CONSTRUCTION PLANS FOR

VERDIN SUBDIVISION OFFSITE SEWER

SANITARY SEWER IMPROVEMENTS

SUBMITTED BY:
MOY TARIN RAMIREZ ENGINEERS, LLC.
12770 CIMARRON PATH, SUITE 100
SAN ANTONIO, TEXAS 78249
TEL: (210) 698-5051
FAX: (210) 698-5085

OWNER/DEVELOPER
KINGFISH DEVLEOPMENT, LLC
2722 W. BITTERS RD. SUITE 106
SAN ANTONIO, TX 78248
210-882-6800

SAWS CONSTRUCTION NOTES
COUNTER PERMIT AND GENERAL CONSTRUCTION PERMIT
JANUARY 2022

General Section

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

Sewer Notes

I. 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.

ADDITIONAL SEWER NOTES

1. 98% COMPACTION NOTE:
   THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEETING 98% COMPACTION ON ALL TRENCH BACKFILL AND FOR 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. THIS PROJECT WILL NOT BE ACCEPTED AND FINALIZED BY SAWS WITHOUT THIS REQUIREMENT BEING MET AND VERIFIED BY PROVIDING ALL NECESSARY DOCUMENTED TEST RESULTS.

NOTES:

1. SANITARY SEWER LATERALS TO BE LOCATED AS SHOWN ON THE SANITARY SEWER PLANS.
2. PAY CUTS FOR SANITARY SEWERS LOCATED IN STREETS ARE ESTIMATED TO THE FINISHED SUBGRADE ELEVATION. PAY CUTS ARE TO EXISTING GROUND IN UNPAVED AREAS.
3. EXTEND ALL SANITARY SEWER LATERALS TO THE PROPERTY LINE OR TO THE EASEMENT LINE AS INDICATED. ALL LATERALS ARE 35' LONG UNLESS OTHERWISE NOTED.
4. SANITARY SEWER LINES AND LATERALS WILL BE PVC SDR 26 ASTM D 3034 UNLESS OTHERWISE NOTED ON PLAN AND PROFILE SHEETS.
5. SDR FITTINGS WILL MATCH SDR SEWER MAIN, NO SEPARATE PAY ITEM.
6. ALL EXCAVATED MATERIAL SHALL BE PLACED ON THE UPGRADIENT SIDE OF THE SEWER TRENCH THUS ALLOWING THE TRENCH TO INTERCEPT ANY SILT CONTAMINATED RUNOFF.
7. QUANTITIES ARE BASED ON CURRENT SAWS SPECIFICATIONS.
8. ALL MANHOLES TO HAVE WATERTIGHT RING AND COVERS.
9. ALL MANHOLES TO BE CONCRETE RING ENCASED.
10. MANHOLES TO BE VENTED AS SHOWN ON THE SANITARY SEWER PLANS.
11. AN "*" DENOTES AN EXISTING TEE.
12. ALL SANITARY SEWER LATERALS SHALL HAVE A MIN. 2.0 % SLOPE TO THE PROPERTY LINE.
13. MINIMUM COVER FROM TOP OF SANITARY SEWER LATERALS TO TOP OF CURB WILL BE:
    A. IF LATERALS DO NOT CROSS WATER MAINS, 5' COVER
    B. IF LATERALS CROSS WATER MAIN,

WATER MAIN	COVER
6"	5.5'
8"	5.7'
12"	6.0'
16"	7.4'

14. ALL MANHOLE OPENINGS SHALL BE 30".

SAN ANTONIO WATER SYSTEM
CRITERIA FOR SEWER MAIN CONSTRUCTION
IN THE VICINITY OF WATER MAINS

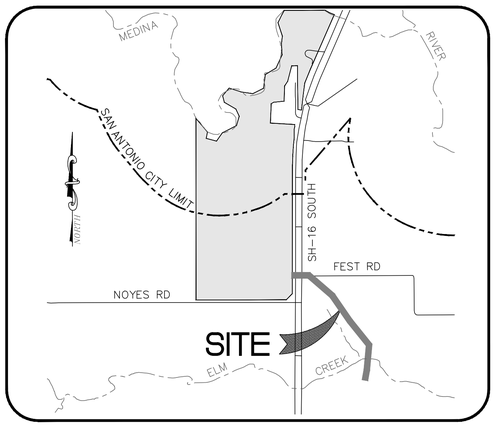
I. WHERE A SEWER MAIN CROSSES OVER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE (9) FEET, ALL PORTIONS OF THE SEWER MAIN WITHIN NINE FEET (9) OF THE WATER LINE SHALL BE CONSTRUCTED USING 150 PSI PRESSURE RATED DUCTILE IRON, CAST IRON OR PVC PIPE AND JOINED WITH EQUALLY PRESSURE RATED PRESSURE RING GASKET CONNECTIONS OR CORROSION PROTECTED MECHANICAL COUPLING DEVICES OF A CAST IRON OR DUCTILE IRON MATERIAL. A SECTION OF 150 PSI PRESSURE RATED PIPE AT LEAST EIGHTEEN (18) FEET IN LENGTH MAY BE CENTERED ON THE WATER MAIN IN LIEU OF PIPE CONNECTION REQUIREMENTS. (NO SEPARATE PAY ITEM)

II. WHERE A SEMI–RIGID OR RIGID SEWER MAIN CROSSES UNDER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE FEET BUT GREATER THAN TWO FEET, THE INITIAL BACKFILL SHALL BE CEMENT STABILIZED SAND (TWO OR MORE BAGS OF CEMENT PER CUBIC YARD OF SAND) FOR ALL SECTIONS OF THE SEWER WITHIN NINE FEET OF THE WATER MAIN.

III. WHERE A SEWER MAIN CROSSES UNDER A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN TWO FEET, THE SEWER MAIN SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI WITHIN NINE FEET OF THE WATER MAIN, SHALL HAVE A SEGMENT OF SEWER PIPE CENTERED ON THE WATER MAIN, SHALL BE PLACED NO CLOSER THAN SIX INCHES BETWEEN OUTER DIAMETERS, AND SHALL BE JOINED WITH PRESSURE RING GASKET CONNECTIONS OR CORROSION PROTECTED MECHANICAL COUPLING DEVICES OF A CAST IRON OR DUCTILE IRON MATERIAL. A SECTION OF 150 PSI PRESSURE RATED PIPE OF A LENGTH GREATER THAN EIGHTEEN (18) FEET MAY BE CENTERED ON THE WATER MAIN IN LIEU OF PIPE CONNECTION REQUIREMENTS. (NO SEPARATE PAY ITEM)

IV. WHERE A SEWER MAIN PARALLELS A WATER MAIN AND THE SEPARATION DISTANCE IS LESS THAN NINE FEET, THE SEWER MAIN SHALL BE BELOW THE WATER MAIN, SHALL BE CONSTRUCTED OF CAST IRON, DUCTILE IRON, OR PVC WITH A MINIMUM PRESSURE RATING OF 150 PSI FOR BOTH PIPE AND JOINTS FOR A DISTANCE OF NINE FEET BEYOND THE POINT OF CONFLICT, SHALL MAINTAIN A MINIMUM SEPARATION DISTANCE BETWEEN OUTER DIAMETERS OF TWO FEET VERTICALLY AND FOUR FEET HORIZONTALLY, AND SHALL BE JOINED WITH PRESSURE RING GASKET CONNECTIONS OR CORROSION PROTECTED MECHANICAL COUPLING DEVICES OF A CAST IRON OR DUCTILE IRON MATERIAL.

SANITARY SEWER MANHOLES SHALL NOT BE INSTALLED ANY CLOSER THAN NINE FEET TO WATER MAINS.



VICINITY MAP
N.T.S.

SUBMITTAL DATE:
July 27, 2023

REVISION DATE:

ESTIMATED SEWER QUANTITIES

ITEM	DESCRIPTION	UNIT	EST/QTY
OFF-SITE SEWER (OPEN TRENCH)			
1	Tie into Existing Sanitary Sewer Main	EA.	**1**
2	Trench Excavation Protection	L.F.	**1,673**
3	12" Sanitary Sewer Pipe, SDR-26 (6'-10')	L.F.	**1,768**
4	12" Sanitary Sewer Pipe, SDR-26 (10'-14')	L.F.	**89**
5	12" Sanitary Sewer Pipe, SDR-26 (14'-18')	L.F.	**81**
6	Standard Sanitary Sewer Manhole	EA.	**4**
7	Extra Depth Manhole	V.F.	**12.8**
8	Jacking, Boring or Tunneling, 24" Steel Casing	L.F.	**265**
9	Concrete Encasement, Cradles, Saddles or Collars	C.Y.	**6.0**
10	Sewer Main Television Inspection	L.F.	**1,938**
SEWER SIPHON (HORIZ. DIRECTIONAL DRILLING)			
11	Revegetation (i.e., Hydromulch)	S.Y.	**3,205**
12	Level 1 - Tree Protection Fencing	L.S.	**1**
13	Level II - Tree Pruning/Clearing	L.S.	**1**
14	Grey Iron/Ductile Iron Fittings	TON	**0.1**
15	12" HDPE Pipe (Open Cut)	L.F.	**12**
16	6" HDPE Air Pipe (Installed with HDD), Gray DR17	L.F.	**397**
17	6" HDPE Siphon Pipe (Installed with HDD), Gray DR17	L.F.	**844**
18	8" HDPE Siphon Pipe (Installed with HDD), Gray DR17	L.F.	**425**
19	Polymer Concrete Sanitary Sewer Manhole (4' Dia.)	EA.	**9**
20	Polymer Concrete Dosing Manhole (6' Dia.)	EA.	**1**
21	Extra Depth Manhole (4' Diameter)	V.F.	**24**
22	Extra Depth Manhole (6' Diameter)	V.F.	**12**
23	Two-Way SS Cleanout (Air Pipe Access Port)	EA.	**1**
24	Miscellaneous Concrete	C.Y.	**30**
25	Sewer Main Television Inspection	L.F.	**1,678**
26	SS2120 Special Shoring	S.F.	**3,270**
27	SS2130 Temporary Pipe Plugs	EA.	**2**
28	SS2140 Solar Sump Pump System (Auto-Switch)	EA.	**1**

SHEET INDEX

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

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 site(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.

NOTE TO CONTRACTOR:

BY THE ACT OF SUBMITTING A BID FOR THIS PROPOSED CONTRACT, THE BIDDER WARRANTS THAT THE BIDDER, AND ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS HE INTENDS TO USE HAVE CAREFULLY AND THOROUGHLY REVIEWED THE DRAWINGS, SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS AND HAVE FOUND THEM COMPLETE AND FREE FROM ANY AMBIGUITIES AND SUFFICIENT FOR THE PURPOSE INTENDED. THE BIDDER FURTHER WARRANTS THAT TO THE BEST OF HIS OR HIS SUBCONTRACTORS' AND MATERIAL SUPPLIERS' KNOWLEDGE, ALL MATERIALS AND PRODUCTS SPECIFIED OR INDICATED HEREIN ARE ACCEPTABLE FOR ALL APPLICABLE CODES AND AUTHORITIES.

THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THESE PLANS HAS BEEN BASED UPON RECORD INFORMATION ONLY AND MAY NOT MATCH LOCATIONS AND/OR DEPTHS AS CONSTRUCTED. THE CONTRACTOR SHALL CONTACT EACH INDIVIDUAL UTILITY, FOR ASSISTANCE IN DETERMINING EXISTING UTILITY LOCATIONS AND DEPTHS PRIOR TO BEGINNING ANY CONSTRUCTION. CONTRACTOR SHALL FIELD VERIFY LOCATIONS OF ALL UTILITY CROSSINGS PRIOR TO BEGINNING ANY CONSTRUCTION.

• Engineers
• Surveyors
• Planners
Moy Tarin Ramirez Engineers, LLC
FIRM TBPELS ENG F-5297 SVY F-10131500
12770 CIMARRON PATH, SUITE 100 TEL: (210) 698-5051
SAN ANTONIO, TEXAS 78249 FAX: (210) 698-5085

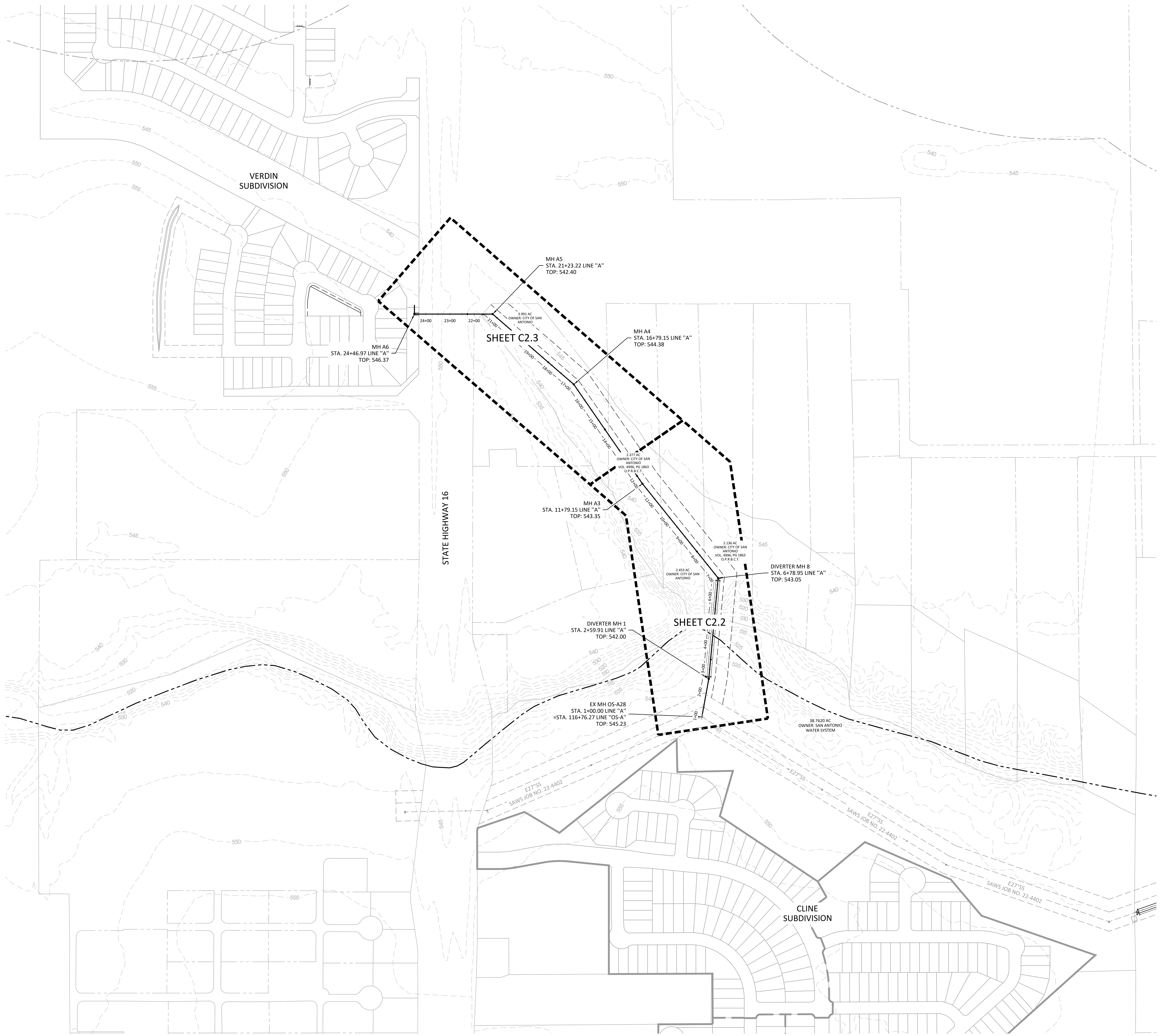
Developer's Name	KINGFISH DEVLEOPMENT, LLC		
Developer's Address	2722 W. BITTERS RD. SUITE 106		
City	SAN ANTONIO	State TX	Zip 78248
Phone #	210-882-6800	Fax #	
SAWS Block Map #	132-514	Total EDU's N/A	Total Acreage N/A
Total Linear Footage of Pipe	12" ~ 1,938 L.F.		Plat No. N/A
Number of Lots	N/A	SAWS Job No.	23-1534

BEXAR COUNTY

SUBMITTAL SET

TEXAS C2.0

R:\McOaker Tract\Off-Site Sewer\Drawings\23094_C2.0- Offsite Sewer Cover.dwg
Plot Date: September 11, 2024 User ID: Paul Landa

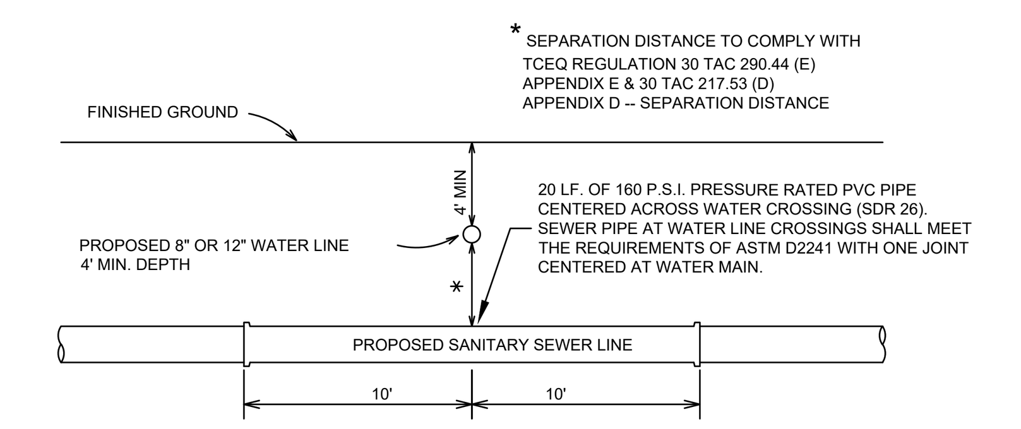


LEGEND

EXISTING WATER MAIN	EX 8"W
PROPOSED WATER MAIN	8"W
PROPOSED FIRE HYDRANT	
EXISTING FIRE HYDRANT	
PROPOSED GATE VALVE	
EXISTING GATE VALVE	
PROPOSED SANITARY SEWER MAIN & MANHOLE	8"SS
EXISTING SANITARY SEWER MAIN & MANHOLE	EX 8"SS
PROPOSED SERVICE LATERAL WITH ONE-WAY CLEAN-OUT	
VERTICAL STACK	VS
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	E.G.T.CA.E.
TEMPORARY BENCHMARK	
PROPOSED MINIMUM FINISH FLOOR ELEVATION	MIN. F.F. = 795.5
SANITARY SEWER/WATER CROSSING LOCATION	
OFFICIAL PUBLIC RECORDS OF BEXAR COUNTY, TEXAS	O.P.R.B.C.T.
OFFICIAL PUBLIC RECORDS OF MEDINA COUNTY, TEXAS	O.P.R.M.C.T.

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 site(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.



TYPICAL SANITARY SEWER/ WATER CROSSING DETAIL

N.T.S.

CAUTION:

EXISTING UTILITIES:

1. LOCATION AND DEPTH OF EXISTING UTILITIES SHOWN HEREON ARE APPROXIMATE ONLY. ACTUAL LOCATIONS AND DEPTHS MUST BE VERIFIED BY CONTRACTOR PRIOR TO THE CONSTRUCTION AND THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION OF SAME DURING CONSTRUCTION.
2. IT IS ESSENTIAL THAT 48 HOURS PRIOR TO CONSTRUCTION ALL UTILITY COMPANIES BE NOTIFIED TO LOCATE AND TAG THEIR UNDERGROUND FACILITIES PRIOR TO EXCAVATION.
3. THE CONTRACTOR NEEDS TO ALLOW FOR THE POSSIBILITY OF UNDETECTED UNDERGROUND UTILITIES. ALSO, THE CONTRACTOR MUST ALLOW FOR CHANGES DUE TO UTILITIES BEING IN LOCATIONS DIFFERENT FROM THOSE SHOWN ON THE UTILITY RECORD DRAWINGS. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND EXPOSING CONFLICTS PRIOR TO CONSTRUCTION.

