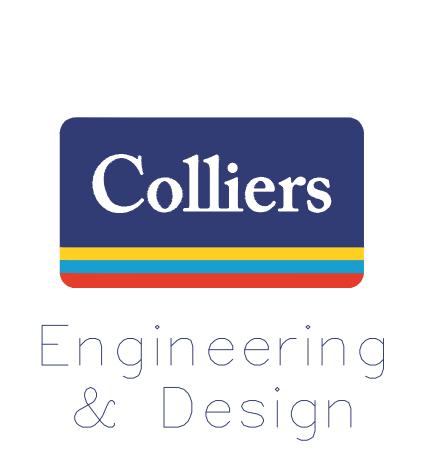
CONSTRUCTION PLANS FOR

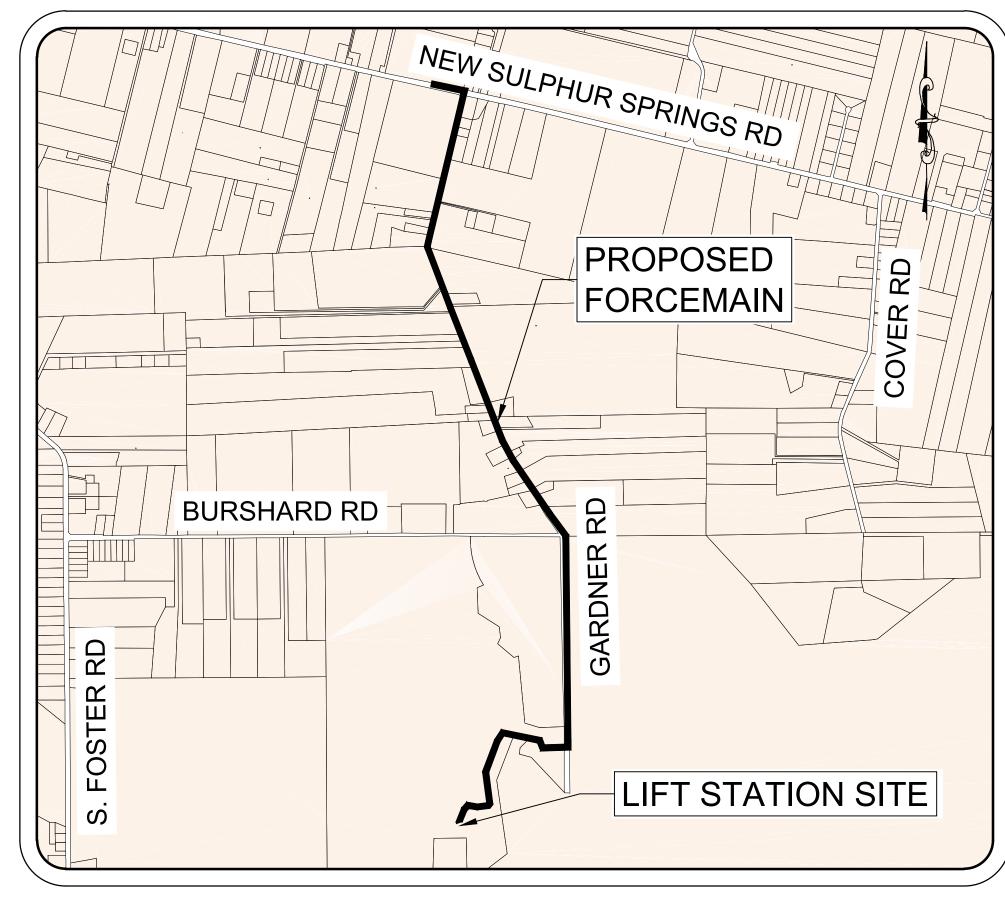
NORTHLAKE LIFT STATION AND FORCE MAIN 100% DESIGN REVIEW SET







THE SEAL APPEARING ON THIS DOCUMENT WAS AUTHORIZED BY DAVID A. KNEUPER, REGISTERED P.E. NO. 96676, February 25, 2025. ALTERATION OF A SEALED DOCUMENT WITHOUT PROPER NOTIFICATION TO THE RESPONSIBLE ENGINEER IS AN OFFENSE UNDER THE TEXAS ENGINEERING PRACTICE ACT.



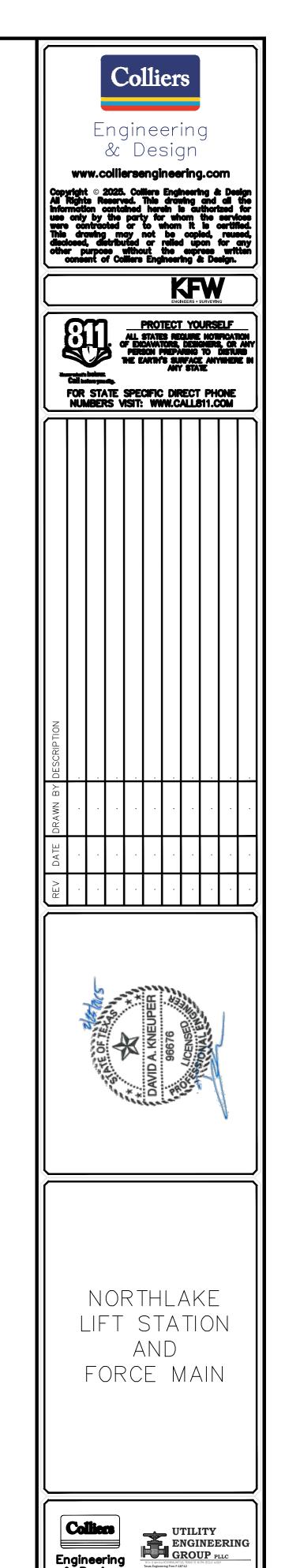
LOCATION MAP N.T.S.



	Sheet List Table
Sheet Number	
OHEEL MUHIDEL	GENERAL
G-1	COVER SHEET
G-2	INDEX AND QUANTITY SHEET
G-2 G-3	TCEQ GENERAL NOTES
G-3 G-4	SAWS GENERAL CONSTRUCTION NOTES
G-4	
101	LIFT STATION
LS-1	SITE PLAN
LS-2	GRADING PLAN
LS-3	LIFT STATION EROSION CONTROL
LS-4	LIFT STATION PLAN VIEW
LS-5	LIFT STATION PROFILE VIEW
LS-6	SAWS LIFT STATION DETAILS 1 OF 5
LS-7	SAWS LIFT STATION DETAILS 2 OF 5
LS-8	SAWS LIFT STATION DETAILS 3 OF 5
LS-9	SAWS LIFT STATION DETAILS 4 OF 5
LS-10	SAWS LIFT STATION DETAILS 5 OF 5
LS-11	ADDITIONAL LIFT STATION DETAIL SHEET 1 OF 5
LS-12	ADDITIONAL LIFT STATION DETAIL SHEET 2 OF 5
LS-13	ADDITIONAL LIFT STATION DETAIL SHEET 3 OF 5
LS-14	ADDITIONAL LIFT STATION DETAIL SHEET 4 OF 5
LS-15	ADDITIONAL LIFT STATION DETAIL SHEET 5 OF 5
	PROP. 15" GRAVITY MAIN
GM-1	GRAVITY MAINS 'A' AND 'B'
	PROP. 12" FORCEMAIN
FM-1	12" FORCEMAIN STA. 0+00.00 - 6+50.00
FM-2	12" FORCEMAIN STA. 6+50.00 - 13+00.00
FM-3	12" FORCEMAIN STA. 13+00.00 - 19+50.00
FM-4	12" FORCEMAIN STA. 19+50.00 - 26+00.00
FM-5	12" FORCEMAIN STA. 26+00.00 - 32+50.00
FM-6	12" FORCEMAIN STA. 32+50.00 - 39+00.00
FM-7	12" FORCEMAIN STA. 39+00.00 - 45+50.00
FM-8	12" FORCEMAIN STA. 45+50.00 - 52+00.00
FM-9	12" FORCEMAIN STA. 52+00.00 - 58+50.00
FM-10	12" FORCEMAIN STA. 58+50.00 - 65+00.00
FM-11	12" FORCEMAIN STA. 65+00.00 - 71+50.00
FM-12	12" FORCEMAIN STA. 71+50.00 - 78+00.00 12" FORCEMAIN STA. 78+00.00 - 84+50.00
FM-13	
FM-14	12" FORCEMAIN STA. 84+50.00 - 91+00.00
FM-15	12" FORCEMAIN STA. 91+00.00 - 97+50.00
FM-16	12" FORCEMAIN STA. 97+50.00 - 104+00.00
FM-17	12" FORCEMAIN STA. 104+00.00 - 110+50.00
FM-18	12" FORCEMAIN STA. 110+50.00 - 117+00.00
FM-19	12" FORCEMAIN STA. 117+00.00 - 123+50.00
FM-20	12" FORCEMAIN STA. 123+50.00 - 130+00.00
FM-21	12" FORCEMAIN STA. 130+00.00 - 136+50.00
FM-22	12" FORCEMAIN STA. 136+50.00 - 142+87.22
FM-23	12" FORCEMAIN STA. 144+50.00 - 148+15.00
	EROSION CONTROL
EC-1	EROSION CONTROL SHEET 1 OF 6
EC-2	EROSION CONTROL SHEET 2 OF 6
EC-3	EROSION CONTROL SHEET 3 OF 6
EC-4	EROSION CONTROL SHEET 4 OF 6
EC-5	EROSION CONTROL SHEET 5 OF 6
EC-6	EROSION CONTROL SHEET 6 OF 6

	Sheet List Table
Sheet Number	Sheet Title
Sheet Number	ELECTRICAL
E-001	ELECTRICAL SYMBOLS AND ABBREVIATIONS
E-002	ELECTRICAL SITE PLAN
E-003	ELECTRICAL GROUNDING PLAN
E-004	ELECTRICAL ON LINE DIAGRAM
E-005	ELECTRICAL CONDUIT AND CABLE SCHEDULE
E-006	ELECTRICAL SCHEDULES
E-007	ELECTRICAL CONTROL DIAGRAMS SHEET 1
E-008	ELECTRICAL CONTROL DIAGRAMS SHEET 2
E-009	ELECTRICAL CONTROL DIAGRAMS SHEET 3
E-010	ELECTRICAL CONTROL DIAGRAMS SHEET 4
E-011	ELECTRICAL CONTROL DIAGRAMS SHEET 5
E-012	ELECTRICAL CONTROL DIAGRAMS SHEET 6
E-013	ELECTRICAL CONTROL DIAGRAMS SHEET 7
E-014	ELECTRICAL CONTROL DIAGRAMS SHEET 8
E-015	ELECTRICAL CONTROL DIAGRAMS SHEET 9
E-016	ELECTRICAL DETAILS SHEET 1
E-017	ELECTRICAL DETAILS SHEET 2
E-018	ELECTRICAL DETAILS SHEET 3
E-019	ELECTRICAL DETAILS SHEET 4
E-020	ELECTRICAL DETAILS SHEET 5
E-021	ELECTRICAL DETAILS SHEET 6
E-022	ELECTRICAL DETAILS SHEET 7
E-023	ELECTRICAL DETAILS SHEET 8
E-024	ELECTRICAL DETAILS SHEET 9
E-025	GENERATOR DETAILS SHEET 1
E-026	GENERATOR AND ELECTRICAL DETAILS
E-027	PROCESS AND INSTRUMENTATION
	ABBREVIATIONS
E-028	PROCESS AND INSTRUMENTATION DIAGRAM SHEET 1
E-029	PROCESS AND INSTRUMENTATION DIAGRAM SHEET 2
	STRUCTURAL NOTES
S-1	STRUCTURAL NOTES
S-2	LIFT STATION CAP AND MAT PLANS
S-3	LIFT STATION SECTIONS

ITEM NO.	ITEM DESCRIPTION	QTY	U
1	SITE CLEARING & PREPARATION	0.4	P
2	PIPE TRENCH & EXCAVATION SAFETY (PLAN AND	14966	l
3	LIFT STATION WET WELL EXCAVATION SAFETY (PLAN AND	1	I
4	DEWATERING PLAN AND IMPLEMENTATION	1	I
5	12-INCH HDPE DIPS DR 13.5 FORCE MAIN & FITTINGS	29634	l
6	24-INCH STEEL CASING PIPE	1690	I
7	15-INCH PVC SDR 26 SANITARY SEWER	149	l
8	6-INCH CHECK VALVE WITH EXTERNAL LEVER AND WEIGHT	4	E
9	6-INCH RESILIENT WEDGE, FLANGED JOINT, PLUG VALVE	4	E
10	6-INCH EMERGENCY BY- PASS ASSEMBLY AND PIPING	1	
11	2-INCH COMBINATION AIR/VACUUM RELEASE VALVE ASSEMBLY	1	E
12	8-INCH RESILIENT WEDGE, FLANGED JOINT, PLUG VALVE	3	E
13	12-INCH RESILIENT WEDGE, FLANGED JOINT, PLUG VALVE	16	E
14	DISCHARGE PIPING DUCTILE IRON FITTINGS	1.4	T
15	SUBMERSIBLE PUMPS (FLYGT NP3202SH3 275IMP 50HP)	3	E
16	14-FOOT DIA. FIBERGLASS WET WELL AND BACKFILL	1	l
17	4-FOOT DIAMETER SANITARY SEWER MANHOLE	1	E
18	ON-SITE MANHOLE TO LIFT STATION (18-INCH SUMP)	1	E
19	REINFORCED CONCRETE VALVE EQUIPMENT PAD	1	l
20	LIFT STATION APPURTENANCES	1	l
21	ASPHALT PAVEMENT	2857	
22	CONCRETE DRIVEWAY REPAIR	30	
23	ASPHALT DRIVEWAY REPAIR	75	
24	GRAVEL DRIVEWAY REPAIR	533	
25	REMOVE AND REPLACE EXISTING CORRUGATED METAL CULVERT	315	l
26	REMOVE AND REPLACE EXISTING RCP CULVERT PIPE	105	l
27	REMOVE AND REPLACE EXISTING RCP HEADWALLS	6	E
28	REMOVE AND REPLACE EXISTING BARBED WIRE FENCE	65	l
29	AIR RELEASE VALVE & MANHOLE FOR FORCEMAIN	2	E
30	SITE WATER SERVICE	1	l
31	SECURITY FENCING WITH MOW STRIP/CURB	420	l
32	SECURITY SWING GATES (8-FT)	4	E
33	PEDESTRIAN GATE	1	E
34	MATERIAL TESTING	1	l
35	PIPING AND WET WELL TESTING	1	l
36	DEMONSTRATION TESTING	1	l
37	SCADA TOWER AND FOUNDATION	1	l
38	MISCELLANEOUS ELECTRICAL EQUIPMENT	1	l
39	INSTRUMENTATION AND CONTROLS	1	l
40	LIGHTING FIXTURES/POLES	1	l
41	EMERGENCY DIESEL GENERATOR AND PAD	1	l
42	ELECTRICAL GEAR W/SSRV'S FOR 3 PUMPS	1	l
43	ELECTRICAL TESTING	1	l
44	ELECTRICAL METER AND TRANSFORMER	1	l
45	WET WELL WIZARD AIR EJECTORS, BLOWERS, HOSES, ETC.	1	l
46	SILT FENCE	9393	l
47	ROCK BERM	196	l
48	CONSTRUCTION ENTRANCE/EXIT	1	E
49	SITE RESTORATION & REVEGETATION	1	



INDEX AND QUANTITY
SHEET

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

- THIS LIFT STATION AND/OR FORCE MAIN MUST BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE TEXAS COMMISSION ON ENVIRONMENTAL QUALITY'S (TCEQ) EDWARDS AQUIFER RULES 30 TEXAS ADMINISTRATIVE CODE (TAC) §213.5(C), THE DESIGN CRITERIA FOR DOMESTIC WASTEWATER SYSTEMS 30 TAC CHAPTER 217, AND ANY LOCAL GOVERNMENT STANDARD SPECIFICATIONS.
- 2. ANY MODIFICATION TO THE ACTIVITIES DESCRIBED IN THE REFERENCED LIFT STATION/FORCE MAIN SYSTEM APPLICATION FOLLOWING THE DATE OF APPROVAL MAY REQUIRE THE SUBMITTAL OF A LIFT STATION/FORCE MAIN SYSTEM APPLICATION TO MODIFY THIS APPROVAL, INCLUDING THE PAYMENT OF APPROPRIATE FEES AND ALL INFORMATION NECESSARY FOR ITS REVIEW AND APPROVAL.
- PRIOR TO COMMENCING ANY REGULATED ACTIVITY. THE APPLICANT OR HIS AGENT MUST NOTIFY THE LOCAL REGIONAL OFFICE, IN WRITING, OF THE DATE ON WHICH THE REGULATED ACTIVITY WILL BEGIN.
- 4. UPON COMPLETION OF THE WET WELL EXCAVATION, A GEOLOGIST MUST CERTIFY THAT THE EXCAVATION HAS BEEN INSPECTED FOR THE PRESENCE OF SENSITIVE FEATURES AND THE CERTIFICATION MUST BE SUBMITTED TO THE APPROPRIATE REGIONAL OFFICE. FURTHER ACTIVITIES 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 ARE PRESENT
- 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 TEXAS COMMISSION ON ENVIRONMENTAL QUALITY 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. LIFT STATIONS SHALL BE DESIGNED TO WITHSTAND AND OPERATE DURING A 100-YEAR FLOOD EVENT AND SHALL BE ACCESSIBLE DURING A 25-YEAR FLOOD. ALL LIFT STATIONS SHALL BE INTRUDER-RESISTANT WITH A CONTROLLED ACCESS.

DRY WELL SUMP PUMPS:

- (A) A DRY WELL MUST USE DUAL SUMP PUMPS, EACH WITH A MINIMUM CAPACITY OF 1,000 GALLONS PER HOUR AND CAPABLE OF HANDLING THE VOLUME OF LIQUID GENERATED DURING PEAK OPERATIONS.
- (B) A PUMP MUST HAVE A SUBMERSIBLE MOTOR AND WATERTIGHT WIRING.
- (C) A DRY WELL FLOOR MUST SLOPE TOWARD A SUMP SIZED FOR PROPER DRAINAGE.
- (D) THE MINIMUM SUMP DEPTH IS 6.0 INCHES AND MUST PREVENT STANDING WATER ON A DRY WELL FLOOR UNDER
- NORMAL OPERATION. (E) A SUMP PUMP MUST OPERATE AUTOMATICALLY BY USE OF A FLOAT SWITCH OR OTHER LEVEL-DETECTING
- (F) A SUMP PUMP MUST USE SEPARATE PIPES CAPABLE OF DISCHARGING MORE THAN THE MAXIMUM LIQUID LEVEL OF AN ASSOCIATED WET WELL.
- (G) A SUMP PUMP OUTLET PIPE MUST BE AT LEAST 1.5 INCHES IN DIAMETER AND HAVE AT LEAST TWO CHECK VALVES IN SERIES.

8. PUMP CONTROLS.

- (A) A LIFT STATION PUMP MUST OPERATE AUTOMATICALLY, BASED ON THE WATER LEVEL IN A WET WELL
- (B) THE LOCATION OF A WET WELL LEVEL MECHANISM MUST ENSURE THAT THE MECHANISM IS UNAFFECTED BY CURRENTS, RAGS, GREASE, OR OTHER FLOATING MATERIALS.
- (C) A LEVEL MECHANISM MUST BE ACCESSIBLE WITHOUT ENTERING THE WET WELL
- (D) WET WELL CONTROLS WITH A BUBBLER SYSTEM REQUIRE DUAL AIR SUPPLY AND DUAL CONTROLS.
- (E) MOTOR CONTROL CENTERS MUST BE MOUNTED AT LEAST 4.0 INCHES ABOVE GRADE TO PREVENT WATER
- INTRUSION AND CORROSION FROM STANDING WATER IN THE ENCLOSURE
- (F) ELECTRICAL EQUIPMENT AND ELECTRICAL CONNECTIONS IN A WET WELL OR A DRY WELL MUST MEET NATIONAL
- FIRE PREVENTION ASSOCIATION 70 NATIONAL ELECTRIC CODE EXPLOSION PREVENTION REQUIREMENTS, UNLESS CONTINUOUS VENTILATION IS PROVIDED.

9. WET WELLS.

- (A) A WET WELL MUST BE ENCLOSED BY WATERTIGHT AND GAS TIGHT WALLS.
- (B) A PENETRATION THROUGH A WALL OF A WET WELL MUST BE GAS TIGHT.
- (C) A WET WELL MUST NOT CONTAIN EQUIPMENT REQUIRING REGULAR OR ROUTINE INSPECTION OR MAINTENANCE, UNLESS INSPECTION AND MAINTENANCE CAN BE DONE WITHOUT STAFF ENTERING THE WET WELL
- (D) A GRAVITY PIPE DISCHARGING TO A WET WELL MUST BE LOCATED SO THAT THE INVERT ELEVATION IS ABOVE THE LIQUID LEVEL OF A PUMP'S "ON" SETTING.
- (E) GATE VALVES AND CHECK VALVES ARE PROHIBITED IN A WET WELL
- (F) GATE VALVES AND CHECK VALVES MAY BE LOCATED IN A VALVE VAULT NEXT TO A WET WELL OR IN A DRY WELL. (G) PUMP CYCLE TIME, BASED ON PEAK FLOW, MUST EQUAL OR EXCEED THOSE IN THE FOLLOWING TABLE: PUMP HORSEPOWER MINIMUM CYCLE TIMES (MINUTES)
- < 50 50-100 > 100

(A) AN EVALUATION OF MINIMUM WET WELL VOLUME REQUIRES THE FOLLOWING FORMULA:

- V = ACTIVE VOLUME (CUBIC FEET) Q = PUMP CAPACITY (GALLONS PER MINUTE)
- T = CYCLE TIME (MINUTES)
- 7.48 = CONVERSION FACTOR (GALLONS/CUBIC FOOT)

10. WET WELL SLOPES.

- (A) A WET WELL FLOOR MUST HAVE A SMOOTH FINISH AND MINIMUM SLOPE OF 10% TO A PUMP INTAKE. (B) A WET WELL DESIGN MUST PREVENT DEPOSITION OF SOLIDS UNDER NORMAL OPERATING CONDITIONS.
- (C) A LIFT STATION WITH GREATER THAN 5.0 MILLION GALLONS PER DAY FIRM PUMPING CAPACITY MUST HAVE ANTI-VORTEX BAFFLING.

DRY WELL ACCESS.

- (A) AN UNDERGROUND DRY WELL MUST BE ACCESSIBLE
- (B) A STAIRWAY IN A DRY WELL MUST USE NON-SLIP STEPS AND CONFORM TO OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION REGULATIONS WITH RESPECT TO RISE AND RUN.
- (C) A LADDER IN A DRY WELL MUST MADE OF NON-CONDUCTIVE MATERIAL AND RATED FOR THE LOAD NECESSARY FOR STAFF AND EQUIPMENT TO DESCEND AND ASCEND
- 12. VENTILATION SHALL BE PROVIDED FOR LIFT STATIONS, INCLUDING BOTH WET AND DRY WELLS.
- 13. HOISTING EQUIPMENT. A LIFT STATION MUST HAVE PERMANENT HOISTING EQUIPMENT OR BE ACCESSIBLE TO PORTABLE HOISTING EQUIPMENT FOR REMOVAL OF PUMPS, MOTORS, VALVES, PIPES, AND OTHER SIMILAR EQUIPMENT.
- 14. A FLOOR DRAIN FROM A VALVE VAULT TO A WET WELL MUST PREVENT GAS FROM ENTERING A VALVE VAULT BY INCLUDING FLAP VALVES, "P" TRAPS, SUBMERGED OUTLETS, OR A COMBINATION OF THESE DEVICES.

15. PUMPS.

- (A) GENERAL REQUIREMENTS. A RAW WASTEWATER PUMP, WITH THE EXCEPTION OF A GRINDER PUMP, MUST:
- BE DESIGNED TO PREVENT CLOGGING; (2) BE CAPABLE OF PASSING A SPHERE OF 2.5 INCHES IN DIAMETER OR GREATER; AND
- (3) HAVE GREATER THAN 3.0 INCH DIAMETER SUCTION AND DISCHARGE OPENINGS
- (B) SUBMERSIBLE AND NON-SUBMERSIBLE PUMPS.
- (1) A NON-SUBMERSIBLE PUMP MUST HAVE INSPECTION AND CLEANOUT PLATES ON BOTH THE SUCTION AND DISCHARGE SIDES OF EACH PUMPING UNIT THAT FACILITATE LOCATING AND REMOVING BLOCKAGE-CAUSING MATERIALS, UNLESS THE PUMP DESIGN ACCOMMODATES EASY REMOVAL OF THE ROTATION ELEMENTS.
- (2) A PUMP SUPPORT MUST PREVENT MOVEMENT AND VIBRATION DURING OPERATION.
- (3) A SUBMERSIBLE PUMP MUST USE A RAIL-TYPE PUMP SUPPORT SYSTEM WITH MANUFACTURER-APPROVED MECHANISMS DESIGNED TO ALLOW PERSONNEL TO REMOVE AND REPLACE ANY SINGLE PUMP WITHOUT ENTERING OR DEWATERING THE WET WELL.
- (4) SUBMERSIBLE PUMP RAILS AND LIFTING CHAINS MUST BE CONSTRUCTED OF A MATERIAL THAT PERFORMS TO AT LEAST THE STANDARD OF SERIES 300 STAINLESS STEEL.
- (C) LIFT STATION PUMPING CAPACITY. THE FIRM PUMPING CAPACITY OF A LIFT STATION MUST HANDLE THE

EXPECTED PEAK FLOW. (D) PUMP HEAD CALCULATIONS.

- (1) AN OWNER SHALL SELECT A PUMP BASED UPON ANALYSIS OF THE SYSTEM HEAD AND PUMP CAPACITY CURVES THAT DETERMINE THE PUMPING CAPACITIES ALONE AND WITH OTHER PUMPS AS THE TOTAL DYNAMIC-HEAD INCREASES DUE TO ADDITIONAL FLOWS PUMPED THROUGH A FORCE MAIN.
- (2) THE PIPE HEAD LOSS CALCULATIONS, USING THE HYDRAULIC INSTITUTE STANDARDS, PERTAINING TO HEAD LOSSES THROUGH PIPES, VALVES, AND FITTINGS, MUST BE INCLUDED IN THE REPORT.
- (3) THE SELECTED FRICTION COEFFICIENT (HAZEN-WILLIAMS "C" VALUE) USED IN FRICTION HEAD LOSS CALCULATIONS MUST BE BASED ON THE PIPE MATERIAL SELECTED.
- (4) FOR A LIFT STATION WITH MORE THAN TWO PUMPS, A FORCE MAIN IN EXCESS OF ONE-HALF MILE, OR FIRM PUMPING CAPACITY OF 100 GALLONS PER MINUTE OR GREATER, SYSTEM CURVES MUST BE PROVIDED FOR BOTH THE NORMAL AND PEAK OPERATING CONDITIONS AT C VALUES FOR PROPOSED AND EXISTING PIPE.
- (E) FLOW CONTROL. (1) A LIFT STATION OR A TRANSFER PUMPING STATION LOCATED AT OR DISCHARGING DIRECTLY TO A WASTEWATER TREATMENT SYSTEM MUST HAVE A PEAK PUMP CAPACITY EQUAL TO OR LESS THAN THE PEAK
- DESIGN FLOW, UNLESS EQUALIZATION IS PROVIDED. (2) A WASTEWATER TREATMENT SYSTEM WITH A PEAK FLOW THAT IS GREATER THAN 300,000 GALLON PER DAY MUST USE THREE OR MORE PUMPS, UNLESS DUPLEX, AUTOMATICALLY CONTROLLED, VARIABLE CAPACITY PUMPS ARE PROVIDED.
- (F) SELF-PRIMING PUMPS.
- (1) A SELF-PRIMING PUMP MUST BE CAPABLE OF PRIMING WITHOUT RELIANCE UPON A SEPARATE PRIMING SYSTEM, AN INTERNAL FLAP VALVE, OR ANY EXTERNAL MEANS FOR PRIMING.
- (2) A SELF-PRIMING PUMP MUST USE A SUCTION PIPE VELOCITY AT LEAST 3.0 FEET PER SECOND BUT NOT MORE THAN 7.0 FEET PER SECOND, AND MUST INCORPORATE ITS OWN SUCTION PIPE.
- (3) A SELF-PRIMING PUMP MUST VENT AIR BACK INTO THE WET WELL DURING PRIMING.
- (G) VACUUM-PRIMING PUMPS.
- (1) A VACUUM-PRIMED PUMP MUST BE CAPABLE OF PRIMING BY USING A SEPARATE POSITIVE PRIMING SYSTEM WITH A DEDICATED VACUUM PUMP FOR EACH MAIN WASTEWATER PUMP
- (2) A VACUUM-PRIMING PUMP MUST USE A SUCTION PIPE VELOCITY AT LEAST 3.0 FEET PER SECOND BUT LESS
- THAN 7.0 FEET PER SECOND AND MUST HAVE ITS OWN SUCTION PIPE. (H) VERTICAL POSITIONING OF PUMPS. A RAW WASTEWATER PUMP MUST HAVE POSITIVE STATIC SUCTION HEAD
- DURING NORMAL ON-OFF CYCLING, EXCEPT A SUBMERSIBLE PUMP WITH "NO SUCTION" PIPES. A VACUUM-PRIMED PUMP, OR A SELF-PRIMING UNIT CAPABLE OF SATISFACTORY OPERATION UNDER ANY NEGATIVE SUCTION HEAD ANTICIPATED FOR THE LIFT STATION.
- (I) INDIVIDUAL GRINDER PUMPS. A GRINDER PUMP SERVING ONLY ONE RESIDENTIAL OR COMMERCIAL STRUCTURE THAT IS PRIVATELY OWNED, MAINTAINED, AND OPERATED IS NOT SUBJECT TO THE RULES OF THIS CHAPTER.
- (J) PUMP FOR LOW-FLOW LIFT STATION. A PUMP USED FOR A LIFT STATION WITH A PEAK FLOW OF LESS THAN 120 GALLONS PER MINUTE MUST BE SUBMERSIBLE AND INCLUDE A GRINDER

(A) HORIZONTAL PUMP SUCTIONS.

- (1) EACH PUMP MUST HAVE A SEPARATE SUCTION PIPE THAT USES AN ECCENTRIC REDUCER.
- (2) PIPES IN A WET WELL MUST HAVE A TURNDOWN TYPE FLARED INTAKE.
- (B) VALVES.
 - (1) THE DISCHARGE SIDE OF EACH PUMP FOLLOWED BY A FULL-CLOSING ISOLATION VALVE MUST ALSO HAVE A CHECK VALVE.
- (A) A CHECK VALVE MUST BE A SWING TYPE VALVE WITH AN EXTERNAL LEVER.
- (B) A VALVE MUST INCLUDE A POSITION INDICATOR TO SHOW ITS OPEN AND CLOSED POSITIONS, UNLESS A
- FULL-CLOSING VALVE IS A RISING-STEM GATE VALVE. (2) A GRINDER PUMP INSTALLATION MAY USE A RUBBER-BALL CHECK VALVE OR A SWING-TYPE CHECK VALVE.
- (3) A BUTTERFLY VALVE, TILTING-DISC CHECK VALVE, OR ANY OTHER VALVE USING A TILTING-DISC IN A FLOW PIPE IS PROHIBITED.

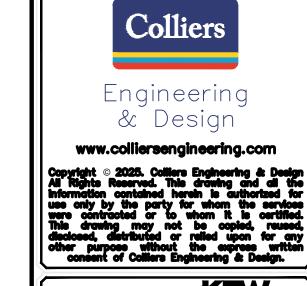
(C) PIPES.

- (1) A LIFT STATION PIPE MUST HAVE FLANGED OR FLEXIBLE CONNECTIONS TO ALLOW FOR REMOVAL OF PUMPS AND VALVES WITHOUT INTERRUPTION OF THE LIFT STATION OPERATIONS.
- (2) WALL PENETRATIONS MUST ALLOW FOR PIPE FLEXURE WHILE EXCLUDING EXFILTRATION OR INFILTRATION. (3) PIPE SUCTION VELOCITIES MUST BE AT LEAST 3.0 FEET PER SECOND BUT NOT MORE THAN 7.0 FEET PER

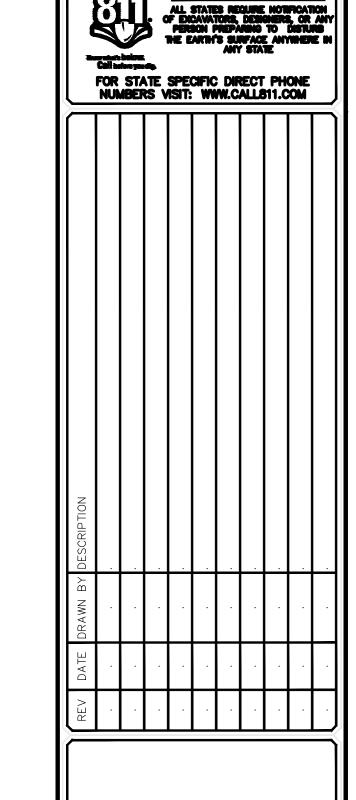
17. EMERGENCY PROVISIONS FOR LIFT STATIONS.

- (A) A COLLECTION SYSTEM LIFT STATION MUST BE EQUIPPED WITH A TESTED QUICK-CONNECT MECHANISM OR A TRANSFER SWITCH PROPERLY SIZED TO CONNECT TO A PORTABLE GENERATOR, IF NOT EQUIPPED WITH AN ONSITE GENERATOR.
- (B) LIFT STATIONS MUST INCLUDE AN AUDIOVISUAL ALARM SYSTEM AND THE SYSTEM MUST TRANSMIT ALL ALARM CONDITIONS THROUGH USE OF AN AUTO-DIALER SYSTEM, SUPERVISORY CONTROL AND DATA ACQUISITION SYSTEM, OR TELEMETERING SYSTEM CONNECTED TO A CONTINUOUSLY MONITORED LOCATION.
- (C) AN ALARM SYSTEM MUST SELF-ACTIVATE FOR A POWER OUTAGE, PUMP FAILURE, OR A HIGH WET WELL WATER
- (D) A LIFT STATION CONSTRUCTED TO PUMP RAW WASTEWATER MUST HAVE SERVICE RELIABILITY BASED ON: (1) RETENTION CAPACITY.
- (A) THE RETENTION CAPACITY IN A LIFT STATION'S WET WELL AND INCOMING GRAVITY PIPES MUST PREVENT DISCHARGES OF UNTREATED WASTEWATER AT THE LIFT STATION OR ANY POINT UPSTREAM FOR A PERIOD OF TIME EQUAL TO THE LONGEST ELECTRICAL OUTAGE RECORDED DURING THE PAST 24 MONTHS, BUT NOT LESS THAN 20 MINUTES.
- (B) FOR CALCULATION PURPOSES, THE OUTAGE PERIOD BEGINS WHEN A LIFT STATION PUMP FINISHED ITS LAST NORMAL CYCLE, EXCLUDING A STANDBY PUMP.
- (1) ON-SITE GENERATORS. A LIFT STATION MAY BE PROVIDED EMERGENCY POWER BY ON-SITE, AUTOMATIC ELECTRICAL GENERATORS SIZED TO OPERATE THE LIFT STATION AT ITS FIRM PUMPING CAPACITY OR AT THE AVERAGE DAILY FLOW, IF THE PEAK FLOW CAN BE STORED IN THE COLLECTION SYSTEM.
- (2) PORTABLE GENERATORS AND PUMPS. (A) A LIFT STATION MAY USE PORTABLE GENERATORS AND PUMPS TO GUARANTEE SERVICE IF THE REPORT
- INCLUDES: (3) THE STORAGE LOCATION OF EACH GENERATOR AND PUMP;
- (4) THE AMOUNT OF TIME THAT WILL BE NEEDED TO TRANSPORT EACH GENERATOR OR PUMP TO A LIFT
- (5) THE NUMBER OF LIFT STATIONS FOR WHICH EACH GENERATOR OR PUMP IS DEDICATED AS A BACKUP; AND (6) THE TYPE OF ROUTINE MAINTENANCE AND UPKEEP PLANNED FOR EACH PORTABLE GENERATOR AND PUMP
- TO ENSURE THAT THEY WILL BE OPERATIONAL WHEN NEEDED. (B) AN OPERATOR THAT IS KNOWLEDGEABLE IN OPERATION OF THE PORTABLE GENERATORS AND PUMPS SHALL BE ON CALL 24 HOURS PER DAY EVERY DAY.
- (C) THE SIZE OF A PORTABLE GENERATOR MUST HANDLE THE FIRM PUMPING CAPACITY OF THE LIFT STATION. (E) SPILL CONTAINMENT STRUCTURES.
- (1) THE USE OF A SPILL CONTAINMENT STRUCTURE AS A SOLE MEANS OF PROVIDING SERVICE RELIABILITY IS PROHIBITED.

- (2) A LIFT STATION MAY USE A SPILL CONTAINMENT STRUCTURE IN ADDITION TO ONE OF THE SERVICE RELIABILITY OPTIONS DETAILED IN THIS IN SUBSECTION (A) OF THIS SECTION.
- (3) THE REPORT MUST INCLUDE A DETAILED MANAGEMENT PLAN FOR CLEANING AND MAINTAINING EACH SPILL CONTAINMENT STRUCTURE.
- (4) A SPILL CONTAINMENT STRUCTURE MUST HAVE A LOCKED GATE AND BE SURROUNDED AN INTRUDER RESISTANT FENCE THAT IS 6.0 FEET HIGH CHAIN LINK, MASONRY, OR BOARD FENCE WITH AT LEAST THREE STRANDS OF BARBED WIRE OR 8.0 FEET HIGH CHAIN LINK, MASONRY, OR BOARD FENCE WITH AT LEAST ONE STRAND OF BARBED WIRE
- (F) A LIFT STATION MUST BE FULLY ACCESSIBLE DURING A 25-YEAR 24-HOUR RAINFALL EVENT.
- (G) LIFT STATION SYSTEM CONTROLS MUST PREVENT OVER-PUMPING UPON RESUMPTION OF NORMAL POWER AFTER A POWER FAILURE. BACKUP OR STANDBY UNITS MUST BE ELECTRICALLY INTERLOCKED TO PREVENT OPERATION AT THE SAME TIME THAT OTHER LIFT STATIONS PUMPS ARE OPERATING ONLY ON THE RESUMPTION OF NORMAL POWER AFTER A POWER FAILURE.



PROTECT YOURSELF



NORTHLAKE LIFT STATION AND FORCE MAIN



ENGINEERING GROUP PLLC

DRAWN BY: CHECKED BY

AS SHOWN 08/24 DM 8002-032 GENERAL NOTES

TCEQ GENERAL NOTES

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

G-3

GENERAL CONSTRUCTION

- 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
- 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, HTTPS://APPS.SAWS.ORG/BUSINESS_CENTER/SPECS/CONSTSPECS/ 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 (DURING REGULAR SAWS WORKING HOURS) AND PROVIDE NOTIFICATION PROCEDURES THE CONTRACTOR WILL USE TO NOTIFY AFFECTED HOME RESIDENTS AND/OR PROPERTY OWNERS TWO (2) WEEKS PRIOR TO EXCAVATION. OUTSIDE OF REGULAR SAWS WORKING HOURS THE SAWS EOC SHOULD BE CONTACTED AT 210-704-7297.
- 4. IF NECESSARY, CONTRACTOR WILL COORDINATE USE OF SAWS PREMISES AT NO ADDITIONAL COST TO SUCH EFFORTS INCLUDE, BUT ARE NOT LIMITED TO, OBTAINING SECURITY IDENTIFICATION BADGES REQUIRED FOR ACCESS TO SAWS FACILITIES.
- 5. 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 PRIOR TO CONSTRUCTION. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO LOCATE UTILITY SERVICE LINES AS REQUIRED FOR CONSTRUCTION AND TO PROTECT THEM DURING CONSTRUCTION AT NO COST TO SAWS.
- 6. THE CONTRACTOR SHALL VERIFY THE EXACT LOCATION OF UNDERGROUND UTILITIES AND DRAINAGE STRUCTURES PRIOR TO CONSTRUCTION WHETHER SHOWN ON PLANS OR NOT. AS-BUILTS FOR SAWS INFRASTRUCTURE CAN BE OBTAINED AT WEBSITE BELOW. CONTRACTOR SHALL COORDINATE PHYSICAL LOCATES FOR SAWS INFRASTRUCTURE THROUGH THE SAWS INSPECTOR. PLEASE ALLOW UP TO 7 BUSINESS DAYS FOR LOCATES REQUESTING PIPE LOCATION MARKERS ON SAWS INFRASTRUCTURE. THE FOLLOWING CONTACT INFORMATION ARE SUPPLIED FOR VERIFICATION PURPOSES:

SAN ANTONIO WATER SYSTEM

- REQUEST AS-BUILTS: HTTPS://WWW.SAWS.ORG/SERVICE/LOCATES-SERVICE/
- COSA DRAINAGE 210-206-8433
- COSA TRAFFIC SIGNAL OPERATIONS 210-207-7720
- TEXAS STATEWIDE ONE CALL LOCATOR 1-800-545-6005 OR 811
- 7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING EXISTING FENCES, CURBS, STREETS, DRIVEWAYS, SIDEWALKS, LANDSCAPING, AND STRUCTURES TO ITS ORIGINAL OR BETTER CONDITION AS A RESULT OF DAMAGES DONE BY THE PROJECT'S CONSTRUCTION.
- 8. CONTRACTOR SHALL NOT MAKE USE OF DUMPSTERS OR WASTE BINS THAT ARE INTENDED TO SERVE RESIDENTS AND/OR BUSINESSES.
- 9. ALL WORK IN TEXAS DEPARTMENT OF TRANSPORTATION AND BEXAR COUNTY RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH RESPECTIVE CONSTRUCTION SPECIFICATIONS AND PERMIT.
- 10. THE CONTRACTOR SHALL COMPLY WITH CITY OF SAN ANTONIO OR OTHER GOVERNING MUNICIPALITY'S TREE ORDINANCES WHEN EXCAVATING NEAR TREES.
- 11. ALL WORK WITHIN THE 100-YEAR FLOODPLAIN SHALL BE DONE IN ACCORDANCE WITH FLOODPLAIN DEVELOPMENT PERMIT.
- 12. 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.
- 13. HOLIDAY WORK: CONTRACTORS WILL NOT BE ALLOWED TO PERFORM SAWS WORK ON SAWS RECOGNIZED HOLIDAYS.

WEEKEND WORK: CONTRACTORS ARE REQUIRED TO SUBMIT REQUEST TO THE SAWS INSPECTION CONSTRUCTION DEPARTMENT BY 12:00PM ON THE WEDNESDAY PRIOR TO THE WEEKEND BEING REQUESTED. REQUEST SHOULD BE SENT TO CONSTWORKREQ@SAWS.ORG.

ANY AND ALL SAWS UTILITY WORK INSTALLED WITHOUT WEEKEND APPROVAL WILL BE SUBJECT TO BE UNCOVERED FOR PROPER INSPECTION AT NO COST TO SAWS.

- 14. 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).
- 15. 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.
- 16. CONSTRUCTION SEQUENCING: IT IS THE CONTRACTOR'SSOLE 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.
- 17. CONTRACTOR SHALL COMPLY WITH APPLICABLE REGULATIONS INCLUDING, BUT NOT LIMITED TO, THOSE OVERSEEN BY THE U.S. OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA). OSHA INFORMATION AND RELATED MATERIALS MAY BE OBTAINED AT HTTPS://WWW.OSHA.GOV/ OR AT THE OSHA SAN ANTONIO OFFICE LOCATED AT FOUNTAINHEAD TOWER, SUITE 605 8200 W. INTERSTATE 10 SAN ANTONIO, TX 78230 WHICH IS ALSO REACHABLE BY PHONE AT (210) 472-5040.

18. TRENCH EXCAVATION SAFETY PROTECTION: CONTRACTOR AND/OR CONTRACTOR'S INDEPENDENTLY RETAINED EMPLOYEE OR STRUCTURAL DESIGN/GEOTECHNICAL/SAFETY/EQUIPMENT CONSULTANT, IF ANY, SHALL REVIEW THESE PLANS AND AVAILABLE GEOTECHNICAL INFORMATION AND THE ANTICIPATED INSTALLATION SITE(S) WITHIN THE PROJECT WORK AREAS 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.

WATER

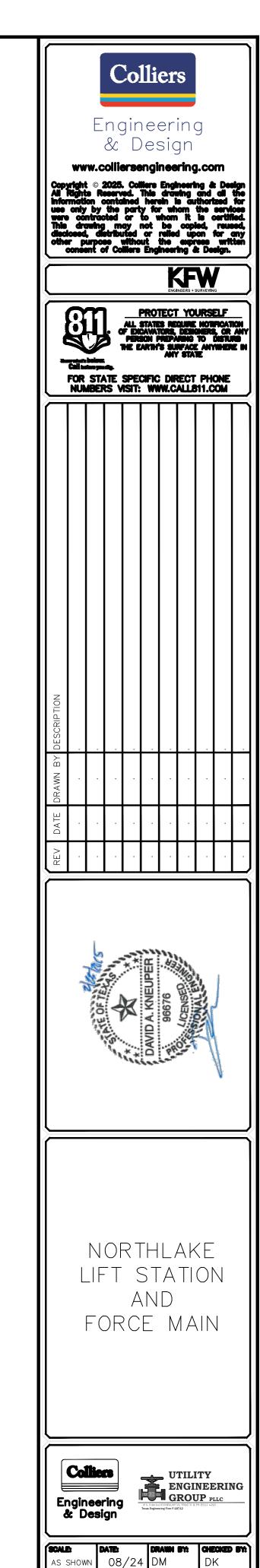
- 19. PRIOR TO TIE-INS, ANY SHUTDOWNS OF EXISTING MAINS OF ANY SIZE MUST BE COORDINATED WITH THE SAWS INSPECTION AND/OR SAWS PRODUCTION GROUPS AT LEAST TWO WEEKS OR MORE IN ADVANCE OF THE SHUTDOWN. THE CONTRACTOR MUST ALSO PROVIDE A SEQUENCE OF WORK AS RELATED TO THE TIE-INS; THIS IS AT NO ADDITIONAL COST TO SAWS OR THE PROJECT AND IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO SEQUENCE THE WORK ACCORDINGLY. SAWS PRODUCTION CONTROL CENTER 210-233-2016
- 20. ASBESTOS CEMENT (AC) PIPE, ALSO KNOWN AS TRANSITE PIPE WHICH IS KNOWN TO CONTAIN ASBESTOS-CONTAINING MATERIAL (ACM), MAYBE LOCATED WITHIN THE PROJECT LIMITS. SPECIAL WASTE MANAGEMENT PROCEDURES AND HEALTH AND SAFETY REQUIREMENTS WILL BE APPLICABLE WHEN REMOVAL AND/OR DISTURBANCE OF THIS PIPE OCCURS, PAYMENT FOR SUCH WORK IS TO BE MADE UNDER ITEM NO. 3000, "HANDLING ASBESTOS CEMENT PIPE". AC PIPE REMOVED ON CONSTRUCTION PROJECTS FOR TIE-IN(S) SHOULD BE IN LENGTH OF 26 LINEAR FEET (LF). LENGTHS OF 13 LF SHOULD BE REMOVED WHERE AC PIPE IS BEING REMOVED AND CROSSING PIPES, CONDUITS, OR BOXES.
- 21. VALVE REMOVAL: WHERE THE CONTRACTOR IS TO ABANDON A WATER MAIN, THE CONTROL VALVE LOCATED ON THE ABANDONING BRANCH WILL BE REMOVED AND REPLACED WITH A CAP/PLUG. (NSPI)
- 22. DIVISION VALVES: DIVISION VALVES SHOWN ON PLANS OR NOT SHOWN ON PLANS BUT FOUND IN THE FIELD SHALL ONLY BE OPERATED BY SAWS DISTRIBUTION AND COLLECTION STAFF AND ONLY WITH PRIOR WRITTEN APPROVAL OF THE SAWS DIRECTOR OF PRODUCTION AND OPERATIONS AND PROPER COORDINATION WITH ALL SAWS DEPARTMENTS. CONTRACTOR SHALL PROVIDE WRITTEN NOTIFICATION TO THE INSPECTOR A MINIMUM OF TWO WEEKS IN ADVANCE TO START THE COORDINATION PROCESS AND WILL BE INFORMED BY THE INSPECTOR WHEN THE DIVISION VALVE WILL BE OPERATED BY THE SAWS DISTRIBUTION AND COLLECTION STAFF. THE DIVISION VALVE CAN ONLY BE OPERATED BY SAWS DISTRIBUTION AND COLLECTION STAFF MEMBER NOT THE INSPECTOR OR THE CONTRACTOR. OPERATION OF A DIVISION VALVE WITHOUT THE EXPRESS PRIOR WRITTEN APPROVAL OF THE SAWS DISTRIBUTION AND COLLECTION STAFF WILL CONSTITUTE A MATERIAL BREACH OF ANY WRITTEN SAWS CONTRACT OR PERMIT IN ADDITION TO SUBJECTING THE CONTRACTOR TO LIABILITY FOR ANY AND ALL FINES, FEES, OR OTHER DAMAGES, DIRECT OR CONSEQUENTIAL, THAT MAY ARISE FROM OR BE CAUSED BY THE OPERATION OF THE VALVE WITHOUT PRIOR WRITTEN PERMISSION. PLEASE BE INFORMED THAT THE APPROVAL OF THE OPERATION OR OPENING OR CLOSING OF A DIVISION VALVE CAN TAKE SEVERAL WEEKS FOR APPROVAL. DIVISION VALVES WILL ALSO HAVE A VALVE LID LABELED DIVISION VALVE AND A LOCKING MECHANISM INSTALLED WITH A THE LOCK AND KEY MECHANISM WILL BE PAID FOR BY THE CONTRACTOR BUT WILL BE INSTALLED BY SAWS DISTRIBUTION AND COLLECTION STAFF.

SEWER

- 23. 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 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)AND PROPERLY DISPOSE OF CONTAMINATED SOIL/MATERIALS.
 - E. CLEAN THE AFFECTED SEWER MAINS AND REMOVE ANY DEBRIS.
 - F. MEET ALL POST-SSO REQUIREMENTS AS PER THE EPA CONSENT DECREE, INCLUDING LINE CLEANING AND TELEVISING THE AFFECTED SEWER MAINS (AT SAWS DIRECTION) WITHIN 24 HOURS.
 - SHOULD THE CONTRACTOR FAIL TO ADDRESS AN SSO IMMEDIATELY AND TO SAWS SATISFACTION, THEY

WILL BE RESPONSIBLE FOR ALL COSTS INCURRED BY SAWS, INCLUDING ANY FINES FROM EPA.

- 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.
- 24. THE CONTRACTOR SHALL PROVIDE BYPASS PUMPING OF SEWAGE AROUND EACH SEGMENT OF PIPE TO BE REPLACED, IN ACCORDANCE WITH SAWS STANDARD SPECIFICATION ITEM NO. 865, "BYPASS PUMPING SMALL DIAMETER SANITARY SEWER MAINS" AND STANDARD SPECIFICATION ITEM NO. 864, "BYPASS PUMPING LARGE DIAMETER SANITARY SEWER MAINS" AS APPLICABLE. PAYMENT FOR SUCH WORK WILL BE MADE UNDER THE APPROPRIATE BID ITEM ASSOCIATED WITH SANITARY SEWER BYPASS PUMPING IN ACCORDANCE WITH SAWS STANDARD SPECIFICATIONS 865 AND 864.
- 25. 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 TWO WEEKS 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.
- 26. ELEVATIONS POSTED FOR TOP OF MANHOLES ARE FOR REFERENCE ONLY:
 - IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO MAKE ALLOWANCES AND ADJUSTMENTS FOR TOP OF MANHOLES TO MATCH THE FINISHED GRADE OF THE PROJECT'S IMPROVEMENTS(NSPI).
- 27. MANHOLE REMOVAL: WHERE EXISTING MANHOLES ARE TO BE REPLACED BY THE CONTRACTOR, THE EXISTING MANHOLES SHALL BE REMOVED. (NSPI)
- 28. SMART MANHOLE COVERS: THE CONTRACTOR SHALL NOTIFY SAWS EOC AT 210-704-SAWS (210-233-7297) AND EITHER AMERICA ESPINOZA AT 210-233-2934 OR JOSE A. MARTINEZ AT 210-233-3071 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.
- 29. FLOW METERS IN MANHOLES: THE CONTRACTOR SHALL NOTIFY BOBBY JOHNSON AT 210-233-3493 OR ABEL BORUNDA AT 210-233-3704 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 FLOW METER IN THE MANHOLE. ANY DAMAGE DONE TO THE FLOW METER WILL BE CHARGED TO THE CONTRACTOR THROUGH A CHANGE ORDER



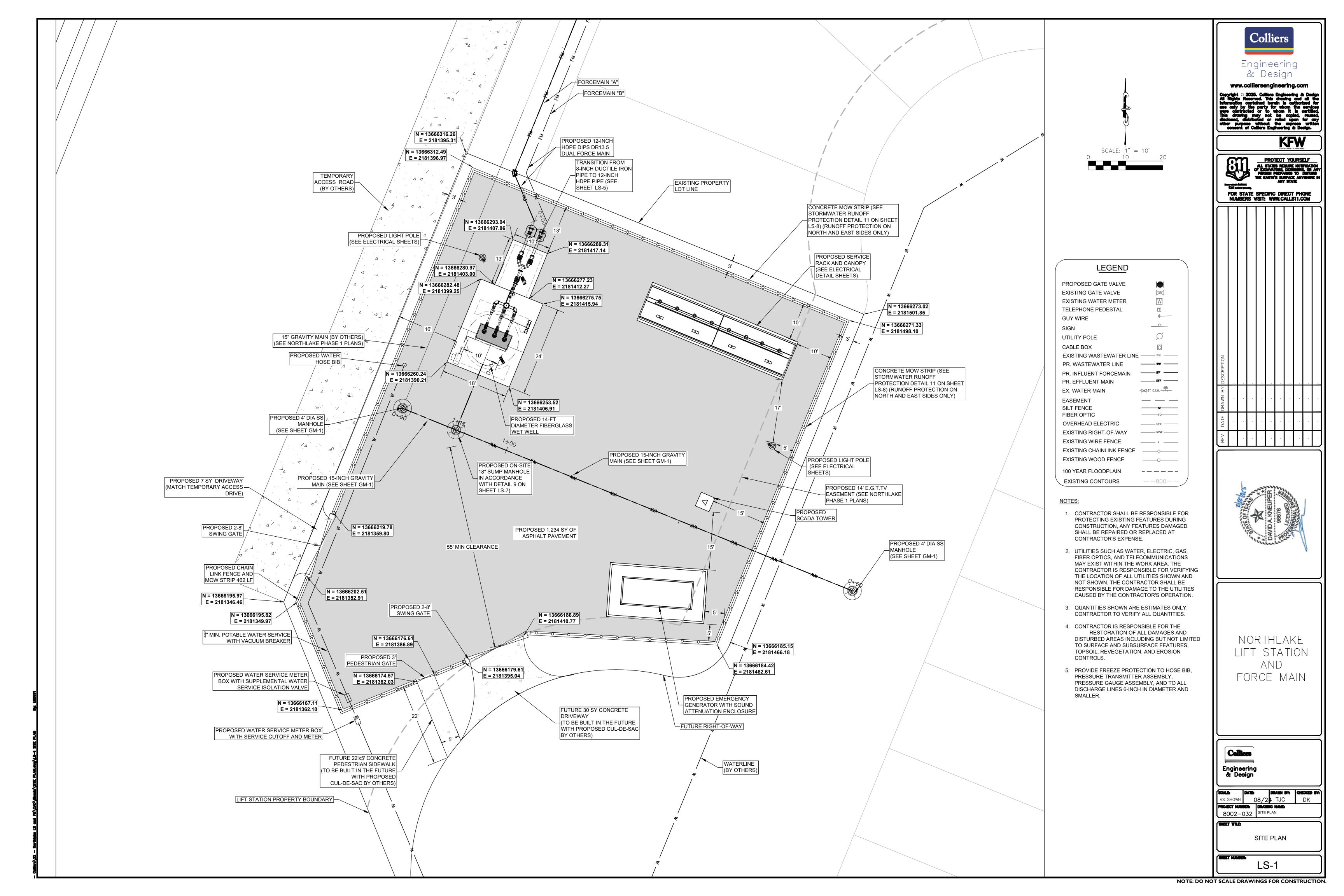
8002-032

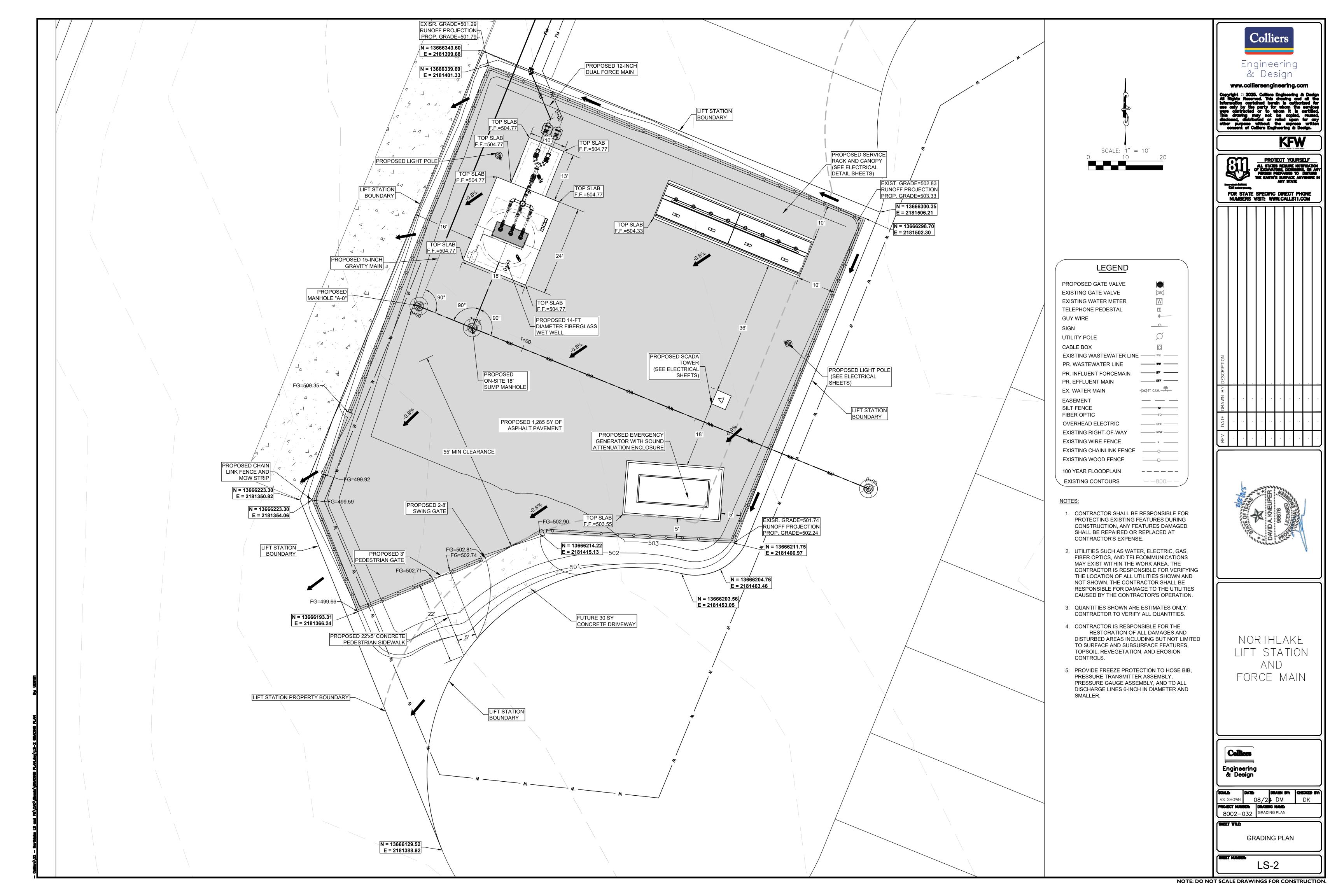
GENERAL NOTES

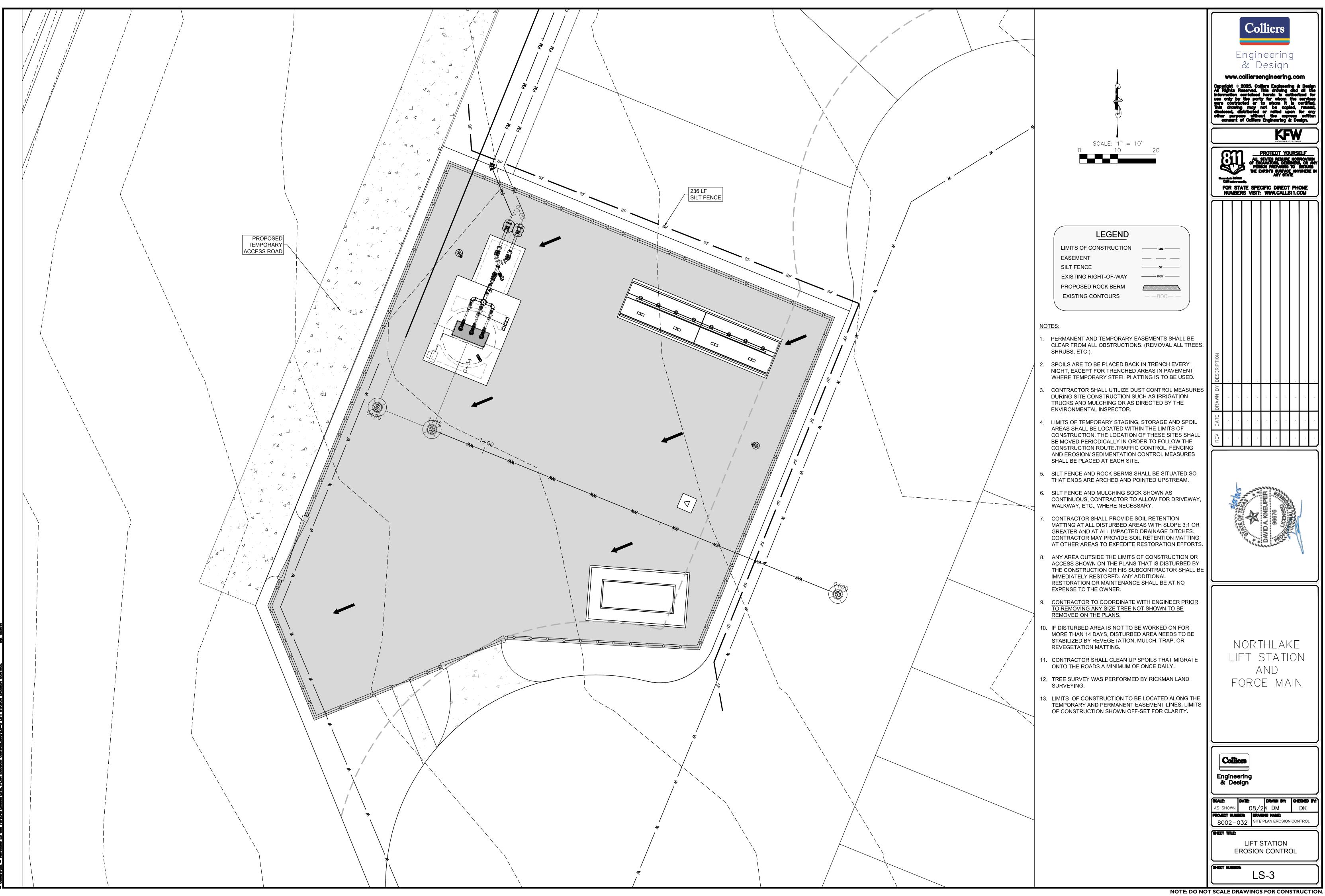
SAWS GENERAL

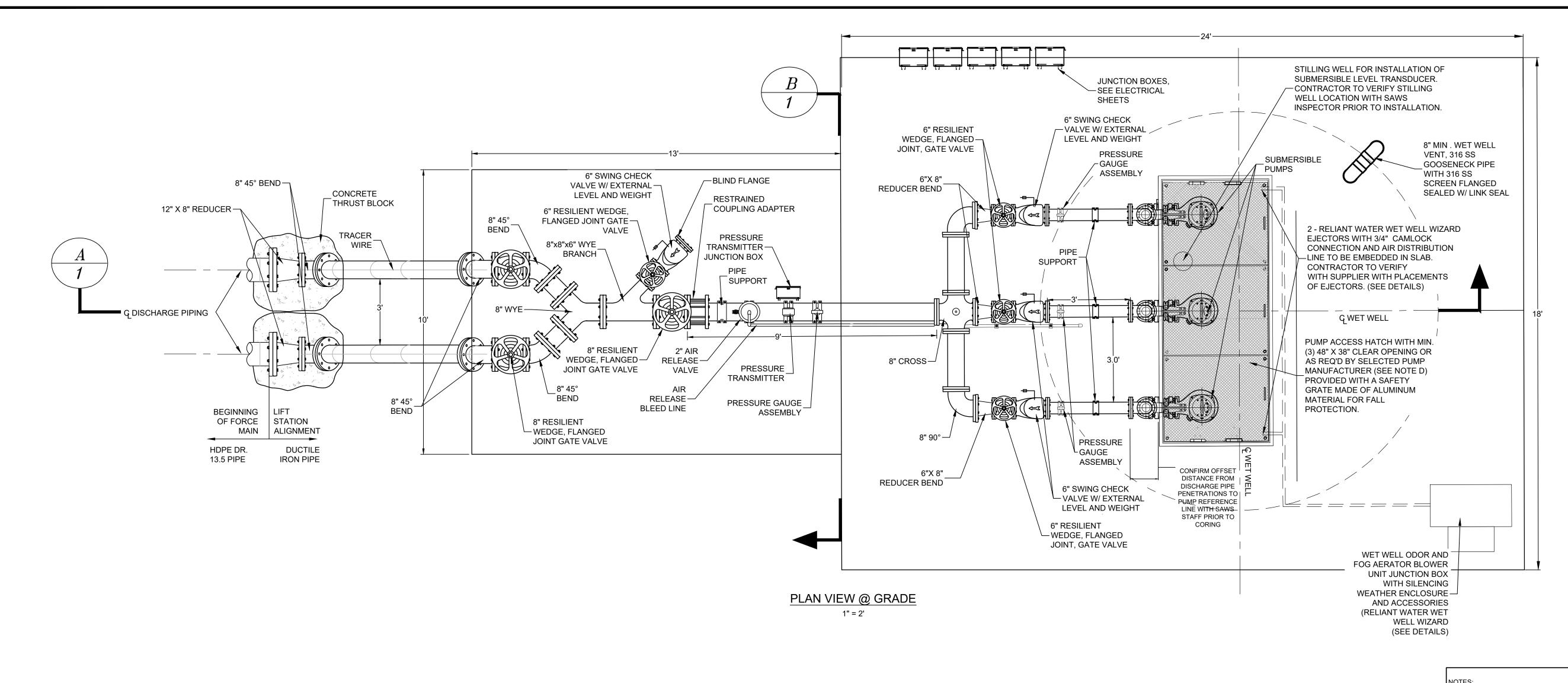
CONSTRUCTION NOTES

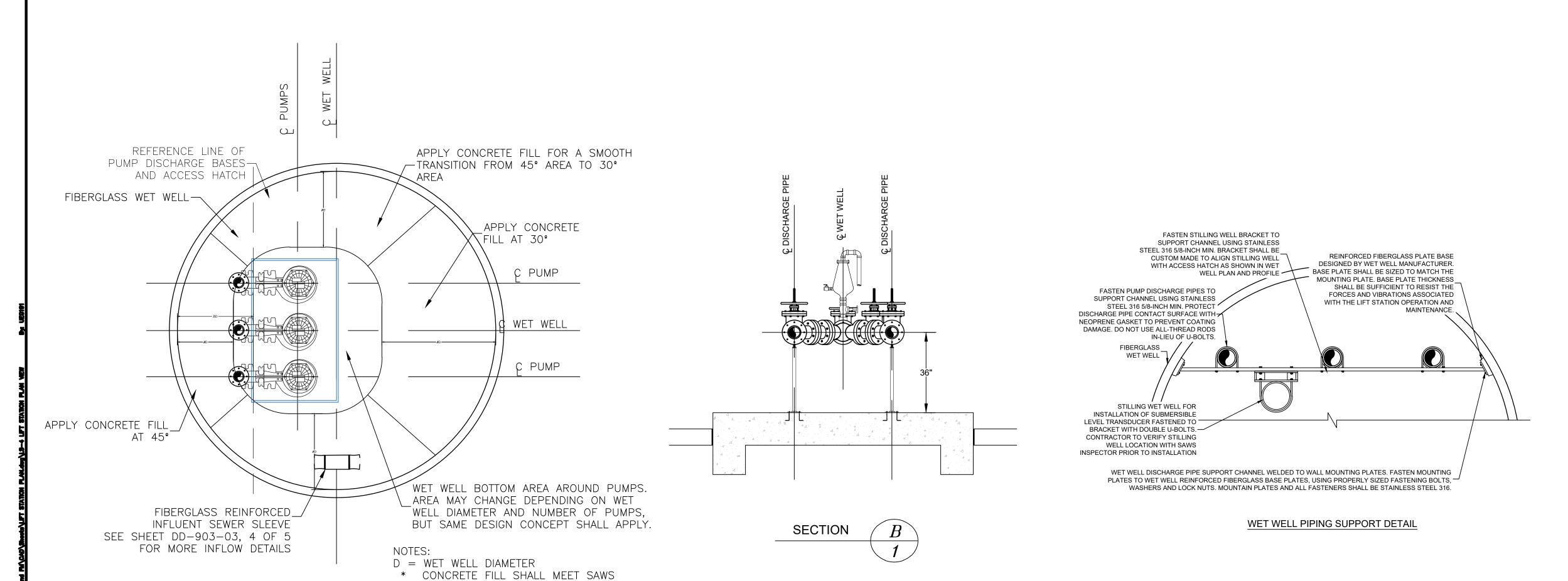
G-4











MANHOLE STANDARDS

WET WELL SECTION /

NOTES:

- A. FIBERGLASS REINFORCED POLYESTER WETWELLS SHALL BE MANUFACTURED FROM COMMERCIAL GRADE POLYESTER RESIN OR VINYL ESTER RESIN, WITH FIBERGLASS REINFORCEMENTS. THE RESIN SYSTEM SHALL BE SUITABLE FOR ATMOSPHERES CONTAINING HYDROGEN SULFIDE AND DILUTE SULFURIC ACID AS WELL AS OTHER GASES ASSOCIATED WITH THE WASTEWATER COLLECTION SYSTEMS. IN ACCORDANCE WITH SAWS SPECIFICATIONS.
- 3. COAT AND PAINT PIPE AND FITTINGS INSIDE WET WELL. (SEE KEY NOTE 4 BELOW).

 C. INSTALL AN EMERGENCY BYPASS CONNECTION COMPLETE WITH GATE VALVE AND
- . INSTALL ACCESS HATCH WITH SAFETY GRATE OF TRIPLE DOOR. MINIMUM CLEAR OPENING AREA TO BE 48" X 114" (TOTAL) AND SHALL OPEN TOWARDS DISCHARGE LINE. INSTALL WET WELL HATCH WITH SAFETY GRATE WITH EACH DOOR MINIMUM CLEAR OPENING TO BE 48" X 38". SAFETY GRATE SHALL NOT HAVE OPENINGS GREATER THAN 4" X 4"X. SAFETY GRATE SHALL BE FLUSHED WITH WET WELL TOP SLAB. REFER TO DETAILS.
- E. COAT AND PAINT PIPE, VALVES, AND FITTINGS (EXCEPT 316 STAINLESS STEEL AND PVC) OUTSIDE THE WET WELL.
- F. INSTALL 6" DIA. 316 STAINLESS STEEL GOOSE NECK VENT. WITH 316 STAINLESS STEEL SCREEN. REFER TO DETAILS
- G. INSTALL PRESSURE GAUGE WITH ISOLATION BALL VALVE, MIN 4" DIAL, 5% ACCURACY, LIQUID FILLED. REFER TO DETAILS.
- H. INSTALL VACUUM GAUGE WITH ISOLATION BALL VALVE, MIN.4" DIAL 5:1 ACCURACY,
- I. INSTALL 2" AIR RELEASE VALVE AND PIPING ASSEMBLY. REFER TO DETAILS.
- J. INSTALL 316 STAINLESS STEEL JUNCTION BOX FOR SUBMERSIBLE PRESSURE LEVEL TRANSMITTER AND HIGH LEVEL FLOAT.
- K. PROVIDE SEAL ON SLEEVED OR CORED DISCHARGE PIPE OPENINGS (LINK SEAL OR APPROVED EQUAL) REFER TO DETAILS.

KEY NOT

- 1. CONTRACTOR TO CONFIRM SIZE AND LOCATION OF' WET WELL HATCHES PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS (48" X 78" MIN.)
- CONTRACTOR SHALL SEAL SLEEVED OR CORED DISCHARGE PIPE OPENINGS WITH LINK SEAL OR APPROVED EQUAL REFER TO DETAILS.
- 3. ALL PUMP DISCHARGE PIPE AND FITTINGS WITHIN WET WELL, SHALL BE FLANGED AND SHALL RECEIVE AFTER INSTALLATION A 100% SOLIDS COAL TAR EPOXY COATING SYSTEM IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS
- ALL PUMP DISCHARGE PIPE, VALVES AND FITTINGS OUTSIDE THE WET WELL, EXCEPT SS316 AND PVC, SHALL RECEIVE AFTER INSTALLATION A 100% SOLIDS EPOXY COATING SYSTEM WITH A TOP COAT OF POLYURETHANE IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS. COLOR SHALL BE GRAY PANTONE #431-U.
- 5. ALL FASTENERS, INSTALLED BOTH INSIDE AND OUTSIDE THE WET WELL, INCLUDING BUT NOT LIMITED TO ANCHORS, BOLTS, NUTS, WASHERS, CABLE GRIPS, LIFTING CHAINS, PULLING CABLES, GUIDERAILS, SUPPORT CHANNELS, MOUNTING PLATES, BRACKETS, ETC. SHALL BE MADE OF STAINLESS STEEL 316.
- 6. DISCHARGE PIPE SUPPORT CHANNEL SHALL BE MINIMUM 6X6-INCH, 1/4-INCH THICK CHANNEL. SUPPORT CHANNEL MOUNTING PLATE SHALL BE 12X12-INCH, 1/4-INCH THICK. ALL MATERIAL SHALL BE STAINLESS STEEL 316. THE DIMENSIONS APPLY FOR DISCHARGE LINES 14-INCH AND SMALLER. LARGER DISCHARGE LINES WILL REQUIRE LARGER SUPPORT CHANNELS AND MOUNTING PLATES.
- 7. TOP AND INTERMEDIATE GUIDERAIL BRACKETS, SLEEVES, AND ALL FASTENERS SHALL BE MADE OF STAINLESS STEEL 316. FOR BRACKETS DIFFERENT THAN THE ONE SHOWN, THE SAME SLEEVE CONCEPT SHALL BE PROVIDED IN THE DESIGN.



Colliers

Engineering

& Design

www.colliersengineering.com

Copyright © 2025. Colliers Engineering & Design All Rights Reserved. This drawing and all the information contained herein is authorized for use only by the party for whom the services were contracted or to whom it is certified. This drawing may not be copied, reused, disclosed, distributed or relied upon for any other purpose without the express written consent of Colliers Engineering & Design.

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

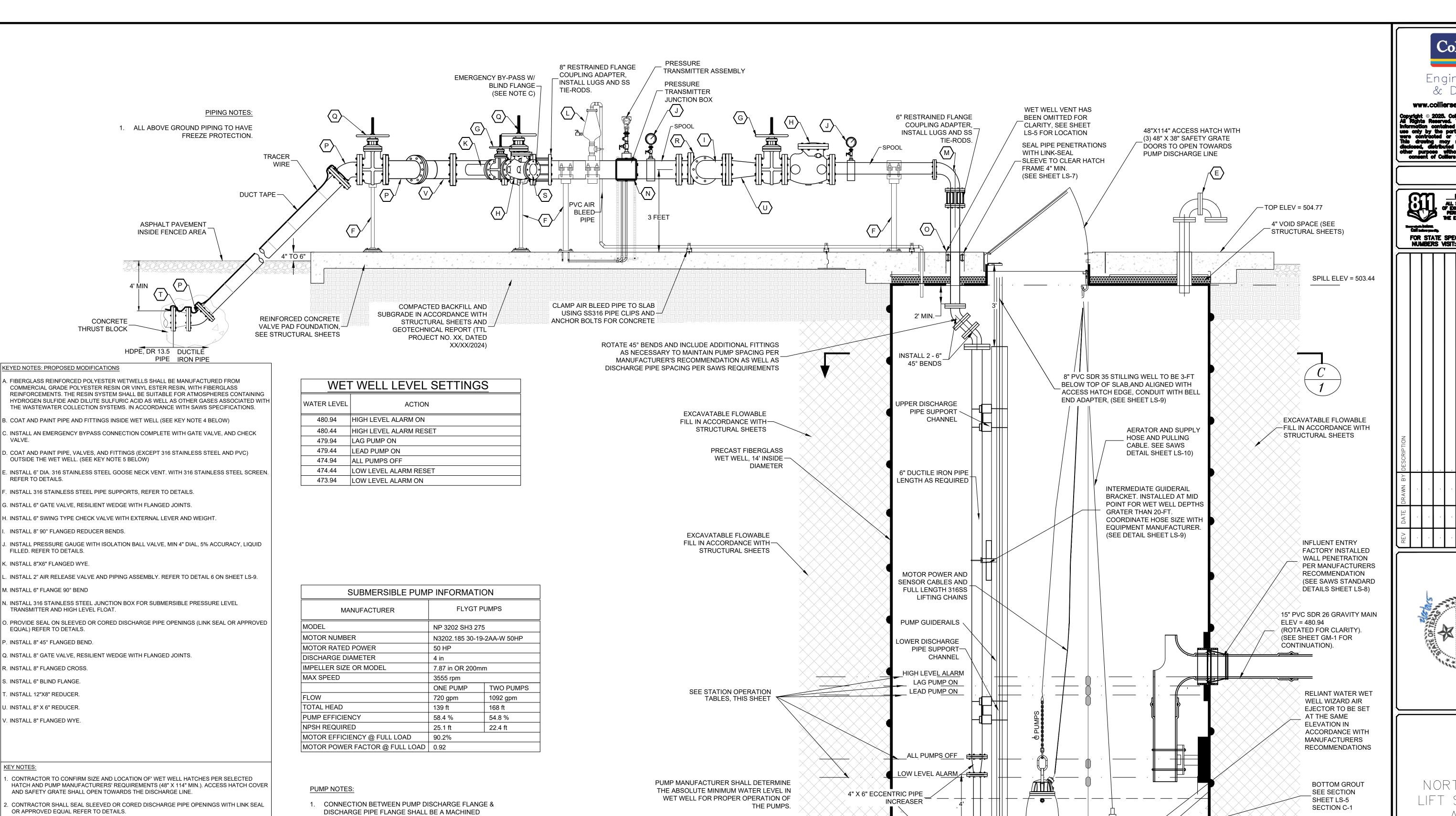
PROTECT YOURSELF

NORTHLAKE LIFT STATION AND FORCE MAIN



AS SHOWN 08/2 TJC DE TOUR SHOWN 08/2 TJC DE TOUR SHOWN DE LIFT STATION PLAN

LIFT STATION PLAN VIEW

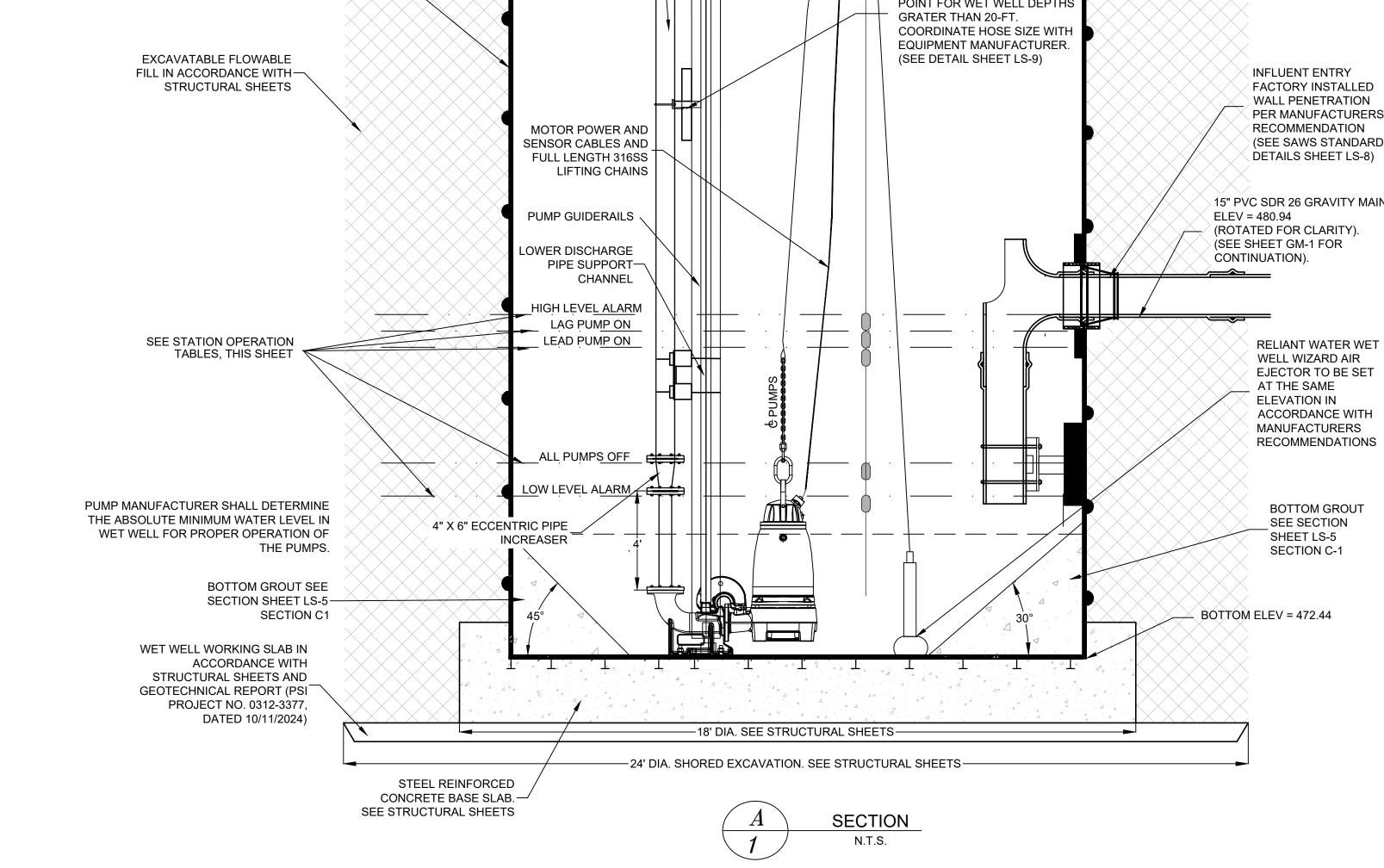


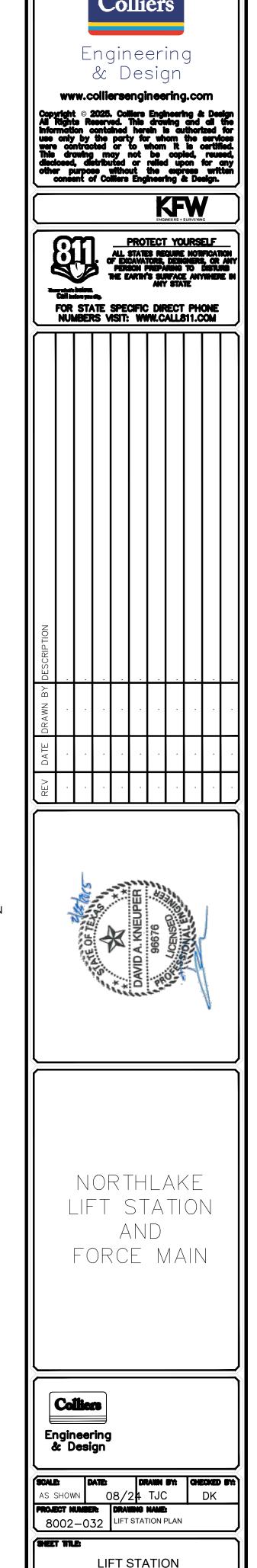
- . CONTRACTOR TO CONFIRM SIZE AND LOCATION OF WET WELL HATCHES PER SELECTED HATCH AND PUMP MANUFACTURERS' REQUIREMENTS (48" X 114" MIN.). ACCESS HATCH COVER AND SAFETY GRATE SHALL OPEN TOWARDS THE DISCHARGE LINE.
- OR APPROVED EQUAL REFER TO DETAILS.
- B. ALL PUMP DISCHARGE PIPE AND FITTINGS WITHIN WET WELL, SHALL BE FLANGED AND SHALL RECEIVE AFTER INSTALLATION A 100% SOLIDS COAL TAR EPOXY COATING SYSTEM IN ACCORDANCE WITH MANUFACTURER INSTRUCTIONS
- . ALL PUMP DISCHARGE PIPE, VALVES AND FITTINGS OUTSIDE THE WET WELL, EXCEPT SS316 AND PVC, SHALL RECEIVE AFTER INSTALLATION A 100% SOLIDS EPOXY COATING AND LINED INTERNALLY WITH A TOP COAT OF POLYURETHANE IN ACCORDANCE WITH MANUFACTURERS' INSTRUCTIONS. COLOR SHALL BE GRAY PANTONE #431-U.
- 5. ALL FASTENERS, INSTALLED BOTH INSIDE AND OUTSIDE THE WET WELL, INCLUDING BUT NOT LIMITED TO ANCHORS, BOLTS, NUTS, WASHERS, CABLE GRIPS, LIFTING CHAINS, PULLING CABLES, GUIDERAILS, SUPPORT CHANNELS, MOUNTING PLATES, BRACKETS, ETC. SHALL BE MADE OF STAINLESS STEEL 316.
- . DISCHARGE PIPE SUPPORT CHANNEL SHALL BE MINIMUM 6X6-INCH, 1/4-INCH THICK CHANNEL. SUPPORT CHANNEL MOUNTING PLATE SHALL BE 12X12-INCH, 1/4-INCH THICK. ALL MATERIAL SHALL BE STAINLESS STEEL 316. THE DIMENSIONS APPLY FOR DISCHARGE LINES 14-INCH AND SMALLER. LARGER DISCHARGE LINES WILL REQUIRE LARGER SUPPORT CHANNELS AND MOUNTING PLATES.
- TOP AND INTERMEDIATE GUIDERAIL BRACKETS, SLEEVES, AND ALL FASTENERS SHALL BE MADE OF STAINLESS STEEL 316. FOR BRACKETS DIFFERENT THAN THE ONE SHOWN, THE SAME SLEEVE CONCEPT SHALL BE PROVIDED IN THE DESIGN.

