



## REQUEST FOR PROPOSAL

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TO: **Prospective Ultraviolet Disinfection Equipment Suppliers**  
DATE: May 16, 2022  
RE: Request for Proposals for an Ultraviolet Disinfection System for the Shenandoah Wastewater Treatment Plant (WWTF)  
FOR: Coweta County Water and Sewerage Authority (CCWSA)  
Newnan, Georgia

### INTRODUCTION

The Shenandoah WWTF has a permitted treatment capacity of 2 million gallons per day (MGD) and an average flow of approximately 1.5 MGD. WWTF improvements are currently in the design phase, and construction is anticipated to begin in the first quarter of 2023. Proposed improvements to the facility include improvements to the existing influent pump station, new headworks, new aeration basin, improvements to the existing aeration basin (fine bubble diffusers, mixers, and BNR), new final clarifiers, new RAS/WAS pump station, additional (new) tertiary filters, new UV disinfection, new cascade (post) aeration, conversion of the existing final clarifiers to aerobic digesters, new solids dewatering facilities and a biosolids drying facility.

CCWSA is requesting proposals to furnish a new ultraviolet (UV) disinfection system for the project. The equipment will be preselected by CCWSA but purchased and installed by a contractor as part of the construction contract. This project is a Georgia Environmental Finance Authority (GEFA) Clean Water State Revolving Fund (CWSRF) funded project, and the equipment manufacturer shall meet the requirements identified in the SRF Supplemental General conditions.

### SCOPE OF SUPPLY FOR UV SYSTEM

The UV system furnished by the Supplier shall include the following components at a minimum:

- UV modules completely assembled containing lamps, quartz sleeves, wiping equipment, and support framework.
- Fully automatic lifting devices for lifting modules to perform maintenance without completely removing the modules from the channels.
- Ballast cabinets completely assembled containing the ballast that will operate the UV lamps. Cabinets will be equipped with the equipment to protect from excessive heat, moisture, and other environmental factors that may negatively impact the cabinet components.
- Lamp-to-ballast cables of sufficient length and quantity.
- UV intensity monitoring and control system.
- Automatic mechanical wiping system to clean the quartz sleeves.
- Two (2) electrically actuated downward opening weir gates.
- Two (2) ultrasonic level sensors to measure water level in the channels and control weir gate modulation.
- Two (2) level probes to indicate low water levels in the channels.
- UV Transmittance monitor for continuous measurement of UV transmittance.
- System control panel with PLC, I/O, HMI, and necessary components to monitor and control the UV system and communicate with the plant SCADA system.
- Spare parts.

- Startup and commissioning services.

Additional information is provided in the following attachments, which are included in the Appendix to this document:

- Appendix A – Preliminary Drawings (Site Plan, UV System Plan and Section)
- Appendix B – Specification Section 444416 – Ultraviolet Disinfection System
- Appendix C - Specification Section 262900 - Manufactured Control Panels
- Appendix D – GEFA Supplemental General Conditions
- Appendix E – Life Cycle Cost Spreadsheet

The Basis of Design for the UV system is summarized in Table 1.

<b>Table 1: Basis of Design for Ultraviolet Disinfection System Shenandoah WWTF</b>	
WWTF influent flow, monthly average	6 MGD
WWTF maximum daily flow	12 MGD
Influent BOD <sub>5</sub> , monthly average	300 mg/l
Influent TSS, monthly average	300 mg/l
Effluent Disinfection Standard	23 col/100ml
Minimum UV Design Dose	50 mJ/cm <sup>2</sup>
Redundancy	One bank per channel at maximum daily flow
Warranty	12 months (minimum) from successful start-up/acceptance of the equipment

### PERFORMANCE TESTING

The successful manufacturer(s) must provide a performance guarantee to confirm UV system efficiency/performance, including a performance bond or irrevocable letter of credit. The manufacturer shall guarantee the operation of the equipment for one year following installation and acceptance by CCWSA. Should the equipment fail to meet the performance criteria during the guarantee period, the manufacturer shall be bound by the requirements outlined in section 44 44 16 including forfeiture of bond should these requirements not be satisfied.

The manufacturer may make the necessary arrangements to visit the facilities and obtain samples of the effluent for testing prior to submitting a proposal. Site visits can be coordinated to obtain samples by contacting Brandon Maliniemi at Krebs Engineering, Inc., 470.724.5050.

### PROPOSALS

The Supplier shall submit a proposal for a complete ultraviolet disinfection system based on the information provided above, and on the information included in the Appendix. Proposals must include the following information at a minimum:

1. Lump-sum cost to furnish a complete, UV disinfection system, including equipment, controls programming, startup and training, taxes, and delivery.
2. Detailed scope of supply, including all alternates, exclusions, and items to be furnished by others. Alternates, exclusions, and exceptions shall be considered, provided they neither alter the design and operating parameters nor impact the performance of the system. All alternates, exclusions, and exceptions shall be clearly stated in an itemized format.
3. Time required to develop and submit shop drawings/equipment submittals, and time required for fabrication/delivery of equipment.
4. Dimensional drawings of the equipment.
5. List of recommended spare/wear parts and annual cost for each.
6. Detailed technical specification to include information on the following:
  - a. SCADA/instrumentation information and list of alarms and other parameters to be monitored.
  - b. Typical process & instrumentation diagrams.
  - c. Low-Level probe and level sensors.
  - d. Lamp dimming control system.
  - e. UV transmittance monitor.
  - f. UV intensity sensors.
  - g. Automatic wiping system.
  - h. Electrical information for all disinfection equipment system components to include detailed electrical interconnection diagrams (showing all field wiring required) for the proposed system. The diagrams shall clearly show all power, control, instrumentation, network and grounding field interconnections required for a fully-functional system. To be provided by the selected manufacturer upon notice of award performance.
  - i. Control Panel(s) and ballast cabinets.
7. Manufacturers shall provide a performance guarantee with complete terms and conditions.
8. List of Owner references for installations of similar size and application in the United States. References will include the following:
  - a. Installation location, and date installed.
  - b. Owner name, phone number, and email address.
  - c. Design engineer name, phone number, and email address.
9. Completed Life Cycle Cost Spreadsheet located in the Appendix.
10. Manufacturers may choose (optional) to offer a five (5) year extended warranty on the equipment listed below. Manufacturers that choose to offer an extended warranty shall list the cost of the warranty separately from the cost of the system.
11. Locations of service departments/technicians with estimated response time for service calls.
12. Company history and list of references and municipal installations in the United States of similar size and scope from the past five (5) years.

**TENTATIVE SCHEDULE:**

Proposals Due – 5 p.m. (Eastern) – Wednesday, June 15, 2022

Advertise for Construction Bids – Thursday, August 25, 2022

Open Construction Bids – Thursday, September 29, 2022

Contract Award/Construction – October 2022

Questions should be emailed to Jarred Jackson ([Jarred.Jackson@krebseng.com](mailto:Jarred.Jackson@krebseng.com)). All sealed proposals must be received no later than Wednesday, June 15, 2022 at 5:00 pm (Eastern Time).

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Proposals shall be submitted to Krebs Engineering, Inc. to the attention of Jarred Jackson (see contact information below).

### **EVALUATION OF PROPOSALS**

Proposals will be evaluated based on the following criteria provided in the proposal:

1. UV system equipment cost.
2. Construction cost for equipment infrastructure. (building, piping, valves, miscellaneous concrete, hoisting equipment, etc.) as estimated by the Engineer.
3. Performance guarantee including terms and conditions.
4. Information obtained from references.
5. Any factors CCWSA considers to be relevant.

Engineer Evaluation – The evaluation will include analysis of the system design and operational parameters provided by the Supplier. A fifteen (15) year net present worth analysis including capital costs, estimated annual operation and maintenance costs (parts and labor), power consumption, and other factors deemed to be important to CCWSA.

### **SELECTION AND AWARD**

CCWSA recognizes individual systems/proposals may differ in equipment supplied and/or configuration; consequently, CCWSA reserves the right to reject all Proposals or any Proposal that in CCWSA's sole judgment, does not conform to the intent and requirements of the Request for Proposals and system requirements; and the right to delay, cancel, or postpone the proposal selection. CCWSA also reserves the right to accept the proposal that, in its sole judgment, is best suited to its needs and to waive any informality or technicality it deems in its best interest.

#### **Please direct all questions related to this proposal to the Engineer (Jarred Jackson).**

Selection will be based on the evaluation of the criteria for each responsive proposal. Only responsive proposals shall be evaluated. Alternate proposals or value engineering alternatives based on design and operating parameters different from those specified will not be considered in the selection process. Alternate proposals or value engineering alternatives from the selected Supplier will be considered following selection of the Supplier.

