# ADDENDUM No. 1

#### To JASPER MASTER LIFT STATION

October 16, 2025

# JASPER, GEORGIA

### Bids received until 2:00 P.M., Local Time, October 21, 2025

ACKNOWLEDGE RECEIPT OF THIS ADDENDUM BY INSERTING ITS NUMBER IN THE BID FORM. THIS ADDENDUM FORMS A PART OF THE PROJECT DOCUMENTS. IT MODIFIES THEM AS FOLLOWS:

# **QUESTIONS & RESPONSES:**

1. Can a pay item be added for J&B through Rock?

Engineer Response: This should be accounted for in line item #15-24" Welded Steel Casing (Jack & Bore/Open Trench)

2. Quantity on bid form is different compared to drawings for the Gravity Sewer Main.

J&B#3 STA:20+21 to 21+16 = 75LF J&B#4 STA:23+09 to 23+49 = 40LF J&B#5 STA:0+00 to 2+10 = 135LF

Total J&B for Gravity Sewer on Drawings is 250LF

Total J&B item #15 on bid form is 240LF

Engineer Response: On sheet C-306 (J&B#5), there is 135 LF of restrained joint pipe, but the Jack & Bore with casing is 125LF. The total amount of Jack & Bore should be 240 LF.

3. Can HDPE be used in lieu of FPVC?

Engineer Response: No, flow calculations were performed using FPVC and FPVC has a higher tensile strength for pulling.

4. What are the current flows (gpm) in the existing pump stations?

Engineer Response: **Town Creek:** MMADF – 318,823 GPD, PDF – 750,252 GPD – **Mineral Springs:** We do not have runtime data – this lift station has been on bypass pumps since the beginning of 2024.

5. 180 days seems tight for a project of this scope. Has engineer / owner thought of increasing this slightly?

Engineer Response: We will extend the length of the project to 9 months (270 days).

6. Is it the contractor's option to open cut vs. J&B?

Engineer Response: The possibility of Open Trench across roadway can be discussed with the Owner before construction. The Jack & Bore underneath Town Creek will be required.

7. Can a separate pay item be added for HDD through rock?

Engineer Response: This should be accounted for in line item #7-10" DR 18 FPVC Horizontal Directional Drilling (FM).

8. Please confirm abandonment of existing FM is just cap / plug. No further work needs to be done on the existing line such as flushing / vac.

Engineer Response: The only action required by the contractor for abandonment of the existing force main is a cap/plug. No further work is required.

9. What will be the FINAL day for questions?

Engineer Response: October 10<sup>th</sup>, 2025 - See Specification Section 00 20 00-5: Instructions to Bidders; Article 7 Interpretations and Addenda

10. The bid schedule has items 14a & 14b which are for 14" DIP. Plan sheet C-302 call out 15" DIP. Please clarify.

Engineer Response: Any reference to 15" DIP shall be installed as 14" DIP

11. The Horizontal directional drills are called out as 225 LF and 150 LF. Our subcontractors that specialize in this type of installation recommend a much longer distance for these and generally can have their steering head at a 2%. That would make the total length approximately 350 LF. Will the contractor only be paid for the length called out on the plans regardless of the actual length installed?

Engineer Response: Agree these bores are minimum lengths but they are constructable. Yes, the contractor will be paid by the length specified in the plans.

12. Can these storm crossings be bid either method - Jack & bore or HDD?

Engineer Response: No, they must be bid as shown in the plans.

13. The outside drop manhole and the doghouse at MH 16 call for 10" DR 18 C900 for the gravity lines. Should the gravity material be changed (from the SDR 26) and should this footage be incidental to other items?

Engineer Response: The use of 10" DR18 C900 pipe at the outside drop and doghouse manhole (MH 16) is intentional to provide added strength at those connections. C900 should be used instead of SDR26 in these short sections. The footage of C900 installed in these areas should be considered incidental to the manhole installation and not a separate pay item.

14. With the federal government shut down, GEFA payments are not being made and are often held up for various reasons. Will the City of Jasper be paying the contractor with existing funds or will the contractor have to wait for GEFA reimbursements?

Engineer Response: The City will not pay with existing funds. All money will come from GEFA, which is a state agency and will not be impacted by the federal shutdown.

15. There is Guardrail – Remove & Replace called out in a section where there will be an HDD. Does this Guardrail need to be replaced even if it is not disturbed?

Engineer Response: Yes, the total length of guardrail to be replaced is shown in the plans.

16. Also, regarding the guardrail, the bid item says "replace", but this will have to meet the latest GDOT standards pertaining to height, setbacks, and anchoring. Please confirm.

Engineer Response: The proposed guardrail placement will not meet the horizontal GDOT standards, but installation shall meet the GDOT standards.

17. The geo-tech report indicates fill/trash in the vicinity of the lift station. Should the contractor plan for material that must be taken to a permitted land fill?

Engineer Response: The contractor will be allowed to move the fill/trash to another location on-site

18. If the material encountered during installation of the lift station is only unsuitable, does the owner have an area this may be disposed of?

Engineer Response: Yes, it can be disposed of on the same property.

19. The Jack & bore going to Manhole 16 indicate the bore pit to be installed inside the existing Mineral Springs lift station and on top of existing piping that must stay in service until abandonment. Can the bore pit be placed on the opposite side of the road and additional easement be provided?

Engineer Response: Yes, the bore pit can be moved to the north side of Mineral Springs Road, and the receiving pit can be placed on the south side of Mineral Springs Road.

20. Would it be possible to close Mineral Springs Road to thru traffic? This would allow a construction zone to be established for a several hundred foot section of the road. This would decrease the overall cost of the project and increase safety - avoiding having a 16-foot cut near edge of pavement with active traffic.

Engineer Response: It is a possibility, but must be discussed with and agreed upon between the City and the County

21. The measurement & payment specifically indicates no additional payment for rock encountered in a Jack & bore – Is this also the case for horizontal directional drill?

Engineer Response: Yes

22. The measurement & payment for doghouse MHs is indicated to be paid by cut classification. All doghouse MHs are greater than (0-6) bid item 17. Please clarify.

Engineer Response: Line Item 18. Extra Dept for Standard 4' Diameter Manhole includes extra depth of doghouse manholes.

23. Are the Manual Transfer Switch and the Pump Control Panel both 3-Phase 120/240 volts?

Engineer Response: Yes

24. Is the Manual Transfer Switch mounted so that the SPD can be installed beneath the switch?

Engineer Response: Not as designed. There are factory mounted options.

25. On the Pump Control Panel, do you want the SPD installed inside of the panel or on the exterior?

Engineer Response: Inside

26. The specification calls for audible alarms. Will an audible alarm mounted on the SPD be sufficient? I can provide a Dry Relay Contract you can use for remote monitoring.

