ADDENDUM NO. 1
TO
PROCUREMENT AND CONTRACTING REQUIREMENTS
FOR
Sweetser Wastewater Improvements
FOR
Town of Sweetser
Issue Date: November 2nd, 2026

BIDS ARE DUE BY

Thursday, November 12th, 2026
07:00 PM (Local Time)
113 N Main Street, Sweetser, IN 46987

This addendum consists of four (4) pages and the following attachments:

Attachment No. 1: Pre-Bid Meeting Minutes, OCRA Pre-Bid Conference Guide, & Sign-in Sheet
Attachment No. 2: Original Bid Summary and Bid Tabulation
Attachment No. 3: Contact List
Attachment No. 4: Revised Division 25 Specifications
Attachment No. 5: Revised Thickening Screw Press Specification (46 71 46)
Attachment No. 6: Revised Plan Sheets

The following, as additions to and modifications in the Bidding Requirements and Contract Documents, will be included in, and become a part of the **Sweetser Wastewater Improvements Project**. This Addendum forms a part of the Contract Documents. Bidders are, therefore, instructed to take the following into account in rendering any Bid for this work. Acknowledge receipt of this Addendum in the space provided on the Bid Form.

CHANGES TO PRIOR ADDENDA: (N/A)

CHANGES TO PROCUREMENT REQUIREMENTS: (N/A)

CHANGES TO CONTRACTING REQUIREMENTS: (N/A)

CHANGES TO SPECIFICATIONS:

1. New Division 25 Specifications issued. **(Attachment No. 4)**
2. Updated Specification 46 71 46 to allow Andritz screw press. **(Attachment No. 5)**

CHANGES TO DRAWINGS:

3. Updated Plan Sheet E113 to reflect pump control panel size modifications and concrete pad for the control panel. **(Attachment No. 6)**
4. Updated Plan Sheet I109A to reflect panel size modifications and layout. **(Attachment No. 6)**

5. Updated Plan Sheet I109B to reflect changes to wiring diagram. **(Attachment No. 6)**

CHANGES TO MISCELLANEOUS DOCUMENTS: (N/A)

SUBMITTED QUESTIONS/REQUESTS & RESPONSES:

I. <u>Emailed Questions</u>

1. Q: (Contractor Question) Is this project a re-bid?
    A. *Yes. The Owner has removed several of the alternates and included them into the base scope of the project.*
2. Q: (Contractor Question) Why is the project being re-bid?
    A. *Both bids were missing forms/information in the package that were required by funding agencies, and the Owner had to reject both bids. One of those funding agencies is no longer involved with the project, so the new rebid package requires less forms to include. After rejection, the Town decided to remove several of the alternates and included them into the base scope of the project for this re-bid.*
3. Q: (Contractor Question) Can bid tabulations be provided from the first round of bidding?
    A. *Yes.* ***(Attachment No. 1)***
4. Q: (Vendor Question) Given that this is a wastewater application, are the gate valves intended to be knife gate valves?
    A. *Refer to Section 2.3 of Specification 40 50 20 for what types of gate valves are acceptable per nominal valve size range.*
5. Q: (Vendor Question) Are flanged butterfly valves acceptable for all sizes?
    A. *Flanged butterfly valves are acceptable for all specified sizes, provided that lift brackets are installed where required to prevent interference with the actuator.*
6. Q: (Vendor Question) Is 150 working PSI and 300 PSI hydro test, rated to 250 degrees Fahrenheit acceptable and sufficient for the air service butterfly valves?
    A. *Air service butterfly valves shall meet the requirements of Specification 40 05 20. Butterfly valves must meet or exceed the specified pressure classification requirements, including a minimum rating of Class 25B.*
7. (Contractor Question) What is the estimated construction range and duration?
    A. *There will be 395 days until substantial completion and 425 days until final completion as shown in the Project Documents.*
8. (Vendor Question) Can Andritz be added to the approved manufacturer's list for the screw press?
    A. *Andritz has been added to the approved manufacturer's list for the screw press.* ***(Attachment No. 5)***
9. (Vendor Question) Specification section 251300 1.2.A specified the new control panels the SI is to include in their scope. Can you confirm the SI is also to include the new ACNCP (I100 & I104), Eagle Drive LSCP (on plans page I109A), and Bank LSCP VFD CP (on plans page I106B). This is similar to specification section 253010 1.1.B. The language here has changed from the previous bid.
    A. *Yes, it is the intent to for SI to provide all shown control panels.*
10. (Vendor Question) The previous bid in Specification section 251300 2.1.H required the SI to provide FT ViewPoint. In the current Specs, the same section removed this language. Since there is still a new SCADA system and computer, what software would the customer like provided?
    A. *Yes, FT Viewpoint is to be provided to allow desktop computer to access MSCP HMI screens.*

11. (Vendor Question) The previous bid in Specification section 253000 2.2 required the SI to provide a SCADA PC with specific requirements. In the current Specs, the same section removed this language. Since there is still a new SCADA computer, what requirements would the customer like provided?
    A. *See revised Division 25 specifications attached to the addendum.* ***(Attachment No. 4)***
12. (Vendor Question) Plans page E113 requires the Eagle Drive LSCP to be controlled by VFDs. Plans page I109A requires this same panel to be motor starters. Since Page I109B shows the power feed to be 240vac, 1-ph and will require phase conversion. Can you confirm this panel requires VFDs only.
    A. *Eagle Drive is a 240v, 1ph system and has two 240v, 1ph pumps. Revised addendum drawing shows potential for future 3 phase pumps which will require 1ph to 3ph conversion using VFDs. See revised drawing sheet for Eagle Dr attached to the addendum.* ***(Attachment No. 6)***
13. (Vendor Question) If VFD's are required, this panel will not be able to be a wall mounted enclosure due to space. Can you confirm there is wall space for a free-standing enclosure?
    A. *Yes, electrical contractor or primary will be required to pour an equipment pad. 60x48x16 free-standing enclosure should do. Apply proper cooling for VFD units.* ***(Attachment No. 6)***
14. (Vendor Question) Plans page I109B show the power supply to be non-redundant. Specification section 253010 2.8.A requires all 24vdc power supplies to be redundant if there is a PLC. Can you confirm which is required for this panel?
    A. *For all new PLC control panels, redundant power supplies are required.*
15. (Vendor Question) Plans page I102A note number 39 requires the HMI to be an Allen Bradley PanelView Pls y 12". Plans page I102B shows the same HMI as a Maple Systems. Can you confirm which is required?
    A. *PANELVIEW PLUS 12". This is required for FT ViewPoint to work.*
16. (Vendor Question) Plans page I100 show a network switch in the Main Office. Can you confirm there is no existing FOPP and this needs to be a small enclosure with a FOPP and Network switch inside?
    A. *There is no existing FOPP and the fiber/Ethernet switch will require a desktop or panel mount unit.*
17. (Vendor Question) Plans page I100 show a network switch in the existing blower building. Can you confirm there is no existing FOPP and this needs to be a be modified with a FOPP and Network switch?
    A. *The existing blower control panel does not currently have a fiber/Ethernet switch. Existing Blower VFD control panel was provided by Toric Eng.*
18. (Vendor Question) It looks like the language requiring the New Sludge Screw Press PLC Control Panel to be provided by the manufacturer was removed. Can you confirm this is still provided by the manufacturer?
    A. *Screw Press control panel is by manufacturer. Screw Press is part of Alternate package.*
19. (Vendor Question) The previous bid in Specification section 251300 2.2.D required the SI to provide integration with the Drum Screen. In the current Specs, the same section removed this language. Can you confirm if this still needs to be integrated into the new SCADA System?
    A. *The drum screen control panel will require hardwired integration. DS control panel is provided by manufacturer.*
20. (Vendor Question) The previous bid in Specification section 251300 2.2.E required the SI to provide integration with the Screw Press. In the current Specs, the same section removed this language. Can you confirm if this still needs to be integrated into the new SCADA System?

A. *Integration with Screw Press will be required if that alternate is accepted.*

21. (Vendor Question) The previous bid in Specification section 251300 2.2.F required the SI to provide integration with the Grinder Pumps. In the current Specs, the same section removed this language. Can you confirm if this still needs to be integrated into the new SCADA System?
    A. *Grinder pump integration is still required.*

II. Phone Call Questions

22. Q: (Contractor Question) Where can project documents be found?
    A. *Project documents are available for anyone to download and review for free at https://dccm.com/public-documents/. Scroll all the way down to the bottom of the page to the Sweetser Wastewater Improvements Project. Since we provide the documents for free, we do not keep a plan holder list but can provide a list of contractors that have been notified of the project out to bid.* ***(Attachment No. 3)***
23. Q: (Contractor Question) What is the bidding schedule?
    A. *The pre-bid meeting will take place on Wednesday. October 28, 2026 at 11:00am, and bid opening will be on Thursday, November 12, 2026 at 7:00pm.*
24. Q: (Contractor Question) How is the project being funded?
    A. *The project is being funded by a state agency and a private loan agency. The project is targeted to have a loan closing take place in December 2025, meaning NTP could happen as early as January (if the loan closes early December) or February 2027 (If the loan closes late December).*
25. Q: (Contractor Question) What is the current basis for wage rates?
    A. *This project has BABA and Davis-Bacon prevailing wage rates requirements. Please follow the posted prevailing wage rate that are currently included in the project manual. If these prevailing wage rates change, the modification will be posted as part of an addendum to the project.*

III. Clarifications/Notifications

+ + END OF ADDENDUM + +

PLEASE ACKNOWLEDGE THIS ADDENDUM IN THE BID FORM YOU SUBMIT.

Certified: Ricardo Jose Paredes Fernandez
Engineer

Date: 11/2/2026

ATTACHMENT 1
PRE-BID MEETING MINUTES, OCRA PRE-BID CONFERENCE GUIDE, AND SIGN-IN SHEET

PRE-BID MEETING MINUTES

Client: Town of Sweetser, Indiana
Project Name: Sweetser Wastewater Improvements
Project ID: 400-6314
Meeting Location: Sweetser Town Hall
Date: October 28th, 2026

Goals

- Introductions
- Scope of Work
- Document Availability
- Contract Milestones
- Addenda
- Special Considerations
- General Questions/Discussion

Introductions

- Town of Sweetser
  - *Patrick Kendall, WWTP Operator*
  - *(Virtual) Travis LeMaster, Town Council Vice President*
- DCCM
  - *Ricardo Paredes, Project Manager*
- Contractors Present
  - *Attached.*
- Kleinpeter Consulting
  - *Justin Kleinpeter*
- Sign-in Sheet
  - *Attached.*

Project Funding Requirements

- *Justin Consulting went through the requirements outlined in the attached Pre-Bid Conference Guide handout from the Office of Community and Rural Affairs (OCRA).*

Scope of Work

- BASE BID
  - Wastewater Improvements
    - Mechanical and Electrical/Instrumentation/Control (EIC) Improvements including the proposed electrical room.
    - Proposed drum screen replacement and walkway expansion
    - Added firewalls and fire rated ceiling w. associated structural improvements.

        - Ceiling improvements and structural improvements.
            - Including mold remediation/spot repairs.
    - Bank Lift Station (LS) Improvements
        - EIC improvements, site improvements, wet well (WW) lining, pumps.
    - Eagle Drive LS Improvements
        - WW lining, hatches, and minor EIC improvements
    - Short Street LS Improvements
        - Site improvements, EIC improvements, pumps.
    - Kelly Drive LS Improvements
        - Site improvements, EIC improvements, meter vault and equipment improvements
    - *This is a re-bid of the first round for this project. The first round received two bids, which were both ultimately rejected by the town due to missing information in both bid packages. The town decided to reject both and re-bid.*
- ALTERNATES
    - Screw press equipment and room
        - Screw press skid and associated equipment, including any life and safety equipment, EIC improvements.
        - Building envelope and foundations
    - Case LS Improvements + Low-Pressure Sewer Improvements
        - Decommissioning efforts and salvaging of EIC equipment for reuse
        - Low Pressure Sewer Improvements including three (3) new grinder stations and flushing stations.

Document Availability

- DCCM Online Plan Room
    - Electronic documents can be downloaded for free from: https://dccm.com/public-documents/

Milestone	Date
Pre-bid Meeting	October 28th, 2026
Last Day for Questions	November 4th, 2026
Final Addendum	**November 5th, 2026**
Open Bids	**November 12th, 2026**
Anticipated Notice to Proceed	**January/February 2027***

**Dependent on date of loan closing.*

- *DCCM is not partnered with Plan Room. Go to our website for the public documents.*

Bid Overview

- Bids Due – **November 12th, 2026 @ 7PM (Local Time)**

  - Bid Location – Sealed bids submitted to 113 N Main Street, Sweetser, IN 46987.
  - Bid Opening will occur at 7:00 PM during the Sweetser Town Council Meeting
- Contract
  - Base Bid (Lump Sum)
  - Mandatory Alternates (Lump Sum)
- Documents due at Bid
  - Completed Bid Form – Section 00 41 13
  - Required Bid Security
  - List of Proposed:
    - Subcontractors
    - Suppliers
  - List of Project References
  - Bidder's state or contractor license number
  - Acknowledgement of Addendum(s)
  - Contractor's Bid for Public Work – Form 96
  - E-Verify Affidavit

Contract Milestones

- Substantial Completion – 395 days (13 months)
- Final Completion – 425 days (14 months)
- Liquidated Damages: $1,500 per day for missing Substantial Completion. $1500 per day for missing Final Completion.

Addenda

- All questions to be sent in writing to Ricardo Paredes no later than Wednesday, November 4th, 2026:
  - Email: rparedes@dccm.com
- Addendum No. 1
  - To be issued after Pre-Bid Meeting
    - *Will include Pre-Bid Meeting minutes.*

General Questions/Discussion

- *Contractor: In the original bid, specification section 25 13 00 25-30 mentioned the plant's SCADA. Is SCADA still in the base bid?*
  - *DCCM: There were some modifications to the specifications, mostly which answered questions that were asked during the original bid phase. A lot of the questions from the original bid addendum were incorporated as part of the re-bid project manual.*
    - *DCCM to confirm.*
- *DCCM: There is no planholders list being kept, only a Contact List.*

Attachments

Attachment – OCRA Pre-Bid Conference Guide
Attachment – Sign-in Sheet

OCRA PRE-BID CONFERENCE GUIDE



Pre-Bid Conference Guide

For Construction Projects funded wholly or partially by the Community Development Block Grant Program.

Grant Services Division
One North Capitol, Suite 600
Indianapolis, Indiana 46204

800-824-2476

Revised November 2023

PRE-BID CONFERENCE GUIDE

GENERAL INFORMATION

- The Grantee must receive a "Release of Funds" letter from OCRA before awarding any construction contracts.

- Prior to contract award, prime contractors must be actively registered in SAM.gov. Alternatively, provide documentation from SAM.gov that registration has been initiated. A copy of the applicable wage decision and the Federal Labor Standards Provisions (HUD-4010) must be physically attached to the contract that the grantee signs with the Prime contractor. The HUD-4010 must be included with all subcontractor contracts.

- The principal contractor (prime or general contractor) is responsible for the full compliance of all employers (the contractor, subcontractors, and any lower-tier subcontractors) with labor standards provisions applicable to the project. If the contractor or any subcontractor fails to comply will all applicable regulations, funds shall be withheld from the prime contractor until all requirements have been met.

- The Build America Buy America Act applies to all infrastructure projects. Under the Buy America Preference, the selected contractor is responsible to procured iron and steel, construction and manufacture materials produced in the United States.

- This project is subject to all federal and state laws, regulations and guidelines pertaining to public works projects in Indiana.

LABOR STANDARDS

1. The grantee may not enter into a contract with any contractor or subcontractor that has been debarred, suspended or is otherwise ineligible to participate in federally funded contracts or programs. The Grant Administrator must verify the eligibility status of all contractors before work is performed on this project. Any contract awarded to a prime contractor or subcontractor that is found to be ineligible for award will be terminated immediately. *HUD Handbook 1344.1 REV-3, (Ch. 5-5).*

   Workers must receive hourly fringe benefits and/or a cash equivalent for all hours worked, including overtime. For workers that perform work in excess of 40 hours, all contractors and subcontractors must pay workers time and one half of the base wage rates listed on the wage decision for all hours worked over 40. Fringe benefits are to be paid straight time.

2. The Copeland Anti-Kickback Act makes it a Federal crime for contractors and subcontractors to coerce or intimidate any laborer or mechanic to relinquish or give up or pay back any of their wages earned on this project. This Act also requires the submission of weekly certified payroll reports (CPR) and signed statements of compliance and regulated permissible payroll deductions (Contractors Guide to Prevailing Wage Requirements, Section 1-1).

3. Payroll records must be kept for at least three years after grant closeout.

4. Payments made by a contractor to an employee must be verifiable. Payments may not be made with an I.O.U., equipment, or any other form of barter.

5. All contractors and subcontractors must submit signed weekly certified payroll reports (CPR) to the Grantee through the GrantAdministrator within seven days after regular payment date of the payroll period. Certified payroll reports will be labeled with "initial" and "final" as appropriate. Best practice: label each certified payroll report in succession.

6. No contractor or subcontractor shall employ workers on this project under the age of 16.

7. Contractors and subcontractors are not permitted to make payroll deductions which are contrary to state and federal law.

DAVIS-BACON REQUIREMENTS

Wages/Worker Classifications

All contractors and subcontractors must pay their workers no less than the hourly wages listed on federal wage determination for each classification of work performed on this project. In addition, if the applicable wage determination contains an hourly fringe benefit amount, the worker must receive benefits equal to that amount or a cash equivalent. All workers must be paid, in full, at least once a week. These requirements apply to salaried workers employed on this project engaged in physical or manual construction labor. It is the responsibility of the general contractor to clearly communicate all labor standards and Davis-Bacon requirements to all subcontractors employed on this project. All workers must be paid at an hourly rate for the type of work performed.

Only the classifications listed in the applicable wage determination or apprentices may be used on this project. Helpers or trainees may not perform work or services on this project. Laborers are not permitted to perform any skilled work which falls under the classification of another trade. For example, a laborer may not perform any electrical, carpentry, plumbing, sheet metal, etc. work on this project. If an employee performs more than one classification per week on this project, that employee should be listed twice showing the division of work on separate lines of the payroll.

All contractors and subcontractors having questions regarding the classification of workers shall direct their inquiries to the Grant Administrator.

Fringe Benefits

Contractors and subcontractors must submit documentation to the Grantee through the Grant Administrator to verify the type and the amounts paid into a bona fide fringe benefit program. The following are examples of bona fide fringe benefit plans:

1) Health, life, dental, vision or other similar insurance premiums paid by the employer;
2) Pension or retirement contributions *made by the employer* into a plan recognized by the Internal Revenue Service;
3) Expenses of certain recognized training programs;
4) Vacation and holiday pay may be considered as long as the employee would receive any unused amounts at termination of employment.

NOTE: Payroll deductions required by law (e.g., social security, worker's compensation, unemployment insurance, Federal/State/Local taxes, etc.) are not considered fringe benefits under Davis-Bacon law.

The following are NOT eligible bona fide fringe benefits:

1) Travel time;
2) Bonus payments;
3) Use of company tools or equipment;
4) Use of company vehicle;
5) Uniforms or safety shoes
6) Union Dues; Contributions into industry campaigns, marketing or advancement;
7) Substance Abuse Testing/Training programs

Independent subcontractors and self-employed owners are considered to be subcontractors of the Prime contractor. They are subject to the same requirements as are all subcontractors. Independent subcontractors and self-employed owners must submit a Certified Payroll Report or be listed on another contractors' weekly payroll following the documentation guidelines as referenced by DOL, WHD-347.

If the contractor or its subcontractors do not pay the proper hourly rate and fringe benefit on this project, the grantee shall withhold a necessary amount from the prime contractor until restitution is made. The prime contractor may be held liable for liquidated damages if its workers or those of subcontractors on this project are not paid the proper hourly wage and benefit.

Apprentices

Contractors and subcontractors may use and classify workers on this project as apprentices provided that the workers are duly registered and certified in a bona fide apprenticeship program recognized by the U.S. Department of Labor, Bureau of Apprenticeship and Training or State Approved Apprenticeship Program. If a contractor or subcontractor intends to utilize apprentices on this project, they must provide documentation to the Grant Administrator to verify the certification of the employee in an approved Apprenticeship Program. Certification must be provided before the apprentice is permitted to work on the job site. Contractors and subcontractors may not exceed the ratio of apprentices to journeymen as established by the apprenticeship program. Apprentices performing work on project site without proper ratio for supervision will be compensated at full journeymen wage complying with the Davis-Bacon Prevailing Wage classification. Contractors must also provide wage and fringe information for various levels of apprenticeship.

On-site Interviews

The Grant Administrator, a representative from the U. S. Department of Labor, a representative of the U. S. Department of Housing and Urban Development and a representative of OCRA shall be permitted to visit the job site and interview workers employed on this project. A Record of Employee Interviews must be maintained in the project file. Employee interviews are to be conducted in person any deviation will require written approval from OCRA or Grant Services per project.

SECTION 3

Section 3 of the Housing and Urban Development Act of 1968 provides that to the greatest extent feasible, contractors and subcontractors should make training and employment opportunities available to Section 3 Residents and Businesses when creating new positions to work on federally assisted projects. "Greatest Extent Feasible" means that contractors must make every effort to recruit, target and direct economic opportunities to Section 3 residents and businesses.

Section 3 residents include Low and Very Low-Income level persons. HUD sets the low-income limit at 80% and very low-income limit at 50% of the median family income for counties and metropolitan areas across the country. A Section 3 Business is one that is owned by Section 3 residents, employs Section 3 residents or subcontracts with businesses that provide opportunities to low and very low-income persons.

Prior to start of construction, the Civil Rights/Section 3 Officer must place Section 3 Posters, providing the type and location of the project, and contact information where Section 3 residents and businesses may request additional information regarding Section 3 opportunities at the nearest Work One Office, (find location and contact person at www.in.gov/dwd/WorkOne/. The 11 x 14 Posters may be sent to Work One via electronic mail if desired. Posters should also be placed in local government offices, Post Office, Library, public housing developments or such other public place that Section 3 residents may have the opportunity to observe the Posters.

The Civil Rights/Section 3 Officer must maintain a list of names and contact information of persons who express an interest in obtaining employment or subcontracts under Section 3 guidelines and provide that information to the prime contractor or any subcontractors working on the federally assisted project as jobs, training or subcontracting opportunities become available.

The prime contractor and any known subcontractors subject to Section 3 must provide a list of current employees to the Civil Rights/Section 3 Officer at the Pre-construction Conference. When the work called for in their contract is complete, each of these contractors and subcontractors are required to submit a Section 3 Compliance Report together with a list of employees at completion of their contract. The beginning list and ending list will be used to determine whether any new employees were hired during the performance of their contract.

