 + A-26	22.52	0.75	10.00	CARRYOVER FROM PT. 23	7	1	18	4.76	6.56	8.16	80.46	110.78	137.84
	A-26	3.59	0.75											
27	A-27	9.11	0.75	9.00		5	3	17	4.91	6.76	8.42	33.52	46.20	57.53
28	A-28	8.13	0.75	9.00		4	2	15	5.24	7.24	9.03	31.95	44.15	55.04
29	A-29	1.61	0.91	14.00		2	0	16	5.06	6.99	8.71	7.42	10.24	12.76
30	A-30	9.92	0.75	9.00		6	1	16	5.06	6.99	8.71	37.68	51.99	64.78
31	PT.29 + A-31	5.04	0.87	9.00		3	2	14	5.42	7.53	9.39	23.77	32.98	41.15
	A-31	3.43	0.85											
32	PT. 30 +PT. 31	14.96	0.84	10.00	CARRYOVER FROM PT. 29	6	1	17	4.91	6.76	8.42	61.65	84.97	105.79
33	A-33	9.17	0.75	9.00		4	1	14	5.42	7.53	9.39	37.29	51.76	64.57
34	PT. 32 + PT.34	19.29	0.78	10.00	CARRYOVER FROM PT. 30	7	2	19	4.63	6.37	7.93	69.83	96.06	119.46
	A-34	4.33	0.75											
35	A-35	6.30	0.75	9.00		3	3	15	5.24	7.24	9.03	24.76	34.21	42.65
36	PT. 33 + PT. 34 + A-36	31.52	0.77	10.00	CARRYOVER FROM PT. 32	9	1	20	4.51	6.21	7.71	109.44	150.44	186.99
	A-36	3.06	0.75											
37	A-37	6.62	0.75	9.00		6	1	16	5.06	6.99	8.71	25.14	34.69	43.23
38	A-38	5.49	0.75	9.00		3	1	13	5.61	7.82	9.76	23.11	32.19	40.19
39	A-40	69.37	0.80	19.00		7	5	31	3.62	4.96	6.14	201.02	275.30	341.36

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ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
3/17/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
MASTER DRAINAGE PLAN

PLAT NO. 21-11800645

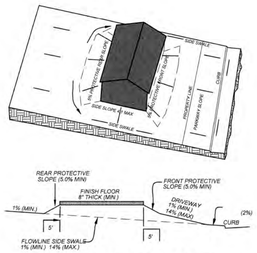
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
2.0

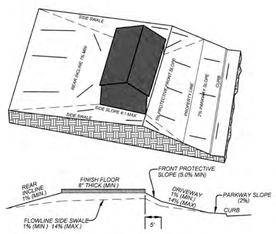
Date: Mar 13, 2023, 2:34pm User ID: cgroff
File: P:\205\43\04\Design\Civil\MDP\205430404.dwg

GENERAL NOTES:

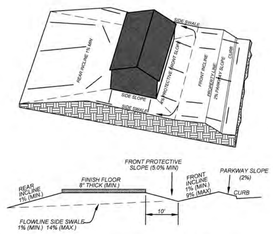
1. ELEVATION SHOWN ON FOUNDATION IS FOR FINISHED FLOOR.
2. CONTRACTOR SHALL PROVIDE OWNER ALL NECESSARY DENSITY TESTS FOR FILL LOTS AS REQUIRED BY HUD SPECIFICATIONS.
3. HOME BUILDER SHALL REFER TO THE APPROVED SUBDIVISION PLAT TO CONFIRM ALL BUILDING SETBACKS PRIOR TO ANY FOUNDATION WORK.
4. AS SOON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



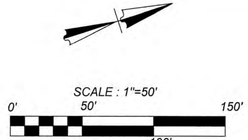
TYPE 'A' LOT GRADING

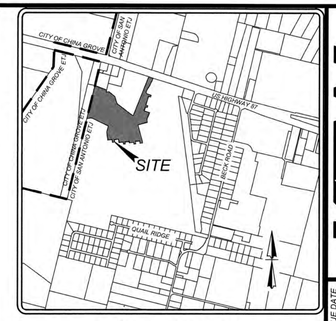


TYPE 'B' LOT GRADING



TYPE 'C' LOT GRADING

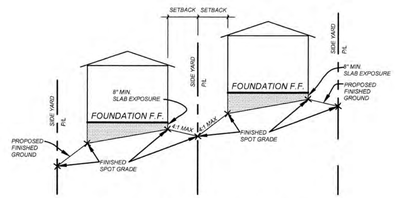




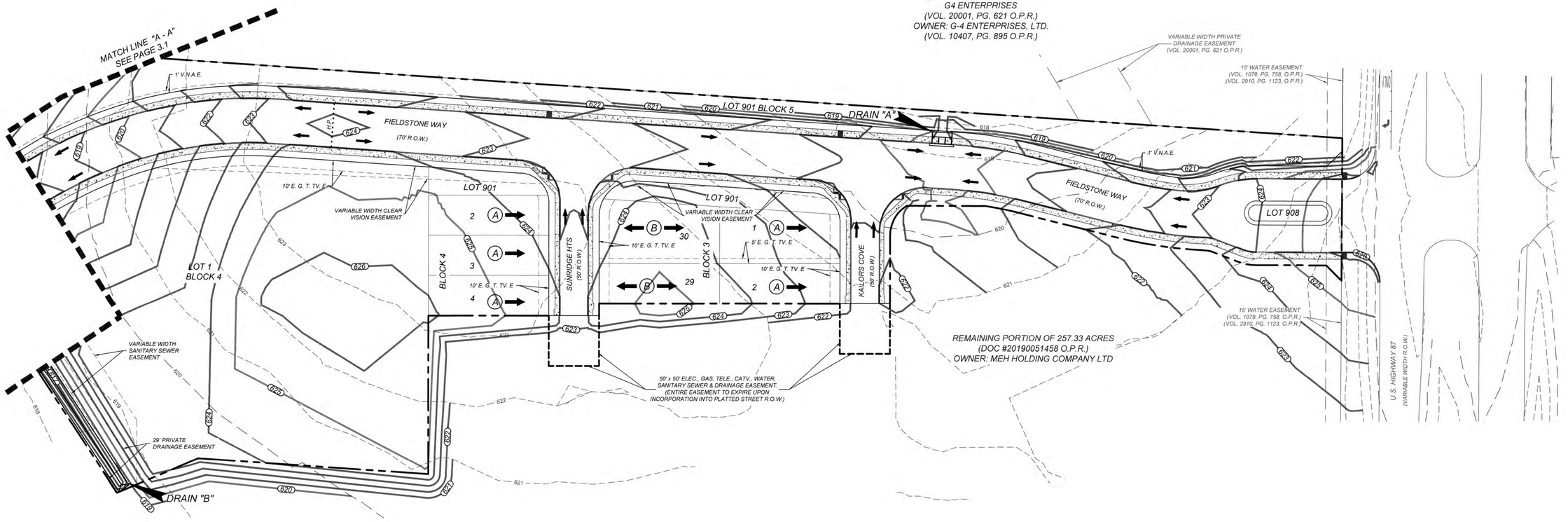
LOCATION MAP
NOT-TO-SCALE

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



TYPICAL SIDE YARD GRADING
N.T.S.



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ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
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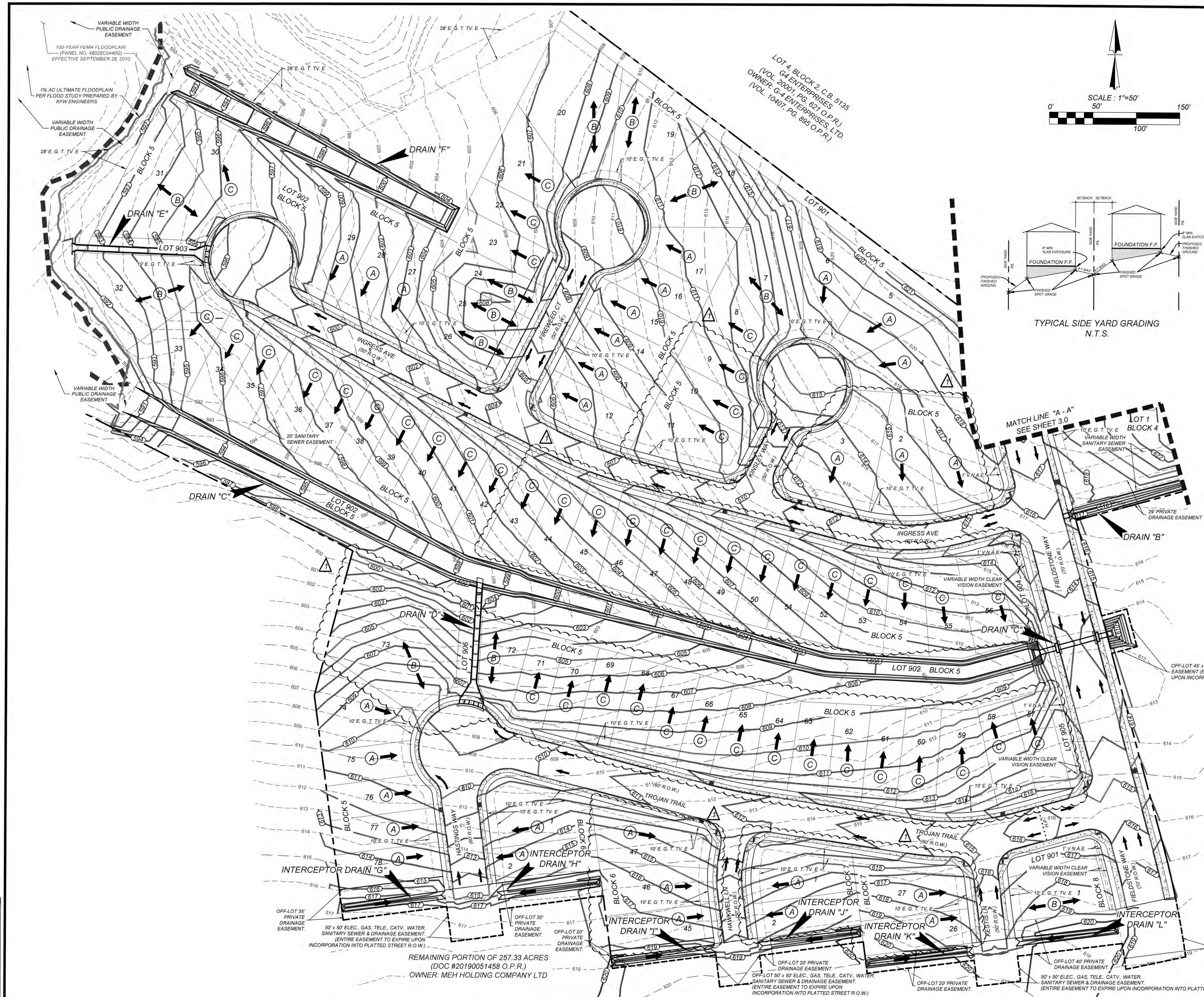
TBPE Firm # 9513 • TBPLS Firm # 10124500

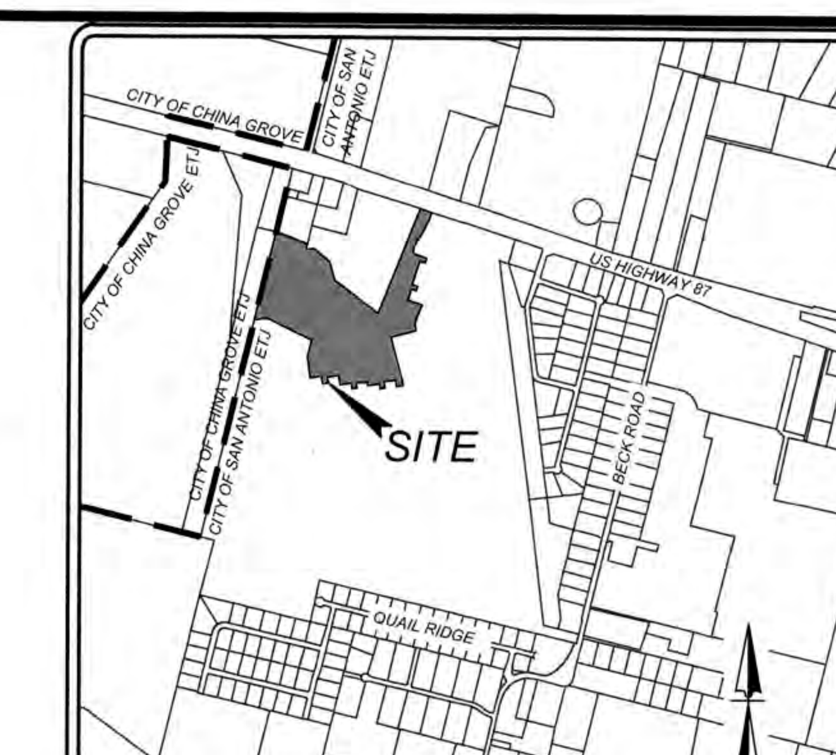
ISSUE DATE
REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
11/29/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
OVERALL GRADING PLAN (SHEET 1 OF 2)

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL
SHEET NUMBER:
3.0





LOCATION MAP
NOT-TO-SCALE

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

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.
6. POSITIVE DRAINAGE SHALL BE MAINTAINED ON ALL SURFACE AREAS WITHIN THE SCOPE OF THIS PROJECT. DRAINAGE SHALL BE DIRECTED AWAY FROM ALL BUILDING FOUNDATIONS AND TOWARDS THE PROPER DRAINAGE EASEMENT OR STREET RIGHT OF WAY ACCORDING TO THE MASTER DRAINAGE PLAN FOR THE PROJECT. CONTRACTOR SHOULD TAKE PRECAUTIONS NOT TO ALLOW PONDING OF WATER.
7. ALL ELEVATIONS AND CONTOURS SHOWN ON THIS GRADING PLAN REFLECT FINISHED GRADES. THE THICKNESS OF PAVEMENT, CURBS, AND SIDEWALKS MUST BE SUBTRACTED TO OBTAIN SUBGRADE ELEVATIONS.
8. GRADING PLAN IS INTENDED FOR USE IN LOT GRADING ONLY. CONTRACTOR SHOULD REFER TO CONSTRUCTION DRAWINGS FOR ALL OTHER GRADES, INCLUDING, BUT NOT LIMITED TO, CHANNELS, ROADS, AND DETENTION PONDS.
9. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE ALL SWALES.

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ISSUE DATE 3/25/2022

REVISIONS
1 REVISED LOT GRADING

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
11/29/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

OVERALL GRADING PLAN (SHEET 2 OF 2)

PLAT NO. 21-11800645

JOB NO.: 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
3.1

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.

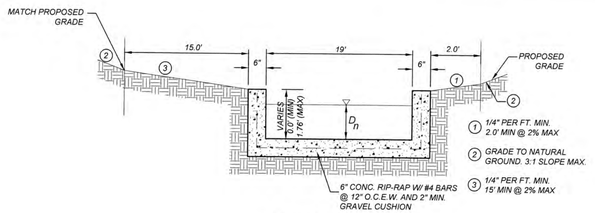
CAUTION!!:

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.

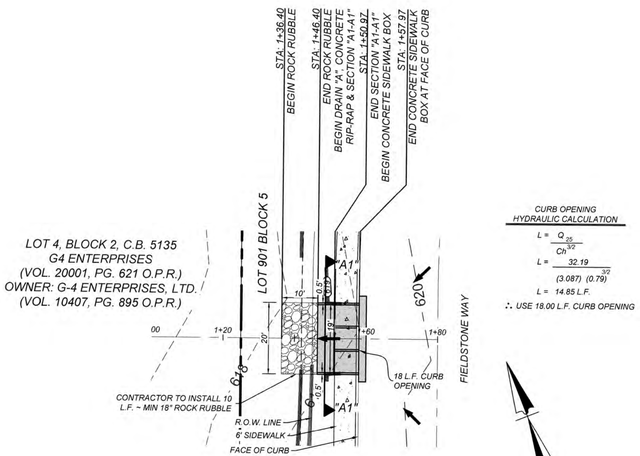
NOTE:

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.



SECTION "A1-A1"
STA. 1+46.40 - STA. 1+50.97
N.T.S.



CURB OPENING HYDRAULIC CALCULATION

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

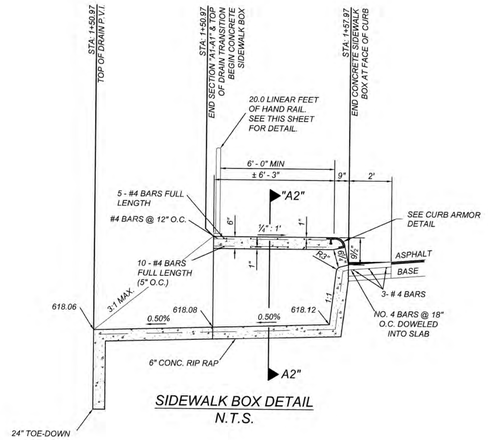
$L = \frac{32.19}{(3.087)\ (0.79)^{3/2}}$

$L = 14.85$ L.F.

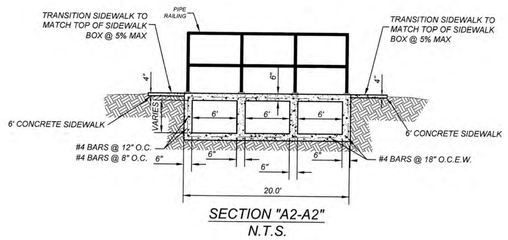
∴ USE 18.00 L.F. CURB OPENING

PRIVATE DRAIN "A"
STA: 1+36.40 - END

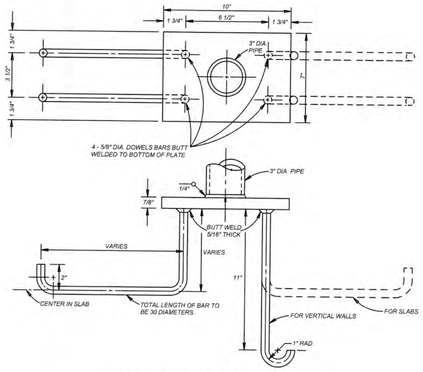
HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



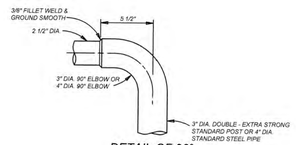
SIDEWALK BOX DETAIL
N.T.S.



SECTION "A2-A2"
N.T.S.

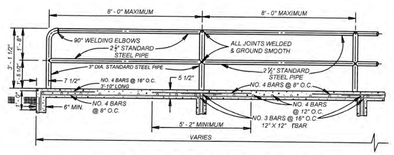


PIPE ANCHORAGE DETAILS
N.T.S.

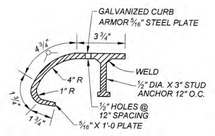


DETAIL OF 90° WELDING ELBOWS
N.T.S.

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



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



CURB ARMOR DETAIL
N.T.S.

CONCRETE "U" CHANNEL
STA. 1+46.40 TO STA. 1+50.97
HYDRAULIC CALCULATION

Q(25) = 32.19 CFS
Bw = 19.0'
n = 0.015
Pw = 19.88 FT.
A = 8.36 S.F.
S = 0.50%
Dn = 0.44'
V = 3.85 fps
VH = 0.23'

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REVISIONS

ISSUE DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
3/17/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

PRIVATE DRAIN "A" PLAN & PROFILE

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL
SHEET NUMBER: 4.0

Date: Mar 13, 2023, 2:35pm User ID: cgroff
File: P:\205\43\04\Design\Civil\Drains\DP205430404.dwg

TRENCH EXCAVATION SAFETY PROTECTION

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

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NOTE:

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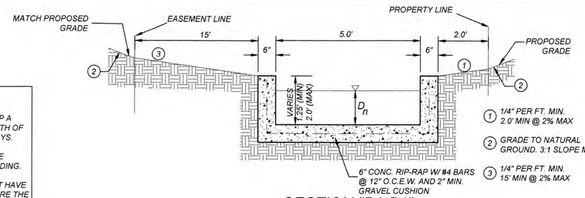
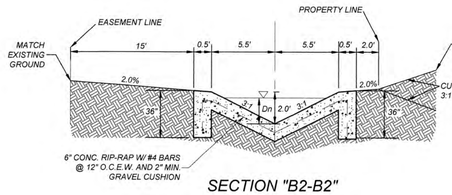
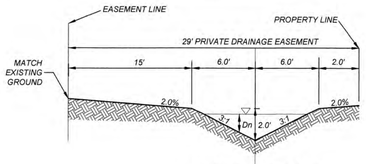
2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.



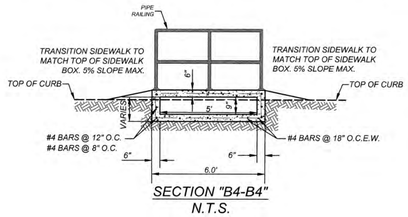
SECTION "B1-B1"
STA. 1+29.00 - STA. 1+31.00
N.T.S.



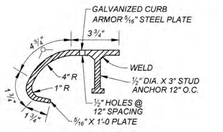
SECTION "B2-B2"
STA. 1+35.00
N.T.S.



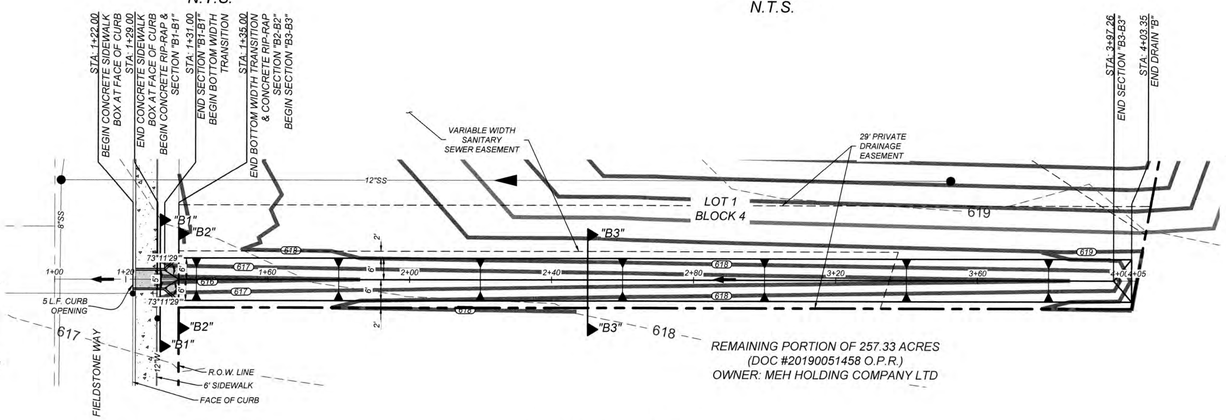
SECTION "B3-B3"
STA. 1+35.00 - STA. 3+97.26
N.T.S.



SECTION "B4-B4"
N.T.S.



CURB ARMOR DETAIL
N.T.S.



CURB OPENING HYDRAULIC CALCULATION

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

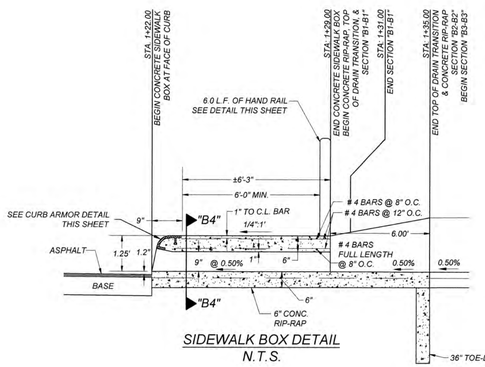
$L = \frac{10.24}{(3.087)\ (0.79)^{3/2}}$

$L = 4.72$ L.F.

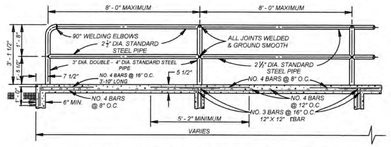
∴ USE 5.0 L.F. CURB OPENING

PRIVATE DRAIN "B"
STA. 1+22.00 TO END

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

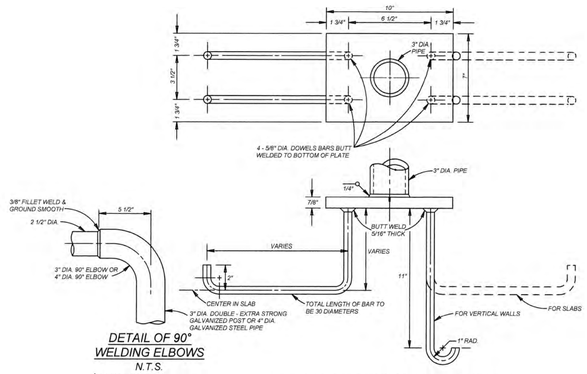


SIDEWALK BOX DETAIL
N.T.S.



TYPICAL SIDEWALK BRIDGE & SIDEWALK PIPE RAILING SECTION

N.T.S.



DETAIL OF 90° WELDING ELBOWS
N.T.S.

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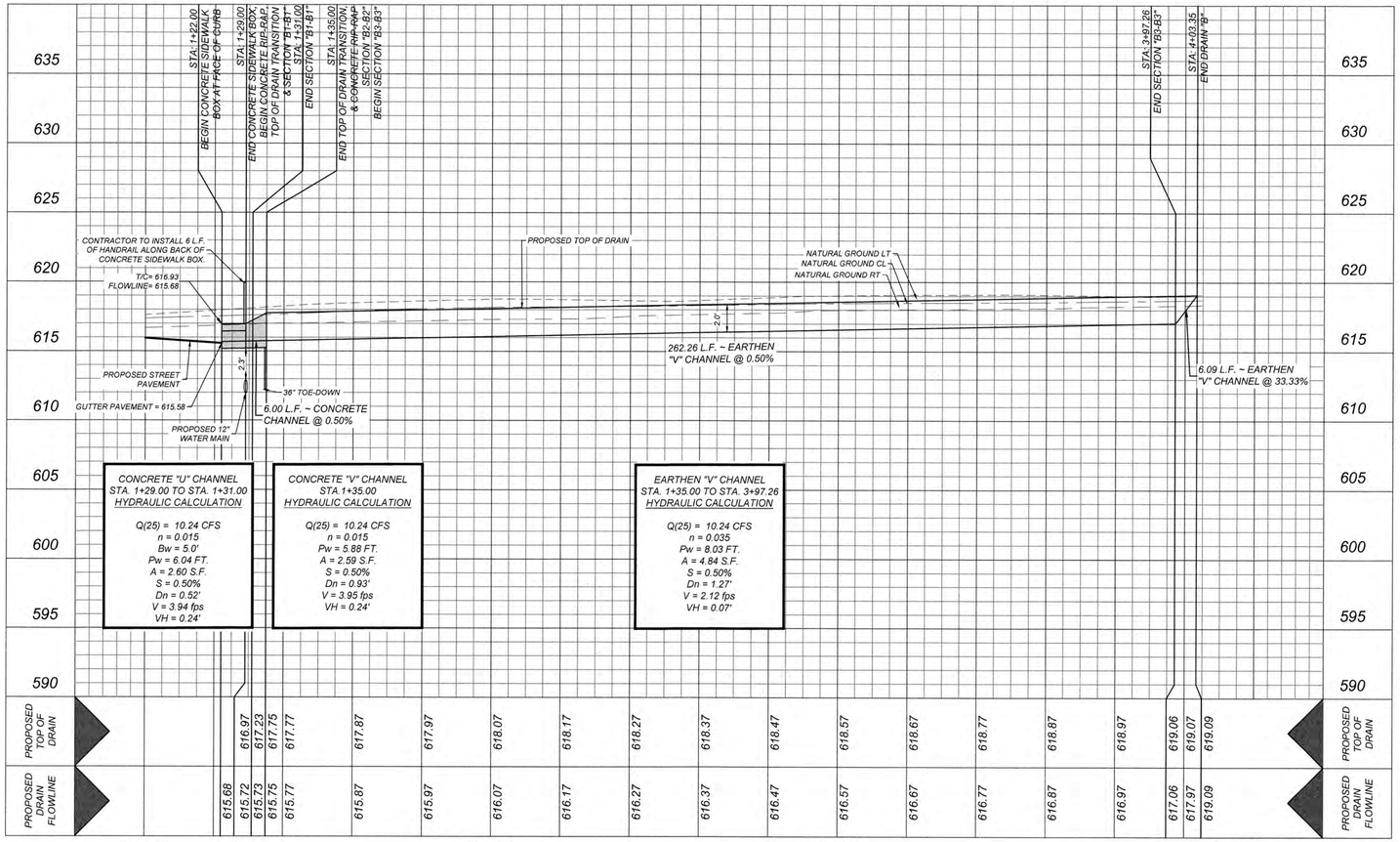
PIPE ANCHORAGE DETAILS
N.T.S.



CONCRETE "U" CHANNEL
STA. 1+29.00 TO STA. 1+31.00
HYDRAULIC CALCULATION

Q(25) = 10.24 CFS
n = 0.015
Bw = 5.0'
Pw = 6.04 FT.
A = 2.60 S.F.
S = 0.50%
Dn = 0.52'
V = 3.94 fps
VH = 0.24'

CONCRETE "V" CHANNEL
STA.1+35.00
HYDRAULIC CALCULATION

Q(25) = 10.24 CFS
n = 0.015
Pw = 5.88 FT.
A = 2.59 S.F.
S = 0.50%
Dn = 0.93'
V = 3.95 fps
VH = 0.24'

EARTHEN "V" CHANNEL
STA. 1+35.00 TO STA. 3+97.26
HYDRAULIC CALCULATION

Q(25) = 10.24 CFS
n = 0.035
Pw = 8.03 FT.
A = 4.84 S.F.
S = 0.50%
Dn = 1.27'
V = 2.12 fps
VH = 0.07'

KFW ENGINEERS + SURVEYING
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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/29/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
PRIVATE DRAIN "B" PLAN & PROFILE

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL
SHEET NUMBER: 4.1

TRENCH EXCAVATION SAFETY PROTECTION

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

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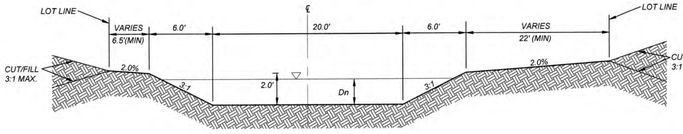
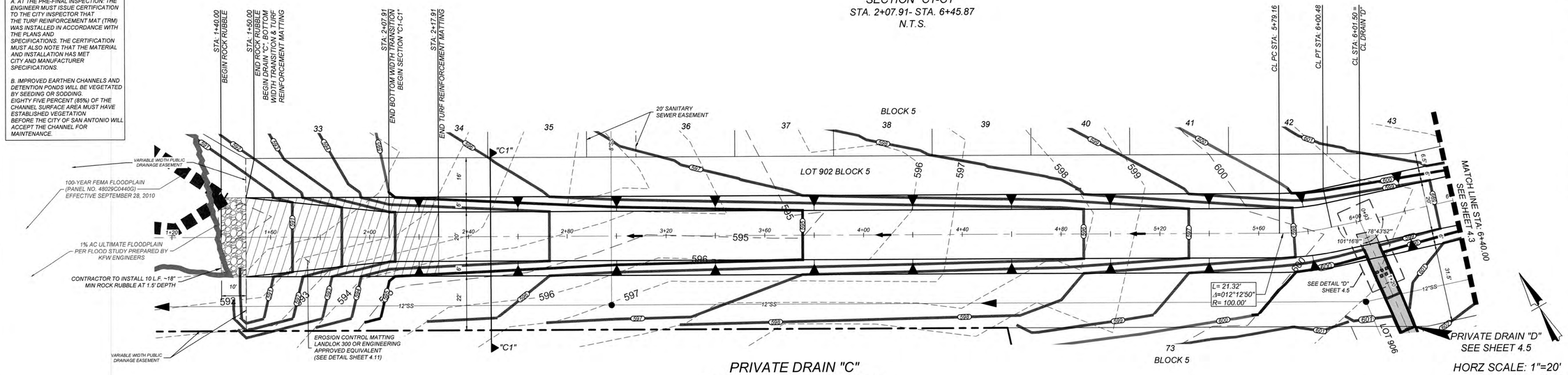
NOTE:

A. AT THE PRE-FINAL INSPECTION: THE ENGINEER MUST ISSUE CERTIFICATION TO THE CITY INSPECTOR THAT THE TURF REINFORCEMENT MAT (TRM) WAS INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE CERTIFICATION MUST ALSO NOTE THAT THE MATERIAL AND INSTALLATION HAS MET CITY AND MANUFACTURER SPECIFICATIONS.

B. IMPROVED EARTHEN CHANNELS AND DETENTION PONDS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY FIVE PERCENT (85%) OF THE CHANNEL SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT THE CHANNEL FOR MAINTENANCE.

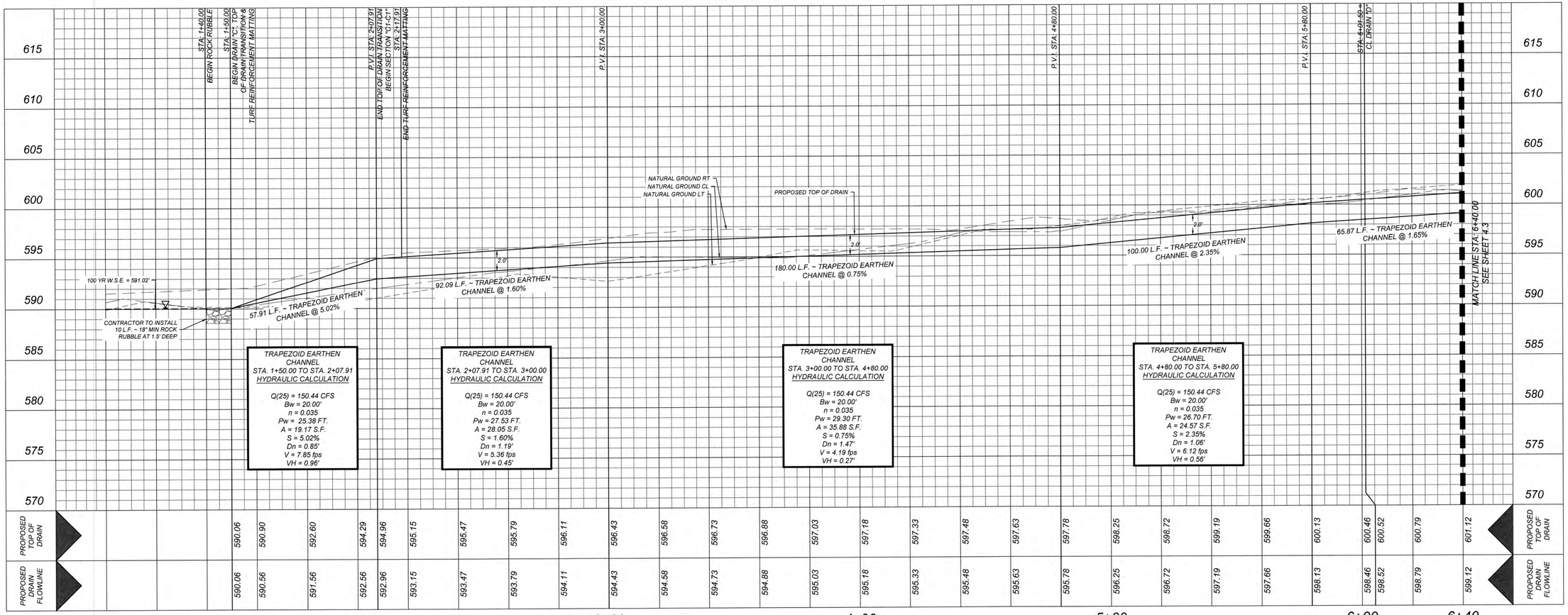


SECTION "C1-C1"
STA. 2+07.91- STA. 6+45.87
N.T.S.



PRIVATE DRAIN "C"
STA: 1+40.00 - STA: 6+40.00

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



TRAPEZOID EARTHEN CHANNEL
STA. 1+50.00 TO STA. 2+07.91
HYDRAULIC CALCULATION

Q(25) = 150.44 CFS
Bw = 20.00'
n = 0.035
Pw = 25.38 FT.
A = 19.17 S.F.
S = 5.02%
Dn = 0.85'
V = 7.85 fps
VH = 0.96'

TRAPEZOID EARTHEN CHANNEL
STA. 2+07.91 TO STA. 3+00.00
HYDRAULIC CALCULATION

Q(25) = 150.44 CFS
Bw = 20.00'
n = 0.035
Pw = 27.53 FT.
A = 28.05 S.F.
S = 1.60%
Dn = 1.19'
V = 5.36 fps
VH = 0.45'

TRAPEZOID EARTHEN CHANNEL
STA. 3+00.00 TO STA. 4+80.00
HYDRAULIC CALCULATION

Q(25) = 150.44 CFS
Bw = 20.00'
n = 0.035
Pw = 29.30 FT.
A = 35.88 S.F.
S = 0.75%
Dn = 1.47'
V = 4.19 fps
VH = 0.27'

TRAPEZOID EARTHEN CHANNEL
STA. 4+80.00 TO STA. 5+80.00
HYDRAULIC CALCULATION

Q(25) = 150.44 CFS
Bw = 20.00'
n = 0.035
Pw = 26.70 FT.
A = 24.57 S.F.
S = 2.35%
Dn = 1.06'
V = 6.12 fps
VH = 0.56'

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

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
6/15/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

PRIVATE DRAIN "C" PLAN & PROFILE (SHEET 1 OF 3)

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER: 4.2

TRENCH EXCAVATION SAFETY PROTECTION

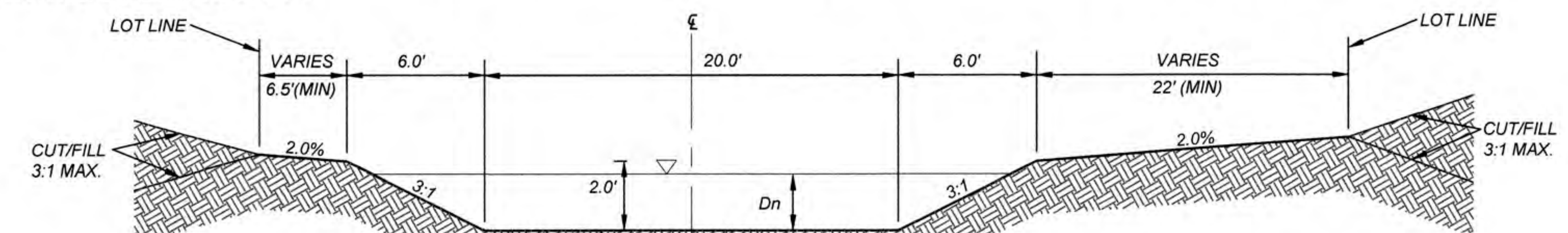
CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S 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!!:

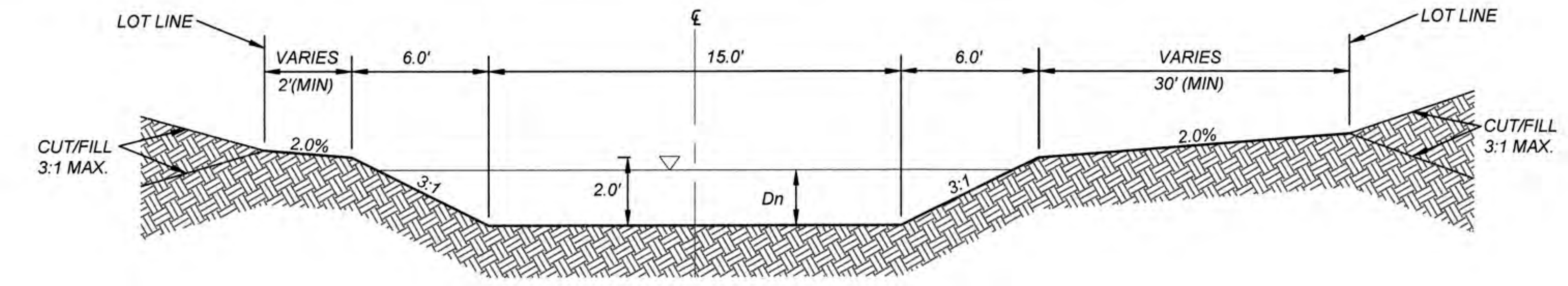
THE CONTRACTOR SHALL BE REQUIRED TO LOCATE ALL PUBLIC OR PRIVATE UTILITIES INCLUDING BUT NOT LIMITED TO: WATER, SEWER, TELEPHONE AND FIBER OPTIC LINES, SITE LIGHTING ELECTRIC, SECONDARY ELECTRIC, PRIMARY ELECTRICAL DUCTBANKS, LANDSCAPE IRRIGATION FACILITIES, AND GAS LINES. ANY UTILITY CONFLICTS THAT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

NOTE:

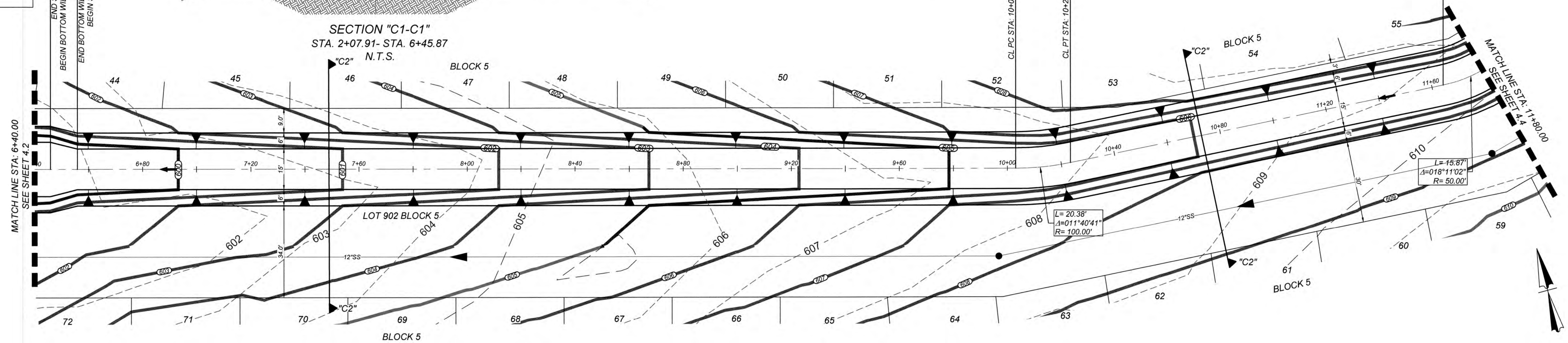
A. IMPROVED EARTHEN CHANNELS AND DETENTION PONDS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY FIVE PERCENT (85%) OF THE CHANNEL SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT THE CHANNEL FOR MAINTENANCE.



SECTION "C1-C1"
STA. 2+07.91- STA. 6+45.87
N.T.S.

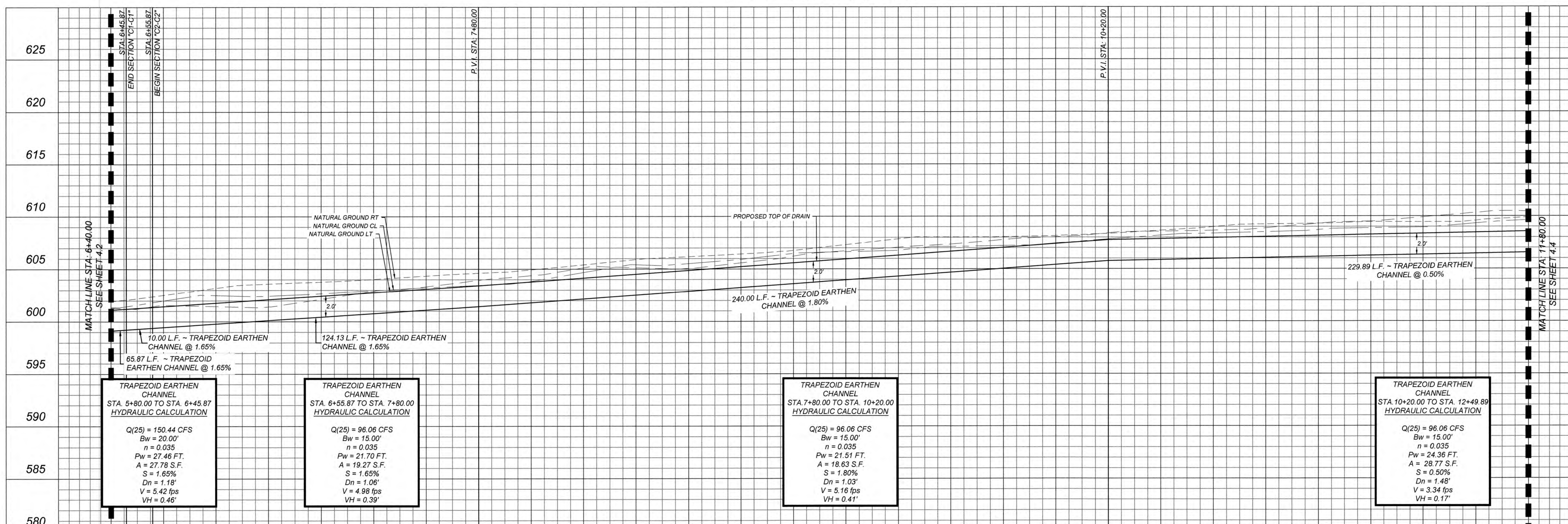


SECTION "C2-C2"
STA. 6+55.87- STA. 12+49.89
N.T.S.



PRIVATE DRAIN "C"
STA: 6+40.00- STA: 11+80.00

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



TRAPEZOID EARTHEN CHANNEL
STA. 5+80.00 TO STA. 6+45.87
HYDRAULIC CALCULATION

Q(25) = 150.44 CFS
Bw = 20.00'
n = 0.035
Pw = 27.46 FT.
A = 27.78 S.F.
S = 1.65%
Dn = 1.18'
V = 5.42 fps
VH = 0.46'

TRAPEZOID EARTHEN CHANNEL
STA. 6+55.87 TO STA. 7+80.00
HYDRAULIC CALCULATION

Q(25) = 96.06 CFS
Bw = 15.00'
n = 0.035
Pw = 21.70 FT.
A = 19.27 S.F.
S = 1.65%
Dn = 1.06'
V = 4.98 fps
VH = 0.39'

TRAPEZOID EARTHEN CHANNEL
STA.7+80.00 TO STA. 10+20.00
HYDRAULIC CALCULATION

Q(25) = 96.06 CFS
Bw = 15.00'
n = 0.035
Pw = 21.51 FT.
A = 18.63 S.F.
S = 1.80%
Dn = 1.03'
V = 5.16 fps
VH = 0.41'

TRAPEZOID EARTHEN CHANNEL
STA.10+20.00 TO STA. 12+49.89
HYDRAULIC CALCULATION

Q(25) = 96.06 CFS
Bw = 15.00'
n = 0.035
Pw = 24.36 FT.
A = 28.77 S.F.
S = 0.50%
Dn = 1.48'
V = 3.34 fps
VH = 0.17'

PROPOSED TOP OF DRAIN	PROPOSED DRAIN FLOWLINE
601.12	599.12
601.22	599.22
601.38	599.38
601.45	599.45
601.78	599.78
602.11	600.11
602.44	600.44
602.77	600.77
603.10	601.10
603.43	601.43
603.79	601.79
604.15	602.15
604.51	602.51
604.87	602.87
605.23	603.23
605.59	603.59
605.95	603.95
606.31	604.31
606.67	604.67
607.03	605.03
607.39	605.39
607.75	605.75
607.85	605.85
607.95	605.95
608.05	606.05
608.15	606.15
608.25	606.25
608.35	606.35
608.45	606.45
608.55	606.55

6+40 7+00 8+00 9+00 10+00 11+00 11+80

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ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/13/2023

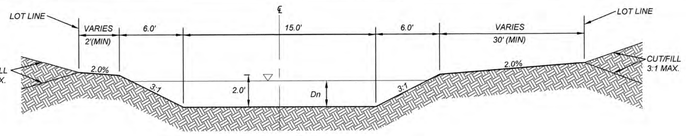
GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

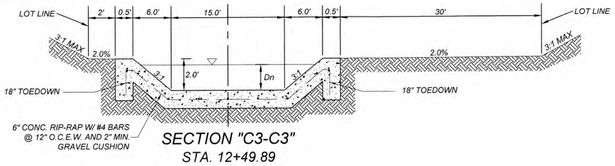
PRIVATE DRAIN "C" PLAN & PROFILE (SHEET 2 OF 3)

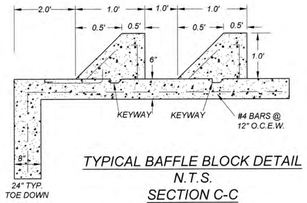
PLAT NO.
21-11800645

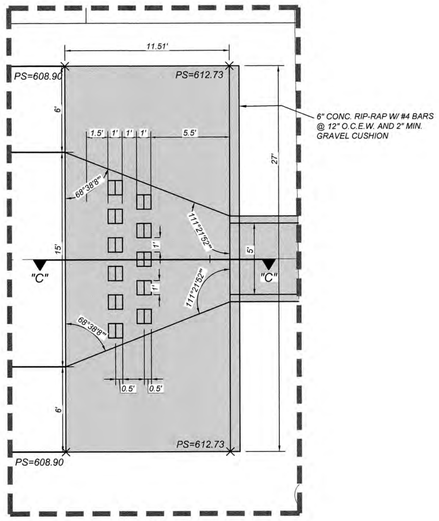
JOB NO: 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

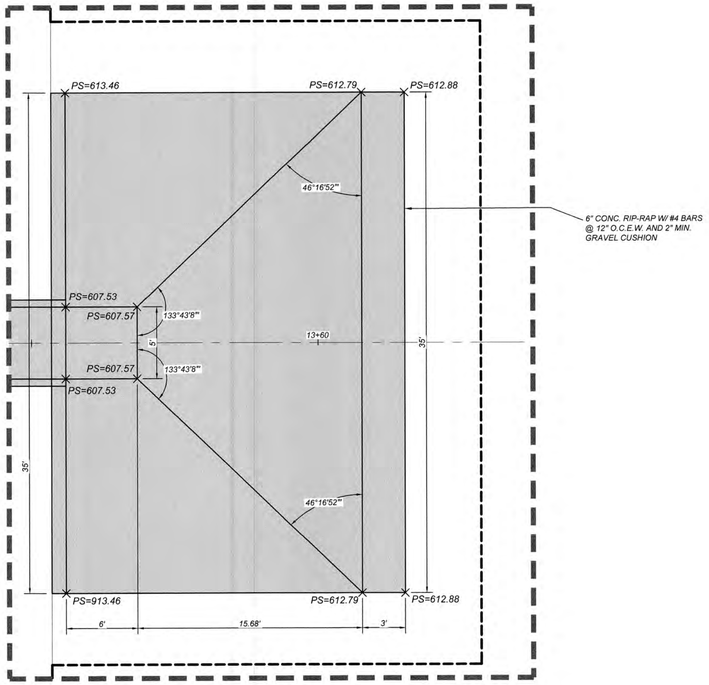
SHEET NUMBER:
4.3

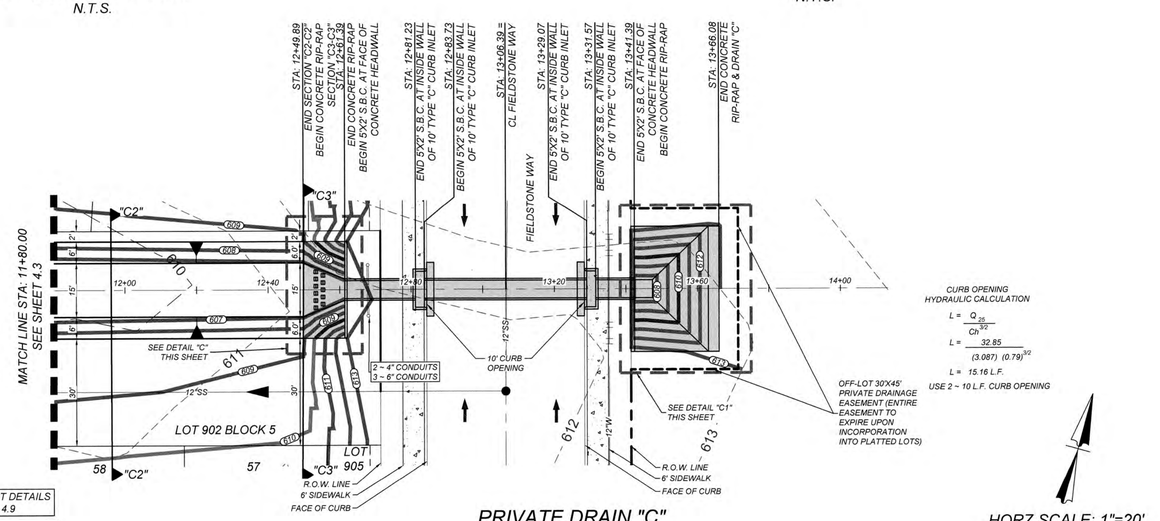












TRENCH EXCAVATION SAFETY PROTECTION

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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.

SECTION "C2-C2"
STA. 6+55.87- STA. 12+49.89
N.T.S.

SECTION "C3-C3"
STA. 12+49.89
N.T.S.

BAFFLE BLOCK CALCULATIONS
(ST. ANTHONY FALLS METHOD)

Q(25) = 79.95 CFS
BOTTOM WIDTH UPSTREAM = 5.0 FT
BOTTOM WIDTH DOWNSTREAM =15.0 FT
Y1 = 0.83' (DEPTH BEFORE JUMP)
Y2 = 1.75' (DEPTH AFTER JUMP)

WIDTH OF BLOCKS = 0.75(Y1) = 0.63 FT. (USE 1.0 FT.)
SPACE BETWEEN BLOCKS = 0.75(Y1) = 0.63 FT. (USE 1.0 FT.)
HEIGHT OF BLOCKS = Y1 = 0.83 FT. (USE 1.0 FT.)
OF BLOCKS ACROSS BOTTOM = 6

% OF FLOOR COVERED WITH BLOCKS = 6 (1.0 FT) /15.0 FT = 40%
(% MUST BE BETWEEN 40% AND 55%)

DEPTH OF TAILWATER (Y2)
FROUDE NUMBER BEFORE JUMP = F1 = 2.87
FROUDE NUMBER AFTER JUMP = F2 = 0.34
LENGTH OF BASIN = LB = 4.5(Y2)/F1^0.76 = 3.53 FT. (USE 10.0 FT.)

DISTANCE TO FLOOR BLOCKS = LB/3 = 1.18 FT. (USE 5.5 FT.)

HEIGHT OF MAX TAILWATER DEPTH:
Z = Y2/3 = 0.57 FT.
Y2' = (1.10 - F1^2 / 120) * Y2 = H = Z + Y2' = 1.80 FT.

VELOCITY AFTER JUMP:
V = Q/A
A = Y2 * [(B + T) / 2] = 17.5 SQ. FT.
V = 79.83/ 17.5= 4.56 F.P.S.

DETAIL "C"
SCALE: 1"=5'

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

DETAIL "C1"
SCALE: 1"=5'

CURB OPENING
HYDRAULIC CALCULATION

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

$$L = \frac{32.85}{(3.087)\ (0.79)^{3/2}}$$

$$L = 15.16 \text{ L.F.}$$

USE 2 ~ 10 L.F. CURB OPENING

SEE BOX CULVERT DETAILS
ON SHEET 4.9

SEE WINGWALL
DETAILS ON SHEET 4.10

PRIVATE DRAIN "C"
STA: 11+80.00 - END

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

TRAPEZOID EARTHEN
CHANNEL
STA.10+20.00 TO STA. 12+49.89
HYDRAULIC CALCULATION

Q(25) = 96.06 CFS
Bw = 15.00'
n = 0.035
Pw = 24.36 FT.
A = 28.77 S.F.
S = 0.50%
Dn = 1.48'
V = 3.34 fps
VH = 0.17'

TRAPEZOID CONCRETE
CHANNEL
STA.12+49.89
HYDRAULIC CALCULATION

Q(25) = 84.97 CFS
Bw = 15.00'
n = 0.015
Pw = 20.44 FT.
A = 15.12 S.F.
S = 0.50%
Dn =0.86'
V = 5.62 fps
VH = 0.49'

5'X2' S.B.C.
STA.12+61.39 to
STA.12+81.23
HYDRAULIC CALCULATION

Q(25) = 84.97 CFS
n = 0.013
A = 9.80 S.F.
S = 0.50%
D(dn) = 1.98'
D(up) = 2.00'
V(dn) = 8.58 fps
V(up) = 8.50 fps
VH(dn) = 1.14'
VH(up) = 1.12'

5'X2' S.B.C.
STA. 12+83.73- STA: 13+29.07
HYDRAULIC CALCULATION

Q(25) = 68.48 CFS
n = 0.013
A = 9.20 S.F.
S = 0.50%
D(dn) = 1.90'
D(up) = 1.80'
V(dn) = 7.21 fps
V(up) = 7.61 fps
VH(dn) = 0.81'
VH(up) = 0.90'

5'X2' S.B.C.
STA: 13+31.57- STA: 13+41.39
HYDRAULIC CALCULATION

Q(25) =51.99 CFS
n = 0.013
A = 7.95 S.F.
S = 0.50%
D(dn) = 1.70'
D(up) = 1.50'
V(dn) = 6.12 fps
V(up) = 6.94 fps
VH(dn) = 0.58'
VH(up) = 0.75'

PROPOSED TOP OF DRAIN	PROPOSED DRAIN FLOWLINE
608.55	606.55
608.65	606.65
608.75	606.75
608.85	606.85
608.90	606.90
612.27	606.95
612.73	606.96
	607.05
	607.06
	607.15
	607.23
	607.33
	607.38
	607.49
	607.53
613.27	607.53
	607.57
	611.77
	612.79
	612.88

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REVISIONS
ISSUE DATE

CLAYTON J. LINNEY
111543
3/17/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
PRIVATE DRAIN "C" PLAN & PROFILE (SHEET 3 OF 3)

PLAT NO.
21-11800645
JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL
SHEET NUMBER:
4.4

TRENCH EXCAVATION SAFETY PROTECTION

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NOTE:

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

BAFFLE BLOCK CALCULATIONS
(ST. ANTHONY FALLS METHOD)

Q(25) = 51.76 CFS
BOTTOM WIDTH UPSTREAM = 6.0 FT
BOTTOM WIDTH DOWNSTREAM = 6.0 FT
Y1 = 0.56' (DEPTH BEFORE JUMP)
Y2 = 2.23' (DEPTH AFTER JUMP)

WIDTH OF BLOCKS = 0.75(Y1) = 0.42 FT. (USE 1.0 FT.)
SPACE BETWEEN BLOCKS = 0.75(Y1) = 0.42 FT. (USE 1.0 FT.)
HEIGHT OF BLOCKS = Y1 = 0.56 FT. (USE 1.0 FT.)
 # OF BLOCKS ACROSS BOTTOM = 3

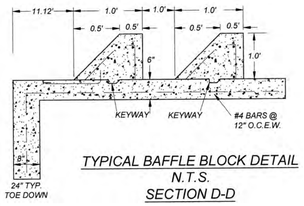
% OF FLOOR COVERED WITH BLOCKS = 3 (1.0 FT) /6.0 FT = 50%
(% MUST BE BETWEEN 40% AND 55%)

DEPTH OF TAILWATER (Y2)
FROUDE NUMBER BEFORE JUMP = F1 = 3.46
FROUDE NUMBER AFTER JUMP = F2 = 0.38
LENGTH OF BASIN = LB = 4.5(Y2)/F1^0.76 = 3.91 FT. (USE 10.0 FT.)

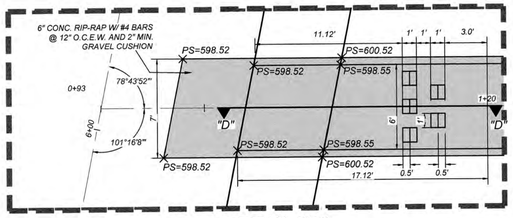
DISTANCE TO FLOOR BLOCKS = LB/3 = 1.30 FT. (USE 3.0 FT.)

HEIGHT OF MAX TAILWATER DEPTH:
Z = Y2/3 = 0.74 FT.
*Y2' = (1.10 - F1^2 / 120) * Y2 = H = Z + Y2' = 2.23 FT.*

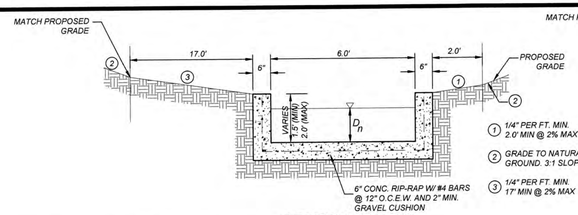
VELOCITY AFTER JUMP:
V = Q/A
*A = Y2 * [(B + T) / 2] = 13.38 SQ. FT.*
V = 51.76/13.38 = 3.87 F.P.S.



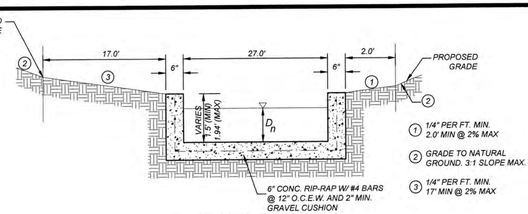
TYPICAL BAFFLE BLOCK DETAIL
N.T.S.
SECTION D-D



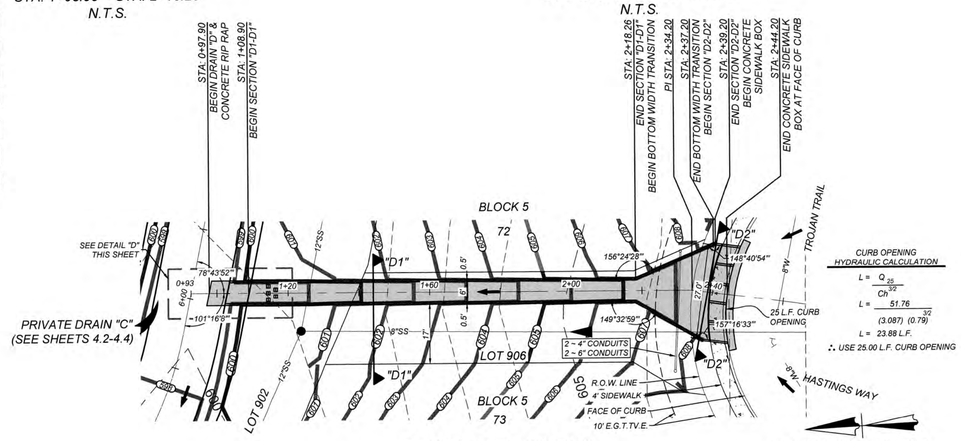
DETAIL "D"
SCALE: 1"=5'



SECTION "D1-D1"
STA. 1+08.90 - STA. 2+18.26
N.T.S.



SECTION "D2-D2"
STA. 2+37.20 - STA. 2+39.20
N.T.S.



