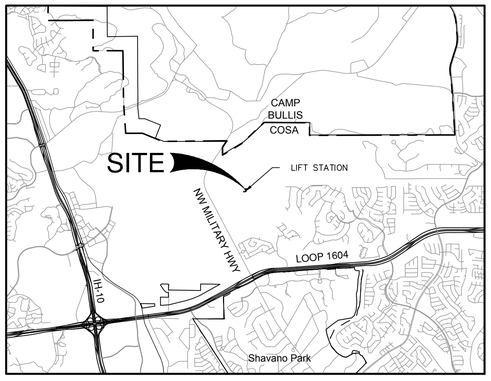
CORNERSTONE LIFT STATION #2 AND FORCE MAIN

BEXAR COUNTY, TEXAS

CIVIL CONSTRUCTION PLANS

SAWS JOB. 23-3000



LOCATION MAP
NOT-TO-SCALE

SHEET INDEX

BITTERBLUE, INC.
11 LYNN BATTS LANE, SUITE 100
SAN ANTONIO, TEXAS 78218

MARCH 2024

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

STATE OF TEXAS
KIM KEEFER
117746
LICENSED
PROFESSIONAL ENGINEER
11/22/23

SHEET C0.00

DEVELOPER'S NAME: BITTERBLUE, INC.
ADDRESS: 11 LYNN BATTS LANE, SUITE 100
CITY: SAN ANTONIO STATE: TX ZIP: 78218
PHONE# (210) 828-6131 FAX#
SAWS BLOCK MAP# TOTAL EDU'S: 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE: 4,502 LF-6" FM 135 LF-8" SS PLAT NO. 23-11800125
NUMBER OF LOTS SAWS JOB NO. 23-3000

SAWS JOB NO. 23-3000 CORNERSTONE LIFT STATION #2 AND FORCE MAIN - 1293400

Date: Mar 18, 2024, 9:32am User ID: eloughlin
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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.

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
11/22/24

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

CORNERSTONE LIFT STATION #2 AND FORCE MAIN

SAN ANTONIO, TX

GENERAL NOTES

DEVELOPER'S NAME: BITTERBLUE, INC.
ADDRESS: 11 LYNN BATTS LANE, SUITE 100
CITY: SAN ANTONIO STATE: TX ZIP: 78218
PHONE# (210) 828-6131 FAX#
SAWS BLOCK MAP# TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE: 135 LF-8" SS, 4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS SAWS JOB NO. 23-3000

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C1.00

Date: Mar 18, 2024, 9:32am User ID: dloughlin
File: P:\12934\00\Design\Civil\LS\QN-12934001.dwg

TEXAS COMMISSION ON ENVIRONMENTAL QUALITY
ORGANIZED SEWAGE COLLECTION SYSTEM (SCS)
GENERAL CONSTRUCTION NOTES

1. THIS ORGANIZED SEWAGE COLLECTION SYSTEM (SCS) MUST BE CONSTRUCTED IN ACCORDANCE WITH 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C), THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S (TCEQ) EDWARDS AQUIFER RULES AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.

2. ALL CONTRACTORS CONDUCTING REGULATED ACTIVITIES ASSOCIATED WITH THIS PROPOSED REGULATED PROJECT MUST BE PROVIDED WITH COPIES OF THE SCS PLAN AND THE TCEQ LETTER INDICATING THE SPECIFIC CONDITIONS OF ITS APPROVAL. DURING THE COURSE OF THESE REGULATED ACTIVITIES, THE CONTRACTORS MUST BE REQUIRED TO KEEP ON-SITE COPIES OF THE PLAN AND THE APPROVAL LETTER.

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. ANY MODIFICATION TO THE ACTIVITIES DESCRIBED IN THE REFERENCED SCS APPLICATION FOLLOWING THE DATE OF APPROVAL MAY REQUIRE THE SUBMITTAL OF AN SCS APPLICATION TO MODIFY THIS APPROVAL, INCLUDING THE PAYMENT OF APPROPRIATE FEES AND ALL INFORMATION NECESSARY FOR ITS REVIEW AND APPROVAL.

5. PRIOR TO BEGINNING ANY CONSTRUCTION ACTIVITY, ALL TEMPORARY EROSION AND SEDIMENTATION (E&S) CONTROL MEASURES MUST BE PROPERLY INSTALLED AND MAINTAINED IN ACCORDANCE WITH THE MANUFACTURERS SPECIFICATIONS. THESE CONTROLS MUST REMAIN IN PLACE UNTIL THE DISTURBED AREAS HAVE BEEN PERMANENTLY STABILIZED.

6. 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 DISCOVERED. A GEOLOGIST'S ASSESSMENT OF THE LOCATION AND EXTENT OF THE FEATURE DISCOVERED MUST BE REPORTED TO THAT REGIONAL OFFICE IN WRITING AND 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.

7. SEWER LINES LOCATED WITHIN OR CROSSING THE 5-YEAR FLOODPLAIN OF A DRAINAGE WAY WILL BE PROTECTED FROM INUNDATION AND STREAM VELOCITIES WHICH COULD CAUSE EROSION AND SCOURING OF BACKFILL. THE TRENCH MUST BE CAPPED WITH CONCRETE TO PREVENT SCOURING OF BACKFILL, OR THE SEWER LINES MUST BE ENCASED IN CONCRETE. ALL CONCRETE SHALL HAVE A MINIMUM THICKNESS OF 6 INCHES.

8. BLASTING PROCEDURES FOR PROTECTION OF EXISTING SEWER LINES AND OTHER UTILITIES WILL BE IN ACCORDANCE WITH THE NATIONAL FIRE PROTECTION ASSOCIATION CRITERIA. SAND IS NOT ALLOWED AS BEDDING OR BACKFILL IN TRENCHES THAT HAVE BEEN BLASTED. IF ANY EXISTING SEWER LINES ARE DAMAGED, THE LINES MUST BE REPAIRED AND RETESTED.

9. ALL MANHOLES CONSTRUCTED OR REHABILITATED ON THIS PROJECT MUST HAVE WATERTIGHT SIZE ON SIZE RESILIENT CONNECTORS ALLOWING FOR DIFFERENTIAL SETTLEMENT. IF MANHOLES ARE CONSTRUCTED WITHIN THE 100-YEAR FLOODPLAIN, THE COVER MUST HAVE A GASKET AND BE BOLTED TO THE RING. WHERE GASKETED MANHOLE COVERS ARE REQUIRED FOR MORE THAN THREE MANHOLES IN SEQUENCE OR FOR MORE THAN 1500 FEET, ALTERNATE MEANS OF VENTING WILL BE PROVIDED. BRICKS ARE NOT AN ACCEPTABLE CONSTRUCTION MATERIAL FOR ANY PORTION OF THE MANHOLE.

   THE DIAMETER OF THE MANHOLES MUST BE A MINIMUM OF FOUR FEET AND THE MANHOLE FOR ENTRY MUST HAVE A MINIMUM CLEAR OPENING DIAMETER OF 30 INCHES. THESE DIMENSIONS AND OTHER DETAILS SHOWING COMPLIANCE WITH THE COMMISSION'S RULES CONCERNING MANHOLES AND SEWER LINE/MANHOLE INVERTS DESCRIBED IN 30 TAC §217.55 ARE INCLUDED ON PLAN SHEET N/A.

   IT IS SUGGESTED THAT ENTRANCE INTO MANHOLES IN EXCESS OF FOUR FEET DEEP BE ACCOMPLISHED BY MEANS OF A PORTABLE LADDER. THE INCLUSION OF STEPS IN A MANHOLE IS PROHIBITED.

10. WHERE WATER LINES AND NEW SEWER LINE ARE INSTALLED WITH A SEPARATION DISTANCE CLOSER THAN NINE FEET (I.E., WATER LINES CROSSING WASTEWATER LINES, WATER LINES PARALLELING WASTEWATER LINES, OR WATER LINES NEXT TO MANHOLES) THE INSTALLATION MUST MEET THE REQUIREMENTS OF 30 TAC §217.53(D) (PIPE DESIGN) AND 30 TAC §290.44(E) (WATER DISTRIBUTION).

11. WHERE SEWERS LINES DEVIATE FROM STRAIGHT ALIGNMENT AND UNIFORM GRADE ALL CURVATURE OF SEWER PIPE MUST BE ACHIEVED BY THE FOLLOWING PROCEDURE WHICH IS RECOMMENDED BY THE PIPE MANUFACTURER: PP 819 TN (PLASTICS PIPE BULLETIN).

    IF PIPE FLEXURE IS PROPOSED, THE FOLLOWING METHOD OF PREVENTING DEFLECTION OF THE JOINT MUST BE USED: ASTM D2657.

    SPECIFIC CARE MUST BE TAKEN TO ENSURE THAT THE JOINT IS PLACED IN THE CENTER OF THE TRENCH AND PROPERLY BEDDED IN ACCORDANCE WITH 30 TAC §217.54.

12. NEW SEWAGE COLLECTION SYSTEM LINES MUST BE CONSTRUCTED WITH STUB OUTS FOR THE CONNECTION OF ANTICIPATED EXTENSIONS. THE LOCATION OF SUCH STUB OUTS MUST BE MARKED ON THE GROUND SUCH THAT THEIR LOCATION CAN BE EASILY DETERMINED AT THE TIME OF CONNECTION OF THE EXTENSIONS. SUCH STUB OUTS MUST BE MANUFACTURED WYES OR TEES THAT ARE COMPATIBLE IN SIZE AND MATERIAL WITH BOTH THE SEWER LINE AND THE EXTENSION. AT THE TIME OF ORIGINAL CONSTRUCTION, NEW STUB-OUTS MUST BE CONSTRUCTED SUFFICIENTLY TO EXTEND BEYOND THE END OF THE STREET PAVEMENT. ALL STUB-OUTS MUST BE SEALED WITH A MANUFACTURED CAP TO PREVENT LEAKAGE. EXTENSIONS THAT WERE NOT ANTICIPATED AT THE TIME OF ORIGINAL CONSTRUCTION OR THAT ARE TO BE CONNECTED TO AN EXISTING SEWER LINE NOT FURNISHED WITH STUB OUTS MUST BE CONNECTED USING A MANUFACTURED SADDLE AND IN ACCORDANCE WITH ACCEPTED PLUMBING TECHNIQUES.

    IF NO STUB-OUT IS PRESENT AN ALTERNATE METHOD OF JOINING LATERALS IS SHOWN IN THE DETAIL ON PLAN SHEET N/A OF N/A, (FOR POTENTIAL FUTURE LATERALS). NOT USED. NO LATERALS SHALL BE CONNECTED TO THE LIFT STATION.

    THE PRIVATE SERVICE LATERAL STUB-OUTS MUST BE INSTALLED AS SHOWN ON THE PLAN AND PROFILE SHEETS ON PLAN SHEET N/A OF N/A AND MARKED AFTER BACKFILLING AS SHOWN IN THE DETAIL ON PLAN SHEET N/A OF N/A, NOT USED. NO STUBOUTS WILL BE INSTALLED FOR THE LIFT STATION.

13. TRENCHING, BEDDING AND BACKFILL MUST CONFORM WITH 30 TAC §217.54. THE BEDDING AND BACKFILL FOR FLEXIBLE PIPE MUST COMPLY WITH THE STANDARDS OF ASTM D-2321, CLASSES IA, IB, II OR III. RIGID PIPE BEDDING MUST COMPLY WITH THE REQUIREMENTS OF ASTM C 12 (ANSI A 106.2) CLASSES A, B OR C.

14. SEWER LINES MUST BE TESTED FROM MANHOLE TO MANHOLE. WHEN A NEW SEWER LINE IS CONNECTED TO AN EXISTING STUB OR CLEAN-OUT, IT MUST BE TESTED FROM EXISTING MANHOLE TO NEW MANHOLE. IF A STUB OR CLEAN-OUT IS USED AT THE END OF THE PROPOSED SEWER LINE, NO PRIVATE SERVICE ATTACHMENTS MAY BE CONNECTED BETWEEN THE LAST MANHOLE AND THE CLEANOUT UNLESS IT CAN BE CERTIFIED AS CONFORMING WITH THE PROVISIONS OF 30 TAC §213.5(C)(3)(E).

15. ALL SEWER LINES MUST BE TESTED IN ACCORDANCE WITH 30 TAC §217.57. THE ENGINEER MUST RETAIN COPIES OF ALL TEST RESULTS WHICH MUST BE MADE AVAILABLE TO THE EXECUTIVE DIRECTOR UPON REQUEST. THE ENGINEER MUST CERTIFY IN WRITING THAT ALL WASTEWATER LINES HAVE PASSED ALL REQUIRED TESTING TO THE APPROPRIATE REGIONAL OFFICE WITHIN 30 DAYS OF TEST COMPLETION AND PRIOR TO USE OF THE NEW COLLECTION SYSTEM. TESTING METHOD WILL BE:
    (a) FOR A COLLECTION SYSTEM PIPE THAT WILL TRANSPORT WASTEWATER BY GRAVITY FLOW, THE DESIGN MUST SPECIFY AN INFILTRATION AND EXFILTRATION TEST OR A LOW-PRESSURE AIR TEST. A TEST MUST CONFORM TO THE FOLLOWING REQUIREMENTS:
        (1) LOW PRESSURE AIR TEST.
            (A) A LOW PRESSURE AIR TEST MUST FOLLOW THE PROCEDURES DESCRIBED IN AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM) C-828, ASTM C-924, OR ASTM F-1417 OR OTHER PROCEDURE APPROVED BY THE EXECUTIVE DIRECTOR, EXCEPT AS TO TESTING TIMES AS REQUIRED IN TABLE C.3 IN SUBPARAGRAPH (C) OF THIS PARAGRAPH OR EQUATION C.3 IN SUBPARAGRAPH (B)(ii) OF THIS PARAGRAPH.
            (B) FOR SECTIONS OF COLLECTION SYSTEM PIPE LESS THAN 36 INCH AVERAGE INSIDE DIAMETER, THE FOLLOWING PROCEDURE MUST APPLY, UNLESS A PIPE IS TO BE TESTED AS REQUIRED BY PARAGRAPH (2) OF THIS SUBSECTION.
                (i) A PIPE MUST BE PRESSURIZED TO 3.5 POUNDS PER SQUARE INCH (PSI) GREATER THAN THE PRESSURE EXERTED BY GROUNDWATER ABOVE THE PIPE.
                (ii) ONCE THE PRESSURE IS STABILIZED, THE MINIMUM TIME ALLOWABLE FOR THE PRESSURE TO DROP FROM 3.5 PSI GAUGE TO 2.5 PSI GAUGE IS COMPUTED FROM THE FOLLOWING EQUATION:

EQUATION C.3

$$T = \frac{0.085 \times D \times K}{Q}$$

WHERE:
T = TIME FOR PRESSURE TO DROP 1.0 POUND PER SQUARE INCH GAUGE IN SECONDS
K = 0.000419 X D X L, BUT NOT LESS THAN 1.0
D = AVERAGE INSIDE PIPE DIAMETER IN INCHES
L = LENGTH OF LINE OF SAME SIZE BEING TESTED, IN FEET
Q = RATE OF LOSS, 0.0015 CUBIC FEET PER MINUTE PER SQUARE FOOT INTERNAL SURFACE

(C) SINCE A K VALUE OF LESS THAN 1.0 MAY NOT BE USED, THE MINIMUM TESTING TIME FOR EACH PIPE DIAMETER IS SHOWN IN THE FOLLOWING TABLE C.3:

PIPE DIAMETER (INCHES)	MINIMUM TIME (SECONDS)	MAXIMUM LENGTH FOR MINIMUM TIME (FEET)	TIME FOR LONGER LENGTH (SECONDS/FOOT)
6	340	398	0.855
8	454	298	1.520
10	567	239	2.374
12	680	199	3.419
15	850	159	5.342
18	1020	133	7.693
21	1190	114	10.471
24	1360	100	13.676
27	1530	88	17.309
30	1700	80	21.369
33	1870	72	25.856

(D) AN OWNER MAY STOP A TEST IF NO PRESSURE LOSS HAS OCCURRED DURING THE FIRST 25% OF THE CALCULATED TESTING TIME.
(E) IF ANY PRESSURE LOSS OR LEAKAGE HAS OCCURRED DURING THE FIRST 25% OF A TESTING PERIOD, THEN THE TEST MUST CONTINUE FOR THE ENTIRE TEST DURATION AS OUTLINED ABOVE OR UNTIL FAILURE.
(F) WASTEWATER COLLECTION SYSTEM PIPES WITH A 27 INCH OR LARGER AVERAGE INSIDE DIAMETER MAY BE AIR TESTED AT EACH JOINT INSTEAD OF FOLLOWING THE PROCEDURE OUTLINED IN THIS SECTION.
(G) A TESTING PROCEDURE FOR PIPE WITH AN INSIDE DIAMETER GREATER THAN 33 INCHES MUST BE APPROVED BY THE EXECUTIVE DIRECTOR.

(2) INFILTRATION/EXFILTRATION TEST.
(A) THE TOTAL EXFILTRATION, AS DETERMINED BY A HYDROSTATIC HEAD TEST, MUST NOT EXCEED 50 GALLONS PER INCH OF DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF 2.0 FEET ABOVE THE CROWN OF A PIPE AT AN UPSTREAM MANHOLE.
(B) AN OWNER SHALL USE AN INFILTRATION TEST IN LIEU OF AN EXFILTRATION TEST WHEN PIPES ARE INSTALLED BELOW THE GROUNDWATER LEVEL.
(C) THE TOTAL EXFILTRATION, AS DETERMINED BY A HYDROSTATIC HEAD TEST, MUST NOT EXCEED 50 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT A MINIMUM TEST HEAD OF TWO FEET ABOVE THE CROWN OF A PIPE AT AN UPSTREAM MANHOLE, OR AT LEAST TWO FEET ABOVE EXISTING GROUNDWATER LEVEL, WHICHEVER IS GREATER.
(D) FOR CONSTRUCTION WITHIN A 25-YEAR FLOOD PLAIN, THE INFILTRATION OR EXFILTRATION MUST NOT EXCEED 10 GALLONS PER INCH DIAMETER PER MILE OF PIPE PER 24 HOURS AT THE SAME MINIMUM TEST HEAD AS IN SUBPARAGRAPH (C) OF THIS PARAGRAPH.
(E) IF THE QUANTITY OF INFILTRATION OR EXFILTRATION EXCEEDS THE MAXIMUM QUANTITY SPECIFIED, AN OWNER SHALL UNDERTAKE REMEDIAL ACTION IN ORDER TO REDUCE THE INFILTRATION OR EXFILTRATION TO AN AMOUNT WITHIN THE LIMITS SPECIFIED. AN OWNER SHALL RETEST A PIPE FOLLOWING A REMEDIATION ACTION.

(b) IF A GRAVITY COLLECTION PIPE IS COMPOSED OF FLEXIBLE PIPE, DEFLECTION TESTING IS ALSO REQUIRED. THE FOLLOWING PROCEDURES MUST BE FOLLOWED:
(1) FOR A COLLECTION PIPE WITH INSIDE DIAMETER LESS THAN 27 INCHES, DEFLECTION MEASUREMENT REQUIRES A RIGID MANDREL.
(A) MANDREL SIZING.
(i) A RIGID MANDREL MUST HAVE AN OUTSIDE DIAMETER (OD) NOT LESS THAN 95% OF THE BASE INSIDE DIAMETER (ID) OR AVERAGE ID OF A PIPE, AS SPECIFIED IN THE APPROPRIATE STANDARD BY THE ASTMS, AMERICAN WATER WORKS ASSOCIATION, UNI-BELL, OR AMERICAN NATIONAL STANDARDS INSTITUTE, OR ANY RELATED APPENDIX.
(ii) IF A MANDREL SIZING DIAMETER IS NOT SPECIFIED IN THE APPROPRIATE STANDARD, THE MANDREL MUST HAVE AN OD EQUAL TO 95% OF THE ID OF A PIPE. IN THIS CASE, THE ID OF THE PIPE, FOR THE PURPOSE OF DETERMINING THE OD OF THE MANDREL, MUST EQUAL BE THE AVERAGE OUTSIDE DIAMETER MINUS TWO MINIMUM WALL THICKNESSES FOR OD CONTROLLED PIPE AND THE AVERAGE INSIDE DIAMETER FOR ID CONTROLLED PIPE.
(iii) ALL DIMENSIONS MUST MEET THE APPROPRIATE STANDARD.
(B) MANDREL DESIGN.
(i) A RIGID MANDREL MUST BE CONSTRUCTED OF A METAL OR A RIGID PLASTIC MATERIAL THAT CAN WITHSTAND 200 PSI WITHOUT BEING DEFORMED.
(ii) A MANDREL MUST HAVE NINE OR MORE ODD NUMBER OF RUNNERS OR LEGS.
(iii) A BARREL SECTION LENGTH MUST EQUAL AT LEAST 75% OF THE INSIDE DIAMETER OF A PIPE.
(iv) EACH SIZE MANDREL MUST USE A SEPARATE PROVING RING.
(C) METHOD OPTIONS.
(i) AN ADJUSTABLE OR FLEXIBLE MANDREL IS PROHIBITED.
(ii) A TEST MAY NOT USE TELEVISION INSPECTION AS A SUBSTITUTE FOR A DEFLECTION TEST.
(iii) IF REQUESTED, THE EXECUTIVE DIRECTOR MAY APPROVE THE USE OF A DEFLECTOMETER OR A MANDREL WITH REMOVABLE LEGS OR RUNNERS ON A CASE-BY-CASE BASIS.
(2) FOR A GRAVITY COLLECTION SYSTEM PIPE WITH AN INSIDE DIAMETER 27 INCHES AND GREATER, OTHER TEST METHODS MAY BE USED TO DETERMINE VERTICAL DEFLECTION.
(3) A DEFLECTION TEST METHOD MUST BE ACCURATE TO WITHIN PLUS OR MINUS 0.2% DEFLECTION.
(4) AN OWNER SHALL NOT CONDUCT A DEFLECTION TEST UNTIL AT LEAST 30 DAYS AFTER THE FINAL BACKFILL.
(5) GRAVITY COLLECTION SYSTEM PIPE DEFLECTION MUST NOT EXCEED FIVE PERCENT (5%).
(6) IF A PIPE SECTION FAILS A DEFLECTION TEST, AN OWNER SHALL CORRECT THE PROBLEM AND CONDUCT A SECOND TEST AFTER THE FINAL BACKFILL HAS BEEN IN PLACE AT LEAST 30 DAYS.

16. ALL MANHOLES MUST BE TESTED TO MEET OR EXCEED THE REQUIREMENTS OF 30 TAC §217.58.
(a) ALL MANHOLES MUST PASS A LEAKAGE TEST.
(b) AN OWNER SHALL TEST EACH MANHOLE (AFTER ASSEMBLY AND BACKFILLING) FOR LEAKAGE, SEPARATE AND INDEPENDENT OF THE COLLECTION SYSTEM PIPES, BY HYDROSTATIC EXFILTRATION TESTING, VACUUM TESTING, OR OTHER METHOD APPROVED BY THE EXECUTIVE DIRECTOR.
(1) HYDROSTATIC TESTING.
(A) THE MAXIMUM LEAKAGE FOR HYDROSTATIC TESTING OR ANY ALTERNATIVE TEST METHODS IS 0.025 GALLONS PER FOOT DIAMETER PER FOOT OF MANHOLE DEPTH PER HOUR.
(B) TO PERFORM A HYDROSTATIC EXFILTRATION TEST, AN OWNER SHALL SEAL ALL WASTEWATER PIPES COMING INTO A MANHOLE WITH AN INTERNAL PIPE PLUG, FILL THE MANHOLE WITH WATER, AND MAINTAIN THE TEST FOR AT LEAST ONE HOUR.
(C) A TEST FOR CONCRETE MANHOLES MAY USE A 24-HOUR WETTING PERIOD BEFORE TESTING TO ALLOW SATURATION OF THE CONCRETE.
(2) VACUUM TESTING.
(A) TO PERFORM A VACUUM TEST, AN OWNER SHALL PLUG ALL LIFT HOLES AND EXTERIOR JOINTS WITH A NON-SHRINK GROUT AND PLUG ALL PIPES ENTERING A MANHOLE.
(B) NO GROUT MUST BE PLACED IN HORIZONTAL JOINTS BEFORE TESTING.
(C) STUB-OUTS, MANHOLE BOOTS, AND PIPE PLUGS MUST BE SECURED TO PREVENT MOVEMENT WHILE A VACUUM IS DRAWN.
(D) AN OWNER SHALL USE A MINIMUM 60 INCH/LB TORQUE WRENCH TO TIGHTEN THE EXTERNAL CLAMPS THAT SECURE A TEST COVER TO THE TOP OF A MANHOLE.
(E) A TEST HEAD MUST BE PLACED AT THE INSIDE OF THE TOP OF A CONE SECTION, AND THE SEAL INFLATED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
(F) THERE MUST BE A VACUUM OF 10 INCHES OF MERCURY INSIDE A MANHOLE TO PERFORM A VALID TEST.
(G) A TEST DOES NOT BEGIN UNTIL AFTER THE VACUUM PUMP IS OFF.
(H) A MANHOLE PASSES THE TEST IF AFTER 2.0 MINUTES AND WITH ALL VALVES CLOSED, THE VACUUM IS AT LEAST 9.0 INCHES OF MERCURY.

17. ALL PRIVATE SERVICE LATERALS MUST BE INSPECTED AND CERTIFIED IN ACCORDANCE WITH 30 TAC §213.5(C)(3)(I). AFTER INSTALLATION OF AND, PRIOR TO COVERING AND CONNECTING A PRIVATE SERVICE LATERAL TO AN EXISTING ORGANIZED SEWAGE COLLECTION SYSTEM, A TEXAS LICENSED PROFESSIONAL ENGINEER, TEXAS REGISTERED SANITARIAN, OR APPROPRIATE CITY

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

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(q)

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
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PHONE (210) 490-3096
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NO.	REVISION	DATE

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

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
11/20/24

CORNERSTONE LIFT STATION #2 AND FORCE MAIN
SAN ANTONIO, TX
GENERAL NOTES

DEVELOPER'S NAME: BITTERBLUE, INC.
ADDRESS: 11 LYNN BATTS LANE, SUITE 100
CITY: SAN ANTONIO STATE: TX ZIP: 78218
PHONE# (210) 828-6131 FAX#
SAWS BLOCK MAP# TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE: 135 LF-6" SS, 4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS SAWS JOB NO. 23-3000

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C1.01

Date: Mar 18, 2024, 9:32am User ID: dloughlin
File: P:\129\34\00\Design\Civil\LSVON-12934x00.dwg

SEE SHEET C4.00

SEE SHEET C4.01

SEE SHEET C4.02

SEE SHEET C4.03

LIFT STATION SITE
SEE SHEET C2.01

PROPOSED M.H. "LS1"
SEE DETAIL SHEET C5.04/B
CONTRACTOR TO MAKE MH
FLUSH WITH PAVEMENT

8" S.S. – LINE "A"

16.00 SANITARY
SEWER EASEMENT

PROPOSED M.H. "A1"
(BY OTHERS)

PROPOSED M.H. "A2"
(BY OTHERS)

PROPOSED SANITARY SEWER
(BY OTHERS)

PROPOSED DUAL 6" FORCE MAIN
SEE SHEET C4.00 – C4.03

PROPOSED GAS
(BY OTHERS)

PROPOSED WATER
(BY OTHERS)

PROPOSED OFFSITE
SAWS PRV FACILITY

PROPOSED GAS
(BY OTHERS)

END FORCE MAIN TIE
INTO EXISTING SEWER

16' SANITARY
SEWER EASEMENT

EXISTING 8" SANITARY SEWER
LINE "B"
SAWS JOB NO. 20-1666

PROPOSED GAS
(BY OTHERS)

WARRIOR WAY
(36' PRIVATE STREET)

SHAVANO RANCH RD

CORNERSTONE WAY
(60' PRIVATE STREET)

100 YR FLOODPLAIN

SCALE: 1"= 100'
0' 100' 200' 300'

DEVELOPER'S NAME:	BITTERBLUE, INC.
ADDRESS:	11 LYNN BATTS LANE, SUITE 100
CITY: SAN ANTONIO	STATE: TX ZIP: 78218
PHONE#	(210) 828-6131 FAX#
SAWS BLOCK MAP#	TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE:	4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS	SAWS JOB NO. 23-3000

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
11/22/24

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
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CORNERSTONE LIFT STATION #2
AND FORCE MAIN
SAN ANTONIO, TX
OVERALL SITE PLAN

PLAT NO.	23-11800125
JOB NO.	12934-00
DATE	MARCH 2024
DESIGNER	JK
CHECKED	RM DRAWN RJ
SHEET	C2.00

Date: Mar 18, 2024, 9:34am User ID: dloughlin
File: P:\1293\34\00\Design\Civil\LS\0A-1293400.dwg

EDGE OF PAVEMENT (BY OTHERS)

PROPOSED WATER MAIN (BY OTHERS)

PROPOSED 8" SANITARY SEWER (BY OTHERS)

16.00' LF SANITARY SEWER EASEMENT

126°16'12"

PROPOSED M.H. "A1" (BY OTHERS)

PROPERTY LINE

C5.02 A — PROPOSED MOW STRIP

C5.02 A — 89 LF CHAIN-LINK FENCE W/ 3-STRAND BARBED WIRE W/ MOW STRIP FLUSH WITH PAVEMENT

C5.02 C — PROP EDGE OF ASPHALT PAVEMENT

EDGE OF PAVEMENT

PROPOSED MOW STRIP C5.02 A

124 LF CHAIN-LINK FENCE W/ 3-STRAND BARBED WIRE W/ MOW STRIP RAISED 4" ABOVE ADJACENT FINISHED GRADE C5.02 A

PROP EDGE OF ASPHALT PAVEMENT C5.02 C

CONCRETE PAD FOR ELECTRICAL CONTROL PANEL AND ROOF CANOPY (SEE STRUCTURAL AND ELECTRICAL SHEETS)

CONTRACTOR SHALL INSTALL 3/4" WATER SERVICE W/ HOSE BIB AND VACUUM BREAKER (CONTRACTOR SHALL PROVIDE FREEZE PROTECTION) C5.02 E

WET WELL JUNCTION BOXES

AERATOR BLOWER

PROPOSED M.H. "LS1" SEE DETAIL SHEET C5.04/B CONTRACTOR TO MAKE MH FLUSH WITH PAVEMENT

PROPOSED METER POLE

PROPOSED 8" SDR 26 GRAVITY MAIN SANITARY SEWER (SEE SHEET C3.00)

170°47'39"

PROPOSED 8" SDR 26 GRAVITY MAIN SANITARY SEWER (SEE SHEET C3.00)

ASPHALT PAVEMENT

8' DIAMETER WET WELL

WET WELL VENT

LIGHT POLE (SEE ELECTRICAL PLANS)

PROPOSED MOW STRIP C5.02 A

PROP EDGE OF ASPHALT PAVEMENT C5.02 C

89 LF CHAIN-LINK FENCE W/ 3-STRAND BARBED WIRE W/ MOW STRIP RAISED 4" ABOVE ADJACENT FINISHED GRADE C5.02 A

WET WELL CONCRETE PAD (SEE STRUCTURAL SHEETS)