The prime contractor and any subcontractors who work on the project must place the appropriate job vacancy on Indiana Career Connect (ICC) at www.indianacareerconnect.com/. In addition, all contractors and subcontractors will search ICC for candidates that meet the requirements of the position and contact the appropriate regional Work One contact person to coordinate with the regional provider to help fill open positions. When the vacant position is filled, it is the responsibility of the Civil Rights/Section 3 Officer and/or the contractor or subcontractor

to advise Indiana Career Connect that the position is no longer available. Contractors are required to give first consideration to any Section 3 residents or Businesses for new positions, training, or subcontracting opportunities. Section 3 residents or businesses are not guaranteed employment or contracting opportunities under Section 3. Section 3 residents must demonstrate that they meet the qualifications for new employment opportunities created as a result of the federally assisted project. Section 3 business concerns must submit evidence to the satisfaction of the party awarding the contract to demonstrate that they are responsible firms and have the ability to perform successfully under the terms and conditions of the proposed contract.

In all instances where new positions are being created, the contractor must document the results of any Section 3 residents contacted regarding the position and the results of that contact. To ensure compliance with this federal regulation, all contractors and subcontractors (whose contract amount exceeds $100,000) must complete a Section 3 Compliance Report when work on the project called for in their contract is complete. Any documentation regarding contacts or consideration of Section 3 applicants must be maintained by the contractor and provided to the Civil Rights/Section 3 Officer with the Compliance Report.

BUY AMERICA PREFERENCE

The Build America Buy America Act provides, to the greatest extent possible, for early coordination with engineers/architects to incorporate products that meet Buy America Preference in the design phase of infrastructure projects.

All contractors who receive federal financial assistance for an infrastructure project which includes construction, alterations, or repairs are subject to the BABA unless a waiver is in place. The Buy America Preference (BAP) requires the use of iron and steel, construction materials and manufactured goods produced in the United States.

Bidders must provide cost estimates based on the most current American made products available. It is the responsibility of the grantee to ensure that BABA requirements are included in bid advertisements. *Form 17: Sample Invitation for Bid Publication* has been updated to reflect Buy America Preference requirements. The Buy America Preference must be included in all subawards, contracts, and purchase orders for the work performed, or products supplied under an OCRA award.

OTHER FEDERAL REQUIREMENTS

Title VI of the Civil Rights Act of 1964 states that no person shall, on the grounds of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program or activity receiving federal financial assistance.

Title VII of the Civil Rights Act of 1964 prohibits discrimination in hiring, promotion and other employment practices on the basis of race, color, religion, sex, or national origin.

Section 109 of the Housing and Urban Development Act of 1974 prohibits discrimination on the basis of race, color, national origin, disability, age, religion and sex within Community Development Block Grant programs or activities.

Title III of the Americans with Disabilities Act prohibits discrimination based on "disability" by requiring that places of public accommodation be readily accessible to and useable by persons with disabilities.

The Architectural Barriers Act of 1968 requires that a project meet at least the minimum requirements of accessibility. A Certificate of Accessibility must be provided to the Grantee with a copy to OCRA on or before the completion of the project.

Section 504 of the Rehabilitation Act of 1974 states that a contractor or subcontractor may not discriminate against an otherwise qualified individual from participating in or enjoying the benefits of this project as a result of a physical handicap.

Executive Order 11063 provides that no person on the basis of race, color, religion, sex, or national origin, shall be discriminated against in federal housing assistance, including lending assistance.

Executive Order 11246 as amended by Executive Order 11375 provides that no person shall be discriminated against on the basis of race, color, religion, sex, or national origin in any phase of employment on federally assisted construction contracts.

All contractors and subcontractors **awarded a federal contract or subcontract in excess of $50,000.00 and having more than 50 employees** must have an Affirmative Action Plan established in writing and on file in its place of business. Failure to have an Affirmative Action Program may result in sanctions established under section 209(a) of Executive Order 11246. This regulation is enforced by the Office of Federal Construction Contract Compliance, and additional information may be found at www.dol.gov/ofccp or at 1-800-397-6251. The Indiana office is located at 46 East Ohio Street, Suite 419, Indianapolis, Indiana 46204 and phone number is 317-226-5680.

Other laws enforced by the U. S. Equal Employment Opportunity Commission (EEOC) may be found at www.eeoc.gov/policy/laws.html.

OTHER RESPONSIBILITIES WHEN PARTICIPATING IN A FEDERALLY FUNDED PROJECT

A) The State of Indiana has established a Minority/ Women Owned Business Enterprise goal of 10% and Veteran Owned Small Business goal of 3% of the grant amount. Documentation of reasonable efforts to meet this goal must be maintained in the grantee's project files.

B) The contractor must display the following posters on the project job site in a location assessable to all employees. Posters may be obtained from the Grant Administrator.

- Equal Employment Opportunity is The Law
- Fair Housing Poster
- Safety and Health Protection on the Job
- Notice to All Employees working on Federally Financed Construction Projects
- Employee Polygraph Protection Act

C) A copy of the applicable wage decision assigned to the project must also be posted at the job site.

SIGN-IN SHEET

Sweetser Wastewater Improvements Project
Pre-Bid Meeting
Town of Sweetser

ATTENDANCE SHEET
(PLEASE PRINT)

October 28th, 2026 @ 11:00AM – Sweetser Town Hall

NAME	COMPANY	PHONE	E-MAIL
Ricardo Paredes	DCCM	317-437-4987	RPAREDES@DCCM.COM
Justin Kleinpeter	KCG	812-530-6662	justin@kleinpetercontracting.c
Pat Kendall	Sweetser	765 667 6136	PatrickKendall@sweetserIN
Greg Reed	BLA	765-426-0825	GREED@BLAUDERSON.com
Russell Jacobs	Crosby	260 410 8247	rjacobs@recrosby.com
Casey Dadley	Redline Underground	765-734-0101	casey@redlineunderground.com
Mark Dillman	HES	501-463-1203	markdillman@hiscontractors.com
Tyler Veerkamp	TruFlo Mechanical	812-614-6808	tveerkamp@truflomc.com
Jason Munsie	TruFlo Mechanical	317 294 6439	Jmunsie@truflomc.com
John Pearce	Central Industrial Contractors	765-669-1522	JM_Pearce@sbcglobal.net

ATTACMENT 2
ORIGINAL BID SUMMARY AND BID TABULATION

DCCM

TOWN OF SWEETSER
SWEETSER WASTEWATER IMPROVEMENTS PROJECT
SUMMARY OF BIDS
BID OPENING: SEPTEMBER 24th, 2026

Table 1. Bid Tabulation

Bid Description	Engineer's Estimate	Central Industrial Contractors Inc.	R. Yoder Construction, Inc.
BASE BID	$2,250,000	$1,499,442	$1,965,030
ALT. #1: Screw Press Equipment Improvements	$670,000	$691,330	$1,017,700
ALT. #2: Screw Press Building Improvements	$160,000	$184,504	$465,200
ALT. #3: Ceiling Improvements	$190,000	$77,500	$276,900
ALT. #4: Bank Lift Station Improvements	$200,000	$179,564	$274,900
ALT. #5: Case Lift Station Improvements	$15,000	$16,040	$29,500
ALT. #6: Eagle Drive Lift Station Improvements	$110,000	$60,531	$189,400
ALT. #7: Short Street Lift Station Improvements	$170,000	$139,610	$210,100
ALT. #8: Kelly Drive Lift Station Improvements	$160,000	$168,441	$359,200
ALT. #9: Low Pressure Sewer Improvements	$180,000	$98,341	$191,800
MANDATORY ALLOWANCE: Spot Repairs and Mold Remediation	$120,000	$120,000	$120,000
Total (BASE + ALL ALTERNATES + ALLOWANCE)	**$4,225,000**	**$3,235,303**	**$5,099,730**



Certified By: Ricardo Juan Paredes Aronsohn, PE11900824

TOWN OF SWEETSER
SWEETSER WASTEWATER IMPROVEMENTS PROJECT
BID TABULATION
BID OPENING: SEPTEMBER 24th, 2026

BASE BID

ITEM	DESCRIPTION	UNIT	QTY	Engineer's Estimate		Central Industrial Contractors		R. Yoder Construction	
				UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
1	Mobilization and Demobilization	LS	1	$190,000	$190,000	$11,930	$11,930	$120,000	$120,000
2	Maintenance of Traffic	LS	1	$190,000	$190,000	$9,500	$9,500	$5,000	$5,000
3	Construction Engineering	LS	1	$40,000	$40,000	$27,700	$27,700	$50,000	$50,000
4	Erosion and Sediment Control	LS	1	$100,000	$100,000	$16,200	$16,200	$10,000	$10,000
5	Site Grading and Restoration	LS	1	$400,000	$400,000	$13,140	$13,140	$30,000	$30,000
6	Dewatering and Temporary Flow Control (Bypass)	LS	1	$80,000	$80,000	$26,600	$26,600	$25,000	$25,000
7	Wastewater Treatment Plant Improvements	LS	1	$1,650,000	$1,650,000	$1,394,372	$1,394,372	$1,725,030	$1,725,030
	BASE BID TOTALS				**$2,650,000**		**$1,499,442**		**$1,965,030**

MANDATORY ALTERNATES

ALT. ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
1	Screw Press Equipment Improvements	LS	1	$670,000	$670,000	$691,330	$691,330	$1,017,700	$1,017,700
2	Screw Press Building Improvements	LS	1	$160,000	$160,000	$184,504	$184,504	$465,200	$465,200
3	Ceiling Improvements	LS	1	$190,000	$190,000	$77,500	$77,500	$276,900	$276,900
4	Bank Lift Station Improvements	LS	1	$200,000	$200,000	$179,564	$179,564	$274,900	$274,900
5	Case Lift Station Improvements	LS	1	$15,000	$15,000	$16,040	$16,040	$29,500	$29,500
6	Eagle Drive Lift Station Improvements	LS	1	$110,000	$110,000	$60,531	$60,531	$189,400	$189,400
7	Short Street Lift Station Improvements	LS	1	$170,000	$170,000	$139,610	$139,610	$210,100	$210,100
8	Kelly Drive Lift Station Improvements	LS	1	$160,000	$160,000	$168,441	$168,441	$359,200	$359,200
9	Low Pressure Sewer Improvements	LS	1	$180,000	$180,000	$98,341	$98,341	$191,800	$191,800
	ALTERNATE TOTALS				**$1,855,000**		**$1,615,861**		**$3,014,700**

MANDATORY ALLOWANCES

ITEM	DESCRIPTION	UNIT	QTY	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT	UNIT PRICE	AMOUNT
1	Spot Repairs and Mold Remediation	ALLOW	1	$120,000	$120,000	$120,000	$120,000	$120,000	$120,000
	ALLOWANCE TOTAL			**TOTAL**	**$120,000**		**$120,000**		**$120,000**



Certified By: Ricardo Juan Paredes Aronsohn, PE11900824

Bidder	REQUIRED SUBMITTALS WITH BID														
	BID PROPOSAL												***SRF REQUIRED DOCUMENTS***		
	Base Bid price Information	Mandatory Alternate price Information	Acknowlegement of Addendums	Signature	Bid Bond (5%)	List of Proposed Subcontractors and Suppliers	List of References	Bidders License No. demonstration evidence of authority to do business in Indiana	Contractors's Bid for Public Work - Form 96	Non-Collusion Affidavit	Financial Statement	E-verify Affidavit	Form OEE-1 (Exhibit D)	Form OEE-2 (Exhibit D)	GPR Bid Breakdown (Exhibit E)
Central Industrial Contractors	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
R. Yoder Construction, Inc.	X	X	X	X	X	X	X	X	X	X	X	X			

Notes:

1. R. Yoder Construction, Inc. did not include signed forms OEE-1, OEE-2, or the GPR Breakdown per SRF required documents

ATTACHMENT 3
CONTACT LIST

DCCM

PROJECT: Sweetser Wastewater Improvements
LOCATION: Sweetser, IN
PROJECT #: 400-6314
DESCRIPTION: Improvements to WWTP and LS

LAST UPDATED BY: RJPA
DATE: 10/21/2026

PLANHOLDER'S LIST

Potential Planholder	Contact Person	Typical Role	In Good Standing?	Speciality					Bonding Capacity ($M)	General Location	Email Address	Phone #	Mailing Address	Decision	Comments
				Plant	Linear	Large Diameter	Deep	Private Side							
SC Case Construction	Skyler Case	General Contractor	Y		x	x				Muncie, IN	skyler@jgcase.com	765-282-4953	171 East Streeter Avenue, Muncie,IN 47303		
Infrastructure Systems Inc	John Stalker	General Contractor	Y	x	x					Orleans, IN	jstalker@infrastructuresystems.com	812-865-3309	260 W Vincennes St, Orleans, IN 47452		
Dashiell Excavating	Chris	General Contractor	Y		x					Marshall, IL	chris@dashiellinc.com	217-826-8194	503 Locust St, Marshall, IL 62441		
Kokosing	Sonja Nichols Jeff Burks	General Contractor	Y	x	x	x				Evansville, IN	snichols@kokosing.biz jeff.burks@kokosing.biz	317-649-1847 317-891-1136 602-820-6390	600 N Weinbach Ave Suite 630 Evansville, Indiana 47711		
Wabash Utilities	Mark Heinz	General Contractor	N					x		Vincennes, IN	mark@wabashutilities.com	812-886-1250	272 E Brown Rd, Vincennes, IN 47591		
Lykins Contracting, Inc.	David Crock or Joe Cook	General Contractor	Y		x	x	x			Sunman, IN	dlykins@lykinsinc.com, jcook@lykinsinc.com	812-623-2244	12783 N SR 101, Sunman, IN 47041		
Kerns Excavating	Ryan Kerns	General Contractor	Y		x	x				Bruceville, IN	ryan@k-exc.com	812-291-5156	6970 IN-67, Bruceville, IN 47516		
Thieneman Construction	Sheri Woodward Jennifer Mroch	General Contractor	Y	x						Westfield, IN	estimating@t-c-i.net	317-867-3462 317-354-7994	17219 Foundation Parkway, Westfield, IN 46074		
Ottenweller Contracting		General Contractor	Y	x						Fort Wayne, IN/Indianapolis, IN	gocinfo@ottenweller.com	260-484-9183	1220 Edsall Avenue, Fort Wayne, IN 46803		
Culy Contracting (Azuria Water)	Aaron Anderson	General Contractor	Y		x	x				Winchester, IN	aaronanderson@azuria.com	765-546-0308	5 Industrial Park Drive, Winchester, IN 47394		
Keith Sullivan Excavating	Keith Sullivan/Becky DeBonis	General Contractor	Y							Marion, IN	keithsullivaninc@sbcglobal.net	765-664-1145	408 West 9th Street Marion, IN 46953		
Brackney Inc.	Kevin Brackney	General Contractor	Y		x	x				Brookeville, IN	estimating@brackneyinc.com	765-647-6551	10028 U.S. #52 P.O. Box 221 Brookville, IN 47012		
Miller Pipeline	Shelley Rardon	General Contractor	Y		x	x	x			Indianapolis, IN	shelley.rardon@millerpipeline.com	317-293-0278	8850 Crawfordsville Road, Indianapolis, IN 46234		
Crider and Crider	Don Conard	General Contractor	Y		x					Indianapolis, IN	dconard@criderandcrider.com	812-327-0089	4806 W 86th St, Indianapolis, IN 46268		
Kieffer Bros	Bryan Kieffer	General Contractor	Y							Indianapolis, IN	bryan@kiefferbros.net	618-262-5108	933 W 3rd St, Mount Carmel, IL 62863		
EDCO Construction	Cole Roberts	General Contractor	Y	x						Indianapolis, IN	croberts@edcoconstruction.com	(317) 787-6685	2101 National Ave, Indianapolis, IN 46227		
Jutle Excavating	Brad Jutte	General Contractor	Y	x						Fort Recovery, OH	brad@jutteexc.com	419-852-8944	1140 Fort Recovery-Minster Rd, Fort Recovery, OH 45846		
Graves Construction	Andrew Graves	General Contractor	Y	x						Switz City, IN	Andrew@gravesinc.net	812-659-3138	6399 W State Road 54, Switz City, IN 47465		
Reynolds Construction	Adam Ralph	General Contractor	Y	x						Orleans, IN	adam.ralph@reynoldscon.com	877-770-0127	6225 N County Road 75 E, Orleans, IN 47452		
Hagerman	Steven Meier	General Contractor	Y	x						Fishers, IN	smeier@hagermangc.com	317-577-6836	10315 Allisonville Rd Fishers, IN 46038		
Patterson Horth		General Contractor	Y	x							info@pattersonhorth.com				
Bowen Engineering	Teddy Deahl	General Contractor	Y	x						Indianapolis, IN	jdeahl@BowenEngineering.com	317-576-8785 (Cell: 317-408-9960	8802 N Meridian St, Indianapolis, IN 46260		
FA Wilhelm	Derek Davidson /Justin Ludwig	General Contractor	Y	x	x	x				Indianapolis, IN	derekdavidson@fawilhelm.com justinludwig@fawilhelm.com	Justin cell 317-460-7433	3914 Prospect Street Indianapolis, IN 46203		
Deig Brothers	Nathan	General Contractor	Y		x		x			Evansville, IN	nathan@deigbros.com, inquiries@deigbros.com	812-423-4201	PO Box 6429, Evansville, IN 47719		
RE Crosby	Russell Jacobs	General Contractor	Y	x						Fort Wayne, IN	Rjacobs@recrosby.com	260-410-8247	2805 Freeman St, Fort Wayne, IN 46802		
Maddox Industial Group (MIG)	D'artagnan Engle	General Contractor	y	X		X				Indianapolis, IN	dengle@maddoxindustrial.com	317-870-2400 Cell 812-595-0841	5906 S. Harding ST. Indianapolis, IN 46217		
Dorsey Excavating	Shawn Johnson	Contractor	Y	X	X	X	X			Noblesville, IN	shawnj@dorseyexcavating.com	Cell 765-659-8886	11460 Greenfield Ave Noblesville, IN 46060		
Weihe Construction	Robert Weihe	General Contractor	Y		X	X	X			Noblesville, IN		Cell 317-281-0811	15215 Stony Creek Way Noblesville, IN 46060		
Watson Excavating	Bill Watson	General Contractor	Y		X					Redkey, IN	billwatsonexc@gmail.com	765-744-2204	109 W High Street, P.O. Box 45, Redkey, IN 47373		
Central Indiana Contractors		General Contractor	Y							Marion, IN	info@cicmarion.com	765-664-3335	1000 N. Park Ave. Mation, IN 46952		
Gerig Contracting	David Gering	General Contractor	Y								david.gerig@gerigcontracting.com				
R. Yoder Construction	Brad Yoder	General Contractor	Y								brad@ryoderconstruction.com				

ATTACHMENT 4
REVISED DIVISION 25
SPECIFICATIONS

SECTION 25 13 00 - INSTRUMENTATION AND CONTROLS

PART 1 - GENERAL

1.1 DESCRIPTION

A. This specification covers the technical requirements for the fabrication, installation, engineering, wiring, adjustment, testing, start-up, commissioning, and training for the instrumentation and control (I&C) systems required for the project. This is an enclosed WWTP and therefore falls into the NFPA 820 rating of C1D2.

B. The instrumentation and control systems shall include all work and materials necessary to perform the control functions as illustrated on the electrical drawings as specified in the Division 25 Specifications.

C. The Systems Integrator subcontractor shall be responsible for work of Division A. Work related to the WWTP upgrades and lift station upgrades. The existing facility has Missions alarm system that shall be replaced with cell modems and PLC messaging.

D. All PLC and HMI programming, software programs, and passwords shall be turned over to the Owner at the end of the project. All programming copies to owner shall be documented.

1.2 SCOPE OF WORK

A. This project includes upgrades at the WWTP and area lift stations. The Systems Integrator shall be responsible for but not limited to the following for this project:

1. Furnish and Program New MSCP PLC to be located within new electrical room.
2. Integration of new instruments, actuators and other designated elements.
3. Relocation of RAS/WAS control panel with any required programming updates.
4. Upgrades to existing blower control panel as shown on drawings.
5. Integration of manufacturer provided equipment and control panels (screw press, drum screen, duplex grinder station, etc…). Integrator to coordinate with manufacturers for communications and PLC addressing and/or wiring diagrams.
6. Integration with Kelly Drive, Eagle Drive, Short Street, Bank and demo of Case Street lift stations.
7. All provisions and upgrades for each lift station as shown on drawings.
8. All local instrumentation, control equipment and calibrations.
9. Furnishing, Installing, and Configuring all network functionality between remote sites and local equipment.
10. All local PLC programming and HMI graphics development, miscellaneous status monitoring and alarms.
11. Fiber Optic connectivity for local network.

1.3 QUALITY ASSURANCE

A. All work and materials specified herein shall be furnished by a single Systems Integrator (SI). The SI shall be an experienced and reputable firm, which has been engaged in the business of providing instrumentation and control systems for water and wastewater treatment facilities for at least five years.

B. Drawings and specifications shown are intended to convey information required for a complete functioning system for the purposes specified. The Systems Integrator shall be responsible for all details which may be necessary to properly install, adjust, and place in operation a complete and working system, including all mechanical and electrical installations, final wiring diagrams, connections, and the final layout, sizes and quantities of conduit and wiring communicated to the Electrical Contractor and other trades.

C. To achieve standardization in appearance, operation, maintenance, and spare parts, similar equipment provided under this contract shall be the end products of a single manufacturer.

D. Codes, specifications, and standards referred to by number of titles shall form a part of this specification to the extent required by the references thereto.

1.4 PRE-CONSTRUCTION SUBMITTALS

A. Submittals shall be as specified in the General Conditions and as further described below:

B. Submit the following:

1. Project schedule, which shall represent the Contractor's and System Integrator's best projections of when activities listed below will occur. Project schedules shall be updated at the Engineer's request, when major changes in the schedule occur. The activities shall include, but not be limited to, the following:

    a. Coordination and loop review meetings
    b. Shop drawing submittals for each group of equipment
    c. Shop drawing approvals for each group of equipment
    d. Equipment manufacturing/panel fabrication
    e. Equipment delivery
    f. Equipment installation
    g. System testing and calibration
    h. Operational testing and demonstration.
    i. As-built submittals
    j. Operation and Maintenance Manual submittals
    k. Operator training
    l. Follow-up Operator training at six months after substantial completion.

2. Manufacturer's certification of compliance with the referenced specifications and standards.
3. Certified copies of reports of factory tests specified herein and required by the referenced standards.
4. Shop drawings, indicating performance and physical data of the equipment specified herein.
5. Manufacturer's installation instructions.

6. Provide mounting details for field mounted equipment.
7. Manufacturer's operation and maintenance instructions.
8. If available, USB driver, DVD and CD ROM media produced by the equipment manufacturer, which contain demonstrations of operation and maintenance procedures for the equipment specified herein.

C. Physical requirements of submittals shall be as follows:

1. Submittals shall be submitted as media on clear (not scanned) pdf documentation.
2. Submittals shall be organized and divided into logical division by means of tagged tabs. Each type of equipment shall be given a separate tab division.
3. Provide an index sheet for the submittals.
4. Drawings shall be on media converted to pdf and printable as 11 by 17 landscape format.
5. All text material shall at minimum be typewritten. Handwritten material is not acceptable.
6. Telecopied (FAX) documents or photocopies of faxed documents shall not be included in submittals. Submittals containing telecopied documents will be rejected and returned immediately.
7. All submitted equipment shall have highlighted features and clear part number designated.