NOTE TO CONTRACTOR:

BY THE ACT OF SUBMITTING A BID FOR THIS PROPOSED CONTRACT, THE BIDDER WARRANTS THAT THE BIDDER, AND ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS HE INTENDS TO USE HAVE CAREFULLY AND THOROUGHLY REVIEWED THE DRAWINGS, SPECIFICATIONS AND ALL OTHER CONTRACT DOCUMENTS AND HAVE FOUND THEM COMPLETE AND FREE FROM ANY AMBIGUITIES AND SUFFICIENT FOR THE PURPOSE INTENDED. THE BIDDER FURTHER WARRANTS THAT TO THE BEST OF HIS OR HIS SUBCONTRACTORS' AND MATERIAL SUPPLIERS' KNOWLEDGE, ALL MATERIALS AND PRODUCTS SPECIFIED OR INDICATED HEREIN ARE ACCEPTABLE FOR ALL APPLICABLE CODES AND AUTHORITIES.

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SCALE: 1"=200'

0 200 400

SEWER: LIVE OAK SLOUGH-MEDINA RIVER & TOWN OF SOMERSET-ELM - DOS RIOS W.R.C.

Developer's Name	KINGFISH DEVLEOPMENT, LLC
Developer's Address	2722 W. BITTERS RD. SUITE 106
City	SAN ANTONIO
State	TX
Zip	78248
Phone #	210-882-6800
Fax #	
SAWS Block Map #	132-514
Total EDU's	N/A
Total Acreage	N/A
Total Linear Footage of Pipe	12" ~ 1,938 L.F.
Plat No.	N/A
Number of Lots	N/A
SAWS Job No.	23-1534

SUBMITTAL SET

NO.	DATE	REVISIONS DESCRIPTION	BY

PROJ. #	DGN. BY:	DWN. BY:	CHKD. BY:	DATE:
22094	ACR	ACR		

MTR
Moy Tarin Ramirez Engineers, LLC
· Engineers · Surveyors · Planners
TBPELS: ENGINEERING F-5297/SURVEYING: F-10131500
12770 CIMARRON PATH, SUITE 100
SAN ANTONIO, TEXAS 78249
TEL: (210) 698-5051
FAX: (210) 698-5085

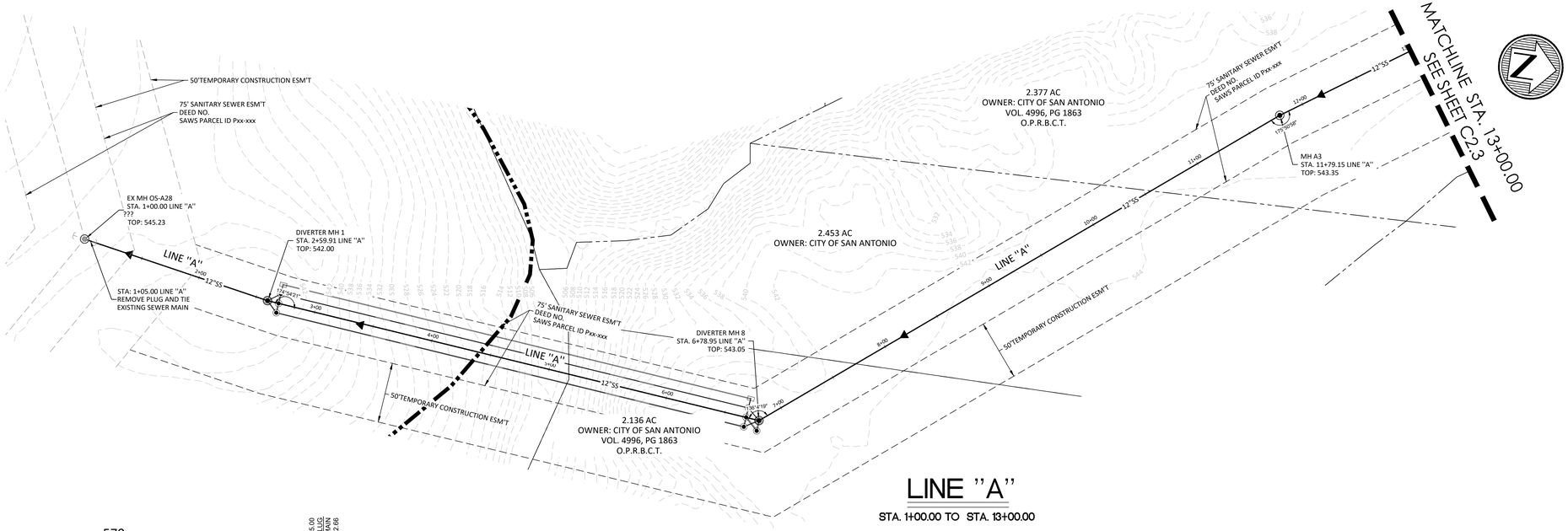
STATE OF TEXAS
PAUL LANDA, JR.
100182
LICENSED PROFESSIONAL ENGINEER
7/25/23

VERDIN SUBDIVISION OFFSITE SEWER

SANITARY SEWER OVERALL PLAN

SHEET

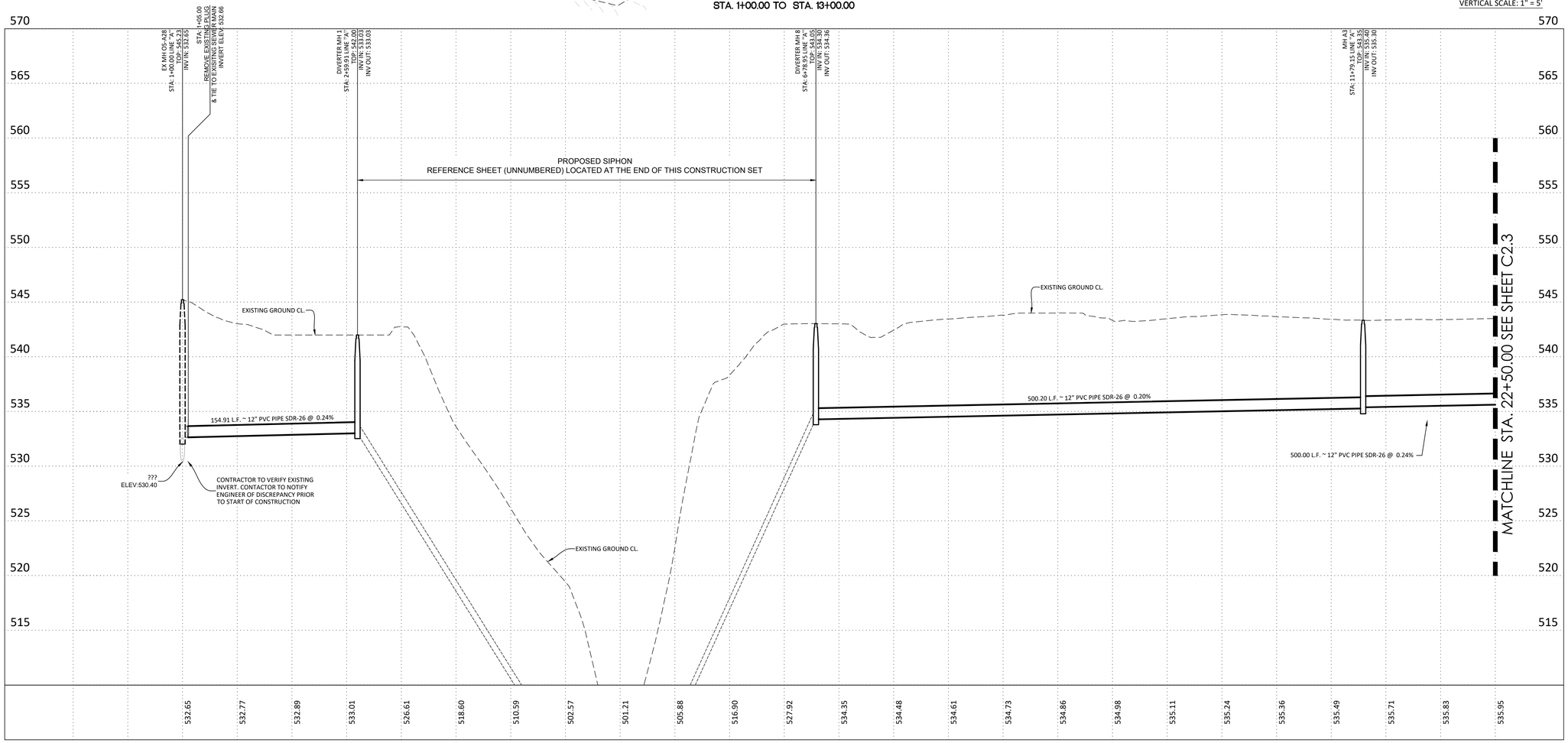
C2.1



LINE "A"

STA. 1+00.00 TO STA. 13+00.00

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



SUBMITTAL SET

LEGEND

EXISTING WATER MAIN	EX 8"W
PROPOSED WATER MAIN	8"W
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OFFICIAL PUBLIC RECORDS OF MEDINA COUNTY, TEXAS	O.P.R.M.C.T.

SCALE: 1"=50'

0 50 100

SEWER: LIVE OAK SLOUGH-MEDINA RIVER & TOWN OF SOMERSET-ELM - DOS RIOS W.R.C.

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City SAN ANTONIO State TX Zip 78248
Phone # 210-882-6800 Fax #
SAWS Block Map # 132-514 Total EDU's N/A Total Acreage N/A
Total Linear Footage of Pipe 12" ~ 1,938 L.F. Plat No. N/A
Number of Lots N/A SAWS Job No. 23-1534

NO.	DATE	REVISIONS DESCRIPTION	BY:

PROJ. # 22094 | DSN. BY: ACR | DWN. BY: ACR | CHKD. BY: | DATE:

• Engineers • Surveyors • Planners
MTR
Moy Tarin Ramirez Engineers, LLC
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SAN ANTONIO, TEXAS 78249 FAX: (210) 698-5085

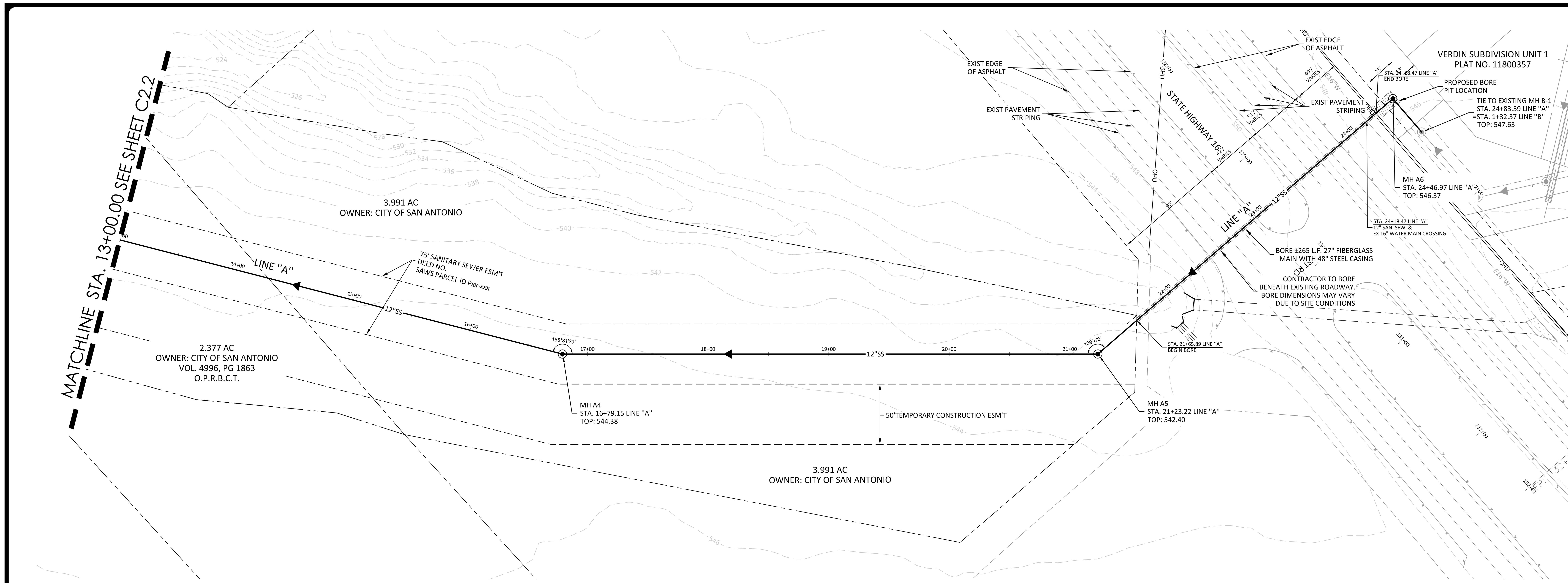
7/05/23
STATE OF TEXAS
PAUL LANDA, JR.
100182
LICENSED PROFESSIONAL ENGINEER

VERDIN SUBDIVISION OFFSITE SEWER

SANITARY SEWER PLAN & PROFILE
LINE "A"
STA. 1+00.00 TO STA. 13+00.00

SHEET
C2.2

Plot Date: September 11, 2024 User ID: Paul Landa
G:\Active Projects\Verdin Sewer\Drawings\22094 C2.2-C2.3 Line A P&P.dwg



LEGEND

EXISTING WATER MAIN	EX 8"W
PROPOSED WATER MAIN	8"W
PROPOSED FIRE HYDRANT	
EXISTING FIRE HYDRANT	
PROPOSED GATE VALVE	
EXISTING GATE VALVE	
PROPOSED SANITARY SEWER MAIN & MANHOLE	8"SS
EXISTING SANITARY SEWER MAIN & MANHOLE	EX 8"SS
PROPOSED SERVICE LATERAL WITH ONE-WAY CLEAN-OUT	
VERTICAL STACK	VS
ELECTRIC, GAS, TELEPHONE & CABLE TV EASEMENT	E.G.T.CA.E.
TEMPORARY BENCHMARK	
PROPOSED MINIMUM FINISH FLOOR ELEVATION	MIN. F.F. = 795.5
SANITARY SEWER/WATER CROSSING LOCATION	
OFFICIAL PUBLIC RECORDS OF BEXAR COUNTY, TEXAS	O.P.R.B.C.T.
OFFICIAL PUBLIC RECORDS OF MEDINA COUNTY, TEXAS	O.P.R.M.C.T.

SCALE: 1"=50'

0 50 100

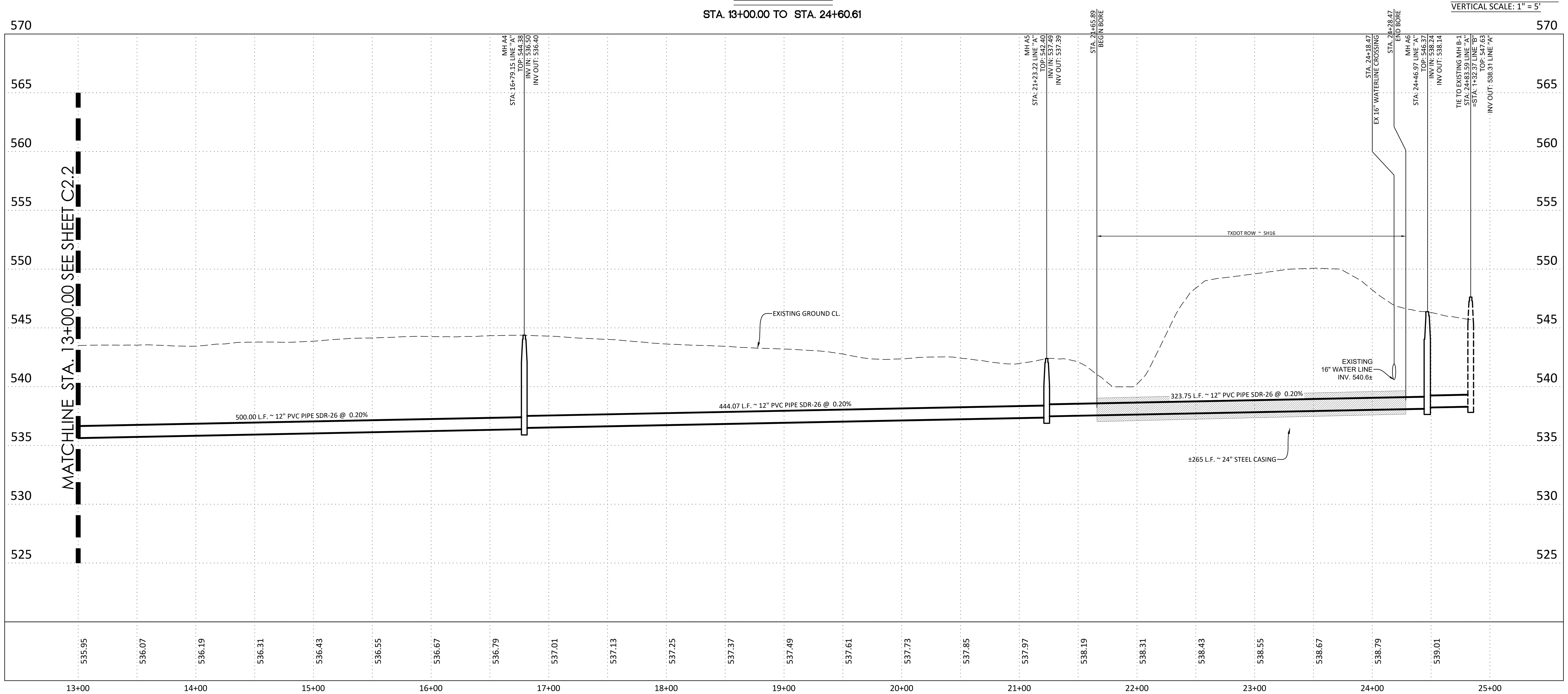
SEWER: LIVE OAK SLOUGH-MEDINA RIVER & TOWN OF SOMERSET-ELM - DOS RIOS W.R.C.

