SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

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

GENERAL NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CITY OF SAN ANTONIO STANDARD SPECIFICATIONS FOR CONSTRUCTION JUNE 2008, OR LATEST.
2. NO EXTRA PAYMENT SHALL BE ALLOWED FOR WORK CALLED FOR ON THE PLANS, BUT NOT INCLUDED IN THE BID PROPOSAL. THIS INCIDENTAL WORK WILL BE REQUIRED AND SHALL BE INCLUDED IN THE PAY ITEM TO WHICH IT RELATES.
3. THE CONTRACTOR SHALL PROVIDE ACCESS FOR THE DELIVERY OF MAIL BY THE U.S. POSTAL SERVICE. 4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING TO ITS ORIGINAL OR BETTER CONDITION ANY DAMAGE DONE TO EXISTING FENCES, CONCRETE ISLANDS, STREET PAVING, CURBS, SHRUBS, BUSHES OR DRIVEWAYS. (NO SEPARATE PAY ITEM).
4. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SEE THAT ALL SIGNS AND BARRICADES ARE PROPERLY INSTALLED AND MAINTAINED. ALL LOCATIONS AND DISTANCES WILL BE DECIDED UPON IN THE FIELD BY THE CONTRACTOR, USING THE "TEXAS MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES". THE CITY'S CONSTRUCTION INSPECTOR AND TRAFFIC ENGINEERING REPRESENTATIVE WILL ONLY BE RESPONSIBLE TO INSPECT BARRICADES AND SIGNS. IF, IN THE OPINION OF THE TRAFFIC ENGINEERING REPRESENTATIVE AND THE CONSTRUCTION INSPECTOR, THE BARRICADES AND SIGNS DO NOT CONFORM TO ESTABLISHED STANDARDS OR ARE INCORRECTLY PLACED OR ARE INSUFFICIENT IN QUANTITY TO PROTECT THE GENERAL PUBLIC, THE CONSTRUCTION INSPECTOR SHALL HAVE THE OPTION TO STOP OPERATIONS UNTIL SUCH TIME AS THE CONDITIONS ARE CORRECTED.
5. IF THE NEED ARISES, ADDITIONAL BARRICADES AND DIRECTIONAL DEVICES MAY BE ORDERED BY THE TRAFFIC ENGINEERING REPRESENTATIVE AT THE CONTRACTOR'S EXPENSE.
6. DUE TO FEDERAL REGULATIONS TITLE 49, PART 192.171 C.P.S. MUST MAINTAIN ACCESS TO GAS VALVES AT ALL TIMES. THE CONTRACTOR MUST PROTECT AND WORK AROUND ANY GAS VALVES THAT ARE IN THE PROJECT AREA.
7. CONTRACTOR SHALL NOTIFY THE CITY INSPECTOR TWENTY FOUR (24) HOURS PRIOR TO BACKFILL OF ANY UTILITY TRENCHES TO SCHEDULE FOR DENSITY TEST AS REQUIRED.
8. CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES, MARKS, ETC. IF ANY ARE DESTROYED OR REMOVED BY THE CONTRACTOR OR HIS EMPLOYEES, THEY SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
9. CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES PRIOR TO CONSTRUCTION TO DETERMINE THE LOCATION OF EXISTING UTILITIES. CONTRACTOR SHALL NOTIFY THE FOLLOWING AT LEAST FORTY-EIGHT (48) HOURS PRIOR TO EXCAVATION OPERATION:

SAN ANTONIO WATER SYSTEM (SAWS)	233-2010
BEXAR METROPOLITAN WATER DISTRICT (BEXAR MET)	354-6538 / 357-5741
COSA DRAINAGE	207-8048
COSA SIGNAL OPERATIONS	207-7720 / 207-7765
TEXAS STATE WIDE ONE CALL LOCATOR	1-800-344-8377
CITY PUBLIC SERVICE ENERGY - TIME WARNER - AT&T - MCI	

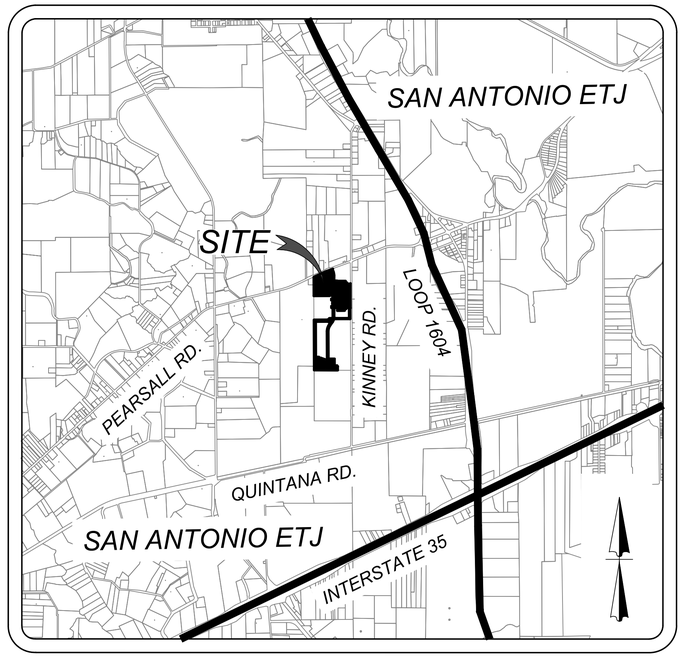
10. THE EXISTENCE AND LOCATION OF UNDERGROUND UTILITIES INDICATED ON THE PLANS ARE TAKEN FROM AVAILABLE RECORDS AND ARE NOT GUARANTEED, BUT SHALL BE INVESTIGATED AND VERIFIED BY THE CONTRACTOR BEFORE STARTING WORK. THE CONTRACTOR SHALL BE HELD RESPONSIBLE FOR ANY DAMAGE TO AND FOR THE MAINTENANCE AND PROTECTION OF THE EXISTING UTILITIES EVEN IF THEY ARE NOT SHOWN ON THE PLANS. LOCATION AND DEPTH OF EXISTING UTILITIES SHOWN HERE ARE APPROXIMATE ONLY. ACTUAL LOCATIONS AND DEPTHS MUST BE VERIFIED BY THE CONTRACTOR PRIOR TO CONSTRUCTION AND HE SHALL BE RESPONSIBLE FOR PROTECTION OF SAME DURING CONSTRUCTION.
11. ALL WASTE MATERIAL SHALL BECOME PROPERTY OF THE CONTRACTOR AND SHALL BE HIS SOLE RESPONSIBILITY TO DISPOSE OF THIS MATERIAL OFF THE LIMITS OF THE PROJECT. NO WASTE MATE- RIAL SHALL BE PLACED IN EXISTING LOWS THAT WILL BLOCK OR ALTER FLOW LIMITS OF EXISTING ARTIFICIAL OR NATURAL DRAINAGE.
12. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIAL IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT.
13. THE CONTRACTOR SHALL MAINTAIN ALL ADJOINING STREETS AND TRAVELED ROUTES FREE FROM SPILLED AND / OR TRACKED CONSTRUCTION MATERIALS AND / OR DEBRIS.
14. IF THE CONTRACTOR ENCOUNTERS ANY ARCHAEOLOGICAL DEPOSITS DURING CONSTRUCTION OPERATIONS, THE CONTRACTOR MUST STOP EXCAVATION IMMEDIATELY, CONTACT THE CITY INSPECTOR, AND CALL THE CITY HISTORIC PRESERVATION OFFICE AT 207-7306 OR 207-3327 FOR AN ARCHAEOLOGICAL INVESTIGATION. THE CONTRACTOR CANNOT BEGIN EXCAVATION AGAIN WITHOUT WRITTEN PERMISSION FROM THE CITY IF MORE THAN THREE (3) DAYS ARE REQUIRED FOR INVESTIGATION (NOT INCLUDING HOLIDAY AND WEEKENDS) AND IF THE CONTRACTOR IS UNABLE TO WORK IN OTHER AREAS, THEN THE CONTRACTOR WILL BE ALLOWED TO NEGOTIATE FOR ADDITIONAL CONSTRUCTION TIME UPON WRITTEN REQUEST WITHIN TEN (10) DAYS AFTER THE FIRST NOTICE TO THE CITY OF ARCHAEOLOGICAL INVESTIGATION FOR EACH EVENT. IF THE TIME REQUIRED FOR INVESTIGATION IS LESS THAN OR EQUAL TO THREE (3) DAYS FOR EACH EVENT, CONTRACT DURATION WILL NOT BE EXTENDED.
15. IF SUSPECTED CONTAMINATION IS ENCOUNTERED DURING CONSTRUCTION OPERATIONS, C.O.S.A. SHALL BE NOTIFIED IMMEDIATELY WHEN CONTAMINATED SOILS AND / OR GROUNDWATER ARE ENCOUNTERED AT LOCATIONS NOT IDENTIFIED IN THE PLANS. THE NOTIFICATION SHOULD INCLUDE THE STATION NUMBER, TYPE OF CONTAMINATED MEDIA, EVIDENCE OF CONTAMINATION AND MEASURES TAKEN TO CONTAIN THE CONTAMINATED MEDIA AND PREVENT PUBLIC ACCESS. THE CONTAMINATED SOIL AND / OR GROUNDWATER SHALL NOT BE REMOVED FROM THE LOCATION WITHOUT PRIOR C.O.S.A. APPROVAL. THE CONTRACTOR MUST STOP THE EXCAVATION IMMEDIATELY AND CONTACT THE C.O.S.A. INSPECTOR. THE CONTRACTOR CANNOT BEGIN EXCAVATION ACTIVITIES WITHOUT WRITTEN PERMISSION FROM THE CITY.
16. CONTRACTOR IS TO INCLUDE A MAILBOX POST BLOCKOUT FOR VACANT LOTS AND ALL RESIDENCES WHICH DO NOT HAVE MAILBOXES AT THE CURB. BLOCKOUTS ARE PROVIDED FOR FUTURE USE BY THE POST OFFICE.
17. CONTRACTOR SHALL NOT REMOVE OR ADJUST ANY VIA FACILITIES. THE CONTRACTOR MUST CONTACT VIA FOURTEEN DAYS PRIOR, FOR THE REMOVAL OF BENCHES, STOP POLES OR ANY OTHER VIA FACILITIES THAT MAY BE PRESENT. PLEASE PROVIDE THIRTY DAYS PRIOR NOTICE FOR SHELTER REMOVAL (TELEPHONE NOS: (210) 362-2155 OR (210) 362-2096). THE CONTRACT- OR WILL BE LIABLE FOR ANY DAMAGES TO VIA FACILITIES NOT REMOVED BY VIA. THE CON- TRACTOR IS REQUIRED TO REPLACE ALL FLATWORK REMOVED OR DAMAGED IN THE COURSE OF EXECUTING THE CONTRACT UNLESS OTHERWISE NOTED BY VIA. THE CONTRACTOR WILL BE RESPONSIBLE FOR PROTECTING VIA FACILITIES IF ADJACENT TO WORK AREA.

TREE PROTECTION AND PRESERVATION GENERAL NOTES

1. NO UTILITY OR STREET EXCAVATION WORK SHALL BEGIN IN AREAS WHERE TREE PRESERVATION AND TREATMENT MEASURES HAVE NOT BEEN COMPLETED AND APPROVED.
2. TREE PROTECTION FENCING SHALL BE REQUIRED. TREE PROTECTION FENCING SHALL BE INSTALLED, MAINTAINED AND REPAIRED BY THE CONTRACTOR DURING SITE CONSTRUCTION. DURING CONSTRUCTION ACTIVITY, AT LEAST A SIX-INCH LAYER OF COARSE MULCH SHALL BE PLACED AND MAINTAINED OVER THE ROOT PROTECTION ZONE (NO SEPARATE PAY ITEM).
3. THE CONTRACTOR SHALL AVOID CUTTING ROOTS LARGER THAN ONE INCH IN DIAMETER WHEN EXCAVATING NEAR EXISTING TREES. EXCAVATION IN THE VICINITY OF TREES SHALL PROCEED WITH CAUTION. THE CONTRACTOR SHALL CONTACT THE CITY INSPECTOR FOR GUIDANCE.
4. ROOTS WILL BE CUT WITH A ROCK SAW OR BY HAND, NOT BY AN EXCAVATOR OR OTHER ROAD CONSTRUCTION EQUIPMENT.
5. ALL CURB AND SIDEWALK WORK SHALL USE ALTERNATIVE CONSTRUCTION METHODS TO MINIMIZE EXTENSIVE ROOT DAMAGE TO TREES (REFER TO DETAILS).
6. EXPOSED ROOTS SHALL BE COVERED AT THE END OF THE DAY USING TECHNIQUES SUCH AS COVERING WITH SOIL, MULCH, OR WET BURLAP.
7. NO EQUIPMENT, VEHICLES OR MATERIALS SHALL OPERATE OR BE STORED WITHIN THE ROOT PROTECTION ZONE OF ANY TREE NEAR THE PROJECT. ROOT PROTECTION ZONE IS 1 FOOT OF RADIUS PER INCH OF TREE'S DIAMETER. A 10-INCH DIAMETER TREE WOULD HAVE A 10 FOOT RADIUS ROOT PROTECTION ZONE AROUND THE TREE. ROOTS OR BRANCHES IN CONFLICT WITH THE CONSTRUCTION SHALL BE CUT CLEANLY ACCORDING TO PROPER PRUNING METHODS. OAK WOUNDS SHALL BE PAINTED OVER WITHIN 30 MINUTES TO PREVENT OAK WILT.
8. SAPLINGS, SHRUBS OR BUSHES TO BE CLEARED FROM THE PROTECTED ROOT ZONE AREA OF A LARGE TREE SHALL BE REMOVED BY HAND AS DESIGNATED BY THE INSPECTOR.
9. NO WIRES, NAILS OR OTHER MATERIAL MAY BE ATTACHED TO PROTECTED TREES.
10. TREES, TREE LIMBS, BUSHES AND SHRUBS LOCATED IN THE CITY STREET OR ALLEY RIGHT-OF-WAY OR PERMANENT EASEMENTS WHICH INTERFERE WITH PROPOSED CONSTRUCTION ACTIVITIES SHALL BE PROPERLY PRUNED FOLLOWING THE ANSI A-300 STANDARDS FOR PRUNING. ALL TREE PRUNING SHALL BE COMPLETED BY A CITY OF SAN ANTONIO TREE MAINTENANCE LICENSED CONTRACTOR (ARTICLE 21-171, CITY CODE) ONLY AFTER APPROVAL FROM THE CAPITAL PROJECTS MANAGEMENT THROUGH THE INSPECTOR.
11. NO EXCESSIVE TREE TRIMMING WILL BE PERMITTED.
12. ALL DEBRIS GENERATED BY THE PRUNING AND TRIMMING OF THE TREES AND / OR BUSHES SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE DISPOSED OF PROPERLY (NO SEPARATE PAY ITEM).
13. TREES MUST BE MAINTAINED IN GOOD HEALTH THROUGHOUT THE CONSTRUCTION PROCESS. MAINTENANCE MAY INCLUDE, BUT NOT LIMITED TO: WATERING THE ROOT PROTECTION ZONE, WASHING FOLIAGE, FERTILIZATION, PRUNING, ADDITIONAL MULCH APPLICATIONS AND OTHER MAINTENANCE AS NEEDED ON THE PROJECT.
14. ANY TREE REMOVAL SHALL BE APPROVED BY THE CITY ARBORIST. (207-0278).
15. TREES WHICH ARE DAMAGED OR LOST DUE TO THE CONTRACTOR'S NEGLIGENCE DURING CONSTRUCTION SHALL BE MITIGATED TO THE CITY'S SATISFACTION.
16. TREE PLANTING FOR MITIGATION OR ENHANCEMENT: ALL PLANTED TREES SHALL BE MAINTAINED IN A HEALTHY CONDITION AT ALL TIMES. THIS INCLUDES IRRIGATION, FERTILIZING, PRUNING AND OTHER MAINTENANCE AS NEEDED ON THE PROJECT. TREES THAT DIE WITHIN TWELVE (12) MONTHS SHALL BE REPLACED WITH A TREE OF EQUAL SIZE AND SPECIES.

ACCESSIBILITY REQUIREMENTS

1. THE CONTRACTOR SHALL PROVIDE AND MAINTAIN VEHICULAR AND PEDESTRIAN ACCESS AT ALL TIMES TO LOCAL RESIDENCES AND BUSINESSES.
2. WHEN THE WORK REQUIRES THE EXCAVATION OF THE STREET AND THE REMOVAL OF THE EXISTING DRIVEWAY APPROACHES AND SIDEWALKS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING TEMPORARY ALL-WEATHER ACCESS TO THE BUSINESSES AND RESIDENCES. THE TEMPORARY DRIVEWAY APPROACHES SHALL BE CONSTRUCTED WITH FLEXIBLE BASE OR GRAVEL MATERIAL AT NO SEPARATE COST TO THE CITY.
3. PRIOR TO INITIATING THE CONSTRUCTION OF NEW DRIVEWAY APPROACHES, THE CONTRACTOR SHALL GIVE ADVANCE WARNING IN PERSON, OR IN WRITING, OF AT LEAST 48 HOURS TO EACH RESIDENCE THAT WILL BE IMMEDIATELY AFFECTED, SO THAT ALTERNATE PLANS MAY BE MADE BY THE RESIDENTS.
4. FOR BUSINESSES WITH MORE THAN ONE DRIVEWAY, AT LEAST ONE DRIVEWAY SHALL REMAIN OPEN WHILE THE OTHER NEW DRIVEWAY APPROACHES ARE CONSTRUCTED. FOR BUSINESSES WITH ONLY ONE DRIVEWAY, THE NEW DRIVEWAY APPROACH SHALL BE CONSTRUCTED IN HALF WIDTHS, UNLESS A TEMPORARY ASPHALT DRIVEWAY IS FIRST INSTALLED AT NO SEPARATE COST TO THE CITY.



LOCATION MAP
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

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

DECEMBER 2009

CITY OF SAN ANTONIO CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT		
CITY OF SAN ANTONIO GENERAL NOTES		
___% SUBMITTAL	PROJECT NO.___	DATE:___
DRWN. BY:___	DSGN. BY:___	CHKD. BY:___	SHEET NO.___OF___

DEVELOPER:
LENNAR HOMES OF TEXAS LAND & CONSTRUCTION, LTD.
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TEXAS 78216
PHONE: (210) 403-6200

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JOB NO. 314-50-03

PLAT NO. 23-11800310 SHEET 0.0

Date: Feb 14, 2024, 4:16pm User ID: rodriguez
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TRENCH EXCAVATION SAFETY PROTECTION

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

CAUTION!!:

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

COMPACTION NOTE:

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

DRY UTILITY CONDUIT NOTE:

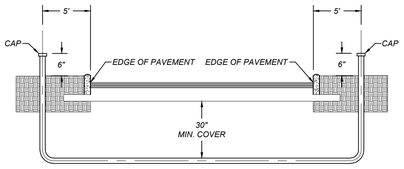
CONDUIT LOCATIONS SHOWN ON PLAN ARE FOR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO INSTALL PROPOSED CONDUITS IN ACCORDANCE WITH DRY UTILITY PURVEYORS SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYORS PLAN.

NOTE:

ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.

WATER / SEWER CROSSING NOTE:

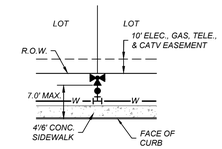
ALL WATER / SEWER CROSSINGS SHALL COMPLY WITH SAWS SPECIFICATION ITEM 812 SANITARY SEWER / WATER DETAIL.



CONDUIT DETAIL
NOT TO SCALE

**PVC SCHEDULE 80 CONDUIT*
SEE PLAN SHEETS FOR SIZE LOCATION AND NUMBER OF CONDUITS

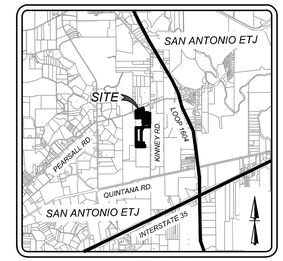
NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH CPS FACILITY AT ALL STREETS AND DRAIN CROSSING IF BUILT AHEAD OF CPS CONSTRUCTION. SLEEVES MUST ALSO BE LOCATED FOR CPS CREWS DURING CONSTRUCTION. (SEPARATE ITEM) SEE THIS SHEET FOR CONDUIT CROSSING DETAIL AND SCHEDULE.



TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

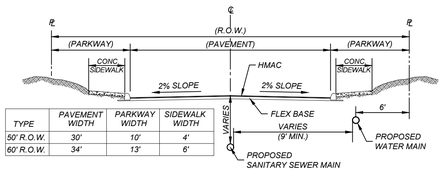
LEGEND

PROPOSED WATER MAIN AND STRUCTURES	=	8"W
PROPOSED WATER SERVICE AND METER BOX	=	
PROPOSED 3/4" WATER IRRIGATION SERVICE AND METER BOX	=	3/4" IRR
PROPOSED FIRE HYDRANT	=	
PROPOSED STREETLIGHT 100W LED (UG)	=	
PROPOSED STREETLIGHT 250W LED (UG)	=	
PROPOSED SANITARY SEWER MAIN	=	8"SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	CS
PROPOSED SANITARY SEWER LATERAL WITH VERTICAL STACK	=	
RIGHT-OF-WAY	=	R.O.W.
PROPOSED ELECTRIC, GAS, TELEPHONE AND CABLE TELEVISION EASEMENT	=	E.G.T.TV.E
VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.
EXISTING WATER MAIN	=	E8"W
FORCE MAIN (BY OTHERS)	=	FM
EXISTING FIRE HYDRANT	=	
EXISTING SANITARY SEWER MAIN	=	E8"SS
EXISTING SANITARY SEWER MANHOLE	=	



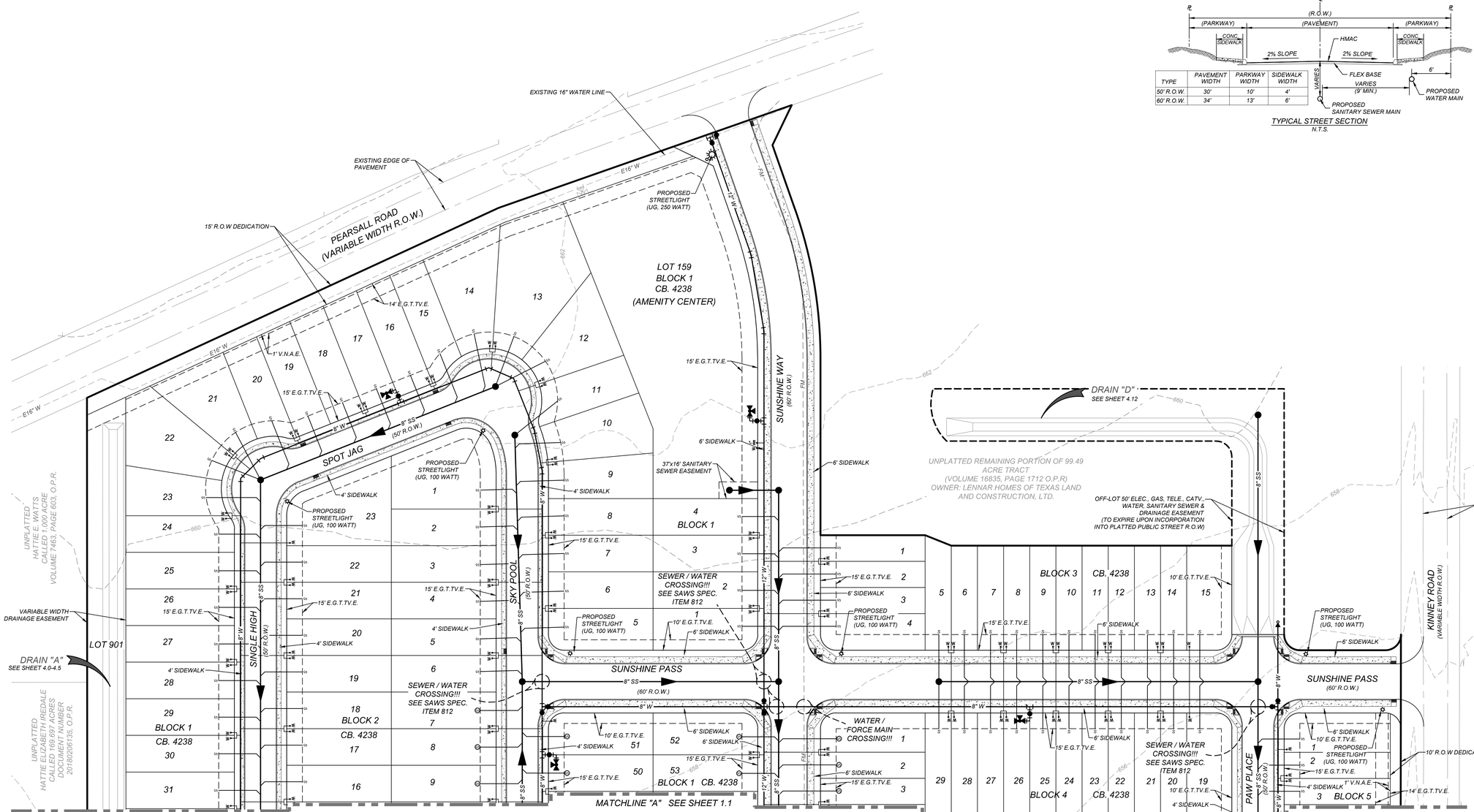
LOCATION MAP
N.T.S.

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



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

TYPICAL STREET SECTION
N.T.S.



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TBPE Firm # 9513 • TBPLS Firm # 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

OVERALL UTILITY PLAN

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN: BL CHECKED: JM

SHEET NUMBER:
1.0

Date: Feb 15, 2024, 8:47am User ID: arodriguez
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TRENCH EXCAVATION SAFETY PROTECTION

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CAUTION!!:

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

COMPACTION NOTE:

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

DRY UTILITY CONDUIT NOTE:

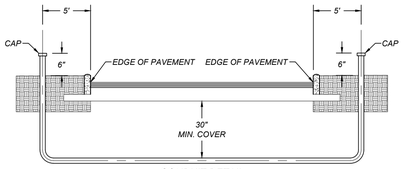
CONDUIT LOCATIONS SHOWN ON PLAN ARE FOR GEOGRAPHICAL PURPOSES ONLY AND ARE APPROXIMATE. CONTRACTOR TO INSTALL PROPOSED CONDUITS IN ACCORDANCE WITH DRY UTILITY PURVEYORS SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYORS PLAN.

NOTE:

ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.

WATER / SEWER CROSSING NOTE:

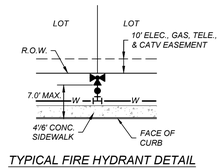
ALL WATER / SEWER CROSSINGS SHALL COMPLY WITH SAWS SPECIFICATION ITEM 812 SANITARY SEWER / WATER DETAIL.



CONDUIT DETAIL
NOT TO SCALE

*PVC SCHEDULE 80 CONDUIT
SEE PLAN SHEETS FOR SIZE LOCATION AND NUMBER OF CONDUITS

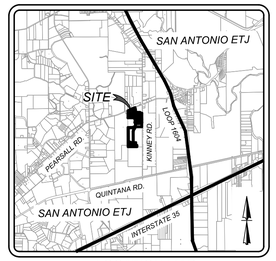
NOTE:
CONTRACTOR SHALL BE RESPONSIBLE FOR PLACING CONDUIT SLEEVES FOR EACH CPS FACILITY AT ALL STREETS AND DRAIN CROSSING IF BUILT AHEAD OF CPS CONSTRUCTION. SLEEVES MUST ALSO BE LOCATED FOR CPS CREWS DURING CONSTRUCTION. (SEPARATE ITEM) SEE THIS SHEET FOR CONDUIT CROSSING DETAIL AND SCHEDULE.



TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

LEGEND

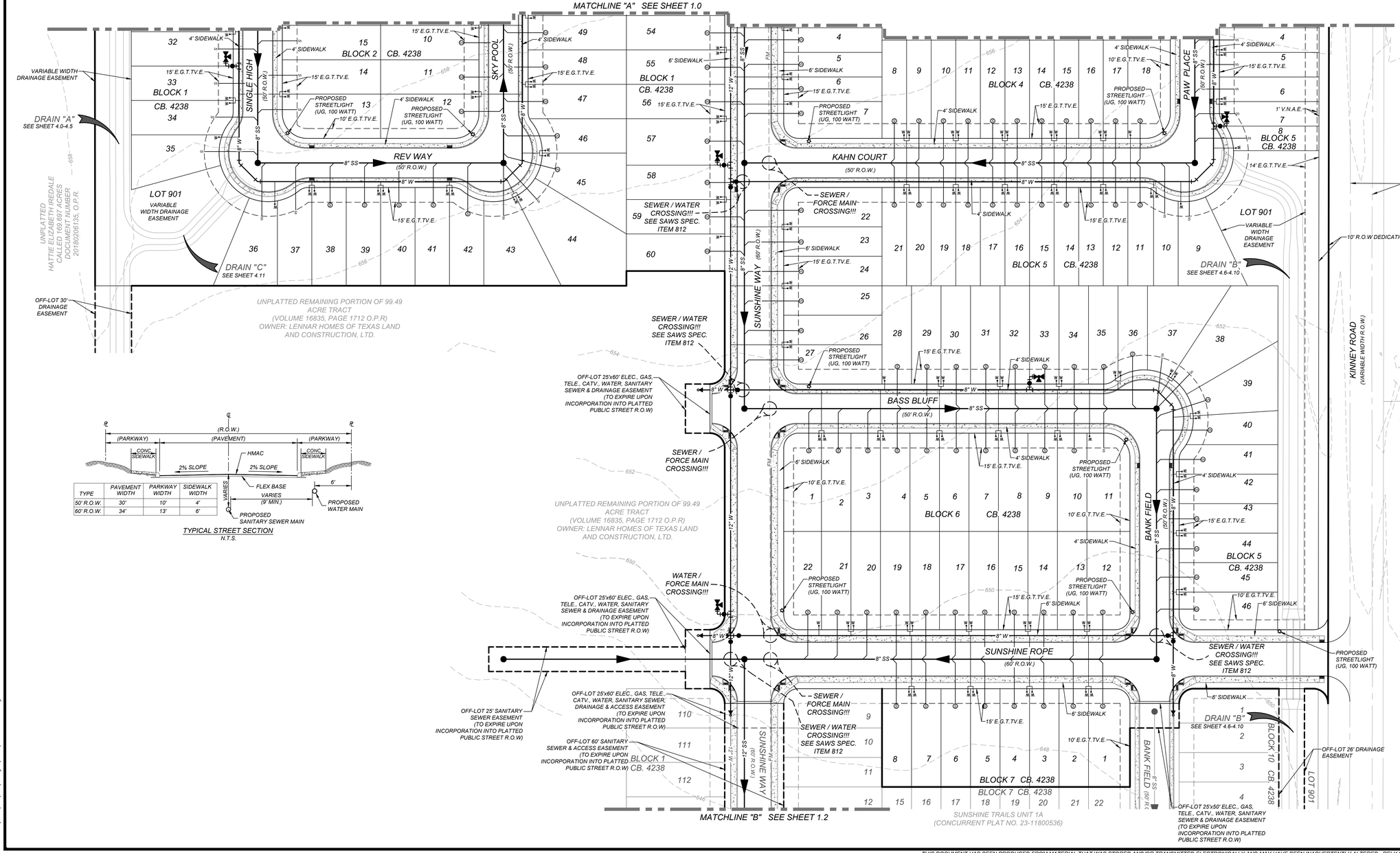
PROPOSED WATER MAIN AND STRUCTURES	=	8"W
PROPOSED WATER SERVICE AND METER BOX	=	
PROPOSED 3/4" WATER IRRIGATION SERVICE AND METER BOX	=	3/4" IRR
PROPOSED FIRE HYDRANT	=	
PROPOSED STREETLIGHT 100W LED (UG)	=	
PROPOSED STREETLIGHT 250W LED (UG)	=	
PROPOSED SANITARY SEWER MAIN	=	8"SS
PROPOSED SANITARY SEWER MANHOLE	=	
PROPOSED SANITARY SEWER LATERAL	=	
PROPOSED SANITARY SEWER LATERAL WITH VERTICAL STACK	=	
RIGHT-OF-WAY	=	R.O.W.
PROPOSED ELECTRIC, GAS, TELEPHONE AND CABLE TELEVISION EASEMENT	=	E.G.T.TV.E
VEHICULAR NON ACCESS EASEMENT	=	V.N.A.E.
EXISTING WATER MAIN	=	E8"W
FORCE MAIN (BY OTHERS)	=	FM
EXISTING FIRE HYDRANT	=	
EXISTING SANITARY SEWER MAIN	=	E8"SS
EXISTING SANITARY SEWER MANHOLE	=	



LOCATION MAP
N.T.S.

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

MATCHLINE "A" SEE SHEET 1.0



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

TYPICAL STREET SECTION
N.T.S.

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

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

OVERALL UTILITY PLAN

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
1.1

Date: Feb 14, 2024, 4:18pm User ID: arodriguez
File: N:\314-50\03\Design\Civil\03-14-50-03.dwg

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TRENCH EXCAVATION SAFETY PROTECTION

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PROPOSED WATER SERVICE AND METER BOX	=	W
PROPOSED 3/4" WATER IRRIGATION SERVICE AND METER BOX	=	3/4" IRR
PROPOSED FIRE HYDRANT	=	
PROPOSED STREETLIGHT 100W LED (UG)	=	
PROPOSED STREETLIGHT 250W LED (UG)	=	
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PROPOSED SANITARY SEWER LATERAL	=	4"S
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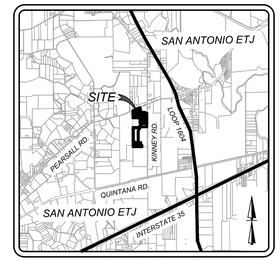
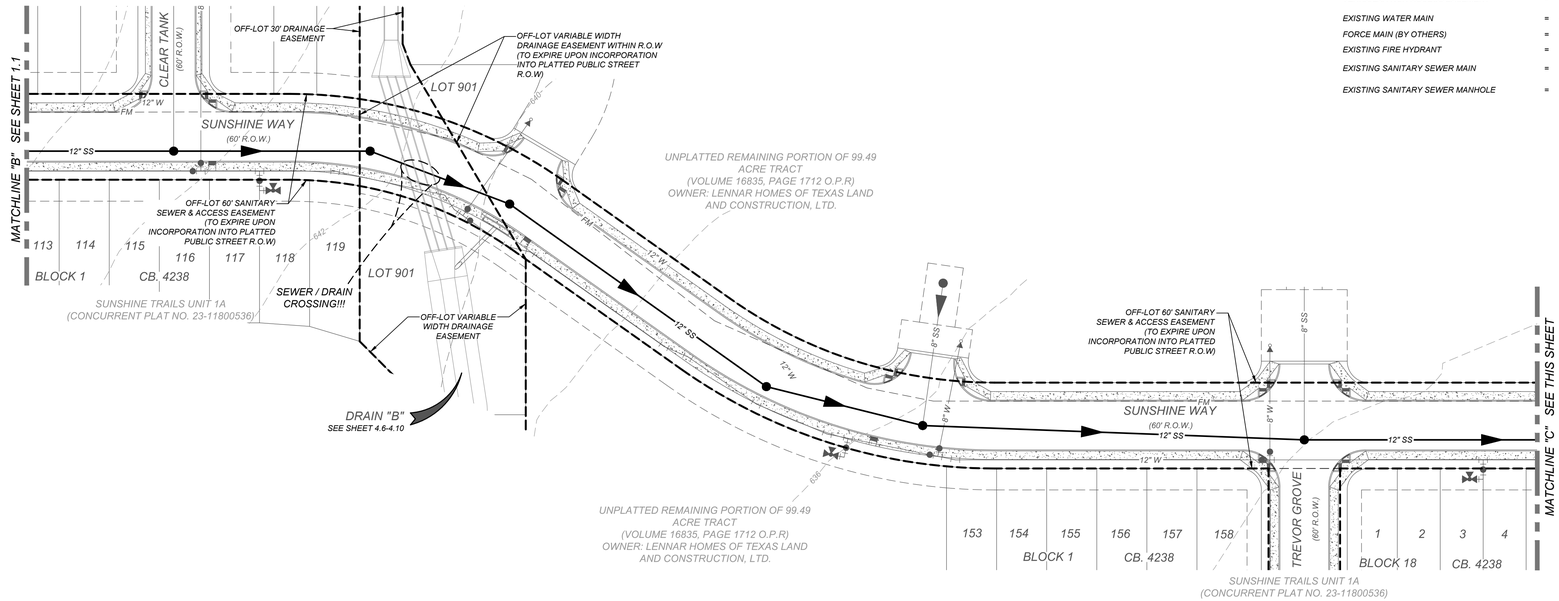
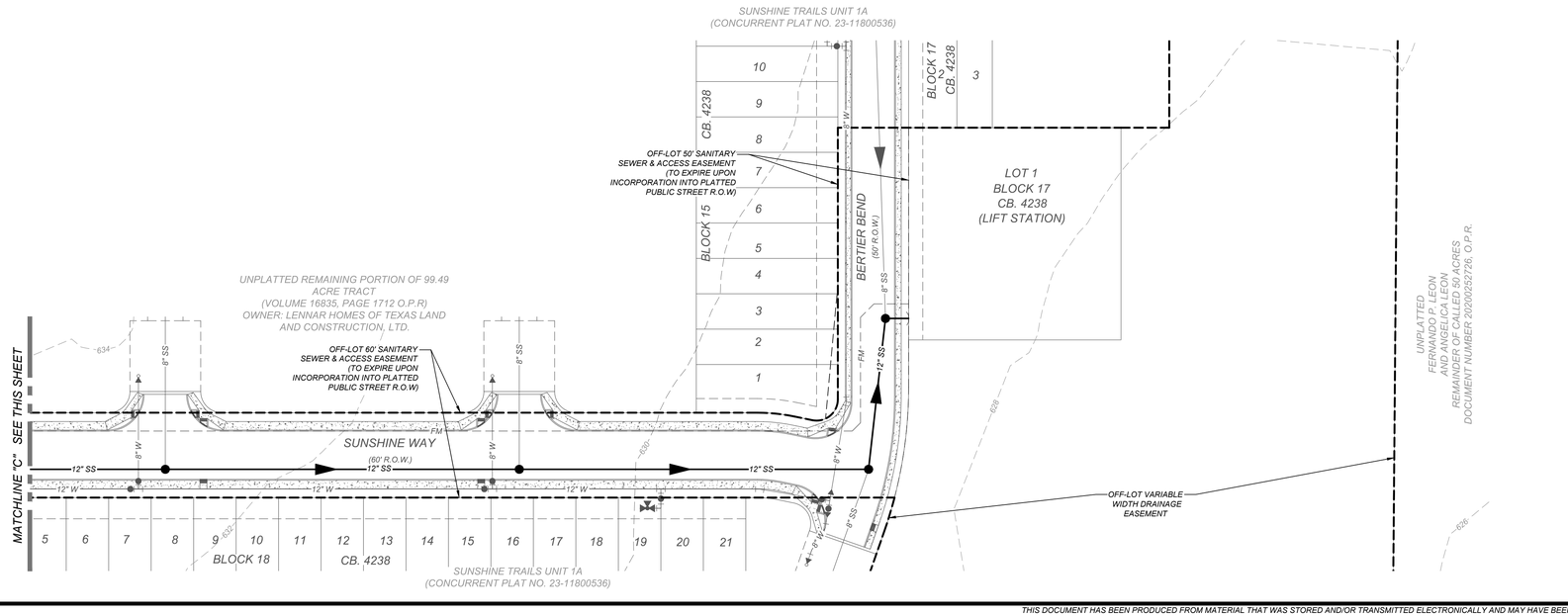


LOCATION MAP
N.T.S.

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





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Phone: 210.979.8444 • Fax: 210.979.8441
TBPE Firm # 1273 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

OVERALL UTILITY PLAN

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 1.2

Date: Feb 14, 2024, 4:16pm User ID: arodriguez
File: N:\314_50\03\Design\Civil\1.2-OVERALL.dwg

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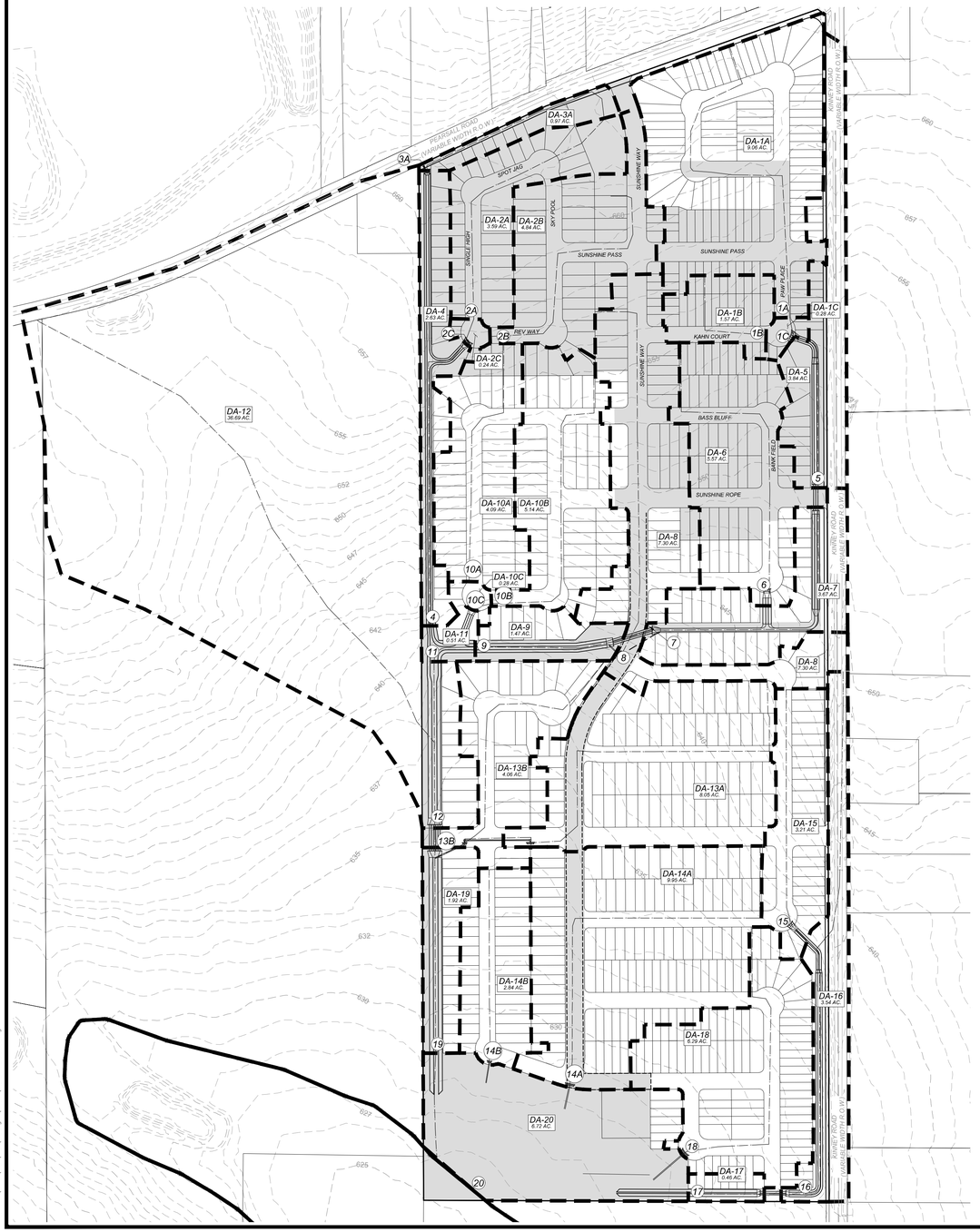

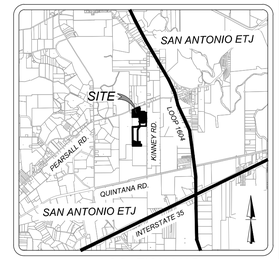

LOCATION MAP
N.T.S.

SCALE : 1" = 200'

0' 200' 600'

400'

LEGEND

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

PROPOSED/ULTIMATE CONDITIONS

HYDROLOGY SUMMARY - RATIONAL METHOD

Study Point	Drainage Area	(Acres)	C	Tcarryover (min)		Tovrl (min)	Tsc (min)	Tch (min)	Ttot (min)	I5 (in/hr)	I25 (in/hr)	I100 (in/hr)	Q5 (ft3/s)	Q25 (ft3/s)	Q100 (ft3/s)
1A	DA-1A	9.06	0.77			17.14	5.43	1.22	23.79	4.11	5.65	7.04	28.66	39.40	49.14
1B	DA-1B	1.57	0.77			17.14	2.25	0.00	19.39	4.55	6.28	7.84	5.50	7.59	9.48
1C	DA-1A+DA-1B+DA-1C	10.91	0.77	FROM DA-1A	23.791			0.164	23.955	4.09	5.63	7.02	34.39	47.26	58.95
2A	DA-2A	3.59	0.77			17.14	0.99	0.62	22.27	4.25	5.84	7.29	11.76	16.16	20.16
2B	DA-2B	4.84	0.77			17.14	4.51	1.17	21.51	4.33	5.95	7.43	16.13	22.17	27.68
2C	DA-2A+DA-2B+DA-2C	8.67	0.77	FROM DA-2A	22.273			0.217	22.490	4.23	5.82	7.26	28.25	38.83	48.45
3	DA-3	0.97	0.77			17.14	1.50	1.16	19.81	4.50	6.21	7.75	3.36	4.64	5.79
4	DA-2A+DA-2B+DA-2C+DA-3+DA-4	12.27	0.77	FROM DA-2C	22.490			2.639	25.128	4.00	5.50	6.84	37.79	51.92	64.65
5	DA-1A+DA-1B+DA-1C+DA-5	14.75	0.77	FROM DA-1C	23.955			1.403	25.358	3.98	5.47	6.81	45.22	62.13	77.38
6	DA-6	5.57	0.77			17.14	5.17	0.88	23.19	4.16	5.73	7.14	17.86	24.56	30.62
7	DA-1A+DA-1B+DA-1C+DA-5+DA-6+DA-7	23.99	0.77	FROM DA-5	25.358			2.631	27.989	3.79	5.20	6.47	70.02	96.08	119.54
8	DA-8	7.30	0.77			17.14	3.12	1.96	22.22	4.26	5.85	7.30	23.93	32.89	41.05
9	DA-1A+DA-1B+DA-1C+DA-5+DA-6+DA-7+DA-8+DA-9	32.76	0.77	FROM DA-7	27.989			1.536	29.525	3.69	5.06	6.30	93.04	127.71	158.98
10A	DA-10A	4.09	0.77			14.21	2.65	0.70	17.55	4.79	6.62	8.28	15.09	20.85	26.06
10B	DA-10B	5.14	0.77			17.14	3.13	1.33	21.60	4.32	5.94	7.41	17.10	23.49	29.33
10C	DA-10A+DA-10B+DA-10C	9.51	0.77	FROM DA-10B	21.602			0.189	21.791	4.30	5.91	7.38	31.49	43.27	54.02
11	DA-1A+DA-1B+DA-1C+DA-2A+DA-2B+DA-2C+DA-3+DA-4+DA-5+DA-6+DA-7+DA-8+DA-9+DA-10A+DA-10B+DA-10C+DA-11	55.05	0.77	FROM DA-9	29.525			0.428	29.952	3.66	5.02	6.26	155.26	212.97	265.15
12	DA-1A+DA-1B+DA-1C+DA-2A+DA-2B+DA-2C+DA-3+DA-4+DA-5+DA-6+DA-7+DA-8+DA-9+DA-10A+DA-10B+DA-10C+DA-11+DA-12+DA-13A+DA-13B	95.80	0.77	FROM DA-11	29.952			1.431	31.383	3.58	4.91	6.10	263.86	362.14	450.10
13A	DA-13A	8.05	0.77			17.14	4.13	1.76	23.04	4.18	5.75	7.16	25.89	35.61	44.41
13B	DA-13B	4.06	0.77			17.14	3.61	0.99	21.74	4.31	5.92	7.39	13.46	18.49	23.09
13C	DA-13A+DA-13B	12.11	0.77	FROM DA-13A	23.038			0.969	24.007	4.09	5.62	7.01	38.13	52.40	65.36
14A	DA-14A	9.95	0.77			17.14	5.55	1.51	24.20	4.07	5.60	6.98	31.21	42.89	53.48
14B	DA-14B	2.84	0.77			17.14	3.69	0.52	21.35	4.34	5.97	7.46	9.50	13.06	16.31
15	DA-15	3.21	0.77			13.55	3.60	1.06	18.21	4.70	6.49	8.11	11.62	16.04	20.05
16	DA-15+DA-16	6.75	0.77			17.14	5.52	2.41	25.07	4.00	5.50	6.85	20.81	28.60	35.60
17	DA-15+DA-16+DA-17	7.21	0.77	FROM DA-16	25.074			0.814	25.888	3.94	5.41	6.74	21.87	30.05	37.44
18	DA-18	6.29	0.77			14.99	5.12	0.74	20.84	4.40	6.04	7.55	21.29	29.28	36.56
19	DA-1A+DA-1B+DA-1C+DA-2A+DA-2B+DA-2C+DA-3+DA-4+DA-5+DA-6+DA-7+DA-8+DA-9+DA-10A+DA-10B+DA-10C+DA-11+DA-12+DA-13A+DA-13B+DA-13C+DA-19	109.83	0.77	FROM DA-12	31.383			1.931	33.314	3.46	4.75	5.92	292.97	402.12	500.53
20	DA-1A+DA-1B+DA-1C+DA-2A+DA-2B+DA-2C+DA-3+DA-4+DA-5+DA-6+DA-7+DA-8+DA-9+DA-10A+DA-10B+DA-10C+DA-11+DA-12+DA-13A+DA-13B+DA-13C+DA-14A+DA-14B+DA-15+DA-16+DA-17+DA-18+DA-19+DA-20	142.84	0.77	FROM DA-19	33.314			0.914	34.227	3.42	4.68	5.83	376.00	515.19	641.42

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ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
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LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

MASTER DRAINAGE PLAN

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
2.0

Date: Feb 15, 2024, 10:55am User ID: arodriguez
File: N:\314\SDV\03\Design\Civil\MD314503.dwg

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

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

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.*
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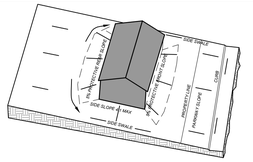
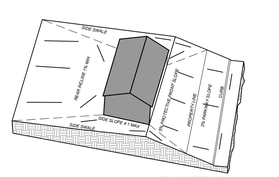


TYPE 'A' LOT GRADING



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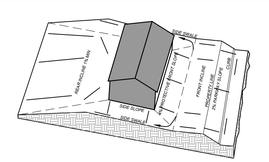
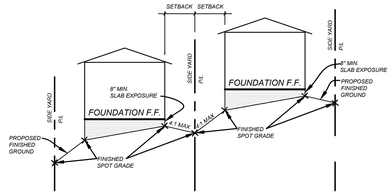
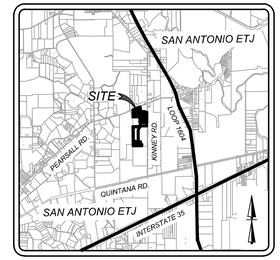


TYPE 'C' LOT GRADING



TYPICAL SIDE YARD GRADING
N.T.S.



LOCATION MAP
N.T.S.

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

LEGEND

LOT GRADE TYPE	=	(A)
EXISTING CONTOURS	=	555
PROPOSED CONTOURS	=	555
FLOW ARROW	=	

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TBPE Firm # 9513 • TBPLS Firm # 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
OVERALL GRADING PLAN

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 3.0

Date: Feb 15, 2024, 9:40am User ID: orodriguez
File: N:\SA\300\03\Design\Civil\(sht 31-42)03.dwg

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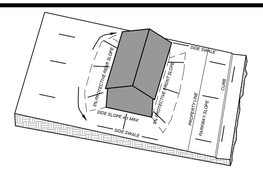
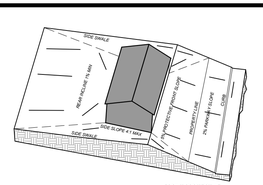
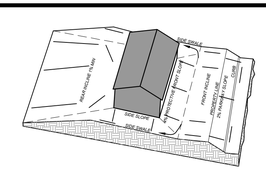


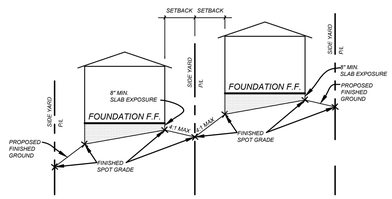
TYPE 'A' LOT GRADING



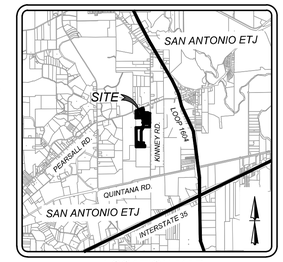
TYPE 'B' LOT GRADING



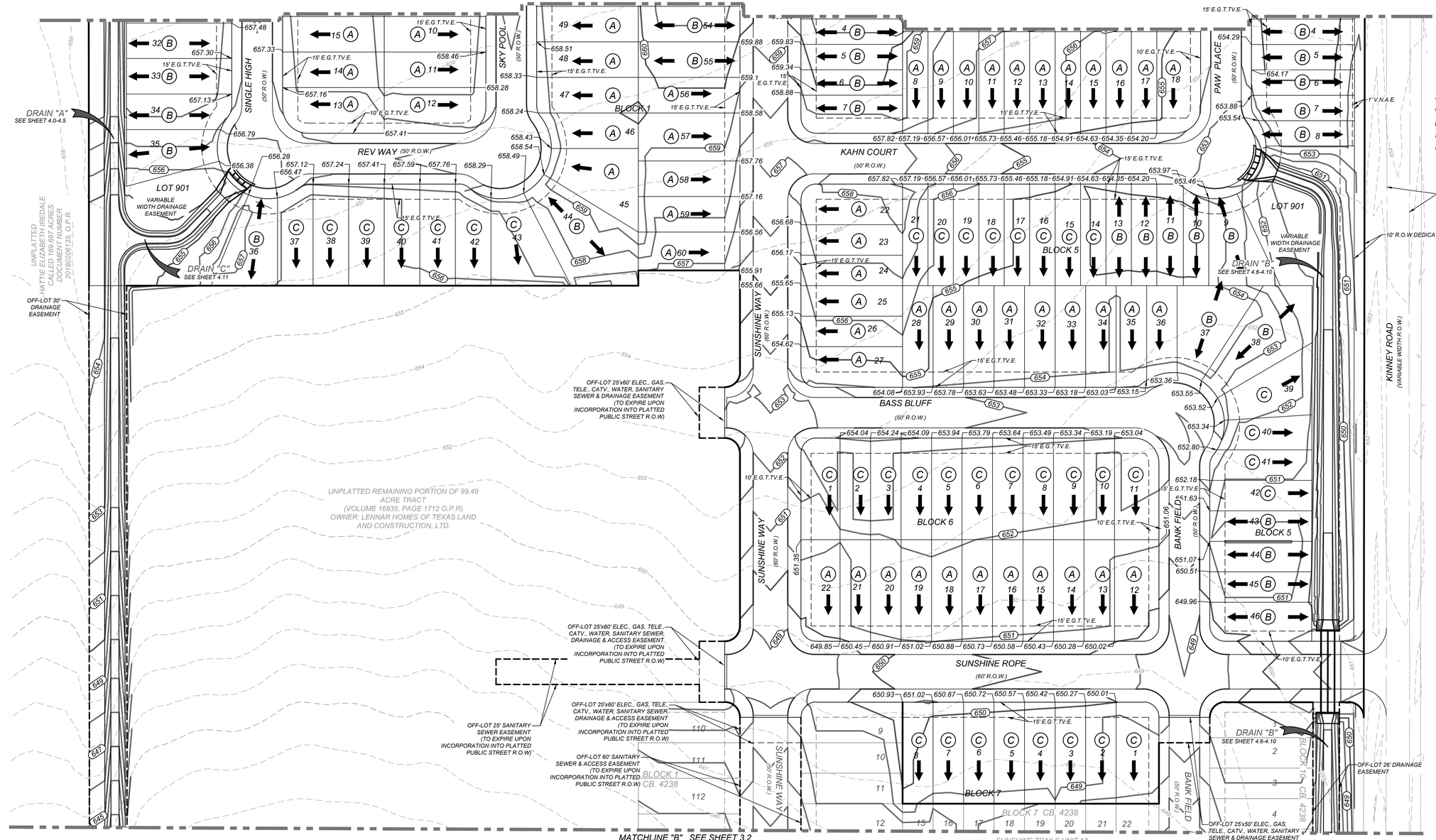
TYPE 'C' LOT GRADING



TYPICAL SIDE YARD GRADING
N.T.S.