D. Shop drawings shall include, but not be limited to, the following:

1. Instrument index, which shall include instrument tag numbers, instrument description and instrument calibrated ranges.
2. Typewritten specification sheets or pdf version, which shall include manufacturer's names and complete catalog numbers.
3. Detailed calculations as applicable, which shall include, but not be limited to, the following:

    a. Power supply sizing calculations
    b. Thermal loading (heat dissipation) calculations

4. Cut sheets and catalog information, which shall contain equipment specifications, dimensions, wiring and piping drawings, and installation and mounting details.
5. Loop drawings, which shall contain, but not be limited to, the following information:

    a. Loop numbers and instrument tag numbers
    b. Individual loop component locations
    c. Actual equipment wiring terminal designations, point to point wiring, and cable shield terminations
    d. Wire type, size and identification number
    e. Signal types (e.g., 120 Volt AC, 4-20 mA DC, pulse frequency, 3-15 psig, etc.)
    f. Contact orientations (e.g., normally open, normally closed, etc.)
    g. Equipment grounding requirements
    h. Sources of loop power, or power supply identifications
    i. Signal boosters, interposing relays and shunt resistors

        1) Reserve output capacity

6. Instrument and control panel layout drawings, which shall include, but not be limited to, the following:

   a. Bill of materials
   b. Front panel layout drawings
   c. Swing-out panel layout drawings
   d. Internal panel layout drawings
   e. Internal wiring diagrams, including wire type, size and identification number
   f. Terminal block layout drawings
   g. Nameplate lists
   h. Color schedules and samples

7. Elementary control diagrams.
8. Other descriptive information that will assist the Engineer with approval.

1.5 RECORD DRAWINGS (AS-BUILT) SUBMITTALS

A. Record drawings (as-built) submittals shall be as specified in the General Conditions, further described below:

B. The record drawings submittals shall consist of, but not be limited to, the following:

1. Submit one set to the Engineer and one set to the owner of corrected contract documents on a USB drive formatted and organized in pdf files. The original contract documents shall be marked to reflect 'as-built' conditions. Corrections shall be made in red.
2. Submit one set to the Engineer and one set to the owner of corrected loop description. The original loop description shall be marked to reflect 'as-built' conditions. Corrections shall be made in red.
3. Submit one set to the Engineer and one set to the Owner printer outputs of the final configuration or programs of all programmable controller-based equipment.
4. Where applicable, submit to the Owner standard magnetic storage devices, such as CD/DVD disks, of all programmable controller-based equipment software and programs.
5. Submit original licensed copies and original documentation for all software. All software licenses shall be in Owner's name.
6. Where applicable, submit to the Owner two sets of pre-configured Read-only Memory Modules, such as EEPROMS or UVPROMS, of all programmable microprocessor-based equipment. Each memory module shall be submitted in an anti-static zippered polybag, which shall be clearly labeled and identified.

1.6 OPERATION AND MAINTENANCE MANUALS

A. The Systems Integrator shall prepare and furnish Operation and Maintenance Manuals of the system, which shall be submitted to the Engineer prior to operator training described below. Provide four (2) bound hard copy sets and one (2) USB drives with complete electronic copy in pdf format.

B. The Operation and Maintenance Manuals shall include, but not be limited to, the following:

1. Approved shop drawings amended by approved change orders and as-built conditions.
2. Manufacturer supplied operating and installation manuals.
3. Detailed procedures and instructions on the operation, removal, installation, adjustment, calibration, and maintenance of each component provided under this contract.
4. As-built control panel and enclosure drawings, including termination drawings, PLC input/output (I/O) wiring diagrams, and panel bill of materials.
5. List of recommended spare parts, which shall include complete catalog numbers
6. List of local or the nearest manufacturer approved repair and service centers.

1.7 OPERATOR TRAINING

A. The System Integrator shall provide operation and maintenance training of the Owner's personnel. This training shall include, but not be limited to, the following:

1. The review of the Operation and Maintenance Manuals prepared and furnished by the System Integrator.
2. The review of 'as-built' panel layout drawings and wiring diagrams.
3. Hands-on training in the operation of each instrument and each loop.
4. Hands-on training in the maintenance, removal, and reinstallation of each instrument and each loop.
5. Hands-on training in the programming or configuration of all programmable microprocessor-based instruments. This does not include the PLC system.

B. For bidding purposes, the System Integrator shall include a minimum training period of one day, at eight hours per day, for up to five persons.

C. The System Integrator shall bear all expenses associated with the operator training activities, including labor, transportation and material costs.

PART 2 PROCESS DESCRIPTION

2.1 GENERAL

A. Where indicated, each pump, blower or actuator will have the following pilot and control devices:

1. HAND-OFF-AUTO selector switch, in some cases, if indicated, these shall be HAND-OFF-REMOTE.

    a. In HAND the equipment shall run.
    b. In OFF the equipment shall remain off.
    c. In AUTO or REMOTE, the equipment shall be controlled by the PLC

2. Green LED RUN/OPEN light.
3. Amber ALARM light.
4. Elapsed time meter (ETM) only for motors.

B. The new main PLC control panel (MSCP), RTU panels, HMI, actuators and VFD units shall communicate via Ethernet/IP networking protocol. The HMI shall display all parts of the system functionality and alarming. Text only information is not acceptable. Graphically represent all functions of the system with an easy-to-use menu system. Graphics that do not represent proper operation, process functionality, ease of use and operator interface shall be rejected.

C. All provided variable frequency drives (VFD) shall have Ethernet/IP connectivity to the PLC for monitoring and control. Hard wired control and monitoring shall be as shown on drawings and is limited. The existing blower VFD units shall be upgraded with Ethernet modules to be added to this communications structure. Each VFD shall have a soft programmed Auto/Manual in the PLC that can be selected by the operator. When in Auto, the VFD shall follow commands from the PLC as described below. In Manual, the operator shall have the ability to manually start/stop each motor and provide a speed setpoint (100% as default) from the HMI and SCADA system.

1. VFD information to be monitored at a minimum via the Ethernet connection (this information shall be available as a popup when a VFD or motor symbol on the display is pressed):

    a. VFD and Motor info
    b. Run status
    c. Fault status (included parameter and a lookup table so operator can easily identify drive fault problem)
    d. Motor torque
    e. Frequency and percentage (drive speed)
    f. Voltage (each leg)
    g. Current (each leg)
    h. Overload status

D. All provided electric actuators shall have Ethernet/IP protocol connectivity for control and monitoring as shown on drawings. Each actuator shall have a soft programmed Auto/Manual in the PLC that can be selected by the operator. When in Auto, the actuator shall follow the commands of the PLC as described herein. When in Manual, the operator shall be able to force valve opened or closed and if it is a positional type of actuator, set the position from closed to 100% open.

E. The new main PLC control panel HMI shall have trending for all flows, levels, temperatures and pressures of the system.

F. The HMI shall have an alarm summary screen.

G. The HMI shall have pop-up screens for all pump, actuators and other equipment controls.

H. All plant HMI graphics shall be accessible on a new desktop SCADA PC. SI to provide FT ViewPoint and make all necessary connections.

I. Flow rates shall have the following and be represented on HMI and SCADA graphics:

1. Current Flow Rate in GPM
2. Total Accumulated Flow in MGD
3. Current Hour Total in Gallons
4. Previous Hour Total in Gallons

5. Current Day Total in MGD
6. Previous Day Total in MGD
7. Current Week Total in MGD
8. Previous Week Total in MGD
9. Current Month Total in MGD
10. Previous Month Total in MGD
11. Current Year Total in MGD
12. Previous Year Total in MGD

2.2 PROCESS CONTROL AND MONITORING DESCRIPTIONS

A. New Main PLC Control Panel (MSCP - located in new electrical room)

1. The new MSCP shall be utilized for all new and some existing input/output signals, communications, local control and monitoring of the existing WWTP and all its functions.
2. Contractor shall allow time to go through operational functions of the system with the Owner and make adjustments that may be required.
3. MSCP shall have installed a cell modem to be utilized for remote connection by the operator(s) and for communications to remote lift stations.
4. MSCP shall communicate with the operator desktop computer, existing RAS/WAS PLC which will be relocated into the electrical room, the existing blower control panel VFD units, all remote lift stations and the new Screw Press PLC along with hardwired IO from the proposed drum screen control panel.
5. It will be the responsibility of the System Integrator to coordinate with manufacturer PLCs and equipment for monitoring and any noted control.

B. RAS/WAS System (R-WCP):

1. An existing RAS/WAS small PLC and control panel shall be updated to tie into the new MSCP. This panel shall be relocated to the new electrical room.
2. The PLC shall be programmed to receive new signals as shown in the schedule (minimum). The current programming shall remain and possibly modified as necessary. SI to allow some time for program modifications per operator choice.
3. A new radar level transmitter shall be added to the RAS/WAS wet well, monitored and used for primary control of RAS/WAS pumps.
4. The existing telescoping valves will have electric modulating actuators (GV2001 and GV2002) installed. Programming shall include soft manual control on the new SCADA screens for operator adjustments.

C. Blower System:

1. There is an existing blower control panel to control/monitor three blower units. These units feed air to the post aeration tank, aeration tanks and digester tanks. Currently, the blowers are set and controlled manually by the operator.
2. Ethernet cables shall be ran to each VFD unit within the blower control panel. Provide Ethernet modules for the existing VFD units. Units are ABB ACQ550-U1-059A-2.
3. The blowers feed air to the Post Aeration, Aeration and Digester tanks. The air piping will have new electric actuators installed to control air flow to each system. Each aeration and digester tank shall have new dissolved oxygen sensors.

4. The existing three blowers are all tied to the same header currently. Actuators installed shall allow separation for air control to the aeration tanks and then to the digester tanks. Each actuator can be controlled by the operator via the SCADA screens. As default, both header valves shall be open to allow any blower to feed aeration tanks and digesters. Actuated valves BV1002 and BV1003 shall be open for this air flow scenario.
5. Blower VFD units in the existing blower control panel shall have Ethernet modules added so that SCADA can monitor and control each VFD. Programming shall be setup so that the VFD speed will be controlled by a PID loop using dissolved oxygen as a process variable.
6. Systems shall be controlled as follows:
    a. Post Aeration:
        i. The new actuator installed at the post aeration system valve shall be of modulating type. Air flow shall be continuously feeding the post aeration system.
        ii. Using setpoints, provide post aeration air flow via the modulating valve actuator BV1001 so that the operator may adjust setpoint to allow the valve to be opened to a set position. As a default, set to 20% open.
    b. Aeration Tanks:
        i. There are two aeration tanks. Each shall have it's own dissolved oxygen (DO) sensor. The blower(s) assigned for aeration tanks use VFDs to control air flow to both tanks. Average the two dissolved oxygen sensor readings together to be coarse control for VFD speed. BV1004 (aeration tank #2) and BV1005 (aeration tank #1) shall be modulating actuators and shall be used as fine control based on each tank's individual DO reading.
        ii. Provide a coarse adjust setpoint to allow the operator to bump the air flow speed in 1% increments as an increase/decrease to the calculated average.
        iii. Only run one blower alternating each cycle. If air flow becomes insufficient based on dissolved oxygen readings, enable the second blower and operate both as described above.
        iv. Aeration tanks have fine diffusers.
    c. Digester Tanks:
        i. Digester tanks will be based on a time setpoint basis. Setup a scheduling algorithm so that the operator can control periods of time that the digesters receive air flow, start / stop and duration. When digester airflow is called to operate, open the digester air flow valves (BV1006 and BV1007). Operation of these valves shall be sole based on either manual setpoint by operator or automatically, when set, by dissolved oxygen readings to manipulate valve position increasing/decreasing air flow.
        ii. Digester tanks have coarse diffusers.

D. Drum Screen:

1. The existing drum screen and associated control panel shall be replaced. System Integrator shall be responsible for tying into this panel for monitoring and control via hardwire.
2. Provide a remote start, run status and general alarm signal for this panel.

E. Screw Press System:

1. The new filter press system shall be provided by the manufacturer with a new control panel with PLC based control and operation. Coordinate with the manufacturer for data

addressing database and integration into the SCADA system. Screw Press System PLC is typically a Rockwell Automation CompactLogix.

2. All filter press information shall be displayed on the new local HMI and new SCADA system. Provide appropriate alarms and warnings.

F. Duplex Grinder Pump Station:

1. Grinder pump station control panel shall be provided by the manufacturer and installed by the Contractor. For monitoring purposes, the Screw Press manufacturer will include inputs from this control panel for monitoring and the System Integrate shall make sure this data is included on the plant screens.
2. Communications to the Screw Press PLC shall be across fiber optic network connected by the System Integrator.
3. System Integrator to coordinate with both manufacturers to insurance all information is available.

G. Lift Stations:

1. The following lift stations shall get upgrades as shown in drawings:
   a. Short Street Lift Station:
      i. This lift station shall be relocated but will remain a duplex pump station with existing pumps.
      ii. The existing pump control panel shall be removed and returned to owner. The existing pump control panel from Case Street lift station shall be removed, modified (as shown in drawings) and installed at this station.
      iii. Provide four new floats for backup control and a new radar level transmitter in stilling tube for primary level control.
   b. Bank Lift Station:
      i. This station shall be reorganized as shown in the drawings.
      ii. An additional VFD control panel, as shown in the drawings, shall be provided.
      iii. The existing pump control panel shall be modified as shown.
      iv. Provide four new floats for backup control and a new radar level transmitter in stilling tube for primary level control.
      v. Provide a doppler clamp on type of flow meter to monitor station effluent flow rate.
      vi. The flow rate shall be used to provide VFD speed control while a pump is running. Programmer shall tune the loop for average flow over a time period as change of rate from this flow meter shall be frequent and it is not recommended to vary speed that quickly and often.
      vii. Pumps shall remain called on/off based on level control. If flow rate becomes too low not allowing wet well to draw down, override the flow control and enable level speed control to draw down the wet well.
   c. Eagle Drive Lift Station:
      i. This lift station shall have a new duplex pump control panel provided as shown in drawings. PLC shall be programmed to match other duplex pump lift station operations with radar level as primary level control and float backup as secondary.
      ii. Provide four new floats for backup control and a new radar level transmitter in stilling tube for primary level control.
      iii. The existing pumps are 240v, 1ph pumps. The new control panel shall be provided with provision of size for future 3ph pumps using VFD units as 1ph to 3ph conversion.
   d. Kelly Drive Lift Station:

i. This lift station is a primary control point and is a triplex station. The existing pump control panel has VFD units and operation of this station shall be modified as shown in drawings.
ii. A new meter vault with a 6" magmeter shall be provided.

e. Case Lift Station:
i. As an alternate, this lift station shall be decommissioned, and the existing pump control panel shall be modified and used at Short Street lift station.

2. Lift stations shall be installed with new cell modems which shall be utilized and set up to communicate data to MSCP at the WWTP.
3. Each site, at a minimum, shall pass the data as shown on the drawing.

2.3 GRAPHIC DESCRIPTIONS

A. General graphics descriptions for Main PLC HMI.

1. Provide all necessary graphic screens for a complete SCADA system for new project scope. Screens shall be developed as required to achieve control systems as described in Division 25 and as shown on contract drawings. Develop new screens to cover all new functionalities at the WWTP and remote lift stations. This includes graphics for systems as provided by other manufacturers such as the RAS/WAS System, Blower System, Screw Press System, Grinder Station, Clarifier System, Rotary Drum Screen, UV System and other.

2. Graphic screens shall comply with standards presented below or similar as approved by the Engineer. These shall include but not limited to:
a. Standard color convention
b. Standard security levels and schemes
c. Standard screen navigation and pop-up windows
d. Standard display screen design

3. Animation: In general, minimize unnecessary animation. Standard animation includes the following:
a. Animate variable signal bar graphs and tank levels.
b. Animate wet well water levels.
c. Unacknowledged alarm shall flash.
d. Change piping colors from light gray on no-flow condition, to process colors as described herein, on positive flow condition.
e. Change equipment status indication color as necessary and as described herein.
f. All animated level or flow indication will also include a digital dynamic value of that variable.
g. Flow direction by arrow movement (incremental flash).

4. Motor Control Pop-Up Window.
a. Provide a motor control pop-up window for each motor-controlled piece of equipment. Double-clicking equipment symbol shall open associated motor control pop-up window.
b. Pop-up for VFDs: Pop-up shall have Start/Stop Pushbutton, Manual/Auto Operation Pushbutton, Speed Control Variable Setpoint, Speed Reference Feedback, VFD Fault Indication and Total Runtime Hours. On/Off Status indication will be shown here as well as on the overview screen. Include all data as provided via the Ethernet connection.
c. Pop-up for Standard ACL Starters: Pop-up shall have Start/Stop Pushbutton, Manual/Auto

Operation Pushbutton, Fault Indication and Total Runtime Hours. On/Off Status indication will be shown here as well as on the overview screen.

d. Valve Control Pop-Up Window. Provide valve control pop-up window for every actuated process valve. Double-clicking valve symbol shall open associated control pop-up window. Pop-up shall have Open/Close function when in manual and a Manual/Auto Pushbutton. Open and Closed statuses will be shown on the pop-up as well as the overview screen.

5. Bitmap Images: In general, minimize unnecessary bitmap images (*.bmp, *.gif, *.jpg, etc.). Bitmap images may be used only if they are helpful and useful to the users.

6. Provide new screens for monitoring Generator and ATS switch position status. The following minimum Generator status signals shall be monitored on the SCADA system via Ethernet:

a. Run Status
b. Prewarning for low oil pressure
c. Prewarning for high coolant temperature
d. Low oil pressure shutdown
e. High coolant temperature shutdown
f. Over crank shutdown
g. Overspeed shutdown
h. Switch off/not in automatic start mode
i. Low coolant temperature
j. High battery voltage
k. Low battery voltage
l. Normal battery voltage
m. Fuel leak detection status
n. Unit ON-OFF-AUTO controls
o. Low Fuel

B. Descriptions of these screens are only for bidding purposes. It will be the responsibility of the Systems Integrator (for PLC and HMI) to provide all necessary screens to cover all operations of this facility and make the usage of a SCADA system as simple and easy to use for all operators of the utility company. All displays, graphical and other, shall be complete, organized, easy to read and completely tested to assure that all signals are linked correctly.

C. Include in bid up to four hours for a virtual meeting with Engineer to review Display Screens and requirements.

PART 3 EXECUTION

3.1 GENERAL

A. The System Integrator shall provide all materials and work necessary for a complete and functioning I&C system and shall have full coordination responsibility of the electrical, mechanical, and structural work as specified herein and as shown on the drawings. The System Integrator shall ensure that the instrumentation and control systems work is properly interfaced with equipment and other work furnished under other divisions of the contract documents.

B. The System Integrator shall install, make final connections to, adjust, test, and start-up the complete instrumentation and control system utilizing the technical service and advice of the various equipment and instrument manufacturers.

3.2 COORDINATION MEETINGS

A. Coordination and control loop review meetings shall be attended by representatives of the Contractor and the Systems Integrator, and the owner may be invited. The meetings shall be held at the Engineer's office periodically during the course of the project. The purpose of these meetings shall be to document the compatibility of the mechanical and electrical work as described in Article 3.01, paragraph A. above.

B. For bidding purposes, the Contractor and the Systems Integrator shall include cost for participation in no less than two (2) coordination and control loop review meetings. Each meeting shall require at least one-half working day.

3.3 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Materials and equipment shall be delivered to the job site at a maximum of ten days prior to installation and not before.

B. All instruments containing electronics components shall be stored off the ground in weathertight enclosures. They shall be kept dry at all times. All plug-in equipment which can be removed from panels without the necessity of disconnecting any wire terminations shall be removed from its panel before shipping. They shall be shipped in separate shipping containers.

C. All equipment covered by this specification shall be shipped in a thoroughly clean condition, free from sand, oil, grit or grease (except when required for lubrication), weld splatter, or other foreign materials. All panel openings shall be capped.

3.4 INSTALLATION

A. General

1. Installation shall be in strict compliance with individual equipment manufacturer's instructions.
2. All gages and indicators shall be mounted in the upright position.
3. Provide sufficient space around the equipment for maintenance and removal.
4. Cover front panels, gages and indicators, during construction for protection from weld and paint splatter.
5. Unless otherwise impractical, support instruments independent of process piping.

B. Installation Hardware

1. All nuts and bolts shall be stainless steel.
2. Support channels shall be stainless steel unistrut channels with stainless steel hardware.
3. Do not mount equipment directly to masonry or concrete walls. Provide unistrut channels on wall.

4. All equipment mounting plates shall be of 0.25-inch thick minimum stainless steel.
5. All contact surfaces between dissimilar metals shall be gasketed to prevent galvanic reaction.

C. Weather Protection

1. Unless noted otherwise or impractical, all externally located instruments shall be installed to face north.
2. All externally located instruments, indicators, totalizers, control panels and control stations shall be mounted on a panel or mounting plate, which shall be provided with an aluminum or stainless steel weathershield to protect the instruments from direct exposure to the sun and weather. This weathershield shall be 3" wider at each end and have a 6" overhang in front of the instrument. All edges shall be smooth and rounded.

3.5 EQUIPMENT IDENTIFICATION AND TAG NUMBERS

A. All apparatus, control equipment, and instruments, both panel and field mounted, shall be plainly identified, using the following methods:

1. Pipe-mounted instruments shall be provided with embossed stainless steel tags, which shall be attached to the instruments by means of stainless steel wire or tie wrap.
2. Wall, plate, or panel mounted instruments shall be provided with engraved laminated plastic tags, which shall be mounted above, or below instruments. The plastic tags shall be mounted at eye level and shall be visible from a minimum distance of 20 feet. Lettering shall be black on white background.

B. Tag numbers and engraved or embossed text shall be as shown on the drawings, or as approved by the Engineer during shop drawing approval.

C. Tag numbers shall conform to the current Instrument Society of America (ISA) Standards, unless otherwise noted, which shall consist of a multi-character prefix, followed by a loop number. Tag numbers shall be as indicated on the drawings.

3.6 TESTING AND CALIBRATION

A. Test all analog loop zeroes and spans by disconnecting wiring at each transmitter and substituting an approved 4-20madc generator. Adjust the indicators and receiving instruments to indicate the correct value, correlated to the simulated current signal.

B. Test all annunciator points by placing jumpers across normally open contact inputs, or by disconnecting wiring on normally closed contact inputs.

C. Submit testing and calibration reports for all instruments to the Engineer.

3.7 COMMISSIONING

A. This activity shall consist of individual loop/instrument tests, overall systems test, and Operator training. Each test shall be witnessed by representatives of the Contractor, Systems Integrator, Owner, and Engineer.

1. Loop Operation Test: The objective is to demonstrate that the instrumentation and control system individual instruments are ready to be placed into permanent operation. Each loop shall be tested and demonstrated.
2. Control Function Test: The objective of this test is to demonstrate that all local and remote-control panels, control stations, MCC, and Operator interface functions are ready to place into permanent operation. All features of the WWF-PLC, WWF-CSO and HMI shall be demonstrated.
3. The Contractor shall prepare an agenda for the commissioning and submit to Engineer as part of the shop drawing submittal package.
4. The Contractor shall conduct training as specified.
5. Substantial completion of the system shall not be approved until satisfactory completion of the above commissioning tasks.