Engineer Response: Use dry contacts for remote monitoring

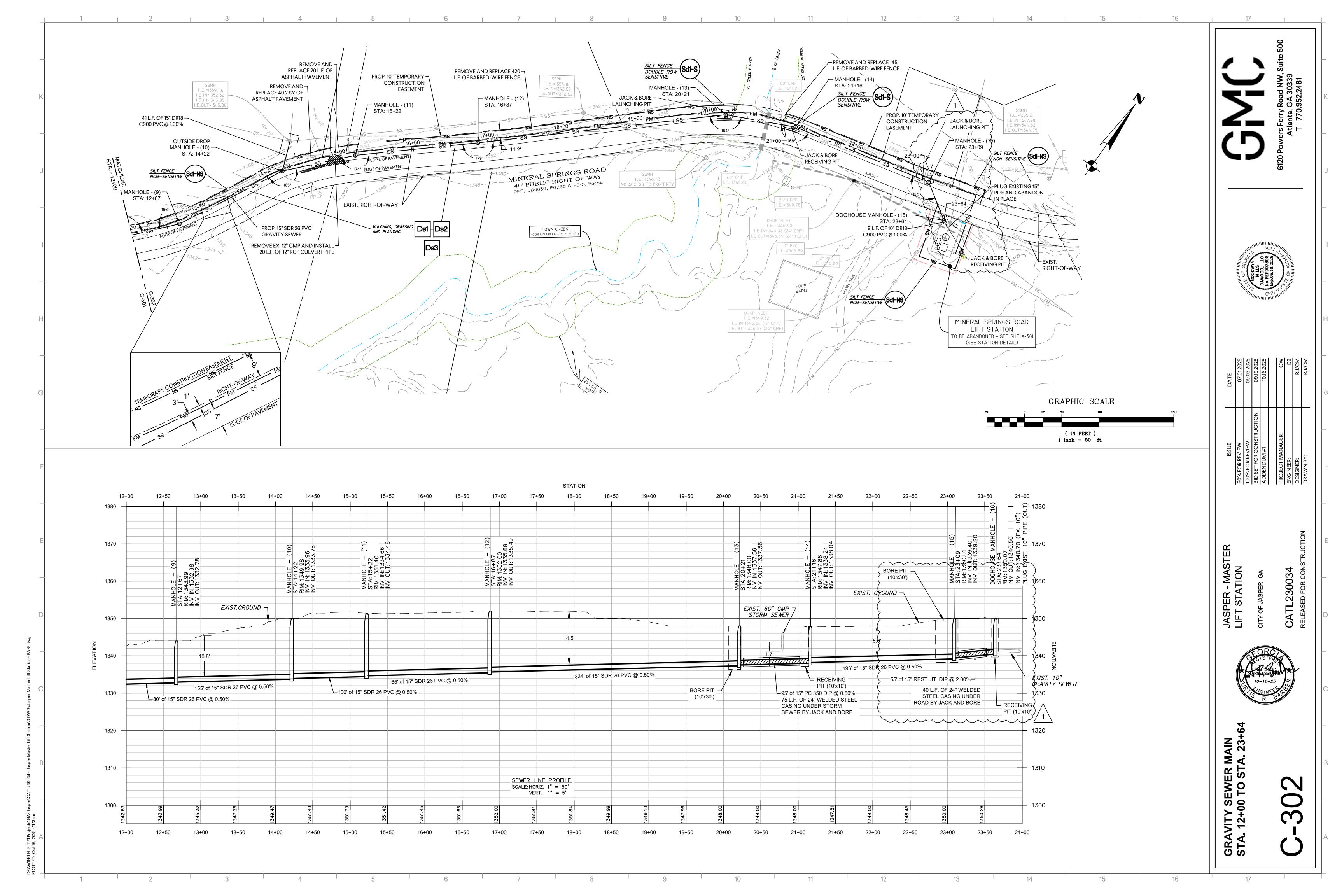
27. What Peak Surge Current do you want at each location? Is 240 kA sufficient on the Manual transfer Switch okay or do you want 300 kA?

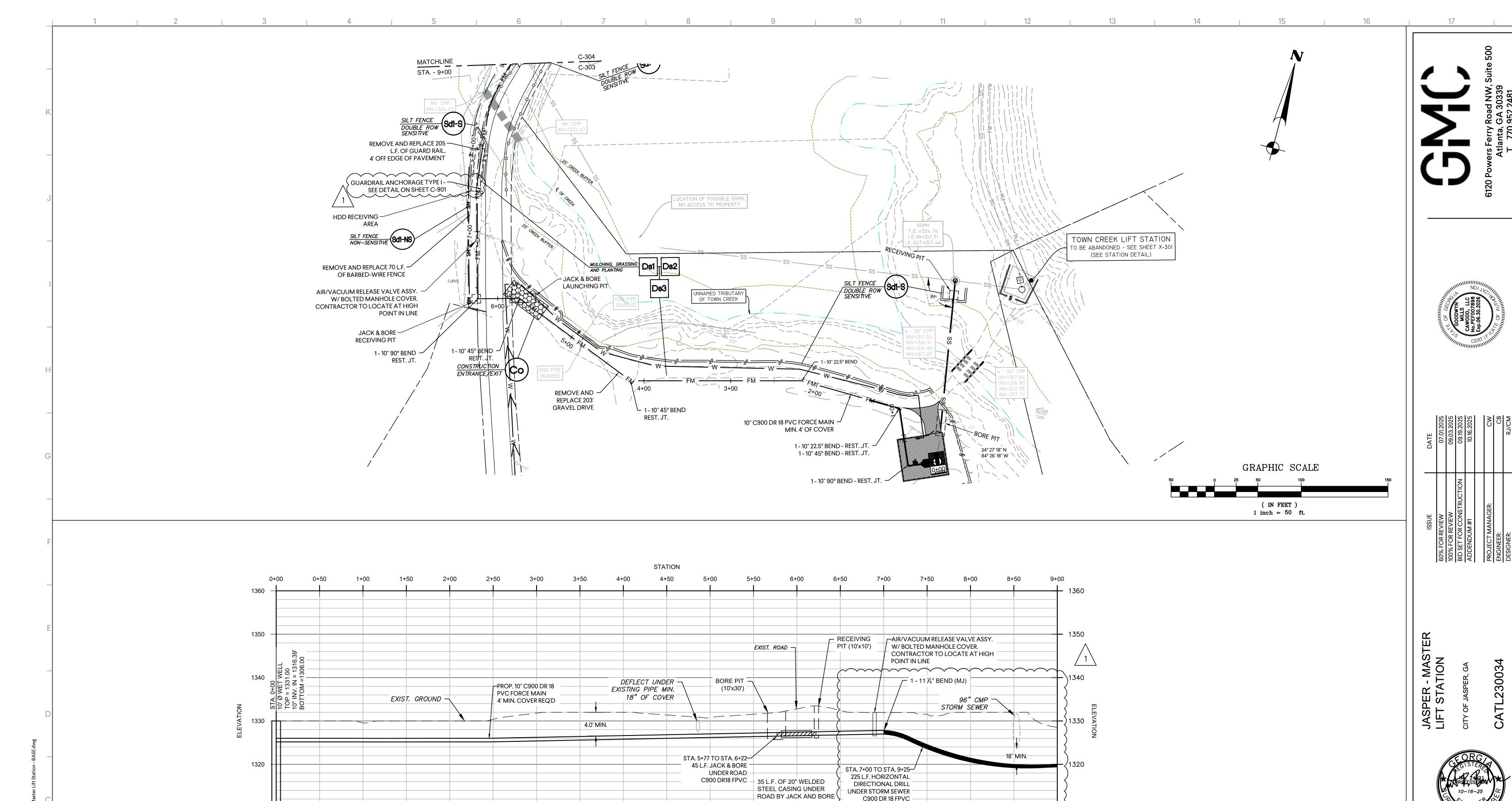
Engineer Response: 240kA is acceptable

# PLEASE CHANGE THE CONTRACT DOUMENTS AND TECHNICAL SPECIFICATIONS:

- 1. SECTION 43 25 13 SUBMERSIBLE CENTRIFUGAL PUMPS: Delete this section and replace with new SECTION 43 25 13 SUBMERSIBLE CENTRIFUGAL PUMPS attached. Changed the approved pump manufacturers.
- 2. Remove and replace sheets C-306, C-307, C-308 and C-901 with the revised sheets.

