



September 1, 2026

**CITY OF ROMA
ROMA, TEXAS
Wastewater Treatment Plant Improvements**

Addendum No. 3

Attention is called to the following modifications to the referenced Plans, Specification and Contract Documents for the above referenced project. The City of Roma (City) will receive sealed Proposals for Wastewater Treatment Plant Improvements at Roma City Hall, located at 201 W Convent Blvd., Roma, TX 78584, by 1:30 p.m., local time on **Wednesday, September 9, 2026**, at which time the sealed Proposals received will be publicly opened and read. We hereby modify the documents as follows:

CONTRACT DOCUMENTS:

1. **REMOVE** and **REPLACE** Bid Form attached to this Addendum. Updated to address minor clarifications on bid line items.

SPECIFICATIONS:

1. Section 01010 "Summary of Work", **DELETE** the existing specification and **REPLACE** with the **PROPOSED** specification included in this addendum. This update clarifies the need for items such as grit removal services at the headworks structure and temporary dewatering containers for solids handling as part of this project.
2. Section 11199 "Sludge Dewatering Belt Filter Press", **DELETE** the existing specification and **REPLACE** with the **PROPOSED** specification included in this addendum.
3. Section 11345 "Ultraviolet Disinfection", **DELETE** the existing specification and **REPLACE** with the **PROPOSED** specification included in this addendum.
4. **ADDITION** of Section 11352 "Belt Conveyor" to the Project Manual, the **PROPOSED** specification included in this addendum.

PLANS:

1. **REMOVE** and **REPLACE** Sheet 01C-02 with plan sheet attached to this Addendum. Updated to address minor clarifications.
2. **REMOVE** and **REPLACE** Sheet 01C-03 with plan sheet attached to this Addendum. Updated to address minor clarifications.

3. **REMOVE** and **REPLACE** Sheet 02X-02 with plan sheet attached to this Addendum. Updated to address minor clarifications.
4. **REMOVE** and **REPLACE** Sheet 02D-02 with plan sheet attached to this Addendum. Updated to address minor clarifications.
5. **REMOVE** and **REPLACE** Sheet 03D-01 with plan sheet attached to this Addendum. Updated to address minor clarifications.
6. **REMOVE** and **REPLACE** Sheet 04X-01 with plan sheet attached to this Addendum. Updated to address minor clarifications.
7. **REMOVE** and **REPLACE** Sheet 05X-01 with plan sheet attached to this Addendum. Updated to address minor clarifications.
8. **REMOVE** and **REPLACE** Sheet 05X-02 with plan sheet attached to this Addendum. Updated to address minor clarifications.
9. **REMOVE** and **REPLACE** Sheet 05D-01 with plan sheet attached to this Addendum. Updated to address minor clarifications.
10. **REMOVE** and **REPLACE** Sheet 05D-02 with plan sheet attached to this Addendum. Updated to address minor clarifications.

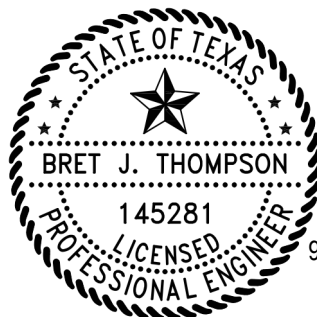
CLARIFICATIONS:

1. If downtime period of the belt press dewatering system is expected to be long periods of time, temporary dewatering container(s) are required to treat solids. Refer to the updated Section 01010 "Summary of Work".
2. For the grit / grease system, a grease skimmer blade system will be acceptable.

This addendum consists of fifty-four (54) pages and becomes a part of the referenced plans, specifications and contract documents and shall be acknowledged by the proposer and attached to the sealed proposal submitted.

Bret Thompson

By Bret Thompson P.E. #145281
 Project Manager



9/1/2026

BID FORM

PROJECT IDENTIFICATION: City of Roma TWDB Project No. 73904 (CID 01) CWSRF Wastewater Treatment Plant Improvements

CONTRACT IDENTIFICATION AND NUMBER:

Wastewater Treatment Plant Improvements
Project Number 8235

THIS BID IS SUBMITTED TO:

City of Roma
201 W. Convent Blvd.
Roma, Texas 78584

- 1.01** The undersigned Bidder proposes and agrees, if this Bid is accepted, to enter into an Agreement with OWNER in the form included in the Bidding Documents to perform and furnish all Work as specified or indicated in the Bidding Documents for the prices and within the times indicated in this Bid and in accordance with the other terms and conditions of the Bidding Documents.
- 2.01** Bidder accepts all of the terms and conditions of the Advertisement or Invitation to Bid and Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. The Bid will remain subject to acceptance for 120 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of OWNER.
- 3.01** In submitting this Bid, Bidder represents, as set forth in the Agreement, that:

- A. Bidder has examined and carefully studied the Bidding Documents, the other related data identified in the Bidding Documents, and the following Addenda, receipt of all which is hereby acknowledged.

<u>Addendum No.</u>	<u>Addendum Date</u>
_____	_____
_____	_____
_____	_____

- B. Bidder certifies Bidder is qualified to do business in the state where the Project is located as required by laws, rules, and regulations or, if allowed by statute, covenants to obtain such qualification prior to contract award.
- C. The Bidder shall provide values for specific performance parameters for the equipment being bid. The Bidder understands and agrees that the values stated in this Section for the associated performance parameters will be compared to the performance standards required in the equipment specifications. Bidders understand and agree to guarantee the performance values stated herein for the equipment bid in accordance with the guidelines specified herein.
- D. Bidder understands and agrees that this PROPOSAL shall form the basis for an agreement with the OWNER. Therefore, the undersigned agrees to enter into an agreement to perform and furnish all Work as specified or indicated in these Specifications for the amount indicated in this Bid and in accordance with the other terms and conditions of these Contract Documents.
- E. Bidder accepts all of the terms and conditions of these Contract Documents including, without limitation, those dealing with the disposition of Bid security, required bonds, and the liquidated damages that may be imposed. This Bid shall remain subject to acceptance for a period of 120 days after the day of Bid opening. The Bidder shall sign and submit the Agreement with the bonds and other required documents within 10 days after the receipt of Notice of Award from the OWNER.
- F. Bidder has given ENGINEER written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents, and the written resolution thereof by ENGINEER is acceptable to Bidder.
- G. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance of the Work for which this Bid is submitted.

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- 4.01** Bidder further represents that this Bid is genuine and not made in the interest of or on behalf of any undisclosed individual or entity and is not submitted in conformity with any agreement or rules of any group, association, organization or corporation; Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid; Bidder has not solicited or induced any individual or entity to refrain from bidding; and Bidder has not sought by collusion to obtain for itself any advantage over any other Bidder or over OWNER.
- 5.01** Bidder will complete the Work in accordance with the Contract Documents for the prices bid in the following Lump Sum Bid Schedule.
- 6.01** Bidder agrees to accept Contract Times as set forth in the Agreement.
- 6.02** Bidder accepts the provisions of the Agreement as to liquidated damages in the event of failure to complete the Work within the Contract Times specified.
- 7.01** The following documents are attached to and made a condition of this Bid:
- A. Required Bid security;
 - B. Non-Collusion Affidavit of Prime Bidder;
 - C. Debarment / Suspension Certification.
- 8.01** The terms used in this Bid with initial capital letters have the meanings indicated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.
- 9.01** NOTE: The prices must be shown in words and figures in the proposal and in the event of discrepancy, the words shall control.

**BID PROPOSAL
FOR LABOR, MATERIAL, EQUIPMENT AND INCIDENTALS:**

ITEM NO	ESTIMATED QUANTITY	DESCRIPTION AND UNIT PRICE (Price to be written in words)	UNIT PRICE	TOTAL PRICE
1	1 LS	Mobilization, bonds and insurance (not to exceed 3 percent of bid) for _____ Dollars and _____ Cents per lump sum.		\$ _____
2	1 LS	Prepare, Obtain applicable approvals(s) for, and Implement Stormwater Pollution Prevention Plan and related work as specified in Section 01564 for _____ Dollars and _____ Cents per lump sum.		\$ _____
3	1 LS	Clear and grub and complete site preparation as specified for _____ Dollars and _____ Cents per lump sum.		\$ _____
4	120 LF	Prepare, Obtain applicable approval(s) for, and Implement Trench and Excavation Safety Plan and related work as specified, for _____ Dollars and _____ Cents per linear foot.	\$ _____ /LF	\$ _____
5	1 LS	Furnish and install new Coarse Mechanical Screen and Compactor per Specification 11075, and all related appurtenances, as shown and as specified, complete and in place, for _____ Dollars and _____ Cents per lump sum.		\$ _____
6	1 LS	Furnish and install new Vertical Ultraviolet Disinfection System per Specification 11345, and all related appurtenances, as shown and as specified, complete and in place, for _____ Dollars and _____ Cents per lump sum.		\$ _____

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ITEM NO	ESTIMATED QUANTITY	DESCRIPTION AND UNIT PRICE (Price to be written in words)	UNIT PRICE	TOTAL PRICE
7	1 LS	Furnish and install new Belt Filter Press and Polymer System and per Specification 11199, and all related appurtenances, as shown and as specified, complete and in place, for _____ _____ Dollars and _____ Cents per lump sum.		\$ _____
8	1 LS	Furnish new Progressive Cavity Pump per Specification 11350, and all related appurtenances, as shown and as specified, complete and in place, for _____ _____ Dollars and _____ Cents per lump sum.		\$ _____
9	1 LS	Furnish and install new Belt Conveyor per Specification 11352, and all related appurtenances, as shown and as specified, complete and in place, for _____ _____ Dollars and _____ Cents per lump sum.		\$ _____
10	1 LS	Removal of Grit Removal System equipment, piping, metals and all related appurtenances, as shown and as specified, complete and in place, for _____ _____ Dollars and _____ Cents per lump sum.		\$ _____
11	1 LS	Provide programming of SCADA Improvements (Refer to Appendix A), and all related appurtenances, as shown and as specified, complete and in place, for <u>six hundred eighty-nine thousand nine hundred and eighty five</u> _____ Dollars and <u>No</u> _____ Cents per lump sum.		\$ <u>689,985.00</u>
12	1 LS	Furnish and install Electrical Improvements shown in the contract documents, all related appurtenances, as shown and as specified, complete and in place, for _____ _____ Dollars and _____ Cents per lump sum.		\$ _____
13	1 LS	Furnish and install listed equipment above and remaining improvements shown in the contract documents, all related appurtenances, as shown and as specified, complete and in place, for _____ _____ Dollars and _____ Cents per lump sum.		\$ _____
14	1 LS	Allowance for work directed in writing by the City for legitimate project related issues at the direct cost for such work (NOTE: Contractor's cost for bonds, insurance, profits, etc. associated with this allowance shall be included in the lump sum for Bid Item 11 above), for <u>one hundred thousand</u> _____ Dollars and <u>zero</u> _____ Cents per lump sum.		\$ <u>100,000.00</u>
TOTAL BASE BID (Items 1 thru 14)			\$ _____	

ALTERNATIVE BID PROPOSAL – CIRCLE ADDITIVE OR DEDUCTIVE

ITEM NO	ESTIMATED QUANTITY	DESCRIPTION AND UNIT PRICE (Price to be written in words)	Additive or Deductive	TOTAL AMOUNT
A1	1 LS	Replace Line Item 6: Furnish and install new Inclined Ultraviolet Disinfection System per Specification 11345, all channel modifications, and all related appurtenances, as shown and as specified, complete and in place, for _____ _____ Dollars and _____ Cents per lump sum.	Additive or Deductive	\$ _____

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ITEM NO	ESTIMATED QUANTITY	DESCRIPTION AND UNIT PRICE (Price to be written in words)	Additive or Deductive	TOTAL AMOUNT
A2	1 LS	Replace Line Item 6: Furnish and install new Horizontal Ultraviolet Disinfection System per Specification 11345, channel modifications, and all related appurtenances, as shown and as specified, complete and in place, for _____ Dollars and _____ Cents per lump sum.	Additive or Deductive	\$ _____
A3	1 LS	Replace Line Item 9: Furnish and install new Screw Conveyor System per Specification 14551, channel modifications, and all related appurtenances, as shown and as specified, complete and in place, for _____ Dollars and _____ Cents per lump sum.	Additive or Deductive	\$ _____
A4	1 LS	Replace Line Item 10: Furnish and install new Aerated Grit and Grease Removal Unit per Specification 11320, plans, electrical, SCADA, and all related appurtenances, as shown and as specified, complete and in place, for _____ Dollars and _____ Cents per lump sum.	Additive or Deductive	\$ _____

SUBMITTED on _____, 2026.

State Contractor License No. _____. (If applicable)

If Bidder is:

An Individual

Name (typed or printed): _____

By: _____ (SEAL)
(Individual's signature)

Doing business as: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Email Address: _____

A Partnership

Partnership Name: _____ (SEAL)

By: _____
(Signature of general partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Business address: _____

Phone No.: _____ FAX No.: _____

Email address: _____

A Corporation

Corporation Name: _____ (SEAL)

State of Incorporation: _____

Type (General Business, Professional, Service, Limited Liability): _____

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Attest _____
(Signature of Corporate Secretary)

(CORPORATE SEAL)

Business address: _____

Phone No.: _____ FAX No.: _____

Email address: _____

Date of Qualification to do business is _____.

A Joint Venture

Joint Venturer Name: _____ (SEAL)

By: _____
(Signature of joint venture partner -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Email address: _____

Joint Venturer Name: _____ (SEAL)

By: _____
(Signature -- attach evidence of authority to sign)

Name (typed or printed): _____

Title: _____

Business address: _____

Phone No.: _____ FAX No.: _____

Phone and FAX Number, and Address for receipt of official communications:

(Each joint venturer must sign. The manner of signing for each individual, partnership, and corporation that is a party to the joint venture should be in the manner indicated above.)

SECTION 01010

SUMMARY OF WORK

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Contract Description.
- B. Coordination.
- C. Contractor Use of Site.
- D. Construction Sequencing.

1.2 CONTRACT DESCRIPTION:

- A. This project is to replace equipment at the wastewater treatment plant which has reached the end of its service life. The design capacity is 2.0 mgd with a peak of 7.5 mgd.
- B. Complete treatment will be provided by the following unit processes:
 - 1. Mechanical Screen – Replacement with a new mechanical screen.
 - 2. Grit Removal – Base Bid: Removal of all existing equipment and metals. Alternate Bid: Replacement of all equipment and metals.
 - 3. Secondary Treatment System – Replacement of modulating motors at gates and valves. Replacement of WAS valves.
 - 4. Effluent Disinfection – The existing UV equipment will be replaced with a new UV equipment either a vertical, inclined, or horizontal lamps.
 - 5. Solids Dewatering – Replace the belt filter press and conveyor equipment with a new belt filter press and conveyor. Additional solids transfer pump will be supplied.
 - 6. Controls – Improve the SCADA interface with the plant.
- C. Related work includes but is not limited to:
 - 1. Temporary Dewatering Container(s) for Solids Handling purposes.
 - a. Ashbrook – Contact Phone: 972-436-2536
 - b. Spectrum – Contact Phone: 972-436-2536
 - c. United Rental – Contact Phone: 956-787-9590
 - d. Site Pro Rental – Contact Phone: 956-331-2495
 - 2. Grit removal services at the headworks structure.

3. Related replacement, extension, and/or relocation of various process and utility lines.
4. Related site civil, structural, and electrical work.

1.3 COORDINATION:

- A. Owner will have staff operate existing, wastewater treatment plant and all associated facilities to provide uninterrupted treatment of wastewater.
 1. Coordinate with Owner's personnel to facilitate uninterrupted treatment of wastewater.
 2. Coordinate with Owner's personnel to facilitate temporary shut downs, start-up and initial bringing on line of the new treatment units.
- B. Contractor shall remain solely responsible for the start-up and operation of the Work under this Contract until Substantial Completion is given by the Owner.
- C. Work under this Contract requires installation of major equipment to the existing treatment system.
 1. Coordinate with Owner's personnel for planned outages of the existing system necessary to complete interconnections.
 2. Owner shall determine, and communicate to the Contractor, the maximum outage allowed. Outage periods are dependent on the time of the year when interconnections will be made.

1.4 CONTRACTOR USE OF SITE:

- A. Limit use of existing wastewater treatment plant site to allow:
 1. Owner occupancy.
 2. Uninterrupted treatment of wastewater.