Developer's Name	KINGFISH DEVLEOPMENT, LLC
Developer's Address	2722 W. BITTERS RD. SUITE 106
City	SAN ANTONIO; State TX; Zip 78248
Phone #	210-882-6800; Fax #
SAWS Block Map #	132-514; Total EDU's N/A; Total Acreage N/A
Total Linear Footage of Pipe	12" ~ 1,938 L.F.; Plat No. N/A
Number of Lots	N/A; SAWS Job No. 23-1534

LINE "A"

STA. 13+00.00 TO STA. 24+60.61

HORIZONTAL SCALE: 1" = 50'
VERTICAL SCALE: 1" = 5'



SUBMITTAL SET

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJ. #	DGN. BY:	DWN. BY:	CHKD. BY:	DATE:
22094	ACR	ACR		

MTR Moy Tarin Ramirez Engineers, LLC
· Engineers · Surveyors · Planners
TBPELS: ENGINEERING F-5297/SURVEYING: F-10131500
12770 CIMARRON PATH, SUITE 100 TEL: (210) 698-5051
SAN ANTONIO, TEXAS 78249 FAX: (210) 698-5085

STATE OF TEXAS
PAUL LANDA, JR.
100182
LICENSED PROFESSIONAL ENGINEER
7/25/23

VERDIN SUBDIVISION OFFSITE SEWER

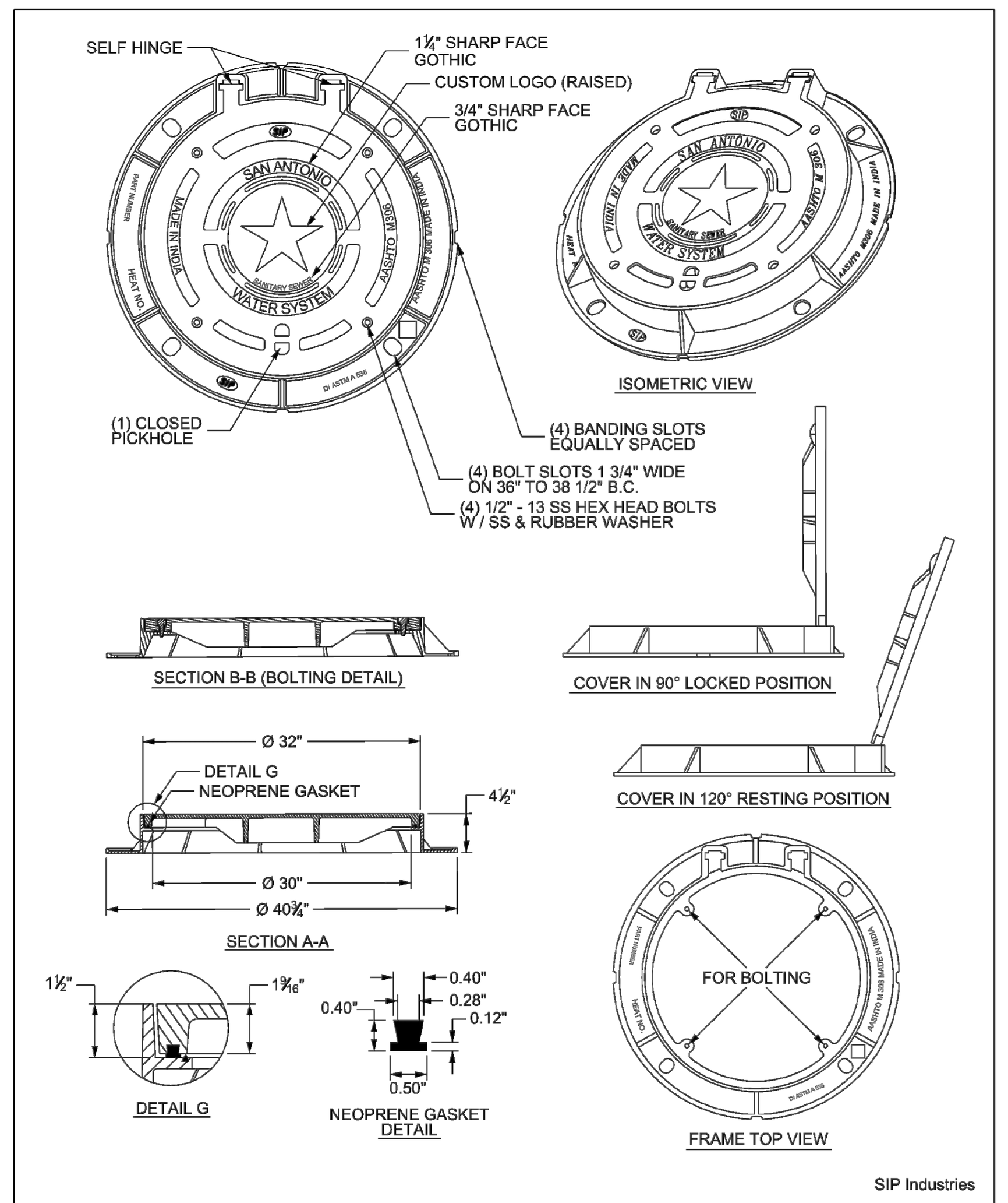
SANITARY SEWER PLAN & PROFILE LINE "A"

STA. 13+00.00 TO STA. 24+60.61

SHEET

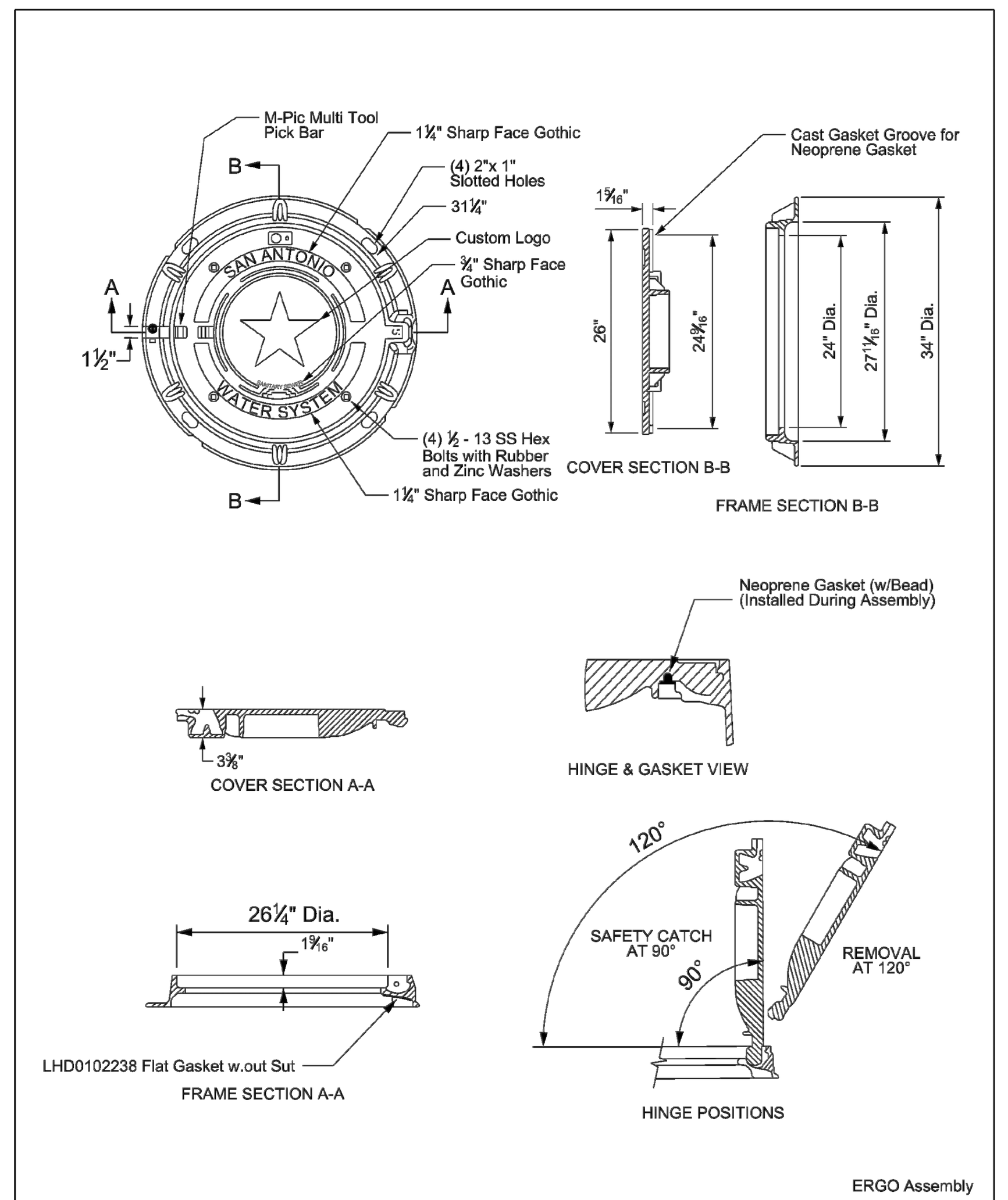
C2.3

PLAT NO. N/A



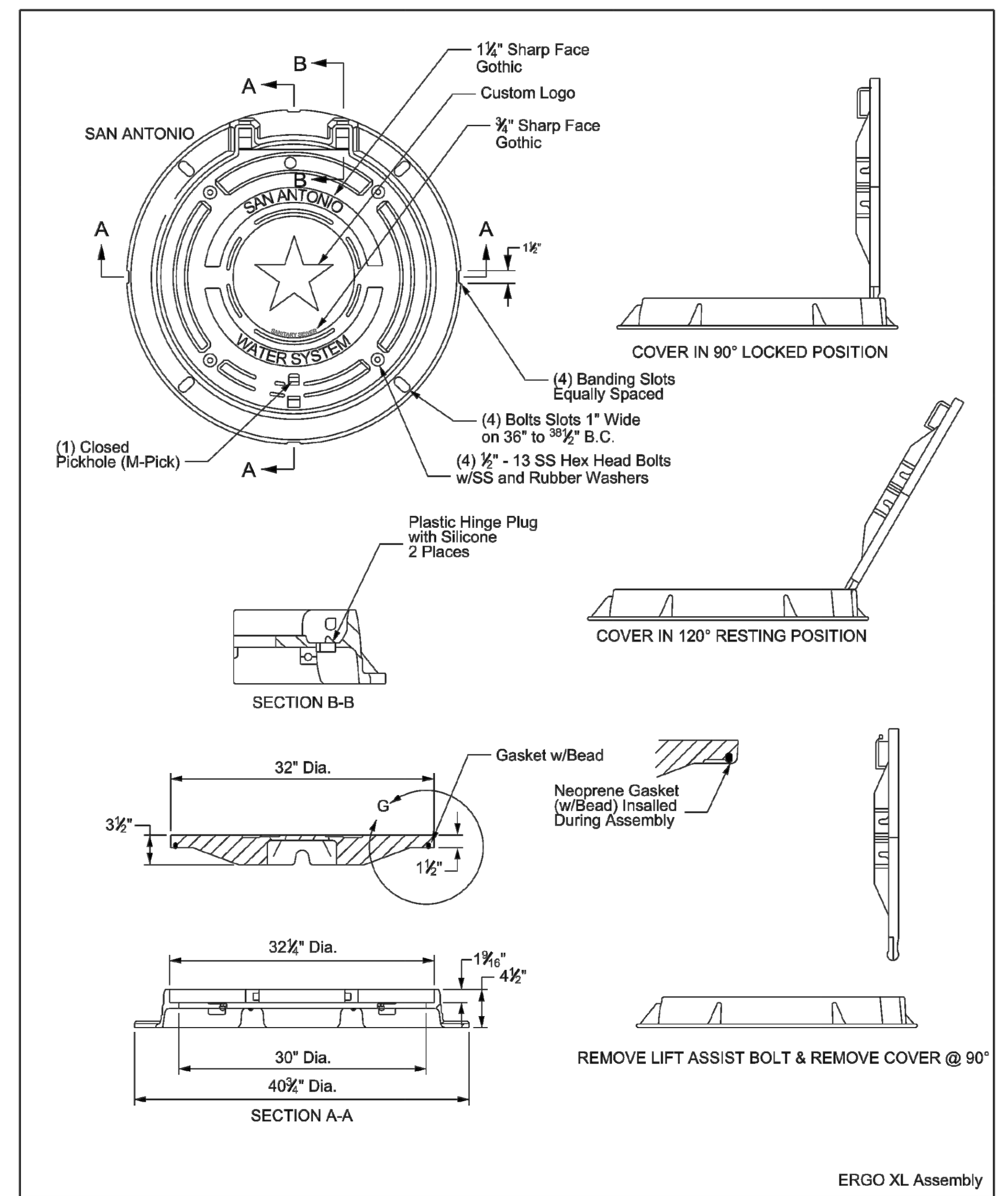
SIP Industries

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | 30" MANHOLE RING AND COVER DETAIL | APPROVED: — | REVISED: AUG 2019 | DD 852-07 | SHEET 1 OF 5



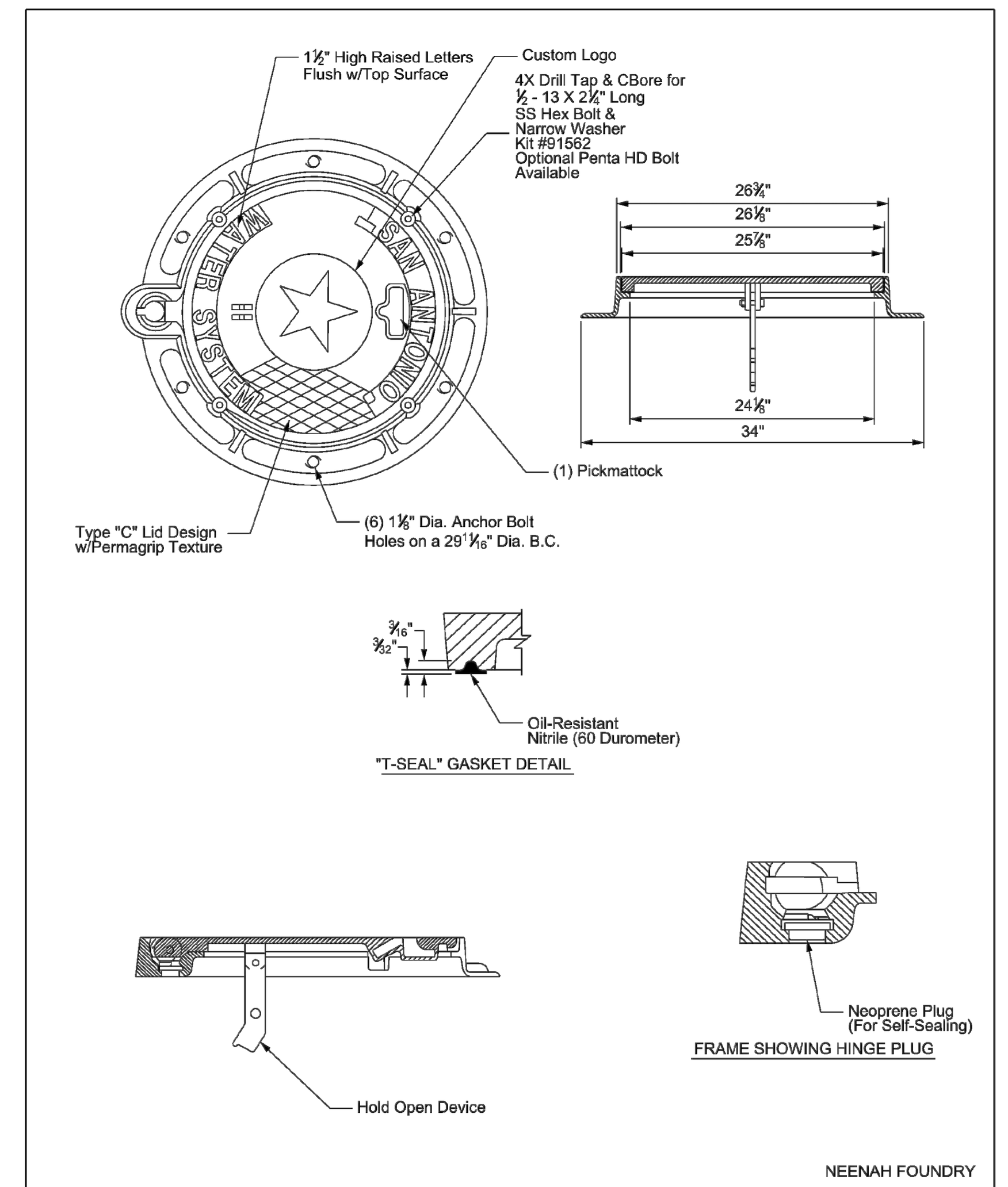
ERGO Assembly

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | MANHOLE RING AND COVER DETAIL | APPROVED: MARCH 2008 | REVISED: AUG 2019 | DD 852-07 | SHEET 2 OF 5



ERGO XL Assembly

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | MANHOLE RING AND COVER DETAIL | APPROVED: MARCH 2008 | REVISED: AUG 2019 | DD 852-07 | SHEET 3 OF 5



NEENAH FOUNDRY

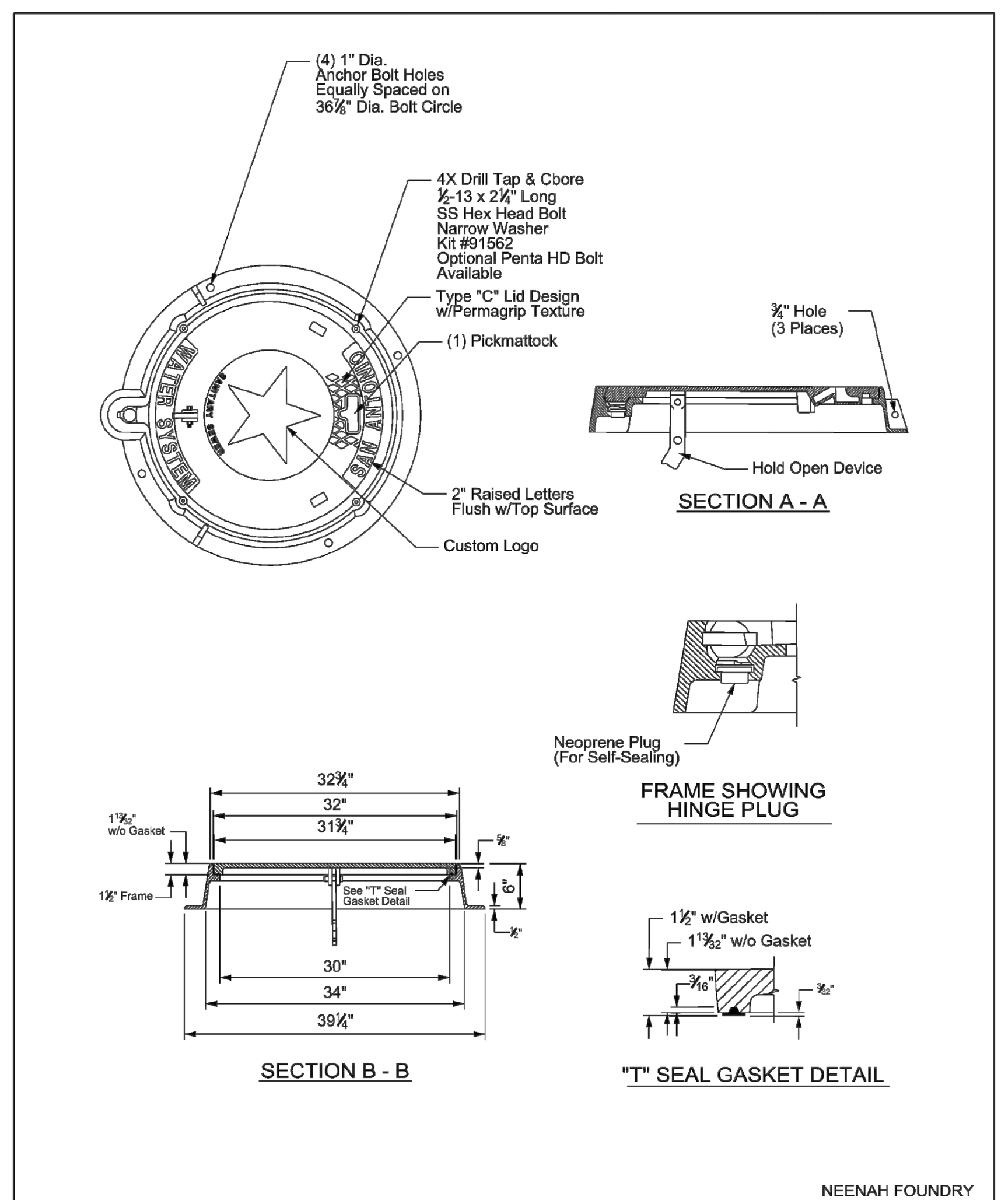
PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | MANHOLE RING AND COVER DETAIL | APPROVED: MARCH 2008 | REVISED: AUG 2019 | DD 852-07 | SHEET 4 OF 5

TRENCH EXCAVATION SAFETY PROTECTION

Contractor and/or Contractor's independently retained employee or structural design/geotechnical/safety/equipment consultant, if any, shall review these plans and available geotechnical information and the anticipated installation site(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.

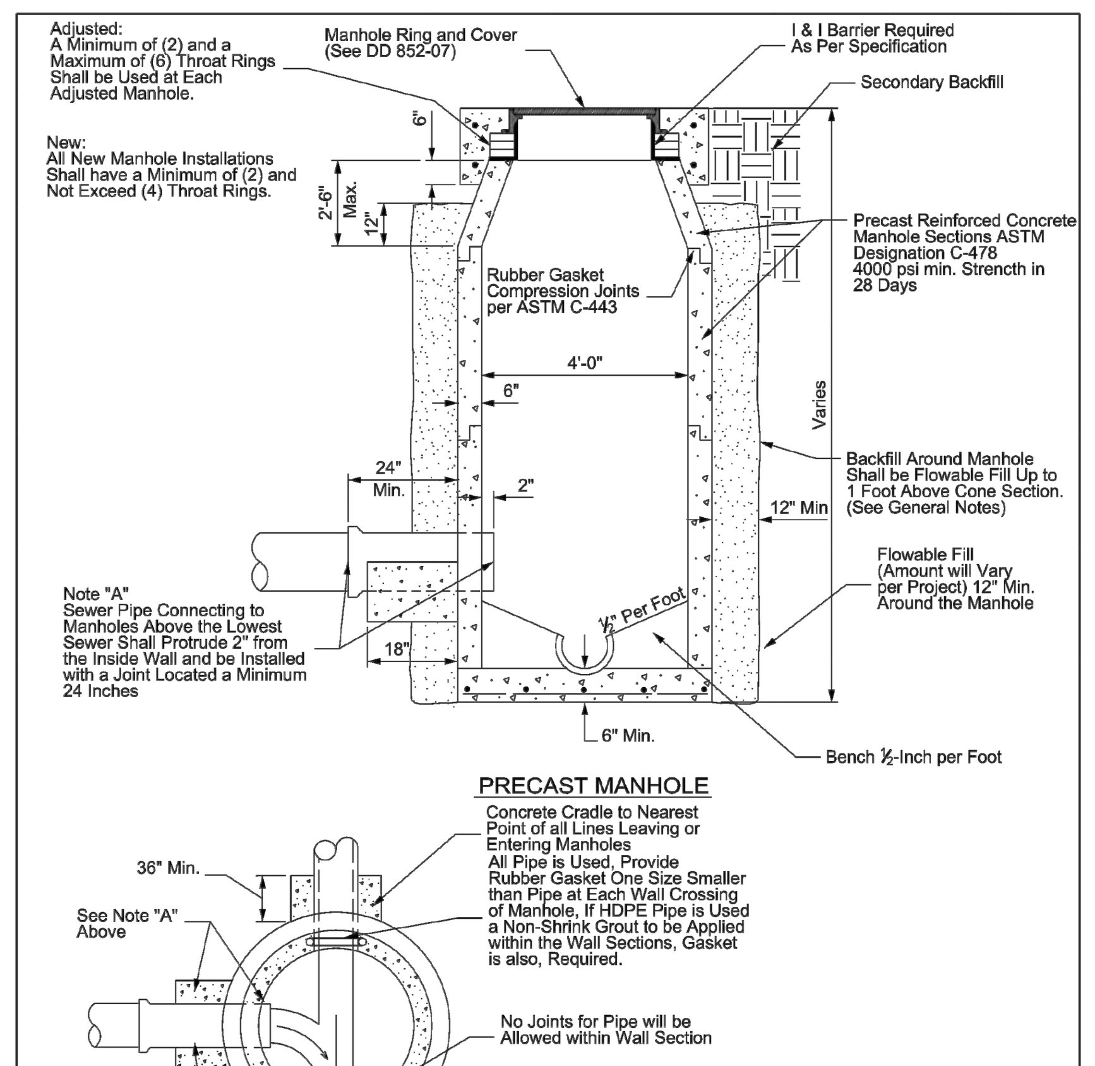
SEWER: LIVE OAK SLOUGH-MEDINA RIVER & TOWN OF SOMERSET-ELM - DOS RIOS W.R.C.