SEE SHEET C5.00 FOR DISCHARGE AND HEADER PIPING DETAILS

LIGHT POLE (SEE ELECTRICAL PLANS)

GENERATOR PAD (SEE STRUCTURAL AND ELECTRICAL SHEETS)

C5.02 G — PROPOSED 3/4" METER W/ H-20 RATED METER BOX AND COVER

3/4" WATER SERVICE

PROPOSED MOW STRIP C5.02 A

59 LF CHAIN-LINK FENCE W/ 3-STRAND BARBED WIRE W/ MOW STRIP FLUSH WITH PAVEMENT C5.02 A

PROP EDGE OF ASPHALT PAVEMENT C5.02 C

C5.02 D — CONCRETE DRIVEWAY

3' PEDESTRIAN GATE

3'X7' CONC. SIDEWALK

16' WIDE DOUBLE SWING GATE C5.02 B

PROPOSED MOW STRIP C5.02 A

48 LF CHAIN-LINK FENCE W/ 3-STRAND BARBED WIRE W/ MOW STRIP FLUSH WITH PAVEMENT C5.02 A

PROP EDGE OF ASPHALT PAVEMENT C5.02 C

PROPERTY LINE

PROPERTY LINE

3/4" WATER SERVICE CONNECTION C5.02 E

3/4" WATER SERVICE

SSFM

SSFM

C5.02 D — CONCRETE DRIVEWAY

PROPOSED GAS MAIN (BY OTHERS)

PROPOSED WATER MAIN (BY OTHERS)

50' UTILITY AND LIFT STATION EASEMENT

PROPOSED DUAL 6" HDPE FORCE MAIN SANITARY SEWER (SEE SHEET C4.00-C4.03)

SCALE: 1"= 10'

0' 10' 20' 30'

DEVELOPER'S NAME:	BITTERBLUE, INC.
ADDRESS:	11 LYNN BATTS LANE, SUITE 100
CITY:	SAN ANTONIO STATE: TX ZIP: 78218
PHONE#	(210) 828-6131 FAX#
SAWS BLOCK MAP#	TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE:	135 LF-8" SS 4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS	SAWS JOB NO. 23-3000

NO. | REVISION | DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
11/22/24

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
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CORNERSTONE LIFT STATION #2 AND FORCE MAIN

SAN ANTONIO, TX

SITE PLAN

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C2.01

Date: Mar 18, 2024, 9:40am User ID: dloughlin
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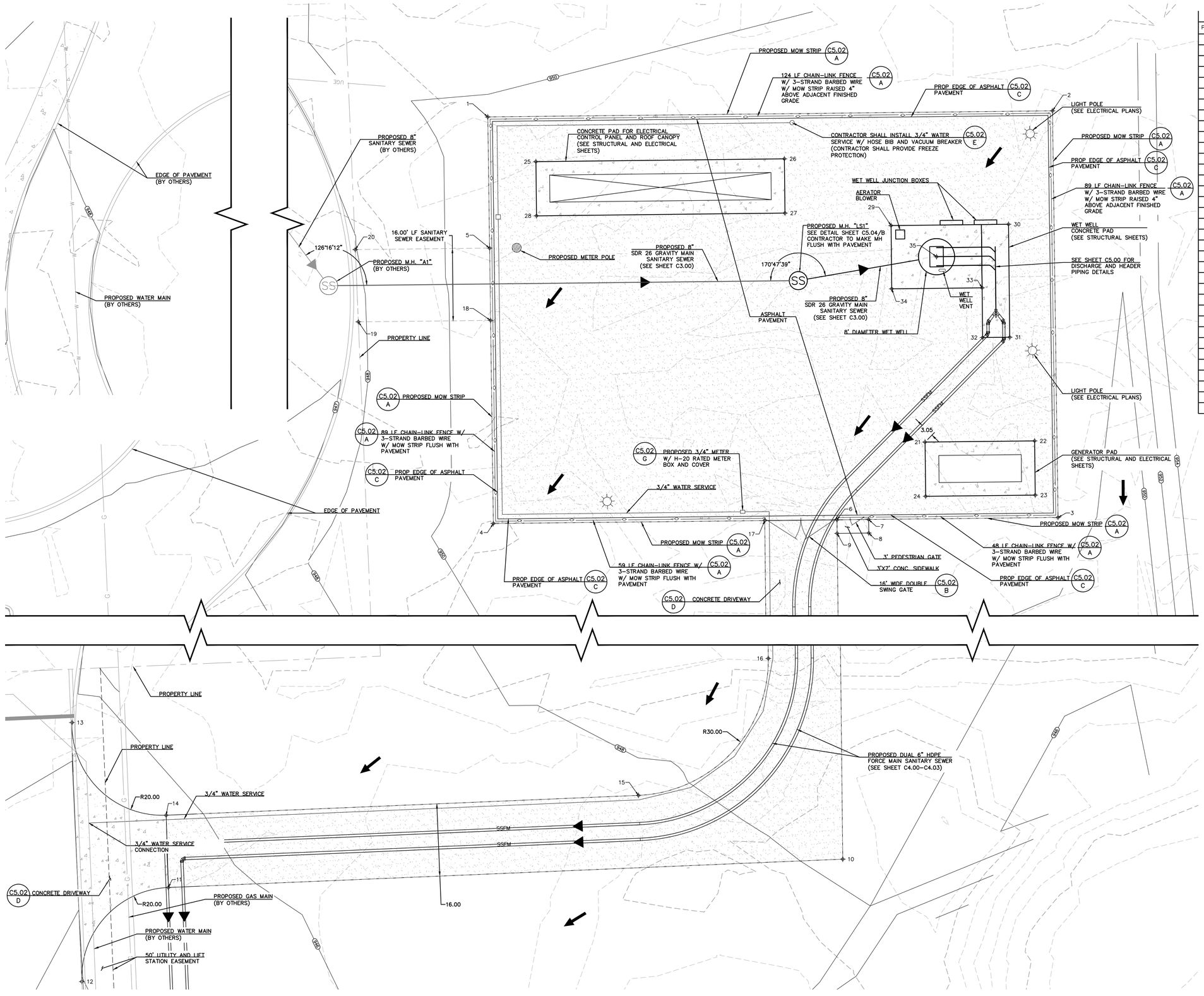

POINTS

POINT #	NORTHING	EASTING	ELEVATION	DESCRIPTION
1	13774364.84	2106975.39	951.00	MOW STRIP EDGE
2	13774366.18	2107100.38	951.00	MOW STRIP EDGE
3	13774276.19	2107101.61	951.00	MOW STRIP EDGE
4	13774274.85	2106976.62	951.00	MOW STRIP EDGE
5	13774335.80	2106975.79	951.00	MOW STRIP EDGE
6	13774275.67	2107052.69	951.00	DRIVEWAY
7	13774275.74	2107059.69	951.00	CONC. SIDEWALK
8	13774272.74	2107059.72	950.84	CONC. SIDEWALK
9	13774272.67	2107052.72	950.92	CONC. SIDEWALK
10	13774158.28	2107053.96	948.16	DRIVEWAY
11	13774152.00	2106904.69	945.68	DRIVEWAY FLARE
12	13774131.18	2106885.54	944.84	DRIVEWAY FLARE
13	13774188.51	2106883.37	945.43	DRIVEWAY FLARE
14	13774168.00	2106904.20	945.85	DRIVEWAY FLARE
15	13774172.39	2107008.74	947.74	DRIVEWAY
16	13774202.69	2107037.48	948.79	DRIVEWAY
17	13774275.49	2107036.69	951.00	DRIVEWAY
18	13774319.80	2106976.01	951.00	EASEMENT EDGE
19	13774319.49	2106946.74	947.81	EASEMENT EDGE
20	13774335.48	2106946.07	947.96	EASEMENT EDGE
21	13774292.88	2107072.18	952.00	GENERATOR PAD
22	13774293.14	2107096.43	952.00	GENERATOR PAD
23	13774281.14	2107096.56	952.00	GENERATOR PAD
24	13774280.88	2107072.31	952.00	GENERATOR PAD
25	13774354.94	2106986.04	0.00	ELEC. CONTROL PANEL PAD
26	13774355.56	2107041.04	0.00	ELEC. CONTROL PANEL PAD
27	13774343.56	2107041.17	0.00	ELEC. CONTROL PANEL PAD
28	13774342.95	2106986.17	0.00	ELEC. CONTROL PANEL PAD
29	13774340.80	2107064.66	951.50	LIFT STATION PAD
30	13774341.08	2107090.65	951.50	LIFT STATION PAD
31	13774316.08	2107090.92	0.00	LIFT STATION PAD
32	13774316.01	2107084.92	0.00	LIFT STATION PAD
33	13774327.01	2107084.81	951.50	LIFT STATION PAD
34	13774326.80	2107064.81	951.50	LIFT STATION PAD
35	13774333.91	2107074.73	951.50	CENTER OF WET WELL

DEVELOPER'S NAME: BITTERBLUE, INC.
ADDRESS: 11 LYNN BATTS LANE, SUITE 100
CITY: SAN ANTONIO STATE: TX ZIP: 78218
PHONE# (210) 828-6131 FAX#
SAWS BLOCK MAP# TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE: 135 LF-8" SS, 4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS SAWS JOB NO. 23-3000

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
11/22/24

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

CORNERSTONE LIFT STATION #2 AND FORCE MAIN
SAN ANTONIO, TX

DIMENSIONAL CONTROL PLAN

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C2.02

Date: Mar 18, 2024, 9:40am User ID: dloughlin
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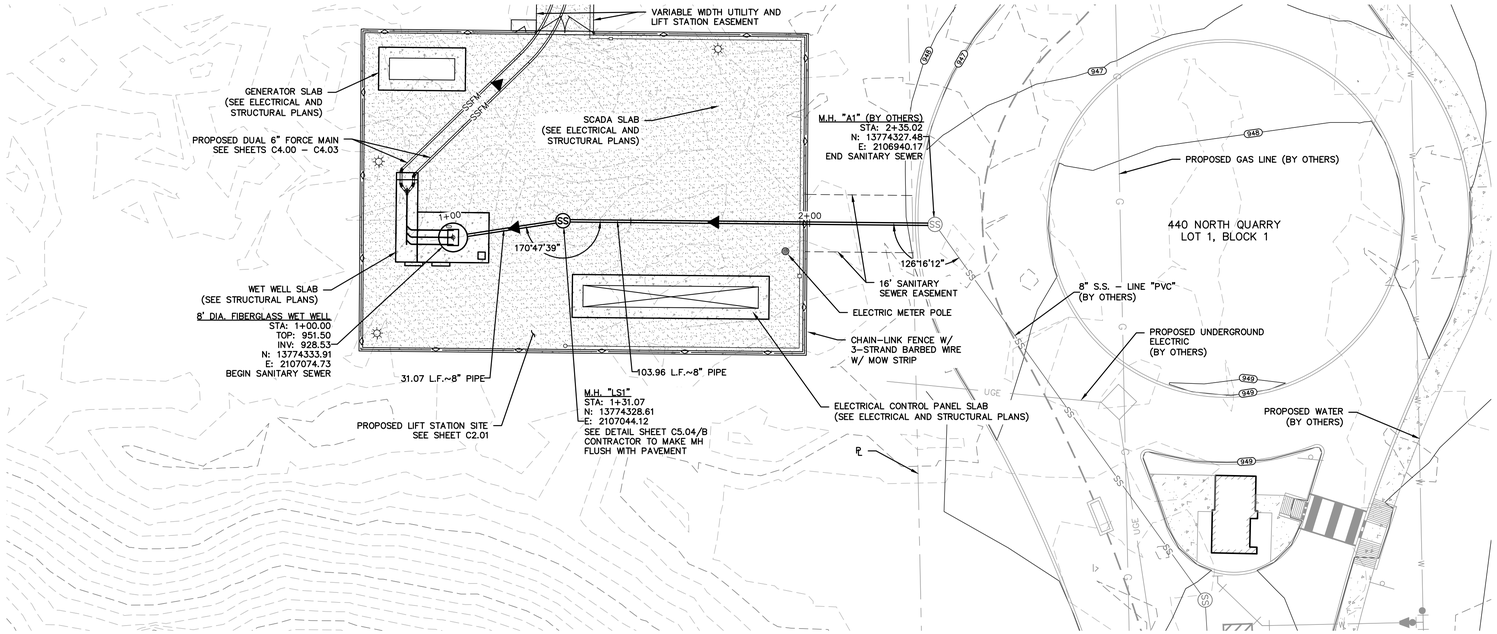
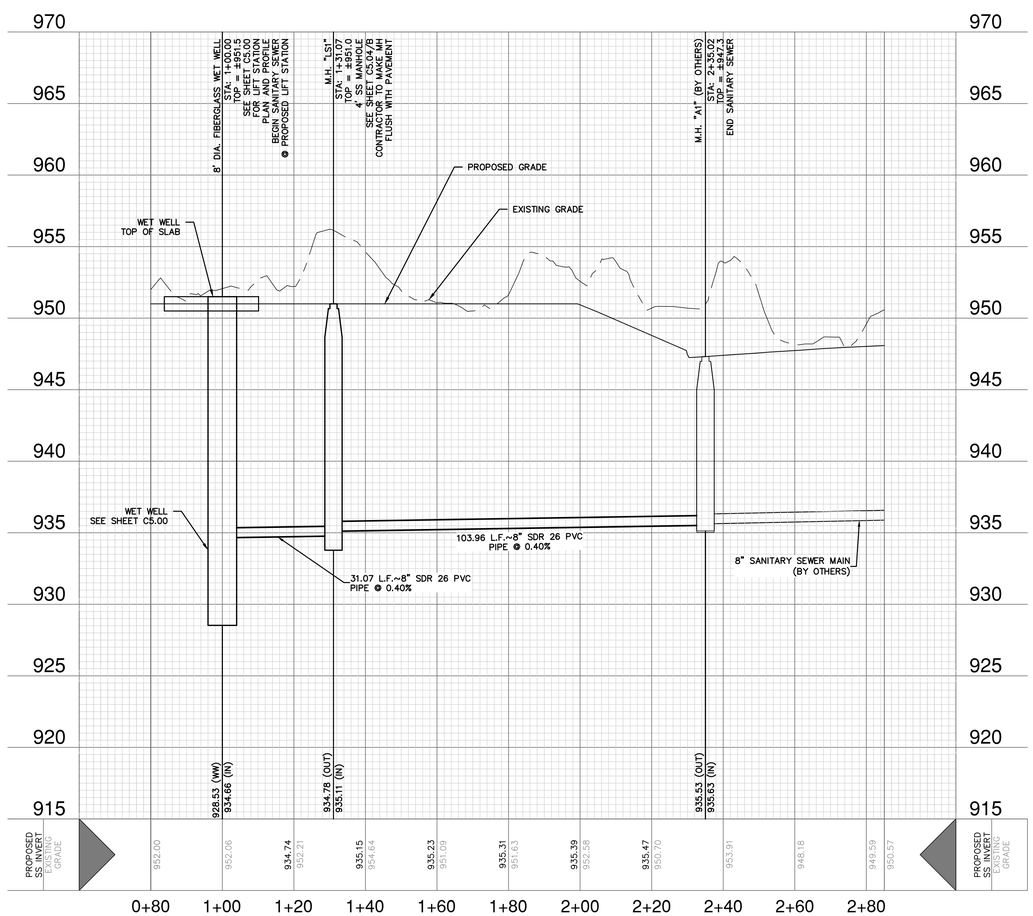
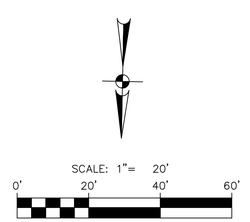


LEGEND

- PROPOSED GRAVITY MAIN
- PROPOSED FORCE MAIN
- PROPOSED GRAVITY MAIN (BY OTHERS)
- ASPHALT PAVEMENT
- CONCRETE PAD
- FENCE
- PROPOSED LIGHT POLE
- PROPOSED ELECTRIC METER POLE
- PROPERTY LINE
- PROPOSED EASEMENT LINE





DEVELOPER'S NAME: BITTERBLUE, INC.	
ADDRESS: 11 LYNN BATTS LANE, SUITE 100	
CITY: SAN ANTONIO	STATE: TX ZIP: 78218
PHONE# (210) 828-6131	FAX#
SAWS BLOCK MAP#	TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE: 135 LF-8" SS 4,502 LF-8" FM	PLAT NO. 23-11800125
NUMBER OF LOTS	SAWS JOB NO. 23-3000

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CORNERSTONE LIFT STATION #2 AND FORCE MAIN

SAN ANTONIO, TX

LIFT STATION GRAVITY MAIN

PLAT NO.	23-11800125
JOB NO.	12934-00
DATE	MARCH 2024
DESIGNER	JK
CHECKED	RM
DRAWN	RJ
SHEET	C3.00

Date: Mar 18, 2024, 9:44am User ID: dloughlin
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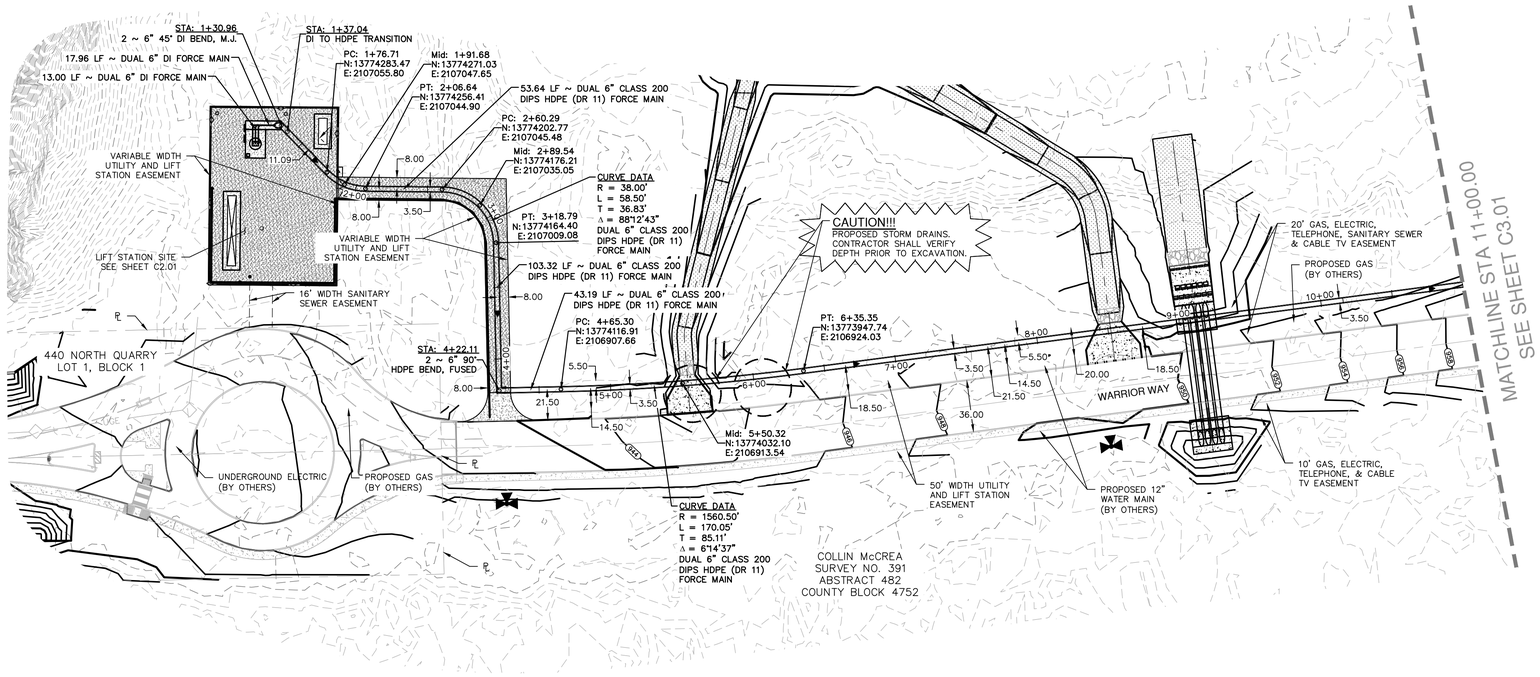

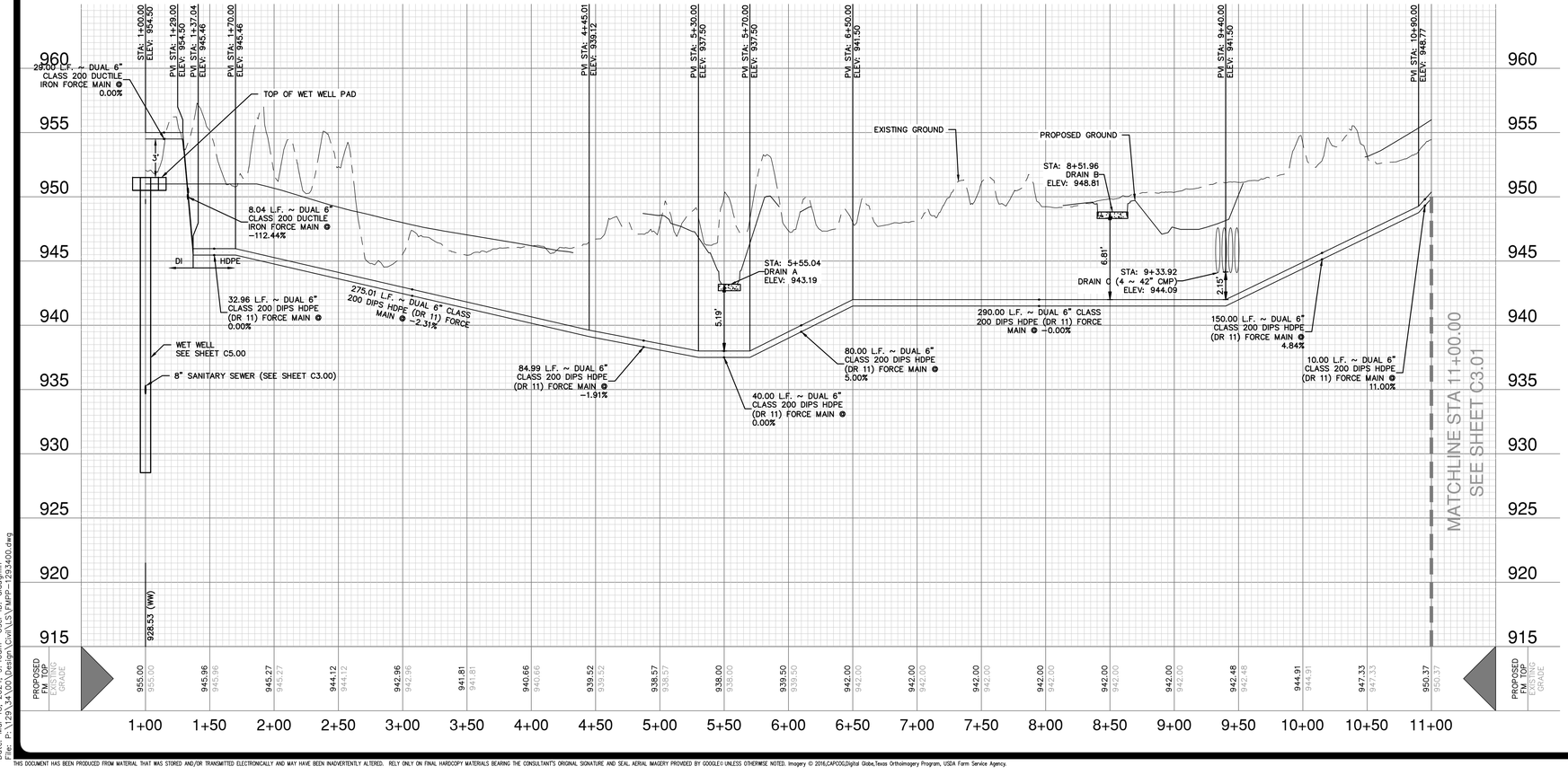

LEGEND

- PROPOSED GRAVITY MAIN
- PROPOSED FORCE MAIN — SSFM
- ASPHALT PAVEMENT
- CONCRETE PAD
- FENCE
- PROPOSED LIGHT POLE
- PROPOSED ELECTRIC METER POLE
- PROPOSED GRAVITY MAIN
- PROPERTY LINE
- PROPOSED EASEMENT LINE

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

DEVELOPER'S NAME:	BITTERBLUE, INC.
ADDRESS:	11 LYNN BATTS LANE, SUITE 100
CITY:	SAN ANTONIO STATE: TX ZIP: 78218
PHONE#	(210) 828-6131 FAX#
SAWS BLOCK MAP#	TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE:	150 LF-8" SS 4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS	SAWS JOB NO. 23-3000

DATE | NO. | REVISION

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CORNERSTONE LIFT STATION #2 AND FORCE MAIN

SAN ANTONIO, TX

FORCE MAIN PLAN AND PROFILE STA 1+00.00 TO 11+00.00

PLAT NO.	23-11800125
JOB NO.	12934-00
DATE	MARCH 2024
DESIGNER	JK
CHECKED	RM DRAWN RJ
SHEET	C4.00

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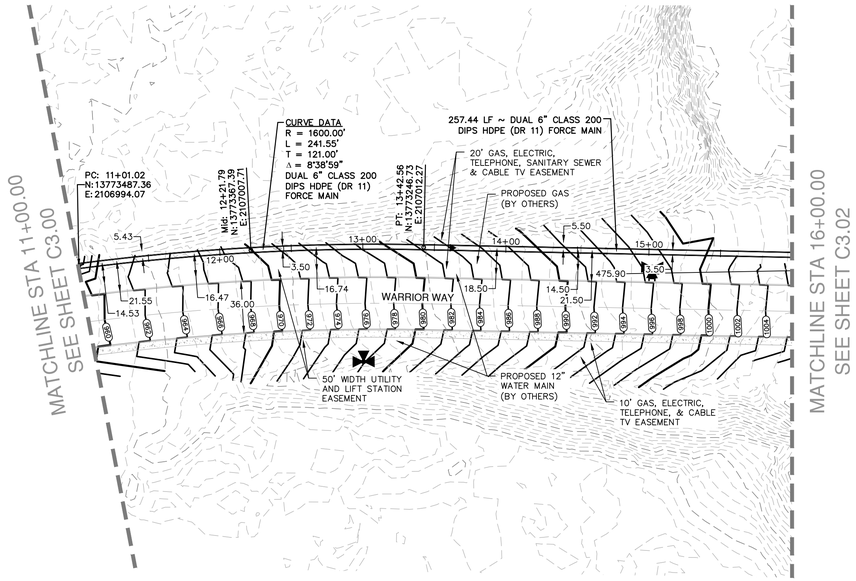

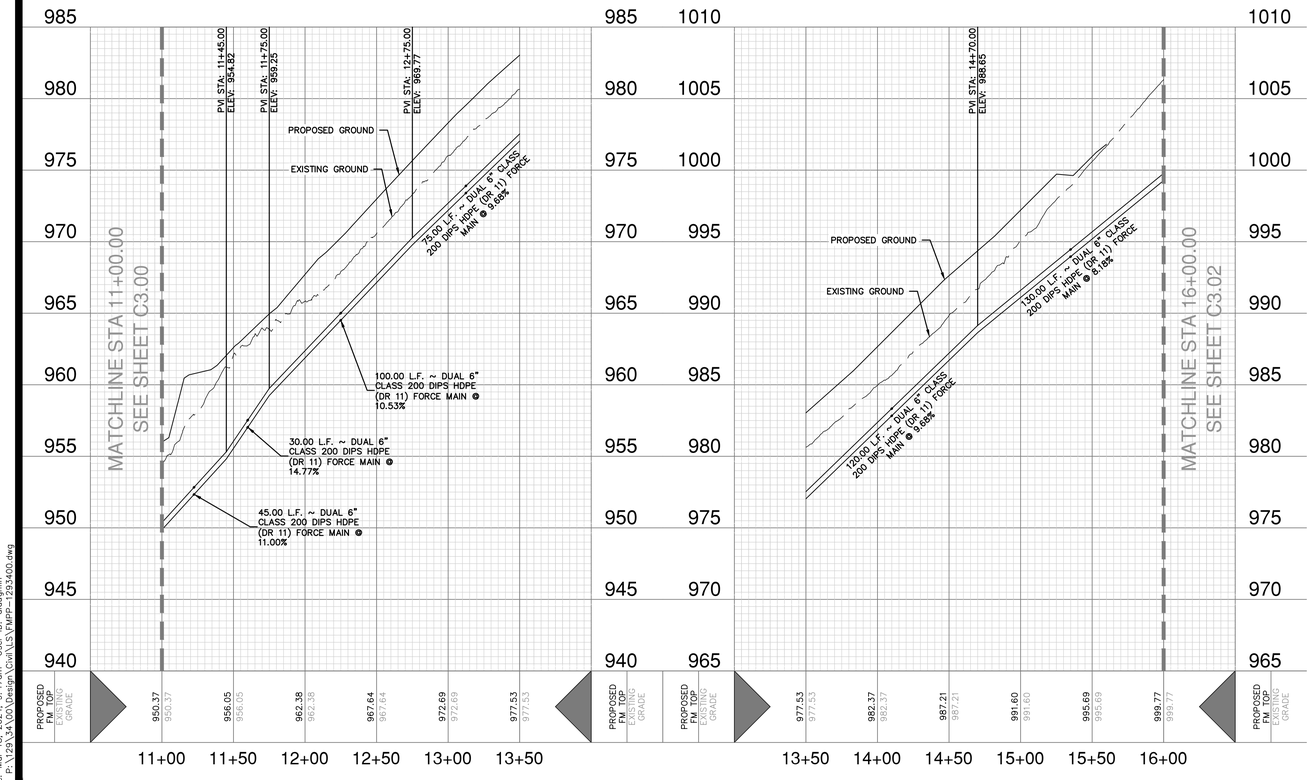

LEGEND

- PROPOSED GRAVITY MAIN (MANHOLE)
- PROPOSED FORCE MAIN (SSFM)
- ASPHALT PAVEMENT
- CONCRETE PAD
- FENCE
- PROPOSED LIGHT POLE
- PROPOSED ELECTRIC METER POLE
- PROPOSED GRAVITY MAIN
- PROPERTY LINE
- PROPOSED EASEMENT LINE

SCALE: 1"= 50'

0' 50' 100' 150'

NO.	REVISION	DATE

KIM KEEFER 117744 LICENSED PROFESSIONAL ENGINEER
11/22/24

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
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CORNERSTONE LIFT STATION #2 AND FORCE MAIN

SAN ANTONIO, TX

FORCE MAIN PLAN AND PROFILE STA 11+00.00 TO 16+00.00

DEVELOPER'S NAME: BITTERBLUE, INC.
ADDRESS: 11 LYNN BATTS LANE, SUITE 100
CITY: SAN ANTONIO STATE: TX ZIP: 78218
PHONE# (210) 828-6131 FAX#
SAWS BLOCK MAP# TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE: 135 LF-8" SS, 4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS SAWS JOB NO. 23-3000

