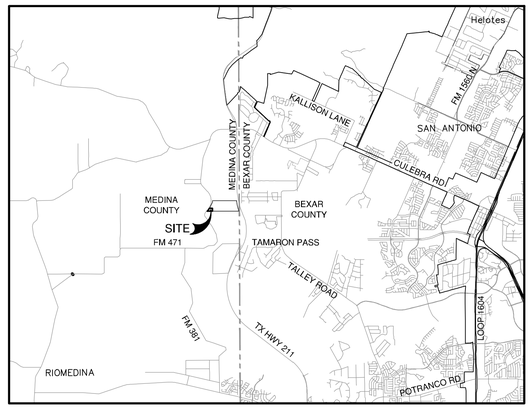
MANGOLD TRACT LIFT STATION

SAN ANTONIO, TEXAS

CIVIL CONSTRUCTION PLANS

SAWS JOB NO. 25-1546



LOCATION MAP
NOT-TO-SCALE

PREPARED FOR:

JEN TEXAS 33 LLC
8023 VANTAGE DRIVE, SUITE 220
SAN ANTONIO, TX 78230

AUGUST 2025

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

Sheet List Table

PD JOB NO. 12537-11 MANGOLD LIFT STATION

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SAWS GENERAL CONSTRUCTION NOTES

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 CONSTRUCTION."
   E. CURRENT CITY OF SAN ANTONIO "UTILITY EXCAVATION CRITERIA MANUAL." (UECM).

2. THE CONTRACTOR SHALL OBTAIN SAWS STANDARD DETAILS FROM SAWS WEBSITE, HTTP://WWW.SAWS.ORG/BUSINESS_CENTER/SPECS. UNLESS OTHERWISE NOTED WITHIN DESIGN PLANS.

3. THE CONTRACTOR IS TO NOTIFY AND MAKE ARRANGEMENTS WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-3500, AND PROVIDE NOTIFICATION PROCEDURES THE CONTRACTOR WILL USE TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS 72 HOURS PRIOR TO EXCAVATION.

4. LOCATIONS AND DEPTHS OF EXISTING UTILITIES AND SERVICE LATERALS SHOWN ON THE PLANS ARE UNDERSTOOD TO BE APPROXIMATE. ACTUAL LOCATIONS AND DEPTHS MUST BE FIELD VERIFIED BY THE CONTRACTOR AT LEAST 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.

5. 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:

   SAN ANTONIO WATER SYSTEM:
   SAWS UTILITY LOCATES: HTTP://WWW.SAWS.ORG/SERVICE/LOCATES

   COSA DRAINAGE 210-207-8048
   COSA TRAFFIC SIGNAL OPERATIONS 210-207-7720
   TEXAS STATE WIDE ONE CALL LOCATOR 1-800-545-6005 OR 811

6. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION AS A RESULT OF DAMAGES DONE BY THE PROJECT'S CONSTRUCTION.

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

8. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.

9. THE CONTRACTOR SHALL NOT PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN PERMIT.

10. ANY WORK COMPLETED WITHOUT PRIOR WRITTEN AUTHORIZATION WHICH IS NOT INCLUDED IN THESE PLANS AND SPECIFICATIONS WILL NOT BE COMPENSATED BY THE SAN ANTONIO WATER SYSTEM.

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. PRE CON SITE VIDEO: BEFORE THE START OF ANY CONSTRUCTION. THE SITE MUST BE VIDEO RECORDED BY THE CONTRACTOR WITH ONE COPY SUBMITTED TO SAWS INSPECTIONS. A PRE-SITE VIDEO WILL PROVIDE ACCURATE DOCUMENTATION OF THE EXISTING CONDITIONS (NSPI).

13. POWER POLE BRACING: CONTRACTORS SHOULD BE ADVISED THAT THERE ARE EXISTING OVERHEAD UTILITY POLES ALONG THE PROJECT CORRIDOR. CONTRACTORS SHOULD FURTHER BE ADVISED THAT IF THE DISTANCE FROM THE OUTSIDE FACE OF A UTILITY TRENCH TO THE FACE OF A UTILITY POLE IS LESS THAN 5 FEET, SAID UTILITY POLE IS SUBJECT TO BRACING, BASED ON A DETERMINATION MADE BY UTILITY POLE OWNER. COSTS INCURRED BY CONTRACTOR FOR BRACING OF THESE UTILITY POLES IS SUBSIDIARY TO THAT RESPECTIVE UTILITY COMPANY'S WORK. IT IS ADVISABLE FOR THE CONTRACTOR TO REVIEW THE CONSTRUCTION DOCUMENTS, AND VISIT THE CONSTRUCTION SITE TO DETERMINE POTENTIAL IMPACTS.

14. CONSTRUCTION SEQUENCING: IT IS THE CONTRACTOR SOLE RESPONSIBILITY TO SCHEDULE SEQUENCING FOR REMOVAL AND INSTALLATION OF EXISTING AND PROPOSED SAWS UTILITIES IN CONJUNCTION WITH GENERAL PROJECT CONSTRUCTION. SEQUENCE OF CONSTRUCTION ACTIVITIES SHALL BE CONSIDERED IN ORDER TO MINIMIZE THE EXTENT AND DURATION OF DISTURBANCES.

SEWER SECTION:

15. 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 210-704-SAWS (210-704-7297). 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) ND 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.

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.

19. THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING OF SEWAGE AROUND EACH SEGMENT OF PIPE TO BE REPLACED, IN ACCORDANCE WITH SAWS SPECIAL SPECIFICATION ITEM NO. 864-S1, "BYPASS PUMPING SMALL DIAMETER SANITARY SEWERS" AND ITEM NO. 864-S2, "BYPASS PUMPING LARGE DIAMETER SANITARY SEWERS". PAYMENT FOR SUCH WORK WILL BE MADE UNDER THE BID ITEM "SANITARY SEWER (BYPASS PUMPING)" (LUMP SUM) AS PER SAWS SPECIAL SPECIFICATION.

20. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING FORCE MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS CONSTRUCTION INSPECTION DIVISION AT 210-233-3500 AND/OR SAWS PRODUCTION GROUPS AT LEAST ONE WEEK OR MORE 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.

21. 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 PROJECTS IMPROVEMENTS (NSPI).

22. SMART MANHOLE COVERS: THE CONTRACTOR SHALL NOTIFY JUAN C. RAMIREZ AT 210-233-3558 AND SAWS EOC AT 210-704-SAWS (210-233-7297) A MINIMUM OF 72 HOURS, NOT COUNTING WEEKENDS OR SAWS HOLIDAYS, BEFORE WORKING ON THE PIPE OR MANHOLE, IN ORDER TO HAVE SAWS REMOVE THE SMART COVER. ANY DAMAGE DONE TO THE SMART COVER WILL BE CHARGED TO THE CONTRACTOR THROUGH A CHANGE ORDER.

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 (9) FEET OF THE WATER LINE SHALL BE CONSTRUCTED USING 160 PSI PRESSURE RATED HDPE 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 160 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 DUCTILE IRON OR C900 PVC PIPE WITH A MINIMUM PRESSURE RATING OF 160 PSI WITHIN NINE FEET OF THE WATER MAIN, SHALL BE PLACED NO CLOSER THAN SIX (6") 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 DUCTILE IRON OR C900 PVC PIPE WITH A MINIMUM PRESSURE RATING OF 160 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.

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

ADDITIONAL GENERAL NOTES

1. PROJECT SPECIFICATIONS TAKE PRECEDENCE OVER PROJECT PLANS. SPECIAL CONDITIONS TAKE PRECEDENCE OVER SPECIFICATIONS AND PLANS. ADDENDUMS TAKE PRECEDENCE OVER ALL.

2. CONTRACTOR IS RESPONSIBLE FOR ALL SITE SAFETY CONSIDERATIONS.

EXCAVATION

1. 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. THE CONTRACTOR'S IMPLEMENTATION OF THE SYSTEMS, PROGRAMS AND/OR PROCEDURES SHALL PROVIDE FOR ADEQUATE TRENCH EXCAVATION SAFETY PROTECTION THAT COMPLIES WITH AS A MINIMUM, OSHA STANDARDS FOR TRENCH EXCAVATIONS. 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.

2. CONTRACTOR IS RESPONSIBLE FOR REMOVAL OF ALL WASTE MATERIALS UPON PROJECT COMPLETION. THE CONTRACTOR SHALL NOT PERMANENTLY PLACE ANY WASTE MATERIALS IN THE 100-YEAR FLOOD PLAIN WITHOUT FIRST OBTAINING AN APPROVED FLOOD PLAIN DEVELOPMENT PERMIT.

3. WATER JETTING THE BACKFILL WITHIN A STREET WILL NOT BE PERMITTED. EXPLOSIVES AND BLASTING ARE NOT PERMITTED.

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY LIFT STATIONS AND FORCE MAINS GENERAL CONSTRUCTION NOTES

1. THIS LIFT STATION AND/OR FORCE MAIN MUST BE CONSTRUCTED IN ACCORDANCE WITH 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C), THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY (TCEQ) EDWARDS AQUIFER RULES, AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.

2. ANY MODIFICATION TO THE ACTIVITIES DESCRIBED IN THE REFERENCED LIFT STATION/FORCE MAIN (LSFM) SYSTEM APPLICATION FOLLOWING THE DATE OF APPROVAL MAY REQUIRE THE SUBMITTAL OF A LSFM SYSTEM APPLICATION TO MODIFY THIS APPROVAL, INCLUDING THE PAYMENT OF APPROPRIATE FEES AND ALL INFORMATION NECESSARY FOR ITS REVIEW AND APPROVAL.

3. A WRITTEN NOTICE OF CONSTRUCTION MUST BE SUBMITTED TO THE PRESIDING TCEQ REGIONAL OFFICE AT LEAST 48 HOURS PRIOR TO THE START OF ANY REGULATED ACTIVITIES. THIS NOTICE MUST INCLUDE:
   - THE NAME OF THE APPROVED PROJECT;
   - THE ACTIVITY START DATE; AND
   - THE CONTACT INFORMATION OF THE PRIME CONTRACTOR.

4. UPON COMPLETION OF ANY LIFT STATION EXCAVATION, A GEOLOGIST MUST CERTIFY THAT THE EXCAVATION HAS BEEN INSPECTED FOR THE PRESENCE OF SENSITIVE FEATURES. THE CERTIFICATION MUST BE SIGNED, SEALED, AND DATED BY THE GEOLOGIST PREPARING THE CERTIFICATION. CERTIFICATION THAT THE EXCAVATION HAS BEEN INSPECTED MUST BE SUBMITTED TO THE APPROPRIATE REGIONAL OFFICE.
   - IF SENSITIVE FEATURE(S) ARE IDENTIFIED, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY AND MAY NOT PROCEED UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT ANY SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY FROM THE LIFT STATION.
   - CONSTRUCTION MAY CONTINUE IF THE GEOLOGIST CERTIFIES THAT NO SENSITIVE FEATURE OR FEATURES WERE PRESENT.

5. IF ANY SENSITIVE FEATURES ARE DISCOVERED DURING THE WASTEWATER LINE TRENCHING ACTIVITIES, ALL REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MUST BE SUSPENDED IMMEDIATELY. THE APPLICANT MUST IMMEDIATELY NOTIFY THE APPROPRIATE REGIONAL OFFICE OF THE TCEQ OF THE FEATURE DISCOVERY. A GEOLOGIST'S ASSESSMENT OF THE LOCATION AND EXTENT OF THE FEATURE DISCOVERED MUST BE REPORTED TO THAT REGIONAL OFFICE IN WRITING WITHIN TWO WORKING DAYS. THE APPLICANT MUST SUBMIT A PLAN FOR ENSURING THE STRUCTURAL INTEGRITY OF THE SEWER LINE OR FOR MODIFYING THE PROPOSED COLLECTION SYSTEM ALIGNMENT AROUND THE FEATURE. THE REGULATED ACTIVITIES NEAR THE SENSITIVE FEATURE MAY NOT PROCEED UNTIL THE EXECUTIVE DIRECTOR HAS REVIEWED AND APPROVED THE METHODS PROPOSED TO PROTECT THE SENSITIVE FEATURE AND THE EDWARDS AQUIFER FROM ANY POTENTIALLY ADVERSE IMPACTS TO WATER QUALITY WHILE MAINTAINING THE STRUCTURAL INTEGRITY OF THE LINE.

6. ALL FORCE MAIN LINES MUST BE TESTED IN ACCORDANCE WITH 30 TAC §217.68. TESTING METHOD WILL BE:
   - A PRESSURE TEST MUST USE 50 POUNDS PER SQUARE INCH ABOVE THE NORMAL OPERATING PRESSURE OF A FORCE MAIN.
   - A TEMPORARY VALVE FOR PRESSURE TESTING MAY BE INSTALLED NEAR THE DISCHARGE POINT OF A FORCE MAIN AND REMOVED AFTER A TEST IS SUCCESSFULLY COMPLETED.
   - A PUMP ISOLATION VALVE MAY BE USED AS AN OPPOSITE TERMINATION POINT.
   - A TEST MUST INVOLVE FILLING A FORCE MAIN WITH WATER.
   - A PIPE MUST HOLD THE DESIGNATED TEST PRESSURE FOR A MINIMUM OF 4.0 HOURS.
   - THE LEAKAGE RATE MUST NOT EXCEED 10.0 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER DAY. THE FOLLOWING EQUATION MUST BE USED TO CALCULATE THE ACCEPTABLE LEAKAGE RATE IN GALLONS PER HOUR PER 1,000 FEET OF PIPE.

FIGURE: 30 TAC §217.68(g)

EQUATION C.5.

$$L = \frac{SD\,P}{155{,}400}$$

WHERE:
L = ACCEPTABLE LEAKAGE RATE (GALLONS/HOUR/1,000 FEET OF PIPE, BASED ON A LEAKAGE RATE OF 10.0 GALLONS PER INCH OF DIAMETER PER MILE OF PIPE PER DAY)
S = LENGTH OF PIPE
D = NOMINAL DIAMETER OF PIPE (INCHES)
P = AVERAGE TEST PRESSURE (POUNDS/SQUARE INCH)

SAN ANTONIO REGIONAL OFFICE
14250 JUDSON ROAD
SAN ANTONIO, TEXAS 78233-4480
PHONE (210) 490-3096
FAX (210) 545-4329

SUPPLEMENTARY NOTES

1. THE CONTRACTOR WILL BE RESPONSIBLE FOR OBTAINING ALL PERMITS.

2. ALL WORK IN THE 100 YEAR FLOODPLAIN SHALL BE ACCOMPLISHED UNDER AN APPROVED FLOODPLAIN PERMIT.

3. CONTRACTOR SHALL PROTECT OR REMOVE AND REPLACE ALL TRAFFIC SIGNS (NSPI).

4. CONTRACTOR SHALL PROTECT OR REMOVE AND REPLACE ALL MAILBOXES (NSPI).

5. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNER IN ADVANCE OF ANY WORK IN THE OWNERS' PROPERTY.

STORM WATER PROTECTION AND EROSION CONTROL NOTES

1. CONTRACTOR SHALL PROVIDE HIS/HER OWN STORM WATER POLLUTION PREVENTION PLAN (SW3P).

2. CONTRACTOR SHALL INSTALL STORM WATER POLLUTION PREVENTION STRUCTURES INCLUDING BUT NOT LIMITED TO, SILT FENCING AND/OR ROCK BERMS IN ALL AREAS TO BE IMPACTED BY CURRENT AND ONGOING CONSTRUCTION AND MAINTAIN SUCH STRUCTURES UNTIL SUITABLE GROUNDCOVER/REVEGETATION IS ACCEPTED. ALL STORM WATER POLLUTION PREVENTION STRUCTURES SHALL BE CONSTRUCTED WITHIN THE COUNTY RIGHT-OF-WAY AND WATER LINE EASEMENTS. ANY FEATURES ON THE PLANS SHOWN OUTSIDE THESE AREAS ARE SHOWN FOR VISUAL CLARITY ONLY.

3. THE LOCATION OF ANY BEST MANAGEMENT PRACTICES (B.M.P.'S) SUCH AS SILT FENCING, ROCK BERMS, STABILIZED CONSTRUCTION ENTRANCE/EXIT, ETC. THAT MAY BE SHOWN ON THESE PLANS ARE SUBJECT TO FIELD VERIFICATION. CONTRACTOR SHALL ADJUST THE LOCATIONS OF B.M.P.'S TO BEST ACCOMMODATE THE CONDITIONS AND TOPOGRAPHY ENCOUNTERED DURING CONSTRUCTION. QUESTIONS REGARDING THE PLACEMENT AND/OR CHANGES CONCERNING B.M.P.'S SHALL BE REFERRED TO THE OWNER AND THE COUNTY. THE CONTRACTOR IS TO ENSURE THAT SEDIMENTATION AND EROSION WILL BE CONTAINED WITHIN THE PROJECT WORK AREAS AND KEPT OFF ROADWAYS AND ADJACENT PROPERTIES AND OUT OF DRAINAGE CHANNELS AND WATER COURSES.

HAULING AND STORAGE

- HAULING AND/OR TEMPORARY STORAGE OF EQUIPMENT AND MATERIALS MAY BE NECESSARY, INCLUDING EXCAVATED MATERIAL AND SPOILS. CONTRACTOR SHALL INCLUDE IN HIS BID PRICE ALL COSTS ASSOCIATED WITH HAULING AND OFF-SITE STORAGE OF ALL MATERIALS AND/OR EQUIPMENT. ALSO REFER TO THE PROJECT SPECIFICATIONS.

EXISTING IMPROVEMENTS

- ALL EXISTING IMPROVEMENTS WITHIN THE PROJECT AREA, WHICH ARE NOT COVERED UNDER THE UNIT PRICE BID PROPOSAL, SHALL BE PROTECTED OR REMOVED AND REPLACED TO EXISTING CONDITION OR BETTER AT NO ADDITIONAL COST TO THE OWNER.

TREE PROTECTION NOTES

1. CONTRACTOR TO PROTECT ALL TREES WHEREVER POSSIBLE. DAMAGE TO TREES IDENTIFIED TO BE PROTECTED WILL BE MITIGATED AT THE CONTRACTOR'S SOLE EXPENSE. ALSO, ALL WORK IN PUBLIC RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH THE CONTROLLING ENTITIES STANDARDS, SPECIFICATIONS AND PERMIT REQUIREMENTS.

2. PROTECT EXISTING TREES SIX INCH (6") DIAMETER AND LARGER. ALL TREES TO BE PRESERVED AS PART OF THE PROJECT SHALL BE PROTECTED AGAINST INJURY OR DAMAGE, INCLUDING CUTTING, SOIL COMPACTION, BREAKING OR SKINNING OF ROOTS, TRUNKS, OR BRANCHES DURING CONSTRUCTION OPERATIONS BY FENCING AS DESCRIBED BELOW. THE TREE PROTECTION SHALL BE PLACED BEFORE ANY EXCAVATION OR GRADING IS BEGUN AND MAINTAINED FOR THE DURATION OF THE CONSTRUCTION WORK. PROTECTION WILL ENCOMPASS THE ROOT PROTECTION ZONE WHICH WILL BE AT MINIMUM ONE FOOT (1.0') RADIUS PER INCH DIAMETER OF THE TREE TRUNK AT 4.5' ABOVE GROUND. NO MATERIAL SHALL BE STORED OR CONSTRUCTION OPERATION SHALL BE CARRIED ON WITHIN THE TREE PROTECTION FENCING, UNLESS AUTHORIZED BY THE OWNER. THE PROTECTION SHALL REMAIN UNTIL ALL WORK IS COMPLETED.

3. NO CONSTRUCTION ACTIVITIES SHALL BE PERFORMED WITHIN 5' FROM THE TRUNK OF A TREE THAT IS PROTECTED. TRENCH SHORING WILL BE REQUIRED INSIDE OF A ROOT PROTECTION ZONE. THE ROOT PROTECTION ZONE IS CALCULATED AS A RADIUS FROM THE TREE TRUNK EQUAL TO ONE FOOT PER DIAMETER INCH OF THE TREE.

4. THIS PROJECT IS SUBJECT TO REGULATIONS ESTABLISHED BY THE CITY OF SAN ANTONIO TREE ORDINANCE.

TEMPORARY LIVESTOCK CONTROL

- WHEN WORKING IN AN AREA WITH LIVESTOCK, THE CONTRACTOR SHALL INSTALL AND MAINTAIN (AT CONTRACTOR'S EXPENSE) THE NECESSARY TEMPORARY FENCING TO KEEP THE LIVESTOCK FROM EXITING THE AREA. ANY ESCAPED LIVESTOCK WILL BE CAPTURED AND RETURNED TO THE AREA AT THE CONTRACTOR'S EXPENSE.

CONTRACTOR STAKING NOTE

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL CONSTRUCTION STAKING AND CUT SHEETS NECESSARY FOR THE CONSTRUCTION OF THE WATER MAIN AND ALL ASSOCIATED APPURTENANCES. ALL CONSTRUCTION SURVEY VERIFICATION AND CONSTRUCTION STAKING SHALL BE PERFORMED BY OR UNDER THE SUPERVISION OF A TEXAS REGISTERED PROFESSIONAL LAND SURVEYOR. THE DESIGN ENGINEER WILL, AT NO ADDITIONAL COST, PROVIDE A DIGITAL PROJECT FILE OF THE PROJECT'S HORIZONTAL AND VERTICAL CONTROL (MINIMUM OF THREE CONTROL POINTS) FOR THE CONTRACTOR. ALL COORDINATES ARE DISPLAYED IN STATE PLANE SURFACE VALUES.

FORCE MAIN NOTES

1. ALL FORCE MAIN PIPE MATERIAL SHALL CONSIST OF HDPE UNLESS OTHERWISE SHOWN ON THE PLANS. PIPE SHALL CONSIST OF HDPE SOLID WALL REFERRED TO AS DRISCO 1000, DRISCO 8600, QUALI PIPE, POLY PIPE, AND PLEXO PIPE THAT IS IN COMPLIANCE WITH ASTM F714. ALL PIPE FITTINGS SHALL BE HIGH DENSITY POLYETHYLENE PIPE AND MADE OF VIRGIN MATERIAL, AND SHALL HAVE A MINIMUM WORKING PRESSURE RATING 200 PSI. HIGH DENSITY POLYETHYLENE MATERIAL SHALL COMPLY WITH PE4710 POLYETHYLENE THAT SHALL MEET OR EXCEED THE REQUIREMENT OF THE ASTM 3350 CELL CLASSIFICATION OF PE445574C/E, TYPE III, GRADE PE47. SOLID WALL PIPE SHALL BE PRODUCED WITH A PLAIN END CONSTRUCTION FOR HEAT-JOINING (BUTT FUSION) CONFORMING TO ASTM 2620, PPI TR-33: NO FLANGED OR SLIP-ON JOINTS WILL BE ACCEPTED. SEE SAWS STANDARD SPECIFICATIONS FOR CONSTRUCTION, ITEM NO. 900: "RECONSTRUCTION OF SANITARY SEWER BY PIPE BURSTING/CRUSHING REPLACEMENT PROCESS", SECTION 900.2.1.

2. COLOR CODING OF FORCE MAIN PIPING METALLIC TAPE (6" WIDE MINIMUM) SHALL BE APPLIED TO ALL FORCE MAIN PIPE. THE METALLIC TAPE SHALL BE LABELED "SEWER PIPE". PIPE SHALL HAVE A MINIMUM OF THREE GREEN STRIPES POSITIONED IN SUCH A MANNER THAT THE STRIPE(S) ARE VISIBLE REGARDLESS OF THE ROTATION OF THE PIPE IN THE TRENCH.

3. ALL FORCE MAINS SHALL BE TESTED IN ACCORDANCE WITH 30 TAC 217.68 AT 50 PSI ABOVE THE NORMAL OPERATING PRESSURE OF THE FORCE MAIN.

4. MINIMIZE THE NUMBER OF PEAKS/VALLEYS ALONG THE FORCE MAIN PROFILE TO LIMIT THE ACCUMULATION OF GASES. ALL HIGH POINTS SHALL HAVE AN AIR AND VACUUM RELEASE VALVE RATED FOR RAW SEWAGE, AS SHOWN ON THE PLANS.

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
8/1/2025

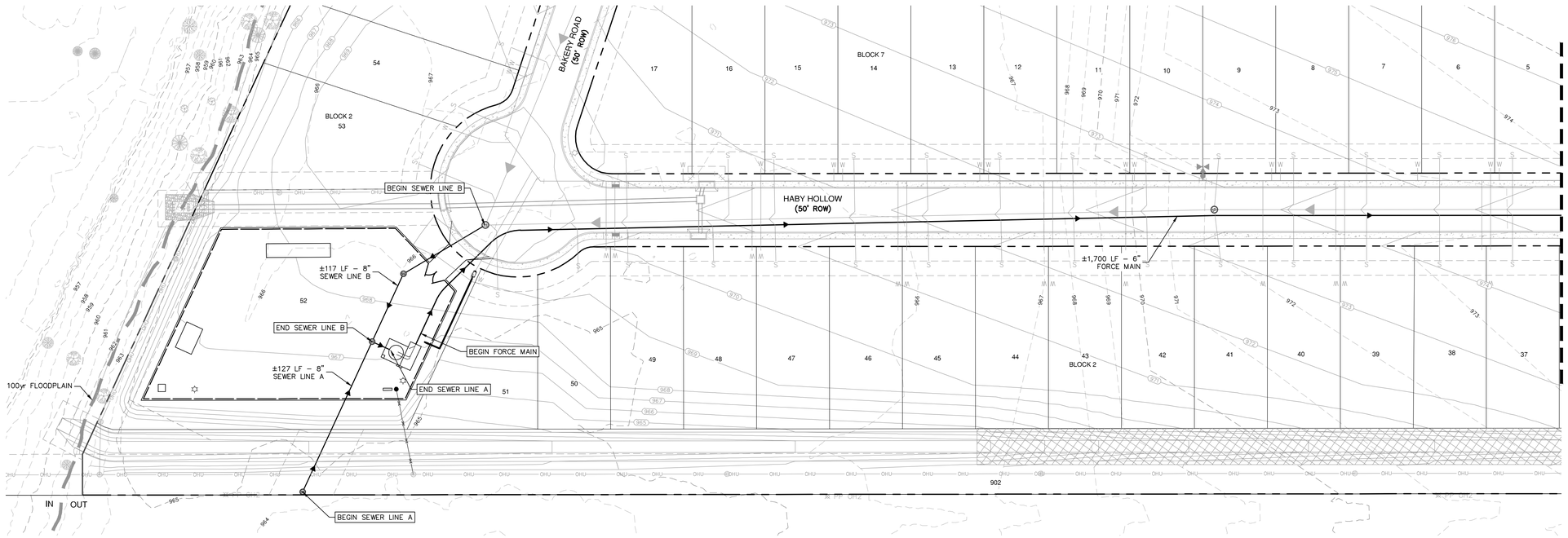
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

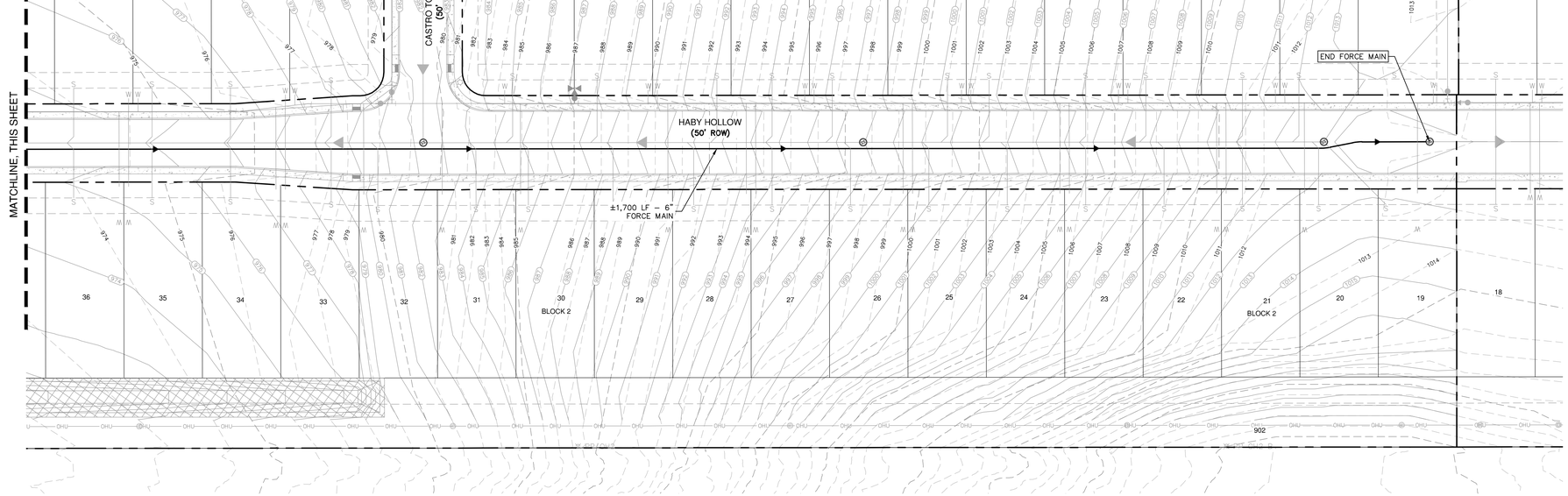
MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

GENERAL CONSTRUCTION NOTES

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C0.10

Date: April 3, 2025, 4:07 PM - User ID: dlaughlin
File: P:\725\37\11\Design\Civil\LS Sheets\GN-125311.dwg





SCALE: 1" = 40'

0' 40' 80' 120'

LEGEND

- PROPERTY/ROW LINE
- LOT LINE
- 100 YR FLOODPLAIN
- 965 EXISTING CONTOUR MAJOR
- 964 EXISTING CONTOUR MINOR
- (965) PROPOSED CONTOUR
- EASEMENT LINE
- OHE OHE OVERHEAD ELECTRIC
- SECURITY FENCE
- PROPOSED SEWER LINE (BY OTHERS)
- PROPOSED MH/SEWER LINE
- PROPOSED FORCE MAIN

NOTE

SEE SHEET C0.10 FOR CONSTRUCTION NOTES.

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SEWER (MEDIO CREEK)

Developer's Name: JEN TEXAS 33 LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 064-600 Total EDU's: 480 Total Acreage 100
703 LF-8" PVC
Total Linear Footage of Pipe: 1,702 LF-6" HDPE (DIPS) FM Plat No.
Number of Lots: 480 SAWS JOB NO. 25-1546

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
8/1/2025

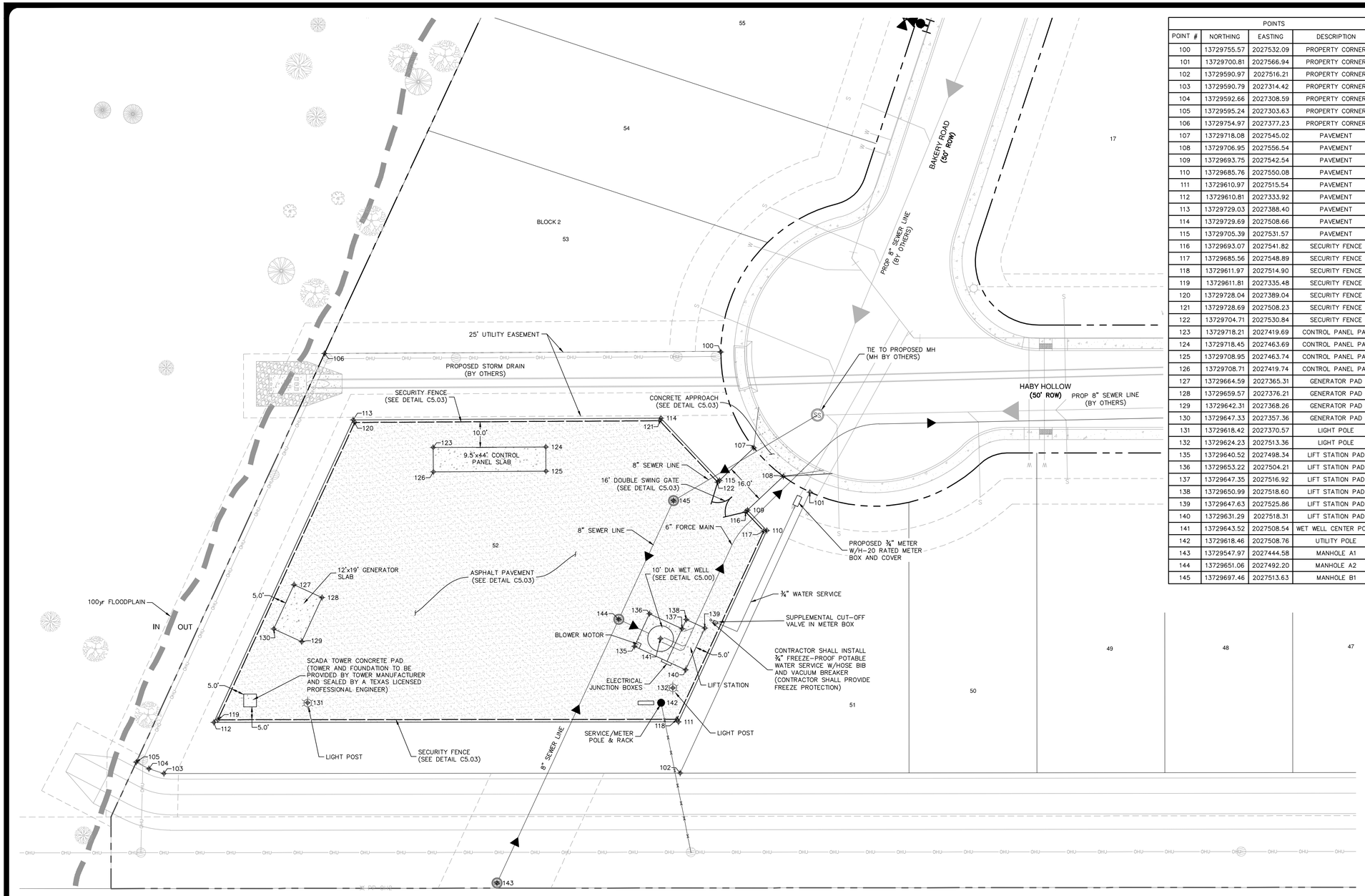
PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

OVERALL SITE PLAN

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C1.00

Date: April 3, 2025, 4:07 PM – User ID: dloughlin
File: P:\125\37\11\Design\Civil\LS Sheets\SP-125311.dwg



POINTS			
POINT #	NORTHING	EASTING	DESCRIPTION
100	13729755.57	2027532.09	PROPERTY CORNER
101	13729700.81	2027566.94	PROPERTY CORNER
102	13729590.97	2027516.21	PROPERTY CORNER
103	13729590.79	2027314.42	PROPERTY CORNER
104	13729592.66	2027308.59	PROPERTY CORNER
105	13729595.24	2027303.63	PROPERTY CORNER
106	13729754.97	2027377.23	PROPERTY CORNER
107	13729718.08	2027545.02	PAVEMENT
108	13729706.95	2027556.54	PAVEMENT
109	13729693.75	2027542.54	PAVEMENT
110	13729685.76	2027550.08	PAVEMENT
111	13729610.97	2027515.54	PAVEMENT
112	13729610.81	2027333.92	PAVEMENT
113	13729729.03	2027388.40	PAVEMENT
114	13729729.69	2027508.66	PAVEMENT
115	13729705.39	2027531.57	PAVEMENT
116	13729693.07	2027541.82	SECURITY FENCE
117	13729685.56	2027548.89	SECURITY FENCE
118	13729611.97	2027514.90	SECURITY FENCE
119	13729611.81	2027335.48	SECURITY FENCE
120	13729728.04	2027389.04	SECURITY FENCE
121	13729728.69	2027508.23	SECURITY FENCE
122	13729704.71	2027530.84	SECURITY FENCE
123	13729718.21	2027419.69	CONTROL PANEL PAD
124	13729718.45	2027463.69	CONTROL PANEL PAD
125	13729708.95	2027463.74	CONTROL PANEL PAD
126	13729708.71	2027419.74	CONTROL PANEL PAD
127	13729664.59	2027365.31	GENERATOR PAD
128	13729659.57	2027376.21	GENERATOR PAD
129	13729642.31	2027368.26	GENERATOR PAD
130	13729647.33	2027357.36	GENERATOR PAD
131	13729618.42	2027370.57	LIGHT POLE
132	13729624.23	2027513.36	LIGHT POLE
135	13729640.52	2027498.34	LIFT STATION PAD
136	13729653.22	2027504.21	LIFT STATION PAD
137	13729647.35	2027516.92	LIFT STATION PAD
138	13729650.99	2027518.60	LIFT STATION PAD
139	13729647.63	2027525.86	LIFT STATION PAD
140	13729631.29	2027518.31	LIFT STATION PAD
141	13729643.52	2027508.54	WET WELL CENTER POINT
142	13729618.46	2027508.76	UTILITY POLE
143	13729547.97	2027444.58	MANHOLE A1
144	13729651.06	2027492.20	MANHOLE A2
145	13729697.46	2027513.63	MANHOLE B1

SCALE: 1" = 20'

0' 20' 40' 60'

LEGEND

- PROPERTY/ROW LINE
- LOT LINE
- 100 YR FLOODPLAIN
- EASEMENT LINE
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- PROPOSED FORCE MAIN
- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

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SEWER (MEDIO CREEK)

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City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map#: 064-600 Total EDU's: 480 Total Acreage: 100
Total Linear Footage of Pipe: 1,702 LF-8" HDPE (DIPS) FM 703 LF-8" PVC Plat No.
Number of Lots: 480 SAWS JOB NO. 25-1546

DATE
NO. REVISION

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
8/1/2025

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

SITE AND DIMENSIONAL CONTROL PLAN

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C2.00

Date: April 3, 2025, 4:08 PM - User ID: dloughlin
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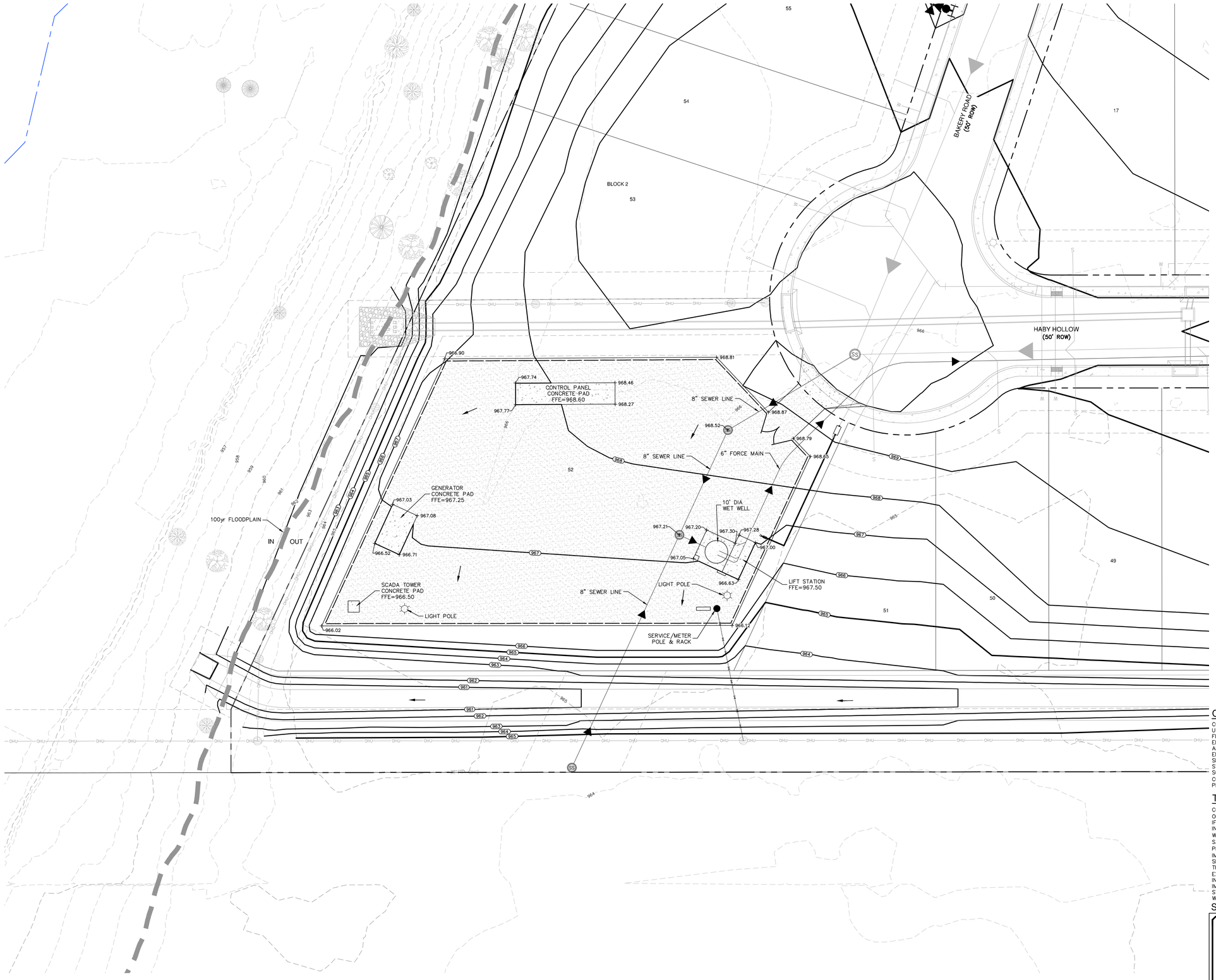

SCALE: 1"= 20'

0' 20' 40' 60'

LEGEND

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- LOT LINE
- 100 YR FLOODPLAIN
- 965 EXISTING CONTOUR MAJOR
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- 968 PROPOSED CONTOUR MINOR
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Number of Lots 480 SAWS JOB NO. 25-1546

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STATE OF TEXAS
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PROFESSIONAL ENGINEER
8/1/2025

