Addendum #5 to Invitation for Bid #19-25-TV is issued in accordance with the IFB Terms & Conditions and is intended to provide additional information and clarification to bidders.

Addendum #5 consists of five (5) items which are listed below, attached hereto and made a part hereof to IFB #19-25-TV.

**Item 1 – BID OPENING DATE:**

*CHANGE* Bid Opening Date *FROM* January 15, 2020 @ 2:00 p.m. *TO* January 22, 2020 @ 2:00 p.m.

**Item 2 – REVISED BID FORM:**

Revised Bid Form for Addendum #5 (attached) shall be used in lieu of the original Bid Form originally posted.

**Item 3 – SUBSTANTIAL AND FINAL COMPLETION CLARIFICATION:**

Substantial completion shall be 760 days after notice to proceed and final completion shall be 820 days after notice to proceed.

**Item 4 – QUESTIONS AND ANSWERS:**

1. **QUESTION:** Is it possible to gain access to the CADD files for the project? Specifically, the site drawings?
   **ANSWER:** The Engineer will not distribute the CADD files during Bid Phase.

2. **QUESTION:** Can you provide more information on the intent and hookup of the temporary Aqua Disk system?
   **ANSWER:** With the demolition of the existing filters for the construction of the MBR Building, a temporary filter is required during Phase 1 of Construction to maintain wastewater treatment requirements. Please refer to the notes on Phasing drawings, and the Supplementary Information Attachment B for existing plant drawings.

3. **QUESTION:** Is it the intent that the County will secure access to an adjacent property for a
staging area and temporary stockpile area?
**ANSWER:** That is correct.

4. **QUESTION:** There was also mention of a County disposal site for excess soils. Can you provide details?
   **ANSWER:** Livingston.

5. **QUESTION:** Drawing C-105 indicates “temporary trailer for operators”. Is this Contractor provided? If so please provide details.
   **ANSWER:** Correct, please refer to Specification 01 50 00 Temporary Facilities and Controls reissued in Addendum # 4 for details.

6. **QUESTION:** Are there any provisions for relocating the existing modified chlorine contact tank, post aeration and outfall in order to make the connection between the PFAS and Membrane?
   **ANSWER:** The existing chlorine contact tank, post aeration, and outfall will remain in place and functional while constructing the connection between PFAS and Membranes.

7. **QUESTION:** The flanges for the SS pipe are Van Stone type with SS stub ends. However, I can't nail down the material required for the backing flanges. Do you know if they’re SS or ductile iron?
   **ANSWER:** Uncertain if question pertains to ALP SS pipe or SS pipe for MBR Permeate. For ALP SS pipe backing / back-up flange ductile iron is acceptable, refer to 40 05 13 19 2.2 B 4 for thickness of back-up flange.

8. **QUESTION:** Please confirm that Circuit 17 “Other” shown on E-105 is UIT-1140 shown on E-102.
   **ANSWER:** Use LV-HW-1 circuit 5 for 120V power to UIT-1140. LV-HW-1 circuit 17 shall be per Addendum #3.

9. **QUESTION:** Storm Inlet CB-6 has a rim elevation 228.0. Inlet sits in plateau elev. 228.0. Is the Rim elevation correct?
    **ANSWER:** Inlet into CB-6 sits at elev 224.6. Rim elevation of CB-6 lowered to 227.9.

10. **QUESTION:** Effluent headwall (N6734162.873; E11766181.997) can a precast alternate be allowed in lieu of the cast-in-place outfall structure as shown on C-503?
    **ANSWER:** No change to the design. Pre-cast alternate may be considered through the substitution process.

11. **QUESTION:** Can polywrap – in purple – be used in lieu of field painting (09 99 00) the 6” DI – REUSE piping (factory sealcoat), laid underground from the MBR building up to the property line?
    **ANSWER:** Please refer to Specification 33 11 21 section 2.3-A-1. for information regarding Ductile Iron Pipe Coating. Bituminous coating is acceptable.

12. **QUESTION:** Drawing M-202 & Section 2 on drawing M-204 both show the Scum Pump
Discharge Piping & Valves to be 4” size. P&ID drawing I-203 shows the Scum Pump Discharge Piping & Valves to be 6” size. Please advise if Piping & Valves should be 4” or 6” size.

**ANSWER:** Piping and Valves for scum pump discharge piping and valves should be 4”.

13. **QUESTION:** Drawing M-301 & M-304 both show ALP Line to the PFAS Tanks as 10” size leaving MBR Building. This same line is shown as 10” size at PFAS Tanks on drawing M-201, M-205 & M-206. Yard Piping drawing C-108 shows a 14” SS Wall Pipe where this line leaves the MBR Building. P&ID drawing shows this line as 20”, 16” & 14” at various places between the MBR Building & the PFAS Tanks. Please advise which pipe sizes are correct. Should this ALP Line be 10” from where it leaves the MBR Building to where it branches off at the PFAS Tanks?

**ANSWER:** ALP line from the MBR Building to the PFAS Tanks should be 10”.

14. **QUESTION:** Drawing M-202, M-205 & M-206 all show a 10” ALP Header & 6” ALP Lines feeding the PFAS Tanks. These drawings also show FE-2212 & FE-2222 to be 6” size. P&ID drawing I-203 shows the ALP Header to be 14” & 12” size with 8” ALP Lines feeding the PFAS Tank & also shows FE-2212 & FE-2222 to be 8” size. Please advise which pipe sizes are correct.

**ANSWER:** Sizes shown on M drawings are correct. With a 10” ALP Header & 6” ALP Lines feeding the PFAS Tanks.

15. **QUESTION:** Process Piping Schedule on drawing M-001 calls for Utility Water Piping 3” & below to be Sch. 80 PVC or Type K Copper. Plug Flow Activated Sludge Intermediate Level Plan drawing M-202 & Yard Piping drawing C-108 both show buried 3” Utility Water piping to be Ductile Iron. Please advise if all 3” & below Utility Water piping should be PVC as shown in Pipe Schedule or should be Ductile Iron as shown on Pipe Layout drawings.

**ANSWER:** M-001 schedule is correct, unless otherwise indicated on the drawings.

16. **QUESTION:** Drawing C-108 shows the Chem Bldg and retaining wall flush with the property line. Will there be an accommodation for encroaching on the adjacent property in order to excavate for construction?

**ANSWER:** Yes, access to property will be allowed for construction.

17. **QUESTION:** We have not found any pipe hangers and supports located on the Process Mechanical drawings. Spec section 40 05 29, 1.3.D states that Contractor shall be responsible for the structural design of all pipe hangers & supports specified in this section and shown on the Contract Drawings. We are having problem finding a Pipe Support manufacturer willing to quote the supports on this project with none being located or shown on the pipe layout drawings. Can drawings be revised to show locations and type of pipe supports required?

**ANSWER:** See Specification 40 05 29 1.4 - B

18. **QUESTION:** I focus on municipal blower applications for Kaeser Compressors in Fredericksburg. I was reviewing the Thornburg WWTP specifications and noticed that we are not an approved supplier for section 43 11 23.11. Kaeser is a global leader in aeration blower technology with over 8000 units running the US. The blowers on this project represent a notable portion of the equipment cost and the only named suppliers are based in PA. Since we are headquartered in Fredericksburg with over 150 employees, you can guarantee we will provide a
superior product and support. What can I do to be named as an approved supplier for this equipment?

ANSWER: No pre-qualification of substitutes / alternates accepted during Bid Phase.

