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To: All Plan Holders of Record

From: CT Consultants, Inc.

Re: ***Addendum No. 2***
City of Canton Water Reclamation Facility
Phosphorus/Total Nitrogen Project Contract No. 26

Date: December 10, 2013

This Addendum forms a part of the contract documents and modifies the original bidding documents dated November 2013. Acknowledge receipt of this addendum in the space provided on the "bid form." Failure to do so may subject the bidder to disqualification.

VOLUME 1

Legal Notice

- Page ii – **CHANGE** Bid Date from December 31, 2013 to January 14, 2014. "Sealed bids will be received at the City of Canton, Purchasing Department, 218 Cleveland Ave SW, Sixth Floor, Canton, OH 44702 until 2:00 p.m., EST, January 14, 2014…"

Instruction to Bidders

- Page ITB-5, H. 5 – **CHANGE** Bid Date from December 31, 2013 to January 14, 2014. "Bids must be received at the designated location for the bid opening before 2:00p.m., local time, on Tuesday, January 14, 2014." With the date change, Apparent Low Bidder must have approvable EPA 1A and EPA 1B forms submitted with their Bid. Bidders also agree to submit signed copy of the Contractor's EEO Certification page EEO-1 and signed copy of the "Certification Regarding Debarment, Suspension and other Responsibility Matters" page DSR-1 by January 17, 2014.

Contractor's Qualification Statement

- Page CQS-5: 5. Financing **ADD**: "Responses to the Request for Financial Statement and Balance Sheet will be treated as "Trade Secrets" by Owner as defined in Ohio Revised Code 1333.61(D). Accordingly, Owner will not consider any submitted Financial Statement or Balance Sheet as a public record to be released under any request made pursuant to Ohio Revised Code 149.43 et seq., the /Ohio Public Records Act/. Should a third party attempt to procure any submitted Financial Statement or Balance Sheet through court action, Owner will inform the affected bidder, who may choose to defend against any such action. Owner will provide reasonable cooperation in that effort."

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Modified General Conditions, EJCDC No. C-700 (2002)

- Page GC-27, 6.14 B – **ADD** Other duties can be assigned to the Safety Representative as the Contractor desires.

VOLUME 2

Specification 01010 – SUMMARY OF WORK

- Page 9, Civil Site Work Paragraph 1. **CHANGE** six (6) inches to four (4) inches. The sentence shall read as follows: "This includes fill material, a minimum of four (4) inches of top soil, grading, seeding and fertilizing."

VOLUME 3

Specification 11216 – VALVES

- **ADD** the following to Section 2:
  "2.21 PVC BALL VALVES

  A. Ball valves shall be of a double union design that permits in-line maintenance without disconnecting the pipe.

  B. Ball valves shall have a hole through the center of the ball, along one axis, that connects the inlet and outlet ports of the valve body. The ball is to be held in place by and rotated 90 degrees within a Teflon seat that provides permanent lubrication. An elastomer o-ring shall seal the valve bubble tight.

  C. Ball valves are to be constructed of thermoplastic, non-corrosive PVC capable of withstanding a pressure of 150 psi at 75° water temperature.

  D. Ball valves are to be of a full port design with a pressure drop equivalent to an equivalent length of straight pipe.

  E. Ball valves shall be True Union Ball Valves as manufactured by Plastomatic, Chemtrol, Swaglok or approved equivalent.

  F. Ball valves utilized for sodium hypochlorite, chlorine or bleach shall have an internal vent that equalizes pressure in the ball and body of the valve to that of the system protecting the valve from temperature induced overpressurization."

Specification 11216 – METERING PUMPS

- **REPLACE** specification in its entirety. (Attached)

Specification 11325 – FINE SCREEN EQUIPMENT

- Control Panels for Screens and Washer Compactors shall all be NEMA 4X Stainless Steel **CHANGE** specification as required.
- Page 8, **REPLACE** Section 2.4 C. 9. Note with the following: "Note: The screenings washing and compaction unit will be sized to handle the peak solids load removed from the fine screens. The screenings washing and compacting unit shall discharge screenings

with a minimum 45 percent solids concentration. The system will be required to thoroughly wash the screenings to reduce the organic content to a minimum and compact the remaining solids into a dry plug. The organic content washed from the screenings will be returned to the channel to continue in the process stream."

- Page 17, **DELETE** Section 2.7 G. 2. b.

Specification 11328 – LONGITUDINAL GRIT AND GREASE REMOVAL SYSTEM

- Page 12, **REPLACE** 2.4 B. with the following: "Clean all stainless steel surfaces and provide glass bead blast or chemically treat all external non-wetted stainless steel to a uniform finish."

Specification 14550 – CONVEYOR SYSTEMS

- Page 4, Section 2.2 C. 6. **REPLACE** sentence with the following: "Conveyor troughs shall be fitted with 3" drain connections as shown on the Drawings. Manufacturer shall account for the drain when fabricating the liner and shall submit details of fabrication with shop drawings submittal."

Specification 14621 – HOISTS, CRANES AND MONORAILS

- Page 8, Section 3.6 C. Jib Crane West of Screening Building **CHANGE** Qty. 2 to Qty. 1.

Specification 15140 – DOMESTIC WATER PIPING

- Page 4, **DELETE** Section 3.4 A

APPENDIX

The following shall serve as clarifications to the noted sections in the Appendix:

1. Sections 1 through 5 - Any price quotations are for reference only. Bidders are responsible for negotiating their own pricing for equipment. Owner will pay no escalation charges and Owner will not ask for a credit for any price de-escalation. Pay requests will be based upon the approved Schedule of Values.
2. Section 2 & 3 – Quotations from Hydro-Dyne
   a. In Hydro-Dyne's quotations they list Comments and Clarifications, Hydro-Dyne has included an adder for the power quick disconnects. Contractor shall provide quick disconnects per specification 11325.
3. Section 5 – Quotation from Farrar Scientific (Refrigerator Environmental Chamber – Incubator Environmental Chamber System): Owner is not interested in the Options listed on Page 2 of 2. Please see Specification 11602 for Scope.
4. Section 13 - OVIVO Scope of Supply Clarifications.
   a. The diffusers in both the Swing Zone and the Pre-aeration basin are pre-assembled. They will need to be connected to the manifold pipes by the Contractor. Please refer to pending OVIVO shop drawing submittal, but please note a detail part list is not available till production starts.
   b. The 636 Submerged Membrane Unites (SMUs) are pre-assembled. However, the Contractor needs to attach the diffuser cases prior to lowering the units into the basin. Please refer to pending OVIVO shop drawing submittal, but please note a detail part list is not available till production starts.

c. The 3" tubing from the SMUs to the Permeate Headers and from the SMUs to the Air Header will not come in pre-cut lengths and it will need to be field cut to fit.
d. OVIVO will supply hardware for pipe connections and support structures inside the MBR basins with exception to where the piping, valves or appurtenances ties into the pipe supplied by the Contractor, where hardware is not supplied.
e. Attached is a reference document prepared by OVIVO to quantify counts of some of their equipment that is to be supplied. Please note that the counts on the sheet are for reference only. OVIVO cannot provide an accurate count before the fabrication drawings are done.

Section 14 – OVIVO Shop Drawings

- OVIVO's Unapproved Shop Drawings are being made available for reference only to planholders. The submittals have not been reviewed and are available only for reference. When available from OVIVO, an e-mail containing the website address and login information will be provided to all planholders to access the documents. The shop drawings are available for viewing on a computer screen only with no permission for printing or download due to OVIVO's confidentiality requirements. Should hard copies of selected pages of Ovivo's shop drawings become necessary, planholder can request them through CT.

PLANS

The following plan sheets are REVISED per the notes below:

Sheet 56	3S-02	**ADD** the following note to sluice channel: #5 dowels by 1'-0" at 24" center to center along each edge of sluice slab. Refer to "Drill and Grout" Notes on Sheet 3S-07, Section X-X.
Sheet 123	5S-03	The note in the upper left corner regarding the crane rail beam should be **REVISED** to require the longitudinal bars to be 2-#6 top and 3-#7 bottom. There is no change to the stirrups.
Sheet 125	5S-05	**ADD** the following note: The "Alternate Crane Steel Beam", Section D-D shows and elevation of the East Crane Beam (W21X48). The West Beam Elevation (W21x68) is not shown but is similar except the span of each is 28'-8" c/c of supports. There is no center column support.
Sheet 147	5P-13	**REVISE** coded item 17 to read "Pressure Relief Valves (10 each) and **DELETE** coded item 19 Anti-Pulsation Dampener (7 each).
Sheet 152	5P-18	**ADD** the following note: All Sodium Hypochlorite Metering Pumps shall be provided with a female hose connection on the suction side of the pump for flush water that matches the same diameter of the suction piping. Contractor shall route a ¾" non-potable water line to a new hose bibb located on the west wall between the CIP and Emergency Disinfection Metering Pumps.

Sheet 154	5P-20	**REVISE** coded item 17 to read "Pressure Relief Valves (9 each)" and **DELETE** coded item 19 Anti-Pulsation Dampener (6 each).
Sheet 155	5P-21	**DELETE** all pulsation dampers and back flow control valves and **ADD** pressure relief valve (typ. for 2) on 1" relief piping. **ADD** General Notes: 1. Schematics may not be representative of actual required installation orientation but contain critical conditions that need to be maintained. See process drawings for location and orientation of equipment. 2. All new piping penetrations shall be core drilled and sealed with modular mechanical seals. 3. Piping shall be Schedule 80 PVC unless otherwise noted. All pipe accessories shall be non-corrosive material suitable for each chemical. 4. All fill, feed and drain lines shall be installed plumb and shall be supported uniformly and continuously by wall, ceiling or floor mounted pipe supports or pipe hangers and/or pipe hangers and/or on pipe racks.
Sheet 199	9P-04	Section cuts are incorrect. In Section cuts A, B and C **CHANGE** 9P-07 to 9P-04 and 9P-08 to 9P-05.
Sheet 200	9P-05	Section cuts are incorrect. In Section A, B and C **CHANGE** 9P-07 to 9P-04 and 9P-08 to 9P-05.
Sheet 228	10A-05	Section 2 – Wall Section **ADD** the following note: Waterproofing shall run only the length of the Sludge Load-Out Building North wall.