3.8 WARRANTY

A. The Instrumentation and Control System shall be fully warranted and guaranteed from defect for a one-year time period, beginning at the date of substantial completion.

B. During the warranty period adjust, recalibrate, repair, replace and otherwise place back into service any instrument and any item(s) that may require service, including software, at no additional cost to the Owner for any reason.

C. During the warranty service, provide unlimited on-site software and operation support, at no additional cost to the Owner for any reason.

D. Respond to a call for service within 24 hours.

E. At approximately six months completion of the warranty period, visit the plant and perform routine diagnostics and tests to determine on-going operation and performance of the I & C system within the project requirements. Make any and all repairs and adjustments necessary at no additional cost to the Owner for any reason. Conduct additional “follow-up training” to assist the Owner in operation of the plant and to address any operational concerns that may have become known after six months of operation.

END OF SECTION 25 13 00

SECTION 25 30 00 - FIELD MOUNTED INSTRUMENTS

PART 1 - GENERAL

1.1 DESCRIPTION OF WORK

A. The work required under this section includes the provision, installation, start-up, testing and calibration of all field mounted instruments required for this project. Please note that this project is a BABA compliant project. The radar level transmitters specified herein are not BABA compliant but are preferred unit. Coordinate with Contractor for meeting 5% non-BABA equipment.

B. This section covers field mounted instruments provided separately from a manufactured system or process equipment package, to be used on the various portions of the project, and the Contractor shall meet the requirements of these Specifications wherever applicable.

C. The types of field mounted instruments required for this project include the following:

1. Magnetic Flow Meter
2. Float Switches
3. Radar Level Transmitters
4. Pressure Transmitters
5. Temperature Transmitters
6. For VFD units in control panels, see Division 26

1.2 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in manufacture of field mounted instruments and systems of types and sizes required, whose products have been in satisfactory use in similar service, and whose products meet all requirements specified herein.

B. Installer: Qualified with successful installation experience on projects with field instrument work similar to that required for this project.

1. It is intended that an experienced electronic systems/instrumentation and control systems subcontractor shall be in responsible charge of all field instrument work.

C. ISA Compliance: Comply with applicable Standards and Practices for Instrumentation published by the Instrument Society of America pertaining to field mounted instruments and related installations.

D. UL Compliance and Labeling: Comply with provisions of UL safety standards pertaining to electrical systems, and provide products and components which have been UL-listed and labeled whenever such UL listed products are available.

E. NEC Compliance: Comply with requirements as applicable to construction and installation of field mounted instruments and installations.

1.3 SUBMITTALS

A. Prepare and submit shop drawings and descriptive data for each instrument and information regarding field installation of each instrument.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Ship instruments and accessories properly protected and packaged.

B. Handle instruments and accessories carefully to prevent damage and protect from weather.

PART 2 - PRODUCT

2.1 GENERAL

A. For each field mounted instrument, provide a complete assembly with all required components, enclosures suitable for the environment and location, fittings, mounting brackets, and other components and accessories as needed to form a complete system.

B. Provide conduit, raceway accessories, wiring and connections necessary to place the instruments into service and necessary to interface the instruments to other equipment control panels, programmable controllers, SCADA system, and similar installations as required for the project.

C. Include TVSS units as specified per specification 25 30 00 where required.

2.2 RADAR LEVEL TRANSMITTER (used for level and flow rate where shown)

A. General This section describes the requirements for a 2-wire Radar level measuring system. Under this item, the contractor shall furnish and install the level measuring system, and all associated equipment and accessories as indicated on the plans and as herein specified.

B. The microprocessor based high performance loop powered 2-wire Radar level transmitter shall employ microwave pulse ranging technology operating on 6.3 GHz to determine the distance to the monitored surface(s), as a basis for display, output, and digital communication. The unit should be configurable using remote and local interface.

C. The level system shall consist of a transmitter/receiver, a rod antenna and a signal processor for continuous measurement of material levels of liquids and slurries in open or closed tanks or in stilling wells or in standpipes, without contacting the medium. Where shown on drawings, radar shall be installed within stilling tubes.

D. The radar level transmitter shall:

1. Measure level, distance, space, and volume of the medium in the vessel
2. Apply 11-point linearization to ensure accurate measurement in non-standard vessels.
3. Be 2-wire loop powered.
4. Create a digitized echo profile, and apply patented Sonic Intelligence echo- processing

techniques to select and verify the echo representing the reflective surface monitored.

5. Process signal using advanced echo-processing techniques such as Auto False- Echo Suppression, and Agitator discrimination for maximum verification of the measurement, display and outputs.
6. Be NEMA 4x and FM approved for Class I Division 1 areas Groups A,B,C,D with Intrinsically Safe Barrier.
7. Have a Polybutylene Terephthalate enclosure with a Polyether Imide lid.
8. Have a single material for rod antenna and integrated threaded connection
9. Compact electronics mounted in a rotating head.
10. Provide user interface via local multi-graphic display with bar graph for readout & entry, and via analog current output.
11. Communicate digitally by HART as a built-in standard.
12. Be commissioned without opening the lid, using intrinsically safe Infrared hand held programmer locally, or remotely using HART hand held unit or Simatic PDM software package.

E. Product Specification

1. Service: As noted
2. Fluid: As noted, turbulent surface
3. Operating Pressure: As noted
4. Process Temperature: minus 40 to 80°C (minus 4°F to 176°F)
5. Humidity: 10 to 90%
6. Installation Drawing: As noted
7. Application: Level and volume monitoring in Closed tanks / Open Wet wells

F. Performance

1. Range: 0.3 to 20 m (1.3 to 65')
2. Accuracy: +/- 10 mm or +/- 0.1% of the range, whichever is greater
3. Repeatability: +/- 5 mm
4. Fail-safe: mA and "reading" programmable high, low or hold, or user selectable upon Loss of Echo **(**LOE**)** condition.

G. Sensor

1. Measuring Principle: Pulse-based microwave
2. Frequency: 6.3 GHz

H. Warranty

1. In the event of component failure during the warranty period, the manufacturer shall promptly replace the unit at no cost to the Owner.

I. Acceptable Manufacturers

1. Manufacturer shall be an ISO 9000 rated facility. The unit shall be as manufactured by the following:

a. Vega VegaPuls and Vegamet 861 Controller
b. Endress & Hauser FMR67
c. Siemens Sitrans Probe LR200
d. Or equal.

J. Installation

1. Each piece of equipment shall be rated for the location it will be mounted.
2. The unit shall be installed according to the manufacturer's recommendations.
3. Mount the sensor to insure a clear path to the surface being measured.
4. Provide stainless steel or FRP mounting brackets as required.

2.3 MAGNETIC FLOW METERS

A. Acceptable Manufacturer:

1. E&H Promag W400 with remote electronics
2. Krohne Optiflux 4000 and IFC-300 Convertor
3. ABB
4. or approved equal

B. METER:

1. All magnetic flow meter housings and connections shall comply with the local area rating of where it is to be installed. Refer to contract drawings.
2. Meter shall be provided with zero upstream and downstream pipe diameter requirement.
3. Shall be a velocity sensing electromagnetic type flanged tube meter with sealed housing for 150 PSI working pressure. The meters shall be a 16-inch for West side of Cline Ave. plant manhole.
4. Meters shall have a digital indicator having a range as shown below, shall be equipped with a 9 digit digital totalizer reading in units of US gallons, and shall be accurate within 0.5% of actual flow.
5. The indicator display shall be direct reading. The system shall be designed for an ambient temperature range of -4o F to 125o F and a 120 VAC 60 Hertz power supply. The system power consumption shall be approximately 5 watts per inch diameter. The meter assembly shall operate within a range of 0.2 FPS to 32 FPS and be constructed as described herein.
6. The sensors have a rugged, robust construction to ensure a long, maintenance-free life under the arduous conditions experienced in the wastewater industry. The sensors shall be inherently submersible (IP68, NEMA 6P), thus ensuring suitability for installation in chambers and metering pits that are susceptible to flooding. The meters shall be designed for the measuring the material (MLSS and sludge) for which they are being specified.

D. METER TUBE (SENSOR):

1. Shall be fabricated stainless steel pipe and use 150 lb. AWWA Class "D" flat face steel flanges (UM06) or 300 lb. AWWA Class "F" raised face steel flanges (UM08). The internal and external of the meter tube shall be blasted and lined with a NSF approved fusion bonded epoxy UltraLiner™, applied by the fluidized bed method.

2. Meter tubes shall have a constant nominal inside diameter offering no obstruction to the flow. Electrodes shall be 316 stainless steel.

E. MAG SHIELD:

1. Shall be welded to the tube providing a completely sealed environment for all coils, electrode connections and wiring harness capable of NEMA 6P/IP68 operation.

F. SIGNAL CONVERTER:

1. Shall be pulsed DC coil excitation type with auto zeroing. The converter shall indicate direction of flow and provide a flow rate indication and a totalization of flow volume for both forward and reverse directions. Both forward and reverse totalizers shall be electronically resettable.
2. The flow meter converter shall be microprocessor based with a keypad for instrument set up and LCD displays for totalized flow, flow rate engineering units and velocity.
3. The converter shall power the flow sensing element and provide galvanically isolated dual 4-20mA outputs. 4-20 mA outputs shall be capable of system integration with a central terminal unit or a PLC. It shall be possible, in the test mode, to easily set the converter outputs to any desired value within the range. The 4-20mA scaling, time constants, pipe size, flow proportional output, engineering units and test mode values shall be easily set via the keypad and display.
4. Four separate fully programmable alarm outputs shall be provided to indicate empty pipe, forward/reverse polarity (normally open/close), analog over-range, fault conditions, high/low flow rates, percent of range and pulse cutoff.
5. The converter shall periodically perform self-diagnostics and display and resulting error messages. All set up and data and totalizer values may be protected by a password.
6. The converter shall be remotely mounted up to 500 feet from the sensor, and shall be supplied in a sealed IP67 rated enclosure. Calibration will be completed at the manufacturer's location in accordance with customer supplied application-based requirements.

G. GROUNDING RINGS:

1. Shall be 316 stainless steel and shall be supplied with the meter tube. Exception: On sensor models which use grounding electrodes, grounding rings are optional. For best performance, grounding rings are recommended for all sizes.

H. POWER AND SIGNAL ISOLATION:

1. The power supplied between the converter and the meter tube (sensor) and signal between the meter tube and the converter shall be isolated and placed in separate submersible cables.

I. SERVICE & SUPPORT:

1. Supplier must have flow calibration laboratories and personnel to perform testing and certify calibration. Personnel must also provide instruction or training as required assuring meters are supported and maintained throughout the guarantee period.

J. VOLUMETRIC TESTING:

1. All meters must be performed and approved prior to shipment. The complete meter assembly and signal converter must be wet accuracy tested and calibrated. The test facility must be rigorously traceable to an accuracy of ±0.15% with the National Institute of Standards and Technology. If desired, the test shall be witnessed by the customer or their selected agent. A copy of the certified accuracy test record must be furnished at no charge to the Owner.

2.4 FLOAT SWITCHES

A. Float switches to be used for backup level control and/or primary control as indicated on drawings.

B. Operating Principle

1. Direct acting, non-mercury float switch, encased in an ellipse shaped molded plastic float, connected to a factory installed cable. Float cable length to be determined by Contractor.
2. The float shall be either pipe-mounted, or suspended by its cable by means of a weight kit, as indicated in the equipment data.

C. Specifications

1. Construction

a. Float material: High impact styrene
b. Mounting: 3/16" SS aircraft cable attached to a 10 pound concrete weight or similar coated boat anchor.
c. Strap float cables individually with PVC cable ties to aircraft cable. This shall allow removal of one float without affecting the other floats.
d. See Drawings for float switching elevations.

2. Electrical

a. The switch contacts shall be normally open or normally closed as indicated in the equipment data.
b. The switch contacts shall be rated 6 amperes, non-inductive at 120 Volts AC. Switches shall be normally closed unless noted otherwise.
c. The cable shall be two fine-stranded AWG #18 conductors in heavy-duty type SJO- W Neoprene jacketing. Standard length of the cables shall be 40 feet.

3. Performance

a. The switch shall make and break over a 1-inch level change.

4. Manufacturer

a. Dura float
b. Approved equal

2.5 PIPE MOUNTED PRESSURE SENSOR

A. Summary

1. Pressure transmitters shall be utilized in this application to continuously monitor system pressure on the discharge side of the blower system.
2. Section Includes: Pressure transducer with piezo-resistive ceramic sensor resistant to overload in a stainless steel housing.
3. Related Sections:
   a. Control and Information System Scope and General Requirements
   b. Powered Instruments, General
4. Pressure transmitters shall conform to these ranges (contractor shall provide 1 spare for each range):
   a. Blower discharge piping: 0 – 300 PSI

B. Submittals

1. Furnish complete Product Data, Shop Drawings, Test Reports, Operating Manuals, Record Drawings, Manufacturer's certifications, Manufacturer's Field Reports
2. Product Data:
   a. Dimensional Drawings.
   b. Materials of Construction:
   c. Measurement accuracy.
   d. Range and range ability.
   e. Enclosure Rating.
   f. Classification Rating.
   g. Power: Output options.

C. Quality Assurance

1. Manufacture instruments facilities certified to the quality standards of ISO Standard 9001 - Quality Systems - Model for Quality Assurance in Design/Development, Production, Installation, and Servicing.

D. Delivery, Storage, And Handling

1. Store all instruments in a dedicated structure with space conditioning to meet the recommended storage requirements provided by the Manufacturer.

E. Project Or Site Conditions

1. Provide instruments suitable for the installed site conditions including, but not limited to, material compatibility, site altitude, process and ambient temperature, and humidity conditions.

E. Maintenance

1. Provide all parts, materials, fluids, etc. necessary for maintenance and calibration purposes throughout the warranty period. Deliver all of these supplies before project substantial completion.

E. Calibration And Warranty

1. The manufacturer shall warranty the meters for manufacturing defects for a period of 18 months after shipment or 12 months after startup or 36 months if commissioned by a Factory field service representative or a manufacturer authorized service provider.

E. Lifecycle Management

1. Equipment life cycle management shall be via web enabled system. System shall contain records related to initial factory settings, subsequent field calibrations, and full history of calibrations, service and software related to the specific device(s).

F. Manufacturer

1. Kobold 86/87 Series
2. Or approved equal.
3. All pressure type sensor to be by same manufacturer.

G. Manufactured Units

1. The pressure transmitter shall be a loop-powered, two-wire device requiring a 11-30 VDC power input with a 4-20 mA DC output, superimposed on the power input lines, proportional to the calibrated span. The sensor shall have a + 5% zero point adjustment with no on site calibration required.
2. The transmitter shall be housed in a compact 304SS enclosure and shall be designed and constructed to allow for direct mechanical mounting by the process connection, requiring no additional mounting hardware. The enclosure shall be NEMA4X with the option of NEMA 6P submersible if ordered with cable end.
3. The transmitter shall utilize capacitance technology in conjunction with a dry cell (no oil fill) ceramic diaphragm design for pressures up to 500 PSIG/A.
4. The ceramic diaphragm shall be immune to damage due to vacuum and shall have an overpressure (proof) pressure rating of:
   a. 150 PSI for URL of 0-15 PSI
   b. 350 PSI for URL of 16-50 PSI
   c. 600 PSI for URL of 51-300 PSI
   d. 850 PSI for URL of 301-500 PSI
5. Otherwise, the transmitter shall utilize Polysilicon sensor technology in conjunction with SS316L diaphragm design for pressures up to 6000 PSIG/A. The sensor shall be compatible with vacuum to 0.295"Hg absolute and shall have an overpressure (proof) pressure rating:
   a. 60 PSI for URL of 15 PSI
   b. 2400 PSI for URL of 500 PSI
   c. 6000PSI for URL of 1500 PSI
   d. 9000 PSI for URL of 6000 PSI
6. The accuracy shall be ± 0.5 % of full span including hysteresis and repeatability. The change of zero point between -4…+185 degrees F shall be no more than 1.5%. Long-term stability shall not exceed a 0.15% shift per year.

2.6 AIR TEMPERATURE TRANSMITTERS

A. Platinum RTDs: Common Requirements:

1. Temperature shall be monitored within 3 areas of the facility. See drawings.
2. 100 or 1000 ohms at zero deg C and a temperature coefficient of 0.00385 ohm/ohm/deg C.
3. Two-wire, PTFE-insulated, 22-gage stranded copper leads.
4. Performance Characteristics:

   a. Range: ~Minus 50 to 275 deg F.

b. Interchangeable Accuracy: At 32 deg F within 0.5 deg F.
c. Repeatability: Within 0.5 deg F.

5. Self-Heating: Negligible.

a. Transmitter Requirements:

6. Transmitter required for each 100-ohm RTD.

B. Transmitter optional for 1000-ohm RTD, contingent on compliance with end-to-end control accuracy.

C. Transmitter shall have an explosion proof housing meeting a minimum of C1D2 classification as an intrinsically safe device.

D. Manufacturer:

1. Pyromation
2. Kobold
3. Other

2.7 DISSOLVED OXYGEN CONTROLLER AND SENSORS

A. The existing wastewater facility has two aeration tanks and two digester tanks. Each of the two aeration tanks shall have pH, ORP and dissolved oxygen (DO) sensors. Each of the two digester tanks shall have DO only. Provide two controllers with minimum of four sensor inputs and a hazardous location enclosure.

B. It is preferred for the controllers to communicate directly to MSCP via Ethernet/IP.

C. GENERAL

1. Section includes:
   a. A dual channel water quality sensor transmitter with a local user interface AND the ability to access sensor data remotely through a browser enabled device.
   b. Scope
   c. Provide labor, material, equipment, related services, and supervision to install and operate the controller to drawings and manufacturer's specifications.
2. Alternates
   a. Parameter-specific controllers that do not allow changing parameter configurations in the field are unacceptable.
   b. Controllers or transmitters without the possibility to access data through an internet browser enabled device and cannot present real-time instrument diagnostics are not acceptable.

D. System Descriptions
1. Design requirements
   a. Includes capability to actively monitor all internal components and present diagnostics on the overall health of connected sensors and time to next

required maintenance, reducing user risk.
1) Ability to see and be notified of upcoming and past due maintenance.
b. Includes capability to provide real-time alerts when sensor issues occur with built in workflows with step-by-step guidance to perform calibration and maintenance tasks, reducing user risk.
c. Includes ability for a cellular network coverage OR Wi-Fi connection OR a LAN connection.
d. Supports advanced communication protocols, including Profibus DPV1, Modbus TCP/IP, Profinet IO, and Ethernet IP.
e. Provides capability to view all connected plant measurements, alerts, calibration, and maintenance status in real time on any internet browser capable device.
1) Connects with overall data system for real time graphic of both online and laboratory data for a full picture of functional plant operational capability.
f. Controller designed to be used in indoor or outdoor locations.

2. Performance Requirements
a. The controller accepts digital sensors in any combination to measure the following water quality parameters:
1) pH/ORP
2) Conductivity
3) Dissolved Oxygen
4) UV Organics
5) Sludge level
6) Ammonium
7) Ammonia
8) Nitrate
9) Combination Ammonium and Nitrate
10) Total suspended solids
11) Orthophosphate
12) Turbidity
13) Free/total Chlorine
14) Combination Chlorine HOCl /Chlorine+Acid / Total free chlorine
15) Ozone in water
16) Chlorine Dioxide
17) Oil in Water
18) Nitrite

3. Environmental Requirements
a. Operational Criteria
1) Operating Temperature:
- Ethernet version: –20 to 45 °C (–4 to 113 °F)
  Cellular version including Controller and external Cellular USB BOX: -20 to 60
  °C (-4 to 140 °F)
- Wi-Fi version including Controller and external Wi-Fi USB BOX: -20 to 60 °C (- 4 to 140 °F)

2) Storage temperature: –20 to 70 °C (–4 to 158 °F)
3) Relative humidity: 0 to 95%, non-condensing

4) Altitude ≤3000m (6,562 ft.)

E. Certifications
1. EMC: CE approved (with all sensor types). Listed for use in general locations to UL and CSA safety standards by ETL (with all sensor types).
2. Safety: General Purpose UL/CSA 61010-1 with cETLus safety mark
3. Possibility for Hazardous Locations Use: **Class 1 Div 2**

F. Warranty
1. Warranted for 1 year from date of shipment from manufacturer defects.

G. Unscheduled Maintenance
1. Clean controller face
2. Calibrate mA output signals

H. Manufacturer
1. Hach Company SC4500 Controller
2. Approved equal

I. Manufactured Unit
1. Microprocessor-based sensor controller.
2. Change digital sensors connected to the controller by unplugging and plugging in sensors as necessary.

J. Modules for connection of Analogue sensors for pH, ORP or Conductivity
1. The controller is available with the following power requirements:
AC powered: 100–240 VAC ±10%, 50/60 Hz; 1 A (28 W sensor load)
DC powered: 24 VDC +15% –20%; 2.5 A (20 W sensor load)
2. The controller uses a menu-driven operation system.
3. The controller is equipped with a real-time clock.
4. The controller is equipped with two security levels.
5. The controller shall have worded operation menus in 24 languages.
6. The controller is equipped with an USB reader for data download and controller software upload.
7. High voltage:
Two relays (SPDT);
Wire gauge: 0.75 to 1.5 mm2 (18 to 16 AWG)
AC controller
Maximum switching voltage: 100–240 VAC
Maximum switching current: 5 A Resistive/1 A Pilot
Duty Maximum switching power: 1200 VA
Resistive/360 VA Pilot Duty **DC controller**
Maximum switching voltage: 30 VAC or 42 VDC
Maximum switching current: 4 A Resistive/1 A
Pilot Duty
Maximum switching power: 125 W Resistive/28 W Pilot Duty
8. Five analogs 0/4-20 mA outputs are provided with a maximum impedance of 500 ohms.
a. The controller can be equipped with five 4-20 mA outputs with a maximum

impedance of 500 ohms.
b. The following can be programmed:
1) Alarms:
- High and Low alarm point
- High and Low alarm point deadband
- On and Off delay

2) Controls
- Linear
- PID

9. The controller can be equipped with the following forms of communication:
a. Profibus DP
b. Modbus TCP/IP
c. Profinet (ODVA certified)
d. Ethernet IP (ODVA certified)
10. The controller can host one of the compatible RTC modules
11. All user settings of the controller are retained for 10 years in flash memory.
12. The controller is equipped with a system check for:
a. Motherboard temperature
b. Field auto-test

K. Equipment
1. Materials
a. Housing: polycarbonate, aluminum (powder coated), and stainless steel Metal enclosure with a corrosion-resistant finish
b. Rating: UL50E type 4X, IEC/EN 60529–IP 66, NEMA 250 type 4X
2. Conduit openings: 0.5 in. NPTController as described in section 1.1.A
3. Mounting hardware for wall, pipe, and panel mounting
4. User manual and installation documentation
5. Dimensions: Refer to controller drawings
6. Weight: 1.7 kg (3.7 lbs.)