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

GRADING PLAN

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C3.00

Date: April 3, 2025, 4:08 PM - User ID: dlaughlin
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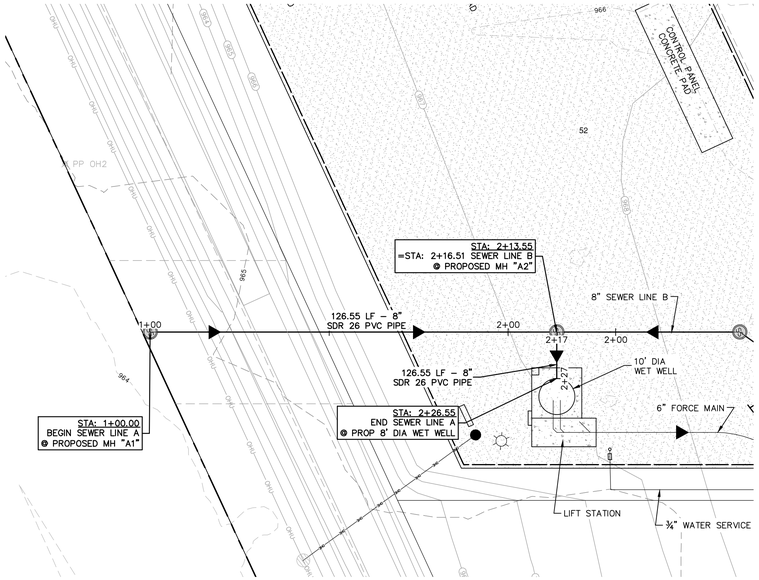

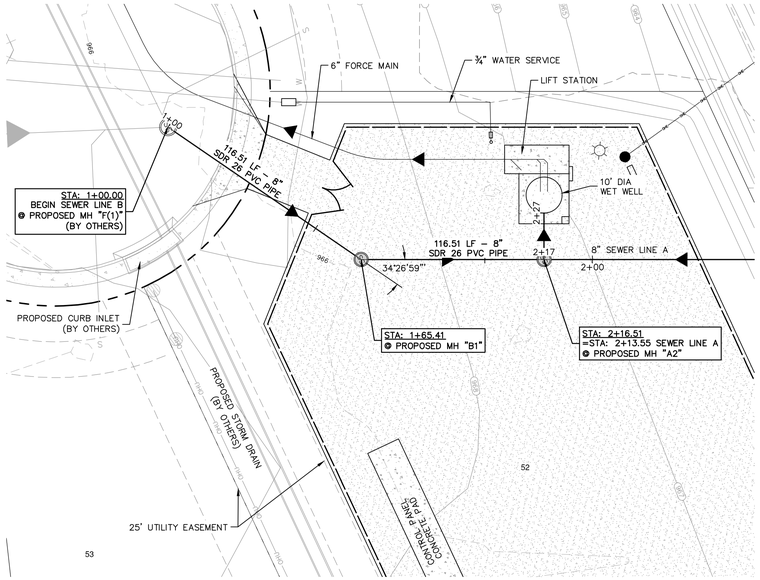

SCALE: 1"= 20'

0' 20' 40' 60'

LEGEND

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- LOT LINE
- 100 YR FLOODPLAIN
- 965 EXISTING CONTOUR MAJOR
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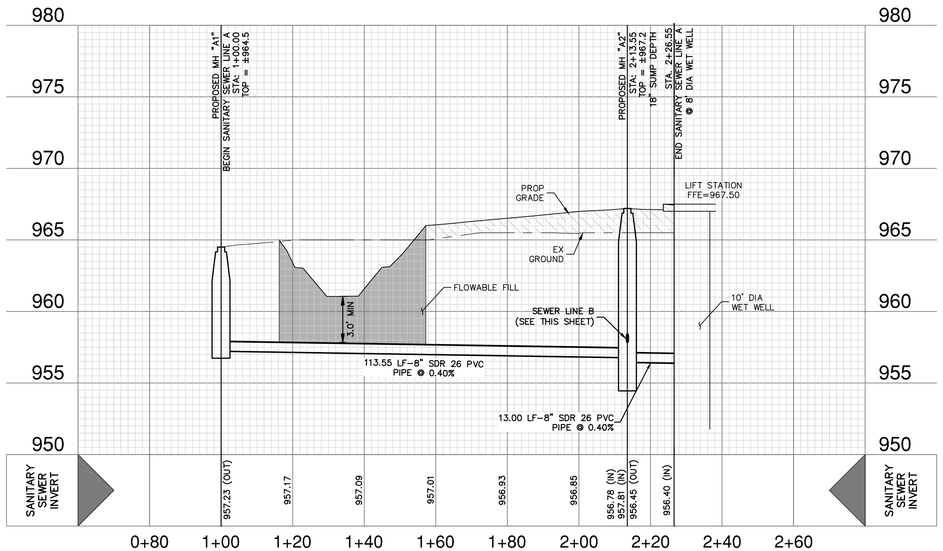
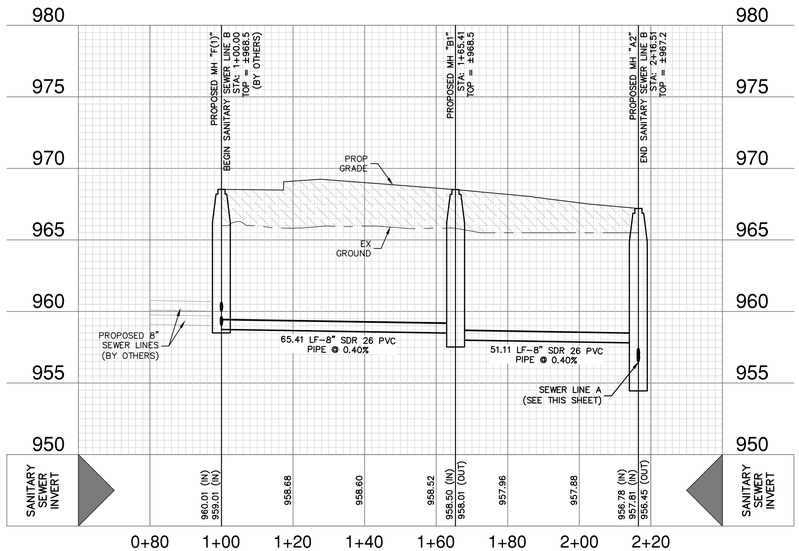
- PROPOSED CONCRETE PAVEMENT
- PROPOSED ASPHALT PAVEMENT

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'

SEWER LINE A STA: 1+00 - 2+32



SEWER LINE B STA: 1+00 - 2+18



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SEWER (MEDIO CREEK)

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City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210–849–1447 FAX#
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Total Linear Footage of Pipe: 1,702 LF–6" HDPE (DIPS) FM 703 LF–8" PVC Plat No.
Number of Lots 480 SAWS JOB NO. 25–1546

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
8/1/2025

PAPE–DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

SEWER LINE A AND B PLAN & PROFILE

PLAT NO.
JOB NO. 12537–11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C4.00

Date: April 3, 2025, 4:09 PM — User ID: dlaughlin
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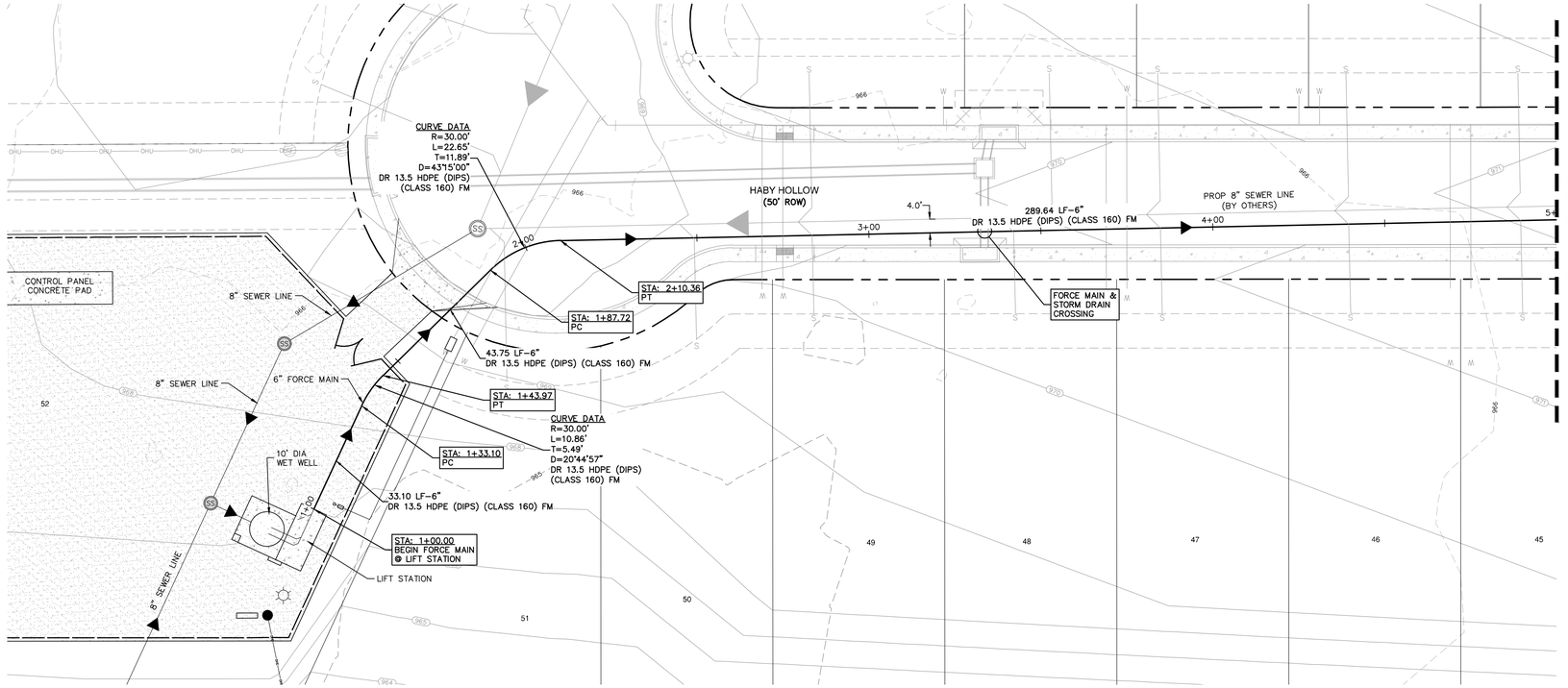

SCALE: 1" = 20'

0' 20' 40' 60'

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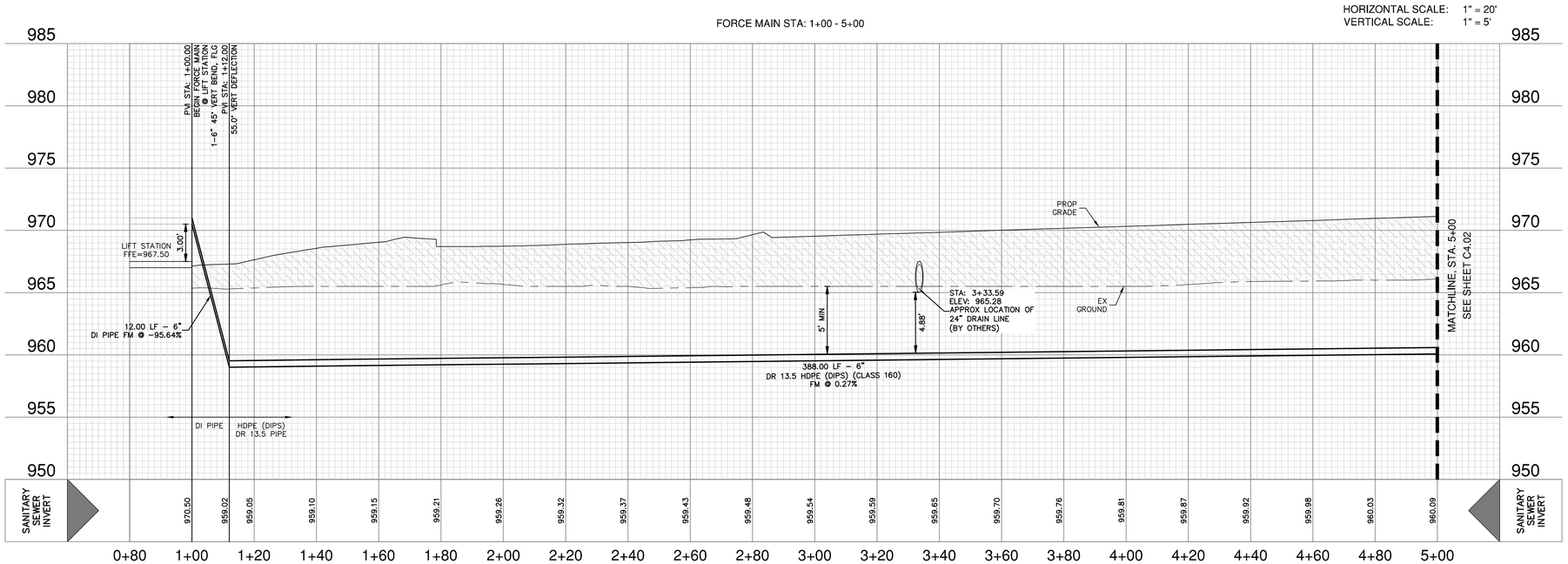

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KIM KEEFER
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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

FORCE MAIN PLAN & PROFILE
STA. 1+00 - 5+00

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C4.01

Date: April 3, 2025, 4:10 PM — User ID: claughlin
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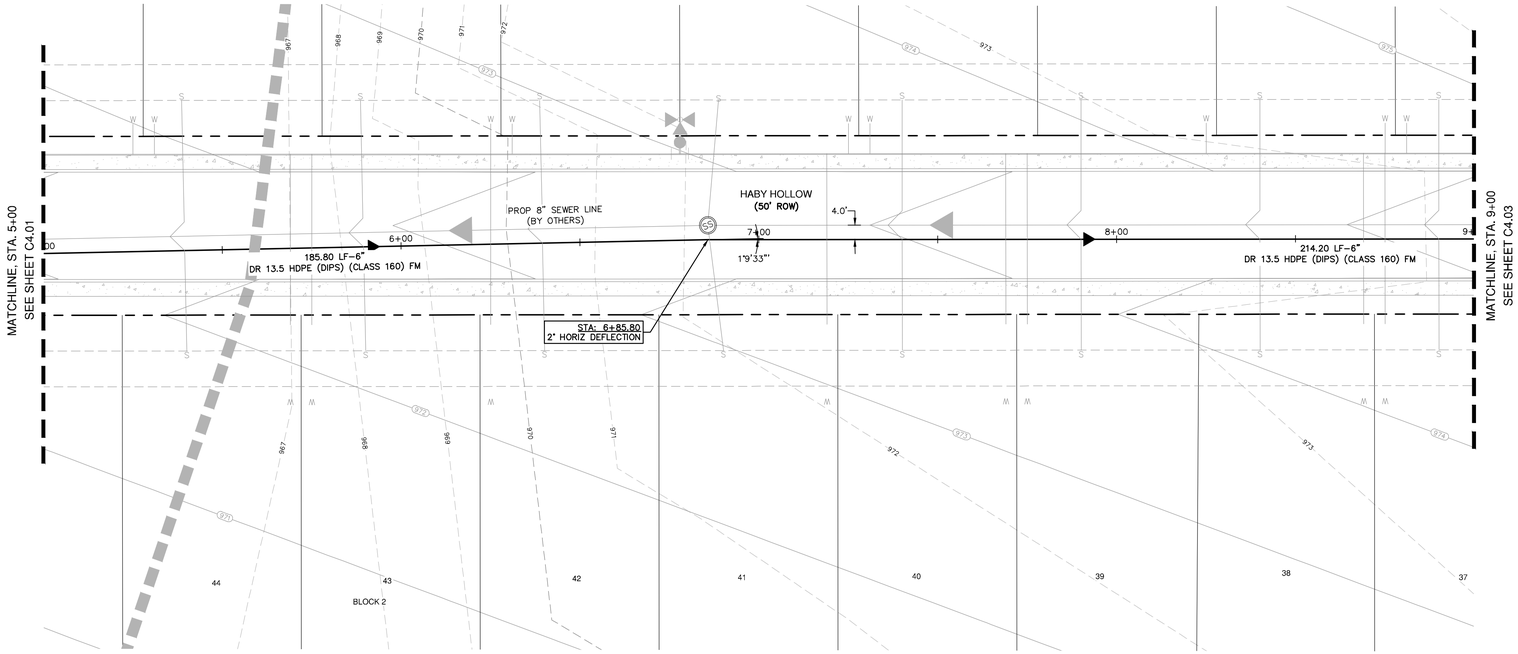

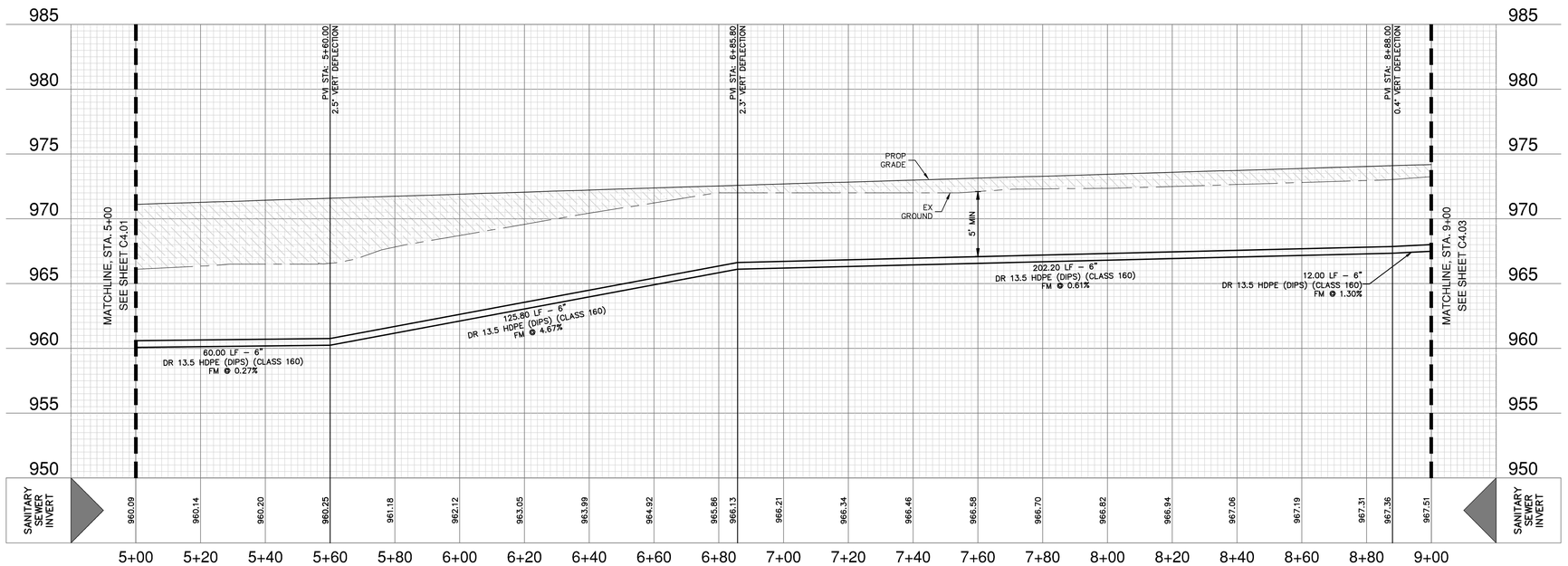

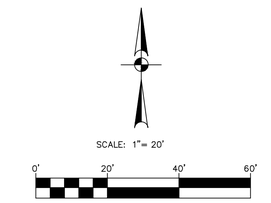

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- OHE OHE OVERHEAD ELECTRIC
- SECURITY FENCE
- PROPOSED SEWER LINE (BY OTHERS)
- PROPOSED SEWER LINE
- PROPOSED FORCE MAIN

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
8/1/2025

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

FORCE MAIN PLAN & PROFILE
STA. 5+00 - 9+00

CAUTION!!

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TRENCH EXCAVATION SAFETY PROTECTION:

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SEWER (MEDIO CREEK)

Developer's Name: JEN TEXAS 33 LLC
Address: 8023 VANTAGE DRIVE, SUITE 220
City: SAN ANTONIO State: TEXAS ZIP: 78230
Phone# 210-849-1447 FAX#
SAWS Block Map# 964-600 Total EDU's 480 Total Acreage 100
Total Linear Footage of Pipe: 703 LF-8" PVC 1,702 LF-6" HDPE (DIPS) FM Plat No.
Number of Lots 480 SAWS JOB NO. 25-1546

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C4.02

Date: April 3, 2025, 4:11 PM - User ID: alaughlin
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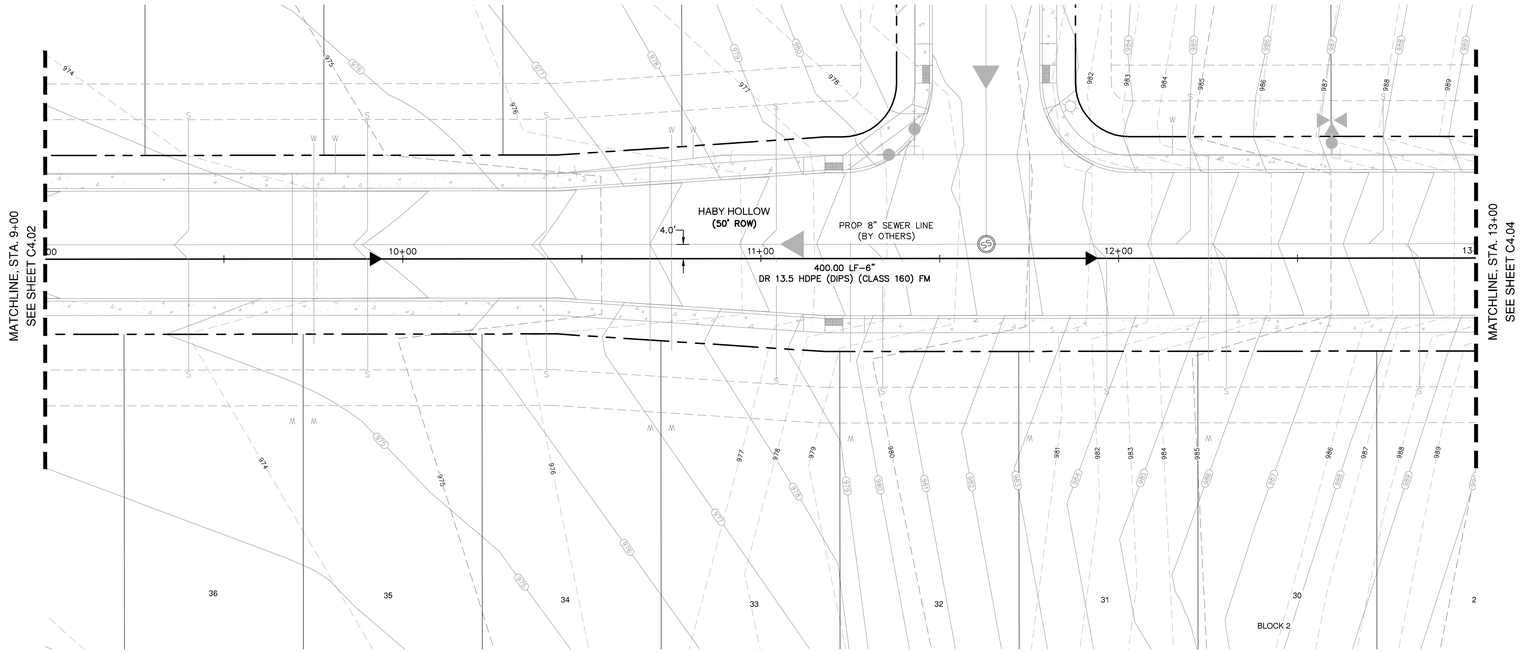

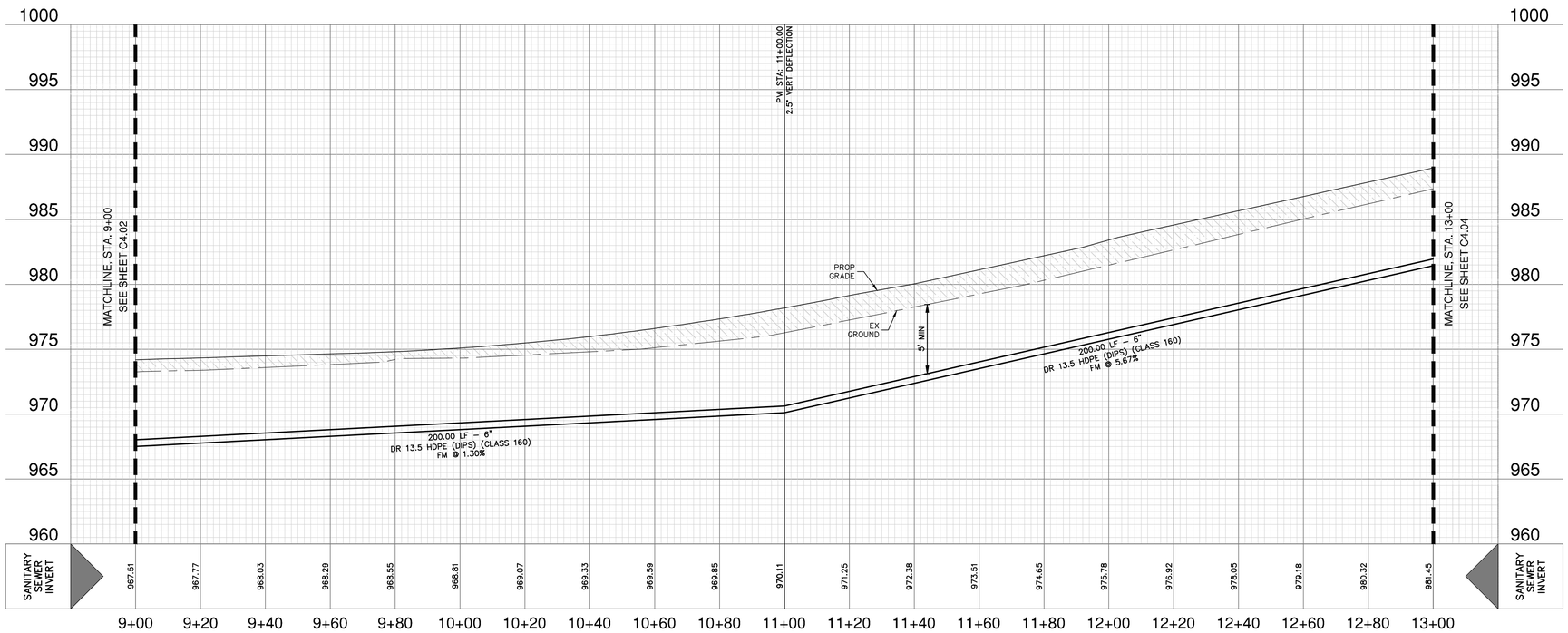

SCALE: 1"= 20'

0' 20' 40' 60'

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FORCE MAIN PLAN & PROFILE
STA. 9+00 - 13+00

PLAT NO.
JOB NO. 12537-11
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SHEET C4.03

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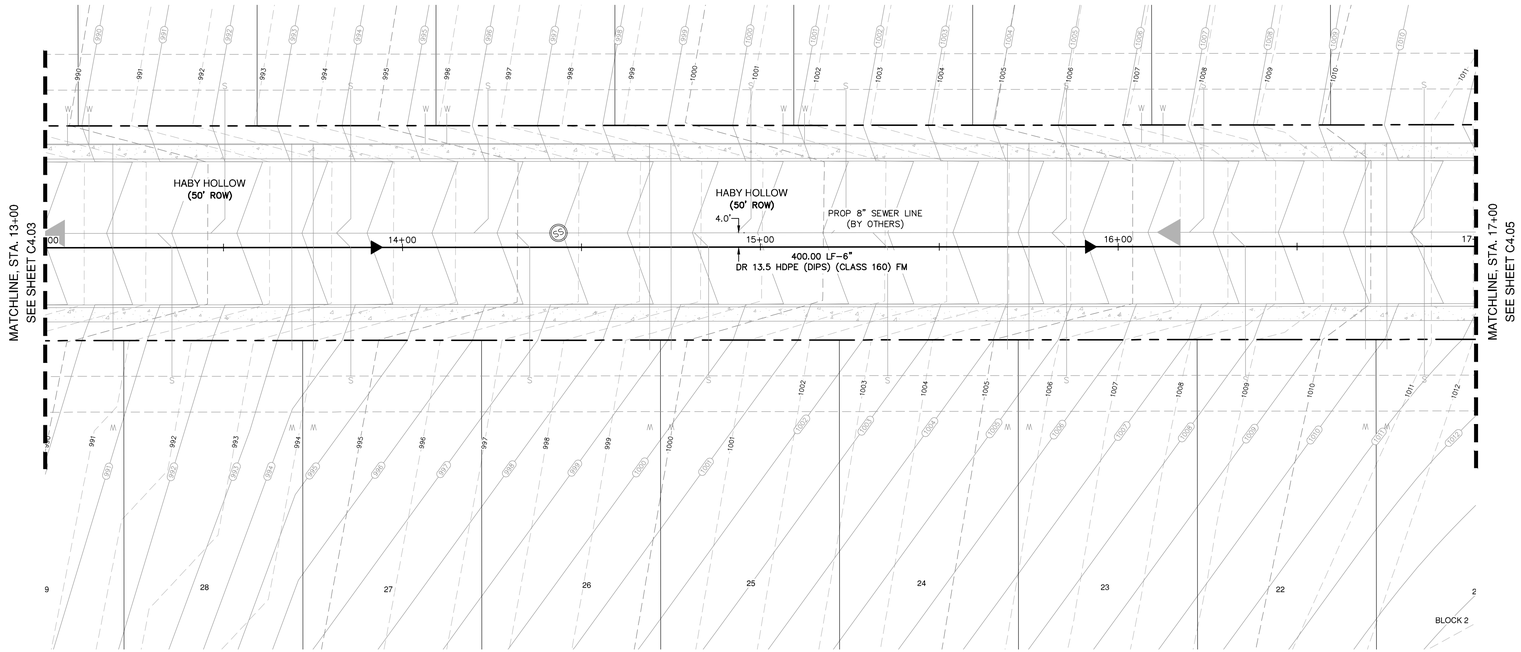

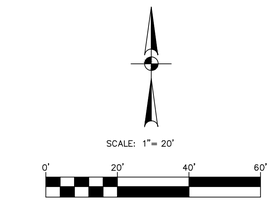

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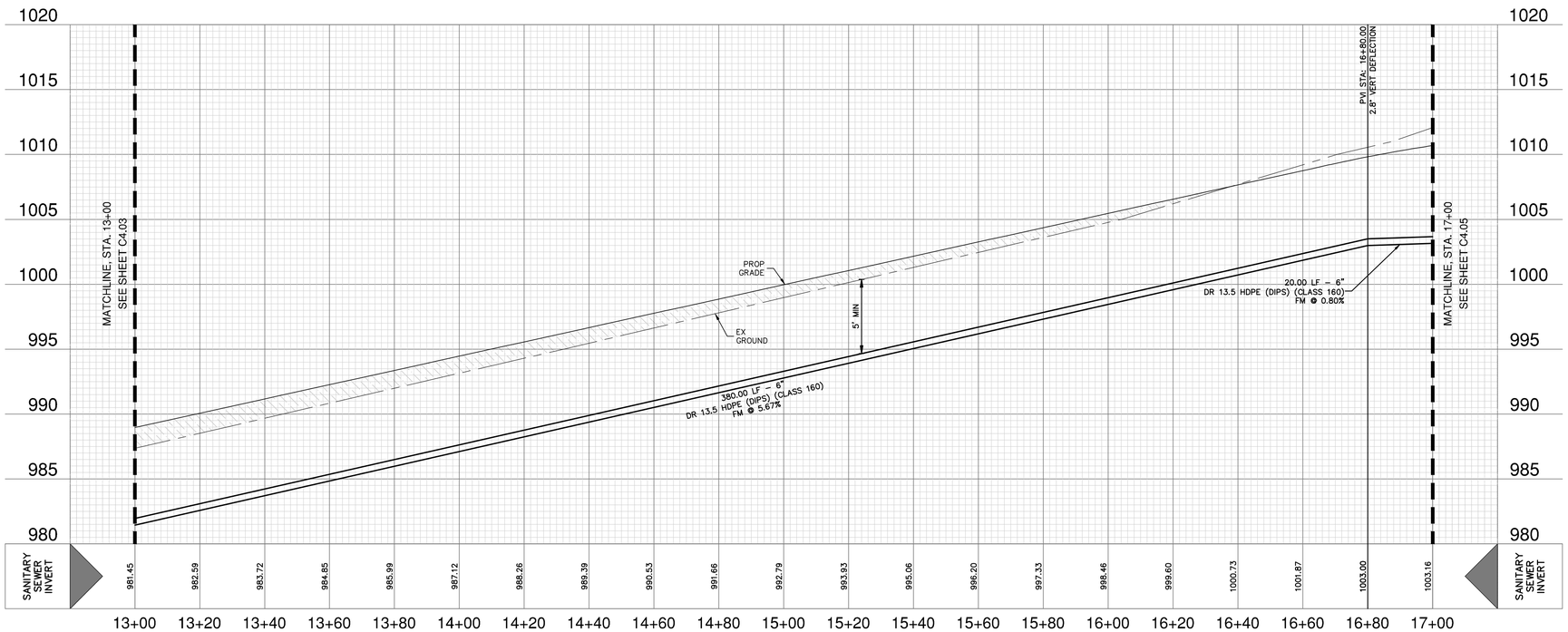
FORCE MAIN STA: 13+00 - 17+00

HORIZONTAL SCALE: 1" = 20'
VERTICAL SCALE: 1" = 5'



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2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

FORCE MAIN PLAN & PROFILE
STA. 13+00 - 17+00

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
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SHEET C4.04

Date: April 3, 2025, 4:11 PM — User ID: dlaughlin
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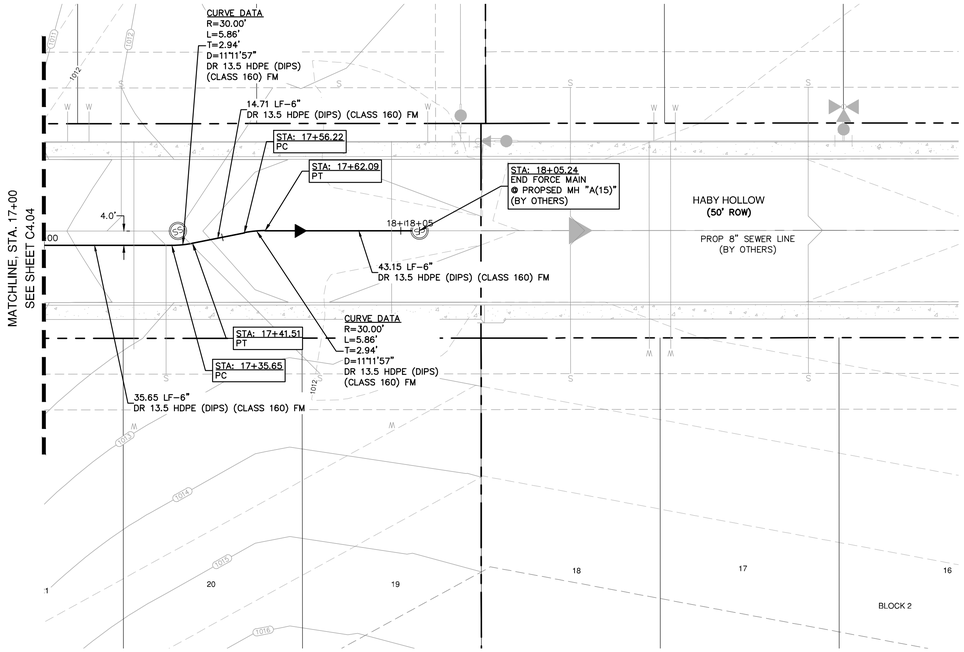

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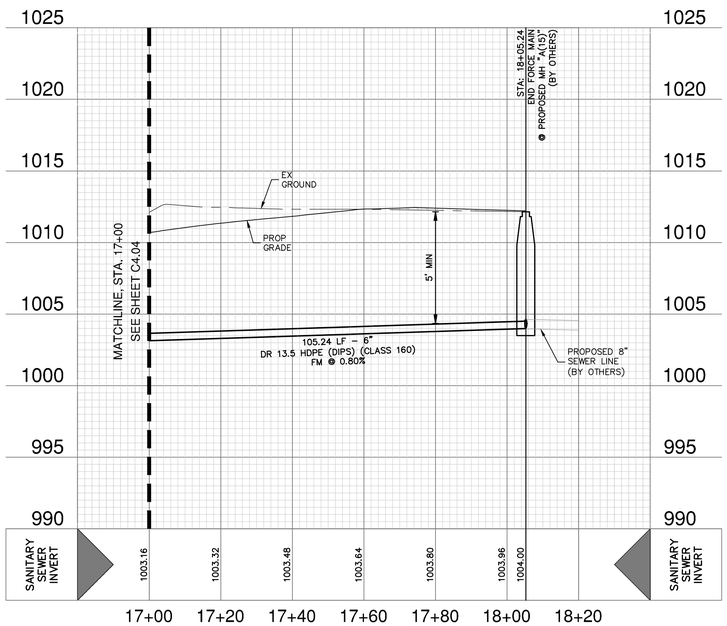
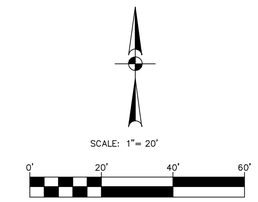
FORCE MAIN STA: 13+00 - 18+02





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Number of Lots 480 SAWS JOB NO. 25-1546

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TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

FORCE MAIN PLAN & PROFILE
STA. 17+00 - 18+00

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C4.05

Date: April 3, 2025, 4:12 PM — User ID: alaughlin
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NOTE TO CONTRACTOR

NO MODIFICATIONS CAN BE MADE TO THE LIFT STATION PRIOR TO APPROVAL BY THE ENGINEER AND SAWS. CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE SAWS INSPECTOR WHEN LIFT STATION CONSTRUCTION HAS PROGRESSED TO THE FOLLOWING MILESTONES.

1. THE CONTRACTOR SHALL NOTIFY THE PROJECT GEOLOGIST AND TCEQ FOR OBSERVATION IF ANY SENSITIVE FEATURES ARE DISCOVERED IN ACCORDANCE WITH 30 TAC 213.5 (f)(2).
2. WHEN LIFT STATION PUMPS ARRIVE AT THE SITE.
3. PRIOR TO PLACEMENT OF HMAC, AND CONCRETE DRIVEWAY.
4. PIPELINE AND WET WELL HYDROSTATIC TESTING, FACILITY STARTUP, ALL FUNCTIONAL TESTING, PROJECT WALKTHROUGH(S), AND FINAL ACCEPTANCE.
5. COMPLETION OF STRUCTURAL STEEL PLACEMENT AND ERECTION OF FORMS, BUT PRIOR TO CONCRETE PLACEMENT OF ALL CONCRETE FOUNDATIONS, AND PADS.
6. UPON COMPLETION OF CONTROL PANEL CANOPY ERECTION.
7. SEE SHEET E.2 FOR ELECTRICAL, AND SCADA CONSTRUCTION OBSERVATION MILESTONES.

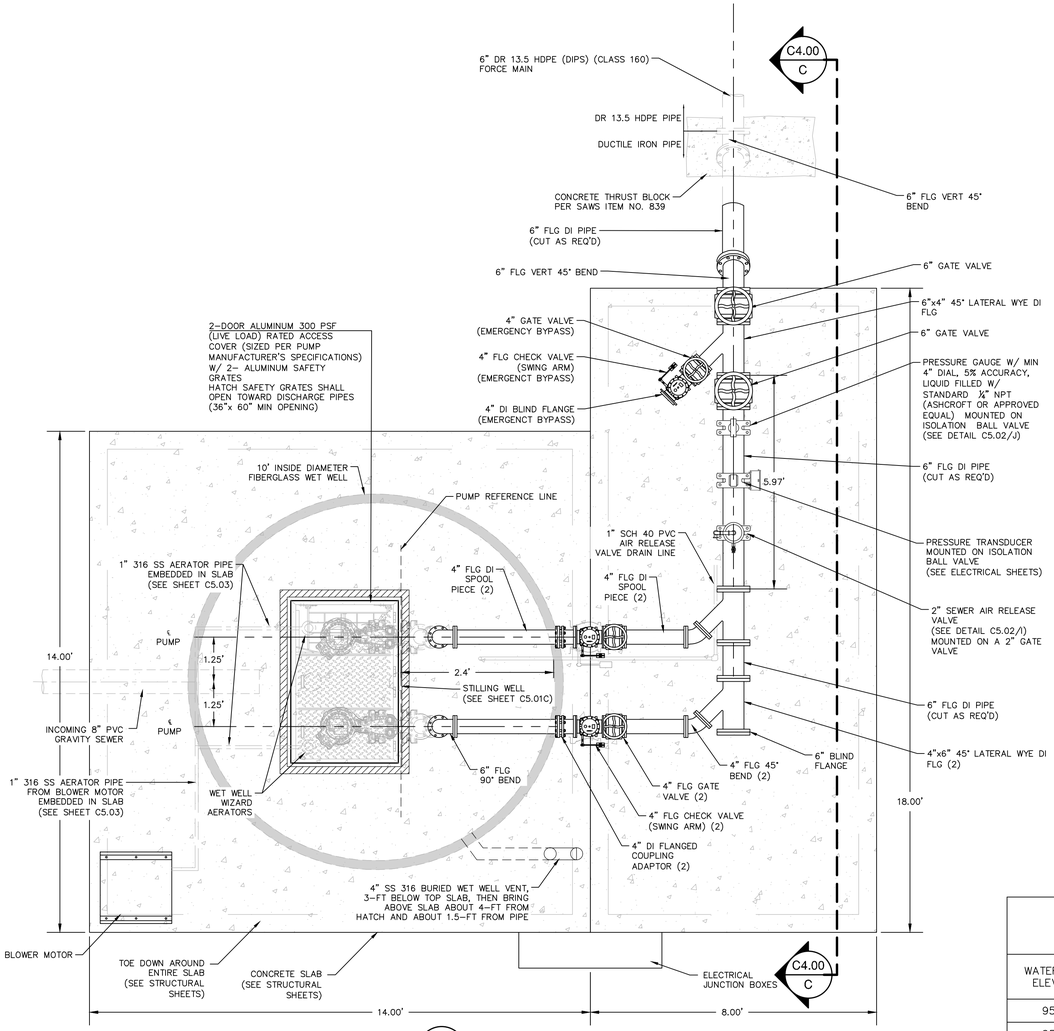
WORK SHALL NOT CONTINUE ON THE LIFT STATION UNTIL THE ENGINEER AND SAWS HAVE HAD AN OPPORTUNITY TO OBSERVE THE STATUS OF CONSTRUCTION AT EACH STAGE. THE CONTRACTOR SHALL PROVIDE THE ENGINEER AND SAWS 48 HOURS ADVANCED NOTICE PRIOR TO THE TIME THAT THE LIFT STATION WILL BE AT THE REQUIRED STAGE.