LOCATION MAP
N.T.S.



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

LOT GRADE TYPE	=	A
EXISTING CONTOURS	=	555
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FLOW ARROW	=	

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ISSUE DATE
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STATE OF TEXAS
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LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
OVERALL GRADING PLAN

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 3.1

Date: Feb 15, 2024, 9:37am User ID: arodriguez
File: N:\314\50\03\Design\Civil\[3D1450003.dwg

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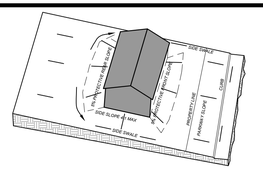
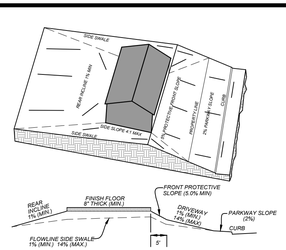
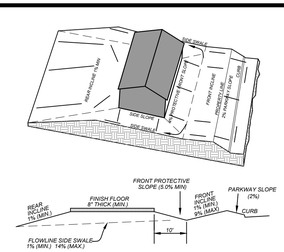


TYPE 'A' LOT GRADING



TYPE 'B' LOT GRADING



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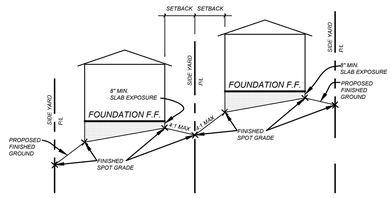
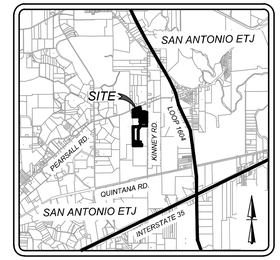
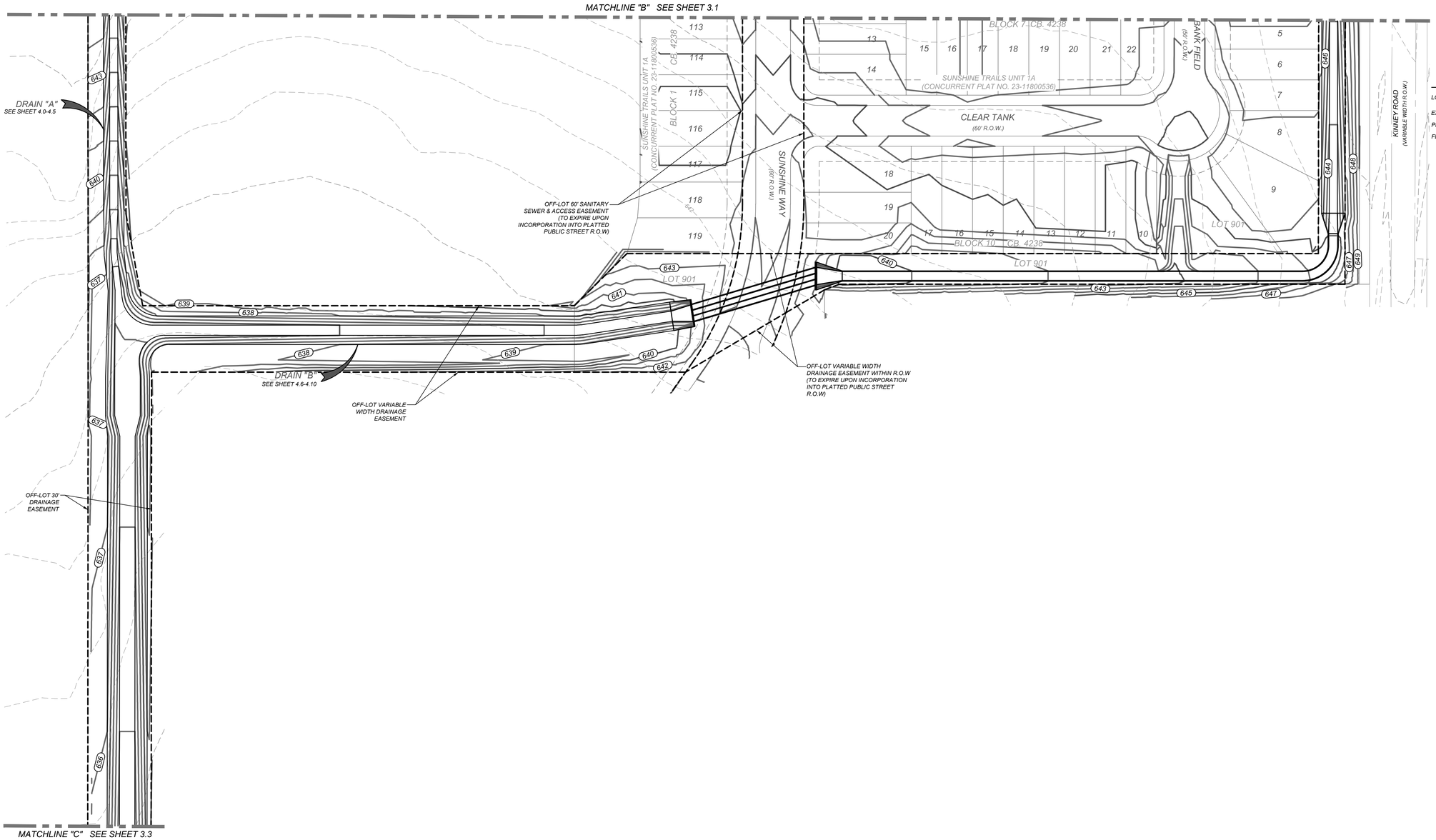


TYPICAL SIDE YARD GRADING
N.T.S.



LOCATION MAP
N.T.S.



SCALE : 1"=50'

0' 50' 150'
100'

LEGEND

LOT GRADE TYPE	=	(A)
EXISTING CONTOURS	=	555
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FLOW ARROW	=	→

KFW
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ISSUE DATE

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LICENSED
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2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
OVERALL GRADING PLAN

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
3.2

Date: Feb 15, 2024, 8:57am User ID: arodriguez
File: N:\314\05\03\Design\Civil\GR314050303.dwg

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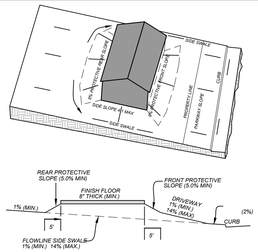

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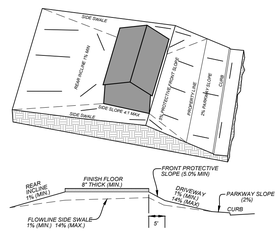

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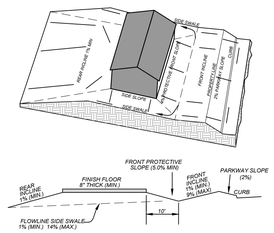

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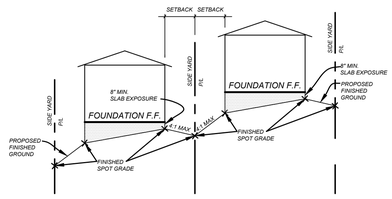

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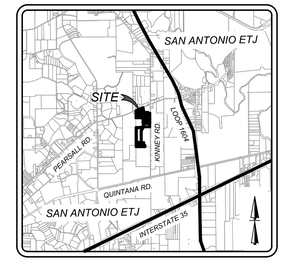
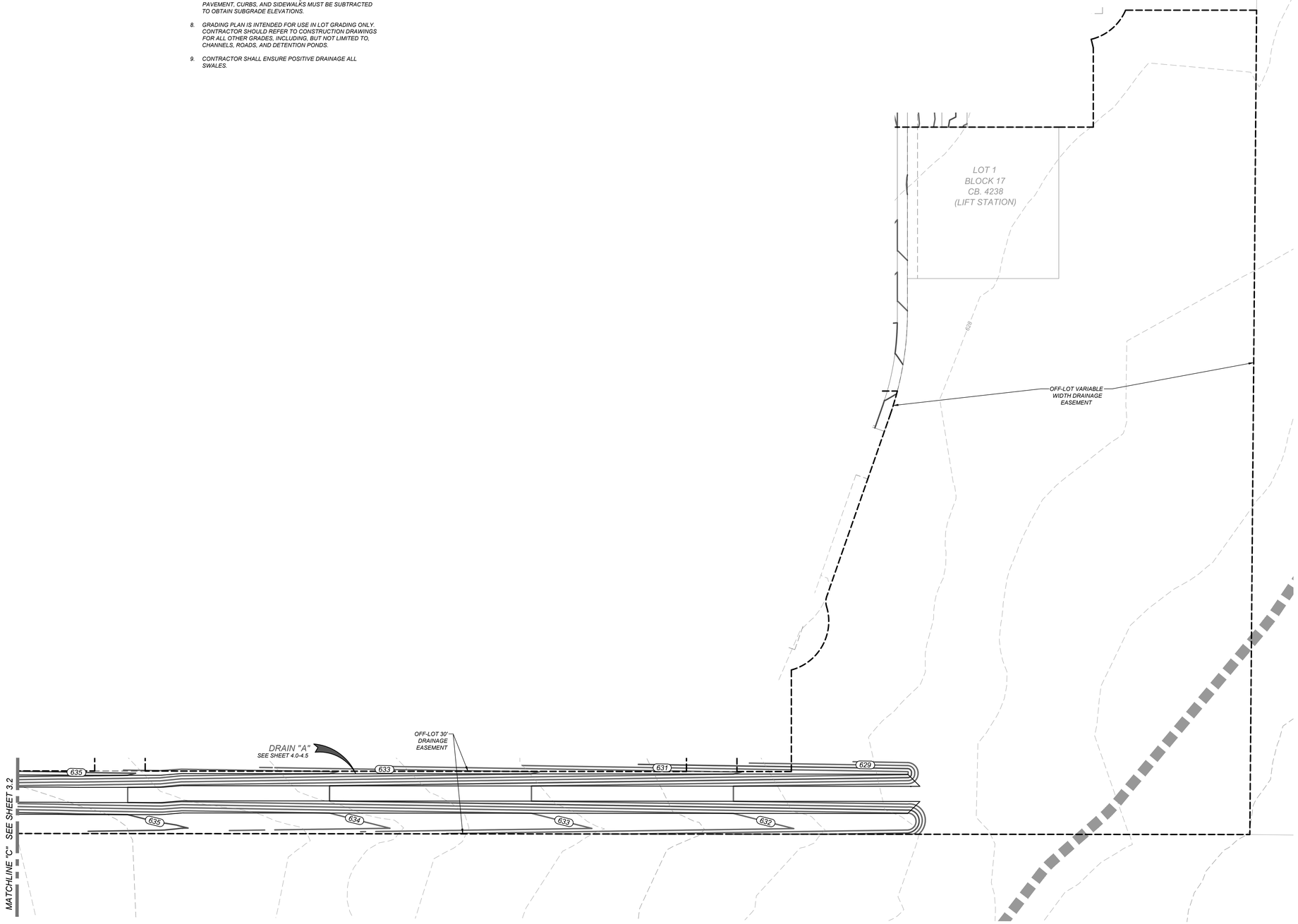


LOCATION MAP
N.T.S.



SCALE : 1"=50'

0' 50' 150'

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LEGEND

LOT GRADE TYPE	=	(A)
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SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

OVERALL GRADING PLAN

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
3.3

Date: Feb 14, 2024, 4:17pm User ID: crodriguez
File: N:\314\50\03\Design\Civil\(08)314503sht.dwg

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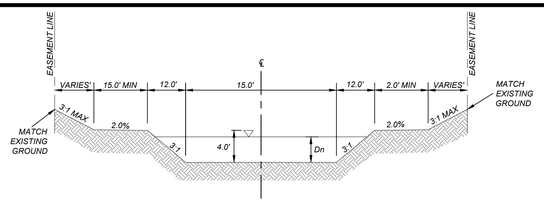
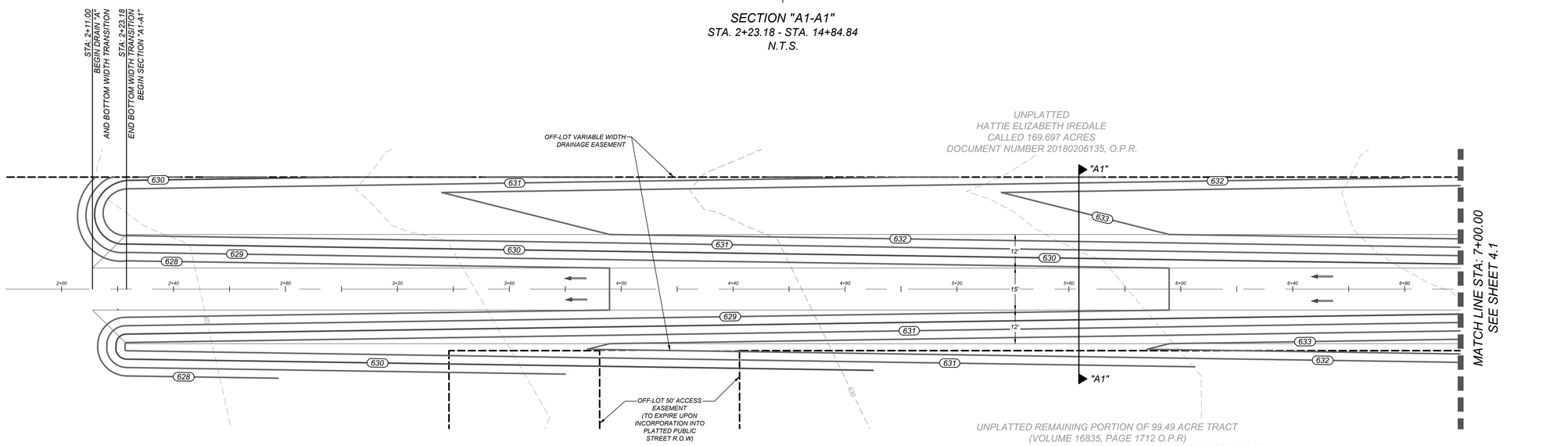
TRENCH EXCAVATION SAFETY PROTECTION

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

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

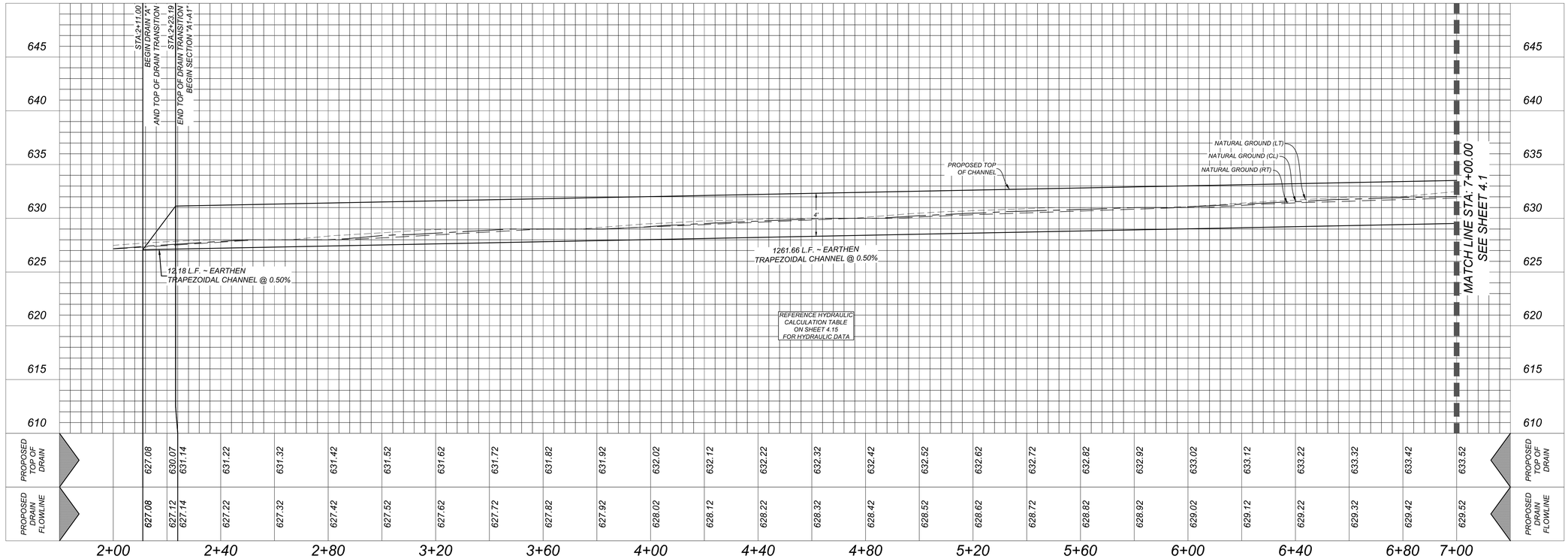


SECTION "A1-A1"
STA. 2+23.18 - STA. 14+84.84
N.T.S.



DRAIN "A"
STA: 2+11.00 TO 7+00.00

HORZ SCALE: 1"=20'
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
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS

DRAIN "A" PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 4.0

Date: Feb 14, 2024, 4:18pm User ID: cgrafigue
File: N:\314\50\03\Design\Civil\Drawings\SSP\314503 – A.dwg

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TRENCH EXCAVATION SAFETY PROTECTION

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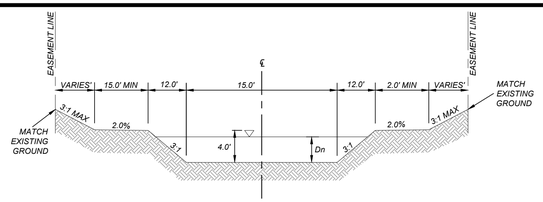
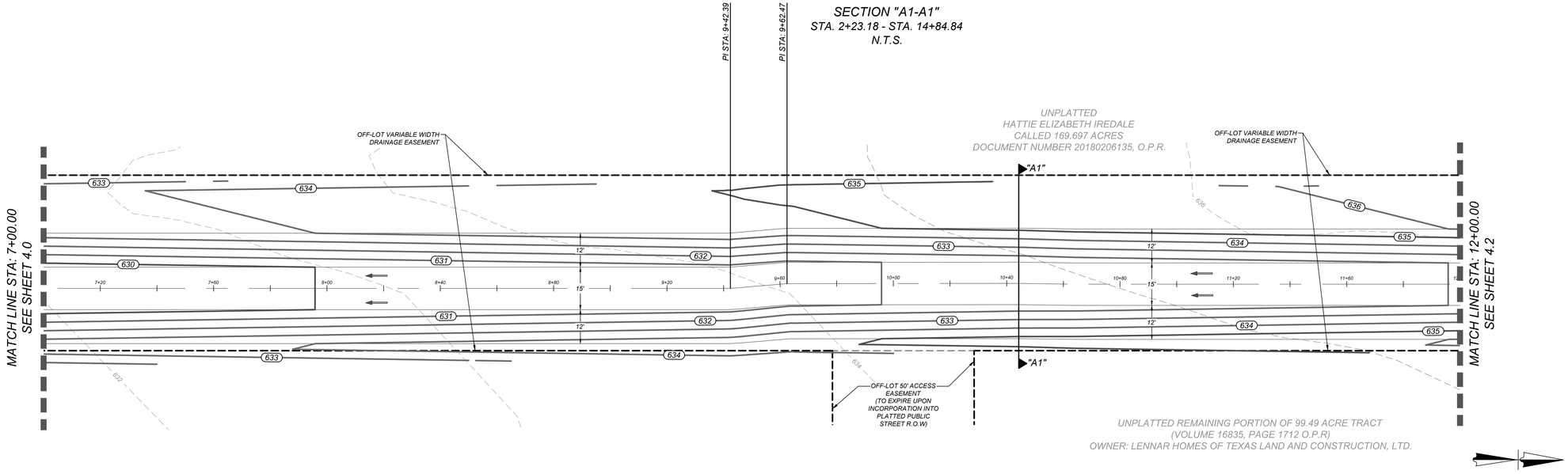
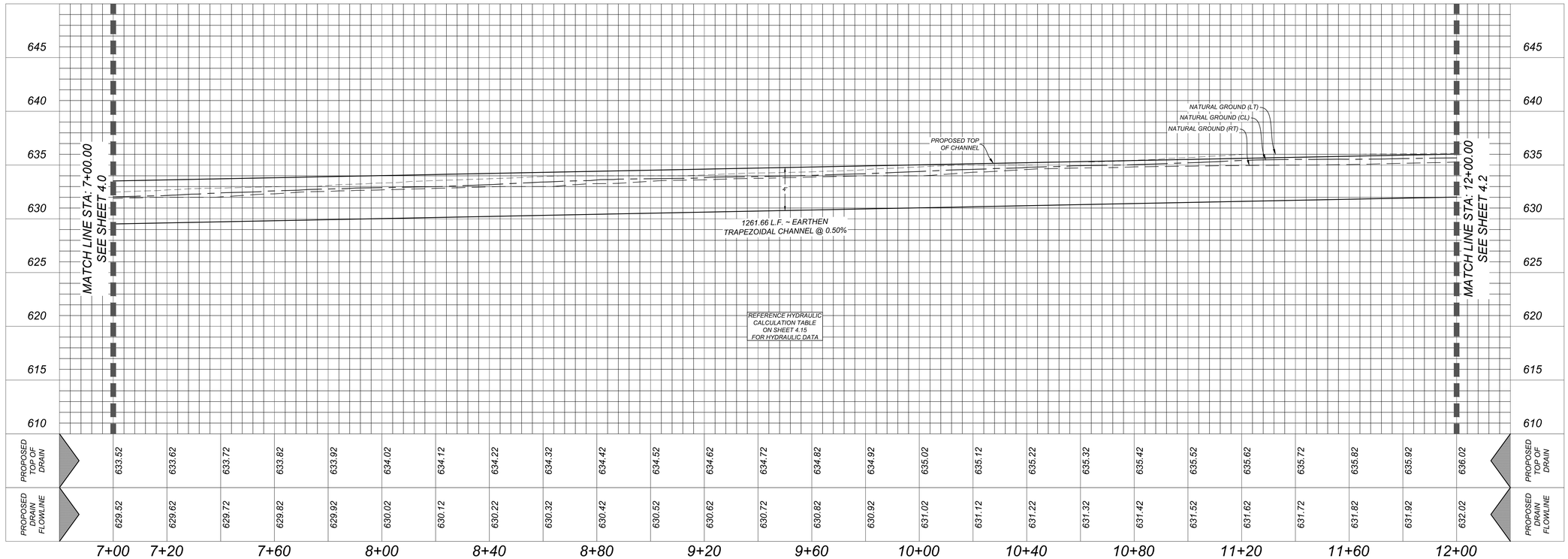


SECTION "A1-A1"
STA. 2+23.18 - STA. 14+84.84
N.T.S.



DRAIN "A"
STA: 7+00.00 TO 12+00.00

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



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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

DRAIN "A" PLAN AND PROFILE

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:

4.1

Date: Feb 14, 2024, 4:18pm User ID: cgrafigue
File: N:\314\50\03\Design\Civil\Drains\SSP3\45003 – A.dwg

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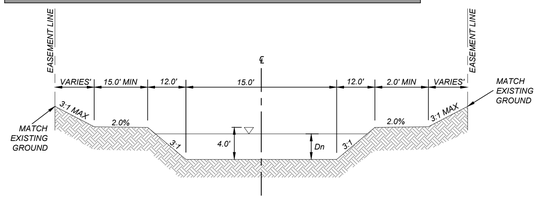
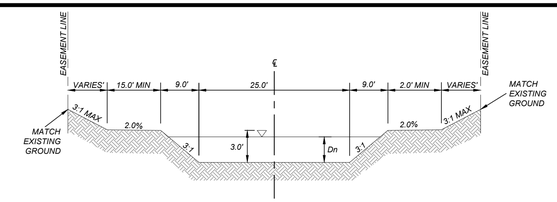
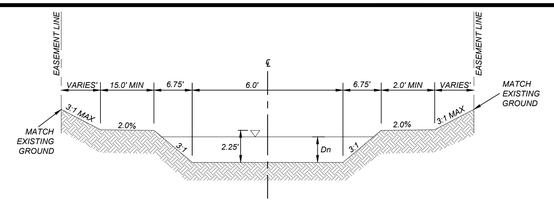


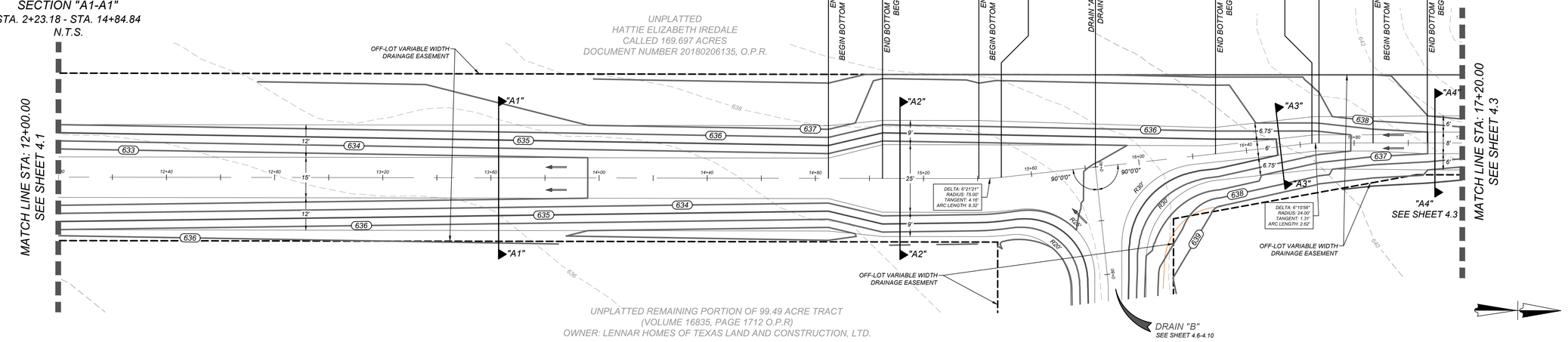
SECTION "A1-A1"
STA. 2+23.18 - STA. 14+84.84
N.T.S.



SECTION "A2-A2"
STA. 15+04.84 - STA. 15+40.47
N.T.S.

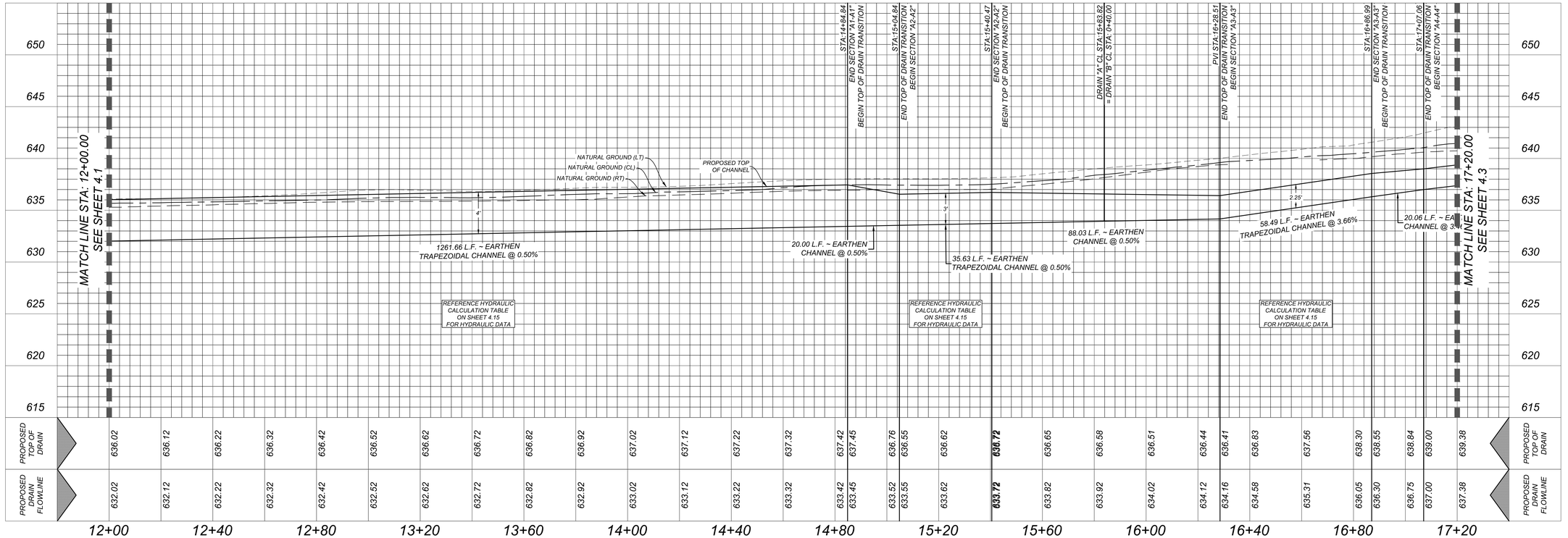


SECTION "A3-A3"
STA. 16+28.51 - STA. 16+86.99
N.T.S.



DRAIN "A"
STA: 12+00.00 TO 17+20.00

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



| | | |

TRENCH EXCAVATION SAFETY PROTECTION

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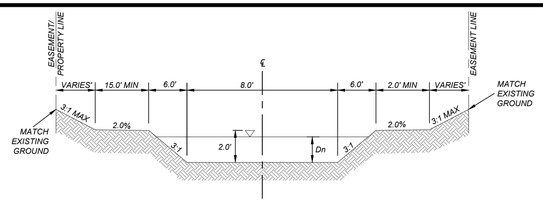
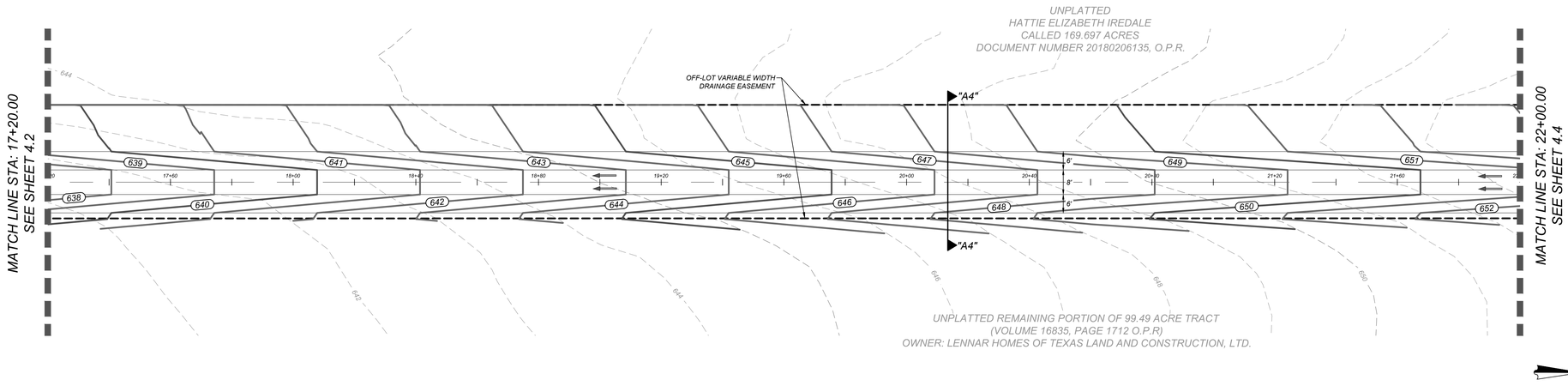
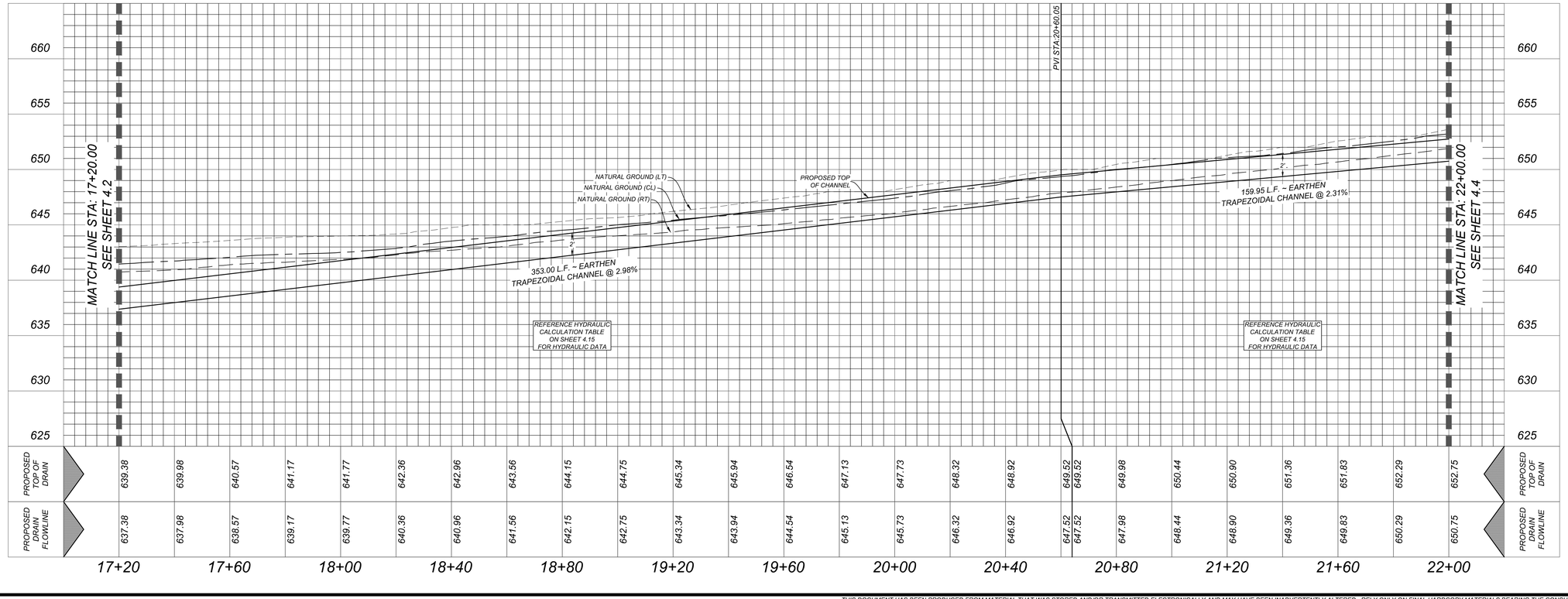


SECTION "A4-A4"
STA. 17+07.06 - STA. 24+45.09
N.T.S.



DRAIN "A"
STA: 17+20.00 TO 22+20.00

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



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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
DRAIN "A" PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 4.3

Date: Feb 14, 2024, 4:18pm User ID: cgallegos
File: N:\314\50\03\Design\Civil\Drawings\SSP3145003 – A.dwg

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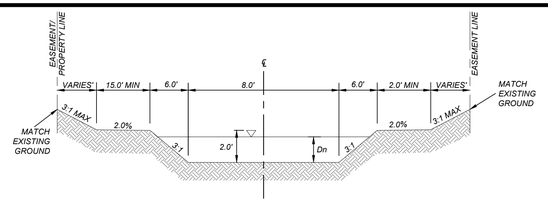
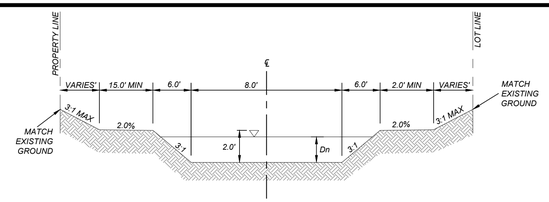
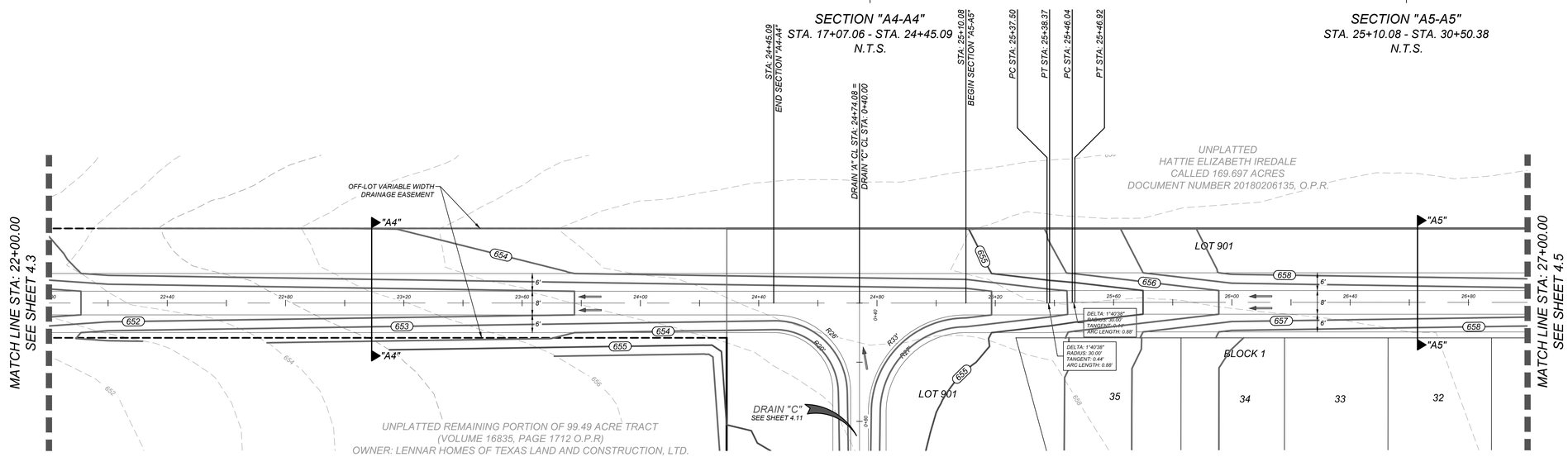


SECTION "A4-A4"
STA. 17+07.06 - STA. 24+45.09
N.T.S.

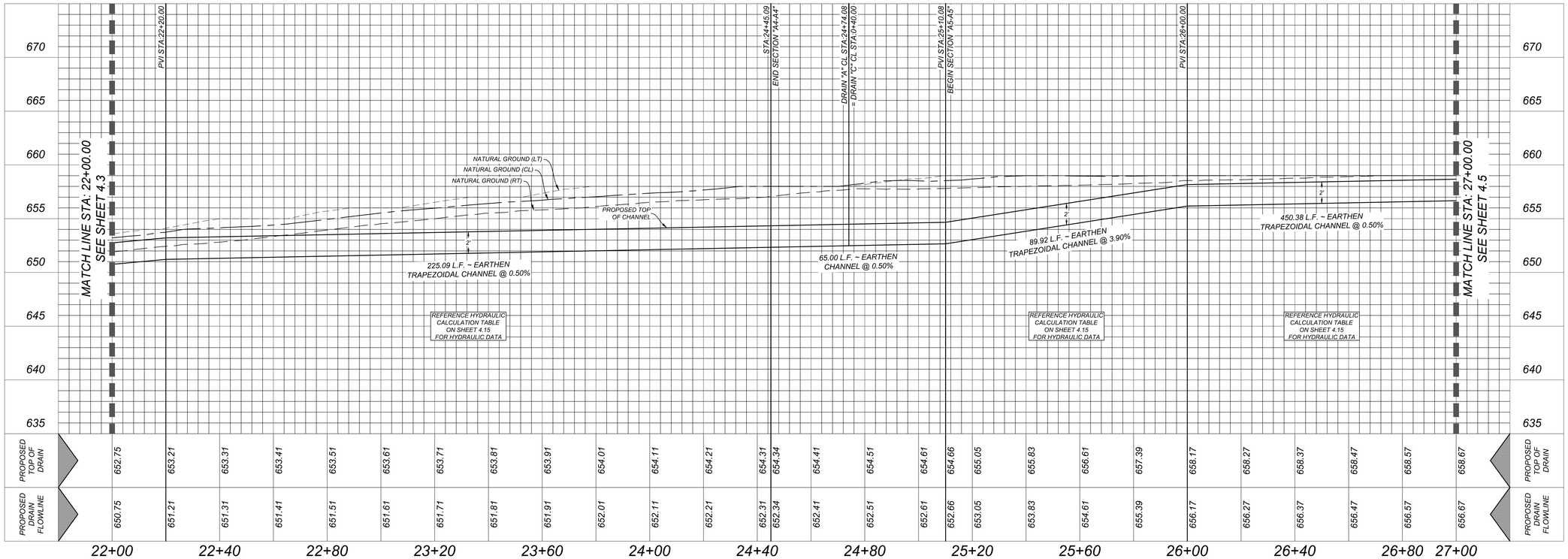


SECTION "A5-A5"
STA. 25+10.08 - STA. 30+50.38
N.T.S.



DRAIN "A"
STA: 22+20.00 TO 27+00.00

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



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TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

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STATE OF TEXAS
JEFFREY W. MARTIN
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LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS

DRAIN "A" PLAN AND PROFILE

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
4.4

Date: Feb 14, 2024, 4:18pm User ID: cgrafigue
File: N:\314\50\04\Design\Civil\Drawings\SSP314503 – A.dwg

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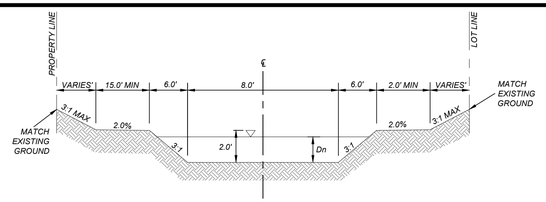
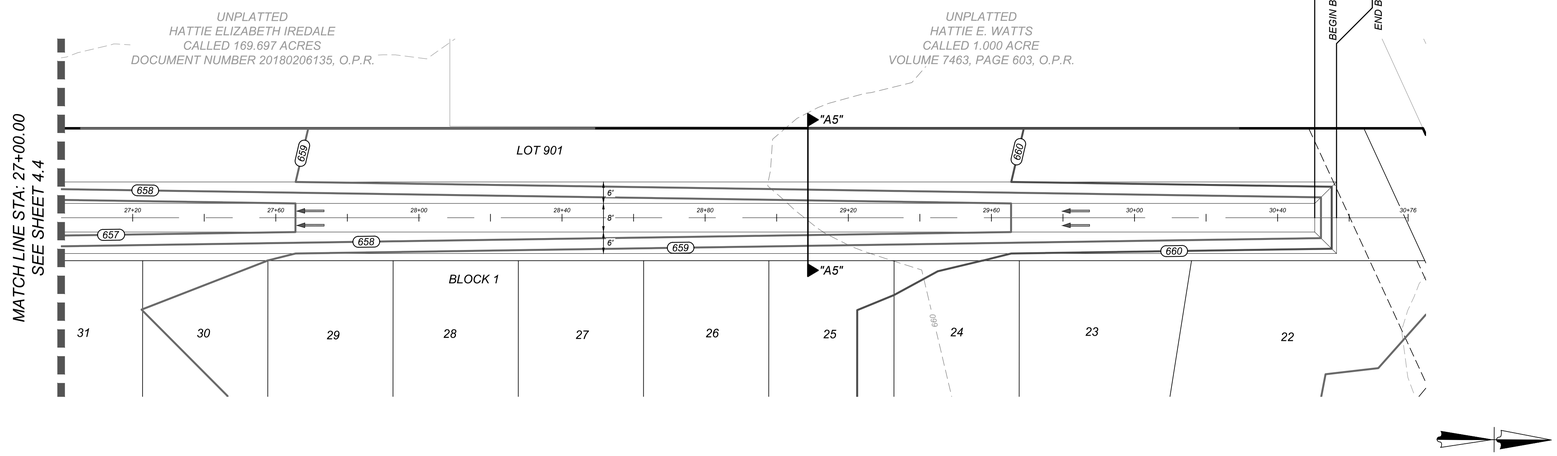
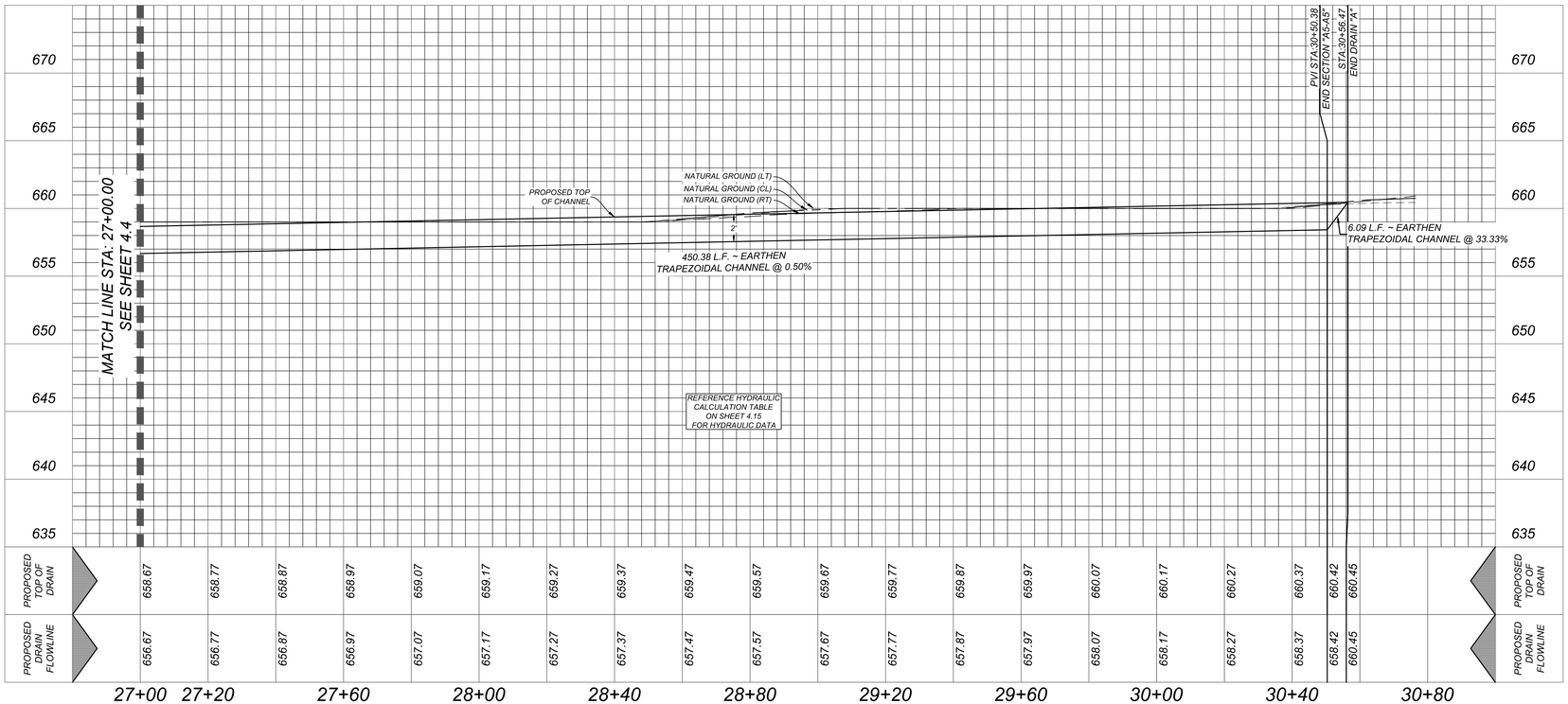


SECTION "A5-A5"
STA. 25+10.08 - STA. 30+50.38
N.T.S.



DRAIN "A"
STA: 27+00.00 TO END

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



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2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
DRAIN "A" PLAN AND PROFILE

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
4.5

Date: Feb 14, 2024, 4:19pm User ID: cgallegos
File: N:\314\50\03\Design\Civil\Drawings\SBP314503 – A.dwg

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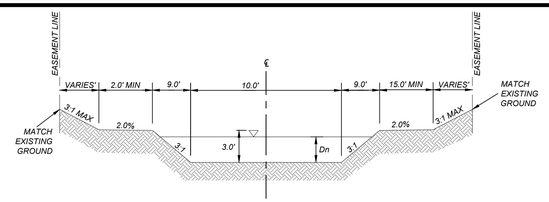
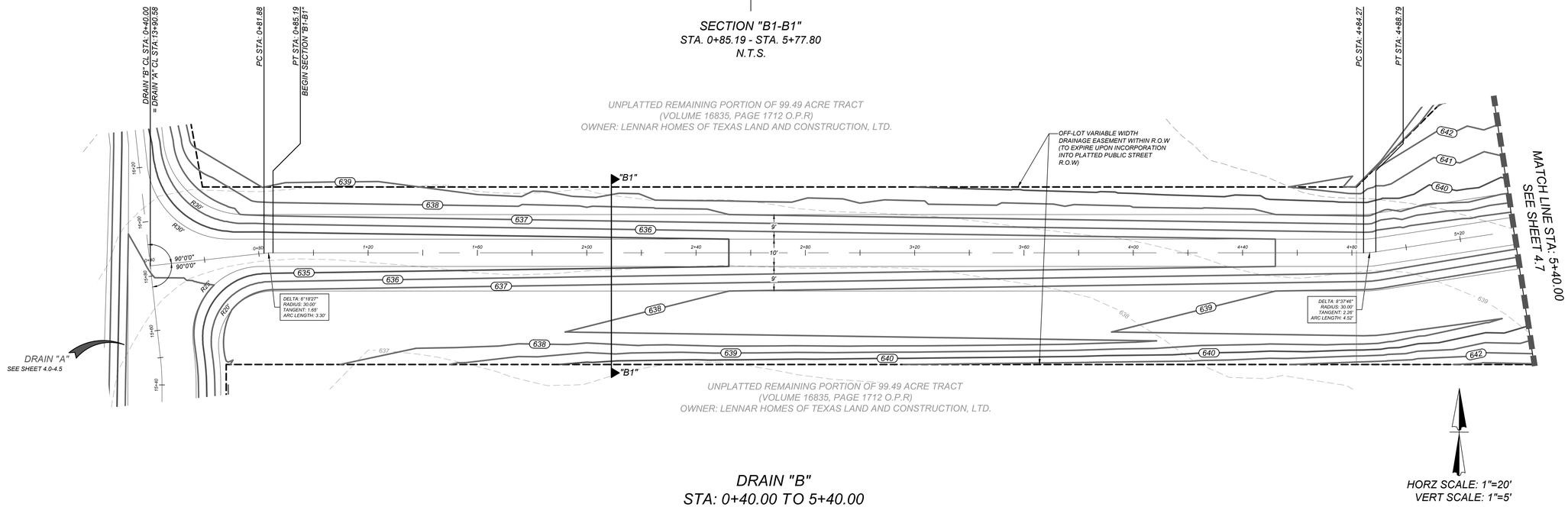
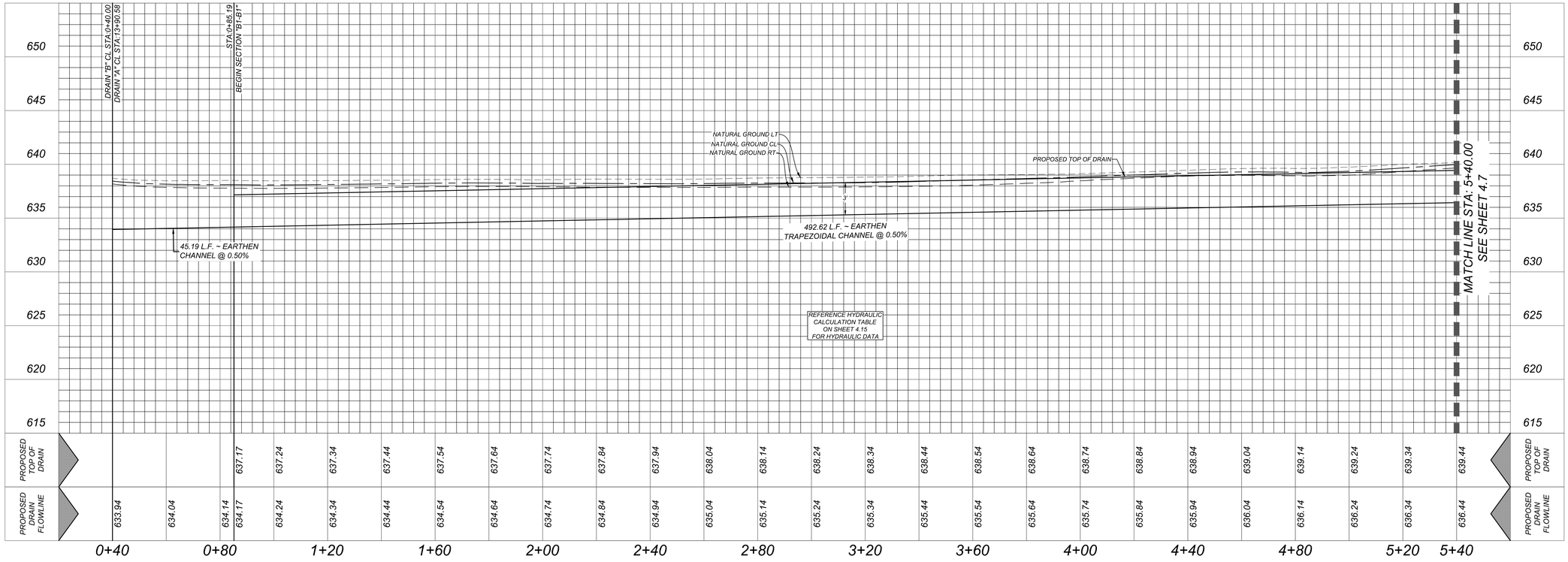


SECTION "B1-B1"
STA. 0+85.19 - STA. 5+77.80
N.T.S.



DRAIN "B"
STA: 0+40.00 TO 5+40.00

HORZ SCALE: 1"=20'
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
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

DRAIN "B" PLAN AND PROFILE

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
4.6

Date: Feb 14, 2024, 4:19pm User ID: cgrafing.ez
File: N:\314\50\03\Design Civil\Drawings\SBP\314503 – BC.dwg

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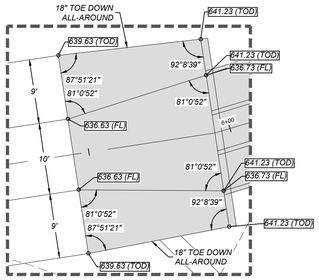
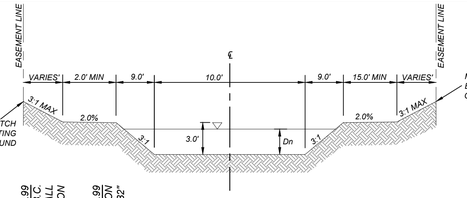
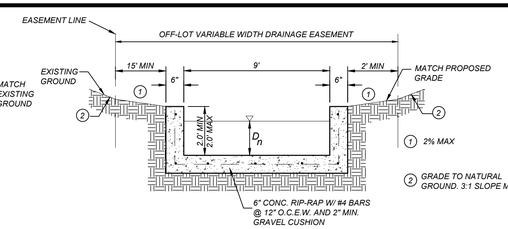


DETAIL "B1"
SCALE: 1"=10'



SECTION "B1-B1"
STA. 0+85.19 - STA. 5+77.80
N.T.S.