CURB OPENING HYDRAULIC CALCULATION

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

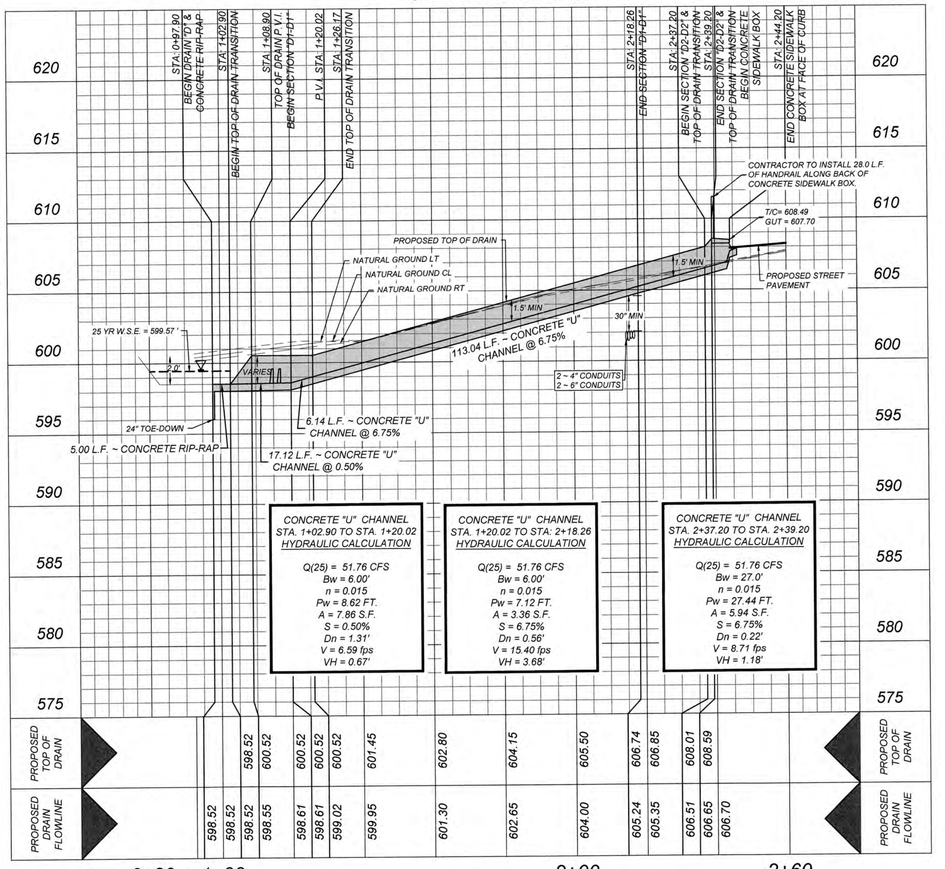
$L = \frac{51.76}{(3.087)(0.79)^{3/2}}$

$L = 23.88$ L.F.

∴ USE 25.00 L.F. CURB OPENING

PRIVATE DRAIN "D"
STA: 0+97.90 - END

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



CONCRETE "U" CHANNEL
STA. 1+02.90 TO STA. 1+20.02
HYDRAULIC CALCULATION

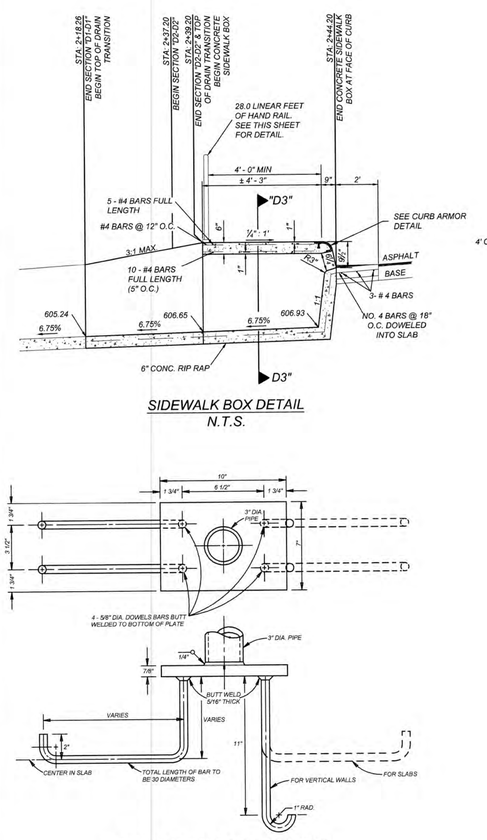
Q(25) = 51.76 CFS
Bw = 6.00'
n = 0.015
Pw = 8.62 FT.
A = 7.86 S.F.
S = 0.50%
Dn = 1.31'
V = 6.59 fps
VH = 0.67'

CONCRETE "U" CHANNEL
STA. 1+20.02 TO STA. 2+18.26
HYDRAULIC CALCULATION

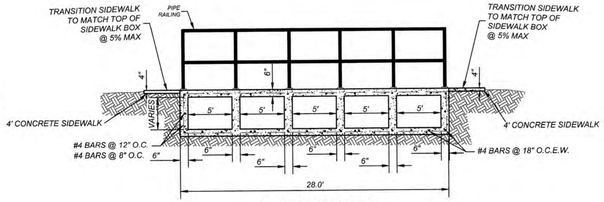
Q(25) = 51.76 CFS
Bw = 6.00'
n = 0.015
Pw = 7.12 FT.
A = 3.36 S.F.
S = 6.75%
Dn = 0.56'
V = 15.40 fps
VH = 3.68'

CONCRETE "U" CHANNEL
STA. 2+37.20 TO STA. 2+39.20
HYDRAULIC CALCULATION

Q(25) = 51.76 CFS
Bw = 27.0'
n = 0.015
Pw = 27.44 FT.
A = 5.94 S.F.
S = 6.75%
Dn = 0.22'
V = 8.71 fps
VH = 1.18'

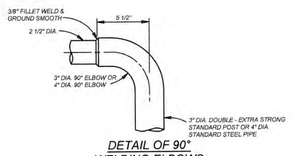


SIDEWALK BOX DETAIL
N.T.S.



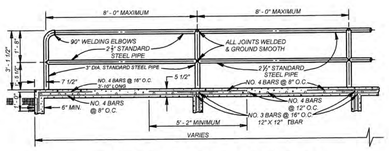
SECTION "D3-D3"
N.T.S.

PIPE ANCHORAGE DETAILS
N.T.S.

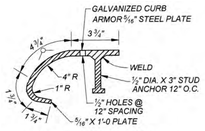


DETAIL OF 90° WELDING ELBOWS
N.T.S.

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



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



CURB ARMOR DETAIL
N.T.S.

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

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/13/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
PRIVATE DRAIN "D" PLAN & PROFILE

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL
SHEET NUMBER: 4.5

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.

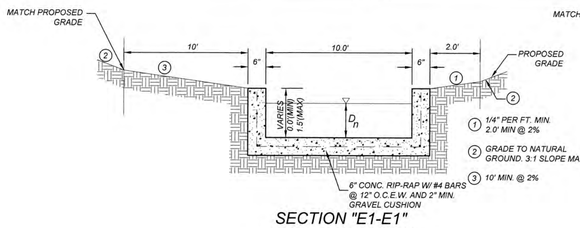
CAUTION!!:

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.

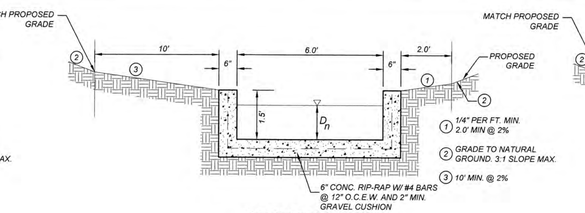
NOTE:

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

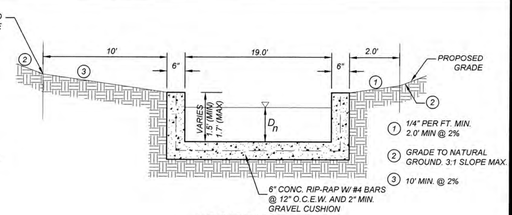
2. ANY DISTURBED AREAS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY-FIVE PERCENT OF THE DISTURBED SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT.



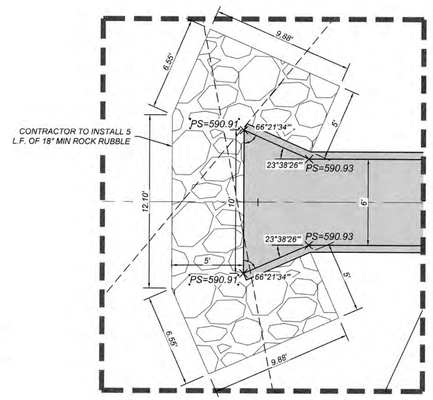
SECTION "E1-E1"
STA. 1+39.00 - 1+43.57
N.T.S.



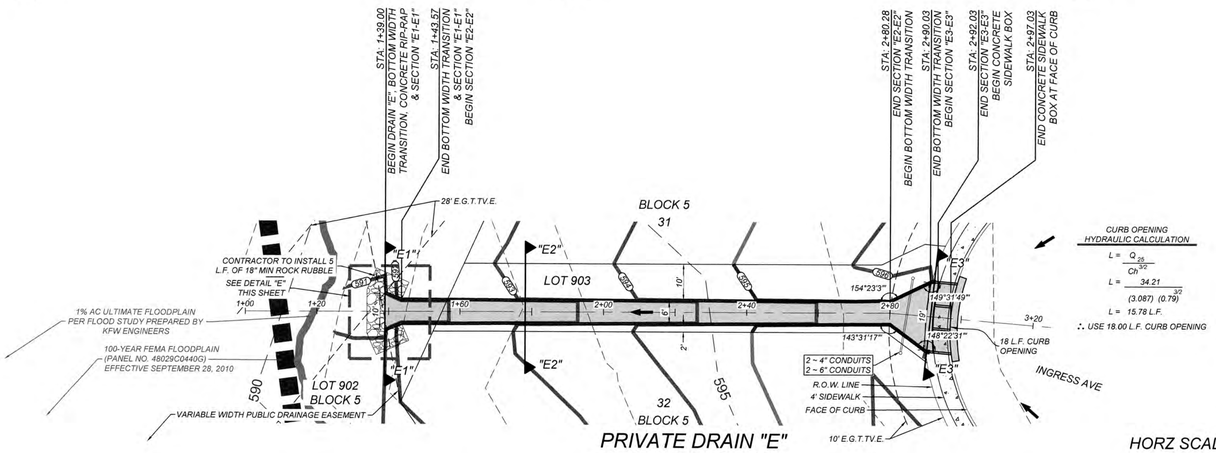
SECTION "E2-E2"
STA. 1+43.57 - STA. 2+80.28
N.T.S.



SECTION "E3-E3"
STA. 2+90.03 - STA. 2+92.03
N.T.S.

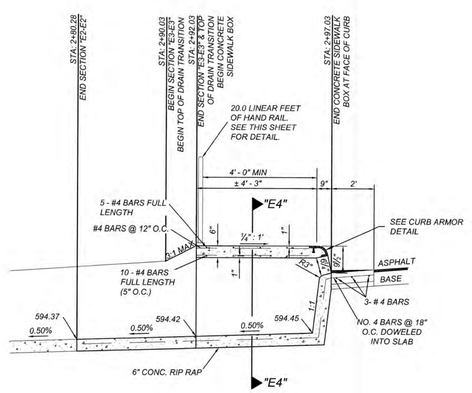


DETAIL "E"
SCALE: 1"=5'

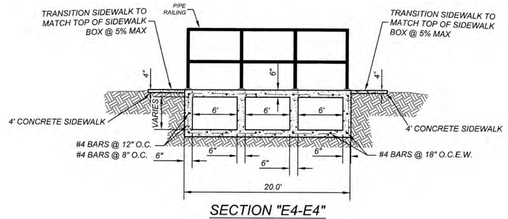


PRIVATE DRAIN "E"
STA: 1+39.00 - END

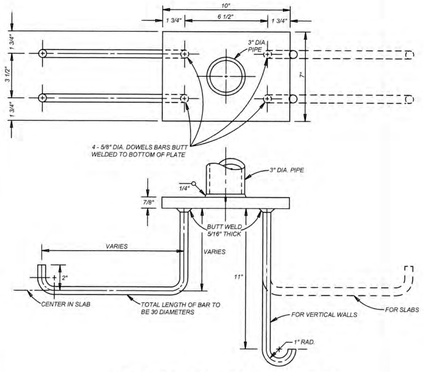
HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



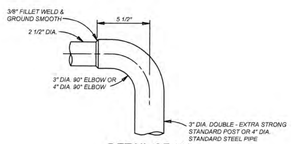
SIDEWALK BOX DETAIL
N.T.S.



SECTION "E4-E4"
N.T.S.



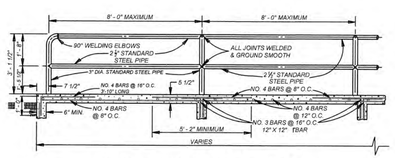
CURB ARMOR DETAIL
N.T.S.



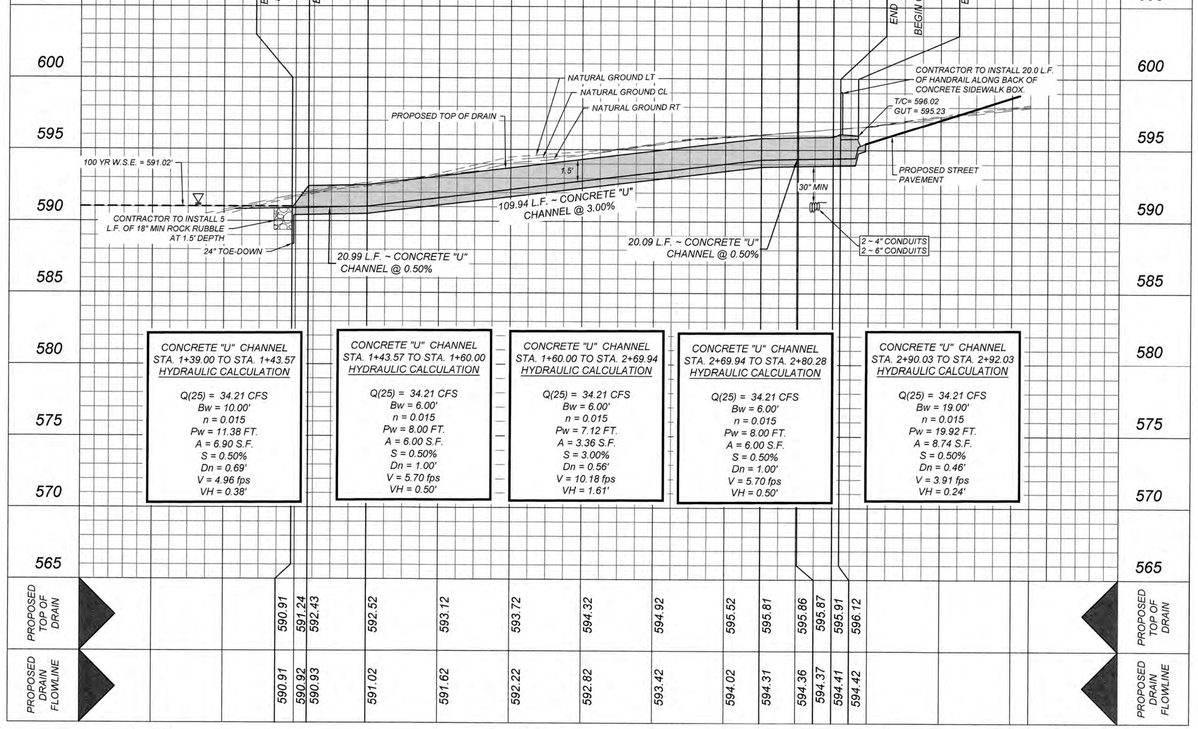
DETAIL OF 90°
WELDING ELBOWS
N.T.S.

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

PIPE ANCHORAGE DETAILS
N.T.S.



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



CONCRETE "U" CHANNEL
STA. 1+39.00 TO STA. 1+43.57
HYDRAULIC CALCULATION
Q(25) = 34.21 CFS
Bw = 10.00'
n = 0.015
Pw = 11.38 FT.
A = 6.90 S.F.
S = 0.50%
Dn = 0.69'
V = 4.96 fps
VH = 0.38'

CONCRETE "U" CHANNEL
STA. 1+43.57 TO STA. 1+60.00
HYDRAULIC CALCULATION
Q(25) = 34.21 CFS
Bw = 6.00'
n = 0.015
Pw = 8.00 FT.
A = 6.00 S.F.
S = 0.50%
Dn = 1.00'
V = 5.70 fps
VH = 0.50'

CONCRETE "U" CHANNEL
STA. 1+60.00 TO STA. 2+69.94
HYDRAULIC CALCULATION
Q(25) = 34.21 CFS
Bw = 6.00'
n = 0.015
Pw = 7.12 FT.
A = 3.36 S.F.
S = 3.00%
Dn = 0.56'
V = 10.18 fps
VH = 1.61'

CONCRETE "U" CHANNEL
STA. 2+69.94 TO STA. 2+80.28
HYDRAULIC CALCULATION
Q(25) = 34.21 CFS
Bw = 6.00'
n = 0.015
Pw = 8.00 FT.
A = 6.00 S.F.
S = 0.50%
Dn = 1.00'
V = 5.70 fps
VH = 0.50'

CONCRETE "U" CHANNEL
STA. 2+90.03 TO STA. 2+92.03
HYDRAULIC CALCULATION
Q(25) = 34.21 CFS
Bw = 19.00'
n = 0.015
Pw = 19.92 FT.
A = 8.74 S.F.
S = 0.50%
Dn = 0.46'
V = 3.91 fps
VH = 0.24'

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10123500

REVISIONS | ISSUE DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
3/17/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

PRIVATE DRAIN "E" PLAN & PROFILE

PLAT NO.
21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
4.6

Date: Mar 13, 2023, 2:40pm User ID: cgroff
File: P:\2019\43\04\Design\Civil\Drains\DR2054304.dwg

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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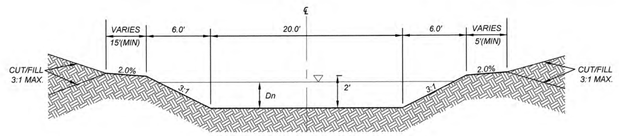
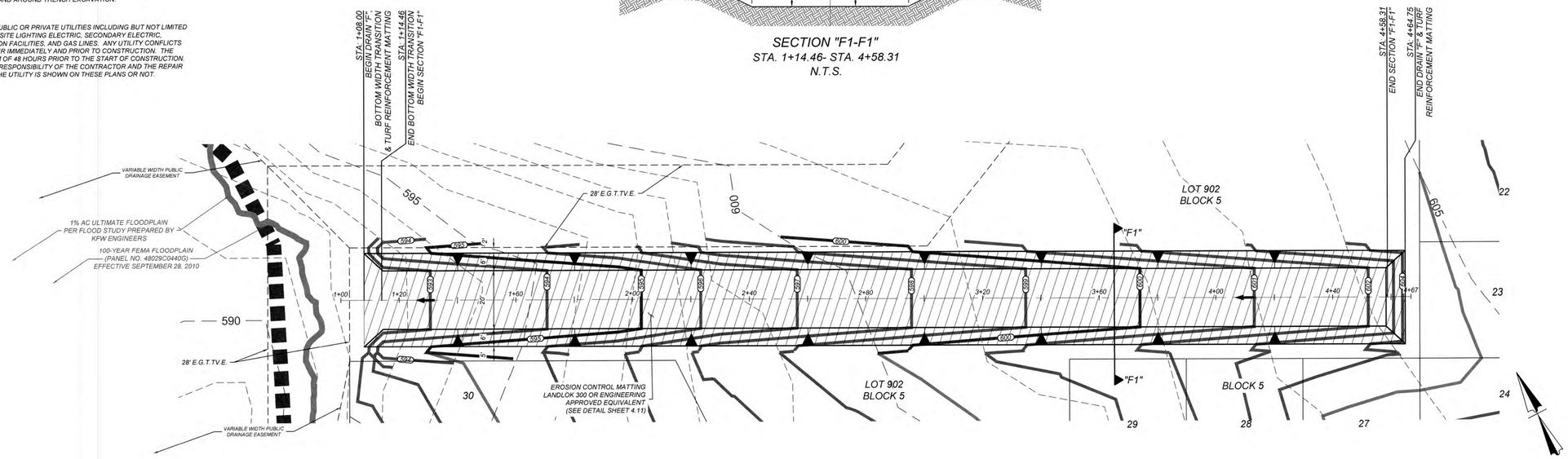
NOTE:

A. AT THE PRE-FINAL INSPECTION: THE ENGINEER MUST ISSUE CERTIFICATION TO THE CITY INSPECTOR THAT THE TURF REINFORCEMENT MAT (TRM) WAS INSTALLED IN ACCORDANCE WITH THE PLANS AND SPECIFICATIONS. THE CERTIFICATION MUST ALSO NOTE THAT THE MATERIAL AND INSTALLATION HAS MET CITY AND MANUFACTURER SPECIFICATIONS.

B. IMPROVED EARTHEN CHANNELS AND DETENTION PONDS WILL BE VEGETATED BY SEEDING OR SODDING. EIGHTY FIVE PERCENT (85%) OF THE CHANNEL SURFACE AREA MUST HAVE ESTABLISHED VEGETATION BEFORE THE CITY OF SAN ANTONIO WILL ACCEPT THE CHANNEL FOR MAINTENANCE.

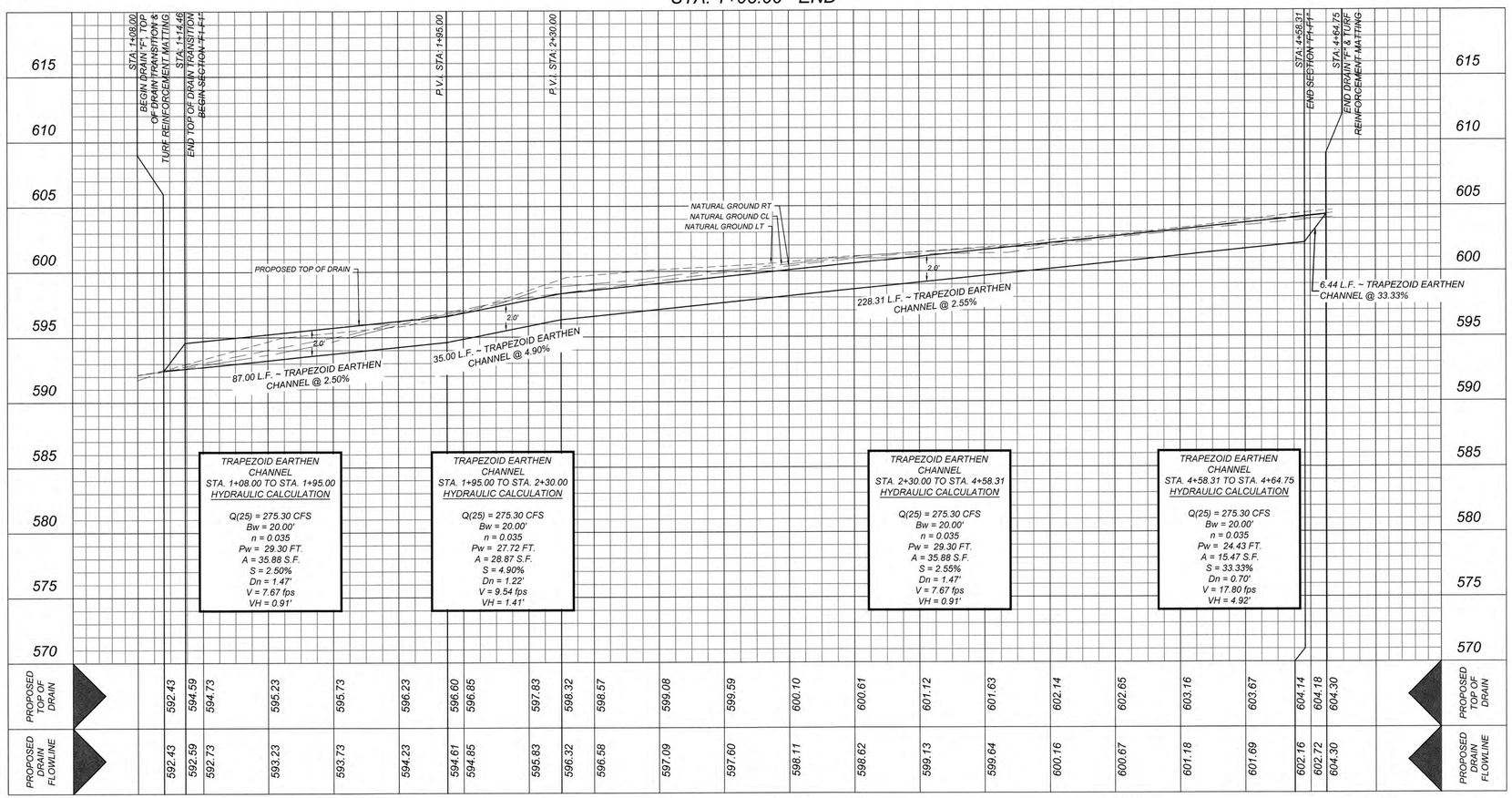


SECTION "F1-F1"
STA. 1+14.46- STA. 4+58.31
N.T.S.



DRAIN "F"
STA: 1+08.00 - END

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



TRAPEZOID EARTHEN CHANNEL
STA. 1+08.00 TO STA. 1+95.00
HYDRAULIC CALCULATION

Q(25) = 275.30 CFS
Bw = 20.00'
n = 0.035
Pw = 29.30 FT.
A = 35.88 S.F.
S = 2.50%
Dn = 1.47'
V = 7.67 fps
VH = 0.91'

TRAPEZOID EARTHEN CHANNEL
STA. 1+95.00 TO STA. 2+30.00
HYDRAULIC CALCULATION

Q(25) = 275.30 CFS
Bw = 20.00'
n = 0.035
Pw = 27.72 FT.
A = 28.87 S.F.
S = 4.90%
Dn = 1.22'
V = 9.54 fps
VH = 1.41'

TRAPEZOID EARTHEN CHANNEL
STA. 2+30.00 TO STA. 4+58.31
HYDRAULIC CALCULATION

Q(25) = 275.30 CFS
Bw = 20.00'
n = 0.035
Pw = 29.30 FT.
A = 35.88 S.F.
S = 2.55%
Dn = 1.47'
V = 7.67 fps
VH = 0.91'

TRAPEZOID EARTHEN CHANNEL
STA. 4+58.31 TO STA. 4+64.75
HYDRAULIC CALCULATION

Q(25) = 275.30 CFS
Bw = 20.00'
n = 0.035
Pw = 24.43 FT.
A = 15.47 S.F.
S = 33.33%
Dn = 0.70'
V = 17.80 fps
VH = 4.92'

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm # 1913 • TBPLS Firm # 10122300

REVISIONS | ISSUE DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
3/17/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

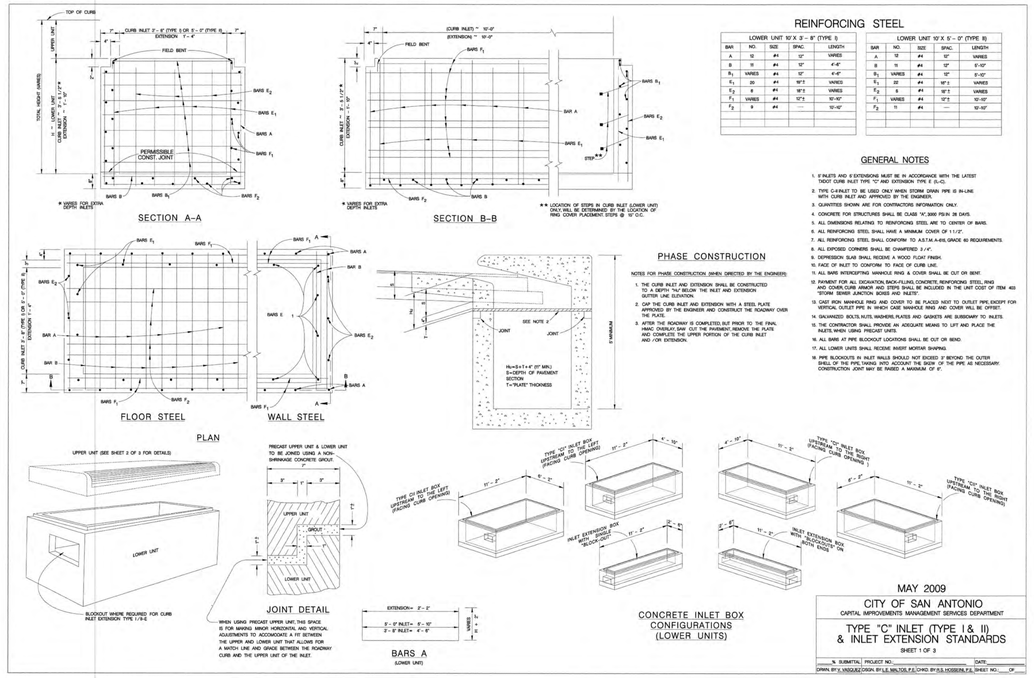
PRIVATE DRAIN "F" PLAN & PROFILE

PLAT NO. 21-11800645

JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER: 4.7

Date: Mar 13, 2023, 2:41pm User ID: cgroff
File: P:\205\43\04\Design\Civil\Drains\DR205430 4.dwg



REINFORCING STEEL

LOWER UNIT 10' X 3' - 8" (TYPE I)

BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	4'-6"
B_1	VARIES	#4	12"	4'-6"
F_1	20	#4	9"±	VARIES
F_2	8	#4	9"±	VARIES
F_3	VARIES	#4	12"±	10'-10"
F_3	9	#4	—	10'-10"

LOWER UNIT 10' X 5' - 0" (TYPE II)

BAR	NO.	SIZE	SPAC.	LENGTH
A	12	#4	12"	VARIES
B	11	#4	12"	5'-10"
B_1	VARIES	#4	12"	5'-10"
F_1	22	#4	9"±	VARIES
F_2	8	#4	9"±	VARIES
F_3	VARIES	#4	12"±	10'-10"
F_3	11	#4	—	10'-10"

GENERAL NOTES

1. 9' INLETS AND 6' EXTENSIONS MUST BE IN ACCORDANCE WITH THE LATEST TXDOT CURB INLET TYPE "C" AND EXTENSION TYPE E (L-C).
2. TYPE C-9 INLET TO BE USED ONLY WHEN STORM DRAIN PIPE IS IN-LINE WITH CURB INLET AND APPROVED BY THE ENGINEER.
3. QUANTITIES SHOWN ARE FOR CONTRACTORS INFORMATION ONLY.
4. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
5. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
6. ALL REINFORCING STEEL SHALL HAVE A MINIMUM COVER OF 1 1/2".
7. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A-615, GRADE 60 REQUIREMENTS.
8. ALL EXPOSED CORNERS SHALL BE CHAMFERED 3/4".
9. DEPRESSION SLAB SHALL RECEIVE A WOOD FLOAT FINISH.
10. FACE OF INLET TO CONFORM TO FACE OF CURB LINE.
11. ALL BARS INTERCEPTING MANHOLE RING & COVER SHALL BE CUT OR BENT.
12. PAYMENT FOR ALL EXCAVATION, BACK-FILLING, CONCRETE, REINFORCING STEEL, RING AND COVER, CURB ARMOR AND STEPS SHALL BE INCLUDED IN THE UNIT COST OF ITEM 403 "STORM SEWER JUNCTION BOXES AND INLETS".
13. CAST IRON MANHOLE RING AND COVER TO BE PLACED NEXT TO OUTLET PIPE, EXCEPT FOR VERTICAL OUTLET PIPE IN WHICH CASE MANHOLE RING AND COVER WILL BE OFFSET.
14. GALVANIZED BOLTS, NUTS, WASHERS, PLATES AND GASKETS ARE SUBSIDIARY TO INLETS.
15. THE CONTRACTOR SHALL PROVIDE AN ADEQUATE MEANS TO LIFT AND PLACE THE INLETS, WHEN USING PRECAST UNITS.
16. ALL BARS AT PIPE BLOCKOUT LOCATIONS SHALL BE CUT OR BEND.
17. ALL LOWER UNITS SHALL RECEIVE INSERT MORTAR SHAPING.
18. PIPE BLOCKOUTS IN INLET WALLS SHOULD NOT EXCEED 3' BEYOND THE OUTER SHELL OF THE PIPE, TAKING INTO ACCOUNT THE SKEW OF THE PIPE, AS NECESSARY. CONSTRUCTION JOINT MAY BE PAISED A MAXIMUM OF 9".

PHASE CONSTRUCTION

NOTES FOR PHASE CONSTRUCTION (WHEN DIRECTED BY THE ENGINEER):

1. THE CURB INLET AND EXTENSION SHALL BE CONSTRUCTED TO A DEPTH 1/2" BELOW THE INLET AND EXTENSION OPENING AS SHOWN.
2. CAP THE CURB INLET AND EXTENSION WITH A STEEL PLATE APPROVED BY THE ENGINEER AND CONSTRUCT THE ROADWAY OVER THE PLATE.
3. AFTER THE ROADWAY IS COMPLETED BUT PRIOR TO THE FINAL HMAC OVERLAY, SAW CUT THE PAVEMENT, REMOVE THE PLATE AND COMPLETE THE UPPER PORTION OF THE CURB INLET AND /OR EXTENSION.

MAY 2009

CITY OF SAN ANTONIO

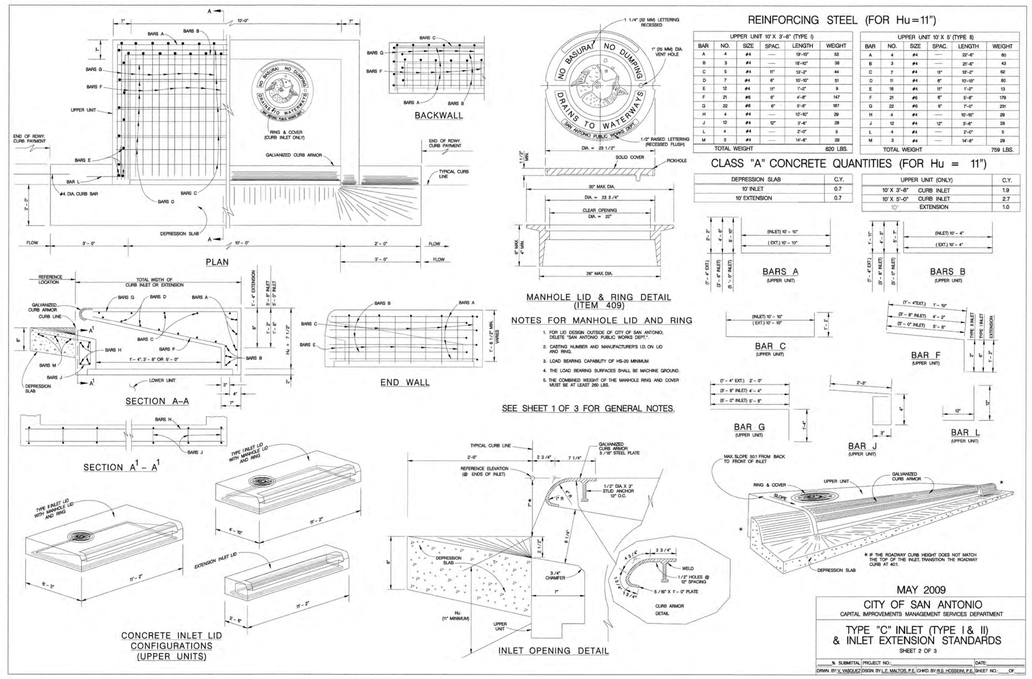
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

SHEET 1 OF 3

∆	SUBMITTAL	PROJECT NO.:	DATE:

DRWN. BY: L. VASQUEZ DSGN. BY: L.E. WALTOS, P.E. CHKD. BY: S.S. HOSSEINI, P.E. SHEET NO.: ___ OF ___



REINFORCING STEEL (FOR Hu=11")

UPPER UNIT 10' X 3'-8" (TYPE I)

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	10'-10"	29
B	3	#4	—	9'-6"	19
C	5	#4	12"	10'-10"	54
D	7	#4	6"	10'-10"	151
E	12	#4	11"	1'-2"	9
F	21	#5	6"	4'-8"	147
G	22	#5	6"	5'-6"	187
H	4	#4	—	10'-10"	29
J	12	#4	12"	2'-1"	26
L	4	#4	—	2'-0"	5
M	3	#4	—	14'-8"	29
TOTAL WEIGHT					820 LBS.

UPPER UNIT 10' X 5'-0" (TYPE II)

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	12'-10"	33
B	3	#4	—	11'-6"	23
C	7	#4	12"	12'-2"	60
D	11	#4	6"	12'-10"	80
E	16	#4	11"	1'-2"	13
F	21	#5	6"	5'-6"	179
G	22	#5	6"	7'-0"	231
H	4	#4	—	12'-10"	29
J	12	#4	12"	2'-1"	26
L	4	#4	—	2'-6"	5
M	3	#4	—	14'-8"	29
TOTAL WEIGHT					759 LBS.

CLASS "A" CONCRETE QUANTITIES (FOR Hu = 11")

DEPRESSION SLAB	C.Y.
10' INLET	0.7
10' EXTENSION	0.7

UPPER UNIT (ONLY)	C.Y.
10' X 3'-8" CURB INLET	1.9
10' X 5'-0" CURB INLET EXTENSION	2.7
TOTAL	1.0

NOTES FOR MANHOLE LID AND RING

1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT."
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF HS-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 350 LBS.

SEE SHEET 1 OF 3 FOR GENERAL NOTES.

MAY 2009

CITY OF SAN ANTONIO

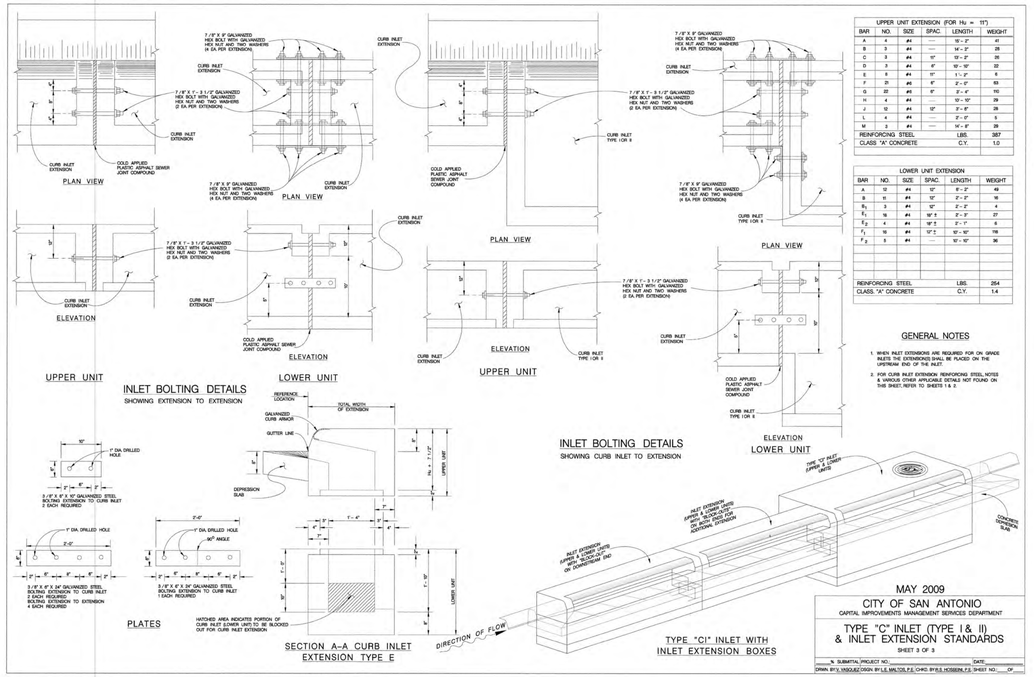
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

SHEET 2 OF 3

∆	SUBMITTAL	PROJECT NO.:	DATE:

DRWN. BY: L. VASQUEZ DSGN. BY: L.E. WALTOS, P.E. CHKD. BY: S.S. HOSSEINI, P.E. SHEET NO.: ___ OF ___



UPPER UNIT EXTENSION (FOR H_U = 11")

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	4	#4	—	12'-2"	32
B	3	#4	—	11'-2"	25
C	3	#4	12"	12'-2"	26
D	3	#4	6"	12'-10"	32
E	9	#4	11"	1'-2"	9
F	21	#5	6"	2'-6"	93
G	22	#5	6"	3'-4"	110
H	4	#4	—	12'-10"	29
J	12	#4	12"	2'-1"	26
L	4	#4	—	2'-0"	5
M	3	#4	—	14'-8"	29
REINFORCING STEEL				LBS.	367
CLASS "A" CONCRETE				C.Y.	1.0

LOWER UNIT EXTENSION

BAR	NO.	SIZE	SPAC.	LENGTH	WEIGHT
A	12	#4	12"	9'-2"	42
B	11	#4	12"	2'-2"	16
B_1	3	#4	12"	2'-2"	4
F_1	16	#4	9"±	2'-3"	27
F_2	4	#4	9"±	2'-1"	6
F_3	10	#4	12"±	10'-10"	116
F_3	3	#4	—	10'-10"	36
REINFORCING STEEL				LBS.	254
CLASS "A" CONCRETE				C.Y.	1.4

GENERAL NOTES

1. WHEN INLET EXTENSIONS ARE REQUIRED FOR ON GRADE INLETS THE EXTENSION(S) SHALL BE PLACED ON THE UPSTREAM END OF THE INLET.
2. FOR CURB INLET EXTENSION REINFORCING STEEL NOTES & VARIOUS OTHER APPLICABLE DETAILS NOT FOUND ON THIS SHEET, REFER TO SHEETS 1 & 3.

MAY 2009

CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TYPE "C" INLET (TYPE I & II) & INLET EXTENSION STANDARDS

SHEET 3 OF 3

∆	SUBMITTAL	PROJECT NO.:	DATE:

DRWN. BY: L. VASQUEZ DSGN. BY: L.E. WALTOS, P.E. CHKD. BY: S.S. HOSSEINI, P.E. SHEET NO.: ___ OF ___

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

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
6/13/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

DRAIN DETAILS (SHEET 1 OF 4)

PLAT NO. 21-11800645

JOB NO. 205-43-04

DATE: OCTOBER 2021

DRAWN: OM CHECKED: CL

SHEET NUMBER:

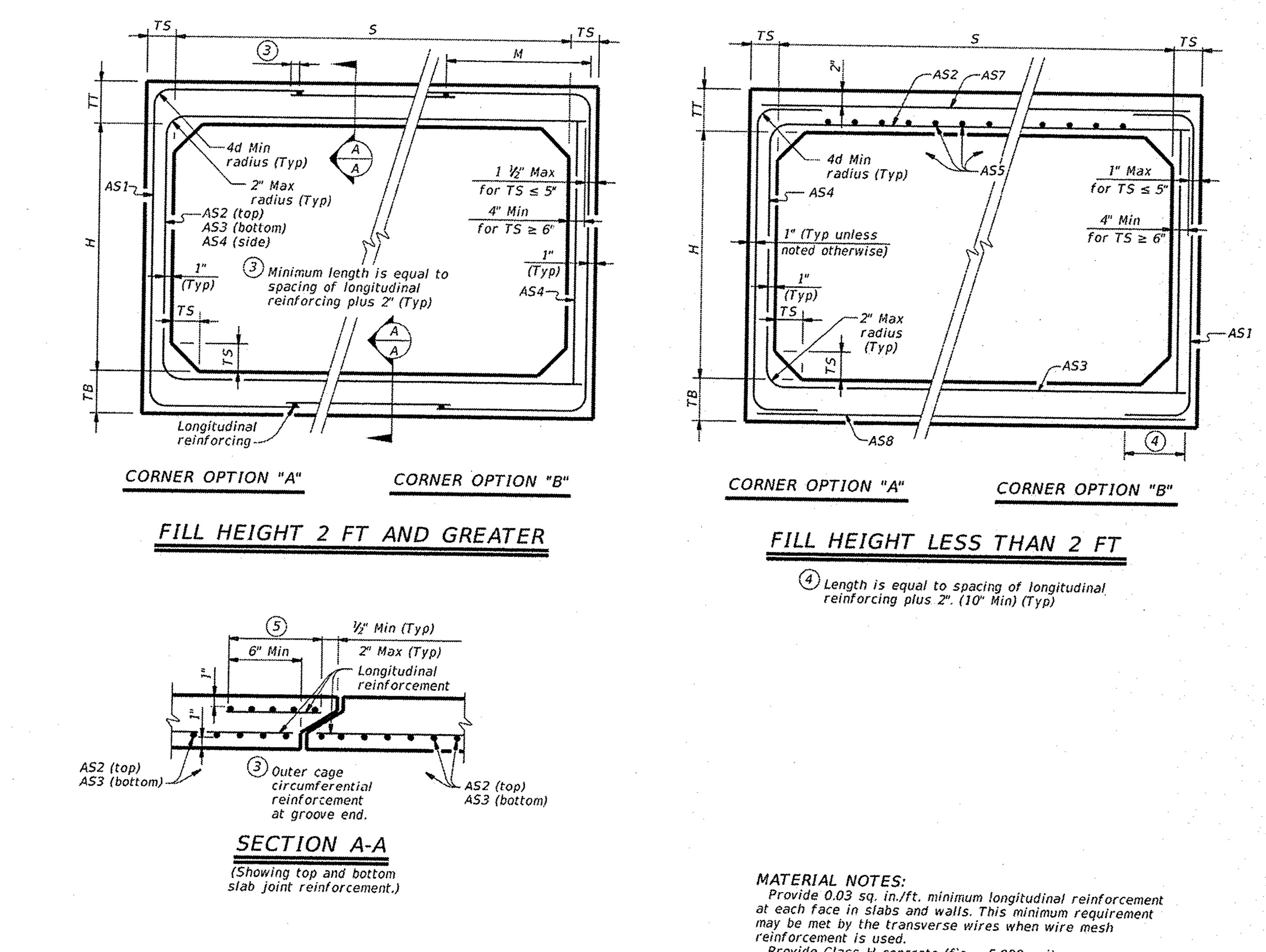
4.8

BOX DATA

SECTION DIMENSIONS S (ft.)	H (ft.)	TT (in.)	TB (in.)	TS (in.)	Fill Height (ft.)	M (Min) (in.)	REINFORCING (sq. in. / ft.) ② AS1	AS2	AS3	AS4	AS5	AS7	AS8	① Lift Weight (tons)
5	2	8	7	6	< 2	-	0.19	0.27	0.18	0.14	0.19	0.19	0.17	6.0
5	2	6	6	6	2 < 3	44	0.22	0.20	0.16	0.14	-	-	-	5.1
5	2	6	6	6	3 - 5	44	0.16	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	10	36	0.15	0.14	0.14	0.14	-	-	-	5.1
5	2	6	6	6	15	36	0.20	0.18	0.18	0.14	-	-	-	5.1
5	2	6	6	6	20	36	0.26	0.23	0.24	0.14	-	-	-	5.1
5	2	6	6	6	25	36	0.33	0.29	0.29	0.14	-	-	-	5.1
5	2	6	6	6	30	36	0.39	0.34	0.35	0.14	-	-	-	5.1
5	3	8	7	6	< 2	-	0.19	0.31	0.21	0.14	0.19	0.19	0.17	6.6
5	3	6	6	6	2 < 3	45	0.18	0.24	0.19	0.14	-	-	-	5.7
5	3	6	6	6	3 - 5	36	0.14	0.17	0.16	0.14	-	-	-	5.7
5	3	6	6	6	10	36	0.14	0.16	0.17	0.14	-	-	-	5.7
5	3	6	6	6	15	35	0.16	0.21	0.22	0.14	-	-	-	5.7
5	3	6	6	6	20	35	0.21	0.27	0.28	0.14	-	-	-	5.7
5	3	6	6	6	25	35	0.26	0.34	0.34	0.14	-	-	-	5.7
5	3	6	6	6	30	35	0.31	0.41	0.41	0.14	-	-	-	5.7
5	4	8	7	6	< 2	-	0.19	0.33	0.24	0.14	0.19	0.19	0.17	7.2
5	4	6	6	6	2 < 3	45	0.16	0.27	0.22	0.14	-	-	-	6.3
5	4	6	6	6	3 - 5	45	0.14	0.19	0.18	0.14	-	-	-	6.3
5	4	6	6	6	10	36	0.14	0.18	0.18	0.14	-	-	-	6.3
5	4	6	6	6	15	35	0.14	0.23	0.24	0.14	-	-	-	6.3
5	4	6	6	6	20	35	0.17	0.30	0.31	0.14	-	-	-	6.3
5	4	6	6	6	25	35	0.21	0.37	0.38	0.14	-	-	-	6.3
5	4	6	6	6	30	35	0.25	0.44	0.45	0.14	-	-	-	6.3
5	5	8	7	6	< 2	-	0.19	0.35	0.26	0.14	0.19	0.19	0.17	7.8
5	5	6	6	6	2 < 3	45	0.14	0.29	0.24	0.14	-	-	-	6.9
5	5	6	6	6	3 - 5	45	0.14	0.21	0.20	0.14	-	-	-	6.9
5	5	6	6	6	10	45	0.14	0.19	0.20	0.14	-	-	-	6.9
5	5	6	6	6	15	36	0.14	0.24	0.25	0.14	-	-	-	6.9
5	5	6	6	6	20	35	0.15	0.31	0.32	0.14	-	-	-	6.9
5	5	6	6	6	25	35	0.18	0.38	0.39	0.14	-	-	-	6.9
5	5	6	6	6	30	35	0.21	0.46	0.47	0.14	-	-	-	6.9

① For box length = 8'-0"

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



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

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

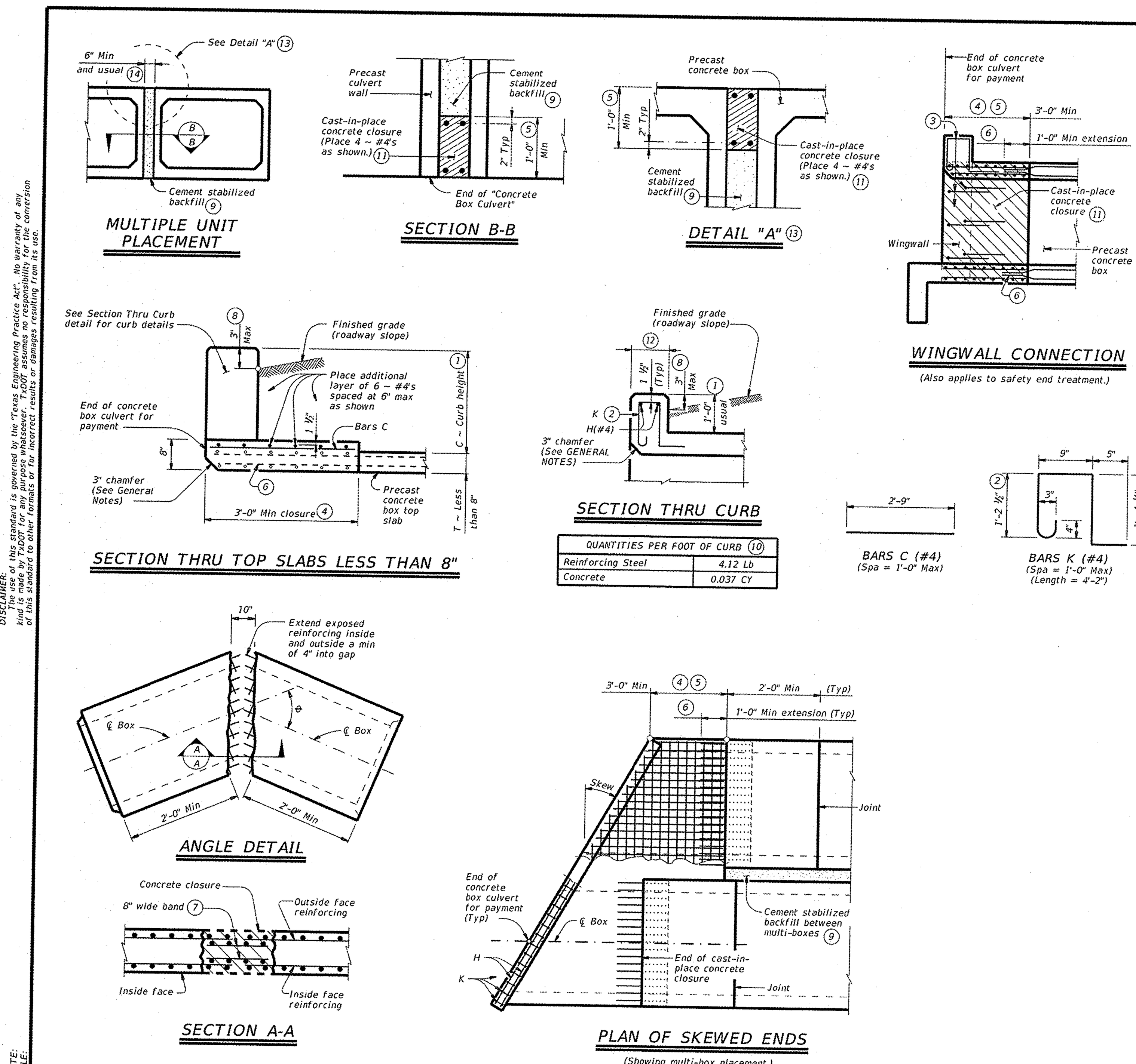
HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

SINGLE BOX CULVERTS
PRECAST
5'-0" SPAN

SCP-5

FILE: scp05sts-20.dgn | DN: TxDOT | CK: TxDOT | DW: TxDOT | CK: TxDOT
©TxDOT February 2020 | CONT | SECT | JOB | HIGHWAY
REVISIONS | DIST | COUNTY | SHEET NO.



① 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail, bicycle rail, or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

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

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

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

⑤ For multiple unit placements, adjust the length of the closure for the interior walls as necessary. Provide a 3'-0" Min cast-in-place closure in the top slab, bottom slab, and exterior wall. See Section B-B detail when interior walls are cast full length.

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

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

⑧ For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

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

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

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

⑫ 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.

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

⑭ This dimension may be increased with approval of the Engineer to allow the precast boxes to be tunneled or jacked in accordance with Item 476, "Jacking, Boring, or Tunneling Pipe or Box". No payment will be made for any additional material in the gap between adjacent boxes.

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

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

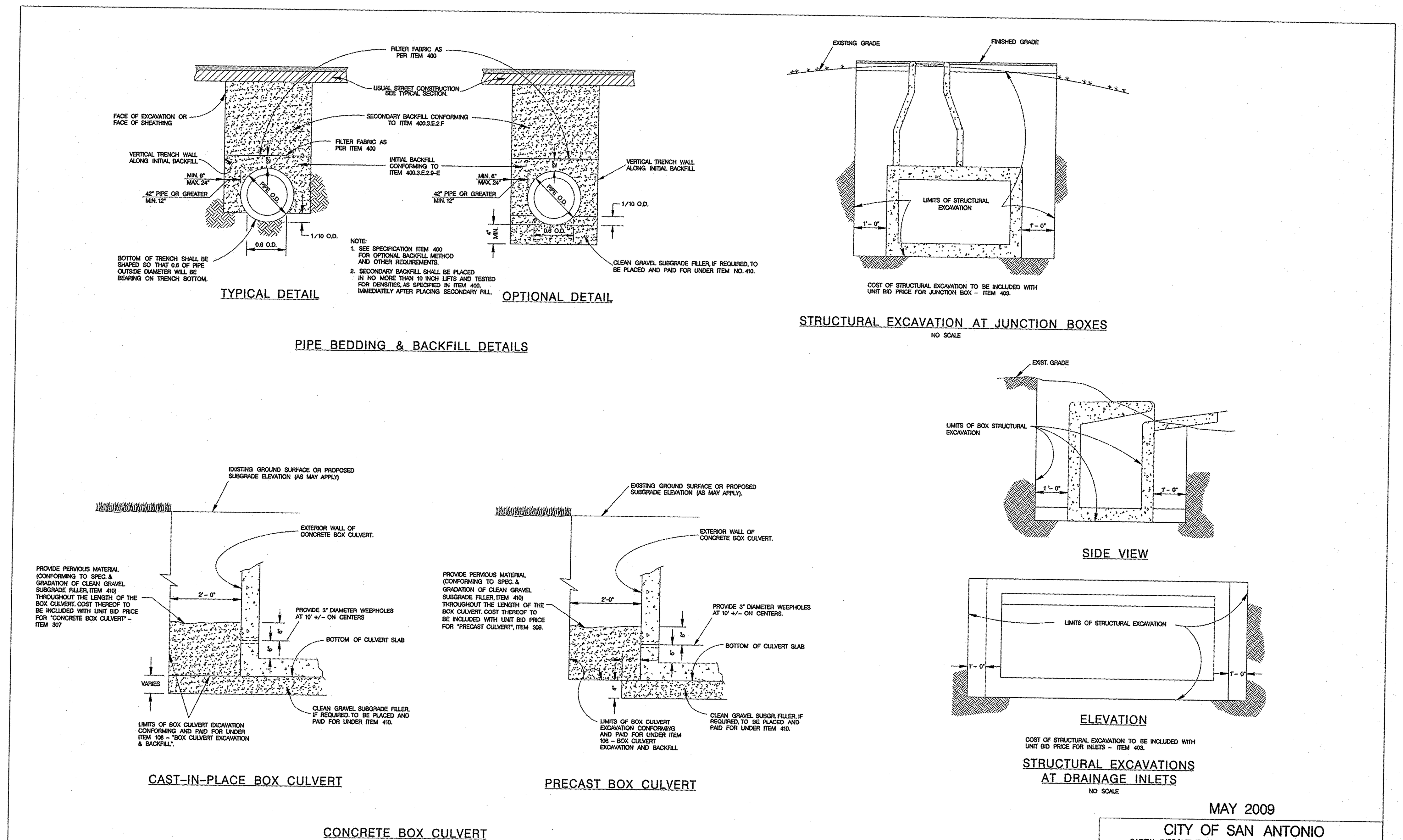
Cover dimensions are clear dimensions, unless noted otherwise.
Reinforcing bars dimensions are out-to-out of bars.

HL93 LOADING

Texas Department of Transportation — Bridge Division Standard

BOX CULVERTS
PRECAST
MISCELLANEOUS DETAILS

SCP-MD



MAY 2009

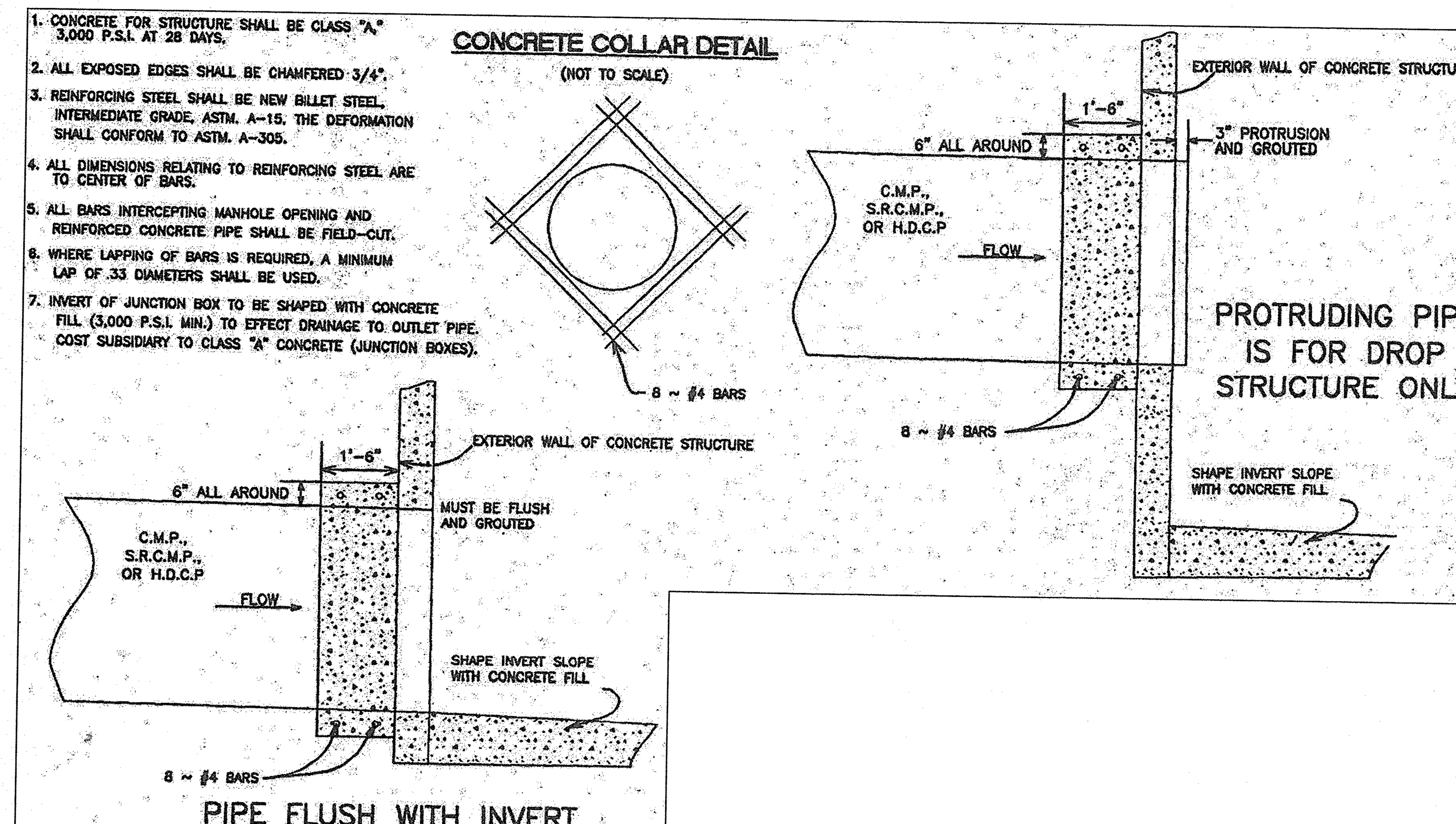
CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

PIPE BEDDING & MISCELLANEOUS DRAINAGE DETAILS

1. CONCRETE FOR STRUCTURE SHALL BE CLASS "A" 3,000 P.S.I. AT 28 DAYS.
2. ALL EXPOSED EDGES SHALL BE CHAMFERED 3/4".
3. REINFORCING STEEL SHALL BE NEW BILLET STEEL, INTERMEDIATE GRADE, ASTM. A-15. THE DEFORMATION SHALL CONFORM TO ASTM. A-305.
4. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER OF BARS.
5. ALL BARS INTERCEPTING MANHOLE OPENING AND REINFORCED CONCRETE PIPE SHALL BE FIELD-CUT.
6. WHERE LAPPING OF BARS IS REQUIRED, A MINIMUM LAP OF 33 DIAMETERS SHALL BE USED.
7. INVERT OF JUNCTION BOX TO BE SHAPED WITH CONCRETE FILL (3,000 P.S.I. MIN.) TO EFFECT DRAINAGE TO OUTLET PIPE. COST SUBSIDIARY TO CLASS "A" CONCRETE (JUNCTION BOXES).