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C4.01

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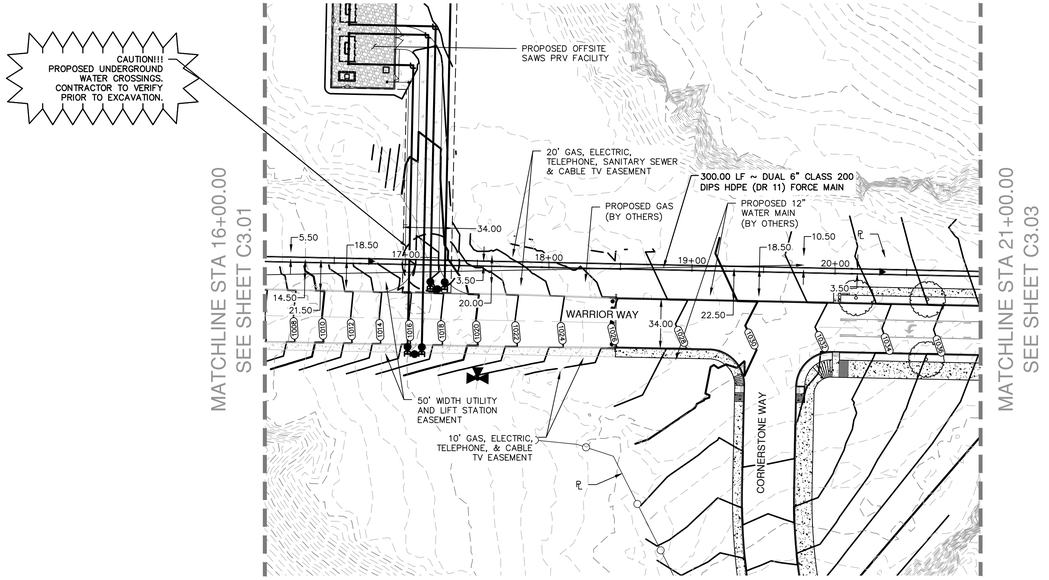

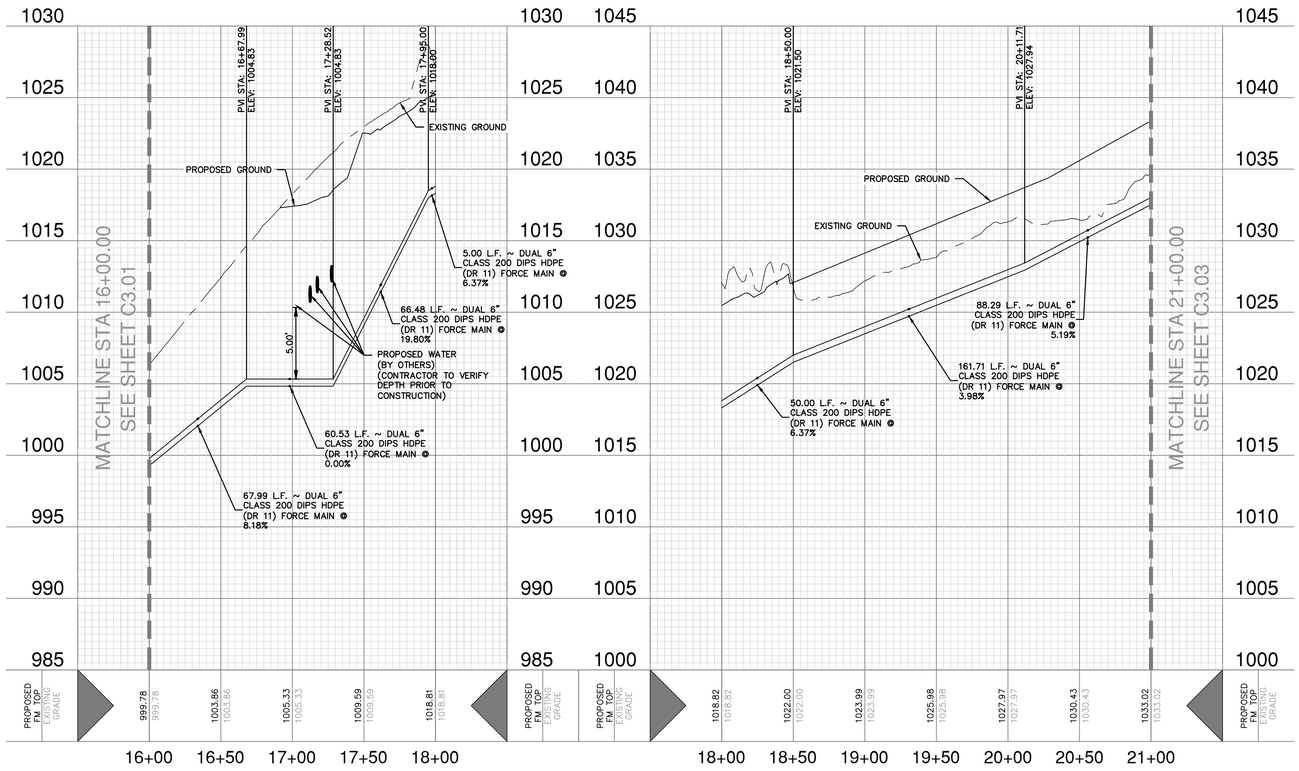

LEGEND

- PROPOSED GRAVITY MAIN (MANHOLE)
- PROPOSED FORCE MAIN (SSFM)
- ASPHALT PAVEMENT
- CONCRETE PAD
- FENCE
- PROPOSED LIGHT POLE
- PROPOSED ELECTRIC METER POLE
- PROPOSED GRAVITY MAIN
- PROPERTY LINE
- PROPOSED EASEMENT LINE

SCALE: 1"= 50'

0' 50' 100' 150'

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
11/22/24

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
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

CORNERSTONE LIFT STATION #2 AND FORCE MAIN

SAN ANTONIO, TX

FORCE MAIN PLAN AND PROFILE STA 16+00.00 TO 21+00.00

DEVELOPER'S NAME: BITTERBLUE, INC.
ADDRESS: 11 LYNN BATTS LANE, SUITE 100
CITY: SAN ANTONIO STATE: TX ZIP: 78218
PHONE# (210) 828-6131 FAX#
SAWS BLOCK MAP# TOTAL EDU'S 425 TOTAL ACREAGE 174
TOTAL LINEAR FOOTAGE OF PIPE: 135 LF-8" SS, 4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS SAWS JOB NO. 23-3000

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C4.02

Date: Mar 18, 2024, 9:47am User ID: dloughlin
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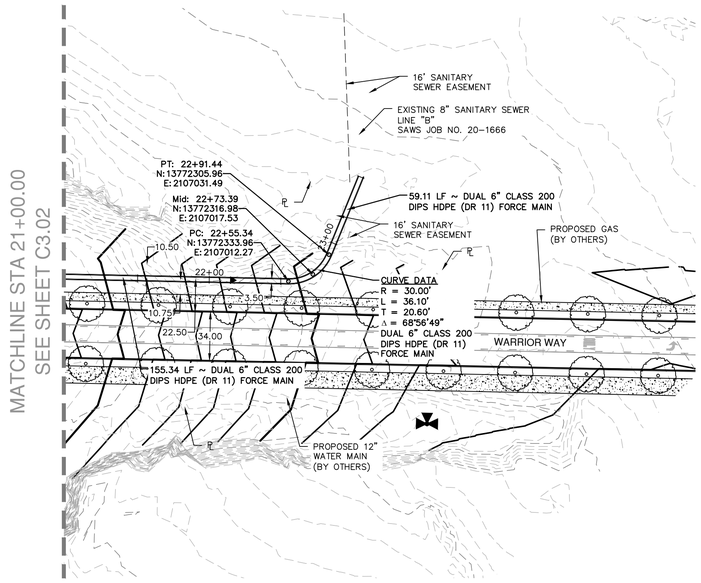

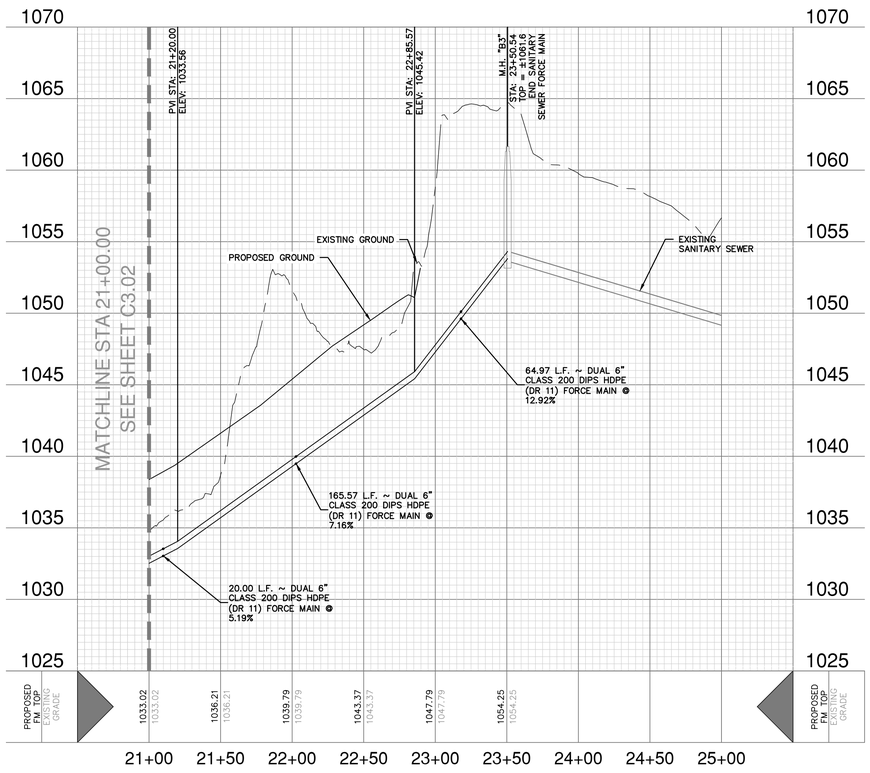

LEGEND

- PROPOSED GRAVITY MAIN (MANHOLE)
- PROPOSED FORCE MAIN (SSFM)
- ASPHALT PAVEMENT
- CONCRETE PAD
- FENCE
- PROPOSED LIGHT POLE
- PROPOSED ELECTRIC METER POLE
- PROPOSED GRAVITY MAIN
- PROPERTY LINE
- PROPOSED EASEMENT LINE

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

DEVELOPER'S NAME: BITTERBLUE, INC.
ADDRESS: 11 LYNN BATTS LANE, SUITE 100
CITY: SAN ANTONIO STATE: TX ZIP: 78218
PHONE# (210) 828-6131 FAX#
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TOTAL LINEAR FOOTAGE OF PIPE: 135 LF-6" SS, 4,502 LF-6" FM PLAT NO. 23-11800125
NUMBER OF LOTS SAWS JOB NO. 23-3000

NO.	REVISION	DATE

STATE OF TEXAS
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PAPE-DAWSON ENGINEERS
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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

CORNERSTONE LIFT STATION #2
AND FORCE MAIN
SAN ANTONIO, TX
FORCE MAIN PLAN AND PROFILE STA 21+00.00 TO 23+86.96

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C4.03

Date: Mar 18, 2024, 9:47am User ID: ahaghlin
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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.

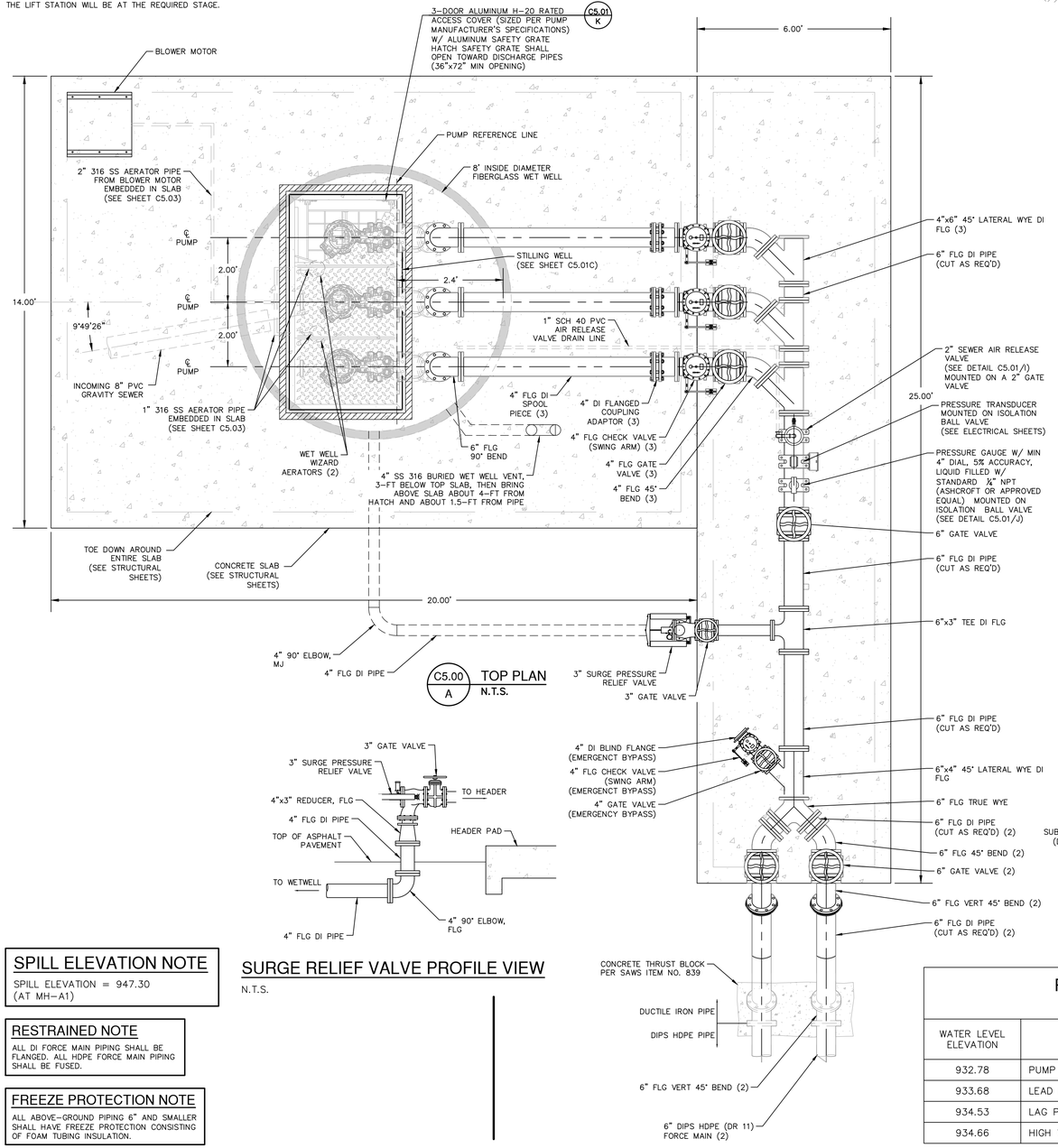
WORK SHALL NOT CONTINUE ON THE LIFT STATION UNTIL THE ENGINEER AND SAWS HAVE HAD AN OPPORTUNITY TO OBSERVE THE STATUS OF CONSTRUCTION AT EACH STAGE. THE CONTRACTOR SHALL PROVIDE THE ENGINEER AND SAWS 48 HOURS ADVANCED NOTICE PRIOR TO THE TIME THAT THE LIFT STATION WILL BE AT THE REQUIRED STAGE.

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(c) (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

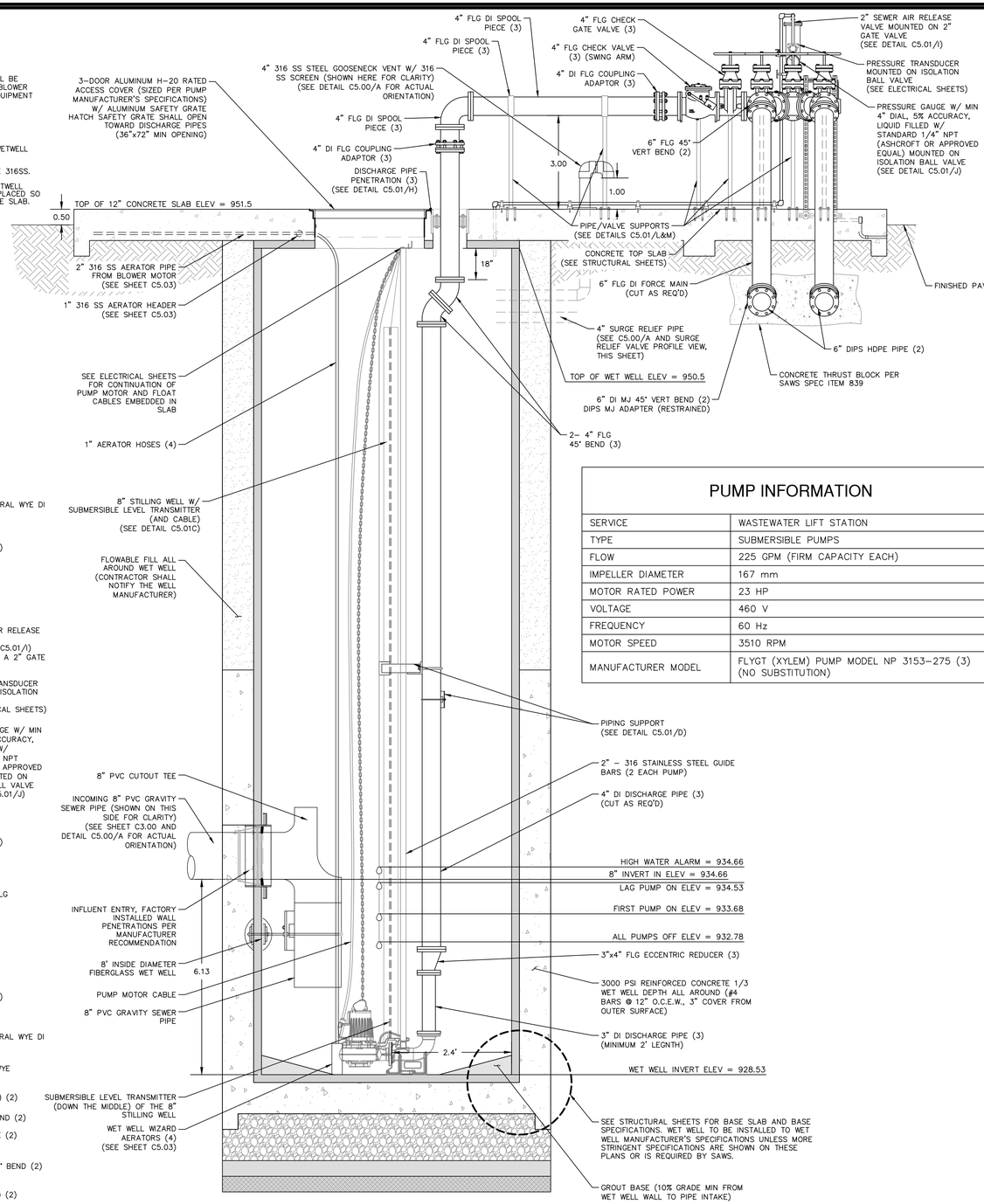
1. BLOWER MOTOR, AIR EJECTORS(2), AND AIR SUPPLY HOSES SHALL BE SUPPLIED BY RELIANT WATER TECHNOLOGIES (504-400-1239). BLOWER MOTOR, AIR EJECTORS(2), AIR SUPPLY HOSES, AN ALL OTHER EQUIPMENT SHALL BE INSTALLED PER RELIANT WATER TECHNOLOGIES RECOMMENDATIONS.
2. BLOWER MOTOR SHALL BE FPZ MODEL R20-MD, 1.5 HP, 60 HZ, 460/230-208 VAC.
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 **TOP PLAN** N.T.S.

SURGE RELIEF VALVE PROFILE VIEW

N.T.S.



C5.00 B **WET WELL PROFILE** N.T.S.

PUMP INFORMATION

SERVICE	WASTEWATER LIFT STATION
TYPE	SUBMERSIBLE PUMPS
FLOW	225 GPM (FIRM CAPACITY EACH)
IMPELLER DIAMETER	167 mm
MOTOR RATED POWER	23 HP
VOLTAGE	460 V
FREQUENCY	60 Hz
MOTOR SPEED	3510 RPM
MANUFACTURER MODEL	FLYGT (XYLEM) PUMP MODEL NP 3153-275 (3) (NO SUBSTITUTION)

SPILL ELEVATION NOTE

SPILL ELEVATION = 947.30 (AT MH-A1)

RESTRAINED NOTE

ALL DI FORCE MAIN PIPING SHALL BE FLANGED. ALL HDPE FORCE MAIN PIPING SHALL BE FUSED.

FREEZE PROTECTION NOTE

ALL ABOVE-GROUND PIPING 6" AND SMALLER SHALL HAVE FREEZE PROTECTION CONSISTING OF FOAM TUBING INSULATION.

RISING LEVEL CYCLE

(TOP OF PUMPS = ±976.93)

WATER LEVEL ELEVATION	ACTION	PUMP(S) IN OPERATION
932.78	PUMP OFF LEVEL	ALL PUMPS ARE OFF
933.68	LEAD PUMP LEVEL	LEAD PUMPS ON
934.53	LAG PUMP LEVEL	LEAD & LAG PUMP ON
934.66	HIGH WATER ALARM LEVEL	HIGH WATER ALARM SOUND

FALLING LEVEL CYCLE

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

NO.	REVISION	DATE

STATE OF TEXAS · KIM KEEFER · 117744 · LICENSED · PROFESSIONAL ENGINEER · 11/20/24

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

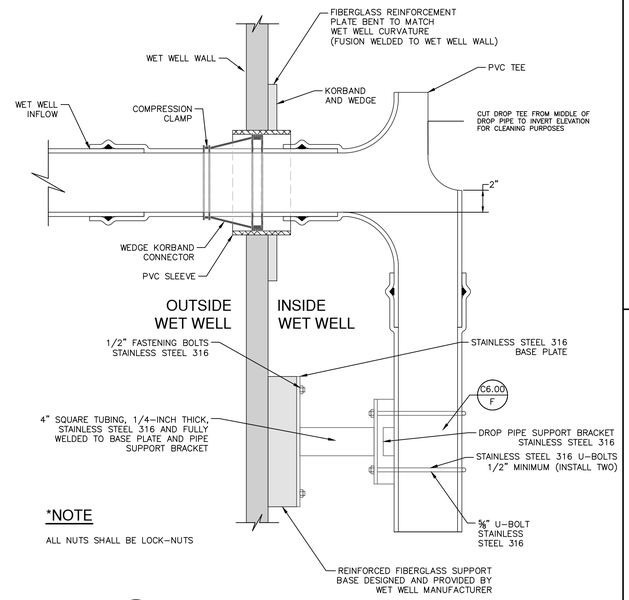
CORNERSTONE LIFT STATION #2 AND FORCE MAIN

SAN ANTONIO, TX

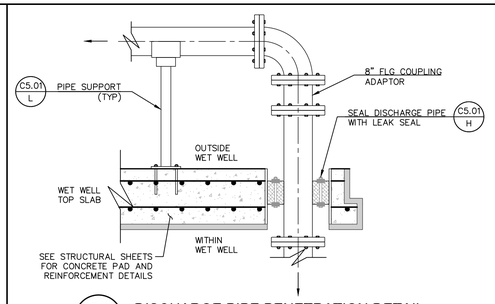
LIFT STATION PLAN AND PROFILE VIEWS

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C5.00

Date: Mar 18, 2024, 9:48am User ID: dloughlin
File: P:\1293\34\00\Design\Civil\LS\DTPP-1293400.dwg



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



C5.01 B — DISCHARGE PIPE PENETRATION DETAIL
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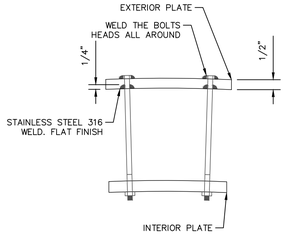

C5.01 E — PLATES DETAIL
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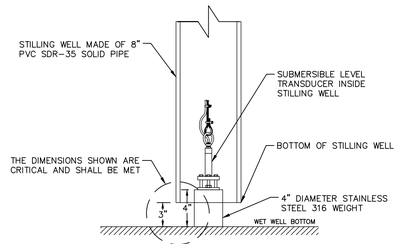

C5.01 C — SUBMERSIBLE LEVEL TRANSDUCER INSTALLATION
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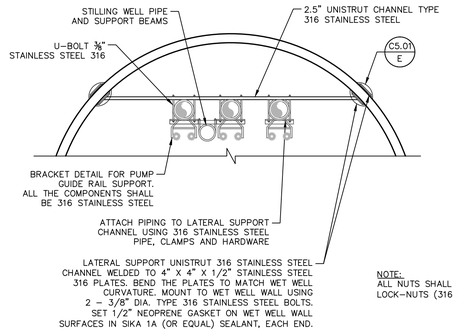
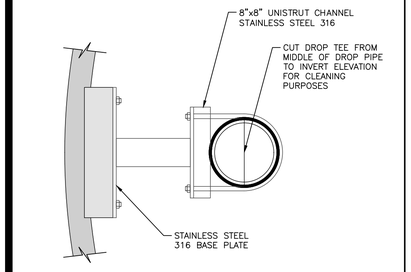
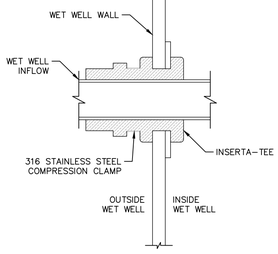


C5.01 D — WET WELL PIPING SUPPORT DETAIL
N.T.S.



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



C5.01 G — INSERTA-TEE DETAIL
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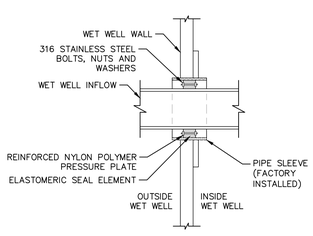

C5.01 H — LINK SEAL DETAIL
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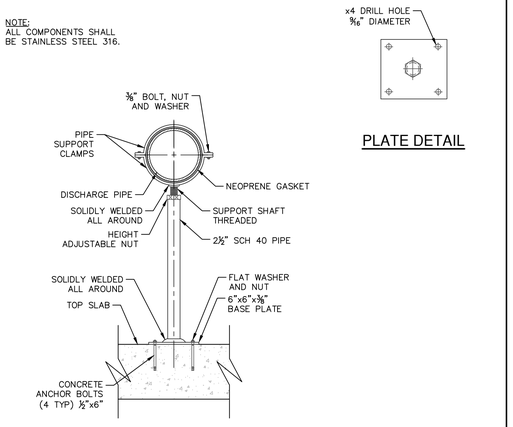

C5.01 L — PIPE SUPPORT DETAIL
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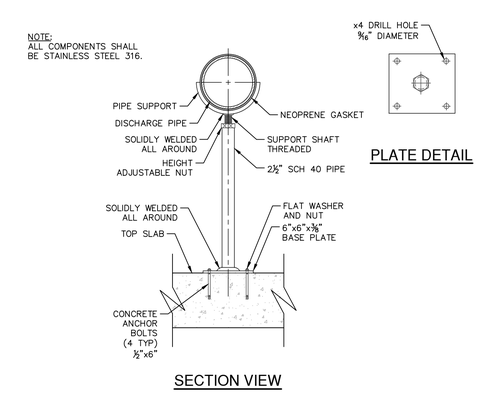

C5.01 M — VALVE SUPPORT DETAIL
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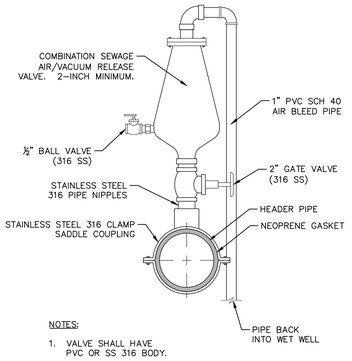
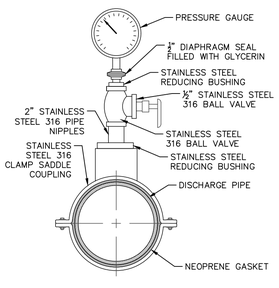
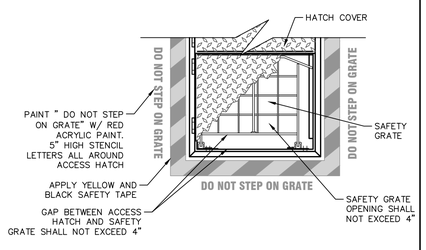


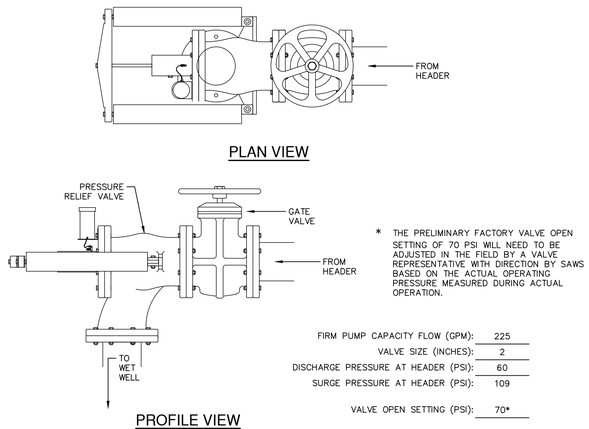
C5.01 I — AIR\VACUUM RELEASE VALVE INSTALLATION DETAIL
N.T.S.



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



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



C5.01 N — 3" SURGE PRESSURE RELIEF VALVE MOUNTING DETAIL
N.T.S.