SECTION "B2-B2"
STA. 7+49.99 TO STA. 12+58.84
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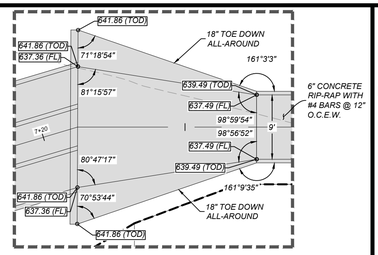
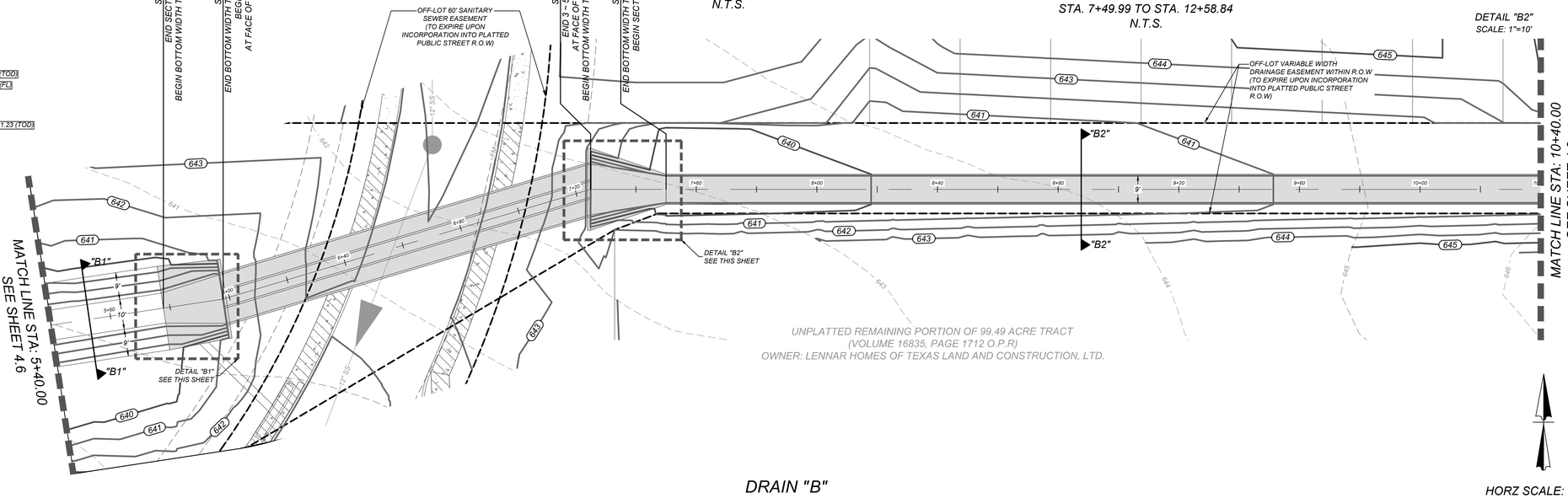
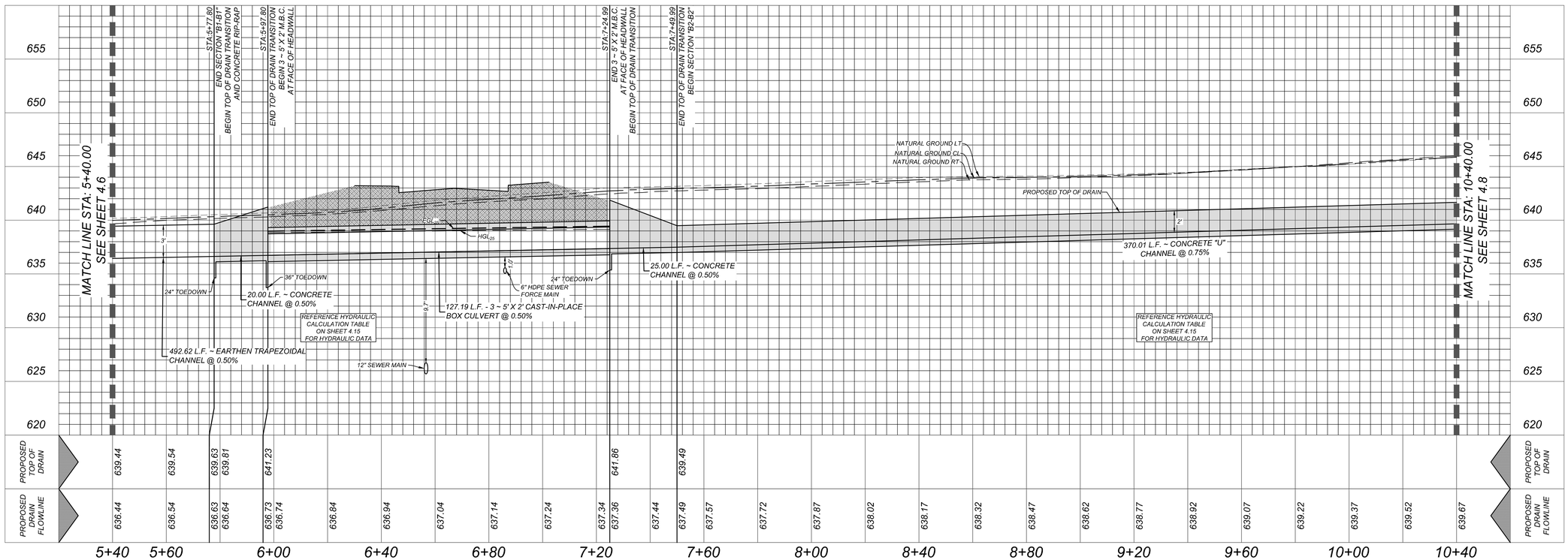


DETAIL "B2"
SCALE: 1"=10'



DRAIN "B"
STA: 5+40.00 TO 10+40.00

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



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LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
DRAIN "B" PLAN AND PROFILE

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 4.7

Date: Feb 16, 2024, 8:44am User ID: crodriguez
File: N:\314\50\03\Design\Civil\Drains\[SUP]314503 – BIC.dwg

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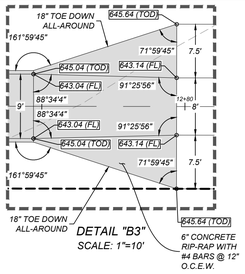
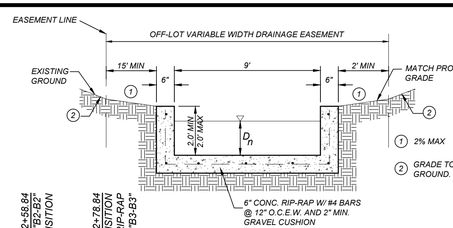
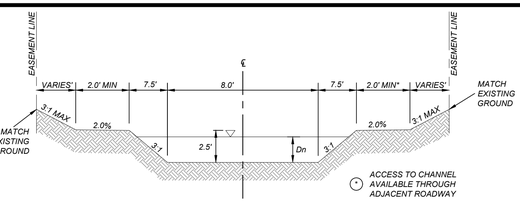


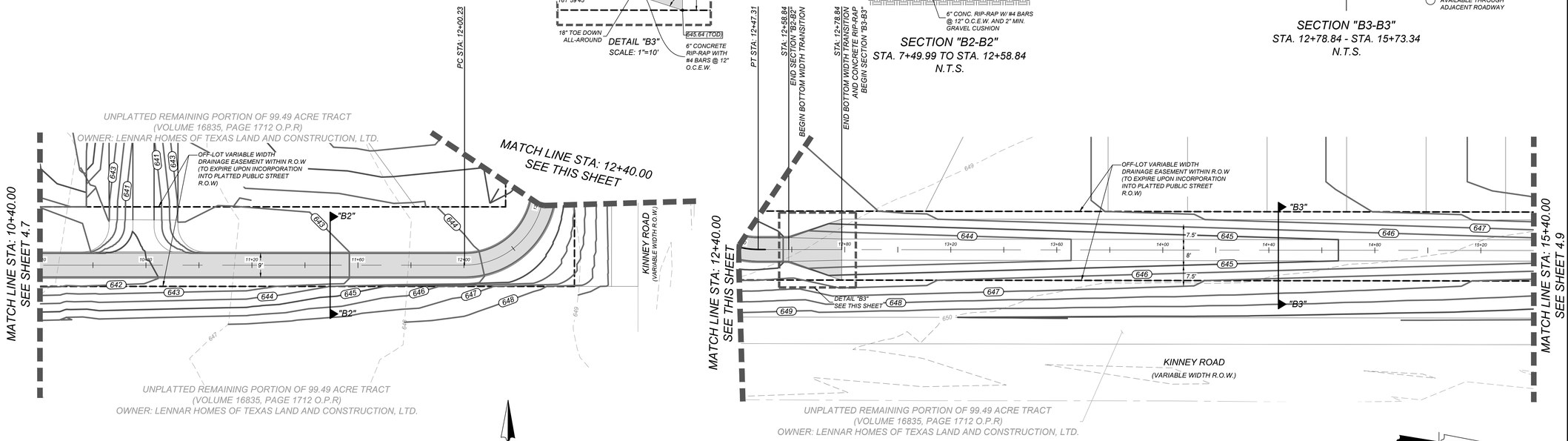
DETAIL "B3"
SCALE: 1"=10'



SECTION "B2-B2"
STA. 7+49.99 TO STA. 12+58.84
N.T.S.

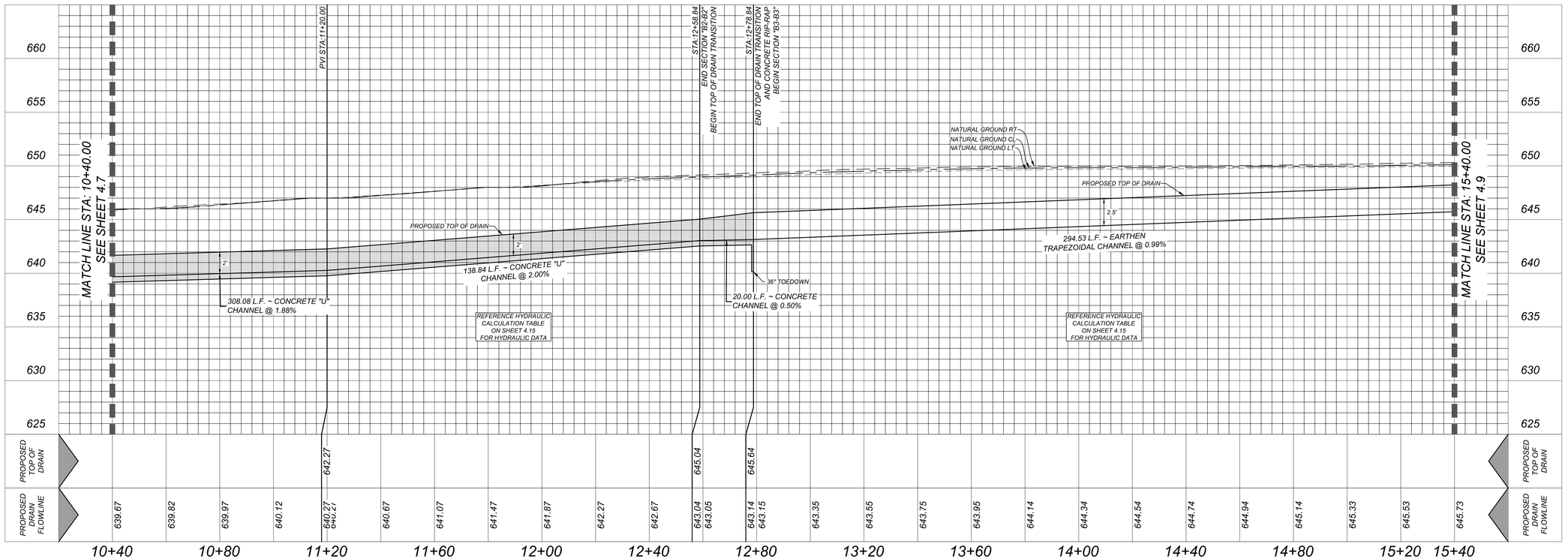


SECTION "B3-B3"
STA. 12+78.84 - STA. 15+73.34
N.T.S.



DRAIN "B"
STA: 10+40.00 TO 15+40.00

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



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SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
DRAIN "B" PLAN AND PROFILE

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
4.8

Date: Feb 14, 2024, 4:20pm User ID: crodriguez
File: N:\314-50\03\Design\Civil\Drains\SSP314-50-03 - BC.dwg

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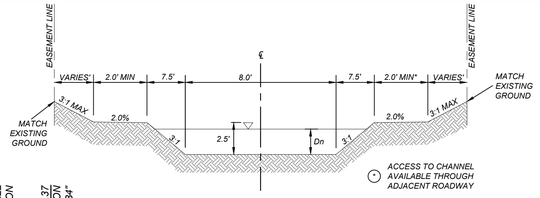
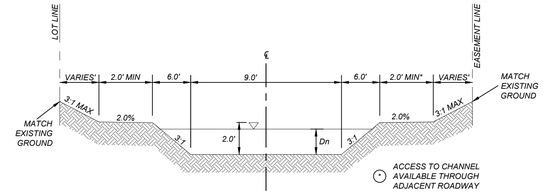
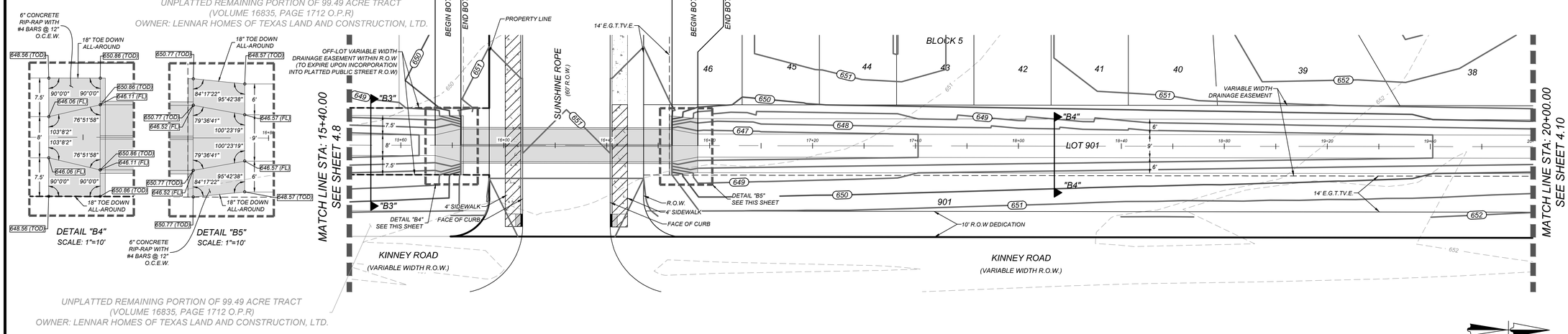


SECTION "B3-B3"
STA. 12+78.84 - STA. 15+73.34
N.T.S.

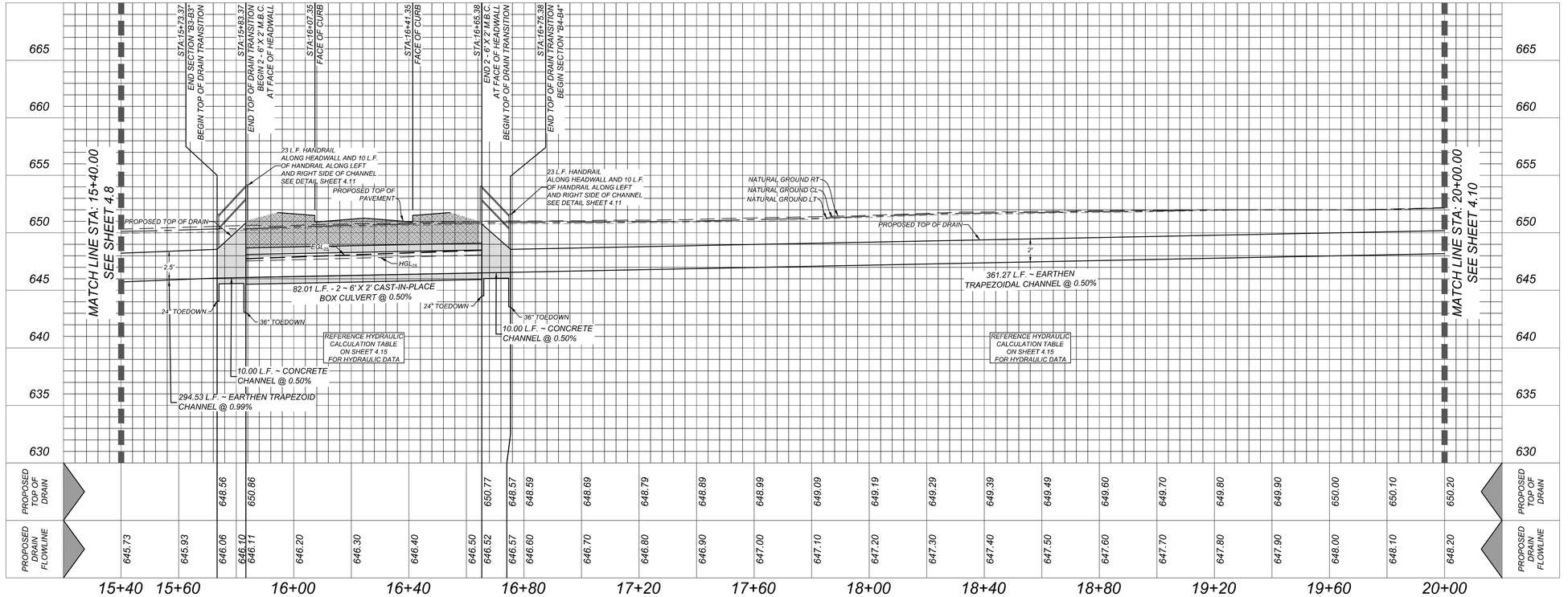


SECTION "B4-B4"
STA. 16+75.37 - STA. 20+36.65
N.T.S.



DRAIN "B"
STA: 15+40.00 TO 20+00.00

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



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PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 4.9

Date: Feb 16, 2024, 8:44am User ID: gradriguez
File: N:\314\50\03\Design\Civil\Drains\SSP314503 – BC.dwg

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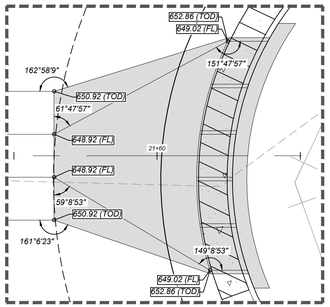
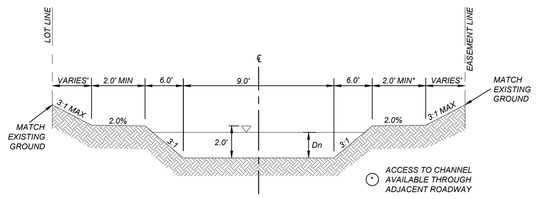
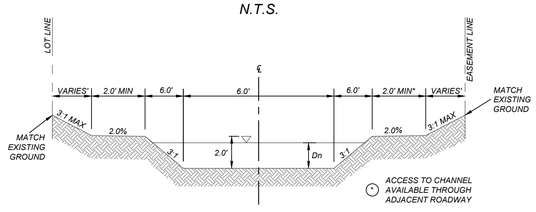


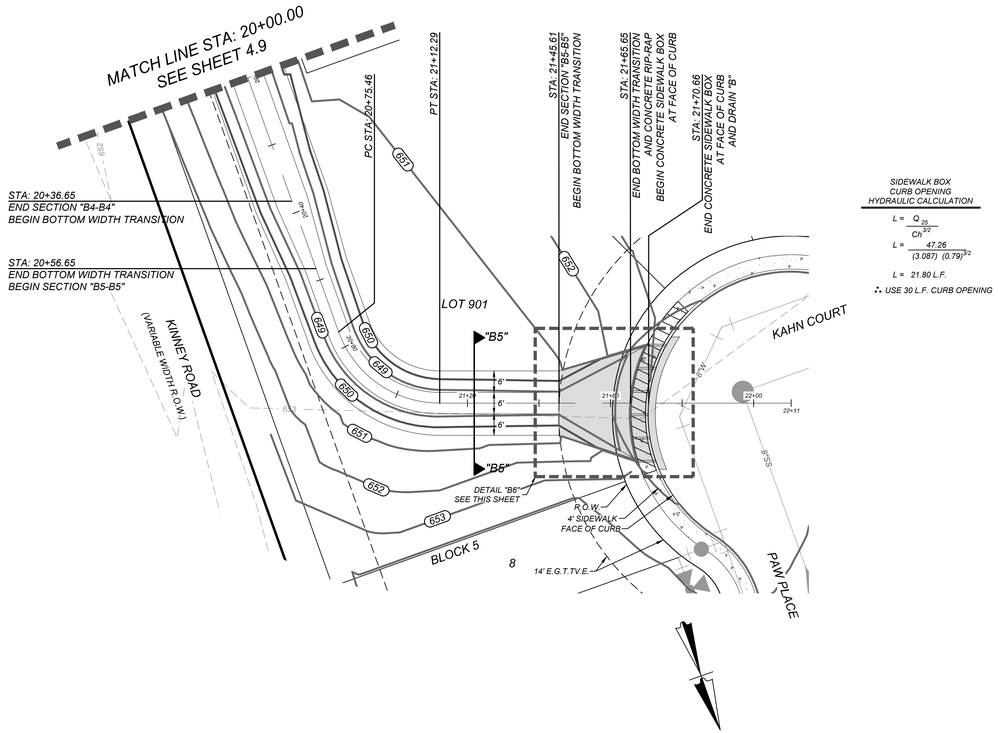
DETAIL "B6"
SCALE: 1"=10'



SECTION "B4-B4"
STA. 16+75.37 - STA. 20+36.65
N.T.S.



SECTION "B5-B5"
STA. 20+56.65 - STA. 21+45.61
N.T.S.



SIDEWALK BOX CURB OPENING HYDRAULIC CALCULATION

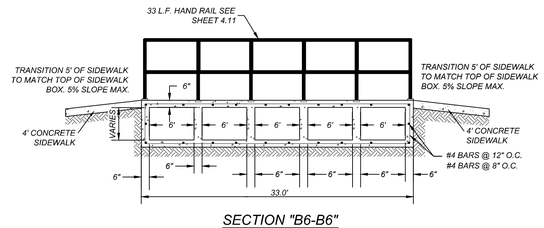
$L = \frac{Q_{25}}{Ch^{3/2}}$

$L = \frac{47.26}{(3.087)\ (0.79)^{3/2}}$

$L = 21.80$ L.F.

∴ USE 30 L.F. CURB OPENING

CURB ARMOR DETAIL
N.T.S.

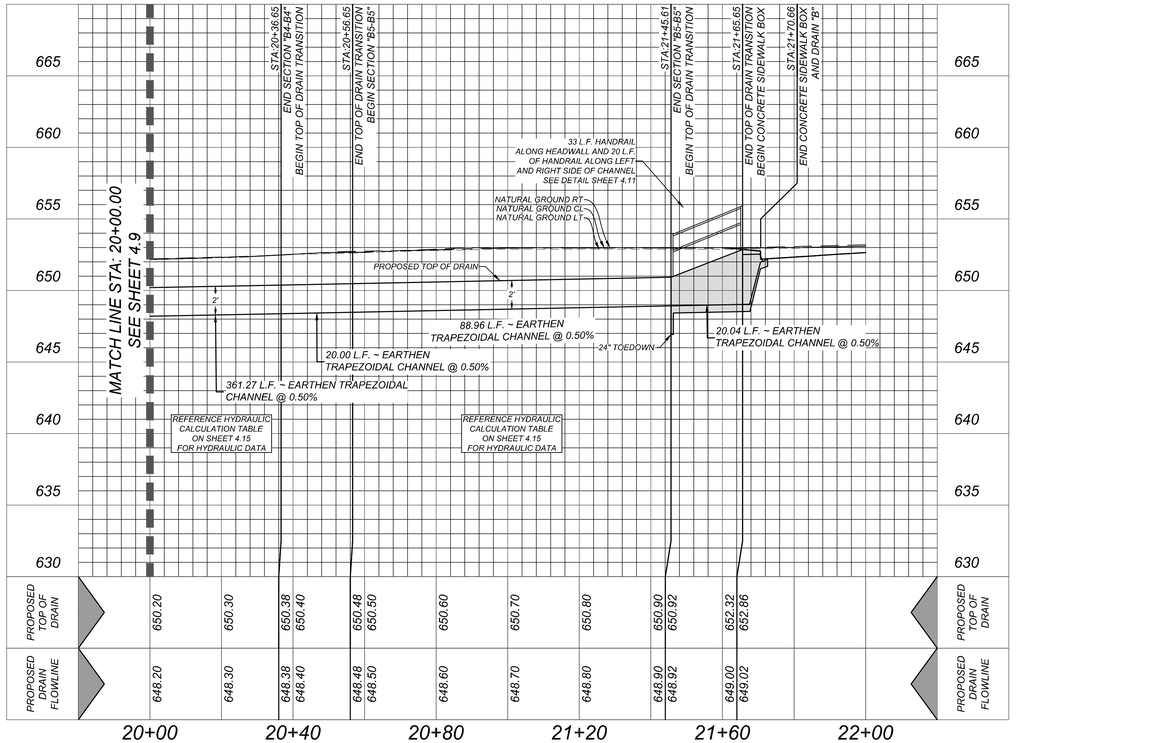


SECTION "B6-B6"
N.T.S.

DETAIL "A" SIDEWALK BOX DETAIL (UPSTREAM)
SCALE: NOT-TO-SCALE

DRAIN "B"
STA: 20+00.00 TO END

HORZ SCALE: 1"=20'
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
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

DRAIN "B" PLAN AND PROFILE

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
4.10

Date: Feb 15, 2024, 8:08am User ID: gonzigruez
File: N:\314\50\03\Design\Civil\Drains\SSPS1-50003 - BC.dwg

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TRENCH EXCAVATION SAFETY PROTECTION

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

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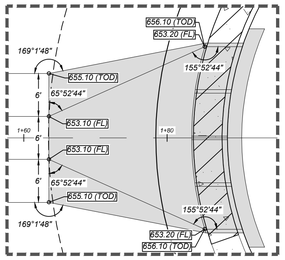
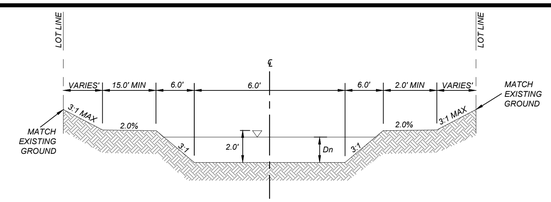
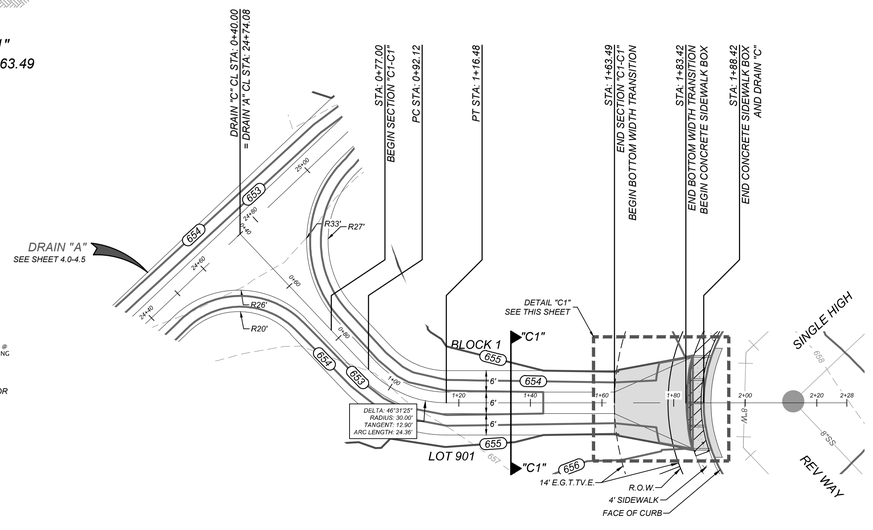


DETAIL "C1"
SCALE: 1"=10'



SECTION "C1-C1"
STA. 0+77.00 - STA. 1+63.49
N.T.S.



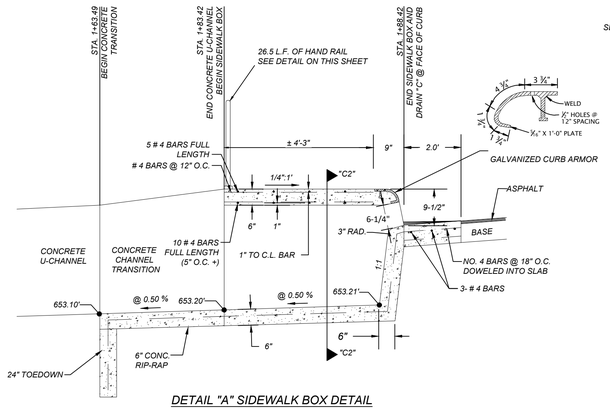
SIDEWALK BOX CURB OPENING HYDRAULIC CALCULATION

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

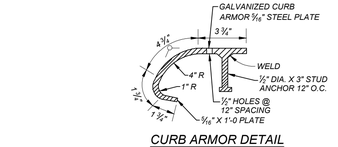
$$L = \frac{38.83}{(3.087)\ (0.79)^{3/2}}$$

$L = 17.91$ L.F.

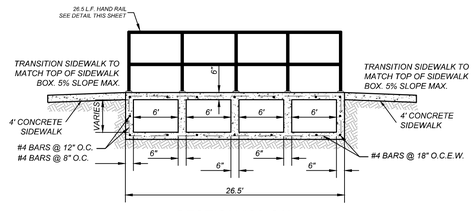
∴ USE 24 L.F. CURB OPENING



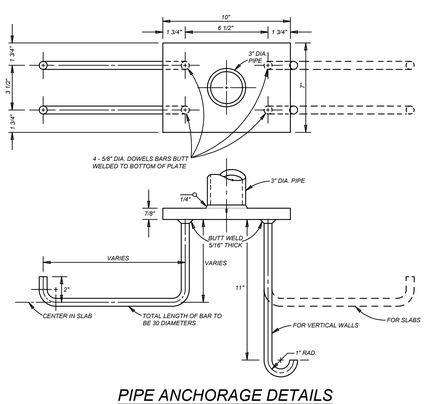
DETAIL "A" SIDEWALK BOX DETAIL (UPSTREAM)
SCALE: NOT-TO-SCALE



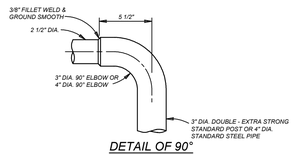
CURB ARMOR DETAIL
N.T.S.



SECTION "C2-C2"
N.T.S.

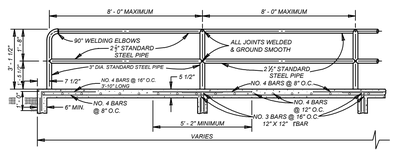


PIPE ANCHORAGE DETAILS
N.T.S.



DETAIL OF 90° WELDING ELBOWS
N.T.S.

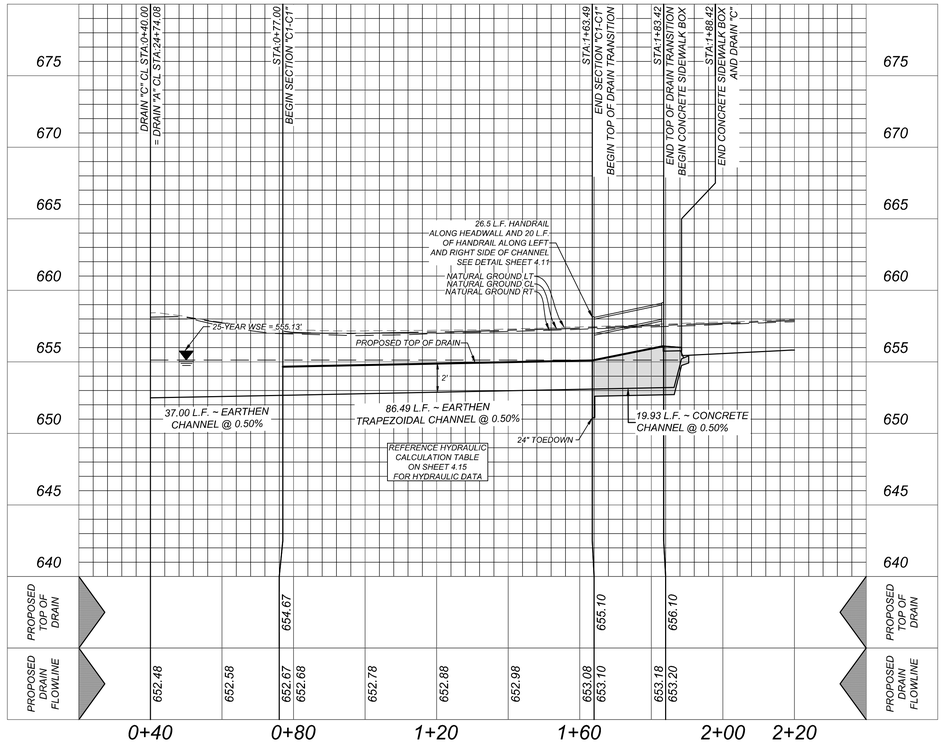
* A NEAT END SECTION, SATISFACTORY TO THE ENGINEER, FROM SUBMITTED SHOP DRAWINGS, MAY BE USED IN LIEU OF THE 90° WELDING ELBOW SHOWN.



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

DRAIN "C"
STA: 0+40.00 TO END

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



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STATE OF TEXAS
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139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
DRAIN "C" PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 4.11

Date: Feb 15, 2024, 8:09am User ID: geraldfigueroa
File: N:\314\50\03\Design\Civil\Drawings\SSP\314503 – BC.dwg

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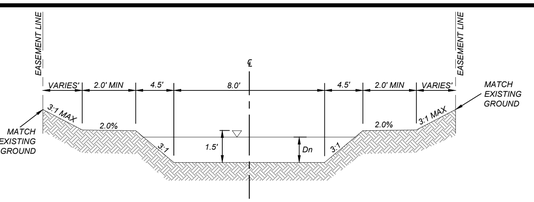
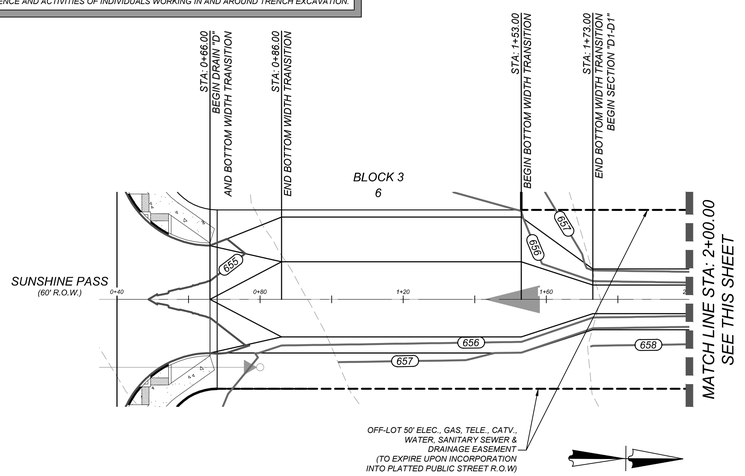
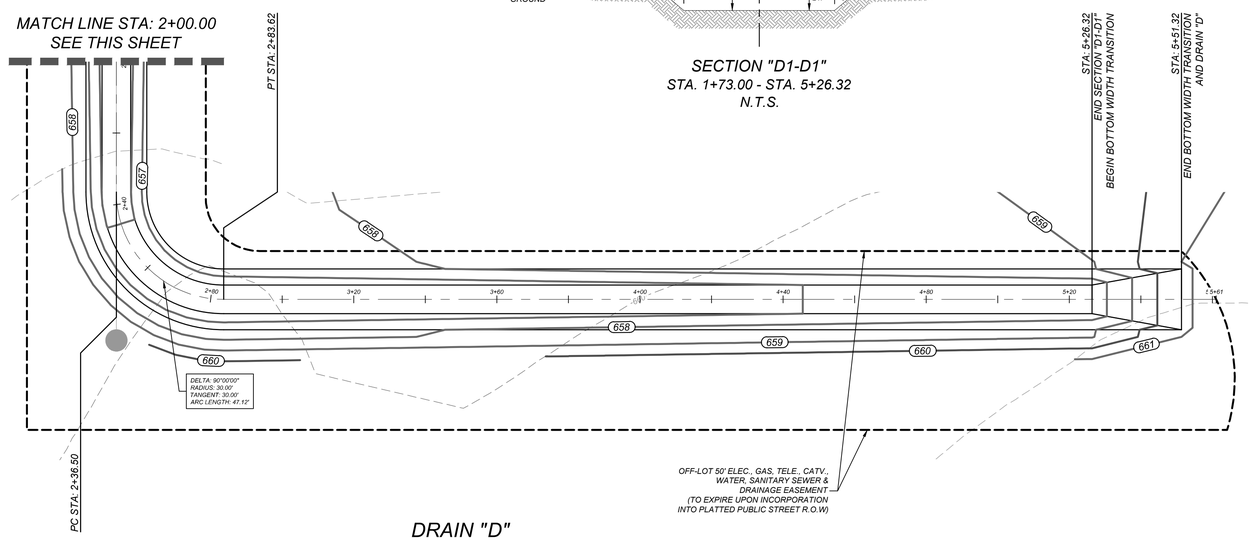


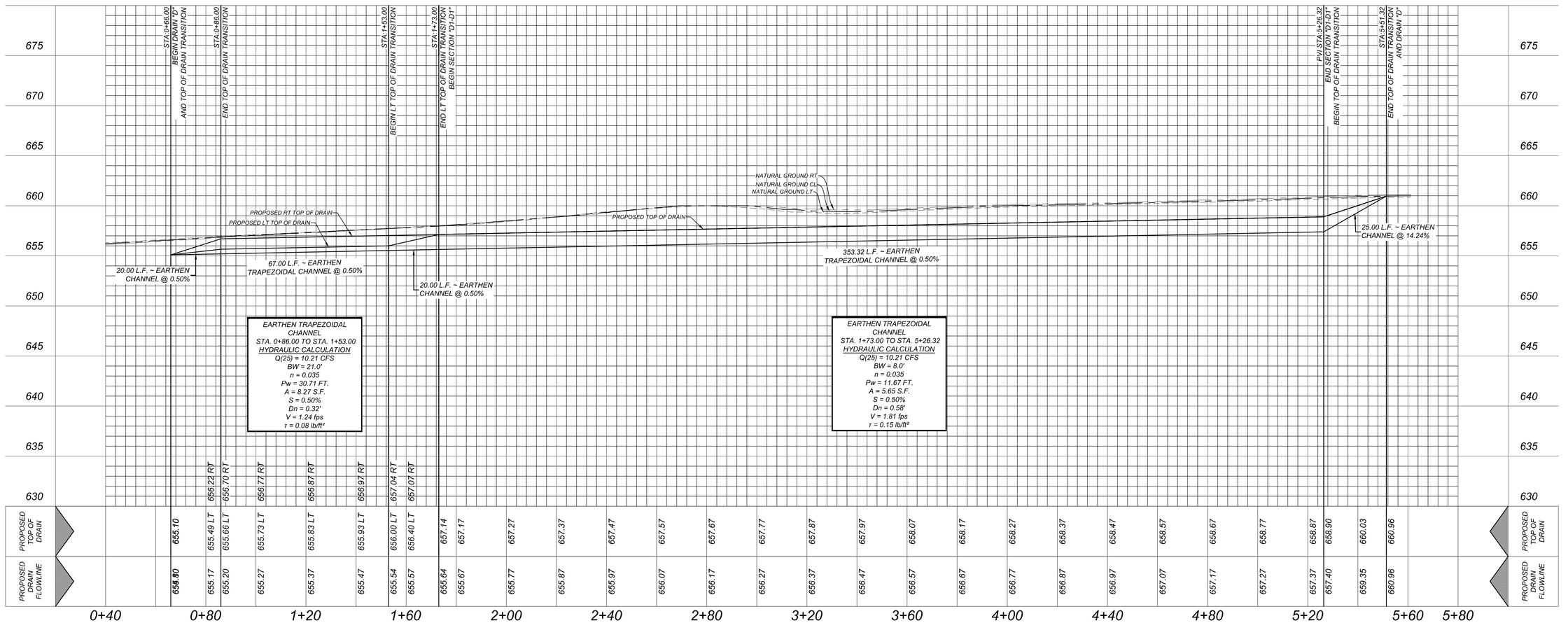
SECTION "D1-D1"
STA. 1+73.00 - STA. 5+26.32
N.T.S.





DRAIN "D"
STA: 0+66.00 TO END

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



EARTHEN TRAPEZOIDAL CHANNEL
STA. 0+86.00 TO STA. 1+53.00
HYDRAULIC CALCULATION
Q(25) = 10.21 CFS
BW = 21.0'
n = 0.035
Pw = 30.71 FT.
A = 8.27 S.F.
S = 0.50%
Dn = 0.32'
V = 1.24 fps
τ = 0.08 lb/ft²

EARTHEN TRAPEZOIDAL CHANNEL
STA. 1+73.00 TO STA. 5+26.32
HYDRAULIC CALCULATION
Q(25) = 10.21 CFS
BW = 8.0'
n = 0.035
Pw = 11.67 FT.
A = 5.65 S.F.
S = 0.50%
Dn = 0.58'
V = 1.81 fps
τ = 0.15 lb/ft²

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REVISIONS | ISSUE DATE

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
DRAIN "D" PLAN AND PROFILE

PLAT NO.
23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER:
4.12

Date: Feb 15, 2024, 8:48am User ID: crodriguez
File: N:\SA\400\03\Design\Civil\Drains\SSPT3\42503 - D.dwg

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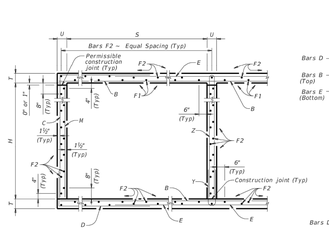
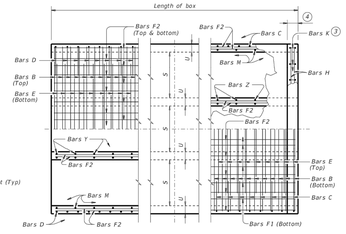
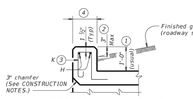


TYPICAL SECTION



BOTTOM SLAB PART PLANS TOP SLAB



SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
2'-0"	2'-6 ½"	3'-8 ½"
3'-0"	3'-6 ½"	3'-8 ½"
4'-0"	4'-6 ½"	3'-8 ½"
5'-0"	5'-6 ½"	3'-8 ½"

1. 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 Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
2. 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.
3. For curbs less than 1'-0" high, till Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
4. 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, H, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 1.7 (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

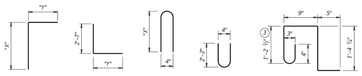
CONSTRUCTION NOTES:
Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

Provide bar laps, where required, as follows:
- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min
- Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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



BARS C BARS D BARS Z BARS Y BARS K (#4) (Spa = 1'-0" Max) (Length = 4'-2")

HL93 LOADING SHEET 1 OF 2

Texas Department of Transportation — Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE
5'-0" SPAN
0' TO 20' FILL
MC-5-20

File: CD-MC520-20.dgn	dn: TBE	ck: BRP	dw: TxDOT	ck: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

DATE: FILE:

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																										QUANTITIES			
					Bars B				Bars C & D						Bars E				Bars F1 ~ #4			Bars F2 ~ #4			Bars M ~ #4			Bars Y & Z ~ #4						Bars H 4 ~ #4		Bars K	Per Foot of Barrel		Curb		Total	
	S	H	T	U	No.	Size	Spa	Length	Wt.	No.	Size	Spa	Bars C Length	Wt.	Bars D Length	Wt.	No.	Size	Spa	Length	Wt.	No.	Spa	Length	Wt.	No.	Spa	Length	Wt.	No.	Spa	Bars Y Length	Wt.	Bars Z Length	Wt.	Length	Wt.	No.	Wt.	Conc (CY)	Reinf (LB)	Conc (CY)	Reinf (LB)	Conc (CY)	Reinf (LB)
2	5'-0"	2'-0"	8"	7"	108	#5	9"	11'-6"	1,295	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	11'-2"	1,649	38	18"	39'-9"	1,009	108	9"	2'-0"	144	54	9"	4'-7"	165	5'-3"	189	11'-6"	31	26	72	0.710	135.2	0.9	103	39.3	5,330
3	6'-0"	2'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	54	18"	39'-9"	1,434	108	9"	2'-0"	144	108	9"	4'-7"	331	5'-3"	379	17'-1"	46	38	106	1.029	188.8	1.3	152	42.4	7,705
4	5'-0"	2'-0"	8"	7"	108	#5	9"	22'-8"	2,553	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	70	18"	39'-9"	1,859	108	9"	2'-0"	144	162	9"	4'-7"	496	5'-3"	568	22'-8"	61	48	134	1.348	242.4	1.7	195	55.6	9,891
5	5'-0"	2'-0"	8"	7"	108	#5	9"	28'-3"	3,182	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	86	18"	39'-9"	2,284	108	9"	2'-0"	144	216	9"	4'-7"	661	5'-3"	758	28'-3"	75	60	167	1.667	296.0	2.1	242	68.8	12,082
6	5'-0"	2'-0"	8"	7"	108	#5	9"	33'-10"	3,811	108	#5	9"	6'-3"	704	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	102	18"	39'-9"	2,708	108	9"	2'-0"	144	270	9"	4'-7"	827	5'-3"	947	33'-10"	90	70	195	1.986	349.6	2.5	285	82.0	14,268
2	5'-0"	3'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	44	18"	39'-9"	1,168	108	9"	3'-0"	216	54	9"	4'-7"	165	7'-3"	262	11'-6"	31	26	72	0.775	159.9	0.9	103	31.9	6,497
3	5'-0"	3'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	62	18"	39'-9"	1,646	108	9"	3'-0"	216	108	9"	4'-7"	331	7'-3"	523	17'-1"	46	38	106	1.115	223.5	1.3	152	43.9	9,093
4	6'-0"	3'-0"	9"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	80	18"	39'-9"	2,124	108	9"	3'-0"	216	162	9"	4'-7"	496	7'-3"	785	22'-8"	61	48	134	1.436	287.2	1.7	195	59.9	11,682
5	5'-0"	3'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	98	18"	39'-9"	2,602	108	9"	3'-0"	216	216	9"	4'-7"	661	7'-3"	1,046	28'-3"	75	60	167	1.796	350.8	2.1	242	73.9	14,274
6	6'-0"	3'-0"	9"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	7'-3"	817	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	116	18"	39'-9"	3,080	108	9"	3'-0"	216	270	9"	4'-7"	827	7'-3"	1,308	33'-10"	90	70	195	2.137	414.5	2.5	285	88.0	16,863
2	5'-0"	4'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	44	18"	39'-9"	1,168	108	9"	4'-0"	289	54	9"	4'-7"	165	9'-3"	334	11'-6"	31	26	72	0.840	166.3	0.9	103	34.5	6,754
3	5'-0"	4'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	62	18"	39'-9"	1,646	108	9"	4'-0"	289	108	9"	4'-7"	331	9'-3"	667	17'-1"	46	38	106	1.202	231.8	1.3	152	49.4	9,422
4	6'-0"	4'-0"	9"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	80	18"	39'-9"	2,124	108	9"	4'-0"	289	162	9"	4'-7"	496	9'-3"	1,001	22'-8"	61	48	134	1.564	297.2	1.7	195	64.3	12,083
5	5'-0"	4'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	98	18"	39'-9"	2,602	108	9"	4'-0"	289	216	9"	4'-7"	661	9'-3"	1,359	28'-3"	75	60	167	1.926	362.7	2.1	242	79.1	14,748
6	6'-0"	4'-0"	9"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	8'-3"	929	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	116	18"	39'-9"	3,080	108	9"	4'-0"	289	270	9"	4'-7"	827	9'-3"	1,668	33'-10"	90	70	195	2.288	426.1	2.5	285	94.0	17,408
2	5'-0"	5'-0"	8"	7"	108	#6	9"	11'-6"	1,865	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	8'-8"	976	8	18"	39'-9"	212	50	18"	39'-9"	1,328	108	9"	5'-0"	361	54	9"	4'-7"	165	11'-3"	406	11'-6"	31	26	72	0.904	176.7	0.9	103	37.0	7,171
3	5'-0"	5'-0"	8"	7"	108	#6	9"	17'-1"	2,771	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	14'-3"	1,605	12	18"	39'-9"	319	70	18"	39'-9"	1,859	108	9"	5'-0"	361	108	9"	4'-7"	331	11'-3"	812	17'-1"	46	38	106	1.288	245.3	1.3	152	52.8	9,965
4	5'-0"	5'-0"	8"	7"	108	#6	9"	22'-8"	3,677	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	19'-10"	2,234	16	18"	39'-9"	425	90	18"	39'-9"	2,390	108	9"	5'-0"	361	162	9"	4'-7"	496	11'-3"	1,217	22'-8"	61	48	134	1.672	313.9	1.7	195	68.6	12,750
5	5'-0"	5'-0"	8"	7"	108	#6	9"	28'-3"	4,583	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	25'-5"	2,863	20	18"	39'-9"	531	110	18"	39'-9"	2,921	108	9"	5'-0"	361	216	9"	4'-7"	661	11'-3"	1,623	28'-3"	75	60	167	2.056	382.5	2.1	242	84.3	15,540
6	5'-0"	5'-0"	8"	7"	108	#6	9"	33'-10"	5,488	108	#5	9"	9'-3"	1,042	6'-4"	713	108	#5	9"	31'-0"	3,492	24	18"	39'-9"	637	130	18"	39'-9"	3,452	108	9"	5'-0"	361	270	9"	4'-7"	827	11'-3"	2,029	33'-10"	90	70	195	2.439	451.0	2.5	285	100.1	18,326

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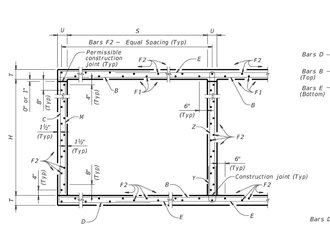
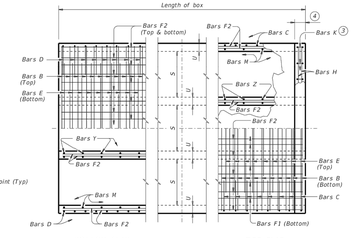
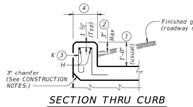


TYPICAL SECTION



BOTTOM SLAB PART PLANS TOP SLAB



SECTION THRU CURB

TABLE OF BAR DIMENSIONS		
H	"X"	"Y"
2'-0"	2'-7 ½"	4'-1"
3'-0"	3'-7 ½"	4'-1"
4'-0"	4'-7 ½"	4'-1"
5'-0"	5'-7 ½"	4'-1"
6'-0"	6'-7 ½"	4'-1"

1. 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 Rail Anchorage Curb (RAC) standard sheet for structures with bridge rail other than T631 or T631LS.
2. 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.
3. For curbs less than 1'-0" high, till Bars K or reduce bar height as necessary to maintain cover. For curbs less than 3" high, Bars K may be omitted.
4. 1'-0" typical. 2'-3" when the Rail Anchorage Curb (RAC) standard sheet is referred to elsewhere in the plans.

The Contractor may replace Bars B, C, D, E, F1, F2, H, Y, and/or Z with deformed welded wire reinforcement (WWR) meeting the requirements of ASTM A1064. The area of required reinforcement may be reduced by the ratio of 60 ksi / 70 ksi. Spacing of WWR is limited to 4" Min and 18" Max. When required, provide lap splices in the WWR of the same length required for the equivalent bar size, rounded up for wire sizes between conventional bar sizes. The lap length required for WWR is never less than the lap length required for uncoated #4 bars.

Example conversion: Replacing No. 6 Gr 60 at 6" Spacing with WWR
Required WWR = (0.44 sq. in. per 0.5 ft.) x (60 ksi / 70 ksi) = 0.755 sq. in. per ft.
If D30.6 wire is used to meet the 0.755 sq. in. per ft. requirement in this example, the required spacing = (0.306 sq. in.) / (0.755 sq. in. per ft.) x (12 in. per ft.) = 4.86" Max spacing. Required lap length for the provided D30.6 wire is 1.7 (the same minimum lap length required for uncoated #5 bars, as listed under MATERIAL NOTES).

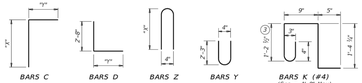
CONSTRUCTION NOTES:
Do not use permanent forms.
Chamfer the bottom edge of the top slab 3" at the entrance.
Optionally, raise construction joints shown at the flow line by a maximum of 6". If this option is taken, Bars M may be cut off or raised, Bars C and D may be reversed, and Bars Y and Z may be reversed.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) for culvert barrel and curb, with the following exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of:
- culverts with overlay,
- culverts with 1-to-2 course surface treatment, or
- culverts with the top slab as the final riding surface.

Provide bar laps, where required, as follows:
- Uncoated or galvanized ~ #4 = 1'-8" Min
- Uncoated or galvanized ~ #5 = 2'-1" Min
- Uncoated or galvanized ~ #6 = 2'-6" Min

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications for the range of fill heights shown.
See the Multiple Box Culverts Cast-In-Place Miscellaneous Detail (MC-MD) standard sheet for details pertaining to skewed ends, angle sections, and lengthening.

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



BARS C BARS D BARS Z BARS Y BARS K (#4) (Spa = 1'-0" Max) (Length = 4'-2")

HL93 LOADING SHEET 2 OF 2

Texas Department of Transportation — Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE
6'-0" SPAN
0' TO 16' FILL
MC-6-16

File: CD-MC616-20.dgn	dn: TBE	ck: BRP	dw: TxDOT	ck: TxDOT
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REVISIONS	DIST	COUNTY		SHEET NO.