1.5 CONSTRUCTION SEQUENCING:

- A. The Contractor shall be solely responsible for construction means, controls, techniques, sequences, procedures, and construction safety in accordance with the Contract Documents.
- B. Contractor shall coordinate with Owner/ Engineer in developing a sequence for construction activities.
- C. The existing offsite collection system must remain in operation; however, brief shutdowns will be allowed.
- D. Refer to notes on Construction Sequencing in the Drawings for further operational constraints and one possible sequence of construction, suggested as an aid to the Contractor. This sequencing plan is not a directive for construction means and methods. Contractor shall be responsible for

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construction means and methods, including determining the construction sequence.

PART 2 PRODUCTS

Not used.

PART 3 EXECUTION

Not used.

END OF SECTION

SECTION 11199**SLUDGE DEWATERING BELT FILTER PRESS****PART 1 GENERAL****1.1 SCOPE:**

- A. Contractor shall furnish one (1) sludge dewatering belt filter press as indicated on the drawings. The belt filter press shall be manufactured from AISI 304L stainless steel shapes. Fabrication and assembly shall be in conformance with these specifications and drawings.
- B. Contractor shall furnish a complete dewatering system including belt filter press, shaftless screw conveyor, drive motors, gear reducers, support legs, anchor bolts, polymer station, piping and wiring, controls, and all accessories and appurtenances specified or otherwise required for a complete and properly operating installation.
- C. Owner shall coordinate all details of the equipment with other related parts of the work. He shall verify that all structures, piping, wiring, and equipment components are compatible. Owner shall be responsible for all structural and other alterations required to accommodate equipment differing in dimensions or other characteristics from these specifications and drawings.
- D. Owner shall install the equipment according to instructions and recommendations of the equipment manufacturer.
- E. Power supply for main control panel is 460 Volts, 60 Hz, 3-phase. The polymer make down system needs a separate 120 VAC, 60 Hz, single phase power supply.

1.2 REFERENCES:

- A. American Society for Testing and Materials (ASTM) Publications:
 - 1. Section A322: Carbon and Alloy Steel Bar Specifications.
 - 2. Section A507-10: Standard Specification for Drawing Alloy Steel, Sheet and Strip, Hot-Rolled and Cold Rolled.
- B. Anti-Friction Bearing Manufacturers Association (AFBMA) Publications:
 - 1. Standard 9-90 Load Ratings and Fatigue Life for Ball Bearings.
 - 2. Standard 11-90 Load Ratings and Fatigue Life for Roller Bearings.
- C. American Institute of Steel Construction (AISC) Publications.
- D. American Welding Society (AWS) Publications.
- E. American Structures Painting Council (ASPC) Publications.

1.3 SUBMITTALS:

The following information shall be submitted to the Engineer. In accordance with Section 01300, copies of all materials required to establish compliance with this Section. Submittals shall include the following:

- A. Product Data: Include the following:
 - 1. Descriptive literature, brochures, catalogs, cut-sheets and other detailed descriptive material of the equipment.
 - 2. Motor characteristics and performance information.
 - 3. Gear reducer data including service factor, efficiency, torque rating, and materials.
 - 4. Parts list including a list of recommended spare parts.
- B. Shop Drawings: Include the following:
 - 1. Manufacturer's installation drawings.
 - 2. Wiring and schematic diagrams.
- C. Operations and maintenance manual: See Section 01300.
- D. Detailed installation instructions, with clear step-by-step points on the correct mechanical and electrical installation procedures.
- E. Equipment weights and lifting points.
- F. Recommendations for short and long term storage.
- G. A copy of the manufacturer's warranty.
- H. A copy of documents proving certification of the Manufacturer's Quality Management System according to ISO 9001.
- I. Failure to include all drawings applicable to the equipment specified in this section will result in rejection of the entire submittal with no further review.

1.4 QUALITY ASSURANCE:

- A. To ensure quality, conformance, and reliability with regard to the manufacturing and production of the machinery described in this section, the equipment manufacturer shall meet the requirements listed in this section.
- B. Manufacturer shall have established an ISO 9001 certified quality management system.

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- C. All stainless steel components and structures shall be submersed in a chemical bath to remove any residues that may be present on the material as a result of forming, manufacture, or handling. After removal from the chemical bath, the equipment must be washed with a high-pressure wash of cold water to remove any remaining surface debris and promote the formation of an oxidized passive layer.
- D. Belt Filter Press shall be manufacturer's standard product and only be modified as necessary to comply with the drawings, specifications, and specified service conditions.
- E. All welding is performed in accordance with American Welding Society (AWS) D1.1 Structural Welding Code, or equivalent.
- F. Manufacturer shall provide belt filter press, polymer system, motors, gear reducers, controls, control panels, and lifting attachments as a complete integrated package to ensure proper coordination, compatibility, and operation of the system.
- G. Manufacturer shall provide services by a factory-trained service engineer, specifically trained on the type of equipment specified for two (2) consecutive days with one (1) trip for equipment checkout and startup. Service engineer requirements include, but are not limited to the following:
 - 1. Be present during initial energizing of equipment to determine directional testing as described in Section 4.1(D)(Installation).
 - 2. Inspect and verify location of anchor bolts, placement, leveling, alignment and field erection of equipment, as well as control panel operation and electrical connections.
 - 3. Instruct plant personnel on the operation and maintenance of the equipment, including preventative maintenance, method of controlling equipment and troubleshooting.
- H. Manufacturer shall guarantee all equipment against faulty or inadequate design, improper assembly, defective workmanship or materials, and breakage or other failure. Owner shall guarantee against faulty installation. Materials shall be suitable for service conditions.
- I. All equipment shall be designed, fabricated, and assembled in accordance with recognized and acceptable engineering and shop practice. Individual parts shall be manufactured to standard sized and thicknesses so that repair parts can be installed in the field. Like parts of duplicate units shall be interchangeable. Equipment shall not have been in service prior to delivery, except as required by testing.
- J. Each major component of equipment shall have the manufacturer's name, address and product identification on a nameplate securely affixed to the equipment.

1.5 DELIVERY, STORAGE, AND HANDLING OF EQUIPMENT:

- A. Equipment shall be shipped and delivered fully assembled, except where partial disassembly is required in order to conform to transportation regulations or for the protection of components.
- B. Owner shall be responsible for unloading and shall have equipment on-site at the time of delivery permitting proper hoisting of the equipment.

1.6 PRE-SUBMITTAL OF ALTERNATE EQUIPMENT:

- A. Manufacturers of alternate equipment shall submit a pre-approval package to the engineer at least two (2) weeks prior to bid date. Alternative manufacturers shall submit the following information and supporting documentation:
- B. A complete set of drawings, specifications, catalog cut-sheets, and detailed descriptive material. Drawings shall show all relevant details of the unit. This information shall identify all technical and performance requirements stipulated on the drawings and in the specification. If the proposed equipment does not meet these specifications, any deviation from the specification must be expressly noted. All deviations shall be listed on a single document.
- C. Detailed installation drawings illustrating how the proposed belt filter press will be installed. The drawings shall include plan, elevation, and sectional views of the installation.
- D. Motor characteristics and performance information. Vendor data shall be furnished to confirm the torque and thrust rating of the drive.
- E. Complete reference list of all installations of same and similar equipment including contract names and phone numbers, showing at least 15 installations of the same type and size as specified.
- F. Complete bill of materials for all equipment, showing dimensions and materials of construction of all components.
- G. Certification that the entire equipment will be passivated by submersion in a chemical bath as specified in Chapter 2.03.
- H. A copy of documents proving certification of the Manufacturer's Quality Management System according to ISO 9001.
- I. Details of the control and instrumentation system including wiring diagrams.
- J. Information on equipment field erection requirements including total weight of assembled components and weight of each sub-assembly.
- K. List of recommended spare parts.

- L. A maintenance schedule showing the required maintenance, frequency of maintenance, lubricants and other items required at each regular preventative maintenance period, including all buy-out items..

1.7 WARRANTY

A. Equipment:

- 1. The equipment furnished under this section will be free of defects in material and workmanship, including damages that may be incurred during shipping for a period of twenty-four (24) months from date of owner's acceptance.

PART 2 PRODUCTS

2.1 ACCEPTABLE MANUFACTURERS:

A. Sentry 3BTP12.93S 3-Belt Unit from Charter Machine Company.

- 1. Polymer System from Charter Machine Company.
- 2. Or Engineer-Approved Equivalent.

B. Klampress AS-H Belt Filter Press G3 100 from Alfa Laval.

- 1. Polymer System from UGSI Chemical Feed Solutions.
- 2. Or Engineer-Approved Equivalent.

C. 1.0m SMX-S8 Belt Filter Press from Andritz.

- 1. Polymer System from Velodyne.
- 2. Or Engineer-Approved Equivalent.

D. 1.5m 3DP Belt Filter Press from BDP Industries, Inc.

- 1. Polymer System from BDP Industries, Inc.
- 2. Or Engineer-Approved Equivalent.

E. Environdyne Belt Filter Press.

- 1. Polymer System: Engineer-Approved Equivalent.

F. Ashbrook Belt Filter Press.

- 1. Polymer System: Engineer-Approved Equivalent.

G. Or Engineer-Approved Equivalents.

2.2 PERFORMANCE AND DESIGN REQUIREMENTS:

A. Sludge to be dewatered shall be well-mixed and well blended having the following characteristics:

- 1. Sludge:

- a. Sludge type: Municipal Sewage.
 - b. Solids concentration: 1%.
 - c. Volatile solids ratio: 68-72%.
-
- | | | |
|----|-------------------------------|----------------------|
| 2. | Design Wastewater Flow | 2.0 MGD |
| 3. | Design BOD ₅ | 200 mg/L |
| 4. | Design TSS | 200 mg/L |
| 5. | Feed Sludge Generation | 2,335 lb/day |
| 6. | Feed Sludge TSS Concentration | 0.75 to 2.0 percent |
| 7. | Sludge Processing | 7 hr/day, 5 day/week |
| 8. | Cake Solids percent d.w.s | > 15% |
-
- B. Each dewatering belt filter press shall be capable of dewatering up to 116 gallons per minute (GPM) (average flow of 93 GPM) of the specified municipal wastewater sludge to a final solids content of 15%. The solids capture rate shall be a minimum of 95%. The polymer consumption shall not exceed 25 lbs of active polymer substance per ton of sludge solids fed.
 - C. The sludge dewatering plant consists of the following major parts:
 1. Belt filter press.
 2. Polymer dosing system.
 - D. All parts of the dewatering press shall be designed and appropriate for the service specified and indicated and for continuous operation.
 - E. Sufficient room for inspection, maintenance, repair and adjustment shall be provided. Owner shall provide hoisting equipment to facilitate installation and maintenance work.
 - F. The physical layout shown on the drawings is based on the Charter Machine Company Sentry 3BTP12.93S 3-Belt Unit. If equipment by another manufacturer is to be supplied, contractor shall include in the bid all necessary modifications to the piping, electrical, structural, and mechanical layouts to accommodate the equipment proposed.
 - G. All parts shall be designed and manufactured to handle the forces that may be exerted on the belt filter press during fabrication, shipping, erection, and proper operation according to the O&M manual.
 - H. All components shall be so arranged that they can be serviced from the operating floor.
 - I. All components shall be balanced so that jamming at any point will not result in structural failure, but will cause the drive motor to stall. All components, including the gear reducer, shall be designed to withstand, without damage or permanent distortion, the full stalling torque of the drive motor.

2.3 SLUDGE DEWATERING PRESS DESIGN SPECIFICATION:**A. Materials:**

1. Sludge dewatering belt filter press shall be manufactured from AISI 304L stainless steel shapes (rods, angles, and channels), pipes, and sheets.
2. Bearings shall be anti-friction.

B. Design:

1. The Combination gravity belt thickener/belt filter press shall be of a three-belt design with three distinct dewatering zones, including an independent gravity-dewatering zone, wedge zone and a shear/pressure zone. The gravity zone shall be independent of the wedge zone and shear/pressure zone making it possible to select different dewatering belts and vary the speed of each area independently of the other for dual use purposes. The separation of the gravity and pressure areas shall optimize throughputs enhancing the hydraulic capacity of the press when processing diluted sludges. Each machine shall be designed to serve both as a belt press and also as an independent gravity belt thickener.
2. The combination 3-Belt Unit shall be designed, fabricated, assembled and tested by the belt filter press manufacturer in their own facility. In order to provide maximum quality assurance, personnel employed by the manufacturer shall perform all aspects of the design, fabrication and assembly. The belt filter press manufacturer shall at the same facility maintain a suitable spare parts inventory.
3. The gravity belt thickener shall be furnished with an upstream sludge-conditioning device consisting of an inline adjustable orifice venturi type mixer complete with polymer injection device. The mixer shall be designed to condition the sludge with polymer to result in a degree of flocculation that will produce the greatest amount of dewatering while maintaining the highest quality filtrate.
4. The gravity-dewatering zone shall consist of a 16.75-foot section of the horizontal filter belt. The minimum dewatering area shall be, 165 square feet. The gravity dewatering zone shall be independent of the belt filter press section and be capable of operating in a thickening mode only, utilizing its own drive, tensioning and tracking systems.
5. A counterweighted doctor blade shall be mounted at the discharge roller for removing sludge cake from the belt. The doctor blade shall be constructed of UHMW polyethylene. The blade shall be rigidly reinforced to provide even, gentle pressure on the belt with a minimal amount of abrasiveness and shall be capable of providing passage clearance for the belt seam without injuring that seam. The thickener shall be capable of discharging thickened sludge into a

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screw conveyor for transfer or direct the thickened sludge into the pressure zone of the combination unit.

6. All rollers shall be designed for a deflection of less than 0.05" at mid span under conditions of maximum operational loading. Maximum operational loading shall be defined as the sum of the belt tension load; friction loads; equipment and sludge loads; any loads induced by the elasticity of the belt; and any loads induced by the torque of the drive. Maximum roll deflection shall be (in) 0.0018", which is calculated using the belt tension of 50 PLI, and the drive torque of 1,960 inch pounds. The drive and tracking roller shall be coated with a minimum 3/8" thick synthetic rubber of 60 durometer to provide the friction required for efficient belt drive and tracking. The tensioning roller shall be coated to the point of insertion of the bearing with Rilsan Nylon II to a thickness of 25 mil by the Electro Static, Fusion Bonded Rilsan Powder Dispersion Process.
7. Roller bearings shall have an L-10 rating greater than 25,000,000 hours per AFBMA test procedure under maximum loading conditions and calculated at a belt speed of 20 meters per minute. All bearings shall be double row spherical roller type with all grease fittings located for servicing from the machine exterior. Bearings shall have quadruple lip contact seals. All bearing housings shall be class 30 cast iron one-piece pillow block type with gasketed end cap as manufactured by Charter Machine Company. Bearing housings shall be coated with Rilsan Nylon II to a thickness of 25 mil by the Electro Static, Fusion Bonded Rilsan Powder Dispersion Process.
8. Belt tensioning shall be maintained pneumatically and controlled from the thickener mounted pneumatic control center. The dewatering belt shall be tensioned by a pair of corrosion resistant pneumatic cylinders attached to a rigid tensioning assembly. The tensioning assembly shall be attached to each tensioning cylinder in such a way as to assure parallel movement of the tensioning roller. Belt tension adjustment shall be possible while the machine is in operation. Tensioning pressure shall be gauged at the pneumatic control center. Tensioning cylinders shall be power retractable for belt replacement and emergency detensioning.
9. Belt tracking shall be totally pneumatic and shall function as a continuous automatic belt guidance system. The belt shall be tracked by a type 304 stainless steel paddle arm and analog system sensor that monitors one edge of the belt and pneumatically signals a corrosion resistant pneumatic cylinder for corrective positioning when required. That corrective motion shall be smooth, minimal, and adjustable.
10. All belt thickener pneumatic system controls, belt tensioning, tracking, and sludge plow grid control shall be frame mounted on the thickener in a 304 S/S NEMA 4X enclosure. Low air alarm switch, tensioning and plow grid lift valves shall be mounted inside the enclosure. Tensioning on/off and plow grid lift levers, tension gauges, and adjustment controls shall extend through the enclosure

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wall for easy access. The enclosed controls shall be preceded by a three (3) micron air filter/regulator with gage and a 0.1-micron oil coalescing filter. One (1) 1/4" female NPT supply air connection shall be required to the total pneumatic system. Lubrication of the pneumatic system is not required.