19. QUESTION: C-108 4”-DI-SUMP lines exiting Chemical Building; M-603 3”-DI-PRD exiting Chemical Building. Are these two sets of lines the same lines? Please confirm size of lines 3-inch in mechanical; 4-inch in civil.

ANSWER: The lines mentioned are two different sets of lines. The correct size of the 4”-DI-SUMP lines exiting NW from the front of the CHM building are 3”, refer to P-603 for location of sump lines within CHM building. C-503 updated to show 3”-DI-SUMP. The 3”-DI-PRD lines serve as drains from the chemical fill station on the south side of the CHM building and are shown as the correct size (3”) on the C & M sheets.

20. QUESTION: C-108 4” lateral out OPS/MBR to MH-PD-1; P-305 shows 3” outlet from OPS/MBR. Please confirm size of line to exit MBR.

ANSWER: 3” is the correct size

21. QUESTION: C-108 4”-DI-DRAIN from Thickener Room to MH-PD-4. Cannot find 4-DI-DRAIN in plumbing or mechanical for this run from Thickener to MH-PD-4.

ANSWER: 4”-DI-DRAIN on C-108 shown as incorrect size. Correct size of drain is 2”. Refer to P-501 for routing of 2” pumped drain within the Sludge Transfer Room. C-108 corrected to show 2”-DI-DRAIN.

22. QUESTION: Please confirm sanitary drain shown on P-503 is 3-inch not 4-inch.

ANSWER: 3” is the correct size

23. QUESTION: P-501 Sludge Transfer Room – Basement Note: 2” Pumped Drain – For Continuation See Civil Plan. Cannot find 2” Pumped Drain on Civil Plan.

ANSWER: Pipe shown on C-108 as 4”-DI-DRAIN. C-108 updated to show 2”-DI-DRAIN.

24. QUESTION: M-101 3” PVC-UW Note see civil drawings for continuation; C-108 2”-DI-UWS shown. Verify DIP or PVC material for pipeline. Verify size of UW 3” on M-101 or 2” on C-108.

ANSWER: Correct size is 2” PVC -UWS.

25. QUESTION: C-108 note on civil plans: 8”-DI-DCW By Others. Will the county waterline be installed prior to start of Phase 1 or Phase 1A.

ANSWER: Waterline will be constructed during Phase 1.

26. QUESTION: No profile for new waterline. Assume no vertical bends along alignment? Minimum depth of bury for fire hydrant? Minimum 3’-6” cover over 8”-DI-DCW?

ANSWER: Engineer offers no objection to contractor utilizing vertical bends as necessary to facilitate construction.

27. QUESTION: There is a water meter & box shown on the civil drawings C-108. What size is required for the water meter? Where does the domestic water service line run from the water
meter to which building?
\textbf{ANSWER:} Please refer to the Water Meter Detail shown on C-504 for the valve and piping arrangement of the water meter and piping arrangement.

28. \textbf{QUESTION:} Will county reuse line be in place prior to start of Phase 1?
\textbf{ANSWER:} The reuse line will be installed in congruence with the waterline referenced in Question 25.

29. \textbf{QUESTION:} P-502 issued with Addendum No. 2 missing Revision No. in Legend box?
\textbf{ANSWER:} Will add revision into rev block of P-502

30. \textbf{QUESTION:} Is a Fire Hydrant Protection detail required at only one of the Fire Hydrant locations?
\textbf{ANSWER:} No additional Siamese FDC connections are required.

31. \textbf{QUESTION:} Please provide detail for area/velocity flowmeter installation inside sanitary manhole for 8-inch gravity sewer. Section 40 91 23.33 Air and Gas Flow Meters – Venturi flow meter is designed to be inserted between pipe flanges?

Designed to be inserted between flanges, the Insert Venturi Meter can be custom fabricated with almost any available machinable material, including fiberglass (For metallic fabrication, see HVT Fabrication Insert datasheet or for fiberglass fabrication, see HVT Plastic Insert datasheet)

This meter pressure and temperature limits integrate automatically into the existing pipe line and delivers high accuracy metering. It is ideal for measuring clean gases or liquids. Static inlet taps and a grouted-in design is available for large line sizes. The HVT- Digester Gas models can be fitted with high and low pressure tap vent cleaners to allow the clearing of buildup on the piezometer taps.” Catalog cut from Primary Flow Signal
\textbf{ANSWER:} Typo spec reference should be 40 91 23.34 not 40 91 23.33

32. \textbf{QUESTION:} Please provide a different pipe material for 2”-DI-UWS. 2” AWWA DIP is not manufactured in the USA. Per M-001 piping schedule, should 2”-DI-UWS be Sch80 PVC?
\textbf{ANSWER:} Agree, Sch80 PVC is appropriate for 2”-UWS.

33. \textbf{QUESTION:} C-108 shows 14”-SS-ALP entering MBR. M-301 shows 10”-DI-ALP entering MBR. Which is correct?
\textbf{ANSWER:} 10”-SS-ALP is correct, C-108 updated to show correct size.

34. \textbf{QUESTION:} Does M-001 note 6 and 8 apply to 8”-DI-DCW – extension of county 8-inch waterline? We are to concrete encase all 8”-DI-DCW piping?
\textbf{ANSWER:} Note clarified to remove roads and driveways from concrete encasement.

35. \textbf{QUESTION:} P-603 note: 2” utility water to solids handling building by others. Is this correct – not in our scope of work?
\textbf{ANSWER:} 2” utility water within scope of work. Wording should be: 2” Utility water to solids handling building. Refer to civil drawings for continuation.
36. **QUESTION:** C-108 3”-DI-DCW-Below & 6”-DI-DCW-Above (MBR to Yard) Are these two lines to be concrete encased as one unit?
   **ANSWER:** Lines not concrete encased. Note on M-001 revised so that pipes under roadways and driveways are not required to be concrete encased.

37. **QUESTION:** Are any gate valves required at the 6” –DI TEE on the 6”-DI-UWS-Above line? Either on 6” branch or 3” branches?
   **ANSWER:** Not required. Isolation at points of use.

38. **QUESTION:** Request for review and acceptance for Keystone Conveyor Corp as equipment and material supplier.
   **ANSWER:** No pre-qualification of substitutes / alternates accepted during Bid Phase.

39. **QUESTION:** Dwg M-202 shows a legend in the bottom left that references pipe supports on dwg M-004. There is no Detail C3 or A3 on this dwg. Please clarify.
   **ANSWER:** Correct details on M-004 are Detail M-014 Sliding Pipe Support and Detail M-015 Fixed Pipe Support.

40. **QUESTION:** Can you provide spec 40 05 13.19 Stainless Steel Process Piping?
   **ANSWER:** See 40 05 13.19 in Specification book for Air low pressure piping, and 40 05 13 for steel piping for wastewater flow.

41. **QUESTION:** The Bid Form shows Allowance Item 1 – Services Provided by E-Merge Systems, Inc. for a total amount of $350,000. Attachment E shows the total amount of E-Merge System’s Cost Proposal of $1,235,000. Should the amount on the Bid Form for Allowance Item 1 be $1,235,000? If so, will a new Bid Form be issued. If not, what is the difference in scope between the allowance amount of $350,000 and the E-Merge Cost Proposal amount of $1,235,000? Is the $350,000 allowance to be carried on the Bid Form, and the $1,235,000 be added to our Base Bid amount?
   **ANSWER:** The Bid Form has been corrected and is attached.