DATE: FILE:

NUMBER OF SPANS	SECTION DIMENSIONS				BILLS OF REINFORCING STEEL (For Box Length = 40 feet)																										QUANTITIES			
					Bars B				Bars C & D						Bars E				Bars F1 ~ #4			Bars F2 ~ #4			Bars M ~ #4			Bars Y & Z ~ #4						Bars H 4 ~ #4		Bars K	Per Foot of Barrel		Curb		Total	
	S	H	T	U	No.	Size	Spa	Length	Wt.	No.	Size	Spa	Bars C Length	Wt.	Bars D Length	Wt.	No.	Size	Spa	Length	Wt.	No.	Spa	Length	Wt.	No.	Spa	Length	Wt.	No.	Spa	Bars Y Length	Wt.	Bars Z Length	Wt.	Length	Wt.	No.	Wt.	Conc (CY)	Reinf (LB)	Conc (CY)	Reinf (LB)	Conc (CY)	Reinf (LB)
2	6'-0"	2'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	6'-8"	753	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	44	18"	39'-9"	1,168	108	9"	2'-0"	144	54	9"	4'-9"	171	5'-5"	195	13'-6"	36	30	84	0.894	182.4	1.0	120	36.8	7,414
3	6'-0"	2'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	63	18"	39'-9"	1,673	108	9"	2'-0"	144	108	9"	4'-9"	343	5'-5"	391	20'-1"	54	44	122	1.302	260.9	1.5	176	53.6	10,611
4	6'-0"	2'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	82	18"	39'-9"	2,177	108	9"	2'-0"	144	162	9"	4'-9"	514	5'-5"	586	26'-8"	71	56	156	1.711	339.4	2.0	227	70.4	13,801
5	6'-0"	2'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	29'-11"	4,853	25	18"	39'-9"	664	101	18"	39'-9"	2,682	108	9"	2'-0"	144	216	9"	4'-9"	685	5'-5"	782	33'-3"	89	70	195	2.120	417.9	2.5	284	87.3	16,999
6	6'-0"	2'-0"	9"	7"	108	#6	9"	39'-10"	6,462	108	#5	9"	6'-8"	751	6'-9"	760	108	#6	9"	36'-6"	5,921	30	18"	39'-9"	797	120	18"	39'-9"	3,186	108	9"	2'-0"	144	270	9"	4'-9"	857	5'-5"	977	39'-10"	106	82	228	2.529	496.4	3.0	334	104.1	20,189
2	6'-0"	3'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	50	18"	39'-9"	1,328	108	9"	3'-0"	216	54	9"	4'-9"	171	7'-5"	268	13'-6"	36	30	84	0.958	192.8	1.0	120	39.3	7,832
3	6'-0"	3'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	71	18"	39'-9"	1,885	108	9"	3'-0"	216	108	9"	4'-9"	343	7'-5"	535	20'-1"	54	44	122	1.389	274.4	1.5	176	57.1	11,152
4	6'-0"	3'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	92	18"	39'-9"	2,443	108	9"	3'-0"	216	162	9"	4'-9"	514	7'-5"	803	26'-8"	71	56	156	1.819	356.1	2.0	227	74.7	14,469
5	6'-0"	3'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	29'-11"	4,853	25	18"	39'-9"	664	113	18"	39'-9"	3,000	108	9"	3'-0"	216	216	9"	4'-9"	685	7'-5"	1,070	33'-3"	89	70	195	2.250	437.7	2.5	284	92.5	17,790
6	6'-0"	3'-0"	9"	7"	108	#6	9"	39'-10"	6,462	108	#5	9"	7'-8"	864	6'-9"	760	108	#6	9"	36'-6"	5,921	30	18"	39'-9"	797	134	18"	39'-9"	3,558	108	9"	3'-0"	216	270	9"	4'-9"	857	7'-5"	1,338	39'-10"	106	82	228	2.681	519.3	3.0	334	110.2	21,107
2	6'-0"	4'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	50	18"	39'-9"	1,328	108	9"	4'-0"	289	54	9"	4'-9"	171	9'-5"	340	13'-6"	36	30	84	1.023	199.2	1.0	120	41.9	8,089
3	6'-0"	4'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	71	18"	39'-9"	1,885	108	9"	4'-0"	289	108	9"	4'-9"	343	9'-5"	679	20'-1"	54	44	122	1.475	282.6	1.5	176	60.5	11,481
4	6'-0"	4'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	92	18"	39'-9"	2,443	108	9"	4'-0"	289	162	9"	4'-9"	514	9'-5"	1,019	26'-8"	71	56	156	1.927	366.1	2.0	227	79.1	14,870
5	6'-0"	4'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	29'-11"	4,853	25	18"	39'-9"	664	113	18"	39'-9"	3,000	108	9"	4'-0"	289	216	9"	4'-9"	685	9'-5"	1,359	33'-3"	89	70	195	2.380	449.5	2.5	284	97.7	18,264
6	6'-0"	4'-0"	9"	7"	108	#6	9"	39'-10"	6,462	108	#5	9"	8'-8"	976	6'-9"	760	108	#6	9"	36'-6"	5,921	30	18"	39'-9"	797	134	18"	39'-9"	3,558	108	9"	4'-0"	289	270	9"	4'-9"	857	9'-5"	1,698	39'-10"	106	82	228	2.832	533.0	3.0	334	116.2	21,652
2	6'-0"	5'-0"	9"	7"	108	#6	9"	13'-6"	2,190	108	#5	9"	9'-8"	1,089	6'-9"	760	108	#6	9"	10'-2"	1,649	10	18"	39'-9"	266	56	18"	39'-9"	1,487	108	9"	5'-0"	361	54	9"	4'-9"	171	11'-5"	412	13'-6"	36	30	84	1.088	209.6	1.0	120	44.5	8,505
3	6'-0"	5'-0"	9"	7"	108	#6	9"	20'-1"	3,258	108	#5	9"	9'-8"	1,089	6'-9"	760	108	#6	9"	16'-9"	2,717	15	18"	39'-9"	398	79	18"	39'-9"	2,098	108	9"	5'-0"	361	108	9"	4'-9"	343	11'-5"	824	20'-1"	54	44	122	1.562	296.2	1.5	176	64.0	12,024
4	6'-0"	5'-0"	9"	7"	108	#6	9"	26'-8"	4,326	108	#5	9"	9'-8"	1,089	6'-9"	760	108	#6	9"	23'-4"	3,785	20	18"	39'-9"	531	102	18"	39'-9"	2,708	108	9"	5'-0"	361	162	9"	4'-9"	514	11'-5"	1,235	26'-8"	71	56	156	2.035	382.7	2.0	227	83.4	15,536
5	6'-0"	5'-0"	9"	7"	108	#6	9"	33'-3"	5,394	108	#5	9

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

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

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)

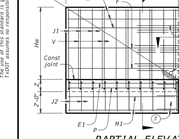
For precast culverts:
Ltw = [(N) (2 1/2 + S) + (N – 1) (0.5')] + cosine (θ)
Total Wingwall Area (two wings – SF)
= (2)(Hw)(Lw) for Type PW-1
= (2)(Hw)(Lw) – 6 SF for Type PW-2 and Hw ≥ 4'
= (2)(Hw)(Lw) – 1.5 SF for Type PW-2 and Hw < 4'

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

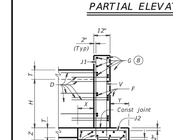
See applicable box culvert standard sheet for S, H, T, and U values.

BARS J1 BARS J2 BARS J3 BARS V

SECTION C-C - PW-1



SECTION C-C - PW-2



PLAN

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

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

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 TL631 or TL631LS bridge rail, refer to the Mounting Details for TL631 & TL631LS Rails (TL631-CM) standard sheet. Refer to the Box Culvert Rail Mounting Details (RAC) standard sheet for structures with bridge rail other than TL631 or TL631LS.
10. For vehicle safety, the following requirements must be met:
    - For structures without bridge rail, construct curbs no more than 3" above finished grade.
    - For structures with bridge rail, construct curbs flush with finished grade.

    Reduce curb heights, if necessary, to meet the above requirements. No changes will be made in quantities and no additional compensation will be allowed for this work.
11. 1'-0" typical. 2'-3" when the Box Culvert Rail Mounting Details (RAC) standard sheet is referred to elsewhere in the plans.
12. 3'-0" for Hw < 4'.
13. 6" for Hw < 4'.

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 epoxy coated reinforcing 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: CD-PW-20.dgn	DN: GAF	CK: CAT	DW: TxDOT	CK: TxDOT
©TxDOT February 2020	CONT	SECT	JOB	HIGHWAY
REVISIONS	DIST	COUNTY		SHEET NO.

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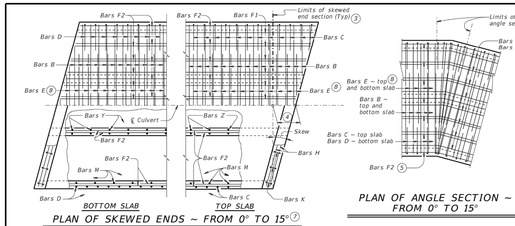


BOTTOM SLAB TOP SLAB
PLAN OF SKEWED ENDS ~ FROM 0° TO 15° 7

BOTTOM SLAB TOP SLAB
PLAN OF SKEWED ENDS ~ OVER 15° TO 30°

BOTTOM SLAB TOP SLAB
PLAN OF SKEWED ENDS ~ OVER 30° TO 45°

PLAN OF ANGLE SECTION ~ FROM 0° TO 15°
PLAN OF ANGLE SECTION ~ OVER 15° TO 30°
PLAN OF ANGLE SECTION ~ OVER 30° TO 45°

1. For skewed box culverts with less than 2'-0" of fill, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension.
   For non-skewed box culverts with less than 2'-0" of fill and for skewed or non-skewed culverts with a fill depth of 2'-0" or greater, break back the top slab to provide a 1'-10" minimum lap of the existing longitudinal bars with the longitudinal bars in the extension. Alternatively, if the box is non-skewed, embed #6 anchor bars with a Type III, Class C, D, E, or F anchor adhesive into the existing walls, top and bottom slab at 1'-6" center-to-center spacing. Minimum embedment depth is 8". Anchor adhesive chosen must be able to achieve a basic bond strength in tension, Nba, of 36.4 kips. Submit signed and sealed calculations or the manufacturer's published literature showing the proposed anchor adhesive's ability to develop this load to the Engineer for approval prior to use. Anchor installation, including hole size, drilling, and clean out, must be in accordance with Item 450.3.3, "Drilled Holes." Perform anchor tests in accordance with Item 450.3.3, "Tests." Test 3 anchors per 100 anchors installed.
   Break back wings and apron as necessary to install the extension. Clean and extend the exposed wingwall and apron reinforcing into the extension. When lengthening existing box culverts with dimensions different than current standard dimensions, form horizontal and vertical transitions as directed by the Engineer. Match bottom slabs to maintain an uninterrupted flow line. Field bend existing and new reinforcing into transitions and maintain specified cover requirements. For top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface, adjust the "H" dimension to provide a smooth riding surface.
2. When the spacing between Bars B or Bars E becomes less than half of the normal spacing, cut bars to avoid conflict.
3. The length of Bars B and Bars E will vary in the skewed end sections.
4. [One half of overall width] x [tangent of the skew angle]
5. Place Bars F1 and F2 continuously through the angle section. Bend Bars F1 and F2 to remain parallel to the walls of the box culvert.
6. When necessary to avoid conflict in acute corners, shorten the slab extension leg of Bars C and Bars D to a minimum of 1'-0" for skews of 30° thru 45°.
7. At the Contractor's option, for skews of 15° or less, place Bars B, C, D, and E parallel to the skewed end while maintaining spacing along centerline of box. Increase lengths of Bars B and Bars E shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets to accommodate the skew.
8. Extend Bars E as shown on the MC standard sheet for direct traffic culverts.

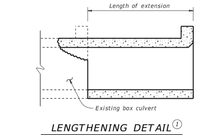
CONSTRUCTION NOTES:
Do not use permanent forms.
When required, lap Bars M 1'-9" for uncoated or galvanized bars.
Provide a minimum of 1 ½" clear cover.

MATERIAL NOTES:
Provide Grade 60 reinforcing steel.
Provide galvanized reinforcing steel, if required elsewhere in the plans.
Provide Class C concrete (f'c = 3,600 psi) with these exceptions: provide Class S concrete (f'c = 4,000 psi) for top slabs of culverts with overlay, with 1-to-2 course surface treatment, or with the top slab as the final riding surface.

GENERAL NOTES:
Designed according to AASHTO LRFD Bridge Design Specifications.
Refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for details of straight sections of culverts.
For box culvert length adjustments, refer to Multiple Box Culverts Cast-in-Place (MC) standard sheets for slab and wall dimensions, bar sizes, maximum bar spacing, and any other details not shown.
For skewed ends with curbs, adjust length of Bars H, number of Bars K, curb concrete volume, and reinforcing steel weight by dividing the values shown on the Multiple Box Culverts Cast-In-Place (MC) standard sheets by the cosine of the skew angle.

Cover dimensions are clear dimensions, unless noted otherwise.

HL93 LOADING



LENGTHENING DETAIL 1

Texas Department of Transportation — Bridge Division Standard

MULTIPLE BOX CULVERTS CAST-IN-PLACE MISCELLANEOUS DETAILS
MC-MD

FILE: CD-MC-MD-20.dgn	DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
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REVISIONS	DIST	COUNTY		SHEET NO.

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
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
DRAINAGE DETAILS

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN: BL CHECKED: JM
SHEET NUMBER: 4.14

Date: Feb 14, 2024, 4:22pm User ID: orodriguez
File: N:\SA\450\03\Design\Civil\Drains\450315405003.dwg

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River	Reach	River Sta	Profile	Q Total	Min Ch El	W.S. Elev	Crit W.S.	E.G. Elev	E.G. Slope	Vel Chnl	Flow Area	Top Width	W.P. Channel	Shear Chan
				(cfs)	(ft)	(ft)	(ft)	(ft)	(ft/ft)	(ft/s)	(sq ft)	(ft)	(ft)	(lb/sq ft)
Drain A	Drain A Up B	2857	Q25	4.64	658.38	658.68		658.73	0.010533	1.79	2.6	9.8	9.88	0.17
Drain A	Drain A Up B	2649	Q25	4.64	657.34	657.8	657.56	657.82	0.002342	1.1	4.23	10.73	10.85	0.06
Drain A	Drain A Up B	2460	Q25	4.64	656.4	656.62	656.62	656.72	0.030811	2.52	1.84	9.34	9.39	0.38
Drain A	Drain A Up B	2329	Q25	4.64	652.83	654		654.01	0.000079	0.34	13.48	15.06	15.42	0
Drain A	Drain A C-B	2249	Q25	51.92	652.28	653.73		653.86	0.004443	2.91	17.87	16.72	17.17	0.29
Drain A	Drain A C-B	2177	Q25	51.92	651.92	653.46		653.57	0.003512	2.67	19.41	17.23	17.72	0.24
Drain A	Drain A C-B	2042	Q25	51.92	651.25	652.21	652.21	652.6	0.020416	4.97	10.45	13.8	14.1	0.94
Drain A	Drain A C-B	1913	Q25	51.92	648.39	649.36	649.36	649.74	0.01998	4.93	10.52	13.82	14.11	0.93
Drain A	Drain A C-B	1753	Q25	51.92	643.89	644.87	644.87	645.24	0.020039	4.94	10.52	95.92	14.14	0.93
Drain A	Drain A C-B	1553	Q25	51.92	637.92	638.89	638.89	639.27	0.020385	4.97	10.45	13.8	14.08	0.94
Drain A	Drain A C-B	1450	Q25	51.92	634.39	636.37		636.44	0.00198	2.21	23.47	17.9	18.51	0.16
Drain A	Drain A C-B	1417	Q25	51.92	634.04	636.39		636.41	0.000234	0.92	56.59	33.03	33.65	0.02
Drain A	Drain A DOWN B	1342	Q25	212.97	633.66	636.24	634.91	636.34	0.001366	2.53	84.32	40.48	41.3	0.17
Drain A	Drain A DOWN B	1296	Q25	212.97	633.42	636.04	635.08	636.24	0.003033	3.58	59.55	30.66	31.49	0.36
Drain A	Drain A DOWN B	1270	Q25	212.97	633.3	635.97	634.94	636.16	0.002782	3.47	61.43	31.04	31.88	0.33
Drain A	Drain A DOWN B	1220	Q25	212.97	633.04	635.86		636.02	0.002282	3.23	65.92	31.9	32.79	0.29
Drain A	Drain A DOWN B	1152	Q25	212.97	632.7	635.75		635.88	0.001683	2.9	73.51	33.27	34.26	0.23
Drain A	Drain A DOWN B	1095	Q25	212.97	632.42	635.68		635.79	0.001294	2.64	80.78	34.57	35.61	0.18
Drain A	Drain A DOWN B	1065	Q25	362.14	632.27	635.3		635.68	0.004982	4.97	72.88	33.17	34.13	0.66
Drain A	Drain A DOWN B	992	Q25	362.14	631.9	634.93		635.32	0.004971	4.97	72.92	33.16	34.12	0.66
Drain A	Drain A DOWN B	942	Q25	362.14	631.66	634.69		635.07	0.004972	4.96	72.94	33.19	34.15	0.66
Drain A	Drain A DOWN B	884	Q25	362.14	631.37	634.4		634.78	0.004977	4.97	72.93	33.19	34.17	0.66
Drain A	Drain A DOWN B	863	Q25	362.14	631.24	634.55	632.79	634.7	0.000245	3.09	117.35	38.62	41.77	0.04
Drain A	Drain A DOWN B	774		Culvert										
Drain A	Drain A DOWN B	773	Q25	362.14	630.83	634.19	632.36	634.33	0.000225	3	120.87	39.02	42.19	0.04
Drain A	Drain A DOWN B	753	Q25	402.12	630.71	633.91	633.07	634.29	0.004725	4.95	81.23	35.8	36.76	0.65
Drain A	Drain A DOWN B	556	Q25	402.12	629.73	632.93	632.11	633.33	0.00499	5.12	78.53	153.59	35.2	0.69
Drain A	Drain A DOWN B	290	Q25	402.12	628.4	631.59	630.79	632	0.00502	5.13	78.37	133.64	35.17	0.7
Drain A	Drain A DOWN B	140	Q25	402.12	627.65	630.85	630.03	631.25	0.004961	5.11	78.73	209.72	35.26	0.69
Drain A	Drain A DOWN B	44	Q25	402.12	627.17	630.36	629.56	630.77	0.005001	5.12	78.47	181.82	35.19	0.7
Drain B	Drain B	2120	Q25	47.26	648.98	650.44		650.47	0.00012	1.3	36.27	26.49	27.6	0.01
Drain B	Drain B	2083	Q25	47.26	648.81	650.3		650.44	0.005048	3.04	15.57	14.95	15.41	0.32
Drain B	Drain B	2017	Q25	47.26	648.48	649.96		650.11	0.005154	3.06	15.45	14.92	15.37	0.32
Drain B	Drain B	1994	Q25	62.13	648.36	649.84		649.99	0.004973	3.15	19.74	17.84	18.31	0.33
Drain B	Drain B	1859	Q25	62.13	647.69	649.16		649.32	0.005032	3.16	19.65	17.82	18.27	0.34
Drain B	Drain B	1637	Q25	62.13	646.58	648.06		648.21	0.004863	3.12	19.91	17.95	18.4	0.33
Drain B	Drain B	1627	Q25	62.13	646.52	648.08	647.38	648.19	0.000518	2.68	23.16	16.65	17.83	0.04
Drain B	Drain B	1626		Culvert										
Drain B	Drain B	1542	Q25	62.13	646.11	647.55		647.68	0.000677	2.93	21.24	16.32	17.56	0.05
Drain B	Drain B	1532	Q25	62.13	646.04	647.46	647.11	647.66	0.006947	3.59	17.31	16.5	16.94	0.44
Drain B	Drain B	1416	Q25	62.13	644.89	645.99	645.97	646.39	0.018486	5.07	12.26	14.55	14.89	0.95
Drain B	Drain B	1246	Q25	62.13	643.21	644.79		644.94	0.004501	3.07	20.22	17.53	18.04	0.31
Drain B	Drain B	1218	Q25	62.13	643.02	644.22	644.22	644.78	0.003897	6.04	10.29	9.2	10.68	0.23
Drain B	Drain B	1131	Q25	96.08	641.28	642.87	642.87	643.61	0.003749	6.88	13.96	9.59	11.55	0.28
Drain B	Drain B	1106	Q25	96.08	640.78	642.37	642.37	643.1	0.003763	6.89	13.94	9.59	11.55	0.28
Drain B	Drain B	1082	Q25	96.08	640.31	641.9	641.9	642.64	0.003744	6.88	13.97	9.58	11.55	0.28
Drain B	Drain B	1067	Q25	96.08	640.17	641.76	641.76	642.49	0.003755	6.89	13.95	9.58	11.55	0.28
Drain B	Drain B-F-D	1013	Q25	96.08	639.76	641.35	641.35	642.08	0.003769	6.89	13.93	9.58	11.54	0.28
Drain B	Drain B-F-D	712	Q25	96.08	637.5	639.09	639.09	639.83	0.003742	6.88	13.97	9.59	11.55	0.28
Drain B	Drain B-F-D	690	Q25	96.08	637.36	639.16	638.33	639.29	0.000464	2.83	33.94	20.11	22.2	0.04
Drain B	Drain B-F-D	689		Culvert										
Drain B	Drain B-F-D	556	Q25	96.08	636.73	638.84		638.93	0.000276	2.39	40.26	21.56	23.07	0.03
Drain B	Drain B-F-D	536	Q25	127.71	636.62	638.66		638.9	0.005218	3.9	32.76	22.21	22.87	0.47
Drain B	Drain B-F-D	462	Q25	127.71	636.25	638.28		638.51	0.005079	3.85	33.17	22.47	23.11	0.46
Drain B	Drain B-F-D	233	Q25	127.71	635.1	637.37	636.58	637.55	0.003414	3.35	38.15	23.61	24.33	0.33
Drain B	Drain B-F-D	112	Q25	127.71	634.52	637.1	635.99	637.22	0.002042	2.78	45.99	25.59	26.41	0.22
Drain B	Drain B-Lower	47	Q25	212.97	634.18	636.14	636.14	636.86	0.016704	6.83	31.19	21.85	22.47	1.45
Drain B	Drain B-Lower	28	Q25	212.97	634.05	636.12		636.5	0.008149	4.95	43.02	28.78	29.31	0.75
Drain C	Drain C	151	Q25	38.83	653.15	654.29	653.7	654.34	0.000321	1.76	22.08	21.95	22.42	0.02
Drain C	Drain C	101	Q25	38.83	652.91	654.1	653.84	654.28	0.008258	3.43	11.33	13.16	13.52	0.43
Drain C	Drain C	38	Q25	38.83	652.57	653.96		654.02	0.001948	1.9	20.47	19.73	20.11	0.12

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
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER

2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

DRAINAGE CALCULATIONS

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
4.15

Date: Feb. 15, 2024, 10:30am User ID: crodriguez
File: N:\314\Q04\01\Design\Civil\Drains\SS2015400S.dwg

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TRENCH EXCAVATION SAFETY PROTECTION

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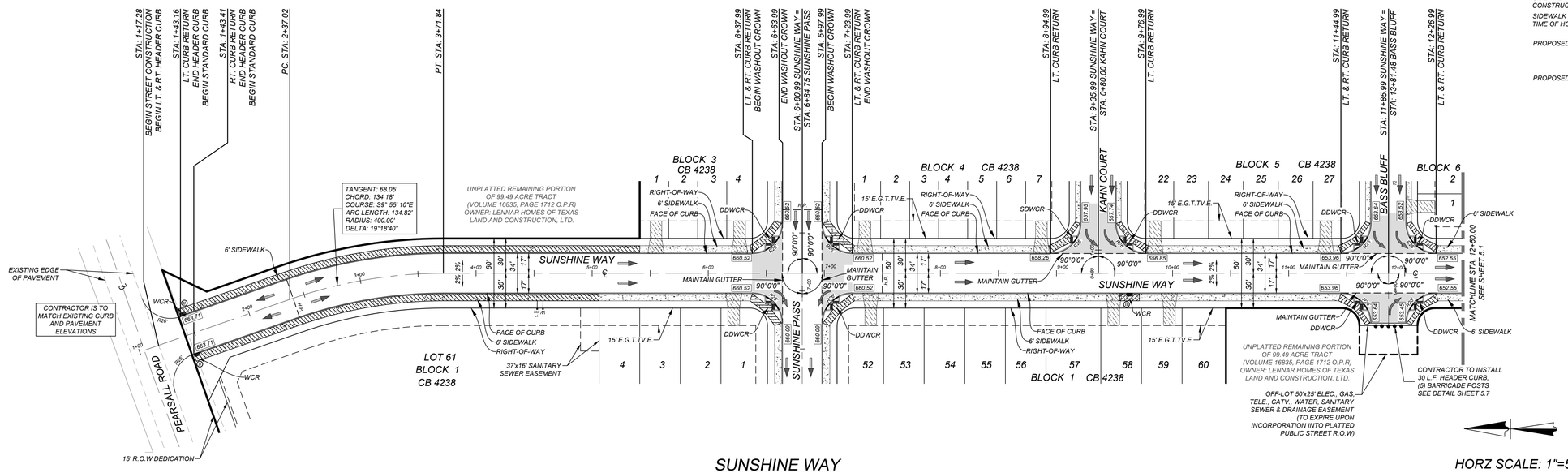
BEXAR COUNTY R.O.W. NOTE

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

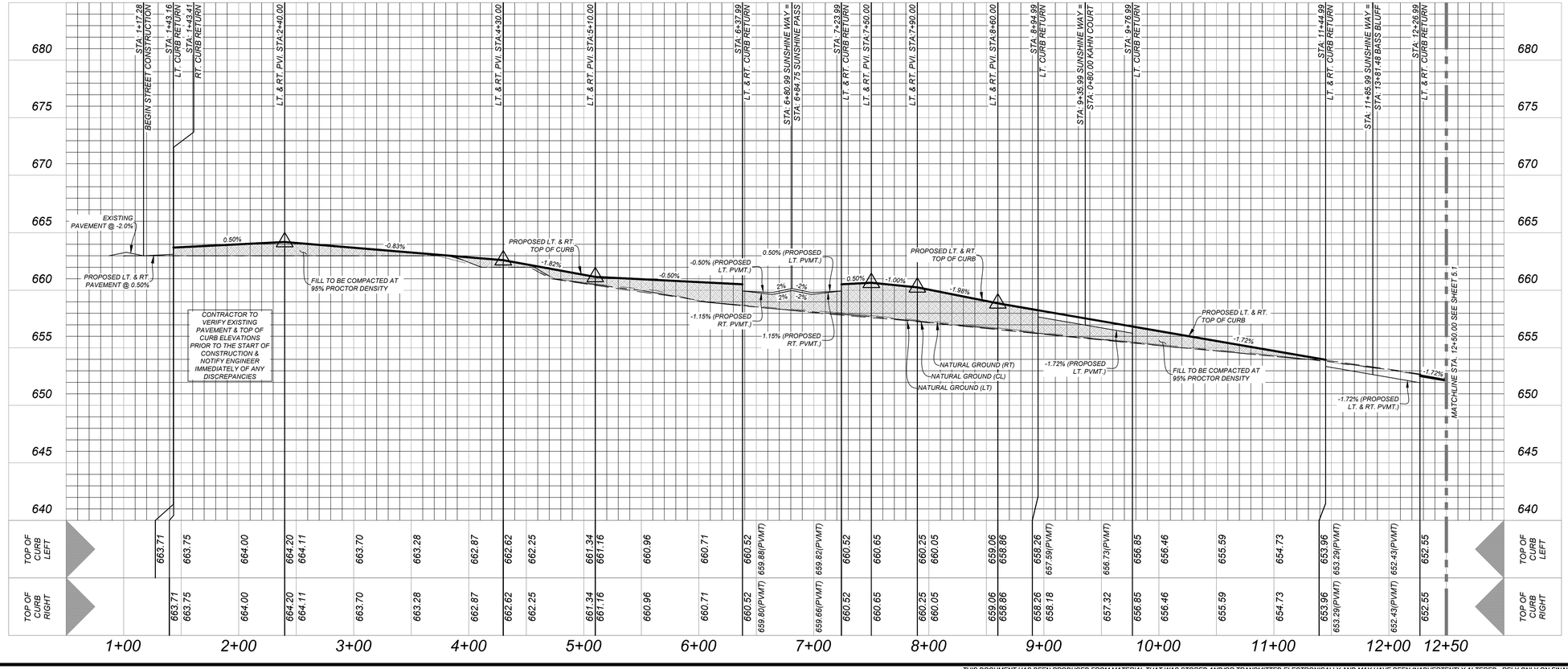
LEGEND

ELECTRIC, GAS ,TELEPHONE & CABLE EASEMENT	=	E.G.T.TV.E.
WHEELCHAIR RAMP	=	W.C.R.
SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	SDWCR
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	DDWCR
HIGH POINT	=	H.P.
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.9	=	(II)
STREET CENTERLINE	=	℄
PROPOSED FLOW ARROW	=	
TOP OF CURB ELEVATIONS	=	552.00
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	



SUNSHINE WAY
STA: 1+17.28 - STA:12+50.00

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



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

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
SUNSHINE WAY PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 5.0

Date: Feb 14, 2024, 4:22pm User ID: orodriguez
File: N:\314\50\03\Design\Civil\SHEETS\SHTS\314503.dwg

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BEXAR COUNTY R.O.W. NOTE

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LEGEND

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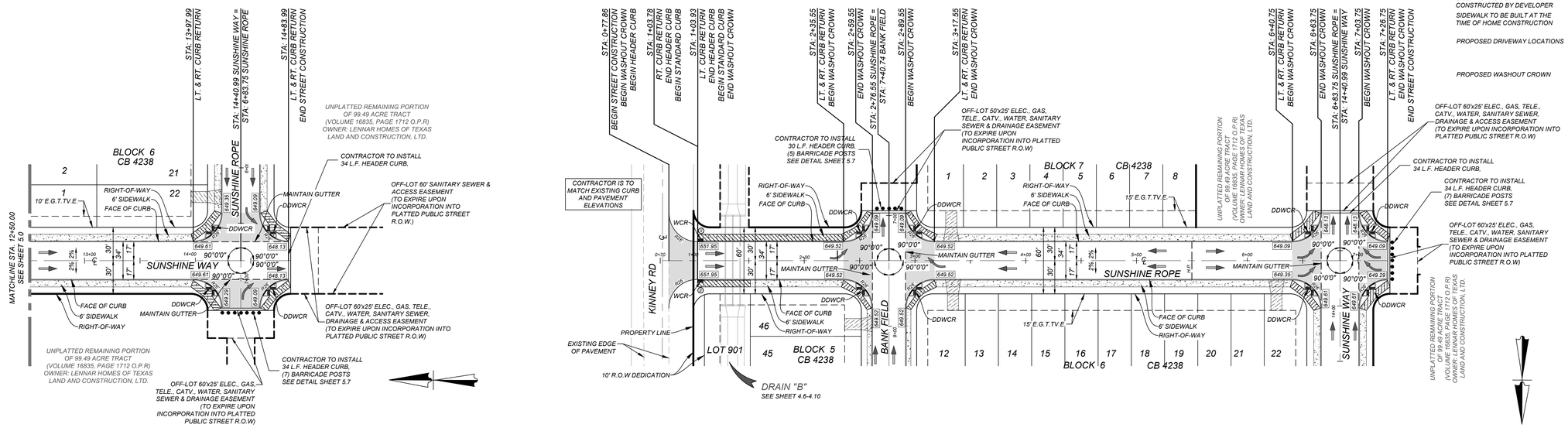
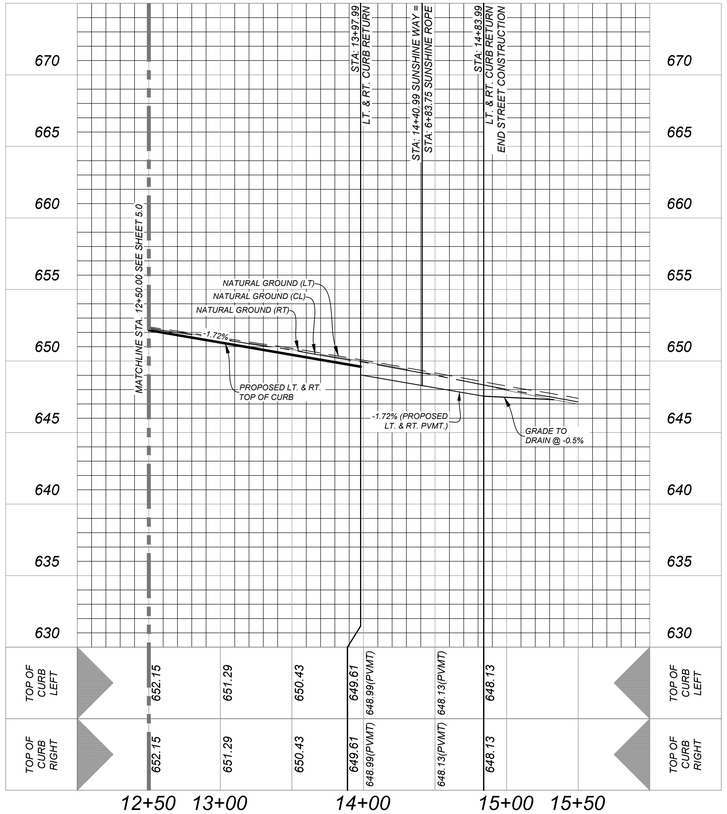
WHEELCHAIR RAMP	=	W.C.R.
SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	SDWCR
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	DDWCR
HIGH POINT	=	H.P.
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.9	=	(II)
STREET CENTERLINE	=	℄
PROPOSED FLOW ARROW	=	
TOP OF CURB ELEVATIONS	=	552.00
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	



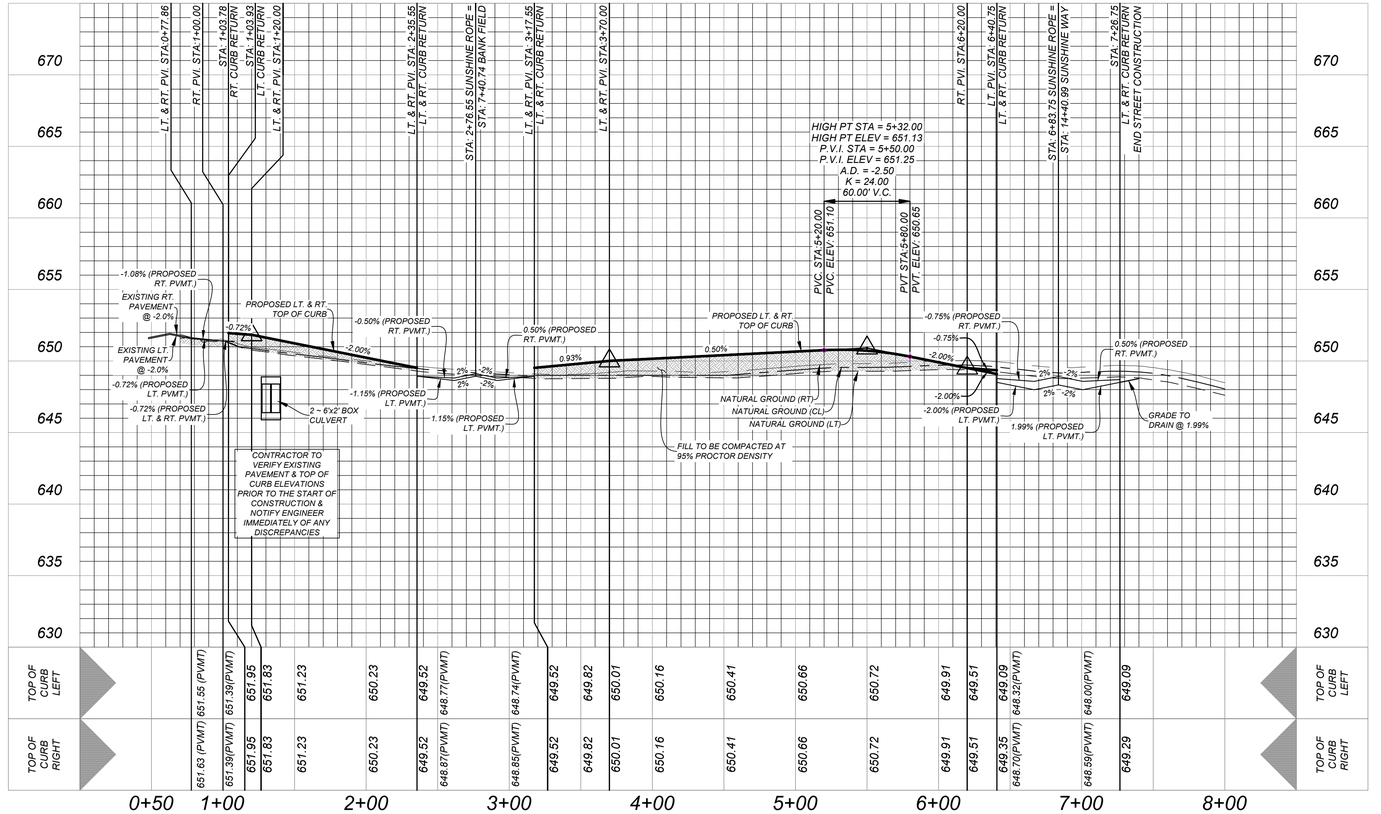
SUNSHINE WAY
STA: 12+50.00 - END

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



SUNSHINE ROPE
STA: 0+77.86 - END

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



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3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Fax: 210.545.9302 • Phone: 210.545.1122
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS

SUNSHINE WAY & SUNSHINE ROPE PLAN AND PROFILE

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 5.1

Date: Feb 14, 2024, 4:22pm User ID: crodriguez
File: N:\314_OD\1_Design\Civil\STREETS\SHTPS\314503.dwg

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LEGEND

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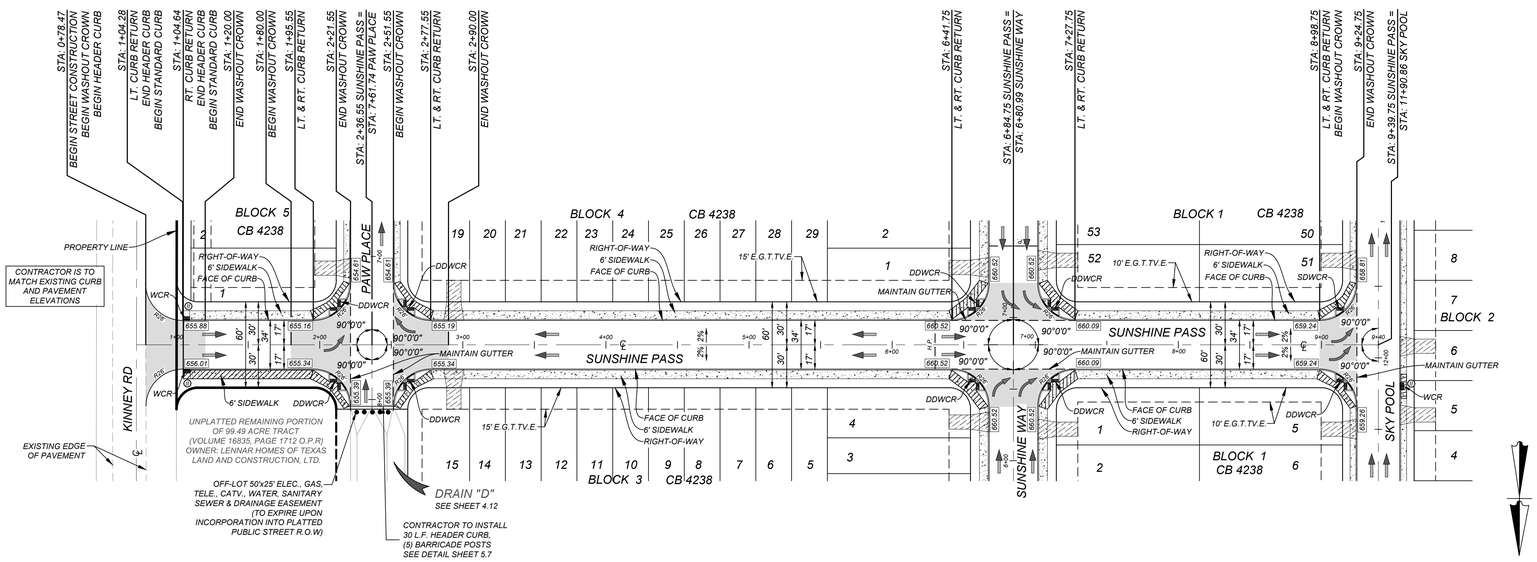
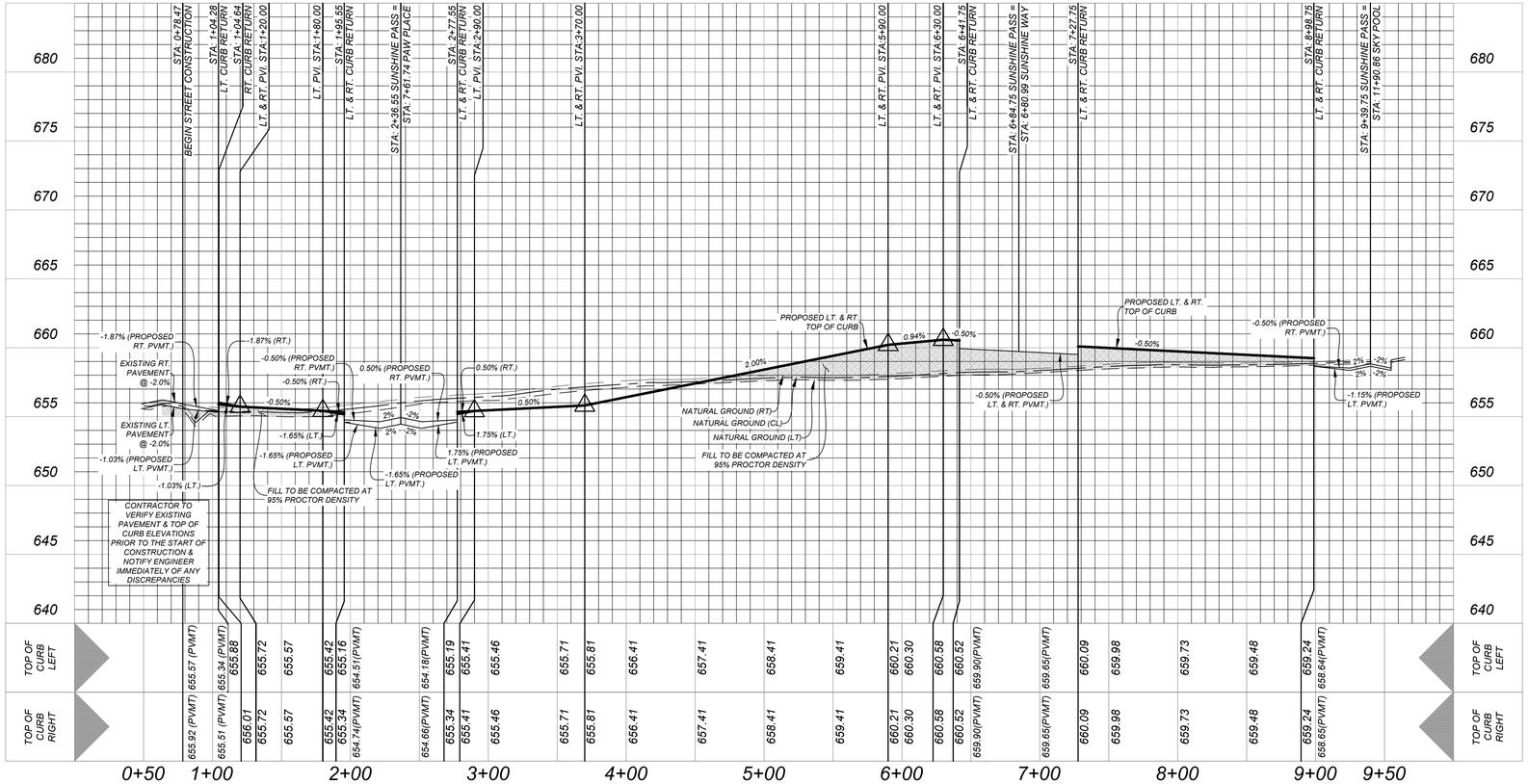
SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	SDWCR
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	DDWCR
HIGH POINT	=	H.P.
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.9	=	Ⓘ
STREET CENTERLINE	=	℄
PROPOSED FLOW ARROW	=	
TOP OF CURB ELEVATIONS	=	552.00
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	



SUNSHINE PASS
STA: 0+78.47 - END

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



KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: 210.979.8444 Fax: 210.979.8441
TBPE Firm # 9513 • TBPLS Firm # 10123300

REVISIONS | ISSUE DATE

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
SUNSHINE PASS PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 5.2

Date: Feb 14, 2024, 4:23pm User ID: cgrodriguez
File: N:\314\50\03\Design\Civil\STREETS\SHTS\314503.dwg

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LEGEND

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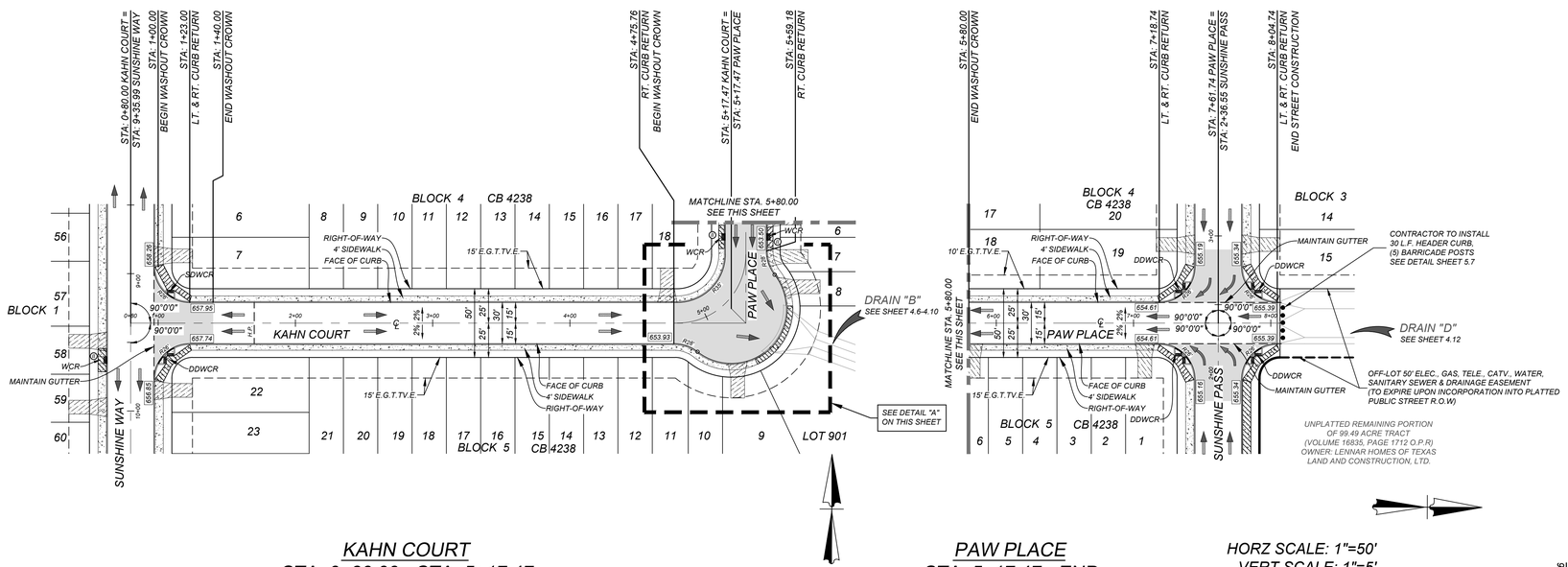
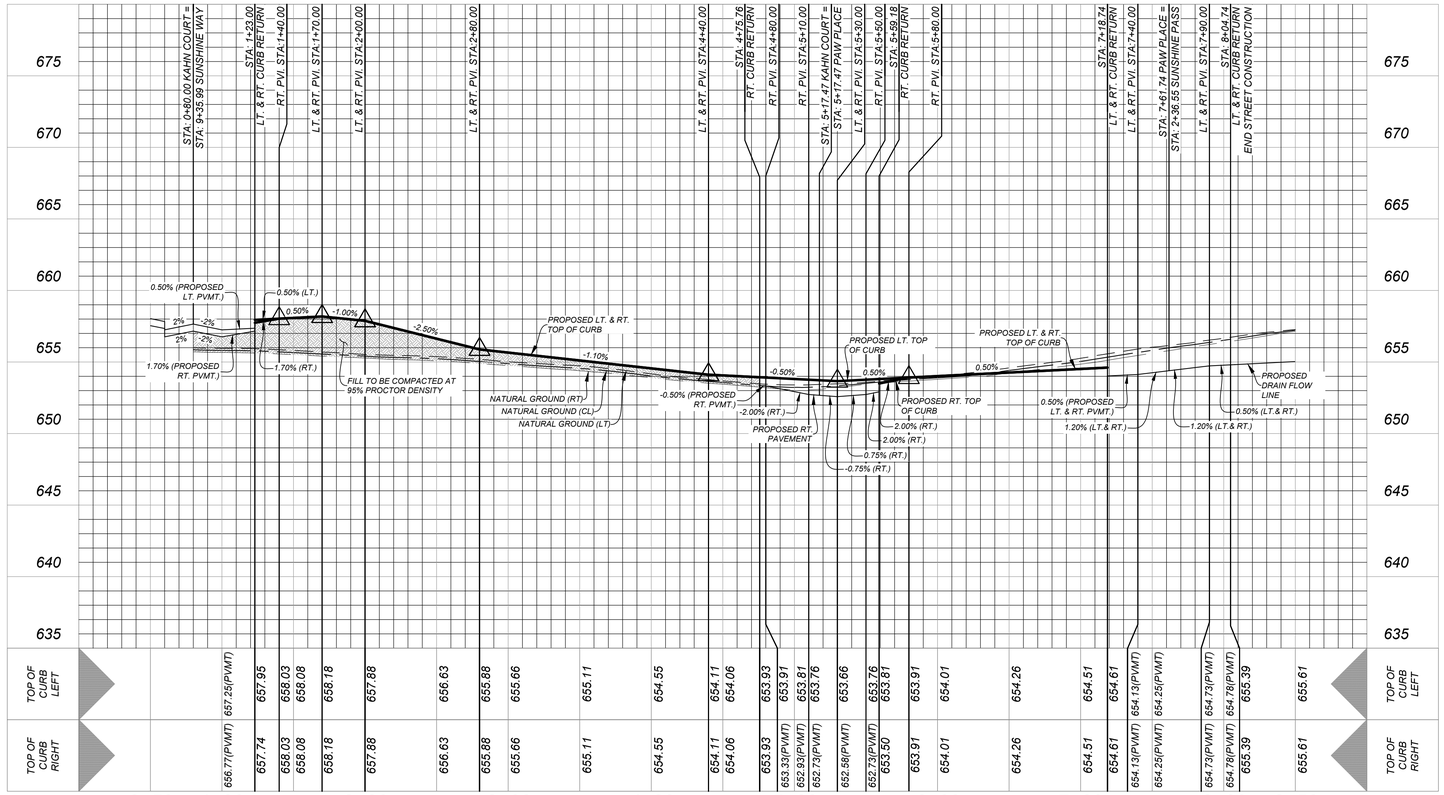
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	DDWCR
HIGH POINT	=	H.P.
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.9	=	(II)
STREET CENTERLINE	=	℄
PROPOSED FLOW ARROW	=	
TOP OF CURB ELEVATIONS	=	552.00
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	

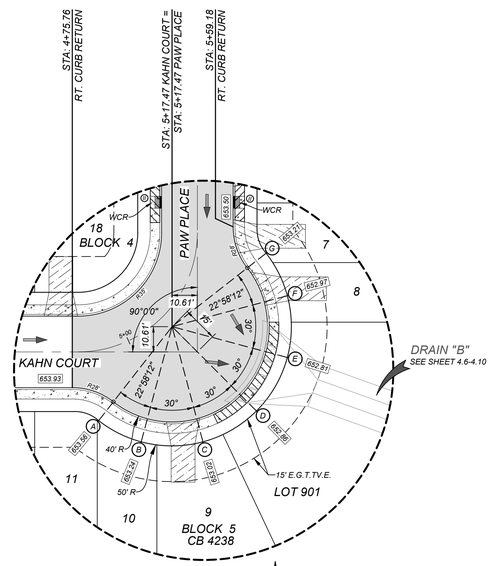


KAHN COURT
STA: 0+80.00 - STA: 5+17.47

PAW PLACE
STA: 5+17.47 - END

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





DETAIL-A
SCALE : 1"=30'

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REVISIONS

ISSUE DATE

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS

KAHN COURT & PAW PLACE PLAN AND PROFILE

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
5.3

Date: Feb 14, 2024, 4:23pm User ID: orodriguez
File: N:\314\Civil\Design Docs\STREETS\SHT\314503.dwg

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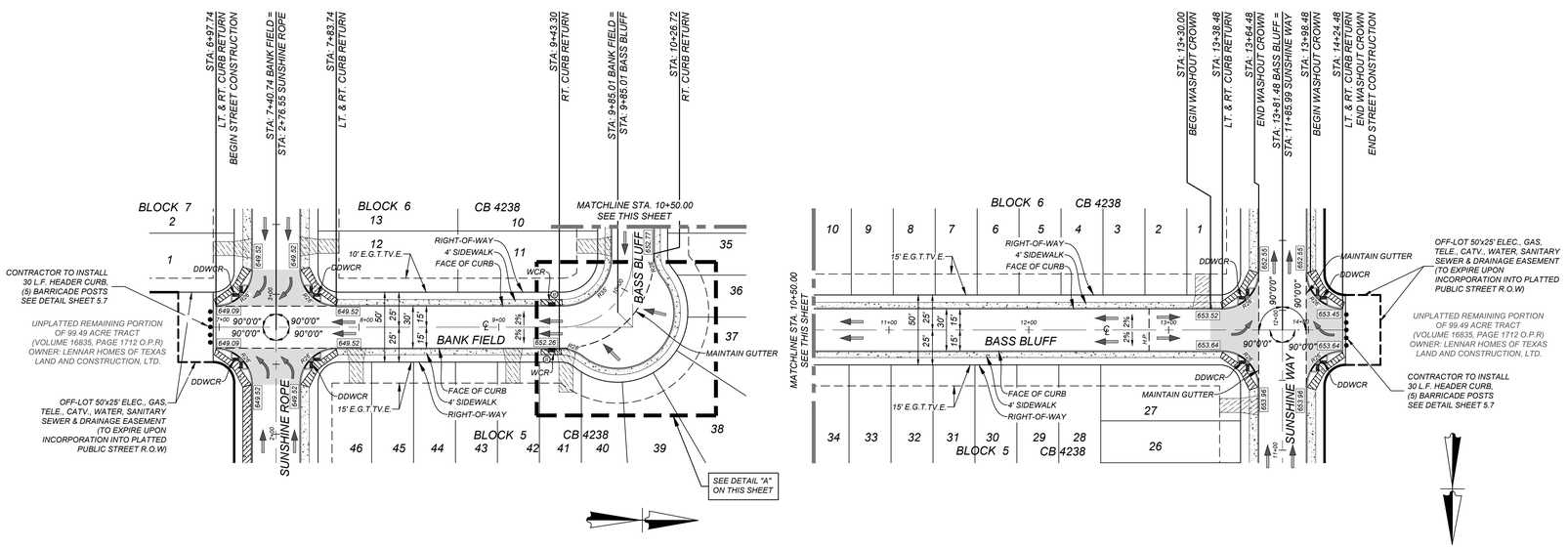
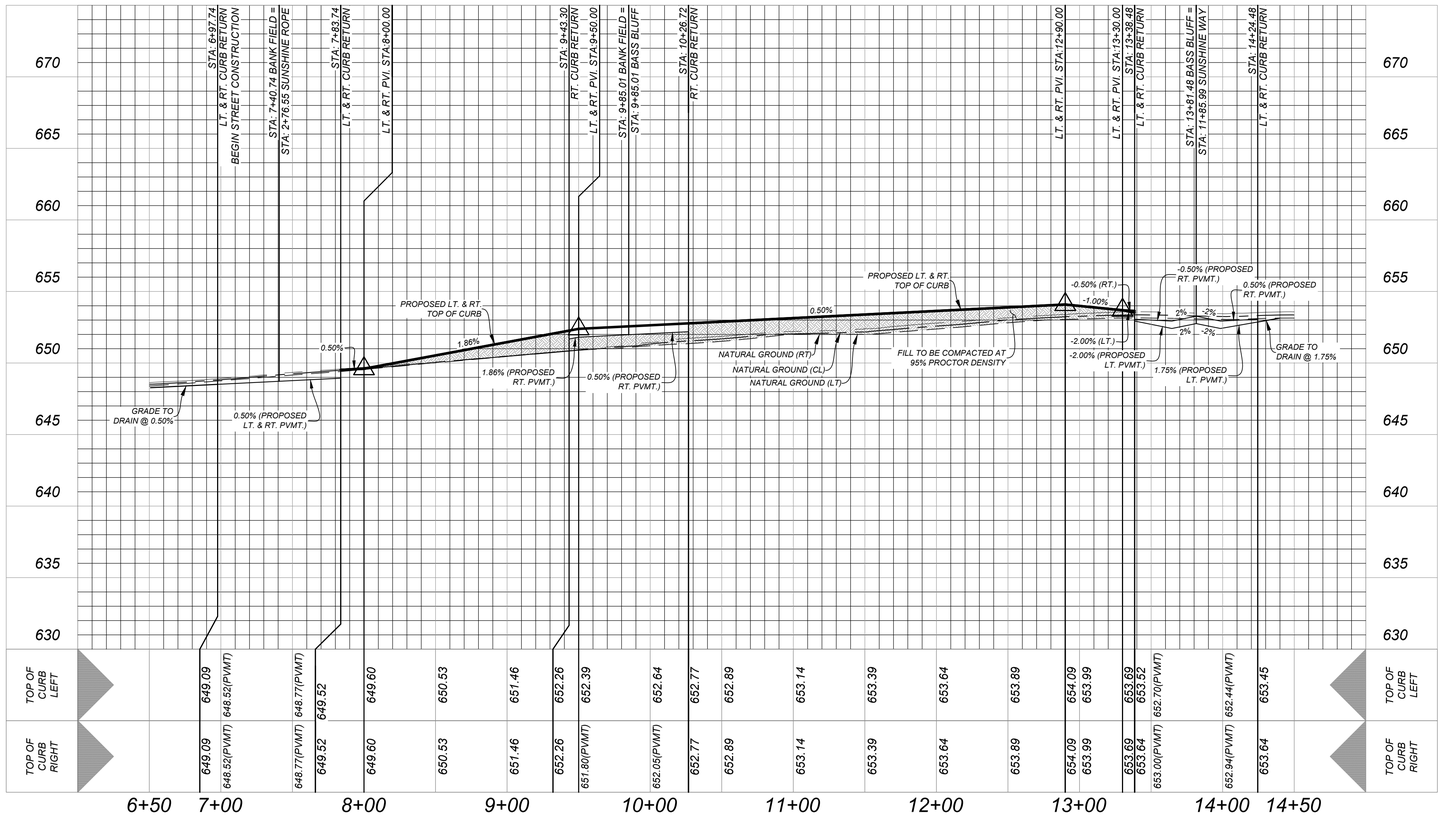
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	DDWCR
HIGH POINT	=	H.P.
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.9	=	(II)
STREET CENTERLINE	=	℄
PROPOSED FLOW ARROW	=	
TOP OF CURB ELEVATIONS	=	552.00
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	