Krebs and CCWSA personnel will review each proposal, and Krebs will issue a recommendation to CCWSA based on the selection criteria. Upon approval of a recommendation by CCWSA, CCWSA will issue a Purchase Order Agreement to the selected Supplier. The Purchase Order Agreement shall be signed by CCWSA and the Supplier and shall serve as a binding document that guarantees the equipment will be furnished and paid for in accordance with the pricing and terms of the submitted proposal. The executed Purchase Order Agreement will be transferred to the successful bidder for construction of the WWTF improvements and as such, shall be included in the construction contract for the WWTF improvements. No direct payment will be made by CCWSA to the Supplier. All payments for the BNR system will be made by the successful construction bidder/contractor. If delays or other changes in schedule occur prior to award and execution of the construction contract, and the Supplier desires to negotiate a price increase, then CCWSA reserves the right to negotiate with other suppliers at no cost to CCWSA.

**KREBS ENGINEERING CONTACT**

Jarred Jackson, P.E., Senior Associate

Krebs & Engineering, Inc.

15 LaGrange Street

Newnan, GA 30263

(O) - (470) 724-5050

(M) – (404) 431-9525

[jarred.jackson@krebseing.com](mailto:jarred.jackson@krebseing.com)

## **Appendix A – Preliminary Drawings (Site Plan, UV System Plan and Section)**

COWETA COUNTY  
WATER & SEWERAGE AUTHORITY  
SHENANDOAH WASTEWATER TREATMENT  
FACILITY IMPROVEMENTS  
COWETA COUNTY, GEORGIA

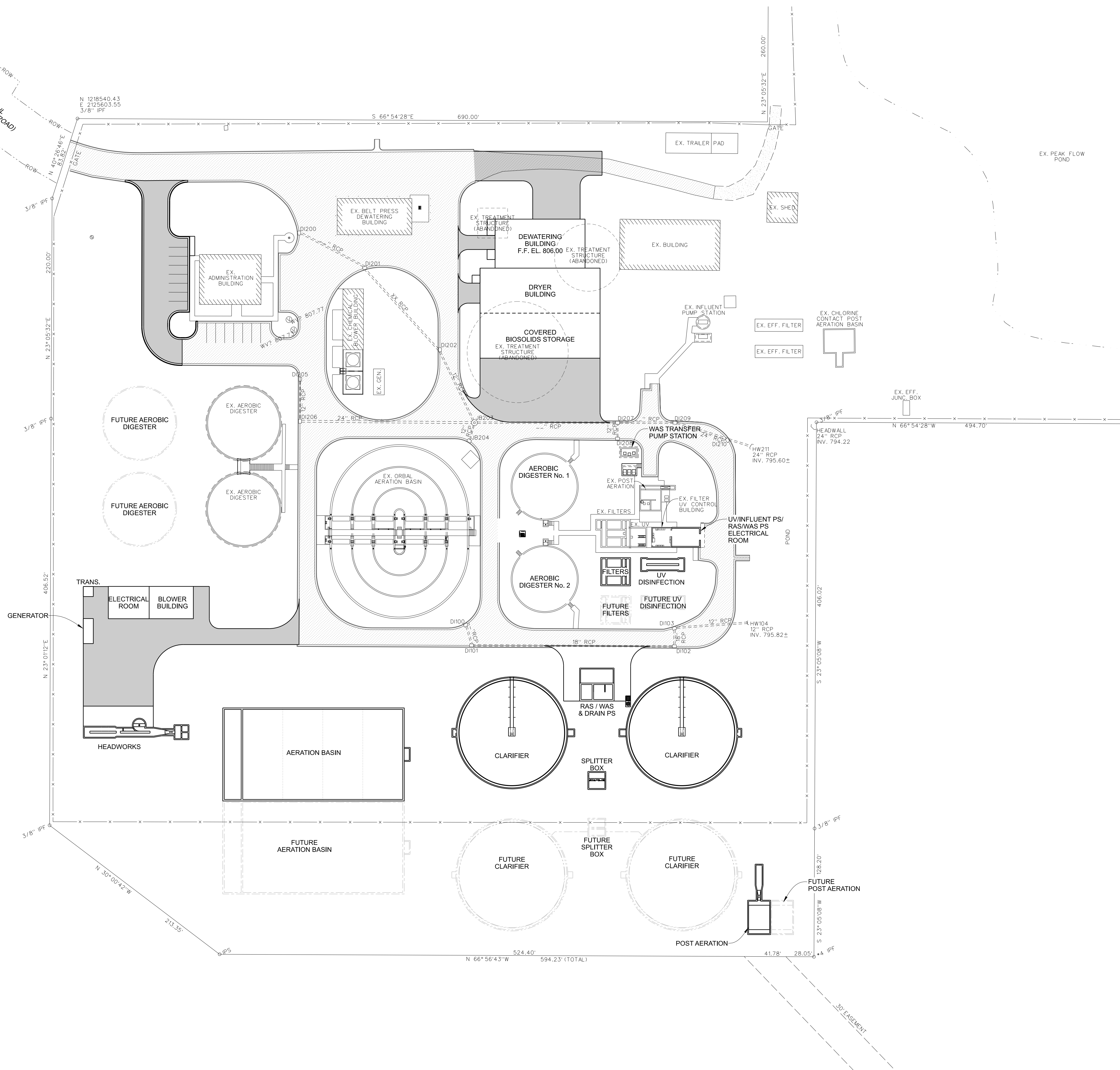
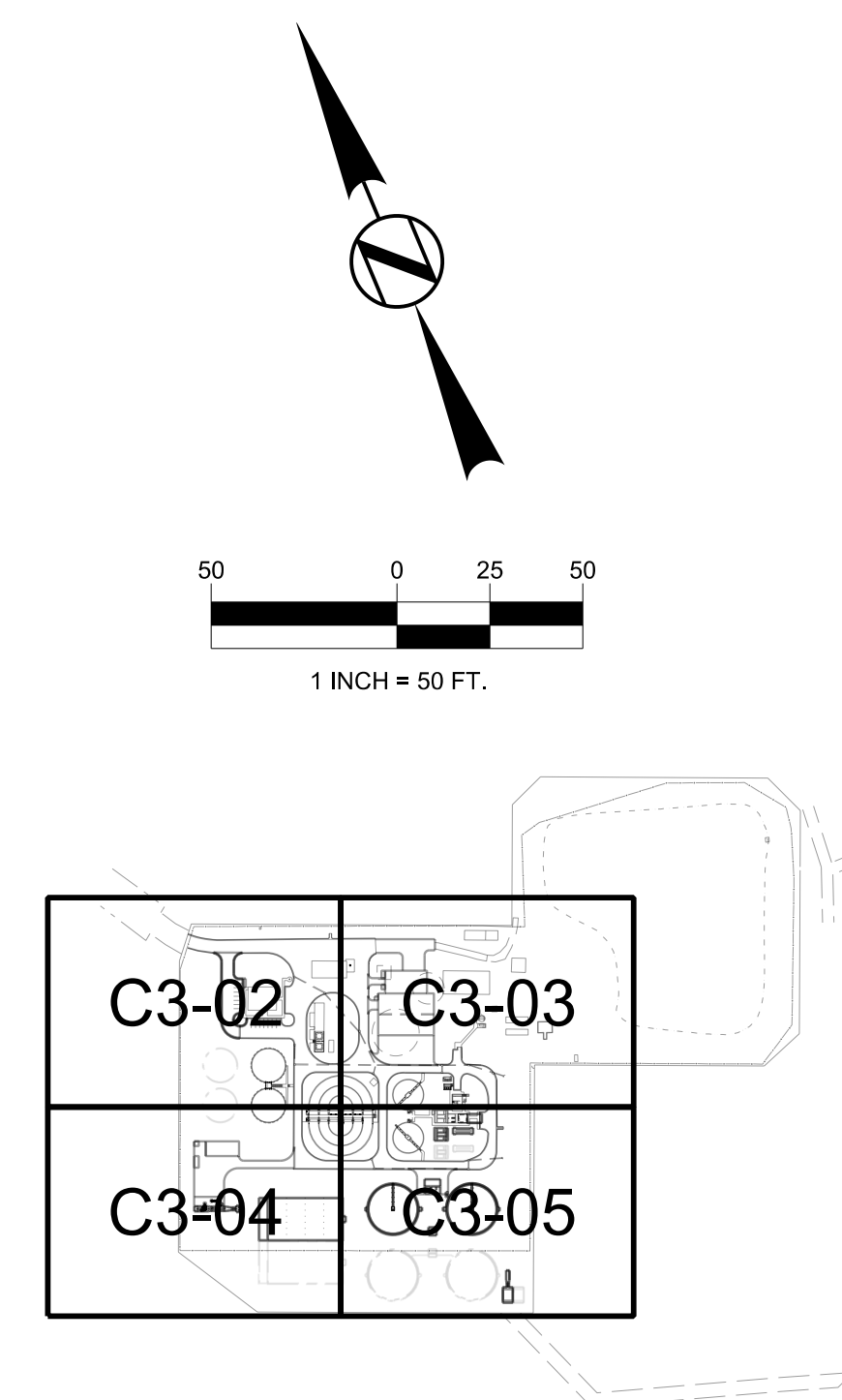