42. **QUESTION:** Addendum #3 DWG. E-303 Note 1 states that we should include a Utility Metering Transformer Compartment in accordance with the Utility Requirements. When we reached out to REC for their metering requirements, they stated they intended to meter at the utility transformer, not the switchboard. Please confirm where the utility metering will be located.
   **ANSWER:** Metering transformers located per REC requirements (at utility transformer) are acceptable. The Main Switchgear utility metering transformer compartment may be deleted.

43. **QUESTION:** In regards to **Section 43 21 36.21**, Rotary Lobe Pumps. I am checking to see if the Engineer will accept Netzsch Tornado Pumps as an “or Equal” to the specified Vogelsang USA rotary lobe pumps?
   **ANSWER:** No pre-qualification of substitutes / alternates accepted during Bid Phase.

44. **QUESTION:** Specification 33 11 21-2.3 calls for bituminous coating on outside of buried
ductile iron pipe. Specifications 40 05 13.21-1.2 and 09 99 00 are in conflict. These specifications call for coal tar epoxy coating on outside of buried ductile iron pipe. Which coating will be required? Please note that bituminous coating is standard from the manufacturer. Coal tar epoxy will cause longer lead times and additional costs.

**ANSWER:** Bituminous coating is acceptable for buried. Coal Tar for below grade interior.

45. **QUESTION:** Regarding the Fiberglass Reinforced Plastic Tanks (Specification Section 43 41 45), is the Contractor required to provide and pay for the initial fill of chemicals in each tank?

**ANSWER:** County will provide initial fill of chemicals.

46. **QUESTION:** Please address the following questions regarding services provided by E-Merge Systems, Inc.:

a. Specification Section 01 29 00; Paragraph 1.5-E-1 refers to a scope provided in IFB Attachment G. However, there is no Attachment G. Please clarify.

b. Attachment D (Bid Forms), page 8 lists a value of $350,000 for Allowance Item 1 – Services Provided by E-Merge Systems, Inc. However, Attachment E, page 15 of the E-Merge Cost Proposal lists the price as $1,235,000. Please clarify the price difference and if the Contractor will need to provide any price difference in their base bid.

c. It is not clear if the E-Merge Systems, Inc. proposal is a pre-selected subcontract, pre-negotiated contract or a pre-purchased contract. Please clarify the Owner’s and the Contractor’s obligations, contractual relationship, responsibilities with E-Merge Systems, Inc. for this project.

d. The E-Merge Systems, Inc. proposal states the proposal is valid through December 31, 2019. The bid date for this project is in 2020. Will a revised proposal and pricing be provided prior to the bid?

e. The E-Merge Systems, Inc. proposal states the proposal does not include any amounts for changes in taxes, tariffs, or other similar charges that are enacted after the date of this proposal. Please clarify how these price changes will be handled if any are applicable for this project.

**ANSWER:** Please refer to Addendum No.3, response to question #27. See below for further clarifications.

a. E-Merge scope/cost is included in Attachment E.

b. Please refer to question #48 response of Addendum #5

c. E-Merge Systems Inc. is a pre-selected sub-contract and pre-negotiated System Integrator selected by the County. The winning Contract must use this firm to provide instrumentation and control systems as detailed in their proposal.

d. Please use proposal and cost, and detailed in Attachment E, in base bid if no revised proposal is provided. A revised proposal will be posted prior to bid opening. If there are pricing changes, a revised bid form will be posted prior to bid opening as well.

e. Any changes to E-Merge’s proposal and/or scope will be administered by Spotsylvania County.

47. **QUESTION:** Refer to Drawings I-305 and I-306. 50-gal chemical storage drums are shown exterior to the building. Where are these tanks located?

**ANSWER:** Exterior is temporary while filling internal sodium hypochlorite and citric acid chemical tanks.

48. **QUESTION:** Please address the following questions regarding the Aqua MiniDisk Filter:

a. Drawing C-105 is the only drawing that shows the location of the “Temporary Aqua Disk Filter”.
The drawings do not indicate what this equipment sits on (gravel, concrete slab, etc.). Please provide information as to what this equipment sits on.

b. Drawing C-105 does not show any piping going to the temporary disk filter area. Please provide drawings detailing the material, size and layout of the pipe required for this system.

c. The bid documents do include general cut sheets and product information for the filter system, but a detailed scope of supply as to what is included and what is to be installed for the temporary system is not provided. Please provide a scope of supply detailing what is provided to the Contractor and what is to be installed.

d. No delivery schedule or unloading information is provided. Please provide details on delivery, unloading, etc.

**ANSWER:** Utilize existing slab. Please refer to Addendum #4 changes to the C drawings.

49. **QUESTION:** Section II – Basis of Award of the Invitation to Bid states the contract award will be based on the Total Lump Sum Bid Price as stated on the Bid Form. The Bid Form contains a line item “Total Price – Base (Lump Sum)” and a total line item ‘Total Bid Price – Base, Options, Contingent and Allowance Items’. Please clarify which line item the low bidder will be determined from.

**ANSWER:** Award will be based on the total bid price which includes, base (lump sum), both options, contingent items and allowance items.

50. **QUESTION:** The Bid Form contains a section of Contingent Unit Price items. The first sentence under this sections states “Contingent work is not identified on plans or in specifications, and not in Base or Option work. Without any explanations or a Measurement and Payment section for these unit prices detailing what is included and what is to be priced for each item, it is difficult to price these items accurately. Please provide a measurement and payment section detailing each Unit Price Item so they can be priced accurately.

**ANSWER:** Assumed quantities are indicated on the Bid Form.

51. **QUESTION:** Please note the following from our review of the specs and dwgs. Several items need to be corrected for accuracy and coordination with other trades.

If possible, can you clarify the Duty vs Standby UV reactor “valve control” question with Ramboll?

They can control it via SCADA or we must add a small, wall mounted Master Control Panel to our scope to address how this occurs.

Having a separate panel to decide which valve opens and which UV reactor is cycled into lead or standby position is simple with two units …. but when the 3rd one gets added down the road as development occurs, it is more complex and best done by our Master Panel mounted locally. It would need to be shown on the drawings as well for the GCs and electrical to provide power, wiring and mounting services for it.

**Section 46 66 23 Closed Vessel Medium Pressure UV Treatment Equipment**

1.5.B - Prorated replacement between 1000 and 8000 hours

[Aquionics] – Prorated replacement for UV lamps shall be between 1000 to 10,000 hours per warranty enclosed at end of document
2.3.A – Operating Parameters
[Aquionics] – A maximum value of inlet E. Coli value of 126,000 E. Coli/100 ml is required to achieve the effluent value of 126 E. Coli stated in specification and to be used by performance testing.

2.3.B – Lamp life shall be 12,000 hours minimum.
[Aquionics] – Lamp life shall be 10,000 hours minimum

2.4.A.1 – Each chamber shall be capable of disinfecting up to 2.25 MGD.
[Aquionics] – This value contradicts the peak flow value of 2.44 MGD in Section 2.3.A. Please verify which is correct.

2.4.A.2 – The maximum length of the chamber installation shall be 107 inches
[Aquionics] – The maximum laying length of the chamber in the piping shall be 31.5 inches

2.4.B.1 – Lamp operating power can be varied between 100 to 60%
[Aquionics] – Lamp operating power can be varied between 100 to 35% in 1% power increments.