NOTES

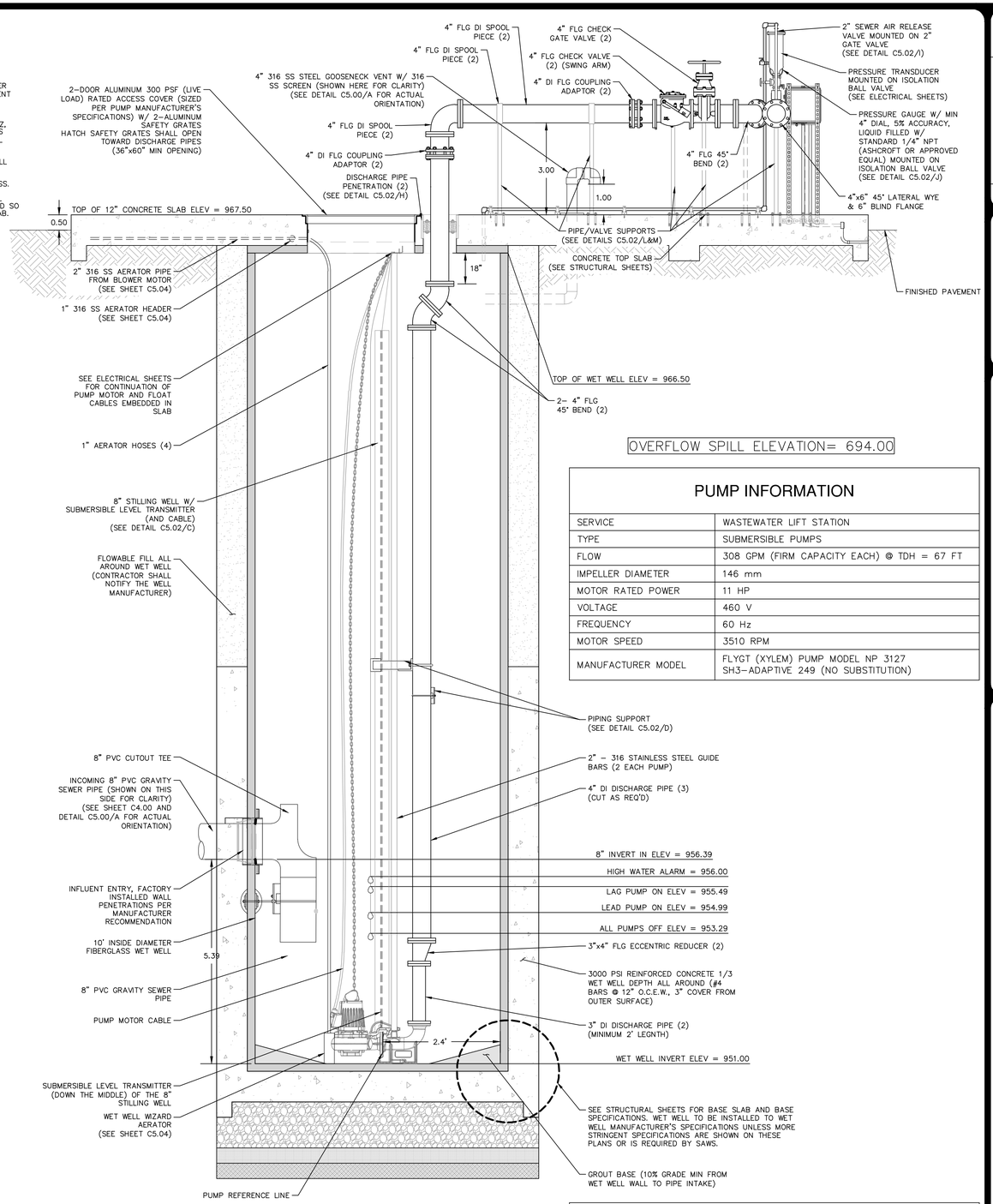
1. EPOXY GROUT SEAL PIPING GOING THROUGH WALLS.
2. WET WELLS MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC 213.5(e) (3) (E) AND 30 TAC 217.60 (b).
3. ALL HARDWARE (BRACKETS, SCREWS, ETC.) IN WET WELL SHALL BE 316 STAINLESS STEEL.
4. ALL EXPOSED PIPE, VALVES AND FITTINGS OUTSIDE THE WET WELL MUST RECEIVE, AFTER INSTALLATION, AN EPOXY COATING SYSTEM WITH A TOP COAT SYSTEM OF URETHANE SUITABLE FOR THE ENVIRONMENT. APPLY PANTONE 431U GRAY FINISH COAT. APPROVED MANUFACTURERS ARE TNEMEC, CARBOLINE, SHERWIN-WILLIAMS, PPG AND M.A.B. PAINTS.
5. ALL PUMP DISCHARGE PIPE AND FITTINGS WITHIN WET WELL, EXCEPT SS 316, MUST RECEIVE, AFTER INSTALLATION, A 100% COAL TAR EPOXY COATING SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. APPROVED MANUFACTURERS ARE TNEMEC, CARBOLINE, SHERWIN-WILLIAMS, PPG AND M.A.B. PAINTS.
6. ALL FORCE MAIN PIPING WITHIN LIFT STATION SITE SHALL BE RESTRAINED.
7. TRACER WIRE SHALL BE BURIED AT A MAXIMUM DEPTH OF 4 FEET ALONG ENTIRE LENGTH OF FORCE MAIN. TRACER WIRE SHALL BE OF SOLID CORE (14 GAUGE INSULATION), AND SHALL BE CONNECTED TO THE MAIN AT 10' INCREMENTS. WIRE SHALL ALSO COME UP TO THE TOP OF AIR RELEASE, VACUUM VALVES, COMBINATION VALVES AND TOP OF GROUND AT LIFT STATION SITE AND AT THE DISCHARGE POINT.
8. CONTRACTOR WILL ALLOW A MINIMUM OF 2' OF SPACING BETWEEN ABOVE GROUND SURGE PRESSURE ASSEMBLY AND PIPING AND THE EMERGENCY BYPASS CONNECTION

BLOWER/AIR EJECTOR NOTES

1. BLOWER MOTOR, AIR EJECTORS(1), AND AIR SUPPLY HOSES SHALL BE SUPPLIED BY RELIANT WATER TECHNOLOGIES (504-400-1239). BLOWER MOTOR, AIR EJECTORS(1), AIR SUPPLY HOSES, AN ALL OTHER EQUIPMENT SHALL BE INSTALLED PER RELIANT WATER TECHNOLOGIES RECOMMENDATIONS.
2. BLOWER MOTOR SHALL BE IP65 MOTOR (REGENERATIVE), 1.5 HP, 60 HZ, 460 WITH AIR FILTRATION SYSTEM, PRESSURE RELIEF VALVE, STAINLESS STEEL FILTER HOOD, WATER GAUGE (IN.), MAGNETIC STARTER, CONTROL BOX, AND AUTO RESTART SWITCH.
3. AIR EJECTORS SHALL BE PLACED ON A FLAT SURFACE OF THE WETWELL FLOOR.
4. ALL AIR DISTRIBUTION PIPING, VALVES, AND HARDWARE SHALL BE 316SS.
5. AIR DISTIBUTION PIPING SHALL BE EMBEDDED WITHIN THE TOP WETWELL SLAB WITH A MIMIMUM CONCRETE COVER OF 3", AND SHALL BE PLACED SO AS NOT TO CONFLICT WITH ANY ELECTRICAL CONDUITS WITHIN THE SLAB.
6. SEE THIS SHEET AND C5.04 FOR DETAILS



C5.00 A — PLAN VIEW
N.T.S.



OVERFLOW SPILL ELEVATION= 694.00

PUMP INFORMATION

SERVICE	WASTEWATER LIFT STATION
TYPE	SUBMERSIBLE PUMPS
FLOW	308 GPM (FIRM CAPACITY EACH) @ TDH = 67 FT
IMPELLER DIAMETER	146 mm
MOTOR RATED POWER	11 HP
VOLTAGE	460 V
FREQUENCY	60 Hz
MOTOR SPEED	3510 RPM
MANUFACTURER MODEL	FLYGT (XYLEM) PUMP MODEL NP 3127 SH3-ADAPTIVE 249 (NO SUBSTITUTION)

RISING LEVEL CYCLE
(TOP OF PUMPS = ±976.93)

WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
953.29	PUMP OFF LEVEL	ALL PUMPS ARE OFF
954.99	LEAD PUMP LEVEL	LEAD PUMPS ON
955.49	LAG PUMP LEVEL	LEAD & LAG PUMP ON
956.00	HIGH WATER ALARM LEVEL	HIGH WATER ALARM SOUND

C5.00 B — WET WELL PROFILE
N.T.S.

FALLING LEVEL CYCLE

WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
955.49	LAG PUMP LEVEL	LEAD & LAG PUMP ON, HIGH LEVEL ALARM RESETS
954.99	LEAD PUMP LEVEL	LEAD PUMP ON, LAG PUMP OFF
953.29	ALL PUMPS OFF LEVEL	ALL PUMPS STOPPED - LAG PUMP SWITCHES TO LEAD PUMP

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Date: April 3, 2025, 4:12 PM — User ID: dlaughlin
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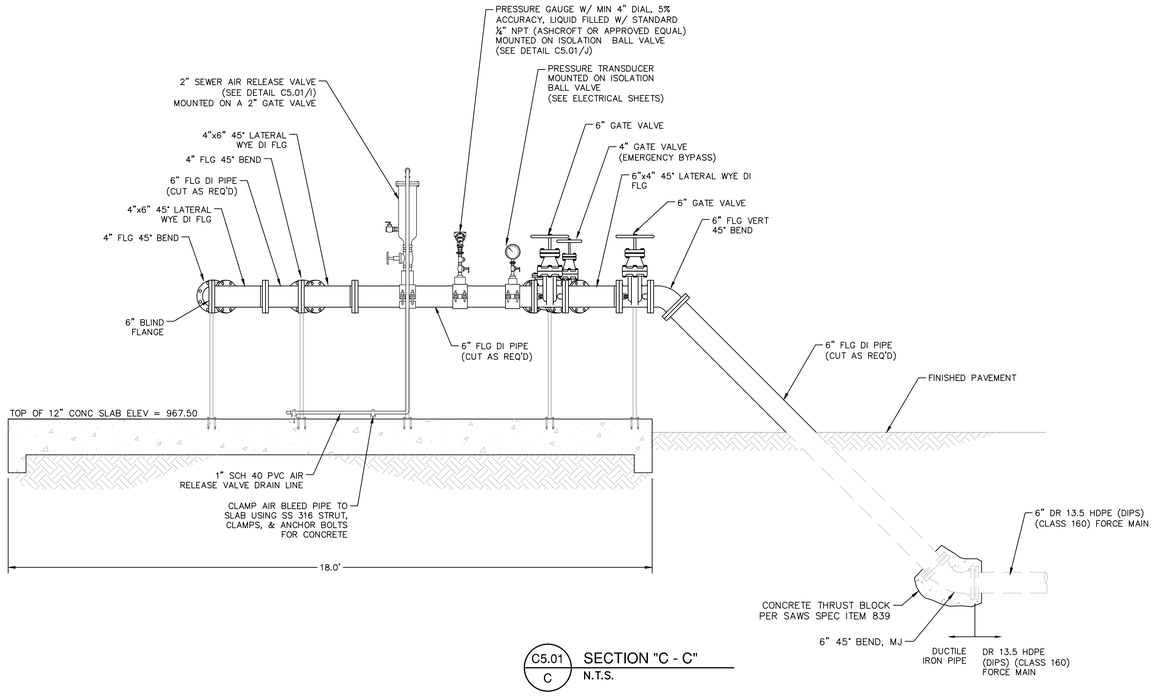

C5.01 / C SECTION "C - C"
N.T.S.

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
8/1/2025

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

LIFT STATION PLAN & PROFILE

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C5.01

Date: April 3, 2025, 4:12 PM — User ID: alaughlin
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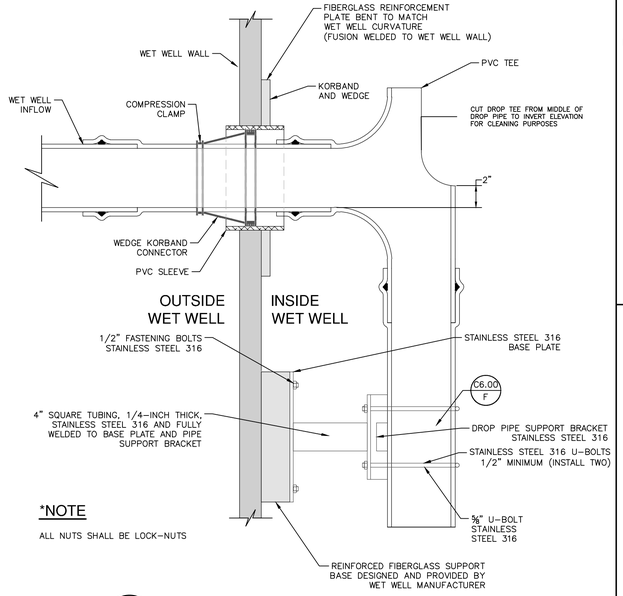
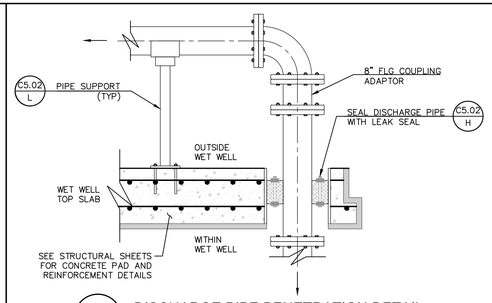
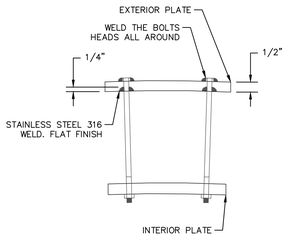


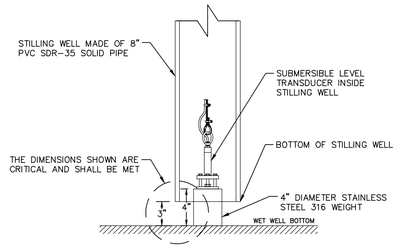
C5.01 A — WET WELL INFLOW PENETRATION DETAIL
N.T.S.



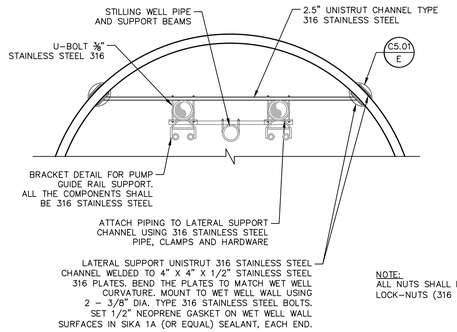
C5.01 B — DISCHARGE PIPE PENETRATION DETAIL
N.T.S.



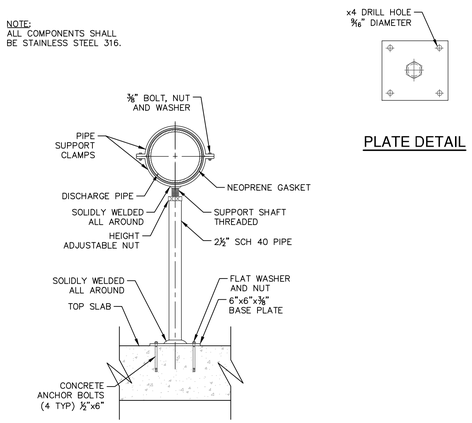
C5.01 E — PLATES DETAIL
N.T.S.



C5.02 C — SUBMERSIBLE LEVEL TRANSDUCER INSTALLATION
N.T.S.



C5.01 D — WET WELL PIPING SUPPORT DETAIL
N.T.S.



SECTION VIEW

PLATE DETAIL

C5.01 L — PIPE SUPPORT DETAIL
N.T.S.

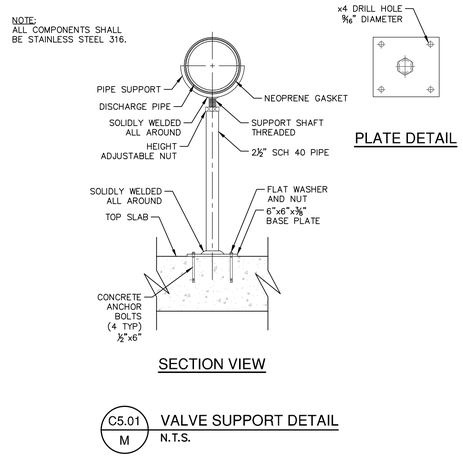
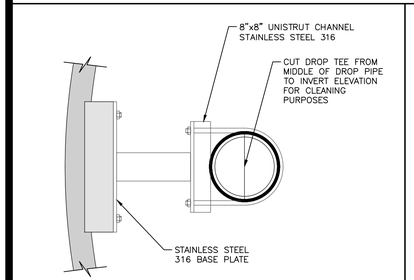


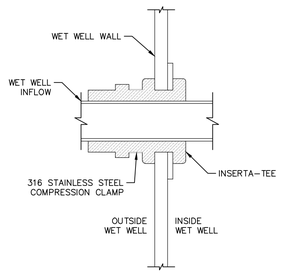
PLATE DETAIL

SECTION VIEW

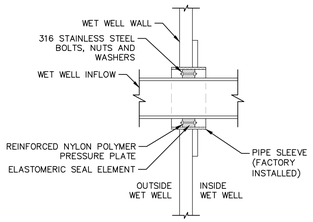
C5.01 M — VALVE SUPPORT DETAIL
N.T.S.



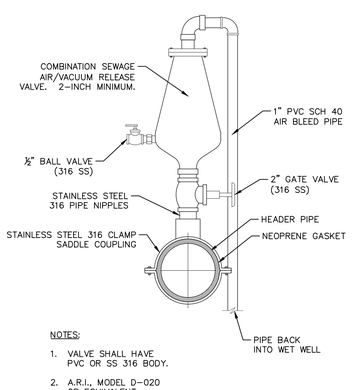
C5.01 F — INFLOW TOP VIEW DETAIL
N.T.S.



C5.01 G — INSERTA-TEE DETAIL
N.T.S.



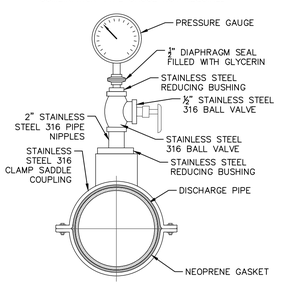
C5.01 H — LINK SEAL DETAIL
N.T.S.



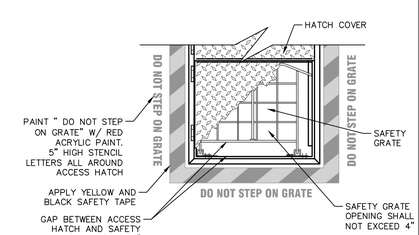
C5.01 I — AIR\VACUUM RELEASE VALVE INSTALLATION DETAIL
N.T.S.

KEY NOTES:

- PRESSURE GAUGE SHALL BE RATED FOR CORROSIVE SERVICE
- 4" DIAL SIZE
- GRADE 1A
- LIQUID FILLED
- TYPE 316 STAINLESS STEEL BOURDON TUBE
- FULL BLOWOUT PROTECTION
- GLASS SAFETY LENS
- PRESSURE RATING: -0 inHG TO 60-PSI
- COMBINATION TYPE GAUGE NOT REQUIRED



C5.01 J — PRESSURE GAUGE INSTALLATION DETAIL
N.T.S.



NOTES:

- SAFETY GRATE SHALL BE UP TO 1/2" BELOW TOP OF CONCRETE SLAB, BUT IN NO CASE SHALL THE 1/2" DISTANCE BE EXCEEDED.
- DISTANCE BETWEEN SAFETY GRATE AND HATCH OPENING MAY NOT EXCEED 4".
- ACCESS HATCH COVER SHALL BE PERFECTLY LEVELED WITH TOP OF CONCRETE SLAB.
- APPLY YELLOW AND BLACK SAFETY TAPE TO THE CONCRETE IMMEDIATELY SURROUNDING THE HATCH.
- PAINT "DO NOT STEP ON GRATE" ON THE CONCRETE AT THE EDGE OF THE HATCH TO EACH SIDE OF THE HATCH NOT PROTECTED BY THE OPEN HATCH ACCESS PANEL. USE 5" HIGH STENCILED LETTERS AND RED ACRYLIC PAINT.

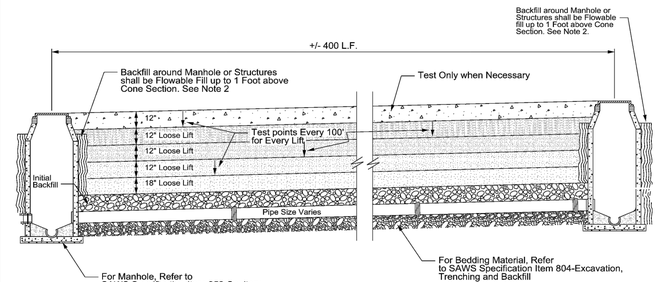
C5.01 K — ACCESS COVER W/ SAFETY GRATE DETAIL
N.T.S.

PROPERTY OF SAN ANTONIO WATER SYSTEM
SAN ANTONIO, TEXAS

TRENCH COMPACTION DETAIL

DD 804-02

APPROVED MARCH 2018
REVISED AUG 2019
SHEET 1 OF 1



NOTES:
1. The Compaction Report will indicate the Station and the Depth of each Test Point.
2. When Contractor opts to backfill, all work will be subject to sections 804.3 and 804.4 of this specification
3. Insure Compaction Probe Penetrates to same Depth as Lift.

C5.01 N — TRENCH COMPACTION DETAIL
N.T.S.

NO. REVISION | DATE

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
8/1/2025

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

LIFT STATION DETAILS

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C5.02

Date: April 3, 2025, 4:12 PM - User ID: olaughlin
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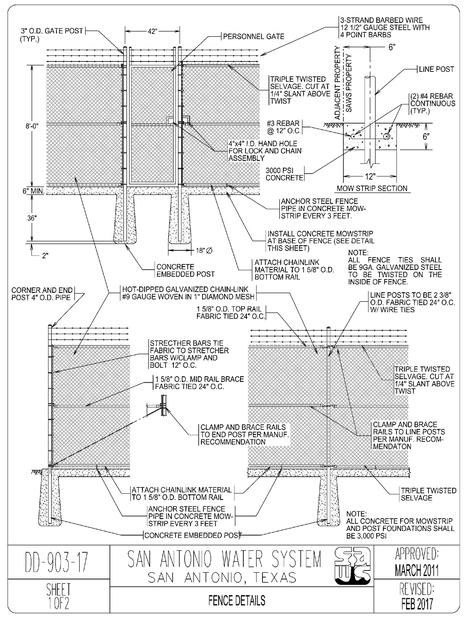
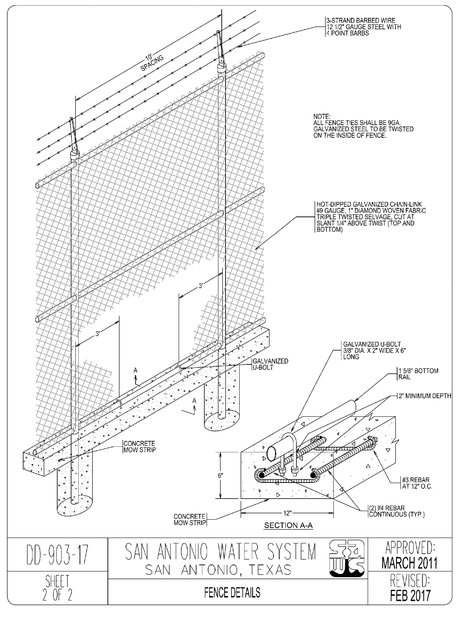


DD-903-17	SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	APPROVED: MARCH 2011
SHEET 1 OF 2	FENCE DETAILS	REVISED: FEB 2017



DD-903-17	SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	APPROVED: MARCH 2011
SHEET 2 OF 2	FENCE DETAILS	REVISED: FEB 2017

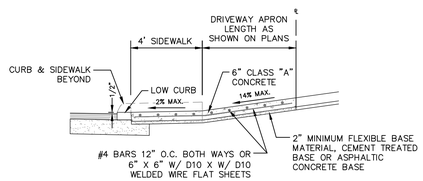
NOTE

BARBED WIRE SHALL BE TILTED TOWARDS OUTSIDE THE LIFT STATION. CHAIN-LINK FENCE MUST BE INSTALLED 1' INSIDE THE LIFT STATION EASEMENT. WHERE SHOWN ON SITE PLAN, TOP OF MOW STRIP SHALL BE FLUSH WITH THE PAVEMENT, OTHERWISE TOP OF MOW STRIP SHALL BE 6" ABOVE THE ADJACENT FINISHED GRADES.

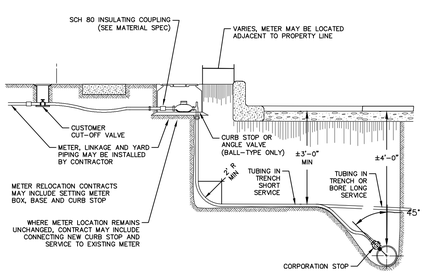
C5.03 A — FENCE DETAILS
N.T.S.

NOTE

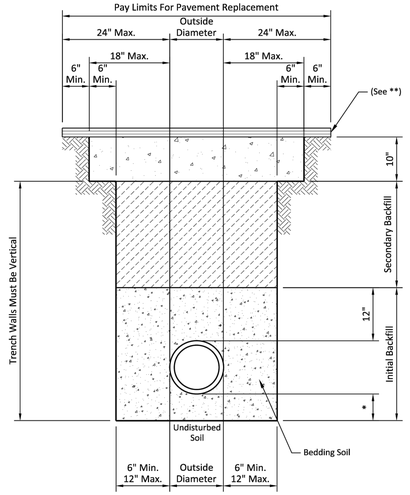
IF THE SUBGRADE HAS A PLASTICITY INDEX OF 20 OR LESS, LIME STABILIZATION IS NOT REQUIRED. HOWEVER THE SUBGRADE SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR (ASTM D-698). THE SUBGRADE SHALL BE MOISTURE CONDITIONED TO THE OPTIMUM MOISTURE CONTENT (MINIMUM) TO +4%



C5.02 D — CONCRETE DRIVEWAY DETAIL
N.T.S.



C5.02 E — 3/4" WATER SERVICE
N.T.S.



The Existing Material at the Bearing Level shall be Removed and Replaced to a Minimum Depth of 6-inches or ¼ of the Outside Diameter of the Pipe, whichever is greater, with Bedding Material.

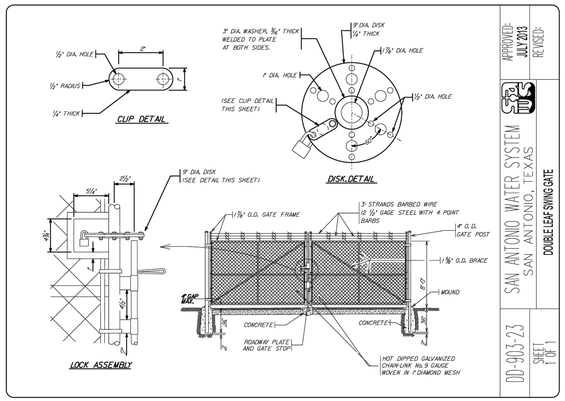
In Areas of over Excavation, Encasement shall extend from Trench Wall. Pay Limits shall not Exceed 12" Max. as shown on Detail. Additional Encasement shall be incidental.

* Sewer Gravel 6" Min. or ½ 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.

- Hot Mix Asphalt Concrete (HMAC)
- Asphalt Treated Base (A.T.B.)

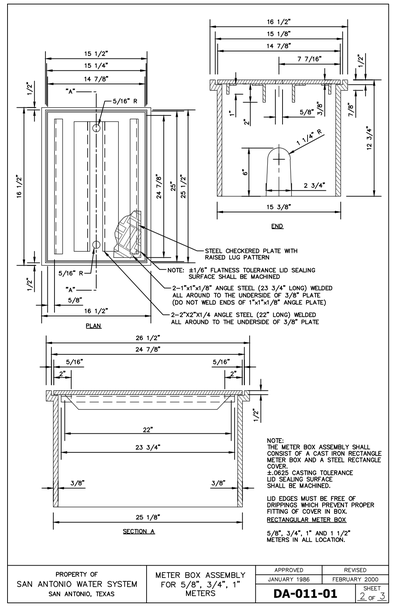
PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	SANITARY SEWER PIPE LAID IN TRENCH	APPROVED: MARCH 2008	REVISED: AUG 2019
		DD-804-01	SHEET 1 OF 1

C5.02 F — STREET CUT DETAIL
N.T.S.



APPROVED: JULY 2013	SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	DD-903-23
REVISED:	DOUBLE LEAF SWING GATE	SHEET 1 OF 1

C5.03 B — DOUBLE LEAF SWING GATE DETAILS
N.T.S.



PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	METER BOX ASSEMBLY FOR 5/8", 3/4", 1" METERS	APPROVED JANUARY 1986	REVISED FEBRUARY 2000
		DA-011-01	SHEET 2 OF 3

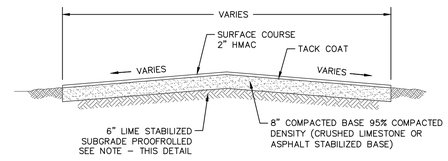
C5.02 G — METER BOX ASSEMBLY FOR 5/8", 3/4", 1" METERS
N.T.S.

NOTES

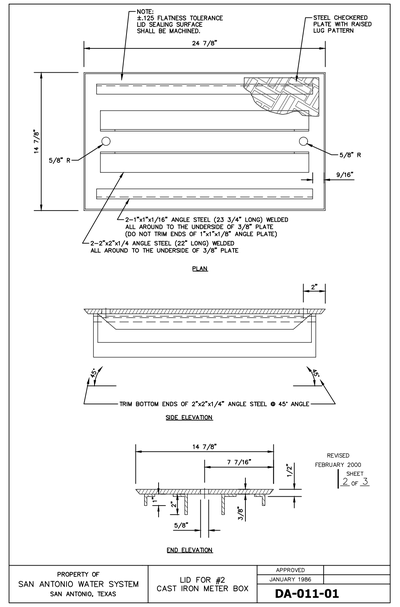
1. DEPTH OF GRAVEL SUBGRADE FILLER TO BE DETERMINED IN FIELD BY OWNER IN CONDITIONS WHERE TRENCH BOTTOM IS UNSTABLE
2. BEDDING SHALL HAVE A MINIMUM THICKNESS OF 6-INCHES BELOW OUTSIDE DIAMETER OF PIPE AND BE PLACED AND SHAPED TO CONFORM TO PIPE BARREL AND BELL OR FLANGES SUCH THAT THE ENTIRE LENGTH OF THE BARREL IS SUPPORTED BY THE BEDDING MATERIAL, NO SEPARATE PAY ITEM (NSPI).
3. INITIAL BACKFILL TO BE A MINIMUM OF 1-FOOT ABOVE OUTSIDE DIAMETER OF PIPE PLACED WITH A TEMPORARY SHIELD OVER THE PIPE TO PROTECT THE PIPE COATING AND/OR POLYWRAP, NO SEPARATE PAY ITEM (NSPI).
4. ALL BEDDING OR GRAVEL SUBGRADE FILLER IF USED TO BE PLACED ON UNDISTURBED SOILS.
5. CONTRACTOR SHALL INCORPORATE THE USE OF A TRENCH BOX OR OTHER ACCEPTABLE SAFETY SYSTEM IN ANY TRENCH THAT EXCEEDS FIVE (5) FEET IN DEPTH.
6. ALL BACKFILL SHALL BE COMPACTED TO 98% OF THE MAXIMUM DRY DENSITY OR DETERMINED BY TxDOT TEST METHOD TEX-113E.

NOTE

IF THE SUBGRADE HAS A PLASTICITY INDEX OF 20 OR LESS, LIME STABILIZATION IS NOT REQUIRED. HOWEVER THE SUBGRADE SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR (ASTM D-698). THE SUBGRADE SHALL BE MOISTURE CONDITIONED TO THE OPTIMUM MOISTURE CONTENT (MINIMUM) TO +4%



C5.02 C — LIFT STATION ASPHALT PAVEMENT DETAIL
N.T.S.



REVISED FEBRUARY 2000 SHEET 2 OF 3

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	LID FOR #2 CAST IRON METER BOX	APPROVED JANUARY 1986	
		DA-011-01	

C5.03 H — LID FOR #2 CAST IRON METER BOX
N.T.S.

NO.	REVISION	DATE

KIM KEEFER 117744 LICENSED PROFESSIONAL ENGINEER 8/1/2025

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2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

LIFT STATION DETAILS

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
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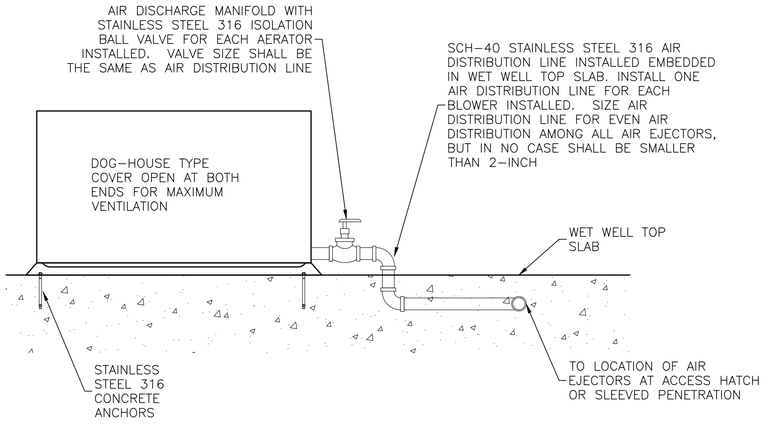
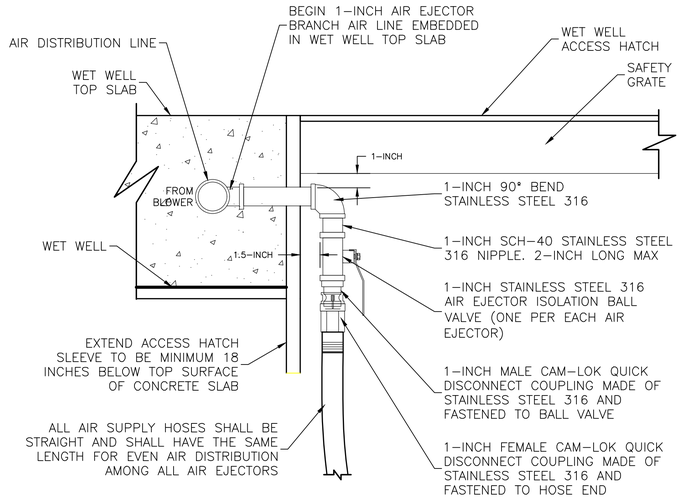
SHEET C5.03



C5.04 A — AERATOR BLOWER INSTALLATION
N.T.S.



C5.04 B — AIR EJECTOR BRANCH LINE HOSE AND INSTALLATION ACCESS HATCH
N.T.S.

NOTES:

1. WHERE POSSIBLE, AIR EJECTORS SHALL TERMINATE AT ACCESS HATCHES. ANY AIR EJECTOR THAT CANNOT TERMINATE AT A WET WELL ACCESS HATCH SHALL TERMINATE AT A DEDICATED SLEEVED PENETRATION 12-INCH DIAMETER AND SHALL BE PROVIDED WITH A HEAVY DUTY POLYETHYLENE COVER FLUSHED WITH THE TOP SLAB SURFACE.
2. THE LOCATION OF ALL AIR ELECTORS AND ASSOCIATED BRANCH LINES, VALVES, FITTINGS AND HANGERS SHALL BE LOCATED IN A DEDICATED AREA THAT IS FREE OF CONDUITS, CABLES, LIFTING CHAINS, TRANSDUCERS, GUIDERAILS, AND BE SET IN A MANNER THAT NO OBSTRUCTION WILL OCCUR WHEN INSTALLING AND REMOVING PUMPS, FLOATS AND LEVEL TRANSDUCERS.
3. ALL PIPING, VALVES AND FITTINGS USED FOR BOTH AIR DISTRIBUTION LINES AND AIR EJECTOR BRANCH LINES SHALL BE SCHEDULE 40, THREADED AND BE MADE OF STAINLESS STEEL 316.
4. ALL ANCHOR BOLTS, STRUT CHANNELS, PIPE CLAMPS AND FASTENERS USED FOR INSTALLATION OF THE AERATOR SYSTEM SHALL BE MADE OF STAINLESS STEEL 316.
5. ALL THREADED JOINTS SHALL BE SEALED WITH SUFFICIENT TEFLON TAPE TO PREVENT AIR LEAK.
6. THE HANGER FOR HOSE SHALL BE SET IN A MANNER THAT THE AIR HOSE IS MAINTAINED STRAIGHT AND WITHOUT BENDS. ALL HOSES SHALL HAVE THE SAME LENGTH.

NO. | REVISION | DATE

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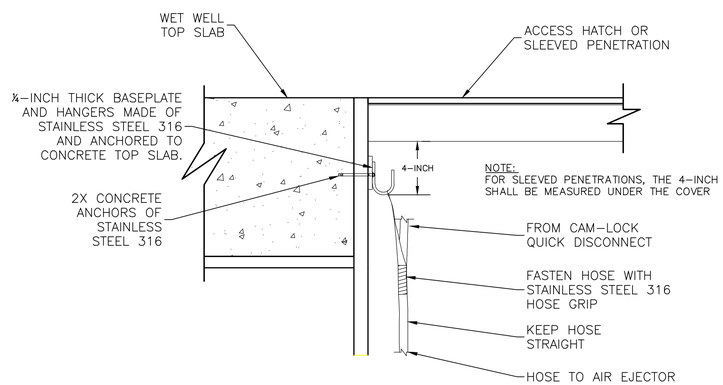
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

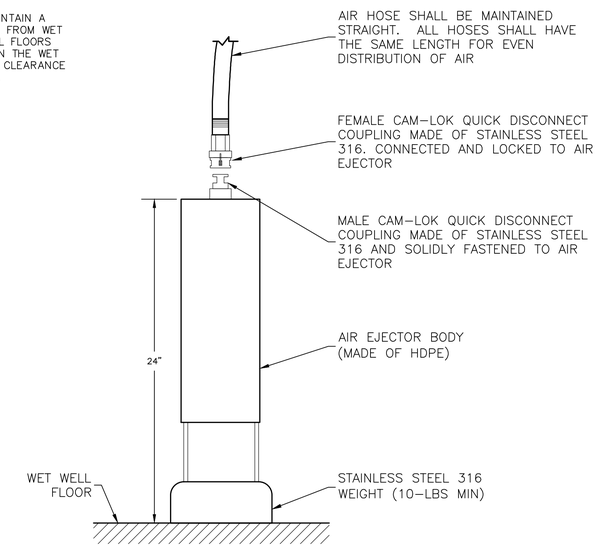
STATE OF TEXAS — KIM KEEFER — 117744 — LICENSED PROFESSIONAL ENGINEER — 8/1/2025

NOTE:
HANGER SHALL BE LOCATED ADJACENT TO BALL VALVE AND WITHOUT OBSTRUCTING THE BALL VALVE AND THE AIR EJECTOR



C5.04 C — AIR EJECTOR AIR HOSE HANGER DETAIL
N.T.S.

NOTE:
ALL AIR EJECTORS SHALL MAINTAIN A 12-INCH MINIMUM CLEARANCE FROM WET WELL WALL, SLOPED WET WELL FLOORS PUMPS AND ANY ITEMS WITHIN THE WET WELL, AND 24-INCH MINIMUM CLEARANCE AMONG OTHER AIR EJECTORS.



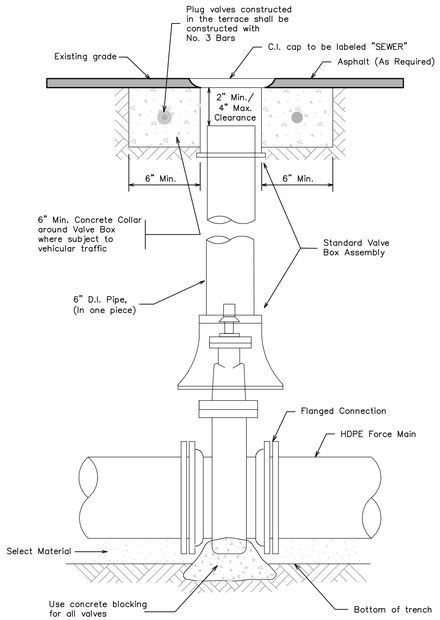
C5.04 D — AIR EJECTOR INSTALLATION DETAIL
N.T.S.

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

ODOR CONTROL DETAILS

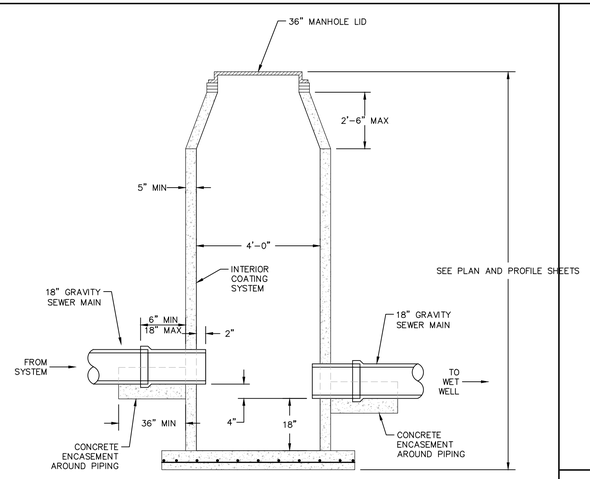
PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C5.04

Date: April 3, 2025, 4:12 PM — User ID: alaughlin
File: P:\25\37\11\design\Civil\SS Sheets\SS-125371I-D1.dwg

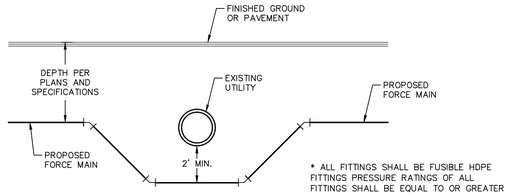


Note:
Contractor shall provide a valve stem riser that elevates the valve to within 3' to 4' of the surface (NSPI).