# END OF ADDENDUM No. 1





C900 DR 18 FPVC -

7+00

7+50

1310

8+50

<u>NOTE:</u> FORCE MAIN SHALL BE INSTALLED ON A CONSTANT UPHILL GRADE WITH NO LOW POINTS OR AIR POCKETS, MIN. SLOPE = 0.5%

SEWER LINE PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'

4+50

5+00

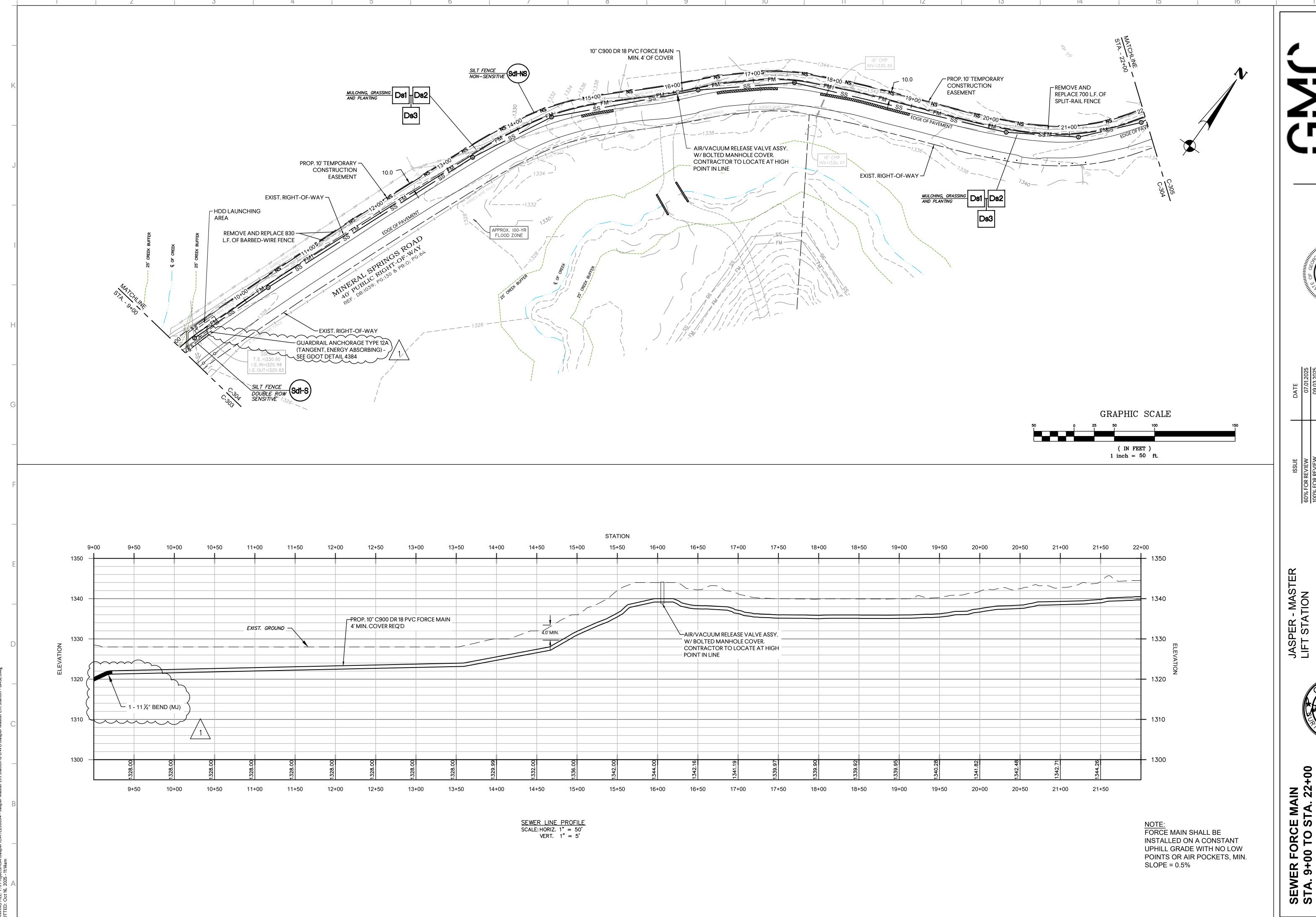
5+50

2+50

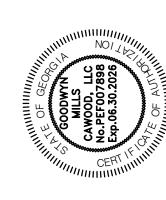
3+00

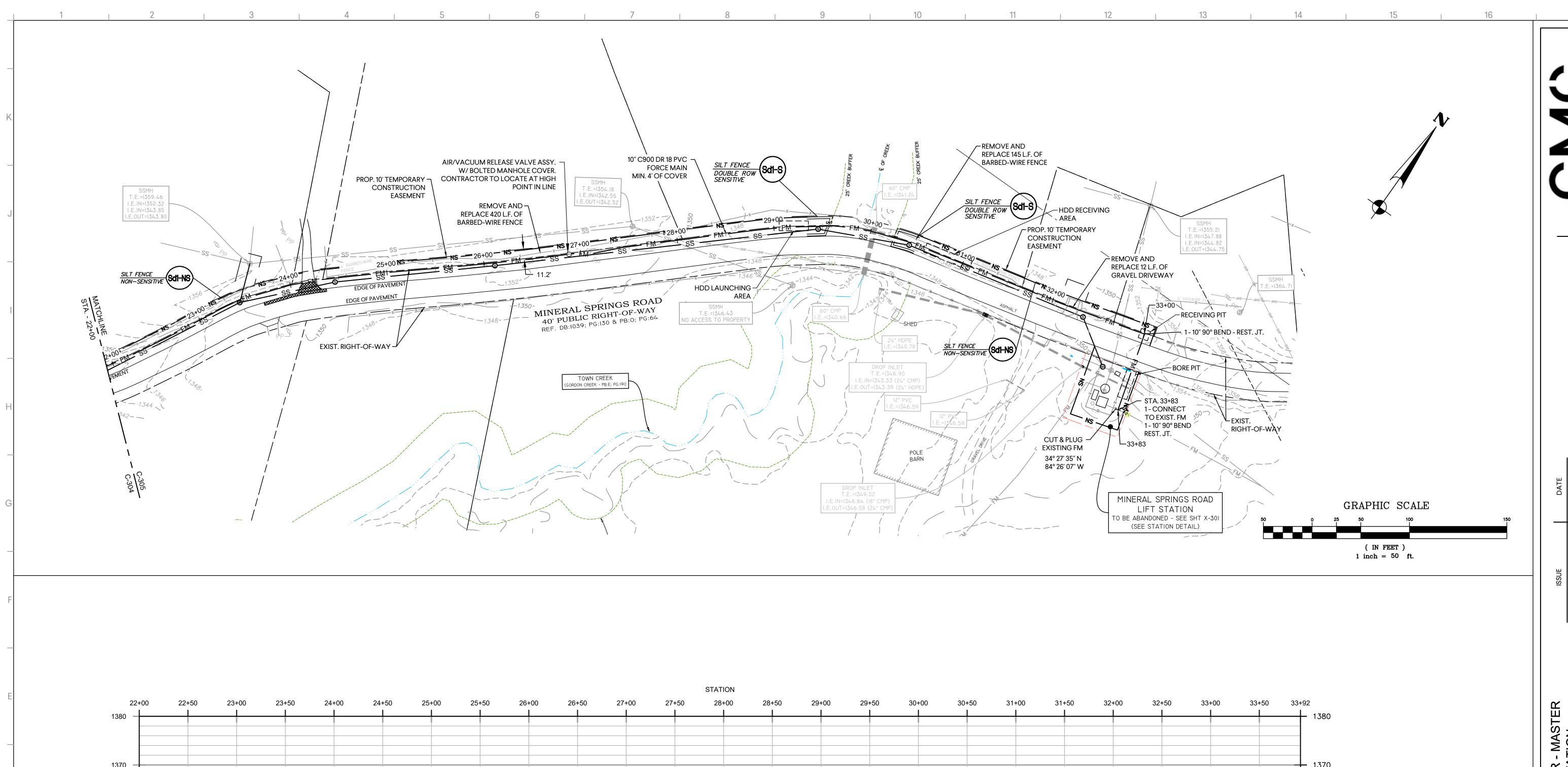
1310

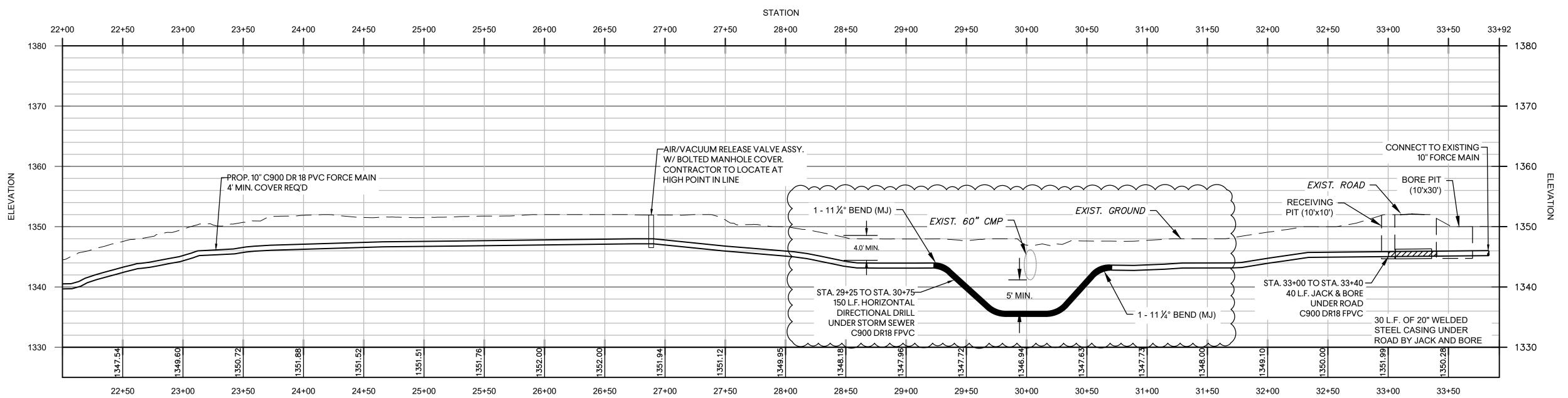
SEWER FORCE MAIN STA. 0+00 TO STA. 9+00