2.4. C. UV Intensity Monitor - One lamp in each bank shall be equipped with a UV monitor
The wet portion of the monitor shall have a SS housing, viton "O" ring, and a high purity quartz probe over the monitor site hole.
[Aquionics] – Standard sensor is a dry design, incorporating a threaded drywell, sealed with a quartz window and o-rings to preclude liquid from entering. No wet sensors shall be allowed that require the entire run of piping to be drained to service the sensor

2.5.C.2 POWER/CONTROL MODULES - This shall consist of an alphanumeric display and membrane buttons for operator interface. All information, warnings, and alarms shall be presented on the alphanumeric display in plain English for ease of operation.
[Aquionics] – The HMI consists of a 7 inch Allen Bradley Touch screen display connected to an Allen Bradley Model 850 PLC with Ethernet based communications capabilities. Most all of the information required by the SCADA system can be connected thru an RJ 45 connection and retrieved digitally

2.6.A – A complete set of spare parts for one chamber shall be provided.
[Aquionics] – The values listed for spare parts in specification do not account for one complete set. If one complete set is desired than the following is required:
UV Lamps 8
Quartz Sleeves 8
Sleeve o-ring seals 16
Wiper Rings 8

Section 26 00 00- Electrical 1.18.A – Vibration and Seismic Controls for Electrical Systems
[Aquionics] – The contractor shall be responsible for all seismic protection equipment and design

Section 26 05 48 – Vibration and Seismic Control for Electrical Systems
[Aquionics] – The contractor shall be responsible for all seismic protection equipment and design

Section 40 96 36 – Process Control Descriptions
Loop No 411x, 412x Ultraviolet System PCS Auto
[Aquionics] – The UV Unit Control Panels cannot control the valves as shown in P+S. The valve control shall be accomplished by SCADA or a UDS Master Control Panel. The SCADA shall turn on the standby unit if the active one fails …. But in long term it might be best to have us supply a stand alone Master Panel for all 3 UV systems

E-302 One Line Diagram
The maximum kW per UV unit is 35 kW, not 21 kW
E-312 Motor and Equipment Schedule
The maximum kW per UV System No. 2 Panel is 35 kW, not 21 kW
I-401 UV and Post Aeration P&ID
[Aquionics] – The UV Unit Control Panel cannot control the valves per existing P&S. The valve control shall be accomplished by SCADA or by Aquionics adding a Master Panel per above commentary.
[Aquionics] – Is the UVT sensor shown in Aquionics scope of supply? …. Or in the I&C contractors scope …. It is not listed in our spec section

ANSWER: Noted spec notes. UV manufacturer shall provide control of the two (2) motorized valves on the inlet of the UV reactors (valves FCV-4112B and FCV-4122B, as shown on I-401).

52. QUESTION: Addendum #3 memorandum states “add specification 26 43 00 surge protection devices”. That specification is not in addendum #3 or #4.
ANSWER: Specification added within Addendum #5

53. QUESTION: Addendum #4 Memorandum “Revised Specification 26 00 00” Bullet #2 states to “add the Hazard Classification Schedule attached to this addendum #4” That schedule doesn’t appear to be in addendum #4’s documents.
ANSWER: Hazard Classification Schedule Added within Addendum #5

54. QUESTION: Dwg M-505 Section 1 calls for the 2” DI UW piping. 2” Ductile Iron Pipe is not readily available (if at all). Is 2” Copper pipe acceptable in lieu of 2” DIP? Please clarify the pipe material for this 2” UW line.
ANSWER: Correct pipe material is Sch80 PVC. Drawing M-505 revised in Addendum #5.

55. QUESTION: 14” Motor Operated Butterfly Valves shown in Section 1 on drawing M-304 are not found in Electric Actuated Valve Schedule on spec page 40 92 13.13-3 & 4. These are shown on P&ID drawing I-401 as valve numbers FCV-4112B & FCV-4122B however they are shown on the Effluent side of the UV Units instead of the Influent side as shown on drawing M-304. Please advise since these valves are not shown in the Valve Schedule if they are supplied by someone else.
ANSWER: Please refer to the Drawings updated in Addendum #2 for clarification on the UV system. Refer to Question #67 on the supply of the valves.

56. QUESTION: 6” Ductile Iron Reuse Line shown on Drawing C-108 is called out to be Purple Pipe. Ductile Iron Pipe is not manufactured in the color Purple. Please advise if this Reuse Line should be PVC.
ANSWER: “Purple Pipe” is in reference to reclaimed water. Color is not purple.

57. QUESTION: Drawing C-108 shows Sump Pump Discharges from Chemical Building to be 4” Ductile Iron. Plumbing Drawing P-603 shows these lines to be 3” Size. Please advise if these Lines should be 3” size as shown on Plumbing Drawing P-603 or 4” Ductile Iron as shown on Civil Drawing C-108.
ANSWER: 3” is the correct size.
58. **QUESTION:** Drawing C-107 & C-108 both show a 12” Storm Sewer Line running along the west wall of the MBR Building. This line feeds into CB-6 on the south end but does not appear to connect to anything on the north end. Please advise where this line should terminate on the north end.

**ANSWER:** This line ties into the roof drains from the architectural drawings. Please refer to architectural drawings for roof drain location and tie in points to the storm sewers.

59. **QUESTION:** Drawing C-108 shows 3” DCW (Domestic Clean Water) Lines to be Ductile Iron. Pipe Schedule on Drawing M-001 shows Potable & Non-Potable Water Lines 3” & Less to be Sch. 80 PVC. Please advise if 3” DCW (Domestic Clean Water) piping should be Ductile Iron or Sch. 80 PVC.

**ANSWER:** 3” UW to follow pipe schedule on M-001 unless otherwise indicated on drawings.

60. **QUESTION:** Yard Piping Drawing C-108 shows 6” DCW (Domestic Clean Water) Line to Chemical Building as 6” size. Plumbing Drawing P-603 shows Incoming Domestic Cold Water Line to be 8” size. Please advise if this line should be 8” size as shown on Plumbing Drawings or 6” size as shown on Yard Piping Plan.

**ANSWER:** Incoming water feed should be 8” and split into 2-6” lines (domestic line and fire protection line)

61. **QUESTION:** Yard Piping Drawing C-108 shows a 6” Line going to Fire Department Connection. Detail 2 on Fire Suppression Drawing F-601 shows Line from Fire Department Connection entering Building as 4” size. Please advise if this line should be 6” size as shown on Yard Piping Drawing C-108 or 4” size as shown on Fire Suppression Drawing F-601.

**ANSWER:** Correct size of FDC is 4” as shown on F-601

62. **QUESTION:** I have included below some spec comments/clarifications regarding the Flygt equipment to forward on to the engineer:

**Section 33 22 16.21:**
- 1.3.B.3.e.4 – 2.7 HP pumps. Please delete hydrostatic testing requirement.
- 2.3.A.4 – 2” pump discharge – not 4” as specified.
- 2.3.A.6 – N3069-SH3 (3 phase pump)
- 2.3.A.8 – 2.7 HP max
- 2.4.B.1.c – Major castings are cast iron ASTM A48 not hard iron. The impeller and insert ring only are hard iron.