Developer's Name: KINGFISH DEVLEOPMENT, LLC
Developer's Address: 2722 W. BITTERS RD. SUITE 106
City: SAN ANTONIO State: TX Zip: 78248
Phone #: 210-882-6800 Fax #:
SAWS Block Map #: 132-514 Total EDU's: N/A Total Acreage: N/A
Total Linear Footage of Pipe: 12" ~ 1,938 L.F. Plat No.: N/A
Number of Lots: N/A SAWS Job No.: 23-1534



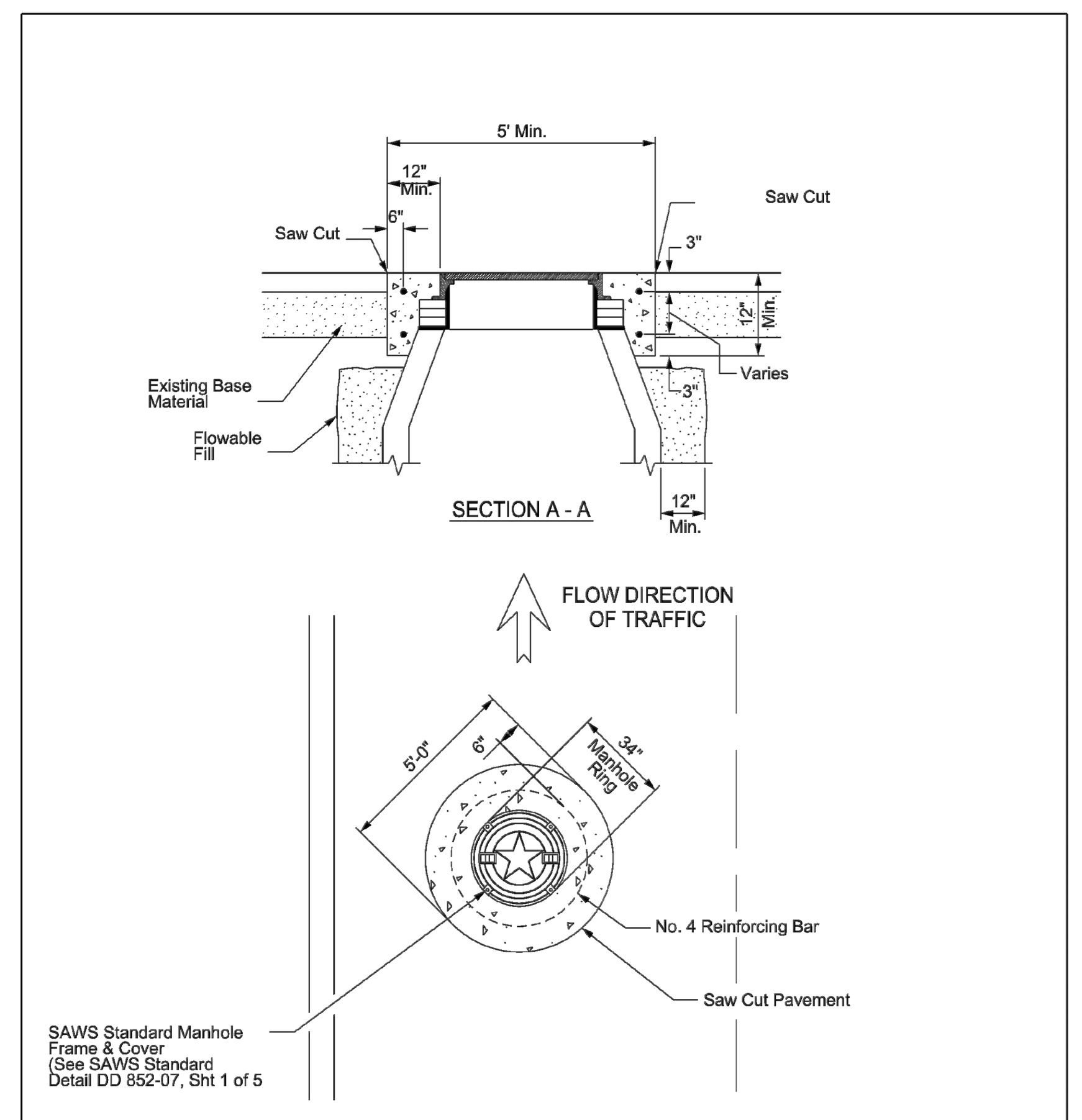
NEENAH FOUNDRY

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | MANHOLE RING AND COVER DETAIL | APPROVED: MARCH 2008 | REVISED: AUG 2019 | DD 852-07 | SHEET 5 OF 5



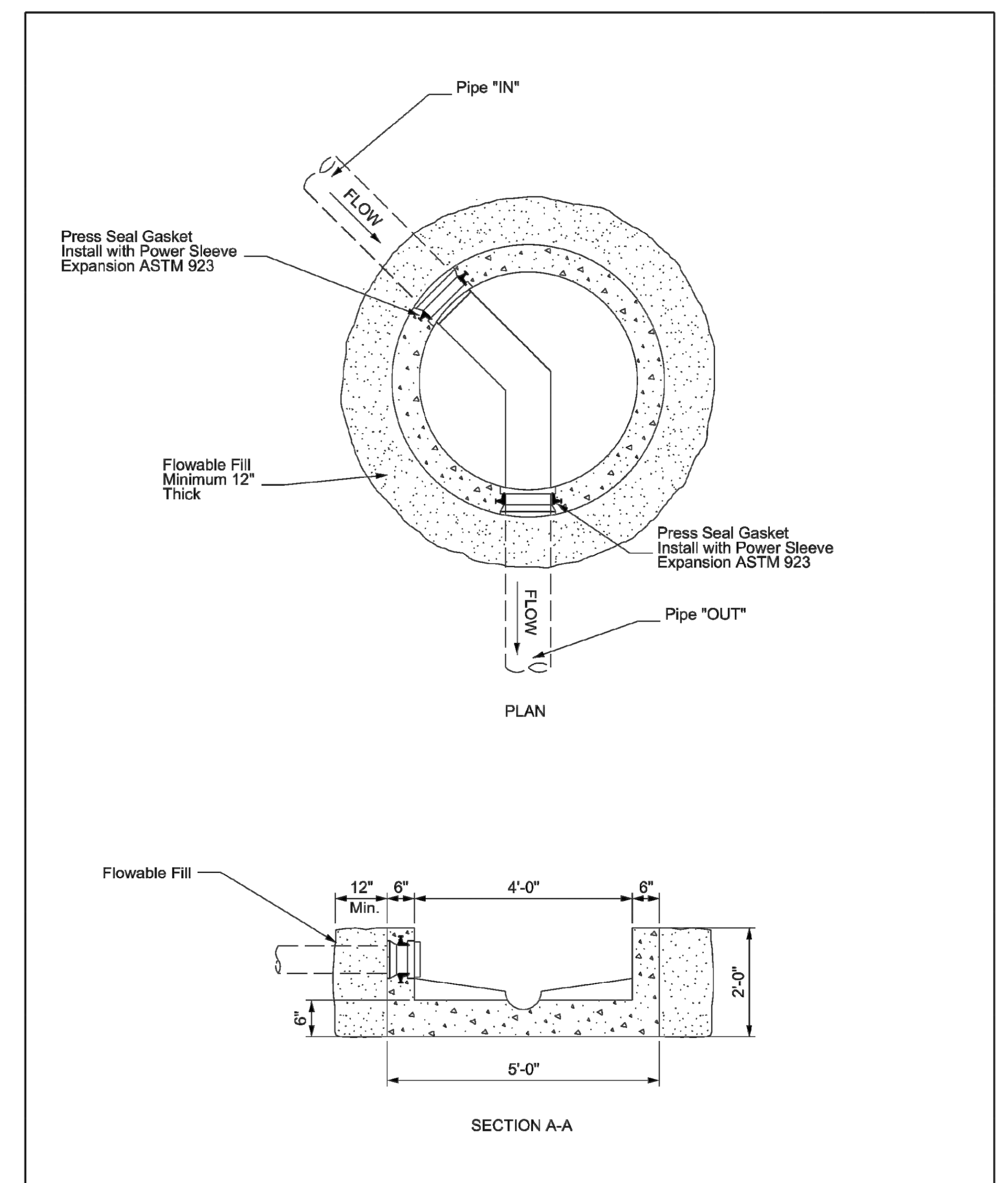
General Notes:
1. Material for Sanitary Sewer Pipe must be the Same from Manhole to Manhole. Changes in Type of Pipe may be Made Only at Manholes, or Special Structures, except as Approved by the SAWS Inspector.
2. Adapters and Concrete Collars shall be Used as Directed and Approved by theSAWS Inspector.
3. Watertight Manhole Rings and Covers shall be Trans-Tex A77 "O" Ring or Approved Equal.
4. The Minimum Angle of Flow for a Connecting Sewer to the Direction of Flow Defined by a Collection System is 90 Degrees, unless Approved by the Engineer.

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | STANDARD PRECAST MANHOLE | APPROVED: MAY 2013 | REVISED: AUG 2019 | DD-852-01 | SHEET 1 OF 2

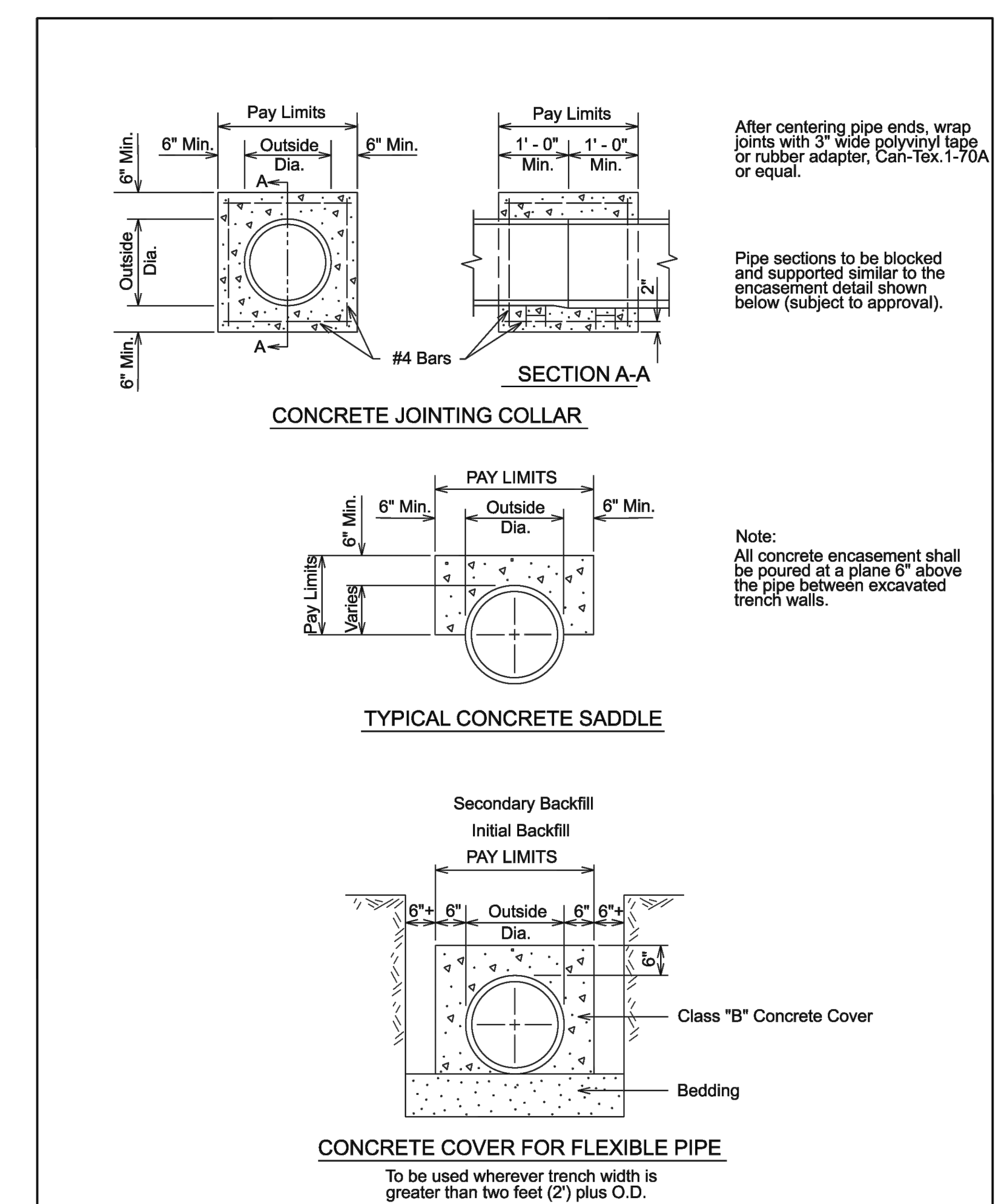


NOTE:
1. The Concrete Shall be 4000 PSI Minimum and Reinforced with No. 4 Bars as Shown.
2. The Concrete Shall Extend to Edge of Saw Cut Pavement.
3. Manhole Ring Encasement is Required on all Manholes.
4. Manhole Lid shall Open in the Direction of Traffic or Downstream in Parkway

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | MANHOLE RING ENCASEMENT DETAIL | APPROVED: AUGUST 2009 | REVISED: AUG 2019 | DD 852-03 | SHEET 1 OF 1

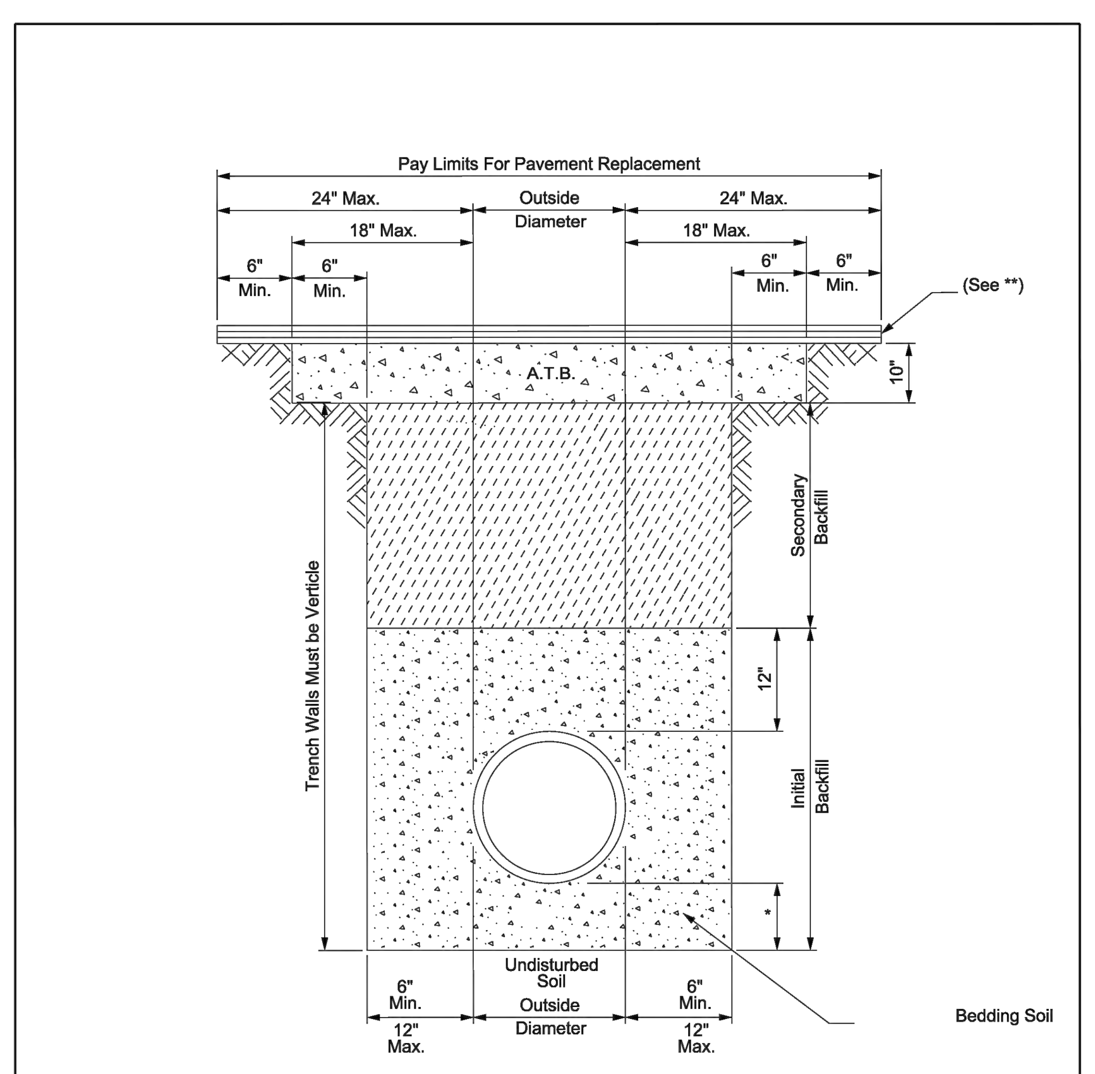


PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | PRECAST MANHOLE BASE 45° ANGLE | APPROVED: MARCH 2008 | REVISED: AUG 2019 | DD-852-06 | SHEET 1 OF 1



Note: All details apply to both water or sewer pipe.

