Jones & Henry
ENGINEERS, LTD.

INVITATION FOR BID NO. 836-8207.001
Paw Paw Lake Area Wastewater Treatment Plant
West Clarifier Improvements

ADDENDUM 002

June 19, 2025

Planholders on the Paw Paw Lake Area Wastewater Treatment Plant, West Clarifier Improvements Project are hereby notified of the following amendments to the Contract Documents. This Addendum is hereby made a part of the Contract Documents.

REFERENCE NOTES

- Any scrap metal produced on-site through the removal of various metal components is to be stored on-site at a location to be chosen by the Owner. The Contractor is to coordinate with the Owner and Engineer which scrap metal shall remain on-site. Scrap metal the Owner rejects shall be disposed of by the Contractor.
- Proposed alternates by the Contractor for materials, equipment, etc. shall be reviewed by the Engineer according to 7.04 of the General Conditions for review of equal items.
- Questions received as of June 18, 2025:

Q: Is the Clarifier Walkway going back in where it is now (aligned with the Channel) or will it be relocated clockwise towards the brick building?
A: The clarifier walkway is to maintain its current configuration.

Q: On Sheet E-2, the Typical Clarifier Schematic shows outputs ”To PLC”. Will these be installed?
A: This will not be installed. Please see addendum #2 for the removal of these outputs to PLC.

Q: Is the Heat Tape fed from the Clarifier Control Panel or the MPZ?
A: Heat trace will be fed from the clarifier control panel.

Q: Spec 16005-11, 3.07 C states: “C. Under pavement crossings shall have a 6-inches minimum concrete cover all around, be reinforced as detailed, and extend 5-feet either side of the pavement.” Is this going to be required where we pass under the asphalt and concrete? If not, can we bore under or do we need to open cut and patch?
A: Yes, concrete encasement is required under asphalt or concrete crossings, regardless of construction method. Concrete duct bank will not be required under sidewalk. Boring is an acceptable installation method.

Q: The Bid Package Form C-410-3 does not include the West Flow Channel. Should we include our quote for the flow channel in with the West Clarifier?
A: Work performed for the western flow channel should be included in item #7: “Lining of Western Channel”, which has been added in addendum #2.

4791 Campus Drive, Kalamazoo, Michigan 49008 - 269.353.9650

Q: Just for clarification, the flow channel and east and west manholes are to be lined with OBIC and the clarifier tank per 09880 is to be lined with Bitumastic or Tnemec 46-465 H.B. Tnemecol? Or is the clarifier tank to be lined with OBIC as well?
A: The clarifier is to be lined as shown in the drawings, which reference specification #09880. The flow channel and manholes are to be lined per specification #09960.

Q: Will steel beams marked for coating that are already on site be shipped to a shop for coating or coated on site?
A: The manufacturer can either coat the reused steel on-site or in their shop. Shipping and coating are to be included in the Contractor's bid under item #2: "West Primary Clarifier Improvements".

Q: Please clarify the intent of the note "Prep Western Split Channel for lining" on drawing R-1.1. Can we assume that the plant will clean this out and the prep is simply for the lining application?
A: Yes. The Owner will clear the channel and ensure it is not in use prior to lining. It is the Contractor's responsibility to ensure the channel is properly prepped prior to lining.

SPECIFICATIONS

Replace the following specifications with the attached:

- C-410 - Bid Form for Construction Contracts
  - Updates work items.
- 09880 – Protective Coating for Concrete
  - Updates approved coatings and coating system requirements.
- 15211 – Small Piping and Valves
  - Updates manhole valve schedule.

Plan holders should update the Table of Contents to reflect the above sections.

An updated Table of Contents will be included in the Issued for Construction Project Manual.

DRAWINGS

Replace the following drawing sheets with the attached:

- Sheet E-2
  - Removes PLC set-up.

An updated Drawing Index will be included in the Issued for Construction Project Manual.

RECEIPT OF THIS ADDENDUM MUST BE ACKNOWLEDGED ON PAGE 8 OF 33 OF THE INVITATION FOR BIDS AND INCLUDED WITH THE CONTRACTOR'S BID.

BID FORM

PAW PAW LAKE AREA WWTP
WEST PRIMARY CLARIFIER IMPROVEMENTS

ARTICLE 1 – BID RECIPIENT

1.01 This Bid is submitted to:

Paw Paw Lake Area Joint Board
Coloma, MI

1.02 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 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.

ARTICLE 2 – BIDDER'S ACKNOWLEDGEMENTS

2.01 Bidder accepts all of the terms and conditions of the Instructions to Bidders, including without limitation those dealing with the disposition of Bid security. This Bid will remain subject to acceptance for 60 days after the Bid opening, or for such longer period of time that Bidder may agree to in writing upon request of Owner.

ARTICLE 3 – BIDDER'S REPRESENTATIONS

3.01 In submitting this Bid, Bidder represents that:

A. Bidder has examined and carefully studied the Bidding Documents, and any data and reference items identified in the Bidding Documents, and hereby acknowledges receipt of the following Addenda:

Addendum No.	Addendum, Date
_____	_____
_____	_____
_____	_____
_____	_____

B. Bidder has visited the Site, conducted a thorough, alert visual examination of the Site and adjacent areas, and become familiar with and satisfied itself as to the general, local, and Site conditions that may affect cost, progress, and performance of the Work.

C. Bidder is familiar with and has satisfied itself as to all Laws and Regulations that may affect cost, progress, and performance of the Work.

D. Bidder has carefully studied all: (1) reports of explorations and tests of subsurface conditions at or adjacent to the Site and all drawings of physical conditions relating to existing surface or subsurface structures at the Site that have been identified in the Supplementary

Conditions, especially with respect to Technical Data in such reports and drawings. No reports or drawings relating to Hazardous Environmental Conditions, at or adjacent to the Site, are known to exist.