JASPER - MASTER LIFT STATION

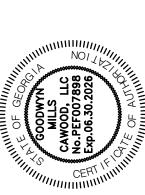






SEWER LINE PROFILE
SCALE: HORIZ. 1" = 50'
VERT. 1" = 5'

NOTE: FORCE MAIN SHALL BE INSTALLED ON A CONSTANT UPHILL GRADE WITH NO LOW POINTS OR AIR POCKETS, MIN. SLOPE = 0.5%

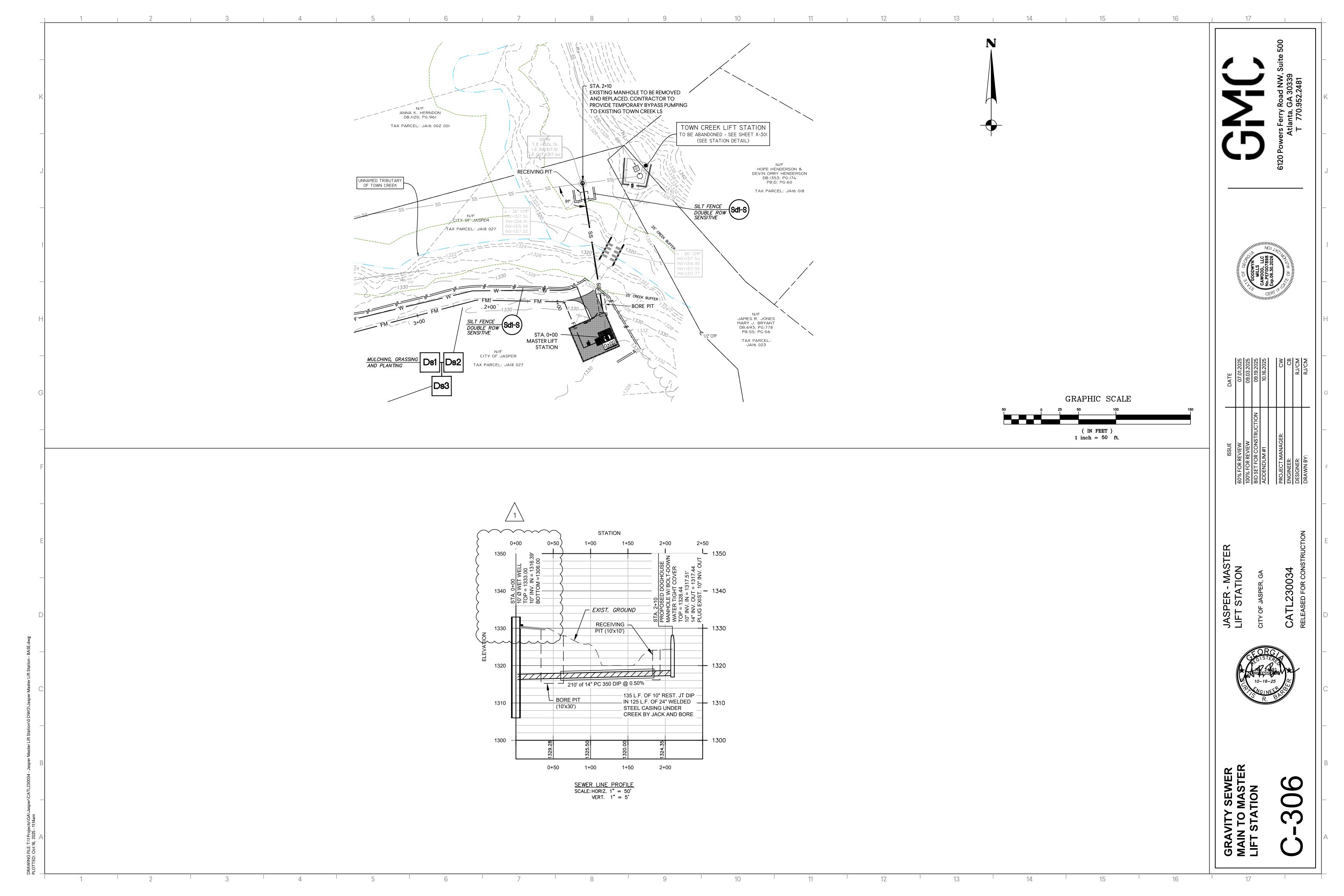


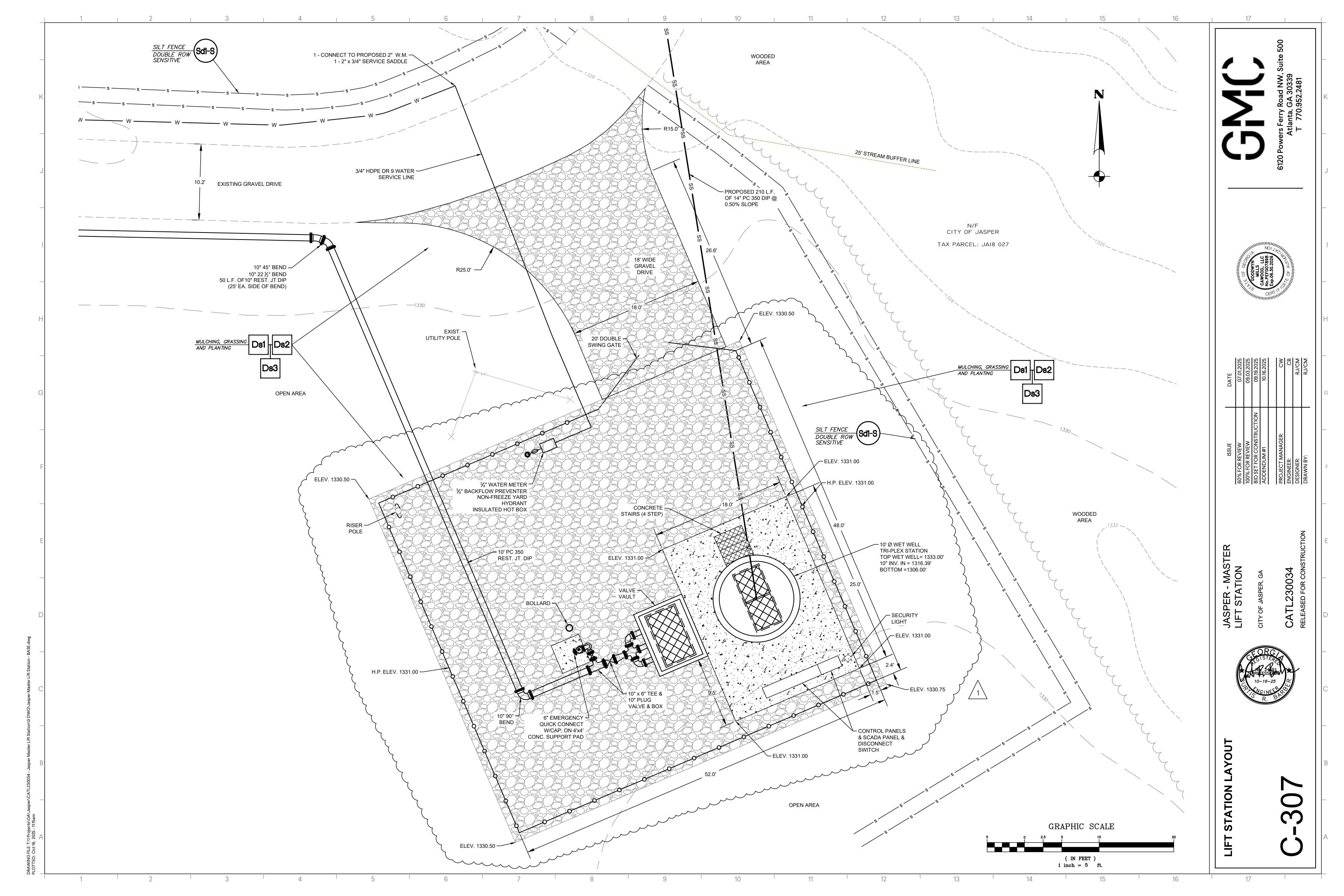
60% FOR REVIEW	07.01.2025
100% FOR REVIEW	09.03.2025
BID SET FOR CONSTRUCTION	09.19.2025
ADDENDUM #1	10.16.2025
PROJECT MANAGER:	CW
ENGINEER:	CB
DESIGNER	BI/CM