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | TYPICAL CONCRETE DETAILS | APPROVED: MARCH 2008 | REVISED: APRIL 2014 | DD-858-02 | SHEET 1 OF 1

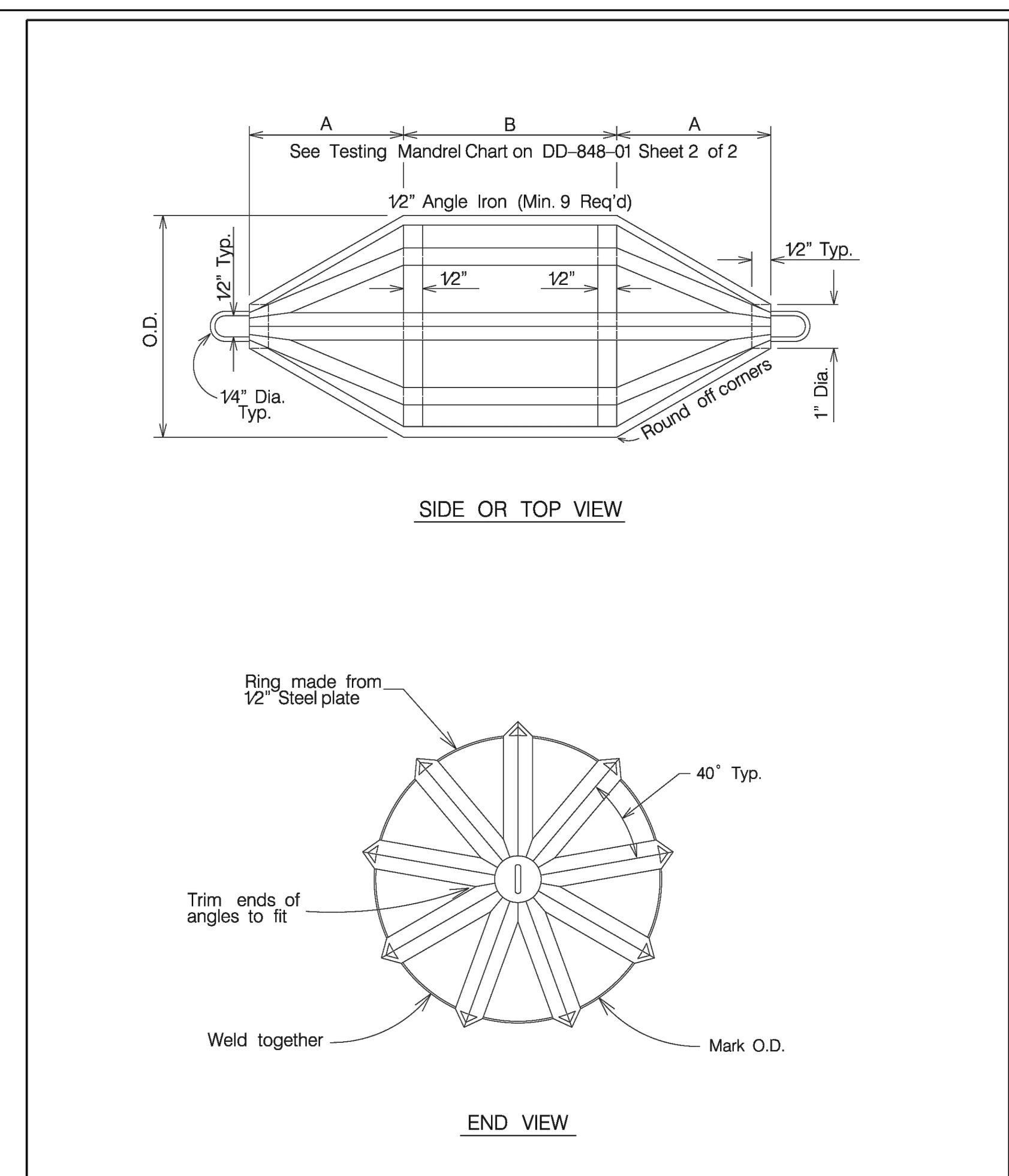


The Existing Materialat the Bearing Level shall be Removed and Replaced to a Minimum Depth of 6-Inches or ⅛ of the Outside Diameter of the Pipe, whichever is Greater, with Bedding Material.

In Areas of over Excavation, Encasement shall extend from Trench Wall. Pay Limits shall not Exceed 12" Max. as shown on Detail. Additional Encasement shall be Incidental.

* Sewer Gravel 6" Min.or ⅛ O.D. of the Pipe, whichever is Greater.
** Minimum 2" HMAC Type "D" for Trench Repair in Local / Residential Streets.
** Minimum 3" HMAC Type "C" for Trench Repair in Collector / Arterial Streets.

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | SANITARY SEWER PIPE LAID IN TRENCH | APPROVED: MARCH 2008 | REVISED: DEC 2018 | DD-804-01 | SHEET 1 OF 1



Note:
All mandrels must be approved by SAWS Construction Inspections and stamped before use.

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | GO, NO GO DEFLECTION TESTING MANDREL | APPROVED: March 2008 | REVISED: — | DD-848-01 | SHEET 1 OF 2

			MANDREL O.D.	RING O.D.
SIZE	A	B*	PVC (SDR-26)	PVC (SDR-26)
6"	4.0"	4.5"	5.50	4.79
8"	5.5"	6"	7.37	6.66
10"	7.0"	7.5"	9.21	8.50
12"	8.0"	9"	10.96	10.25
15"	10.0"	11"	13.42	12.71
18"	12.0"	13.5"	——	——
21"	14.0"	16"	——	——
24"	16.0"	18"	——	——
27"	18.0"	20"	——	——

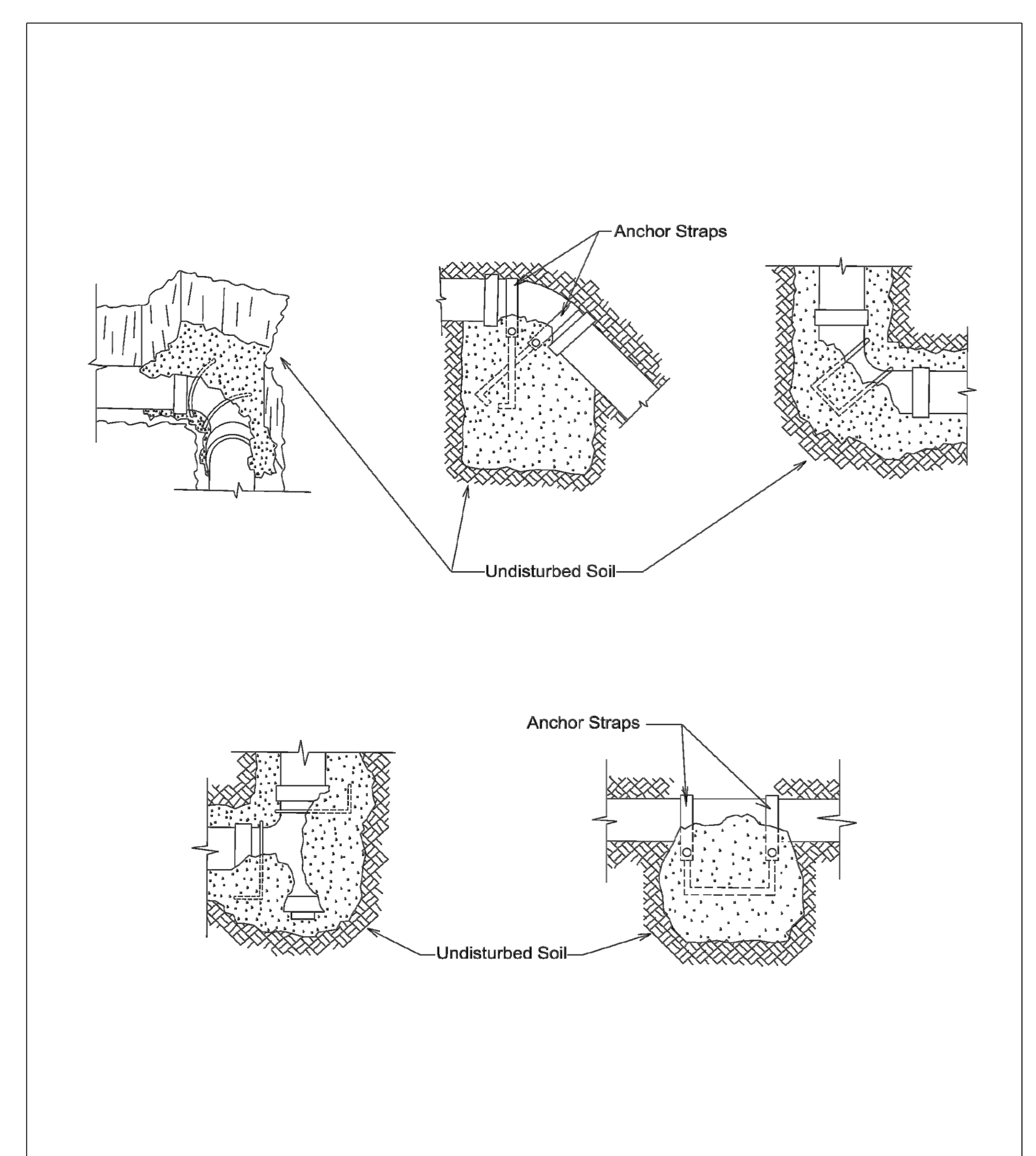
* Minimum Length

CHART

Notes:
PVC pipes and fittings 6" to 15" in diameter shall conform to ASTM D-3034-08.
PVC pipes and fittings 18" to 27" in diameter shall conform to ASTM F-679-08.

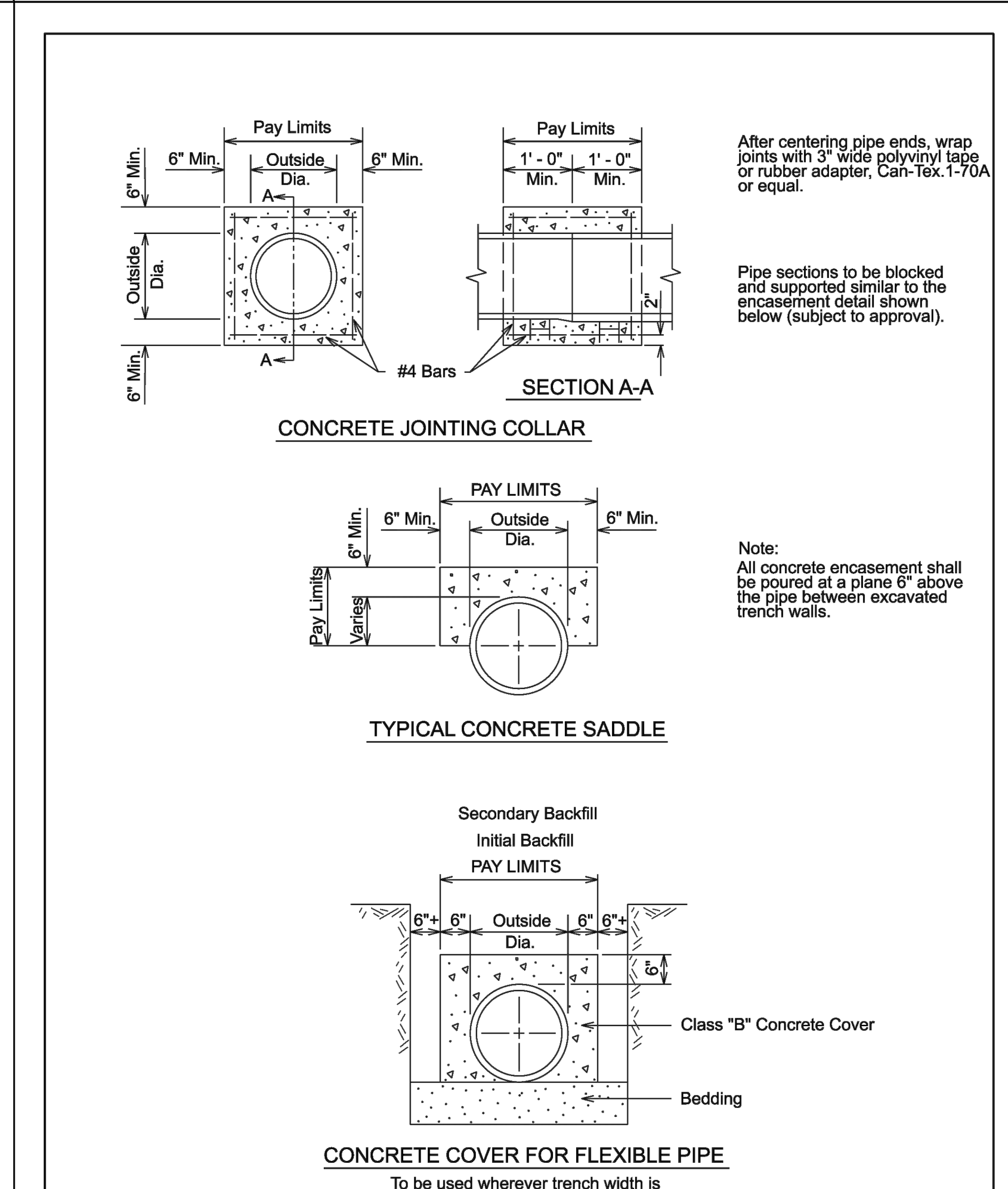
This information is provided as a reference. All deflection testing shall be done in accordance with TCEQ Chapter 217.

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | GO, NO GO DEFLECTION TESTING MANDREL CHART | APPROVED: MARCH 2008 | REVISED: APRIL 2014 | DD-848-01 | SHEET 2 OF 2



Note:
All concrete used for thrust blocking shall have a minimum concrete strength of 3,000 psi

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | TYPICAL THRUST BLOCKS (SEWER ONLY) | APPROVED: March 2008 | REVISED: AUG 2019 | DD-839-03 | SHEET 1 OF 1



Note: All details apply to both water or sewer pipe.

PROPERTY OF SAN ANTONIO WATER SYSTEM, SAN ANTONIO, TEXAS | TYPICAL CONCRETE DETAILS | APPROVED: MARCH 2008 | REVISED: APRIL 2014 | DD-858-02 | SHEET 1 OF 1

SUBMITTAL SET

REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJ. #	DGN. BY:	DWN. BY:	CHKD. BY:	DATE:
22094	ACR	ACR		

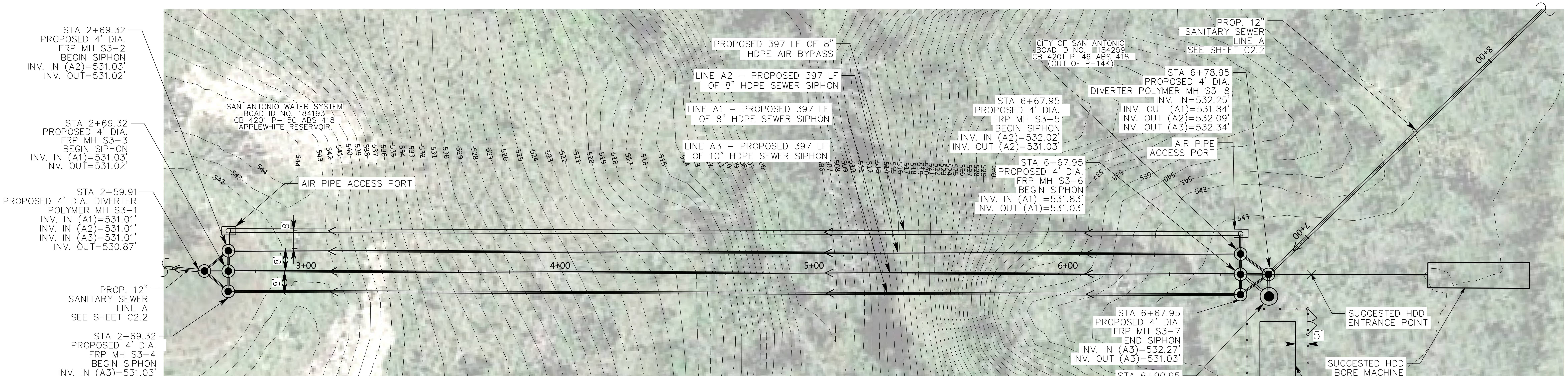
MTR · Engineers · Surveyors · Planners
Moy Tarin Ramirez Engineers, LLC
TBPELS: ENGINEERING F-5297/SURVEYING: F-10131500
12770 CIMARRON PATH, SUITE 100 SAN ANTONIO, TEXAS 78249
TEL: (210) 698-5051 FAX: (210) 698-5085

7/25/23
STATE OF TEXAS PAUL LANDA, JR. 100182 LICENSED PROFESSIONAL ENGINEER

VERDIN SUBDIVISION OFFSITE SEWER

SANITARY SEWER DETAILS

SHEET

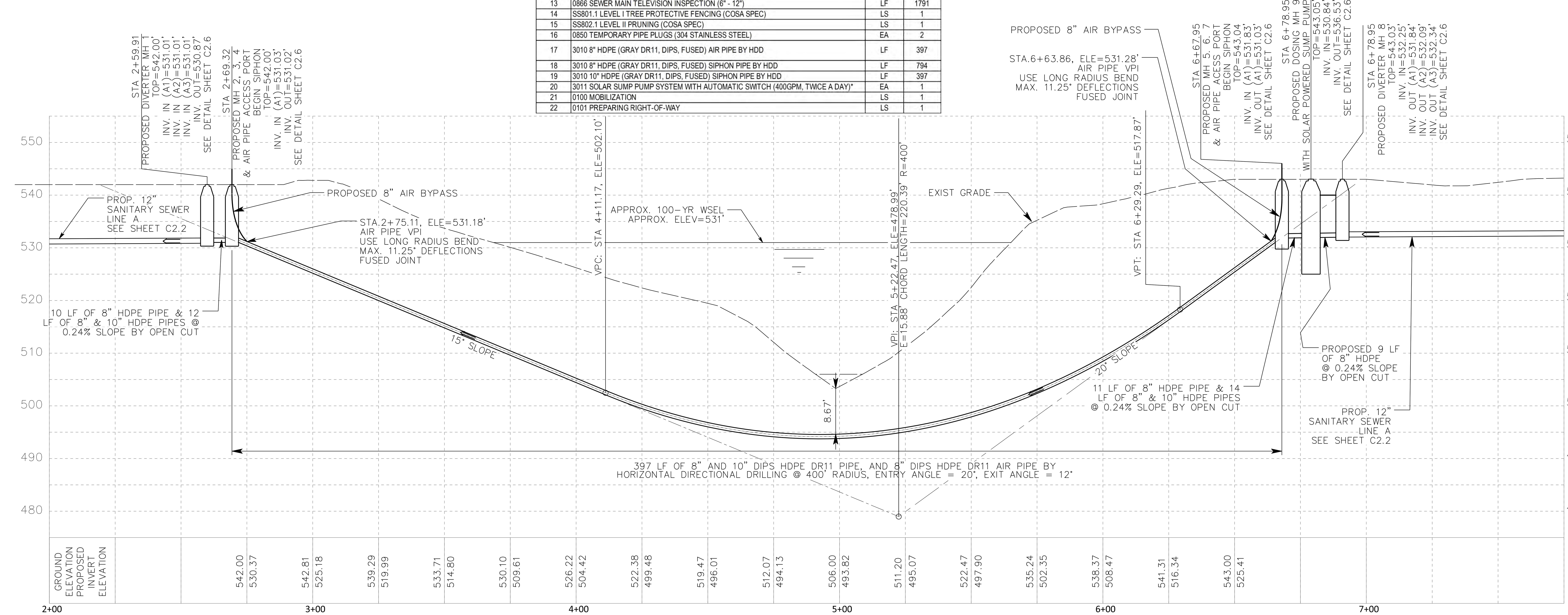


VERDIN SIPHON-PLAN VIEW

HORIZ. 0' 20' 40'
VERT. 0' 10' 20'
SCALE IN FEET

ITEM NO.	SPEC NO. & DESCRIPTION	UNIT	QUANTITY
1	507.3 CHAIN LINK FENCE (8 FT.)	LF	128
2	507.5 GATES (VEHICULAR)	OPEN	1
3	520.1 HYDROMULCHING (COSA SPEC)	SY	3205
4	0836 GREY IRON AND DUCTILE-IRON FITTINGS	TON	1
5	0848 8" HDPE (GRAY DR11, DIPS, FUSED) PIPE BY OPEN CUT (SIPHON PIPE)	LF	102
6	0848 10" HDPE (GRAY DR11, DIPS, FUSED) PIPE BY OPEN CUT (SIPHON PIPE)	LF	27
7	0848 8" HDPE (GRAY DR11, DIPS, FUSED) PIPE BY OPEN CUT (AIR PIPE)	LF	74
8	0850 POLYMER SANITARY SEWER STRUCTURES (4-FOOT DIA)-DIVERSION MH	EA	2
9	0852 CONCRETE DOSING MANHOLE (6-FOOT DIA) (1200-GALLON STORAGE CAPACITY)	EA	1
10	0853 FRP SEWER STRUCTURES (4-FOOT DIA)-SIPHON MH	EA	6
11	0854.1 TWO-WAY SANITARY SEWER CLEANOUT (AIR PIPE ACCESS PORT)	EA	2
12	0858 MISCELLANEOUS CONCRETE	CY	30
13	0866 SEWER MAIN TELEVISION INSPECTION (6" - 12")	LF	1791
14	SS801.1 LEVEL I TREE PROTECTIVE FENCING (COSA SPEC)	LS	1
15	SS802.1 LEVEL II PRUNING (COSA SPEC)	LS	1
16	0850 TEMPORARY PIPE PLUGS (304 STAINLESS STEEL)	EA	2
17	3010 8" HDPE (GRAY DR11, DIPS, FUSED) AIR PIPE BY HDD	LF	397
18	3010 8" HDPE (GRAY DR11, DIPS, FUSED) SIPHON PIPE BY HDD	LF	794
19	3010 10" HDPE (GRAY DR11, DIPS, FUSED) SIPHON PIPE BY HDD	LF	397
20	3011 SOLAR SUMP PUMP SYSTEM WITH AUTOMATIC SWITCH (400GPM, TWICE A DAY)*	EA	1
21	0100 MOBILIZATION	LS	1
22	0101 PREPARING RIGHT-OF-WAY	LS	1

NOTE:
1. PAY LIMIT FOR FLOWABLE FILL IS 2 FEET AROUND MANHOLE.
2. PVOVIDE TEMPORARY SHORING AS REQUIRED. (N.S.P.I.)