- METAL TO METAL WATER TIGHT CONTACT.
- 2. NO PORTION OF THE PUMP SHALL BE IN CONTACT WITH THE FLOOR.
- 3. PUMPS AND WET WELL LEVELS SHALL BE MONITORED VIA SCADA

STRUCTURAL NOTES:

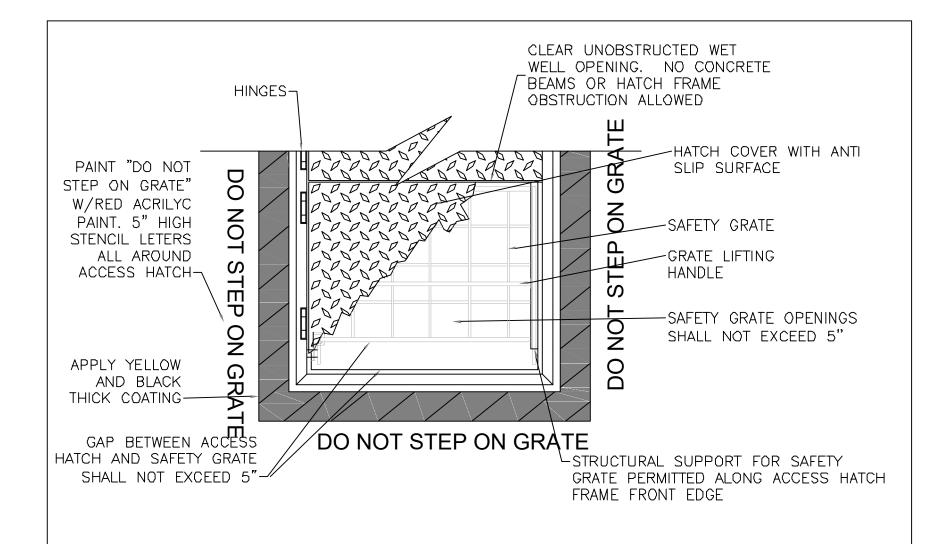
- 1. CONCRETE SLABS AND SUBGRADE FILLING SHALL BE DESIGN BASED ON THE WET WELL DIMENSIONS, SOIL CONDITIONS, ETC
- 2. CONTRACTOR TO COORDINATE WITH OWNER AND ENGINEER FOR DIRECTION ON SPOIL MATERIAL HAUL-OFF OR PLACEMENT ON SITE.





PROFILE VIEW

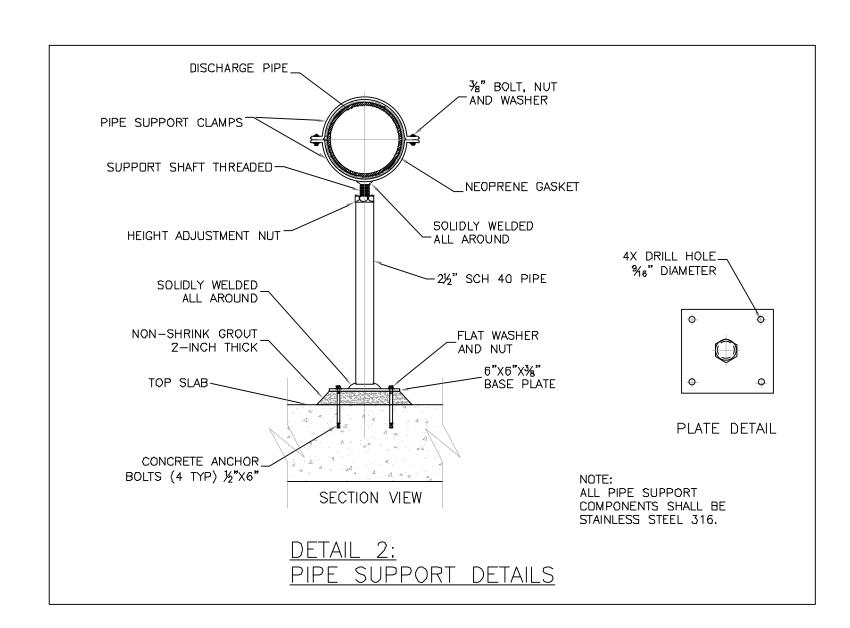
LS-5

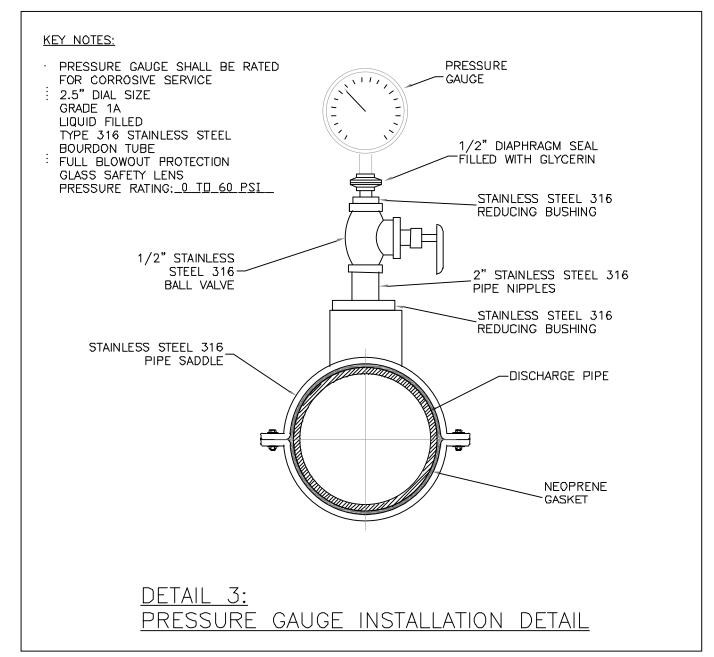


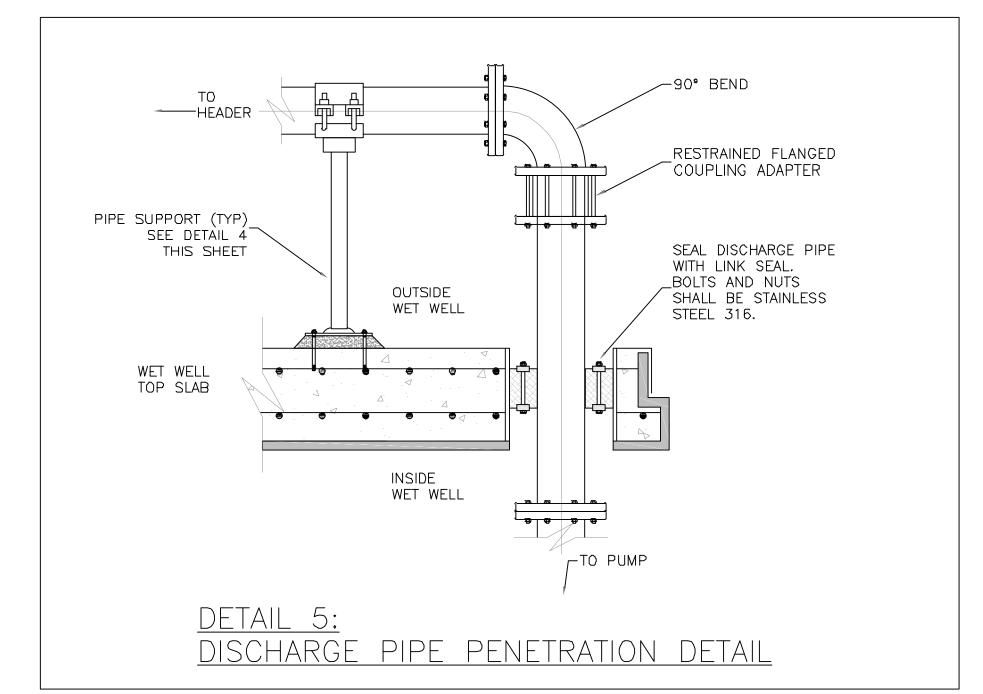
KEY NOTES:

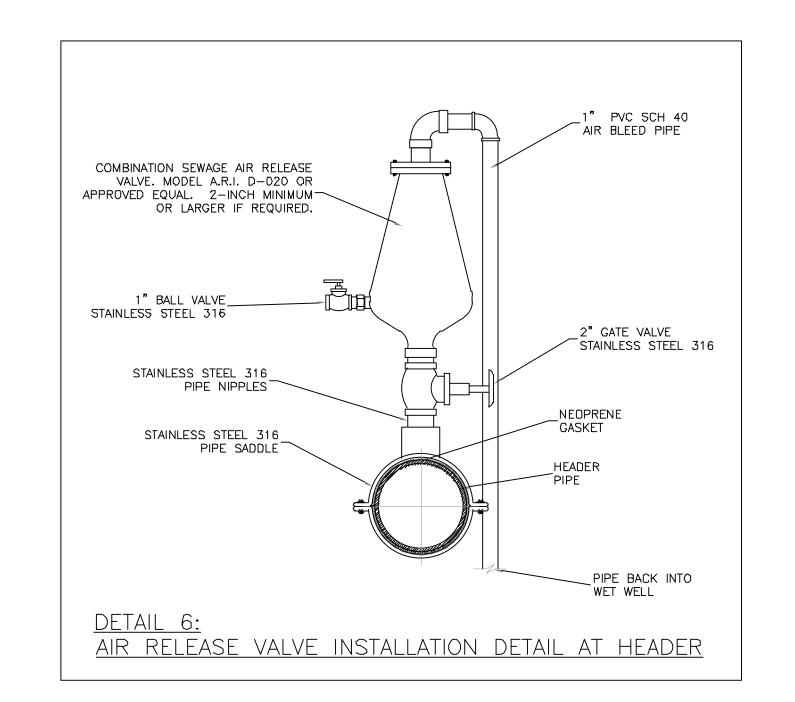
- · SAFETY GRATE SHALL BE UP TO $\frac{1}{2}$ " BELOW TOP OF CONCRETE SLAB, BUT IN NO CASE THE $\frac{1}{2}$ " DISTANCE SHALL BE EXCEEDED.
- ACCESS HATCH COVER SHALL BE PERFECTLY LEVELED WITH TOP OF CONCRETE SLAB.
 ACCESS HATCH AND SAFETY GRATE SHALL OPEN TOWARDS DISCHARGE PIPE.
- · A FULL UNOBSTRUCTED WET WELL OPENING SHALL BE AVAILABLE WHEN THE ACCESS HATCH AND SAFETY GRATES ARE OPENED. OBSTRUCTIONS SUCH AS CONCRETE BEAMS OR HATCH FRAMES SHALL NOT INTERFERE WITH THE OPENING.
- · SAFETY GRATE SHALL SUPPORT THE ACCESS HATCH, AND IT SHALL PROVIDE STRUCTURAL SUPPORT TO ALLOW PERSONNEL TO WALK OVER THE ACCESS HATCH AND SAFETY GRATE.
- · ALL PUMP ACCESS HATCHES AND SAFETY GRATES SHALL OPEN TOWARDS THE PUMP DISCHARGE LINES. OPENING IN OTHER DIRECTIONS IS PROHIBITED.

<u>DETAIL 1:</u>
<u>ACCESS HATCH AND</u>
SAFETY GRATE DETAIL

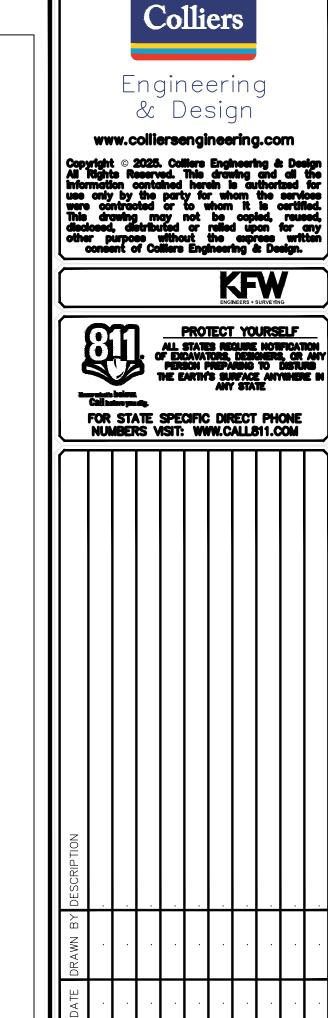


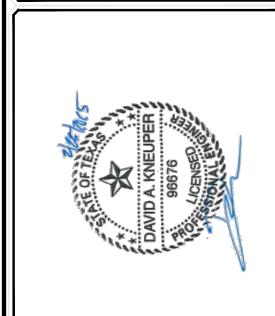












NORTHLAKE LIFT STATION AND FORCE MAIN





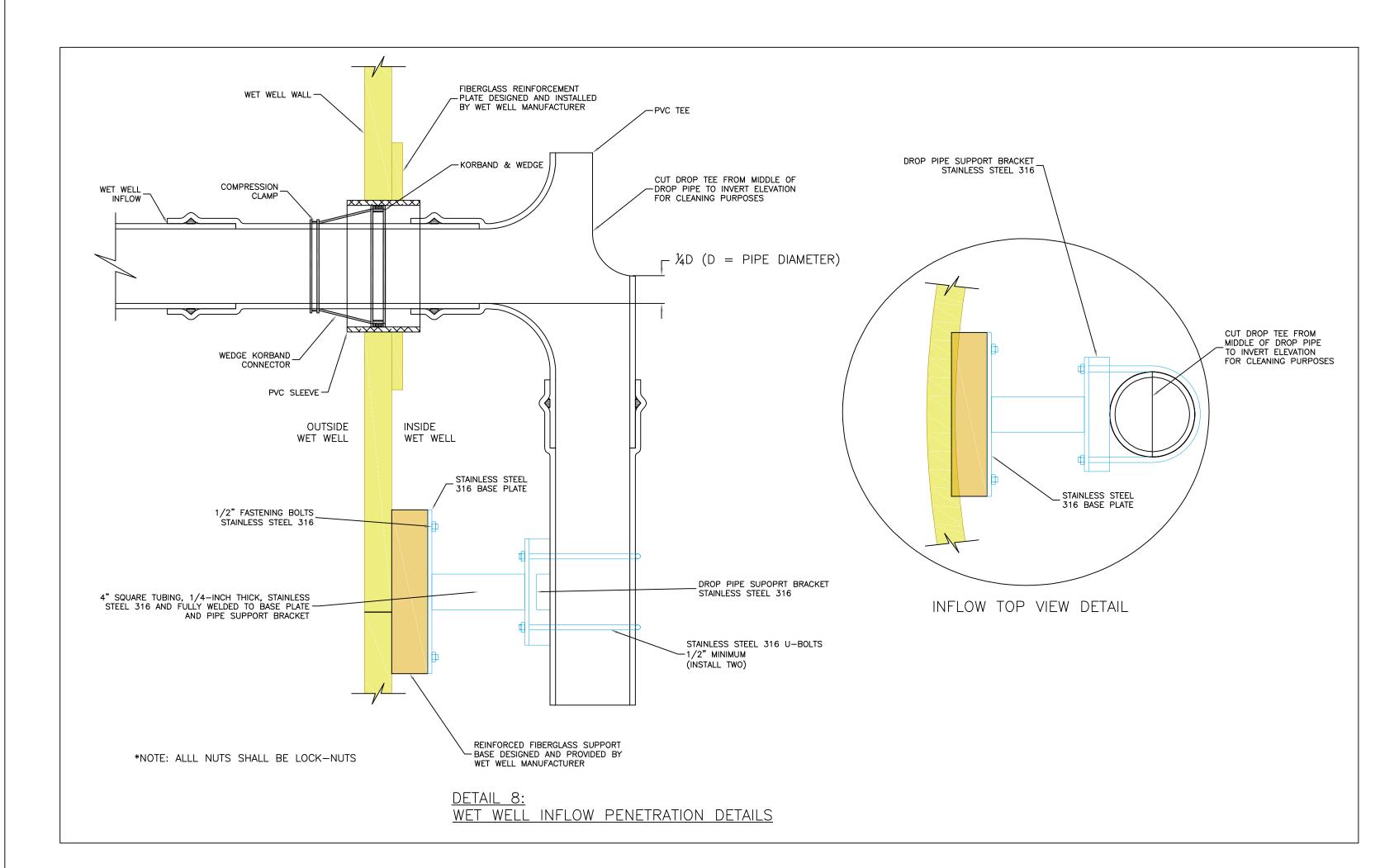
SCALE: DATE: DRAWN BY: CHECKED BY: DK

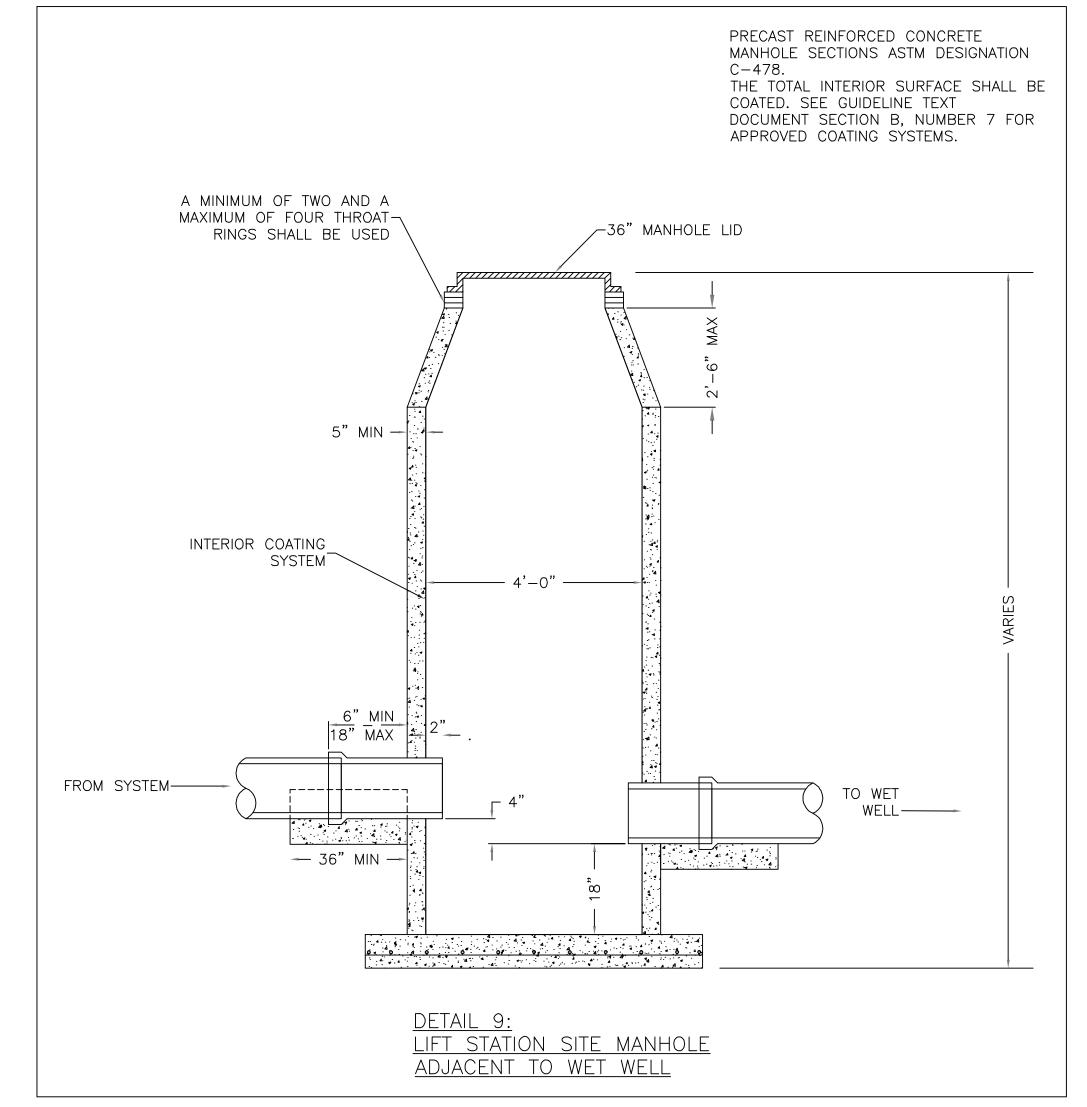
O8/24 DM DK

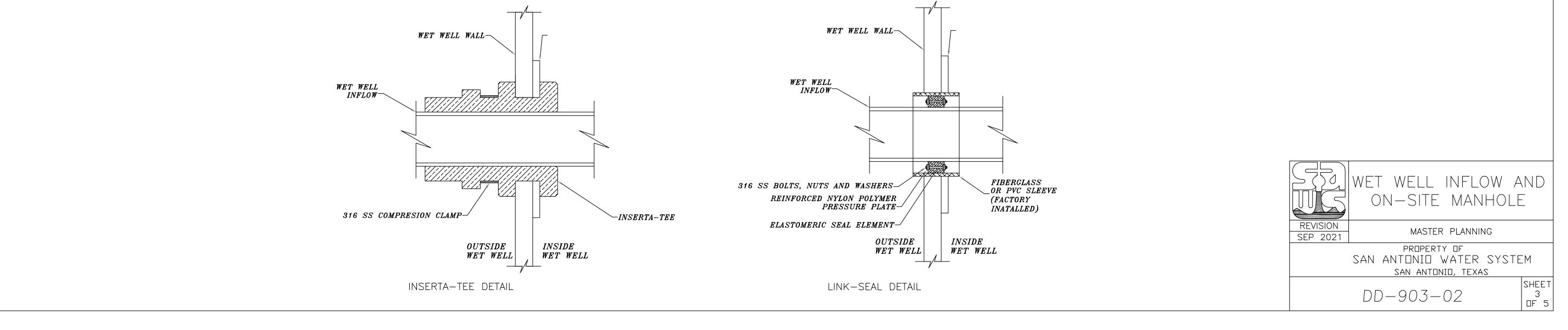
PROJECT NUMBER: DRAWNS NAME: SAWS DETAILS

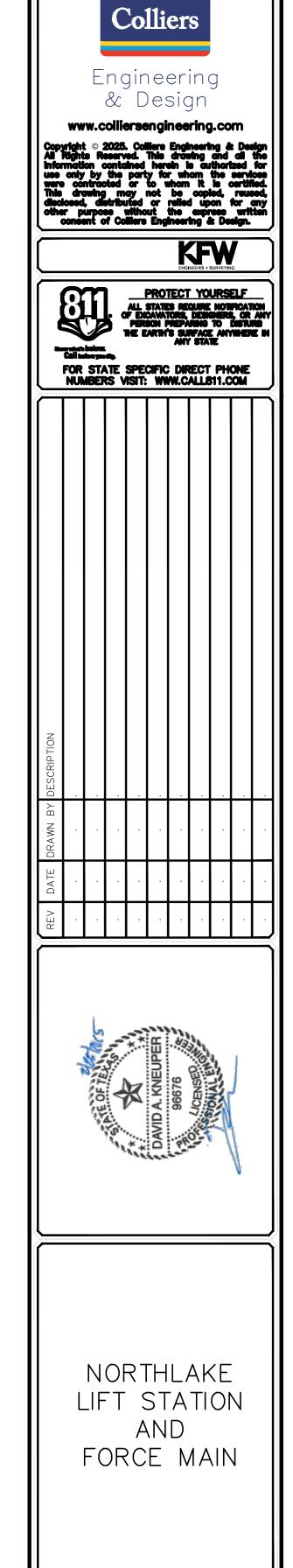
SAWS LIFT STATION DETAILS 1 OF 5

LS-6









Engineering & Design

SCALE: DATE: DRAWN 5Y: CHECKED 5Y: AS SHOWN 08/24 DM DK

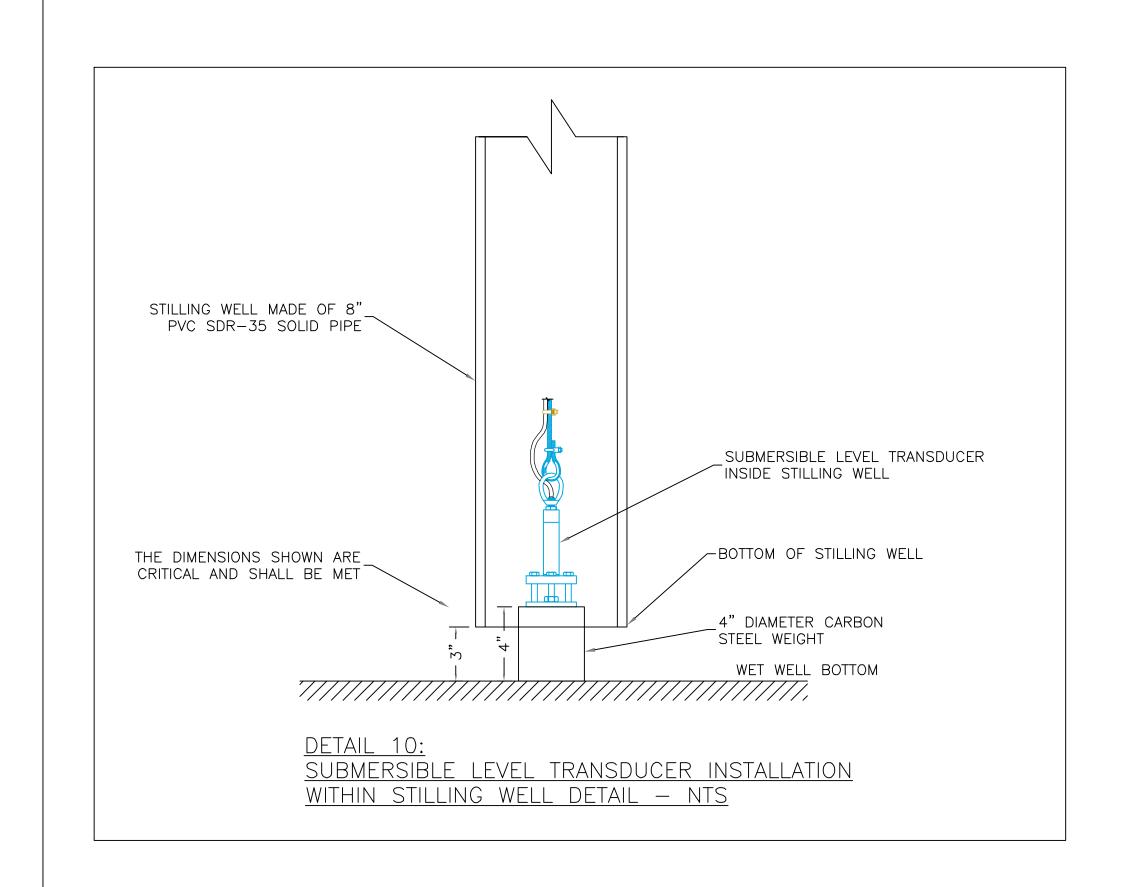
UTILITY ENGINEERING GROUP PLLC

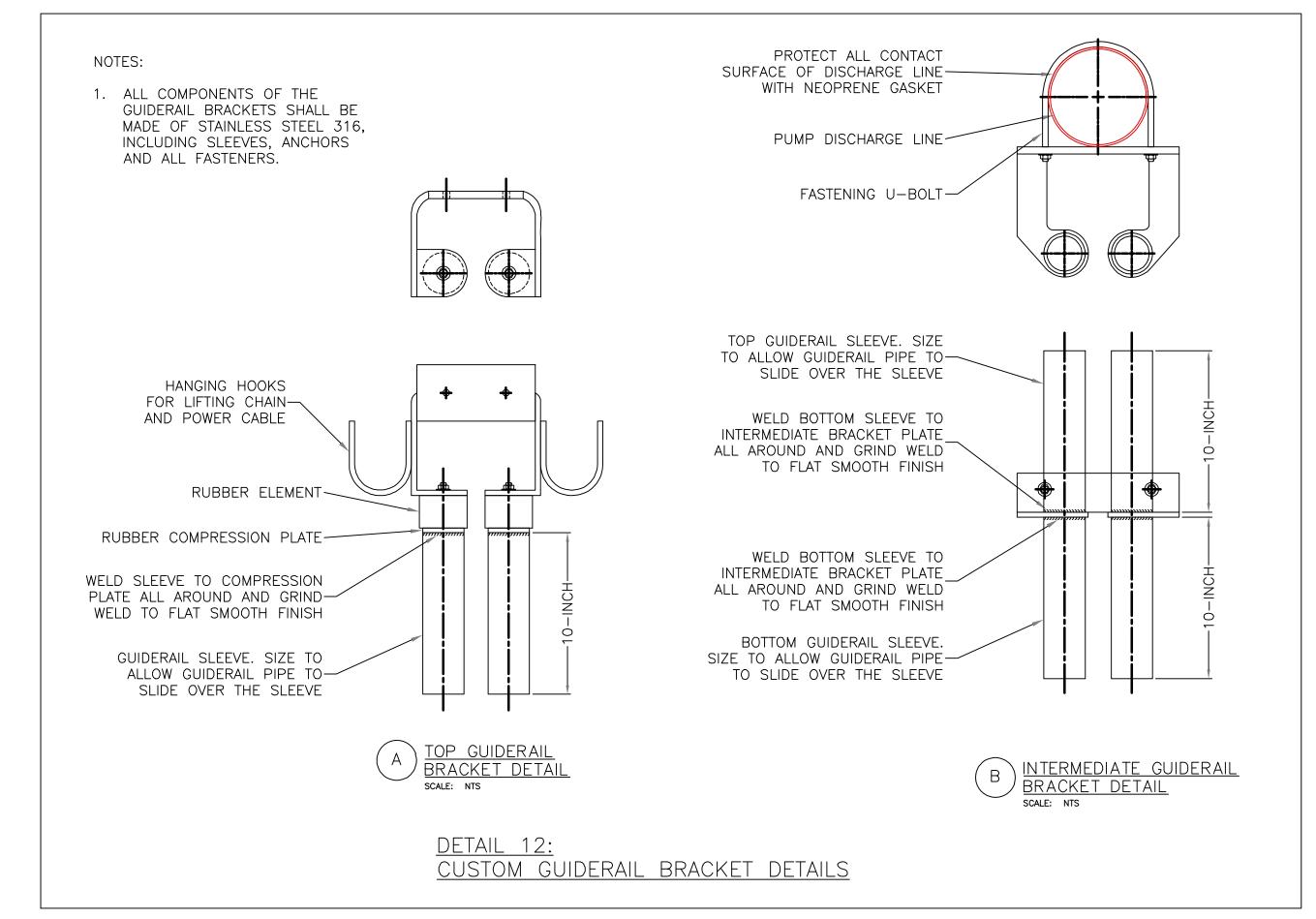
This UPPLANT SELECT FOR THE SE

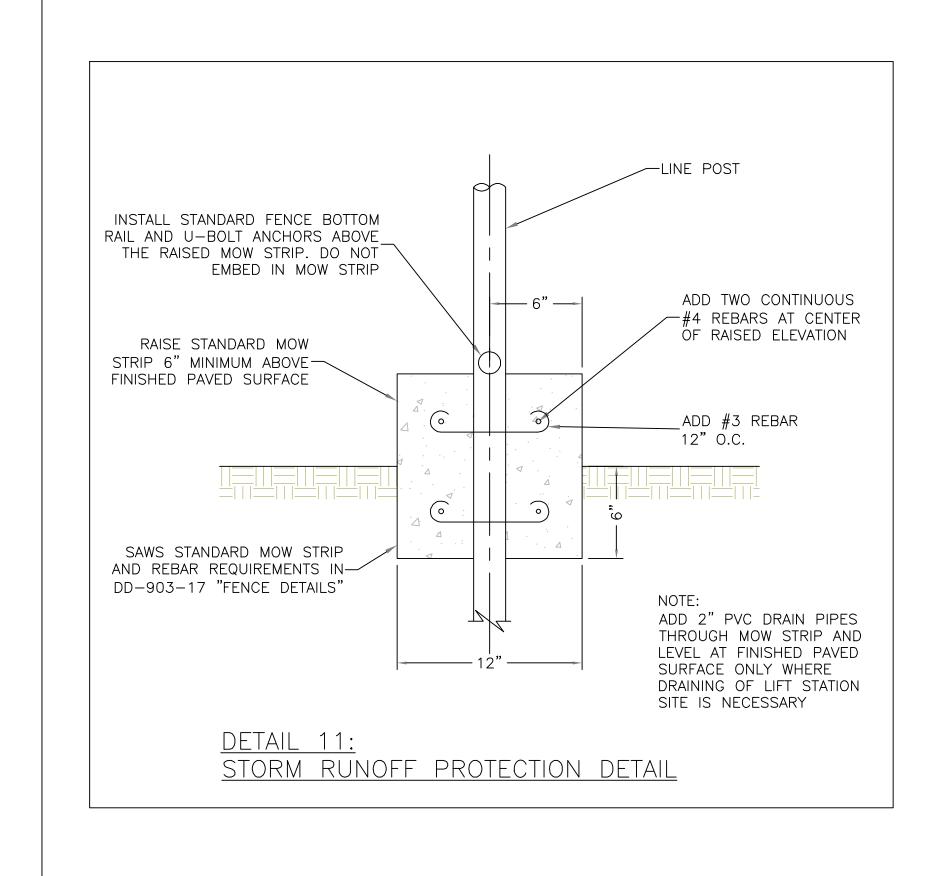
AS SHOWN 08/24 DM DI
PROJECT NUMBER: SAWS DETAILS

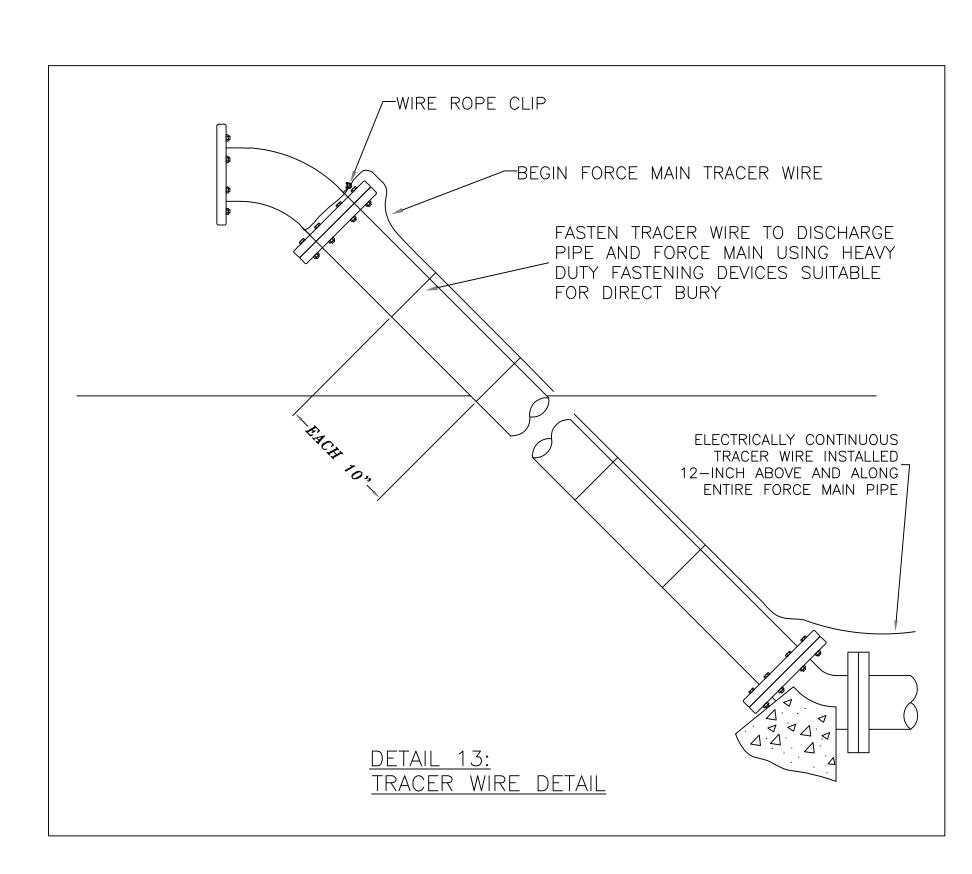
SAWS LIFT STATION DETAILS 2 OF 5

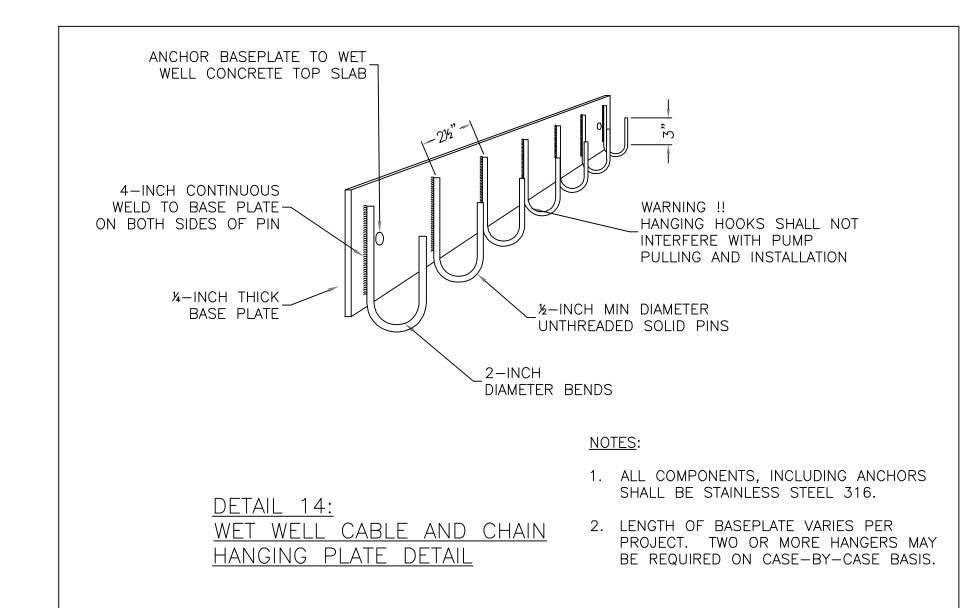
LS-7



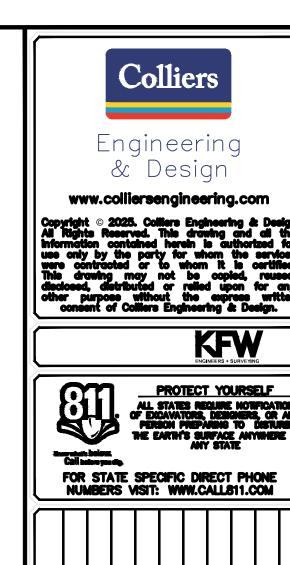


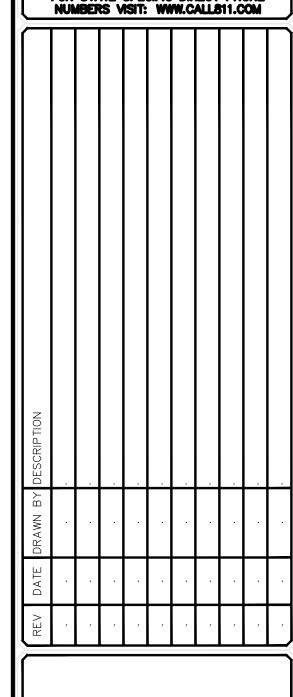












NORTHLAKE LIFT STATION AND FORCE MAIN

	Colliers	UT EN
E	ingineering & Design	GR ISI N. Leian Ave IIEW BYA. R. FELS. TE Texas Engineering Firm F-18712

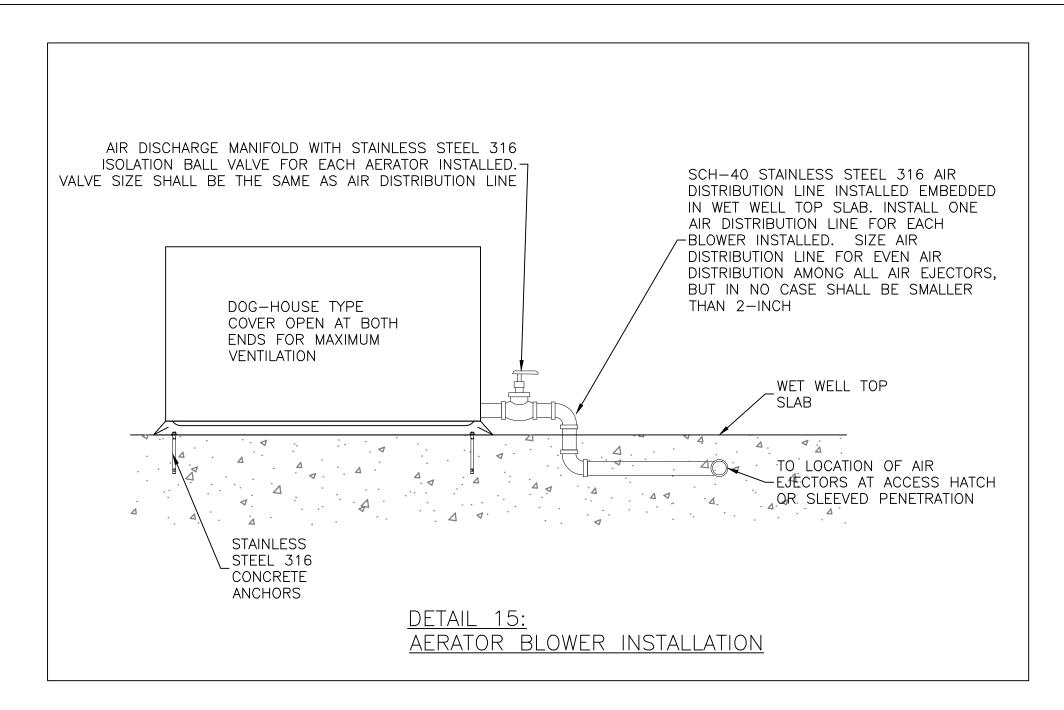
NGINEERING ROUP PLLC

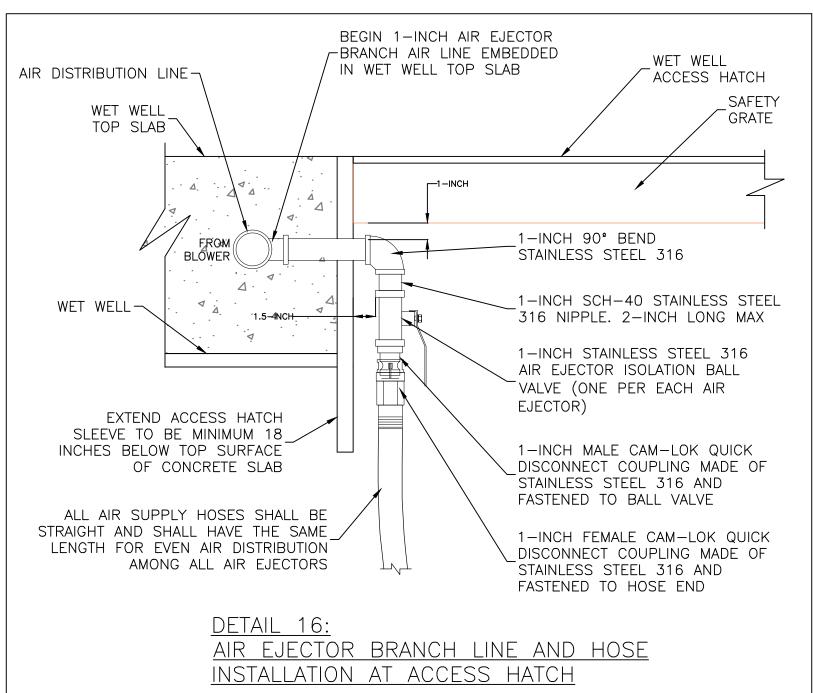
SCALE: DATE: DRAWN 5Y: CHECKED 5Y: AS SHOWN 08/24 DM DK

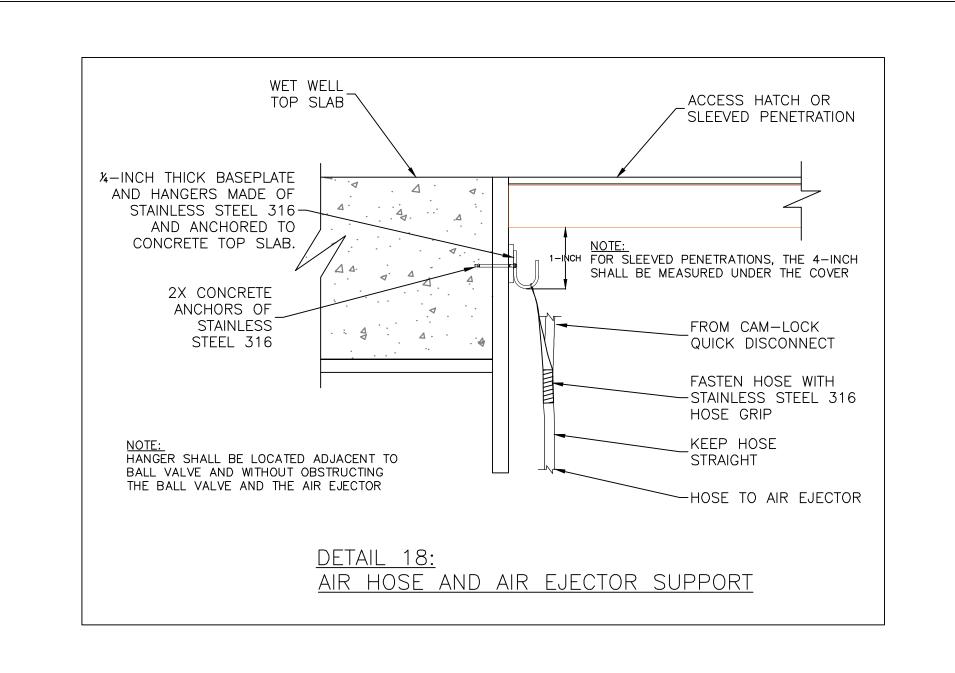
PROJECT NUMBER: DRAWNS NAME: 8002-032 SAWS DETAILS

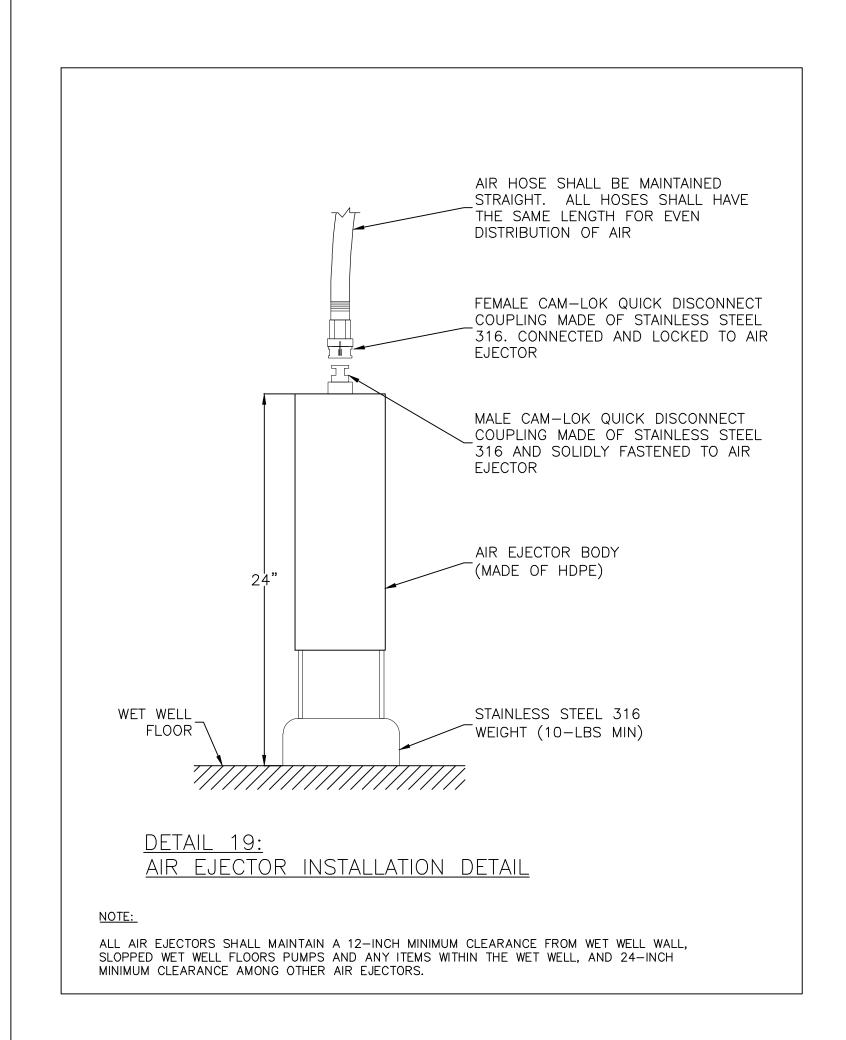
> SAWS LIFT STATION DETAILS 3 OF 5

> > LS-8



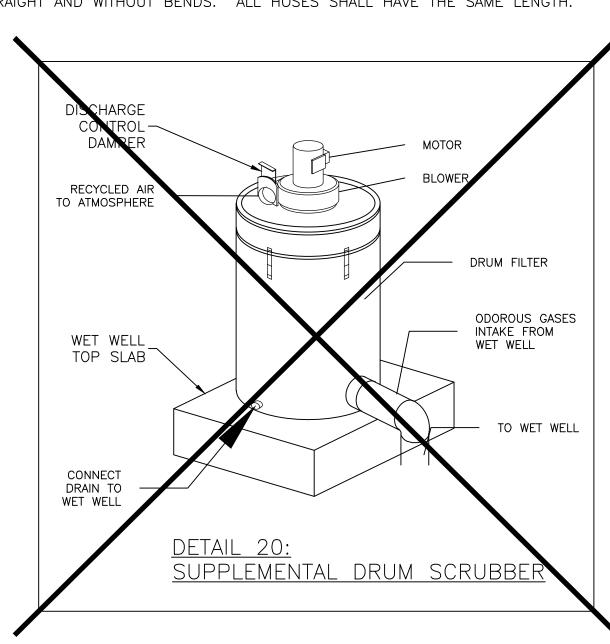


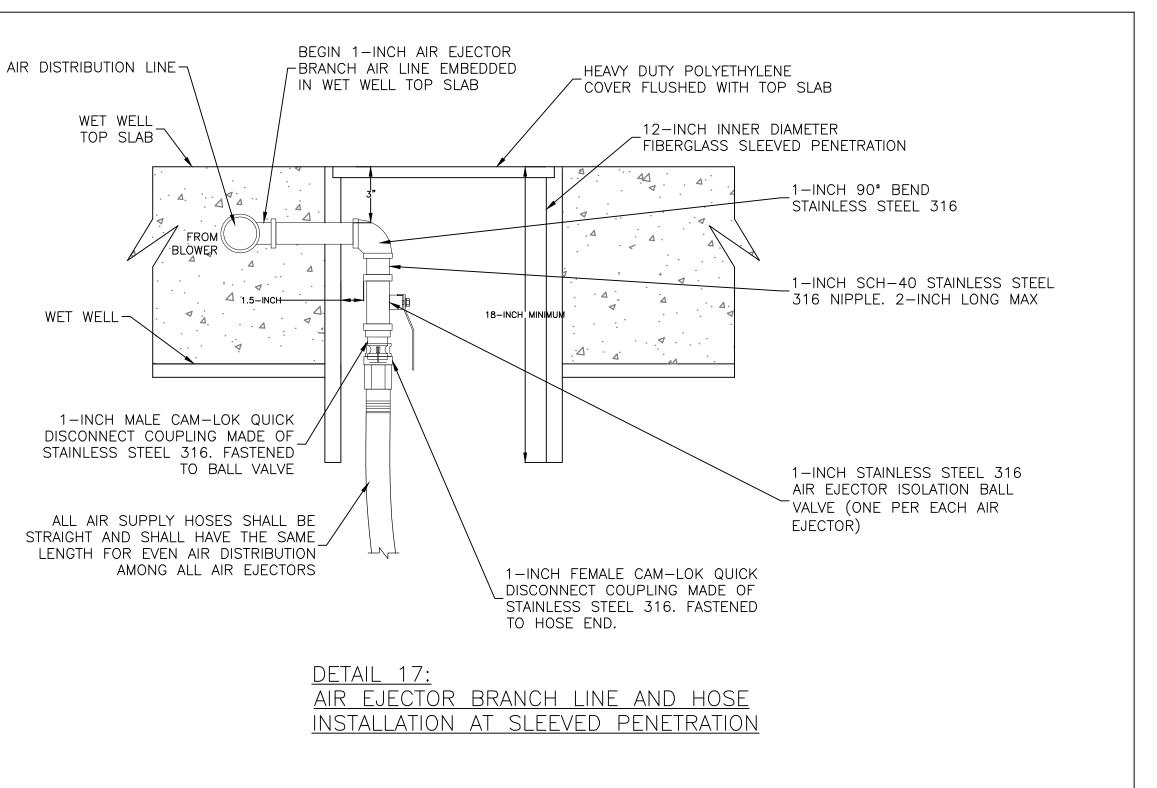


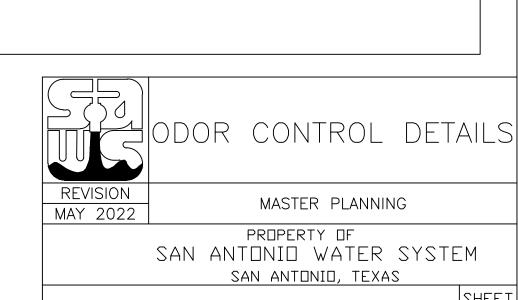


NOTES:

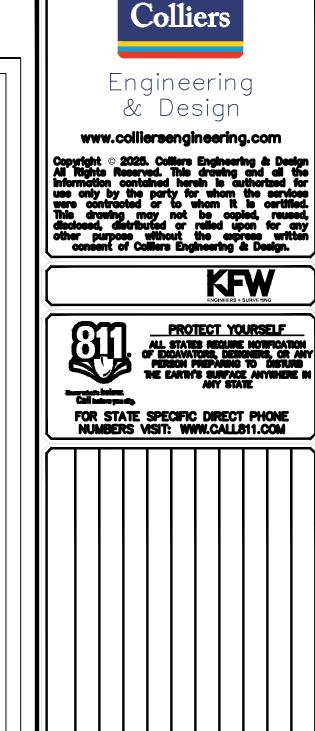
- 1. DESIGN ENGINEER SHALL COORDINATE THE DESIGN OF THE WET WELL TOP SLAB WITH THE AERATOR SYSTEM MANUFACTURER, THE ELECTRICAL AND STRUCTURAL ENGINEERS, AND WITH SAWS.
- 2. WHERE POSSIBLE, AIR EJECTORS SHALL TERMINATE AT ACCESS HATCHES. ANY AIR EJECTOR THAT CANNOT TERMINATE AT A WET WELL ACCESS HATCH 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.
- 3. 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.
- 4. 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.
- 5. ALL ANCHOR BOLTS, STRUT CHANNELS, PIPE CLAMPS AND FASTENERS USED FOR INSTALLATION OF THE AERATOR SYSTEM SHALL BE MADE OF STAINLESS STEEL 316.
- 6. ALL THREADED JOINTS SHALL BE SEALED WITH SUFFICIENT TEFLON TAPE TO PREVENT AIR LEAK.
- 7. 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.

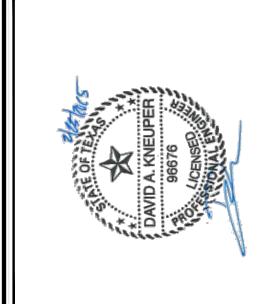






DD-903-02





NORTHLAKE LIFT STATION AND FORCE MAIN

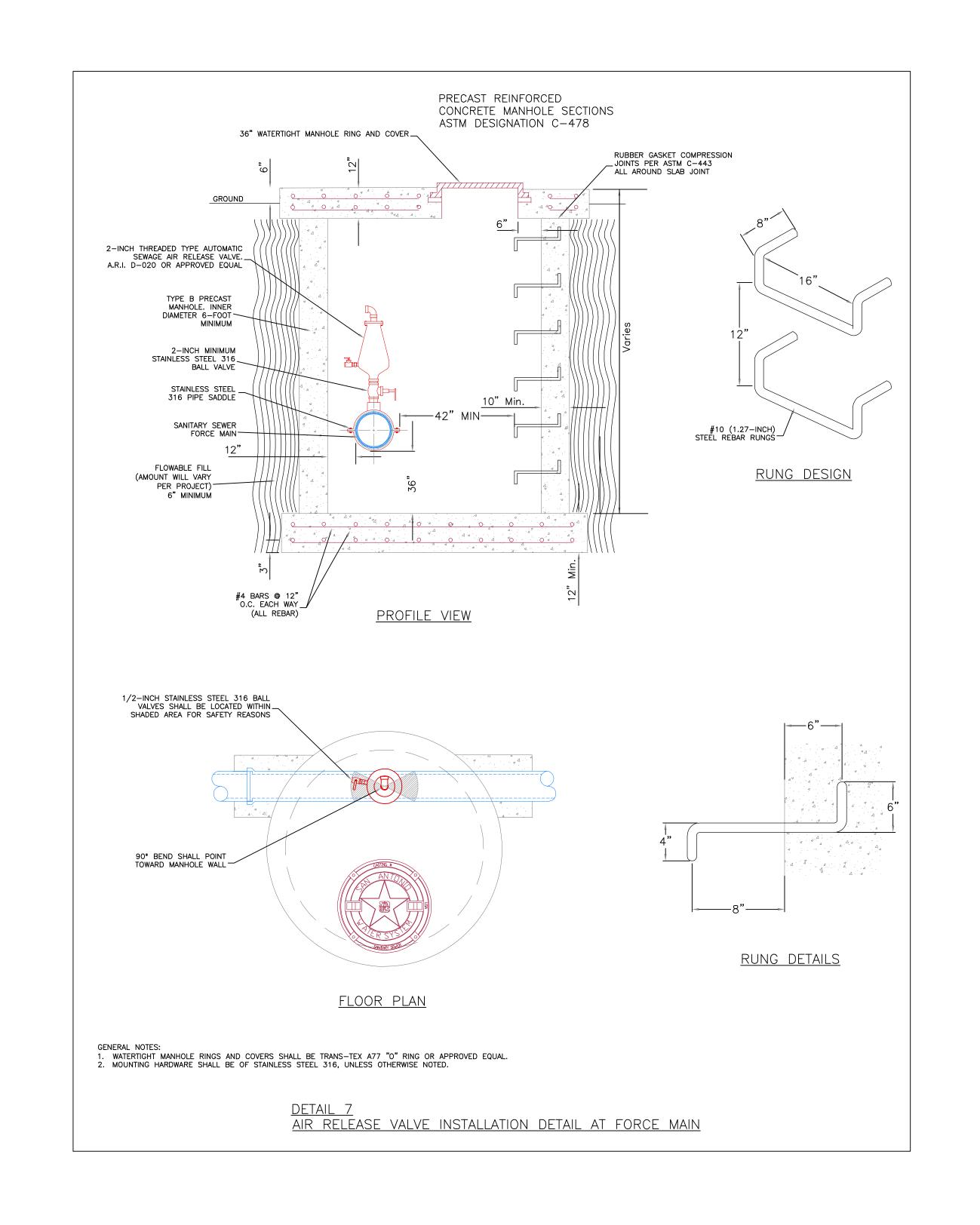


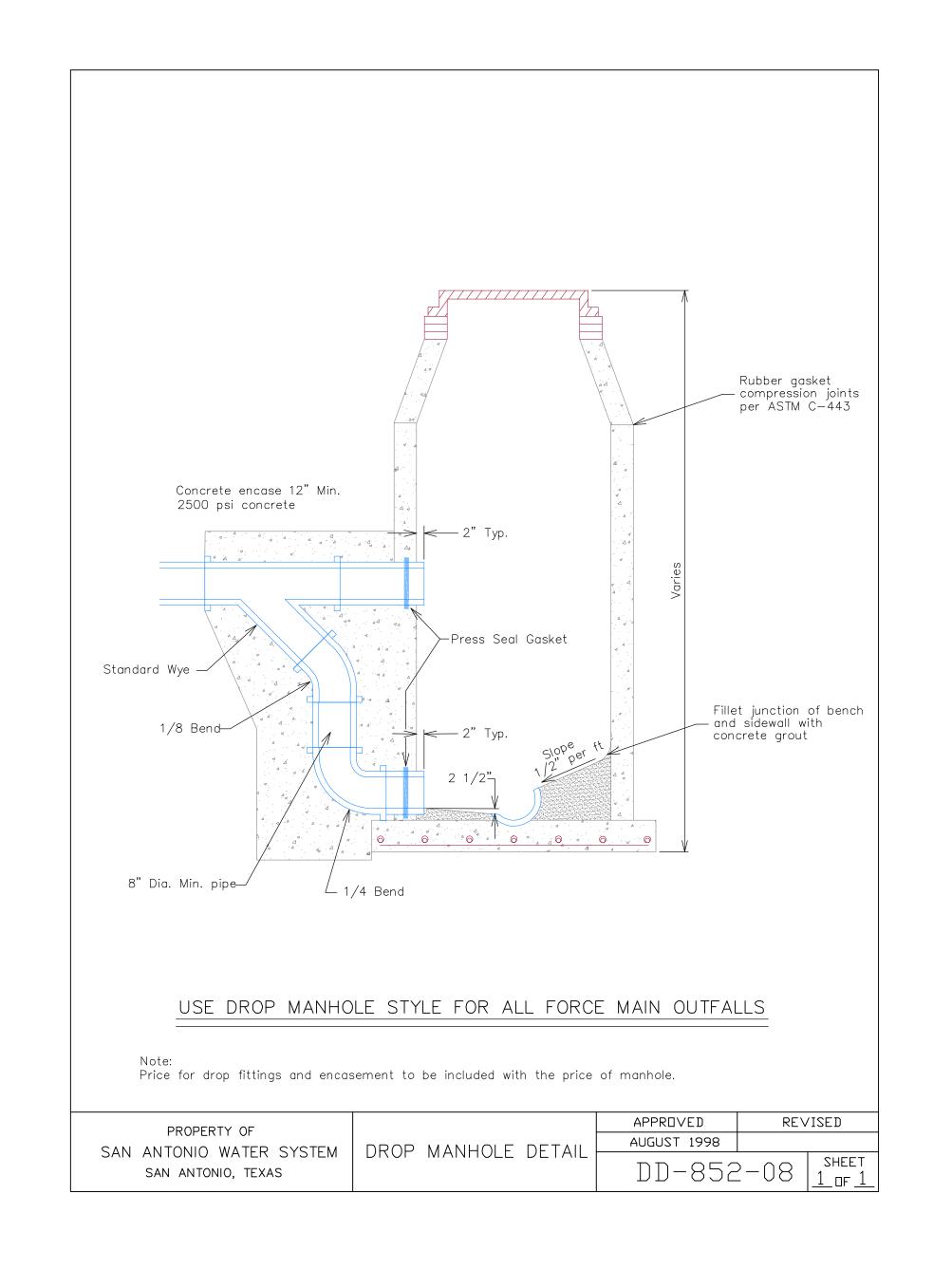
UTILITY ENGINEERING GROUP PLLC

SCALE: DATE: DRAWN BY: CHECKED BY:
AS SHOWN 08/24 DM DK 8002-032 SAWS DETAILS

SAWS LIFT STATION DETAILS 4 OF 5

LS-9





REVISION SEP 2021

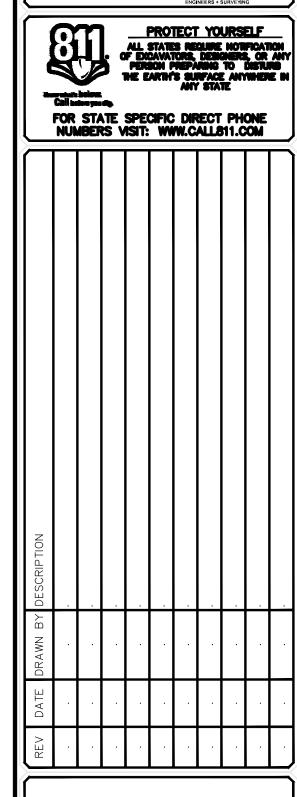
FORCE MAIN AIR RELEASE VALVES DISCHARGE MANHOLE

MASTER PLANNING

PROPERTY OF SAN ANTONIO WATER SYSTEM SAN ANTONIO, TEXAS

SHEET 2 DF 5 DD-903-02

Colliers & Design www.colliersengineering.com PROTECT YOURSELF





NORTHLAKE LIFT STATION AND FORCE MAIN

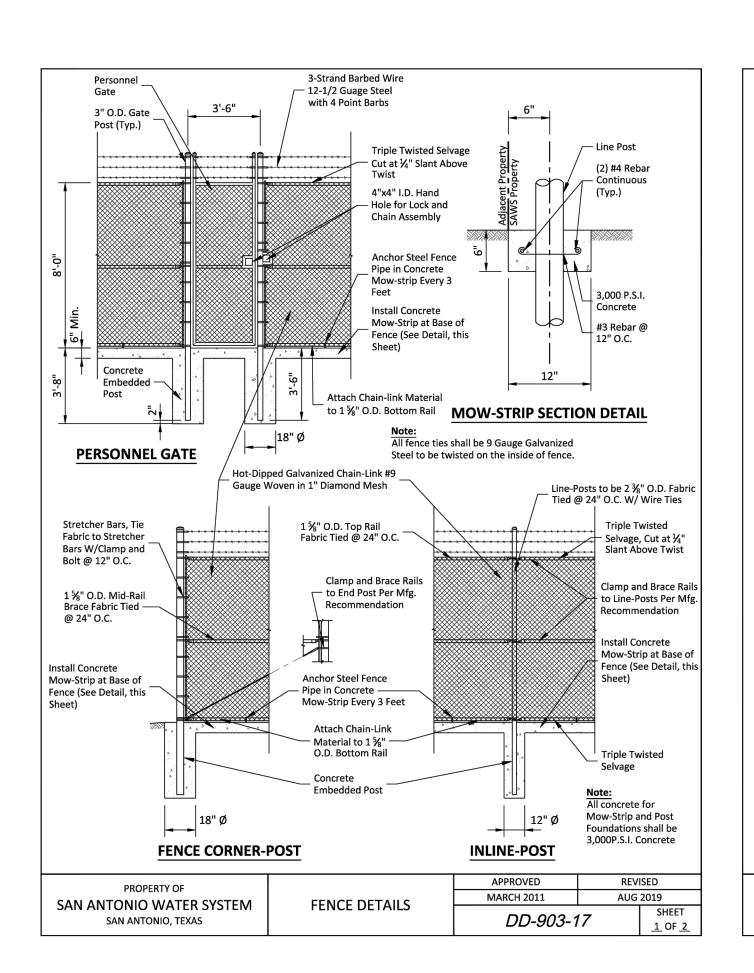


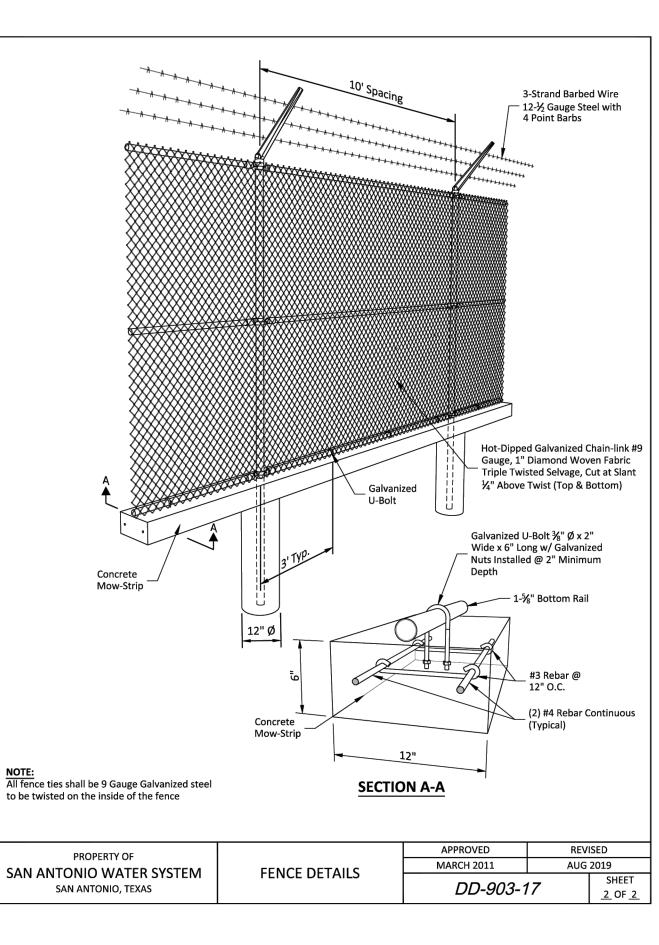
UTILITY
ENGINEERING
GROUP PLC
BILLOWS POR HEND STANDELS, TEXAS TRUST PLACES

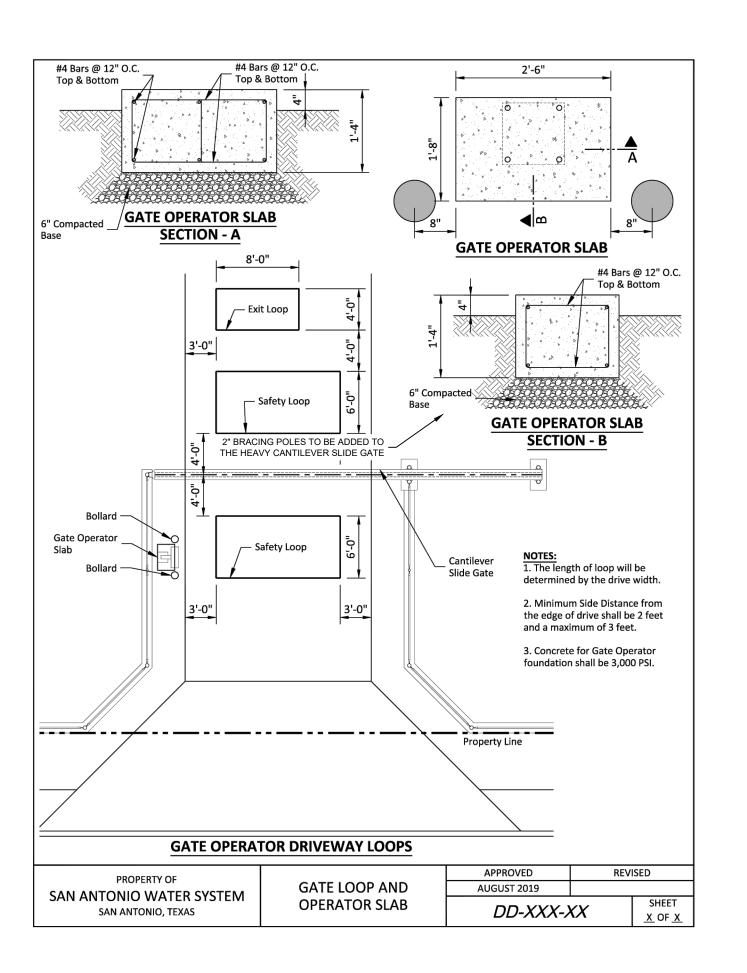
AS SHOWN 08/24 DM DK 8002-032 SAWS DETAILS

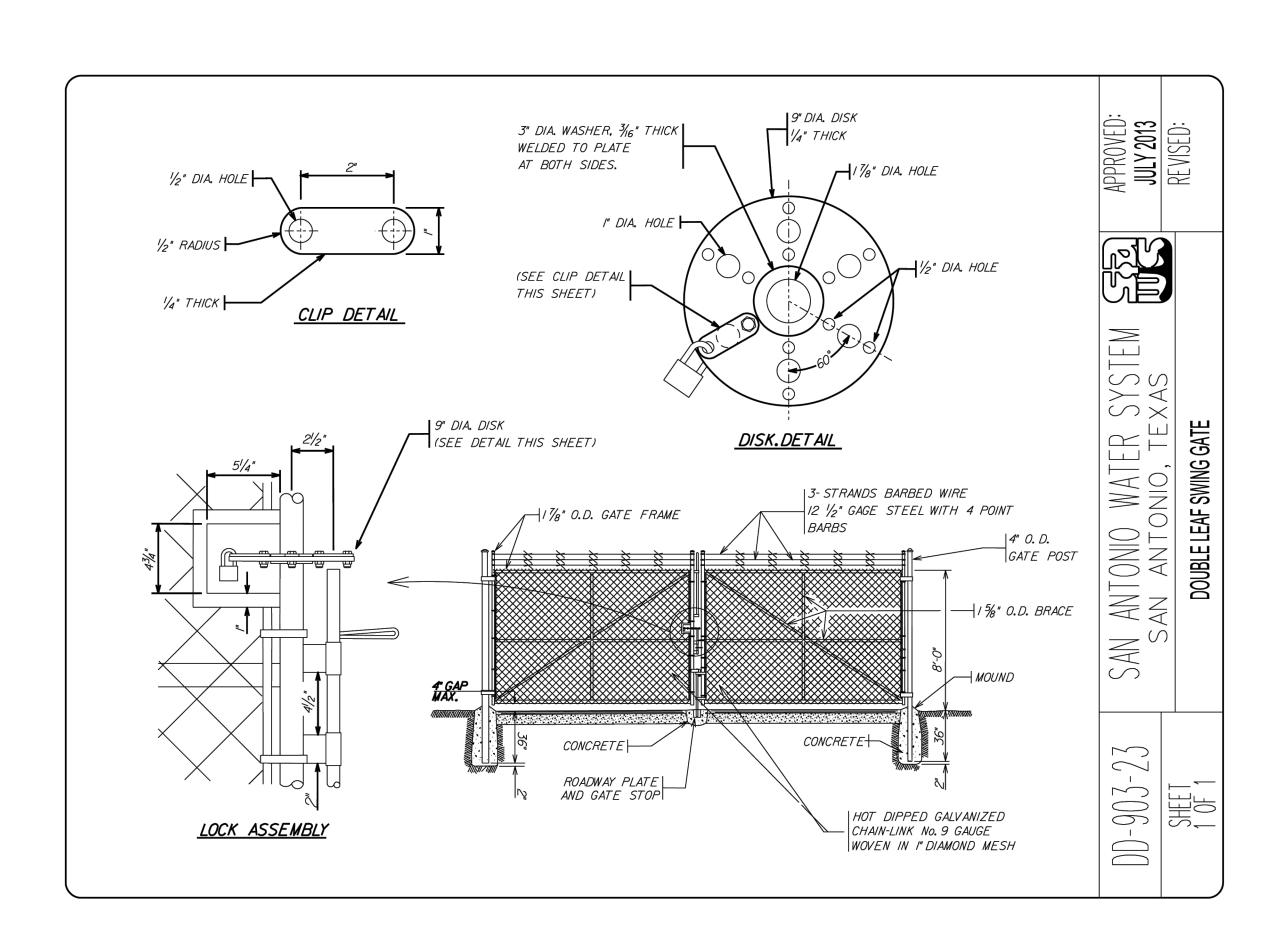
> SAWS LIFT STATION DETAILS 5 OF 5

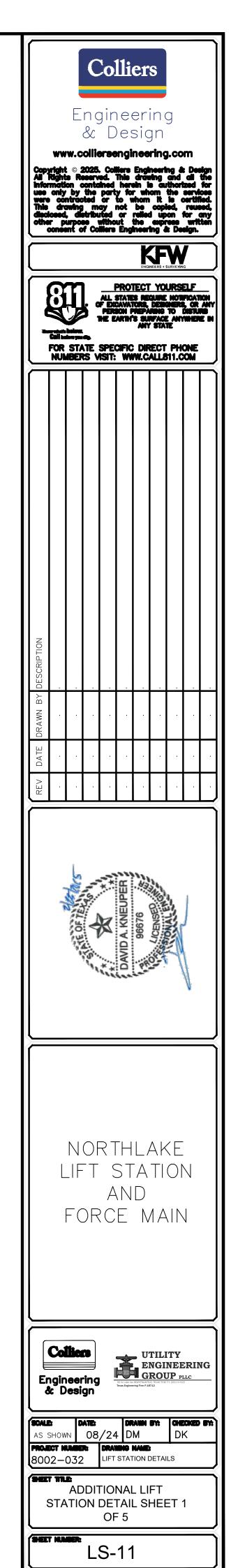
> > LS-10

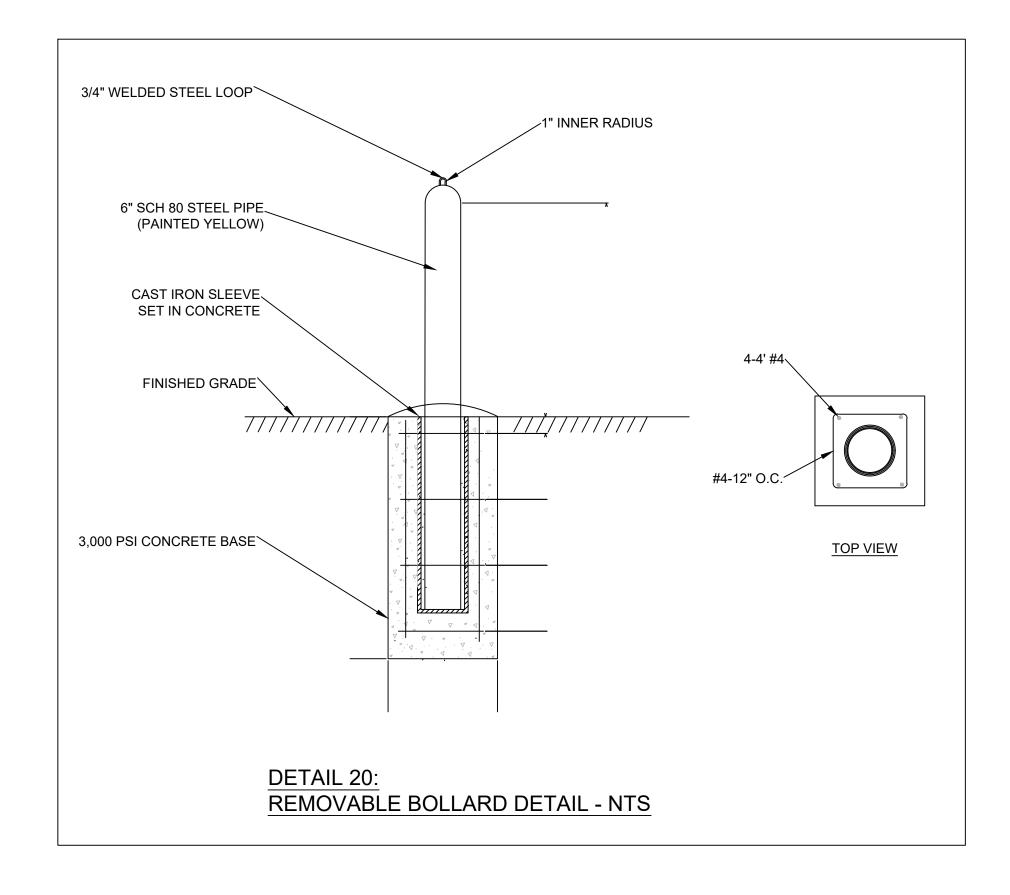


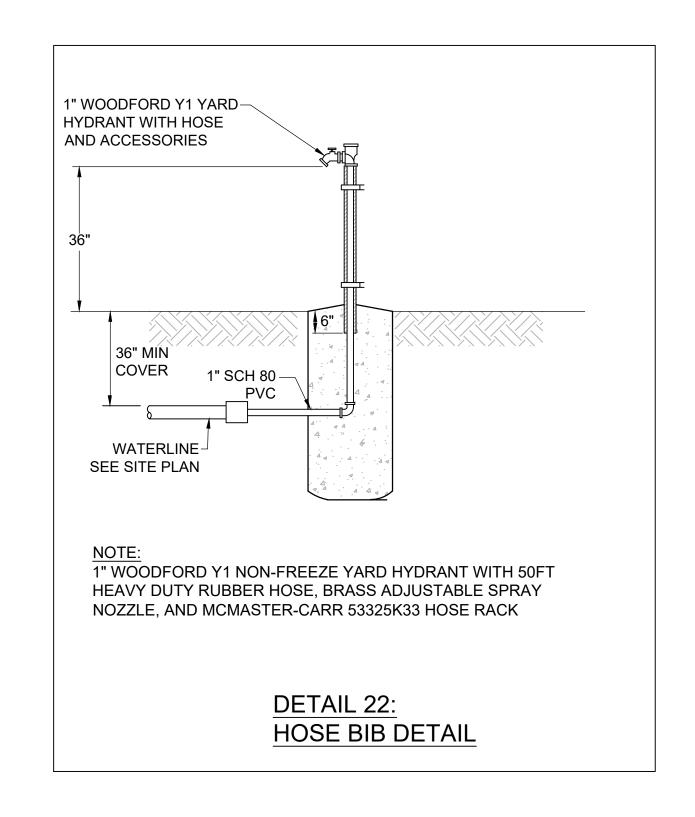


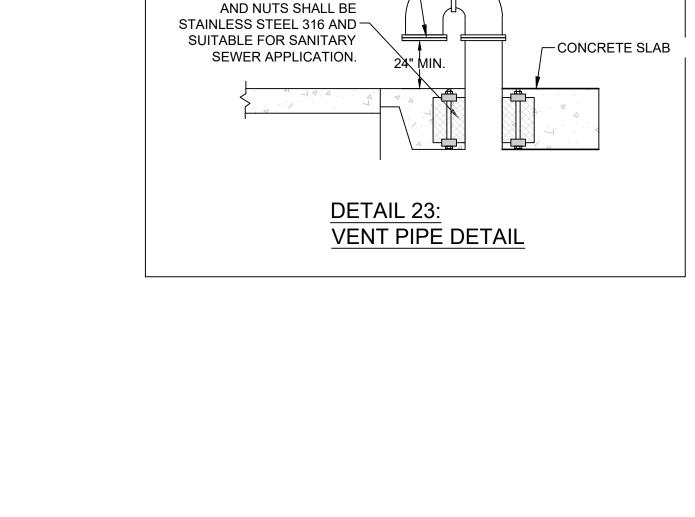












20 MESH STAINLESS

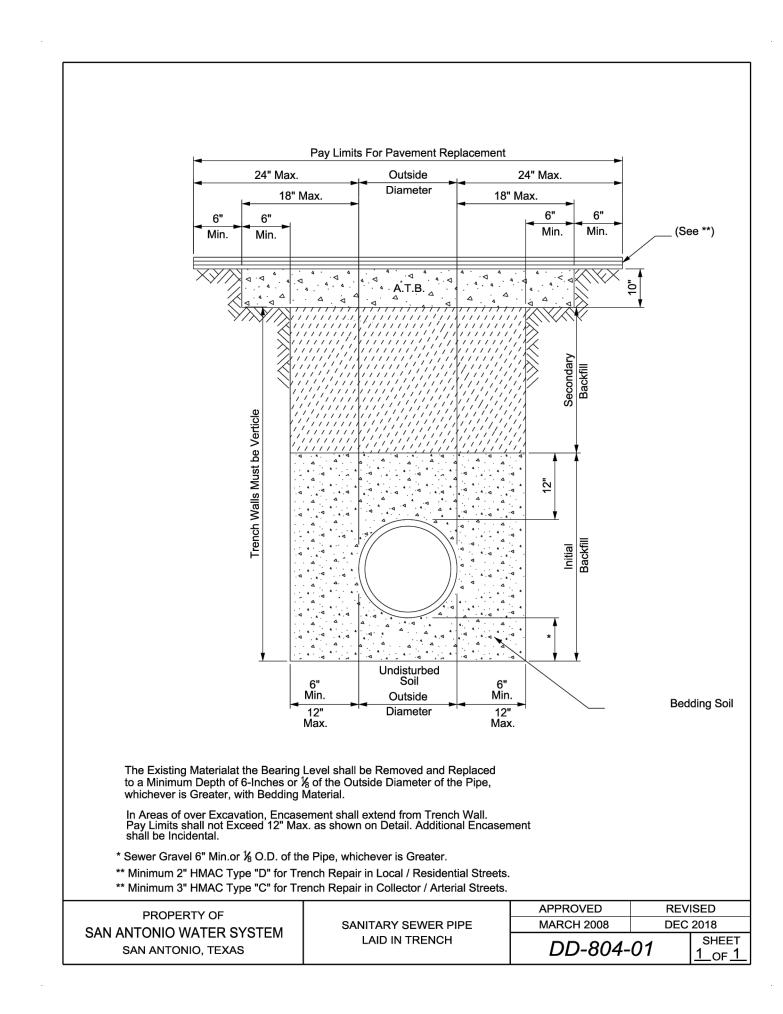
STEEL 316 SCREEN

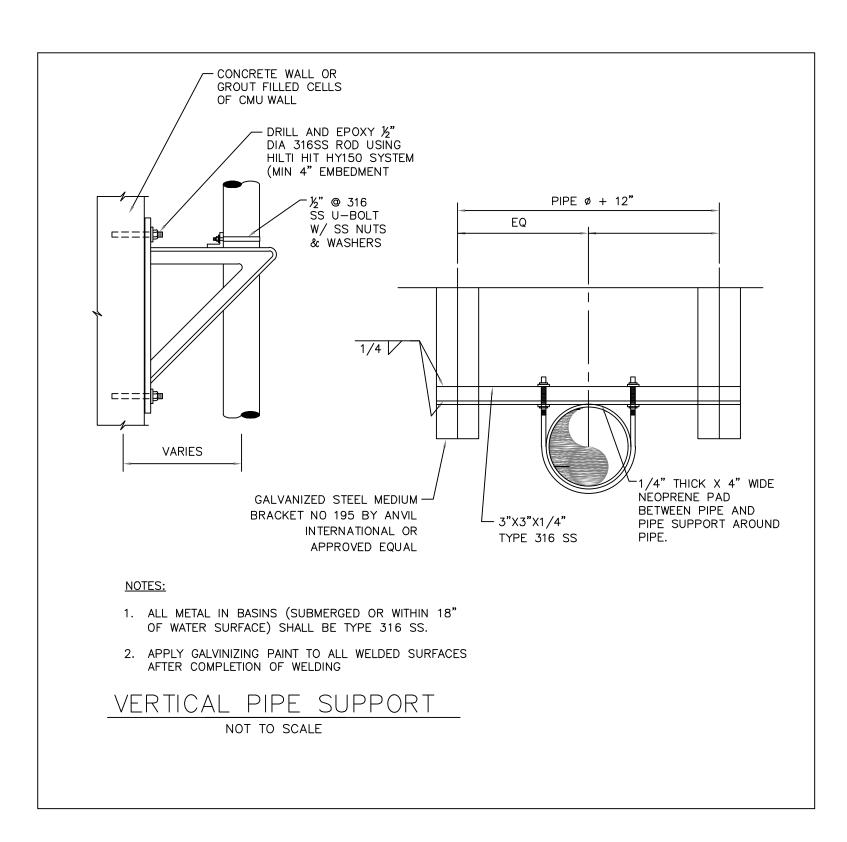
SEAL DISCHARGE PIPE

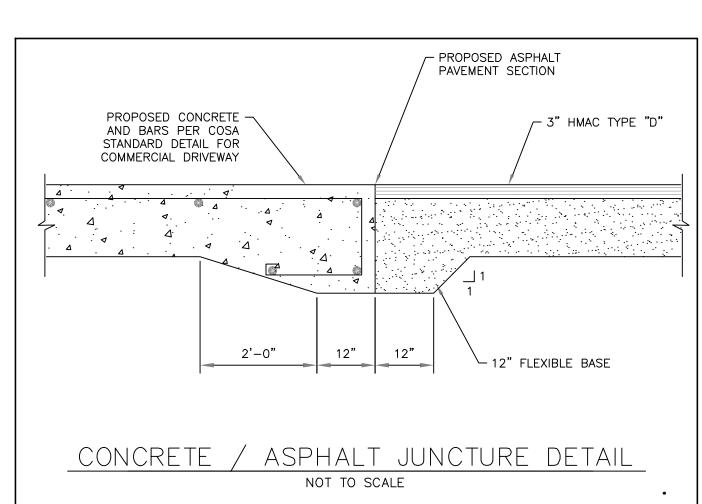
WITH LINK SEAL. BOLTS

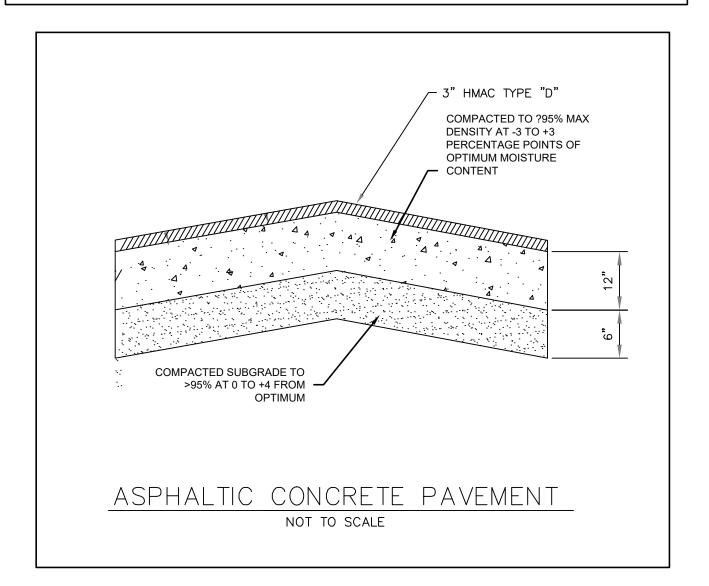
TO BE INSTALLED
BETWEEN FLANGES

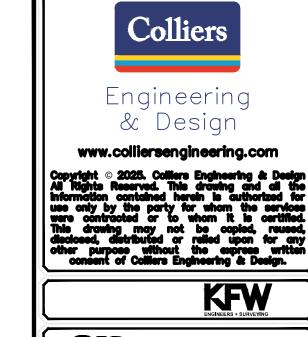
6" MIN. DIAMETER 316



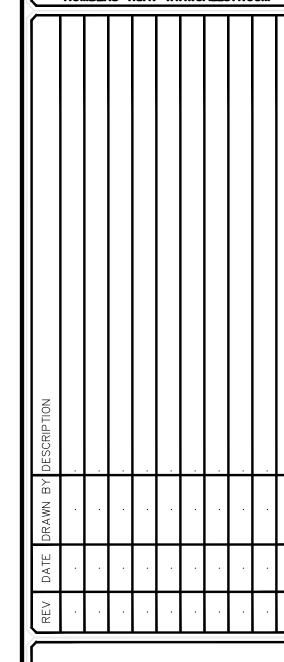














NORTHLAKE LIFT STATION AND FORCE MAIN





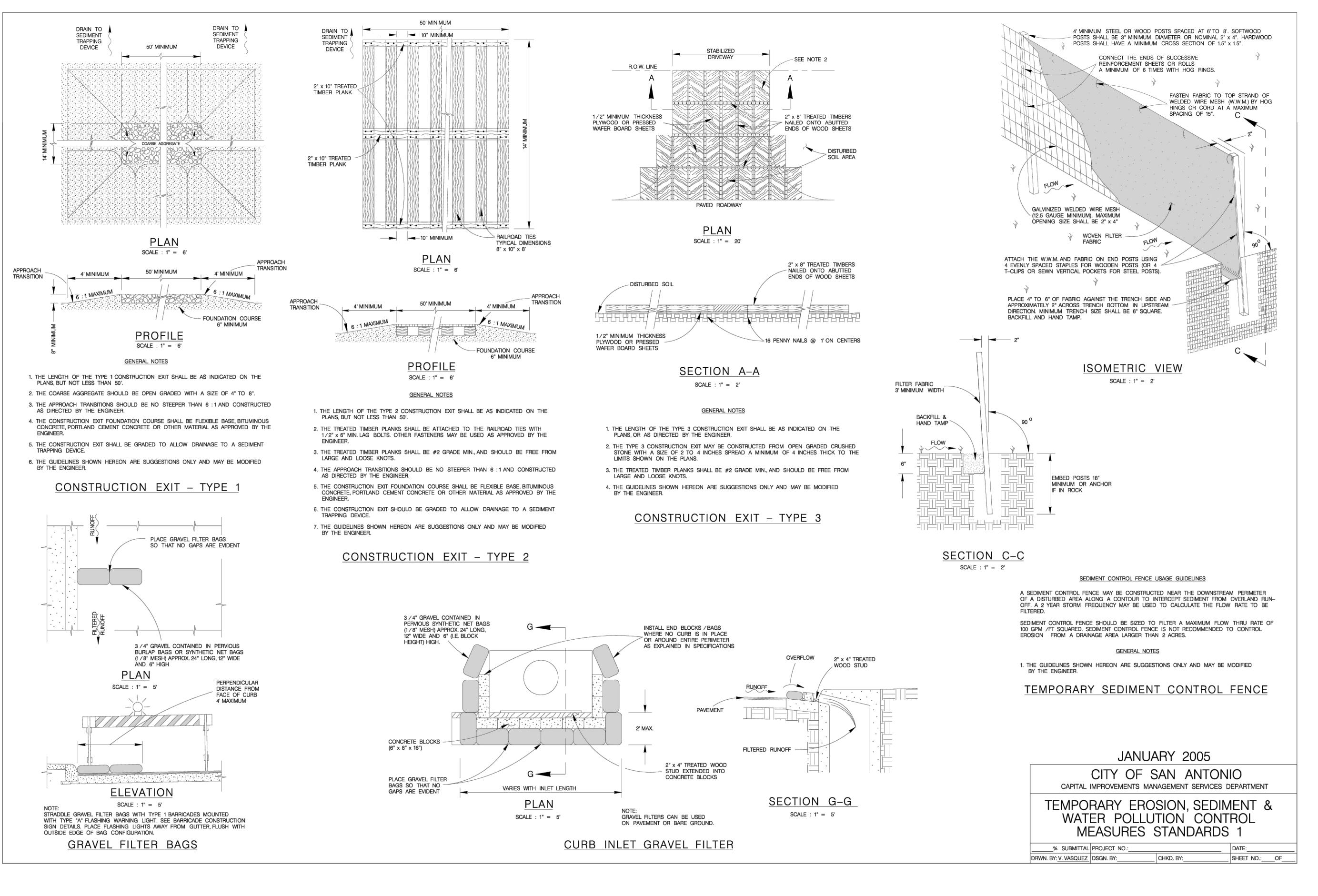
AS SHOWN 08/24 DM DK

PROJECT NUMBER: DRAWN NAME:

8002-032 LIFT STATION DETAILS

ADDITIONAL LIFT STATION DETAIL SHEET 2 OF 5

LS-12



Colliers

Engineering

Design

www.colliersengineering.com

Copyright © 2025. Colliers Engineering & Design

All Rights Reserved. This drawing and all the Information contained herein is authorized for use only by the party for whom the services were contracted or to whom it is cortified. This drawing may not be copied, reused, disclosed, distributed or relied upon for any other purpose without the supress written consent of Colliers Engineering & Design.