The following plan sheets have been REVISED per the referenced attached Sketches:

Sheet 122	5S-02	Sketch S-1	**ADD** notes
Sheet 127	5S-07	Sketch S-2	**ADD** detail for grating support
Sheet 127	5S-07	Sketch S-3	**REVISE** Section C_{5S-01}- C_{5S-07}
Sheet 136	5P-02	Sketch P-1	**ADD** Chemical Feed Lines and Notes
Sheet 140	5P-06	Sketch P-2	**ADD** Chemical Feed Lines and Notes
Sheet 144	5P-10	Sketch P-3	**ADD** Blind Flanges and REVISED Nitrogen Reduction Feed Line Notes
Sheet 242	12A-01	Sketch A-1	**REVISE** schedule

REMOVE the following plan sheets and replace with the attached:

Sheet 234	12P-03	Sheet 232 was issued twice, **REPLACE** Sheet 234 with the attached.

AGW/saa

Enclosures

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SECTION 11216 - METERING PUMPS

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

A. The work covered by this Section shall include the furnishing of all labor and materials to complete the equipment fabrication, installation and initiate satisfactory operation of metering pumps along with all support brackets, fasteners, anchors and other incidental work, including chemical solution to start-up and calibrate the completed installation.

B. It is the intent of this Contract that the final installation is complete in all respects and the Contractor shall be responsible for minor or specific details; coordination with trades, equipment manufacturing, installation and manufacturers start-up representatives; and any necessary special construction not specifically included in the Drawings or Specifications.

C. The Contractor shall pay particular attention to the following elements of the installation.

1. Electrical Coordination. The Contractor shall coordinate all electrical components including wiring, conduit, equipment and installation based on the shop drawings for the equipment being supplied by providing the Contractor/trade with the appropriate drawings and information.
2. Instrumentation/central control interface.

1.2 SCOPE

A. Contractor shall provide all labor, materials , equipment and incidentals, as shown, specified and required to furnish and install chemical metering pumps.

1.3 RELATED SECTIONS

A. Section 09801 – Special Coatings

B. Section 11830 – Process Pipe Hangers and Supports

C. Section 11381 – Process Pipe and Fittings

D. Section 11503 – Heated and Insulated Bulk Chemical Storage Tanks

E. Section 13500 – Process Instrumentation and Control Systems

F. Division 16 – Electrical Work

1.4 QUALITY ASSURANCE

A. The named equipment in addition to the detailed specifications, establishes the minimum acceptable standards of material and workmanship.
In addition to requirements of these Specifications, all work performed shall be in accordance with approved trade practices and manufacturers recommendations.
All equipment shall perform as specified and accessories shall be provided as required for satisfactory operation.

B. Responsibility and Coordination:

1. Under this Contract, the Contractor shall be responsible for the purchase, storage, and installation of the metering pumps complete, and any accessories required. The devices shall be completely wired, tested, and be suitable for operation.
2. The Drawings and Specifications are intended to illustrate and define the equipment installation but do not propose to cover all details entering into its design and construction, however the Contractor shall properly install, adjust, and place in operation the complete installation. The Contractor shall assume full responsibility for additional costs which may result from unauthorized deviations from the Specifications.

C. The Contractor shall coordinate and verify that the equipment furnished meets the Specification, system intentions and design criteria prior to equipment submittals and shipment from the manufacturers to the project site.

1.5 SUBMITTALS

A. Product Data: Submit manufacturer's technical data and application instructions in accordance with Division 1. Product data shall include data for each size and type of pump, motor, and accessories, including manufacturer's brochure, specifications, weight, performance data, turndown, and capacity.

B. Shop Drawings: The Contractor shall submit complete shop drawings of all equipment furnished for this project as covered by these Specifications. The Contractor's submittal must include a certification that the submitted material describes exactly the equipment to be provided. Substitutions of equipment subsequent to those equipment names provided with the bid or to previously approve will not be accepted. All shop drawings shall clearly identify the specific equipment and material being supplied, the quantity being supplied, and all accessories, dimensions, descriptions, mounting and connection details, electrical control diagrams, wiring schematics and any other information necessary to determine compliance with the plans and Specifications. The submittal as a minimum shall include the following data drawings and other related materials.

C. Testing Plans: The Contractor shall submit source quality control testing plan and the field quality control testing plan for review and approval

D. Operation and Maintenance Manuals: Six (6) copies of Operation and Maintenance (O&M) Manuals shall be submitted when requested to the Owner's Representative prior to delivery of the equipment.

E. Warranty: The Equipment Manufacturer shall warrant that all equipment furnished by him shall be free of defects in the material and workmanship for a period of five (5) years from the date of acceptance. Warranties shall comply with the General Requirements.

1.6 REFERENCES

A. ASTM – American Society for Testing and Materials
B. NEC – National Electrical Code
C. NEMA – National Electrical Manufacturers Association

PART 2 - PRODUCTS

2.1 GENERAL

A. The chemical metering pumps shall be provided to supply the following systems:

1. BNR/MBR Alum Feed
2. BNR/MBR Refined Glycerin Feed
3. Emergency Disinfection Feed

B. The metering pumps shall be suitable r pumping the chemicals listed below with the following characteristics:

1. MBR Alum Feed = 48.5% Alum by Weight
2. MBR Refined Glycerin Feed = 70% Refined Glycerin by Weight
3. Emergency Disinfection Feed = 12.5% Sodium Hypochlorite

C. Pumps shall be manufactured by Wallace & Tiernan, Watson Marlow, Master Flex or Approved Equal.

3.2 MATERIALS/EQUIPMENT

A. Chemical Feed Pumps – dimensions and capacities

1. MBR Alum Feed Pumps (To RAS Recycle Well and Preaeration)

a.	Quantity	9 (6 duty, 3 standby)
b.	Maximum Capacity, each	14.6 gph
c.	Minimum Capacity, each	4.2 gph
d.	Maximum Discharge Pressure	25 psi
e.	Inlet/Outlet Connections	1" NPT
f.	Power	120V, 1 Ph., 60 Hz
g.	Motor	0.5 Hp, SCR Drive

2. MBR Nitrogen Reduction Feed Pumps (To MBR Main Influent Channel)

a.	Quantity	2 (1 duty, 1 standby)
b.	Maximum Capacity, each	100 gph
c.	Maximum Discharge Pressure	25 psi
d.	Inlet/Outlet Connections	2" NPT
f.	Power	120V, 1 Ph., 60 Hz
g.	Motor	0.5 Hp, SCR Drive

3. MBR Nitrogen Reduction Feed Pumps (To RAS Recycle Wells)

a.	Quantity	8 (6 duty, 2 standby)
b.	Maximum Capacity, each	16.67 gph
c.	Maximum Discharge Pressure	25 psi
c.	Inlet/Outlet Connections	1" NPT
f.	Power	120V, 1 Ph., 60 Hz
g.	Motor	0.5 Hp, SCR Drive

4. Emergency Disinfection Feed Pumps

a.	Feed Point	48" North Permeate Pipe and 36" South Permeate Pipe
b.	Chemical	12.5% Sodium Hypochlorite
c.	Quantity	2
d.	Maximum Feed Rate, each	180 gph
e.	Maximum Discharge Pressure	20 psi
f.	Inlet/Outlet Connections	1" NPT
g.	Power	120V, 1 Ph., 60 Hz
h.	Motor	1 Hp

4.2 PERISTALTIC METERING PUMPS

A. General

1. Chemical metering pumps shall be peristaltic, complete with pump head, flexible extruded tube, and integral variable speed drive. Equipment shall be compatible with the intended chemical service. All wetted surfaces of the feed pump and all sealing gaskets shall be suitable for continuous exposure to chemicals listed.

B. Pump Head

1.
1. Tubing shall be completely contained within the pump head. Pump cover shall be provided with a viewing window positioned to allow viewing direction of rotation. When close, pump door shall seal against the pump track for leak containment in the event of a tube failure.
2. Pump shall not require used of check valves or dynamic seals in contact with pumped fluid. One roller shall at all times be fully engaged with the tubing providing complete compression to prevent backflow or siphoning.

3. All pump cover bolts and fasteners shall be of Type 316 stainless steel.
4. Tubing shall be replaceable with no disassembly of pump head and without using tools.
5. Capable of delivering continuous discharge pressure specified.
6. The pump head must be capable of accepting difference diameter tubing.
7. Rotor shall be capable of self-priming with suction lift capability of 25 feet of water.
8. Pump must be able to run dry without damaging pump or tubing.
9. Each pump shall be furnished and installed with factory mounted switch for indication of "Tubing/Hose Failure".
10. Leak detector shall be mounted at the lowest point of the pump cover. Each switch shall be compatible with the pumped fluid and shall be SPDT rated for 5A, 240 VAC, single phase.
11. Speed adjustment:
    a. Two modes: manual scale with zero to 100 percent scale indication, and automatic via remote 4-20 mA DC flow proportional signal.
    b. Adjustment shall be possible while pump is operating.
    c. Infinitely- variable to meet or exceed minimum-to-maximum flow range specified.
12. Pump drive shall be completely contained within integral enclosure, complete with brackets, supports, fasteners, and appurtenance suitable for mounting as shown or indicated in the Drawings. Enclosure finish shall provide long-term protection form environmental conditions. Unpainted enclosures are not acceptable. Each pump shall have stainless steel nameplate with manufacture name, model, serial number, rating, range, speed, and other pertinent data.
13. Pumpheads shall be rated for 24 hour continuous service, 40 degrees C ambient temperature. .