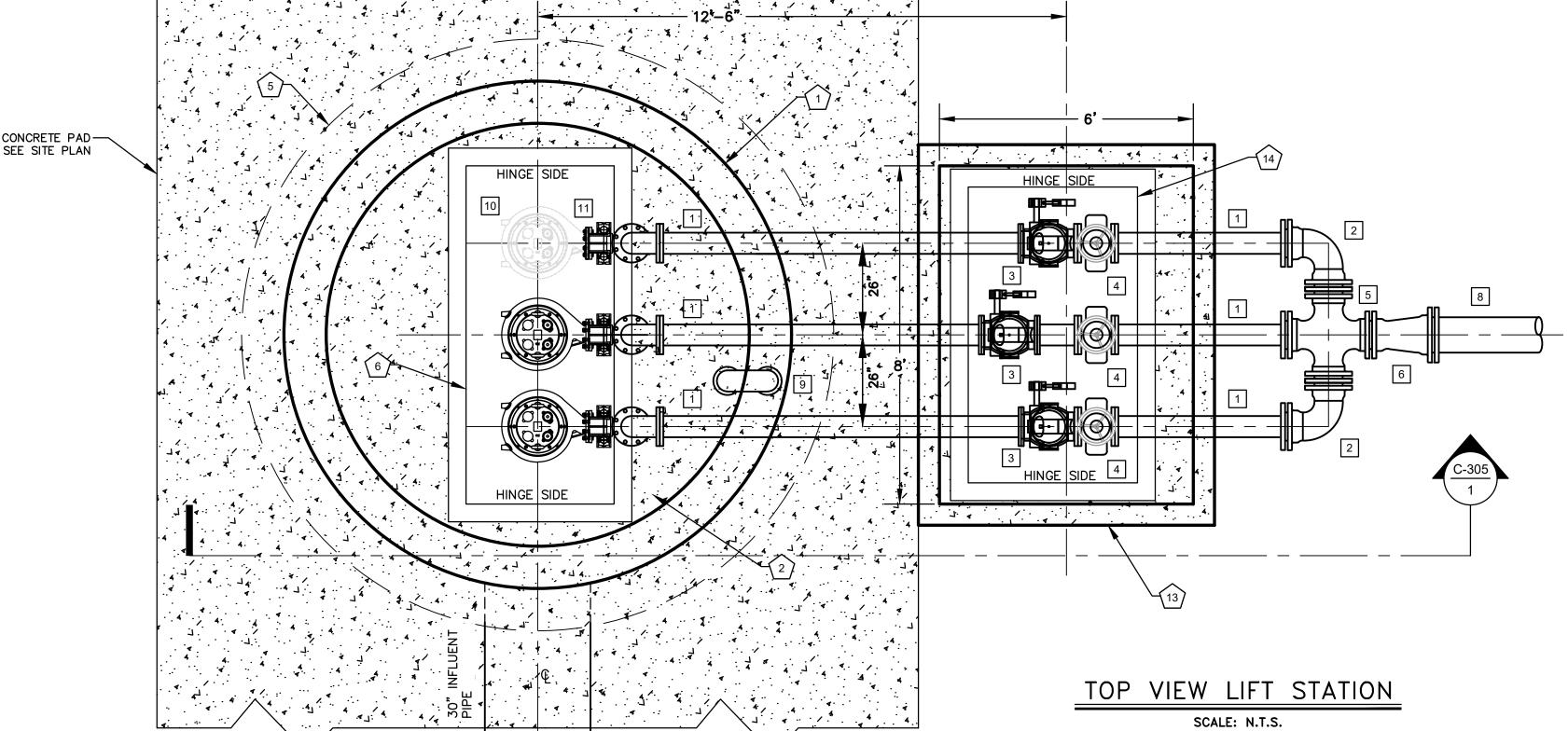




SEWER FORCE MAIN STA. 22+00 TO STA. 3







**GENERAL NOTES** 

THE CONTRACTOR SHALL FURNISH THREE (3) SPARE FUSES FOR EACH FUSE SIZE. 2. THE CONTRACTOR SHALL PROVIDE ONE (1) SPARE PRESSURE TRANSDUCER LEVEL SENSOR & CABLE AS SPECIFIED.

3. UPON INSTALLATION, ALL PUMPS SHALL BE CHECKED BY A MANUFACTURER'S REPRESENTATIVE FOR PROPER ROTATION, PUMPING CAPACITY, AMPERAGE DRAW, LACK OF VIBRATION, AND OTHER CHECKS AS MAY BE DEEMED NECESSARY TO ASSURE PROPER OPERATION. ALL SUBMERSIBLE PUMPS SHALL BE PULLED OUT OF, AND REINSTALLED IN THE LIFT STATION IN THE PRESENCE OF A REPRESENTATIVE OF THE OWNER TO ASSURE PROPER CLEARANCES FOR EASY REMOVAL OF THE PUMPS FOR MAINTENANCE.

4. LIFT STATIONS SHALL BE PROVIDED WITH A HIGH LEVEL ALARM BELL, BUZZER, OR HORN, RED ALARM LIGHT, ETC. SEE SECTION 43 25 13 FOR A COMPLETE LIST OF REQUIRED ACCESSORIES. ALL METAL ACCESSORIES SHALL BE STAINLESS STEEL.

5. THE LIFT STATION SHALL BE PROVIDED WITH SECURITY LIGHTING.

6. THE AREA SURROUNDING THE LIFT STATION SHALL BE GRADED TO PROVIDE A MINIMUM OF 0.5% SLOPE AWAY FROM THE STATION IN ALL DIRECTIONS.

7. WATER METER SHALL BE SUPPLIED BY THE OWNER AND PAID FOR BY THE CONTRACTOR.

8. UNPAVED AREAS INSIDE THE FENCED LIFT STATION AREA AND ONE FOOT OUTSIDE FENCED AREA SHALL BE COVERED WITH A MINIMUM OF SIX INCHES (6") OF GAB OR GDOT #57 STONE.