E. Bidder has considered the information known to Bidder itself; information commonly known to contractors doing business in the locality of the Site; information and observations obtained from visits to the Site; the Bidding Documents; and any Site-related reports and drawings identified in the Bidding Documents, with respect to the effect of such information, observations, and documents on (1) the cost, progress, and performance of the Work; (2) the means, methods, techniques, sequences, and procedures of construction to be employed by Bidder; and (3) Bidder's safety precautions and programs.

F. Bidder agrees, based on the information and observations referred to in the preceding paragraph, that no further examinations, investigations, explorations, tests, studies, or data are necessary for the determination of this Bid for performance of the Work at the price bid and within the times required, and in accordance with the other terms and conditions of the Bidding Documents.

G. Bidder is aware of the general nature of work to be performed by Owner and others at the Site that relates to the Work as indicated in the Bidding Documents.

H. Bidder has given Engineer written notice of all conflicts, errors, ambiguities, or discrepancies that Bidder has discovered in the Bidding Documents and confirms that the written resolution thereof by Engineer is acceptable to Bidder.

I. The Bidding Documents are generally sufficient to indicate and convey understanding of all terms and conditions for the performance and furnishing of the Work.

J. The submission of this Bid constitutes an incontrovertible representation by Bidder that Bidder has complied with every requirement of this Article, and that without exception the Bid and all prices in the Bid are premised upon performing and furnishing the Work required by the Bidding Documents.

ARTICLE 4 – BIDDER'S CERTIFICATION

4.01 Bidder certifies that:

A. 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 collusive agreement or rules of any group, association, organization, or corporation;

B. Bidder has not directly or indirectly induced or solicited any other Bidder to submit a false or sham Bid;

C. Bidder has not solicited or induced any individual or entity to refrain from bidding; and

D. Bidder has not engaged in corrupt, fraudulent, collusive, or coercive practices in competing for the Contract. For the purposes of this Paragraph 4.01.D:

1. "corrupt practice" means the offering, giving, receiving, or soliciting of any thing of value likely to influence the action of a public official in the bidding process;

2. "fraudulent practice" means an intentional misrepresentation of facts made (a) to influence the bidding process to the detriment of Owner, (b) to establish bid prices at artificial non-competitive levels, or (c) to deprive Owner of the benefits of free and open competition;
3. "collusive practice" means a scheme or arrangement between two or more Bidders, with or without the knowledge of Owner, a purpose of which is to establish bid prices at artificial, non-competitive levels; and
4. "coercive practice" means harming or threatening to harm, directly or indirectly, persons or their property to influence their participation in the bidding process or affect the e execution of the Contract.

ARTICLE 5 – BASIS OF BID

5.01 Bidder will complete the Work in accordance with the Contract Documents for the following price(s):

BASE BID UNIT PRICES

ITEM	DESCRIPTION	ESTIMATED QUANTITY	UNITS	BID AMOUNT
1	General Conditions/Mobilization	1	LSUM	
2	West Primary Clarifier Improvements	1	LSUM	
3	East Flow Balancing Manhole Improvements	1	LSUM	
4	West Flow Balancing Manhole Improvements	1	LSUM	
5	Lining of Western Primary Clarifier	1	LSUM	
6	Lining of Flow Balancing Manholes	1	LSUM	
7	Lining of Western Channel	1	LSUM	

(Addendum 002, Issued on 06-19-2025)

Grand Total of Work Items 1-7 Based on 'A' Equipment Items $_____

5.02 **MAJOR EQUIPMENT ITEMS.** In connection with the items of Major Equipment to be furnished and installed under the Agreement and Contract Documents, the Bidder expressly agrees to the following provisions:

A. The base bid lump sum or total base bid price stated hereinbefore includes the furnishing and installation of all items of Major Equipment of the manufacturers or suppliers listed in the following tabulation. The items listed with a letter "A" shall be the equipment included in the Contractor's base bid cost. Any other equipment shall require Owner's approval;

B. The Owner may select items of any manufacturer or supplier as listed in the following tabulation, that the undersigned Bidder agrees to furnish and install such items as selected and for a contract price equal to the base bid lump sum or total base bid price stated above, adjusted by the difference between the sum of the installed prices for the items selected by the Owner as stated in the following tabulation;

C. The installed price stated in the following tabulation on **all** sub-items includes the preparation and submission to the Engineer by the Bidder of detailed Drawings showing all modifications, if any, of the Drawings necessary to accommodate the Major Equipment;

D. The installed cost stated in the following tabulation on **all** sub-items includes a complete operating installation, including the furnishing and installation of any and all changes or additions in structures, piping, buildings, mechanical and electrical work, accessories and controls necessary to accommodate the Major Equipment; and

E. All items offered in the following tabulation, if any, fully comply with the Specifications.

F. The Owner may weigh all factors in determining low bid, using the Tabulation of Major Equipment, and assessing the base bids and alternate manufacturers and lead times to determine which combination of options is in the best interest of the Owner.

TABULATION OF MAJOR EQUIPMENT ITEMS

Section No.	Equipment Item No.	Description	Manufacturer or Supplier	Installed Price
11824	1	West Primary Clarifier Mechanism	(A) Clearstream (B) _____	$ _____ $ _____
15211	2	Flow Balancing Manhole Valves	(A) Beck (B) Rotork (C) _____	$ _____ $ _____
15211	3	Flow Balancing Manhole Actuators	(A) Beck (B) Rotork (C) _____	$ _____ $ _____

ARTICLE 6 – TIME OF COMPLETION

6.01 Bidder agrees that the Work will be substantially complete **within 365 days** from Notice to Proceed , and will be completed and ready for final payment in accordance with Paragraph 15.06 of the General Conditions **within 420 days** from Notice to Proceed.