C. Tubing/Hose

1. During normal operation, tubing's inner wall shall be the only surface in contact with pumped fluid.
2. Tubing/Hose shall be extruded from material compatible with pumped fluid.
3. Tubing/Hose shall be compatible with the pumped fluid and pressures specified.
4. Supply two (2) one-meter long flexible reinforced hoses for connection to the pump suction and discharge process lines. The flexible hose shall have built-in shut-off valves for ease of maintenance and connection to the process lines.

D. Drive

1. Drive motor shall be variable speed, brushless DC with integral gearbox.
2. Circuitry shall be microprocessor-controlled with temperature- and load-compensation and protection.
3. Drive Speed: Infinitely variable to meet or exceed associated pump speed range specified.

4. Rating: Continuous 24-hour per day operating, 40 degrees C ambient temperature.
5. Power supply 110/120 volt, single phase, 50/60 Hertz, field switchable and fused. Supply nine-foot length main power cord with standard 120-volt three prong plug.
6. Controls shall have manual override. Provide interface for the following signals.
    a. Analog Input: 4-20 mA DC (250 ohms) speed reference signal. Provisions for alternative remote accessory potentiometer (if supplied by others) for primary speed control or secondary speed scaling.
    b. Analog Output:
    c. Digital Input (drive contact closure): start/stop signal
    d. Digital Output (dry contact closure, rated two amps at 120 volts AC): in auto status, running status, hose break alarm status, and faults status signals.
    e. Interface shall accept RS485 or RS232 data protocol.
7. Minimum requirements for operator interface functionality:
    a. Blacklit graphical liquid crystal display (LCD) capable of up to four lines of text with 16 characters per line to display pump speed, running status, flow rate, and programming instructions.
    b. Keypad for start, stop, speed increment, speed decrement, forward/reverse direction, rapid prime, and programming.
    c. Menu-driven, on-screen programming of manual or auto control, flow, and remote signal calibration, and general programming.
    d. Programmable "Auto Restart" features to resume pump status after power outage.
    e. Programmable "Keypad Lock" to allow operator lockout of all keys expect emergency start/stop.
    f. Programmable "Maximum Speed" to allow operator to set maximum speed of pump.
    g. Control Logic:
        1. When the Local mode, pump speed shall be regulated via keypad or speed potentiometer and shall be started or stopped via the keypad. When in the Remote position, pump shall be started or stopped via a remote closed contact signal and pump speed shall be controlled via remote 4-20 mA signal. When in Remote, pump will not stop until remote contact start is disengaged.
        2. When running, run status shall be indicated on the LCD screen.
        3. In the event of a hose failure, motor over temperature or drive failure the fault shall be indicated on the LCD screen.

2.3

2.3 SHOP PAINTING/FINISHES

A. Surface preparation and painting shall conform to Section 09801, Special Coatings. All surfaces shall be cleaned of dirt, grease, oil, rust, scale or other injurious substances. Unless otherwise noted, all ungalvanized metal surfaces shall receive a shop cleaned surface preparation equivalent to SSPC-SP-10 immediately prior to shop priming by the manufacturer.

B. All ungalvanized metal surfaces shall receive manufacturer's standard primer and finish coatings.

2.5 ACCESSORIES:

Provide the following accessories in the quantities shown or as indicated on the drawings:

A. Pressure relief valves (PRV) - Valve construction shall be PVC with same nominal size as pump discharge. Valves shall be field-adjustable without removing from piping, and shall initially be set ten psi higher than design discharge pressure of the associated pumps. Pressure relief valves shall be adjustable from 0 – 60 psi.

B. Pressure gauge and switch combination with a diaphragm seal on the discharge of the pump. Gauge to have a 3.5" dial with liquid filled case, ½" NPT connection, stainless steel tube and socket with pressure range of 0 – 60 psi.

C.

D.

C. Calibration columns as shown on the drawings.

1. Calibration column shall be a transparent, clear tube. Graduations markings have both ml calibrations and direct reading flow in gallons per milliliter in proportion to the size of the column..
2. Calibration column shall be sized to provide at least 30 seconds of storage at maximum rated pump flow.
3. Calibration column must have an inlet port and outlet port that can be connected to piping via threaded or solvent welded joints.

2.6 SPARE PARTS

The intent of this Specification is to provide uninterrupted operation for a minimum period of three (3) years. To meet this objective, the equipment manufacturer shall supply any spare parts that are required to meet this time frame. As a minimum, the following spare parts will be furnished:

A. Furnish the following for each type and size of pump furnished:

1. One spare pump head assembly.
2. For each chemical application, two (2) spare tube elements for each pump
3. One quart of touch-up paint.

4. Two complete sets of special tools required for normal maintenance and operation.

B. These parts shall be identified, prepared and packed for long term storage.

The manufacturer shall provide, as a minimum, a complete inventory of all manufacturer recommended spare parts. Spare parts shall be protected and packaged as recommended by the manufacturer. Each package shall be tagged for positive identification noting: part name, part number, associated equipment name and number, manufacturer name and address.

PART 3 - EXECUTION

3.1 FIELD CONSTRUCTION QUALITY CONTROL

A. Procedure

The Contractor shall submit to the Owner for review and comment a construction procedure and quality control procedure prior to commencing work. Construction procedure and all required testing shall comply with these specifications and all applicable codes and standards.

1. Inspection: Prior to all work of this Section, carefully inspect the fabricated and installed work of all other trades and verify that all such work is completed to the point where this installation may properly commence.
2. Inspect all parts of the furnished equipment and verify that the system may be installed in strict accordance with all pertinent codes and regulations, the original drawings, the referenced standards, and the manufacturers' recommendations.
3. Discrepancies: Notify the Owner's Representative immediately of all unsatisfactory conditions or discrepancies. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved. Beginning with the installation means, the installer accepts the existing surfaces and conditions.
4. Coordination: It is the Contractor's responsibility to notify and coordinate with the equipment manufacturer and other trades in a timely manner in order for them to conduct their required work, inspection, servicing, testing, and instruction.
5. Anchorage. The Contractor shall be responsible for furnishing and placing all anchorage systems (bolts, nuts, washers, gaskets and any other items necessary) for the installation of the equipment. The Contractor shall coordinate with the manufacturer in identifying proper size and locations of all anchorage.
6. Protection: Protect adjacent equipment, materials, piping, structures, and/or valving against damage from the installation procedure.
7. Manufacturer's Instructions: Preparatory work in accordance with manufacturer's instructions shall be completed prior to equipment installation.

3.2 MANUFACTURER'S FIELD SERVICE

A qualified representative of the manufacturer shall inspect the completed installation, service the equipment, adjust, field test, operate the equipment under all design conditions, instruct the Owner's personnel in proper operating and maintenance procedures, and provide the Owner with a written certificate of approval. This representative shall spend at least one (1) - eight (8) hour visits performing the required services and submit a manufacturer's representative report for each site visit. The training shall be scheduled with specified service time spent on site.

3.3 LUBRICATION

A. Storage Lubrication. Any equipment delivered and stored shall be checked at delivery for storage practices and lubricated for long term storage as recommended by the equipment manufacturer as outlined in the O & M Manual.

B. Continuous Service Lubrication - As part of the equipment start-up and testing procedures, the Contractor shall service and lubricate the equipment for continuous duty in accordance with the manufacturer's recommendations.

3.4 FIELD ADJUSTMENT/START-UP FIELD TESTING

A. The source quality control testing plan and that field quality control testing plan shall be submitted to the Engineer for review and approval.

B. Prior to acceptance, conduct an operational test of the equipment herein specified and controls systems in accordance with start-up and testing, under the observation of the Engineer, to determine if the installed equipment meets the purpose and intent of the specification.

C. A factory trained engineer from the equipment manufacturer shall conduct the tests in the presence of the Owner. The equipment manufacturer shall provide all materials, instruments and equipment required for the tests and shall provide a written report of test results to the Contractor and Owner.

D. Field calibrate each pump and present calibration curves to the Owner. Perform capacity/head tests, including pump's rated design point, at shutoff, and at maximum flow.

E. Contractor shall be responsible for furnishing sufficient chemicals as noted in Item 2.1.C at his expense for startup, calibration, and demonstration purposes of the metering pumps for each system. Coordinate delivery with Owner.

F. Certification - The manufacturer shall submit to the Engineer and the Owner a written notarized report of the results of the tests which includes certifying that the equipment has been checked and is suitable for operation.

3.5 OPERATION AND MAINTENANCE (O&M) MANUALS

Operation and Maintenance (O&M) Manuals will be provided by the equipment manufacturer at least two (2) weeks prior to shipment of all major equipment components. The O & M Manuals shall include instructions on storage, installation, start-up, and operation and maintenance, together with a complete parts list and a recommended spare parts list. Each O&M Manual shall be a bound, indexed binder with drawings and parts lists prepared specifically for this project rather than general instructions that are not designed for this project. As a minimum the manual shall contain:

A. General arrangement and detail equipment drawings.

B. Detail erection drawings.

C. A complete bill of materials for the equipment including the weights of all components.

D. Installation, operation and maintenance instructions for the specific equipment including the erection sequence, maintenance, and trouble-shooting checkpoints and complete lubrication procedures with recommended grades of lubricants.