**Section 33 22 16.21:**
- 3.6.A should be removed

**Section 46 41 23:**
- 1.3.F – Remove CFD Analysis (can be done just extra cost)
- 2.3.B – Premium Efficiency is not available
- 2.3.D – Remove CFD Analysis
- 2.4.B.4 – Remove Meltic Plug & Receptacle
- 2.4.D – Inner & Outer Seals only

**Section 43 21 39.41:**

11
1.1.c – VFD to be integral to the pump motor.
1.6.A – 4 rails
2.2.C, E – Integral VFD only. They cannot use an outside VFD with this pump.
2.3.A – 4 rails / 5.5 HP to attain 479 @ .56’ / Motor Eff should be IE4
2.4.A.8 – delete
2.4.a.13 – I see no evidence that the pumps have water integrity to 100 feet

**Section 43 21 39.01:**

2.4.E.1 – 2 bearings – not 3
2.4.F.13 – Gateway – not MiniCAS
2.5.A.2 – Cast iron elbow – not steel
2.5.B.1 – there is no baseplate – this is a stand/elbow combination

**ANSWER:** Noted on all. Refer to updated specifications issued in Addendum #5.

---

63. **QUESTION:** Please confirm that Liquidated Damages will be the sole and exclusive remedy for delay. Paragraph V.F. (page 10) of the October 16, 2019 IFB #19-25-TV is not clear.

**ANSWER:** Language will remain as stated in IFB #19-25-TV, dated October 16, 2019. There are no plans to modify this language.

64. **QUESTION:** Section 033100, Tank Leak Testing, does not identify if the contractor is required to purchase test water or if provided by the plant. Please advise. Please also advise how the test water may be disposed.

**ANSWER:** Assume potable water line extension is in place.

65. **QUESTION:** Will the Bid Form be re-issued with the correct Substantial and Final completion days of duration?

**ANSWER:** The Bid Form has been corrected and is attached.

66. **QUESTION:** What equipment will arrive in the Fall of 2020 and Spring of 2021?

**ANSWER:** Refer to C1 Bid.

67. **QUESTION:** The As-Builts drawings show 2” asphalt over 8” aggregate base for existing conditions, what is the proposed section for new work?

**ANSWER:** New pavement shall be shown on sheet C-502 detail A, Access Road Detail

---

**Item 5 – REVISED TECHNICAL SPECIFICATIONS AND DRAWINGS & REVISED Q&A FROM ADDENDUM #3:**

Refer to attached Memorandum dated January 3, 2020 for a listing of and copies Revised Technical Specifications and Drawings for IFB #19-25-TV for the Thornburg WWTP Expansion and Upgrade.

Bidder shall acknowledge receipt of this Addendum on the Bid Form.

**Toni Vaughan**
Toni Vaughan
Senior Procurement Officer

**January 7, 2020**
Date
REVISED – Bid Form – Addendum #5
IFB #19-25-TV
Thornburg WWTP Expansion and Upgrade, Contract No. 2 – General Construction

In compliance with this Invitation for Bid, Addenda and to all the Terms and Conditions imposed therein and hereby incorporated by reference, the authorized undersigned offers and agrees to furnish the goods/services at the price(s) indicated on the Bid Form, in accordance with this Signed Bid Form.

The signer of this bid form must be an authorized officer of the company.
(Please include any documentation of authority. For example, resolution of the board of directors, articles of incorporation, etc.)

Name and Address of Firm:

___________________________________________
Date: _______________________________________

___________________________________________
By: ________________________________________
(Signature In Ink)

___________________________________________
Name: ______________________________________
(Please Print)

___________________________________________
Zip Code: ___________________________________

___________________________________________
Date: _______________________________________

___________________________________________
By: ________________________________________
(Signature In Ink)

___________________________________________
Name: ______________________________________
(Please Print)

___________________________________________
E-mail: _____________________________________

___________________________________________
Phone: (_____) ___________________________ Fax: (_____) ___________________________

If Corporation or LLC, list State of Incorporation or Corporation: _____________________________
Contractors License Number: _____________________________________________________________
Commonwealth of Virginia State Corporation Commission Number: ____________________________

(ATTACH A COPY OF YOUR STATE CORPORATION COMMISSION CERTIFICATE AND A LIST OF OFFICERS)

D-U-N-S Number: _____________________________________________________________

The named party hereby submits a bid in response to this Spotsylvania County IFB to furnish construction services and materials as described in the Specification and bid form to this IFB. The entire Bid Form, including Response Statement, license certifications, and any supplemental materials required to be provided by the bidder pursuant to the terms and conditions of the IFB, constitute the entire bid submission.

The party hereby certifies that such bid is genuine and not collusive or sham; that said bidder has not colluded, conspired, connived or agreed, directly or indirectly, with any bidder or person, to put in a sham bid or to refrain from bidding, and has not in any manner, directly or indirectly, sought by agreement or collusion or communication or conference, with any person to fix the bid price or affiant or any bidder, or to fix any overhead, profit or cost element of said bid price, or of that of any other bidder, or to secure any advantage against Spotsylvania County or any person interested in the proposed contract.

The party submitting the forgoing bid acknowledges the provisions, terms and conditions of this IFB including all attachments and addenda, and agrees to be bound by those provisions, terms and conditions. Further, the party certifies that all information submitted in response to this IFB is correct and true.

Receipt of the following Addenda are acknowledged:

Addendum No. __________. dated __________
Addendum No. __________. dated __________
Addendum No. __________. dated __________
Addendum No. __________. dated __________
Addendum No. __________. dated __________

(RETURN THIS FORM)
Response Statement

This Response Form is to be completed by the Bidder to more specifically describe and define the proposed services. Any deviations from the IFB specifications shall be stated on this form or attached to this form.

1. **Item Description**

Thornburg WWTP Expansion and Upgrade, Contract No. 2 – General Construction

2. **Deviations from IFB Specifications**

Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #19-25-TV

Signature:__________________________ Name of Firm:__________________________

(RETURN THIS FORM)
REVISED – Bid Form – Addendum #5

Thornburg WWTP Expansion and Upgrade, Contract No. 2 – General Construction

A list of 3 References for which the Contractor has provided similar work over the last 5 years similar in Scope to that which is described herein shall be provided with the Bid Package. **Spotsylvania County cannot be listed as a reference.**

**Please list references below:**

| Company Name: | ___________________________ |
| Phone Number: | ___________________________ |
| Email Contact: | ___________________________ |
| Project Name: | ___________________________ |
| Location Address: | ___________________________ |
| Additional Information: | ___________________________ |

| Company Name: | ___________________________ |
| Phone Number: | ___________________________ |
| Email Contact: | ___________________________ |
| Project Name: | ___________________________ |
| Location Address: | ___________________________ |
| Additional Information: | ___________________________ |

| Company Name: | ___________________________ |
| Phone Number: | ___________________________ |
| Email Contact: | ___________________________ |
| Project Name: | ___________________________ |
| Location Address: | ___________________________ |
| Additional Information: | ___________________________ |

**Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #19-25-TV**

Signature: ___________________________ Name of Firm: ___________________________

(RETURN THIS FORM)
SUBCONTRACTOR IDENTIFICATION SHEET

Bidder proposes to use the following Subcontractors who will perform work on this project.

<table>
<thead>
<tr>
<th>Name of Firm, Address, and Contact Person By Subcontractor</th>
<th>Work to be Performed by Subcontractor</th>
<th>Value of work to be completed</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #19-25-TV

Signature: ___________________________ Name of Firm: ___________________________

(RETURN THIS FORM)
Provide construction services and materials to complete the Thornburg WWTP Expansion and Upgrade, Contract No. 2 – General Construction, project as described in the Spotsylvania County IFB #19-25-TV, Specifications and Construction Drawings.