6.02 Bidder accepts the provisions of the Agreement as to liquidated damages.

ARTICLE 7 – ATTACHMENTS TO THIS BID

7.01 The following documents are submitted with and made a condition of this Bid:

A. Required Bid security;

B. Evidence of authority to do business in the State of the Project.

ARTICLE 8 – DEFINED TERMS

8.01 The terms used in this Bid with initial capital letters have the meanings stated in the Instructions to Bidders, the General Conditions, and the Supplementary Conditions.

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ARTICLE 9 – BID SUBMITTAL

BIDDER: *[Indicate correct name of bidding entity]*

_____

By:
[Signature] _____

[Printed name] _____
(If Bidder is a corporation, a limited liability company, a partnership, or a joint venture, attach evidence of authority to sign.)

Attest:
[Signature] _____

[Printed name] _____

Title: _____

Submittal Date: _____

Address for giving notices:

_____

_____

_____

Telephone Number: _____

Fax Number: _____

Contact Name and e-mail address: _____

_____

Bidder's License No.: _____
(where applicable)

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SECTION 09880
PROTECTIVE COATING FOR CONCRETE

PART 1 GENERAL

1.01 SCOPE

A. This Section includes protective coating for concrete.

B. Additional product requirements are specified in Section 01350.

1.02 SUBMITTALS

A. Submittals shall be in accordance with the requirements of Section 01300 and shall include:

1. Shop Drawings for Review:

a. Contractor shall indicate variances from requirements of Contract Documents.

b. Product literature.

2. Information for the Record:

a. Material certification.

b. Manufacturer's surface preparation, mixing, application, and curing instructions.

1.03 DELIVERY, STORAGE AND HANDLING

A. Materials shall be stored in enclosed, dry space protected from weather and out of direct sunlight. Temperature of storage area shall be maintained between 40 degrees F and 90 degrees F.

1.04 PROJECT CONDITIONS

A. Surfaces to receive coating shall have temperature between 50 degrees F and 90 degrees F. Coating shall not be applied when surface temperature is less than 5 degrees F above dew point.

1.05 SCHEDULING AND SEQUENCING

A. Surfaces shall be allowed to cure minimum of 28 days prior to application of coating.

PART 2 PRODUCTS

2.01 COATING SYSTEM

A. Coating shall be polyurea or epoxy. Sherwin Williams “Dura-Plate 6000”, Sherwin-Williams “Hi-Mil Sher-Tar Epoxy”, or equal. **(Addendum 002, Issued on 06-19-2025)**

PART 3 EXECUTION

3.01 SURFACE PREPARATION

A. Surfaces to receive membrane shall be dry and free of oil, form release agents, curing compounds, grease, laitance, and loose material. Protrusions shall be removed.

B. Surfaces shall be abrasive blasted in accordance with ASTM D4259. Surface texture shall be equivalent to medium grit sand paper.

C. Bugholes and surface defects shall be patched.

D. Contractor shall verify dryness of concrete by plastic sheet method in accordance with D4263.

3.02 APPLICATION

A. Coating shall be applied in accordance with manufacturer’s written instructions.

B. Coating shall be applied in two coats. Dry film thickness of each coat shall be 13-16 mils.

C. Each coat shall be cured in accordance with manufacturer’s recommendations. Final coat shall be cured minimum of 14 days prior to immersion.

PART 4 SPECIAL PROVISIONS

END OF SECTION

SECTION 15211
SMALL PIPING AND VALVES

PART 1 GENERAL

1.01 SCOPE

A. This Section includes furnishing and installing all pipelines and valves less than 4-inch in diameter as shown on the Drawings or as required for a complete piping system for each service or combination of services except the piping and valves included in Section 15400 and Section 15500.

B. Each piping system shall be adequate to conduct and control the flow of process water, plant water, non-potable water, instrument air, compressed air, vacuum, natural gas, sewage gas, propane, fuel oil, chemicals, sewage, sludge, sampling or other uses as specified or shown on the Drawings.

C. This Section includes, but is not limited to:

1. Securing and bearing the cost of all permits, certificates, and inspection as required by local regulations and state codes.
2. All pipe, fittings, and connections for water supply to equipment and waste to drains.
3. Valves less than 4-inch in diameter, control devices, pipe hangers, anchors, supports, and sleeves for the piping systems covered under this Section.
4. Hose bibbs, sill cocks, and hydrants.
5. Non-potable water supply, drain lines, and connections to boilers, pump priming systems, pump gland seals, valve operating cylinders, or other equipment requiring these services.
6. Compressed air piping, valves, connections to valve operators, and other equipment requiring compressed air.
7. Compressed air, non-potable water, natural gas, propane, vacuum, deionized water, and other services as required for laboratory service.

D. The Contractor shall remove all existing pipelines and valves less than 4-inch in diameter that are indicated on the Drawings to be removed except piping and valves included in Section 15400 and Section 15500. Removals shall be done in accordance with the requirements of Section 02110.

E. The Contractor shall relocate existing piping and valves less than 4-inch in diameter, except piping and valves included in Section 15400 and Section 15500, which interfere with Work under this Section or any Section of the Specifications.

F. The Contractor shall furnish, install, and remove all temporary piping and valves that are required to maintain processes in operation during construction.

G. All wall, floor, and roof penetration and any building modifications which are required for the installation of the Work under this Section shall be included in this Section.

H. Instruments which are to be located in pipelines to be furnished under Division 16 shall be installed under this Section.

1.02 SUBMITTALS

A. Submittals shall be in accordance with the requirements of Section 01300 and shall include:

1. Shop Drawings for Review:

a. Drawings shall include plan dimensions to and elevations of sleeves, inserts, and anchors, the size and location of each run of pipe, and the location of valves and unions.

b. Manufacturer's literature, catalog data, specifications, and illustrations shall be bound in a brochure which includes a complete bill of materials.

2. Information for the Record:

a. Operation and maintenance manual.

