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Bradenton, FL 34205
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Solicitation Addendum

Addendum No.:	6
Solicitation No.:	19-TA002970CD
Project No.:	6050470
Solicitation Title:	Lake Manatee Water Treatment Plant Filter Upgrade
Addendum Date:	February 22, 2019
Procurement Contact:	Chris Daley, CPPO, CPPB, Procurement Manager

IFBC NO. 19-TA002970CD IS AMENDED AS SET FORTH HEREIN. RESPONSES TO QUESTIONS POSED BY PROSPECTIVE BIDDERS ARE PROVIDED BELOW. THIS ADDENDUM IS HEREBY INCORPORATED IN AND MADE A PART OF IFBC NO. 19-TA002970CD.

Change to:
ADVERTISEMENT, DATE, TIME AND PLACE DUE

The Due Date and Time for submission of Bids in response to this IFBC **is ~~February 28, 2019~~ March 12, 2019 at 3:00 P.M. ET.** Bids must be delivered to the following location: Manatee County Administration Building, 1112 Manatee Ave. W., Suite 803, Bradenton, FL 34205 prior to the Due Date and Time.

Change to:
INFORMATION FOR BIDDERS, FIRST PARAGRAPH OF SECTION A.01, BID DUE DATE:

The Due Date and Time for submission of Bids in response to this Invitation for Bid (IFBC) **is ~~February 28, 2019~~ March 12, 2019 at 3:00 P.M. ET.** Bids must be delivered to the following location: Manatee County Administration Building, 1112 Manatee Ave. W., Suite 803, Bradenton, FL 34205 and time stamped by a Procurement representative prior to the Due Date and Time.

Change to:
INFORMATION FOR BIDDERS, THIRD PARAGRAPH OF SECTION A.43, BASIS OF AWARD:

Multiple schedules for completion of Work shall be considered. Two bids shall be submitted and considered, Bid 'A' based on ~~630~~ 730 calendar days completion time and Bid 'B' based on ~~730~~ 910 calendar days completion time. County, at its sole discretion, shall select either Bid 'A' or Bid 'B', whichever is in the best interest of the County. Only one (1) award will be made.

Change to:
INFORMATION FOR BIDDERS, SECTION A.45, COMPLETION OF WORK:

The Work will be completed and ready for final inspection within the specified calendar days from the date the Contract Time commences to run. Completion time shall be based on Bid 'A' for ~~630~~ 730 calendar days or Bid 'B' based on ~~730~~ 910 calendar days completion time at the County, sole discretion.

Change to:
INFORMATION FOR BIDDERS, SECTION A.50, SOLICITATION SCHEDULE

The following schedule has been established for this Solicitation process. Refer to the County's website (www.mymanatee.org > Online Services > *Bids & Proposals*) for meeting locations and updated information pertaining to any revisions to this schedule.

Scheduled Item	Scheduled Date
Mandatory Solicitation Information Conference at Lake Manatee WTP, 17915 Waterline Road, Bradenton, FL. Site tour will be conducted immediately following the Information Conference.	January 8, 2019, 9:00 A.M.
Additional Site Visit	February 19, 2019, 1:00 P.M.
Question and Clarification Deadline	February 13, 2019
Final Addendum Posted	~~February 21, 2019~~ February 27,2019
Bid Response Due date and Time	~~February 28, 2019, 3:00 PM, ET~~ March 12, 2019, 3:00 PM, ET
Due Diligence Review Completed	~~March 6, 2019~~ March 19, 2019
Projected Award	~~March 2019~~ April 2019

Replace:
APPENDIX I, BID PRICING FORM, PAGES APPENDIX I-2 AND I-3

Replace Bid Pricing Form pages Appendix I-2 and I-3 issued with Addendum 4 with the attached Bid Pricing form pages Appendix I-2 and I-3 revised per this Addendum 6.

Change to:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 01_14_00 SECTION 1.04.C.

Change Section 1.04.C in Specification 01_14_00 as follows:

Bear ~~the~~ any cost directly associated with the violation ~~of penalties imposed on~~ incurred by the Owner for water quality violations caused by actions of the Contractor. Penalty not to exceed $15,000 per occurence.

Change to:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 01_14_00 SECTION 1.05 A.9.

Change Section 1.05 A.9 in Specification 01_14_00 as follows:

Post Mix Basins: Shutdown of post mix ~~basins~~ basin B is not allowed during the months of November to April. Shutdown of both post mix basin A1 and post mix basin A2 at the same time is not allowed during the months of November to April**.**

Add:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 01_14_00 SECTION 1.05 A.10.b

Add Section 1.05 A.10.b to Specification 01_14_00 as follows:

Filter Basin B and Clearwell B cannot be out of service for more than 15 months during the project.

Change to:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 01_14_00 SECTION 1.08 A.5.b

Change Section 1.08 A.5.b in Specification 01_14_00 as follows:

Tie-in for Bypass for Clearwell A - Tie-ins will be constructed for blend chamber bypass piping to Clearwell A. Modifications for piping to Clearwell A ~~piping modifications~~ will be scheduled so that they do not coincide with maximum demand. Take Filter Bay A and Clearwell A out of service for Owner approved short duration, for tie-in to the blend chamber bypass piping to Clearwell A. Modifications for piping to Clearwell A ~~piping modifications~~ will be scheduled so that they do not coincide with the period of high demand. Modifications for piping to Clearwell A ~~modifications~~ may be scheduled either after full membrane capacity is online (preferred), or at the beginning of construction (before Clearwell B is taken offline).

Change to:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 01_14_00 SECTION 1.08 A.5.c

Change Section 1.08 A.5.c in Specification 01_14_00 as follows:

Tie-in for Bypass for Clearwell C - Tie-ins will be constructed for blend chamber bypass piping to Clearwell C. Take Filter Bay C and Clearwell C out of service for Owner approved short duration, for tie-in to the blend chamber bypass piping to Clearwell C. Clearwell C piping modifications will be scheduled so that they do not coincide with the period of high demand. Clearwell C modifications should ~~may~~ be scheduled ~~either after full membrane capacity is online (preferred), or~~ if possible at the beginning of construction (before Clearwell B is taken offline), which is the Owner preference. If that's not possible due to Contractor's work sequencing, then Clearwell C modifications may be done after full membrane capacity is online.

Replace:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 01_75_19 SECTION 3.01.B

Replace Section 01_75_19, Part 3.01.B with the following:

B. Test the following concrete structures for water leakage:
   1. Existing structures before modifications (i.e., membrane tanks and influent channel, post-mix basins, clearwells) to give a base line.
   2. Membrane tanks including influent channel.
   3. Permeate storage tank compartments (in Chemical Building).
   4. Post-mix basins upstream of the new wall installed for the pre-screens.
   5. Equalization tank.
   6. Clearwells B and C.
   7. False floor separating the bottom of the membrane basins from Clearwell B.

Replace:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 01_75_19 SECTION 3.02

Replace Section 01_75_19, Part 3.02 with the following:

A. Water used for the first filling of the tank will be furnished by Owner.
   1. Contractor shall obtain water for leakage testing of the membrane tanks and post-mix basins from settled water from the influent channel to filter Bay A. Pumps and pipes to convey water is to be provided and powered by Contractor.
   2. Contractor shall obtain water for leakage testing of the permeate storage tank from the plant's utility water supply. The Utility Water connection indicated on the Drawings may be used for filling one compartment of the permeate storage tank. Each compartment of the permeate storage tank shall be tested independently. The test water from the first compartment shall be reused for testing the second and third compartment.
   3. Contractor shall obtain water for leakage testing of the false floor, equalization basin, and clearwells from the plant's utility water supply. All other pumps and pipes to convey water is to be provided and powered by Contractor.

B. In the event that retesting is required, Contractor shall bear the cost of refilling the tank for subsequent tests.

C. After leakage testing is complete, Contractor shall dispose of water.
   1. For testing of membrane tanks and influent channel, false floor, post-mix basins, clearwells, and permeate storage tank, Contractor shall dispose of water by pumping and piping it to the Backwash Ponds.
   2. For testing of Equalization Basin, Contractor shall dispose of water by pumping and piping it to the sanitary sewer.

Replace:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 01-78-23 OPERATIONS AND MAINTENANCE DATA

Replace Specification 01-78-23, Operations and Maintenance Data, with attached Specification 01-78-23, Operations and Maintenance Data revised per this Addendum 6.

Add:
BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 40-05-33.03 HIGH DENSITY POLYETHYLENE PLASTIC (HDPE) PIPE: AWWA C906

The attached Specification 40-05-33.03, High Density Polyethylene Plastic (HDPE) Pipe, is hereby incorporated into this IFBC.

Add:

BID ATTACHMENT 2, VOLUME 1 TECHNICAL SPECIFICATIONS, SPECIFICATION 43-33-40.01 MAGNETIC DRIVE ROTARY SAMPLE PUMPS

The attached Specification 43-33-40.01, magnetic Drive Gear Rotary Sample Pumps, is hereby incorporated into this IFBC.

Replace:

VOLUME 2 PLANS, PLAN SHEET 03S04

Replace Plan Sheet 03S04 with the REVISED Plan Sheet 03S04 issued with this Addendum 6.

Replace:

VOLUME 2 PLANS, PLAN SHEET 03S12

Replace Plan Sheet 03S12 with the REVISED Plan Sheet 03S12 issued with this Addendum 6.

Replace:

VOLUME 2 PLANS, PLAN SHEET 04S02

Replace Plan Sheet 04S02 with the REVISED Plan Sheet 04S02 issued with this Addendum 6

Replace:

VOLUME 2 PLANS, PLAN SHEET 00M02- PIPE SCHEDULE

Replace Pipe Schedule on Plan Sheet 00M02 with the REVISED Pipe Schedule that is issued with this Addendum 6.

Replace:

VOLUME 2 PLANS, PLAN SHEET 05DM01

Replace Plan Sheet 05DM01 with the REVISED Plan Sheet 05DM01 issued with this Addendum 6.

Replace:

VOLUME 2 PLANS, PLAN SHEET 05DM02

Replace Plan Sheet 05DM02 with the REVISED Plan Sheet 05DM02 issued with this Addendum 6.

Replace:

VOLUME 2 PLANS, PLAN SHEET 05M02

Replace Plan Sheet 05M02 with the REVISED Plan Sheet 05M02 issued with this Addendum 6.

Add:

VOLUME 2 PLANS, TYPICAL DETAILS M263, P310, P602, P604, P613

The attached Typical Details M263, P310, P602, P604, and P613 are hereby incorporated into this IFBC.

Add:

The following items are issued with this Addendum 6 for informational purposes only:

1. Post Mix A Record Drawings (T28 and T29)- February 1965

QUESTIONS AND RESPONSES:

Q1. Specification section 46_05_10 - 1.04.C.1.a – Requires continuous welds. Hydro-Dyne screens are designed and fabricated for very tight tolerances, so we use continuous welds only where required. The screen is also fully passivated for corrosion protection. Please confirm this is acceptable.

R1: The design and fabrication of individual equipment to meet the requirements of the specifications is the responsibility of the equipment manufacturer, and the Engineer cannot comment on the specific use of continuous welds, tolerances, etc. employed by the manufacturer. The screen materials shall be suitable for use in a water treatment plant with the settled water quality conditions as previously discussed with Hydro-Dyne and as shown in Volume 3 Appendix B (Bid Submittal)-MFS Procurement Documents, Section 46_51_42.01, Exhibits 1A and 1B.

Q2. Specification section 46_05_10 - 1.04.C.2 – Requires manufacture to machine support pads. Our support pads are manufactured to a tolerance of 1/16" which is sufficient for leveling and anchoring; and therefore, do not require machining. Please confirm this is acceptable.

R2: Section 46_05_10 establishes basic requirements for all process and building mechanical equipment for the project. It is not intended to replace, override or supersede any specific design, manufacturing or installation criteria individual manufacturers require for their equipment. The manufacture shall provide support pads to meet or exceed the requirements of Section 46_05_10 and that will facilitate proper installation and operation of their equipment.

Q3. Specification section 46_05_10 - 1.04.C.3 – Requires supply of jacking screws in bases and supports for equipment weighing over 1,000 pounds. Request clarification of scope split between equipment supplier and contractor for anchoring of screens. Equipment supplier can provide jacking screws and supports to anchor equipment (anchors provided by ??) to contractor supplied concrete stands.

R3: The scope of supply for the screen anchoring system must be determined between the equipment suppliers and the Contractor.

Q4. Specification section 46_05_10 - 1.04.C.5.b – Requires selection and supply of anchors. Request clarification as to whether this is in contractor's or equipment manufacturer's scope (not specified elsewhere).

R4: The scope of supply for the screen anchoring system must be determined between the equipment suppliers and the Contractor.

Q5. Specification section 46_05_10 - 1.05.D.2 – Requires submittal of calculations for mechanical equipment. Our screen will rotate extremely slow compared to equipment where these calculations would be needed. Please confirm we do not need to supply these calculations

R5: The structural calculations (Section 46_05_10, 1.05, D, 1, a) and bearing life calculations (Section 46_05_10, 1.05, D, 2, a) are required. Per Section 46_05_10, 1.05, D, 2, c, torsional analysis is only required if is specified in the individual equipment specification section. A torsional analysis is not specified in Section 46_21_43 and therefore not required.

Q6. Specification section 46_05_10 - 1.05.E.2.b - Requires inclusion of calculated ball pass frequencies in O&M. Our screen will rotate extremely slow compared to equipment where these calculations would be needed. Please confirm we do not need to supply this information.

R6: The equipment manufacturer shall conform to the requirements of the specifications for ball pass frequencies. If the equipment manufacturer has substantiating data to justify the elimination of the requirements, then such data should be submitted during the submittal process subsequent to the award of the Construction Contract

Q7. Specification section 46_05_10 - 3.02.B.1 – Requires cast-in-place anchors. Our equipment does not use cast-in-place anchors. Please confirm this is acceptable.
R7: Acceptable anchors shall be from the types specified in Sections 03_21_17 and 05_05_24.

Q8. Specification section 46_05_94 - 3.07 – Requires balancing of equipment and vibration testing. Our screen will rotate extremely slow compared to equipment where this would be needed. Please confirm we do not need to balance and conduct vibration testing.
R8: The equipment manufacturer shall conform to the requirements of the specifications for the balancing and vibration testing requirements. If the equipment manufacturer has substantiating data to justify the elimination of the requirements, then such data should be submitted during the submittal process subsequent to the award of the Construction Contract.

Q9. Drawings N05 thru N33 note 1, states all signals are to be connected to the membrane system supplier MSS panel. There are many field devices with light/faded dashed lines throughout those pages that indicates a diamond shape to suggest that equipment is being furnished by the division 40 supplier. Also, note 1 states 'all dotted lines/equipment' is by others. Please advise.
R9: The devices shown with the diamond symbol are to be provided by the Instrumentation and Control (I&C) Contractor and the faded line shows the signals will be connected to the MSS supplied PLC or RIO system. The faded notes (No.1 thru No.3) are from the MSS supplier drawings and not applicable to the I&C Contractor. I&C Contractor shall furnish and install devices/instruments as per the dark lineweight notes and symbols. I&C Contractor shall also review the Attachment 4 Volume 3 Appendix A to delineate the scope between I&C Supplier and MSS supplier (as per note No.9 on drawing 00N01 in Volume 2).