C5.04 A — INSTALLATION OF BURIED PLUG VALVE WITH VALVE BOX AND EXTENSION DETAIL
N.T.S.

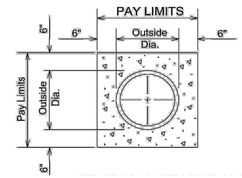


C5.04 B — LIFT STATION SITE MANHOLE "A2"
N.T.S.



* ALL FITTINGS SHALL BE FUSIBLE HDPE FITTINGS PRESSURE RATINGS OF ALL FITTINGS SHALL BE EQUAL TO OR GREATER THAN THE FORCE MAIN PIPING. THE CONTRACTOR MY ELECT TO BEND THE PIPE.

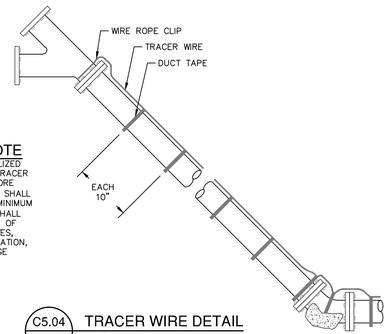
C5.04 C — TYPICAL UTILITY CROSSING DETAIL
N.T.S.



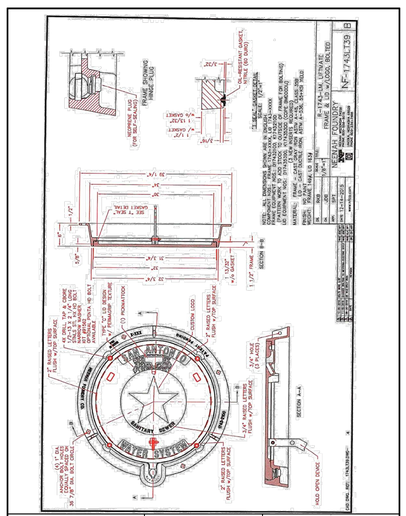
C5.04 D — SINGLE FORCE MAIN CONCRETE ENCASEMENT DETAIL
N.T.S.

TRACER WIRE NOTE

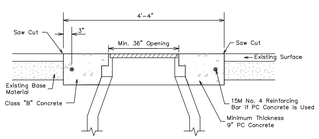
TRACER WIRE SHALL BE UTILIZED FOR LOCATION PURPOSES. TRACER WIRE SHALL BE OF SOLID CORE (14 GAUGE INSULATED) AND SHALL BE TAPED TO THE MAIN A MINIMUM OF 10" INCREMENTS. WIRE SHALL ALSO COME UP TO THE TOP OF AIR RELEASE, VACUUM VALVES, TOP OF GROUND AT LIFT STATION, AND AT THE MAIN DISCHARGE POINT.



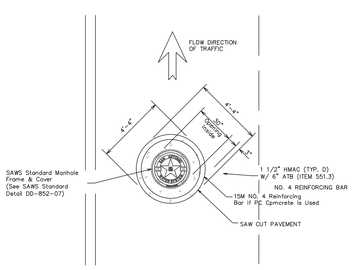
C5.04 F — TRACER WIRE DETAIL
N.T.S.



C5.04 E — MANHOLE RING AND COVER DETAIL
N.T.S.

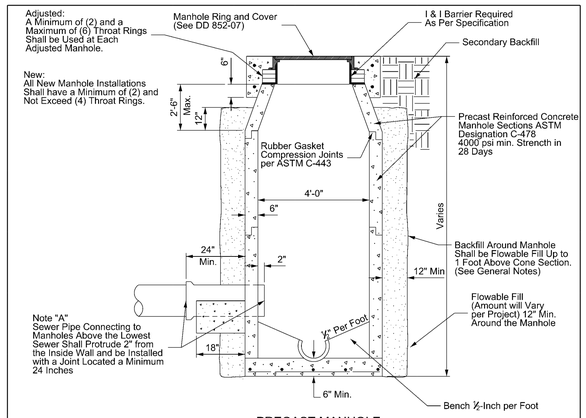


SECTION A–A

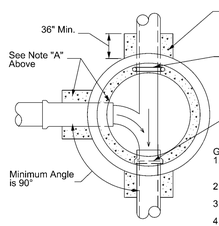


NOTE:
1. The concrete shall be 3000 psi, min, and reinforced with No. 4 bars, as shown.
2. The concrete shall extend to edge of saw cut pavement.
3. Manhole Ring Encasement is required on all manholes.

C5.04 G — MANHOLE RING ENCASEMENT DETAIL
N.T.S.



PRECAST MANHOLE



Concrete Cradle to Nearest Point of all Lines Leaving or Entering Manholes
All Pipe is Used, Provide Rubber Gasket One Size Smaller than Pipe at Each Wall Crossing of Manhole, If HDPE Pipe is Used a Non-Shrink Grout to be Applied within the Wall Sections, Gasket is also, Required.

No Joints for Pipe will be Allowed within Wall Section

PRECAST MANHOLE

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

C5.05 H — STANDARD PRECAST MANHOLE
N.T.S.

NO.	REVISION	DATE

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

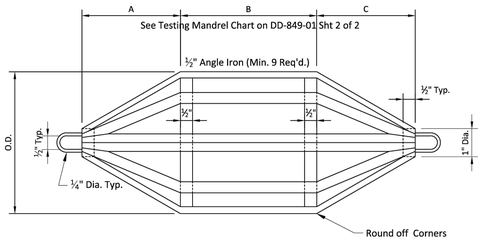
STATE OF TEXAS
KIM KEEFER
117744
LICENSED PROFESSIONAL ENGINEER
8/1/2025

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

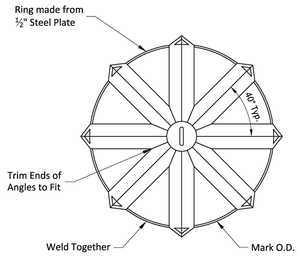
FORCE MAIN AND SANITARY SEWER DETAILS

PLAT NO.
JOB NO. 12537–11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C5.05

Date: April 3, 2025, 4:12 PM – User ID: dloughlin
File: P:\125\37\11\Design\Civil\LS Sheets\LS-125371I-DT.dwg



SIDE OR TOP VIEW



END VIEW

Note:
All Mandrels must be Approved by SAWS Construction Inspection Dept. and Stamped before Use.

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	GO, NO GO DEFLECTION TESTING MANDREL	March 2008	December 2019
		DD-849-01	SHEET 1 OF 2

C5.06 A DEFLECTION TESTING MANDREL
N.T.S.

SIZE	A	B*	MANDREL O.D. PVC (SDR -26)	RING O.D. 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-2241
PVC PIpes and Fittings 18" to 27" in Diameter shall Conform to ASTM F-679

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

PROPERTY OF		APPROVED	REVISED
SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	GO, NO GO DEFLECTION TESTING MANDREL CHART	March 2008	December 2019
		DD-849-01	SHEET 2 OF 2

C5.06 B DEFLECTION TESTING MANDREL
N.T.S.

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
8/1/2025

PAPE-DAWSON
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STAION
SAN ANTONIO, TEXAS

FORCE MAIN AND SANITARY SEWER
DETAILS

PLAT NO.
JOB NO. 12537-11
DATE AUGUST 2025
DESIGNER RM
CHECKED MP DRAWN AL
SHEET C5.06

Date: April 3, 2025, 4:13 PM User ID: dlaughlin
File: P:\125\37\11\Design\Civil\LS Sheets\LS-125311-01.dwg

ELECTRICAL LEGEND

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	CONVENIENCE RECEPTACLE-DUPLEX UNLESS SPECIFIED OTHERWISE CR = CORROSION RESISTANT WP = WEATHERPROOF GFI = GROUND FAULT INTERRUPTER
	RECEPTACLE - 240V., 1ϕ OR 208V., 1ϕ
	CONTACT - NORMALLY OPEN
	CONTACT - NORMALLY CLOSED
	THERMAL OVERLOAD HEATER - AMBIENT COMPENSATED
	CIRCUIT BREAKER - THERMAL MAGNETIC 3 POLE UNLESS INDICATED OTHERWISE CONTINUOUS AMP TRIP SETTING INDICATED
	MOMENTARY PUSHBUTTON NORMALLY OPEN
	MOMENTARY PUSHBUTTON NORMALLY CLOSED
150A	FUSED SWITCH - SWITCH AND FUSE CURRENT RATING INDICATED. 3 POLE UNLESS INDICATED OTHERWISE.
100A	SWITCH - CURRENT RATING INDICATED. 3 POLE UNLESS INDICATED OTHERWISE
	FUSED TERMINAL BLOCK
R	ALARM HORN AND BEACON
O H A POLE 1 XOO POLE 2 OOX	SELECTOR SWITCH-MAINTAINED CONTACT. CHART DEFINES OPERATION:

	POSITION		
POLE	HAND	OFF	AUTO
1	X	0	0
2	0	0	X

X = CLOSED CONTACT
0 = OPEN CONTACT

	GROUND
	TRANSFORMER
M	MOTOR, SQUIRREL CAGE INDUCTION-HORSEPOWER INDICATED ON ONE LINE.
	LUMINAIRE, POLE MOUNTED. ● INDICATES FOUNDATION
A PTT	INDICATING LIGHT-PUSH TO TEST (PTT) LETTER INDICATES COLOR. A = AMBER Y = YELLOW G = GREEN B = BLUE R = RED W = WHITE
	MOTOR OR STARTER ENCLOSURE SPACE HEATER
*	BASIC RELAY SYMBOL-SOME RELAY FUNCTIONS: ALT = ALTERNATOR CR = CONTROL RELAY TR = TIMING RELAY M = MOTOR CONTACTOR
	THERMOSTAT
	LEVEL FLOAT
	GROUNDING CONNECTION EXOTHERMIC OR COMPRESSION
	GATE FLEXIBLE GROUNDING STRAP.
	GROUND ROD CONNECTION 3/4" X 10' LONG.
	TEST WELL WITH GROUND ROD CONNECTION 3/4" X 10' LONG.
	ABOVE GRADE TAIL FOR EQUIPMENT CONNECTION. TO BE LOCATED FOR PROPER EQUIPMENT ENTRANCE. PENETRATION THRU CONCRETE TO HAVE SCHEDULE 80 PVC PIPE SEGMENT.
	GROUND MOISTURIZING PORT

SWITCHGEAR / MCC SYMBOLS

SYMBOL	DESCRIPTION
SSOLR	SOLID STATE OVERLOAD RELAY MOTOR OVERLOAD, PHASE LOSS,AND CURRENT UNBALANCE PROTECTION

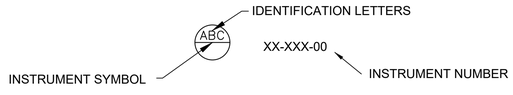
I/O SYMBOL LEGEND

SYMBOL	DESCRIPTION
▲	DIGITAL INPUT
△	ANALOG INPUT

ELECTRICAL ABBREVIATIONS

ATS	AUTOMATIC TRANSFER SWITCH
AUTO	AUTOMATIC
AUX	AUXILIARY
BC	BYPASS CONTACTOR
CC	CONTROL CABLE
CPT	CONTROL POWER TRANSFORMER
CR	CONTROL RELAY
CS	CONTROL SWITCH
CT	CURRENT TRANSFORMER
EI	ELECTRICAL INTERRUPT
ETM	ELAPSED TIME METER
FLA	FULL LOAD AMPERE
FU	FUSE
FVNR	FULL VOLTAGE NON-REVERSING
HOA	HAND OFF AUTOMATIC SWITCH
ISW	ISOLATION SWITCH
J,JB	JUNCTION BOX
KVA	KILOVOLT-AMPERE
KW	KILOWATT
LC	LINE CONTACTOR
LS,LMS	LIMIT SWITCH
G	GREEN INDICATING LIGHT
M	MAGNETIC CONTACTOR COIL
M	ELECTRIC MOTOR
M	MAIN CONTACTOR AUXILIARY
MIN	MINUTES
MTS	MANUAL TRANSFER SWITCH
N	NEUTRAL GROUNDED CONDUCTOR
OC	OVERCURRENT
PH	PHASE
RVSS	REDUCED VOLTAGE SOFT START
SA	SURGE ARRESTOR
SEC	SECONDS
SPD	SURGE PROTECTIVE DEVICE
TR	TIMER
V	VOLT
WP	WEATHER PROOF
XFMR	TRANSFORMER

P& ID INSTRUMENTATION IDENTIFICATION SYMBOL



INSTRUMENTATION IDENTIFICATION LEGEND

LETTER	PROCESS OR INITIATING VALUE	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (*)	ALARM		
B	BURNER FLAME	USERS CHOICE (*)	USERS CHOICE (*)	USERS CHOICE (*)
C	CONDUCTIVITY		CONTROL	
D	DENSITY (3.0)			
E	VOLTAGE	PRIMARY ELEMENT		
F	FLOW RATE			
G	GAUGE	GLASS	GATE	
H	HAND (MANUAL)			HIGH
I	CURRENT	INDICATE		
J	POWER			
K	TIME OR SCHEDULE		CONTROL STATION	
L	LEVEL	LIGHT (PILOT)		LOW
M	MOTION			MIDDLE
N	USERS CHOICE (*)	USERS CHOICE (*)	USERS CHOICE (*)	USERS CHOICE (*)
O	USERS CHOICE (*)	ORIFICE		
P	PRESSURE (OR VACUUM)	POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT	INTEGRATE		
R		RECORD OR PRINT		
S	SPEED OR FREQUENCY		SWITCH	
T	TEMPERATURE		TRANSMIT	
U	MULTIVARIABLE (*)	MULTIFUNCTION (*)	MULTIFUNCTION (*)	MULTIFUNCTION (*)
V	VISCOSITY		VALVE OR DAMPER	
W	WEIGHT OR FORCE	WELL		
X	UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)
Y	USERS CHOICE (*)		RELAY OR COMPUTE (*)	
Z	POSITION		DRIVE, ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	

(*) WHEN USED, EXPLANATION IS SHOWN ADJACENT TO INSTRUMENT SYMBOL. SEE ABBREVIATIONS AND LETTER SYMBOLS.

P&ID SYMBOLS

SYMBOL	DESCRIPTION
	SWING CHECK VALVE
	GATE VALVE
	PUMP

INSTRUMENTATION SYMBOLS

SYMBOL	DESCRIPTION
FIT	FIELD MOUNTED INSTRUMENT
YL	LOCAL CONTROL PANEL MOUNTED INSTRUMENT
YL	POINT MONITORED BY SCADA

INSTRUMENTATION IDENTIFICATION

LIC	LEVEL INDICATING CONTROLLER
PIT	PRESSURE INDICATING TRANSMITTER
LAH	LEVEL ALARM HIGH
TAH	TEMPERATURE ALARM HIGH
TT	TEMPERATURE TRANSMITTER

P&ID ABBREVIATION INDEX

BYP/SS	BYPASS OR SOFT START SELECTION
ETM	ELAPSED TIME METER
HOA	HAND OFF AUTOMATIC
HLR	HIGH LEVEL RELAY
ILP	INFLUENT LIFT PUMP
IR	ISOLATION RELAY
LC	LINE CONTACTOR
LLR	LOW LEVEL RELAY
LS	LIFT STATION
OL	MOTOR OVERLOAD
OT	OVERTEMPERATURE
PLR	PHASE LOSS RELAY
TR	TIMING RELAY
SL	SEAL LEAK
SS	SELECTOR SWITCH
TF	TRANSFER FAIL RELAY

GRUBB ENGINEERING, INC.
ELECTRICAL POWER SYSTEMS
DESIGN AND TESTING
TBPE FIRM REGISTRATION NO. 3904
2727 N. ST. MARY'S ST. TEL. NO. 210-658-7250
SAN ANTONIO, TX 78212 FAX NO. 210-658-9805

NO.	REVISION	DATE

7/25/2025
STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DALLAS
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800

MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS
ELECTRICAL LEGEND

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-1

GRUBB ENGINEERING, INC.
ELECTRICAL POWER SYSTEMS
DESIGN AND TESTING
TBPE FIRM REGISTRATION NO. 3904
2727 N. ST. MARY'S ST. SAN ANTONIO, TX 78212
TEL. NO. 210-658-7250
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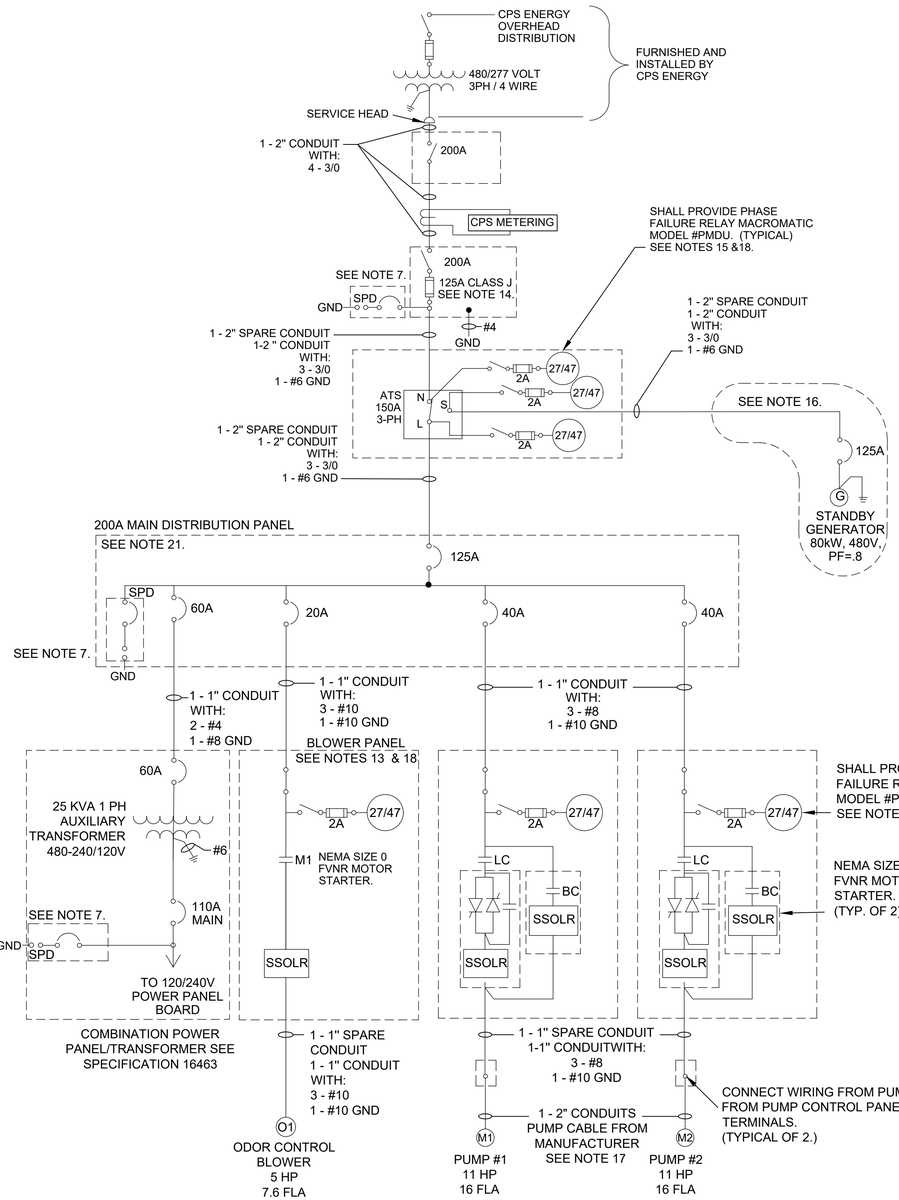


A ELECTRICAL ONE-LINE DIAGRAM
SCALE: N.T.S.

LOAD SCHEDULE		
DESCRIPTION	CONNECTED LOAD	ESTIMATED DEMAND
PUMP 1	11.0KVA	11.0KVA
PUMP 2	11.0KVA	11.0KVA
BLOWER	5.0KVA	5.0KVA
TRANSFORMER	25.0KVA	20.0KVA
TOTAL	52.0KVA	47.0KVA

NOTE TO CONTRACTOR

NO MODIFICATIONS CAN BE MADE TO THE LIFT STATION PRIOR TO APPROVAL BY THE ENGINEER AND SAWS.

CONTRACTOR SHALL NOTIFY THE ENGINEER AND THE SAWS INSPECTOR WHEN LIFT STATION CONSTRUCTION HAS PROGRESSED TO THE FOLLOWING MILESTONES:

- WHEN PUMP CONTROL PANEL ARRIVES AT THE SITE
- WHEN SCADA PANEL ARRIVES AT THE SITE
- DUCTBANKS PRIOR TO POUR
- GROUNDING PRIOR TO POUR
- SCADA MAST FOUNDATION PRIOR TO POUR
- UPON COMPLETION OF ALL TERMINATIONS
- ELECTRICAL SERVICE RACK PAD PRIOR TO POUR
- GENERATOR FOUNDATION PRIOR TO POUR

WORK SHALL NOT CONTINUE ON THE LIFT STATION UNTIL THE ENGINEER AND SAWS HAS HAD AN OPPORTUNITY TO OBSERVE THE STATUS OF CONSTRUCTION AT EACH STAGE. THE CONTRACTOR SHALL PROVIDE THE ENGINEER AND SAWS 48 HOURS ADVANCED NOTICE PRIOR TO THE TIME THAT THE LIFT STATION WILL BE AT THE REQUIRED STAGE.

TYPE: 225A COPPER BUS
110A MAIN BREAKER
120/240V
1-PHASE, 3-WIRE

POWER PANEL 'A'

LABEL	CONDUIT	WIRE	LOAD	BREAKER SIZE	POLE	CKT.	CKT.	POLE	BREAKER SIZE	LOAD	WIRE	CONDUIT	LABEL
GENERATOR BLOCK HEATER	1"	2 - #10 1 - #10 GND	1.0 KW	20	2	1	2	1	20	0.2 KW	2 - #10 1 - #10 GND	1"	GENERATOR BATTERY CHARGER
						3	4	1	20	0.6 KW	2 - #10 1 - #10 GND	1"	HEAT TRACE CONTROL PANEL
AREA LIGHT #1	1"	2 - #10 1 - #10 GND	0.3 KW	20	1	5	6	1	20	0.2 KW	2 - #10 1 - #10 GND	1"	SPD FOR COMBO XFMR
CANOPY LIGHTS	1"	2 - #10 1 - #10 GND	0.2 KW	20	1	7	8	1	20	1.9 KW	2 - #10 1 - #10 GND	1"	PUMP CONTROL PANEL #1
SCADA UPS	1"	2 - #10 1 - #10 GND	2.0 KW	20	1	9	10	1	20	1.9 KW	2 - #10 1 - #10 GND	1"	SCADA PANEL RECEPT. & LTS
SCADA PANEL AIR COND.	1"	2 - #10 1 - #10 GND	2.0 KW	20	1	11	12	1	20	1.9 KW	2 - #10 1 - #10 GND	1"	LEVEL CONTROL PANEL
PUMP CONTROL PANEL #2	1"	2 - #10 1 - #10 GND	1.9 KW	20	1	13	14	1	20	0.1 KW	2 - #10 1 - #10 GND	1"	SCADA HEATER
ELECTRICAL RACK RECEPTACLE	1"	2 - #10 1 - #10 GND	1.9 KW	20	1	15	16	1	20	1.9 KW	2 - #10 1 - #10 GND	1"	ODOR CONTROL BLOWER
AREA LIGHT #2	1"	2 - #10 1 - #10 GND	0.3 KW	20	1	15	16	1	20	-	2 - #10 1 - #10 GND	1"	SPARE
SPARE			-			17	18			-			SPARE
SPARE			-			19	20			-			SPARE
SPARE			-			21	22			-			SPARE
SPARE			-			23	24			-			SPARE
SPARE			-			25	26			-			SPARE
SPARE			-			27	28			-			SPARE
			9.6 KW			18.3 KW			8.7 KW				

NOTES:
1. CONTRACTOR TO COORDINATE BREAKER AND CABLE RATING WITH GENERATOR REQUIREMENTS.
2. EACH CIRCUIT SHALL HAVE SEPARATE HOT, NEUTRAL, GROUND WIRES. DO NOT SHARE NEUTRAL GROUND WIRE FROM OTHER CIRCUITS.

B 120/240V POWER PANEL
SCALE: N.T.S.

NOTES:
1. ALL ELECTRIC CONDUIT SHALL BE CONCRETE ENCASED 24 INCHES BELOW GRADE.
2. ABOVE GROUND CONDUIT SHALL BE RIGID ALUMINUM. PVC COATED ALUMINUM CONDUIT SHALL BE PROVIDED ON AREAS WHERE CONCRETE COMES IN CONTACT WITH ALUMINUM CONDUIT.
3. UNDER GROUND CONDUIT SHALL BE PVC SCHEDULE 40 CONDUIT. SEE DETAILS B AND D ON SHEET E13.
4. ALL ENCLOSURES AND DISCONNECT SWITCHES MUST BE PAD-LOCKABLE. PUMP CONTROL PANELS SHALL BE SINGLE DOOR, WALL MOUNTED TYPE WITH 480V EQUIPMENT LOCATED IN THE RIGHT SIDE FOR EACH PUMP INSTALLED. LEVEL CONTROL PANEL SHALL BE COMMON TO ALL PUMP CONTROL PANELS FOR AUTOMATIC CONTROL. ALL ENCLOSURES AND JUNCTION BOXES MUST BE WHITE ENAMELED COATED.
5. ALL DISCONNECTS SHALL BE NEMA 4X, 316 STAINLESS STEEL.
6. PROVIDE SEALING FITTINGS FOR ALL CONDUIT LEAVING THE WET-WELL. SEALS MUST BE LOCATED WITHIN 18" OF ENCLOSURE PER NEC.
7. PROVIDE A SURGE PROTECTIVE DEVICE IN A SEPARATE WHITE ENAMELED COATED ENCLOSURE ADJACENT TO THE MDP, (IF MANUFACTURER DOES NOT MAKE AN INTEGRATED SPD.) POWER PANEL AND SAFETY SWITCHES. DEVICE MUST ADHERE TO UL1449 4TH EDITION STANDARDS. REFER TO SPECIFICATION 16451. PROVIDE BREAKER FOR SURGE PROTECTIVE DEVICE AS RECOMMENDED BY MANUFACTURER. TAPPED FEEDER SIZE SHALL BE LARGEST ALLOWED BY MANUFACTURER. CABLE LENGTH BETWEEN THE EQUIPMENT THE SPD IS PROTECTING AND THE SPD PANEL MUST BE AS SHORT AS POSSIBLE PER NEC ARTICLE 242.24 UNLESS DIRECTED OTHERWISE BY MANUFACTURER.
8. NOT ALL SPARE CONDUITS ARE SHOWN ON THIS SHEET. SEE SITE PLAN FOR ADDITIONAL SPARE CONDUITS.
9. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS AT ANY POINT.
10. ALL ELECTRICAL COMPONENTS SHALL BE NEMA RATED.
11. IF PROVIDED PUMPS ARE NOT SIZED PER PROJECT PLANS, CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ENGINEERING REQUIRED FOR RESIZING ALL EQUIPMENT AT NO CHARGE TO SAWS AND/OR DEVELOPER.
12. PROTECTIVE DEVICES ARE SIZED PER NEC GUIDELINES. CONTRACTOR SHALL SIZE PROTECTIVE DEVICES PER NEC AND PER RESULT OF POWER SYSTEM STUDY.
13. MANUFACTURER'S RECOMMENDED INSTALLATION PROCEDURE MUST BE UTILIZED DURING EQUIPMENT INSTALLATION START-UP TO AVOID EQUIPMENT DAMAGE. IF EQUIPMENT IS DAMAGED DURING START-UP DUE TO NOT FOLLOWING MANUFACTURER'S PROCEDURE, THEN CONTRACTOR IS RESPONSIBLE FOR COST ASSOCIATED WITH EQUIPMENT REPLACEMENT.
14. BOND NEUTRAL TO GROUNDING ELECTRODE CONDUCTOR.
15. INSTALL THE THREE (3) PHASE FAILURE RELAYS FOR INCOMING POWER WITHIN THE ATS ENCLOSURE. THE ENCLOSURE OF THE ATS SHALL BE LARGE ENOUGH TO ALLOW THE INTERNAL INSTALLATION OF THE THREE PHASE LOSS RELAYS AND THEIR COMPACT CIRCUIT PROTECTORS. THESE PHASE LOSS RELAYS ARE TO PROVIDE SCADA INDICATION.
16. GENERATOR SIZE TO BE VERIFIED BY GENERATOR MANUFACTURER BASED ON PERFORMANCE TEST REQUIREMENTS IN SPECIFICATION 16600. GENERATOR SHALL BE PROVIDED WITH OVER CURRENT PROTECTION BREAKER AS RECOMMENDED BY MANUFACTURER.
17. MOTOR BRANCH CIRCUIT CONDUITS FROM WET WELL HATCH TO WET WELL JUNCTION BOX, WHERE THE MOTOR POWER CABLES WILL BE RUN. CONDUIT SHALL BE TWO (2) INCHES. SEE SHEET E12.
18. CONTRACTOR TO PROVIDE PHASE FAILURE RELAY (PLR) MACROMATIC MODEL #PMDU. FUSES FOR PHASE FAILURE RELAY BE DISCONNECTABLE AS MANUFACTURED BY BUSSMAN MODEL CCP2-3-30CF. ROTARY HANDLE NOT REQUIRED.
19. AUTOMATIC TRANSFER SWITCH (ATS) SHALL HAVE A COMMON SOLID GROUND CONDUCTOR TO THE GENERATOR AND SERVICE.
20. MAIN DISTRIBUTION PANELBOARD (MDP) SHALL BE OF THE BOLTED TYPE CIRCUIT BREAKERS.
21. ALL BREAKERS MUST BE INDIVIDUALLY LOCKABLE. LOCKING MEANS MUST NOT BE READILY REMOVABLE. PORTABLE LOCKING MEANS ARE NOT ALLOWED.

7/25/2025
STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DALLAS
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800

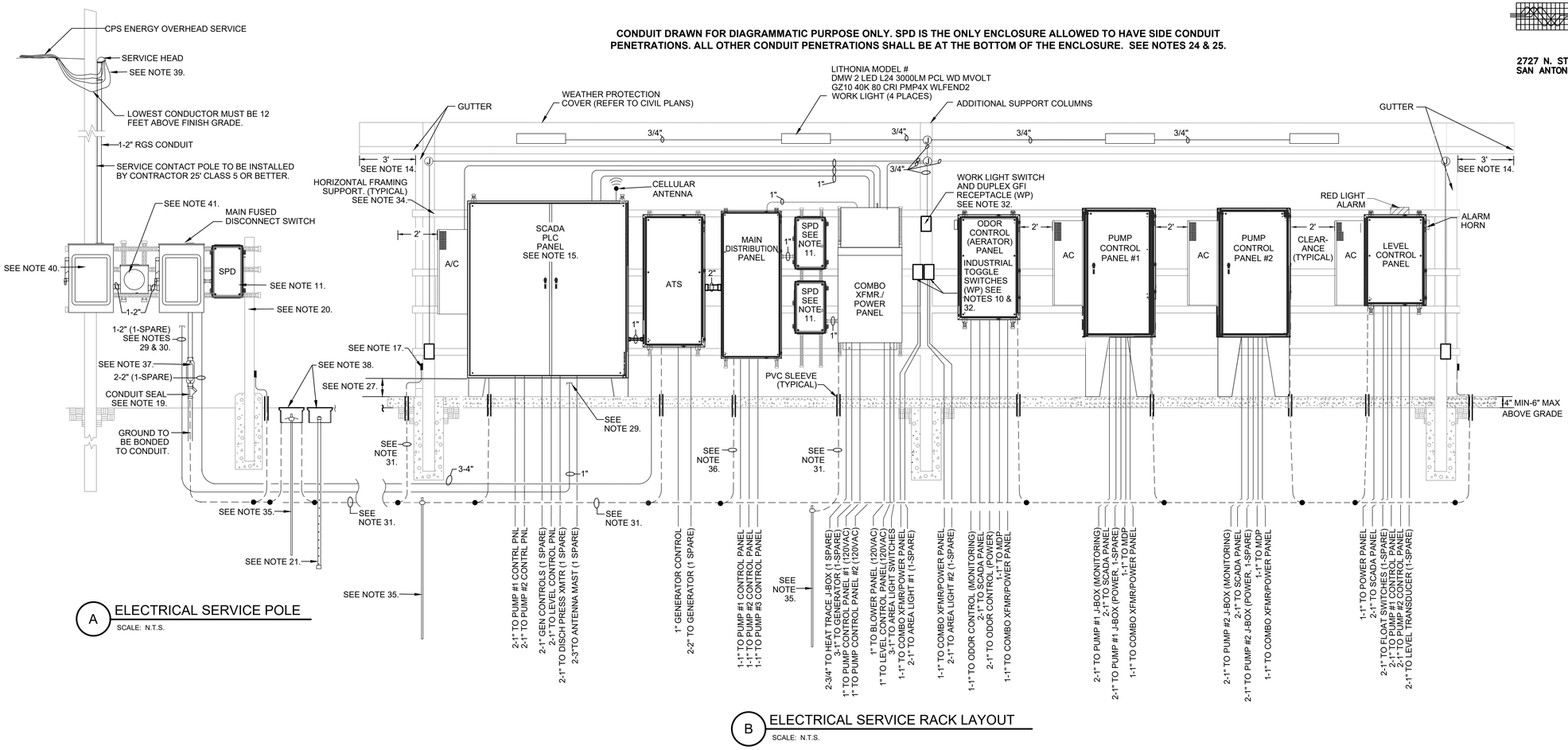
MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

ELECTRICAL ONE-LINE DIAGRAM

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-2

GRUBB ENGINEERING, INC.
ELECTRICAL POWER SYSTEMS
DESIGN AND TESTING
TBPE FIRM REGISTRATION NO. 3904
2727 N. ST. MARY'S ST. TEL. NO. 210-658-7250
SAN ANTONIO, TX 78212 FAX NO. 210-658-9805

CONDUIT DRAWN FOR DIAGRAMMATIC PURPOSE ONLY. SPD IS THE ONLY ENCLOSURE ALLOWED TO HAVE SIDE CONDUIT PENETRATIONS. ALL OTHER CONDUIT PENETRATIONS SHALL BE AT THE BOTTOM OF THE ENCLOSURE. SEE NOTES 24 & 25.



A ELECTRICAL SERVICE POLE
SCALE: N.T.S.

B ELECTRICAL SERVICE RACK LAYOUT
SCALE: N.T.S.

NOTES:

1. ALL ELECTRIC CONDUIT SHALL BE CONCRETE ENCASED 24 INCHES BELOW GRADE.
2. ABOVE GROUND CONDUIT SHALL BE RIGID ALUMINUM. PVC COATED ALUMINUM CONDUIT SHALL BE PROVIDED ON AREAS WHERE CONCRETE COMES IN CONTACT WITH ALUMINUM CONDUIT.
3. UNDER GROUND CONDUIT SHALL BE PVC SCHEDULE 40 CONDUIT. SEE DETAILS B AND D ON SHEET E13.
4. ALL ENCLOSURES AND DISCONNECT SWITCHES MUST BE PAD-LOCKABLE. PUMP CONTROL PANEL SHALL BE SINGLE DOOR, WALL MOUNTED TYPE WITH 480V EQUIPMENT LOCATED IN THE RIGHT SIDE. INSTALL ONE PUMP CONTROL PANEL FOR EACH PUMP. LEVEL CONTROL PANEL SHALL BE COMMON TO ALL PUMP CONTROL PANELS FOR AUTOMATIC CONTROL. ALL ENCLOSURES AND JUNCTION BOXES MUST BE WHITE ENAMELED COATED ON EXTERIOR.
5. ALL MOUNTING HARDWARE, FITTINGS AND STRUT CHANNEL SHALL BE 316 STAINLESS STEEL. ALL ENCLOSURES SHALL BE NEMA 4X, 316 STAINLESS STEEL WITH WHITE ENAMELED COATING ON EXTERIOR.
6. ALL DISCONNECTS SHALL BE NEMA 4X, 316 STAINLESS STEEL.
7. SERVICE RACK STRUTS NEED TO BE 1-1/2" MINIMUM 316 STAINLESS STEEL AND SHALL BE MOUNTED ON 4" DIAMETER, 1/2" THICK STRUCTURAL HOT DIP GALVANIZED STEEL TUBE. STRUT CHANNEL ENDS SHALL BE PROTECTED WITH END CAPS.
8. THERE SHALL BE 6" MINIMUM SPACING BETWEEN EQUIPMENT MOUNTED ON THE RACK WITH THE EXCEPTION OF THE SPD. ALLOW 2 FEET CLEARANCE FOR SERVICE OF PANEL A/C UNIT.
9. ELECTRICAL RACK SHALL HAVE SUPPORT COLUMNS EVERY 5 FEET.
10. 20 AMP, SPDT, CENTER OFF, INDUSTRIAL TOGGLE SWITCH.
11. PROVIDE A SURGE PROTECTIVE DEVICE IN A SEPARATE WHITE ENAMEL COATED EXTERIOR ENCLOSURE ATTACHED TO THE ADJACENT TO THE SAFETY SWITCHES, MDP AND COMBO TRANSFORMER/POWER PANEL (IF MANUFACTURER DOES NOT MAKE AN INTEGRATED SPD FOR THE MDP AND COMBO/TRANSFORMER/POWER PANEL.) DEVICE MUST ADHERE TO UL1449 4TH EDITION STANDARDS. REFER TO SPECIFICATION 16451. PROVIDE BREAKER FOR SURGE PROTECTIVE DEVICE AS RECOMMENDED BY MANUFACTURER. TAPPED FEEDER SIZE SHALL BE LARGEST ALLOWED BY MANUFACTURER. LENGTH MUST BE AS SHORT AS POSSIBLE, UNLESS DIRECTED OTHERWISE BY MANUFACTURER, BETWEEN THE EQUIPMENT THE SPD IS PROTECTING TO THE SPD PANEL NEC ARTICLE 242.24.
12. NOT ALL SPARE CONDUITS ARE SHOWN ON THIS SHEET. SEE SITE PLAN FOR ADDITIONAL SPARE CONDUITS.
13. ALL EQUIPMENT SHALL BE MOUNTED ON THE FRONT OF THE SERVICE RACK. NO EQUIPMENT SHALL BE MOUNTED ON THE BACK OF RACK. ANY LENGTHENING OF THE RACK TO BE APPROVED BY THE STRUCTURAL ENGINEER.
14. CANOPY SHALL EXTEND 3 FEET BEYOND THE ENCLOSURE SIDE EDGE. (THE AIR CONDITIONER IS CONSIDERED THE ENCLOSURES SIDE EDGE.)
15. SEE SHEETS E9 AND E10 FOR SCADA PANEL INFORMATION.
16. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS AT ANY POINT.
17. GROUNDING CONNECTION TO SERVICE RACK. SEE SHEET E13 DETAIL A. (TYPICAL).
18. ALL ELECTRICAL COMPONENTS SHALL BE NEMA RATED.
19. SEALS MUST BE LOCATED WITHIN 18" OF ENCLOSURE PER NEC.
20. CONTRACTOR SHALL FOLLOW CPS ENERGY STANDARDS FOR RACK INSTALLATION.
21. MOISTURIZING PORT SHALL BE LOCATED ADJACENT TO TEST WELL. MOISTURIZING PORT IS 1-INCH PVC SCH 80 PIPE WITH 1/8-INCH DIAMETER PERFORATIONS TO ALLOW WATER SEEPAGE 1 FOOT AWAY FROM GROUNDING ROD.
22. REFER TO STRUCTURAL DRAWINGS FOR CANOPY AND RACK STRUCTURAL DETAILS.
23. ALL PANELS SHALL BE GROUNDED WITH #6 COPPER GROUNDING CONDUCTOR PER SAWS DIRECTION.
24. RACK SHOWN IS FOR DIAGRAMMATIC PURPOSE ONLY. PLEASE SEE STRUCTURAL DRAWINGS FOR CANOPY AND RACK CONSTRUCTION AND FOUNDATION DETAILS.
25. CONDUIT TOP PENETRATIONS, BACK PENETRATIONS AND SIDE PENETRATIONS ON ALL PANELS AND JUNCTION BOXES REGARDLESS OF LOCATION ARE NOT ALLOWED. SURGE PROTECTIVE DEVICE IS THE ONLY ENCLOSURE TO HAVE SIDE PENETRATIONS. CONDUIT SHOWN ARE DRAWN FOR DIAGRAMMATIC PURPOSE ONLY.
26. PROTECTIVE DEVICES ARE SIZED PER NEC GUIDELINES. CONTRACTOR SHALL SIZE PROTECTIVE DEVICES PER NEC AND PER RESULT OF POWER SYSTEM STUDY.
27. 24" MINIMUM FROM GRADE TO BOTTOM OF ENCLOSURES.
28. DIELECTRIC COUPLINGS SHALL BE INSTALLED BETWEEN DISSIMILAR METALS IN ALL CASES.
29. TWO (2) - ONE (1) INCH CONDUITS FOR FUTURE TELEPHONE LINE. CONTRACTOR TO TERMINATE CONDUIT ON TYPE "C" CONDUIT BODIES WITH CAP OPEN END TO PREVENT INTRUSION OF MOISTURE AND DEBRIS BEHIND SCADA PANEL.
30. CONTRACTOR TO TERMINATE THE SPARE CONDUITS ON TYPE "C" CONDUIT BODIES AND CAP FOR FUTURE ENCLOSURE INSTALLATION.
31. #4/0 COPPER GROUND CONDUCTOR FURNISHED AND INSTALLED BY CONTRACTOR (TYPICAL).
32. PROVIDE LABELS FOR LIGHT SWITCHES AND RECEPTACLE.
33. EQUIPMENT MUST BE MOUNTED FACING SOUTH.
34. CONTRACTOR TO MOUNT HORIZONTAL FRAMING TO SUPPORT COLUMNS USING U-BOLTS. DO NOT DRILL IN SUPPORT COLUMN.
35. APPROVED GROUNDING ELECTRODE AND CLAMP FURNISHED AND INSTALLED BY CONTRACTOR. GROUND ROD SHALL BE 3/4" X 10'. CONNECTION IS TO BE MADE BELOW FINISH GRADE. GROUND RESISTANCE OF INSTALLED ROD W/O CONNECTIONS SHALL BE MEASURED AND REPORTED TO THE ENGINEER. REFER TO SECTION 16950.
36. #6 COPPER TINNED GROUND CONDUCTOR (TYPICAL OF 9).
37. ALUMINUM CONDUIT BODY TYPE C. CONTRACTOR WILL LEAVE A GROUNDING CONDUCTOR LOOP TO ALLOW GROUND RESISTANCE MEASUREMENT
38. 6" DUCTILE IRON COVER FOR GROUND TEST WELL AND MOISTURIZING PORT. PVC PIPE PROVIDED WITH THREADED CAP. SEE NOTE 21 AND 35.
39. CONTRACTOR MUST PROVIDE 24" OF WIRE ENDS EXTENDING OUT OF SERVICE HEAD FOR CPS TO MAKE CONNECTIONS AND FOR FORMING A DRIP LOOP CONDUCTOR.
40. INCOMING MAIN NON FUSED DISCONNECT SWITCH. TOP OF ENCLOSURE MUST BE 5 FEET ABOVE FINISHED GRADE FOR BOTH FUSED AND NON FUSED DISCONNECT SWITCHES.
41. POWER METER FURNISHED BY CPS, AND INSTALLED BY CONTRACTOR.