PART 2 PRODUCTS

2.01 PIPING MATERIALS

A. Copper Pipe and Tubing shall be manufactured in accordance with ASTM B88. Type L hard temper shall be used above ground and inside of structures for compressed air, hot and cold potable water, plant water, vacuum, and other services unless another type of pipe is specifically called for. Type K soft temper shall be used where underground piping is installed. Fittings and unions shall be solder joint fittings of cast bronze manufactured in accordance with ASTM B62 and with ends complying to ANSI B16.18 or wrought copper manufactured in accordance with ASTM B75 and with ends complying to ANSI B16.22. Unions shall be cast bronze and shall be installed adjacent to valves and equipment and as required to assemble the piping but not less than one union shall be included in each run. Threaded adapters shall be installed on each side of valves in copper lines. Where joints are made between pipes of different materials, dielectric couplings shall be installed. Pipe nipples shall be standard weight seamless red brass pipe ASTM B43. Solder joints shall be made in conformance with ASTM B828 Flux conforming to ASTM B813 shall be applied. Materials used for solder joints in all potable water services shall contain less than 0.2% lead and comply with ASTM B32.

B. Steel Pipe, unless otherwise noted, shall be used for all aboveground natural gas, digester gas aboveground only, aboveground fuel oil, and scum. Pipe shall be ASTM A53

Schedule 40, unless otherwise noted or where code requirements differ, with standard weld or malleable iron fittings. Unions shall comply with ANSI B16.3.

1. Steel piping installed above ground, unless otherwise noted, shall be Schedule 40 pipe with standard malleable iron screwed fittings. Unions shall be 250 pound screwed malleable iron with iron to iron seats. On pipes 2-inch and larger, ASTM A105 companion flanges shall be used in lieu of unions. For natural gas through 2-inch, fittings shall be 3,000-pound forged steel socket weld. For natural gas, digester gas, and fuel oil, pipe 2-1/2-inch and larger, ASTM A234 weld fittings and ASTM A105 flanges shall be used.

2. Steel piping installed underground, unless otherwise noted, shall be Schedule 40 plastic coated at the factory with Scotchkote 212 by 3M or equal. Pipe fittings through 1-1/2-inch shall be 3000-pound forged steel socket weld, and 2-inch and larger shall be ASTM A234 weld fittings. Joints shall be welded, primed, and wrapped double the manufacturer's recommended thickness with Tapecoat TC Primer and Tapecoat CT, or equal.

3. Where couplings are called for on gas piping, they shall be Dresser Style 38, or equal. The couplings shall be specifically designed for digester or natural gas, middle ring width shall be 5-inch long.

C. PVC Pipe and fittings shall be composed of Class 12454-B rigid PVC compound in conformance with ASTM D1784 (formerly classified Type I, Grade 1). Pipe shall be Schedule 80 with a design stress of 2000 psi in conformance with ASTM D1785. All joints, unless otherwise shown on the Drawings, shall be solvent welded in conformance with ASTM D2855. Joint solvent shall be as recommended by the pipe manufacturer and shall comply with ASTM D2564. In pressure or vacuum lines and in gravity drains 1-inch diameter and less, the fittings shall be Schedule 80 and shall conform to ASTM D2467. For gravity drains greater than 1-inch diameter, the fittings shall conform to the requirements of ASTM D2665. PVC pipe shall be used for acid-resistant services and all lines carrying chlorine solution, sodium hypochlorite, De-ionized (DI) water and other chemicals unless otherwise shown on the Drawings or specified.

2.02 VALVES

A. Unless otherwise specified or shown on drawings, valves installed in pipelines 3-1/2-inch diameter and smaller for process water lines shall be gate valves; for compressed air and vacuum, globe valves; for natural and sewage gas lines, lubricated plug or eccentric nonlubricated plug valves; and for gas lines less than 2-inch diameter tapered nonlubricated plug cocks; for fuel oil, ball valves; for sludge, eccentric nonlubricated plug valves. Valves for other types of services when required will be specified under that Section.

B. Gate Valves shall be 150-pound, all bronze, rising stem, solid wedge disc furnished with screwed or flanged ends as required. Gate valves shall be Crane No. 431, Jenkins No. 47-U, Powell No. 514/515, or equal.

C. Globe Valves shall be 150-pound, all bronze body with renewable plug-type disc of 500 Brinell Hardness Stainless Steel. The seat ring shall be screwed-in and of the same material as the disc. Globe valves shall be Powell No. 2600, Crane No. 14-1/2P, Jenkins No. 2032, or equal.

D. Ball Valves through 2-inch shall be screwed end bronze, two-piece, 125 psi, Teflon seats, bronze trim, and blowout-proof stem, Nibco No. T-580-BR-Y-20, or equal.

E. Butterfly Valves shall be AWWA, Class 150 B, wafer body equipped for ANSI 125-pound flanges. Butterfly valves shall provide bubble-tight shutoff to 150 psig cold water pressure. The valve body shall be made from ASTM A126, Grade B cast iron or equal. The valve disc shall be made with nickel-coated cast iron, bronze, or equal. Valve shall have bronze shaft bearings, O-ring shaft seals, and EPDM valve body seat Keystone Figure 239, or equal. Valves shall be hand lever actuated.

F. Check Valves shall be 200-pound, all bronze body with bronze disc, Y-pattern, with flanged or screwed ends as required. The check valves shall be Crane No. 36, Powell 560-Y/561-Y, Jenkins 762-A, or equal. Non-slam check valves shall be used on all pipelines operating at 25 psig or higher pressure and shall be Valve and Primer Corporation, Series 300 or equal.

2.03 PVC VALVES

A. PVC Ball Valves shall be used in all PVC lines under this Section. Ball valves shall be PVC body, Hayward TBH Series True Union; or equal.