<table>
<thead>
<tr>
<th>Description</th>
<th>Total Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>TOTAL PRICE – BASE (LUMP SUM)</td>
<td></td>
</tr>
<tr>
<td>TOTAL PRICE – OPTION – DEWATERING (LUMP SUM)</td>
<td></td>
</tr>
<tr>
<td>TOTAL PRICE – OPTION – PRECAST (LUMP SUM)</td>
<td></td>
</tr>
<tr>
<td>TOTAL – CONTINGENT ITEMS</td>
<td></td>
</tr>
<tr>
<td>TOTAL – ALLOWANCE ITEMS</td>
<td>$1,310,000</td>
</tr>
<tr>
<td>TOTAL LUMP SUM BID PRICE – BASE, OPTIONS, CONTINGENT AND ALLOWANCE ITEMS</td>
<td></td>
</tr>
</tbody>
</table>

Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #19-25-TV
Signature: ___________________________________________ Name of Firm: ___________________________________________

(RETURN THIS FORM)
Contingent Items

Contingent work is not identified on plans or in specifications, and not in Base or Option work. Bidder shall include the total cost entered below for the assigned quantities of units and totals (unit quantity x price per unit quantity in the Total Bid Price above, for additional work that may be directed by Owner or Engineer.

<table>
<thead>
<tr>
<th>Contingent Items</th>
<th>Quantity and Units</th>
<th>Price Per Unit Quantity</th>
<th>Total (Unit Qty x Price Per Unit Quantity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Sheeting and Shoring Left in Place</td>
<td>5,000 SF</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>2 – Excavation Below Subgrade</td>
<td>500 CY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>3 – Test Pits</td>
<td>5 EA</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>4 – Erosion and Sediment Control, Silt Fencing</td>
<td>250 LF</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>5 – Concrete Sidewalk</td>
<td>100 SY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>6 – Bituminous Paving</td>
<td>250 SY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>7 – Miscellaneous Rock Removal</td>
<td>100 CY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>8 – Select Fill – Type “A” (Crushed Gravel)</td>
<td>100 CY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>9 – Select Fill – Type “E” (Run-of-Bank Gravel)</td>
<td>250 CY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>10 – Select Fill – Type “F” (Run-of-Crusher Stone)</td>
<td>100 CY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>11 – Miscellaneous Form Work</td>
<td>500 SF</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>12 – Miscellaneous Reinforcement</td>
<td>2,500 LBS</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td>13 – Miscellaneous Concrete (4,000 psi)</td>
<td>100 CY</td>
<td>$</td>
<td>$</td>
</tr>
<tr>
<td><strong>Total – Contingent Items</strong></td>
<td>--</td>
<td>--</td>
<td>$</td>
</tr>
</tbody>
</table>

Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #19-25-TV

Signature:_____________________________ Name of Firm:_____________________________

(RETURN THIS FORM)
Allowance Items

Bidder shall include the total cost entered below for the assigned allowance items in the Total Bid Price above.

<table>
<thead>
<tr>
<th>Allowance Items</th>
<th>Quantity and Units</th>
<th>Price Per Unit Quantity</th>
<th>Total (Unit Qty x Price Per Unit Quantity)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 – Services Provided by E-Merge Systems, Inc.</td>
<td>--</td>
<td>--</td>
<td>$1,235,000</td>
</tr>
<tr>
<td>2 – Security System</td>
<td>--</td>
<td>--</td>
<td>$15,000</td>
</tr>
<tr>
<td>3 – Electric Utility Coordination</td>
<td>--</td>
<td>--</td>
<td>$60,000</td>
</tr>
<tr>
<td>Total – Allowance Items</td>
<td>--</td>
<td>--</td>
<td>$1,310,000</td>
</tr>
</tbody>
</table>

This project has the following schedule for completion after the Notice to Proceed has been issued:

- Substantial Completion – 760 days
- Final Completion – 820 days

Sign here to confirm accuracy of Bid Form and conformity with provisions of IFB #19-25-TV

Signature:_______________________________ Name of Firm:_______________________________

(RETURN THIS FORM)
The following equipment system information is not required to be submitted with the Bid Form, but shall be supplied within twenty-four (24) hours after requested by the Procurement Division.

Equipment System Write-Ins

1. Specifications Section 26 24 19 – Motor Control Centers (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

2. Specifications Section 26 29 23 – Variable-Frequency Motor Controllers (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

3. Specifications Section 26 32 13 – Diesel-Engine-Driven Generator Sets (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

4. Specifications Section 43 11 23.11 – Positive Displacement Blowers (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

5. Specifications Section 43 21 36.21 – Rotary Lobe Pumps (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

6. Specifications Section 43 21 39.11 – Dry-Pit Submersible Pumps (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

7. Specifications Section 43 21 39.11 – Submersible Non-Clog Centrifugal Pumps (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

8. Specifications Section 43 21 39.23 – Submersible Recirculator Chopper Pumps (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

9. Specifications Section 44 31 16 – Odor Control Equipment (a portion of Total Price - Base)
   Manufacturer / Model: _____________________________________________________

10. Specifications Section 46 21 00 – Screening Equipment (a portion of Total Price - Base)
    Manufacturer / Model: _____________________________________________________

11. Specifications Section 46 33 44 – Peristaltic Metering Pumps (a portion of Total Price - Base)
    Manufacturer / Model: _____________________________________________________

12. Specifications Section 46 36 00 – Dry Chemical Feed Equipment (a portion of Total Price - Base)
    Manufacturer / Model: _____________________________________________________

13. Specifications Section 46 41 23 – Submersible Mechanical Mixers (a portion of Total Price - Base)
    Manufacturer / Model: _____________________________________________________
14. Specifications Section 46 51 21 – Coarse Bubble Diffusers (a portion of Total Price - Base)
Manufacturer / Model: ________________________________________________

15. Specifications Section 46 51 33 – Flexible Membrane Disc Diffusers (a portion of Total Price - Base)
Manufacturer / Model: ________________________________________________

16. Specifications Section 46 66 23 – Closed-vessel Medium-press. UV Treatment Equipment (a portion of Total Price - Base)
Manufacturer / Model: ________________________________________________

17. Specifications Section 46 51 33 – Flexible Membrane Disc Diffusers (a portion of Total Price - Base)
Manufacturer / Model: ________________________________________________

18. Specifications Section 46 33 33 – Liquid Polymer Blending and Feed Equipment (a portion of Total Price - Option)
Manufacturer / Model: ________________________________________________

19. Specifications Section 46 71 36 – Centrifuge System (a portion of Total Price - Option)
Manufacturer / Model: ________________________________________________
Below is a list of the changes made to the Issued for Bid Design Documents for the Thornburg WWTP Expansion and Upgrade as part of Addendum 5.

**Revised Questions and Answers from Addendum #3**

- ADD to Question #5 in Addendum #3 “Refer to 01 41 06 1.3 A. for clarification on responsibility of the hiring of Special Inspections Agency.”

