



Steven M. Clouse WRC Digester Mixing and System Enhancements Phase 3
Solicitation No.: CO-00455
Job No.: 20-6501

ADDENDUM No. 3
Date: February 15, 2022

To Bidder of Record:

This addendum, applicable to work referenced above, is an amendment to the bid proposal, plans and specifications and as such will be a part of and included in the Contract Documents. Acknowledge receipt of this addendum by entering the Addendum number and issue date on the space provided in submitted copies of the bid proposal.

RESPONSES TO QUESTIONS

1. Question: We received this project today and we are not listed as an Approved Lightning Protection Manufacturer. I have attached an approval letter about our company. Our websites are listed in the letter where you may view our products and services. We would like to be listed as an Approved Lightning Protection Manufacturer on this project and future projects. If I have sent this to you in error please forward to proper personnel.

Response: Robbins Lightning, Inc. will not be added to the list of manufacturers at this time. Materials for potential use on future projects may be submitted for consideration using the product submittal application process under Construction & Materials Specs in SAWS website.
2. Question: Spec 150602.17.A indicates that megaflanges are not allowed on "interior" pipe. many megaflanges have been approved/used on multiple SAWS projects in the past. Will megaflanges be allowed on the exposed pipe for this project?

Response: Megaflanges shall not be allowed on any piping systems in this project.
3. Question: DWG 01M18 indicates a new thermowell at the existing sludge mixing pump suction line. Several other dwg's also show new thermowells on new & existing pipe. However, we are unable to find a detail for the requirements on how these are to be installed on the existing DI pipe. Are there existing taps? If not, should a saddle be used? Will detail be issued?

Response: Taps are not existing. Contractor shall tap and install a threaded service saddle on the top side of the pipe. A threaded thermowell with sufficient length to reach the center of the piping shall be attached to the service saddle. Refer to CHANGES TO THE PLANS section of this addendum, bullet 26.
4. Question: Spec 15060.2.1.5 calls for exposed exterior bolts/nuts to be stainless steel, whereas spec 15062.2.2.C.2 calls for mechanical galvanized. Which is correct?

Response: Stainless steel is correct. Refer to CHANGES TO THE SPECIFICATIONS section of this addendum, bullet 16.
5. Question: Regarding DWG 01M31, is a closure plate required on the interior of the 12" sludge mixing pipe at el. 513.5 since this pipe does not extend beyond the digester wall?

Response: A closure plate is not required on the interior side of the existing wall casting.
6. Question: DWG 01M31 appears to show pipe straps on the 20" interior B22 sludge mixing suction line. However, the referenced detail 1/01M05 shows no pipe strap. Are pipe straps required at these supports?

Response: Pipe straps are not required on these supports.

- 7.** Question: DWG. 01M32 Section A and Detail 2 on DWG 01M06 shows a 2" sewage air relief valve. We are unable to find a specification for this valve. Will one be issued.
Response: Yes, see bullet 3 in the CHANGES TO THE SPECIFICATIONS section of this addendum.
- 8.** Question: DWG 01M31 Detail C indicates "penetration and support by delegated design". For the purpose of bidding should a SST wall sleeve and dbl. link seals be included until the "delegated design" is done?
Response: No, SST wall sleeve and dbl. link seals should not be included until "delegated design" is done. Contractor shall include all costs for procuring the delegated design as well as all costs to make the penetration in accordance with the delegated design. Adjustment in pricing after delegated design will not be allowed.
- 9.** Question: DWG 01M24 key note 1 indicates "contractor shall locate and replace all existing manual drip traps (throughout the entire plant)". Are there more traps than shown on DWG 01M43 the drip trap replacement plan? If so, for bidding purposes how many more should be anticipated?
Response: See Sheet 01M43 for location of drip traps. There are 19 (per available information) all of which are within the extents of Sheet 01M43.
- 10.** Question: What is the el. of the 6" re-circ influent and discharge pipes on DWG 01M25? This is needed to determine the length (height) of the drop pipes into the relocated heat exchange r#3.
Response: The influent header is at CL. EL. 497.00 and the discharge header is at CL. EL. 500.00. See Section A/01M29.
- 11.** Question: DWG 01I10,13,16,19 shows RS inf pipe as 8", whereas DWG 01M26 & 29 show this pipe as 6". Which is correct?
Response: The RS influent header is 8" diameter piping. All branches from the tanks to the header, from the header to the pumps, and from the pumps to the heat exchangers are 6" diameter. See process drawings and photos for correct sizes.
- 12.** Question: DWG 01I10 shows new influent/discharge pipe with PI/TI/DPIT taps to heat exchanger #1, whereas dwg's 01M24/25/26 show no new pipe and taps. Which is correct?
Response: All sludge piping for Heat Exchanger 1 is existing and the Contractor shall reuse the existing taps.
- 13.** Question: DWG 01I10 & 21 show new PI/TI/DPIT instrument & piping for HEX#9 & 13 not shown on 01M26 or 30. Which is correct?
Response: All PI/TI/DPIT instruments for all heat exchangers shall be replaced, and new instruments shall be installed per Sheets 01I10 and 01I21.
- 14.** Question: DWG 01M26 shows a 4" manual flow control globe valve, however we find no specification for this valve. Will one be issued?
Response: 4" manual globe valve shall be model No. 1123 manufactured by Lunkenheimer, or approved equal.
- 15.** Question: DWG 01M26 shows a 2-1/2" modulating flow control globe valve, however we find no specification for this valve. Will one be issued?
Response: Refer to Specification Section 15125, paragraph 2.01 for modulating flow control valve information.
- 16.** Question: SPEC 150703.2.P references spec 15101 gate valves. this is not found in the project manual. Will it be provided?
Response: Contractor shall install plug valves in lieu of gate valves in all indicated locations. See Specification Section 15114 Plug Valves for valve information on various services.
- 17.** Question: Is the 10" combined sludge work shown on DWG 01M36 applicable to both pump sta. 3 & 4?
Response: Yes, this work is typical for Pump Station Nos. 3 and 4.
- 18.** Question: Please confirm that all the valves on DWG 01M42 scheduled to be replaced at pump station #3 are to be duplicated for pump station #4 except for PV-52 & 53 shown on 01M27 PS#4 partial plan.
Response: Correct. The only other non-duplicate valve is PV-49 on the 10" combined sludge feed shown on Sheet 01M28.

- 19.** Question: DWG 01M30 sheet key note 1 calls for a 6" gate valve, but none are shown. Where will this valve be installed?
Response: *Key Note 1 shall be removed. 6" gate valve is not applicable to this sheet.*
- 20.** Question: DWG 02M02 key note 8 references sheet 02ed01 for "pump and valve replace replacement plans". however, nothing on sheet 02ED01 shows anything about valve replacement. What work is required at these hws pumps/piping?
Response: *All valves in the boiler area are manual. The Key Note 8 is to coordinate between Mechanical and Electrical for the HWS pump replacement. The conduit and wire described on 02ED01 is to not to interfere with the HWS pump or valve operation and maintenance. Work at the HWS pumps shall include pump replacement, replacement of three (3) suction and three (3) discharge isolation valves and three (3) discharge check valves. Refer to I 02MD01 for existing pumps and valves to be replaced.*
- 21.** Question: DWG 01M07 Detail 1 Note 2 indicates "for check valve replacement, follow this detail". Further, there are photographs showing check valves on the valve replacement drawings. However, we find no check valves listed on dwg 01M42 valve replacement schedule. What size and how many check valves are to be replaced?
Response: *Contractor shall replace each 6" check valve in the vertical segment of all recirculation pump discharge piping in Pump Station Nos. 3 and 4. There will be 6 check valves total.*
- 22.** Question: REF Plan Page 01M32. What is the pipe material for the 6" drain pipe? Can you please provide a specification for the 6" ball valve?
Response: *The 6" drainpipe shall be cast iron. The 6" ball valve shall be Apollo Series 6PLF.*
- 23.** Question: Section 13410 (Process Instrument Schedule) is referenced in Section 13310 but does not appear to be included. Can Section 13410 be provided?
Response: *Yes. Specification Section 13410 is included as an attachment to this addendum.*
- 24.** Question: Section 13505 (Operator Interface Terminals) is referenced in Section 13325 but does not appear to be included. Can Section 13505 be provided?
Response: *The noted reference to Specification Section 13505 is prefaced with "Where an operator interface terminal is designed as part of the control panel." The PCSI's scope does not include furnishing Operator Interface Terminals; therefore, Specification Section 13505 is not provided.*
- 25.** Question: Section 13510 (Human Machine Interface) is referenced in Section 13325 but does not appear to be included. Can Section 13510 be provided?
Response: *The noted reference to Specification Section 13510 is prefaced with "Where a Human Machine Interface is designed as part of the control system." The design intent is to integrate the project control system components into the plant's overall existing Human Machine Interface. PCSI's scope does not include furnishing Human Machine Interface hardware and software products; therefore, Specification Section 13510 is not provided.*
- 26.** Question: I do have a question on this project concerning the pad mount transformer. Can we confirm that live front bushings are what is needed on the 13.2kV primary side of the transformer? Spec section 2.06 below:
2.06 PRIMARY CONNECTIONS
A. Transformer primary connections shall be live front bushings with NEMA spades or eyebolt terminals suitable for cable sizes shown on the drawings.
2.07 LIGHTNING ARRESTORS
A. Provide suitable lightning arrestors in the primary compartment, rated 3
Response: *Transformer primary connections shall be dead front with elbow connection suitable for cable sizes shown on the drawings. Refer to Item No. 4 in the CHANGES TO THE SPECIFICATIONS section of this addendum.*
- 27.** Question: Section 13400 states the control logic for Digester Operation, including the Digester Gas Flares, resides in the existing Ovation Controller 9/59. This project moves all control logic from the Ovation Controller 9/59 to new PLCs per Section 13400. Please provide existing I/O list for the Ovation Controller 9/59 and/or confirm the required I/O for the new PLC(s) that replaces the Ovation Controller 9/59.
Response: *All inputs and outputs for the new PLC-based control system at the digesters facility are shown in the plans.*

- 28.** Question: It is presumed the existing I/O from the Ovation Controller 9/59 will be replaced by the new I/O to be supplied as part of the new Digesters Main Control Panel. However, if this is not the case, please provide a separate I/O list that reflects the required I/O to be provided for the new Digesters Main Control Panel.
Response: All inputs and outputs for the new PLC-based control system at the digesters facility are shown in the plans. I/O Lists are to be developed by the PCSI. Refer to Specification Section 13300 for I/O List submittal requirements
- 29.** Question: Contract Drawing 01147 states the PCSI is to provide a new back panel and PLC to accommodate all existing I/O in the Digester Area RIO-US5 Generator Control Panel. Please provide existing I/O list for the Emerson Remote I/O that is currently being utilized for the Digester Area RIO-US5 Generator Control Panel and/or confirm the required I/O for the new PLC I/O that replaces the existing Emerson Remote I/O equipment.
Response: Inputs and outputs for the PLC replacing RIO-US5 are as follows: 3 analog inputs, 8 discrete inputs. Include required spares in total input/output count for this PLC. PCSI will request the I/O list from the Owner at the start of the construction.
- 30.** Question: Please provide I/O list that reflects the required PLC I/O to be provided for the new Digesters 5 & 7 Control Panel and Digesters 6 & 8 Control Panel.
Response: All inputs and outputs for the new PLC-based control system at the digesters facility are shown in the plans. I/O lists will be developed by the PCSI. Refer to specification Section 13300 for I/O list submittal requirements.
- 31.** Question: Please provide I/O list that reflects the required PLC I/O to be provided for the existing Digesters 1 & 3 Control Panel, Digesters 2 & 4 Control Panel, and Digester 10 Control Panel.
Response: All inputs and outputs for the new PLC-based control system at the digesters facility are shown in the plans. I/O lists will be developed by the PCSI. Refer to specification Section 13300 for I/O list submittal requirements.
- 32.** Question: Due to current bid volume and Covid related impacts (internal and external), we kindly request that you consider postponing the submittal date by one week.
Response: Refer to Addendum 1 and Addendum 2 for dates that have been revised.
- 33.** Question: It appears in the documents that the general contractor will not be able to issue purchase orders and subcontracts until the middle of April due to board approval of the contract. Due to the pandemic, material pricing is very volatile and lead times are continually being impacted negatively. Escalation margins are increasing along with lead times. Will SAWS please consider adding a contingency item for cost escalation? This escalation item will be required to provide bid day backup and January pricing from suppliers to release any escalation charges. Will SAWS also consider contract extensions for items that have a change in lead time from bid day to contract award?
Response: Submittals from interested Responders should account for cost escalation within their Price Proposals. Any request for additional days may be considered by SAWS and the Engineer during the construction period. Any contract changes shall be done in accordance with SAWS General Conditions.
- 34.** Question: I noticed that there are 2 wage rate classifications for this project- building and heavy highway construction. Normally we only see one wage rate classification which wage classification should we use?
Response: Building and Heavy Highway Wage Rates Classification are both required.
- 35.** Question: GC 5.7.1.1.7.8 on Page GC-27 states "all risk builder's risk (if applicable). It is not clear if SAWS will require the general contractor to purchase a builder's risk policy. Please confirm if SAWS will require contractors to purchase a builder's risk policy?
Response: Builder's Risk is not required. Please refer to Supplemental Conditions, Article V.
- 36.** Question: Page 8 of Cleaver Brooks proposal shows freight to be ex works factory. I understand this to mean the buyer pays for the freight to the job site. If the estimate of \$6,700.00 does not cover the cost of freight will SAWS compensate the contractor for the additional cost?
Response: Per this addendum (Addendum 2), the referenced proposal has been removed from the scope of this project.
- 37.** Question: Page 8 of Cleaver Brooks proposal also excludes liquidated damages. If the vendor is not able to meet delivery dates per the construction schedule will SAWS waive LD's to the contractor if the vendor will not sign a contract to with a LD clause?
Response: Per this addendum (Addendum 2), the referenced proposal has been removed from the scope of this project.

- 38.** Question: Olympus Technologies in their proposal has taken a few exceptions to SAWS specifications. Can Olympus Technologies provide all contractors a price for these services or is the contractor to cover these costs? Per SC8 it appears that the proposals from vendors will supersede the specifications and any requirements excluded in the proposal will not be required by the contractor.

Response: As described in Specification Section 01130 Measurement and Payment Paragraph P Item 16-Heat Exchanger Equipment: "1. Measurement: Allowance for the heat exchanger equipment in the amount of \$842,300.00 associated with the project. This shall include the scope as detailed in the Olympus Technology Inc. price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional heating system as detailed in the Contract Documents shall be included in Item 12."

- 39.** Question: Olympus Technologies in their proposal is requiring 10% payment for approved submittals. On past SAWS projects you have not allowed payment for submittals. Will SAWS allow for payment of submittals on this project?

Response: The payment terms and conditions will be between equipment vendor and Contractor. Contractor payments are outlined in General Conditions in the Contract Documents, Article VII.

- 40.** Question: Olympus Technologies in their proposal excludes field services. Can OTI provide all contractors a cost for these services per specifications?

Response: As described in Specification Section 01130 Measurement and Payment 1.08.P Item 16 - Heat Exchanger Equipment: "1. Measurement: Allowance for the heat exchanger equipment in the amount of \$842,300.00 associated with the project. This shall include the scope as detailed in the Olympus Technology Inc. price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional heating system as detailed in the Contract Documents shall be included in Item 12."

- 41.** Question: Evoqua proposal shows freight to be FCA shipping point. I understand this to mean the buyer pays for the freight to the job site. Can Evoqua provide a freight quote for all contractors?

Response: As described in 01130 Measurement and Payment 1.08.Q Item 17 – Digester Mixing Equipment: "1. Measurement: Allowance for Digester Mixing Equipment in the amount of \$1,330,033.00 associated with the project. This shall include the scope as detailed in the Evoqua price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional digester mixing systems as detailed in the Contract Documents shall be included in Item 6."

- 42.** Question: Will SAWS provide contractors with a change order for this exclusion in Evoqua proposal?

Due to volatility in steel costs, prices quoted in this proposal will be adjusted to reflect changes in the Metal and Metal Products Index (MMPI) published by the U.S. Department of Labor, Bureau of Labor Statistics. The most recent published MMPI is 316.1 for August 2021. If the MMPI exceeds 322.6 at the time the Equipment is released for manufacture, then the price will be increased by the same percentage as the MMPI exceeds 322.6.

Response: Per Special Conditions 9 of the Contract Documents: "The work associated with the Evoqua JetMix Digester Mixing Equipment is as outlined in the Contract Documents and as provided by Evoqua JetMix. See Appendix C attached after this section. The allowance in the price proposal is reflective of this scope of work in the Contract Documents and is to be provided by Evoqua JetMix. The selected Contractor must comply with the proposal as part of the Contract Documents. Any additional or different scope for the Evoqua JetMix contract negotiated at the request of the selected Contractor may result in a modification of Evoqua JetMix's price. Any additional costs incurred due to renegotiation of the Evoqua JetMix's proposal by Contractor or Contractor's subcontractors will be at Contractor's sole risk, and Contractor agrees to incur such costs at no additional cost to Owner and agrees that the Owner Contract Price for the project will not be increased by Contractor due to such costs. Contractor agrees to indemnify and hold Owner harmless from any claims that may arise from or are associated with such additional costs above the costs provided for under the line item in the Owner Contract for the work and caused by renegotiation of the Evoqua JetMix proposal provided under the Contract Documents by Contractor or his subcontractor. Owner will not pay for any increase in price due to this request nor any delays incurred as a result of this activity. Contractor shall issue Letter of Intent to purchase equipment no later than five (5) calendar days after Owner issues Notice to Proceed."

- 43.** Question: Evoqua in their proposal is requiring 10% payment for submittal delivery. On past SAWS projects you have not allowed payment for submittals. Will SAWS allow for payment of submittals on this project?

Response: The payment terms and conditions will be between equipment vendor and Contractor. Contractor payments are outlined in General Conditions in the Contract Documents, Article VII.

44. Question: Evoqua in their proposal excludes pump services, start-up and field testing. Can Evoqua provide all contractors a cost for these services per specifications? Or is the cost for Environmental Improvements for pump services included in this proposal?
 Response: *As described in 01130 Measurement and Payment 1.08.Q Item 17 – Digester Mixing Equipment: “1. Measurement: Allowance for Digester Mixing Equipment in the amount of \$1,330,033.00 associated with the project. This shall include the scope as detailed in the Evoqua price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional digester mixing systems as detailed in the Contract Documents shall be included in Item 6.”*
45. Question: L&J Technologies proposal shows freight to be FOB hillside. I understand this to mean the buyer pays for the freight to the job site. Can L&J Technologies provide a freight quote for all contractors?
 Response: *As described in 01130 Measurement and Payment 1.08.R Item 18 – Digester Gas Equipment: 1. Measurement: Allowance for Digester Gas Equipment in the amount of \$533,801.00 associated with the project. This shall include the scope as detailed in the L&J Technologies price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional digester gas system as detailed in the Contract Documents shall be included in Item 7.”*
46. Question: L&J Technologies in their proposal is requiring 10% payment for submittal delivery. On past SAWS projects you have not allowed payment for submittals. Will SAWS allow for payment of submittals on this project?
 Response: *The payment terms and conditions will be between equipment vendor and Contractor. Contractor payments are outlined in General Conditions in the Contract Documents, Article VII.*
47. Question: L&J Technologies in their proposal only has a 12 month warranty. Can they add cost to provide the 24 month warranty required per SAWS specifications?
 Response: *As described in 01130 Measurement and Payment 1.08.R Item 18 – Digester Gas Equipment: 1. Measurement: Allowance for Digester Gas Equipment in the amount of \$533,801.00 associated with the project. This shall include the scope as detailed in the L&J Technologies price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional digester gas system as detailed in the Contract Documents shall be included in Item 7.”*
48. Question: Panametrics has the following clause which contradicts SAWS specifications. Please advise?
COVID-19 Force Majeure Clause:
 Notwithstanding anything else, Seller shall not have any liability for delays resulting directly from governmental actions, supply chain shortages, or any other consequences attributable to the widespread impact of the pandemic known as Covid-19 or other similar strains or Coronavirus pandemics
 Response: *Per Special Conditions “SC4. Agreements: There is no formal agreement between the Owner and the named vendors that are included in Appendix C. Contractor shall be responsible for entering into an agreement with the named vendors that is consistent with the Contract Documents. Contractor shall include all costs to negotiate terms and conditions and enter into an agreement with the named vendors in the Price Proposal where indicated by the Specification Section 01130 Measurement and Payment.”*
49. Question: Panametrics in their proposal excludes start-up commissioning service. Can Panametrics provide all contractors a cost for these services per specifications?
 Response: *As described in Specification Section 01130 Measurement and Payment, 1.08.S Item 19 – Digester Gas Flow Instrumentation: “Allowance for Digester Gas Flow Instrumentation in the amount of \$353,952.30 associated with the project. This shall include the scope as detailed in the Panametrics price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional digester gas system as detailed in the Contract Documents shall be included in Item 8.”*
50. Question: Regarding Section 13300 sub section 1.05 for PCSI pre-approval. It notes that pre-approved integrators will be defined. Is this still open to where integrators can fill out the pre-approval and send to you or the appropriate contractor?
 Response: *Refer to CHANGES TO THE SPECIFICATIONS section of this addendum for the PCSI list.*

- 51.** Question: Hope you're doing well. I'm writing in regards to the coating specified on this project, CIM 1000. Sika Corp is an international supplier of repair and protection for concrete structures and we have a direct equal to the specified coating (we are already in the specification under concrete repair). Ours is called Sikagard 7600. Would you be able to let me know who I can speak to regarding getting Sikagard 7600 added as an approved equal for this project? Attached is the product data guide for your review. Thanks in advance for your help.
Response: Refer to CHANGES TO THE SPECIFICATIONS section of this addendum for the PCSI list.
- 52.** Question: Good afternoon ma'am. I hope all is well? I have a questions to ask for the above project. 1st. In the following spec sections #13310.2.03, #13314.2.08 & #13316.2.09. Each spec section calls out Section #13410 Process Instrument Schedule. I cannot find this spec section. Please provide per an addendum.
Response: Refer to CHANGES TO THE SPECIFICATIONS section and attachments of this addendum for Specification Section 13410, Process Instrument Schedule.
- 53.** Question: Good morning, I am writing in regards to the Steven M Clouse WRC Digester Mixing System PH 3 project. More specifically I am writing in regards to specification section 15114-2; 2.05; M on the actuators. We are the local representative for Auma Actuators and currently have installation many locations around the SAWS plants. As it stands Auma does not appear in this specification and I would like to ask if we can be approved as an equal. This will allow SAWS to receive a better variety of bids and a more competitive offering. If you have any questions please feel free to let me know, I look forward to your reply and thank you for the consideration.
Response: No additional manufacturers will be named during bidding. Products submitted by Contractor for the project must fully comply with the specifications.
- 54.** Question: Plan 02M03, Note 6 mentions bird netting being installed, bty there is no specification. Can Bird-x premium grade bird netting be used for this scope. Please see specification attached for consideration.
Response: See the 'CHANGES TO THE PLANS' section of this addendum.
- 55.** Question: Good morning, I am writing in regards to the Steven M Clouse WRC Digester Mixing System PH 3 project. We are the local representative for Crispin valves and currently have installation many locations around the SAWS plants. As it stands Crispin does not appear in this specification for plug valves and I would like to ask if we can be approved as an equal. This will allow SAWS to receive a better variety of bids and a more competitive offering. If you have any questions, please feel free to let me know, I look forward to your reply and thank you for the consideration.
Response: No additional manufacturers will be named during bidding. Products submitted by Contractor for the project must fully comply with the specifications.
- 56.** Question: The respondent checklist, CH-1 in the Bidding and Contract Requirements, indicates the schedule of manufacturers and suppliers for major equipment form is to be uploaded with File 2. Would the Owner consider moving this form to File 01, as it corresponds with the general bid items?
Response: Schedule of Manufacturers and Suppliers for Major Equipment form may also be included in File 2. Refer to CHANGES TO THE SPECIFICATIONS section of this addendum, bullet 15.
- 57.** Question: Spec 01650 3.05 A states contractor is to maintain all equipment between placing in operation and completion of the entire project. Given the phasing of this project we would have to maintain the equipment on the first digesters placed into operation for nearly two years until the end of the project. Also, SAWS will be operating the equipment during this time so they will need to be responsible for maintaining the equipment. Please change wording of paragraph A to "The contractor shall maintain all equipment until placed into operation for beneficial use of the Owner."
Response: Refer to CHANGES TO THE SPECIFICATIONS section of this addendum, bullet 13.
- 58.** Question: Spec 01650 3.05 B seems to state the contractor is responsible for power costs for startup, testing and operation of the equipment installed under this contract. Since this is an existing facility how will SAWS meter the cost of testing and operation? What is the cost for power the contractor will be charged? Even if we know the cost of power, we do not know how many watts the equipment will take to operate during this period. We suggest SAWS remove this paragraph from the specifications due to the costs the contractor will have to add to the bid price to cover these unknowns.
Response: Refer to CHANGES TO THE SPECIFICATIONS section of this addendum, bullet 14.

- 59.** Question: Will contractor be allowed to get Partial Acceptance for portions of work after they are placed in operation? Will 2-year warranty start upon placing equipment in operation or upon Final Acceptance as indicated in Article 9.3? If it is based on Final Acceptance the process equipment manufacturers will need to provide cost to extend the warranty on the equipment for the duration between placing in operation and final acceptance. This cost will be added to the bid proposal.
Response: Refer to Article IX, 9.1, 9.2 and 9.3 for Final Acceptance, Partial Acceptance, and warranty periods. The warranty period starts from the time Owner takes beneficial occupancy of the completed part of the work following the issuance of Conditional Letter of Acceptance.
- 60.** Question: Special Condition SC 4 states contractor shall include all costs to negotiate terms and conditions and enter into an agreement with the named vendors. It has come to our attention that many of the proposals have exceptions and unacceptable terms and conditions. We can attempt to include costs associated with scope gaps but has SAWS and the design engineer reviewed and approved the exceptions/exclusions, payment terms, etc.? We have no way of knowing what will be accepted which means we have no choice but to add money to cover our risk if we have to pay them extra to provide the exclusions/exceptions or agree to their payment terms. Also, if the named vendors do not accept our terms and conditions, many of which are passed down by the SAWS agreement, we have no recourse since they were preselected. We will endeavor to monetize the exceptions and cover the risk in our price proposal but will SAWS accept the exceptions to specifications, terms and conditions presented to SAWS in the vendor proposals included in Appendix C.
Response: As described in Specification Section 01130 Measurement and Payment, 1.08, Items 16, 17, 18 and 19, several vendor packages and prices have been included as allowance line items. These shall include the scope as detailed in the vendor price proposals included in the Contract Documents. Costs for all additional Work related to providing a complete and functional system as detailed in the Contract Documents shall be included in the line respective item associated with that equipment package.
- 61.** Question: Spec 01300 does not indicate how long the engineer/SAWS has for reviewing submittals. We need to know how many days to include in our proposal schedule.
Response: Refer to General Conditions in the Contract Documents, Article V., 5.12.2.3 for submittal review period.
- 62.** Question: Please confirm the contractor is not required to pay for costs associated with Materials Testing and Special Inspections.
Response: Refer to General Conditions in the Contract Documents, Article V., 5.2 and 5.3 for Owner and Contractor responsibilities. Contractor is responsible for the cost of all quality control inspections and testing services to assure project compliance with Contract Documents. Owner is responsible for the cost of quality assurance testing and inspections of the Contractor's work. Owner's testing and inspection do not replace or is in lieu of Contractor's own testing and inspection. Contractor, at their expense, shall furnish assistance to Owner in obtaining and providing samples.
- 63.** Question: On drawing No. 01S12 Section A the depth of the Grade Beam is NOT shown, can you provide one please.
Response: 01S12 Section A is a typical section to be used at each of the digester pump pads. Grade beam depth may be calculated by applying the grade beam depth below grade to grading elevations shown on drawings 01C02 through 01C05.
- 64.** Question: Contract Documents require demolition of existing facilities and structures. Can you please provide Record Documents to fully understand the extent of the demolition requirements.
Response: Record drawings may be provided to the selected Contractor upon request during construction phase.
- 65.** Question: Contract Drawing 01MD10 and 01MD16 show the Iron Sponges to be demolished. Please provide Record Drawings to fully understand the extent of the equipment, piping, etc. to be demolished.
Response: Record drawings may be provided to the selected Contractor upon request during construction phase.
- 66.** Question: Contract Drawing 01MD10 and 01MD17 show the Digester Building, Grinder Pump Station and Valve Pad to be demolished. Please provide Record Drawings to fully understand the extent of the equipment and piping to be demolished inside the facilities.
Response: Record drawings may be provided to the selected Contractor upon request during construction phase.

8. Section 13300 Process Control Systems General Provisions: Delete paragraph 1.05.D and Replace with the following:
"D. PCSI shall fulfill the role and perform the scope of work of the Application Services Provider (ASP) for the project. The PCSI shall be one of the following:
 1. Prime Controls
1725 Lakepointe Drive
Lewisville, Texas 75057
Attn: Brian Poarch
Phone: 972-221-4849
 2. Control Panels USA, Inc.
9207 Marbach Road
Suite 106
San Antonio, TX 78245
Attn: Jason Triggs
Phone: (210) 421-7732
 3. Tesco Controls, Inc.
8440 Florin Road
Sacramento, CA 95828
Attn: Brian Adams
Phone: (916) 395-8800"
9. Section 13300 Process Control Systems General Provisions: Add the following paragraphs 1.01.I.27; 1.01.I.28; 1.01.I.29; 1.01.I.30 and 1.01.I.31:
 - "27. Prior to beginning project work, request the current version in use of SAWS plant tagging conventions document titled "Input/Output (I/O) Tag Naming Standards for Water Recycling Centers." Confirm all equipment and instrument tags included in the Contract Documents are in accordance with this document. Use this document for developing all additional equipment, instrument, and input/output tags for the project. Conduct a Tag Coordination Workshop with the Owner for review and confirmation of any tagging revisions and additions identified. Following the Tag Coordination Workshop, submit any equipment and/or instrument tag revisions and additions for approval with the Project Plan, Schedule and Deviation List submittal required herein. Develop all input/output tags using this document and include in I/O List submittal required herein. Include latest tag revisions and additions in all subsequent required project documentation.
 28. Develop all project graphics screens using PCSI's Rockwell Automation FactoryTalk software of the same version in use at the plant at time of graphics development. Confirm version prior to beginning development of graphics. Develop all project graphics in accordance with SAWS standards and conventions. Submit project graphics screens in the native export file format of the Rockwell Automation software and as a fully annotated PDF file.
 29. Develop all project PLC programs using PCSI's Rockwell Automation Studio 5000 software of the same version in use at the plant at time of program development. Confirm version prior to beginning development of PLC programs. Develop all PLC programs in accordance with SAWS standards and conventions. Submit PLC Programs in the native export file format of the Rockwell Automation software and as a fully annotated PDF file.
 30. Provide all testing hardware and software for the Un-witnessed and Witnessed Factory Tests as required under specification Section 13302. Load PLC hardware with only approved versions of PLC programs. Provide temporary networking hardware and a temporary standalone HMI server for the tests. For these tests, use the Owner's current FactoryTalk application for testing process graphic screens for correct monitoring and control functionality.
 31. Coordinate all Operational Readiness and Functional Demonstration field tests with the Owner. Load the developed project applications onto the Owner's virtual duplicate plant control system, known as a "sandbox" system and conduct the tests using this system. Loading of developed applications on the live plant system is not permitted until the required ORTs and FDTs have been performed successfully using the sandbox system and have been accepted and signed off by the Owner. Following approval by the Owner, load the tested applications onto the live plant system."