B. PVC Butterfly Valves:

1. Butterfly Valves shall be made of Class 23447-B rigid PVC compound in conformance with ASTM D1/84 (formerly classified Type IV, Grade 1).
2. Shaft shall be 316 stainless steel. Seats and secondary seals shall be Viton.
3. Bearings shall be glass filled Teflon. Butterfly valves shall have a pressure rating of 150 psi at 70 degrees F.
4. Valve bodies shall be the wafer type compatible with 150-pound ANSI flanges.
5. Valves which are scheduled to be motor operated shall be furnished with mounting saddle. Manually operated valves shall be furnished with lever operators.

C. Check Valves:

1. Check Valves shall be made of Class 12454-B rigid PVC compound in conformance with ASTM D1784 (formerly classified Type I, Grade 1).
2. All check valves shall have Viton seals.
3. Check valves 4-inch size and smaller shall be true union ball checks.

D. PVC Pressure Relief Valves shall be Wallace & Tiernan No. U-23655, Fischer & Porter, or equal, with 1-inch female NPT BPV connections. These shall not be used on chlorination systems.

2.04 RESERVED

2.05 RESERVED

2.06 RESERVED

2.07 RESERVED

2.08 ELECTRIC VALVE OPERATORS (OPEN-CLOSE)

A. Electric operators shall be sized and geared to meet the torques required at a valve opening and closing speed of 2 to 8 seconds per 90-degree rotation. The operator shall be rated for 25% duty cycle at maximum rate output.

B. Operators shall be powered by 115 v, single phase, 60 Hz current and shall operate in any mounting attitude.

C. Operators shall have thermal overload protection, reversing magnetic starter, and a explosion proof NEMA 7 enclosure for all electrical components. The starter shall be capable of receiving contact closures from remote sources to actuate the operator in either direction. The operating motor shall be provided with surge suppression to limit voltage transients. The surge suppression device shall be equal to Electrocube Part No. RC1782, sized as required to suit the motor characteristics.

D. Adjustable limit switches shall be provided. Two limit switches shall be used for de-energizing operator once the fully open position or fully closed position of the valve is reached. Two limit switches shall be used for remote indication of end positions. Limit switches shall be single pole double throw snap acting totally enclosed and rated at 250 VAC.

E. Each operator shall be equipped with a manual override feature with manual lockout switch to prevent electrical operation when in the manual mode. Upon completion of manual operation, the operator will automatically return to the electrical mode.

F. Each operator shall be supplied with local indicator for visual valve position and an electro-mechanical brake to minimize overrun.

G. Electric motor valve operators that are to be supplied with butterfly valves shall be sized for 1-1/2 times the valves rated torque or a minimum of 400-inch-pound, whichever is greater.

H. The operators shall be a product of Beck kit 12-9577-29, Rotork SI3 SI4, or engineer preferred equal **(Addendum 001, Issued on 06-09-2025).** Operators shall have easily identifiable terminal blocks for all external power and control connections.

2.09 RESERVED

2.10 RESERVED

2.11 RESERVED

2.12 RESERVED

2.13 RESERVED

2.14 RESERVED

PART 3 EXECUTION

3.01 INSTALLATION

A. Cutting of all pipe shall be done with sharp tools. The ends of each pipe shall be reamed until all burrs or fins are removed. Full tapered threads shall be used throughout and threaded joints shall turn up perfectly tight without the use of filling substances. A standard pipe joint paste or tape suitable to use of pipe shall be used on the male threads only, and none shall be allowed to accumulate on the inside of the pipes. All connections between pipe, pipe hangers, and equipment shall be made with an approved dielectric insulating material. Dielectric unions or insulated couplings shall be installed between any dissimilar metallic piping materials or at connections between dissimilar metallic pipes and equipment, tanks, etc.

B. Pipe joints shall conform to respective industry standards.

C. Expansion and contraction of the piping system shall be provided for by the use of swing joints, right angle loops, or approved expansion joints. Branch connections shall have three elbow spring pieces to allow for movement. Unless specified in Part 4, the piping system shall provide for the expansion as required in Section 15010. An expansion joint is also required at all building isolation or expansion joints.

D. Interior and exterior pipelines shall be installed and graded in accordance with State and/or Local Codes. Interior pipes shall run at right angles or parallel to building walls, placed as close as practicable to the ceiling and/or walls, and supported according to Section 15010. Drain valves shall be installed at all low points.

E. Pipe groups shall be run parallel with pipes of other trades, and wherever practicable, all piping shall be supported on common group hangers unless pitch of pipe as hereinbefore mentioned is required.

F. The piping shall be installed in a workmanlike manner and shall avoid interference with columns, beams, equipment, and other piping or fixed construction. A minimum of 7-feet of headroom shall be maintained at any point including stairs.

G. Type C wall sleeves shall be provided for all pipes passing through exterior walls unless other sleeve types are noted on the Drawings. Type C sleeves shall also be provided in interior walls where indicated on the Drawings, Type D floor sleeves shall be used where piping passes through floor. Other sleeve types shall be used where shown on the Drawings.

H. Buried pipe shall be firmly bedded the full length with the exception where bell holes are required. Buried piping located less than 3-feet below a building slab or footing shall be encased in concrete. Where unstable soil conditions occur under buildings, support shall be made from the underside of the structural slab by an approved type hanging device embedded in the concrete.

I. Unless shown otherwise on the Drawings, all buried pipe carrying liquids shall be installed with a minimum cover of 42-inch. Pressure piping which carries gases shall be installed with a minimum cover of 3-feet. When new piping crosses existing utilities and other obstructions which force a change in elevation or horizontal alignment, the Contractor shall install the new piping at a deeper elevation or new alignment to avoid the obstructions unless otherwise instructed by the Engineer. Such changes in elevation or alignment shall be made either by installing fittings or by deflecting joints in accordance with the pipe manufacturer's recommendations. Such Work shall be performed at no additional cost to the Owner. To the extent possible, pressure and process piping shall be installed at a constant grade. All changes in grade shall be approved by the Engineer.