11. The filter belt shall be equipped with a belt wash station for constant belt washing. The belt wash station shall include a manifold with removable stainless steel nozzles, internal hand wheel operated brush, hand wheel operated flush valve, and stainless steel neoprene skirted enclosure for containing spray mist. Belt spray water shall be collected in the stainless steel enclosure and plumbed to the base sump. Spray nozzles shall be suitable for use with non-potable water with a maximum solids concentration of 200 mg/l without clogging. The press shall be designed to allow the operator to close the wash water supply solenoid valve to the pressure belts to reduce the belt wash water requirements when utilizing the thickening operation only.
12. The filter belt shall be of polyester monofilament wovenware with minimum tensile strength of 890 pounds per lineal inch. Belt edges shall be chamfered and sealed. The belt seams shall be type 316 stainless steel clipper type. Mesh shall be selected for optimal gravity dewatering of the pertinent sludge.
13. The drive shall be Variable Frequency Drive using AC motor and quadruple gear speed reducer. The inverter along with start/stop and speed control of the drive shall be located in the master control panel.

2.4 DRIVE:

- A. The belt filter press shall be driven by Variable Frequency Drive using AC motor and quadruple gear speed reducer. The inverter along with start/stop and speed control of the drive shall be located in the master control panel.
- B. The drive motor shall be a severe duty, TEFC, type motor of ample power for starting and operating under normal conditions without exceeding the nameplate horsepower. The drive motor shall have a service factor of 1.15.
- C. Power requirements for the belt filter press shall be 460V, 3-phase, 60 Hz.

2.5 POLYMER DOSING SYSTEM FOR LIQUID POLYMER:

- A. Description:
 1. The Polymer preparation/feed unit shall be capable of automatically metering, diluting, activating and feeding an emulsion polymer with water.
 2. The Polymer system shall be compatible with the submitted belt filter press system.

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3. The system shall be capable of controlling separately the water flow and the polymer injection dosage.
4. The polymer equipment shall be furnished as a complete assembled unit to the Contractor, complete with 304 stainless steel stand.

B. Products:

1. Charter Machine Company.
2. Excell Polymer Systems.
3. Lutz Jesco.
4. Or Engineer-Approved Equal.

C. System Description:

1. Make up water flow shall be variable and measurable by means of a control valve and a sight glass rotometer.
2. The inlet stream shall have an electronic flow sensor with immersed in-line element capable of transmitting a signal for a low/no flow alarm. Element shall be removable without plumbing disassembly.
3. Unit shall have an electric solenoid valve for on/off control of dilution water flow.

D. Polymer Make-up Pump (LMI C121-75HV, 0-4 GPH, OR LMI-C131-25HV, 0-8GPH)

1. A polymer make-up pump shall be integrated in the system. The pump shall be a diaphragm electrical pulsation type, with separate speed and stroke controls.

E. Multi-Zone Acrylic Polymer Blending Chamber (Low Energy)

1. The mixed polymer solution is then transferred to an exclusive acrylic blending chamber allowing the pre-mixed polymer solution to be gently mixed and provide additional retention time to achieve the highest performance.

F. Multi-zone Mixing Chamber (High Energy)

1. Polymer shall be injected in the water stream by the feed pump to a kinetic mixing chamber to create a thorough mixing energy. The design shall include a motor driven impeller to create a high impact energy and low fluid shear. Solution shall undergo a tapered mixing intensity slope as it passes through a second recovery zone. Polymer activation efficiency shall be consistent over the entire dilution water range.
2. A portion of the mixed polymer is then re-circulated through the mixing chamber ensuring optimum mixing has occurred.

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3. A transparent section after the mixing chamber shall be provided to observe the solution consistency.

G. Post Dilution System

1. Dilution water shall be split into two streams. Primary water flow shall supply the mixing chamber. Secondary water flow shall be used to post dilute the activated polymer stream. These two streams shall be completely blended by a static mixer prior to exiting the unit.
 - a. The post dilution water flow shall be variable and measurable by means of a control valve and a sight glass rotometer.
 - b. Unit shall have an electric solenoid valve for on/off control of post dilution water flow.

H. Assembly and Frame Work

1. All sheet metal work and frame assemblies shall be of type 304 stainless steel.

I. Controls:

1. A local-off-remote switch for the mixing chamber shall be provided.
2. A hand-off-auto switch for the polymer injection pump shall be provided.
3. The system shall be provided with positive flow logic to signal an alarm in the event of low dilution water flow. This alarm will disable the polymer injection pump from operating when the injection pump is run in the automatic mode.
4. The polymer preparation system shall be capable of remote start/stop operation.
5. A speed potentiometer for the polymer make-up pump speed rate shall be provided.
6. All controls are to be mounted in a NEMA 4X FRP enclosure and wired directly to its components. A common power feed cord (10 ft. min) with a standard male plug for a 120V, 20-amp receptacle shall be furnished. *(Receptacle by others)*

2.6 CONTROLS AND INSTRUMENTATION:

- A. Each belt filter press shall be provided with a control panel that will contain the necessary control devices and equipment for controlling the dewatering process as described herein. The control panel shall meet the following general requirements:

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1. The control panel shall accept a 460 volts, 60 hertz, 3-phase ac power input. A main disconnect circuit breaker and operator mechanism shall be included. When the disconnect is in the open position, all power shall be removed from the control system.
 2. IEC rated motor starters shall be provided for the air compressor, belt wash water booster pump, cross conveyor, and the discharge conveyor.
 3. Variable frequency drive (VFD) shall be provided for the pressure belt drive and gravity belt drive. VFD for sludge feed pump and polymer pump can be supplied if specified.
 4. Short circuit protection for each motor shall be accomplished utilizing fuses. Individual thermal overload protection shall be provided (except for the belt drive and sludge feed pump).
 5. A control power transformer shall be included that will provide 120 volts, ac control power to the system.
 6. An industrial programmable logic controller (PLC) located in the control panel shall perform all logic functions for the system.
 7. A CONTROL POWER ON/OFF switch shall be located on the front of the control panel. When in the ON position, the CONTROL POWER ON pilot light will be illuminated and control power shall be distributed to the control system. When in the OFF position, the control system shall be held de-energized.
 8. An EMERGENCY STOP pushbutton shall be located on the control panel. It shall be a mushroom head style pushbutton that when depressed shall immediately de-energize all moving equipment in the system.
 9. An alarm horn shall be included with the control panel for audible alarm annunciation along with a horn silencing button in the front of the panel.
 10. Controls and drives for ancillary equipment will be provided and installed in the master control panel as specified.
- B. Control and Pilot Devices: As a minimum, the following control and pilot devices shall be located on the front of the control panel with nameplates as worded below in UPPERCASE LETTERS:
1. Pushbuttons:
 - a. AUTO START
 - b. AUTO STOP
 - c. SYSTEM RESET
 - d. ALARM SILENCE
 - e. WASHWATER PUMP START
 - f. WASHWATER PUMP STOP

- g. BELT DRIVE START
 - h. BELT DRIVE STOP
 - i. GRAVITY BELT DRIVE START
 - j. GRAVITY BELT DRIVE STOP
 - k. SLUDGE PUMP START
 - l. SLUDGE PUMP STOP
 - m. POLYMER PUMP START
 - n. POLYMER PUMP STOP
 - o. CROSS CONVEYOR START
 - p. CROSS CONVEYOR STOP
2. Selector Switches:
- a. PRESS HAND/OFF/AUTO MODE
 - b. CONTROL POWER ON/OFF
 - c. AIR COMPRESSOR ON/OFF
 - d. DEWATERING MODE THICKENER/PRESS
3. Indicator Lights:
- a. PREWET CYCLE ON
 - b. POSTWASH CYCLE ON
 - c. AIR COMPRESSOR RUNNING
 - d. WASHWATER PUMP RUNNING
 - e. BELT DRIVE RUNNING
 - f. GRAVITY BELT DRIVE RUNNING
 - g. SLUDGE PUMP RUNNING
 - h. POLYMER SYSTEM RUNNING
 - i. CROSS CONVEYOR RUNNING
 - j. LOW AIR PRESSURE
 - k. BELT OVERTRAVEL
 - l. BELT BROKEN
4. Speed Potentiometers:
- a. BELT DRIVE SPEED
 - b. GRAVITY BELT SPEED
5. Signal Input and Output Devices:
- a. Discrete Input Signals: The control panel can receive, if required and specified, the following discrete input signals from normally open dry contacts in external devices (contacts close when the equipment runs or a fault occurs):
 - i. POLYMER PUMP RUNNING
 - ii. POLYMER PUMP FAIL
 - iii. SLUDGE FEED PUMP RUNNING
 - iv. SLUDGE FEED PUMP FAIL
 - v. DISCHARGE CONVEYOR RUNNING
 - vi. DISCHARGE CONVEYOR FAIL

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- b. Discrete Output Signals: The control panel shall provide the following discrete signals for transmission using normally open dry contacts (contacts close when the equipment is called to run or a fault occurs):

- i. SYSTEM RUNNING
- ii. SYSTEM FAULT

6. Sequence of Operation: (THICKENING MODE)

a. Automatic Mode of Operation:

- i. Turn operation selector switch to the thickening position.
- ii. The thickener may be operated in the automatic mode by placing the HAND/OFF/AUTO selector switch in the AUTO position. The operator will next turn the AIR COMPRESSOR SELECTOR SWITCH to the ON position and allow the pressure to reach normal operating level.
- iii. After the air pressure has reached operating level, the operator will press the AUTO START pushbutton, this will energize the wash water booster pump and GRAVITY belt drive, illuminate the PREWET CYCLE ON pilot light and start the pre-wet time delay. After the pre-wet timer times out, the sludge pump, polymer system, cross conveyor and the discharge conveyor will be energized.
- iv. Pressing the AUTO STOP pushbutton will de-energize the sludge pump and polymer pump, illuminate the WASHDOWN CYCLE ON pilot light and start a wash down time delay. After the wash down timer has timed out, the gravity belt drive, washwater pump, cross conveyor and discharge conveyor will be de-energized.

b. Manual Mode of Operation:

- i. To operate the press in the manual mode, the operator will place the HAND/OFF/AUTO selector switch in the HAND position. The operator will next turn the air compressor selector switch to the on position. After the air pressure has reached operating level, all components or drives can be started individually.
- ii. The system will be stopped by pressing the respective STOP pushbutton for each drive or component.

7. Sequence of Operation: (PRESS MODE)**a. Automatic Mode of Operation:**

- i. Turn operation selector switch to the Press position.
- ii. The press may be operated in the automatic mode by placing the HAND/OFF/AUTO selector switch in the AUTO position. The operator will next turn the Air Compressor selector switch to the on position and allow the pressure to reach normal operating level.
- iii. After the air pressure has reached operating level, the operator will press the AUTO START pushbutton, this will energize the washwater booster pump belt drive and gravity belt drive, illuminate the PREWET CYCLE ON pilot light and start the pre-wet time delay. After the pre-wet timer times out, the sludge pump and polymer pump will be energized. (The cross conveyor remains off.)
- iv. Pressing the AUTO STOP pushbutton will de-energize the sludge pump and polymer pump, illuminate the WASHDOWN CYCLE ON pilot light and start a washdown time delay. After the washdown timer has timed out, the gravity belt drive, washwater pump and cross conveyor will be de-energized.

b. Manual Press Mode of Operation:

- i. To operate the press in the manual mode, the operator will place the HAND/OFF/AUTO selector switch in the HAND position. The operator will next turn the air compressor selector switch to the ON position. After the air pressure has reached operating level, all components or drives can be started individually.
- ii. The system will be stopped by pressing the respective STOP pushbutton for each drive or component.

8. Faults:

- a. When any of the following fault conditions occur, in automatic or manual mode, the appropriate fault indicator will be illuminated, the alarm horn will sound and the belt filter press and associated equipment will be de-energized:
 - i. LOW AIR PRESSURE (amber light)
 - ii. BELT OVERTRAVEL (amber light)

- iii. BELT BROKEN (amber light)
- iv. LOW POLYMER (amber light) if specified
- v. BOOSTER PUMP FAULT (flashing run light)
- vi. GRAVITY BELT DRIVE FAULT (flashing run light)
- vii. GRAVITY BELT DRIVE (flashing run light)
- viii. SLUDGE PUMP FAULT (flashing run light)
- ix. CROSS CONVEYOR FAULT (flashing run light)

9. Components:

- a. Enclosures: Control panel enclosures shall be free-standing, fabricated of type 304 stainless steel and shall be suitable for NEMA 4X service. Enclosures shall be manufactured by Saginaw Manufacturing.
- b. Wiring: All power and control wiring shall be 600 volt, type MTW insulation stranded copper and shall be sized for the required load, 18 AWG minimum.
- c. Circuit Breakers: Circuit breakers for the main disconnect shall be thermal magnetic molded case units. Circuit breakers shall be ABB type
- d. Motor Starters: Motor starters shall be full voltage, nonreversing, IEC style across-the-line units. Coils shall be 120 volts ac. Siemens type Sirius 3RT10.
- e. Selector Switches: All selector switches shall be heavy duty, corrosion resistant units rated for NEMA 4X service. Contact blocks shall be rated for 10-ampere continuous service. Selector switches shall be Idec Series TWTD.
- f. Pushbuttons: All pushbuttons shall be heavy duty, corrosion resistant units rated for NEMA 4X service. Contact blocks shall be rated for 10-ampere continuous service. Pushbuttons shall be Idec Series TWTD.
- g. Pilot Lights: Pilot lights shall be heavy duty, corrosion resistant units rated for NEMA 4X service. Units shall be 120 VAC full voltage incandescent type. Pilot lights shall be Idec Series TWTD.
- h. Terminal Blocks: Terminal blocks shall be high density, solderless box lug style, with 600-volt rating. Terminal blocks shall be Allen Bradley type 1492.
- i. Control Relays: Control relays shall be general purpose type with a 10 amp contact rating, miniature square base and internal on status pilot light. Relays shall be IDEC RY series.

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- j. Programmable Logic Controller (PLC): The PLC shall be a modular type with discrete and analog capabilities. The CPU shall have 6K minimum RAM for user instructions. The unit shall have battery backed RAM and EEPROM backup. The PLC shall be an Allen Bradley Micrologix Type.
- k. Variable Frequency Drive (VFD): The VFD shall be UL listed and shall be manufactured by Control Techniques.

PART 3 SPARE PARTS

- 3.1 The following Spare Parts shall be included and supplied together with the equipment:
 - A. One (1) set of brushes with mounting hardware (clips) - (brushes are wear parts).
 - B. One (1) bearing assembly for shaft.
 - C. One (1) solenoid valve 1-inch, 110V, Cl.1/ Div.2 for spray bar washing system.
 - D. Complete set of spare belts.
 - E. Ten (10) nozzles for spray bar washing system.
 - F. One (1) spare part kit for neat polymer pump.
 - G. Spare parts shall be packaged with labels indicating the contents of each package, and shall be delivered to Owner as directed.

PART 4 EXECUTION

- 4.1 INSTALLATION, START-UP AND OPERATOR TRAINING:
 - A. Owner shall verify all dimensions in the field to ensure compliance of equipment dimensions with the drawings. Owner shall notify engineer of significant deviations.
 - B. Installation of the equipment shall be in strict accordance with the contract documents and the manufacturer's instructions and shop drawings. Manufacturer shall supply anchor bolts for the equipment. Owner shall install the anchor bolts in accordance with the manufacturer's recommendations.
 - C. After Installation touch-up paint shall be applied to all scratched, abraded and damaged shop painted surfaces. Coating type and color shall match shop painting. Owner shall passivate all field welds.
 - D. Supplier shall furnish the services of a factory-trained service engineer for two (2) trips including a total of six (6) workdays to inspect the installation, observe start up, and provide operator training.

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1. Equipment shall not be energized, or “bumped” to check the electrical connection for motor rotation without the service engineer present.
2. The service engineer shall make all necessary adjustments and settings to the controls.
3. The service engineer shall demonstrate proper and sequential operation of the dewatering system. The dewatering system shall be able to operate fully automatically.

END OF SECTION

SECTION 11345

ULTRAVIOLET DISINFECTION EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES:

Furnish all labor, materials, equipment and appurtenances required to provide an open channel, gravity flow, low pressure low intensity ultraviolet (UV) either as vertical lamp, inclined lamp, or horizontal lamp disinfection system complete and operational with all control equipment and accessories as shown and specified. This system will be capable of disinfecting effluent to meet the water quality standards listed in this Section. The existing UV modules will be replaced one at a time to minimize downtime of the UV system.