10. Section 16430 Pad-mounted Transformers, Paragraph 2.06: Delete:
 "A. Transformer primary connections shall be live front bushings with NEMA spades or eyebolt terminals suitable for cable sizes shown on the drawings." and replace with "A. Transformer primary connections shall be dead front with elbow connection suitable for cable sizes shown on the drawings."
11. Section 16430 Pad-mounted Transformers, Paragraph 2.07: Delete:
 "A. Provide suitable lightning arrestors in the primary compartment, rated 3 kV." and replace with "A. Provide suitable lightning arrestors in primary compartment rated for 10 kV (8.4 MCOV)."
12. Section 16670 Lightning Protection System, Paragraph 1.01: Add:
 "D. Provide lightning protection for the following facilities:
 1. Electrical Building for Digester No. 5 & No. 7.
 2. Electrical Building for Digester No. 6 & No. 8.
 3. Boiler Facility."
13. Change Section 01650 Facility Start-Up, Paragraph 3.05.A to: "The Contractor shall maintain all equipment placed into operation for beneficial use of the Owner until completion of the project or until a Conditional Letter of Acceptance has been issued for that portion of the Work."
14. Section 01650 Facility Start-Up, Paragraph 3.05.B: Delete this paragraph in its entirety
15. RESPONDENT'S PROPOSAL CHECKLIST – Include the following box in the Respondent's Proposal Checklist File: Schedule
 of Manufacturers and Suppliers for Major Equipment
16. Spec 15062 Paragraph 2.2.C.2 Delete and Replace with 2. Exposed: Bolts and nuts shall be of 18-8 stainless steel

CHANGES TO THE PLANS

1. Delete all Sheet Keynotes on sheet 01M30.
2. Sheet 02M03 General Sheet Note 6:
 Append to the note "Bird netting shall be ¾" opening, black in color, UV stabilized knotted HDPE net that is non-conductive, flame resistant, rot-proof, and waterproof, as Manufactured by Bird-X, Inc. PE-Plus Premium Grade Bird Net. Install with stainless steel hardware according to Manufacturer's recommendations."
3. Delete Drawing 00E09 in its entirety and replace with revised Drawing 00E09 included in this addendum.
4. Delete Drawing 00E12 in its entirety and replace with revised Drawing 00E12 included in this addendum.
5. Delete Drawing 01E36 in its entirety and replace with revised Drawing 01E36 included in this addendum.
6. Delete Drawing 02E02 in its entirety and replace with revised Drawing 02E02 included in this addendum.
7. Drawing 01ED20 Digester No. 1 – No. 4 Equipment Listing:
 Add Sheet Keynotes – Demolition 2 to read "The equipment tags as shown on this sheet are existing. Refer to sheet 01I32 and 01IE33 for new tag names. All existing tags on equipment shall be removed and new tags shall be installed."
8. Drawing 01E03 Digester No. 5 & No. 7 Equipment Listing:
 Add : "General Sheet Notes
 1. The Contractor shall coordinate the equipment tag names as shown on Drawings 01I32 and 01I33. The Contractor shall adjust the tags after the tagging workshop between the Contractor and the Owner during Construction phase."
9. Drawing 01E05 Proposed MCC-PD3B One-line Diagram:
 Delete on line 6 the identification of "New Control Panel" and replace with the identification of "Existing Control Panel."

10. Drawing 01E06 Proposed MCC-PD3A & PD3B Elevation & Lighting Schedule:

Delete the two rows of the LIGHTING FIXTURE SCHEDULE for the Type R and S fixtures and replace with the following:

TYPE	DESCRIPTION	MANUFACTUERER/CATALOG NUMBER OR APPROVED EQUAL	INPUT WATTS (120V)	LAMP TYPE	NOTES / COMMENTS
R	LED PENEANT/CEILIG MOUNT LIGHT FIXTURE CLASS 1, DIV 1-2 LED 120V, 1PHASE GLASS GLOBE, DOME REFLECTOR STANTION MOUNT	<u>FIXTURE:</u> CROUSE-HINDS: EVLLA-7L-C-CX-3-0-UNV1	69 W	LED LAMPS INCLUDED	CEILING MOUNTED
S	LED FIXTURE, MOUNTED ON A 10 FOOT TELESCOPING POLE, CLASS I, DIV 1. 208V, 1 PHASE, GLASS GLOBE, 25 DEGREE STANTION MOUNT	<u>FIXTURE:</u> CROUSE-HINDS: VMVL-5-BLANK-JM5-R3-208-BLANK. <u>POLE:</u> 10' TELESCOPING POLE	43 W	LED LAMPS INCLUDED	MOUNTED ON 10' TELESCOPING POLE

11. Drawing 01E09 Pump Station No. 3 Electrical Plan:

Add General Sheet Note 4 to read "All receptacles shall be WP/GFI with in-use cover."

12. Drawing 01E10 Digester No. 5 & No. 7 Electrical Building Plan, Detail 2 – Electrical Building Electrical MCC-PD3A & MCC-PD3B Lighting and Receptacle Plan:

Delete type BE fixture outside of Control Room and replace with type B fixture.

13. Drawing 01E18 Digester No. 6 & No. 8 Ductbank Section, Detail F – Ductbank Section:

Delete the conduit size of 2" for Conduit Nos. 1, 2, 3 and 4 and replace with a conduit size of 3."

14. Drawing 01E19 Digester No. 6 & No. 8 Equipment Listing:

Add to drawing:

"General Sheet Notes

- The Contractor shall coordinate the equipment tag names as shown on sheet 01I32 and 01I33. The Contractor shall adjust the tags after the tagging workshop between the Contractor and the Owner during Construction phase."

15. Drawing 01E25 Pump Station No. 4 Electrical Plan:

Add General Sheet Note 4 to read "All receptacles shall be WP/GFI with in-use cover."

16. Drawing 01E29 Digester No. 6 & No. 8 PLC Interface Diagram – 1:

Delete conduit tags "PL101", "PL102", "PL103" and "PL104" between Digester No. 6 & No. 8 Local Control Panel and Digester No. 6 & No. 8 PLC and relace with conduit tags "PL601", "PL602", "PL603" and "PL604", respectively.

17. Drawing 01E30 Digester No. 6 & NO. 8 PLC Interface Diagram – 2:

Delete Tag No. "911 Sludge Tank High/Low Level" and conduit tag "PL-631" from the last row.

18. Drawing 01E34 Gas Compressor Floor Plan Electrical Modifications:

Add General Sheet Note 6 to read "All receptacles and light switch shall be rated for Class 1/ Div. 2."

19. Drawing 02E01 Boiler Facility Electrical Modification Plan, Detail 1 – Boiler Area Lighting and Receptacle Plan:

Delete light fixtures type "H" and replace with light fixtures type "R."

20. Drawing 01I32, Digester Instrument and Equipment Tags-I and Drawing 01I33 Digester Instrument and equipment Tags-II:

Add General Sheet Note 1 to read "During construction, this listing may require revisions and/or additions resulting from the requirements included in specification Section 13300, paragraph 1.01.1.27." Refer to "CHANGES TO THE SPECIFICATIONS" section of this addendum.

21. Delete Drawing 02MD01 in its entirety and replace with revised Drawing 02MD01 included in this addendum.

22. Delete Drawing 02MD02 in its entirety and replace with revised Drawing 02MD02 included in this addendum.

23. Delete Drawing 02M02 in its entirety and replace with revised Drawing 02M02 included in this addendum.

24. Delete Drawing 01M02 in its entirety and replace with revised Drawing 01M02 included in this addendum.

25. Delete Drawing 02M02 in its entirety. Boiler Facility Roof Replacement is removed from the scope of work.

26. Delete Drawing 01M18 in its entirety and replace with revised Drawing 02M18 included in this addendum.

CLARIFICATIONS

1. This addendum removes replacement of Boiler 1 from the scope of work, and adds an allowance line item for CPS Energy.
2. The Engineer's Opinion of Probable Construction Cost for this project has been modified from \$24,573,000.00 to \$23,599,000.00.

END OF ADDENDUM

This Addendum is one hundred and six (106) pages in its entirety.

Attachments: Price Proposal
Special Conditions
Specification Section 01130 Measurement and Payment
Specification Section 13410 Process Instrument Schedule
Plan Sheet 01M02
Plan Sheet 01M18
Plan Sheet 02MD01
Plan Sheet 02M02
Plan Sheet 02MD02
Plan Sheet 00E09
Plan Sheet 00E12
Plan Sheet 01E36
Plan Sheet 02E02
Plan Sheet 01I05
Plan Sheet 01I28



Joseph A. Draper
Joseph A. Draper, P.E.
Whitman, Requardt and Associates, LLP

PRICE PROPOSAL

PROPOSAL OF _____, a corporation
a partnership consisting of _____
an individual doing business as _____

THE SAN ANTONIO WATER SYSTEM:

Pursuant to Instructions and Invitation for Competitive Sealed Proposals, the undersigned proposes to furnish all labor and materials as specified and perform the work required for the project as specified, in accordance with the Plans and Specifications for the following prices in the bid proposal to wit:

PLEASE SEE ATTACHED LIST OF BID ITEMS.

RESPONDENT'S SIGNATURE & TITLE

FIRM'S NAME (TYPE OR PRINT)

FIRM'S ADDRESS

FIRM'S PHONE NO. /FAX NO.

FIRM'S EMAIL ADDRESS

The Contractor herein acknowledges receipt of the following: **Addendum No(s)**. _____

OWNER RESERVES THE RIGHT TO ACCEPT THE OVERALL MOST RESPONSIBLE PROPOSAL.

The Respondent offers to construct the Project in accordance with the Contract Documents for the contract price, and to complete the Project within **1080** calendar days after the start date, as set forth in the Authorization to Proceed. **The Respondent understands and accepts the provisions of the Contract Documents relating to liquidated damages of the project if not completed on time.**

Complete the additional requirements of the Price Proposal which are included on the following pages.

Statement on President's Executive Orders

Has your firm previously performed work subject to the President's Executive Orders Numbers 11246 and 11375 or any preceding similar executive orders (Numbers 10925 and 11114)? Yes No

Texas Government Code Chapter 2274 Verifications

- (1) Are you, Contractor, held or controlled by individuals who are citizens of China, Iran, North Korea, Russia or a country designated by the Governor of the State of Texas pursuant to Texas Government Code Chapter 2274? Yes No
- (2) Are you, Contractor, held or controlled by a company or other entity, including a governmental entity, that is owned or controlled by citizens of or directly controlled by the government of China, Iran, North Korea, Russia or a county designated by the Governor of the State of Texas pursuant to Texas Government Code Chapter 2274? Yes No
- (3) Are you, Contractor, headquartered in China, Iran, North Korea, Russia or a country designated by the Governor of the State of Texas pursuant to Texas Government Code Chapter 2274? Yes No

PROPOSAL LINE ITEMS

Item No.	Description	Unit	Quantity	Unit Price	Total Price
1	Trench Excavation Safety Protection	LS	1	\$ _____	\$ _____
2	Digesters Cleaning for 9 Digesters	DRY TON	5700	\$ _____	\$ _____
3	Dome Liner and Concrete Repair for 3 Digesters (Exclude #6)	SF	3400	\$ _____	\$ _____
4	Dome Crack Repair for 3 Digesters (Exclude #6)	LF	750	\$ _____	\$ _____
5	Tank Base (Floor, Wall, Joint) Repair for 3 Digesters	LF	1,050	\$ _____	\$ _____
6	Mixing System for 4 Digesters	LS	1	\$ _____	\$ _____
7	Dome Gas System and Dome Appurtenances	LS	1	\$ _____	\$ _____
8	Electrical and Instrumentation Upgrades	LS	1	\$ _____	\$ _____
9	Sludge Plug Valves Replacement	LS	1	\$ _____	\$ _____
10	Combined Sludge Feed Line Piping Modification	LS	1	\$ _____	\$ _____
11	Hot Water Distribution System	LS	1	\$ _____	\$ _____

Item No.	Description	Unit	Quantity	Unit Price	Total Price
12	Heat Exchanger System Modifications	LS	1	\$ _____	\$ _____
13	Boiler Area Modifications	LS	1	\$ _____	\$ _____
14	Iron Sponge and Digester Building Demolition and Related Modifications	LS	1	\$ _____	\$ _____
SUBTOTAL (ITEMS 1 - 14)				\$	
15	Heat Exchanger Equipment	ALW	1	\$842,300.00	\$842,300.00
16	Digester Mixing Equipment	ALW	1	\$1,330,033.00	\$1,330,033.00
17	Digester Gas Equipment	ALW	1	\$533,801.00	\$533,801.00
18	Digester Gas Flow Instrumentation	ALW	1	\$353,952.30	\$353,952.30
19	Subsurface Utility Investigation	ALW	1	\$200,000.00	\$200,000.00
20	Permitting Fees	ALW	1	\$10,000.00	\$10,000.00
21	CPS Energy	ALW	1	\$300,000.00	\$300,000.00

Item No.	Description	Unit	Quantity	Unit Price	Total Price
22	Intermediate Mobilization and Demobilization	EA	1	\$ _____	\$ _____
100	Mobilization and Demobilization, Max 8% of Subtotal Line Items 1 - 14	LS	1	\$ _____	\$ _____

Mobilization shall be limited to the maximum percentage shown. **If the percentage exceeds the allowable maximum stated for mobilization, Owner reserves the right to cap the amount at the percentages shown and adjust the extensions of the bid items accordingly.**

TOTAL BID PRICE (TO INCLUDE LINE ITEMS 1 - 22 AND 100)	\$ _____
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Special Conditions

SC1. Scope of Work: The (prime) Contractor is to anticipate a period of careful planning in close coordination with Owner prior to beginning any work to fully develop procedures and standards for the work that will be performed.

SC2. Communication Protocol: All communication from the Owner's Construction Inspector to the Contractor shall be through the Contractor's Project Manager and/or Superintendent. Communication to/from the Contractor's subcontractors shall be routed to the Owner's Construction Inspector through the Contractor. Contact information for the Owner's Construction Inspector and the Contractor will be provided at the pre-construction conference.

SC3. Construction Phasing and Sequencing: The Contractor may follow the proposed construction sequencing in the Contract Documents. The Contractor shall submit an alternative sequence of construction (if different than proposed) in writing to the Owners Construction Inspector for approval. It is the Contractor's responsibility to provide sufficient work force, materials, and equipment to complete the work in accordance with the Contract duration.

SC4. Agreements: There is no formal agreement between the Owner and the named vendors that are included in Appendix C. Contractor shall be responsible for entering into an agreement with the named vendors that is consistent with the Contract Documents. Contractor shall include all costs to negotiate terms and conditions and enter into an agreement with the named vendors in the Price Proposal where indicated by the Specification Section 01130 Measurement and Payment.

SC5. Safety: Following are the safety conditions for the Contractor to comply with:

- The Contractor shall have at least one person with them at all times that have attended the Owner's 1-hour Contractor Safety training.
- The Contractor is notified that some of the work at the plant could be confined space work. The Contractor shall maintain, onsite and available for inspection, documentation that all Contractor personnel to be working in a confined space have received proper training.
- The Contractor shall submit to the Owner a copy of the Safety Plan for review and approval before the Work commences.
- The Contractor shall abide by all federal, state, and local hazardous material handling and disposal rules and regulations.

SC6. Trench Excavation Safety Protection: Contractor shall include the work associated with trench excavation safety protection as outlined in the Contract Documents and applicable federal, state, and local regulations.

SC7. Heat Exchanger Equipment (Quotes Line Item): The work associated with the Olympus Technology, Inc. (OTI) Heat Exchanger Equipment is as outlined in the Contract Documents and

as provided by OTI. See Appendix C attached after this section. The allowance in the price proposal is reflective of this scope of work in the Contract Documents and is to be provided by OTI. The selected Contractor must comply with the proposal as part of the Contract Documents. Any additional or different scope for the OTI contract negotiated at the request of the selected Contractor may result in a modification of OTI's price. Any additional costs incurred due to renegotiation of the OTI proposal by the Contractor or Contractor's subcontractors will be at Contractor's sole risk, and Contractor agrees to incur such costs at no additional cost to Owner and agrees that the Owner Contract Price for the project will not be increased by the Contractor due to such costs. Contractor agrees to indemnify and hold Owner harmless from any claims that may arise from or are associated with such additional costs above the costs provided for under the line item in the Owner Contract for the work and caused by renegotiation of the OTI proposal provided under the Contract Documents by the Contractor or his subcontractor. Owner will not pay for any increase in price due to this request nor any delays incurred as a result of this activity. Contractor shall issue Letter of Intent to purchase equipment no later than five (5) calendar days after Owner issues Notice to Proceed.

SC8. Digester Mixing Equipment (Quotes Line Item): The work associated with the Evoqua JetMix Digester Mixing Equipment is as outlined in the Contract Documents and as provided by Evoqua JetMix. See Appendix C attached after this section. The allowance in the price proposal is reflective of this scope of work in the Contract Documents and is to be provided by Evoqua JetMix. The selected Contractor must comply with the proposal as part of the Contract Documents. Any additional or different scope for the Evoqua JetMix contract negotiated at the request of the selected Contractor may result in a modification of Evoqua JetMix's price. Any additional costs incurred due to renegotiation of the Evoqua JetMix's proposal by the Contractor or Contractor's subcontractors will be at Contractor's sole risk, and Contractor agrees to incur such costs at no additional cost to Owner and agrees that the Owner Contract Price for the project will not be increased by the Contractor due to such costs. Contractor agrees to indemnify and hold Owner harmless from any claims that may arise from or are associated with such additional costs above the costs provided for under the line item in the Owner Contract for the work and caused by renegotiation of the Evoqua JetMix proposal provided under the Contract Documents by the Contractor or his subcontractor. Owner will not pay for any increase in price due to this request nor any delays incurred as a result of this activity. Contractor shall issue Letter of Intent to purchase equipment no later than five (5) calendar days after Owner issues Notice to Proceed.

SC9. Digester Gas Equipment (Quotes Line Item): The work associated with the L&J Technologies Digester Gas Equipment is as outlined in the Contract Documents and as provided by L&J Technologies. See Appendix C attached after this section. The allowance in the price proposal is reflective of this scope of work in the Contract Documents and is to be provided by L&J Technologies. The selected Contractor must comply with the proposal as part of the Contract Documents. Any additional or different scope for the L&J Technologies contract negotiated at the request of the selected Contractor may result in a modification of L&J Technologies' price. Any additional costs incurred due to renegotiation of the L&J Technologies proposal by the Contractor or Contractor's subcontractors will be at Contractor's sole risk, and Contractor agrees to incur such costs at no additional cost to Owner and agrees that the Owner Contract Price for the project will not be increased by the Contractor due to such costs. Contractor agrees to indemnify and hold Owner harmless from any claims that may arise from or are associated with such additional costs

above the costs provided for under the line item in the Owner Contract for the work and caused by renegotiation of the L&J Technologies proposal provided under the Contract Documents by the Contractor or his subcontractor. Owner will not pay for any increase in price due to this request nor any delays incurred as a result of this activity. Contractor shall issue Letter of Intent to purchase equipment no later than five (5) calendar days after Owner issues Notice to Proceed.

SC10. Digester Gas Flow Instrumentation (Quotes Line Item): The work associated with the Baker Hughes Digester Gas Flow Instruments is as outlined in the Contract Documents and as provided by Baker Hughes. See Appendix C attached after this section. The allowance in the price proposal is reflective of this scope of work in the Contract Documents and is to be provided by Baker Hughes. The selected Contractor must comply with the proposal as part of the Contract Documents. Any additional or different scope for the Baker Hughes contract negotiated at the request of the selected Contractor may result in a modification of Baker Hughes' price. Any additional costs incurred due to renegotiation of the Baker Hughes' proposal by the Contractor or Contractor's subcontractors will be at Contractor's sole risk, and Contractor agrees to incur such costs at no additional cost to Owner and agrees that the Owner Contract Price for the project will not be increased by the Contractor due to such costs. Contractor agrees to indemnify and hold Owner harmless from any claims that may arise from or are associated with such additional costs above the costs provided for under the line item in the Owner Contract for the work and caused by renegotiation of the Baker Hughes proposal provided under the Contract Documents by the Contractor or his subcontractor. Owner will not pay for any increase in price due to this request nor any delays incurred as a result of this activity. Contractor shall issue Letter of Intent to purchase equipment no later than five (5) calendar days after Owner issues Notice to Proceed.

SC11. Subsurface Utility Investigation (Quotes Line Item): Unforeseen utility locate and depth verification to identify existing underground utilities shall be paid from the "Subsurface Utility Investigation Allowance" proposal line item.

The cost and time impacts for these services shall be negotiated through Request for Proposal Process. The items of payment for the Contractor services shall be in accordance with the contract terms and conditions.

SC12. Permitting Fees (Quotes Line Item): SAWS will obtain the City of San Antonio (CoSA) Building Permit, and Stormwater Permit. All other permits shall be the responsibility of the Contractor including but not limited to TCEQ Stormwater Permit.

The Contractor is solely responsible for obtaining all other necessary permits, notifications and inspections. The Contractor shall be solely responsible for applying and securing the permits, sending notifications to the relevant agencies/authorities and requesting inspections in a timely manner as to not cause any delays in the construction duration.

The Contractor shall be reimbursed for the permit fees from the respective proposal line item upon submission of proof of payment.

SC13. CPS Energy (Quotes Line Item): This item shall be an allowance for CPS Energy fees. Contractor shall provide receipts from CPS Energy to SAWS for reimbursement for the fees. Payments to the Contractor for the work associated with natural gas pipeline work shall also be

made from this line item. Any unused portion of the allowance will be credited to SAWS. Contractor is responsible for coordination and scheduling with CPS Energy prior to commencing work.

The items of payment for the Contractor services shall be in accordance with the contract terms and conditions.

SC14. Intermediate Mobilization and Demobilization (Quotes Line Item): This bid item is limited to delays outside of the Contractor's control that are not otherwise provided for in the General Conditions. Examples of these types of delays would be Owner easement acquisition, permitting issues (only those permits not controlled by the Contractor), or other Owner activities. Any other provision contained herein notwithstanding Contractor will not be entitled to compensation under this bid item for work suspended during the 10 cumulative days allowed for by the Contract in the General Conditions, Article IV, Paragraph 4.8 Suspension of Work by Owner.

SC15. The wastewater plant and all supporting processes shall remain in operation at all times. Bypass piping/pumping or temporary on site engine powered generation of back up electrical power may be required and shall be provided by the Contractor at no additional cost to the Contract.

SC16. Coordination with On-Site Personnel: The Contractor agrees to cooperate and coordinate its work with the work conducted by other supplier(s)/contractor(s) and/or Owner's Operations staff within the project area so that this project can be completed in an orderly and coordinated manner, reasonably free of significant disruption to any party. Without limitation of the foregoing, the Contractor understands and agrees that access areas to the project site may be utilized by other supplier(s)/contractor(s). All parties shall be solely required and obligated to coordinate and cooperate with each other to accomplish the scope of work required by their respective contracts, meaning SAWS shall have no duty to administer, perform or supervise the coordination for the use of the project site by all suppliers/contractors. The Contractor agrees that any delay or hindrance caused by or contributed to by failure to cooperate and/or coordinate among all parties will be governed by this Section and General Conditions of this contract.

SC17. Storm Water Pollution Prevention Plan: The Contractor is responsible for carrying out the Storm Water Pollution Prevention Plan in accordance with local requirements, including any revisions made to the plan during construction. Reference Technical Specification Section 02270.

SC18. Geotechnical Data Report has been developed for SAWS on this project and has been made available for Contractors for informational purposes only. SAWS will require the execution of a SAWS disclaimer form by the Contractor as a condition of and prior to the release of the report. To complete the disclaimer form and obtain the report, please go to the following link on SAWS website: https://www.saws.org/business_center/ContractSol/

Appendix C of the Special Conditions

- 1. Heat Exchanger Equipment – Olympus Technologies, Inc. Proposal #2126**
- 2. Digester Mixing Equipment – Evoqua Water Technologies Quotation No. 00281774**
- 3. Digester Gas Equipment – L&J Technologies Proposal 77044**
- 4. Digester Gas Flow Instrumentation – Panametrics Proposal No. 2338803-1504774**

The following proposals are provided to detail the scope and price that is proposed by the named vendors and included in the Allowances in the Price Proposal.

Specification Section 11403 – Tube-In-Tube Heat Exchangers:

(6) HXt6x24.21 skid mounted, Concentric Tube Heat Exchangers each with (See P20 1005A):

- (24) 8" sch. 40, steel water tubes.
- (24) 6" sch. 40, steel sludge tubes.
- (23) 6", sch. 40 return bends.
- (2) 6" steel sludge inlet/outlet flanged nozzles with threaded and plugged ports for temperature gauges.
- (4) 4" steel water inlet/outlet flanged nozzles with threaded and plugged ports for temperature gauges.
- Necessary ductile iron couplings with EPDM gaskets and 316 stainless steel fasteners.
- Necessary steel drain, temperature and vent ports with plugs (pressure and temperature gauges not by OTI).
- Structural steel skid and support frame.
- Galvanized steel enclosure panels with 1 1/2" minimum insulation.
- Stainless steel epoxy anchor bolts.

Design basis (Extreme Winter Heat Requirement): 3,850,000 Btu/Hr heat transfer, 2.1 cP, 650 gpm sludge input at 90°F, water flow 200 gpm (100 gpm/per loop) at 180°, sludge fouling factor 0.0010 hr-ft²-F/Btu.

Spare Parts:

- One spare coupling gasket of each size coupling for the heat exchanger.

Additional items or services provided:

- Installation, operation, & maintenance manuals.
- Freight, FOB factory, with freight prepaid to the jobsite.
- Manufacturer service as specified.

Paint:

- All fabricated steel component exposed piping (outside the panels), the skid and structural support frame shall receive an SSPC SP1 solvent cleaning, as required, followed by application Hammerite Rust Cap, 4-9 mils dft.
- Vendor supplied items such as couplings, etc. will have manufacturers standard finished.
- Insulated panels are galvanized steel and do not receive further shop coatings.



Double Loop Heat Exchanger Design

JOB INFORMATION

Job Name: WR & Assoc. - San Antonio, TX
Location: San Antonio, TX
Order No.: NA

Table with 4 columns: Rev, By, Description, Date. Row A: Revision A, 10/05/20. Row B: (empty). Row C: (empty).

INPUT PARAMETERS

Heat Exchanger Description and General Input

Form with dropdowns for tube size (6" SCH 40 x 8" SCH 40), flow type (COUNTER-CURRENT), and checkboxes for return bend configuration, end closure, and type (Heater/Cooler). Includes a URF box with value 1.00.

Table of input parameters: Total Required Heat Transfer Capacity (3,874,206 BTU/hr), Total Quantity of Tube Bundles (24), Actual Physical Length of each Interior Sludge Tube (9.0830 ft), etc.

Table of Sludge Parameters Input: Sludge Tube (Inner Tube) Outside Diameter (6.6250 in), Sludge Tube (Inner Tube) Inside Diameter (6.0650 in), Sludge Flow (650.00 gpm), etc.

Table of material and conductivity parameters: Sludge Tube Thermal Conductivity (31.000 BTU/hr-ft-F), Thickness of Glass Lining (0.000 in), Glass Lining Thermal Conductivity (0.693 BTU/hr-ft-F), etc.

Table for 1st and 2nd Loop parameters: Sludge Inlet Temperature (90.00 F), Sludge Apparent Dynamic Viscosity (2.1000 cP), Sludge Density (61.96 lbm/ft^3), etc.

Table of Water Parameters Input: Water Tube (Outer Tube) Outside Diameter (8.6250 in), Water Tube (Outer Tube) Inside Diameter (7.9810 in), Water Flow in Each Loop (100.00 gpm), etc.

Form for Anti-freeze Percentage (0.00%) and Type of Anti-Freeze (Ethylene Glycol selected).

Table of density parameters: Water Density (61.106 lbm/ft^3), Water Specific Gravity (1.000).

GENERAL NOTES:

- 1 The performance results output above are accurate within the limits of currently recognized heat exchanger theory and the predictability of several uncertain design parameters (fouling factors, viscosity, etc.). OTI expects that the specified required heat duty includes appropriate safety factors which take these limits into account.
2 Head loss values are calculated using a standard implementation of the Darcy-Weisbach equation. The output head loss values calculated above should only be expected to be accurate within the limits of this theory.

OUTPUT VALUES

Heat Transfer Output

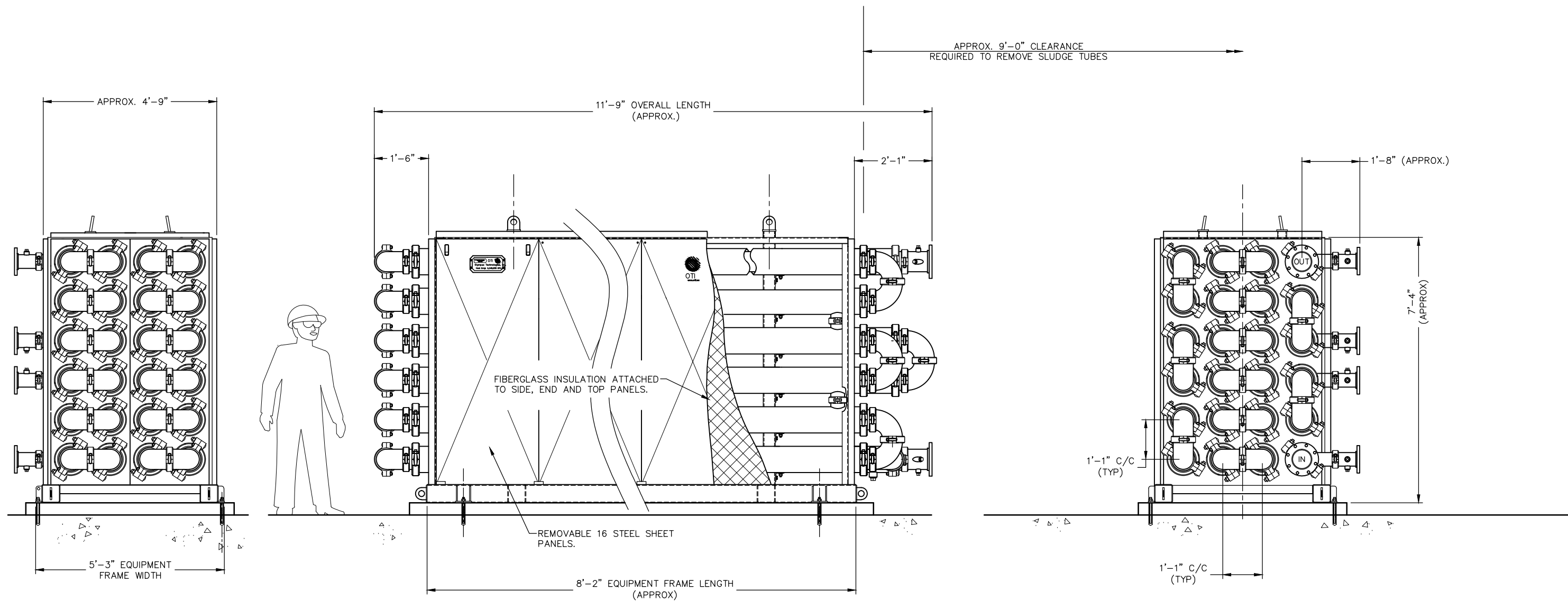
Table of Heat Transfer Output for 1st Loop (L1): Quantity of Tube Bundles (12), L1 Heat Transfer Capacity (2006328 BTU/hr), L1 Req'd Physical Length (9.0830 ft), etc.

Table of Heat Transfer Output for 2nd Loop (L2): L2 Heat Transfer Capacity (1867878 BTU/hr), L2 Req'd Physical Length (9.0830 ft), L2 Actual Heat Exchanger Heat Duty (1867878 BTU/hr), etc.

Table of physical and driving force parameters: Actual Physical Length of each Terminal Sludge Tube (9.8330 ft), Driving Force (90.00 F), Heat Transfer Constant (0.133), etc.

Table of Sludge Pressure Loss Output: Sludge Friction Factor (0.019 ft), Total Sludge Tube Length (108.996 ft), Total Sludge Head Loss (3.744 psi), etc.

Table of Water Pressure Loss Output: Water Tube Annulus Friction Factor (0.025), Total Water Tube Length (104.496 ft), Total Water Head Pressure Loss (3.697 ft), etc.