Q10. Section 46 05 94, 3.07, E, 4 (table) : States "Vertical Turbine, Mixed Flow, and Propeller pumps…" to have a field and factory vibration test limit of "0.13" in/sec . ANSI/HI 9.6.4-2016 standard states: factory testing in POR = 0.221 in/sec, outside of POR = 0.17 in/sec. Field vibration in POR = 0.13 in/sec, outside of POR = 0.169 in/sec. We request the vibration testing standards be per ANSI/HI 9.6.4-2016 standard.
R10: The vibration velocity limits shown in Section 46_05_94, 3.07, E, 4, c for the Vertical Turbine, Mixed Flow, and Propeller Pumps (HI Types VS1, VS2, VS3, VS4, VS5, VS6, VS7, and VS8) are based on the 2009 Version of the Hydraulic Institute Standard, HI 9.6.4 version. The limits will be modified to match those shown in the 2016 version of HI 9.6.4, which is the most recent standard.

Q11. RW Gate has extensive experience in the design and fabrication of stainless steel slide gates such as those designed for this project. RW Gate Company respectfully request that they be added to the list of approved manufactures in specification Section 40_05_59.20.
R11: Specification 40_05_59.20 will remain unchanged. Sections 01_60_00, 2.03 and 40_05_59.20, 2.01, B. allow for "or equal" submittals, which would be addressed through the submittal process subsequent to the award of the Construction Contract. The Engineer will make the sole determination if a product is deemed as an "or equal".

Q12. Per drawing 00C07 the existing Electric Substation Pad is 3' of off the northern wall of the new Chemical Building. The Permeate Storage Tank is located on the north side of the Chemical Building and its foundation extends 3' north of the exterior wall and 20' below grade per drawing cut section H/02S05. The edge of the foundation for the Permeate Storage Tank appears to be in the same location as the edge of the Electrical Substation Pad and is 20' below grade. Per specification 315000-1.04B.4 (Set inside face of shoring not less than 2 foot 6 inches from edge of foundation) due to this requirement and the location of the existing Electrical Substation Pad we believe the Permeate Storage Tank cannot be constructed in its current configuration. Please confirm how the contractor will protect the Electrical Substation Pad due there being no room for sheeting/shoring.

R12: The shoring distance specified in Section 31_50_00 Article 1.04.B.4 can be reduced on the south side of the existing substation pad; particularly near the concrete handhole.

Q13. Due to complexity of the demolition as we must maintain operations of water during the demolition of Filter Train B can Record Drawings be provided for this structure.
R13: See Addendum No. 5 for record drawings.

Q14. Drawings 00E14, 00E16 various conduits are shown without the circuit schedule classification, please provide updated drawings.
R14: Circuit schedule tables are shown on drawing 00E24.

Q15. Drawings 00E05, 00E06 various pumps call for pulling VFD cable with control wires. Due to the VFD cables being armored per the specs, should the control wires be pulled in same conduit, this could cause damage to control wires. Please advise.
R15: VFD armored cables consists of exterior PVC jacket (see Southwire Armor-X cables cut sheet or equal). The code allows control and VFD cables in the same conduit as long as the insulation rating is the same. Contractor shall be aware that VFD armored cables must be terminated with armored cable termination kits at both ends.

Q16. Analog cables in duct banks can be installed in PVC 40, is this acceptable? Please advise.
R16: PVC 40 is the correct type of conduits for duct banks as per specification 26 05 33, 3.03 describes the underground concrete encased raceways shall be “PVC schedule 40” and all exposed conduits shall be “Rigid Aluminum” except for lighting circuits in a conditioned environment. Contractor shall be aware that that instrumentation conduits must be 2 feet away from 480V duct bank and 1 feet away from 120V duct bank as per Note 20 on Drawing 00E02.

Q17. Please confirm that the MSS supplier has bonded the equipment to the Owner.
R17. Confirmed. The MSS supplier has bonded the equipment to the Owner.

Q18. Specification 40-05-00.01-2.05G calls for PTFE gaskets to be used for drinking water piping meeting NSF requirements. Please direct as to which piping services this will apply.
R18: The following piping services shall meet NSF requirements: BCB, BLW, CFL, MFL, and WM. Change PTFE gaskets to EPDM material with 80 Shore A durometer rating, Garlock, 98206, John Crane, or equal.

Q19. Referencing Specification Section 01 14 00; Paragraph 1.04-C, this sentence states the Contractor shall bear the cost of penalties imposed on the Owner for water quality violations caused by actions of the Contractor. This statement is open ended in that these potential penalties are not specified, and the dollar amount is not capped or limited. Not knowing what these potential penalties and amounts are puts an unmeasurable amount of risk on the Contractors and makes calculating that risk difficult in preparing our bids. Please consider removing this statement or please specify the potential amounts or cap the amount of penalties applied to the Contractor.
R19: Water quality violations penalties are determined by the FDEP and incur various expenses for the Owner. The penalty has been capped.

Q20. Drawing 02M20 shows IX Supply Pump labeled as 20-FV-602-2. Please confirm this is the same pump as listed in Specification Section 43 23 13.45 (Horizontal Self-Priming Sample Centrifugal Pumps).
R20: Correct. The tag label on Drawing 02M20 for the IX Supply Pump is incorrect. The remaining drawings and specifications tag the IX Supply Pump correctly as 20-P-901.

Q21. Reference Drawing 05M02: A new 36" clearwell overflow pipe is shown. Where does this pipe connect outside of the clearwell?
R21: Connect new 36" OF to the existing 36-inch overflow pipe north of existing 12D-DI/MJ (north of Filter No. 16 outside the building). Refer to drawings M-31 and C-23 in Addendum 5 Record Drawing Part 2 and Part 3.

Q22 Drawing 03M08 shows Sample Pumps 20-P-101-A and B with a detail designation M263. However, this detail is not provided with the Typical Mechanical Details (Dwg. 00GM01 to 00GM03). Please clarify.
R22: Typical Detail M263 is attached in this Addendum.

Q23 Drawing 05M01 and 05M02 Key Note 9 calls for chemical injection pipes to be field routed to the nearest existing chemical carrier pipes. We need to know the location of the nearest existing chemical carrier pipes. Please advise.
R23: Locations are in the existing chemical pipe trench on west side of filter Bay B, between filter Bay B and C and the east side of the Blend Chamber. Existing chemical trench is identified on 05M01 and 05M02.

Q24. Drawing 04M02 shows the installation of four (4) new slide gates at the existing Post Mix Basin B channel wall. However, no details are provided if the Contractor is to provide new wall openings for these gates. Please provide the required wall opening dimensions for these new slide gates.
R24: The wall openings are existing (1'-0" x 4'-8").

Q25. The Process Flow Diagram on drawing 00M10 contains a note to "Supply shelf spare for Sodium Hypochlorite Bulk Transfer Pump". However, this pump is not listed in the specifications nor any details provided. Please provide specifications for this pump.
R25: Contractor shall supply a shelf-spare sodium hypochlorite bulk transfer pump that matches existing (Finish Thompson DB6V Mag Drive pump for sodium hypochlorite service, 1/2 HP, single phase, 1-inch connections, teflon/viton components).

Q26. Reference IFBC, General Conditions Article 2.4.FF.(3) and Article 13.1.(N). As defined in these Articles of the contract and as further noted in specification section 01 78 36, the project warranty period is 3 years. It is requested that the warranty period be modified to a period of 1 year.
R26: The warranty period shall remain as stated in the IFBC.

Q27. Reference IFBC, General Conditions Article 13.1.(N). We are unable to accept the terms of this paragraph requiring the Contractor to bear "indirect and consequential costs" associated with warranty repairs. Please delete from this paragraph.
R27: General Conditions Article 13.1.N shall remain unchanged.

Q28. Reference IFBC, General Conditions Article 5.5. This section only allows adjustments to contract sum and/or contract time if work is stopped for more than a seven (7) day period. Please remove the reference of 7 days in the last sentence.
R28: General Conditions Article 5.5 shall remain unchanged.

Q29. Reference IFBC. General Conditions Article 14.1. Regarding termination for cause by the Owner, no time for cure is stated. Please provide a provision for a fourteen (14) day period to begin cure.
R29: General Conditions Article 14.1 already provides for periods of cure, and shall remain unchanged.

Q30. Photo 2 on drawing 03DM02 notes to "Demolish existing 36" pipe supports…..See Structural drawing for new pipe supports." However, no other drawings show or note which existing pipe supports are to be demolished. Drawing 03S02 shows the new support footings and the locations shown seem to indicate that all six (6) existing 36" pipe supports need to be removed. Please confirm which existing pipe supports need to be demolished.
R30: There are four existing pipe supports to be demolished.

Q31. Drawing 05DM02 shows a section view of the existing pipe which needs to be demolished under the existing roadway between Filter Buildings B and C. This section view shows the support piers and footings for the elevated walkway/pipe support structure. However, this section view cuts off the support pier in the middle of road just below grade and does not show the full depth or footing in relation to the existing pipe. Please provide as-built drawings or additional details of this support so the Contractor will fully know what will be required to remove and replace these pipes.
R31: Refer to drawings S-26, M-15, and M-16 in Addendum 5 Record Drawing Part 2 and Part 3.

Q32. We understand two site inspections have already been provided for this project. However, as we have delved into the details of this project an additional site visit would be helpful to obtain more information regarding some unique situations in the construction of this project. Can another site visit be arranged?
R32: See Addendum 5.

Q33. Reference Drawings 05M01 and 05DM02: Some of the elevated walkway foundations are not shown. We need to know the size and elevation of all of these foundations, to determine how to install the new 54" piping in this area. Please provide any as-built information available for these foundations. Related to this subject it appears that the footing on the attached sketch will likely be in direct conflict with the routing of the new 54". Please advise as to resolution of this conflict.
R33: Refer to drawings S-26, M-15, and M-16 in Addendum 5 Record Drawing Part 2 and Part 3. We didn't find the referenced 'attached sketch' highlighting the potential conflict. Note that the intent is to install the new 54" piping along the same route as the existing 54" piping.

Q34. Due to the details and specifics to complete this project without disrupting operation of this plant, we are requesting a one week postponement for the bid due date to better understand and estimate the requirements of this project.
R34: The Bid Date has been extended with this Addendum.

Q35. Several lining systems for ductile iron pipe are listed in Specification 40-05-19.01. Please direct as to which piping services will use each of the linings.
R35: Modified Pipe Schedule for pipe linings and coatings is included in this Addendum 6.

Q36. Pipe schedule on 00M02 calls for NWW underground to be HDPE Schedule 80. Plan sheet 00C07 shows this line is 16" diameter. Please provide a specification for 16" HDPE. Is DI pipe an acceptable alternative to HDPE?
R36: The HDPE pipe thickness shall be DR 11. Ductile iron pipe will not be accepted for the underground portions of the NWW piping. Ductile iron pipe is required inside the Waste Equalization Tank for the stand pipe. The HDPE pipe specification is included in this Addendum 6.

Q37. Per Drawings 00C07 and 00M02, 10" CIP, 14" MFL, and 16" OF underground piping is shown as PVC Schedule 80. Please confirm if this is correct?
R37: Please see revised pipe schedule in this Addendum 6.

Q38. Reference Drawing 99A01; the door and frame type designations have not been provided on the Door Schedule. Also, not shown on same drawing are Details 10, 11, and 12. Please provide.
R38: Sheet 99A01, Chemical Building and Filter Building, Door and Louver Schedule; Door and Frame Type; Clarification: For the hangar door requirements, refer to detail 2 on 03A17 for architectural intent, and please refer to structural drawings for all proposed beam sizes and locations. The proposed hangar style doors are intended to operate similar to an overhead door with mounting/guide tracks in lieu of any required frames. See the response to next item for further clarification.

Q39. Reference North Elevation 1 on Drawing No. 03A11; there does not appear to be enough information provided for the head and jamb supports for such large impact resistant hanger doors and oversized aluminum swing doors. Please provide additional details of how these doors are to be anchored and weatherstripped.
R39: Sheet 03A11, Filter Building North Elevation, Head and Jamb Supports Detail; Clarification: Door(s) 101B, 208B, 208C, 209B, and 209C are custom engineered doors and require a specialty engineer. Door(s) 101B, 208B and 209B are standard swing doors where the header will be an integral part of the hangar style door and may or may not require an easily removable header/jamb. Doors 208C and 209C are engineered hangar style doors and must be designed and operate integrally with swing style doors. It is the responsibility of the manufacturer and contractor to provide signed and sealed shop drawings by a specialty engineer that meet the requirements of the proposed openings. Refer to structural drawings for all wind load and structural requirements.

Q40. Drawings 03DM03 and 03M01 shows the required pipe demolition and replacement in Clearwell B. However, the drawings do not indicate any access openings into this clearwell to move pipe in and out of this space. Please provide as-built drawings or any additional information that shows any existing access openings to this clearwell.
R40: See markup to Drawing 03S04 included in this Addendum, indicating the location of a new access opening required in the permeate pump area for access to Clearwell B.

Q41. Specification Section 01 50 00; Paragraph 1.04-A-3 and 1.04-D-4 both reference a 30-day operational test. However, Specification Section 01 75 17 (Testing, Training, and Facility Start-up); Paragraph 1.07 describes a 7-day operational test. Please clarify.
R41: Replace reference to 30-day operational test in Section 01_50_00, Paragraph 1.04.A.3 and 1.04.D.4 with 7-day operational test. This refers to the operational test that will be required to obtain the Certificate of Proper Installation. After the 7-day operational test and issuance of Certificate of Proper Installation, additional testing and delivery of membrane manufacturer field services (e.g., Functional Testing, Direct Integrity Test Validation, Initial Performance Test, and Membrane Filtration System Monitored Test Period) are required, as described Section 46_51_42.01 in the Membrane Filtration System Procurement Documents.

Q42. Specification Sections 40 70 01; Paragraph 1.06-A and 40 90 00; Paragraph 1.06-A both state to guarantee all equipment and installation for a period of one year. However, Specification Section 01 78 36; Paragraph 1.05-F states the warranty duration is 3 years per Article XIII of the General Conditions. Please clarify.
R42: The project shall have a warranty duration of 3 years on all equipment and installation as specified in 01_78_36 (per Article XIII of the General Conditions), except for the I&C portion (ref. 40-70-01 Article 1.06.A and 40-90-00 1.06.A), for which warranty shall be 1 year on all equipment and installation.

Q43. Controlled Low Strength Material (CLSM) as referenced in specification section 31_21_24 is required per Note 2 on drawings 02S04 and 02S05. What is the intended depth and extent of CLSM beyond the outside edge of foundation? The chemical building drawings only reference CLSM installation beneath the structure foundation; please confirm the chemical building structure is the only structure requiring CLSM.
R43: Provide CLSM where shown on the drawings. The depth and extent are dependent on the excavation limits. This is a Contractor decision.