Equipment Designations:

<u>Number</u>	<u>Description</u>
CP-600	UV Control Panel
05-UVM-1101	UV Lamp Module
05-UVM-1102	UV Lamp Module
05-UVM-1201	UV Lamp Module
05-UVM-1202	UV Lamp Module

1.2 QUALITY ASSURANCE:

A. Design Criteria:

1. Provide equipment that shall disinfect effluent with the following characteristics:
 - a. Peak Flow (per Channel): 3.75 Million Gallons per Day (MGD)
 - b. Average Flow (per Channel): 1.0 MGD
 - c. Total Suspended Solids: 20 mg/L, 20 day average of grab samples
 - d. Annual Effluent Temperature Range: 33 to 85° F
 - e. Ultraviolet Transmittance @253.7 nm: 5%, minimum
 - f. Maximum Mean Particle Size: 30 microns
 - g. Effluent standards to be 126/100 mL E. coli based achieved: on a 30 day Geometric Mean of daily samples.
2. The UV system is to be installed in two existing open channels having the following dimensions:
 - a. Length: 25.5 ft (As shown on Drawings)
 - b. Width: 29 in (As shown on Drawings)
 - c. Depth: 69.6 in (As shown on Drawings)
3. The effluent depth in the channel shall be 58.0 in in at low flow and 62.0 in at max flow.

4. System configuration:**a. The UV system configuration shall be as follows:**

Number of Channels:	2
Number of Banks per Channel:	2
Number of UV Modules per Bank:	1
Number of Lamps per UV Module:	40
Total Number of Lamps per Channel:	160
Number of System Control Centers:	1 (existing)
Number of Power distribution Centers:	2 (existing)
Number of Level Controller(s):	1 (existing fixed weir)

B. Performance Requirements:

1. The UV system will be designed to deliver a minimum UV dose of 30,000 $\mu\text{Ws}/\text{cm}^2$ at peak flow, in effluent with a minimum UV Transmission of 65% at end of lamp life. The basis for evaluating the UV dose delivered by the UV system will be the manufacturer's bioassay as carried out by an independent third part. Bioassay validation methodology to follow protocols described in the US EPA Design Manual - Municipal Wastewater Disinfection (EPS/625/1-86/021), without exception.
2. The ultraviolet disinfection system will produce an effluent conforming to the following discharge permit: 126 E. coli /100 ml based on a 30 day Geometric Man of daily grab samples. Grab samples will be taken in accordance with the Microbiology Sampling Techniques found in Standard Methods for the Examination of Water and Wastewater. 19th Ed.
3. Provide UV disinfection system complete with UV Modules, System Control Center, Power Distribution Center(s), Support Rack(s), and Level Controller as shown on the contract drawings and as herein specified.
4. The system will be able to continue providing disinfection while replacing UV lamps, quartz sleeves, and ballasts, and while cleaning the sleeves.
5. The system will be designed for complete outdoor installation.

1.3 SUBMITTALS:**A. Submit for review, shop drawings showing the following:**

1. Complete description in sufficient detail to permit an item comparison with the specification.
2. Dimensions and installation requirements.
3. Descriptive information including catalog cuts and manufacturers' specifications for major components.

4. Electrical schematics and layouts.
5. Hydraulic calculations demonstrating compliance with the required hydraulic characteristics.
6. Experience Documentation.
7. Dose calculations and independent bioassay report.

1.4 GUARANTEE:

A. Equipment:

1. The equipment furnished under this section will be free of defects in material and workmanship, including damages that may be incurred during shipping for a period of twenty-four (24) months from date of owner's acceptance.
2. UV Lamps:
 - a. The UV lamps to be warranted for a minimum of 12,000 hours. On/off cycles are limited to an average of three (3) per day.

PART 2 PRODUCTS

2.1 MANUFACTURER:

- A. The following manufacturer is listed as acceptable in order to set a definite standard of quality and performance. Listed manufacturers and products are expected to fully comply with the specifications.
 1. UltraTech. (Vertical)
 2. Veolia. (Incline)
 3. Wedeco. (Incline)
 4. Trojan. (Incline or Horizontal)
 5. Neotech. (Horizontal)
 6. Glasco. (Vertical)
 7. De Nora. (Horizontal)
 8. Or Engineer-approved Equivalent.
- B. To be acceptable, the UV system must operate in an open channel, be of modular design, use low intensity low pressure vertical, inclined, or horizontal UV lamps, electronic ballasts with multiple power settings, and utilize stainless steel cleaning racks for manual cleaning.
- C. If other equipment is proposed, the Contractor will demonstrate to the Engineer and the Owner that all requirements of materials, performance, and workmanship have been met or exceeded by the equipment proposed. Contractors proposing alternate manufacturers will be responsible for all costs associated with system evaluation and redesign including all electrical, mechanical and civil aspects of the installation.

2.2 DESIGN, CONSTRUCTION AND MATERIALS:**A. General:**

1. All welded metal components in contact with effluent shall be Type 316L stainless steel.
2. All metal components above the effluent shall be Type 304 stainless steel with the exception of the ballast enclosure, which is constructed of anodised aluminium.
3. All wiring exposed to UV light shall be Teflon coated.
4. All wires connecting the lamps to the ballasts shall be enclosed inside the frame of the UV Module and not exposed to the effluent.

B. Lamp Array Configuration:

1. The lamp array configuration will be the uniform array with all lamps parallel to each other and to the flow. The lamps will be evenly spaced in horizontal and vertical rows with centerline spacing equal in both directions.
2. The single array pattern will be continuous and symmetrical throughout the reactor.
3. Systems with a concentric array or uniform staggered array and having an equivalent UV density will have 30% additional lamps to compensate for the inefficiencies of these arrays.
4. The system will be designed for complete immersion of the UV lamps including both electrodes and the full length of the lamp tube in the effluent. Both lamp electrodes will operate at the same temperature and be cooled by the effluent.

C. UV Module:

1. Each UV module will consist of UV lamps with an electronic ballast enclosure mounted on the Type 316 stainless steel frame. Ballasts housed in a separate enclosure located external to the channel which require mechanical cooling shall not be permitted.
2. Each lamp will be enclosed in its individual quartz sleeve, one end of which will be closed and the other end sealed by a lamp end seal and compressed O-ring. To be considered as an alternate, lamp quartz sleeves that are open at both ends will be supplied with twice the amount of specified spare seals and lamps.
3. The closed end of the quartz sleeve will be held in place by means of a retaining O-ring. The quartz sleeve will not come in contact with any steel in the frame.

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4. The ends of the lamp sleeve will not protrude beyond the stainless steel frame of the UV Module.
5. Lamp wires will terminate in the electronic ballast enclosure located at the top of the UV Module.
6. The electronic ballast enclosure will contain the electronic ballasts and L.E.D. lamp status displays visible through a red plexiglass viewing plate.
7. The ballast enclosure will be anodised aluminum.
8. All wires connecting the lamps to the ballasts will be enclosed inside the frame of the UV Module and not exposed to the effluent.
9. All lamp to ballast connections will be made by and tested by the UV Manufacturer.
10. At the point of exit from the UV Module frame the multiconductor cable will pass through a waterproof strain relief.
11. Each UV Module will weigh no more than 50 lbs and will be individually removable without using mechanical lifting devices.
12. Each UV Module will be connected to a receptacle on the Power Distribution Center by means of a multiconductor cable with a moulded connector.
13. Each UV Module will have a NEMA rating of Type 4.

D. UV Lamps:

1. Low pressure mercury slimline of the hot cathode instant start design. The coiled filamentary cathodes to be heated by the arc current.
2. The filament will be of the clamped design, significantly rugged to withstand shock and vibration.
3. Electrical connections at one end.
4. Each connection will have only two pins.
5. 90% of UV output will be within the wavelengths of 233.7 to 273.7 nm.
6. Rated to produce zero levels of ozone.
7. Lamp bases will be of a metal and ceramic construction resistant to UV and ozone.

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8. The lamp base will incorporate a dielectric barrier or pin isolator. The pin isolator will consist of a non-conductive divider placed between the lamp pins to prevent direct arcing across the pins in moist conditions.

E. Lamp End Seal and Lamp Holder:

1. The open end of the lamp sleeve will be sealed by means of a Type 316 stainless steel sleeve nut which threads onto a sleeve cup and compresses the sleeve O-ring.
2. The sleeve nut will have a knurled surface to allow a hand grip for tightening. The sleeve nut will not require any tools for removal.
3. The lamp will be held in place by means of a moulded lampholder that will incorporate two seals. The lampholder will seal against the inside of the quartz sleeve to act as a second seal in series with the external O-ring seal.
4. The second seal on the lampholder will isolate and seal the lamp from the module frame and all other lamps in the module.
5. In the event of a quartz sleeve fracture the two seals of the lamp holder will prevent moisture from entering the lamp module frame and the electrical connections to the other lamps in the module.
6. The lamp holder will also incorporate a UV resistant plastic stop that will prevent the lamp sleeve from touching the steel sleeve cup.

F. UV Lamp Sleeves:

1. Type 214 clear fused quartz circular tubing as manufactured by General Electric or equal.
2. Lamp sleeves shall be domed at one end.
3. The nominal wall thickness shall be 1.5 mm.

G. UV Lamp Module Support Rack:

1. The module support rack shall be Type 304 stainless steel and be suspended above the effluent in the channel by means of slotted angles allowing adjustment to the precise height of the channel and requiring no fastening of the individual UV lamp modules.
2. The module support rack shall be designed so that no ultraviolet light shall radiate above the channel when the UV lamp modules are energized and fully immersed in the effluent.

H. Electrical:

1. General:

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- a. Each UV module will be powered from the Power Distribution Center through a bus bar and will include a relay board and watertight connectors.
- b. Each ballast will drive two lamps.
- c. Electrical supply to each System Control Center will be 208 Volts, single phase, 2 wire (plus ground), 5 Amps.
- d. Electrical supply to each Power Distribution Center(s) will be no greater than 208 Volts, 1 phase, 2 wire (plus ground), 3.8 kVA.
- e. Forced air cooling of control panels that contain electronic circuit boards will not be acceptable.

2. Power Distribution Center:

- a. Power distribution will be through bus bars to environmentally sealed receptacles to allow for local connection of UV Modules.
- b. Fusing of each UV module circuit will be located inside the Power Distribution Center.
- c. Enclosure material will be fiberglass.
- d. Enclosure will be waterproof.
- e. Cross-sectional dimension will be 8 inches high by 16 inches wide and span the complete channel width.
- f. All Power Distribution Centers to be NEMA approved with a rating of Type 4.
- g. One separate sealed Power Distribution Center will be provided per bank of lamps to ensure complete electrical independence.

I. Control and Instrumentation:

1. System Control Center (SCC) Type B:

- a. UV System control and monitoring will be provided through display screen and message keypad to allow complete operator interface. Hardwired panel devices and meters will not be permitted.
- b. Keypad will have a sealed membrane overlay covering all function keys and numerical keys.
- c. Operator interface will be NEXT and PREV driven with a flashing display upon alarm conditions.

ADDENDUM NO. 3

- d. Minor alarms will be provided to indicate to plant operators that maintenance attention is required. Alarms will include:
 - i. Low Warning UV Intensity will be pre-set at the factory for 25% of the Intensity after 100 hours. Alarm set point will be field adjustable.
 - ii. Individual Lamp Failure will indicate single lamp failures that occur.
 - e. Elapsed time of each bank will be recorded and displayed on the display screen when prompted.
 - f. Panel will be NEMA Type 4 and be 20 inches high by 20 inches wide by 12 inches deep. Panel will be wall mounted at a minimum of 40" above the ground level.
 - g. Digital I/O modules rated for 10 amps will be provided to remotely indicate:
 - i. Common Major Alarm Condition.
 - ii. Bank status (one for each UV bank supplied).
2. SCC shall interface with the overall plant SCADA system as existing system.
- a. Provide status outputs to plant SCADA system.
 - b. Update existing interface screens for the plant OIC.
 - c. All alarms shall be interfaced with the plant SCADA for alerting operating personnel.
 - d. Operation of the UV system by the OIC is not required.

2.3 UV DETECTION SYSTEM:

- A. A submersible UV sensor will continuously sense the UV intensity produced in each bank of UV lamps. The sensor will measure only the germicidal portion of the light emitted by the UV lamps. The detection system will be factory calibrated. Detection systems which can be field calibrated will not be permitted.

2.4 FLOW PACING:

- A. A flow pacing system will be supplied to turn the UV banks on and off in relationship to a 4-20 mA signal from an effluent flow monitor (by Others). The flow pacing system will allow the operator to vary the flow rate setting. Logic and time delay relays will be provided to regulate the UV bank ON/OFF cycle.

ADDENDUM NO. 3

- B. Bank status will be capable of being placed either in Manual, Off or Auto mode.
- C. Banks will be cycled for equal wear and timed off to minimize bank cycling.

2.5 CLEANING SYSTEM:

- A. Cleaning Rack:
 - 1. Reuse existing cleaning rack.

2.6 PROTECTOR CAPS:

- A. Caps will provide a replacement seal for UV Module plugs and Power Distribution Center receptacles when UV Modules are removed from the effluent channel.

2.7 PHOTOMETER:

- A. A single beam UV photometer with front panel and 100% transmittance control adjustment will be supplied to measure the UV transmittance of the effluent.
- B. The range will be 0 - 100% transmittance with a wavelength accuracy of _ 0.16 half band width.

2.8 SPARE PARTS:

The following spare parts and safety equipment will be furnished:

- A. 1 - UV Module (complete).
- B. 6 - UV Lamps.
- C. 6 - Lamp Sleeves.
- D. 6 - Lamp Holder Seals.
- E. 1 - Operators kit including face shield, gloves and cleaning solution.

PART 3 EXECUTION

3.1 INSTALLATION:

- A. In accordance with Drawings and manufacturer's shop drawings and instructions.

3.2 FIELD QUALITY CONTROL:

- A. Retain a qualified representative of the manufacturer to perform the following services:
 - 1. Oversee installation of the equipment specified herein.

ADDENDUM NO. 3

2. Inspect the completed installation and note deficiencies.
 3. Be present and assist the CONTRACTOR during start-up, adjusting, and site testing of completed installation.
 4. Furnish test forms and procedures for field testing.
 5. Instruct OWNER's personnel in the operations and maintenance of the equipment with minimum services as follows.
 - a. Installation assistance: As required.
 - b. Owner personnel instruction, classroom and jobsite: 2 hrs.
 - c. Plant startup: 4 hrs.
 - d. Coordinate training and start-up with Owner's personnel.
 - e. Owner may videotape training.
 - f. Manufacturer shall make four additional trips to the job site, at 3 months, 6 months, 12 months and 24 months to inspect and provide troubleshooting support of the equipment.
 6. Prepare manufacturer's installation report and submit within 30 days after completion of field testing. Include the following information:
 - a. Field testing results.
 - b. Descriptions of installation deficiencies not resolved to the manufacturer's satisfaction.
 - c. Description of problems or potential problems.
 - d. Names of OWNER personnel who attended operations and maintenance training sessions.
 - e. Record copy of materials used for training session including outlined summary of course.
- B. Field representatives shall have a minimum of five (5) years of experience with the operation of and training on this type of equipment.
1. Factory personnel will be required to perform this service. Sales representatives will only be considered acceptable service technicians if they have three (3) years of experience with the operation of and training on this type of equipment from the manufacturer being supplied and have started up 10 units of a similar size and type from the manufacturer.
- C. Field Testing:
1. Testing and startup schedule shall be submitted to ENGINEER for approval.
 2. Test Procedure: Verify proper operation.

END OF SECTION

SECTION 11352

BELT CONVEYOR

PART 1 GENERAL

1.1 SECTION INCLUDES:

- A. Mechanical belt conveyor to remove the dewatered solids from the belt filter press and place the solids into a dumpster for disposal.

1.2 REFERENCES:

- A. CEMA C5--Idlers.
- B. ASTM A36--Structural Steel Specifications.
- C. ASTM A11\23--Hot-Dipped Galvanizing.
- D. OSHA--Safety Stop Switch.
- E. OSHA--Safety Guards at Nip Points.

1.3 SYSTEM DESCRIPTION:

- A. The multi-direction belt convey shall have horizontal centers, horizontal to incline configuration, sidewall type.
- B. Equipment List:
 - 1. Cake Conveyor CN-461.
- C. Related Section:
 - 1. Section 11199 Belt Filter Press System.