NO.	REVISION	DATE

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
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

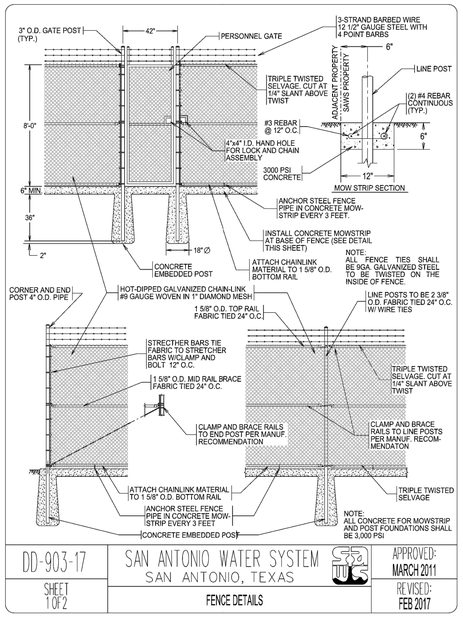
STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
11/22/24

CORNERSTONE LIFT STATION #2
AND FORCE MAIN
SAN ANTONIO, TX

LIFT STATION DETAILS I

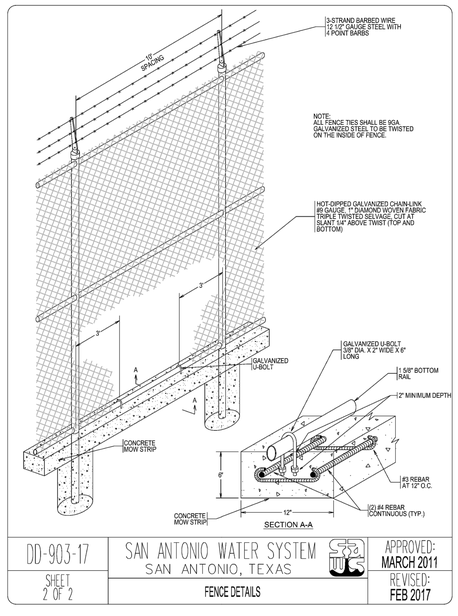
PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C5.01

Date: Mar 18, 2024, 9:48am User ID: oloughlin
File: P:\129\34\03\Design\Civil\LS\DT-12934-00.dwg



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

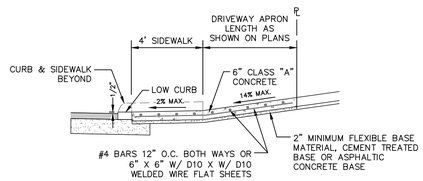
C5.02 A — FENCE DETAILS
N.T.S.



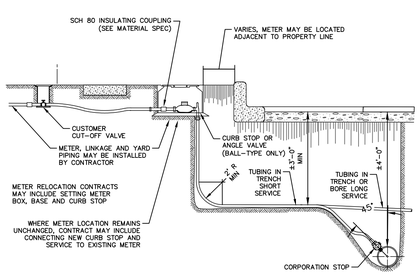
DD-903-17	SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	APPROVED: MARCH 2011
SHEET 2 OF 2	FENCE DETAILS	REVISED: FEB 2017

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.

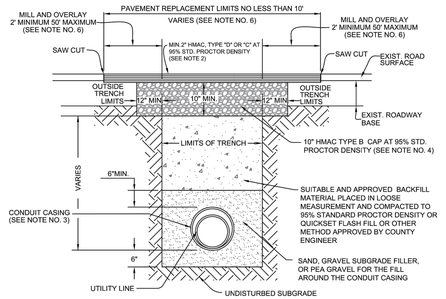
NOTE
IF THE SUBGRADE HAS A PLASTICITY INDEX OF 20 OR LESS, LIME STABILIZATION IS NOT REQUIRED. HOWEVER THE SUBGRADE SHALL BE COMPACTED TO 95% OF THE STANDARD PROCTOR (ASTM D-698). THE SUBGRADE SHALL BE MOISTURE CONDITIONED TO THE OPTIMUM MOISTURE CONTENT (MINIMUM) TO +4%



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



C5.02 E — 3/4" WATER SERVICE
N.T.S.



NOTES:

1. ALL UTILITIES WILL BE BORED UNDER EXISTING PAVEMENT. ONLY AT THOSE LOCATIONS AT WHICH IT IS PHYSICALLY IMPOSSIBLE TO BORE WILL THE PAVEMENT BE ALLOWED TO BE CUT AND RESTORED ACCORDING TO THIS DETAIL.

2. THE TYPE OF THE PAVEMENT REPLACEMENT WILL BE DETERMINED AT THE TIME A PERMIT IS REVIEWED AND MUST BE SAW CUT STRAIGHT. TACK OIL AT A RATE OF 0.10 GAL/SY SHALL BE PLACED PRIOR TO PLACEMENT OF 2 INCHES HMAC TYPE "C" OR "D" FINISHED SURFACE. LONGITUDINAL ROADWAY CUTS WILL BE PAVED WITH THE CLOSEST LINE EXTENSION OF THE EXISTING PAVEMENT EDGE AS A MINIMUM. IF EXISTING ROAD SURFACE IS CHIP SEAL, 2 INCHES OF HMAC TYPE "C" WILL BE PLACED PRIOR TO APPLICATION OF FINAL CHIP SEAL COURSE.

3. CONDUIT CASING TO BE PROVIDED AND INSTALLED BY UTILITY COMPANY FOR ALL UTILITIES, EXCEPT FOR SANITARY SEWER GRAVITY LINES AND NATURAL GAS SERVICE LINES. MATERIAL TO BE USED SHALL BE DUCTILE IRON (FOR DEPTH LESS THAN OR EQUAL TO 36 INCHES),SCHEDULE 40 PVC PIPE (GREATER THAN 36 INCHES DEEP), OR APPROVED EQUAL BY COUNTY ENGINEER. THE CONDUIT CASING SHALL EXTEND A MINIMUM OF FIVE FEET OUTSIDE THE EDGE OF SHOULDER OR CURBING DEPENDING ON FUTURE EXPANSION OF STREET WIDTH.

4. A 10" THICKNESS OF HMAC TYPE "B", BENCHED NO LESS THAN 1 FOOT EACH SIDE OF TRENCH, WILL BE USED FOR THE FINAL LIFT OF THE TRENCH REPAIR. THE TYPE "B" ASPHALT, PLACED IN 5 INCH LIFTS, SHALL BE BROUGHT UP TO WITHIN 2 INCHES OF THE EXISTING PAVEMENT SURFACE.

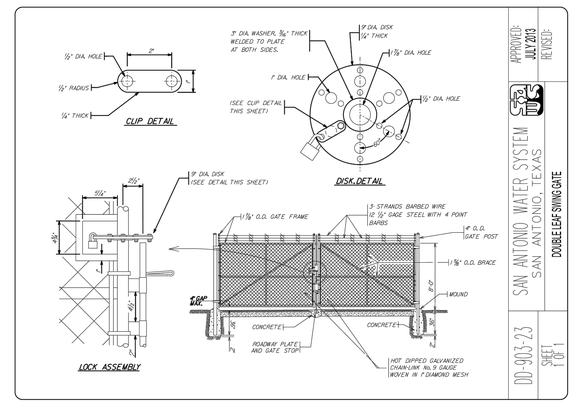
5. THE UTILITY COMPANY OR CONTRACTOR WILL BE RESPONSIBLE FOR THE MAINTENANCE OF OF THE STREET CUT THEREAFTER UNTIL AND IF THE COUNTY REMOVES THE STREET CUT THROUGH RECONSTRUCTION.

6. PAVEMENT REPLACEMENT LIMITS WILL BE DETERMINED AT THE TIME OF PERMIT REVIEW OR INSPECTION. WHERE EXISTING SURFACE IS ASPHALT, SURFACE MUST BE MILLED AND REPLACED NO LESS THAN 10 FT OVERALL OR UP TO 50 FT IN EACH DIRECTION BEYOND THE LIMITS OF THE TRENCH UNLESS OTHERWISE DETERMINED BY ON-SITE INSPECTION. IF EXISTING SURFACE IS CHIP SEAL, THE LIMITS OF SURFACE REPLACEMENT WILL BE A MINIMUM OF 5 FT IN EACH DIRECTION BEYOND LIMITS OF THE TRENCH. (SEE NOTE 2 FOR SURFACE REPLACEMENT GUIDELINES)

7. UNLESS OTHERWISE NOTED IN THE ROW STANDARD SPECIFICATIONS, WHEN GEOGRID OR OTHER GEOSYNTHETIC SUBGRADE/BASE REINFORCEMENT IS PRESENT, THE CONTRACTOR SHALL CONDUCT EXCAVATION TO PROVIDE APPROPRIATE OVERLAP (2' MIN.) AND TIE TO EXISTING UNDISTURBED REINFORCEMENT AS REQUIRED BY MANUFACTURER FOR EACH LAYER OF REINFORCEMENT ENCOUNTERED.

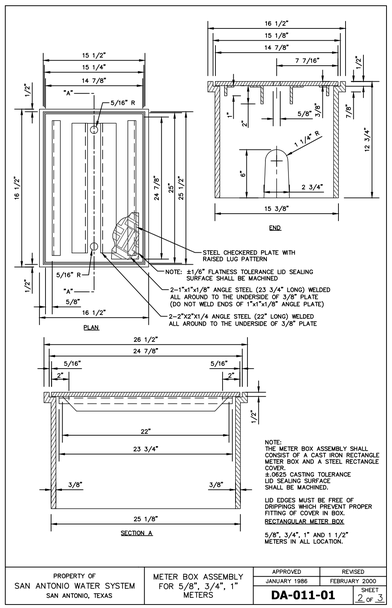
PREPARED BY: BEXAR COUNTY PUBLIC WORKS DEPARTMENT — June 4, 2013

C5.02 F — STREET CUT DETAIL
N.T.S.



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

C5.02 B — DOUBLE LEAF SWING GATE DETAILS
N.T.S.

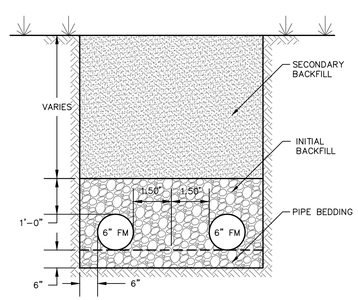


PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	METER BOX ASSEMBLY FOR 5/8", 3/4", 1" METERS	APPROVED JANUARY 1986 DA-011-01	REVISED FEBRUARY 2000 SHEET 2 OF 3

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

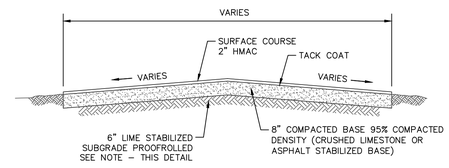
NOTES

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.

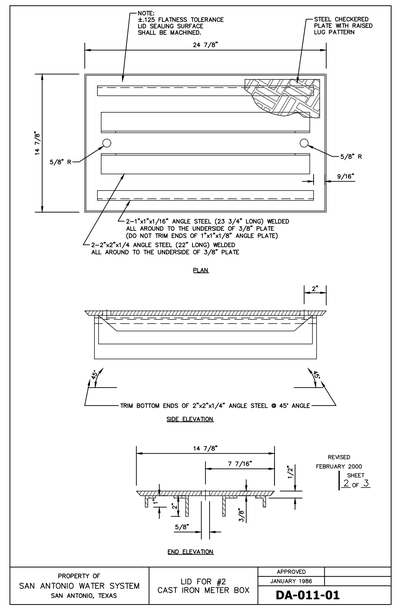


C5.02 I — DUAL 6" FORCE MAIN TRENCH DETAIL
N.T.S.

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



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

C5.02 H — LID FOR #2 CAST IRON METER BOX
N.T.S.

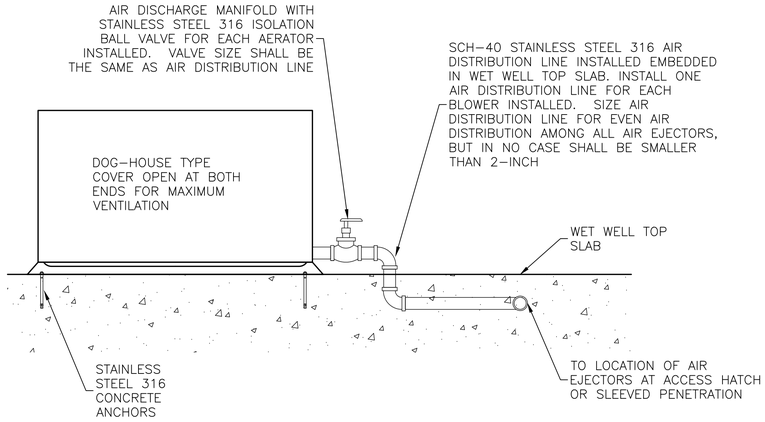
NO.	REVISION	DATE

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

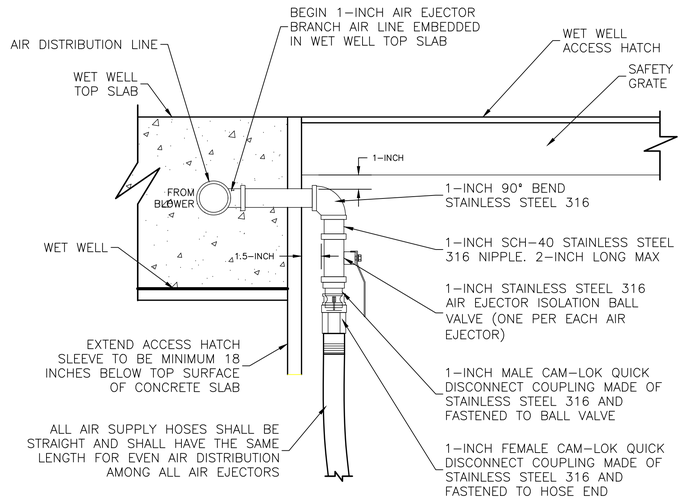
CORNERSTONE LIFT STATION #2
AND FORCE MAIN
SAN ANTONIO, TX
LIFT STATION DETAILS II

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C5.02

Date: Mar 18, 2024, 9:48am User ID: dloughlin
File: P:\129\34\00\Design\Civil\LS\01-1293400.dwg



C5.03 A — AERATOR BLOWER INSTALLATION
N.T.S.

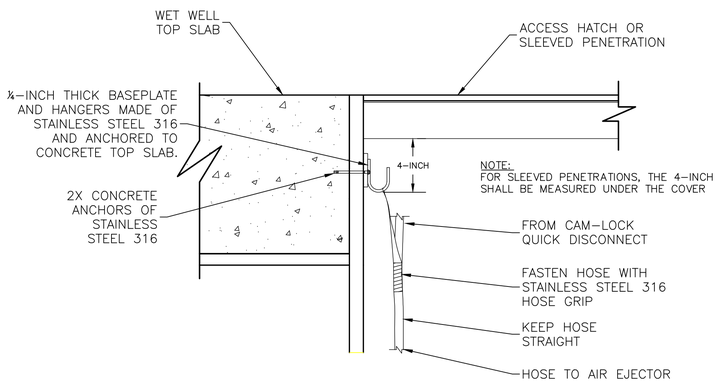


C5.03 B — AIR EJECTOR BRANCH LINE HOSE AND INSTALLATION ACCESS HATCH
N.T.S.

NOTES:

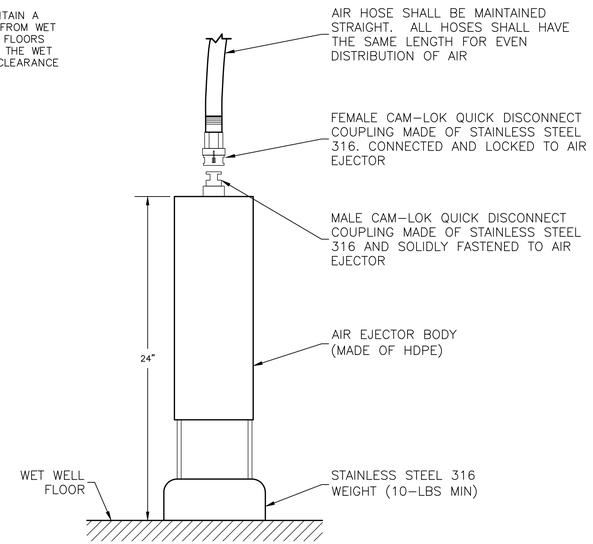
1. WHERE POSSIBLE, AIR EJECTORS SHALL TERMINATE AT ACCESS HATCHES. ANY AIR EJECTOR THAT CANNOT TERMINATE AT A WET WELL ACCESS HATCH SHALL TERMINATE AT A DEDICATED SLEEVED PENETRATION 12-INCH DIAMETER AND SHALL BE PROVIDED WITH A HEAVY DUTY POLYETHYLENE COVER FLUSHED WITH THE TOP SLAB SURFACE.
2. THE 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.

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



C5.03 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.



C5.03 D — AIR EJECTOR INSTALLATION DETAIL
N.T.S.

NO.	REVISION	DATE

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

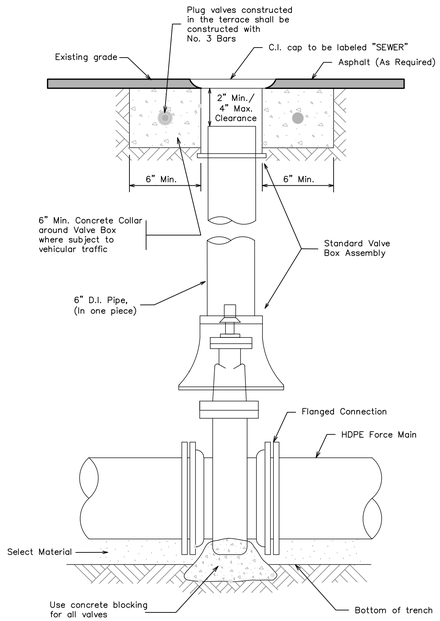
STATE OF TEXAS — KIM KEEFER — 117744 — LICENSED PROFESSIONAL ENGINEER — 11/22/24

CORNERSTONE LIFT STATION #2 AND FORCE MAIN
SAN ANTONIO, TX

ODOR CONTROL DETAILS

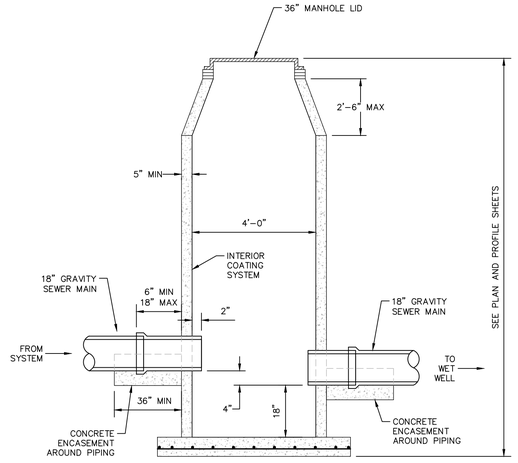
PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C5.03

Date: Mar 18, 2024, 9:48am User ID: dloughlin
File: P:\12934\00\Design\Civil\LS\D7-12934001.dwg

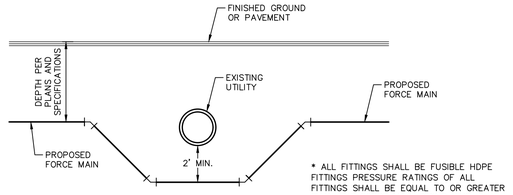


Note:
Contractor shall provide a valve stem riser that elevates the valve to within 3' to 4' of the surface (NSPI).

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

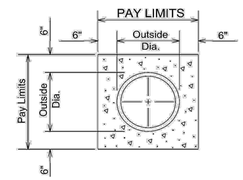


C5.04 B — LIFT STATION SITE MANHOLE "MH-LS-1"
N.T.S.

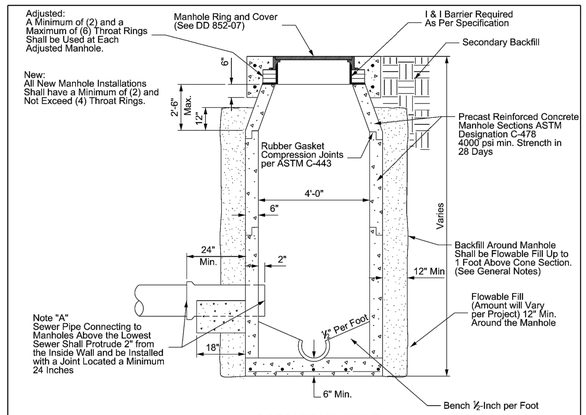


* ALL FITTINGS SHALL BE FUSIBLE HDPE FITTINGS PRESSURE RATINGS OF ALL FITTINGS SHALL BE EQUAL TO OR GREATER THAN THE FORCE MAIN PIPING. THE CONTRACTOR MY ELECT TO BEND THE PIPE.

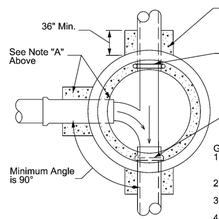
C5.04 C — TYPICAL UTILITY CROSSING DETAIL
N.T.S.



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



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

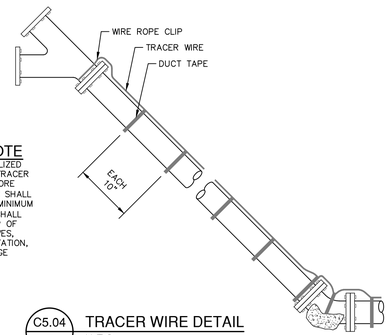
General Notes:
1. Material for Sanitary Sewer Pipe must be the Same from Manhole to Manhole. Changes In Type of Pipe may be Made Only at Manholes, or Special Structures, except as Approved by the SAWS Inspector.
2. Adapters and Concrete Collars shall be Used as Directed and Approved by theSAWS Inspector.
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

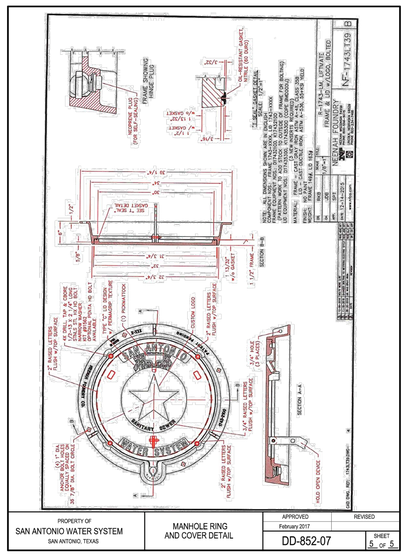
C5.04 H — STANDARD PRECAST MANHOLE
N.T.S.

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.

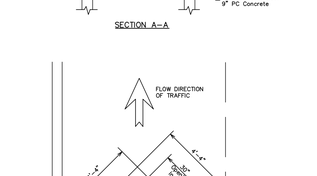


C5.04 F — TRACER WIRE DETAIL
N.T.S.

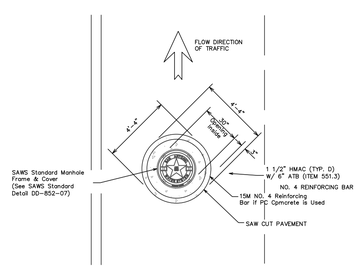


PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS	MANHOLE RING AND COVER DETAIL	APPROVED February 2017	REVISED
		DD-852-07	SHEET 5 OF 5

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.

NO.	REVISION	DATE

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
TEXAS ENGINEERING FIRM #470 I TEXAS SURVEYING FIRM #10028800

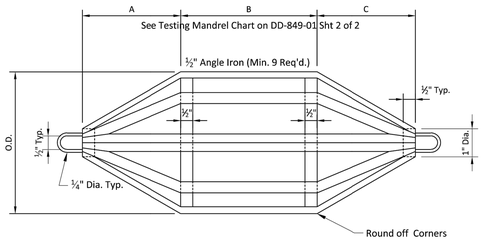
STATE OF TEXAS
KIM KEEFER
117744
LICENSED PROFESSIONAL ENGINEER
11/22/24

CORNERSTONE LIFT STATION #2 AND FORCE MAIN
SAN ANTONIO, TX

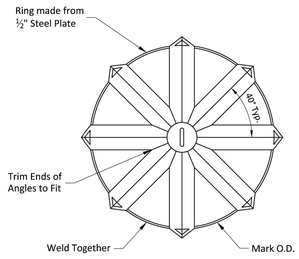
FORCE MAIN AND SANITARY SEWER DETAILS I

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C5.04

Date: Mar 18, 2024, 9:48am User ID: dloughlin
File: P:\129\34\00\Design\Civil\LS\DT-12934400.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

C5.05 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

C5.05 B DEFLECTION TESTING MANDREL
N.T.S.

NO.	REVISION	DATE

STATE OF TEXAS
KIM KEEFER
117744
LICENSED
PROFESSIONAL ENGINEER
11/22/24

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

CORNERSTONE LIFT STATION #2
AND FORCE MAIN
SAN ANTONIO, TX
FORCE MAIN AND SANITARY SEWER DETAILS II

PLAT NO. 23-11800125
JOB NO. 12934-00
DATE MARCH 2024
DESIGNER JK
CHECKED RM DRAWN RJ
SHEET C5.05

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: X = CLOSED CONTACT 0 = OPEN CONTACT

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

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

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

12/6/2023
STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED
PROFESSIONAL ENGINEER

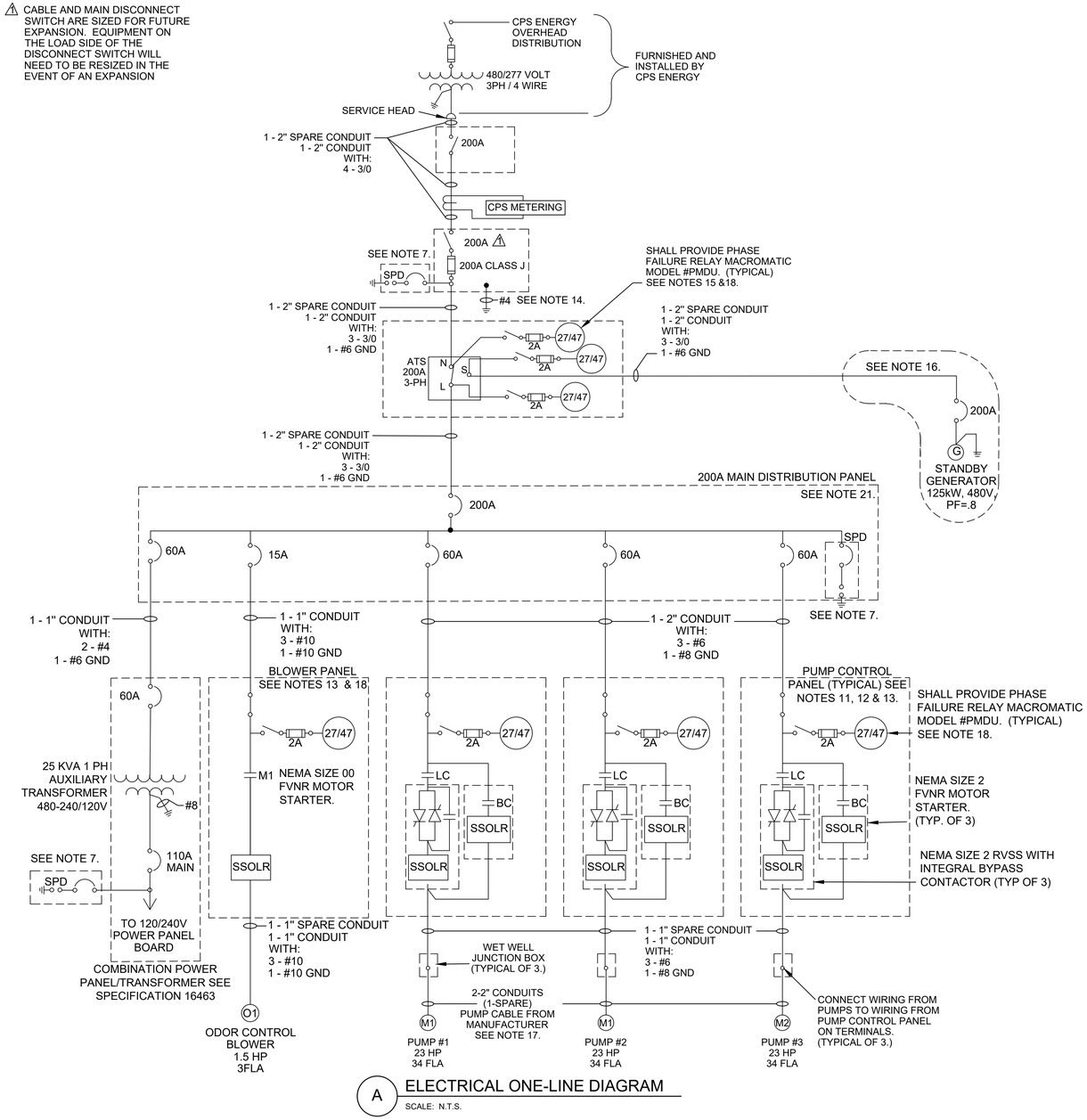
PAPE-DAWSON ENGINEERS
SAN ANTONIO I AUSTIN I HOUSTON I FORT WORTH I DALLAS
2000 NW LOOP 410 I SAN ANTONIO, TX 78213 I 210.375.9000
TBPE FIRM REGISTRATION #470 I TBPLS FIRM REGISTRATION #10028800

CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS
ELECTRICAL LEGEND

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E1

Date: Dec 06, 2023, 4:14pm User ID: SGraf
File: R:\Pape-Dawson\2023 Cornerstone Lift Station\100% Design\Drawings\E-1 elect legend.dwg

⚠ CABLE AND MAIN DISCONNECT SWITCH ARE SIZED FOR FUTURE EXPANSION. EQUIPMENT ON THE LOAD SIDE OF THE DISCONNECT SWITCH WILL NEED TO BE RESIZED IN THE EVENT OF AN EXPANSION



A ELECTRICAL ONE-LINE DIAGRAM

SCALE: N.T.S.

LOAD SCHEDULE		
DESCRIPTION	CONNECTED LOAD	ESTIMATED DEMAND
PUMP 1	23.0KVA	23.0KVA
PUMP 2	23.0KVA	23.0KVA
PUMP 3	23.0KVA	23.0KVA
BLOWER	1.5KVA	1.5KVA
TRANSFORMER	25.0KVA	20.0KVA
TOTAL	95.5KVA	90.5KVA

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
PUMP CONTROL PANEL #3	1"	2 - #10 1 - #10 GND	1.9 KW	20	1	15	16	1	20	0.3 KW	2 - #10 1 - #10 GND	1"	AREA LIGHT #3
AREA LIGHT #2	1"	2 - #10 1 - #10 GND	0.3 KW	20	1	17	18	1	20	-			SPARE
SPARE			-			19	20			-			SPARE
SPARE			-			21	22			-			MOVE
SPARE			-			23	24			-			SPARE
SPARE			-			25	26			-			SPARE
SPARE			-			27	28			-			SPARE
			11.5 KW			20.4 KW			9.0 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.

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 RACK. 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 MINIMUM OF 3/0 AWG UNLESS REQUIRED TO BE LARGER PER MANUFACTURER REQUIREMENTS. CABLE LENGTH BETWEEN THE EQUIPMENT THE SPD IS PROTECTING AND THE SPD PANEL MUST BE AS SHORT AS POSSIBLE PER 2017 NEC ARTICLE 285.12 (2020 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.