**Revised Technical Specifications**

- Revised Specification 26 00 00:
  - ADD the Hazard Classification Schedule attached to this Addendum #5.
- ADD 26 43 00 Surge Protective Devices
  - 1.3.B.3.a.4., DELETE “shop hydrostatic head”
  - 2.3.A.6. DELETE “N-3069-SH1” and SUBSTITUTE THEREFORE “N-3069-SH3”.
  - 2.3.A.8. DELETE “2.5” and SUBSTITUTE THEREFORE “2.7 (nominal)”.
  - 3.6.A DELETE this subsection
- Revised Specification 46 21 39.41
  - 1.6.A DELETE “6 total” and SUBSTITUTE THEREFORE “4 total”
- Revised Specification 46 41 23
  - 1.3.F DELETE this subsection
  - 2.3.D, DELETE “and include CFD analysis”

**Revised Drawings**

- DELETE Drawing C-107 Proposed Site Grading Plan (Rev No. 3, Dated December 2019) and SUBSTITUTE THEREFORE Drawing C-107 Proposed Site Grading Plan (Rev No. 4, Dated January 2020) Attached to this Addendum #5.
- DELETE Drawing C-108 Yard Piping Plan (Rev No. 5, Dated December 2019) and SUBSTITUTE THEREFORE Drawing C-108 Yard Piping Plan (Rev No. 6, Dated January 2020) Attached to this Addendum #5.
- Revised Drawing M-001:
  - Interior and Exterior Process Piping Schedule ADD “Unless otherwise indicated on drawings” to the Pipe Material and Joining description of Plant Utility water (3-inches and less), etc.
● DELETE Note 8 from General Mechanical Notes
● DELETE “roadways, and driveways” from Note 6 of the General Mechanical Notes
● DELETE Note 9 from General Mechanical Notes

● Revised Drawing M-101:
  ○ DELETE “ 3” PVC UW” and SUBSTITUTE THEREFORE “ 2” PVC UW”.

● Revised Drawing M-102:
  ○ DELETE “ 3” PVC UW” and SUBSTITUTE THEREFORE “ 2” PVC UW”.

● Revised Drawing M-103:
  ○ DELETE “ 3” UW” on Section 1 and SUBSTITUTE THEREFORE “ 2” PVC UW”.
  ○ DELETE “ 3” PVC UW” on Section 2, and Section 3 and SUBSTITUTE THEREFORE “ 2” PVC UW”.

● Revised Drawing M-104:
  ○ DELETE “ 3” PVC UW” on Section 1 and SUBSTITUTE THEREFORE “ 2” PVC UW”.
  ○ DELETE “ 3” UW” call outs on Section 4 and SUBSTITUTE THEREFORE “ 2” PVC UW”.
  ○ DELETE “ 3” PVC UW” call outs on Section 4 and SUBSTITUTE THEREFORE “ 2” PVC UW”.
  ○ DELETE “ 3” GV” on Section 4 and SUBSTITUTE THEREFORE “ 2” GV”.

● Revised Drawing M-202:
  ○ DELETE “C3” from Legend Note 1 and SUBSTITUTE THEREFORE “M-014”.
  ○ DELETE “A3” from Legend Note 2 and SUBSTITUTE THEREFORE “M-015”.

● Revised Drawings M-501
  ○ DELETE “DI” from call outs for 2” UW piping and SUBSTITUTE THEREFORE “PVC”

● Revised Drawing M-505
  ○ DELETE “DI” from call outs for 2” UW piping and SUBSTITUTE THEREFORE “PVC” on Section 1

● Revised Drawing M-507
  ○ DELETE “DI” from call outs for 2” UW piping and SUBSTITUTE THEREFORE “PVC” on Section 1.

● Revised Drawing P-502:
  ○ ADD Addendum # 2 revision to the revision block on P-502

● Revised Drawing P-603
  ○ DELETE “by others” from indicated call out and SUBSTITUTE THEREFORE “Refer to civil drawings for continuation”.

● Revised Drawing I-203
  ○ On the suction side of PFAS Blower No. 2 DELETE “ 10” “and SUBSTITUTE THEREFORE “ 6” “.
MEMORANDUM

- On the suction side of PFAS Blower No. 3 DELETE “10”” and SUBSTITUTE THEREFORE “6””.
- On the discharge side of PFAS Blower No. 2 DELETE 10” butterfly valve and SUBSTITUTE THEREFORE 6” Butterfly Valve.
- On the discharge side of PFAS Blower No. 3 DELETE 10” butterfly valve and SUBSTITUTE THEREFORE 6” Butterfly Valve.
- On the discharge side of PFAS Blower No. 2 DELETE 10” x 14” reducer and SUBSTITUTE THEREFORE 6” x 10” reducer.
- On the discharge side of PFAS Blower No. DELETE 10” x 14” reducer and SUBSTITUTE THEREFORE 6” x 10” reducer.
- On the discharge header between PFAS Blower 1 and PFAS Blower 2 DELETE 10” x 14” reducer.
- On the discharge header after PFAS Blower 3 DELETE 16” x 20” reducer.
- ADD 10” to ALP header before drop to PFAS Tank No 1.
- DELETE 12”x 14” reducer on ALP header after drop into PFAS Tank No 1.
- DELETE 10” x 12” reducer before future connection for PFAS Tanks 3 & 4 and SUBSTITUTE THEREFORE 10” x 8”.
- DELETE “Future connection for PFAS Tanks 3&4” and SUBSTITUTE THEREFORE “Future connection for PFAS Tanks 3&4 8” to future”.
- On the 8” tee to PFAS Tank No 1 DELETE “8” ALP” and SUBSTITUTE THEREFORE “6” ALP”.
- DELETE 8” x 4” reducer between FIT 2212 and ZC 2212 and SUBSTITUTE THEREFORE 6”x 4” reducer.
- DELETE 4” x 8” reducer after ZC 2212 and SUBSTITUTE THEREFORE 4” x 6” reducer.
- DELETE “8” ALP” between ZC 2212 and AIT 2214 and SUBSTITUTE THEREFORE 6” ALP”.
- DELETE 8” x 6” reducer between PFAS Tank 1 Zone No 7 and Zone No 6 and SUBSTITUTE THEREFORE 6”.
- On the 8” tee to PFAS Tank No 2 DELETE “8” ALP” and SUBSTITUTE THEREFORE “6” ALP”.
- DELETE 8” x 4” reducer between FIT 2222 and ZC 2222 and SUBSTITUTE THEREFORE 6”x 4” reducer.
- DELETE 4” x 8” reducer after ZC 2222 and SUBSTITUTE THEREFORE 4” x 6” reducer.
- DELETE 8” x 6” reducer between PFAS Tank 2 Zone No 7 and Zone No 6 and SUBSTITUTE THEREFORE 6”.
- On the discharge of Scum Pump No. 1 DELETE 6” check valve and SUBSTITUTE THEREFORE 4” check valve.
- DELETE 4” plug valve on the scum pump discharge line and SUBSTITUTE THEREFORE 4” plug valve.
- DELETE 6”-SCM and SUBSTITUTE THEREFORE 4”-SCM.
SECTION 26 43 00
SURGE PROTECTIVE DEVICES

PART 1 - GENERAL

1.1 SUMMARY
A. Provide transient voltage surge suppression devices (SPDs) for protection of low-voltage building electric and electronic systems from the effects of line and induced transient voltage surges and coupled lightning discharged transients.

1.2 REFERENCES
A. Materials and installation shall be in conformance with the latest revisions of the following codes, standards and specifications, except where more stringent requirements have been specified herein:
   2. National Electrical Code (NEC)
   3. The Institute of Electrical and Electronic Engineers (IEEE) ANSI/IEEE C62.41, Recommended Practice for Surge Voltages in Low Voltage AC Power Circuits.