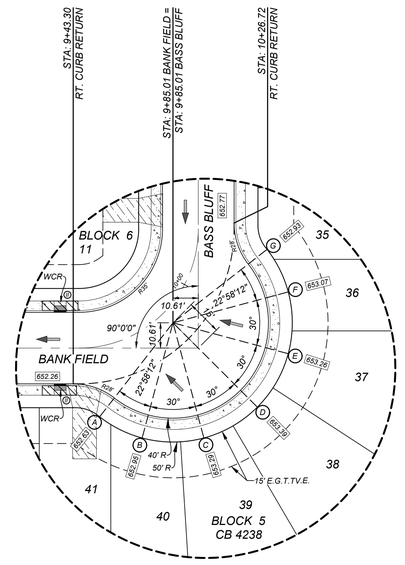


HORZ SCALE: 1"=50'
VERT SCALE: 1"=5'

BANK FIELD
STA: 6+97.74 - STA: 9+85.01

BASS BLUFF
STA: 9+85.01 - END





DETAIL-A
SCALE : 1"=30'

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
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS

BANK FIELD & BASS BLUFF PLAN AND PROFILE

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
5.4

Date: Feb 14, 2024, 4:23pm User ID: nrodriguez
File: N:\314_00\03\Design\Civil\STREETS\STP24150003.dwg

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TRENCH EXCAVATION SAFETY PROTECTION

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

CAUTION!!:
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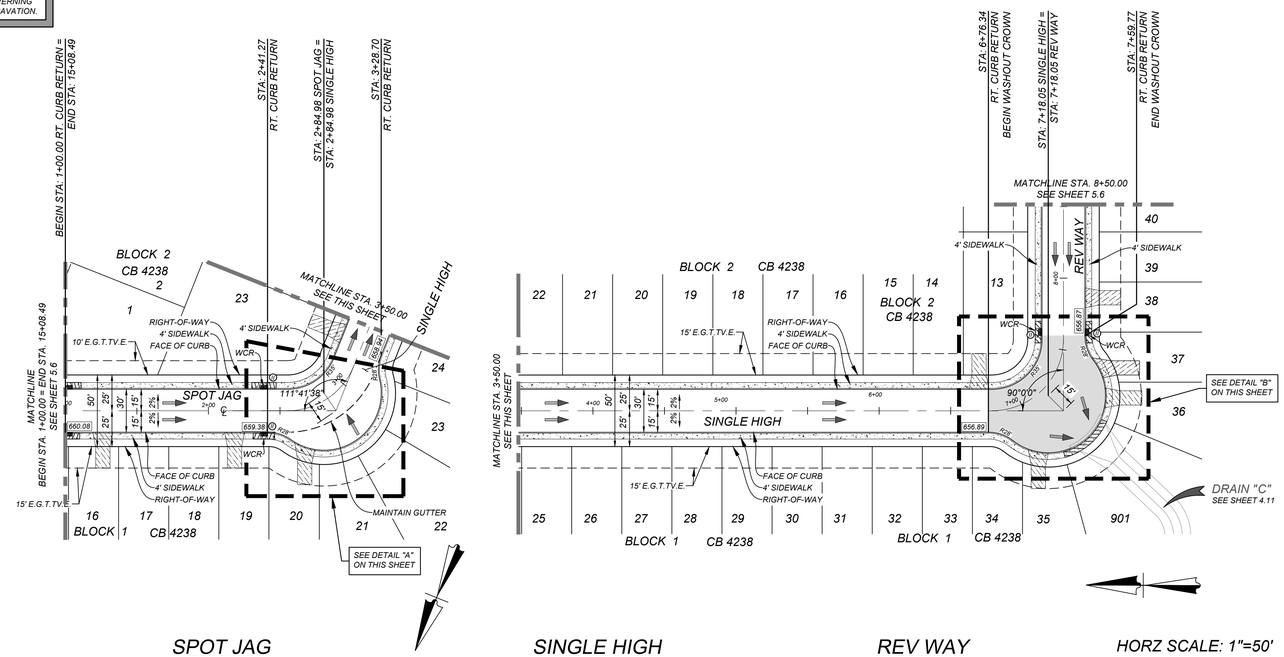
BEXAR COUNTY R.O.W. NOTE

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

LEGEND

ELECTRIC, GAS ,TELEPHONE & CABLE EASEMENT	=	E.G.T.TV.E.
WHEELCHAIR RAMP	=	W.C.R.
SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	SDWCR
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	DDWCR
HIGH POINT	=	H.P.
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.9	=	(II)
STREET CENTERLINE	=	℄
PROPOSED FLOW ARROW	=	
TOP OF CURB ELEVATIONS	=	552.00
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	

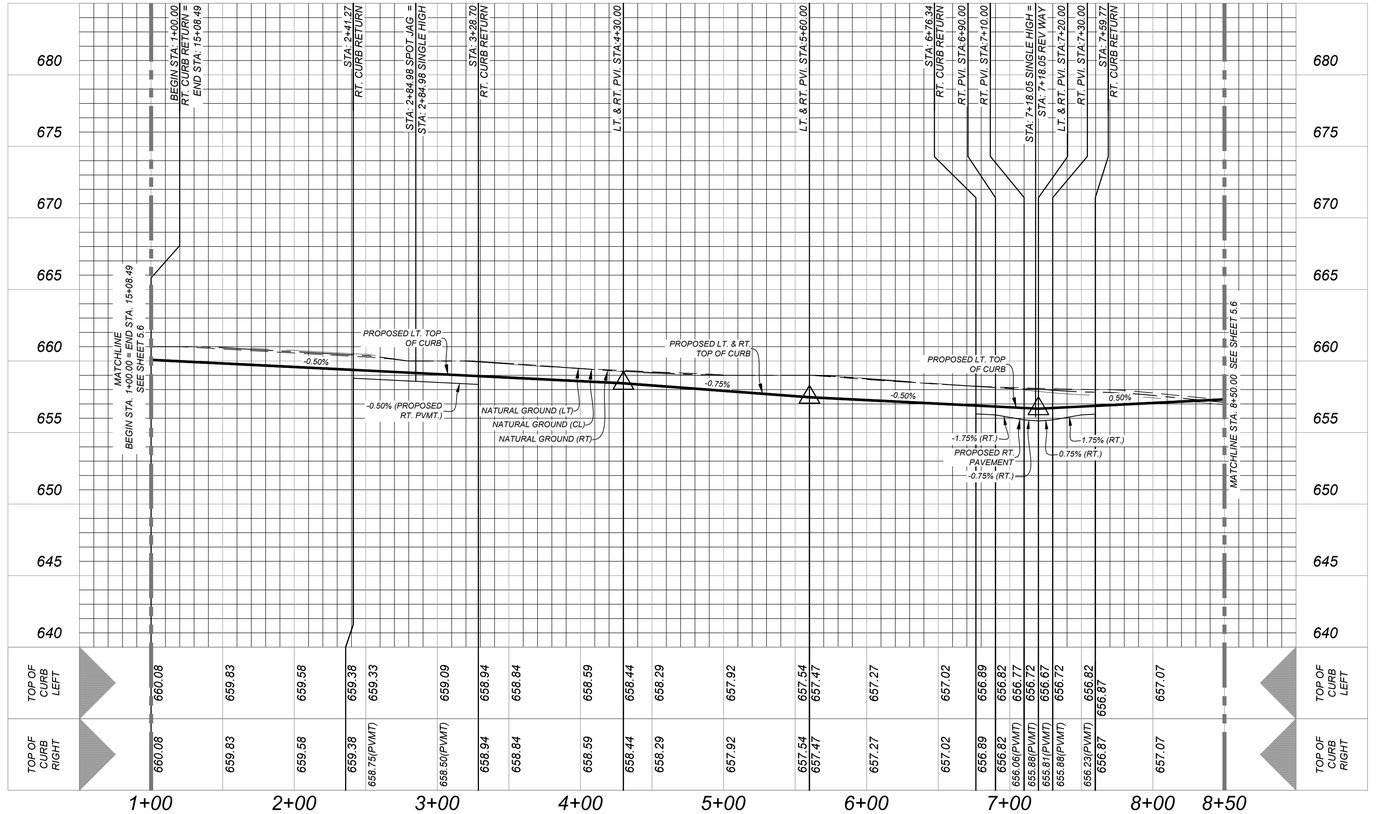


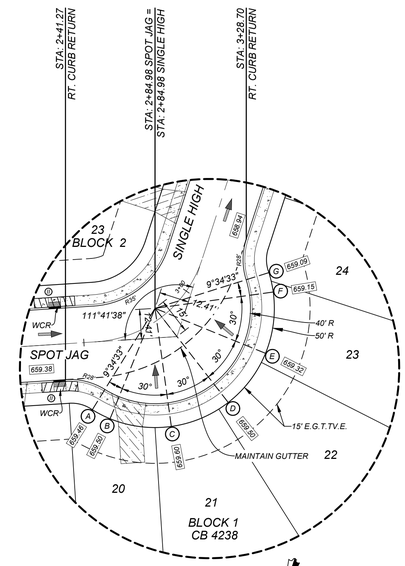
SPOT JAG
STA: 1+00.00 - STA: 2+84.98

SINGLE HIGH
STA: 2+84.98 - STA: 7+18.05

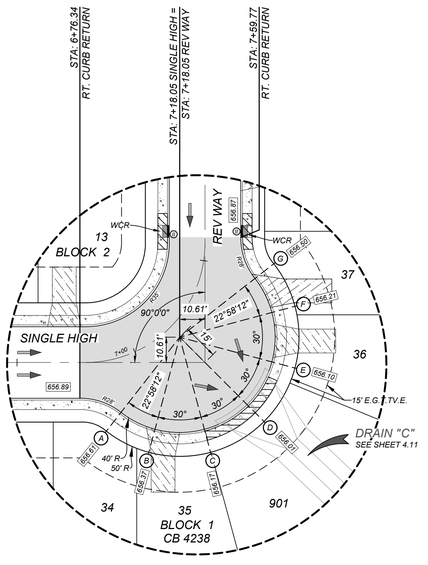
REV WAY
STA: 7+18.05 - STA: 8+50.00

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





DETAIL-A
SCALE : 1"=30'



DETAIL-B
SCALE : 1"=30'

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
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS

SPOT JAG, SINGLE HIGH & REV WAY PLAN AND PROFILE

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
5.5

Date: Feb 14, 2024, 4:23pm User ID: mrodriguez
File: N:\314\50\03\Design\Civil\SHEETS\SHT5314503.dwg

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BEXAR COUNTY R.O.W. NOTE

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LEGEND

ELECTRIC, GAS ,TELEPHONE & CABLE EASEMENT	=	E.G.T.TV.E.
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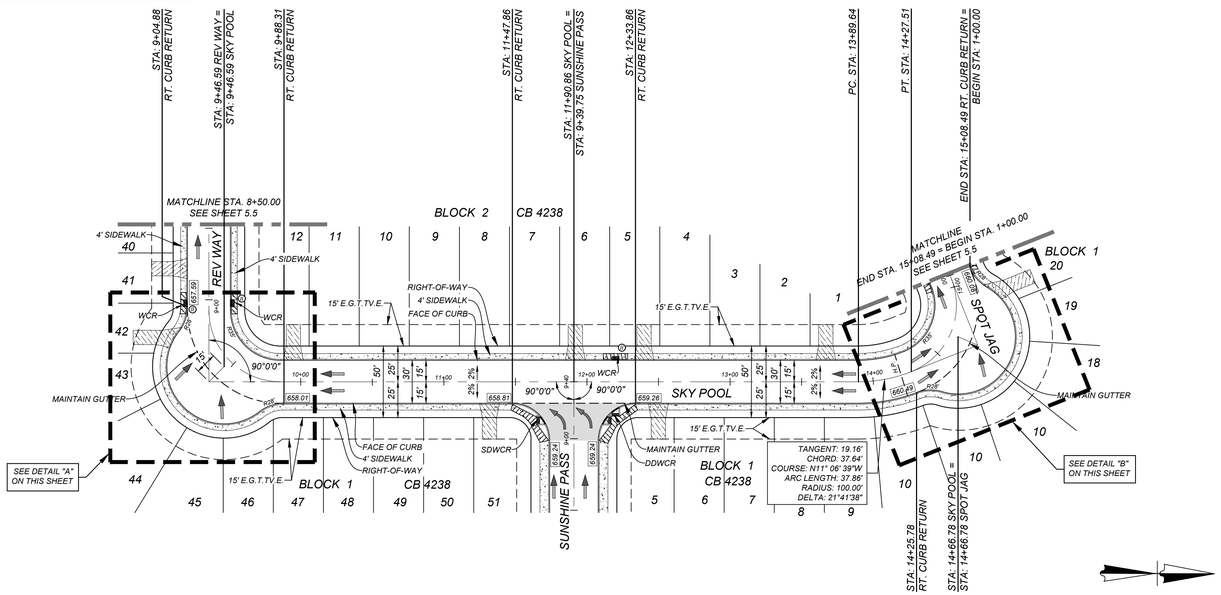
SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	SDWCR
DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (SEE SHEET 5.7)	=	DDWCR
HIGH POINT	=	H.P.
WHEELCHAIR RAMP TYPE "II" SEE SHEET 5.9	=	(II)
STREET CENTERLINE	=	℄
PROPOSED FLOW ARROW	=	
TOP OF CURB ELEVATIONS	=	552.00
SIDEWALK TO BE CONSTRUCTED BY DEVELOPER	=	
SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION	=	
PROPOSED DRIVEWAY LOCATIONS	=	
PROPOSED WASHOUT CROWN	=	

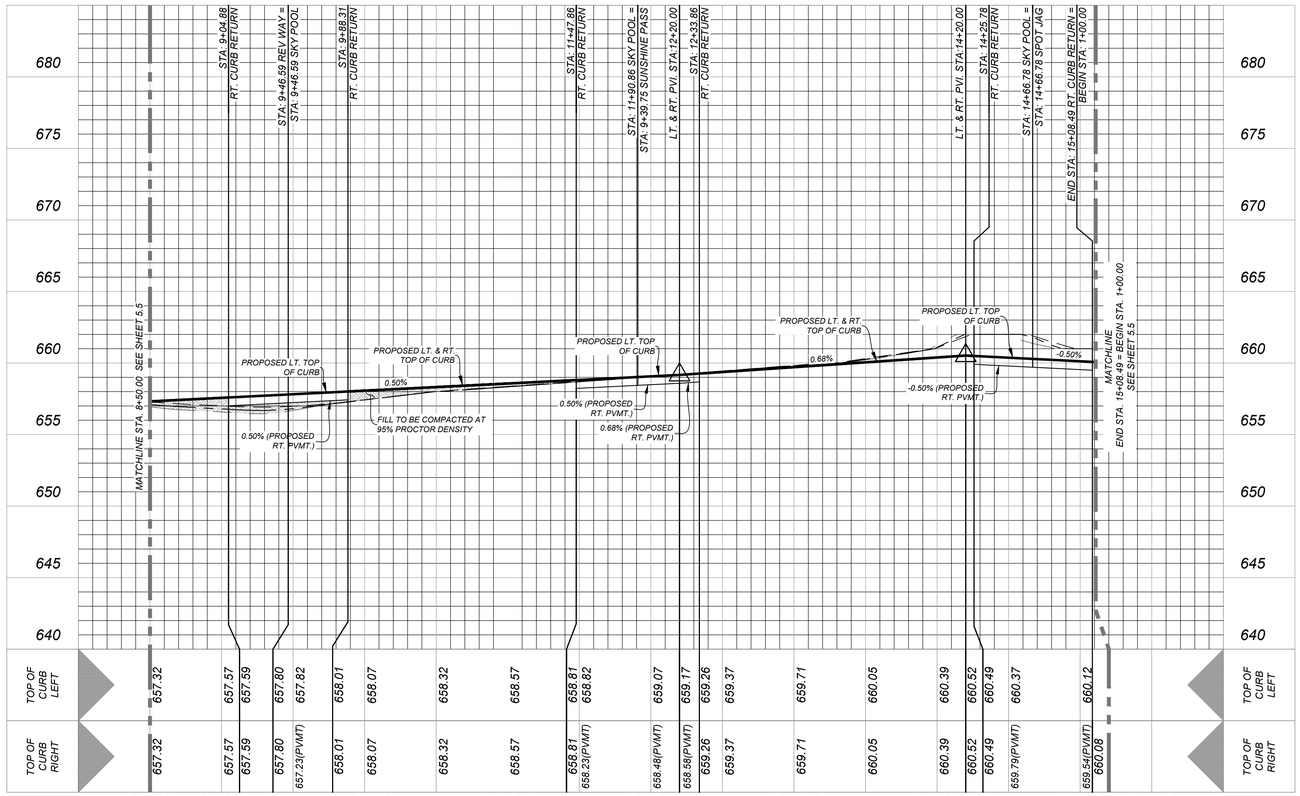


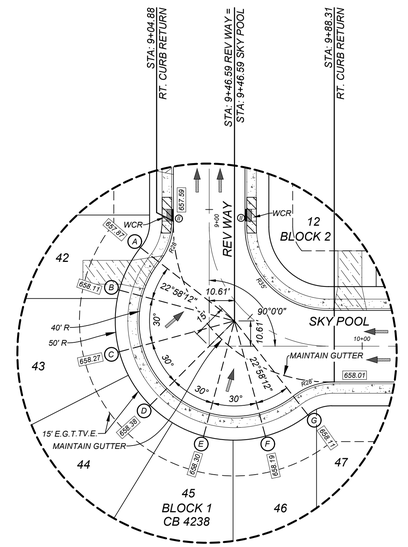
REV WAY
STA: 8+50.00 - STA: 9+46.59

SKY POOL
STA: 9+46.59 - STA: 14+66.78

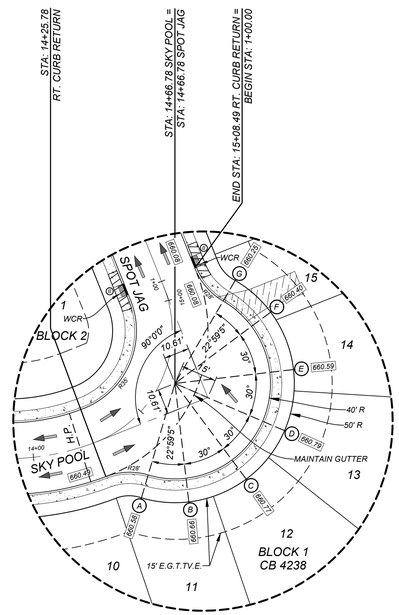
SPOT JAG
STA: 14+66.78 - STA: 15+08.49

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





DETAIL-A
SCALE : 1"=30'



DETAIL-B
SCALE : 1"=30'

KFW ENGINEERS + SURVEYING
3421 Paesanos Pkwy, Suite 200, San Antonio, TX 78231
Phone: 210.979.8444 Fax: 210.979.8441
TBPE Firm #: 2712 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS

REV WAY, SKY POOL & SPOT JAG PLAN AND PROFILE

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
5.6

Date: Feb 14, 2024, 4:24pm User ID: crostrigue
File: N:\314\50\03\Design\Civil\STREETS\STP314-5003.dwg

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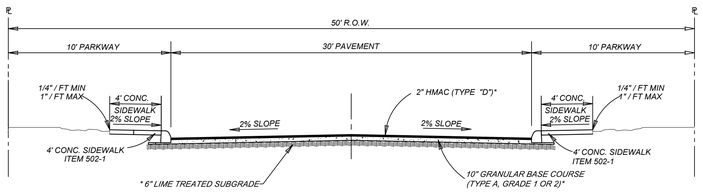
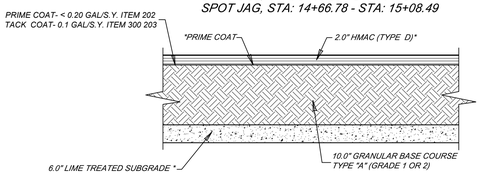


TYPICAL LOCAL "A" STREET SECTION

NOT TO SCALE

KAHN COURT, STA: 0+80.00 - STA: 5+17.47
PAW PLACE, STA: 5+17.47 - END
BANK FIELD, STA: 6+97.74 - STA: 9+85.01
BASS BLUFF, STA: 9+85.01 - END
SPOT JAG, STA: 1+00.00 - STA: 2+84.98
SINGLE HIGH, STA: 2+84.98 - STA: 7+18.05
REV WAY, STA: 7+18.05 - STA: 9+46.59
SKY POOL, STA: 9+46.59 - STA: 14+66.78
SPOT JAG, STA: 14+66.78 - STA: 15+08.49



ASPHALT PAVEMENT DETAIL

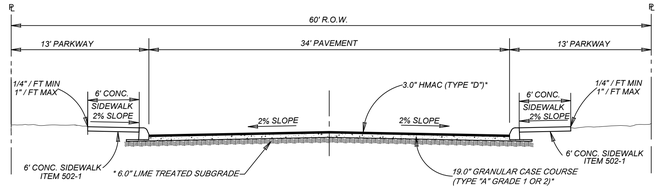
NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE "A"

FLEXIBLE PAVEMENT SYSTEM

Pavement Section
2.0" HMAC (TYPE "D")
10.0" GRANULAR BASE COURSE (TYPE "A" GRADE 1 OR 2)
6.0" LIME TREATED SUBGRADE (35 LBS/SY)
Total: 18.0"
Structural No: 2.28
C.B.R = 4.0

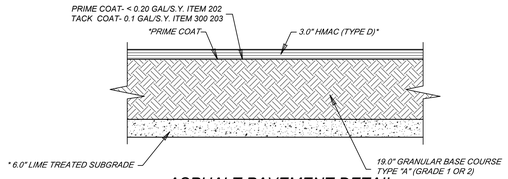
TTL PROJECT NO. 00200902405.00 OCTOBER 8, 2021



TYPICAL LOCAL "B" STREET SECTION

NOT TO SCALE

SUNSHINE WAY, STA: 1+17.28 - END
SUNSHINE ROPE, STA: 0+77.86 - END
SUNSHINE PASS, STA: 0+78.47 - END



ASPHALT PAVEMENT DETAIL

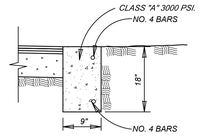
NOT-TO-SCALE

DETAIL FOR ALL LOCAL TYPE "B"

FLEXIBLE PAVEMENT SYSTEM

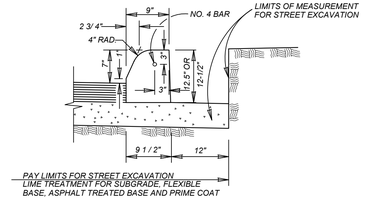
Pavement Section
3.0" HMAC (TYPE "D")
19.0" GRANULAR BASE COURSE (TYPE "A" GRADE 1 OR 2)
6.0" LIME TREATED SUBGRADE (35 LBS/SY)
Total: 28.0"
Structural No: 3.98
C.B.R = 4.0

TTL PROJECT NO. 00200902405.00 OCTOBER 8, 2021



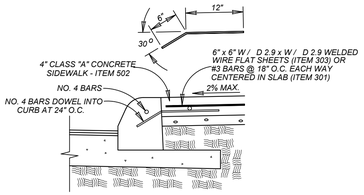
HEADER CURB

ITEM 500 ON SAND OR GRAVEL
NOT TO SCALE



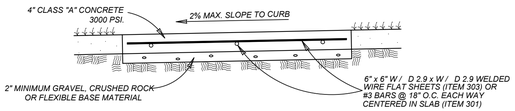
CONCRETE CURB

ITEM 500 ON FLEXIBLE BASE MATERIAL
NOT TO SCALE



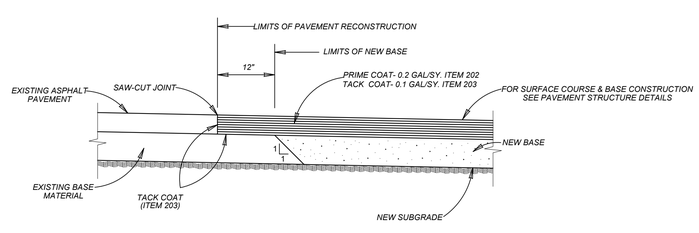
CONCRETE SIDEWALK ABUTTING CURB SECTION

ITEM 502
NOT TO SCALE



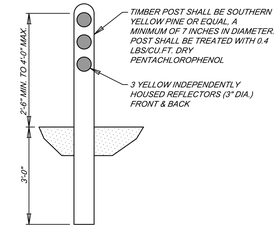
CONCRETE SIDEWALK SECTION

ITEM 502
NOT TO SCALE



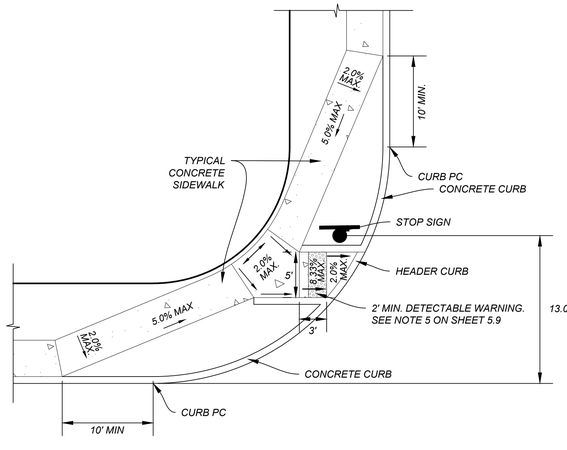
PAVEMENT JUNCTION DETAILS

NOT TO SCALE



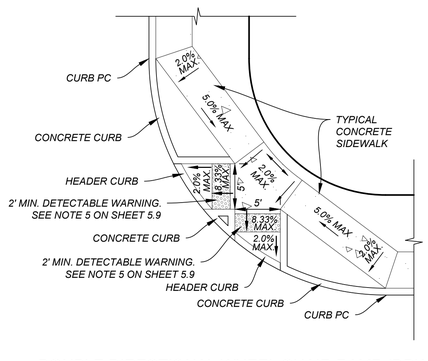
TIMBER GUARD POST DETAIL

NOT-TO-SCALE



SINGLE DIRECTIONAL WHEEL CHAIR RAMP (SDWCR)

NOT TO SCALE



DOUBLE DIRECTIONAL WHEEL CHAIR RAMP (DDWCR)

NOT TO SCALE

"NOTE: CONTRACTOR TO REFERENCE GEOTECH REPORT PREPARED BY TTL PROJECT NO. 00200902405.00 DATED OCTOBER 8, 2021

HOT MIX ASPHALTIC CONCRETE SURFACE - THE PAVING MIXTURE AND CONSTRUCTION METHODS SHALL CONFORM TO ITEM 340, "GHOT MIX ASPHALTIC CONCRETE, TYPE D"H OF THE STANDARD SPECIFICATIONS BY TXDOT. THE MIX SHOULD BE COMPACTED BETWEEN 91 AND 95 PERCENT OF THE MAXIMUM THEORETICAL DENSITY AS MEASURED BY TEX-227-F. THE ASPHALT CEMENT CONTENT BY PERCENT OF TOTAL MIXTURE WEIGHT SHOULD FALL WITHIN A TOLERANCE OF ±0.3 PERCENT ASPHALT CEMENT FROM THE SPECIFIC MIX. IN ADDITION, THE MIX SHOULD BE DESIGNED SO 75 TO 85 PERCENT OF THE VOIDS IN THE MINERAL AGGREGATE (VMA) ARE FILLED WITH ASPHALT CEMENT. THE ASPHALT CEMENT GRADES SHOULD CONFORM TO THE TABLE SHOWN BELOW.

AGGREGATES KNOWN TO BE PRONE TO STRIPPING SHOULD NOT BE USED IN THE HOT MIX. IF SUCH AGGREGATES ARE USED MEASURES SHOULD BE TAKEN TO MITIGATE THIS CONCERN. THE MIX SHOULD HAVE AT LEAST 70 PERCENT STRENGTH RETENTION WHEN TESTED IN ACCORDANCE WITH TEX-531-C. PAVEMENT SPECIMENS, WHICH SHALL BE EITHER CORES OR SECTIONS OF ASPHALTIC PAVEMENT, WILL BE TESTED ACCORDING TO TEST METHOD TEX-207-F. THE NUCLEAR-DENSITY GAUGE OR OTHER METHODS WHICH CORRELATE SATISFACTORILY WITH RESULTS OBTAINED FROM PROJECT PAVEMENT SPECIMENS MAY BE USED WHEN APPROVED BY THE ENGINEER. UNLESS OTHERWISE SHOWN ON THE PLANS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING THE REQUIRED PAVEMENT SPECIMENS AT THEIR EXPENSE AND IN A MANNER AND AT LOCATIONS SELECTED BY THE ENGINEER.

PRIME COAT - THE PRIME COAT SHOULD CONSIST OF SEALING THE BASE WITH AN OIL SUCH AS MC-30 OR AE-P ASPHALT CEMENT. THE PRIME COAT SHOULD BE APPLIED AT A RATE NOT TO EXCEED 0.35 GALLONS PER SQUARE YARD WITH MATERIALS WHICH MEET TXDOT ITEM 300. THE PRIME COAT WILL HELP TO MINIMIZE PENETRATION OF RAINFALL AND OTHER MOISTURE THAT PENETRATES THE BASE.

GRANULAR BASE MATERIAL - BASE MATERIAL MAY BE COMPOSED OF CRUSHED LIMESTONE BASE MEETING ALL OF THE REQUIREMENTS OF 2014 TXDOT ITEM 247, TYPE A, GRADE 1 OR 2; AND SHOULD HAVE NO MORE THAN 15 PERCENT OF THE MATERIAL PASSING THE NO. 200 SIEVE. THE BASE SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH TEST METHOD TEX-113-E AT MOISTURE CONTENTS RANGING BETWEEN -2 AND +3 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT.

LIME TREATMENT - LIME TREATMENT SHALL BE PERFORMED ONLY ON THE DARK BROWN CLAY SUBGRADE. THE SUBGRADE SHALL BE TREATED WITH HYDRATED LIME IN ACCORDANCE WITH TXDOT ITEM 260. WE ANTICIPATE THAT APPROXIMATELY 6 PERCENT HYDRATED LIME WILL BE REQUIRED (APPROXIMATELY 35 POUNDS PER SQUARE YARD). THE OPTIMUM HYDRATED LIME CONTENT SHOULD RESULT IN A SOIL-LIME MIXTURE WITH A PH OF AT LEAST 12.4 WHEN TESTED IN ACCORDANCE WITH ASTM C 977, APPENDIX XI.

THE HYDRATED LIME SHOULD INITIALLY BE BLENDED WITH A MIXING DEVICE SUCH AS A PULVERMIXER. AFTER SUFFICIENT MOISTURE CONDITIONING, THE TREATED SOIL MIXTURE SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH THE STANDARD EFFORT (ASTM D 698) AT MOISTURE CONTENTS FROM OPTIMUM TO +4 PERCENTAGE POINTS OF THE OPTIMUM MOISTURE CONTENT. IF THE IN-PLACE GRADATION REQUIREMENTS CAN BE ACHIEVED DURING INITIAL MIXING, THE REMIXING AFTER THE CURING PERIOD CAN BE ELIMINATED.

CEMENT TREATMENT – CEMENT TREATMENT OF THE SAND SUBGRADE SHALL BE ACCOMPLISHED IN ACCORDANCE WITH 2014 TXDOT ITEM 275. A MIX DESIGN FOR THIS OPTION WAS NOT A PART OF OUR SCOPE OF SERVICES FOR THIS PROJECT AND, AS A RESULT, HAS NOT BEEN DETERMINED. IF CEMENT TREATMENT OF THE SUBGRADE IS DESIRED, WE SHOULD BE CONTACTED TO DEVELOP THE MIX DESIGN.

SOIL BULK SAMPLES WERE COLLECTED TO DETERMINE THE CALIFORNIA BEARING RATIO (CBR) VALUE TO BE USED FOR OUR PAVEMENT DESIGN RECOMMENDATIONS. THE LOCATIONS AT WHICH THE CBR BULK SAMPLESWERE TAKEN ARE INDICATED ON THE BORING LOCATION PLAN IN APPENDIX A. WE PERFORMED CBR TESTS AT THREE COMPACTION LEVELS (I.E. 90%, 95% AND 100% FOR A TOTAL OF THREE (3 CBR TESTS) ON EACH SAMPLE LOCATION. BASED ON LABORATORY TEST RESULTS, CBR VALUES OF ABOUT 4.1 AND 7.4 PERCENT WERE OBTAINED FOR THE EXISTING UNTREATED SUBGRADE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY DETERMINED IN ACCORDANCE WITH ASTM D 698. TTL RECOMMENDS THAT A CBR VALUE OF 4.0 PERCENT BE USED TO REPRESENT THE PAVEMENT SUBGRADE CONDITIONS AT THIS SITE. THERE ARE A NUMBER OF PUBLISHED CORRELATIONS RELATING CBR TO THE RESILIENT MODULUS (MR). IN ACCORDANCE WITH THE COSA AND BEXAR COUNTY DESIGN GUIDELINES, WE USED A RESILIENT MODULUS (MR) = 1,500 TIMES THE CBR IN PSI, TO CONVERT CBR TO MR.

THE COSA PAVEMENT GUIDELINES REQUIRE LIME TREATMENT OF CLAY SUBGRADES WITH A PI GREATER THAN 20. IT IS ANTICIPATED THAT EVEN AFTER THE MASS GRADING IS COMPLETED THAT THE SOILS WILL REQUIRE LIME TREATMENT.

TTL DIDN'T CONDUCT THE LIME SERIES TESTING AS THE PI(S) OF THE CBR SAMPLES WERE LESS THAN 20. HOWEVER, CONSIDERING THE OVERALL CONDITION OF THE SUBGRADE SOILS AND THE BORINGS DRILLED FOR THIS PROJECT, WE ANTICIPATE THAT THE SURFICIAL PI(S) OF THE SUBGRADE SOILS WILL BE MORE THAN 20; THAT'S WHY LIME TREATMENT WILL BE REQUIRED FOR THE PAVEMENT SUBGRADES.

WE ANTICIPATE THAT SIX (6) PERCENT LIME (BY WEIGHT) WILL BE REQUIRED FOR THIS PROJECT. HOWEVER, IT SHOULD BE NOTED THAT, UPON COMPLETION OF THE GRADING OPERATIONS AT THE SITE, THE INDEX PROPERTIES OF THE SUBGRADE SOILS SHOULD BE CHECKED TO DETERMINE WHETHER OR NOT LIME TREATMENT IS REQUIRED. THIS IS BECAUSE MASS GRADING OPERATIONS MAY HAVE REMOVED LOWER PI MATERIAL TO EXPOSE HIGHER PI MATERIAL OR HIGHER PI FILL MAY HAVE BEEN PLACED OVER LOWER PI MATERIALS.

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TBPE Firm # 9513 • TBPLS Firm # 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

STREET DETAIL SHEET

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 5.7

Date: Feb 14, 2024, 4:24pm User ID: cgrodrigues
File: N:\Civil\50\03\Design Civil\STREETS\5070314503.dwg

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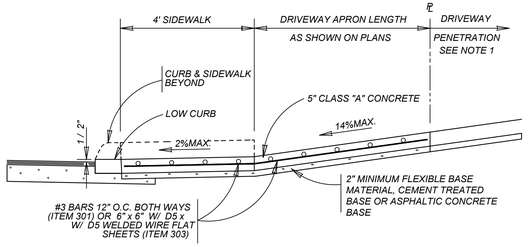
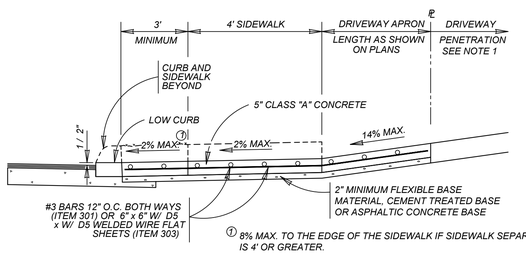


TYPICAL RESIDENTIAL DRIVEWAY SECTION

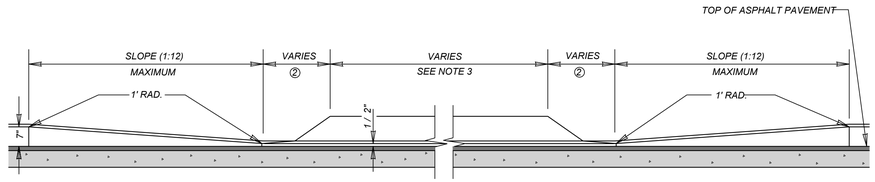
WITH SIDEWALK ABUTTING CURB
ITEM 503.1



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

TYPICAL RESIDENTIAL DRIVEWAY SECTION

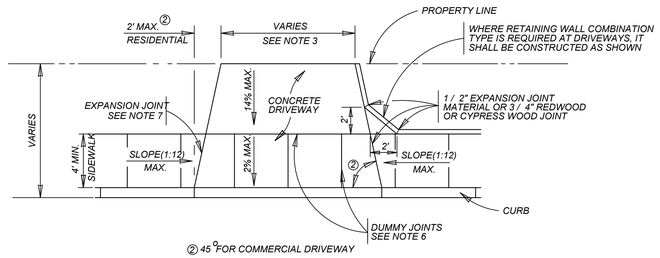
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.1



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

CURB PROFILE AT DRIVEWAY

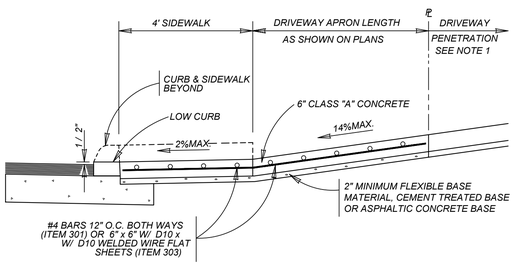
WITH SIDEWALK ABUTTING CURB



② 45° FOR COMMERCIAL DRIVEWAY

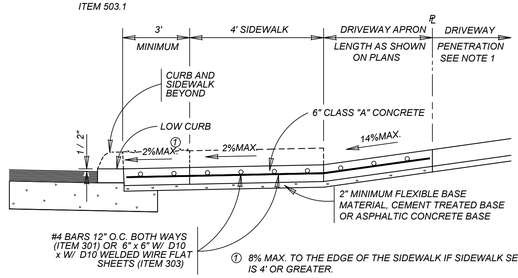
TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK ABUTTING CURB



TYPICAL COMMERCIAL DRIVEWAY SECTION

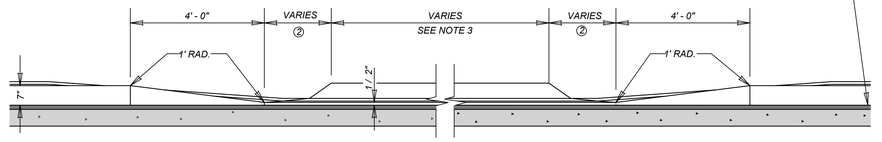
WITH SIDEWALK ABUTTING CURB
ITEM 503.2



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

TYPICAL COMMERCIAL DRIVEWAY SECTION

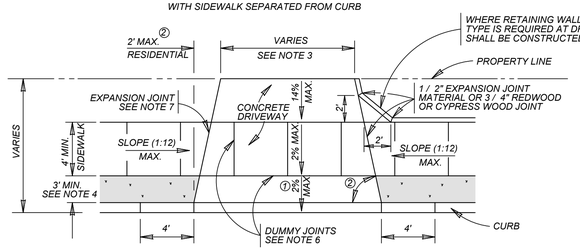
WITH SIDEWALK SEPARATED FROM CURB
ITEM 503.2



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

CURB PROFILE AT DRIVEWAY

WITH SIDEWALK SEPARATED FROM CURB

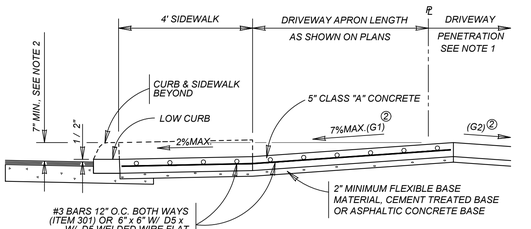


① 8% MAX. TO THE EDGE OF THE SIDEWALK IF SIDEWALK SEPARATION IS 4' OR GREATER.

② 45° FOR COMMERCIAL DRIVEWAY

TYPICAL DRIVEWAY PLAN VIEW

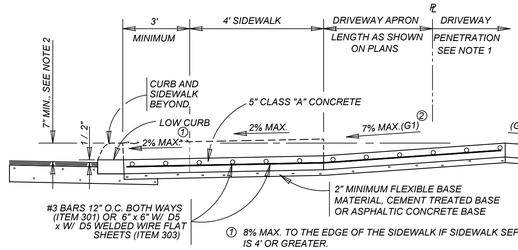
WITH SIDEWALK SEPARATED FROM CURB



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

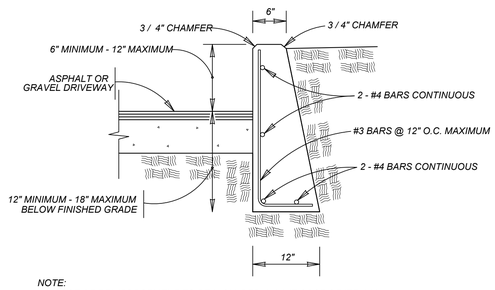
WHERE PROPERTY IS LOWER THAN STREET & SIDEWALK IS SEPARATED FROM CURB
ITEM 503.1

CONCRETE DRIVEWAY NOTES

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

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

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



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

DRIVEWAY - CONCRETE RETAINING WALL

ON COMPACTED SUBGRADE
ITEM 307.1

MAY 2009

CITY OF SAN ANTONIO

CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

CONCRETE DRIVEWAY STANDARDS

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

KFW ENGINEERS + SURVEYING
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
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
CONCRETE DRIVEWAY DETTAIL SHEET

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 5.8

Date: Feb 14, 2024, 4:24pm User ID: rrodriguez
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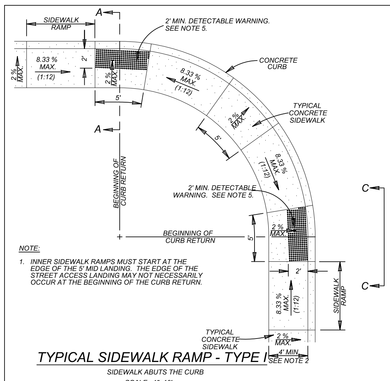
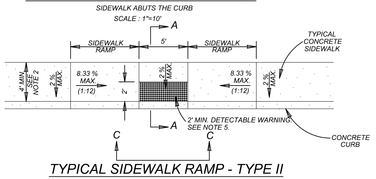
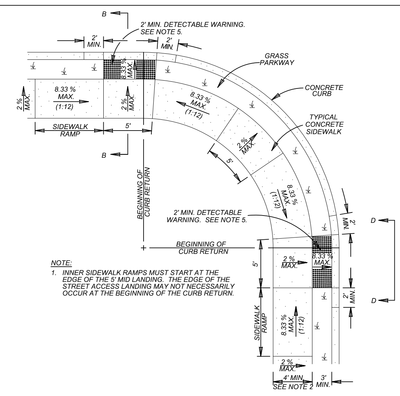


TYPICAL SIDEWALK RAMP - TYPE I

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

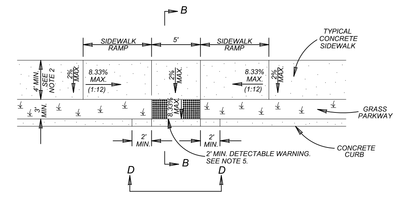


TYPICAL SIDEWALK RAMP - TYPE II
USED AT TEE INTERSECTIONS WHERE SIDEWALK ABUTS CURB
SCALE : 1"=10'

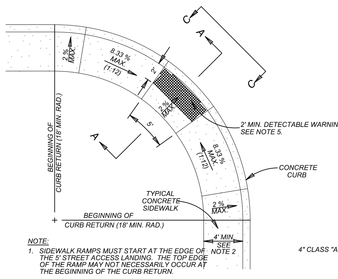


NOTE:
1. INNER SIDEWALK RAMPS MUST START AT THE EDGE OF THE 5' MID LANDING. THE EDGE OF THE STREET ACCESS LANDING MAY NOT NECESSARILY OCCUR AT THE BEGINNING OF THE CURB RETURN.

TYPICAL SIDEWALK RAMP - TYPE III
SIDEWALK SEPARATED FROM CURB
SCALE : 1"=10'

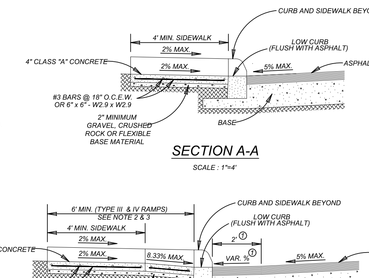


TYPICAL SIDEWALK RAMP - TYPE IV
USED AT TEE INTERSECTIONS WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1"=10'

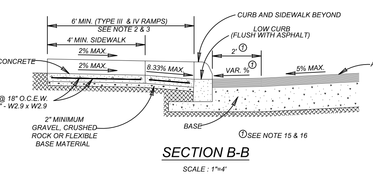


NOTE:
1. SIDEWALK RAMPS MUST START AT THE EDGE OF THE 5' STREET ACCESS LANDING. THE TOP EDGE OF THE RAMP MAY NOT NECESSARILY OCCUR AT THE BEGINNING OF THE CURB RETURN.
2. TYPE V RAMPS MUST HAVE 18' MIN. RADIUS.

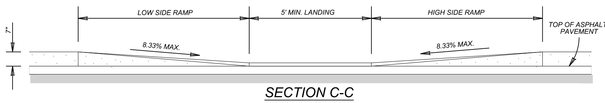
TYPICAL SIDEWALK RAMP - TYPE V
SIDEWALK ABUTS CURB
SCALE : 1"=10'



SECTION A-A
SCALE : 1"=4'



SECTION B-B
SCALE : 1"=4'

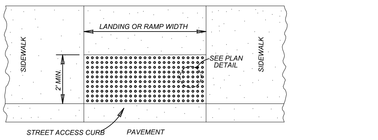


SECTION C-C
CURB PROFILE WHERE SIDEWALK ABUTS CURB
SCALE : 1"=4'

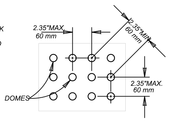
SECTION D-D
CURB PROFILE WHERE SIDEWALK IS SEPARATED FROM CURB
SCALE : 1"=4'

GENERAL NOTES

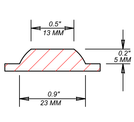
1. WHEN POSSIBLE SIDEWALKS SHOULD BE PLACED NEXT TO THE PROPERTY LINE, ALLOWING A MINIMUM OF 1 FOOT BUFFER. DEVIATION OF THE PATHWAY FROM A STRAIGHT LINE IS ENCOURAGED TO AVOID TREES OR OTHER OBSTRUCTIONS.
2. FOR LOCAL TYPE "A" STREETS, SIDEWALKS SHALL HAVE A MINIMUM UNOBSTRUCTED WIDTH OF 4' AND IF SEPARATED 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 FINISHED.
9. THESE DETAILS ARE FOR REFERENCE ONLY. ACTUAL LOCATIONS OF WHEELCHAIR RAMPS TO BE SHOWN ON CONSTRUCTION PLANS. CITY CONSTRUCTION INSPECTOR CAN ADJUST LOCATIONS FOR SAFETY OR UTILITY CLEARANCE.
10. SIDEWALKS LESS THAN 5 FEET IN WIDTH SHALL BE PROVIDED WITH A PASSING SPACE AT A MAXIMUM SPACING OF 200 FEET.
11. WHEELCHAIR RAMP SHALL BE CONSTRUCTED WITH 4" CLASS "A" CONCRETE AND 2" MINIMUM GRAVEL, CRUSHED ROCK OR FLEXIBLE BASE MATERIAL.
12. REINFORCING STEEL SHALL BE #3 BARS AT 18" O.C.E.W. OR 6" x 6" - W2.9 x W2.9 WIRE MESH.
13. SIDEWALK GRADES SHALL NOT EXCEED THE GRADE ESTABLISHED FOR THE ADJACENT ROADWAY. ANY SIDEWALK 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'

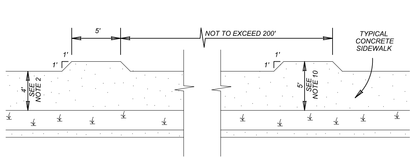


PLAN DETAIL
NO SCALE



DOME SECTION
NO SCALE

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



SIDEWALK PASSING SPACE
SCALE : 1"=10'

TABLE 1
(SEE NOTE 4)

GUTTER SLOPE	SIDEWALK RAMP LENGTH (1:12)	
	LOW SIDE	HIGH SIDE
1%	5'-6"	7'-2"
2%	5'-0"	6'-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:

GENERAL NOTES

CURB RAMPS

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

DETECTABLE WARNING MATERIAL

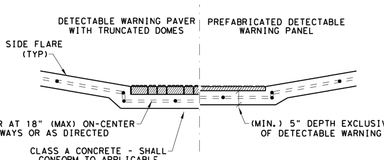
19. Curb ramps must contain a detectable warning surface that consists of raised truncated domes complying with PROWAG. The surface must contrast visually with adjoining surfaces, including side flares. Furnish and install an approved cast-in-place dark brown or dark red detectable warning surface material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

DETECTABLE WARNING PAVERS (IF USED)

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

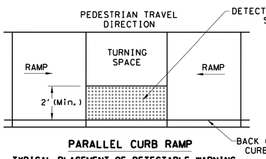
SIDEWALKS

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

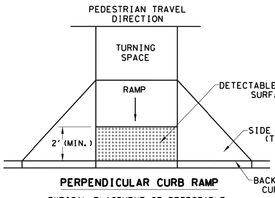


SECTION VIEW DETAIL
CURB RAMP AT DETECTIBLE WARNINGS

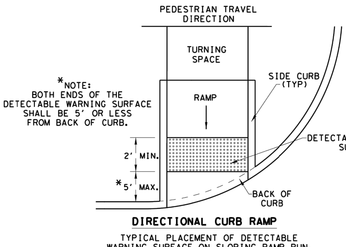
DETECTABLE WARNING SURFACE DETAILS



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



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



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

SHEET 2 OF 4

Texas Department of Transportation | Design Division Standard

PEDESTRIAN FACILITIES
CURB RAMPS

PED-18

FILE: ped18	DN: TxDOT	CK: VP	DW: KM	CK: PK & JG
© TxDOT: MARCH, 2002	CONT	SECT	JOB	HIGHWAY
REVISIONS 09.2005 04.2012 01.2018	DIST	COUNTY		SHEET NO.