PROTECT YOURSELF
ALL STATES REQUIRERS, OR AN
PERSON PREPARING TO DISTURB
THE EARTH'S SUFFACE ANYWHERE IS
ANY STATE
FOR STATE SPECIFIC DIRECT PHONE
NUMBERS WSIT: WWW.CALLB11.COM

DAVID A. KNEUPER

96676

NORTHLAKE LIFT STATION AND FORCE MAIN

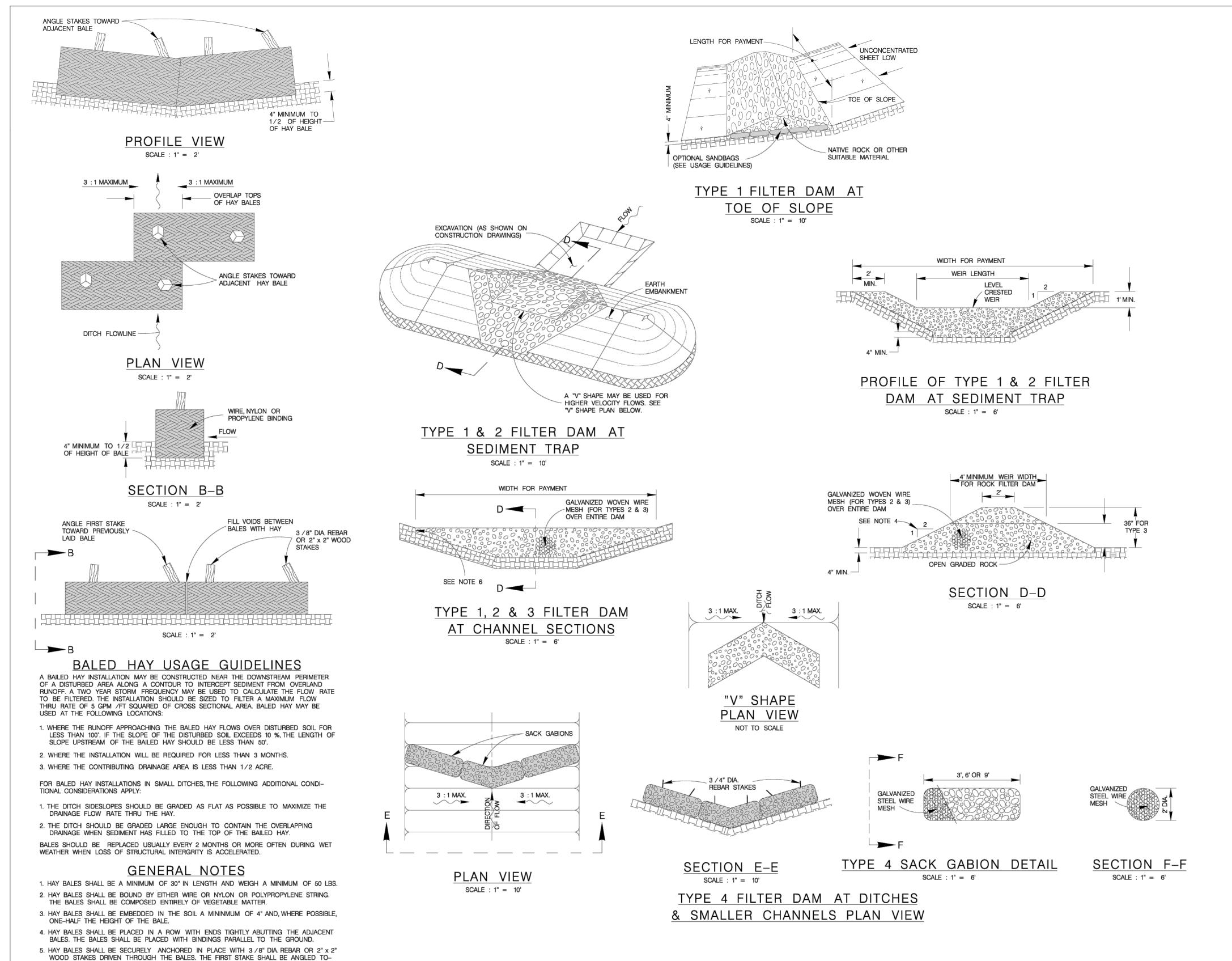
Colliers

Engineering & Design

UTILITY
ENGINEERING
GROUP PLLC
311-Luga de HEWERBAPHS, TOUR DING PL PROJECTION

ADDITIONAL LIFT
STATION DETAIL SHEET 3
OF 5

LS-13



WARDS THE PREVIOUSLY LAID BALE TO FORCE THE BALES TOGETHER.

6. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED

BALED HAY FOR EROSION CONTROL

ROCK FILTER DAM USAGE GUIDELINES

ROCK FILTER DAMS SHOULD BE CONSTRUCTED DOWNSTREAM FROM DISTURBED AREAS TO INTERCEPT SEDIMENT FROM OVERLOAD RUNOFF AND /OR CONCENTRATED FLOW. THE DAMS SHOULD BE SIZED TO FILTER A MAXIMUM FLOW THRU RATE OF 60 GPM /FT SQUARED OF CROSS SECTIONAL AREA. A 2 YEAR STORM FREQUENCY MAY BE USED TO CALCULATE THE FLOW RATE.

TYPE 1 (18" HIGH WITH NO WIRE MESH):

TYPE 1 MAY BE USED AT THE TOE OF SLOPES, AROUND INLETS, IN SMALL DITCHES AND AT DIKE OR SWALE OUTLETS. THIS TYPE OF DAM IS RECOMMENDED TO CONTROL EROSION FROM A DRAINAGE AREA OF 5 ACRES OR LESS. TYPE 1 MAY NOT BE USED IN CONCEN-TRATED HIGH VELOCITY FLOWS (APPROXIMATELY 8 FT./SEC. OR MORE) IN WHICH AGGREGATE WASH OUT MAY OCCUR. SANDBAGS MAY BE USED AT THE EMBEDDED FOUNDATION (4" DEEP MIN.) FOR BETTER FILTERING EFFICIENCY OF LOW FLOWS IF CALLED FOR ON THE PLANS OR AS DIRECTED BY THE ENGINEER.

TYPE 2 (18" HIGH WITH WIRE MESH):

TYPE 2 MAY BE USED IN DITCHES AND AT DIKE OR SWALE OUTLETS.

TYPE 3 (36" HIGH WITH WIRE MESH):

POLLUTION PREVENTION PLANS.

TYPE 3 MAY BE USED IN STREAM FLOW AND SHOULD BE SECURED TO THE STREAM BED.

TYPE 4 (SACK GABIONS):

TYPE 4 MAY BE USED IN DITCHES AND SMALLER CHANNELS TO FORM AN EROSION CONTROL DAM.

GENERAL NOTES

- 1. IF SHOWN ON THE PLANS OR DIRECTED BY THE ENGINEER, FILTER DAMS SHOULD BE PLACED NEAR THE TOE OF SLOPES WHERE EROSION IS ANTICIPATED, UPSTREAM AND / OR DOWNSTREAM AT DRAINAGE STRUCTURES, AND IN ROADWAY DITCHES AND CHANNELS TO COLLECT SEDIMENT.
- 2. MATERIALS (AGGREGATE, WIRE MESH, SANDBAGS, ETC.) SHALL BE AS INDICATED BY THE SPECIFICATION FOR ROCK FILTER DAMS FOR EROSION AND SEDIMENTATION CONTROL.
- 3. THE ROCK FILTER DAM DIMENSIONS SHALL BE AS INDICATED ON THE STORM WATER
- 4. SIDE SLOPES SHOULD BE 2:1 OR FLATTER. DAMS WITHIN THE SAFETY ZONE SHALL HAVE SIDE SLOPES OF 6:1 OR FLATTER.
- 5. MAINTAIN A MINIMUM OF 1' BETWEEN TOP OF ROCK FILTER DAM WEIR AND TOP OF EMBANKMENT FOR FILTER DAMS AT SEDIMENT TRAPS.
- 6. FILTER DAMS SHOULD BE EMBEDDED A MINIMUM OF 4" INTO THE EXISTING GROUND.
- 7. THE SEDIMENT TRAP FOR PONDING OF SEDIMENT LADEN RUNOFF SHALL BE OF THE DIMENSIONS SHOWN ON THE PLANS.
- 8. ROCK FILTER DAM TYPES 2 & 3 SHALL BE SECURED WITH 20 GAUGE GALVANIZED WOVEN WIRE MESH WITH 1" DIAMETER HEXAGONAL OPENINGS. THE AGGREGATE SHALL BE PLACED ON THE MESH TO THE HEIGHT AND SLOPES SPECIFIED. THE MESH SHALL BE FOLDED AT THE UPSTREAM SIDE OVER THE AGGREGATE AND TIGHTLY SECURED TO ITSELF ON THE DOWNSTREAM SIDE USING WIRE TIES OR HOG RINGS. IN STREAM USE, THE MESH SHOULD BE SECURED OR STAKED TO THE STREAM BED PRIOR TO AGGREGATE PLACEMENT.
- 9. SACK GABIONS SHOULD BE STAKED DOWN WITH 3 /4" DIA. REBAR STAKES.
- 10. FLOW OUTLET SHOULD BE ONTO A STABILIZED AREA (VEGETATION, ROCK, ETC.).
- 11. THE GUIDELINES SHOWN HEREON ARE SUGGESTIONS ONLY AND MAY BE MODIFIED BY THE ENGINEER.

JANUARY 2005

CITY OF SAN ANTONIO CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

TEMPORARY EROSION, SEDIMENT & WATER POLLUTION CONTROL MEASURES STANDARDS 2

CHKD. BY:

SHEET NO.:___OF_

% SUBMITTAL PROJECT NO .:

DRWN. BY: V. VASQUEZ DSGN. BY:

NORTHLAKE LIFT STATION AND FORCE MAIN

Colliers

& Design

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

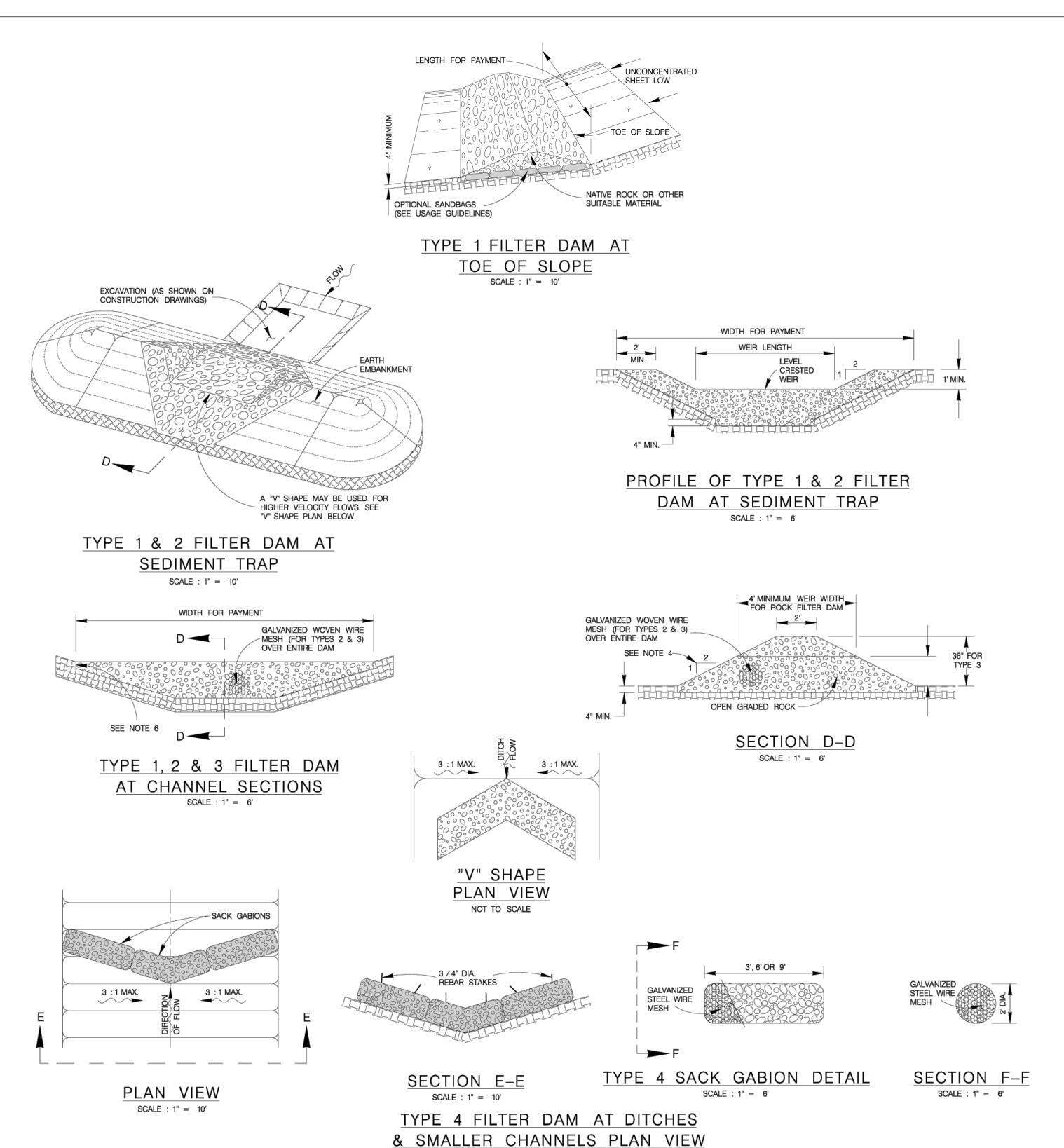
UTILITY ENGINEERING GROUP PLLC Engineering & Design CALE: DATE: DRAWN BY: CHECKED BY: AS SHOWN 08/24 DM DK

8002-032 LIFT STATION DETAILS ADDITIONAL LIFT

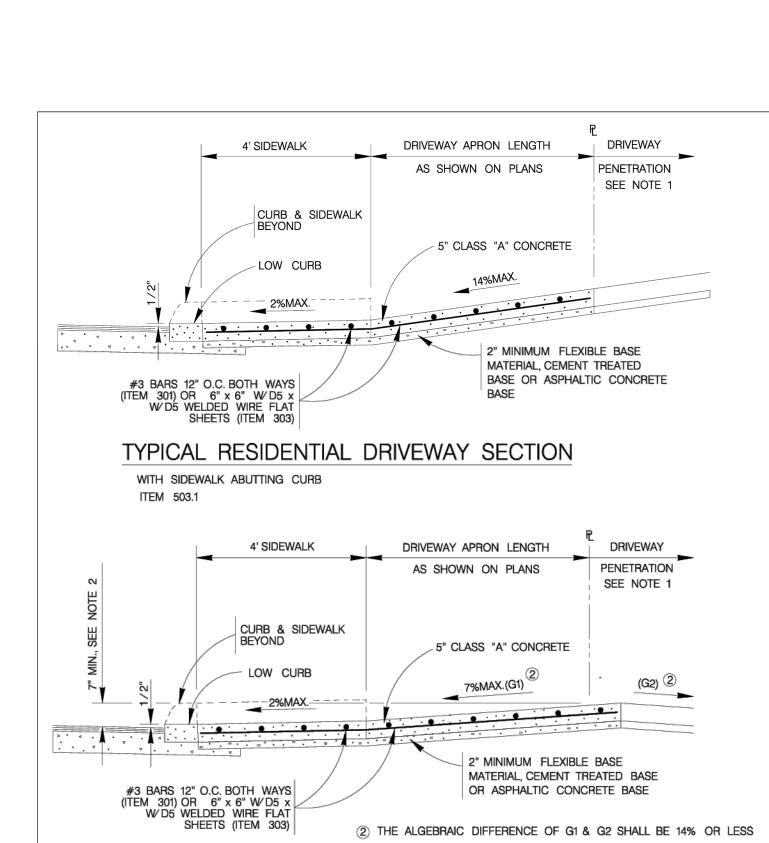
STATION DETAIL SHEET 4 OF 5

LS-14

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



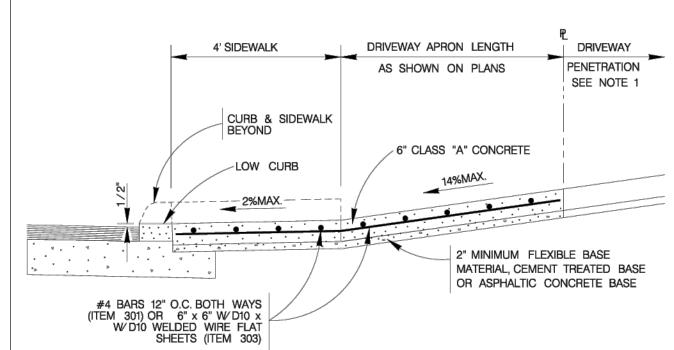
ROCK FILTER DAMS



TYPICAL RESIDENTIAL DRIVEWAY SECTION WHERE PROPERTY IS LOWER THAN STREET & SIDEWALK IS ABUTTING CURB

ITEM 503.1

ITEM 503.2



TYPICAL COMMERCIAL DRIVEWAY SECTION WITH SIDEWALK ABUTTING CURB

COMMERCIAL - ONE WAY | 12' | 20'

COMMERCIAL - TWO WAY 24' 30'

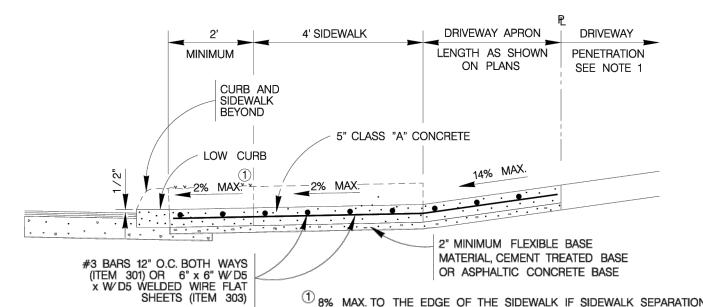
CONCRETE DRIVEWAY NOTES

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

TYPE	MINIMUM	MAXIMUM
SIDENTIAL	10'	20'

ENGINEER, THE WIDTH SHALL BE WITHIN THE FOLLOWING VALUES:

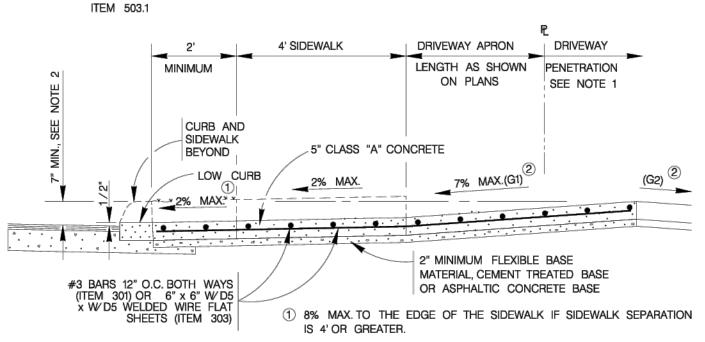
- 4. FOR LOCAL TYPE "A" STREETS, SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND IF SEPARATED FROM THE CURB, THE SIDEWALK SHALL BE LOCATED A MINIMUM OF 2' FROM THE BACK OF CURB.
- 5. FOR OTHER THAN LOCAL TYPE "A" STREETS, THE SIDEWALK SHALL HAVE A MINIMUM WIDTH OF 4' AND SEPARATED A MINIMUM OF 2' FROM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



TYPICAL RESIDENTIAL DRIVEWAY SECTION

IS 4' OR GREATER.

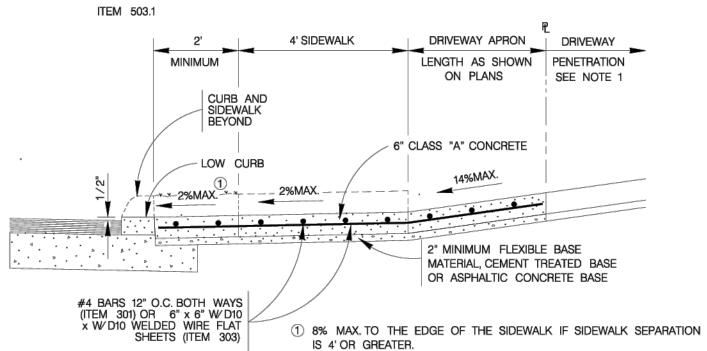
WITH SIDEWALK SEPARATED FROM CURB



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

TYPICAL RESIDENTIAL DRIVEWAY SECTION

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



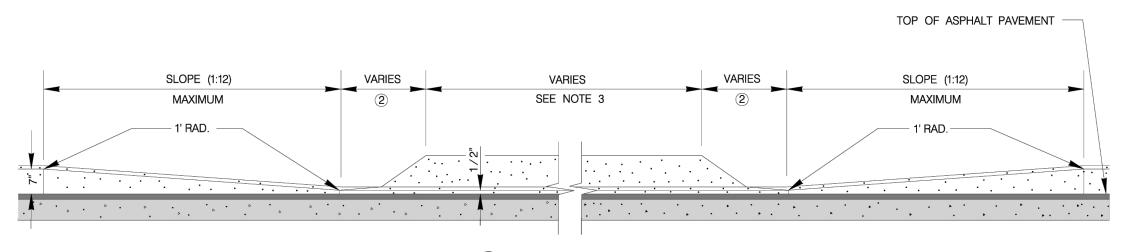
TYPICAL COMMERCIAL DRIVEWAY SECTION WITH SIDEWALK SEPARATED FROM CURB

ITEM 503.2

_ 3 /4" CHAMFER 3 / 4" CHAMFER-6" MINIMUM - 12" MAXIMUM ---ASPHALT OR GRAVEL DRIVEWAY - 2 - #4 BARS CONTINUOUS #3 BARS @ 12" O.C. MAXIMUM 2 - #4 BARS CONTINUOUS 12" MINIMUM - 18" MAXIMUM BELOW FINISHED GRADE

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

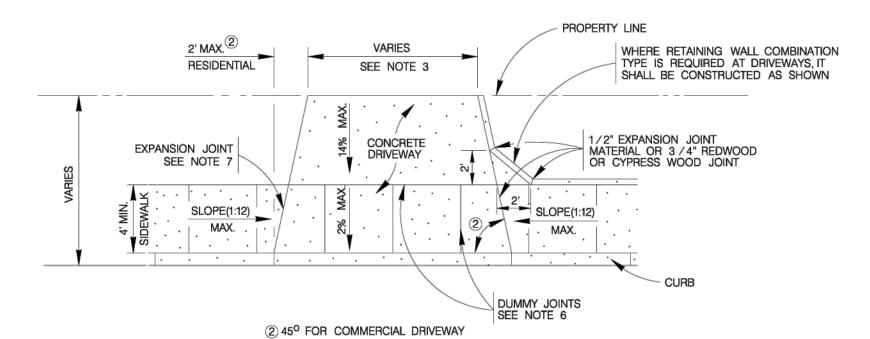
DRIVEWAY - CONCRETE RETAINING WALL ON COMPACTED SUBGRADE ITEM 307.1



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

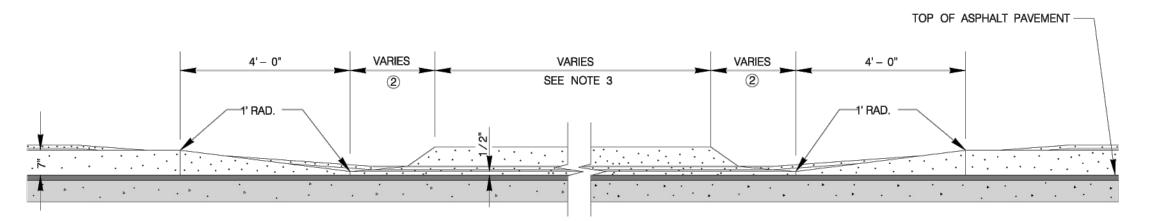
CURB PROFILE AT DRIVEWAY

WITH SIDEWALK ABUTTING CURB



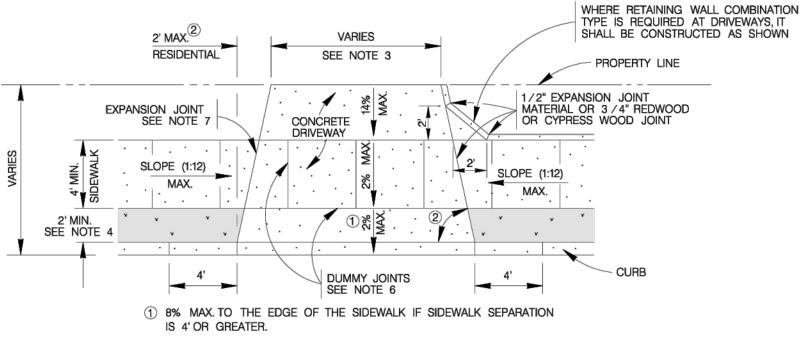
TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK ABUTTING CURB



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

CURB PROFILE AT DRIVEWAY WITH SIDEWALK SEPARATED FROM CURB



(2) 45° FOR COMMERCIAL DRIVEWAY

TYPICAL DRIVEWAY PLAN VIEW

WITH SIDEWALK SEPARATED FROM CURB

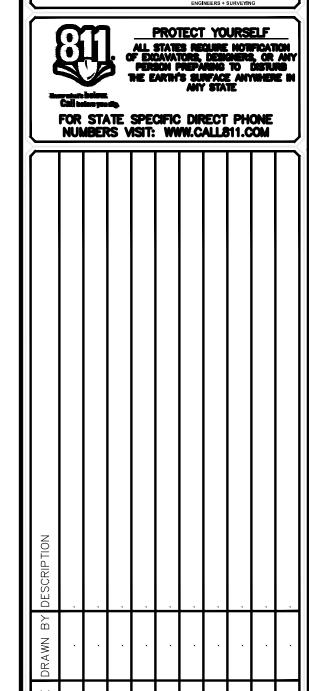
MAY 2009

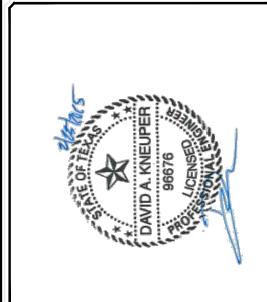
CITY OF SAN ANTONIO CAPITAL IMPROVEMENTS MANAGEMENT SERVICES DEPARTMENT

CONCRETE DRIVEWAY STANDARDS

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

Colliers Engineering & Design www.colliersengineering.com Copyright © 2025. Calliers Engineering & Design All Rights Reserved. This drawing and all the information contained herein is authorized for use only by the party for whom the services were contracted or to whom it is certified. This drawing may not be copied, reused, disclosed, distributed or relied upon for any other purpose without the express written consent of Calliers Engineering & Design.





NORTHLAKE LIFT STATION AND FORCE MAIN

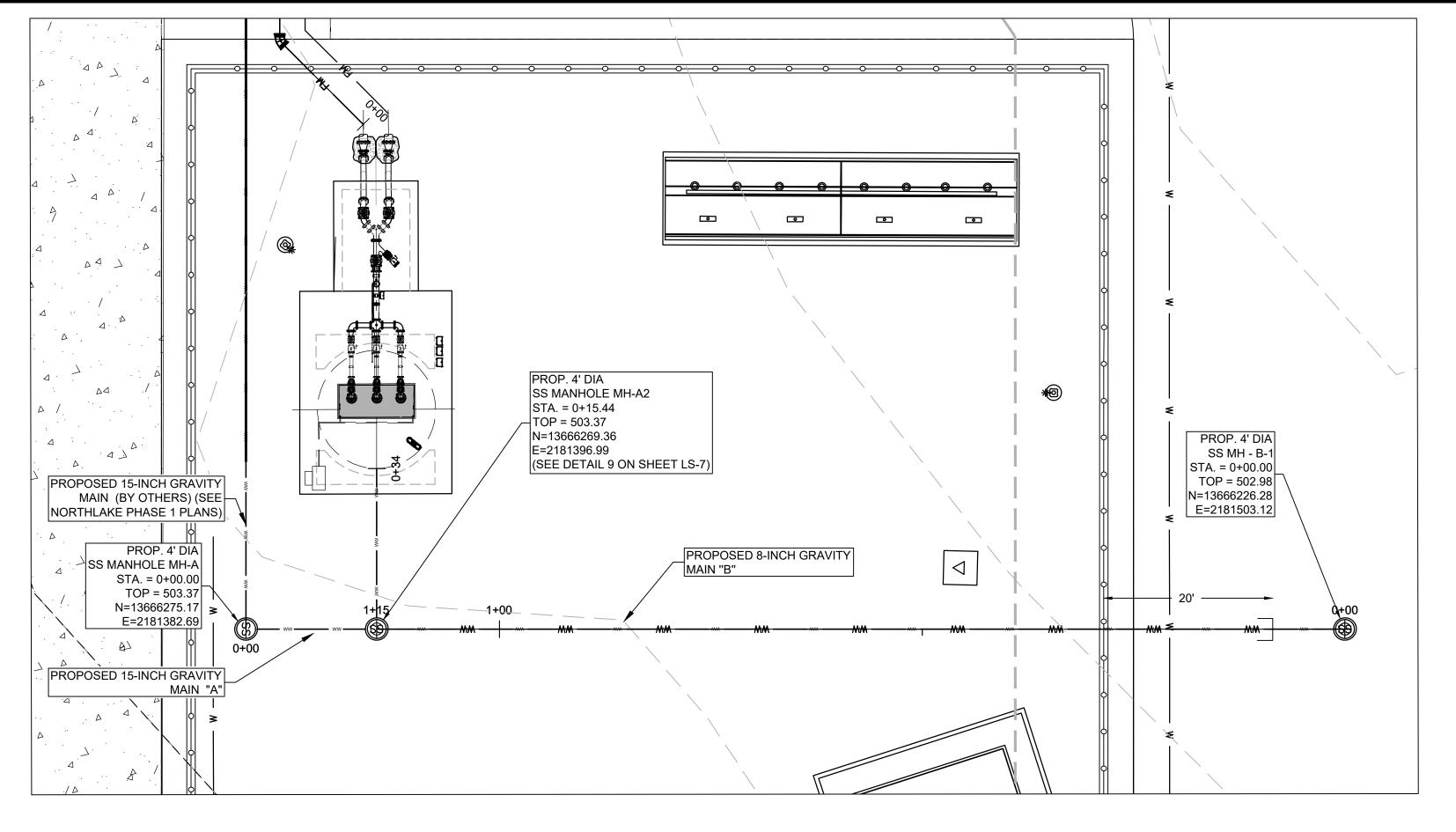


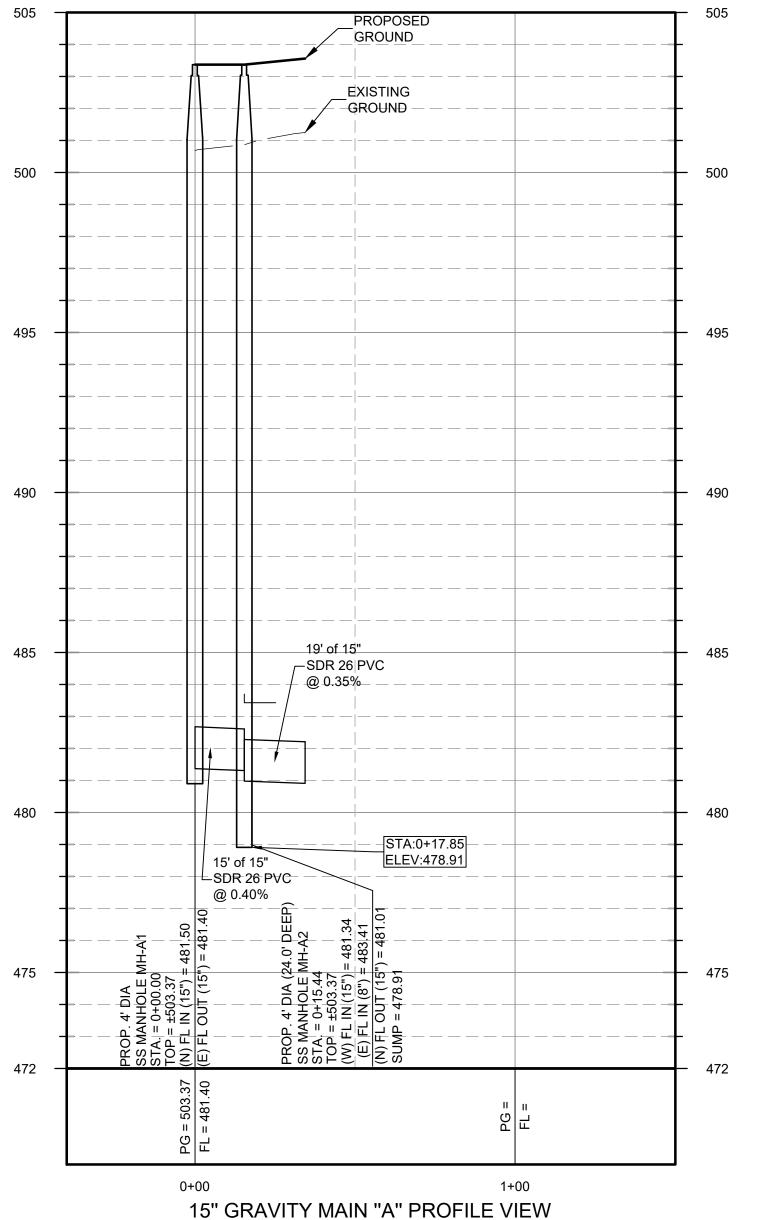
UTILITY ENGINEERING GROUP PLLC

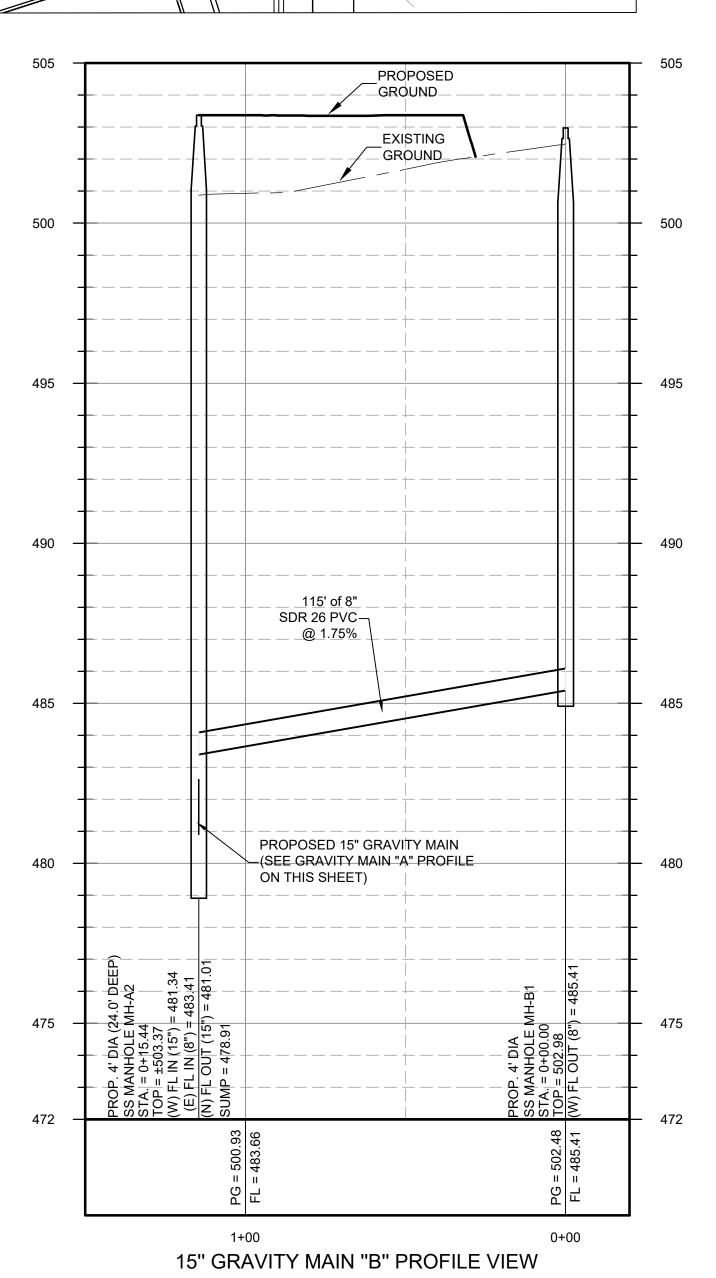
CALE: DATE: DRAWN BY: CHECKED BY: AS SHOWN 08/24 DM DK 8002-032 LIFT STATION DETAILS ADDITIONAL LIFT

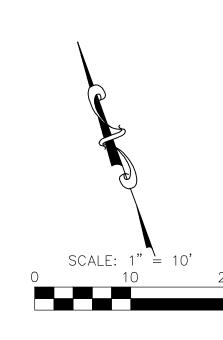
STATION DETAIL SHEET 5 OF 5

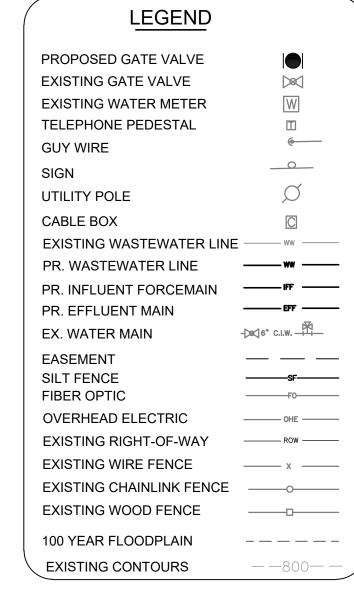
LS-15





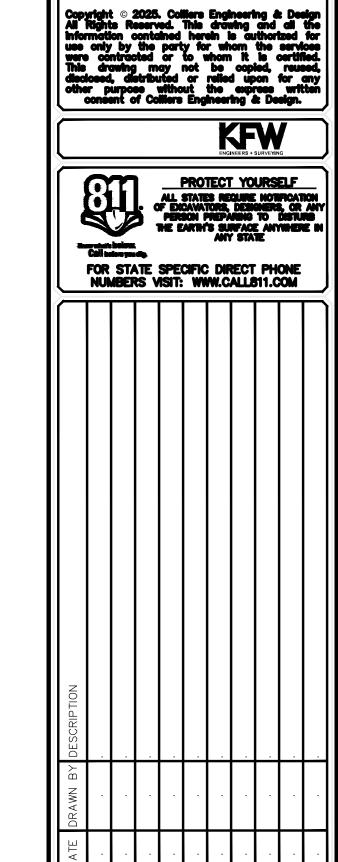






NOTE

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



Colliers

& Design

www.colliersengineering.com

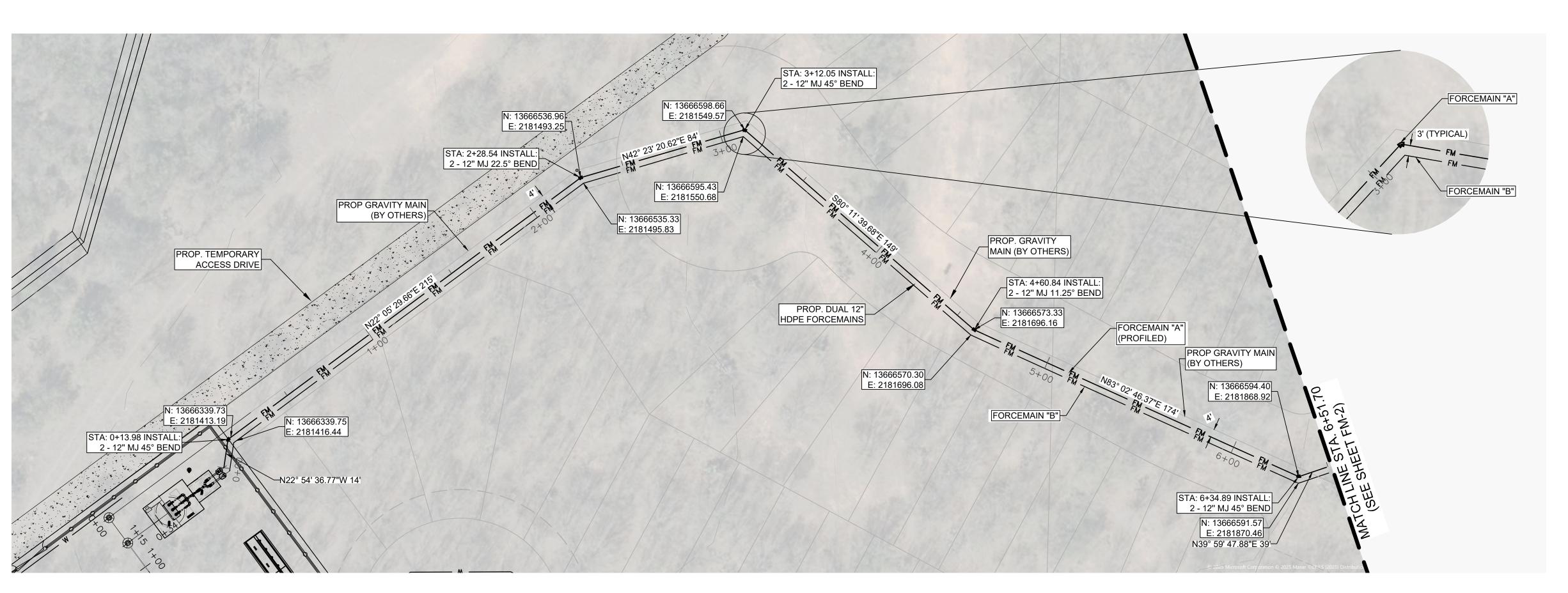


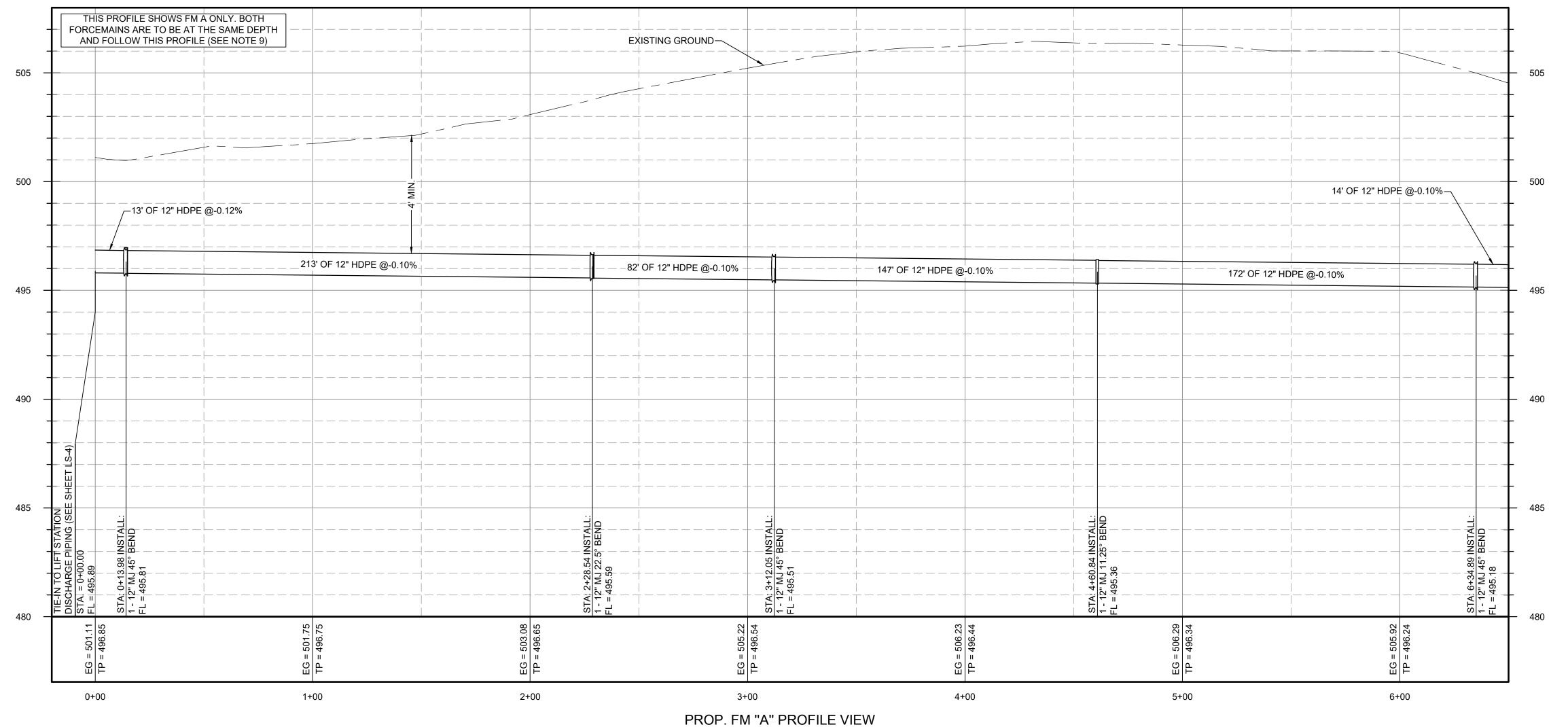
NORTHLAKE LIFT STATION AND FORCE MAIN

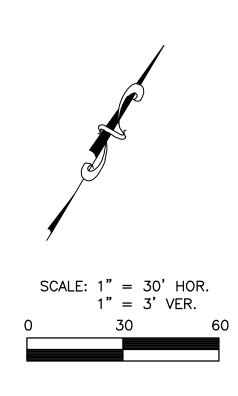
	Die		
&	ineer Desi	gn	

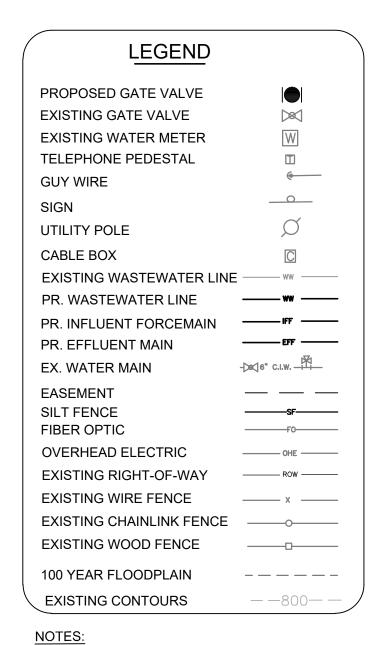
AS SHOWN	90	3/24	DM	DK
PROJECT NUM 8002-03			IG NAME: FATION 15" GR	IIAM YTIVA
SHEET TILE:				
GRAV	ΊΤΥ	MAIN	IS 'A' AN	D 'B'

GM-1

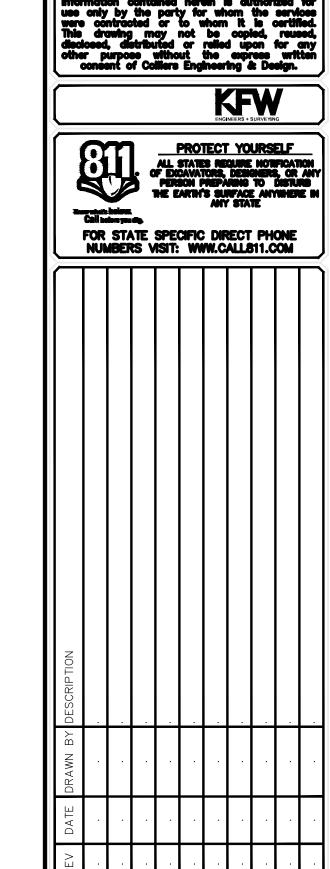


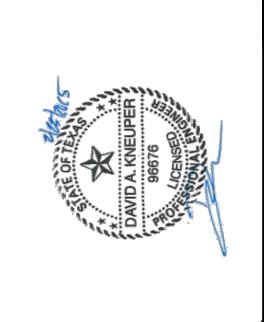






- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES
 PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.





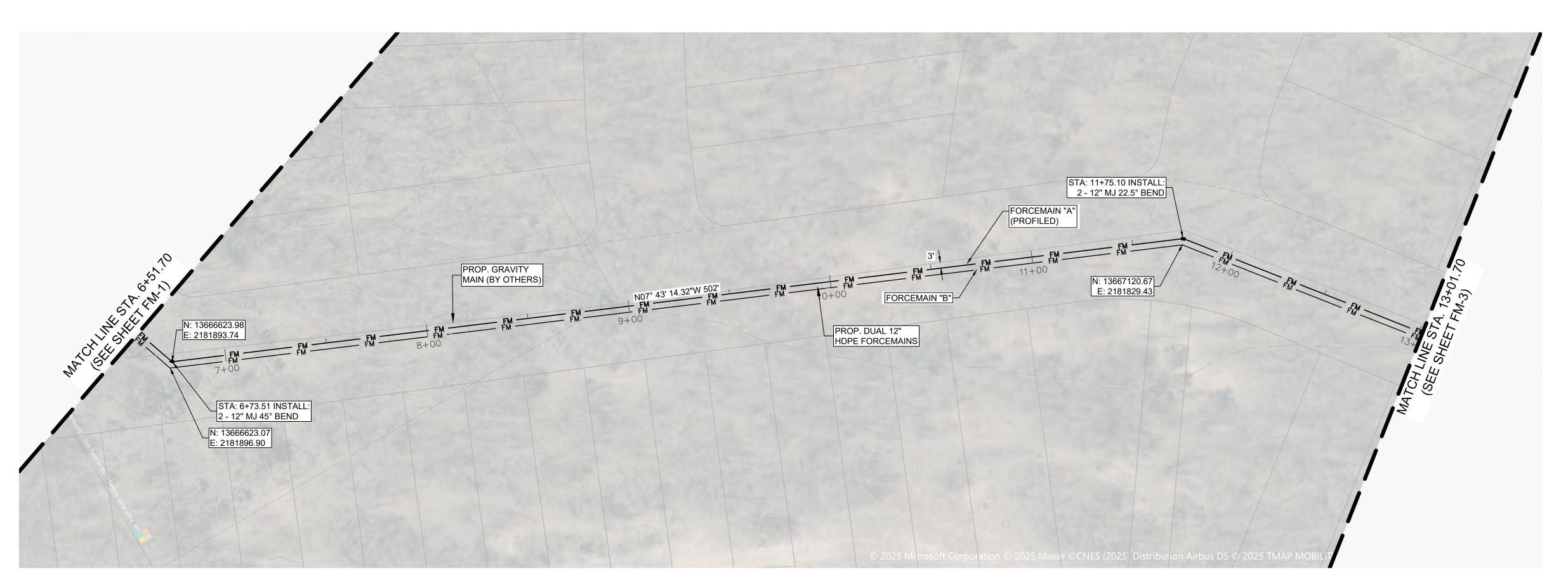
NORTHLAKE LIFT STATION AND FORCE MAIN

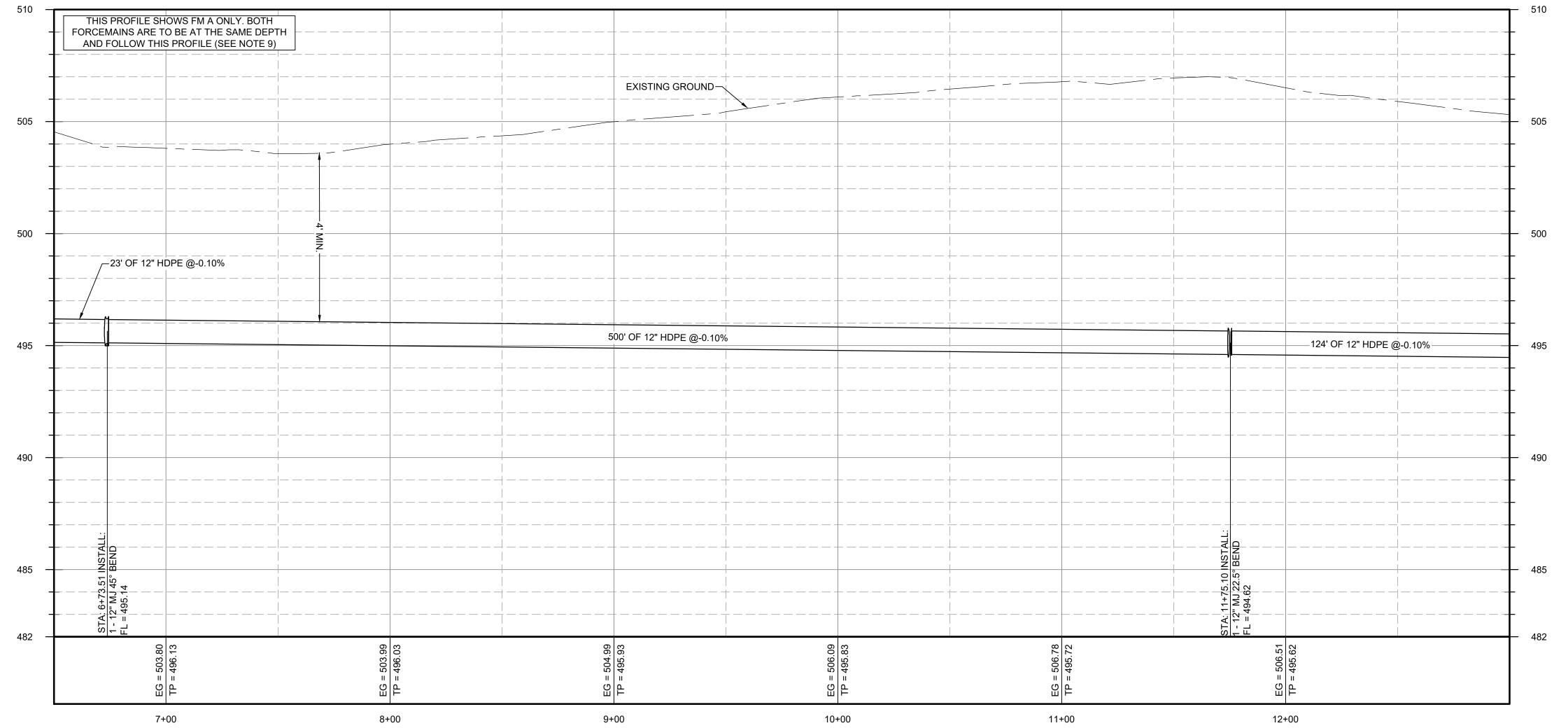
Colli				
Engine & De:				
SCALE AS SHOWN	DATE: 08	/24	DRAWN DM	S):
PROJECT NUM 8002-03	52	12" FO 142+87	G NAME RCEMAIN 7.22	
Tours and				

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

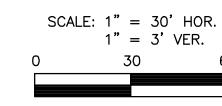
FM-1

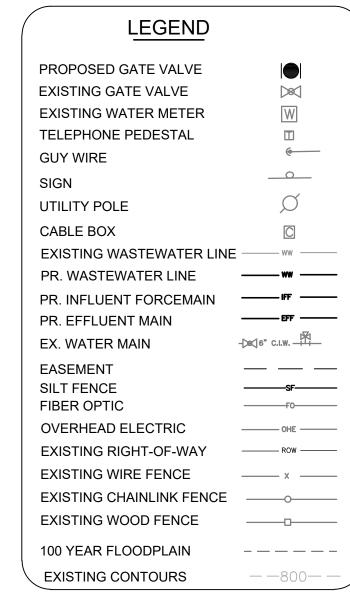
12" FORCEMAIN STA. 0+00.00 - 6+50.00









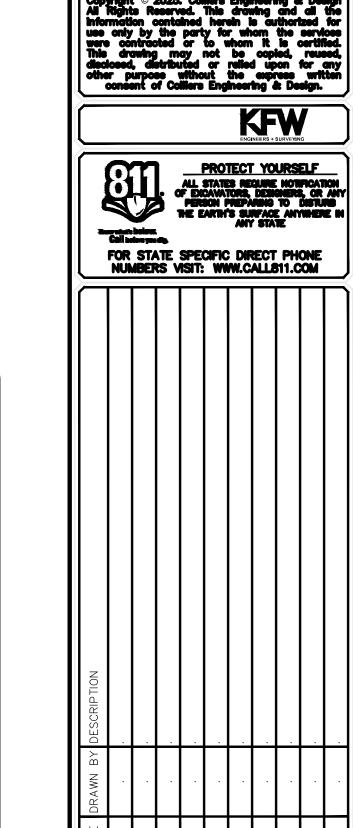


NOTES:

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.

APPROVAL PRIOR TO CONSTRUCTION.

- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



& Design

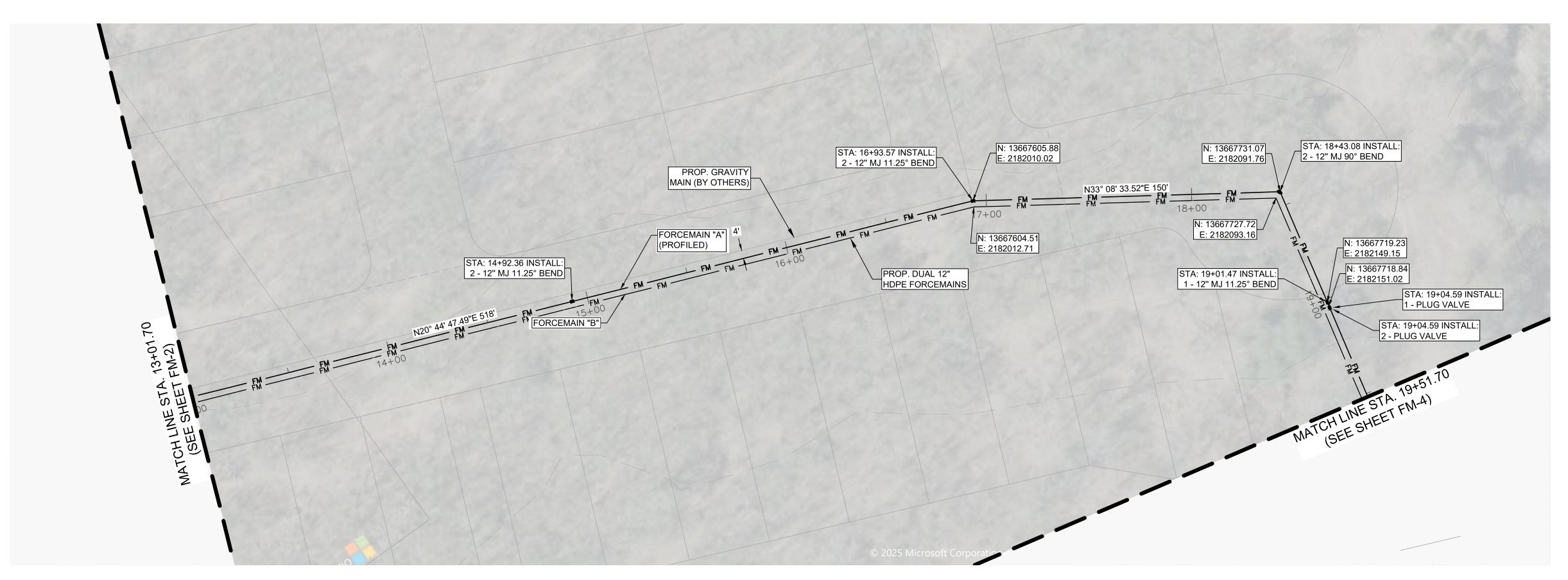


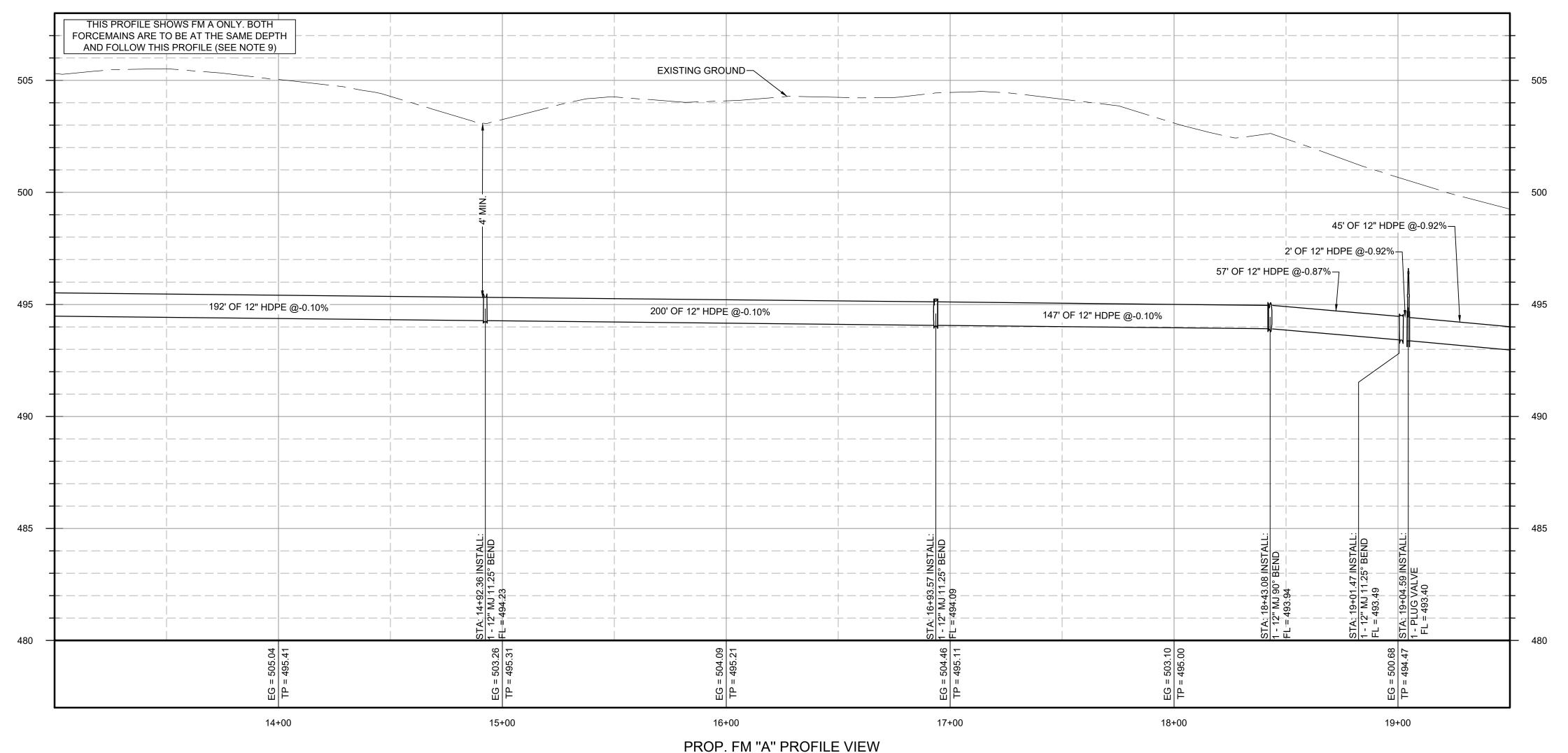
NORTHLAKE LIFT STATION AND FORCE MAIN

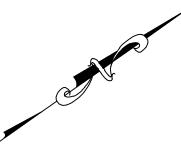


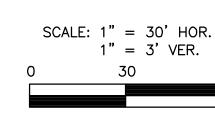
SCALE:	DATE		DRAWN BY:	CHECKED
AS SHOWN	08	/24	DM	DK
PROJECT NUM 8002-03		12" FO 142+87	O NAME: RCEMAIN STA. 7.22	0+00.00 -

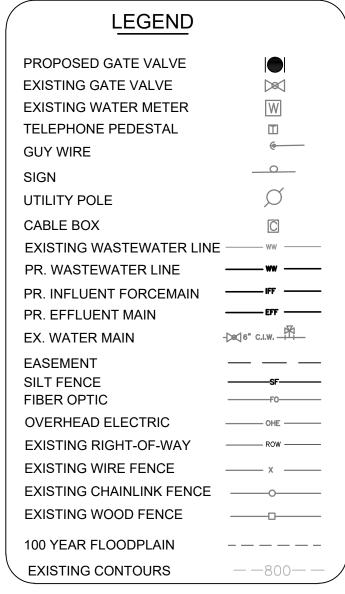
12" FORCEMAIN STA. 6+50.00 - 13+00.00





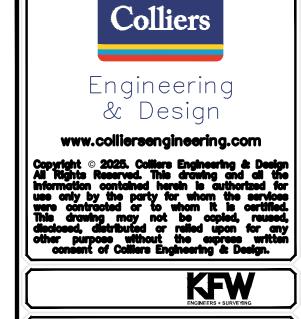


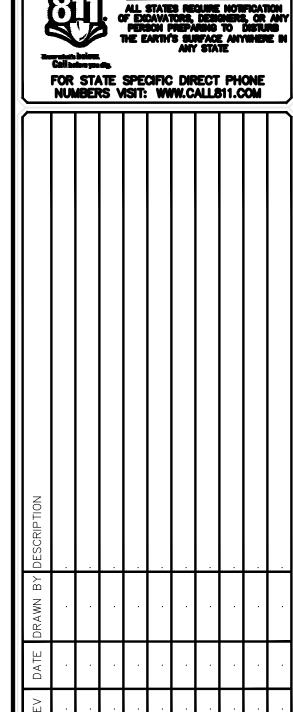




NOTES:

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES
 PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.







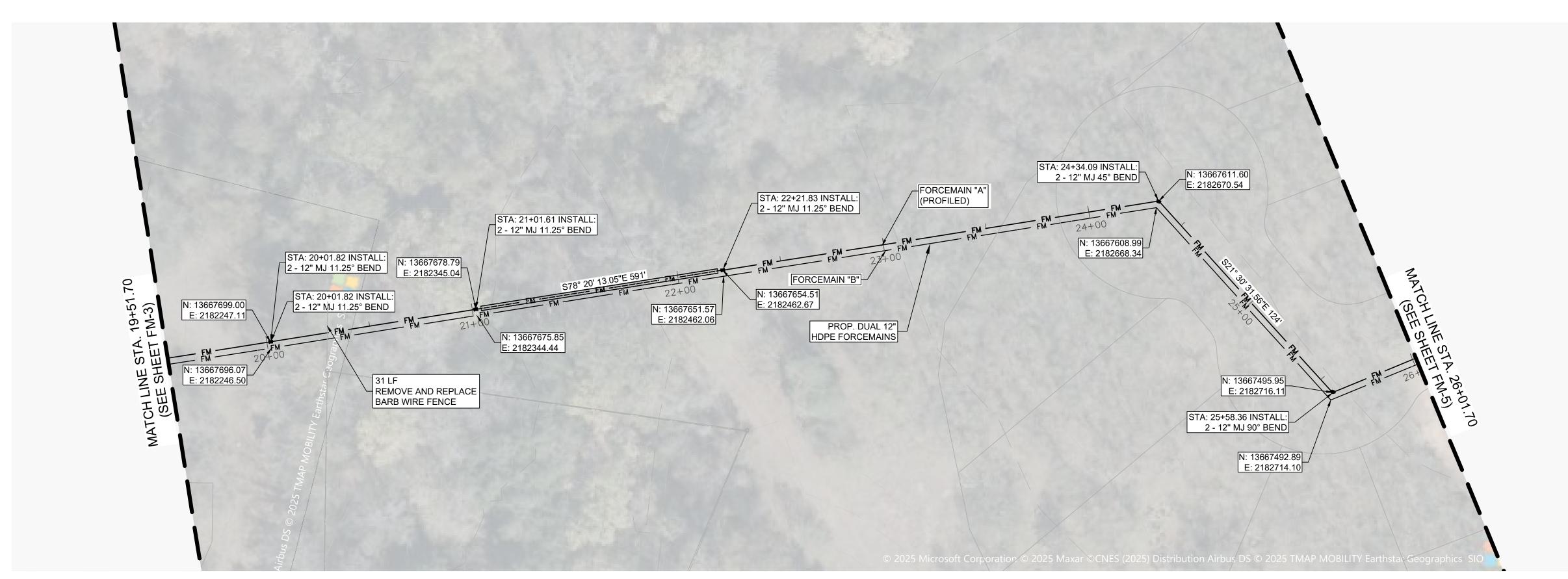
NORTHLAKE LIFT STATION AND FORCE MAIN

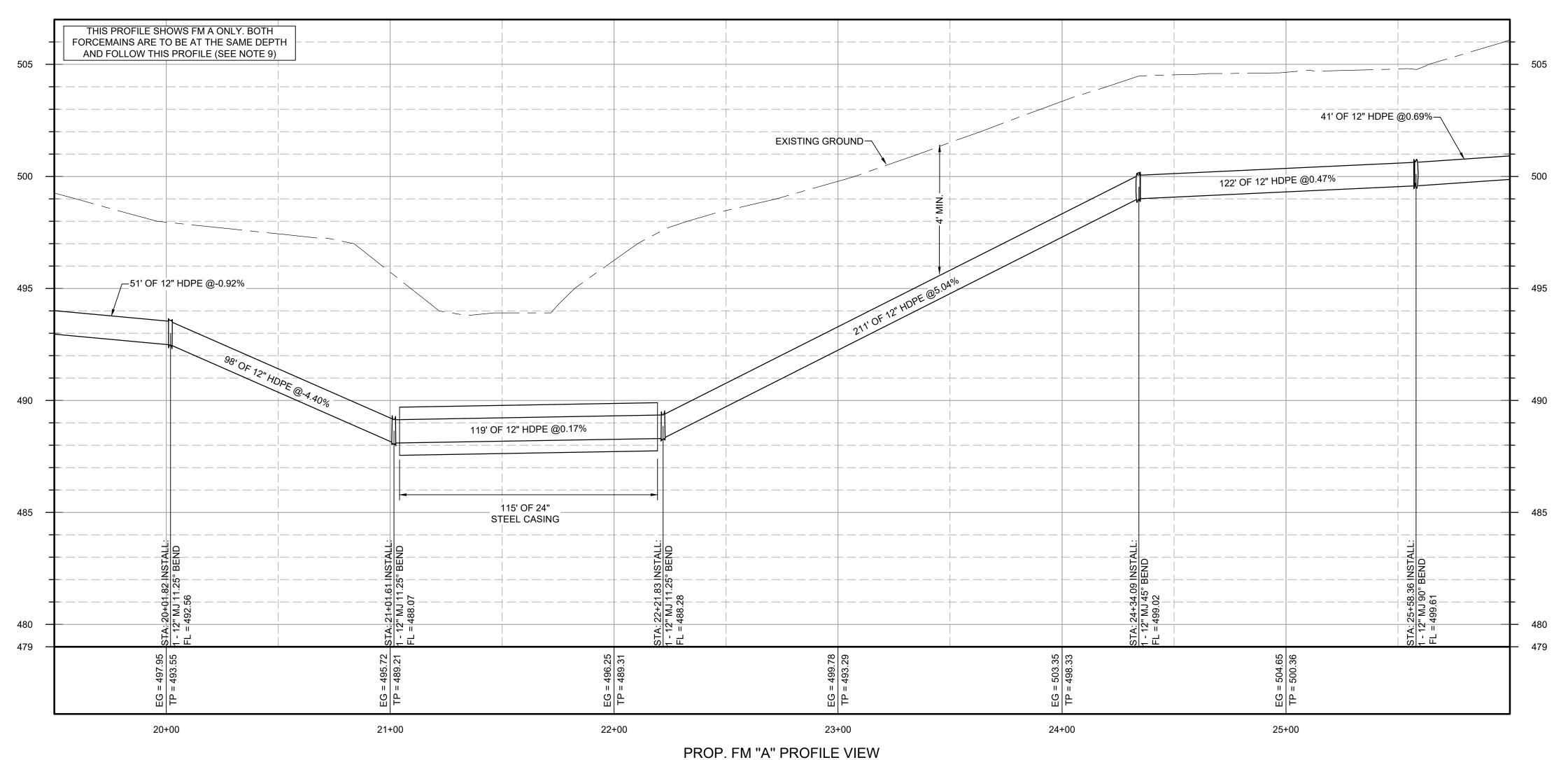
Colliers	
Engineering & Design	

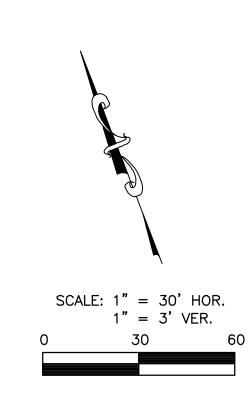
SCALE: DATE: DRAWN BY: CHECKED DM DK

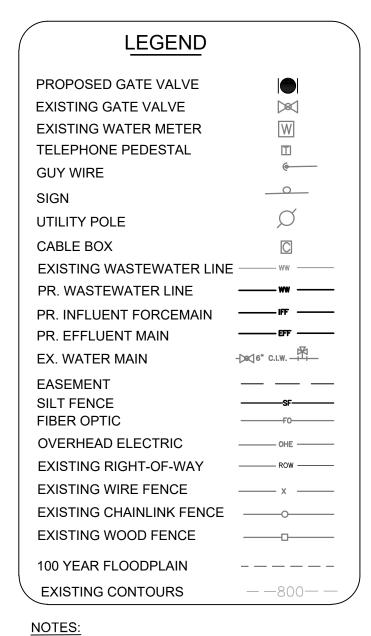
PROJECT NAMES: 12" FORCEMAIN STA. 0+00.00 - 142+87.22

12" FORCEMAIN STA. 13+00.00 - 19+50.00





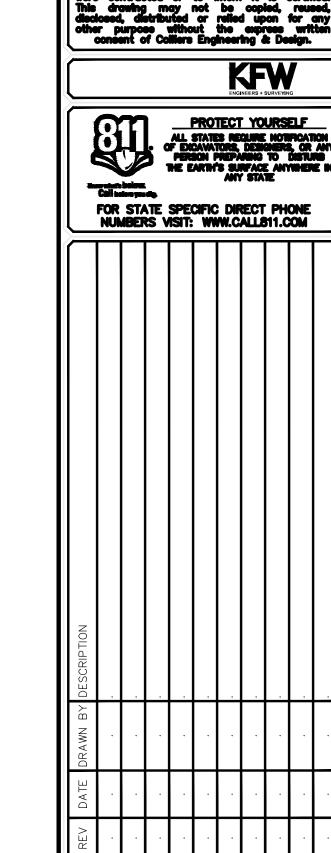




OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES

PER DETAILS, MATCH EXISTING MATERIAL.

- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



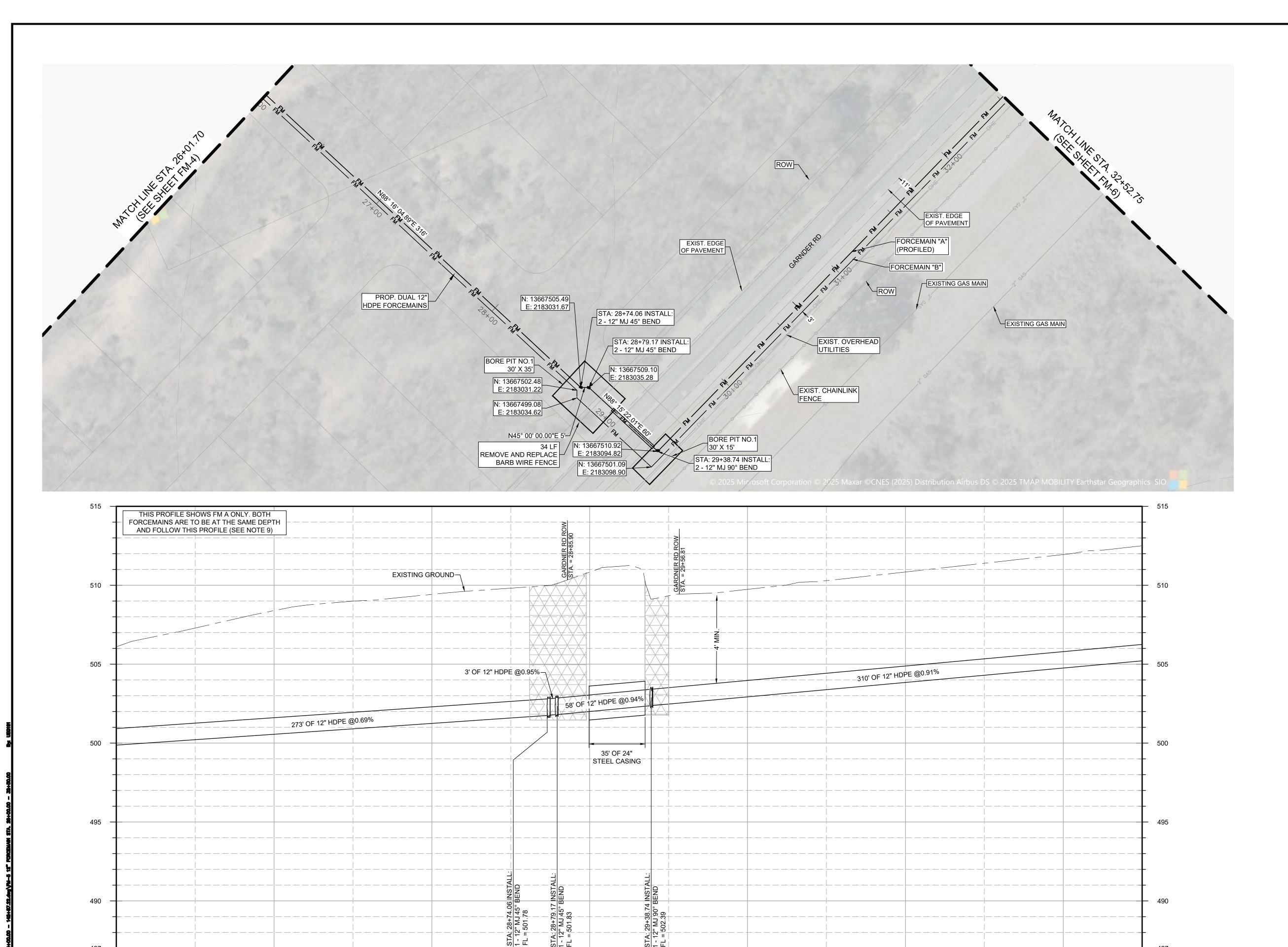


NORTHLAKE LIFT STATION AND FORCE MAIN

Colline & Des	ering	ļ		
SCALE: AS SHOWN	DATE: 08	/24	DRAWN BY: DM	DK
PROJECT NUM 8002-03			G NAME RCEMAIN STA. 7.22	0+00.00 -

12" FORCEMAIN STA. 19+50.00 - 26+00.00

FM-4



27+00

28+00

29+00

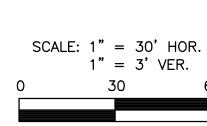
PROP. FM "A" PROFILE VIEW

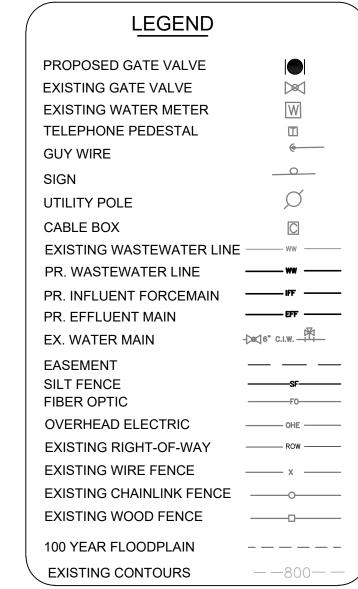
31+00

30+00

32+00





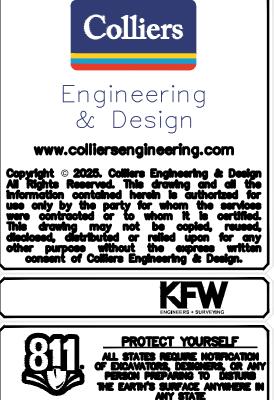


NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR

APPROVAL PRIOR TO CONSTRUCTION.

- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



DATE DRAWN BY DESCRIPTION									
DRAWN BY	•	•	•	٠	٠	•		•	٠
						•	•	•	
REV DATE									



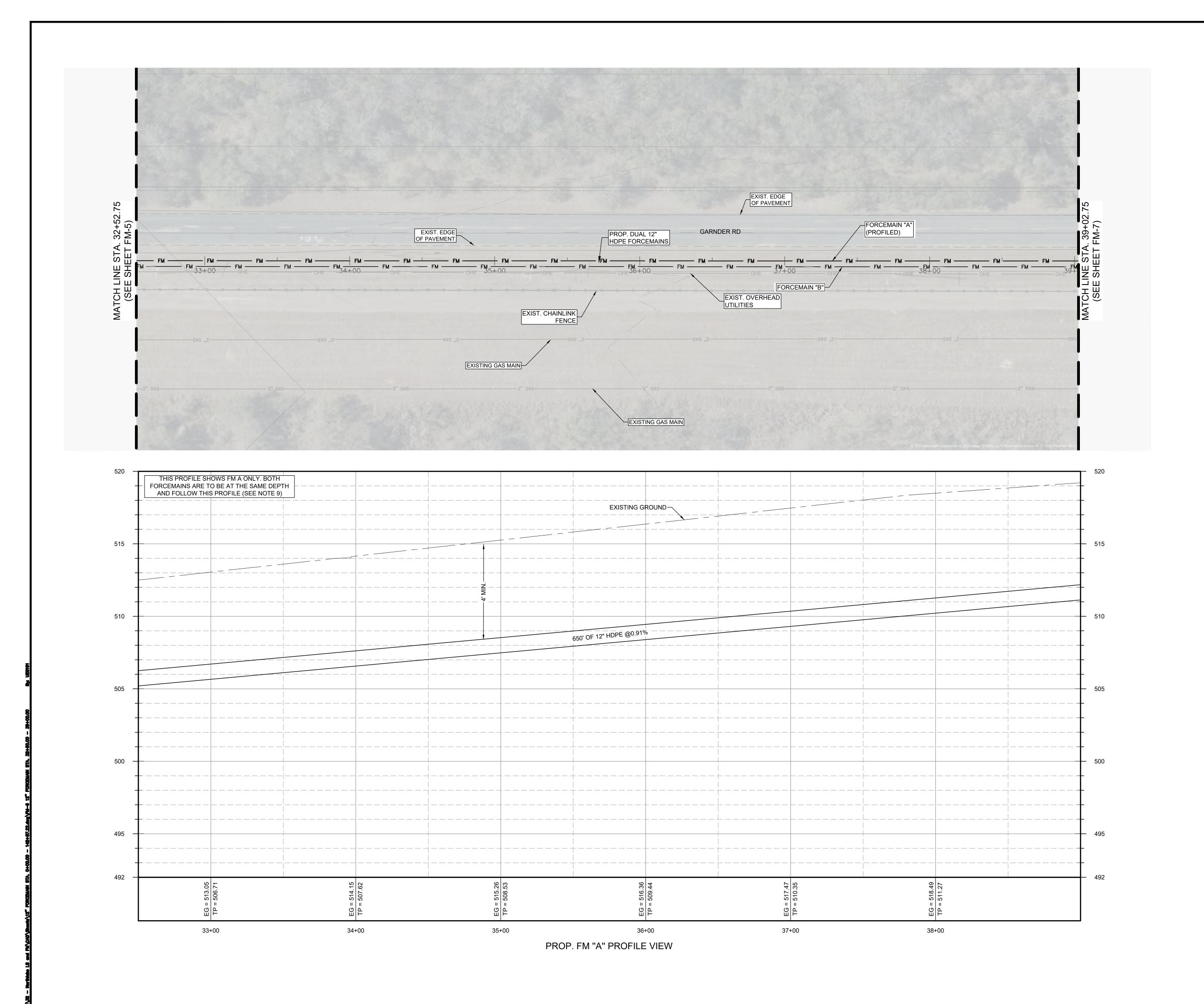
NORTHLAKE LIFT STATION AND FORCE MAIN

,	Colliers
E	Ingineering & Design

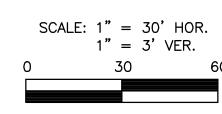
1					
	SCALE AS SHOWN	DATE: 08	/24	DRAWN BY: DM	DK
	PROJECT NUM 8002-03			C NAME: RCEMAIN STA 7.22	. 0+00.00 -
	SHEET TITLE:				

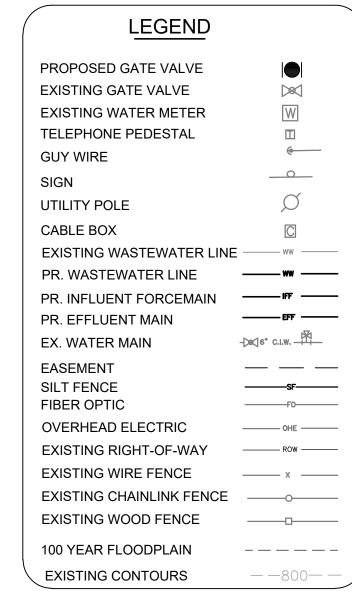
12" FORCEMAIN STA. 26+00.00 - 32+50.00

FM-5



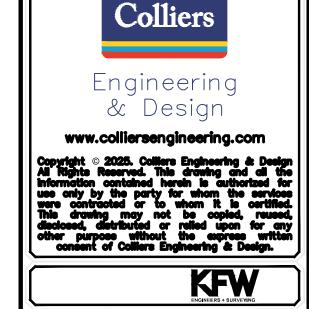




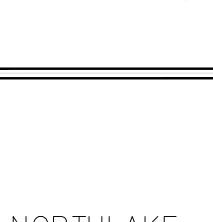


NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



	FOR NUM	ST/ ABER	NTE S	SPE(ISIT:	CIFIC WW	W.C	ALLE ALLE	PH(ONE OM	_
DATE DRAWN BY DESCRIPTION										
DRAWN BY										·
DATE	·		·		•		·	·	·	
REV										

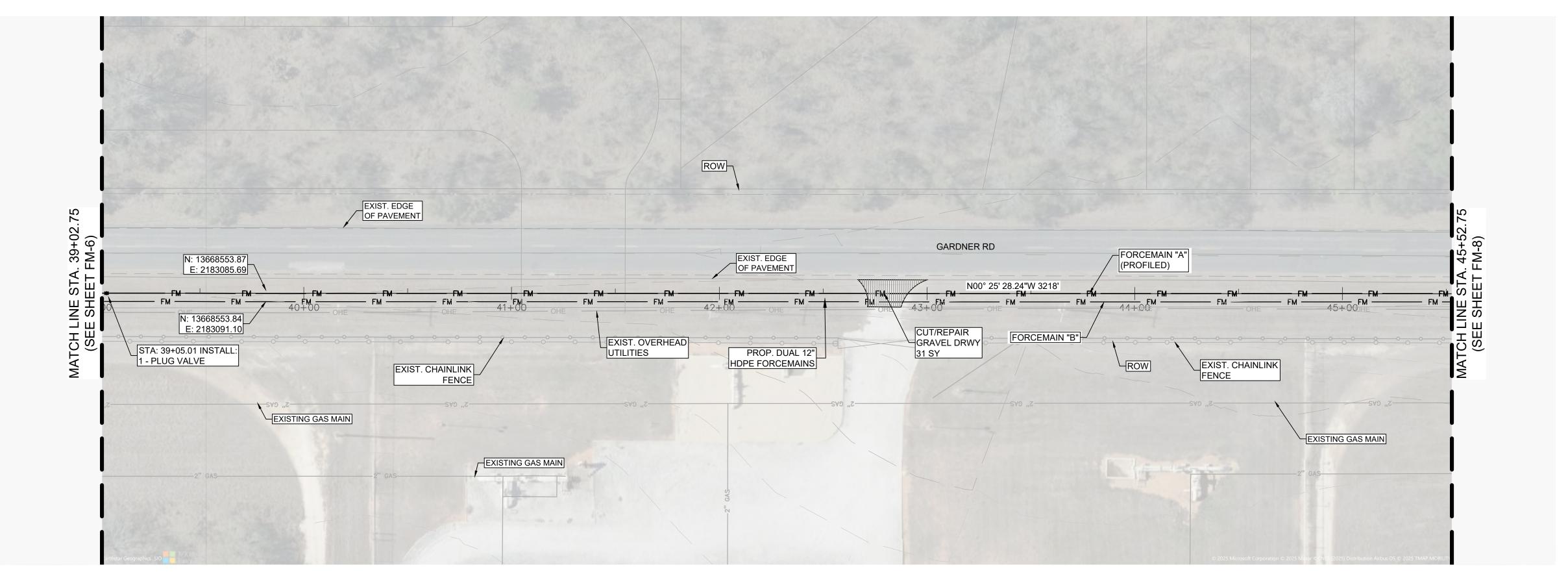


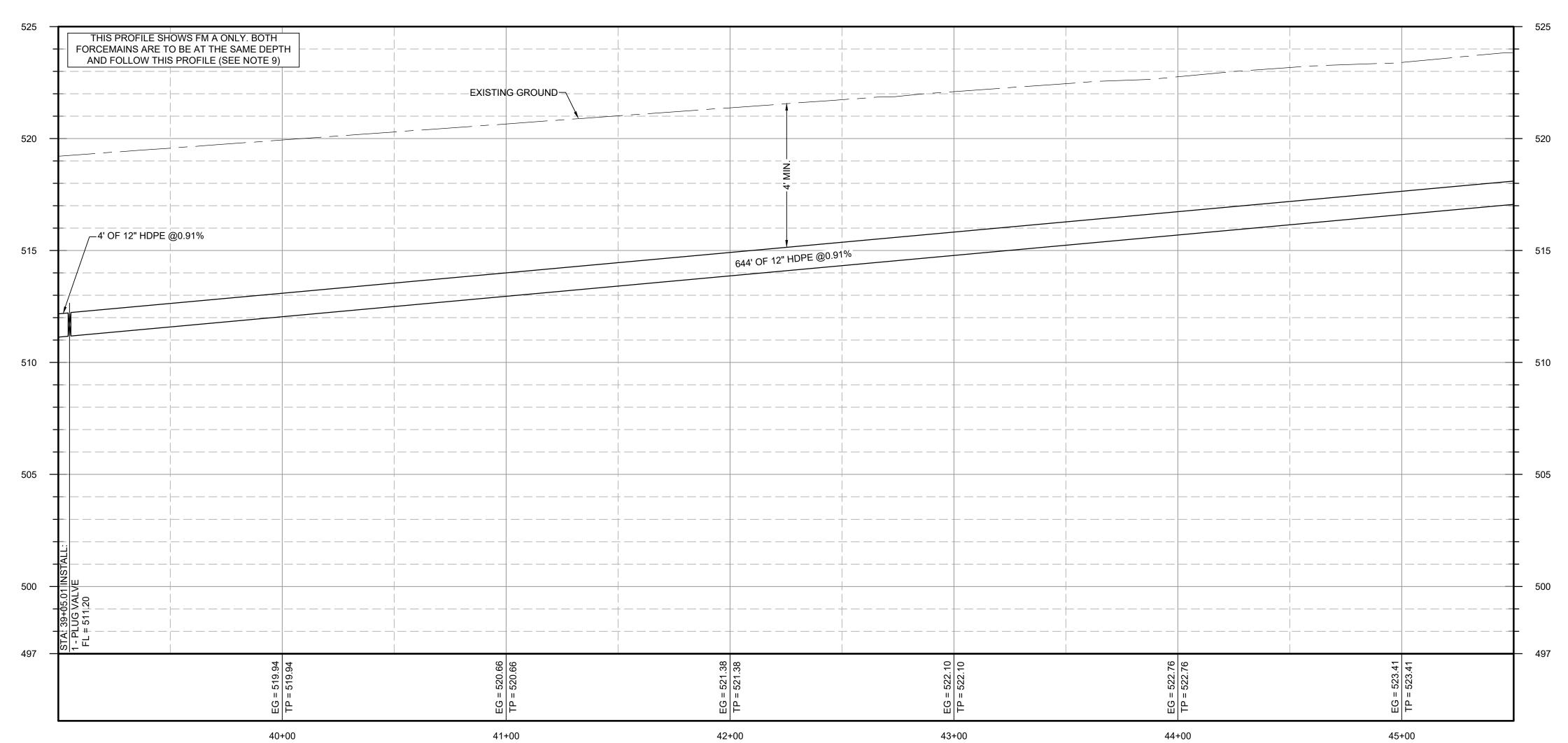
NORTHLAKE LIFT STATION AND FORCE MAIN

	Colliers	
=	cineering	
5	ngineering & Design	

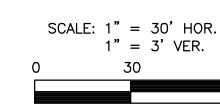
SCALE: AS SHOWN	DATE: 08,	/24	DRAWN BY: DM	CHECKED DK
PROJECT NUM 8002-03		12" FO 142+87	IO NAME: RCEMAIN STA. '.22	0+00.00 -
SHEET TILE:				

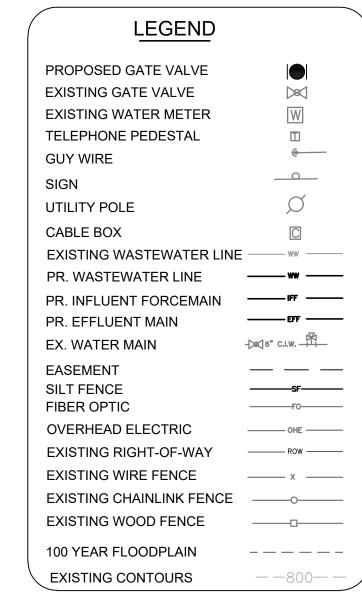
12" FORCEMAIN STA. 32+50.00 - 39+00.00





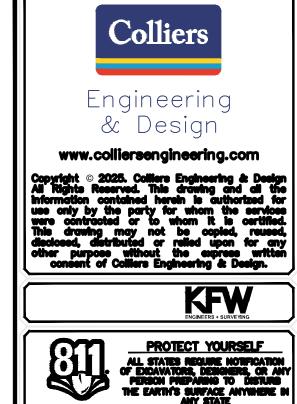




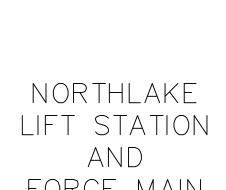


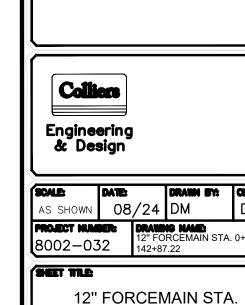
NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.

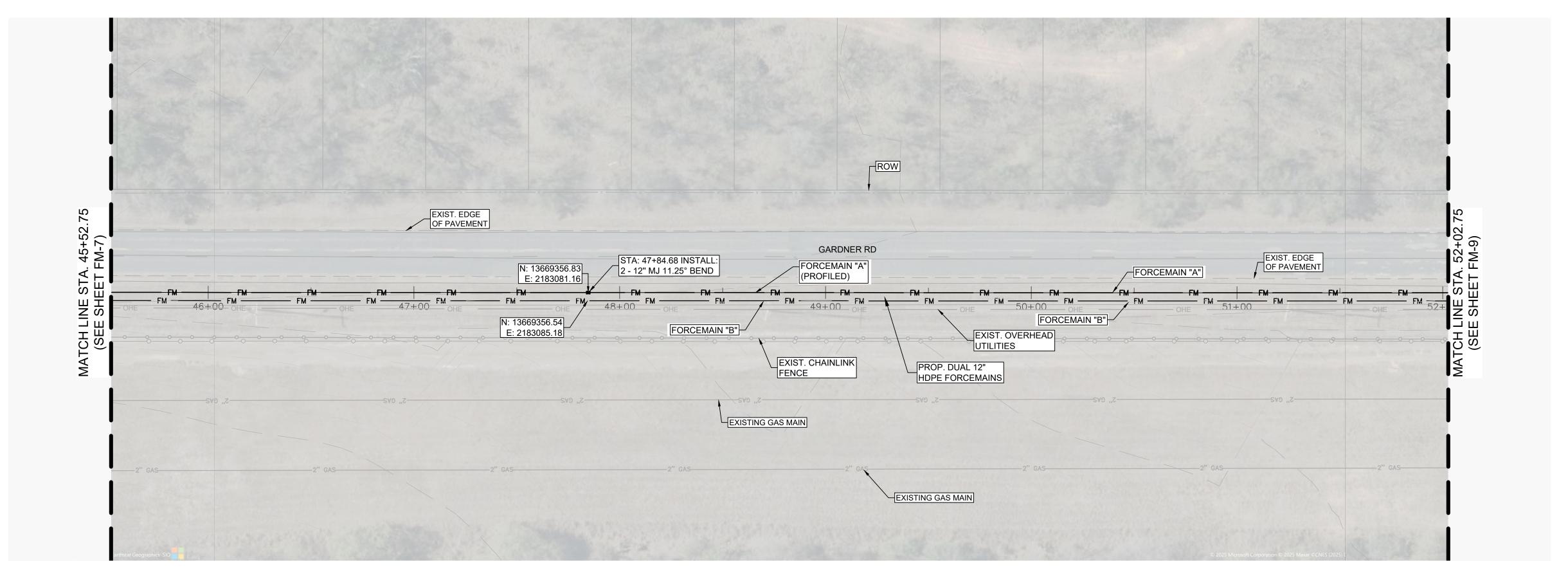


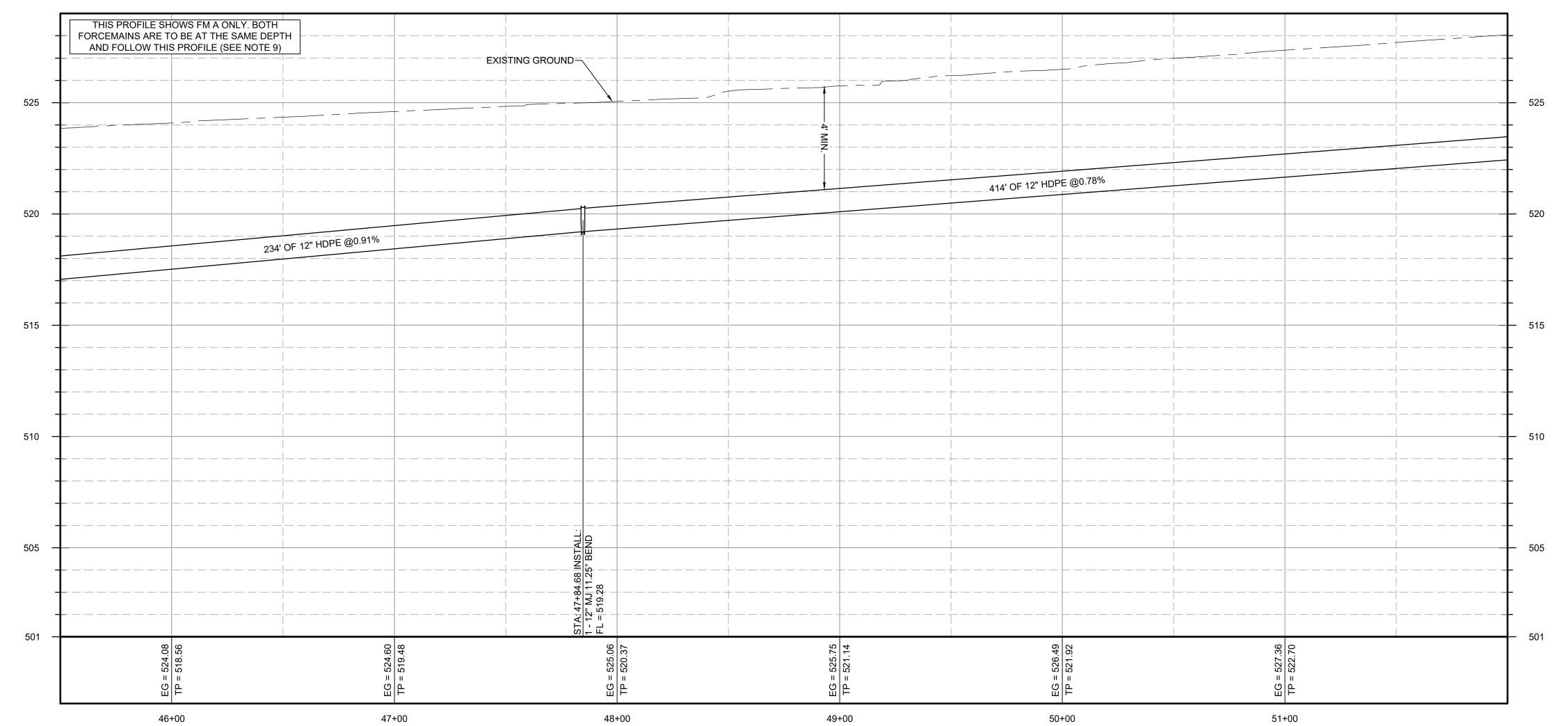
	FOR NUI	ABEF	es v	ISIT:	W	M.C.	ALLE	11.C	MOX	
DATE DRAWN BY DESCRIPTION										
DRAWN BY										
DATE										
REV										



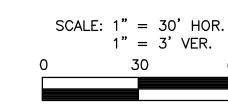


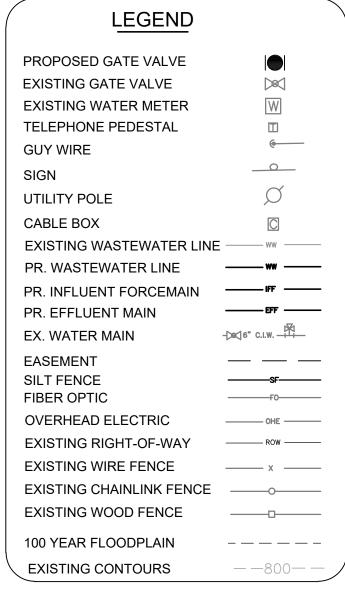
39+00.00 - 45+50.00





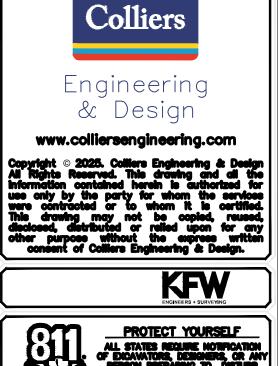




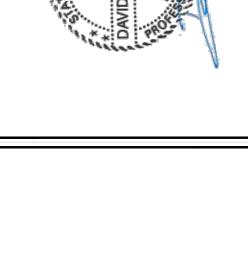


NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



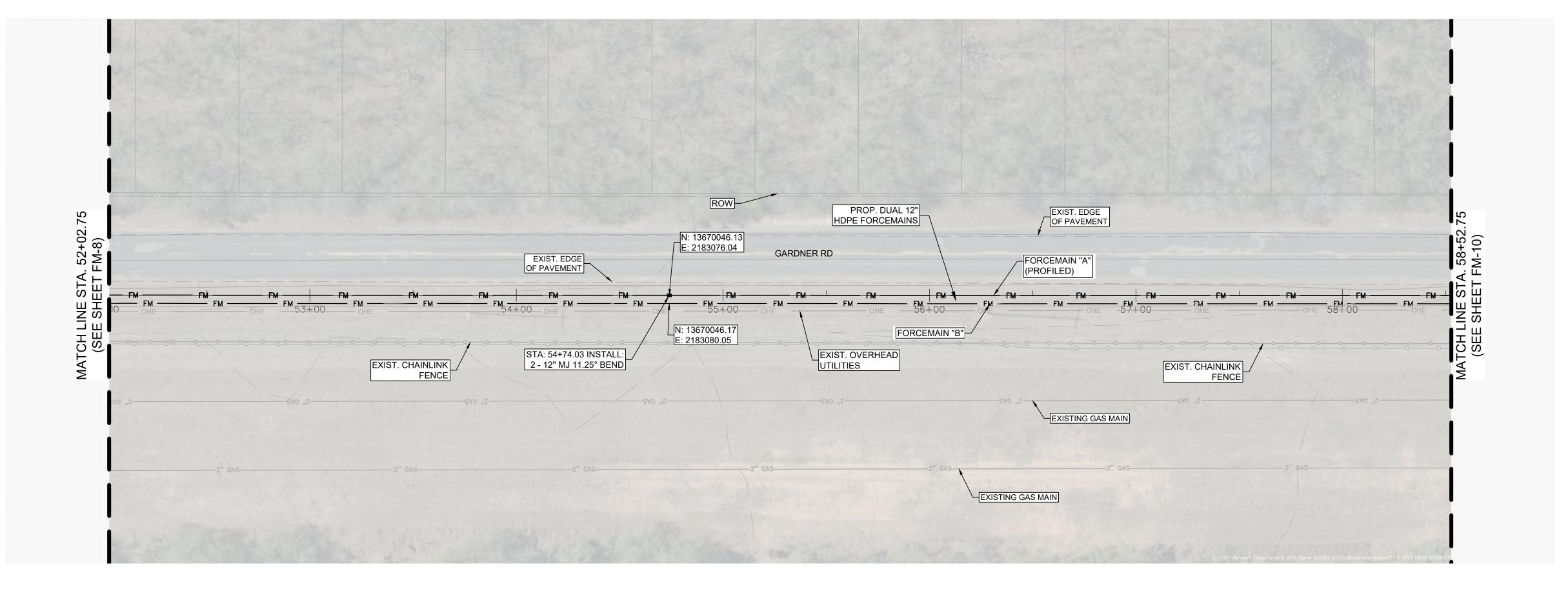
F	FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM									
DATE DRAWN BY DESCRIPTION										
DRAWN BY		•	٠	•	•	٠	·	·	٠	
DATE										
REV										

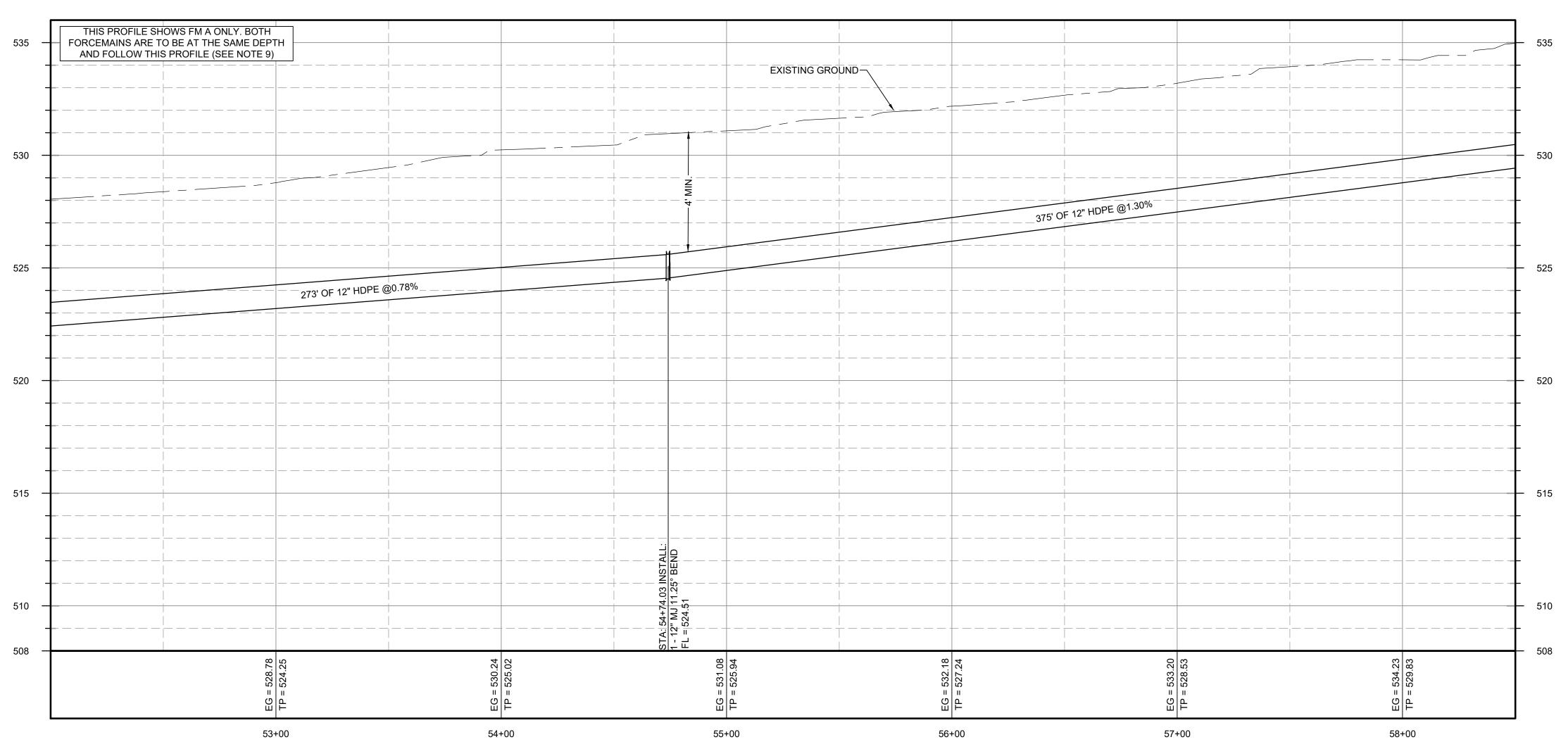


NORTHLAKE LIFT STATION AND FORCE MAIN

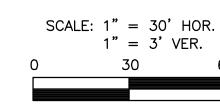
Colline & Des	erina	l	
SCALE: AS SHOWN	DATE: 08	/24	DRAWN DM
PROJECT NUM 8002-03		12" FO 142+87	G NAME RCEMAI 7.22

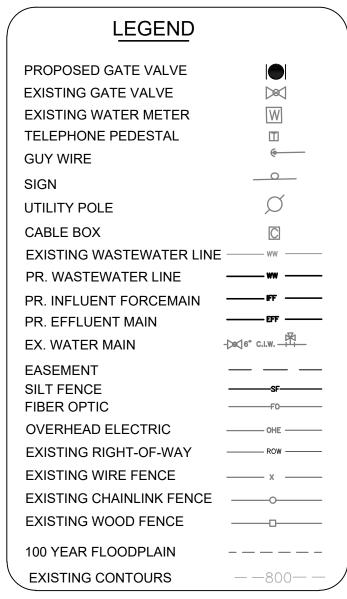
12" FORCEMAIN STA. 45+50.00 - 52+00.00









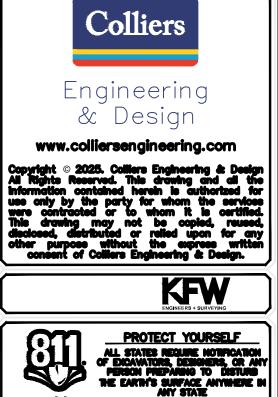


NOTES:

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES
 PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR

APPROVAL PRIOR TO CONSTRUCTION.

- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



FOR STATE SPECIFIC DIRECT PHONE

	NUI	ABE!	(2 A	ISIT:	W.	W.C)II.Q	
DATE DRAWN BY DESCRIPTION									
DRAWN BY		•	•		•	•	•		٠
ATE		•	•	٠					
REV D									



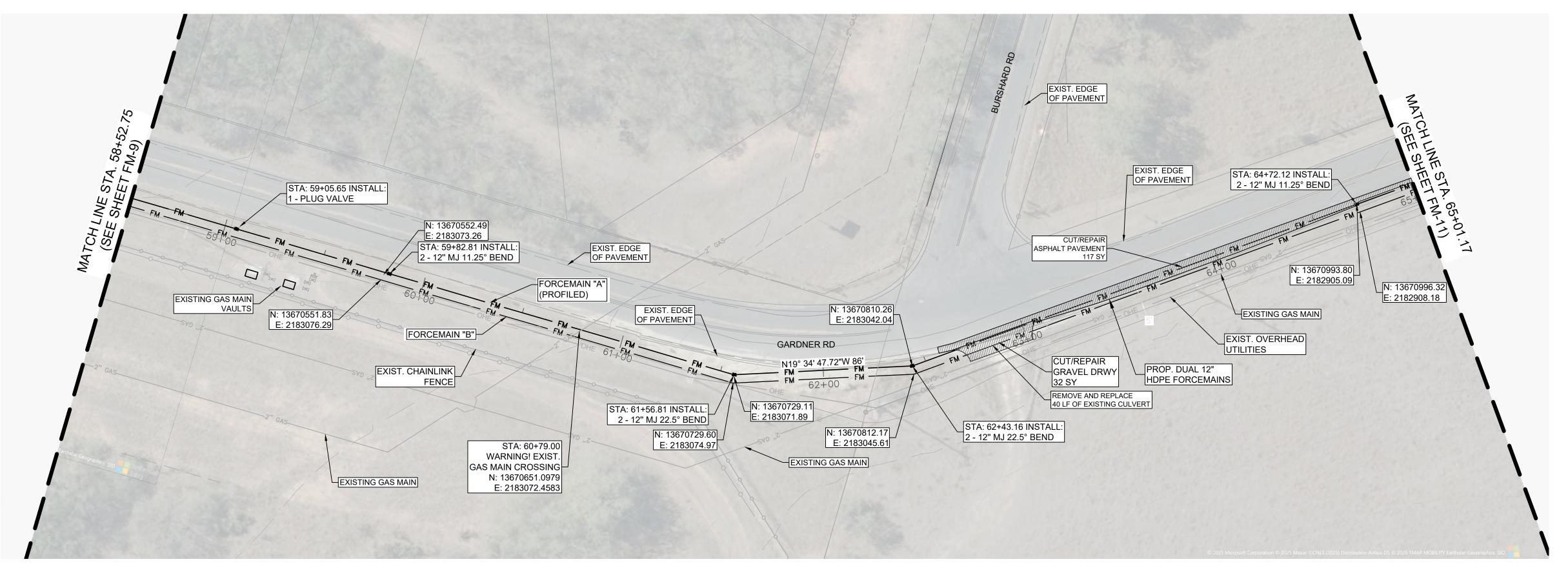
NORTHLAKE LIFT STATION AND FORCE MAIN

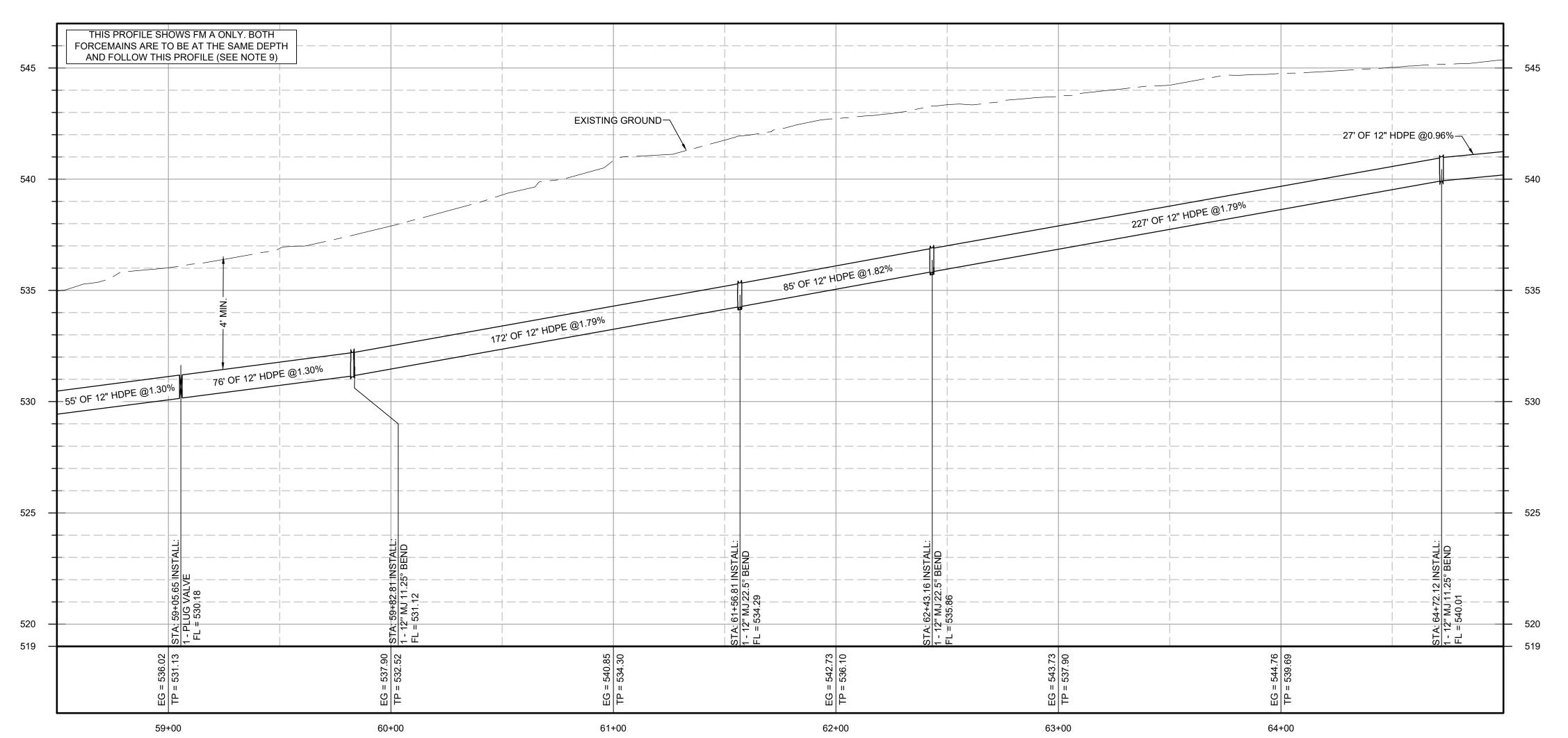
Colliers	_
Engineering & Design	

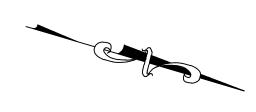
SCALE AS SHOWN	DATE: 08/2	DRAWN 4 DM	ST:	CHECKED E
PROJECT NUM 8002-03	12"	FORCEMA +87.22	IN STA.	0+00.00 -
SHEET TILE:				

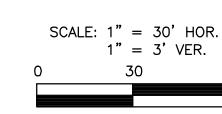
12" FORCEMAIN STA. 52+00.00 - 58+50.00

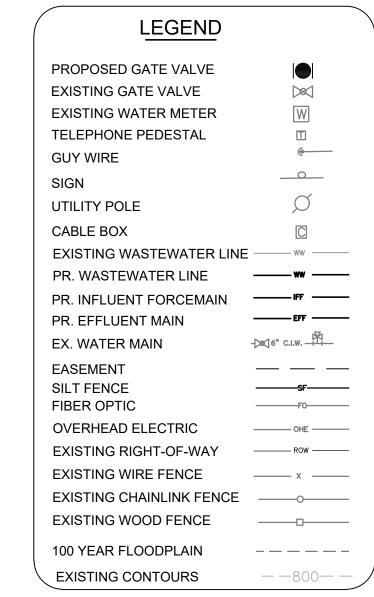
FM-9





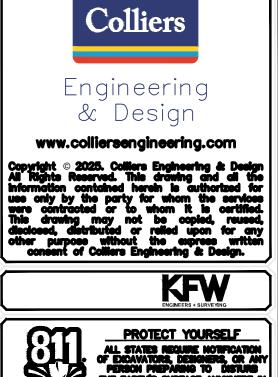






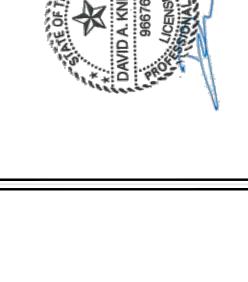
NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



FOR STATE SPECIFIC DIRECT PHONE

=		1311:) II.Q		
DATE DRAWN BY DESCRIPTION								
DRAWN BY		÷	÷	÷	÷	÷	÷	
DATE								



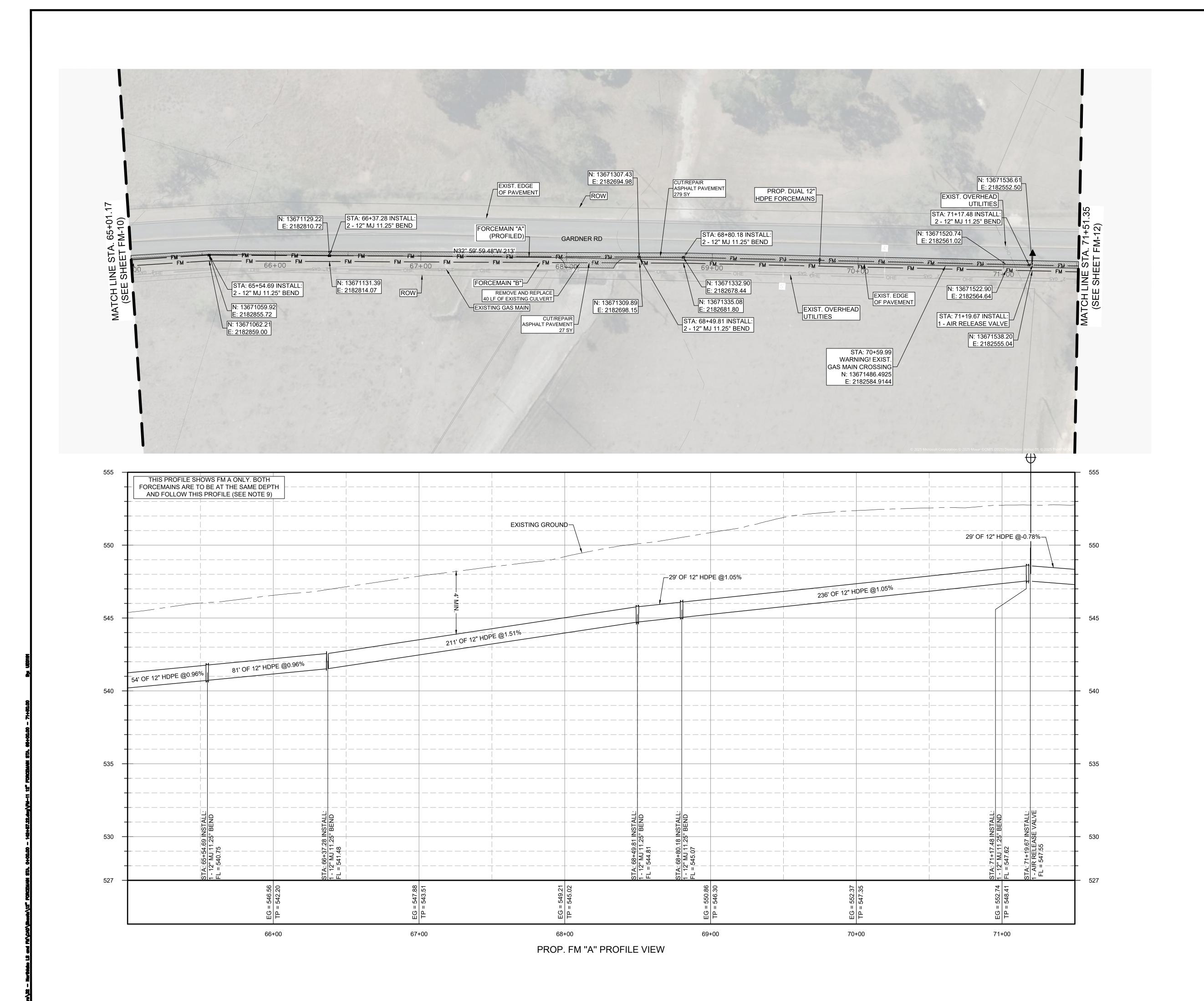
NORTHLAKE LIFT STATION AND FORCE MAIN

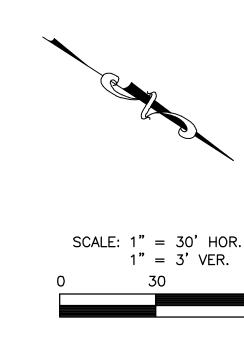
	Colliers
E	ingineering & Design

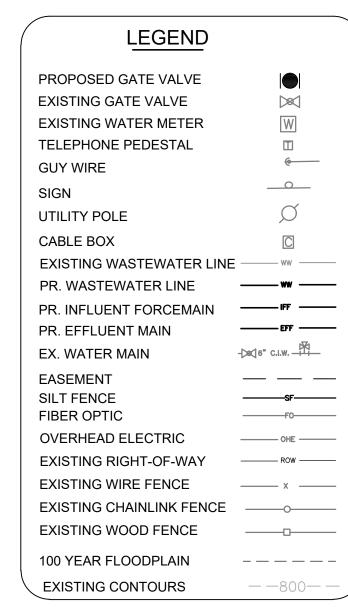
SCALE:	DATE		DRAWN BY:	CHECKED
AS SHOWN	80	/24	DM	DK
PROJECT NUM	ER:	DRAW	IS NAME:	0.00.00
8002-03	32	12" FO 142+87	RCEMAIN STA. 7.22	0+00.00 -
SUSSET THE				

12" FORCEMAIN STA.

58+50.00 - 65+00.00

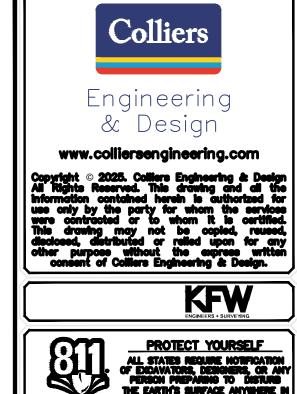




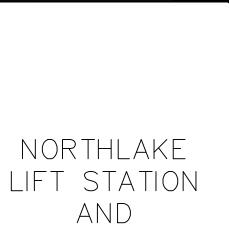


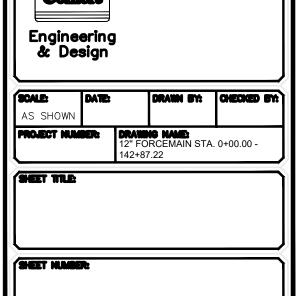
NOTE

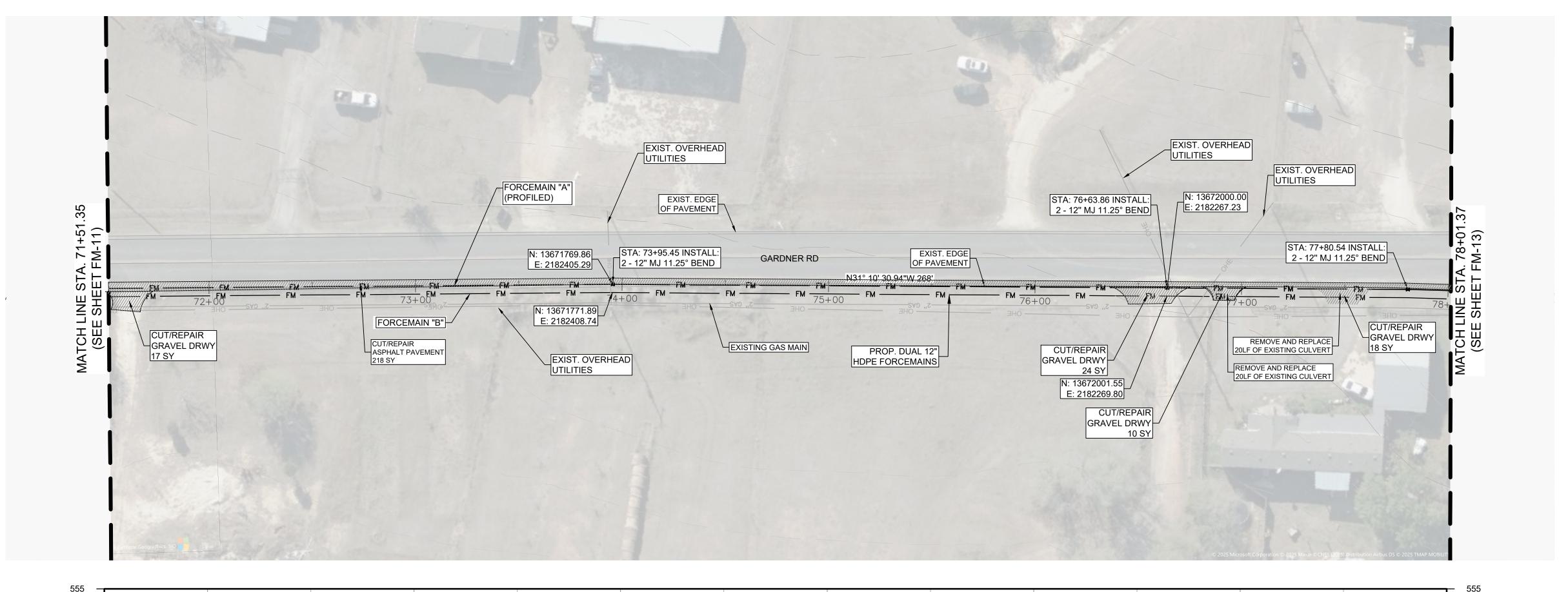
- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.

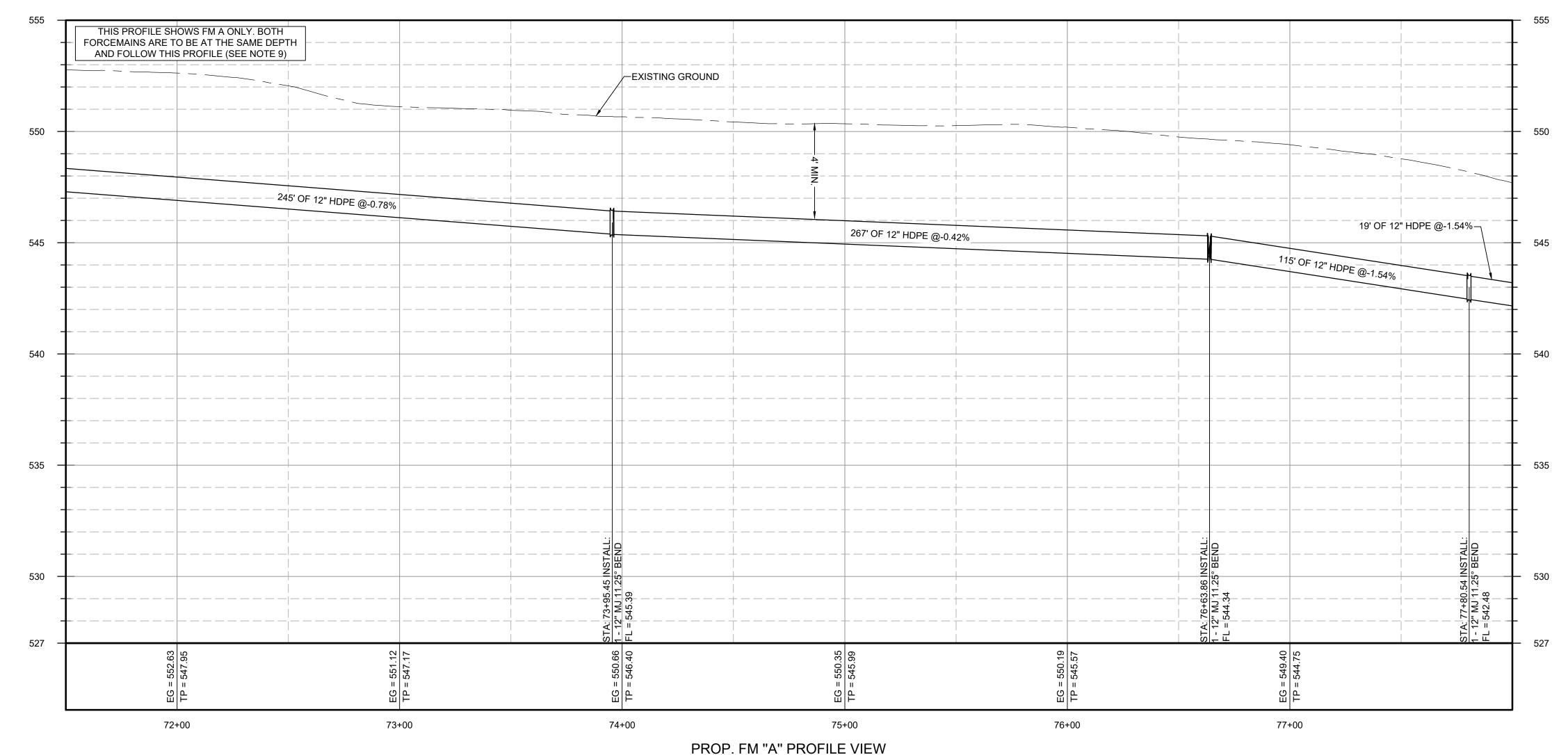


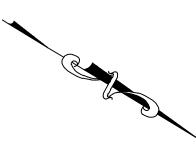
	NUI	ABEF	RS V	ISIT:	W	W.C	ALLE	11.C	OM	
DATE DRAWN BY DESCRIPTION										
DRAWN BY			•		•	•			٠	
REV DATE										

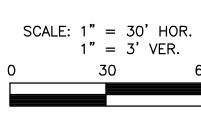


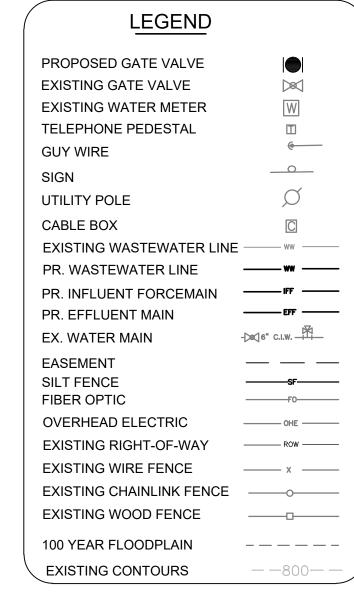






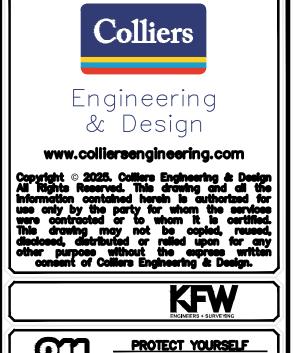




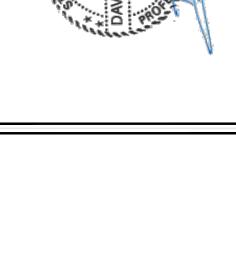


NOTE

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



L	FOR NUI	ST/ ABER	NTE S	SPE(ISIT:	CIFIC WM	DIR W.C.	ECT ALLE	PH(ONE	
DESCRIPTION										
DRAWN BY										
DATE										
REV									٠	Ŀ



NORTHLAKE LIFT STATION AND FORCE MAIN

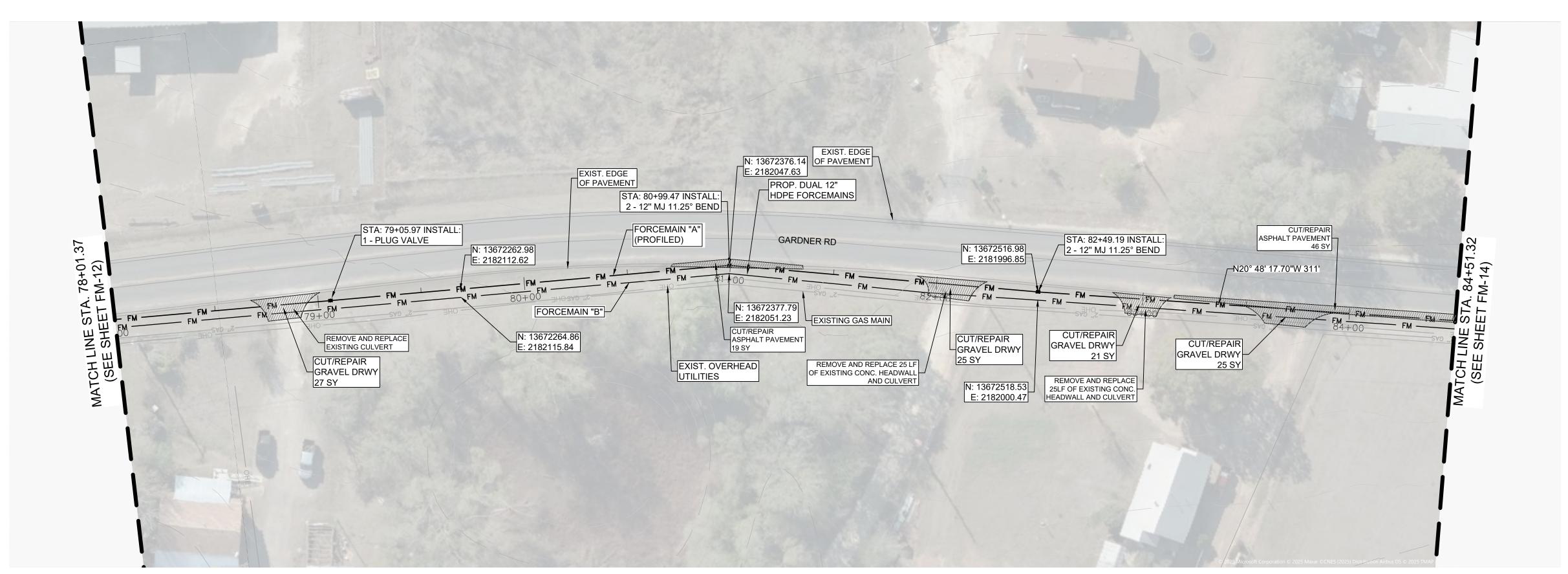
Colli Engine & Des	ering		
SCALE	DATE:	DRAWN BY:	CHECKED BY:
AS SHOWN	08/24	DM	DK

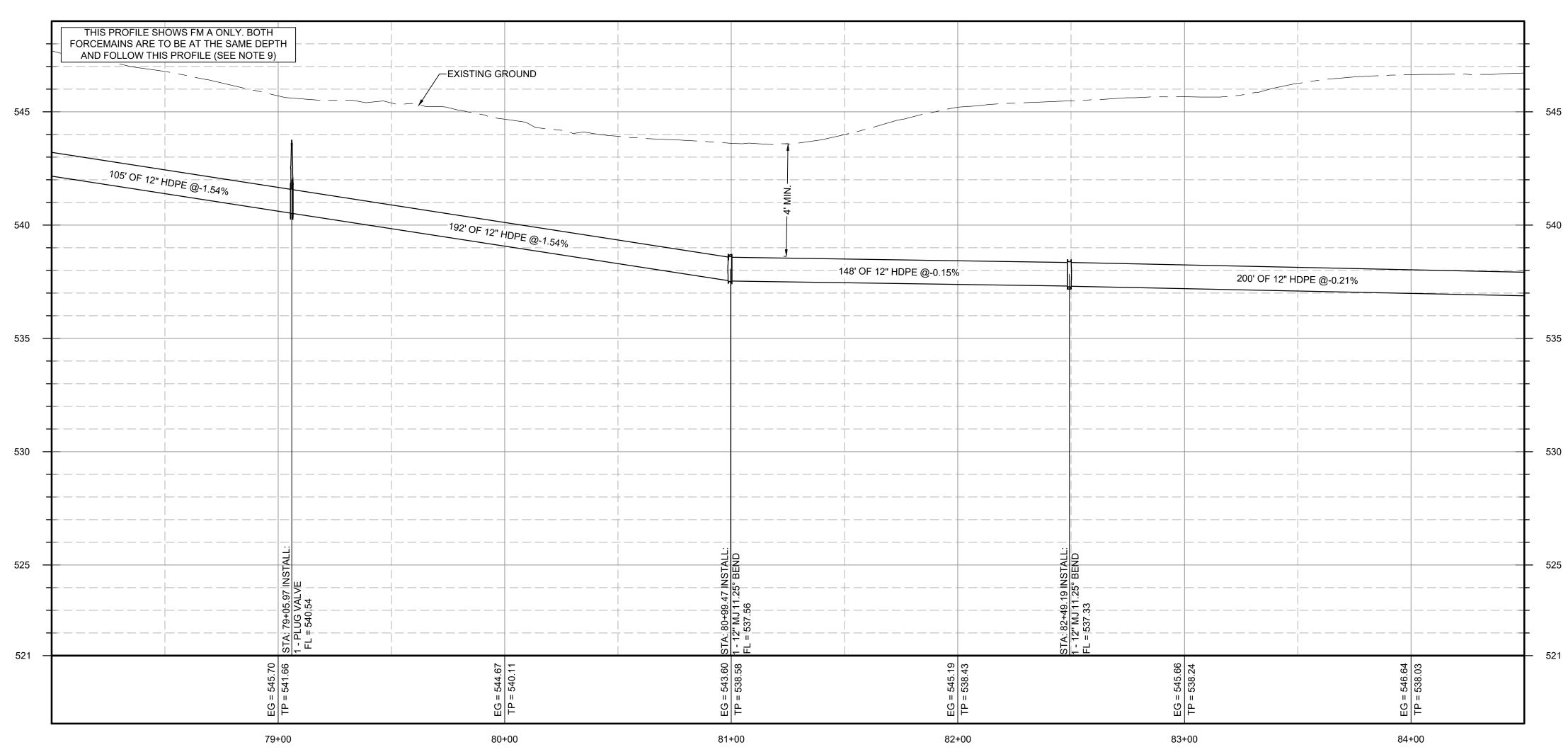
PROJECT NUMBER: 12" FORCEMAIN STA. 0+00.00 - 142+87.22

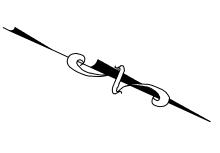
SHEET TILE

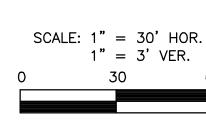
12" FORCEMAIN STA.

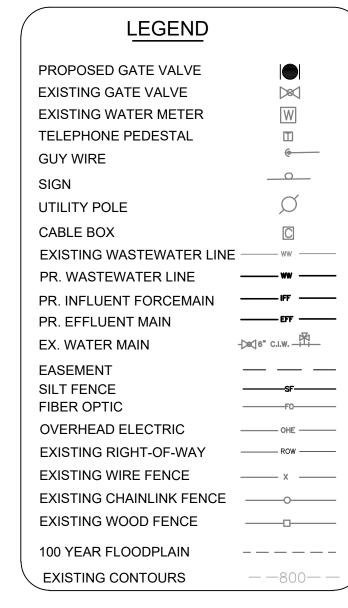
71+50.00 - 78+00.00





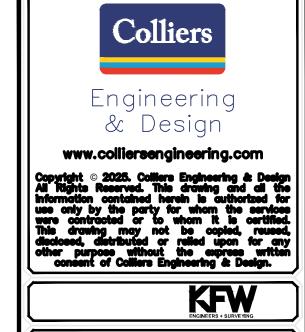






NOTES:

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



PROTECT YOURSELF

L	FOR NUI	ST/ ABE	NTE :	SPE(ISIT:	CIFIC W	DIF W.C.	ECT ALL8	PH 111.C	ONE OM	
DRAWN BY DESCRIPTION										
DRAWN BY										
DATE										
REV			•			•				



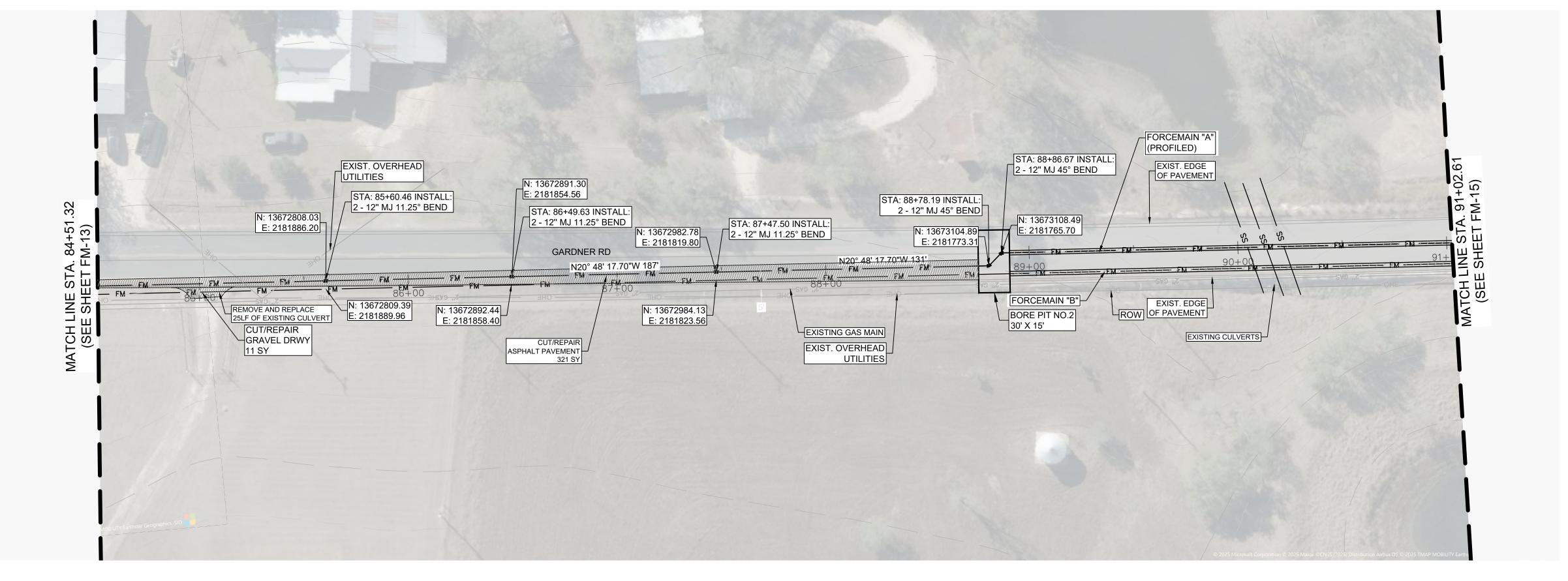
NORTHLAKE LIFT STATION AND FORCE MAIN

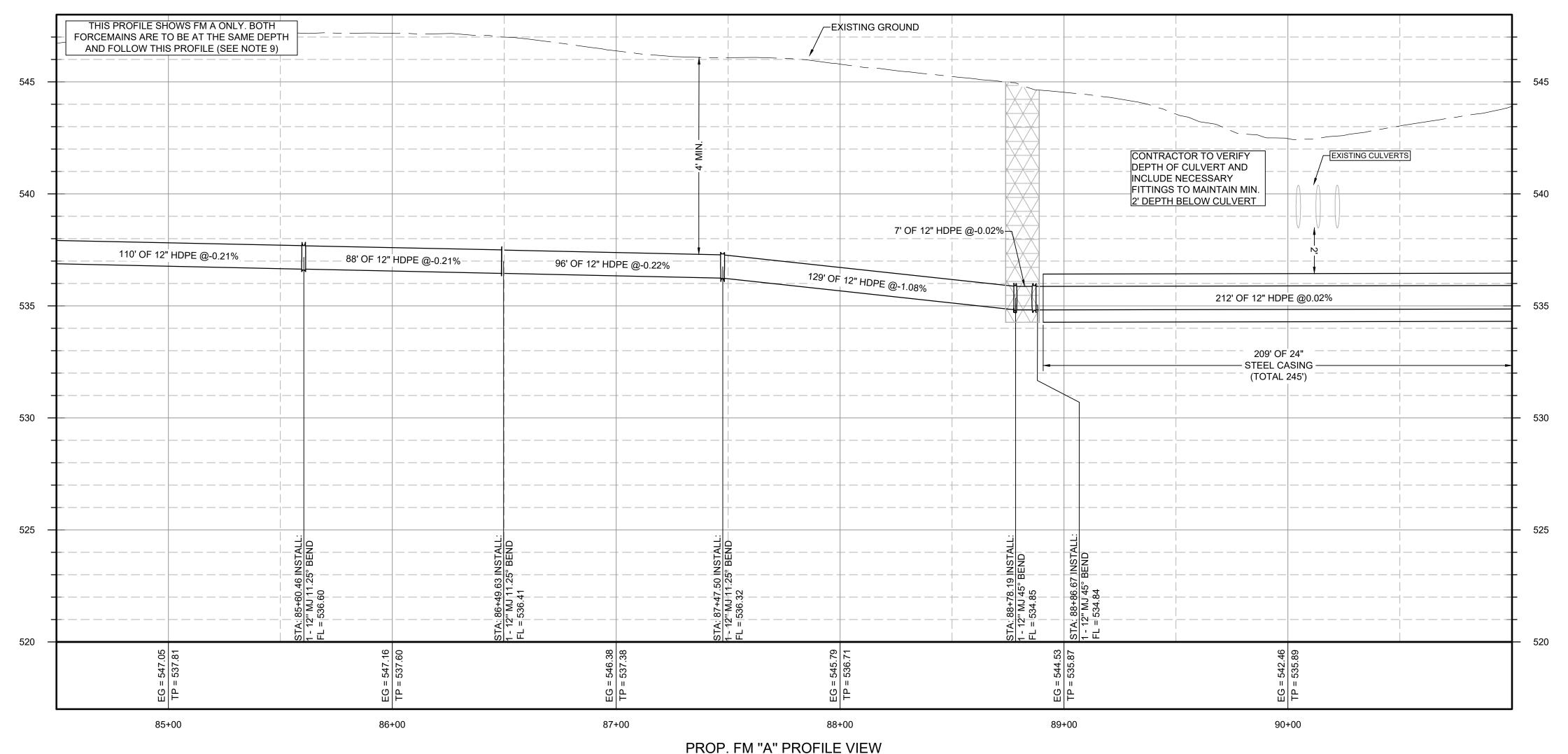
Colliers	
Engineering & Design	

SCALE: AS SHOWN	DATE: 08	/24	DRAWN 5Y: DM	CHECKED I
PROJECT NUM 8002-03		12" FO 142+87	16 NAME: RCEMAIN STA. 7.22	0+00.00 -
SEET TILE				

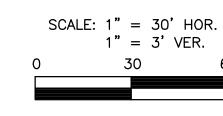
FM-13

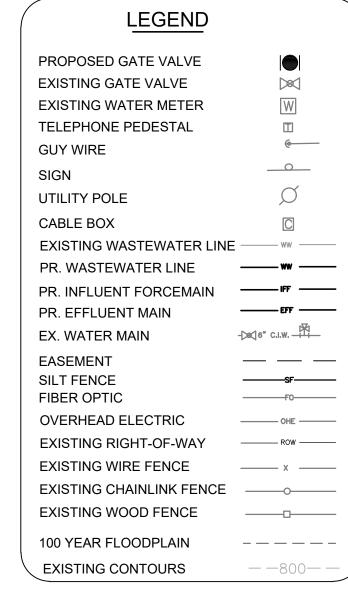
12" FORCEMAIN STA. 78+00.00 - 84+50.00





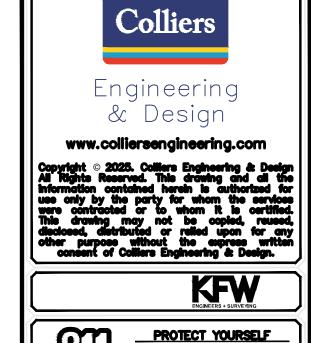




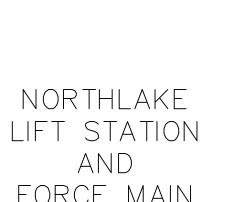


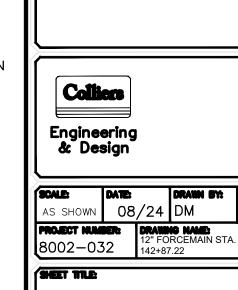
NOTES:

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES
 PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



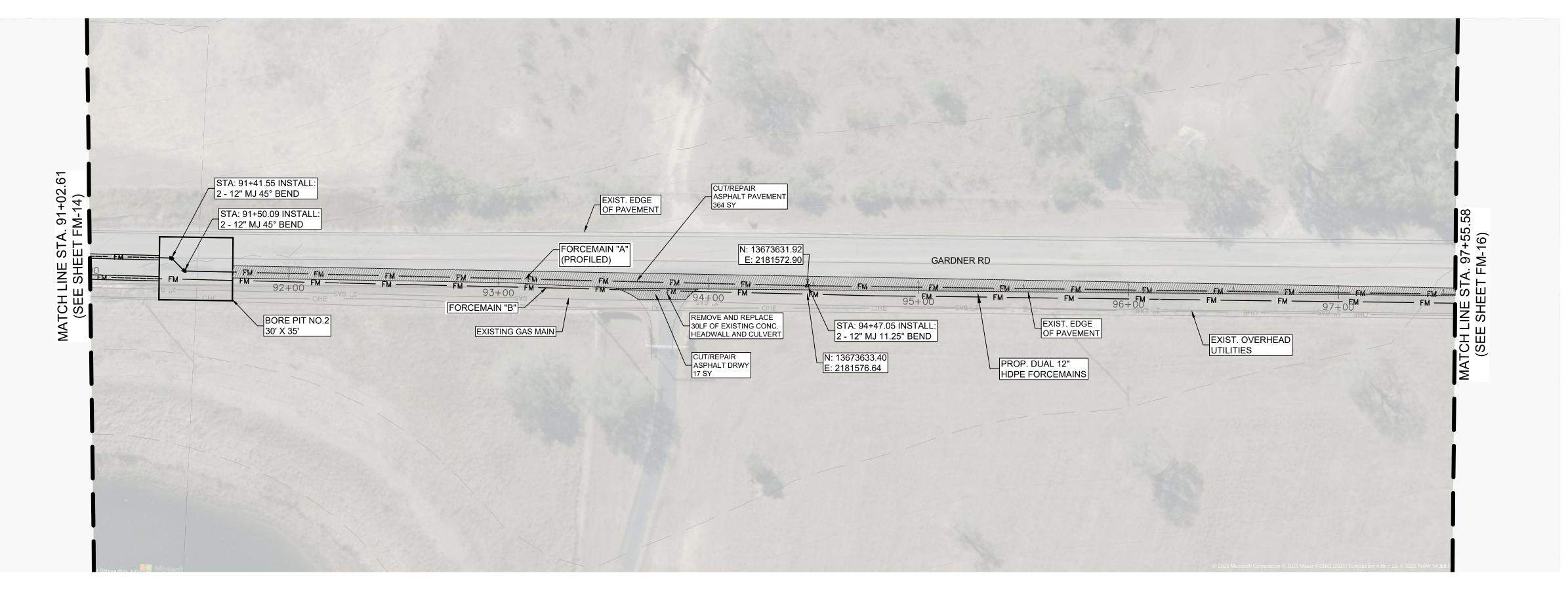
	L	FOR NUI	ST/ ABEF	NTE RS V	SPE(ISIT:	CIFIC	W.C	ECT ALL8	PH(ONE	_
	DATE DRAWN BY DESCRIPTION										
	DRAWN BY							٠	٠		
	DATE	·	·	•	·						
	REV										
/											_

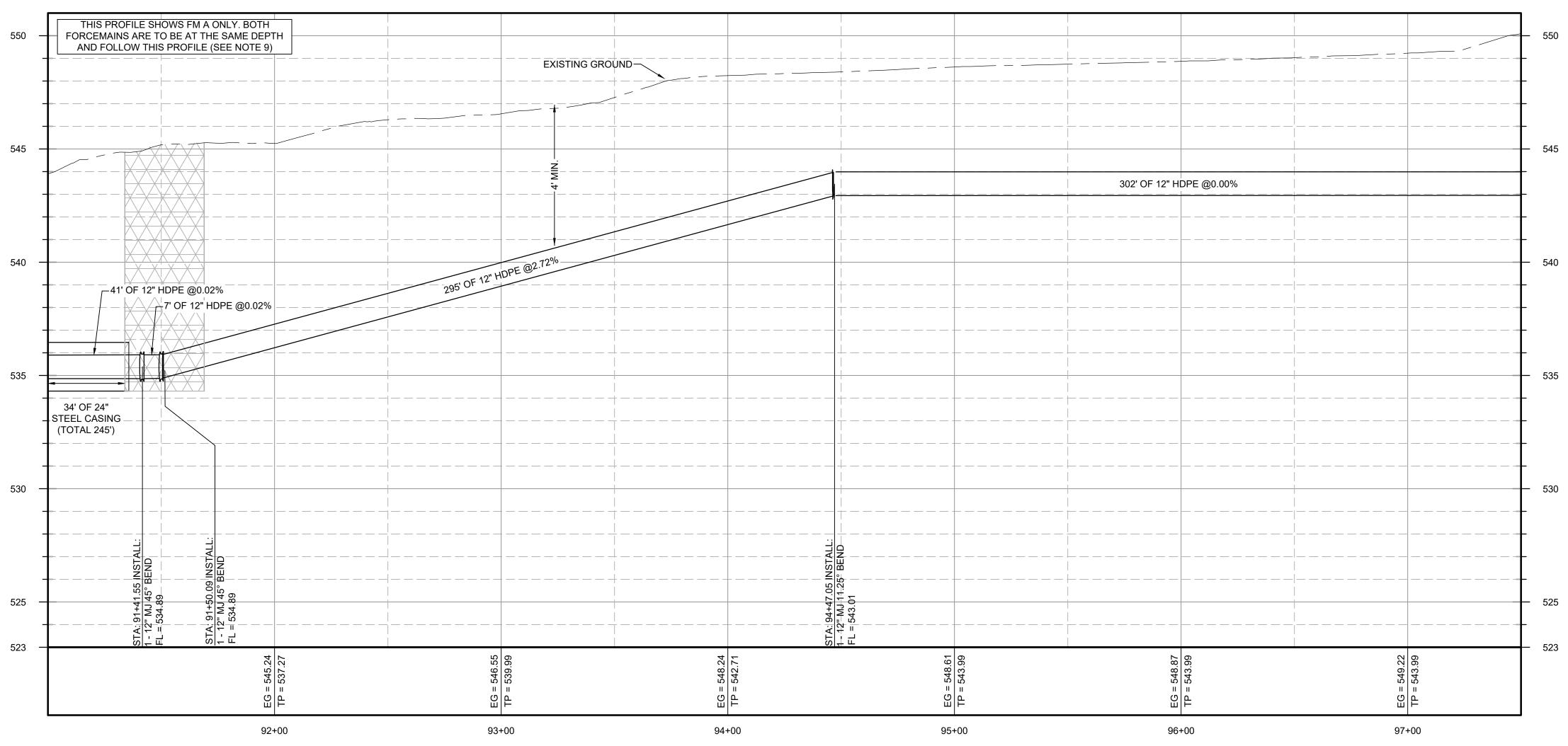


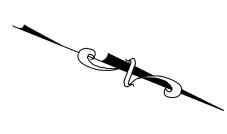


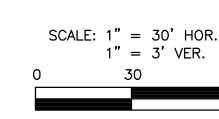
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

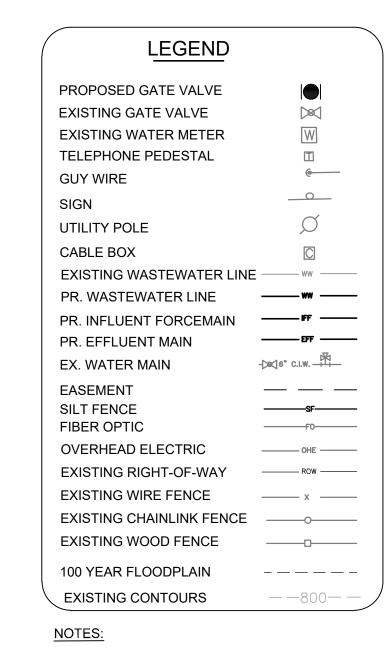
12" FORCEMAIN STA. 84+50.00 - 91+00.00



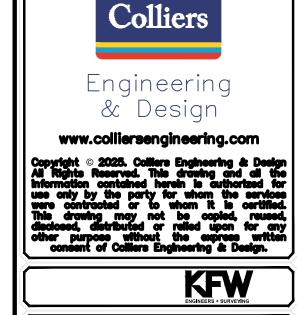








- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES
 PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.

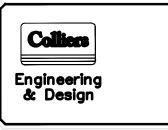


PROTECT YOURSELF
ALL STATES REQUIRE NOTIFICATION
OF ENGAVATORS, DESIGNERS, OR AV
PERSON PREPARENT TO DISTURB
THE EARTH'S SURFACE ANYWHERE
ANY STATE

		FOR NUI	ST/ /BEF	NTE RS V	SPE(ISIT:	CIFIC	DIF W.C	ECT ALLE	PH 011.0	ONE OM	,
	DATE DRAWN BY DESCRIPTION										
	DRAWN BY	٠	٠	٠	٠	٠	٠	٠	٠	٠	٠
		·	·	·	·	·	·	·	·	·	·
1	>										



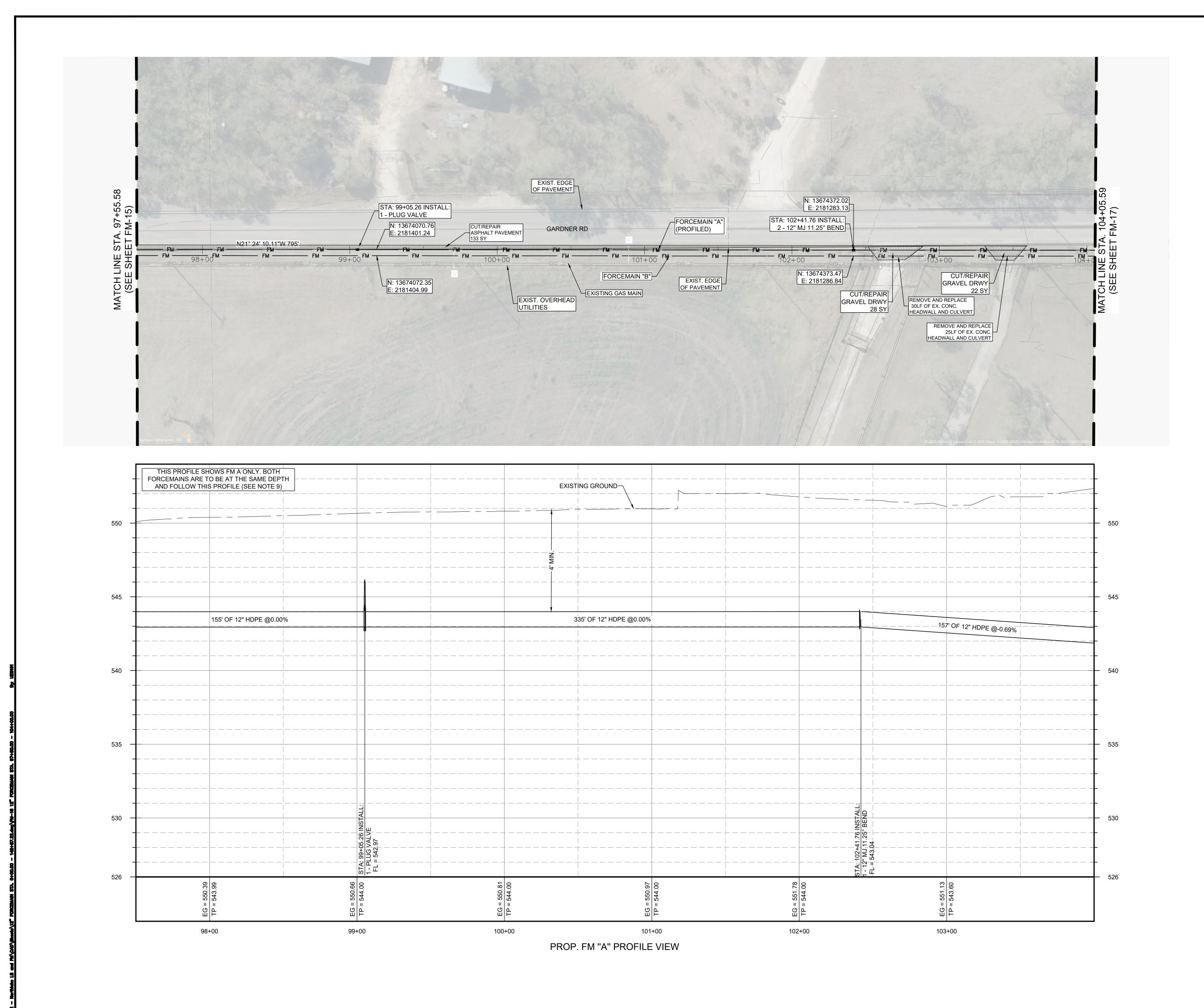
NORTHLAKE LIFT STATION AND FORCE MAIN

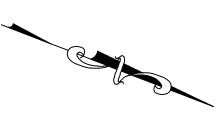


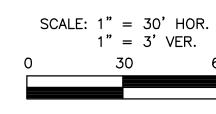
ſ					
	SCALE: AS SHOWN	DATE:	/24	DRAWN BY:	DK
ļ	PROJECT NUM 8002-03		12" FO 142+87	G NAME RCEMAIN STA 7.22	. 0+00.00 -

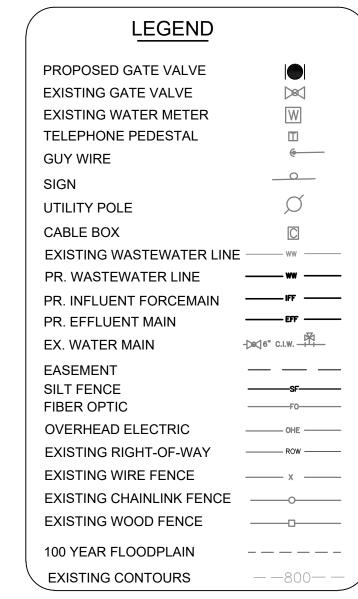
12" FORCEMAIN STA. 91+00.00 - 97+50.00

FM-15



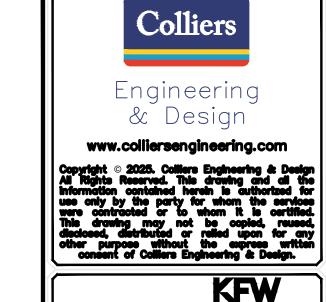






NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.