E. Cut sheets for all items of equipment purchased from other manufacturers.

F. A list of the manufacturer's recommended spare parts specifically denoting wear items, long delivery items, and all items convenient for stocking as optional replacement items.

G. An address, phone number and contact person for servicing equipment and ordering parts.

3.6 TRAINING

The equipment manufacturer shall each provide up to four (4) hours of training session on the operation and maintenance and control of the equipment after installation is complete and before the start-up and testing of the first unit.

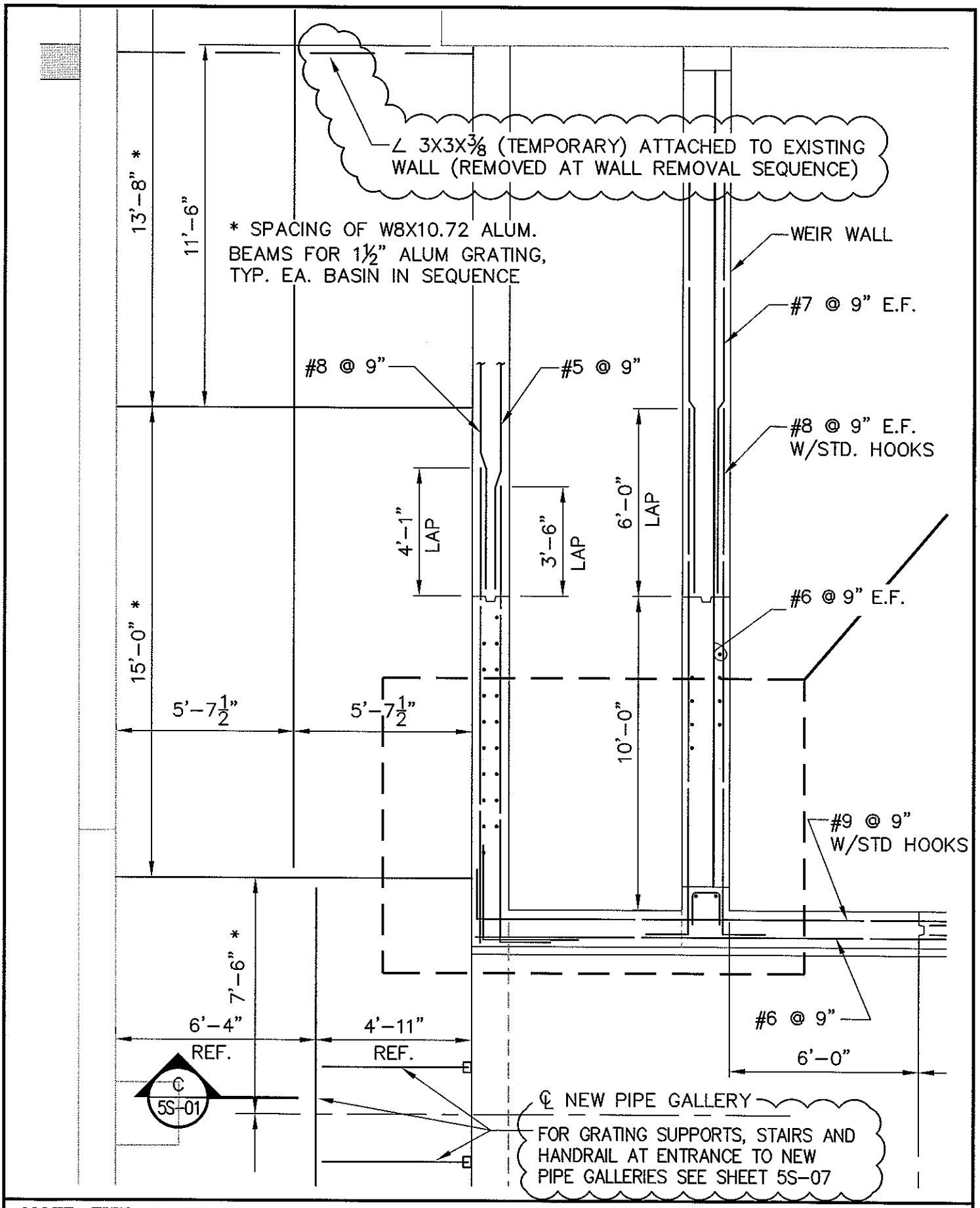
END OF SECTION 11216

OVIVO
Bringing water to life

CANTON, OH

For Reference Only.
Actually Count May Vary
***Hardware at Tie Points
Provided by Contractor

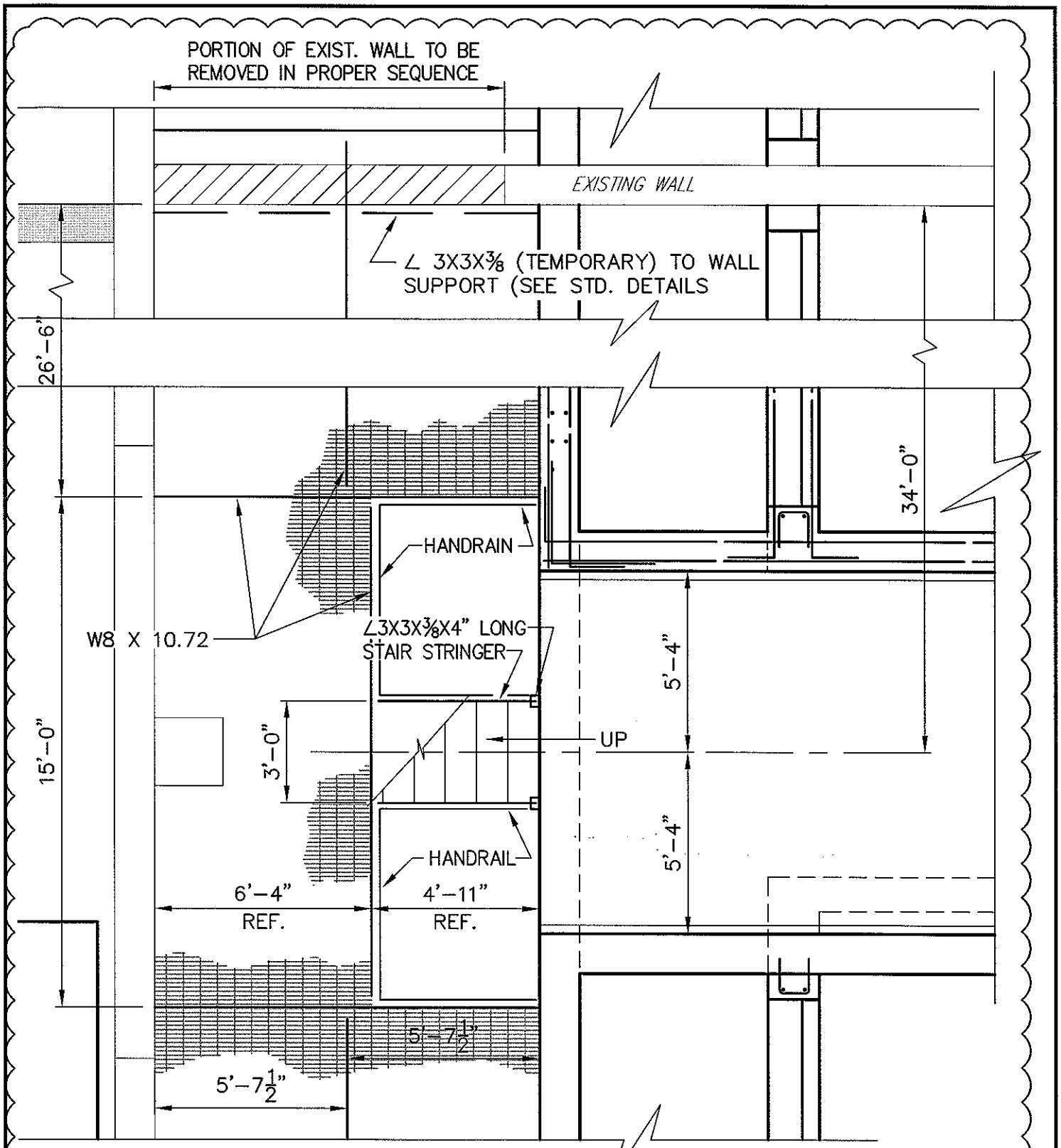
SMU	PER SMU	PER BASIN	TOTAL
SP-400 SMU	NA	53	636
SP-400 SMU FLOOR ANCHORS	8	424	5088
SP-400 SMU GUIDE PIPE BOLTED CONNECTIONS	8	424	5088
SP-400 SMU MOUNTING BRACKET BOLTED CONNECTIONS	10	530	6360
3" FLANGED CONNECTIONS	3	159	1908
HEADERS	**PER HEADER**	**PER BASIN**	**TOTAL**
8" PERMEATE HEADERS	NA	16	192
8" PERMEATE HEADER SECTIONS	2	32	384
8" FLANGED CONNECTIONS - FASTENERS PROVIDED	1	16	192
8" FLANGED CONNECTIONS - TIE-POINTS ***	1	16	192
10" AIR HEADERS	NA	8	96
10" AIR HEADER SECTIONS	2	16	192
10" AIR PIPE SPOOLS	1	8	96
10" FLANGED CONNECTIONS - FASTENERS PROVIDED	2	16	192
10" FLANGED CONNECTIONS - TIE-POINTS ***	1	8	96
HEADER SUPPORTS	**PER SUPPORT**	**PER BASIN**	**TOTAL**
MID-BASIN HEADER SUPPORTS	NA	7	84
MID-BASIN HEADER SUPPORT FLOOR ANCHORS	4	28	336
MID-BASIN HEADER SUPPORT WALL ANCHORS	10	70	840
MID-BASIN HEADER SUPPORT BOLTED CONNECTIONS	38	266	3192
MID-BASIN HEADER SUPPORT U-BOLTS	10	70	840
EAST WALL HEADER SUPPORTS	NA	1	12
EAST WALL HEADER WALL ANCHORS	13	13	156
EAST WALL HEADER BOLTED CONNECTIONS	12	12	144
EAST WALL HEADER U-BOLTS	3	3	36
WEST WALL HEADER SUPPORTS	NA	1	12
WEST WALL HEADER WALL ANCHORS	16	16	192
WEST WALL HEADER BOLTED CONNECTIONS	12	12	144
WEST WALL HEADER U-BOLTS	6	6	72



NOTE: THIS DRAWING SHALL BE CONSIDERED TO BE PART OF SHEET 122 OF 375 - 5S-02 .