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SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS

WHEELCHAIR RAMP DETAIL SHEET

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN: BL CHECKED: JM

SHEET NUMBER: 5.9

STATE OF TEXAS — JEFFREY W. MARTIN — 130094 — LICENSED PROFESSIONAL ENGINEER
2/16/24

REVISIONS | ISSUE DATE

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

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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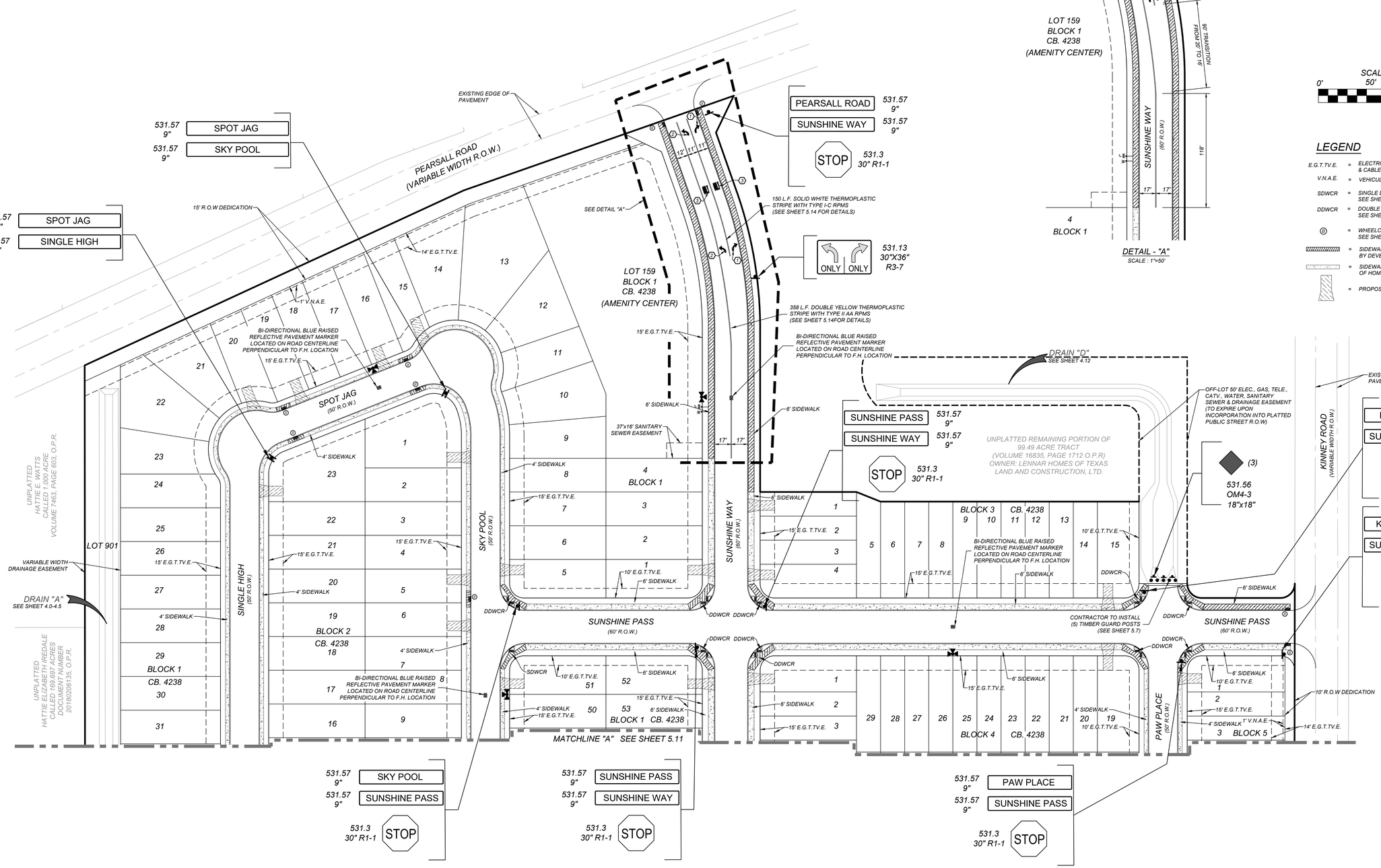
BEXAR COUNTY R.O.W. NOTE

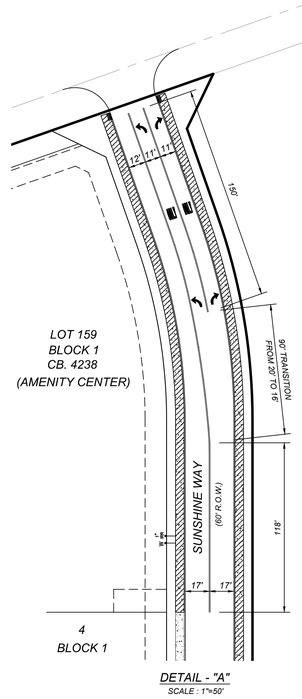
A BEXAR COUNTY PERMIT MUST BE OBTAINED BEFORE WORKING IN BEXAR COUNTY R.O.W.

NOTE: ALL PAVEMENT MARKINGS TO BE THERMOPLASTIC

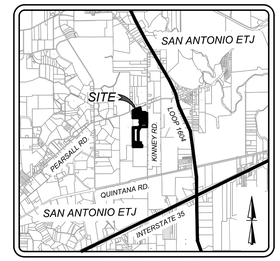
KEYED NOTES

1. *RIGHT TURN ARROW PAVEMENT MARKING (SEE SHEET 5.14 FOR DETAIL)*
2. *LEFT TURN ARROW PAVEMENT MARKING (SEE SHEET 5.14 FOR DETAIL)*
3. *"ONLY" PAVEMENT MARKING (SEE SHEET 5.14 FOR DETAIL)*





DETAIL - "A"
SCALE : 1"=50'



LOCATION MAP
N.T.S.

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

LEGEND

E.G.T.TV.E.	=	ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
SDWCR	=	SINGLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.7
DDWCR	=	DOUBLE DIRECTIONAL WHEEL CHAIR RAMP SEE SHEET 5.7
(II)	=	WHEELCHAIR RAMP TYPE II SEE SHEET 5.9
	=	SIDEWALK TO BE CONSTRUCTED BY DEVELOPER.
	=	SIDEWALK TO BE BUILT AT THE TIME OF HOME CONSTRUCTION
	=	PROPOSED DRIVEWAY LOCATIONS

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
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

TRAFFIC SIGNAGE AND PEDESTRIAN PLAN

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 5.10

Date: Feb 14, 2024, 4:24pm User ID: orodriguez
File: N:\314\50\03\Design\Civil\TS\314503-Neg

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TRENCH EXCAVATION SAFETY PROTECTION

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LEGEND

E.G.T.TV.E.	=	ELECTRIC, GAS, TELEPHONE & CABLE EASEMENT
V.N.A.E.	=	VEHICULAR NON-ACCESS EASEMENT
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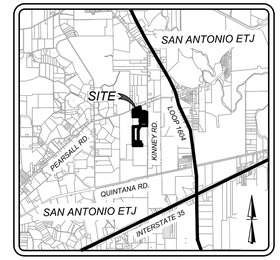

LOCATION MAP
N.T.S.

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

MATCHLINE "A" SEE SHEET 5.10

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

SUNSHINE WAY 531.57 9"
KAHN COURT 531.57 9"
STOP 531.3 30" R1-1

DRAIN "A" SEE SHEET 4.0-4.5

SINGLE HIGH (50' R.O.W.)

REV WAY (50' R.O.W.)

SKY POOL (50' R.O.W.)

BLOCK 2 CB. 4238

BLOCK 1 CB. 4238

LOT 901 VARIABLE WIDTH DRAINAGE EASEMENT

UNPLATTED HATTIE ELIZABETH REDALE CALLED 169.69' ACRES DOCUMENT NUMBER 20180206135, O.P.R.

DRAIN "C" SEE SHEET 4.11

OFF-LOT 30' DRAINAGE EASEMENT

UNPLATTED REMAINING PORTION OF 99.49 ACRE TRACT (VOLUME 16835, PAGE 1712 O.P.R) OWNER: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.

SUNSHINE WAY (60' R.O.W.)

KAHN COURT (50' R.O.W.)

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

BLOCK 4 CB. 4238

BLOCK 5 CB. 4238

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

DRAIN "B" SEE SHEET 4.6-4.10

LOT 901 VARIABLE WIDTH DRAINAGE EASEMENT

EXISTING EDGE OF PAVEMENT

10' R.O.W DEDICATION

KAHN COURT 531.57 9"
PAW PLACE 531.57 9"

BASS BLUFF 531.57 9"
BANK FIELD 531.57 9"

BANK FIELD 531.57 9"
SUNSHINE ROPE 531.57 9"
STOP 531.3 30" R1-1

KINNEY ROAD 531.57 9"
SUNSHINE ROPE 531.57 9"
STOP 531.3 30" R1-1

SINGLE HIGH 531.57 9"
REV WAY 531.57 9"

REV WAY 531.57 9"
SKY POOL 531.57 9"

(3) OM4-3 18"x18" 531.56

SUNSHINE WAY 531.57 9"
BASS BLUFF 531.57 9"
STOP 531.3 30" R1-1

SUNSHINE WAY 531.57 9"
SUNSHINE ROPE 531.57 9"
STOP 531.3 30" R1-1

SUNSHINE WAY 531.57 9"
SUNSHINE ROPE 531.57 9"
STOP 531.3 30" R1-1

BASS BLUFF (50' R.O.W.)

BANK FIELD (50' R.O.W.)

SUNSHINE ROPE (60' R.O.W.)

KINNEY ROAD (VARIABLE WIDTH R.O.W.)

OFF-LOT 25'x60' ELEC., GAS, TELE., CATV., WATER, SANITARY SEWER & DRAINAGE EASEMENT (TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W)

CONTRACTOR TO INSTALL (5) TIMBER GUARD POSTS (SEE SHEET 5.7)

CONTRACTOR TO INSTALL (6) TIMBER GUARD POSTS (SEE SHEET 5.7)

OFF-LOT 25' SANITARY SEWER EASEMENT (TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W)

OFF-LOT 25'x60' ELEC., GAS, TELE., CATV., WATER, SANITARY SEWER, DRAINAGE & ACCESS EASEMENT (TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W)

OFF-LOT 50' SANITARY SEWER & ACCESS EASEMENT (TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W)

OFF-LOT 26' DRAINAGE EASEMENT

OFF-LOT 25'x50' ELEC., GAS, TELE., CATV., WATER, SANITARY SEWER & DRAINAGE EASEMENT (TO EXPIRE UPON INCORPORATION INTO PLATTED PUBLIC STREET R.O.W)

UNPLATTED REMAINING PORTION OF 99.49 ACRE TRACT (VOLUME 16835, PAGE 1712 O.P.R) OWNER: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION, LTD.

SUNSHINE TRAILS UNIT 1A (CONCURRENT PLAT NO. 23-11800536)

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
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

TRAFFIC SIGNAGE AND PEDESTRIAN PLAN

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 5.11

Date: Feb 14, 2024, 4:24pm User ID: arodriguez
File: N:\314\50\03\Design\Civil\TS\314-50-03.dwg

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SIGN SUPPORT DESCRIPTIVE CODES

(Descriptive Codes correspond to project estimate and quantities sheets)

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

Post Type
- FRP = Fiberglass Reinforced Plastic Pipe (see SMD(FRP))
- TWT = Thin-Walled Tubing (see SMD(TWT))
- 10BWG = 10 BWG Tubing (see SMD(SLIP-1) to (SLIP-3))
- 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:
- 1EXT or 2EXT = Number of Extensions (see SMD(SLIP-1) to (SLIP-3), (TWT))
- BM = Extruded Wing 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))

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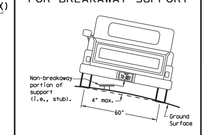
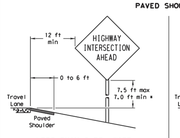
REQUIRED CLEARANCE FOR BREAKAWAY SUPPORT



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 patrol).

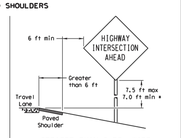
SIGN LOCATION

PAVED SHOULDERS



LESS THAN 6 FT. WIDE

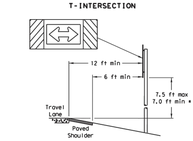
When the shoulder is 6 ft. or less in width, the sign must be placed at least 12 ft. from the edge of the travel lane.



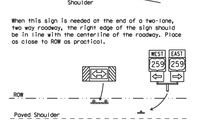
GREATER THAN 6 FT. WIDE

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.

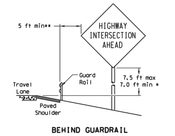
T-INTERSECTION



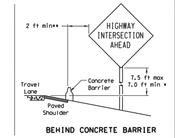
When this sign is needed at the end of a two-lane, two way roadway, the right edge of the sign should be in line with the centerline of the roadway. Place as close to ROW as practical.



BEHIND BARRIER



BEHIND GUARDRAIL



BEHIND CONCRETE BARRIER

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

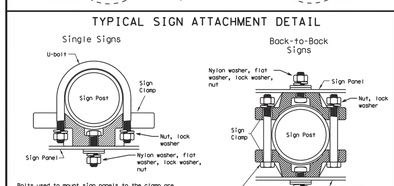
- * Signs shall be mounted using the following condition that results in the greatest sign elevations:
  - (1) a minimum of 7 to a maximum of 7.5 feet above the edge of the travel lane or
  - (2) a minimum of 7 to a maximum of 7.5 feet above the grade at the base of the support when sign is installed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



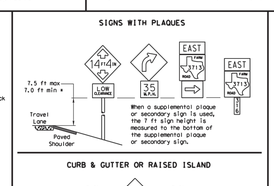
Bolts used to mount sign panels to the clamp are 5/16-18 UNC galvanized square head with nut, nylon washer, flat washer and lock washer. The bolt length is 1 inch for aluminum.

When two sign clamps are used to mount signs back-to-back, use a 5/16-18 UNC galvanized hex head per ASTM A307 w/m 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.

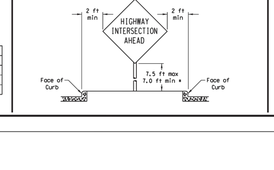
Pipe Diameter	Approximate Bolt Length	
	Specific Clamp	Universal Clamp
2" nominal	3"	3 or 3 1/2"
2 1/2" nominal	3 or 3 1/2"	3 1/2 or 4"
3" nominal	3 1/2 or 4"	4 1/2"

SIGNS WITH PLAQUES

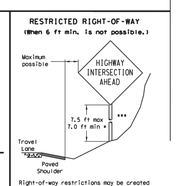


When a supplemental plaque or secondary sign is used, the 7 ft sign height is measured to the bottom of the supplemental plaque or secondary sign.

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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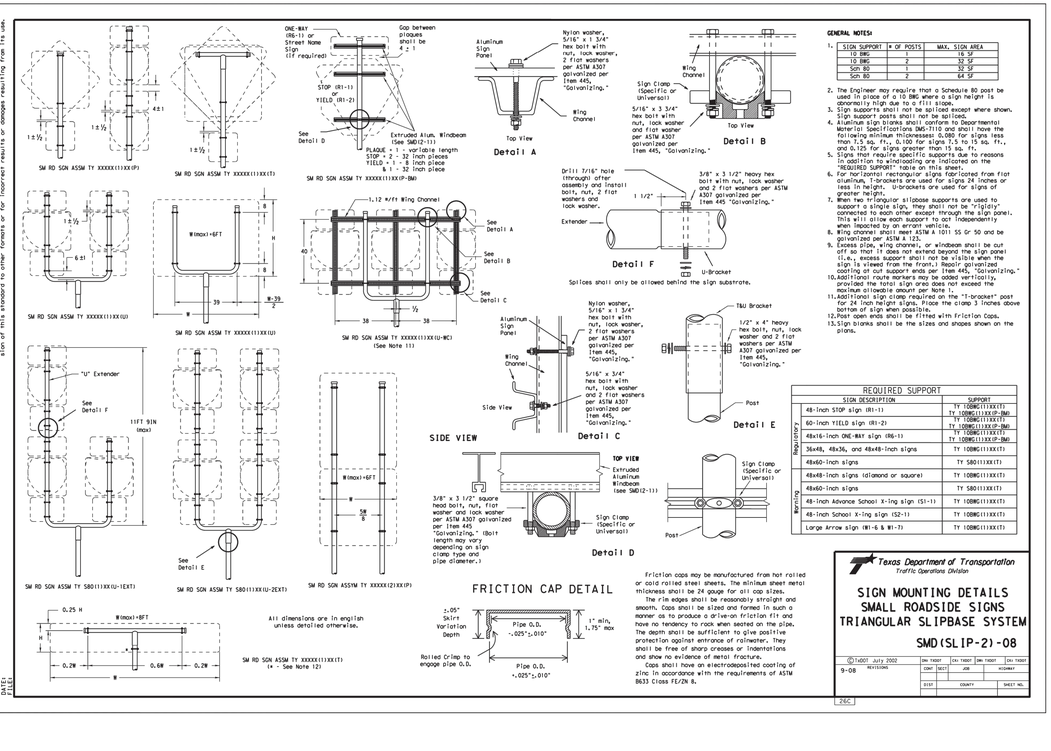

GENERAL NOTES:

1. | SIGN SUPPORT | # OF POSTS | MAX. SIGN AREA |
   |---|---|---|
   | 12 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 high 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)
	60-inch YIELD Sign (R1-2)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	48x16-inch ONE-WAY sign (R6-1)	TY 10BWG(1)XX(T) TY 10BWG(1)XX(P-BM)
	36x48, 48x36, and 48x48-inch signs	TY 10BWG(1)XX(T)
	48x60-inch signs	TY SB01(1)XX(T)
	48x48-inch signs (diamond or square)	TY 10BWG(1)XX(T)
	48x60-inch signs	TY SB01(1)XX(T)
Warning	48-Inch Advance School X-ing sign (S1-1)	TY 10BWG(1)XX(T)
	48-Inch School X-ing sign (S2-1)	TY 10BWG(1)XX(T)
	Large Arrow sign (W1-6 & W1-7)	TY 10BWG(1)XX(T)

FRICTION CAP DETAIL

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

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

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

Texas Department of Transportation
Traffic Operations Division

SIGN MOUNTING DETAILS SMALL ROADSIDE SIGNS TRIANGULAR SLIPBASE SYSTEM

SMD(SLIP-2)-08

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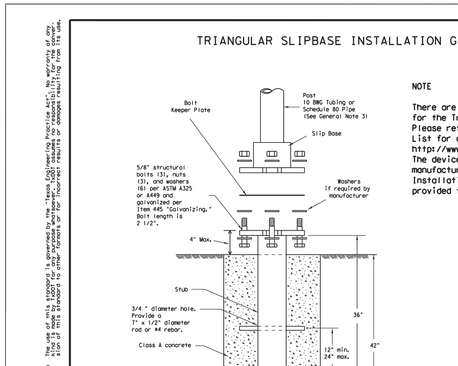


SM RD SGN ASSM TY XXXXX(X)SA(X-XXXX)

TRIANGULAR SLIPBASE INSTALLATION GENERAL REQUIREMENTS

NOTE

There are various devices approved for the Triangular Slipbase System. Please reference the Material Producer List for approved slip base systems. https://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:

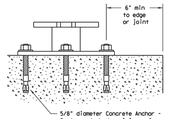
1. Slip base shall be permanently marked to indicate manufacturer. Method, design, and location of marking are subject to approval of the TxDOT Traffic Standards Engineer.
2. Material used as post with this system shall conform to the following specifications:
   - 10 BWG Tubing (2.875" outside diameter)
     - 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 followings
       - 55,000 PSI minimum yield strength
       - 70,000 PSI minimum tensile strength
       - 20% minimum elongation in 2"
     - Wall thickness (uncoated) shall be within the range of 0.122" to 0.138"
     - Outside diameter (uncoated) shall be within the range of 2.853" to 2.895"
     - 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 followings
       - 46,000 PSI minimum yield strength
       - 62,000 PSI minimum tensile strength
       - 21% minimum elongation in 2"
     - Wall thickness (uncoated) shall be within the range of 0.248" to 0.304"
     - Outside diameter (uncoated) shall be within the range of 2.853" 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, mator-driven concrete mixer. For small placements less than 0.5 cubic yards, hand mixing in a suitable container may be allowed by Engineer. Concrete shall be Class A.
3. Push the pipe end of the slip base stub into the center of the concrete. Rotate the stub back and forth while pushing it down into the concrete to assure good contact between the concrete and stub. Continue to work the stub into the concrete until it is between 2 to 4 inches above the ground.
4. Plumb the stub. Allow a minimum of 4 days to set, unless otherwise directed by the Engineer.
5. The triangular slipbase system is multidirectional and is designed to release when struck from any direction.

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

CONCRETE ANCHOR



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

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

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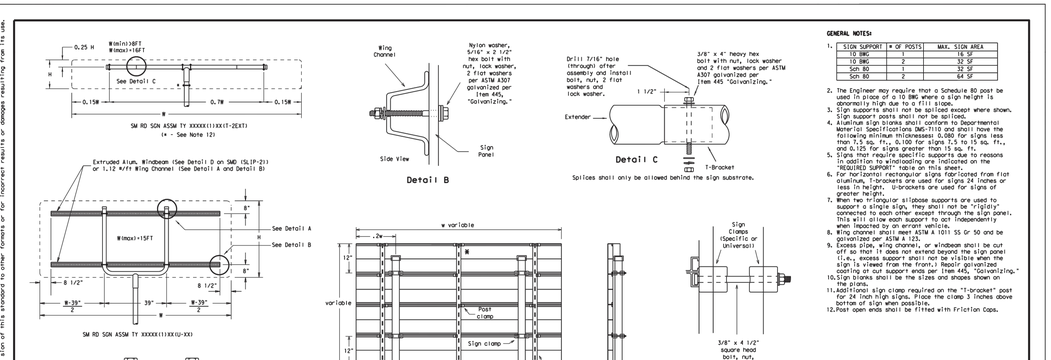

GENERAL NOTES:

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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.
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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."
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12. Post open ends shall be fitted with friction Caps.

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	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

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ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
TRAFFIC SIGNAGE NOTES & DETAIL SHEET

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN: BL CHECKED: JM
SHEET NUMBER: 5.12

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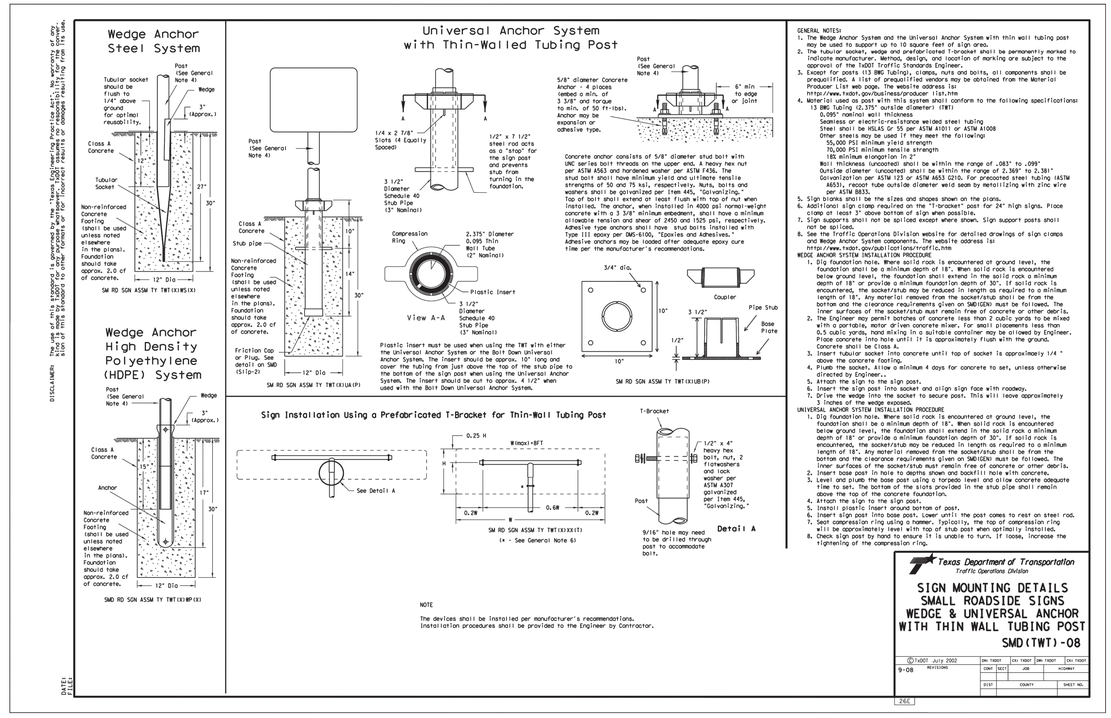
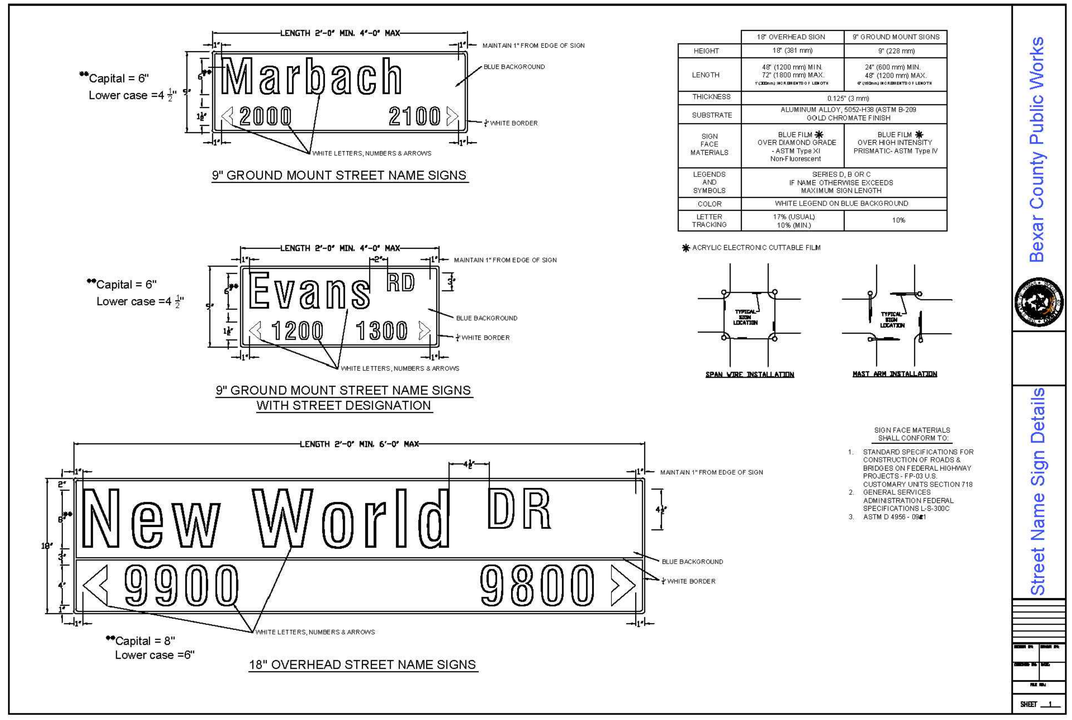
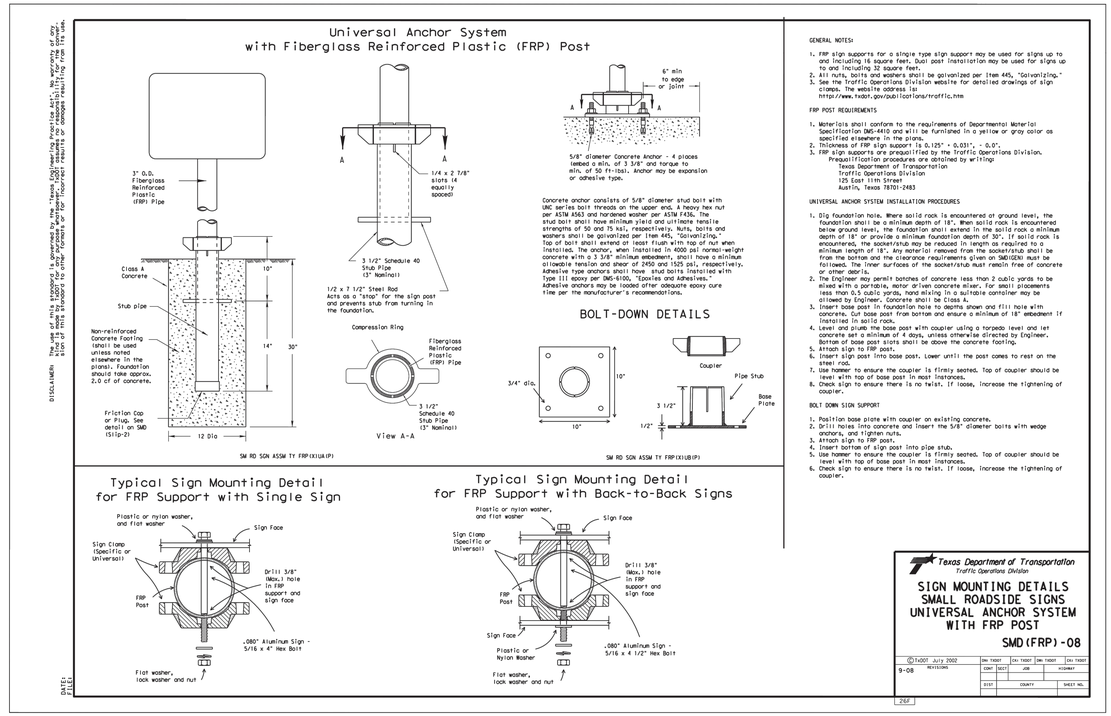




	18" OVERHEAD SIGN	9" GROUND MOUNT SIGNS
HEIGHT	18" (381 mm)	9" (228 mm)
LENGTH	48" (1200 mm) MIN. 72" (1800 mm) MAX. (12" (300 mm) INCREMENTS BY LENGTH)	24" (600 mm) MIN. 48" (1200 mm) MAX. (6" (150 mm) INCREMENTS BY LENGTH)
THICKNESS	0.125" (3 mm)	
SUBSTRATE	ALUMINUM ALLOY, 5052-H38 (ASTM B-209 GOLD 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

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 - (Use)



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TBPE Firm # 9513 - TBPLS Firm # 10122300

Bexar County Public Works

ISSUE DATE

REVISIONS

Street Name Sign Details

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

ISSUED IN:	ISSUED ON:
ORIGINAL NO.	SHEET
REVISION NO.	SHEET
REVISION NO.	SHEET

SHEET 1

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
TRAFFIC SIGNAGE NOTES & DETAIL SHEET

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
5.13

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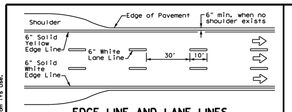
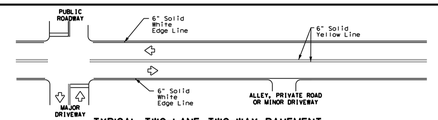
DATE:
FILE:

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



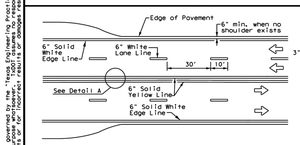
TYPICAL TWO-LANE, TWO-WAY PAVEMENT MARKINGS THROUGH INTERSECTIONS

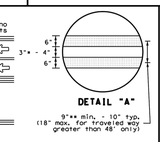


GENERAL NOTES

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

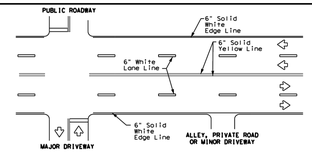
CENTERLINE AND LANE LINES FOUR LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS



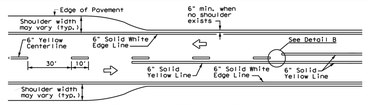


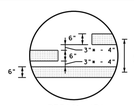
* 2" minimum for restripe projects when approved by the Engineer.
** 8" minimum for restripe projects when approved by the Engineer.

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

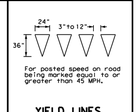


TWO LANE TWO-WAY ROADWAY WITH OR WITHOUT SHOULDERS

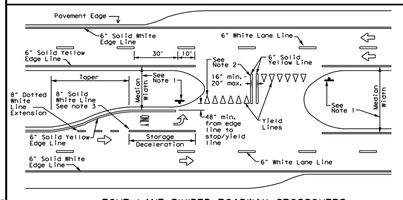




* 2" minimum for restripe projects when approved by the Engineer.



FOUR LANE DIVIDED ROADWAY CROSSOVERS



NOTES

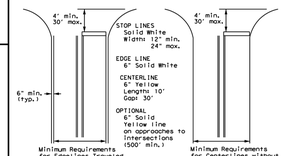
1. Where divided highways are separated by median widths at the median opening itself of 30 feet or more, median openings shall be signed as two separate intersections. Each median opening has two width measurements, with one measurement for each approach. The narrow median width will be the controlling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

GENERAL NOTES

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

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

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



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

GUIDE FOR PLACEMENT OF STOP LINES, EDGE LINE & CENTERLINE

Based on Traveled Way and Pavement Widths for Undivided Roadways

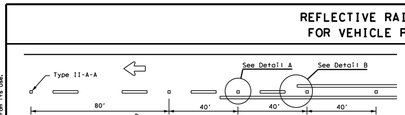
Texas Department of Transportation — Traffic Safety Division Standard

TYPICAL STANDARD PAVEMENT MARKINGS

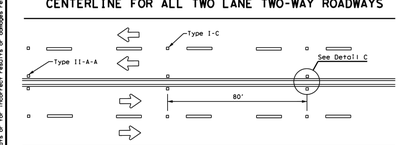
PM(1)-22

FILE:	pm1-22.dgn	DN:	CK:	DW:	CK:
©TxDOT	December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS					
11-78	8-00 6-20				
8-95	5-03 12-22				
5-00	2-10	DIST	COUNTY		SHEET NO.
8-00	2-12				

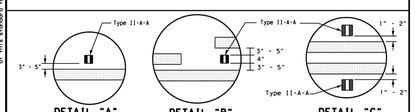
REFLECTIVE RAISED PAVEMENT MARKERS FOR VEHICLE POSITIONING GUIDANCE

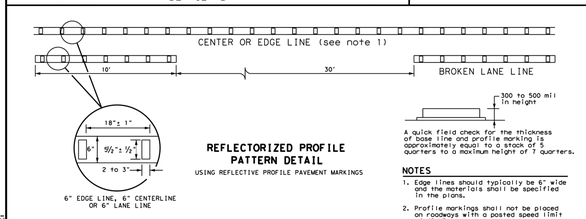


CENTERLINE FOR ALL TWO LANE TWO-WAY ROADWAYS



CENTERLINE & LANE LINES FOR FOUR LANE TWO-WAY ROADWAYS





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.

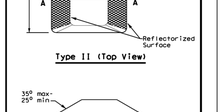
REFLECTORIZED PROFILE PATTERN DETAIL

USING REFLECTIVE PROFILE PAVEMENT MARKINGS

NOTES

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

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.

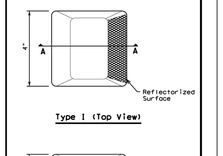
See Note 3.

GENERAL NOTES

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

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.



Type I (Top View)

Type II (Top View)

SECTION A

RAISED PAVEMENT MARKERS

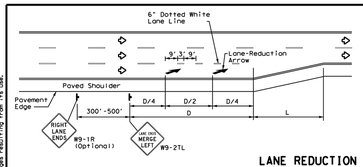
Texas Department of Transportation — Traffic Safety Division Standard

POSITION GUIDANCE USING RAISED MARKERS RELECTORIZED PROFILE MARKINGS

PM(2)-22

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

LANE REDUCTION



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 TS21(1). standard sheets.
2. On divided highways, an additional RIGHT LANE ENDS (#9-1R) sign may be installed in the median aligned with the #9-1R 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.

ADVANCED WARNING SIGN DISTANCE (D)		
Posted Speed	D (ft)	L (ft)
30 MPH	460	$L=\frac{WS^2}{60}$
35 MPH	565	
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	

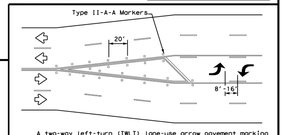
GENERAL NOTES

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 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. See Chapter 3 of the Roadway Design Manual for additional information on turning lanes or storage lengths.

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

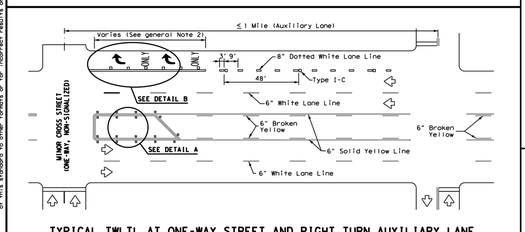
All pavement marking materials shall meet the required Departmental Material Specifications as specified by the plans.

TYPICAL TRANSITION FOR TWLTL AND DIVIDED HIGHWAY

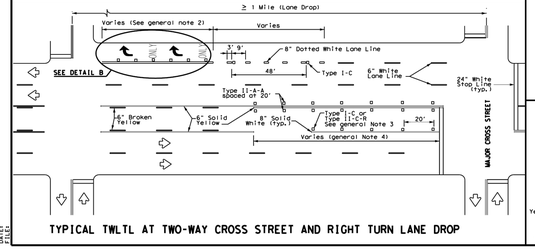


A two-way left-turn (TWLT) lane-use arrow pavement marking should be used at or just downstream from the beginning of a two-way left-turn lane within a corridor. Repeating the marking after each intersection or dedicated turn bay is not required unless stated elsewhere in the plans.

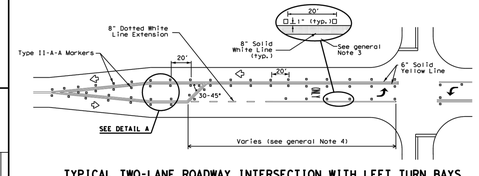
TYPICAL TWLTL AT ONE-WAY STREET AND RIGHT TURN AUXILIARY LANE

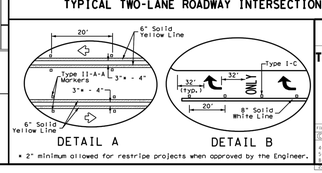


TYPICAL TWLTL AT TWO-WAY CROSS STREET AND RIGHT TURN LANE DROP



TYPICAL TWO-LANE ROADWAY INTERSECTION WITH LEFT TURN BAYS





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

Texas Department of Transportation — Traffic Safety Division Standard

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

PM(3)-22

FILE:	pm3-22.dgn	DN:	CK:	DW:	CK:
©TxDOT	December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS					
4-98	5-03 6-20				
5-00	2-10 12-22				
8-00	2-12	DIST	COUNTY		SHEET NO.

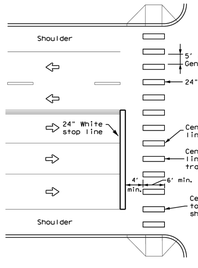
GENERAL NOTES

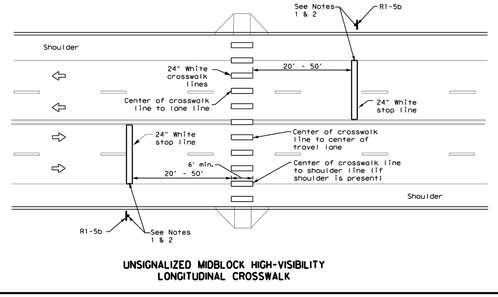
1. Longitudinal crosswalk lines should not be placed in the wheel path of vehicles. Center the crosswalk lines on travel lanes, lane lines, and shoulder lines (if present).
2. A minimum 6' clear distance shall be provided to the curb face. If the last crosswalk line falls into this distance it must be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

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

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

HIGH-VISIBILITY LONGITUDINAL CROSSWALK AT CONTROLLED APPROACH





UNSIGNALIZED MIDBLOCK HIGH-VISIBILITY LONGITUDINAL CROSSWALK

NOTES:

1. Use stop bars with Stop Here For Pedestrians (R1-5b) signs at unsignalized midblock cross walks.
2. Use stop bars with STOP HERE ON RED (R10-6 or R10-6a) signs at mid block crosswalks controlled by traffic signals or pedestrian hybrid beacons.

Texas Department of Transportation — Traffic Safety Division Standard

CROSSWALK PAVEMENT MARKINGS

PM(4)-22A

FILE:	pm4-22c.dgn	DN:	CK:	DW:	CK:
©TxDOT	December 2022	CONT	SECT	JOB	HIGHWAY
REVISIONS					
6-20					
6-22		DIST	COUNTY		SHEET NO.
12-22					

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
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

TXDOT PAVEMENT MARKING DETAILS

PLAT NO. 23-11800310

JOB NO. 314-50-03

DATE: APRIL 2023

DRAWN: BL CHECKED: JM

SHEET NUMBER: 5.14

Date: Feb 15, 2024, 9:34am User ID: arodriguez
File: N:\314\50\03\Design\Civil\TS21(4)22A.dwg

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KFW
ENGINEERS + SURVEYING
8421 Pleasanta Pkwy, Suite 200, San Antonio, TX, 78231
Phone # (210) 764-4444 • Fax # (210) 764-4441
TBPE Firm # 9513 • TBPLS Firm # 10122300

REVISIONS | ISSUE DATE

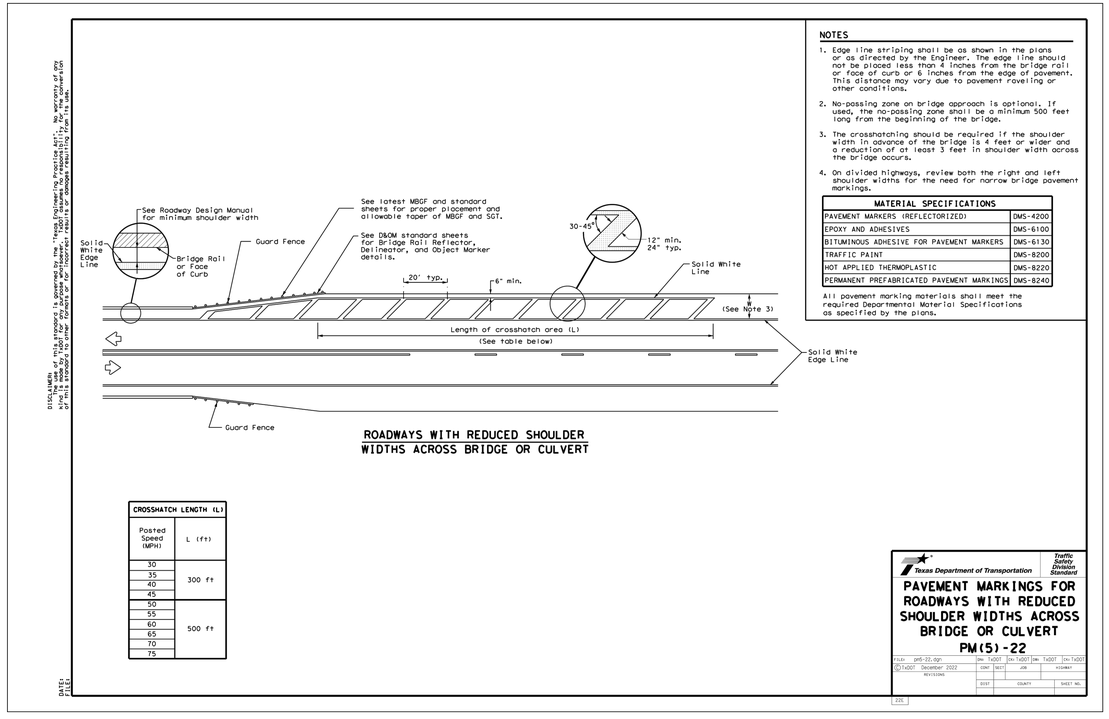
STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
TXDOT PAVEMENT MARKING DETAILS

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
5.15



ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT

NOTES

1. Edge line striping shall be as shown in the plans or as directed by the Engineer. The edge line should not be placed less than 4 inches from the bridge rail or face of curb or 6 inches from the edge of pavement. This distance may vary due to pavement raveling or other conditions.
2. No-passing zone on bridge approach is optional. If used, the no-passing zone shall be a minimum 500 feet long from the beginning of the bridge.
3. The crosshatching should be required if the shoulder width in advance of the bridge is 4 feet or wider and a reduction of at least 3 feet in shoulder width across the bridge occurs.
4. On divided highways, review both the right and left shoulder widths for the need for narrow bridge pavement markings.

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.

CROSSHATCH LENGTH (L)	
Posted Speed (MPH)	L (ft)
30	300 ft
35	
40	
45	
50	500 ft
55	
60	
65	
70	
75	

Texas Department of Transportation — Traffic Safety Division Standard

PAVEMENT MARKINGS FOR ROADWAYS WITH REDUCED SHOULDER WIDTHS ACROSS BRIDGE OR CULVERT
PM(5)-22

FILE: pm5-22.dgn
© TxDOT December 2022
REVISIONS

DN: TxDOT	CK: TxDOT	DW: TxDOT	CK: TxDOT
CONT	SECT	JOB	HIGHWAY
DIST	COUNTY		SHEET NO.

ZSN

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SUNSHINE TRAILS UNIT 1

SAN ANTONIO, TEXAS

SANITARY SEWER IMPROVEMENTS

SAWS CONSTRUCTION NOTE
COUNTER PERMIT AND GENERAL CONSTRUCTION PERMIT

General Section

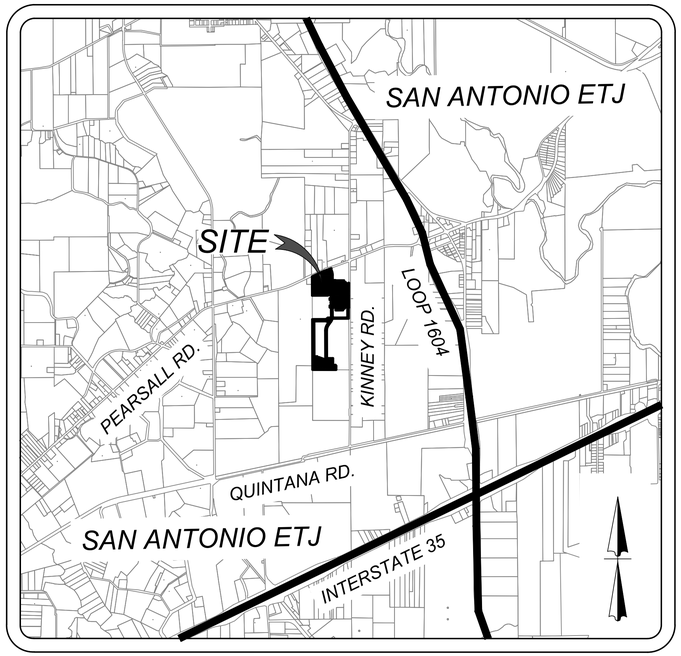
1. All materials and construction procedures within the scope of this contract shall be approved by the San Antonio Water System (SAWS) and comply with the Plans, Specifications, General Conditions and with the following as applicable:
   A. Current Texas Commission on Environmental Quality (TCEQ) "Design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

Water Section

1. Prior to tie-ins, any shutdowns of existing mains of any size must be coordinated with the SAWS Construction Inspection Division at least one week in advance of the shutdown. The Contractor must also provide a sequence of work as related to the tie-ins; this is at no additional cost to SAWS or the project and it is the responsibility of the Contractor to sequence the work accordingly.
   - For water mains 12" or higher: SAWS Emergency Operations Center (210) 233-2014
2. Asbestos Cement (AC) pipe, also known as transite pipe which is known to contain asbestos containing material (ACM), may be located within the project limits. Special waste management procedures and health and safety requirements will be applicable when removal and/or disturbance of this pipe occurs. Such work is to be made under Special Specification Item No. 3000, "Special Specification for Handling Asbestos Cement Pipe".
3. Valve removal: Where the contractor is to abandon a water main, the control valve located on the abandoning branch will be removed and replaced with a cap/plug. (NSPI)
4. Suitable anchorage/thrust blocking or joint restraint shall be provided at all of the following main locations: dead ends, plugs, caps, tees, crosses, valves, and bends, in accordance with the Standard Drawings DD-839 Series and Item No. 839, in the SAWS Standard Specifications for Construction.
5. All valves shall read "open right".
6. PRVs Required: Contractor to verify that no portion of the tract is below ground elevation of _809_ feet where the static pressure will normally exceed 80 PSI. At all such locations where the ground level is below _809_ feet, the Developer or Builder shall install at each lot, on the customer's side of the meter, an approved type pressure regulator in conformance with the Plumbing Code of the City of San Antonio. No dual services allowed for any lot(s) if *PRV is/are required for such lot(s), only single service connections shall be allowed. *Note: A pressure regulator is also known as a pressure reducing valve (PRV).
7. Pipe Disinfection with Dry HTH for Projects less than 800 linear feet. (Item No. 847.3): Mains shall be disinfected with dry HTH where shown in the contract documents or as directed by the Inspector, and shall not exceed a total length of 800 feet. This method of disinfection will also be followed for main repairs. The Contractor shall utilize all appropriate safety measure to protect his personnel during disinfection operations.
8. Backflow Prevention Devices:
   - All irrigation services within residential areas are required to have backflow prevention devices.
   - All commercial backflow prevention devices must be approved by SAWS prior to installation.
9. Final connection to the existing water main shall not be made until the water main has been pressure tested, chlorinated, and SAWS has released the main for tie-in and use.

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 source 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 costs 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 the 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. 864, "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 to 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(e)(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 the 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
N.T.S.

INDEX

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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
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

DEVELOPER:
LENNAR HOMES OF TEXAS LAND & CONSTRUCTION, LTD.
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TEXAS 78216
PHONE: (210) 403-6200

SEWER: UPPER MEDINA WATERSHED-DOS RIOS W.R.C

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION LTD.
DEVELOPER'S ADDRESS: 100 NE Loop 410, SUITE 1155
CITY: SAN ANTONIO *STATE:* TEXAS *ZIP:* 78216
PHONE#: (210) 403-6282 *FAX#:* _____ *TOTAL ACREAGE:* 39.29 Ac.
SAWS BLOCK MAP#: 100530, 100532 *TOTAL EDU'S:* 203
TOTAL LINEAR FOOTAGE OF PIPE: 1,972 L.F. ~ 12" SDR 26 PIPE
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NUMBER OF LOTS: 203 *SAWS JOB#:* XX-XXXX *PLAT NO.:* 23-11800310

GENERAL CONSTRUCTION
PERMIT S.A.W.S. JOB# XX-XXX

JOB NO. 314-50-03

PLAT NO. 23-11800310 *SHEET 6.0*

Date: Feb 14, 2024, 4:25pm User ID: crodriguez
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TRENCH EXCAVATION SAFETY PROTECTION

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WATER / SEWER CROSSING NOTE:

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NOTE:

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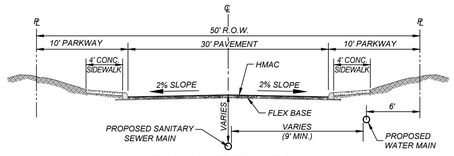
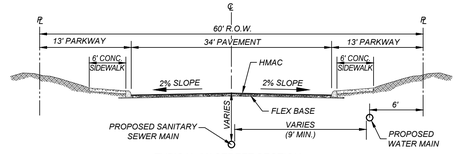
3. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
4. *ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER. SEE SAWS STANDARD SPECIFICATIONS.*



TYPICAL 50' STREET SECTION
NOT TO SCALE



TYPICAL 60' STREET SECTION
NOT TO SCALE

LEGEND

- PROPOSED WATER MAIN — 8" W
- PROPOSED 8" SANITARY SEWER MAIN — 8"SS
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
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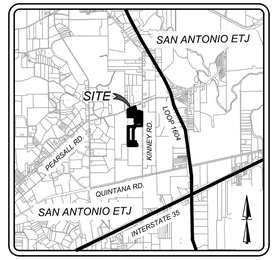
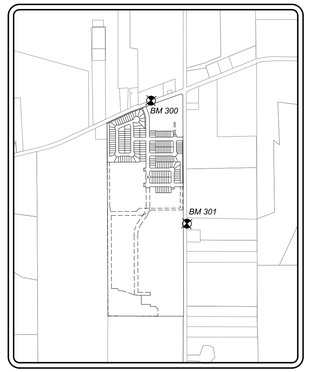


LOCATION MAP
N.T.S.

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

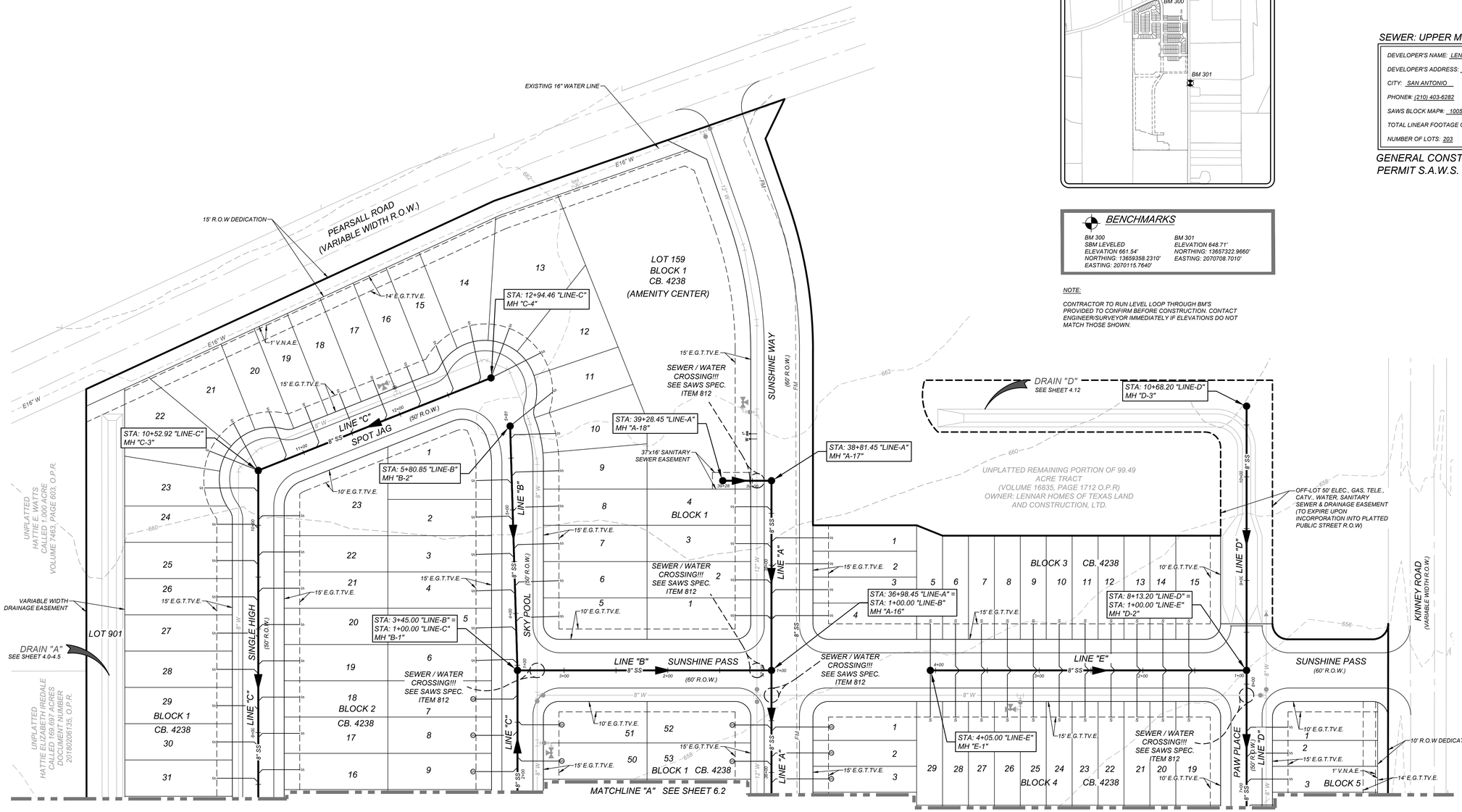


BENCHMARKS

BM 300	BM 301
SBM LEVELED	ELEVATION 648.71'
ELEVATION 661.54'	NORTHING: 13657322.9660'
NORTHING: 13659358.2310'	EASTING: 2070708.7010'
EASTING: 2070115.7640'	

NOTE:

CONTRACTOR TO RUN LEVEL LOOP THROUGH BM'S PROVIDED TO CONFIRM BEFORE CONSTRUCTION. CONTACT ENGINEER/SURVEYOR IMMEDIATELY IF ELEVATIONS DO NOT MATCH THOSE SHOWN.