Q44. Specification 434168-6, Sections 2.07A and D, require the tank to be built with a 1/10th rise dome. We suggest requiring a 1/12th rise for any domed tanks less than a 50'-0" diameter. The tank surface profile will be more ascetically pleasing to the eye. Please confirm that a 1/12th rise is acceptable in lieu of a 1/10th rise.
R44: A 1/12 dome rise is acceptable.

Q45. Please confirm that the Waste Equalization tank does not require disinfection.
R45: The Waste Equalization tank does not require disinfection.

Q46. Drawing Sheet 02M24, requires a 50" dome center vent with cover. Drawing Sheet 02M26, Detail H, shows a 50" dome center vent. Typically, Crom provides a 25" vent for tanks less than 50'-0" in diameter. Please delete 50" vent and replace with 25" vent.
R46: The 50” vent will be replaced with a 25” vent.

Q47. Drawing Sheet 02M24, requires the exterior aluminum ladder to include a TS safety rail, safety cage and cage security gate. Drawing Sheet 02M26, Detail G, shows the exterior aluminum ladder with a TS safety rail, safety cage and cage security gate. OSHA does not require safety devices on exterior ladders with a length less than 20'-0". However, if security is a requirement, Crom suggests requiring a ladder security door, detail provided. Please confirm if the ladder security door is an acceptable alternate in lieu of the TS safety rail, safety cage and security gate.
R47: The Owner prefers to keep the exterior ladder, including safety rail, cage and cage security gate as shown on the Drawings.

Q48. Please confirm if the aluminum dome handrail, exterior ladder, and/or ladder security door are required to be anodized.
R48: Confirmed

Q49. Specification 260526 provides information about grounding. Specification 264100, Section 1.02 A5, requires a lightning protection system. Section 3.04B, requires 1-inch PVC conduit provided in building walls or columns for main downleads and roof risers. Drawing Sheet 00E34 notes that the contractor shall bond rebar in foundation to ground using exothermic connections. Bonding to any concrete encased tank steel is not recommended and shall not be allowed per the tank manufacturer. All bonding shall be done by using air terminals on the top of the tank dome with PVC conduit adhered to the exterior tank wall. Electrical grounding to the reinforcing of a prestressed concrete tank is prohibited by AWWA D110-13, per Section 5.16. Items requiring grounding, such as lightning protection, are required to be a separate system with its own ground connections. Excerpts of the referenced sections are provided below.
• AWWA D110-13, Sec. 5.16 – Electrical grounding to non-prestressed reinforcing steel or prestressed reinforcement for any equipment or electrical service shall be strictly prohibited.
• AWWA D110-13, Sec. 5.17 – Lightning protection, if required, shall be a separate system with its own ground connections.

R49: Engineer agrees with Crom recommendation on installing PVC conduit adhered to the exterior of the tank wall for bonding air terminals to the ground grid. Ground grid shall be provided as per drawing 00E34 around the tank but do not bond to the tank rebar. New ground grid shall have 3 ground rods as shown on 00E34 to form its own grounding system. Grounding Note 2 on drawing 00E34 is not applicable to Crom tank.

Q50. Please confirm that there are no wage scale requirements for this project.
R50: Confirmed.

Q51. Please confirm that this project is not subject to Buy American/AIS Requirements.
R51: Confirmed.

Q52. Where is the nearest valve to the east on the 36" DIP of Train C that is to be removed and capped per Note 6. on Drawing 05DM01?
R52: Refer to drawing M19 for degasifiers in Addendum 5 Record Drawing Part 3.

Q53. Please provide the discharge location of the 8” FM shown on Drawing 00C08. Does this tie to the Manatee County Wastewater System?
R53: The 8” FM is existing and connects to the existing force main located along Waterline Road.

Q54. Please confirm the sizing of the new Clearwell B vent piping is 24" on Drawing 03M19 as a note indicates we are to provide a 24" x 24" removable mesh screen. I do not see the piping size for the vent on this drawing but the existing vent that is being removed on Drawing 03DM02 is 30".
R54: The new Clearwell B vent piping on drawing 03M19 is 30”.

Q55. Drawing 03S2, note 2, calls out 3” grout infill. Please clarify type of grout required
R55: Epoxy grout per 03_60_00.

Q56. Drawing 03S08 shows several precast connection Details. Is there a Detail to show precast column to precast beams?
R56: Connection to be detailed by precaster per General Notes on 03S05.

Q57. Drawing 03S04 Calls out HD-50 Solid AL Plank. Drawing 04S01 & 04S02 Call out HD-40 Solid AL Plank. Please confirm Filter Building Grid Line 12 Separates the two types of Solid AL Plank areas. Drawing 03S04 note8.
R57: Grid line 12 separates the plank types.

Q58. Where does the 36" OF pipeline on Drawing 05M02 tie-in to an existing piping on the north side of Train C?
R58: Connect new 36” OF to the existing 36-inch overflow pipe north of existing 12D-DI/MJ (north of Filter No. 16 outside the building). Refer to drawings M-31 and C-23 in Addendum 5 Record Drawing Part 2 and Part 3.

Q59. Please confirm Note #8 - 720 linear feet of channel is to cover the 4’ wide Channels along Grids C & H from Filter Bld. Grid 12 South to Post Mix A & B. and includes all Solid AL Plank shown on Drawings 04S01 & 04S02.
R59: Note 8 refers to the AL plank indicated by the arrow and not all AL plank on Drawing 04S01 & 04S02.

Q60. During Start-up and testing of the system where will the water for testing be disposed of as this could be a substantial volume and duration for the process start-up prior to being approved by the FDEP to place the water into the potable water system? Please identify the location for discharge.
R60: Refer to Item #21 in Addendum No. 4 for discharge from membrane system startup related to glycerin flushing to the Manatee County Southeast Water Reclamation Facility. Outside of that, the discharge from other testing can be to the lift station (via the new neutralization system/waste equalization tank) or the existing backwash pond at the Lake Manatee WTP, in consultation and approval with the Owner depending on the type of test and discharge volume. Chlorinated water may only be disposed of in a sanitary sewer system with the written permission of the Owner. The discharge to the sanitary sewer shall not exceed 400,000 gallons per day.

Q61. Please confirm that the "Bidder's Qualifying Agent" in question #12 in Appendix F is referring to the "Surety's Resident Agent" in question #18 in Appendix A.
R61: No, these are two separate individuals. The Bidder's Qualifying Agent is an individual employed by the Bidder that meets the requirement of Section 489.119 of the Florida Statute. The Surety's Resident Agent is an agent for the Surety company.

Q62. There are several large bids in the State of Florida taking place within one week of this bid. Please consider moving the bid a minimum of 2 weeks to avoid potential conflicts.
R62: The Bid date has been extended with this Addendum.

Q63. Are there existing floor drains in the Wet Well for Train A, Train B & Train C? These tanks must be drained to perform work in Post Mix A & Post Mix B? I do not see any shown in the Bid Documents?
R63: For Post Mix A, refer to the two drawings M-4 and M-5 (T-28 and T-29) included in this Addendum 6 from the 1965 record drawing set. For Post Mix B, refer to record drawings in Addendum 5 Record Drawing Part 2 and Part 3.

Q64. Are there any pressure relief valves in the bottom of the Structures being modified and drained previously and is uplift a concern that must be anticipated while they are drained?
R64: Record drawings does not indicate pressure relief valves at existing structures. Contractor shall maintain groundwater level at no more than EL 49.25 while Clearwell B is empty.

Q65. Please provide location and existing piping configuration for the Backwash Pumps that will be taken out of service per Addendum 4 Question 19. Please provide the location for the water source for the potential temporary pump to supply backwashing of the Filter Train A during this time period for the demolition and construction of Train B Modifications.
R65: Item #9 in Addendum No. 4 pertains to temporary bypass piping for backwash waste water, not backwash supply water. Refer to drawing 00DM03 for the two manholes (on southeast and northeast corners of Bay B) that need to be connected via the temporary bypass piping and pumping (for backwash waste water). During construction, Bay A filters will continue to be provided with backwash supply water from the backwash pump in Clearwell A or from the existing elevated storage tank.

Q66. Specification 01 60 00 2.02A Products in contact with drinking water and Concrete Specification 03 30 00 2.01.D 2.D, 201.D.3.A. reference to NSF 61 Testing for The Concrete Mix design materials. Does the concrete have to be certified in compliance with NSF 61 for water containing structures only or will all concrete have to be certified as NSF 61 approved?
R66: Water containing structures shall use NSF 61 certified concrete.

Q67. We are requesting a 2week extension of the Bid Date as some electricians were not willing to start reviewing the project until after the clarification of the Electrical Subcontractor Qualifications in Addendum 4 and the Revised electrical drawings provided in Addendum 3. We are requesting another site visit prior to the Bid as some electricians were not qualified to attend the initial site visit.
R67: The Bid Date has been extended with this Addendum. Additional site visit was provided for in Addendum 5.

Q68. Installing the solid planks over the influent troughs around Train B would means they would have to be removed and reinstalled after the change of the trough wall height shown on Drawings 03S06 and OS307 detail 4. Is this the intent or would some other means of protecting the trough be acceptable?
R68: Bid contract documents as shown. Alternate may be submitted as RFI after contract award.

Q69. Reference "CO#1 to Agreement between Manatee County and MSS", Item 4 states: "the total contract Price for the full and complete performance by Supplier shall not exceed $10,493,890". The revised bid form issued under Addendum # 4 does not include the entire contract price as referenced, Is it the intent of the Owner that the General Contractor include the price difference of $504,483 in their bid offer, and if so, under which bid item should this be added under?
R69: The total contract price for the Agreement between the County and the MSS consists of three work schedules. The bid form includes the total price for Work Schedule B, which is what will be assigned to the successful bidder. The County has already paid the MSS for Work Schedule A and will be responsible for paying the MSS for Work Schedule C.

Q70. Would it be possible for the double tees to be 28" instead of 24"? We could dap the tees 4" on the ends so the bearing point is the same.
R70: Bid as shown in the contract documents.

Q71. Section 1.10 (*01_50_00 Article 1.10.B.1.e*) under Engineer field office on line E requires wood stairs with handrails. Can the steps be aluminum?
R71: Aluminum steps are acceptable.

Q72. Has the Owner made any adjustments for the listed Membrane System Supplier from Section 01 00 01 Section 3.01-B with delivery anticipated in 2nd Quarter of 2019 and Start-up and Substantial Completion being in the 3rd Quarter of 2019?
R72: The overall construction schedule is per the calendar days defined in the bid form. Contractor shall work with the membrane system supplier to develop a detailed schedule for delivery of equipment, start-up, and substantial completion.

Q73. Drawing 02M16 is showing FLOW METER 20-FIT-701-1 is between two valves that I assume. What type of valves are we supposed to use and what details should we follow? same thing for FLOW METER 20-FIT-701-2 on the same drawing
R73: These valves (Tag Nos. 20-HV-716-1, 20-HV-717-1, 20-HV-716-2, and 20-HV-717-1) are butterfly valves included in the MSS scope of supply.

Q74. Drawing 03S06, Section H, Note 1 calls out for Hot Dip Galvanize All Steel Members. Detail 18 on 03S10 called out from Section H on 03S06 shows a section of the W12 Crane Girder. Please confirm if the W12 Crane Girder and its required Misc. Metals as shown in Detail 9 on 03S08 will be required to be HDG.
R74: Coat crane girder per 09_96_01.

Q75. Please confirm that the owner is responsible for all taxes, tariffs, fees, and costs that may be imposed and effective at time of shipment and is not currently included in the MSS contract.
R75: See response to question 7 in Addendum 4.

Q76. Can the General Contractor be limited to the same CAP% for liquidated damages as the negotiated MSS supplier?
R76: No.

Q77. Can the Liquidated Damages rate per day for the General Contractor be limited to the same rate as the agreement with the MSS supplier?
R77: No.

Q78. Does the specified crane have adequate head clearance to handle the membrane cassette height?
R78: Provide crane where shown on contract drawing. Contractor responsible to coordinate supplied crane with cassette.

Q79. Please confirm the quantity of davit cranes and bases required as per note 10 on drawing 02S02
R79: (1) davit crane is required. Assume 4 wall mounted bases; see callout on drawing 02S02.

Q80. Detail M907 on drawing 00GM03 provides a detail of a Sample Pump, but no details or specifications are provided. Please provide the required manufacturer and pump performance data/information required for these sample pumps.
R80: All sample pumps shown on 03M08**,** 03M14, 03M16 per Typical Details M907 and M263. Typical Detail M263 is included in this Addendum. Specification for sample pumps is included in this Addendum.

Q81. Reference Drawings 05M01 and 05DM01 and Specification 01-14-00-1.03C: In order to install the new 54" filtered water piping from trains A and B to train C, we will need to alternate service from trains A and B. It seems an additional 54" butterfly valve is required to isolate the 54" MFL-B from 54" CFL-A. What are the allowable individual shutdown durations for trains A and B respectively, to demo and tie-in this piping?
R81: Install additional 54" butterfly valve on 54"MFL immediately north of the new chemical injection assemblies (drawing 05M01). Short durations for demo and tie-ins of 54" piping for Trains A and B shall be such that they do not coincide with periods of high or maximum demand, and the specific day(s) and timing(s) shall be first discussed with and approved by the Owner in writing at least 48 hours in advance of the activity.

Q82. It seems highly likely that in order to connect the piping into train B, the 54" from train A will need to be bypassed by pumping. A previous addendum indicated an applicable volume of 12,500 gpm. Please advise as to the suction and discharge locations for this bypass operation.
R82: Sequencing short duration tie-ins for the 54" filtered/finished water piping versus alternate bypass piping/pumping is the Contractor's determination. Alternate can be submitted as RFI after contract award with justification. Item #19 in Addendum No. 4 referred to applicable pumping rate for the backwash waste water from Bay A Filters; not for the 54" filtered/finished water piping. For clarification about suction and discharge locations for the bypass for backwash waste water, refer to drawing 00DM03 for the two manholes (on southeast and northeast corners of Bay B) that need to be connected via the temporary bypass piping and pumping.

Q83. The Geotechnical Report did not provide the differential settlement, subgrade modulus, unit weight of backfill, and coefficient of rest. There was also no mention for the possibility of perched water, sinkhole potential, or liquefaction. Please provide and confirm.
R83: Settlement at the center of the tank is expected to be about 1.5 inches with settlement at the perimeter of about half of that. A modulus of subgrade reaction of 10 pci may be used. The moist unit weight of compacted backfill would be 115 pcf and a saturated unit weight would be about 120 pcf. Groundwater is expected to occur about 12 inches below grade in the wet season. There is a very low sinkhole potential on this site and very limited potential for liquefaction due to the very low probability for seismic activity at this site in west central Florida. The RFI also references a request for the "coefficient of rest" which we are not familiar with.