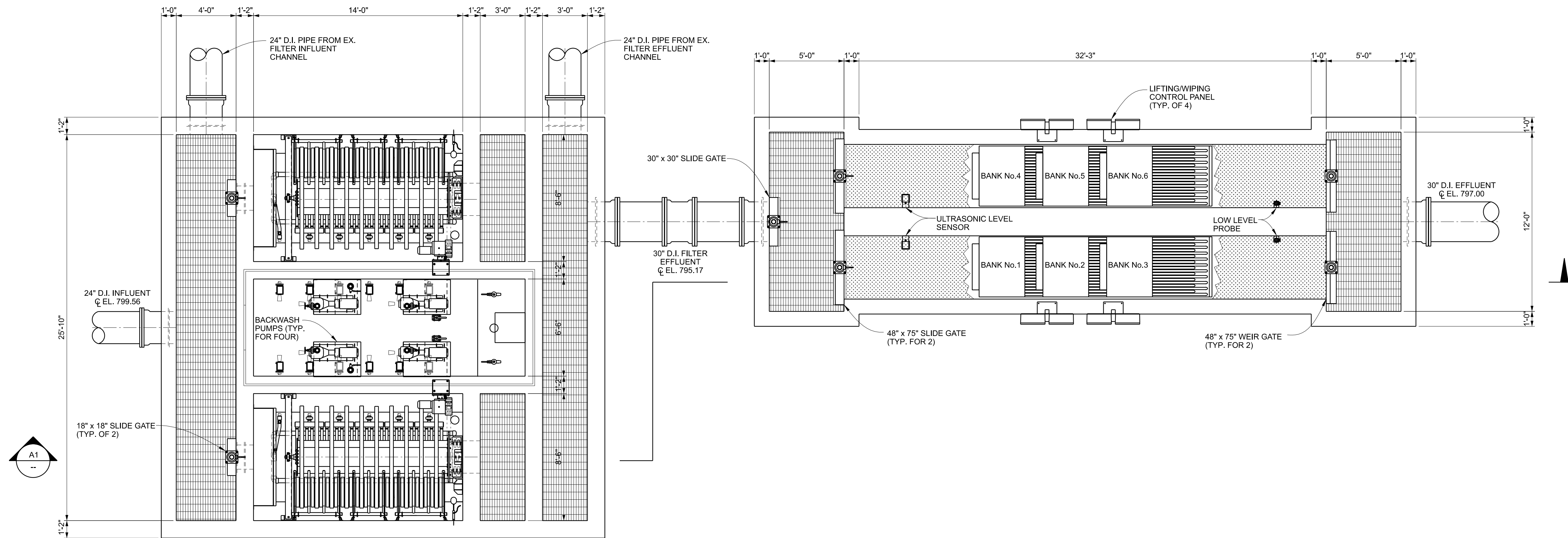
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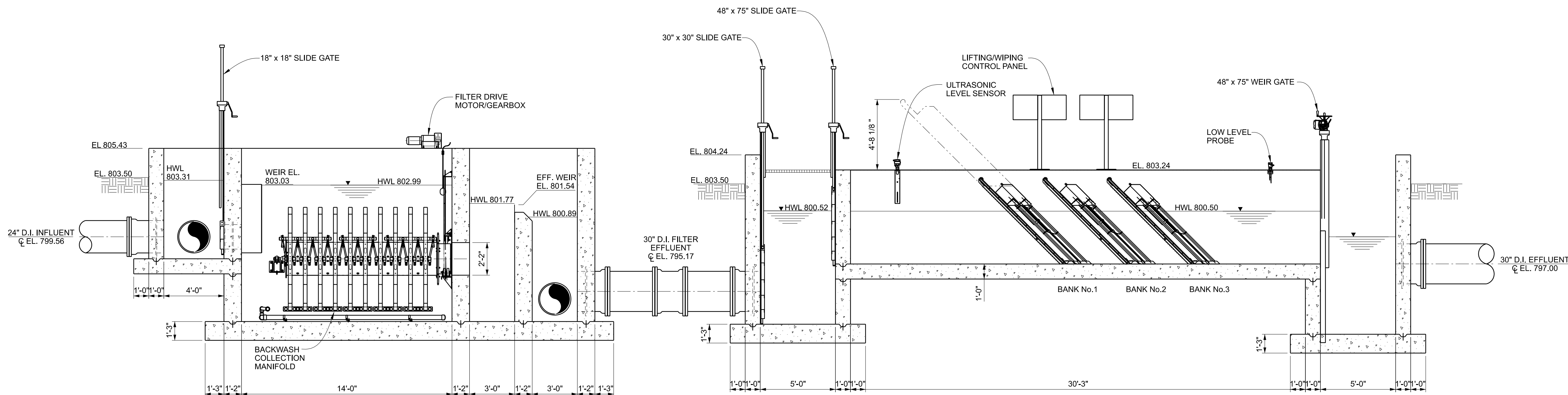
OVERALL SITE  
PLAN

Issue Date APR., 2022	Sheet No.
Sequence -- of --	C3-01





F1 PLAN 1/4" = 1'-0"



A1 SECTION 1/4" = 1'-0"



## **Appendix B – Specification Section 444416 – Ultraviolet Disinfection System**

## **SECTION 44 44 16 – ULTRAVIOLET DISINFECTION SYSTEM**

### **PART 1 - GENERAL**

#### **1.1 SUMMARY**

- A. The equipment specified in this section has been pre-selected by the Owner through a request for proposal (RFP) process. The specifications that follow were the basis for manufacturers to develop proposals. The pre-selected Manufacturer's proposal can be found in the Appendix of these specifications.
- B. This section includes a complete ultraviolet disinfection (UV) system and all associated components. It shall serve as a detailed description of the scope of supply for the uv system supplier (Manufacturer).
- C. The work requires that the UV system be furnished complete with all accessories and appurtenances, be the end product of one responsible system Manufacturer. The Manufacturer shall furnish and/or coordinate all components and accessories as necessary to place the equipment in operation in conformance with the specified performance, features and functions indicated herein.
- D. The Contractor shall be responsible for furnishing and installing the system as specified herein.
- E. The Contractor, equipment manufacturers and/or suppliers, and representatives shall be responsible for reviewing the specified equipment/systems during the bid period, and confirming that the specified equipment and appurtenances are suitable for use in this application and that they are compatible. The Contractor shall notify the Engineer immediately upon discovery of any issues with the equipment or appurtenances.

#### **1.2 SCOPE OF SUPPLY**

- A. The UV Manufacturer's scope of supply shall include, but not be limited to the following:
  - 1. Narrative describing the complete scope of supply
  - 2. UV modules
  - 3. Lamps
  - 4. Quartz sleeves
  - 5. Lamp to ballast cables
  - 6. Ballasts
  - 7. Automatic lifting device
  - 8. UV intensity monitoring
  - 9. UV Transmittance monitoring
  - 10. Automatic wiping system
  - 11. Low water level sensor
  - 12. Ultrasonic level sensor
  - 13. Automatic level control device
  - 14. Spare parts

#### **1.3 SUBMITTALS**

- A. **Certification from Contractor and Manufacturer/Suppliers:** During the bid period and again prior to submitting/ordering and installing materials, products, and

equipment, the Contractor and all manufacturers and suppliers shall thoroughly review the materials, products, and equipment being supplied and shall familiarize themselves with the existing and proposed/new facilities, as well as connections to existing facilities/utilities. This shall include field verification of the location, nature, size/dimensions, current and intended future use, etc. Prior to ordering and installation, the Contractor shall coordinate with all manufacturers and suppliers to provide all needed information including field dimensions, photographs, information on related materials and equipment, etc.). The Contractor and all manufacturers and suppliers shall include written confirmation (with the submittal) of the following:

- B. Review of the submittal data by the Engineer shall not relieve the Contractor or the manufacturer of responsibility for all detailed dimensions and correct fitting of all parts, or for the satisfactory operation and service of the equipment as specified.
  - 1. The materials, products, and equipment being supplied are of the correct size, materials, and type.
  - 2. The materials, products, and equipment being supplied do not conflict with existing or proposed/new facilities.
  - 3. The products/equipment being supplied are intended for use in this application.
  - 4. All manufacturer(s) and supplier(s) shall provide (either with submittals or separately) written concurrence/acknowledgment of their review/coordination and concurrence with the items above.
  - 5. Shop drawings and product data submitted for review by the Engineer shall bear the Contractor's certification that he has reviewed, checked, and approved the submittals, that they comply with the requirements of the project and with the provisions of the Contract Documents, and that he has verified all sizes, dimensions, locations, field measurements, construction criteria, materials, catalog numbers, and similar data. Field dimensions, sizes, and other pertinent information shall be clearly shown on the shop drawings/submittals. The Contractor shall also certify that the work represented by the shop drawings is recommended by the Contractor and that the Contractor's warranty and guaranty shall fully apply.
- C. Complete bill of materials listing all items to be supplied.
- D. Product Data: Include performance data, furnished specialties, cut sheets, and ancillary equipment data.
- E. Shop Drawings: Show dimensioned equipment layout and electrical connections. Include setting drawings with templates, conduit locations, directions for installing anchor bolts, and other anchorages.
- F. Hydraulic calculations demonstrating compliance with the required hydraulic characteristics.
- G. Manufacturers shall submit a third-party bioassay validation certificate submitted with the project bid documents. The full bioassay report shall be made available to the Engineer for review upon request. Only bioassays that are conducted by an independent third party shall be accepted, without exception. Bioassay validation methodology shall follow protocols described in NWRI Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (May 2003).
- H. Electrical schematics and layouts and description of the operation of system controls.
- I. Complete manufacturer's specifications.
- J. Provide basis of design including background data, calculations, test reports, operational data, and other information showing the design development per this specification.