J. Where PVC piping is laid in a trench, the bottom of the trench shall be well graded and compacted to insure even bearing for the full length of the pipe and the pipe shall be snaked at approximate 50-foot intervals to provide for expansion or contraction. Prior to testing the pipe, the pipe shall be center loaded with backfill between joints before testing to prevent the pipe from arching or whipping under pressure. During backfill the line shall be pressurized to 25 psi to minimize impact damage.

K. All valves shall be installed with their stems horizontal or above. As far as possible, all valves of the same type shall be of the same manufacturer.

L. Solenoid operated valves shall be installed in horizontal lines with the solenoid mounted vertically and upright.

M. The T-drill method manufacturing tees in continuous copper tubing is not acceptable.

3.02 EQUIPMENT CONNECTIONS

A. The Contractor shall make all connections where required between the various piping systems and all pieces of equipment. This shall include adapters, traps, backwater valves, or other fittings required when not furnished with the equipment.

B. Unions - Provide a union or flange in piping connections to each valve, device, or item of equipment, and elsewhere as required to makeup or disconnect piping. Each union shall be so installed as to permit the removal of parts and equipment for inspection and cleaning, and shall be installed in a position which will permit the valve device or part to be removed without disconnection of any piping except unions. Union and flange shall be installed in such a position as will be accessible for disconnection items which are to be screwed. All ground joint unions on copper lines shall be cast brass or bronze. Wrought copper unions are not to be used. All unions, where possible, shall be brass to MPT type.

3.03 INSTRUMENTATION CONNECTIONS

A. The Contractor shall make all necessary allowances for and install all controls and instrumentation furnished under any Contract Division and which require in-line connection to process and pressure piping.

B. The Contractor shall provide all necessary mounting bosses, pipe and boss taps, plugs, tees, and any miscellaneous appurtenances to allow connection of Instrumentation and Controls and their associated piping to process and pressure piping.

C. Thermowells complete with all appurtenances listed in Division 16 shall be furnished and installed under that Division. Thermowells complete with all appurtenances which are not included in the list in Division 16 and are to be installed in piping under this Section, shall be furnished and installed under this Section.

D. Instrumentation and Controls are furnished and specified under various Sections including Section 16902. Any schedules shown in Section 16902 are not guaranteed to be complete.

3.04 PRESSURE AND LEAKAGE TESTS FOR (LIQUID) PROCESS AND PRESSURE PIPE

A. The Contractor shall furnish the pump, pipe connections, taps, gauges, auxiliary water container, bulkheads, plugs, and other necessary equipment and make pressure and leakage tests of all liquid conducting lines unless otherwise directed by the Engineer.

B. Tests shall be conducted on all liquid conducting pipelines or valved sections thereof as directed by the Resident Engineer. Testing of pipelines laid in excavation or bedded in concrete shall be done prior to backfilling or placing concrete cover, except restrained sections of pipe which shall be backfilled prior to testing, unless otherwise permitted by the Engineer. Tests on lines anchored or blocked by concrete shall not be conducted until the concrete has taken permanent set.

C. The line or section thereof to be tested shall be filled slowly with water to expel all air. Hydrostatic pressure shall be applied by pumping water from an auxiliary supply. The test pressure shall be maintained two hours minimum and additional time as required for thorough inspection to find any leaks or defects in the force main and appurtenances. Unless indicated otherwise in Part 4, the test pressure shall be 100 pounds per square inch or 50% above the normal operating pressure, whichever is greater. Should the pipe section fail to pass the tests, the Contractor shall find and correct failures and repeat the tests until satisfactory results are obtained.

D. Leakage tests shall be made simultaneously with or following completion of pressure tests of all lines or valved sections thereof. Leakage is defined as the quantity of water added to the pipe under test to maintain the required test pressure for a specified time. The leakage test pressure shall be not less than the maximum operating pressure of the section under test. The duration of the leakage test shall be not less than two hours. Allowable leakage for buried piping shall not exceed 50 gallons per inch of pipe diameter per mile of pipe in 24 hours. For piping not buried, any leakage during the test is unacceptable.

E. Lines that conduct fuel oil, gasoline, or chemicals that would have a deleterious effect upon the pipeline or process when mixed with water shall be purged after the pressure and leakage tests. Purging shall be performed with air or an inert gas such as nitrogen or carbon dioxide. Purging shall be continued for a minimum of two hours after all visible water has disappeared.

F. Testing of chlorination system piping shall also comply with the provisions of Section 11235.

3.05 RESERVED

3.06 RESERVED

3.07 RESERVED

PART 4 SPECIAL PROVISIONS

4.01 MOTORIZED VALVE SCHEDULE

A. The following letter designations are used in the Valve Schedule:

Mark Designation			
P-HD-14S	First Letter	=	Type of Valve
	Second Letters	=	Location
	Number and Letter	=	Valve Number

Type	**Location**
BP - Ball Valve	AEA - DAF Building, Basement Level
GV - Gate Valve	AEB - DAF Building, Main Ground Level
PV - Plug Valve	AEF - DAF Building, DAF Tanks

AEG - DAF Building, DAF Tank Tunnels
FJ - Gravity Thickener Building, Basement Level

Fittings

F - Flanged
SC - Screwed

Service

C - Chlorine
DW - Polymer Dilution Water
IC - Iron Chloride
NPW - Non-potable Water
PW - Potable Water
PL - Polymer