Q84. Specification 434168-4, Section 2.03A 2c, requires a minimum 4000 psi compressive strength at 28 days, maximum ¾ inch aggregate, 5 percent ±1 percent air content, 4 inch ±1 inch slump. Specification 033000-13, Section 2.03D, Table A: Concrete, Class A Concrete requires a 4500 psi minimum compressive strength at 28 days and including a slump range from 2" to 4". Drawing Sheet 00S01, second paragraph, Typical Structural Materials, Concrete 2A, requires a minimum compressive strength at 28 days for structures utilizing Class A or B concrete = 4500 psi. Tank design recommends 4000 psi for all tanks similar size, please delete 4500 and replace with 4000 psi concrete for the Equalization tank floor and dome?
R84: 4000 psi concrete is used for prestressed tank see 43_41_68 article 2.03 and 2.07 for floor and dome respectively.

Q85. Specification 033000-22, Section 3.03A 7a, requires 1 set of test cylinders for each 150 cubic yards of each class of concrete. Crom requires testing per 50 cubic yards in lieu of the 150 cubic yards for the Equalization tank. Please delete 150 and replace with 50.
R85: Testing frequency of 50 cubic yards is acceptable and will be noted in 43_41_68.

Q86. Specification 033000-22, Section 3.03B, requires a set of 3 cylinder specimens, 6-inch by 12-inch long, please replace with 4-inch by 8-inch (6 x 12 are not typically used). Crom suggests requiring a minimum of 5 cylinder specimens, testing one at 7 days, two at 28 days, and holding the other two specimens for the Equalization tank. Please confirm.
R86: 4" x 8" cylinders are acceptable.

Q87. Specification 434168-6, Sections 2.07C, requires overflow outlets shall be installed on the dome roof in such numbers as will provide an overflow open area three times the area of the largest tank pipe. Drawing Sheet 02M24, requires five #675 dome overflows. Drawing Sheet 02M26, Detail K, shows #675 dome overflow. Drawing Sheet 02M28, Parapet Wall, shows a #675 overflow. Based on open area requirements for the largest pipe, four #200 dome overflows are adequate. Please delete five #675 dome overflows and replace with four #200 dome overflows.
R87: The four #200 dome overflows are acceptable and the Engineer will modify the drawings accordingly.

Q88. Specification 434168-10, Section 3.03D, requires a screeded finish, this is not permitted with standard 4-inch membrane floor, soft broom finish only. Please delete screeded finish. Specification 033529, Section 3.02, provides different concrete finishes.
R88: Broom finish is acceptable.

Q89. Specification 099100, Section 3.6 provides a coating system for concrete, stucco, and masonry for exterior surfaces. Please confirm that this coating system is required for the Waste Equalization tank. Crom's standard exterior coating system includes two coats Tnemec Series 156, please delete all other exterior coating systems. See attachments.
R89: Crom's standard exterior coating system is acceptable. Submit as RFI after contract award.

Q90. Specification 032000-4, Section 2.01C 4a, requires Type 304 stainless steel wire bar support chairs or bolsters supported on Type 304 stainless steel plates resting on the ground surface. Crom does not provide or recommend stainless steel, carbon steel only or plastic to prevent dissimilar metals contact. Industry standard is to provide steel plate bolsters over a layer of visqueen to support the mat of floor steel. Please delete stainless and replace with standard steel plate bolsters.
R90: Galvanized steel plate bolster is acceptable.

Q91. Drawing Sheet 02M26, Detail H, requires 24/24 stainless steel mesh screen for the 50" vent. Detail K requires 24/24 mesh screen for the overflow. Please delete stainless steel screen as it corrodes over time and replace with polyester screen for the vent and overflows.
R91: Polyester screens are not desired due to long-term durability concerns and potential damage by birds. Provide a 316 stainless steel mesh screen to address corrosion and durability concerns.

Q92. DOORS# 101B, 101C, 106B &107B: Notes 3 and 5 on the door schedule 99A01 indicate doors to be on mounted outside face of the wall, however, the floor plan as well as details 5/99A01 and 6/99A01indicate doors are inside face mounted. Please clarify as exterior mount will require exterior chain-covers, environmental motor modifications etc.
R92: Sheet 99A01, Remarks, Clarification: Note 3 and Note 5 are not applicable to these doors and should be disregarded.

Q93. Door material is shown on the door schedule as aluminum. This is not consistent with the wind load and/or impact ratings required by the building design criteria as shown on the structural drawings and/or Florida Building Code. Doors must incorporate steel components to bear the appropriate FBC Approval # and associated labeling for wind load and/or impact certification. Manufacturer's standard range of color selections is White, Gray, Tan or Brown. Doors are also available in 200 optional powder coat finishes (RAL 6006 approximates the appearance of clear anodized aluminum) if required. Please advise. Also, please advise if additional corrosion resistance provisions (i.e. ZRG zinc enriched powder coat undercoat) for steel components is required.
R93: Sheet 99A01, Specified Door Material, Clarification: It was noted within the questions received that the door material specified was not consistent with required building design criteria. Assuming this is in reference to the overhead aluminum doors, it has been our experience that overhead door manufacturers have been able to provide supporting engineering data to support that the aluminum material can meet the required building design criteria. However, if the size of these proposed overhead doors exceeds the engineering to allow aluminum doors, then the contractor will have to use the steel doors with the optional 200 powder coat finish to emulate a clear anodized finish. Contractors are advised that if the overhead doors are required to be steel, additional corrosion resistance provisions shall be included (i.e. ZRG zinc enriched powder coat undercoat) as required for steel components.

Q94. Spec 033529 – 3.02 Concrete Finish Schedule. Calls out the use of F4 and F3 Finish for Vertical surfaces to be painted and exposed to view. What is the required Finish for Vertical surfaces to be backfilled?
R94: See Section 03_35_29 3.02.A.2.c

Q95. Drawing 02A08, Sec. 3 shows a concrete beam that is not shown in the Structural drawings. Please provide information on concrete beam
R95: Provide CMU lintel per S410/Typ per 00GS05 at opening.

Q96. 055000 2.02 D.2 describes Aluminum handrails and guardrails to be (nonwelded pipe) with an anodized finish. Drawings 02A06 and 02A07 have call outs for the Alum. Railing to be Fully Welded with Powder Coating. Other drawings just call out for Alum. Railing. Please confirm which Alum. Railings need to be Fully Welded with Powder Coating and color of Powder Coating.
R96: Sheets 02A06 and 02A07, Aluminum railings, Clarification: All required railings shall be fully welded aluminum with powder coat finish. Color to be selected to emulate clear anodized.

Q97. Spec. 055000 2.02 E.2 describes Aluminum Ladders to have anodized finish. Drawing 02A06 calls out for the Roof Access Ladder to be Powder Coated. Other drawings just call out for Alum. Ladder. Please confirm which Alum Ladders are to be Powder Coated and what color of Powder Coating.
R97: Sheets 02A06 and 02A07, Aluminum ladders, Clarification: All required ladders shall be fully welded aluminum with powder coat finish. Color to be selected to emulate clear anodized.

Q98. 02A01 shows two ladders in the Hot Water Pit. O2S01 only shows one ladder. Please confirm number of ladders required and if Powder Coating is Required.
R98: Provide two ladders per 02A01. Refer to response for Q97 for powder coating.

Q99. Section Drawings 02A06 thru 02A10 are calling out for Alum. Grating. O2S02 Note 9 calls for HDG Steel type W-22-2 grating with 4"x 3/8" bearing bars. Please confirm which type of metal grating is required.
R99: Provide grating per 02S02.

Q100. How will the Membrane system be delivered to the site assembled or in parts a pieces that will need to be put together?
R100: The membrane system will be delivered loose shipped. Any items which are panel mounted are shown on the P&IDs (refer where P&IDs are located i.e. Turbidimeter Panels).

Q101. What are the storage requirements for the membrane system when delivered to the site and how much storage space must be made available?
R101: The membrane system supplier will coordinate the project schedule with the Contractor to determine when equipment is required at site. If there are delays beyond the agreed upon delivery dates, then the Contractor will be responsible for storage.

Q102. Drawing 02M14 is calling for detail P203 which is not provided with the drawings. Please, provide the mentioned detail.
R102: The correct typical detail callout should be P230, which is included in the Drawings.

Q103. Drawing 02M15 is calling for support per detail P613. This detail is missing from the drawings. Please, provide the needed detail.
R103: Typical Detail P613 is included in this Addendum.

Q104. Drawing 02M21 is calling for support detail P602. Please, provide the support detail.
R104: Typical detail P602 is included in this Addendum.

Q105. Drawing 05M02 is calling for support detail P604. Please, provide the support detail.
R105: Typical detail P604 is included in this Addendum.

Q106. Drawing 03M11 is calling for detail P310 for the penetrations. Please, provide the needed detail.
R106: Typical detail P310 is included in this Addendum.

Q107. Will the UF Membranes ship separately from the remainder of the equipment items supplied by the MSS? As the system requires to be tested independently before installing the membranes, shipping the membranes at the same time as the other equipment items will result in storage and storage maintenance fees onsite.
R107: Yes, the membranes ship separately from the remainder of the equipment.

Q108. What constitutes "adequate storage" for onsite storage of the UF Membranes?
R108: Temperature controlled storage is required for the membranes if they are delivered and not installed. As noted in membrane system supplier's proposal (section 4, scope of supply). Following is an excerpt about storage.

- Storage of cassettes with UF membranes on site must meet GE requirements. They must be stored in a sheltered area, protected from freezing, direct sunlight or extreme heat, and sealed as shipped until ready for use. Storage should be in a dark, dry, level area, out of direct sunlight and at a temperature of 5-30°C (39-86°F). It is recommended that the cassettes and membranes not be stored longer than necessary prior to installation. Coordinate with GE for appropriate shipment times.

Q109. Please confirm if the membrane basins need to be completely dry for inspection by the MSS Supplier before placing the membranes into the basins.
R109: Prior to filling the basins, the lines are flushed back into the basin to collect and remove any construction debris that may have accumulated in the lines. Basins are then filled with water which is circulated to ensure functionality, membranes cassettes are then installed and glycerin flushing commences. The six trains in either bank must be installed and operational prior to installing the membrane cassettes.

Q110. Does the fire sprinkle piping need to get painted?
R110: Per Specification Section 40_05_00.03, fire protection pipe shall be red.

Q111. Are the gates being installed along the east basin wall per Drawing 04M02 replacing existing slide gates or will they require new openings to be cut into the Basin Walls for installation as no existing slide gates or openings are shown on Drawing 04S02?
R111: The wall openings are existing (1'-0" x 4'-8").

Q112. Proposed Slide Gate 18-SGL-125 on drawing 04M02 does not appear to have any access for plant operations from the existing or proposed walkways. Will access need to be provided for operation if access is required please provide a detail?
R112: Access for slide gate is required. Provide concrete walkway at divider wall per amended drawing 04S02 included in this Addendum.

Q113. Chemical Storage tanks are called out to have an NSF certification. We have received notification from the named suppliers that this certification can't be provided for the caustic soda tank. Would the engineer entertain changing this requirement for this tank?
R113: The tank supplied must meet the regulations for drinking water service. Per Rule 62-555, F.A.C, newly installed or constructed Public Water System (PWS) components that come into contact with drinking water or drinking water treatment chemicals shall conform to one of the following:

a. NSF International Standard 61 as adopted in Rule 62-555.335, F.A.C.,

b. NSF International Standard 42, 44, 53, 55, 58, or 62 as adopted in Rule 62-555.335, F.A.C.,
c. Section 6 of NSF International Standard 14 as adopted in Rule 62-555.335, F.A.C., or
d. The Food and Drug Administration's regulations for indirect food additives as contained in the April 1, 2002, revision of 21 C.F.R. Parts 174 through 189, which are incorporated in 62-555, F.A.C. by reference.

Q114. Please confirm that the MSS system package as presented to this contract is acceptable to the engineer and that the General Contractor does not have to get submittal approvals on any of the proposed equipment/material that is included in the MSS scope of supply
R114: The MSS has provided design submittals to the Engineer. Additional submittals during the construction phase, such as the final design submittal, shop drawings, test reports, test plans, and other submittals specified in Volume 3, Appendix B shall be provided through the General Contractor.

Q115. Drawing 02M14 is calling for an 8" overflow while drawing 02M16 section B is calling for a 10" overflow. Please, clarify which size is correct
R115: The 10" overflow on 02M16 is correct.

Q116. Drawing 02M16, Key note 1 is calling for a simplex strainer. However, the strainer is showing between what seems to be valves. Can you please clarify what type of valves to be used?
R116: It is assumed this should be referring to Drawing 02M14. The valves shown on either side of each strainer can be deleted as there are additional upstream and downstream valves for isolation.

Q117. Drawing 05M02 is showing a 36" OF pipe while drawing 00C07 is not showing this pipe line. Please, provide more details of this line.
R117: Connect new 36" OF to the existing 36-inch overflow pipe north of existing 12D-DI/MJ (north of Filter No. 16 outside the building). Refer to drawings M-31 and C-23 in record drawing file 1989 Nov_WTP EXPANSION - GROUNDWATER TRAIN.pdf, provided as part of Addendum No. 5.

Q118. Please confirm that the Membrane Filtrate (MFL) Buried 14" to Permeate Storage Tank line located at the top middle of Drawing 00C07 is PVC Schedule 80 as described in the Pipe and Material Schedule on Drawing 00M02.
R118: PVC Schedule 80 is confirmed.

Q119. Has the MSS Supplier accepted the selected band screen (Hydrodyne) as an adequate pre-treatment to their membrane system?
R119: Yes.

Q120. Reference Drawing 05DM01: Note 8 indicates removal and replacement of chemical piping, trench, and cover. Please provide details of the trench construction and quantity, size, material and type of chemical pipes within the trench as it appears that temporary rerouting will be required to facilitate the new 54" filtered effluent lines.
R120: Existing chemical trench is shown on 05M01 and 05M02. The chemical pipes as shown in the northern most above ground location depicted by Photo #1 in drawing 03DM01 are as follows: Electrical conduit (1 pipe, 1", PVC Sch 80), Alum (1 pipe; 1.5", PVC Sch 80), Lime (4 pipes, 1" ea., PVC Sch 80), Polymer (1 pipe, 1.5" PVC Sch 80), Phosphate (1 pipe,1.5", PVC Sch 80), Ammonia (2 pipes, 1" ea., 316 Stainless Steel Seamless Schedule 80), Sodium Hypochlorite (3 pipes, 1.5" ea., PVC Sch 80), and Plant water (1 pipe, 3", PVC Sch 80). Contractor to field verify the number and type of chemical pipes that transition below ground to the existing chemical trench and continue through the trench routing to the blend chamber. Contractor to field verify the number and type of chemical pipes that transition from the cable tray (mounted on west influent channel) to the pretreatment trains.

Q121. Please provide information relating to any access entry ways into the Clearwell for all Filter Trains A, B & C which will allow access to remove and install piping inside the structures. DWG 03M01, 03M02, 03M03, 03M10, 5M01, 05M02, 05DM01,
R121: No piping is being replaced inside Clearwell A. See marked up Drawings 03S04 and 03S12 included in this Addendum, indicating the location of a new access opening required in the permeate pump area for access to Clearwell B. As shown on 05DM01, an existing 60" wall pipe is being removed for installation of new piping. This opening can be expanded (to 6'-6" W X 6'-0" H) and used for temporary construction access to Clearwell C. Additional information is be provided via drawing markups included in this Addendum.