- K. Provide an unexecuted copy of the required Warranty Bond.
- L. Provide startup and performance testing report and manufacturer's certification required in section 3.
- M. Testing procedures, requirements, and results specified in section 3.
- N. Provide Operational and Maintenance Data manuals.
- O. Manufacturers shall include a detailed description of any exceptions taken to the specification.
- P. The manufacturer shall submit a bioassay evaluation for the proposed reactor, without exception. The bioassay shall have been completed by an independent third party and have followed protocols described in the latest edition of the UVDGM Ultraviolet Disinfection Guidance Manual. The bioassay must demonstrate that the proposed UV system design and the number of lamps shall deliver the specified dose using MS2 bacteriophage as the surrogate test organism.
- Q. Independent certification of fouling factor and lamp aging factor must be submitted if values other than the specified default values are being proposed.
- R. Documentation of UV manufacturer's service capabilities including location and experience.
- S. Sample disinfection performance guarantee including scope and duration of the guarantee.

#### 1.4 DELIVERY, STORAGE, AND HANDLING

- A. Retain shipping flange protective covers and protective coatings during storage.
- B. Protect UV system against damage.
- C. Comply with UV manufacturer's rigging instructions for handling.

### PART 1 - PRODUCTS

#### 2.1 DESIGN REQUIREMENTS

- A. Design Criteria: The equipment furnished shall be low pressure, high output ultraviolet light disinfection equipment designed to reduce E. coli micro-organisms of treated wastewater so that the final effluent shall meet the discharge conditions specified herein. The UV systems shall be hydraulically rated for the peak hourly flow rates listed and shall provide a minimum dose of 50,000 microwatt-sec/cm<sup>2</sup> (50 mJ/cm<sup>2</sup>) validated by independent third-party bioassay as outlined by NWRI, at the peak flow rates listed in Table 1 below.

Table 1 – UV Disinfection System Design Criteria	
No. Channels	2
Average Design Flow	6 MGD
Peak Design Flow	12 MGD
Total Suspended Solids	10 mg/L(maximum)
Allowable effluent temperature	41-86° F
Ultraviolet Transmittance @ 253.7 nm	65%, minimum
Fecal Coliform (30-day geometric mean)	23 col/100mL
UV Dose	50 mJ/cm <sup>2</sup>

- A. The UV system shall be installed in the new open concrete channels.
- B. The UV system shall be designed to provide one redundant bank per channel.

- C. The UV system shall be designed to pass the maximum daily flow and deliver the minimum design dose with standby units off.
- D. The UV disinfection system shall be designed in accordance with the NWRI guideline.
- E. The end of lamp life (EOLL) UV dose produced by the system shall not be less than 50,000 microwatt-secs/cm<sup>2</sup>, validated by independent third-party bioassay as outlined by NWRI, at peak flow in an effluent with 65 percent UV transmission at 253.7nm. Lamp output must be at least 80 percent of the initial level after 14,000 hours of operation and with fouled lamp sleeves.
- F. The ultraviolet disinfection system shall produce an effluent conforming to the discharge permit limits listed in this specification.
- G. The system design shall be based on independent third-party bioassay test results, with the following criteria. The basis for evaluating the UV dose delivered by the UV system shall be by an independent third-party bioassay, without exception. Bioassay validation methodology shall follow protocols described in NWRI Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse (May 2003). The dose shall be evaluated on the basis of MS2 bacteriophage only.
- H. The ballast cabinets and control panel shall be installed in the Filter/UV Control Building.

## 2.2 MATERIALS OF CONSTRUCTION

### A. General

- 1. All module metal components, including anchoring hardware, in contact with effluent shall be Type 316 stainless steel.
- 2. All metal components above the effluent, including anchoring hardware, shall be Type 316 stainless steel.
- 3. All wiring exposed to UV light shall be Teflon™ coated.
- 4. All wires connecting the lamps to the ballasts shall be enclosed inside the frame of the UV Module and not exposed to the effluent.

### B. UV Module

- 1. The UV module shall be fitted in a horizontal or angled position within the effluent flow channel.
- 2. Each UV module shall consist of UV lamps with an electronic ballast enclosure mounted on a Type 316 stainless steel frame.
- 3. Each lamp shall be enclosed in its individual quartz sleeve.
- 4. All lamp to ballast connections shall be made by and tested by the UV Manufacturer.
- 5. The electronic ballast enclosure shall contain the electronic ballasts and addressable lamp status monitoring systems.
- 6. Each UV module shall have a rating of Type 6P/IP67.

### C. UV Lamps:

- 1. Low Pressure-High Output (LPHO).
- 2. Filament: Rugged to withstand shock and vibration.
- 3. Lamp Base: Resistant to UV.

D. UV Lamp Quartz Sleeves:

1. Open-end(s) of lamp sleeve shall be sealed by means of an O-ring and Type 316 stainless steel compression plate.  
Guaranteed for a minimum duration of 20 years. At end of guaranteed sleeve life, sleeve output shall be greater than or equal to 90 percent of new sleeve output immediately after sleeve cleaning.

E. Intensity Sensor:

1. Use germicidal UV sensors as defined in USEPA UVDGM. Do not use "wet" intensity sensors.
2. The UV sensor shall be according to ÖNORM M 5873-1 and shall measure only the germicidal portion of the light emitted by the UV lamps as measured at 254 nm.

F. Low Water Level Sensor:

1. One low water level sensor shall be provided by the UV Manufacturer for each UV channel.
2. During manual, automatic and remote modes of system operation, the water level sensor shall ensure that lamps extinguish automatically if the water level in the channel drops below an acceptable level.
3. The low water level sensor shall be powered by the UV manufacturer-supplied control panel.

H. Automatic level control (ALC) system:

The UV Manufacturer shall provide an automatic level control system as required for the operation of their UV system and to meet the specified disinfection requirements herein. The ALC shall maintain the water level within the UV channels to provide the proper submergence needed for the operation of the system. However, the upstream water level shall not exceed elevation 800.50 above MSL.

## 2.3 ELECTRICAL AND CONTROLS

A. Electrical:

1. UV manufacturer to supply all cabling between lamps and ballasts.
2. UV manufacturer to perform all terminations between lamps and ballasts.
3. UV manufacturer shall provide surge protection device at main power input for each panel fed with a dedicated power circuit.

B. Control and Instrumentation:

1. System Control Panel
  - a. The operation of the UV system is managed at the system control panel by a PLC-based controller which continuously monitors and controls the system functions. The Control system shall be based on the Allen Bradley Compact Logix. PLCs and I/O modules should be in an active life cycle status at the

time of installation.

- b. The PLC shall be capable of communication using Ethernet TCP/IP Protocol over a copper Ethernet connection. An Ethernet switch with multi-mode fiber optic Ethernet ports shall be provided for full system monitoring and limited control from the plant SCADA system.
- c. The operator interface display screen shall be menu-driven with automatic fault message windows appearing upon alarm conditions. Operator Interface shall be color and 10" minimum.
- d. Alarms and general status indications shall be provided to indicate to plant operators that maintenance attention is required or to indicate an extreme alarm condition in which the disinfection performance may be jeopardized. Digital I/O modules shall be provided to remotely indicate status and alarm conditions as required. The alarms and status indications shall include but not be limited to:
  - 1) ON/OFF Status of the UV reactor
  - 2) Lamp age for each lamp
  - 3) Lamp failure
  - 4) Multiple Lamp Failure
  - 5) I/O board failure
  - 6) Surge suppressor failure
  - 7) UPS status
  - 8) Power supply status
  - 9) UV intensity
  - 10) Low UV calculated dose
  - 11) Wiper failure
  - 12) Wiper count exceeds warranty
  - 13) Max flow exceeded
  - 14) Weir actuator status
  - 15) Ultrasonic sensor status
  - 16) Loss of UVT signal
  - 17) Low flow alarm
  - 18) Other major/critical Alarm conditions
- e. The 100 most recent alarms shall be recorded in an alarm history register and displayed when prompted.
- f. Bank status shall be capable of being placed either in Manual, Off or Auto mode.
- g. Elapsed time of each bank shall be recorded and displayed on the display screen when prompted.
- h. The system shall be configured to accept a system total flow input signal (if required for proper operation) from either a dedicated 4-20mA input signal or via the fiber optic Ethernet network connection to SCADA (input signal type to be selected by owner/engineer during the design phase).