GRUBB ENGINEERING, INC.
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2727 N. ST. MARY'S ST. SAN ANTONIO, TX 78212
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FAX NO. 210-658-9805

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STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED PROFESSIONAL ENGINEER

PAPE-DAWSON ENGINEERS
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CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS
ELECTRICAL ONE-LINE DIAGRAM

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E2

Date: Dec 06, 2023, 4:14pm User ID: SGraf
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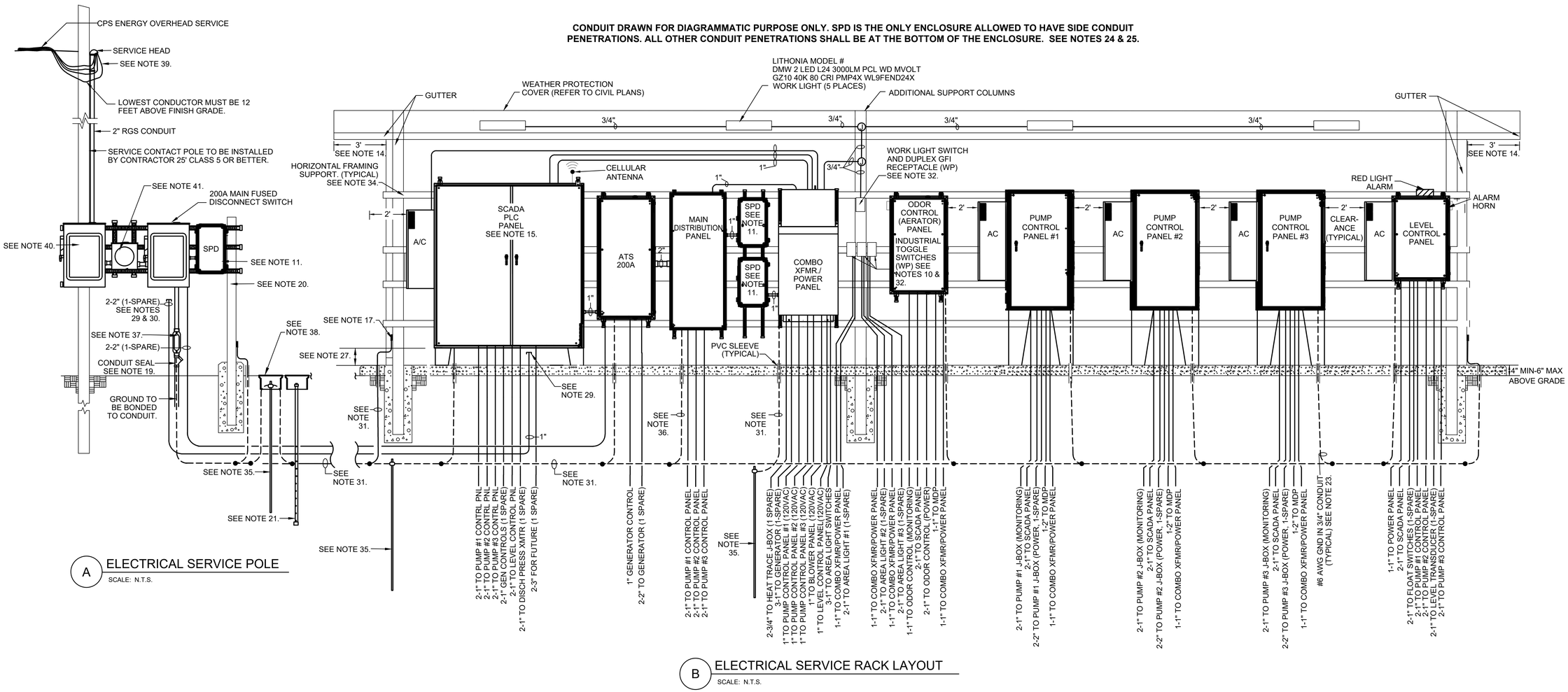
CONDUIT DRAWN FOR DIAGRAMMATIC PURPOSE ONLY. SPD IS THE ONLY ENCLOSURE ALLOWED TO HAVE SIDE CONDUIT PENETRATIONS. ALL OTHER CONDUIT PENETRATIONS SHALL BE AT THE BOTTOM OF THE ENCLOSURE. SEE NOTES 24 & 25.



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 C AND E ON SHEET E12.
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 MINIMUM OF #10 AWG UNLESS REQUIRED TO BE LARGER PER MANUFACTURER REQUIREMENTS. LENGTH MUST BE AS SHORT AS POSSIBLE, UNLESS DIRECTED OTHERWISE BY MANUFACTURER, BETWEEN THE EQUIPMNENT THE SPD IS PROTECTING TO THE SPD PANEL PER 2017 NEC ARTICLE 285.12 (2022 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 E-9 AND E-10 FOR SCADA PANEL INFORMATION.
16. GROUND RESISTANCE SHALL NOT EXCEED 5 OHMS AT ANY POINT.
17. GROUNDING CONNECTION TO SERVICE RACK. SEE SHEET E-13 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 4-3/0 CU.
40. INCOMING MAIN 200A 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

CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS

ELECTRICAL SERVICE POLE AND RACK LAYOUT

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JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E3

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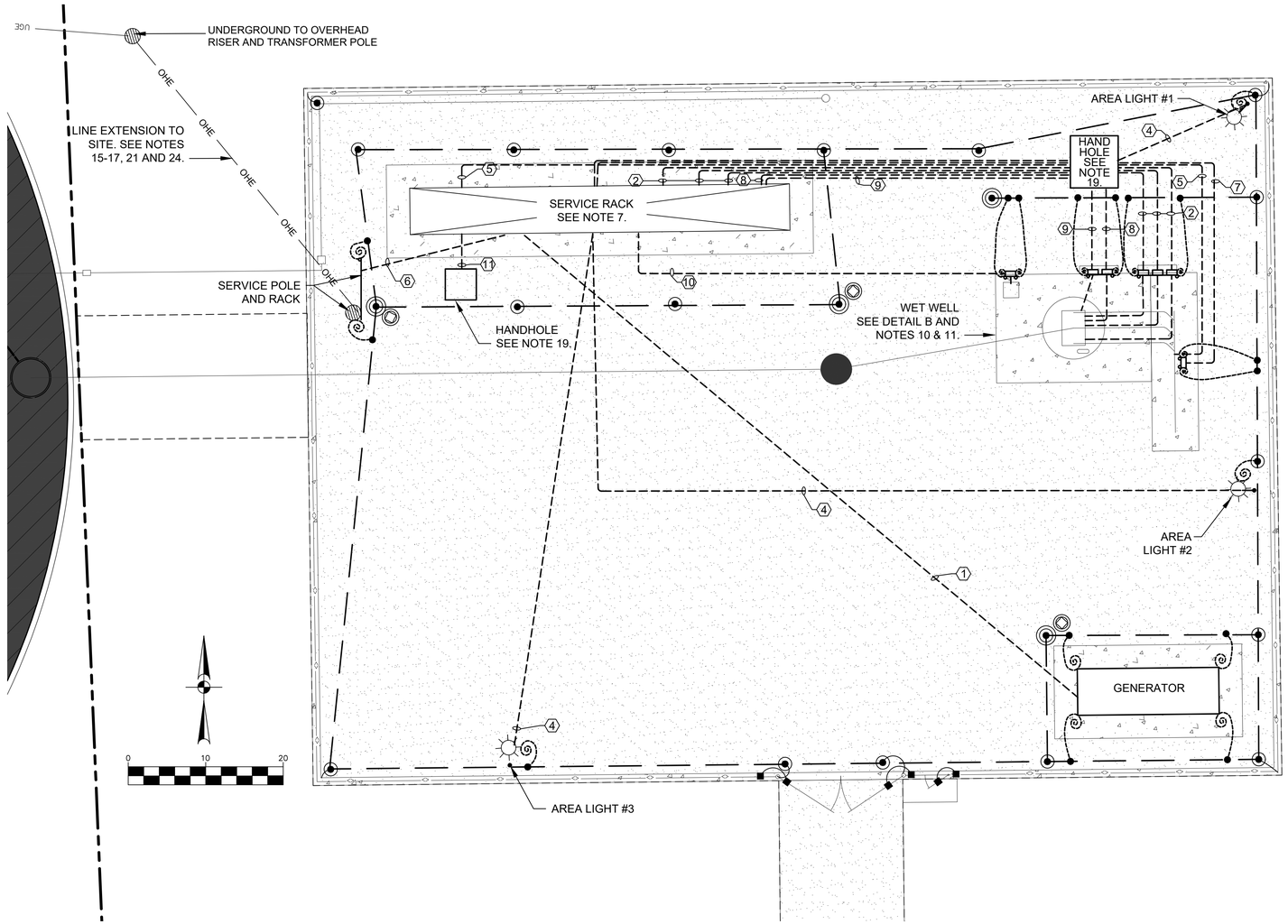
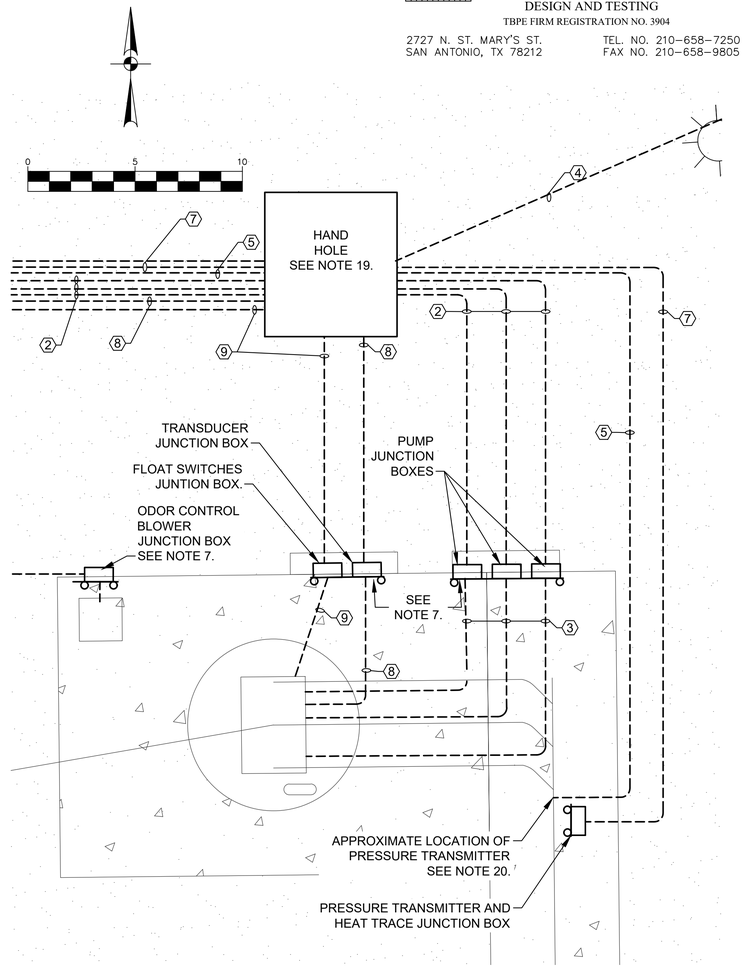


A SITE PLAN
SCALE: AS SHOWN



B WET WELL
SCALE: AS SHOWN

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

OH — OVERHEAD SERVICE

OHE — PROPOSED CPS ENERGY OVERHEAD ELECTRIC

OHE — EXISTING CPS ENERGY OVERHEAD ELECTRIC

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. 2-2" 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. 2-1" C (1 SPARE) TO DISCHARGE PRESSURE TRANSMITTER. 2X(#16 TW/SH/PR) SEE CIVIL DRAWINGS FOR LOCATION.
6. 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
7. 2-3/4" C (1 SPARE) TO JUNCTION BOX FOR PRESSURE TRANSMITTER & HEAT TRACE POWER. SEE SHEET E12 DETAIL B.
8. 2-1" C TO TRANSDUCER (1 SPARE) CABLE PER MANUFACTURER
9. 2-1" C TO LEVEL FLOAT SWITCHES (1 SPARE) 8-#12
10. 2-1"C TO ODOR CONTROL BLOWER (1 SPARE) REFER TO SHEET E2 DETAILS A & B FOR CABLE DETAILS. 2-1"C TO ODOR CONTROL BLOWER CONTROLS PER CONTROLS
11. 2-3"C FOR FUTURE SCADA

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 UNDERGROUND DUCTBANK AND 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. REFER TO SHEET E13 DETAIL G FOR HAND HOLE 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 MUST BE MOUNTED FACING SOUTH.
24. CPS ENERGY TRANSFORMER POLE MUST HAVE 28 FOOT EASEMENT.
25. DUCTBANKS AND CONDUIT RUNS FOR POWER SCADA SIGNAL WIRING SHALL BE SEPARATED AND CONTRACTOR SHALL MAINTAIN A MINIMUM OF 12-INCH SEPARATION BETWEEN DUCTBANKS.
26. GROUND GRID MUST USE ALL EXOTHERMIC WELD TO MAKE A SOLID COMMON GROUNDING LOOP.

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CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS
ELECTRICAL SITE PLAN

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DESIGNER BD
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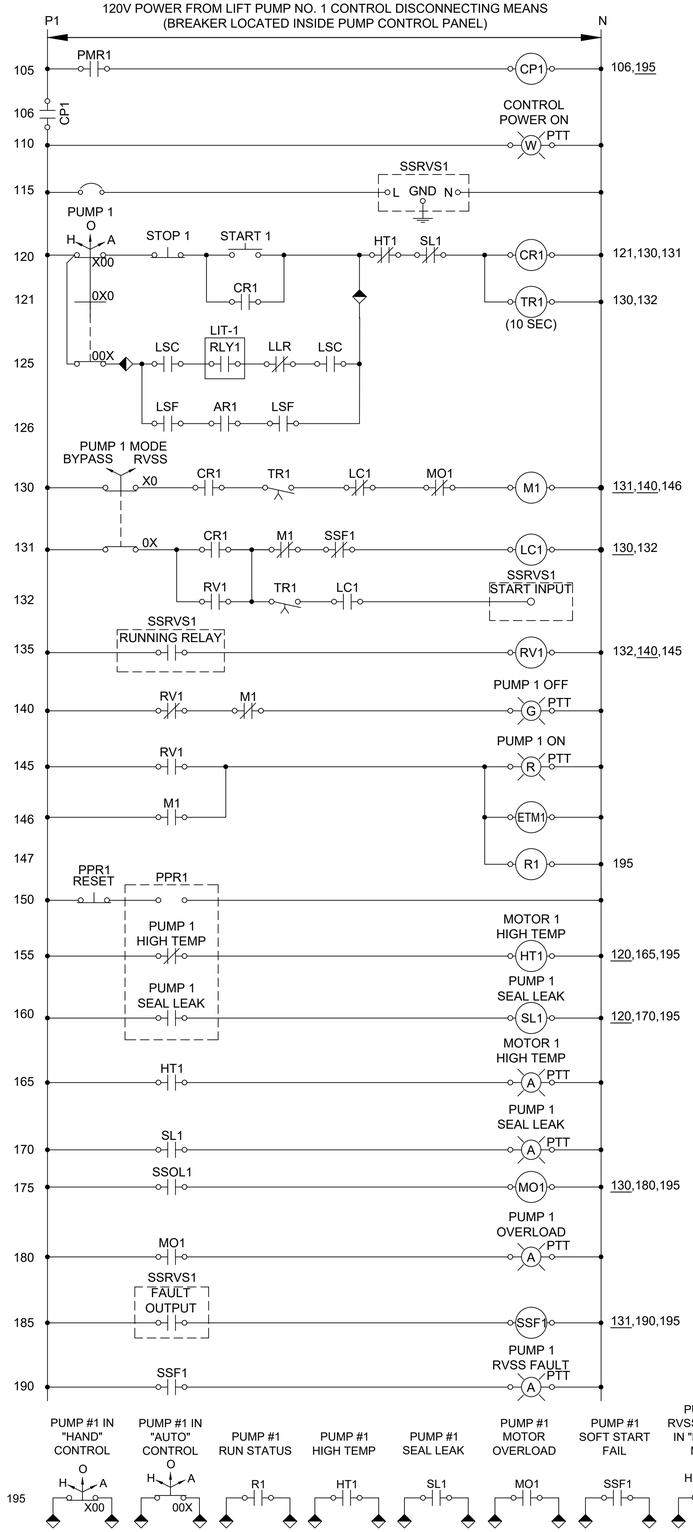
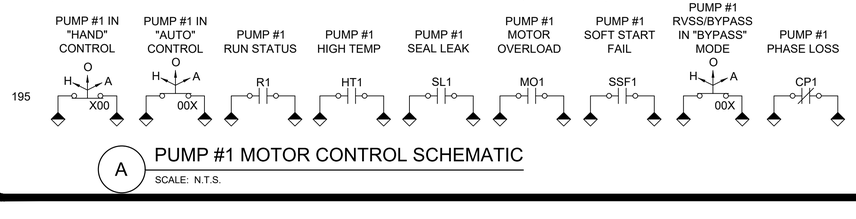
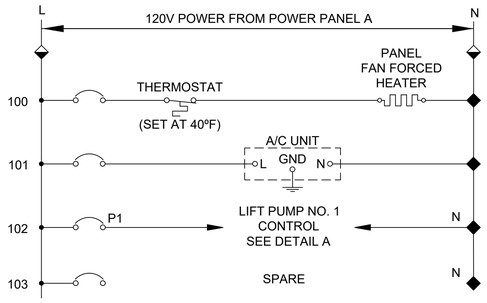




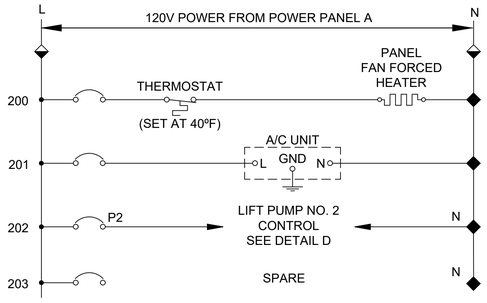
A PUMP #1 MOTOR CONTROL SCHEMATIC

SCALE: N.T.S.



B PUMP CONTROL PANEL #1 CONTROL POWER DISTRIBUTION SCHEMATIC

SCALE: N.T.S.

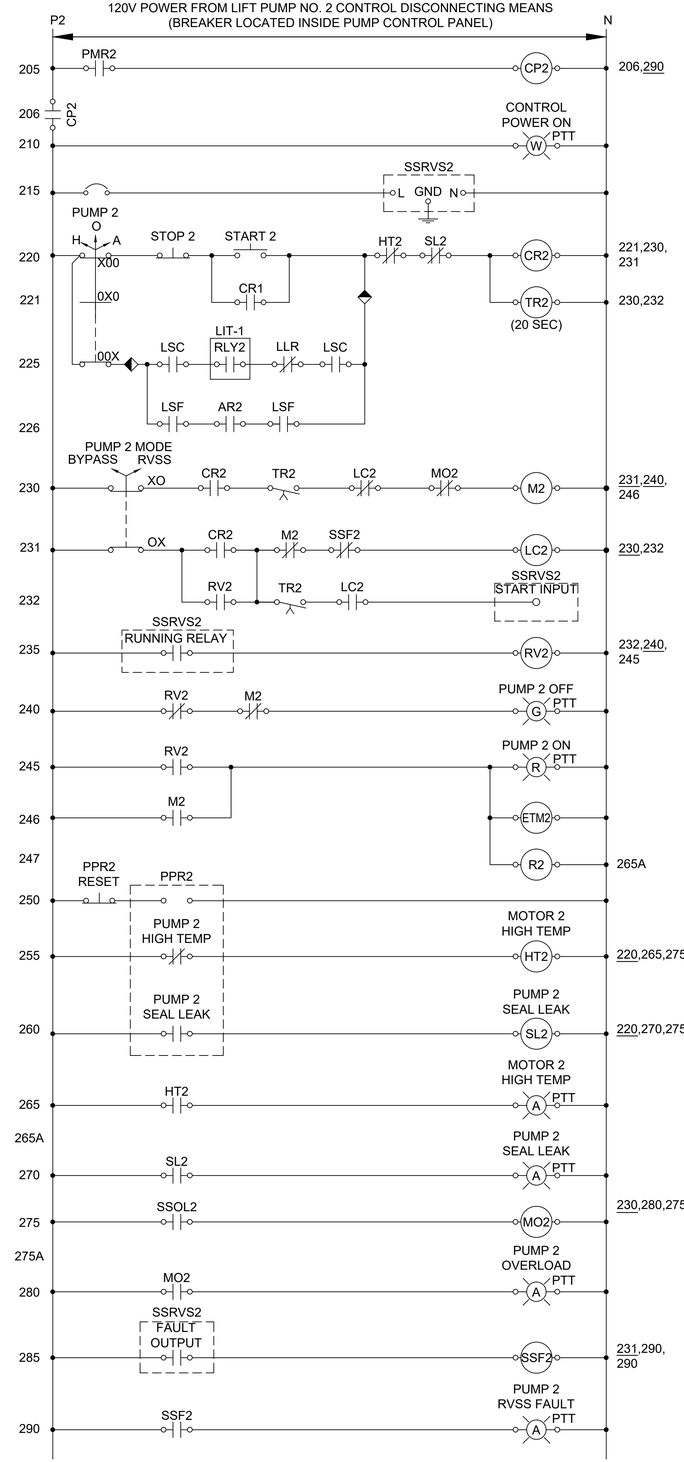


C PUMP CONTROL PANEL #2 CONTROL POWER DISTRIBUTION SCHEMATIC

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.

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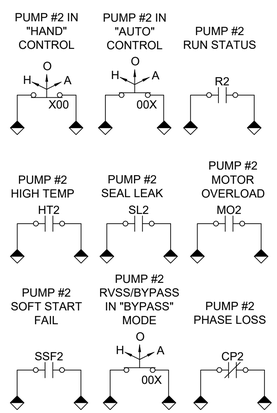
GENERAL NOTES

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.

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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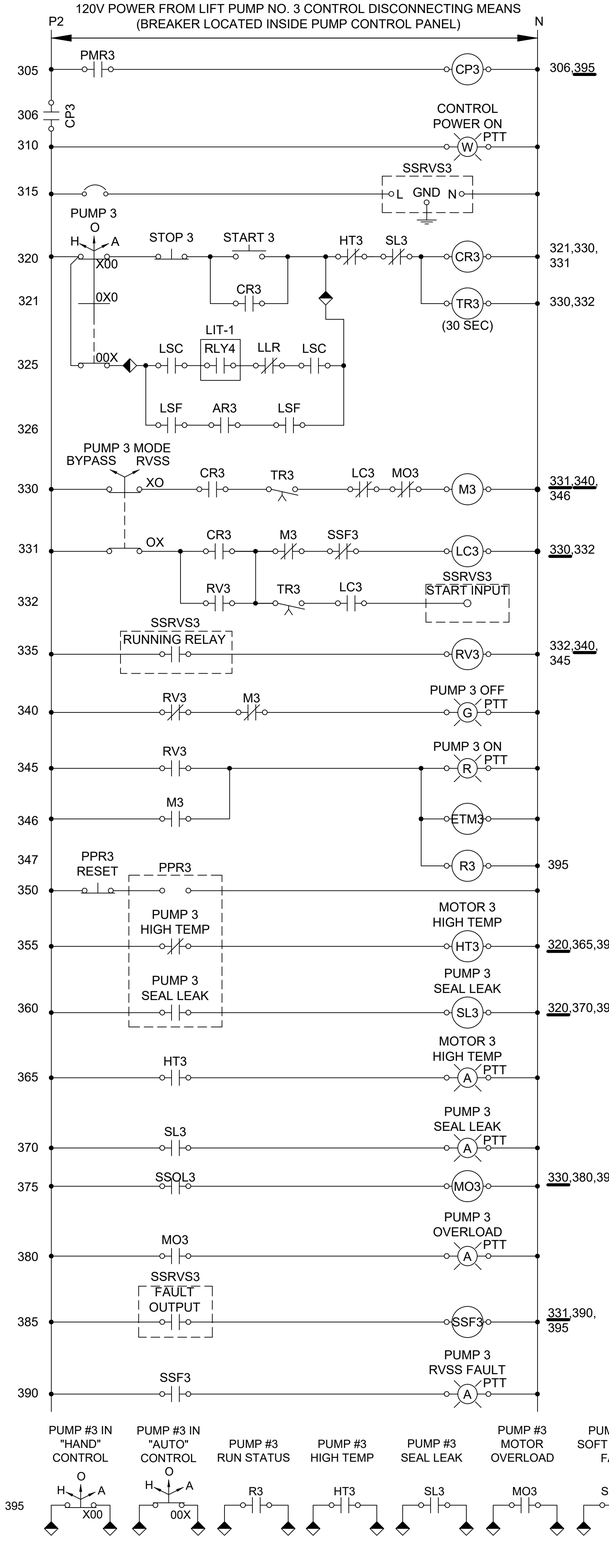
CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION CONTROL DETAILS #1 PUMP CONTROL PANEL SCHEMATIC

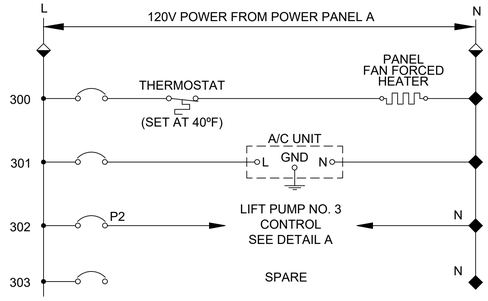
SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E5

Date: Dec 06, 2023, 4:17pm User ID: SGraf
File: R:\Pape-Dawson\2023 Cornerstone Lift Station\100% Design\Drawings\LF-5 LIFT STATION CONTROL DETAILS #1 PUMP CONTROL PANEL.dwg



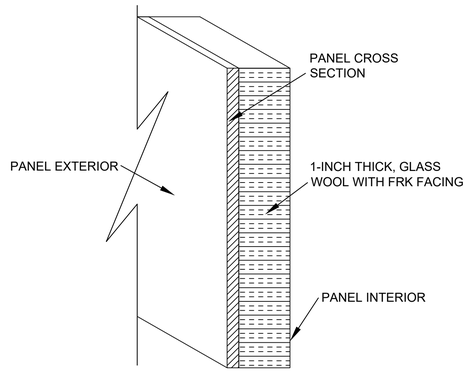
A PUMP #3 MOTOR CONTROL SCHEMATIC

SCALE: N.T.S.



B PUMP CONTROL PANEL #3 CONTROL POWER DISTRIBUTION SCHEMATIC

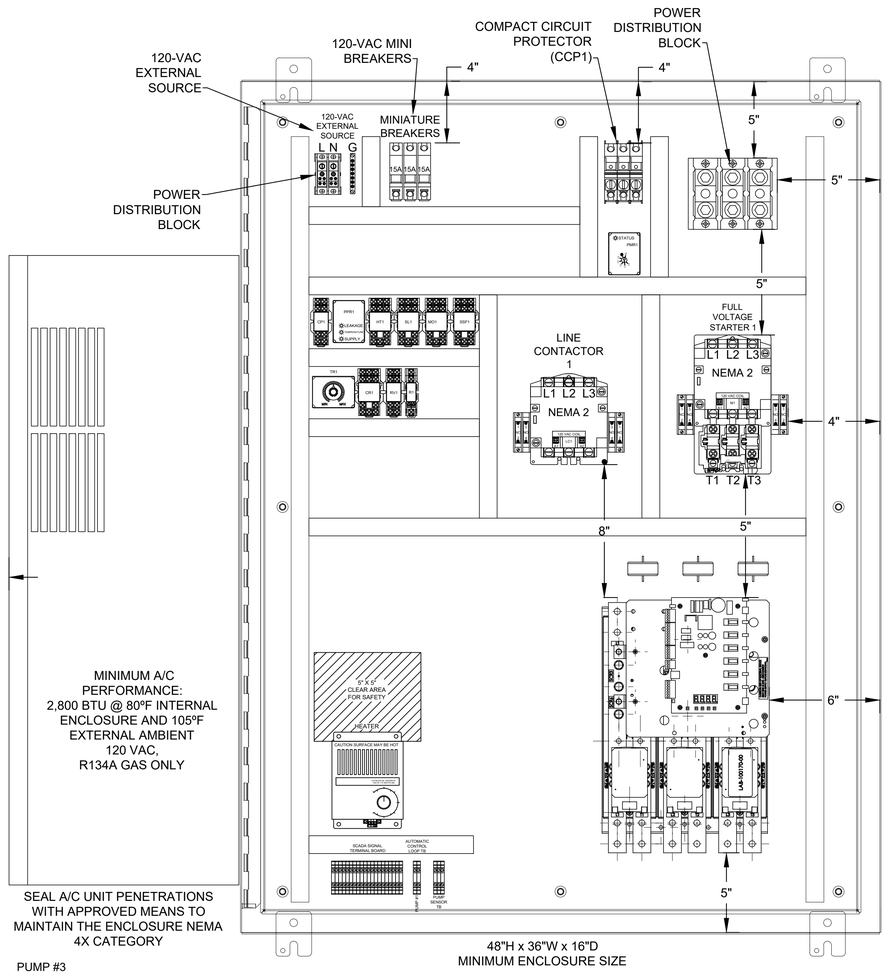
SCALE: N.T.S.



C CLIMATE CONTROLLED PANEL INSULATION

SCALE: N.T.S.

SEE NOTES 10-11.



D PUMP CONTROL PANEL LAYOUT (TYPICAL OF 3)

SCALE: N.T.S.

SEE NOTES 1-11

INTERNAL SWING PANEL

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 C.
11. INSTALL INSULATING SHEETS IN THE INTERIOR SURFACES OF THE PANEL, INCLUDING DOOR(S). NOT REQUIRED FOR INTERNAL SWING PANELS.