CONCRETE COLLAR DETAIL

(NOT TO SCALE)



JANUARY 2006

STANDARD PLANS
CITY OF SAN ANTONIO, TEXAS
DEVELOPMENT SERVICES

CONCRETE COLLAR DETAIL

SHEET 1 OF 1

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

ISSUE DATE

REVISIONS

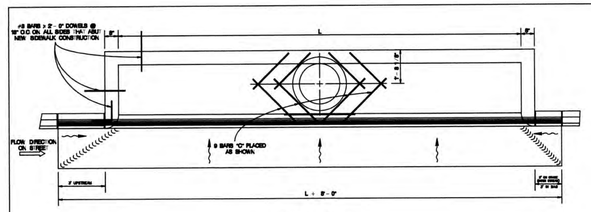
STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
4/25/2022

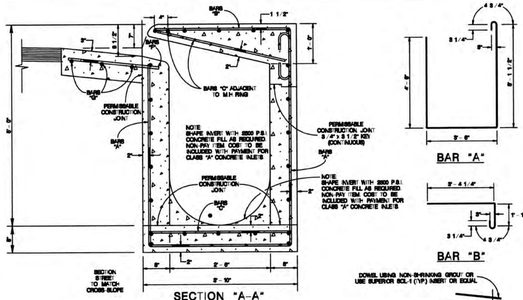
GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

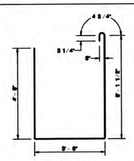
DRAIN DETAILS (SHEET 2 OF 4)

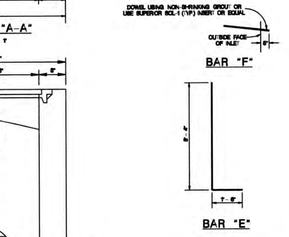
PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
4.9









PLAN VIEW

SCALE 1" = 2'

2'-0" SHALL BE REDUCED AT UPSTREAM END OF ON-GRADE INLETS FOR INLETS IN SUMP CONDITION THIS DIMENSION SHALL BECOME 2'-0"

FRONT VIEW

SCALE 1" = 2'

SECTION "A-A"

SCALE 1" = 1'

SIDE VIEW

SCALE 1" = 1'

BAR "A"

BAR "B"

BAR "F"

BAR "E"

INLET LENGTH	BAR	NO.	SIZE	SPACING	LENGTH	WEIGHT
L=5'-0"	A	16	4	6" O.C.	18'-9 1/2"	199
	B	16	4	6" O.C.	6'-1 3/4"	62
	C	30	4	9" O.C.	3'-6"	70
	D	22	4	10" O.C.	6'-1"	89
	E	10	4	10 1/2" O.C.	6'-10"	46
	F	8	5	12" O.C.	2'-3"	27
	G	3	4	12" O.C.	9'-6"	20
	H	5	5	12" O.C.	1'-6"	9
* CONCRETE TOTAL=3.89 CU. YDS. M.H. CASTING=260 LBS. STEEL TOTAL=436 LBS.						
L=10'-0"	A	27	4	6" O.C.	18'-9 1/2"	349
	B	27	4	6" O.C.	6'-1 3/4"	98
	C	37	4	9" O.C.	3'-6"	87
	D	22	4	10" O.C.	11'-1"	163
	E	10	4	10 1/2" O.C.	6'-10"	46
	F	12	5	12" O.C.	2'-3"	27
	G	3	4	12" O.C.	14'-6"	30
	H	5	5	12" O.C.	1'-6"	9
* CONCRETE TOTAL=5.75 CU. YDS. M.H. CASTING=260 LBS. STEEL TOTAL=704 LBS.						
L=15'-0"	A	39	4	6" O.C.	18'-9 1/2"	389
	B	39	4	6" O.C.	6'-1 3/4"	134
	C	48	4	9" O.C.	3'-6"	101
	D	22	4	10" O.C.	16'-1"	236
	E	10	4	10 1/2" O.C.	6'-10"	46
	F	17	5	12" O.C.	2'-3"	39
	G	3	4	12" O.C.	19'-6"	40
	H	5	5	12" O.C.	1'-6"	9
* CONCRETE TOTAL=7.97 CU. YDS. M.H. CASTING=260 LBS. STEEL TOTAL=983 LBS.						
L=20'-0"	A	51	4	6" O.C.	18'-9 1/2"	470
	B	51	4	6" O.C.	6'-1 3/4"	176
	C	60	4	9" O.C.	3'-6"	117
	D	22	4	10" O.C.	21'-1"	310
	E	10	4	10 1/2" O.C.	6'-10"	46
	F	22	5	12" O.C.	2'-3"	50
	G	3	4	12" O.C.	24'-6"	50
	H	5	5	12" O.C.	1'-6"	9
* CONCRETE TOTAL=10.19 CU. YDS. M.H. CASTING=260 LBS. STEEL TOTAL=1227 LBS.						
L=25'-0"	A	63	4	6" O.C.	18'-9 1/2"	580
	B	63	4	6" O.C.	6'-1 3/4"	217
	C	67	4	9" O.C.	3'-6"	139
	D	22	4	10" O.C.	26'-1"	383
	E	10	4	10 1/2" O.C.	6'-10"	46
	F	27	5	12" O.C.	2'-3"	61
	G	3	4	12" O.C.	29'-6"	60
	H	5	5	12" O.C.	1'-6"	9
* CONCRETE TOTAL=12.41 CU. YDS. M.H. CASTING=260 LBS. STEEL TOTAL=1469 LBS.						
L=30'-0"	A	75	4	6" O.C.	18'-9 1/2"	691
	B	75	4	6" O.C.	6'-1 3/4"	259
	C	69	4	9" O.C.	3'-6"	147
	D	22	4	10" O.C.	31'-1"	457
	E	10	4	10 1/2" O.C.	6'-10"	46
	F	32	5	12" O.C.	2'-3"	72
	G	3	4	12" O.C.	34'-6"	70
	H	5	5	12" O.C.	1'-6"	9
* CONCRETE TOTAL=14.69 CU. YDS. M.H. CASTING=260 LBS. STEEL TOTAL=1750 LBS.						

* THESE FIGURES DO NOT EXCLUDE CONCRETE & STEEL INTERCEPTED BY MANHOLE AND REINFORCED CONC PIPE
* INCLUDES CONCRETE GUTTER FOR ON GRADE INLET. REDUCE BY .40 CY FOR INLETS IN SUMP

GENERAL NOTES

1. ALL BARS INTERCEPTING MANHOLE RING & REINFORCING CONCRETE PIPE SHALL BE FIELD CUT.
2. CONCRETE FOR STRUCTURES SHALL BE CLASS "A", 3000 PSI IN 28 DAYS.
3. ALL DIMENSIONS RELATING TO REINFORCING STEEL ARE TO CENTER BARS.
4. ALL EXPOSED CORNERS SHALL BE CHAMFERED TO 3/4"
5. CONSTRUCTION JOINT SHOWN AT FLOWLINE MAY BE RAISED A MAXIMUM OF 6" AT THE CONTRACTOR'S DISCRETION. ADJUST LENGTH OF VERTICAL STEEL AS REQUIRED.
6. ALL REINFORCING STEEL SHALL CONFORM TO A.S.T.M. A-615, GRADE 60 REQUIREMENTS.
7. INVERT OF DROP INLET TO BE SHAPED WITH CONCRETE FILL TO AFFECT DRAINAGE TO OUTLET PIPE.
8. DELETE 4 "D" BARS FROM SCHEDULE QUANTITIES IF MANHOLE RING AND COVER ARE PLACED AT END OF INLET.
9. CAST IRON MANHOLE RING AND COVER TO BE PLACED NEXT TO OUTLET PIPE EXCEPT FOR VERTICAL OUTLET PIPE IN WHICH CASE MANHOLE RING AND COVER WILL BE OFFSET.
10. PAYMENT FOR ALL EXCAVATION, BACK FILLING, CONCRETE, REINFORCING STEEL, RING AND COVER SHALL BE INCLUDED IN THE UNIT COST OF ITEM 405 "STORM SEWER JUNCTION BOXES AND INLETS".

MANHOLE LID & RING DETAIL

(ITEM 409)

SCALE : 1" = 8"

OPENING DETAIL FOR CURB SECTION

SCALE : 1" = 8"

NOTES FOR MANHOLE LID AND RING

1. FOR LID DESIGN OUTSIDE OF CITY OF SAN ANTONIO, DELETE "SAN ANTONIO PUBLIC WORKS DEPT.".
2. CASTING NUMBER AND MANUFACTURER'S I.D. ON LID AND RING.
3. LOAD BEARING CAPABILITY OF H 5-20 MINIMUM.
4. THE LOAD BEARING SURFACES SHALL BE MACHINE GROUND.
5. THE COMBINED WEIGHT OF THE MANHOLE RING AND COVER MUST BE AT LEAST 260 LBS.

ISOMETRIC VIEW

CURB ARMOR DETAIL

JANUARY 2005

STANDARD PLANS
CITY OF SAN ANTONIO, TEXAS
DEPARTMENT OF PUBLIC WORKS

TYPE "C" INLET
DETAILS

DRAWN BY: V. VASQUEZ	DATE	REVISIONS	SCALE: SEE ABOVE
			DATE:
CHECKED BY: NAT HARDY, P.E.			SHEET: OF

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

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

TABLE OF WINGWALL REINFORCING
(2~wings)

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

TABLE OF TOEWALL REINFORCING

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

BARS D1

BARS D2

BARS J1

BARS J2

BARS J3

BARS V

WING DIMENSION FORMULAS:

(All values are in feet.)

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

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

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

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

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

① Skew = 0°

② At discharge end, chamfer may be ¾" minimum.

③ For 15° skew - 1"
For 30° skew - 2"
For 45° skew - 3"

④ Quantities shown are for two Type PW-1 wings. Adjust concrete volume for Type PW-2 wings. To determine estimated quantities for two wings, multiply the tabulated values by Lw. Quantities shown do not include weight of Bars D.

⑤ Provide weepholes for Hw = 5'-0" and greater. Fill around weepholes with coarse gravel.

⑥ Extend Bars E2 1'-6" minimum into the wingwall footing.

⑦ Lap Bars M1 1'-6" minimum with Bars M2.

⑧ Place Bars G as shown, equally spaced at 8" maximum. Provide at least two pairs of Bars G per wing.

⑨ 0" Min to 5'-0" Max. Estimated curb heights are shown elsewhere in the plans. For structures with pedestrian rail or curbs taller than 1'-0, refer to the Extended Curb Details (ECD) standard sheet. For structures with T631 or T631LS bridge rail, refer to the Mounting Details for T631 & T631LS Rails (T631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.

⑩ For vehicle safety, the following requirements must be met:
- For structures without bridge rail, construct curbs no more than 3" above finished grade.
- For structures with bridge rail, construct curbs flush with finished grade.

Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.

⑪ 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elswhere in the plans.

⑫ 3'-0" for Hw < 4'.

⑬ 6" for Hw < 4'.

SECTION C-C - PW-1

SECTION C-C - PW-2

PARTIAL ELEVATION - PW-1

PARTIAL ELEVATION - PW-2

SECTION A-A
(Showing wing reinforcement.)

SECTION B-B
(Showing wing reinforcement.)

PLAN

DETAILS FOR
NON-SKEWED BOX CULVERTS

PLAN

DETAILS FOR
SKEWED BOX CULVERTS
(Showing 30° skew.)

DESIGNER NOTES:
Type PW-1 can be used for all applications and must be used if railing is to be mounted to the wingwall.
Type PW-2 can only be used for applications without a railing mounted to the wingwall.

MATERIAL NOTES:
Provide Class C concrete (f'c=3,600 psi).
Provide Grade 60 reinforcing steel.
Provide galvanized reinforing steel if required elsewhere in the plans.

GENERAL NOTES:
Designed in accordance with AASHTO LRFD Bridge Design Specifications.
Depth of toewalls for wingwalls and culverts may be reduced or eliminated when founded on solid rock, when directed by the Engineer.
See Box Culvert Supplement (BCS) standard sheet for wingwall type and additional dimensions and information.
Quantities for concrete and reinforcing steel resulting from the formulas given on this sheet are for the Contractor's information only.

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

Texas Department of Transportation
Bridge Division Standard

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

PW

FILE: pwstde01-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

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

REVISIONS
ISSUE DATE

CLAYTON J. LINNEY
111543
Clayton Linney
6/23/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

DRAIN DETAILS (SHEET 3 OF 4)

PLAT NO.
21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
4.10

LANDLOK BY PROPEX — Product Data LANDLOK 300®

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

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

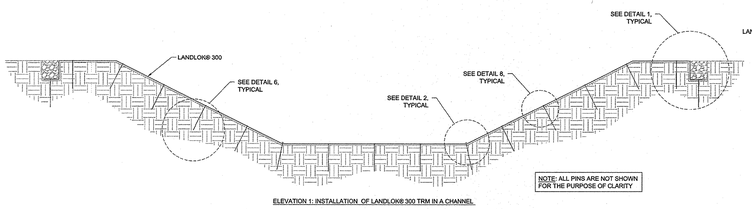
PROPERTY	TEST METHOD	ENGLISH	METRIC
		MARV[2]	
ORIGIN OF MATERIALS			
% U.S. Manufactured Inputs		100%	100%
% U.S. Manufactured		100%	100%
PHYSICAL			
Mass/Unit Area	ASTM D-6566	7.5 oz/yd²	254.3 g/m²
Thickness	ASTM D-6525	0.25 in	6.35 mm
Light Penetration (% Passing)	ASTM D-6567	50% (Max)	50%
Color	Visual	Green or Tan	
MECHANICAL			
Tensile Strength (Grab)	ASTM D-6818	2000 x 1800 lb/ft	29.2 x 26.3 kN/m
Elongation	ASTM D-6818	50% (max)	50% (max)
Resiliency	ASTM D-6524	70%	70%
Flexibility	ASTM D-6575	0.195 in-lb (avg)	225,000 mg-cm (avg)
ENDURANCE			
UV Resistance % Retained 3000 hrs	ASTM D-4355	90%	90%
PERFORMANCE			
Velocity[3] (Vegetated)	Large Scale	20 ft/sec	6.10 m/sec
Shear Stress[3] (Vegetated)	Large Scale	12 lb/ft²	575 Pa
Manning's 'n'[4] (Unvegetated)	Calculated	0.030	0.030
Seedling Emergence[4]	ECTC Draft Method #4	-	-
ROLL SIZES		8.5 ft x 106 ft	2.6 m x 32.3 m

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

Propex™ Geotextile Systems

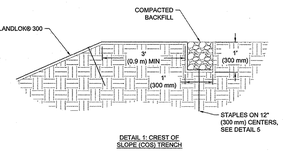
TESTED. PROVEN. TRUSTED.
www.geotextile.com

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

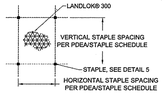


ELEVATION 1: INSTALLATION OF LANDLOK® 300 TRM IN A CHANNEL

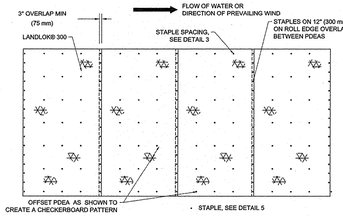
NOTE: ALL PINS ARE NOT SHOWN FOR THE PURPOSE OF CLARITY



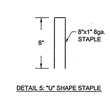
DETAIL 1: CREST OF SLOPE (COS) TRENCH



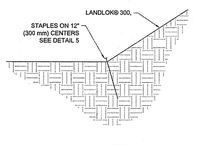
DETAIL 3: STAPLE PATTERN



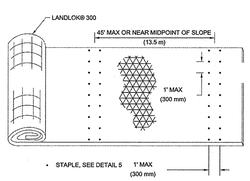
DETAIL 4: STAPLE PATTERN



DETAIL 5: "U" SHAPE STAPLE

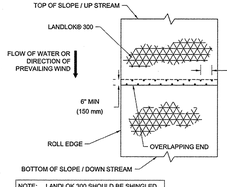


DETAIL 2: BREAK IN SLOPE INTERFACE



DETAIL 7: SIMULATED CHECK SLOT DETAIL

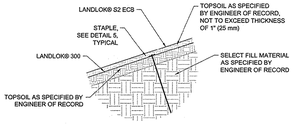
STAPLE SCHEDULE	
SECURING DEVICE	STAPLE
HORIZONTAL POEA SPACING	2' (0.60 m)
VERTICAL POEA SPACING	2.5' (0.75 m)
EMBEDMENT DEPTH	PER MANUFACTURES DESIGN



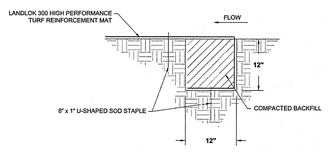
NOTE: LANDLOK 300 SHOULD BE SHINGLED IN THE DIRECTION OF THE DOWN SLOPE AND FLOW

STAPLE, SEE DETAIL 5

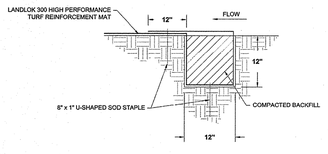
DETAIL 6: OVERLAP AT ROLL END DETAIL



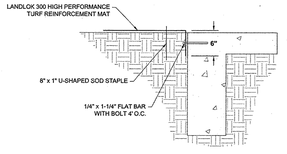
DETAIL 8: VEGETATION ESTABLISHMENT



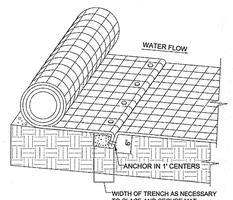
DETAIL 9: INITIAL CHANNEL (IC) TRENCH (DOWNSTREAM)



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



DETAIL 11: CONCRETE/HPTRM CONNECTION DETAIL



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

DETAIL 12: INTERMITTENT CHECK SLOT DETAIL

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

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

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

4.2 INSTALLATION - HPTRM

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

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

4.3 Irrigation, Mowing, and Project Acceptance

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

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

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

REVISIONS

ISSUE DATE	REVISIONS

LANDLOK 300 INSTALLATION DETAILS

CHANNEL DETAILS

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

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
4/25/2022

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

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

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
DRAIN DETAILS (SHEET 4 OF 4)

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER: 4.11

Date: Apr 19, 2022, 9:22am User ID: omminers
File: P:\205\43\04\Design\Civil\Drains\DRDT205430 4.dwg

TRENCH EXCAVATION SAFETY PROTECTION

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

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NOTE:

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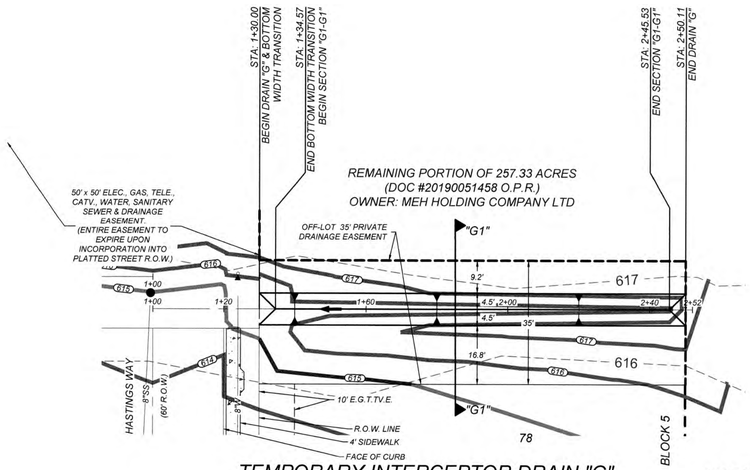
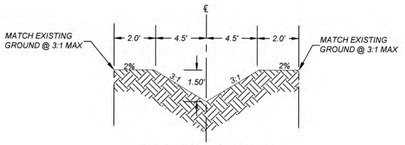
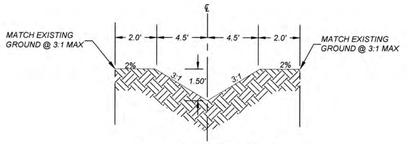


TEMPORARY INTERCEPTOR DRAIN "G"
STA: 1+30.00 - END

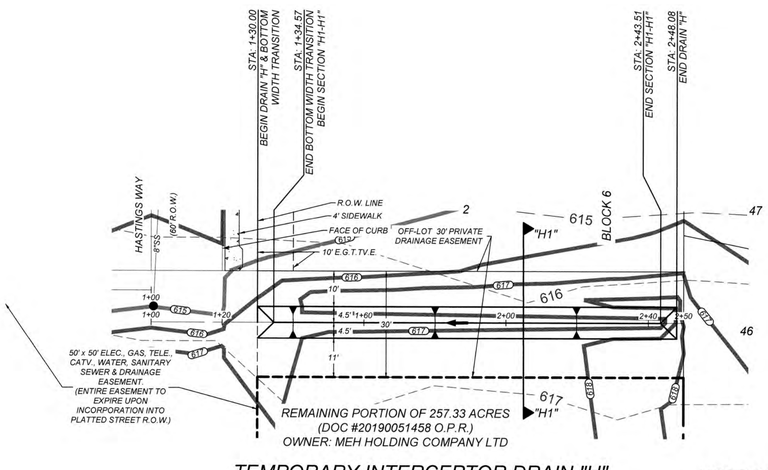
HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



SECTION "G1-G1"
STA. 1+34.57- STA. 2+45.53
N.T.S.



SECTION "H1-H1"
STA. 1+34.57- STA. 2+43.51
N.T.S.



TEMPORARY INTERCEPTOR DRAIN "H"
STA: 1+30.00 - END

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

EARTHEN "V" CHANNEL
STA. 1+30.00 TO STA. 2+45.53
HYDRAULIC CALCULATION

Q(25) = 2.49 CFS
n = 0.035
Pw = 4.74 FT.
A = 1.69 S.F.
S = 0.50%
Dn = 0.75'
V = 1.48 fps
VH = 0.03'

EARTHEN "V" CHANNEL
STA. 1+30.00 TO STA. 2+43.51
HYDRAULIC CALCULATION

Q(25) = 2.78 CFS
n = 0.035
Pw = 4.93 FT.
A = 1.83 S.F.
S = 0.50%
Dn = 0.78'
V = 1.52 fps
VH = 0.04'

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10102300

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/23/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

TEMPORARY INTERCEPTOR DRAIN "G" & "H" PLAN & PROFILE

PLAT NO.
21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
4.12

TRENCH EXCAVATION SAFETY PROTECTION

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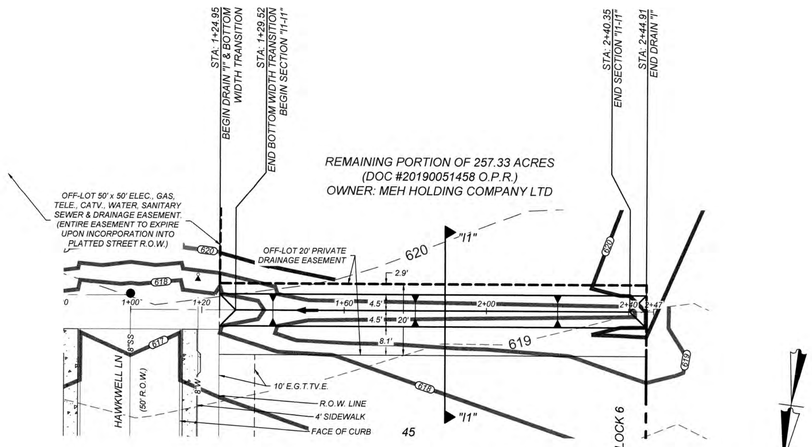
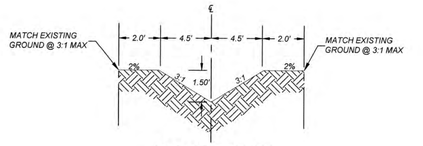
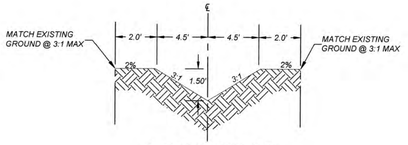


TEMPORARY INTERCEPTOR DRAIN "I"
STA: 1+24.95 - END

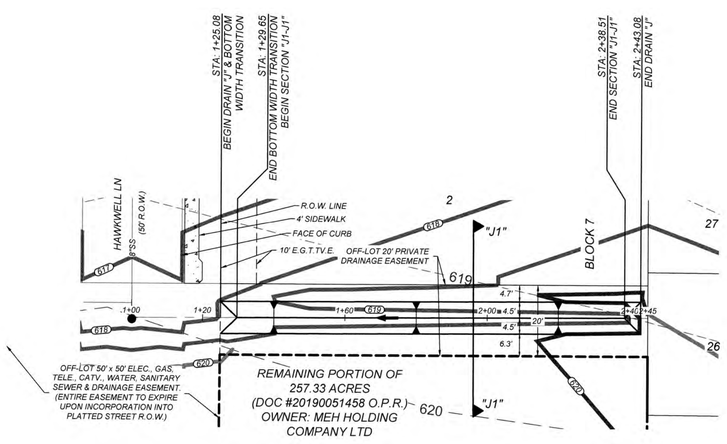
HORZ SCALE: 1"=20'
VERT SCALE: 1"=5'



SECTION "I1-I1"
STA. 1+29.52- STA. 2+40.35
N.T.S.



SECTION "J1-J1"
STA. 1+29.65- STA. 2+38.51
N.T.S.



TEMPORARY INTERCEPTOR DRAIN "J"
STA: 1+25.08 - END

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

KFW ENGINEERS + SURVEYING
5421 Fredericksburg Road, Suite 200, San Antonio, Texas 78229
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122900

REVISIONS | ISSUE DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/23/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

TEMPORARY INTERCEPTOR DRAIN "I" & "J" PLAN & PROFILE

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER: 4.13

TRENCH EXCAVATION SAFETY PROTECTION

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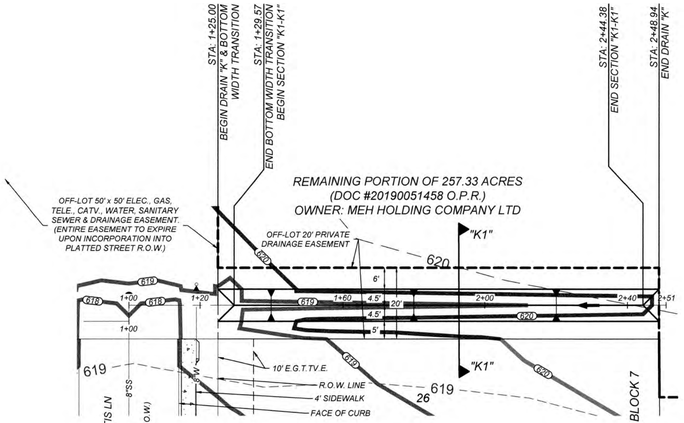
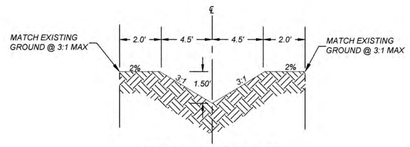
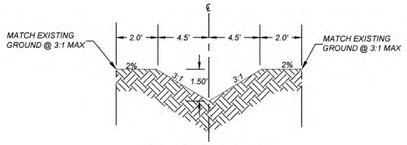


TEMPORARY INTERCEPTOR DRAIN "K"
STA: 1+25.00 - END

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



SECTION "K1-K1"
STA. 1+29.57- STA. 2+44.38
N.T.S.



SECTION "L1-L1"
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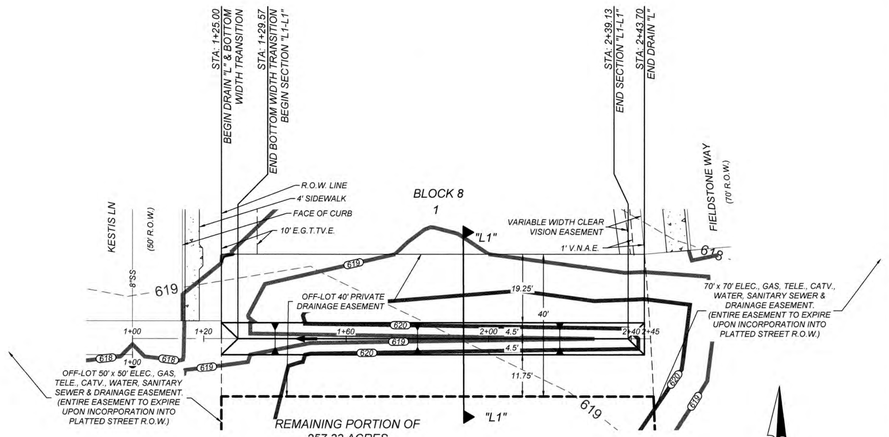
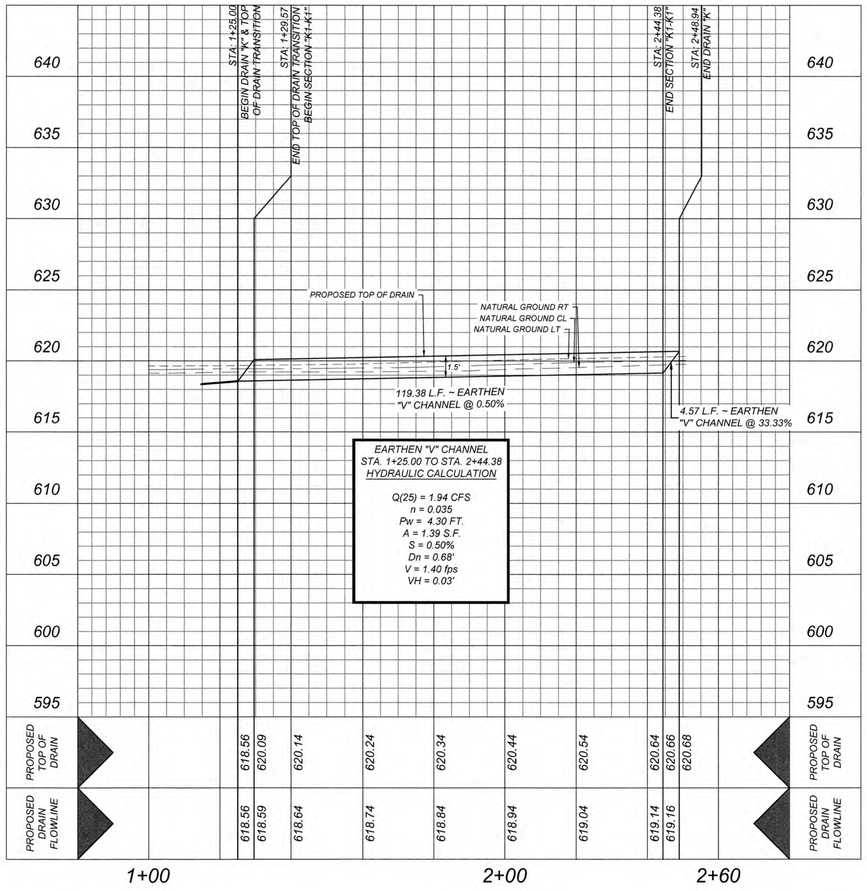
N.T.S.



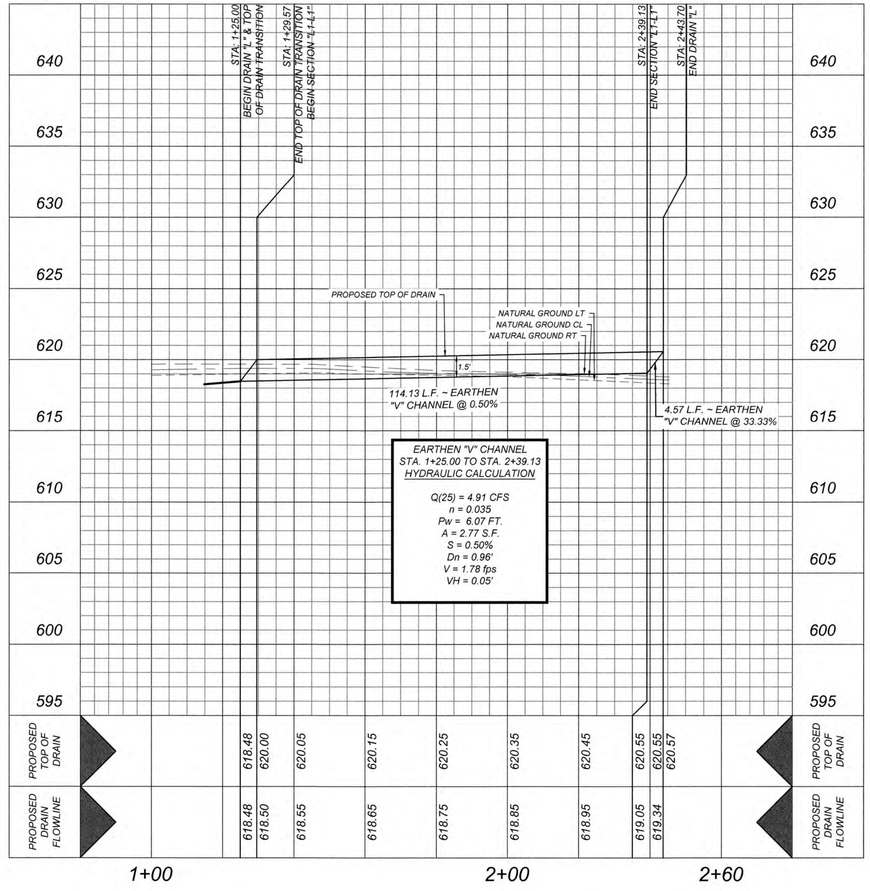
TEMPORARY INTERCEPTOR DRAIN "L"
STA: 1+25.00 - END

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



EARTHEN "V" CHANNEL
STA. 1+25.00 TO STA. 2+44.38
HYDRAULIC CALCULATION

Q(25) = 1.94 CFS
n = 0.035
Pw = 4.30 FT.
A = 1.39 S.F.
S = 0.50%
Dn = 0.68'
V = 1.40 fps
VH = 0.03'



EARTHEN "V" CHANNEL
STA. 1+25.00 TO STA. 2+39.13
HYDRAULIC CALCULATION

Q(25) = 4.91 CFS
n = 0.035
Pw = 6.07 FT.
A = 2.77 S.F.
S = 0.50%
Dn = 0.96'
V = 1.78 fps
VH = 0.05'

KFW ENGINEERS + SURVEYING
4421 Pleasanton Road, Suite 200, San Antonio, TX 78231
Phone: (210) 979-8444 Fax: (210) 979-8441
TBPE Firm # 9513 • TBPLS Firm # 10122300

REVISIONS

ISSUE DATE

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/23/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

TEMPORARY INTERCEPTOR DRAIN "K" & "L" PLAN & PROFILE

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:

4.14

TRENCH EXCAVATION SAFETY PROTECTION

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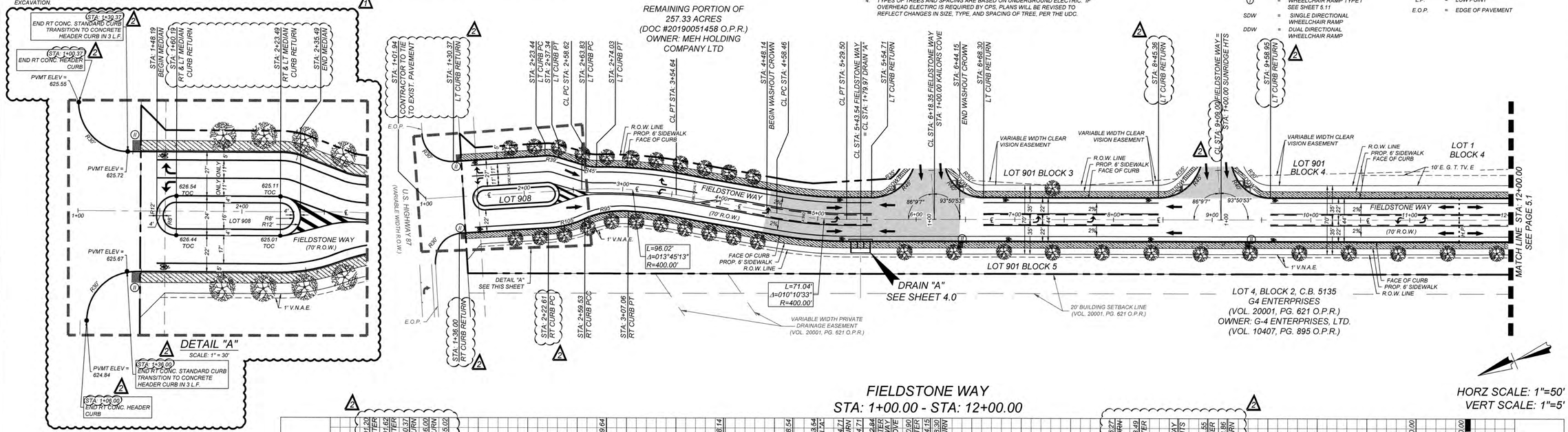
STREETSCAPE TREE PLANTING NOTES

LARGE TREES (PER UDC) TO BE PLANTED EVERY 50 FEET OR CLUSTERS ALONG FIELDSTONE WAY R.O.W. PER "NEW TREE PLANTING DETAIL ON SHEET 5.9.

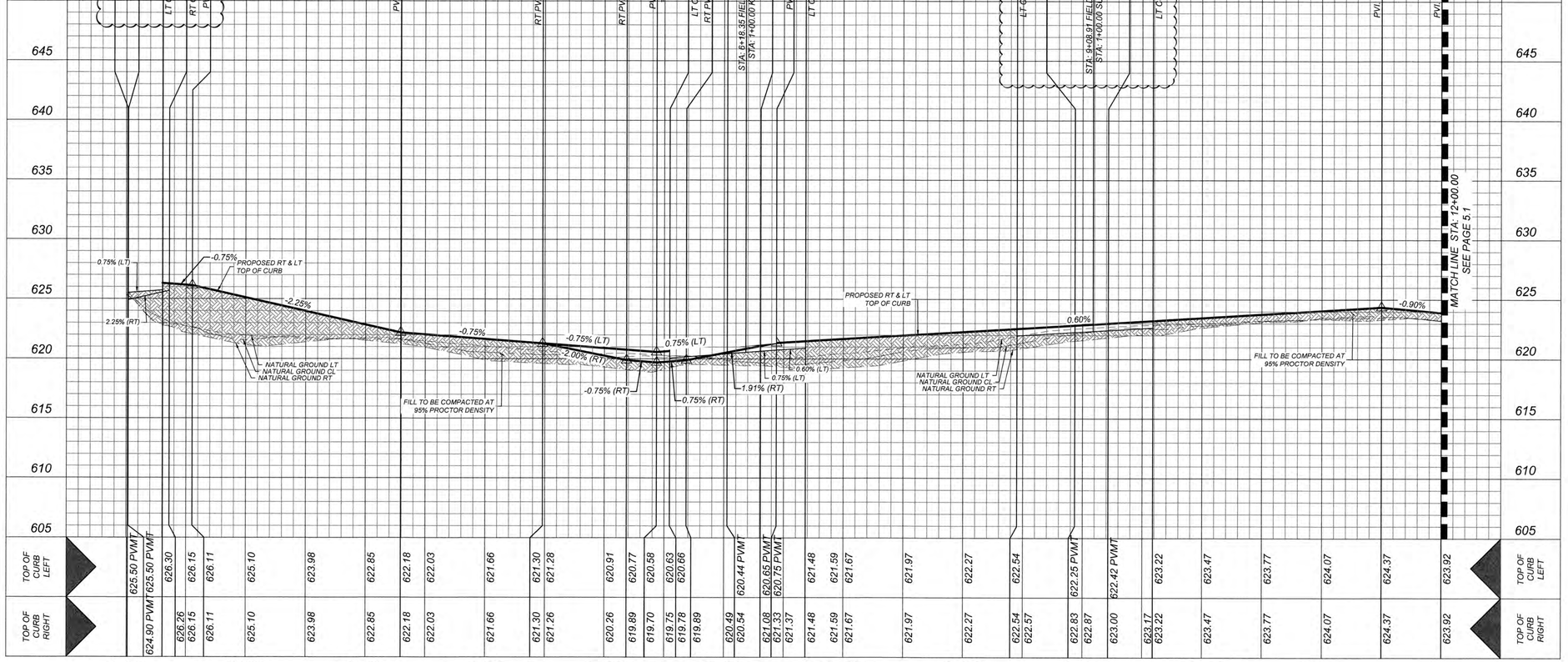
1. SPECIES OF TREES TO BE DETERMINED BY DEVELOPER'S PROJECT LANDSCAPE ARCHITECT TO CONFIRM WITH THE STREETSCAPE PLANTING STANDARDS.
2. DEVELOPER TO PROVIDE MAINTENANCE ON PLANTED STREET TREES FOR A MINIMUM OF 3 YEARS.
3. ALL LANDSCAPE SHALL COMPLY WITH THE CLEAR VISION AREA AS DEFINED BY THE LATEST VERSION OF AASHTO's "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."
4. TYPES OF TREES AND SPACING ARE BASED ON UNDERGROUND ELECTRIC. IF OVERHEAD ELECTIRC IS REQUIRED BY CPS, PLANS WILL BE REVISED TO REFLECT CHANGES IN SIZE, TYPE, AND SPACING OF TREE, PER THE UDC.

LEGEND

R.O.W.	= RIGHT OF WAY		= SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
G.E.T.TV.E.	= GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT		= SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	= FLOW ARROW		= PROPOSED DRIVEWAY LOCATION
	= WASHOUT CROWN	H.P.	= HIGH POINT
(II)	= WHEELCHAIR RAMP TYPE II SEE SHEET 5.11	L.P.	= LOW POINT
(I)	= WHEELCHAIR RAMP TYPE I SEE SHEET 5.11	E.O.P.	= EDGE OF PAVEMENT
SDW	= SINGLE DIRECTIONAL WHEELCHAIR RAMP		
DDW	= DUAL DIRECTIONAL WHEELCHAIR RAMP		



FIELDSTONE WAY
STA: 1+00.00 - STA: 12+00.00



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TBPE Firm # 9513 · TBPLS Firm # 10122300

REVISIONS	ISSUE DATE
1 REVISED CURB RETURN STATIONS	4/18/2022
2 REVISED STATIONS	9/26/2023

STATE OF TEXAS · CLAYTON J. LINNEY · 111543 · LICENSED PROFESSIONAL ENGINEER
9/27/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

FIELDSTONE WAY PLAN & PROFILE (SHEET 1 OF 2)

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL
SHEET NUMBER: 5.0

Date: Sep 26, 2023, 3:48pm User ID: cgroff
File: P:\205x\43\04\Design\Civil\STREETS\S7205x4304.dwg

TRENCH EXCAVATION SAFETY PROTECTION

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

CAUTION!!:

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

BEXAR COUNTY R.O.W. NOTE

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

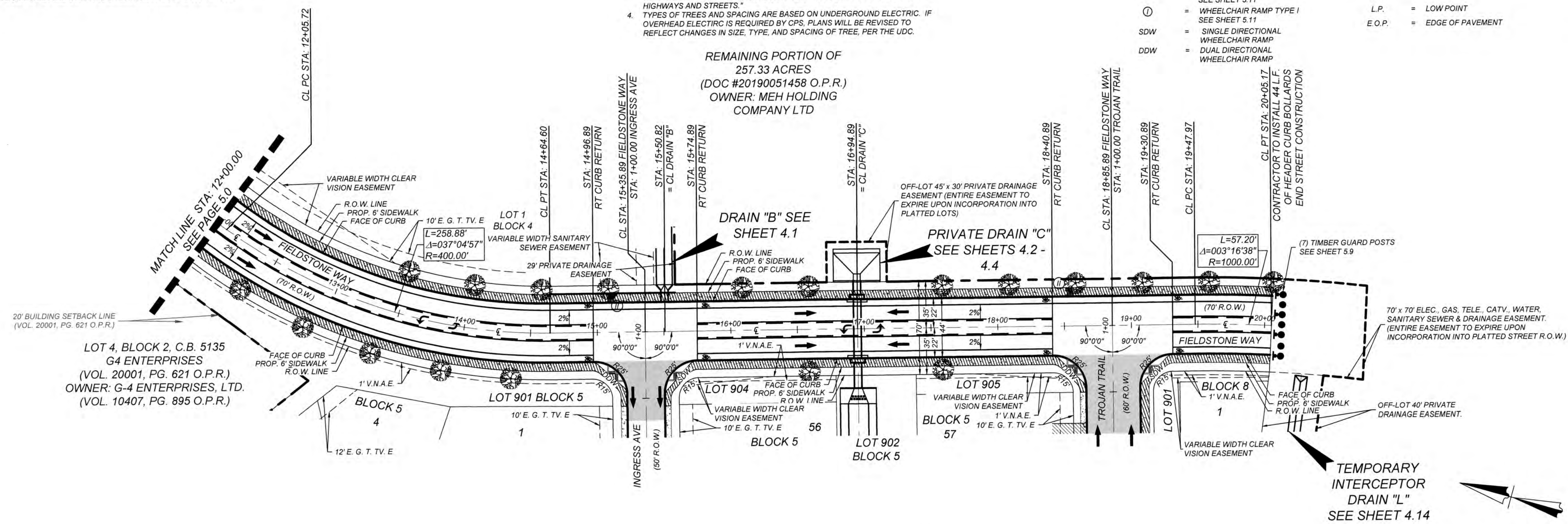
STREETSCAPE TREE PLANTING NOTES

LARGE TREES (PER UDC) TO BE PLANTED EVERY 50 FEET OR CLUSTERS ALONG FIELDSTONE WAY R.O.W. PER "NEW TREE PLANTING DETAIL ON SHEET 5.9.

1. SPECIES OF TREES TO BE DETERMINED BY DEVELOPER'S PROJECT LANDSCAPE ARCHITECT TO CONFIRM WITH THE STREETSCAPE PLANTING STANDARDS.
2. DEVELOPER TO PROVIDE MAINTENANCE ON PLANTED STREET TREES FOR A MINIMUM OF 3 YEARS.
3. ALL LANDSCAPE SHALL COMPLY WITH THE CLEAR VISION AREA AS DEFINED BY THE LATEST VERSION OF AASHTO's "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."
4. TYPES OF TREES AND SPACING ARE BASED ON UNDERGROUND ELECTRIC. IF OVERHEAD ELECTIRC IS REQUIRED BY CPS, PLANS WILL BE REVISED TO REFLECT CHANGES IN SIZE, TYPE, AND SPACING OF TREE, PER THE UDC.

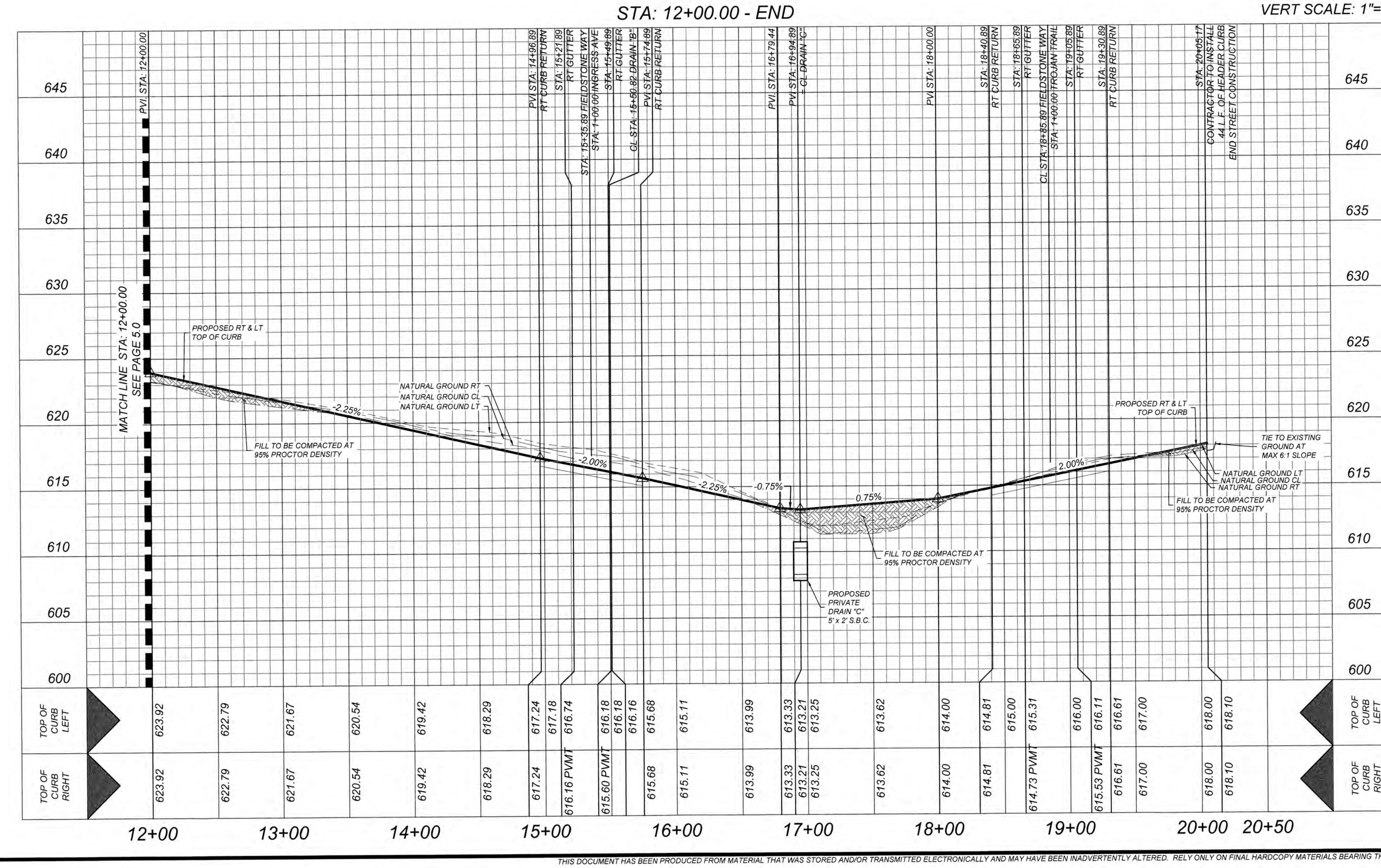
LEGEND

R.O.W.	=	RIGHT OF WAY
G.E.T.TV.E.	=	GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
(arrow)	=	FLOW ARROW
(shaded box)	=	WASHOUT CROWN
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.11
(I)	=	WHEELCHAIR RAMP TYPE I SEE SHEET 5.11
SDW	=	SINGLE DIRECTIONAL WHEELCHAIR RAMP
DDW	=	DUAL DIRECTIONAL WHEELCHAIR RAMP
(hatched)	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
(dotted)	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
(hatched)	=	PROPOSED DRIVEWAY LOCATION
H.P.	=	HIGH POINT
L.P.	=	LOW POINT
E.O.P.	=	EDGE OF PAVEMENT



FIELDSTONE WAY
STA: 12+00.00 - END

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



TOP OF CURB LEFT: 623.92, 622.79, 621.67, 620.54, 619.42, 618.29, 617.24, 617.18, 616.74, 616.18, 616.18, 616.16, 615.68, 615.11, 613.99, 613.33, 613.21, 613.25, 613.62, 614.00, 614.81, 615.00, 615.31, 616.00, 616.11, 616.61, 617.00, 618.00, 618.10

TOP OF CURB RIGHT: 623.92, 622.79, 621.67, 620.54, 619.42, 618.29, 617.24, 616.16 PVMT, 615.60 PVMT, 616.18, 616.16, 615.68, 615.11, 613.99, 613.33, 613.21, 613.25, 613.62, 614.00, 614.81, 614.73 PVMT, 615.53 PVMT, 616.61, 617.00, 618.00, 618.10

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

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/29/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

FIELDSTONE WAY PLAN & PROFILE (SHEET 2 OF 2)

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
5.1

TRENCH EXCAVATION SAFETY PROTECTION

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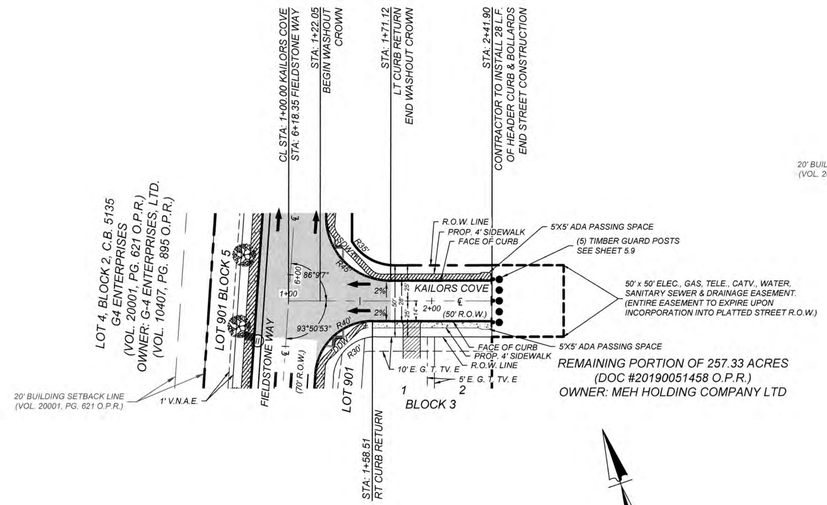
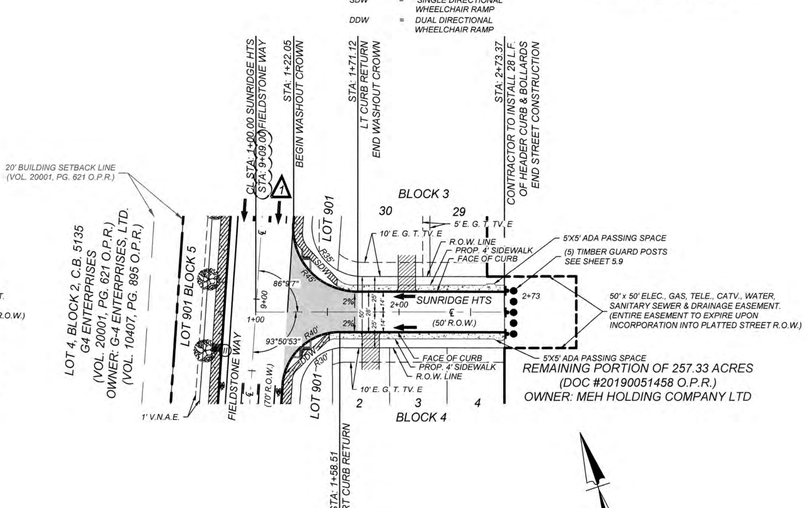
BEXAR COUNTY R.O.W. NOTE

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

LEGEND

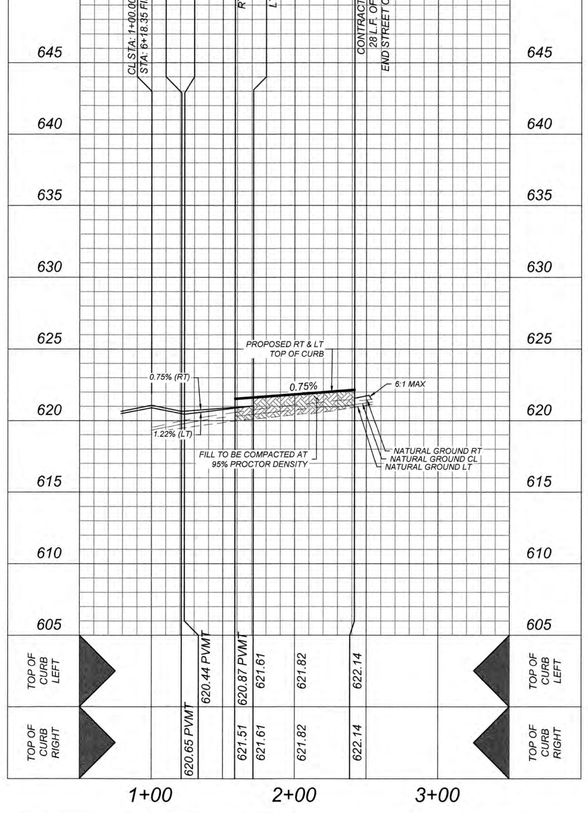
R.O.W.	= RIGHT OF WAY		= SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
G.E.T.V.E.	= GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT		= SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	= FLOW ARROW		= PROPOSED DRIVEWAY LOCATION
	= WASHOUT CROWN	H.P.	= HIGH POINT
	= WHEELCHAIR RAMP TYPE II SEE SHEET 5.11	L.P.	= LOW POINT
	= WHEELCHAIR RAMP TYPE I SEE SHEET 5.11	E.O.P.	= EDGE OF PAVEMENT
SDW	= SINGLE DIRECTIONAL WHEELCHAIR RAMP		
DDW	= DUAL DIRECTIONAL WHEELCHAIR RAMP		





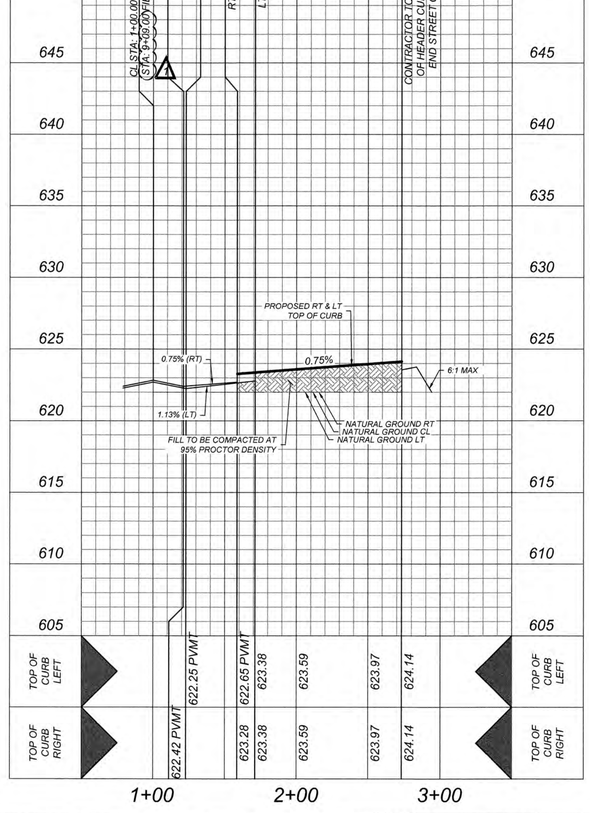
KAILORS COVE
STA: 1+00.00 - END

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



SUNRIDGE HTS
STA: 1+00.00 - END

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



KFW ENGINEERS + SURVEYING
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Phone: 210-979-8444 Fax: 210-979-8441
TBPE Firm # 9513 • TBPLS Firm # 10122300

REVISIONS	ISSUE DATE
REVISED STATIONS	9/26/2023

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
9/27/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

KAILORS COVE AND SUNRIDGE HTS PLAN & PROFILE

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER: 5.2

Date: Sep 26, 2023, 3:53pm User ID: cgroff
File: P:\205\4304\Design\Civil\STREETS\ST205\4304.dwg

TRENCH EXCAVATION SAFETY PROTECTION

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

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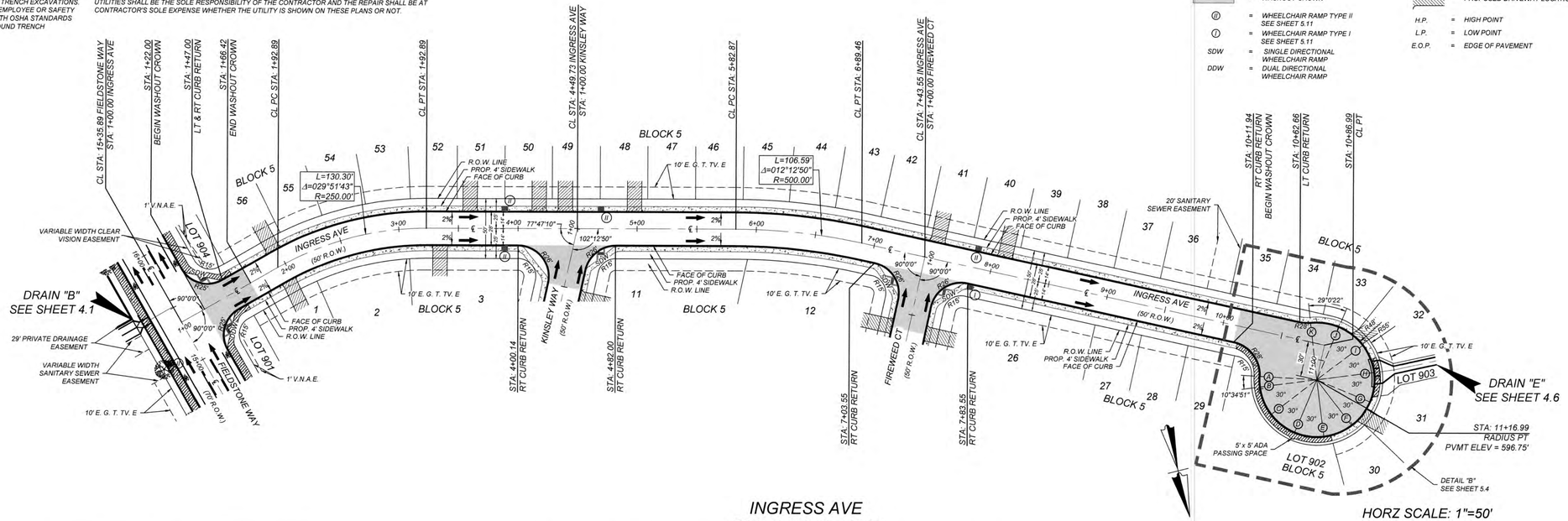
BEXAR COUNTY R.O.W. NOTE

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

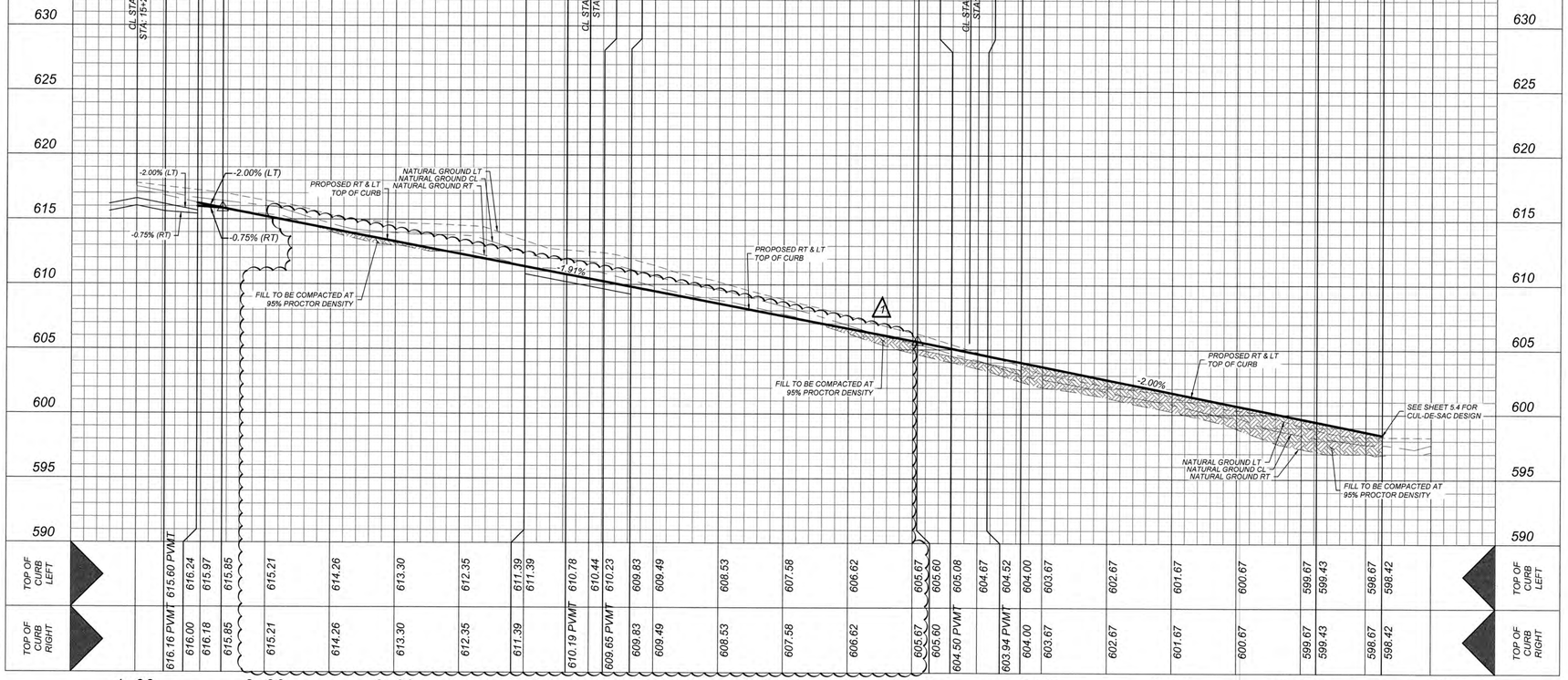
LEGEND

R.O.W.	= RIGHT OF WAY		= SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
G.E.T.V.E.	= GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT		= SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	= FLOW ARROW		= PROPOSED DRIVEWAY LOCATION
	= WASHOUT CROWN	H.P.	= HIGH POINT
(H)	= WHEELCHAIR RAMP TYPE II SEE SHEET 5.11	L.P.	= LOW POINT
(I)	= WHEELCHAIR RAMP TYPE I SEE SHEET 5.11	E.O.P.	= EDGE OF PAVEMENT
SDW	= SINGLE DIRECTIONAL WHEELCHAIR RAMP		
DDW	= DUAL DIRECTIONAL WHEELCHAIR RAMP		