CT JOB NO. 10182	CANTON WATER RECLAMATION FACILITY PHOSPHORUS/TOTAL NITROGEN PROJECT CONTRACT NO. 26 CITY OF CANTON, STARK COUNTY, OHIO	DATE	SCALE	ADDENDUM	SKETCH
CT Consultants engineers | architects | planners		12/10/13	1/4" - 1'-0"	# 2	S-1

Drawing name: H:\2010\10182\DWG\Aeration-MBR MIDDLE .dwg Layout: ADD 2 - 5S-02 S1 by: marano



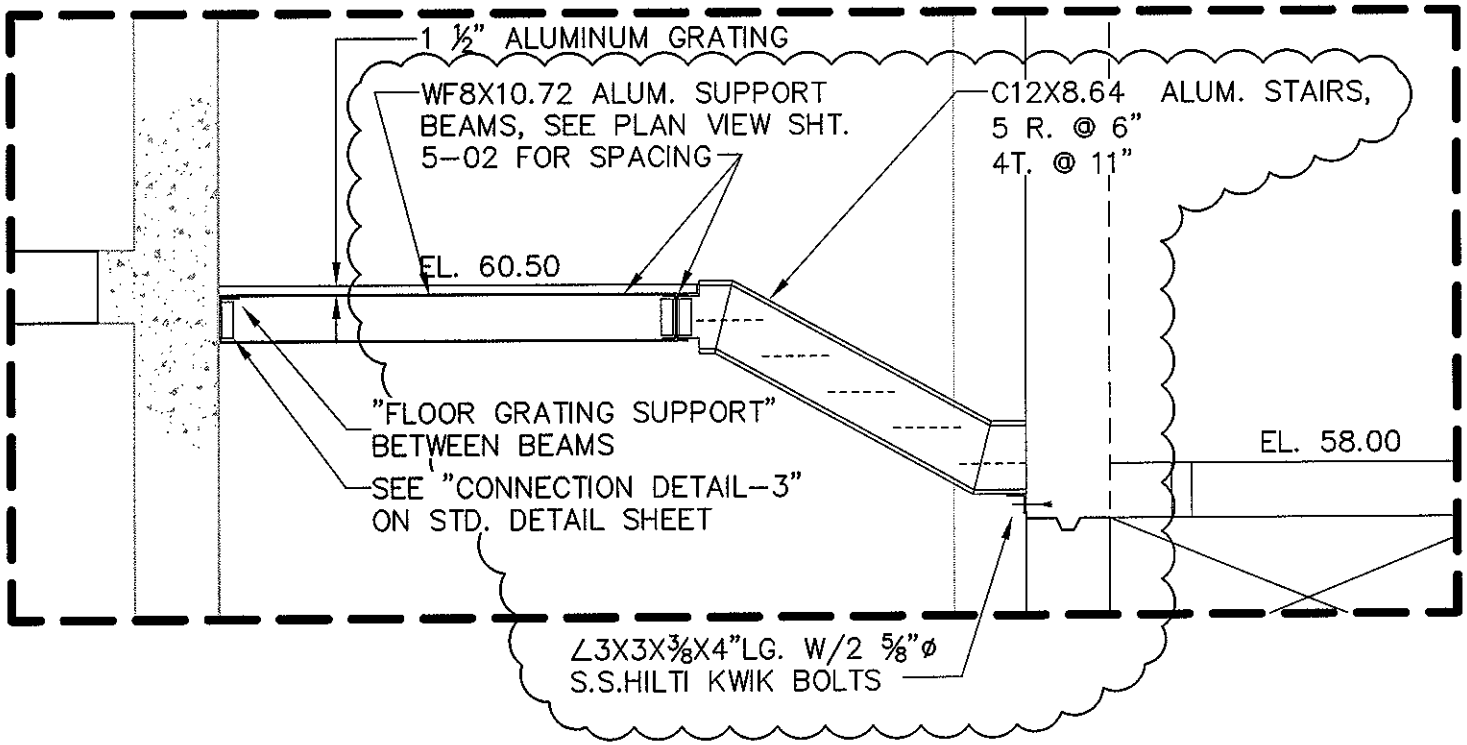
TYPICAL GRATING SUPPORT AT ENTRANCE TO NEW PIPE GALLERY

SCALE: ¼" = 1'-0"

NOTE: THIS DRAWING SHALL BE CONSIDERED TO BE PART OF SHEET 127 OF 375 - 5S-07.

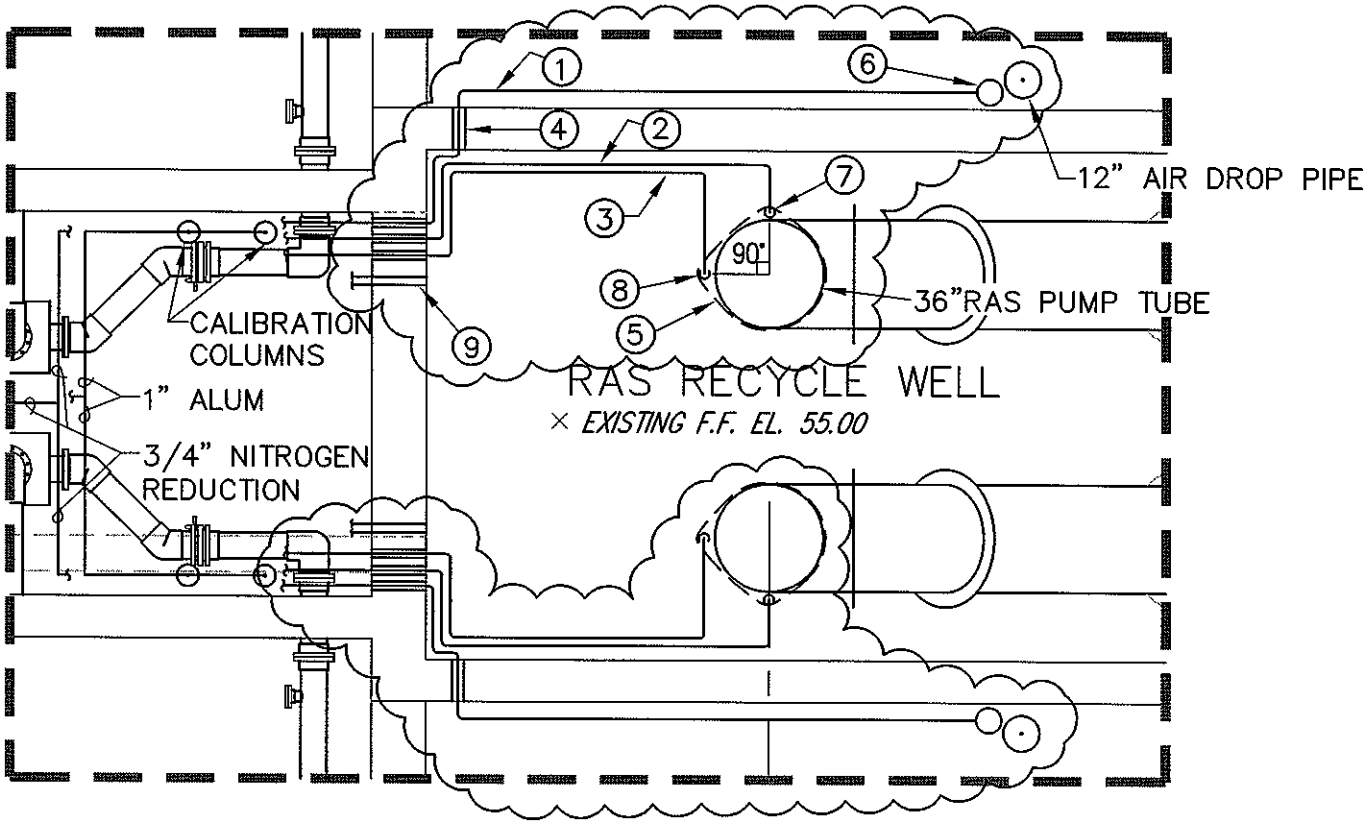
CT JOB NO. 10182	CANTON WATER RECLAMATION FACILITY PHOSPHORUS/TOTAL NITROGEN PROJECT CONTRACT NO. 26 CITY OF CANTON, STARK COUNTY, OHIO	DATE	SCALE	ADDENDUM	SKETCH
CT Consultants engineers | architects | planners		12/10/13	1/4" - 1'-0"	# 2	S-2

Drawing name: H:\2010\10182\DWG\Aeration-MBR Sections.dwg Layout: ADD 1 5S-07 S2 by: marano



NOTE: THIS DRAWING SHALL BE CONSIDERED TO BE PART OF SHEET 127 OF 375 - 5S-07 .