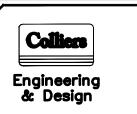


PROTECT YOURSELF

	FOR NUI	ST/ ABEF	NTE V	SPE(ISIT:	CIFIC	DIR W.C.	ALLE	PH(ONE OM	_
DRAWN BY DESCRIPTION										
DRAWN BY										
DATE										
REV										

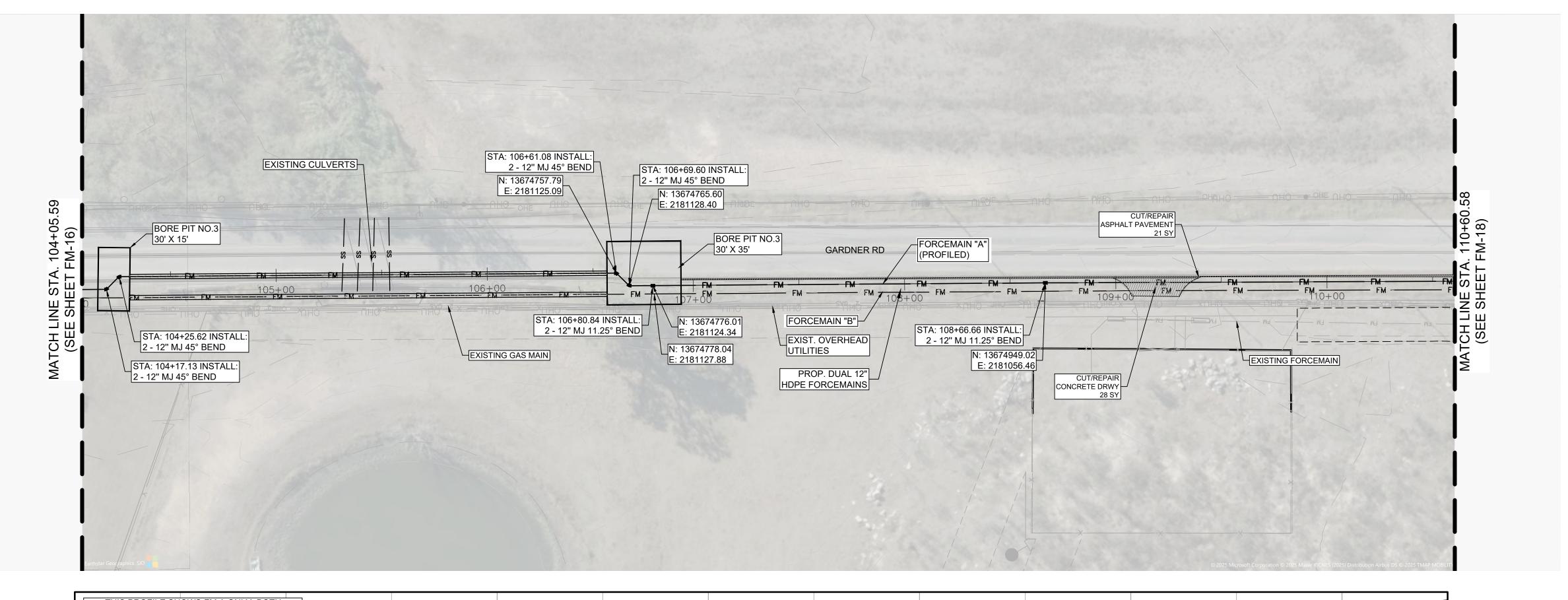


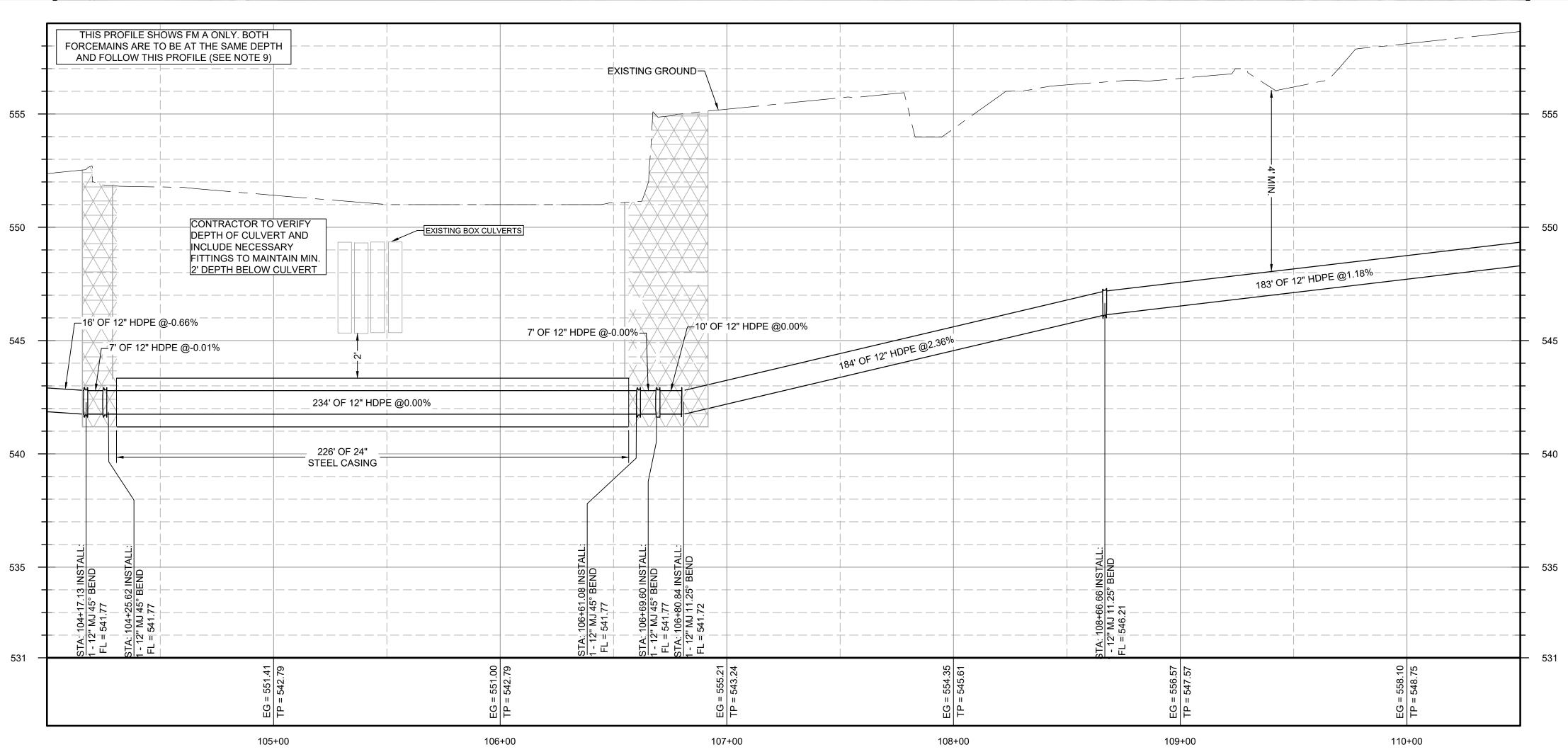
NORTHLAKE LIFT STATION AND FORCE MAIN



ME S SHOWN	DATE: 08	/24		CHECKED BY
		DRAYING NAME: 12" FORCEMAIN STA. 0+00.00 - 142+87.22		

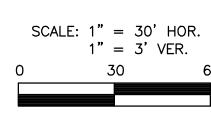
12" FORCEMAIN STA. 97+50.00 - 104+00.00

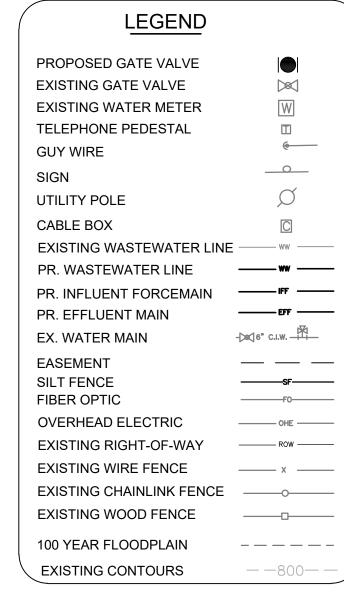




PROP. FM "A" PROFILE VIEW

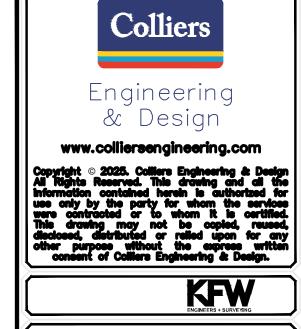






NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



PROTECT YOURSELF

FOR STATE SPECIFIC DIRECT PHONE

K	<u> </u>	NUI	ABER	(2 A	ISIT:	W	M.C	ALLS	11.C	UM	_/
	DATE DRAWN BY DESCRIPTION										
	DRAWN BY		٠				٠		٠	٠	
	DATE										
	REV										



NORTHLAKE LIFT STATION AND FORCE MAIN

Colliers	
Engineering & Design	

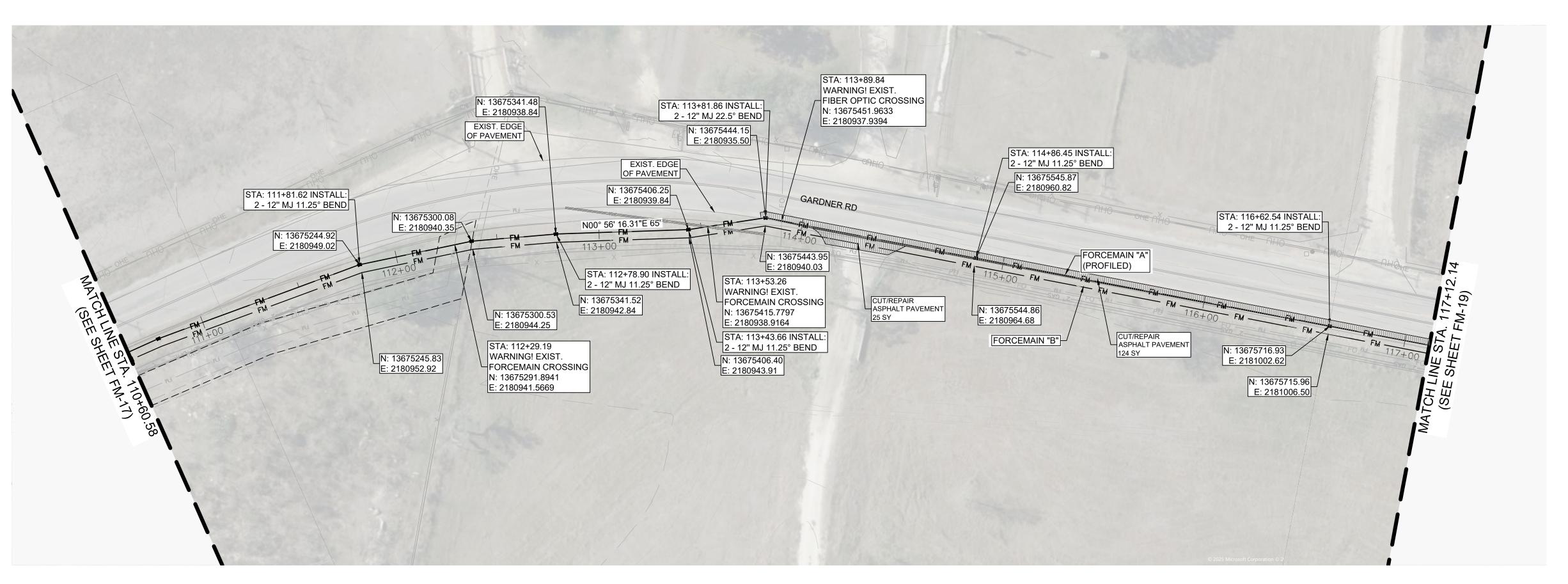
SCALE: AS SHOWN	DATE: 08	/24	DRAWN 5Y: DM	CHECKED I
PROJECT NUM 8002-03		12" FO 142+87	IO NAME: RCEMAIN STA. 7.22	0+00.00 -
SEET TILE				

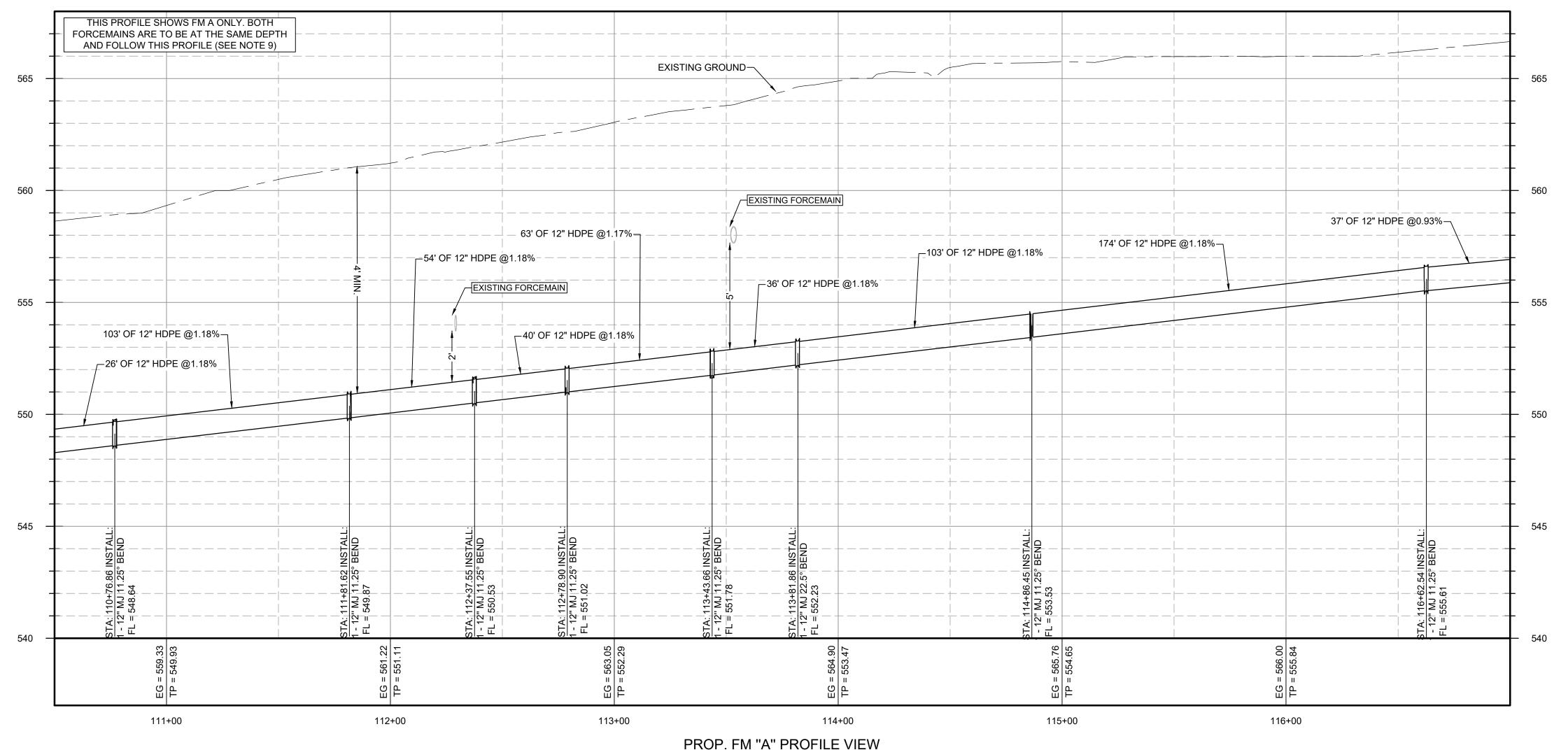
12" FORCEMAIN STA.

104+00.00 - 110+50.00

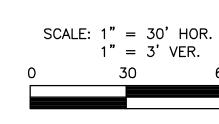
FM-17

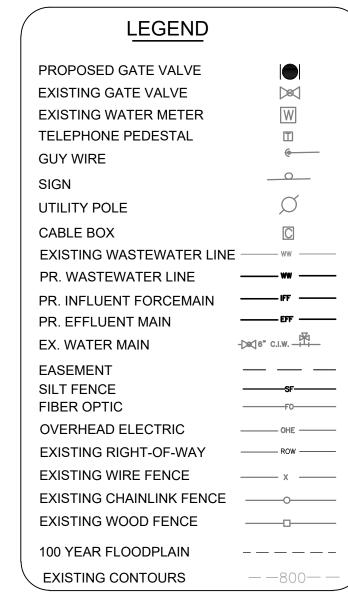
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.





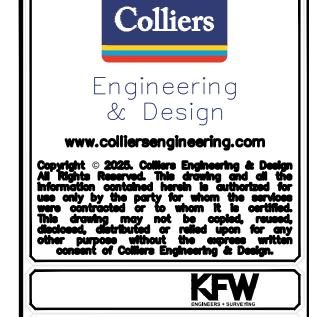






NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



PROTECT YOURSELF

	FOR NUM	ST/	TE:	SPE(CIFIC	DIF	ECT ALL	PH(ONE OM	
DRAWN BY DESCRIPTION										
DKAWN BY				·						
IE.										



NORTHLAKE LIFT STATION AND FORCE MAIN



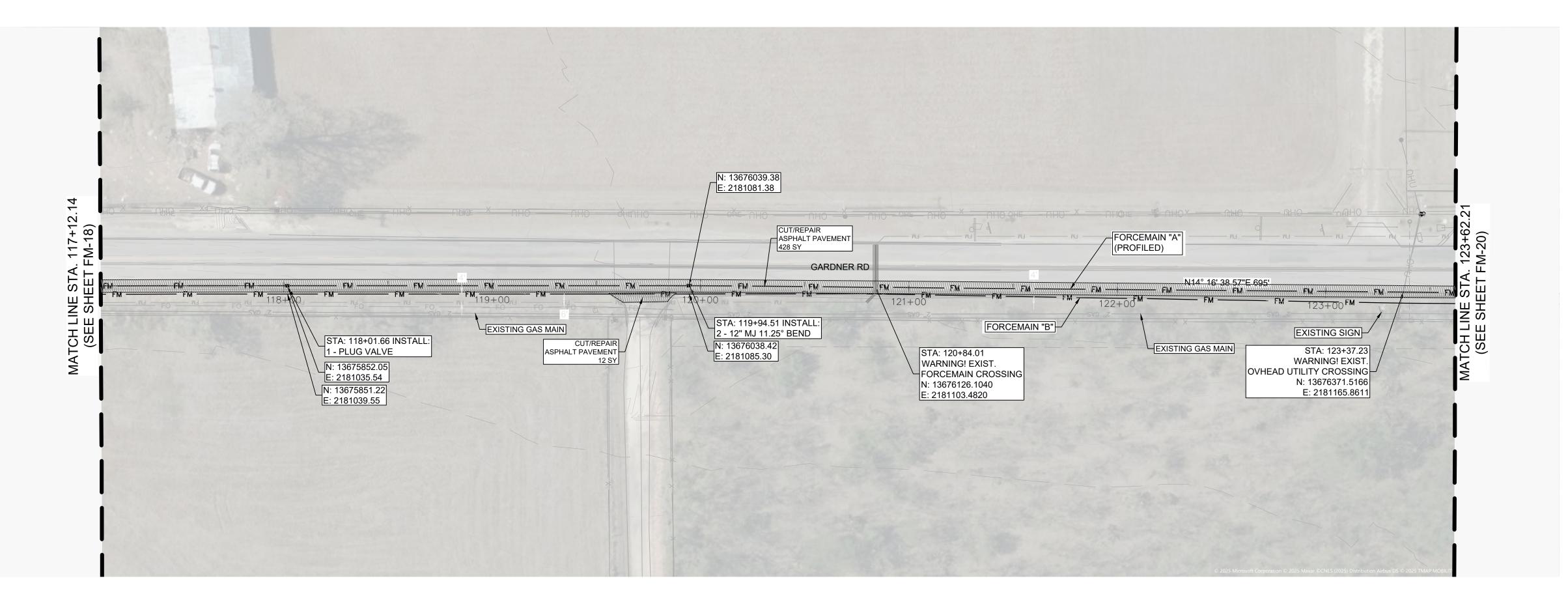
SCALE AS SHOWN	DATE: 08	DRAWN BY: DM	CHECKED I
PROJECT NUM 8002-03		O NAME: RCEMAIN STA. 7.22	0+00.00 -
SHEET TITLE:			

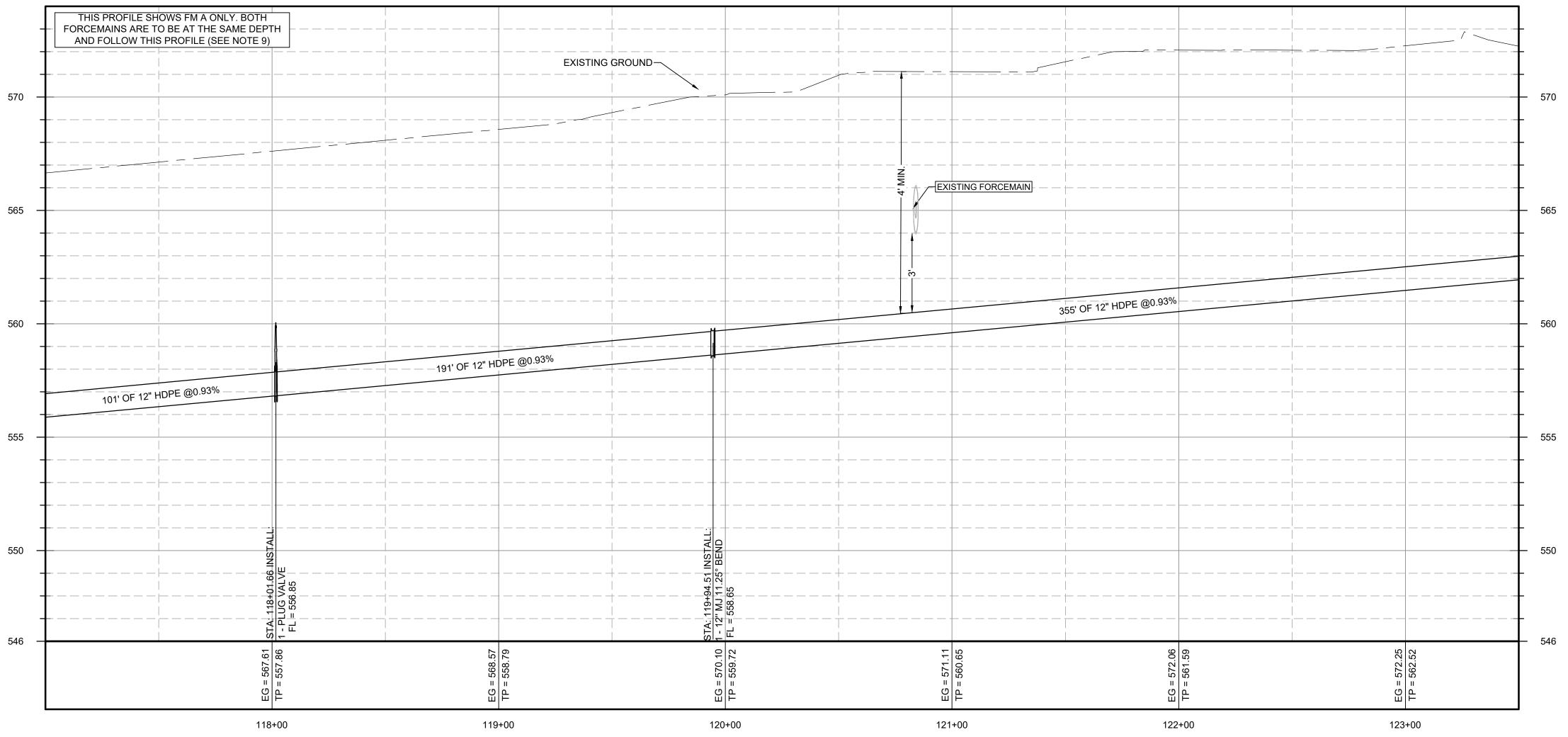
110+50.00 - 117+00.00

FM-18

12" FORCEMAIN STA.

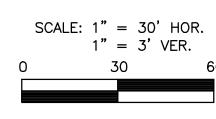
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

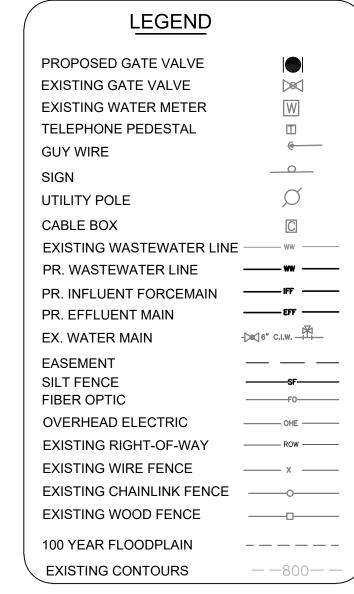




PROP. FM "A" PROFILE VIEW

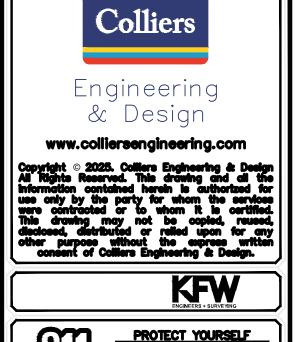


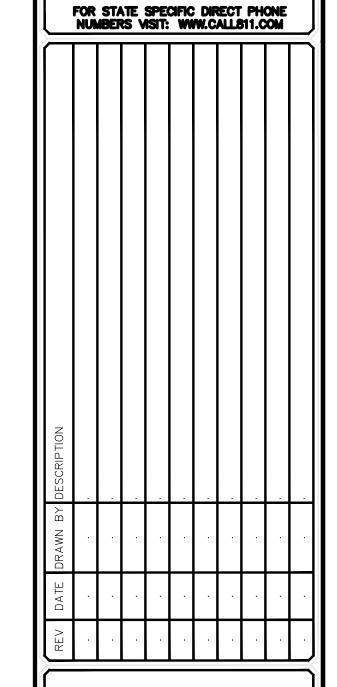




NOTES:

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.





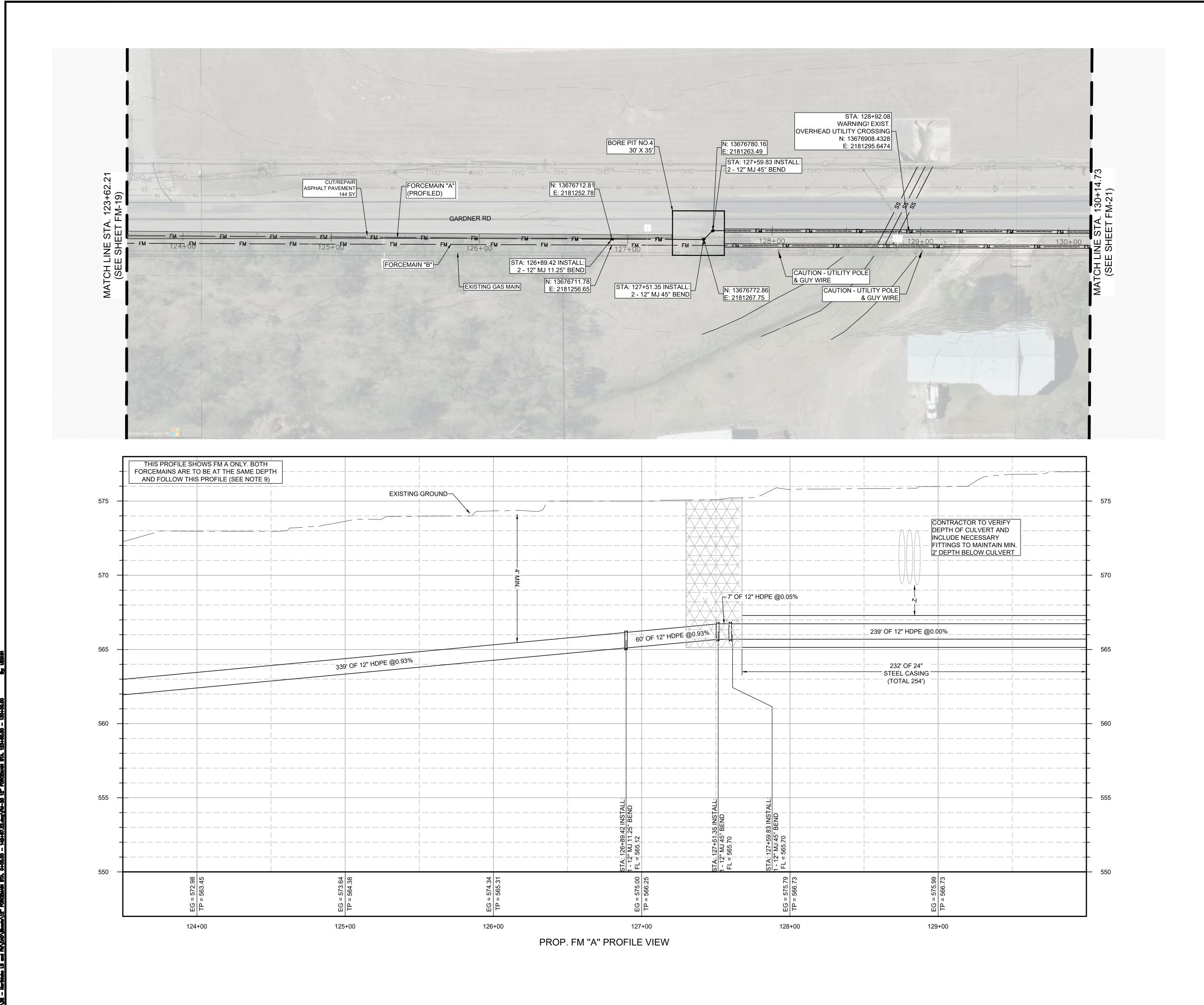


NORTHLAKE LIFT STATION AND FORCE MAIN

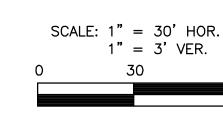


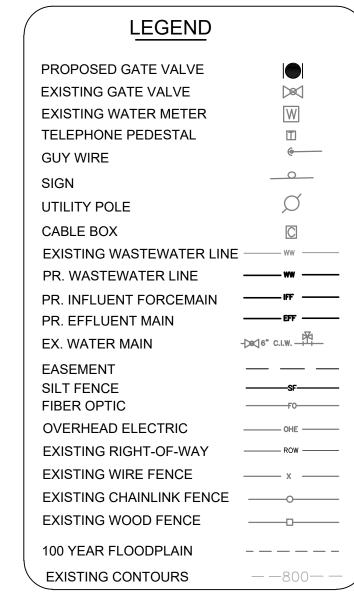
SCALE AS SHOWN	DATE: 08	/24	DRAWN BY: DM	DK
PROJECT NUM 8002-03		12" FO 142+87	IS NAME: RCEMAIN STA 7.22	A. 0+00.00 -

12" FORCEMAIN STA. 117+00.00 - 123+50.00



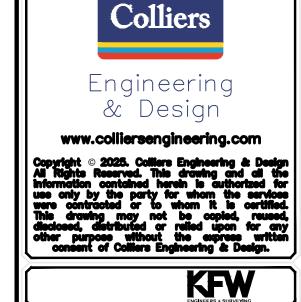




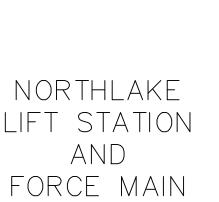


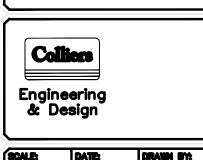
NOTE

- 1. OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



	FOR NUM	ST/ ABER	NTE S	SPE(ISIT:	CIFIC WM	W.C	ALLE	PH(ONE	_
DRAWN BY DESCRIPTION										
DRAWN BY	·	·	·	·	·	·	·	·	·	
DATE	·		٠	٠		·				
REV	·					·				·

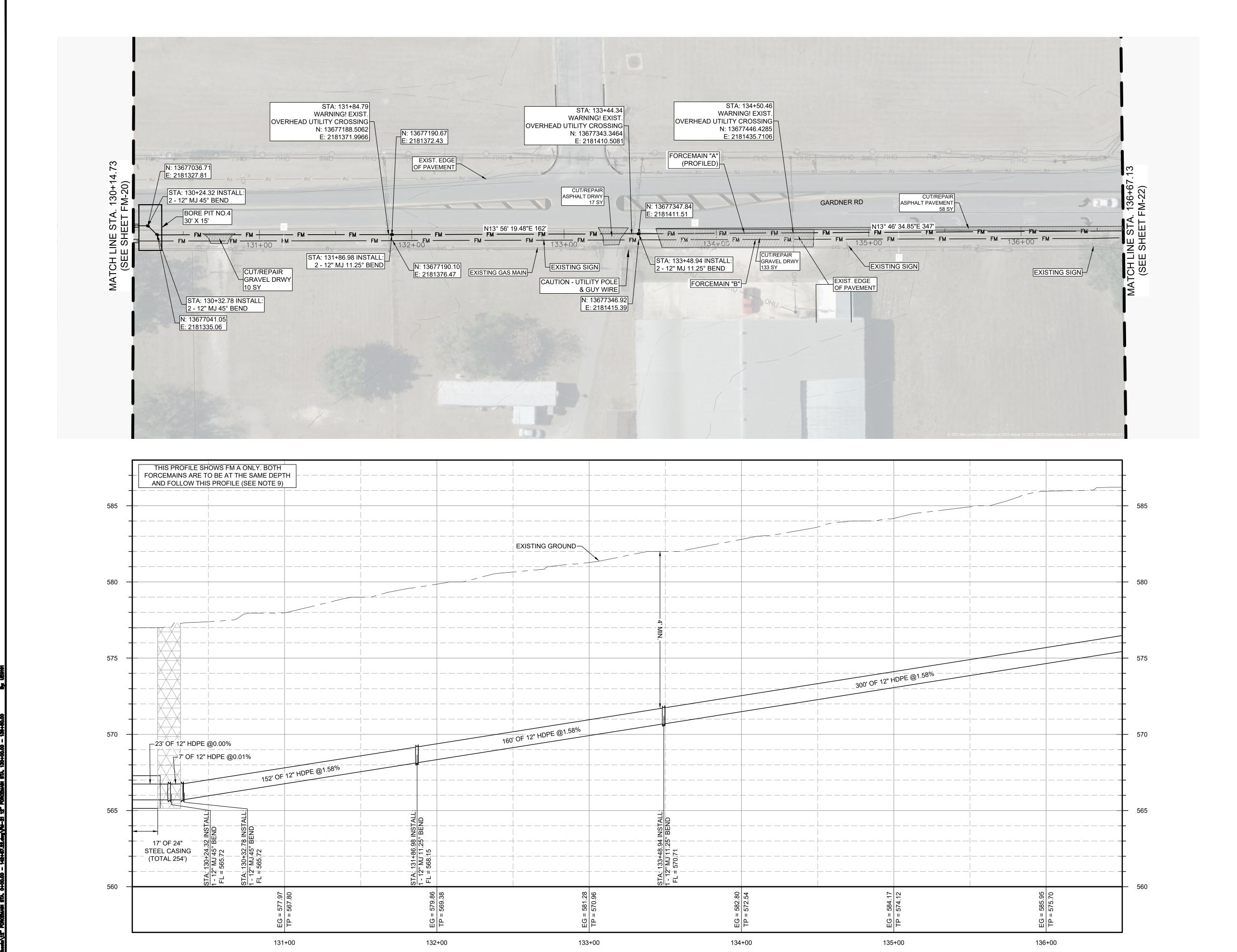




AS SHOWN 08/24 DM DK

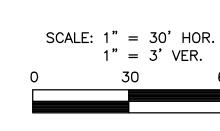
PROJECT MANSES
8002-032 DRAWN MASS
12" FORCEMAIN STA. 0+00.00 142+87.22

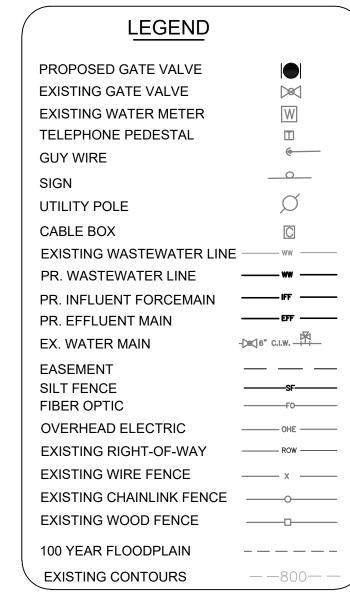
12" FORCEMAIN STA. 123+50.00 - 130+00.00



PROP. FM "A" PROFILE VIEW





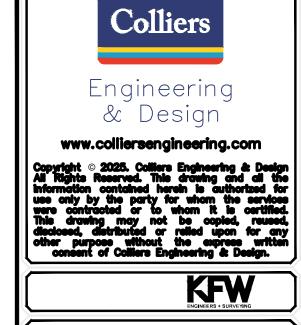


NOTES:

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR

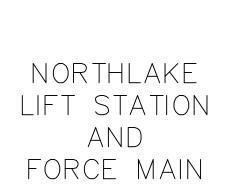
APPROVAL PRIOR TO CONSTRUCTION.

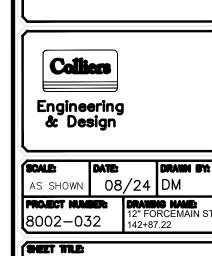
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



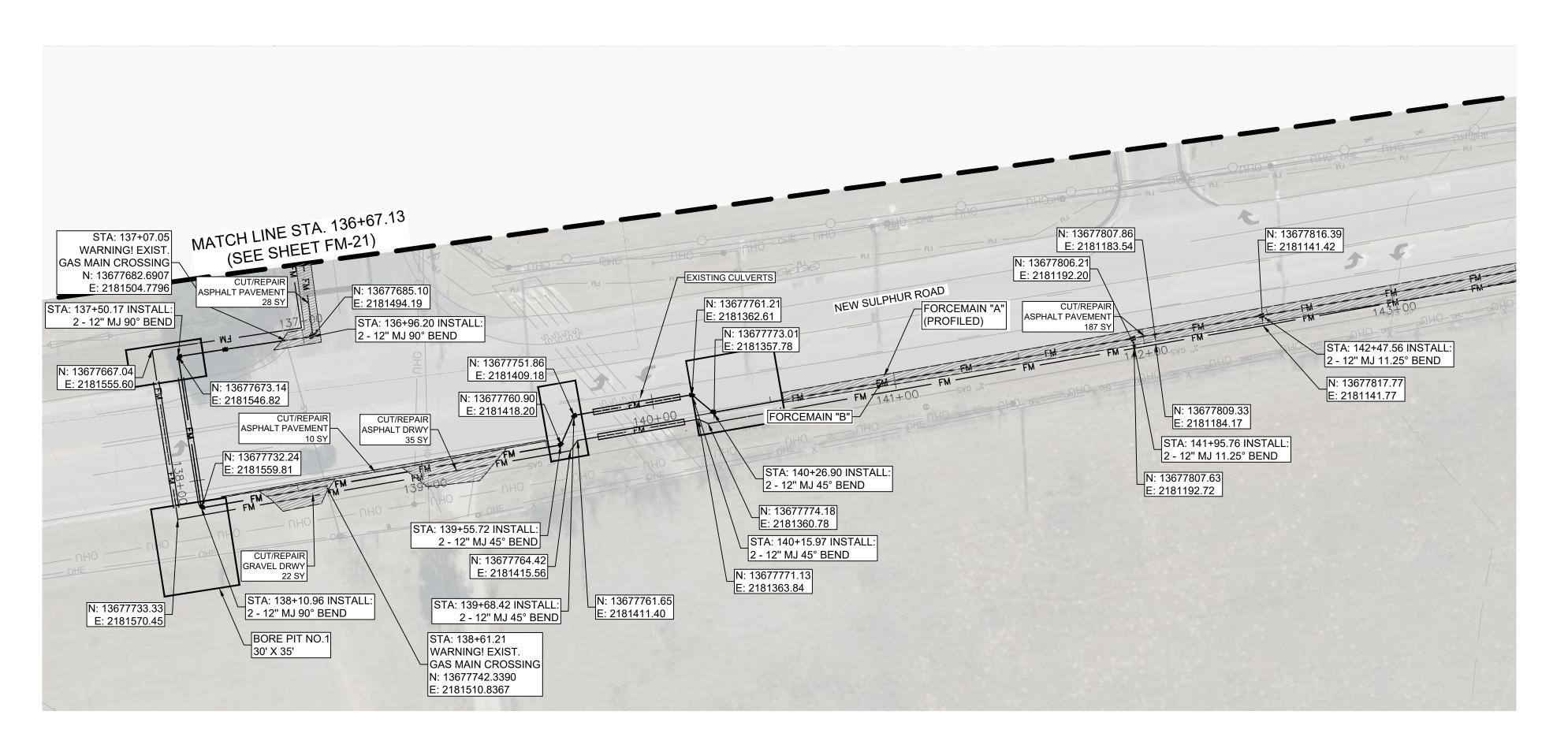
PROTECT YOURSELF

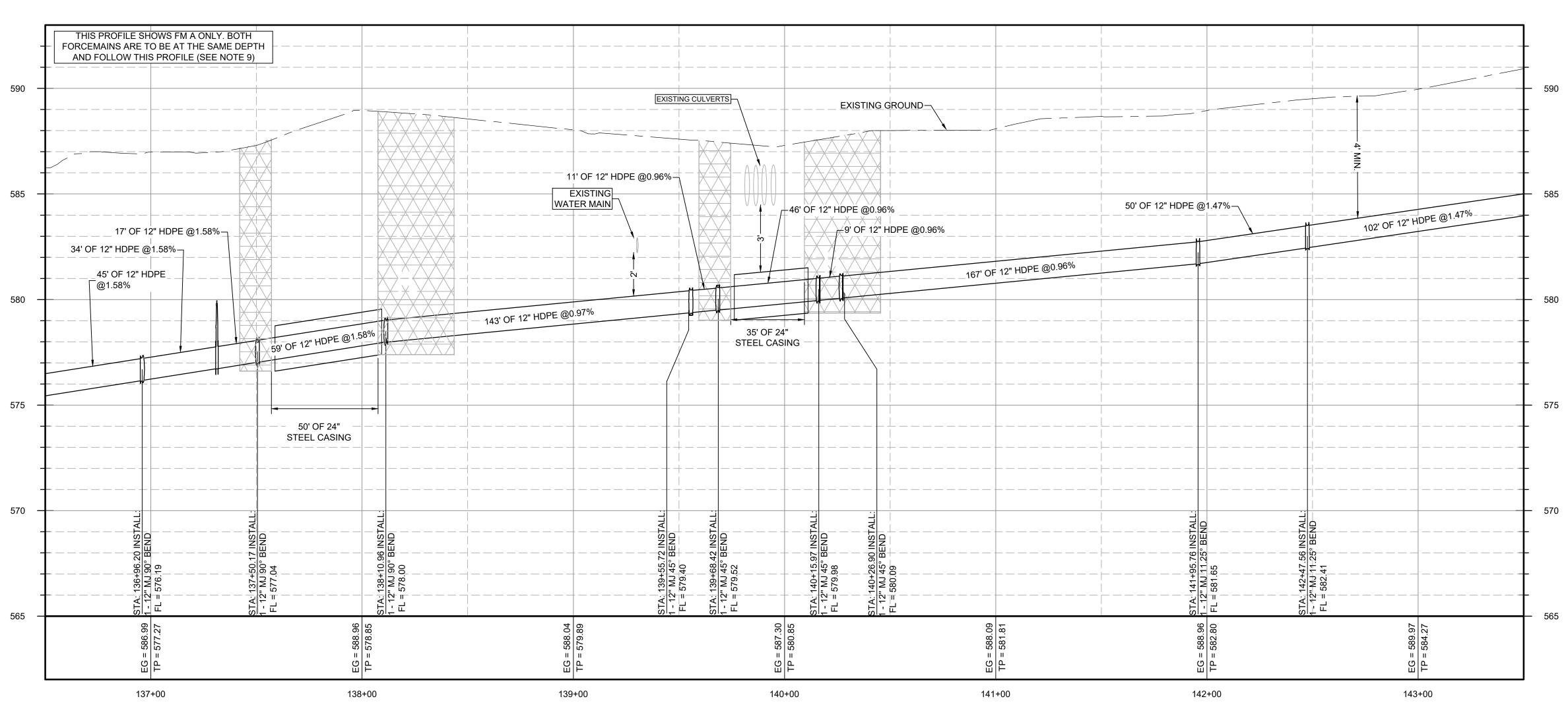
_	1101	ABE!	(S V	SPER	W	W.C	ALLE	311.0	OM	
REV DATE DRAWN BY DESCRIPTION										
m z										
DRAW										
DATE DRAW	·	,	·					٠		



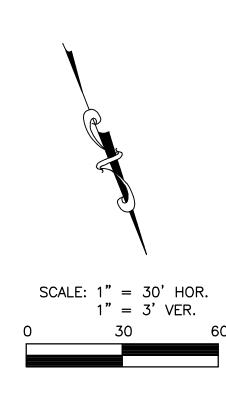


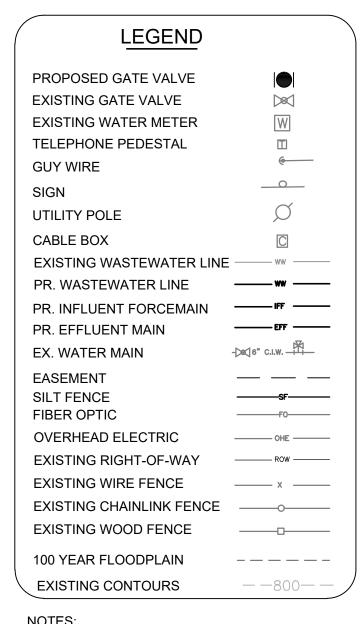
12" FORCEMAIN STA. 130+00.00 - 136+50.00





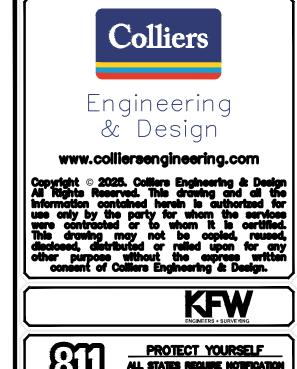
PROP. FM "A" PROFILE VIEW





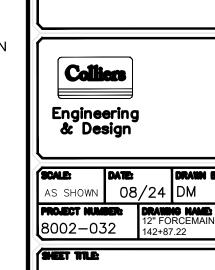
120.

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.

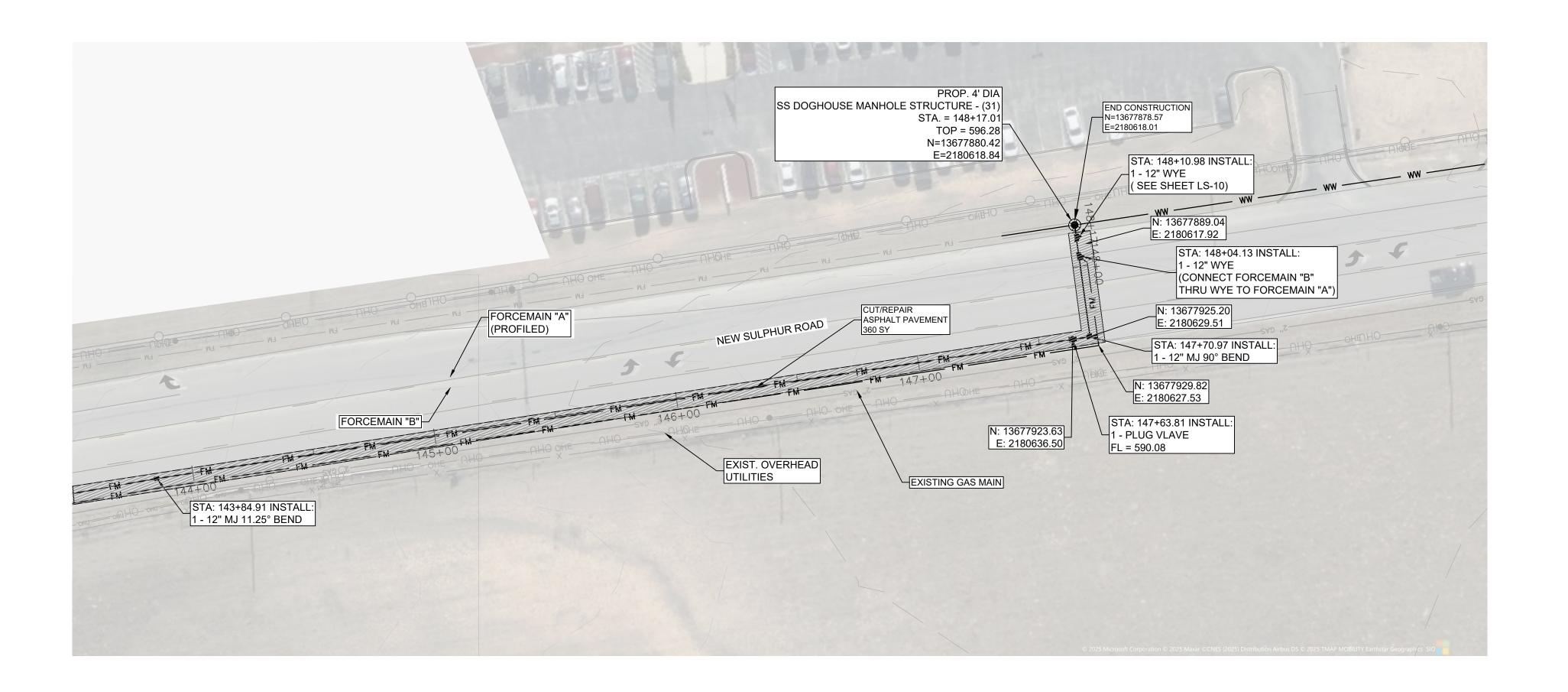


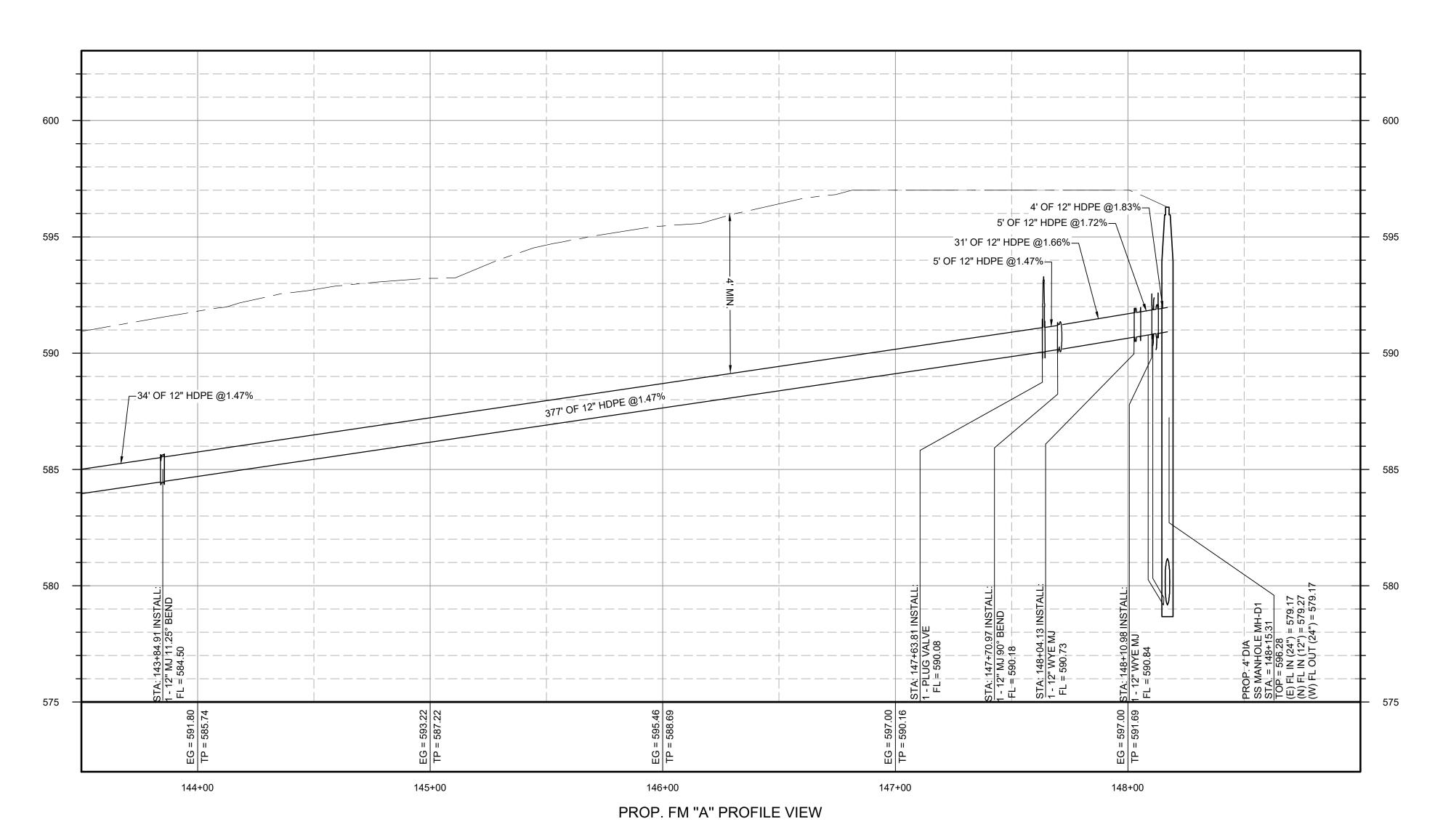
	FOR NUI	ST/ ABER	NTE S V	SPE(ISIT:	CIFIC	W.C	ALL8	PH(ONE	_/
DATE DRAWN BY DESCRIPTION										
DRAWN BY										
DATE										
REV										

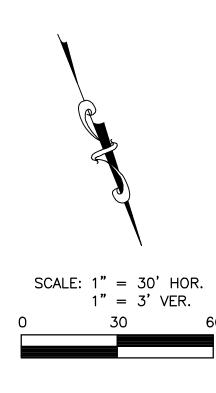
NORTHLAKE LIFT STATION AND FORCE MAIN

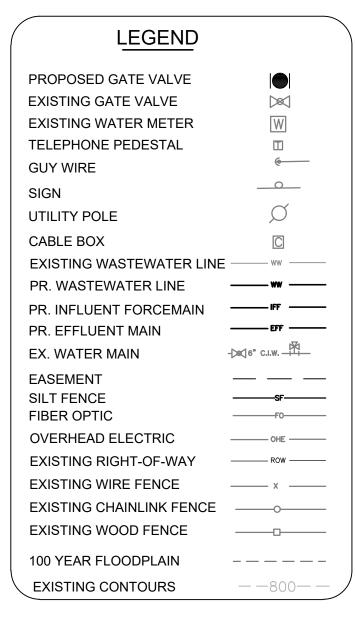


12" FORCEMAIN STA. 136+50.00 - 142+87.22



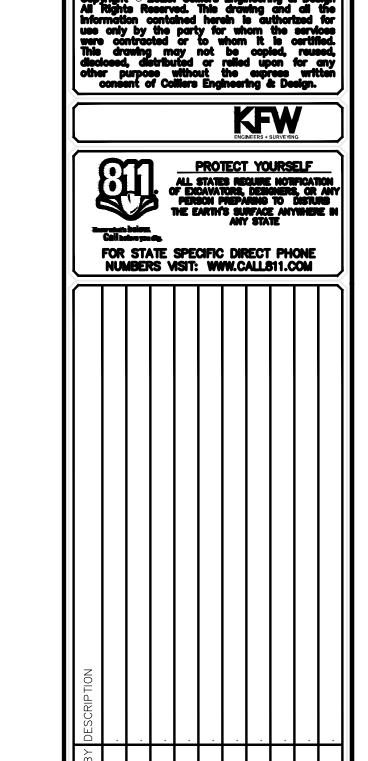






NOTE

- OPEN CUT AND REPAIR ASPHALT & GRAVEL DRIVES PER DETAILS, MATCH EXISTING MATERIAL.
- 2. CONTRACTOR TO JOINT RESTRAIN ALL FORCEMAIN LINES, VALVES & FITTINGS. REFERENCE NOTES ON MECHANICAL RESTRAINTS & THRUST BLOCKING DETAIL. CONTRACTOR TO SUBMIT PROPOSED RESTRAINT LENGTHS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
- 3. CONTRACTOR TO FIELD VERIFY DEPTH, LOCATION, MATERIAL TYPE, AND SIZE OF ALL EXISTING UTILITIES IN THE PROJECT AREA.
- 4. CONTRACTOR SHALL BE RESPONSIBLE FOR JOB SITE SECURITY AND CONTROL AND PROTECTION OF LIVESTOCK. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY FENCING AND GATES AS NECESSARY. INCLUDING ALL FENCING REPAIR AND MAINTAINING LIVESTOCK WITHIN PROPERTY LIMITS.
- 5. ALL CONSTRUCTION ACTIVITIES TO REMAIN WITHIN THE PERMANENT & TEMPORARY EASEMENT AND EXISTING RIGHT-OF-WAY.
- 6. ALL WEATHER ACCESS MUST BE MAINTAINED FOR RESIDENTIAL DRIVEWAYS DURING CONSTRUCTION.
- 7. PERMANENT EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS, INCLUDING OFF SITE DISPOSAL OF ALL DEBRIS. (REMOVAL ALL TREES, SHRUBS, ETC.)
- 8. CONTRACTOR IS RESPONSIBLE FOR THE RESTORATION OF ALL DAMAGES AND DISTURBED AREAS INCLUDING BUT NOT LIMITED TO SURFACE AND SUBSURFACE FEATURES, TOPSOIL, REVEGETATION, AND EROSION CONTROLS.
- 9. THERE ARE TWO PARALLEL FORCEMAINS (FM A & FM B) FOLLOWING THE ALIGNMENT AS SHOWN IN THE PLAN VIEW. PROFILE VIEW IS ONLY FORCEMAIN A FOR CLARITY BUT ALL PIPES, FITTINGS, VALVES, AND APPURTENANCES SHOWN IN THE PROFILE VIEW ARE ONLY REPRESENTING FM A. USE PLAN VIEW AND QUANTITY TABLES FOR OFFICIAL MATERIAL QUANTITIES.



& Design

www.colliersengineering.com

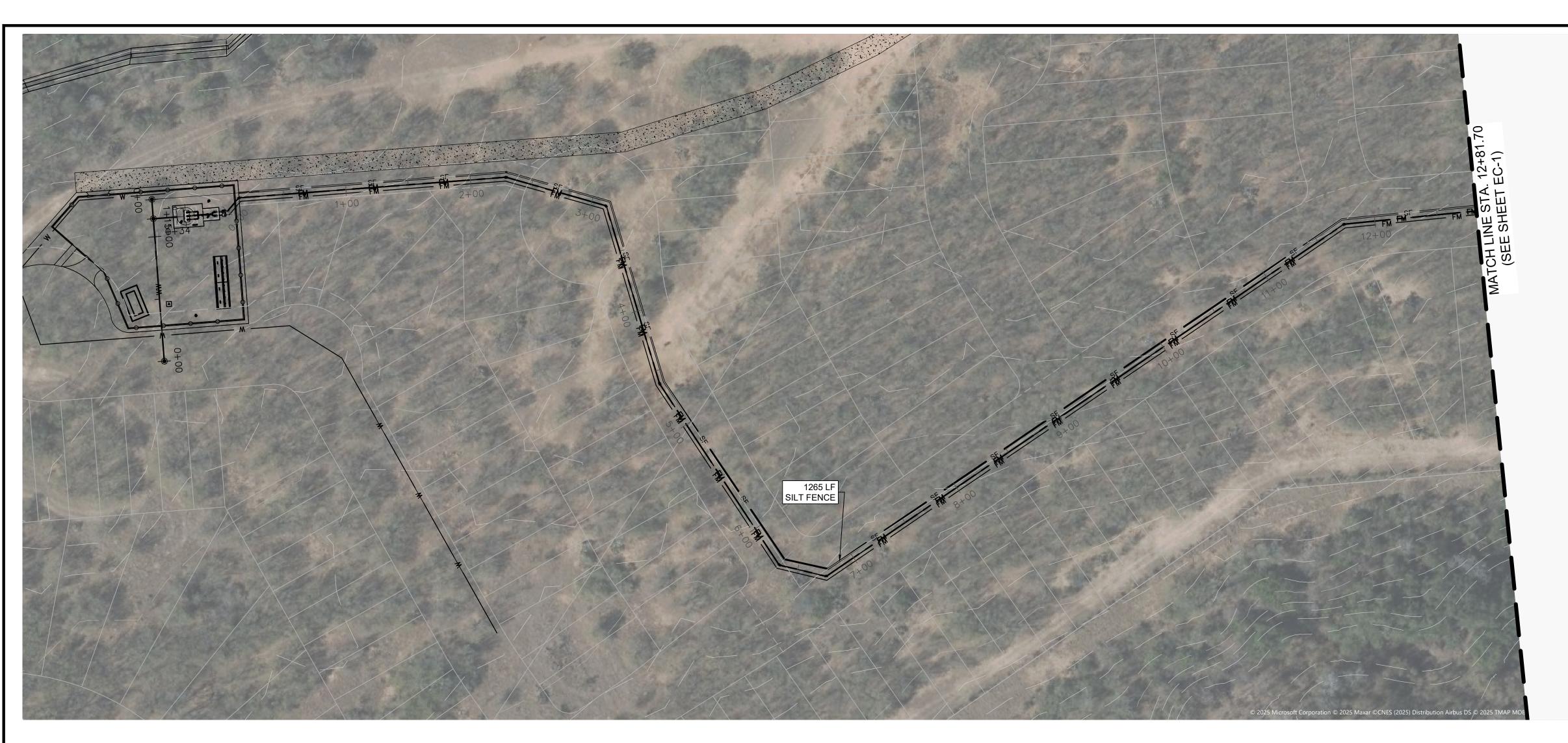


NORTHLAKE LIFT STATION AND FORCE MAIN

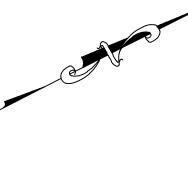
AS SHOWN 08/24 DM DK	Colline & Des	ering	ļ		
PROJECT NUMBER: DRAWNS NAME: 12" FORCEMAIN STA. 0+00.00 -			/24		DK
	PROJECT NUM	ER:	DRAW 12" FO	S NAME: RCEMAIN STA	

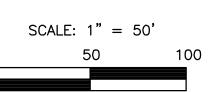
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

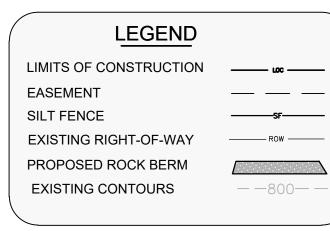
12" FORCEMAIN STA. 144+50.00 - 148+15.00



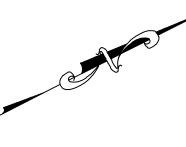


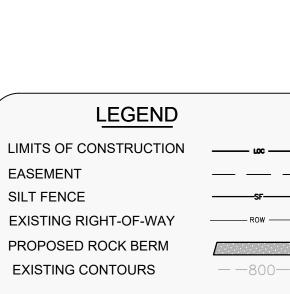


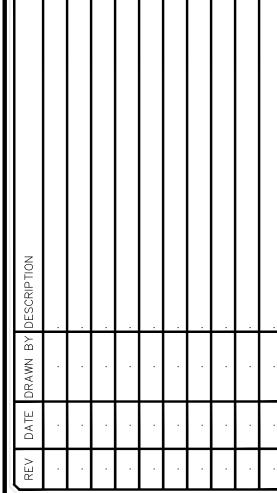




- 1. PERMANENT AND TEMPORARY EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS. (REMOVAL ALL TREES SHRUBS, ETC.).
- 2. SPOILS ARE TO BE PLACED BACK IN TRENCH EVERY NIGHT, EXCEPT FOR TRENCHED AREAS IN PAVEMENT WHERE TEMPORARY STEEL PLATTING IS TO BE USED.
- 3. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
- 4. LIMITS OF TEMPORARY STAGING, STORAGE AND SPOIL AREAS SHALL BE LOCATED WITHIN THE LIMITS OF CONSTRUCTION. THE LOCATION OF THESE SITES SHALL BE MOVED PERIODICALLY IN ORDER TO FOLLOW THE CONSTRUCTION ROUTE.TRAFFIC CONTROL, FENCING AND EROSION/ SEDIMENTATION CONTROL MEASURES SHALL BE PLACED AT EACH SITE.
- 5. SILT FENCE AND ROCK BERMS SHALL BE SITUATED SO THAT ENDS ARE ARCHED AND POINTED UPSTREAM.
- 6. SILT FENCE AND MULCHING SOCK SHOWN AS CONTINUOUS, CONTRACTOR TO ALLOW FOR DRIVEWAY, WALKWAY, ETC., WHERE NECESSARY.
- CONTRACTOR SHALL PROVIDE SOIL RETENTION MATTING AT ALL DISTURBED AREAS WITH SLOPE 3:1 OR GREATER AND AT ALL IMPACTED DRAINAGE DITCHES. CONTRACTOR MAY PROVIDE SOIL RETENTION MATTING AT OTHER AREAS TO EXPEDITE RESTORATION EFFORTS
- 8. ANY AREA OUTSIDE THE LIMITS OF CONSTRUCTION OR ACCESS SHOWN ON THE PLANS THAT IS DISTURBED BY THE CONSTRUCTION OR HIS SUBCONTRACTOR SHALL BE IMMEDIATELY RESTORED. ANY ADDITIONAL RESTORATION OR MAINTENANCE SHALL BE AT NO EXPENSE TO THE OWNER.
- 9. CONTRACTOR TO COORDINATE WITH ENGINEER PRIOR TO REMOVING ANY SIZE TREE NOT SHOWN TO BE REMOVED ON THE PLANS.
- 10. IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TRAP, OR REVEGETATION MATTING.
- 11. CONTRACTOR SHALL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
- 12. TREE SURVEY WAS PERFORMED BY RICKMAN LAND SURVEYING.
- 13. LIMITS OF CONSTRUCTION TO BE LOCATED ALONG THE TEMPORARY AND PERMANENT EASEMENT LINES. LIMITS OF CONSTRUCTION SHOWN OFF-SET FOR CLARITY.







www.colliersengineering.com

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM



NORTHLAKE LIFT STATION

Engineering & Design UTILITY ENGINEERING GROUP PLLC Trius Engineering Prim 7-28712 Trius Engineering Prim 7-28712
--

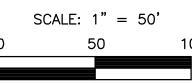
8002-032 STA. 0+00.00 - 143+09.61

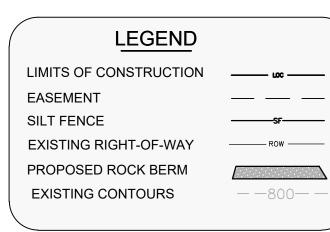
EROSION CONTROL SHEET 1 OF 6





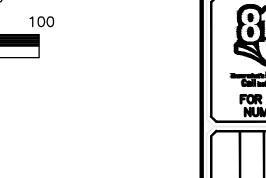






- 1. PERMANENT AND TEMPORARY EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS. (REMOVAL ALL TREES, SHRUBS, ETC.).
- 2. SPOILS ARE TO BE PLACED BACK IN TRENCH EVERY NIGHT, EXCEPT FOR TRENCHED AREAS IN PAVEMENT WHERE TEMPORARY STEEL PLATTING IS TO BE USED.
- CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
- LIMITS OF TEMPORARY STAGING, STORAGE AND SPOIL AREAS SHALL BE LOCATED WITHIN THE LIMITS OF CONSTRUCTION. THE LOCATION OF THESE SITES SHALL BE MOVED PERIODICALLY IN ORDER TO FOLLOW THE CONSTRUCTION ROUTE.TRAFFIC CONTROL, FENCING AND EROSION/ SEDIMENTATION CONTROL MEASURES SHALL BE PLACED AT EACH SITE.
- 5. SILT FENCE AND ROCK BERMS SHALL BE SITUATED SO THAT ENDS ARE ARCHED AND POINTED UPSTREAM.
- 6. SILT FENCE AND MULCHING SOCK SHOWN AS CONTINUOUS, CONTRACTOR TO ALLOW FOR DRIVEWAY, WALKWAY, ETC., WHERE NECESSARY.
- 7. CONTRACTOR SHALL PROVIDE SOIL RETENTION MATTING AT ALL DISTURBED AREAS WITH SLOPE 3:1 OR GREATER AND AT ALL IMPACTED DRAINAGE DITCHES. CONTRACTOR MAY PROVIDE SOIL RETENTION MATTING AT OTHER AREAS TO EXPEDITE RESTORATION EFFORTS
- 8. ANY AREA OUTSIDE THE LIMITS OF CONSTRUCTION OR ACCESS SHOWN ON THE PLANS THAT IS DISTURBED BY THE CONSTRUCTION OR HIS SUBCONTRACTOR SHALL BE IMMEDIATELY RESTORED. ANY ADDITIONAL RESTORATION OR MAINTENANCE SHALL BE AT NO EXPENSE TO THE OWNER.
- 9. CONTRACTOR TO COORDINATE WITH ENGINEER PRIOR TO REMOVING ANY SIZE TREE NOT SHOWN TO BE REMOVED ON THE PLANS.
- 10. IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TRAP, OR REVEGETATION MATTING.
- 11. CONTRACTOR SHALL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
- 12. TREE SURVEY WAS PERFORMED BY RICKMAN LAND SURVEYING.
- 13. LIMITS OF CONSTRUCTION TO BE LOCATED ALONG THE TEMPORARY AND PERMANENT EASEMENT LINES. LIMITS OF CONSTRUCTION SHOWN OFF-SET FOR CLARITY.





DATE DRAWN BY DESCRIPTION									
DRAWN BY									
DATE	·		٠	٠	٠	·	·	·	
REV									

www.colliersengineering.com



NORTHLAKE LIFT STATION AND FORCE MAIN

Collices Engineering	UTILITY ENGINEE GROUP PL
& Design	Texas Engineering Firm F-18712

ENGINEERING
GROUP PLLC

100 AN PEN BRAUNFES, TEXAS 78 133 PM (500) 214-46311

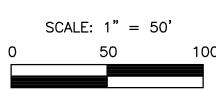
DATE: DRAWN BY: CHECKED BY: 08/24 TJC DK 8002-032 STA. 0+00.00 - 143+09.61

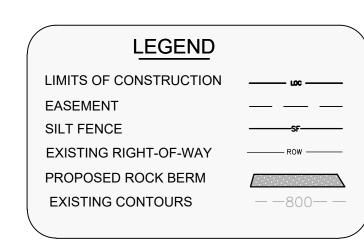
> **EROSION CONTROL** SHEET 2 OF 6





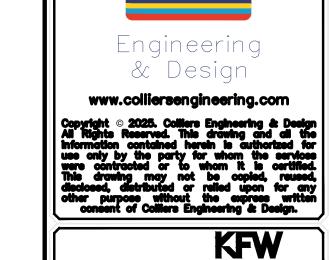






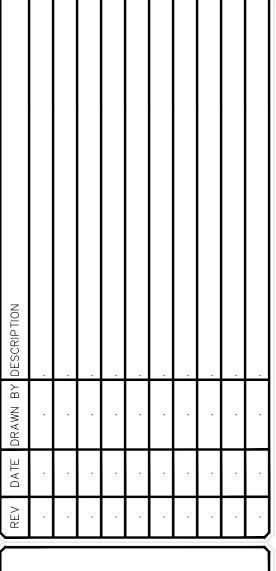
NOTES

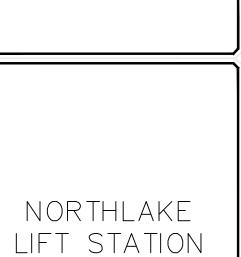
- 1. PERMANENT AND TEMPORARY EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS. (REMOVAL ALL TREES, SHRUBS, ETC.).
- 2. SPOILS ARE TO BE PLACED BACK IN TRENCH EVERY NIGHT, EXCEPT FOR TRENCHED AREAS IN PAVEMENT WHERE TEMPORARY STEEL PLATTING IS TO BE USED.
- 3. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
- 4. LIMITS OF TEMPORARY STAGING, STORAGE AND SPOIL AREAS SHALL BE LOCATED WITHIN THE LIMITS OF CONSTRUCTION. THE LOCATION OF THESE SITES SHALL BE MOVED PERIODICALLY IN ORDER TO FOLLOW THE CONSTRUCTION ROUTE.TRAFFIC CONTROL, FENCING AND EROSION/ SEDIMENTATION CONTROL MEASURES SHALL BE PLACED AT EACH SITE.
- 5. SILT FENCE AND ROCK BERMS SHALL BE SITUATED SO THAT ENDS ARE ARCHED AND POINTED UPSTREAM.
- 6. SILT FENCE AND MULCHING SOCK SHOWN AS CONTINUOUS, CONTRACTOR TO ALLOW FOR DRIVEWAY, WALKWAY, ETC., WHERE NECESSARY.
- 7. CONTRACTOR SHALL PROVIDE SOIL RETENTION
 MATTING AT ALL DISTURBED AREAS WITH SLOPE 3:1 OR
 GREATER AND AT ALL IMPACTED DRAINAGE DITCHES.
 CONTRACTOR MAY PROVIDE SOIL RETENTION MATTING
 AT OTHER AREAS TO EXPEDITE RESTORATION EFFORTS
- 8. ANY AREA OUTSIDE THE LIMITS OF CONSTRUCTION OR ACCESS SHOWN ON THE PLANS THAT IS DISTURBED BY THE CONSTRUCTION OR HIS SUBCONTRACTOR SHALL BE IMMEDIATELY RESTORED. ANY ADDITIONAL RESTORATION OR MAINTENANCE SHALL BE AT NO EXPENSE TO THE OWNER.
- 9. CONTRACTOR TO COORDINATE WITH ENGINEER PRIOR TO REMOVING ANY SIZE TREE NOT SHOWN TO BE REMOVED ON THE PLANS.
- 10. IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TRAP, OR REVEGETATION MATTING.
- 11. CONTRACTOR SHALL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
- 12. TREE SURVEY WAS PERFORMED BY RICKMAN LAND SURVEYING.
- 13. LIMITS OF CONSTRUCTION TO BE LOCATED ALONG THE TEMPORARY AND PERMANENT EASEMENT LINES. LIMITS OF CONSTRUCTION SHOWN OFF-SET FOR CLARITY.





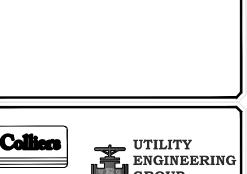
PROTECT YOURSELF





AND

FORCE MAIN

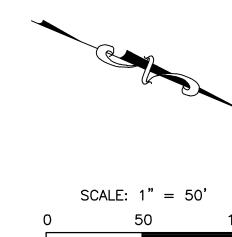


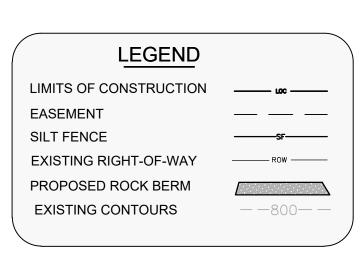
Engineering & Design UTILITY ENGINEERING GROUP PLLC Trook Engineering From F-26F122 UTILITY ENGINEERING					
SCALE	DATE:		DRAWN BY:	CHECKED BY:	
AS SHOWN	08	/24	TJC	DK	
PROJECT NUM 8002-03			IG NAME: +00.00 - 143+0	9.61	

EROSION CONTROL SHEET 3 OF 6



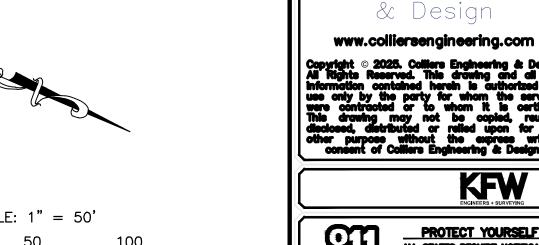


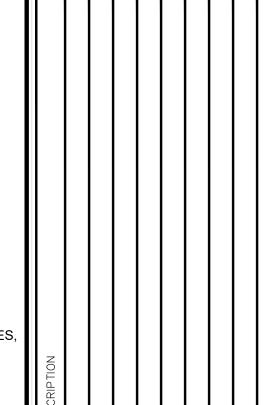




NOTES

- PERMANENT AND TEMPORARY EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS. (REMOVAL ALL TREES SHRUBS, ETC.).
- 2. SPOILS ARE TO BE PLACED BACK IN TRENCH EVERY NIGHT, EXCEPT FOR TRENCHED AREAS IN PAVEMENT WHERE TEMPORARY STEEL PLATTING IS TO BE USED.
- CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES
 DURING SITE CONSTRUCTION SUCH AS IRRIGATION
 TRUCKS AND MULCHING OR AS DIRECTED BY THE
 ENVIRONMENTAL INSPECTOR.
- 4. LIMITS OF TEMPORARY STAGING, STORAGE AND SPOIL AREAS SHALL BE LOCATED WITHIN THE LIMITS OF CONSTRUCTION. THE LOCATION OF THESE SITES SHALL BE MOVED PERIODICALLY IN ORDER TO FOLLOW THE CONSTRUCTION ROUTE.TRAFFIC CONTROL, FENCING AND EROSION/ SEDIMENTATION CONTROL MEASURES SHALL BE PLACED AT EACH SITE.
- 5. SILT FENCE AND ROCK BERMS SHALL BE SITUATED SO THAT ENDS ARE ARCHED AND POINTED UPSTREAM.
- 6. SILT FENCE AND MULCHING SOCK SHOWN AS CONTINUOUS, CONTRACTOR TO ALLOW FOR DRIVEWAY, WALKWAY, ETC., WHERE NECESSARY.
- 7. CONTRACTOR SHALL PROVIDE SOIL RETENTION
 MATTING AT ALL DISTURBED AREAS WITH SLOPE 3:1 OR
 GREATER AND AT ALL IMPACTED DRAINAGE DITCHES.
 CONTRACTOR MAY PROVIDE SOIL RETENTION MATTING
 AT OTHER AREAS TO EXPEDITE RESTORATION EFFORTS.
- 8. ANY AREA OUTSIDE THE LIMITS OF CONSTRUCTION OR ACCESS SHOWN ON THE PLANS THAT IS DISTURBED BY THE CONSTRUCTION OR HIS SUBCONTRACTOR SHALL BE IMMEDIATELY RESTORED. ANY ADDITIONAL RESTORATION OR MAINTENANCE SHALL BE AT NO EXPENSE TO THE OWNER.
- 9. CONTRACTOR TO COORDINATE WITH ENGINEER PRIOR TO REMOVING ANY SIZE TREE NOT SHOWN TO BE REMOVED ON THE PLANS.
- 10. IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TRAP, OR REVEGETATION MATTING.
- 11. CONTRACTOR SHALL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
- 12. TREE SURVEY WAS PERFORMED BY RICKMAN LAND SURVEYING.
- 13. LIMITS OF CONSTRUCTION TO BE LOCATED ALONG THE TEMPORARY AND PERMANENT EASEMENT LINES. LIMITS OF CONSTRUCTION SHOWN OFF-SET FOR CLARITY.





FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

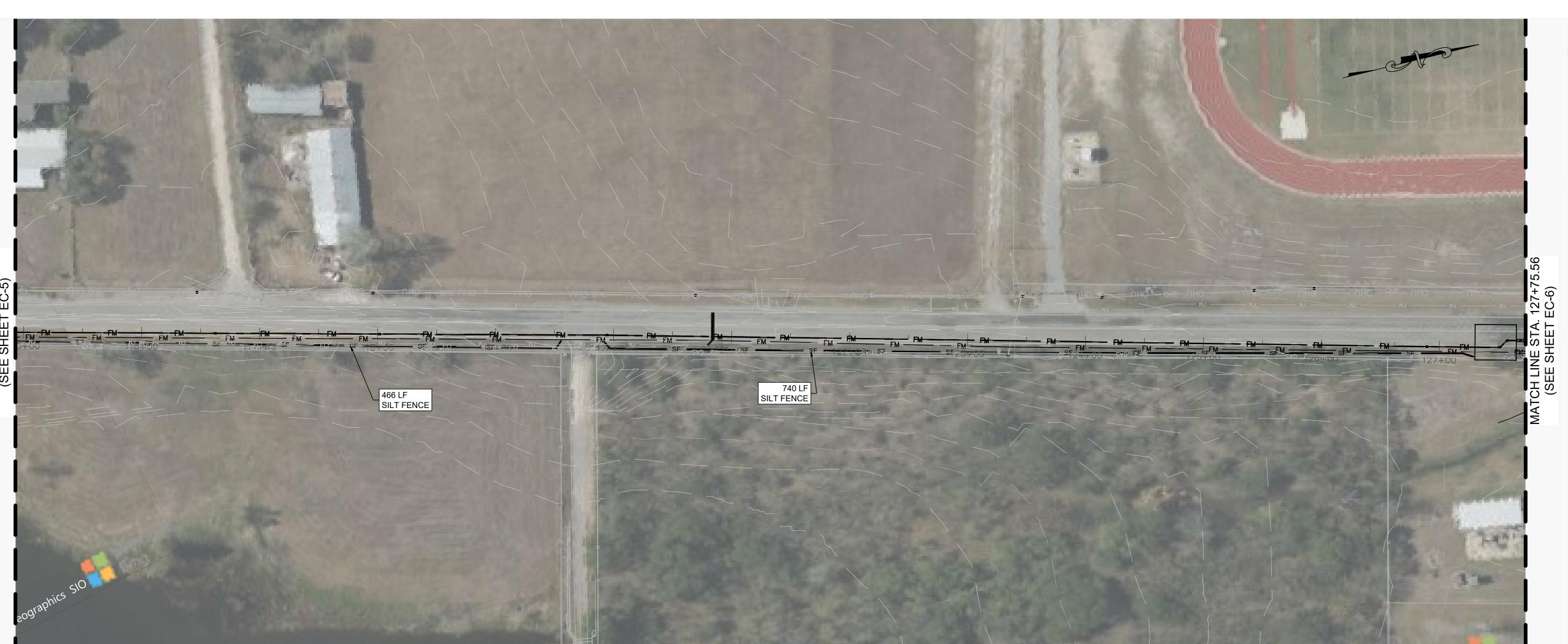


NORTHLAKE LIFT STATION AND FORCE MAIN

Collination of the Collination o				NEERING JP PLLC
SCALE: AS SHOWN	DATE	/24	DRAWN BY: TJC	DK
PROJECT NUM	ER:	DRAW	10 NAME: +00.00 - 143+0	<u> </u>

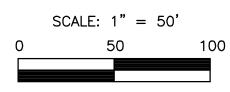
EROSION CONTROL SHEET 4 OF 6

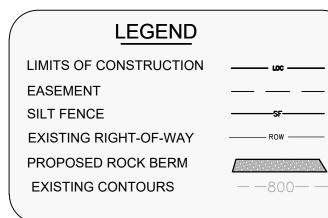




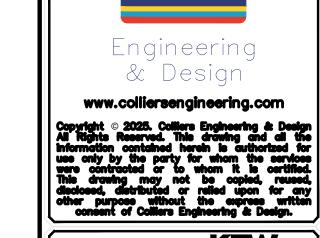
© 2025 Microsoft Corporation © 2025 Maxar ©CNES (2025) Distribution Airbus DS © 2025 TMAP MOBILITY Earthstar Geographics SIO



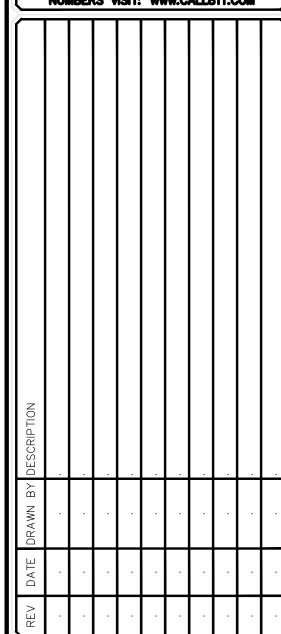




- 1. PERMANENT AND TEMPORARY EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS. (REMOVAL ALL TREES SHRUBS, ETC.).
- 2. SPOILS ARE TO BE PLACED BACK IN TRENCH EVERY NIGHT, EXCEPT FOR TRENCHED AREAS IN PAVEMENT WHERE TEMPORARY STEEL PLATTING IS TO BE USED.
- 3. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
- 4. LIMITS OF TEMPORARY STAGING, STORAGE AND SPOIL AREAS SHALL BE LOCATED WITHIN THE LIMITS OF CONSTRUCTION. THE LOCATION OF THESE SITES SHALL BE MOVED PERIODICALLY IN ORDER TO FOLLOW THE CONSTRUCTION ROUTE.TRAFFIC CONTROL, FENCING AND EROSION/ SEDIMENTATION CONTROL MEASURES SHALL BE PLACED AT EACH SITE.
- 5. SILT FENCE AND ROCK BERMS SHALL BE SITUATED SO THAT ENDS ARE ARCHED AND POINTED UPSTREAM.
- 6. SILT FENCE AND MULCHING SOCK SHOWN AS CONTINUOUS, CONTRACTOR TO ALLOW FOR DRIVEWAY, WALKWAY, ETC., WHERE NECESSARY.
- 7. CONTRACTOR SHALL PROVIDE SOIL RETENTION MATTING AT ALL DISTURBED AREAS WITH SLOPE 3:1 OR GREATER AND AT ALL IMPACTED DRAINAGE DITCHES. CONTRACTOR MAY PROVIDE SOIL RETENTION MATTING AT OTHER AREAS TO EXPEDITE RESTORATION EFFORTS
- 8. ANY AREA OUTSIDE THE LIMITS OF CONSTRUCTION OR ACCESS SHOWN ON THE PLANS THAT IS DISTURBED BY THE CONSTRUCTION OR HIS SUBCONTRACTOR SHALL BE IMMEDIATELY RESTORED. ANY ADDITIONAL RESTORATION OR MAINTENANCE SHALL BE AT NO EXPENSE TO THE OWNER.
- 9. CONTRACTOR TO COORDINATE WITH ENGINEER PRIOR TO REMOVING ANY SIZE TREE NOT SHOWN TO BE REMOVED ON THE PLANS.
- 10. IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TRAP, OR REVEGETATION MATTING.
- 11. CONTRACTOR SHALL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
- 12. TREE SURVEY WAS PERFORMED BY RICKMAN LAND SURVEYING.
- 13. LIMITS OF CONSTRUCTION TO BE LOCATED ALONG THE TEMPORARY AND PERMANENT EASEMENT LINES. LIMITS OF CONSTRUCTION SHOWN OFF-SET FOR CLARITY.