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

INGRESS AVE
STA: 1+00.00 - END



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

REVISIONS	ISSUE DATE
1 REVISED STREET DESIGN	3/29/2022

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/28/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

INGRESS AVE PLAN & PROFILE

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER: 5.3

TRENCH EXCAVATION SAFETY PROTECTION

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

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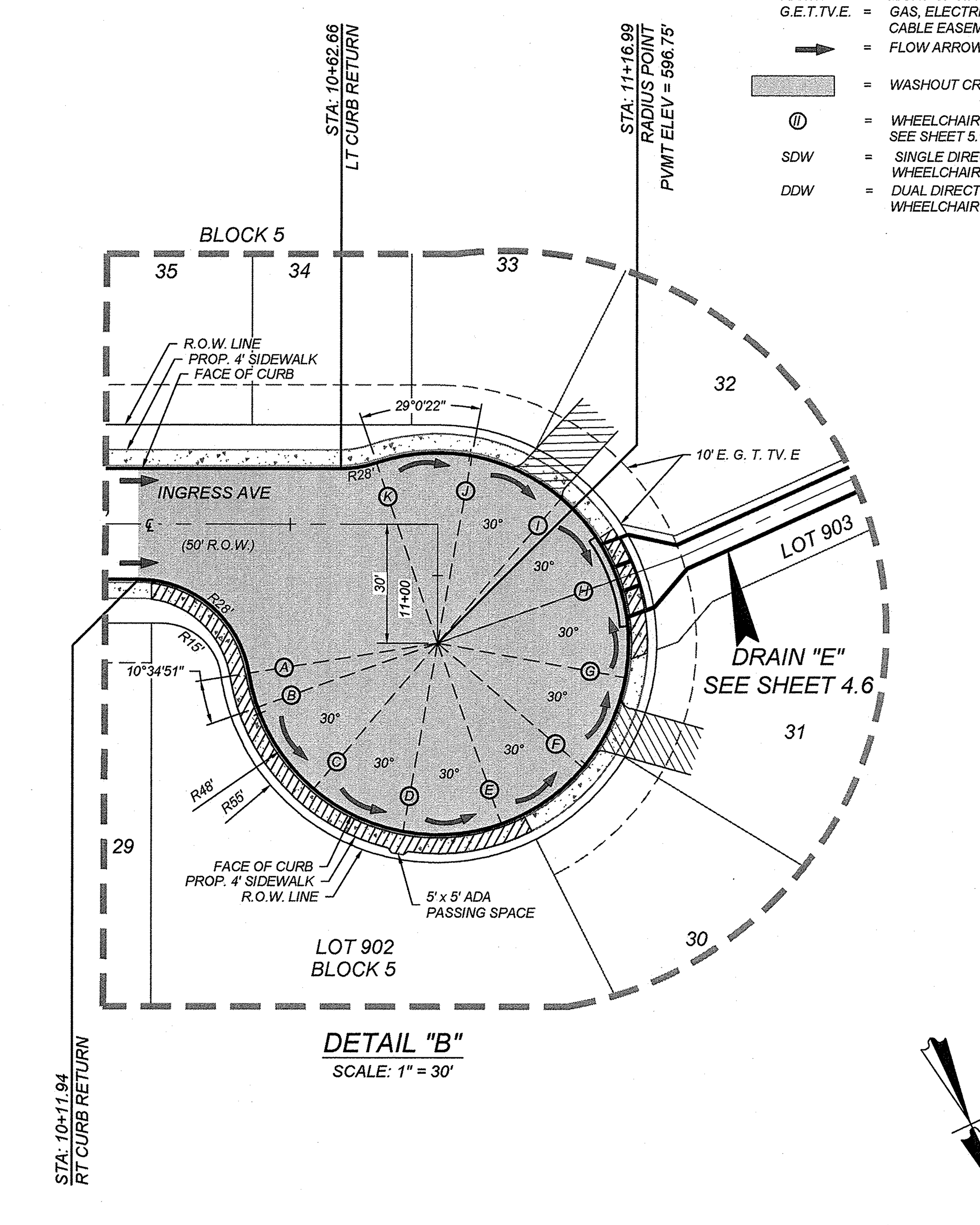
BEXAR COUNTY R.O.W. NOTE

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

LEGEND

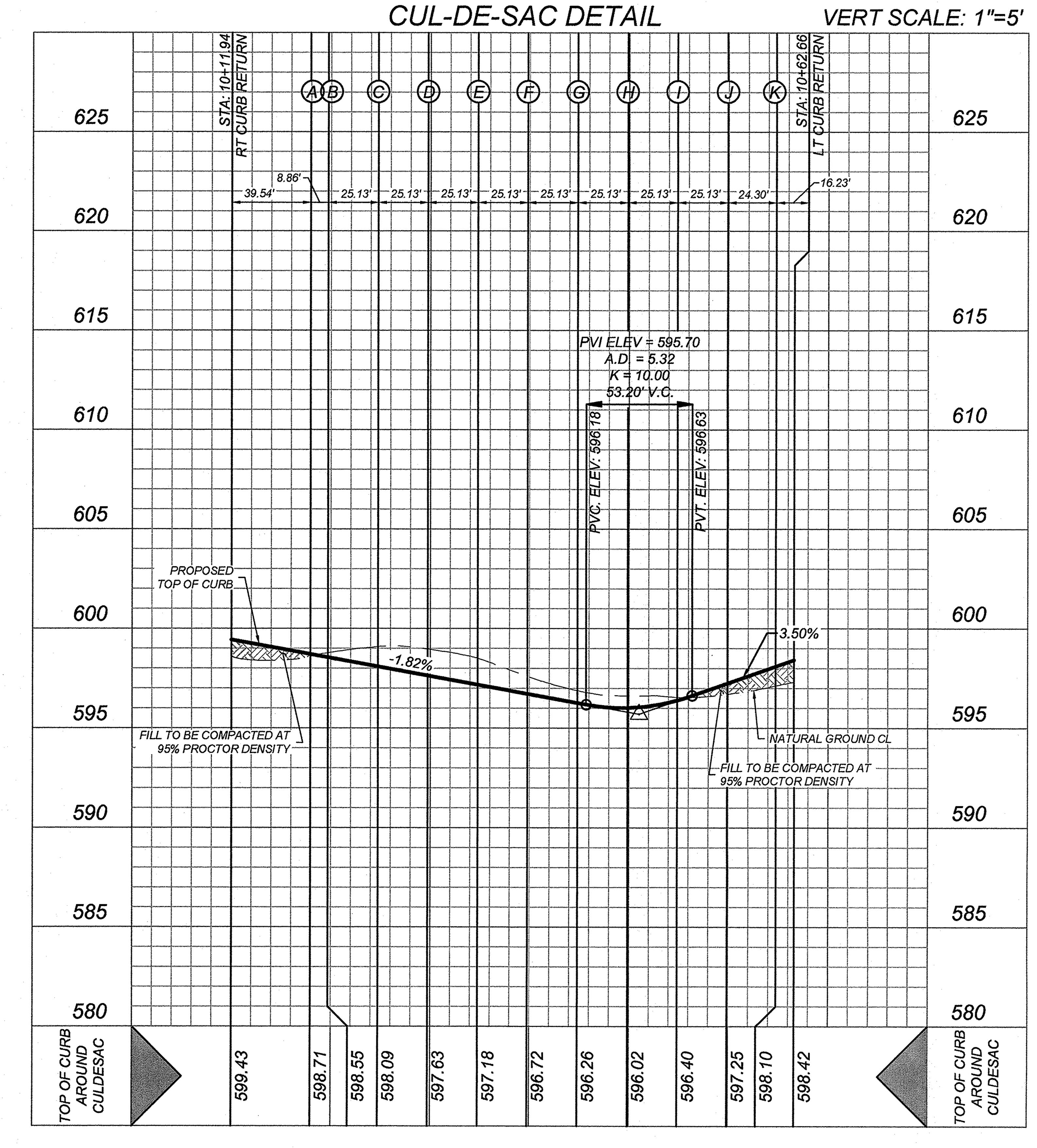
R.O.W.	=	RIGHT OF WAY
G.E.T.TV.E.	=	GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
(arrow)	=	FLOW ARROW
(shaded)	=	WASHOUT CROWN
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.11
SDW	=	SINGLE DIRECTIONAL WHEELCHAIR RAMP
DDW	=	DUAL DIRECTIONAL WHEELCHAIR RAMP
(hatched)	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
(dotted)	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
(hatched)	=	PROPOSED DRIVEWAY LOCATION
H.P.	=	HIGH POINT
L.P.	=	LOW POINT
E.O.P.	=	EDGE OF PAVEMENT



DETAIL "B"
SCALE: 1" = 30'

INGRESS AVE CUL-DE-SAC DETAIL

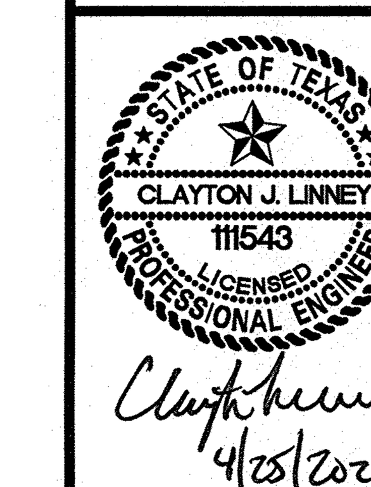
HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



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

ISSUE DATE

REVISIONS



GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
INGRESS AVE CUL-DE-SAC DETAIL

PLAT NO.
21-11800645

JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
5.4

TRENCH EXCAVATION SAFETY PROTECTION

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BEXAR COUNTY R.O.W. NOTE

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

LEGEND

R.O.W.	= RIGHT OF WAY		= SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
G.E.T.TV.E	= GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT		= SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
→	= FLOW ARROW		= PROPOSED DRIVEWAY LOCATION
	= WASHOUT CROWN	H.P.	= HIGH POINT
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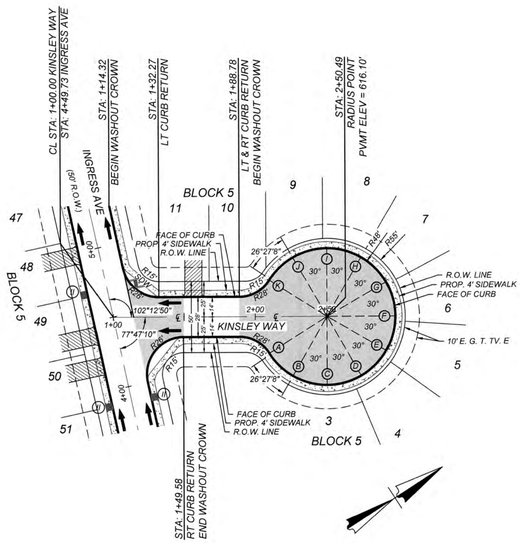
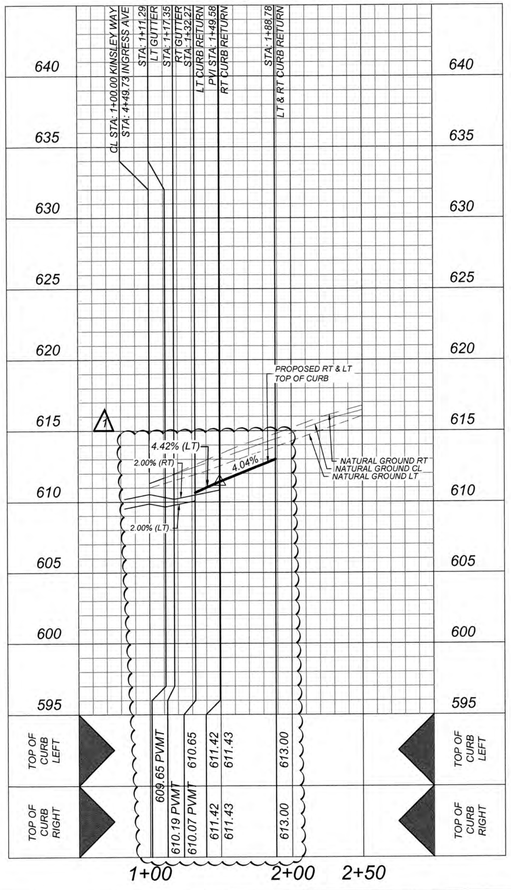
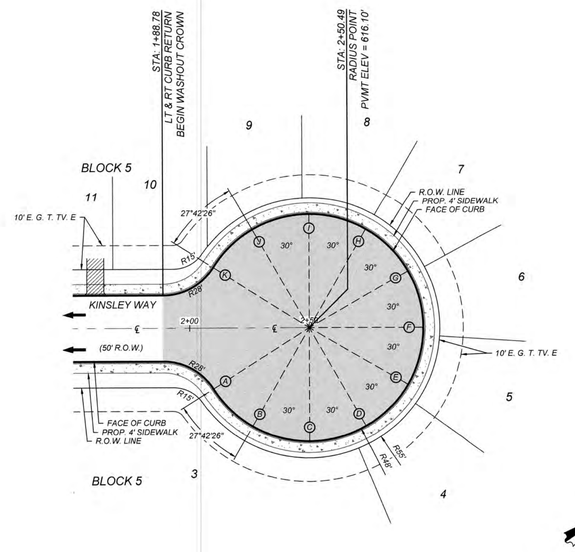


KINSLEY WAY
STA: 1+00.00 - END

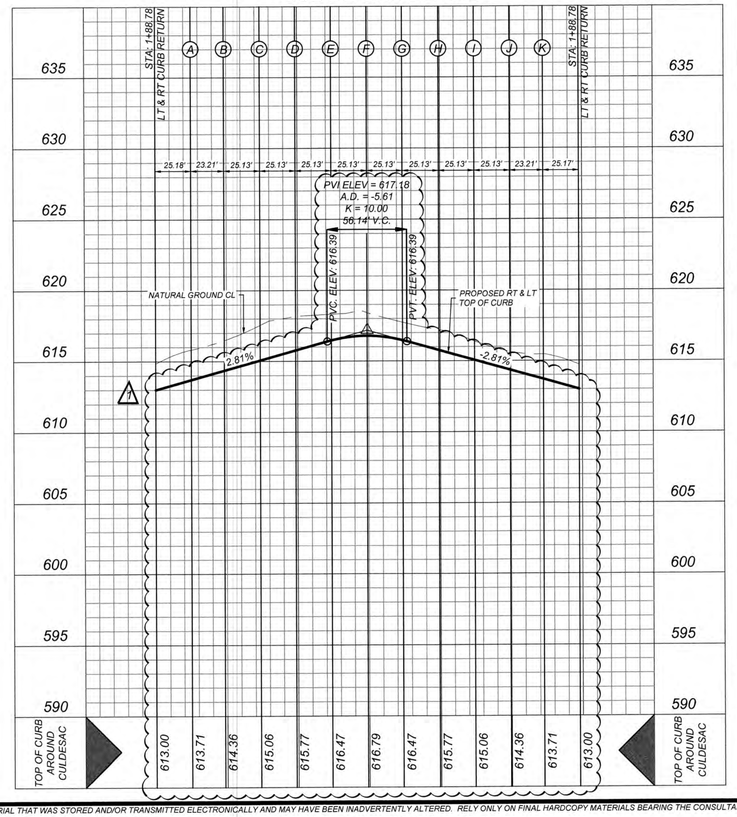
HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'





CUL-DE-SAC DETAIL

HORZ SCALE: 1"=30'
VERT SCALE: 1"=5'



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

ISSUE DATE
3/25/2022

REVISIONS
REVISED STREET DESIGN

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/28/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

KINSLEY WAY PLAN & PROFILE

PLAT NO.
21-11800645

JOB NO.205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
5.5

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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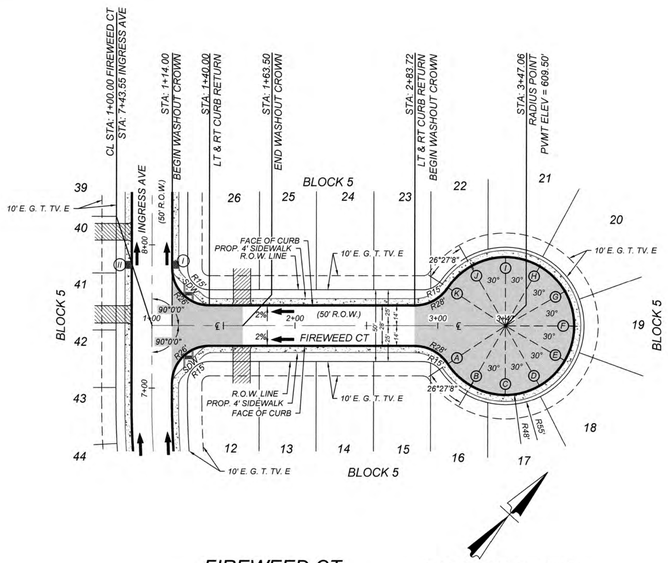
BEXAR COUNTY R.O.W. NOTE

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

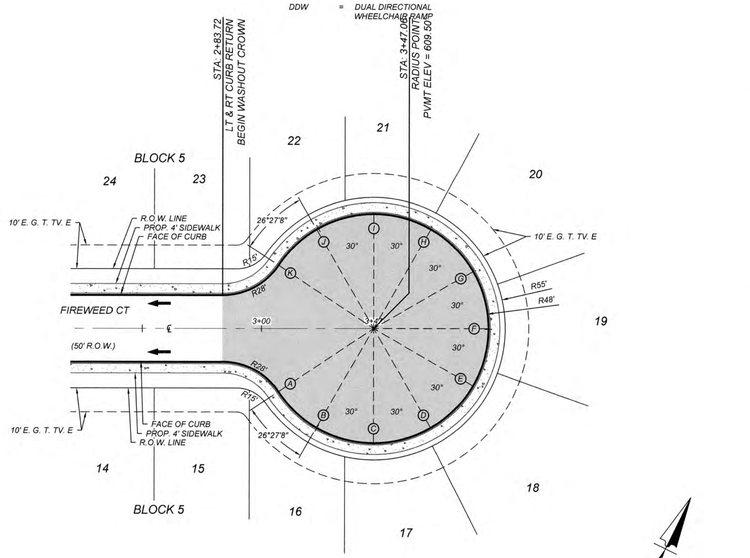
LEGEND

- R.O.W. = RIGHT OF WAY
- G.E.T.T.V.E. = GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
- = FLOW ARROW
- = WASHOUT CROWN
- (II) = WHEELCHAIR RAMP TYPE II SEE SHEET 5.11
- (I) = WHEELCHAIR RAMP TYPE I SEE SHEET 5.11
- SDW = SINGLE DIRECTIONAL WHEELCHAIR RAMP
- DDW = DUAL DIRECTIONAL WHEELCHAIR RAMP
- = 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
- E.O.P. = EDGE OF PAVEMENT



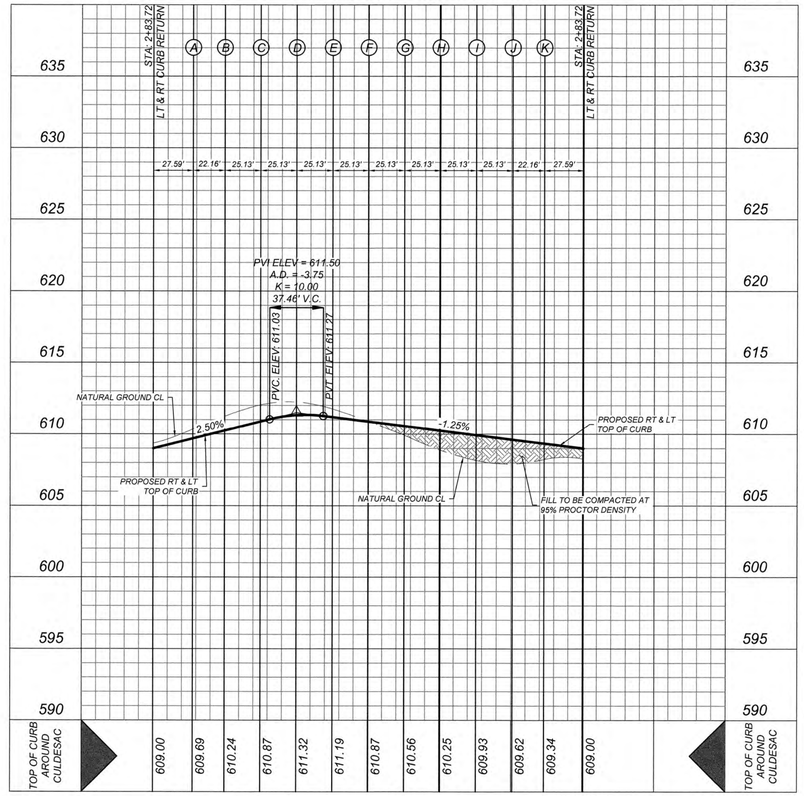
FIREWEED CT
STA: 1+00.00 - END

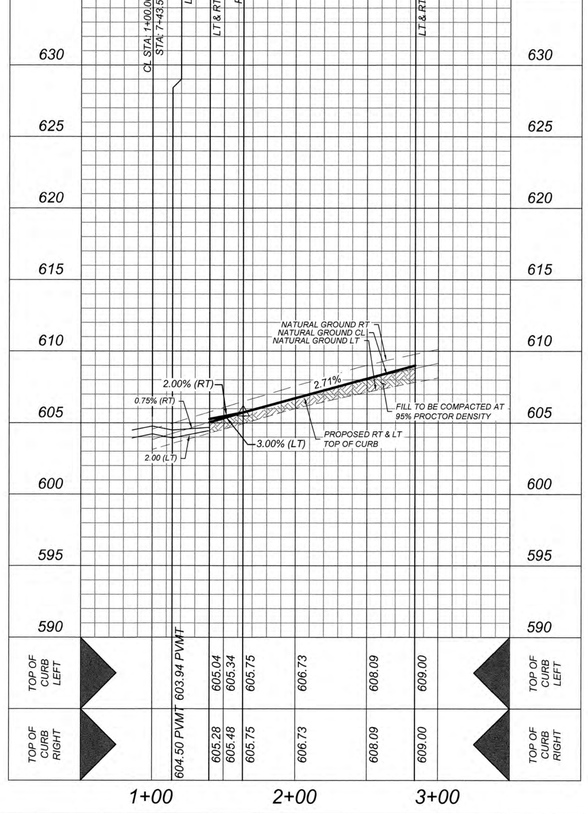
HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'



CUL-DE-SAC DETAIL

HORZ SCALE: 1"=30'
VERT SCALE: 1"=5'





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

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
3/17/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

FIREWEED CT PLAN & PROFILE

PLAT NO.
21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
5.6

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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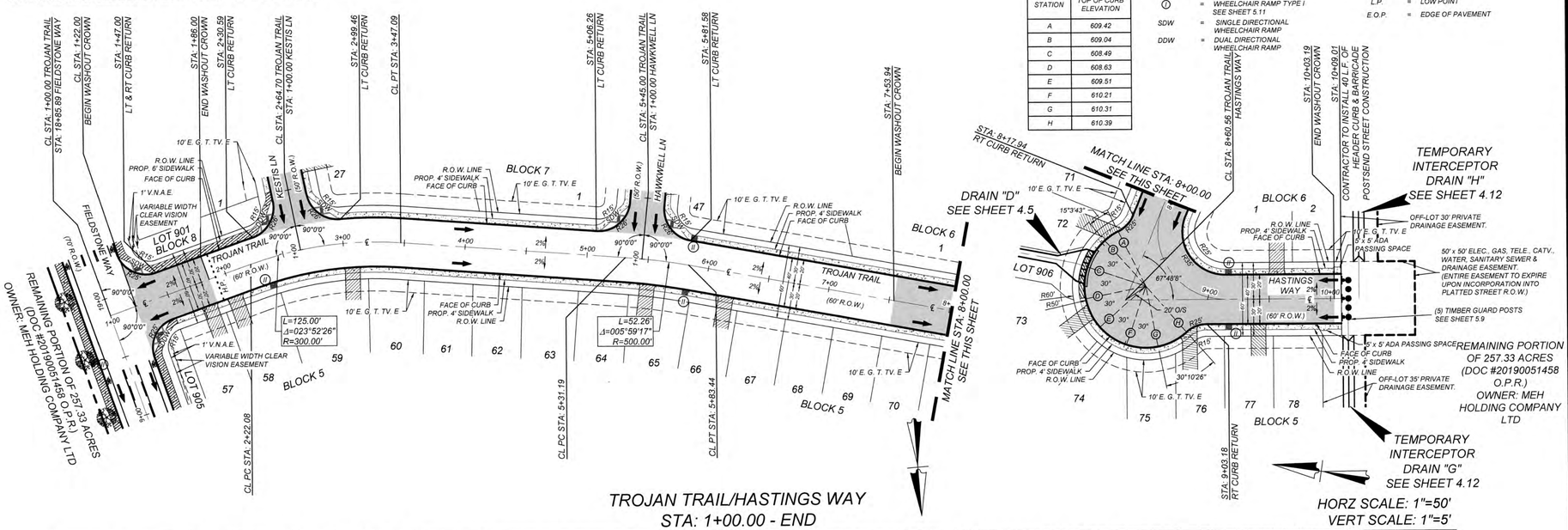
BEXAR COUNTY R.O.W. NOTE

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

LEGEND

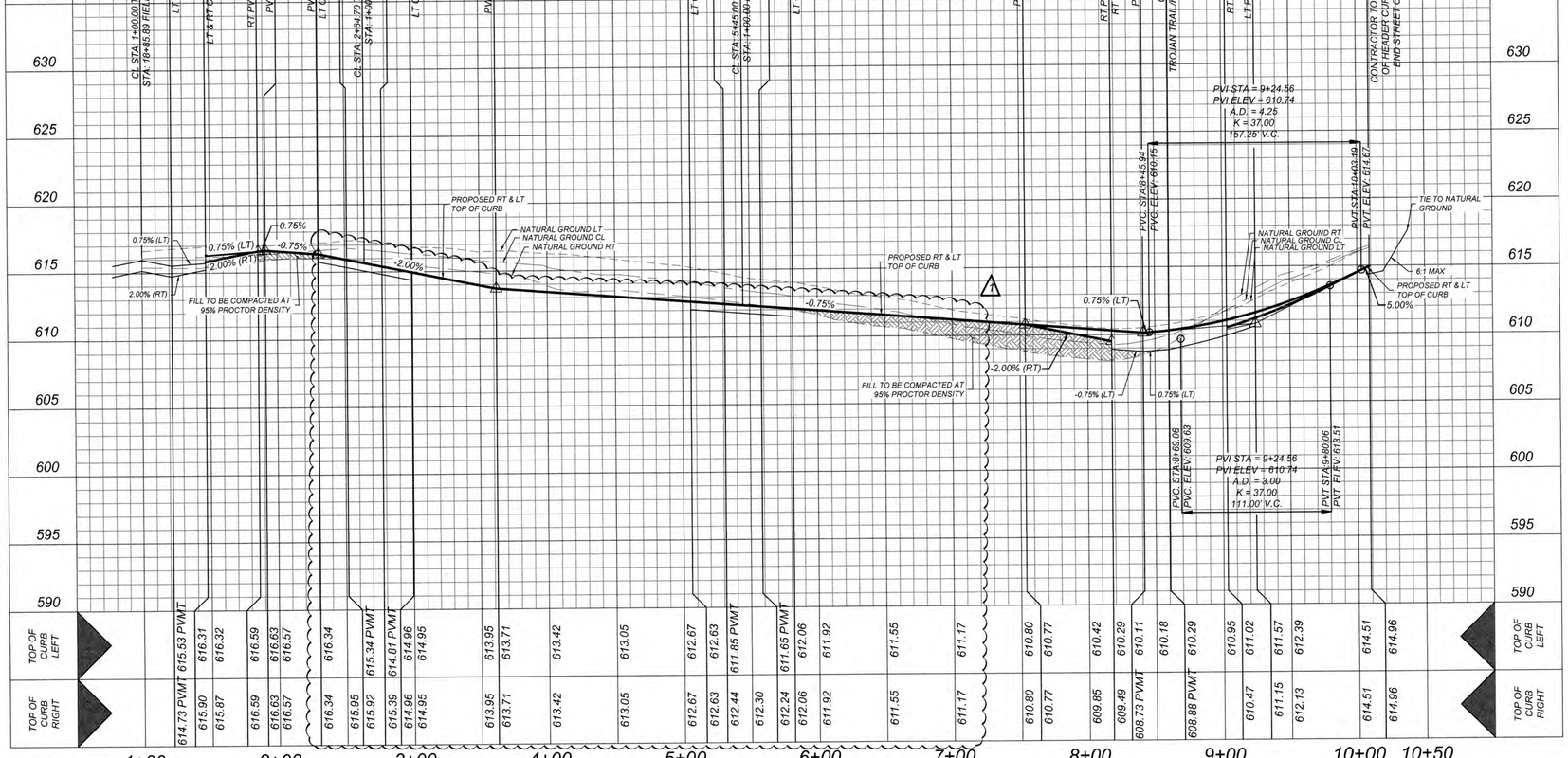
R.O.W. = RIGHT OF WAY
G.E.T.T.V.E. = GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
= FLOW ARROW
= WASHOUT CROWN
= WHEELCHAIR RAMP TYPE II SEE SHEET 5.11
= WHEELCHAIR RAMP TYPE I SEE SHEET 5.11
SDW = SINGLE DIRECTIONAL WHEELCHAIR RAMP
DDW = DUAL DIRECTIONAL WHEELCHAIR RAMP
= SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
= SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
= PROPOSED DRIVEWAY LOCATION
H.P. = HIGH POINT
L.P. = LOW POINT
E.O.P. = EDGE OF PAVEMENT

CULDESAC ELEVATIONS	
STATION	TOP OF CURB ELEVATION
A	609.42
B	609.04
C	608.49
D	608.63
E	609.51
F	610.21
G	610.31
H	610.39



TROJAN TRAIL/HASTINGS WAY
STA: 1+00.00 - END

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



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

ISSUE DATE
3/25/2022

KEY/SHOWS
REVISED STREET DESIGN

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/23/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

TROJAN TRAIL & HASTINGS WAY PLAN & PROFILE

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER: 5.7

TRENCH EXCAVATION SAFETY PROTECTION

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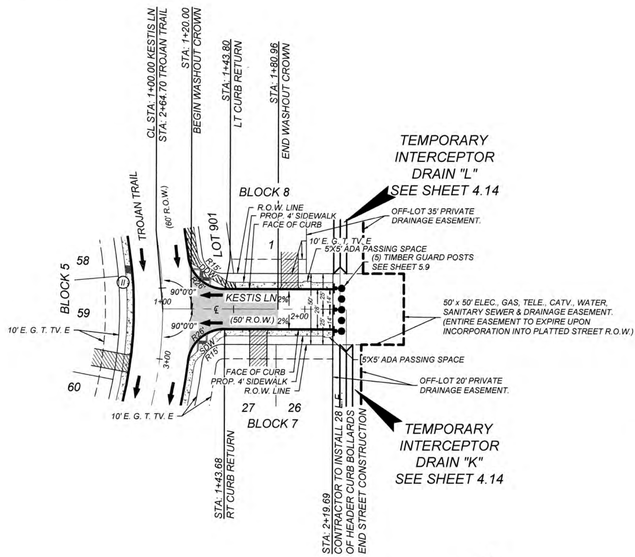
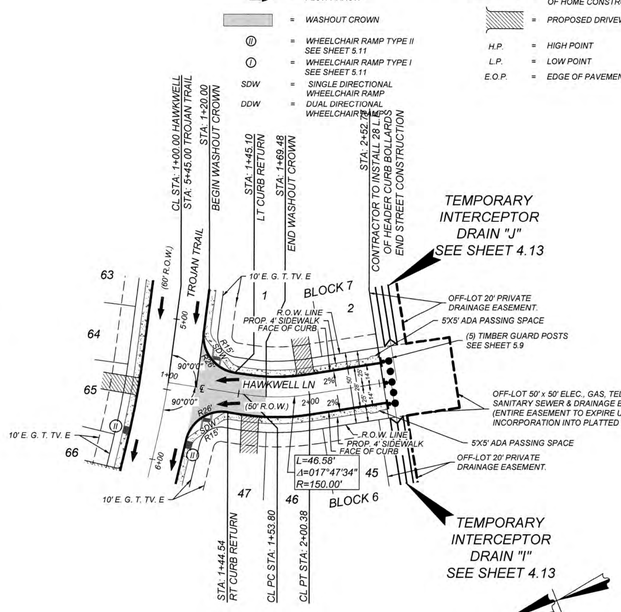
BEXAR COUNTY R.O.W. NOTE

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





LEGEND

- R.O.W. = RIGHT OF WAY
- G.E.T.V.E. = GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
- = FLOW ARROW
- = WASHOUT CROWN
- = WHEELCHAIR RAMP TYPE II SEE SHEET 5.11
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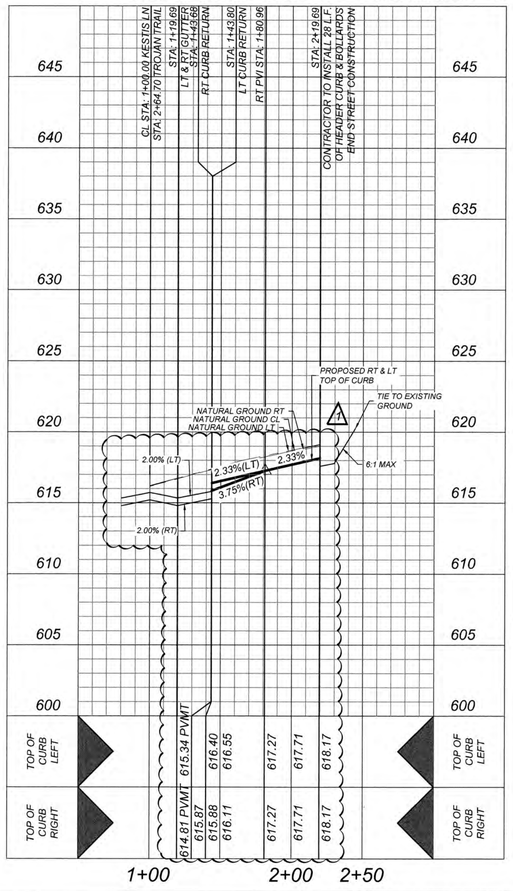
- SDW = SINGLE DIRECTIONAL WHEELCHAIR RAMP
- DDW = DUAL DIRECTIONAL WHEELCHAIR RAMPS
- = SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
- = SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
- = PROPOSED DRIVEWAY LOCATION
- H.P. = HIGH POINT
- L.P. = LOW POINT
- E.O.P. = EDGE OF PAVEMENT

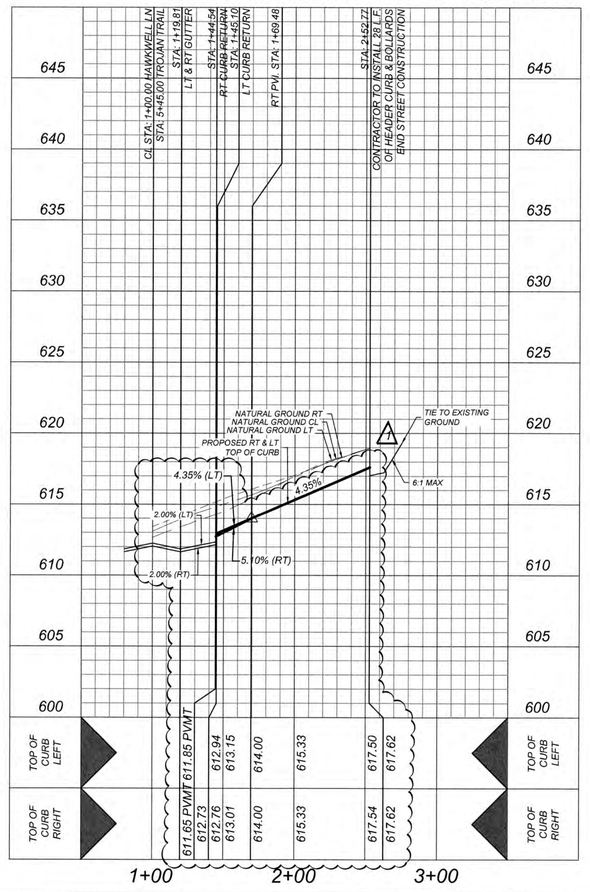
KESTIS LN
STA: 1+00.00 - END

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



HAWKWELL LN
STA: 1+00.00 - END

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



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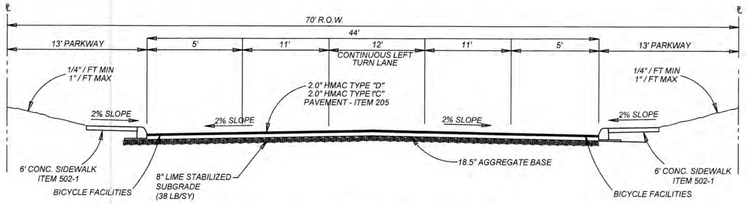
REVISIONS
1 REVISED STREET DESIGN
ISSUE DATE 3/25/2022

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/21/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

KESTIS LN & HAWKWELL LN PLAN & PROFILE

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL
SHEET NUMBER: 5.8



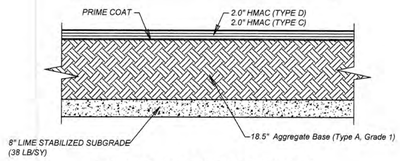
TYPICAL COLLECTOR STREET SECTION

NOT TO SCALE

USE COLLECTOR STREET SECTION FOR STREETS BELOW:

FIELDSTONE WAY: STA. 1+00.00 - END

Pavement Section
2.0" HMAC Type "D"
2.0" HMAC Type "C"
18.5" Aggregate Base (Type A, Grade 1)
8.0" Lime Stablized Subgrade(38 LB/SY)
Total: 30.5"
Structural No: 4.99
CBR: 2.5



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

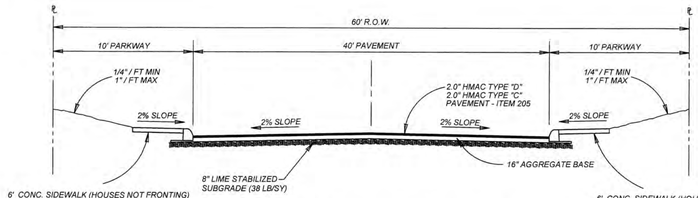
DETAIL FOR ALL COLLECTORS

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY INTEC, LLC. PROJECT NO. S211512 DATED DECEMBER 18, 2021.

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.



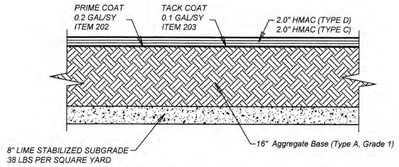
TYPICAL LOCAL "B" STREET SECTION

NOT TO SCALE

USE LOCAL "B" STREET SECTION FOR STREETS:

TROJAN TRAIL/HASTINGS WAY: STA. 1+00.00 - END

Pavement Section
2.0" HMAC Type "D"
2.0" HMAC Type "C"
16" Aggregate Base (Type A, Grade 1)
8.0" Lime Stablized Subgrade(38 LB/SY)
Total: 28"
Structural No: 4.64
CBR: 2.5



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE B

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY INTEC, LLC. PROJECT NO. S211512 DATED DECEMBER 18, 2021.

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.

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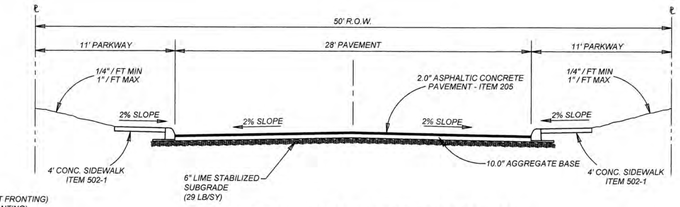


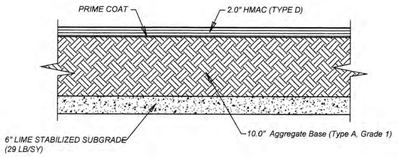
TYPICAL LOCAL "A" STREET SECTION

NOT TO SCALE

USE LOCAL "A" STREET SECTION FOR STREETS BELOW:

KAILORS COVE: STA: 1+00.00 - END
SUNRIDGE HTS: STA: 1+00.00 - END
INGRESS AVE: STA: 1+00.00 - END
KINSLEY WAY: STA: 1+00.00 - END
FIREWEED CT: STA: 1+00.00 - END
KESTIS LN: STA: 1+00.00 - END
HAWKWELL LN: STA: 1+00.00 - END

Pavement Section
2.0" HMAC Type "D"
10.0" Aggregate Base (Type A, Grade 1)
6.0" Lime Stablized Subgrade (29 LB/SY)
Total: 18.0"
Structural No: 2.76
CBR: 2.5



ASPHALT PAVEMENT DETAIL

NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE A

NOTES:
1. PAVEMENT DESIGN THICKNESS BASED ON GEOTECHNICAL REPORT BY INTEC, LLC. PROJECT NO. S211512 DATED DECEMBER 18, 2021.

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GENERAL NOTES:

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

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

1. AFTER INITIAL MIXING THE SOIL-LIME MIXTURE SHALL MELLOW FOR A PERIOD OF TWO TO THREE (2 - 3) DAYS. MAINTAIN MOISTURE DURING MELLOWING;
2. AFTER MELLOWING AND FINAL MIXING, THE PULVERIZATION SHALL BE CHECKED USING THE FOLLOWING CRITERIA (REMOVE NON-SLAKING AGGREGATES RETAINED ON THE ½ INCH SIEVE FROM THE SAMPLE):

MINIMUM PASSING 1 ¾" SIEVE	100
MINIMUM PASSING ½" SIEVE	85
MINIMUM PASSING NO. 4 SIEVE	60

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

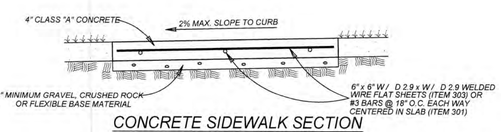
NOTES:

ANY FILL USED TO RAISE THE SUBGRADE:
- SHOUD NOT CONTAIN ANY DELETERIOUS MATERIAL
- SHOULD HAVE A CBR VALUE OF 2.5 OR GREATER
- SHOULD HAVE THE "LIME PERCENTAGE/APPLICATION RATE" RE-EVALUATED AND TESTED PRIOR TO INSTALLATION
- PI SHOULD BE A MAXIMUM OF 50

STREETSCAPE TREE PLANTING NOTES

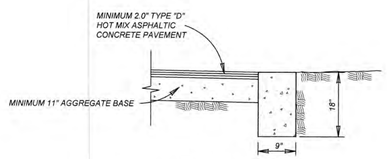
LARGE TREES (PER UDC) TO BE PLANTED EVERY 50 FEET OR CLUSTERS ALONG FIELDSTONE WAY R.O.W. PER "NEW TREE PLANTING DETAIL" ON THIS SHEET.

1. SPECIES OF TREES TO BE DETERMINED BY DEVELOPER'S PROJECT LANDSCAPE ARCHITECT TO CONFIRM WITH THE STREETSCAPE PLANTING STANDARDS.
2. DEVELOPER TO PROVIDE MAINTENANCE ON PLANTED STREET TREES FOR A MINIMUM OF 3 YEARS.
3. ALL LANDSCAPE SHALL COMPLY WITH THE CLEAR VISION AREA AS DEFINED BY THE LATEST VERSION OF AASHTO's "A POLICY ON GEOMETRIC DESIGN OF HIGHWAYS AND STREETS."
4. TYPES OF TREES AND SPACING ARE BASED ON UNDERGROUND ELECTRIC. IF OVERHEAD ELECTIRC IS REQUIRED BY CPS, PLANS WILL BE REVISED TO REFLECT CHANGES IN SIZE, TYPE, AND SPACING OF TREE, PER THE UDC.



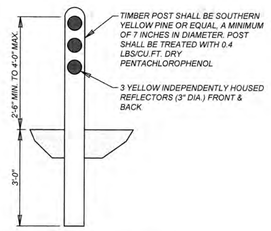
CONCRETE SIDEWALK SECTION

ITEM 502
NOT TO SCALE



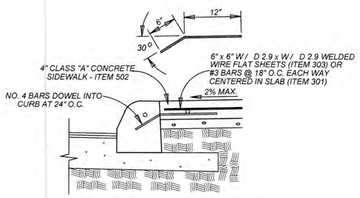
HEADER CURB

ITEM 500 ON SAND OR GRAVEL
NOT TO SCALE



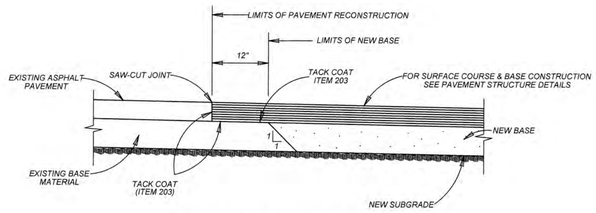
TIMBER GUARD POST DETAIL

NOT-TO-SCALE



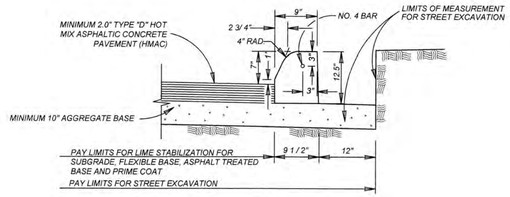
CONCRETE SIDEWALK ABUTTING CURB SECTION

ITEM 502
NOT TO SCALE



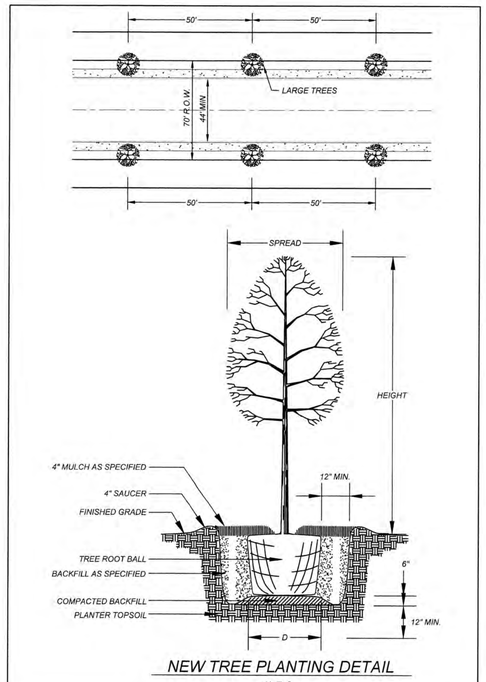
PAVEMENT JUNCTION DETAILS

NOT TO SCALE



CONCRETE CURB

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



NEW TREE PLANTING DETAIL

N. T. S.

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

ISSUE DATE

REVISIONS

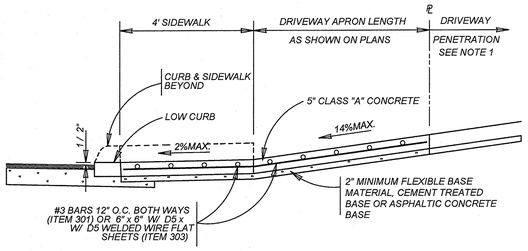
STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
6/15/2023

GATES SUBDIVISION UNIT 1
SAN ANTONIO, TX

TYPICAL STREET DETAILS

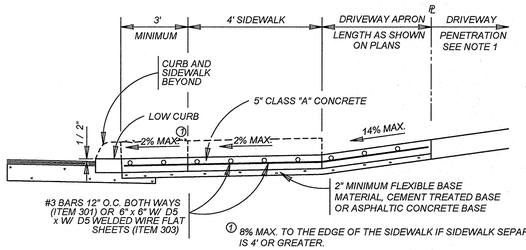
PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER: 5.9



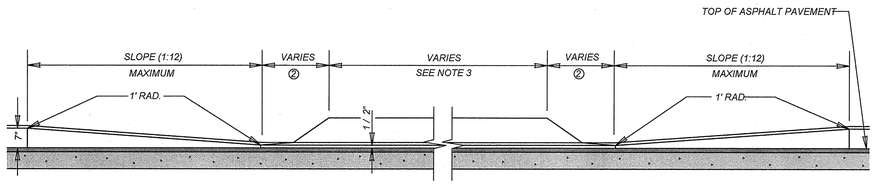
TYPICAL RESIDENTIAL DRIVEWAY SECTION

WITH SIDEWALK ABUTTING CURB
ITEM 503.1



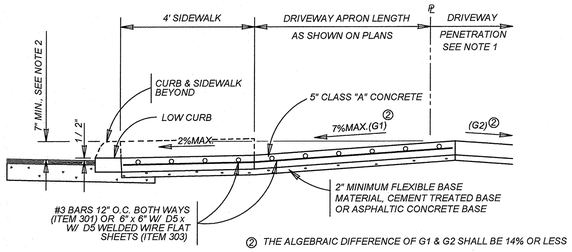
TYPICAL RESIDENTIAL DRIVEWAY SECTION

WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1



CURB PROFILE AT DRIVEWAY

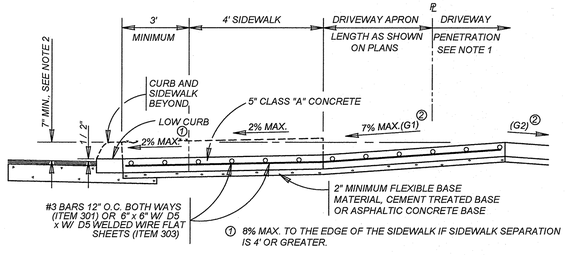
WITH SIDEWALK ABUTTING CURB



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

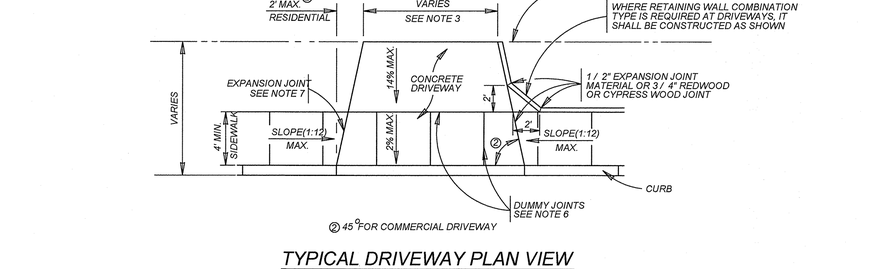


① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

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

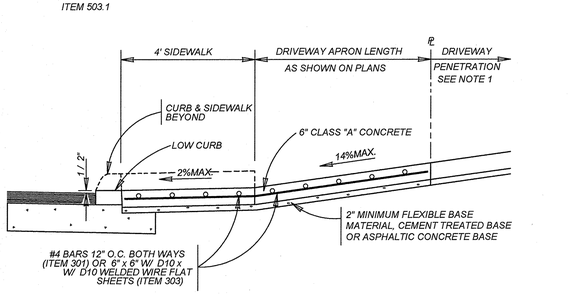
TYPICAL RESIDENTIAL DRIVEWAY SECTION

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



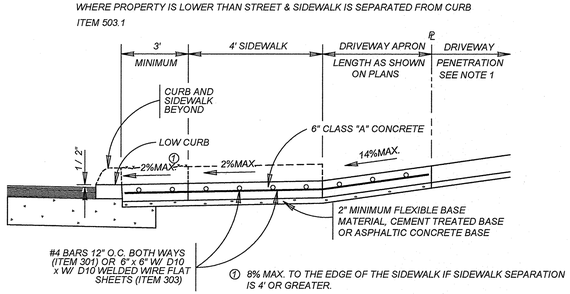
TYPICAL DRIVEWAY PLAN VIEW

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

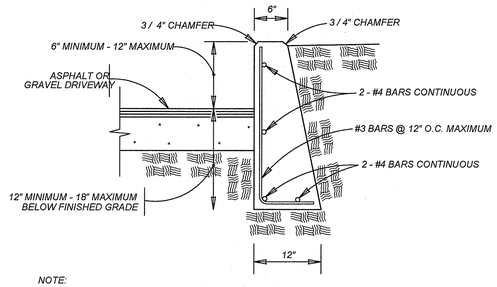
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2

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'

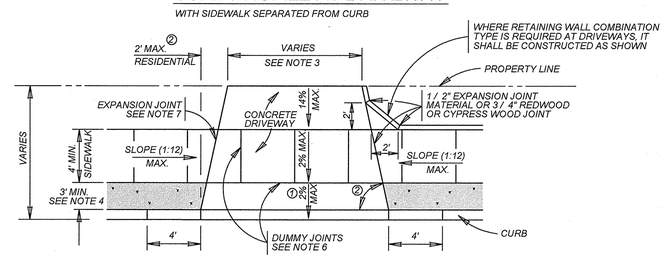
4. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 3' FROM THE BACK OF CURB.
5. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 3' FROM THE 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



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

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: 210.979.8444 Fax: 210.979.8441
TBPE Firm #: 5813 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

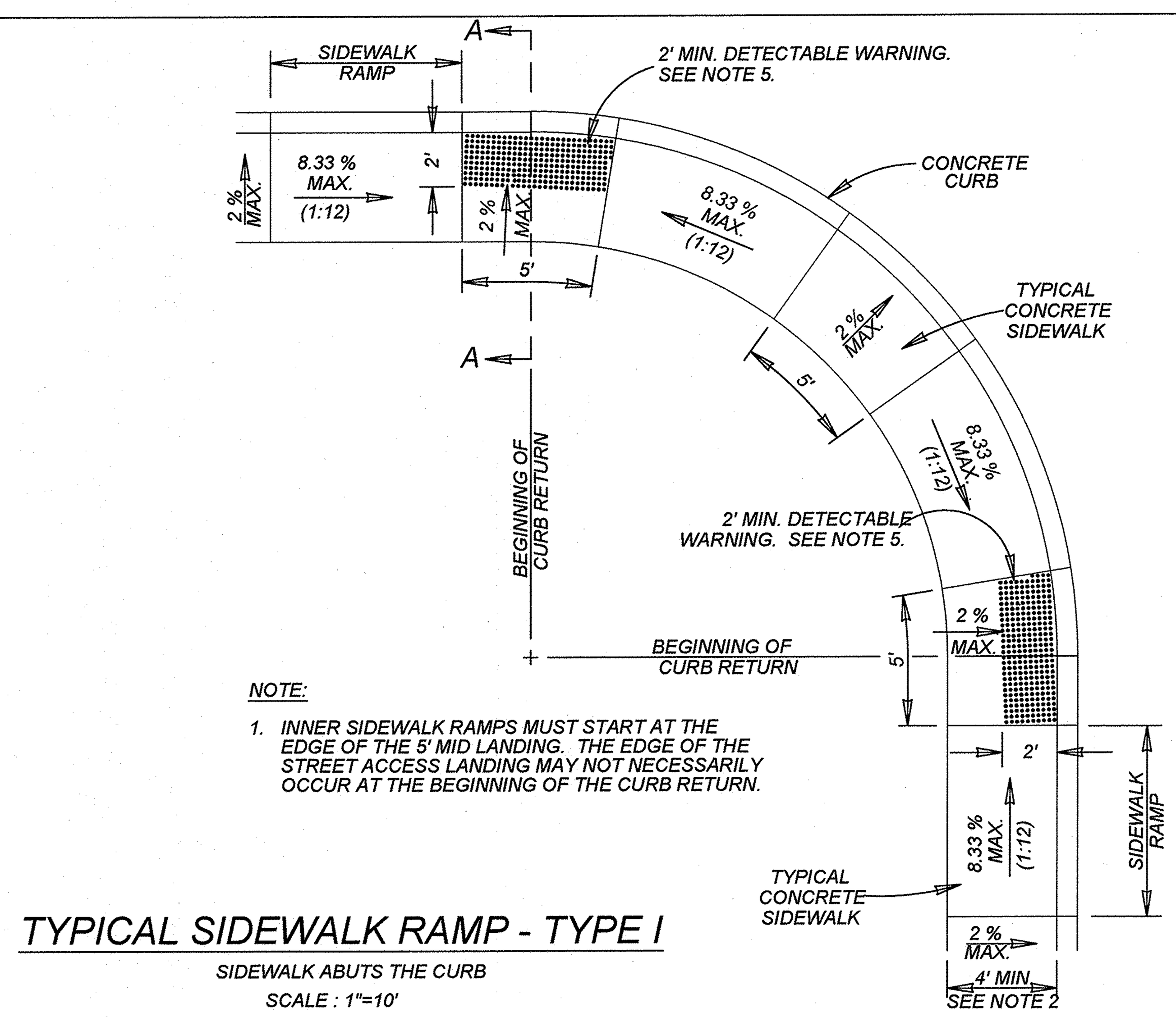
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
STATE OF TEXAS
4/25/2022

GATES SUBDIVISION UNIT 1
SAN ANTONIO, TX
CONCRETE DRIVEWAY DETAILS

PLAT NO. 21-11800645

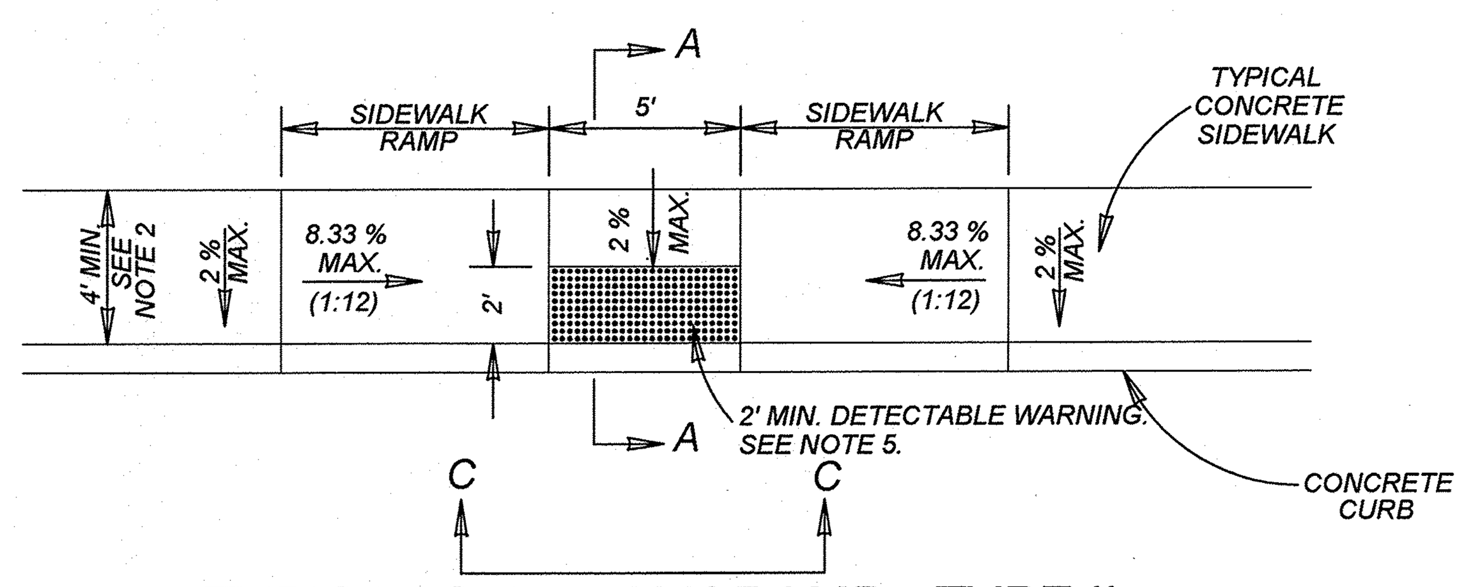
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER: 5.10

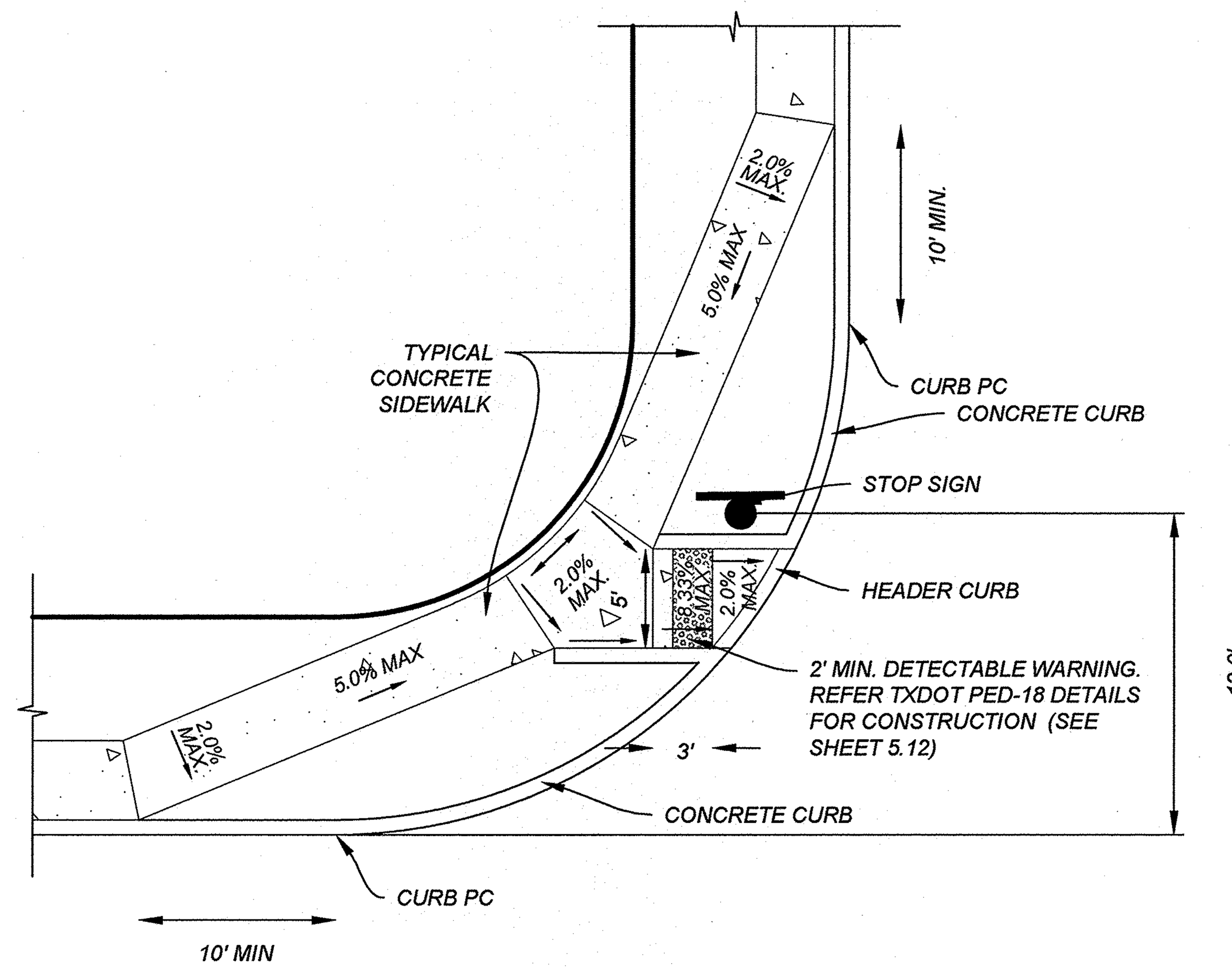


NOTE:
1. INNER SIDEWALK RAMPS MUST START AT THE EDGE OF THE 5' MID LANDING. THE EDGE OF THE STREET ACCESS LANDING MAY NOT NECESSARILY OCCUR AT THE BEGINNING OF THE CURB RETURN.