1.4 SUBMITTALS:

- A. Provide the following information in accordance with Section 01300:
 - 1. Product information including catalog data, dimensional drawings, and material of construction to verify that the equipment provided meets the requirements set forth in the specifications.
 - 2. Results of factory tests including test logs.
 - 3. Layout drawings for all equipment showing installation details and exploded diagrams.
 - 4. Manufacturer's installation, operation, and maintenance instructions to include as a minimum:

ADDENDUM NO. 3

- a. Supplier Identification: The names and addresses of the manufacturer, the nearest representative of the manufacturer, and the nearest supplier of the manufacturer's equipment and parts.
- b. Lubrication Information: Manufacturer's recommendation regarding the lubricants to be used and the lubrication schedule to be followed.
- c. Control Diagrams: Diagrams shall show internal and connection wiring.
- d. Start-up Procedures: These instructions consist of equipment manufacturer's recommendation for installation, adjustment, calibration, and troubleshooting.
- e. Operating Procedures: These instructions consist of the equipment manufacturer's recommended step-by-step procedures for starting, operating, and stopping the equipment under specified modes of operation.
- f. Preventive Maintenance Procedures: These instructions consist of the equipment manufacturer's recommended steps and schedules for maintaining the equipment.
- g. Overhaul Instructions: These instructions consist of the equipment manufacturer's directions for the assembly, repair, and reassembly of the equipment and any safety precautions that must be observed while performing the work.
- h. Parts List: This list consists of the manufacturer's recommendations of number of parts which should be stored by the Owner and any required special storage precautions.
- i. Exploded View: Exploded or cut views of equipment shall be provided if available as a standard item of the manufacturer's information. When exploded or cut views are not available, plan and section views shall be provided with detailed call-outs.
- j. Specific Information: Where items of information not included in the above list are required, provide them.

1.5 DELIVERY, STORAGE, AND HANDLING:

- A. Store and handle the belt-conveyor and appurtenances in accordance with the manufacturer's written instructions. Protect the belt-conveyor and appurtenances from damage.

1.6 SPARE PARTS:

- A. One (1) Wiper blade.

- B. One (1) Bearing of each size.
- C. Two (2) Idlers of each type.
- D. Ten feet zero inches (10'0") of belting.
- E. One (1) Splice kit with tools.
- F. One (1) Set of V-belts.

1.7 SPECIAL TOOLS:

- A. One (1) set of any special tools required for maintenance and operation.

1.8 QUALIFICATION OF MANUFACTURER:

- A. The supplier and/or manufacturer will have been in the business of designing and manufacturing "Waste Treatment Conveying Systems" for a minimum of ten (10) years and have "in-house" fabrication, painting, and assembly capabilities to ensure quality controls. The supplier and/or manufacturer will allow periodic inspection of work in progress when requested.

PART 2 PRODUCTS

2.1 SERVICE CONDITIONS:

- A. General: Provide one (1) belt conveyor system with a 24-inch wide belt and controls to convey dewatered domestic sludge.
- B. Design Criteria:
 - 1. Average Cake Flow: 50 cu ft/h at 15 percent solids
 - 2. Peak Cake Flow: 100 cu ft/h at 15 percent solids
 - 3. Cake Solids concentration range: 15 to 20 percent.
 - 4. Operation: 7 hours/day, 5 days/week.
 - 5. Number of units: One (1).
 - 6. Belt width: Twenty-four inches (24 inches).
 - 7. Configuration: Horizontal to incline as per the contract drawings.

2.2 MANUFACTURERS:

- A. Custom Conveyor Corporation.
- B. TMH Systems.
- C. MLM.
- D. Jim, Myers, and Sons. Inc.
- E. Engineered Approved equivalent.

2.3 EQUIPMENT:

A. Motor:

1. Conveyor is to be driven by a 2-hp, 3-phase, 60-HZ, 230/460-VACTEFC enclosure motor.

B. Reducer:

1. Speed reduction will be achieved by dual B-Section V-belts and sheaves through an AGMA Class II helical shaft mount gear reducer.

C. Pulleys & Bearings:

1. The pulleys are to be 12-inch diameter minimum with tapered "QD" compression type hubs mounted on cold rolled steel shafting supported by 1-15/16-inch diameter minimum self-aligning roller bearings. The head pulley will have 1/4-inch thick vulcanized neoprene lagging to prevent a belt slip. The tail pulley will be supported by protected screw take-ups. The take-ups will include stainless steel adjusting rods with brass bearing capture nuts.

D. Belting and Splice:

1. Belt conveyors will incorporate a 2-ply nylon carcass belt, 24 inches wide, of cross rigid construction with 1/8-inch x 1/16-inch oil-resistant covers and a rated tension of 220 P.I.W. 3 inches high, oil-resistant corrugated sidewalls vulcanized to the belt to contain the product and prevent spillage.

The multi-direction conveyor will include recessed sidewalls with a carrying surface width 10 inches less than the overall belt width.

2. The belt is to be spliced with a stainless steel mechanical hinged fastener, drawn, and recessed into the belt cover. The sidewalls are to be spliced with a cold vulcanizing kit and a single plate stainless steel fastener offset 6 inches from the carcass splice.

E. Idlers:

1. Belt will be supported on the carrying run by CEMA C-5, flat idlers on 3'-0" maximum centers except at the load points on 1'-0" centers and return runs on CEMA C-5 idlers at maximum spacing of 4'-0".
2. Idlers are to be covered with corrosion- and wear-resistant 1/4-inch thick molded urethane and supported from the frame by hot-dipped galvanized brackets.
3. Idlers will include 3/4-inch diameter shafts and tapered roller bearings with controlled greasing. Shaft seals will be multi-passage labyrinth with a positive wiper and an outer shield constructed as established by CEMA.

F. Directional Transitions:

1. The multi-directional belt is to be supported at the transition from horizontal to incline at the belt edge with stub can idlers, minimum (4) per side.

G. Frame:

1. Belt conveyor frames and supports will be constructed of ASTM A36 structural members with spreaders, sized as required to limit deflection to 1/250 at the longest support span. Top of channel frames will be covered with a 3/16-inch thick nominal fiberglass reinforced plastic (FRP) return belt cover to prevent product spillage onto the return run of the belt. Frame and support assemblies are to be hot-dipped galvanized per ASTM A123 standards after fabrication.

H. Accessories:

1. Skirting:

- a. Conveyor will be provided with continuous 3/16-inch FRP skirt at load area with an adjustable neoprene seal strip at the belt to guide and control the product.

2. Drip Pan:

- a. Return run of the belt will be provided with a 3/16-inch thick FRP drip pan 6-inches wide than overall belt width with water-tight flanged connections in 10'-0" maximum lengths. Drains will be located as shown on the Drawings. The pan should be installed to also serve as a guard for the return run of belting.

3. Guards:

- a. Conveyor will be provided with OSHA-style guards at all nip points and motor-driven rotating components, specifically including motor drive and tail pulley and head pulley guards. Guards will be constructed of FRP.

4. Switches:

- a. The conveyor will be provided with a cable operated OSHA safety stop switch with continuous cable run on both sides and a zero speed switch mounted at the conveyor tail shaft. Switches will be SPDT, 120 VAC.

5. Belt Wiper:

- a. The product will be scraped from the belt surface by a spring tensioned adjustable neoprene scraper blade. The blade will be tensioned by (2) adjustable stainless steel springs.

2.4 COATING:

- A. Fabricated mild steel frames and supports will be hot-dipped galvanized per ASTM A123 standards after fabrication. Component hardware will be epoxy painted. Non-ferrous items will remain unfinished. Shafting will be coated with a rust-inhibitive compound equal to Mobile ARMA 633.

2.5 FASTENERS:

- A. Component assembly will be achieved with 304 stainless steel nuts, bolts, flat and lock washers.

PART 3 EXECUTION

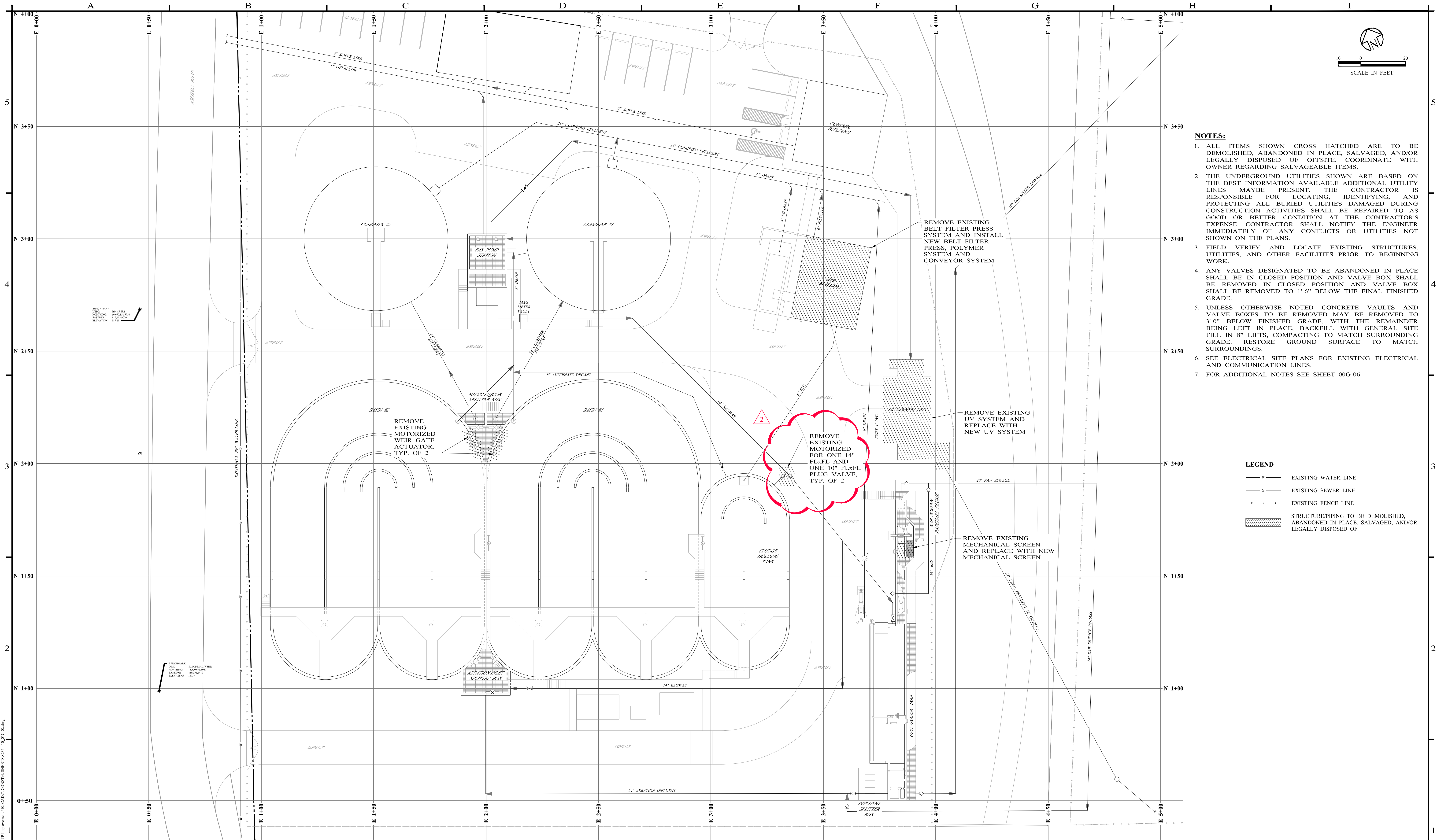
3.1 INSTALLATION:

- A. Install the equipment in accordance with manufacturer's instructions and as shown.

3.2 FIELD QUALITY CONTROL:

- A. Provide services of factory-trained manufacturers representative to inspect, check out, and place system into operation. Representative shall demonstrate satisfactory system operation and provide instruction to Owner's personnel. Visit shall be at least one full working day (8 hours) on-site. Visit to be after sludge is available.

END OF SECTION



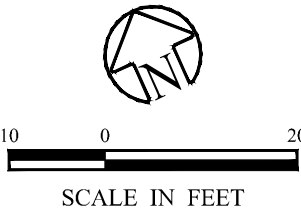
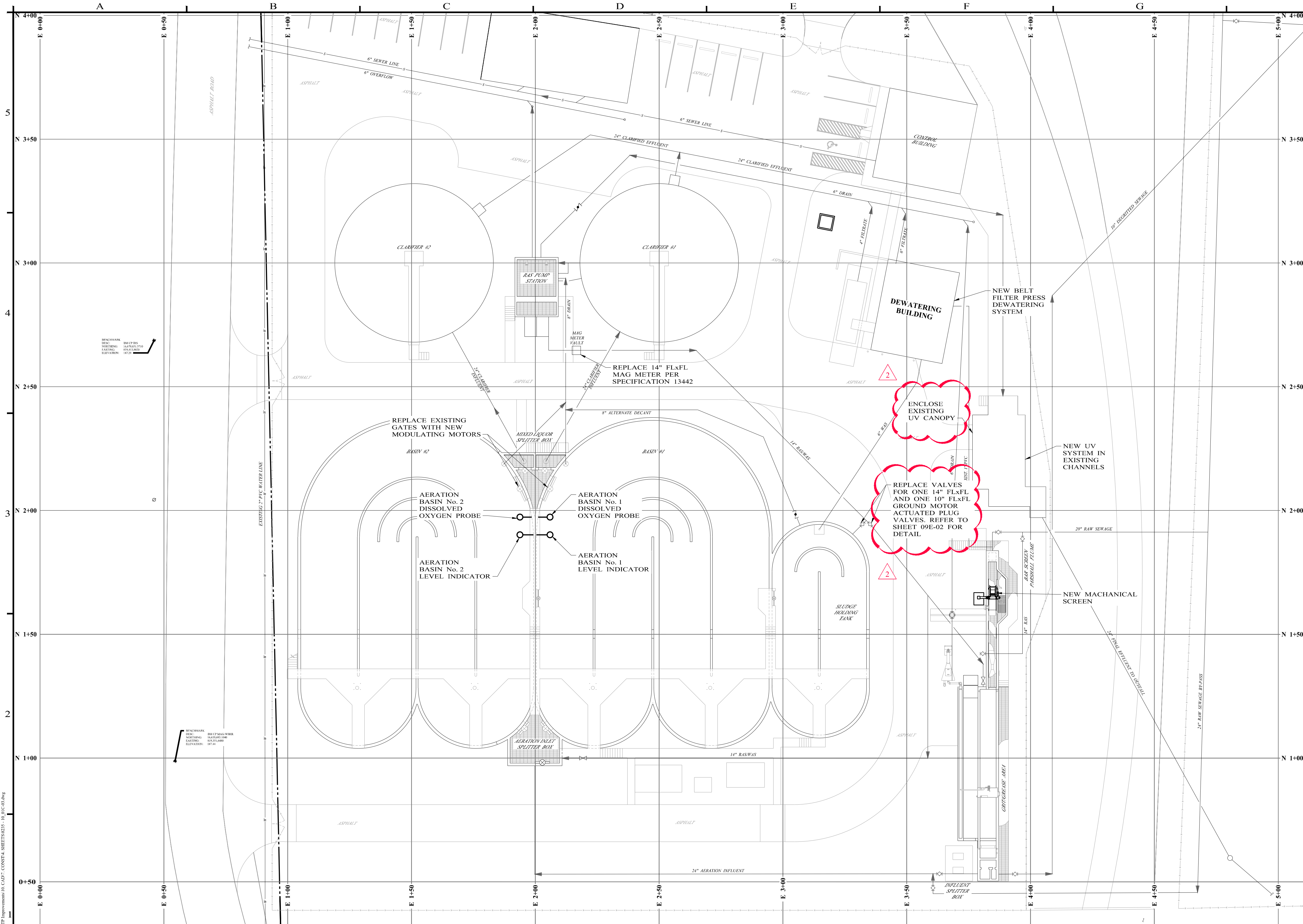
- NOTES:**
1. ALL ITEMS SHOWN CROSS HATCHED ARE TO BE DEMOLISHED, ABANDONED IN PLACE, SALVAGED, AND/OR LEGALLY DISPOSED OF OFFSITE. COORDINATE WITH OWNER REGARDING SALVAGEABLE ITEMS.
 2. THE UNDERGROUND UTILITIES SHOWN ARE BASED ON THE BEST INFORMATION AVAILABLE. ADDITIONAL UTILITY LINES MAYBE PRESENT. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING, IDENTIFYING, AND PROTECTING ALL BURIED UTILITIES DAMAGED DURING CONSTRUCTION ACTIVITIES SHALL BE REPAIRED TO AS GOOD OR BETTER CONDITION AT THE CONTRACTOR'S EXPENSE. CONTRACTOR SHALL NOTIFY THE ENGINEER IMMEDIATELY OF ANY CONFLICTS OR UTILITIES NOT SHOWN ON THE PLANS.
 3. FIELD VERIFY AND LOCATE EXISTING STRUCTURES, UTILITIES, AND OTHER FACILITIES PRIOR TO BEGINNING WORK.
 4. ANY VALVES DESIGNATED TO BE ABANDONED IN PLACE SHALL BE IN CLOSED POSITION AND VALVE BOX SHALL BE REMOVED IN CLOSED POSITION AND VALVE BOX SHALL BE REMOVED TO 1'-6" BELOW THE FINAL FINISHED GRADE.
 5. UNLESS OTHERWISE NOTED CONCRETE VAULTS AND VALVE BOXES TO BE REMOVED MAY BE REMOVED TO 3'-0" BELOW FINISHED GRADE, WITH THE REMAINDER BEING LEFT IN PLACE, BACKFILL WITH GENERAL SITE FILL IN 8" LIFTS, COMPACTING TO MATCH SURROUNDING GRADE. RESTORE GROUND SURFACE TO MATCH SURROUNDINGS.
 6. SEE ELECTRICAL SITE PLANS FOR EXISTING ELECTRICAL AND COMMUNICATION LINES.
 7. FOR ADDITIONAL NOTES SEE SHEET 00G-06.