#### C. UV Detection System

- 1. A submersible UV sensor shall continuously monitor the UV intensity produced in each bank of UV lamps.
- 2. The sensor shall measure only the germicidal portion of the light emitted by the UV lamps. The detection system shall be factory calibrated. Detection systems that can be field calibrated shall not be permitted.

D. Dose-Pacing:

1. A dose-pacing system shall be supplied to modulate the lamp UV output in relationship to a 4-20 mA DC signal from an effluent flow meter (by Others).
2. The system to be dose-paced such that as the flow and effluent quality change, the design UV dose is delivered while conserving power.
3. The dose-pacing system shall allow the operator to vary the design dose setting. Logic and time delays shall be provided to regulate UV bank ON/OFF cycling.

E. Automatic Cleaning System:

1. An automatic cleaning system shall be provided to clean the quartz sleeves using both mechanical and/or chemical methods, as applicable. Wiping sequence shall be automatically initiated with capability for manual override.
2. The cleaning system shall be fully operational while UV lamps and modules are submerged in the effluent channel and energized.
3. Cleaning cycle intervals to be field adjustable.
4. Remote Manual and Remote Auto cleaning control options shall be provided.
5. The cleaning system shall be provided with the required solutions necessary for initial equipment testing and for equipment start-up.
6. The UV manufacturer shall be responsible for supplying including any equipment not specifically listed required to perform out of channel cleaning.

## PART 3 - EXECUTION

### 3.1 QUALITY ASSURANCE

- A. To be considered, the manufacturer shall be regularly engaged in the manufacture of UV systems with a proven track record.
- B. The manufacturer shall provide documentation of previous experience with municipal UV disinfection systems in wastewater applications with variable output electronic ballasts.
- C. The manufacturer shall provide the services of a UV Manufacturer representative to supervise and inspect and certify the equipment is operating as designed. The manufacturer shall provide classroom and field training on the operation and maintenance required at each installation. The manufacturer shall provide a representative to supervise the performance testing. Representatives' days on-site shall be 8 hours per day not including travel time. Additional days on-site if requested by the owner shall be negotiated between the Owner and the UV Manufacturer. See Table 2 for requirements.

Table 2 – Manufacturers Representative Requirements	
Task	Duration
Pre-installation Meetings and Site Visits	1 day (minimum)
Installation Supervision	2 days
Startup and Functional Testing	7 days
Performance Testing	3 days
Operator Training	1 day (minimum)

### 3.2 INSTALLATION AND OPERATION



A. Pre-Installation Meetings and Site Visits:

1. The UV Manufacturer's representative, Contractor, and Engineer shall attend a pre-installation meeting prior to the construction of the concrete UV channels. The Manufacturer shall discuss general procedures, dimensions, tolerances, installation instructions and sequence, and any other relevant topics required. The meeting may be held on-site or virtually via video conference.
2. After the construction of the concrete channels, the UV Manufacturer's representative shall examine areas and conditions, with the Contractor and Engineer, for compliance with the tolerances required for proper installation and performance of the equipment. If the concrete channels are in compliance with the requirements, the UV Manufacturer shall provide written certification to the Contractor and Engineer that the channels have been properly constructed and are ready for the equipment to be installed. If the channels are found to be out of compliance with the requirements the Contractor shall be responsible for correcting all deficiencies to bring the concrete channels into compliance. The Contractor shall bear any costs associated with the Manufacturer's representative to return to the site and verify compliance.

B. The UV Manufacturer shall verify that all equipment is in suitable condition and ready for installation.

C. Installation of the equipment shall be in accordance with instructions and recommendations of the Manufacturer.

D. The UV Manufacturer shall provide support to the Contractor during the equipment installation, and shall provide startup and commissioning services as required to verify that components are free from damage and are properly fitted, assembled, installed, and ready for operation.

E. The UV Manufacturer shall provide startup and commissioning services as required.

3.3 CLEANING AND PROTECTING

A. Restore marred, abraded surfaces to their original condition or replace them.

B. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer that ensure equipment is without damage or deterioration at the time of Substantial Completion.

3.4 TESTING REQUIREMENTS

A. Install the UV disinfection system in strict compliance with the UV Manufacturer's instructions and recommendations.

B. Functional Testing

1. Prior to startup, the UV Manufacturer's representative shall inspect the installed UV disinfection system for proper alignment, correct operation, proper connection, and satisfactory function of all components. The UV manufacturer's representative shall approve the installation and provide certification that the system components have been installed correctly and are ready for operation.

2. Proposed functional testing procedures shall be developed by the UV Manufacturer, submitted to the Engineer, and approved by the Engineer not less than two weeks prior to scheduling and performing the functional test.
3. Functional testing shall include proof of the fiber optic Ethernet interface between the UV controller and the plant control system. All functions be monitored and controlled by the plant's SCADA system shall be tested to ensure correct functionality prior to final acceptance of the UV system.
4. If, in the opinion of the Engineer, the system meets the requirements specified herein, the system shall advance to the performance testing.
5. If, in the opinion of the Engineer, the functional tests do not meet the requirements specified herein, performance testing shall not begin until the UV Manufacturer has made, at no cost to the Owner, such adjustments, changes, and /or additions as necessary to correct the system and demonstrated this by a satisfactory functional test as specified above.

D. Performance Testing

1. The UV manufacturer shall submit the proposed performance testing procedures for the Engineer's review and approval not less than two weeks before scheduling and executing the performance test. The performance test shall include effluent quality test, preliminary lamp output test, and power consumption tests.
2. The guaranteed effluent quality shall only be considered to be achieved when both performance testing demonstrates that the system meets the performance requirements of this specification within the power consumption range predicted by the UV Manufacturer.
3. Effluent Quality Test
  - a. The UV Manufacturer shall conduct one effluent quality test. The purpose of the effluent quality test is to confirm that the system is capable of producing the stated final effluent quality under the specified worst-case design conditions (i.e., peak flow, minimum UV dose, the lowest UV transmittance, and the highest suspended solids), and power consumption does not exceed the system peak power consumption specified.
  - b. If, during the test period, the UV influent conditions are significantly better than the worst-case design conditions, the effluent quality test shall be conducted under actual plant flow conditions.
  - c. The effluent quality test shall be carried out as soon as the functional test of all individual equipment is completed satisfactorily. The duration of the test program shall be 3 days. If the UV system is forced to shut down during the test, then the 3-day test shall be repeated until it is satisfactorily passed.
  - d. Prior to the start of the effluent quality test, the UV Manufacturer shall propose the number, location, and power outlet of online UV lamps based on the measured filtered UV transmittance and average lamp age and the average

UV dose to be delivered. The lamps shall be cleaned at the frequency recommended by the UV Manufacturer and approved by the Engineer; UV dosage shall be calculated based on a clean lamp.

- e. The timing for the test shall be determined based on the diurnal flow variations and the laboratory working hours.
- f. On each day during the effluent quality tests; 10 sets of grab samples from the UV influent and 10 sets of grab samples from the effluent of the UV disinfection facility shall be collected and analyzed for E.-coli levels. At the time these samples are collected, the following information shall be recorded:
  - i. Date and Time
  - ii. UV intensity
  - iii. Lamp Age
  - iv. UV transmittance reading from UVT monitor
  - v. Power output levels
  - vi. Effluent flow rates

In addition to being analyzed for E.-coli levels, the UV influent samples shall also be analyzed for the following:

- i. UV transmittance (filtered and unfiltered)
  - ii. Total suspended solids
  - iii. CBOD<sub>5</sub>
- g. The effluent quality test shall be considered to be successful if testing performed under actual worst-case design conditions demonstrates all of the following:
  - i. The geometric mean of the final effluent E.-coli levels of the 30 samples is less than 23 col/100m. Power consumption does not exceed system peak power consumption as specified.

#### 5. Lamp Output Testing

- a. The UV Manufacturer shall submit the proposed lamp output testing procedures to the Engineer for approval not less than two weeks before scheduling and executing the testing.
- b. The UV Manufacturer shall conduct testing of 15 percent of the total in-service UV lamps at 100 hours of operating time.
- c. Lamp Output shall be tested at room temperature in darkroom using a calibrated International Light model 1700 radiometer to test the irradiance of the lamp at a 3-meter distance. The lamp shall be tested vertically with the irradiance readings taken at its center.