VERDIN SIPHON-PROFILE VIEW

UNINTECH CONSULTING ENGINEERS, INC.
TBPE REG. NO. F-5499
2431 E. EVANS ROAD
TBPLS NO. 10051100
SAN ANTONIO, TEXAS 78259
WWW.UNINTECH.COM
P: (210) 641-6003 F: (210) 641-8279

MTR
Moy Tarin Ramirez Engineers, LLC
· Engineers · Surveyors · Planners
TBPELS: ENGINEERING F-5297/SURVEYING: F-10131500
12770 CIMARRON PATH, SUITE 100
SAN ANTONIO, TEXAS 78249
TEL: (210) 698-5051
FAX: (210) 698-5085

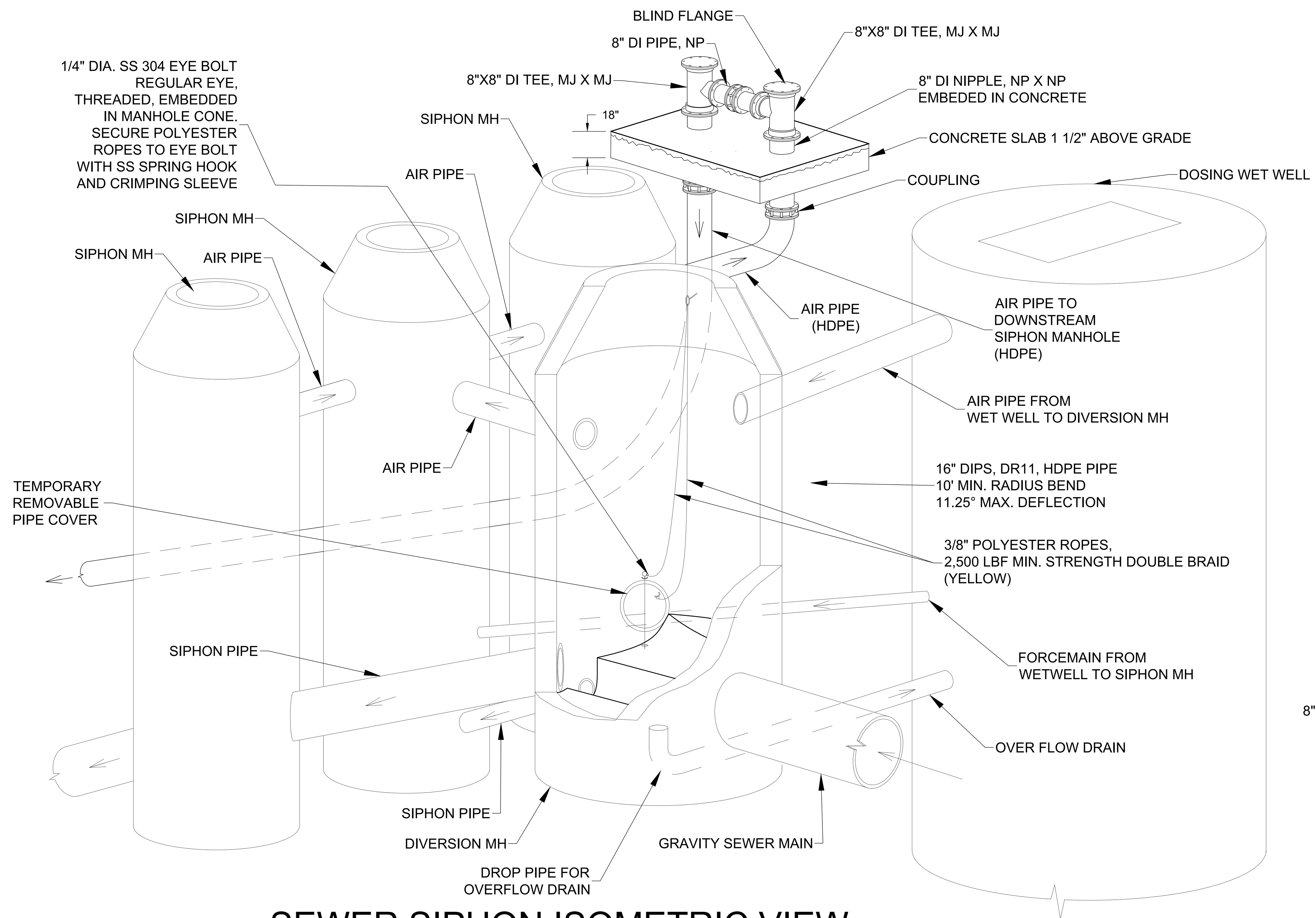
REVISIONS							
NO.	DATE	DESCRIPTION					BY
			PROJ. #	DGN. BY:	DWN. BY:	CHKD. BY:	DATE:
			210093	KW	JJ	KW	

6/25/2024
STATE OF TEXAS
JIAN JIAO
145329
LICENSED PROFESSIONAL ENGINEER

VERDIN
SIPHON PLAN AND PROFILE

SHEET
C2.3

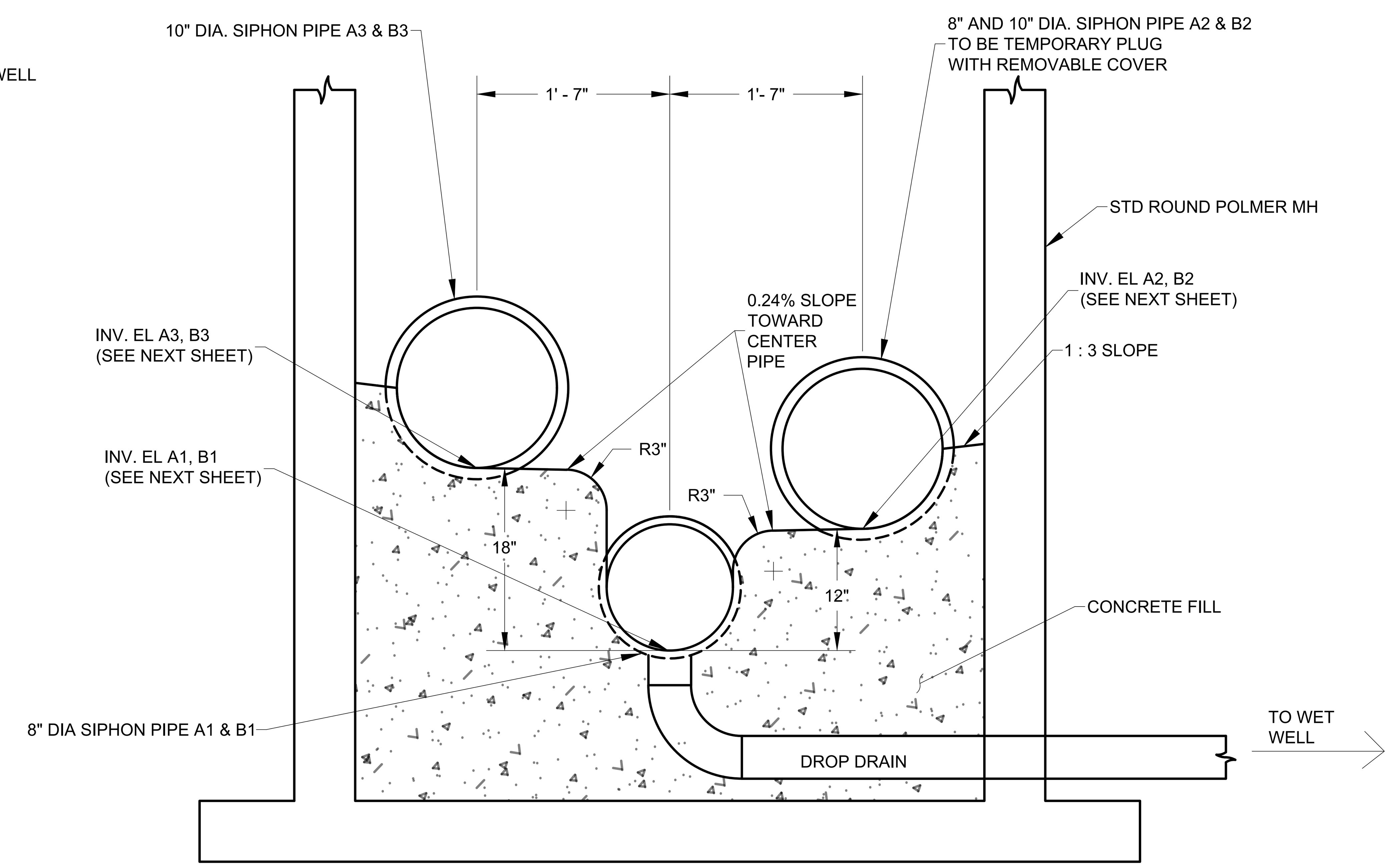
Plot Date: ---- User ID: Jian Jiao
V:\22-210-V (MTR) 12-in Siphon\2Design Phase\1-Drawings\XRef\x-22-210-V-tbk.dwg



SEWER SIPHON ISOMETRIC VIEW

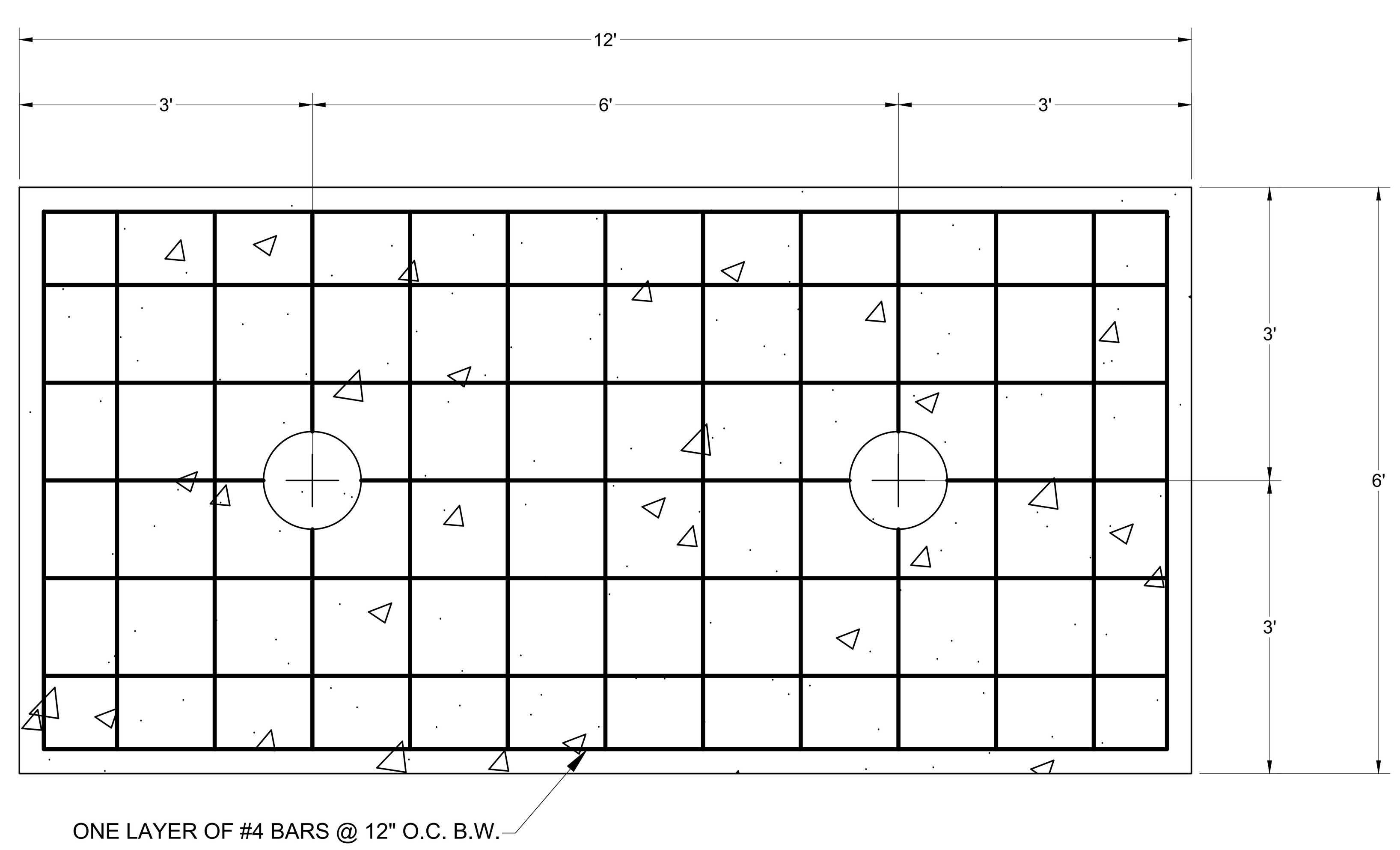
NOT TO SCALE

FLOOD FLOOD FLOW DIRECTION



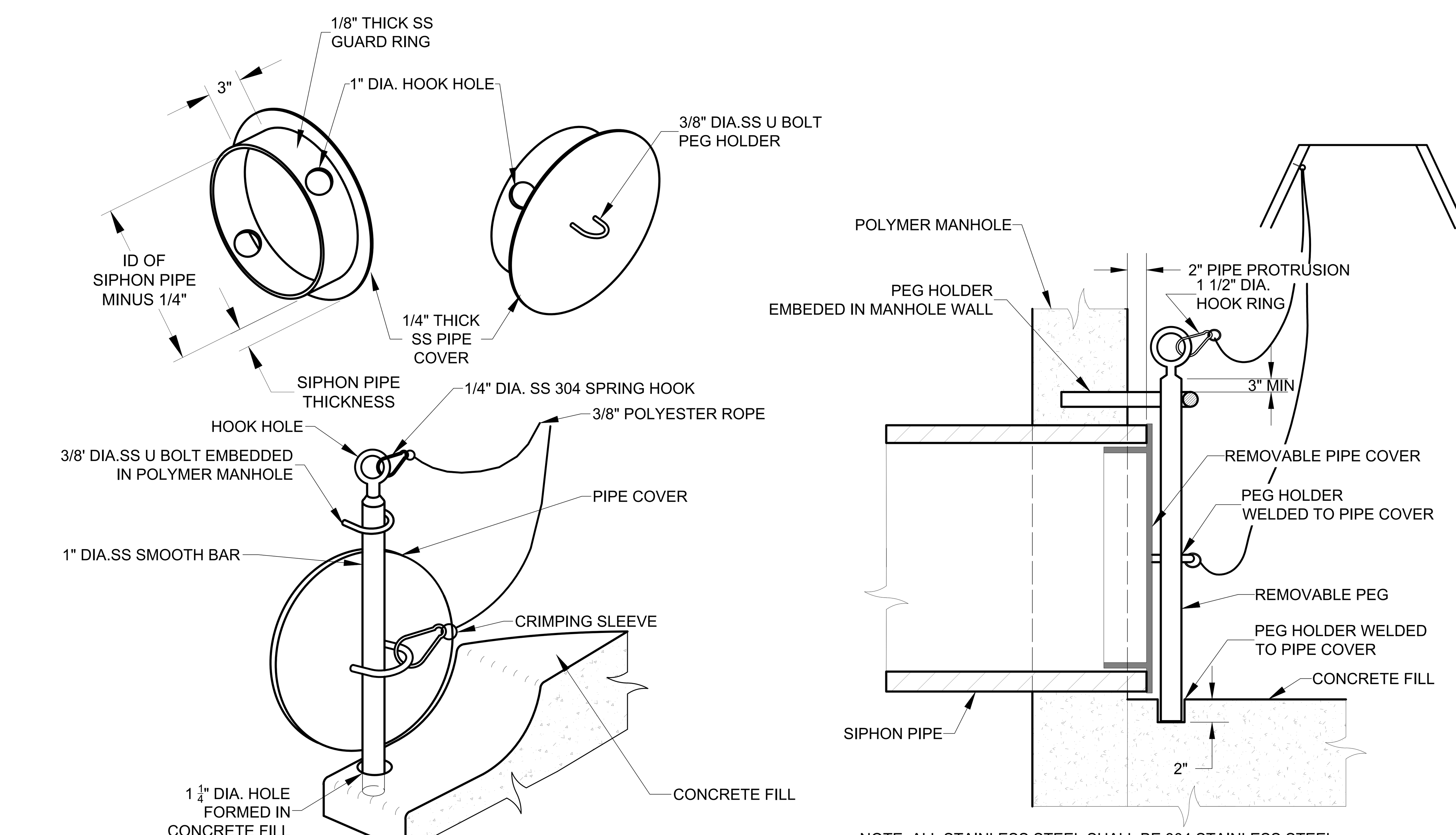
UPSTREAM DIVERSION MANHOLE (MH-8) LAYOUT

NOT TO SCALE



ACCESS PORT CONCRETE SLAB DETAILS

NOT TO SCALE



NOTE: ALL STAINLESS STEEL SHALL BE 304 STAINLESS STEEL.

REMOVABLE PIPE PLUG DETAILS

NOT TO SCALE

UNINTECH CONSULTING ENGINEERS, INC.
2431 E. EVANS ROAD
SAN ANTONIO, TEXAS 78259
P: (210) 641-6003 F: (210) 641-8279
TBPE REG. NO. F-5499
TBPLS NO. 10051100
WWW.UNINTECH.COM

NO.	DATE	REVISIONS DESCRIPTION	BY

PROJ. # | DGN. BY: | DWN. BY: | CHKD. BY: | DATE:

Moy Tarin Ramirez Engineers, LLC
· Engineers · Surveyors · Planners
TBPELS: ENGINEERING F-5297/SURVEYING: F-10131500
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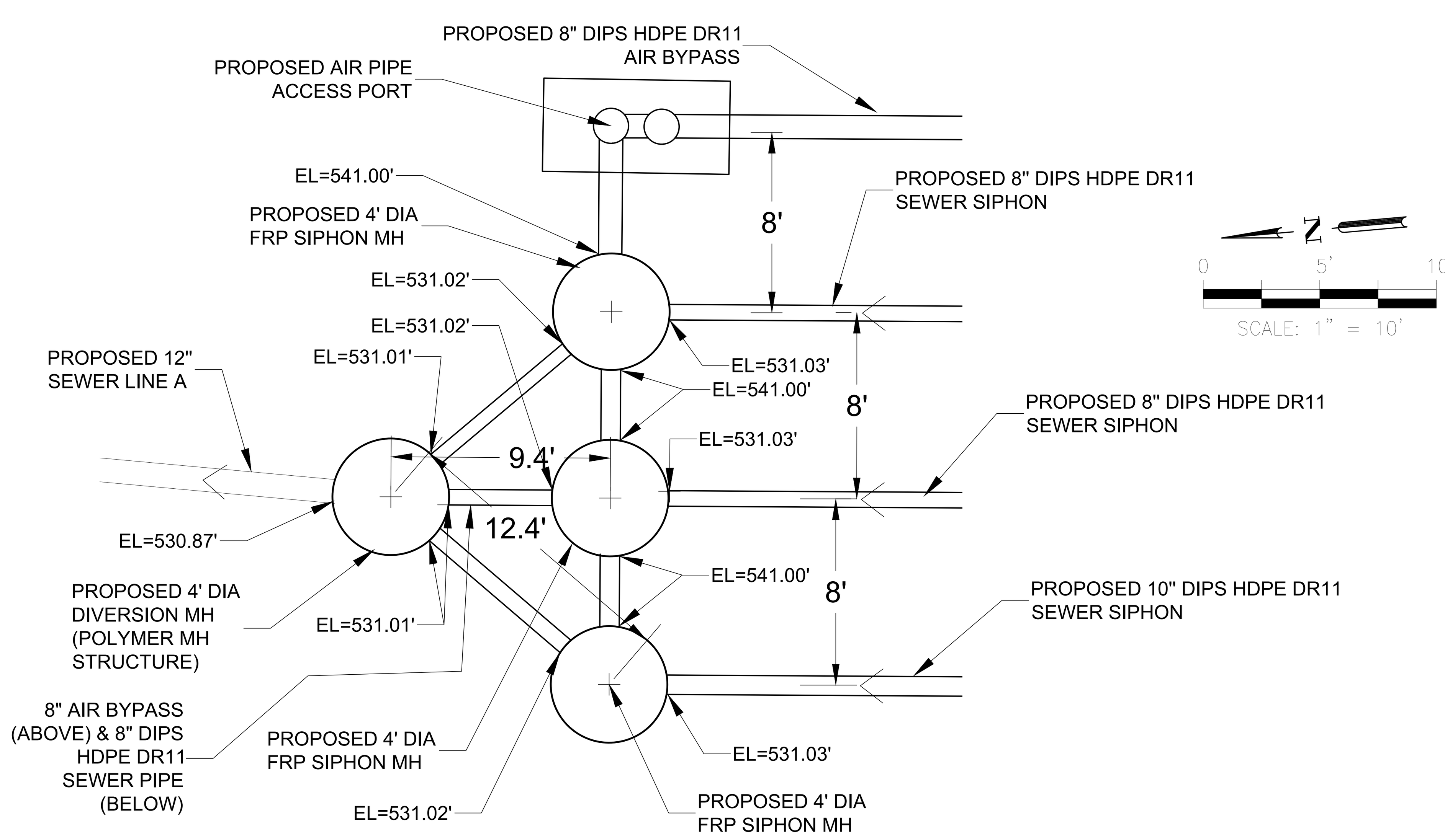
6/25/2024
STATE OF TEXAS
JIAN JIAO
145329
LICENSED PROFESSIONAL ENGINEER