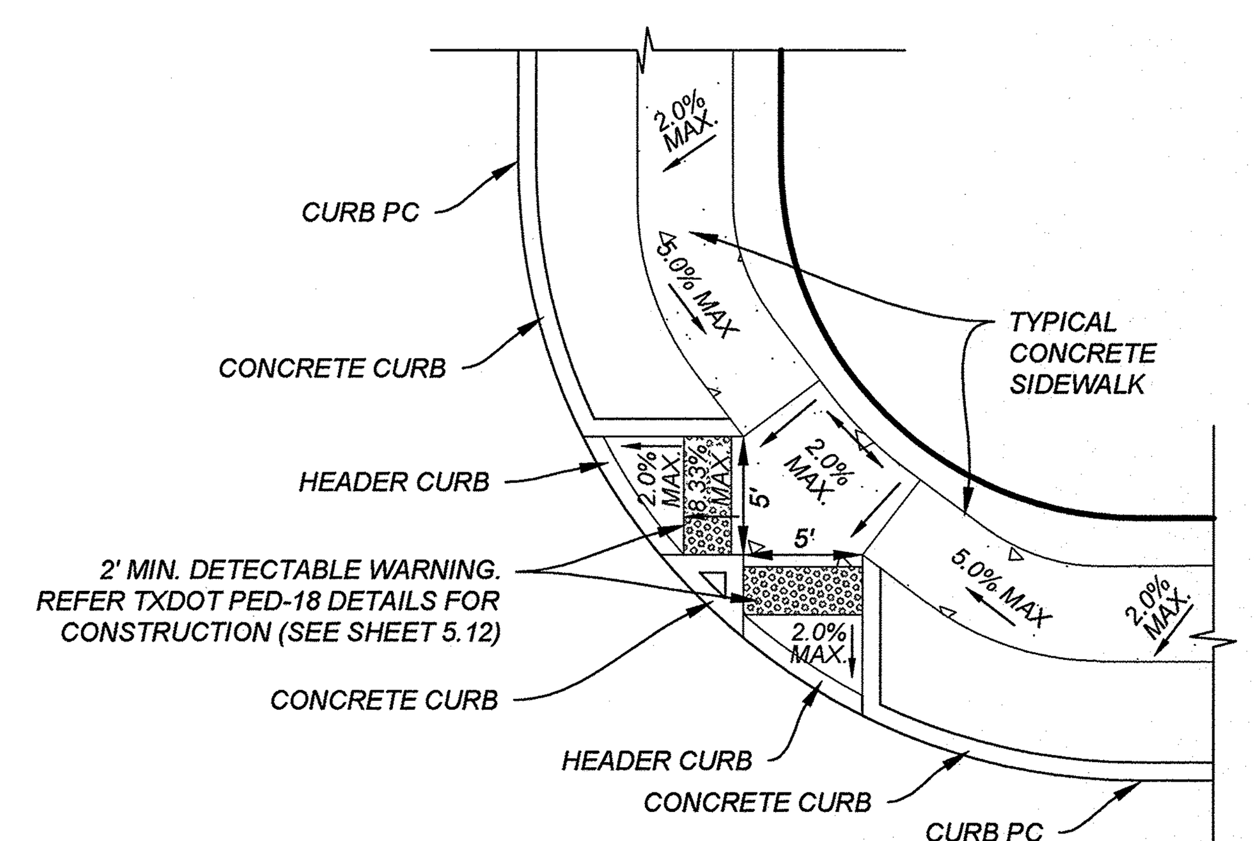
TYPICAL SIDEWALK RAMP - TYPE I
SIDEWALK ABUTS THE CURB
SCALE : 1"=10'



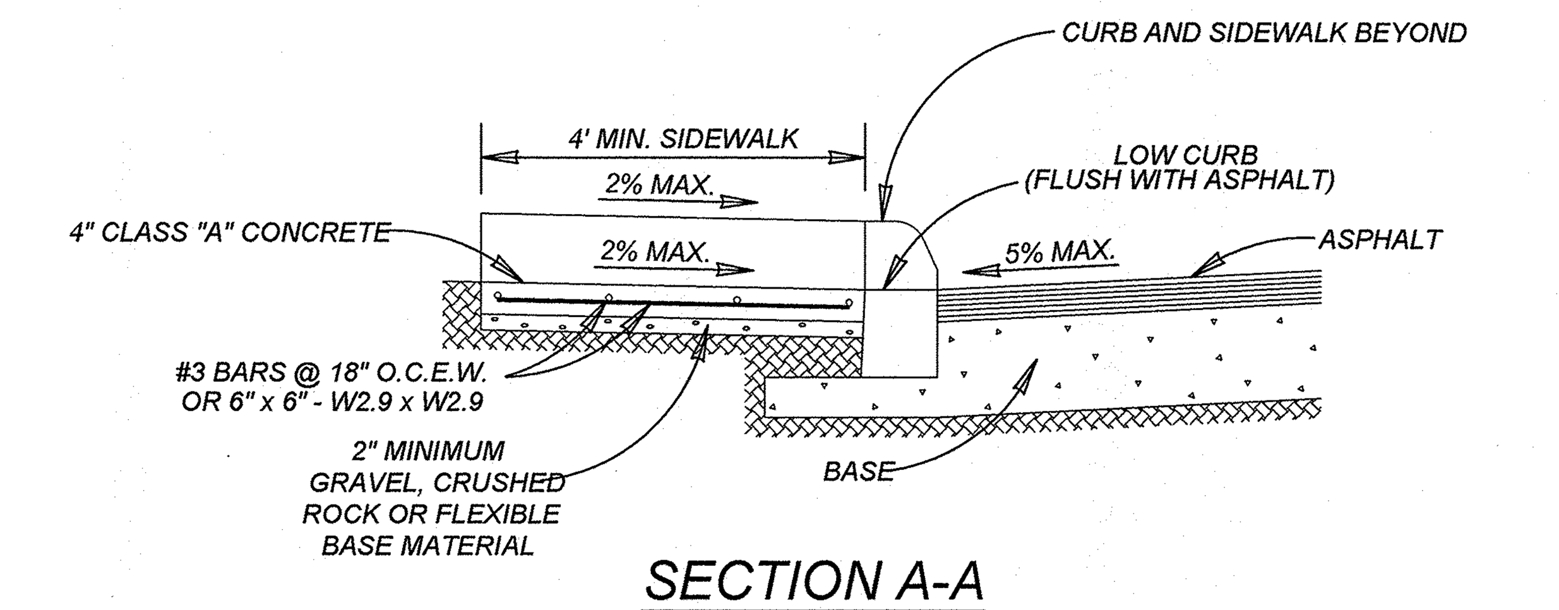
TYPICAL SIDEWALK RAMP - TYPE II
USED AT TEE INTERSECTIONS WHERE SIDEWALK ABUTS CURB
SCALE : 1"=10'



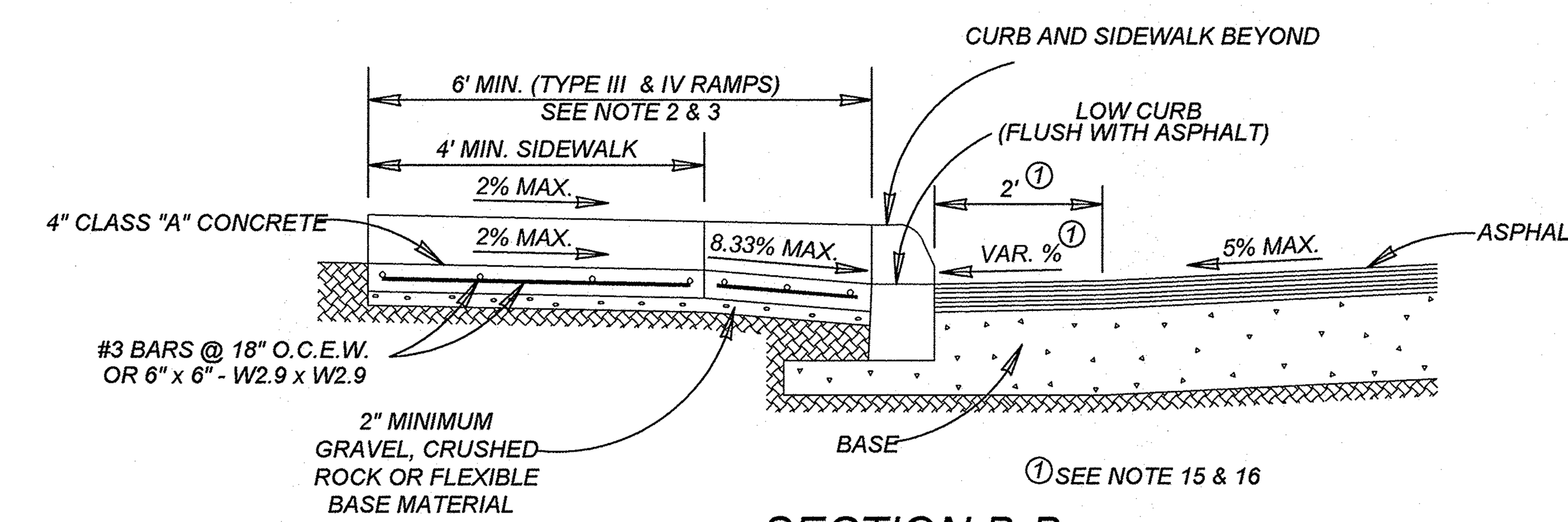
SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SDWCR)
NOT TO SCALE



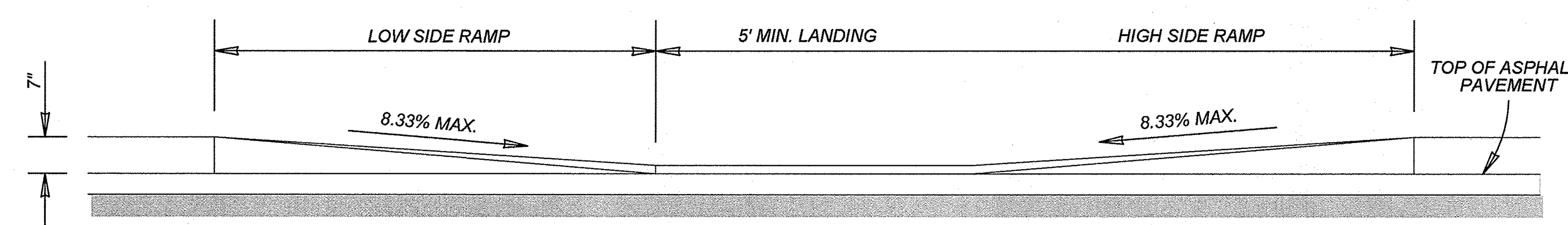
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (DDWCR)
NOT TO SCALE



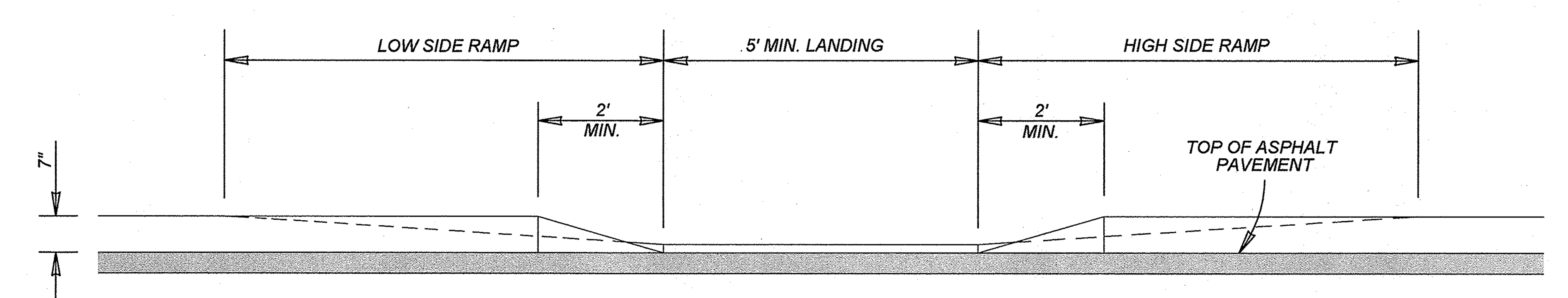
SECTION A-A
SCALE : 1"=4'



SECTION B-B
SCALE : 1"=4'



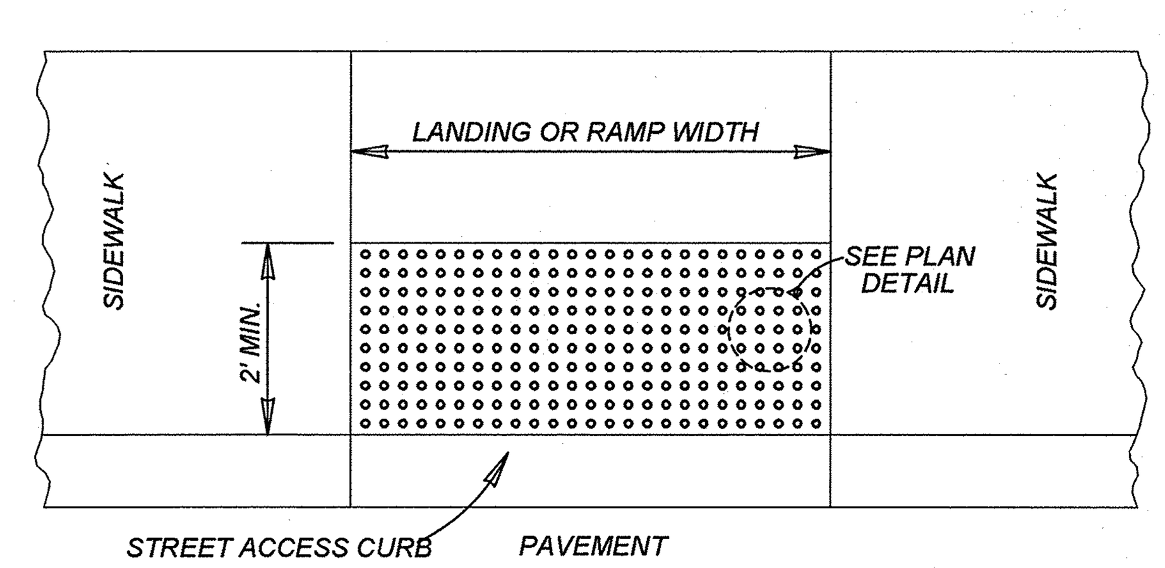
SECTION C-C
CURB PROFILE WHERE SIDEWALK ABUTS CURB
SCALE : 1"=4'



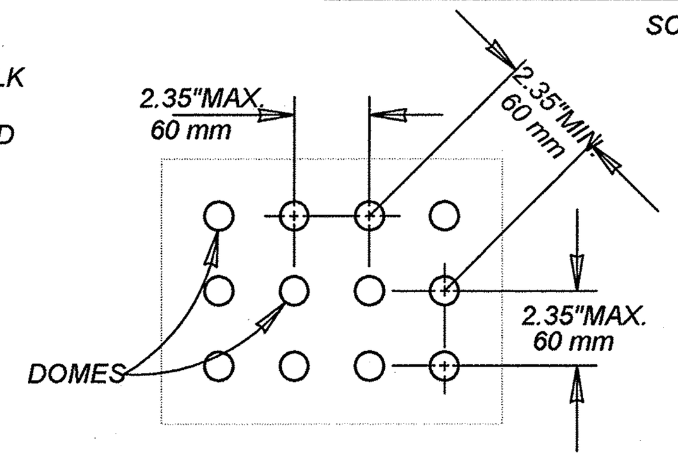
SECTION D-D
CURB PROFILE WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1"=4'

GENERAL NOTES

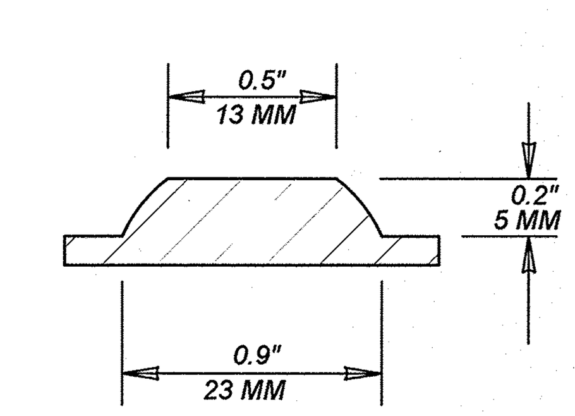
1. WHEN POSSIBLE SIDEWALKS SHOULD BE PLACED NEXT TO THE PROPERTY LINE, ALLOWING A MINIMUM OF 1 FOOT BUFFER. DEVIATION OF THE PATHWAY FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TREES OR OTHER OBSTRUCTIONS.
2. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 3' FROM THE BACK OF CURB.
3. FOR OTHER THAN LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND SEPARATED A MINIMUM OF 3' FROM THE BACK OF CURB OR AS AN OPTION, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 6' WHEN LOCATED AT THE BACK OF CURB.
4. SIDEWALK RAMP LENGTHS PRESENTED IN TABLE 1 ARE GUIDELINES ONLY. SIDEWALK RAMP LENGTHS SHALL BE OF SUFFICIENT LENGTH TO MAINTAIN 8.33% (1:12) MAXIMUM SLOPE.
5. ALL CURB-RAMPS OR LANDINGS ABUTTING THE CROSSWALK SHALL HAVE A DETECTABLE WARNING 24 INCHES DEEP (IN THE DIRECTION OF PEDESTRIAN TRAVEL) AND EXTENDING THE FULL WIDTH OF THE CURB RAMP OR LANDING. THE DETECTABLE WARNING SHALL CONSIST OF RAISED TRUNCATED DOMES, ALIGNED IN A GRID PATTERN WITH A DIAMETER OF A NOMINAL 0.9 INCHES (23 MM), A HEIGHT OF NOMINAL 0.2 INCHES (5 MM) AND A CENTER-TO-CENTER SPACING OF NOMINAL 2.35 INCHES (60 MM). THE DETECTABLE WARNING SURFACE SHALL BE PAVERS CONFORMING TO TXDOT STANDARD PED-05, PEDESTRIAN FACILITIES.
6. DETECTABLE WARNINGS SHALL CONTRAST VISUALLY WITH ADJOINING SURFACES, EITHER LIGHT-ON-DARK, OR DARK-ON-LIGHT. THE MATERIAL USED TO PROVIDE CONTRAST SHALL BE AN INTEGRAL PART OF THE WALKING SURFACE.
7. SIDEWALK RAMP TYPE V SHALL BE USED ONLY WHERE THERE IS SIGNIFICANT RESTRICTION WITHIN THE PARKWAY TO CONSTRUCT TYPE I OR TYPE III RAMPS.
8. CONSTRUCTION OF ALL WHEELCHAIR RAMPS TO BE INCLUDED UNDER ITEMS "500 - CONCRETE CURB, GUTTER, AND CONCRETE CURB AND GUTTER" AND / OR "502 - CONCRETE SIDEWALKS". RAMP SURFACE SHALL BE BRUSH
9. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF WHEELCHAIR RAMPS TO BE SHOWN ON CONSTRUCTION PLANS. CITY CONSTRUCTION INSPECTOR CAN ADJUST LOCATIONS FOR SAFETY OR
10. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM
11. WHEELCHAIR RAMP SHALL BE CONSTRUCTED WITH 4" CLASS "A" CONCRETE AND 2" MINIMUM GRAVEL, CRUSHED ROCK OR FLEXIBLE BASE MATERIAL.
12. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C.E.W. OR 6" x 6" - W2.9 x W2.9 WIRE MESH.
13. SIDEWALK GRADES SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY, ANY SIDEWALK CONSTRUCTION THAT DEVIATES FROM THE NATURAL GRADE OF THE ROADWAY TO CREATE A GRADE STEEPER THAN THE EXISTING ROADWAY WILL REQUIRE RAMPS, HANDRAILS AND RESTING PLATFORMS TO BE CONSTRUCTED IN ACCORDANCE WITH ADA AND TAS STANDARDS.
14. SIDEWALK CROSS GRADE SHALL HAVE A MAXIMUM SLOPE OF 2%. LANDINGS SHALL HAVE A MAXIMUM SLOPE OF 2% IN ANY DIRECTION.
15. THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES SHALL BE LESS THAN 11%. THE CHANGE OF GRADE SHALL BE DEFINED AS THE ALGEBRAIC DIFFERENCE OF THE ADJACENT SURFACE SLOPES. IN THE CASE OF A STREET ACCESS RAMP DESIGNED AT THE 8.33% MAXIMUM SLOPE, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN 2.67% (I.E. 8.33-(-2.67)=11). IN ADDITION, THE ADJACENT PAVEMENT CROSS SLOPE SHALL BE LESS THAN OR EQUAL TO 5%.
16. IF THE CHANGE OF GRADE BETWEEN ADJACENT SURFACES IS GREATER THAN OR EQUAL TO 11%, A LEVELING STRIP, 2 FEET IN LENGTH, SHALL BE PROVIDED TO TRANSITION THE ADJACENT SURFACES.
17. ADA COMPLIANCE IN ALTERATIONS INCLUDE ONLY THAT WORK WITHIN THE LIMITS, BOUNDARIES OR SCOPE OF A PLANNED PROJECT.



DETECTABLE WARNING SURFACE
SCALE : 1"=4'



PLAN DETAIL
NO SCALE



DOME SECTION
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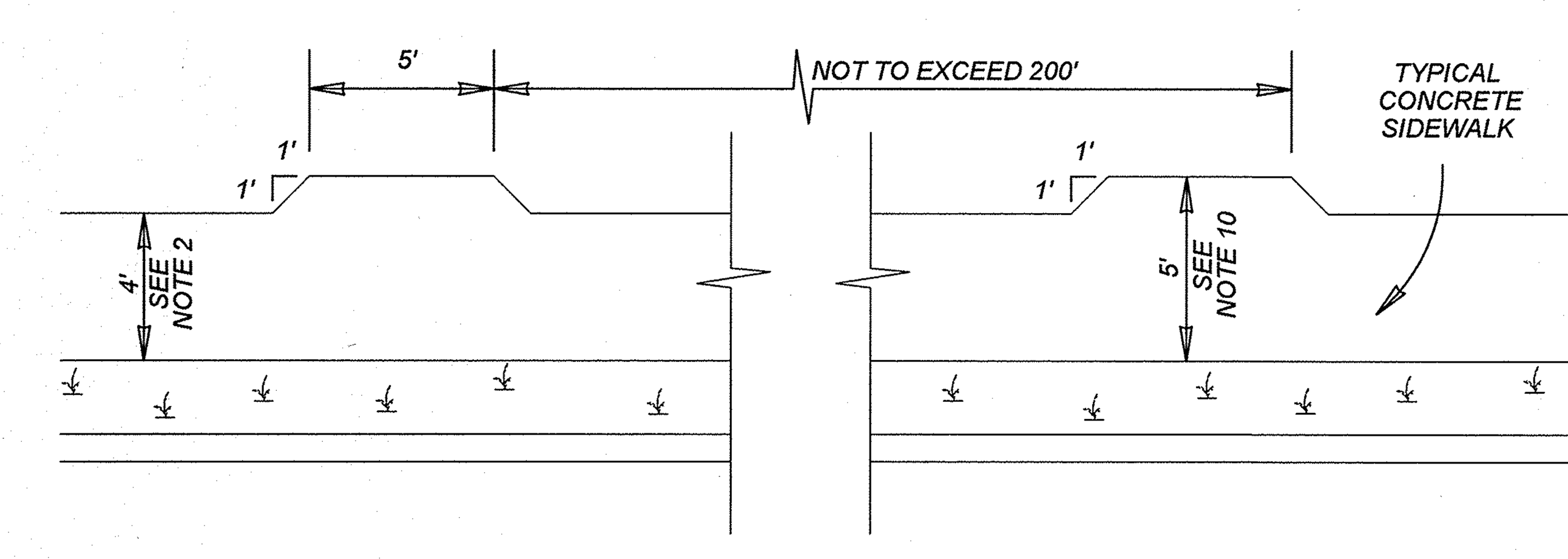

SIDEWALK PASSING SPACE
SCALE : 1"=10'

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.

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"

MAY 2009

CITY OF SAN ANTONIO
CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

WHEELCHAIR RAMP STANDARDS

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

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

ISSUE DATE
REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
4/25/2022

GATES SUBDIVISION UNIT 1
SAN ANTONIO, TX

WHEELCHAIR RAMP DETAILS

PLAT NO.
21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
5.11

Date: Apr 19, 2022, 9:25am User ID: omeiners
File: P:\205\43\04\Design\Civil\STREETS\STDT2054304.dwg

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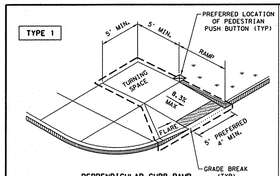
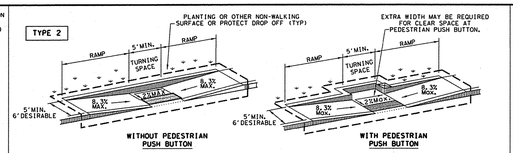
DATE:
FILE:

TYPE 1



PERPENDICULAR CURB RAMP

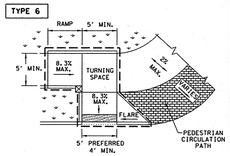
TYPE 2



PARALLEL CURB RAMP

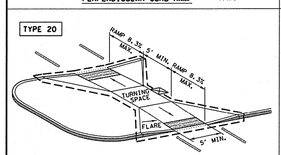
TYPE 3

TYPE 6



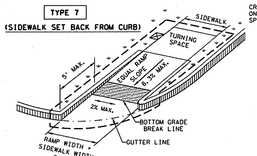
COMBINATION CURB RAMPS

TYPE 20

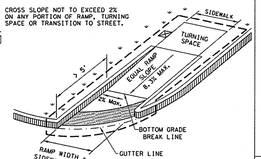


CURB RAMPS AT MEDIAN ISLANDS

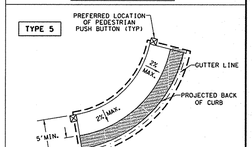
TYPE 7
(SIDEWALK SET BACK FROM CURB)



TYPE 7



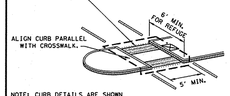
TYPE 5



BLENDED TRANSITION
(FLUSH LANDING)

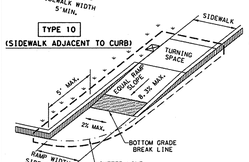
INSTALL DETECTABLE WARNING SURFACE AT EACH END OF THE CUT-THROUGH RAMP WITH A MINIMUM 2' USUAL SIDEWALK SURFACE BETWEEN. IF MEDIAN IS LESS THAN 6' WIDE, ELIMINATE DETECTABLE WARNING SURFACES.

TYPE 21

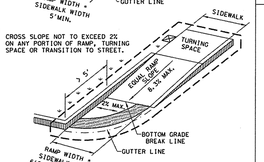


NOTE: CURB DETAILS ARE SHOWN ELSEWHERE IN THE PLANS.

TYPE 10
(SIDEWALK ADJACENT TO CURB)

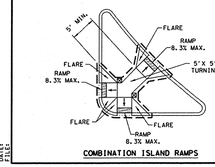


TYPE 10

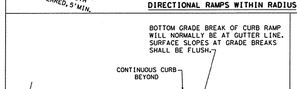


DIRECTIONAL RAMPS WITHIN RADIUS

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. — GUTTER LINE

DETECTABLE WARNING SURFACE — GRADE BREAK

DENOTES PREFERRED LOCATION OF PEDESTRIAN PUSH BUTTON IF APPLICABLE. — 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: PE & JC
©TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
REVISED 06.2003	DIST	COUNTY			SHEET NO.
REVISED 09.2003					
REVISED 09.2004					

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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 uncolored concrete, unless specified elsewhere in the plans.
20. Detectable Warning Materials must meet TxDOT Departmental Materials Specification DMS 4350 and be listed on the Material Producer List. Install products in accordance with manufacturer's specifications.
21. Detectable warning surfaces must be firm, stable and slip resistant.
22. Detectable warning surfaces shall be a minimum of 24 inches in depth in the direction of pedestrian travel, and extend the full width of the curb ramp or landing where the pedestrian access route enters the street.
23. Detectable warning surfaces shall be located so that the edge nearest the curb line is at the back of curb and neither end of that edge is greater than 5 feet from the back of curb. Detectable warning surfaces may be curved along the corner radius.
24. Shaded areas on Sheet 1 of 4 indicate the approximate location for the detectable warning surface for each curb ramp type.

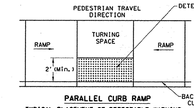
DETECTABLE WARNING PAVERS (IF USED)

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

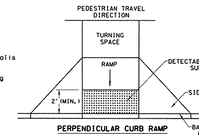
SIDEWALKS

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

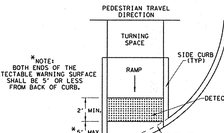
DETECTABLE WARNING SURFACE DETAILS



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



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



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

SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

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: PE & JC
©TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
REVISED 06.2003	DIST	COUNTY			SHEET NO.
REVISED 09.2003					
REVISED 09.2004					

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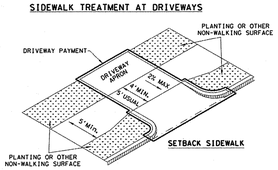
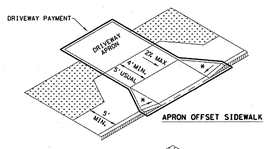
DATE:
FILE:

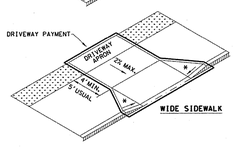
SIDEWALK TREATMENT AT DRIVEWAYS



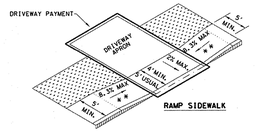
SETBACK SIDEWALK



APRON OFFSET SIDEWALK



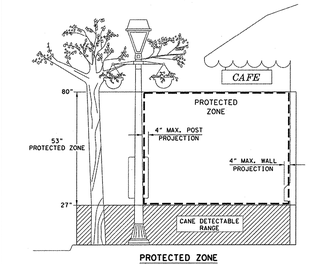
WIDE SIDEWALK



RAMP SIDEWALK

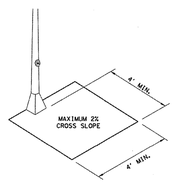
NOTES:
* WHERE DRIVEWAYS CROSS THE PEDESTRIAN ROUTE, SIDES SHALL BE FLARED AT 10% MAX SLOPE.

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

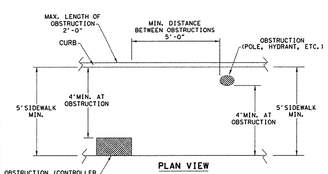


PROTECTED ZONE

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



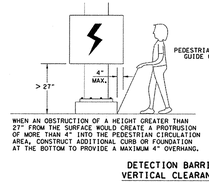
CLEAR SPACE ADJACENT
TO PEDESTRIAN PUSH BUTTON



PLAN VIEW

PLACEMENT OF STREET FIXTURES

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



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

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

DETECTION BARRIER FOR VERTICAL CLEARANCE < 80"

SHEET 3 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	CK:	DW: VP	CK: KM	CK: PE & JC
©TxDOT: MARCH, 2002	CONT	SECT	JOB		HIGHWAY
REVISIONS					
REVISED 06.2003	DIST	COUNTY			SHEET NO.
REVISED 09.2003					
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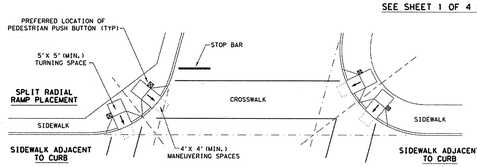
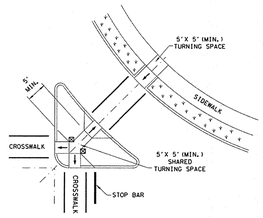
TYPICAL CROSSING LAYOUTS

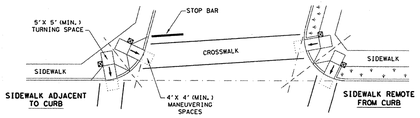
SEE SHEET 1 OF 4 FOR DETAILS AND DIMENSIONS



SKEWED INTERSECTION WITH "LARGE" RADIUS

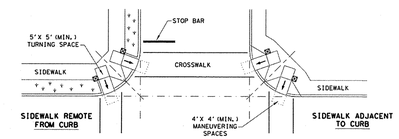


AT INTERSECTION
W/FREE RIGHT TURN & ISLAND



SKEWED INTERSECTION WITH "SMALL" RADIUS

MID-BLOCK PLACEMENT
PERPENDICULAR RAMPS



NORMAL INTERSECTION WITH "SMALL" RADIUS

LEGEND:

SHOWS DOWNWARD SLOPE. →

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

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

SHEET 4 OF 4

Texas Department of Transportation — Design Division Standard

PEDESTRIAN FACILITIES CURB RAMPS

PED-18

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REVISED 06.2003	DIST	COUNTY			SHEET NO.
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ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
4/25/2022

GATES SUBDIVISION UNIT 1
SAN ANTONIO, TX

TXDOT PEDESTRIAN CURB RAMP DETAIL

PLAT NO.
21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
5.12

Date: Apr 19, 2022, 9:25am User ID: omeiners
File: P:\205\43\04\Design\Civil\STREET\STDTD72004304.dwg

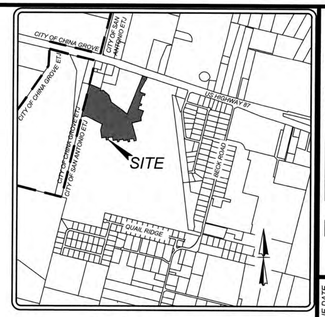
TRENCH EXCAVATION SAFETY PROTECTION

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.

SCALE : 1"=50'

0' 50' 150'

100'



LOCATION MAP
NOT-TO-SCALE

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 5.11
SDW	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.11
DDW	=	DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.11
	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	=	PROPOSED DRIVEWAY LOCATION

KFW ENGINEERS + SURVEYING
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Phone: 210-979-8444 Fax: (210) 979-8441
TBPE Firm # 9813 • TBPLS Firm # 10122300

ISSUE DATE

REVISIONS

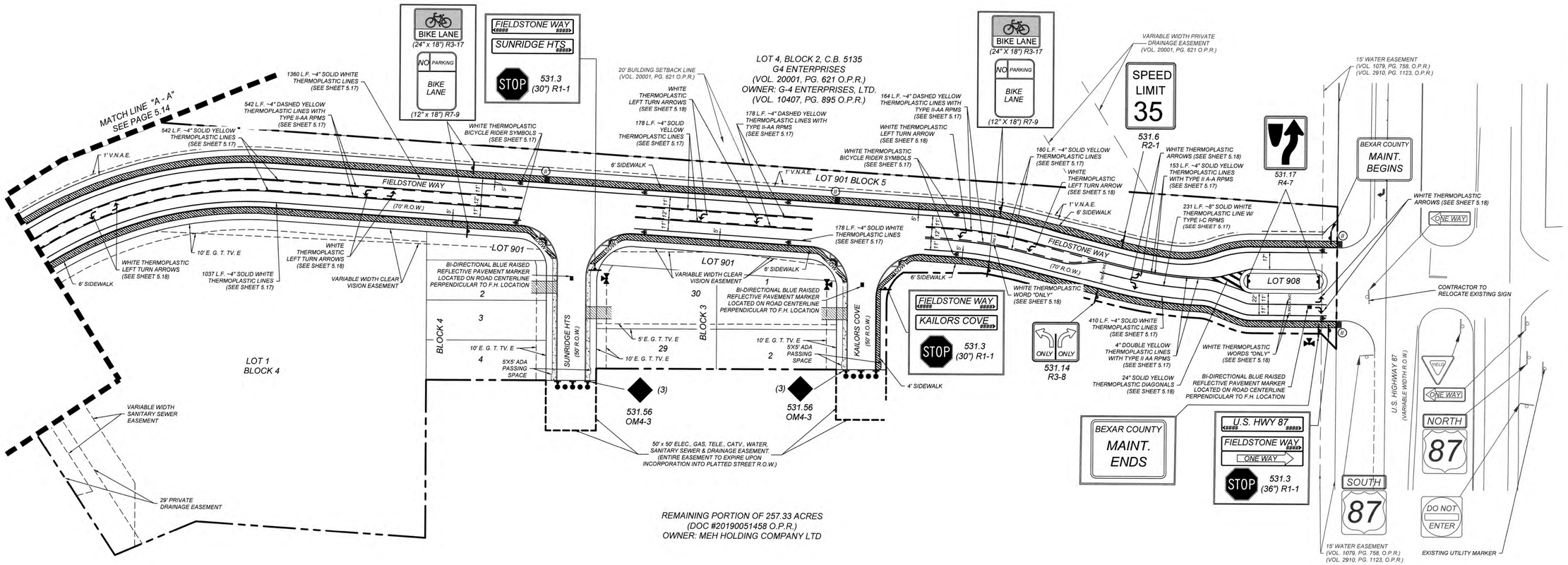
STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/29/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

TRAFFIC SIGNAL & PEDESTRIAN ACCESSIBILITY PLAN

(SHEET 1 OF 2)

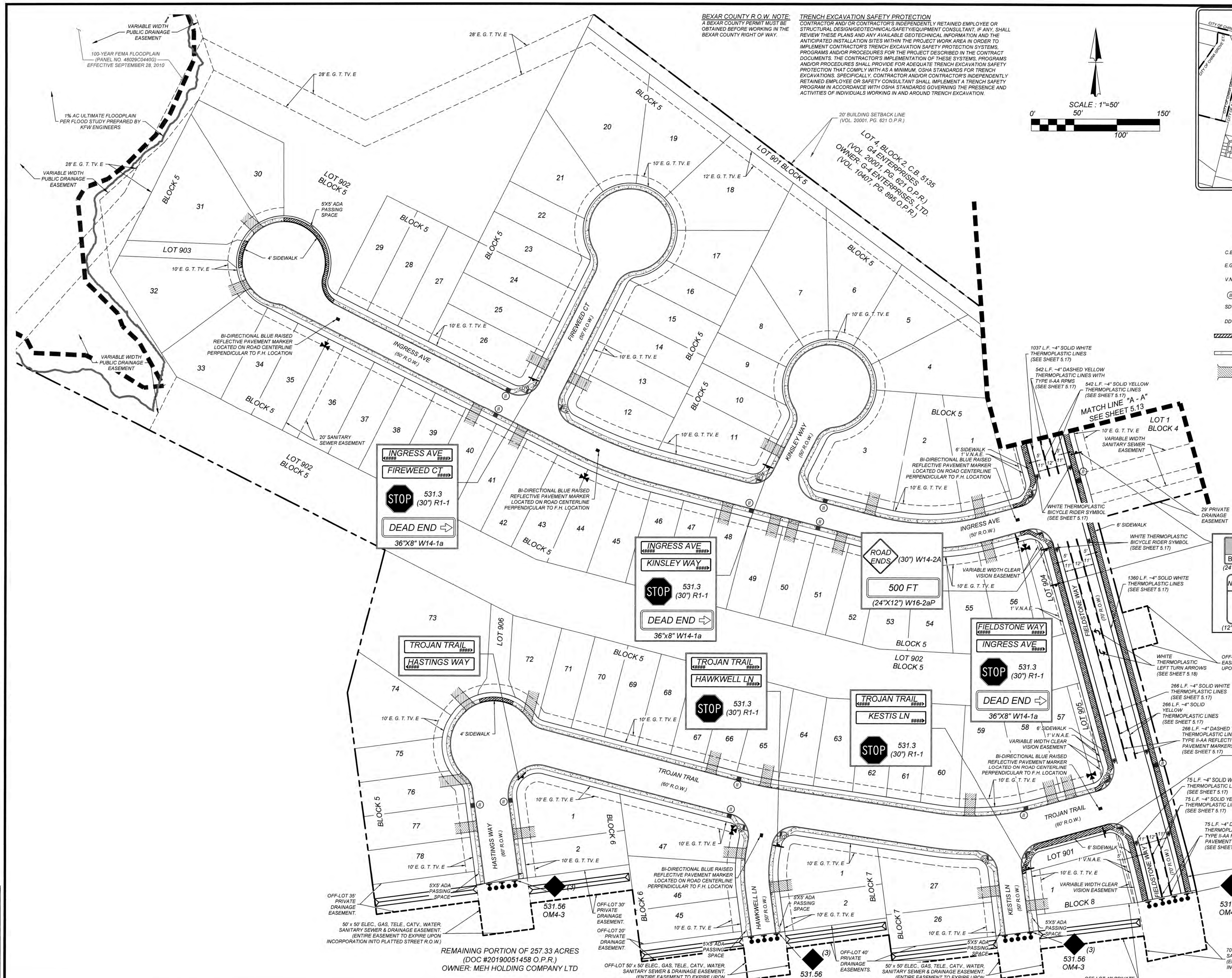


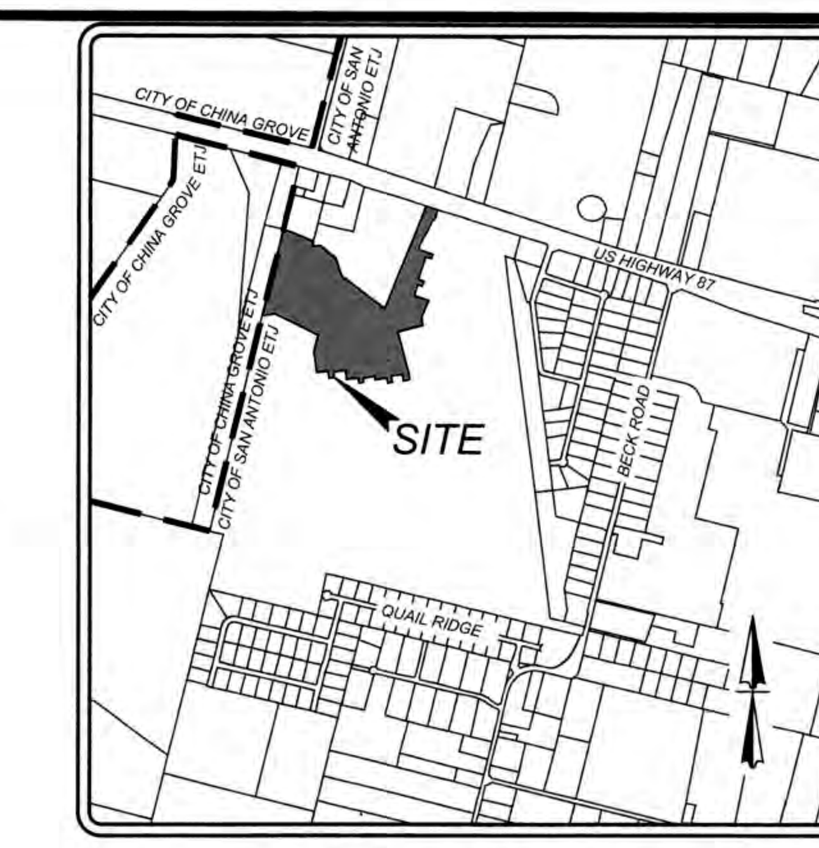
PLAT NO.
21-11800645

JOB NO.205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:

5.13





LOCATION MAP
NOT-TO-SCALE

BEXAR COUNTY R.O.W. NOTE:

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

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.

LEGEND

C.B	=	COUNTY BLOCK
E.G.T.C.E.	=	GAS, ELECTRIC, TELEPHONE & CABLE EASEMENT
V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
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SDW	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.11
DDW	=	DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.11
(hatched)	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER
(open)	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
(hatched)	=	PROPOSED DRIVEWAY LOCATION

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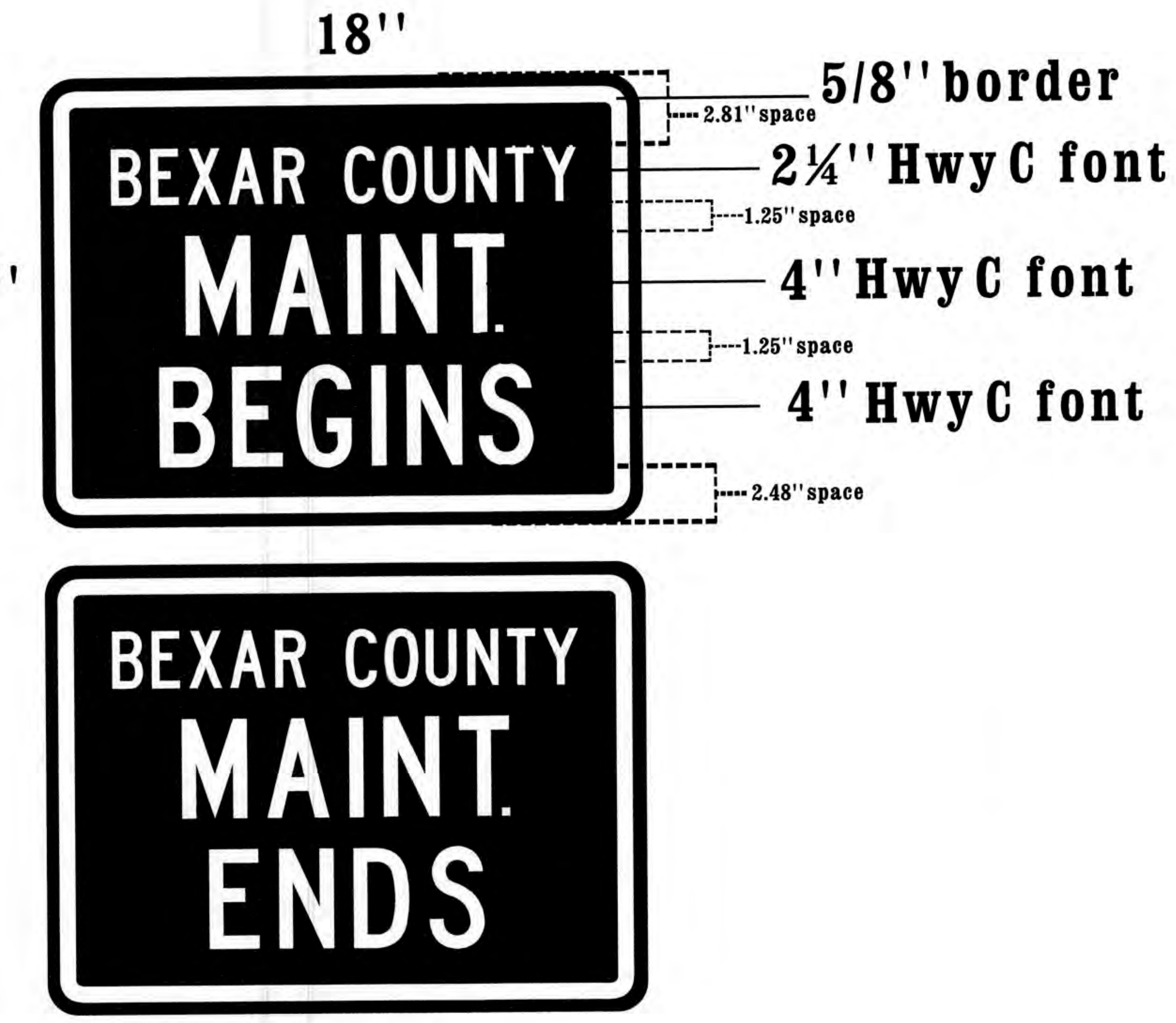
111543
LICENSED PROFESSIONAL ENGINEER
4/29/2027

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
TRAFFIC SIGNAGE & PEDESTRIAN ACCESSIBILITY PLAN
(SHEET 2 OF 2)

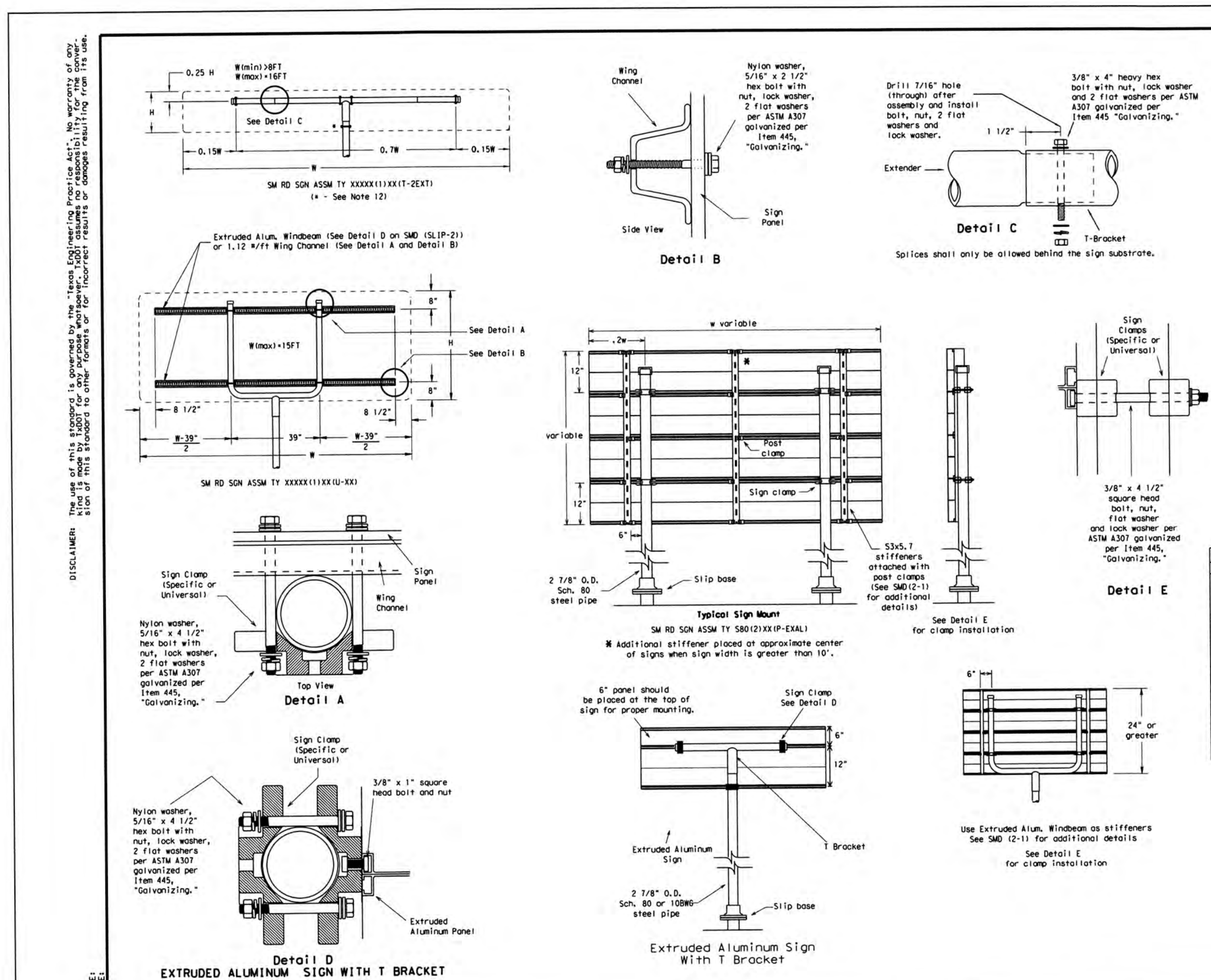
PLAT NO. 21-11800645

JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
5.14



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



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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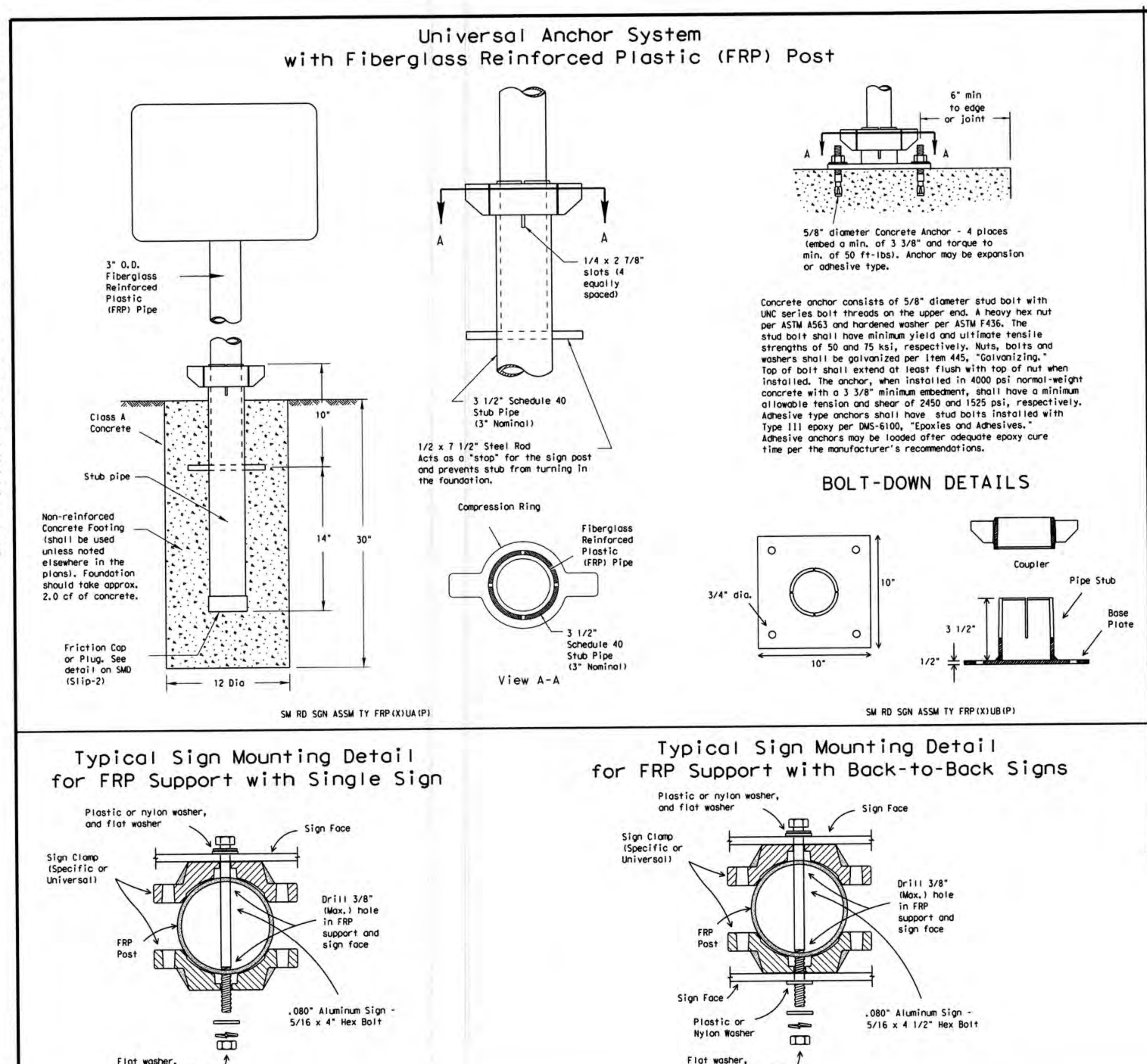

GENERAL NOTES:

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

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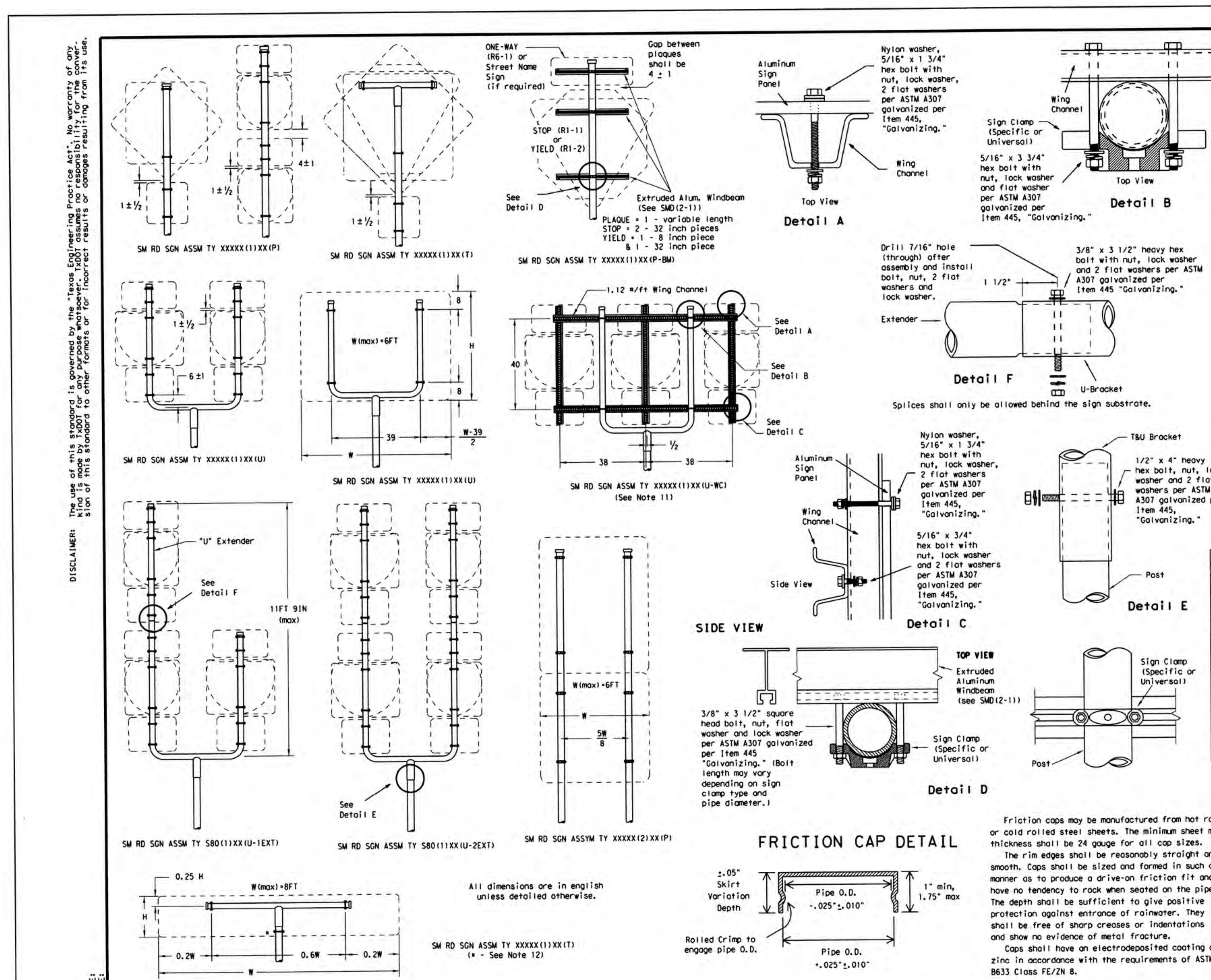

GENERAL NOTES:

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. 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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ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE
REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
3/17/2023

GATES SUBDIVISION UNIT 1
SAN ANTONIO, TX

TRAFFIC SIGNAGE DETAILS (SHEET 1 OF 2)

PLAT NO.
21-11800645
JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL
SHEET NUMBER:
5.15

Date: Mar 13, 2023, 3:13pm User ID: cgroff
File: P:\205\43\04\Design\Civil\STREETS\TS0720543\04.dwg

SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

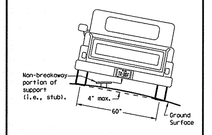
Post Type
- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thin-Walled Tubing (see SMD(TWT))
- ICONC = 10 EMC Tubing (see SMD(SLIP-1) to (SLIP-3))
- SBO = Schedule 80 Pipe (see SMD(SLIP-1) to (SLIP-3))

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))

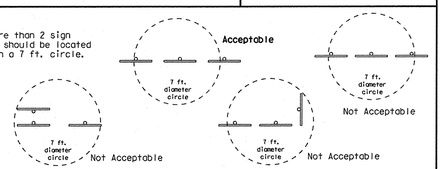
Sign Mounting Designation
- P = Prefab. "Plain" (see SMD(SLIP-1) to (SLIP-3), (TWT), (FRP))
- T = Prefab. "T" (see SMD(SLIP-1) to (SLIP-3), (TWT))
- U = Prefab. "U" (see SMD(SLIP-1) to (SLIP-3))
- IF REQUIRED
- TEXT or ZEXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
- BM = Extruded Wind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

REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



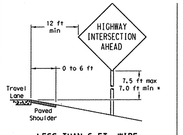
To avoid vehicle undercarriage snagging, any substantial remains of a breakaway support, when it is broken away, should not project more than 4 inches above a 60-inch chord (i.e., typical space between wheel paths).

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



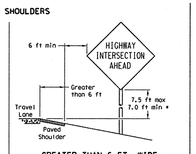
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

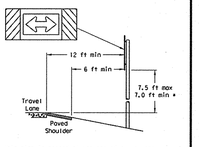
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



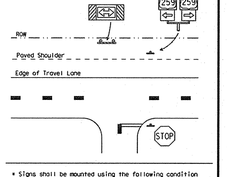
GREATER THAN 6 FT. WIDE

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

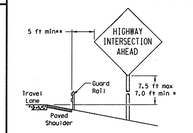
T-INTERSECTION



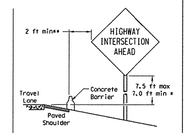
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

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

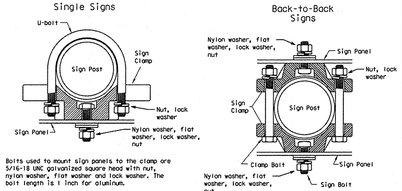
- Signs shall be mounted using the following condition that results in the greatest sign elevations
  - (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
  - (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed on 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

TYPICAL SIGN ATTACHMENT DETAIL



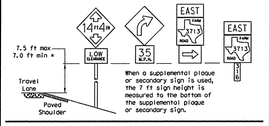
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

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

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

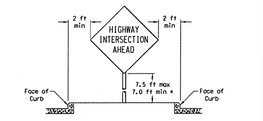
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

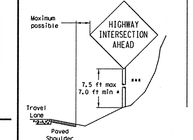


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

CURB & GUTTER OR RAISED ISLAND



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



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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS GENERAL NOTES & DETAILS

SMD(GEN)-08

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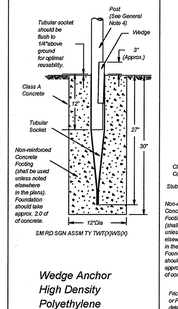
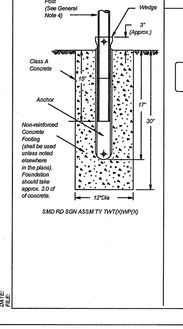
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

DATE: FILE:

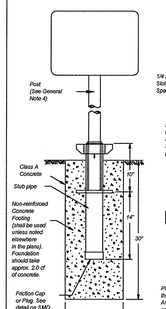
Wedge Anchor Steel System



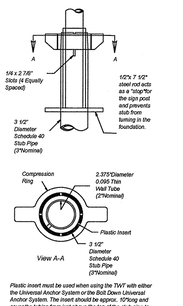
Wedge Anchor High Density Polyethylene (HDPE) System



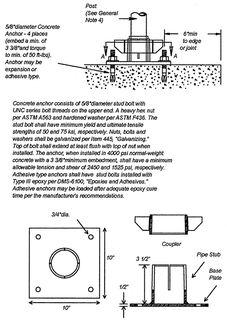
Universal Anchor System with Thin-Walled Tubing Post

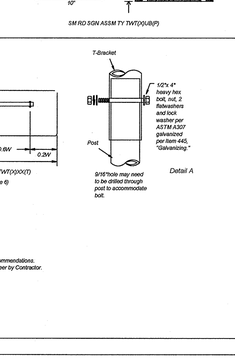


1/2"x 7 1/2" steel rod acts as a "stop"for the sign post and prevents stub from turning in the foundation.

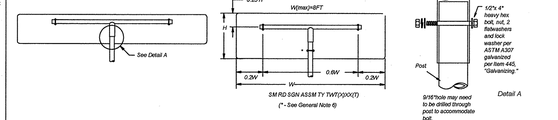


Plastic insert must be used when using the TWT with either the Universal Anchor System or the Bolt Down Universal Anchor System. The insert should be approx. 10"long and cover the tubing from just above the top of the stub pipe to the bottom of the sign post when using the Universal Anchor System. The insert should be cut to approx. 4 1/2"when used with the Bolt Down Universal Anchor System.





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



NOTE

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

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 A 607 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
   70,000 PSI minimum tensile strength
   20% minimum elongation in 2"
   Wall thickness tuncoated shall be within the range of 0.122" to 0.138"
   Outside diameter tuncoated 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 tuncoated shall be within the range of 0.248" to 0.304"
   Outside diameter tuncoated shall be within the range of 2.655" to 2.895"
   Galvanization per ASTM A123
5. 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
6. Sign supports shall not be spliced except where shown. Sign support posts shall not be spliced.