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103671
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CORNERSTONE LIFT STATION AND FORCE MAIN
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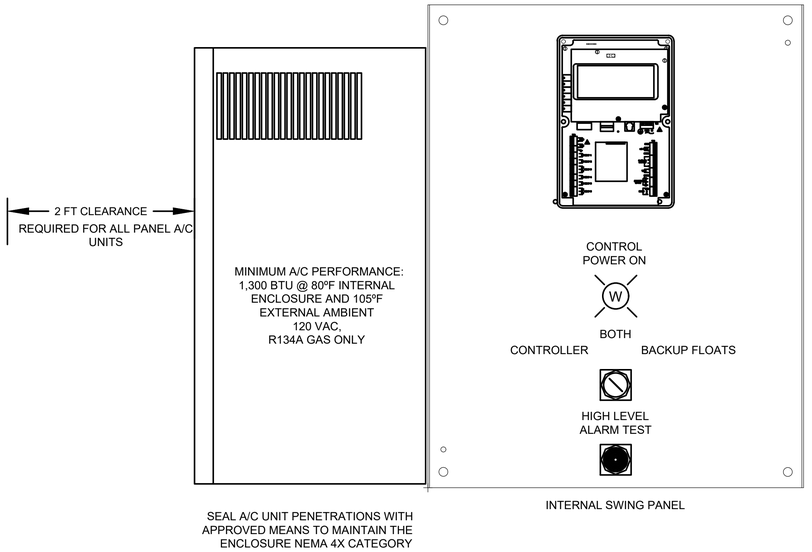
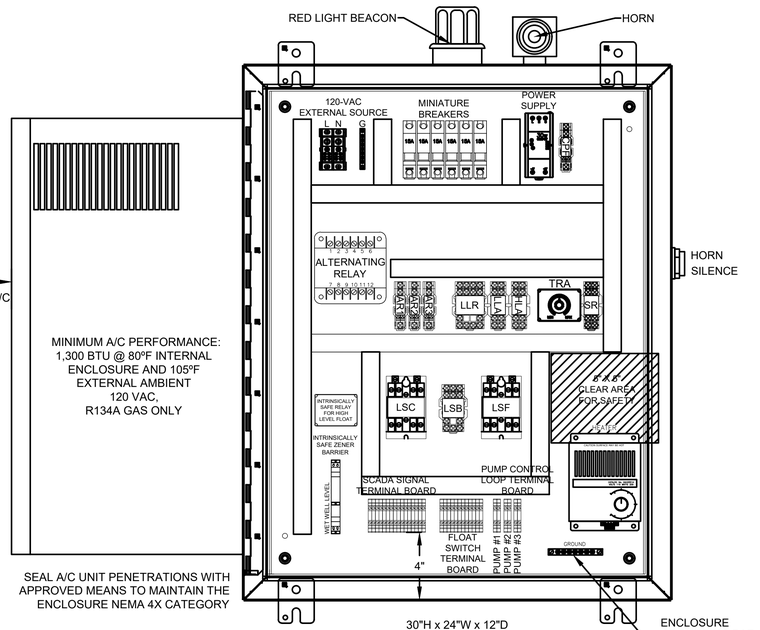
LIFT STATION CONTROL DETAILS #2
PUMP CONTROL PANEL LAYOUTS

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E6

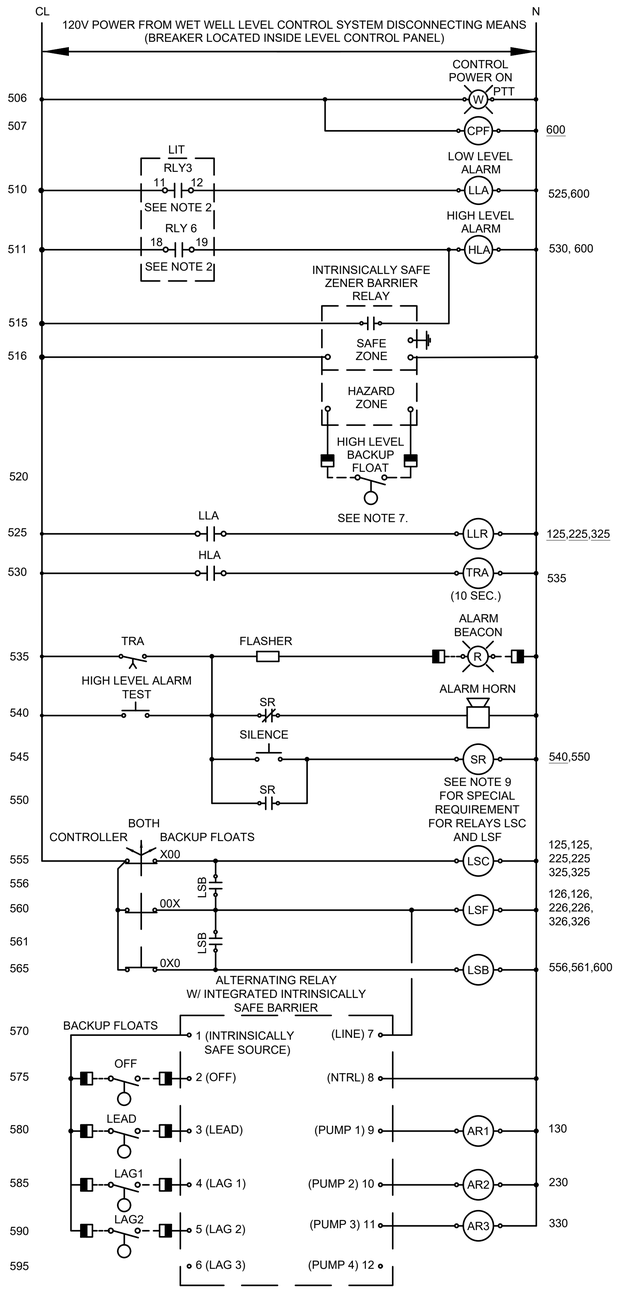
Date: Dec 06, 2023, 4:17pm User ID: SGraf
File: R:\Pape-Dawson\2023 Cornerstone Lift Station\100% Design\Drawings\E-6 LIFT STATION CONTROL DETAILS #2 PUMP CONTROL PANEL.dwg



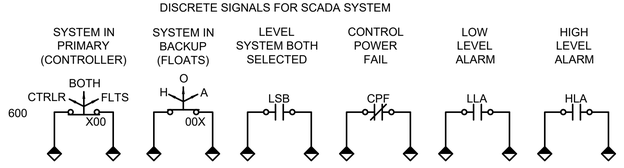


A LEVEL CONTROL PANEL LAYOUT

SCALE: N.T.S.



DISCRETE SIGNALS FOR SCADA SYSTEM



B LEVEL CONTROL SCHEMATIC LOCATED IN LEVEL CONTROL PANEL

SCALE: N.T.S.

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

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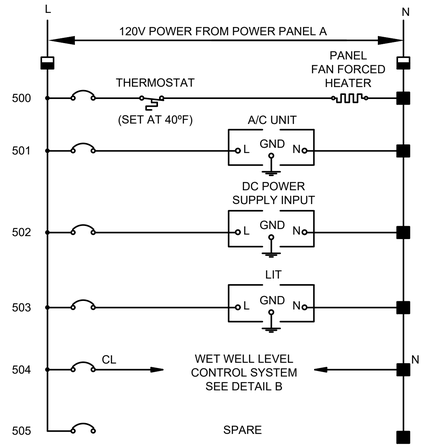
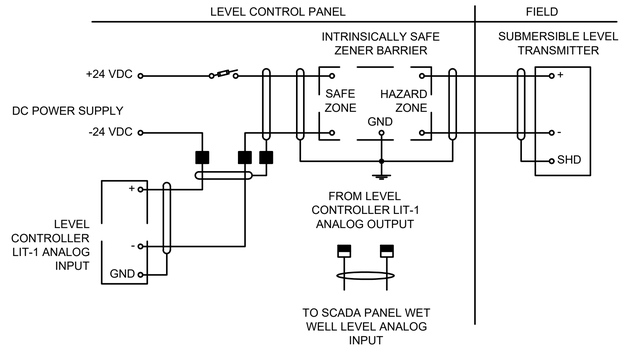


C LEVEL CONTROL PANEL CONTROL POWER DISTRIBUTION SCHEMATIC

SCALE: N.T.S.



D WET WELL LEVEL TRANSMITTER INSTRUMENT WIRING SCHEMATIC

SCALE: N.T.S.

NOTES:

1. LEVEL CONTROLLER OUTPUT RELAYS RLY1, RLY2 AND RLY4 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

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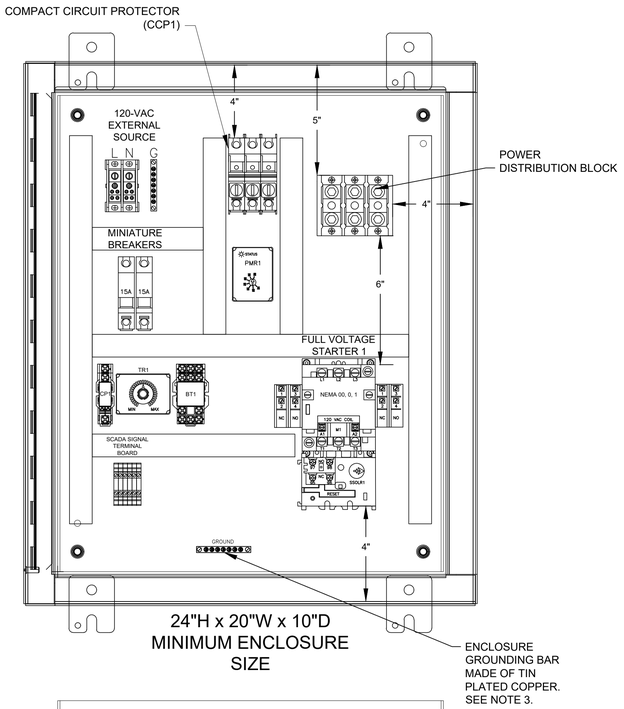
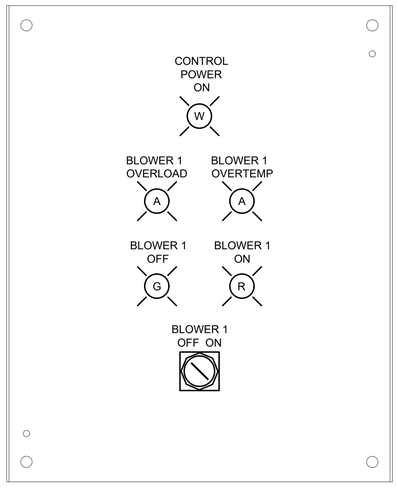
LIFT STATION CONTROL DETAILS #3 LEVEL CONTROL
PANEL LAYOUT AND CONTROL SCHEMATIC

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E7

Date: Dec 06, 2023, 4:16pm User ID: SGraf
File: R:\Pape-Dawson\2023 Cornerstone Lift Station\100% Design\Drawings\E7 LIFT STATION CONTROL DETAILS #2 LEVEL CONTROL PANEL.dwg

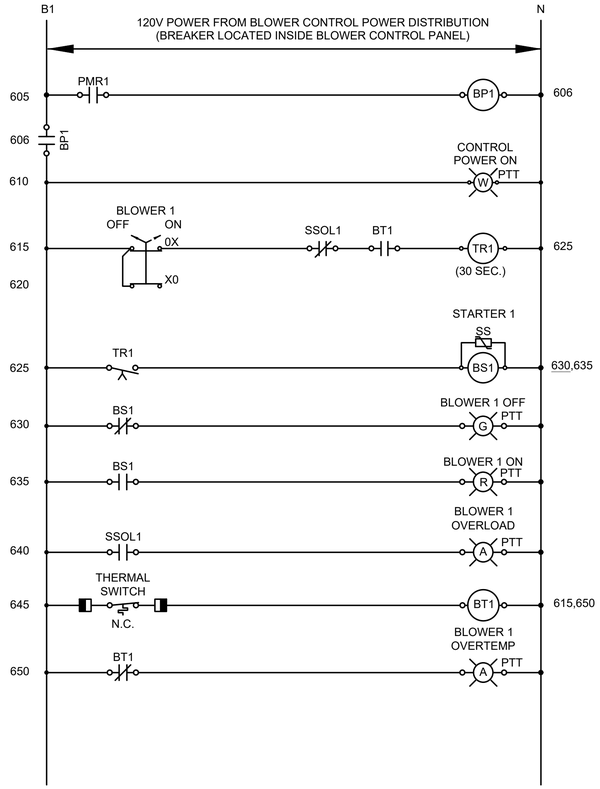




INTERNAL SWING PANEL

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.

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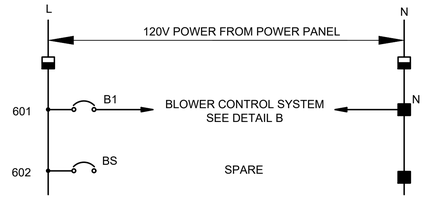

C ODOR CONTROL BLOWER CONTROL
POWER DISTRIBUTION SCHEMATIC

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

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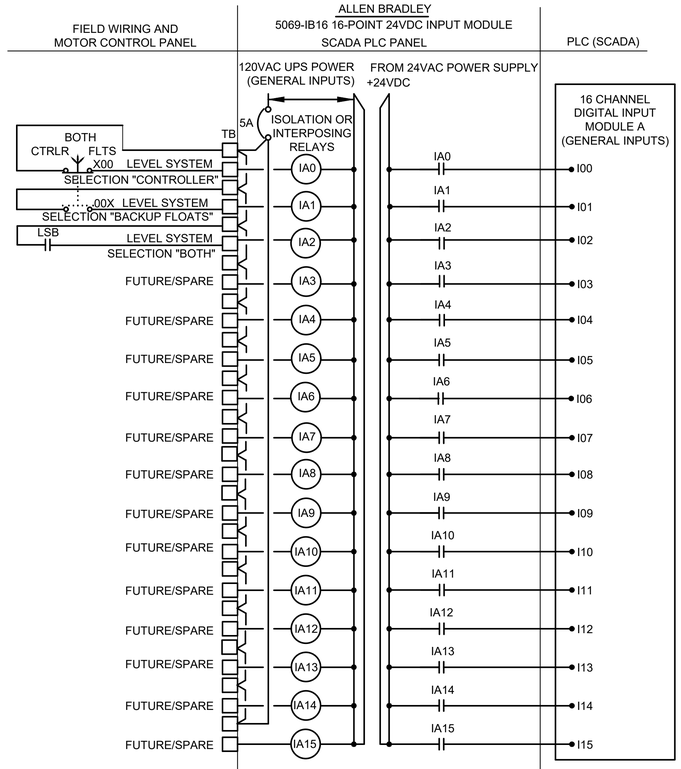
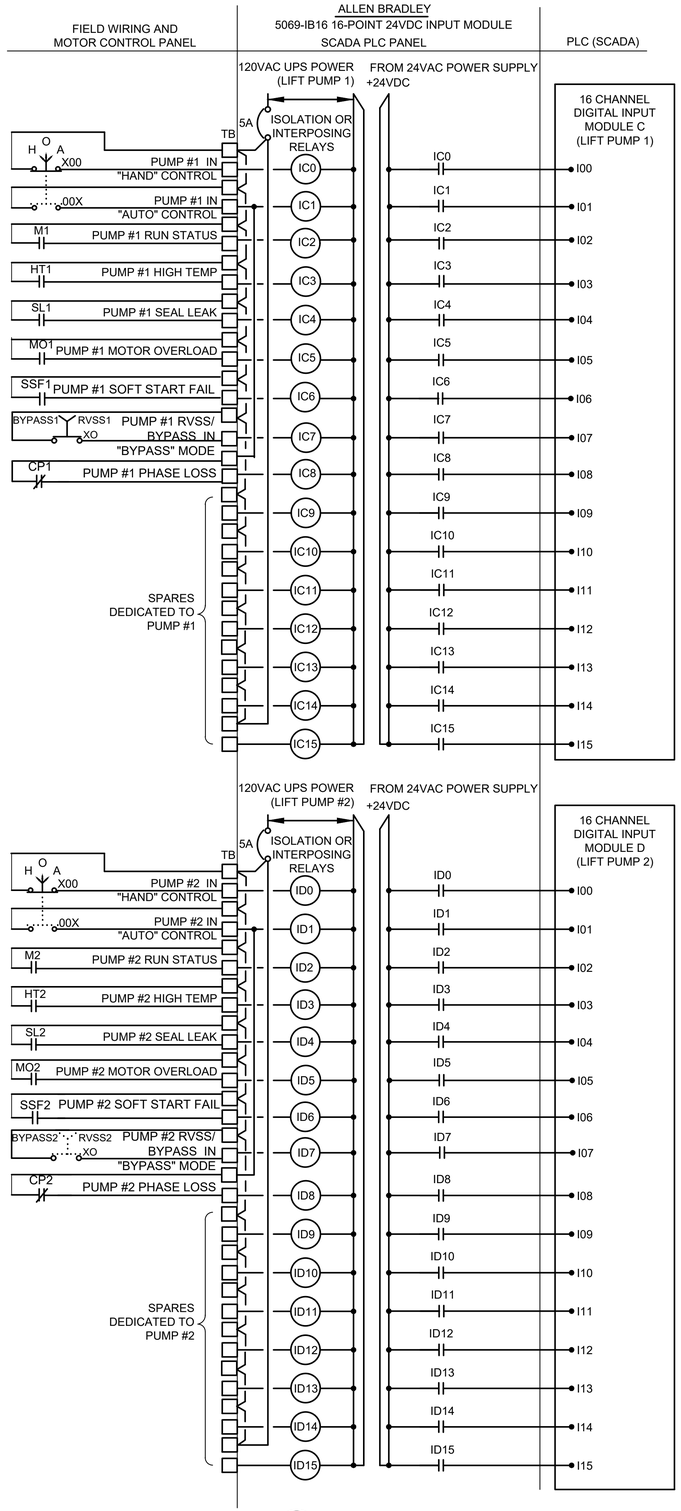
LIFT STATION CONTROL DETAILS #4 BLOWER CONTROL
PANEL LAYOUT AND CONTROL SCHEMATIC

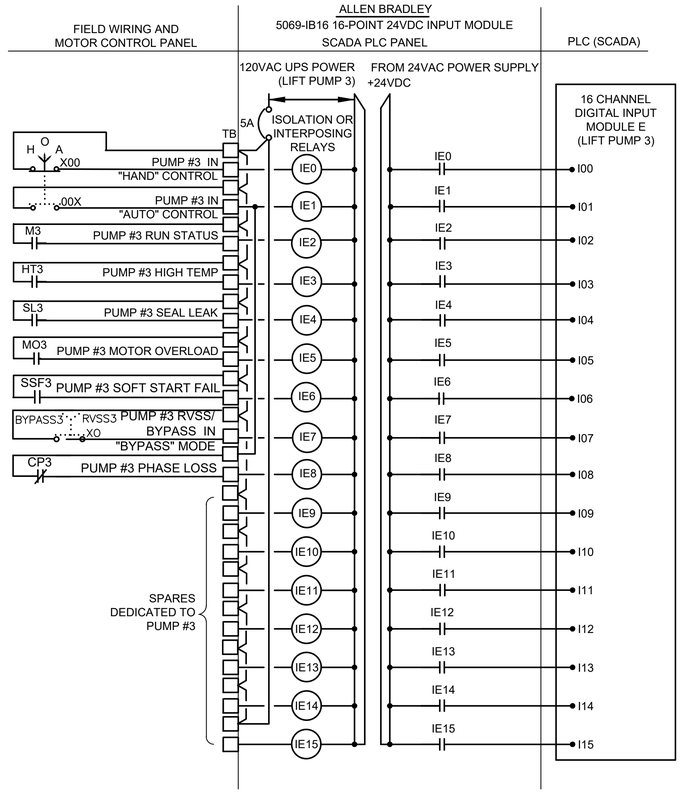
SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E8

Date: Dec 06, 2023, 4:16pm User ID: SGraf
File: R:\Pape-Dawson\2023 Cornerstone Lift Station\100% Design\Drawings\E-8 LIFT STATION CONTROL DETAILS #4 BLOWER CONTROL PANEL.dwg





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



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.

LEGEND
PFR PHASE FAILURE RELAY

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CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION
SCADA DETAILS #1

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E9

Date: Dec 06, 2023, 4:16pm User ID: SGraf
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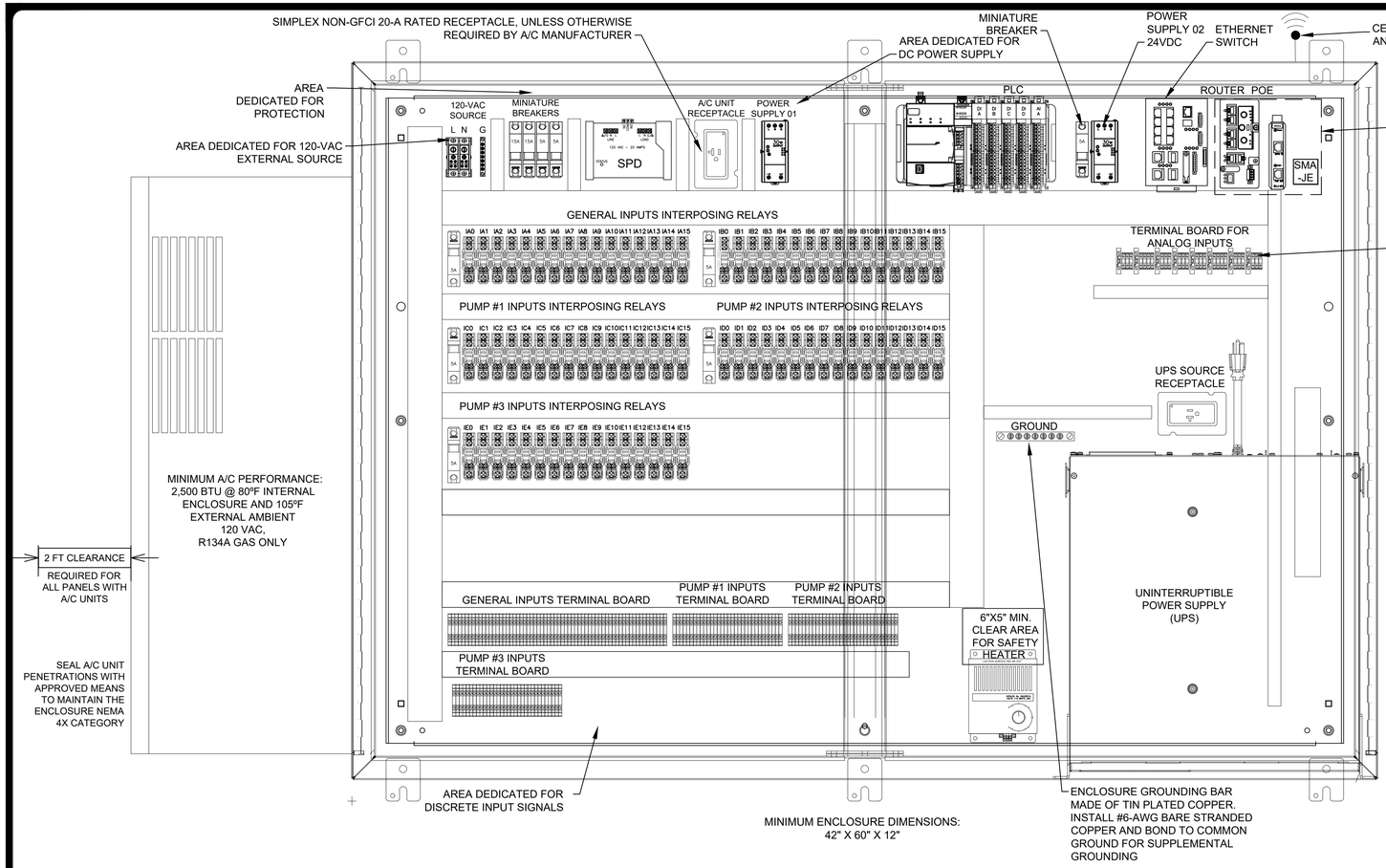
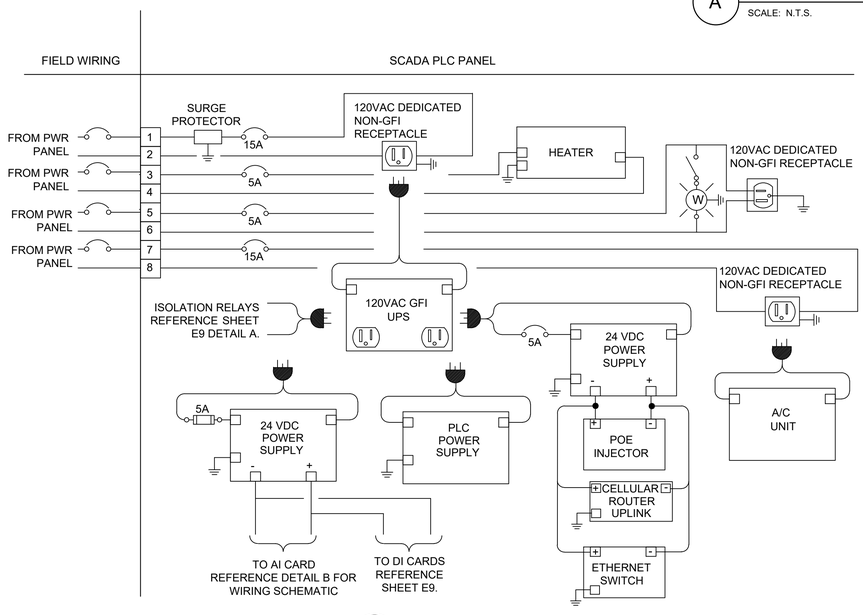


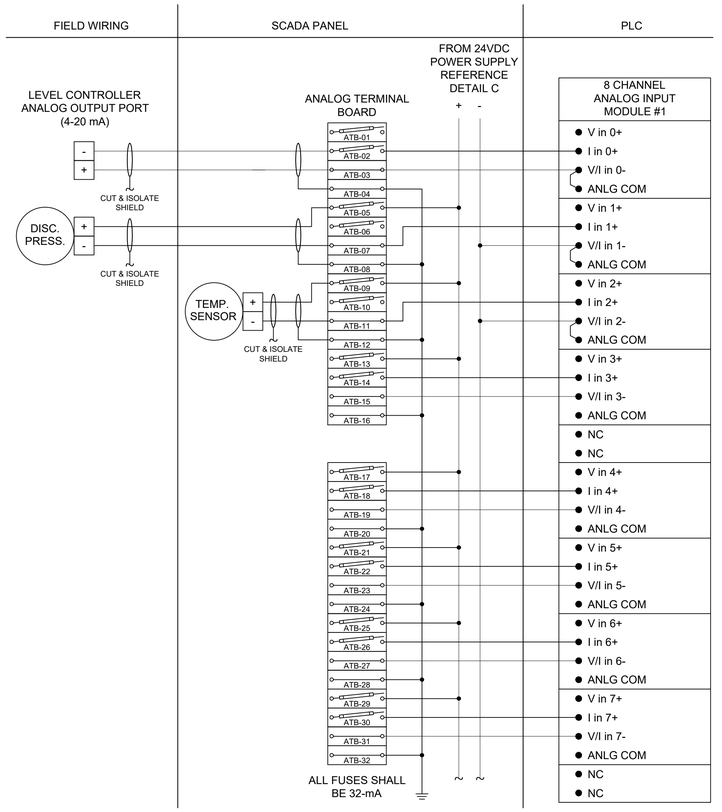
A SCADA INTERIOR PANEL LAYOUT

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



C SCADA POWER DISTRIBUTION

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

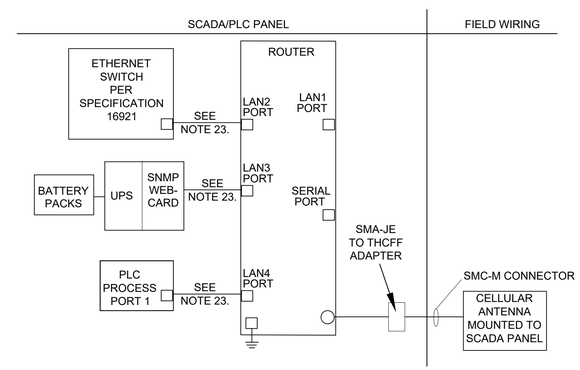


B SCADA ANALOG INPUTS

SCALE: N.T.S. SEE NOTES 15-18, 20

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. NOT USED.
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 04-001-64, 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.



D SCADA PANEL COMMUNICATIONS

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

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CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION
SCADA DETAILS #2

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E10

Date: Dec 06, 2023, 4:19pm User ID: SGraf
File: R:\Page-Dawson\2023 Cornerstone Lift Station\100% Design\Drawings\E-10 LIFT STATION SCADA DETAILS #2.dwg

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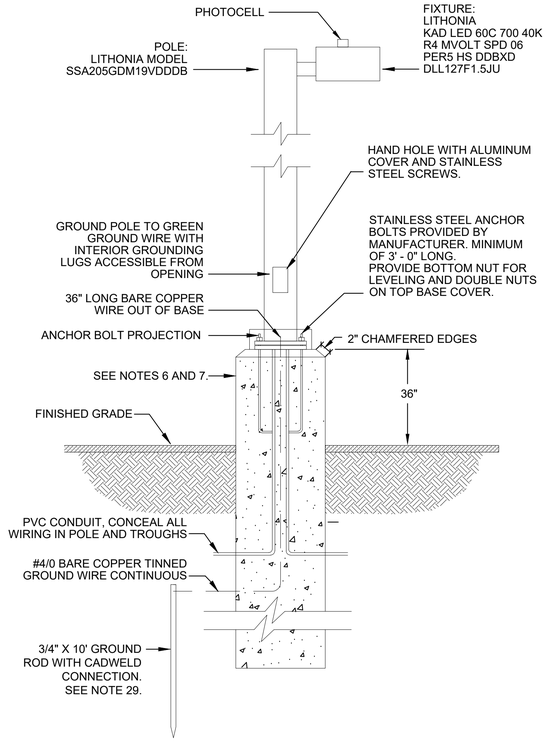
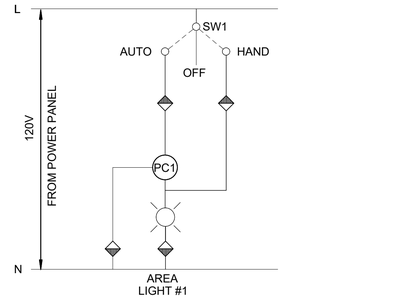
NO.	REVISION	DATE



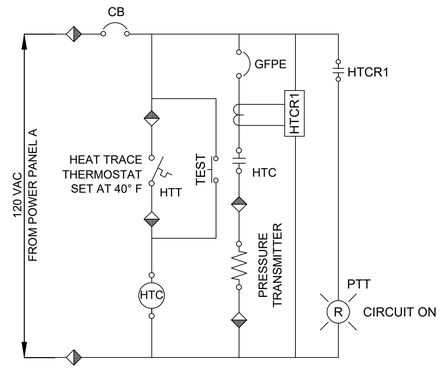
A LIGHT POLE FOUNDATION (TYP. OF 2)
SCALE: N.T.S. SEE NOTES 6-9.

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



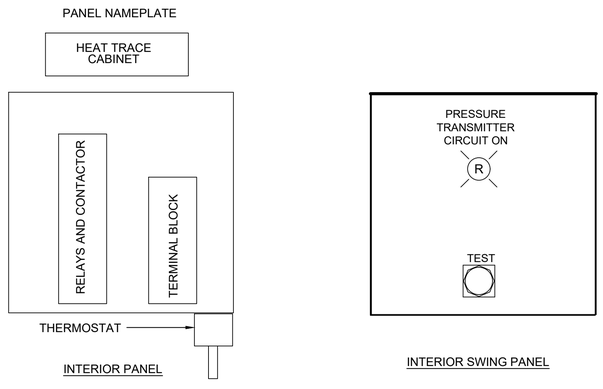
B AREA LIGHT WIRING DIAGRAM (TYPICAL OF 3)
SCALE: N.T.S. SEE NOTE 12.