SEWER: UPPER MEDINA WATERSHED-DOS RIOS W.R.C

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION LTD.
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CITY: SAN ANTONIO STATE: TEXAS ZIP: 78216
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GENERAL CONSTRUCTION
PERMIT S.A.W.S. JOB# XX-XXX

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

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

OVERALL SANITARY SEWER PLAN

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 6.1

Date: Feb 14, 2024, 4:25pm User: ID: crodriguez
File: X:\314\Civil\Work\Overall Sewer\6.1 Overall Sewer.dwg

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SEWER: UPPER MEDINA WATERSHED-DOS RIOS W.R.C

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GENERAL CONSTRUCTION PERMIT S.A.W.S. JOB# XX-XXX

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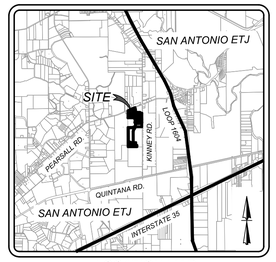
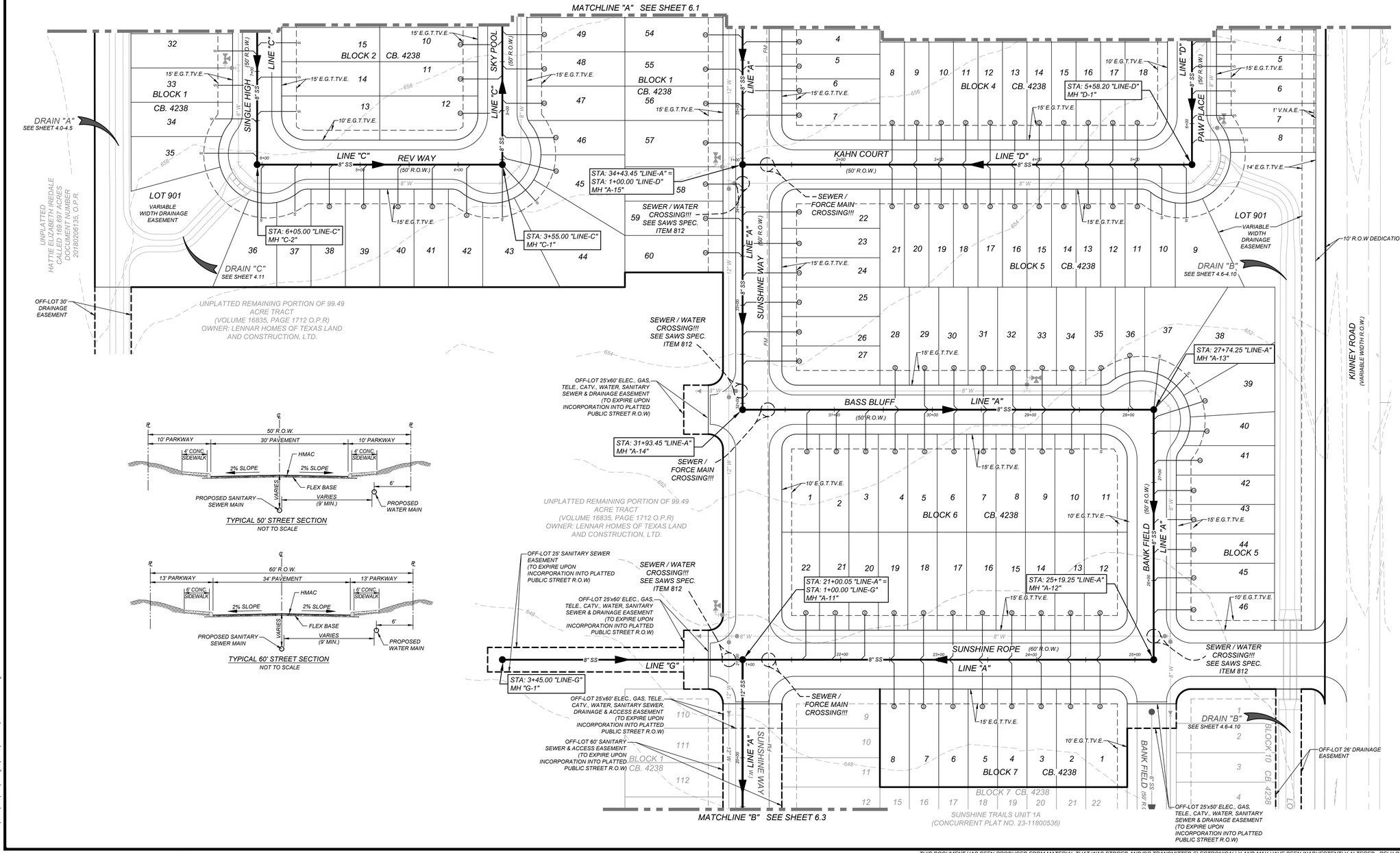


LOCATION MAP
N.T.S.

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

MATCHLINE "A" SEE SHEET 6.1



TYPICAL 50' STREET SECTION
NOT TO SCALE

TYPICAL 60' STREET SECTION
NOT TO SCALE

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

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
OVERALL SANITARY SEWER PLAN

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 6.2

Date: Feb 14, 2024, 4:25pm User ID: rodriguez
File: N:\314-50\03-Design\Civil\SEWER\SS314-5003.dwg

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TRENCH EXCAVATION SAFETY PROTECTION

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CAUTION!!:

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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.

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 PURVEYORS SPECIFICATIONS. CONTRACTOR TO VERIFY THE CONDUIT LOCATIONS AND SIZES BASED ON THE DRY UTILITY PURVEYORS PLAN.

NOTE:

ALL MATERIALS AND CONSTRUCTION PROCEDURES WITHIN THE SCOPE OF THIS CONTRACT SHALL BE IN ACCORDANCE WITH THE SAN ANTONIO WATER SYSTEM (SAWS) STANDARD SPECIFICATIONS.

WATER / SEWER CROSSING NOTE:

ALL WATER / SEWER CROSSINGS SHALL COMPLY WITH SAWS SPECIFICATION ITEM 812 SANITARY SEWER / WATER DETAIL.

NOTE:

1. *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 SHEETS 6.0, SANITARY SEWER GENERAL NOTES.*
2. *SEE SHEET 6.1 FOR BENCHMARK INFORMATION.*
3. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
4. *ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER. SEE SAWS STANDARD SPECIFICATIONS.*

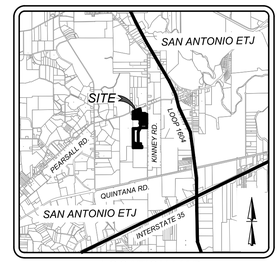
SEWER: UPPER MEDINA WATERSHED-DOS RIOS W.R.C

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION LTD.
DEVELOPER'S ADDRESS: 100 NE Loop 410, SUITE 1155
CITY: SAN ANTONIO STATE: TEXAS ZIP: 78216
PHONE#: (210) 403-6282 FAX#: _____ TOTAL ACREAGE: 39.29 Ac.
SAWS BLOCK MAP#: 100530, 100532 TOTAL EDU'S: 203
TOTAL LINEAR FOOTAGE OF PIPE: 1,972 L.F. ~ 12" SDR 26 PIPE; 4,922 L.F. ~ 8" SDR 26 PIPE; 100 L.F. ~ 8" SDR 26 PIPE (160 PSI)
NUMBER OF LOTS: 203 SAWS JOB#: XX-XXXX PLAT NO.: 23-11800310

GENERAL CONSTRUCTION PERMIT S.A.W.S. JOB# XX-XXX

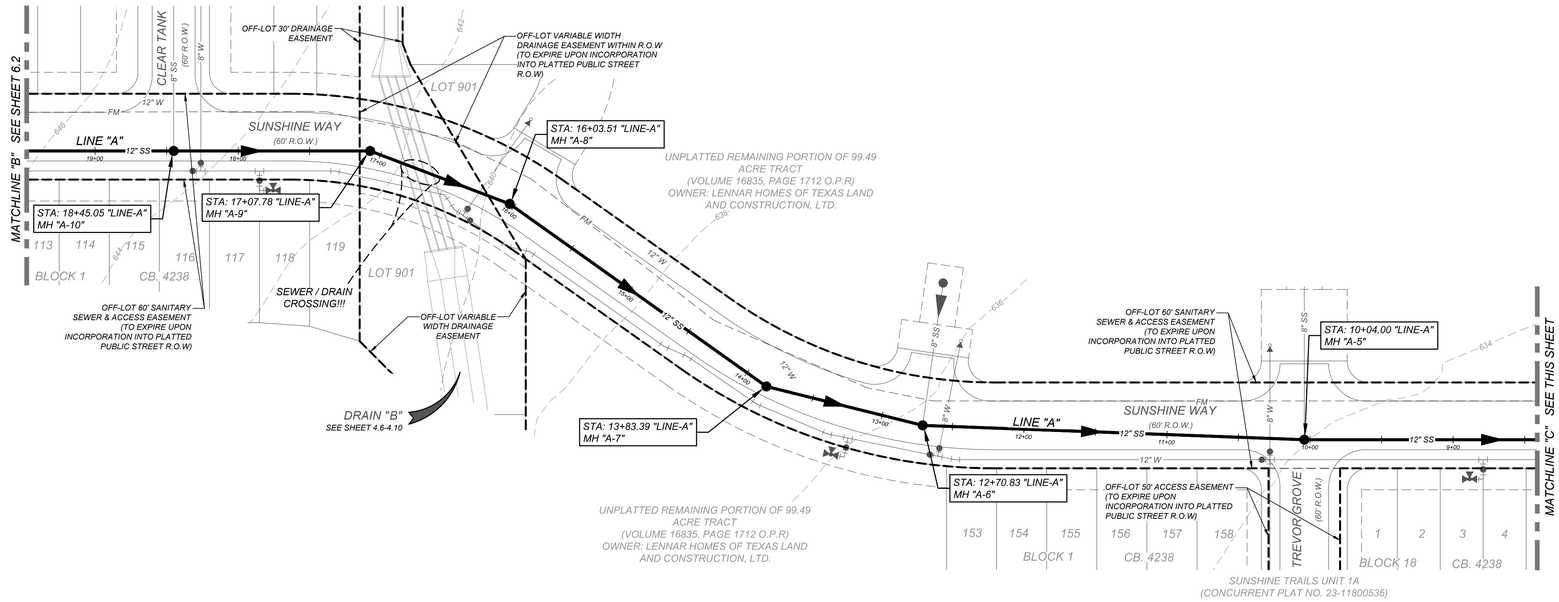
LEGEND

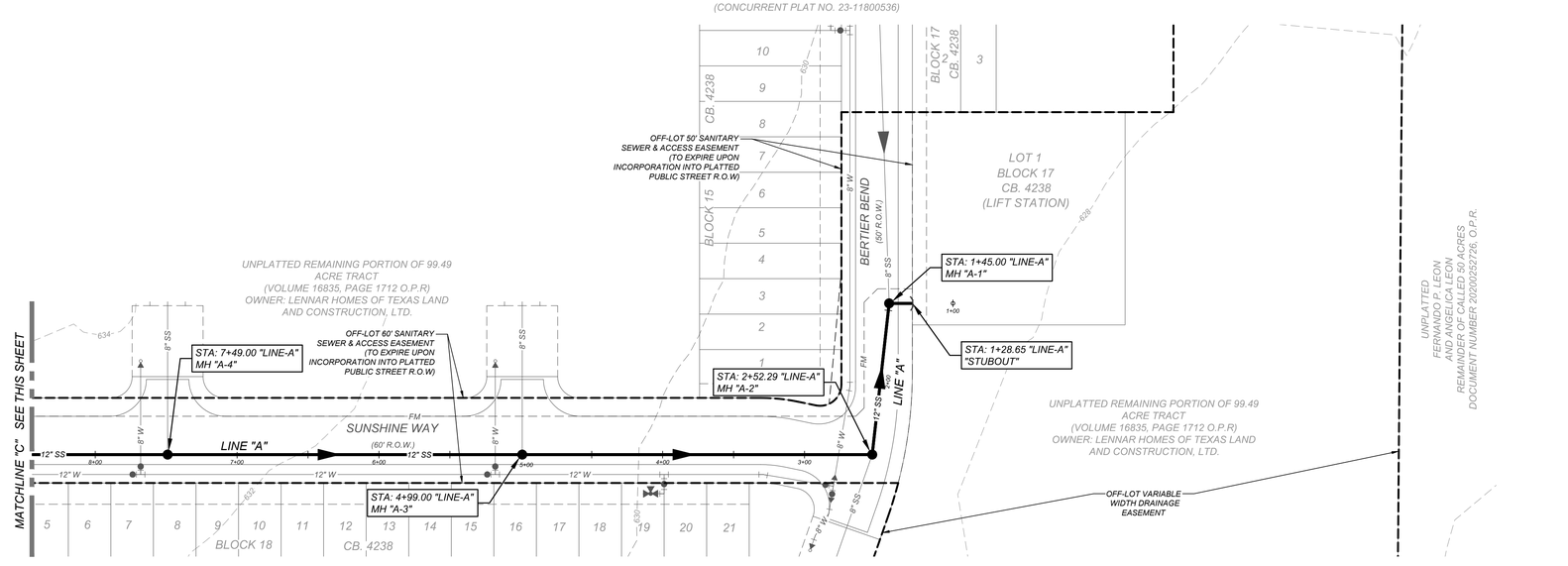
- PROPOSED WATER MAIN — 8" W
- PROPOSED 8" SANITARY SEWER MAIN — 8"SS
- PROPOSED SANITARY SEWER MANHOLE
- EXISTING SANITARY SEWER MANHOLE
- EXISTING WATER MAIN — 8" W
- EXISTING SANITARY SEWER MAIN — 8" SS
- FORCE MAIN — FM
- PROPOSED FIRE HYDRANT
- EXISTRING FIRE HYDRANT
- PROPOSED SANITARY SEWER LATERAL — S
- PROPOSED SANITARY SEWER LATERAL WITH VERTICAL STACK — VS
- RIGHT-OF-WAY — R.O.W
- VEHICULAR NON ACCESS EASEMENT — V.N.A.E
- PROPOSED ELECTRIC, GAS,TELEPHONE & CABLE T.V. EASEMENT — E.G.T.TV.E
- RIGHT OF WAY — R.O.W.



LOCATION MAP
N.T.S.

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





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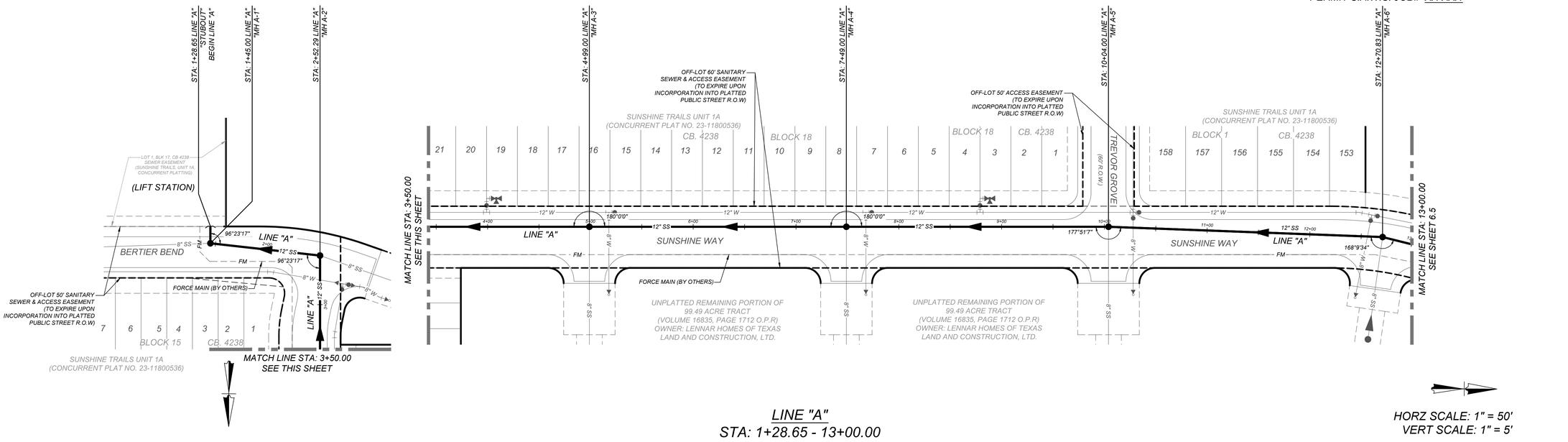
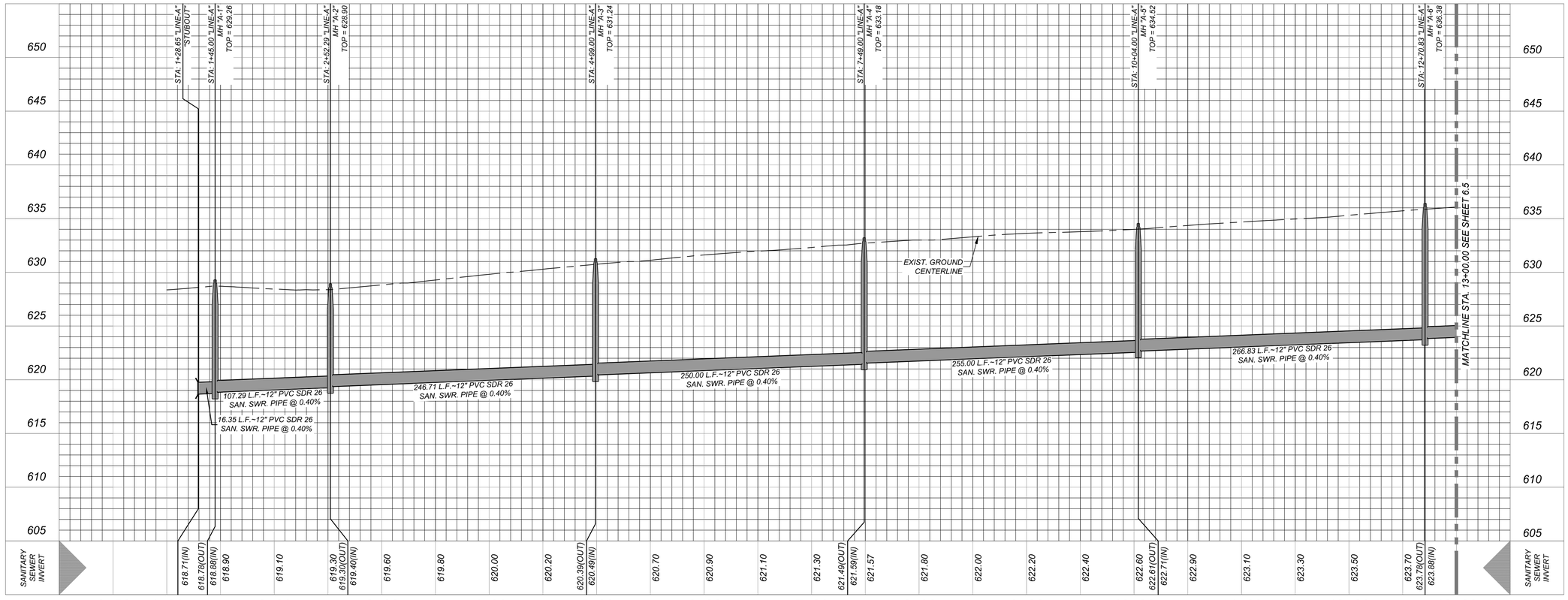
GENERAL CONSTRUCTION
PERMIT S.A.W.S. JOB# XX-XXX



LINE "A"
STA: 1+28.65 - 13+00.00

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



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SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
LINE "A" PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 6.4

Date: Feb 14, 2024, 4:26pm User ID: orodriguez
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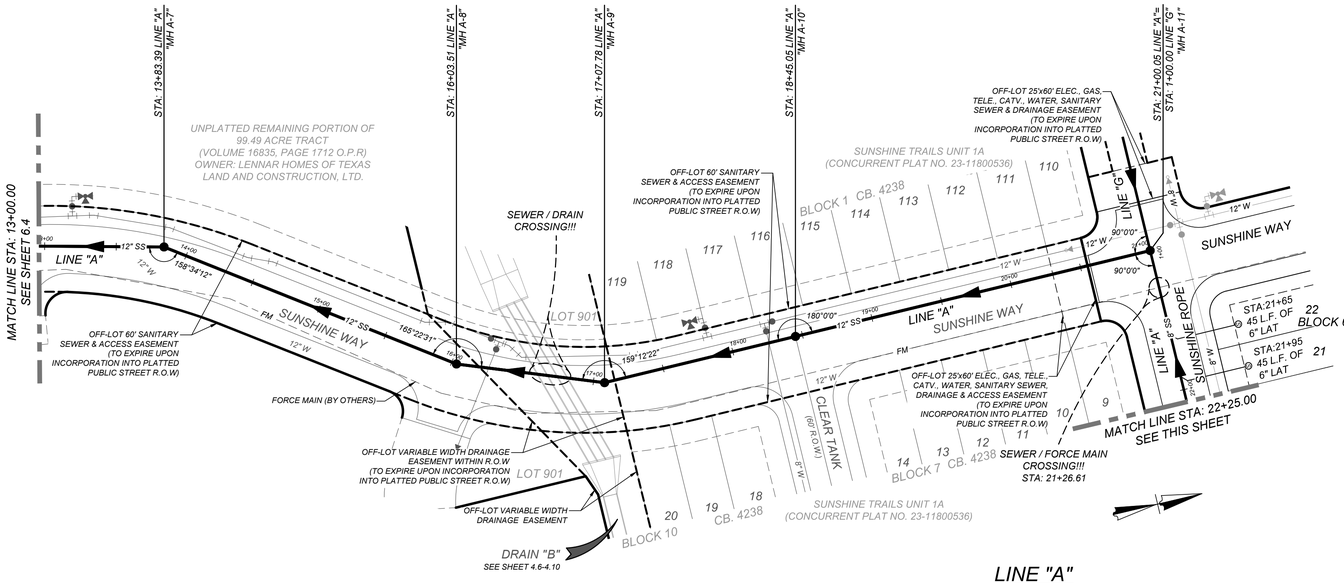

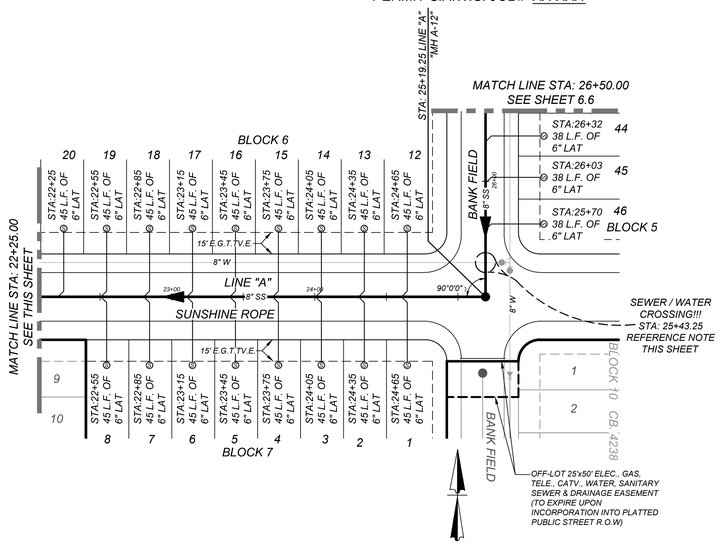

LINE "A"
STA: 13+00.00 - 26+50.00

HORZ SCALE: 1" = 50'
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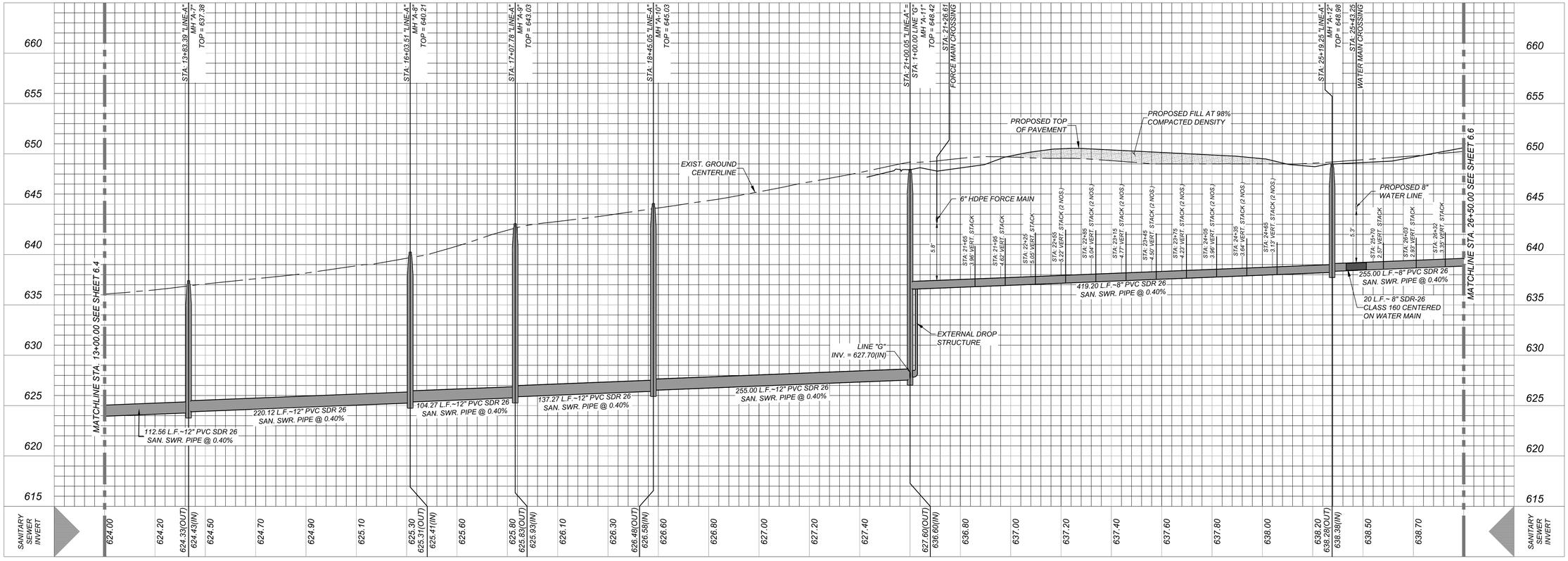

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SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
LINE "A" PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
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Date: Feb 14, 2024, 4:26pm User ID: cgrodriguez
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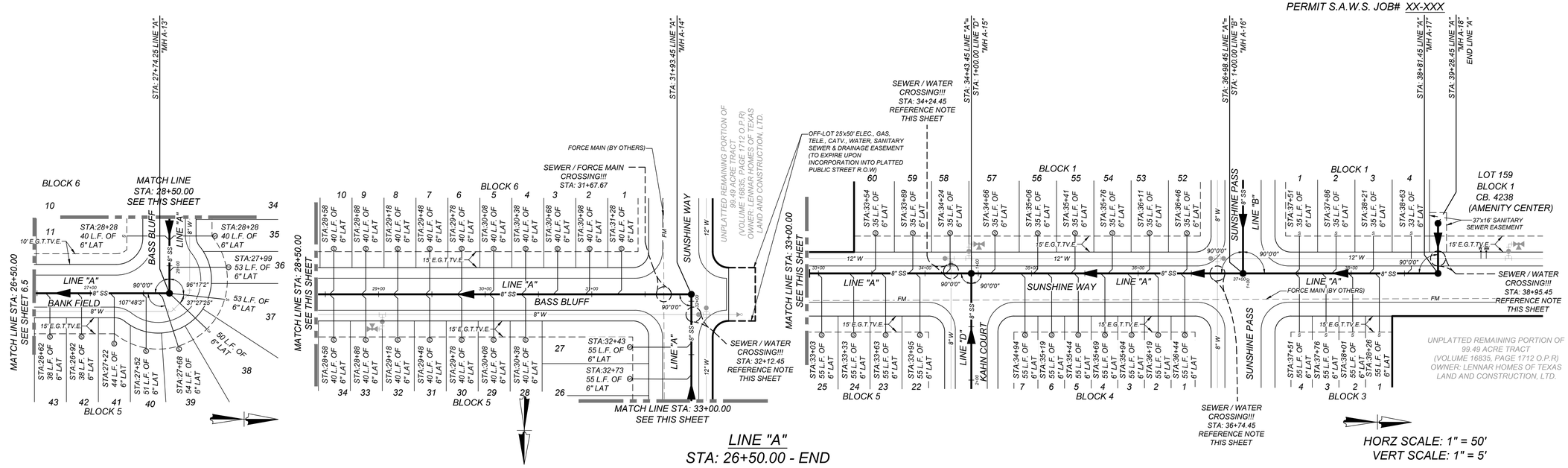

LINE "A"
STA: 26+50.00 - END

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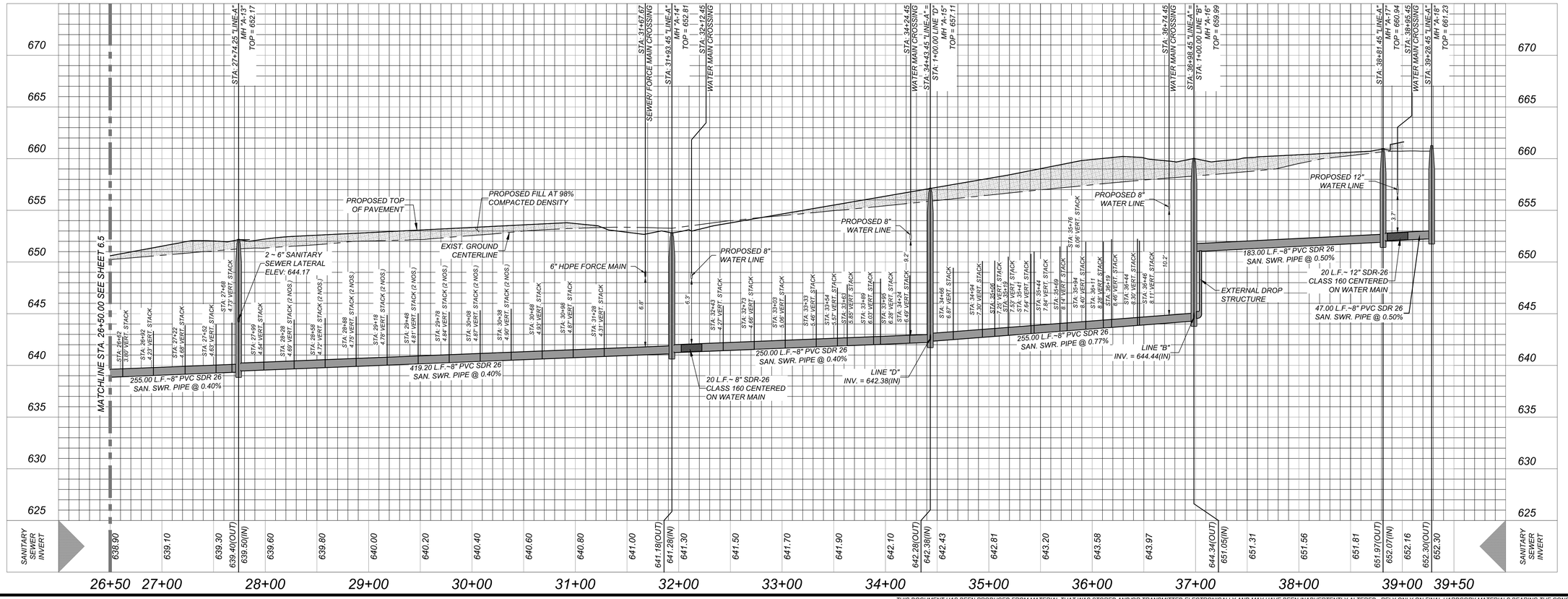

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CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES WITHIN THE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

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2. *SEE SHEET 6.1 FOR BENCHMARK INFORMATION.*
3. *PIPE TYPE DESIGNATIONS ARE SDR 26.*
4. *ALL MANHOLES SHALL HAVE CONCRETE RING ENCASEMENT AND A WATER TIGHT RING AND COVER. SEE STANDARD SPECIFICATIONS.*

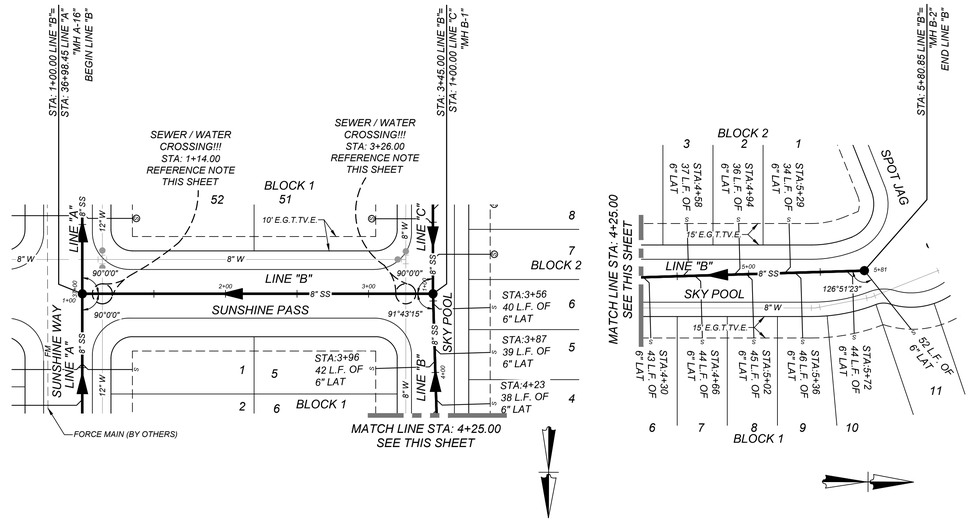
WATER / SEWER CROSSING NOTE:

ALL WATER / SEWER CROSSINGS SHALL COMPLY WITH SAWS SPECIFICATION ITEM 812 SANITARY SEWER / WATER DETAIL.

SEWER: UPPER MEDINA WATERSHED-DOS RIOS W.R.C

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION LTD.
DEVELOPER'S ADDRESS: 100 NE Loop 410, SUITE 1155
CITY: SAN ANTONIO STATE: TEXAS ZIP: 78216
PHONE#: (210) 403-6282 FAX#: _____ TOTAL ACREAGE: 39.29 Ac.
SAWS BLOCK MAP#: 100530, 100532 TOTAL EDU'S: 203
TOTAL LINEAR FOOTAGE OF PIPE: 1,972 L.F. ~ 12" SDR 26 PIPE; 4,922 L.F. ~ 8" SDR 26 PIPE; 100 L.F. ~ 8" SDR 26 PIPE (160 PSI)
NUMBER OF LOTS: 203 SAWS JOB#: XX-XXXX PLAT NO.: 23-11800310

GENERAL CONSTRUCTION PERMIT S.A.W.S. JOB# XX-XXX



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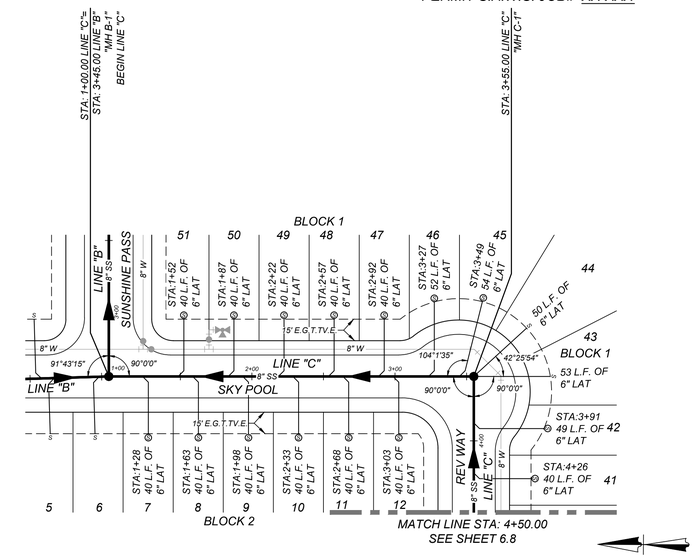
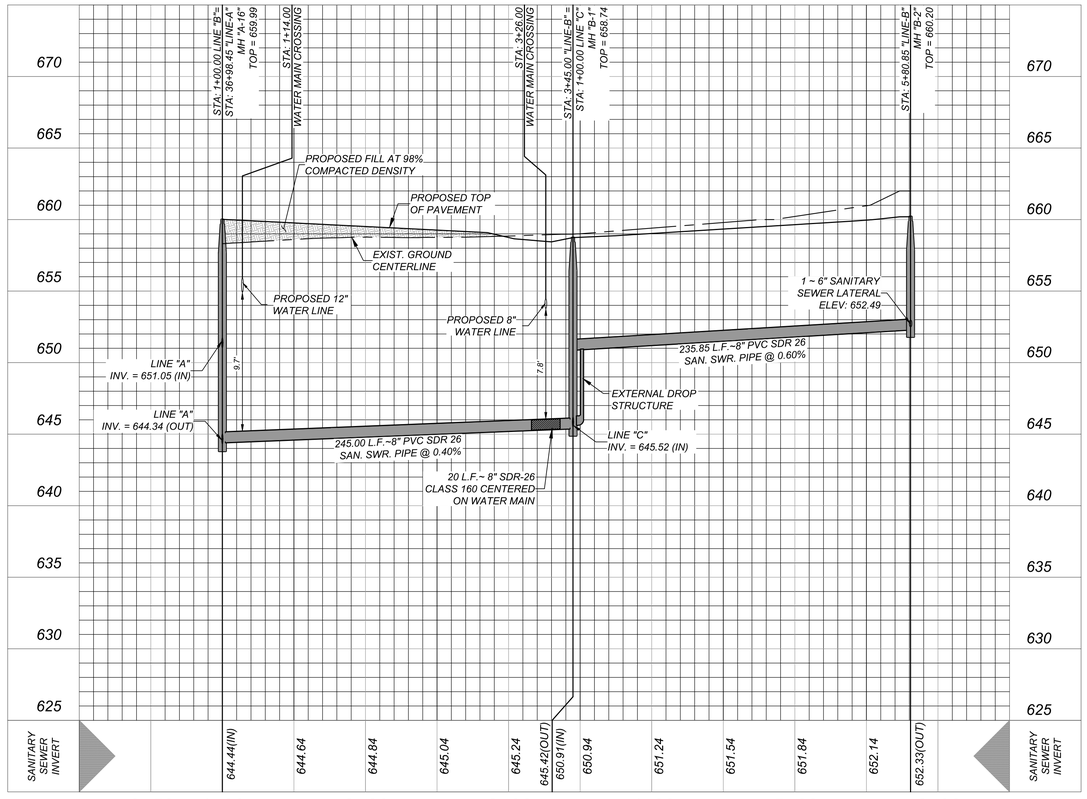
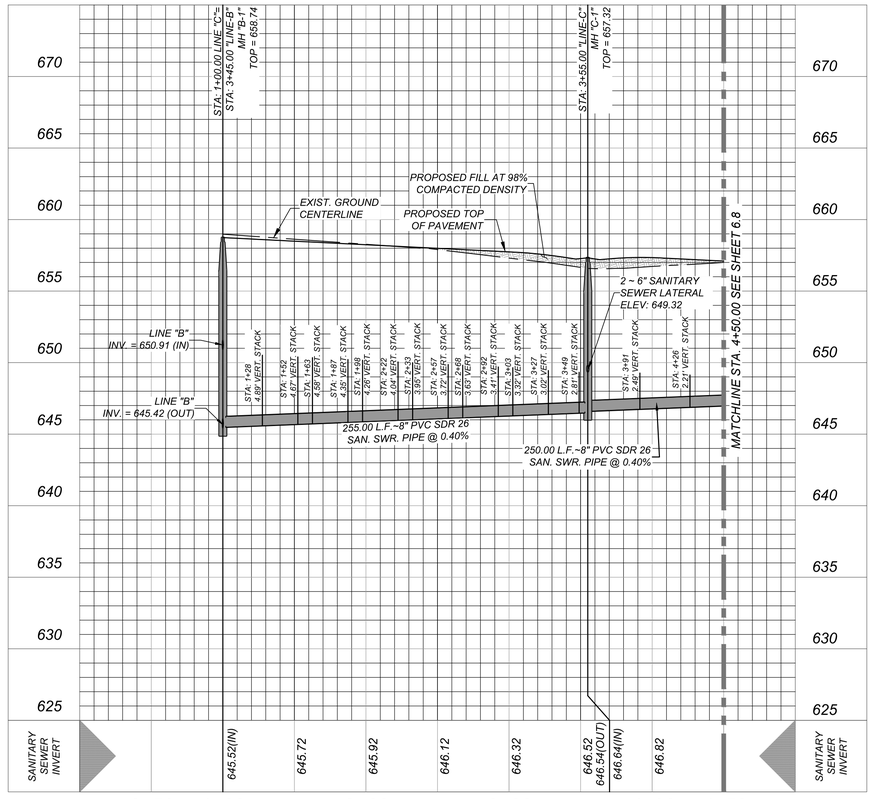


LINE "C"
STA: 1+00.00 - 4+50.00

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





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Phone: 210.979.8444 • Fax: 210.979.8441
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ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
LINE "B" & "C" PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 6.7

Date: Feb. 14, 2024, 4:27pm User ID: orodriguez
File: N:\314\50\03\Design\Civil\SEWER\SSP-314-5003.dwg

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WATER / SEWER CROSSING NOTE:

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SEWER: UPPER MEDINA WATERSHED-DOS RIOS W.R.C

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION LTD.

DEVELOPER'S ADDRESS: 100 NE Loop 410, SUITE 1155

CITY: SAN ANTONIO STATE: TEXAS ZIP: 78216

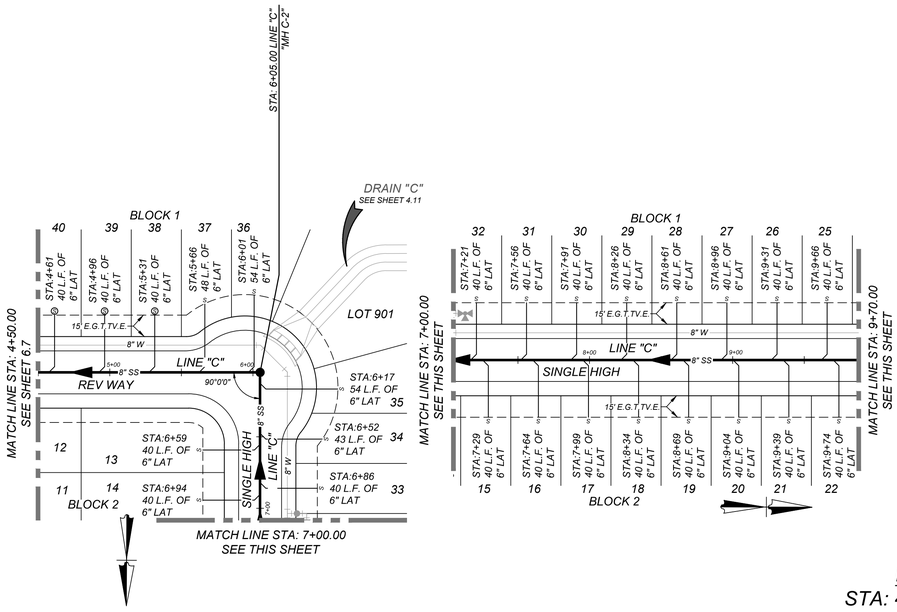
PHONE#: (210) 403-6282 FAX#: _____ TOTAL ACREAGE: 39.29 Ac.

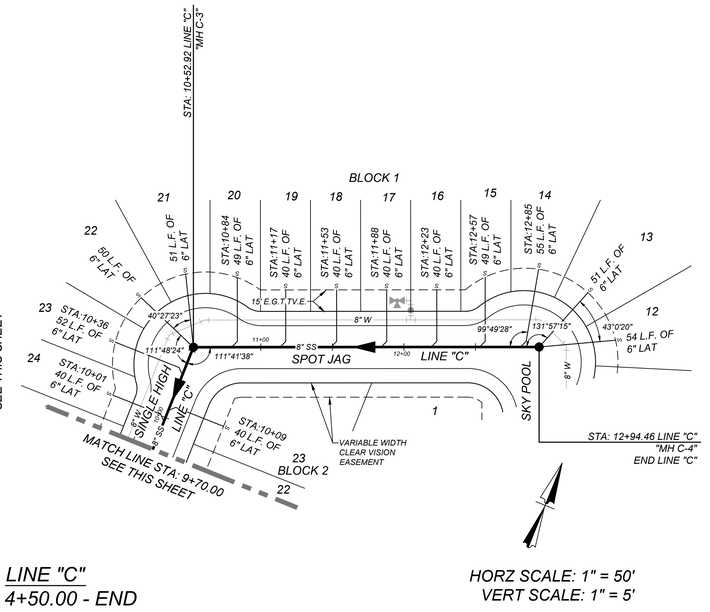
SAWS BLOCK MAP#: 100530, 100532 TOTAL EDU'S: 203

TOTAL LINEAR FOOTAGE OF PIPE: 1,972 L.F. ~ 12" SDR 26 PIPE; 4,922 L.F. ~ 8" SDR 26 PIPE; 100 L.F. ~ 8" SDR 26 PIPE (160 PSI)

NUMBER OF LOTS: 203 SAWS JOB#: XX-XXXX PLAT NO.: 23-11800310

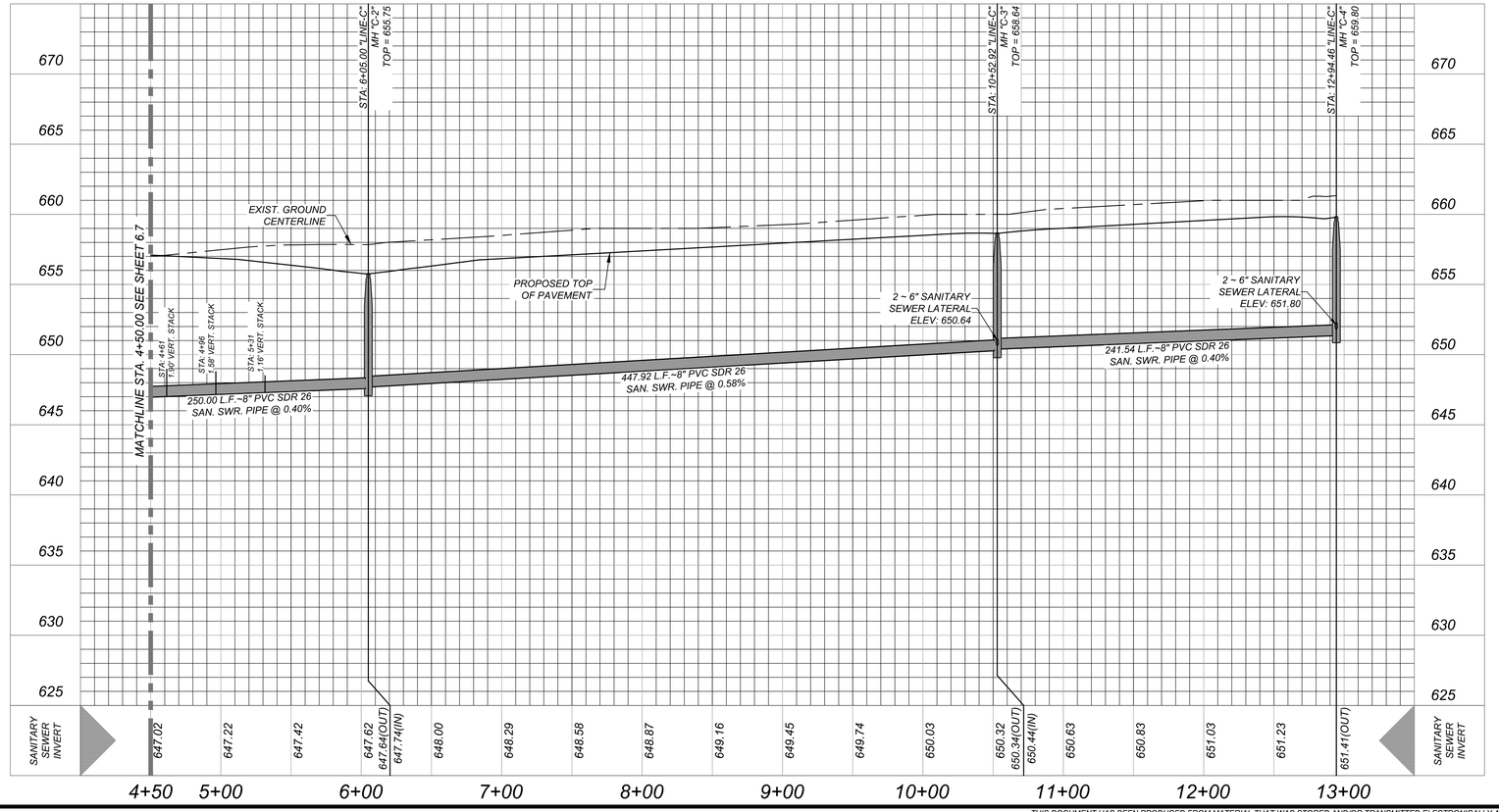
GENERAL CONSTRUCTION
PERMIT S.A.W.S. JOB# XX-XXX





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

LINE "C"
STA: 4+50.00 - END



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Fax: 210.545.9572 Phone: 210.545.1122
TBPE Firm #: 9513 • TBPLS Firm #: 10122300

ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
LINE "C" PLAN AND PROFILE

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
6.8

Date: Feb 14, 2024, 4:27pm User ID: cgrodriguez
File: N:\314\50\03\Design\Civil\SEWER\SSP314-5003.dwg

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WATER / SEWER CROSSING NOTE:

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SEWER: UPPER MEDINA WATERSHED-DOS RIOS W.R.C

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION LTD.
DEVELOPER'S ADDRESS: 100 NE Loop 410, SUITE 1155
CITY: SAN ANTONIO STATE: TEXAS ZIP: 78216
PHONE#: (210) 403-6282 FAX#: _____ TOTAL ACREAGE: 39.29 Ac.
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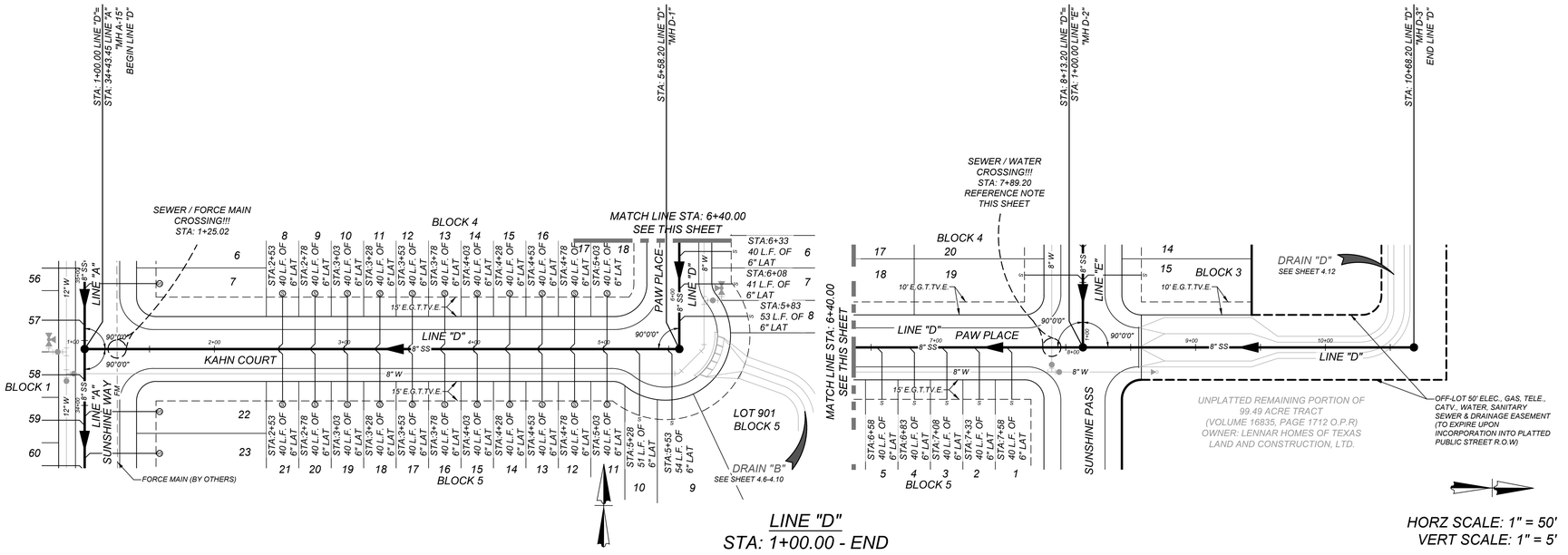
NUMBER OF LOTS: 203 SAWS JOB#: XX-XXXX PLAT NO.: 23-11800310

GENERAL CONSTRUCTION PERMIT S.A.W.S. JOB# XX-XXX



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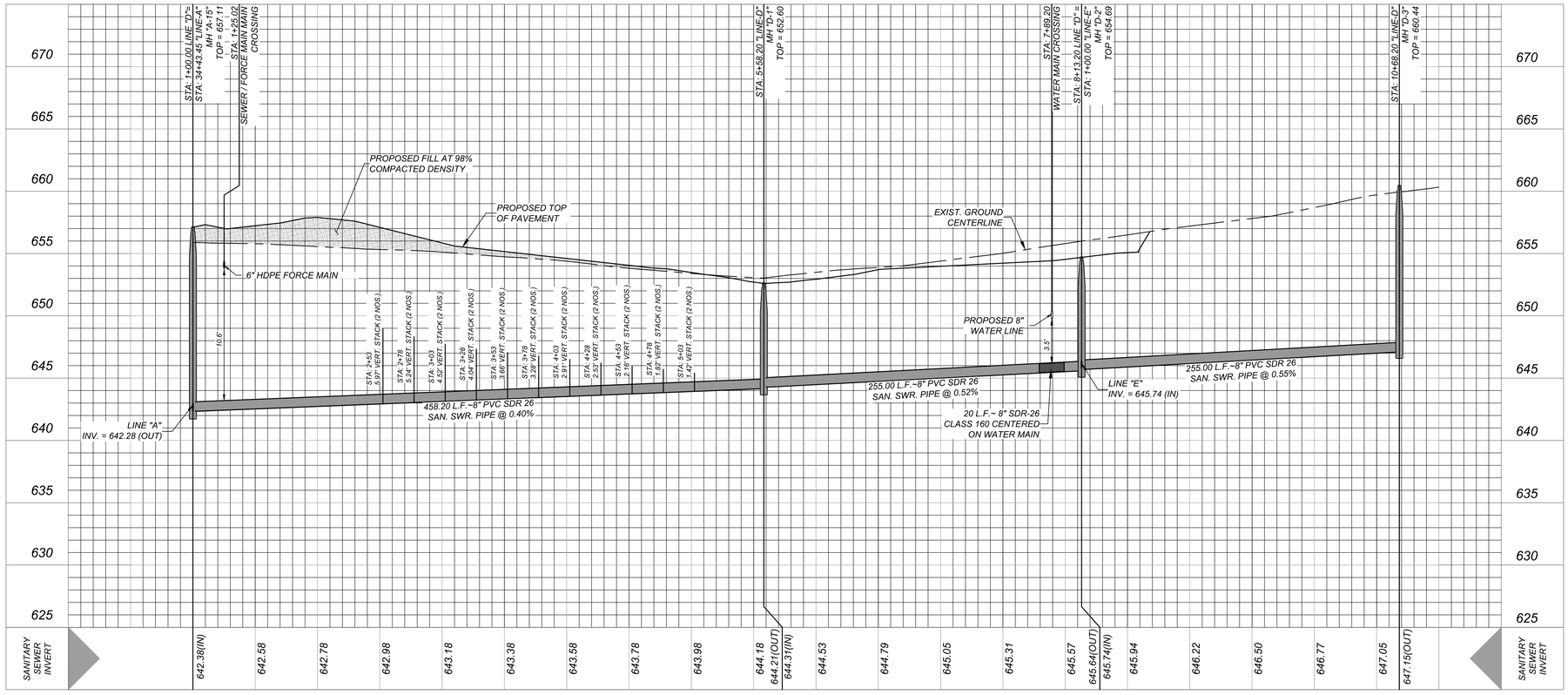
HORZ SCALE: 1" = 50'
VERT SCALE: 1" = 5'



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Phone: 210.979.8444 • Fax: 210.979.8441
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REVISIONS | ISSUE DATE

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
LINE "D" PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 6.9

Date: Feb 14, 2024, 4:27pm User ID: cgrodriguez
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WATER / SEWER CROSSING NOTE:

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SEWER: UPPER MEDINA WATERSHED-DOS RIOS W.R.C