NORTHLAKE LIFT STATION AND FORCE MAIN

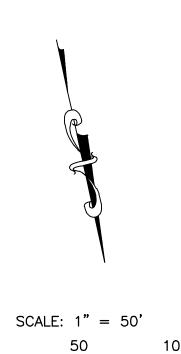
Collie Enginee & Desi	ring	191 N. Linion Ava SEAV Texas Engineering 8	GRO	NEERI UP pllc
		Issa		Levener

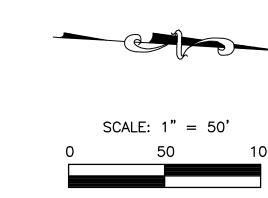
AS SHOWN 08/24 TJC 8002-032 STA. 0+00.00 - 143+09.61

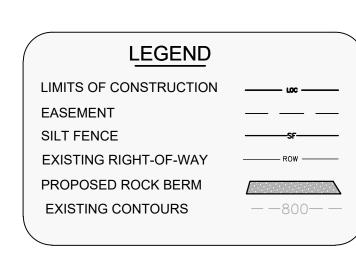
> **EROSION CONTROL** SHEET 5 OF 6











NOTES:

- PERMANENT AND TEMPORARY EASEMENTS SHALL BE CLEAR FROM ALL OBSTRUCTIONS. (REMOVAL ALL TREES, SHRUBS, ETC.).
- SPOILS ARE TO BE PLACED BACK IN TRENCH EVERY NIGHT, EXCEPT FOR TRENCHED AREAS IN PAVEMENT WHERE TEMPORARY STEEL PLATTING IS TO BE USED.
- 3. CONTRACTOR SHALL UTILIZE DUST CONTROL MEASURES DURING SITE CONSTRUCTION SUCH AS IRRIGATION TRUCKS AND MULCHING OR AS DIRECTED BY THE ENVIRONMENTAL INSPECTOR.
- 4. LIMITS OF TEMPORARY STAGING, STORAGE AND SPOIL AREAS SHALL BE LOCATED WITHIN THE LIMITS OF CONSTRUCTION. THE LOCATION OF THESE SITES SHALL BE MOVED PERIODICALLY IN ORDER TO FOLLOW THE CONSTRUCTION ROUTE.TRAFFIC CONTROL, FENCING AND EROSION/ SEDIMENTATION CONTROL MEASURES SHALL BE PLACED AT EACH SITE.
- 5. SILT FENCE AND ROCK BERMS SHALL BE SITUATED SO THAT ENDS ARE ARCHED AND POINTED UPSTREAM.
- SILT FENCE AND MULCHING SOCK SHOWN AS CONTINUOUS, CONTRACTOR TO ALLOW FOR DRIVEWAY, WALKWAY, ETC., WHERE NECESSARY.
- 7. CONTRACTOR SHALL PROVIDE SOIL RETENTION MATTING AT ALL DISTURBED AREAS WITH SLOPE 3:1 OR GREATER AND AT ALL IMPACTED DRAINAGE DITCHES. CONTRACTOR MAY PROVIDE SOIL RETENTION MATTING AT OTHER AREAS TO EXPEDITE RESTORATION EFFORTS
- 8. ANY AREA OUTSIDE THE LIMITS OF CONSTRUCTION OR ACCESS SHOWN ON THE PLANS THAT IS DISTURBED BY THE CONSTRUCTION OR HIS SUBCONTRACTOR SHALL BE IMMEDIATELY RESTORED. ANY ADDITIONAL RESTORATION OR MAINTENANCE SHALL BE AT NO EXPENSE TO THE OWNER.
- 9. CONTRACTOR TO COORDINATE WITH ENGINEER PRIOR TO REMOVING ANY SIZE TREE NOT SHOWN TO BE REMOVED ON THE PLANS.
- 10. IF DISTURBED AREA IS NOT TO BE WORKED ON FOR MORE THAN 14 DAYS, DISTURBED AREA NEEDS TO BE STABILIZED BY REVEGETATION, MULCH, TRAP, OR REVEGETATION MATTING.
- 11. CONTRACTOR SHALL CLEAN UP SPOILS THAT MIGRATE ONTO THE ROADS A MINIMUM OF ONCE DAILY.
- 12. TREE SURVEY WAS PERFORMED BY RICKMAN LAND SURVEYING.
- 13. LIMITS OF CONSTRUCTION TO BE LOCATED ALONG THE TEMPORARY AND PERMANENT EASEMENT LINES. LIMITS OF CONSTRUCTION SHOWN OFF-SET FOR CLARITY.



Colliers



<u>≻</u>	
DRAW	
DATE DRAWN BY DESCRIPTION	<u> </u>
SE	



NORTHLAKE LIFT STATION AND FORCE MAIN

Colliers	UTILITY ENGINEE
Engineering & Design	GROUP P. 1911. Los An SE P. BRAUFES, TAX 7910 PH (S00 21445) Texas Engineering Prim F-187122

AS SHOWN 08/24 TJC DK

FROSCT NAMES: STA. 0+00.00 - 143+09.61

SHEET 6 OF 6

EROSION CONTROL

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

PLAN LEGEND					
	EQUIPMENT CONNECTION				
J	JUNCTION OR CONNECTION BOX				
LC	STARTER OR LIGHTING CONTACTOR				
	DISCONNECT SWITCH				
MH	MANHOLE				
НН	HANDHOLE				
(#)	KEYED NOTE. NUMBER MATCHES NOTE NUMBER				
\$	TOGGLE SWITCH, WALL MOUNTED, SINGLE POLE SINGLE THROW. MOUNTED 54 IN. AFF. UNLESS OTHERWISE NOTED.				
\$4	TOGGLE SWITCH, WALL MOUNTED, FOUR WAY. MOUNTED 54 IN. AFF. UNLESS OTHERWISE NOTED.				
\$ _M	SWITCH MOTOR RATED WITH TERMINAL OVERLOADS				
os	OCCUPANCY SENSOR				
	TERMINAL BOARD				
$\overline{\mathbf{Y}}$	TELEPHONE OUTLET, PRIVATE. MOUNTED 12 IN. AFF.				
∇	DATA OUTLET, SURFACED MOUNTED				
#	MOTOR LOAD, NUMBER INDICATES HORSEPOWER				
	POLE				
	TRANSFORMER , DRY TYPE, KVA RATING MAY BE DISPLAYED NEXT TO SYMBOL				
Y	ANTENNA				
###	HOMERUN, LETTERS INDICATE PANELBOARD, NUMBERS INDICATE CIRCUIT NUMBER IN PANELBOARD				
	CONDUIT CAPPED FOR FUTURE USE				
	CONDUIT GOING DOWN				
	CONDUIT GOING UP				
	CONDUIT ABOVE GROUND				
	CONDUIT RUN UNDERGROUND OR CONCEALED CONDUIT RUN BELOW CONCRETE				
-++++++-	LIQUID TIGHT FLEXIBLE CONDUIT				
	SURFACE MOUNT				
=	120V RECEPTACLE FLUSH MOUNTED				
HQ=	120V RECEPTACLE SURFACE MOUNTED				
#	120V QUAD RECEPTACLE FLUSH MOUNTED				
<u>+</u> #=	120V QUAD RECEPTACLE SURFACE MOUNTED 208V RECEPTACLE FLUSH MOUNTED				
	208V RECEPTACLE PLOSH MOUNTED				
	WELDING OUTLET				
Ū	THERMOSTAT				
	PANELBOARD FLUSH MOUNTED				
<u> </u>	PANELBOARD SURFACE MOUNTED				
- Z -	NORTH ARROW				
TS	TORQUE SWITCH				
SV	SOLENOID SWITCH				
LS	LIMIT SWITCH				
AS	AMMETER SWITCH				
VS	VOLTMETER SWITCH				
PS	PRESSURE SWITCH				
LC	LIGHTING CONTACTOR				
PC	PHOTOCELL				

	GROUNDING LEGEND				
\odot	A=GROUNDING RECEPTACLE; B=GROUND TEST WELL				
	BARE COPPER GROUNDING CONDUCTOR				
	GROUNDING CONNECTION				
<u> </u>	COPPER CLAD GROUND ROD				
	MOISTURIZING PORT				

	ONE-LINE AND CONTRO	OL SCHEMATIC LE	EGEND
<u> </u>	GROUND CONNECTION	WYE	
	NORMALLY OPEN RELAY OR CONTACTOR CONTACTS		WYE TRANSFORMER CONNECTION
	NORMALLY CLOSED RELAY OR CONTACTOR CONTACTS	DELTA	DELTA TRANSFORMER CONNECTION
	CONDUCTOR CONNECTION	7	
TEXT	CIRCUIT BREAKER, MOLDED CASE, TRIP CURRENT AND QUANTITY OF POLES (P) SHOWN NEXT TO SYMBOL	₽ CT ###:#	CURRENT TRANSFORMER WITH RATIO SHOWN
J, TEXT	DISCONNECT SWITCH NON-FUSED, LOAD BREAK. CONTINUOUS CURRENT RATING, QUANTITY OF	AIT	ANALYTICAL TRANSMITTER
TEXT	POLES (P) SHOWN NEXT TO SYMBOL	FS	FLOW OR FLOAT SWITCH
ار الم	DISCONNECT SWITCHED FUSED, LOAD BREAK.	(I)	LEVEL TRANSMITTER
TEXT	CONTINUOUS CURRENT RATING, QUANTITY OF POLES (P), AND FUSE RATING SHOWN NEXT TO	PT	PRESSURE TRANSMITTER
	SYMBOL	SV	SOLENOID VALVE
TEXT	FUSE. RATING SHOWN NEXT TO SYMBOL	MOV	MOTOR OPERATED VALVE
\frac{1}{5}	MOTOR STARTER THERMAL OVERLOAD PROTECTOR	ETM	ELAPSED TIME METER
CR##	CONTACTOR OR RELAY COIL. LETTERS AND NUMBERS MATCH CONTACTS CONTROLLED	TD 0-10 MIN.	TIME DELAY RELAY. TIMES OUT AFTER ENERGIZATION. ADJUSTABLE TIME DELAY TIME INDICATED NEXT TO SYMBOL.
-0	LIMIT SWITCH NORMALLY CLOSED	TD 0-10 MIN.	TIME DELAY RELAY. TIMES OUT AFTER DE-ENERGIZATION. ADJUSTABLE TIME DELAY TIME
-0~0-	LIMIT SWITCH NORMALLY OPEN	TOD	INDICATED NEXT TO SYMBOL.
∳	MOTOR OPERATED VALVE GEARED LIMIT SWITCH	XXX###	CONDUIT TAG
~ <u>T</u> ~	PRESSURE SWITCH NORMALLY CLOSED OPEN ON INCREASING PRESSURE	1	PILOT LIGHT. R=RED, B=BLUE, G-GREEN, A=AMBER, Y=YELLOW
- -	PRESSURE SWITCH NORMALLY OPEN CLOSES ON INCREASING PRESSURE LEVEL SWITCH NORMALLY CLOSED OPEN ON	480V ————————————————————————————————————	CONTROL POWER TRANSFORMER. PRIMARY AND SECONDARY VOLTAGE INDICATED
-%-	INCREASING LEVEL LEVEL SWITCH NORMALLY OPEN CLOSES ON INCREASING LEVEL	PT	CPT = CONTROLS POWER/INSTRUMENT TRANSFORMER
	FLOW SWITCH NORMALLY CLOSED OPENS WITH FLOW FLOW SWITCH NORMALLY OPEN CLOSES ON PRESENCE OF FLOW	15 KVA $\stackrel{480V}{\bigcap}$ 120/240V	PT = POWER TRANSFORMER. VOLTAGE AND KVA RATING AS SHOWN
卓	SPACEHEATER	TV	TELEVISION CAMERA
		TQ	TORQUE SWITCH
ØF	PHASE FAILURE RELAY	A	AMMETER
STOP	MAINTAINED CONTACT START/STOP PUSHBUTTON	V	VOLTMETER
START \		⊸ ^{LA} ⊶	LIGHTING ARRESTOR
OFF HAND AUTO	MAINTAINED CONTACT HAND-OFF-AUTO SELECTOR SWITCH	CAP - (SURGE CAPACITOR
HAND		MCP	MOTOR STARTER FVNR = FULL VOLTAGE NON-REVERSING
-مله-	NORMALLY CLOSED MOMENTARY CONTACT PUSHBUTTON	SIZE 1	FVR = FULL VOLTAGE REVERSING MCP = MOTOR CIRCUIT PROTECTOR RVNR = REDUCED VOLTAGE NON-REVERSING
	NORMALLY OPEN MOMENTARY CONTACT PUSHBUTTON	<u> </u>	RVSS = REDUCED VOLTAGE SOFT START SIZE = NEMA STARTER SIZE

	LIGHTING FIXTURE LEGEND							
O "A"	LED STRIP LIGHT; LETTER IN OR BESIDE FIXTURE IDENTIFIES IN FIXTURE SCHEDULE			POLE MOUNTED LED LUMINAIRE. SEE SCHEDULE OR NOTES FOR FIXTURE TYPE. ORIENT FIXTURE FOR CUT-OFF TOWARDS AREA TO BE LIT. ORIENT				
O "A"	LED STRIP LIGHT WITH BATTERY BACKUP; LETTER IN OR BESIDE FIXTURE IDENTIFIES IN FIXTURE SCHEDULE		€ "D"	HOUSE SHIELD TOWARDS BUILDING. SEE DETAILS FOR POLE BASE. PROVIDE POLE CASE GROUND ROD.				
Ø	ED FIXTURE, SURFACE OR SUSPENDED, CEILING OUNTED		"E"	EMERGENCY LED LIGHT FIXTURE, SELF CONTAINED, BATTERY OPERATED				
<u>(?)</u>	LED FIXTURE, STANCHION MOUNTED		\"D"	PAR LAMP HOLDER. NUMBER OF TRIANGLES				
(?)	LED FIXTURE, WALL MOUNTED			INDICATE NUMBER OF FIXTURES.				
"X"	LED LIGHTED EXIT SIGN; LETTER IN OR BESIDE FIXTURE IDENTIFIES IN FIXTURE SCHEDULE		"D"	POLE MOUNTED FLOOR LIGHT. NUMBER OF TRIANGLES INDICATE NUMBER OF FIXTURES.				
•—— "D"	REMOTE EMERGENCY LIGHTS			ARROW DENOTES FLOODING AND DIRECTION POLE FOLDS DOWN.				

1/C	ONE CONDUCTOR	МСС	MOTOR CONTROL CENTER
3/C	THREE CONDUCTOR	MFR	MANUFACTURER
A	AMPERES OR TRIP AMPERES	MIN.	MINIMUM
AC A (C	ALTERNATING CURRENT	MPR	MOTOR PROTECTION RELAY
A/C	AIR CONDITIONING	MTD	MOUNTED
AFF	ABOVE FINISHED FLOOR	MTG	MOUNTING
AFG	ABOVE FINISHED GRADE	MRCT	MULTI-RATIO CURRENT TRANSFORME
AIC	SYMMETRICAL AMPERES INTERRUPTING CAPACITY	MV	MERCURY VAPOR
		N.C.	NORMALLY CLOSED
BLDG	BUILDING	NEC	NATIONAL ELECTRICAL CODE
BKR	BREAKER	NEMA	NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION
С	CONDUIT		WANT ACTORETTO ACCOUNTION
CAP	CAPACITOR	NEUT.	NEUTRAL
CKT	CIRCUIT	N.O.	NORMALLY OPEN
CONT'D	CONTINUED	N.T.S.	NOT TO SCALE
CPT	CONTROL POWER TRANSFORMER	OC	ON CENTER
СТ	CURRENT TRNASFORMER	ОН	OVERHEAD
CU	COPPER	Р	POLE
DBL	DOUBLE	PC	PHOTOCELL
DISC SW.	DISCONNECT SWITCH	PH	PHASE
DC	DIRECT CURRENT	PNL	PANEL
EMER.	EMERGENCY	PRI	PRIMARY
EMT	ELECTRICAL METALLIC TUBING	PVC	POLYVINYL CHLORIDE
ENCL.	ENCLOSURE	REQ'D	REQUIRED
EP	EXPLOSION PROOF	SCH	SCHEDULE
EQUIP.	EQUIPMENT	SEC	SECONDARY
FS	FLOAT SWITCH	S/N	SOLID NEUTRAL
G	GROUND WIRE	SPACE	SPACE(S) ONLY - NO BREAKER OR
GALV.	GALVANIZED		DEVICE
GEN	GENERATOR	SPARE	SPARE BREAKER OR DEVICE
GFI	GROUND FAULT INTERRUPTER CIRCUIT	SPECS	SPECIFICATIONS
GND	GROUND	S.D. BARE	SOFT DRAWN BARE
HDG	HOT DIPPED GALVANIZED	SS HDWE	STAINLESS STEEL HARDWARE
HPS	HIGH PRESSURE SODIUM	SWBD	SWITCHBOARD
HT	HEIGHT	SWGR	SWITCHGEAR
HZ	HERTZ	ТВ	TERMINAL BLOCK
INST.	INSTRUMENT	TYP.	TYPICAL
KV	KILOVOLTS	UL	UNDERWRITERS LABORATORIES
KVA	KILOVOLTS AMPERES	V	VOLTS
KWH	KILOWATT HOURS	VA	VOLT AMPERES
LA	LIGHTNING ARRESTOR	W	WATTS
LPR	LIGHTING PROTECTION RELAY	W/	WITH
<u></u> L-L	LINE TO LINE	W/O	WITHOUT
<u>– –</u> L-N	LINE TO NEUTRAL	WP	WEATHERPROOF
	<u> </u>	XFMR	TRANSFORMER

LEGEND & GENERAL NOTES:

1. BRANCH CIRCUIT NUMBERS MAY BE SHOWN NEXT TO SYMBOLS IN MULTIWIRE CIRCUITS.

- 2. SYMBOL SIZE DOES NOT IMPLY EQUIPMENT SIZE UNLESS OTHERWISE NOTED.
- 3. LOWER CASE LETTERS NEXT TO SYMBOLS INDICATE FIXTURE(S) CONTROLLED BY THE SWITCH DISPLAYING THE SAME LETTER.
- 4. THIS IS A STANDARD LEGEND LIST ALL SYMBOLS MAY NOT BE USED.
- 5. INSTALLATION SHALL BE PER LATEST VERSION OF NATIONAL ELECTRICAL CODE, SAWS, STANDARDS, AND ALL APPLICABLE LOCAL CODES. ORDINANCES. NOT ALL CODE AND STANDARD REQUIREMENTS MAY BE SHOWN ON PLANS. CONTRACTOR SHALL ADHERE TO CODES AND STANDARDS REGARDLESS OF BEING SHOWN ON PLANS OR SPECIFICATIONS IN DETAILED FASHION.

VIATIONS						C	ol
MCC	MOTOR CONTROL CENTER	1					
MFR	MANUFACTURER	1			Ε	ng	ine
MIN.	MINIMUM	1				&	
MPR	MOTOR PROTECTION RELAY	1		W	ww.	collie	rser
MTD	MOUNTED	1	27	-24	©		29
MTG	MOUNTING	1				3	
MRCT	MULTI-RATIO CURRENT TRANSFORMER	1		t.			
MV	MERCURY VAPOR	1				Pall	
N.C.	NORMALLY CLOSED	1					
NEC	NATIONAL ELECTRICAL CODE	1					
NEMA	NATIONAL ELECTRICAL	1		<u> </u>	רד	_	PI
1	MANUFACTURER'S ASSOCIATION			9	-	EX(ALL STA CAVAT PREPA
NEUT.	NEUTRAL	1			bolous		SURF
N.O.	NORMALLY OPEN	1	F	OR ST			
N.T.S.	NOT TO SCALE	1	Į		VIS	SIT: W	WW.
ос	ON CENTER	1					
ОН	OVERHEAD	1					
Р	POLE	1					
PC	PHOTOCELL	1					
PH	PHASE	1					
PNL	PANEL	1					
PRI	PRIMARY	1					
PVC	POLYVINYL CHLORIDE	1					
REQ'D	REQUIRED	1					
SCH	SCHEDULE	1					
SEC	SECONDARY	1					
S/N	SOLID NEUTRAL	1					
SPACE	SPACE(S) ONLY - NO BREAKER OR	1					
1	DEVICE		z				
SPARE	SPARE BREAKER OR DEVICE	1	RIPTIC				
SPECS	SPECIFICATIONS	1	DESCF				
S.D. BARE	SOFT DRAWN BARE	1		H		十	十
SS HDWE	STAINLESS STEEL HARDWARE	1	AWN	•			\cdot
SWBD	SWITCHBOARD	1		Ш		+	4
SWGR	SWITCHGEAR	1	DATE	.			
ТВ	TERMINAL BLOCK	1	>	H		+	+
TYP.	TYPICAL	1	RE	·			Ĺ
UL	UNDERWRITERS LABORATORIES	1					
V	VOLTS	1					
VA	VOLT AMPERES	1					
W	WATTS	1			IN [.]	TERIN	M RE
W/	WITH	1		ре	Not to ermit o	be used	d for catory a
W/O	WITHOUT	1 l			docum inter	nent is re im revie	elease ew und
WP	WEATHERPROOF	1 l		-	CON -	in⊵K ST	Engineer 99: TBPE Li
	MFR MIN. MPR MTD MTG MRCT MV N.C. NEC NEMA NEUT. N.O. N.T.S. OC OH P PC PH PNL PRI PVC REQ'D SCH SEC S/N SPACE SPARE SPECS S.D. BARE SPECS S.D. BARE SPECS S.D. BARE SYBD SWBD SWBD SWBD SWBD SWBD SWBR TB TYP. UL V VA W W/ W/O	MCC MOTOR CONTROL CENTER MFR MANUFACTURER MIN. MINIMUM MPR MOTOR PROTECTION RELAY MTD MOUNTED MTG MOUNTING MRCT MULTI-RATIO CURRENT TRANSFORMER MV MERCURY VAPOR N.C. NORMALLY CLOSED NEC NATIONAL ELECTRICAL CODE NEMA NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION NEUT. NEUTRAL N.O. NORMALLY OPEN N.T.S. NOT TO SCALE OC ON CENTER OH OVERHEAD P POLE PC PHOTOCELL PH PHASE PNL PANEL PRI PRIMARY PVC POLYVINYL CHLORIDE REQ'D REQUIRED SCH SCHEDULE SEC SECONDARY S/N SOLID NEUTRAL SPACE SPACE(S) ONLY - NO BREAKER OR DEVICE SPECS SPECIFICATIONS S.D. BARE SOFT DRAWN BARE SS HDWE STAINLESS STEEL HARDWARE SWBD SWITCHBOARD SWGR SWITCHGEAR TB TERMINAL BLOCK TYP. TYPICAL UL UNDERWRITERS LABORATORIES V VOLTS WW WATTS W/ WITH W/O WITHOUT	MCC MOTOR CONTROL CENTER MFR MANUFACTURER MIN. MINIMUM MPR MOTOR PROTECTION RELAY MTD MOUNTED MTG MOUNTING MRCT MULTI-RATIO CURRENT TRANSFORMER MV MERCURY VAPOR N.C. NORMALLY CLOSED NEC NATIONAL ELECTRICAL CODE NEMA NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION NEUT. NEUTRAL N.O. NORMALLY OPEN N.T.S. NOT TO SCALE OC ON CENTER OH OVERHEAD P POLE PC PHOTOCELL PH PHASE PNL PANEL PRI PRIMARY PVC POLYVINYL CHLORIDE REC'D REQUIRED SCH SCHEDULE SEC SECONDARY S'N SOLID NEUTRAL SPACE SPACE(S) ONLY - NO BREAKER OR DEVICE SPECS SPECIFICATIONS S.D. BARE SOFT DRAWN BARE SS HDWE STAINLESS STEEL HARDWARE SWBD SWITCHBOARD VANTS VA VOLT AMPERES V V VOLTS VA VOLTS W/W WITH W/O WITHOUT	MCC MOTOR CONTROL CENTER MFR MANUFACTURER MIN. MINIMUM MPR MOTOR PROTECTION RELAY MTD MOUNTED MTG MOUNTING MRCT MULTI-RATIO CURRENT TRANSFORMER MV MERCURY VAPOR N.C. NORMALLY CLOSED NEC NATIONAL ELECTRICAL CODE NEMA NATIONAL ELECTRICAL N.O. NORMALLY OPEN N.T.S. NOT TO SCALE OC ON CENTER OH OVERHEAD P POLE PC PHOTOCELL PH PHASE PNL PANEL PRI PRIMARY PVC POLYVINYL CHLORIDE RECOD RECURED SCH SCHEDULE SEC SECONDARY S/N SOLID NEUTRAL SPACE SPACE(S) ONLY - NO BREAKER OR DEVICE SPECS SPECIFICATIONS S.D. BARE SOFT DRAWN BARE SS HDWE STAINLESS STEEL HARDWARE SWBD SWITCHBOARD SWGR SWITCHBOARD SWGR SWITCHBOARD SWGR SWITCHBOARD SWGR SWITCHBOARD SWGR SWITCHBOARD VA VOLT AMPERES W WATTS W/ WITH W/O WITHOUT	MCC MOTOR CONTROL CENTER MFR MANUFACTURER MIN. MINIMUM MPR MOTOR PROTECTION RELAY MTD MOUNTED MTG MOUNTING MRCT MULTI-RATIO CURRENT TRANSFORMER MV MERCURY VAPOR N.C. NORMALLY CLOSED NEC NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION NEUT. NEUTRAL N.O. NORMALLY OPEN N.T.S. NOT TO SCALE OC ON CENTER OH OVERHEAD P POLE PC PHOTOCELL PH PHASE PNL PANEL PRI PRIMARY PVC POLYVINYL CHLORIDE REC'D REQUIRED SCH SCHEDULE SEC SECONDAPY S/N SOLID NEUTRAL SPACE SPACE(S) ONLY - NO BREAKER OR DEVICE SPARE SPARE BREAKER OR DEVICE SPECS SPECIFICATIONS S.D. BARE SOFT DRAWN BARE SYNDE STAINLESS STEEL HARDWARE SWBD SWITCHBOARD SWCR SWITCHBOARD SWCR SWITCHBOARD SWCR SWITCHBOARD V VOLTS VA VOLT AMPERES W WAYTTS W/ WITH W/O WITHOUT	MCC MOTOR CONTROL CENTER MFR MANUFACTURER MIN. MINIMUM MPR MOTOR PROTECTION RELAY MTD MOUNTID MTG MOUNTING MRCT MULTI-RATIO CURRENT TRANSFORMER MV MERCURY VAPOR N.C. NORMALLY CLOSED NEC NATIONAL ELECTRICAL CODE NEMA NATIONAL ELECTRICAL CODE NEMA NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION NEUT. NEUTRAL N.O. NORMALLY OPEN N.T.S. NOT TO SCALE OC ON CENTER OH OVERHEAD P POLE PC PHOTOCELL PH PHASE PNL PANEL PRI PRIMARY PVC POLYVINYL CHLORIDE REO'D REQUIRED SCH SCHEDULE SEC SECONDARY S/N SOLID NEUTRAL SPACE SPACE(S) ONLY - NO BREAKER OR DEVICE SPECS SPECIFICATIONS S.D. BARE SOFT DRAWN BARE SS HOWE STAINLESS STEEL HARDWARE SWED SWITCHBOARD SWGR SWITCHBOARD SWGR SWITCHBOARD SWGR SWITCHBOARD SWGR SWITCHBOARD UL UNDERWRITERS LABORATORIES V V VOLTS VA VOLT AMPERES W WATTS W/ WITH W/O WITHOUT	MCC MOTOR CONTROL CENTER MFR MANUFACTURER MIN. MINIMUM MPR MOTOR PROTECTION RELAY MTD MOUNTED MTG MOUNTING MRCT MULTI-RATIO CURRENT TRANSFORMER MV MERCURY VAPOR N.C. NORMALLY CLOSED NECM NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION NEUT. NEUTRAL N.O. NORMALLY OPEN N.T.S. NOT TO SCALE OC ON CENTER OH OVERHEAD P POLE PC PHOTOCELL PH PHASE PNL PANSE PNL PANSE PNL PANSE PNL PANSE PSC SCONDARY S/N SOLID NEUTRAL SPACE SPACE(S) ONLY - NO BREAKER OR DEVICE SPECS SPECIFICATIONS S.D. BARE SOFT DRAWN BARE SS HDWE STAINLESS STEEL HARDWARE SWMD SWITCHGOARD SWGR SWITCHGOARD TYP. TYPICAL UL UNDERWRITERS LABORATORIES V V VOLTS W WATTS W/W WITH W/O WITHOUT

CLEARY ZIMMERMANN **ENGINEERS** Firm No. F-9357 | ClearyZimmermann.com

רעי	PROTECT YOURSELF
	ALL STATES REQUIRE NOTIFICATION XCAVATORS, DESIGNERS, OR ANY PE PREPARING TO DISTURB THE EART SURFACE ANYWHERE IN ANY STAT
R STATE SPECI	FIC DIRECT PHONE NUMBER

	DATE DRAWN BY DESCRIPTION					
	DRAWN BY					
	DATE					
	REV					
lí						

REVIEW ONLY or construction, bidding, y approval purposes.This ased for the purpose of under the authority of: DIVANT, P.E., PEng. mann Engineers, Inc. gineering Firm No. F-9357

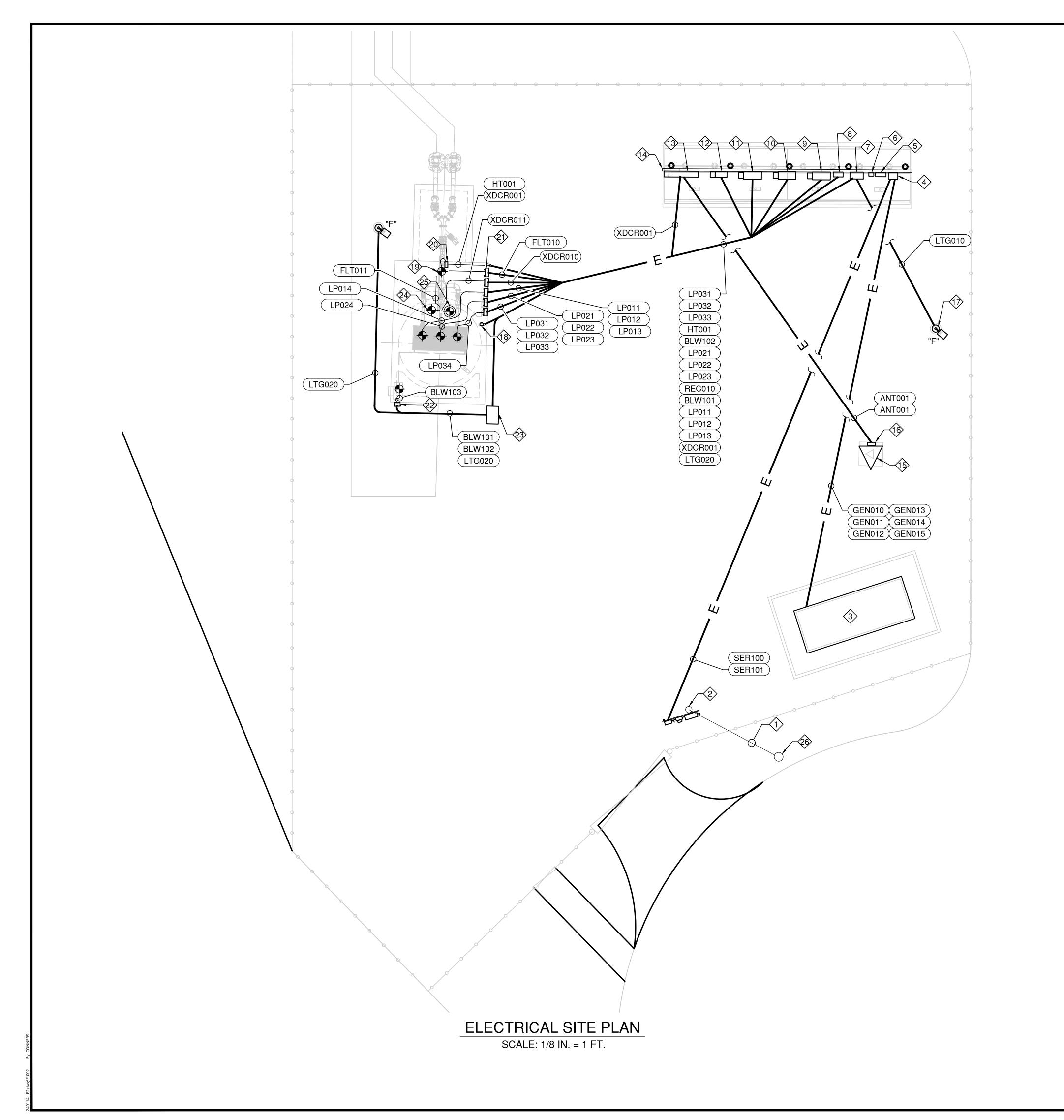
NORTHLAKE LIFT STATION AND **FORCE MAIN**

Colliers	
Engineering & Design	

1	SCALE:	DATE:		DRAWN BY:	CHECKED BY		
	AS SHOWN	9/18	3/24	CS	JC		
	PROJECT NUMBE	R:	DRAWING NAME:				
				240114 - E1			

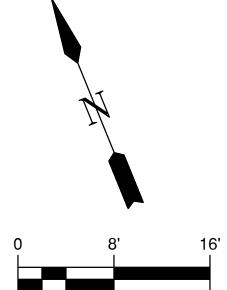
ELECTRICAL SYMBOLS AND **ABBREVIATIONS**

E-001

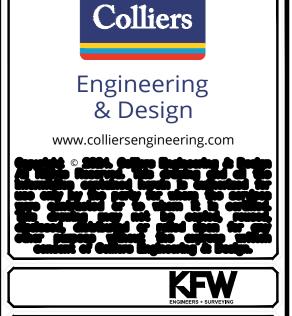


KEYED NOTES:

- ELECTRICAL SERVICE DROP CONFIGURED FOR 400A, 480Y/277V, 4W ELECTRICAL SERVICE TO SITE.
- ELECTRICAL SERVICE POLE W/UTILITY METER AND SERVICE DISCONNECT RACK. RE: ELECTRICAL SERVICE POLE
- 200KW, 250KVA, 480/277V, 3Ø DIESEL GENERATOR W/ 15 HR. DOUBLE-WALL, SUB-BASE FUEL TANK AND A LEVEL 2 SOUND-ATTENUATING ENCLOSURE.
- 480V, 400A, 3P, OPEN-TRANSITION AUTOMATIC TRANSFER SWITCH IN NEMA 4X STAINLESS STEEL ENCL.
- 5 PANEL "DP-1".
- 6 SPD'S
- 7 PANEL "A"
- ODOR CONTROL BLOWER PANEL. RE: ODOR CONTROL UNIT PANEL TYPICAL LAYOUT.
- DESCRIPTION STATES STAT
- LIFT PUMP NO. 2 CONTROL PANEL. RE: LIFT PUMP CONTROL PANEL TYPICAL LAYOUT.
- LIFT PUMP NO. 3 CONTROL PANEL. RE: LIFT PUMP CONTROL PANEL TYPICAL LAYOUT.
- LEVEL CONTROL PANEL. RE: LEVEL CONTROL PANELLAYOUT.
- SCADA PANEL. RE: SCADA PANEL INTERIOR LAYOUT.
- EQUIPMENT RACK CANOPY. RE: ELECTRICAL EQUIPMENT RACK LAYOUT.
- ANTENNA TOWER. RE: TYPICAL ANTENNA TOWER DETAIL.
- RE: TOWER ENCLOSURE. TYPICAL ANTENNA TOWER
- AREA LIGHT (TYP). RE:AREA LIGHT POLE DETAIL.
- POST-MOUNTED WEATHERPROOF CONVENIENCE RECEPTACLE. RE: POST MOUNTED CONVENIENCE RECEPTACLE DETAIL.
- DISCHARGE PRESSURE TRANSMITTER. RE: DISCHARGE PRESSURE TRANSMITTER MOUNTING DETAIL.
- DISCHARGE PRESSURE TRANSMITTER AND HEAT TRACE J-BOX. RE: DISCHARGE PRESSURE TRANSMITTER MOUNTING DETAIL.
- MOTOR JUNCTION AND INSTRUMENTATION JUNCTION BOXES (TYP). RE: WET WELL JUNCTION BOX DETAIL.
- ODOR CONTROL BLOWER J-BOX. PROVIDE MINIMUM 12" X 12" X 8" STAINLESS STEEL NEMA 4X ENCLOSURE.
- NEMA-SIZED HANDHOLE.
- WET WELL LEVEL FLOATS. RE: CONDUITS, HANGING PLATES AND CONTROL DEVICES DETAIL.
- SUBMERSIBLE LEVEL TRANSDUCER IN 8"Ø STILLING WELL. RE: SUBMERSIBLE LEVEL TRANSDUCER MOUNTING DETAIL AND CONDUITS, HANGING PLATES AND CONTROL DEVICES DETAIL.
- PROPOSED UTILITY POLE TO BE PLACED NO CLOSER THAN 10' TO SITE PROPERTY LINE.



SCALE: 1/8 IN. = 1 FT.



PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSO PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

DATE DRAWN BY DESCRIPTION					
TE DRAW	·				
REV DATI				•	

INTERIM REVIEW ONLY

Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

Engineer of Record

99971

TEPE License No.

09/18/2024

Date

Cleary Zimmermann Engineers, Inc.

Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

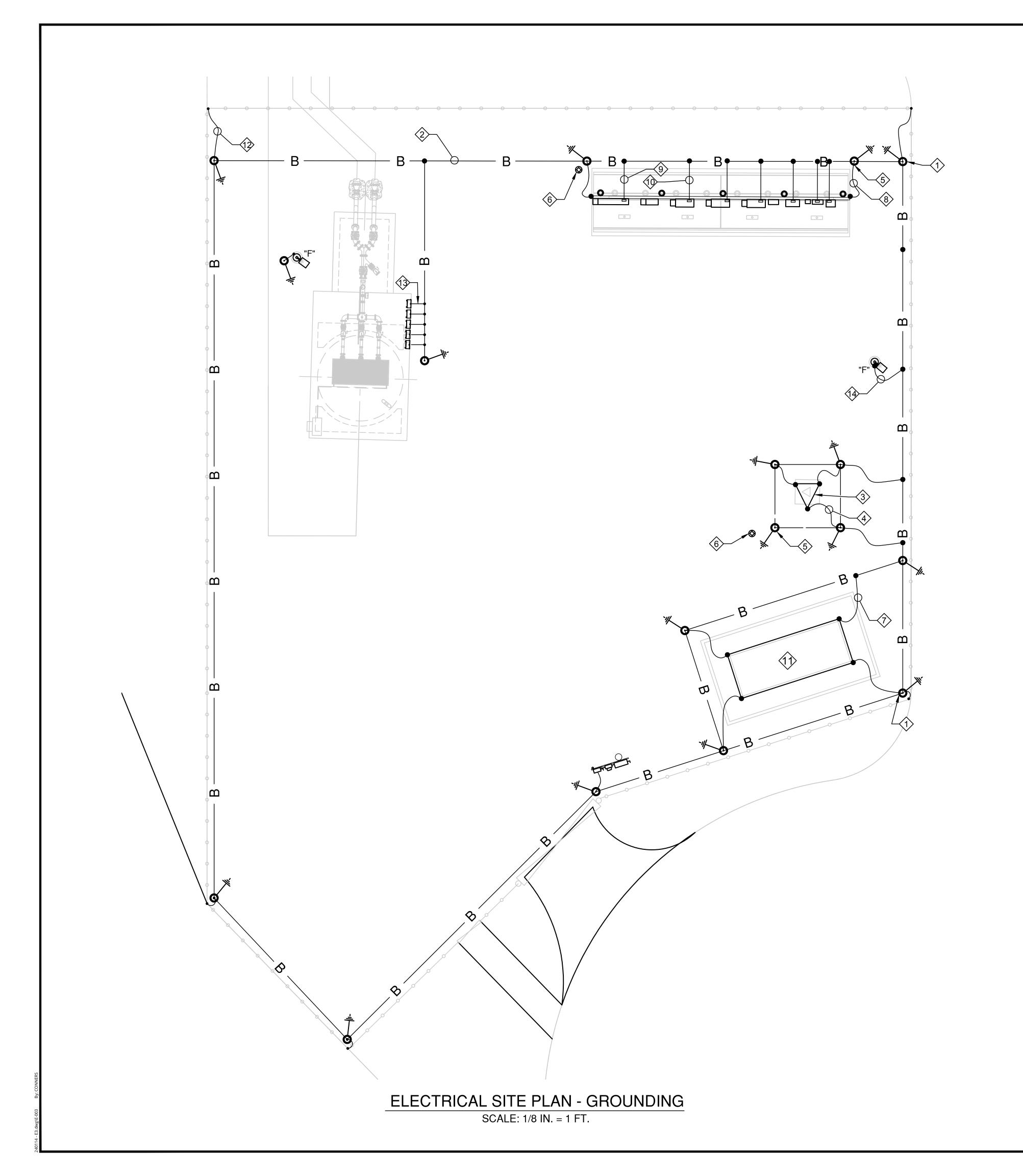
ColliersEngineering & Design

1	SCALE:	DATE:		DRAWN BY:	CHECKED B	
	AS SHOWN	9/18	3/24	CS	JC	
1	PROJECT NUMBER:		DRAWING NAME:			
			240114	1 - E2		

ELECTRICAL SITE PLAN

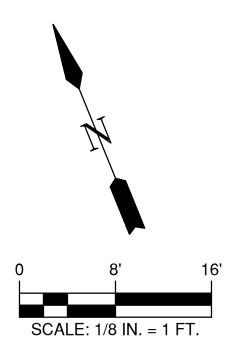
E-002

CLEARY
ZIMMERMANN
ENGINEERS
Firm No. F-9357 | ClearyZimmermann.com

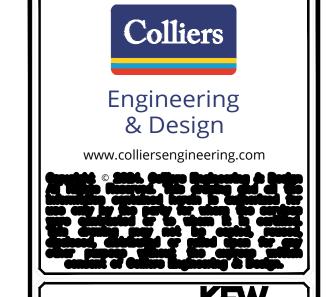


KEYED NOTES:

- 3/4"ØX10' COPPER CLAD GROUND ROD (TYP.). EXOTHERMICALLY WHO TO GROUND CABLE BURIED MIN. 30" BELOW GRADE.
- #4/0 SOFT DRAWN, BARE COPPER CABLE BURIED MIN. 30"
 BELOW GRADE (TYP). EXOTHERMICALLY WELD ALL BELOW GRADE
 CONNECTIONS EXCEPT AT TEST WELLS.
- 3 ANTENNA TOWER AND BASE. RE: TYPICAL ANTENNA TOWER DETAIL.
- #6 SOFT DRAWN ,BARE COPPER GROUNDING TAIL TO ANTENNA TOWER (TYP.).
- GROUND TEST WELL. RE: GROUND TEST WELL ARRANGEMENT DETAIL.
- 6 MOISTURIZING POINT. RE: MOISTURIZING PORT DETAIL.
- #6 SOFT DRAWN, BARE COPPER TAIL TO EACH CORNER OF GENERATOR FRAME.
- (8) #6 SOFT DRAWN, BARE COPPER TAIL TO EACH END OF ELECTRICAL EQUIPMENT SHELTER.
- 9 #6 SOFT DRAWN, BARE COPPER TO SCADA PANEL GROUND BUS.
- #6 SOFT DRAWN, BARE COPPER TO EQUIPMENT GROUND BUS (TYP).
- 200 KW, 250 KVA, 480/277V, 3Ø STAND BY DIESEL GENERATOR W/15HR DOUBLE-WALL, SUB BASE LEVEL TANK AND LEVEL 3 SOUND ATTENUATED ENCLOSURE.
- #6 SOFT DRAWN BARE COPPER TAIL, EXOTHERMICALLY WELD TO FENCE POST (TYP).
- #6 SOFT DRAWN BARE COPPER TAIL, ROUTE TO GROUND BUS IN J-BOX (TYP).
- GROUND PER AREA LIGHTING INSTALLATION DETAIL (TYP).







PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS
VISIT: WWW.CALL811.COM

SCRIPTION					
DESCR					 L.
DATE DRAWN BY DESCRIPTION					
REV					
\equiv					

INTERIM REVIEW ONLY

Not to be used for construction, bidding, permit or regulatory approval purposes.This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

Engineer of Record

99971

TEPE License No.

09/18/2024

Date

Cleary Zimmermann Engineers, Inc.

Texas Registered Engineering Firm No. F-9357

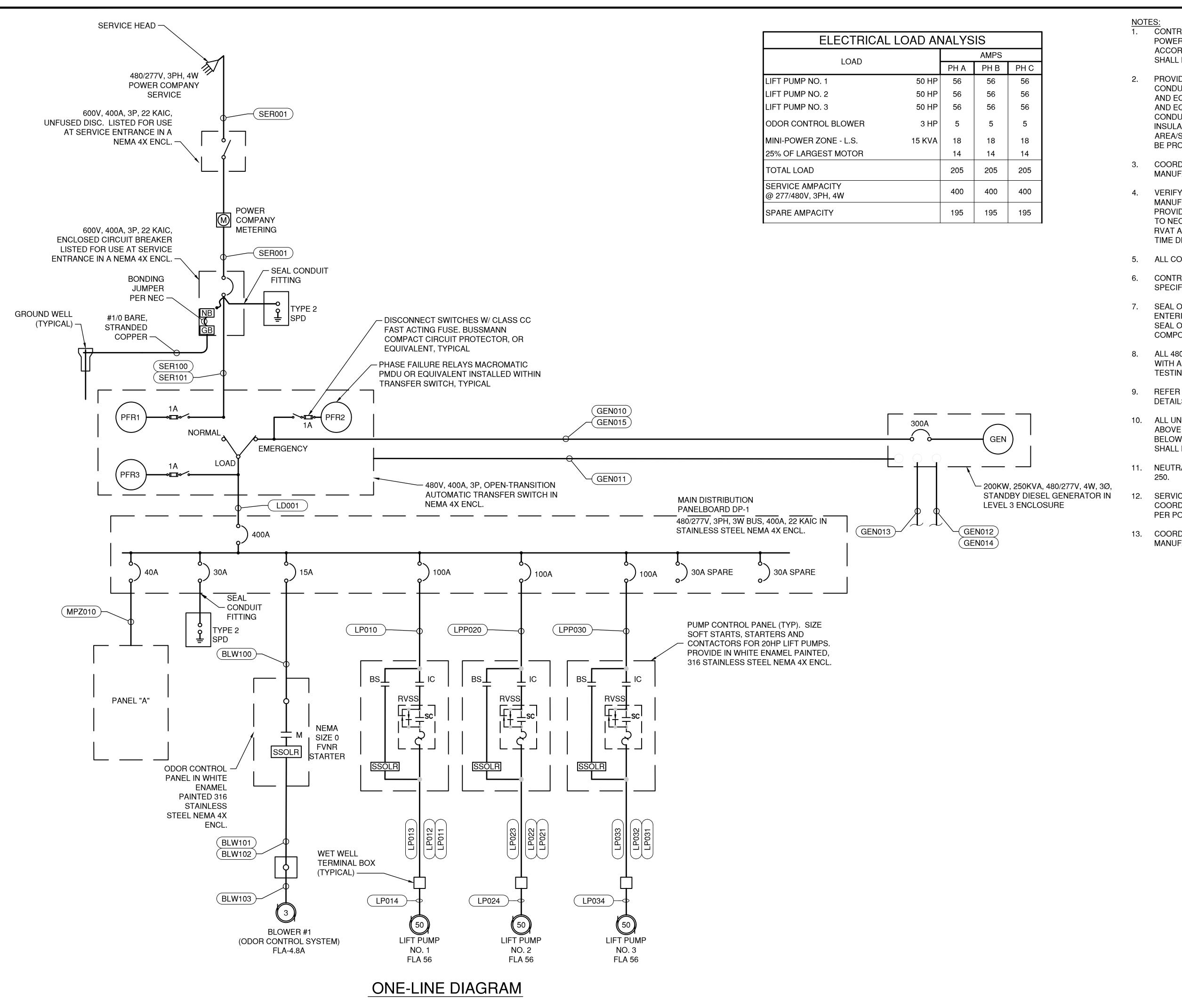
NORTHLAKE LIFT STATION AND FORCE MAIN

ColliersEngineering

l	SCALE:	DATE:		DRAWN BY:	CHECKED BY:		
	AS SHOWN	9/18	3/24	CS	JC		
Ш	PROJECT NUMBE	PROJECT NUMBER:		DRAWING NAME:			
			240114	4 - E3			

ELECTRICAL GROUNDING
PLAN

SHEET NUMBER: E-003



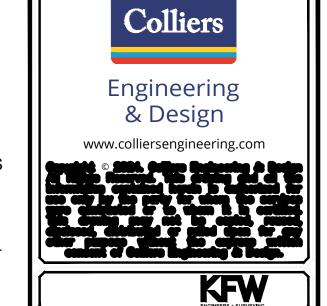
- 1. CONTRACTOR SHALL VERIFY AVAILABLE FAULT CURRENT WITH POWER COMPANY AND PROVIDE EQUIPMENT RATED ACCORDINGLY. INTERRUPT CAPACITY FOR ALL COMPONENTS SHALL BE SAME AS SERVICE.
- 2. PROVIDE ALL REQUIRED ALARM AND DEVICE POWER CONDUCTORS FOR LOCAL PANELS INSTALLED NEAR MOTORS AND EQUIPMENT. SEE ONE-LINE DIAGRAM, CONTROL DIAGRAMS AND EQUIPMENT SPECIFICATIONS FOR REQUIREMENTS. CONDUCTORS MAY BE ROUTED IN POWER CONDUITS WHERE INSULATION RATING IS 600 VOLTS AND WHERE CONDUIT AREA/SPACE IS PER NEC, OR SEPARATE 1 INCH CONDUIT SHALL BE PROVIDED.
- 3. COORDINATE LV BREAKER SIZES WITH GENERATOR MANUFACTURER FOR AUXILIARY LOADS
- 4. VERIFY CAPACITOR SIZE REQUIREMENTS WITH MOTOR MANUFACTURER BEFORE ORDERING. DO NOT OVERCORRECT. PROVIDE CONDUCTORS AND CONDUITS SIZED ACCORDINGLY TO NEC. CAPACITORS SHALL NOT BE DIRECTLY CONNECTED TO RVAT AND SOLID STATE STARTERS. (USE CONTRACTOR, HOA, TIME DELAY AND BREAKER) INTERLOCK WITH STARTERS.
- 5. ALL CONTROL PANELS TO BE UL LISTED.
- 6. CONTRACTORS SHALL READ ENTIRE CONTENTS OF SPECIFICATIONS BEFORE BIDDING ON THIS PROJECT
- 7. SEAL OFF FITTINGS ARE REQUIRED FOR ALL RACEWAYS ENTERING AND EXITING WET WELL JUNCTIONS BOXES. FILL SEAL OFF FITTINGS WITH 3M-2123 RE-ENTERABLE SEALING COMPOUND.
- 8. ALL 480V LINE AND CONDUCTORS SHALL BE MEGGER TESTED WITH A MINIMUM READING OF 50 OHMS TO BE ACCEPTABLE. ALL TESTING SHALL BE WITNESSED BY AN ENGINEER.
- 9. REFER TO CONDUIT/CABLE SCHEDULE FOR ADDITIONAL DETAILS.
- 10. ALL UNDERGROUND CONDUITS SHALL BE PVC SCH. 40. ALL ABOVE GROUND CONDUITS SHALL BE ALUMINUM RMC. ALL BELOW GRADE TO ABOVE GRADE TRANSITIONS CONDUITS SHALL BE PVC-COATED ALUMINUM RMC.
- 11. NEUTRAL BONDING PER NATIONAL ELECTRICAL CODE ARTICLE 250.
- 12. SERVICE SHALL BE ADHERE TO LATEST UTILITY STANDARDS. COORDINATE AND PAY FOR ALL UTILITY RELATED EXPENSES PER POWER COMPANY ALLOWANCE.

CLEARY

ZIMMERMANN

ENGINEERS

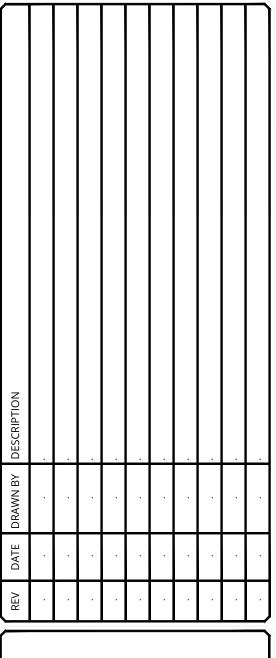
13. COORDINATE ALL CONNECTIONS TO GENERATOR WITH MANUFACTURER.



PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSO PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM



INTERIM REVIEW ONLY

Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

Engineer of Record
99971

Tepfe Lecree No.
09/18/2024

Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

Colliers

Engineering
& Design

SCALE: DATE: DRAWN BY: CHECKED BY:

AS SHOWN 9/18/24 CS JC

PROJECT NUMBER: DRAWING NAME:

240114 - E4

ELECTRICAL ONE LINE DIAGRAM

NUMBER: **E-004**

Firm No. F-9357 | ClearyZimmermann.com

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

	CABLE AND CONDUIT SCHEDULE								
CABLE/CONDUIT TA	AG CONDUIT QUANTITY	CONDUIT SIZE	FROM	TO	CONDUCTOR (EACH CONDUIT)	CABLE TYPE	DESCRIPTION		
ANT001	1	2 IN.	SCADA PANEL	ANTENNA TOWER	ETHERNET CABLE	-	RADIO POE		
ANT002	1	2 IN.	SCADA PANEL	ANTENNA TOWER	PULL STRING	-	SPARE		
ATS001	1	1 IN.	ATS	SCADA PANEL	6#14	XHHW-2	PHASE FAIL RELAY OUTPUTS TO SCADA PANEL		
BLW100	1	1 IN.	PANEL "A"	ODOR CONTROL BLOWER PANEL	3#12,1#12G	XHHW-2	ODOR CONTROL BLOWER PANEL FEEDER		
BLW101	1	1 IN.	ODOR CONTROL BLOWER PANEL	ODOR CONTROL BLOWER J-BOX	3#12,1#12G	XHHW-2	ODOR CONTROL BLOWER FEEDER		
BLW102	1	1 IN.	ODOR CONTROL BLOWER PANEL	ODOR CONTROL BLOWER J-BOX	PULL STRING	-	SPARE		
BLW103	1	1 IN.	ODOR CONTROL BLOWER J-BOX	ODOR CONTROL BLOWER	3#12,1#12G	XHHW-2	ODOR CONTROL BLOWER WHIP		
FLT010	1	1 & 1/2 IN.	LEVEL CONTROL PANEL	FLOATS/TRANSDUCER TERMINAL BOX	10#12, 1#12G	XHHW-2	FLOATS		
FLT011	1	1 & 1/2 IN.	FLOATS/TRANSDUCER TERMINAL BOX	WET WELL	(5) MANUFACTURER'S CABLE	-	FLOATS		
GEN010	1	2 IN.	EMERGENCY GENERATOR	AUTOMATIC TRANSFER SWITCH	3#3/0,1#6G	XHHW-2	EMERGENCY POWER		
GEN011	1	1 IN.	EMERGENCY GENERATOR	AUTOMATIC TRANSFER SWITCH	2#12	XHHW-2	GENERATOR START/STOP FROM ATS		
GEN012	1	1 IN.	EMERGENCY GENERATOR	SCADA PANEL	6#14	XHHW-2	GENERATOR STATUS, LOW FUEL, GENERAL ALARM		
GEN013	1	1 IN.	EMERGENCY GENERATOR	PANEL "B"	2#10,4#12,3#12G	XHHW-2	GENERATOR DEVICES (HEATER, BATTERY CHARGER, JACKET HEATER)		
GEN014	1	1 IN.	EMERGENCY GENERATOR	SCADA PANEL	ETHERNET CABLE	-	GENERATOR ETHERNET COMMUNICATIONS		
GEN015	1	2 IN.	EMERGENCY GENERATOR	AUTOMATIC TRANSFER SWITCH	PULL STRING	-	SPARE SPANSE TRANSPORTED ASS		
HT001	1	1 IN.	PANEL "A"	HEAT TRACE J-BOX	2#12,1#12G	XHHW-2	PRESSURE TRANSDUCER HEAT TRACE		
LD001	2	2 IN.	AUTOMATIC TRANSFER SWITCH	PANEL "DP-1"	3#4/0,1#2G	XHHW-2	FEEDER TO PANEL "DP-1"		
LP010	1	1 IN.	PANEL "DP-1"	LIFT PUMP NO. 1 CONTROL PANEL	3#4,1#8G 3#4,1#8G	XHHW-2	LIFT PUMP NO. 1 FEEDER		
LP011 LP012	1	1 IN.	LIFT PUMP NO. 1 CONTROL PANEL	LIFT PUMP NO. 1 J-BOX	14-1 PR., 16 GA. BELDEN #31P1601	XHHW-2	LIFT PUMP NO. 1 FEEDER		
	1	1 IN.	LIFT PUMP NO. 1 CONTROL PANEL LIFT PUMP NO. 1 CONTROL PANEL	LIFT PUMP NO. 1 J-BOX	· · · · · · · · · · · · · · · · · · ·	XHHW-2	LIFT PUMP NO. 1 CONTROLS SPARE		
LP013 LP014	1	1 IN. 2 IN.	LIFT PUMP NO. 1 J-BOX	LIFT PUMP NO. 1 J-BOX LIFT PUMP NO. 1	PULL STRING MANUFACTURER'S CABLES	-	LIFT PUMP NO. 1 CABLES		
LP014 LP015	1	2 IIV. 1 IV.	LIFT PUMP NO. 1 J-BOX LIFT PUMP NO. 1 CONTROL PANEL	SCADA PANEL	18#14	XHHW-2	DISCRETE INPUTS FROM LIFT PUMP #1 CONTROL PANEL		
LP015 LP016	1	1 IN.	PANEL "A"	LIFT PUMP NO. 1 CONTROL PANEL	2#12,1#12G	XHHW-2	LIFT PUMP #1 CONTROL PANEL		
	1				<u>'</u>				
LP020	1	1 IN.	PANEL "DP-1"	LIFT PUMP NO. 2 CONTROL PANEL	3#4,1#8G	XHHW-2	LIFT PUMP NO. 2 FEEDER		
LP021	1	1 IN.	LIFT PUMP NO. 2 CONTROL PANEL	LIFT PUMP NO. 2 J-BOX	3#4,1#8G	XHHW-2	LIFT PUMP NO. 2 FEEDER		
LP022	1	1 IN.	LIFT PUMP NO. 2 CONTROL PANEL	LIFT PUMP NO. 2 J-BOX	14-1 PR., 16 GA. BELDEN #31P1601	XHHW-2	LIFT PUMP NO. 2 CONTROLS		
LP023	1	1 IN.	LIFT PUMP NO. 2 CONTROL PANEL	LIFT PUMP NO. 2 J-BOX	PULL STRING	-	SPARE		
LP024	1	2 IN.	LIFT PUMP NO. 2 J-BOX	LIFT PUMP NO. 2	MANUFACTURER'S CABLES	-	LIFT PUMP NO. 2 CABLES		
LP025	1	1 IN.	LIFT PUMP NO. 2 CONTROL PANEL	SCADA PANEL	18#14	XHHW-2	DISCRETE INPUTS FROM LIFT PUMP #2 CONTROL PANEL		
LP026	1	1 IN.	PANEL "A"	LIFT PUMP NO. 2 CONTROL PANEL	2#12,1#12G	XHHW-2	LIFT PUMP #2 CONTROL PANEL POWER		
LP030	1	1 IN.	PANEL "DP-1"	LIFT PUMP NO. 3 CONTROL PANEL	3#4,1#8G	XHHW-2	LIFT PUMP NO. 3 FEEDER		
LP031	1	1 IN.	LIFT PUMP NO. 3 CONTROL PANEL	LIFT PUMP NO. 3 J-BOX	3#4,1#8G	XHHW-2	LIFT PUMP NO. 3 FEEDER		
LP032	1	1 IN.	LIFT PUMP NO. 3 CONTROL PANEL	LIFT PUMP NO. 3 J-BOX	14-1 PR., 16 GA. BELDEN #31P1601	-	LIFT PUMP NO. 3 CONTROLS		
LP033	1	1 IN.	LIFT PUMP NO. 3 CONTROL PANEL	LIFT PUMP NO. 3 J-BOX	PULL STRING	_	SPARE		
LP034	1	2 IN.	LIFT PUMP NO. 3 J-BOX	LIFT PUMP NO. 3	MANUFACTURER'S CABLES	_	LIFT PUMP NO. 3 CABLES		
LP035	1	1 IN.	LIFT PUMP NO. 3 CONTROL PANEL	SCADA PANEL	18#14	XHHW-2	DISCRETE INPUTS FROM LIFT PUMP #3 CONTROL PANEL		
LP036		1 IN.	PANEL "A"	LIFT PUMP NO. 3 CONTROL PANEL	2#12,1#12G	XHHW-2	LIFT PUMP #3 CONTROL PANEL POWER		
	1				<u> </u>				
LTG010	1	1 IN.	PANEL "A"	AREA LIGHT	2#12,1#12G 2#12,1#12G	XHHW-2	AREA LIGHT		
LTG020	1	1 IN.	PANEL "A"	AREA LIGHT	·	XHHW-2	AREA LIGHT LEVEL CONTROL OPERATIONAL STATUS, CONTROL POWER FAIL, HIGH LEVEL ALARM,		
LVL001	1	1 IN.	LEVEL CONTROL PANEL	SCADA PANEL	12#14	XHHW-2	LOW LEVEL ALARM		
LVL002	1	1 IN.	LEVEL CONTROL PANEL	PANEL "A"	2#12,1#12G	XHHW-2	LEVEL CONTROL PANEL FEEDER		
LVL003	1	3/4 IN.	LEVEL CONTROL PANEL	LIFT PUMP NO. 1 CONTROL PANEL	2#14	XHHW-2	PUMP NO. 1 START CONTROL LOOP FROM LEVEL CONTROL PANEL		
LVL004	1	3/4 IN.	LEVEL CONTROL PANEL LEVEL CONTROL PANEL	LIFT PUMP NO. 2 CONTROL PANEL LIFT PUMP NO. 3 CONTROL PANEL	2#14 	XHHW-2 XHHW-2	PUMP NO. 2 START CONTROL LOOP FROM LEVEL CONTROL PANEL PUMP NO. 3 START CONTROL LOOP FROM LEVEL CONTROL PANEL		
LVL005 MPZ010	1	3/4 IN. 1 IN.	PANEL "DP-1"	PANEL "A"	2#14 3#8,1#10G	XHHW-2 XHHW-2	PUMP NO. 3 START CONTROL LOOP FROM LEVEL CONTROL PANEL PANEL "A" FEEDER		
REC010	1	1 IN.	PANEL DP-1 PANEL "A"	WET WELL CONVENIENCE RECEPTACLE	2#12,1#12G	XHHW-2 XHHW-2	WET WELL CONVENIENCE RECEPTACLE FEEDER		
SER001	2	2 1/2 IN.	SERVICE DROP	SERVICE ENTRANCE DISCONNECT SWITCH	2#12,1#12G 4#4/0	XHHW-2	SERVICE DROP		
SER100	2	2 1/2 IN.	SERVICE ENTRANCE DISCONNECT	AUTOMATIC TRANSFER SWITCH	3#4/0,1#2G	XHHW-2	SERVICE DROP		
SER100 SER101	1	2 1/2 IN. 2 1/2 IN.	SERVICE ENTRANCE DISCONNECT	AUTOMATIC TRANSFER SWITCH AUTOMATIC TRANSFER SWITCH	PULL STRING	ΛΠΠΨΨ-2	SERVICE DROP SPARE		
XDCR001	1	1 IN.	PRESSURE TRANSDUCER	SCADA PANEL	1 PR., 16 GA. BELDEN #8760		DISCHARGE PRESSURE TRANSDUCER TO SCADA PANEL		
XDCR010	1	1 IN.	LEVEL CONTROL PANEL	LEVEL TRANSDUCER TERMINAL BOX	1 PR., 16 GA. BELDEN #8760	_	WET WELL LEVEL TRANSDUCER		
VDOLIGIO	'	1 11 V 1	LL V LL OOINTHOL I AINLL	LEVEL III/IIIVODOCEIT I ETIIVIIIIVAE DOX	TITE, TO WILL DELDER πΟΙ Ου		WELL WELLEVEL HIMNODOOLII		

MANUFACTURER'S CABLE

FLOATS/TRANSDUCER TERMINAL BOX

1 &1/2 IN.

XDCR011

STILLING WELL



NORTHLAKE LIFT STATION AND FORCE MAIN

INTERIM REVIEW ONLY

Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

Engineer of Record
99971

Tepe License No.
09/18/2024

Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

& Design

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

Colliers
Engineering & Design

-						
l	SCALE:	DATE:		DRAWN BY:	CHECKED	
	AS SHOWN	9/18	3/24	CS	JC	
	PROJECT NUMBE	R:	DRAWING NAME:			
			240114	4 - E5		

ELECTRICAL CONDUIT AND CABLE SCHEDULE

E-005



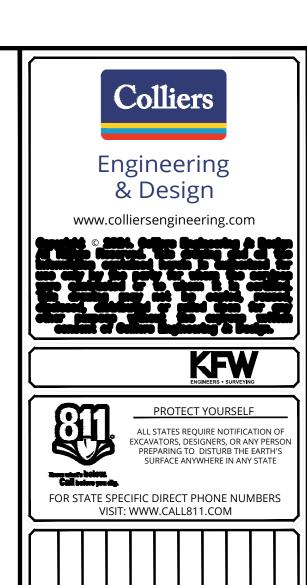
WET WELL LEVEL TRANSDUCER

	LIGHTING FIXTURE SCHEDULE									
MARK	MARK DESCRIPTION VOLTAGE VA LAMP TYPE MOUNTING MANUFACTURER CATALOG FIXTURE NUMBER POLE DATA									
А	VAPORTITE CANOPY LIGHT	120	42	LED	SURFACE	LITHONIA OR EQUAL	VAP 4000LM FST MD MVOLT 40K 80CRI	-		
F	LED AREA LIGHT	120	138	LED	POLE	LITHONIA OR APPROVED EQUAL	DSX1LED-P5-40K-T5S-120-SPA-PER-SF	STSH-20-4F-DM29AS-UL-DDB		

PANEL DP-1 SERVICE VOLTAGE 480V MAIN BREAKER SIZE 200A		_	NE SH	UTRAL	JS RATIN . BUS RA ⁻ IRCUIT R N <u>ELEC</u> T	TING _ ATING	- 65 K	_		NEU \ PHAS	SIZE _ WIRE SI SE <u>3</u> NTING _	ZE <u> </u>			WITH: ■ SOLID NEUTRAL & GROUND □ ISOLATED GROUND BUS □ 200% NEUTRAL NOTE: ADJ. CKTS. TO BAL. PNL.
OVE DECODIDEION	MIDE	BRE	AKER	,	VA/WATT	S	CKT	СКТ	\	/A/WATT	S	BRE	AKER	MIDE	OVT DECODIDITION
CKT. DESCRIPTION	WIRE	POLE	AMP	Α	В	С	NO.	NO.	Α	В	С	POLE	AMP	WIRE	CKT. DESCRIPTION
				-			1	2	7205						
SPD	10	3	30		-		3	4		7205		3	50	#8	LIFT PUMP 1 CONTROL PANEL
						-	5	6			7205				
				7205			7	8	7205						
LIFT PUMP 2 CONTROL PANEL	8	3	50		7205		9	10		7205		3	50	#8	LIFT PUMP 3 CONTROL PANEL
						7205	11	12			7205				
				5000			13	14	1330						
PANEL "A"	10	3	40		5000		15	16		1330		3	15	#12	ODOR CONTROL BLOWER
						5000	17	18			1330				
				-			19	20	-						
SPARE	_	3	30		-		21	22		-		3	30	-	SPARE
						-	23	24			-]			
TOTAL PHASE A: <u>27945</u> VOLT-AMP TOTAL PHASE B: <u>27945</u> VOLT-AMP TOTAL PHASE C: <u>27945</u> VOLT-AMP	S							•					ТО	TAL CO	NNECTED LOAD: <u>83835</u> VA

PANEL A SERVICE VOLTAGE 120/208V MAIN BREAKER SIZE 40A		-	NE SH	UTRAL IORT CII	S RATIN BUS RA ^T RCUIT R <u>ELEC</u> T	TING _ ATING				NEU PHAS	E SIZE _ WIRE SI SE _3_ NTING _	ZE <u>#</u>			WITH: ■ SOLID NEUTRAL & GROUND □ ISOLATED GROUND BUS □ 200% NEUTRAL NOTE: ADJ. CKTS. TO BAL. PNL.
CVT DECODIDATION	WIDE	BREA	KER	V	'A/WATT	S	СКТ	СКТ	-	VA/WAT	ΓS	BREA	KER	WIDE	CVT DECODIDATION
CKT. DESCRIPTION	WIRE	POLE	AMP	Α	В	С	NO.	NO.	Α	В	С	POLE	AMP	WIRE	CKT. DESCRIPTION
JACKET WATER HEATER	8	2	30	1500			1	2	180			1	20	12	CONVENIENCE RECEPTACLE
SACKET WATERTIEATER	0		30		1500		3	4		800		1	20	12	GENERATOR BATTERY CHARGER
SCADA PANEL	12	1	20			1000	5	6			84	1	20	12	CANOPY LIGHTS
PRESSURE XDCR HEAT TRACE	12	1	20	800			7	8	138			1	20	12	YARD LIGHT NO. 1
YARD LIGHT NO. 2	12	1	20		138		9	10		500		1	20	12	ALTERNATOR SPACE HEATER
LIFT PUMP CONTROL PANEL #2	12	1	20			400	11	12			400	1	20	12	LIFT PUMP CONTROL PANEL #1
LEVEL CONTROL PANEL	12	1	20	400			13	14	400			1	20	12	LIFT PUMP CONTROL PANEL #3
ODOR CONTROL BLOWER PANEL	12	1	20		400		15	16		180		1	20	12	WET WELL CONVENIENC RECEPT.
SPARE		1	20			-	17	18			500	1	20	12	SCADA PANEL
SPARE		1	20	-			19	20	-			1	20		SPARE
SPARE		1	20		-		21	22		-		1	20		SPARE
SPARE		1	20			-	23	24			-	1	20		SPARE
TOTAL PHASE A: 3418 VOLT-AMPS TOTAL PHASE B: 3518 VOLT-AMPS TOTAL PHASE C: 2384 VOLT-AMPS				TOTAL	PHASE A PHASE E PHASE (3 CURRE	ENT: 29	AMPS					TC	TAL C	ONNECTED LOAD: <u>9320</u> VA

PANEL "A" IS A 15KVA COMBINATION XFMR/PANELBOARD IN A STAINLESS STEEL NEMA 3R ENCL.



		 1311.	V V V V	v.CAL	LOII	.CON	VI	_
DATE DRAWN BY DESCRIPTION								
DRAWN BY	•	•	•	•		•	•	
REV								

INTERIM REVIEW ONLY

Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

Engineer of Record
99971

TBPE Licrone No.
09/18/2024

Date

Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

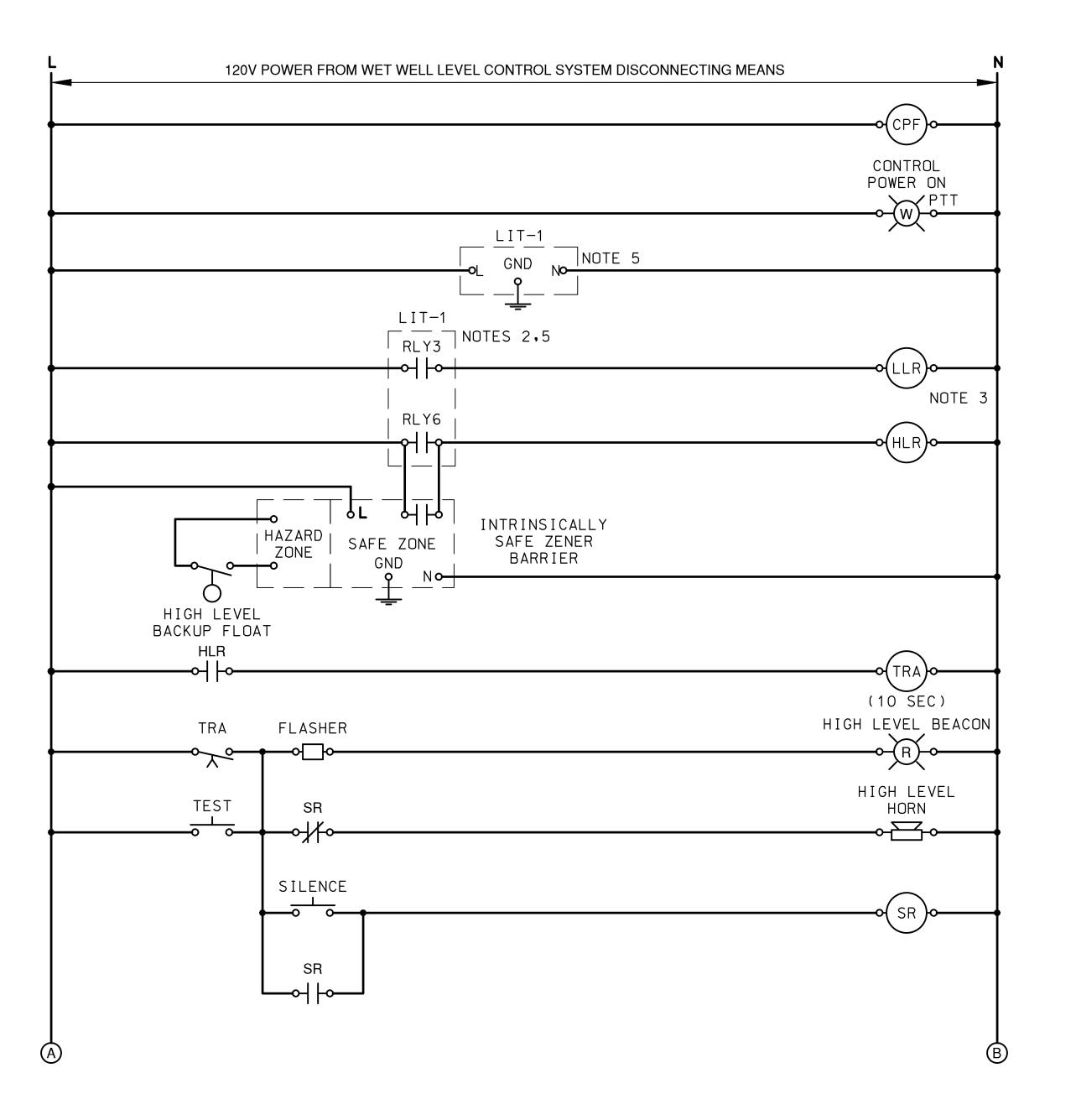
Colliers
Engineering & Design

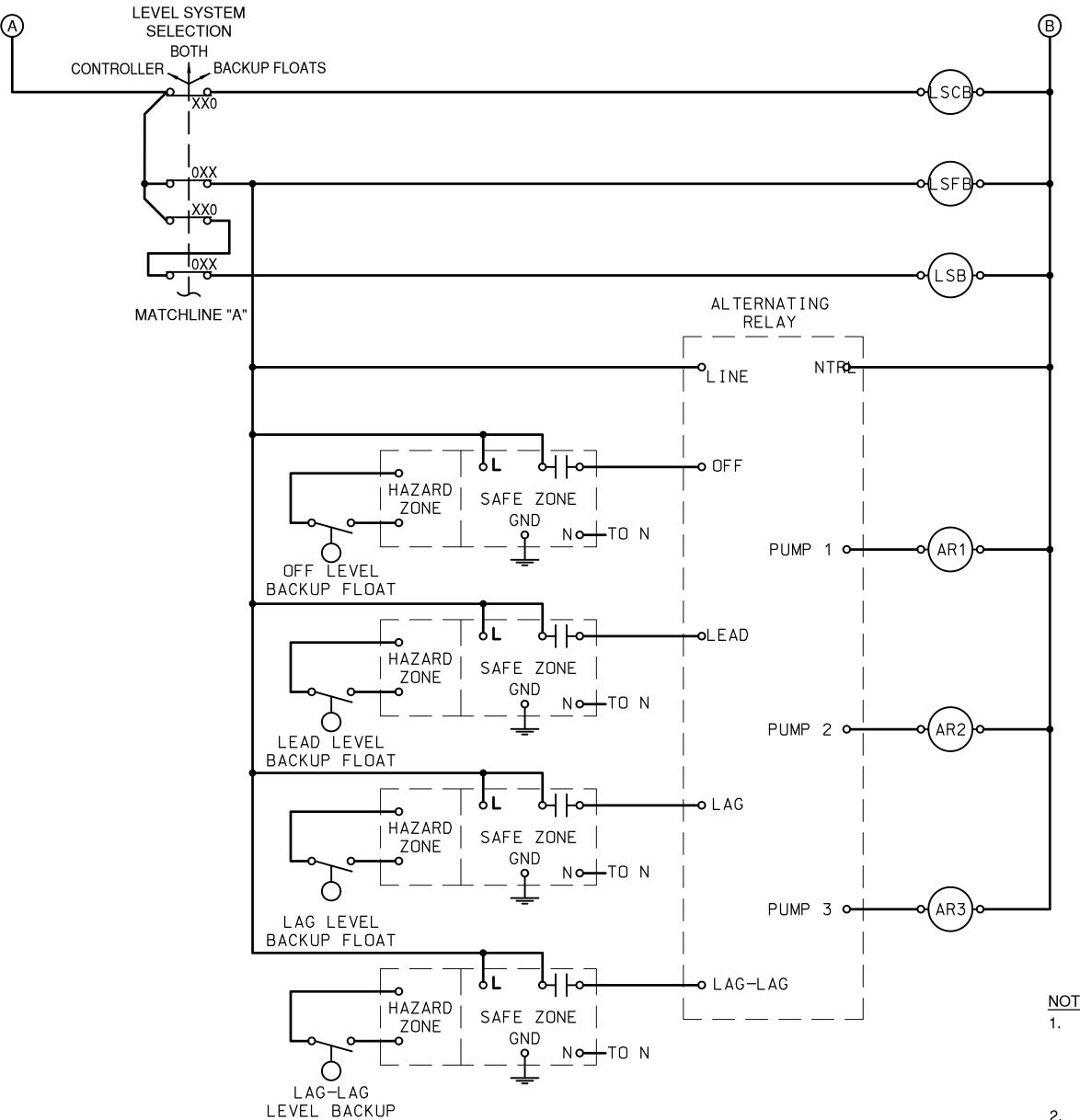
l	SCALE:	DATE:		DRAWN BY:	CHECKED
	AS SHOWN	9/18	3/24	CS	JC
Ш	PROJECT NUMBE	R:	DRAWIN	NG NAME:	
			240114	1 - E6	
١.					

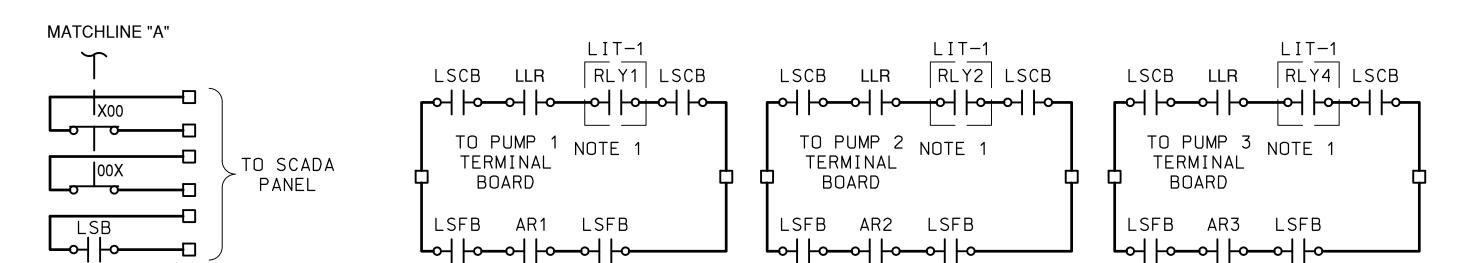
SHEET TITLE:

ELECTRICAL SCHEDULES

E-006





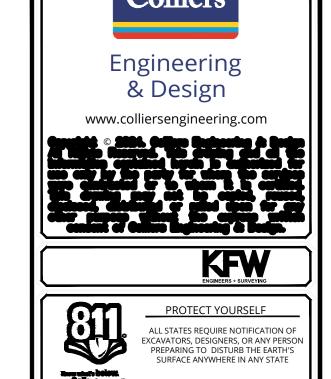


- ALTERNATING RELAY PUMP 1 RUN COMMAND
- AR2 ALTERNATING RELAY PUMP 2 RUN COMMAND
- AR3 ALTERNATING RELAY PUMP 3 RUN COMMAND
- HLR HIGH LEVEL RELAY
- LLR LOW LEVEL RELAY

FLOAT

- LSB LEVEL SELECTION BOTH CONTROLLER AND BACKUP FLOATS RELAY
- LSCB
- LEVEL SELECTION CONTROLLER AND BOTH RELAY
- LSFB LEVEL SELECTION BACKUP FLOATS AND BOTH RELAY SR SILENCE RELAY
- TRA ALARM TIME DELAY RELAY

- 1. LEVEL CONTROLLER OUTPUT RELAYS RLY1, RLY2, RLY 4 AND RLY5 SHALL BE ASSIGNED TO A PUMP FUNCTION AND SHALL BE MANAGED BY A PUMPING ALGORITHM TO ALTERNATE THE LEAD PUMP AND LAGS 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 CONTACT OPEN. UNDER WET WELL LEVEL ALARM CONDITION, THE RESPECTIVE RELAY SHALL ENERGIZED AND CONTACT
- 3. RELAY RLY3 (LOW LEVEL) IS A COMMON RELAY FOR ALL PUMPS INSTALLED. PROVIDE ADDITIONAL GENERAL PURPOSE RELAYS WHERE REQUIRED.
- 4. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.
- 5. 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.
- RELAYS LSCB AND LSFB 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



FOR STATE SPECIFIC DIRECT PHONE NUMBERS

_		V	ISIT: '	WWV	V.CAL	L811	.CON	Л		
DATE DRAWN BY DESCRIPTION										
DRAWN BY	•	•	•	•	•	•	•	•		
DATE									·	
REV										
$\overline{}$										

NORTHLAKE LIFT STATION AND FORCE MAIN

INTERIM REVIEW ONLY Not to be used for construction, bidding,

permit or regulatory approval purposes. This document is released for the purpose of

interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

09/18/2024

Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

,				
SCALE:	DATE:		DRAWN BY:	CHECKED BY:
AS SHOWN	9/18	3/24	CS	JC
PROJECT NUMBE	R:	DRAWIN	NG NAME:	
		240114	1 - E7	

ELECTRICAL CONTROL DIAGRAMS SHEET 1

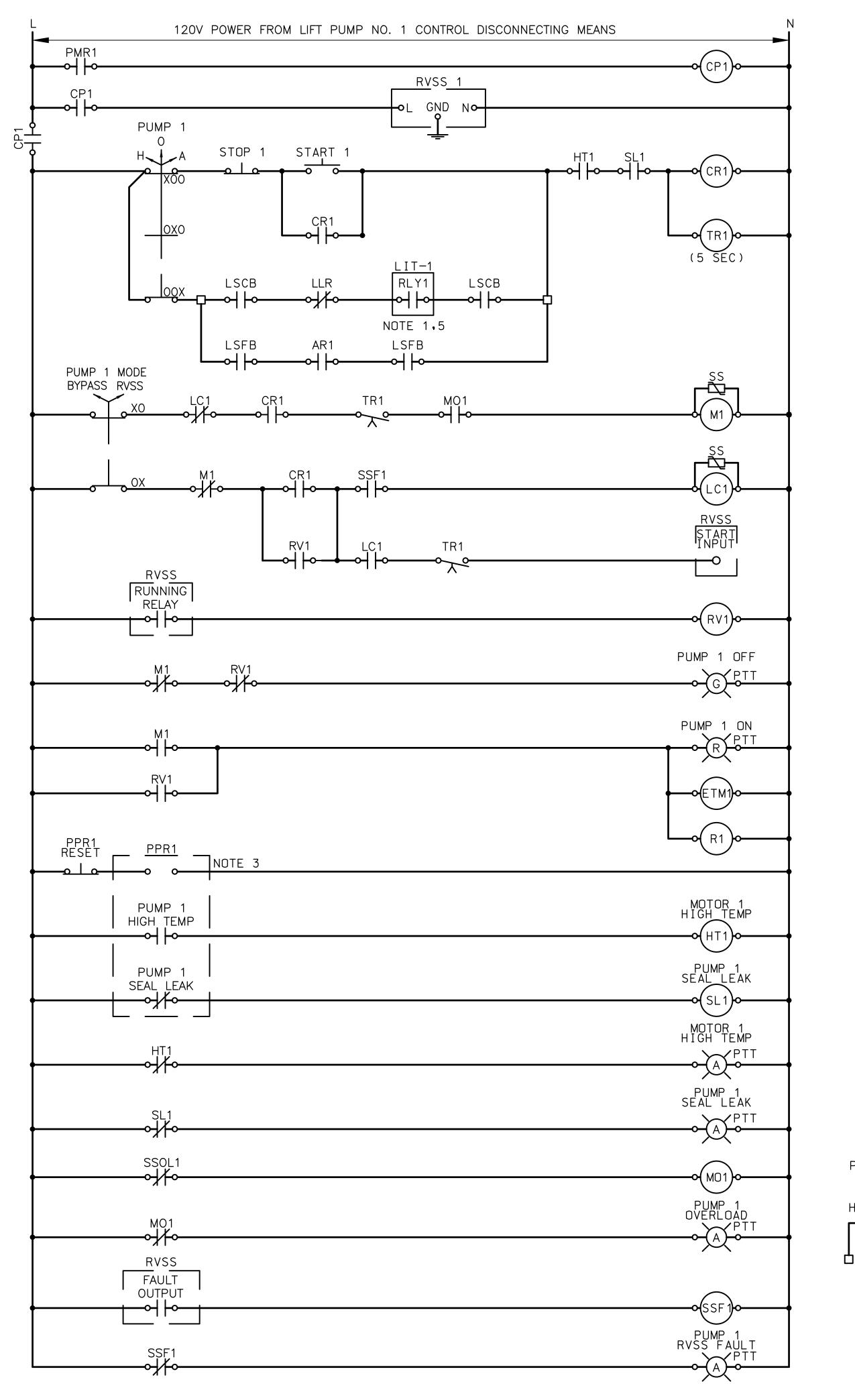
E-007

AND CONTROLLED RESPECTIVELY.

CLEARY ZIMMERMANN **ENGINEERS**

Firm No. F-9357 | ClearyZimmermann.com

LEVEL CONTROL PANEL SCHEMATIC



BYPASS MODE TIMING RELAY CONTROL POWER RELAY CONTROL RELAY ELAPSED TIME METER HIGH TEMPERATURE RELAY RVSS LINE CONTACTOR BYPASS STARTER CONTACTOR MOTOR OVERLOAD RELAY POWER MONITORING RELAY RUN AUXILIARY RELAY

RVSS MODE AUXILIARY RELAY RVT RVSS MODE TIMING RELAY RVSS MODE RUN COMMAND RELAY **RVSS SHORTING CONTACTOR**

SEAL LEAK RELAY

RVSS FAULT RELAY

SOLID STATE OVERLOAD RELAY

TIMING RELAY

1. LEVEL CONTROLLER OUTPUT RELAYS RLY1, RLY2, RLY 4 AND RLY5 ARE ASSIGNED A PUMP FUNCTION AND ARE MANAGED BY A PUMPING ALGORITHM TO ALTERNATE THE LEAD PUMP AND LAGS FOR EACH PUMPING CYCLE.

2. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.

3. PUMP PROTECTION RELAYS SHALL BE PROVIDED FOR EACH PUMP INSTALLED. AT A MINIMUM PROVIDE PROTECTION AGAINST MOTOR HIGH TEMPERATURE AND PUMP SEAL LEAK.

4. LEVEL SENSOR PROBES FOR PUMP CONTROL ARE NOT ALLOWED.

5. 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.