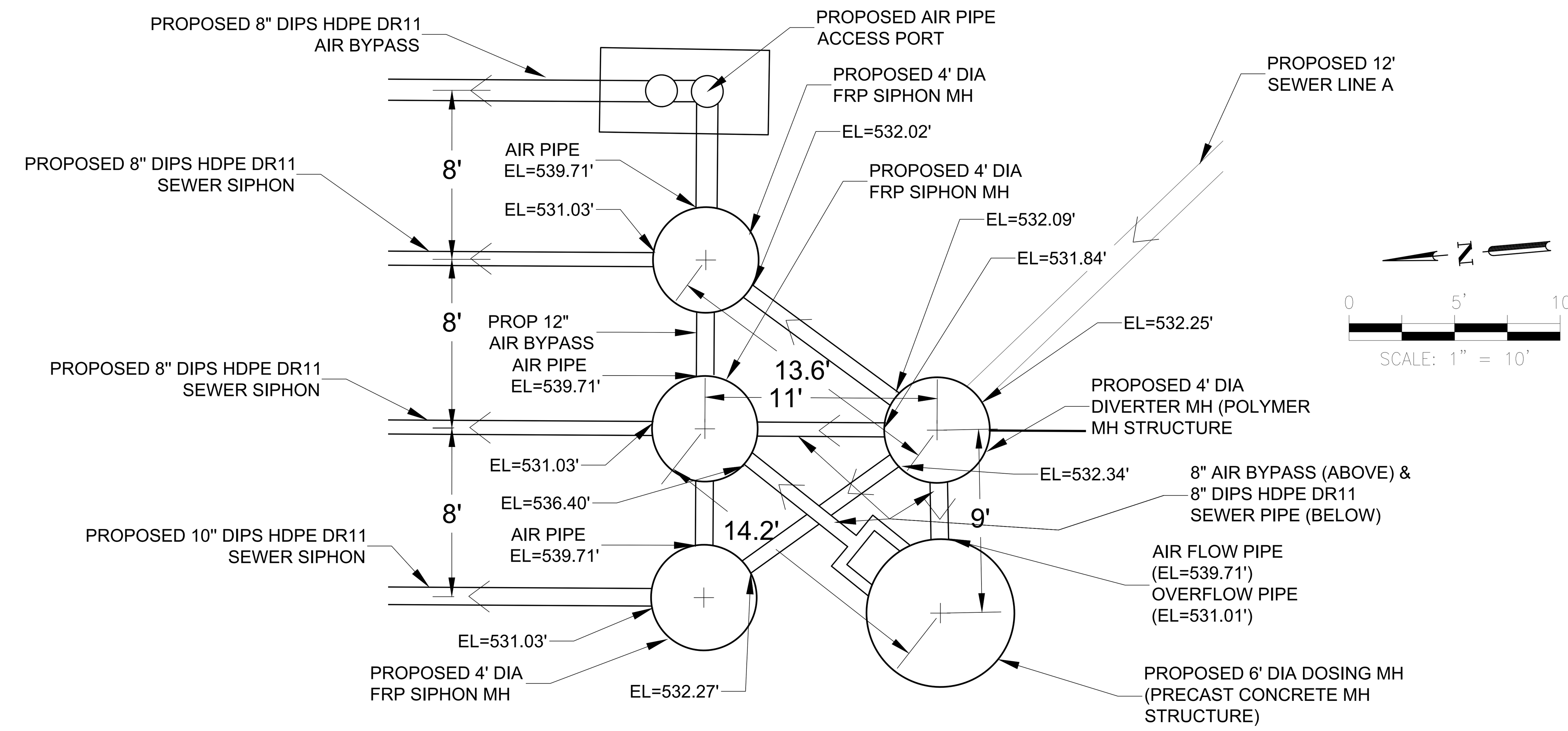
VERDIN
SIPHON DETAILS 1

SHEET

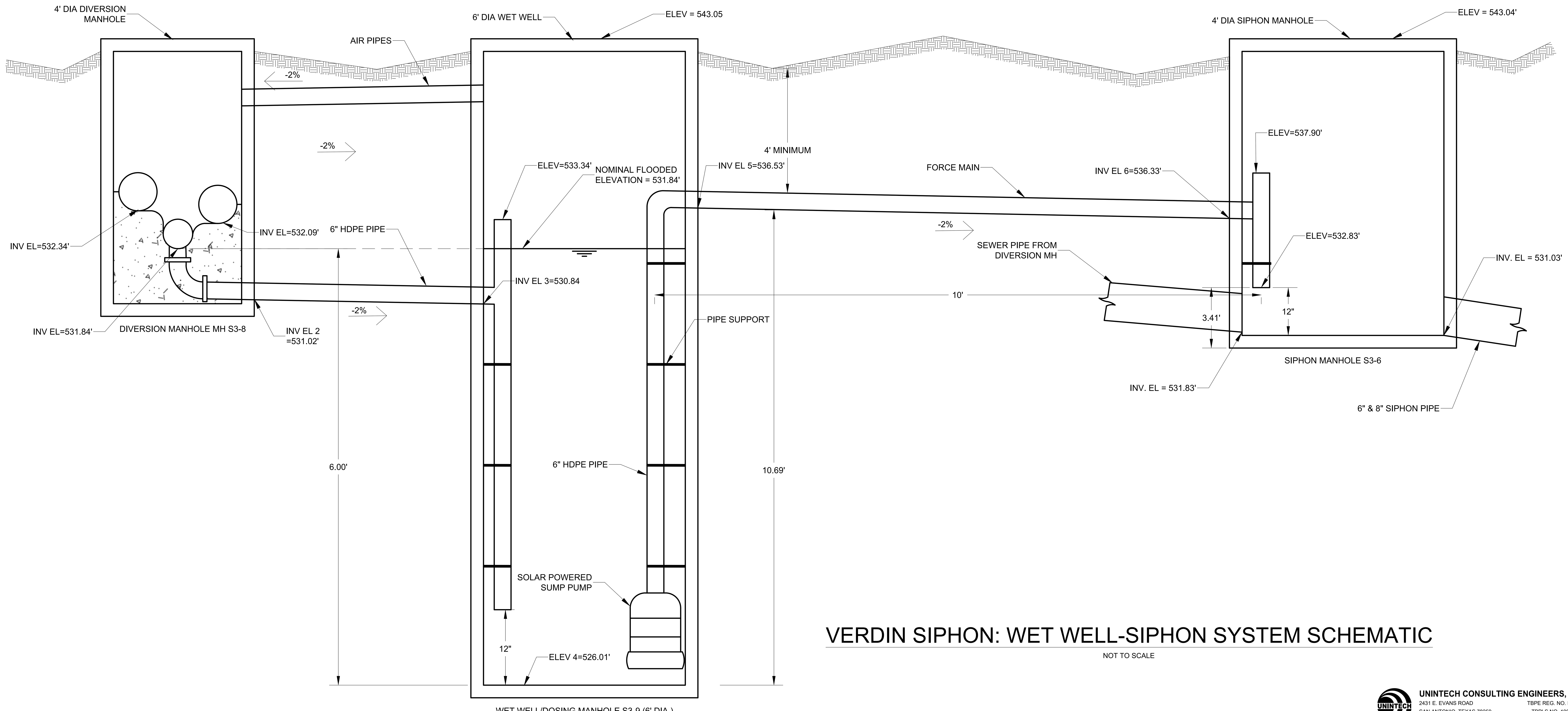
C2.5



VERDIN SIPHON DOWNSTREAM MANHOLES



VERDIN SIPHON UPSTREAM MANHOLES



VERDIN SIPHON: WET WELL-SIPHON SYSTEM SCHEMATIC

NOT TO SCALE

UNINTECH CONSULTING ENGINEERS, INC.
2431 E. EVANS ROAD
SAN ANTONIO, TEXAS 78259
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TBPE REG. NO. F-5499
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WWW.UNINTECH.COM

NO.	DATE	REVISIONS DESCRIPTION	BY

DATE:
CHKD. BY:
DWN. BY:
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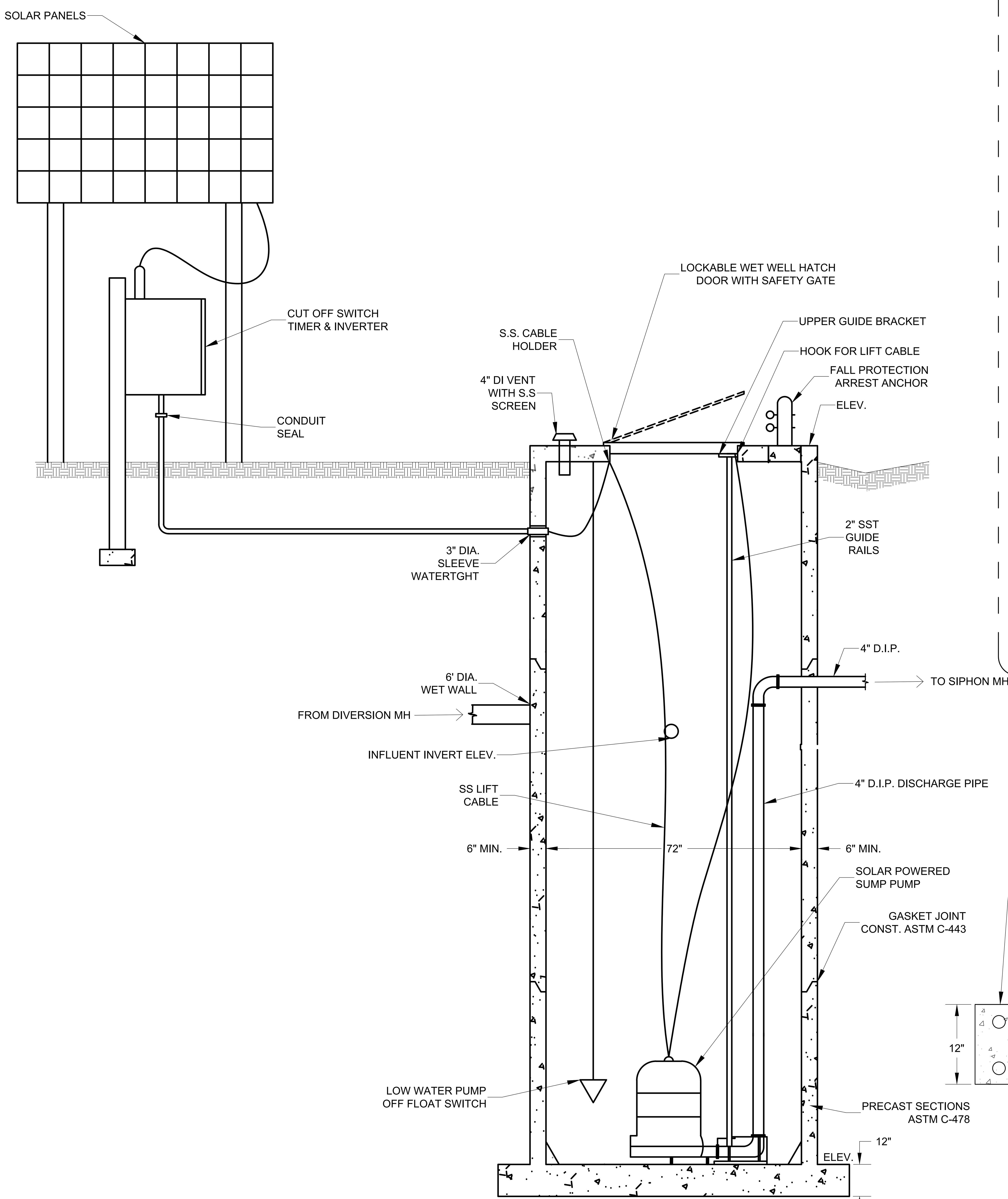
6/25/2024
STATE OF TEXAS
JIAN JIAO
145329
LICENSED
PROFESSIONAL ENGINEER

VERDIN SIPHON
SIPHON DETAILS 2

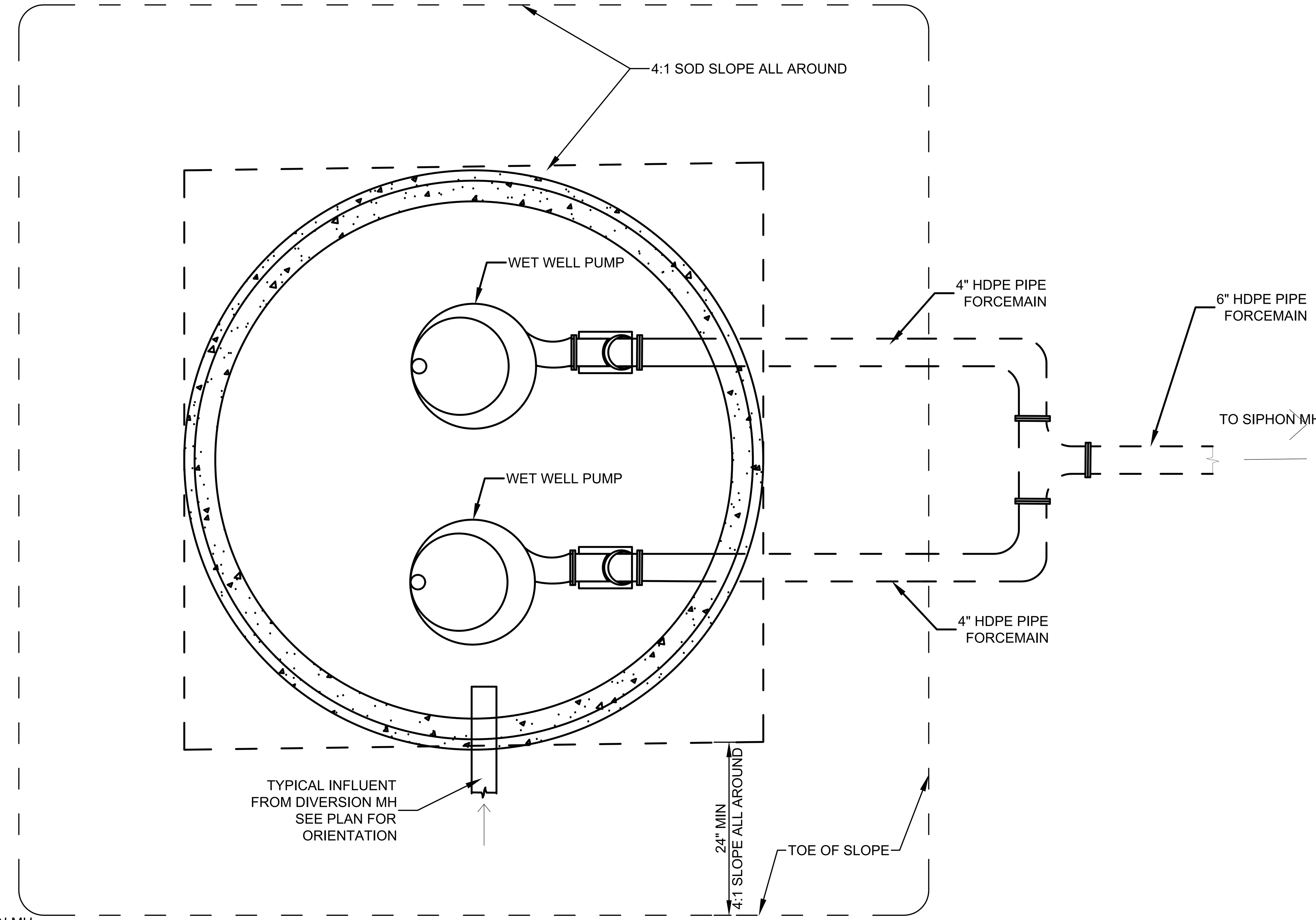
SHEET
C2.6



PUMP MANUFACTURER		VOLTAGE/PHASE	SEE SHT C3.22	ALARM	N/A
PUMP MODEL NUMBER		PUMP RATE - G.P.M.	SEE SHT C3.22	BOTH PUMPS ON	12 PM & 4 PM
PUMP H.P.	7 MIN.	T.O.H.	10 FT	LEAD PUMP ON	N/A
PUMP R.P.M.	1735	F.M. LENGTH	APPROX 14'	BOTH PUMPS OFF	6" ABOVE INTAKE
IMPELLER SIZE		F.M. SIZE	4" DIA.	CONCRETE	4,000 PSI
		TYPE OF F.M. PIPE	HDPE	STEEL	ASTM A-615, GRADE 60
				TRAFFIC LOAD	H-20