Q122. Please provide a schedule showing the project duration of 730 Calendar days as this is not adequate for the construction of this project when all factors are take into account such as maintaining flow disinfection and testing of multiple basins replacement of piping after the new membranes system is operational to keep Train C and Train A in operation during the demolition and reconstruction of Train B and the new Chemical System A and the constraints of working in Post Mix A, post Mix B and Train C in non-peak flow months defined as November to April in the bid documents?
R122: Bid contract documents per schedule shown in revised bid form included in this Addendum. Specific sequencing and means and methods of project elements in construction schedule is the Contractor's scope. Consider possibility of performing Clearwell C piping modifications at the beginning of the project (i.e. before Filter Bay B/Clearwell B is placed out of service).

Q123. Please provide the proposed sequence of the design for the demolition of the interconnected piping between Trains A, B & C shown on Drawing 05DM01 & 05DM02, 05M01 & 05M02. The piping modifications as shown will require taking more than 1 train off line to make the interconnections that must be performed. what is the maximum duration that more than one train can be off line for this construction.
R123: See Specification 01_14_00 Section 1.05.A.8 in Attachment 2, Volume 1 Technical Specifications and Specification 01_14_00 Section 1.05.A.9 as revised in this Addendum. Specific sequencing and means and methods of project elements in construction schedule is the Contractor's scope.

Q124. Drawing 05DM01 Note 8 indicates that we are to remove the existing Chemical Trench and piping to remove the existing & install the new piping in this area. What chemical systems and feed lines pipe materials are in this pipe trench and what is the maximum duration they can be out of service without impacting the WTP operations?
R124 See response to Q120 in this Addendum.

Q125. Please provide the name of the existing Chemical Trench that must be removed so we can match the existing.
R125: Existing chemical trench is shown on 05M01 and 05M02. Refer to record drawing file 1989 Nov_WTP EXPANSION - GROUNDWATER TRAIN.pdf, provided as part of Addendum No. 5.

Q126. Please provide the size and type of the chemical piping that is existing to be removed per Drawing 03DM01 as temporary piping will need to be provided to maintain operations that are feed from the existing system until the new system can be provided.
R126: See response to Q120 in this Addendum.

Q127. Will temporary chemical piping need to be dual contained or heat traced? If this is required, please provide the type and size of the chemical piping that must be relocated prior to the demolition of Train B.
R127: All temporary chemical pipes shall be double contained. Heat tracing not required for these existing chemicals. See response to Q120 in this Addendum for the types and sizes of chemical piping.

Q128. The proposed construction duration does not provide adequate time during the first calendar year to modify both Train A and Train B work during the same calendar year with the limitation to be done in Non-Peak Months between May and October. We need time to obtain permits then procure all the material, submit shop drawings and fabricate piping and complete it this year with the anticipated NTP being in late April or May 2019. We are looking at a fabrication period of +/- 18 Weeks for the screens to delivered and MCC3 will be approximately 20 Weeks for fabrication. Installation in either Train A or B work could not commence this year without going beyond November (peak month).
This would mean we could not commence either Post Mix A or Post Mix B Basin until May of 2020. The work period for the combined construction of both Post Mix Basins would go beyond November 2020. This requires that one of the Post Mix Basins will need to be delayed until May 2021. This also prohibits the Modifications in Train C to being performed until after Train B is placed into operation to keep the WTP functioning at capacity. We are there for requesting an additional 8 months for construction due to the restrictions of when work can be performed in the Post Mix and Train C Piping Modifications.
R128: See response to Q122 in this Addendum.

Q129. Drawings 05DM01, 05DM02, 05M01 & 15M02 to make the 54" Piping connections with the interconnection as shown will require shutting down piping from all 3 Filter Trains. The Demolition and piping installation may take several months to complete due to the complexity and depths of the installations. What is the maximum time that these Filter can be offline for making these piping connections.
R129: See response to Q123 in this Addendum.

Q130. In order to perform the system functional test before installing the membranes, where would the effluent water be routed to?
R130. The discharge from testing can be to the lift station or the existing backwash pond at the Lake Manatee WTP depending on the type of test and discharge volume, in consultation and with written approval of the Owner. Chlorinated water may only be disposed of in a sanitary sewer system with the written permission of the Owner. The discharge to the sanitary sewer shall not exceed 400,000 gallons per day.

Q131. Section 43.23.13.45 specifies a self-priming pump for IX Supply. Of the manufacturers listed, Barnes and Gorman-Rupp do not have a 316 SS self-priming pump that will meet the flow and head conditions. The Goulds eSV is a multistage pump that is not selfpriming. Goulds does make a 316 SS pump that will hit the flow and head conditions but there are a few issues. It is not close coupled per paragraph 2.07. The motor HP required to be non-overloading throughout the curve is 10 HP. The spec asks for 1 HP. Shut-off head is 132.3, not 150. The main issue is the horsepower required. Will this pump be acceptable to the engineer, and if not, please advice on an available pump that will meet the specifications.
R131: Contractor may submit alternate pump up to 10 HP.

Q132. Prestressed Concrete Tank Specification 434168 and the drawings do not provide information or require an exterior or interior coating on the Equalization tank. Specification 099100, Sections 3.6 and 3.7 provide a coating system for concrete, stucco, and masonry for exterior and interior surfaces. Specification 099601-12, Section 3.14C 2a, requires the Waste Equalization Tank to include an asphalt extended urethane for interior surfaces of the tank and dome. Please confirm that the asphalt extended urethane coating is required; that a Tnemec product is acceptable to use in lieu of the listed coatings manufacturers, and that only the tank wall and underside of dome is to be coated. See attachments.
R132: Bid coating as specified in 09_96_01. Alternate can be submitted as RFI after contract award. Submittal to include a letter from Tnemec stating acceptance of the alternate coating system for this application.

Q133. Can a 54" BFV be added to the 54" MFL Pipe connecting at Train B shown on Drawing 05M01 to allow the 54" Train A to C 54" CFL Piping to be placed back into service quicker by isolating the new Piping in Train B Clearwell with this valve?
R133: See response to Q81.

NOTE: Items that are ~~struck through~~ are deleted. Items that are <u>underlined</u> have been added or changed. All other terms and conditions remain as stated in the IFBC.

End of Addendum

INSTRUCTIONS:
Receipt of this addendum must be acknowledged as instructed in the solicitation document. Failure to acknowledge receipt of this Addendum may result in the response being deemed non-responsive.

AUTHORIZED FOR RELEASE: TWebb

Digitally signed by TWebb
DN: cn=TWebb, o=Manatee County BCC, ou, email=theresa.webb@mymanatee.org, c=US
Date: 2019.02.22 16:29:49 -05'00'

BID FORM

(Submit in Duplicate)

LAKE MANATEE WATER TREATMENT PLANT FILTER UPGRADE

Bid "A" Based on Completion Time of 730 Calendar Days

PAY ITEM NO.	DESCRIPTION	TOTAL QTY.	UNITS	BID PRICE PER UNIT ($)	TOTAL BID PRICE ($)
	ROADWAY				
1	GENERAL CONDITIONS	LS	1		
2	SITE WORK	LS	1		
3	SCREENS AND POST-MIX BASIN MODIFICATIONS	LS	1		
4A	UF SYSTEM EQUIPMENT/SPECIAL SERVICES & ANCILLARY EQUIPMENT (BY MSS)	LS	1	$9,988,647.50	$9,988,647.50
4B	UF SYSTEM EQUIPMENT & ANCILLARY SERVICES (BY GENERAL CONTRACTOR)	LS	1		
4C	UF SYSTEM ALLOWANCE FOR ADDITIONAL ON-SITE COMMISSIONING (BY MSS)	Day	129	$1,614.00	$208,206.00
5	PROCESS PIPING	LS	1		
6	CHEMICAL BUILDING	LS	1		
7	NEUTRALIZATION FACILITY	LS	1		
8	WASTE EQUALIZATION TANK	LS	1		
9	FILTER BAY B BASINS AND BUILDING MODIFICATIONS	LS	1		
10	BLEND CHAMBER MODIFICATIONS	LS	1		
11	ELECTRICAL, INSTRUMENTATION, AND CONTROL WORK	LS	1		
12	RELOCATION/MODIFICATION OF EXISTING FIBER OPTIC CONDUIT AND CABLES (FOR RAW WATER P.S.)	LS	1		
13	PERMIT ALLOWANCE	LS	1	$20,000.00	$20,000.00
	TOTAL BASE BID "A" - Based on Completion Time of 730 Calendar Days				
	CONTRACT CONTINGENCY WORK (USED ONLY WITH COUNTY APPROVAL)			5%	
TOTAL OFFER FOR BID "A" with Contract Contingency - Based on Completion Time of 730 Calendar Days					

Bidder Name: _____

Authorized Signature: _____

BID FORM

(Submit in Duplicate)

LAKE MANATEE WATER TREATMENT PLANT FILTER UPGRADE

Bid "B" Based on Completion Time of 910 Calendar Days

PAY ITEM NO.	DESCRIPTION	TOTAL QTY.	UNITS	BID PRICE PER UNIT ($)	TOTAL BID PRICE ($)
	ROADWAY				
1	GENERAL CONDITIONS	LS	1		
2	SITE WORK	LS	1		
3	SCREENS AND POST-MIX BASIN MODIFICATIONS	LS	1		
4A	UF SYSTEM EQUIPMENT/SPECIAL SERVICES & ANCILLARY EQUIPMENT (BY MSS)	LS	1	$9,988,647.50	$9,988,647.50
4B	UF SYSTEM EQUIPMENT & ANCILLARY SERVICES (BY GENERAL CONTRACTOR)	LS	1		
4C	UF SYSTEM ALLOWANCE FOR ADDITIONAL ON-SITE COMMISSIONING (BY MSS)	Day	129	$1,614.00	$208,206.00
5	PROCESS PIPING	LS	1		
6	CHEMICAL BUILDING	LS	1		
7	NEUTRALIZATION FACILITY	LS	1		
8	WASTE EQUALIZATION TANK	LS	1		
9	FILTER BAY B BASINS AND BUILDING MODIFICATIONS	LS	1		
10	BLEND CHAMBER MODIFICATIONS	LS	1		
11	ELECTRICAL, INSTRUMENTATION, AND CONTROL WORK	LS	1		
12	RELOCATION/MODIFICATION OF EXISTING FIBER OPTIC CONDUIT AND CABLES (FOR RAW WATER P.S.)	LS	1		
13	PERMIT ALLOWANCE	LS	1	$20,000.00	$20,000.00
	TOTAL BASE BID "B" - Based on Completion Time of 910 Calendar Days				
	CONTRACT CONTINGENCY WORK (USED ONLY WITH COUNTY APPROVAL)			5%	
TOTAL OFFER FOR BID "B" with Contract Contingency - Based on Completion Time of 910 Calendar Days					

Bidder Name: _____

Authorized Signature: _____

SECTION 01_78_23

OPERATION AND MAINTENANCE DATA

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Preparation and submittal of Operation and Maintenance Manuals.

1.02 GENERAL

A. Submit Operation and Maintenance Manuals as specified in technical sections.

B. Make approved manuals available at project site for use by construction personnel and Owner.

1.03 SUBMITTALS

A. Draft Operation and Maintenance Manuals:
   1. Submit prior to shipment of equipment or system to site.
   2. Shipment will be considered incomplete without the draft Operation and Maintenance Manuals.
   3. Quantity:
      a. Hard copy: ~~4 sets~~1 set.
      b. Electronic: ~~2 CD-ROM, DVD, or other read-only electronic storage device~~AD6
         1) Upload to E-Builder and complete required form fields associated with the submittal process.
         ~~1)~~2) Deliver all construction documentation on CD or flash drive AD6

B. Final Operation and Maintenance Manuals:
   1. Make additions and revisions in accordance with Owner's and Engineer's review comments on draft manuals.
   2. Submit approved Operation and Maintenance Manuals at least 30 days prior to Functional Testing and at least 60 days prior to Owner Training.
   3. Quantity:
      a. Hard copy: ~~4 sets~~1 set.
      b. Electronic:
         1) Upload to E-Builder and complete required form fields associated with the submittal process.
         2) Deliver all final construction documentation on CD or flash drive. ~~an external Solid State Drive (SSD) USB disk.~~
      ~~b. Electronic: 2 CD-ROM or DVD.~~AD6

1.04 PREPARATION

A. General requirements:
   1. All vendor supplied operations and maintenance manuals must be written in English.

2. Provide dimensions in English units.
3. Assemble material, where possible, in the same order within each volume.
4. Reduce drawings and diagrams to 8 1/2 by 11-inch size, if possible unless otherwise specified.
5. Complete forms on computer, handwriting not acceptable.
6. Delete items or options not provided in the supplied equipment or system.
7. Provide package control system annotated ladder logic for PLC, if applicable.

B. Hard copy requirements:
1. Binders: 3-ring with rigid covers.
   a. Break into separate binders as needed to accommodate large size.
2. Utilize numbered tab sheets to organize information.
3. Provide original and clear text on reproducible non-colored paper, 8 1/2 by 11-inch size, 24 pound paper.
4. Drawings larger than 8 1/2 by 11 inch:
   a. Fold drawings separately and place in envelope bound into the manual.
   b. Label each drawing envelope on the outside regarding contents.

C. Electronic requirements:
1. File format:
   a. Entire manual in PDF format (Adobe version 8.0 or greater).
      1) Include text and drawing information.
      2) Provide the following PDF files:
         a) A single PDF file even if the hard copy version is broken into separate binders due to being large.
         b) File names must be in English, clearly convey the information contained within the file, and must not exceed 100 characters in length. Only standard abbreviations may be used in file names.
         c) No special characters should be used in the file names. The following specific characters are not to be used in file names[AD6]. ` ! @ # $ % ^ & *( ) - = + < > ? / \ | . , ~ ' " ; { [}]
         ~~b)~~
         ~~c)~~d) Pagination and appearance to match hard copy.
      3) PDF should be searchable.
      4) Bookmarks:
         a) Bookmarks shall match the table of contents.
         b) Bookmark each section (tab) and heading.
         c) Drawings: Bookmark at a minimum, each discipline, area designation, or appropriate division.
         d) At file opening, display all levels of bookmarks as expanded.
      5) Thumbnails optimized for fast web viewing.
   b. Drawing requirements.
      1) Provide additional copy of drawings in most current version of AutoCAD format.
      2) Drawings shall have a white background.
      3) Drawing shapes shall not degrade when closely zoomed.
      4) Screening effects intended to de-emphasize detail in a drawing must be preserved.
      5) Delete items or options not provided in the supplied equipment or system.
2. Media:
   a. CD-ROM or DVD-ROM compatible with Microsoft Windows.

b. Read-only flash drive.
~~b.~~c. E-Builder Web site[AD6]

3. Label media with the following information:
   a. Operation and Maintenance Manual.
   b. Equipment name.
   c. Specification Section Number
   d. Equipment tag number.
   e. Owner's name.
   f. Project number and name.
   g. Date.
4. If multiple submittals are made together, each submittal must have its own subdirectory that is named and numbered based on the submittal number.