NOT TO SCALE

FRONT VIEW

GENERAL NOTES

1. OTI TO SUPPLY ONE (1) MODEL HXt6x24.21 CONCENTRIC TUBE HEAT EXCHANGER AS SHOWN AND NOTED.
 2. ALL TUBES ARE STANDARD WEIGHT CARBON STEEL PIPES. MINIMUM PIPE WALL THICKNESS = $\frac{1}{4}$ ".
 3. MATERIALS OF CONSTRUCTION TO BE:
 PIPING: ASTM A53 STEEL
 STRUCTURAL STEEL: ASTM A36
 OPTIONAL INSULATED HOUSING: 16 GAGE GALV. STEEL
 4. HEAT EXCHANGER DESIGN PRESSURE: 150 PSIG.
 5. MINIMUM HEAT DUTY IS 3,850,000 BTU/HR BASED ON THE FOLLOWING:
 SLUDGE FLOW RATE: 650 GPM
 WATER FLOW RATE: (2) PASSES OF 100 GPM EACH
 SLUDGE INLET TEMP: 90 °F
 WATER INLET TEMP: 180 °F
 SLUDGE VISCOSITY: 2.1 cP
 6. THE CALCULATED PRESSURE DROP THROUGH THE SLUDGE TUBES IS < 8 FT.
 THE CALCULATED PRESSURE DROP THROUGH THE WATER TUBES IS < 4 FT.
 7. ESTIMATED DRY WEIGHT APPROX. 15,500 LB.
 ESTIMATED WET WEIGHT APPROX. 19,900 LB.
 8. THE SUPPORT FRAME, 8" EXTERIOR PIPE SURFACES AND 6" RETURN BENDS EXTERIOR SURFACES TO BE SHOP BLAST CLEANED, AND COATED WITH (2) COATS OF SHERWIN-WILLIAMS DIMENSO ONE-COAT, 4 TO 7 MILS DFT.
- VENDOR SUPPLIED ITEMS WILL HAVE THE MANUFACTURER'S STANDARD FINISHES.

Addendum 3

<p>OTI Olympus Technologies, Inc.</p>	<p>MODEL HXt6x24.21 CONCENTRIC TUBE HEAT EXCHANGER</p>	Job No. _____ Base Drawing _____ Parent Drawing _____ Drawing Number: P20 1110B
	The information on this drawing, and all copies thereof, is confidential and is to be considered the exclusive property of Olympus Technologies, Inc. subject to return on demand. It must not be made public or copied without OTI's explicit consent. This drawing is not to be used in any manner detrimental to the interests of OTI.	



OTI

Olympus Technologies, Inc.

Proposal #2126RevB

November 30, 2021

Items NOT Included

- sludge pump, piping, pipe fittings, valves, controls, instruments, etc.
- pipe insulation or linings other than provided above.
- temperature control valves, transmitters, etc.
- pressure or temperature gauges, instruments, transmitters, thermometers, thermowells, etc.
- connecting water, sludge, gas piping, supports fittings, drain valves, vent valves, etc.
- flange bolts, blind flanges, or gaskets (except for heat exchanger couplings).
- field touch up painting.
- concrete pad, grout, shims, spacers, etc.
- field installation or field tests.
- unloading, weather protection, or storage.

Comments and clarification:

- Specification section 3.01.A – Examination of foundation/support structure, as well as any modifications needed are by others, not OTI
- Specification section 3.02 – Installation by others, not OTI.
- Specification section 3.04.A,B, and C – Testing is by others, not OTI.

SECTION 11403

TUBE IN TUBE HEAT EXCHANGERS

PART 1 - GENERAL

1.01 DESCRIPTION

The Contractor shall furnish and install all materials, equipment and appurtenances necessary for the complete and satisfactory installation of the tube in tube heat exchangers as specified herein and as shown on the Contract Drawings.

1.02 SUBMITTALS

✓ A. Shop drawings shall be submitted for all items specified herein as specified in **SECTION 01300, SUBMITTALS**.

- ✓ 1. Shop drawings showing general equipment arrangement, installation details, dimensions, weight, and materials.
- ✓ 2. Descriptive information such as catalogs, performance data, and other product literature showing equipment meets specified design criteria.
- ✓ 3. Catalog cut sheets on accessory equipment such as flexible couplings, thermometers, pressure gauges, etc.
- ✓ 4. Description of manufacturer's shop coating materials.

✓ B. Complete Operation and Maintenance Manuals shall be submitted as submitted under **DIVISIONS 0 AND 1**.

✓ 1.03 EQUIPMENT DESIGN

Equipment design, workmanship, testing and operation shall be as specified under **SECTION 15000, GENERAL MECHANICAL REQUIREMENTS**.

1.04 QUALITY ASSURANCE

✓ A. Qualifications and Control:

- ✓ 1. Manufacturer shall be engaged primarily in design and fabrication of wastewater treatment equipment including heat exchangers.
- ✓ 2. To ensure quality and single point responsibility the manufacturer shall design and fabricate its equipment. The use of contract fabrication shops shall not be allowed.
- ✓ 3. The manufacturer shall design the heat exchanger to applicable ASME codes: B31 Pressure Piping; Section VIII, Div. 1 Boiler and Pressure Vessel, and/or Section IX Welding, Brazing and Fusing Qualifications.

100% Submittal
July 2021

- ✓ 4. The unit shall be factory hydrostatically tested at 80 psig (minimum) for 1 hour on both the water and sludge tubes.
- ✓ 5. Installation, Operation, and Maintenance manuals shall be delivered prior to shipment of the equipment.

✓ 1.05 MANUFACTURER'S INSPECTION AND START-UP

The Contractor shall furnish the services of the Heat Exchanger Manufacturer's qualified field representative to inspect the equipment after installation, instruct plant personnel in its operation and maintenance, and supervise its initial operation for a minimum of one 8 hour day as specified under **DIVISIONS 0 AND 1**.

✓ 1.06 MANUFACTURER'S CERTIFICATE

The Contractor shall furnish the Engineer with a Manufacturer's Certificate, as specified under **DIVISIONS 0 AND 1** certifying the plug valves have been installed in a complete and satisfactory manner ready for operation.

PART 2 - PRODUCTS

✓ 2.01 ACCEPTABLE MANUFACTURERS

- ✓ A. Olympus Technologies, Inc.

2.02 GENERAL

- ✓ A. Number of heat exchangers required: six (6).
- ✓ B. Minimum heat transfer requirements, each unit: 3,850,000 Btu/hr.
- ✓ C. Sludge conditions:
 - 1. Sludge flow: 650 gpm.
 - 2. Sludge inlet temperature: 90 °F.
 - 3. Normal operating pressure: 25 psig.
 - 4. Maximum allowable pressure loss: 18 ft.
 - 5. Sludge from: Anaerobic digester.
 - 6. Design Apparent Dynamic Viscosity: 2.1 cP
 - 7. Sludge tube fouling factor: 0.0019 hrft²°F/Btu
- ✓ D. Hot water conditions:
 - 1. Water flow: 200 gpm.
 - 2. Water temperature: 180 °F.
 - 3. Normal operating pressure: 25 psig.
 - 4. Maximum allowable pressure loss: 4 ft.

✓ 2.03 HEAT EXCHANGER DESIGN

- ✓ A. The heat exchanger shall be a concentric tube within a tube unit.
- ✓ B. The heat exchanger shall be a maximum overall length of 11 feet 9 inches, and shall fit in the space indicated on the Contract Documents.
- ✓ C. Sludge shall circulate through the inner 6-inch tube.
- ✓ D. Water shall circulate through the surrounding 8-inch tube in a counter current arrangement.
- ✓ E. There shall be 24 sludge and water tubes for the heat exchanger.
- ✓ F. All tubes shall be constructed of carbon steel pipe with minimum nominal wall thickness of ¼". Tubes shall meet ASME A-53-B for steel piping.
- ✓ G. Pipe nozzles shall be designed with and provided class 150 flanges.
- ✓ H. Gasket materials shall be full faced, UL approved neoprene, EPDM with minimum thickness of ⅛" and rated for 200 psi and 230 °F.
- ✓ I. The sludge tubes shall be connected by full passage coupled return bends.
- ✓ J. Water tubes shall be connected by short coupled tubes.
- ✓ K. All tube connections shall be provided with grooved ends and flexible couplings to prevent leaking and prevent mixing of water with sludge.
- ✓ L. Flexible couplings shall meet ASTM A47/ASTM A536 requirements and be rated for 350 psi working pressure.
- ✓ M. Sludge inlet and outlet tubes and water inlet and outlet tubes shall be provided with ¾ inch NPT couplings for temperature gauges.
- ✓ N. At high points and low points for sludge and water tubes, 1-inch NPT couplings with plugs shall be provided for draining and venting purposes.
- ✓ O. Provide the heat exchanger with a structural tube support structure which shall be bolted or welded to a structural support skid.
- ✓ P. Provide support and lifting lugs sufficient to lift the heat exchanger.
- ✓ Q. Manufacturer shall supply stainless steel epoxy anchor bolts.

2.04 INSULATION PANELS

- ✓ A. Enclose all straight run sections of sludge and water tubes within a 16-gauge galvanized steel panel enclosure.
- ✓ B. Return bends and inlet and outlet nozzles shall not be enclosed or insulated.
- ✓ C. Provide a minimum 1 ½ ” thick heat resistant urethane foam insulation on the inside of the galvanized steel panel enclosure sections.

2.05 SPARE PARTS

- ✓ A. Provide one spare coupling gasket of each size coupling for the heat exchanger.

PART 3 - EXECUTION

3.01 FOUNDATION

- A. Examine foundation or support structure where the heat exchanger is to be located and make any modifications necessary for mounting the equipment.
- ✓ B. Anchor bolts shall be provided for the equipment and shall be located as required. Anchor bolts shall be 316 stainless steel adhesive type.

3.02 INSTALLATION

- A. Install the equipment and accessories in accordance with the drawings and manufacturer's written instructions.
- B. Check all piping and bolted connections to make sure they are properly tightened.

3.03 SHOP PAINTING

- A. Exposed piping and support structure.
 - ✓ 1. All steel piping exposed outside of insulation enclosure, support base and framing members shall receive surface preparation of minimum of SSPC-SP1, solvent cleaning.
 - ✓ 2. Painting shall be Hammerite Rust Cap, anti-rust, synthetic resin, fortified with glass and aluminum particles paint, 4-9 mils dft.
- ✓ B. Provide galvanized steel enclosure – exterior surfaces.

- ✓ 1. Steel insulated enclosure of galvanized steel gauge metal - no additional coatings required.
- ✓ C. Interior surfaces and piping inside insulated enclosure shall not require painting.

3.04 TESTING

- A. Inspect the installation of the heat exchanger and make final preparations for operational testing.
- B. To check piping connections to the heat exchanger, fill the sludge and water tubes and delivery and discharge sludge and water piping with test water. Pressurize both water and sludge tubes and piping to operating design pressure and maintain pressure for at least 1 hr. to demonstrate water tight construction.
- C. Perform a one-hour test at design flows for both water and sludge tubes without malfunction or leakage.
- ✓ D. Certify that the heat exchanger has been installed properly and is ready for normal operation.

END OF SECTION 11403



OTI

Olympus Technologies, Inc.

Proposal #2126RevB

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PRICING:

Unless otherwise indicated, the prices listed below are for the equipment only. Prices quoted are in US currency. Price quote is good for (180) days beyond proposal date.

<u>Spec Section</u>	<u>Equipment</u>	<u>Price</u>
11403	(6) HXt6x24.21 Heat Exchangers	<u>\$842,300</u>

Terms: Net (30) days from invoices. (10%) upon submittal approval, (85%) upon shipment, (5%) retention allowed until startup or (90) days from delivery, whichever occurs first.

Sales Tax: No sales taxes, use taxes, fees, tariffs or duties are included in the prices above. Any applicable taxes, fees, port costs, or duties are by others, not by OTI.

Freight: The prices above are F.O.B. jobsite.

Submittals: Submittal packages, including shop drawings will be provided 3 - 4 weeks after purchase order is received in OTI's office.

Shipment: OTI estimates commencement of shipment of the equipment items 14 - 20 weeks after approved submittals are received in OTI's office.

Field Service: The prices above do not include field services unless noted in the preceding proposal. Additional field service is available at OTI's standard regionalized daily rates plus actual incurred expenses.

FIRM PROPOSAL

DIGESTER MIXING AND SYSTEM
ENHANCEMENTS, PHASE 3 SAWS
JOB NO. 20-6501
SAN ANTONIO, TX

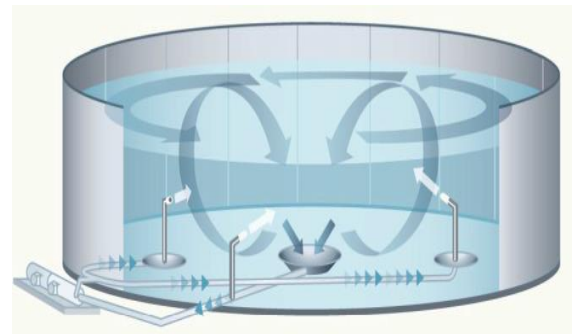
SECTION 11385 DIGESTER MIXING SYSTEM

Quotation No: 00281774 R1– October 2021

Questions related to this Proposal should be
directed to Evoqua's area sales representative:

SALES REPRESENTATIVE

Brian Phenegar
Environmental Improvements, Inc.
235 Trademark Dr.
Buda, TX 78610
Phone: 512.295.3733
Email: phenegar@ei2austin.com



To: All Bidding Contractors
Owner: San Antonio Water System (SAWS)
Engineer: Whitman, Requardt & Associates LLP
Proposal Date: 11/16/2021

1. SUMMARY

Evoqua Water Technologies LLC (Evoqua) proposes to furnish the equipment specified in this Quotation in accordance to the scope of supply described in this quotation and subject to the Clarifications/Exceptions and Standard Terms of Sale stated herein.

Addenda received: N/A

The information in this quotation is confidential and/or proprietary and has been prepared solely for the recipient's use in considering the purchase of the equipment and/or services described herein. Transmission of all or any part of this information to others, or use by the recipient, for other purposes is expressly prohibited without Evoqua's prior written consent.

ITEM & DESCRIPTION

Section 11385 Digester Mixing System

TOTAL PRICE \$1,330,033.00

Evoqua's price includes only the specific items detailed in this quotation. Items not specifically identified herein are to be furnished by others. Please refer to the excluded items in Section 4 of this quotation for a list of items to be furnished by others.

A. OPTIONS: An order for items quoted as an extra cost option, if any, will be accepted only when included with the basic equipment order.

B. FREIGHT: Pricing is FCA shipping point with standard freight allowed to the job site. Our price does not include any costs for unloading, transporting on the site, phased shipments or storage.

C. QUOTATION VALIDITY: This quotation is valid for a period of one hundred eighty (180) days unless extended in writing by Evoqua. Due to current raw material price fluctuation, Evoqua reserves the right to re-quote the equipment proposed herein after that time.

Due to volatility in steel costs, prices quoted in this proposal will be adjusted to reflect changes in the Metal and Metal Products Index (MMPI) published by the U.S. Department of Labor, Bureau of Labor Statistics. The most recent published MMPI is 316.1 for August 2021. If the MMPI exceeds 322.6 at the time the Equipment is released for manufacture, then the price will be increased by the same percentage as the MMPI exceeds 322.6.

D. FIELD SERVICES: Evoqua’s pricing includes the services of a factory field service technician for checking the installed equipment and instruction of Owner’s personnel; all of which shall be performed over a total of four (4) trip with eight (8) days on site.

Category	Trips	Days on Site
Mechanical	4	8
Total	4	8

E. SERVICE MANUALS: Our pricing includes an electronic version of the operation and maintenance (O&M) manual as an Adobe PDF file format only. If requested, Evoqua will supply hard copies of the service manual at the customers expense. Drawings will be supplied in an unchangeable TIF, bitmap, or PDF file format only. The rights to the content of Evoqua O&M manuals and drawings belong solely to Evoqua and Evoqua reserves the right to make changes to content at any time.

F. PAYMENT AND PRICE TERMS: The terms of payment are net 30 in accordance with the following milestones:

- 10% on drawing submittal delivery;
- 85% on shipment of equipment, or offer to ship;
- 5% on startup of equipment or 120 days from final delivery, whichever occurs first.

Cancellation Policy: If Evoqua is issued an order and the Buyer cancels or suspends its order for any reason other than Evoqua's breach, the Buyer shall promptly pay Evoqua for work performed prior to cancellation or suspension and any other costs incurred by Evoqua as a result of such cancellation or suspension. At a minimum, cancellation after executed contract will result in a cancellation fee of 10% of the total order value.

Evoqua’s prices are exclusive of any taxes. If this project is not subject to sales or use tax, please issue a Tax-Exempt Certificate with any ensuing purchase order (P.O.). If applicable, please provide a copy of payment bond information with the P.O. With no exemption or if this project is subject to sales or use tax, the Purchaser will be invoiced for taxes at the then-current rate of sales, use or other tax for the jobsite location.

2. DRAWING AND SHIPPING INFORMATION

Evoqua will furnish shop drawing submittals and equipment per the following project schedule:

- Submittal Drawings: Within eight (8) to ten (10) weeks from the date of final agreement by both parties.
- Submittal Drawing Reviews/Approvals: Within four (4) weeks from Evoqua’s delivery of Submittal Drawings.
- Shipment of Equipment: Within twenty-six (26) to thirty (30) weeks after approval of Submittal Drawings.

Evoqua has provided typical standard times and shipment dates. Actual times will be provided upon receipt of a Purchase Order based upon current backlog. Evoqua will work closely with the General Contractor and/or Engineer to provide delivery dates to meet the overall project schedule as possible.

If Submittal Drawing Reviews/Approvals are not received by Evoqua in accordance with the project schedule noted above, Evoqua shall be entitled to a reasonable extension of the *Shipment of Equipment* times and/or a reasonable increase in the contract price to cover costs incurred because of Submittal Drawing Review/Approval delays unless the delay is the fault of Evoqua.

3. EQUIPMENT SCOPE

The following equipment and services are included in Evoqua's scope of work:

No.	Description	Quantity
1.	Section 11385 Digester Mixing System	4

SECTION 11385 DIGESTER MIXING SYSTEM

Evoqua proposes to furnish and deliver, ready for installation, four (4) JetMix mixing systems in four (4) existing tanks 110 ft diameter with 30 ft side water depth.

EQUIPMENT The quantities listed below are for each tank.

- Seven (7) Hi-Chrome cast iron nozzle assemblies with 8x6" elbows in a steel base with S.S. adhesive anchors for floor mounting.
- One (1) 304 S.S. top nozzle assembly 3" flanged connection, with support bracket and S.S. adhesive anchors.
- Two (2) Hayward Gordon XCS16C screw centrifugal pumps (one (1) duty and one (1) stand-by). The pump will be provided with a 125 HP, 1800 rpm direct drive motor. The pump, motor and accessories will be mounted on a common base plate. S.S. adhesive anchors will be supplied.
- One (1) pressure gauge (0 to 60 psi) for the discharge and one (1) pressure gauge (-30 to 30 psi) for the suction connections of the pump will be shipped loose to be field mounted by the contractor.

PAINTING

The Hi-Chrome cast iron nozzles and common base plate will be sandblasted in accordance with SSPC-SP6. The coating system shall be Tnemec Series 69 Hi-Build Epoxoline. The prime coat shall have a minimum DFT of 3 – 5 mils and intermediate and finish coat shall be applied with a DFT of 5+ mils each for a total coating DFT of 13 – 16 mils.

TESTING

Mixing performance test, Section 11385, Paragraph 1.03 V.

CFD MODELLING (Computational Fluid Dynamics)

A model for a similar tank and arrangement of the exact size or similar.

SPARE PARTS

Specified in the engineer's specification, Section 11385, Paragraph 2.16 B.

SHIPPING INFORMATION: The equipment will be shipped as follows:

Each system will be shipped on skids or crated as needed.

Shipping weight of each system components is approximately 8,525 lbs.

The chopper pump assembly is the heaviest piece and weighs approximately 3,350 lbs.

4. EXCLUDED ITEMS

The price from Evoqua includes only those items listed in this Quotation. The items listed below are excluded:

- Installation or labor.
- Pump services and start-up.
- Electrical, hydraulic, or pneumatic controls.
- Wiring of motors or controls, control panels, or panel supports.
- Piping, valves, wall sleeves, gates, drains, weirs, baffles.
- Floor grating, stairways, ladders, platforms, handrailing.
- Concrete, grout, mastic, sealing compounds, shims.
- Lubricants, grease piping, grease gun.
- Machinery or bearing supports, shims.
- Detail shop fabrication drawings.
- Tools or spare parts.
- Equipment offloading and installation of any kind.
- Modifications to existing equipment or structures.
- Supervisory services; laboratory, shop, or field testing.
- Underwriters Laboratory inspection of electrical controls.

5. CLARIFICATIONS/EXCEPTIONS

The equipment specified herein shall conform to the specification sections referenced in Section 1 of Evoqua's Quotation to the extent they are technically applicable to Evoqua's scope of supply as described in this Quotation and subject to the following clarifications:

Article, Section	Clarifications/Proposed Modifications
	This quotation is valid for a period of one-hundred and eighty (180) days from the date of this proposal unless extended in writing by Evoqua. In order to purchase the equipment for the price stated in the proposal, a contract between seller and buyer must be executed within the one-hundred and eighty (180) validity period.
	The proposed Jet Mix system shall be identical to the other digester mixing systems Evoqua project number 45050 provided in 2014.

	The Seller warrants the pumps, through the earlier of (i) thirty (30) months from delivery or (ii) twenty-four (24) months from initial operation of the pumps.
	The Seller warrants the mixing system nozzles, through the earlier of (i) one hundred twenty-six (126) months from delivery or (ii) one hundred twenty (120) months from initial operation of mixing system.
1.03 D., 11385	A model for a similar tank and arrangement of the exact size or similar. A CFD model from Evoqua project 45050/phase II improvements shall be provided.
1.07 A., 11385	Evoqua has included and shall be responsible for field service days regarding installation check, training, and solids profile testing supervision.
1.07 A., 11385	Pump services and pump start-up shall be provided by Environmental Improvements Inc.
2.07 A., 11385	Shaft shall be 4140 carbon steel protected through the sea area by a 316SS shaft sleeve.
3.01/3.08, 11385	Witnessed 6 pt performance testing is included. All transportation and travel expenses are not included. Pump testing does not include NPSH testing. NPSH testing results from previous tests shall be provided.

Evoqua's standard terms and conditions, including without limitation Evoqua's warranty obligations in Article 7 govern the purchase and sale of equipment, products, and related services, referred to in Evoqua's proposal. Evoqua's offer or acceptance is expressly conditioned on Buyer's assent to these terms. Evoqua rejects all additional or different terms in any of Buyer's forms or documents.

The Influent and Effluent criteria listed in the Bid Documents was used as the basis of design for equipment selection. Evoqua makes no express or implied performance warranty by offering equipment under this specification, unless specifically included in Evoqua's proposal. System performance may be impacted by factors outside of Evoqua's control. These factors may include but are not limited to site conditions including variation in flows and loadings, operator inputs, temperature, pH, toxic or inhibitory substances, and failure or limitations of other unit processes.

6. ADDITIONAL FIELD SERVICES

Should the Purchaser feel that additional services will be required, they can be purchased from Evoqua. Additional services may be purchased at the per diem rate stated below.

Evoqua's price does not include service of a factory field service technician during the time of installation of the equipment items.

In the event Purchaser wishes to videotape the Evoqua field service personnel during start-up and/or field service, Purchaser must execute Evoqua's standard "Videotape Agreement" in which the Purchaser shall expressly waive any claim against Evoqua, for injury or damage caused by inaccuracies or errors in such videotape(s), and acknowledge that such videotaping is done by Purchaser at its sole risk.

TERMS GOVERNING FIELD SERVICES: Services of a factory field service technician to inspect installation and/or first operation of the products specified in the quotation can be furnished by Evoqua at the following rates:

- A.** Supervision or consultation of a process service technician within the continental limits of the United States: \$1,400 per eight (8) hour day, Monday through Friday inclusive.
- B.** Supervision or inspection of a field service technician within the continental limits of the United States: \$1,200 per eight (8) hour day, Monday through Friday inclusive. Overtime Monday through Friday and Saturday work is charged at time and one-half. Time worked on Sunday will be charged double time; time worked on U.S. Holidays will be charged triple time.
- C.** Traveling, living and incidental expenses at cost, including shipping charges on tools and other equipment which the factory field service technician has shipped to the construction site.
- D.** Travel time will be charged to and from Purchaser's construction site, and weekend or holiday travel request or required by Purchaser will be charged at the overtime rates.
- E.** Rescheduling or cancellation of a field service trip once booked will incur the greater of either a \$1,500 cancellation or re-scheduling charge, or actual costs.

Rates shown above apply only to additional services performed within twelve (12) months from the date of Quotation. Additional services performed after twelve (12) months from the date of Quotation shall be subject to Evoqua's current rates at the time such service is provided. Except for the direct acts or omissions of the factory field service technician, the responsibility for the installation and/or first operation shall be Purchaser's. Evoqua will assume responsibility for workmen's compensation coverage of Evoqua employees only and will provide umbrella liability coverage during installation. All other insurance coverage and necessary materials to accomplish installation shall be provided by Purchaser.

QUOTATION SUBMITTED BY EVOQUA WATER TECHNOLOGIES LLC

Signature below indicates acceptance of this quotation including the Standard Terms of Sale attached hereto and will act as the purchase order document between Evoqua Water Technologies LLC, the Seller, and the Buyer. The Standard terms of Sale shall form the complete and only set of terms for this order.

Accepted by Buyer:

Acknowledged by Seller:

Company

Evoqua Water Technologies LLC

Company

Printed Name

Printed Name

Title

Title

Signature

Signature

Date

Date

Billing Address

Evoqua Water Technologies LLC
N19 W23993 Ridgeview Pkwy, Suite 200
Waukesha, WI 53188

Address

Shipping Address

Please submit the signed proposal to TWEL@evoqua.com along with the Billing Address, Shipping Address, Tax-Exempt Certificate, and a Copy of Payment Bond. It is clarified that the purchase order price does not include sales tax and that sales tax is to be added to the sale price unless the Seller receives a Tax-Exempt Certificate or Resale Certificate.



L&J engineering



PROPOSAL

To: Whitman, Requardt & Associates, LLP 801 South Caroline Street Baltimore, MD 21231 United States Phone: Fax: Attn: David Nixon Email:	Reply To: GPE Controls, Inc / Shand & Jurs L&J Technologies 5911 Butterfield Road Hillside, IL 60162 USA Phone: (708) 236-6000 Fax: (708) 236-6006 Attn: David Garb dgarb@ljtechnologies.com
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We are pleased to submit the following Proposal.
 This Proposal is subject to the attached Terms and Conditions.

Proposal Number: 77735 R1

Date: Nov 29, 2021 02:29 PM

Estimated Lead Time: 12 Weeks after Receipt of Purchase Order, Credit Approval, & Drawing Approval if required.

Item	Unit Qty	Item Description	Unit Price	Total Price
1.	16	97570 Combination Conservation Vent and Flame Arrester (2"-12" Sizes) 97570-16-07-18-AD-2 (16) - 6" Size / Flanged Connection / Aluminum Body Material (07) - FF ANSI 150 lb Flange Type/ Vent Type: Open Vent with "All Weather" Coating (18) - Expanda-Seal Pallet type with FEP Diaphragm // Lead Pallet Weights 6" -16" W.C. in 1" Increments Including (1)-1/2 In. and (2)-1/4 In. W.C. Weights PRESSURE SET POINT= 12 Inches W.C. VACUUM SET POINT= 1 Inches W.C. (AD) - Standard Seat / Standard Pallet Material // Normal Cleaning /316 Stainless Steel Trim Material (2) - Flame Arrester Materials: Aluminum Body with 316 SS Tube Bank / 316 Stainless Steel Shell	\$ 0.00	\$ 0.00
2.	8	97190 3-Way Safety Selector Valve 97190-64-33-11-11 (64) - 6" Unit Size / AL Body Material (33) - 316 SS ROTOR / ANSI 150 lb. FF Flange Connection @ Inlet and Outlet (11) - Inlet to Outlet (A/B) Flow Arrangement / Teflon Seat Seal Material (11) - 316 Stainless Steel Trim / Nut Drive Operator/	\$ 0.00	\$ 0.00
3.	2	94210 Emergency Vent and Manhole Cover (Hinged) x94210-45-12-00 (45) - 30 inch size / Aluminum Base Material / ANSI Flange (12) - 16 Inches W.C. Pressure Setting (00) - Standard Marking / Standard Seal x=Incremental weights 14" W.C. ->18" W.C. per suggestions published with specification	\$ 0.00	\$ 0.00
4.	3	97100P (Electric Drip Trap Panel) 97100P-14-23 (14) - 1 Unit Control Capacity//Aluminum NEMA 7 Enclosure (23) - Automatic with Timer / 110 VAC Control/Power // Status Contacts w/Fail and Auto Outputs DTCP-6, 12, and 5	\$ 0.00	\$ 0.00

Item	Unit Qty	Item Description	Unit Price	Total Price
5.	9	97100P (Electric Drip Trap Panel) 97100P-24-23 (24) - 2 Unit Control Capacity//Aluminum NEMA 7 Enclosure (23) - Automatic with Timer / 110 VAC Control/Power // Status Contacts w/Fail and Auto Outputs DTCP-1, 2, 3, 4, 7, 8, 9, 10, 11 As shown on: 01I30 - DTCP 1, 2, 7, 3, 10 01I31 - DTCP 11, 4, 8, 9	\$ 0.00	\$ 0.00
6.	21	97100E Electric Drip Trap 97100E-63-12-02 (63) - 6 Quart Cap. / 5 PSIG MAWP//Aluminum w/ Anodized Disc/Cover Body Material (12) - CR (Chloroprene (Neoprene equivalent)) Soft Goods // Air Inlet (02) - SS Bracket / SS Hardware // No Timer, Nema 4/7 class actuator w/manual handwheel	\$ 0.00	\$ 0.00
7.	6	VW Submittals (Approvals, Submittals, and O&M manuals)	\$ 0.00	\$ 0.00
8.	1	Standard Freight Cost	\$ 0.00	\$ 0.00
9.	2	Field Service 2 trips to the plant in order to check installation, provide start-up assistance, and train the operators in the use of the equipment across the swing shift.	\$ 0.00	\$ 0.00
10.	1	Total Project Price Price good for 180 days from 11/16/21 (5/15/2022)	\$ 533,801.00	\$ 533,801.00
			Sub Total	\$ 533,801.00
			Total Equipment Net Price	\$ 533,801.00

Payment Terms: Net 30 Pending approval of credit

Freight: F.O.B. Hillside IL

Valid For:

Notes: Quote Valid for 180 days from 11/16/21 (5/15/2022)

- Any emissions testing by others
- Any and All Heat Trace is By Others
- Flame trap assembly shipped from factory disassembled (two separate pieces)
- Any and All Piping is By Others
- Installation Anchor Bolts and hardware are Supplied By Others.
- It is the responsibility of the CONTRACTOR to verify the accuracy and quantities of the proposed scope of supply.
- Installation hardware and gaskets are supplied by others.
- Any inline deflagration arresters or flame trap assemblies are provided per specification. Detonation arresters are factory recommended.
- Submittals are provided 2 weeks after receiving PO and parties (Purchaser and Supplier) agree on terms and conditions.
- Customer Review: As Required, Not to Exceed 30 Days
- Final Drawings Must be Approved by Customer Before Production Lead Time Starts
- Payment Terms: Net 30 Days - Date of Seller's Invoice
- 10% on Receipt of Submittals
- 90% Upon Shipment of Shand & Jurs Equipment
- Final Payment shall not exceed twelve (12) months from shipment date of the materials
- If all items and quantities on this proposal are not purchase at the same time, the quoted prices are not valid
- Consult factory for any additional field service requirements
- Standard Warranty: Warranty Period not to exceed twelve (12) months from successful start-up or eighteen (18) months from delivery date of the materials, whichever is sooner. Warranty is for parts only

SAN ANTONIO WATER SYSTEM

Steven M. Clouse WRC Digester Mixing and System Enhancements Phase 3



Date: 01 Dec 2021

Company Name: SAN ANTONIO WATER SYSTEM
For the attention of: Wendy Nilsson
Panametrics Proposal No.: 2338803-1504774 - Rev 2
Project Name: Steven M. Clouse WRC Digester Mixing and System Enhancements Phase 3

ATTN: Wendy Nilsson

In response to your above referenced inquiry, Panametrics is pleased to provide this revised quotation to SAN ANTONIO WATER SYSTEM for the supply of the items listed herein.

Revision #2: Changed - Project titled and validation date.

This opportunity will have an internal project level of L3. A project manager and project engineer will be assigned to this opportunity should a PO be issued for the full quoted scope.

Should you have any questions or require any additional information please do not hesitate to contact the undersigned.