2.2 Instrument Options & Accessories

[ ] Power cord (specify geography)
[X] **Hazardous location rating (C1D2)**
[ ] Internet Connection (via LAN, Cellular, or Wi-Fi)
[ ] Modbus TCP/IP
[ ] 4-20mA input module
[ ] 4-20mA output module, 5 outputs
[ ] Profibus DP network module [ ] Profinet IO (ODVA certified)
[X] **Ethernet IP (ODVA certified)**
[ ] M12/RJ45 connector kit (Ethernet cable) [ ] M12/M12 connector kit (Ethernet cable) [ ] LZY472-01 USB adapter
[ ] Ethernet cable M12 to M12, 10 m [ ] Ethernet cable M12 to RJ45, 5 m

[ ] Mobile holder
[ ] Memory-Stick (USB)
[ ] UV protection screen
[ ] UV protection screen with sun roof [ ] Cellular USB Box
[ ] Wi-Fi USB Box
[ ] RTC Module

PART 3 - EXECUTION

3.1 INSTALLATION - GENERAL

A. Each instrument or system shall be installed, wired, calibrated, and tested in strict compliance with the manufacturer's instruction. Calibrate for operational range required for this project.

B. Installation Hardware

1. All nuts and bolts shall be stainless steel.
2. Support channels mount externally, or mounted in a corrosive atmosphere, shall be stainless steel unistrut channels.
3. Do not mount equipment directly to masonry or concrete walls. Provide unistrut channels on wall.
4. All equipment mounting plates shall be of 0.25-inch thick minimum stainless steel.
5. All contact surfaces between dissimilar metals shall be gasketed to prevent galvanic reaction.

C. All test instruments used for field calibrations shall have a minimum accuracy of 3 times greater than that of the instrument being calibrated. Test instruments shall have been calibrated to National Bureau of Standards requirements within 6 months of their use on this project. Provide evidence of such calibration upon request by the Owner of Engineer.

D. Final conduit connection to the instruments shall be through watertight flexible conduit. Where noted, final connection shall be by extra hard service cable rated for wet location. Use explosion-proof or liquid-tight flexible conduit where required.

E. Line powered units shall receive 120-volt AC supply through a disconnect switch and surge protector, see specification 13600 for description.

3.2 ENVIRONMENTAL PROTECTION

A. Transmitters and similar items located outdoors or in unheated or untreated spaces must be manufactured for the environment to be encountered. If not suitable for the environment where located, the Contractor shall provide a heated and insulated and exhaust fan ventilated enclosure suitable for the environment, to protect the transmitter or instrument.

B. All transmitters and local control stations shall have aluminum sheet metal sun shields/weather shields.

3.3 CALIBRATION

A. In addition to the above requirements, calibrate each system as follows:

1. Each system, including its complete instrument loop, shall be calibrated. Reading on the remote receiving instruments shall be equal to reading at the converter indicator.
2. Provide a written loop-calibration report for each system, which shall include but shall not be limited to the following:

a. Date & time the final calibration was completed.
b. Atmospheric conditions when the final calibration was performed.
c. Comparison of readings at the converter with readings at the remote receiving instruments.
d. Provide a table showing calculated and measured values at 0%, 25%, 50%, 75% & 100%.
e. Verification of accuracy of the outputs, including those at the receiving instruments.
f. Verification of operation of all contact outp8uts, including those at the receiving instruments.
g. Description of method of calibration.
h. The names and signatures of personnel performing the calibration. Provide room for 2 names.
i. The names and signatures of engineer's field representatives. Provide room for 2 names.
j. Special comments or notes, including "as left" conditions.
k. This report may be 2 pages if required for each instrument.

END OF SECTION 25 30 00

SECTION 25 30 10 - INSTRUMENT PANEL CONSTRUCTION

PART 1 - GENERAL

1.1 DESCRIPTION

A. This specification covers the technical requirements for the fabrication, engineering, wiring and installation for instrument panels and enclosures. This is a BABA compliancy project.

B. The instrument panels shall be as shown on the drawings. They shall include, but shall not be limited to the following:

1. Main PLC Control Panel with HMI (MSCP)
2. Existing RAS/WAS Control Panel modifications
3. Existing Blower Control Panel modifications
4. Existing UV System Control Panel integration
5. Existing Clarifier Control Panel integration
6. Drum Screen Control Panel integration (provided by manufacturer)
7. Screw Press Control Panel integration (provided by manufacturer)
8. Duplex Grinder Station integration (provided by manufacturer)
9. Eagle Drive LS Pump Control Panel (complete)
10. Existing Kelly Drive LS Pump Control Panel modifications
11. Existing Short Street LS Pump Control Panel modifications (modification and reuse of Case lift station pump control panel)
12. Existing Bank Pump Control Panel modifications
13. New Bank LS VFD Control Panel

1.2 SUBMITTALS

A. Submittals shall be as specified in the appropriate sections.

B. Each panel submittal shall have a complete layout drawing of all equipment and a parts list.

PART 2 - PRODUCTS

2.1 GENERAL

A. The instrument panels and enclosures shall be as follows:

1. Located in environmentally controlled (heated and ventilated) rooms, shall be steel rated NEMA 12.
2. General instrumentation and control panels located outdoors or in non-air-conditioned areas shall be stainless steel rated NEMA 4X.

B. NEMA 12 enclosures shall be painted electro-statically, prior to equipment installation:

C. The exterior surfaces of a NEMA 4X stainless steel enclosure shall not be painted. The finish shall be sandblasted, roughened or chemically etched to reduce gloss, reflections & glare.

D. Conduit knockouts on the enclosure shall be made prior to installation of any equipment within the enclosure. The size and the number of conduit knockouts shall be as required. Provide malleable iron watertight conduit hubs for all NEMA 4X enclosures.

E. All enclosures exposed to weather conditions shall be provided with sun shields to protect the enclosure from direct exposure from the sun and rain.

2.2 PANEL CONSTRUCTION

A. General

1. Stiffening members shall be provided for strength and stiffness as required.
2. Seamless welded construction shall be used throughout. All exposed seams shall be continuously welded and ground smooth.
3. Lifting rings shall be provided for panels in excess of 100 pounds.
4. Subpanels shall e provided as required, with mounting designed for easy removal. The subpanels shall be finished with 2 coats if white enamel paint.
5. Print pockets shall be attached to the interior side of each door.
6. Hinges shall be stainless steel piano type.

B. NEMA 12 Enclosures

1. NEMA 12 enclosures shall be fabricated from 12 gauge cold rolled sheet steel or better.
2. Double doors shall be of the flush type construction with continuous hinge and gasket.
3. Doors shall be equipped with three-point latching mechanism and door locks.
4. Corrosion inhibitors shall be furnished for corrosion control inside the panel.

C. NEMA 4X Enclosures

1. Nema 4X enclosures shall be fabricated from 14 gauge stainless steel or better.
2. Enclosure door shall be provided with neoprene gasket, which shall be attached to the enclosure with oil-resistant adhesive, and held in place with stainless steel retaining strips.
3. Door clamps shall be provided on three sides of the enclosure door.
4. A hasp and staple shall be provided for padlocking.
5. Panel heaters, corrosion inhibitors and breather drains shall be furnished for condensation and corrosion control inside the panel. Panel heaters shall be of the forced air types, provided with integral thermostat control.

D. PANEL GROUNDING

1. Where noted or specified, provide a ground bus tied to the facility grounding system.

2. The ground busbars shall be of nickel-plated copper, rated for at least 100 amperes.

3. The busbar shall be provided with two (2) screw clamp terminal blocks, which shall be capable of accepting conductors up to #2 AWG.
4. The busbar shall be provided with a minimum of twenty (20) screw clamp terminal blocks, which shall be capable of accepting conductors up to #10 AWG.

2.3 PANEL WIRING

A. Wiring within the enclosure shall be continuous and shall be terminated only at terminal blocks or equipment terminals.

B. Not more than two wires shall be terminated at any terminal.

C. Wiring splices and wire nuts will not be permitted within the enclosure.

D. Wiring within the enclosure shall be protected as follows:

1. In general, all wiring within the enclosure shall be put in plastic wiring ducts. Wiring ducts shall be sized to include 100% (percent) spare capacity.
2. Wiring outside of the ducts shall be restrained by means of plastic ties.
3. Wiring passing a door hinge shall be grouped and wrapped in a protective wire harness.
4. Provide abrasion protection for any wire bundles passing through holes or across sheet metal edges.

E. In general, wiring within the enclosure shall be as follows:

1. 120VAC control wiring within and external to the enclosure shall be #14 AWG stranded.
2. DC control wiring within the enclosure shall be #16 AWG stranded.
3. Wiring for long distance DC signals shall be #14 AWG stranded.
4. Wiring for 4-20 mA DC analog signals shall be #16 AWG twisted shielded pair.

F. In general, wiring within the enclosure shall follow the following color convention to comply with NFPA 79 (1994), part 16.

G. AC and DC wiring shall be separated from each other. Where AC and DC wire runs parallel, the minimum separation between them shall be four (4) inches. Where AC and DC wire runs cross, they shall cross at 90o. Provide separate wiring duct for AC and DC wiring.

H. Equipment and signal ground wiring, as well as Neutral wiring, shall not be daisy-chained; they shall each be terminated at isolated, bussed terminal blocks.

I. Each conductor end shall be terminated at a terminal block or at an equipment wiring terminal. Each terminal block shall have a unique identification number. The terminal blocks shall be arranged and numbered in consecutive order, based on standard alpha-numeric order.

J. Terminal blocks within each enclosure shall be grouped for the voltage and type of circuit connected.

K. Provide 25% spare terminal blocks (minimum of six) for each type used in each enclosure.

2.4 TERMINAL BLOCKS

A. Terminal blocks within enclosures shall be of the high-density modular types, constructed of nylon material, suitable for mounting on standard DIN rails. Termination type shall be tubular screw with serrated pressure plate. The terminal block system shall be manufactured by Phoenix Contact, Weidmuller, or pre-approved equal.

B. All current carrying parts (metal bodies) shall be made of nickel/tin-plated copper.

C. Ground terminals shall be color coded in accordance with international standard, which shall be yellow/green.

D. Matching jumper bridges shall be color coded to the wiring colors.

E. Panel power distribution fused terminal blocks shall be provided with disconnect lever puller mechanism and illuminated indication.

2.5 PANEL ACCESSORIES

A. The Systems Integrator/enclosure fabricator shall be responsible for all accessories, including interposing relays, analog signal isolators, terminal blocks, power distribution blocks, grounding blocks, fuse blocks and fuses, circuit breakers, duplex receptacle, heaters, exhaust fans, louvers and filters, DIN mounting rails, plastic wiring channels, hardware, wire tags, engraved nameplates, and all such accessories needed for a professional class panel fabrication.

B. Panels shall have the appropriate cooling and heating equipment. Panels located indoors with climate control shall require proper cooling and exhaust fan units when VFD units are installed. Panels with VFD units located outside shall have a properly sized air conditioning and heating unit.

C. Panels located outdoors shall include corrosion inhibitors for environment protection.

2.6 PILOT AND CONTROL DEVICES

A. Pilot Devices: Pushbuttons, selector switches, and indicating lights shall be rated heavy-duty, oiltight or watertight and corrosion resistant as required. All units shall be furnished with standard size legend plates with legends as indicated on the project Drawings.

B. For Class 1, Division 2 areas, devices shall either be explosion proof type, or all contacts and other items which may arc or spark shall be hermetically sealed. Hermetically sealed contacts and devices shall meet the current and voltage ratings required for the circuit.

C. Selector switches shall have the number of positions, switching arrangement, number and type of contact blocks indicated on the project Drawings.

D. Contact blocks shall have a minimum continuous current rating of 10 amperes at 240 VAC. Contact blocks shall have screw type connection terminals.

E. Indicating lights shall be LED type only. Provide flashing type lights where indicated.

F. Pilot lights shall be 120VAC, push-to-test (PTT) 30mm type.

G. Pilot device manufacturers shall be:

1. Square D, Class 9001, Type K
2. Allen-Bradley Bulletin 800H or 800T
3. IDEC
4. Approved Equal

H. Control relays shall be plug-in type with sockets and hold-in clips. Sockets shall have screw terminals, compression terminals not acceptable. Contacts shall be silver-cadmium, rated 10 amperes at 240 VAC. Relays shall have as a minimum two pole, double throw contacts (2PDT). Relays shall have a manual operator and miniature pilot light. Coil voltages shall be 120 VAC, or as noted on the project Drawings. Relays shall be as manufactured by Allen-Bradley Bulletin 700, Type HA or HB, Square D, Idec, or approved equal.

I. PLC digital output isolation relays shall be SPDT type with minimum 6A rated contacts. Coil voltage to match PLC output card. Phoenix Contact or equal.

J. Latching relays shall be similar to the control relays. Relay position shall be magnetically held, and shall be the single coil type.

K. Timing relays shall be solid sate, plug-in type with screw terminal sockets. Each relay shall have 5 adjustable timing ranges, switch selectable, and 4 timing modes, switch selectable. Timing ranges shall allow from 0.05 seconds to 999 minutes timing. Timing modes shall be ON delay, OFF delay, ONE SHOT, and REPEAT CYCLE. Output contacts shall be DPDT, rated 10 amperes at 240 VAC. Timing setting shall be by thumbwheel switches. Coil voltages shall be 120VAC, or as noted on the project Drawings.

L. Elapsed Time Totalizers (ETT's) shall be the synchronous motor driven type with digital readout to indicate the total time a piece of equipment is energized. Totalizer shall have a minimum of six-digit wheels including a 1/10-digit wheel to provide the range of time measured in hours, unless noted otherwise. Units shall be non-resettable, and operate on 120V, 1 phase, 60 Hz. Elapsed Time Meter (ETM) shall be considered synonymous with Elapsed Time Totalizer (ETT).

2.7 EQUIPMENT IDENTIFICATION AND WIRE TAGGING

A. All equipment and wiring identifications shall conform to and be compatible with the Owner's current labeling system, and shall be completed prior to final acceptance of the work. It is the responsibility of the Contractor to coordinate with the Owner's Engineer, to obtain from him or her, all labeling standards and documentation.

B. All control wiring shall be identified by means of computer-generated, heat shrink type wire marker. Wire numbers shall be as shown on the drawings.

C. Each major component mounted within the enclosure shall be provided with equipment identification. Equipment and device nameplates or identification shall be of engraved laminated plastic, with black lettering on white background. Nameplates shall be as listed herein or as shown on the project Drawings.

D. The enclosure vendor shall be responsible for providing and sizing all instrument loop power supplies. The instrument loop power supplies shall be sized to include at least 100% spare capacity. The enclosure vendor shall submit power supply load calculations with the panel shop drawings.

2.8 REGULATED POWER SUPPLY

A. When DC power supply is required for PLC discrete inputs, and 2-wire analog loops, provide at least two redundant 24 V DC regulated power supplies. A redundancy module with alarm contacts shall be provided for auto-switching of power supplies and power supply failure notification.

B. The power supply shall be sized to include 100% spare capacity.

C. Acceptable power supply manufacturers:

1. Phoenix Contact
2. SOLA
3. IDEC
4. Approved equal

2.9 UNINTERRUPTIBLE 120VAC POWER SUPPLY

A. When panels include a programmable controller or computer, provide an uninterruptible power supply to condition incoming power and ride-through utility power interruptions. UPS shall be 1500VA minimum unless otherwise noted.

B. This location has generator backup system; therefore, all UPS units shall be of dual conversion type confirmed by manufacturer to work properly with generators.

C. Acceptable power supply manufacturers:

1. APC SRT series
2. or approved equal

PART 3 - EXECUTION

3.1 GENERAL

A. All panels shall be installed level and plumb.

B. Installation Hardware

1. All nuts and bolts shall be stainless steel.

2. Support channels mount externally, or mounted in a corrosive atmosphere, shall be either reinforced fiberglass or stainless steel unistrut channels. All cuts and holes on fiberglass unistrut channels shall be coated with appropriate resin coating to protect them from deterioration.
3. Do not mount equipment directly to masonry or concrete walls. Provide unistrut channels on wall.
4. All equipment mounting plates shall be of 0.25-inch thick minimum clear anodized aluminum.
5. All contact surfaces between dissimilar metals shall be gasketed to prevent galvanic reaction.

C. Touch up all nicks, scratches, etc. with materials as recommended by the enclosure manufacturer.

END OF SECTION 25 30 10

(NO TEXT FOR THIS PAGE)

SECTION 25 30 20 - PROCESS CONTROLLERS AND COMPUTER SYSTEMS

PART 1 GENERAL

1.1 DESCRIPTION OF WORK

A. The work required under this section includes the provision, installation, start-up, testing and calibration of all PLCs, HMIs and associated network equipment and communications required for this project.

B. The Systems Integrator (SI) shall be responsible for work of this division. SI for this project will have scope of work associated with Division 25; see Electrical drawings and Process drawings for associated information.

C. Provide Owner with copies of all graphics, programs, configurations, and setup parameters for all equipment and systems provided in Division 25. Provide the Owner with software version and documentation of all programs, as part of Record Documents and Operation and Maintenance Manuals. Provide the Owner with all passwords required for full program access for all levels of PLC, PC, HMI, LAN and VPN network programming. The Owner shall have full legal right to use without restriction, and modify if they choose at their own risk, all programs, screens and reports prepared for this project, for their use in operating, maintaining, and managing their facilities.

1.2 QUALITY ASSURANCE

A. Manufacturers: Firms regularly engaged in the startup and commissioning of SCADA and similar systems of types and sizes to this project, whose products have been in satisfactory use in similar service, and whose products meet all requirements specified herein.

B. Installer: Qualified with successful installation experience on projects with field instrument work similar to that required for this project.

1. It is intended that an experienced electronic systems/instrumentation and control systems subcontractor shall be in responsible charge of all field instrument work.

C. ISA Compliance: Comply with applicable Standards and Practices for Instrumentation published by the Instrument Society of America pertaining to field mounted instruments and related installations.

D. UL Compliance and Labeling: Comply with provisions of UL safety standards pertaining to electrical systems, and provide products and components which have been UL-listed and labeled whenever such UL listed products are available.

E. NEC Compliance: Comply with requirements as applicable to construction and installation of field mounted instruments and installations.

1.3 SUBMITTALS

A. Provide submittals in accordance with Section 25 13 00.

1.4 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Ship instruments and accessories properly protected and packaged.

B. Handle instruments and accessories carefully to prevent damage and protect from weather.

PART 2 PRODUCT

2.1 GENERAL

A. For each system, provide a complete assembly with all required components, enclosures suitable for the environment and location, fittings, mounting brackets, and other components and accessories as needed to form a complete system.

B. Provide conduit, raceway accessories, wiring and connections necessary to place the systems into service and necessary to interface the instruments to other equipment control panels, programmable controllers, SCADA system, and similar installations as required for the project.

2.2 DESKTOP SCADA PC

A. Provide a networkable desktop PC with 27” display and UPS backup for monitoring all plant systems and lift stations.
B. Provide FactoryTalk Viewpoint for connectivity and viewability of the HMI graphics located at MSCP.
C. Desktop computer shall be similar to DELL Pro Tower or approved equal with the minimum requirements:
   1. Windows 11 Pro
   2. Intel Core i6-4500 vPro
   3. 32 GB RAM
   4. 1 TB SSD drive with a mirrored backup drive
   5. NVIDIA RTX A400, 4GB GDDR6 video card
   6. Ethernet
   7. Keyboard and mouse
   8. 3 year warranty
   9. 27” high definition display

2.3 NETWORKING

A. Provide all necessary network setup and hardware to create a complete networked system between PLCs and SCADA computers.

B. Minimum requirements:

   1. Provide in each specified PLC control panel an Ethernet switch with multiple ports to

accommodate all equipment requiring Ethernet connection. The Ethernet switch in MSCP shall be have fiber-to-Ethernet conversion and up to 1GB speed. See contract drawings.

2. Provide and setup a remote connection to Main SCADA for Operator and Superintendent Connectivity via cell modem. Cyber security measures are mandatory.

2.4 PROCESS CONTROLLERS

A. MANUFACTURERS

1. Allen-Bradley CompactLogix 5370 or 5380 Series.
2. No Substitutes.

B. GENERAL

1. Perform stand-alone monitoring and control and include following as minimum.
   a. Microprocessor based controller (PLC processor) to execute program instructions, store data, and control data transfer.
   b. PLC memory.
   c. I/O subsystem interfaces.
   d. Power supply, including power conditioning and surge protection.
   e. Communication interfaces.
   f. Programming interface.
2. Must integrate with any existing network of PLCs, ASDs, LOIs and HMIs.
3. Utilized as Main SCADA PLC networked to local panel mounted PC and HMI software. See drawings for list of IO and connectivity to field instruments and devices.

C. PLC PROCESSORS - COMPACTLOGIX 1769-L306ER (System's Integrator may submit alternate AB CompactLogix unit for approval).

D.

1. Features:
   a. 10/100 Mbps, RJ-45, Ethernet I/P Communication Interface Card mounted in one of the two available Communication Card Slots in processor chassis.
   b. Ladder, sequential function chart (SFC), structured text, and function block programming ready.
2. Provide orderly shutdown on power failure, saving register contents with automatic restart on power restoration.
3. Interface to programmer unit for maintenance and troubleshooting. Continually update display when data requested. Provide capability to monitor or change following.
   a. Discrete I/O.
   b. Analog I/O.

c. Pulsed I/O.
d. Communication parameters.
e. Configuration data.
f. Internal program data values.

E. PLC POWER SUPPLY - P4

1. 85-264 VAC.
2. Sizing is responsibility of System Supplier.

F. I/O MODULES

1. I/O modules specifically designed for interfacing of I/O signals to PLC processor. Screw-type removable wiring arms required for each I/O module are responsibility of System Supplier.

2. Include sufficient I/O modules to accommodate I/O with provisions for 20% spare I/O prewired to terminal strips. Where no I/O of a listed type (digital input, digital output, analog input, analog output) is shown, provide one spare prewired module. Each processor or I/O chassis must contain a minimum of one spare slot, beyond the required spare I/O. Provide 1769-N2 filler strips for all empty slots in processor and I/O chassis.

3. 120VAC Digital Input 1769-IA16

a. 120 VAC individually isolated as required by application.
b. 16 points per module.
c. LED indication of on/off status of each point.

4. 120 VAC Digital Output 1769-OA16

a. 120 VAC non-isolated as required by application.
b. 16 points per module.
c. LED indication of on/off status of each point.
d. Interposing relay for each output point required.

5. Analog Input 1769-IF4I

a. Individually isolated.
b. 6 points per module.
c. Accept 4-20 mAdc or 1-5 vdc inputs as required by application.

6. Analog Output 1769-OF4I

a. Individually isolated.
b. 6 points per module.
c. Transmit 4-20 mAdc.

G. ETHERNET ADAPTER 1769-ENBT

1. Provides connectivity between SCADA system and PLC processers on Ethernet data highway.

2. 10/100 auto-switching.

H. COMMUNICATIONS SOFTWARE

1. Communication software and configuration shall meet monitoring and control requirements of each process in accordance with functional descriptions.
2. Within each hardware unit communicating over data highway, include executive routines or traffic controller to control and coordinate activities on communication links. Use integrated, standard products for communication software to manage transmission protocols, line error detection, and message switching.
3. Interface software for transfer of data from one location to another.
4. Expandable systems shall accommodate addition of future equipment as specified elsewhere.
5. Diagnostic facilities to check performance of communication links and communications interface portion of devices on data highway.
6. Include routines to detect transmission errors. Perform automatic re-interrogations and retransmissions before alarm is sounded. Generate system alarms.