CT JOB NO. 10182	CANTON WATER RECLAMATION FACILITY PHOSPHORUS/TOTAL NITROGEN PROJECT CONTRACT NO. 26 CITY OF CANTON, STARK COUNTY, OHIO	DATE	SCALE	ADDENDUM	SKETCH
CT Consultants engineers | architects | planners		12/10/13	1/4" - 1'-0"	# 2	S-3



ENLARGED PLAN 'A'

SCALE: 3/16" = 1'-0"

NOTES:

1. ¾" SCH. 80 PVC ALUM FEED LINE TO PREAERATION ZONE.
2. ¾" SCH. 80 PVC ALUM FEED LINE TO RAS RECYCLE WELL.
3. ¾" SCH. 80 PVC NITROGEN REDUCTION FEED LINE TO RECYCLE WELL.
4. CORE DRILL AND LINK SEAL, TYP.
5. 316 STAINLESS STEEL BANDING AS REQUIRED TO RIGIDLY SECURE DROP PIPE FROM MOVEMENT.
6. ¾" ALUM DROP PIPE TO DIFFUSERS.
7. ¾" ALUM DROP PIPE IN RAS RECYCLE WELL. BOTTOM OF OPEN PIPE END AT EL. 56.25
8. ¾" NITROGEN REDUCTION DROP PIPE IN RAS RECYCLE WELL. BOTTOM OF OPEN PIPE END AT EL. 56.25
9. ¾" SCH. 80 PVC VENT PIPE FOR ALUM AND NITROGEN REDUCTION AT EL.70.33 AND 70.67, RESPECTIVELY (TYP.).

NOTE: THIS DRAWING SHALL BE CONSIDERED TO BE PART OF SHEET 136 OF 375 - 5P-02 .

CT JOB NO. 10182	CANTON WATER RECLAMATION FACILITY PHOSPHORUS/TOTAL NITROGEN PROJECT CONTRACT NO. 26 CITY OF CANTON, STARK COUNTY, OHIO	DATE	SCALE	ADDENDUM	SKETCH
CT Consultants engineers | architects | planners		12/10/13	3/16"-1'-0"	# 2	P-1

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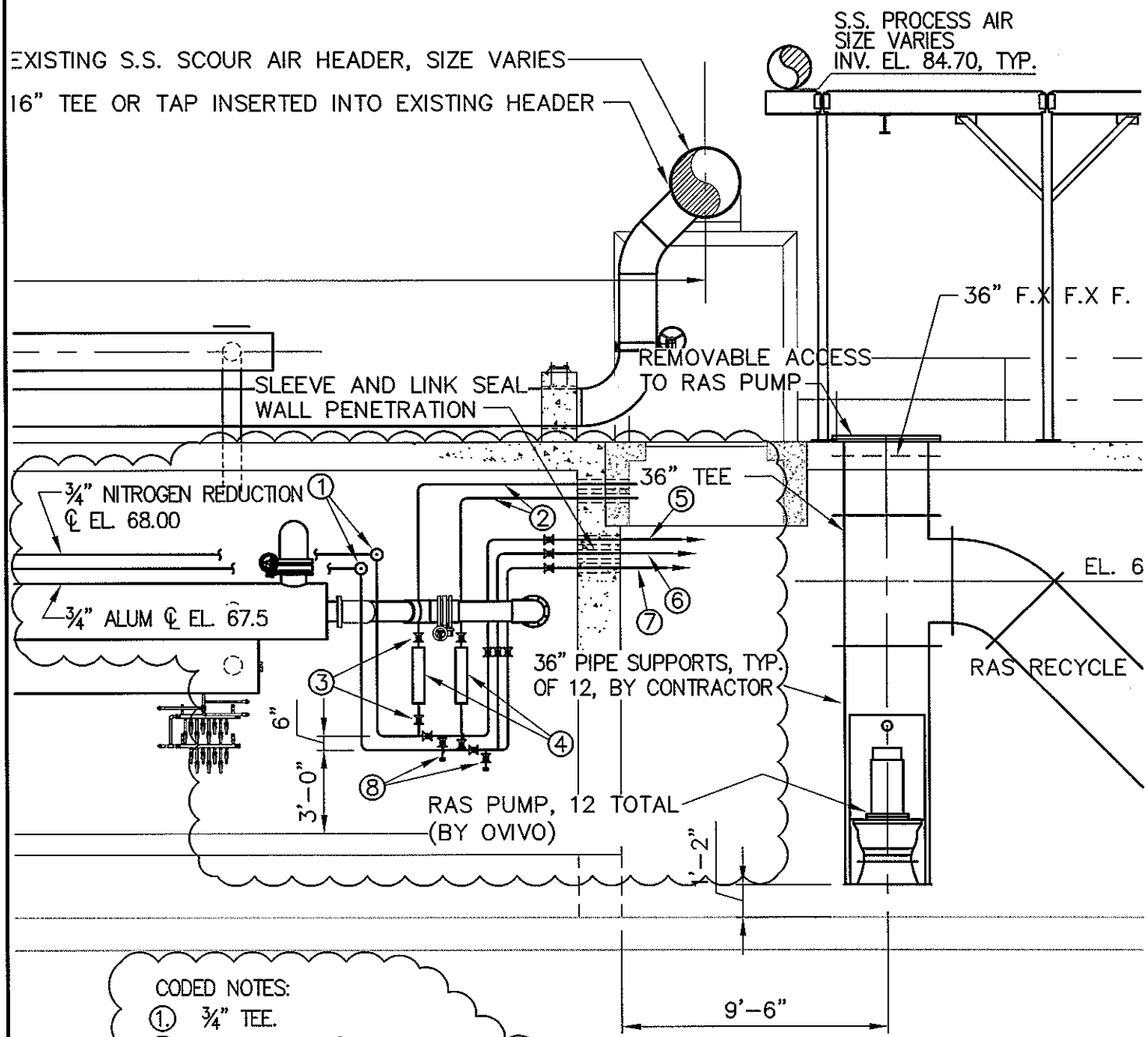
Drawing name: H:\2010\10182\DWG\Aeration-MBR MIDDLE .dwg Layout: ADD 2 5P-02 P1 by: marana



CODED NOTES:

1. ¾" TEE.
2. VENT LINES –℄ EL. 70.50.
3. ¾" PVC BALL VALVES (TYP.).
4. 1000 ML CALIBRATION COLUMN (FLUID LEVEL MARKINGS IN GPH).
5. NITROGEN REDUCTION FEED LINE TO RAS RECYCLE WELL – ℄ EL. 67.50.
6. ALUM FEED LINE TO RAS RECYCLE WELL ℄ EL. 67.25.
7. ALUM FEED LINE TO PREAERATION ℄ EL. 67.00.
8. DRAIN CONNECTION WITH CAP.

CHEMICAL FEED PIPING NOTES

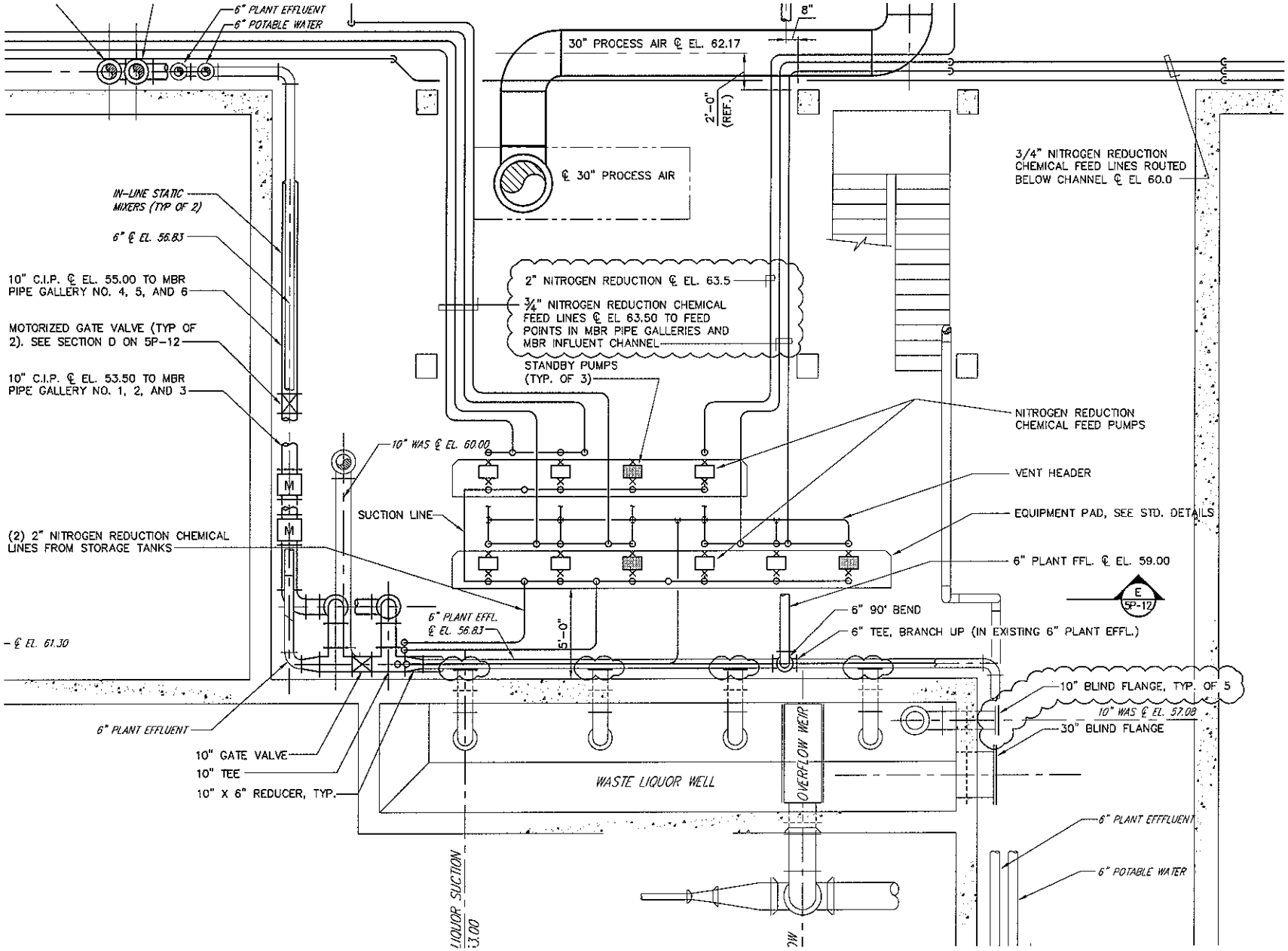
1. ALL NITROGEN REDUCTION AND ALUM PIPING TO BE ¾" SCH 80 PVC.
2. PROVIDE LABELS OR PLACARDS FOR CALIBRATION COLUMNS, FEED AND VENT PIPING FOR NITROGEN REDUCTION AND ALUM.
3. INSTALL MIRROR IMAGE OF PIPING, CALIBRATION COLUMNS AND VALVES ON WEST WALL OF GALLERY. (TYP. FOR ALL TANKS)

NOTE: THIS DRAWING SHALL BE CONSIDERED TO BE PART OF SHEET 140 OF 375 - 5P-06.