NO.	REVISION	DATE

7/25/2025
STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED PROFESSIONAL ENGINEER

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2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
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MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

ELECTRICAL SERVICE POLE AND RACK LAYOUT

SAWS JOB NO. XX-XXXX
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SHEET E-3

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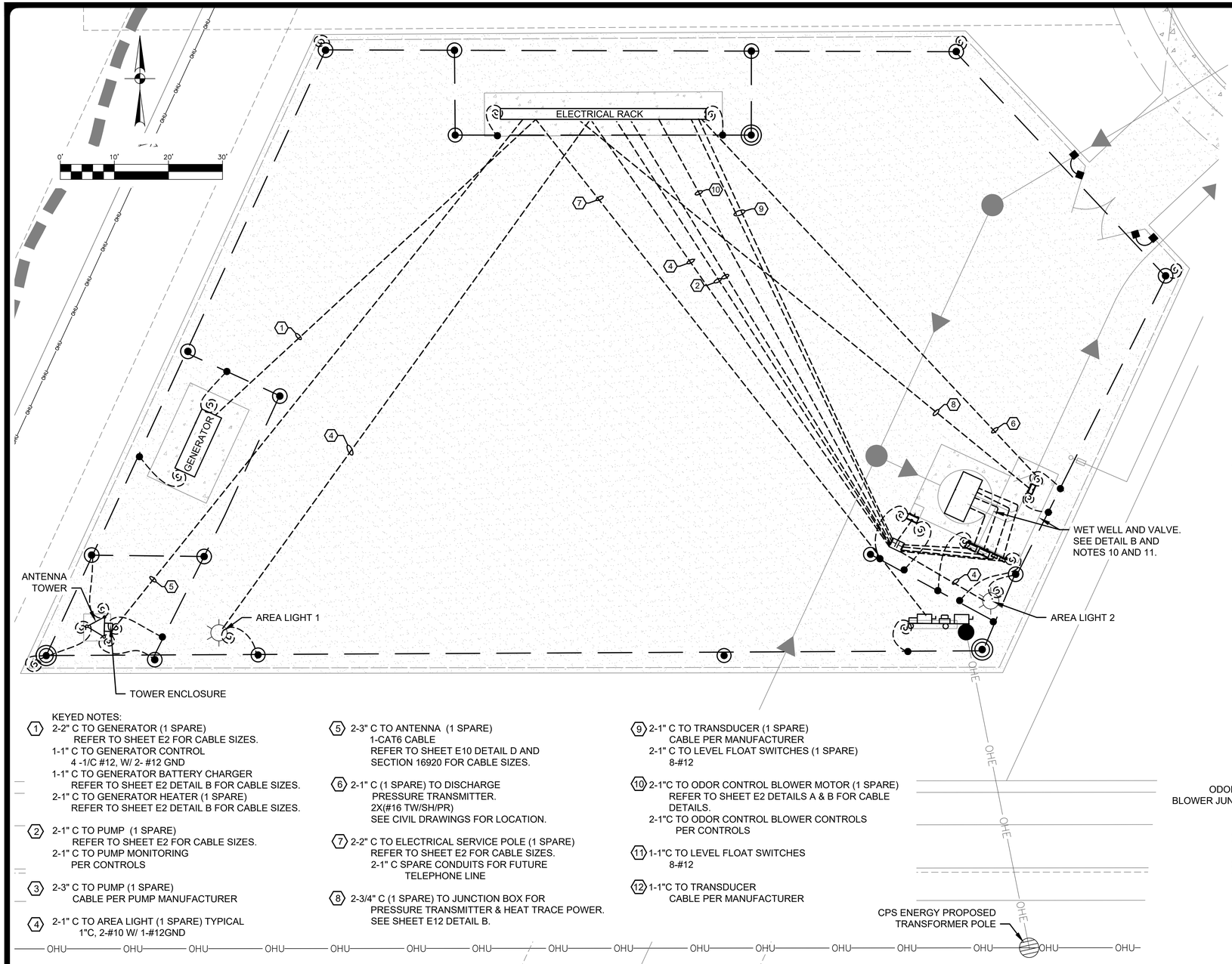
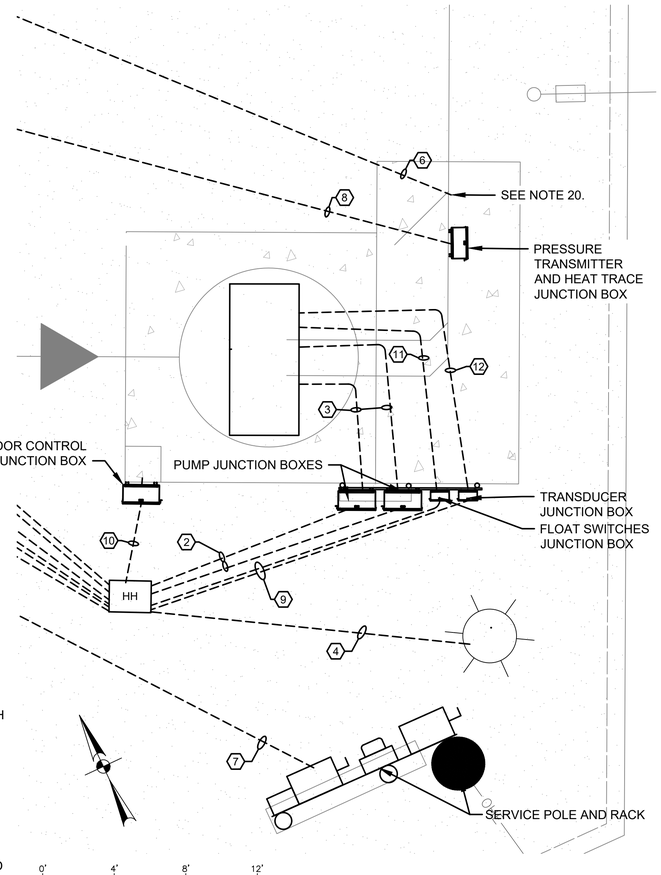


LEGEND

- GROUND MOISTURIZING PORT
- GROUNDING CONNECTION EXOTHERMIC OR COMPRESSION
- GATE FLEXIBLE GROUNDING STRAP.
- GROUND ROD CONNECTION 3/4" X 10' LONG.
- TEST WELL WITH GROUND ROD CONNECTION 3/4" X 10' LONG.
- ABOVE GRADE TAIL FOR EQUIPMENT CONNECTION. TO BE LOCATED FOR PROPER EQUIPMENT ENTRANCE. PENETRATION THRU CONCRETE TO HAVE SCHEDULE 80 PVC PIPE SEGMENT.
- #4/0 STRANDED BARE TINNED COPPER WIRE, SOFT DRAWN AS SHOWN ON PLANS
- UNDERGROUND ELECTRIC DUCTBANK
- OHE — OHE — PROPOSED CPS ENERGY OVERHEAD ELECTRIC
- OHU — OHU — EXISTING CPS ENERGY OVERHEAD ELECTRIC
- HH — HAND HOLE REFER TO SHEET E12 DETAIL G.



A WET WELL
SCALE: AS SHOWN

KEYED NOTES:

1. 2-2" C TO GENERATOR (1 SPARE)
   REFER TO SHEET E2 FOR CABLE SIZES.
   1-1" C TO GENERATOR CONTROL
   4 -1/C #12, W/ 2- #12 GND
   1-1" C TO GENERATOR BATTERY CHARGER
   REFER TO SHEET E2 DETAIL B FOR CABLE SIZES.
   2-1" C TO GENERATOR HEATER (1 SPARE)
   REFER TO SHEET E2 DETAIL B FOR CABLE SIZES.
2. 2-1" C TO PUMP (1 SPARE)
   REFER TO SHEET E2 FOR CABLE SIZES.
   2-1" C TO PUMP MONITORING
   PER CONTROLS
3. 2-3" C TO PUMP (1 SPARE)
   CABLE PER PUMP MANUFACTURER
4. 2-1" C TO AREA LIGHT (1 SPARE) TYPICAL
   1"C, 2-#10 W/ 1-#12GND
5. 2-3" C TO ANTENNA (1 SPARE)
   1-CAT6 CABLE
   REFER TO SHEET E10 DETAIL D AND
   SECTION 16920 FOR CABLE SIZES.
6. 2-1" C (1 SPARE) TO DISCHARGE
   PRESSURE TRANSMITTER.
   2X(#16 TW/SH/PR)
   SEE CIVIL DRAWINGS FOR LOCATION.
7. 2-2" C TO ELECTRICAL SERVICE POLE (1 SPARE)
   REFER TO SHEET E2 FOR CABLE SIZES.
   2-1" C SPARE CONDUITS FOR FUTURE
   TELEPHONE LINE
8. 2-3/4" C (1 SPARE) TO JUNCTION BOX FOR
   PRESSURE TRANSMITTER & HEAT TRACE POWER.
   SEE SHEET E12 DETAIL B.
9. 2-1" C TO TRANSDUCER (1 SPARE)
   CABLE PER MANUFACTURER
   2-1" C TO LEVEL FLOAT SWITCHES (1 SPARE)
   8-#12
10. 2-1"C TO ODOR CONTROL BLOWER MOTOR (1 SPARE)
    REFER TO SHEET E2 DETAILS A & B FOR CABLE
    DETAILS.
    2-1"C TO ODOR CONTROL BLOWER CONTROLS
    PER CONTROLS
11. 1-1"C TO LEVEL FLOAT SWITCHES
    8-#12
12. 1-1"C TO TRANSDUCER
    CABLE PER MANUFACTURER

NOTES:

1. FENCE SHALL BE GROUNDED AT EACH CORNER WITH 3/4" X 10' GROUND ROD. RODS SHALL BE LOCATED INSIDE THE FENCE.
2. ALL GATES SHALL BE EQUIPPED WITH GROUNDING STRAPS. SEE LEGEND.
3. THERE SHALL BE A 20' SEPARATION BETWEEN GROUND RODS. SPACING SHOWN ON PLAN IS FOR REFERENCE ONLY AND MIGHT NOT BE TO SCALE.
4. ALL ABOVE GROUND CONDUIT SHALL BE INSTALLED AS TO NOT CREATE A TRIPPING HAZARD.
5. PVC COATED ALUMINUM CONDUIT SHALL BE PROVIDED IN AREAS WHERE CONCRETE COMES INTO CONTACT WITH ALUMINUM CONDUIT AND SHALL BE USED FOR ALL BURIED AND CONCRETE STUB-UPS.
6. GENERATOR SHALL BE BONDED TO GROUNDING RING AT GROUNDING POINTS.
7. SEE SHEET E13 DETAIL A FOR GROUNDING DETAILS FOR ALL RACKS AND FREE STANDING ENCLOSURES.
8. CONTRACTOR SHALL OBSERVE NEC WORKING SPACE REQUIREMENTS WHEN LOCATING EQUIPMENT.
9. PROVIDE BARRIER PER NEC IN JUNCTION BOX TO SEPARATE POWER AND SIGNAL CABLES.
10. PANELS SHALL OPEN AWAY FROM WET WELL.
11. SEE SHEET E12 DETAILS C, D, E & F FOR JUNCTION BOX DETAIL. SEE CIVIL DRAWINGS FOR EXACT LOCATION OF ACCESS COVER, STILLING WELL AND PUMP NUMBERS. DO NOT EXTEND SPARE CONDUIT INSIDE WET WELL.
12. ALL GROUND GRID CONDUCTORS SHALL BE CONTINUOUS EXCEPT WHERE SPLICING IS UNAVOIDABLE.
13. MOISTURIZING PORT SHALL BE LOCATED ADJACENT TO TEST WELL LESS THAN 1' APART.
14. SEPARATION AMONG GROUNDING ELECTRODE RODS AND WET WELL SHALL BE 10-FEET.
15. IF LOCATION OF ELECTRIC SERVICE POLE CHANGES DURING CONSTRUCTION PHASE, CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY FOR APPROVAL.
16. OVERHEAD CONDUCTORS MUST HAVE A HORIZONTAL CLEARANCE WITHOUT WIND OF 10 FEET FOR VOLTAGES UP TO 50KV.
17. UTILITIES NOT SHOWN FOR CLARITY. EXISTING OVERHEAD LINES ARE APPROXIMATION. PLEASE SEE CIVIL DRAWINGS FOR UTILITIES.
18. GROUND RESISTANCE MEASURE 5 OHMS OR LESS. CONTRACTOR TO ADD SUPPLEMENTAL GROUND RODS WHERE NECESSARY TO ACHIEVE THE RESISTANCE REQUIRED.
19. SEE SHEET E11 DETAILS A AND B FOR ANTENNA GROUNDING DETAILS.
20. DISCHARGE PRESSURE TRANSMITTER TO BE INSTALLED IN A LOCATION WHICH MAXIMIZES ACCURACY. MODIFY PIPING AS NEEDED TO MEET THIS REQUIREMENT. REFER TO CIVIL PLANS FOR EXACT LOCATION.
21. CONTRACTOR SHALL COORDINATE WITH CPS ENERGY AND COVER ALL COST FOR LINE EXTENSION AND SERVICE DROP INSTALLATION.
22. REFER TO SHEET SHEET E2 FOR ADDITIONAL CABLES NOT LISTED IN DUCTBANKS ON THIS SHEET.
23. EQUIPMENT LOCATED ON SERVICE RACK SHALL BE MOUNTED FACING SOUTH WITH PROTECTIVE SHADE DETAIL PER CIVIL/STRUCTURAL PLANS.
24. TOWER GROUND RING MUST BE AT LEAST 2 FEET AWAY FROM TOWER BASE. TOWER RING CONDUCTOR SIZE TO BE #4/0 BARE TINNED COPPER AND BURIED THIRTY INCHES BELOW GRADE. BOND FENCE TO TOWER GROUND GRID.
25. CPS ENERGY TRANSFORMER POLE SHALL HAVE A 28 FOOT EASEMENT.
26. DUCTBANKS AND CONDUIT RUNS FOR POWER SCADA SIGNAL WIRING SHALL BE SEPARATED AND CONTRACTOR SHALL MAINTAIN A MINIMUM OF 12-INCH SEPARATION BETWEEN DUCTBANKS.
27. GROUND GRID MUST USE ALL EXOTHERMIC WELD TO MAKE A SOLID COMMON GROUNDING LOOP.

MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

ELECTRICAL SITE PLAN

SAWS JOB NO.	XX-XXXX
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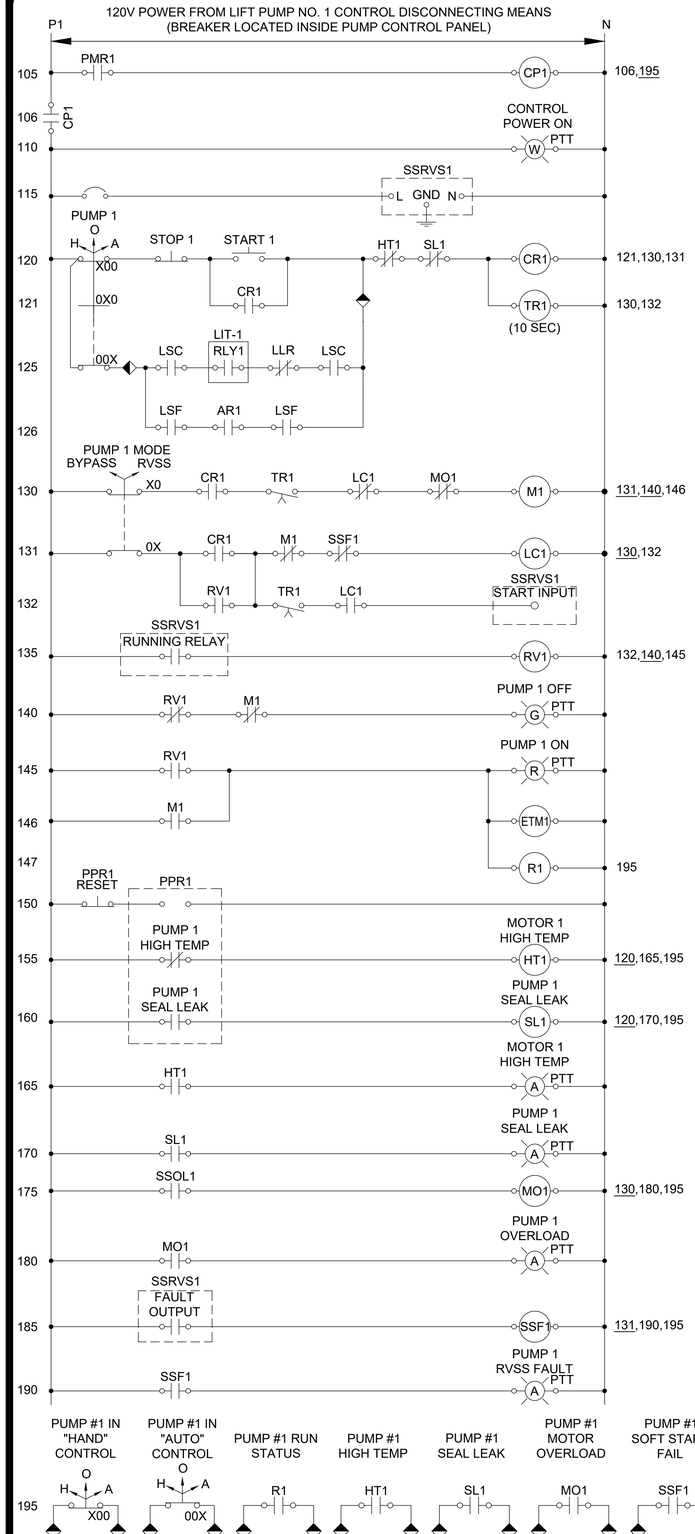
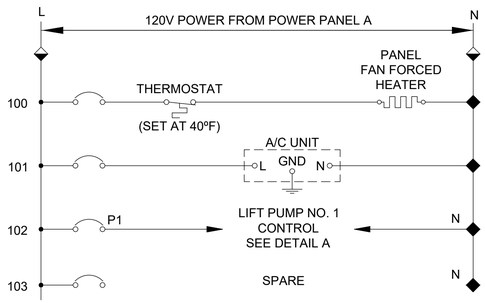
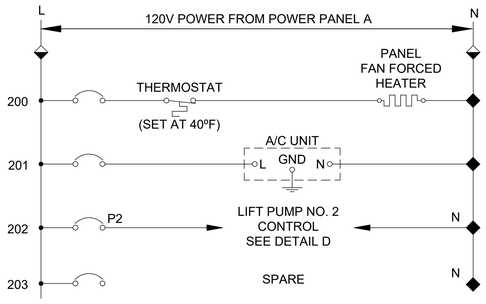
CHECKED	SM
DRAWN	BD
SHEET	E-4



A PUMP #1 MOTOR CONTROL SCHEMATIC
SCALE: N.T.S.



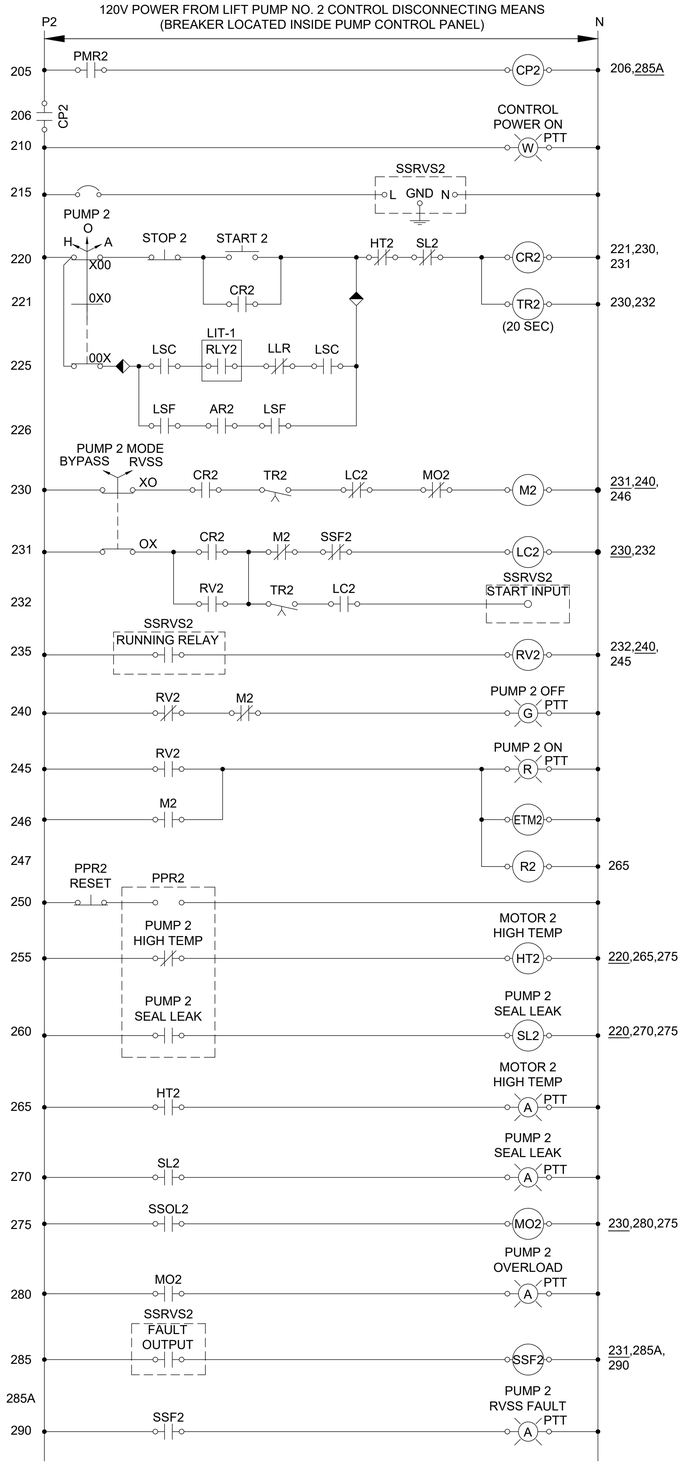
B PUMP CONTROL PANEL #1 CONTROL POWER DISTRIBUTION SCHEMATIC
SCALE: N.T.S.



C PUMP CONTROL PANEL #2 CONTROL POWER DISTRIBUTION SCHEMATIC
SCALE: N.T.S.

ELECTRICAL ABBREVIATIONS

AR	ALTERNATING RELAY FOR FLOAT MODE
CCP	COMPACT CIRCUIT PROTECTOR
CP	CONTROL POWER RELAY
CR	CONTROL RELAY
ETM	ELAPSED TIME METER
HT	MOTOR HIGH TEMPERATURE RELAY
LC	RVSS LINE CONTACTOR
LIT	LEVEL CONTROLLER
LLR	LOW LEVEL RELAY CUTOFF
LSC	LEVEL SYSTEM WITH CONTROLLER
LSF	LEVEL SYSTEM WITH FLOATS
M	FULL VOLTAGE BYPASS STARTER
MO	MOTOR OVERLOAD RELAY
PMR	PHASE MONITORING RELAY
PPR	PUMP PROTECTION RELAY
PPT	PUSH-TO-TEST
R	RUN INDICATION RELAY
RV	SSRVS RUN AUXILIARY RELAY
SC	SSRVS INTERNAL SHORTING CONTACTOR
SL	SEAL LEAK RELAY
SS	COIL SURGE SUPPRESSOR
SSF	SOFT STARTER FAULT RELAY
SSOL	SOLID STATE OVERLOAD RELAY
SSRVS	SOLID STATE REDUCED VOLTAGE STARTER
TR	TIMING RELAY

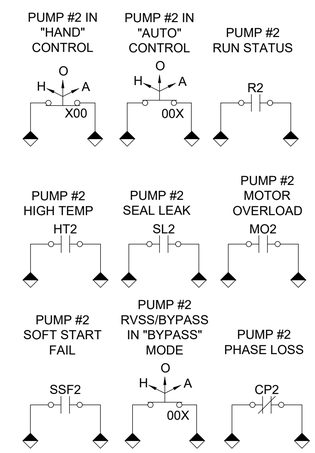


D PUMP #2 MOTOR CONTROL SCHEMATIC
SCALE: N.T.S.

LEGEND

- PUMP CONTROL PANEL (DARK SIDE INDICATES CONNECTION INTERNAL TO PANEL.)
- EXTERNAL PANEL WIRING
- INTERNAL PANEL WIRING

DISCRETE SIGNALS FOR SCADA SYSTEM



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GENERAL NOTES

1. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.
2. A PUMP PROTECTION RELAY SHALL BE PROVIDED FOR EACH PUMP INSTALLED AND SHALL PROVIDE PROTECTION AGAINST MOTOR HIGH TEMPERATURE AND PUMP SEAL LEAK.
3. LEVEL SENSOR PROBES FOR PUMP CONTROL ARE NOT ALLOWED.
4. NOT USED.
5. PUMP PROTECTION RELAY CONTACT LOGIC SHALL BE AS FOLLOW:
   - 5.A. UNDER NORMAL CONDITIONS, N.C. HIGH TEMP CONTACT IS OPEN, AND N.O. SEAL LEAK CONTACT IS OPEN.
   - 5.B. UNDER MOTOR HIGH TEMP CONDITION, THE N.C. HIGH TEMP CONTACT CLOSES.
   - 5.C. UNDER PUMP SEAL LEAK CONDITION, THE N.O. SEAL LEAK CONTACT CLOSES.
6. SOFT STARTER FAULT OUTPUT RELAY SHALL BE OPEN UNDER NORMAL CONDITION AND SHALL CLOSE UNDER SOFT STARTER FAULT CONDITION.
7. THE CONTACT OF THE OVERLOAD RELAY FOR THE FULL VOLTAGE BYPASS STARTER SHALL BE OPEN UNDER NORMAL CONDITION AND SHALL CLOSE UNDER OVERLOAD CONDITION.
8. RELAY TAGS SHALL BE AS SHOWN.

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MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION CONTROL DETAILS #1
PUMP CONTROL PANEL SCHEMATIC

SAWS JOB NO. XX-XXXX
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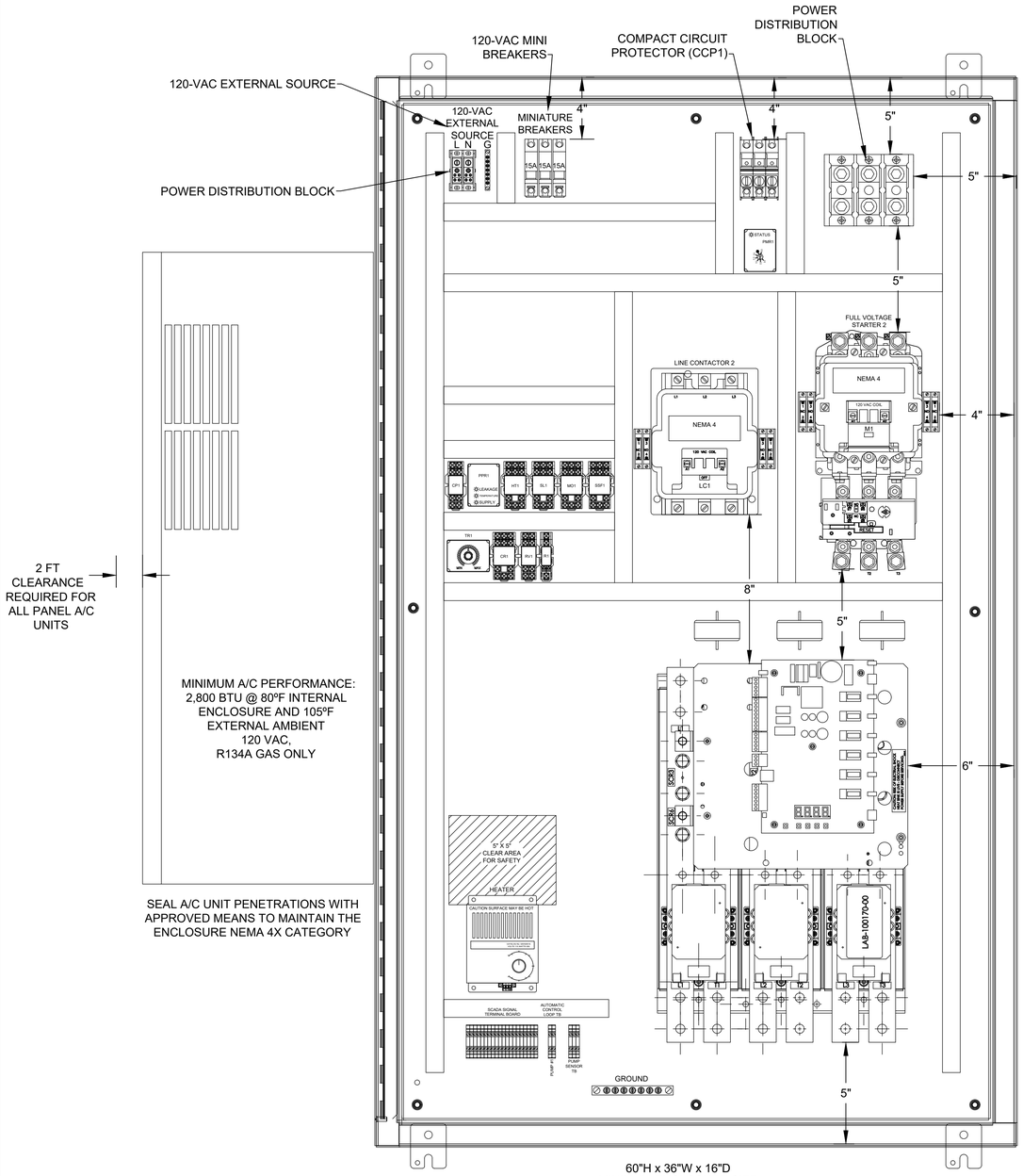

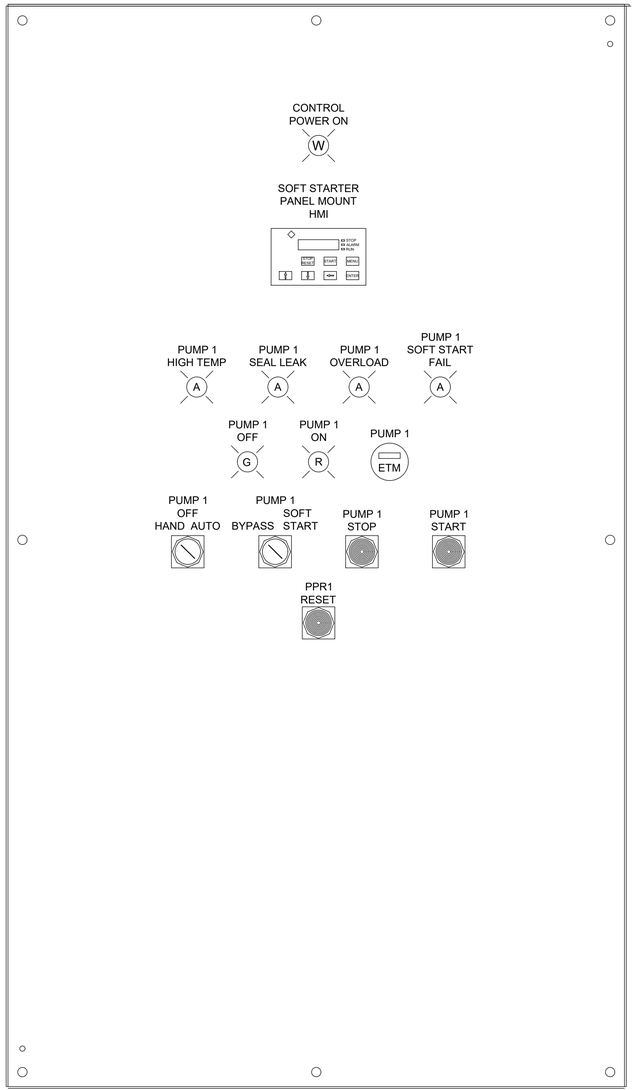

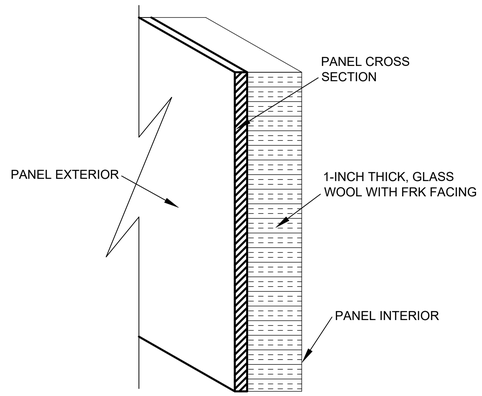

B CLIMATE CONTROLLED PANEL INSULATION
SCALE: N.T.S. SEE NOTES 10 AND 11

A PUMP CONTROL PANEL LAYOUT (TYPICAL OF 2)
SCALE: N.T.S.

NOTES:
1. DISTANCE BETWEEN INTERIOR PANEL AND ANY COMPONENT SHALL BE AT LEAST 5".
2. DISTANCE BETWEEN EXTERIOR PANEL AND INTERIOR PANEL SHALL BE AT LEAST 2".
3. DESIGN WILL COMPLY WITH MINIMUM SEPARATION DISTANCES AMONG INTERNAL COMPONENTS AS SHOWN.
4. THE CONTRACTOR SHALL REFER TO THE PLANS AND SPECIFICATIONS FOR MORE DETAILED EQUIPMENT REQUIREMENTS.
5. SEE INTERNAL LAYOUTS FOR FURTHER PANEL DETAILS.
6. PANEL MOUNT AIR CONDITIONER SIZE IS AN APPROXIMATION. CONTRACTOR TO SIZE AIR CONDITIONER PER EQUIPMENT AND ENCLOSURE SIZE. SEAL A/C UNIT PENETRATIONS WITH APPROVED MEANS TO MAINTAIN THE ENCLOSURE NEMA 4X CATEGORY. ENCLOSURE INTERNAL TEMPERATURE SHALL BE 80°F AND EXTERNAL AMBIENT TEMPERATURE OF 105°F.
7. CONTRACTOR SHALL PROVIDE BARRIER BETWEEN ALL DISSIMILAR VOLTAGES.
8. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.
9. PUMP PROTECTION RELAYS SHALL BE PROVIDED FOR EACH PUMP INSTALLED. AT A MINIMUM PROVIDE PROTECTION AGAINST MOTOR HIGH TEMPERATURE AND PUMP SEAL LEAK.
10. INSULATION IS REQUIRED FOR ALL ENCLOSURES EQUIPPED WITH A/C UNIT, INCLUDING SCADA ENCLOSURES, RVSS ENCLOSURES AND LEVEL CONTROL ENCLOSURES. SEE DETAIL B.
11. INSTALL INSULATING SHEETS IN THE INTERIOR SURFACES OF THE PANEL, INCLUDING DOOR(S). NOT REQUIRED FOR INTERNAL SWING PANELS.

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STEVEN MOUSER
103671
LICENSED PROFESSIONAL ENGINEER

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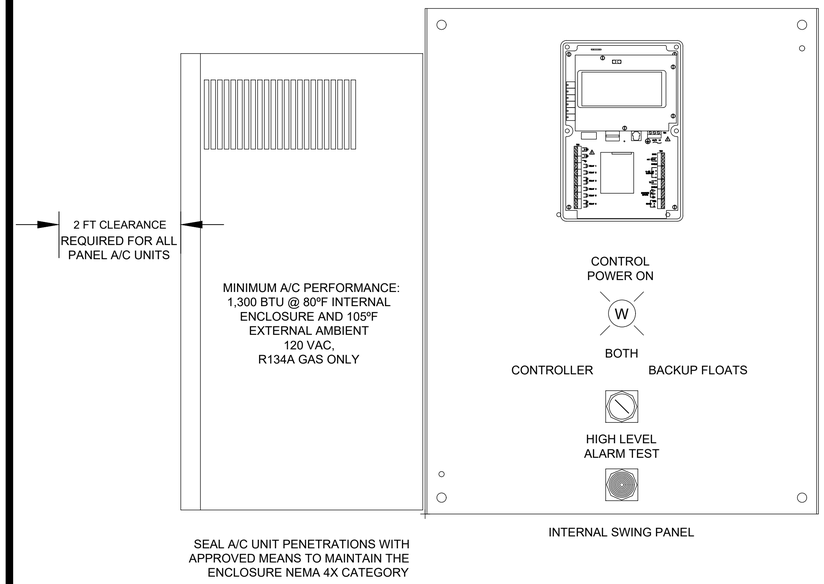
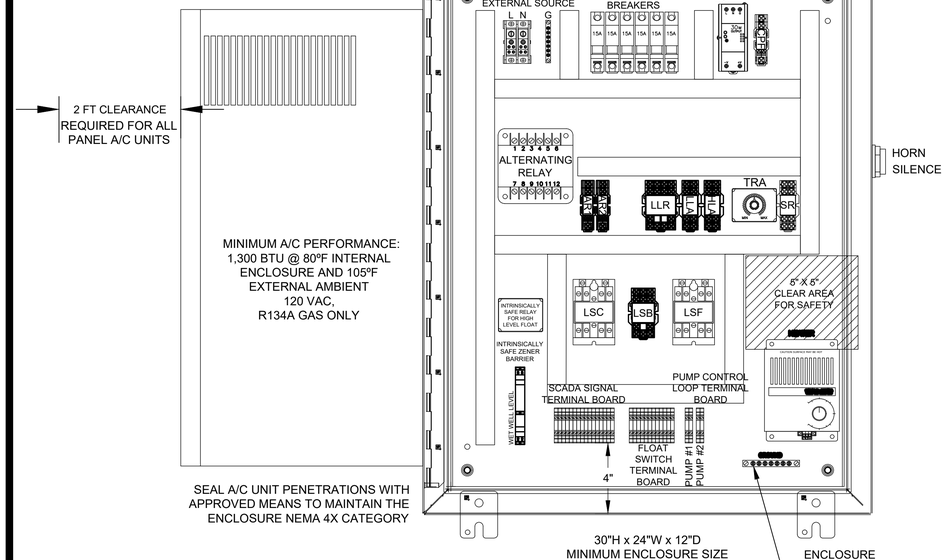
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800

MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS
CONTROL DETAILS #2
PUMP CONTROL PANEL LAYOUTS

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-6

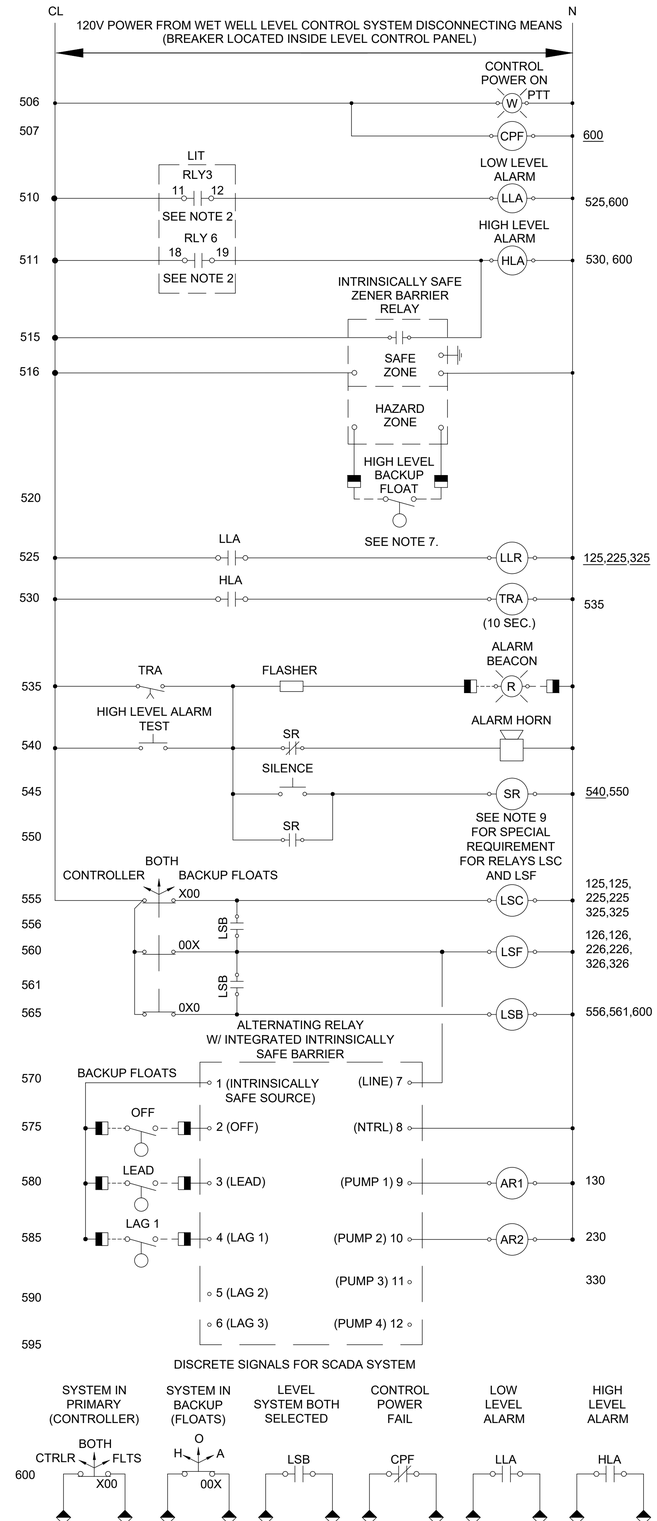




A LEVEL CONTROL PANEL LAYOUT

SCALE: N.T.S.

LEGEND	
	LEVEL CONTROL PANEL (DARK SIDE INDICATES CONNECTION INTERNAL TO PANEL.)
- - - -	EXTERNAL PANEL WIRING
———	INTERNAL PANEL WIRING



B LEVEL CONTROL SCHEMATIC LOCATED IN LEVEL CONTROL PANEL

SCALE: N.T.S.