END OF SECTION 25 30 20

(NO TEXT FOR THIS PAGE)

ATTACHMENT 5
REVISED THICKENING SCREW PRESS SPECIFICATION (46 71 46)

SECTION 46 71 46 – THICKENING SCREW PRESS AND SHAFTLESS SCREW CONVEYOR

PART 1 GENERAL

1.1 WORK INCLUDED

A. There shall be furnished a dewatering system including dewatering screw press, flocculation tank, polymer makedown system, sludge feed pump and local control panel all integrally mounted, pre-piped and pre-wired to each other on an aluminum skid as specified in this Section and scheduled below. Equipment should also include a shaftless screw conveyor (loose and separate). All equipment shall be provided by a single manufacturer. The dewatering screw press skid shall be capable of processing municipal waste activated sludge.

1.2 REFERENCES

A. American Bearing Manufacturers Association (ABMA)

B. American Gear Manufacturers Association (AGMA)

C. American Society of Mechanical Engineers (ASME)

D. Institute of Electrical and Electronics Engineers, Inc. (IEEE)

E. American Welding Society (AWS) D1.1, Structural Welding Code.

F. National Electric Code (NEC).

G. National Electrical Manufacturers Association (NEMA).

H. American National Standards Institute (ANSI).

I. Conveyor Equipment Manufacturers Association (CEMA)

1.3 DEWATERING EQUIPMENT SKID DESCRIPTION

A. Manufacturer to design, engineer and fabricate one (1) dewatering screw press skid assembled with the following components Screw Press

1. Flocculation Tank

2. Sludge Feed Pump

3. Polymer Makedown System

4. Local Control Panel

5. Instrumentation

6. Aluminum Skid

7. Conveyor System - Shaftless Screw Conveyor (loose and separate)

B. All equipment mounted on the skid shall be pre-piped and pre-wired to each other.

1.4 SCREW PRESS DESCRIPTION

A. Screw press system shall be capable of municipal waste activated sludge described below.

B. This Conveyor System shall be capable of handling sludge and consist of screw conveyor, discharge chute, supports, and accessories for a complete functional system. The manufacturer shall furnish all components and accessories for the system including chutes to connect to the screw press, support systems, brackets, and components necessary for ease of operation and maintenance.

C. Dewatering screw press with components as specified in this Section and shown on the Drawings and as required for a complete and functional screw press system, including:

1. Screw press with all 304 stainless steel wetted parts.

2. Sludge inlet headbox.

3. Removable split drums.

4. Removable drum covers.

5. Minimum of two screen spray showers.

6. Speed reducer.

7. Galvanized carbon steel base.

8. Flanged filtrate outlet.

9. Back pressure cone.

10. Flocculation tank with mixer.

11. Equipment Motors.

12. Pressure transducer type level element with indicating transmitter and high level probe.

D. Design Requirements:

1. Screw Press Minimum Performance Requirements

Type of Sludge	Aerobic Digested Sludge
Feed Solids, % total solids (TS)	1.0 %
Discharge Solids, % TS	15 - 18 % with polymer addition
Design Inlet Capacity	15 gpm at 1.0% TS
Design Capacity	75 dry lbs per hour

2. Motor Characteristics – as described in this Section.

1.5 SUBMITTALS

A. Submit as specified in Division 01.

B. Product Data:

1. Submit data completely describing product including plan and section views and listings of materials of construction.

2. Submit surface preparation and finishes to be applied to all equipment.

C. The Conveyor System

1. Descriptive literature, bulletins, and catalog cuts of the equipment.

2. Materials of Construction.

3. Sequence of operation or functional narrative.

4. Complete wiring diagram.

5. Complete installation instructions with points of electrical and requirements clearly shown.

6. Assembly and Electrician’s installation checklist (written by manufacturer) necessary to be completed by Contractor before manufacturer provides start-up services.

7. Motor Data.

8. Instrumentation and wiring diagram.

9. Shop drawings showing layout and necessary details of construction, including dimensions of major components; discharge chutes length, width and opening; size and location of connections to other work, access, material thickness, structural support members, sizes and locations, and locations of each equipment assembly.

10. Cross sectional details including dimensions and complete cross-referenced list of materials and part numbers.

11. Screw Conveyor

    a. Trough dimensions

    b. Screw diameters, flight diameter, width, thickness and pitch, rotating speed, material certificate and mill test report.

12. Weight of each major component along with total weight of equipment.

13. A list of manufacturer's recommended lubricants.

14. List of spare parts and special tools.

D. Shop Drawings:

1. Complete manufacturer fabrication/assembly drawings.

2. Certified drawings showing dimensions, weights, loading information and location of all components; Include details on interconnecting piping, supports, and control panel.

3. Wiring, control schematics, and control logic diagrams for all electrical and control components furnished.

4. Manufacturer's Drawings shall be coordinated with the Contract Drawings, including equipment numbers and piping designations.

5. List of Recommended Spare Parts with price information

E. Resume of Technician to perform screw press adjustments, inspections, observations of test operations, supervision of functional and performance testing, and training.

F. Operating and Maintenance Manuals: Include complete lubrication, maintenance, and operation instructions, including initial start-up instructions, and unloading and handling methods.

G. Operations and Maintenance Data (Conveyor System)

1. The contractor shall furnish no later than thirty (30) days prior to shipment of the equipment, one (1) complete set of operation and maintenance (O&M) manuals to the Owner.

2. Complete set of equipment arrangements and dimension drawings.

3. Installation instructions.

4. Preventative maintenance instructions detailing lubrication procedures and detailed maintenance instructions which describe procedures for adjustment, disassembly, and reassembly etc.

5. Complete parts list keyed to sectional drawings of the equipment.

6. Start-up checklist, maintenance inspection checklist, and performance data sheets.

H. Manufacturer's references

I. Quality Control Submittals:

1. Special shipping storage, protection, and handling instructions

2. Manufacturer's Installation Instructions

3. Factory Test Results

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Consideration will be given only to the equipment of Manufacturers who are regularly engaged in such work and thoroughly experienced in the design and manufacture of screw press equipment specifically manufactured for municipal, secondary treated, waste activated sludge.

B. Certifications: The dewatering equipment supplier must provide the "Certification of Compliance" (COC) letter with their priced equipment proposal to the general contractor(s) bidding the project. The general contractor must include the dewatering equipment supplier COC in their bid proposal submitted to the OWNER at bid closing.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Contractor shall unload, store, and handle the equipment per the manufacturer's instructions.

1.8 WARRANTY

A. Warranty shall extend for 12 months after start-up or 18 months after delivery, whichever comes first.

B. Warranty shall include all parts, labor, and coatings for repairing or replacing equipment that fails during the warranty period. Defects occurring within the warranty period shall be repaired or replaced by the manufacturer at no cost to the OWNER.

C. Equipment manufactured by others but supplied by screw press Manufacturer will have the equipment warranty as supplied by the manufacturer which is typically 12 months from delivery of the equipment.

1.9 PROJECT CONDITIONS

A. Deliver the dewatering skid as completely assembled as practical to minimize field assembly. All equipment mounted on the dewatering skid shall be pre-piped and pre-wired to each other at the factory. Contractor shall be responsible for unloading and any necessary field assembly. Contractor shall contact manufacturer for screw press field assembly requirements during bid.

1.10 SEQUENCING AND SCHEDULING

A. Coordinate work with restrictions as specified.

1.11 INSTALLATION EQUIPMENT

A. Special Tools: Provide standard manufacturer supplied toolbox with all tools needed to assemble and disassemble the screw press.

PART 2 PRODUCTS

2.1 SCREW PRESS

A. MANUFACTURER

1. Manufacturer: FKC Co., LTD., Andritz or approved equal.

a. The screw press and all other components mounted on the dewatering skid shall be supplied by one manufacturer and delivered as a complete dewatering system.

2. Where a manufacturer's standard equipment name and/or model number is listed, the equipment system shall be provided as modified to conform to the performance, functions, features, and materials of construction as specified herein.

B. MATERIALS

1. Wetted Parts: Stainless Steel, Type 304, unless otherwise indicated.

2. Drive Unit: As scheduled.

3. Galvanized carbon steel base

4. Other parts: Coated carbon steel

5. Miscellaneous hardware, including bolts, nuts, washers, and fastener clips in the wetted area: Stainless steel.

C. HOUSING

1. Housing shall be rigid Type 304 stainless steel weldment, supported by structural carbon steel base and shall have removable Type 304 stainless steel covers for screen access.

2. Sludge feed connections and filtrate discharge connections shall respectively be Type 304 stainless steel pipe stub and flanged meeting ANSI/ASME B 16.1, Class 125, or ANSI/ASME B 16.5, Class 150; provide higher pressure class as required to meet Design Working Pressure.

3. Press shall have Type 304 stainless steel discharge box with hinged lid. Dimensions as indicated on the Drawings.

4. Housing shall be designed for noise reduction, to act as a protective guard and to provide a complete enclosure for odor containment.

5. The screw press shall be provided with Type 304 stainless steel spray covers on the top and sides of the screw press drums where necessary for sanitation and personnel protection. Side covers shall be easily removable by a single person.

6. Headbox shall include hinged top inspection door.

D. DRIVE SYSTEM

1. Drive system shall consist of an electric motor suitable to use with a variable speed drive system as required to provide full load capacity and also to withstand the full starting torque of the system. VFD shall be provided as part of the Dewatering Control Panel.

2. Screw speed shall be electronically controlled by means of a VFD in a NEMA 4X enclosure. Maximum screw speed shall be 0.6 rpm or lower.

3. Speed Reducer:

   a. Provide speed reducer rated for uniform shock load classification.

   b. Speed reducer shall be Sumitomo Cyclo Reducer or equal.

4. Shaft Seals shall be Musashi double lip spring-loaded Nitrite oil seal or equal.

E. BEARINGS

1. Screw press shall be designed so that the entire rotating assembly is supported on the discharge end by a grease lubricated ball or spherical roller type bearing. The bearing shall be conservatively designed to withstand all stresses of the service specified. Main bearings shall have a minimum B-10 life rating of 500,000 hours at standard operating speeds.

2. Bearings for the screw shall be anti-friction with grease lubrication.

F. Flexible connectors for the drive motor and screw press junction boxes shall be furnished by the installing Contractor such that all local electrical codes are met.

G. SCREW PRESS MOTOR

1. Provide inverter rated, severe duty motor, 1.15 SF, NEMA Premium Efficiency, cast iron frame with manufacturer's standard, corrosion resistant, epoxy finish.

2. Max screw press motor requirements of 2 HP, (208V/3 phase)

H. SCREW

1. Screw Shell: Stainless steel, Type 304.

2. Helical flight welded to screw shell: Stainless steel Type 304 flight.

a. Screw flight shall be machined for clearances to have no contact with the drums.

3. The screw shall be supported at the discharge by a radial bearing.

I. SCREENS

1. Type 304 stainless steel panels with punched holes.

2. Wedge wire screens are not acceptable.

3. Oscillating or moving rings are not acceptable.

J. SHOWER HEADERS

1. Type 304 stainless steel pipe, fittings and shower nozzles.

2. Shower headers shall be provided along the entire length of the drum set, beneath the headbox, and along the edge of the filtrate pan on the discharge end.

3. Operating pressure for all shower headers shall not exceed 90 psi.

4. Shower headers shall be stationary and remain in a fixed position. Moving or rotational showers within the wetted, sludge dewatering area or underneath the press covers are not permitted.

K. DRUM ASSEMBLY

1. Drums shall be 0.5 to 1.0 meters in length and split into two, removable drum halves.

2. Inner diameter of drums shall be no less than 0.4 meters.

3. Drum configuration shall allow maintenance work in the screw press flight area without removal of the screw from the press.

L. BACK PRESSURE CONE

1. Back pressure cone will be free of electrical and air connection requirements.

M. PRESS ASSEMBLY

1. Screw press assembly shall be such that clearances around the entire perimeter of the unit for maintenance work shall not exceed 36 inches.

N. SURFACE PREP & COATINGS

1. Surface preparation of carbon steel surfaces on the screw press and flocculation tank shall be in accordance with SSPC-SP6 standards and shall be coated as follows:

2. Prime Coat: 5 mils of Carboline 890

3. Top Coat: 2 mils of Carboline 890 (if outdoors & exposed to direct sunlight), 5 mils (if indoors or covered outdoors)

4. Motor and gearbox for the screw press shall be prepared and coated with the manufacturer's standard surface preparation, prime coat and top coat for corrosion resistance.

2.2 FLOCCULATION TANK

A. Flocculation tank wetted parts shall be constructed of 304 stainless steel throughout.

B. Flocculation tank shall be designed for a retention time of 2 to 5 minutes under the average design flow rate. The inlet of the tank shall be located at the bottom of the tank and conditioned sludge shall overflow from the discharge pipe located near the top of the tank. Provide discharge pipe stub with flexible rubber hose sleeve connection.

C. Flocculation tank shall be supplied complete with an agitator. The agitator gearbox shall be an SEW. Agitator speed shall be adjusted electronically via VFD in the control panel.

D. Flocculation tank, agitator, and agitator drive shall be designed to handle the entire flow capacity range of the screw press.

E. Motor for the drive shall be a minimum of 1.0 hp, 208 V / 3-phase unit. Motor shall have an aluminum cast frame. Motor efficiency will be 82% or greater.

F. Provide split flocculation tank cover with a hinged inspection port.

G. Motor and gearbox for the flocculation tank shall be prepared and coated with the manufacturer's standard surface preparation, prime coat and top coat for corrosion resistance.

H. Polymer mixing valves, other mixing energy apparatus or piping configurations that does not allow for full view and testing of flocculated material by the operator is not acceptable.

2.3 POLYMER MAKEDOWN SYSTEM

A. MANUFACTURER

1. Manufacturer: FKC, Velodyne, or equal.

B. DESGN CRITERIA

1. Polymer Type: Emulsion
2. Polymer Activity (percent active): 30 to 75
3. Solution Concentration Range: 0.1% to 1% based on neat polymer
4. Solution Concentration Design Point: 0.5% based on neat polymer

Neat Polymer Flow Range (GPH)	Dilution Water Range (GPH)
0.3 – 3.0	60 – 600

C. POLYMER ACTIVATION & BLENDING CHAMBER

1. These specifications are based on a multi-stage, multi-zone, Hydro-Mechanical polymer activation & blending technology. Alternate technologies will only be considered if proven to provide an equal level of performance, versatility, reliability and quality, otherwise the following technology will be provided without exception.
2. In order to provide control and versatility to optimize the performance of the wide range of polymers available and to optimize system reliability, a multi-stage Hydro-Mechanical polymer blending technology shall be provided with both a non-mechanical and mechanical mixing stage:
    a. Non-Mechanical Stage: To optimize reliability, the device shall be capable of activating and blending polymer based on plant water pressure alone at 30 psid or greater. Polymer shall be injected directly into a water jet by means of an injection quill positioned such that the non-mechanical mixing energy is in no way diminished prior to polymer and water contact. The non-mechanical zone shall be designed such that the velocity of the mixing energy producing water jet is maintained or increases as flow decreases.
    b. Hydro-Mechanical mixing Stage: In order to provide optimal polymer performance under all operating conditions and to provide total control over mixing energy, in addition to the non-mechanical mixing stage the device shall be capable of producing its mixing energy independent of plant water pressure

through a variable intensity, controllable stainless steel hydro-mechanical mixer. The mixing impeller shall be fully controllable and capable of inducing ultra high, non-damaging mixing energy at all flow rates. This shall be accomplished by controlling mixing intensity and preventing over exposure to, or damaging recirculation through the impeller. The polymer mixing impeller shall be designed to produce both axial and radial flow to optimize mixing effectiveness and to effectively inducing high, non-damaging mixing energy over the systems full flow range.

c. Mixers that rely solely on plant water pressure and or flow for mixing energy will not be acceptable. Mixers where performance is affected by flow rate and therefore retention time resulting in under or over exposure to mixing energy, or which rely on constant speed impellers or that rely on close tolerances for blending shall not be acceptable.

3. In order to prevent polymer build-up, the mixing chamber shall maintain high velocity in the entire chamber - at no time shall there be low velocity within any portion of the mixing chamber.

4. The mixing impeller shall be controlled by VFD motor controller and driven by a wash-down duty AC motor. The motor shall be mounted horizontally. Motors mounted under the mixing chamber where seal failure or leaks can damage the motor shall not be acceptable

5. The mixer drive shaft shall be sealed by a mechanical seal which shall have an integrally mounted and factory plumbed seal flush. A drain hole behind the seal shall be provided in the mixing chamber to drain the polymer solution in case of a seal failure. The seal shall be easily accessible for replacement. Systems without a seal flushing system shall not be considered. All bearings shall be external from the mixing chamber. Internal bearings shall not be acceptable.

6. Both mechanical and non-mechanical mixing zones shall be clear polycarbonate to view the mixing action and blending effectiveness. Acrylic chambers prone to becoming brittle over time and cracking, or opaque pipe shall not be acceptable to meet this requirement. The clear cover shall have a stainless steel reinforced gusseted flange with a stainless steel discharge connection in order to handle maximum operating pressures.

7. The mixing chamber shall have a maximum rated pressure of 100 psi. Provide a pressure relief on the mixing chamber factory set at 75 psi.

8. Provide a neat polymer check valve specifically designed to isolate neat polymer from dilution water.

D. DILUTION WATER ASSEMBLY

1. The dilution water flow rate shall be monitored by a rotameter flow meter having the range as specified under paragraph 1.02 above. Unions or flanges shall be provided on the flow meter to allow easy removal for cleaning.

2. The unit shall have an electric solenoid valve for on/off control of total dilution water flow.

3. A differential pressure type low water differential pressure alarm shall be provided. The switch shall be adjustable between 25 and 100 psid. Static working pressure, 500 psi. The pressure switch shall be as manufactured by Ashcroft.

4. Provide a 2-1/2" stainless steel liquid filled pressure gauge to monitor dilution water inlet pressure.

E. POLYMER METERING PUMP

1. The unit shall have one (1) neat polymer metering pump(s) integrally mounted on the systems skid. The metering pump(s) shall have a range as specified under paragraph 1.02 above. The pump shall be a positive displacement, progressive cavity type constructed of stainless steel and Viton. The shaft seal shall be mechanical seals, packing type shall not be used. A 208 VAC wash-down duty motor shall drive the pump. DC motor are not acceptable. A gear reducer shall be provided to produce a maximum pump shaft speed of not more than 545 RPM. The motor shall be controlled by an VFD located in the system control panel.

2. Provide a calibration column with two full port PVC ball valves having Viton o-rings. The column shall be calibrated for a one-minute draw-down at maximum pump rate and read in GPH and milliliters. The calibration column shall be rigidly mounted to the systems frame with a minimum of two heavy duty brackets. Mounting the calibration to the neat polymer inlet piping shall not be acceptable. Provide a breather plug in the top of the calibration column designed to allow adequate displacement of air during calibration while preventing water or other foreign material from entering the calibration column.

3. Provide a thermal type loss of polymer flow sensor. The flow sensor shall include a stainless-steel plumbing assembly with a stainless-steel full port ball valve for draining during cleaning.

F. SOLUTION DISCHARGE ASSEMBLY

1. Provide a 2-1/2" stainless steel liquid filled pressure gauge to monitor system discharge pressure.

G. CONTROLS

1. A control panel integral to the systems frame shall be provided. The enclosure shall be rated NEMA 4X and constructed of FRP. The control panel shall consist of all controllers, digital displays, potentiometers, switches, lights, relays, and other control

devices required for a complete operable system. The control panel and all components shall be industrial duty. All skid mounted electrical components interconnected to the control panel shall terminate at numbered and labeled terminal blocks. The terminal blocks shall be sized for 14 ga. wire. Wires shall be neatly run through wire raceway and numbered with shrink tubing type labels. Adhesive labels shall not be used. The control panel shall be positioned such that there are no obstructions in front of the control panel per related NFPA requirements. Control.

2. Power: 120 VAC, 1Ph, 60/50 Hz.

3. Operator Interface – Discrete Selector Switch:

   a. System ON / OFF (reset) / Remote

   b. One-Turn Potentiometer – Mixer Speed

   c. Ten-Turn Potentiometer – Progressive Cavity Metering Pump Control

4. Status / Alarm Indicators:

   a. Main Power ON

   b. Display of Metering Pump Rate (diaphragm pump only: located on diaphragm metering pump face)

   c. Low Water Differential Pressure Alarm

   d. Low Polymer Flow Alarm

5. Inputs (signals by others):

   a. Remote Start / Stop (discrete dry contact)

   b. Pacing Signal Based on Process Flow (4-20mA)

6. Outputs:

   a. System Running (discrete dry contact)

   b. Remote Mode (discrete dry contact)

   c. Common Alarm (discrete dry contact)

H. POLYMER EQUIPMENT SKID

1. The system's frame shall be of rugged 304 stainless steel construction. No mild steel shall be used. All piping shall be rigidly supported.

2. Under no circumstance shall the pump suction exceed 5” from the bottom of the skid for progressive cavity pumps.

3. The overall system dimensions shall not exceed 36”W x 26”D X 60”H.

2.4 SLUDGE FEED PUMP

A. MANUFACTURER

1. Manufacturer: Seepex, Netzsch, or equal.

2. The screw press, all other components mounted on the dewatering skid, and the conveyor shall be supplied by one manufacturer and delivered as a complete dewatering system.

B. DESCRIPTION

1. Pump shall be heavy duty, positive displacement, progressing cavity type. The pump shall be cradle mounted to permit the suction port to be rotated to any angle perpendicular to the centerline of the pump. Suction and discharge connections shall be 125 pound flat faced ANSI cast iron flanged.

C. HOUSING

1. Suction and discharge housings are to have smooth flow characteristics and be manufactured from GG25 cast iron. The housings shall be drilled and tapped NPT connections that can be used for the installation of pressure gauges/switches or for a drain.

D. ROTOR & DRIVE TRAIN

1. The rotor shall be driven by means of a heavy duty drive train. The pump rotor shall be machined of AISI 4150 alloy steel, hardened to a Rockwell "C" value of 57 to 60 and covered with a heavy layer of hard chrome plate at least 0.010-in thick for abrasion resistance.

2. The rotor shall be joined to the drive shaft by a carbon steel connecting rod and oil-lubricated sealed pin type or crown gear type universal joints of chrome alloy tool steel of adequate design to transmit the required thrust and torque while allowing the rotor to move through is eccentric path. The joint seals shall be clamped at both outside and inside diameters and recessed within heavy walled steel tubing to prevent damage by rags or other objects.

3. To maximize universal joint and seal life, the connecting rod operating angle shall not exceed 1¼ degrees off center. The drive shaft shall be solid. If hollow drive shaft is used, then a fiber deflector shall be installed to prevent the solids from entering the hollow shaft.