- LEGEND**
- EXISTING WATER LINE
 - EXISTING SEWER LINE
 - EXISTING FENCE LINE
 - STRUCTURE/PIPING TO BE DEMOLISHED, ABANDONED IN PLACE, SALVAGED, AND/OR LEGALLY DISPOSED OF.

NO.		REVISION		DATE		09/01/2026				 Enprotec Hibbs & Todd 402 Cedar Street • Abilene, Texas 79601 • T: (325) 698-5560 • F: (325) 690-3240 • www.e-h-t.com PE Firm Registration No. 1151 • PG Firm Registration No. 50103 • RPLS Firm Registration No. 10011900		BAR IS ONE INCH ON ORIGINAL DRAWING  IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.		DESIGNED BY		SCALE		ROMA WWTP IMPROVEMENTS ROMA, STARR COUNTY, TEXAS DEMOLITION SITE PLAN AND PIPING		PROJECT NO.: 8235	
1		ISSUED FOR BID		08/03/2026		DRAWN BY								DATE		SEQUENCE No.					
2		ADDENDUM #3		09/01/2026		JR SALINAS								08/03/2026		11 OF 51					
																SHEET No.					
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A		B		C		D		E		F		G		H		I					

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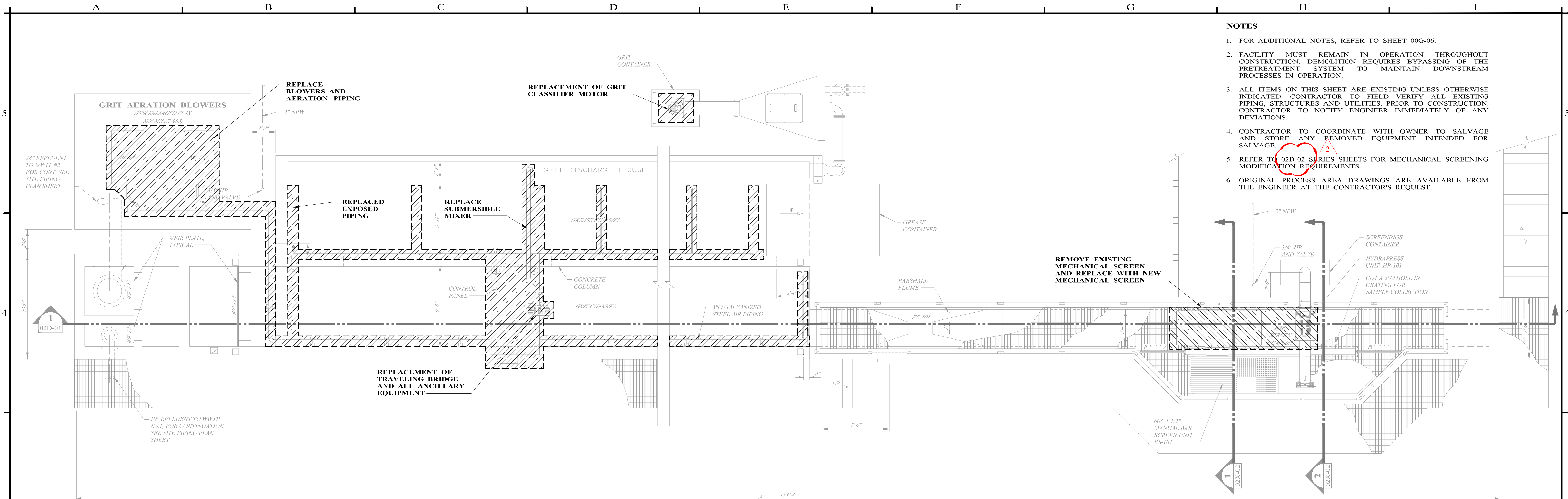
NOTES

1. INDIVIDUAL MECHANICAL AND PLUMBING SHEETS IDENTIFY PROCESS AND BUILDING PIPING ASSOCIATED WITH INDIVIDUAL PROCESS UNITS AND BUILDINGS.
2. ALL PIPING UNDER CONCRETE SLABS SHALL BE PRESSURE TESTED PRIOR TO CONCRETE BEING PLACED.
3. ALL PIPING UNDER CONCRETE SLABS SHALL BE ENCASED IN CONCRETE. REFER TO DETAIL F ON SHEET 08D-01. EXTEND CONCRETE ENCASEMENT A MINIMUM OF 3 FEET BEYOND THE BUILDING FOUNDATION UNLESS OTHERWISE SPECIFIED.
4. CONTRACTOR SHALL FIELD VERIFY THE LOCATION OF ALL EXISTING UTILITIES.
5. CONTRACTOR SHALL REPAIR UTILITY LINES THAT MAY BECOME DAMAGED BY CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.
6. WHEN CROSSING UNDER EXISTING UTILITIES, PROVIDE ADEQUATE SUPPORT TO KEEP EXISTING UTILITY IN SERVICE. RE-COMPACT ALL TRENCH AREAS WITHIN 5 FEET OF EXISTING UTILITY DURING BACKFILL VIA 6" LIFTS TO 95% STANDARD PROCTOR DENSITY UP TO THE SPRING LINE OF THE EXISTING UTILITY. THERE SHALL BE A MINIMUM OF 24" VERTICAL SEPARATION BETWEEN OUTSIDE DIAMETERS (O.D.'S) OF PIPE (OR PIPE ENCASEMENT) AT CROSSING.
7. ALL FITTINGS SHALL BE RESTRAINED WITH MECHANICAL JOINT RESTRAINTS.
8. ALL METAL OR IRON PIPE, FITTINGS, ETC. BELOW GRADE SHALL BE POLY WRAPPED WITH MINIMUM 8-MIL PLASTIC.
9. ALL YARD PIPING SHALL HAVE A MINIMUM OF 36" OF COVER. WHERE THIS CANNOT BE ACHIEVED, PIPE SHALL BE CONCRETE ENCASED IN ACCORDANCE WITH DETAIL F ON SHEET 08D-01. COORDINATE WITH ENGINEER ON ALL INSTANCES WHERE PIPES CANNOT BE INSTALLED WITH 36" OF COVER.
10. ALL PIPE BENDS SHALL BE MADE WITH APPROPRIATE FITTINGS.
11. PIPE JOINT DEFLECTIONS SHALL BE NO GREATER THAN 75 PERCENT OF THE MANUFACTURER'S RECOMMENDED MAXIMUM DEFLECTION, UNLESS APPROVED BY ENGINEER. THE CONTRACTOR SHALL FURNISH AND INSTALL APPROPRIATE JOINTS AND/OR FITTINGS WHEREVER REQUIRED TO COMPLETE PIPELINE INSTALLATIONS AS SHOWN.
12. AT EACH PIPELINE CROSSING WITH PIPES 8" IN DIAMETER OR GREATER, CONTRACTOR SHALL USE CEMENT-STABILIZED SAND A MINIMUM OF 3' IN EACH DIRECTION OF EACH PIPE FROM BOTTOM OF LOWEST TRENCH TO TOP OF HIGHEST PIPE.

LEGEND

- W — EXISTING WATER LINE
- S — EXISTING SEWER LINE
- F — EXISTING FENCE LINE

NO. 1 2			REVISION ISSUED FOR BID ADDENDUM #3		DATE 08/03/2026 09/01/2026		09/01/2026				 402 Cedar Street • Abilene, Texas 79601 • T: (325) 698-5560 • F: (325) 690-3240 • www.e-ht.com PE Firm Registration No. 1151 • PG Firm Registration No. 50103 • RPLS Firm Registration No. 10011900		DESIGNED BY B. THOMPSON DRAWN BY JR SALINAS CHECKED BY B. THOMPSON		SCALE 1" = 20' DATE 08/03/2026		ROMA WWTP IMPROVEMENTS ROMA, STARR COUNTY, TEXAS MODIFICATION SITE PLAN AND PIPING		PROJECT NO.: 8235 SEQUENCE No. 12 OF 51 SHEET No. 01C-03	
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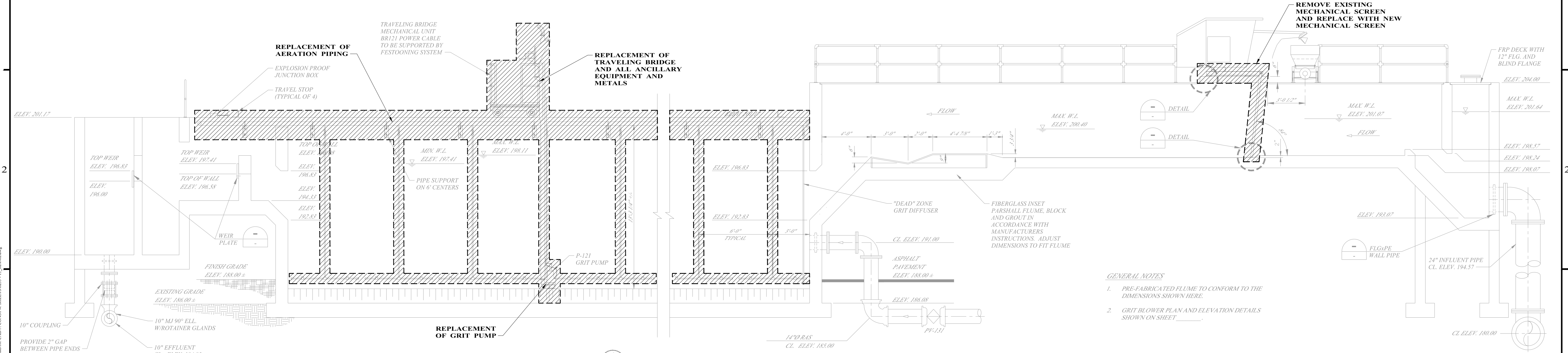


NOTES

1. FOR ADDITIONAL NOTES, REFER TO SHEET 00G-06.
2. FACILITY MUST REMAIN IN OPERATION THROUGHOUT CONSTRUCTION. DEMOLITION REQUIRES BYPASSING OF THE PRETREATMENT SYSTEM TO MAINTAIN DOWNSTREAM PROCESSES IN OPERATION.
3. ALL ITEMS ON THIS SHEET ARE EXISTING UNLESS OTHERWISE INDICATED. CONTRACTOR TO FIELD VERIFY ALL EXISTING PIPING, STRUCTURES AND UTILITIES. PRIOR TO CONSTRUCTION, CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DEVIATIONS.
4. CONTRACTOR TO COORDINATE WITH OWNER TO SALVAGE AND STORE ANY REMOVED EQUIPMENT INTENDED FOR SALVAGE.
5. REFER TO 02D-02 SERIES SHEETS FOR MECHANICAL SCREENING MODIFICATION REQUIREMENTS.
6. ORIGINAL PROCESS AREA DRAWINGS ARE AVAILABLE FROM THE ENGINEER AT THE CONTRACTOR'S REQUEST.



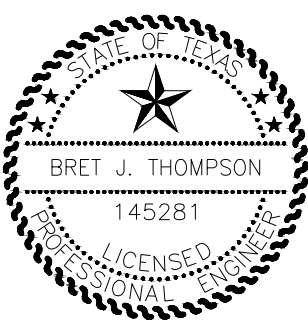
BAR SCREEN AND GRIT / GREASE CHAMBER - PLAN VIEW



SECTION

NO.	REVISION	DATE
1	ISSUED FOR BID	08/03/2026
2	ADDENDUM #3	09/01/2026

09/01/2026



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BAR IS ONE INCH ON ORIGINAL DRAWING
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DESIGNED BY
B. THOMPSON
DRAWN BY
JR SALINAS
CHECKED BY
B. THOMPSON

SCALE
1/4" = 1'-0"
DATE
08/03/2026

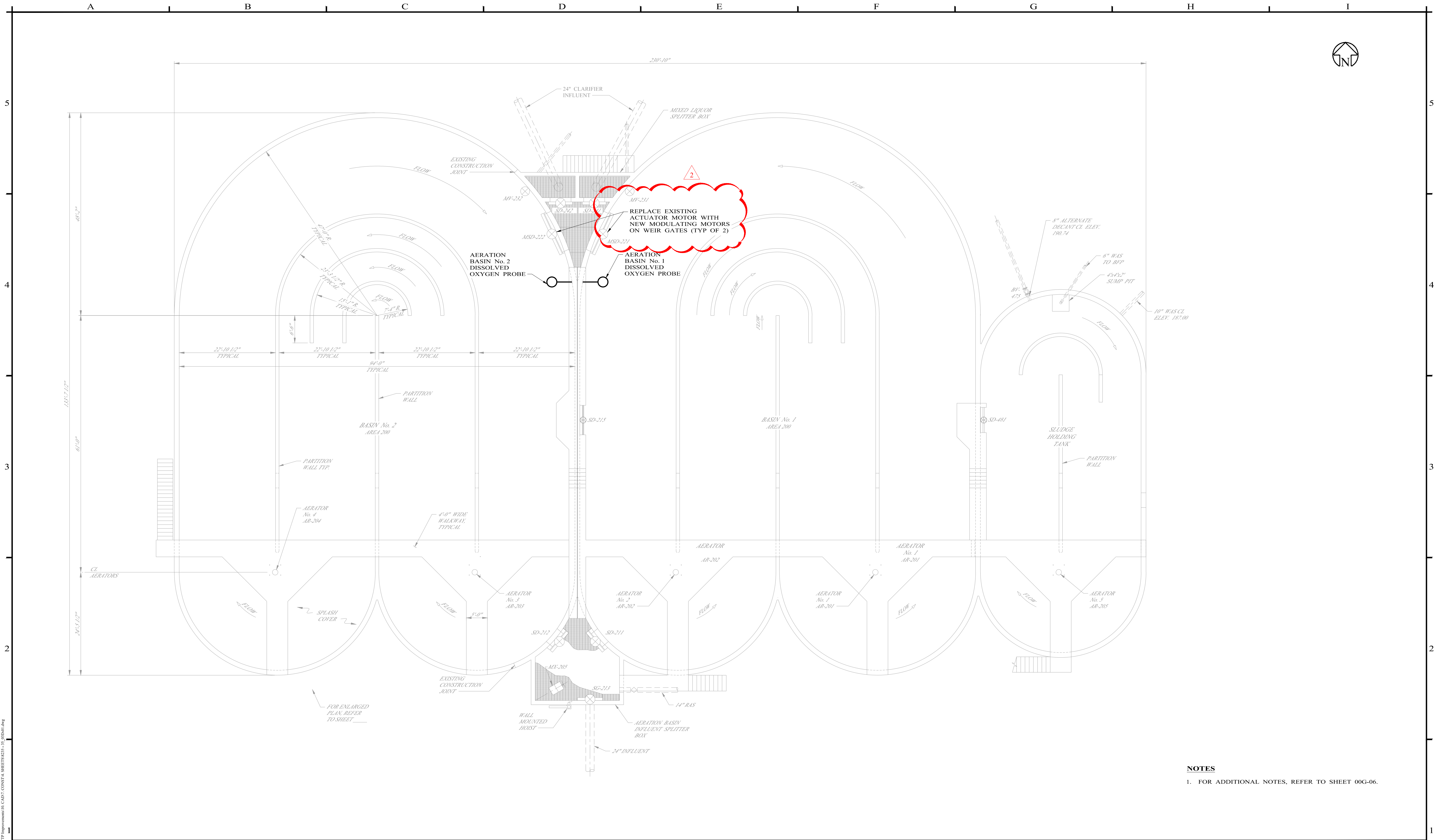
**ROMA WWTP IMPROVEMENTS
ROMA, STARR COUNTY, TEXAS**