6. PUMP PROTECTION RELAY CONTACT LOGIC SHALL BE AS FOLLOW:

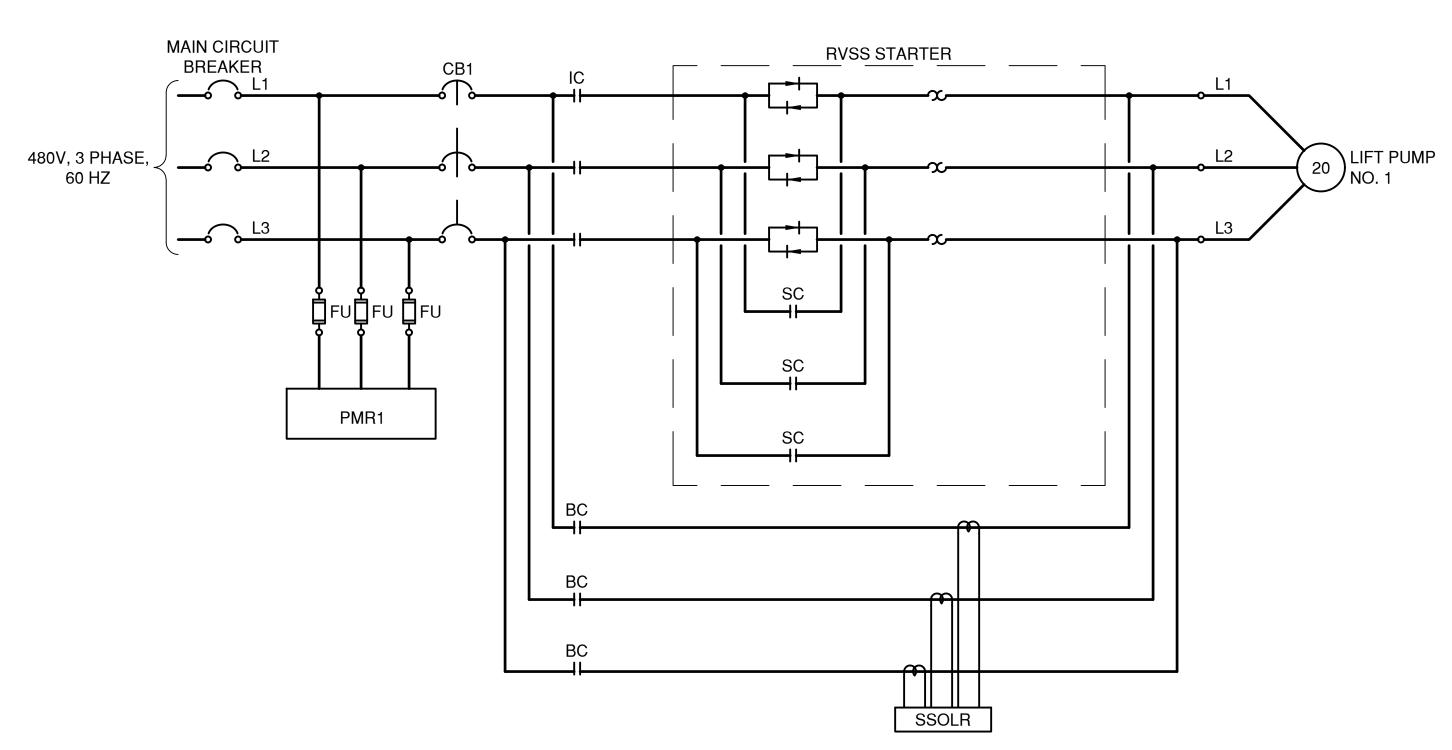
UNDER NORMAL CONDITIONS N.O. CONTACT HIGH TEMP

CLOSES AND N.C. SEAL LEAK CONTACT REMAINS CLOSED.

UNDER MOTOR HIGH TEMP CONDITION, THE N.O. HIGH TEMP CONTACT OPENS.

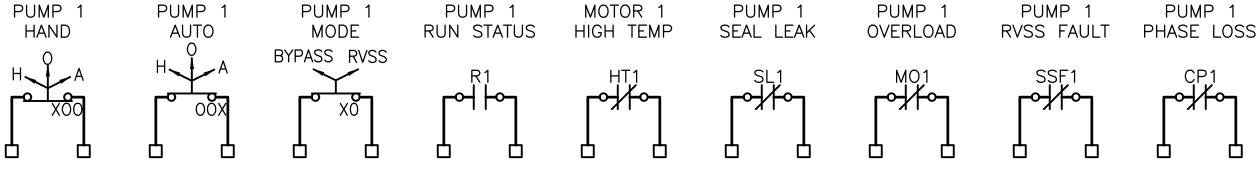
6.B. UNDER PUMP SEAL LEAK CONDITION, THE N.C. SEAL LEAK CONTACT OPENS.

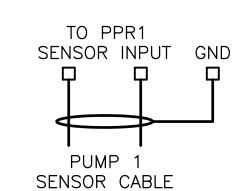
7. SOFT STARTER FAIL RELAY SHALL BE CLOSED UNDER NORMAL CONDITION AND SHALL OPEN UNDER SOFT STARTER FAIL CONDITION.



LIFT PUMP NO. 1 STARTER SCHEMATIC

DISCRETE SIGNALS FOR SCADA SYSTEM







Colliers Engineering & Design www.colliersengineering.com **KFW**

PROTECT YOURSELF ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSO PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE Terre uner-bolott. Call before you de FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of: CONNER STURDIVANT, P.E., PEng. 09/18/2024 Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

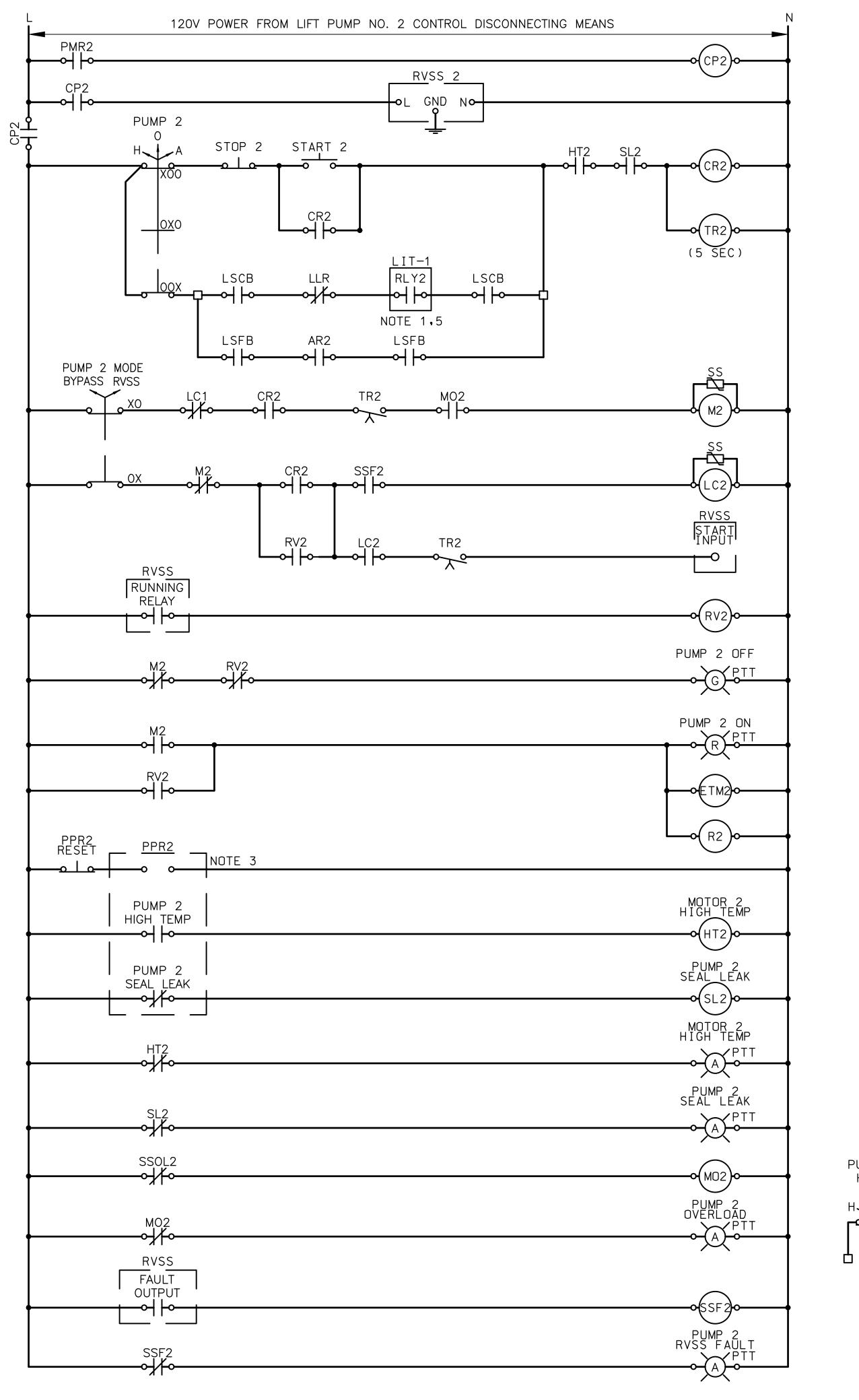
Colliers Engineering & Design

9/18/24

ELECTRICAL CONTROL DIAGRAMS SHEET 2

E-008

LIFT PUMP NO. 1 CONTROL SCHEMATIC



BPT BYPASS MODE TIMING RELAY
CP CONTROL POWER RELAY
CR CONTROL RELAY
ETM ELAPSED TIME METER
HT HIGH TEMPERATURE RELAY
LC RVSS LINE CONTACTOR
M BYPASS STARTER CONTACTOR

MO MOTOR OVERLOAD RELAY

PMR POWER MONITORING RELAY

R RUN AUXILIARY RELAY

RV RVSS MODE AUXILIARY RELAY

RVT RVSS MODE TIMING RELAY

RVC RVSS MODE RUN COMMAND RELAY
SC RVSS SHORTING CONTACTOR
SL SEAL LEAK RELAY

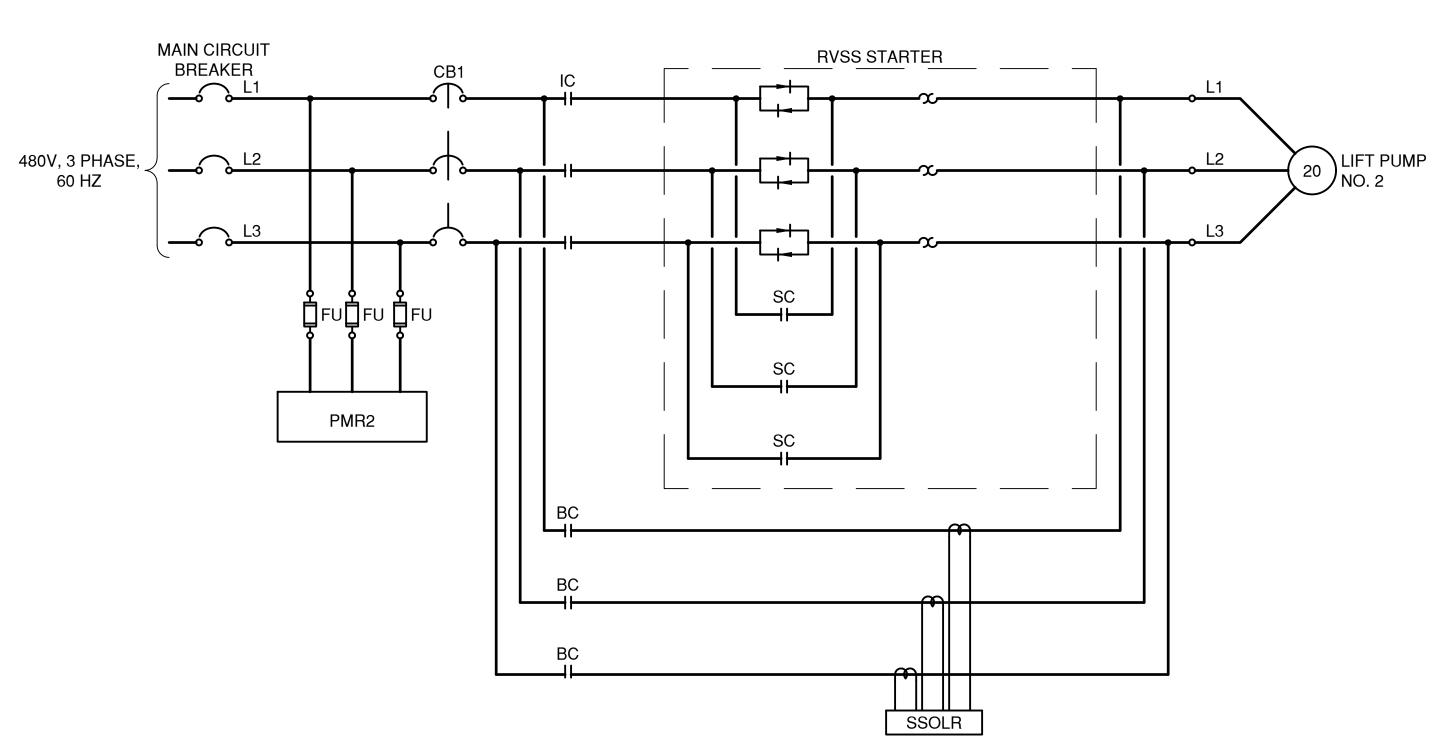
SSF RVSS FAULT RELAY
SSOL SOLID STATE OVERLOAD RELAY

TR TIMING RELAY

- 1. LEVEL CONTROLLER OUTPUT RELAYS RLY1, RLY2, RLY 4 AND RLY5 ARE ASSIGNED A PUMP FUNCTION AND ARE MANAGED BY A PUMPING ALGORITHM TO ALTERNATE THE LEAD PUMP AND LAGS FOR EACH PUMPING CYCLE.
- 2. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.
- 3. PUMP PROTECTION RELAYS SHALL BE PROVIDED FOR EACH PUMP INSTALLED. AT A MINIMUM PROVIDE PROTECTION AGAINST MOTOR HIGH TEMPERATURE AND PUMP SEAL LEAK.
- 4. LEVEL SENSOR PROBES FOR PUMP CONTROL ARE NOT ALLOWED.
- 5. 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.
- 6. PUMP PROTECTION RELAY CONTACT LOGIC SHALL BE AS FOLLOW:
 - 6.A. UNDER NORMAL CONDITIONS N.O. CONTACT HIGH TEMP CLOSES AND N.C. SEAL LEAK CONTACT REMAINS CLOSED.

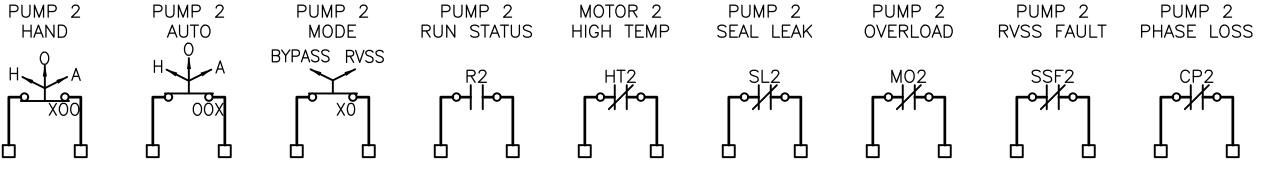
UNDER MOTOR HIGH TEMP CONDITION, THE N.O. HIGH TEMP CONTACT OPENS.

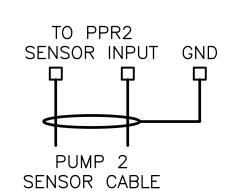
- 6.B. UNDER PUMP SEAL LEAK CONDITION, THE N.C. SEAL LEAK CONTACT OPENS.
- 7. SOFT STARTER FAIL RELAY SHALL BE CLOSED UNDER NORMAL CONDITION AND SHALL OPEN UNDER SOFT STARTER FAIL CONDITION.



LIFT PUMP NO. 2 STARTER SCHEMATIC

DISCRETE SIGNALS FOR SCADA SYSTEM







Colliers

Engineering & Design

www.colliersengineering.com

www.colliersengineering.com

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS

VISIT: WWW.CALL811.COM

INTERIM REVIEW ONLY

Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

Engineer of Record
99971

TEPPE License No.
09/18/2024

Date

Cleary Zimmermann Engineers, Inc.

Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

Colliers

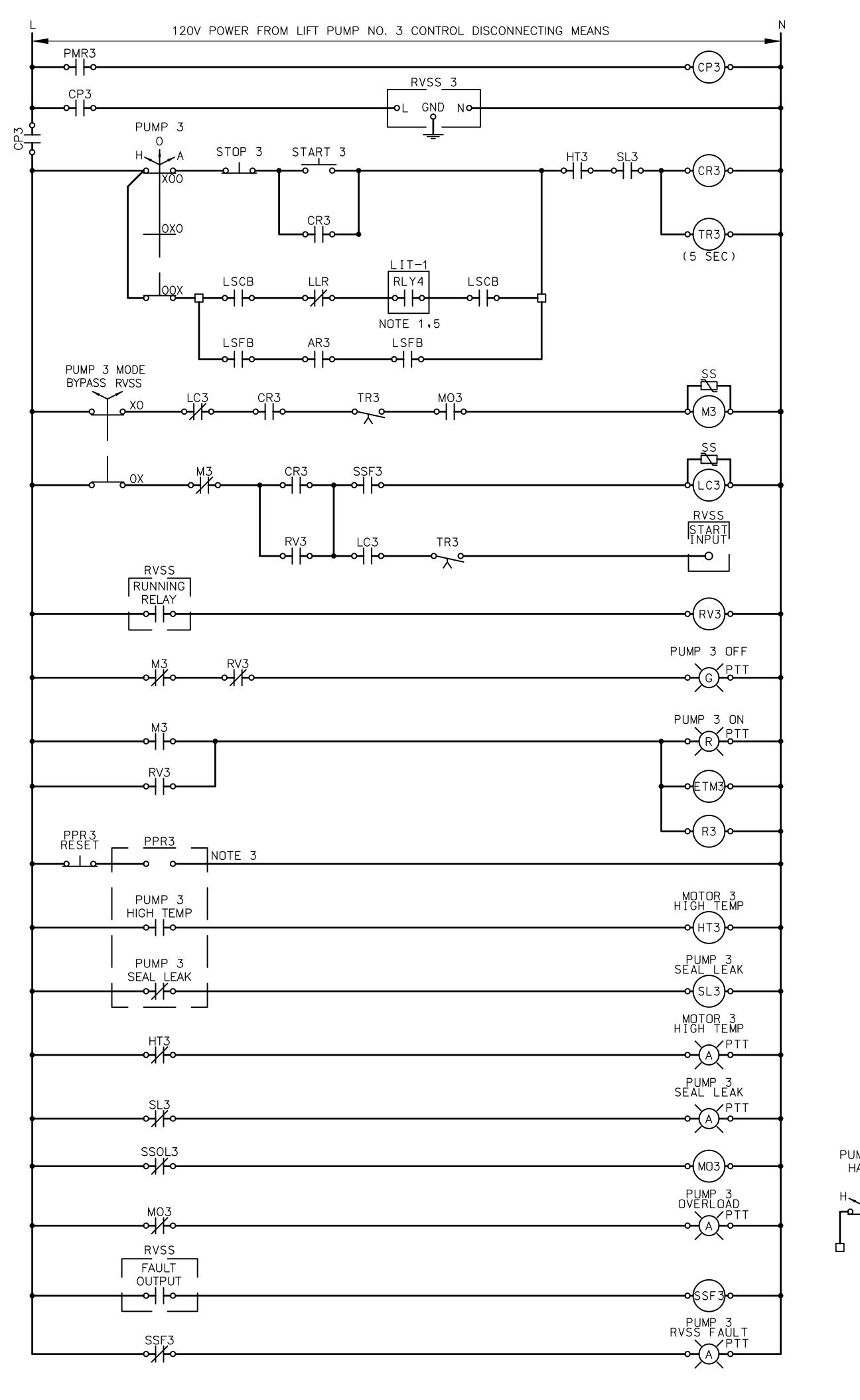
Engineering
& Design

SCALE: DATE: DRAWN BY: CHECKED BY:
AS SHOWN 9/18/24 CS JC

PROJECT NUMBER: DRAWING NAME:
240114 - E9

ELECTRICAL CONTROL
DIAGRAMS SHEET 3

E-009



BYPASS MODE TIMING RELAY CONTROL POWER RELAY CONTROL RELAY ELAPSED TIME METER HIGH TEMPERATURE RELAY **RVSS LINE CONTACTOR** BYPASS STARTER CONTACTOR MOTOR OVERLOAD RELAY POWER MONITORING RELAY RUN AUXILIARY RELAY

SEAL LEAK RELAY

TIMING RELAY

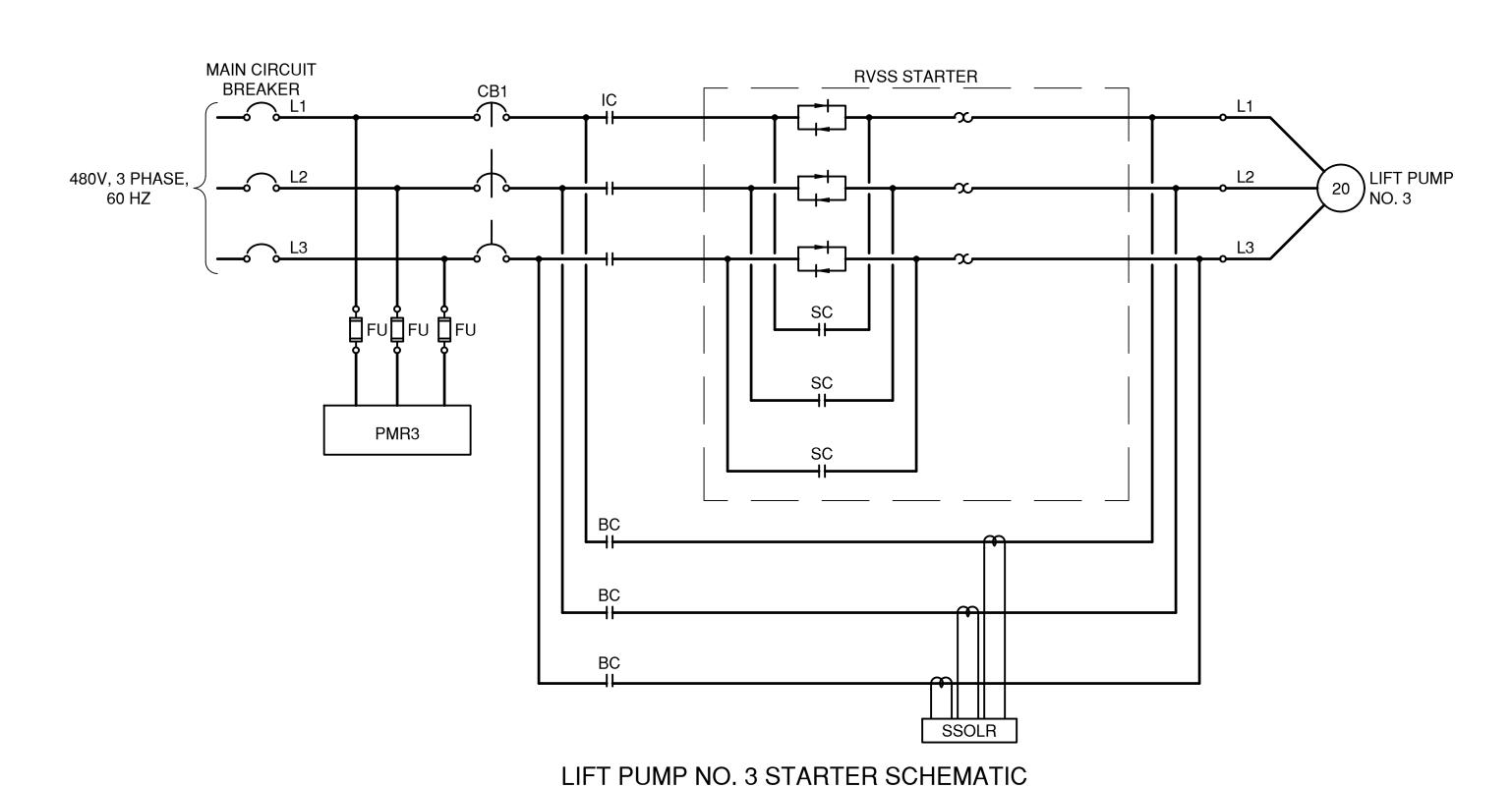
RVSS MODE AUXILIARY RELAY RVT RVSS MODE TIMING RELAY RVSS MODE RUN COMMAND RELAY **RVSS SHORTING CONTACTOR**

RVSS FAULT RELAY SOLID STATE OVERLOAD RELAY

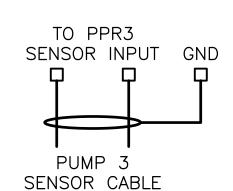
- 1. LEVEL CONTROLLER OUTPUT RELAYS RLY1, RLY2, RLY 4 AND RLY5 ARE ASSIGNED A PUMP FUNCTION AND ARE MANAGED BY A PUMPING ALGORITHM TO ALTERNATE THE LEAD PUMP AND LAGS FOR EACH PUMPING CYCLE.
- 2. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.
- 3. PUMP PROTECTION RELAYS SHALL BE PROVIDED FOR EACH PUMP INSTALLED. AT A MINIMUM PROVIDE PROTECTION AGAINST MOTOR HIGH TEMPERATURE AND PUMP SEAL LEAK.
- 4. LEVEL SENSOR PROBES FOR PUMP CONTROL ARE NOT ALLOWED.
- 5. 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.
- 6. PUMP PROTECTION RELAY CONTACT LOGIC SHALL BE AS FOLLOW:
 - UNDER NORMAL CONDITIONS N.O. CONTACT HIGH TEMP CLOSES AND N.C. SEAL LEAK CONTACT REMAINS CLOSED.

UNDER MOTOR HIGH TEMP CONDITION, THE N.O. HIGH TEMP CONTACT OPENS.

- 6.B. UNDER PUMP SEAL LEAK CONDITION, THE N.C. SEAL LEAK CONTACT OPENS.
- 7. SOFT STARTER FAIL RELAY SHALL BE CLOSED UNDER NORMAL CONDITION AND SHALL OPEN UNDER SOFT STARTER FAIL CONDITION.



DISCRETE SIGNALS FOR SCADA SYSTEM PUMP 3 RUN STATUS OVERLOAD RVSS FAULT MODE PHASE LOSS HAND SEAL LEAK HIGH TEMP BYPASS RVSS



CLEARY ZIMMERMANN **ENGINEERS** Firm No. F-9357 | ClearyZimmermann.com

NORTHLAKE LIFT STATION AND FORCE MAIN

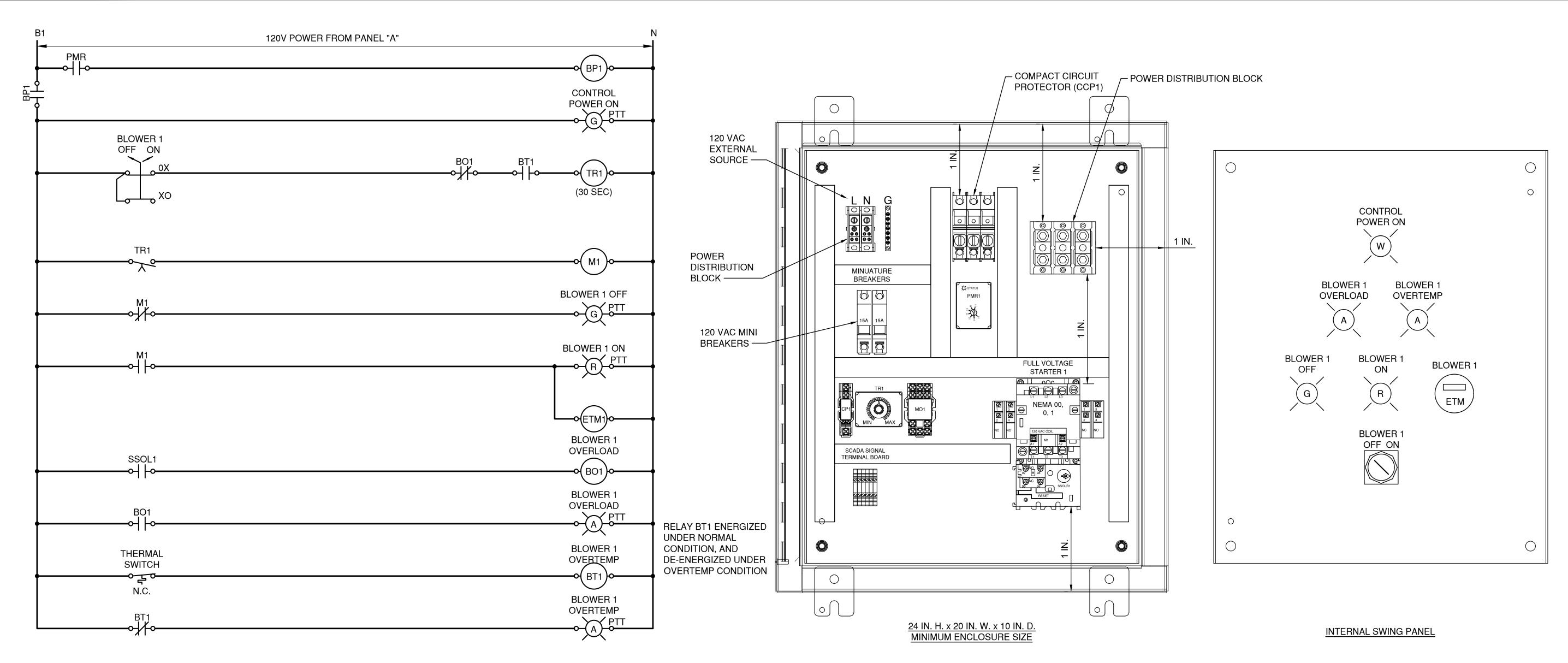
	Colliers
Er	ngineering & Design

9/18/24

ELECTRICAL CONTROL DIAGRAMS SHEET 4

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION

E-010



ODOR CONTROL BLOWER CONTROL SCHEMATIC

NOTES:

ELECTRICAL ABBREVIATIONS

BLOWER FULL VOLTAGE STARTER

COMPACT CIRCUIT PROTECTOR

BLOWER OVER TEMPERATURE RELAY

BLOWER OVERLOAD RELAY

CONTROL POWER RELAY

ELAPSED TIME METER

STARTER CONTACTOR

TIMING RELAY

MOTOR OVERLOAD RELAY

PHASE MONITORING RELAY
COIL SURGE SUPPRESSOR

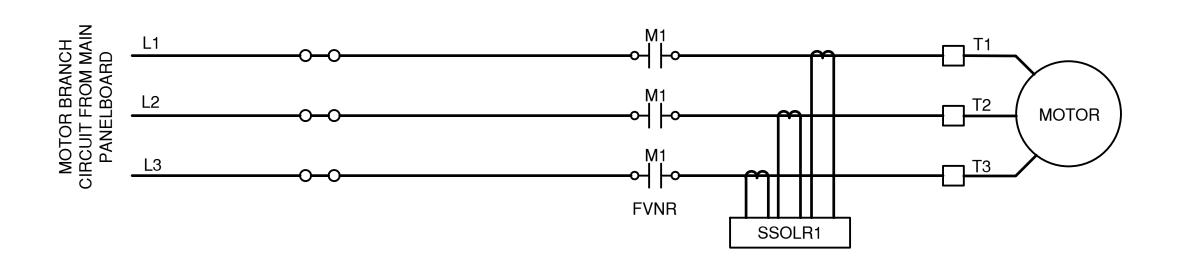
SOLID STATE OVERLOAD RELAY

ВО

TR

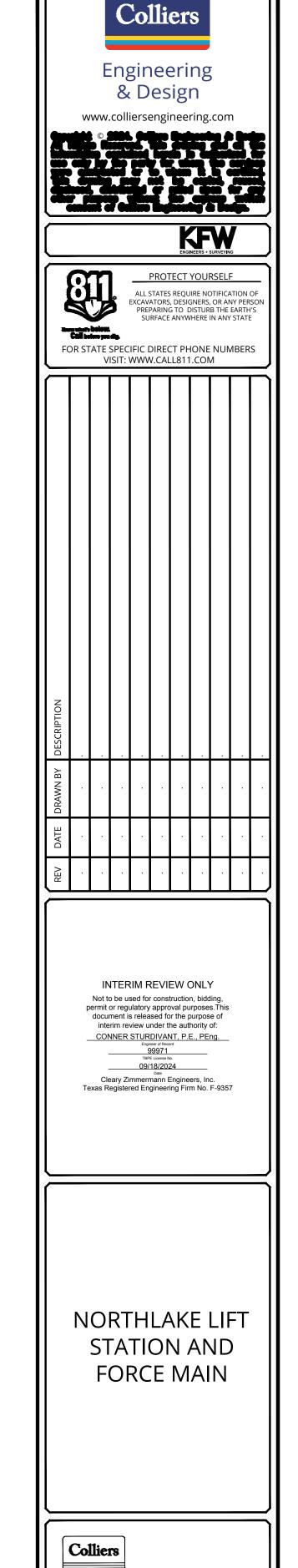
- 1. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.
- 2. THE BLOWER INTERNAL THERMAL SWITCH IS CLOSED UNDER NORMAL CONDITION AND SHALL OPEN UNDER BLOWER OVERTEMPERATURE CONDITION.

ODOR CONTROL UNIT PANEL TYPICAL LAYOUT



ODOR CONTROL BLOWER THREE LINE DIAGRAM





Colliers	
Engineering & Design	

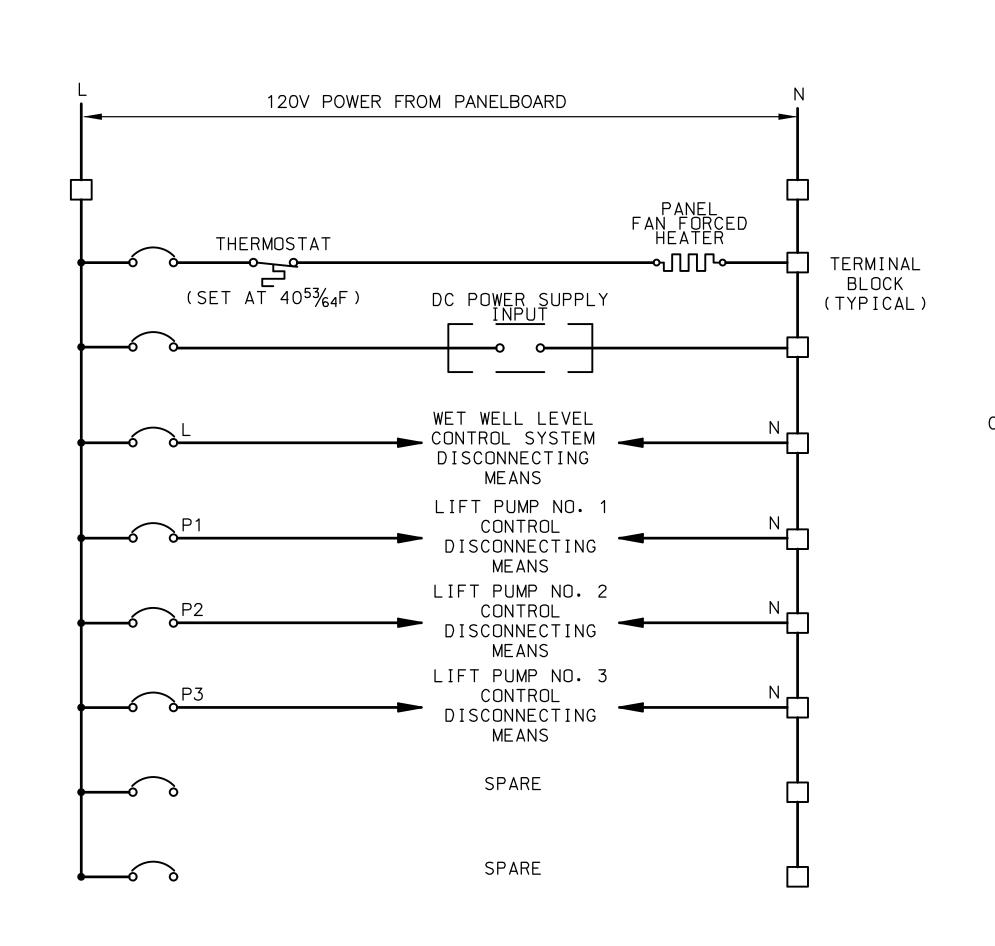
AS SHOWN 9/18/24 CS JC

PROJECT NUMBER: DRAWING NAME:
240114 - E11

ELECTRICAL CONTROL DIAGRAMS SHEET 5

E-011

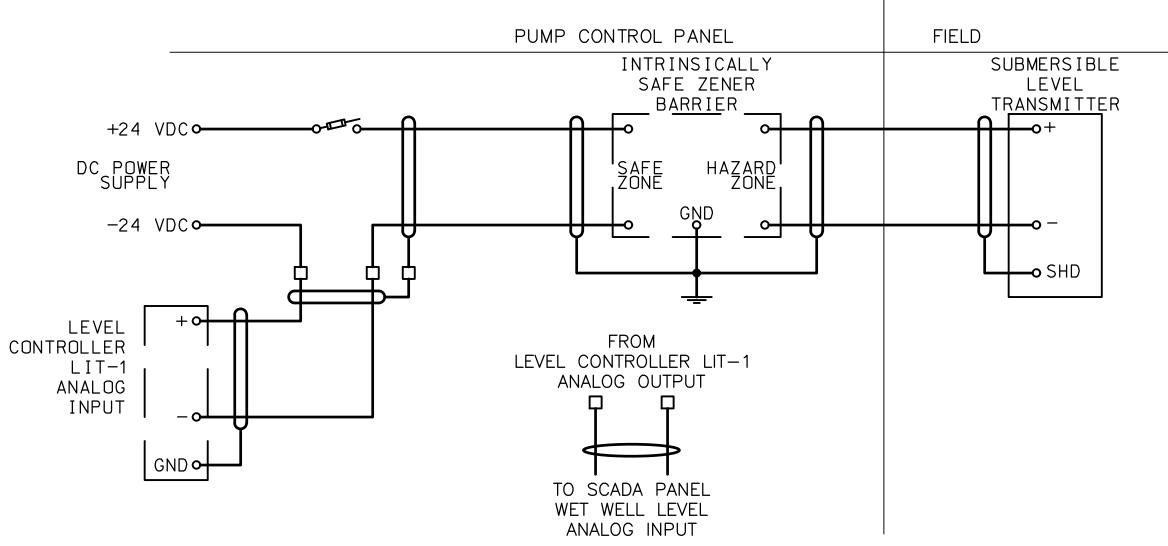
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



PUMP CONTROL PANEL CONTROL POWER DISTRIBUTION SCHEMATIC

PROVIDE ONE MINIATURE BREAKER FOR DISCONNECTING MEANS OF

THE CONTROL POWER WITHIN EACH PUMP CONTROL PANEL.

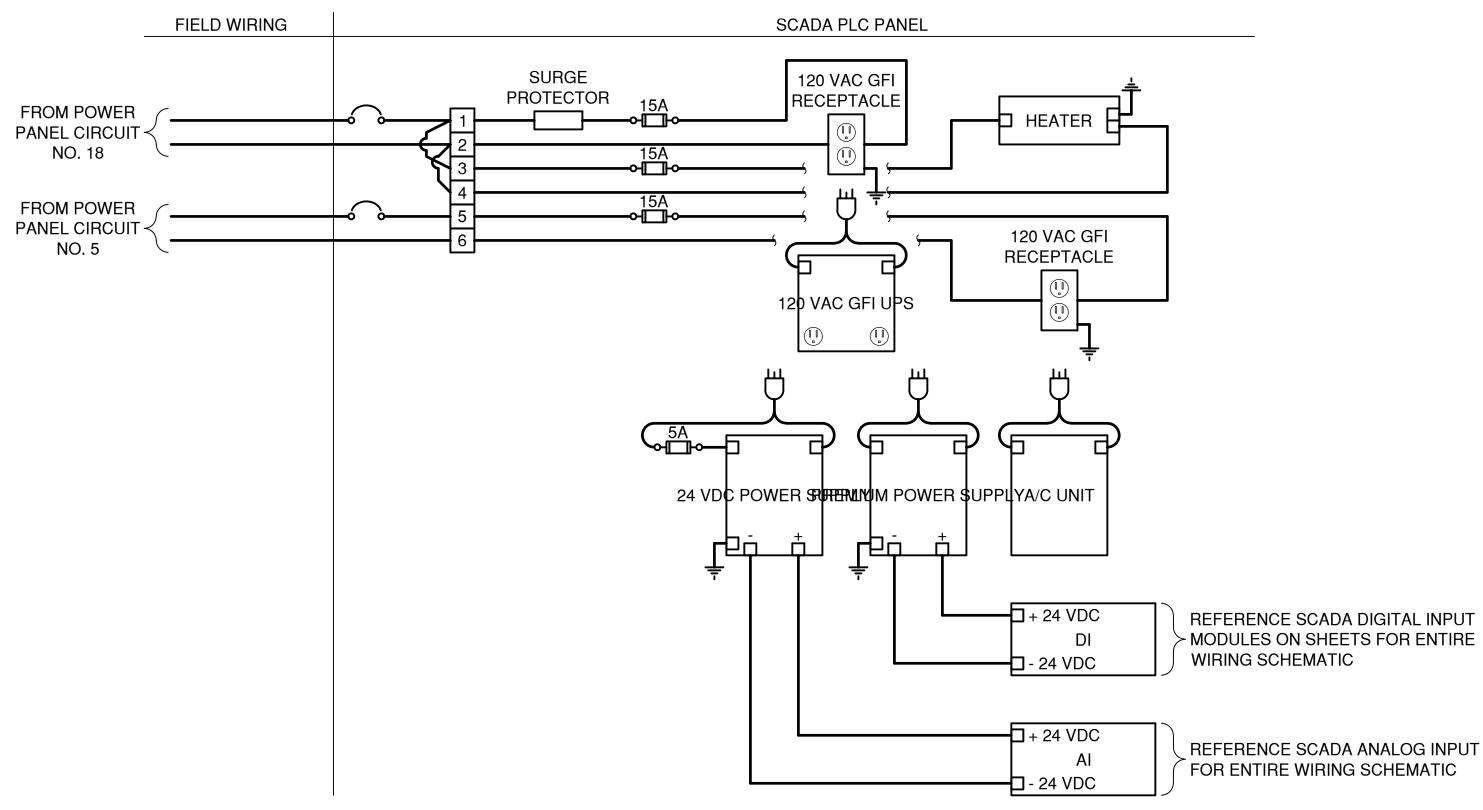


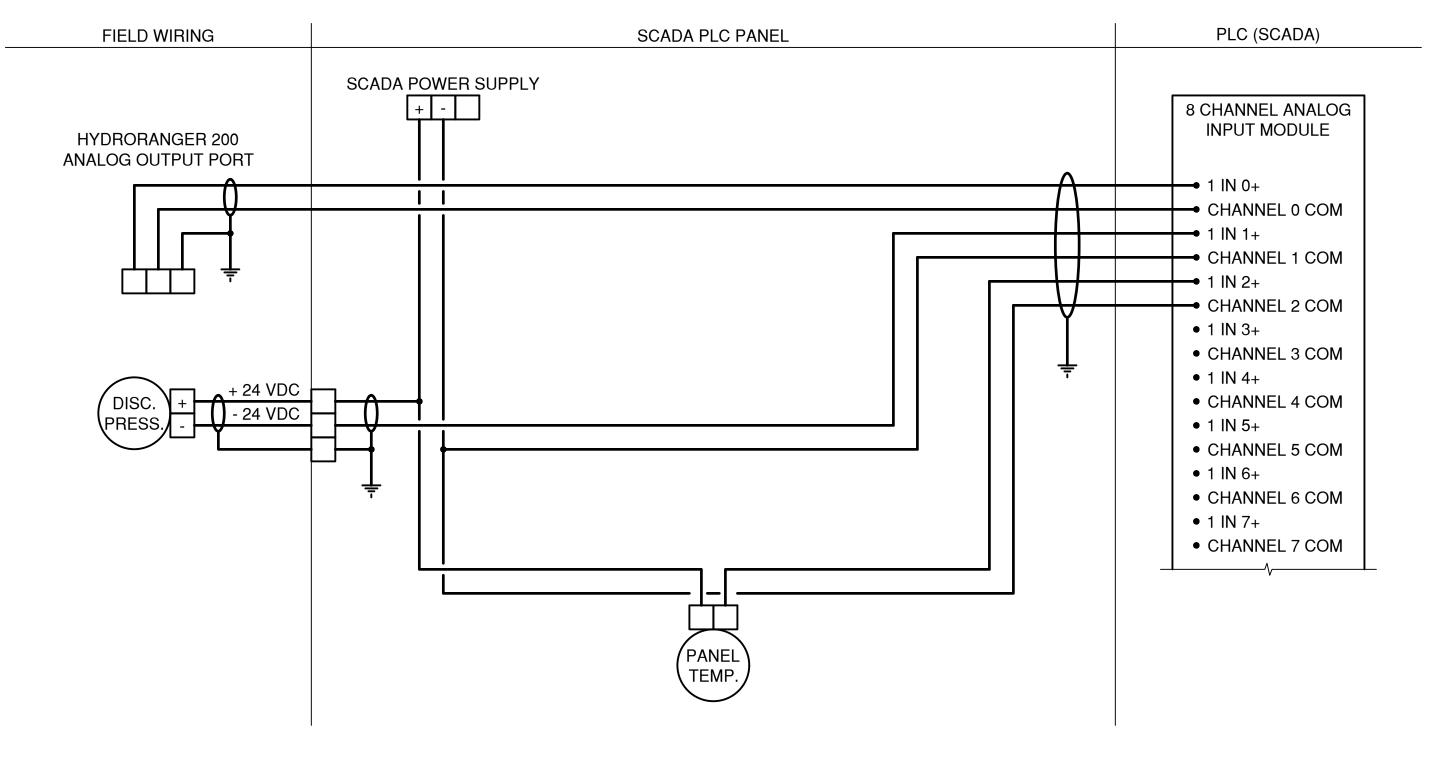
WET WELL LEVEL TRANSMITTER INSTRUMENT WIRING SCHEMATIC

120V POWER FROM UPS WITH BATTERY BACKUP AT SCADA PLC PANEL LIFT STATION INPUTS LIFT PUMP NO. 1 DIGITAL INPUTS LIFT PUMP NO. 2 🕳 DIGITAL INPUTS LIFT PUMP NO. 3 — DIGITAL INPUTS

SIGNAL POWER DISTRIBUTION

PROVIDE ONE MINIATURE BREAKER FOR DISCONNECTING MEANS OF THE DIGITAL CONTRLS WITHIN SCADA PANEL. AN ADDITIONAL MINIATURE BREAKER SHALL BE ADDED FOR EACH ADDITIONAL PUMP INSTALLED.





CLEARY ENGINEERS

ELECTRICAL CONTROL DIAGRAMS SHEET 6

9/18/24

Colliers

Engineering & Design

Firm No. F-9357 | ClearyZimmermann.com

REFERENCE SCADA ANALOG INPUT SCADA ANALOG INPUT SCADA POWER DISTRIBUTION

PROVIDE MINIATURE BREAKERS FOR DISCONNECTING MEANS OF THE

CONTROL POWER WITHIN SCADA PANEL.

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

E-012

Colliers

Engineering

& Design

KFW

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS
VISIT: WWW.CALL811.COM

INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of

interim review under the authority of: CONNER STURDIVANT, P.E., PEng.

09/18/2024

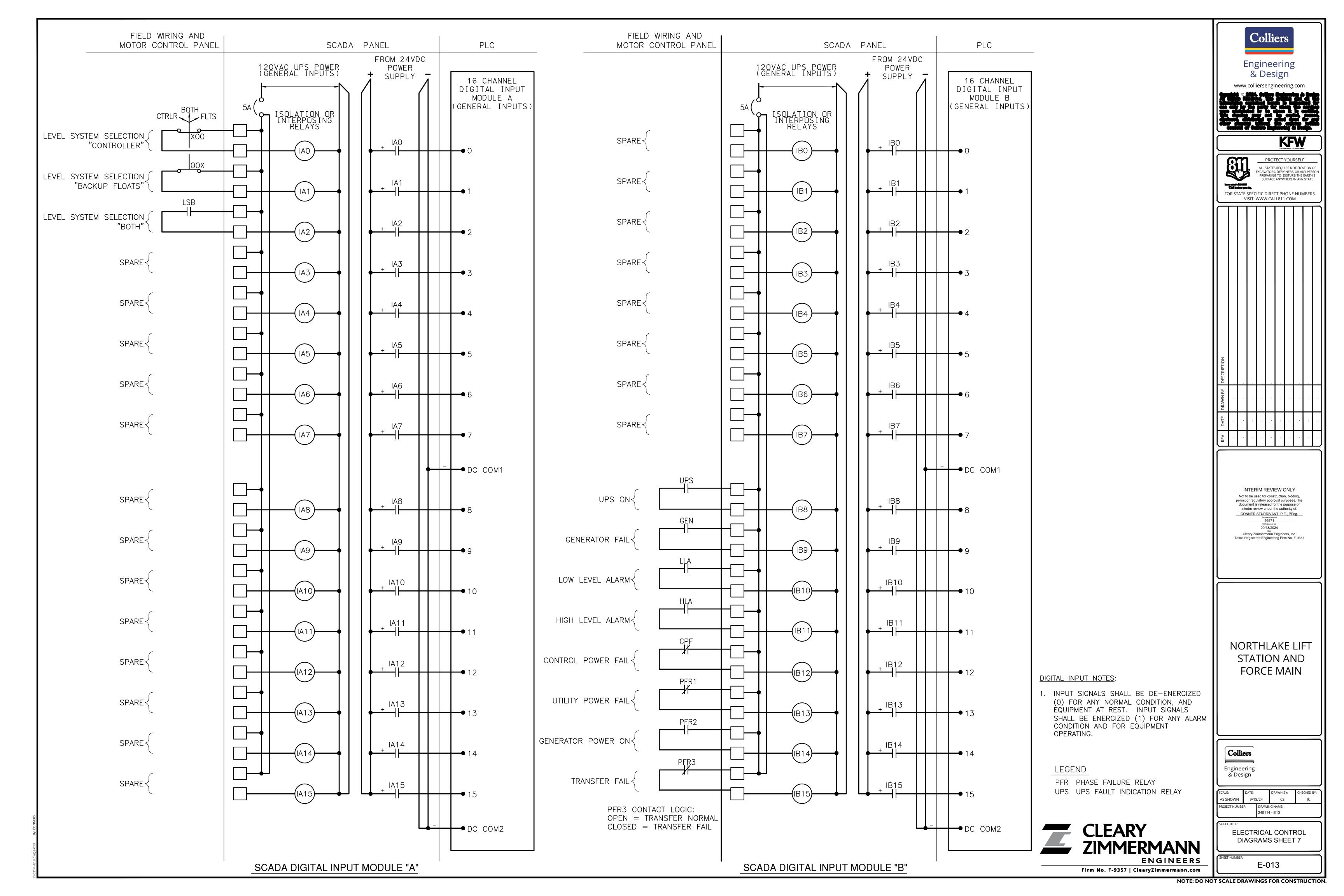
Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

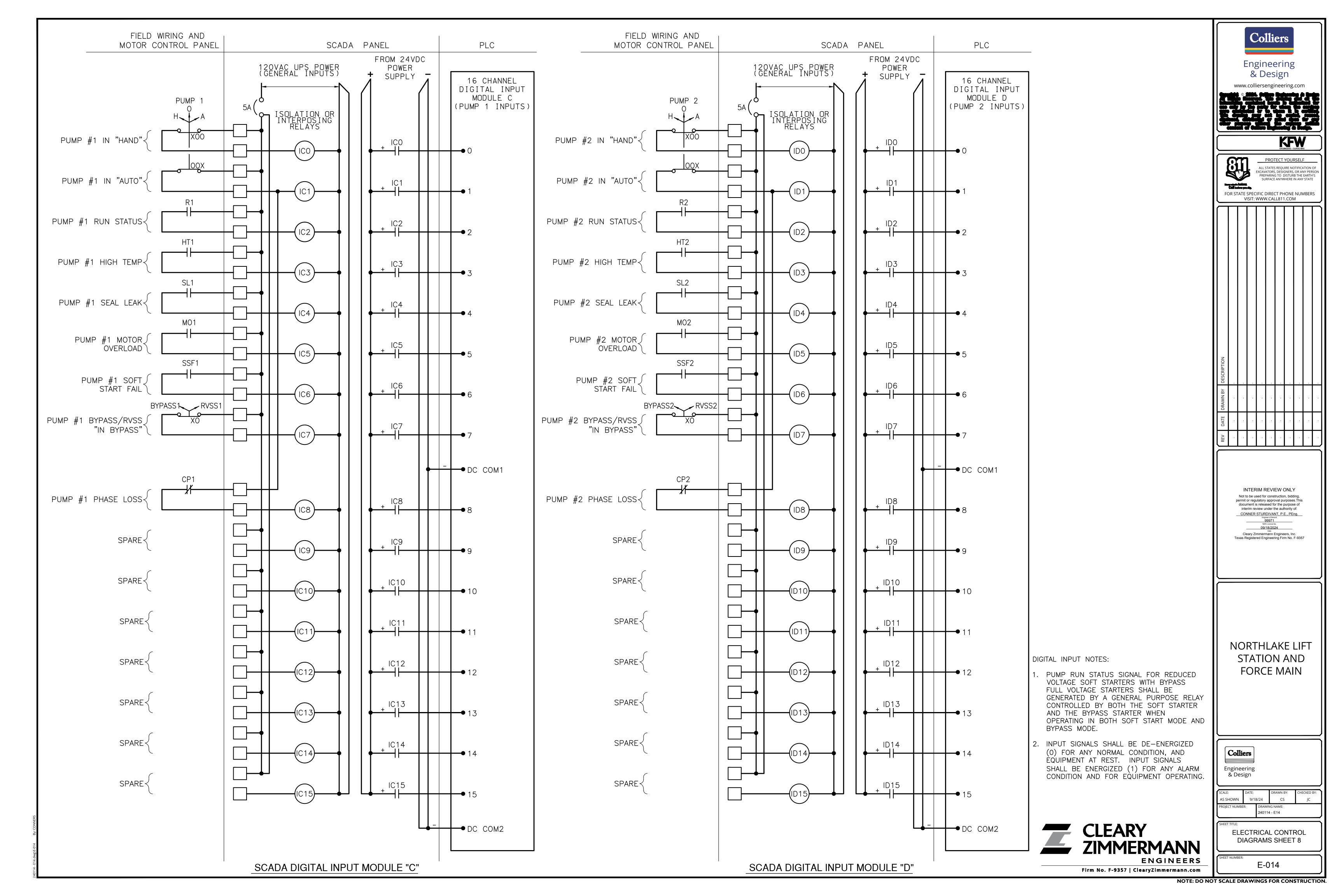
NORTHLAKE LIFT

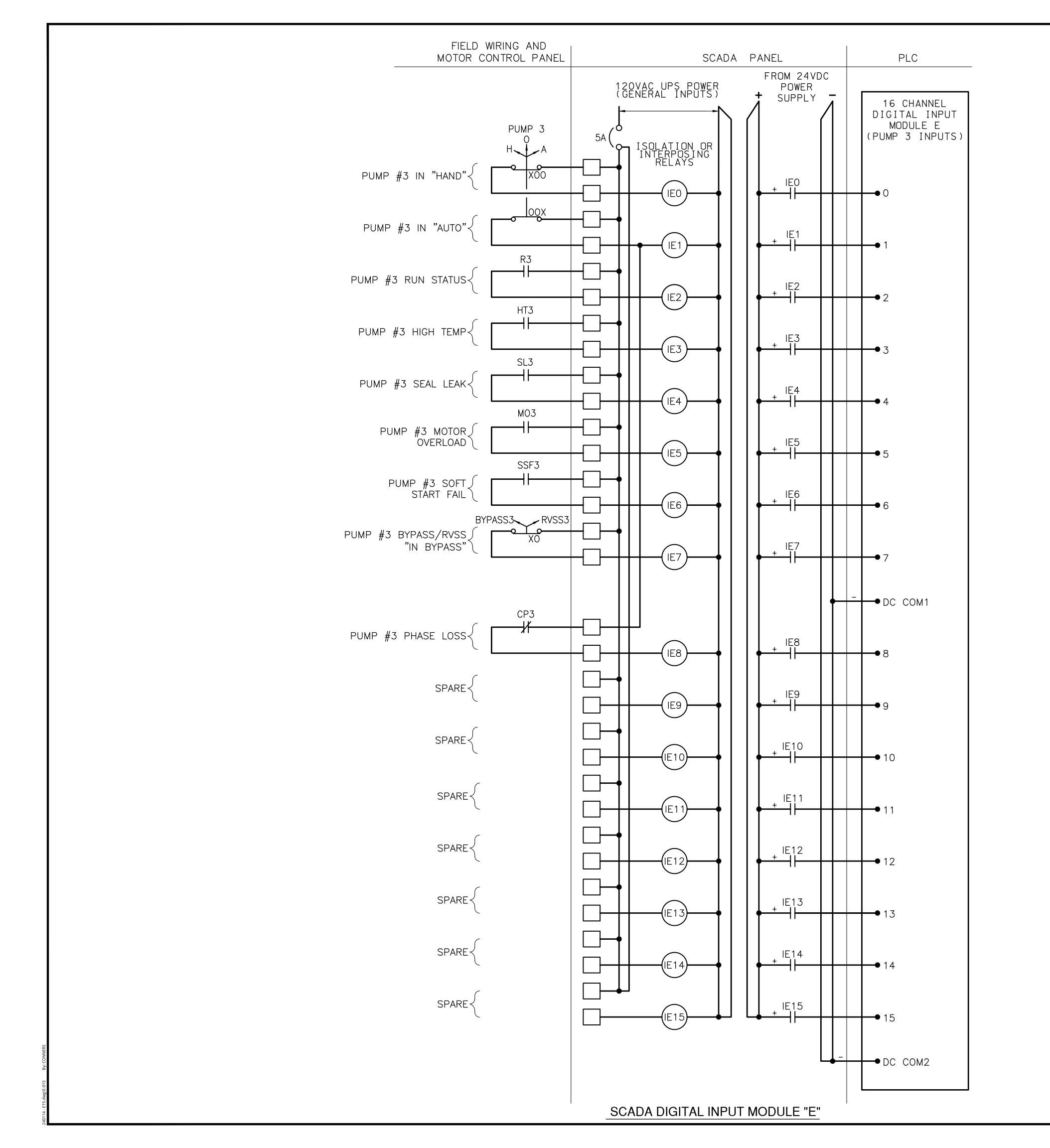
STATION AND

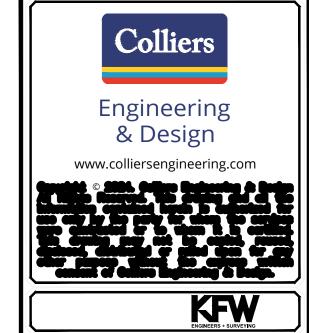
FORCE MAIN

There what a bolous. Call before you dip.









PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

 REV
 DATE
 DRAWN BY
 DESCRIPTION

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

 ...
 ...
 ...
 ...

INTERIM REVIEW ONLY

Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

Engineer of Record

99971

TBPE LIJERIE NO.

09/18/2024

Cleary Zimmermann Engineers, Inc.

Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

Colliers

Engineering
& Design

SCALE: DATE: DRAWN BY: CHECKED B'
AS SHOWN 9/18/24 CS JC

PROJECT NUMBER: DRAWING NAME:
240114 - E15

ELECTRICAL CONTROL DIAGRAMS SHEET 9

MBER: **E-015**

ENGINEERS
Firm No. F-9357 | ClearyZimmermann.com

DIGITAL INPUT NOTES:

1. PUMP RUN STATUS SIGNAL FOR

2. INPUT SIGNALS SHALL BE

REDUCED VOLTAGE SOFT STARTERS
WITH BYPASS FULL VOLTAGE STARTERS

SHALL BE GENERATED BY A GENERAL PURPOSE RELAY CONTROLLED BY BOTH THE SOFT STARTER AND THE BYPASS STARTER WHEN OPERATING IN

BOTH SOFT START MODE AND BYPASS

DE-ENERGIZED (0) FOR ANY NORMAL

CONDITION, AND EQUIPMENT AT REST.

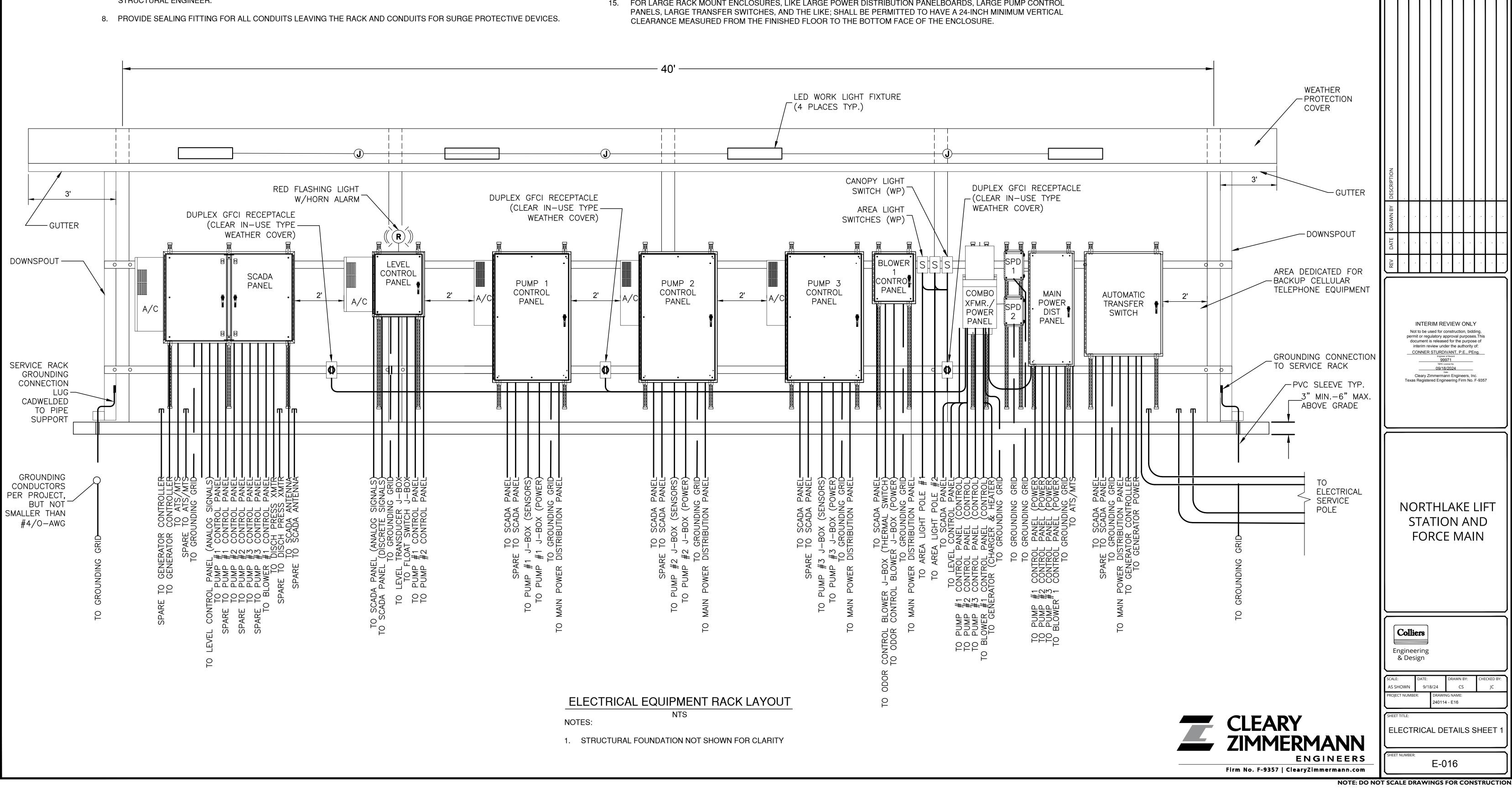
INPUT SIGNALS SHALL BE ENERGIZED

(1) FOR ANY ALARM CONDITION AND FOR EQUIPMENT OPERATING.

CLEARY

NOTES: 1. ALL ENCLOSURES SHALL BE PAD-LOCKABLE. PUMP CONTROL PANEL SHALL BE SINGLE DOOR, WALL MOUNTED TYPE. INSTALL ONE PUMP CONTROL PANEL FOR EACH PUMP INSTALLED. LEVEL CONTROL PANEL SHALL BE COMMON TO ALL PUMP CONTROL PANELS FOR AUTOMATIC CONTROL. 2. ALL MOUNTING HARDWARE AND STRUT CHANNEL SHALL BE OF STAINLESS STEEL 316. ALL ENCLOSURES SHALL BE NEMA 4X, STAINLESS STEEL 316. PUMP CONTROL PANEL AND SCADA ENCLOSURES SHALL ALSO BE WHITE ENAMEL COATED ON EXTERIOR. 3. CONDUIT PENETRATION TO ALL ENCLOSURES AND JUNCTION BOXES, REGARDLESS OF LOCATION, SHALL BE MADE AT THE BOTTOM FACE ONLY. CONDUIT PENETRATIONS ON BACK, SIDES OR TOP SHALL BE PROHIBITED. 4. ALL SERVICE DISCONNECT SWITCHES SHALL BE NEMA RATED AND BE ENCLOSED IN NEMA 4X, STAINLESS STEEL 316 ENCLOSURE. 5. SERVICE RACK STRUTS SHALL BE OF STAINLESS STEEL 316 1-1/2 INCH MINIMUM, AND SHALL BE MOUNTED ON 4-INCH X 1/2-INCH THICK STRUCTURAL STEEL TUBE. ALL STRUT CHANNEL ENDS SHALL BE PROTECTED WITH END CAPS. 6. THERE SHALL BE 6" MINIMUM SPACING BETWEEN EQUIPMENT MOUNTED ON THE RACK. WHEN PANEL MOUNT CLIMATE CONTROL UNITS ARE INSTALLED, THERE SHALL BE A MINIMUM SPACE CLEARANCE OF 24 INCHES. 7. ELECTRIC RACK SHALL HAVE SUPPORT COLUMNS EVERY 10 FEET, UNLESS OTHERWISE DETERMINED BY THE STRUCTURAL ENGINEER. 8. PROVIDE SEALING FITTING FOR ALL CONDUITS LEAVING THE RACK AND CONDUITS FOR SURGE PROTECTIVE DEVICES.

- 9. PROVIDE A TYPE 2 SURGE PROTECTIVE DEVICE IN A SEPARATE NEMA 4X, STAINLESS STEEL 316, WHITE ENAMELED COATED ENCLOSURE ADJACENT TO THE INCOMING SERVICE DISCONNECT SWITCH.
- 10. ALL LIFT STATIONS SHALL BE PROVIDED WITH A STAND-BY GENERATOR WITH AUTOMATIC TRANSFER SWITCH SIZED TO POWER ALL THE LIFT STATION LOAD, INCLUDING STANDBY PUMPS.
- 11. ALL ELECTRICAL COMPONENTS SHALL BE NEMA RATED.
- 12. THE RESISTANCE TO GROUND SHALL NOT EXCEED 5 OHMS AT ANY POINT.
- 13. THE BOTTOM OF ALL JUNCTION BOXES AND ENCLOSURES FOR ELECTRICAL EQUIPMENT, INCLUDING METERS, DISCONNECT SWITCHES, PANELBOARDS, LOAD CENTERS, PUMP CONTROL PANELS, AND SCADA PANELS; LOCATED AT SERVICE POLE METER RACK, ELECTRIC SERVICE RACK, INSIDE AN ELECTRICAL BUILDING, AT THE WET WELL AREA, OR ANYWHERE ELSE, SHALL HAVE A MINIMUM 48-INCH VERTICAL CLEARANCE MEASURED FROM THE FINISH FLOOR TO THE BOTTOM FACE OF THE ENCLOSURE, PROVIDED THE VERTICAL CLEARANCE MEASURED FROM THE FINISHED FLOOR TO THE TOP FACE OF THE ENCLOSURE DOES NOT EXCEED 6.5 FEET AND IS OUTSIDE THE 100-YEAR FLOODPLAIN.
- 14. THE FINISHED FLOOR SHALL BE CONSIDERED THE SURFACE IN WHICH ELECTRICIANS WOULD STAND TO OPEN THE BOXES AND PERFORM WORK.
- 15. FOR LARGE RACK MOUNT ENCLOSURES, LIKE LARGE POWER DISTRIBUTION PANELBOARDS, LARGE PUMP CONTROL



Engineering

& Design

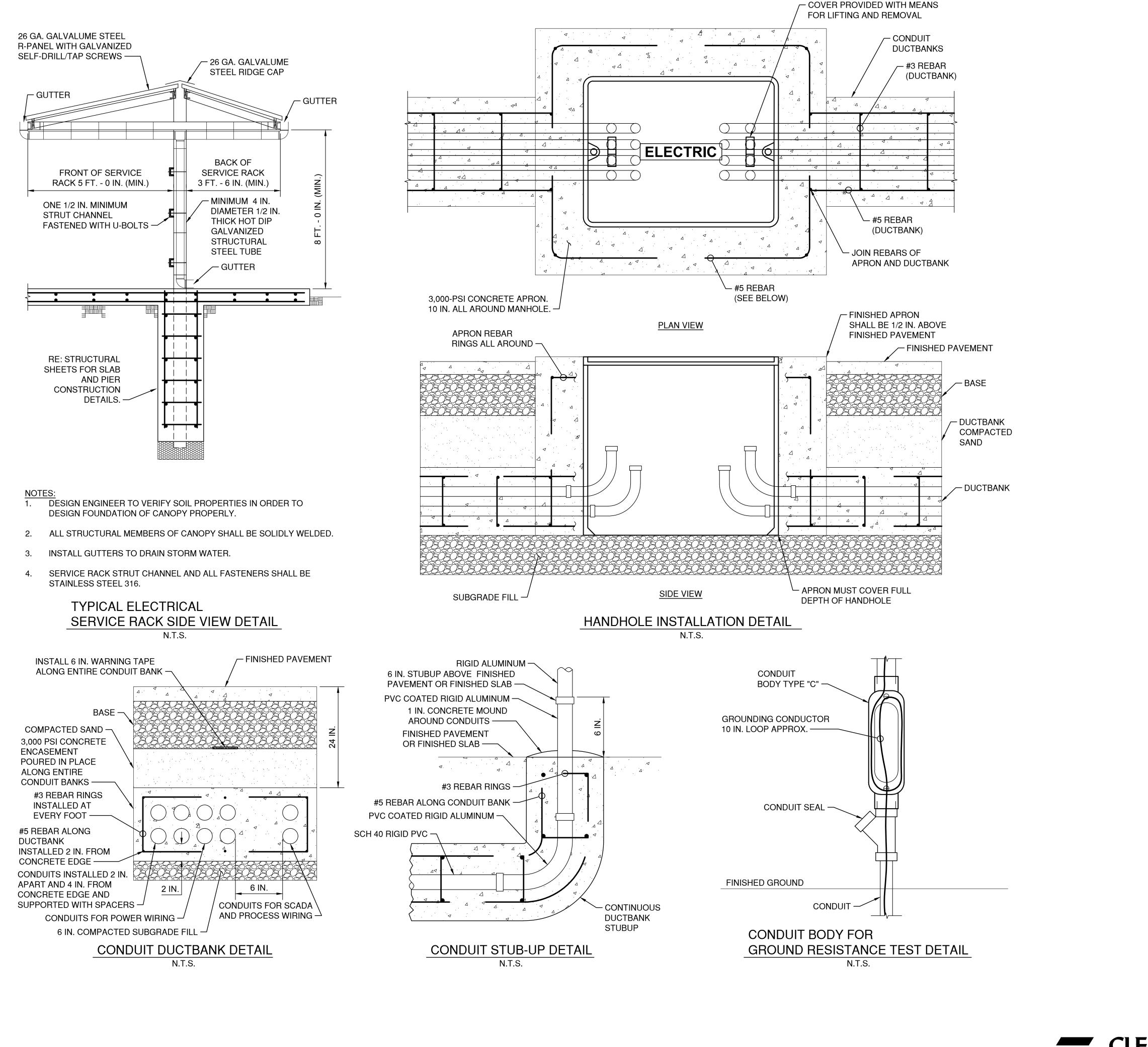
www.colliersengineering.com

KFW

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSO PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM



CLEARY
ZIMMERMANN
ENGINEERS
Firm No. F-9357 | ClearyZimmermann.com

9/18/24

ELECTRICAL DETAILS SHEET 2

E-017

Colliers

Engineering & Design

Colliers

Engineering

& Design

KFW

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSO PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

INTERIM REVIEW ONLY

Not to be used for construction, bidding,

permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

09/18/2024

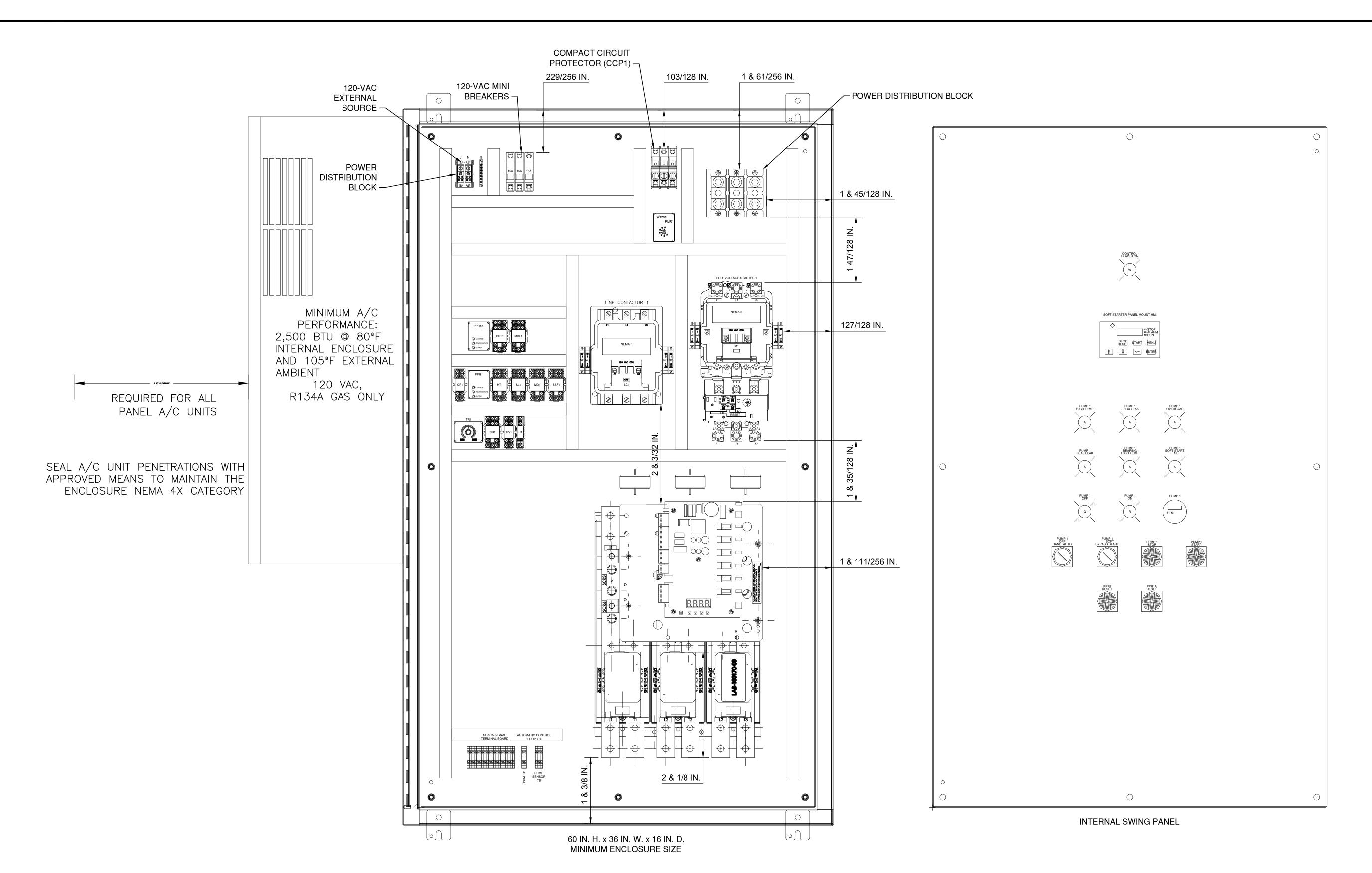
Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT

STATION AND

FORCE MAIN

CS



LIFT PUMP CONTROL PANEL TYPICAL LAYOUT SCALE: N.T.S.

NOTE

<u>NOTES.</u> 1. ALL INDICATING LAMPS SHALL BE PUSH-TO-TEST TYPE.

- 2. PUMP PROTECTION RELAYS SHALL BE PROVIDED FOR EACH PUMP INSTALLED. AT A MINIMUM PROVIDE PROTECTION AGAINST MOTOR HIGH TEMPERATURE AND PUMP SEAL LEAK.
- 3. LEVEL SENSOR PROBES FOR PUMP CONTROL ARE NOT ALLOWED.
- 4. 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.

NOTES (CONT'D):

- 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.

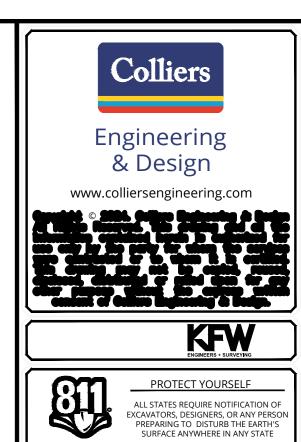
NOTES (CONT'D):

- 7. SUPPLEMENTAL PUMP PROTECTION RELAY PPR1A SHALL ONLY BE INCLUDED FOR LARGE PUMPS WHICH ARE REQUIRED TO BE PROTECTED AGAINST BEARING HIGH TEMP AND MOTOR BOX LEAK. DELETE WHEN NOT REQUIRED.
 - 7.A. UNDER NORMAL CONDITIONS, N.C. BEARING HIGH TEMP CONTACT IS OPEN, AND N.O. MOTOR BOX LEAK CONTACT IS OPEN.
 - 7.B. UNDER PUMP MAIN BEARING HIGH TEMP CONDITION, THE N.C. BEARING HIGH TEMP CONTACT CLOSES.
 - 7.C. UNDER MOTOR BOX LEAK CONDITION, THE N.O. MOTOR BOX LEAK CONTACT CLOSES.

NOTES (CONT'D):

- 8. THE CONTACT OF THE OVERLOAD RELAY FOR THE FULL VOLTAGE BYPASS STARTER SHALL BE OPEN UNDER NORMAL CONDITION AND SHALL CLOSE UNDER OVERLOAD CONDITION.
- 9. THE PERFORMANCE OF THE A/C UNIT SHOWN IS FOR THE ENCLOSURE SIZE INDICATED. FOR LARGER ENCLOSURES, THE DESIGN ENGINEER SHALL SIZE THE BTU CAPACITY TO MAINTAIN THE SAME TEMPERATURE PERFORMANCE.





	Call L OR ST	ATE :	SPEC	IFIC [DIREO V.CAL	CT P⊢ .L811	IONE .COM	NUN M	//BER	S
DATE DRAWN BY DESCRIPTION										
DRAWN BY										
DATE										
REV										

NORTHLAKE LIFT

STATION AND

FORCE MAIN

INTERIM REVIEW ONLY

permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of:

CONNER STURDIVANT, P.E., PEng.

______09/18/2024 Cleary Zimmermann Engineers, Inc. Texas Registered Engineering Firm No. F-9357

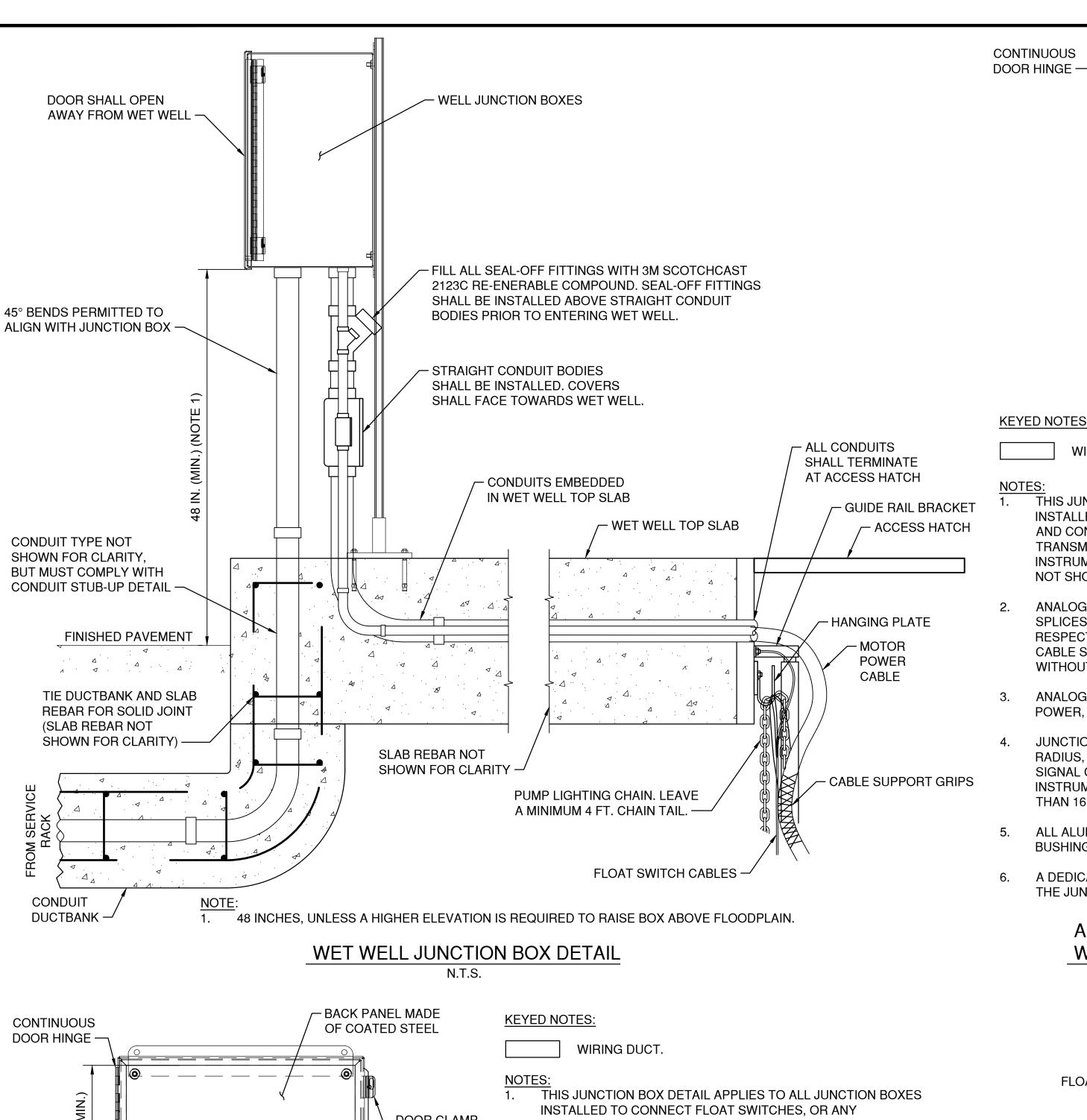
Colliers
Engineering & Design

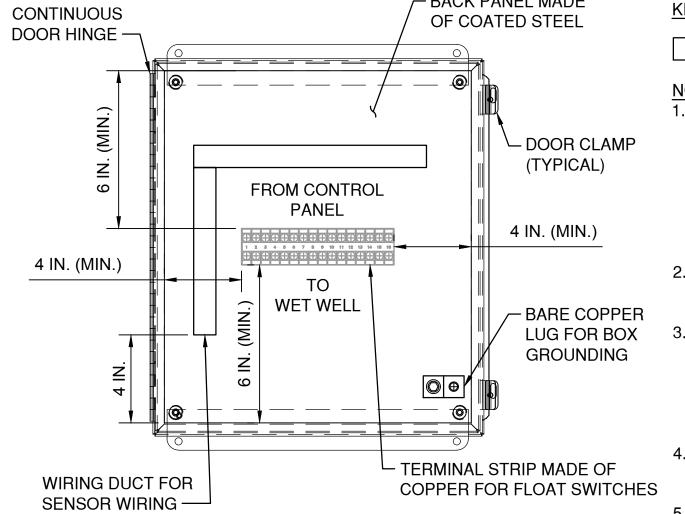
II.							
1	SCALE:	SCALE: DATE:		DRAWN BY: CHECKED			
	AS SHOWN	9/18	3/24 CS JC				
	PROJECT NUMBER:		DRAWING NAME:				
			240114 - E18				

ELECTRICAL DETAILS SHEET 3

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

E-018

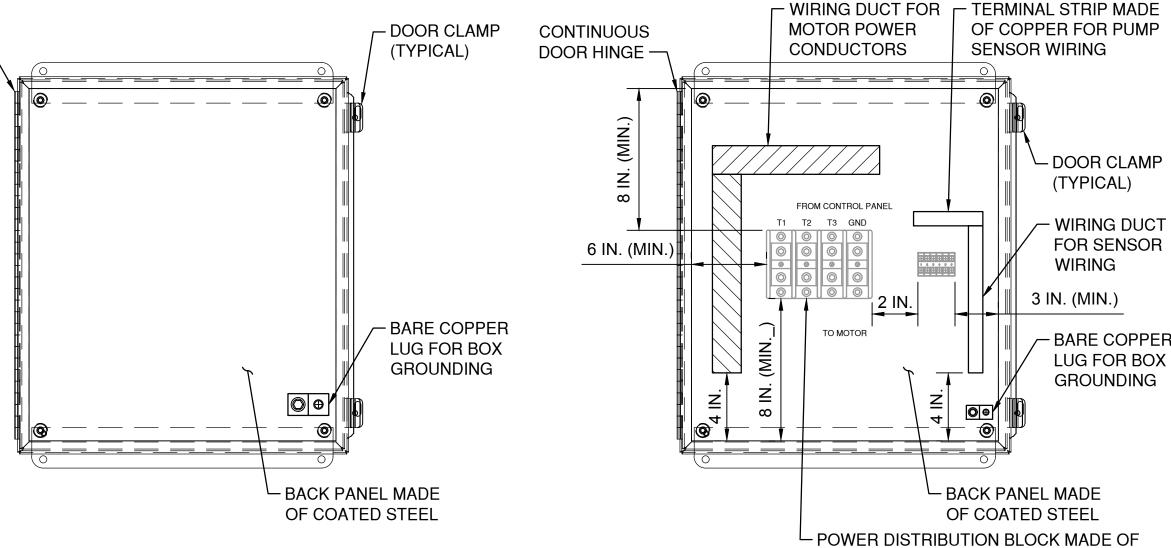




INSTRUMENTATION AND CONTROL DEVICE THAT IS INSTALLED BUT NOT SHOWN ON THESE STANDARD DRAWINGS, IN WHICH THE WIRING CONSIST OF DISCRETE SIGNALS THAT OPERATE AT 120-VAC, OR ANY OTHER VOLTAGE SYSTEM, PROVIDED EACH VOLTAGE SYSTEM HAS ITS OWN DEDICATED JUNCTION BOX.