9. THE CONTRACTOR SHALL FURNISH TO THE OWNER A (1) ONE YEAR WARRANTY ON

10. THE CONTRACTOR SHALL FURNISH TO THE OWNER, FIVE (3) SETS OF OPERATION AND MAINTENANCE MANUALS AND "AS-BUILT" DRAWINGS TO INCLUDE, AS A MINIMUM, THE FORCE MAIN LAYOUT, AIR / VACUUM RELIEF VALVES, FITTINGS LOCATION & DETAILS, DETAILED WIRING SCHEMATICS, AND A LIST OF NAMES, ADDRESSES AND TELEPHONE NUMBERS OF THE CONTRACTOR, EACH EQUIPMENT REPRESENTATIVE AND THE DESIGN ENGINEER, BEFORE FINAL INSPECTION.

LIFT STATION NOTES:

1. THE DESIGN AND LAYOUT OF THIS SUBMERSIBLE LIFT STATION IS BASED ON SUBMERSIBLE PUMPS MANUFACTURED BY HOMA. (NOTE: IF OTHER SUBMERSIBLE PUMPS ARE LISTED AS ACCEPTABLE TO THE OWNER AND/OR IF AN ALTERNATE SUBMERSIBLE PUMP IS PROPOSED, THE CONTRACTOR SHALL BEAR THE COST OF REDESIGN AND RESUBMITTAL REQUIRED BY AN ALTERNATE PUMP SELECTION.)

2. HOMA SUBMERSIBLE PUMPS (2 REQ'D) DESIGN PUMPING RATE = 700 GPM @ 165 ft. TDH (HAZEN-WILLIAMS C=140). MODEL: AKX434-340-70G/C

3. THE LIFT STATION CONTROLS WILL ALLOW TRIPLEX OPERATION OF THE STATION (I.E. 1st PUMP "ON", 2nd PUMP "ON", 3rd PUMP "ON" (FUTURE), HIGH WATER ALARM LEVEL AND LOW-LOW LEVEL PUMPS OFF). BACK UP FLOATS FOR HIGH WATER ALARM AND LOW-LOW LEVEL ALL PUMPS OFF. THE CONTROLLER SHALL BE CAPABLE OF ALTERNATING PUMPS TO EQUALIZE RUN TIMES.

4. ALL PIPING AND FITTINGS 4"Ø AND GREATER ARE TO BE PC. 350 DIP. ALL PIPING AND FITTINGS LESS THAN 4"Ø ARE TO BE STAINLESS STEEL

5. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY PIPING, SS GUIDE RAILS, VALVES, FITTINGS AND EQUIPMENT FOR A COMPLETELY OPERABLE LIFT STATION AS REQUIRED BY THESE PLANS AND REFERENCED SPECIFICATIONS.

6. ANCHOR VALVES AND FITTINGS ON THE CONCRETE SLAB TO CONCRETE SUPPORTS WITH STAINLESS STEEL STRAPS (1/8" THICK MIN.).

# LIFT STATION & VALVE VAULT DETAILS: (#)

1. 10' Ø WETWELL

2. LIFT STATION WITH 12" TOP SLAB DESIGNED FOR H-20 LOAD RATING

3. 10' Ø PRECAST RISER SECTION WITH 10" THICK WALLS (MIN.) WITH PROTECTIVE LINING FOR CONCRETE ON ALL INTERNAL LIFT STATION SURFACES

4. STANDARD PRECAST BASE SECTION. CONTRACTOR TO SUBMIT REBAR DESIGN

AND LAYOUT IF A PRECAST BASE WILL NOT BE USED.

5. LIFT STATION FOOTING OUTLINE

6. 42" X 96" ALUMINUM ACCESS DOUBLE LEAF HATCHES WITH SAFE-HATCH ACCESS COVERS DESIGNED FOR 300 LBS/SF LOAD RATING W/FALL PREVENTION SYSTEM 7. UPPER GUIDE BAR BRACKET

8. CABLE HOLDER

9. CONTROL & POWER CABLES FROM CONTROL PANEL

10. PRESSURE TRANSDUCER LEVEL SENSOR & CABLE

11. INTERMEDIATE STAINLESS STEEL GUIDE BAR BRACKETS (USE FOR STAINLESS

STEEL GUIDE BARS OVER 20 FT. LONG)

12. GROUT FILL (SEE PUMP REQUIREMENTS)

13. 6' x 8' PRECAST CONCRETE VALVE VAULT & TOP DESIGNED FOR H-20 LOADING 14. 72" x 48" ALUMINUM ACCESS DOUBLE LEAF HATCHES FOR VALVE VAULT DESIGNED FOR 300 LBS/SF LOAD

15. GROUT VALVE VAULT FLOOR TO DRAIN TO 4"Ø DRAIN (AS REQUIRED)

16. 6" T x 1' W x 1' H CONC. PIER (2 REQ'D.) STAINLESS STEEL STRAP PIPE TO PIER

# **VALVE NOTES:**

1. CHECK VALVES SHALL BE DEZURIK APCO AIR CUSHION SWING CHECK VALVE OR APPROVED EQUAL

2. PLUG VALVES SHALL BE DEZURIK ECCENTRIC PLUG VALVE, OR APPROVED EQUAL.

PIPING AND FITTING SCHEDULE: | # | 1. 6"  $\emptyset$  PC. 350 DIP (MJ x MJ) w/ 0-160 PSI PRESSURE GAUGE

2. 6" Ø PC. 350 DIP FL 90° BEND

3. 6" Ø FL AIR CUSHION SWING CHECK VALVE

4. 6" Ø FL TOP MOUNTED HANDWHEEL OPERATED PLUG VALVE

5. 6" X 6" CROSS (MJ x MJ)

6. 6" X 10" REDUCER (MJ x MJ)

7. 12" Ø C900 DR 18 PVC (FL x MJ)

8. 10" PC. 350 DIP FORCE MAIN 9. 4" Ø (MIN.) C900 PVC DR 18 VENT PIPE W/SSTL VENT SCREEN

10. FUTURE PUMP

11. 4" BLIND FLANGE (FL x FL) PUMP BASE ELBOW, INLET SIDE

12. 4" PROFLEX RUBBER DUCKBILL CHECK VALVE

13. 4" PC 350 DIP

14. 4" X 6" REDUCER (FL x FL)

# **PIPING NOTES:**

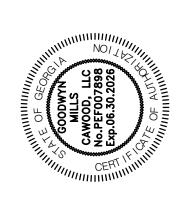
1. ALL PIPE CONNECTIONS IN THE LIFT STATION AND ABOVE GROUND ARE TO BE FLANGE TO FLANGE. NO UNIFLANGE CONNECTIONS ARE ALLOWED.

2. ALL FLANGE-FLANGE CONNECTIONS ARE TO USE STAINLESS STEEL BOLTS. 3. ALL OF THE AFOREMENTIONED INFORMATION SHALL BE CONSIDERED THE BASIS OF THE DESIGN OF THIS LIFT STATION. ANY DEVIATIONS FROM THIS BASIS OF DESIGN MUST FIRST BE APPROVED BY THE OWNER.