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(SIGN) 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. Invert 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. Invert the sign post into socket and 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(SIGN) 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. Seal compression ring using a hammer. Typically, the lip 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.

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DATE: FILE:

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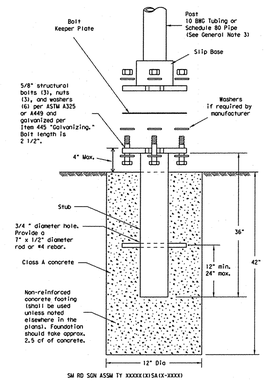
9-08 REVISIONS	CONT	SECT	JOB	HIGHWAY
	DIST	COUNTY		SHEET NO.

268

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS



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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.

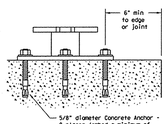
GENERAL NOTES:
1. Slip base shall be permanently marked to indicate manufacturer, Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   10 BWG Tubing (2.875" 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 tuncoated shall be within the range of 0.122" to 0.138"
   Outside diameter tuncoated 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 tuncoated shall be within the range of 0.248" to 0.304"
   Outside diameter tuncoated shall be within the range of 2.655" 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.
4. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
5. Round the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
6. 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 traveltay (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 traveltay. The cut shall be plumb and straight.
2. Attach sign to support using connections shown. When multiple signs are installed on the same support, ensure the minimum clearance between each sign is maintained. See SMD(SLIP-2) for clearances based on sign types.

CONCRETE ANCHOR



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

Concrete anchor consists of 5/8" diameter stud bolt with UNC series bolt threads on the upper end. 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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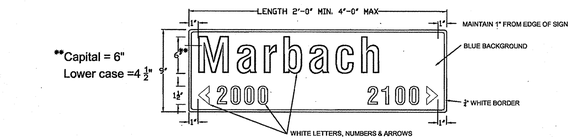
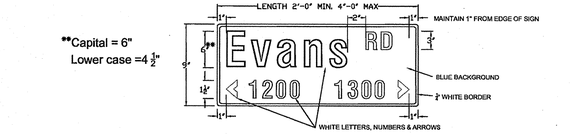
268



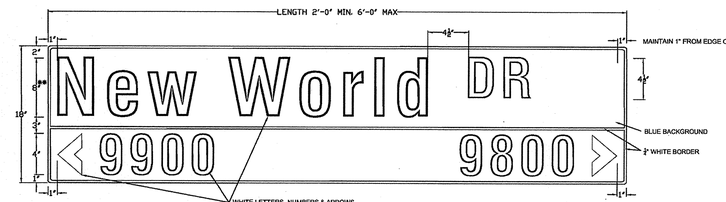
**Capital = 6"
Lower case =4 1/2"

9" GROUND MOUNT STREET NAME SIGNS



**Capital = 6"
Lower case =4 1/2"

9" GROUND MOUNT STREET NAME SIGNS WITH STREET DESIGNATION

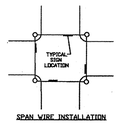


**Capital = 8"
Lower case =6"

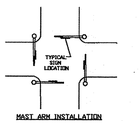
18" OVERHEAD STREET NAME SIGNS

	18" OVERHEAD SIGN	9" GROUND MOUNT SIGNS
HEIGHT	18" (381 mm)	9" (228 mm)
LENGTH	48" (1200 mm) MIN. 72" (1800 mm) MAX. 1'-0(300mm) INCREMENTS OF LENGTH	24" (600 mm) MIN. 48" (1200 mm) MAX. 6" (150mm) INCREMENTS OF LENGTH
THICKNESS	0.125" (3 mm)	
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209	GOLD CHROMATE FINISH
SIGN FACE MATERIALS	BLUE FILM ✳ OVER DIAMOND GRADE - ASTM Type XI Non-Fluorescent	BLUE FILM ✳ OVER HIGH INTENSITY PRISMATIC- ASTM Type IV
LEGENDS AND SYMBOLS	SERIES D, B OR C IF NAME OTHERWISE EXCEEDS MAXIMUM SIGN LENGTH	
COLOR	WHITE LEGEND ON BLUE BACKGROUND	
LETTER TRACKING	17% (USUAL) 10% (MIN.)	10%

✳ ACRYLIC ELECTRONIC CUTTABLE FILM

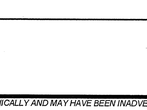


SPAN WIRE INSTALLATION



MAST ARM INSTALLATION

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



INFRASTRUCTURE SERVICES DEPARTMENT
PUBLIC WORKS DIVISION

STREET NAME SIGNING DETAILS

REVISION	

DESIGNED BY:	CHECKED BY:
MT	MS
DRAWN BY:	DATE:
MT	10/05/21
FILE NO.: SGNDET2.dwg	
SHEET 1	

GATES SUBDIVISION UNIT 1

SAN ANTONIO, TX

TRAFFIC SIGNAGE DETAILS (SHEET 2 OF 2)

PLAT NO. 21-11800645

JOB NO.205-43-04

DATE: OCTOBER 2021

DRAWN:OM CHECKED:CL

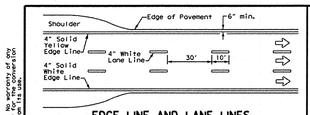
SHEET NUMBER: 5.16

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

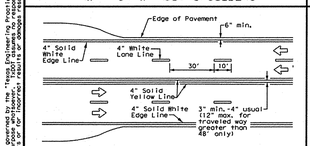
ISSUE DATE

REVISIONS

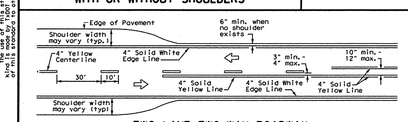
STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
4/25/2022



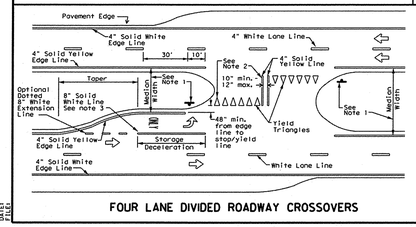
EDGE LINE AND LANE LINES
ONE-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



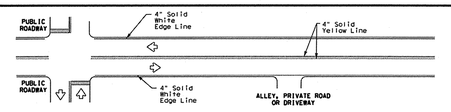
CENTERLINE AND LANE LINES
FOUR LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



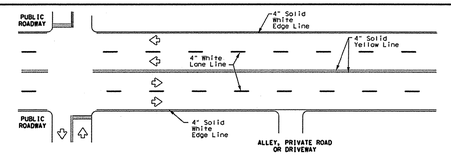
TWO LANE TWO-WAY ROADWAY
WITH OR WITHOUT SHOULDERS



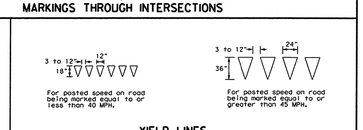
FOUR LANE DIVIDED ROADWAY CROSSOVERS



TYPICAL TWO-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



TYPICAL MULTI-LANE, TWO-WAY PAVEMENT
MARKINGS THROUGH INTERSECTIONS



YIELD LINES

NOTES

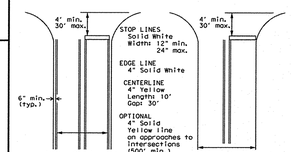
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



GUIDE FOR PLACEMENT OF STOP LINES,
EDGE LINE & CENTERLINE
Based on Traveled Way and Pavement Widths
for Undivided Highways

Texas Department of Transportation — Traffic Safety Division Standard

TYPICAL STANDARD
PAVEMENT MARKINGS
PM(1)-20

FILE:	pm1-20.dgn	DN:	CK:	DW:	CK:
©TxDOT	November 1978	CONT	SECT	JOB	HIGHWAY
REVISIONS					
8-95	3-03				
5-00	2-12	DIST	COUNTY		SHEET NO.
8-00	6-20				

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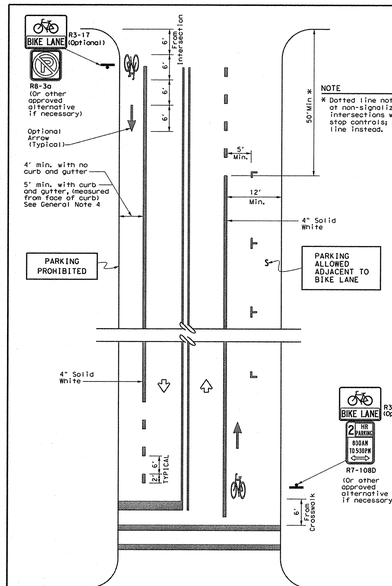
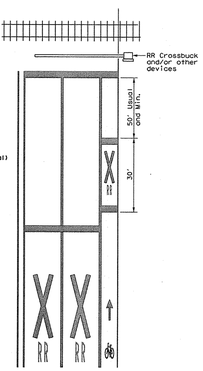
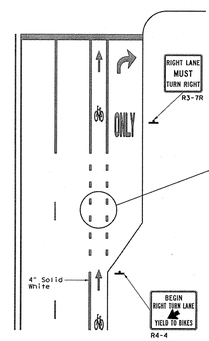


TWO-WAY STREET

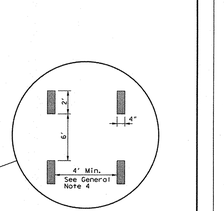


(See RCPM Standard for travel lane details)

RAILROAD CROSSING APPROACH



RIGHT TURN ONLY LANE



DETAIL "A"

GENERAL NOTES

1. All bicycle lane pavement markings shall be white unless otherwise noted.
2. All pavement marking materials shall meet the required Department Material Specifications as specified by the plans.
3. Exact sign placement and details are shown elsewhere in the plans.
4. The current edition of AASHTO'S Guide for the Development of Bicycle Facilities should be referenced for variations in design, other geometric conditions, and lane width options.
5. Other bicycle lane symbol or word markings as shown in the Texas Manual on Uniform Traffic Control Devices may be used. Details for words, arrows and symbols as shown in the Standard Highway Sign Designs for Texas.
6. The "BIKE LANE" (R3-17) sign with the "AHEAD" (R3-17a)sign mounted directly below should be installed in advance of the beginning of a marked bike lane.
7. The "BIKE LANE" (R3-17) sign with the "END" (R3-17b)sign mounted directly below should be installed at the end of marked bicycle lane.

LEGEND	
	Sign
	Traffic Flow

SPECIFICATION REFERENCE TABLE	
Traffic Paint	DMS-8200
Hot Applied Thermoplastic	DMS-8220
Permanent Prefabricated Pavement Markings	DMS-8240
Glass Traffic Beads	DMS-8290

NOTES

1. Bicycle lane pavement markings typically repeated after each intersection or signalized driveway.
2. On uninterrupted sections of roadway, bicycle lane pavement markings typically repeated as follows:
   -1200' for 45 MPH or less roads
   -2500' for 50 MPH and greater roads.

Texas Department of Transportation — Traffic Operations Division

BICYCLE LANE
PAVEMENT MARKINGS
BLPM-10

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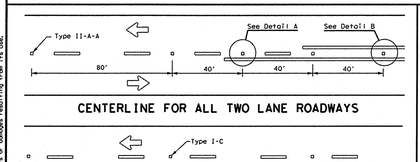
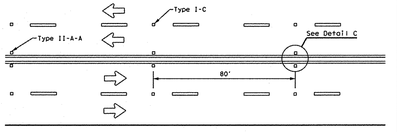
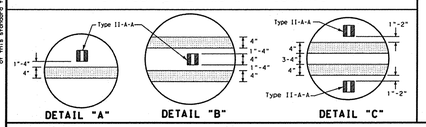
REFLECTIVE RAISED PAVEMENT MARKERS
FOR VEHICLE POSITIONING GUIDANCE



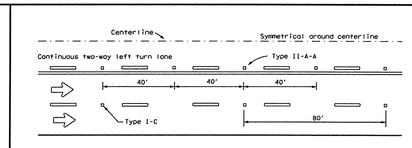
CENTERLINE FOR ALL TWO LANE ROADWAYS



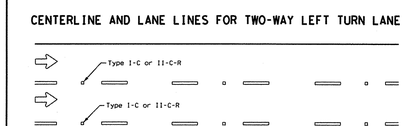
CENTERLINE & LANE LINES
FOR FOUR LANE TWO-WAY HIGHWAYS



DETAIL "A" DETAIL "B" DETAIL "C"

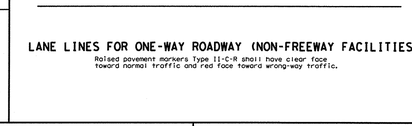


CENTERLINE AND LANE LINES FOR TWO-WAY LEFT TURN LANE

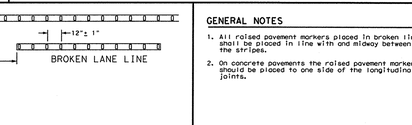


LANE LINES FOR ONE-WAY ROADWAY (NON-FREEWAY FACILITIES)

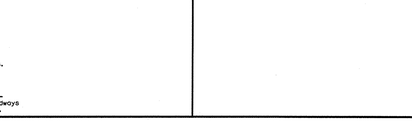
Raised pavement markers Type II-C-R shall have clear face toward normal traffic and red face toward wrong-way traffic.



Type I (Top View)

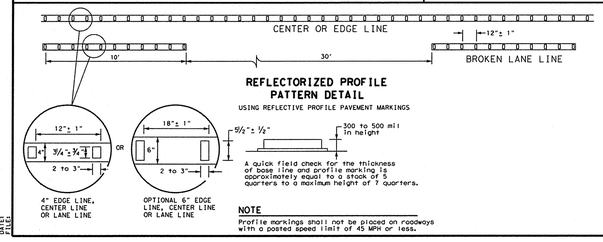


Type II (Top View)



SECTION A

RAISED PAVEMENT MARKERS



REFLECTORIZED PROFILE
PATTERN DETAIL
USING REFLECTIVE PROFILE PAVEMENT MARKINGS

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

4" EDGE LINE, CENTER LINE OR LANE LINE

OPTIONAL 6" EDGE LINE, CENTER LINE OR LANE LINE

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

GENERAL NOTES

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

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

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

Texas Department of Transportation — Traffic Safety Division Standard

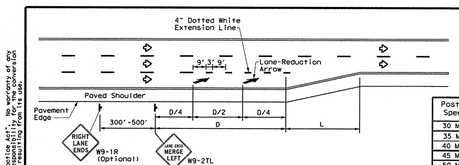
POSITION GUIDANCE USING
RAISED MARKERS
RELECTORIZED PROFILE
MARKINGS
PM(2)-20

FILE:	pm2-20.dgn	DN:	CK:	DW:	CK:
©TxDOT	April 1977	CONT	SECT	JOB	HIGHWAY
REVISIONS					
4-92	2-10				
5-00	2-12	DIST	COUNTY		SHEET NO.
8-00	6-20				

225

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

DATE:
FILE:

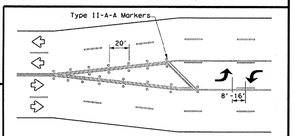


LANE REDUCTION

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

NOTES

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



A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

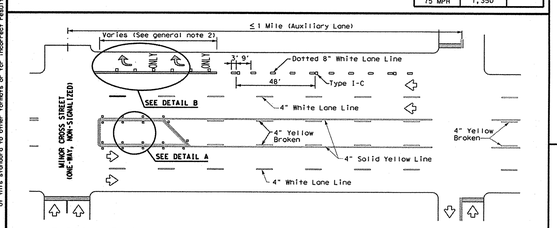
TYPICAL TRANSITION FOR TWLTL
AND DIVIDED HIGHWAY

GENERAL NOTES

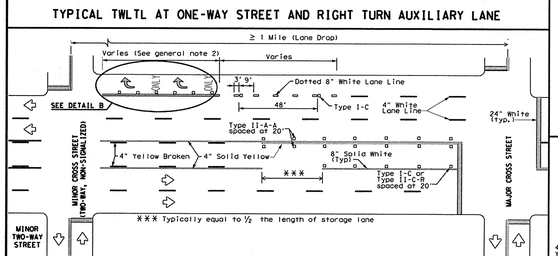
1. Lane use word and arrow markings shall be used where through lanes approaching an intersection become mandatory turn lanes. Lane use word and arrow markings should be used in auxiliary lanes of substantial length. Lane use arrow markings or word and arrow markings may be used in other lanes and turn bays for emphasis. Details for words and arrows are as shown in the Standard Highway Sign Designs for Texas.
2. When lane-use words and arrow markings are used, two sets of arrows should be used if the length of the bay is greater than 180 feet. When a single lane use arrow or word and arrow marking is used for a short turn lane, it should be located at or near the upstream end of the full-width turn lane.
3. Use raised pavement marker Type I-C with undivided highways, flush medians and two way left turn lanes. Use raised pavement marker Type II-C-R with divided highways and raised medians.
4. Length of turn bays, including taper, deceleration, and storage lengths shall be as shown on the plans or as directed by the Engineer.

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

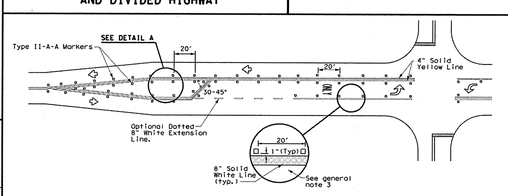
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.



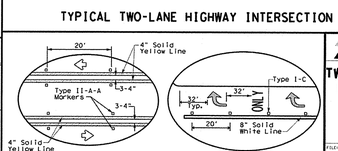
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE



TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE HIGHWAY INTERSECTION WITH LEFT TURN BAYS



DETAIL A DETAIL B

Texas Department of Transportation — Traffic Safety Division Standard

TWO-WAY LEFT TURN LANES,
RURAL LEFT TURN BAYS,
AND LANE REDUCTION
PAVEMENT MARKINGS
PM(3)-20

FILE:	pm3-20.dgn	DN:	CK:	DW:	CK:
©TxDOT	April 1998	CONT	SECT	JOB	HIGHWAY
REVISIONS					
5-00	2-12				
8-00	6-20	DIST	COUNTY		SHEET NO.
5-03	6-20				

226

KFW
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TBPE Firm #: 8015 • TBPLS Firm #: 10123500

ISSUE DATE

REVISIONS

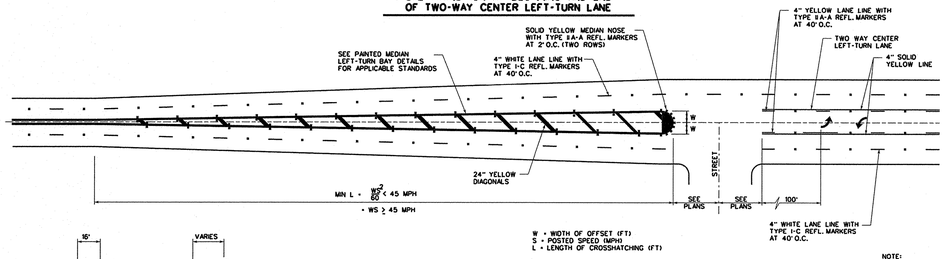
STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
4/07/2022

GATES SUBDIVISION UNIT 1
SAN ANTONIO, TX
PAVEMENT MARKING DETAILS (SHEET 1 OF 2)

PLAT NO.
21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL
SHEET NUMBER:
5.17

Date: Apr 19, 2022, 9:26am User ID: cmeiners
File: P:\2015\43\04\Design\Civil\STREET\STD\STD205430 4.dwg

TYPICAL TRANSITION AT BEGINNING AND END OF TWO-WAY CENTER LEFT-TURN LANE

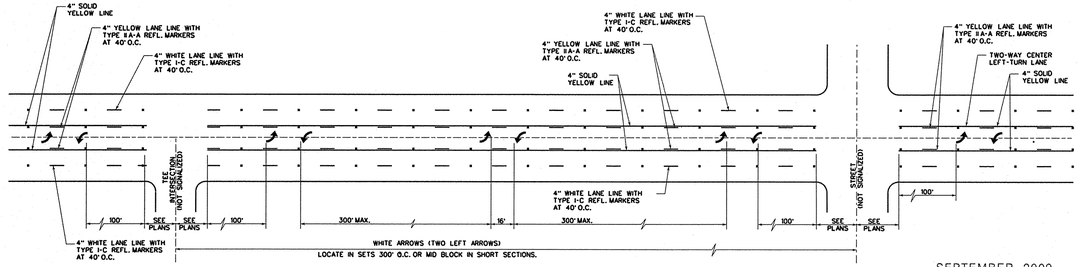


NOTE:

1. REFLECTIVE RAISED PAVEMENT MARKERS SHOULD BE IN ACCORDANCE WITH STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS FOR POSITION GUIDANCE AND LEFT-TURN & RIGHT-TURN LANE STANDARD PAVEMENT MARKINGS WITH REFLECTIVE RAISED PAVEMENT MARKERS.
2. SEE LEFT-TURN & RIGHT-TURN LANE DESIGN WORKSHEET FOR APPLICABLE INFORMATION.
3. SEE LEFT-TURN "ONLY" AND ARROW SPACING WORKSHEET.

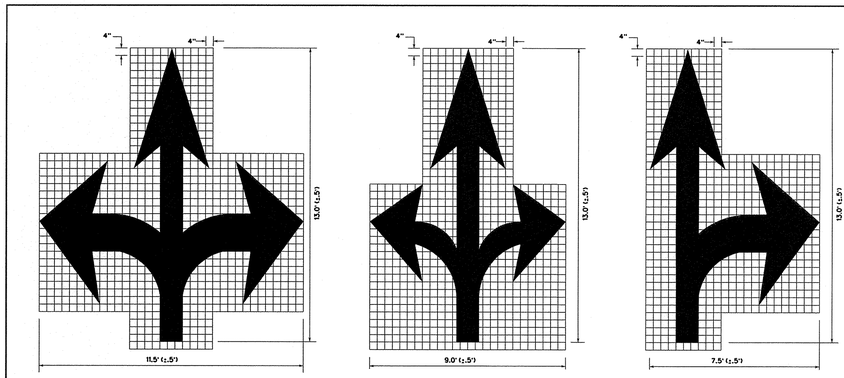
LEGEND
TYPICAL DETAIL
(PLACE LEGENDS IN ACCORDANCE TO LEFT TURN "ONLY" AND ARROW SPACING WORKSHEET)

TWO-WAY LEFT-TURN LANE DETAILS NON-SIGNALIZED INTERSECTIONS



SEPTEMBER 2009
CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS
TRAFFIC ENGINEERING STANDARDS
TWO-WAY LEFT-TURN LANE DETAILS 1
SHEET 12 OF 16

% SUBMITTAL	PROJECT NO.		DATE:
DRAWN BY: LMS	DESIGN BY: J.A.S.	CHKD BY: M.F.	SHEET NO. OF



NOTES:

1. MINIMUM 8 FOOT WHITE MARKINGS SHALL BE USED, UNLESS OTHERWISE NOTED. IF MESSAGE CONSISTS OF MORE THAN ONE WORD, IT SHOULD BE PLACED WITH FIRST WORD NEAREST THE DRIVER.
2. THESE DETAILS ARE STANDARD SIZE FOR NORMAL INSTALLATION SIZES MAY BE REDUCED APPROXIMATELY ONE-THIRD DEPENDING ON CONDITIONS.
3. THE LONGITUDINAL SPACE BETWEEN MARKINGS SHOULD BE 30 FEET.
4. MARKINGS CONSIDERED APPROPRIATE FOR USE WHEN WARRANTED INCLUDE THE FOLLOWING:
   - A. REGULATORY
     - STOP
     - RIGHT (LEFT) TURN ONLY
     - 25 MPH
     - SYMBOL ARROWS
   - B. WARNING
     - STOP AHEAD
     - SIGNAL AHEAD
     - SCHOOL
     - SCHOOL X-ING
     - PED X-ING
     - R X R (SEE RCPM DETAIL)

   OTHER WORDS OR SYMBOLS MAY BE NECESSARY UNDER CERTAIN CONDITIONS
5. UNCONTROLLED USE OF PAVEMENT MARKINGS CAN RESULT IN DRIVER CONFUSION. WORD AND SYMBOL MARKINGS SHOULD BE NO MORE THAN THREE LINES.
6. THE WORD "STOP" SHALL NOT BE USED ON THE PAVEMENT UNLESS ACCOMPANIED BY A STOP LINE AND STOP SIGN. THE WORD "STOP" SHALL NOT BE PLACED ON THE PAVEMENT IN ADVANCE TO A STOP LINE, UNLESS EVERY VEHICLE IS REQUIRED TO STOP AT ALL TIMES.
7. PAVEMENT MARKINGS SHOULD GENERALLY BE NO MORE THAN ONE LANE IN WIDTH, WITH SCHOOL MESSAGES BEING THE EXCEPTION. FOR DETAILS OF SCHOOL AND SCHOOL CROSSING PAVEMENT MARKINGS, REFER TO PART VIII OF THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES".
8. SPACING BETWEEN LETTERS SHOULD BE APPROXIMATELY 4 INCHES. THE WIDTH OF LETTERS MAY VARY DEPENDING ON THE WIDTH OF THE TRAVEL LANES.
9. LANE-USE ARROW MARKINGS MAY BE USED TO CONVEY EITHER GUIDANCE OR MANDATORY MESSAGES. ARROWS USED TO CONVEY A MANDATORY MOVEMENT MUST BE ACCOMPANIED BY STANDARD SIGNS AND THE PAVEMENT MARKING WORD "ONLY".
10. PAVEMENT MARKINGS ARE TO BE LOCATED AS SPECIFIED ELSEWHERE IN THE PLANS.

SEPTEMBER 2009
CITY OF SAN ANTONIO
DEPARTMENT OF PUBLIC WORKS
TRAFFIC ENGINEERING STANDARDS
STANDARD PAVEMENT MARKINGS (ARROWS)
SHEET 3 OF 16

% SUBMITTAL	PROJECT NO.		DATE:
DRAWN BY: LMS	DESIGN BY: J.A.S.	CHKD BY: M.F.	SHEET NO. OF

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3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: (210) 979-8444 Fax #: (210) 979-8441
TBPE Firm # 9513 • TBPLS Firm # 10123900

ISSUE DATE
REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
4/25/2022

GATES SUBDIVISION UNIT 1
SAN ANTONIO, TX
PAVEMENT MARKING DETAILS (SHEET 2 OF 2)

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL
SHEET NUMBER: 5.18

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

SANITARY SEWER IMPROVEMENTS

GENERAL SEWER NOTES (REVISED JULY 2017)

1. All materials and construction procedures within the scope of this contract shall be approved by the San Antonio Water System (SAWS) and comply with the Plans, Specifications, General Conditions and with the following as applicable:

   A. Current Texas Commission on Environmental Quality (TCEQ) "Design Criteria for Domestic Waste water System", Texas Administrative Code (TAC) Title 30 Part 1 Chapter 217 and "Public Drinking Water", TAC Title 30 Part 1 Chapter 290.
   B. Current TXDOT "Standard Specifications for Construction of Highways, Streets and Drainage".
   C. Current "San Antonio Water System Standard Specifications for Water and Sanitary Sewer Construction".
   D. Current City of San Antonio "Standard Specifications for Public Works Construction".
   E. Current City of San Antonio "Utility Excavation Criteria Manual" (UECM).

2. The contractor shall not proceed with any pipe installation work until they obtain a copy of the approved Counter Permit or General Construction Permit (GCP) from the consultant and has been notified by SAWS Construction I nspection Division to proceed with the work and has arranged a meeting with the inspector and consultant for the work requirements. Work completed by the contractor without an approved Counter Permit and/or a GCP will be subject to removal and replacement at the expense of the contractors and/or the developer.

3. The Contractor shall obtain the SAWS Standard Details from the SAWS website, http://www.saws.org/business_center/specs. Unless otherwise noted within the design plans.

4. The Contractor is to make arrangements with the SAWS Construction Inspection Division at (210) 233-2973, on notification procedures that will be used to notify affected home residents and/or property owners 48 hours prior to beginning any work.

5. Location and depth of existing utilities and service laterals shown on the plans are understood to be approximate. Actual locations and depths must be field verified by the Contractor at least 1 week prior to construction. It shall be the Contractor's responsibility to locate utility service lines as required for construction and to protect them during construction at no cost to SAWS.

6. The Contractor shall verify the exact location of underground utilities and drainage structures at least 1-2 weeks prior to construction whether shown on plans or not. Please allow up to 7 business days for locates requesting pipe location markers on SAWS facilities. The following contact information are supplied for verification purposes:

   SAWS Utility Locates: http://www.saws.org/Service/Locates
   COSA Dreinage (210) 207-0724 or (210) 207-5026
   COSA Traffic Signal Operations (210) 206-8480
   COSA Traffic Signal Damages (210) 207-3951
   Texas State Wide One Call Locator 1-800-545-6005 or 811

7. The Contractor shall be responsible for restoring existing fences, curbs, streets, driveways, sidewalks, landscaping and structures to its original or better condition if damages are made as a result of the project's construction.

8. All work in Texas Department of Transportation (TxDOT) and/or Bexar County right-of-way shall be done in accordance with respective construction specifications and permit requirements.

9. The Contractor shall comply with City of San Antonio or other governing municipality's tree ordinances when excavating near trees.

10. The Contractor shall not place any waste materials in the 100-year Flood Plain without first obtaining an approved Flood Plain Permit.

11. Holiday Work: Contractors will not be allowed to perform SAWS work on SAWS recognized holidays. Request should be sent to constworkreq@saws.org. Weekend Work: Contractors are required to notify the SAWS Inspection Construction Department 48 hours in advance to request weekend work. Request should be sent to constworkreq@saws.org. Any and all SAWS utility work installed without holiday/weekend approval will be subject to be uncovered for proper inspection.

12. Compaction note (Item 804): The contractor shall be responsible for meeting the compaction requirements on all trench backfill and for paying for the tests performed by a third party. Compaction tests will be done at one location point randomly selected, or as indicated by the SAWS Inspector and/or the test administrator, per each 12-inch loose lift per 400 linear feet at a minimum. This project will not be accepted and finalized by SAWS without this requirement being met and verified by providing all necessary documented test results.

13. A copy of all testing reports shall be forwarded to SAWS Construction Inspection Division.

Sewer Notes:

1. The Contractor is responsible for ensuring that no Sanitary Sewer Overflow (SSO) occurs as a result of their work. All contractor personnel responsible for SSO prevention and control shall be trained on proper response. Should an SSO occur, the contractor shall:

   A. Identify the soruce of the SSO and notify SAWS Emergency Operations Center (EOC) immediately at (210) 233-2014. Provide the address of the spill and an estimated volume or flow.
   B. Attempt to eliminate the source of the SSO
   C. Contain sewage from the SSO to the extent of preventing a possible contamination of waterways.
   D. Clean up spill site (return contained sewage to the collection system if possible) and properly dispose of contaminated soil/materials.
   E. Clean the affected sewer mains and remove any debris.
   F. Meet all post-SSO requirements as per the EPA Consent Decree, including line cleaning and televising the affected sewer mains (at SAWS direction) within 24 hours.

Should the Contractor fail to address an SSO immediately and to SAWS satisfaction, they will be responsible for all cost incurred by SAWS, including any fines from EPA, TCEQ and/or any other Federal, State or Local Agencies.

No separate measurement or payment shall be made for this work. All work shall be done according to guidelines set by TCEQ and SAWS.

2. If bypass pumping is required, the Contractor shall perform such work in accordance with SAWS Standard Specification for Water and Sanitary Sewer Construction, Item No. 854, "Bypass Pumping".

3. Prior to tie-ins, any shutdowns of existing force mains of any size must be coordinated with the SAWS Construction Inspection Division at (210) 233-2973 at least one week in advance of the shutdown. The Contractor must also provide a sequence of work as related to the tie-ins: this is at no additional cost to SAWS or the project and it is the responsibility of the Contractor sequence the work accordingly.

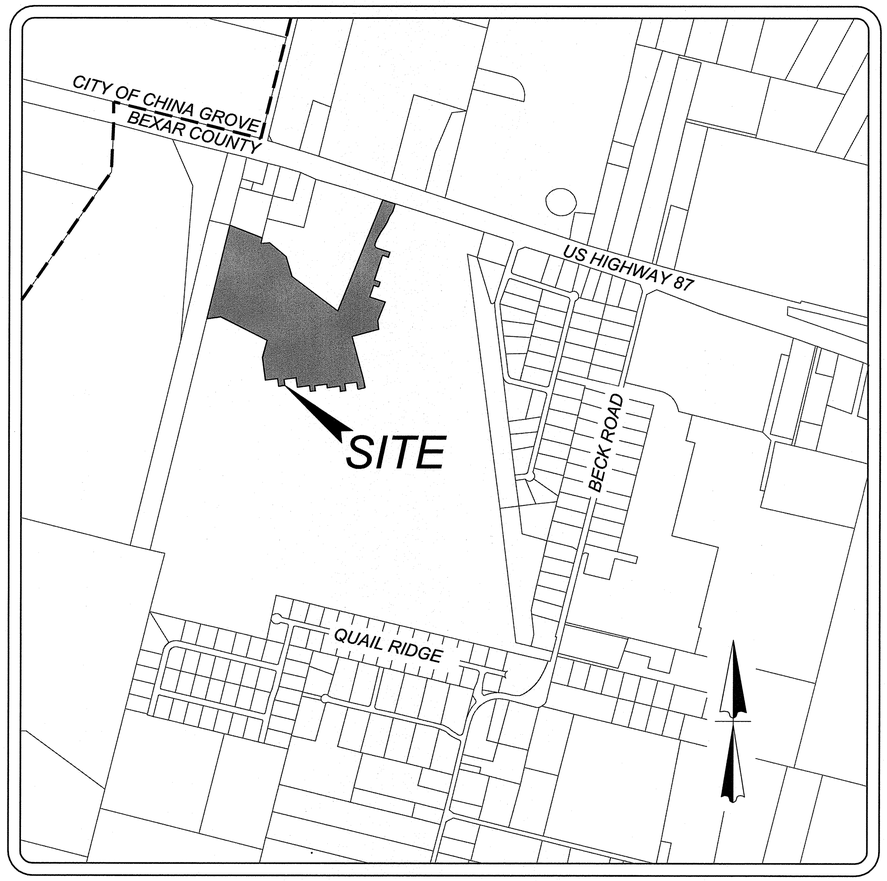
4. Sewer pipe where water line crosses shall be 160 psi and meet the requirements of ASTM D2241, TAC 217.53 and TCEQ 290.44(Ee)(4)(B). Contractor shall center a 20' joint of 160 psi pressure rated PVC at the proposed water crossing.

5. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY: It shall be the responsibility of the Contractor to make allowances and adjustments for top of manholes to match the finished grade of the project's improvements. (NSPI).

6. Spills, Overflows, or Discharges of Wastewater: All Spills, overflows, or discharges of wastewater, recycled water, petroleum products, or chemicals must be reported immediately to the SAWS Inspector assigned to the Counter Permit or GEneral Construction Permit (GCP). This requirement applies to every spill, overflow, or discharge regardless of size.

7. Manhole and all pipe testing (including the TV inspection) must be performed and passed prior to Final Field Acceptance by SAWS Construction Inspection Division, as per SAWS Specifications For Water and Sanitary Sewer Construction.

8. All PVC pipe over 14 feet of cover shall be extra strength with minimum pipe stiffness of 115 psi.



LOCATION MAP
NOT-TO-SCALE

SHEET INDEX

SHEET REVISION LOG

DATE	SHEET NO.	REVISION NO.	DESCRIPTION

OWNER INFORMATION
MEH HOLDING COMPANY LTD
1202 W. BITTERS, BUILDING 1, SUITE 1200
SAN ANTONIO, TX 78216

DEVELOPER'S NAME: MEH HOLDING COMPANY LTD
DEVELOPER'S ADDRESS: 1202 W. BITTERS RD, BUILDING 1, SUITE 1200
CITY: SAN ANTONIO STATE: TEXAS ZIP: 78258
PHONE#: FAX#: TOTAL ACREAGE: 35.11 AC.
SAWS BLOCK MAP#: 216562, 216560, 214560 TOTAL EDU'S: 95
TOTAL LINEAR FOOTAGE OF PIPE: 3,536 L.F. ~ 8" SDR 26; 1,235 L.F. ~ 12" SDR 26 PLAT NO.: 21-11800645
NUMBER OF LOTS: 95 SAWS JOB#: 21-1726

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
4/25/2022

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

JOB NO.: 205-43-04

PLAT NO. 21-11800645 SHEET 6.0

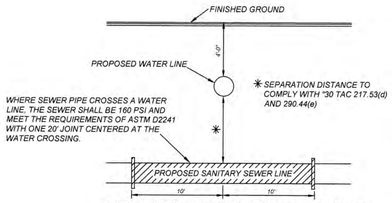
Date: Apr 19, 2022, 4:48pm User ID: smeiners
File: P:\205\43\04\Design\Civil\SEWER\CVSS205430 4.dwg

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.

MANHOLE NOTE:
ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS DETAIL DD852-02.

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.
(REFERENCE SAWS DD-812)

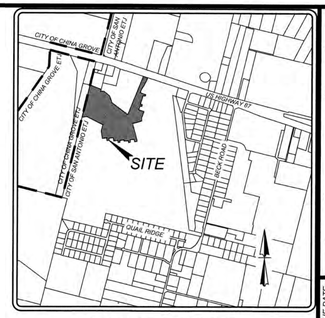
NOTE:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (S.A.W.S.) 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). REFERENCE SANITARY SEWER GENERAL NOTES, S.A.W.S. CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.
3. SEE THIS SHEET FOR BENCHMARK INFORMATION.
4. PIPE TYPE DESIGNATION'S ARE SDR 26.
5. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
6. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER.

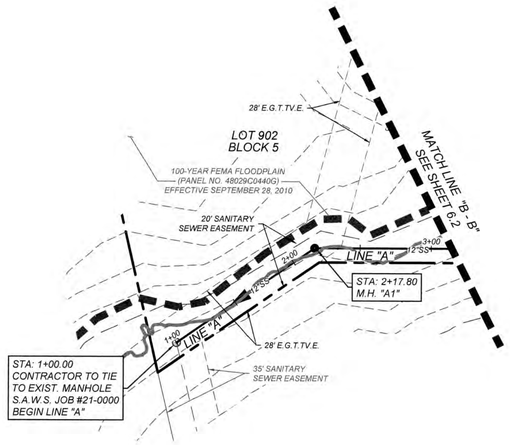
REFERENCE S.A.W.S. DETAILS

DD-804-01 SANITARY SEWER PIPE LAID IN TRENCH
DD-804-02 TRENCH COMPACTION DETAIL
DD-848-01 GO, NO GO DEFLECTION TESTING MANDREL
DD-852-01 STANDARD PRECAST MANHOLE
DD-852-02 VENTED MANHOLE RING AND COVER DETAIL (WHEN SPECIFIED)
DD-852-03 MANHOLE RING ENCASEMENT DETAIL
DD-854-ERZD HOUSE LATERAL DETAIL (IN THE E.A.R.Z.)
DD-858-01 TYPICAL CONCRETE ENCASEMENT DETAILS
DD-858-02 TYPICAL CONCRETE DETAILS
DD-860-01 TYPICAL VERTICAL STACK DETAILS
DD-852-06 PRECAST MANHOLE BASE 45° ANGLE
DD-852-08 DROP MANHOLE DETAIL
DD-852-07 MANHOLE RING AND COVER DETAIL

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

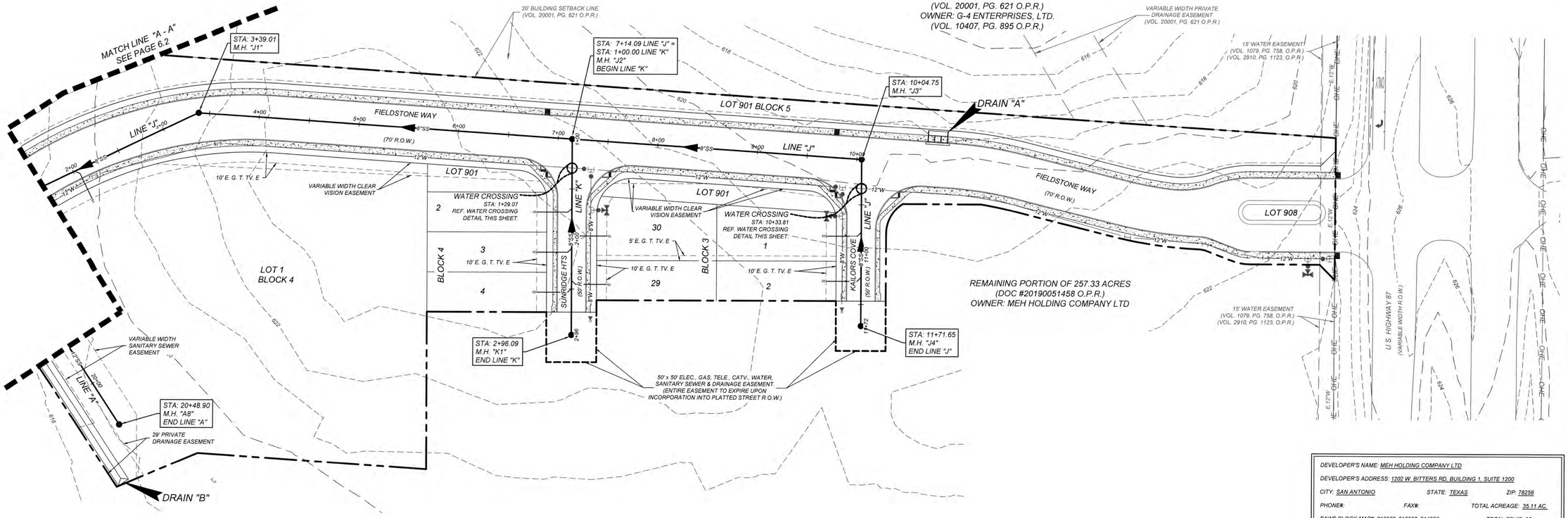


LOCATION MAP
NOT-TO-SCALE



LEGEND

PROPOSED WATER MAIN	=	W
PROPOSED WATER SERVICE & METER BOX	=	
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	
PROPOSED FIRE HYDRANT	=	
PROPOSED WATER VALVE	=	
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



DEVELOPER'S NAME: MEH HOLDING COMPANY LTD	
DEVELOPER'S ADDRESS: 1202 W. BITTERS RD. BUILDING 1, SUITE 1200	
CITY: SAN ANTONIO	STATE: TEXAS ZIP: 78258
PHONE#:	FAX#: TOTAL ACREAGE: 35.11 AC.
SAWS BLOCK MAP#: 216562, 216560, 214560	TOTAL EDU'S: 95
TOTAL LINEAR FOOTAGE OF PIPE: 3,536 L.F. – 8" SDR 26 1,235 L.F. – 12" SDR 26	PLAT NO.: 21-11800645
NUMBER OF LOTS: 95	SAWS JOB#: 21-1726

KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: (210) 979-8444 Fax: (210) 979-8441
TBPE Firm #: 8813 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

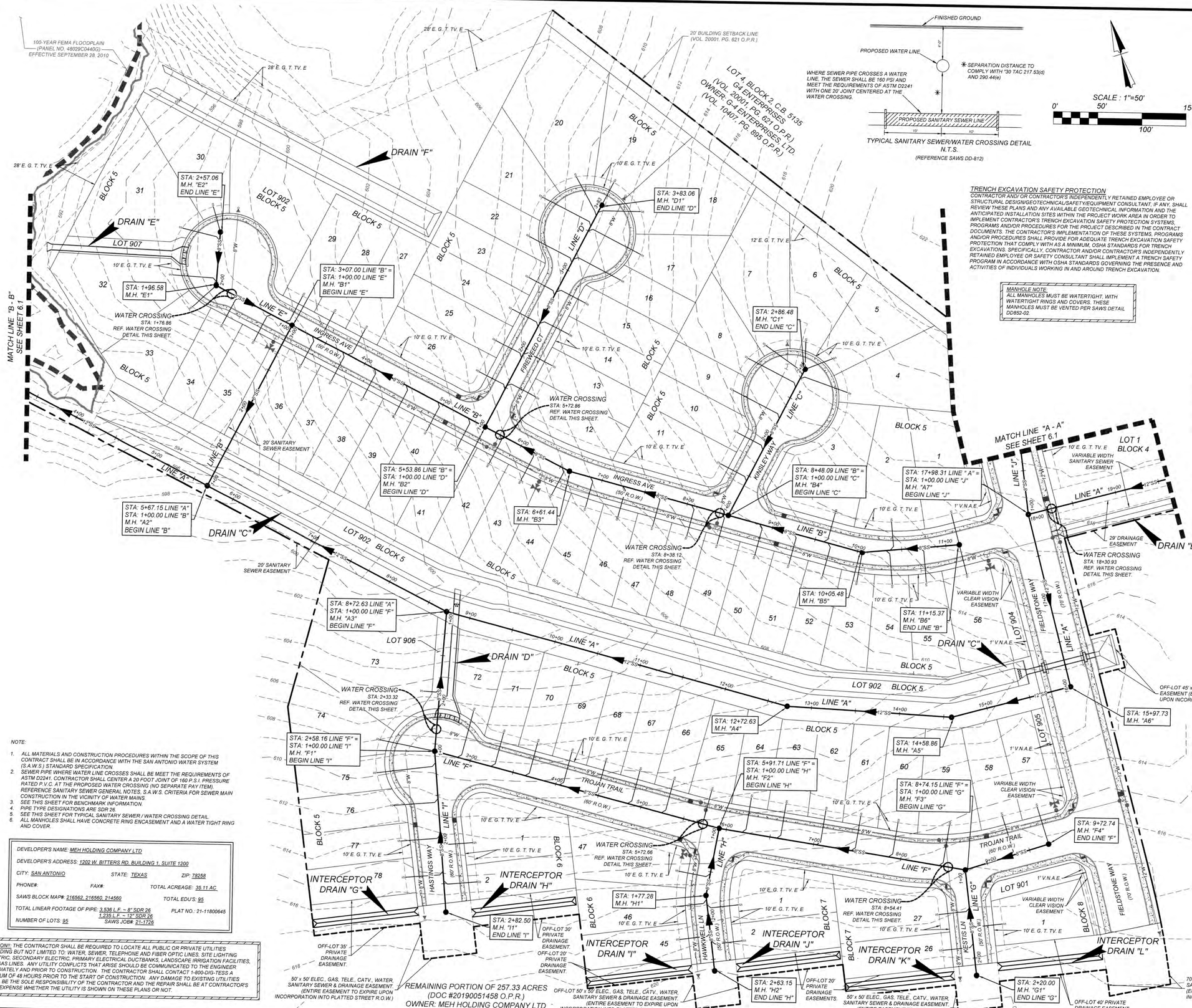
STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
6/29/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
OVERALL SANITARY SEWER PLAN (SHEET 1 OF 2)

PLAT NO.
21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
6.1



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.

MANHOLE NOTE:
ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS DETAIL DD852-02.

LEGEND

- PROPOSED WATER MAIN = W
- PROPOSED WATER SERVICE & METER BOX = M.H.
- PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX = IRR
- PROPOSED FIRE HYDRANT
- PROPOSED WATER VALVE
- PROPOSED SANITARY SEWER MAIN = SS
- PROPOSED SANITARY SEWER MANHOLE
- PROPOSED SANITARY SEWER LATERAL = ss
- PROPOSED ELECTRIC, GAS, TELEPHONE, & CABLE TV EASEMENT = E. G. T. TV. E
- EXISTING WATER MAIN = E.W
- EXISTING FIRE HYDRANT
- EXISTING WATER VALVE
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- EXISTING OVERHEAD ELECTRIC W/POWER POLE = OHE
- EXISTING GUY WIRE/OVERHEAD ELECTRIC = OHE

REFERENCE S.A.W.S. DETAILS

DD-804-01 SANITARY SEWER PIPE LAID IN TRENCH
DD-804-02 TRENCH COMPACTION DETAIL
DD-848-01 GO, NO GO DEFLECTION TESTING MANDREL
DD-852-01 STANDARD PRECAST MANHOLE
DD-852-02 VENTED MANHOLE RING AND COVER DETAIL (WHEN SPECIFIED)
DD-852-03 MANHOLE RING ENCASEMENT DETAIL
DD-854-ERZD HOUSE LATERAL DETAIL (IN THE E.A.R.Z.)
DD-858-01 TYPICAL CONCRETE ENCASEMENT DETAILS
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DD-860-01 TYPICAL VERTICAL STACK DETAILS
DD-852-06 PRECAST MANHOLE BASE 45° ANGLE
DD-852-08 DROP MANHOLE DETAIL
DD-852-07 MANHOLE RING AND COVER DETAIL

NOTE:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (S.A.W.S.) 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). REFERENCE SANITARY SEWER GENERAL NOTES, S.A.W.S. CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.
3. SEE THIS SHEET FOR BENCHMARK INFORMATION.
4. PIPE TYPE DESIGNATIONS ARE SDR 26.
5. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
6. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER.

DEVELOPER'S NAME: MEH HOLDING COMPANY LTD	
DEVELOPER'S ADDRESS: 1202 W. BITTERS RD. BUILDING 1, SUITE 1200	
CITY: SAN ANTONIO STATE: TEXAS	ZIP: 78258
PHONE#: FAX#:	TOTAL ACREAGE: 35.11 AC.
SAWS BLOCK MAP#: 216562, 216560, 214560	TOTAL EDU'S: 95
TOTAL LINEAR FOOTAGE OF PIPE: 3,536 L.F. ~ 8" SDR 26; 1,235 L.F. ~ 12" SDR 26	PLAT NO.: 21-11800645
NUMBER OF LOTS: 95 SAWS JOB#: 21-1726	

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.

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10172300

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/29/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

OVERALL SANITARY SEWER PLAN (SHEET 2 OF 2)

PLAT NO. 21-11800645

JOB NO.205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER: 6.2

TRENCH EXCAVATION SAFETY PROTECTION

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NOTE:

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

REFERENCE S.A.W.S. DETAILS

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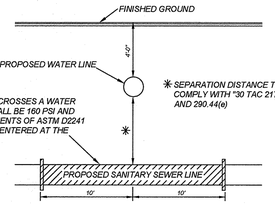
DD-804-02 TRENCH COMPACTION DETAIL
DD-848-01 GO, NO GO DEFLECTION TESTING MANDREL
DD-852-01 STANDARD PRECAST MANHOLE
DD-852-02 VENTED MANHOLE RING AND COVER DETAIL (WHEN SPECIFIED)
DD-852-03 MANHOLE RING ENCASEMENT DETAIL
DD-854-ERZD HOUSE LATERAL DETAIL (IN THE E.A.R.Z.)
DD-858-01 TYPICAL CONCRETE ENCASEMENT DETAILS
DD-858-02 TYPICAL CONCRETE DETAILS
DD-860-01 TYPICAL VERTICAL STACK DETAILS
DD-852-06 PRECAST MANHOLE BASE 45° ANGLE
DD-852-08 DROP MANHOLE DETAIL
DD-852-07 MANHOLE RING AND COVER DETAIL

WHERE SEWER PIPE CROSSES A WATER LINE, THE SEWER SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT THE WATER CROSSING.

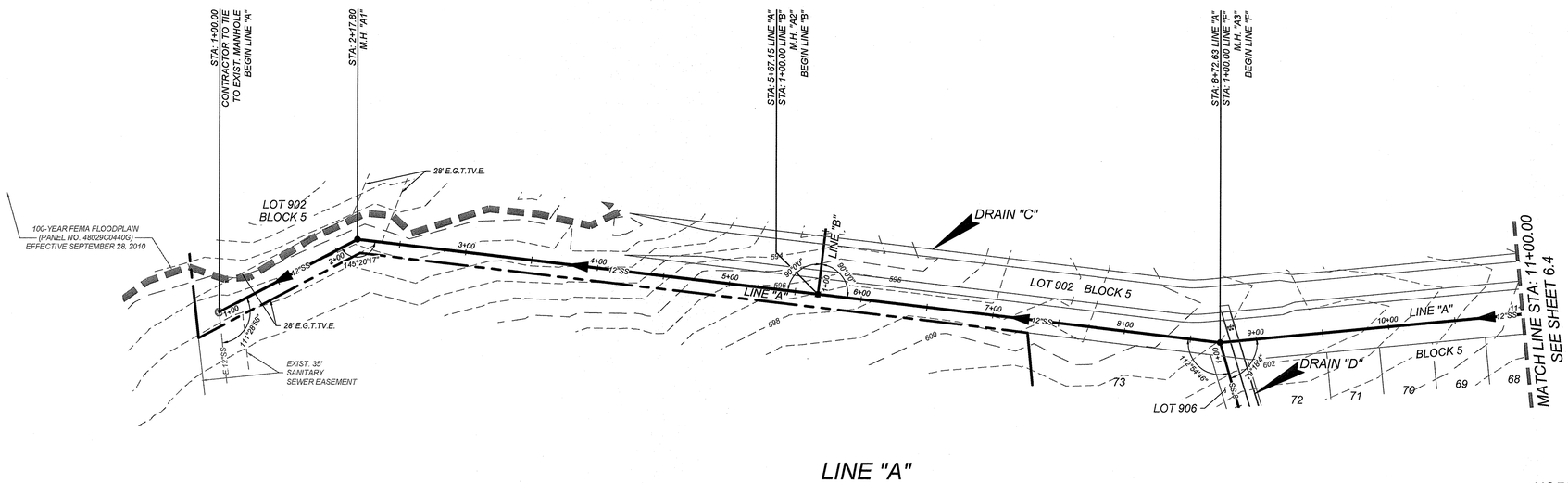


TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.
(REFERENCE SAWS DD-812)

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.

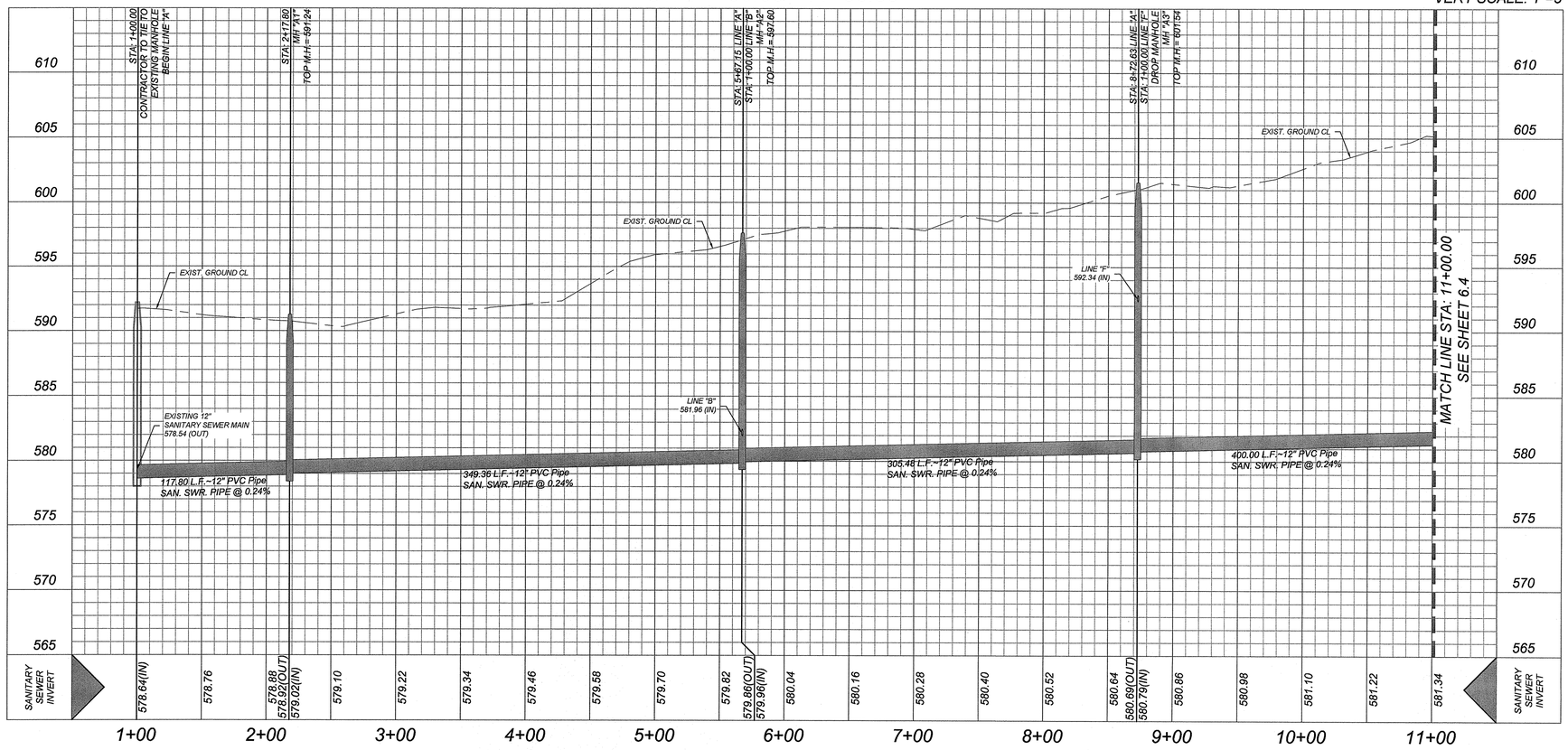
MANHOLE NOTE:
ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS DETAIL DD852-02.