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



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

C PRESSURE TRANSMITTER HEAT TRACE CONTROL
SCALE: N.T.S. SEE NOTES 10-11



D HEAT TRACE PANEL
SCALE: N.T.S. SEE NOTES 13-14

NOTES:
1. ALL UNDERGROUND ELECTRIC CONDUIT SHALL BE CONCRETE ENCASED 24 INCHES BELOW GRADE.
2. ALL ENCLOSURESSHALL BE PAD-LOCKABLE.
3. ALL MOUNTING HARDWARE AND STRUT CHANNEL SHALL BE 316 STAINLESS STEEL. ALL ENCLOSURES SHALL BE NEMA 4X, UNLESS OTHERWISE NOTED.
4. GROUND RESISTANCE SHALL BE AS MINIMUM AS POSSIBLE, BUT IN NO CASE SHALL EXCEED 5 OHMS.
5. REFER TO SPECIFICATION 16050 FOR SWITCH AND NAMEPLATE REQUIREMENTS.
6. SEE STRUCTURAL PLAN DRAWINGS FOR FOUNDATION.
7. CONTRACTOR TO REMOVE IRREGULARITIES AND TO PROVIDE SMOOTH FINISH, PAINT EXPOSED AREA SAFETY YELLOW.
8. GROUND ROD SHALL BE BONDED TO SITE GROUNDING SYSTEM.
9. LIGHT FIXTURE TO BE MOUNTED TWENTY-THREE FEET ABOVE GRADE, WHICH INCLUDES THE 3' BASE.
10. HTCR* IMPLIES HEAT TRACE CURRENT SENSING RELAY.
11. PROVIDE LITTELFUSE CURRENT SENSING RELAY ECS40A.
12. PHOTOCELL SHALL BE LOCATED ON RESPECTIVE LIGHT FIXTURE.
13. CONTRACTOR SHALL PROVIDE ADEQUATE SPACE FOR COMPONENTS FROM ENCLOSURE EDGES
14. INSTALL TAG AS SHOWN ON FRONT EXTERIOR OF PANEL.

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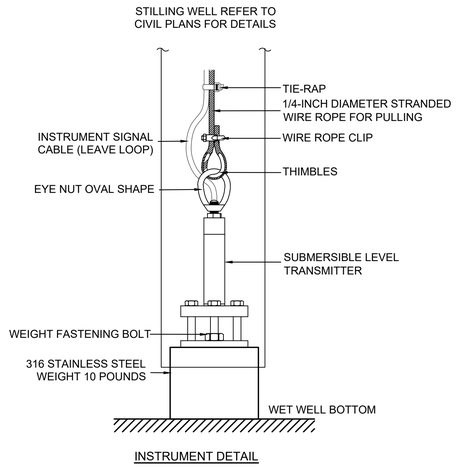
CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION
MISCELLANEOUS DETAILS #1

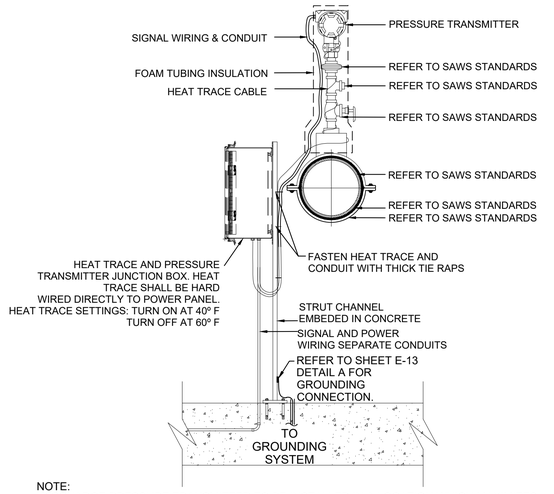
SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E11

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 FAX NO. 210-658-9805



A SUBMERSIBLE LEVEL TRANSDUCER MOUNTING DETAIL

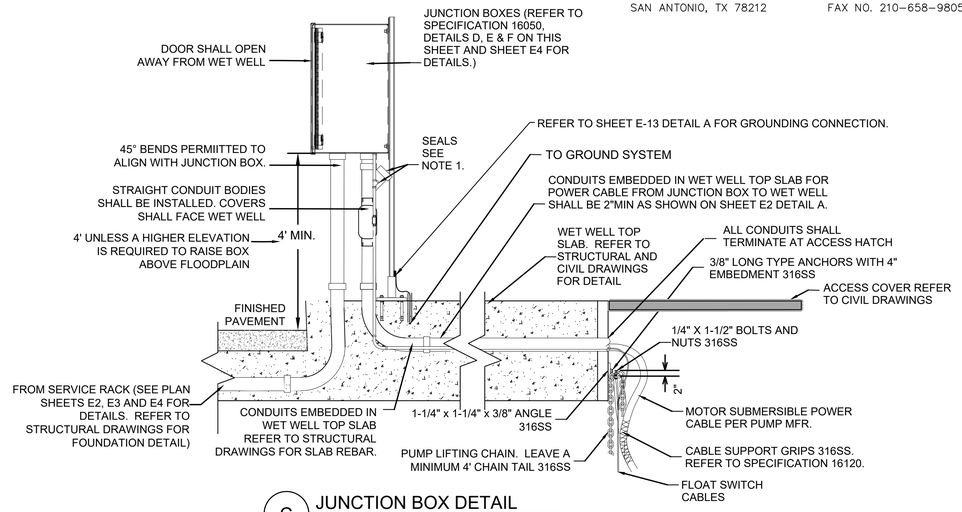
SCALE: N.T.S. SEE NOTES 16-22.



B DISCHARGE PRESSURE TRANSMITTER MOUNTING DETAIL

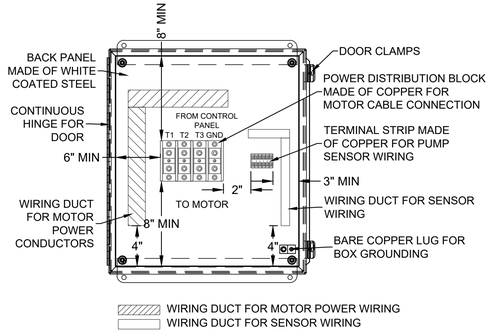
SCALE: N.T.S. SEE NOTES 12-15, 22-29.

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



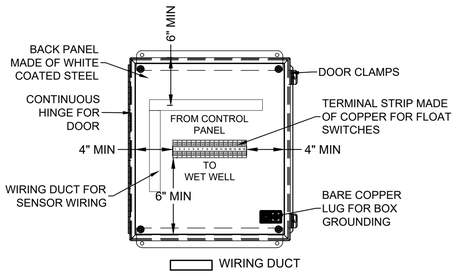
C JUNCTION BOX DETAIL

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



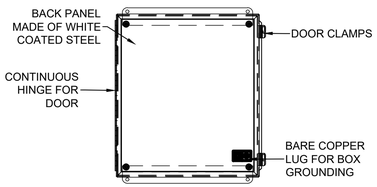
D MOTOR JUNCTION BOX INTERNAL DETAIL

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.

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.
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.

NO.	REVISION	DATE

12/6/2023
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103671
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CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION
JUNCTION BOXES & INSTRUMENTATION SCHEMATICS

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E12

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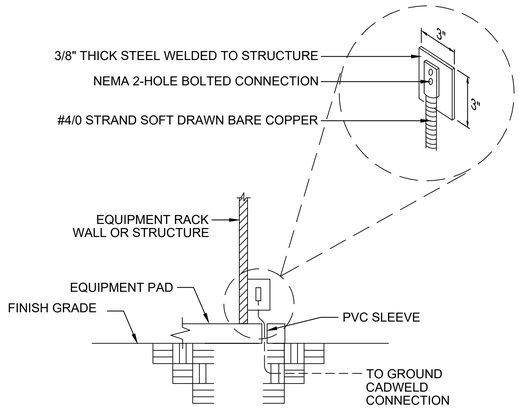
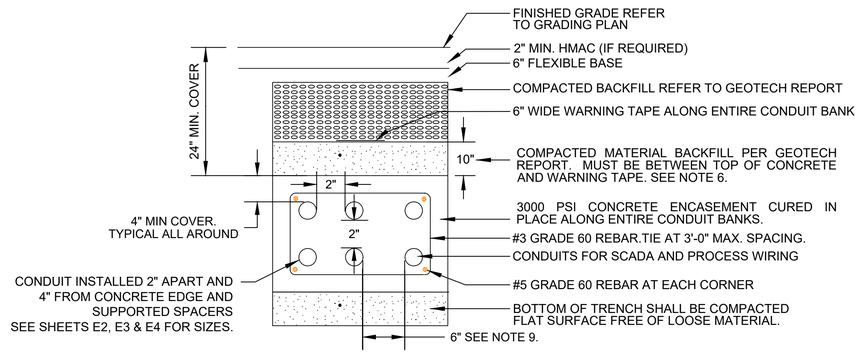
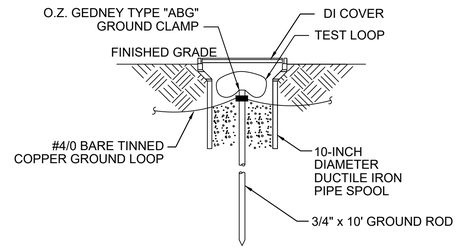
TEL. NO. 210-658-7250 FAX NO. 210-658-9805



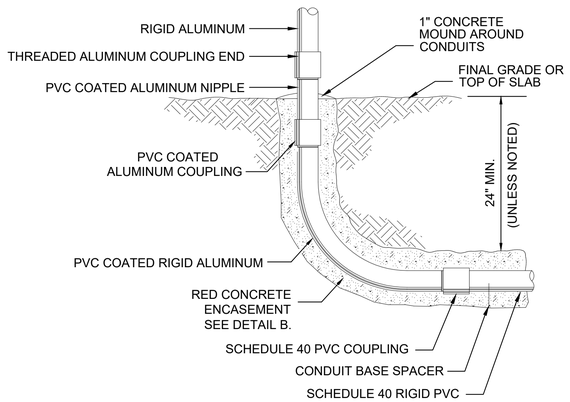
A TYPICAL STRUCTURE GROUND DETAIL
SCALE: N.T.S. SEE NOTES 1-2.



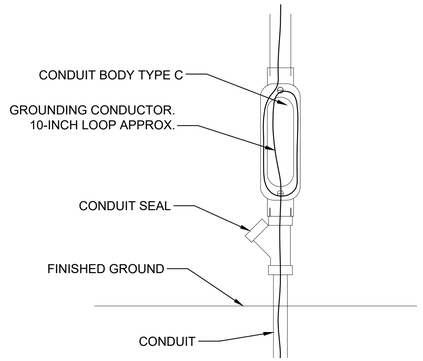
B TYPICAL LOW VOLTAGE DUCT BANK SECTION
SCALE: N.T.S. SEE NOTES 3-10.



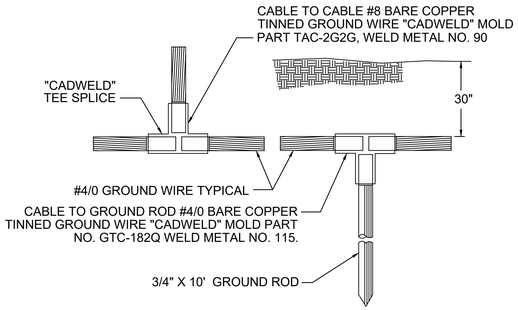
C GROUND TEST WELL ARRANGEMENT
SCALE: N.T.S.



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



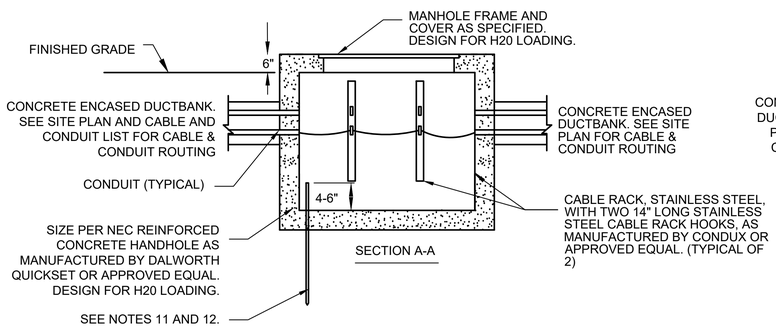
E CONDUIT BODY FOR GROUND RESISTANCE TEST DETAIL
SCALE: N.T.S.

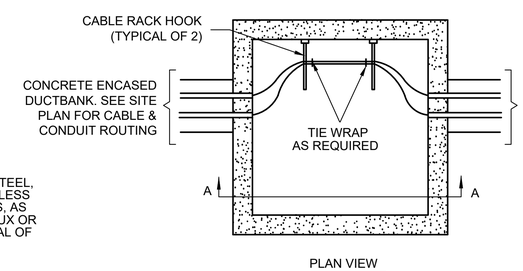


NOTE: THIS DETAIL DOES NOT EXCLUDE CONTRACTOR FROM USING OTHER APPROVED PRODUCTS.

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.
11. 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.
12. CONNECT ALL NON CURRENT-CARRYING METAL PART AN ANY METALLIC RACEWAY GROUNDING BUSHINGS TO GROUND ROD CONNECTOR WITH #4/0 AWG COPPER CONDUCTOR.





G PRE-CAST VAULT DETAIL
SCALE: N.T.S. SEE NOTES 11 AND 12.

NO.	REVISION	DATE

12/6/2023
STATE OF TEXAS
STEVEN MOUSER
103671
LICENSED
PROFESSIONAL ENGINEER

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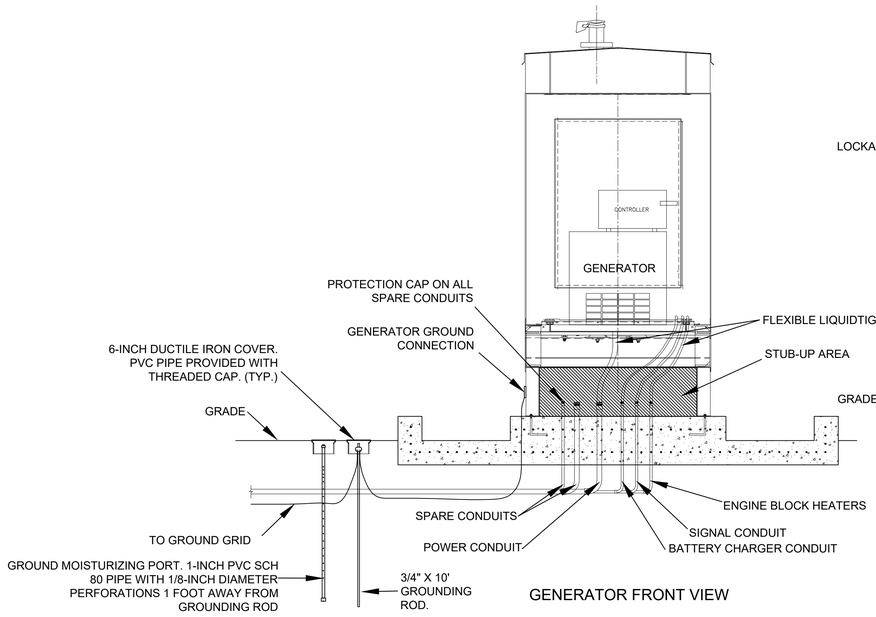
CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS
LIFT STATION
DUCTBANK AND GROUNDING DETAILS

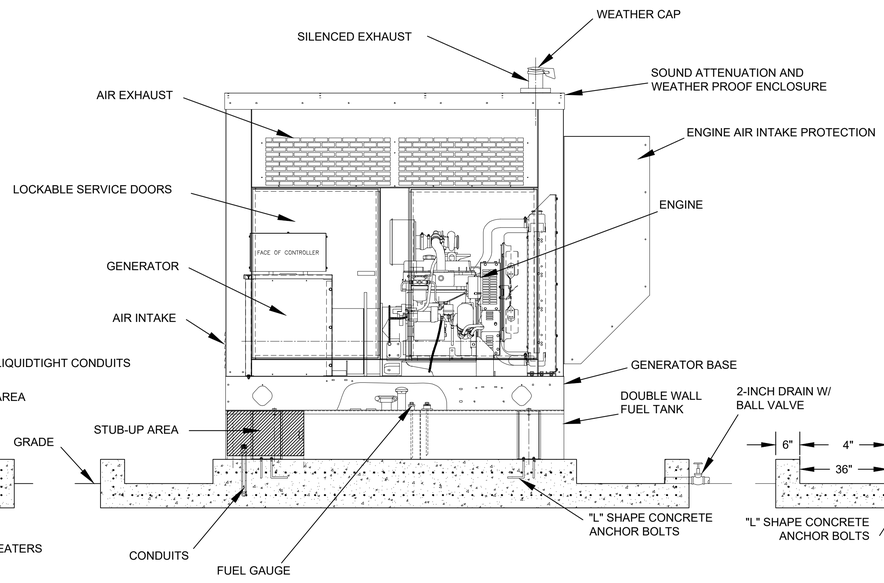
SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E13

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 FAX NO. 210-658-9805

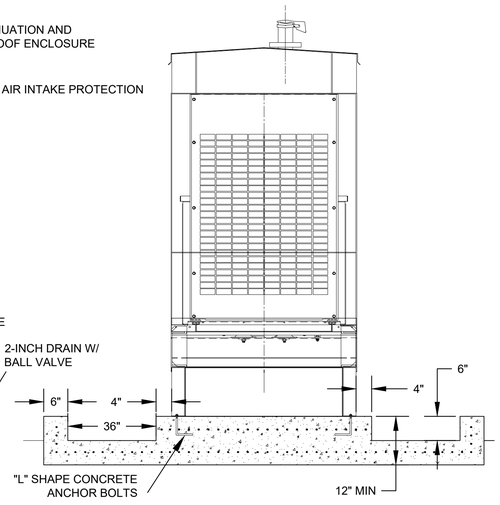
NO.	REVISION	DATE



GENERATOR FRONT VIEW



GENERATOR SIDE VIEW



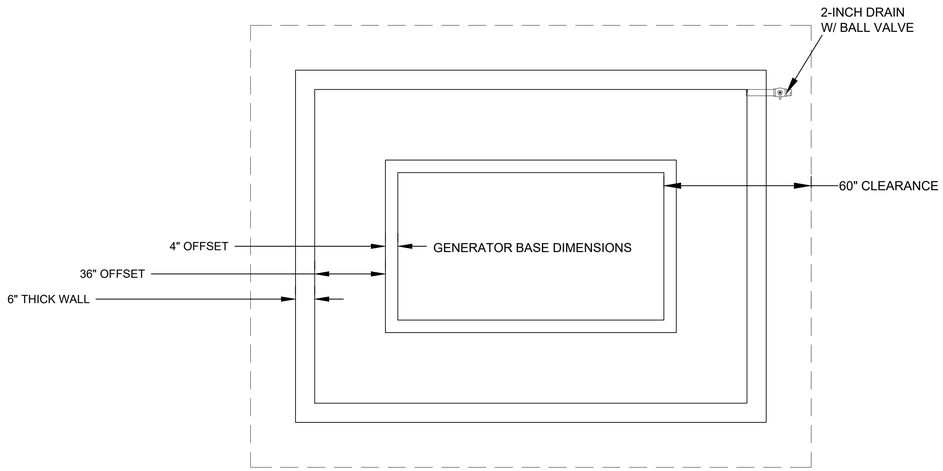
GENERATOR BACK VIEW

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.

12/6/2023
STATE OF TEXAS
STEVEN MOUSER
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CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION
GENERATOR DETAILS

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E14

Date: Dec 06, 2023, 4:21pm User ID: SGref
File: R:\Pape-Dawson\2023 Cornerstone Lift Station\100% Design\Drawings\E-14 LIFT STATION GENERATOR DETAILS.dwg

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

NO.	REVISION	DATE

12/6/2023
STATE OF TEXAS
STEVEN MOUSER
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CORNERSTONE LIFT STATION AND FORCE MAIN
SAN ANTONIO, TEXAS

LIFT STATION
P&ID

SAWS JOB NO. 22-XXXX
JOB NO. 12632-06
DATE DECEMBER 2023
DESIGNER BD
CHECKED SM DRAWN BD
SHEET E15

GRUBB ENGINEERING, INC.
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CORNERSTONE LIFT STATION AND FORCE MAIN
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LIFT STATION
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SAWS JOB NO. 22-XXXX
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DATE DECEMBER 2023
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SHEET E16

SCADA SYSTEM
DIGITAL INPUTS
ANALOG INPUTS
LOCAL SCADA PANEL
CONTROL PANELS
ATS

ZS ZS YA YA IR TAH YA YA YA PI TI YA YA
PUMP #3 IN HAND
PUMP #3 IN AUTOMATIC
PUMP #3 PHASE LOSS
PUMP #3 SOFT START IN BYPASS
PUMP #3 RUN STATUS
PUMP #3 HIGH TEMP
PUMP #3 SEAL LEAK
PUMP #3 SOFT START FAULT
PUMP #3 MOTOR OVERLOAD
FORCE MAIN PRESSURE
UPS FAIL ALARM
SCADA PANEL TEMPERATURE
GENERATOR FAIL
IE0 IE1 IE8 IE7 IE2 IE3 IE4 IE6 IE5 IA24 UPS IB9
TT

LIFT PUMP #3 CONTROL PANEL
HOA HS 301
CP3
STOP HS 302
PMR3
HS 303 BYP/SS
START HS 302
TR3
R3
CR3
HT3 OT YA 301
SL SL3 YA 302
SSF YA 304
SSF3
MO3
OL YA 303
RV3
RVSS
ON YL 301
OFF YL 302
ETM 301
M3
LC3
OE 301
OL
RESET HS 304
TAH 301
LAH 301
MOTOR OVERTEMP & SEAL FAIL PROTECTION

BLOWER CONTROL PANEL
PMR
BP1
HS 501 SS
TR1
ON YL 501
OFF YL 502
BS1
OL YA 503
OT YA 504
BO1
BT1
OL OE 501

LS-BLOWER #1
TE
LS-LP-03
ME
PIT LS-PIT-01
YA GENERATOR

A P&ID (CONTINUED FROM SHEET E16)
SCALE: N.T.S.

CONCRETE NOTES:

CN-1 ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF ACI 301 "SPECIFICATION FOR STRUCTURAL CONCRETE BUILDINGS" AND ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE."

CN-2 CONSTRUCTION TOLERANCES SHALL CONFORM TO ACI 117 "STANDARD TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS."

CN-3 CONTRACTOR SHALL SUBMIT THE FOLLOWING SHOP DRAWINGS:

REINFORCING STEEL – DETAILING FABRICATION AND ERECTION OF ALL REINFORCING BARS INCLUDING ACCESSORIES IN ACCORDANCE WITH THE LATEST EDITION OF ACI 315 "MANUAL OF STANDARD PRACTICE FOR DETAILING REINFORCED CONCRETE."

CONCRETE MIX DESIGN – FOR EACH TYPE OF CONCRETE TO BE USED BASED ON AGGREGATE SIZE AND CEMENT PROPORTION. MIX DESIGN SHALL INCLUDE CERTIFICATION OF COMPLIANCE WITH SPECIFIED MATERIALS BASED ON FIELD SAMPLES AND COMPRESSION TEST DATA FOR LABORATORY PREPARED TRIAL MIX OR FIELD TEST DATA FOR SPECIFIED MIX. FIELD TEST DATA SHALL BE FROM AN IDENTICAL MIX DESIGN SUPPLIED FROM PROPOSED BATCH PLANT AND SHALL HAVE BEEN PREPARED WITHIN THE PRECEDING SIX MONTHS.

CN-4 CONTRACTOR SHALL DESIGN, CONSTRUCT, ERECT, SHORE, BRACE AND MAINTAIN FORM WORK ACCORDING TO ACI 301. WOOD FORM WORK SHALL BE #2 COMMON OR BETTER PLYWOOD, EXPOSED SURFACES SHALL BE NEW OR LIKE NEW MOISTURE RESISTANT FIR FORM PLYWOOD. LIGHTLY COAT FORMS WITH NON-STAINING FORM OIL, REMOVE SURPLUS OIL.

CN-5 REINFORCING STEEL SHALL BE DOMESTIC NEW BILLET STEEL CONFORMING TO ASTM A615 GRADE 60, EXCEPT TIES AND STIRRUPS MAY BE GRADE 40. BARS DESIGNATED AS CONTINUOUS SHALL BE LAPPED 48 BAR DIAMETERS. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 AND SHALL BE LAPPED 8" MINIMUM AT SPLICE POINTS OR 1 1/2 MESHES, WHICHEVER IS GREATER.

CN-6 PORTLAND CEMENT SHALL COMPLY WITH ASTM C-150, TYPE 1. FLY ASH SHALL CONFORM TO ASTM C-618. NORMAL WEIGHT AGGREGATE SHALL COMPLY WITH ASTM C33. WATER SHALL BE POTABLE AND COMPLY WITH ASTM C1602. ADMIXRURES SHALL COMPLY WITH THE FOLLOWING PROVISIONS; WATER REDUCTION AND SETTING TIME MODIFICATION: ASTM C494, PRODUCING FLOWING CONCRETE: ASTM C1017, AIR ENTRAINMENT: ASTM C260, INHIBITING CHOLRIDE-INDUCED CORROSION: ASTM C1582.

CN-7 CONCRETE SHALL BE NORMAL WEIGHT, LABORATORY DESIGNED TO DEVELOP MINIMUM SPECIFIED 28 DAY COMPRESSIVE STRENGTH AND PROPORTIONED AS FOLLOWS:

CONCRETE MIXTURE REQUIREMENTS

APPL.	DESIGN STRN, f'c	w/cm RATIO	MAX AGGR. SIZE	AIR ENTR.	EXPOSURE CLASS
SLAB ON GRADE	3000	NA	1 1/2	NA	NA

w/cm RATIOS NOT SPECIFIED SHALL BE AS REQUIRED TO ACHIEVE DESIGN STRENGTH
IF AN EXPOSURE CLASS IS SPECIFIED, PROVIDE MIX DESIGNS PER ACI 301

CN-8 ALL REINFORCING STEEL SHALL BE FREE OF RUST, SCALE, AND DRIED CONCRETE, AND SHALL BE ACCURATELY BENT AND SECURELY TIED INTO POSITION TO PREVENT MOVEMENT DURING CONCRETE PLACEMENT. RAISING REINFORCEMENT DURING POUR WILL NOT BE PERMITTED.

CN-9 CONCRETE COVER SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:

A. CONCRETE CAST AGAINST EARTH – 3"

B. CONCRETE EXPOSED TO EARTH OR WEATHER:
BARS 3/4" AND LARGER IN DIAMETER – 2 INCHES
BARS SMALLER THAN 3/4" DIAMETER – 1 1/2"

C. CONCRETE NOT EXPOSED TO WEATHER OR GROUND:
SLAB ON GRADE – 1 1/2" FROM TOP OF SLAB

CN-10 SET AND BUILD ANCHORAGE AND OTHER EMBEDDED ITEMS INTO FORM WORK AS REQUIRED FOR OTHER WORK THAT IS ATTACHED TO OR SUPPORTED BY CONCRETE. COORDINATE WITH OTHER DISCIPLINES.

CN-11 CONCRETE SHALL BE MIXED AND DELIVERED IN ACCORDANCE WITH ASTM C-94 "STANDARD SPECIFICATION FOR READY-MIXED CONCRETE."

CN-12 CONCRETE WHEN DEPOSITED SHALL HAVE A TEMPERATURE NOT BELOW 50°F OR ABOVE 90°F. APPROPRIATE MEASURES SHALL BE TAKEN TO MAINTAIN TEMPERATURE RANGE AND PREVENT WATER EVAPORATION FOR 5 DAYS AFTER PLACEMENT. SALT OR OTHER CHEMICALS SHALL NOT BE ADDED TO PREVENT FREEZING.

CN-13 CONCRETE SHALL BE CONVEYED TO AND DEPOSITED IN FORM WORK NEAR ITS FINAL POSITION, WITH A FREE VERTICAL DROP NOT EXCEEDING 3 FEET. PLACE CONCRETE IN 12 INCH MAXIMUM LAYERS AND COMPACT EACH LAYER BY MECHANICAL VIBRATING.

CN-14 CONSTRUCTION JOINTS IN MONOLITHIC FRAMING SHALL HAVE PRIOR APPROVAL OF THE ARCHITECT/ENGINEER, U.N.O.

CN-15 SCREENING, RE-STRAIGHTENING, AND FINISHING OPERATIONS SHALL COMPLY WITH ACI 302.1R. COORDINATE ALL FINISHES WITH ARCHITECTURAL DRAWINGS AND FLOOR FINISH REQUIREMENTS. CAREFULLY TOOL ALL EXPOSED EDGES.

CN-16 CURE CONCRETE FOR AT LEAST SEVEN DAYS BY MOISTURE CURING, SEALED MOISTURE RETAINING COVER CURING, OR A CLEAR WATERBORNE CURING COMPOUND CONFORMING TO ASTM C309.

CN-17 SIDE FORMS MAY BE REMOVED AFTER CUMULATIVE CURING AT NOT LESS THAN 50°F FOR 24 HOURS AFTER PLACING CONCRETE. SOFFITS OF SUSPENDED CONCRETE MAY BE REMOVED AFTER CURING FOR AT LEAST SEVEN DAYS AND COMPRESSIVE TEST RESULTS INDICATE AT LEAST 75% OF SPECIFIED DESIGN STRENGTH. RESHORE AS REQUIRED FOR CONSTRUCTION LOADS.

CN-18 PATCH HONEYCOMB, TIE HOLES, AND MINOR DEFECTS WITH ONE PART CEMENT AND TWO PARTS SAND IMMEDIATELY AFTER REMOVING FORMS.

CN-19 EXPOSED CONCRETE SHALL BE RUBBED WITH CARBORUNDUM BRICKS AND WATER AFTER 48 HOURS BUT BEFORE ONE WEEK. PLASTERING SURFACES WILL NOT BE PERMITTED.

CN-20 NOTIFY ENGINEER WHEN FORM WORK AND REINFORCING IS IN PLACE SO ENGINEER CAN OBSERVE REINFORCING STEEL PRIOR TO ALL CONCRETE POURS.

CN-21 INDEPENDENT TESTING LABORATORY SHALL TAKE SAMPLES AND PERFORM SLUMP AND COMPRESSION TESTS PER ASTM C-39 ON CONCRETE PLACED EACH DAY AT THE RATE OF ONE SET OF FOUR CYLINDERS FOR EACH 80 CU. YDS. OR FRACTION THEREOF WITH A MINIMUM INTERVAL OF 50 CU. YDS. BETWEEN SAMPLES.

STEEL FRAMING NOTES:

SF-1 STRUCTURAL STEEL SHAPES SHALL CONFORM TO ASTM 992, Fy=50 KSI. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B, Fy=46 KSI. PIPES SHALL CONFORM TO ASTM A501, Fy=36 KSI OR ASTM A-53, TYPE E OR S, GRADE B, Fy=35 KSI. STEEL PLATES, BARS, AND OTHER SHAPES SHALL CONFORM TO ASTM A36, Fy=36 KSI. CONNECTIONS SHALL CONFORM TO REQUIREMENTS OF AISC.

SF-2 WELDING SHALL BE BY WELDERS HOLDING VALID CERTIFICATES AND CURRENT EXPERIENCE IN THE TYPE OF WELD SHOWN ON THE DRAWINGS ALL WELDING DONE BY E70XX SERIES LOW HYDROGEN RODS. FOR ASTM A615 GRADE 60 REINFORCING BARS, USE 706 SERIES. ALL WELDS ON DRAWINGS ARE SHOWN AS SHOP WELDS, UNLESS NOTED OTHERWISE.