Best Regards,

Cherish Giovinazzo
Panametrics
Baker Hughes Company
1100 Technology Park Drive
Billerica, Massachusetts 01821
E: cherish.giovinazzo@bakerhughes.com

Product Summary

Tag Reference	Summary Description	Quantity	Unit Price	Extended price
Compressors FE/FIT/PIT/TIT-002 (10") GAS	DigitalFlow™ GM868 Panametrics General Purpose Gas Ultrasonic Flowmeter, 1 Path(s), T5 Transducer, Barrel Holder Transducer Holder, Coax Cables and 10" OD, SS 316, Des/Sch 10S, Rate 150 Custom Flowcell.	1	\$ 54,243.39	\$ 54,243.39
Digester Nos. 5-8 / 4 Total (10")	DigitalFlow™ GM868 Panametrics General Purpose Gas Ultrasonic Flowmeter, 1 Path(s), T5 Transducer, Barrel Holder Transducer Holder, Coax Cables and 10" OD, SS 316, Des/Sch 10S, Rate 150 Custom Flowcell.	1	\$ 223,350.76	\$ 223,350.76
Ameresco: FE/FIT/PIT/TIT-001 (16") GAS	DigitalFlow™ GM868 Panametrics General Purpose Gas Ultrasonic Flowmeter, 1 Path(s), T5 Transducer, Barrel Holder Transducer Holder, Coax Cables and 16" OD, SS 316, Des/Sch 10S, Rate 150 Custom Flowcell.	1	\$ 71,170.79	\$ 71,170.79
Approval Documentation	Flowcell Fabrication, Wiring and General Assembly Drawings	1	\$ 2,593.68	\$ 2,593.68
Final Documentation	Test Reports, Certifications, and final documentation	1	\$ 2,593.68	\$ 2,593.68
			Grand Total	\$ 353,952.30

Payment Terms: Net 30

Incoterms: CPT

Estimated Delivery: 19 Weeks From receipt of Approved Drawings

Quote validity: 180 days.

Proposal Prepared by: Seeley, Scott (Scott.W.Seeley@bakerhughes.com)

COVID-19 Force Majeure Clause:

Notwithstanding anything else, Seller shall not have any liability for delays resulting directly from governmental actions, supply chain shortages, or any other consequences attributable to the widespread impact of the pandemic known as Covid-19 or other similar strains or Coronavirus pandemics

Purchase orders to be submitted to the following address:

PANAMETRICS LLC
 1100 Technology Park Dr
 BILLERICA, MA 01821-4111
 UNITED STATES
 custcareboston@bakerhughes.com

Please be aware that Baker Hughes is in the process of updating our legal entity names as we separate from GE. If the legal entity on this quotation has GE in the name it will change during 2020 to a Baker Hughes specific name. Should a purchase order be placed per this proposal, it is possible that our legal entity may have changed after the proposal was sent or might change during execution of the order. Baker Hughes will make every effort to minimize the impact caused
Customer: SAN ANTONIO WATER SYSTEM

by this change and will advise you if any specific actions are required on your part. Our Bank account details and Tax ID details will remain the same.

Purchase orders should include the following information:

- Complete Sold To (Customer address), Bill To and Ship To address details
- Contact name and phone number for purchase order inquiries and same for documentation submissions, if different
- End user name and Country
- Prices are exclusive of any current and future taxes, which, if applicable, will be added to the price
- Purchase Order should be either electronically issued or on Company Headed Paper
- Specific Delivery Date or Dates ("as soon as possible" is acceptable)
- Include reference to this quote on your PO or in the text of PO email if inclusion on PO is not possible

** The following technical documents were referenced for this RFQ package.*

Project Name:	Steven M. Clouse WRC Digester Mixing and System Enhancements	DM	2338803
RFQ No:		App Engineer:	Scott Seeley
BH Proposal No:	2338803 -1504774	Revision:	0

Item No.	Document Number	Revision	Title	Received	Date Received	TOC Comments
1	Ameresco Gas Flow Meter ADS		General Gas Flowmeter Application Data Sheet	Y	10/06/2021	
2	Compressors Discharge to Boilers Gas Flow Meter ADS		General Gas Flowmeter Application Data Sheet	Y	10/06/2021	
3	Digesters 5 - 8 Gas Flow Meters ADS		General Gas Flowmeter Application Data Sheet	Y	10/07/2021	
4	Section 13310 Flow Instruments		SECTION 13310 FLOW INSTRUMENTS	Y	10/06/2021	13

* Only specifications listed above have been considered in the preparation of this proposal. Sub- referenced customer documents not provided have not been considered. Panametrics reserves the right to re-quote based on any additional specification not listed above as received.

Project Name:	Steven M. Clouse WRC Digester Mixing and System Enhancements	DM:	2338803
App Engineer:	Scott Seeley	Revision:	0

Compliance Status Legend:

C - Clarification	The requirement is satisfied and a clarifying response is offered to prevent any misunderstanding.
E - Exception	The requirement cannot be met as stated.
D - Deviation	The offering satisfies the noted deviation to the requirement.
N - Not Applicable	The requirement is the responsibility of others/Deemed Not Applicable to product offered

Section 13310 Flow Instruments - SECTION 13310 FLOW INSTRUMENTS

Item #	Paragraph Reference	C	E	D	N	Comment
1	Para. 1.03 D, Submittals			X		Operation and Maintenance Manuals provided with Order Final Documents
2	Para. 1.03 D1, Submittals			X		Operation and Maintenance manuals per Panametrics standard documentation.
3	Para. 1.05 B QUALITY ASSURANCE		X			Equipment submitted shall fit within the space or location Drawings. No Drawings were provided with RFQ.
4	Para. 1.06 A WARRANTY		X			Warranty per Baker Hughes - Panametrics terms
5	Para. 2.02 C.1.c Temperature transducer		X			Proposal does not include temperature transducers
6	Para. 2.02 C.1.d Pressure transducer		X			Proposal does not include pressure transducers
7	Para. 2.02 C.2.a Accuracy	X				Refer to G-FAST Summary Results for full performance.
8	Para. 2.02 C.2.b Repeatability		X			Refer to G-FAST Summary Results for full performance.
9	Para. 2.02 C.2.d Retract mechanism		X			Retractable transducer mechanism not recommended and quoted for this proposal.
10	Para. 2.02 C.4.a-d Temperature Transducer		X			Temperature Transducer not supplied (provide bu others).
11	Para. 2.02 C.5.a-d Pressure Transducer		X			Pressure Transducer not supplied (provide by others).
12	Para. 2.03 A Spare Instruments		X			Spare Instruments shall be as listed in SECTION 13410 PROCESS INSTRUMENT SCHEDULE. Schedule not provided with RFQ, spares not quoted.
13	PART 3 Execution		X			Section applicable to Instrument installer not instrument manufacturer.

GENERAL NOTES

Item #	Paragraph Reference	C	E	D	N	Comment
14	Cable Length	X				The required cable length for these installations has not been provided. An estimated footage of flowmeter cable has been supplied for quotation purpose, please advise if additional cable is required.
15	Cable Rating	X				Cable must be run in conduit per NEC to meet hazardous area requirements, if hazardous area requirements are needed.
16	Composition (Gas)	X				Panametrics have assumed gas properties as detailed in G-FAST. For accurate calculations please provide composition data
17	Customer Reference Specifications	X				Any customer specification(s) referenced, but not provided with the request for bid package are assumed to be not applicable to this proposal.
18	Documentation	X				Your RFQ did not include Vendor Data Requirements (VDR). Panametrics standard data package has been quoted. Quoted price may vary if a formal VDR is included with the PO.
19	Documentation Format	X				Documentation is not issued in native file format. PDF only

Project Name:	Steven M. Clouse WRC Digester Mixing and System Enhancements	DM:	2338803
App Engineer:	Scott Seeley	Revision:	0

Compliance Status Legend:

C - Clarification	The requirement is satisfied and a clarifying response is offered to prevent any misunderstanding.
E - Exception	The requirement cannot be met as stated.
D - Deviation	The offering satisfies the noted deviation to the requirement.
N - Not Applicable	The requirement is the responsibility of others/Deemed Not Applicable to product offered

20	Liquids Droplets/Suspended Solids	X				Calculations for process conditions assume there is less than 5% (by Volume) liquid droplets or suspended solids are present in your process line. Please advise if this is incorrect, we may have to offer a different design.
21	NDE Testing	X				The quoted systems include Hydrostatic test, LPI (liquid penetrate inspection), and X-ray (Radiography) testing where applicable. If this is not sufficient please contact Panametrics with an update for your specific requirements.
22	Origin of Material, AVL & AML	X				Specific countries for material origin, Acceptable Vendor List (AVL) or Acceptable Manufacturer List (AML) have not been taken into consideration or provided for this quotation. Panametrics standard products provided.
23	Specifications	X				Panametrics quotation is based only on the specifications supplied to us. These specifications are listed in the attached Specifications Register.
24	Start Up/Commissioning	X				Start Up/Commissioning service assistance has not been included in this proposal, but is available through Panametrics's Service Team. Please advise if you would require a separate Service quotation for this option.
25	Straight Run (Gas)	X				The ultrasonic flow meter performance referenced is based on a fully developed flow profile with 20D upstream and 10D downstream of straight pipe run. For straight runs with less than recommended 20D/10D a flow analysis study (CFD) to develop a view of the flow profile and meter correction factors is available on request at additional cost.

Customer Technical Offer

Customer	SAN ANTONIO WATER SYSTEM	Tag Reference/Identifier(s)	Compressors FE/FIT/PIT/TIT-002 (10") GAS
Customer reference		Proposal number	2338803-1504774
Date Printed	01 Dec 2021		

Qty	Description
1	<p>GM868-1-1-1-2-0-9-1-4-11-0-0</p> <p>Model: GM868 General Purpose Flowmeter with RS232 digital port; capable of measuring flow velocity, actual or standard volumetric flowrate Note- Determination of standard volumetric flow requires pressure and temperature inputs (See section H)</p> <p>Channels: Single channel</p> <p>Power: 100 to 120 VAC operating voltage</p> <p>Package: NEMA 4X aluminum enclosure, epoxy painted, with external sealed keypad. Suitable for General purpose & Div 2 environments.</p> <p>Analog Outputs: Six isolated 4 to 20 mA outputs</p> <p>Alarms: None</p> <p>Optional (Totalizer / Freq. / Digital): Ethernet card. Allows PanView or OPC Server to communicate with meter over the Ethernet.</p> <p>Analog Inputs: Two isolated configurable 4 to 20 mA inputs for pressure or temperature (Internal 24 VDC supply)</p> <p>Transducer Frequency: 100 kHz transducer operating frequency</p> <p>Certification: USA/CAN for Div 2, Class 1, Groups ABCD. Requires enclosure option D = 1 or 2.</p> <p>Software: No Special Software</p> <p>Special: None</p>

Qty	Description
1	<p>FC-HAZCOAX-25-FT-FL150-0-BNC75-0-0-0</p> <p>Model: Flowmeter Cable</p> <p>Cable Type: Pair of coaxial cables for use in conduit (Price shown is price per pair)</p> <p>Cable Length: Cable Length: 25</p> <p>Units: Feet</p> <p>Front Connector: Flying leads for XGX868i, XMT868i, XMT1000, IGM878, NEMA 4X DF868, GX868</p> <p>Front Gland: Not required for AT868 or AT600, rack mount DF868 or GX868</p> <p>End Connector: BNC Plug for standard transducers</p> <p>End Gland: None</p> <p>Material: None</p> <p>Special: None</p>

Qty	Description
2	<p>T5-18-10-16-NT-TI-1-2-4-1-0-GASNIST</p> <p>Model: T5 All welded gas transducer, Certifications include: ATEX Flameproof II 2 GD Ex d IIC T(x); CSA/C-US Class 1, Div. 1, Groups C, D; IECEx Flameproof Ex d IIC T(x)</p> <p>Head Angle: Straight head, 180 deg</p> <p>Frequency: 100 KHz frequency</p> <p>Tube Length: 16 inch Tube Length</p> <p>Temperature Range: Normal Range: -55 to 150 deg C (-67 to 302 deg F)</p> <p>Material: Standard titanium head with titanium tube. Material certs per EN10204 Type 3.1 The transducer material also meets the requirements of NACE MR-01-75 and MR-01-03</p> <p>Junction Box: Explosion proof Aluminum Enclosure</p> <p>XAMP: XAMP without transformer (for Standard and Extended Range operation)</p> <p>Preamp Gain: Gain of 40 (hi flow Flare)</p> <p>Certification: USA/CAN for Div 1, Class 1, Group C & D hazardous locations</p> <p>Miscellaneous: None</p>

Qty	Description
	<p>Modifications</p> <p>Modifications: Test Performance per Gas NIST</p>

Qty	Description
2	<p>BH-1.5-15-36-4-0-4</p> <p>Model: Barrel holder consisting of 1" SCH 160 pipe and RF flange, with 2 compression fittings, includes dampener fitting (316SS, graphite)</p> <p>Flange Size: 1.5 inch flange</p> <p>Flange Rating: 150 lb flange rating</p> <p>Material: All 316L SS components</p> <p>Barrel Pipe Length: Barrel Length (inches): 4</p> <p>Miscellaneous: None</p> <p>Hardware: Hardware for 3" flange connection; Stud: 316 SS, ASTM A193 Grade B8M; Nut: 316 SS ASTM A194 GRADE 8M</p>

Qty	Description
1	<p>Flowcell-Gas-S6-10-150-S</p> <p>Model: Flowcell</p> <p>Application: Flowcell for Gas</p> <p>Material: 316 Stainless Steel</p> <p>Line Size: Line size 10 inches</p> <p>Rating: Flange Rating 150 lbs</p> <p>SPECIAL: Flowcell #278865. Pipe Material: SS 316, A312-TP316/316L [SMLS]. Pipe Size: 10" OD, Sch 10S, Face to Face Length: 48". Process Connection: WN RF Flange, 150, A182-F316/316L, ANSI B16.5. Transducer Connection Details: Type: Barrel Holder, 1.5" OD, LWN RF Flange, 150#. Configuration: HD1, 1 Path(s). Additional Ports: Pressure: LWN RF, 1", Temperature: LWN RF, 1.5". Pipe Specification: None. Paint: System A: Bare Metal. Options: LPI, X-Ray, Hydro *</p>

G-FAST RESULTS SUMMARY

Flowmeter Application Calculator and Test System® Ver. 2.68, June-2-2021

Customer Name: San Antonio Water System
 CPO#: 2338803
 Tag Number: Compressors FE/FIT/PIT/TIT-002

Pipe Data

Pipe Material: 316 Stainless Steel
 Pipe Size: 10 in
 Pipe Schedule: 10S
 Outer Diameter: 10.75 in
 Inner Diameter: 10.42 in
 Wall thickness: 0.165 in
 Internal Area: 0.59219 ft²

Fluid Data

Fluid Name/Type: Gas Composition Tab 47%CO2 50%CH4 +other
 Variables **Min** **Nom** **Max** **Units**
 Provided Flowrate 300.00 1,200.00 1,500.00 SCF/Minute
 Velocity 8.01 31.74 19.61 ft/s
 Temperature 50.00 95.00 110.00 °F
 Pressure 0.50 2.00 20.00 Psig
 Density 0.082 0.083 0.169 lb/ft3
 Sound Speed 1055.3 1100.9 1115.7 ft/s
 Reynold's No. 63,746 235,654 287,401
 Base Temperature 60.0 °F
 Base Pressure 14.7 PSIA
 Barometric Pressure 14.7 PSIA
 Molecular Weight 29.55
 Max Allowed Vel. 125 ft/s

Configuration Data

Transducer Configuration: Custom, D45 Full Diameter
 Traverses/Paths: 1 Traverse , 1 Path
 Transducer Material: Ti
 PREAMP GAIN: 40

Repeatability Results (% of Reading)

Accuracy/repeatability calculated is based on velocity

Flow Rate:	Temperature		
	Min	Nom	Max
Min	0.75%	0.75%	0.75%
Nom	0.75%	0.75%	0.75%
Max	0.75%	0.75%	0.75%

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Design Accuracy Results (% of Reading)

Flow Rate:	Temperature		
	Min	Nom	Max
Min	2.00%	2.00%	2.00%
Nom	2.00%	2.00%	2.00%
Max	2.00%	2.00%	2.00%

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Calibrated Accuracy Results (% of Reading)

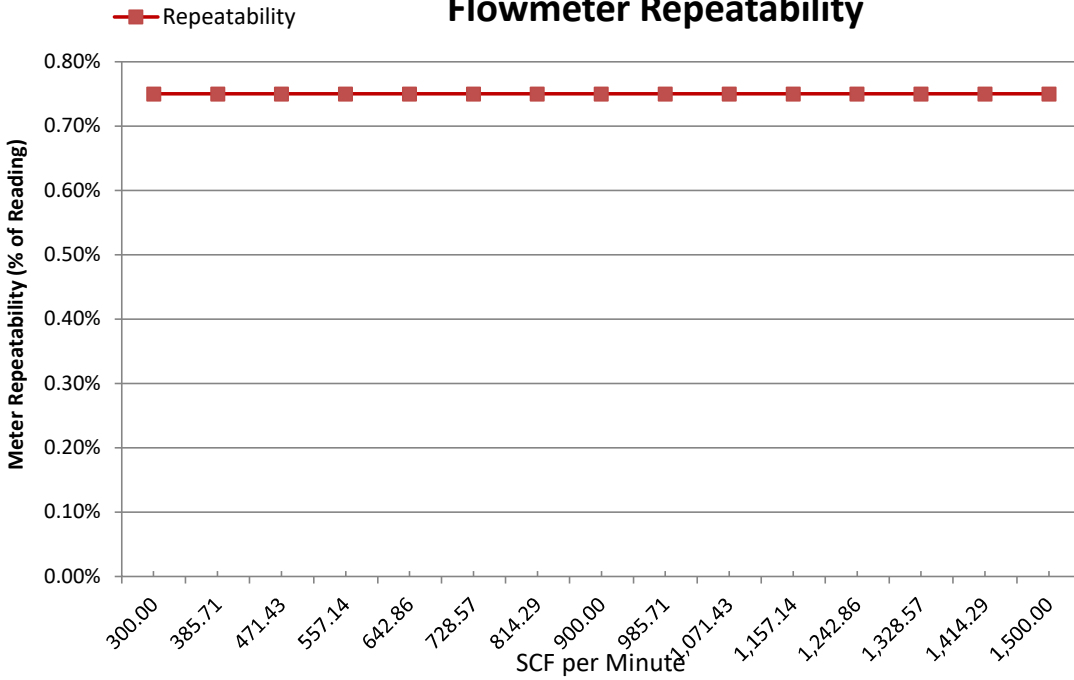
Flow Rate:	Temperature		
	Min	Nom	Max
Min	0.75%	0.75%	0.75%
Nom	0.75%	0.75%	0.75%
Max	0.75%	0.75%	0.75%

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

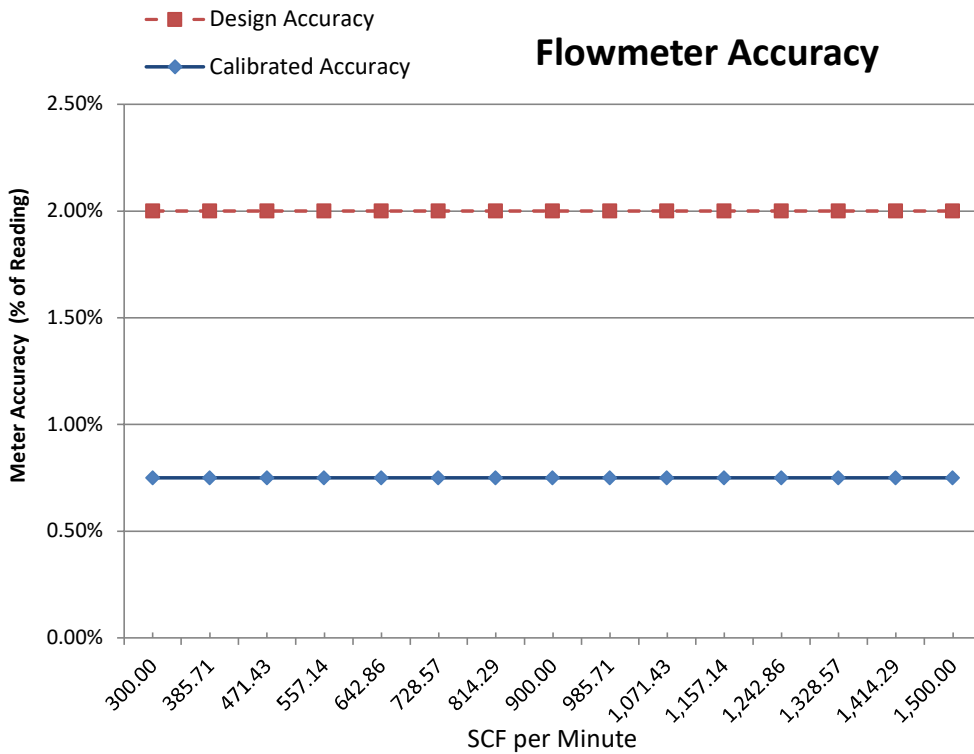
Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Flowmeter Repeatability



SCF / Minute	Repeatability
300	0.8%
386	0.8%
471	0.8%
557	0.8%
643	0.8%
729	0.8%
814	0.8%
900	0.8%
986	0.8%
1,071	0.8%
1,157	0.8%
1,243	0.8%
1,329	0.8%
1,414	0.8%
1,500	0.8%

Flowmeter Accuracy



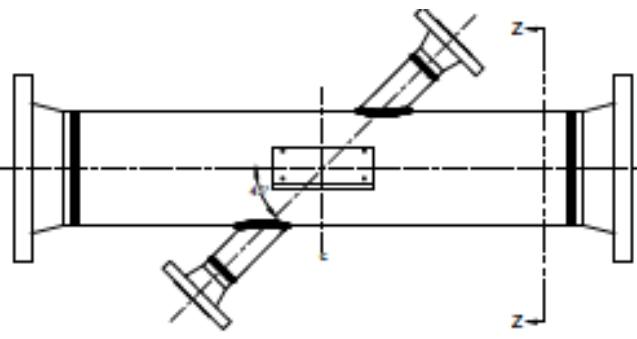
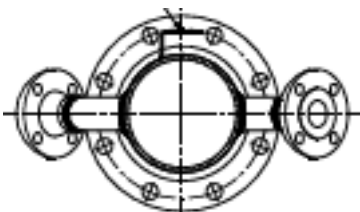
SCF / Minute	Design Accuracy	Calibrated Accuracy
300	2.0%	0.8%
386	2.0%	0.8%
471	2.0%	0.8%
557	2.0%	0.8%
643	2.0%	0.8%
729	2.0%	0.8%
814	2.0%	0.8%
900	2.0%	0.8%
986	2.0%	0.8%
1,071	2.0%	0.8%
1,157	2.0%	0.8%
1,243	2.0%	0.8%
1,329	2.0%	0.8%
1,414	2.0%	0.8%
1,500	2.0%	0.8%

Project: Steven M. Clouse WRC Digester Mixing and System Enhancements

DM: 2338803

Tag: Compressors FE/FIT/PIT/TIT-002

Child CPO: 278865

PIPE (PER ASME B36.10)	FLOWCELL CONFIGURATION
SIZE: 10", SCH 10S MATERIAL: A312-TP316/316L [SMLS] PIPE CLASS: None	 <p>FLOW DIRECTION →</p> <p>FLOWCELL LENGTH: 48" Tilted Diameter, HD1, 1 Path(s) FLOWCELL No. C01</p> <p>SECT Z-Z (Looking Upstream) TOP OF PIPE (12' O'CLOCK)</p> 
PROCESS FLANGE (ANSI B16.5)	
SIZE: 10 " 150 Weldneck MATERIAL: A182-F316/316L	
TRANSDUCER CONNECTION	
SIZE: 1.5", 150#, LWN RF Flange MATERIAL: A182-F316/316L TRANSDUCER: T5, Barrel Holder	
OPTIONAL PORTS (Not Depicted)	
PRESS.: Nipple 0.50" TEMP.: Sockolet 0.75"	
NOTES:	
EXT. COATING: System A: Bare Metal OPTIONS: LPI, X-Ray, Hydro	

Customer Technical Offer

Customer	SAN ANTONIO WATER SYSTEM	Tag Reference/Identifier(s)	Digester Nos. 5-8 / 4 Total (10")
Customer reference		Proposal number	2338803-1504774
Date Printed	01 Dec 2021		

Qty	Description
4	<p>GM868-2-1-1-2-0-9-1-4-11-0-0</p> <p>Model: GM868 General Purpose Flowmeter with RS232 digital port; capable of measuring flow velocity, actual or standard volumetric flowrate Note- Determination of standard volumetric flow requires pressure and temperature inputs (See section H)</p> <p>Channels: Two channel capable of being configured as 2 channel or 2 path</p> <p>Power: 100 to 120 VAC operating voltage</p> <p>Package: NEMA 4X aluminum enclosure, epoxy painted, with external sealed keypad. Suitable for General purpose & Div 2 environments.</p> <p>Analog Outputs: Six isolated 4 to 20 mA outputs</p> <p>Alarms: None</p> <p>Optional (Totalizer / Freq. / Digital): Ethernet card. Allows PanView or OPC Server to communicate with meter over the Ethernet.</p> <p>Analog Inputs: Two isolated configurable 4 to 20 mA inputs for pressure or temperature (Internal 24 VDC supply)</p> <p>Transducer Frequency: 100 kHz transducer operating frequency</p> <p>Certification: USA/CAN for Div 2, Class 1, Groups ABCD. Requires enclosure option D = 1 or 2.</p> <p>Software: No Special Software</p> <p>Special: None</p>

Qty	Description
4	<p>FC-HAZCOAX-25-FT-FL150-0-BNC75-0-0-0</p> <p>Model: Flowmeter Cable</p> <p>Cable Type: Pair of coaxial cables for use in conduit (Price shown is price per pair)</p> <p>Cable Length: Cable Length: 25</p> <p>Units: Feet</p> <p>Front Connector: Flying leads for XGX868i, XMT868i, XMT1000, IGM878, NEMA 4X DF868, GX868</p> <p>Front Gland: Not required for AT868 or AT600, rack mount DF868 or GX868</p> <p>End Connector: BNC Plug for standard transducers</p> <p>End Gland: None</p> <p>Material: None</p> <p>Special: None</p>

Qty	Description
8	<p>T5-18-10-16-NT-TI-1-2-4-1-0-GASNIST</p> <p>Model: T5 All welded gas transducer, Certifications include: ATEX Flameproof II 2 GD Ex d IIC T(x); CSA/C-US Class 1, Div. 1, Groups C, D; IECEx Flameproof Ex d IIC T(x)</p> <p>Head Angle: Straight head, 180 deg</p> <p>Frequency: 100 KHz frequency</p> <p>Tube Length: 16 inch Tube Length</p> <p>Temperature Range: Normal Range: -55 to 150 deg C (-67 to 302 deg F)</p> <p>Material: Standard titanium head with titanium tube. Material certs per EN10204 Type 3.1 The transducer material also meets the requirements of NACE MR-01-75 and MR-01-03</p> <p>Junction Box: Explosion proof Aluminum Enclosure</p> <p>XAMP: XAMP without transformer (for Standard and Extended Range operation)</p> <p>Preamp Gain: Gain of 40 (hi flow Flare)</p> <p>Certification: USA/CAN for Div 1, Class 1, Group C & D hazardous locations</p> <p>Miscellaneous: None</p>

Qty	Description
	<p>Modifications</p> <p>Modifications: Test Performance per Gas NIST</p>

Qty	Description
8	<p>BH-1.5-15-36-4-0-4</p> <p>Model: Barrel holder consisting of 1" SCH 160 pipe and RF flange, with 2 compression fittings, includes dampener fitting (316SS, graphite)</p> <p>Flange Size: 1.5 inch flange</p> <p>Flange Rating: 150 lb flange rating</p> <p>Material: All 316L SS components</p> <p>Barrel Pipe Length: Barrel Length (inches): 4</p> <p>Miscellaneous: None</p> <p>Hardware: Hardware for 3" flange connection; Stud: 316 SS, ASTM A193 Grade B8M; Nut: 316 SS ASTM A194 GRADE 8M</p>

Qty	Description
4	<p>Flowcell-Gas-S6-10-150-S</p> <p>Model: Flowcell</p> <p>Application: Flowcell for Gas</p> <p>Material: 316 Stainless Steel</p> <p>Line Size: Line size 10 inches</p> <p>Rating: Flange Rating 150 lbs</p> <p>SPECIAL: Flowcell #278865. Pipe Material: SS 316, A312-TP316/316L [SMLS]. Pipe Size: 10" OD, Sch 10S, Face to Face Length: 48". Process Connection: WN RF Flange, 150, A182-F316/316L, ANSI B16.5. Transducer Connection Details: Type: Barrel Holder, 1.5" OD, LWN RF Flange, 150#. Configuration: HD1, 1 Path(s). Additional Ports: Pressure: LWN RF, 1", Temperature: LWN RF, 1.5". Pipe Specification: None. Paint: System A: Bare Metal. Options: LPI, X-Ray, Hydro *</p>

G-FAST RESULTS SUMMARY

Flowmeter Application Calculator and Test System® Ver. 2.68, June-2-2021

Customer Name: San Antonio Water System
 CPO#: 2338803
 Tag Number: Digester Nos. 5-8 (4 total quantity)

Pipe Data

Pipe Material: 316 Stainless Steel
 Pipe Size: 10 in
 Pipe Schedule: 10S
 Outer Diameter: 10.75 in
 Inner Diameter: 10.42 in
 Wall thickness: 0.165 in
 Internal Area: 0.59219 ft²

Fluid Data

Fluid Name/Type: Gas Composition Tab 47%CO2 50%CH4 +other
 Variables **Min** **Nom** **Max** **Units**
 Provided Flowrate 50.00 150.00 200.00 SCF/Minute
 Velocity 1.37 4.42 5.88 ft/s
 Temperature 50.00 95.00 110.00 °F
 Pressure 0.07 0.29 0.72 Psig
 Density 0.080 0.075 0.075 lb/ft3
 Sound Speed 1055.3 1100.9 1115.7 ft/s
 Reynold's No. 10,596 29,454 38,304
 Base Temperature 60.0 °F
 Base Pressure 14.7 PSIA
 Barometric Pressure 14.7 PSIA
 Molecular Weight 29.55
 Max Allowed Vel. 122 ft/s

Configuration Data

Transducer Configuration: Custom, D45 Full Diameter
 Traverses/Paths: 1 Traverse , 1 Path
 Transducer Material: Ti
 PREAMP GAIN: 40

Repeatability Results (% of Reading)

Accuracy/repeatability calculated is based on velocity

Flow Rate:	Temperature		
	Min	Nom	Max
Min	0.94%	0.95%	0.98%
Nom	0.75%	0.75%	0.75%
Max	0.75%	0.75%	0.75%

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Design Accuracy Results (% of Reading)

Flow Rate:	Temperature		
	Min	Nom	Max
Min	2.00%	2.00%	2.00%
Nom	2.00%	2.00%	2.00%
Max	2.00%	2.00%	2.00%

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Calibrated Accuracy Results (% of Reading)