DEVELOPER'S NAME: MEH HOLDING COMPANY LTD
DEVELOPER'S ADDRESS: 1202 W. BITTERS RD, BUILDING 1, SUITE 1200
CITY: SAN ANTONIO STATE: TEXAS ZIP: 78258
PHONE#: FAX#: TOTAL ACREAGE: 35.11 AC.
SAWS BLOCK MAP#: 216562, 216560, 214560 TOTAL EDU'S: 95
TOTAL LINEAR FOOTAGE OF PIPE: 3,536 L.F. – 8" SDR 26 PLAT NO.: 21-11800645
1,239 L.F. – 12" SDR 26
NUMBER OF LOTS: 95 SAWS JOB#: 21-1726



LINE "A"
STA: 1+00.00 - 11+00.00

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



GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
LINE "A" PLAN & PROFILE (SHEET 1 OF 2)

PLAT NO.
21-11800645

JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
6.3

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

ISSUE DATE
REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
4/25/2022

Date: Apr 19, 2022, 9:32am User ID: cmeiners
File: P:\205\43\04\Design\Civil\SEWERS\205430 4.dwg

TRENCH EXCAVATION SAFETY PROTECTION

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3. SEE THIS SHEET FOR BENCHMARK INFORMATION.
4. PIPE TYPE DESIGNATIONS ARE SDR 26.
5. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
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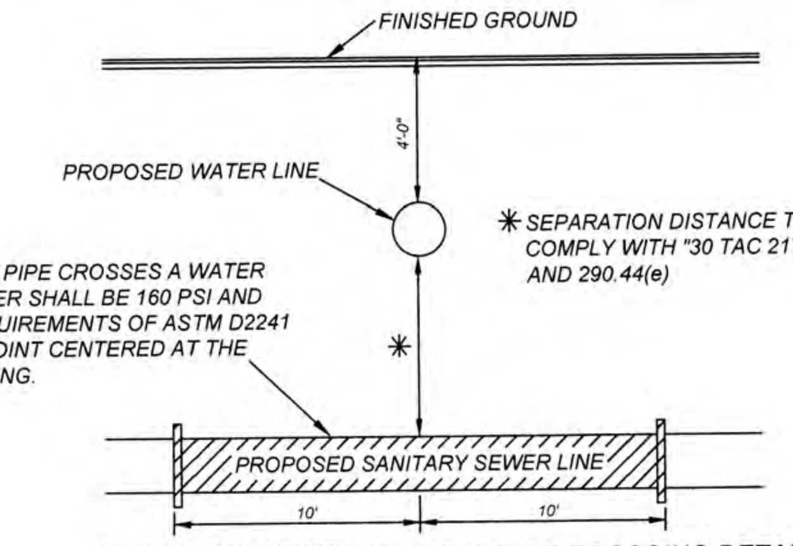

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.
(REFERENCE SAWS DD-812)

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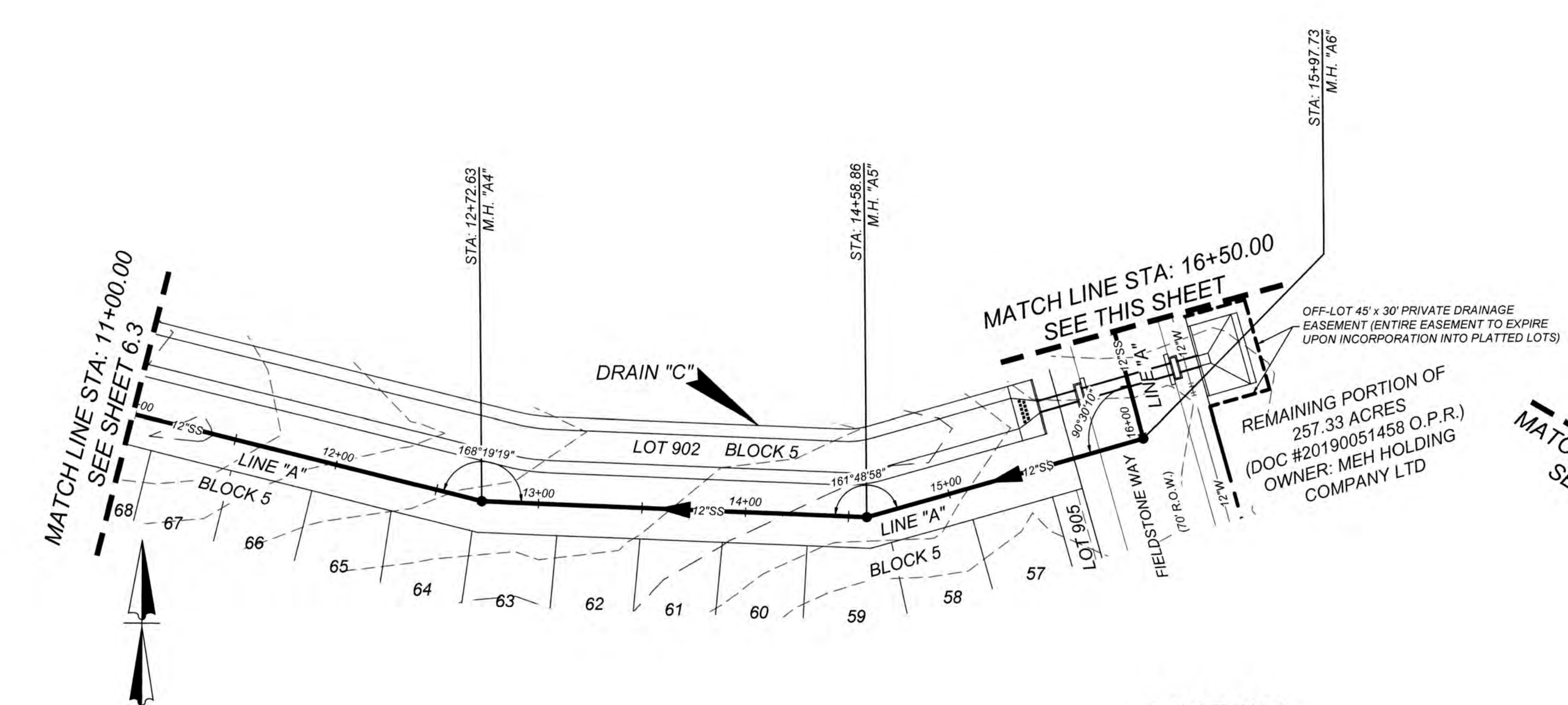
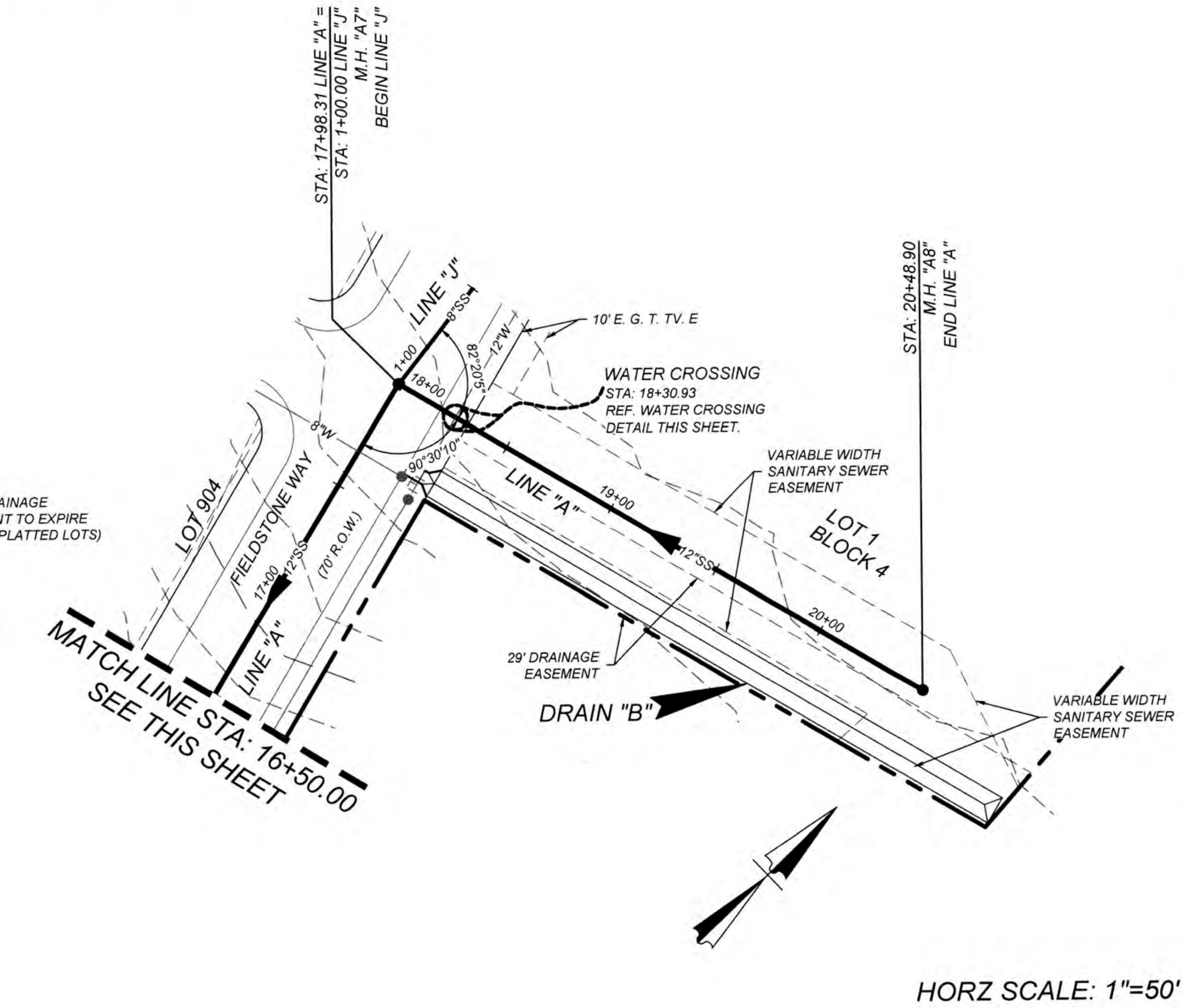
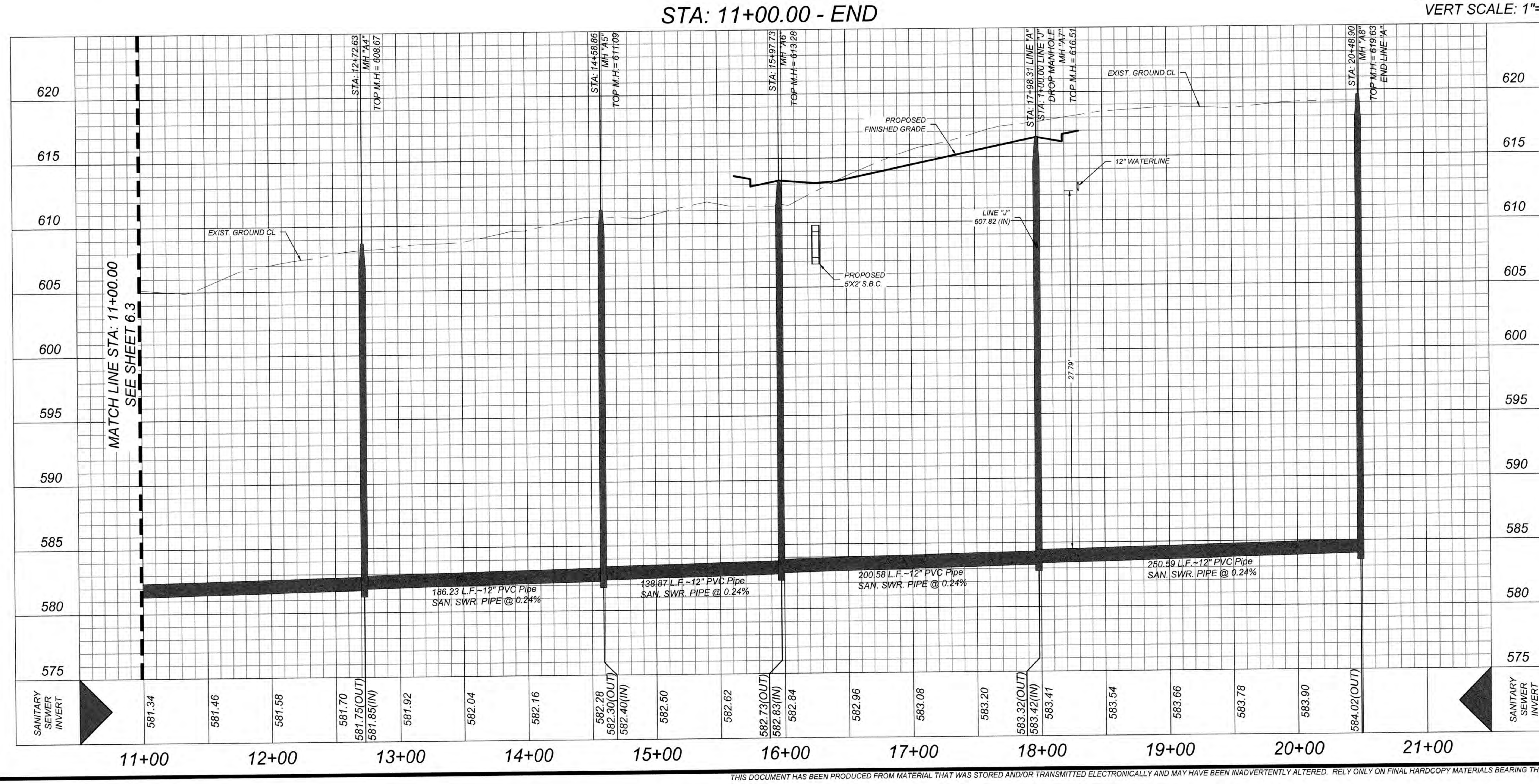




LINE "A"
STA: 11+00.00 - END

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



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ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/29/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

LINE "A" PLAN & PROFILE (SHEET 2 OF 2)

PLAT NO.
21-11800645

JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
6.4

TRENCH EXCAVATION SAFETY PROTECTION

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3. SEE THIS SHEET FOR BENCHMARK INFORMATION.
4. PIPE TYPE DESIGNATIONS ARE SDR 26.
5. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
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REFERENCE S.A.W.S. DETAILS

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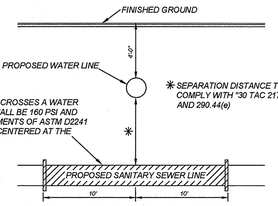
DD-852-08 DROP MANHOLE DETAIL
DD-852-07 MANHOLE RING AND COVER DETAIL



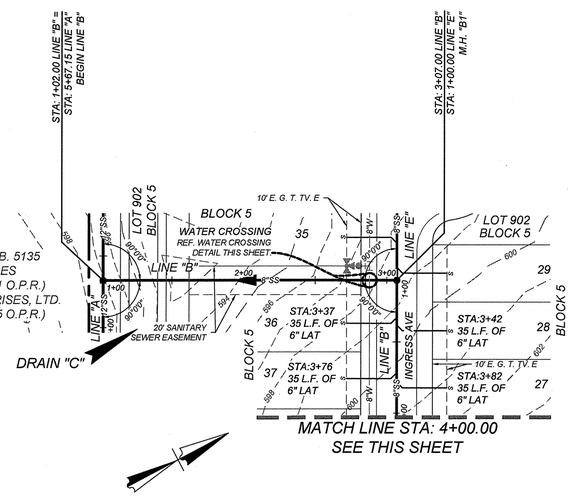
TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.
(REFERENCE SAWS DD-812)

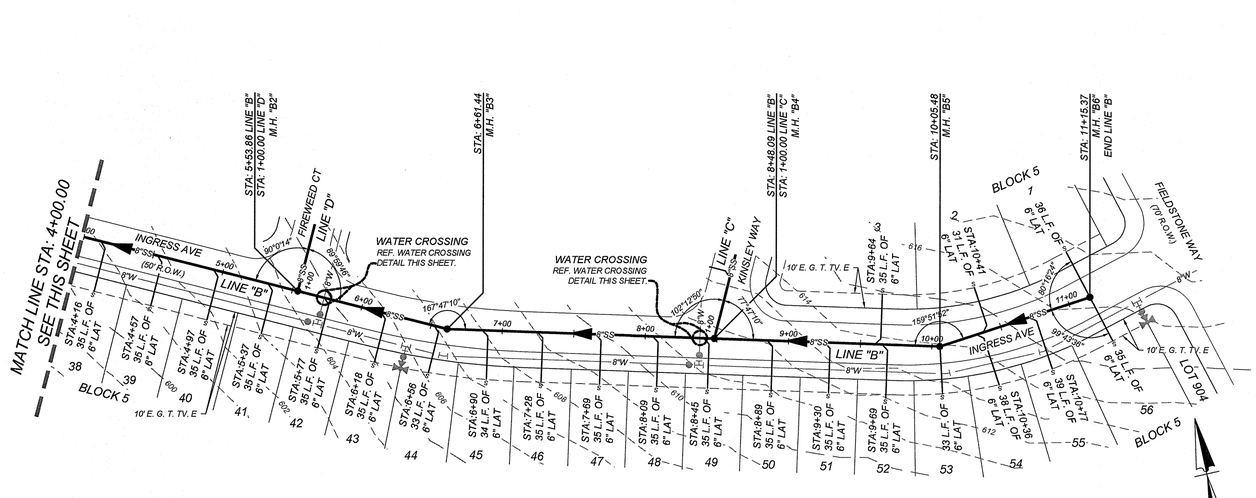
WHERE SEWER PIPE CROSSES A WATER LINE, THE SEWER SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT THE WATER CROSSING.

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.

MANHOLE NOTE:
ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS DETAIL DD852-02.

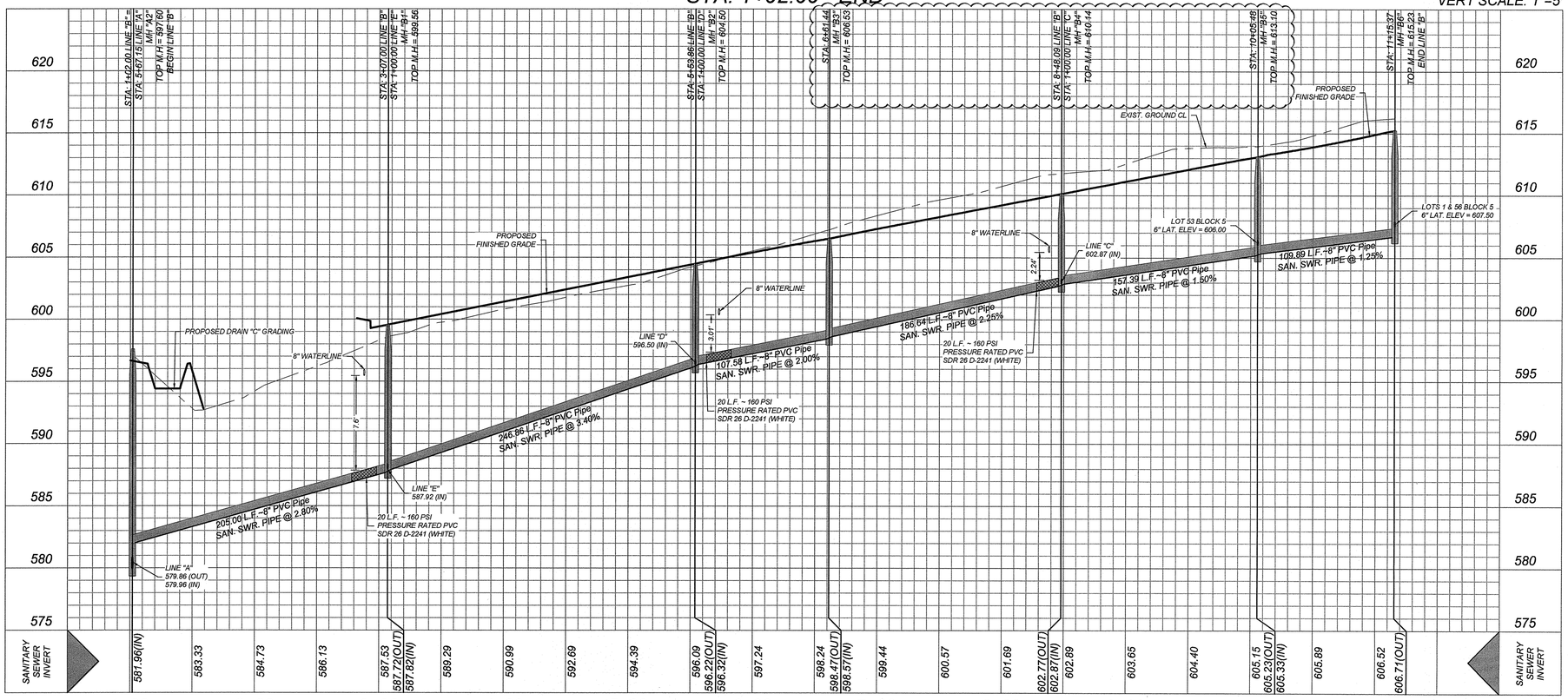
DEVELOPER'S NAME: MEH HOLDING COMPANY LTD
DEVELOPER'S ADDRESS: 1202 W. BITTERS RD, BUILDING 1, SUITE 1200
CITY: SAN ANTONIO STATE: TEXAS ZIP: 78258
PHONE#: FAX#: TOTAL ACREAGE: 35.11 AC.
SAWS BLOCK MAP#: 216562, 216560, 214560 TOTAL EDU'S: 95
TOTAL LINEAR FOOTAGE OF PIPE: 3,536 L.F. ~ 8" SDR 26; 1,235 L.F. ~ 12" SDR 26 PLAT NO.: 21-11800645
NUMBER OF LOTS: 95 SAWS JOB#: 21-1726





LINE "B"
STA: 1+02.00 - END

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



KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 8513 • TBPLS Firm #: 10124300

ISSUE DATE
4/1/2022

REVISIONS
1 REVISED TOP OF MANHOLE ELEVATIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
4/25/2022

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
LINE "B" PLAN & PROFILE

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL
SHEET NUMBER: 6.5

Date: Apr 19, 2022, 9:34am User ID: omeines
File: P:\2020\43\04\Design\Civil\SEWERS\SDS\43404.dwg

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.

NOTE:

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

REFERENCE S.A.W.S. DETAILS

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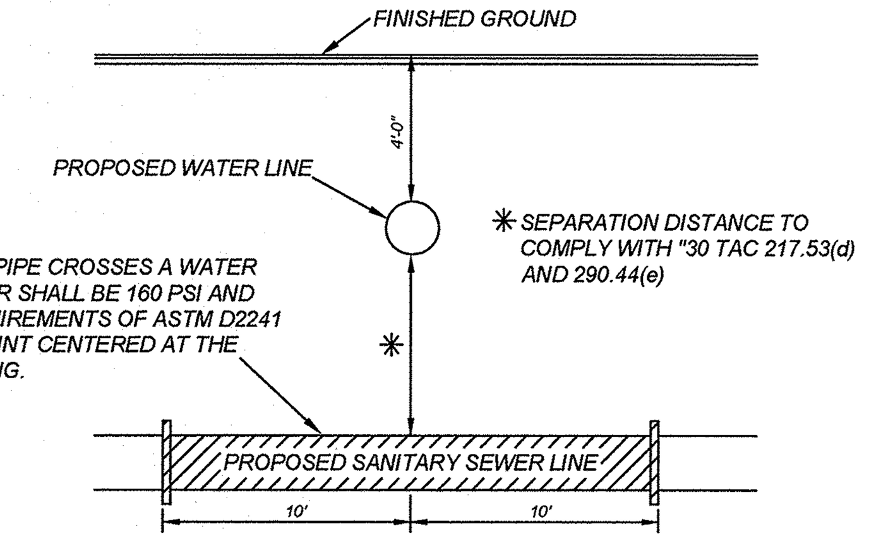
DD-852-01 STANDARD PRECAST MANHOLE
DD-852-02 VENTED MANHOLE RING AND COVER DETAIL (WHEN SPECIFIED)
DD-852-03 MANHOLE RING ENCASEMENT DETAIL
DD-854-ERZD HOUSE LATERAL DETAIL (IN THE E.A.R.Z.)
DD-858-01 TYPICAL CONCRETE ENCASEMENT DETAILS
DD-858-02 TYPICAL CONCRETE DETAILS
DD-860-01 TYPICAL VERTICAL STACK DETAILS
DD-852-06 PRECAST MANHOLE BASE 45° ANGLE
DD-852-08 DROP MANHOLE DETAIL
DD-852-07 MANHOLE RING AND COVER DETAIL



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.
(REFERENCE SAWS DD-812)

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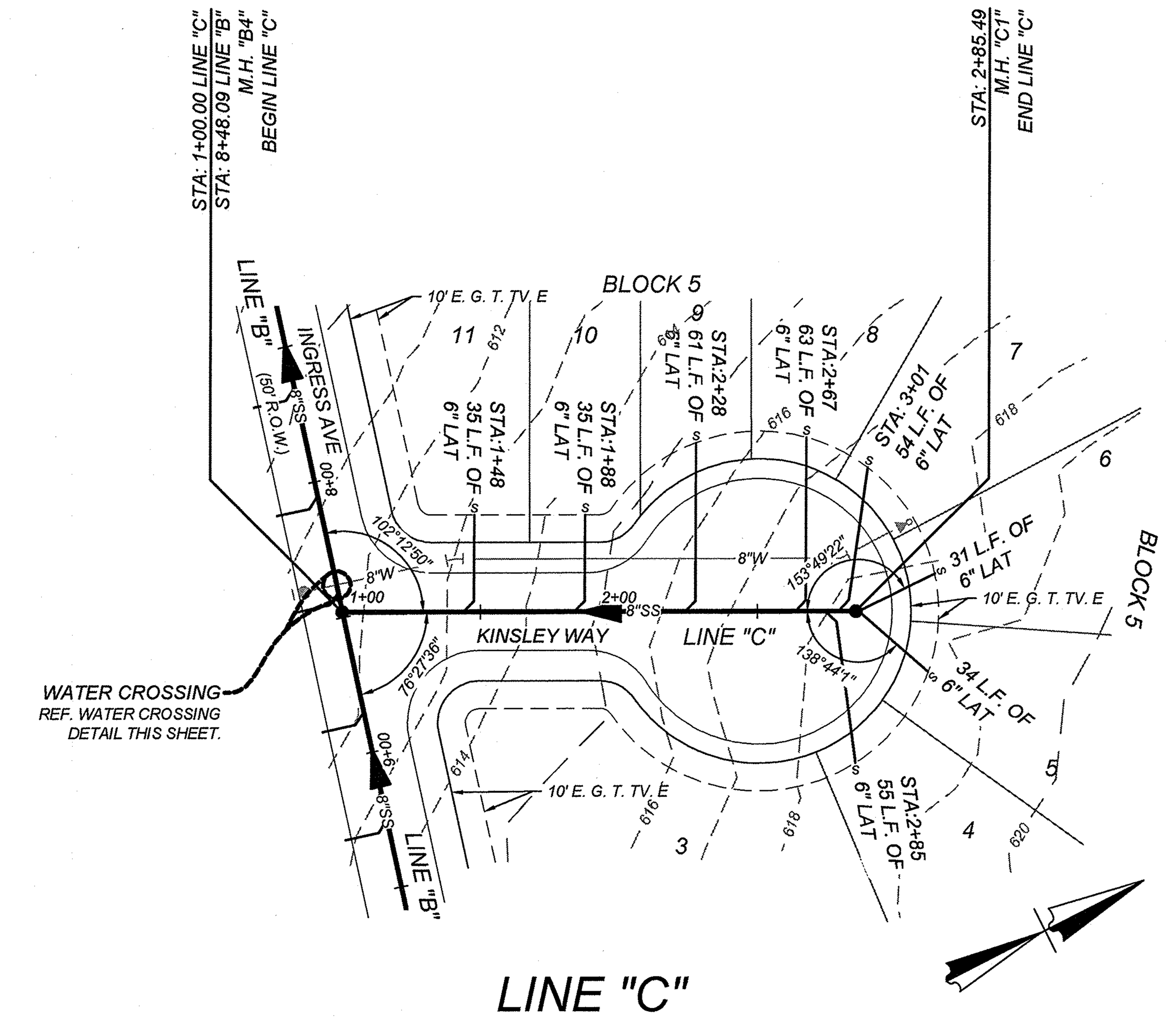
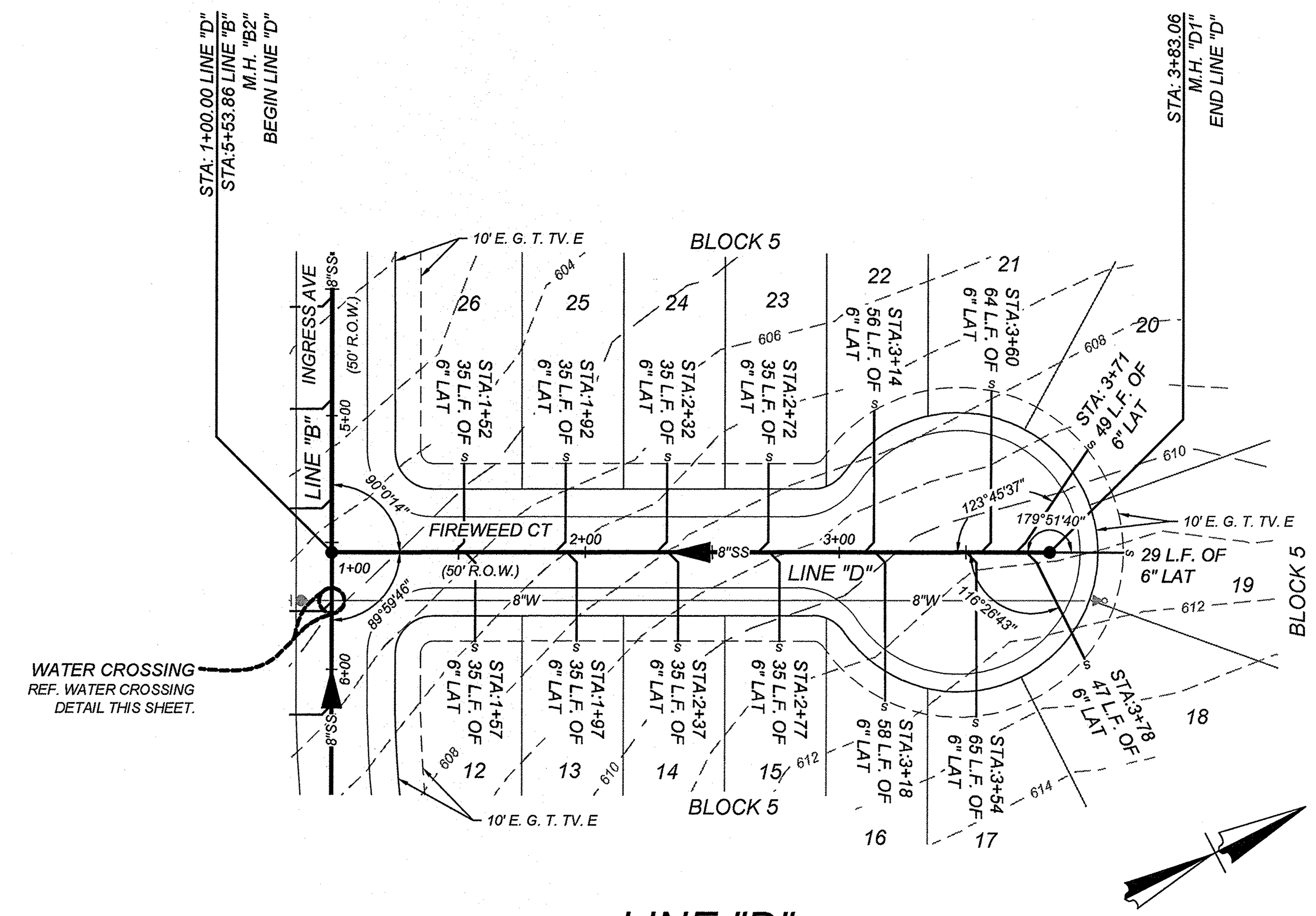
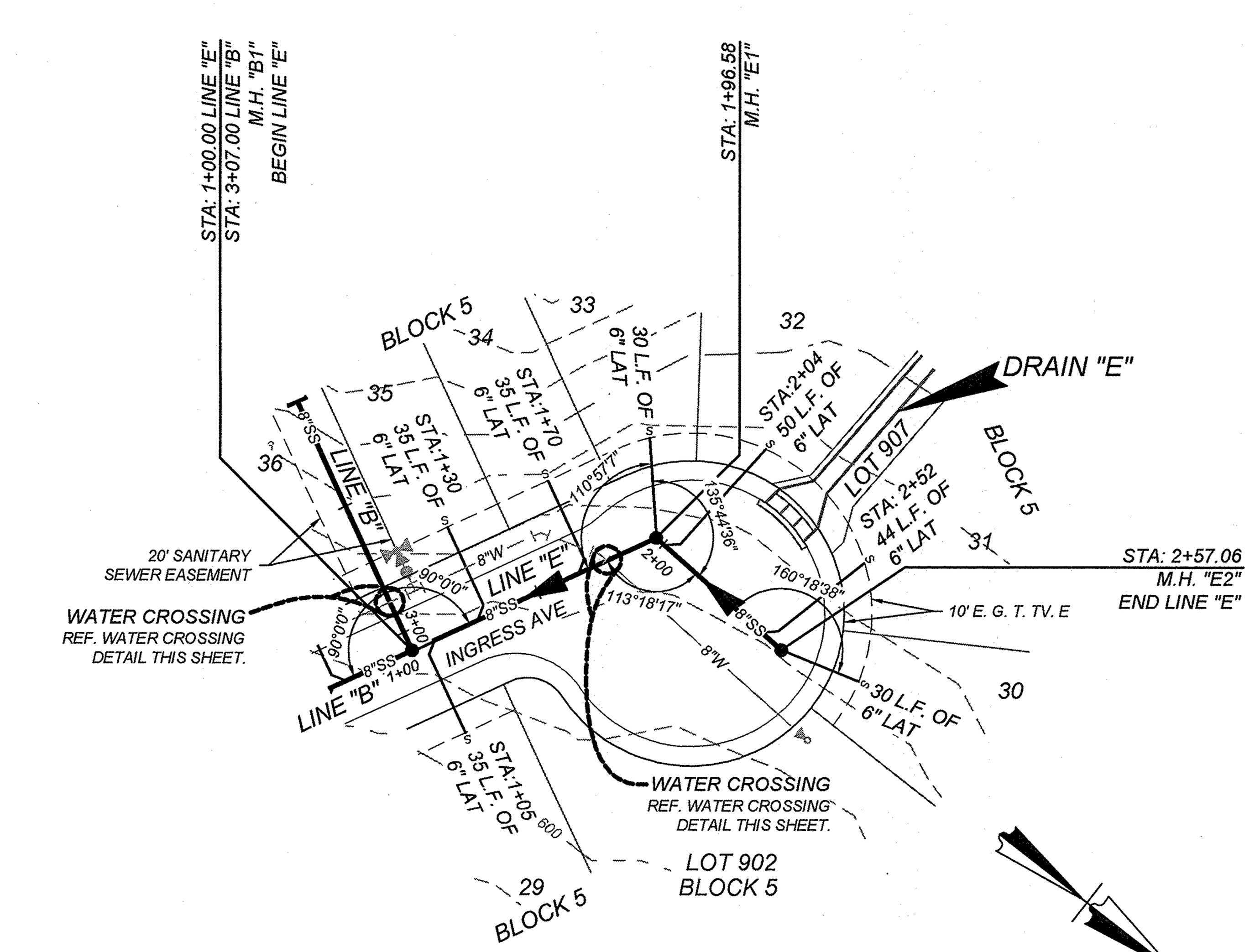
DEVELOPER'S ADDRESS: 1202 W. BITTERS RD, BUILDING 1, SUITE 1200
CITY: SAN ANTONIO STATE: TEXAS ZIP: 78258
PHONE#: FAX#: TOTAL ACREAGE: 35.11 AC.
SAWS BLOCK MAP#: 216562, 216560, 214560 TOTAL EDU'S: 95
TOTAL LINEAR FOOTAGE OF PIPE: 3,536 L.F. ~ 8" SDR 26; 1,235 L.F. ~ 12" SDR 26 PLAT NO.: 21-11800645
NUMBER OF LOTS: 95 SAWS JOB#: 21-1726

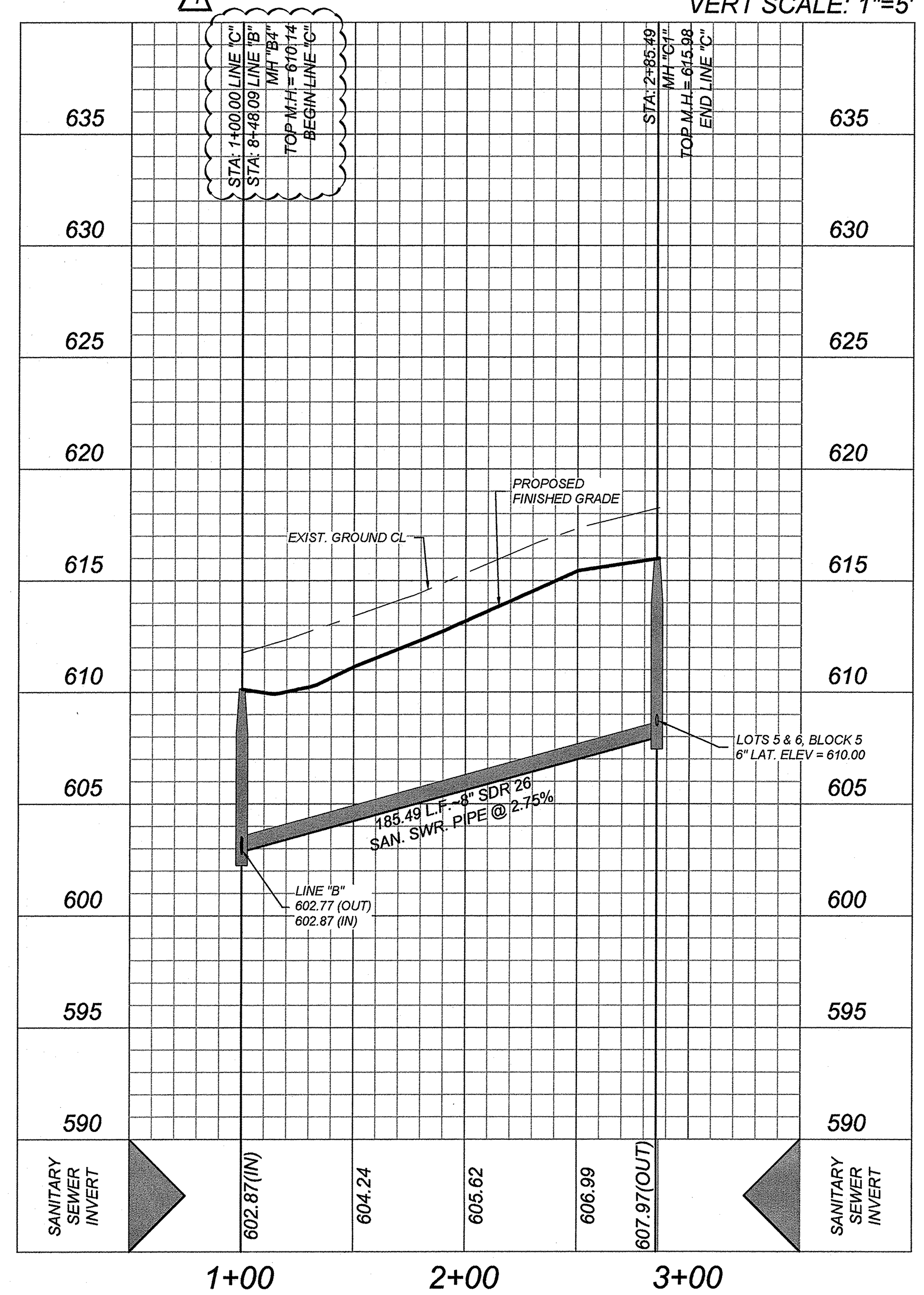






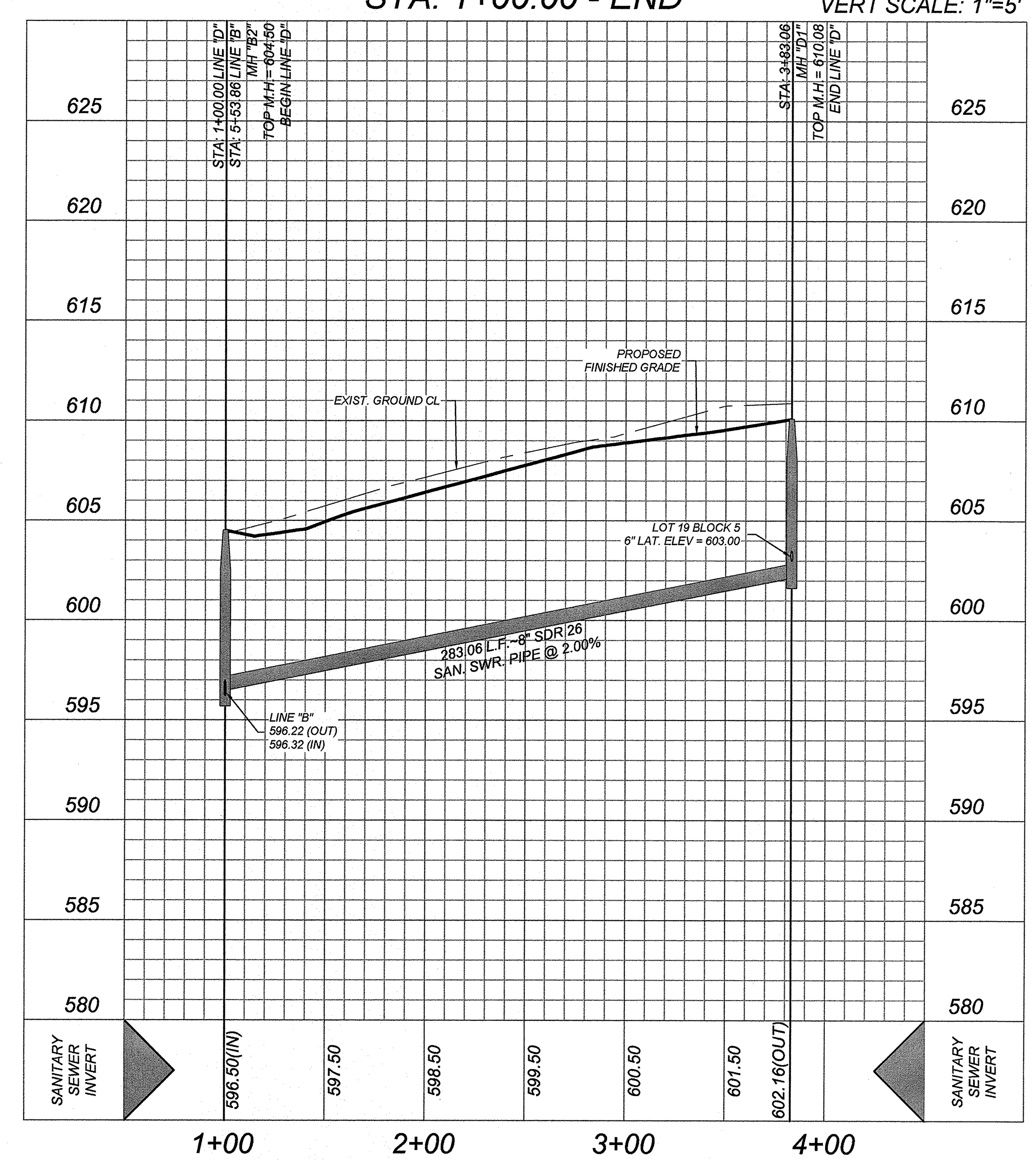
LINE "C"
STA: 1+00.00 - END

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



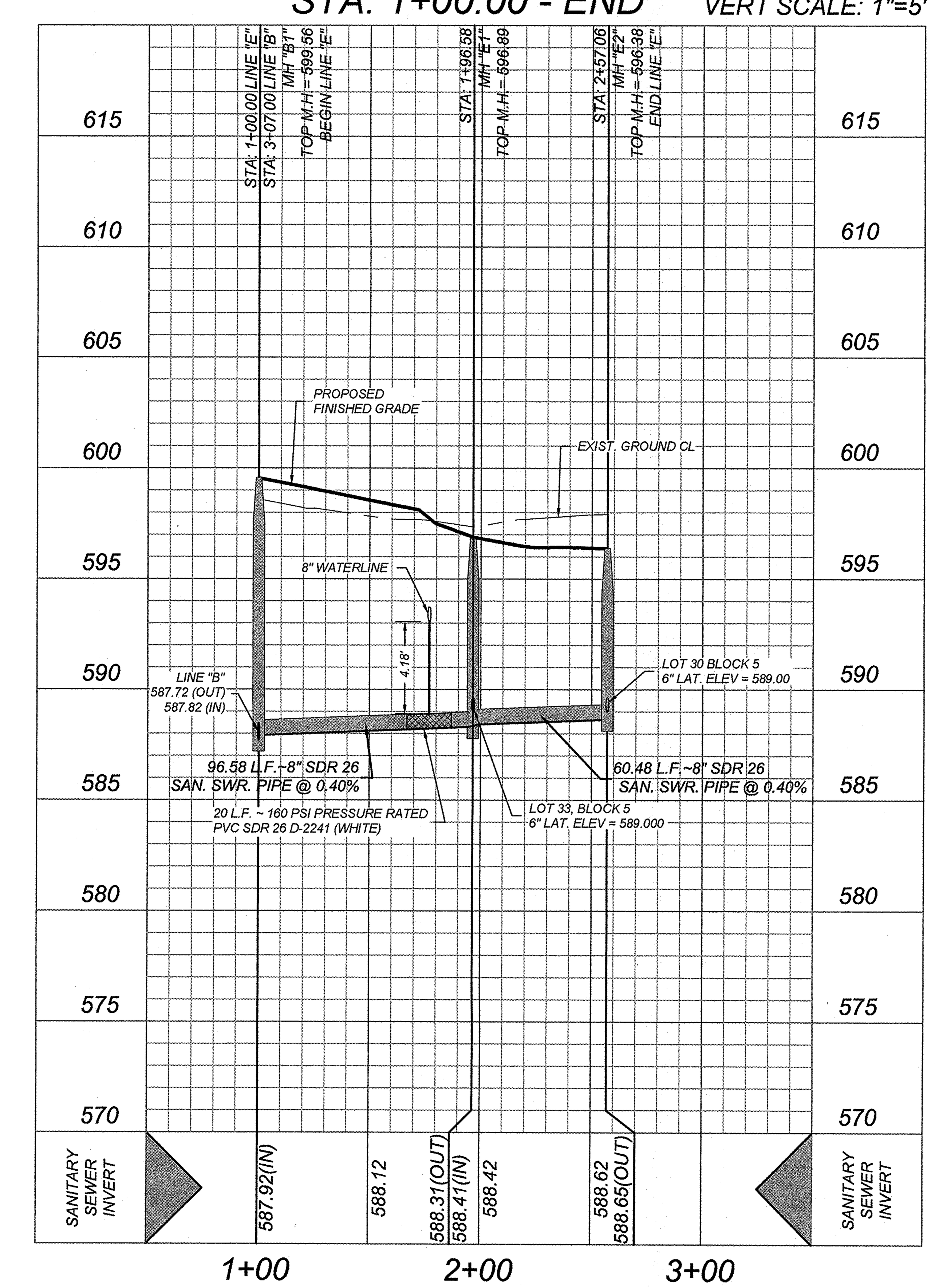
LINE "D"
STA: 1+00.00 - END

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



LINE "E"
STA: 1+00.00 - END

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



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REVISIONS	ISSUE DATE
1 REVISED TOP OF MANHOLE ELEVATION	4/1/2022

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
4/25/2022

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

LINE "C", "D" & "E"" PLAN & PROFILE

PLAT NO.
21-11800645
JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL
SHEET NUMBER:
6.6

Date: Apr 19, 2022, 9:36am User ID: omelners
File: P:\205\43\04\Design\Civil\SEWERS205430404.dwg

TRENCH EXCAVATION SAFETY PROTECTION

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5. PIPE TYPE DESIGNATIONS ARE SDR 26.
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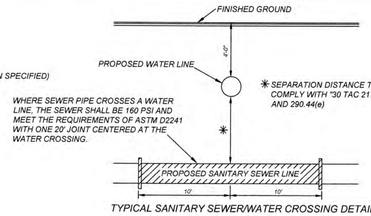

WHERE SEWER PIPE CROSSES A WATER LINE, THE SEWER SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT THE WATER CROSSING.

TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.
(REFERENCE SAWS DD-812)

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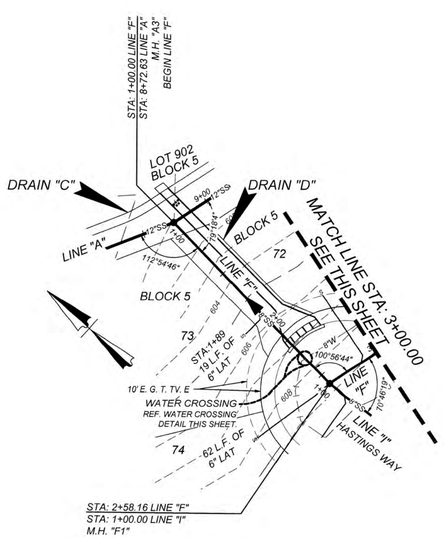
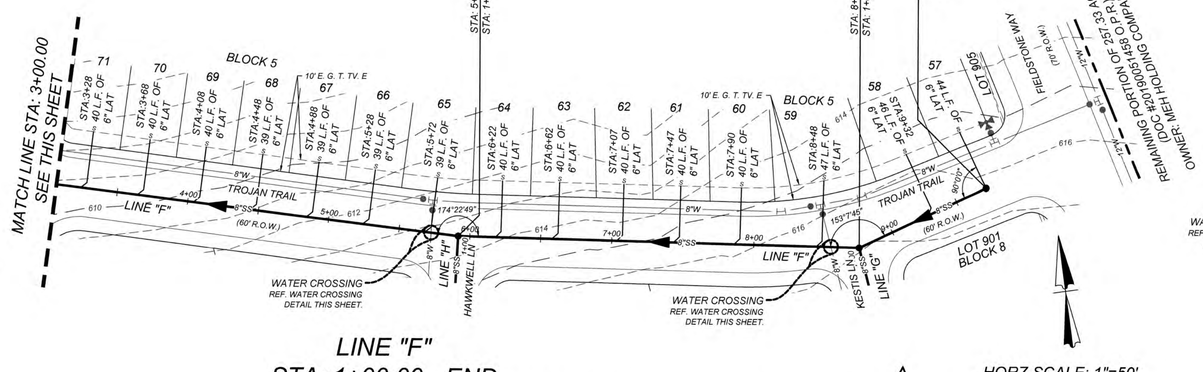
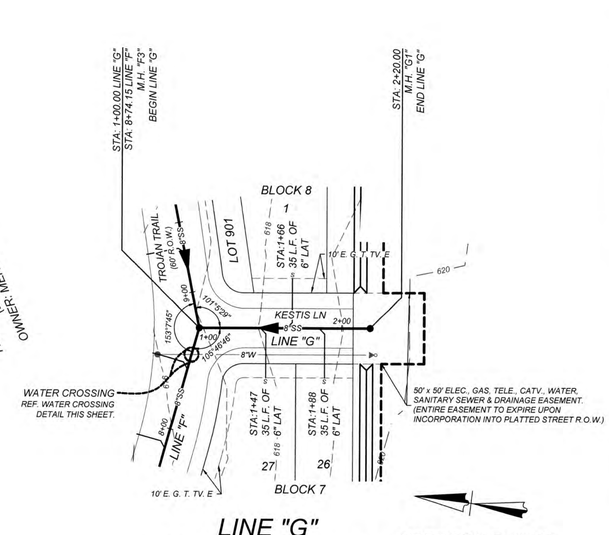




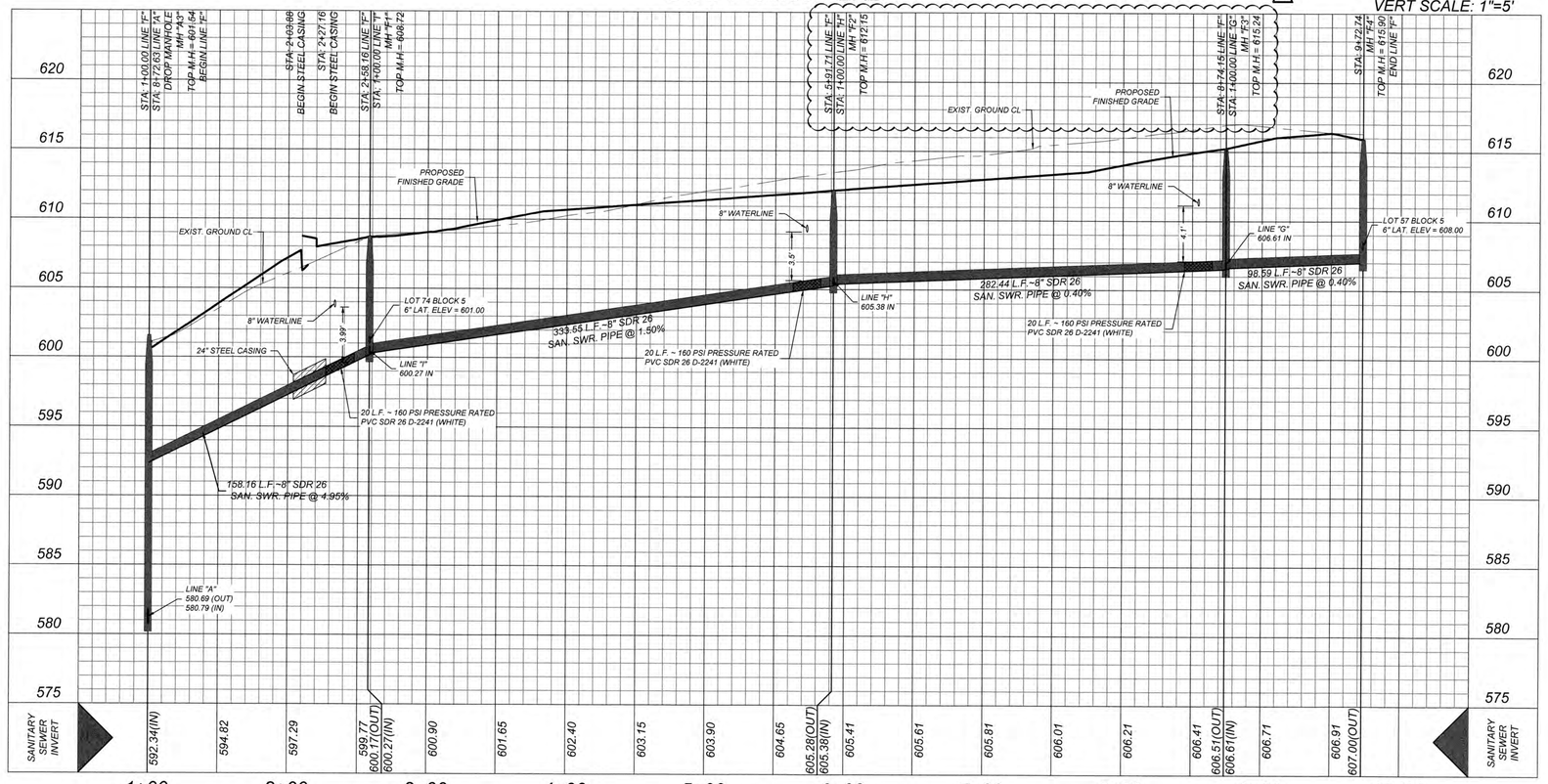
LINE "F"
STA: 1+00.00 - END

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



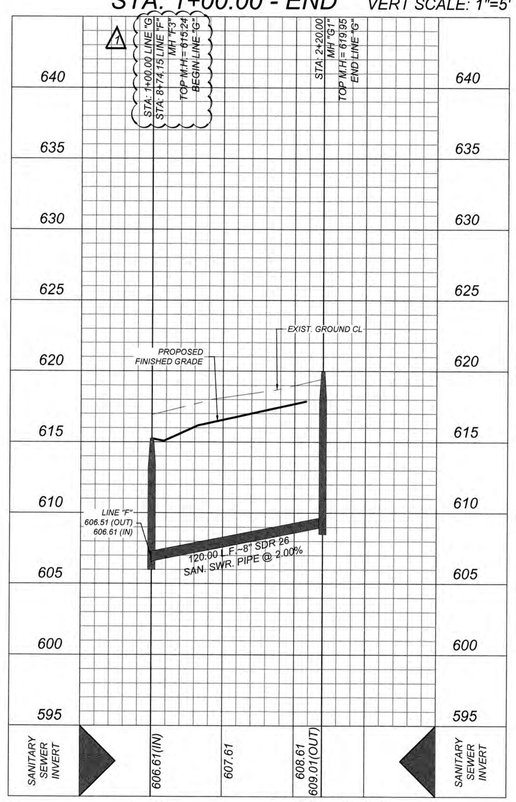
LINE "G"
STA: 1+00.00 - END

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



LINE "G"
STA: 1+00.00 - END

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



REVISIONS	ISSUE DATE
1 REVISED TOP OF MANHOLE ELEVATIONS	4/1/2022

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
6/24/2022

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

LINE "F" & "G" PLAN & PROFILE

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL
SHEET NUMBER: 6.7

TRENCH EXCAVATION SAFETY PROTECTION

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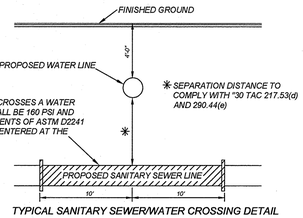

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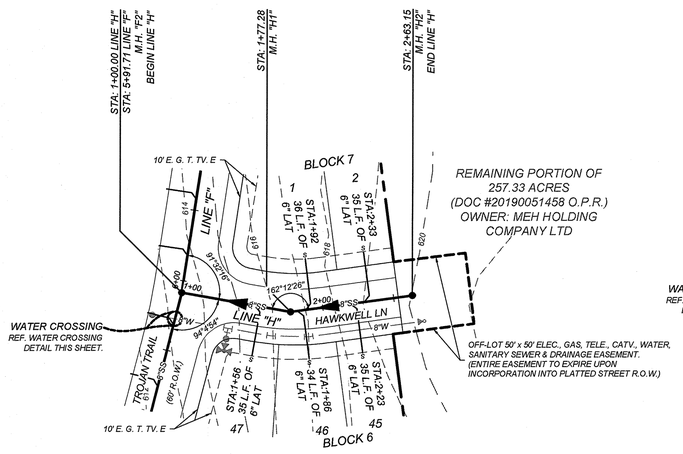
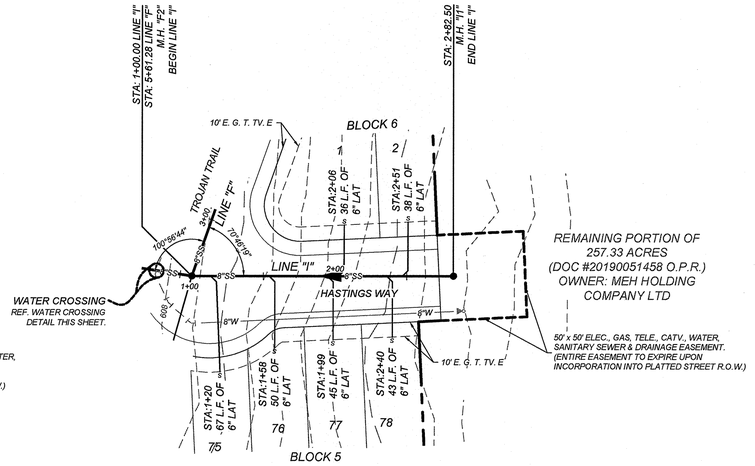
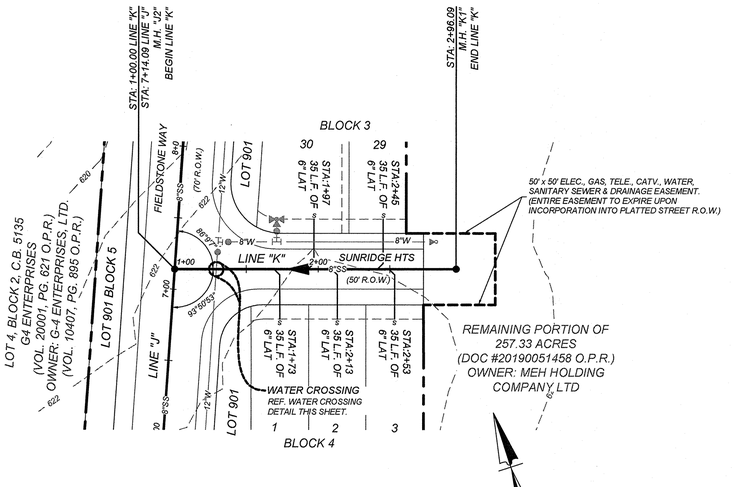
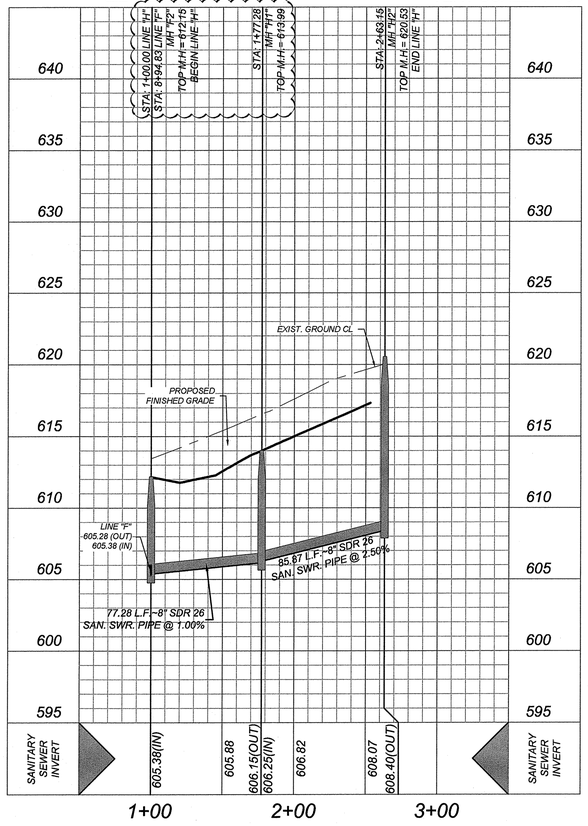






LINE "H"
STA: 1+00.00 - END

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



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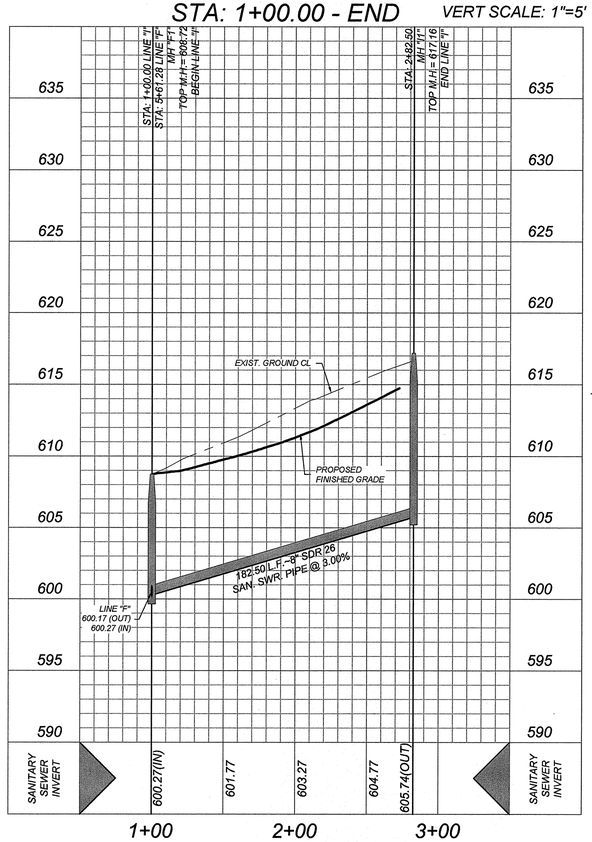

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STA: 1+00.00 - END

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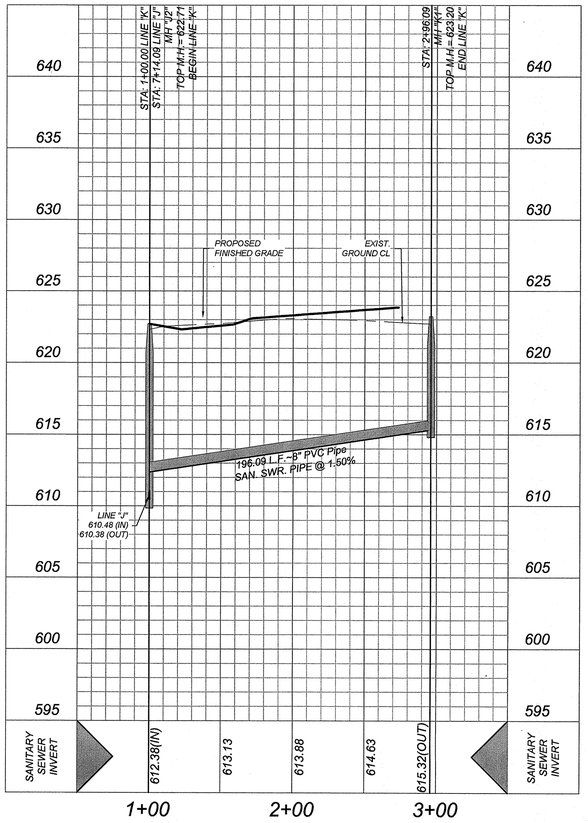
VERT SCALE: 1"=5'



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

ISSUE DATE
4/1/2022

REVISIONS
REVISED TOP OF MANHOLE ELEVATIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
4/25/2022

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
LINE "H", "I" & "K" PLAN & PROFILE

PLAT NO.
21-11800645

JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
6.8

Date: Apr 19, 2022, 9:39am User ID: cmeiners
File: P:\205\43\04\Design\Civil\SEWERS\205-4304.dwg

TRENCH EXCAVATION SAFETY PROTECTION

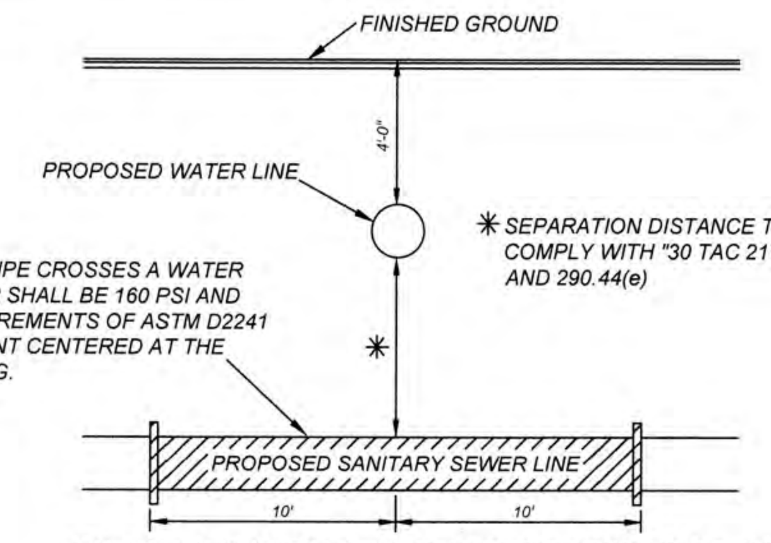
CONTRACTOR AND/ OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND ANY AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S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

NOTE:

1. ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (S.A.W.S.) 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). REFERENCE SANITARY SEWER GENERAL NOTES, S.A.W.S. CRITERIA FOR SEWER MAIN CONSTRUCTION IN THE VICINITY OF WATER MAINS.
3. SEE THIS SHEET FOR BENCHMARK INFORMATION.
4. PIPE TYPE DESIGNATIONS ARE SDR 26.
5. SEE THIS SHEET FOR TYPICAL SANITARY SEWER / WATER CROSSING DETAIL.
6. ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER.

REFERENCE S.A.W.S. DETAILS

DD-804-01 SANITARY SEWER PIPE LAID IN TRENCH
DD-804-02 TRENCH COMPACTION DETAIL
DD-848-01 GO, NO GO DEFLECTION TESTING MANDREL
DD-852-01 STANDARD PRECAST MANHOLE
DD-852-02 VENTED MANHOLE RING AND COVER DETAIL (WHEN SPECIFIED)
DD-852-03 MANHOLE RING ENCASEMENT DETAIL
DD-854-ERZD HOUSE LATERAL DETAIL (IN THE E.A.R.Z.)
DD-858-01 TYPICAL CONCRETE ENCASEMENT DETAILS
DD-858-02 TYPICAL CONCRETE DETAILS
DD-860-01 TYPICAL VERTICAL STACK DETAILS
DD-852-06 PRECAST MANHOLE BASE 45° ANGLE
DD-852-08 DROP MANHOLE DETAIL
DD-852-07 MANHOLE RING AND COVER DETAIL



TYPICAL SANITARY SEWER/WATER CROSSING DETAIL
N.T.S.
(REFERENCE SAWS DD-812)

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.

MANHOLE NOTE:
ALL MANHOLES MUST BE WATERTIGHT, WITH WATERTIGHT RINGS AND COVERS. THESE MANHOLES MUST BE VENTED PER SAWS DETAIL DD852-02.