D. Special Provisions for Electronic O&M Manual Format:
   1. Special Provisions for Electronic O&M Manual Format:
   2. Electronic copy of the O&M manual shall contain all documents in Adobe PDF Format with electronic PDF bookmarks denoting chapters, sections, and drawings. Include additional electronic file formats for specific O&M manual contents as detailed in this section.
   3. Electronic copy of the O&M manual shall contain a separate copy of the training manual as a Microsoft Word or Power Point [AD6]document, formatted in Word or Power Point [AD6]2010 or later, in addition to Adobe PDF format.
   4. Electronic copy of the O&M manual shall contain a copy of the most current 3D model files used for the SCADA screens in the native format of the software, in addition to JPEG, TIF, or GIF image file format.
   5. Electronic copy of the O&M manual shall contain the Asset ID Tag Number List ~~as a Microsoft Excel document, formatted in Excel 2010 or later~~as part of Appendix A Equipment Data Form.[AD6]
   6. Electronic copy of the O&M manual must be submitted on a Microsoft Windows compatible CD-ROM, DVD-ROM, or other read-only electronic storage device, and uploaded to the County construction document management system.
   7. Adobe PDF bookmarks shall include a logical description of the chapter or section or the title and number of a drawing.
   8. Page setup within electronic documents must be formatted to standard letter (8 ½ x 11) portrait for text and/or legal (11 x 17) landscape for drawings.
   9. Acceptable fonts for electronic documents include Arial, Verdana, Helvetica, and Times New Roman.
   10. Font sizes for electronic documents must be no less than 10 pt. and no greater than 14 point for general text, and no less than 12 point and no greater than 18 point for headers.
   11. Font color must be black.
   12. Text decorations, such as bold and italic, may only be used to emphasize key points.
   13. All information provided electronically shall be consistent with information provided in bound format. Do not add content to electronic submittal which is not also in bound submittal.
   14. File names must be in English, clearly convey the information contained within the file, and must not exceed 100 characters in length. Only standard abbreviations may be used in file names
   15. File names shall be descriptive of file contents and shall not be arbitrary

16. File names shall contain no spaces, shall not exceed 100 characters, shall have only alphanumeric characters, and shall not contain symbols such as listed below:
` ! @ # $ % ^ & *( ) - = + < > ? / \ | . , ~ ' " ; { [}]
17. Images shall be stored separately from electronic documents in JPEG or GIF format.
18. Any annotations on images shall be made directly in the image file through an image editor.
19. Scanned documents are not acceptable for the electronic copy of the O&M manual.
20. Electronic files must not be password protected.

1.05 CONTENTS

A. Label the spines:
1. Equipment name.
2. Tag number.
3. Project name.
4. Owner name.

B. Cover page:
1. Operation and Maintenance Manual.
2. Equipment name.
3. Specification Section Number
4. Equipment tag number(s).AD6
5. Owner's name.
6. Project number and name.
7. Date.

C. Table of Contents: General description of information provided within each tab section.

~~C.~~D. Reference equipment acronyms from Appendix – B and amend Appendix – B as needed.AD6

~~D.~~E. Equipment ~~Summary~~ Data Form: Completed form as specified in Appendix A of this Section.AD6

~~E. Equipment Maintenance Summary Form: Completed form as specified in Appendix B of this Section.~~AD6

~~F. Electric Motor Technical Data Form: Completed form as specified in Appendix C of this Section.~~AD6

~~G.~~F. Description of equipment function, normal operating characteristics, and limiting conditions.

~~H.~~G. Manufacturer's product data sheets:
1. Where printed material covers more than 1 specific model, indicate the model number, calibrated range, and other special features.

~~I.~~H. Assembly, installation, alignment, adjustment, and checking instructions.

~~J.~~I. Storage instructions: Control diagrams:
1. Internal and connection wiring, including logic diagrams, wiring diagrams for control panels, ladder logic for computer based systems, and connections between existing systems and new additions, and adjustments such as calibrations and set points for relays, and control or alarm contact settings.
2. Complete set of 11-inch by 17-inch drawings of the control system.
3. Complete set of control schematics.

~~K.~~J. Programming: Copies of Contractor furnished programming.

~~L.~~K. Start-up procedures: Recommendations for installation, adjustment, calibration, and troubleshooting.

~~M.~~L. Operating procedures:
1. Step-by-step instructions including but not limited to the following:
   a. Safety precautions.
   b. Guidelines.
   c. Manual keyboard entries.
   d. Entry codes.
   e. System responses.
   f. Other information as needed for safe system operation and maintenance.
2. Modes:
   a. Startup.
   b. Routine and normal operation.
   c. Regulation and control.
   d. Shutdown under specified modes of operation.
   e. Emergency operating shutdown.

~~N.~~M. Preventative maintenance procedures:
1. Recommended steps and schedules for maintaining equipment.
2. Troubleshooting.

~~O.~~N. Lubrication information: Required lubricants and lubrication schedules.

~~P.~~O. Overhaul instructions: Directions for disassembly, inspection, repair and reassembly of the equipment; safety precautions; and recommended tolerances, critical bolt torques, and special tools that are required.

~~Q.~~P. Parts list:
1. Complete parts list for equipment including but not limited to the following information:
2. Catalog data: Generic title and identification number of each component part of equipment.
3. Include bearing manufacturer, model and ball or roller pass frequencies for every bearing.
4. Availability.
5. Service locations.

~~R.~~Q. Spare parts list: Recommended number of parts to be stored at the site and special storage precautions.

~~S.~~R. Engineering data:
1. Drawings: Complete set of 11-inch by 17-inch equipment drawings.

2. Exploded view or plan and section views with detailed callouts.
3. Outline, cross-section, and assembly drawings.
4. System drawings: Provide interconnection and wiring diagrams, plan views, panel layouts, bill of materials, etc.
5. Packaged equipment system drawings: Provide instrumentation loop drawing, control schematic diagrams, interconnection and wiring diagrams, plan views, panel layouts, bill of materials, etc.
6. System drawings and data sheets: Include drawings and data furnished by the Engineer and the Supplier; provide "as installed" version.
7. Provide electrical and instrumentation schematic record drawings.

~~T.~~S. Test data and performance curves, when applicable.

~~U.~~T. Manufacturer's technical reference manuals.

~~V.~~U. Source (factory) Test results: Provide copies of Source Tests reports as specified in technical sections.

~~W.~~V. Functional Test results: After Functional Tests are completed, insert Functional Test reports as specified in technical sections.

1.06 ARCHIVAL DOCUMENTATION

A. Typically does not require updating to remain valid and should be stored in a format that preserves the document and limits one's ability to make changes.

B. Types of archival documents include the following:
1. Record drawings.
2. Reports.
3. Specifications.
4. Shop drawings.
5. Vendor Equipment O & M Manuals.
6. Photos.
7. Demonstration and training videos.
a. Videos shall be recorded by the Contractor and submitted to the Engineer.
b. Videos shall be recorded in low ambient noise areas, when possible. Speakers shall wear a clip-on wireless microphone (Lavalier Microphones systems) to improve audio quality in the video.
c. Video file format requirements are listed in Appendix C.
d. Video file storage size should be less than 250 megabytes.
e. Video picture size shall be not less than 720 pixels wide by 480 pixels high.
~~b.~~f. Video picture quality shall be sufficient for text presented in training or on equipment to be readable at playback of the full size of the video file.AD6
8. Other.

1.07 LIVING DOCUMENTATION

A. Requires periodic updates to remain valid and should be stored in formats that are easy to update.

B. Types of living documents include the following:
1. Facility O&M Manuals.

2. Standard Operating Procedures.
3. Other.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

Not Used.

END OF SECTION

APPENDIX A

EQUIPMENT / INSTRUMENT ~~SUMMARY~~ DATA FORM

Complete attached workbook file per instructions enclosed in each sheet.AD6

~~1. EQUIPMENT ITEM~~

~~2. MANUFACTURER~~

~~3. EQUIPMENT IDENTIFICATION NUMBER(S)~~
~~(maps equipment number)~~

~~4. LOCATION OF EQUIPMENT~~

~~5. WEIGHT OF INDIVIDUAL COMPONENTS (OVER 100 POUNDS)~~

~~NAMEPLATE DATA -~~
~~Horsepower~~
~~Amperage~~
~~Voltage~~
~~Service Factor (S.F.)~~
~~Speed~~
~~ENC Type~~
~~Capacity~~
~~Other~~

~~7. MANUFACTURER'S LOCAL REPRESENTATIVE~~

~~Name~~

~~Address~~

~~Telephone Number~~

~~8. MAINTENANCE REQUIREMENTS~~

~~9. LUBRICANT LIST~~

~~10. SPARE PARTS (recommendations)~~

~~11. COMMENTS~~

APPENDIX B

EQUIPMENT ~~MAINTENANCE SUMMARY~~ACRONYM LIST[AD6]

Attached

~~1. Equipment Item: _____~~

~~2. Manufacturer: _____~~

~~3. Serial No. (if applicable): _____~~

~~4. Manufacturer's Order No. (if applicable): _____~~

~~5. Nameplate Data (horsepower, voltage, speed, etc.): _____~~

~~6. Manufacturer's Local Representative:~~

~~Name: _____~~

~~Address: _____~~

~~Telephone: _____~~

~~7. Maintenance Requirements:~~

~~Maintenance Operation~~	~~Frequency~~	~~Lubricant (if applicable)~~	~~Comments~~
~~(List each operation required. Refer to specific information in Manufacturer's Manual, if applicable)~~	~~(List required frequency of each maintenance operation)~~	~~(Refer by symbol to lubricant list as required)~~	

~~8. Lubricant List:~~

~~Reference Symbol~~	~~Conoco Phillips~~	~~Exxon/Mobil~~	~~BP/Amoco~~	~~Other (List)~~
~~(Symbols used in Item 7 above)~~	~~(List equivalent lubricants, as distributed by each manufacturer for the specific use recommended)~~			

All Equipment must use existing acronyms as listed in Appendix B. Where an equipment type is not listed, append the Appendix B and note items appended.

~~9. Spare Parts: (Include recommendation on what spare parts should be kept on the job):~~

~~_____~~

~~_____~~

~~_____~~

APPENDIX C[AD6]

ELECTRIC MOTOR TECHNICAL DATA

Technical Data for Each Motor:

Application: _____

Manufacturer: _____

Frame No.: _____ Type: _____

Code Letter: _____ Design Letter: _____

Rating:

Horsepower: _____ Voltage: _____ Phase: _____

Cycles: _____ Full Load rpm: _____

_____ (wound rotor secondary)

Volts: _____ Amperes: _____

Full Load Current: _____ amperes

Locked Rotor Current: _____ amperes

Locked Rotor or Starting Torque (percent of full load): _____ percent

Full Load Torque: _____ ft-lb

Breakdown Torque: _____ percent

Efficiency: Power Factor:

Full Load: _____ percent Full Load _____ percent

3/4 Load: _____ percent 3/4 Load: _____ percent

1/2 Load: _____ percent 1/2 Load: _____ percent

Insulation:

Type: _____

Class: _____

Temperature Rise: _____ Above Ambient: _____

Enclosure: _____

Net Weight: _____ lbs

Wk^2: _____ lbs/sq ft

Type of Bearings: _____

Service Factor: _____

Noise Level in Decibels: _____

Heaters: _____ kW, _____ Phase, _____ volts

Altitude: _____

_____

Appendix A[AD6]

Equipment Data

Equipment Description

Instructions:
Complete all applicable column fields for each piece of equipment.
-Equipment Type Text must follow acronyms in Appendix "X" if available. Where an equipment type is not represented in Appendix "X" vendor can supply an appropriate two to three alpha character abbreviation.
-Manufacturer and Local Representative Contact Information must include (full mailing address, phone number, fax number, and Web address)
-Comments and Notes columns - enter applicable FINAL submittal PDF page number of each reference
* Example text shown, equipment as needed to complete all equipment referenced in the FINAL submittal

Equipment Description								Comments and Notes			
Equipment Name Description*	Equipment Type Text*	Process Text*	Equipment Tag Number	Model No	Serial Number	Service Life	FINAL Submittal file name	Warnings Comment	Start Up Comments	Start Up Comments	Technical Comments
A BASIN RAPID MIX STRUCTURE	STRUCTURE	RAPID MIX									

Appendix A

Eqiupment Data

Equipment Procurement Information

Instructions:
Warranty Items column - enter the first page number from FINAL submittal PDF of each reference.
Contact Information - include mailing address, phone number, fax number, and Web site URL if applicable

Equipment Procurement Information						Contact Information			
Purchase Order Number	Installed (mm/dd/yyy)	Warranty Items	Purchase Date	Purchase Amount	Received Date	Manufacturer Name	Manufacturer Contact Information	Local Representative	Representative Contact Information

Appendix A
Equipment Data
Equipment Nameplate Data

Instructions:
Complete applicable columns per equipment type.

Equipment Nameplate Data										Frame			Rating										Efficiency %			Power Factor %			Insulation	
Series	Size	Stages	Enclosure	Type of Bearings	Noise Level in Decibels	Altitude	Service Factor	Frame	Product Weight	Frame No.	Type	Code Letter	Horsepower	RPM	Voltage	Phase	Hertz	Full Load Current - Amps	Locked Rotor Current - Amps	Locked Rotor or Starting Torque (% Full Load)	FL Torque, ft-lb	Breakdown Torque %	Full Load	3/4 Load	1/2 Load	Full Load	3/4 Load	1/2 Load	Type	Class

Appendix A
Equipment Data
Maintence Requirements

Instructions:
Complete all applicable column fields for each piece of equipment.
Enter the first page number from FINAL submittal PDF of each reference.

Maintenance Requirements		**Frequency of Maintenance Req.**		**Lubricant List**						**Parts**
List each operation required. Refer to specific information in Manufacturer’s Manual, if applicable.	1st Page Number of FINAL PDF submittal	List required frequency of each maintenance operation	1st Page Number of FINAL PDF submittal	Reference Symbol (Symbols used in Item 7 above)	Conoco Phillips	Exxon/Mobil	BP/Amoco	Other (List)	1st Page Number of FINAL PDF submittal	1st Page Number of FINAL PDF submittal
					List equivalent lubricants, as distributed by each manufacturer for the specific use recommended.					