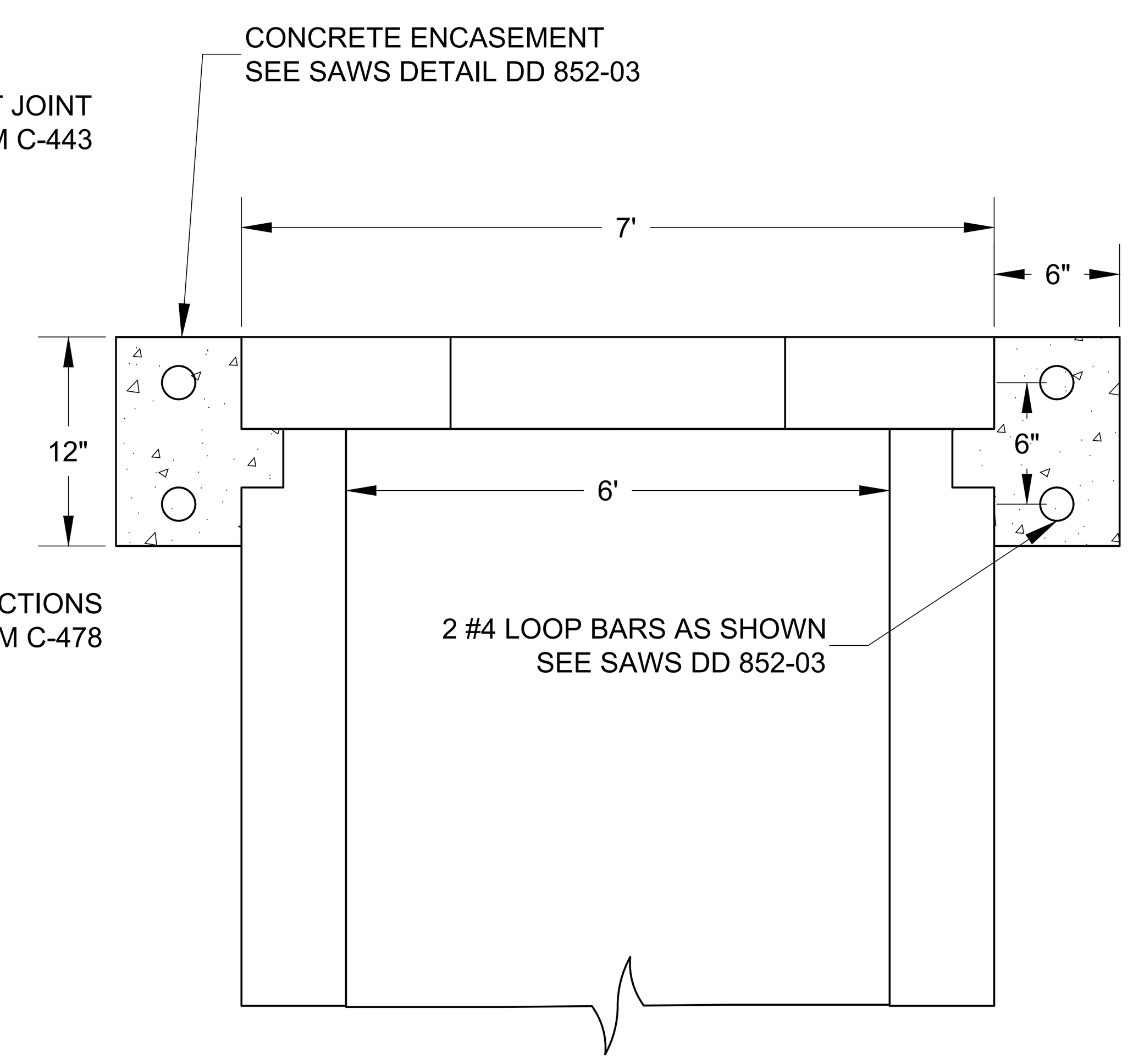
TYPICAL WET WALL & VALVE VAULT SECTION

NOT TO SCALE



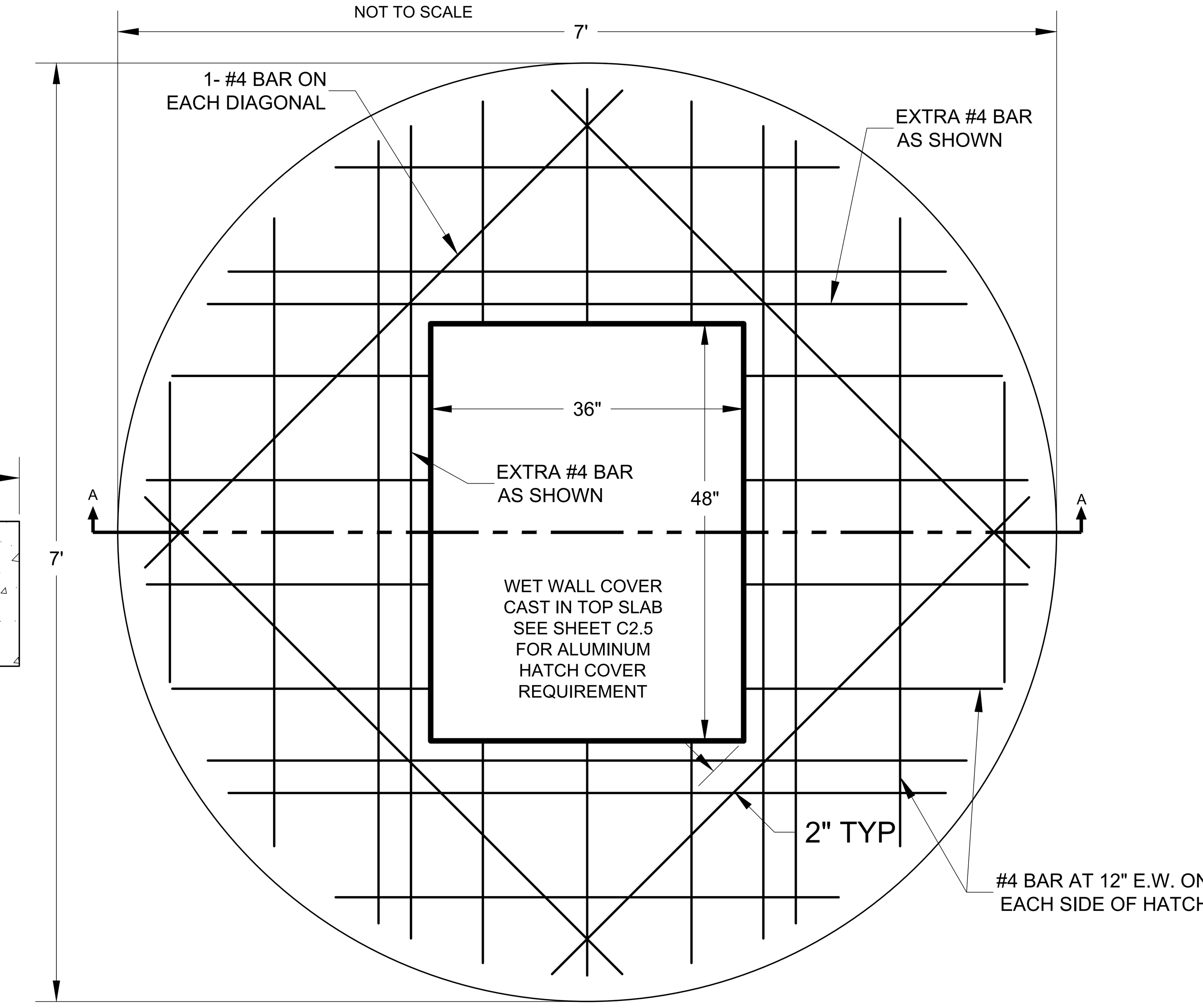
TYPICAL WET WALL & VALVE VAULT PLAN VIEW

NOT TO SCALE



SECTION A-A

NOT TO SCALE



PLAN VIEW TYPICAL WET WALL COVER

NOT TO SCALE

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REVISIONS

NO.	DATE	DESCRIPTION	BY

PROJ. # | DGN. BY: | DWN. BY: | CHKD. BY: | DATE:

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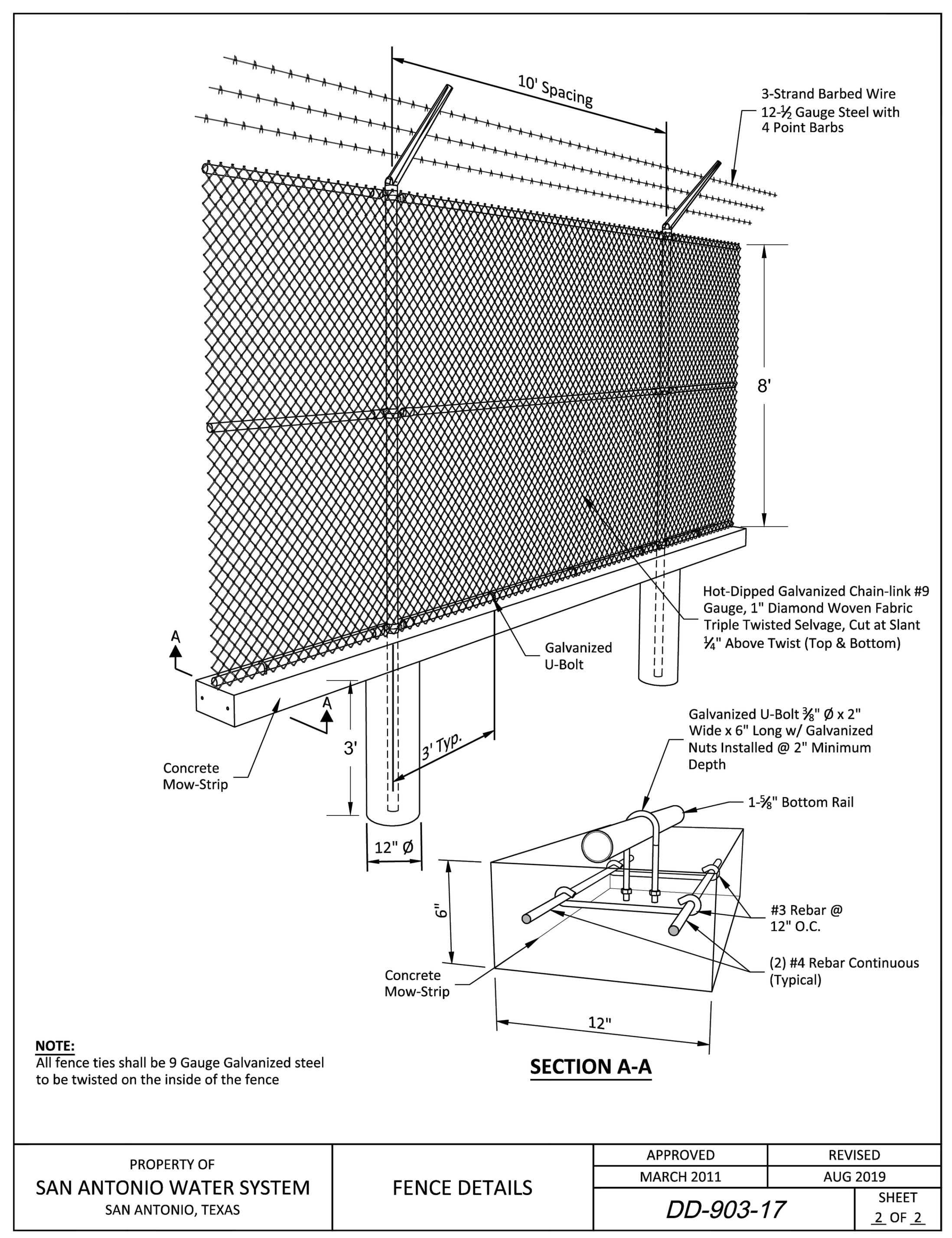
Solar Sump Pump System Requirements

1. Design Codes/Standards:
   - A. The design of solar panels and support structures shall be in accordance with the International Building Code, 2021 edition with the city of San Antonio amendments.
   - B. ASCE/SEI 7-16 minimum design loads for utility structures, with Supplement 1.
   - C. ACI 318-19, Building Code Requirements for structural concrete.
   - D. Solar panels and support structures shall be designed for:
     - a. Wind Load: 90 MPH, Exposure “C”
     - b. Snow Load: 20 PSF
   - E. Structural steel members shall conform to ASTM A992, A36 steel.
   - F. Structural steel members shall be hot dip galvanized. Touch up with cold galvanizing compound any scratches where coatings are applied.
2. Solar Panels:
   - A. Solar Panels shall be Monocrystalline Solar Panels, sized to deliver a minimum of 12,000 watts. The sewage pumps shall run directly on solar panels without the need for any battery.
   - B. Trees and shrubs shall be removed or trimmed back a minimum of 12 feet away from Solar Panels (N.S.P.I.)
   - C. The elevation of all concrete slabs shall be elevated 6” above finished grade.
   - D. Solar panels shall be installed a minimum of 50 feet away from existing utility power lines.
   - E. Solar pump system shall be electrically grounded.
   - F. Electrical materials and apparatus must comply with all applicable tests, ratings, specifications, and requirements. Underwriter's Laboratories, Inc. (UL) listed electrical components or assemblies must be used and must bear the approved device label of UL. Motors must comply with all applicable referenced standards, and they must be designed for continuous submerged service in accordance with the National Electrical Code (NEC) and National Electrical Manufacturers Association (NEMA) standards.
   - G. Transfer switches, motor controls, inverters, load centers, and wiring gutters shall be mounted on a single rack. Mounting rack shall be constructed of type 304 stainless steel strut, 1-1/2” minimum, mounted on a minimum 4-inch diameter and ½-inch thick hot dip galvanized structural steel tube. Approved manufacturers: UNISTRUT, Kindorf, and B-Line. Touch up with cold galvanizing compound any scratches where coatings are applied. Close all exposed tube ends with proper size PVC plug caps. Do not use the electrical service pole for support.
   - H. All underground electrical conduits shall be grey, rigid nonmetallic conduit (RNC). Field bending of conduits is not permitted. Only factory fabricated conduit bends are allowed. Buried conduits shall have a cover depth of 18 to 24 inches beneath the finished surface. Conduit shall comply with minimum NEC bend radius and not bend or kinked.
   - I. All exposed conduits shall be rigid aluminum. To avoid tripping hazards, conduits must be buried and/or embedded in concrete slabs.
   - J. Do not run overhead wires over wet well.
   - K. Installation must comply with the latest editions of the NEC, National Fire Protection Association (NFPA) 70, NFPA 79, the National Electrical Safety Code (NESC), and all applicable state, municipal, and local codes. Work must be subject to inspection and approval requirements of the local authority having jurisdiction.
   - L. Solar pump system shall be a complete Turnkey System and shall include Operation & Maintenance Manual (O&M), Field Start-up demonstration, and Spare Parts List.
   - M.Solar pump system shall have a minimum of two-year warranty on the materials, fabrication, and workmanship of any and all items furnished and installed. The Contractor and Solar Pump System manufacturer must guarantee all work and rectify any defects due to faulty materials or workmanship during the warranty period. The Contractor and Solar Pump System manufacturer must also pay for damage to other work resulting from faulty materials or workmanship which occurs within said period. Warranty periods shall commence upon written acceptance of the component or appurtenance by the San Antonio Water System (SAWS).
3. Sewage Pump:
   - A. Sewage Pumps shall be submersible duplex capable of emptying the wet well twice a day at 10:00 am and at 4 pm, at a minimum flow rate of 230 GPM, at a Total Dynamic Head (TDH) of 15 ft.
   - B. Sewage Pump(s) shall be a minimum of 3 HP each, and capable of delivering the required flow rate.
   - C. Maximum vertical lift (Safety Shut-off) at _30_ft head.
   - D. Provide automatic "On" switch at programable set time of day. Pump(s) shall automatically turn on twice a day every day at specified time.
   - E. Provide automatic low level “Shut off” float switch at _6_ inch above intake.
   - F. Pumps shall be electric, centrifugal non-clogging units capable of passing 3-inch diameter incompressible spheres and shall have no less than 4-inch diameter suction and discharge openings.
   - G. Impellers shall consist of cast stainless steel or ductile iron. Mechanical Seals shall consist of Tungsten Carbide.
   - H. Pumps shall be capable of meeting all system hydraulic conditions without overloading the motors.
   - I. Install sump pump per manufacturer's instructions.
   - J. Install check valves to prevent sewer/water from reentering the sump well through the pumps.

Wet Well Requirements:

1. Pumps shall be readily removable and replaceable without dewatering the wet well or disconnecting any piping in the wet well.
2. Provide guide rail assembly with stainless steel chain for easy removal and servicing of pumps. Every integral component of the guide system shall be stainless steel 316, which includes the following but not limited to: guide rails, brackets, fittings, bolts, nuts, fasteners, adapters, attachments, etc. Flanged discharges are not allowed.
3. Install stainless steel float bracket. Level control device and float switch shall be fully accessible without the need for personnel entering the wet well.
4. Provide automatic timer for pump to empty the wet well twice a day.
5. Provide mechanical float switch for low water shut-off.
6. Wet well shall be vented.
7. Wet well shall be anchored to prevent floating.
8. All electrical equipment/panels and controls shall be above ground.
9. All cables shall be continuous (no splices allowed) and intended for wastewater service applications.
10. Provide lockable aluminum hatch covers with anti-slip top surface for access to the wet well, pumps, floats, and level control devices. Minimum hatch dimensions shall be 3 feet by 4 feet, or as required; allowing plentiful clearance for removal of submersible pumps and access to the wet well. Hatch safety grates shall be installed to provide fall protection and shall consist of aluminum material. Safety Grate shall be designed to have gaps of not more than 5 inches, and be flush with the top of the wet well concrete slab. Black and yellow strips shall be painted around the access hatch using Epoxy Enamel (Tnemec, or equal) coating system. A “Caution! Fall Hazard” sign shall be painted/stenciled on all four sides of the hatch. Coating requirements and thickness shall be in accordance with Manufacturer's recommendations.
11. No fixed ladders are permitted in the wet well.
12. Contractor shall submit Operation and Maintenance procedures for the Siphon System before construction.
13. Provide special shoring as required (NSPI).
14. Pressure pipe and forcemains shall be HDPE pipe in accordance with Item 848 Sanitary Sewer, paragraph 848.4.3.
15. The stainless steel removable pipe plug and wet well system may be removed when sewer flow depth at daily peak flow reaching 12" deep inside the diversion manhole, or EDU of the sewer system reached 663 units.



Solar Pump Spec

Solar Panel Specifications

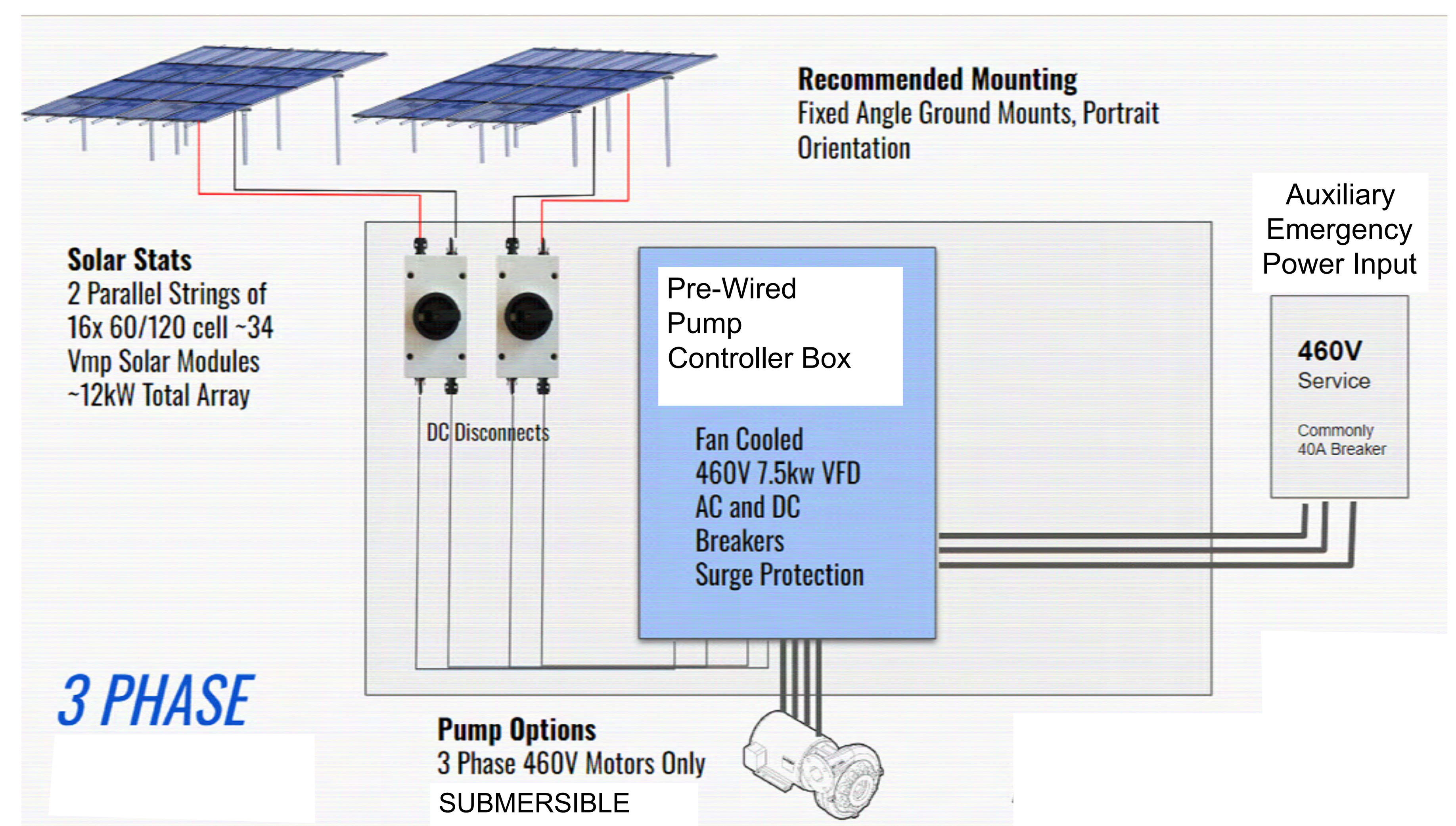
Maximum Power	Pm	370W
Open-Circuit Voltage	Voc	41.1V
Short-Circuit Current	Isc	11.26A
Maximum Power Voltage	Vmp	34.9V
Maximum Power Current	Imp	10.6A
Power Tolerance	0~+3%	

All technical data at standard test condition

(E=1000W/m². Tc=25°C, AM=1.5)

Maximum System Voltage	DC	1000V
Module Application	Class A	
Nom Operating Cell Temp (NOCT)	47±2°C	
Temperature Cycling Range	-40°C to +85°C	
Weight	21kg/46.3lbs	
Dimensions	1755x1038x35mm 69.1"x40.9"x1.4"	
Cell Technology	Mono-Si 20.3%	

TYPICAL SOLAR PANEL INSTALLATION



TYPICAL SOLAR SUMP PUMP DIAGRAM

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