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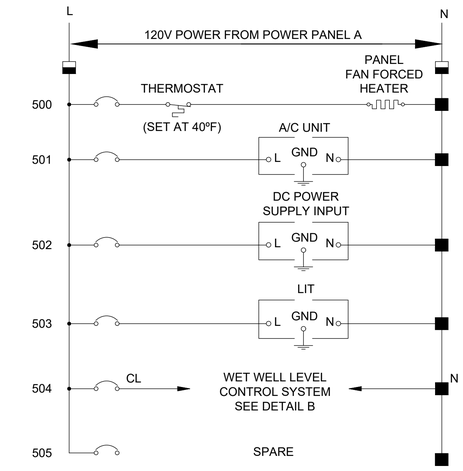
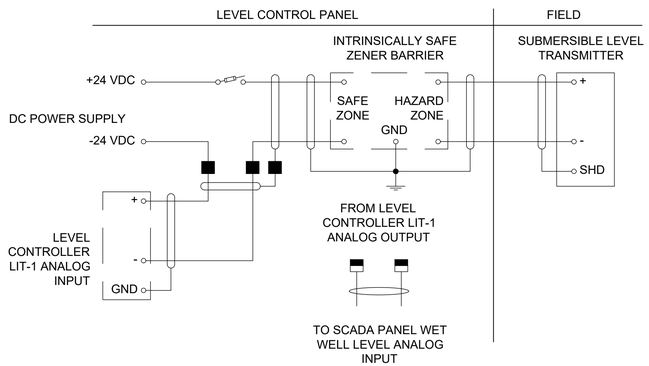
FAX NO. 210-658-9805



C LEVEL CONTROL PANEL CONTROL POWER DISTRIBUTION SCHEMATIC

SCALE: N.T.S.



D WET WELL LEVEL TRANSMITTER INSTRUMENT WIRING SCHEMATIC

SCALE: N.T.S.

NOTES

1. LEVEL CONTROLLER OUTPUT RELAYS RLY1 AND RLY2 SHALL BE ASSIGNED TO A PUMP FUNCTION AND SHALL BE MANAGED BY A PUMPING ALGORITHM TO ALTERNATE THE LEAD PUMP AND LAG PUMP FOR EACH PUMPING CYCLE.
2. LEVEL CONTROLLER OUTPUT RELAYS RLY3 AND RLY6 SHALL BE ASSIGNED FOR WET WELL LOW LEVEL ALARM AND HIGH LEVEL ALARM RESPECTIVELY. UNDER NORMAL WET WELL LEVEL CONDITION, BOTH RELAYS SHALL BE DE-ENERGIZED AND CONTACTS OPEN. UNDER WET WELL LEVEL ALARM CONDITION, THE RESPECTIVE RELAY SHALL BE ENERGIZED AND CONTACT CLOSED.
3. RELAY RLY3 (LOW LEVEL) IS A COMMON RELAY FOR ALL PUMPS INSTALLED.
4. HIGH LEVEL ALARM SHALL BE GENERATED WITH BOTH RELAY RLY6 (HIGH LEVEL) AND THE HIGH LEVEL FLOAT.
5. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.
6. THE LOAD OF EACH INTERNAL DIGITAL RELAY OF THE LEVEL CONTROLLER MUST BE LIMITED TO NO MORE THAN ONE GENERAL PURPOSE RELAY COIL AND ONE TIME DELAY RELAY COIL, OR TWO GENERAL PURPOSE RELAY COILS.
7. BACKUP FLOAT SWITCHES SHALL BE PROVIDED AS SHOWN.
8. ENCLOSURE SHALL INCLUDE A PANEL MOUNT A/C UNIT. THE CAPACITY OF THE A/C UNIT, FOR THE ENCLOSURE SIZE INDICATED, SHALL BE 1,300-BTU/HR FOR AN ENCLOSURE INTERNAL TEMPERATURE OF 80ºF AND AND EXTERNAL AMBIENT TEMPERATURE OF 105ºF.
9. RELAYS LSC AND LSF SHALL BE OF THE NEMA INDUSTRIAL CONTROL RELAY TYPE WITH STACKABLE MULTIPLE CONTACTS, AND EACH RELAY SHALL BE PROVIDED WITH TWO (2) INDEPENDENT N.O. CONTACTS FOR EACH PUMP INSTALLED AND CONTROLLED RESPECTIVELY.
10. INSTALL #6-AWG BARE STRANDED COPPER AND BOND TO COMMON GROUND FOR SUPPLEMENTAL GROUNDING.
11. RELAY TAGS SHALL BE AS SHOWN

NO.	REVISION	DATE

7/25/2025

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MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION CONTROL DETAILS #3
LEVEL CONTROL PANEL LAYOUT AND CONTROL SCHEMATIC

SAWS JOB NO.	XX-XXXX
JOB NO.	12175-02
DATE	JULY 2025
DESIGNER	BD
CHECKED	SM
DRAWN	BD
SHEET	E-7

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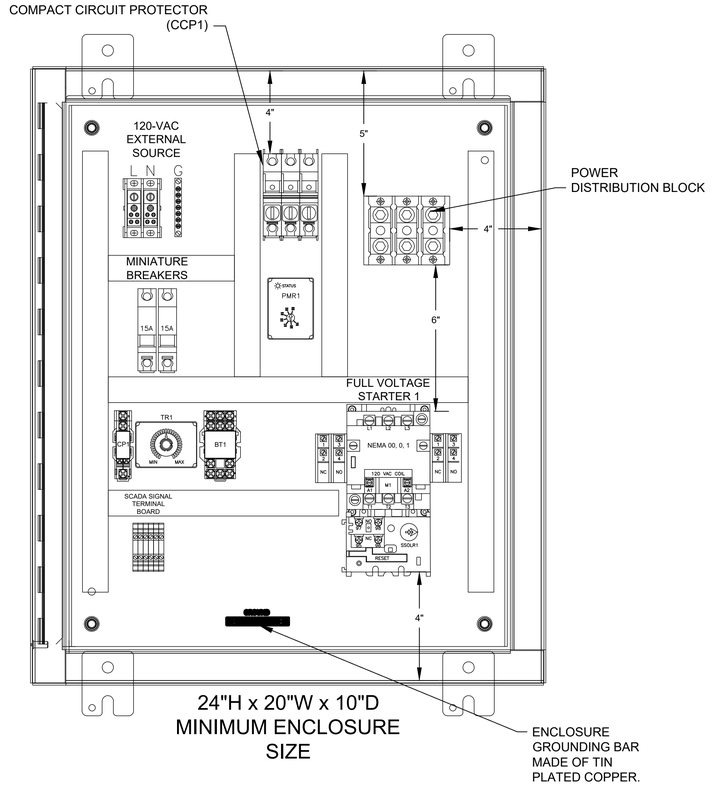
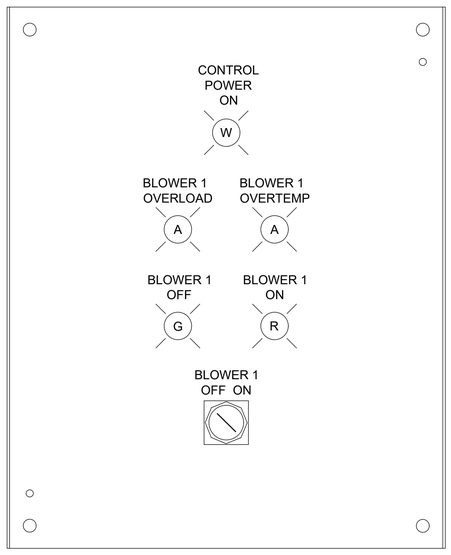
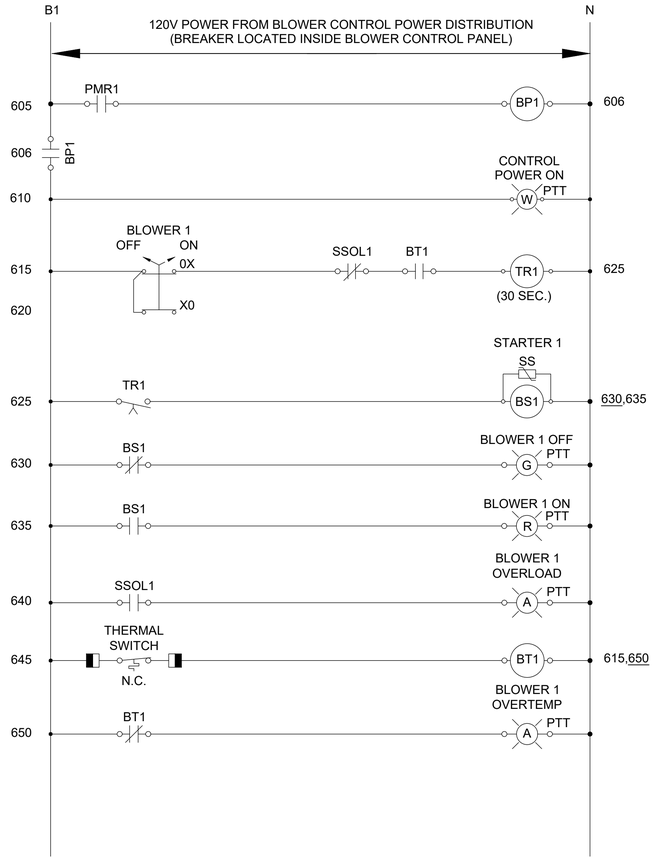
TEL. NO. 210-658-7250 FAX NO. 210-658-9805





INTERNAL SWING PANEL

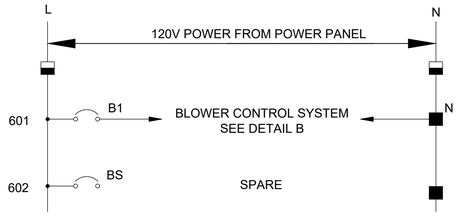
A ODOR CONTROL BLOWER PANEL LAYOUT
SCALE: N.T.S.



B ODOR CONTROL BLOWER CONTROL SCHEMATIC
SCALE: N.T.S.

NOTES:

1. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.
2. THE BLOWER INTERNAL THERMAL SWITCH IS CLOSED UNDER NORMAL CONDITION AND SHALL OPEN UNDER BLOWER OVERTEMPERATURE CONDITION.
3. INSTALL #6-AWG BARE STRANDED COPPER AND BOND TO COMMON GROUND FOR SUPPLEMENTAL GROUNDING.
4. RELAY TAGS SHALL BE AS SHOWN.



C ODOR CONTROL BLOWER CONTROL POWER DISTRIBUTION SCHEMATIC
SCALE: N.T.S.

ELECTRICAL ABBREVIATIONS	
BS	BLOWER FULL VOLTAGE STARTER
BT	BLOWER OVER TEMPERATURE RELAY
CCP	COMPACT CIRCUIT PROTECTOR
CP	CONTROL POWER
PMR	PHASE MONITORING RELAY
PTT	PUSH-TO-TEST
SS	COIL SURGE SUPPRESSOR
SSOL	SOLID STATE OVERLOAD RELAY
TR	TIMING RELAY

LEGEND	
▬	BLOWER CONTROL PANEL (DARK SIDE INDICATES CONNECTION INTERNAL TO PANEL.)
- - - -	EXTERNAL PANEL WIRING
———	INTERNAL PANEL WIRING

NO.	REVISION	DATE

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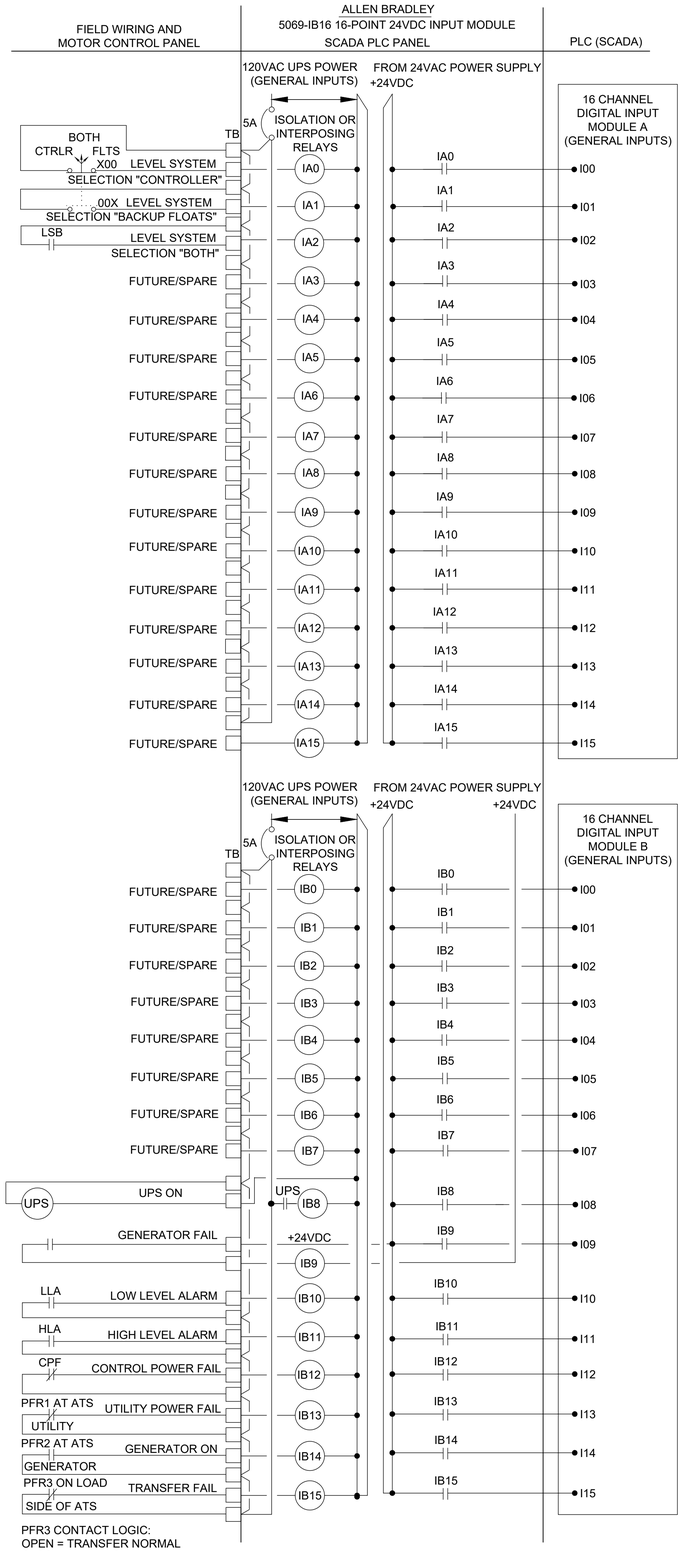
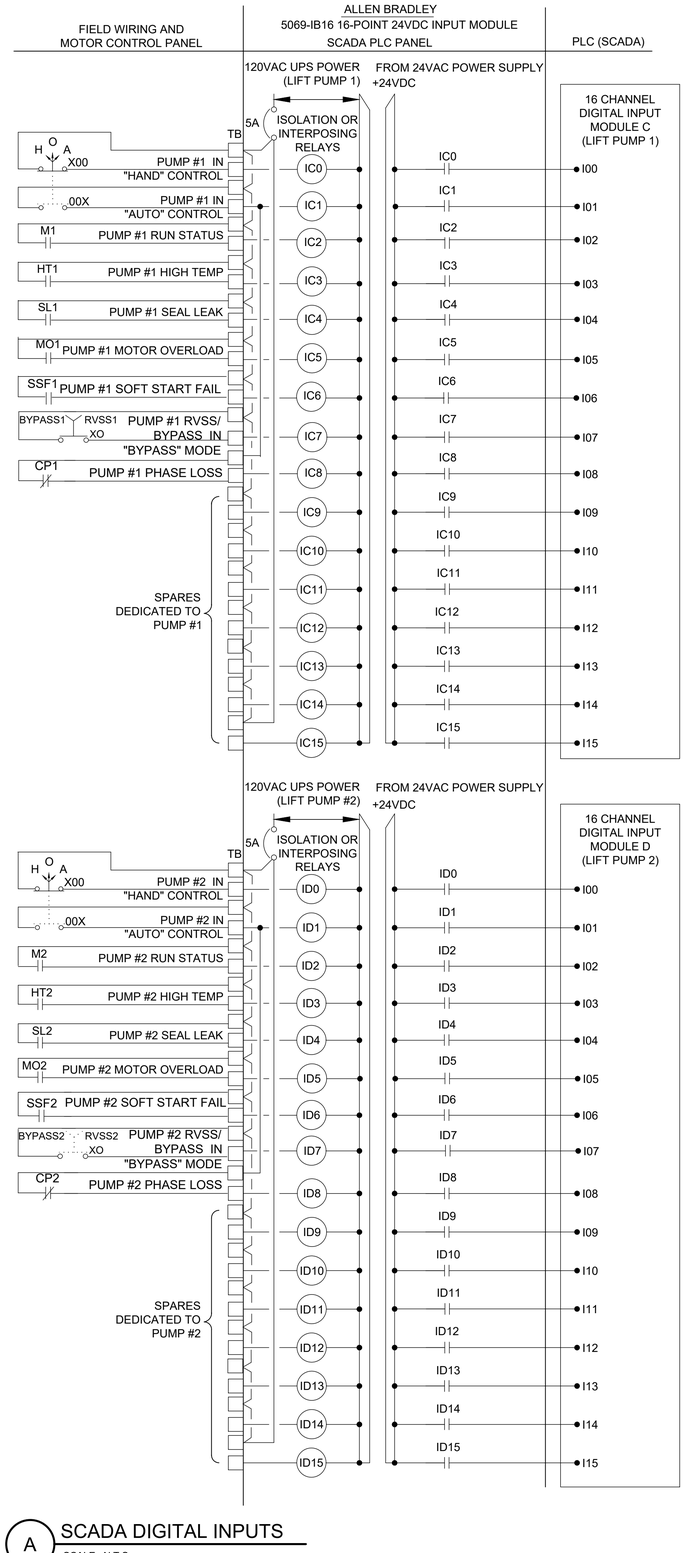
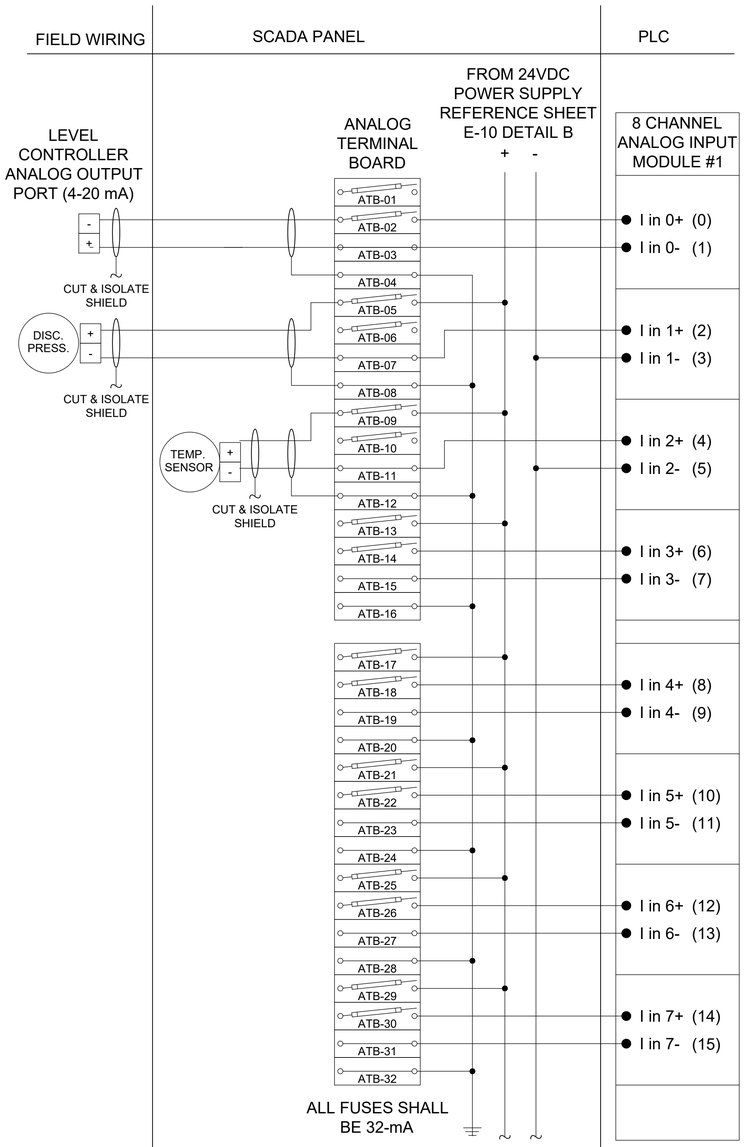
MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS
LIFT STATION CONTROL DETAILS #4
BLOWER CONTROL PANEL LAYOUT AND CONTROL SCHEMATIC

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-8





A SCADA DIGITAL INPUTS
SCALE: N.T.S.



B SCADA ANALOG INPUTS
SCALE: N.T.S.

LEGEND
PFR PHASE FAILURE RELAY

NOTES:

1. ISOLATION RELAYS (IR*) ARE SINGLE POLE SINGLE THROW. WIRE ALL RELAYS TO INPUT CARDS INCLUDING SPARES.
2. DESIGNATED POINTS MAY CHANGE DURING COORDINATION MEETING WITH SAWS. REFER TO SPECIFICATION 16921.
3. INPUT SIGNALS SHALL BE DE-ENERGIZED (0) FOR ANY NORMAL CONDITION, AND EQUIPMENT AT REST. INPUT SIGNALS SHALL BE ENERGIZED (1) FOR ANY ALARM CONDITION AND FOR EQUIPMENT OPERATING.
4. RELAY TAGS SHALL BE AS SHOWN.

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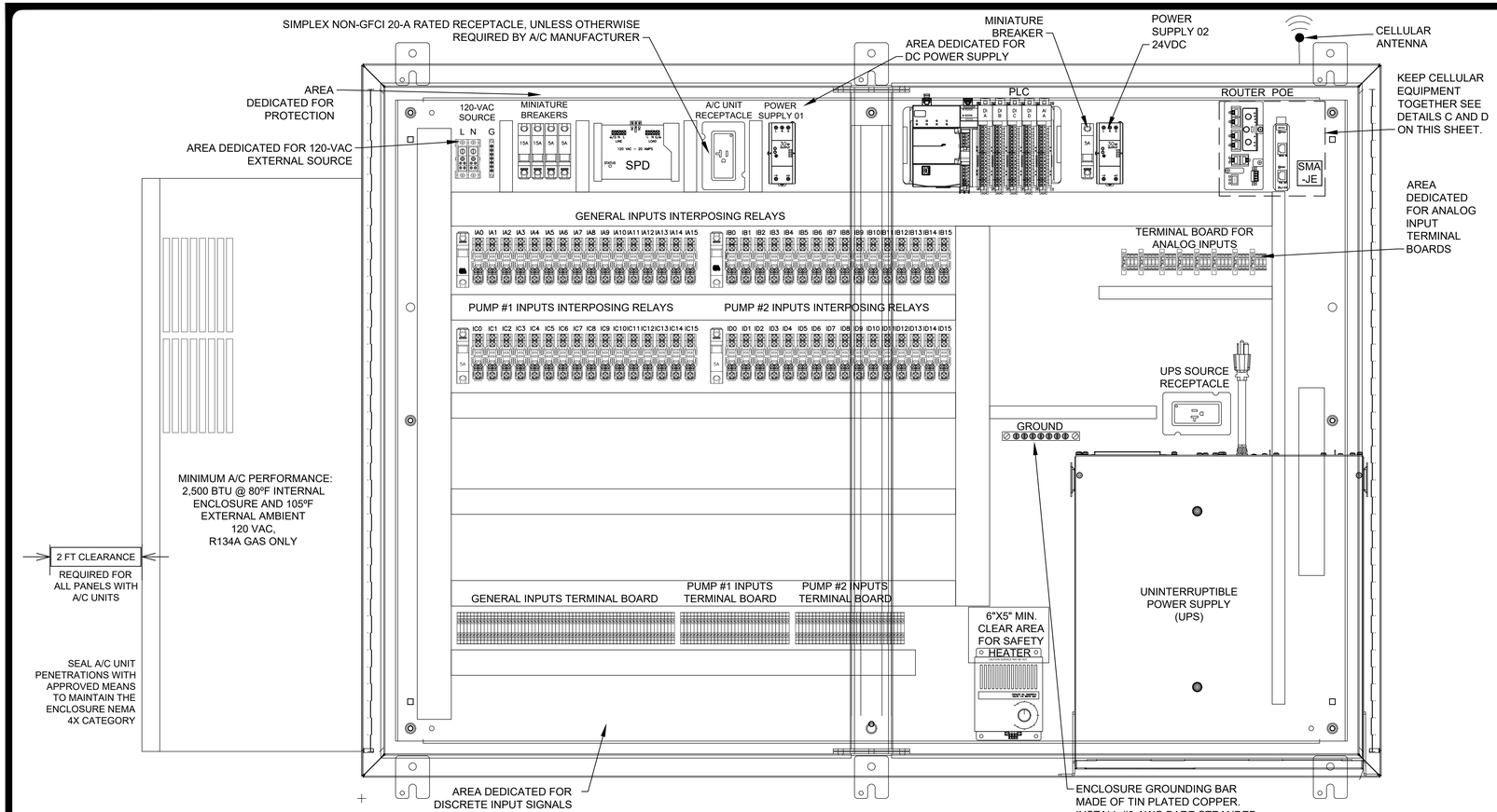
MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

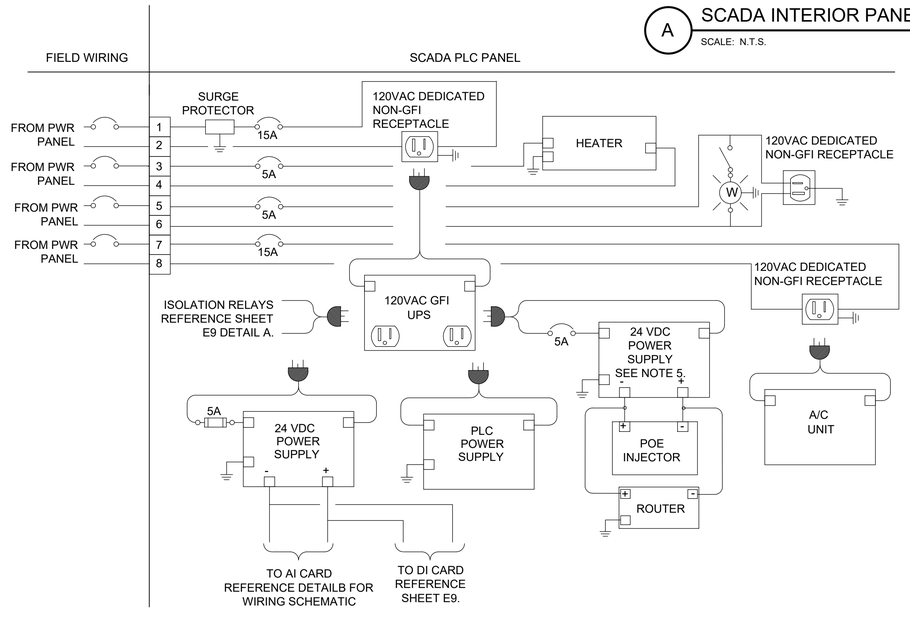
LIFT STATION SCADA DETAILS #1

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-9



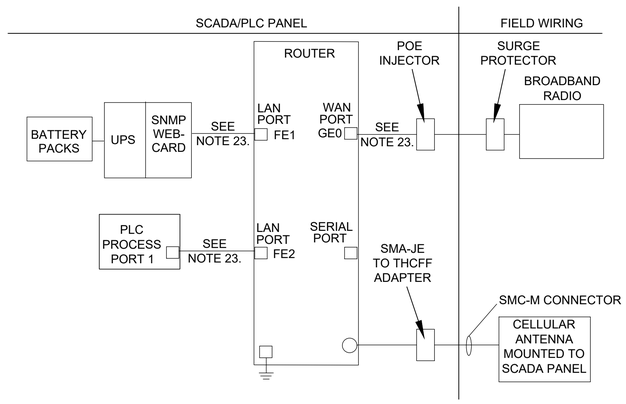
A SCADA INTERIOR PANEL LAYOUT

SCALE: N.T.S. SEE NOTES 1-22



C SCADA POWER DISTRIBUTION

SCALE: N.T.S. SEE NOTE 8, 17-19



C SCADA PANEL COMMUNICATIONS

SCALE: N.T.S. SEE NOTES 5, 15-16, 20-22

NOTES:

1. THIS DETAIL IS SHOWN PER SAWS LIFT STATION SCADA DESIGN GUIDELINES.
2. INSTALL ONE ISOLATION RELAY FOR EACH DISCRETE INPUT PROVIDED PER EACH MODULE INSTALLED. EACH DISCRETE INPUT LOOP SHALL BE PRE WIRED FROM THE TERMINAL BOARD, TO ISOLATION RELAY TO MODULE INPUT CHANNEL. SIMILARLY, INSTALL ONE FUSED TERMINAL BOARD WITH A 32-MA FUSE AND ASSOCIATED NEGATIVE AND GROUND TERMINAL BOARDS FOR EACH ANALOG INPUT CHANNEL PROVIDED BY THE MODULE AND ALSO PRE WIRE THE ANALOG LOOPS. ALL ISOLATION RELAYS TO BE SINGLE POLE SINGLE THROW. WIRE ALL RELAYS TO INPUT CARDS, INCLUDING SPARES.
3. CONTRACTOR SHALL PROVIDE ADEQUATE SPACE FOR COMPONENT REMOVAL. SCADA PANEL SUBMITTAL SHALL SHOW OFFSET DISTANCES OF COMPONENTS FROM ENCLOSURE EDGES AND BETWEEN COMPONENTS.
4. AIR CONDITIONER SIZE IS AN APPROXIMATION. CONTRACTOR TO SIZE AIR CONDITIONER PER EQUIPMENT AND ENCLOSURE SIZE. CATEGORY ENCLOSURE INTERNAL TEMPERATURE SHALL BE 80°F AND EXTERNAL AMBIENT TEMPERATURE OF 105°F
5. POWER SUPPLY WITH PHOENIX CONTACT NUMBER 2907719 REDUNDANT MODULE OR EQUAL.
6. REFER TO SPECIFICATION 16050 AND SHEET E9.
7. ALL INSTRUMENT SIGNAL CABLES (SHIELDED CABLES) SHALL BE CONTINUOUS WITHOUT SPLICES.
8. THE UNINTERRUPTIBLE POWER SUPPLY SHALL BE INSTALLED WITHIN THE SCADA ENCLOSURE WITHOUT INTERFERING WITH ACCESS TO TERMINAL STRIPS, RELAYS, SPACE HEATER OR ANY OTHER TYPE OF DEVICE. THE SIZING OF THE UPS AND EXTERNAL BATTERY TO PROVIDE 2 HOURS OF EXTENDED RUNTIME AT 125% OF CONSTANT LOAD.
9. THE ENCLOSURE TEMPERATURE TRANSDUCER SHALL BE PROVIDED WITH RTD TO COVER A TEMPERATURE RANGE OF 0 TO 150-ºF.
10. ENCLOSURE SHALL BE RATED NEMA 4X, BE MADE OF STAINLESS STEEL 316 AND SHALL BE WHITE ENAMELED COATED.
11. SPACE HEATER SHALL BE PROVIDED WITH MINIMUM SAFETY CLEARANCES INDICATED BY MANUFACTURER TO PREVENT DAMAGE DUE TO CLOSENESS TO HEATER.
12. THE ENCLOSURE DOOR SHALL BE PROVIDED WITH AN INTERNAL FOLDING TABLE. AND A POCKET TO STORE WIRING DIAGRAMS AND O&M INFORMATION.
13. INSULATION IS REQUIRED FOR ALL ENCLOSURES EQUIPPED WITH A/C UNIT, INCLUDING SCADA ENCLOSURES, AND LEVEL CONTROL ENCLOSURES. SEE SHEET E6 DETAIL C.
14. INSTALL INSULATING SHEETS IN THE INTERIOR SURFACES OF THE PANEL, INCLUDING DOOR(S). NOT REQUIRED FOR INTERNAL SWING PANELS.
15. ALL CABLES, CONNECTORS, & PINOUT CONNECTIONS SHALL BE SUBMITTED TO OWNER FOR APPROVAL.
16. CONTRACTOR TO INTEGRATE, CONFIGURE AND PROGRAM RELAYS.
17. CONTRACTOR SHALL FURNISH AND INSTALL ADDITIONAL 8-POINT ANALOG INPUT CARD AND CONNECTION CABLES FOR FUTURE ANALOG INPUTS.
18. PROVIDE SPARE TERMINALS FOR ALL SPARE INPUTS.
19. ALL CONNECTIONS TO BE HARDWIRED. PLUGS ARE SHOWN FOR DIAGRAMMATIC PURPOSE ONLY.
20. REFER TO SPECIFICATION 16921 FOR EQUIPMENT DETAILS.
21. TIA/EIA 568B OSP CAT 6, #23 AWG ETHERNET OUTDOOR, UL LISTED, 23 AWG WITH WATERPROOF WATERTIGHT RATED IP67 RATED RJ45 CONNECTORS AT EACH END. (DO NOT EXCEED 300 FEET.) CABLING WILL BE SUPERIOR ESSEX TYPE BBDGE CABLE, COPPER CLAD CABLING, PART NUMBER#: ENDURAGAIN OSP SHIELDED SUPERIOR ESSEX 04-001-62, NO SUBSTITUTIONS.
22. MOUNT CELLULAR ANTENNA ON TOP OF SCADA PANEL IF CELLULAR SERVICE IS DEEMED ACCEPTABLE TO SAWS INSPECTIONS. USE OUTDOOR RATED COAXIAL CABLE FOR CONNECTION.
23. UTP CAT6 JUMPER USE PURPLE COLOR FOR SCADA DEVICES.

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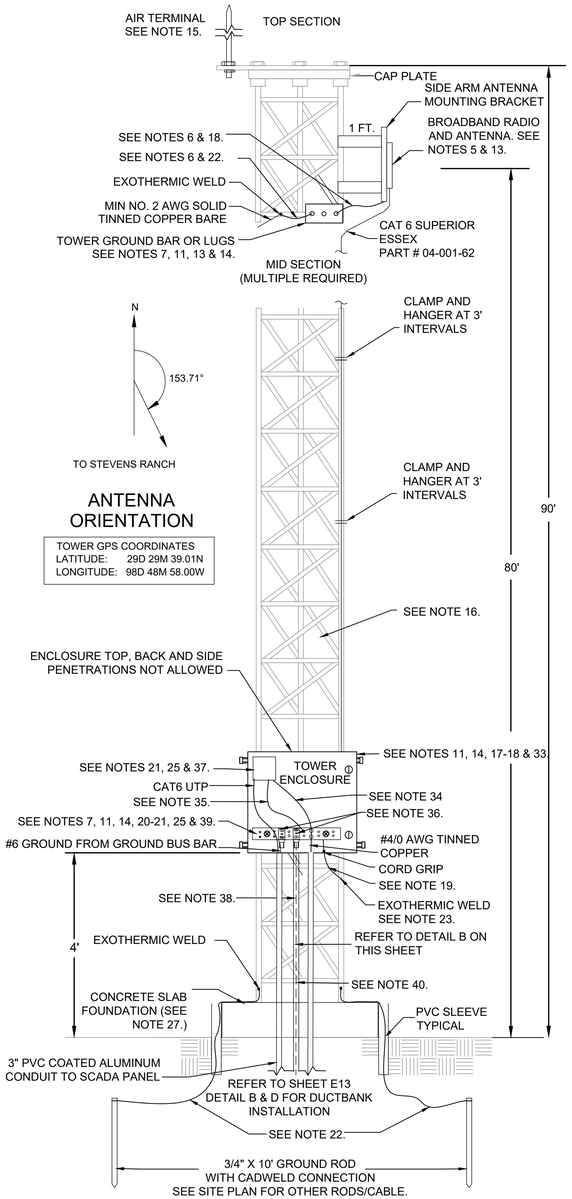
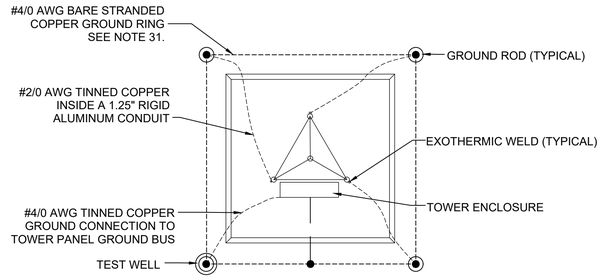
MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION SCADA DETAILS #2

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-10

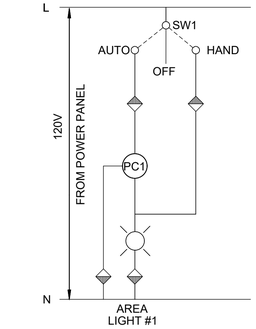


A SIDE VIEW SCADA ANTENNA TOWER & RADIO PANEL
SCALE: N.T.S. SEE NOTES 1-25 & 31-40.



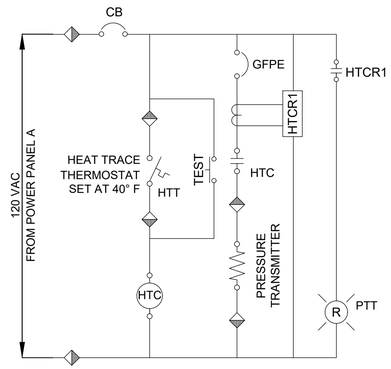
B ANTENNA CABLE ROUTING AND GROUNDING DETAILS PLAN VIEW
SCALE: N.T.S. SEE NOTES 31-32.

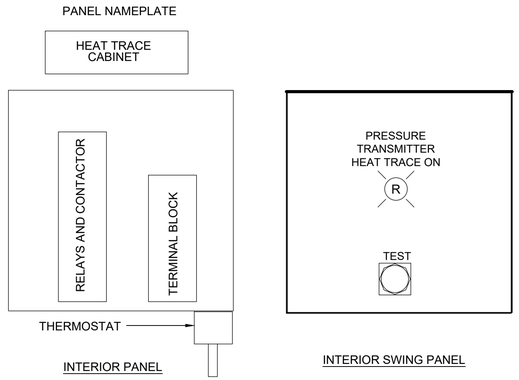
PC -PHOTO CELL CONTACTOR
SW -20 AMP, SPDT, CENTER OFF, INDUSTRIAL TOGGLE SWITCH



C AREA LIGHT WIRING DIAGRAM (TYPICAL OF 2)
SCALE: N.T.S.

◈ TERMINAL POINT IN SWITCH ENCLOSURE. DARK SIDE INDICATES CONNECTIONS INTERNAL TO PANEL.

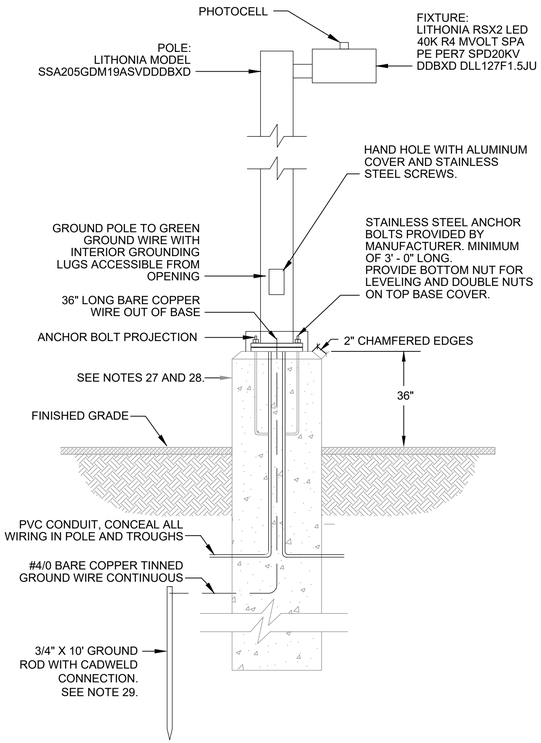




◈ TERMINAL POINT IN HEAT TRACE PANEL DARK SIDE INDICATES CONNECTIONS INTERNAL TO PANEL.

D PRESSURE TRANSMITTER HEAT TRACE CONTROL
SCALE: N.T.S. SEE NOTES 41-42

E HEAT TRACE PANEL
SCALE: N.T.S. SEE NOTES 43-44



F LIGHT POLE FOUNDATION (TYP. OF 2)
SCALE: N.T.S. SEE NOTES 26-30.