DEVELOPER'S NAME: MEH HOLDING COMPANY LTD

DEVELOPER'S ADDRESS: 1202 W. BITTERS RD, BUILDING 1, SUITE 1200

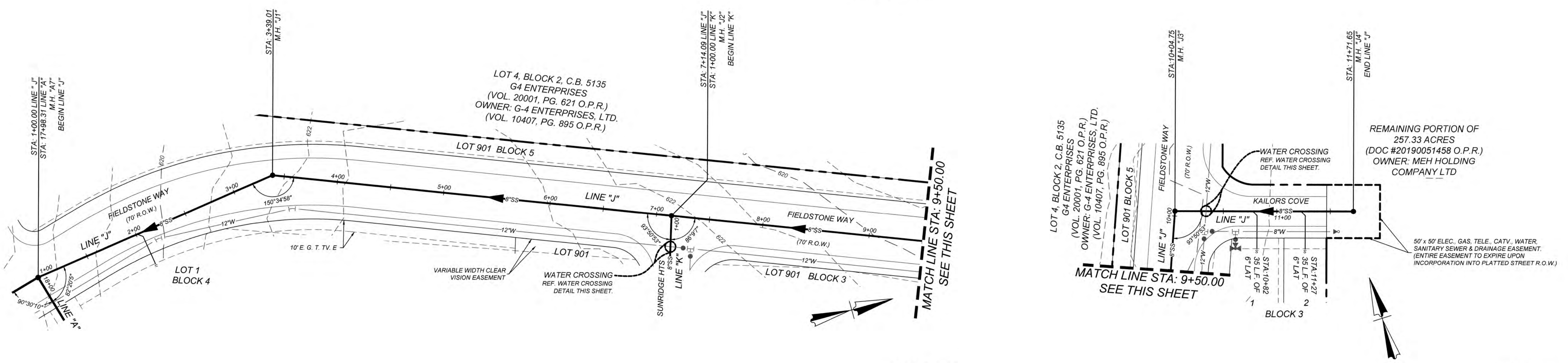
CITY: SAN ANTONIO STATE: TEXAS ZIP: 78258

PHONE#: FAX#: TOTAL ACREAGE: 35.11 AC.

SAWS BLOCK MAP#: 216562, 216560, 214560 TOTAL EDU'S: 95

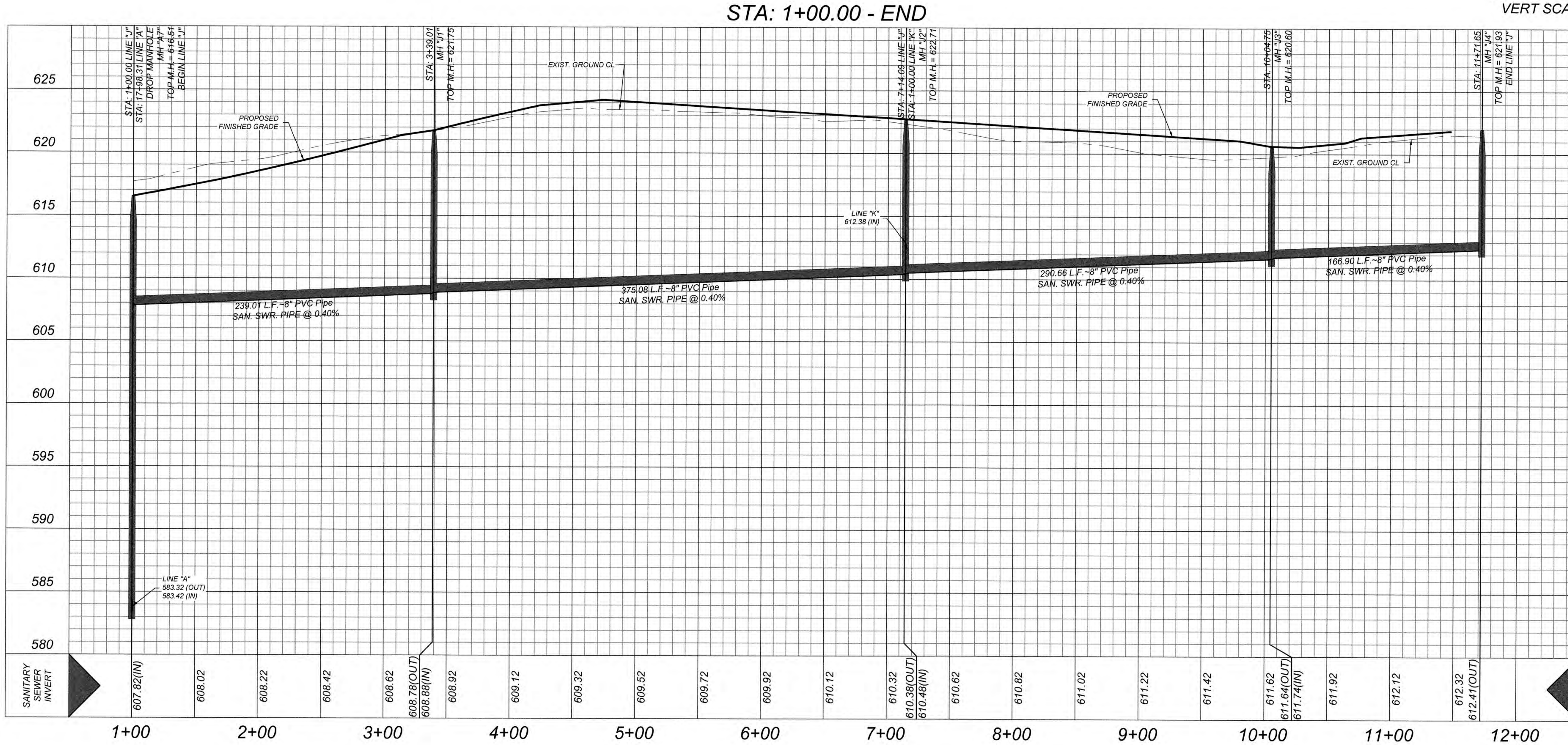
TOTAL LINEAR FOOTAGE OF PIPE: 3,536 L.F. ~ 8" SDR 26
1,235 L.F. ~ 12" SDR 26 PLAT NO.: 21-11800645

NUMBER OF LOTS: 95 SAWS JOB#: 21-1726



LINE "J"
STA: 1+00.00 - END

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



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

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/29/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

LINE "J" PLAN & PROFILE

PLAT NO.
21-11800645

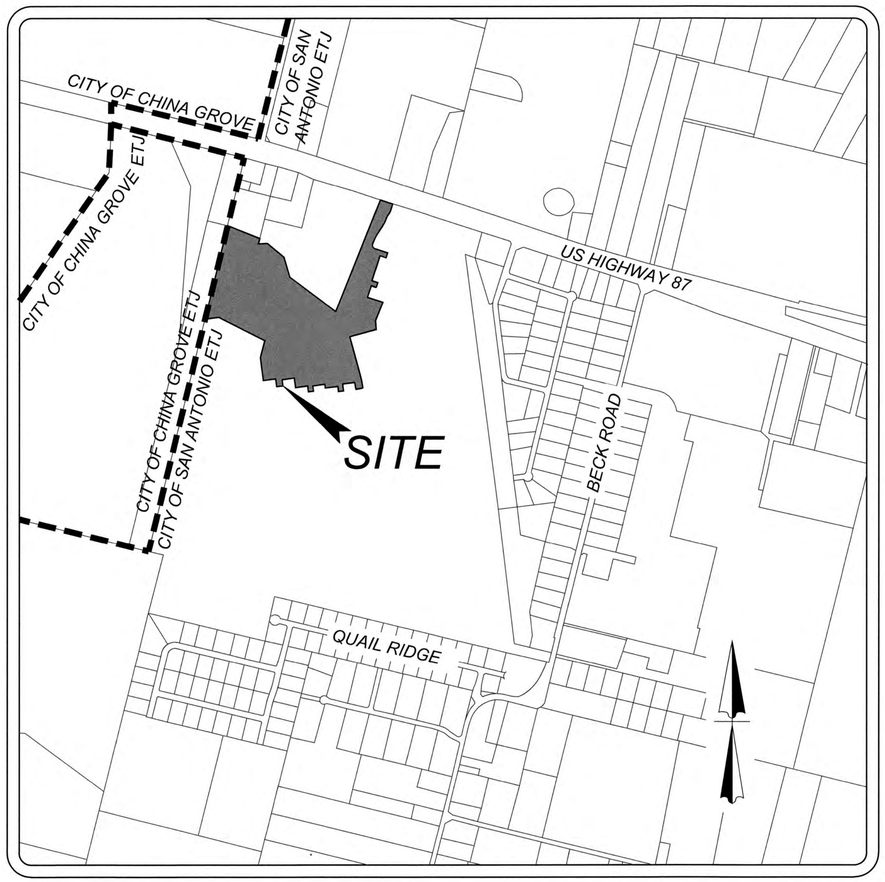
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: CL

SHEET NUMBER:
6.9

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

WATER IMPROVEMENTS



LOCATION MAP
NOT-TO-SCALE

SHEET INDEX

SHEET REVISION LOG

DATE	SHEET NO.	REVISION NO.	DESCRIPTION
11/14/2023	7.1,7.2	1	ADDED GATE VALVES
11/14/2023	7.3-7.6	1	REVISED WATER DETAILS

OWNER INFORMATION
MEH HOLDING COMPANY LTD
1202 W. BITTERS, BUILDING 1, SUITE 1200
SAN ANTONIO, TX 78216

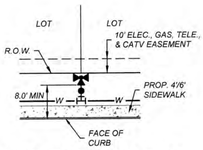
STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
11/14/2023

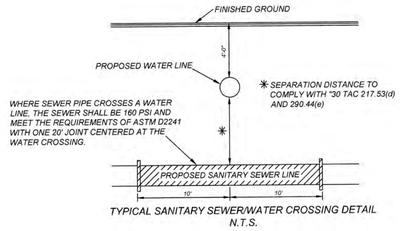
KFW
ENGINEERS + SURVEYING
3421 Paesanos Pkwy., Suite 200, San Antonio, TX 78231
Phone #: (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

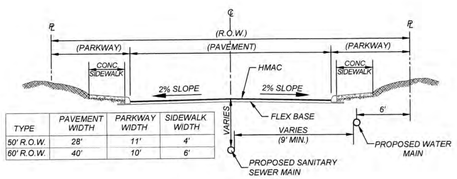
JOB NO.: 205-43-04

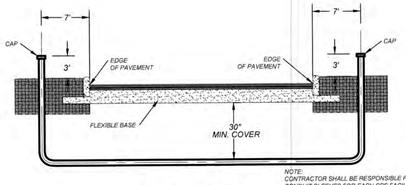
PLAT NO. 21-11800645

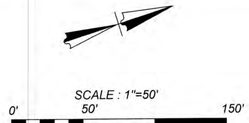
SHEET 7.0

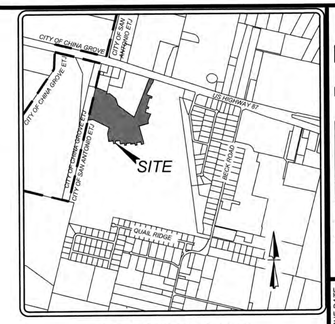












COMPACTION NOTE:

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 ECSUD 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.

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.

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 ECSUD 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.

WATER PLAN NOTES:

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

FIRE FLOW NOTE:

IN AN EFFORT TO MEET THE CITY OF SAN ANTONIO'S FIRE FLOW REQUIREMENTS FOR THE PROPOSED RESIDENTIAL DEVELOPMENT, THE PUBLIC WATER MAIN SYSTEM HAS BEEN DESIGNED FOR A MINIMUM FIRE FLOW DEMAND OF 1,500 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.

TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

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.

WHERE SEWER PIPE CROSSES A WATER LINE, THE SEWER SHALL BE 160 PSI AND MEET THE REQUIREMENTS OF ASTM D2241 WITH ONE 20' JOINT CENTERED AT THE WATER CROSSING.

✳ SEPARATION DISTANCE TO COMPLY WITH "30 TAC 217.53(d) AND 290.44(e)

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

TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	28'	11'	4'
60' R.O.W.	40'	10'	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.

LOCATION MAP
NOT-TO-SCALE

LEGEND

PROPOSED WATER MAIN	=	—— W ——
PROPOSED WATER SERVICE & METER BOX	=	W W
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=	¾IRR
PROPOSED FIRE HYDRANT	=	⧓
PROPOSED WATER VALVE	=	●
PROPOSED SANITARY SEWER MAIN	=	— SS ◀—
PROPOSED SANITARY SEWER MANHOLE	=	——●——
PROPOSED ELECTRIC, GAS, TELE., & CABLE TV EASEMENT	=	E, G, T, & TV ESM'T
EXISTING WATER MAIN	=	— — —E.?"W— — —
EXISTING FIRE HYDRANT	=	⋈
EXISTING WATER VALVE	=	⋈
EXISTING SANITARY SEWER MAIN	=	—E.?"SS— ◁ —
EXISTING SANITARY SEWER MANHOLE	=	— ——○—— —
EXISTING OVERHEAD ELECTRIC W/POWER POLE	=	—OHE- - -●- - -OHE—
EXISTING GUY WIRE/OVERHEAD ELECTRIC	=	- - ▷- - - - -OHE- -

KFW
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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE
11/14/2023

REVISIONS
1 ADDED GATE VALVES

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
Clayton Linney
11/14/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
WATER DISTRIBUTION PLAN (SHEET 1 OF 2)

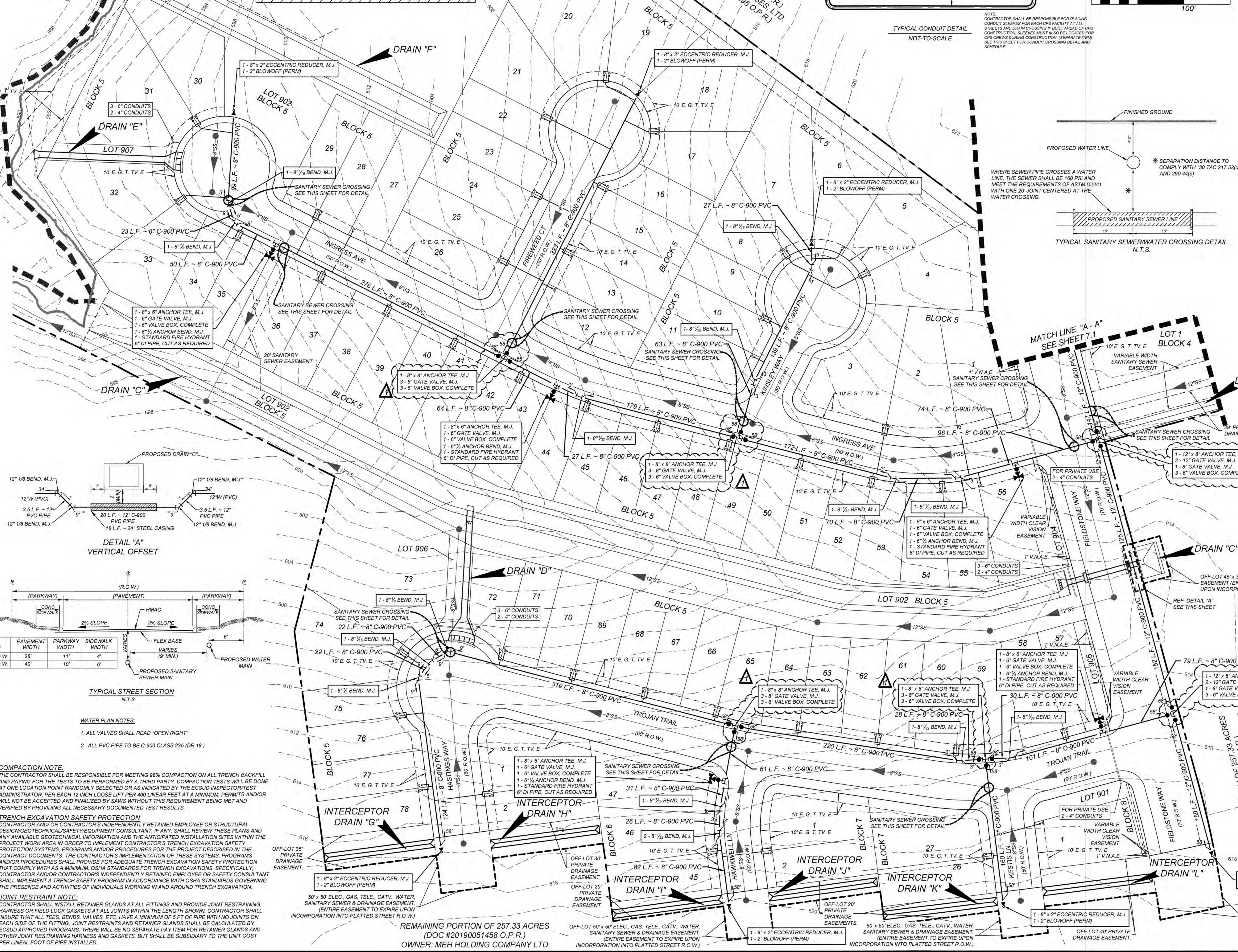
PLAT NO.
21-11800645

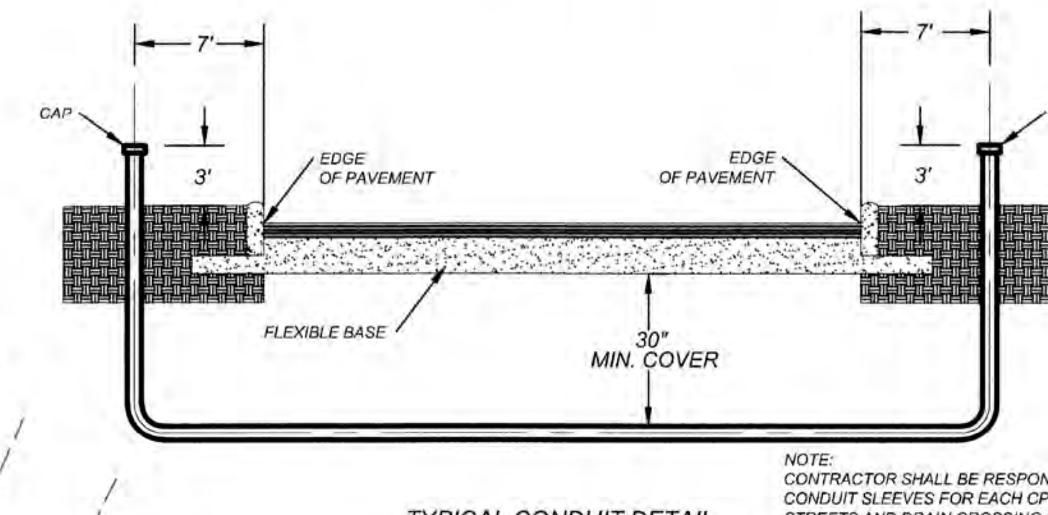
JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

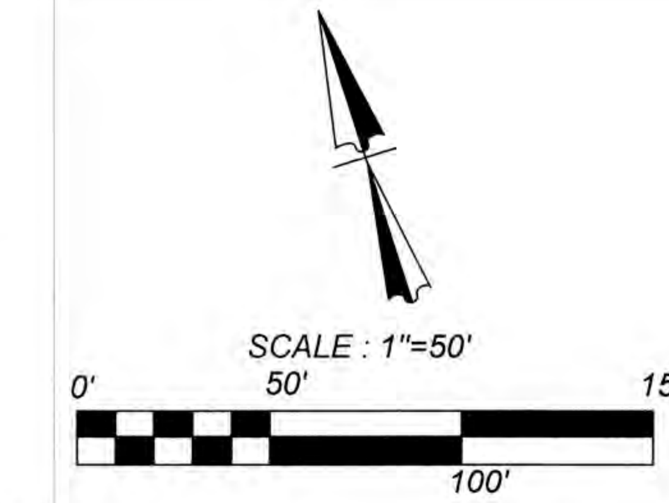
SHEET NUMBER:
7.1

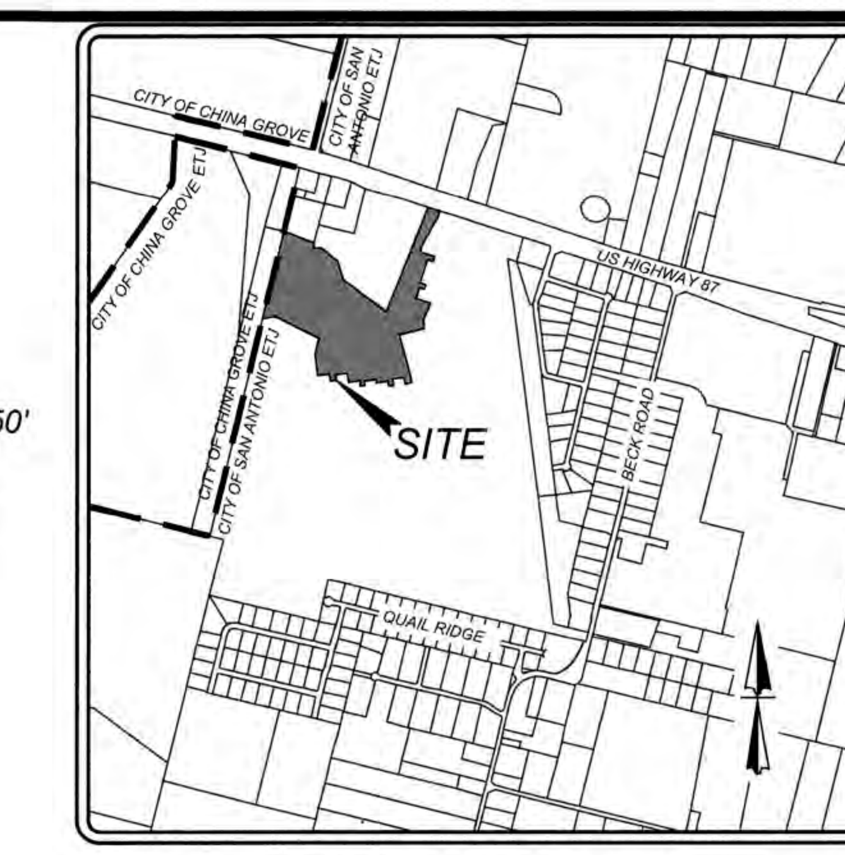
COMPACTION NOTE:
THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND PAYING FOR THE TESTS TO BE PERFORMED BY A THIRD PARTY. COMPACTION TESTS WILL BE DONE AT ONE LOCATION POINT RANDOMLY SELECTED OR AS INDICATED BY THE SAWS INSPECTOR/TEST ADMINISTRATOR, PER EACH 12 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.

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.







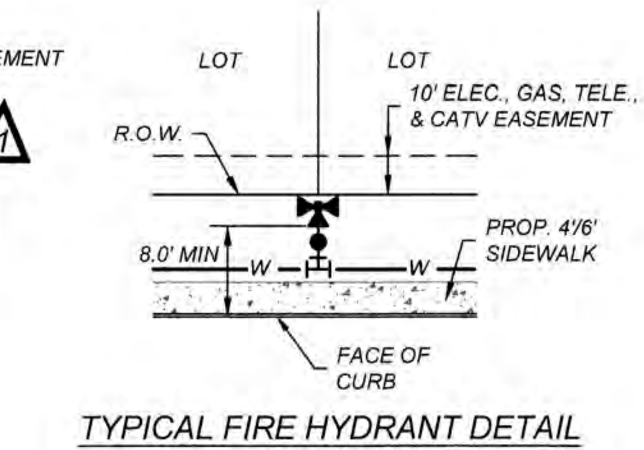


LOCATION MAP
NOT-TO-SCALE

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

LEGEND

PROPOSED WATER MAIN	= —— W ——
PROPOSED WATER SERVICE & METER BOX	=
PROPOSED WATER 3/4" IRRIGATION SERVICE & METER BOX	=
PROPOSED FIRE HYDRANT	=
PROPOSED WATER VALVE	=
PROPOSED SANITARY SEWER MAIN	= —— SS ——
PROPOSED SANITARY SEWER MANHOLE	=
PROPOSED ELECTRIC, GAS, TELE., & CABLE TV EASEMENT	= E, G, T, & TV ESM'T
EXISTING WATER MAIN	= — — —E.?"W— — —
EXISTING FIRE HYDRANT	=
EXISTING WATER VALVE	=
EXISTING SANITARY SEWER MAIN	= —E.?"SS—
EXISTING SANITARY SEWER MANHOLE	=
EXISTING OVERHEAD ELECTRIC W/POWER POLE	= —OHE— — —OHE—
EXISTING GUY WIRE/OVERHEAD ELECTRIC	= — — — —OHE— —



DETAIL "A"
VERTICAL OFFSET

TYPE	PAVEMENT WIDTH	PARKWAY WIDTH	SIDEWALK WIDTH
50' R.O.W.	28'	11'	4'
60' R.O.W.	40'	10'	6'

TYPICAL STREET SECTION
N.T.S.

WATER PLAN NOTES:

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

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 ECSUD 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.

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.

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 ECSUD 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.

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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE 11/14/2023

REVISIONS
△ ADDED GATE VALVES

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
11/14/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

WATER DISTRIBUTION PLAN (SHEET 2 OF 2)

PLAT NO. 21-11800645
JOB NO.:205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
7.2

TESTING OF PRESSURE PIPELINES

1.0 DESCRIPTION

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

2.0 MATERIALS

Not applicable.

3.0 CONSTRUCTION METHODS

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

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

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

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

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

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

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

H. Pressure/Leakage Tests

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

a. For Ductile Iron Pipe:

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

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

b. For PVC Pipe:

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

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

H. Final Acceptance

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

I. Special Project Requirements

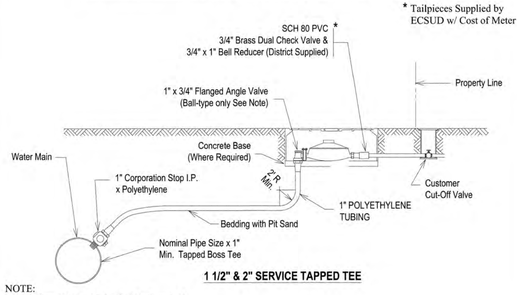
Water Source. Obtaining water for testing purposes shall be the responsibility of the Contractor. The Contractor shall provide all equipment and labor required to transport water from the source to the test point.

4.0 MEASUREMENT AND PAYMENT

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

East Central SUD	TESTING FOR PRESSURE PIPELINES	APPROVED	REVISED
		JULY 2022	
		DET-100-Ø1	SHEET 1 OF 1

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



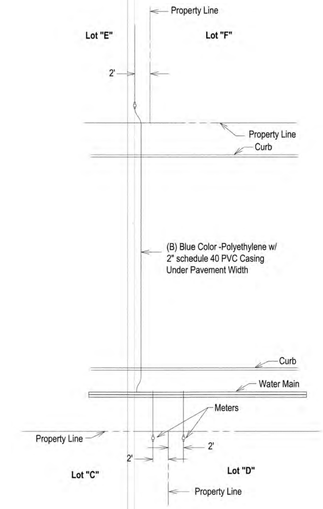
* Tailpieces Supplied by ECSUD w/ Cost of Meter

1 1/2" & 2" SERVICE TAPPED TEE

NOTE:
1. No Direct Tap to Main, Saddle Required
2. Anything Under 1 1/2" will use a angle valve with meter
3. Anything Greater Than 1 1/2" Will Use a Angle x Flange

FOR PERFERED MANUFACTURERS SEE STANDARD SPECIFICATIONS

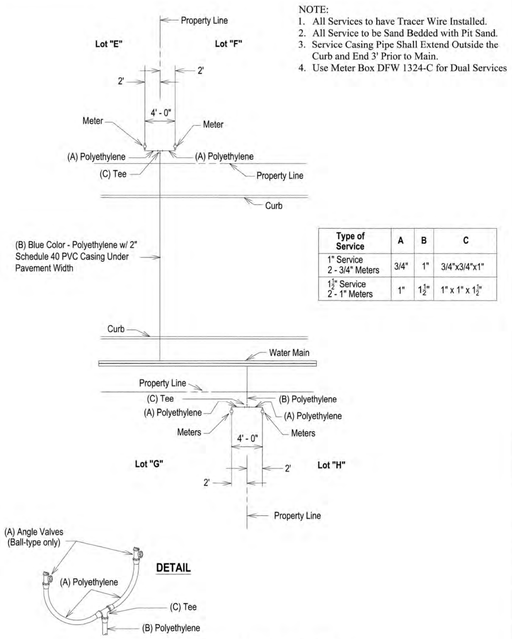
East Central SUD	SERVICE INSTALLATION TAPPING SCHEDULE	APPROVED	REVISED
		JULY 2022	
		DET-824-Ø1	SHEET 1 OF 1



NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Pipe Shall Extend Outside the Curb and End 3' Prior to Main.

SINGLE SERVICE LINE - SINGLE METER

East Central SUD	TYPICAL SERVICE ARRANGEMENT	APPROVED	REVISED
		JULY 2022	
		DET-824-Ø5	SHEET 1 OF 4

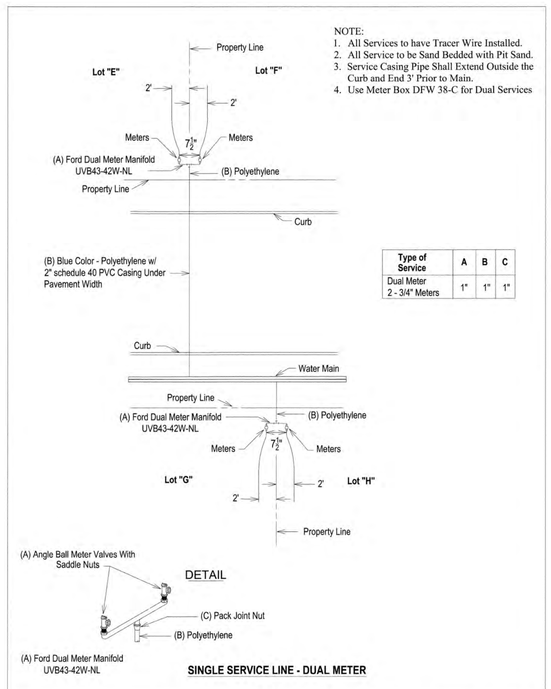


Type of Service	A	B	C
1" Service 2 - 3/4" Meters	3/4"	1"	3/4"x3/4"x1"
1½" Service 2 - 1" Meters	1"	1½"	1" x 1" x 1½"

NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Pipe Shall Extend Outside the Curb and End 3' Prior to Main.
4. Use Meter Box DFW 1324-C for Dual Services

SINGLE SERVICE LINE - DUAL METER

East Central SUD	TYPICAL RURAL SERVICE ARRANGEMENT	APPROVED	REVISED
		JULY 2022	
		DET-824-Ø5	SHEET 2 OF 4

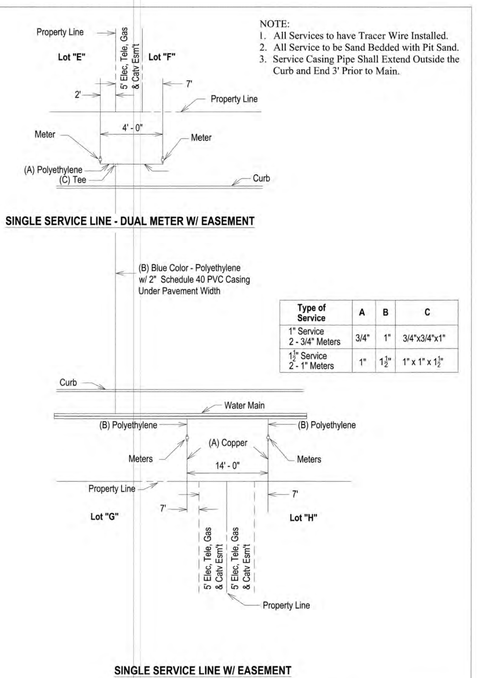


Type of Service	A	B	C
Dual Meter 2 - 3/4" Meters	1"	1"	1"

NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Pipe Shall Extend Outside the Curb and End 3' Prior to Main.
4. Use Meter Box DFW 38-C for Dual Services

SINGLE SERVICE LINE - DUAL METER

East Central SUD	TYPICAL HIGH DENSITY RESIDENTIAL SERVICE ARRANGEMENT	APPROVED	REVISED
		JULY 2022	
		DET-824-Ø5	SHEET 3 OF 4



NOTE:
1. All Services to have Tracer Wire Installed.
2. All Service to be Sand Bedded with Pit Sand.
3. Service Casing Pipe Shall Extend Outside the Curb and End 3' Prior to Main.

SINGLE SERVICE LINE - DUAL METER W/ EASEMENT

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

SINGLE SERVICE LINE W/ EASEMENT

East Central SUD	TYPICAL SERVICE ARRANGEMENT	APPROVED	REVISED
		JULY 2022	
		DET-824-Ø5	SHEET 4 OF 4

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ISSUE DATE 11/14/2023

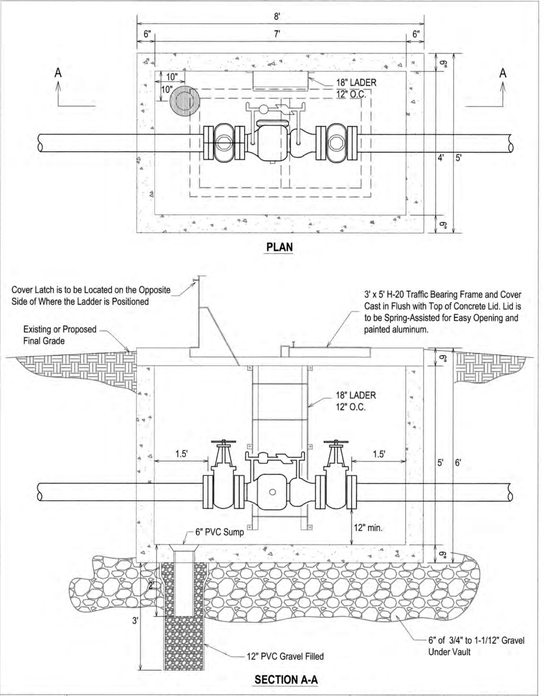
REVISIONS
△ ADDED GATE VALVES

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
11/14/2023

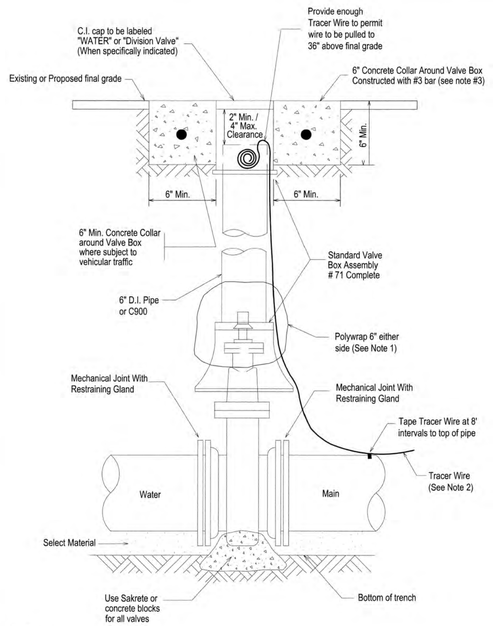
GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
WATER DISTRIBUTION DETAILS (SHEET 1 OF 4)

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:##

SHEET NUMBER:
7.3

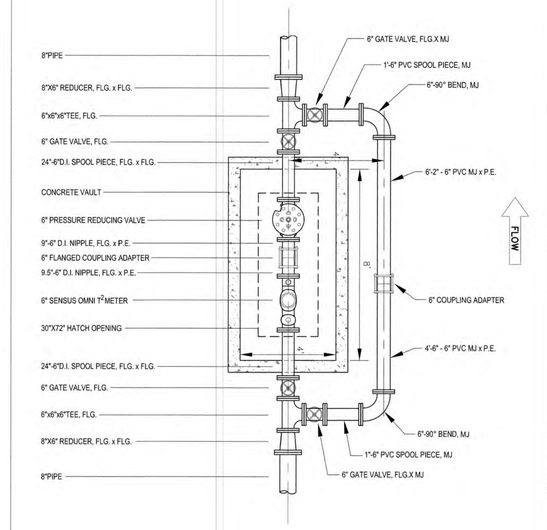


East Central SUD	6" DOUBLE CHECK DETECTOR ASSEMBLY WITH 5'x8' CONCRETE VAULT BOX	APPROVED JULY 2022	REVISED
		DET-808-Ø1	SHEET 1 OF 1



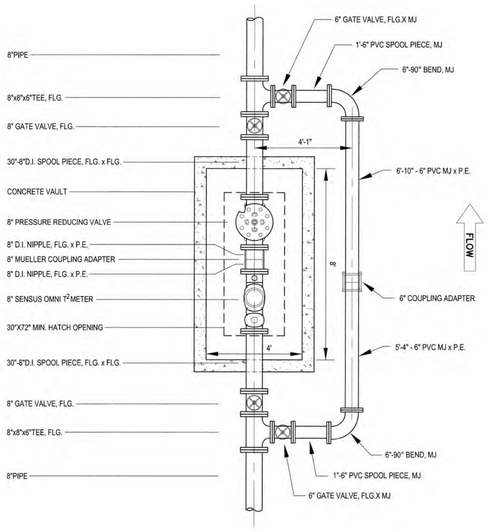
NOTE:
1. Polywrap C-900 or D.I. Pipe to Boot 6" on Either Side.
2. Tracer Wire to be Outside the Pipe Till Valve Box Top Section.
3. Min. 18" Concrete Form Tube Centered Around Valve Box for Concrete Collar W/ #3 Bar.

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



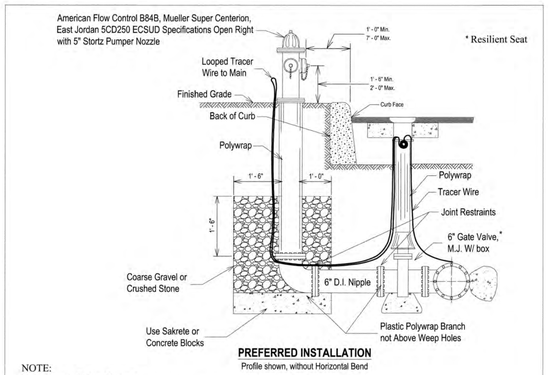
SCALE:1"=3'

East Central SUD	6" TURBO METER DETAIL WITH 4'x8' CONCRETE VAULT BOX	APPROVED JULY 2022	REVISED
		DET-825-Ø1	SHEET 1 OF 1



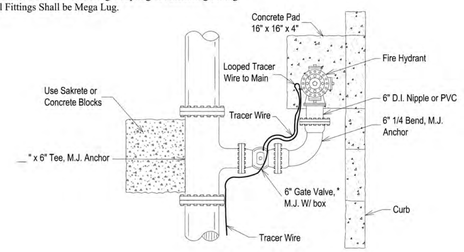
SCALE:1"=3'

East Central SUD	8" TURBO METER DETAIL WITH 4'x8' CONCRETE VAULT BOX	APPROVED JULY 2022	REVISED
		DET-825-Ø2	SHEET 1 OF 1



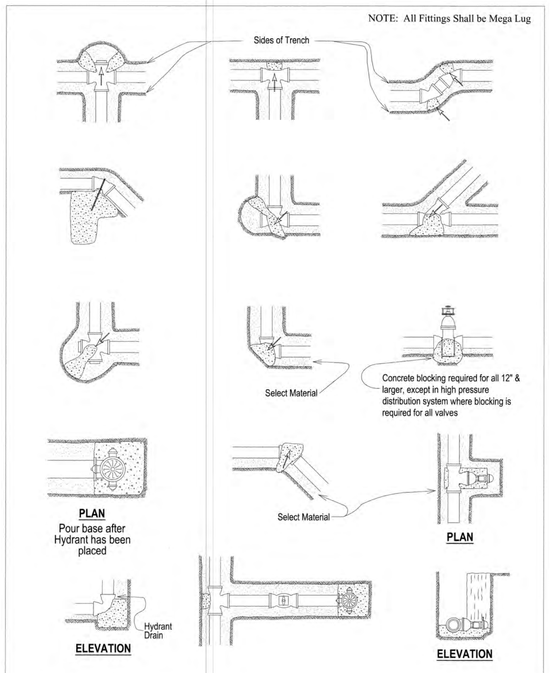
PREFERRED INSTALLATION
Profile shown, without Horizontal Bend

NOTE:
1. Polywrap Below Ground
2. Use Anchoring Tee with M.J. Fitting or M.J. Valve
3. Std. M.J. Tee with Anchoring Coupling or Anchoring Fitting.
4. All Fittings Shall be Mega Lug.



ALTERNATE INSTALLATION
Plan shown, with Bend

East Central SUD	FIRE HYDRANT INSTALLATION	APPROVED JULY 2022	REVISED
		DET-834-Ø1	SHEET 1 OF 1



East Central SUD	THRUST BLOCKS FOR FITTINGS (WATER ONLY)	APPROVED JULY 2022	REVISED
		DET-839-Ø1	SHEET 1 OF 1

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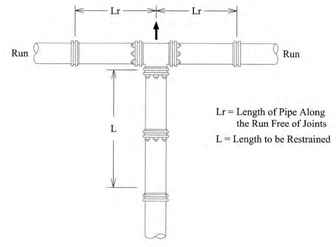
ISSUE DATE 11/14/2023

REVISIONS
1 REVISED WATER DETAILS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
11/14/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
WATER DISTRIBUTION DETAILS (SHEET 2 OF 4)

PLAT NO. 21-11800645
JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: ##
SHEET NUMBER: 7.4



Lr = Length of Pipe Along the Run Free of Joints

L = Length to be Restrained

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

RESTRAINED LENGTH DESIGN

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

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

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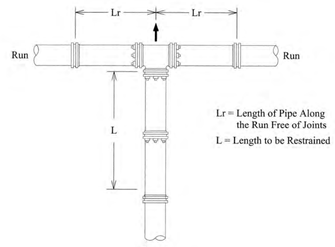
RESTRAINED LENGTHS FOR TEES

APPROVED	REVISED
MARCH 2020	
DET-839-04	SHEET 1 OF 2



Lr = Length of Pipe Along the Run Free of Joints

L = Length to be Restrained

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

RESTRAINED LENGTH DESIGN

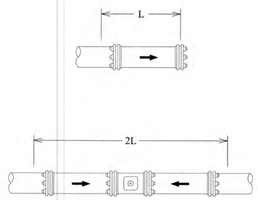
Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet.

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

East Central SUD — OUR QUALITY IS CLEAR

RESTRAINED LENGTHS FOR TEES

APPROVED	REVISED
MARCH 2020	
DET-839-04	SHEET 2 OF 2



L = Length to be Restrained

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

RESTRAINED LENGTH DESIGN

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

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

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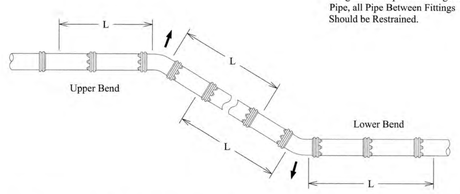
RESTRAINED LENGTHS FOR DEAD ENDS / INLINE VALVES

APPROVED	REVISED
JULY 2022	
DET-839-05	SHEET 1 OF 1

L = Length to be Restrained on Both Sides of Fitting. When Restrained Lengths Overlap on the Diagonal Pipe, all Pipe Between Fittings Should be Restrained.



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

RESTRAINED LENGTH DESIGN

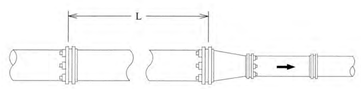
Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet.

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

East Central SUD — OUR QUALITY IS CLEAR

RESTRAINED LENGTHS VERTICAL OFFSETS

APPROVED	REVISED
JULY 2022	
DET-839-06	SHEET 1 OF 1



L = Length to be Restrained

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

RESTRAINED LENGTH DESIGN

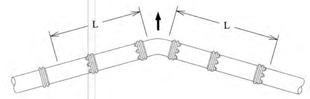
Restrained Length Calculations are for P.V.C. Pipe Bedded in Compacted Granular Material Extending to the Top of the Pipe. The Native Soil Material is Assumed to be Inorganic Clay of High Plasticity. Depth of Bury is Assumed to be 4 Feet.

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

East Central SUD — OUR QUALITY IS CLEAR

RESTRAINED LENGTHS FOR REDUCERS

APPROVED	REVISED
JULY 2022	
DET-839-07	SHEET 1 OF 1



L = Length to be Restrained on Both Sides of Fitting

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

RESTRAINED LENGTH DESIGN

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

NOTE:
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East Central SUD — OUR QUALITY IS CLEAR

RESTRAINED LENGTHS FOR HORIZONTAL BENDS

APPROVED	REVISED
JULY 2022	
DET-839-08	SHEET 1 OF 1

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

REVISIONS
1 ADDED DATE VALVES

ISSUE DATE 11/14/2023

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
11/14/2023

GATES SUBDIVISION UNIT 1

BEXAR COUNTY, TX

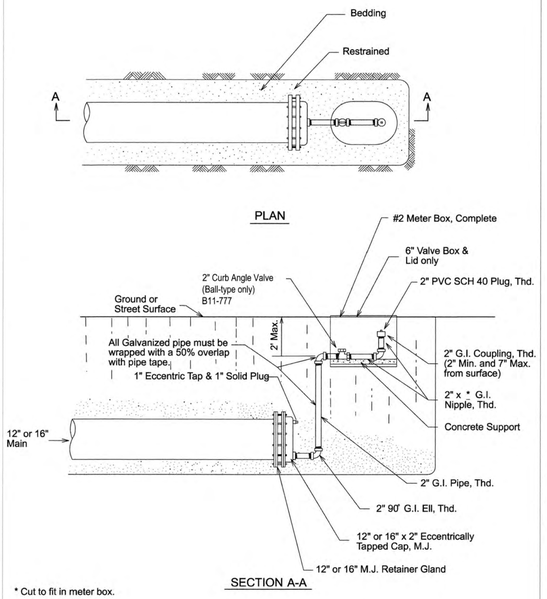
WATER DISTRIBUTION DETAILS (SHEET 3 OF 4)

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:##

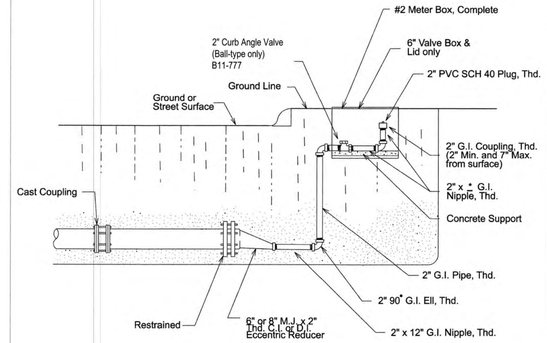
SHEET NUMBER:

7.5



* Cut to fit in meter box.

East Central SUD	2" PERMANENT BLOW-OFF ASSEMBLY ON 12" & 16" MAINS	APPROVED JULY 2022	REVISED
		DET-844-02	SHEET 1 OF 2



* Cut to fit in meter box.

East Central SUD	2" PERMANENT BLOW-OFF ASSEMBLY ON 6" & 8" MAINS	APPROVED JULY 2022	REVISED
		DET-844-02	SHEET 2 OF 2

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

ISSUE DATE 11/14/2023

REVISIONS
1 ADDED GATE VALVES

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
11/14/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
WATER DISTRIBUTION DETAILS (SHEET 4 OF 4)

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN: OM CHECKED: ##

SHEET NUMBER:
7.6

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).
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GENERAL:

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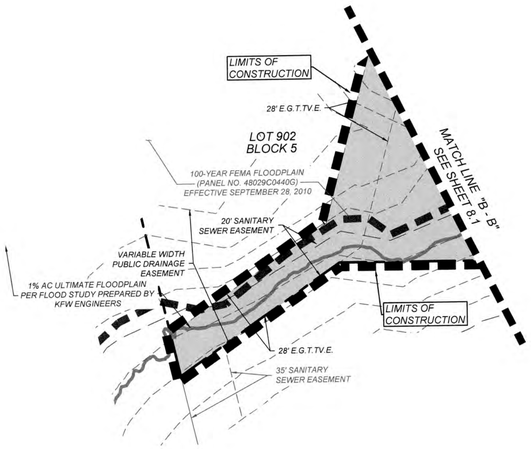
2. THE PURPOSE OF THE SIGNATURE AND SEAL OF THE ENGINEER ON THIS DOCUMENT IS TO DEMONSTRATE COMPLIANCE WITH THE TPDES STORMWATER POLLUTION PREVENTION PLAN REGULATIONS ONLY.
3. ALL OWNERS/OPERATORS ARE RESPONSIBLE FOR FAMILIARIZING THEMSELVES WITH THE STORMWATER POLLUTION PREVENTION PLAN AND COMPLYING WITH THE REGULATIONS CONTAINED WITHIN IT.

LEGEND

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

LOCATION MAP
NOT-TO-SCALE

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

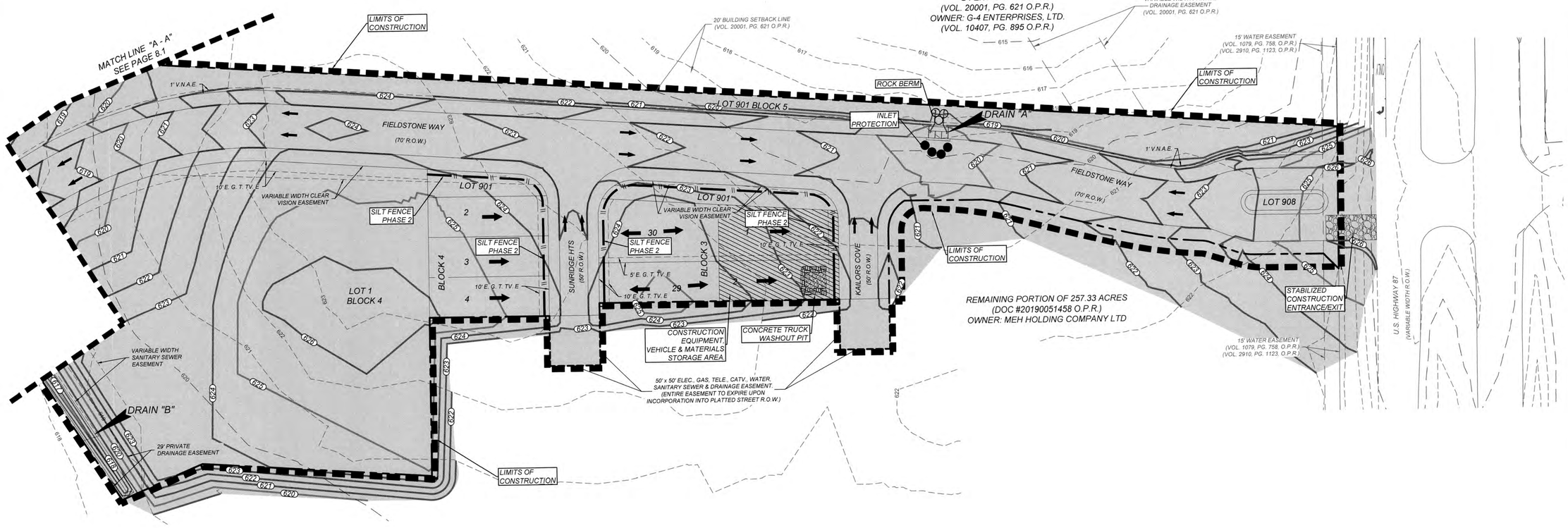


SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

COORDINATION NOTE:

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



KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone # (210) 979-8444 • Fax #: (210) 979-8441
TBPE Firm #: 9513 • TBPLS Firm #: 10124500

ISSUE DATE

REVISIONS

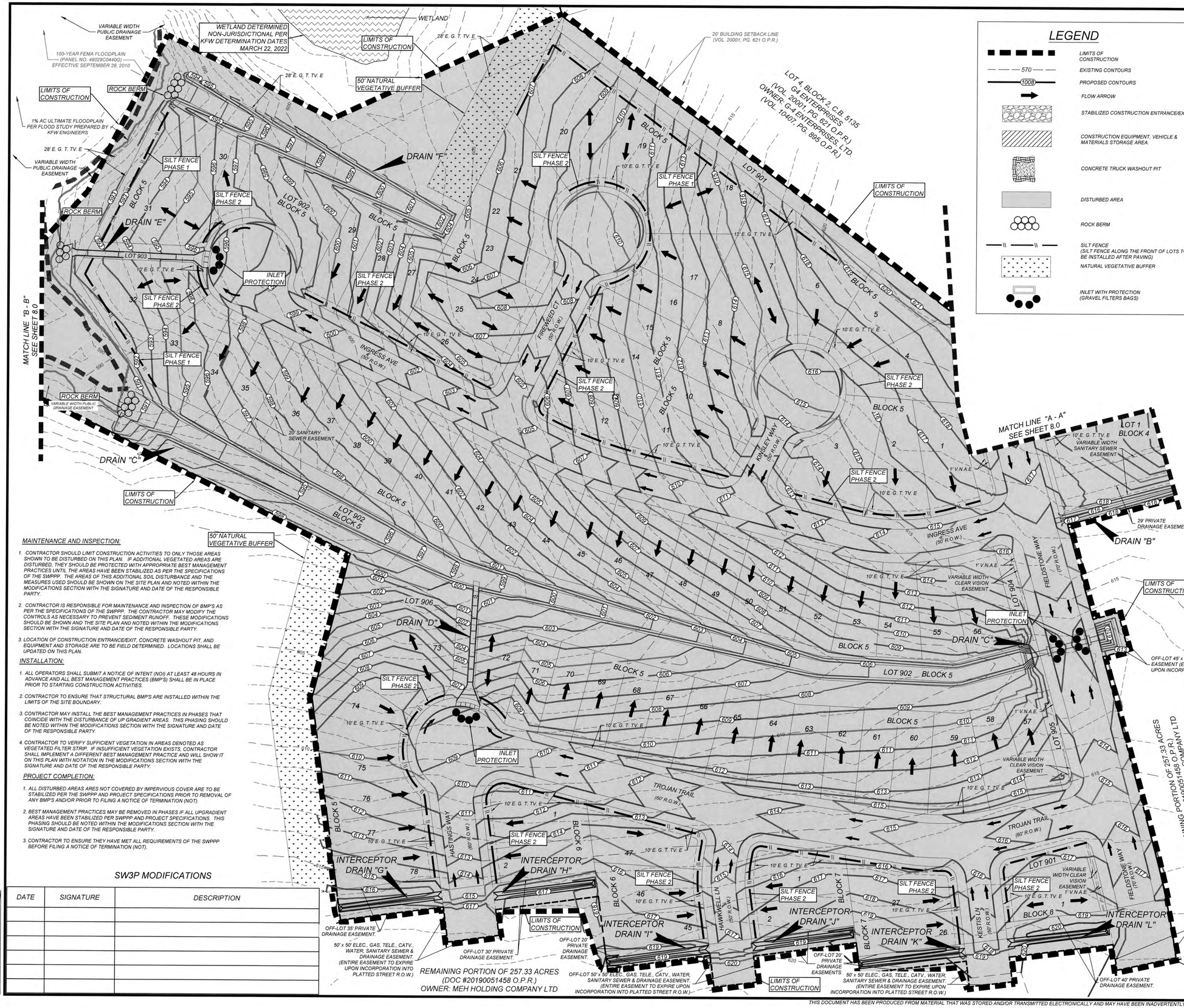
STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/29/2023

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
STORM WATER POLLUTION PREVENTION PLAN
(SHEET 1 OF 2)

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
8.0



LEGEND

- LIMITS OF CONSTRUCTION
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- 1008 — PROPOSED CONTOURS
- FLOW ARROW
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.
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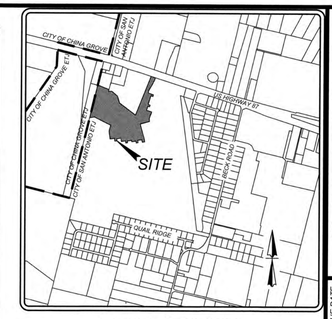

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100'

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SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED PROFESSIONAL ENGINEER
6/29/2023

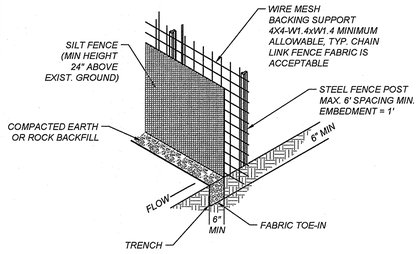
GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX

STORM WATER POLLUTION PREVENTION PLAN (SHEET 2 OF 2)

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
8.1



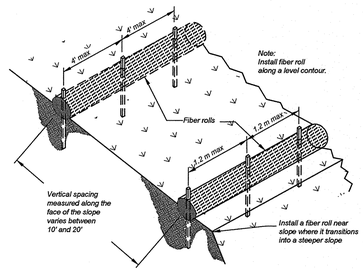
ISOMETRIC PLAN VIEW

SILT FENCE

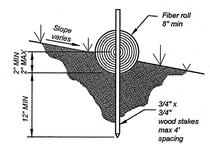
Materials:
(1) Silt fence material should be polypropylene, polyethylene or polyamide woven or nonwoven fabric. The fabric width should be 36 inches, with a minimum unit weight of 4.5 oz/yd, mullen burst strength exceeding 190 lb/in2, ultraviolet stability exceeding 70%, and minimum apparent opening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

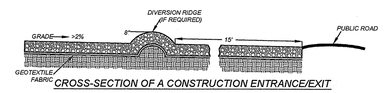
FIBER ROLL

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.

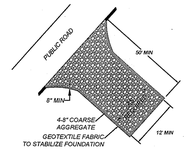
Implementation:
(1) Locate fiber rolls on level contours spaced as follows:
Slope inclination of 4:1 (H:V) or flatter: Fiber rolls should be placed at a maximum interval of 20 ft.
Slope inclination between 4:1 and 2:1 (H:V): Fiber Rolls should be placed at a maximum interval of 15 ft. (a closer spacing 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.



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 rock should be included in the plans. Divert wastewater to a sediment trap or basin.

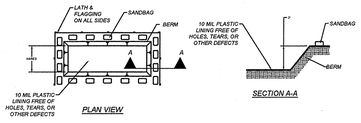


TEMPORARY CONSTRUCTION ENTRANCE/EXIT

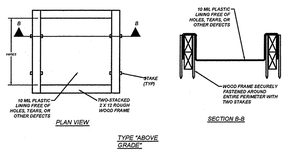
Installation: (North Carolina, 1993)
(1) Avoid curves on public roads and steep slopes. Remove vegetation and other objectionable material from the foundation area. Grade crown foundation for positive drainage.
(2) The minimum width of the entrance/exit should be 12 feet or the full width of exit roadway, whichever is greater.
(3) The construction entrance should be at least 50 feet long.
(4) If the slope toward the road exceeds 2%, construct a ridge, 6 to 8 inches high with 3:1 (H:V) side slopes, across the foundation approximately 15 feet from the entrance to divert runoff away from the public road.
(5) Place geotextile fabric and grade foundation to improve stability, especially where wet conditions are anticipated.
(6) Place stone to dimensions and grade shown on plans. Leave surface smooth and slope for drainage.
(7) Divert all surface runoff and drainage from the stone pad to a sediment trap or basin.
(8) Install pipe under pad as needed to maintain proper public road drainage.

Inspection and Maintenance Guidelines:
(1) The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
(2) All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.
(3) When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.
(4) When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.
(5) All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

STABILIZED CONSTRUCTION ENTRANCE / EXIT



TYPE "BELOW GRADE"

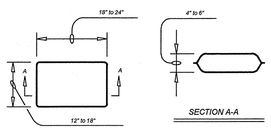


TYPE "ABOVE GRADE"

GENERAL NOTES:

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

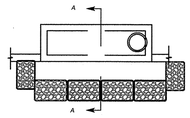
CONCRETE TRUCK WASHOUT PIT

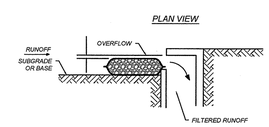


GENERAL NOTES:

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

GRAVEL FILTER BAG DETAIL

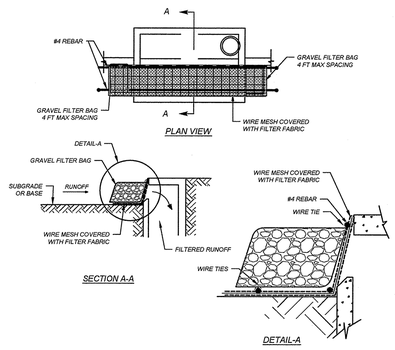




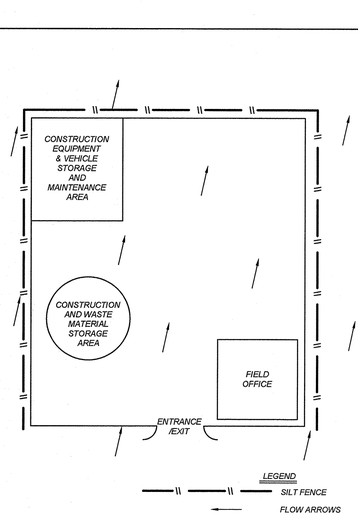
GENERAL NOTES:

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

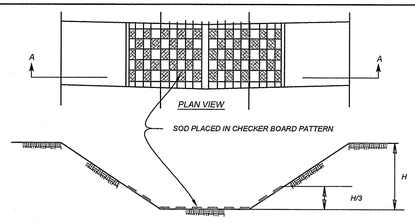
CURB INLET PROTECTION GRAVEL FILTER BAGS



CURB INLET PROTECTION (ALTERNATE)

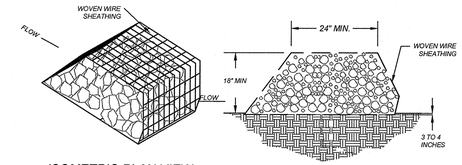


TYPICAL CONSTRUCTION STAGING AREA



- *CHANNEL TO BE STABILIZED WITH SOD PLACED IN A CHECKER BOARD PATTERN TON THE CHANNEL BOTTOM AND ON THE SIDES UP TO 1/3 THE DEPTH OF CHANNEL.*

CHANNEL LINING



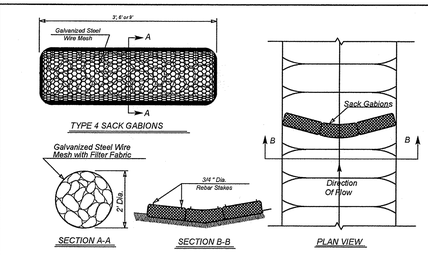
ISOMETRIC PLAN VIEW — CROSS SECTION

Materials:
(1) The berm structure should be. secured with a woven wire sheathing having maximum opening of 1 inch and a minimum wire diameter of 20 gauge galvanized and should be secured with shoat rings.
(2) Clean, open graded 3- to 5-inch diameter rock should be used, except in areas where high velocities or large volumes of flow are expected, where 5- to 8-inch diameter rocks may be used.

Installation:
(1) Lay out the woven wire sheathing perpendicular to the flow line. The sheathing should be 20 gauge woven wire mesh with 1 inch openings.
(2) Berm should have a top width of 2 feet minimum with side slopes being 2:1 (H:V) or flatter.
(3) Place the rock along the sheathing as shown in the diagram Figure 1-28), to a height not less than 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, ain't 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



- *THE TOP OF THE SACK GABIONS SHOULD BE LEVEL AND ORIENTED PERPENDICULAR TO THE DIRECTION OF FLOW.*
- *FILTER FABRIC MATERIAL SHALL BE FASTENED TO WOVEN WIRE SUPPORT.*
- *FILTER FABRIC MATERIAL SHOULD MEET THE FOLLOWING SPECIFICATIONS: RESISTANT TO ULTRAVIOLET LIGHT, FABRIC SHOULD BE NON-WOVEN GEOTEXTILE WITH MINIMUM WEIGHT OF 3.5 OUNCES PER SQUARE YARD, MINIMUM MULLEN BURST STRENGTH OF 200 POUNDS PER SQUARE INCH AND A FLOW THRU RATE OF 120 GALLONS PER MINUTE PER SQUARE FOOT OF FRONTAL AREA.*
- *STONE SIZE: ±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

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ENGINEERS + SURVEYING
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TBPE Firm #: 9513 • TBPLS Firm #: 10124300

ISSUE DATE

REVISIONS

STATE OF TEXAS
CLAYTON J. LINNEY
111543
LICENSED
PROFESSIONAL ENGINEER
4/8/2022

GATES SUBDIVISION UNIT 1
BEXAR COUNTY, TX
STORM WATER POLLUTION PREVENTION DETAILS

PLAT NO. 21-11800645

JOB NO. 205-43-04
DATE: OCTOBER 2021
DRAWN:OM CHECKED:CL

SHEET NUMBER:
8.2

Date: Apr 19, 2022, 9:45am User ID: omeiners
File: P:\205\43\04\Design\Civil\SWPPP\205430 4.dwg