Appendix B[AD6]
CMMS Equipment Acronyms

TAG	DESCRIPTION
AER	Aerator
AIC	Air Compressor
ARC	Air Compressor
ACU	Air Conditioning
DRY	Air Dryer
ARF	Air Filter
AHU	Air Handling Unit
ARV	Air Release valve
AS	Air Scour
AVR	Air Vacuum Relief
AVV	Air/Vacuum Valve
ALU	Alum System
AE	Analog Probe
AIT	Analog Transmitter
ALZ	Analyzer
AND	Anerobic Digester
ARR	Arrestor
AUG	Auger
ATS	Automatic Transfer Switch
BPR	Back Pressure Sustaining Valve
BAV	Ball Valve
BAR	BAR screen
BAS	Basin
BSN	Basin
BFP	Belt Filter Press
BIT	BIo Tower
BIF	Bio-Filter
BLO	Blower
BOI	Boilor
BUO	Buoy
BDC	Bridge Crane
BDG	Building
BFV	Butterfly Valve
BC	Bypass Contactor
CSS	Cake Storage Silo
CAL	Calibration column
DU	Carriage Drive
CEN	Centrifuge
CHI	Chiller
CHL	Chlorinator
CB	Circuit Breaker
CLR	Clarifier
CLA	Classifier
CLU	Clutch
COA	Coalescer
COL	Collector
COS	Composite Sampler
LCP	Control Panel
CPT	Control Power Transformer
CR	Control Relay
CON	Conveyer
COO	Cooler
CRN	Crane
CRU	Crusher
DAM	Damper
DCD	DC Drive
DEC	Decarbonator
DGF	Degassifier
PED	Differential Pressure Element
PDI	Differential Pressure Indicator
DIF	Diffuser
DIG	Digester
DP	Distribution Panel
DIS	Distributor
DCT	Disconnect
DRV	Drive Unit
TFR	Dry Type Transformer
DRY	Dryer
DYB	Drying Bed
DSC	Dust Collector
SHA	Dust Collector Shaker
EDU	Eductor
ELE	Electrical
EAM	Electric Analog Modulating
EDM	Electric Discrete Modulating
EUH	Electric Unit Heater
EML	Emergency Lighting
ESP	Emergency Stop
ERV	Energy Recovery Ventilator
ENG	Engine Generator
EQB	Equalization Basin
EVP	Evaporator
ECU	Evaporator Cooler
EXC	Exchanger
EF	Exhaust Fan
ESEW	Eyewash Station
FAN	Fan
FDR	Feeder Belt Mechanical
FLT	Filter
SCR	Fine Screen
FHY	Fire Hydrant
FLA	Flare
FLO	Flocculator
FE	Flow Meter
FIT	Flow Meter Transmitter
FS	Flow Switch
FM	Force Main
FU	Fuse
GAT	Gate
MOP	Gate Motor Operator
GEB	Gearbox
GEN	Generator
GRI	Grinder
GRC	Grit Chamber
GRW	Grit Washer
GDL	Grounds or Landscaping
HOI	Hoist
HOP	Hopper
HRN	Horn
HAM	Hydralic Analog Modulating
HDM	Hydraulic Discrete Modulating
HDR	Hydraulic Discrete Run
INJ	Injector
PWI	Power Inverter
IC	Isolation Contactor
SLG	Isolation Gate
JP	Jockey Pump
KGV	Knife gate Valve
LAB	Laboragory
LAG	Lagoon
LE	Level Sensor
LS	Level Switch
LIT	Level Transmitter
LP	Lighting Panel
MMS	Magnetic Motor Starter
PCP	Main Low Voltage PLC
MAU	Make-up Air Unit
MH	Manhole
MW	Manway
MPM	Metering Pump
MIX	Mixer
MON	Monorail
MTR	Motor
MS	Motor Moisture Detector
MPR	Motor Protection Relay
TS	Motor Temperature Switch
DPB	Panels, Main, Circuit Breaker, Load Center
PC	Personal Computer
PLV	Plug Valve
NAM	pNeumatic Analog Modulating
NDM	pNeumatic Discrete Modulating
NDR	pNeumatic Discrete Run
POP	Pneumatic Operator
PBL	Polymer Dilution Blend Unit
PP	Power Panel
PRE	Press
PSL	Pressure Switch Low
PIT	Pressure Transmitter
PLC	Programmable Logic Controller
PLD	Pulsation Dampner
PMP	Pump
HSP	High Service Pump
BTP	Backwash / Transfer Pump
PPR	Pump Protection Relay
PS	Pump Station
REC	Reciever
RTU	Remote Telemtry Unit
RES	Reservoir
RAS	Return Activated Sludge
RDR	Roll-up Door
VEN	Roof Ventilator
ROO	Room
ROT	Rotameter
SAM	Sample Pump
SRP	Sraper
SCP	Screenings Compactor
CNV	Screenings Sluiceway
SCB	Scrubber
SEJ	Scum Ejector
SEL	Seal
SWS	Seal Water System
SLR	Silencer
SLA	Slaker
SDG	Slide Gate
EDR	Slide Gate Actuator
SLC	Sludge Collector
CNV	Sludge Conveyor
SSS	Soft Start
SV	Solenoid Valve
VSC	Speed Controller
SPW	Spillway
BAV	Spray Water Control Valve
STP	Stop Plate
STR	Strainer
SUP	Sump Pump
SF	Supply Fan
SUF	Supply Fan
CKS	Swing Check Valve
SBD	Switchboard
SGR	Switchgear
TNK	Tank
TLV	Telescoping Valve
TPN	Termination Panel
THK	Thickener
TBK	Tie-Breaker
TFR	Transformer
ATS	Transfer Switch
TRA	Trap
BRG	Traveling Bridge
TLS	Truck Loading Station
TRB	Turbidimeter
UVR	Ultra Violet Reactor
LEU	Ultrasonic Level Meter
UPS	Uninterruptible Power Supply
VAL	Valve
MOV	Valve Actuator
EDR	Valve Actuators And Parts
DMV	Valves, Diaphragm
MV	Valves, Miscellaneous
PRV	Valves, Pressure Relief
VFD	Variable Frequency
VFD	Variable Frequency Drive
WAS	Waste Activated Sludge
WH	Water Heater
WRS	Water Softener
WEL	Well

APPENDIX C[AD6]

VIDEO FILE FORMAT[AD6]

Supported video file formats

Video file format	Video file extension
Advanced Video Coding High Definition (AVCHD) [MPEG-2 Transport Stream]	.mts, .m2ts
Audio-Video Interleaved (AVI)	.avi
Digital camcorder MPEG-2 (MOD)	.mod
DVD video object (VOB) file	.vob
Expression Encoder Screen Capture Codec file	.xesc
MP4	.mp4
MPEG-1 System Stream	.mpeg, .mpg
MPEG-2 video file	.m2v
Smooth Streaming File Format (PIFF 1.3)	.ismv
Windows Media Video (WMV)	.wmv

[AD6] Addendum No. 6

SECTION ADDED IN ITS ENTIRETY[AD6]

SECTION 40_05_33.03

HIGH DENSITY POLYETHYLENE PLASTIC (HDPE) PIPE: AWWA C906

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: High Density Polyethylene Pipe (HDPE), and fittings.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. D1238 - Standard Test Method for Melt Flow Rates of Thermoplastics by Extrusion Plastometer.
   2. D1505 - Standard Test Method for Density of Plastics by the Density-Gradient Technique.
   3. D1599 - Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings.
   4. D1603 - Standard Test Method for Carbon Black Content in Olefin Plastics.
   5. D2122 - Standard Test Method for Determining Dimensions of Thermoplastic Pipe and Fittings.
   6. D2290 - Standard Test Method for Apparent Hoop Tensile Strength of Plastic or Reinforced Plastic Pipe by Split Disk Method.
   7. D3261 - Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing.
   8. D3350 - Standard Specification for Polyethylene Plastic Pipe and Fittings Material.
   9. F645 - Standard Guide for Selection, Design, and Installation of Thermoplastic Water-Pressure Piping Systems.
   10. F714 - Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter.

B. Plastic Pipe Institute (PPI):
   1. PE 4710.

1.03 ABBREVIATIONS

A. HDPE: High-density polyethylene pipe.

B. ID: Inside diameter of piping or tubing.

C. OD: Outside diameter.

D. SDR: Standard dimension ratio.

1.04 SUBMITTALS

A. Submit as specified in Section 01_33_00 - Submittal Procedures.

B. Shop drawings:
   1. Detailed layout drawings showing alignment of pipes, location of valves, fittings, and appurtenances, types of joints, and connections to pipelines or structures.

C. Product data: As specified in Section 40_05_00.01 - Common Work Results for General Piping:
   1. Describe materials and installation equipment including fusion machine. Include optimum range of fusion conditions such as fusion temperature, interface pressure, and cooling time Pipe loads and structural calculations.
   2. Installation instructions.

D. Qualifications of installation crew for high-density polyethylene pipe including qualifications of the fusion machine technician. Furnish proof of training in the use of fusion equipment.

1.05 QUALITY ASSURANCE

A. Markings on the pipe shall be in accordance with AWWA C906.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect piping materials from sunlight, scoring, and distortion.

B. Do not allow surface temperatures on pipe and fittings to exceed 120 degrees Fahrenheit.

C. Store and handle PE pipe and fittings as recommended by manufacturer in published instructions.

PART 2 PRODUCTS

2.01 MATERIALS

A. Extruding and molding material: Virgin material containing no scrap, regrind, or rework material except where permitted in the referenced standards.

B. Fittings: Same material as the pipe and of equal or greater pressure rating.

2.02 HDPE PIPING

A. General:
   1. Pipe and fittings: High-density polyethylene.
   2. Dimensions of pipe and fittings: Based on controlled outside diameter in accordance with ASTM F714:
      a. SDR: As given in Piping Schedule on the drawings; or, if not given, minimum SDR equals 9.
      b. Pipe Diameter: DIPS dimensions.
   3. Pipe, fittings, and adapters: Furnished by the same manufacturer, or compatible with components in the same system and with components of other systems to which connected.

B. Materials:
   1. Manufacturers: One of the following or equal:
      a. Performance Pipe.
      b. Isco Ind.
   2. Polyethylene: As listed by the PPI under the designation PE 4710; and have a minimum cell classification, in accordance with ASTM D3350, of 445574C:
      a. Pipe and fittings: Manufactured from material with the same cell classification.
      b. Manufacturer shall certify that pipe and fittings meet the above classifications.
   3. Polyethylene fittings and custom fabrications:
      a. Molded or fabricated.
      b. Butt fusion outlets shall be made to the same outside diameter, wall thickness, and tolerances as the mating pipe.
      c. All fittings and custom fabrications shall be fully rated for the same internal pressure as the mating pipe.
      d. Pressure de-rated fabricated fittings are prohibited.
   4. Molded fittings:
      a. Manufactured in accordance with ASTM D3261, Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing, and shall be so marked.
      b. Each production lot of molded fittings shall be subjected to the tests required under ASTM D3261.
   5. X-ray inspection: The Manufacturer shall submit samples from each molded fittings production lot to x-ray inspection for voids, and shall certify that voids were not found.
   6. Fabricated fittings:
      a. Made by heat fusion joining specially machined shapes cut from pipe, polyethylene sheet stock, or molded fittings.
      b. Rated for internal pressure service at least equal to the full service pressure rating of the mating pipe.
   7. Polyethylene flange adapters:
      a. Flange adapters shall be made with sufficient through-bore length to be clamped in a butt fusion joining machine without the use of a stub-end holder.
      b. The sealing surface of the flange adapter shall be machined with a series of small v-shaped grooves to provide gasketless sealing, or to restrain the gasket against blowout.
   8. Back-up rings and flange bolts:
      a. Flange adapters shall be fitted with Type 304 or 316 stainless steel back-up rings pressure rated equal to or greater than the mating pipe.
      b. The back-up ring bore shall be chamfered or radiused to provide clearance to the flange adapter radius.
      c. Flange bolts and nuts shall be the same material as backing flange and as specified in Section 40_05_00.01 - Common Work Results for General Piping.

2.03 SOURCE QUALITY CONTROL

A. HDPE piping:
   1. Manufacturer's quality control: The pipe and fitting manufacturer shall have an established quality control program responsible for inspecting incoming and outgoing materials.
   2. Incoming polyethylene materials:
      a. Inspected for density, melt flow rate, and contamination.
      b. The cell classification properties of the material shall be certified by the supplier, and verified by manufacturer's quality control.
      c. Approved by quality control before processing into finished goods.
   3. Outgoing materials shall be checked for:
      a. Outside diameter, wall thickness, and eccentricity in accordance with ASTM D2122 at a frequency of at least once per hour.
      b. Out of roundness at a frequency of at least once per hour.
      c. Straightness, inside and outside surface finish, markings and end cuts shall be visually inspected in accordance with ASTM F714 on every length of pipe:
         1) Quality control shall verify production checks and test for:
            a) Density in accordance with ASTM D1505 at a frequency of at least once per extrusion lot.
            b) Melt Index in accordance with ASTM D1238 at a frequency of at least once per extrusion lot.
            c) Carbon content in accordance with ASTM D1603 at a frequency of at least once per day in accordance with extrusion line.
            d) Quick burst pressure in accordance with ASTM D1599 at a frequency of at least once per day per line.
            e) Ring Tensile Strength in accordance with ASTM D2290 at a frequency of at least once per day per line.
      d. X-ray inspection shall be used to inspect molded fittings for voids, and knit line strength shall be tested. All fabricated fittings shall be inspected for joint quality and alignment.
   4. Permanent records: The manufacturer shall maintain permanent QC and QA records.
   5. Compliance tests:
      a. Manufacturer's inspection and testing of the materials.
         1) In case of conflict with manufacturer's certifications, the Contractor, Engineer, or Owner may request retesting by the manufacturer or have retests performed by an outside testing service.
         2) All retesting shall be at the requestor's expense, and shall be performed in accordance with this Section.

PART 3 EXECUTION

3.01 INSTALLATION

A. General:
   1. Where not otherwise specified, install piping in accordance with ASTM F645, or manufacturer's published instructions for installation of piping, as applicable to the particular type of piping.

2. Provide molded transition fittings for transitions from HDPE to metal or IPS pipe. Do not thread or solvent weld HDPE pipe.

B. Installation of HDPE piping:
   1. Joining:
      a. Heat fusion joining:
         1) Joints between plain end pipes and fittings shall be made by butt fusion, and joints between the main and saddle branch fittings shall be made utilizing saddle fusion employing only procedures that are recommended by the pipe and fitting manufacturer.
         2) The Contractor shall certify, in writing, that persons making heat fusion joints have received training in the manufacturer's recommended procedure and have had at least 3 years current experience in the heat fusion butt welding process.
         3) The Contractor shall maintain records of trained personnel, and shall certify that training was received not more than 12 months before commencing construction.
         4) External and internal beads shall not be removed.
      b. Heat fusion training services: The manufacturer shall provide training in the manufacturer's recommended butt fusion and saddle fusion procedures to the Contractor's installation personnel, and to the inspector(s) representing the Owner, prior to the start of construction.
      c. Mechanical joining:
         1) Polyethylene pipe and fittings may be joined together or to other materials by means of flanged connections (flange adapters and back-up rings) or, where specifically indicated on the Drawings, flexible couplings designed for joining polyethylene pipe or for joining polyethylene pipe to another material.
         2) Flexible couplings shall be fully pressure rated and fully thrust restrained such that when installed in accordance with manufacturer's recommendations, a longitudinal load applied to the mechanical coupling will cause the pipe to yield before the mechanical coupling disjoins.
   2. Installation:
      a. General:
         1) The Manufacturer shall package products for shipment in a manner suitable for safe transport by commercial carrier.
         2) When delivered, a receiving inspection shall be performed, and any shipping damage shall be reported to the Manufacturer within 7 days.
         3) Damaged pipe shall be promptly removed from the job site.
         4) Installation shall be in accordance with Manufacturer's recommendations, and this specification.
         5) Prior to making a terminal connection of each individual run of HDPE pipe, the temperature of the pipe should be allowed to approach the service temperature at which the pipe is intended to operate.
         6) All necessary precautions shall be taken to ensure a safe working environment in accordance with applicable codes and standards.
      b. Large diameter fabricated fittings: Fabricated fittings shall be butt fused to the end of a pipe.
      c. Mechanical joint and flange installation:
         1) Mechanical joints and flange connections shall be installed in accordance with the manufacturer's recommended procedure.