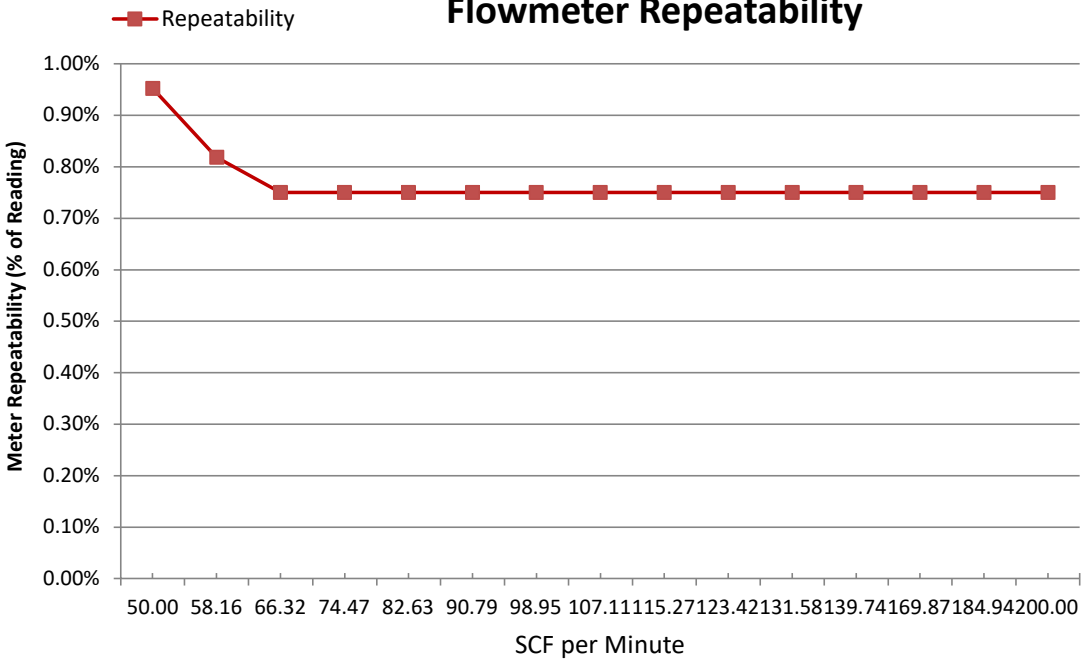
Flow Rate:	Temperature		
	Min	Nom	Max
Min	0.94%	0.95%	0.98%
Nom	0.75%	0.75%	0.75%
Max	0.75%	0.75%	0.75%

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

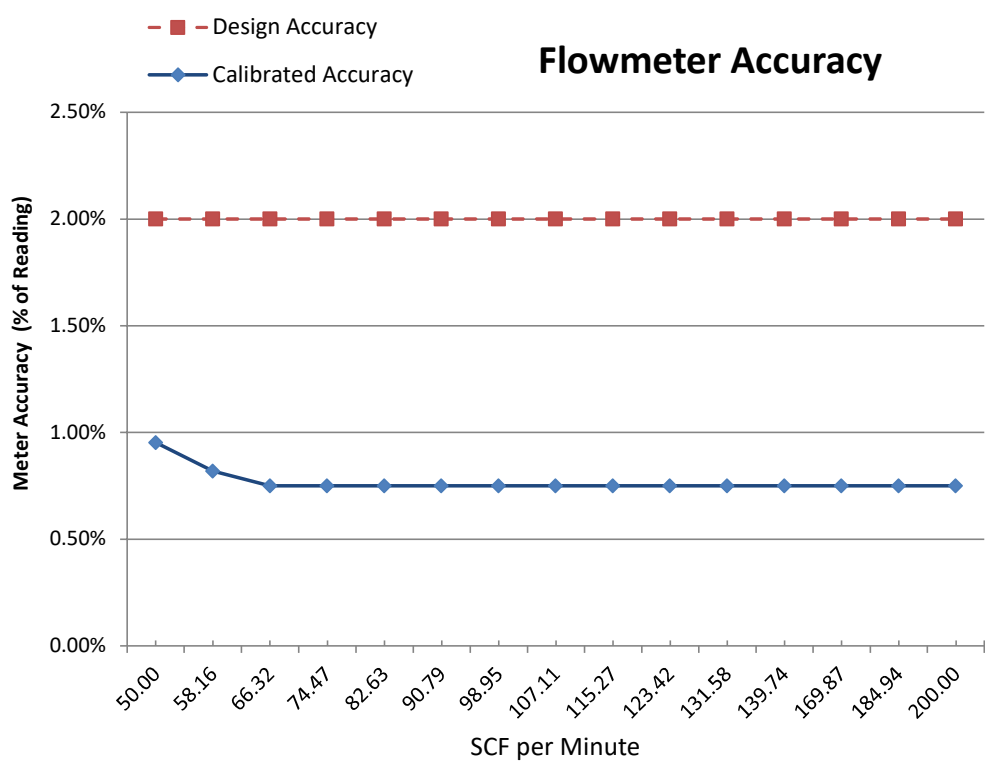
Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Flowmeter Repeatability



SCF / Minute	Repeat-ability
50.0	1.0%
58.2	0.8%
66.3	0.8%
74.5	0.8%
82.6	0.8%
90.8	0.8%
98.9	0.8%
107	0.8%
115	0.8%
123	0.8%
132	0.8%
140	0.8%
170	0.8%
185	0.8%
200	0.8%

Flowmeter Accuracy



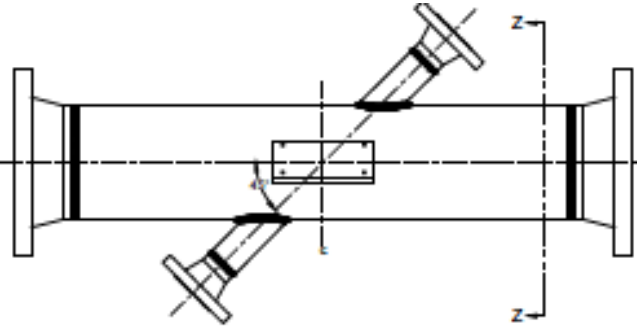
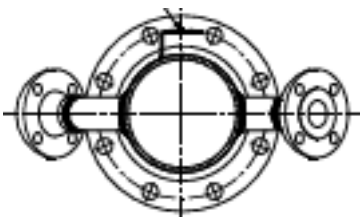
SCF / Minute	Design Accuracy	Calibrated Accuracy
50.0	2.0%	1.0%
58.2	2.0%	0.8%
66.3	2.0%	0.8%
74.5	2.0%	0.8%
82.6	2.0%	0.8%
90.8	2.0%	0.8%
98.9	2.0%	0.8%
107	2.0%	0.8%
115	2.0%	0.8%
123	2.0%	0.8%
132	2.0%	0.8%
140	2.0%	0.8%
170	2.0%	0.8%
185	2.0%	0.8%
200	2.0%	0.8%

Project: Steven M. Clouse WRC Digester Mixing and System Enhancements

DM: 2338803

Tag: Digester Nos. 5-8 (4 total quantity)

Child CPO: 278865

PIPE (PER ASME B36.10)	FLOWCELL CONFIGURATION
SIZE: 10", SCH 10S MATERIAL: A312-TP316/316L [SMLS] PIPE CLASS: None	 <p>FLOW DIRECTION →</p> <p>FLOWCELL LENGTH: 48" Tilted Diameter, HD1, 1 Path(s) FLOWCELL No. C01</p> <p>SECT Z-Z (Looking Upstream) TOP OF PIPE (12' O'CLOCK)</p> 
PROCESS FLANGE (ANSI B16.5)	
SIZE: 10 " 150 Weldneck MATERIAL: A182-F316/316L	
TRANSDUCER CONNECTION	
SIZE: 1.5", 150#, LWN RF Flange MATERIAL: A182-F316/316L TRANSDUCER: T5, Barrel Holder	
OPTIONAL PORTS (Not Depicted)	
PRESS.: Nipple 0.50" TEMP.: Sockolet 0.75"	
NOTES:	
EXT. COATING: System A: Bare Metal OPTIONS: LPI, X-Ray, Hydro	

Customer Technical Offer

Customer	SAN ANTONIO WATER SYSTEM	Tag Reference/Identifier(s)	Ameresco: FE/FIT/PIT/TIT-001 (16") GAS
Customer reference		Proposal number	2338803-1504774
Date Printed	01 Dec 2021		

Qty	Description
1	<p>GM868-1-1-1-2-0-9-1-4-11-0-0</p> <p>Model: GM868 General Purpose Flowmeter with RS232 digital port; capable of measuring flow velocity, actual or standard volumetric flowrate Note- Determination of standard volumetric flow requires pressure and temperature inputs (See section H)</p> <p>Channels: Single channel</p> <p>Power: 100 to 120 VAC operating voltage</p> <p>Package: NEMA 4X aluminum enclosure, epoxy painted, with external sealed keypad. Suitable for General purpose & Div 2 environments.</p> <p>Analog Outputs: Six isolated 4 to 20 mA outputs</p> <p>Alarms: None</p> <p>Optional (Totalizer / Freq. / Digital): Ethernet card. Allows PanView or OPC Server to communicate with meter over the Ethernet.</p> <p>Analog Inputs: Two isolated configurable 4 to 20 mA inputs for pressure or temperature (Internal 24 VDC supply)</p> <p>Transducer Frequency: 100 kHz transducer operating frequency</p> <p>Certification: USA/CAN for Div 2, Class 1, Groups ABCD. Requires enclosure option D = 1 or 2.</p> <p>Software: No Special Software</p> <p>Special: None</p>

Qty	Description
1	<p>FC-HAZCOAX-25-FT-FL150-0-BNC75-0-0-0</p> <p>Model: Flowmeter Cable</p> <p>Cable Type: Pair of coaxial cables for use in conduit (Price shown is price per pair)</p> <p>Cable Length: Cable Length: 25</p> <p>Units: Feet</p> <p>Front Connector: Flying leads for XGX868i, XMT868i, XMT1000, IGM878, NEMA 4X DF868, GX868</p> <p>Front Gland: Not required for AT868 or AT600, rack mount DF868 or GX868</p> <p>End Connector: BNC Plug for standard transducers</p> <p>End Gland: None</p> <p>Material: None</p> <p>Special: None</p>

Qty	Description
2	<p>T55-18-10-20-NT-TI-1-2-4-1-0-GASNIST</p> <p>Model: T5 All welded gas transducer, Certifications include: ATEX Flameproof II 2 GD Ex d IIC T(x); CSA/C-US Class 1, Div. 1, Groups C, D; IECEx Flameproof Ex d IIC T(x)</p> <p>Head Angle: Straight head, 180 deg</p> <p>Frequency: 100 KHz frequency</p> <p>Tube Length: Replace <> with Standard length Shown Below.: 20</p> <p>Temperature Range: Normal Range: -55 to 150 deg C (-67 to 302 deg F)</p> <p>Material: Standard titanium head with titanium tube. Material certs per EN10204 Type 3.1 The transducer material also meets the requirements of NACE MR-01-75 and MR-01-03</p> <p>Junction Box: Explosion proof Aluminum Enclosure</p> <p>XAMP: XAMP without transformer (for Standard and Extended Range operation)</p> <p>Preamp Gain: Gain of 40 (hi flow Flare)</p> <p>Certification: USA/CAN for Div 1, Class 1, Group C & D hazardous locations</p> <p>Miscellaneous: None</p>

Qty	Description
	Modifications Modifications: Test Performance per Gas NIST

Qty	Description
2	BH-1.5-15-36-8-0-4 Model: Barrel holder consisting of 1" SCH 160 pipe and RF flange, with 2 compression fittings, includes dampener fitting (316SS, graphite) Flange Size: 1.5 inch flange Flange Rating: 150 lb flange rating Material: All 316L SS components Barrel Pipe Length: Barrel Length (inches): 8 Miscellaneous: None Hardware: Hardware for 3" flange connection; Stud: 316 SS, ASTM A193 Grade B8M; Nut: 316 SS ASTM A194 GRADE 8M

Qty	Description
1	Flowcell-Gas-S6-16-150-S Model: Flowcell Application: Flowcell for Gas Material: 316 Stainless Steel Line Size: Line size 16 inches Rating: Flange Rating 150 lbs SPECIAL: Flowcell #278866. Pipe Material: SS 316, A312-TP316/316L [SMLS]. Pipe Size: 16" OD, Sch 10S, Face to Face Length: 54". Process Connection: WN RF Flange, 150, A182-F316/316L, ANSI B16.5. Transducer Connection Details: Type: Barrel Holder, 1.5" OD, LWN RF Flange, 150#. Configuration: HD1, 1 Path(s). Additional Ports: Pressure: LWN RF, 1", Temperature: LWN RF, 1.5". Pipe Specification: None. Paint: System A: Bare Metal. Options: LPI, X-Ray, Hydro *

G-FAST RESULTS SUMMARY

Flowmeter Application Calculator and Test System® Ver. 2.68, June-2-2021

Customer Name: San Antonio Water System
 CPO#: 2338803
 Tag Number: Ameresco: FE-FIT-PIT-TIT-001

Pipe Data

Pipe Material:	316 Stainless Steel
Pipe Size:	16 in
Pipe Schedule:	10S
Outer Diameter:	16 in
Inner Diameter:	15.624 in
Wall thickness:	0.188 in
Internal Area:	1.33141 ft ²

Fluid Data

Fluid Name/Type:	Gas Composition Tab 47%CO2 50%CH4 +other			
Variables	Min	Nom	Max	Units
Provided Flowrate	300.00	1,200.00	1,500.00	SCF/Minute
Velocity	3.67	15.73	19.62	ft/s
Temperature	50.00	95.00	110.00	°F
Pressure	0.07	0.29	0.72	Psig
Density	0.080	0.075	0.075	lb/ft3
Sound Speed	1055.3	1100.9	1115.7	ft/s
Reynold's No.	42,560	157,170	191,644	
Base Temperature	60.0			°F
Base Pressure	14.7			PSIA
Barometric Pressure	14.7			PSIA
Molecular Weight	29.55			
Max Allowed Vel.	122			ft/s

Configuration Data

Transducer Configuration: Custom, D45 Full Diameter
 Traverses/Paths: 1 Traverse , 1 Path
 Transducer Material: Ti
 PREAMP GAIN: 40

Repeatability Results (% of Reading)

Accuracy/repeatability calculated is based on velocity

		Temperature		
Flow Rate:	Min	Nom	Max	
Min	0.75%	0.75%	0.75%	
Nom	0.75%	0.75%	0.75%	
Max	0.75%	0.75%	0.75%	

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Design Accuracy Results (% of Reading)

		Temperature		
Flow Rate:	Min	Nom	Max	
Min	2.00%	2.00%	2.00%	
Nom	2.00%	2.00%	2.00%	
Max	2.00%	2.00%	2.00%	

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Calibrated Accuracy Results (% of Reading)

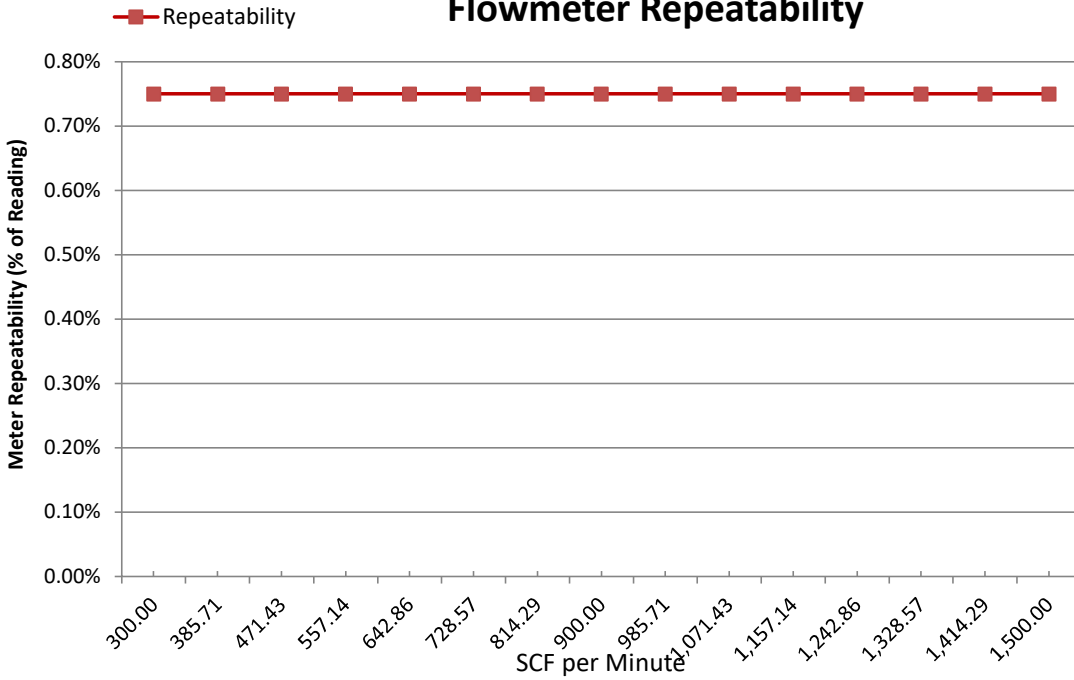
		Temperature		
Flow Rate:	Min	Nom	Max	
Min	0.75%	0.75%	0.75%	
Nom	0.75%	0.75%	0.75%	
Max	0.75%	0.75%	0.75%	

Calculations evaluated at **specified** conditions:

Min Flow @ Min Temp, Min Pressure, and Min Density (if applicable)

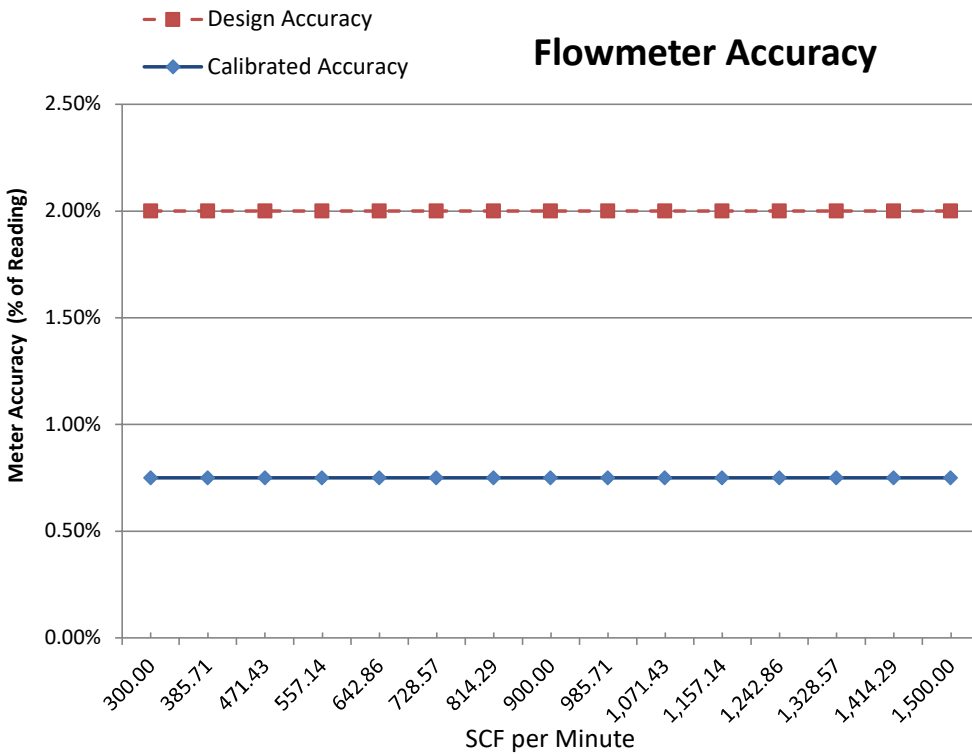
Max Flow @ Max Temp, Max Pressure, and Max Density (if applicable)

Flowmeter Repeatability



SCF / Minute	Repeat-ability
300	0.8%
386	0.8%
471	0.8%
557	0.8%
643	0.8%
729	0.8%
814	0.8%
900	0.8%
986	0.8%
1,071	0.8%
1,157	0.8%
1,243	0.8%
1,329	0.8%
1,414	0.8%
1,500	0.8%

Flowmeter Accuracy



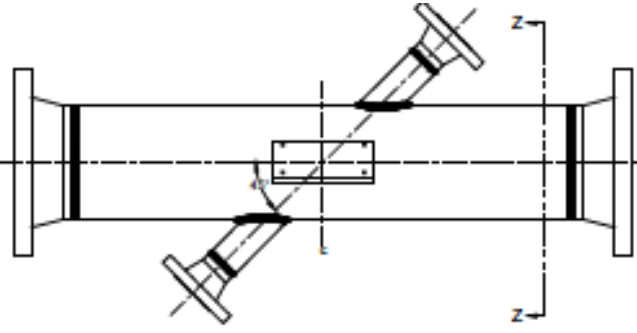
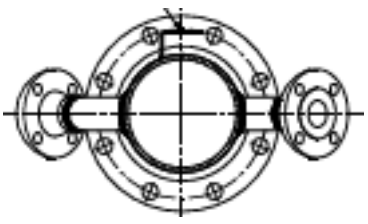
SCF / Minute	Design Accuracy	Calibrated Accuracy
300	2.0%	0.8%
386	2.0%	0.8%
471	2.0%	0.8%
557	2.0%	0.8%
643	2.0%	0.8%
729	2.0%	0.8%
814	2.0%	0.8%
900	2.0%	0.8%
986	2.0%	0.8%
1,071	2.0%	0.8%
1,157	2.0%	0.8%
1,243	2.0%	0.8%
1,329	2.0%	0.8%
1,414	2.0%	0.8%
1,500	2.0%	0.8%

Project: Steven M. Clouse WRC Digester Mixing and System Enhancements

DM: 2338803

Tag: Ameresco: FE/FIT/PIT/TIT-001

Child CPO: 278866

PIPE (PER ASME B36.10)	FLOWCELL CONFIGURATION
SIZE: 16", SCH 10S MATERIAL: A312-TP316/316L [SMLS] PIPE CLASS: None	 <p>FLOW DIRECTION →</p> <p>FLOWCELL LENGTH: 54" Tilted Diameter, HD1, 1 Path(s) FLOWCELL No. C01</p> <p>SECT Z-Z (Looking Upstream) TOP OF PIPE (12' O'CLOCK)</p> 
PROCESS FLANGE (ANSI B16.5)	
SIZE: 16 " 150 Weldneck MATERIAL: A182-F316/316L	
TRANSDUCER CONNECTION	
SIZE: 1.5", 150#, LWN RF Flange MATERIAL: A182-F316/316L TRANSDUCER: T5, Barrel Holder	
OPTIONAL PORTS (Not Depicted)	
PRESS.: Nipple 0.50" TEMP.: Sockolet 0.75"	
NOTES:	
EXT. COATING: System A: Bare Metal OPTIONS: LPI, X-Ray, Hydro	

Customer Technical Offer

Customer	SAN ANTONIO WATER SYSTEM	Tag Reference/Identifier(s)	Approval Documentation
Customer reference		Proposal number	2338803-1504774
Date Printed	01 Dec 2021		

Documentation

Qty	Description
1	FLOW DOC APP Approval documentation for a flowmeter system

Customer Technical Offer

Customer	SAN ANTONIO WATER SYSTEM	Tag Reference/Identifier(s)	Final Documentation
Customer reference		Proposal number	2338803-1504774
Date Printed	01 Dec 2021		

Documentation

Qty	Description
1	FLOW DOC FINAL Final documentation for a flowmeter system

Customer:		San Antonio Water System			
Project Name:		Steven M. Clouse WRC Digester Mixing and System Enhancements			
Item No.	Approval Qty & Type	Final Qty & Type	Description	Customer Doc ID	Comments/Notes
Drawings					
1	1E		General Arrangement Drawing		
2	1E		Flowcell Fabrication Drawing		
3	1E		Meter Terminal Wiring Diagram		
AE & PE Information					
10		1E	Instrument Cut Sheets (Literature)		submitted with proposal
11		1E	(electronics) Haz Area Certifications		
12		1E	(transducers) Haz Area Certifications		
13		1E	Flow Sizing Calculations (Clarity, GFAST or FACTS)		
Final Reports					
54		1E	(flowcell) Xray Report (RT radiographic test)		
56		1E	(flowcell) LPI test Report (liquid penetrant)		
57		1E	(flowcell) Hydrostatic Test Report		
77		1E	GASNIST Test Report		
Shipping Reports					
83		1E	IOM - Installation, Operations & Maintenance Manuals (electronic copy only)		

LEGEND

E = Electronic Copy



DigitalFlow™ GM868

Panametrics general-purpose gas ultrasonic flowmeter

Applications

The DigitalFlow GM868 flow transmitter is a complete ultrasonic flow metering system for measurement of most gases including:

- Hydrocarbon gases
- Vent gases
- Biogases
- Digester gases
- Fuel gases
- Waste gases
- Incinerator air flow
- Vapor recovery
- Stack gases
- Other gases

Features

- Full-featured flowmeter package
- Transducer removable under line pressure
- No moving parts
- No pressure drop
- Wide rangeability with 1500 to 1 turndown ratio
- Non-obstructive flow measurement
- Tolerance to dirty streams
- Low maintenance
- Suitable for high temperatures
- Two-path measurement available for maximum accuracy

Panametrics ultrasonic general purpose gas flowmeter

The DigitalFlow GM868 flowmeter uses the patented Correlation Transit-Time™ method of ultrasonic flow measurement to provide accurate, drift-free measurements, without impeding or obstructing the flow.

Wide range of pipe sizes and flow conditions

With its broad range of measurement velocities, and its ability to measure flow in any pipe from small to very large, one DigitalFlow GM868 meter does the job of several conventional meters. It handles pipes from 1 to 120 inches in diameter (2.5 cm to 3 m), and velocities from 0.1 to 150 ft/s (0.03 to 46 m/s)—in either direction, in steady or pulsating flow.

For maximum accuracy, use a two-channel meter to measure along two different paths at the same location. A two-channel meter can also measure the flow in two separate pipes or at two different places in the same pipe.

No pressure drop, low maintenance

Since the DigitalFlow GM868's transducers do not obstruct the flow, they generally do not cause any pressure drop as other types of flowmeters do. The DigitalFlow GM868 has no parts that foul or collect debris, and no moving parts to wear out. As a result, it requires no lubrication, cleaning or other routine maintenance.

Digital and analog output options

The DigitalFlow GM868 flowmeter makes it easy to send the data where it needs to go, through the standard digital output, standard or optional analog outputs or optional alarms. All outputs are conveniently set up and calibrated from the keypad or from a computer using the PanaView program.

Transducer type	T5 wetted transducer				T17 wetted transducer			
Flow measurement range								
Standard range	-150 to 150 ft/s (-50 to 50 m/s) - bidirectional							
Applicable pipe sizes								
Diagonal 45	3 in to 14 in (50 to 350 mm) OD				14 in to 120 in (350 to 3000 mm) OD			
Bias 90	Note 1 and 2				Not applicable			
Design velocity accuracy from 1 to 150 ft/s (0.3 to 50 m/s)								
Transducer type	T5 wetted transducer				T17 wetted transducer			
Number of Paths	One path		Two paths		One path		Two paths	
	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)
Pipe dia. ≤ 6 in. (150mm)	+-2.5%	+-2.0%	+-2.0%	+-1.5%	NA	NA	NA	NA
Pipe dia. ≥ 6 in. (150mm)	+-2.0%	+-2.0%	+-1.5%	+-1.5%	+-2.0%	+-2.0%	+-1.5%	+-1.5%
Calibrated velocity accuracy from 1 to 150 ft/s (0.3 to 50 m/s) – see notes below								
Transducer type	T5 Wetted Transducer				T17 Wetted Transducer			
Number of paths	One path		Two paths		One path		Two paths	
	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)	1 ft/s (0.3 m/s)	>3 ft/s (1 m/s)
Pipe dia. ≤ 6 in. (150mm)	+-1.5%	+-1.0%	+-1.0%	+-0.75%	NA	NA	NA	NA
Pipe dia. ≥ 6 in. (150mm)	+-1.0%	+-1.0%	+-0.75%	+-0.75%	+-1.0%	+-1.0%	+-0.75%	+-0.75%
Flow velocity sensitivity from .1 to 1 ft/s (0.03 to .3 m/s)								
Pipe dia. = 10 in. (250 mm)	±0.12 in/s (±0.004 m/s)		±0.08 in/s (±0.003 m/s)		NA		NA	
Pipe dia. = 14 in. (250 mm)	±0.12 in/s (±0.004 m/s)		±0.08 in/s (±0.003 m/s)		±0.08 in/s (±0.003 m/s)		±0.06 in/s (±0.002 m/s)	
Pipe dia. ≥ 20 in. (500 mm)	±0.12 in/s (±0.004 m/s)		±0.08 in/s (±0.003 m/s)		±0.06 in/s (±0.002 m/s)		±0.04 in/s (±0.0015 m/s)	

Note 1 Accuracy and sensitivity are dependent on pipe diameter, molecular weight and temperature. All accuracy specs assume molecular weights greater than 24 kg/kmole and temperatures less than 100 °F (38 °C)

Note 2 Accuracy is dependent on straight run. All accuracy specs assume a fully developed flow profile or a minimum straight run of 20D upstream and 10D downstream

Note 3 Stated accuracy may be achieved with total straight run as little as 10D using flow profile correction - contact factory for details

GM868 specifications

Operation and performance

Fluid types

All acoustically conductive gases

Pipe sizes

2 in to 120 in (50 mm to 3,000 mm) NB and larger

Pipe materials

All metals. Consult GE for other materials.

Flow accuracy (velocity)

±1% to 2% of reading typical

Accuracy depends on pipe size and whether measurement is one-path or two-path. Accuracy to ±0.5% of reading may be achievable with process calibration.

Repeatability

±0.2% to 0.5% of reading

Range (bidirectional)

-150 to 150 ft/s (-46 to 46 m/s)

Rangeability (overall)

1500:1

Specifications assume a fully developed flow profile (typically 20 diameters upstream and 10 diameters downstream of straight pipe run) and flow velocity greater than 3 ft/s (1 m/s).

Measurement parameters

Mass flow, standard and actual volumetric flow, totalized flow, and flow velocity

Electronics

Flow measurement

Transit time

Enclosures

- Standard: Epoxy-coated aluminum Type 4X/IP66 Class I, Division 1, Groups B,C&D
Flameproof ISSeP 02ATEX008
II 2 GD EEx d IIC T5 IP66 T95°C
- Optional: Stainless steel

Dimensions (h x d)

Standard: Size 8.2 in x 6.6 in (208 mm x 168 mm), weight 10 lb (4.5 kg)

Channels

- Standard: One channel
- Optional: Two channels (for two pipes or two-path averaging)

Display

Optional: 2 line x 16 character backlit LCD display, configurable to display up to four measurement parameters in sequence

Keypad

Built-in infrared, six-button keypad for full functionality operation

Power supplies

- Standard: 100-240 VAC
- Optional: 12 to 28 VDC, ±5%

Note: For DC-powered meters, Class 2 rated supplies must be used for the line power

Power consumption

20 W maximum

Operating temperature

-4° to 131°F (-20° to 55°C)

Storage temperature

-67° to 167°F (-55° to 75°C)

Standard inputs/outputs

Two 0/4 to 20 mA isolated outputs, 550 S maximum load
Namur NE043 compliant

Optional inputs/outputs

There are six additional slots available for any combination of the following I/O boards:

- Analog inputs: Select up to three boards of one of the following types:
 - Analog input board with two isolated 4 to 20 mA inputs and 24V loop power
 - RTD input board with two isolated, three-wire, RTD inputs; span -100° to 350°C (-148° to 662°F); 100 S
- Totalizer/frequency outputs: Select up to three totalizer/frequency output boards, each with four outputs per board, 10 kHz maximum
- Alarm relays: Select up to two boards of one of the following types:
 - General purpose: Relay board with three Form C relays
 - Hermetically sealed: Relay board with three hermetically sealed Form C relays

Digital interfaces

- Standard: RS232
- Optional: RS485 (multiuser)
- Optional: Modbus® RS485 or TCP protocol
- Optional: Ethernet
- Optional: OPC server
- Optional: Foundation fieldbus

Data logging

- Standard: None
- Optional: Memory capacity (linear and/or circular type) to log over 150,000 flow data points

European compliance

System complies with EMC Directive 2004/108/EC, 2006/95/EC LVD (Installation Category II, Pollution Degree 2) and transducers comply with PED 97/23/EC for DN<25

Wetted ultrasonic flow transducers

Temperature range

- Standard: -58°F to 302°F (-50°C to 150°C)
- Optional (overall): -310°F to 842°F (-190°C to 450°C)

Pressure range

- Standard: 0 psig to 2700 psig (1 bar to 187 bar)
- Optional: 3480 psig (240 bar) maximum

Materials

- Standard: Titanium
- Optional: Monel® or Hastelloy® alloys

Process connections

Flanged and compression fittings

Mountings

Flowcell or cold tap

Area classifications

- Standard: General purpose
- Optional: Weatherproof Type 4X/IP66
- Optional: Explosion-proof enclosure Class I, Division 1, Groups B, C, and D
- Optional: Flameproof enclosure Class I, II 2 GD EEx dIIC T6

Transducers and flowcells for specific applications are available. Consult Panametrics for details.

Transducer cables

- Standard: One pair of coaxial cables, type RG62 AU, or as specified for transducer type
- Optional: Lengths up to 1000 ft (330 m) maximum

High-temperature and high-pressure ultrasonic flow transducers

Bundle Waveguide Technology™ (BWT) System transducer and holder (see BWT System specifications) are available.