E. STATOR

1. The rotor shall rotate relative to a one-piece, medium-high Buna "N" rubber stator of approximate 65(±5) Durometer hardness (Shore A) securely bonded to its steel tube housing. The stator shall be chamfered on the ends to increase the chamber filling efficiency. The stator shall have integral moulded gaskets to prevent the pumped material from contacting the bonding of the tube.

F. SHAFT SEAL

1. The stuffing box shall be equipped with a single acting mechanical seal as manufactured by Burgmann or equal. The Seal is to be of the rubber bellows design and be able to operate independently of the direction of rotation and. The mechanical seal is to be so situated in the suction housing to ensure the best possible flushing of the seal by the product. Additionally the mechanical seal housing is to have a flushing connection. The metal parts are to be stainless steel and the seal faces are to be silicon carbide.

G. DRIVE & BASEPLATE

1. The motors shall be horizontal, totally enclosed fan cooled and of the horsepower and speed as required by the specified conditions. The motor shall be c-faced to a gear reducer in an arrangement as shown on the drawings. The pump and motor shall be mounted in-line on a structural steel baseplate.

2. Provide inverter rated, severe duty motor, 1.15 SF, NEMA Premium Efficiency, cast iron frame with manufacturer’s standard, corrosion resistant, epoxy finish.

3. Minimum sludge feed pump motor requirements of 3 HP, (208V/3 phase).

H. SURFACE PREPARATION & COATINGS

1. All surfaces shall be prepared and shop painted with the manufacturer’s standard system.

I. ACCESSORIES

1. To prevent damage through dry running the pump stator is to be provided with thermal dry running protection, including the control module for installation in the local control panel of the dewatering skid.

2.5 LOCAL CONTROL PANEL

A. Screw press manufacturer shall provide the dewatering control panel, PLC and field instrumentation for the dewatering system, as described and shown on the Contract Documents.

B. The PLC will be programmed by the screw press manufacturer. PLC shall be Allen Bradley CompactLogix 1769-L24ER, or approved equal (BABA Compliant) Screw press manufacturer is responsible to direct all programming changes required to meet the system performance standards.

C. The HMI will be programmed by the screw press manufacturer. HMI shall be Maple Systems 9.7-inch, HMI5097DXL, or approved equal, color touchscreen or larger. Screw press manufacturer shall provide all programming and screens required for display, setpoints, alarms and parameter ranges.

D. The local control panel shall include a minimum of the following:

1. NEMA 4X Stainless Steel Enclosure.
2. Variable Frequency Drive, AB Powerflex 525, for the Screw Press Motor.
3. Variable Frequency Drive, AB Powerflex 525, for the Sludge Feed Pump.
4. Variable Frequency Drive, AB Powerflex 525, for the Flocculation Tank.
5. Variable Frequency Drive, AB Powerflex 525, for the Incline Conveyor.
6. 3% Impedance Line Reactor for each VFD.
7. 208V/120V Transformer for 120V/1ph & 24VDC power supply for Polymer Makedown System and Instrumentation listed in paragraph 2.6.
8. Surge Protector, 208VAC 3-Phase Delta; 47 to 63 Hz.
9. Surge Arrestor, Pluggable type, 150VAC/DC, Square D.
10. Ethernet Switch, 8-port.
11. Mushroom Head, Red, Process Stop Push Button.
12. NEMA 4X Air Conditioner, 200 BTU, Through-Mount, EIC Solutions.

E. The local control panel shall include customer connections and programming for the following:

1. Pump #1 Run Status (Screw Press Grinder Station)
2. Pump #1 Seal Fail (Screw Press Grinder Station)
3. Pump #1 Overtemp (Screw Press Grinder Station)
4. Pump #1 Overload (Screw Press Grinder Station)
5. Pump #2 Run Status (Screw Press Grinder Station)

6. Pump #2 Seal Fail (Screw Press Grinder Station)

7. Pump #2 Overtemp (Screw Press Grinder Station)

8. Pump #2 Overload (Screw Press Grinder Station)

9. Wet well high-level float (Screw Press Grinder Station)

10. Wet well low-level float (Screw Press Grinder Station)

11. Wet well level (Screw Press Grinder Station) (analog)

12. Digester #1 Level (analog)

    a. Pump off at low water level of 840.00 FT and alert to main SCADA controls.

13. Digester #2 Level (analog)

    a. Pump off at low water level of 840.00 FT and alert to main SCADA controls.

14. These will include ten (10) dry contact digital inputs and three (3) – 4-20mA signals.

2.6 INSTRUMENTATION

A. HEADBOX LEVEL TRANSMITTER

1. Screw press manufacturer shall provide a pressure sensing type level indicating transmitter as follows:

2. MANUFACTURER

    a. Manufacturer: IMF Efector PI2307 or approved equal

B. HI-LEVEL SWITCH

1. MANUFACTURER

    a. Manufacturer: Warrick or approved equal

2. MATERIAL

    a. 303 Stainless Steel electrodes, ¼" diameter.

    b. Junction Box & Electrode Mounting Assembly: stainless steel.

3. STANDARD RELAY

    a. 10 A resistive at up to 120 VAC, 8-pin socket to be installed in screw press local control panel.

C. SOLENOID VALVES

1. MANUFACTURER

a. Manufacturer: ASCO Red Hat or equal

2. DESCRIPTION

a. Slow Closing Solenoid Valves

b. Pilot operated, normally closed.

c. Brass Body, NMR disc, PTFE & MBR Seals, 305SS Core Tube, 430FSS Core & Plugnut, 302SS Springs, & copper shading coil.

d. 120V/1ph, 6.1 watts, Class F Coil Insulation.

e. 125 psi max differential pressure.

f. 150 deg. F maximum fluid temperature

D. Provide a Fiber to Ethernet managed switch for PLC Ethernet I/P network. Refer to Construction Drawings.

2.7 SKID

A. The skid shall be 16-feet long by 8-feet wide and shall be comprised of 5052 bright aluminum 3/16” tread plate fastened on structural 6061-T6 aluminum 6” channel. Stainless steel is also an acceptable skid material option.

B. All other aluminum sheets, plates, bars, angles and structural shapes shall be grade 6061-T6 or 3003.

C. The entire skid shall be capable of being lifted, moved and set using the four lifting points.

D. All equipment integral to the skid shall be secured with stainless steel anchor bolts and nuts mounted through drilled holes in flat bar welded to the aluminum structure.

E. All electrical and power conduit shall be routed below the aluminum trade plate within the dimensions of the skid. Conduit shall be liquid-tight flexible nonmetallic type.

F. Piping between the sludge feed pump and flocculation tank shall be schedule 80 PVC. Piping from the polymer systems to the sludge feed line and/or flocculation tanks shall be flexible hose type.

G. An aluminum access ladder for view the top of the floc tank shall be included and mounted on the skid.

2.8 SHAFTLESS SCREW CONVEYOR

A. Manufacturer

1. Manufacturer: FKC Co., Ltd. or approved equal

B. Description

1. The shaftless screw conveyor is to be loose and separate from the skid. Contractor shall provide one (1) inclined screw conveyor. The inclined conveyor shall be of a shaftless design and be 6” nominal diameter.

2. The Conveyor System shall accept dewatered sludge cake from the screw press and through an inlet hopper and convey the dewatered sludge cake to the outlet.

3. The screw conveyor shall be fully assembled and tested prior to shipping. The screw conveyor shall be shipped fully assembled, no field screw welding allowed.

4. The conveyor operation shall not cause excessive noise or vibration under loading conditions. The conveyor, including drive units, shall be designed such that noise levels in normal operation will not exceed 80 dBA at 3 feet from the equipment.

5. PERFORMACE REQUIREMENTS

a. The screw conveyors shall be capable of continuous transport of dewatered sludge at the following operating conditions:

1) Sludge volumetric min. transport rate.: 10 cu. ft./hour at 30 RPM

2) The conveyor shall be sized to convey the sludge at less than 60 percent of the conveyor’s rated capacity or 30 percent through filling. The conveyor drive unit shall be designed for 100 percent of conveyor rated capacity

b. 6” Diameter and 20-feet in length

c. Maximum incline of 26 degrees.

d. Screw conveyor will be able to be used in a through-wall application.

e. The Conveyor System shall meet service at 50% of the conveyor’s trough filling capacity. Each conveyor drive unit and spiral shall be designed for 100% of the conveyor’s trough filling capacity, and the starting of the conveyor based on a fully loaded condition. Design units for continuous operations.

6. MATERIALS

a. Steel plate & shapes: 304 SS

b. Spiral: Cold formed spring steel, minimum thickness of 0.75-inch x 2.5-inch wide, 8620, 220 min BHN

c. Wear Liners: ½ inch thick ultra-high molecular weight (UHMW) PE 48" maximum length.

d. Bolt, Nuts, Washers: 304 SS, nuts and bolts shall be coated with anti-seize compound.

e. Cover: 10-gauge 304 SS bolted with gaskets in 5-foot removable sections.

7. SPIRAL

a. The spiral for the shaftless conveyors shall be designed to convey material without a center shaft, and with the stability to prevent distortion and jumping in the trough. Shaftless sections shall be formed to diameter and pitch in one operation. Shaftless sections shall be made from 0.75" thick x 2.5" wide, 8620 bar. Cut plate or sectional flights shall not be used. Minimum flight hardness 220 BHN.

b. The spiral shall have double bevel full penetration welds at splice connections. The spiral shall be aligned to assure true alignment when assembled and shall be coupled to the end shaft by a welded connection.

c. The spiral shall be concentric to within 1/16 inch over its entire length and shall be capable of withstanding a torque of at least 3,500 ft. lbs. without failure.

8. TROUGH

a. The trough shall conform to the dimensional standards of CEMA 300 and enclosure classification IIE and shall be fabricated from minimum 10 GA 304 SS stainless steel sheet. The trough shall be U shaped, formed flange, and shall be equipped with one (1) filling and one (1) discharge chutes for transferring material from screw presses to the designated discharge point, as shown on the Drawings.

b. The trough shall be furnished complete with a replaceable wear liner manufactured of ultrahigh molecular weight polyethylene PE, 48" long max sections for easy removal. Trough shall have a 304 stainless steel side hold down bolted in place to prevent the screw from lifting in trough and bending the screw.

9. INLET/OUTLET CHUTES

a. The inlet and outlet chutes shall be fabricated from minimum 12 GA 304 SS stainless steel sheet. The inlet chute shall be supplied with a flange and 304

SS hardware to match the screw press discharge flange. The outlet chute shall be supplied with a flange and 304 SS hardware to match the inlet chute.

10. SUPPORT FRAMES

    a. The conveyors shall be furnished complete support frames necessary to carry all loading. Frame bracing may not extend any further than the extent of the frame legs. with galvanized carbon steel intermediate support legs suitable for anchoring to the concrete base as shown on the contract drawings. The supports shall be shop fabricated from galvanized structural steel shapes and plates, with welding conforming to the standards of the American Welding Society.

    b. Bolts, nuts and washers for conveyor supports shall be 304 stainless steel. Bolts, nuts and washers in contact with sludge together with those connecting the inlet and outlet chutes shall be 304 stainless steel. Nuts and bolts shall be coated with anti-seize compound.

    c. The supports shall be designed to avoid interference with other equipment, equipment supports, or walking access around the conveyor. The supports shall be designed to prevent excessive vibration of the conveyor unit under every loading conditions.

11. GEAR REDUCER

    a. The gear reducer shall be direct-coupled to the conveyor drive shaft.

    b. Gear reducers shall be commercially built, AGMA Class II, single or double reduction, helical gear units with high capacity roller bearings. Bearings shall be designed for the thrust loads from the spiral flights and shall have an AFBNA B 10 life of 100,000 hours. The reducers shall be standard air-cooled units with no auxiliary cooling required. Lubrication shall be by splash as a minimum.

    c. The applied torque of the drive unit and gear reducer shall be adequate to start the spiral conveyor when fully loaded.

12. DRIVE SHAFTS CONVEYOR SYSTEM

    a. The drive shafts shall be heat-treated alloy steel AISI 4150. The shaft shall be accurately ground and fitted with key seats, as required.

13. BEARINGS

    a. Bearings shall have a B-10 life rating of 100,000 hours and conform to AFBMA standards.

14. COVERS

a. A protection cover fabricated of minimum 10-guage 304 stainless steel shall be provided for the exposed length of the conveyor, as shown on the Drawings. The cover shall be bolted. The cover shall be sectioned to allow removal in 5-foot (maximum) pieces and shall be attached with stainless steel fasteners.

15. MOTOR REQUIREMENTS

a. The spiral conveyors shall be driven by an electric motor directly connected to a gear reducer. The gear reducer shall be shaft mounted with a trough end adapter. The drive system shall be designed for starting the conveyor full loaded. OSHA-approved drive guards shall be provided to protect against moving parts.

b. The motors shall be squirrel-cage TEFC electric induction motor complying meeting NEMA MG 1 and other applicable NEMA, ANSI and CISD, IEEE standards. Motor shall be constructed with Class B or F insulated winding, cast iron frame and cast iron end bells, with minimum B 30,000 anti-friction bearings. The motor shall be rated at 5 HP, 208 volts, 3 phase, 60 Hertz, continuous duty at 40 degrees C ambient temperature with a 1.15 service factor. The connecting load shall not exceed the motor nameplate horsepower rating under design operating conditions.

c. Motor shall be listed and labeled by a recognized electrical testing laboratory for the application.

16. FABRICATION AND TESTING

a. The conveyors shall be fabricated and assembled and tested prior to shipment. The system shall be broken down as required and shipped as an assembled unit in maximum permissible sizes where possible. Fabrication shall include shop drilling and reaming of field-assembled connections and fabrication of support frames. Exposed surfaces shall have a smooth finish and sharp edges and corners shall be ground off and removed.

17. SPARE OR REPLACEMENT PARTS

a. Furnish a set of special tools required for removing worn parts, carrying out routine maintenance, and for making machine adjustments. Special tools are defined as those tools, which because of their limited use of purpose-made design are not normally readily available, but which are necessary for maintaining the equipment.

b. Furnish gauges, indicators and lubricating devices necessary for the proper operation o the equipment, whether or not such accessories are specified.

18. WARRANTY

a. The contractor shall submit manufacturer's warranties for equipment to be furnished in accordance with this section.

b. Warranty shall extend for 12 months after start-up or 18 months after delivery, whichever comes first.

c. Warranty shall include parts, labor, and coatings for repairing or replacing equipment that fails during the warranty period. Defects occurring within the warranty period shall be repaired or replaced by the manufacturer at no cost to the Owner.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install products in accordance with manufacturer's instructions and approved submittals.

B. The Contractor shall provide all hardware and accessories required for installation.

C. Manufacturer's Field Services

1. Include the following:

a. Inspection and Functional/Operational Testing: One trip with 3 days service.

b. Performance Testing/Training: One trip with 2 days service.

2. Additional trips resulting from failed tests shall be the sole responsibility of the manufacturer.

3. The Conveyor System

a. The contractor shall install the conveyors as shown in the drawings and as recommended by the manufacturer. Install the screw conveyors in a workmanlike manner, taking possible precautions to ensure proper alignment of shafts, gears, and other parts of the equipment.

b. The Contractor shall make electrical and process connections to the system prior to the arrival of the manufacturer's representative.

c. The Conveyor System is a subsystem of the Solids Dewatering System. Contractor responsibilities include assembly of components, connections between components, power supply, interconnecting wiring, instrumentation and controls, supports and miscellaneous hardware not specifically stated herein to ensure the exceptional overall system performance with seamless transition from one component to the next.

3.2 EQUIPMENT STARTUP AND TESTING

A. Perform start-up and functional testing for entire dewatering system, with all units operating in AUTO mode. The Contractor shall complete all electrical/instrumentation and loop testing prior to functional performance testing

B. Provide Major Certificate of Proper Installation.

C. Operational Test:

1. Functional/operational tests may be performed in the same trip.

D. Guaranteed Performance Testing:

1. Include the minimum number of trips and duration of service as previously indicated.

2. Include demonstration that dewatering system meets minimum specified performance requirements of this specification.

3. Manufacturer’s representative shall supervise all performance testing and be solely responsible for operating the dewatering and ancillary equipment (e.g., sludge and polymer feed systems). The Owner shall furnish personnel to assist in operating the equipment and take samples. Manufacturer shall provide certified test reports.

4. After adjustments are made to achieve the operating requirements, the dewatering system will be operated at the design conditions to demonstrate consistent performance. Samples of feed, filtrate, and cake shall be collected by Engineer's appointed representative or Owner and evaluated by the Manufacturer. The test will be deemed successful if average test results meet or exceed those specified.

5. Sample testing and analysis costs shall be the responsibility of the Owner.

6. Polymer shall be as selected by the polymer representative and supplied by the Owner for testing.

7. Data collected during each test run used to complete guaranteed performance testing shall include, as a minimum:

a. Run number.

b. Date.

c. Time.

d. Feed sludge percent total solids, %TS

e. Sludge feed rate, gpm.

f. Polymer name.

g. Polymer percent active, %.

h. Polymer feed rate (neat), gph.

i. Screw press speed, rpm.

j. Amperage draw by the screw press drive.

k. Cake percent total solids, %TS.

8. Provide calculated values for the following:

a. Solids throughput, lbs TS/hr.

9. Solids concentrations will be determined using “Standard Methods.”

10. Guaranteed Performance Test Runs:

a. Test runs shall consist of two 24 hour steady state runs performed on two separate days, one week apart. Maintain the minimum design solids throughput throughout the test runs. Inlet sludge for test runs shall be 1.0% or greater.

b. All test data and values and previously described and required to demonstrate compliance shall be recorded at the start of each run and every hour thereafter. The averaged results for each sample shall meet or exceed the minimum and guaranteed performance standards.

c. The units shall be operated in AUTO mode at all times during the Guaranteed Performance test runs.

d. Should the installed equipment fail to meet the specified minimum performance requirements, the manufacturer shall within 30 days make all necessary changes to the equipment and/or operation at no cost to the Owner. The equipment shall be retested using the same procedure indicated above. If after the second test the equipment still does not meet the minimum performance requirements and/or guaranteed performance standards, damages will be assessed and equipment replaced.

e. The screw press dewatering system shall meet every item of the performance criteria as specified prior to acceptance of the Owner.

11. MANUFACTURER shall prepare and submit a written report documenting the test data listed above.

12. Provide a computer spreadsheet compatible with Microsoft Excel (latest version) with the test data listed above.

E. Witnessing: All field testing shall be witnessed by the Owner's representative or Engineer.

F. A representative of the screw press manufacturer shall be provided for the following:

1. To inspect the equipment and installation

2. To make any field adjustments to ensure proper equipment operation

3. To furnish affidavit stating that the dewatering system has been tested and is ready for installation as specified.

4. To inspect start-up

G. Manufacturer shall inspect system before initial start-up and certify that system has been correctly installed and prepared for start-up.

H. Training:

1. Provide operator training for at least 2 days on-site by factory trained representative. Operator training to include:

a. Operations and inspection training.

b. Safety instruction.

c. Preventative maintenance instruction.

d. Calibration and other pertinent services.

I. The Conveyor System

1. The conveyor manufacturer shall test general operation and perform the following inspections and tests on each conveyor before shipment from the factory:

a. A conveyor run test to verify correct rotation and mechanical integrity. The entire unit is checked for vibration.

b. A Full Load Motor Test (run dry for 5 minutes at full load) to verify electrical data measurements.

c. A final inspection of screw, trough, motor rating, and electrical connections for compliance with purchase order.

2. The conveyors shall be tested onsite under typical operating load conditions before final acceptance.

3. The Contractor shall include services of a qualified representative to perform a pre-operational checkout and start-up of the equipment. Startup shall include one (eight) 8-hour session.

4. The Contractor shall adjust the instruments and signals associated with the Conveyor System as required to affect the conveyor operation described in this specification.

5. Provide one session (session for 4 hours) of field training for the Owner's operation staff in conjunction with or immediately following the performance testing.

6. Provide authorized representative from equipment manufacturers to instruct the Owner's personnel in the operation and maintenance and configuration of the equipment. Training shall be scheduled a minimum of 2 weeks in advance of the first session.

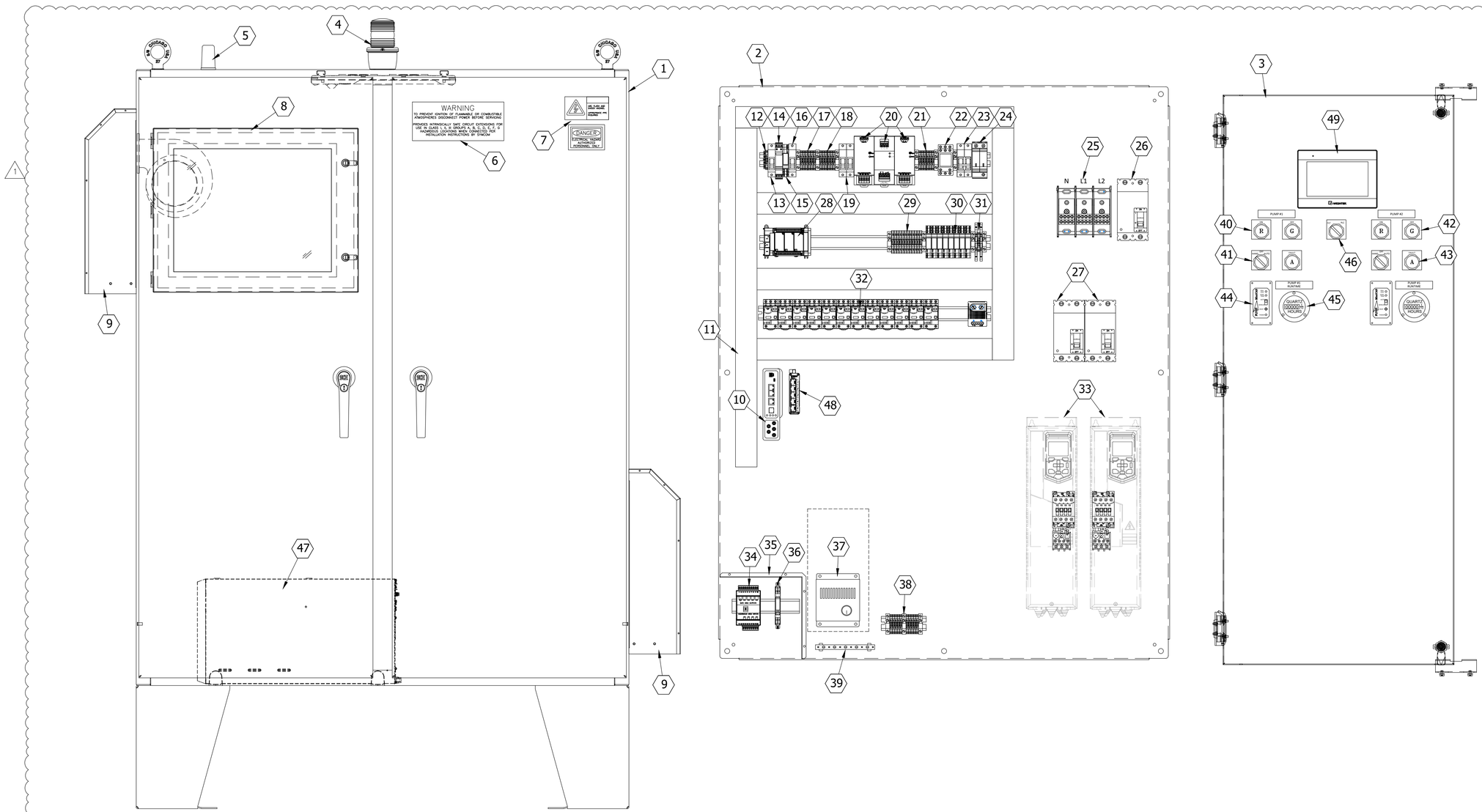
7. Proposed training materials shall be submitted for review, and comments shall be incorporated. Training materials shall remain with the trainees.