Operator Designation

C - Chain Wheel
MOI - Motor Operated with Integral Control

B. The Schedule is as follows **(Addendum 002, Issued on 06-19-2025):**

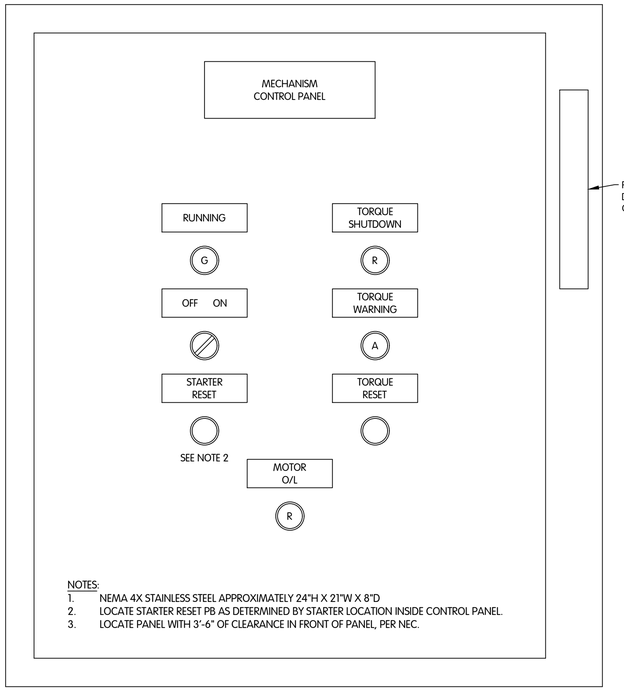
Mark	Size (in.)	Fitting	Service	Operator	Drawing No.
Plug Valves					
West Manhole Valve 1	12	F	NPW	MOI	C-0.3
West Manhole Valve 2	18	F	NPW	MOI	C-0.3
East Manhole Valve 1	12	F	NPW	MOI	C-0.3
East Manhole Valve 2	18	F	NPW	MOI	C-0.3

4.02 PIPING SERVICE MATERIAL REQUIREMENTS

A. The following are the material classifications to be used for the piping service identified.

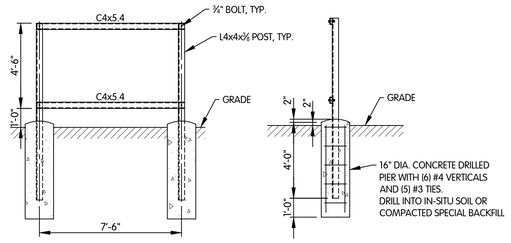
Service	Piping
Scum Spray Bar	PVC

END OF SECTION



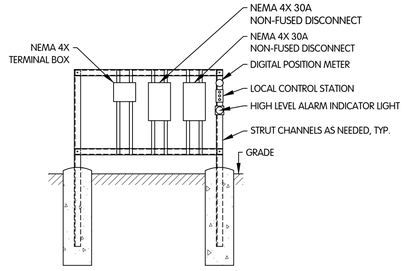
NOTES:
1. NEMA 4X STAINLESS STEEL APPROXIMATELY 24"H X 21"W X 8"D
2. LOCATE STARTER RESET PB AS DETERMINED BY STARTER LOCATION INSIDE CONTROL PANEL.
3. LOCATE PANEL WITH 3'-6" OF CLEARANCE IN FRONT OF PANEL, PER NEC.

MECHANISM CONTROL PANEL
NTS



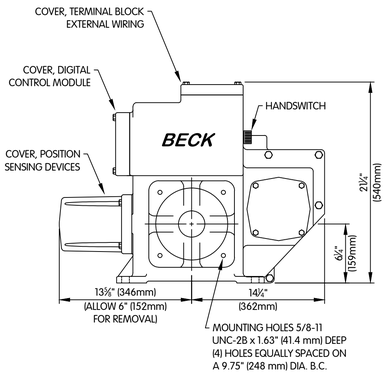
NOTES:
1. PROVIDE HOT DIPPED GALVANIZED FRAME AND CONNECTIONS.
2. CONTRACTOR TO SELECT GALVANIZED UNISTRUT (OR EQUAL) VERTICAL MEMBERS AS REQUIRED TO SUPPORT ELECTRICAL EQUIPMENT AND FASTEN TO CHANNELS. FASTENERS SHALL BE GALVANIZED OR ZINC PLATED.
3. REFER TO SECTION FOR REINFORCING AND SPECIAL BACKFILL BASE.

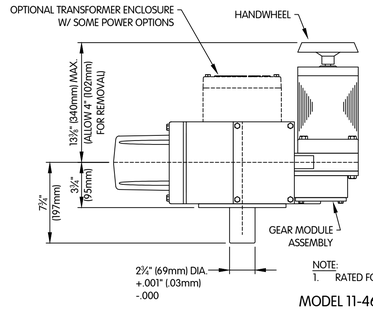
TYPICAL ELECTRICAL RACK ELEVATION
NTS



NOTES:
1. MOUNTED EQUIPMENT SHALL BE A MINIMUM OF 3'-0" ABOVE GRADE FROM BOTTOM OF EQUIPMENT.
2. SEE SHEET S-X.X FOR ELECTRICAL EQUIPMENT RACK STRUCTURAL DETAILS.
3. WEST CONTROL RACK SHALL ADDITIONALLY MOUNT A 7.5 KVA MPZ ALONGSIDE WHAT IS SHOWN IN DETAIL.

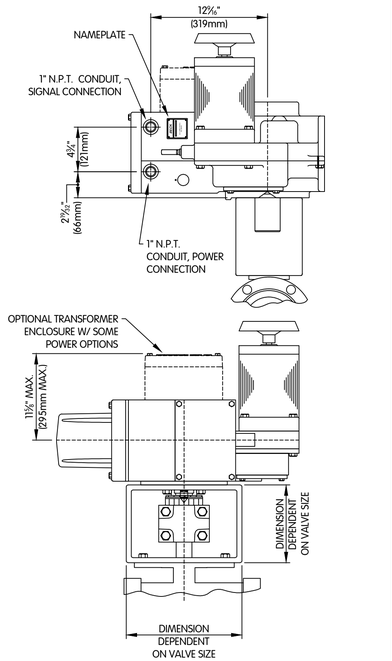
TYPICAL LOCAL CONTROL RACK ELEVATION
NTS