DEVELOPER'S NAME: LENNAR HOMES OF TEXAS LAND AND CONSTRUCTION LTD.
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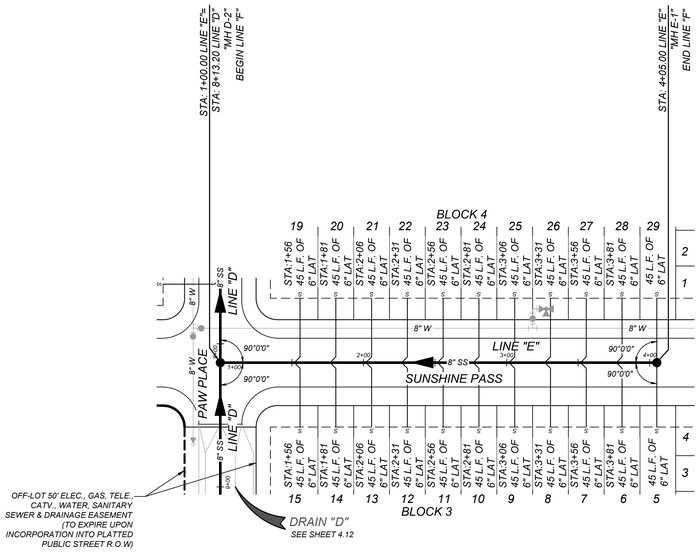
NUMBER OF LOTS: 203 *SAWS JOB#:* XX-XXXX *PLAT NO.:* 23-11800310

GENERAL CONSTRUCTION
PERMIT S.A.W.S. JOB# XX-XXX



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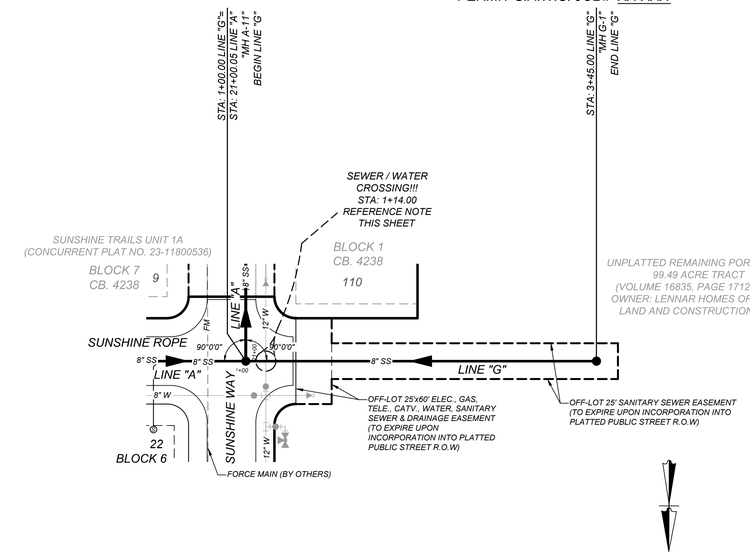
HORZ SCALE: 1" = 50'
VERT SCALE: 1" = 5'



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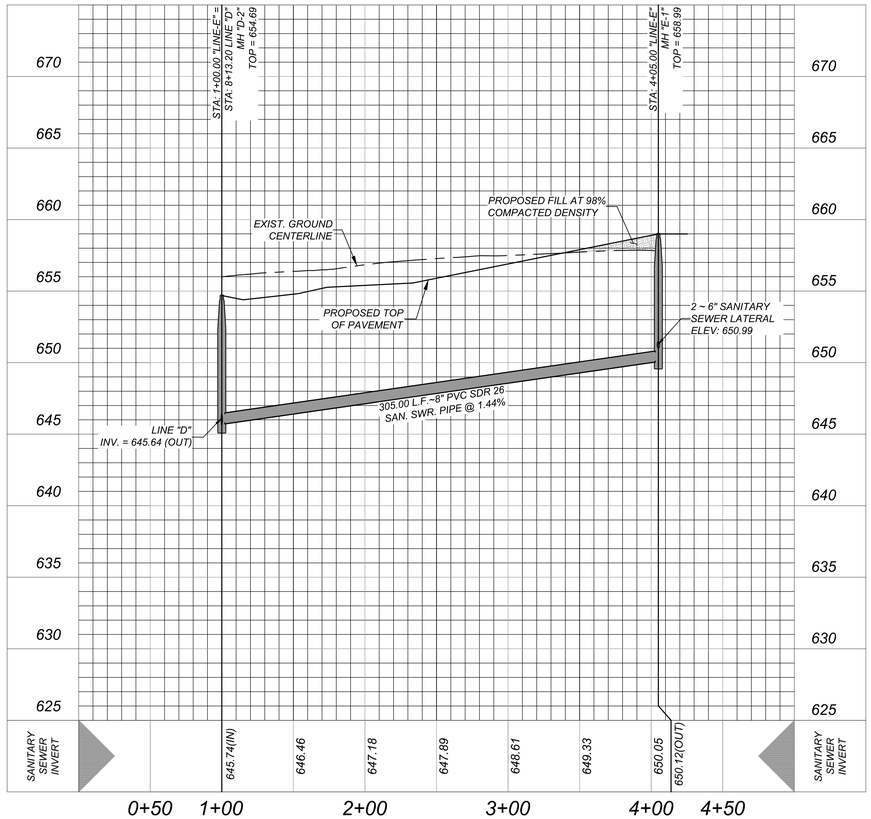
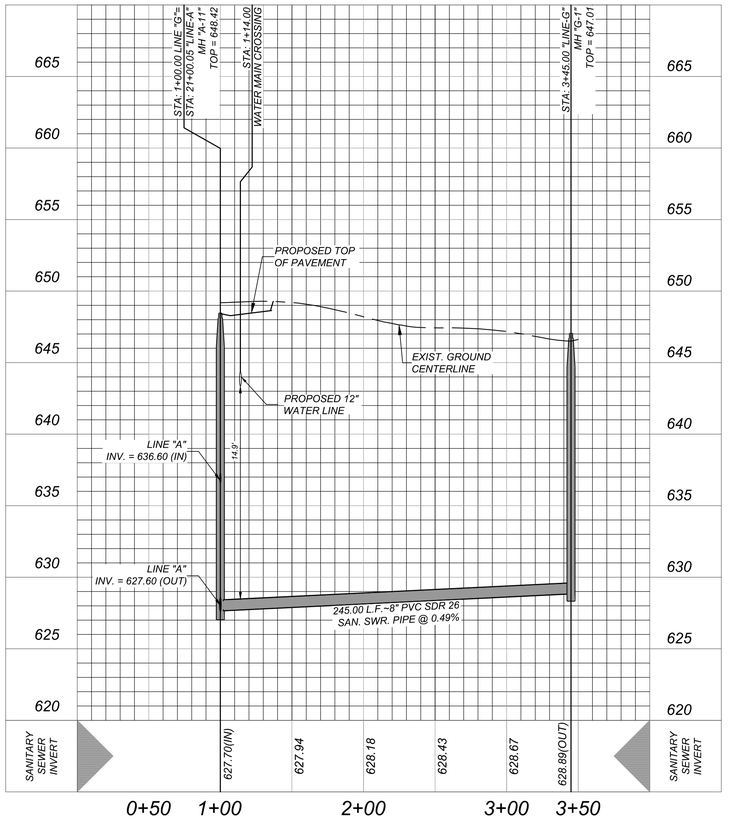
HORZ SCALE: 1" = 50'
VERT SCALE: 1" = 5'





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STATE OF TEXAS
JEFFREY W. MARTIN
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LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
LINE "E" & "G" PLAN AND PROFILE

PLAT NO. 23-11800310
JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM
SHEET NUMBER: 6.10

Date: Feb 14, 2024, 4:27pm User ID: cmartignac
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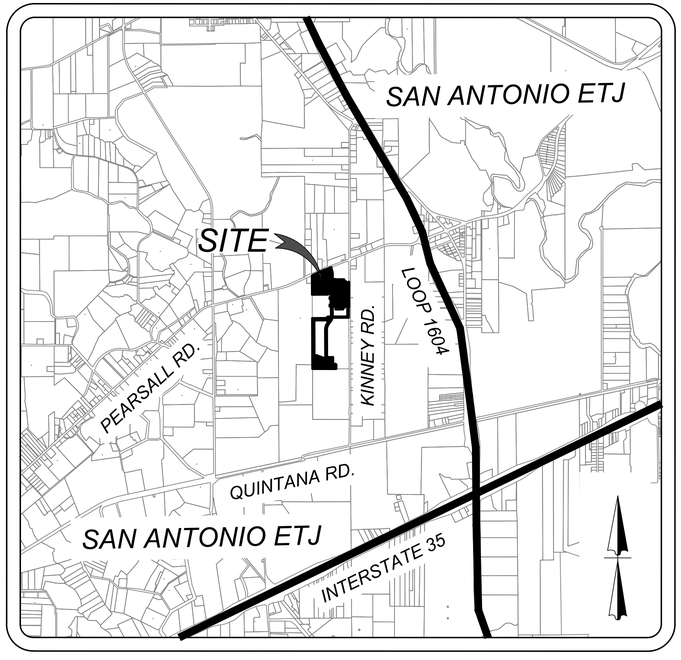
SUNSHINE TRAILS UNIT 1

SAN ANTONIO, TEXAS

WATER IMPROVEMENTS

GENERAL NOTES

1. ALL VALVES SHALL REMAIN CLOSED UNTIL MAINS HAVE BEEN DISINFECTED, FLUSHED, AND RELEASED FOR PUBLIC USE BY THE ENGINEER.
2. EXISTING UTILITIES SHOWN ARE TAKEN FROM VARIOUS UTILITY COMPANY RECORDS. CONTRACTORS SHALL VERIFY THE EXACT LOCATION AND DEPTH OF ALL UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES, WHETHER SHOWN ON THE PLANS OR NOT, PRIOR TO BEGINNING CONSTRUCTION. CONTRACTORS SHALL BE RESPONSIBLE FOR THE PROTECTION OF EXISTING UTILITIES AND DRAINAGE STRUCTURES DURING CONSTRUCTION.
3. ALL EXCAVATION SHALL BE UNCLASSIFIED REGARDLESS OF MATERIAL ENCOUNTERED.
4. BIDDERS ARE NOTIFIED TO MAKE SUBSURFACE INVESTIGATIONS AS THEY DEEM NECESSARY. NO ADDITIONAL PAYMENT WILL BE MADE FOR WATER, SAND, GRAVEL OR OTHER UNSTABLE CONDITIONS ENCOUNTERED IN EXCAVATIONS.
5. DETOUR OF TRAFFIC AROUND WORK ACTIVITIES, MAINTENANCE OF TRAFFIC CONTROL SIGNS, AND FLAGMEN ARE THE CONTRACTOR'S RESPONSIBILITY. NO SEPARATE PAYMENT WILL BE MADE.
6. THE CONTRACTOR SHALL PROTECT ALL OPEN EXCAVATIONS AND EQUIPMENT FROM CHILDREN, PEDESTRIANS, AND VEHICLES IN THE AREA.
7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE RESTORATION OF ALL FENCES IN THE WORK AREA TO THEIR ORIGINAL CONDITION PRIOR TO COMPLETION OF THE CONTRACT. THIS SHALL APPLY TO ALL FENCES IN THE WORK AREA WHETHER THEY ARE SHOWN ON THE PLANS OR NOT.
8. CONTRACTOR SHALL PRESERVE ALL CONSTRUCTION STAKES, MARKS, ETC. ANY CONSTRUCTION STAKES, MARKS, ETC., DESTROYED OR REMOVED BY THE CONTRACTOR OR HIS EMPLOYEES SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
9. THE CONTRACTOR SHALL CONFER WITH EACH INDIVIDUAL PROPERTY OWNER AS TO THE LOCATION OF EACH INDIVIDUAL METER BOX.
10. CONTRACTOR SHALL DISINFECT ALL NEW WATER MAINS BEFORE TYING INTO EXISTING WATER MAINS.
11. ALL VALVES SHALL BE PERMANENTLY MARKED BY THE USE OF A VALVE MARKER. NO SEPARATE PAY ITEM.
12. CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITES(S) WITHIN THE PROJECT WORK AREA IN ORDER TO IMPLEMENT CONTRACTOR'S TRENCH EXCAVATION SAFETY PROTECTION SYSTEMS, PROGRAMS AND/OR PROCEDURES FOR THE PROJECT DESCRIBED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR'S IMPLEMENTATION OF THESE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLY WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. SPECIFICALLY, CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR SAFETY CONSULTANT SHALL IMPLEMENT A TRENCH SAFETY PROGRAM IN ACCORDANCE WITH OSHA STANDARDS GOVERNING THE PRESENCE AND ACTIVITIES OF INDIVIDUALS WORKING IN AND AROUND TRENCH EXCAVATION.
13. CONTRACTOR SHALL MAINTAIN FENCING FOR THE CONTAINMENT OF LIVESTOCK DURING CONSTRUCTION. ALL FENCES REMOVED FOR CONSTRUCTION SHALL BE REPLACED. ALL REQUIRED FENCING SHALL BE INCIDENTAL TO CONSTRUCTION AND NOT A SEPARATE PAY ITEM.
14. ALL DRIVEWAYS, INCLUDING DRAIN PIPES, CULVERTS AND HEADWALLS, DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR TO EQUAL OR BETTER THAN PRECONSTRUCTION CONDITION. ASPHALT DRIVES ARE NOT ALLOWED TO BE CUT WITHOUT OWNERS PERMISSION. INSTALLATION OF WATER MAINS CROSSING CONCRETE DRIVES WILL BE BORED. ALL DRAIN PIPE, CULVERT AND HEADWALL REPAIR SHALL BE INCIDENTAL TO CONSTRUCTION AND NOT A SEPARATE PAY ITEM. DRIVEWAY PAVEMENT REPAIR SHALL BE PAID FOR AS PER ITEM NO. 02950, "CUTTING AND PATCHING ASPHALT PAVEMENT, ASPHALT DRIVES, CONCRETE DRIVES, OR GRAVEL ROADS AND DRIVES". PAYMENT FOR BORES UNDER CONCRETE DRIVES DRIVES SHALL BE PAID FOR AS PER ITEM 02445 "BORING AND CASING PIPE UNDER HIGHWAYS, RAILROADS, OR OTHER AREAS".
15. LOCATIONS OF COMBINATION AIR VALVES WHERE SHOWN ON PLANS ARE APPROXIMATE. FINAL LOCATIONS TO BE ADJUSTED IN FIELD AT TIME OF CONSTRUCTION AT THE DIRECTION OF THE ENGINEER.
16. ALL WORK SHALL BE SCHEDULED TO TAKE PLACE ON MONDAY THROUGH FRIDAY, DURING NORMAL WORK HOURS. CONTRACTOR SHALL NOTIFY ECSUD 48 HOURS PRIOR TO SERVICE SHUT OFF AFFECTING CUSTOMERS. SERVICE SHALL NOT BE SHUT OFF FOR MORE THAN EIGHT (8) HOURS AT A TIME.
17. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO PROPERTY, INCLUDING, BUT NOT LIMITED TO, FENCES, PAVEMENT, DRIVEWAYS, LAWNS, CULVERTS, AND TREES, AT NO COST TO THE OWNER.
18. THE CONTRACTOR SHALL PROVIDE EROSION CONTROL AT ALL CULVERT, STREAM AND DRAINAGE SWALE CROSSINGS. EROSION CONTROL MEASURES SHALL INCLUDE AS A MINIMUM SILT FENCES. SILT FENCES SHALL BE INSTALLED PRIOR TO DISTURBANCE OF THE WORK AREAS AND SHALL REMAIN IN PLACE UNTIL FINAL STABILIZATION OF THE DISTURBED AREAS UPSTREAM. EROSION CONTROL SHALL BE COORDINATED WITH THE ENGINEER.
19. THE CONTRACTOR SHALL REMOVE AND REPLACE ANY MAILBOXES, TRAFFIC OR ROAD SIGNS ENCOUNTERED. NO SEPARATE PAY ITEM.
20. CONTRACTOR SHALL SUBMIT TO ENGINEER PROPOSED CONSTRUCTION SEQUENCE PRIOR TO BEGINNING CONSTRUCTION.
21. ALL FITTINGS ARE TO BE DUCTILE IRON, MECHANICAL JOINT TYPE, UNLESS OTHERWISE NOTED ON PLANS.
22. ALL THRUST BLOCKS SHALL BE INSPECTED BY OWNER AND/OR ENGINEER PRIOR TO BACKFILLING.
23. ALL EXISTING VALVES SHOWN ON PLANS TO BE ABANDONED, SHALL HAVE BOXES REMOVED AND SHALL BE BACKFILLED ACCORDING TO SPECIFICATIONS. NO SEPARATE PAY ITEM.
24. CONTRACTOR SHALL CONTAIN ALL CONSTRUCTION AND STAGING WITHIN EXISTING UTILITY EASEMENTS, UNLESS OTHER ARRANGEMENTS ARE MADE WITH OWNER AND/OR TxDOT.
25. WHERE THE NEW WATER MAIN SHOWN ON THE PLANS REQUIRES CROSSING AN EXISTING WATER MAIN OR OTHER UTILITY, THE CONTRACTOR SHALL VERTICALLY DEFLECT THE PROPOSED WATER MAIN. DEFLECTION SHALL BE IN ACCORDANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS. FITTINGS ARE NOT PERMISSIBLE, UNLESS OTHERWISE SHOWN ON THE PLANS. NO SEPARATE PAY ITEM.



LOCATION MAP
N.T.S.

INDEX

DESCRIPTION	SHEET NO.
WATER DISTRIBUTION COVER SHEET	7.0
OVERALL WATER DISTRIBUTION PLAN	7.1
OVERALL WATER DISTRIBUTION PLAN	7.2

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

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

DEVELOPER:
LENNAR HOMES OF TEXAS LAND & CONSTRUCTION, LTD.
100 NE LOOP 410, SUITE 1155
SAN ANTONIO, TEXAS 78216
PHONE: (210) 403-6200

JOB NO. 314-50-03

PLAT NO. 23-11800310 SHEET 7.0

Date: Feb 14, 2024, 4:27pm User ID: orodriguez
File: N:\314\50\03\Design\Civil\WATER\CVL_0031450303.dwg

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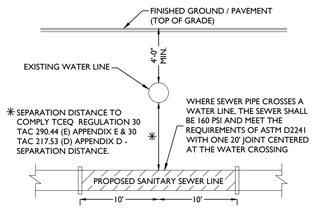
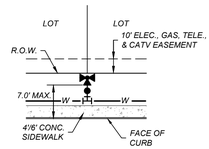
CONTRACTOR SHALL TIE NEW 12" PVC PIPE TO EXISTING 16" PIPE AFTER DISINFECTION BY CONTRACTOR AND ACCEPTANCE BY ATASCOSA RURAL WATER SERVICE COMPANY

FOR CHLORINATION INJECTION
2 ~ 1" CORP STOP C.C. x I.P.
2 ~ 1" COMP x 1 ½ CPL. CURB STOP
2 ~ 1" COPPER TUBING, CUT AS REQUIRED
2 ~ 1 ½" THD. SOLID CAPS, THR.
CONTRACTOR SHALL PROVIDE A 2" JUMPER CONNECTION TO LOAD NEW MAIN

1 ~ 16"X12" TEE, M.J.
1 ~ 12" GATE VALVE, M.J.
1 ~ 16" GATE VALVE, M.J.
2 ~ 6" VALVE BOX, COMPLETE
REFERENCE DETAIL SHEET 7.3



TYPICAL SANITARY SEWER / WATER CROSSING DETAIL
NOT TO SCALE



TYPICAL FIRE HYDRANT DETAIL
NOT-TO-SCALE

LEGEND

PROPOSED WATER MAIN	8"W
PROPOSED 3/4" WATER SERVICE W/ 5/8" METER	
PROPOSED 3/4" WATER IRRIGATION SERVICE AND METER BOX	3/4" IRR
PROPOSED FIRE HYDRANT	
PROPOSED ELECTRIC, GAS, TELEPHONE & CABLE T.V. EASEMENT	E.G.T.TV.E
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PROPOSED SANITARY SEWER MAIN	8"SS
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EXISTING FIRE HYDRANT	
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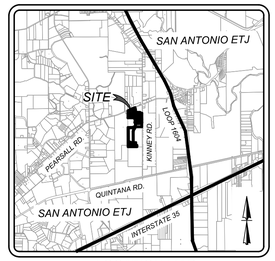
FORCE MAIN (BY OTHERS)	FM
RESTRAINED LENGTH	7'
ENTIRE LENGTH OF PIPE TO BE RESTRAINED	



LOCATION MAP
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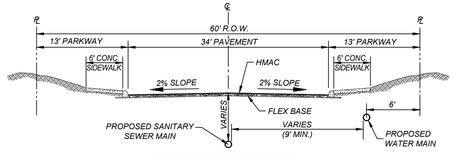
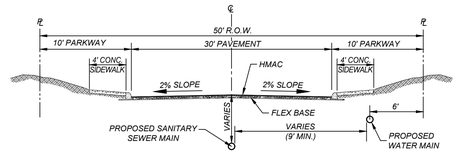


TYPICAL 60' STREET SECTION
NOT TO SCALE



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

ISSUE DATE

REVISIONS

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STATE OF TEXAS
JEFFREY W. MARTIN
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LICENSED PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
OVERALL WATER DISTRIBUTION PLAN

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

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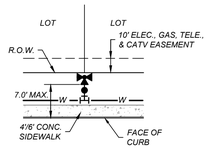

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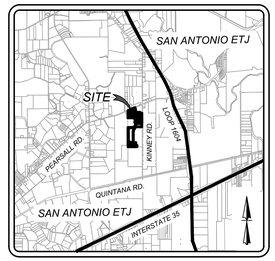

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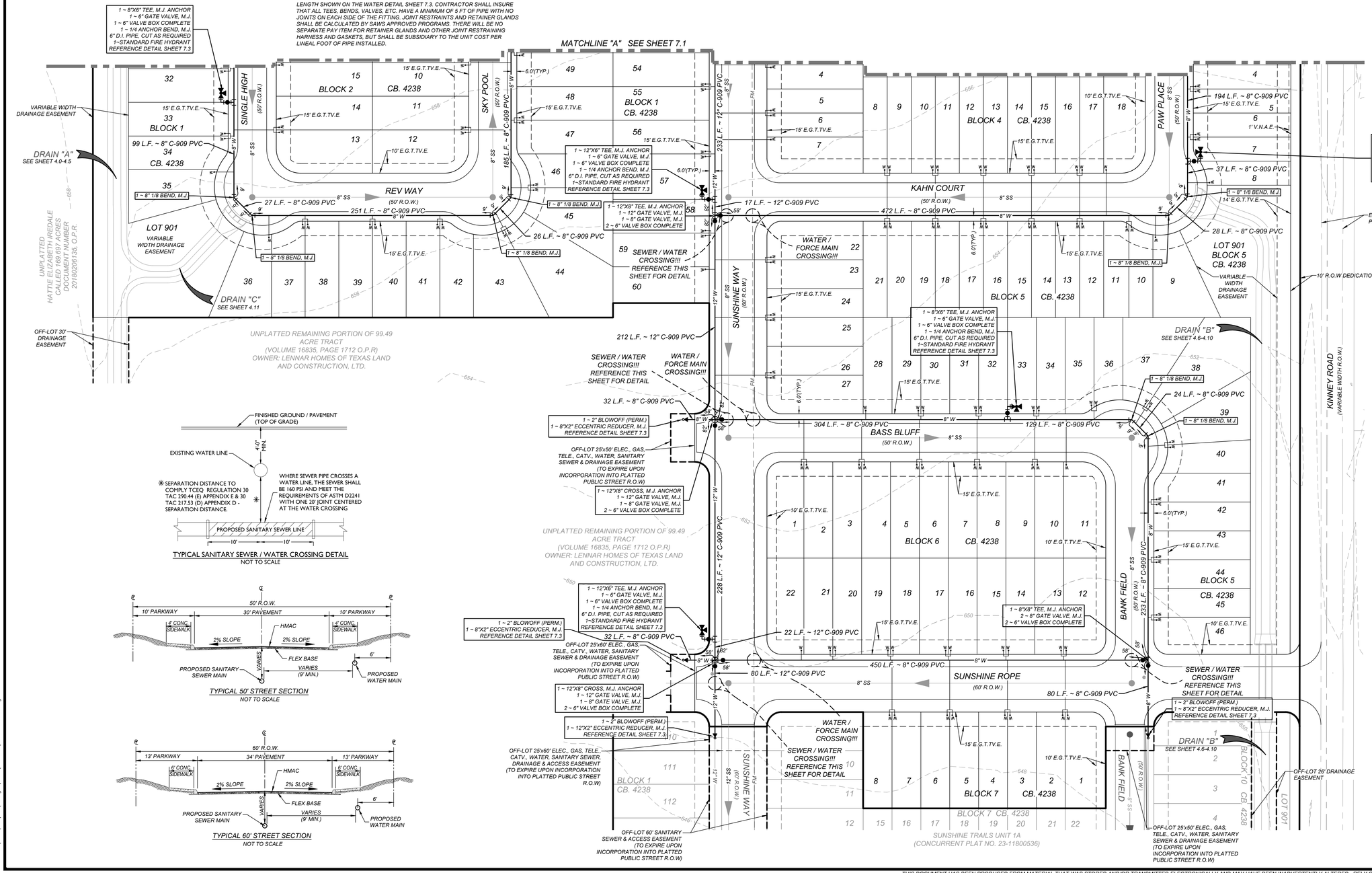

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TYPICAL 50' STREET SECTION
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SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

LEGEND

- LIMITS OF CONSTRUCTION
- EXISTING CONTOURS (570)
- PROPOSED CONTOURS (570)
- FLOW ARROW
- STABILIZED CONSTRUCTION ENTRANCE/EXIT
- CONSTRUCTION EQUIPMENT, VEHICLE & MATERIALS STORAGE AREA.
- CONCRETE TRUCK WASHOUT PIT
- DISTURBED AREA
- ROCK BERM
- SILT FENCE
- INLET WITH PROTECTION (GRAVEL FILTERS BAGS)
- NATURAL VEGETATIVE BUFFER

INSTALLATION:

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

MAINTENANCE AND INSPECTION:

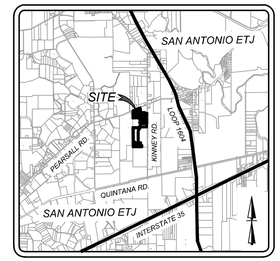
1. CONTRACTOR SHOULD LIMIT CONSTRUCTION ACTIVITIES TO ONLY THOSE AREAS SHOWN TO BE DISTURBED ON THIS PLAN. IF ADDITIONAL VEGETATED AREAS ARE DISTURBED, THEY SHOULD BE PROTECTED WITH APPROPRIATE BEST MANAGEMENT PRACTICES UNTIL THE AREAS HAVE BEEN STABILIZED AS PER THE SPECIFICATIONS OF THE SWPPP. THE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

PROJECT COMPLETION:

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

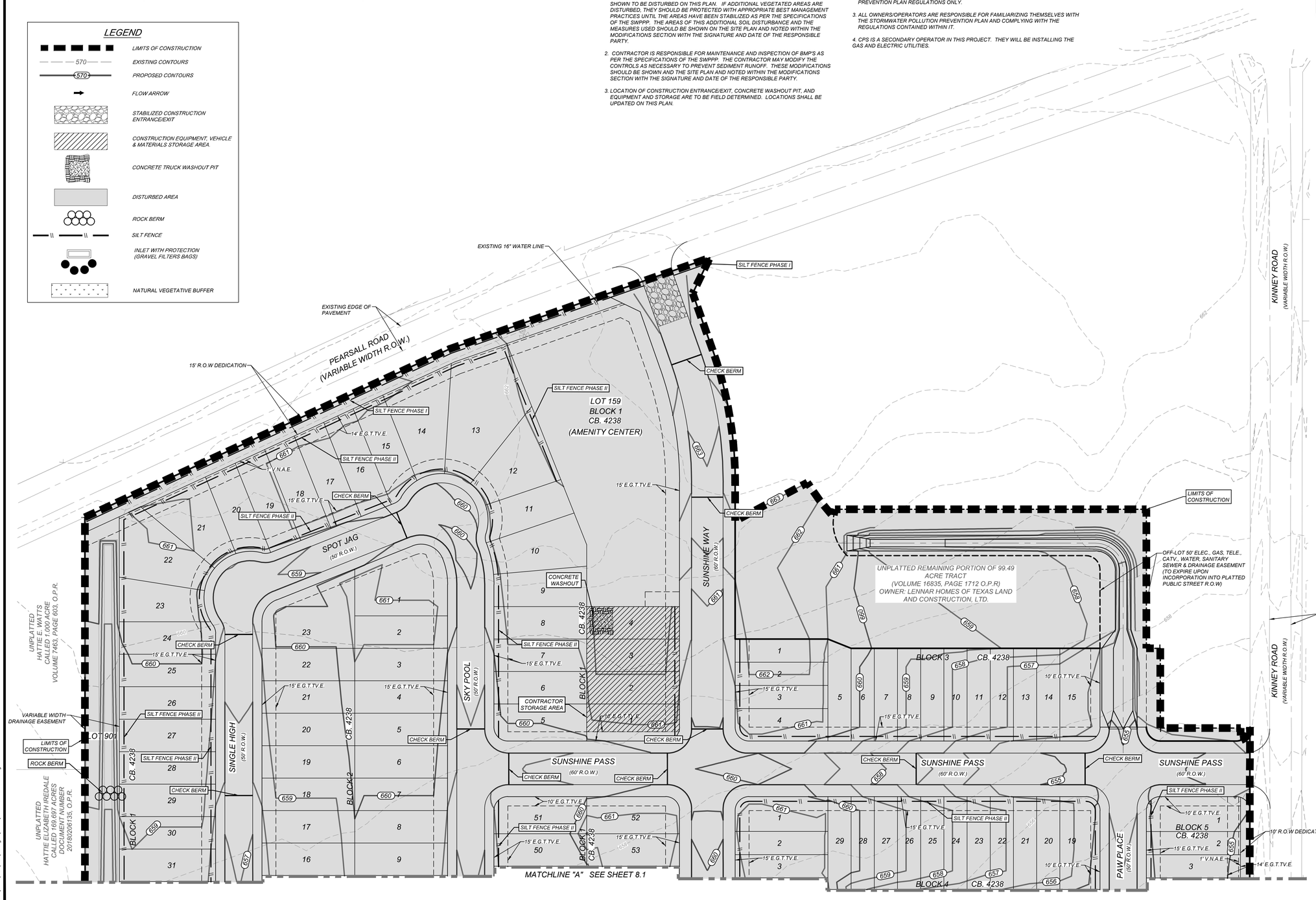
GENERAL:

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



LOCATION MAP
N.T.S.

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



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

JEFFREY W. MARTIN
139094
LICENSED PROFESSIONAL ENGINEER
3/7/24

SUNSHINE TRAILS UNIT 1
BEXAR COUNTY, TEXAS
STORM WATER POLLUTION PREVENTION PLAN

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
8.0

Date: Mar 06, 2024, 6:50pm User ID: rodriguez
File: N:\314\50\03\Design\Civil\SWPPP\314500-Swp

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SW3P MODIFICATIONS

DATE	SIGNATURE	DESCRIPTION

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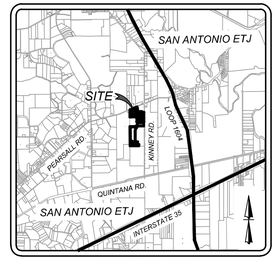

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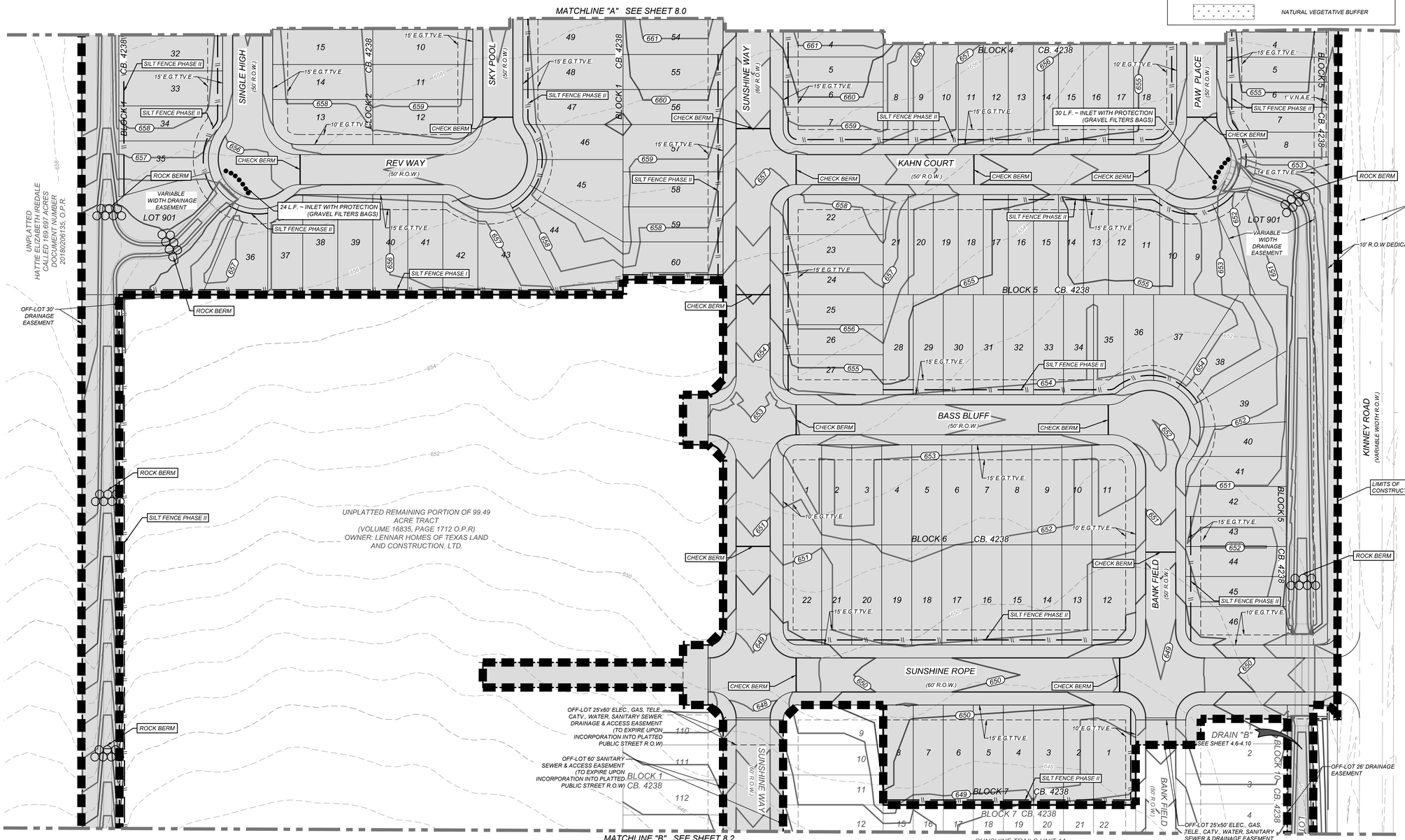

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STORM WATER POLLUTION PREVENTION PLAN

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER: 8.1

Date: Mar 06, 2024, 6:51pm User ID: arodriguez
File: N:\SA\50\03\Design\Civil\SWPPP\450503.dwg

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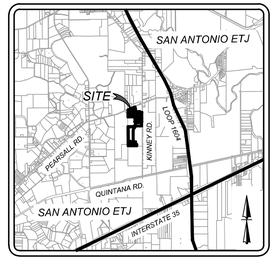

LOCATION MAP
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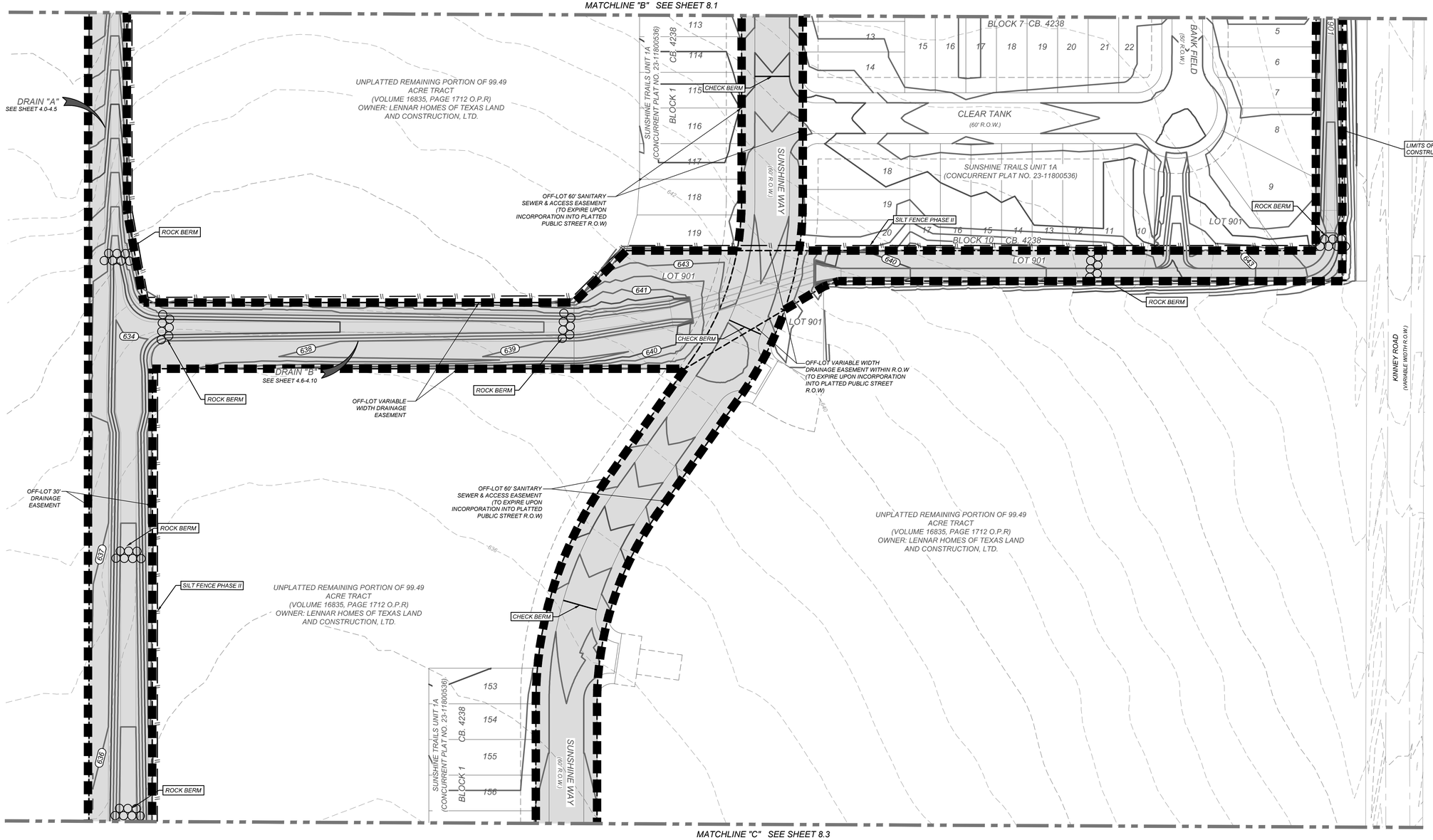

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ISSUE DATE

REVISIONS

STATE OF TEXAS
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

STORM WATER POLLUTION PREVENTION PLAN

PLAT NO.
23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:
8.2

Date: Feb 15, 2024, 9:27am User ID: arodriguez
File: N:\314\50\03\Design\Civil\SWP3\314503.dwg

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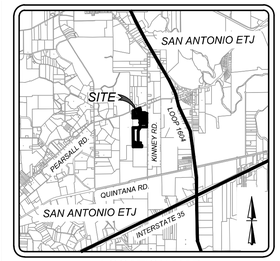
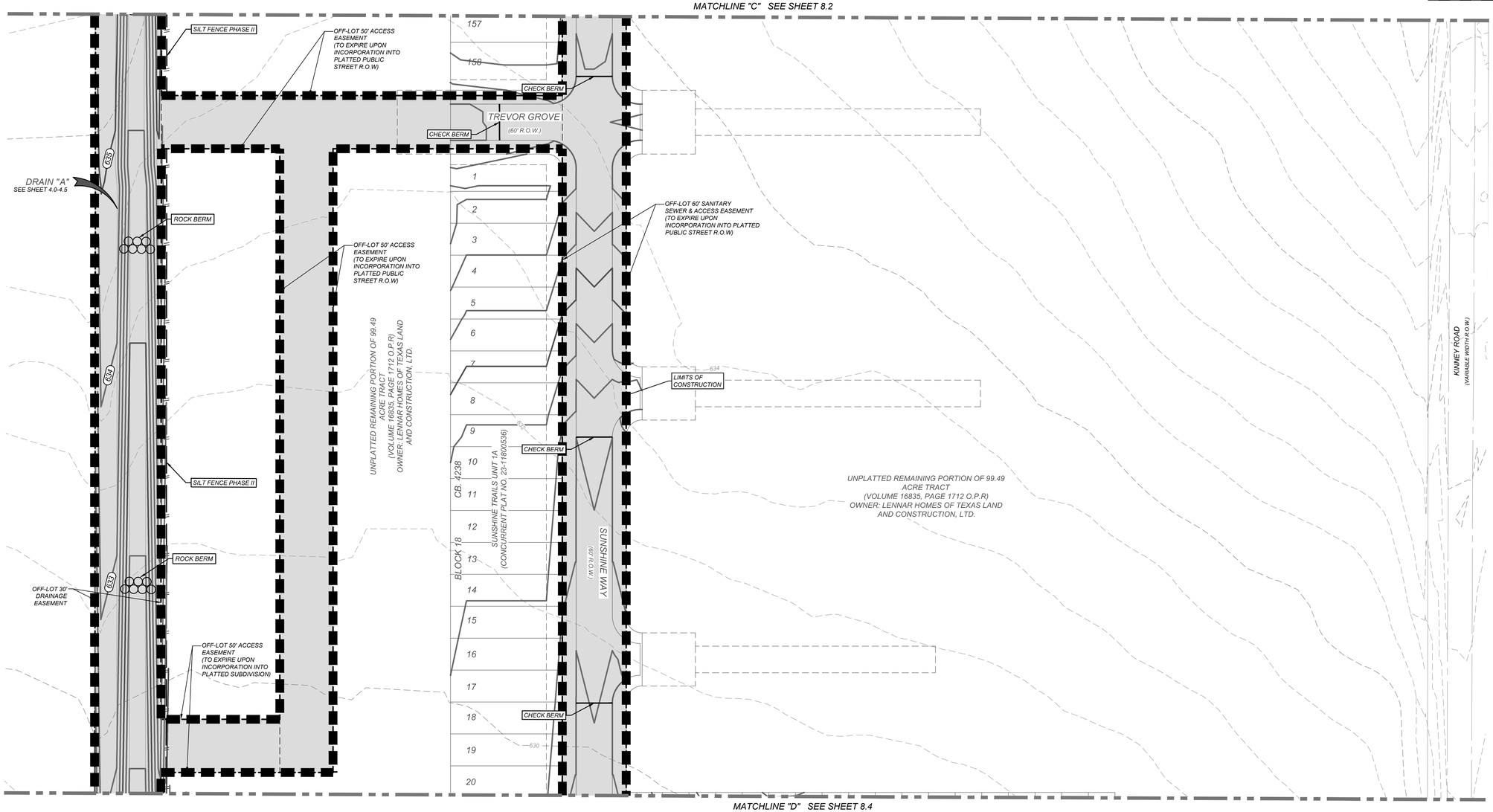


LOCATION MAP
N.T.S.

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

MATCHLINE "C" SEE SHEET 8.2



MATCHLINE "D" SEE SHEET 8.4

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STORM WATER POLLUTION PREVENTION PLAN

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DRAWN:BL CHECKED:JM

SHEET NUMBER:
8.3

Date: Feb 15, 2024, 9:27am User ID: arodriguez
File: K:\314-50\CAD\CS\Design\Civil\SWP3\14-5003.dwg

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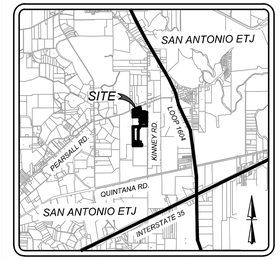

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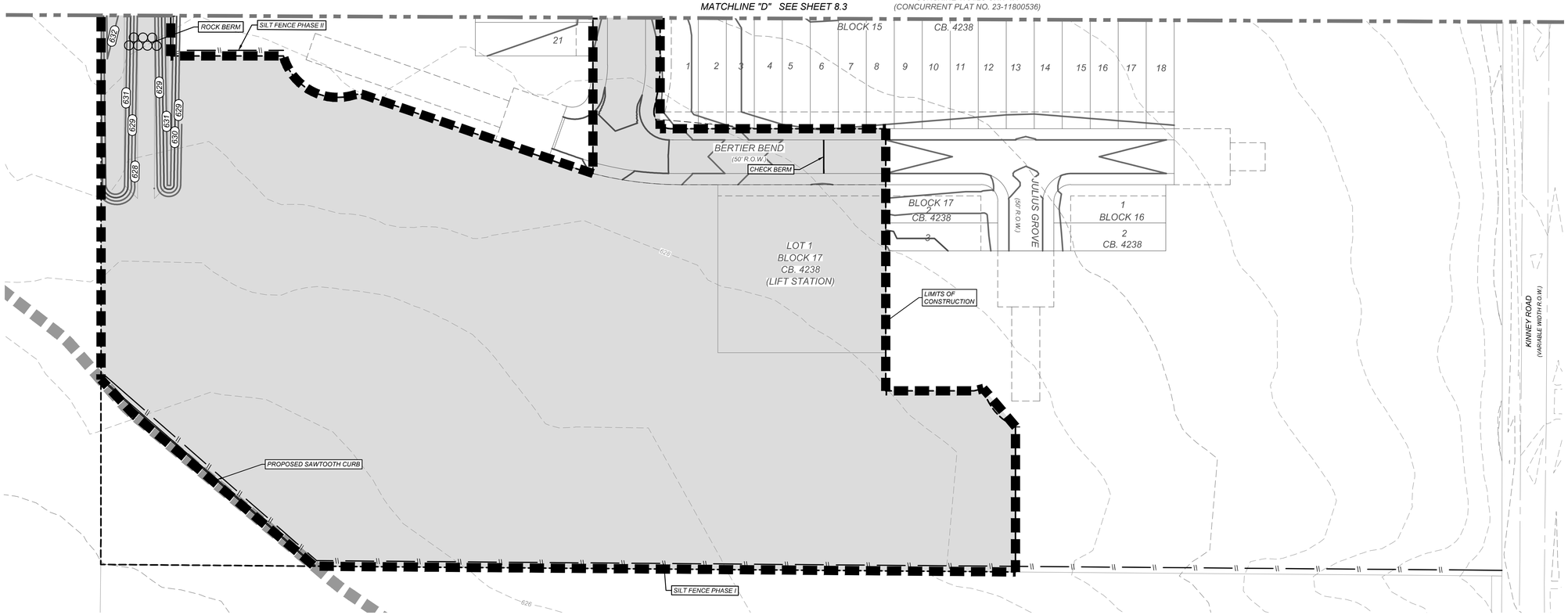

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Date: Feb 15, 2024, 9:28am User ID: arodriguez
File: N:\314\03\Design\Civil\SWPPP\314003.dwg

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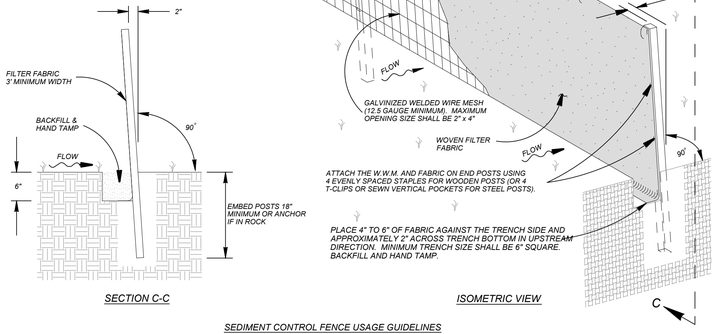


SECTION C-C

ISOMETRIC VIEW

SEDIMENT CONTROL FENCE USAGE GUIDELINES

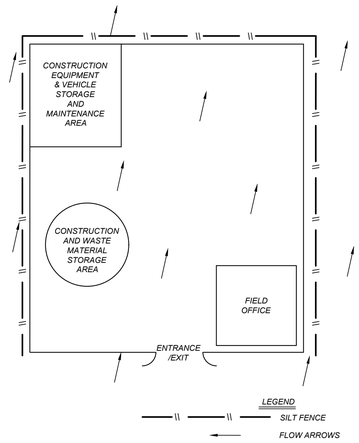
A SEDIMENT CONTROL FENCE MAY BE CONSTRUCTED NEAR THE DOWNSTREAM PERIMETER OF A DISTURBED AREA ALONG A CONTOUR TO INTERCEPT SEDIMENT FROM OVERLAND RUN-OFF. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE TO BE FILTERED.

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

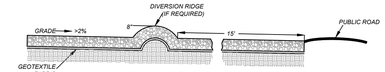
GENERAL NOTES

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

TEMPORARY SEDIMENT CONTROL FENCE



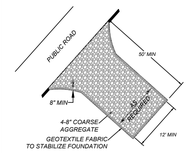
TYPICAL CONSTRUCTION STAGING AREA



CROSS-SECTION OF A CONSTRUCTION ENTRANCE/EXIT

Materials:

(1) The aggregate should consist of 4 to 8 inch washed stone over a stable foundation as specified in the plan.
(2) The aggregate should be placed with a minimum thickness of 8 inches.
(3) The geotextile fabric should be designed specifically for use as a soil filtration media with an approximate weight of 6 oz/yd2, a mullen burst rating of 140 lb/in2, and an equivalent opening size greater than a number 50 sieve.
(4) If a washing facility is required, a level area with a minimum of 4 inch diameter washed stone or commercial rack should be included in the plans. Divert wastewater to a sediment trap or basin.



TEMPORARY CONSTRUCTION ENTRANCE/EXIT

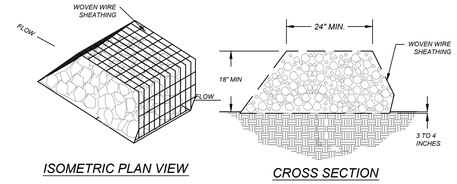
Installation: (North Carolina, 1993)

(1) Avoid curves on public roads and steep slopes. Remove vegetation and other objectionable material from the foundation area. Grade crown foundation for positive drainage.
(2) The minimum width of the entrance/exit should be 12 feet or the full width of exit roadway, whichever is greater.
(3) The construction entrance should be at least 50 feet long.
(4) If the slope toward the road exceeds 2%, construct a ridge, 6 to 8 inches high with 3:1 (H:V) side slopes, across the foundation approximately 15 feet from the entrance to divert runoff away from the public road.
(5) Place geotextile fabric and grade foundation to improve stability, especially where wet conditions are anticipated.
(6) Place stone to dimensions and grade shown on plans. Leave surface smooth and slope for drainage.
(7) Divert all surface runoff and drainage from the stone pad to a sediment trap or basin.
(8) Install pipe under pad as needed to maintain proper public road drainage.

Inspection and Maintenance Guidelines:

(1) The entrance should be maintained in a condition, which will prevent tracking or flowing of sediment onto public rights-of-way. This may require periodic top dressing with additional stone as conditions demand and repair and/or cleanout of any measures used to trap sediment.
(2) All sediment spilled, dropped, washed or tracked onto public rights-of-way should be removed immediately by contractor.
(3) When necessary, wheels should be cleaned to remove sediment prior to entrance onto public right-of-way.
(4) When washing is required, it should be done on an area stabilized with crushed stone that drains into an approved sediment trap or sediment basin.
(5) All sediment should be prevented from entering any storm drain, ditch or water course by using approved methods.

STABILIZED CONSTRUCTION ENTRANCE / EXIT



ISOMETRIC PLAN VIEW

CROSS SECTION

Materials:

(1) The berm structure should be. secured with a woven wire sheathing having maximum opening of 1 inch and a minimum wire diameter of 20 gauge galvanized and should be secured with shoat rings.
(2) Clean, open graded 3- to 5-inch diameter rock should be used, except in areas where high velocities or large volumes of flow are expected, where 5- to 8-inch diameter rocks may be used.

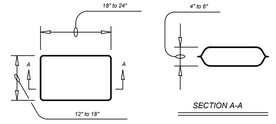
Installation:

(1) Lay out the woven wire sheathing perpendicular to the flow line. The sheathing should be 20 gauge woven wire mesh with 1 inch openings.
(2) Berm should have a top width of 2 feet minimum with side slopes being 2:1 (H:V) or flatter.
(3) Place the rock along the sheathing as shown in the diagram Figure 1-26), 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 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 50% 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

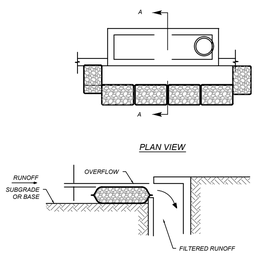


SECTION A-A

GENERAL NOTES:

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

GRAVEL FILTER BAG DETAIL

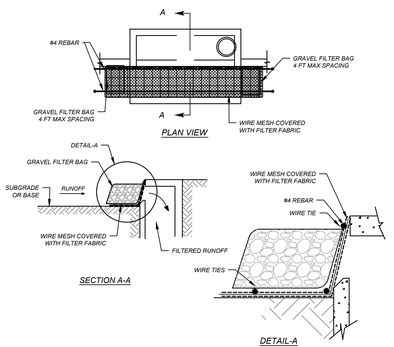


SECTION A-A

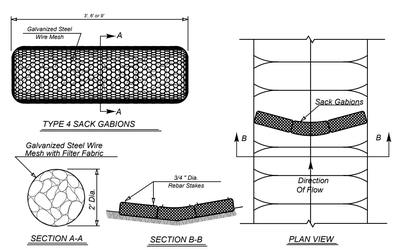
GENERAL NOTES:

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

CURB INLET PROTECTION GRAVEL FILTER BAGS



CURB INLET PROTECTION (ALTERNATE)



GENERAL NOTES:

- THE TOP OF THE SACK GABIONS SHOULD BE LEVEL AND ORIENTED PERPENDICULAR TO THE DIRECTION OF FLOW.
- FILTER FABRIC MATERIAL SHALL BE FASTENED TO WOVEN WIRE SUPPORT.
- FILTER FABRIC MATERIAL SHOULD MEET THE FOLLOWING SPECIFICATIONS: RESISTANT TO ULTRAVIOLET LIGHT. FABRIC SHOULD BE NON-WOVEN GEOTEXTILE WITH MINIMUM WEIGHT OF 3.5 OUNCES PER SQUARE YARD, MINIMUM MULLEN BURST STRENGTH OF 200 POUNDS PER SQUARE INCH AND A FLOW THRU RATE OF 120 GALLONS PER MINUTE PER SQUARE FOOT OF FRONTAL AREA.
- STONE SIZE: ±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 50% 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

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
JEFFREY W. MARTIN
139094
LICENSED
PROFESSIONAL ENGINEER
2/16/24

SUNSHINE TRAILS UNIT 1

BEXAR COUNTY, TEXAS

STORM WATER POLLUTION PREVENTION DETAILS

PLAT NO. 23-11800310

JOB NO. 314-50-03
DATE: APRIL 2023
DRAWN:BL CHECKED:JM

SHEET NUMBER:

8.5

Date: Feb 14, 2024, 4:29pm User ID: arodriguez
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