STATION PLAN CTION VIEW DE

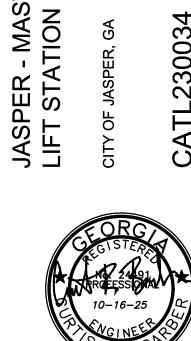
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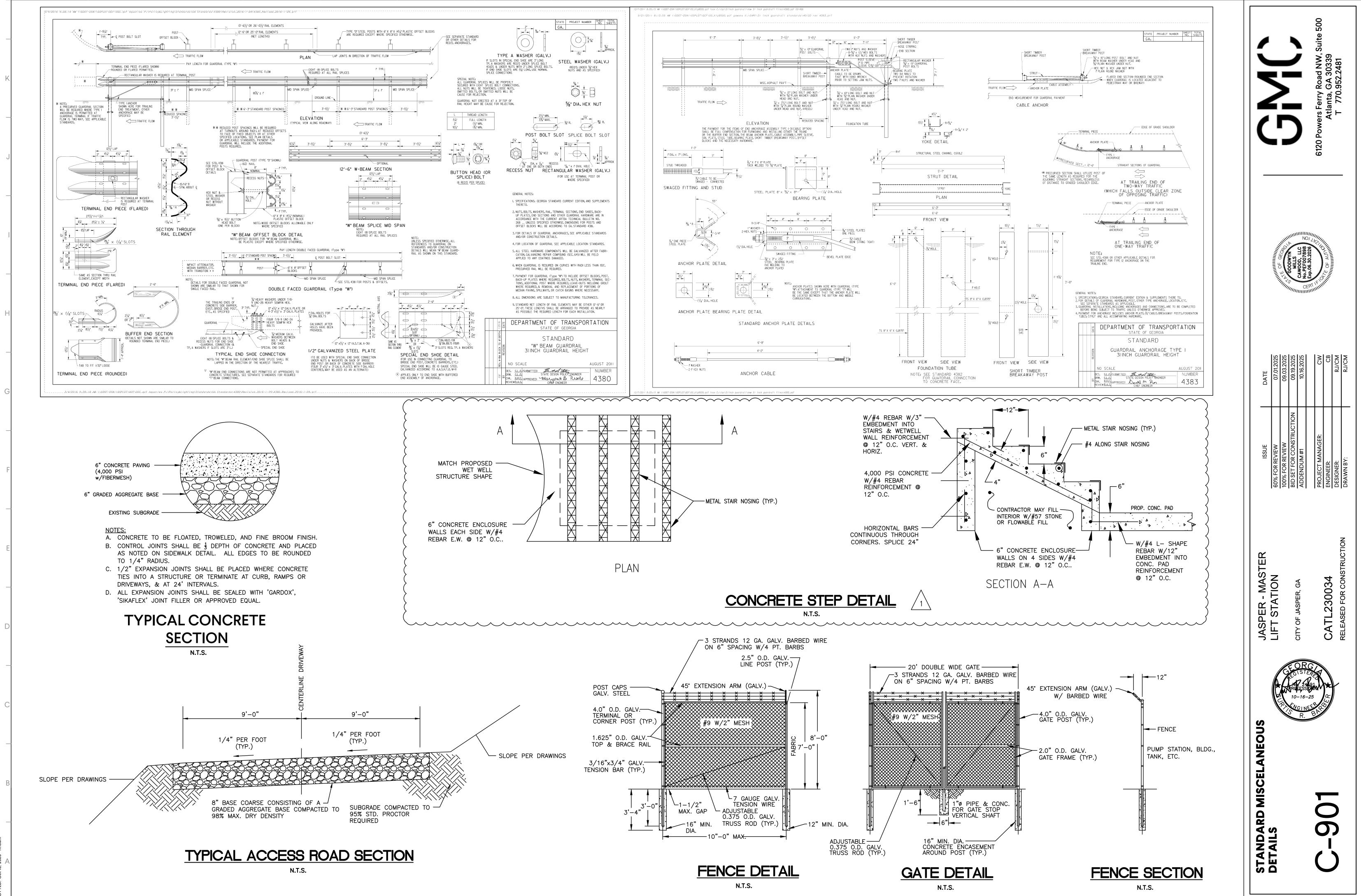
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PROJECT MANAGER:	CW
ENGINEER:	CB
DESIGNER:	RJ/CM
DRAWN BY:	RJ/CM

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#### SECTION 43 25 13 - SUBMERSIBLE CENTRIFUGAL PUMPS

#### PART 1 GENERAL

#### 1.1 SECTION INCLUDES

- A. Wet-pit submersible pump(s) complete with all appurtenances, accessories, and spare parts as required to produce a complete and workable installation and as specified herein.
- B. All submersible pumps for this project shall be the product of one manufacturer.

# 1.2 RELATED WORK SPECIFIED ELSEWHERE

A. Section 09 96 00 - High-Performance Coatings

#### 1.3 SUBMITTALS

- A. Submit in accordance with Section 01 33 00.
- B. Data to be submitted:
  - 1. Pump curves for each size unit showing Total Dynamic Head, Pump Efficiency, Brake Horsepower, Power Input to Electric Drive Motor of Pumping Unit for the various conditions under which the units are to operate along with descriptive data and specifications describing in detail the construction of the complete units.
  - 2. The manufacturer shall have a minimum of five installations of the exact combination of pump and motor model proposed to be furnished for this project. Installations must be in operation for a minimum of five years. A list of these installations shall be furnished to the Engineer upon request.
  - 3. Dimensional Data: Shop drawings, showing all weights and dimensions necessary for the installation of foundations, anchor bolts, piping and valve connections.
- C. Submit operations and maintenance instructions in accordance with manufacturer's recommendations.
- D. Complete operating and maintenance instructions shall be furnished for all equipment included under these specifications.
  - 1. The maintenance instructions shall include troubleshooting data and full preventative maintenance schedules and complete spare parts lists with ordering information.

- 2. The manuals shall be prepared specifically for this installation and shall include all required cuts, drawings, equipment lists, descriptions, etc., that are required to instruct operation and maintenance personnel who are unfamiliar with such equipment.
- E. Manufacturer's Installation and Startup Report: Submit in accordance with manufacturer's recommendations.

#### 1.4 WARRANTY

A. The pumps and motors shall be covered by a five (5) year warranty that shall comprise the following terms: The initial eighteen (18) months from start-up of the equipment shall be covered 100% for parts and labor. The remaining warranty period shall be pro-rated, refer to the Manufacturers' warranty certificate for more details.

#### 1.5 SPARE PARTS

- A. The manufacturer shall furnish one set of the following spare parts:
  - 1. O-Ring Set
  - 2. Wear rings, of each size/type utilized
- B. A written description of each spare part and the storage recommendation shall be provided as directed by the Engineer.

# PART 2 PRODUCTS

# 2.1 MANUFACTURER

A. HOMA, Grundfos or Xylem.

# 2.2 PUMP PERFORMANCE:

A. Each pump shall be capable of the following performance:

Service	Master LS
No. of Pumps	2
Installation	Wet Pit
Duty Point Flow (gpm)	700
Duty Point TDH (ft)	165
Minimum Hydraulic Eff at Duty Point	65.90%
Maximum NPSHr at Duty Point (ft)	6
Maximum Nominal Motor Power	
(HP)	70
Max Motor Speed (rpm)	1750

Minimum Shut-off Pressure	e (ft)	223
William Shut-on ressure	(11)	223

# 2.3 PUMP CONSTRUCTION

- A. All major castings shall be of ASTM A-48, Class 40B gray, cast iron with smooth surfaces devoid of porosity, irregularities, or other defects.
- B. All exposed fasteners shall be of AISI 304 stainless steel.
- C. All exterior surfaces not constructed of stainless steel shall be protected by a factory-applied, two-part, high solids epoxy paint.
- D. Critical wear items including the pump impeller, volute & pressure cover I lower seal plate shall be treated with a plasma ion nitriding process which will create surface hardness equivalent to Vickers 650 HV or Rockwell HRC58.
- E. Sealing design between castings shall incorporate Nitrile (Buna-N) O-rings in controlled compression in two planes of the sealing interface. The interfaces shall be machined, metal-to-metal contacts and shall not require a specific torque on the securing fasteners to ensure sealing. Rectangular cross sectioned gaskets which require specific torque limits to achieve compression are susceptible to uneven compression and may be compressed beyond the point of permanent deformation; therefore they shall not be acceptable.