SECTION 01130

MEASUREMENT AND PAYMENT

PART 1- GENERAL

1.01 SUMMARY

A. Scope:

1. Items listed starting in Article 1.08 of this Section refer to and are the same pay items listed in the Proposal Form and constitute all pay items for completing the Work.
2. No direct or separate payment will be made for providing miscellaneous temporary or accessory works, plant or facility services, Contractor's or Engineer's field offices, layout surveys, project signs, sanitary requirements, testing, safety provisions and safety devices, submittals and record drawings, water supplies, power and fuel, maintenance of traffic, removal of waste, security, coordination with Owner's operations, information technology (including hardware, software, and services) required during construction, commissioning where specified, bonds, insurance, or other requirements of the General Conditions, Supplementary Conditions, Division 01 Specifications, and other requirements of the Contract Documents.
3. Compensation for all services, items, materials, and equipment shall be included in prices stipulated for lump sum and unit price pay items listed in this Section and included in the Contract.
4. Each lump sum and unit price, as bid, shall include an amount considered by Contractor to be adequate to cover Contractor's overhead and profit for each separately identified item.
5. Record Drawings and CPM schedules shall be submitted with each pay application. Failure to properly submit will delay payment until they are properly submitted.
6. Contractor shall prepare and submit to Owner/Engineer for acceptance a Schedule of Values that allocates cost to each item of the Work. Schedule of Value list of line items shall correspond to each aspect of the Work, establishing in detail the portion of the Contract Price allocated to each major component of the Work.
7. Upon request of Owner/Engineer, support values with data that substantiate their correctness.
8. Submit preliminary Schedule of Values to Owner/Engineer for initial review at the pre-construction conference. Contractor shall incorporate Owner/Engineer's comments into the Schedule of Values and resubmit to Owner/Engineer. Owner/Engineer may require corrections and re-submittals until Schedule of Values is acceptable.
9. Schedule of Values and General Conditions will be the basis for preparing each Application for Payment.

1.02 SUBMITTALS

- A. Submit to Owner/Engineer Schedule of Values via the Internet-Based Contract and Project Management System (CPMS).
- B. Content of Schedule of Values submittals shall be in accordance with this Section.
- C. Schedule of Values: Submit on Contractor's standard form.
- D. Schedule of Estimated Progress Payments:
 - 1. Submit with initially acceptable Schedule of Values.
 - 2. Submit adjustments thereto with Application for Payment.
- E. Application for Payment.
- F. Final Application for Payment.

1.04 RELATED PROVISIONS

- A. Changes in Contract Price: Refer to General Conditions and Supplementary Conditions.

1.05 UNIT QUANTITIES SPECIFIED

- A. Quantities and measurements indicated in the Proposal Form are for bidding and contract purposes only. Quantities and measurements supplied or placed in the Work and verified by the Owner/Engineer shall determine payment.
- B. If the actual Work requires more or fewer quantities than those quantities indicated, provide the required quantities at the unit prices contracted.
- C. Owner reserves the right to increase or decrease unit quantities to suit their needs.

1.06 ALLOWANCES SPECIFIED

- A. Contractor shall include in the Proposal Price all allowances so named in the Contract Documents and shall cause the Work so covered to be performed for such sums and by such persons or entities as may be acceptable to Owner and Engineer.
- B. Contractor shall agree that the allowances include the cost to the Contractor of materials and equipment required by the allowances to be delivered at the Site.
- C. Contractor's costs for applicable taxes, unloading and handling on the Site, labor, installation, overhead, profit, and other expenses contemplated for the allowances have been included in the Proposal Price and is not included in the allowances, and no demand for additional payment on account of the foregoing will be accepted.

1.07 MEASUREMENT OF QUANTITIES

- A. Linear and Area Measurements: Unless herein noted differently, linear shall be measured at the item centerline or mean chord, and area measurements calculated from a sufficient number of linear measurements to accurately estimate the area, with survey chain, steel tape, approved distance meter, or by use of Total Surveying Stations and Engineering Software, as approved by Owner/Engineer.

1.08 GENERAL CONSTRUCTION

- A. Item 1 – Trench Excavation Safety Protection
 - 1. Measurement: All costs associated with protecting trench excavations. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 - 2. Payment: Lump sum payment for Item 1 will be full compensation for completing trench excavation safety protection to complete the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- B. Item 2 – Digesters Cleaning for 9 Digesters
 - 1. Measurement: All costs associated with emptying, processing and disposal of contents of the nine (9) Digesters Nos. 1 through 8, and 10. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for unit price.
 - 2. Payment: Unit payment for Item 2 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- C. Item 3 – Dome Liner and Concrete Repair for 3 Digesters (Exclude #6)
 - 1. Measurement: All costs associated with repairs to the dome liner and associated concrete for the three (3) Digesters Nos. 5, 7 and 8. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the unit price.
 - 2. Payment: Unit price payment for Item 3 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- D. Item 4 – Dome Crack Repair for 3 Digesters (Exclude #6)
 - 1. Measurement: All costs associated with dome crack repair for the three (3) Digesters Nos. 5, 7 and 8. It shall include all materials, equipment, labor, tools, and incidental in accordance with the Contract Documents, complete in-place for the unit price.
 - 2. Payment: Unit price payment for Item 4 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- E. Item 5 – Tank Base (Floor, Wall, Joint) Repair for 3 Digesters:
 - 1. Measurement: All costs associated with tank base (floor, wall, joint) repair for the three (3) Digesters Nos. 5, 7 and 8. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the unit price.
 - 2. Payment: Unit price payment for Item 5 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- F. Item 6 – Mixing System for 4 Digesters
 - 1. Measurement: All costs associated with the mixing systems and the installation of the secondary overflow for the 4 digesters Nos. 5, 6, 7, and 8, other than that included in the Item 17 Digester Mixing Equipment allowance. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 - 2. Payment: Lump sum payment for Item 6 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- G. Item 7 – Dome Gas System and Dome Appurtenances
 - 1. Measurement: All costs associated with the dome gas system and dome appurtenances, other than that included in the Item 18 Digester Gas Equipment allowance. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 - 2. Payment: Lump sum payment for Item 7 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- H. Item 8 – Electrical and Instrumentation Upgrades
 - 1. Measurement: All costs associated with the electrical and instrumentation upgrades, other than that included in the Item 19 Digester Gas Flow Instrumentation allowance. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 - 2. Payment: Lump sum payment for Item 8 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- I. Item 9 – Sludge Plug Valves Replacement
 - 1. Measurement: All costs associated with sludge valves replacements. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 - 2. Payment: Lump sum payment for Item 9 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- J. Item 10 – Combined Sludge Feed Line Piping Modification
 - 1. Measurement: All costs associated with sludge feed line piping modification and valve replacements. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 - 2. Payment: Lump sum payment for Item 10 will be full compensation for completing the Work, as shown on the Contract Documents or indicated

under Division 01 through Division 17.

- K. Item 11 – Hot Water Distribution System
 1. Measurement: All costs associated with the hot water distribution system. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 2. Payment: Lump sum payment for Item 11 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- L. Item 12 – Heat Exchanger System Modifications
 1. Measurement: All costs associated with the heat exchangers and pump station modifications, other than that included in the Item 16 Heat Exchanger Equipment allowance. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 2. Payment: Lump sum payment for Item 12 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- M. Item 13 – Boiler Area Modifications
 1. Measurement: All costs associated with the Boiler Area modifications. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 2. Payment: Lump sum payment for Item 13 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- N. Item 14 – Iron Sponge and Digester Building Demolition and Related Modifications
 1. Measurement: All costs associated with the iron sponge and digester building demolition and related modifications. It shall include all materials, equipment, labor, tools, and incidentals in accordance with the Contract Documents, complete in-place for the lump sum price.
 2. Payment: Lump sum payment for Item 14 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

- O. Item 15 – Heat Exchanger Equipment
 1. Measurement: Allowance for the heat exchanger equipment in the amount of \$842,300.00 associated with the project. This shall include the scope as detailed in the Olympus Technology Inc. price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional heating system as detailed in the Contract Documents shall be included in Item 12.
 2. Payment: Contractor to pay and be reimbursed for actual amount by Owner. Allowance will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division

17.

P. Item 16 – Digester Mixing Equipment

1. Measurement: Allowance for Digester Mixing Equipment in the amount of \$1,330,033.00 associated with the project. This shall include the scope as detailed in the Evoqua price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional digester mixing systems as detailed in the Contract Documents shall be included in Item 6.
2. Payment: Contractor to pay and be reimbursed for actual amount by Owner. Allowance will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

Q. Item 17 – Digester Gas Equipment

1. Measurement: Allowance for Digester Gas Equipment in the amount of \$533,801.00 associated with the project. This shall include the scope as detailed in the L&J Technologies price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional digester gas system as detailed in the Contract Documents shall be included in Item 7.
2. Payment: Contractor to pay and be reimbursed for actual amount by Owner. Allowance will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

S. Item 18 – Digester Gas Flow Instrumentation

1. Measurement: Allowance for Digester Gas Flow Instrumentation in the amount of \$353,952.30 associated with the project. This shall include the scope as detailed in the Panametrics price proposal included in the Contract Documents. Costs for all additional Work related to providing a complete and functional digester gas system as detailed in the Contract Documents shall be included in Item 8.
2. Payment: Contractor to pay and be reimbursed for actual amount by Owner. Allowance will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

T. Item 19 – Subsurface Utility Investigation

1. Measurement: Allowance for \$200,000.00 for completion of unforeseen subsurface utility investigation. This shall include furnishing all tools, labor, materials, equipment and incidentals necessary for the completion of this item to locate existing utilities without any damage.
2. Payment: Contractor to pay and be reimbursed for actual amount by Owner.

U. Item 20 – Permitting Fees

1. Measurement: Allowance for \$10,000.00 for fees associated with this project. This shall include furnishing all labor, materials, tools, equipment,

- 2. incidentals, required to obtain all necessary permits.
 - 2. Payment: Contractor to pay and be reimbursed for actual amount by Owner.
- V. Item 21 – CPS Energy
- 1. Measurement: This item shall be an allowance for CPS Energy fees. Contractor shall provide receipts from CPS Energy to SAWS for reimbursement for the fees. Payments to the Contractor for the work associated with natural gas pipeline work shall also be made from this line item. Any unused portion of the allowance will be credited to SAWS. Contractor is responsible for coordination and scheduling with CPS Energy prior to commencing work.
 - 2. Payment: Contractor to pay and be reimbursed for actual amount by Owner.
- W. Item 22 – Intermediate Mobilization and Demobilization
- 1. Intermediate Mobilization and Demobilization: this bid item will only be paid if prior authorized in writing by Owner. This bid item is limited to delays outside of the Contractor’s control that are not otherwise provided for in the General Conditions. Examples of these types of delays would be Owner easement acquisition, permitting issues (only those permits not controlled by the Contractor), or other Owner activities. Any other provision contained herein notwithstanding Contractor will not be entitled to compensation under this bid item for work suspended during the 10 cumulative days allowed for by the Contract in the General Conditions, Article IV, Paragraph 4.8 Suspension of Work by Owner.
- W. Item 100 – Mobilization and Demobilization, Max 8% of Subtotal Line Items 1 - 14
- 1. Measurement: This item shall include project move-in and move-out of personnel and equipment, for all work including furnishing all labor, materials, tools, equipment and incidentals required to mobilize, demobilize, clean site upon project completion, and bond and insure the Work in accordance with the Contract Documents, complete in place. Maximum of 8% of the total of Line Items 1 through 14.
 - 2. Payment: Lump sum payment for Item 100 will be full compensation for completing the Work, as shown on the Contract Documents or indicated under Division 01 through Division 17.

1.09 SCHEDULE OF VALUES FORMAT AND CONTENT

- A. Organization and Major Elements of Schedule of Values
- 1. Prepare Schedule of Values on the “progress estimate” or “continuation sheets”, as applicable, of the Application for Payment form indicated herein and in accordance with the Internet-Based Contract and Project Management System (CPMS) system.
 - 2. Include in Schedule of Values itemized list of Work for each major work area included in the Work, for each payment item specified herein.
 - 3. Organization in Accordance with Specification Sections:

- a. Within each work area, organize the Schedule of Values by the various Specifications Section numbers and titles included in the Contract Documents.
 - b. Label each row in the Schedule of Values with the appropriate Specifications Section number. Include an amount for each row in the Schedule of Values.
 - c. List sub-items of major products or systems, as appropriate or when requested by Owner or Engineer.
4. Include in Schedule of Values unit price payment items with their associated quantity.

Provide in the Schedule of Values detailed breakdown of unit prices.

B. Requirements for preliminary Schedule of Values and Schedule of Values are:

1. Subcontracted Work:
 - a. Schedule of Values shall show division of Work between Contractor and Subcontractors.
 - b. Line items for Work to be done by Subcontractor shall include the word, “(SUBCONTRACTED)”.
2. Apportionment between Materials and Equipment, and Installation:
 - a. Schedule of Values shall include breakdown of costs for materials and equipment, installation, and other costs used in preparing the Bid by Contractor and each Subcontractor.
 - b. List purchase and delivery costs for materials and equipment for which Contractor may apply for payment as stored materials.
3. Sum of individual values shown on the Schedule of Values shall equal the total of associated payment item. Sum of payment item totals in the Schedule of Values shall equal the Contract Price.
4. Overhead and Profit: Include in each line item a directly proportional amount of Contractor’s overhead and profit. Do not include overhead and profit as separate item(s).
5. Include separate line item for each unit price item.
6. Bonds and Insurance Costs: Include line item for bonds and insurance in accordance with General Conditions. Bonds and insurance shall not amount to more than 2% of the Contract price.
7. Include relevant items for the General Conditions, permits (when applicable), Work Progress Schedule, and other items required by Engineer. Include such items in Applications for Payment on payment schedule acceptable to Owner/Engineer.
8. Line items for Site maintenance such as dust control, compliance with storm water pollution prevention plans and permits, spill prevention control and countermeasures plans, and for construction photographic documentation; temporary utilities and temporary facilities, field offices, temporary controls, field engineering, and similar Work shall be included in the Schedule of Values and proportioned in Applications for Payment throughout duration of the Work.
9. Mobilization and Demobilization:
 - a. Document for Owner/Engineer the activities included in

- mobilization and demobilization line item.
- b. Mobilization and Demobilization will be limited to eight percent of the Contract Price, excluding allowances and Intermediate Mobilization/Demobilization, and will be paid as follows:
 - 1) When 1% of the adjusted contract amount for construction items is earned, 50% of the “lump sum” mobilization bid item will be paid.
 - 2) When 5% of the adjusted contract amount for construction items is earned, 75% of the “lump sum” mobilization bid item will be paid.
 - 3) When 10% of the adjusted contract amount for construction items is earned, 90% of the “lump sum” mobilization bid item will be paid.
 - 4) The remaining 10% of the mobilization bid item will be paid upon completion of all work.
 - c. Demobilization shall be not less than 1 percent of the Contract Price and shall be included with the Application for Payment following Substantial Completion, or other schedule acceptable to Owner/Engineer.
10. Intermediate Demobilization and Remobilization
- a. This item shall govern the contractor expenses for an Owner-directed intermediate Project demobilization of personnel and equipment that occurs after the Contract Notice to Proceed has been given and work has been commenced, and the subsequent remobilization of personnel and equipment to complete the project.
 - b. Each Intermediate Demobilization and Remobilization shall only be authorized upon a written directive by the Owner.
11. Costs for Shop Drawings, Samples, and other submittals; operations and maintenance manuals; field testing; and training of operations and maintenance personnel shall be as follows, unless otherwise accepted by Owner/Engineer:
- a. No direct or separate payment will be made for these items.
12. Project Record Documents:
- a. No direct or separate payment will be made for these items.
13. Coordinate Schedule of Values with cost-loading of the Progress Schedule, in accordance with General Conditions.

1.10 SCHEDULE OF VALUES

- A. Prepare a separate Schedule of Values for the schedule of the Work under the Agreement.
- B. Upon request of Owner/Engineer, provide support documentation to support the accuracy of the Schedule of Values.
- C. Unit Price Work: Reflect unit price quantity and price breakdown from Proposal Form.
- D. Lump Sum Work:

1. Reflect Schedule of Values format included in Proposal Form, specified allowances, alternates, and equipment selected by Owner, as applicable.
 2. List bonds and insurance premiums, mobilization, demobilization, preliminary and detailed progress schedule preparation, facility startup, and contract closeout separately.
 3. Break down by Division 1 through 17 with appropriate subdivision of each specification for each Project facility.
- E. An unbalanced or front-end loaded schedule will not be acceptable.
- F. Summation of the complete Schedule of Values representing all the Work shall equal the Contract Price.
- G. Submit Schedule of Values via the Internet-Based Contract and Project Management System (CPMS) in a spreadsheet format compatible with latest version of Microsoft Excel.

1.11 SCHEDULE OF ESTIMATED PROGRESS PAYMENTS

- A. Show estimated payment requests throughout Contract Times aggregating initial Contract Price.
- B. Base estimated progress payments on initially acceptable progress schedule. Adjust to reflect subsequent adjustments in progress schedule and Contract Price as reflected by modifications to the Contract Documents.

1.12 APPLICATION FOR PAYMENT

- A. Scope: Contractor's requests for payment shall be in accordance with the Agreement, General Conditions and Supplementary Conditions, and the Specifications.
- B. Form: Applications for Payment shall be in accordance with the Owner's CPMS format and the Sub-contracting Payment and Utilization Reporting (S.P.U.R.) System.
- C. Procedure:
1. Review with Owner/Engineer quantities and the Work proposed for inclusion in each progress payment. Application for Payment shall cover only the Work and quantities recommended by the Owner/Engineer.
 2. Contractor will be required to review with Owner/Engineer the status of record documents in connection with Owner's review of each Application for Payment.
 3. Submit Application for Payment via CPMS. Upload the following to Owner's CPMS with each monthly payment application:
 - a. Updated Work Progress Schedule as pdf and Microsoft Project or Primavera files.
 - b. Updated redlines/record drawings.
 - c. Narrative/Daily Log documenting Weather Days/Delay Request for previous month.

1.13 NONPAYMENT FOR REJECTED OR UNUSED PRODUCTS

- A. Payment will not be made for following:
1. Loading, hauling, and disposing of rejected material.
 2. Quantities of material wasted or disposed of in manner not called for under Contract Documents.
 3. Rejected loads of material, including material rejected after it has been placed by reason of failure of Contractor to conform to provisions of Contract Documents.
 4. Material not unloaded from transporting vehicle.
 5. Defective Work not accepted by Owner.
 6. Material remaining on hand after completion of Work.

END OF SECTION 01130

SECTION 13410

PROCESS INSTRUMENT SCHEDULE

PART 1 - GENERAL

1.01 SCOPE OF WORK

- A. This Section includes a schedule of the Process Instruments provided by the PCSI.

1.02 RELATED WORK

- A. **SECTION 13310 FLOW INSTRUMENTS**
- B. **SECTION 13312 LEVEL INSTRUMENTS**
- C. **SECTION 13314 PRESSURE INSTRUMENTS**
- D. **SECTION 13316 TEMPERATURE INSTRUMENTS**
- E. **SECTION 13345 INSTRUMENT SUPPORT HARDWARE**

1.03 SUBMITTALS

- A. Refer to **SECTION 13300** and the related work sections for submittal requirements.

1.04 SYSTEM DESCRIPTION

- A. The Process Instrument Schedule provides a summary of the major process instrumentation requirements as utilized within the control loops represented in the Contract Documents. Additional instruments shall be provided as required to fully implement the functionality as described in these specifications and as recommended by the process and mechanical equipment division suppliers.
- B. The Process Instrument Schedule is not intended to be an all-inclusive listing of all elements and appurtenances required to execute the control loop functions; rather, it is intended to supplement and complement the drawings and other specification sections. The Process Instrument Schedule shall not be considered equal to a bill of materials.
- C. Provide instrumentation hardware and software as necessary to perform control functions specified herein and as shown on drawings.

1.05 PROCESS INSTRUMENT SCHEDULE

- A. The Well Sites Process Instrument Schedule follows in Table **13410**.

TABLE 13410 PCSI-FURNISHED PROCESS INSTRUMENT SCHEDULE

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
1	01108	DMX-TIT-0101	Digester No. 1 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
2	01108	DTK-LIT-0102	Digester No. 1 Secondary Level	Radar Level Transmitter	0-50 ft	
3	01109	DMX-TIT-0301	Digester No. 3 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
4	01109	DTK-LIT-0302	Digester No. 3 Secondary Level	Radar Level Transmitter	0-50 ft	
5	01110	HXC-DIF-0101	Digester No. 1 Heat Exchanger Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
6	01110	HXC-FIT-0101	Digester No. 1 Heat Exchanger Hot Water Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
7	01110	HXC-TIT-0101C	Digester No. 1 Heat Exchanger Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250 F	
8	01110	HXC-TIT-0101D	Digester No. 1 Heat Exchanger Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250 F	
9	01110	RCR-TIT-0102	Digester No. 1 Recirculation Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
10	01110	HXC-DIF-0301	Digester No. 3 Heat Exchanger Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
11	01110	HXC-FIT-0301	Digester No. 3 Heat Exchanger Hot Water Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
12	01110	HXC-TIT-0301C	Digester No. 3 Heat Exchanger Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250 F	

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San Antonio Water System

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
13	01110	HXC-TIT-0301D	Digester No. 3 Heat Exchanger Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250 F	
14	01110	RCR-TIT-0302	Digester No. 3 Recirculation Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
15	01110	HXC-PSH-0901	Heat Exchanger No. 9 Differential Pressure	Differential Pressure Transmitter	0-10 psi	
16	01110	HXC-FIT-0901	Heat Exchanger No. 9 Hot Water Flow	Temperature Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
17	01110	HXC-TIT-0901C	Heat Exchanger No. 9 Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250 F	
18	01110	HXC-TIT-0901D	Heat Exchanger No. 9 Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250 F	
19	01111	DMX-TIT-0201	Digester No. 2 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
20	01111	DTK-LIT-0202	Digester No. 2 Secondary Level	Radar Level Transmitter	0-50 ft	
21	01112	DMX-FIT-0401	Digester No. 4 Mixing Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-10,000 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
22	01112	DMX-TIT-0401	Digester No. 4 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
23	01112	DTK-LIT-0402	Digester No. 4 Secondary Level	Radar Level Transmitter	0-50 ft	
24	01113	HXC-DIF-0201	Digester No. 2 Heat Exchanger Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
25	01113	HXC-FIT-0201	Digester No. 2 Heat Exchanger Hot Water Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
26	01113	HXC-TIT-0201C	Digester No. 2 Heat Exchanger Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250 F	
27	01113	HXC-TIT-0201D	Digester No. 2 Heat Exchanger Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250 F	
28	01113	RCR-TIT-0202	Digester No. 2 Recirculation Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
29	01113	HXC-DIF-0401	Digester No. 4 Heat Exchanger Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
30	01113	HXC-FIT-0401	Digester No. 4 Heat Exchanger Hot Water Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
31	01113	HXC-TIT-0401C	Digester No. 4 Heat Exchanger Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
32	01113	HXC-TIT-0401D	Digester No. 4 Heat Exchanger Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
33	01113	RCR-TIT-0402	Digester No. 4 Recirculation Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
34	01113	HXC-PSH-1001	Heat Exchanger No. 10 Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
35	01113	HXC-FIT-1001	Heat Exchanger No. 10 Hot Water Flow	Temperature Sensor/Indicating Transmitter	0-500 gpm	
36	01113	HXC-TIT-1001C	Heat Exchanger No. 10 Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
37	01113	HXC-TIT-1001D	Heat Exchanger No. 10 Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
38	01114	DMX-FIT-0501	Digester No. 5 Mixing Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-10,000 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
39	01114	DMX-TIT-0501	Digester No. 5 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
40	01114	DTK-PIT-0501	Digester No. 5 Pressure	Pressure Indicating Transmitter	0-30" WC	
41	01114	DTK-LIT-0501	Digester No. 5 Primary Level	Hydrostatic Pressure Sensor/Level Indicating Transmitter	0-50 ft WC	Include diaphragm seals as required.
42	01114	DTK-LIT-0502	Digester No. 5 Secondary Level	Radar Level Transmitter	0-50 ft	
43	01115	DMX-FIT-0701	Digester No. 7 Mixing Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-10,000 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
44	01115	DMX-TIT-0701	Digester No. 7 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
45	01115	DTK-PIT-0701	Digester No. 7 Pressure	Pressure Indicating Transmitter	0-30" WC	
46	01115	DTK-LIT-0701	Digester No. 7 Primary Level	Hydrostatic Pressure Sensor/Level Indicating Transmitter	0-50 ft WC	Include diaphragm seals as required.
47	01115	DTK-LIT-0702	Digester No. 7 Secondary Level	Radar Level Transmitter	0-50 ft	
48	01116	HXC-DIF-0501	Digester No. 5 Heat Exchanger Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
49	01116	HXC-FIT-0501	Digester No. 5 Heat Exchanger Hot Water Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
50	01116	HXC-TIT-0501C	Digester No. 5 Heat Exchanger Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
51	01116	HXC-TIT-0501D	Digester No. 5 Heat Exchanger Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
52	01116	RCR-FIT-0502	Digester No. 5 Recirculation Sludge Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
53	01116	RCR-TIT-0502	Digester No. 5 Recirculation Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
54	01116	HXC-DIF-0701	Digester No. 7 Heat Exchanger Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
55	01116	HXC-FIT-0701	Digester No. 7 Heat Exchanger Hot Water Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
56	01116	HXC-TIT-0701C	Digester No. 7 Heat Exchanger Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
57	01116	HXC-TIT-0701D	Digester No. 7 Heat Exchanger Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
58	01116	RCR-FIT-0702	Digester No. 7 Recirculation Sludge Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
59	01116	RCR-TIT-0702	Digester No. 7 Recirculation Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
60	01116	HXC-PSH-1101	Heat Exchanger No. 11 Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
61	01116	HXC-FIT-1101	Heat Exchanger No. 11 Hot Water Flow	Temperature Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
62	01116	HXC-TIT-1101C	Heat Exchanger No. 11 Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
63	01116	HXC-TIT-1101D	Heat Exchanger No. 11 Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
64	01117	DMX-FIT-0601	Digester No. 6 Mixing Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-10,000 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
65	01117	DMX-TIT-0601	Digester No. 6 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150F	
66	01117	DTK-PIT-0601	Digester No. 6 Pressure	Pressure Indicating Transmitter	0-30" WC	
67	01117	DTK-LIT-0601	Digester No. 6 Primary Level	Hydrostatic Pressure Sensor/Level Indicating Transmitter	0-50 ft WC	Include diaphragm seals as required.
68	01117	DTK-LIT-0602	Digester No. 6 Secondary Level	Radar Level Transmitter	0-50 ft	
69	01118	DMX-FIT-0801	Digester No. 8 Mixing Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-10,000 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
70	01118	DMX-TIT-0801	Digester No. 8 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150F	
71	01118	DTK-PIT-0801	Digester No. 8 Pressure	Pressure Indicating Transmitter	0-30" WC	
72	01118	DTK-LIT-0801	Digester No. 8 Primary Level	Hydrostatic Pressure Sensor/Level Indicating Transmitter	0-50 ft WC	Include diaphragm seals as required.
73	01118	DTK-LIT-0802	Digester No. 8 Secondary Level	Radar Level Transmitter	0-50 ft	
74	01119	HXC-DIF-0601	Digester No. 6 Heat Exchanger Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
75	01119	HXC-FIT-0601	Digester No. 6 Heat Exchanger Hot Water Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
76	01119	HXC-TIT-0601C	Digester No. 6 Heat Exchanger Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
77	01119	HXC-TIT-0601D	Digester No. 6 Heat Exchanger Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
78	01119	RCR-FIT-0602	Digester No. 6 Recirculation Sludge Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
79	01119	RCR-TIT-0602	Digester No. 6 Recirculation Temperature	Temperature Sensor/Indicating Transmitter	0-150F	
80	01119	HXC-DIF-0801	Digester No. 8 Heat Exchanger Differential Pressure	Differential Pressure Transmitter	0-10psi	Include diaphragm seals as required.
81	01119	HXC-FIT-0801	Digester No. 8 Heat Exchanger Hot Water Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
82	01119	HXC-TIT-0801C	Digester No. 8 Heat Exchanger Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
83	01119	HXC-TIT-0801D	Digester No. 8 Heat Exchanger Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
84	01119	RCR-FIT-0802	Digester No. 8 Recirculation Sludge Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-500 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
85	01119	RCR-TIT-0802	Digester No. 8 Recirculation Temperature	Temperature Sensor/Indicating Transmitter	0-150F	
86	01119	HXC-PSH-1201	Heat Exchanger No. 12 Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
87	01119	HXC-FIT-1201	Heat Exchanger No. 12 Hot Water Flow	Temperature Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
88	01119	HXC-TIT-1201C	Heat Exchanger No. 12 Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
89	01119	HXC-TIT-1201D	Heat Exchanger No. 12 Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
90	01120	DMX-FIT-1001	Digester No. 10 Mixing Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-10,000 gpm	Furnish with all instrument accessory items, including, but not limited to, grounding rings.
91	01120	DMX-TIT-1001	Digester No. 10 Mixing Temperature	Temperature Sensor/Indicating Transmitter	0-150F	
92	01120	DTK-LIT-1002	Digester No. 10 Secondary Level	Radar Level Transmitter	0-50 ft	
93	01121	HXC-PSH-1301	Heat Exchanger No. 13 Differential Pressure	Differential Pressure Transmitter	0-10 psi	Include diaphragm seals as required.
94	01121	HXC-FIT-1301	Heat Exchanger No. 13 Hot Water Flow	Temperature Sensor/Indicating Transmitter	0-500 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
95	01121	HXC-TIT-1301C	Heat Exchanger No. 13 Hot Water Inlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
96	01121	HXC-TIT-1301D	Heat Exchanger No. 13 Hot Water Outlet Temperature	Temperature Sensor/Indicating Transmitter	0-250F	
97	01124	GAS-FIT-0501	Digester No. 5 Gas Flow	Ultrasonic Flow Sensor/Indicating Transmitter	0-300 cfm	
98	01124	GAS-PIT-0501	Digester No. 5 Gas Pressure	Pressure Indicating Transmitter	0-30" WC	
99	01124	GAS-TIT-0501	Digester No. 5 Gas Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
100	01124	GAS-FIT-0601	Digester No. 6 Gas Flow	Ultrasonic Flow Sensor/Indicating Transmitter	0-300 cfm	
101	01124	GAS-PIT-0601	Digester No. 6 Gas Pressure	Pressure Indicating Transmitter	0-30" WC	

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
102	01124	GAS-TIT-0601	Digester No. 6 Gas Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
103	01124	GAS-FIT-0701	Digester No. 7 Gas Flow	Ultrasonic Flow Sensor/Indicating Transmitter	0-300 cfm	
104	01124	GAS-PIT-0701	Digester No. 7 Gas Pressure	Pressure Indicating Transmitter	0-30" WC	
105	01124	GAS-TIT-0701	Digester No. 7 Gas Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
106	01124	GAS-FIT-0801	Digester No. 8 Gas Flow	Ultrasonic Flow Sensor/Indicating Transmitter	0-300 cfm	
107	01124	GAS-PIT-0801	Digester No. 8 Gas Pressure	Pressure Indicating Transmitter	0-30" WC	
108	01124	GAS-TIT-0801	Digester No. 8 Gas Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
109	01124	GAS-PIT-2401	Digesters Nos. 5-8 Gas Header Pressure	Pressure Indicating Transmitter	0-30" WC	
110	01124	GAS-TIT-2401	Digesters Nos. 5-8 Gas Header Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
111	01126	GAS-FIT-0001	Ameresco Gas Flow	Ultrasonic Flow Sensor/Indicating Transmitter	0-2,500 cfm	
112	01126	GAS-PIT-0001	Ameresco Gas Pressure	Pressure Indicating Transmitter	0-30" WC	
113	01126	GAS-TIT-0001	Ameresco Gas Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
114	01126	GAS-FIT-0005	Ameresco Line Pressure	Pressure Indicating Transmitter	0-30" WC	
115	01126	GAS-TIT-0005	Ameresco Line Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
116	01126	GAS-FIT-0002	Boilers Gas Flow	Ultrasonic Flow Sensor/Indicating Transmitter	0-1,500 cfm	