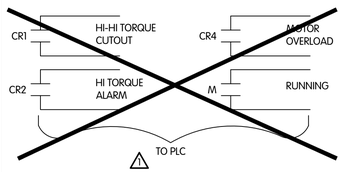


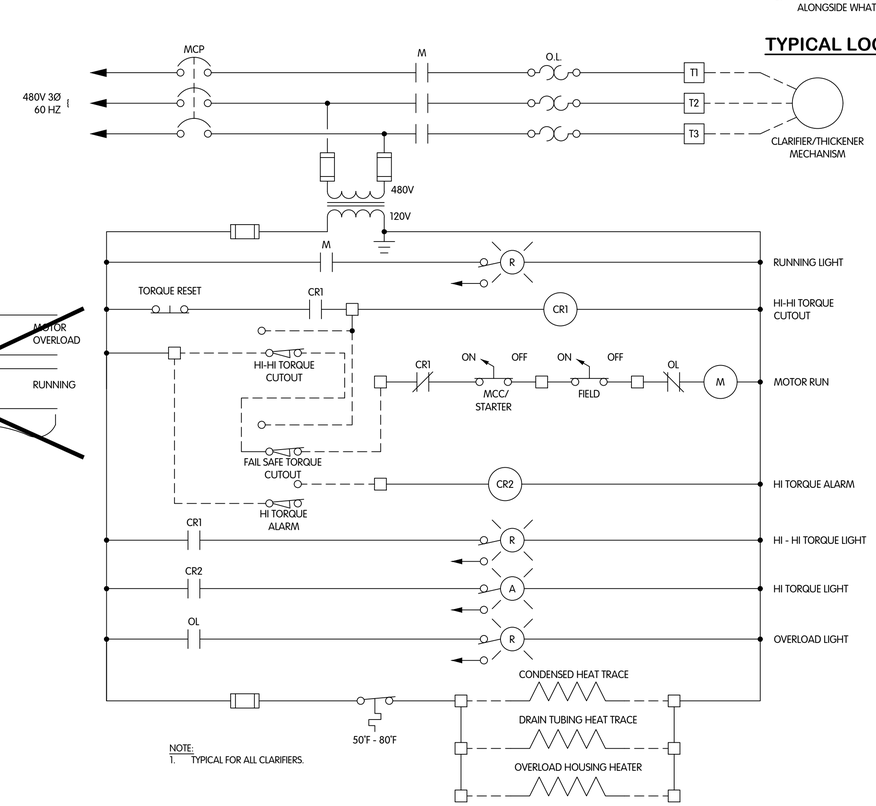
NOTE:
1. RATED FOR CLASS 1 DIVISION 2 AREA.

MODEL 11-469 SPECIFICATIONS



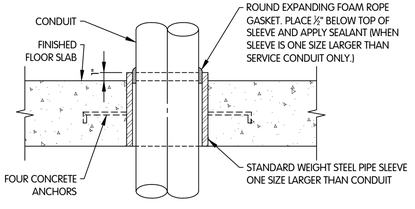
TYPICAL ACTUATOR MOUNTING
NTS





NOTE:
1. TYPICAL FOR ALL CLARIFIERS.

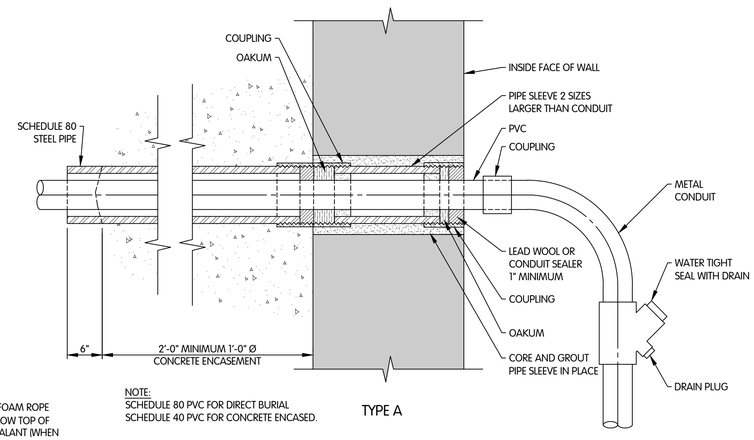
TYPICAL CLARIFIER SCHEMATIC



TYPE D

NOTE:
THRU EXISTING FLOORS WHERE TYPE "D" FLOOR SLEEVES ARE CALLED OUT, THE CONTRACTOR SHALL CORE FLOOR AND CAULK AS SHOWN, ELIMINATING THE STEEL SLEEVE.

CONDUIT FLOOR SLEEVE
NTS



NOTE:
SCHEDULE 80 PVC FOR DIRECT BURIAL
SCHEDULE 40 PVC FOR CONCRETE ENCASED.

TYPE A

EXTERIOR WALL SLEEVE FOR PVC CONDUIT
NTS

PAW PAW LAKE AREA WASTEWATER TREATMENT PLANT

PAW PAW LAKE AREA WASTEWATER PLANT - COLOMA, MICHIGAN
WEST PRIMARY CLARIFIER IMPROVEMENTS

ELECTRICAL
DETAILS

NO.	DATE	REVISIONS AFTER ISSUED FOR BID	BY
1	6/18/2025	ADDENDUM #2	NRB

Jones & Henry Engineers, Ltd.
Fluid thinking©.
www.JHeng.com

JOB NO.: 836-8207.001
SCALE: AS INDICATED
THIS LINE SCALES 1" WHEN PLOTTED TO NOTED SCALE

DESIGNED	DRAWN	CHECKED
NRB	RGW	PLM

STATUS: ISSUED FOR BID
DATE: MAY 2025
SHEET NO.: E-2
15 OF 19

K:\AL_8207001_E01\E-2 - DETAILS
6/18/2025 12:51 PM - CFERRELL
6/18/2025 12:51 PM