#### 6. Power Consumption & Harmonic Testing

- a. Guaranteed performance requirements for power consumption shall be measured. The power consumption per lamp including ballast losses is calculated to be the total power draw divided by the number of lamps powered.
- b. Measurement shall be taken when all lamps in all modules in the channel are ON and set to full power. Kilowatt-hours and power factor shall be measured and recorded. Measurements shall be made using a kilowatt-hour meter temporarily mounted at the location stated. The meter manufacturer shall have calibrated the meter within the 6 months immediately preceding the test.
  - i. Power consumption testing shall be conducted within 1 month of startup of the system at a time when all components are functioning satisfactorily.
  - ii. If, for any reason, additional lamps are required after installation in order to meet performance requirements, the power consumption guarantee based on the initial number of lamps shall remain in effect.
- c. The power testing apparatus shall be provided by the Contractor. Testing shall be conducted under supervision by a vendor technician.
- d. The harmonic current and voltage attributable to the UV disinfection system as measured in the power distribution system shall be measured for all bank configurations prior to final acceptance. The point of common coupling is defined as the line-side terminals of the isolation transformer feeding the system. If the measured harmonic current and voltage do not comply with Tables 10.2 and 10.3 of IEEE 519-1992, then the UV Manufacturer shall make modifications to limit the harmonic distortion through their equipment.

### 3.5 SUPERVISION, CERTIFICATION, AND REPORT OF TESTING

- A. The UV Manufacturer's representative shall supervise the functional testing, effluent quality testing, lamp output testing, and power consumption testing, analyze data and certify the system's performance during the test. Tests shall be documented during the continuous operation of the system, and the UV Manufacturer shall submit to the Engineer three copies of a complete report containing all data, calculations, lab report sheets, and a description of all of the testing procedures and results.

### 1.6 WARRANTY

- A. The equipment furnished under this section shall be free from defects in materials and workmanship, including damages that may be incurred during shipping, storage, and installation for a period of 1 year from the date of startup.
- B. The UV Manufacturer shall provide the Owner with a warranty bond equal to the UV equipment contract as a guarantee that the installed system produces a final effluent that meets the bacteriological inactivation requirements and is within the specified power consumption, ballast, and lamp life requirements. The filtered effluent quality entering the UV system shall be equal to or better than that specified above when measuring performance. The bond shall be for a term of 1 year from the date of written acceptance of the UV system by the Engineer and Owner. The term of the bond shall be extended to match any extended warranty term submitted by the Manufacturer.

- C. Warranty shall be for unlimited usage of the equipment for the specified rated capacity over the term of the warranty.
- D. The UV lamps shall be warranted for a minimum of 14,000 hours of operation prorated after 9,000 hours. The manufacturer shall warrant that the UV lamp output will be no less than the EOLL factor (with fouled sleeves) listed in this specification.

### 3.6 ACCEPTANCE/NONACCEPTANCE OF SYSTEM

- A. If, in the opinion of the Engineer, the system meets the performance requirements during the performance testing specified herein, and the Owner has received the executed Warranty Bond, the Engineer shall recommend to the Owner, by letter, the official acceptance/approval of the UV disinfection system. If in the opinion of the Engineer, the test results do not meet the performance requirements during the performance testing, the Engineer shall notify the UV manufacturer and the Owner in writing of the non-acceptable performance.
- B. In the case of non-acceptable performance, the UV Manufacturer shall then have 30 days in which to perform, at the UV Manufacturer's sole expense, any supplemental testing, equipment adjustment, changes, or additions and request and perform an additional retest of the non-acceptable system.
- C. Should the UV system fail to meet the requirements of the Specifications or the performance requirements after three attempts, the UV Manufacturer shall remove the system and replace it with one that shall meet the performance requirements.

### 3.7 MANUFACTURERS CERTIFICATION

- A. Submit a letter from the UV Manufacturer stating that he/she has inspected the installation and checked its performance and certifies that the installation is operating correctly and meets all the requirements of this section and references cited herein.

### 3.8 WARRANTY BOND DELIVERY

- A. Following installation, startup, testing and satisfactory completion of performance testing, delivery of all required parts, chemicals, documents and other items required in this specification, submit the executed warranty bond to the Owner.

### 3.9 SPARE PARTS

- A. Spare Parts:

1. The following spare parts and safety equipment to be supplied.
  - a. A number of spare lamps equal to 10% of the total number of lamps supplied.
  - b. A number of spare quartz sleeves equal to 10% of the total number of quartz sleeves supplied.
  - c. A number of spare ballasts equal to 5% of the number of ballasts supplied
  - d. A number of spare quartz seals equal to 10% of the total number of quartz seals supplied.
  - e. A number of spare wiper rings equal to 10% of the total number of wiper rings supplied.

- f. Operators kit including face shield, gloves and cleaning solution.

To be considered as an alternate, systems that require more lamps than specified, the UV manufacturer shall provide spares in the amount equal to the quantities listed plus an additional quantity equal to the percentage of lamps required over and above the number of lamps specified

**END OF SECTION 44 44 16**

## **Appendix C - Specification Section 262900 - Manufactured Control Panels**

## **SECTION 26 29 00 - MANUFACTURED CONTROL PANELS**

### **PART 1 - GENERAL**

#### **1.1. SCOPE**

- A. This section describes control stations, PLC panels, motor control panels, manufactured control panels, and other similar panels specified herein. Specifications herein are intended as an extension of requirements in other Divisions of these specifications where reference is made to Electrical Specifications.

#### **1.2. DEFINITIONS**

- A. "Control Stations": Enclosures (with all required accessories) containing only door-mounted pushbuttons, indicator lights and/or selector switches (no electronic components or starter/controller equipment).
- B. "Control Panels": Enclosures (with all required accessories) containing equipment/devices other than door-mounted pushbuttons, indicator lights and/or selector switches (such as electronic components, starter/controller equipment, etc.).

#### **1.3. SUBMITTALS**

- A. Provide the following for each control panel:
  - 1. A job-specific, custom wiring diagram
    - a. The wiring diagram shall clearly show all components (whether the components are mounted internal or external to the control panel enclosure).
    - b. All wires and terminal blocks shall be clearly labeled.
    - c. Diagram shall be in accordance with NEMA/ICS standards.
  - 2. Size, type and rating of all system components.
  - 3. Unit frontal elevation and dimension drawings.
  - 4. Internal component layout diagrams.
  - 5. Manufacturer's product data sheets for all components.
- B. A Bill of Materials shall be included with catalog information on all components.
- C. Information shall be included on any proprietary logic component sufficient to demonstrate its ability to perform the required functions.
- D. The following calculations shall be submitted:
  - 1. Thermal calculations showing amount of air conditioning or ventilation and heating required for each control panel, per ambient requirements listed below and operating temperature limitations of all equipment/devices within each control panel. Where possible, forced air ventilation shall be utilized rather than air conditioning. Panel shall be oversized, interior equipment/devices shall be derated, and solar shielding shall be provided as required to allow the use of forced air ventilation as the cooling method.
    - a. Thermal calculations used for sizing cooling/ventilation systems for each control panel located in exterior or non-conditioned spaces shall assume:



- 1) Ambient exterior air temperature ranges of -5 degrees F to 105 degrees F.
- 2) Full solar contact where applicable (not applicable where enclosures are fully protected from solar contact using solar shields separated from panel enclosure with standoffs or similar).
- 3) No wind.
- 4) Heat loss from interior equipment (electronics, etc.) per equipment supplier's information.
- b. Thermal calculations used for sizing heating systems for each control panel shall assume:
  - 1) Ambient exterior air temperature ranges of -5 degrees F to 105 degrees F.
  - 2) No heat loss by interior components of control panel.
  - 3) No solar gain on exterior of control panel.
  - 4) Doubling of heating wattage required to account for wind where control panels are located outdoors.
  - 5) Minimum temperature difference (due to heating) of 10 degrees F to prevent condensation, regardless of equipment temperature limitations.
2. Load calculations showing the sizing of all power supplies provided (with spare capacity as specified).
3. Load calculations showing the sizing and anticipated runtime of all Uninterruptible Power Supply systems provided (with spare capacity as specified).

## PART 2 - PRODUCTS

### 2.1. GENERAL

- A. Control panels shall be Underwriters' Laboratories labeled by the panel manufacturer. Control panel manufacturers not capable of applying the U.L. label to their products are unacceptable.
- B. All human interface equipment/devices (indicator lights, selector switches, pushbuttons, time switches, displays, keypads, and other similar items used for control, adjustments or monitoring) shall be mounted on the non-energized side of enclosure door(s) in such a way as to be accessible without exposing the user to energized parts.