NOTES:

1. CONTRACTOR SHALL PROVIDE TOWER PER SPECIFICATION 17600.
2. CONTRACTOR TO USE CABLE CLAMPS AND HANGERS BY ANDREW OR EQUAL SUITABLE FOR HANGING CAT6 CABLE. HOSE CLAMPS AND WIRE TIES ARE NOT ALLOWED.
3. ANTENNA TOWER SHOWN IS FOR DIAGRAMMATIC PURPOSES ONLY. FOR REQUIRED MATERIAL SPECIFICATIONS, EQUIPMENT INSTALLATION, NOTES AND TOLERANCES SEE MANUFACTURER DRAWINGS.
4. AZIMUTH IS BASED ON THE CLOCKWISE ANGLE FROM TRUE NORTH AS SHOWN.
5. CONTRACTOR SHALL SUPPLY ALL ASSOCIATED EQUIPMENT FOR TOWERS PER SPECIFICATION 17600.
6. REFER TO SAWS LATEST DESIGN GUIDELINES AS REQUIRED BY SAWS, FOR TOWER GROUNDING DETAIL, COMPLY WITH TOWER GROUNDING REQUIREMENTS PER TOWER MANUFACTURER.
7. TOWER GROUND BAR OR LUG SHALL BE MADE OF TIN PLATED COPPER. DO NOT DRILL TOWER STRUCTURE. USE HARGER P/N TGBI14212TGBKT FOR MOUNTING. USE TWO HOLE LUGS AT BUSBARS.
8. CAT 6 CABLE SHALL BE ROUTED THROUGH PULLBOX AND UP TOWER USING CABLE CLAMPS. CABLE SHALL NOT BE ROUTED THROUGH TOP OF PULLBOX. TOP AND SIDE PENETRATIONS WILL NOT BE ACCEPTED.
9. ALL UNDERGROUND ELECTRIC CONDUIT SHALL BE CONCRETE ENCASED 24 INCHES BELOW GRADE.
10. ALL ENCLOSURES AND DISCONNECTS SHALL BE PAD-LOCKABLE.
11. ALL MOUNTING HARDWARE AND STRUT CHANNEL SHALL BE 316 STAINLESS STEEL. ALL ENCLOSURES SHALL BE NEMA 4X, UNLESS OTHERWISE NOTED.
12. GROUND RESISTANCE SHALL BE AS MINIMUM AS POSSIBLE, BUT IN NO CASE SHALL EXCEED 5 OHMS.
13. CONTRACTOR SHALL PROVIDE ALL ASSOCIATED EQUIPMENT FOR MOUNTING ANTENNA TO THE TOWER AT AN ELEVATION OF 80 FEET ON A 90 FOOT TOWER.
14. REFER TO SPECIFICATION 17600 FOR ADDITIONAL DETAILS.
15. THE COMPLETED INSTALLATION OF THE LIGHTNING PROTECTION SYSTEM SHALL MEET THE "INSTALLATION REQUIREMENTS FOR LIGHTNING PROTECTION SYSTEMS UL96A OF UNDERWRITERS LABORATORIES CURRENT EDITION AND NFPA 780 CURRENT EDITION. A CERTIFICATE OF COMPLETION FROM AN AUTHORITY HAVING JURISDICTION SHALL BE FURNISHED TO THE OWNER UPON COMPLETION. CONTRACTOR TO REFER TO TOWER MANUFACTURER GUIDELINES FOR INSTALLATION OF LIGHTNING PROTECTION SYSTEM. CONTRACTOR TO REFER TO RADIO MANUFACTURER FOR AIR TERMINAL MOUNTING REQUIREMENTS.
16. 10-FOOT CLIMB GUARDS SHALL BE PROVIDED TO EACH SIDE OF THE TOWER. MUST BE CUSTOM MADE IF MANUFACTURER IS UNABLE TO PROVIDE THEM.
17. THE LIGHTNING PROTECTION UNIT WILL BE CONTAINED IN AN NEMA 4 ENCLOSURE AT THE BASE OF THE TOWER TO INCLUDE A BUS BAR FOR BONDING AND GROUNDING. ONE BUS BAR AND A TOWER LIGHTNING 4 FT COPPER TINNED AIR TERMINAL SHALL BE REQUIRED TO BE BONDED AT TOP OF TOWER. LIGHTNING PROTECTION UNITS, SURGE PROTECTION MODULES, BUS BARS AND AIR TERMINALS WILL BE BONDED AND GROUNDED IN ACCORDANCE WITH MANUFACTURERS' STANDARDS AND MEET OR EXCEED TIA-607D STANDARDS. AS TECHNOLOGY ADVANCES OVER TIME, COORDINATE WITH SAWS STANDARDS ON LIGHTNING PROTECTION DEVICES.
18. CONTRACTOR TO USE #6 AWG 19 STRAND CABLE WITH GREEN INSULATION.
19. CONTRACTOR TO USE #2 AWG SOLID BARE TINNED COPPER. MUST BE ON THE TOWER AND AT THE CENTER OF BUS BAR
20. TELECOMMUNICATIONS BONDING AND GROUNDING OF TOWER MUST COMPLY WITH ANSI/TIA/EIA-607-D AND TIA/EIA-222 LATEST EDITIONS.
21. ALL MECHANICAL CONNECTIONS FOR BONDING AND GROUNDING MUST USE ANTIOXIDANT COMPOUND HARGER P/N HCAJC1/2 OR HCAJC8 OR OWNER APPROVED EQUAL.
22. CONTRACTOR TO USE #4/0 BARE COPPER TINNED FOR TOWER GROUNDING RING SYSTEM.
23. MUST BE EXOTHERMIC WELD AT THE CENTER OF THE BUS BAR AND AT THE TOWER GROUND RING.
24. PROVIDE CABLE SERVICE LOOPS AT BOTTOM AND TOP OF TOWER
25. FOR GROUNDING AND BONDING USE COMPRESSION LUGS LONG BARREL HARGER P/N GECLB62A OR OWNER APPROVED
26. REFER TO SPECIFICATION 16050 FOR SWITCH AND NAMEPLATE REQUIREMENTS.
27. REFER TO SPECIFICATION 17600 FOR FOUNDATION.
28. CONTRACTOR TO REMOVE IRREGULARITIES AND TO PROVIDE SMOOTH FINISH, PAINT EXPOSED AREA SAFETY YELLOW.
29. GROUND ROD SHALL BE BONDED TO SITE GROUNDING SYSTEM.
30. LIGHT FIXTURE TO BE MOUNTED TWENTY-THREE FEET ABOVE GRADE, WHICH INCLUDES THE 3' BASE.
31. WHERE THERE ARE OBSTUCTIONS TO INSTALLING ONE OF THE SIDES OF THE GROUND RING AS SHOWN, EXTEND THE GROUND RING FROM THE MIDPOINT OF THE UNOBSTRUCTION PORTION DIRECTLY AWAY FROM THE EQUIPMENT. THIS SUBSTITUTE LENGTH OF CONDUCTOR SHALL BE EQUIVALENT IN LENGTH TO THE PORTION THAT WAS OBSTRUCTED AT THE END OF THIS SUBSTITUTE LENGTH, BOND TO A NEW GROUND ROD.
32. ALL TELCOM GROUNDING CONDUCTORS ARE TINNED.
33. AMERICAN PRODUCTS UTILITY WITH WOOD BACKER AND WALL MOUNT KIT ENCLOSURE: AMW-242410-A, BACKER: AMW-2420-WB WALL MOUNT: AMW-WM SEE NOTES 14, 17 AND 18.
34. CAT6 STP FROM ANTENNA.
35. #6 GROUND FROM LPU TO GROUND BUS BAR
36. MECHANICAL DOUBLE LUG CONNECTION
37. SURGE ARRESTOR TRANSTECTOR CPX SYSTEM MODULE: 1000-1117, CHASSIS: 1101-1137
38. EXOTHERMIC WELD TO TOWER GROUND RING CONDUCTOR FROM BUSBAR TO TOWER GROUND RING.
39. GROUND BUS INSIDE ENCLOSURE. GROUND BUS SHALL BE HARGER - TGBI14212TGB. LOCATED INSIDE THE ENCLOSURE (SHOWN HERE FOR CLARITY.)
40. COPPER GROUND WIRE IN 1"C FROM TOWER ENCLOSURE GROUND BUS
41. HTCR* IMPLIES HEAT TRACE CURRENT SENSING RELAY.
42. PROVIDE LITTELFUSE CURRENT SENSING RELAY ECS40A.
43. INSTALL TAG AS SHOWN ON FRONT EXTERIOR OF PANEL.
44. CONTRACTOR SHALL PROVIDE ADEQUATE SPACE FOR COMPONENTS FROM ENCLOSURE EDGES

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SAN ANTONIO, TX 78212 FAX NO. 210-658-9805

NO.	REVISION	DATE

7/25/2025
STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED
PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
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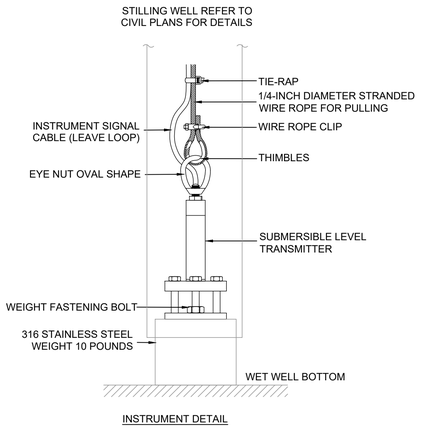
MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION
MISCELLANEOUS DETAILS #1

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-11

NOTES:

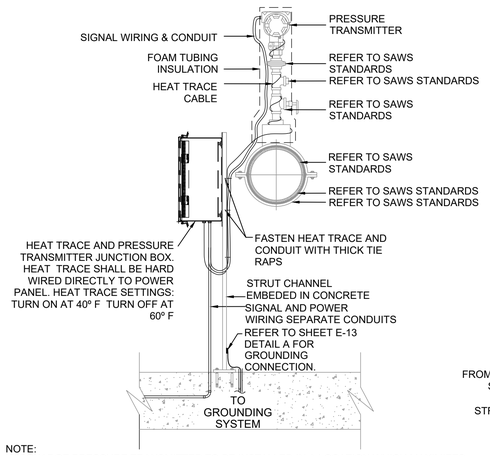
1. SEAL ALL CONDUITS ENTERING WET WELL. SEALS SHALL BE INSTALLED ABOVE STRAIGHT CONDUIT BODIES. SEALS MUST BE LOCATED WITHIN 18" OF THE ENCLOSURE PER NEC. SEAL CONDUITS PROPERLY TO PREVENT GASES FROM ENTERING ELECTRICAL BOXES.
2. SUBMERSIBLE TRANSDUCER CABLE SHALL BE ROUTED THROUGH CONDUIT EMBEDDED IN WET WELL TOP SLAB DIRECTLY TO LEVEL CONTROL PANEL.
3. THIS JUNCTION BOX DETAIL APPLIES TO ALL JUNCTION BOXES INSTALLED TO CONNECT MOTORS SUCH AS PUMPS, BLOWERS, OR ANY SPECIAL MOTOR APPLICATION REQUIRED BUT NOT SHOWN ON THESE STANDARD DRAWINGS.
4. JUNCTION BOXES SHALL BE SIZED TO MEET THE INTERNAL DIMENSIONS, BASED ON THE REQUIRED SIZE OF POWER DISTRIBUTION BLOCK, WIRING DUCTS AND NUMBER OF TERMINAL STRIPS FOR PUMP SENSOR SIGNALS, BUT IN NO CASE SHALL THE PUMP JUNCTION BOXES BE SMALLER THAN 20(H)X16(W)X8(D)-INCHES.
5. POWER DISTRIBUTION BLOCKS SHALL HAVE A SHORT CIRCUIT RATING THAT EXCEEDS THE MAXIMUM AVAILABLE FAULT CURRENT AT THE SERVICE ENTRANCE.
6. SHOWN INTERNAL DIMENSIONS SHALL BE MEASURED FROM EDGE OF BACK PANEL AND NOT FROM THE ENCLOSURE BODY.
7. ALL ALUMINUM CONDUITS SHALL BE PROVIDED WITH GROUNDING BUSHINGS AND SHALL BE GROUNDED.
8. THIS JUNCTION BOX DETAIL APPLIES TO ALL JUNCTION BOXES INSTALLED TO CONNECT FLOAT SWITCHES, OR ANY INSTRUMENTATION AND CONTROL DEVICE THAT IS INSTALLED BUT NOT SHOWN ON THESE DRAWINGS, IN WHICH THE WIRING CONSIST OF DISCRETE SIGNALS THAT OPERATE AT 120-VAC, OR ANY OTHER VOLTAGE SYSTEM, PROVIDED EACH VOLTAGE SYSTEM HAS ITS OWN DEDICATED JUNCTION BOX.
9. INSTRUMENT WIRING SUCH AS FLOAT SWITCH CABLES SHALL TERMINATE AT THE TERMINAL STRIP.
10. JUNCTION BOXES SHALL BE SIZED TO MEET THE INTERNAL DIMENSIONS, BASED ON THE REQUIRED SIZE AND NUMBER OF TERMINAL STRIPS, AND THE SIZE AND NUMBER OF WIRING DUCTS, BUT IN NO CASE SHALL THE INSTRUMENTATION AND CONTROL JUNCTION BOXES BE SMALLER THAN 16(H)X12(W)X8(D)-INCHES.
11. THIS JUNCTION BOX DETAIL APPLIES TO ALL JUNCTION BOXES INSTALLED FOR ANALOG SIGNAL WIRING FOR INSTRUMENTATION AND CONTROL DEVICES SUCH AS SUBMERSIBLE LEVEL TRANSMITTERS, DISCHARGE PRESSURE TRANSMITTERS, OR ANY INSTRUMENTATION AND CONTROL DEVICE THAT IS INSTALLED BUT NOT SHOWN ON THESE DRAWINGS.
12. ANALOG SIGNAL CABLES SHALL BE CONTINUOUS AND WITHOUT SPLICES, FROM INSTRUMENT, THROUGH JUNCTION BOX, TO RESPECTIVE ANALOG I/O MODULE OR DEVICE. ANALOG SIGNAL CABLE SHALL BE LOOPED AND TIED IN A NEAT MANNER AND WITHOUT OVER BENDING.
13. ANALOG SIGNAL WIRING SHALL NOT BE MIXED WITH ANY OTHER POWER, CONTROL OR SIGNAL WIRING.
14. JUNCTION BOXES SHALL BE SIZED BASED ON THE SIZE, BENDING RADIUS, NUMBER OF LOOPS, AND TOTAL NUMBER OF ANALOG SIGNAL CABLES CONTAINED, BUT IN NO CASE SHALL THE INSTRUMENTATION AND CONTROL JUNCTION BOXES BE SMALLER THAN 16(H)X12(W)X8(D)-INCHES.
15. A DEDICATED GROUNDING CABLE SHALL BE INSTALLED TO GROUND THE JUNCTION BOX AND EACH CONDUIT BUSHINGS.
16. INSTRUMENT, WIRE ROPE AND ALL FASTENERS SHALL BE OF STAINLESS STEEL 316 TYPE.
17. WEIGHT SHALL BE DRILLED AND TAPPED AT THE CENTER TO ALLOW A BOLT TO SOLIDLY FASTEN INSTRUMENT TO WEIGHT.
18. INSTRUMENT SIGNAL CABLE SHALL BE FASTENED TO WIRE ROPE WITH THICK HEAVY DUTY PLASTIC TIE-RAPS.
19. EYE NUT THREADED TO INSTRUMENT AND OVAL SIZE SHALL BE LARGE ENOUGH TO ALLOW SIGNAL CABLE TO FREELY BEND AND PASS THROUGH.
20. THIS DETAIL IS SHOWN PER SAWS LIFT STATION SCADA DESIGN GUIDELINES.
21. REFER TO CIVIL DRAWINGS FOR SUBMERSIBLE LEVEL TRANSDUCER INSTALLATION WITHIN STILLING WELL DETAIL.
22. INSTRUMENT SIGNAL CABLE SHALL NOT BE SPLICED AND SHALL BE CONTINUOUS FROM THE TRANSDUCER TO THE PUMP CONTROL PANEL.
23. REFER TO DETAIL C AND D OF SHEET E11.
24. ALL PIPING NIPPLES AND FITTINGS SHALL BE MADE OF STAINLESS STEEL 316.
25. INSTALL TAG LABELED "HEAT TRACE AND PRESSURE TRANSMITTER" ON FRONT EXTERIOR OF PANEL.
26. CONTRACTOR SHALL PROVIDE ADEQUATE SPACE FOR COMPONENTS FROM ENCLOSURE EDGES.
27. ENCLOSURE SHALL BE NEMA 4X 316SS WITH WHITE ENAMELED EXTERIOR. ENCLOSURES SHALL BE PAD-LOCKABLE.
28. DISCHARGE PRESSURE TRANSMITTER TO BE INSTALLED IN A LOCATION WHICH MAXIMIZES ACCURACY. MODIFY PIPING AS NEEDED TO MEET THE REQUIREMENTS.
29. CONTRACTOR TO REQUEST THE DETAILS FROM SAWS INSPECTOR.
30. CONTRACTOR SHALL PROVIDE HANDHOLE EQUIPPED WITH 1" PENETRATION FOR GROUND ROD. PENETRATION SHALL BE SEALED TO AVOID SEEPAGE AFTER GROUND ROD IS DRIVEN TO HEIGHT AS SHOWN.
31. CONNECT ALL NON CURRENT-CARRYING METAL PART AN ANY METALLIC RACEWAY GROUNDING BUSHINGS TO GROUND ROD CONNECTOR WITH #4/0 AWG COPPER CONDUCTOR.
32. EXPANSION FITTING FOR SITE SETTLEMENT FOR ALL JUNCTION BOXES LOCATED ON WET WELL AND VALVE. (UP TO 2.5" OF SETTLEMENT). REFER TO SPECIFICATION 26 11 00.



INSTRUMENT DETAIL

A SUBMERSIBLE LEVEL TRANSDUCER MOUNTING DETAIL

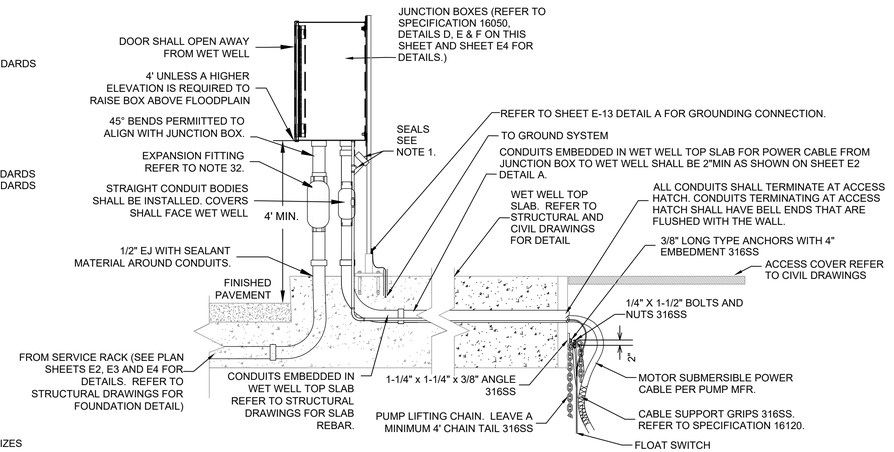
SCALE: N.T.S. SEE NOTES 16-22.



NOTE:
DISCHARGE PRESSURE TRANSMITTER TO BE INSTALLED IN A LOCATION WHICH MAXIMIZES ACCURACY. MODIFY PIPING AS NEEDED TO MEET THE REQUIREMENTS.

B DISCHARGE PRESSURE TRANSMITTER MOUNTING DETAIL

SCALE: N.T.S. SEE NOTES 12-15, 22-29.

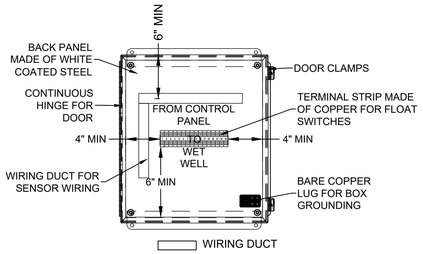


C JUNCTION BOX DETAIL

SCALE: N.T.S. SEE NOTES 1-2, 26-27.

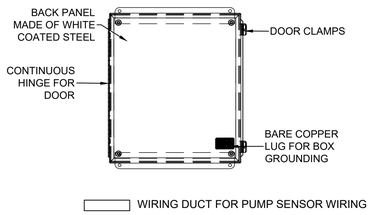
D MOTOR JUNCTION BOX INTERNAL DETAIL

SCALE: N.T.S. SEE NOTES 3-7.



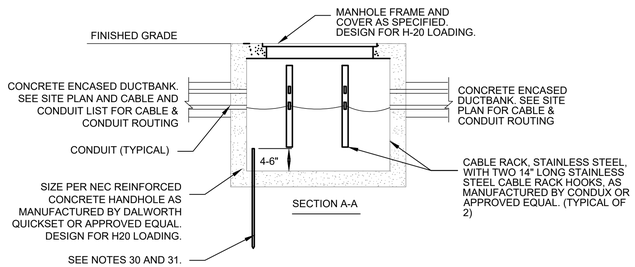
E INSTRUMENTATION AND CONTROL JUNCTION BOX INTERNAL DETAIL

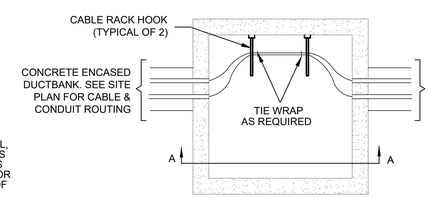
SCALE: N.T.S. SEE NOTES 7-10.



F ANALOG SIGNAL WIRING JUNCTION BOX DETAIL

SCALE: N.T.S. SEE NOTES 7, 11-15.





G PRE-CAST VAULT DETAIL

SCALE: N.T.S. SEE NOTES 30 AND 31.

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NO.	REVISION	DATE

7/25/2025
STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED PROFESSIONAL ENGINEER

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MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS
JUNCTION BOXES & INSTRUMENTATION SCHEMATICS

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-12

GRUBB ENGINEERING, INC.
ELECTRICAL POWER SYSTEMS
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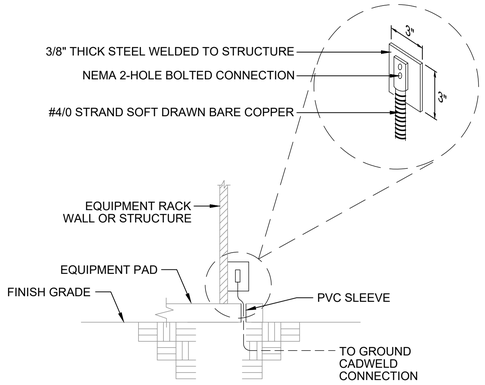
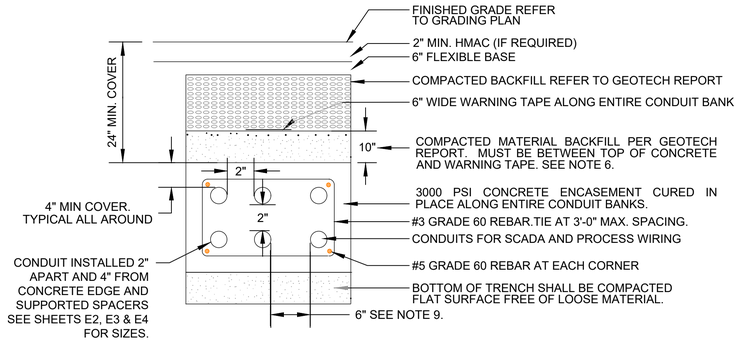
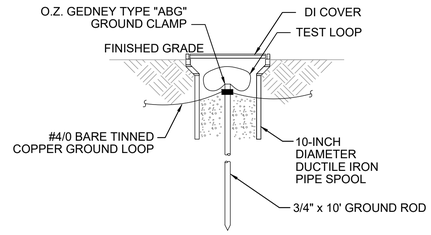
NO.	REVISION	DATE



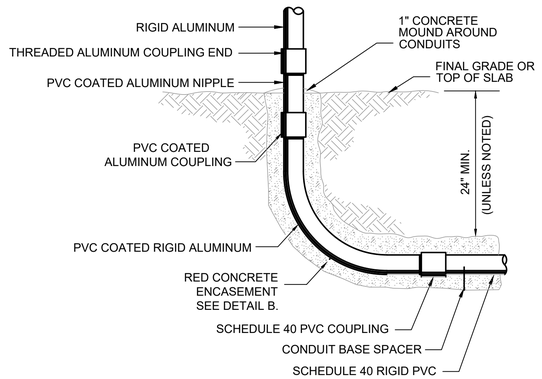
A TYPICAL STRUCTURE GROUND DETAIL
SCALE: N.T.S. SEE NOTES 1-2.



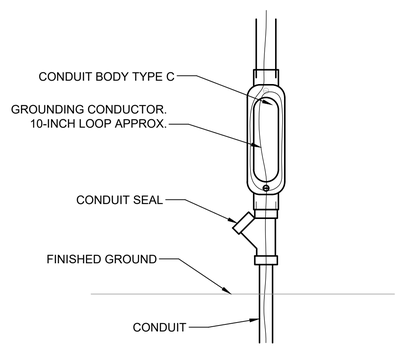
B TYPICAL LOW VOLTAGE DUCT BANK SECTION
SCALE: N.T.S. SEE NOTES 3-10.



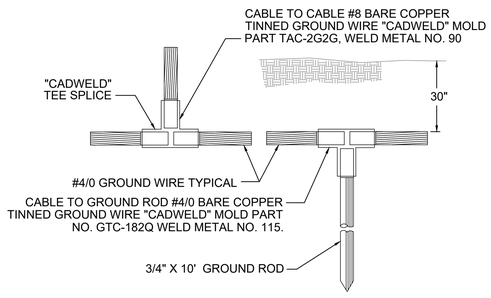
C GROUND TEST WELL ARRANGEMENT
SCALE: N.T.S.



D TYPICAL DUCT-BANK TRANSITION DETAIL
SCALE: N.T.S.



E CONDUIT BODY FOR GROUND RESISTANCE TEST DETAIL
SCALE: N.T.S.



NOTE: THIS DETAIL DOES NOT EXCLUDE CONTRACTOR FROM USING OTHER APPROVED PRODUCTS.

F TYPICAL GROUND DETAIL
SCALE: N.T.S.

NOTES:
1. IF METAL STRUCTURES ARE NOT FURNISHED WITH PROVISION FOR BOLTED CONNECTION TO GROUNDING SYSTEM, CONTRACTOR SHALL PROVIDE WELDED PAD FOR GROUND CONNECTION. ALL RACKS MUST BE GROUNDED AT EACH END.
2. CABLES SHALL NOT BE DIRECTLY BOLTED TO STRUCTURES.
3. PROVIDE 100% CONCRETE ENCASEMENT BOTH HORIZONTALLY AND VERTICALLY.
4. CONTRACTOR SHALL COORDINATE LOCATION WITH EXISTING AND NEW UNDERGROUND WATER PIPE, AND ELECTRIC CABLE/CONDUIT.
5. REBAR SHALL BE WIRE TIED TO REBAR STIRRUPS TO PROVIDE STABILITY DURING CONCRETE POUR.
6. ALL BACKFILL SHALL BE COMPACTED TO 98% OF THE MAXIMUM DRY DENSITY OR DETERMINED BY TXDOT TEST METHOD TEX-113E
7. REFER TO GEOTECH REPORT AND STRUCTURAL DRAWINGS FOR BACKFILL MATERIAL TYPE AND BACKFILL MOISTURE CONTENT.
8. REFER TO GEOTECH REPORT AND STRUCTURAL DRAWINGS FOR EXCAVATION.
9. 6" SEPARATION BETWEEN CONDUITS FOR POWER AND CONDUITS FOR SCADA AND PROCESS WIRING.
10. UNDERGROUND DUCT BANK BENDS 25 DEGREES AND LARGER SHALL BE PVC-COATED RIGID ALUMINUM. ALL PIPING NIPPLES AND FITTINGS SHALL BE MADE OF STAINLESS STEEL 316.

7/25/2025
STATE OF TEXAS
STEVEN MOUSER
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LICENSED
PROFESSIONAL ENGINEER

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TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800

MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

DUCTBANK AND GROUNDING DETAILS

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-13

GRUBB ENGINEERING, INC.
ELECTRICAL POWER SYSTEMS
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TBPE FIRM REGISTRATION NO. 3904
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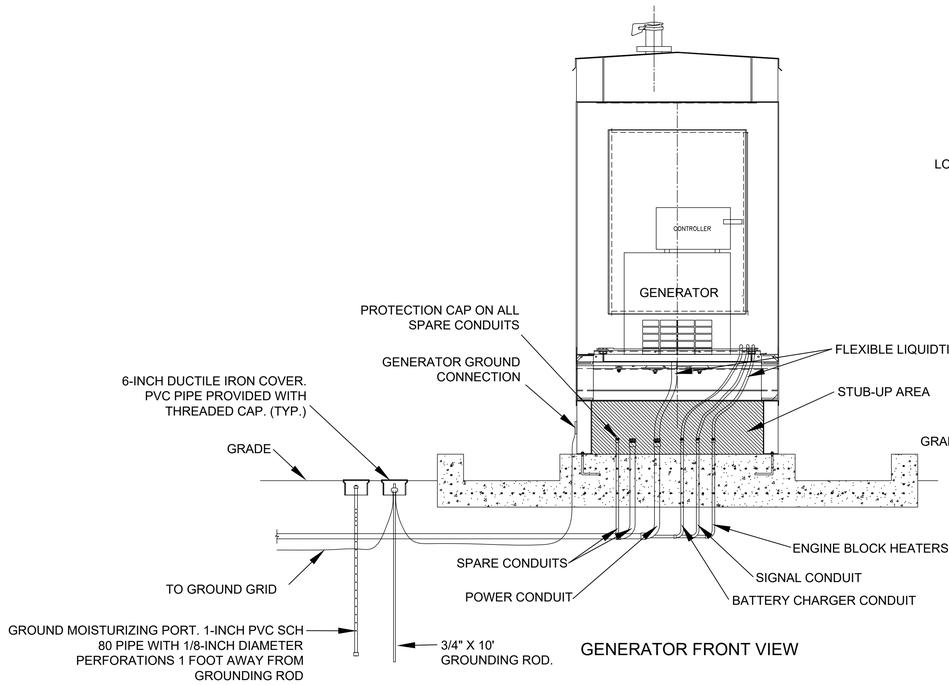
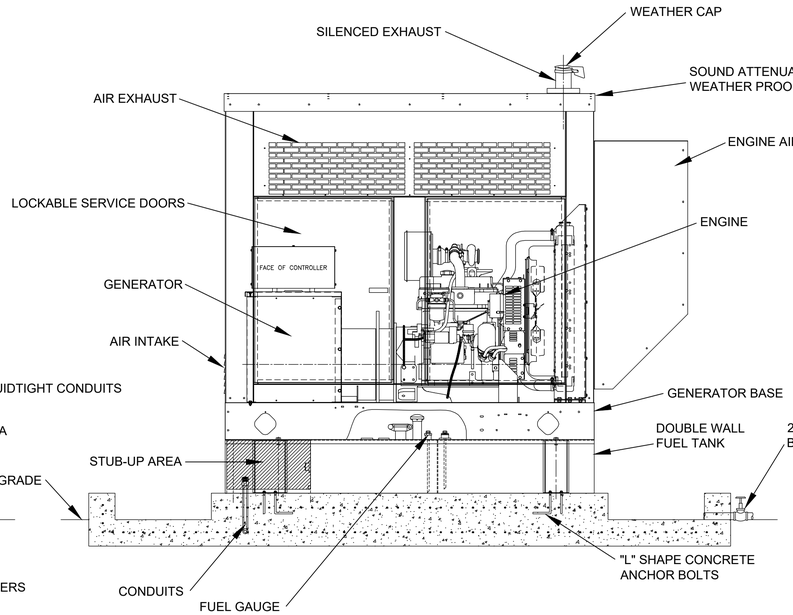
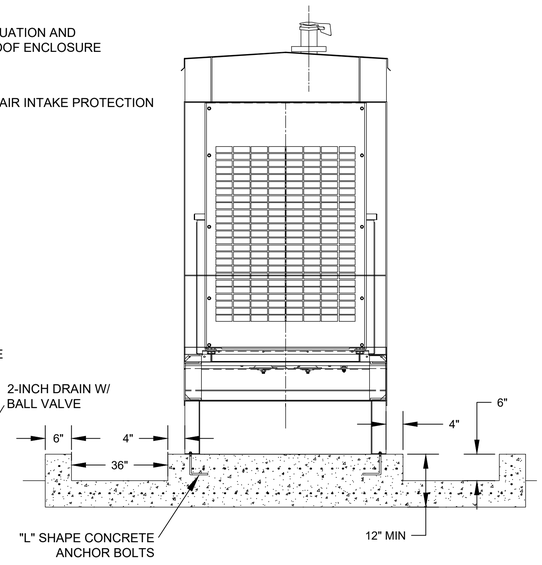
TEL. NO. 210-658-7250 FAX NO. 210-658-9805



GENERATOR FRONT VIEW



GENERATOR SIDE VIEW

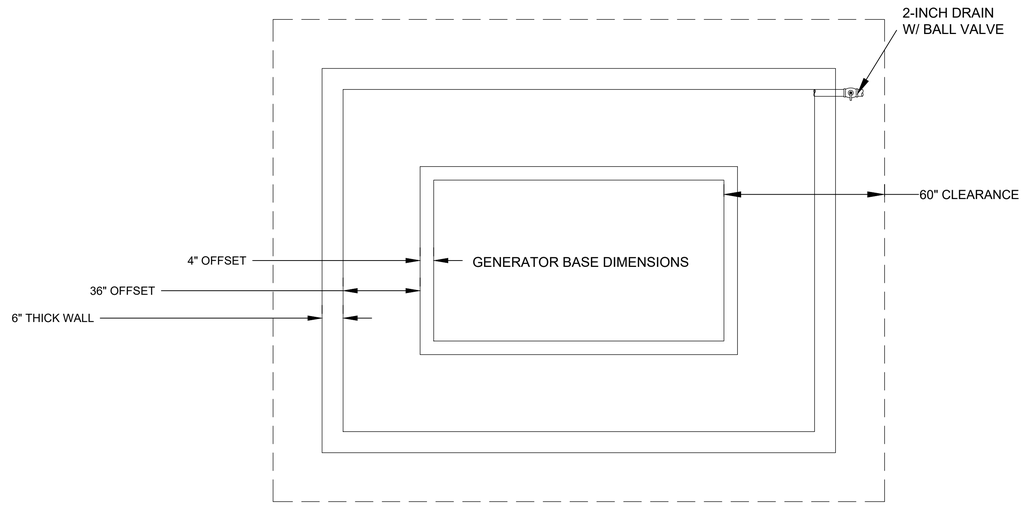


GENERATOR BACK VIEW

A STAND BY GENERATOR INSTALLATION DETAILS
SCALE: N.T.S.

NOTES

1. GENERATOR GROUND AND FRAME SHALL BE SOLIDLY BONDED TO THE REST OF THE GROUNDING SYSTEM AT EACH CORNER. GROUND RESISTANCE MEASURED AT THE GENERATOR SHALL HAVE THE SAME MAGNITUDE AS THE REST OF THE GROUNDING SYSTEM, AND IT SHALL NOT EXCEED 5 OHMS.
2. GENERATOR SHALL BE PROVIDED WITH SOUND ATTENUATION ENCLOSURE AND EXHAUST, AND MUST BE WEATHER PROOF. SEE SPECIFICATIONS FOR OTHER GENERATOR REQUIREMENTS.
3. GENERATOR FRAME SHALL BE SOLIDLY ANCHORED TO CONCRETE SLAB. ALL COMPONENTS USED TO FASTEN THE GENERATOR SHALL BE MADE OF STAINLESS STEEL 316.
4. CONDUITS SHALL INCLUDE AC POWER, BATTERY CHARGER, ENGINE BLOCK HEATER, SIGNAL AND SPARE.
5. FUEL TANK SHALL BE DOUBLE WALL TYPE.
6. CONCRETE SLAB SHALL BE MADE OF CONCRETE MIX WITH A COMPRESSIVE STRENGTH OF 3,000 PSI. CONCRETE SLAB MUST INCLUDE A CONTAINMENT STRUCTURE AS SHOWN IN DETAIL B OF THIS SHEET. A 2-INCH DRAIN PIPE AND BALL VALVE SHALL BE PROVIDED. REFER TO STRUCTURAL SHEETS FOR PAD DETAILS.
7. A 5-FOOT DEDICATED CLEARANCE AROUND GENERATOR CONTAINMENT SLAB SHALL BE PROVIDED IN STRICT COMPLIANCE WITH SAWS LIFT STATION STANDARDS.
8. CONDUIT STUB-UP AREA SHOWN IN THIS DRAWING IS FOR ILLUSTRATION PURPOSES ONLY. CONTRACTOR MUST VERIFY THE LOCATION OF THE STUB-UP AREA WITH THE GENERATOR MANUFACTURER.
9. CONTRACTOR SHALL VERIFY GENERATOR INSTALLATION REQUIREMENTS WITH GENERATOR MANUFACTURER.
10. VOLTAGE DIP SHALL NOT DROP BELOW 15% AND FREQUENCY SHALL NOT DROP BELOW 5% WHEN STARTING ACROSS-THE-LINE THE LARGEST MOTOR WHILE ALL OTHER LIFT STATION MOTORS AND AUXILIARY TRANSFORMER ARE RUNNING AT FULL LOAD.
11. GENERATOR SHALL BE WIRED AS A NON-SEPARATELY DERIVED SYSTEM, IN STRICT COMPLIANCE WITH NEC CURRENT REQUIREMENT.



B CONTAINMENT BASE DETAILS
SCALE: N.T.S.

NO.	REVISION	DATE

7/25/2025
STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
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TBPE FIRM REGISTRATION #470 | TBPLS FIRM REGISTRATION #10028800

MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION GENERATOR DETAILS

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-14

GRUBB ENGINEERING, INC.
ELECTRICAL POWER SYSTEMS
DESIGN AND TESTING
TBPE FIRM REGISTRATION NO. 3904
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7/25/2025
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MANGOLD LIFT STATION & FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION P&ID

SAWS JOB NO. XX-XXXX
JOB NO. 12175-02
DATE JULY 2025
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E-15

DESIGN CRITERIA

LOCATION: SAN ANTONIO, TEXAS.

BUILDING CODE:
- IBC 2021
- AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-19)
- AMERICAN CONCRETE INSTITUTE BUILDING CODE REQUIREMENTS FOR ENVIRONMENTAL CONCRETE STRUCTURES (ACI 350-06)
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION MANUAL 15TH EDITION
- STRUCTURAL WELDING CODE – STEEL: AWS D1.1
- STRUCTURAL WELDING CODE – ALUMINUM: AWS D1.6
- STRUCTURAL WELDING CODE – STAINLESS STEEL: AWS D1.6

DESIGN LOADS:
- DEAD LOAD = EQUIPMENT WEIGHT + SELF WEIGHT
- LIVE LOAD = 300 PSF EQUIPMENT WEIGHT + TOP SLAB
  150 PSF OTHER AREAS
- GROUND SNOW LOAD = 5 PSF
- STRUCTURE RISK CATEGORY: III

GEOTECHNICAL CONDITIONS:
- FOUNDATION DESIGN AND EXISTING SOIL CONDITIONS ARE BASED ON THE SUBSURFACE EXPLORATION AND FOUNDATION ANALYSIS, PROPOSED NEW LIFT STATION, MANGOLD SUBDIVISION, SAN ANTONIO, TEXAS PREPARED BY INTEC. INTEC PROJECT NO. S251722 DATED MARCH 28, 2025.
- FROST DEPTH: 0 INCHES.
- GROUNDWATER IS EXPECTED. DEWATERING REQUIRED FOR DEEP EXCAVATIONS IS THE RESPONSIBILITY OF THE CONTRACTOR.
- SELECT FILL MATERIAL USED AT THIS SITE SHOULD HAVE A MAXIMUM LIQUID LIMIT OF 40 AND A PLASTICITY INDEX (PI) BETWEEN 5 AND 20. THE FILL SHOULD BE COMPACTED TO AT LEAST 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR ASTM D698, WITHIN –1% AND 3% OF THE OPTIMUM WATER CONTENT. THE SELECT FILL MATERIAL SHALL ALSO HAVE AT MOST 30% PERCENT OF THE SOIL PASSING THE NO. 200 SIEVE.

WIND DESIGN LOAD:
- BASIC WIND SPEED: 115 MPH
- WIND EXPOSURE: B
- INTERNAL PRESSURE COEFFICIENT, GCpi = ±0.18
- COMPONENTS AND CLADDING: ASCE 7

SEISMIC DESIGN LOADS:
- SEISMIC SITE CLASS: D
- Ss = 0.049
- S1 = 0.020
- Sds = 0.052
- Sd1 = 0.032
- DESIGN CATEGORY: A
- IMPORTANCE FACTOR, I: 1.25
- RESPONSE COEFFICIENT, Cs = 0.0163
- DESIGN BASE SHEAR = 0.0163W
- ANALYSIS PROCEDURE: NOT APPLICABLE

GENERAL NOTES

1. THESE PLANS ARE INTENDED TO DESCRIBE THE GENERAL REQUIREMENTS FOR THIS PROJECT. NOT ALL CONDITIONS ARE SPECIFICALLY DETAILED. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL ITEMS REQUIRED FOR A COMPLETE AND FINISHED PRODUCT.
2. THE NOTES CONTAINED HEREWITH CORRESPOND TO THE STRUCTURAL WORK CONTAINED IN THIS PROJECT. CONSTRUCTION NOTES PROVIDED IN OTHER SHEETS RELATE TO THE PORTION OF THE WORK ON THOSE SHEETS.
3. CONTRACTOR SHALL VERIFY EQUIPMENT AND MEMBER SIZES AND ACTUAL DIMENSIONS AND ACCOMMODATE THE CONSTRUCTION WORK TO ALLOW A PROPER FIT OF SAID COMPONENTS WITH THE PROPOSED STRUCTURES FOR WHICH SAID COMPONENTS WILL BE INSTALLED.
4. CONTRACTOR SHALL NOTIFY ENGINEER OF ANY DISCREPANCIES AND/OR POTENTIAL CONFLICTS WITH OTHER COMPONENTS OF THE CONSTRUCTION WORK, SUPPORTS, OR EQUIPMENT.
5. CONTRACTOR SHALL COMPLY WITH OSHA REGULATIONS AND STATE OF TEXAS LAW CONCERNING EXCAVATION, TRENCHING AND SHORING.
6. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS, SIGNED AND SEALED BY AN ENGINEER LICENSED IN THE STATE OF TEXAS, FOR ALL PRECAST CONCRETE ITEMS.
7. THE INTERIOR WET WELL SHALL BE COATED WITH AN EPOXY AS SPECIFIED. PRIOR TO COATING, SURFACES SHALL BE FREE OF ALL LATENT MATTER, BURRS AND FINS. INSIDE CONCRETE SURFACE OF WET WELL SHALL BE WASHED WITH 10 PERCENT SOLUTION OF MURIATIC ACID, THEN RINSED CLEAN WITH FRESH WATER AND FINALLY, THOROUGHLY DRIED RESULTING IN A FINISHED SURFACE BEING FREE OF SCALE, DUST, OIL, GREASE, AND OTHER FOREIGN MATTER. IF THIS SURFACE COATING PREPARATION CONFLICTS WITH THE MANUFACTURER RECOMMENDATIONS, THEN THE MANUFACTURE RECOMMENDATIONS SHALL BE SUBMITTED FOR APPROVAL PRIOR TO BEGINNING WORK.
8. ALL MATERIAL & EQUIPMENT SHALL BE APPROVED THROUGH THE SHOP DRAWING SUBMITTAL PROCESS.
9. SEE ELECTRICAL DRAWINGS AND CIVIL DRAWINGS FOR DIMENSIONS AND INFORMATION NOT SHOWN.
10. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF THE ACCESS HATCH OPENINGS PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS.
11. DIMENSIONS NOTED ARE RELATIVE TO THE PUMP SIZE AND MANUFACTURER SELECTED. CONTRACTOR SHALL CONFIRM.