8. Provide ongoing technical support for Owner's operation staff for the full warranty period, including additional remote or field training if requested by the Owner due to operational issues.

END OF SECTION

(NO TEXT THIS PAGE)

ATTACHMENT 6
REVISED PLAN SHEETS



CONTROL PANEL KEYED NOTES:

1. STAINLESS STEEL NEMA4X PUMP CONTROL PANEL - 60"X48"X18" MINIMUM. SIMILAR TO SCE-60EL4818SSLPPL.
2. 60"X48" EQUIPMENT PANEL. SIMILAR TO SCE-60P48.
3. 60"X24" DEAD FRONT PANEL (HALF PANEL). SIMILAR TO SCE-DF60EL48LP.
4. LED FLASHING ALARM BEACON.
5. CELL MODEM ANTENNA.
6. WARNING LABEL.
7. ARC FLASH - VOLTAGE WARNING LABEL.
8. 20" X 16" NEMA4X HINGED WINDOW KIT. SIMILAR TO SCE-HWK1620SS.
9. NEMA4X VENTED BLOWER KIT FOR INTAKE AND EXHAUST WITH FAN.
10. CELL MODEM FOR CONNECTIVITY BACK TO PLANT. SIMILAR TO APRISA 4RF LTE. PROVIDE WITH DIN RAIL MOUNT AND CABLES.
11. HIGH DENSITY GRAY WIRE DUCT.
12. 120V PANEL CONTROL POWER GROUND AND NEUTRAL TERMINAL BLOCK.
13. 120V PANEL CONTROL POWER 15A CIRCUIT BREAKER.
14. 120V CONTROL POWER SURGE PROTECTION DEVICE.
15. 120V CONTROL POWER LOSS RELAY.
16. SUPPLEMENTAL CIRCUIT BREAKER FOR SITE LIGHT.
17. 120V CONTROL POWER DISTRIBUTION TERMINAL BLOCKS.
18. 120V CONTROL POWER NEUTRAL DISTRIBUTION TERMINAL BLOCKS.
19. 120V 3A CIRCUIT BREAKER FOR 24VDC POWER SUPPLY AND 15A CIRCUIT BREAKER FOR LOCAL RECEPTACLE.
20. REDUNDANT 24VDC, 5A POWER SUPPLIES WITH REDUNDANCY MODULE.
21. 24VDC DISTRIBUTION TERMINAL BLOCKS.
22. UPS FAIL-OVER CONTACTOR/RELAY.
23. 2P CIRCUIT BREAKER FOR 240V, 1PH SURGE PROTECTION DEVICE.
24. 240V, 1PH SURGE PROTECTION DEVICE. SIMILAR TO ABB OVRT2 2L SERIES.
25. MAIN POWER DISTRIBUTION BLOCK.
26. MAIN POWER CIRCUIT BREAKER.
27. MOTOR PROTECTION CIRCUIT BREAKERS. THESE SHALL BE ABB TYPE IN COMPLIANCE WITH ABB STANDARDS FOR VFD PROTECTION.
28. ALLEN BRADLEY MICRO850 2080-LC50-24 PLC WITH REQUIRED I/O.
29. PLC DIGITAL INPUT FIELD TERMINATION BLOCKS.
30. PLC DIGITAL OUTPUT ISOLATION RELAYS.
31. PLC ANALOG INPUT/OUTPUT DISTRIBUTION TERMINATION BLOCKS.
32. 120V CONTROL RELAYS.
33. NEMA SIZE 1 MINIMUM NON-REVERSING MOTOR STARTERS WITH SOLID STATE OVERLOADS. SPACE TO BE PROVIDED FOR FUTURE ABB ACQ580-01 SERIES VFD DRIVE UNIT PROVIDING 240V, 1PH CONVERSION TO 240V, 3PH.
34. ISB FOR FLOAT SWITCHES. SIMILAR TO ISDUR4.
35. INTRINSICALLY SAFE BARRIER.
36. ANALOG ISB.
37. MINIMUM 100W CONDENSATION PANEL HEATER.
38. TERMINAL BLOCKS FOR MOTOR PROTECTION (SEAL FAIL/OVERTEMP) WIRING FROM MOTOR.
39. CONTROL PANEL GROUND BUS BAR.
40. 30MM PUSH-TO-TEST (PTT) MOTOR RUNNING RED LED PILOT LIGHT.
41. 30MM 3 POSITION HAND-OFF-AUTO SELECTOR SWITCH.
42. 30MM PUSH-TO-TEST (PTT) MOTOR STOPPED GREEN LED PILOT LIGHT.
43. 30MM PUSH-TO-TEST (PTT) MOTOR FAILED AMBER LED PILOT LIGHT.
44. FLUSH MOUNT MINI-CAS SEAL FAIL/OVERTEMP MODULE WITH RESET AND INDICATOR LIGHTS. DIN RAIL MOUNT NOT ACCEPTABLE.
45. RUNTIME METER.
46. 30MM 2-POSITION SELECTOR SWITCH FOR FLOAT/PLC MODE.
47. MINIMUM 700VA UPS DUAL CONVERSION UPS.
48. DIN RAIL MOUNT ETHERNET SWITCH.
49. MAPLESYSTEMS 7.3" COLOR TOUCH HMI. SIMILAR TO CMT3072XHT.

DCCM

SWEETSER WASTE WATER IMPROVEMENTS

SWEETSER, INDIANA, 46987

#	Revision	Date
1	ADDENDUM #1	11-2-2026

Project #: 400-6314

Designed By: JAR

Drawn By: JAR

Checked By: ALC

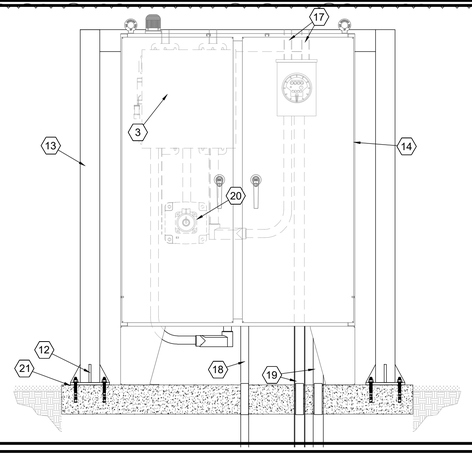
Date: 08/14/2026

AARON L. CRAW REGISTERED No. PE11800762 STATE OF INDIANA PROFESSIONAL ENGINEER

EAGLE DRIVE LIFT STATION CONTROL PANEL UPGRADES

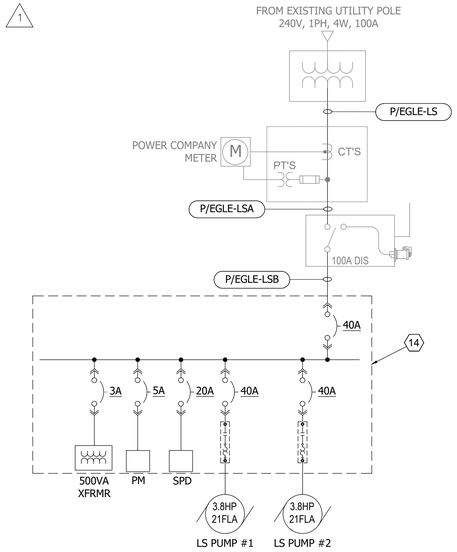
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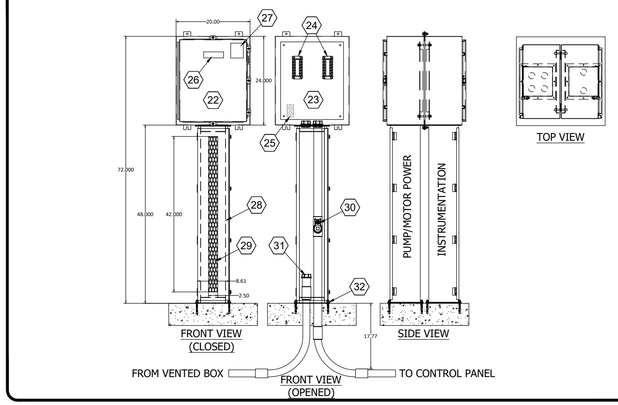


LIFT STATION ELECTRICAL EQUIPMENT RACK

NO SCALE



BASIC ONE-LINE DIAGRAM

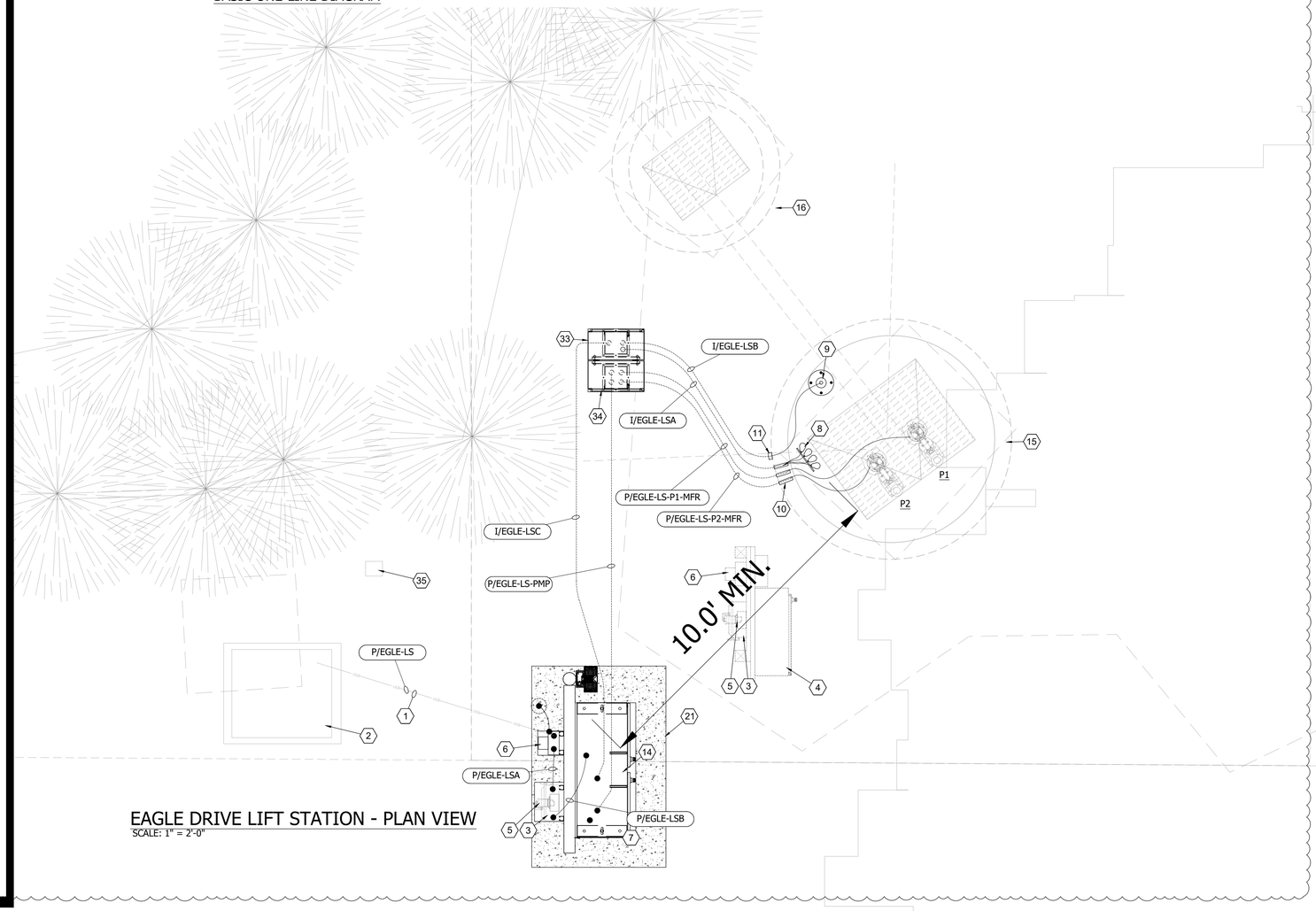


LIFT STATION VENT BOX DETAIL

NO SCALE

ELECTRICAL KEYED NOTES:

1. EXISTING UTILITY UNDERGROUND 100A SERVICE. 240V, 1PH. LIFT STATION UNDERGROUND SERVICE TO BE RELOCATED FROM EXISTING TRANSFORMER TO NEW EQUIPMENT RACK.
2. EXISTING UTILITY TRANSFORMER. TO REMAIN.
3. EXISTING 240V, 1PH, 100A RONK 7103 MAIN DISCONNECT AND MANUAL TRANSFER SWITCH. TO BE RELOCATED TO NEW RACK.
4. EXISTING PUMP CONTROL PANEL. TO BE REMOVED AND RETURNED TO OWNER.
5. EXISTING MOBILE GENERATOR PLUG AND JUNCTION BOX. TO BE RELOCATED TO NEW EQUIPMENT RACK.
6. EXISTING UTILITY METER, TO BE REMOVED. COORDINATE WITH LOCAL UTILITY FOR DISCONNECT AND RELOCATION TO ELECTRICAL EQUIPMENT RACK.
7. PROPOSED ELECTRICAL EQUIPMENT RACK. SEE DETAIL.
8. EXISTING FLOAT SWITCHES TO BE REMOVED AND REPLACED WITH NEW (4 NON-MERCURY TYPE). PROVIDE STAINLESS STEEL J-HOOK FOR FLOAT CABLES.
9. REMOVE EXISTING LEVEL TRANSMITTER AND PROVIDE A NEW RADAR LEVEL TRANSMITTER IN STILLING TUBE. SEE DETAILS SHEET E110.
10. PROVIDE LINK SEALS FOR ALL WET WELL ENTRIES FOR NEW CABLES. SEAL ALL EXISTING CONDUIT/CABLE ENTRIES.
11. JUNCTION BOX OR LB FOR LEVEL SIGNAL CABLE TRANSITION FROM ABOVE GRADE TO BELOW.
12. LIFT STATION EQUIPMENT RACK WELDED BASE PLATE WITH GASKET AND STAINLESS STEEL WEDGE BOLTS.
13. PROPOSED ALUMINUM EQUIPMENT RACK. 3" X 3" SQUARE ALUMINUM TUBING WELDED OR ALUMINUM ANGLE.
14. PROPOSED PUMP CONTROL PANEL.
15. LIFT STATION WET WELL.
16. LIFT STATION VALVE VAULT.
17. EQUIPMENT SUPPORT: STAINLESS OR ALUMINUM UNI-STRUT.
18. INSTRUMENTATION CONDUIT FROM INSTRUMENTATION VENTED BOX.
19. MOTOR POWER CONDUIT FROM MOTOR POWER VENTED BOX.
20. EXISTING MOBILE GENERATOR PLUG.
21. 6' X 4' X 6" POURED RE-ENFORCE CONCRETE PAD.
22. 24" X 20" X 8" NEMA4X STAINLESS STEEL ENCLOSURE. TYPICAL FOR BOTH MOTOR VENTED BOX AND INSTRUMENT VENTED BOX.
23. 24"X20" EQUIPMENT PANEL. TYPICAL FOR BOTH.
24. TERMINATION BLOCKS: 1 SET PER BOX FOR WIRE ENTRY FROM WET WELL AND 1 SET FOR WIRE DEPARTURE TO PUMP CONTROL PANEL.
    24.1. MOTOR VENT BOX: MOTOR LEADS/SEAL FAIL/OVERTEMP
    24.2. I&C VENT BOX: FLOAT SWITCHES/LEVEL TRANSMITTER
25. GROUNDING TERMINAL BLOCK.
26. PHENOLIC IDENTIFICATION NAMEPLATE. BLACK LETTERING ON WHITE.
27. VOLTAGE RATING ON BOX.
28. STAINLESS STEEL WIRE TROUGH SIMILAR TO HAMMOND 1487E48SS. CUT-IN OPENING ON TROUGH DOOR TO APPROXIMATE DIMENSIONS SHOWN. ALL CUT EDGES TO BE CLEAR OF BURRS AND SHARP EDGES.
29. STAINLESS STEEL GRATE. .75" TO 1" HOLE 13GA. MINIMUM. WELDED AND FINISHED TO INSIDE OF TROUGH DOOR CUT-OUT.
30. SEAL-OFF. (SIZED PER WIRE REQUIREMENTS).
31. WIRE PROTECTION BUSHING.
32. STAINLESS STEEL WEDGE ANCHOR: MINIMUM 3/8" X 3" MINIMUM.
33. INSTRUMENTATION VENTED TERMINATION BOX. SEE DETAIL.
34. MOTOR VENTED TERMINATION BOX. SEE DETAIL.
35. EXISTING TELEPHONE JUNCTION BOX. DO NOT DISTURB.



EAGLE DRIVE LIFT STATION - PLAN VIEW

SCALE: 1" = 2'-0"

DCCM

SWEETSER WASTE WATER IMPROVEMENTS

SWEETSER, INDIANA, 46987

#	Revision	Date
1	ADDENDUM #1	11-2-2026

Project #: 400-6314

Designed By: JAR

Drawn By: JAR

Checked By: ALC & DB

Date: 08/14/2026

DUSTIN E. BARTH
REGISTERED
No. 12200401
STATE OF INDIANA
PROFESSIONAL ENGINEER

Dustin Barth

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GRAPHIC SCALE

EAGLE DRIVE LS ELECTRICAL DETAILS - PROPOSED

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POWER INPUT
240VAC, 100A, 1 PH,
W/ GND

N L1 L2

CB 40A

POWER DISTRIBUTION BLOCK

CB 20A — SPD — SURGE PROTECTIVE DEVICE

SPD — TB — TO PLC — TB

CB 40A — MS1 — LIFT PUMP #1 — 3.8HP 21FLA

CB 40A — MS2 — LIFT PUMP #2 — 3.8HP 21FLA

CB 20A — CB 15A — WP/GFI

PFR

PFR TO PLC

POWER FAIL ALARM
LOSS OF 120VAC

CB 15A — PANEL HEATER FOR CONDENSATION

PANEL LIGHT

CB 10A — THERMAL — COOLING FAN

UPS - MINIMUM
1500VA
DUAL CONVERSION

UPSR1 UPSR1 UPSR1 UPSR1

UPS R1 — UPS FAIL CONTACTOR
MINIMUM 20A CONTACT
RATING

UPS FAILURE
TO PLC

ALLEN BRADLEY
MICRO850
CONTROLLER

CB 5A

CB 3A

5A

+24VDC -24VDC

L1 L2 UL1 UN N

L1 N

MODE
FLOAT PLC
FLOAT
TPCX

CR9 — CR12

OFF
HAND AUTO
X00

CR5 — PUMP 1 — VFD1

OOX — TDR1

OOX — DO-CR1

OOX — TB — TB — AUTO TO PLC

ETM 1 — VFD1 RUN — G — RUNNING

VFD1

PUMP#1 START/STOP TO VFD
RESETABLE ELAPSED RUNTIME METER

VFD1 RUN
PUMP#1 VFD RUNNING TO PLC

VFD1 RUN

VFD1 FAULT — A — FAILED PILOT — VFD1 FLT

VFD1 FLT
PUMP#1 VFD FAIL TO PLC

OFF
HAND AUTO
X00

CR7 — PUMP 2 — VFD2

OOX — TDR2

OOX — DO-CR2

OOX — TB — TB — AUTO TO PLC

ETM 2 — VFD2 RUN — G — RUNNING

VFD2

PUMP#2 START/STOP TO VFD
RESETABLE ELAPSED RUNTIME METER

VFD2 RUN
PUMP#2 VFD RUNNING TO PLC

VFD2 RUN

VFD2 FAULT — A — FAILED PILOT — VFD2 FLT

VFD2 FLT
PUMP#2 VFD FAIL TO PLC

CR15 — 1 — 7 — TDR 1
3 — ALTERNATING RELAY
CT16 — 2 — 6 — 8 — TDR 2

TIME DELAY ON ENERGIZE;
0-60 SEC ADJUSTABLE,
SET AT 5 SEC.

TDR1

PRESET SPEED SET - 100%

TDR2

PRESET SPEED SET - 100%

FLTHL — DO-CR3 — ALMCR — BEACON — ALM

L1 N

MSPR-P1

TB — 2 — MiniCASII MOTOR SENSOR — 10 — TB

6

T1 SENSORS T2 — 7 — 5

HIGH TEMP — 4 — 1 — 3

LEAKAGE — 11 — 9 — 10S — 8

BLU — GRN — YEL — MOTOR SENSOR CABLES PUMP 1

CR5 — PUMP 1 OVERTEMP RELAY

CR6 — PUMP 1 LEAKAGE RELAY

MSPR-P2

TB — 2 — MiniCASII MOTOR SENSOR — 10 — TB

6

T1 SENSORS T2 — 7 — 5

HIGH TEMP — 4 — 1 — 3

LEAKAGE — 11 — 9 — 10S — 8

BLU — GRN — YEL — MOTOR SENSOR CABLES PUMP 2

CR7 — PUMP 2 OVERTEMP RELAY

CR8 — PUMP 2 LEAKAGE RELAY

CR9 — LOW LEVEL FLOAT

CR10 — LEAD LEVEL FLOAT

CR11 — LAG LEVEL FLOAT

CR12 — HIGH LEVEL FLOAT

TDR3 — ALARM

L N A1 C1 A2 C2 A3 C3 A4 C4 A5 C5

DIGITAL INTRINSICALLY SAFETY BARRIER

P1 N1 P2 N2 P3 N3 P4 N4 P5 N5

LOW ALL OFF LEAD LAG HIGH

CLASS 1 DIV 1 AREA

ISB-2 — WET WELL LEVEL TO PLC

RED BLK GRN

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PLOT SCALE: 1:186.91 EDIT DATE: 11/1/26 - 10:09 AM EDITED BY: JREED DRAWING FILE: P:\400-6314 SWEETSER WW IMPROVEMENTS\5 ACAD\PLAN SHEETS & WORKING DRAWINGS\400-6314 - EAGLE DRIVE LS PANEL WIRING DETAILS.DWG

DCCM

SWEETSER WASTE WATER IMPROVEMENTS

SWEETSER, INDIANA, 46987

#	Revision	Date
1	ADDENDUM #1	11-2-2026

Project #: 400-6314
Designed By: JAR
Drawn By: JAR
Checked By: ALC
Date: 08/14/2026

AARON L. CROW
REGISTERED
No. PE11800762
STATE OF INDIANA
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EAGLE DRIVE LIFT STATION CONTROL PANEL WIRING DETAILS

I109B