### 2.2. RATINGS

- A. All Control Panels shall have short circuit current ratings at least equal to the lesser of the following, unless noted otherwise on plans:
  1. The short circuit current rating of the electrical distribution equipment that feeds the Control Panel.
  2. 150% of the available fault current at the Control Panel as determined by a Short Circuit Current study prepared by a licensed professional electrical engineer.
- B. All equipment/devices installed within control panels shall be rated to operate in ambient temperatures of 50 degrees C (122 degrees F) or higher.

### 2.3. ENCLOSURES

- A. All enclosures (with any required accessories or auxiliary items) shall fit within the space shown on the Plans. Any costs associated with furnishing equipment which exceeds the available space shall be borne by the Contractor.
- B. Enclosures (with any required accessories or auxiliary items) shall be suitable for the environment where installed.
- C. Enclosure materials shall be as follows unless noted otherwise:
  - 1. Control Stations:
    - a. Where located in extremely corrosive areas (chlorine rooms, fluoride rooms, etc.): NEMA 4X of non-metallic construction (with non-metallic hardware) compatible with the associated chemical(s).
    - b. Where located in other wet, process or outdoor areas: NEMA 4X of type 304 stainless steel construction (with stainless steel hardware).
    - c. Where located in dry, non-process, indoor areas (such as electrical rooms): NEMA 1 of die cast zinc/aluminum construction.
  - 2. Control Panels:
    - a. Where located in extremely corrosive areas (chlorine rooms, fluoride rooms, etc.): NEMA 4X of non-metallic construction (with non-metallic hardware) compatible with the associated chemical(s).
    - b. Where located in other wet, process or outdoor areas: NEMA 4X of type 316 stainless steel construction (with stainless steel hardware).
    - c. Where located in dry, non-process, indoor areas (such as electrical rooms): NEMA 1 or 12.
- D. Control Panel Enclosure Construction:
  - 1. Non-metallic control panel enclosure material, where specified, shall be reinforced polyester resin or equivalent, with a minimum thickness of 3/16 inch for all surfaces except those requiring reinforcement. Panels shall be precision molded to form a one piece unit with all corners rounded. Exterior surfaces shall be gel-coated to provide a corrosion-resistant maintenance-free satin finish which shall never need painting. Color pigments shall be molded into the resin. Color shall be grey.
  - 2. Metallic control panel enclosures, where specified, shall be fabricated using a minimum of 14 gauge steel for wall or frame mounted enclosures and a minimum of 12 gauge for freestanding enclosures. Continuously weld all exterior seams and grind smooth. Reinforce sheet steel with steel angles where necessary support equipment and ensure rigidity and preclude resonant vibrations.
  - 3. Use pan-type construction for doors.
  - 4. Door widths shall not exceed 36-inches.
  - 5. Mount doors with full length, heavy duty piano hinge with hinge pins.
  - 6. Provide gasket completely around each door opening.
  - 7. Mount and secure all internal components to removable back plate assembly.
  - 8. For NEMA 1 or 12 enclosures, provide handle-operated key-lockable three point stainless steel latching system for each door.
  - 9. For NEMA 4X enclosures, provide provisions for padlocking all doors and provide clamps on three (3) sides of each door.

#### 2.4. CONTROL PANEL ACCESSORIES:

- A. Cooling systems shall be provided if so required by the application to maintain temperatures within the acceptable ranges of the interior equipment. In no case

(regardless of temperature ratings of internal equipment) shall maximum temperatures within control panels be allowed to exceed 50 degrees C (122 degrees F). Thermostats shall be provided to control cooling without need of manual operation. Thermostat setpoints shall be as per recommendations of the equipment suppliers. See above for thermal calculation requirements. Cooling units shall be as manufactured by Hoffman Engineering Co., Rittal or approved equal and shall be thermostatically controlled.

- B. Space heaters shall be provided for condensation and temperature control. Thermostats AND hygrostats (or combination hygrotherm controllers) shall be provided to control heating requirements (based on temperature and relative humidity within enclosure) without need of manual operation. Setpoints shall be as per recommendations of the equipment suppliers. See above for thermal calculation requirements. Space heaters and associated control devices shall be as manufactured by Hoffman Engineering Co., Rittal, Stego or approved equal.
- C. NEMA 4X control panels shall be provided with vapor-phase corrosion inhibitor(s) (chemical combinations that vaporize and condense on all surfaces in the enclosed area, to protect metal surfaces/devices within the enclosed area from corrosion). Corrosion inhibitor shall be Hoffman #AHCI series (sized as required by the enclosure volume to be protected) or equal.
- D. For outdoor panels, stainless steel solar shields for front, top and each side of panel, supported to associated panel face with standoffs as required (to allow free air flow between solar shield and panel enclosure), shall be provided where required to limit solar loading on panel to allow use of a ventilated panel design rather than an air-conditioned panel design.
- E. Provide a sun shield over all LCD displays in exterior-mounted panels. Sun shield shall be collapsible to fully protect LCD display from UV light when not in use, shall provide side and top shielding when in use, shall be constructed of stainless steel and shall be installed such as to maintain NEMA 4X ratings of enclosures.
- F. Provide a clear polycarbonate gasketed hinged door or window to encompass all indicators, controllers, recorders, etc. mounted on NEMA 4 and 4X enclosures.
- G. Provide interior mounting panels and shelves constructed of minimum 12 gauge steel with white enamel finish. Provide metal print pocket with white enamel finish on inside of door.
- H. Provide interior LED light kit, mounted at top of interior of panel, and switched to turn "ON" when door is opened for the following control panels:
  - 1. Control panels with outer dimensions greater than 20" wide or 30" high.
  - 2. Control panels containing PLCs or other similar programmable devices.
- I. Control panels containing VFDs or Reduced Voltage Soft Starters shall include a door mounted digital keypad for adjusting the starter parameters and viewing process values and viewing the motor and starter statuses without opening the enclosure deadfront door.

## 2.5. CONTROL COMPONENTS

- A. General:
1. All pushbuttons, pilot lights, selector switches and other control devices shall be separate, standard size (full 30mm) and shape, heavy duty oil-tight units.
    - a. Devices in extremely corrosive areas (chlorine rooms, fluoride rooms, etc.) shall be of non-metallic construction.
    - b. Devices in other areas shall be of chrome-plated construction.
  2. All components and devices so that connection can be easily made and so there is ample room for servicing each item.
  3. Door-mounted indicators, recorders, totalizers and controllers shall be located between 48" and 72" above finished floor level.
  4. Door-mounted indicator lights, selector switches and pushbuttons shall be located between 36" and 80" above finished floor level.
  5. All devices and components shall be adequately supported to prevent movement. Mounting strips shall be used to mount relays, timers and other devices suitable for this type of mounting.
- B. Pilot Lights:
1. All pilot lights to be cluster LED type & push to test.
- C. Pushbuttons:
1. All STOP operators within control stations located at equipment shall be provided with lockout provisions and a minimum of two (2) sets of contact blocks.
  2. Emergency shutoff pushbutton devices shall be as follows unless noted otherwise:
    - a. 2 1/4" diameter, mushroom-style, maintained contact push buttons
    - b. With a minimum of one (1) normally open dry contact and three normally closed dry contacts.
    - c. Connections made such that pushing "in" the button will shutoff the associated equipment.
    - d. Provided with a red engraved nameplate with 1/2" lettering to read "Emergency Shutoff".
- D. Relays:
1. Control relays shall have the following characteristics, unless noted otherwise:
    - a. General purpose, plug-in type.
    - b. Minimum mechanical life of 10 million operations.
    - c. Coil voltage as indicated or required by application.
    - d. Single-break contacts rated 12 amperes, resistive at 240 volts.
    - e. Contacts as shown on wiring diagrams plus a minimum of one (1) spare N.O. contact and one (1) spare N.C. contact. At a minimum, each individual relay shall have 3PDT contacts. Where required, multiple control relays shall be provided (to provide the required quantities of contacts) for each "relay" function shown on plans/diagrams.
    - f. Furnished with RC transient suppressor to suppress coil-generated transients to 200% of peak voltage.
    - g. LED on/off indicator light and manual operator.
    - h. Industry standard wiring and pin terminal arrangements.
    - i. Equal to Square D 8501KP series with matching plug-in socket.
  2. Interposing/isolation relays used to isolate discrete output field wiring (and where required for voltage translation for other discrete signals) to/from PLC inputs/outputs shall be terminal-block style. Terminal-block style relays shall have the following characteristics, unless noted otherwise:

- a. Minimum mechanical life of 10 million operations.
  - b. Single-break contacts rated 6 amperes, resistive at 120 volts.
  - c. One (1) N.O. contact per relay.
  - d. Furnished with integral transient protection.
  - e. LED on/off indicator light.
  - f. DIN-rail mounted.
  - g. Equal to Square D type Zelio RSL.
3. Timer relays shall be electronic, adjustable plug-in devices meeting the following characteristics, unless noted otherwise:
- a. General purpose, plug-in type.
  - b. Minimum mechanical life of 10 million operations.
  - c. Single-break contacts rated 10 amperes, resistive at 240 volts.
  - d. Contacts as shown on wiring diagrams plus a minimum of one (1) spare N.O. contact and one (1) spare N.C. contact. At a minimum, each relay shall have DPDT contacts (2 N.O. & 2N.C.). Where required, multiple timer or control relays shall be provided (to provide the required quantities of contacts) for each "relay" function shown on plans/diagrams.
  - e. Rotary-thumbwheel adjustments for time value, timing range and function.
  - f. Time value adjustments from .05 seconds to 999 hours
  - g. Selectable Timing Functions, including the following:
    - 1) On Delay
    - 2) Interval
    - 3) Off Delay
    - 4) One Shot
    - 5) Repeat Cycle-Off
    - 6) Repeat Cycle-On
    - 7) On/Off Delay
    - 8) One Shot Falling Edge
    - 9) Watchdog
    - 10) Trigger On Delay
  - h. Accuracy shall be  $\pm 2\%$  and repeatability shall be  $\pm 0.1\%$ .
  - i. Furnished with integral transient protection.
  - j. LED indicator light(s) for "timing" and "on/off status"
  - k. Held in place with hold-down spring
  - l. Equal to Square D type JCK with matching plug-in socket.