- INSTRUMENT WIRING SUCH AS FLOAT SWITCH CABLES SHALL TERMINATE AT THE TERMINAL STRIP.
- 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.
- SHOWN INTERNAL DIMENSIONS SHALL BE MEASURED FROM EDGE OF BACK PANEL AND NOT FROM THE ENCLOSURE BODY.
- ALL ALUMINUM CONDUITS SHALL BE PROVIDED WITH GROUNDING BUSHINGS AND SHALL BE GROUNDED.

FLOAT CONTROLS JUNCTION BOX INTERNAL DETAIL



KEYED NOTES:

NOTES:

KEYED NOTES:

WIRING DUCT FOR PUMP SENSOR WIRING.

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 STANDARD DRAWINGS.

- 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.
- ANALOG SIGNAL WIRING SHALL NOT BE MIXED WITH ANY OTHER POWER, CONTROL OR SIGNAL WIRING.
- 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 IN. H. x 12 IN. W x 8 IN. D.
- ALL ALUMINUM CONDUITS SHALL BE PROVIDED WITH GROUNDING BUSHINGS AND SHALL BE GROUNDED.
- 6. A DEDICATED GROUNDING CABLE SHALL BE INSTALLED TO GROUND THE JUNCTION BOX AND EACH CONDUIT BUSHINGS.

ANALOG SIGNAL WIRING JUNCTION BOX DETAIL N.T.S.

MOTOR JUNCTION BOX INTERNAL DETAIL

5. ALL ALUMINUM CONDUITS SHALL BE PROVIDED WITH GROUNDING

WIRING DUCT FOR PUMP SENSOR WIRING.

WIRING DUCT FOR MOTOR POWER WIRING.

1. THIS JUNCTION BOX DETAIL APPLIES TO ALL JUNCTION BOXES

2. JUNCTION BOXES SHALL BE SIZED TO MEET THE INTERNAL

BACK PANEL AND NOT FROM THE ENCLOSURE BODY.

BE SMALLER THAN 20 IN. H. x 16 IN. W. x 8 IN. D.

BUSHINGS AND SHALL BE GROUNDED.

THESE STANDARD DRAWINGS.

SERVICE ENTRANCE.

INSTALLED TO CONNECT MOTORS SUCH AS PUMPS, BLOWERS, OR

ANY SPECIAL MOTOR APPLICATION REQUIRED BUT NOT SHOWN ON

DIMENSIONS, BASED ON THE REQUIRED SIZE OF POWER DISTRIBUTION

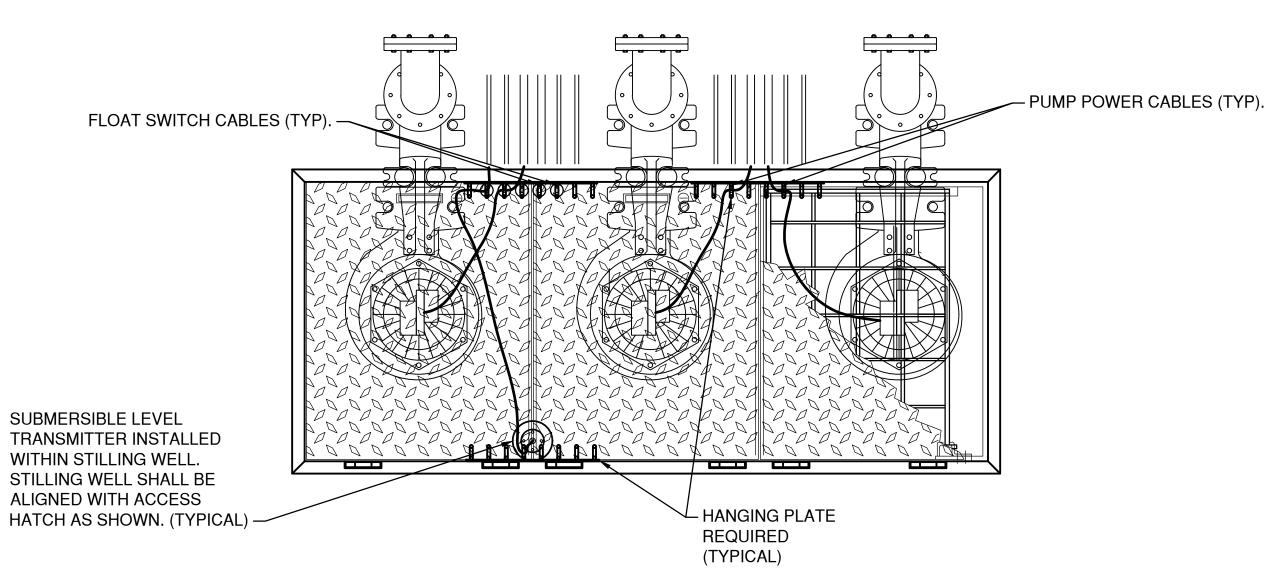
SENSOR SIGNALS, BUT IN NO CASE SHALL THE PUMP JUNCTION BOXES

BLOCK, WIRING DUCTS AND NUMBER OF TERMINAL STRIPS FOR PUMP

SHOWN INTERNAL DIMENSIONS SHALL BE MEASURED FROM EDGE OF

4. POWER DISTRIBUTION BLOCKS SHALL HAVE A SHORT CIRCUIT RATING THAT EXCEED THE MAXIMUM AVAILABLE FAULT CURRENT AT THE

COPPER FOR MOTOR CABLE CONNECTION



ALL CONDUITS EMBEDDED IN WET WELL TOP SLAB

CONDUITS, HANGING PLATES, AND CONTROL DEVICES DETAIL

N.T.S.

Colliers Engineering & Design **KFW**

PROTECT YOURSELF EXCAVATORS, DESIGNERS, OR ANY PERSO PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of: CONNER STURDIVANT, P.E., PEng. 09/18/2024 Cleary Zimmermann Engineers, Inc. Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND **FORCE MAIN**

Colliers Engineering & Design

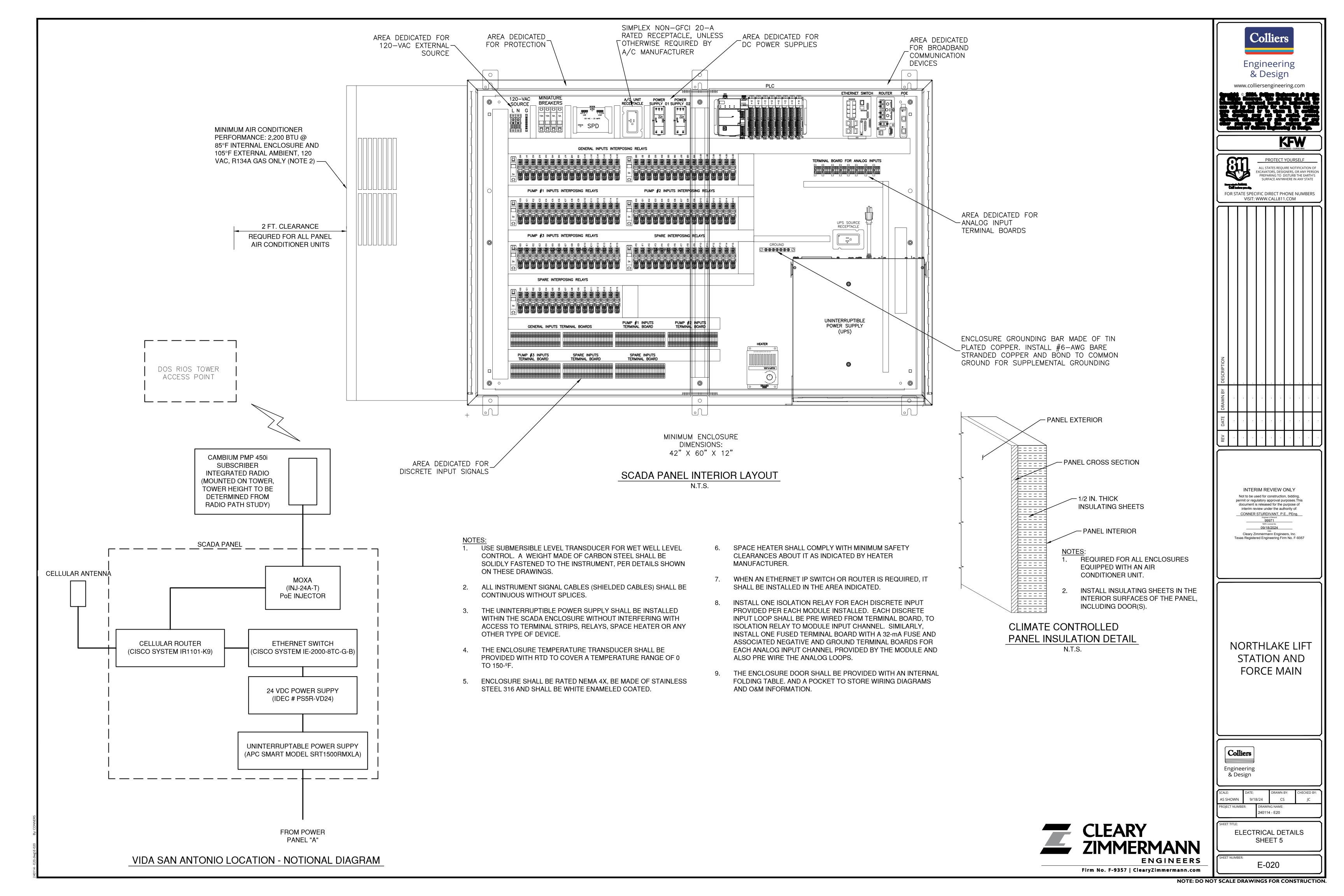
CS 9/18/24

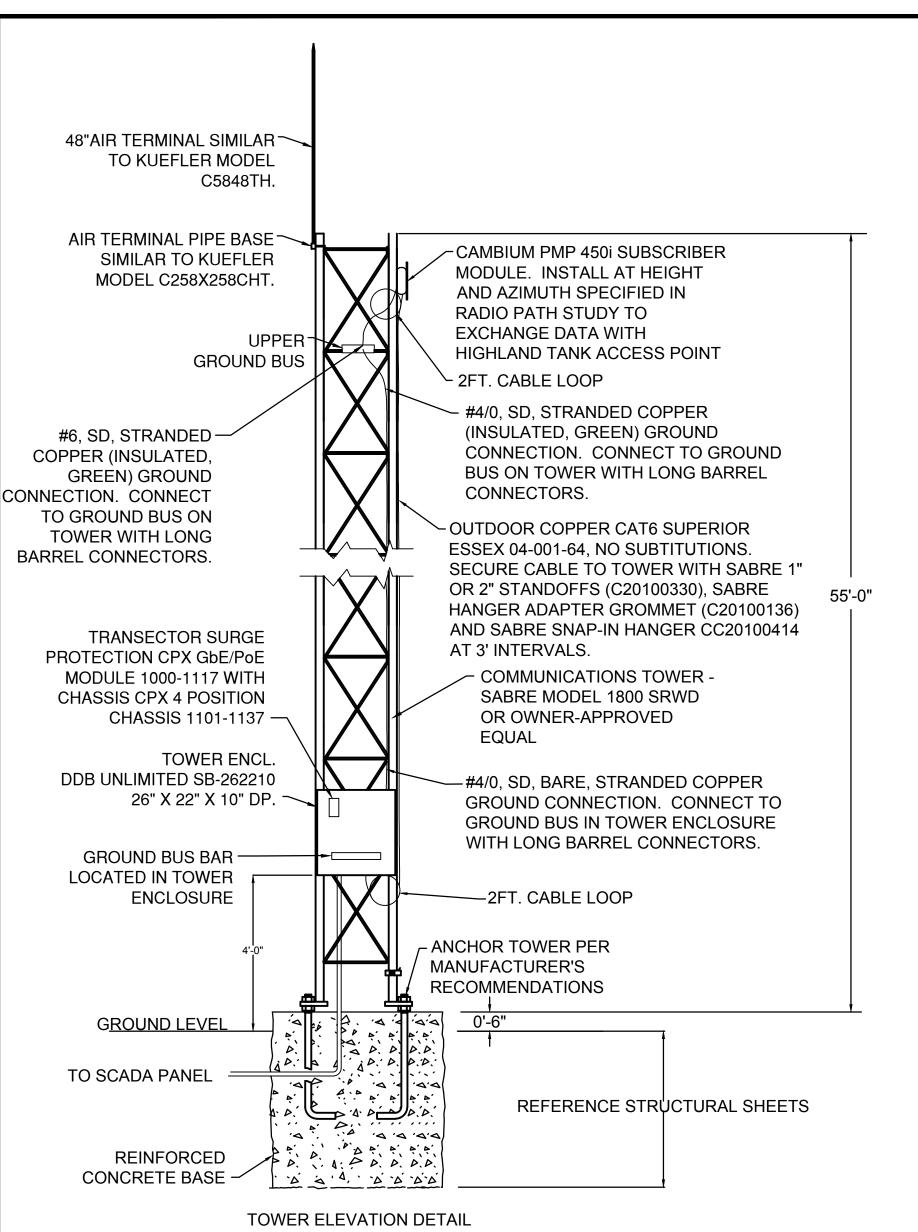
ELECTRICAL DETAILS

SHEET 4

E-019 Firm No. F-9357 | ClearyZimmermann.com

CLEARY ZIMMERMANN **ENGINEERS**



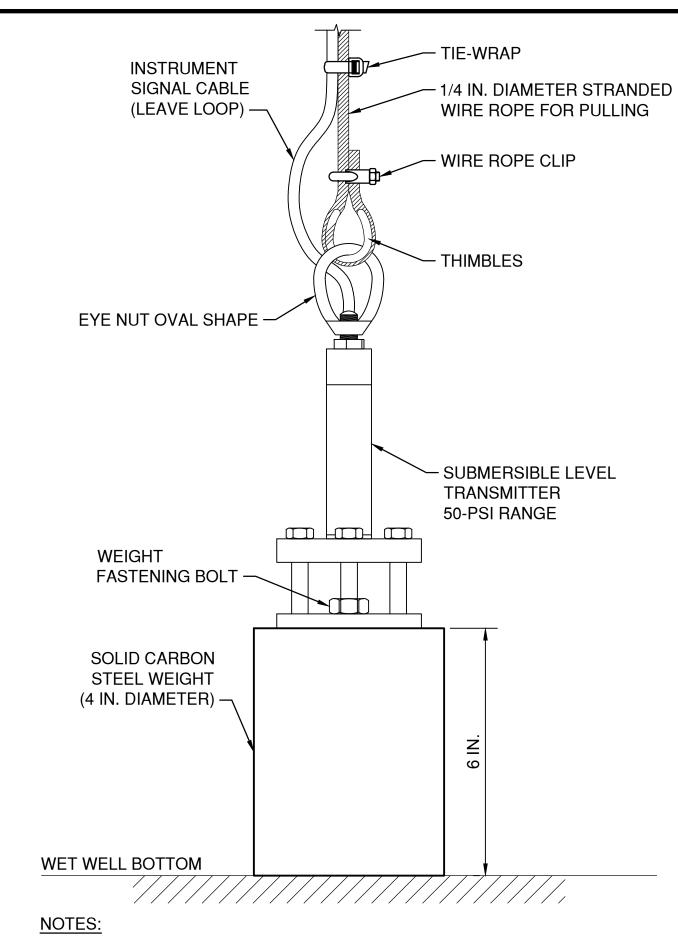


1. PROVIDE ALL NECESSARY HARDWARE AND ACCESSORIES TO MOUNT RADIO/ANTENNA.

- FOR REQUIRED MATERIAL SPECIFICATIONS, EQUIPMENT INSTALLATION, NOTES 12. AND TOLERANCES, SEE MANUFACTURER'S DRAWINGS.
- DESIGN OF MAST AND FOUNDATION TO BE PROVIDED BY CONTRACTOR. FOUNDATION AND MAST STRUCTURE SHALL BE DESIGNED BY A P.E. REGISTERED IN THE STATE OF TEXAS. PROVIDE SUBMITTAL FOR ANTENNA FOUNDATION FOR ENGINEER REVIEW. FOUNDATION AND MAST SHALL BE DESIGNED TO SUPPORT ALL SPECIFIED EQUIPMENT AS ARRANGED AND INDICATED ON DRAWINGS.
- TOWER SHALL CONFORM TO THE LATEST CITY OF SAN ANTONIO ORDINANCES.
- TOWER MATERIALS SHALL BE HOT-DIPPED GALVANIZED AS OUTLINED IN ASTM A-123.
- WITH ANSI/TIA/EIA-607-B AND TIA/EIA-222 LATEST EDITION.
- CONTRACTOR TO SUPPLY ALL NECESSARY SAFETY CLIMBING EQUIPMENT THAT COMPLIES TO OSHA AND ANSI STANDARDS THAT INCLUDE BUT NOT LIMITED TO STEP BOLTS, CABLE SYSTEM, ARRESTORS, & CARABINER CABLE GUIDES.
- CONTRACTOR SHALL SUPPLY ALL ASSOCIATED EQUIPMENT FOR TOWERS PER SPECIFICATIONS.

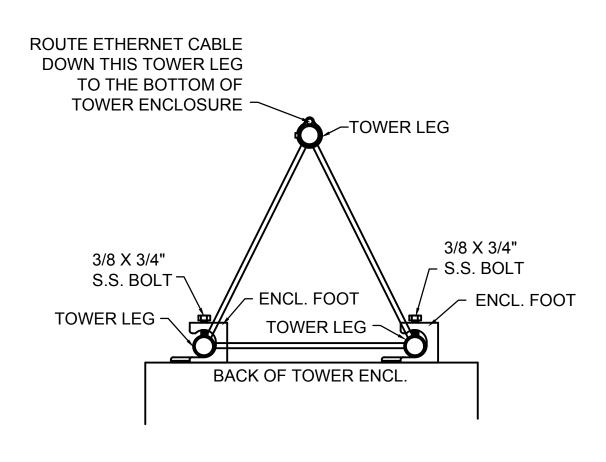
- TOWER, MAST AND FOUNDATION SHALL BE ENGINEERED TO WITHSTAND 110 MPH, 3 SECOND WIND GUST. LATTICE-TYPE MAST SHALL BE ENGINEERED FOR MAXIMUM 85' HEIGHT WITH RADIO/ANTENNA MOUNTED AT TOP OF MAST.
- REFER TO LATEST DESIGN GUIDELINES AS REQUIRED BY SAWS FOR TOWER GROUNDING DETAIL. COMPLY WITH TOWER GROUNDING REQUIREMENTS PER TOWER MANUFACTURER.
- CONTRACTOR TO FOLLOW SAWS GUIDELINES AND MANUFACTURERS GUIDELINES TO GROUND RADIOS.
- 14. ALL EQUIPMENT IS NOT SHOWN FOR DRAWING CLARITY.
- 15. TOWER GROUND BUS SHALL BE TIN-PLATED, SOLID COPPER 1/4" x 2" x 12" PER TIA-607 STANDARD. HARGER TGB114212TGB OR OWNER APPROVED EQUAL. DO NOT DRILL TOWER STRUCTURE FOR INSTALLATION.
- 16. ALL CAT6 CABLES SHALL HAVE A SURGE PROTECTOR INSIDE THE TOWER ENCL.
- TELECOMMUNICATIONS BONDING AND GROUNDING OF TOWER MUST COMPLY 17. ADD ADDITIONAL GROUNDING AS NECESSARY TO COMPLY WITH ELECTRICAL SPECIFICATIONS.
 - GROUNDING SYSTEM SHALL CONFORM TO TIA-607 TYPE 2 SITE REQUIREMENTS. GROUNDING SYSTEM SHALL HAVE A RESISTANCE OF 5 OHMS OR LESS.

TYPICAL ANTENNA TOWER DETAIL N.T.S./ (FINAL HEIGHT TO BE DETERMINED BY RADIO PATH STUDY)



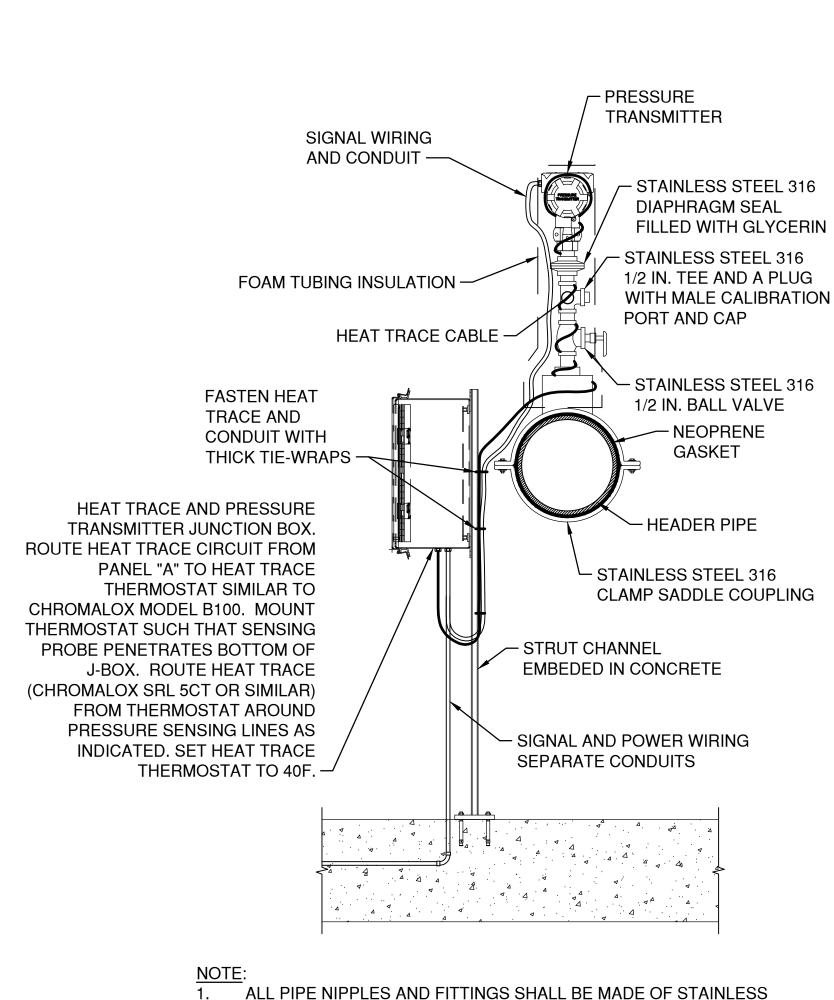
- 1. INSTRUMENT, WIRE ROPE AND ALL FASTENERS SHALL BE OF STAINLESS STEEL 316 TYPE.
- 2. WEIGHT SHALL BE DRILLED AND TAPPED AT THE CENTER TO ALLOW A BOLT TO SOLIDLY FASTEN INSTRUMENT TO WEIGHT.
- INSTRUMENT SIGNAL CABLE SHALL BE FASTENED TO WIRE ROPE WITH THICK HEAVY DUTY PLASTIC TIE-RAPS.
- 4. EYE NUT THREADED TO INSTRUMENT AND OVAL SIZE SHALL BE LARGE ENOUGH TO ALLOW SIGNAL CABLE TO FREELY BEND AND PASS THROUGH.

SUBMERSIBLE LEVEL TRANSDUCER MOUNTING DETAIL



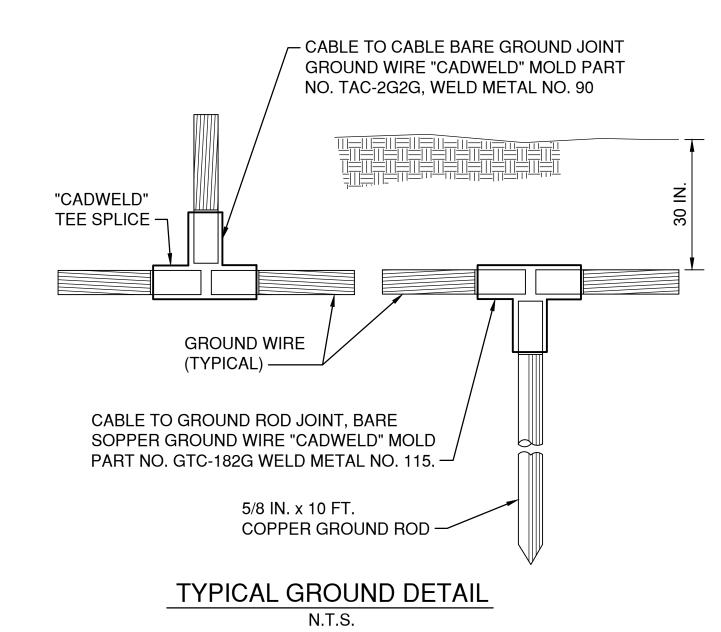
TYPICAL TOWER ENCLOSURE MOUNTING DETAIL N.T.S./ TOP VIEW

1. CONDUITS SERVING TOWER ENCLOSURE SHALL BE ROUTED ON EXTERIOR OF TOWER STRUCTURE, NOT INTERIOR.



STEEL 316.

DISCHARGE PRESSURE TRANSMITTER MOUNTING DETAIL N.T.S.





Firm No. F-9357 | ClearyZimmermann.com

Engineering & Design **KFW** PROTECT YOURSELF ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSO PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM

Colliers

INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of: CONNER STURDIVANT, P.E., PEng. 09/18/2024 Cleary Zimmermann Engineers, Inc. Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

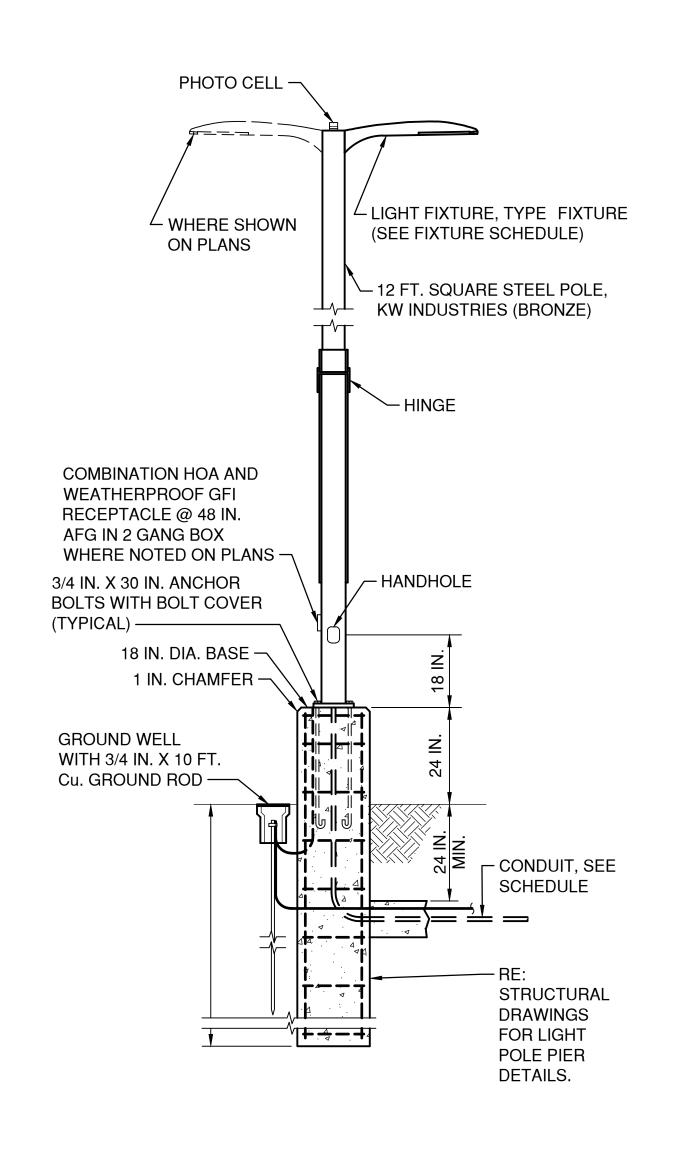
Colliers Engineering & Design

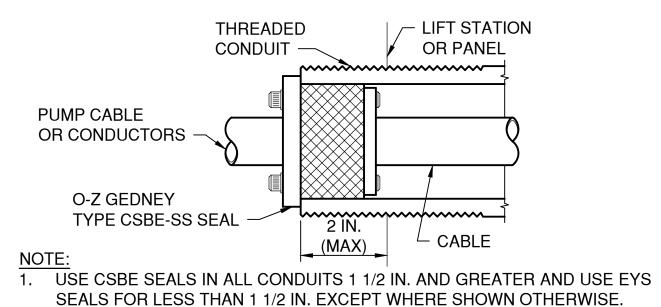
CS AS SHOWN 9/18/24 240114 - E21

> **ELECTRICAL DETAILS** SHEET 6

E-021

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION





AREA LIGHT POLE DETAIL

N.T.S. (TYPICAL)

_ DI COVER

- TEST LOOP

─ 12 IN. DIAMETER

GROUND TEST WELL

O.Z. GEDNEY TYPE "ABG"

FINISHED GRADE

GROUND CLAMP —

BARE COPPER GROUND LOOP —

5/8 IN. x 10 FT.

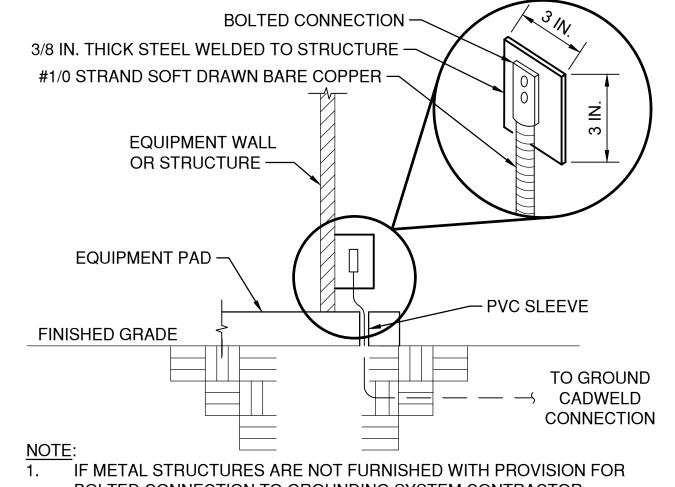
COPPERWELD

GROUND ROD —

GROUND TEST WELL

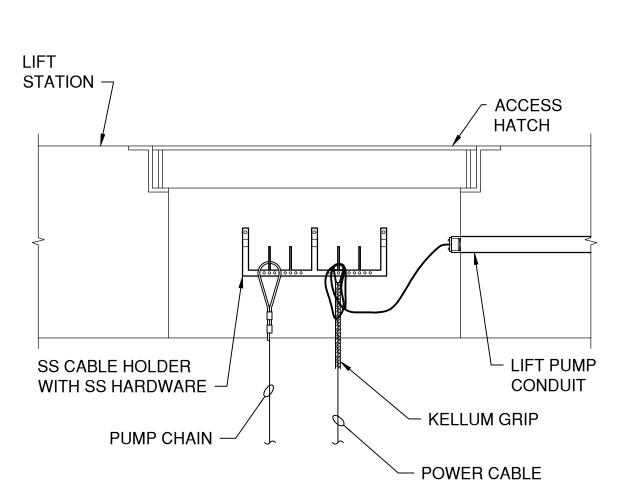
ARRANGEMENT DETAIL

N.T.S.



BOLTED CONNECTION TO GROUNDING SYSTEM CONTRACTOR SHALL PROVIDE WELDED PAD FOR GROUND CONNECTION.

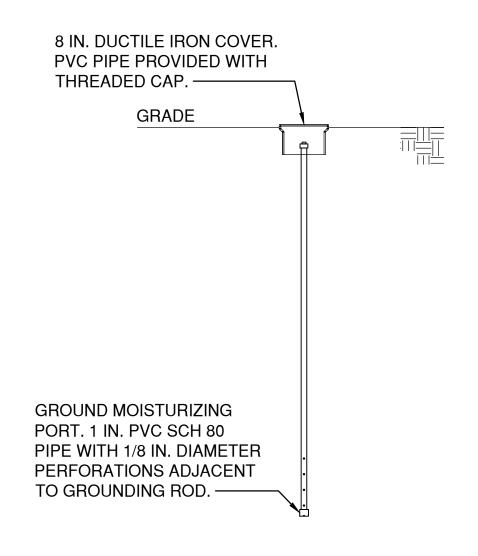
> **TYPICAL** STRUCTURE GROUND DETAIL N.T.S.



CONDUIT SEAL DETAIL

N.T.S. (TYPICAL)

PUMP CABLE INSTALLATION N.T.S.



MOISTURIZING PORT DETAIL N.T.S.

> **CLEARY ZIMMERMANN ENGINEERS** Firm No. F-9357 | ClearyZimmermann.com

Engineering & Design www.colliersengineering.com PROTECT YOURSELF ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE FOR STATE SPECIFIC DIRECT PHONE NUMBERS
VISIT: WWW.CALL811.COM INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of: CONNER STURDIVANT, P.E., PEng.

09/18/2024 Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

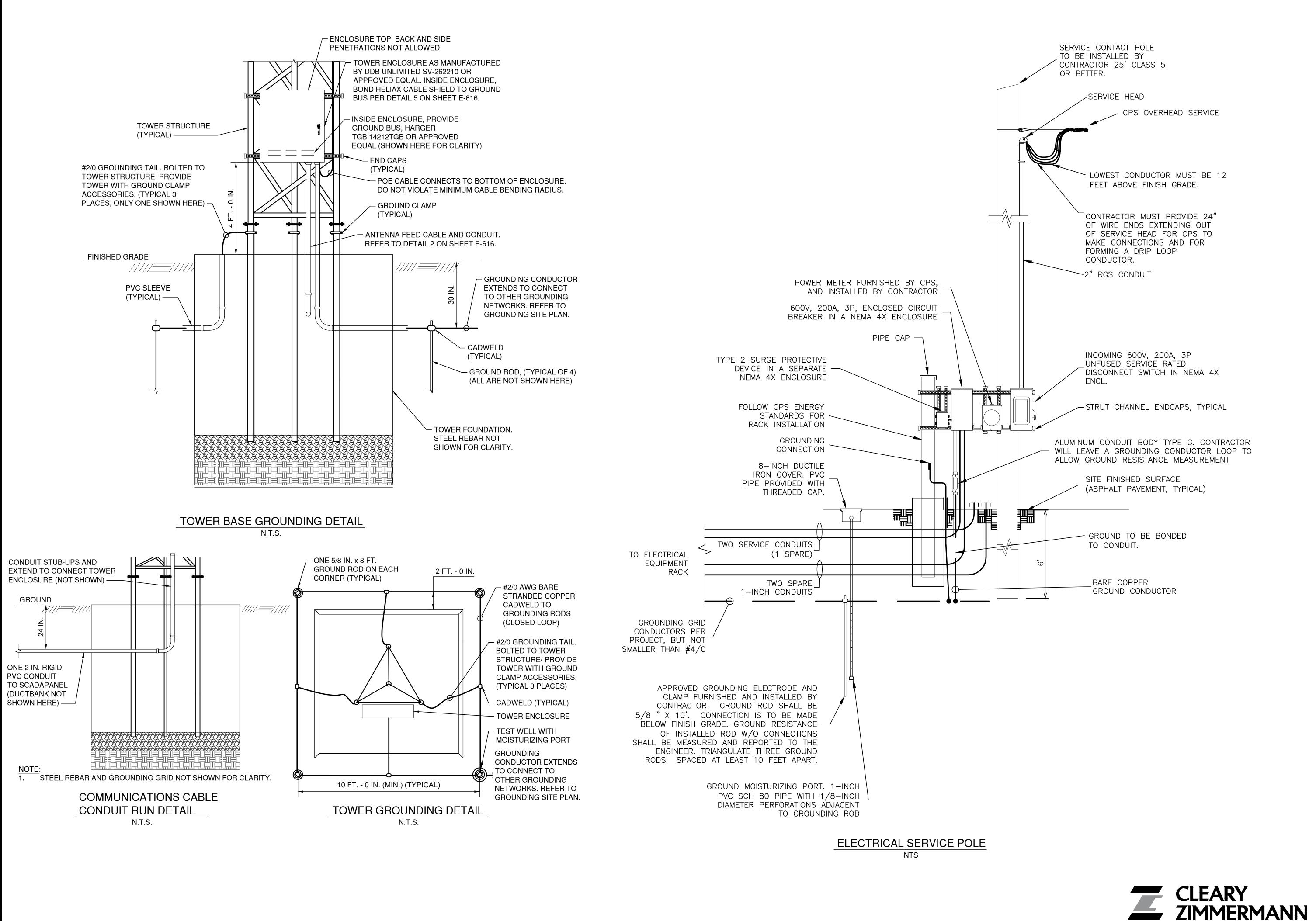
Colliers Engineering & Design

CS 9/18/24

ELECTRICAL DETAILS SHEET 7

E-022

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



Colliers Engineering & Design www.colliersengineering.com **KFW** PROTECT YOURSELF ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSO PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of: CONNER STURDIVANT, P.E., PEng. 09/18/2024 Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357 NORTHLAKE LIFT STATION AND FORCE MAIN Colliers Engineering & Design CS AS SHOWN 9/18/24 240114 - E23

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

ENGINEERS

Firm No. F-9357 | ClearyZimmermann.com

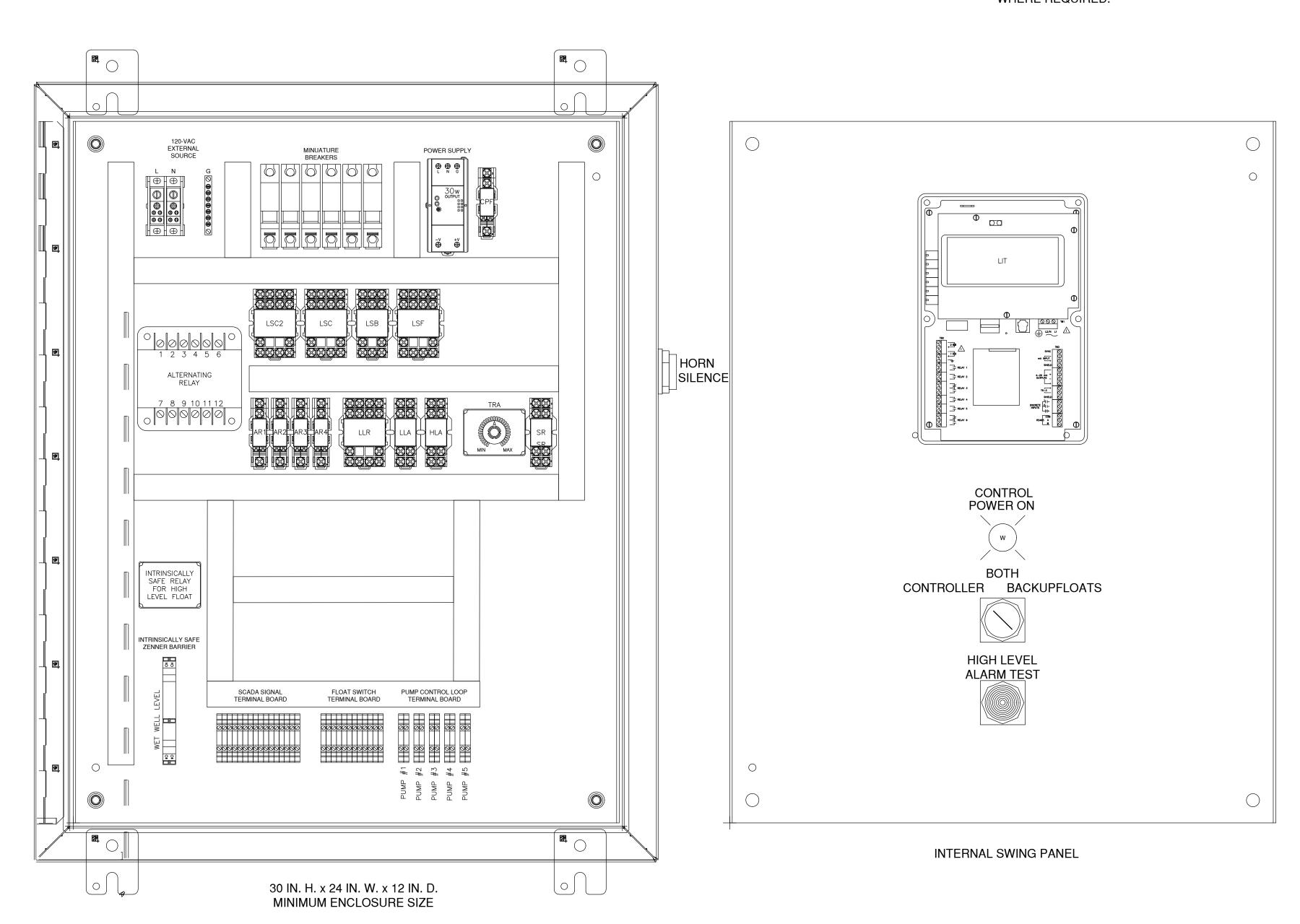
ELECTRICAL DETAILS SHEET 8

E-023

NOT

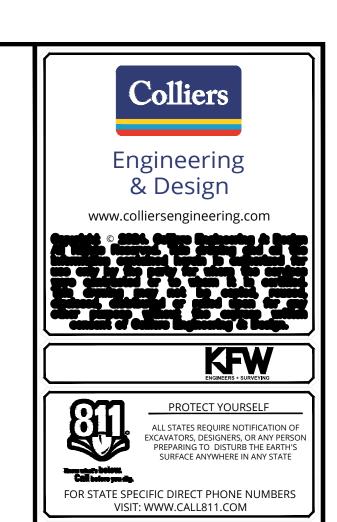
- 1. LEVEL CONTROLLER OUTPUT RELAYS RLY1, RLY2, RLY 4 AND RLY5 SHALL BE ASSIGNED TO A PUMP FUNCTION AND SHALL BE MANAGED BY A PUMPING ALGORITHM TO ALTERNATE THE LEAD PUMP AND LAGS FOR EACH PUMPING CYCLE. FOR LIFT STATIONS WITH FIVE PUMPS, ASSIGN RLY6 TO CONTROL THE FIFTH PUMP.
- 2. LEVEL CONTROLLER OUTPUT 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 ENERGIZED AND CONTACT CLOSE. FOR LIFT STATIONS WITH FIVE PUMPS, THE HIGH LEVEL ALARM SHALL BE GENERATED BY THE HIGH LEVEL FLOAT SWITCH ONLY.
- 3. RELAY RLY3 (LOW LEVEL) IS A COMMON RELAY FOR ALL PUMPS INSTALLED. PROVIDE ADDITIONAL GENERAL PURPOSE RELAYS WHERE REQUIRED.

- 4. HIGH LEVEL ALARM SHALL BE GENERATED WITH BOTH RELAY RLY6 (HIGH LEVEL) AND THE HIGH LEVEL FLOAT FOR LIFT STATIONS WITH UP TO FOUR PUMPS INSTALLED. FOR LIFT STATIONS WITH FIVE PUMPS INSTALLED, THE HIGH LEVEL ALARM SHALL BE GENERATED ONLY BY 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 FOR UP TO FOUR PUMPS. FOR LIFT STATIONS WITH FIVE PUMPS, THE FIFTH PUMP SHALL NOT BE INCLUDED IN THE BACKUP FLOAT SWITCH CONTROL MODE, BUT SHALL BE INCLUDED IN THE LEAD-LAD ALTERNATING ALGORITHM OF THE LEVEL CONTROLLER.



LEVEL CONTROLLER PANEL TYPICAL LAYOUT SCALE: N.T.S.





,			
REV	DATE	DRAWN BY	DATE DRAWN BY DESCRIPTION
ŀ,			

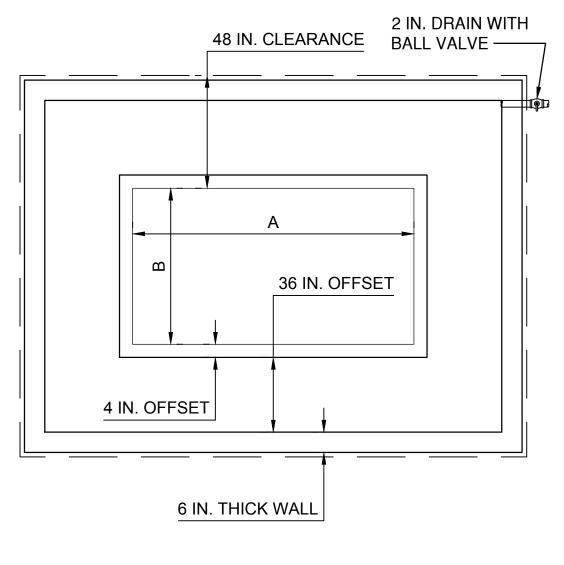
NORTHLAKE LIFT STATION AND FORCE MAIN

Colliers
Engineering & Design

1	SCALE: DATE:			DRAWN BY:	CHECKED BY:	
ı	AS SHOWN	9/18	3/24 CS JC			
I	PROJECT NUMBE	R:	DRAWIN	NG NAME:		
ı	Į l		240114 - E24			

ELECTRICAL DETAILS SHEET 9

E-024



	SENERATOR & TANK DATA
ITEMS	DATA
GENERATOR*	200 KW (MIN.), 250 KVA, 300A FUEL CONSUMPTION RATE 1/2 LOAD - 5 GPH FUEL CONSUMPTION RATE FULL LOAD - 9 GPH WT = 7,676 LBS. (GENERATOR AND ENCLOSURE)
ENCLOSURE*	LEVEL 2 SOUND ATTENUATING DIM. 157 IN. L x 51 IN. W x 75.8 IN. H
NFPA 110	CLASS 24, TYPE 10, LEVEL 2

* VERIFY EQUIPMENT PARAMETERS WITH THE SPECIFIC

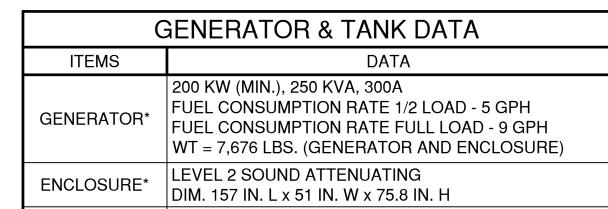
MANUFACTURER

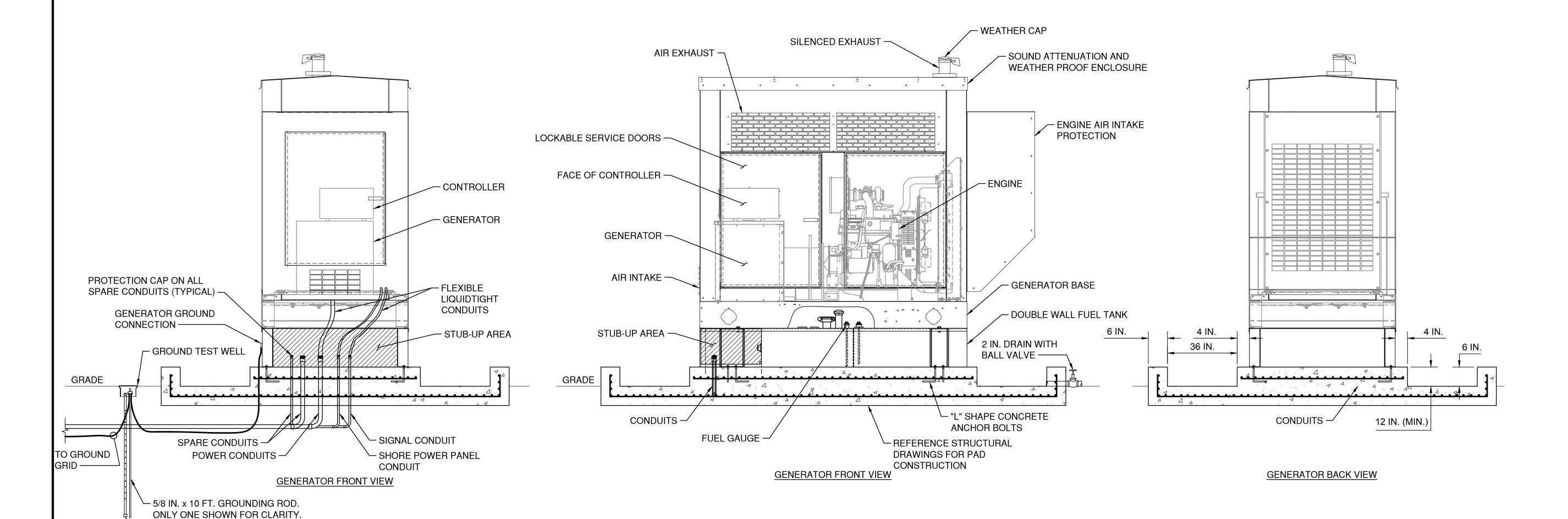
CONTAINMENT BASE DETAIL N.T.S.

- GROUND MOISTURIZING PORT. 1 IN. PVC SCH 80 PIPE WITH 1/8 IN.

ADJACENT TO GROUNDING ROD.

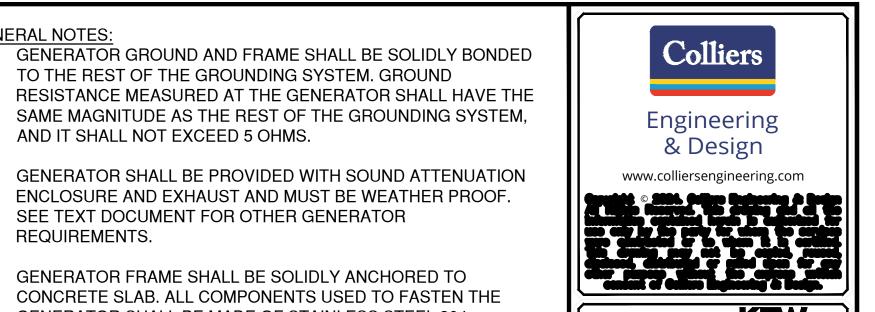
DIAMETER PERFORATIONS





STANDBY GENERATOR INSTALLATION DETAIL N.T.S.





GENERAL NOTES:

REQUIREMENTS.

PROVIDED.

TO THE REST OF THE GROUNDING SYSTEM. GROUND

SEE TEXT DOCUMENT FOR OTHER GENERATOR

4. CONDUITS SHALL INCLUDE SPACE HEATER, BATTERY

5. FUEL TANK SHALL BE DOUBLE WALL TYPE, UL142 RATED.

6. CONCRETE SLAB SHALL BE MADE OF CONCRETE MIX WITH A

7. A 4-FOOT CLEARANCE AROUND GENERATOR IS REQUIRED,

8. CONDUIT STUB-UP AREA SHOWN IN THIS DRAWING IS FOR

EXCLUDING CONTAINMENT STRUCTURE.

ILLUSTRATION PURPOSES ONLY.

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

GENERATOR FRAME SHALL BE SOLIDLY ANCHORED TO

GENERATOR SHALL BE MADE OF STAINLESS STEEL 304.

CHARGER, ENGINE BLOCK HEATER, SIGNAL AND SPARE.

GENERATOR SHALL BE PROVIDED WITH SOUND ATTENUATION

ENCLOSURE AND EXHAUST AND MUST BE WEATHER PROOF.

CONCRETE SLAB. ALL COMPONENTS USED TO FASTEN THE

AND IT SHALL NOT EXCEED 5 OHMS.

PROTECT YOURSELF ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE FOR STATE SPECIFIC DIRECT PHONE NUMBERS

VISIT: WWW.CALL811.COM

INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of

interim review under the authority of: CONNER STURDIVANT, P.E., PEng.

09/18/2024

Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357

NORTHLAKE LIFT STATION AND FORCE MAIN

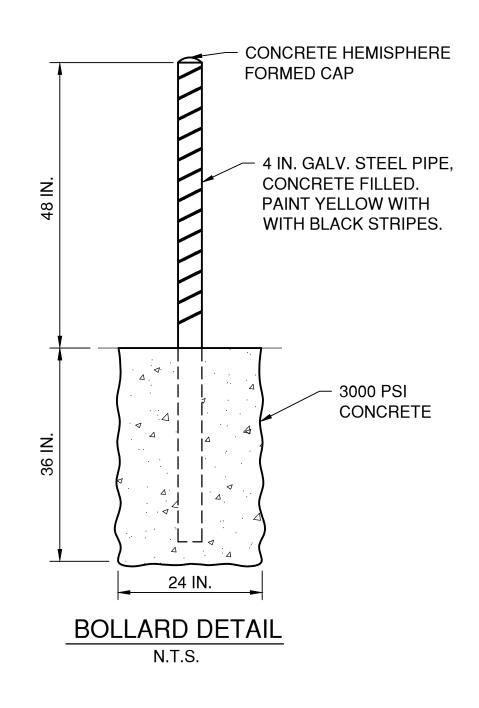
Colliers Engineering & Design

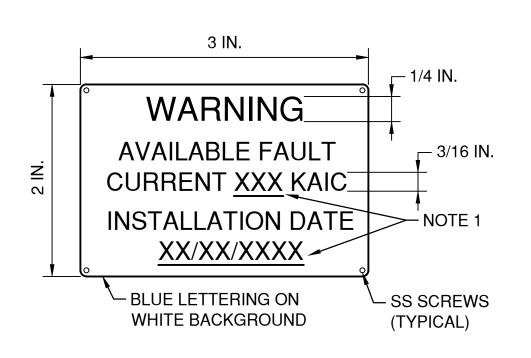
9/18/24

GENERATOR DETAILS SHEET 1

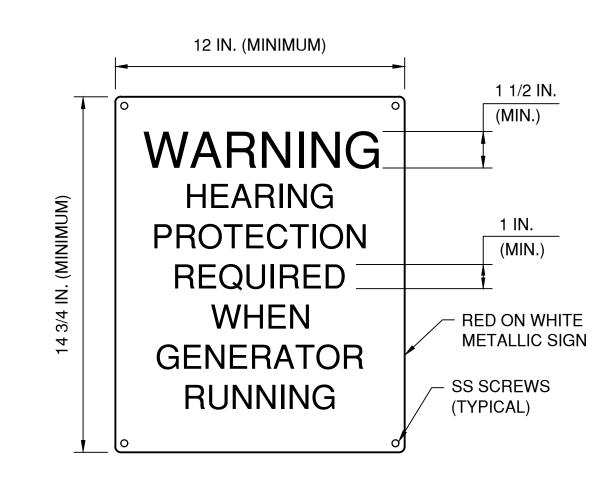
E-025

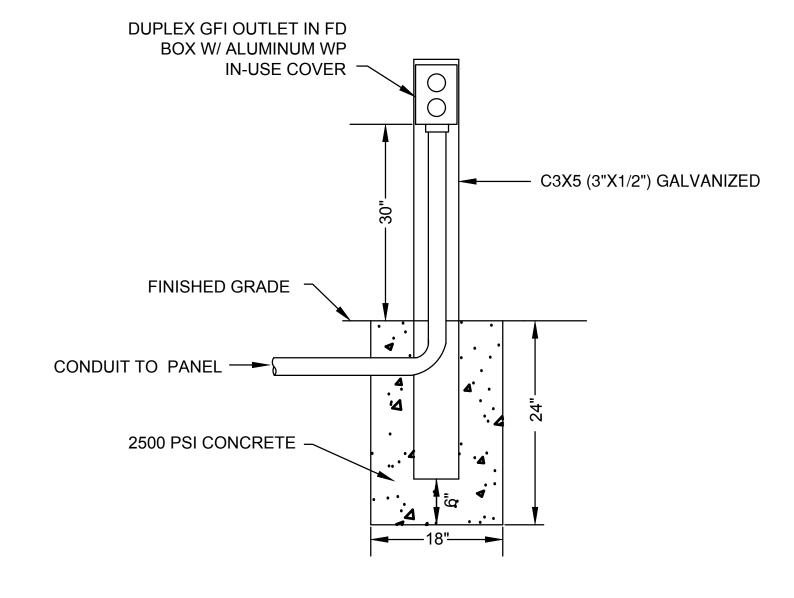
NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



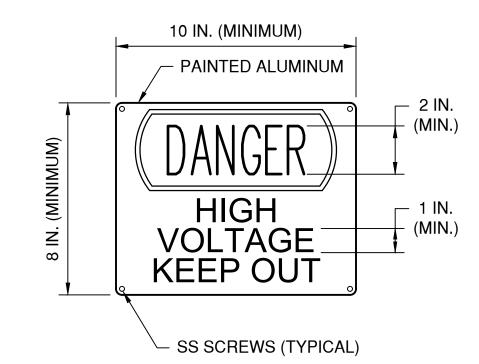


FAULT CURRENT WARNING SIGN DETAIL N.T.S.





POST MOUNTED RECEPTACLE INSTALLATION DETAIL N.T.S.



HIGH VOLTAGE SIGN DETAIL N.T.S.

HEARING WARNING SIGN DETAIL
N.T.S.

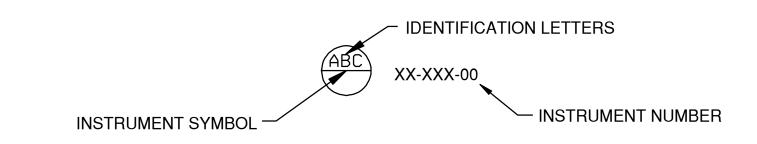


PROTECT YOURSELF ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE FOR STATE SPECIFIC DIRECT PHONE NUMBERS
VISIT: WWW.CALL811.COM INTERIM REVIEW ONLY Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of: CONNER STURDIVANT, P.E., PEng. Date
Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357 NORTHLAKE LIFT STATION AND FORCE MAIN Colliers Engineering & Design CS 9/18/24 **GENERATOR AND ELECTRICAL DETAILS** E-026

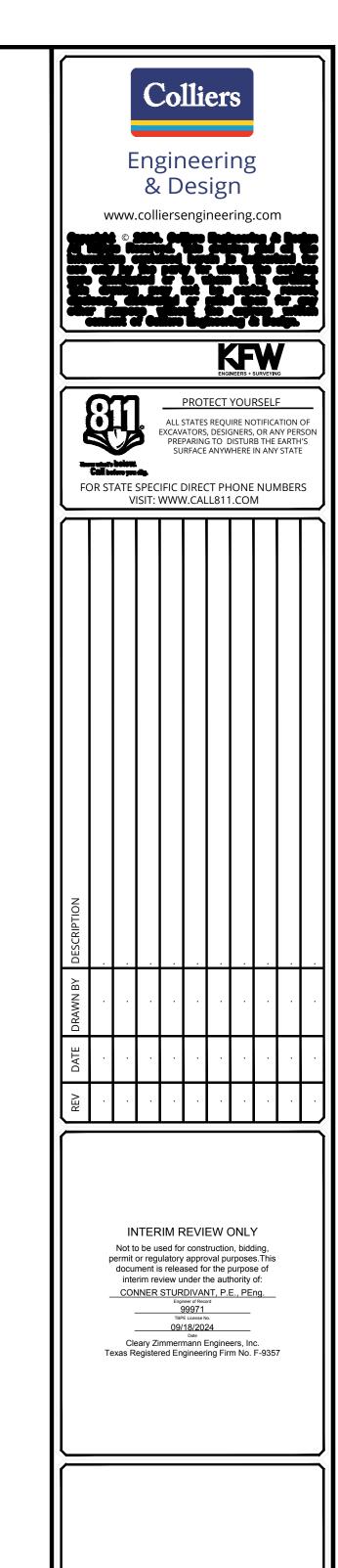
Colliers

Engineering & Design

LETTER	DDOOFCC OD INITIATING WALLE	INSTRUMENT IDENTIFIC	1	MODIFIED
	PROCESS OR INITIATING VALUE	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS (*)	ALARM	LICEBO CHOICE (*)	LICEDO CHOICE (*)
B	BURNER FLAME	USERS CHOICE (*)	USERS CHOICE (*)	USERS CHOICE (*)
<u>C</u>	CONDUCTIVITY DENSITY (2.0)		CONTROL	
	DENSITY (3.0)	DDIMA DV ELEMENT		
		PRIMARY ELEMENT		
F FLOW RATE		01.400		
G	GAUGE	GLASS	GATE	LUOLI
H .	HAND (MANUEL)	INDICATE		HIGH
<u> </u>	CURRENT	INDICATE		
G	POWER		CONTROL OTATION	
K .	TIME OR SCHEDULE	LIGHT (BILOT)	CONTROL STATION	1.014
L	LEVEL	LIGHT (PILOT)		LOW
M	MOTION	LIGERO CLICIOF (*)	LIGERO CHOIGE (t)	MIDDLE
N	USERS CHOICE (*)	USERS CHOICE (*)	USERS CHOICE (*)	USERS CHOICE (*)
0	USERS CHOICE (*)	ORIFICE		
Р	PRESSURE (OR VACUUM)	POINT (TEST CONNECTION)		
Q	QUANTITY OR EVENT	INTEGRATE		
R		RECORD OR PRINT		
S	SPEED OR FREQUENCY		SWITCH	
Т	TEMPERATURE			
U	MULTIVARIABLE (*)	MULTIFUNCTION (*)	MULTIFUNCTION (*)	MULTIFUNCTION (*)
V	VISCOSITY		VALVE OR DAMPER	
W	WEIGHT OR FORCE	WELL		
Χ	UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)	UNCLASSIFIED (*)
Υ	USERS CHOICE(*)		RELAY OR COMPUTE (*)	
Z	POSITION		DRIVE ACTUATE OR UNCLASSIFIED FINAL CONTROL ELEMENT	



SYMBOLS	INSTRUMENT	SYMBOLS	ABBREVIATION INDEX	
SWING CHECK VALVE		FIELD MOUNTED		CONTROL RELAY
	INSTRUMENT		EMT	ELAPSED TIME METER
GATE VALVE	YL	LOCAL CONTROL PANEL	НОА	HAND-OFF-AUTO SWITCH
PUMP		MOUNTED INSTRUMENT	HTR	HIGH TEMPERATURE RELAY
FOINT	POINT MONITORED BY SCADA		ILP	INFLUENT LIFT PUMP
			LDR	LEAK DETECTION RELAY
				LOCAL-REMOTE SWITCH
				LEVEL RELAY
	INSTRUM	ENT IDENTIFICATION	LS	LIFT STATION
				MOTOR OVERLOAD
	LIC LEVEL INDICATING CONTROLLER PIT PRESSURE INDICATING TRANSMITTER		ОТ	OVERTEMPERATURE
			PFR	PHASE FAILURE RELAY
	LIC LEVEL ALA	IC LEVEL ALARM HIGH		MOTOR FAILURE RELAY
			SL	SEAL LEAK
			SS	START-STOP STATION
			TFR	TRANSFER FAIL RELAY
			TI	TEMPERATURE INDICATOR
			TR	TIMING RELAY



NORTHLAKE LIFT STATION AND FORCE MAIN

ColliersEngineering & Design

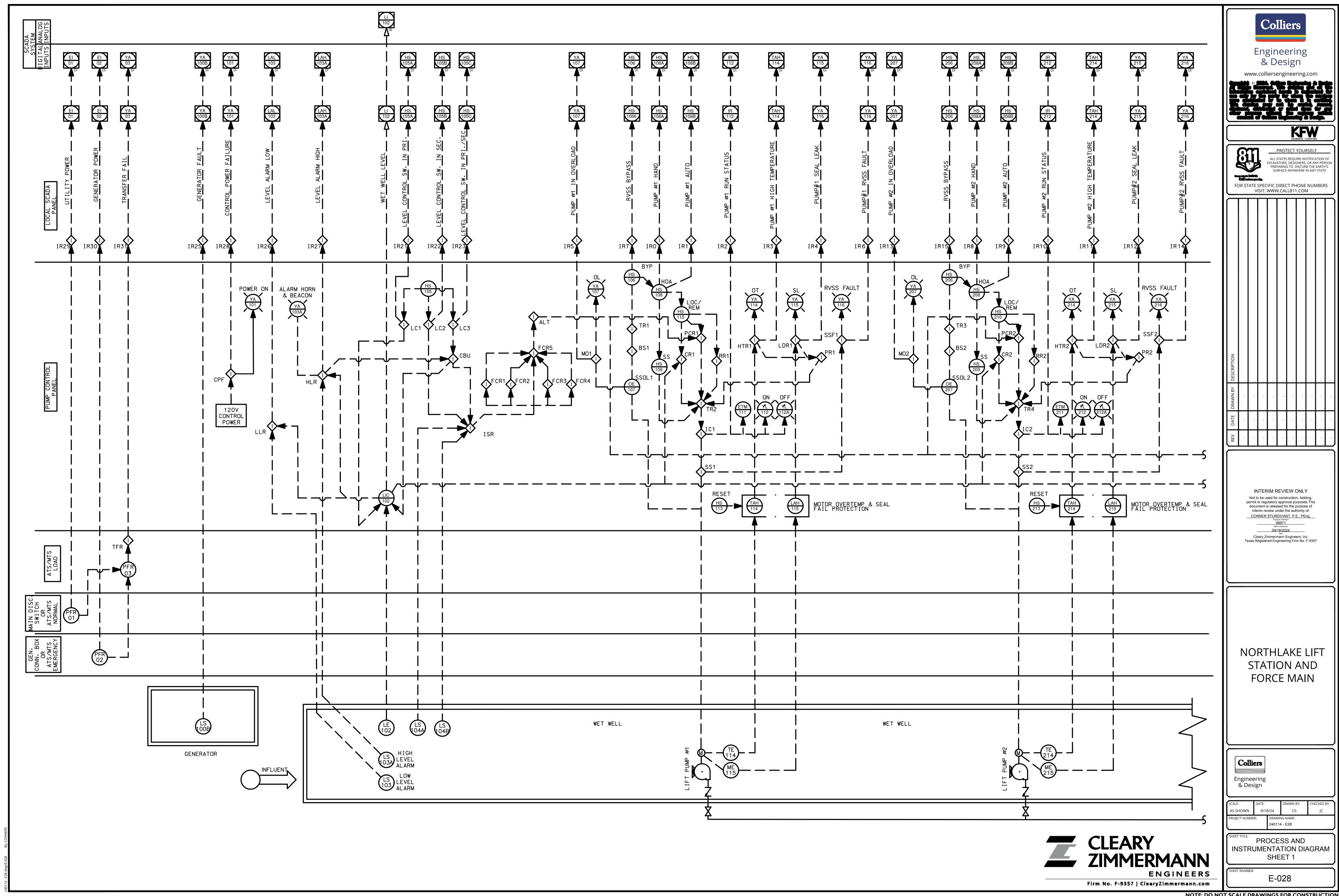
SCALE:	DATE:		DRAWN BY:	CHECKED
AS SHOWN	9/18	3/24	CS	JC
PROJECT NUMBE	R:	DRAWIN	NG NAME:	
		240114 - E27		

PROCESS AND
INSTRUMENTATION
ABBREVIATIONS

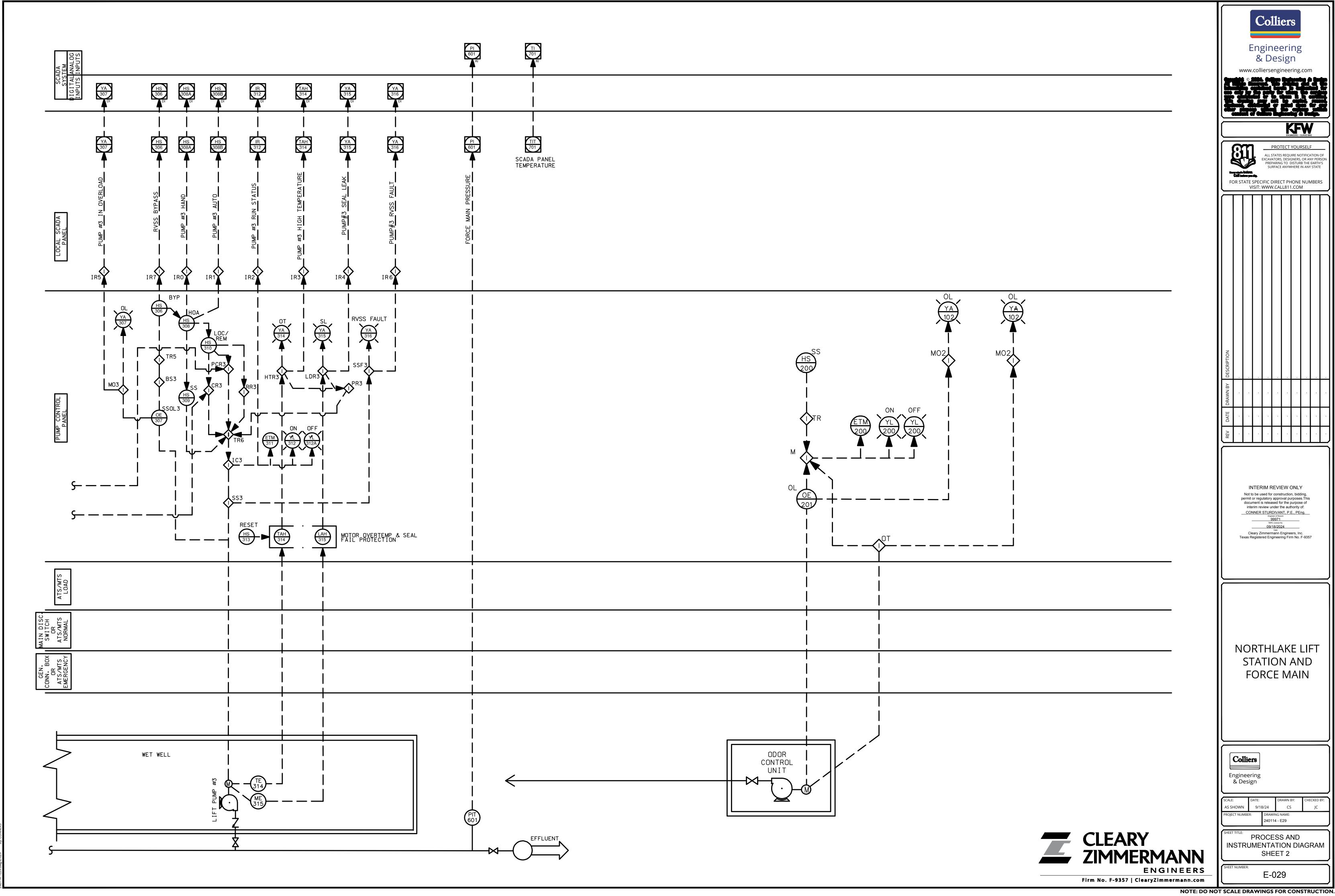
E-027

CLEARY ZIMMERMANNENGINEERS

Firm No. F-9357 | ClearyZimmermann.com



NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.



ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM Not to be used for construction, bidding, permit or regulatory approval purposes. This document is released for the purpose of interim review under the authority of: CONNER STURDIVANT, P.E., PEng. Cleary Zimmermann Engineers, Inc.
Texas Registered Engineering Firm No. F-9357 NORTHLAKE LIFT STATION AND FORCE MAIN

GENERAL NOTES

GENERAL

Contractor shall carefully review the Structural series drawings and compare them with the Specifications (including any Addenda) as well as the Civil, Mechanical, Electrical and Plumbing series drawungs. Before construction, all Civil drawing dimensions and proposed equipment shall be compared with the Structural drawings for compatibility.

Any differences shall be promptly referred to the Civil Engineer for instruction. In the event of a discrepancy between the Structural drawings and specifications, (unless directed otherwise) Contractor shall bid on the item of greater quantity and/or more expensive quality.

Foundation designs are based upon the geotechnical engineering recommendations provided by Professional Service Industries, Inc. (PSI) for this project in their geotechincal engineering report (No. Ø312-3377) dated October 11, 2024.

CODE REQUIREMENTS FOR CONSTRUCTION

Building Code: 2021 International Building Code (IBC).

Concrete: Building Code Requirements for Reinforced Concrete, ACI 318-05 and Code Requirements for Environmental Concrete Structures, ACI 350-06.

Structural Steel: Manual of Steel Construction, American Institute of Steel Construction, Ninth Edition.

Design Loads: Minimum Design Loads for Buildings and Other Structures, ASCE 7-10.

DESIGN LOADS

- 1. Live Loads
- A. Wet Well Concrete Cap

100 psf

2. Equivalent Lateral Fluid Pressure on Wet Well Walls 150 pcf (Unfactored)

EXCAVATION, WET WELL FOUNDATION AND BACKFILL

- 1. Construction areas (5'-0" min. beyond the Wet Well and Equipment Pad perimeter) shall be stripped of all vegetation, organics and deletrious material, including debris, to expose the subgrade.
- 2. Wet well excavation shall comply with OSHA Standard 29CFR, Part 1926, Subpart P and all State of Texas and local requirements. According to OSHA, "Sloping or benching for excavations greater than 20 ft. deep" shall be designed by a professional engineer registered to practice in the State of Texas.
- Excavation may be sloped or shored at Contractor's discretion provided that methods comply with OSHA, state and local requirements.
- 3. During construction, excavation dewatering measures shall be implemented to prevent ponding of water on the subgrade. Subgrade and building pads shall not be allowed to dry out.
- If the bearing soils are softened by water intrusion or by desiccation, the unsuitable material must be removed from the foundation excavation and replaced as required by the project geotechnical engineer.
- 4. Once final wet well subgrade elevations have been achieved, coordinate with the appropriate PSI, Inc. personnel for their observation and direction regarding any required subgrade improvements (e.g. removal of debris/soft material and replacement with compacted select fill).
- 5. Once approved, construct a 2500 psi (min. 28 day compressive strength) 6" thick unreinforced concrete working slab on top of the subgrade within 24 hours max. of subgrade approval.
- 6. Construct foundation mat.
- 7. Upon reaching a minimum foundation mat concrete strength of 3000 psi, coordinate with and install the prefabricated fiberglass wet well in accordance with manufacturer's recommendations.
- 8. Construct the perimeter reinforced concrete ring around the base of the prefabricated fiberglass wet well.
- 9. Backfill around the wet well walls in a uniform, balanced manner with an "Excavatable Flowable Fill" material meeting the requirements of the Texas Department of Transportation Item 401: Flowable Fill (80 psi to 200 psi max.) up to approximately 3 ft. below natural grade.

EQUIPMENT SLAB BUILDING PAD

- 1. Upon completion of 9. above, excavate and remove the existing soils in the Equipment Slab area (2'-0" min. beyond its perimeter) to a minimum depth of 3'-0" below natural grade.
- 2. Once final subgrade elevations have been achieved, the exposed subgrade shall then be carefully proofrolled with a 20-ton pneumatic roller or fully loaded dump truck to detect any weak zones in the subgrade. Soft spots shall be removed and replaced with compacted select fill.
- 3. The exposed subgrade shall then be scarified to a depth of 9 inches, then moisture conditioned to between optimum and + 4% of optimum moisture content. The subgrade shall then be recompacted to at least 95% of the Standard Proctor dry density as determined by ASTM D698. The subgrade shall not be allowed to dry out or become saturated prior to installation of select fill.
- 4. During construction, excavation dewatering measures shall be implemented to prevent ponding of water on the subgrade. Subgrade and building pads shall not be allowed to dry out. Foundation backfill shall proceed as soon as possible (24 hours max.) after approval of the subgrade preparation. If the bearing soils are softened by water intrusion or by desiccation, the unsuitable material must be removed from the foundation excavation and replaced as required.
- 5. Bring the building pad to grade with a crushed limestone base material meeting TxDOT Item 247 Specifications for Type A or B, Grades 1, 2 or 3 with a plasticity index (PI) between 8 and 20. index (PI) between 8 and 20.
- 6. Install select fill in 8 inch maximum loose lift thicknesses and compact to 95% minimum of ASTM D 698 maximum dry density at a moisture content between (-)1% and (+)3% of optimum.

CONCRETE AND REINFORCING STEEL

- All concrete shall be normal weight concrete made with natural aggregates.
 Do not add air-entraining admixtures without receiving prior approval from the Engineer.
- 2. Concrete shall have a minimum compressive strength of 4000 psi at 28 days and shall not contain less than 5 1/2 sacks of cement per cubic yard of concrete with a maximum water/cement ratio of 0.49.
- 3. Construction joints in concrete pours shall be permitted only where indicated on the drawings. The location of construction joints shall be as approved by the Structural Engineer. Additional reinforcing at construction joints shall be as specified by the Engineer without additional cost to the Owner.
- 4. No conduit or piping shall be run within the concrete slab thickness specified. Provide additional excavation (and slab thickness) as required to maintain the minimum 6" slab thickness along with a minimum of 1" clearance/cover from/between reinforcing steel.
- 5. Reinforcing steel shall be deformed new billet steel bars in accordance with A.S.T.M. Specification A615 Grade 60. Welded wire fabric shall conform to ASTM 185 requirements.
- 6. Detailing of reinforcing steel shall conform to the American Concrete Institute Detailing Manual.
- 7. Provide 2-*6 \times 4'-0" "L" shaped bars top and bottom at all corners and "T" intersections of beams.
- 8. All hooks and bends in reinforcing bars shall conform to ACI Standards unless shown otherwise.
- 9. Lap continuous unscheduled reinforcing bars 48 bar diameters unless noted otherwise.
- 10. Tack welding on reinforcing steel will not be permitted.
- 11. Heat shall not be used in the fabrication or installation of reinforcement.
- 12. Reinforcing steel coverage shall be as follows:
- a) Wet Well Foundation Mat 3" bottom, 2" top, 3" sides b) Cap Slab 5" top, 2" bottom, 3" sides
- 13. Concrete must reach the following percentages of 28 day compressive strength (Fc') before forms may be removed:

mat and slab sides 40% bottom of cap slab 85%

COORDINATION

- 1. Only certain of the required openings in the wet well structure are indicated on the structural series drawings. All sleeves, inserts, openings, frames, etc., required for incorporation of the Work of the Contract, including Mechanical, Electrical and Plumbing shall be provided. The provision for sleeves or framed openings shall include the verification and coordination of their sizes, alignment, dimensions, position, locations, elevations and grades. Openings not indicated on the structural series drawings, but required as above, shall be specifically noted on shop drawings for review by the Engineer.
- 2. Refer to Civil, Mechanical, Electrical and Plumbing series drawings for floor elevations, slopes, drains and location of depressed and elevated floor areas.
- 3. Structural series drawings shall be compared with drawings other series. Differences shall be referred to the Civil Engineer for instruction.
- 4. Compatibility of structural framing with proposed equipment, including location, loading and sizes, shall be verified prior prior to submission of shop drawings. Any conflicts or differences shall be referred to the Civil Engineer for review and approval or notation.
- 5. Shop drawings shall be prepared for all structural items and submitted for review by the Engineer. Engineering contract drawings shall not be reproduced and used as shop drawings. Any items deviating from the contract drawings or from previous shop drawings submitted shall be so noted. Written notice shall be provided for each deviation from the contract documents and from previous submittals.
- 6. The details designated as "Typical Details" apply generally to the drawings in all areas where conditions are similar to those described in the details.
- T. The design and provision of all temporary supports such as guys, braces, falsework, cribbing, masonry wall bracing, formwork, wall bracing, supports and anchors for safety lines or any other temporary elements required for the execution of the Contract are not included in these drawings and shall be the responsibility of the Contractor.

SPECIAL INSPECTIONS

GENERAL

- 1. In addition to the regular inspections required by Section 110 of the 2021 International Building Code (IBC), Special Inspections are required in accordance with Sections 1704, 1705 and 1706 of the 2021 IBC. Structural Observations as noted in Sections 1704.6 are
- 2. Special Inspections as noted in Sections 1705.12 (Wind Resistance) and, 1705.13 (Seismic Resistance) are not required.
- 3. See Specification Section Ø145Ø, "Special Inspections and Quality Control", for a more detailed description of special inspection and quality control requirements.
- 4. Contractor shall communicate and coordinate work schedule with the Special Inspector. Contractor shall generally notify the Special Inspector of upcoming inspection items I days prior to the work being executed.

EXCAYATION, FILLING AND BACKFILLING

- 1. A qualified representative of the geotechnical engineer, PSI Geotechnical of San Antonio, I shall provide periodic inspections of excavation operations.
- 2. PSI's representative must be engaged to carefully monitor all filling and backfilling operations, including placement and compaction of each lift as noted on this sheet and this sheet and Specification Section 01450.

STRUCTURAL CONCRETE

- 1. Inspect all reinforcing steel before placement of concrete and provide concrete inspection and testing in accordance with Specification Section Ø1450.
- 2. Provide periodic inspections of concrete formwork as required to confirm compliance with Specification Section 03100, "Concrete Formwork".



WINTER ENGINEERING
FIRM NO. F-1865

1100 LAKEWAY DRIVE, SUITE #220 AUSTIN, TEXAS 78734 (512) 261-4400 Colliers

Engineering & Design

Www.colliersengineering.com

Copyright © 2025. Colliers Engineering & Design All Rights Reserved. This drawing and all the information contained herein is authorized for use only by the party for whom the services were contracted or to whom it is certified. This drawing may not be copied, reused, disclosed, distributed or relied upon for any other purpose without the express written consent of Colliers Engineering & Design.

ENGINEERS + SURVEYING

PROTECT YOURSELF

ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR AN PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN ANY STATE

(Crous which's bodow).

Call barfore you dis.

FOR STATE SPECIFIC DIRECT PHONE

NUMBERS VISIT: WWW.CALL811.COM

THIS DOCUMENT IS RELEASED FOR THE PURPOSE OF INTERIM REVIEW UNDER THE AUTHORITY OF DAVID A. KNEUPER, REGISTERED P.E. 96676 AND IS NOT TO BE USED FOR FINAL BIDDING, PERMIT ACQUISITION(S) AND/OR CONSTRUCTION PURPOSES.

NORTHLAKE LIFT STATION AND FORCE MAIN

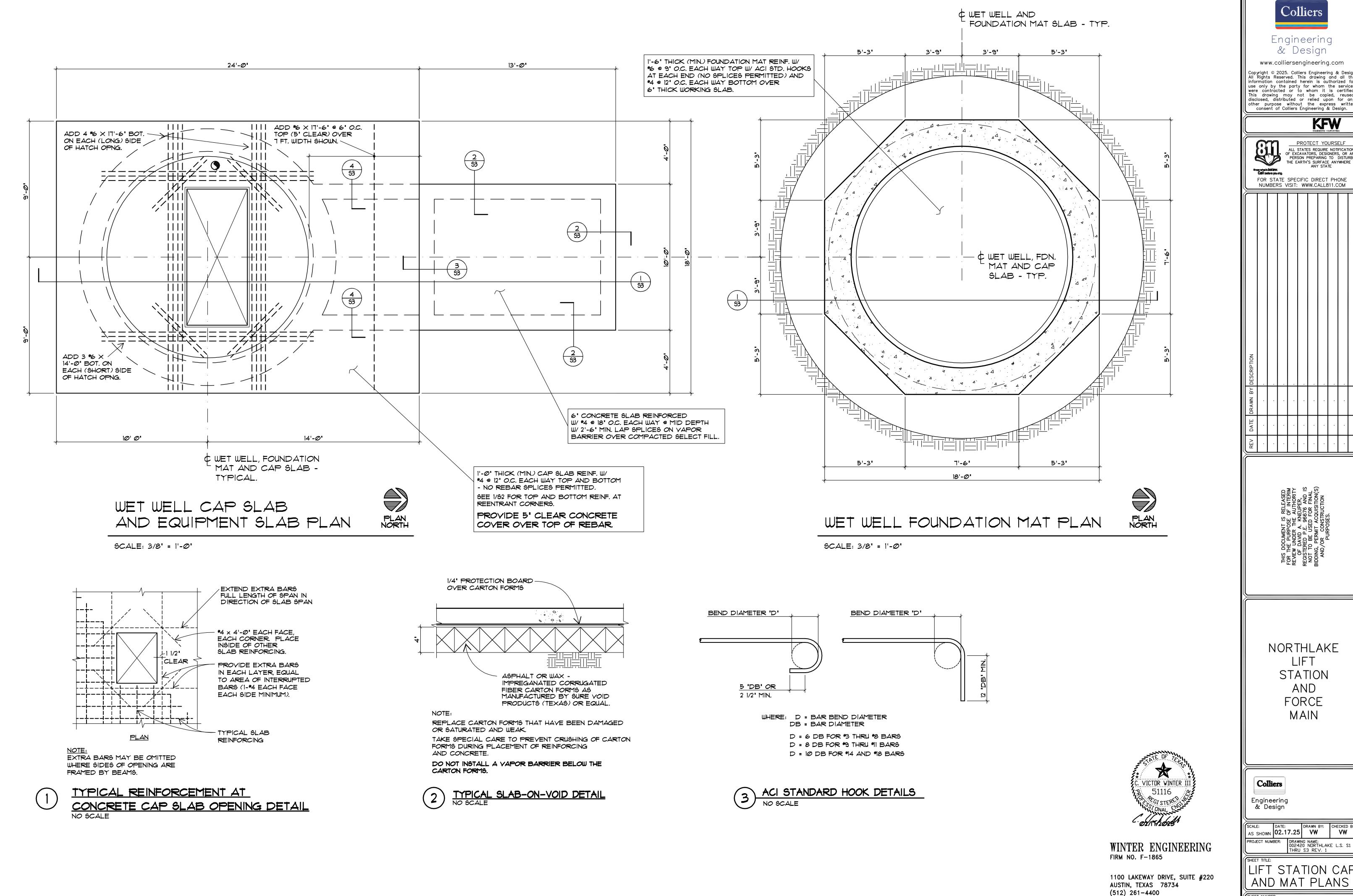
Colliers

Engineering & Design

SCALE: DATE: DRAWN BY: CHECKED BY
AS SHOWN 02.17.25 VW VW
PROJECT NUMBER: DRAWING NAME:
002420 NORTHLAKE L.S. S1
THRU S3 REV. 1

STRUCTURAL NOTES

S-1



Colliers Engineering & Design www.colliersengineering.com Copyright © 2025. Colliers Engineering & Design All Rights Reserved. This drawing and all the information contained herein is authorized for use only by the party for whom the services were contracted or to whom it is certified. This drawing may not be copied, reused, disclosed, distributed or relied upon for any other purpose without the express writter consent of Colliers Engineering & Design. **KFW** PROTECT YOURSELF ALL STATES REQUIRE NOTIFICATION OF EXCAVATORS, DESIGNERS, OR ANY PERSON PREPARING TO DISTURB THE EARTH'S SURFACE ANYWHERE IN FOR STATE SPECIFIC DIRECT PHONE NUMBERS VISIT: WWW.CALL811.COM NORTHLAKE LIFT

STATION AND FORCE MAIN

SCALE: DATE: DRAWN BY: CHECKED BY AS SHOWN 02.17.25 VW VW

LIFT STATION CAP AND MAT PLANS

S-2

NOTE: DO NOT SCALE DRAWINGS FOR CONSTRUCTION.