**PRETREATMENT STRUCTURE
DEMOLITION PLAN VIEW AND SECTION
(ALTERNATIVE BID)**

PROJECT NO.:
8235

SEQUENCE No.
15 OF 51

SHEET No.
02X-02

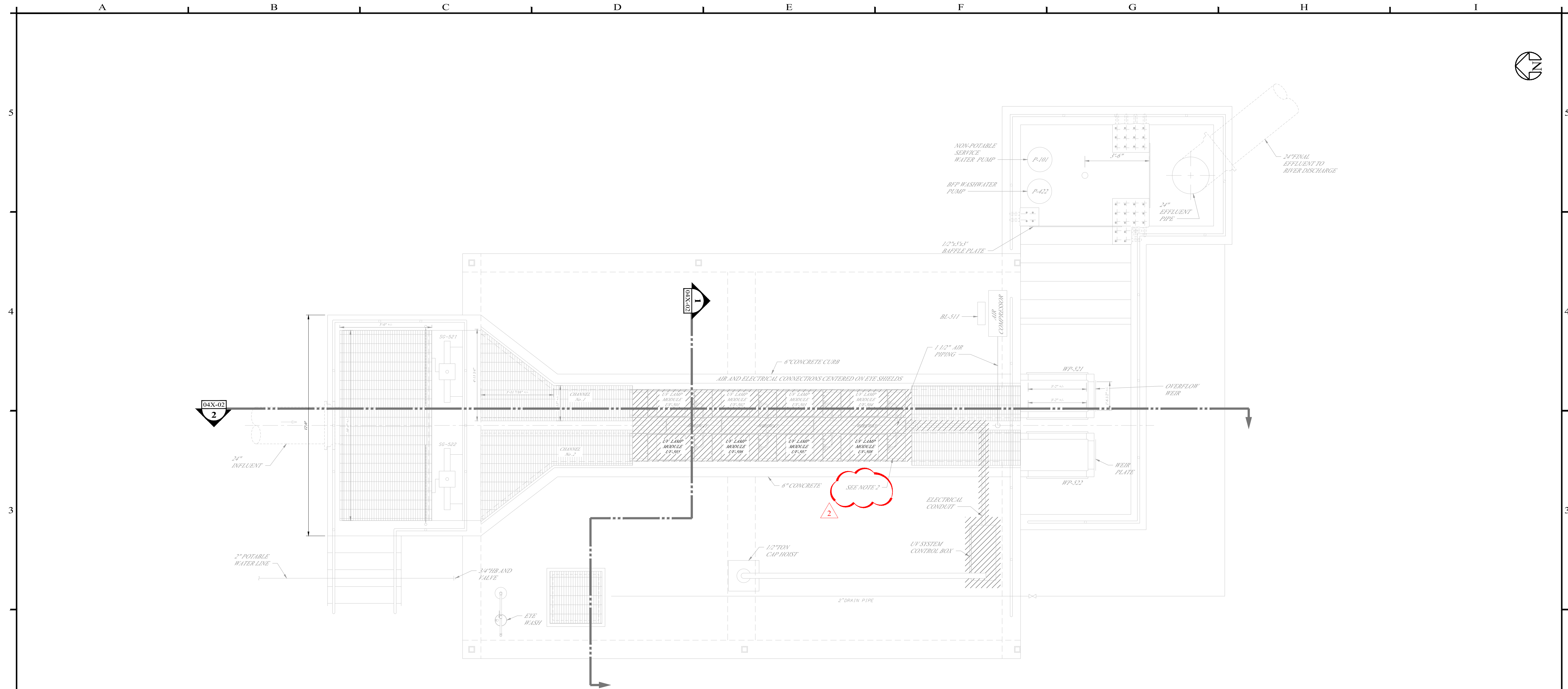


- NOTES**
1. FOR ADDITIONAL NOTES, REFER TO SHEET 00G-06.

NO.		REVISION	DATE	09/01/2026			 Enprotec Hibbs & Todd 402 Cedar Street • Abilene, Texas 79601 • T: (325) 698-5560 • F: (325) 690-3240 • www.e-ht.com PE Firm Registration No. 1151 • PG Firm Registration No. 50103 • RPLS Firm Registration No. 10011900	BAR IS ONE INCH ON ORIGINAL DRAWING  IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	DESIGNED BY	SCALE	ROMA WWTP IMPROVEMENTS ROMA, STARR COUNTY, TEXAS AERATION BASIN MODIFICATION PLAN	PROJECT NO.:					
1	ISSUED FOR BID	08/03/2026	B. THOMPSON	3/32" = 1'-0"	SEQUENCE No.												
2	ADDENDUM #3	09/01/2026	DRAWN BY	DATE	20 OF 51												
			JR SALINAS	08/03/2026	SHEET No.												
			CHECKED BY		03D-01												
			B. THOMPSON														
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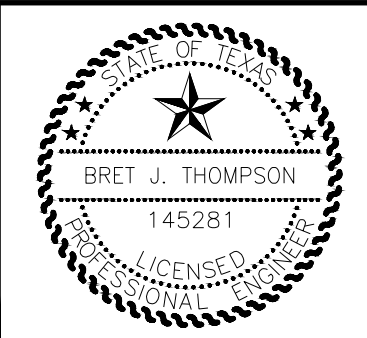
- NOTES:**
- FOR ADDITIONAL NOTES, REFER TO SHEET 00G-06.
 - FACILITY MUST REMAIN IN OPERATION THROUGHOUT CONSTRUCTION.
 - ALL ITEMS ON THIS SHEET ARE EXISTING UNLESS OTHERWISE INDICATED. CONTRACTOR TO FIELD VERIFY ALL EXISTING PIPING, STRUCTURES AND UTILITIES, PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DEVIATIONS.

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NO.	REVISION	DATE
1	ISSUED FOR BID	08/03/2026
2	ADDENDUM No. 3	09/01/2026

09/01/2026

Bret Thompson



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PE Firm Registration No. 1151 • PG Firm Registration No. 50103 • RPLS Firm Registration No. 10011900

BAR IS ONE INCH ON ORIGINAL DRAWING

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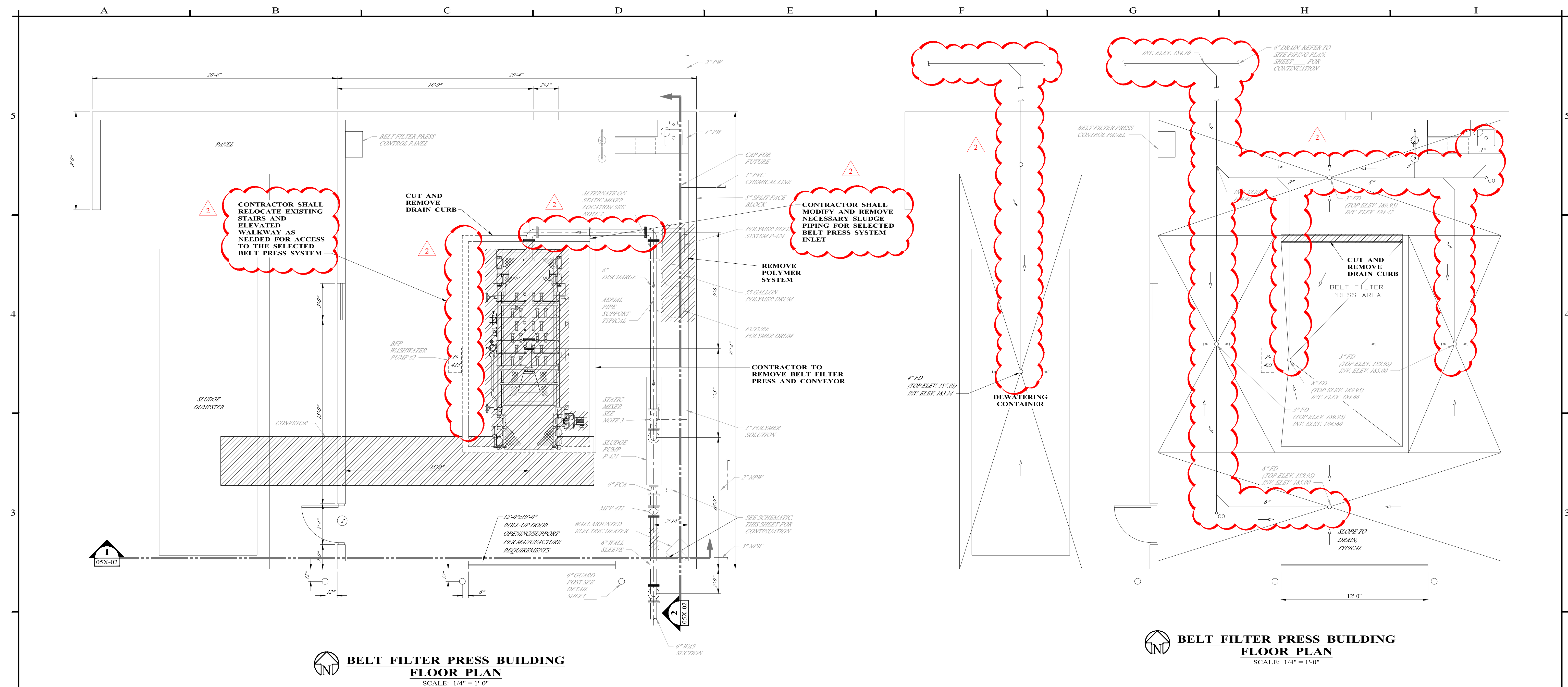
IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.

DESIGNED BY B. THOMPSON	SCALE 3/8" = 1'-0"
DRAWN BY JR SALINAS	DATE 08/03/2026
CHECKED BY B. THOMPSON	

ROMA WWTP IMPROVEMENTS
ROMA, STARR COUNTY, TEXAS

UV SYSTEM DEMOLITION PLAN

PROJECT NO.: 8235
SEQUENCE No. 21 OF 51
SHEET No. 04X-01



BELT FILTER PRESS BUILDING
FLOOR PLAN
 SCALE: 1/4" = 1'-0"

- NOTES**
1. FOR ADDITIONAL NOTES, REFER TO SHEET 00G-06.
 2. ALL ITEMS ON THIS SHEET ARE EXISTING UNLESS OTHERWISE INDICATED. CONTRACTOR TO FIELD VERIFY ALL EXISTING PIPING, STRUCTURES, AND UTILITIES PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY ON ANY DEVIATIONS.
 3. CONTRACTOR TO COORDINATE WITH OWNER TO SALVAGE AND STORE AWAY REMOVED EQUIPMENT INTENDED FOR SALVAGE.
 4. REFER TO 05D-01 SHEETS FOR MODIFICATION REQUIREMENTS.

NO.	REVISION	DATE	09/01/2026   Enprotec Hibbs & Todd 402 Cedar Street • Abilene, Texas 79601 • T: (325) 698-5560 • F: (325) 690-3240 • www.e-ht.com PE Firm Registration No. 1151 • PG Firm Registration No. 50103 • RPLS Firm Registration No. 10011900 BAR IS ONE INCH ON ORIGINAL DRAWING  IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY. DESIGNED BY B. THOMPSON DRAWN BY JR SALINAS CHECKED BY B. THOMPSON SCALE 1/4" = 1'-0" DATE 08/03/2026 ROMA WWTP IMPROVEMENTS ROMA, STARR COUNTY, TEXAS BELT FILTER PRESS DEMOLITION PLANS <td>PROJECT NO.: 8235</td>	PROJECT NO.: 8235
1	ISSUED FOR BID	08/03/2026		SEQUENCE No. 29 OF 51
2	ADDENDUM #3	09/01/2026		SHEET No. 05X-01