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

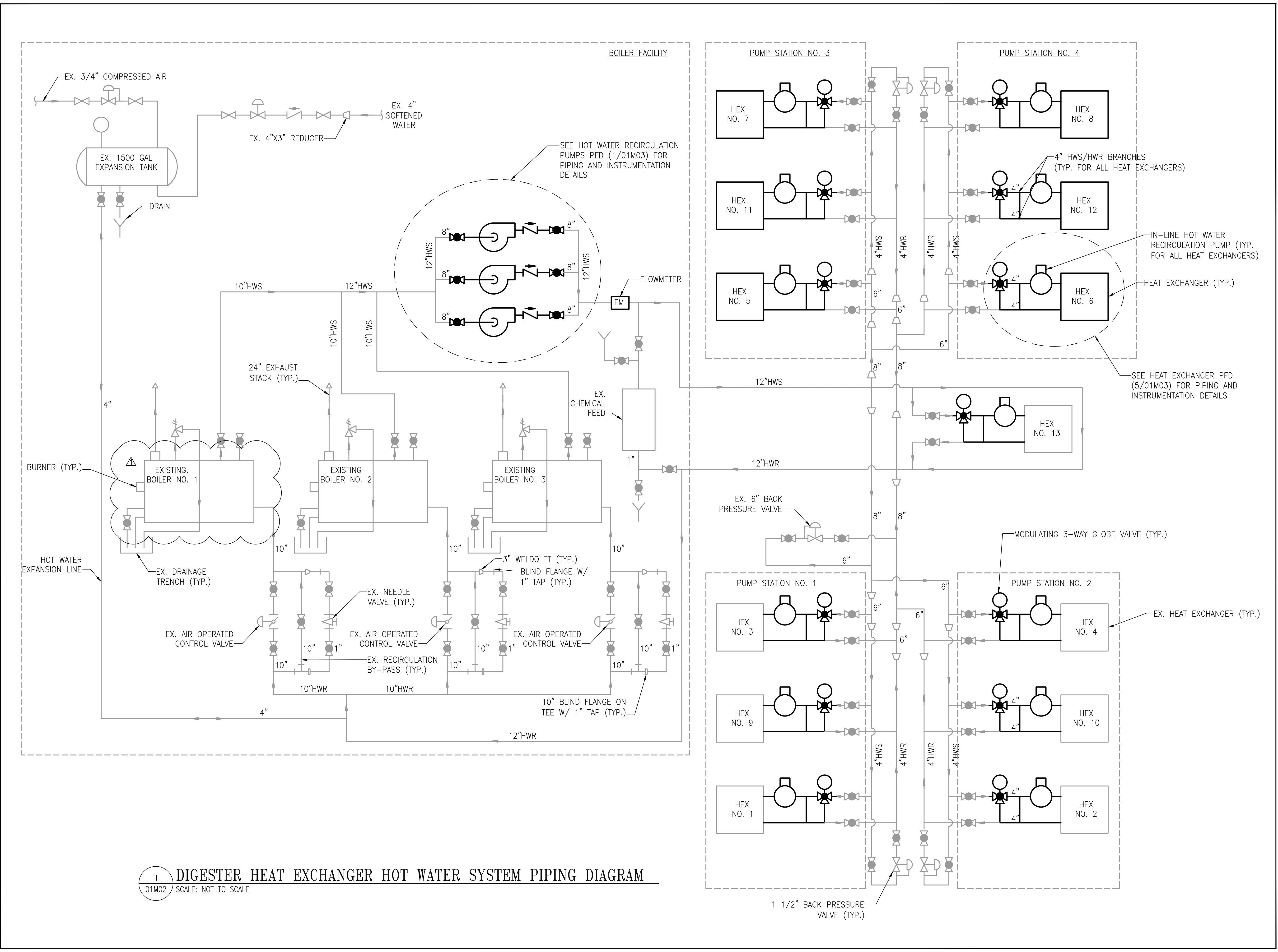
ITEM NO.	P&ID	INSTRUMENT TAG	DESCRIPTION	INSTRUMENT TYPE	INSTRUMENT RANGE OR SET POINT	COMMENTS
117	01126	GAS-PIT-0002	Boilers Gas Pressure	Pressure Indicating Transmitter	0-10 psi	
118	01126	GAS-TIT-0002	Boilers Gas Temperature	Temperature Sensor/Indicating Transmitter	0-150 F	
119	01129	BLS-FIT-004	Hot Water Header Flow	Electromagnetic Flow Sensor/Indicating Transmitter	0-4000 gpm	Note extended temperature requirement in instrument specification. Furnish with all instrument accessory items, including, but not limited to, grounding rings.
120	01129	BLS-PSH-004	Hot Water Header Low Pressure	Pressure Indicating Transmitter	5 psi	Alarms if pressure does not exceed setpoint, after delay during startup
121	01129	BLS-TSH-004	Hot Water Header Low Temperature	Temperature Sensor/Indicating Transmitter	150 F	Alarms if temperature does not exceed setpoint
122	01129	BLS-PSH-001	Hot Water Pump No. 1 High Discharge Pressure	Pressure Switch	45 psi	Alarms if pressure exceeds setpoint, after delay during startup
123	01129	BLS-PSH-002	Hot Water Pump No. 2 High Discharge Pressure	Pressure Switch	45 psi	Alarms if pressure exceeds setpoint, after delay during startup
124	01129	BLS-PSH-003	Hot Water Pump No. 3 High Discharge Pressure	Pressure Switch	45 psi	Alarms if pressure exceeds setpoint, after delay during startup
125	01128	BLS-LSH-001	Expansion Tank Low Level	Level Switch	N/A	Install in existing tank port.
126	N/A	ELB-TIT-5702	Digesters Nos. 5 & 7 Electrical Building Electrical Room Temperature	Room Temperature Transmitter	0-150F	
127	N/A	ELB-TIT-5701	Digesters Nos. 5 & 7 Electrical Building PLC Room Temperature	Room Temperature Transmitter	0-150F	
128	N/A	ELB-TIT-6802	Digesters Nos. 6 & 8 Electrical Building Electrical Room Temperature	Room Temperature Transmitter	0-150F	
129	N/A	ELB-TIT-6801	Digesters Nos. 6 & 8 Electrical Building PLC Room Temperature	Room Temperature Transmitter	0-150F	

Steven M. Clouse WRC Digester Mixing and System Enhancements, Phase 3
San Antonio Water System

PART 2 -PRODUCTS (NOT USED)

PART 3 -EXECUTION (NOT USED)

END OF SECTION 13410



1 DIGESTER HEAT EXCHANGER HOT WATER SYSTEM PIPING DIAGRAM
 01M02 SCALE: NOT TO SCALE

REVISIONS	
1	ADDENDUM NO. 3

CLIENT INFORMATION
SAN ANTONIO WATER SYSTEM
 STEVEN M. CLOUSE WRC
 DIGESTER MIXING AND SYSTEM ENHANCEMENTS
 PHASE 3

KEY PLAN

GRAPHIC SCALES

SIGNATURE



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 227 North Loop, 1604 E. Suite 150, San Antonio, Texas 78232

DIGESTER HEAT EXCHANGER HOT WATER SYSTEM PIPING DIAGRAM

DRAWING NO.
01M02

SCALE: NOT TO SCALE
 DATE: DECEMBER 2021 SHEET 27 OF 231
 DES: EMS DRAWN: EMS CHECK: DRN

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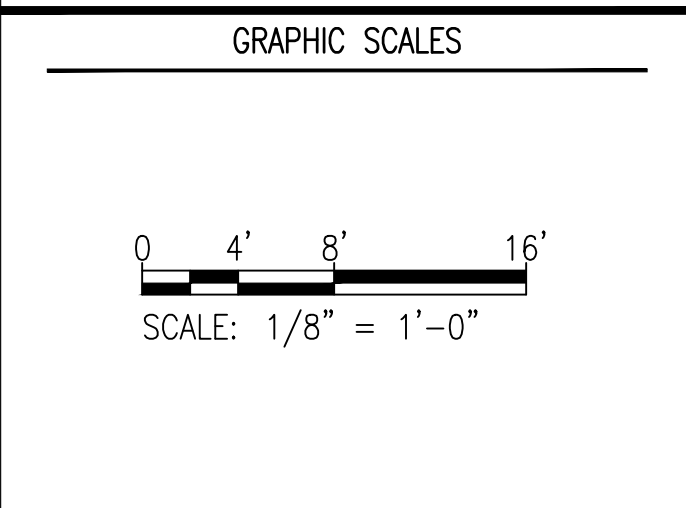
REVISIONS	
1	ADDENDUM NO. 3

CLIENT INFORMATION

SAN ANTONIO WATER SYSTEM

STEVEN M. CLOUSE WRC
DIGESTER MIXING AND SYSTEM ENHANCEMENTS
PHASE 3

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DIGESTER NO. 4 PLAN

DRAWING NO.

01M18

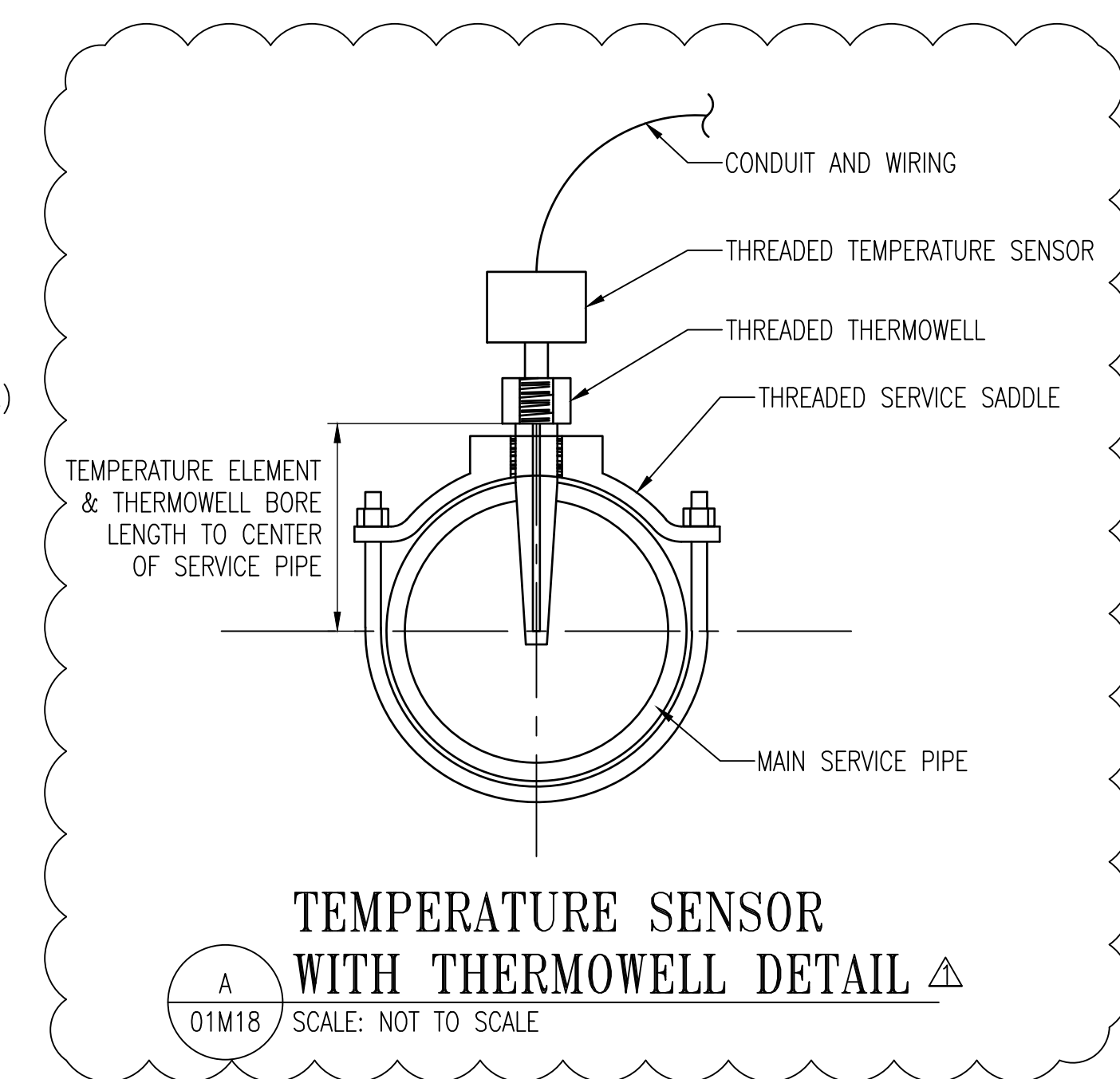
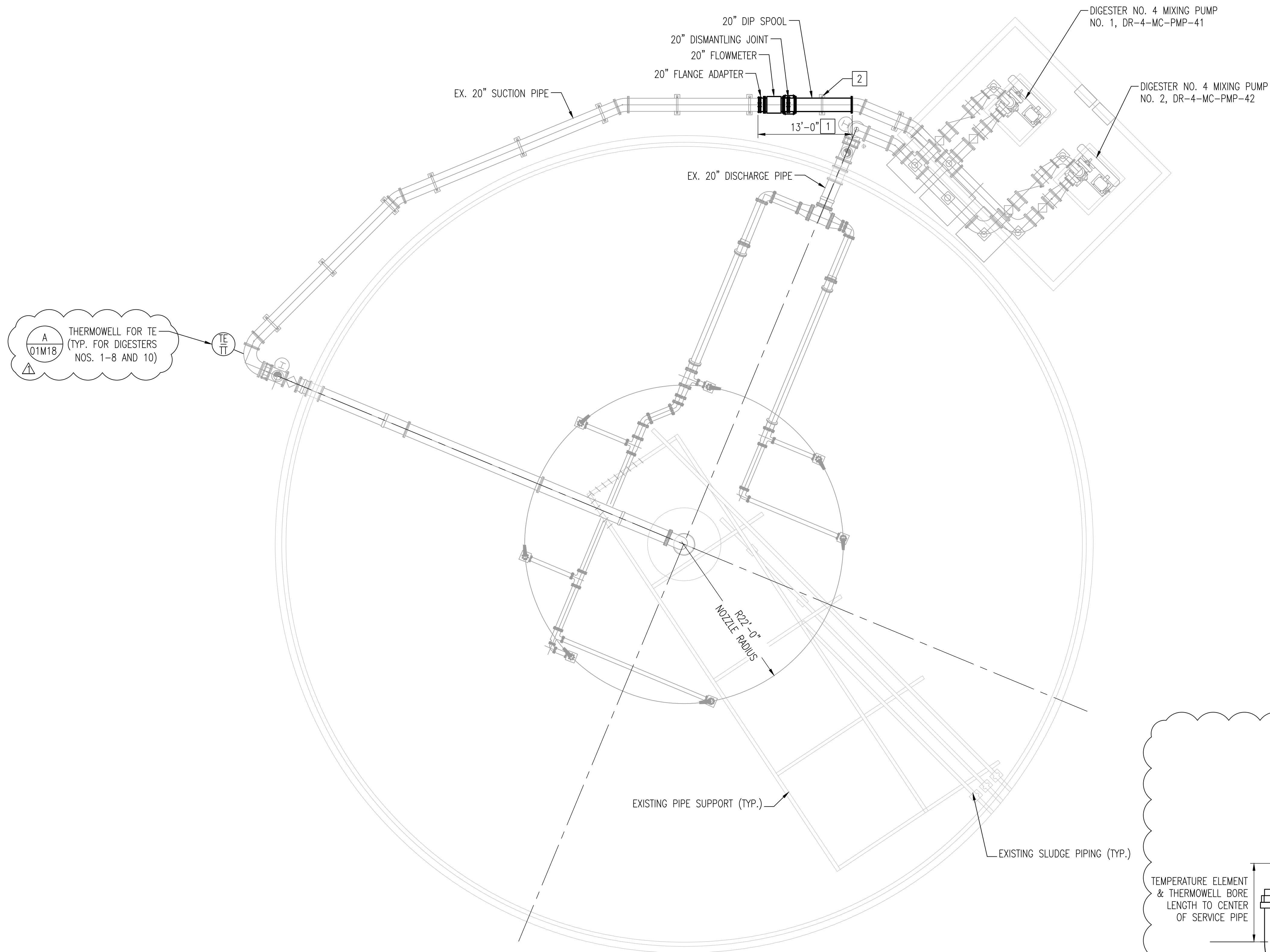
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DATE: DECEMBER 2021 SHEET 43 OF 231

DES: EMS DRAWN: EMS CHECK: DRN

X SHEET KEYNOTES

- CONTRACTOR SHALL CUT AND REMOVE EXISTING DUCTILE IRON PIPE AND INSTALL A FLANGE ADAPTER WITH TIE RODS.
- REUSE EXISTING PIPE SUPPORT.



1 DIGESTER NO. 4 PLAN
01M18 SCALE: 1/8"=1'-0" ↑

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REVISIONS	
1	ADDENDUM 3

CLIENT INFORMATION
SAN ANTONIO WATER SYSTEM
 SMC WRC DIGESTER MIXING AND SYSTEM ENHANCEMENTS
 PHASE 3
 CONTRACT NO. PS-00083-01

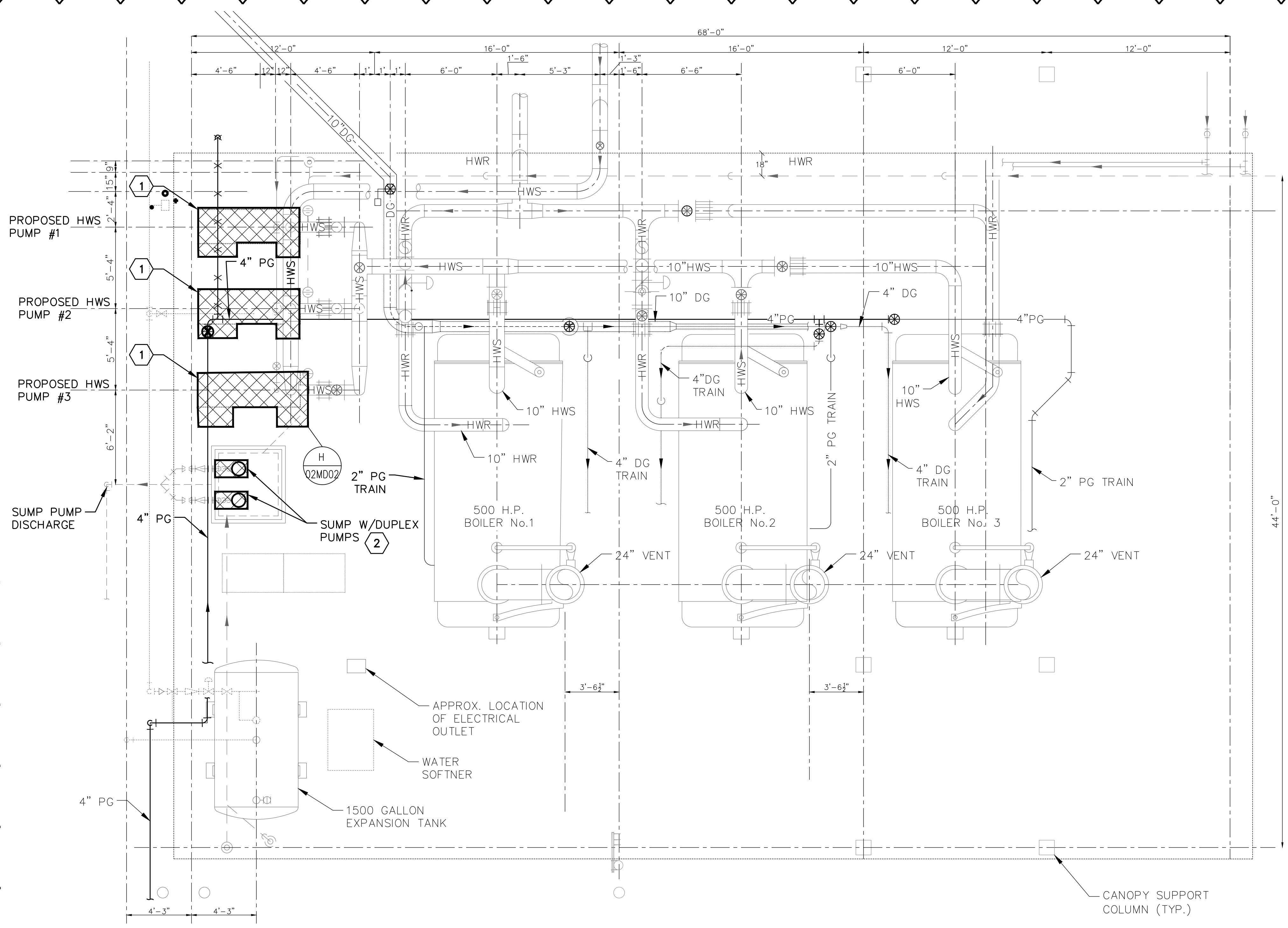
KEY PLAN

GRAPHIC SCALES

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BOILER FACILITY DEMOLITION PLAN
 (1 OF 2)
 DRAWING NO.
02MD01
 SCALE: 1/4" = 1'-0"
 DATE: NOV 2021 SHEET 61 OF 231
 DES: JG DRAWN: RL CHECK: JG



LEGEND
 HWR HOT WATER RETURN
 HWS HOT WATER SUPPLY
 PG PROPANE GAS
 DG DIGESTER GAS
 [Hatched Box] EQUIPMENT TO BE REMOVED/DEMOLISHED AND REPLACED

GENERAL SHEET NOTES

- COORDINATE ALL SHUTDOWNS WITH SAWS OPERATIONS. MAINTAIN UNINTERRUPTED SERVICES AT ALL TIMES. NOTIFY SAWS OPERATIONS AT LEAST 72-HOURS PRIOR TO ANY SHUTDOWNS.
- PROJECT INCLUDES SEVERAL INTERCONNECTIONS. THESE INTERCONNECTIONS SHALL BE ACCOMPLISHED PRIOR TO DELIVERY OF HWS PUMPS AND SUMP PUMPS. PERFORM ALL PREP WORK TO FACILITATE AND EXPEDITE INSTALLATION OF HWS PUMPS AND SUMP PUMPS.
- STENCIL AND TAG ALL UTILITIES.

SHEET KEYNOTES-DEMOLITION

- REMOVE HWS PUMPS NO'S 1, 2, AND 3. REFER TO SHEET 02ED01 FOR LIMITS OF DEMO WORK.
- REMOVE SUMP PUMPS.

1 DEMOLITION PLAN
 02MD02 SCALE: 1/4" = 1'-0"



Javier Garcia 1/20/22
GIC
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1

NOT USED

REVISIONS	
1	ADDENDUM 3

CLIENT INFORMATION
**SAN ANTONIO WATER
SYSTEM**

**SMC WRC DIGESTER MIXING
AND SYSTEM ENHANCEMENTS
PHASE 3
CONTRACT NO. PS-00083-01**

KEY PLAN

GRAPHIC SCALES

SIGNATURE

1

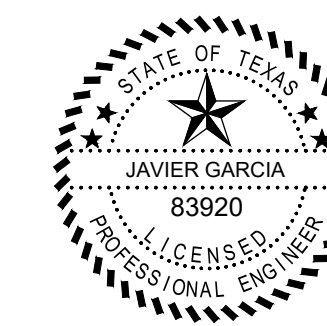


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**BOILER FACILITY
PLAN**

DRAWING NO.
02M02

SCALE: 1/4" = 1'-0"
DATE: NOV 2021 SHEET 63 OF 231
DES: JG DRAWN: RL CHECK: JG



Javier Garcia 1/20/22



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1	ADDENDUM 3

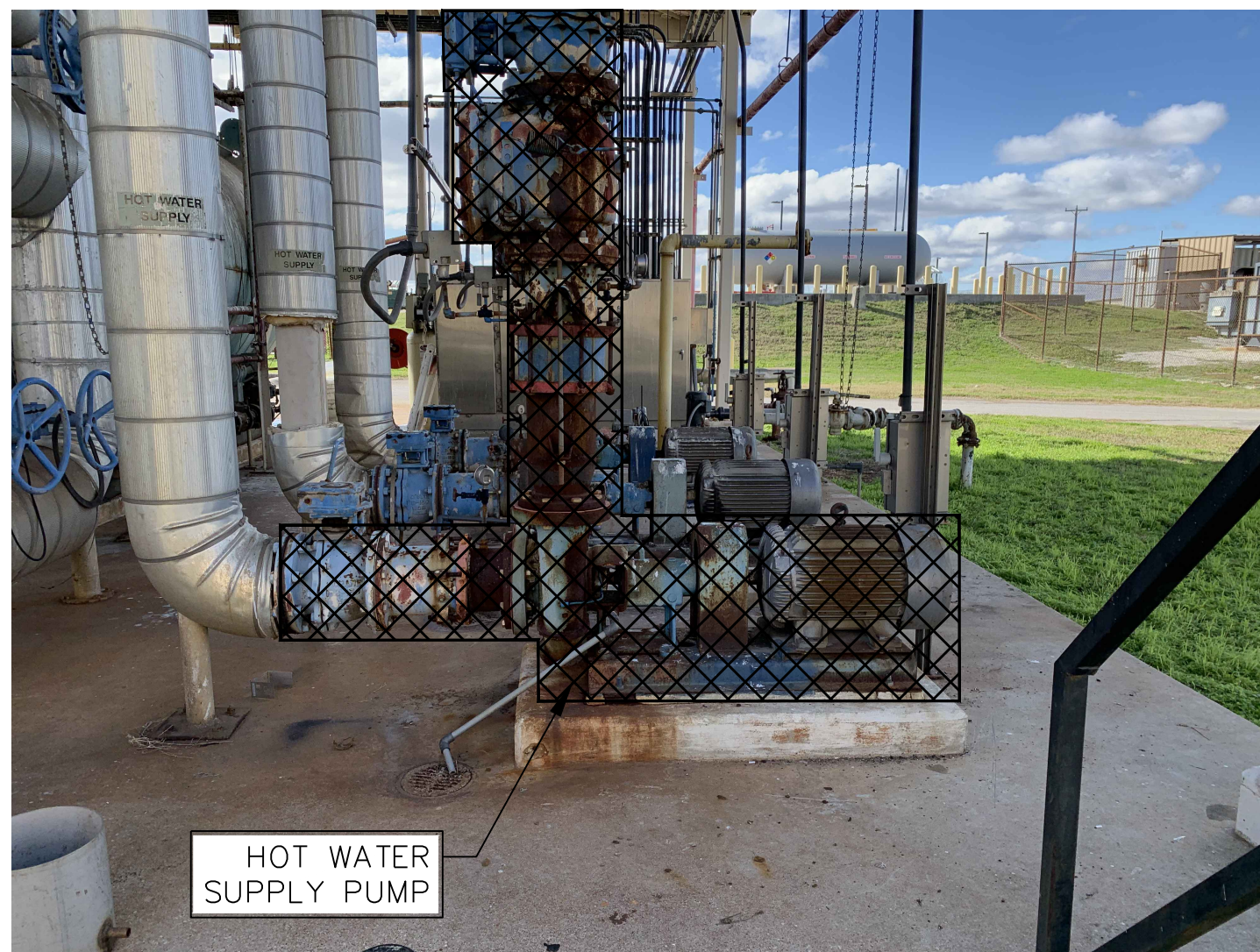
CLIENT INFORMATION
SAN ANTONIO WATER SYSTEM

SMC WRC DIGESTER MIXING AND SYSTEM ENHANCEMENTS
 PHASE 3
 CONTRACT NO. PS-00083-01

KEY PLAN

GRAPHIC SCALES

SIGNATURE



HOT WATER SUPPLY PUMP

DESCRIPTION: HOT WATER SUPPLY PUMP

1 PHOTOGRAPH
 02MD01 SCALE: NOT TO SCALE

1



Javier Garcia 1/20/22



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BOILER FACILITY DEMOLITION PLAN
 (2 OF 2)
 DRAWING NO.
02MD02
 SCALE: NOT TO SCALE
 DATE: NOV 2021 SHEET 62 OF 231
 DES: JG DRAWN: RL CHECK: JG

REVISIONS		
1	ADDENDUM NO.3	GAI

CLIENT INFORMATION


SAN ANTONIO WATER SYSTEM

SMC WRC DIGESTER MIXING AND SYSTEM ENHANCEMENTS
PHASE 3
CONTRACT NO. PS-00083-01

KEY PLAN

GRAPHIC SCALES

SIGNATURE



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ELECTRICAL
STANDARD DETAILS - 6

DRAWING NO.
00E09

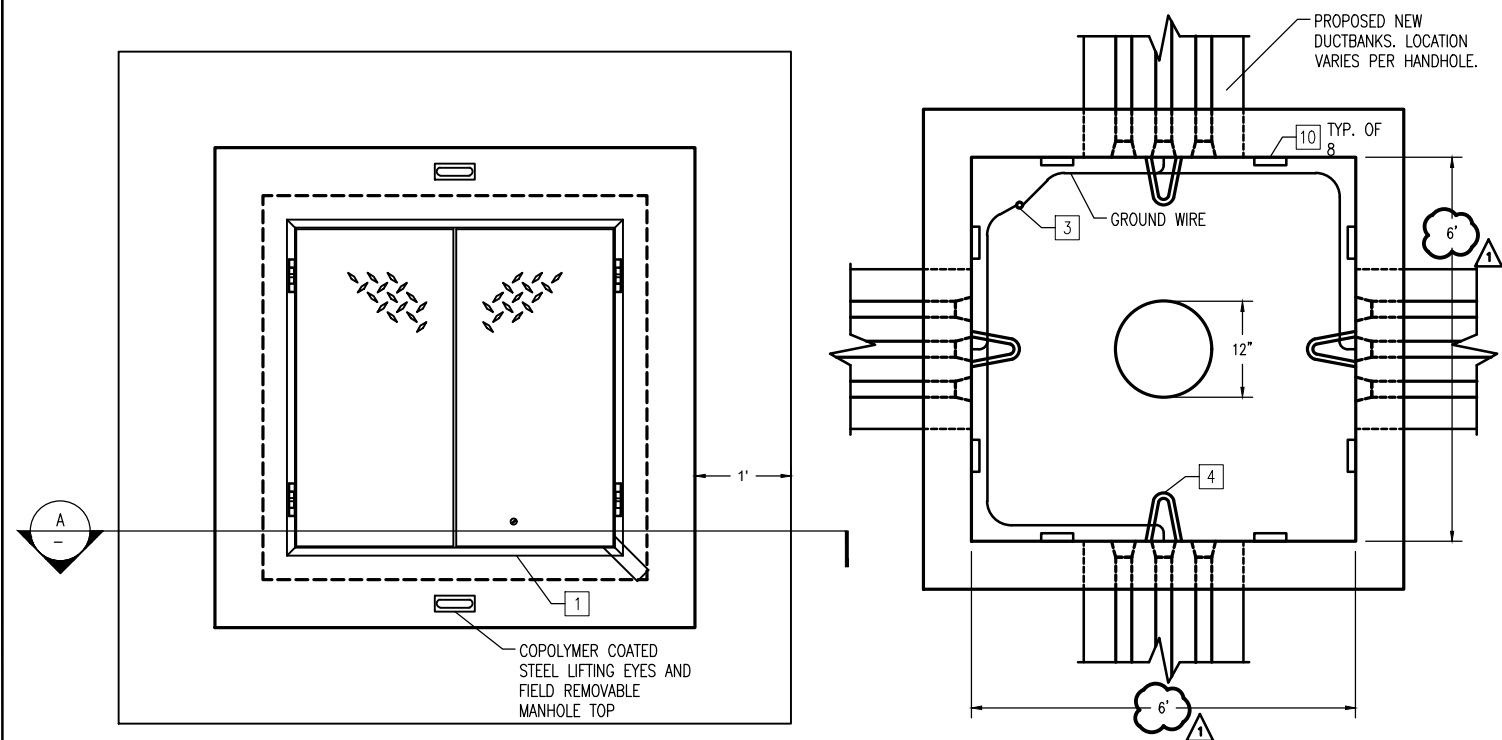
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DATE: NOV 2021 SHEET 82 OF 231

DES: VKG DRAWN: CEM CHECK: GL

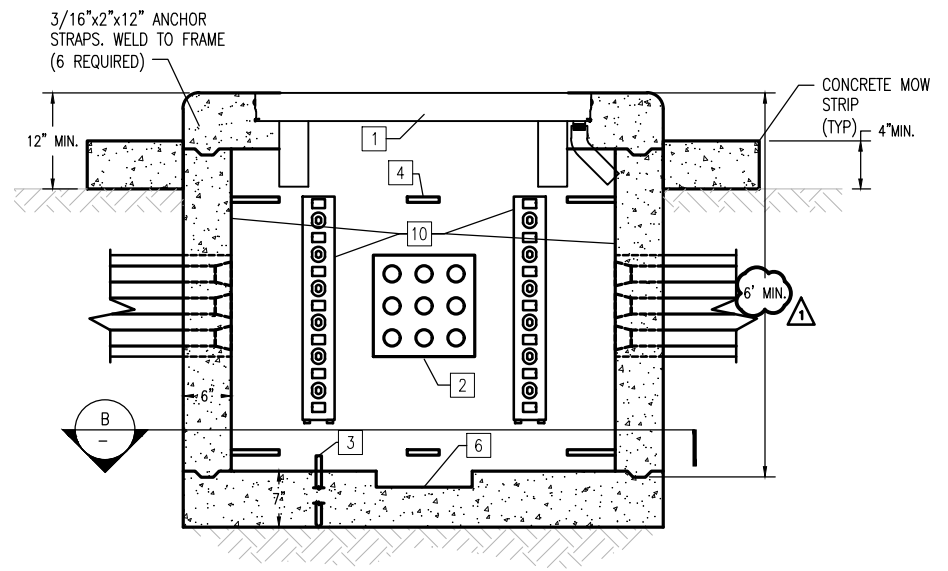
X SHEET KEYNOTES

- HANDHOLE COVER SHALL BE AS SPECIFIED, AND SHALL BE STAMPED ELECTRICAL OR COMMUNICATION AS REQUIRED BY CONTRACTOR.
- ALL CONDUITS SHALL BE TERMINATED IN HANDHOLE WITH BELL ENDS AND CENTER ON THE ENTERING WALL.
- 3/4" X 10'-0" STAINLESS STEEL GROUND ROD.
- PROVIDE PULLING IRONS AS SPECIFIED.
- #4/0 BARE STRANDED TINNED COPPER CONDUCTOR TO MAIN GROUND GRID.
- HANDHOLES SHALL BE EQUIPPED WITH 12" DEPRESSION.
- HANDHOLE EXTENSIONS SHALL BE USED WHENEVER BOX IS BELOW EXISTING GRADE.
- ANCHORS SHALL BE 316 SS OR FIBERGLASS AS SPECIFIED.
- HANDHOLE SHALL BE 12" ABOVE GRADE WHEN LOCATED IN GRASSY AREAS, CONTRACTOR SHALL PROVIDE A 12" MOW STRIP 6" TALL AROUND HANDHOLE.
- MOUNTING RACKS SHALL BE AS SPECIFIED.
- REFER TO SPECIFICATION 26.05.43 "UNDERGROUND SYSTEM" FOR ADDITIONAL INFORMATION.
- THE FIBER HANDHOLE FHH SHALL BE 4'x4'(MIN.).
- THE ELECTRICAL MANHOLE EMH SHALL BE 6'x6'(MIN.).