2) Flange faces shall be centered and aligned to each other before assembling and tightening bolts.
3) Every effort shall be made to ensure that the opposing faces of the flange assemblies mate up securely at a temperature approximately the same as the service temperature.
4) In no case shall the flange bolts be used to draw the flanges into alignment.
5) Bolt threads shall be lubricated, and flat washers shall be fitted under the flange nuts.
6) Bolts shall be evenly tightened according to the tightening pattern and torque step recommendations of the manufacturer.
7) At least 1 hour after initial assembly, flange connections shall be re-tightened following the tightening pattern and torque step recommendations of the manufacturer.
8) The final tightening torque shall be 100 feet-pounds or less as recommended by the manufacturer.

d. Pipe handling:
1) Lift, move, or lower pipe and fittings only with wide fabric choker slings.
2) Wire rope or chain shall not be used.
3) Slings shall be of sufficient capacity for the load, and shall be inspected before use.
4) Worn or defective equipment shall not be used.

3.02 FIELD QUALITY CONTROL

A. Testing:
1. Butt fusion testing:
a. Pipe size 14 inches and larger:
1) The first fusion of each day shall be a trial fusion.
a) The trial fusion shall be allowed to cool completely.
b) Fusion test straps shall be cut out.
(1) The test strap shall be 12 inches (minimum) or 30 times the wall thickness in length with the fusion in the center, and 1 inch (minimum) or 1.5 times the wall thickness in width.
c) Bend the test strap until the ends of the strap touch.
2) If the fusion fails at the joint, a new trial fusion shall be made, cooled completely and tested.
3) Butt fusion of pipe to be installed shall not commence until a trial fusion has passed the bent strap test.
b. Pipe size smaller than 14 inch:
1) Test daily using ultrasonic time-of-flight diffraction (TOFD) per ISO/DIS 10863, Welding - Use of time-of-flight diffraction technique.

B. Data logging and test data:
1. A data logger shall be installed on the fusion heated joining machine. Data on each joint shall be recorded by the data logger. Data to be recorded shall be minimum temperature of joint fusion and interface pressure of the fused joint.
2. Recorded data from the fusion data logger and the TOFD shall be transmitted to the Owner daily.

C. Pressure testing:
   1. Test pressures as specified in Section 40_05_00.01 - Common Work Results for General Piping.
   2. Temperature of test water shall be no more than 73 degrees Fahrenheit.

END OF SECTION

[AD6] Addendum No. 6 - February 18, 2019

SECTION ADDED IN ITS ENTIRETY[AD6]

SECTION 43_33_40.01

MAGNETIC DRIVE GEAR ROTARY SAMPLE PUMPS

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Rotary positive displacement pumps with external gears, magnetically coupled with appurtenances.

B. Tag numbers: As specified in Pump Schedule.

1.02 REFERENCES

A. ASTM International (ASTM):
   1. A276 - Standard Specification for Stainless Steel Bars and Shapes.
   2. B367 - Standard Specification for Titanium and Titanium Alloy Castings.
   3. B462 - 10e1: Standard Specification for Forged or Rolled UNS N06030, UNS N06022, UNS N06035, UNS N06200, UNS N06059, UNS N10362, UNS N06686, UNS N08020, UNS N08024, UNS N08026, UNS N08367, UNS N10276, UNS N10665, UNS N10675, UNS N10629, UNS N08031, UNS N06045, UNS N06025, UNS R20033 Alloy Pipe Flanges, Forged Fittings, and Valves and Parts for Corrosive High-Temperature Service.
   4. B575 - Standard Specification for Low-Carbon Nickel-Chromium-Molybdenum, Low-Carbon Nickel-Chromium-Molybdenum-Copper, Low-Carbon Nickel-Chromium-Molybdenum-Tantalum, Low-Carbon Nickel-Chromium-Molybdenum-Tungsten, and Low-Carbon Nickel-Molybdenum-Chromium.
   5. B584 - Standard Specification for Copper Alloy Sand Castings for General Applications.

B. Hydraulic Institute (HI):
   1. 3.1-3.5 - Rotary Pumps for Nomenclature, Definitions, Applications and Operation.
   2. 9.1-9.5 - Pumps - General Guidelines for Types, Definitions, Application, Sound Measurement and Decontamination.

1.03 DEFINITIONS

A. Pump head (Total Dynamic Head), flow capacity, pump efficiency, net positive suction head available (NPSHa), and net positive suction heat required (NPSHr): As defined in HI 3.1-3.5 and 9.1-9.5 and as modified in this Section.

B. Suction head: Gauge pressure available at pump-intake flange or bell in feet of fluid above atmospheric; average when using multiple suction pressure taps, regardless of variation in individual taps.

C. Tolerances: In accordance with Hydraulic Institute 3.1-3.6 and 9.1-9.5, unless specified more restrictively.

1.04 SYSTEM DESCRIPTION

A. Horizontal, magnetically coupled external gear pump with close coupled motor and appurtenances specified below.

B. Design requirements:
   1. Pumped fluid: As specified in the Pump Schedule.
   2. Pump performance characteristics: As specified in the Pump Schedule.
   3. Motor characteristics:
      a. As specified in the Pump Schedule.
      b. Other characteristics as specified in Section 26_05_09 - Electric Motors.

1.05 SUBMITTALS

A. Submit as specified in Section 01_33_00 - Submittal Procedures.

B. Product data: As specified in Section 46_05_10 - Common Work Results for Mechanical Equipment.
   1. Materials of construction and chemical resistances.
   2. Manufacturer's Representative's qualifications as specified in Section 01_75_17 – Testing, Training, and Facility Start-Up.
   3. Manufacturer's certificate stating that the materials of construction are compatible with the pumped fluid.

C. Shop drawings: As specified in Section 46_05_10 - Common Work Results for Mechanical Equipment.

D. Vendor operation and maintenance manuals: As specified in Section 01_78_23 - Operation and Maintenance Data.

E. Commissioning submittals:
   1. Provide Manufacturer's Certificate of Source Testing as specified in Section 01_75_17 - Testing, Training, and Facility Start-Up when specified in the Pump Schedule.
   2. Provide Manufacturer's Certificate of Installation and Functionality Compliance as specified in Section 01_75_17 - Testing, Training, and Facility Start-Up.

1.06 WARRANTY

A. As specified in Section 01_78_36 - Warranties and Bonds.

PART 2 PRODUCTS

2.01 GENERAL

A. As specified in Section 46_05_10 - Common Work Results for Mechanical Equipment.

2.02 MANUFACTURERS

A. Gear pump:
   1. Manufacturer qualifications: Pump manufacturer shall have at least 5 years of experience in the manufacture of similar equipment utilized in water applications.
   2. Manufacturers: One of the following or equal:
      a. Tuthill, D Series

2.03 MATERIALS

A. General:
   1. All wetted materials shall be compatible with the scheduled pumped fluid.

B. Type 316 Stainless Steel: In accordance with ASTM A276.

C. Hastelloy: Hastelloy-C: In accordance with ASTM B584 or ASTM B575.

D. Titanium: In accordance with ASTM B367.

E. Alloy 20: In accordance with ASTM B462-10e1.

F. PEEK: Polyether ether ketone, organic polymer thermoplastic.

G. Ryton: 25 percent glass filled and 15 percent PTFE-filled poly-phenylene sulfide (PPS).

H. PPS: Polyphenylene Sulfide.

I. ETFE: Carbon reinforced ethylene tetrafluoroethylene polymer.

J. PVDF: Thermoplastic fluoropolymer form polyvinylidene difluoride.

K. PFA: Perfluoroalkoxy copolymer resin (Teflon™ material).

2.04 GENERAL PUMP CONSTRUCTION

A. Characteristics:
   1. Heavy-duty horizontal positive displacement, external-rotary-gear type, seal-less, and magnetically driven gear pumps that provide continuous, pulseless liquid flow.
   2. The pump shall operate by radically gapped magnets, mounted on 2 cylinders.
      a. One cylinder shall be attached to the motor shaft, the second cylinder shall be attached to the driven shaft.
      b. When the motor turns, the outer drive magnet shall turn and operate the inner magnet and the gears attached to the inner magnet.
   3. The magnetic-coupling end shall have sufficient torque-transmission capacity to process the motor nameplate horsepower.
   4. Pump and motor shall be pre-aligned and assembled at the factory.

2.05 PUMP HOUSING

A. Type: 1 piece with integral suction and discharge nozzles.

B. Material: Compatible with the pump fluid and as scheduled.

2.06 GEARS AND WEAR PLATES

A. Material: Compatible with the pump fluid and as scheduled.

B. The pump housing shall have pressure-relieved wear plates.

C. Gears shall be attached to the pumps shaft with key and retaining rings, allowing them to be individually replaced.

2.07 BEARING AND SHAFTS

A. Material: Compatible with the pump fluid and as scheduled.

B. The process fluid shall provide pump lubrication.
   1. The pump and motor unit shall be mounted on a common pedestal.

C. Materials:
   1. Materials shall be compatible with the pump fluid and as scheduled.

2.08 SUPPORTS, PEDESTALS, AND BASEPLATES

A. Pedestal:
   1. Pump and driver shall be mounted on a common pedestal.
   2. The pedestal shall house the driving magnet and the driven magnet and be enclosed in a containment can.
   3. The driving magnet shall be attached to the motor shaft and the driven magnet shall be attached to the pump shaft.
   4. Magnets shall be rare earth magnets.
   5. The pedestal shall support the motor and the pump.
   6. The motor and drive magnets shall be removable from the pedestal without removing the housing from the piping, enabling the motor to be repaired without exposing operators to process fluid.
   7. Materials:
      a. Containment can: Same as pump housing.
      b. Pedestal: Manufacturer standard materials.

2.09 DRIVERS

A. Horsepower:
   1. As scheduled.
   2. Listed driver horsepower is the minimum to be supplied.
      a. Increase driver horsepower if required to prevent driver overload while operating at any point of the supplied pump operating head-flow curve including runout.
      b. When scheduled driver is a motor, increase motor horsepower if required to prevent operation in the service factor.
      c. Make all structural, mechanical, and electrical changes required to accommodate increased horsepower.

B. Motors: Provide NEMA C face flange-mounted motor as specified in Section 26_05_09 - Electric Motors and as specified in this Section:
   1. Revolutions per minute: As scheduled.
   2. Enclosure: As scheduled.
   3. Electrical characteristics: As scheduled.
   4. Efficiency, service factor, insulation, and other motor characteristics: As specified in Section 26_05_09 - Electric Motors.
   5. Motor accessories: As specified in Section 26_05_09 - Electric Motors and in this Section.

2.10 SPARE PARTS AND SPECIAL TOOLS

A. Spare parts: None.

B. Special tools: Deliver 1 set for each furnished pump type and size needed to assemble and disassemble the pump.

PART 3 EXECUTION

3.01 COMMISSIONING

A. As specified in Section 01_75_17 - Testing, Training, and Facility Start-Up and this Section.

B. Manufacturer services:
   1. Provide certificates:
      a. Manufacturer's Certificate of Source Testing.
      b. Manufacturer's Certificate of Installation and Functionality Compliance.
   2. Manufacturer's Representative onsite requirements:
      a. Installation: 1 trip, 3 day minimum.
      b. Functional Testing: 1 trips, 2 day minimum each.
   3. Training:
      a. Maintenance: 4 hours per session, 2 sessions.
      b. Operation: 2 hours per session, 2 sessions.
   4. Process operational period:
      a. As required by Owner or Contractor.

C. Source testing: As specified in Pump Schedule.

D. Functional testing: As specified in Pump Schedule.

3.02 PUMP SCHEDULE

A. Schedule is not a take-off list. See the following Pump Schedule:

Pump Tag No.	20-P-101-A, 20-P-101-B	20-P-311-1, 20-P-311-2, 20-P-311-3, 20-P-311-4, 20-P-311-5, 20-P-311-6, 20-P-311-7, 20-P-311-8, 20-P-311-9, 20-P-311-10, 20-P-311-11, 20-P-311-12	20-P-390	20-P-501
General Characteristics:				
Service	Membrane Feed Water (MFW)	Membrane Filtrate (MFL)	Blended Water (BLW)	Membrane Filtrate (MFL)
Number of Pumps	2	12	1	1
Pump Construction	Metallic	Metallic	Metallic	Metallic
Pump Characteristics:				
Impeller Type	External Gear	External Gear	External Gear	External Gear
Coupling Type	Magnetically Coupled	Magnetically Coupled	Magnetically Coupled	Magnetically Coupled
Maximum Capacity, Gallons per hour	29.1	15.9	29.1	121.0
Minimum Capacity, Gallons per hour	9.5	1.6	9.5	106.7
Maximum Discharge Pressure (psig)	87	87	87	87
Motor Characteristics:				
Minimum Motor Size (hp)	1/4	¼	1/4	1/4
Motor Service Factor	1.0	1.0	1.0	1.0
Voltage/Phase/Frequency	115/1/60	115/1/60	115/1/60	115/1/60
Maximum Motor Speed (rpm)	1,800	1,800	1,800	1,800
Motor Enclosure	TEFC	TEFC	TEFC	TEFC

Pump Tag No.	20-P-101-A, 20-P-101-B	20-P-311-1, 20-P-311-2, 20-P-311-3, 20-P-311-4, 20-P-311-5, 20-P-311-6, 20-P-311-7, 20-P-311-8, 20-P-311-9, 20-P-311-10, 20-P-311-11, 20-P-311-12	20-P-390	20-P-501
Pump Materials:				
Housing	316SS	316SS	316SS	316SS
Drive Gear	316SS	316SS	316SS	316SS
Idler Gear	316SS	316SS	316SS	316SS
Wear Plates	PEEK	PEEK	PEEK	PEEK
Bearings	PEEK	PEEK	PEEK	PEEK
Shafts	316SS	316SS	316SS	316SS
Source Testing:				
Test Witnessing	Not Witnessed	Not Witnessed	Not Witnessed	Not Witnessed
Performance Test Level	None	None	None	None
Vibration Test Level	None	None	None	None
Noise Test Level	None	None	None	None
Functional Testing:				
Performance Test Level	1	1	1	1
Vibration Test Level	None	None	None	None
Noise Test Level	None	None	None	None

END OF SECTION

[AD6] Addendum No. 6