CONCRETE NOTES

1. CONCRETE CONSTRUCTION SHALL CONFORM TO THE PROJECT SPECIFICATIONS AND ACI 318 BUILDING CODE FOR REINFORCED CONCRETE. WHERE THE PROJECT SPECIFICATIONS CONFLICTS WITH ACI 318, THE STRICTER SPECIFICATION SHALL GOVERN.
2. CONCRETE PLACEMENT IN HOT OR COLD WEATHER SHALL CONFORM TO THE PROVISIONS OF ACI 305R OR 306R, RESPECTIVELY.
3. ALL REINFORCING STEEL SHALL BE GRADE 60 STEEL AS PER ASTM A615. ALL LAP SPLICES FOR CONTINUOUS REINFORCING STEEL SHALL BE 50 BAR DIAMETERS UNLESS OTHERWISE SPECIFIED. ALL REINFORCING SHOWN TO BE HOOKED SHALL HAVE STANDARD HOOKS AS PER ACI 315.
4. UNLESS OTHERWISE NOTED ON THE CONSTRUCTION PLANS, ALL CAST-IN-PLACE STRUCTURAL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI @ 28 DAYS. MUD MAT/SEAL SLAB SHALL HAVE A MINIMUM STRENGTH OF 1,500 PSI @ 28 DAYS.
5. COVER (CLR) IS THE LEAST DISTANCE BETWEEN THE SURFACE OF THE EMBEDDED REINFORCEMENT AND THE SURFACE OF THE CONCRETE. COVER IS A MINIMUM CLEAR DISTANCE BUT IS ALSO A MAXIMUM DISTANCE, SPECIFYING THE LOCATION OF THE REINFORCEMENT. THROUGH ACI 117-10 SPECIFICATIONS FOR TOLERANCES FOR CONCRETE, THE MAXIMUM DISTANCE BETWEEN THE SURFACE OF THE CONCRETE AND THE SURFACE OF THE REINFORCEMENT IS THE CLR DISTANCE PLUS THE REINFORCEMENT PLACEMENT TOLERANCE. BASED ON ACI 117, FOR CONCRETE MEMBERS 12 INCHES THICK OR LESS, THE TOLERANCE IS ⅜ INCH, AND FOR CONCRETE MEMBERS GREATER THAN 12 INCHES THICK, THE TOLERANCE IS ½ INCH. SEE CONCRETE PROTECTION TABLE DETAIL 3 SHEET S2 FOR COVER REQUIREMENTS.
6. REINFORCEMENT ACROSS CONSTRUCTION JOINTS SHALL BE IN ACCORDANCE WITH LAP SCHEDULE. TERMINATE IN STANDARD HOOKS WHERE CONCRETE DIMENSIONS DO NOT ALLOW FULL DEVELOPMENT OF REINFORCEMENT USING LAP SPLICES.
7. CONSTRUCTION JOINTS AND/OR SAW CUT JOINTS SHALL BE AT SPACING LESS THAN 40 TIMES SLAB THICKNESS IN EACH DIRECTION IN SLABS ON GRADE UNLESS OTHERWISE NOTED AND ARE NOT ALLOWED IN MAT FOUNDATIONS OR SLABS WITH THICKNESS 18 INCHES OR GREATER.
8. COORDINATE ALL LOCATIONS OF PENETRATIONS IN SLAB AS NEEDED FOR PIPING, WIRING, AND CONTROLS WITH REINFORCING. PENETRATIONS FOR ELECTRICAL CONDUITS OR PIPING SHALL MAINTAIN 2 INCHES CLEAR FROM REINFORCEMENT. REINFORCEMENT MAY NOT BE MOVED OR OMITTED TO ALLOW PENETRATION OF CONDUITS THROUGH CONCRETE WALLS AND FOUNDATIONS WITHOUT PERMISSION OF ENGINEER OF RECORD.
9. ALL EXPOSED EDGES OF BEAMS, COLUMNS, SLABS AND WALLS SHALL BE CHAMFERED ¾" UNLESS MASONRY OR OTHER MEMBERS ARE ERECTED FLUSH WITH THEM.

FOUNDATION NOTES

1. ALL EXCAVATIONS SHALL BE CONDUCTED IN THE DRY, AND PROVISIONS MADE TO PREVENT THE BOTTOM OF ALL EXCAVATIONS FROM FREEZING OR FLOODING.
2. GROUNDWATER CONTROL MAY BE REQUIRED FOR INSTALLATION OF THE LIFT STATION. CONTRACTOR SHALL PROVIDE POSITIVE METHODS OF GROUNDWATER MANAGEMENT PRIOR TO STARTING EXCAVATION OPERATIONS. IF REQUIRED, GROUNDWATER SHALL BE LOWERED AT LEAST 3 FEET BELOW THE BOTTOM OF THE EXCAVATION TO PROVIDE A FIRM WORKING SURFACE. IF REQUIRED, DEWATERING SHALL CONTINUE UNTIL THE UTILITY INSTALLATION HAS BEEN COMPLETED AND THAT THE DEWATERING SYSTEM BE TURNED OFF IN STAGES TO ALLOW GROUNDWATER TO RECOVER TO ITS ORIGINAL LEVEL GRADUALLY, OVER A PERIOD OF 3 DAYS MINIMUM.
3. ALL STRUCTURAL FILL SHALL BE COMPACTED IN 8-INCH LIFTS TO 95% ASTM D698 WITHIN –2% TO +2% OF OPTIMUM MOISTURE. BACKFILL PLACED WITHIN 5 FEET OF THE WALLS SHALL BE HAND COMPACTED.
4. THE AREA AROUND THE ENTIRE STRUCTURE SHALL BE WELL GRADED TO DRAIN AWAY FROM THE STRUCTURE WITHOUT DRAINING TO ADJACENT PROPERTIES. FINISH GRADE ELEVATIONS SHOWN ARE APPROXIMATE. SEE GRADING AND DRAINAGE PLANS FOR TRUE F.G. ELEVATIONS.
5. BENEATH THE PIPE SLAB FOUNDATION, CEMENT STABILIZED SAND, HAVING A MINIMUM UNCONFINED COMPRESSIVE STRENGTH OF 100 PSI @ 48-HOURS, SHALL BE USED TO A MINIMUM DEPTH OF 1 FOOT. ALSO, USE CEMENT STABILIZED SAND BACKFILL BENEATH AND OUTSIDE THE INFLUENT LINES FROM LIMITS OF LIFT STATION EXCAVATION. ANY OVER EXCAVATION BEYOND THE 1-FOOT DEPTH FOR FOUNDATION SHALL BE BACKFILLED WITH CEMENT STABILIZED SAND.

MISCELLANEOUS NOTES

1. EPOXY GROUT SHALL BE POR-ROK EPOXY GROUT, OR APPROVED EQUAL.
2. PROVIDE CONTINUOUS WATER STOPS IN ALL CONSTRUCTION JOINTS.
3. ALL DIMENSIONS AND LOCATIONS SHALL BE VERIFIED FROM CERTIFIED VENDOR DRAWINGS, PRIOR TO CONSTRUCTION.

STRUCTURAL STEEL NOTES

1. STRUCTURAL STEEL SHALL CONFORM TO THE LATEST AISC "SPECIFICATION FOR THE DESIGN. FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS". STEEL PIPE & HSS SHALL CONFORM TO ASTM A500 GR B. WIDE FLANGES SHALL CONFORM TO ASTM A992. ALL OTHER STRUCTURAL STEEL SHALL PROVIDE A MINIMUM YIELD STRENGTH OF 36 KSI.
2. ALL BOLTED CONNECTIONS SHALL BE MADE WITH ¾-INCH DIAMETER ASTM F593 STAINLESS STEEL BOLTS EXCEPT AS OTHERWISE SHOWN OR NOTED.
3. FIELD CONNECTIONS SHALL BE BOLTED, EXCEPT AS OTHERWISE SHOWN OR NOTED.
4. ALL WELDING SHALL CONFORM TO THE LATEST SPECIFICATION OF THE AMERICAN WELDING SOCIETY. ALL WELDED CONNECTIONS SHALL BE MADE WITH AWS A5.1 OR A5.5 E70 XX ELECTRODE.
5. ANCHOR BOLTS – ASTM F593.
6. ANCHOR BOLTS WHICH ARE SUBMERGED, LOCATED ABOVE A LIQUID SURFACE, OR ARE IN A CORROSIVE ENVIRONMENT: SS 304 OR SS 316.
7. ALL EQUIPMENT ANCHOR BOLT DIMENSIONS AND LOCATIONS SHALL BE VERIFIED FROM CERTIFIED VENDOR DRAWINGS, PRIOR TO CONSTRUCTION.
8. ALL STRUCTURAL STEEL SECTIONS, PLATES, BOLTS, NUTS, & ANCHORS SHALL BE HOT-DIP GALVANIZED UNLESS OTHERWISE NOTED.
9. ALL HOLES TO BE STANDARD HOLES. UNLESS OTHERWISE NOTED.
10. GRIND ALL SHARP EDGES SMOOTH AS REQUIRED. HOT-DIP GALVANIZE AFTER FABRICATION.
11. ALL JOINTS ARE TO BE WELDED USING A ⅜" MIN. CONT. FILLET WELD, UNLESS OTHERWISE NOTED.
12. USE STAINLESS STEEL TYPE 304L OR TYPE 316L WHERE STAINLESS STEEL IS TO BE WELDED.

REINFORCING LAP SPLICE TABLE – 4,000 PSI CONCRETE

BAR SIZE	CONDITION 1: CLEAR COVER >= 2 DIA AND C-TO-C SPA >= 5 DIA		CONDITION 2: CLEAR COVER >= 2 DIA AND C-TO-C SPA >= 3 DIA		CONDITION 3	HOOKS: STD 90 DEGREE HOOK LENGTH
	TOP	OTHER	TOP	OTHER	ALL BARS	
#3	1'-4"	1'-4"	2'-0"	1'-6"	SEE NOTE 3	0'-6"
#4	1'-7"	1'-4"	2'-8"	2'-1"		0'-8"
#5	2'-0"	1'-6"	3'-4"	2'-8"		0'-10"
#6	2'-6"	1'-10"	4'-0"	3'-1"		1'-0"
#7	3'-6"	2'-9"	5'-10"	4'-7"		1'-2"
#8	4'-0"	3'-1"	6'-8"	5'-2"		1'-4"
#9	4'-6"	3'-6"	7'-7"	5'-10"		1'-7"
#10	5'-1"	3'-11"	8'-6"	6'-6"		1'-10"
#11	5'-8"	4'-4"	9'-5"	7'-4"		2'-0"

DETAIL NOTES:

1. LAP ALL BARS PER THIS SCHEDULE UNLESS NOTED OTHERWISE.
2. BAR COVER AND SPACING MUST BOTH MEET THE CRITERIA OF CONDITION 1 OR 2 IN ORDER TO USE THAT PARTICULAR LAP LENGTH.
3. TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.
4. FOR BARS THAT DO NOT SATISFY EITHER CONDITION, LAP LENGTH SHALL BE THE LENGTH FROM THE APPROPRIATE CATEGORY ("TOP" OR "OTHER") OF CONDITION 2 MULTIPLIED BY 1.5.
5. NONCONTACT LAP SPLICE LENGTH IS THE LAP SPLICE PLUS THE SEPARATION OF BARS BEING LAPPED. BARS BEING LAPPED CANNOT BE FURTHER APART THAN ⅕" OF THE LAP SPLICE LENGTH OR 6 INCHES, WHICHEVER IS SMALLER.
6. CLEAR COVER IS DISTANCE FROM THE FACE OF CONCRETE TO FACE OF BAR.

1. CONCRETE REINFORCING LAP SPLICE TABLE
SCALE: NONE

NO.	REVISION	DATE

07/08/2025
STATE OF TEXAS
MARCOS A. WORTLEY
128045
LICENSED
PROFESSIONAL ENGINEER
Marcos Ariel Wortley

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STATION
SAN ANTONIO, TEXAS

STRUCTURAL
GENERAL NOTES

PLAT NO. ---
JOB NO. 12537-11
DATE MAY 2025
DESIGNER JAP
CHECKED MGF DRAWN JRT
SHEET S1

Date: March 19, 2024, 5:55 PM – User ID: mwortley
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PRELIMINARY

STANDARD CONCRETE ANCHORS						
ANCHOR DIAMETER	⅜"	½"	⅝"	¾"	⅞"	1"
STANDARD MECHANICAL ANCHOR EMBED, UNO (NOTE 1)	3¼"	3½"	4½"	5½"	N/A	N/A
STANDARD ADHESIVE ANCHOR EMBED, UNO (NOTE 1)	3¼"	4"	5"	6"	8"	10"
MINIMUM SPACING	4"	6"	8"	9"	12"	16"
MINIMUM EDGE DISTANCE	4"	4"	5"	8"	12"	16"
MINIMUM CONCRETE THICKNESS	5"	6"	8"	10"	12"	14"
ALLOWABLE TENSION "T" (LB) *	750*	1,100*	1,450*	2,350*	5,200*	7,800*
ALLOWABLE SHEAR "V" (LB) *	300*	400*	625*	1,150*	1,950*	3,250*

* LOADS ONLY APPLICABLE TO INSTALLATION INTO CRACKED CONCRETE $4{,}000 \leq f'_c \leq 8{,}000$ PSI MEETING MINIMUM EMBED, SPACING, AND EDGE DISTANCES SHOWN. LOADS FOR SINGLE ANCHOR, OUT OF THE GROUP BELOW, WITH SERVICE LEVEL (ASD) LOADING.

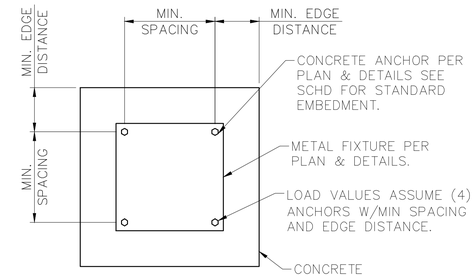
DETAIL NOTES:

1. ALL ANCHORS SHALL RECEIVE STANDARD EMBED, SPACING, EDGE DISTANCE, CONCRETE THICKNESS, AND LOAD CONDITIONS, UNLESS NOTED OTHERWISE ON "S" SHEETS. UNLESS NOTED OTHERWISE, MINIMUM EMBEDMENT SHALL BE PER TABLE ABOVE. IN NO CASE MAY THE EMBEDMENT BE LESS THAN THE MANUFACTURER'S "MINIMUM EMBEDMENT" FROM PUBLISHED CATALOG LITERATURE.
2. CONTRACTOR SHALL USE BASIS OF DESIGN ANCHORS OR SUBMIT ENGINEERED ANCHORS MEETING REQUIREMENTS OF ACI 355.2 & APPLICABLE TO EDGE AND SPACING REQUIREMENTS OF THE CONTRACT DOCUMENTS FOR APPROVAL. BASIS OF DESIGN ANCHORS INCLUDE:
   A. SCREW: HILTI KWIK-HUS EZ AND SIMPSON TITEN HD
   B. EXPANSION: HILTI KWIK BOLT 2
   C. ADHESIVE: HILTI HIT-RE 500 V3 & SIMPSON SET 3G WITH THREADED ROD

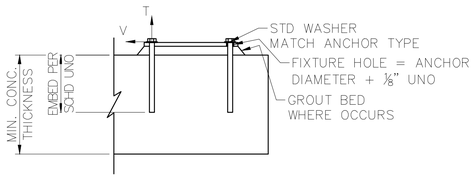
   WHERE DRAWINGS CALL FOR CONCRETE ANCHORS, CONTRACTOR MAY CHOOSE BETWEEN EXPANSION, SCREW OR ADHESIVE ANCHOR. WHERE DRAWINGS CALL FOR MECH ANCHOR, CONTRACTOR MAY CHOOSE BETWEEN EXPANSION AND SCREW ANCHOR.
3. INSTALL IN STRICT ACCORDANCE WITH MANUFACTURER'S PUBLISHED RECOMMENDATIONS AND ADDITIONAL RECOMMENDATIONS OF ICC EVALUATION SERVICE REPORT.
4. ALL CONCRETE ANCHORS MUST BE INSPECTED TWICE:
   A. AFTER HOLE IS DRILLED AND CLEANED, AND
   B. DURING INSTALLATION OF ADHESIVE AND/OR MECHANICAL ANCHOR.
5. ON DRAWINGS, ADHESIVE ANCHORS MAY ALSO BE REFERRED TO AS EPOXY OR EPOXY SET ANCHORS.
6. FOR ANCHORS RESISTING TENSION AND SHEAR USE FOLLOWING EQUATION: (ACTUAL TENSION/ALLOWABLE TENSION) + (ACTUAL SHEAR/ALLOWABLE SHEAR) < 1.00
7. ADHESIVE ANCHORS MAY NOT BE USED IN OVERHEAD APPLICATIONS UNLESS NOTED OTHERWISE ON THE "S" SHEETS.
8. ANY ADHESIVE ANCHOR IN CONSTANT TENSION OR INSTALLED IN ANY ORIENTATION BETWEEN HORIZONTAL AND OVERHEAD VERTICAL MUST BE INSTALLED AND INSPECTED BY CERTIFIED INSTALLER/INSPECTOR. SEE DIVISION 5 SPECIFICATIONS.
9. ALL CONCRETE ANCHORS SHALL BE STAINLESS STEEL TYPE 316 UNO.
10. DO NOT INSTALL ADHESIVE IN CONCRETE LESS THAN 21 DAYS OLD.

1 CONCRETE ANCHOR SCHEDULE

N.T.S.



TOP VIEW OF ANCHOR GROUP IN CONCRETE



SECTION VIEW INTO CONCRETE

CONCRETE SCHEDULE		
MATERIAL PROPERTIES	CONCRETE MIX	
	STRUCTURAL CONCRETE	SEAL SLAB CONCRETE
COMPRESSIVE STRENGTH – MINIMUM	4,000 PSI	1500 PSI
PORTLAND CEMENT – ASTM C150	TYPE I OR TYPE II	TYPE I OR TYPE II
FLYASH – ASTM C618	15% MAX	15% MAX
AGGREGATE – COARSE – ASTM C33	1" MAX	SAND
AIR ENTRAINMENT – ASTM C260	4% ± 1%	N/A
SUPER PLASTICIZER – ASTM C494	(OPTIONAL) TYPE F	N/A
WATER TO CEMENT RATIO – MAXIMUM	0.45 MAX	N/A
SYNTHETIC FIBERS	OPTIONAL	NO
SLUMP	3" ± 1"	4" ± 1"
WATERPROOFING	N/A	N/A

DETAIL NOTES:

1. ALL CONCRETE SHALL BE STRUCTURAL CONCRETE UNLESS NOTED OTHERWISE.
2. TOPPING SLABS SHALL BE 2" MIN THICKNESS, MIX 1, BUT WITH MAX ½" AGGREGATE.
3. LIMIT AIR CONTENT OF STEEL-TROWELED FLOORS TO 3% MAX.

2 CONCRETE MATERIAL SCHEDULE

N.T.S.

CONCRETE PROTECTION FOR REINFORCEMENT CONCRETE CLEAR COVER DIMENSIONS UNLESS NOTED OTHERWISE	
CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH OR "RAW" SEWAGE	3"
CONCRETE IN CONTACT WITH OR IMMEDIATELY ABOVE OR ADJACENT TO WATER/WASTEWATER	2"
CONCRETE EXPOSED TO EARTH OR WEATHER	
#6 THROUGH #11 BARS	2"
#5 AND SMALLER, W31 OR D31 WIRE	1½"
CONCRETE NOT EXPOSED TO WEATHER, CONTACT WITH GROUND, OR WASTEWATER	
SLABS, WALLS, AND JOISTS: #11 AND LARGER BARS	1½"
#10 AND SMALLER BARS	LARGER OF 1" OR BAR DIA
BEAMS AND COLUMNS: PRIMARY REINFORCEMENT, TIES STIRRUPS AND SPIRALS	1½"

DETAIL NOTES:

1. SEE SPECIFICATIONS OR GENERAL NOTES FOR TOLERANCES.
2. CLEAR COVER IS DISTANCE FROM FACE OF CONCRETE TO FACE OF BAR.

3 CONCRETE COVER REQUIREMENTS

N.T.S.

NO.	REVISION	DATE

07/08/2025

STATE OF TEXAS
MARCOS A. WORTLEY
128045
LICENSED PROFESSIONAL ENGINEER

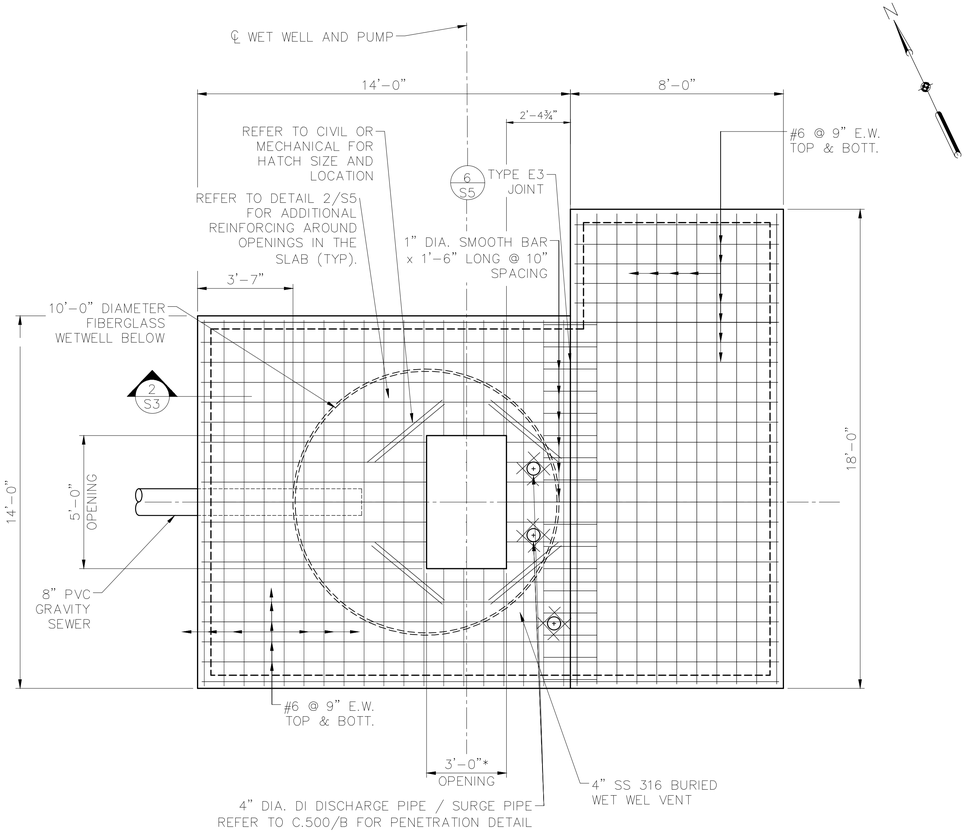
PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STATION
SAN ANTONIO, TEXAS

STRUCTURAL SCHEDULES

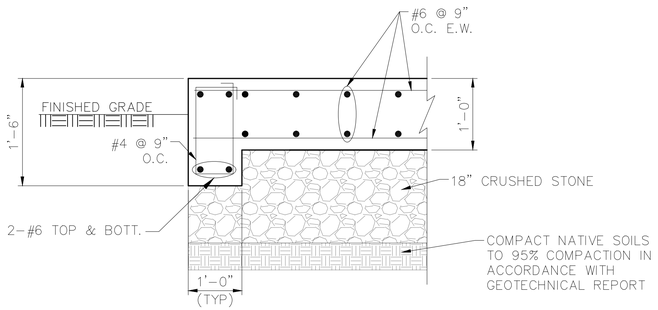
PLAT NO. ---
JOB NO. 12537-11
DATE MAY 2025
DESIGNER JAP
CHECKED MGF DRAWN JRT
SHEET S2

PRELIMINARY



1 PLAN VIEW - TOP SLAB

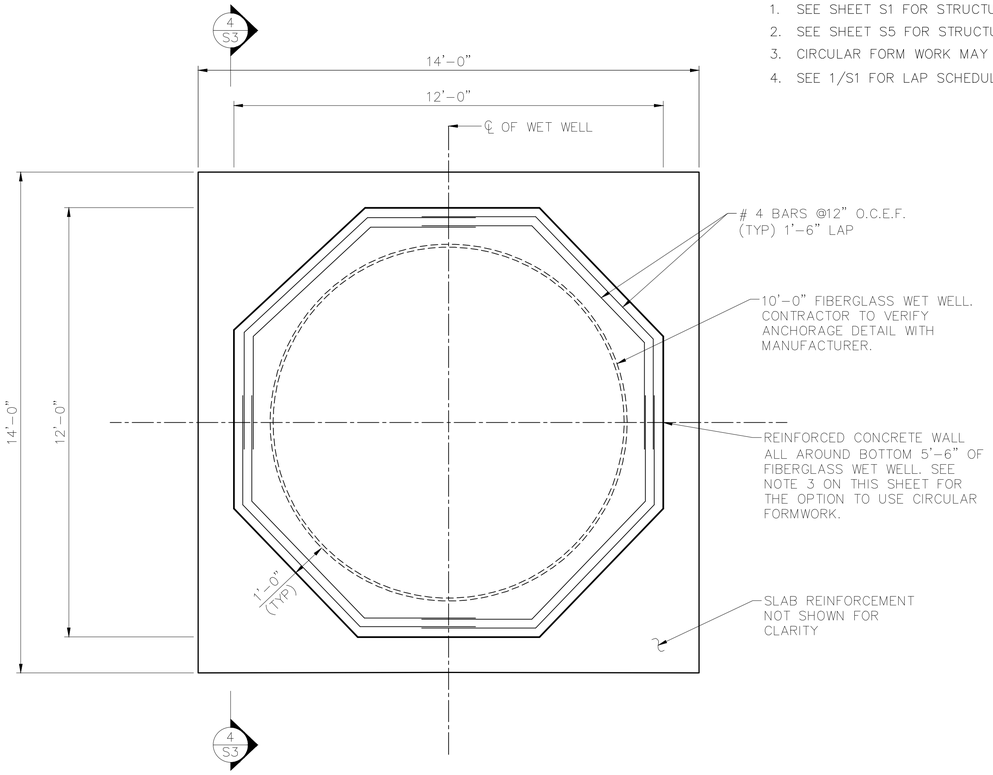
SCALE: ⅜"=1'-0"



2 GRADE BEAM SLAB SECTION

SCALE: ¾"=1'-0"

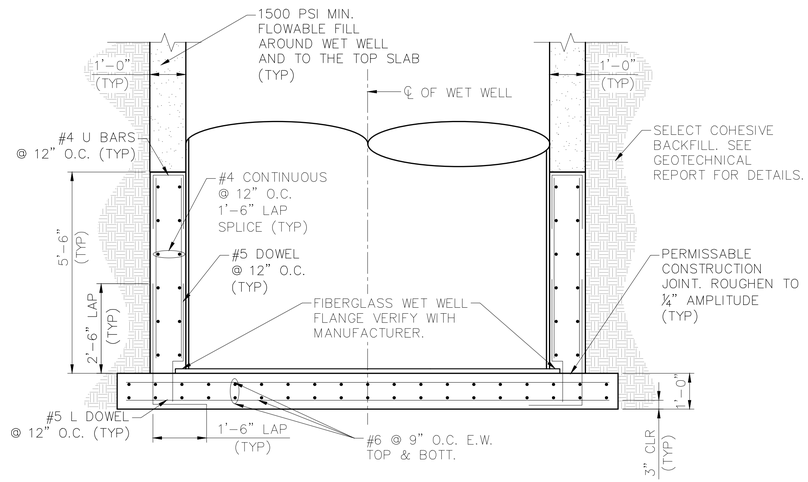
SEE CIVIL FOR TOP SLAB ELEVATION AND FINISH GRADE ELEVATION



3 ANTI-FLOTATION SLAB PLAN

SCALE: ½"=1'-0"

VERTICAL REINFORCING NOT SHOWN FOR CLARITY



4 BOTTOM SLAB SECTION

SCALE: ½"=1'-0"

NOTES:

1. SEE SHEET S1 FOR STRUCTURAL NOTES.
2. SEE SHEET S5 FOR STRUCTURAL DETAILS.
3. CIRCULAR FORM WORK MAY BE USED.
4. SEE 1/S1 FOR LAP SCHEDULE.

NO.	REVISION	DATE

09/03/2025

STATE OF TEXAS
MARCOS A. WORTLEY
128045
LICENSED PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STATION
SAN ANTONIO, TEXAS

STRUCTURAL
LIFT STATION PLAN & PROFILE

PLAT NO. ---
JOB NO. 12537-11
DATE MAY 2025
DESIGNER JAP
CHECKED MGF DRAWN JRT

SHEET S3

Date: March 19, 2024, 3:05 PM – User ID: James.taylor
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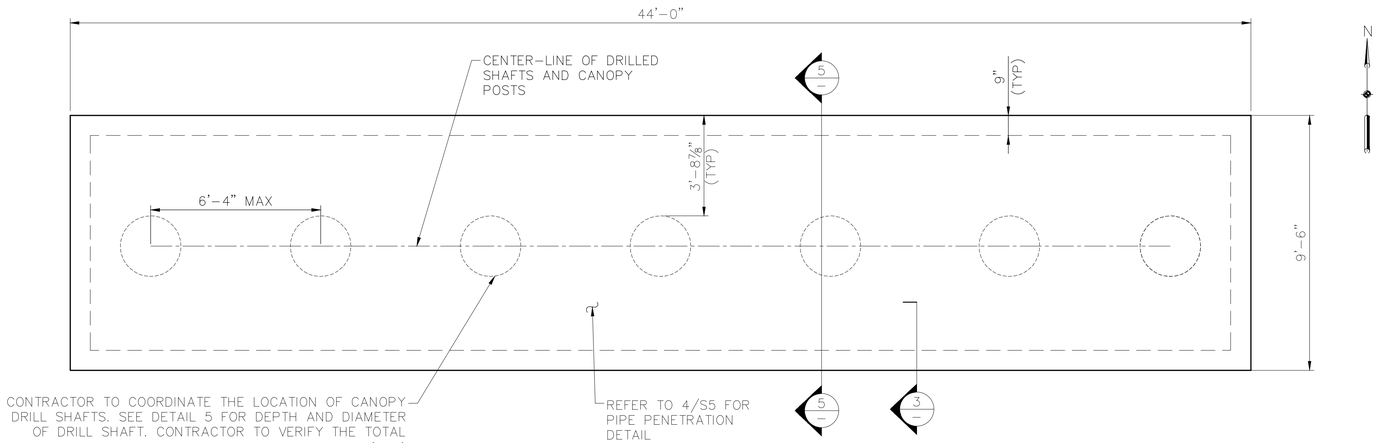
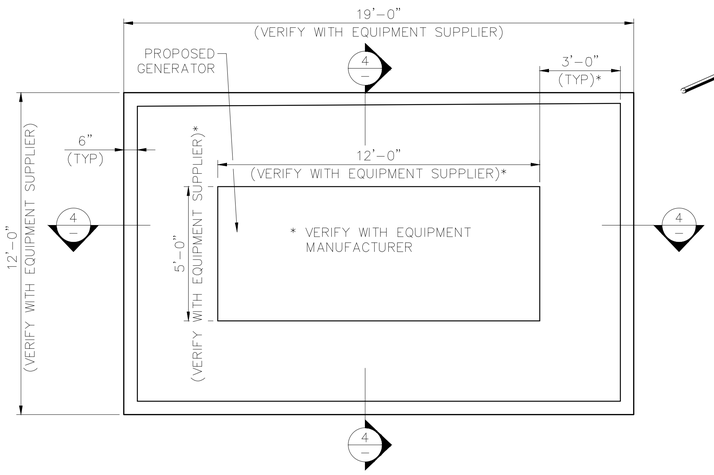
PRELIMINARY



1 CONTROL PANEL PAD PLAN
SCALE: ⅜" = 1'-0"

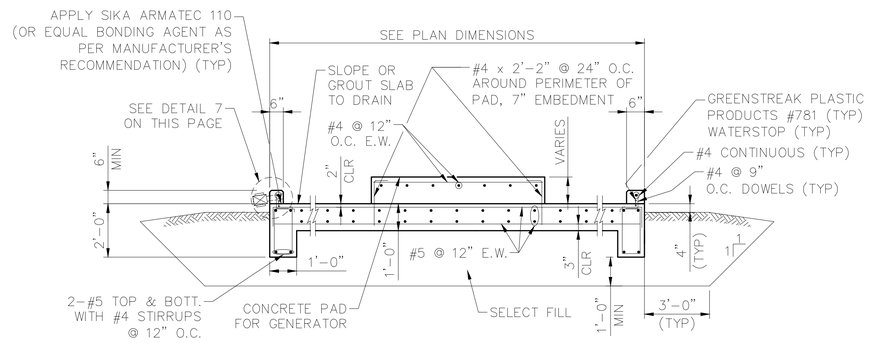
NOTES:

1. SEE SHEET S1 FOR STRUCTURAL NOTES.
2. SEE SHEET S5 FOR STRUCTURAL DETAILS.



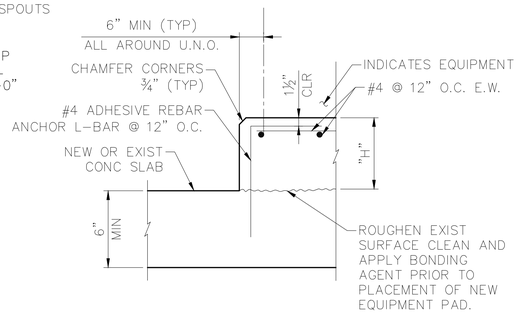
CONTRACTOR SHALL SUBMIT ANCHOR BOLT LAYOUT/EMBEDMENT TO ENGINEER FOR REVIEW PRIOR TO ANY CONSTRUCTION.

2 GENERATOR PAD PLAN
SCALE: ⅜" = 1'-0"



TYPICAL SECTION FOR GENERATOR PAD
4 N.T.S.

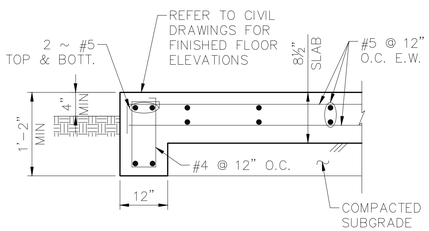
CANOPY SUPPORT AND FOUNDATION DETAIL
5 N.T.S.



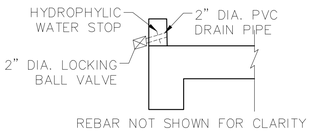
DETAIL NOTES:

1. "H" TO BE DETERMINED BY MOUNTING HEIGHT OF EQUIPMENT.
2. "H" SHALL NOT BE LESS THAN 3½" OR GREATER THAN 8" WITHOUT ENGINEERS APPROVAL.
3. PAD SIZE SHALL BE MINIMUM INDICATED OR AS SHOWN ON THE PLANS OR AS INDICATED BY THE MANUFACTURER AND APPROVED BY THE ENGINEER.
4. THE SIZE, NUMBER, TYPE, LOCATION, AND THREAD PROJECTION OF THE ANCHOR BOLTS SHALL BE DETERMINED BY THE EQUIPMENT MANUFACTURER, AND SHALL BE HELD IN POSITION WITH A ONE PIECE TEMPLATE, MATCHING THE BASE PLATE, WHILE PAD IS BEING POURED.
5. EQUIPMENT BASES SHALL BE INSTALLED LEVEL UNLESS SPECIFIED OTHERWISE.
6. WHEN ANCHORAGE OF EQUIPMENT TO SLAB IS REQUIRED, USE SPECIFIED STAINLESS STEEL WEDGE ANCHORS.

6 EQUIPMENT PAD
N.T.S.



TYPICAL SECTION FOR CONTROL PANEL PAD
3 N.T.S.



7 DRAIN VALVE DETAIL
SCALE: N.T.S.

NO.	REVISION	DATE

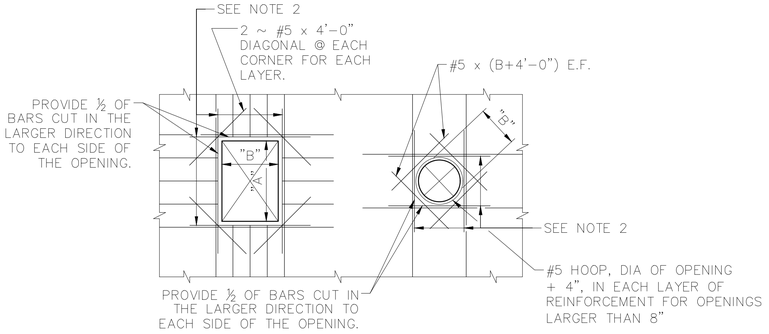
09/03/2025
STATE OF TEXAS
MARCOS A. WORTLEY
128045
LICENSED PROFESSIONAL ENGINEER
Marcos Oriel Wortley

PAPE-DAWSON ENGINEERS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

MANGOLD LIFT STATION
SAN ANTONIO, TEXAS
STRUCTURAL
MISCELLANEOUS PADS & CANOPY FOUNDATION DETAILS

PLAT NO. ---
JOB NO. 12537-11
DATE MAY 2025
DESIGNER JAP
CHECKED MGF DRAWN JRT
SHEET S4

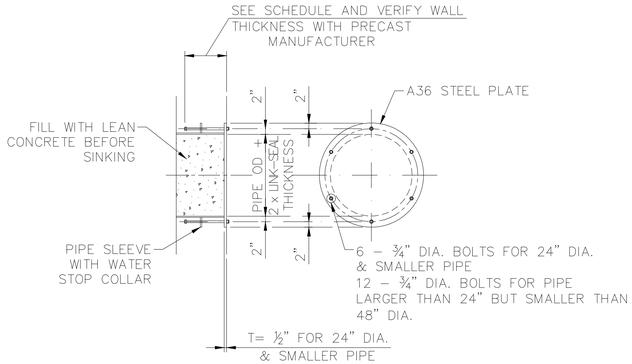
PRELIMINARY



1. THE MAXIMUM DIAMETER OR RECTANGULAR OPENING ALLOWED IS 6'-0"
2. PROVIDE LAPS FOR ALL REINFORCEMENT AS SPECIFIED IN SCHEDULE FOR TOP BARS.
3. DO NOT WELD REINFORCING BARS TO PIPE SLEEVES OR INSERTS.
4. CONTRACTOR TO COORDINATE ALL OPENINGS WITH ALL DISCIPLINES.
5. DIAGONAL BARS TO BE BENT AT CONSTRAINED LOCATIONS. NO CUTTING OF SAID BARS ARE ALLOWED WITHOUT ENGINEER'S REVIEW.
6. REINFORCEMENT SHOWN IS ADDITIONAL TO THE SPECIFIED REINFORCEMENT SPECIFIED ELSEWHERE IN THE PLANS.

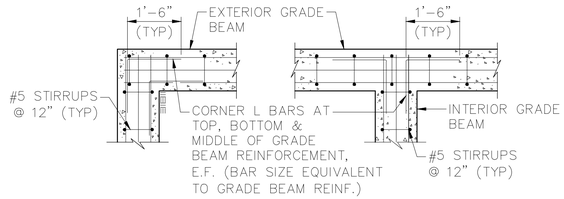
ADDITIONAL REINFORCING STEEL AT OPENINGS IN WALLS AND SLABS

1 N.T.S.



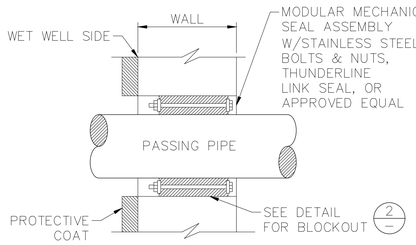
TYPICAL PIPE BLOCK-OUT DETAIL FOR WET WELL WALL PENETRATION

2 N.T.S.



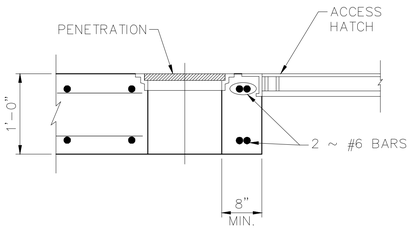
GRADE BEAM CORNER DETAILS

3 N.T.S.



PENETRATION SEAL DETAIL FOR PIPING 6" DIA & LARGER

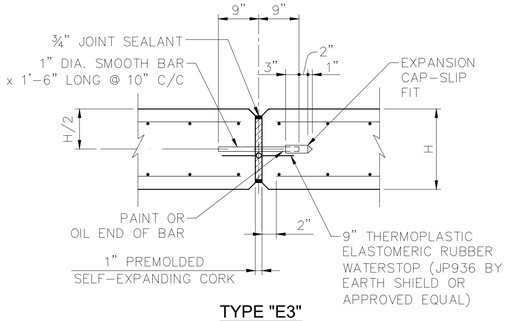
4 N.T.S.



PLACE REINFORCEMENT AS SHOWN WHEN PIPE PENETRATIONS ARE IN CLOSE PROXIMITY TO HATCH AS TO DISRUPT THE REINFORCING SPACING SHOWN ELSEWHERE IN PLANS.

HATCH FRAME SECTION

5 N.T.S.

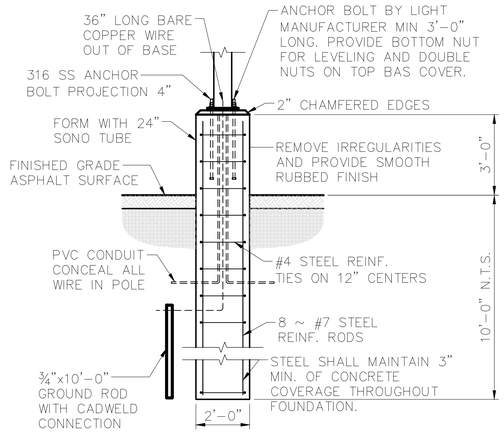


TYPE "E3"

CHAMFER EXPANSION JOINTS IN WALLS AND CEILINGS FOR FLOOR JOINTS USE EDGER INSTEAD OF CHAMFERING

EXPANSION JOINT DETAILS

6 N.T.S.



LIGHT POLE FOUNDATION (TYP)

7 N.T.S.

NOTE:
1. REFERENCE SHEET E–11 DETAIL F FOR ADDITIONAL LIGHT POLE INFORMATION.

NO.	REVISION	DATE

07/08/2025

STATE OF TEXAS
MARCOS A. WORTLEY
128045
LICENSED
PROFESSIONAL ENGINEER

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2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #100288-00

MANGOLD LIFT STATION
SAN ANTONIO, TEXAS

STRUCTURAL
LIFT STATION DETAILS

PLAT NO. ---
JOB NO. 12537-11
DATE MAY 2025
DESIGNER JAP
CHECKED MGF DRAWN JRT
SHEET S5