1.3 SUBMITTALS
A. Submit manufacturer's catalog data for each product, clearly marked to show which items are proposed for this project. Cross out non-applicable information.
B. Submittals shall include UL 1449 Listing documentation verifying:
   1. Short Circuit Current Rating (SCCR)
   2. Voltage Protection Ratings (VPRs) for all modes
   3. Maximum Continuous Operating Voltage rating (MCOV)
   4. Nominal current rating (I-n)
   5. Type 1 or 2 Device Listing
C. Submit acceptance test report.

1.4 QUALITY ASSURANCE
A. The surge protective device shall have a minimum of 10 years warranty.

PART 2 - PRODUCTS

2.1 GENERAL
A. Manufacturers

1. Subject to compliance with requirements, provide products by one of the following:
   a. Advanced Protection Technologies, Inc.
   c. Leviton Manufacturing Co. Inc.
   d. Liebert Corp.
   e. Siemens Energy Automation.
   f. Square D Co.
   g. Or approved equal.

2.2 SWITCHGEAR, MOTOR CONTROL CENTER AND PANELBOARD APPLICATIONS

A. Surge protective devices shall be of the fast-acting Metal Oxide Varistor (MOV) design.

B. Provide the following features and accessories:
   1. Integrally mounted in switchgear, motor control center or panelboard enclosure.
   2. Integral disconnect switch or branch circuit breaker disconnect.
   3. UL labeled as Type 1 or 2 as indicated on the Drawings. Suppression components of each mode, including N-G, shall be protected by internal overcurrent and thermal over-temperature controls. SPDs relying upon external or supplementary installed safety disconnects shall not be acceptable.
   4. UL labeled with 200 kA Short Circuit Current Rating (SCCR). Fuse ratings shall not be considered in lieu of demonstrated withstand testing of SPD, per NEC 285.6.
   5. UL labeled with 20 kA I nominal (I-n) in compliance with UL 96A Lightning Protection Master Label and NFPA 780.
   6. Suppression components shall be heavy duty ‘large block’ MOVs, each exceeding 30 mm diameter. Include redundant suppression circuits. Internal connections shall be by bolted compression lugs.
   7. Connections for wiring external to the SPD shall be suitable for the conductor size, quantity and type as shown on the Drawings and as specified.
   8. Red and green LED indicator lights for power and protection status. Each MOV shall be individually monitored, including N-G. Units merely indicating “power on” shall not be acceptable.
   9. Audible alarm, with silencing switch, to indicate when protection has failed.
   10. One set of voltage-free contacts rated 5 amps, 250 VAC, for remote monitoring of protection status.
   11. Surge-event operations counter.
   13. Protection modes and UL 1449 Voltage Protection Ratings for grounded wye circuits on 480Y/277 volts, 3-phase, 4-wire systems shall be as follows:
      1) Line to Line: 2000 volts
      2) Line to Neutral: 1200 volts
3) Line to Ground: 1200 volts
4) Neutral to Ground: 1200 volts

14. Protection modes and UL 1449 Voltage Protection Ratings for grounded wye circuits on 208Y/120 volts, 3-phase, 4-wire systems shall be as follows:
   1) Line to Line: 1200 volts
   2) Line to Neutral: 700 volts
   3) Line to Ground: 700 volts
   4) Neutral to Ground: 700 volts

2.3 VARIABLE FREQUENCY DRIVE APPLICATIONS

A. Surge protective devices shall be of the fast-acting Metal Oxide Varistor (MOV) design.

B. Provide the following features and accessories:
   1. Integrally mounted within VFD enclosure in accordance with VFD manufacturer’s requirements.
   2. UL labeled as Type 2. Suppression components of each mode shall be protected by internal overcurrent and thermal over-temperature controls. SPDs relying upon external or supplementary installed safety disconnects shall not be acceptable.
   3. UL labeled with 200 kA Short Circuit Current Rating (SCCR). Fuse ratings shall not be considered in lieu of demonstrated withstand testing of SPD, per NEC 285.6.
   4. UL labeled with 20 kA I nominal (I-n) in compliance with UL 96A Lightning Protection Master Label and NFPA 780.
   5. Suppression components shall be heavy duty ‘large block’ MOVs, each exceeding 30 mm diameter. Include redundant suppression circuits. Internal connections shall be by bolted compression lugs.
   6. Connections for wiring external to the SPD shall be suitable for the conductor size, quantity and type as required by the VFD manufacturer.
   7. Red and green LED indicator lights for power and protection status. Each MOV shall be individually monitored. Units merely indicating “power on” shall not be acceptable.
   8. Audible alarm, with silencing switch, to indicate when protection has failed.
   9. One set of voltage-free contacts rated 5 amps, 250 VAC, for remote monitoring of protection status.
  10. Surge-event operations counter.
  12. Protection modes and UL 1449 Voltage Protection Ratings for 480 volts, 3-phase, 3-wire branch circuits shall be as follows:
      1) Line to Line: 2000 volts
      2) Line to Ground: 1200 volts
PART 3 - EXECUTION

3.1 INSTALLATION

A. Provide installation in accordance with the manufacturer’s installation recommendations.

B. Install with conductors between suppressor and points of attachment as short and straight as possible. Do not exceed manufacturer's recommended lead length. Do not bond neutral and ground.

3.2 FIELD QUALITY CONTROL

A. Verify installation complies with manufacturer’s requirements.

B. Perform the following field tests and inspections and prepare test reports:
   2. Certify compliance with test parameters.
   3. Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

END OF SECTION
<table>
<thead>
<tr>
<th>#</th>
<th>Structure</th>
<th>Structure Code</th>
<th>Area</th>
<th>Electrical Classification</th>
<th>Extent of Classification</th>
<th>Dry/Wet/Damp/Exterior/Corrosive Area</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Headworks - 100 Series</strong></td>
<td></td>
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<tr>
<td>1</td>
<td>Headworks</td>
<td>HW</td>
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<td>Screening Room</td>
<td>Div 1</td>
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</tr>
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<td></td>
<td>Electrical Room</td>
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<tr>
<td></td>
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<td></td>
<td></td>
<td>Odor Control</td>
<td>Div 2</td>
<td>within 3 feet of equipment and leakage sources</td>
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<tr>
<td><strong>Plug Flow Activated Sludge - 200 Series</strong></td>
<td></td>
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<tr>
<td>2</td>
<td>Plug Flow Activated Sludge Bioreactors 1-4</td>
<td>PFAS</td>
<td></td>
<td>Bioreactors</td>
<td>Div 2</td>
<td>18 in. above the top of the tank and extending 0.46 m 18 in. beyond tank exterior walls</td>
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<tr>
<td></td>
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<td>Scum Boxes</td>
<td>Div 2</td>
<td>Within a 10 ft envelope around equipment and open channel (the area beyond the envelope is unclassified)</td>
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<tr>
<td><strong>MBR/OPS - 300 Series</strong></td>
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<tr>
<td>3</td>
<td>MBR Building</td>
<td>MBR</td>
<td></td>
<td>MBRs</td>
<td>Div 2</td>
<td>Interior of tank from the minimum operating water surface to the top of the tank wall; envelope 18 in. above the top of the tank and extending 18 in. beyond exterior tank wall</td>
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<td></td>
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<td>Membrane Room</td>
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<td>Operations / Maintenance Building</td>
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<td>Blower Room</td>
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<td><strong>Solids Handling - 500 Series</strong></td>
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<td>Solids Handling Building</td>
<td>SHB</td>
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<td>Sludge Storage Tanks</td>
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<td>Tank Interior (covered tank)</td>
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<td>Membrane Thickeners</td>
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<td>Tank Interior (covered tank)</td>
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