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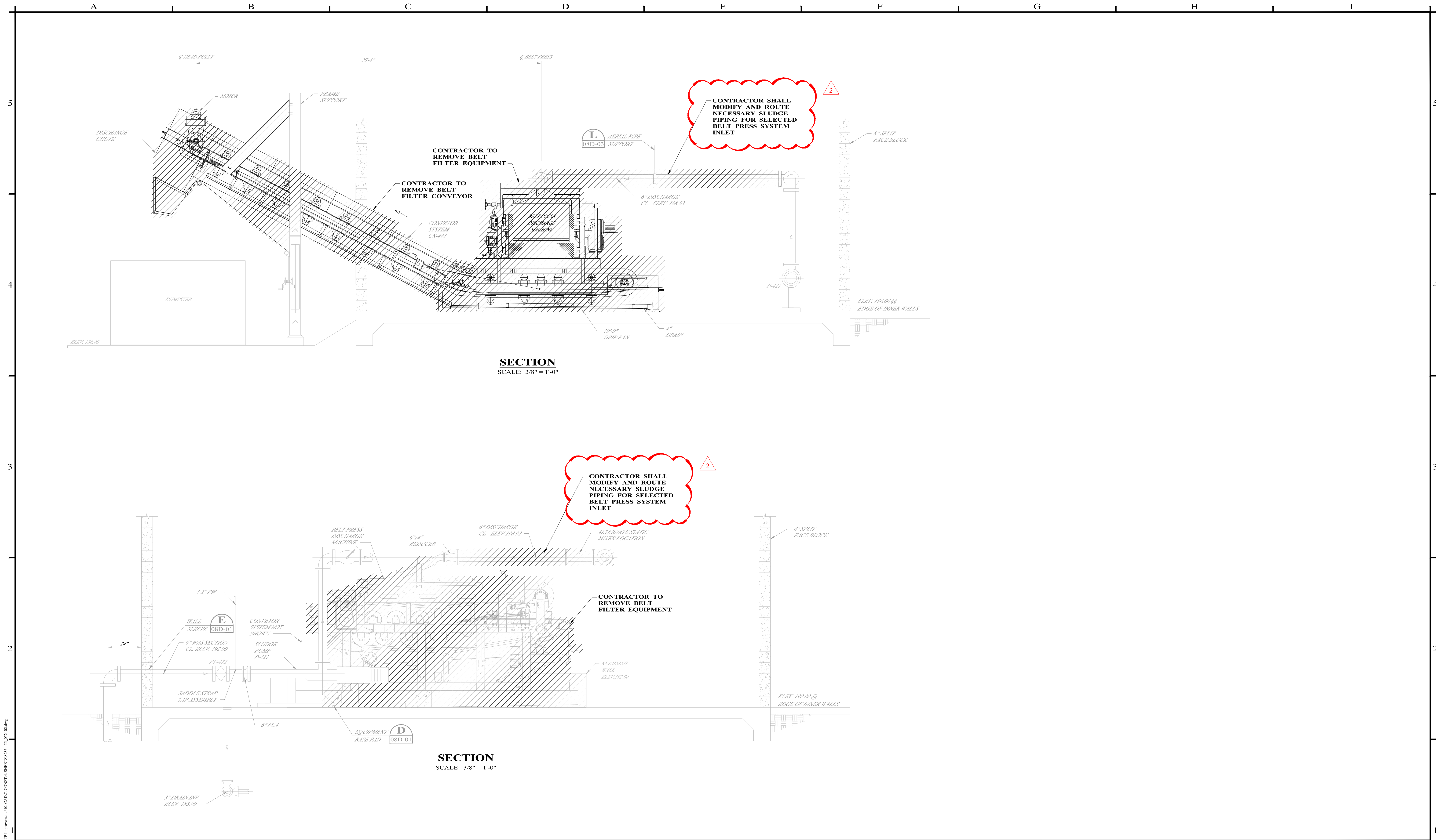
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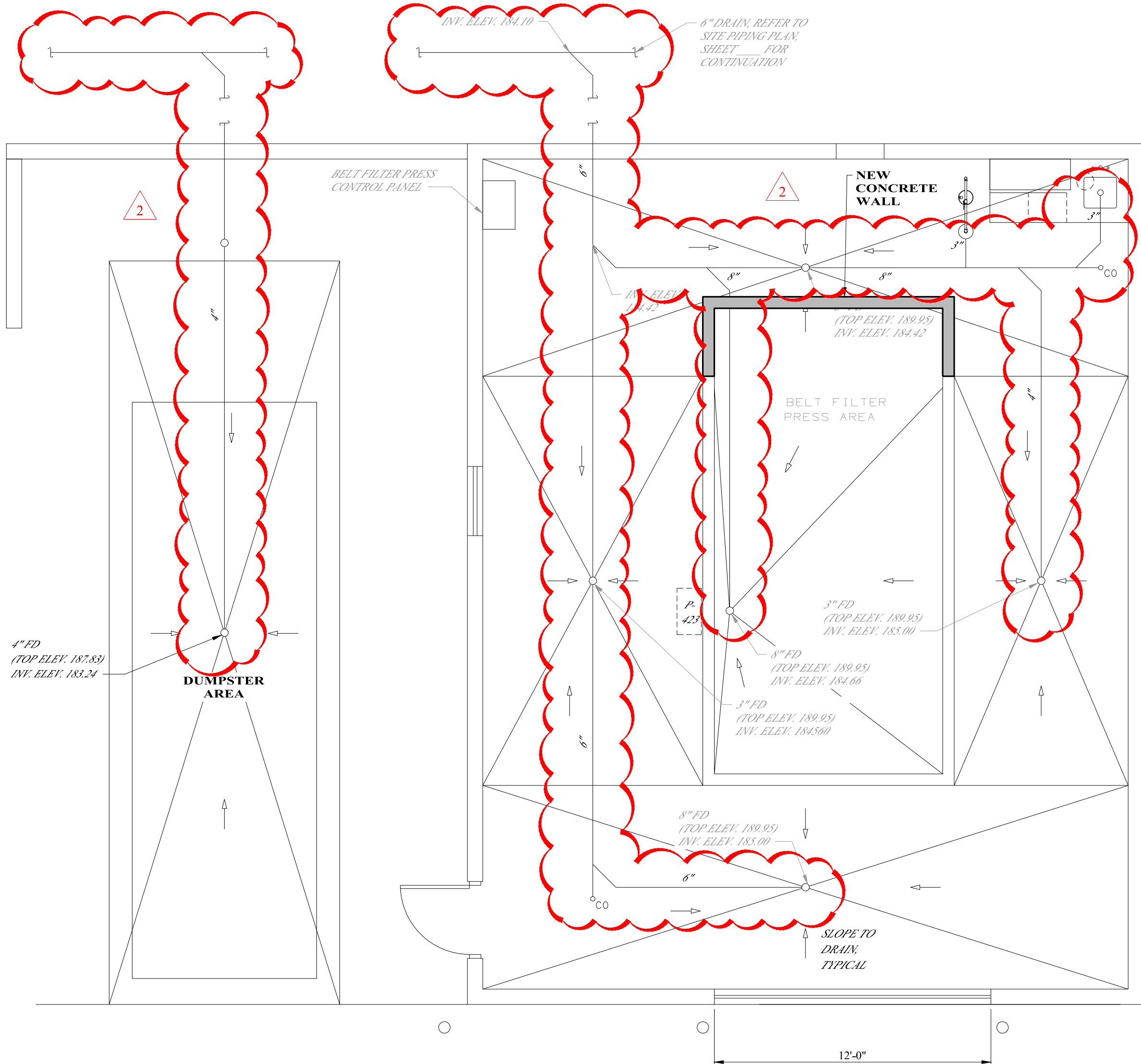
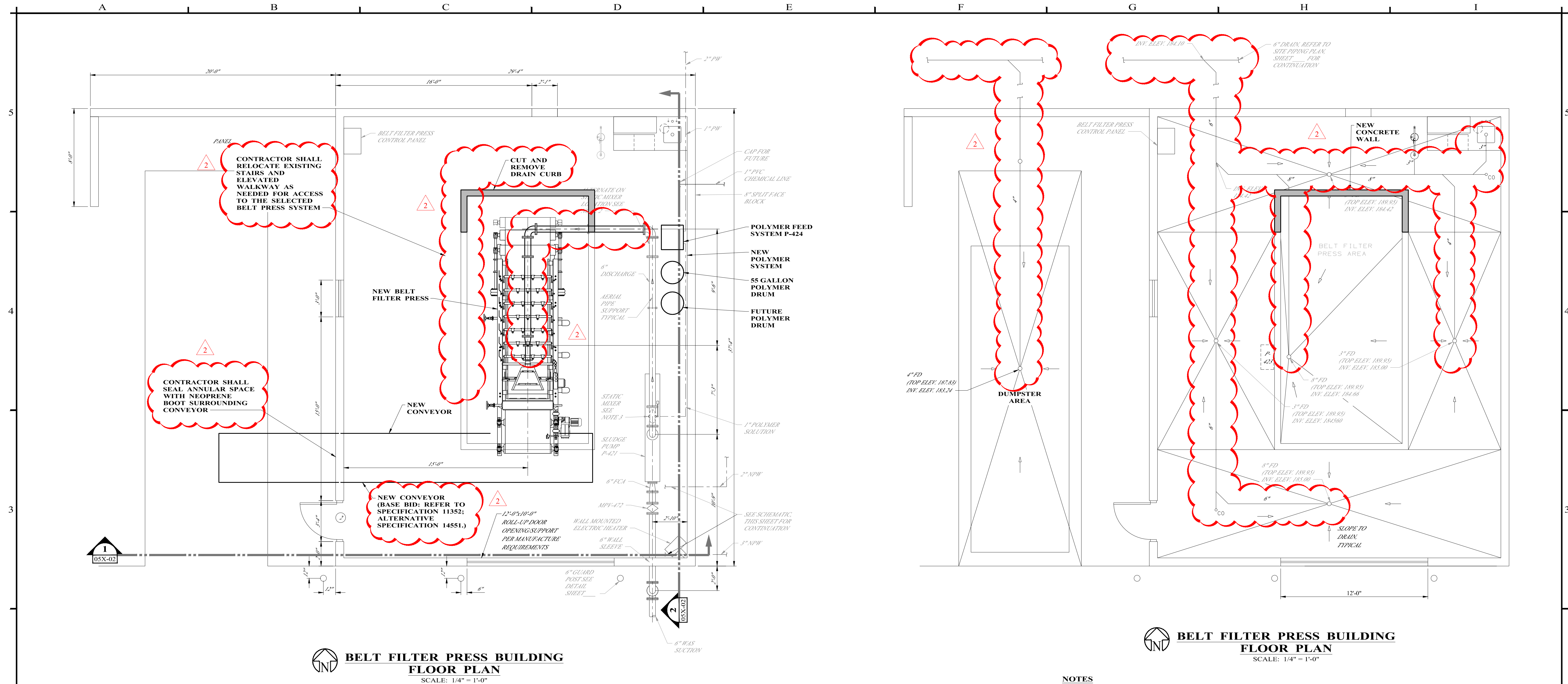
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NO.			REVISION	DATE	09/01/2026		 Enprotec Hibbs & Todd 402 Cedar Street • Abilene, Texas 79601 • T: (325) 698-5560 • F: (325) 690-3240 • www.e-ht.com PE Firm Registration No. 1151 • PG Firm Registration No. 50103 • RPLS Firm Registration No. 10011900	BAR IS ONE INCH ON ORIGINAL DRAWING 01 IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	DESIGNED BY	SCALE	ROMA WWTP IMPROVEMENTS ROMA, STARR COUNTY, TEXAS	PROJECT NO.:
1	ISSUED FOR BID	08/03/2026	B. THOMPSON	3/8" = 1'-0"					SEQUENCE No.			
2	ADDENDUM #3	09/01/2026							30 OF 51			
				DATE					SHEET No.			
				08/03/2026					05X-02			
A			B		C	D	E	F	G	H	I	



- NOTES**
1. FOR ADDITIONAL NOTES, REFER TO SHEET 00G-06.

2. CONTRACTOR TO FIELD VERIFY ANY EXISTING PIPING STRUCTURES, AND UTILITIES IN THE AREA, PRIOR TO CONSTRUCTION. CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY OF ANY DEVIATIONS IN ORDER TO ADDRESS ASAP.

3. VALVES UNDER 1-INCH WILL NOT BE SHOWN FOR CLARITY. REFER TO P&ID SCHEMATICS FOR ADDITIONAL INFORMATION. NOT ALL COMPONENTS PROVIDED BY DEWATERING SYSTEM AND POLYMER SYSTEM MANUFACTURER'S MAY BE SHOWN FOR CLARITY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO REVIEW THE EQUIPMENT P&IDS.

4. PVC PIPING, VALVES, AND FITTINGS 6-INCH AND SMALLER SHALL BE EITHER FLANGED OR SOLVENT WELDED PUSH-ON JOINT. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REQUIRED CHANGES TO THE MECHANICAL LAYOUT PROVIDED.

5. PIPING, VALVES, AND FITTINGS LARGER THAN 6-INCH SHALL BE FLANGED JOINT. CONTRACTOR SHALL BE RESPONSIBLE FOR ANY REQUIRED CHANGES TO THE MECHANICAL LAYOUT PROVIDED.
6. REFER TO SPECIFICATION 11199 FOR ADDITIONAL DETAIL ON DEWATERING PRESS REQUIREMENTS.

7. REFER TO SHEET 07Y-14 FOR THE P&ID FOR THE DEWATERING SYSTEM.

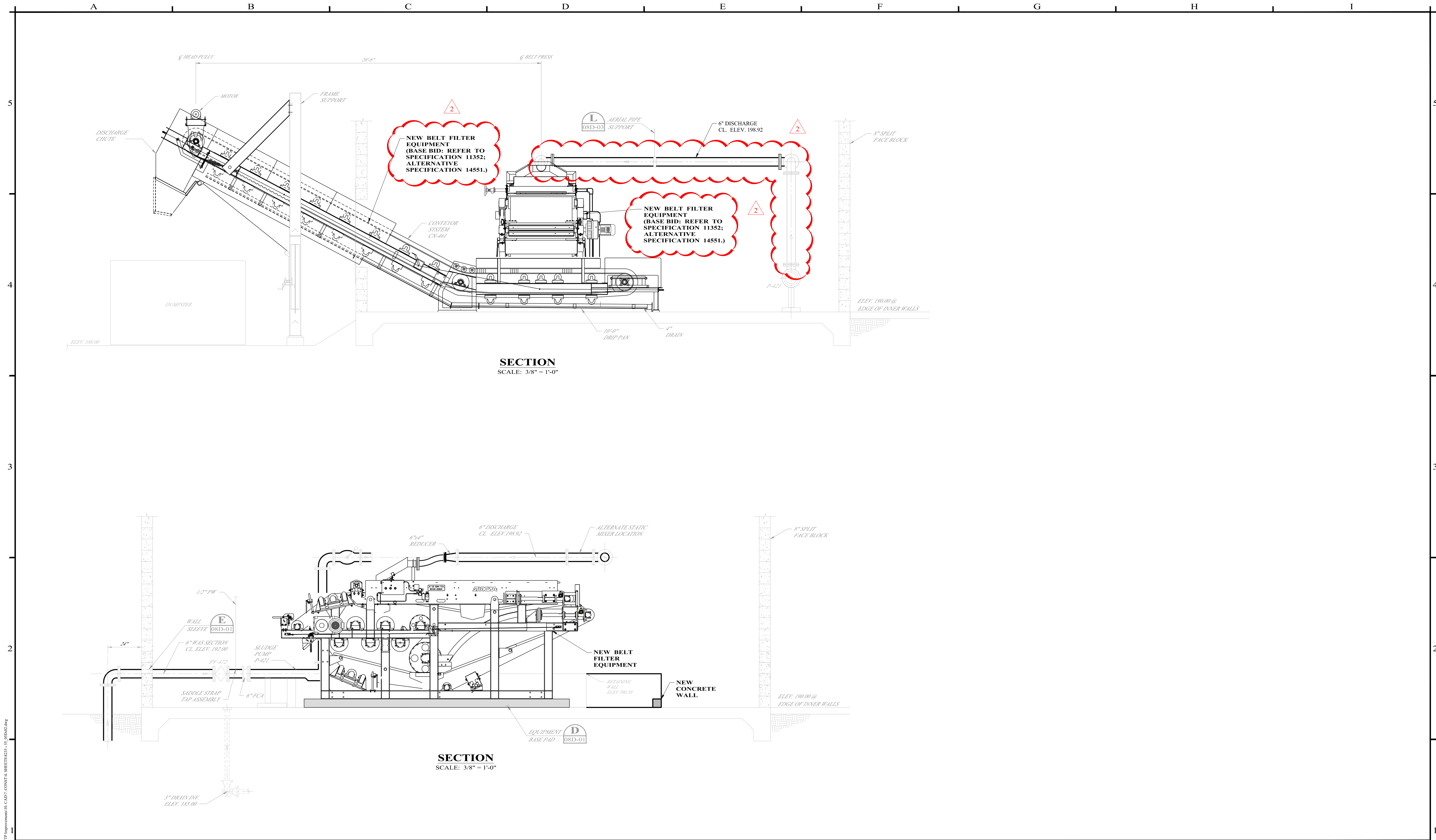
8. VARIOUS DRAIN LINES FOR BELT FILTER PRESS UNIT ARE NOT SHOWN FOR CLARITY. CONTRACTOR TO ROUTE ALL DRAIN LINES ACCORDING TO MANUFACTURER'S P&ID. SUBMIT PROPOSED PLAN TO ENGINEER FOR REVIEW.

9. INLET AND OUTLET PIPING FOR HYDRAULIC UNIT NOT SHOWN. CONTRACTOR TO ROUTE ALL LINES ACCORDING TO MANUFACTURER'S P&ID. SUBMIT PROPOSED PLAN TO ENGINEER FOR REVIEW.

10. ALL NON-POTABLE PLANT WATER CONNECTIONS WITHIN THE DEWATERING BUILDING ARE NOT SHOWN.

11. CONTRACTOR TO ROUTE LINES IN A CLEAN MANNER TO VARIOUS EQUIPMENT. COORDINATE WITH ENGINEER.

<table><tr><td>NO.</td><td>REVISION</td><td>DATE</td></tr><tr><td>1</td><td>ISSUED FOR BID</td><td>08/03/2026</td></tr><tr><td>2</td><td>ADDENDUM #3</td><td>09/01/2026</td></tr></table>			NO.	REVISION	DATE	1	ISSUED FOR BID	08/03/2026	2	ADDENDUM #3	09/01/2026	09/01/2026				402 Cedar Street • Abilene, Texas 79601 • T: (325) 698-5560 • F: (325) 690-3240 • www.e-ht.com PE Firm Registration No. 1151 • PG Firm Registration No. 50103 • RPLS Firm Registration No. 10011900	BAR IS ONE INCH ON ORIGINAL DRAWING. IF NOT ONE INCH ON THIS SHEET, ADJUST SCALES ACCORDINGLY.	DESIGNED BY B. THOMPSON	SCALE 1/4" = 1'-0"	ROMA WWTP IMPROVEMENTS ROMA, STARR COUNTY, TEXAS	PROJECT NO.: 8235
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							DRAWN BY JR SALINAS	DATE 08/03/2026	BELT FILTER PRESS MODIFICATION PLANS	SEQUENCE No. 31 OF 51											
								CHECKED BY B. THOMPSON			SHEET No. 05D-01										

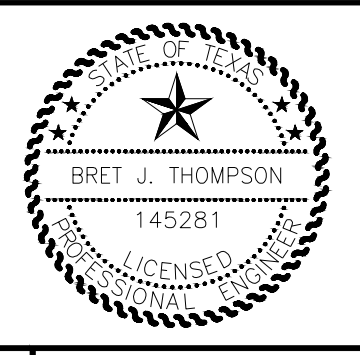


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DESIGNED BY
B. THOMPSON

DRAWN BY
JR SALINAS

CHECKED BY
B. THOMPSON

SCALE
3/8" = 1'-0"

DATE
08/03/2026

ROMA WWTP IMPROVEMENTS
ROMA, STARR COUNTY, TEXAS

BELT FILTER PRESS MODIFICATION
SECTIONS AND DETAILS

PROJECT NO.:
8235

SEQUENCE No.
32 OF 51

SHEET No.
05D-02