SF-3 STRUCTURAL FRAMING CONNECTIONS SHALL BE SEATED COLUMN CAPS, CLIP ANGLES OR WEB PLATES AS INDICATED ON DETAILS. USE A325 HIGH STRENGTH BOLTS OR WELDS SUFFICIENT TO DEVELOP REACTION CAPACITY ALLOWABLE UNIFORM LOAD/SPAN DIVIDED BY TWO AS SHOWN IN AISC MANUAL SECTION 2 (9TH EDITION).

SF-4 DECK STOP ANGLES, FASCIA ANGLES, HANGERS, CLIPS AND OTHER STRUCTURAL AND MISCELLANEOUS MEMBERS SHALL BE CONNECTED OR JOINED USING 3/16" OR LARGER FILLET OR GROOVE WELDS AS REQUIRED FOR ADEQUATE CONNECTION.

SF-5 WHERE OPENINGS THROUGH ROOF ARE REQUIRED, FRAME AS DETAILED.

STEEL FRAMING NOTES CONT:

SF-6 ALL EXPOSED STRUCTURAL STEEL AND LINTEL ANGLES SHALL BE CLEANED AND GALVANIZED. APPLY ZINC COATING BY THE HOT-DIP PROCESS AND ACCORDING TO A.S.T.M. A123. FIELD WELDS, BOLTED CONNECTIONS AND ABRADED AREAS SHALL BE CLEANED AND "TOUCHED UP" WITH GALVANIZING REPAIR PAINT IN ACCORDANCE WITH A.S.T.M. A780. THE GALVANIZING REPAIR PAINT SHALL HAVE A HIGH ZINC-DUST CONTENT WITH DRY FILM CONTAINING NO LESS THAN 95% ZINC-DUST BY WEIGHT, AND COMPLYING WITH THE DOD-P-21035A OR SSPC-PAINT 20.

SF-7 CONTRACTOR SHALL PROVIDE PROTECTION FOR ALL EXISTING CONSTRUCTION DURING ALL FIELD WELDING OPERATIONS. A FIRE EXTINGUISHER SHALL BE ON THE JOB SITE AND IN THE IMMEDIATE WORKING AREA OF ALL FIELD WELDING.

SF-8 CONTRACTOR SHALL SUBMIT STRUCTURAL STEEL SHOP DRAWINGS SHOWING ANCHORAGE PLACING PLANS, ERECTION PLANS, AND DETAIL DRAWINGS FOR ALL STEEL FRAMING MEMBERS INCLUDING BRIDGING, BRACING, CONNECTIONS, METHODS OR ASSEMBLY, ETC.

STEEL COLUMN SCHEDULE

MK	SECTION	BASE PLATE			TOP CONN.	REMARKS
		W x D x t	ANCHORS	DETAIL		
C1	HSS5x5x3/8	N/A	N/A	6/S2.0	6/S2.0	

LEHMANN ENGINEERING, Inc.
1006 Beckett, San Antonio, TX 78213
Ph (210)348-8889
TX Firm Reg. No. F-5298

GENERAL NOTES:

GN-1 THIS STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (2015) AS AMENDED AND ADOPTED BY THE CITY OF _____, AND APPLICABLE INDUSTRY STANDARDS (AISC, ACI, ETC.).

GN-2 DESIGN CRITERIA:
DEAD LOADS – THE WEIGHT OF THE MATERIALS FORMING THE PERMANENT PART OF THE BUILDING. A SUPERIMPOSED DEAD LOAD OF 5 PSF HAS BEEN APPLIED FOR MECHANICAL DUCTS, CONDUITS, CEILING, ETC.

LIVE LOADS - IN ACCORDANCE WITH IBC SECTION 1607	
FLOORS:	LOADS
RESIDENTIAL – ATTICS WITH STORAGE	20 PSF
RESIDENTIAL – HABITABLE ATTICS AND SLEEPING AREAS	30 PSF
RESIDENTIAL – ALL OTHER AREAS EXCEPT BALCONIES	40 PSF
RESIDENTIAL – BALCONIES	60 PSF
STADIUMS AND ARENAS – BLEACHERS	100 PSF
STADIUMS AND ARENAS – FIXED SEATING	60 PSF
WALKWAYS AND ELEVATED PLATFORMS (OTHER THAN EXIT WAYS)	60 PSF
BALCONIES (UNLESS NOTED OTHERWISE)	100 PSF
CORRIDORS (UNLESS NOTED OTHERWISE)	100 PSF
MOVABLE PARTITION	15 PSF
DECKS	SAME AS OCCUPANCY
STAIRS AND EXITS (UNLESS NOTED OTHERWISE)	100 PSF OR 300 LBS.
MECHANICAL ROOM	150 PSF
ROOFS:	LOADS
ROOF	20 PSF
AWNINGS AND CANOPIES	5 PSF
MECHANICAL EQUIPMENT	AS INDICATED ON PLANS
LIVE LOADS REDUCTIONS - FLOORS IN ACCORDANCE WITH IBC SECTION 1607.9	
LIVE LOADS REDUCTIONS - ROOFS IN ACCORDANCE WITH IBC SECTION 1607.11	
WIND LOADS - PER IBC SECTION 1609	
ULTIMATE DESIGN WIND SPEED (3 SECOND GUST), V-ult	115 MPH
NOMINAL DESIGN WIND SPEED, V-asd	89 MPH
EXPOSURE CATEGORY	C
RISK CATERGORY	II
SNOW LOADS - PER IBC SECTION 1608	5 PSF
EARTHQUAKE LOADS - PER IBC SECTIONS 1613	
IMPORTANCE FACTOR	1
OCCUPANCY CATEGORY	11
0.2 SEC SPECTRAL RESPONSE ACCELERATION (Ss)	0.1000
1 SEC SPECTRAL RESPONSE ACCELERATION (S1)	0.030
SITE CLASS	D
0.2 SEC SPECTRAL RESPONSE COEFFICIENT (SDs)	0.1070
1 SEC SPECTRAL RESPONSE COEFFICIENT (SD1)	0.048
SEISMIC DESIGN CATEGORY	A
RESISTING SYSTEM	WOOD SHEAR WALLS
ANALYSIS PROCEDURE	ASCE 7-11.7
RESPONSE COEFFICIENT	N/A
MODIFICATION FACTOR	N/A
BASE SHEAR	N/A

GN-3 THE STRUCTURE HAS BEEN DESIGNED TO RESIST DESIGN LOADS ONLY AS A COMPLETED STRUCTURE. CONTRACTOR SHALL CONSIDER ALL LOADS APPLIED TO THE PARTIALLY COMPLETED STRUCTURE AND PROVIDE TEMPORARY BRACING AS REQUIRED UNTIL ALL PERMANENT CONNECTIONS ARE MADE. ANY PROPOSED APPLICATION OF CONSTRUCTION LOADS WHICH EXCEED THE DESIGN LOADS WILL REQUIRE REANALYSIS AND PROBABLE REDESIGN.

GN-4 THE FOUNDATION DESIGN IS BASED ON THE GEOTECHNICAL ENGINEERING STUDY PREPARED BY INTEC (PROJECT NO. S231712, JUNE 5, 2023). THE GEOTECHNICAL ENGINEERING STUDY REPORT INCLUDES OTHER RECOMMENDATIONS THAT EFFECT THE LONG TERM PERFORMANCE OF THE FOUNDATION WHICH ARE BEYOND THE SCOPE OF LEHMANN ENGINEERING'S SERVICES. THE CONTRACTOR AND OWNER SHALL REVIEW THE SOILS REPORT AND IMPLEMENT RECOMMENDATIONS PROVIDED WITH (I.E. LANDSCAPING VEGETATION, ROOT BARRIERS, SITE DRAINAGE, ROOF DRAINS, SOIL MOISTURE MAINTENANCE, ETC.)

GN-5 PRIOR TO START OF CONSTRUCTION, THE CONTRACTOR AND FABRICATOR SHALL VERIFY ALL QUANTITIES, DIMENSIONS AND CONDITIONS AND NOTIFY ARCHITECT/ENGINEER OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK.

GN-6 VERIFY REQUIREMENTS OF OTHER TRADES (MECHANICAL, ELECTRICAL, ETC.) PRIOR TO PROCEEDING WITH FABRICATION OR INSTALLATION OF MATERIALS.

GN-7 UTILITIES PENETRATING BUILDING SHALL BE FLEXIBLE, USING SLEEVE JOINTS, BENDS, LOOPS, ETC. TO PERMIT MOVEMENTS DUE TO EXPANSIVE UNDERLYING SOILS.

GN-8 THE DETAILS DESIGNATED AS "TYPICAL DETAILS", APPLY GENERALLY TO THE DRAWINGS IN ALL AREAS WHERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN DETAILS.

GN-9 COMPLETED SHOP DRAWINGS SHALL BE PROVIDED FOR FABRICATED ITEMS, REFERENCE INDIVIDUAL SECTIONS FOR SPECIFIC REQUIREMENTS. SUBMIT A MINIMUM OF FOUR COPIES OF EACH SUBMITTAL WITH ADDITIONAL COPIES AS DIRECTED BY THE ARCHITECT. SHOP DRAWINGS SHALL BE REVIEWED BY THE GENERAL CONTRACTOR AND SUBMITTED THROUGH THE ARCHITECT/ENGINEER PRIOR TO FABRICATION. THE STRUCTURAL DRAWINGS ARE COPYRIGHTED AND SHALL NOT BE REPRODUCED FOR SHOP DRAWINGS.

GN-10 CONTRACTOR SHALL NOTIFY ARCHITECT/ENGINEER AT LEAST 24 HOURS IN ADVANCE OF ANY CONCRETE POUR OR OTHER ACTION THAT WILL COVER UP STRUCTURAL ELEMENTS SO THE ENGINEER CAN CONDUCT PERIODIC SITE OBSERVATIONS AS REQUIRED TO PROVIDE A FINAL LETTER OF GENERAL COMPLIANCE TO THE OWNER AND/OR BUILDING AUTHORITY. PERIODIC SITE OBSERVATIONS ARE SOLELY FOR THE PURPOSE OF DETERMINING IF THE WORK IS PROCEEDING IN GENERAL ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND ARE NOT INTENDED TO BE A COMPREHENSIVE OR EXHAUSTIVE CHECK OF THE QUALITY AND/OR QUANTITY OF THE WORK. THESE OBSERVATIONS DO NOT CONSTITUTE THE SPECIAL INSPECTION REQUIREMENTS OF THE IBC SECTION 1704.

GN-11 THE ENGINEER SHALL NOT HAVE CONTROL OF, AND SHALL NOT BE RESPONSIBLE FOR, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES, FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, FOR THE ACTS OR OMISSION OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK, OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.

GN-12 THE OWNER SHALL EMPLOY AN INDEPENDENT TESTING LABORATORY TO PERFORM CONSTRUCTION MATERIALS TESTING FOR THE PROJECT. REFERENCE SPECIFIC SECTIONS FOR TESTING REQUIREMENTS. THE CONTRACTOR SHALL NOTIFY THE OWNER OF THIS REQUIREMENT AND COORDINATE THESE SERVICES AS NECESSARY THROUGHOUT THE PROCESS OF CONSTRUCTION.

GN-13 ASSUMPTIONS HAVE BEEN MADE BY THIS OFFICE REGARDING EXISTING CONDITIONS. ACTUAL CONDITIONS MAY VARY FROM THOSE ASSUMED. THE CONTRACTOR IS TO REPORT ANY SUCH DISCREPANCIES TO THE ENGINEER FOR POSSIBLE MODIFICATIONS NEEDED TO THE CONTRACT DRAWINGS BEFORE PROCEEDING WITH FURTHER WORK.

NO.	REVISION	DATE
1	REVISION	03.15.24

STATE OF TEXAS
AARON M. STAAS
104806
LICENSED PROFESSIONAL ENGINEER
JANUARY 24, 2024

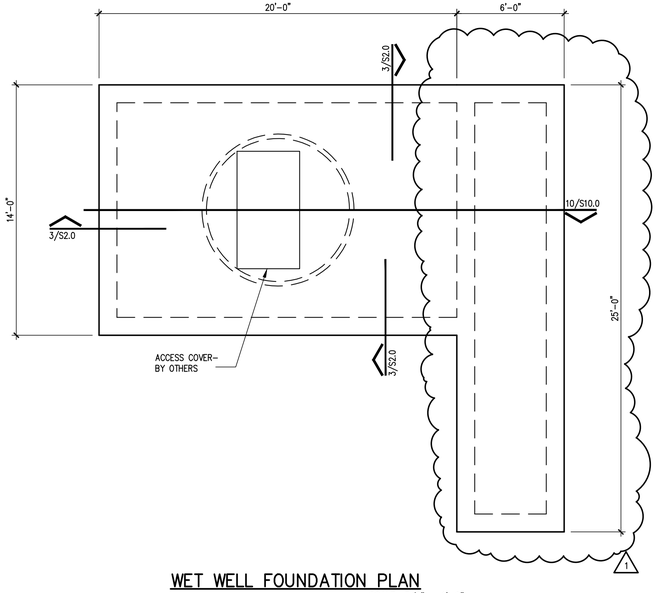
PAPE-DAWSON ENGINEERS
SAN ANTONIO | AUSTIN | HOUSTON | FORT WORTH | DALLAS
2000 NW LOOP 410 | SAN ANTONIO, TX 78213 | 210.375.9000
TEXAS ENGINEERING FIRM #470 | TEXAS SURVEYING FIRM #10028800

440 QUARRY IMPROVEMENTS PRV ASSEMBLIES
SAN ANTONIO, TX

PLAT NO. _____
JOB NO. 12934-00
DATE APRIL 2023
DESIGNER CD
CHECKED AMS DRAWN JR
SHEET S1.0

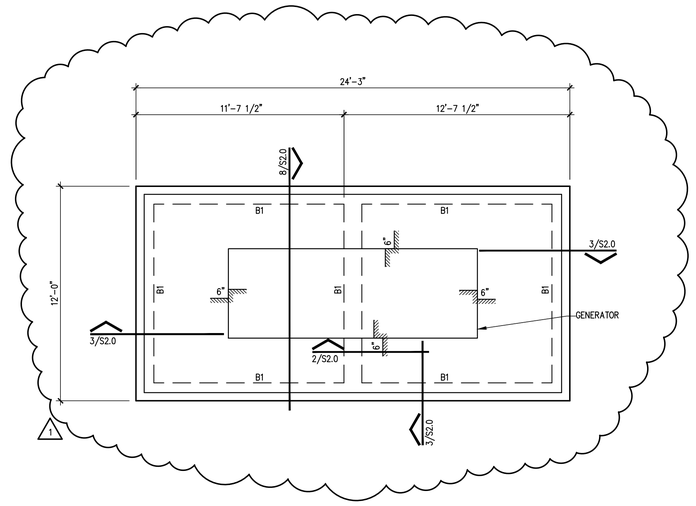
LE PROJECT NO.: 23-03875
LE FILE NO.: S1.0

LEHMANN ENGINEERING, Inc.
1006 Beckett, San Antonio, TX 78213
Ph (210)348-8889
TX Firm Reg. No. F-5298



WET WELL FOUNDATION PLAN
SCALE: 3/8" = 1'-0"

TEXAS ONE CALL SYSTEM
CALL BEFORE YOU DIG
UNDERGROUND UTILITIES
1-800-245-4545
CALL 48 HOURS BEFORE YOU DIG, DRILL, OR BLAST.

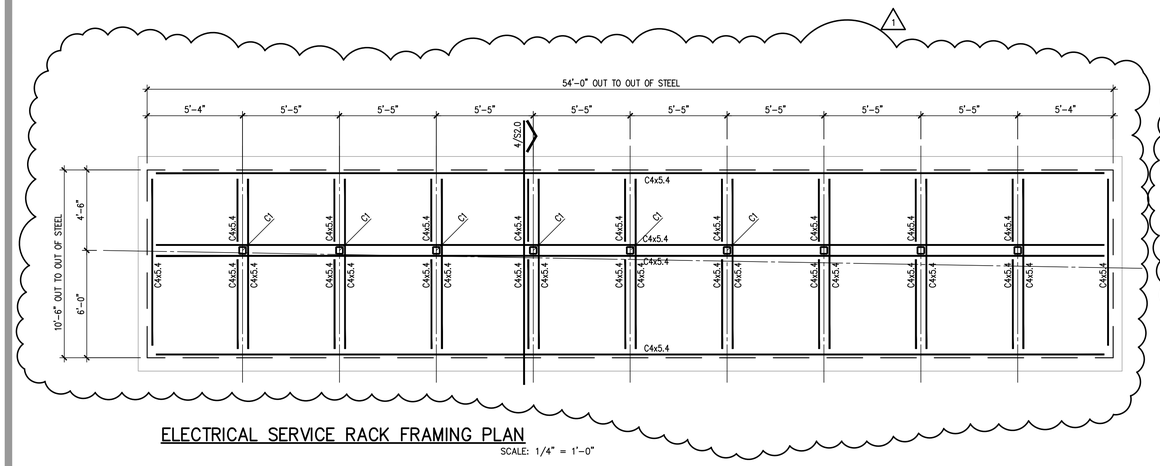


GENERATOR FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

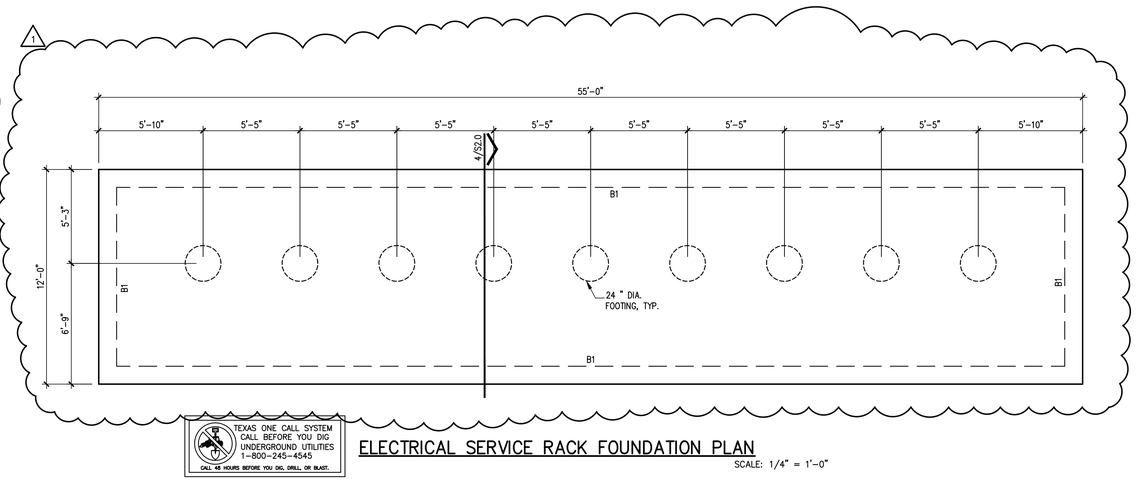
TEXAS ONE CALL SYSTEM
CALL BEFORE YOU DIG
UNDERGROUND UTILITIES
1-800-245-4545
CALL 48 HOURS BEFORE YOU DIG, DRILL, OR BLAST.

PLAN NOTES:

1. B1 – REF. GRADE BEAM SCHEDULE ON SHEET S2.0
2. T.O.C.=? DENOTES TOP OF CONCRETE ELEVATION RELATIVE TO STRUCTURAL DATUM



ELECTRICAL SERVICE RACK FRAMING PLAN
SCALE: 1/4" = 1'-0"



TEXAS ONE CALL SYSTEM
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UNDERGROUND UTILITIES
1-800-245-4545
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ELECTRICAL SERVICE RACK FOUNDATION PLAN
SCALE: 1/4" = 1'-0"

NO.	REVISION	DATE
1	REVISION	03.15.24

STATE OF TEXAS
AARON M. STAAS
104806
LICENSED
PROFESSIONAL ENGINEER
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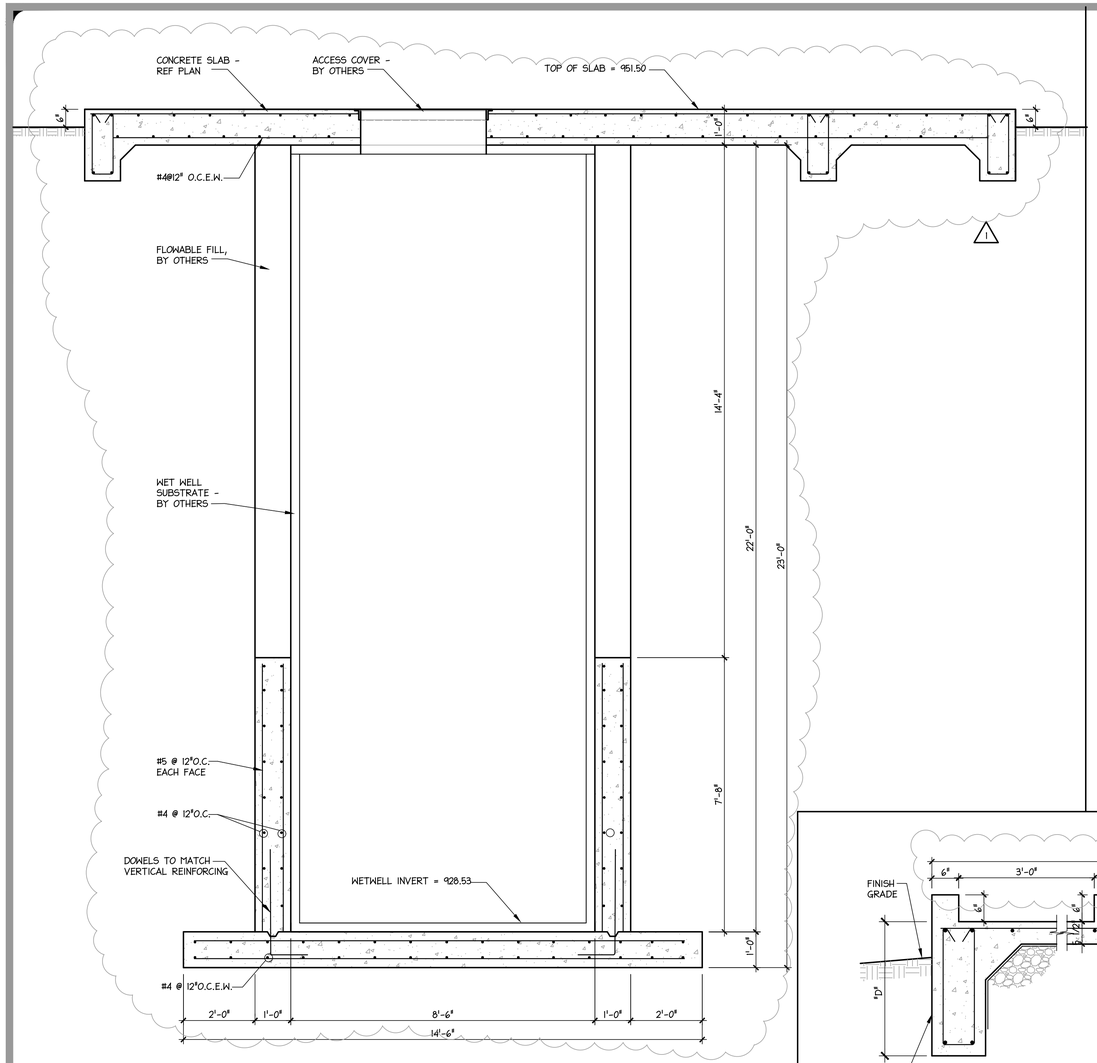
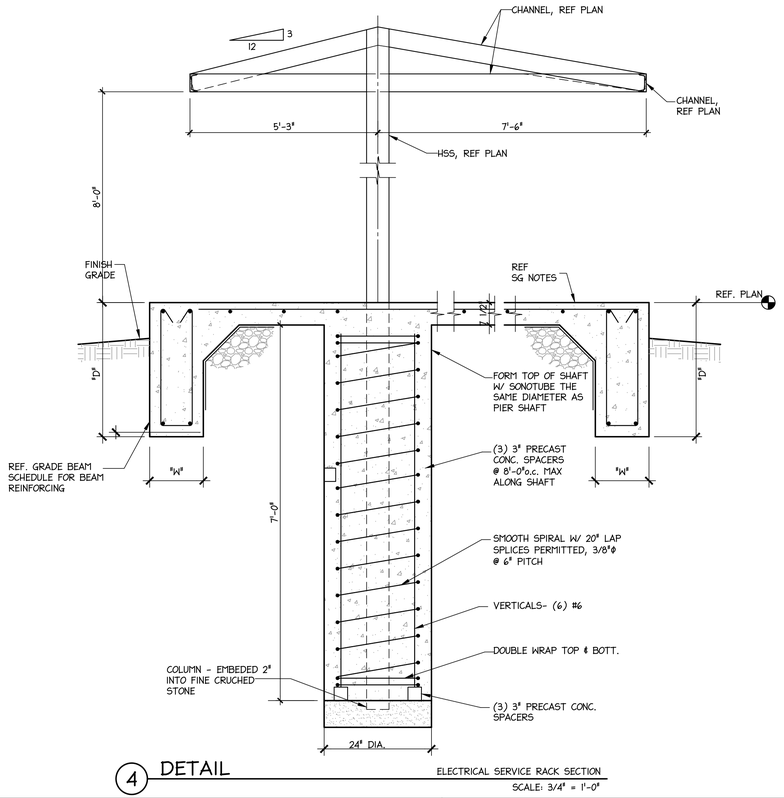


10 SECTION

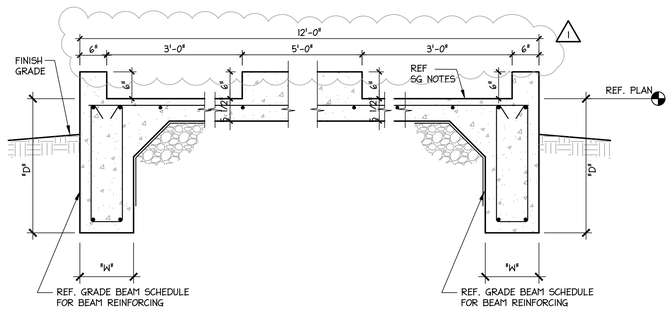
SCALE: 1/2" = 1'-0"



4 DETAIL

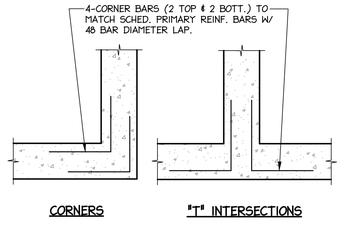
ELECTRICAL SERVICE RACK SECTION

SCALE: 3/4" = 1'-0"



8 SECTION

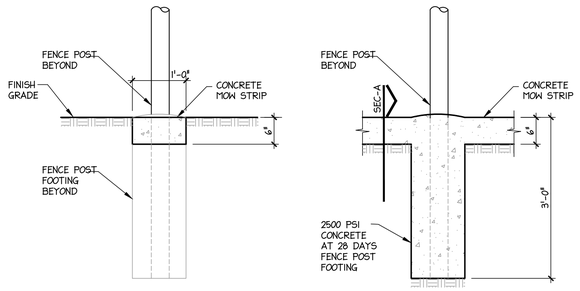
SCALE: 3/4" = 1'-0"



5 DETAIL

TYP. CORNER BARS

SCALE: 1/2" = 1'-0"



SEC-A

11 SECTION AT MOW STRIP/FENCE POST

SCALE: 1/2" = 1'-0"

LIGHT POLE FOOTING SCHEDULE

MK	SHAFT			DEPTH	REMARKS
	DIA.	VERT. BARS	SPIRAL		
LP1	24"	(6) #6	3/8"ϕ @ 6" PITCH	5'-0"	

LIGHT POLE FOOTING NOTES:

LP-1 FORM TOP OF SHAFT WITH FIBERFORM AT LEAST 2'-0" BELOW GRADE, OR DEEPER IF IMPROPERLY DRILLED OVERSIZE OR OUT OF ROUND.

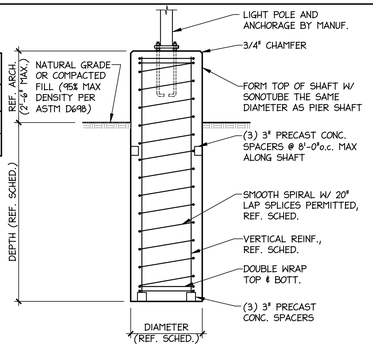
LP-2 REINFORCING CAGE SHALL BE HELD SECURELY AWAY FROM EARTH AT SIDES & BOTTOM BY SETS OF 3 PRECAST CONCRETE SPACER BLOCKS EVERY 8'-0" ALONG CAGE AND AT BOTTOM. DO NOT RAISE CAGE OFF OF BOTTOM.

LP-3 ALL FOOTING EXCAVATIONS SHALL BE FREE OF WATER PRIOR TO PLACING CONCRETE.

LP-4 PIER SHAFT SHALL BE DRILLED PLUMB ALONG ITS TOTAL LENGTH WITHIN 1/2" PER 10'-0" OF DEPTH.

LP-5 BOTTOM OF FOOTING SHALL BE CLEAN AND FREE OF ALL LOOSE MATERIALS AND RECOMPACTED CUTTING PRIOR TO PLACING CONCRETE.

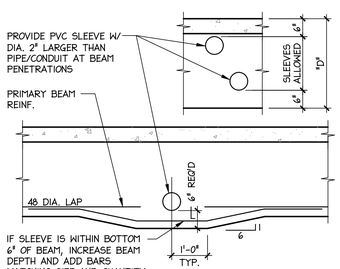
LP-6 PLACEMENT OF CONCRETE AND REINFORCING IN SHAFT SHALL BE THE SAME DAY OF DRILLING.



9 DETAIL

TYPICAL LIGHT POLE FOOTING

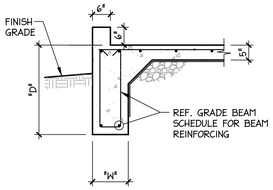
SCALE: N.T.S.



6 DETAIL

TYP. BEAM PENETRATION

SCALE: 1/2" = 1'-0"



3 SECTION

SCALE: 1/2" = 1'-0"

LE PROJECT NO.: 23-03875
LE FILE NO.: S2.0

LEHMANN ENGINEERING, Inc.
1006 Beckett, San Antonio, TX 78213
Ph (210)348-8889
TX Firm Reg. No. F-5298

NO.	REVISION	DATE
1	REVISION	05.15.24

STATE OF TEXAS
AARON M. STAAS
104806
LICENSED
PROFESSIONAL ENGINEER
JANUARY 24, 2024

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

440 QUARRY IMPROVEMENTS PRV ASSEMBLIES
SAN ANTONIO, TX

PLAT NO.
JOB NO. 12934-00
DATE APRIL 2023
DESIGNER CD
CHECKED AMS DRAWN JR
SHEET S2.0