#### 2.4 WET WELL INSTALLATION

- A. For automatic operation in a wet well, an auto-coupling assembly shall be supplied for the retrieval of pumps, to eliminate the need for entering the wet well for service. This system shall consist of a permanently installed base elbow in the wet well and a removable guiding flange to be attached to the pump discharge. The auto-coupling discharge flange shall be ANSI Class 125 lb. cast iron in 4 inch size. Both the base elbow and the guiding flange shall be made of ASTM A-48, Class 40B cast iron. The guiding flange shall utilize a dual rail system with two rigid guide pipes connected to the base elbow to reliably provide a self-engaging, firm, leak-proof coupling between the pump discharge and the elbow. In order to maximize reliability of this sealing, systems that utilize a single rail, or non-rigid guiding systems such as cable or line shall not be considered acceptable.
- B. Sealing shall be accomplished through the use of a field-replaceable, Nitrile (Buna- N) profile gasket that is axially and evenly compressed upon contact to positively seal the pump discharge against the base elbow. Sealing systems that rely on metal-to- metal contact faces are subject to leaking and blow-by and shall not be considered acceptable.
- C. Project specific lifting cable or chain will be attached to a suitably sized stainless steel round stock lift handle secured to the top of the pump.

### 2.5 IMPELLER

A. The impeller shall be cast as one piece of ASTM A-48, Class 40B Cast Iron, statically and dynamically balanced. The impeller shall be of the single-vane closed (double¬shrouded) non-clog design, and shall meet the Ten State Standards requirement for minimum solids passage of 3 inches. Upon request, the manufacturer must certify a test of a static solids

passing test to confirm the supplied pump is capable of passing 3" non-compressible solids in a static configuration. Impellers that are not capable of passing a 3 inch, non-compressible solid in a static state, or which require axial movement in order to pass shall not be considered acceptable. Impellers that require adjustment over time in order to maintain proper tolerance to the volute shall not be acceptable.

### 2.6 VOLUTE

A. The volute shall be cast in one piece of ASTM A-48, Class 40B Cast Iron with smooth contours and surfaces to provide obstruction-free passageways with low friction losses. The discharge flange of the volute shall have a standard ANSI or DIN bolt pattern. Proprietary bolt patterns shall not be acceptable.

#### 2.7 WEAR RING

A. On single-vane double-shrouded impellers, tolerance between the nose of the impeller and the suction flange of the volute shall be controlled by a pair of replaceable wear rings. A stationary wear ring cast from ASTM B505 Bronze shall be press fit into the volute suction, and an integral wear ring shall be cast into the nose of the impeller in ASTM A-48, Class 40B Cast Iron. Wear systems that require routine adjustment in order to maintain tolerances shall not be acceptable.

#### 2.8 BEARINGS

A. The shaft shall be supported by pre-lubricated, anti-friction bearings. These bearings shall be non-proprietary and shall be produced and branded by a major manufacturer of bearings. The bearings shall have an L-10 life of 50,000 hours minimum at the pump's Best Efficiency Point (BEP). The lower, impeller-side bearing shall be a double-row, deep groove, angular contact ball bearing, axially-retained, to sustain both axial and radial loads. The upper, motor-end bearing shall be a single-row, deep groove ball bearing, axially floating, to sustain radial loads only.

#### 2.9 SEALS

- A. The motor shall be protected from water intrusion by a tandem mechanical seal arrangement. The mechanical seals shall be of a non-proprietary design and shall be produced and branded by a major manufacturer of mechanical seals. The seals shall operate in an isolated oil chamber, which shall provide lubrication and cooling. One seal shall prevent intrusion from the pumped medium into the oil chamber, and the second seal shall prevent intrusion from the oil chamber into the motor. Each seal shall utilize one stationary silicon-carbide seal face, and one rotating silicon carbide seal face positively driven by its own spring and utilize Nitrile (Buna-N) elastomers. The springs shall be protected from the pumped medium, and under no circumstances shall solid particles accumulate on the external spring and hamper its effectiveness. Seals shall not require routine maintenance except periodic inspection of the oil chamber.
- B. In order to prevent damaging particles in the pumped media from interfering with the seal, the top shroud of the impeller shall maintain a close tolerance to a matching surface in the wall of the volute. This tolerance shall be small enough that potentially damaging particles in the pumped media are unable to pass. Arrangements that rely on cutting systems to reduce the size of particles or those that rely on directing particles away from the seal shall not be acceptable

C. Seal systems that utilize a common single or double spring acting between the upper and lower seal, any system that utilizes pressure differential to ensure proper sealing, seals utilizing mechanical locking devices such as set screws or pins to hold the seal in place, and any proprietary seal not produced and branded by a major mechanical seal manufacturer shall not be allowed.

# 2.10 SEAL FAILURE EARLY WARNING SYSTEM

A. In order to warn of seal failure and allow the pump to be shut down before moisture reaches the motor, the pump shall be supplied with an early warning system, consisting of a conductive seal probe to be installed in the seal oil chamber. This probe shall monitor for leakage and shall provide early warning of potential seal failure before moisture reaches the motor. Systems which utilize less reliable mechanical leakage detectors shall not be acceptable. Systems which rely upon detectors in the motor housing shall not be considered an early warning system and shall not be acceptable.

#### 2.11 MOTOR

- A. The motor shall be an air-filled, submersible, squirrel cage, induction-type motor of the NEMA type B design. The motor shall be housed in a watertight enclosure capable of continuous operation at a submergence of 65 feet, and made of ASTM A-48, Class 40B Cast Iron. Fitting the stator into the enclosure with the use of bolts, pins, or other fastening devices which would require penetration of the housing shall not be acceptable.
- B. The stator windings shall be insulated with moisture-resistant Class-H insulation. In each phase winding, there shall be embedded a bi-metallic temperature sensor, wired in series and interlocked with the motor overload protection in the control panel. Any of these thermal switches shall cut out electric power if the temperature in its winding exceeds 140 °C (284°F), and shall automatically reset when the winding temperature returns to normal conditions.
- C. The motor shall be non-overloading through the selected performance curve and shall perform in accordance with NEMA MG1. The motor shall be rated for continuous operation in environments up to 104°F or intermittently up to MOT, and shall be capable of sustaining 15 starts per hour.

#### 2.12 SHAFT

A. The pump and motor shaft shall be an integral, one-piece unit composed of AISI 430 Stainless Steel. Shafts that utilize carbon steel, two-piece or sleeved construction shall not be considered acceptable. The maximum allowable shaft deflection at the shaft seal shall not be more than 0.002 inches while within operating range.

# 2.13 CABLE ENTRY

A. Each cable entry assembly shall contain a cylindrical elastomer grommet, flanked by two washers, closely fitted to the cable O.D. A watertight seal shall be maintained by screwing a threaded cable entry gland into a cable inlet flange which bolts into the motor cap. The cable entry shall not require a specific torque to ensure watertight integrity. The gland shall incorporate a strain-relief and anti-kink feature that shall function independently from the separate sealing action. For pumps over 10.5 horsepower, an isolated junction chamber containing the terminal board shall be sealed from the motor by means of a watertight isolation plate.

B. When the application requires, the cable entry shall be drilled and potted to completely prevent gas intrusion. The assembly shall be non-removable to ensure the integrity is preserved, and shall be approved for operation in Class 1 Division 1, Group C & D Areas by Factory Mutual (FM).

#### PART 3 EXECUTION

# 3.1 FIELD QUALITY CONTROL

# A. Field Testing:

- 1. After the installation of the pumps, controls and all appurtenances, and when construction of other units will permit, each complete pumping unit will be subject to field tests as specified herein under actual operating conditions.
- 2. The field tests shall be made by the Contractor under the direct supervision of a qualified factory trained engineer, and in the presence of, and as directed by the Engineer. The Contractor shall provide, calibrate and install all temporary gauges and meters, shall make necessary tapped holes in the pipes, and install all temporary piping and wiring required for the field tests.
- 3. The field tests shall determine the head, discharge flow and overall efficiency characteristics of each pumping unit and in addition, shall demonstrate that under all conditions of operation each unit:
  - a. Has not been damaged by transportation or installation.
  - b. Has been properly installed.
  - c. Has no mechanical defect.
  - d. Is in proper alignment.
  - e. Has been properly connected.
  - f. Is free of overheating of any parts.
  - g. Is free of all-objectionable vibration and noise.
  - h. Is free of overloading of any parts.

END OF SECTION 43 25 13