CT JOB NO. 10182	CANTON WATER RECLAMATION FACILITY PHOSPHORUS/TOTAL NITROGEN PROJECT CONTRACT NO. 26 CITY OF CANTON, STARK COUNTY, OHIO	DATE	SCALE	ADDENDUM	SKETCH
CT Consultants engineers | architects | planners		12/10/13	3/16" - 1'-0'	# 2	P-2

Drawing name: H:\2010\10182\DWG\Aeration-MBR Sections.dwg Layout: ADD 2 5P-06 P2 by: marano

Drawing name: H:\2010\10182\DWG\Aeration-MBR BOTTOM .dwg Layout: ADD 2 5P-10 P-3 by: marono



NOTE: THIS DRAWING SHALL BE CONSIDERED TO BE PART OF SHEET 144 OF 375 - 5P-10.

CT JOB NO. 10182	CANTON WATER RECLAMATION FACILITY PHOSPHORUS/TOTAL NITROGEN PROJECT CONTRACT NO. 26 CITY OF CANTON, STARK COUNTY, OHIO	DATE	SCALE	ADDENDUM	SKETCH
CT Consultants engineers | architects | planners		12/10/13	N.T.S.	# 2	P-3

DOOR SCHEDULE

DOOR						FRAME							REMARKS
								DETAIL					
OPENING NO.	MATERIAL	TYPE	WIDTH	HEIGHT	THICKNESS	MATERIAL	TYPE	HEAD	JAMB	SILL	LINTEL	HARDWARE SET	
PRELIMINARY TREATMENT – FINE SCREEN BLDG.													
3A-100	ALUM	D1	36"	86"	1-3/4"	ALUM	F1	H1	J1	S1	L-5	2	
3A-101	ALUM	D1	(2) 36"	86"	1-3/4"	ALUM	F2	H1	J1	S1	L-6	1	
3A-102	ALUM	D1	36"	86"	1-3/4"	ALUM	F1	H1	J1	S1	L-5	2	
3A-103	ALUM	D1	36"	86"	1-3/4"	ALUM	F1	H1	J1	S1	L-5	2	
3A-104	*	–	8'-0"	4'-0"	–	HM	F3	H2	J2	–	L-8	–	* BORROWED LITE FRAME
PRELIMINARY TREATMENT – SOLIDS BLDG.													
3A-105	ALUM	D1	(2) 36"	86"	1-3/4"	ALUM	F2	H1	J1	S1	L-6	1	
3A-106 ***	ALUM	D2	12'-0"	12'-0"	–	ALUM	–	H3	J3	*	L-7	**	*SEE DET. 2/3A-03. ** AS PROVIDED BY MFG. ***PROVIDE ROLL UP BUG SHIELD SPEC. 08340CT
3A-107	ALUM	D1	36"	86"	1-3/4"	ALUM	F1	H1	J1	S1	L-5	2	
3A-108 ***	ALUM	D2	12'-0"	12'-0"	–	ALUM	–	H3	J3	*	L-7	**	*SEE DET. 2/3A-03. ** AS PROVIDED BY MFG. ***PROVIDE ROLL UP BUG SHIELD SPEC. 08340CT
3A-109 ***	ALUM	D2	14'-0"	12'-0"	–	ALUM	–	H3	J3	*	L-7	**	*SEE DET. 2/3A-03. ** AS PROVIDED BY MFG. ***PROVIDE ROLL UP BUG SHIELD SPEC. 08340CT
3A-110 ***	ALUM	D2	14'-0"	12'-0"	–	ALUM	–	H3	J3	*	L-7	**	*SEE DET. 2/3A-03. **AS PROVIDED BY MFG. ***PROVIDE ROLL UP BUG SHIELD SPEC. 08340CT
3A-111	ALUM	D1	36	86"	1-3/4"	ALUM	F1	H1	J1	S1	L-5	2	
3A-112	ALUM	D1	36"	86"	1-3/4"	ALUM	F1	H1	J1	S1	L-5	2	
SECONDARY TREATMENT–BNR/MBR–ACCESS STAIR BLDG (NORTH)													
5A-100	ALUM	D1	(2) 36"	86"	1-3/4"	ALUM	F2	H1	J1	S1	L-6	1	
SECONDARY TREATMENT–BNR/MBR–ACCESS STAIR BLDG (SOUTH)													
5A-101	ALUM	D1	(2) 36"	86"	1-3/4"	ALUM	F2	H1	J1	S1	L-6	1	
SECONDARY TREATMENT–BNR/MBR–CONTROL AREA													
5A-102	ALUM	D1	36"	86"	1-3/4"	ALUM	F1	H4	J4			2	
5A-103	*	–	32"	48"	–	HM	F4	H4 SIM	J4 SIM			–	* BORROWED LITE FRAME
SOLIDS HANDLING – AERATED SLUDGE HOLDING													
9A-100	ALUM	D1*	36"	86"	1-3/4"	ALUM	F1	H1	J1	S1	L-5	2	* PROVIDE 24"x 24" LOUVER
9A-101	*	–	48"	48"	–	HM	F5	H2	J2	–	L-2	–	* BORROWED LITE FRAME
9A-102	ALUM	D1	36"	86"	1-3/4"	ALUM	F1	H1	J1	S1	L-5	2	
SOLIDS DEWATERING – SLUDGE LOADING BUILDING													
10A-100	ALUM	D2	14'-0"	14-0"	–	ALUM	–	*	*	*	L-10	**	*SEE DET. 3/10A-04. ** AS PROVIDED BY MFG.
10A-101	ALUM	D2	14'-0"	14-0"	–	ALUM	–	*	*	*	L-10	**	*SEE DET. 3/10A-04. ** AS PROVIDED BY MFG.
10A-102	ALUM	D2	14'-0"	14-0"	–	ALUM	–	*	*	*	L-10	**	*SEE DET. 3/10A-04. ** AS PROVIDED BY MFG.
10A-103	ALUM	D2	14'-0"	14-0"	–	ALUM	–	*	*	*	L-10	**	*SEE DET. 3/10A-04. ** AS PROVIDED BY MFG.
10A-104	ALUM	D1	36	86"	1-3/4"	ALUM	F1	H5	J5	S1	L-11	2	

2

LINTEL SCHEDULE:

L-1 (1) L-4"x 3-1/2" x 5/16" (LLV) MIN. 8" BEARING @ EACH END
L-2 (2) Ls-3 1/2"x 3 1/2" x 5/16" MIN. 8" BEARING @ EACH END
L-3 (3) Ls-3 1/2"x 3-1/2" x 5/16" MIN. 8" BEARING @ EACH END
L-4 (2) Ls-4"x 3-1/2" x 5/16" (LLV) MIN. 8" BEARING AT EACH END
L-5 (3) Ls-4"x 3-1/2" x 5/16" (LLV) MIN. 8" BEARING @ EA. END
L-6 (3) Ls-6"x 3-1/2" x 5/16" (LLV) MIN. 8" BEARING @ EA. END
L-7 W8 x 24 WITH 11"x 3/8" PLATE MIN. 8" BEARING @ EACH END
L-8 W8 x 10 WITH 11"x 3/8" PLATE MIN. 8" BEARING @ EACH END
L-9 (2) Ls-4"x 4" x 5/16" MIN. 8" BEARING @ EACH END
L-10 W18 x ? WITH 15"x 3/8" PLATE MIN. 8" BEARING @ EACH END
L-11 (4) Ls-4"x 3-1/2" x 5/16" (LLV) MIN. 8" BEARING @ EA. END

NOTE: LINTELS SHALL BE PAINTED WITH CORROSION RESISTANT PAINT.

NOTE: THIS DRAWING SHALL BE CONSIDERED TO BE PART OF SHEET242 OF 375 - 12A-01.