PLAN

SECTION
SCALE: NOT TO SCALE



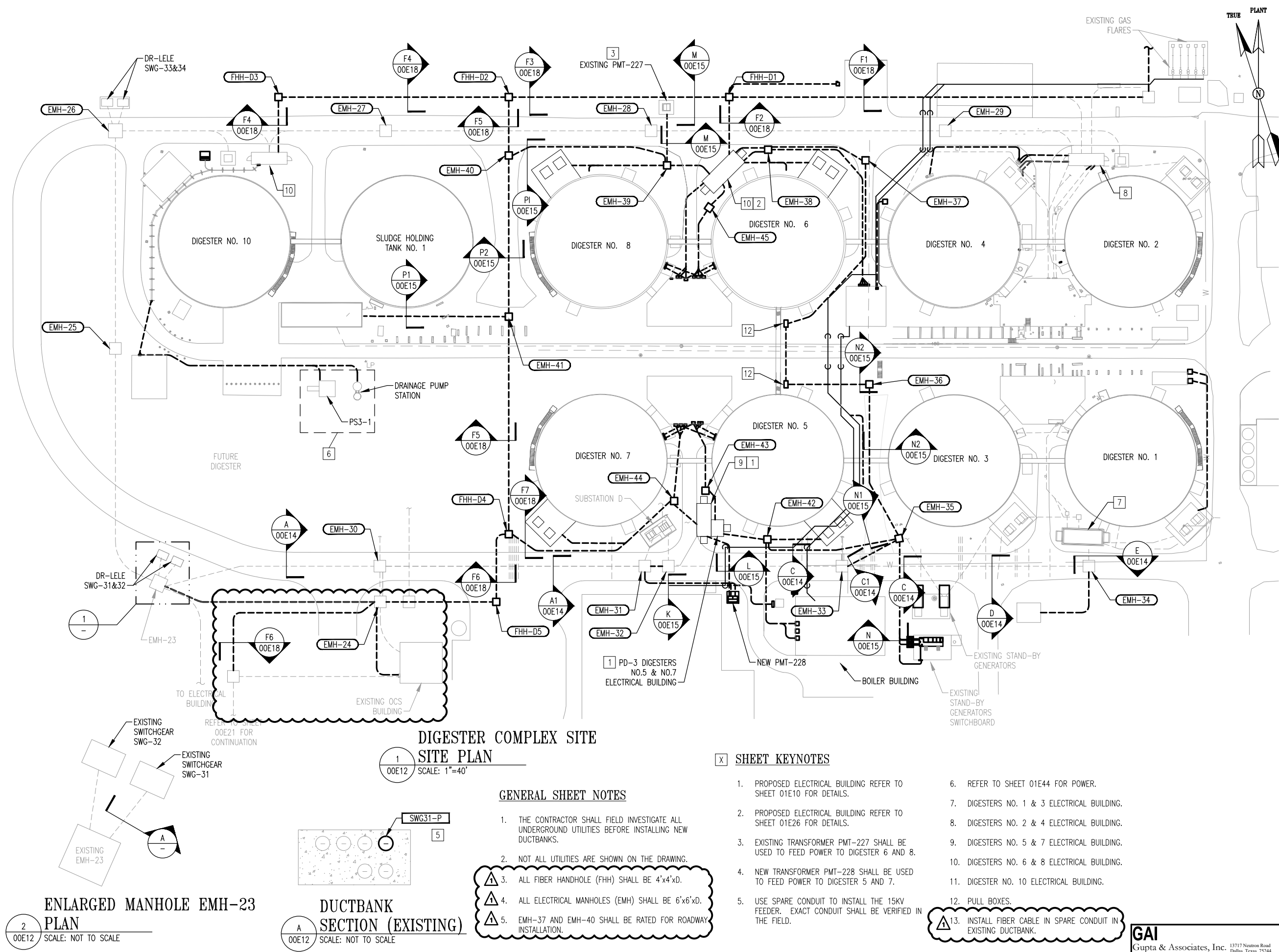
SECTION A-A
SCALE: NOT TO SCALE

(NON-ROADWAY)
ELECTRICAL HANDHOLE (EMH & FHH) DETAIL

E37
00E09
SCALE: NOT TO SCALE

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CLIENT INFORMATION
SAN ANTONIO WATER SYSTEM
 SMC WRC DIGESTER MIXING AND SYSTEM ENHANCEMENTS
 PHASE 3
 CONTRACT NO. PS-00083-01

KEY PLAN

GRAPHIC SCALES

SIGNATURE

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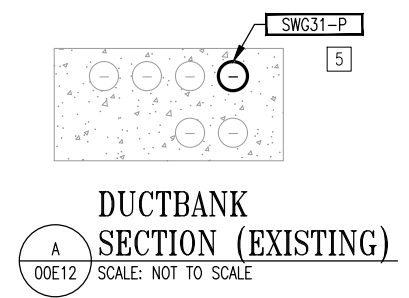
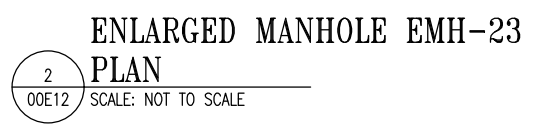
DIGESTER AREA
 SITE PLAN - MODIFICATION

DRAWING NO.
00E12

SCALE: AS SHOWN

DATE: NOV 2021 SHEET 85 OF 231

DES: VKG DRAWN: CEM CHECK: GL



DIGESTER COMPLEX SITE SITE PLAN
 SCALE: 1"=40'

GENERAL SHEET NOTES

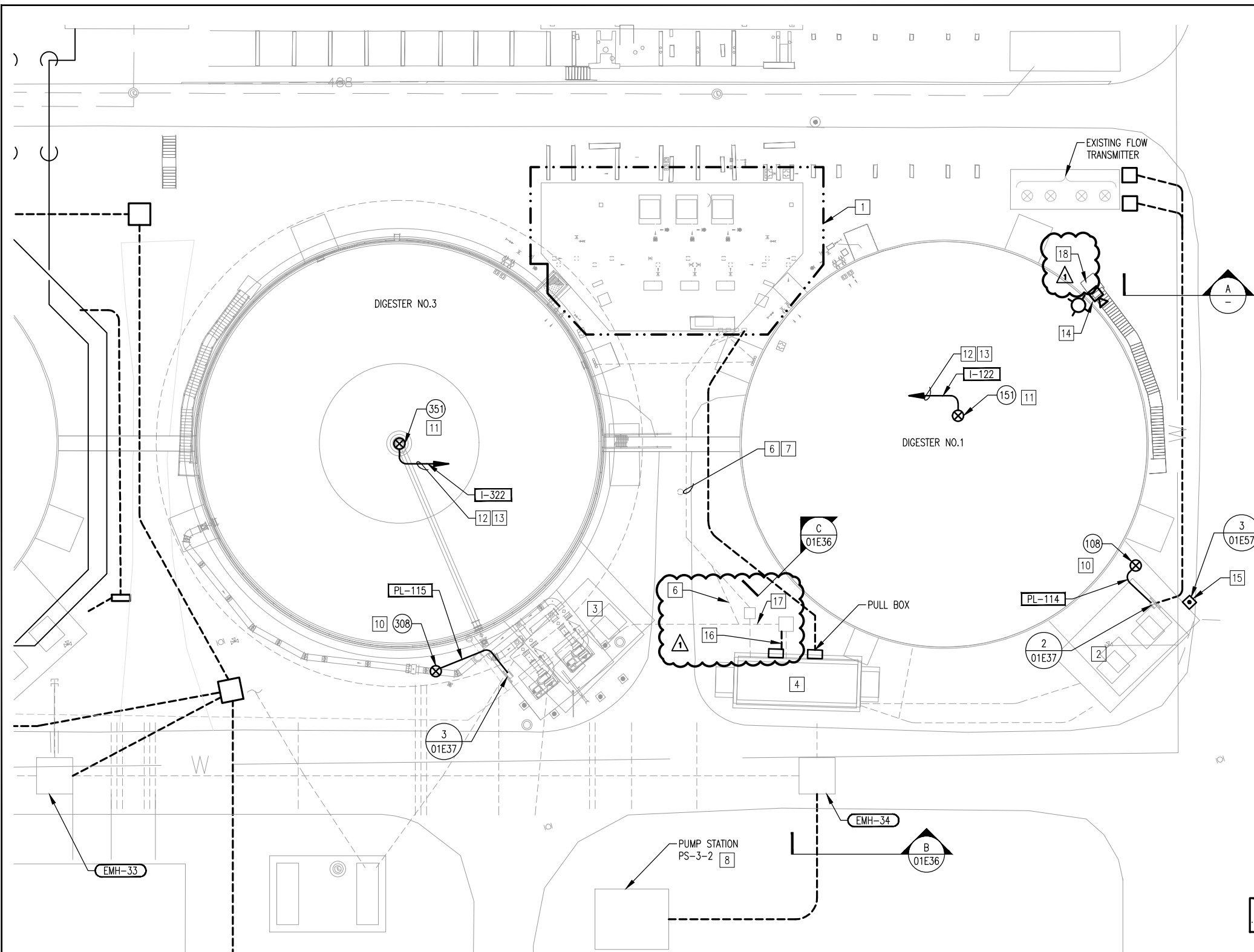
1. THE CONTRACTOR SHALL FIELD INVESTIGATE ALL UNDERGROUND UTILITIES BEFORE INSTALLING NEW DUCTBANKS.
2. NOT ALL UTILITIES ARE SHOWN ON THE DRAWING.
3. ALL FIBER HANDHOLE (FHH) SHALL BE 4'x4'x'D.
4. ALL ELECTRICAL MANHOLES (EMH) SHALL BE 6'x6'x'D.
5. EMH-37 AND EMH-40 SHALL BE RATED FOR ROADWAY INSTALLATION.

SHEET KEYNOTES

1. PROPOSED ELECTRICAL BUILDING REFER TO SHEET 01E10 FOR DETAILS.
2. PROPOSED ELECTRICAL BUILDING REFER TO SHEET 01E26 FOR DETAILS.
3. EXISTING TRANSFORMER PMT-227 SHALL BE USED TO FEED POWER TO DIGESTER 6 AND 8.
4. NEW TRANSFORMER PMT-228 SHALL BE USED TO FEED POWER TO DIGESTER 5 AND 7.
5. USE SPARE CONDUIT TO INSTALL THE 15KV FEEDER. EXACT CONDUIT SHALL BE VERIFIED IN THE FIELD.
6. REFER TO SHEET 01E44 FOR POWER.
7. DIGESTERS NO. 1 & 3 ELECTRICAL BUILDING.
8. DIGESTERS NO. 2 & 4 ELECTRICAL BUILDING.
9. DIGESTERS NO. 5 & 7 ELECTRICAL BUILDING.
10. DIGESTERS NO. 6 & 8 ELECTRICAL BUILDING.
11. DIGESTER NO. 10 ELECTRICAL BUILDING.
12. PULL BOXES.
13. INSTALL FIBER CABLE IN SPARE CONDUIT IN EXISTING DUCTBANK.

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GENERAL SHEET NOTES

1. FIELD ROUTE ALL CONDUITS.
2. THE CONTRACTOR SHALL FIELD VERIFY THE ROUTING AND MAKE ADJUSTMENTS AS NECESSARY TO AVOID ABOVE GROUND AND UNDERGROUND STRUCTURE OR EQUIPMENT.
3. THE CONTRACTOR SHALL BE RESPONSIBLE TO HYDRO VACUUM THE AREA TO DETERMINE UNDERGROUND OBSTRUCTIONS BEFORE INSTALLING UNDERGROUND DUAL BANKS AND MAKE ADJUSTMENTS AS NECESSARY.
4. EXACT LOCATION OF EQUIPMENT SHALL BE VERIFIED IN THE FIELD.

X SHEET KEYNOTES

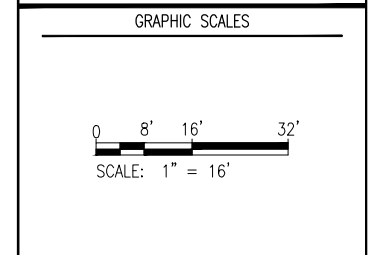
1. RECIRCULATION AND SLUDGE TRANSFER PUMP STATION NO.1. REFER TO SHEET 01E37.
2. DIGESTER NO.1 MIXING PUMPS INSTALL NEW TEMP TRANSMITTER.
3. DIGESTER NO.3 MIXING PUMPS INSTALL NEW TEMP TRANSMITTER.
4. ELECTRICAL BUILDING.
5. REFER TO SHEET 01E38.
6. EXISTING DUCTBANKS. INSTALL NEW WIRE FROM THE HEAT EXCHANGERS TO THE ELECTRICAL BUILDING. REFER TO SECTION A ON SHEET 01E39.
7. THE CONTRACTORS SHALL FIELD VERIFY THE AVAILABLE SPARE CONDUITS IN THE DUCTBANK.
8. PROVIDE POWER TO EXISTING PUMP STATION.
9. REFER TO SHEET 01ED16 & 01ED17 FOR DEMOLITION PLAN.
10. INSTALL TIT FOR DIGESTER TEMPERATURE MEASUREMENT. EXACT LOCATION SHALL BE COORDINATED WITH MECHANICAL DRAWINGS. REFER TO RISER DIAGRAM ON SHEET 01E37.
11. INSTALL NEW RADAR LEVEL TRANSMITTER.
12. USE EXISTING CONDUIT, WHICH WAS PREVIOUSLY USED FOR TEMPERATURE TRANSMITTER TO INSTALL NEW WIRES FROM NEW LEVEL TRANSMITTER TO THIS LOCAL DISPLAY PANEL.
13. PROVIDE EXPLOSION PROOF J-BOX, AND EXTEND CONDUIT AS NECESSARY FOR A COMPLETE OPERATIONAL SYSTEM.
14. HORN/BEACON ALARM MOUNT ON TOP OF STAIRWAY LANDING ON 10' TELESCOPIC POLE. EXACT LOCATION SHALL BE COORDINATED IN THE FIELD.
15. REMOTE SILENCE PUSH-BUTTON STATION FOR HORN.
16. INSTALL (4) - 2°C FOR NEW POWER CONDUCTORS, SHOWN IN DUCTBANK SECTIONS A&C ON SHEET 01E39.
17. REFER TO SECTION C ON SHEET 01E39.

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SMC WRC DIGESTER MIXING AND SYSTEM ENHANCEMENTS
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KEY PLAN



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DIGESTER NO.1 & NO.3
 OVERALL ELECTRICAL PLAN

DRAWING NO.
01E36

SCALE: 1"=16'

DATE: NOV 2021 SHEET 157 OF 231

DES: VKG DRAWN: CEM CHECK: GL

DUCTBANK SECTION A
 SCALE

TABLE FOR SECTION A			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-116, 117, 118, 119	2°C	ANALOG SIGNALS TO PLC
2	LD1-25	1°C	120V POWER TO FIT

ENLARGED PARTIAL SITE PLAN
 SCALE: 1"=16'

DUCTBANK SECTION B
 SCALE

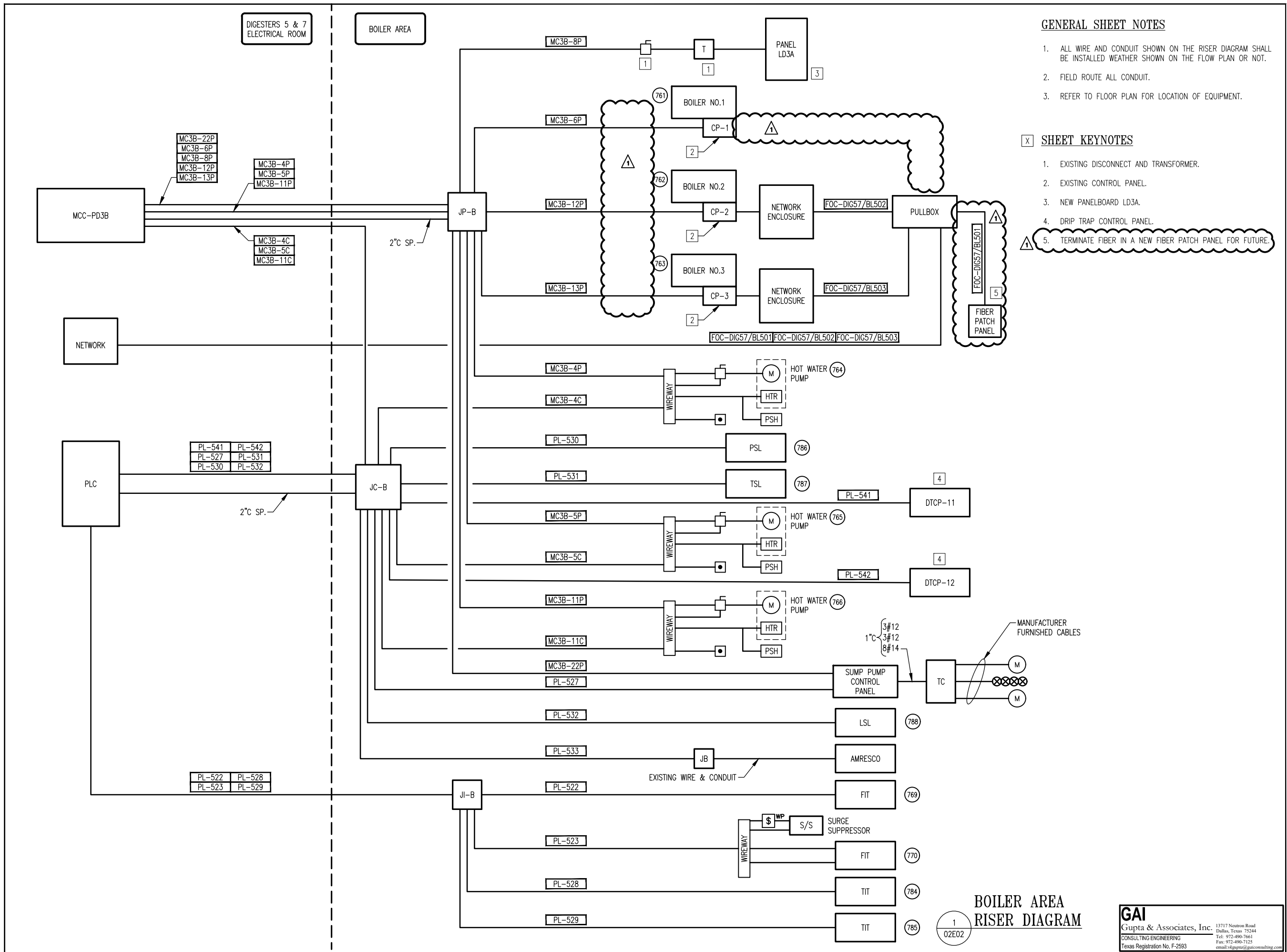
TABLE FOR SECTION B			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PD1-7P	2°C	480V POWER TO EXISTING CONTROL PANEL
2	SPACE	1°C	SPARE

DUCTBANK SECTION C
 SCALE

TABLE FOR SECTION C			
CONDUIT NO.	CONDUIT TAG	CONDUIT SIZE	DESCRIPTION
1	PL-110A, 111A, 310A, 122	2°C	DIGITAL SIGNALS TO PLC
2	LD1-22, 28	2°C	120V POWER
3	SPARE	2°C	SPARE

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- GENERAL SHEET NOTES**
1. ALL WIRE AND CONDUIT SHOWN ON THE RISER DIAGRAM SHALL BE INSTALLED WEATHER SHOWN ON THE FLOW PLAN OR NOT.
 2. FIELD ROUTE ALL CONDUIT.
 3. REFER TO FLOOR PLAN FOR LOCATION OF EQUIPMENT.

- [X] SHEET KEYNOTES**
1. EXISTING DISCONNECT AND TRANSFORMER.
 2. EXISTING CONTROL PANEL.
 3. NEW PANELBOARD LD3A.
 4. DRIP TRAP CONTROL PANEL.
 5. TERMINATE FIBER IN A NEW FIBER PATCH PANEL FOR FUTURE.

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CLIENT INFORMATION

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PHASE 3
CONTRACT NO. PS-00083-01

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BOILER FACILITY RISER DIAGRAM

DRAWING NO.
02E02

SCALE: NO SCALE

DATE: NOV 2021 SHEET 184 OF 231

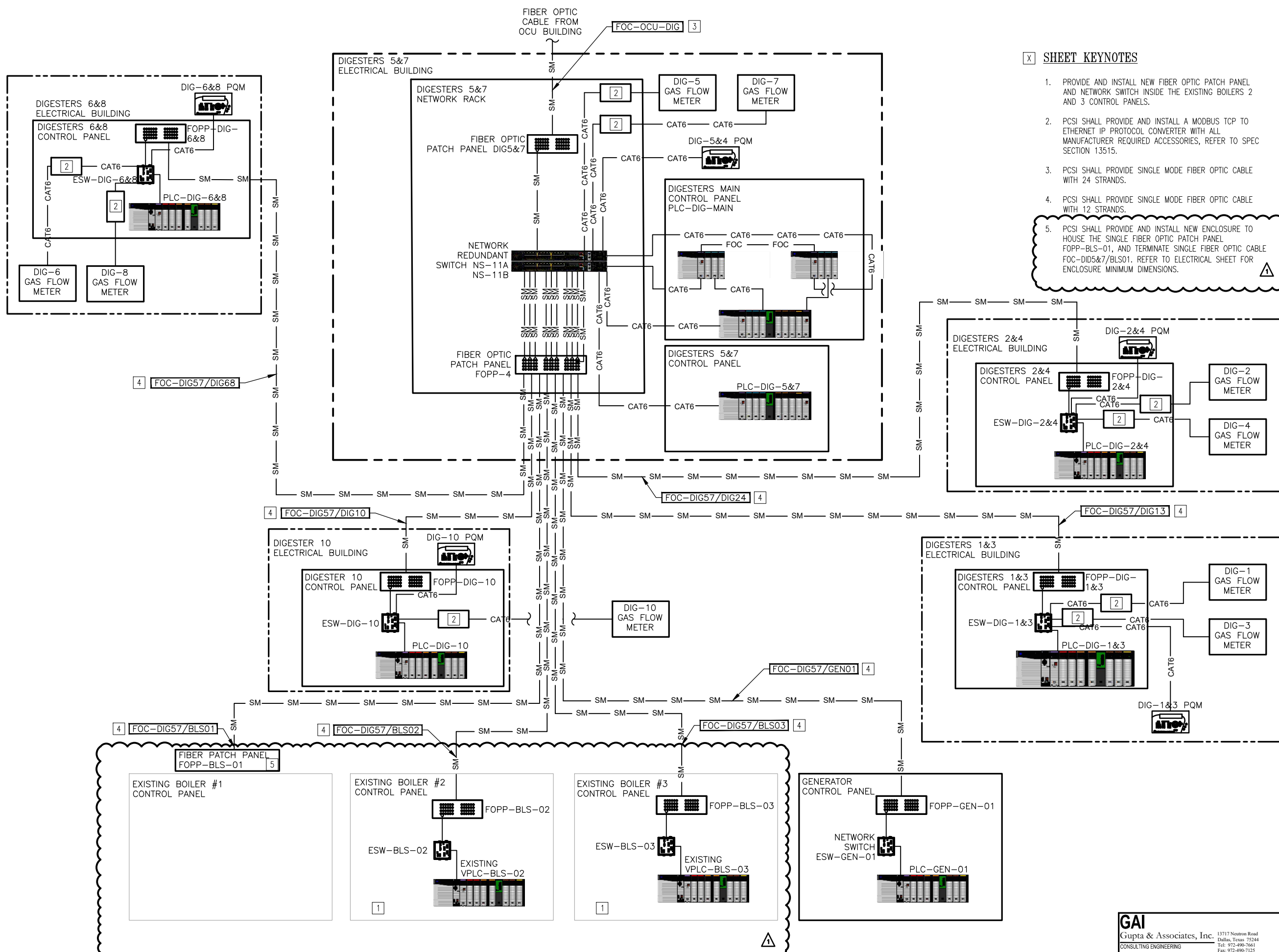
DES: VKG DRAWN: CEM CHECK: GL

BOILER AREA RISER DIAGRAM

1
02E02

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X SHEET KEYNOTES

1. PROVIDE AND INSTALL NEW FIBER OPTIC PATCH PANEL AND NETWORK SWITCH INSIDE THE EXISTING BOILERS 2 AND 3 CONTROL PANELS.
2. PCSI SHALL PROVIDE AND INSTALL A MODBUS TCP TO ETHERNET IP PROTOCOL CONVERTER WITH ALL MANUFACTURER REQUIRED ACCESSORIES, REFER TO SPEC SECTION 13515.
3. PCSI SHALL PROVIDE SINGLE MODE FIBER OPTIC CABLE WITH 24 STRANDS.
4. PCSI SHALL PROVIDE SINGLE MODE FIBER OPTIC CABLE WITH 12 STRANDS.
5. PCSI SHALL PROVIDE AND INSTALL NEW ENCLOSURE TO HOUSE THE SINGLE FIBER OPTIC PATCH PANEL FOPP-BLS-01, AND TERMINATE SINGLE FIBER OPTIC CABLE FOC-DIG5&7/BLS01. REFER TO ELECTRICAL SHEET FOR ENCLOSURE MINIMUM DIMENSIONS.

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MODIFIED DIGESTER AREA
 NETWORK DIAGRAM - II

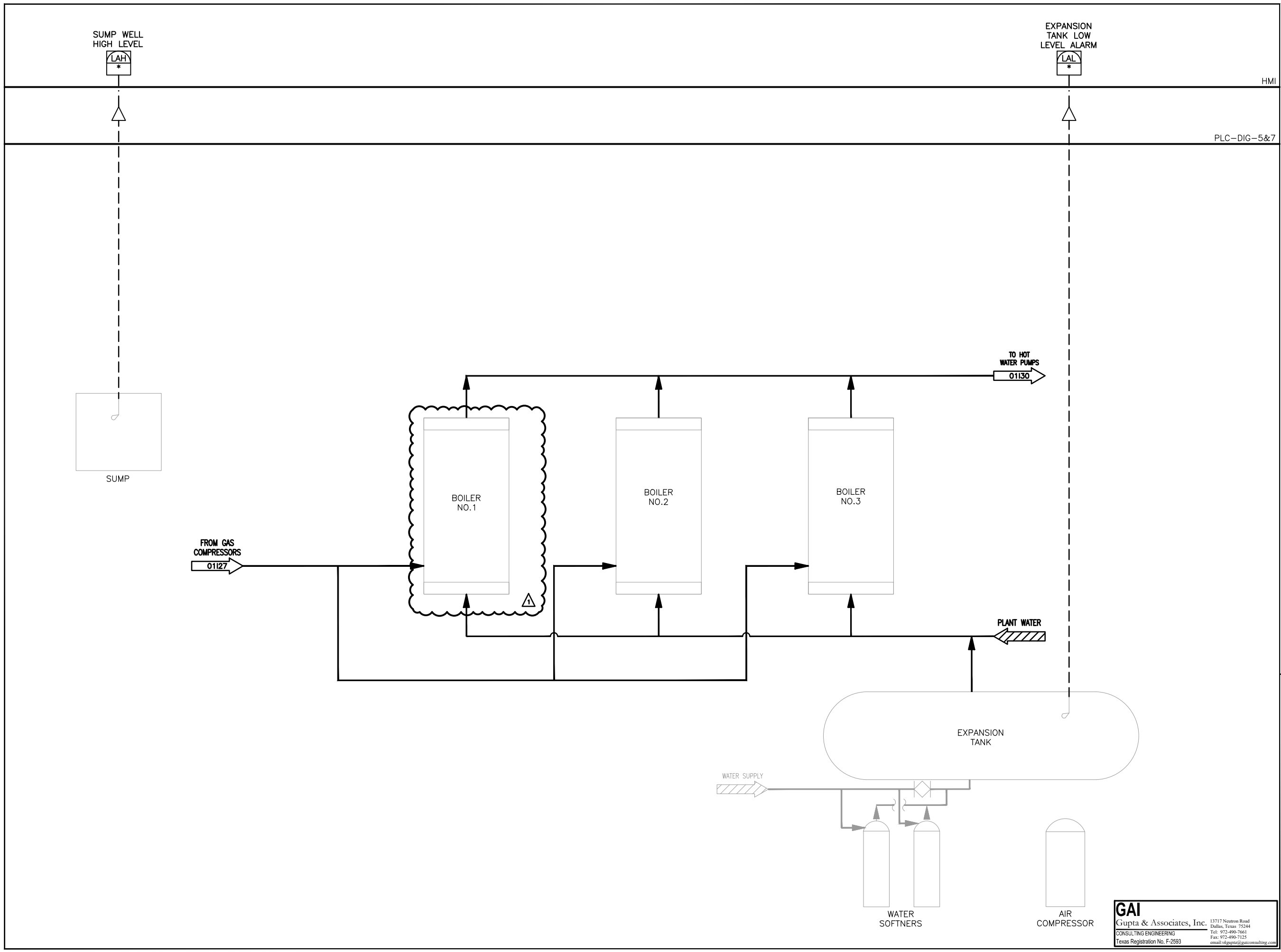
DRAWING NO.
01105

SCALE: NO SCALE

DATE: JAN 2022	SHEET 189 OF 231
DES: FA	DRAWN: MG
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BOILERS P&ID
 DRAWING NO.
01128
 SCALE: NO SCALE
 DATE: JAN 2022 SHEET 212 OF 231
 DES: FA DRAWN: MG CHECK: VKG

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