CT JOB NO. 10182	CANTON WATER RECLAMATION FACILITY PHOSPHORUS/TOTAL NITROGEN PROJECT CONTRACT NO. 26 CITY OF CANTON, STARK COUNTY, OHIO	DATE	SCALE	ADDENDUM	SKETCH
CT Consultants engineers | architects | planners		12/10/13	N.T.S.	# 2	A-1

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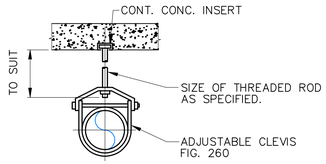
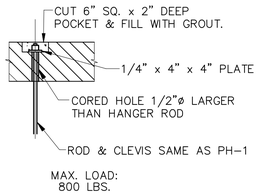
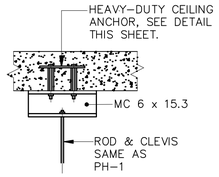
Drawing name: H:\2010\10182\DWG\Door_Finish_Schedule-ARCH.dwg Layout: 12A-01 ADD 2 by: torowski



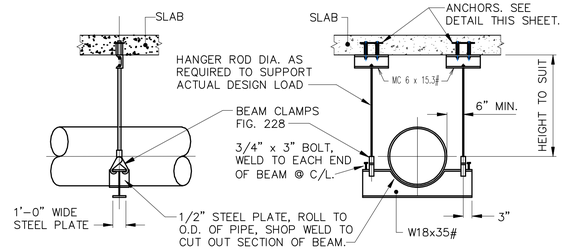
PIPE HANGER PH–1



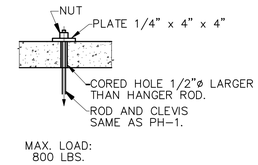
PIPE HANGER PH–2



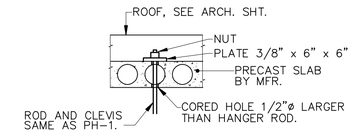
PIPE HANGER PH–3



PIPE HANGER PH–4

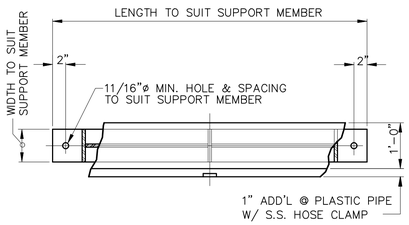


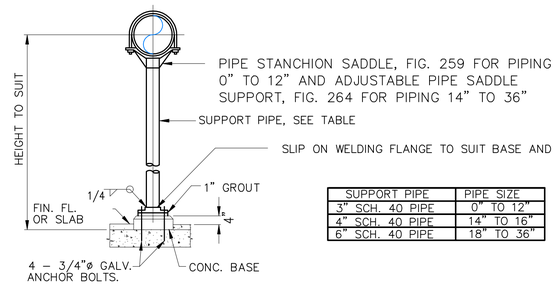
PIPE HANGER PH–5



NOTE: FIELD DRILL ROOF SLABS FOR EYEBOLTS. AVOID HIGH TENSION STRANDS DURING DRILLLING.

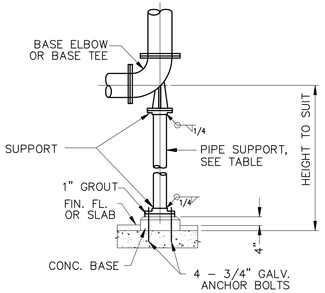
PIPE HANGER PH–6



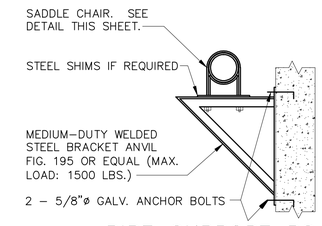


SUPPORT PIPE	PIPE SIZE
3" SCH. 40 PIPE	0" TO 12"
4" SCH. 40 PIPE	14" TO 16"
6" SCH. 40 PIPE	18" TO 36"

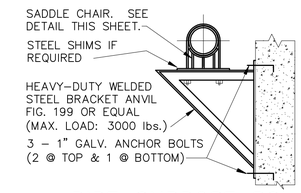
PIPE SUPPORT PS–1



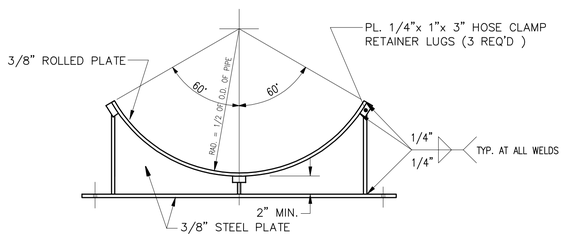
PIPE SUPPORT PS–2



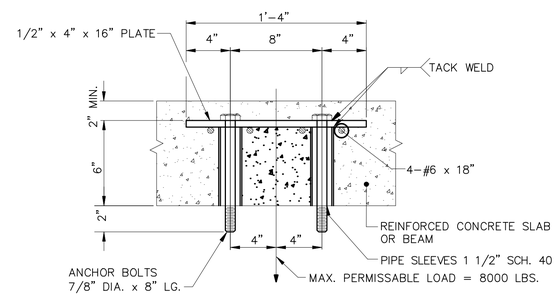
PIPE SUPPORT PS–3



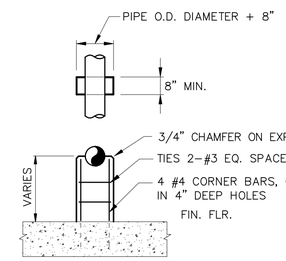
PIPE SUPPORT PS–4



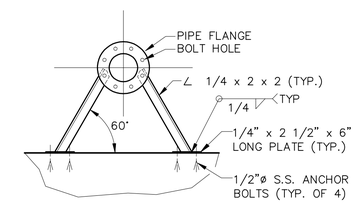
SADDLE CHAIR DETAIL
FOR PIPE 18" AND SMALLER



HEAVY–DUTY CEILING ANCHOR

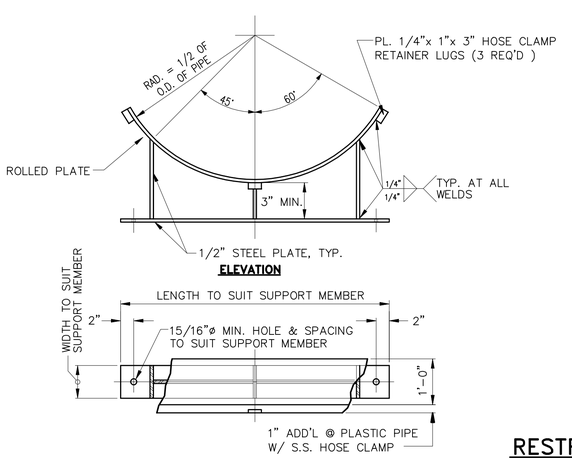


CONCRETE PIPE SUPPORT DETAIL
ON FLOOR

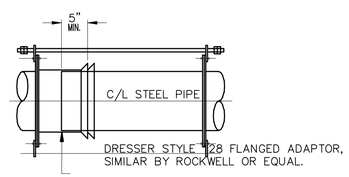


NOTE: GALVANIZE PIPE SUPPORT AFTER FABRICATION

PIPE SUPPORT DETAIL
11/88 SD–6–17

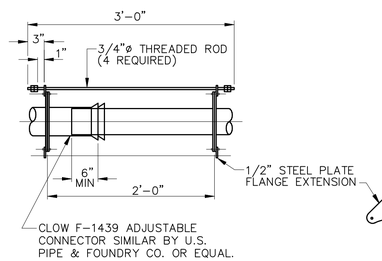


SADDLE CHAIR DETAIL
FOR PIPE 20" AND LARGER

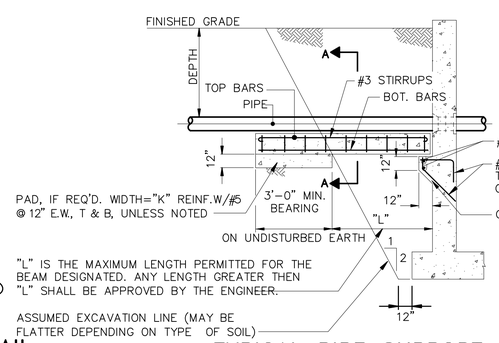


NOTE: FOR DIMENSIONS NOT SHOWN, SEE DETAIL FOR DUCTILE IRON PIPE.

STEEL PIPE

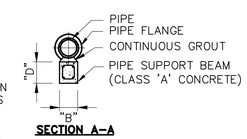


RESTRAINED EXPANSION COUPLING DETAIL
DUCTILE IRON PIPE



TYPICAL PIPE SUPPORT BEAM DETAIL

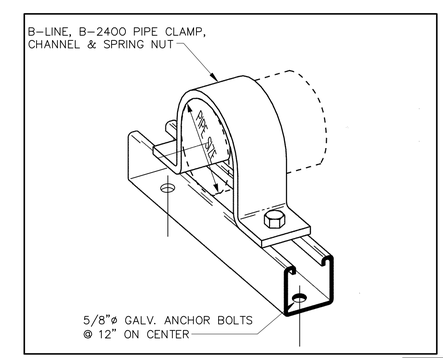
NOTE: ALTERNATE TO SUPPORT BEAM USE 'LSM' BACKFILL TO CRADLE PIPE IN LIEU OF CORBEL & BEAM



SECTION A–A

GENERAL NOTES

1. PIPE HANGER AND SUPPORT CATALOGUE NUMBERS SHOWN ARE GRINNELL CORP. SIMILAR BY ELCEN OR EQUAL IS ACCEPTABLE.
2. PIPE HANGER AND SUPPORT DETAILS SHOWN INCLUDE MOST PIPE SIZES 4" AND LARGER. FOR ADDITIONAL INFORMATION SEE SPEC.



PIPE SUPPORT PS–5
(FOR 1" TO 8" DIA. PIPE)

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CANTON WATER RECLAMATION FACILITY
PHOSPHORUS/TOTAL NITROGEN PROJECT
CONTRACT NO. 26
CITY OF CANTON, STARK COUNTY, OHIO

STANDARD DETAILS & SCHEDULES

PIPING

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