## 2.6. DC POWER SUPPLIES

- A. DC Power supplies shall be provided where specified elsewhere, or as required by design of system. Power supplies shall be industrial type, AC-to-DC switching, output voltage as required, 120vac input, size as required for the initial application plus 50% spare capacity.
- B. Redundant power supplies with diode isolation shall be provided so that the loss of one power supply does not affect system operation. The back-up supply systems shall be designed so that either the primary or the back-up supply can be removed, repaired, and returned to service without disrupting the system operation.
- C. Power supply output shall be protected by secondary overcurrent protection device(s).

- D. The power distribution from multiloop supplies shall be selectively fused so that a fault in one instrument loop will be isolated from the other loops being fed from the same supply.
- E. Each power supply shall meet the following requirements.
  - 1. Regulation, line: 0.4% for input from 105 to 132vac.
  - 2. Regulation, load: 0.8%
  - 3. Ripple/Noise: 15mV RMS / 200 mV peak to peak
  - 4. Operating temperature range: 0 deg C - 60 deg C
  - 5. Overvoltage protection
  - 6. Overload Protection
  - 7. Output shall remain within regulation limits for a least 16ms after loss of AC power at full load.
  - 8. Output status indicator.
  - 9. UL listing
- F. Power supplies shall be manufactured by Puls, Sola, Phoenix Contact or equal.

## 2.7. UNINTERRUPTIBLE POWER SUPPLIES

- A. Uninterruptible power supplies (UPSs) shall be provided where specified elsewhere, or as required by design of system. Power supplies shall be industrial type, size as required for the initial application plus 50% spare capacity unless noted otherwise.
- B. Battery runtime shall be as specified elsewhere. If no other specification for battery runtime is specified, battery runtime shall be 12.5 minutes at full load.
- C. UPSs shall be double-conversion, on-line type.
- D. UPSs shall be rated for operation in -20 degrees C to 55 degrees C ambient temperatures.
- E. UPS batteries shall be hot-swappable and 12-year rated when installed in 25 degrees C environment and 4-year rated when installed in 50 degrees C environment.
- F. UPSs shall include dry contacts for the following alarm points:
  - 1. Loss of Input Power Alarm
  - 2. Low Battery Alarm
- G. UPSs shall be manufactured by Falcon UPS or approved equal.

## 2.8. DISCONNECTS

- A. A main disconnect switch or circuit breaker shall be supplied integral to all control panels. The main disconnect or circuit breaker shall be accessible/operable without exposing the operator to energized sections of the control panel(s).
- B. Individual circuit breakers shall be provided integral to the manufactured control panel for each separate power circuit originating within the control panel.
- C. Where the highest continuous current trip setting for which the actual overcurrent device installed in a circuit breaker is rated (or can be adjusted to is 1200A or higher,

breakers shall be electronic trip and shall be provided with arc energy-reducing maintenance switching (with local status indicator) to reduce arc flash energy per NEC 240.87 requirements.

## 2.9. COMBINATION STARTERS

- A. All combination starters shall utilize a unit disconnect. Magnetic starters shall be furnished in all combination starter units unless specifically shown otherwise. All starters shall utilize full NEMA/EEMAC rated contactors (size 1 minimum).
- B. Starters shall be provided with a three-pole, external (door mounted) manual reset, solid state overload relay. Solid state overload relay shall have switch-selectable trip class and shall provide protection from:
  - 1. Overload.
  - 2. Phase Unbalance.
  - 3. Phase Loss.
  - 4. Ground Fault (Class II detection).
- C. Unless specifically shown otherwise, each combination starter shall be furnished with a control circuit transformer including two primary protection fuses and one secondary fuse (in the non-ground secondary conductor). The transformer shall be sized to accommodate the contactor(s) and all connected control circuit loads (including motor space heaters and other similar loads where specified). The transformer rating shall be fully visible from the front when the unit door is opened. Unless otherwise indicated, control voltage shall be 120V AC. Control power shall be provided by individual unit control power transformers.
- D. When a unit control circuit transformer is not provided, the disconnect shall include an electrical interlock for disconnection of externally powered control circuits.
- E. Auxiliary control circuit interlocks shall be provided where indicated. Auxiliary interlocks shall be field convertible to normally open or normally closed operation.
- F. NEMA/EEMAC Size 1-4 starters shall be mounted directly adjacent to the wireway so that power wiring (motor leads) shall connect directly to the starter terminals without the use of interposing terminals. Larger starters shall be arranged so that power wiring may exit through the bottom of the starter cubical without entering the vertical wireway.
- G. Each starter shall be equipped with a minimum of the following control devices:
  - 1. Door-mounted reset button.
  - 2. Two (2) field-reversible (N.O./N.C.) auxiliary contacts
  - 3. For reversing and two-speed starters: Four (4) field-reversible (N.O./N.C.) auxiliary contacts
  - 4. Additional control devices as indicated on plans.
- H. Terminal Blocks
  - 1. Wiring within all units shall be type B, with unit-mounted control terminal blocks for each field wire.
  - 2. Terminal blocks shall be the pull-apart type 600 volt and rated at 25 amps. All current carrying parts shall be tin plated. Terminals shall be accessible from inside the unit when the unit door is opened. Terminal blocks shall be DIN rail mounted with the stationary portion of the block secured to the unit bottom plate.

The stationary portion shall be used for factory connections, and shall remain attached to the unit when removed. The terminals used for field connections shall face forward so they can be wired without removing the unit or any of its components.

I. Nameplates

1. Each unit shall be properly labeled with an engraved phenolic nameplate with a white background and black letters.
2. Each pilot device shall be properly labeled with a legend plate or an engraved phenolic nameplate.

2.10. WIRING

- A. Refer to Section 26 05 19 for all wiring types/applications.
- B. All wiring shall be identified on each end with hot stamped, shrink tube type, or self-laminating vinyl permanent wire markers to correspond with numbering shown on wiring diagrams.
- C. All connections shall be made on terminals with no splices.
- D. All wiring runs shall be along horizontal or vertical routes to present a neat appearance. Angled runs will not be acceptable. Group or bundle parallel runs of wire in plastic wire duct where practical.
- E. All wiring runs shall be securely fastened to the panel or wire duct by means of plastic wire ties. Adequately support and restrain all wire runs to prevent sagging or movement.
- F. AC power wiring and instrumentation/analog wiring shall be run separate.
- G. Color code all internal wiring (not field wiring) as follows:
  1. Line and load circuits: Black (B)
  2. AC control wiring: Red (R)
  3. Externally-Powered control wiring: Orange (O)
  4. Neutral wiring: White (W)
  5. Low voltage DC(+)pos: Blue (BL)
  6. Low voltage DC(-)neg: Blue/White Tracer (BL/W)
  7. Grounding: Green/Yellow Tracer (G/Y)
- H. Terminal strips shall be provided for all input and output wiring. No more than two (2) wires shall be connected to one (1) terminal block.

2.11. ELECTRICAL SURGE AND TRANSIENT PROTECTION

- A. General
  1. Function: Protect the system against damage due to electrical surges.
- B. Application: As a minimum, provide surge and transient protection (with proper grounding) at the following locations as described below:
  1. Power Input:



- a. Provide surge protection device at any connection of 120VAC power to panels containing programmable logic controllers, remote I/O equipment, UPS's, transmitters, radios, VFDs, Reduced Voltage Soft Starters or other electronic equipment. Device shall:
  - 1) Be mounted internal to the associated panel, with dedicated overcurrent protection.
  - 2) Be of two-part (base and SPD), DIN-rail mountable construction.
  - 3) Have 15kA total nominal discharge current per line (based on 8/20 $\mu$ s waveform).
  - 4) Have maximum continuous operating voltage (MCOV) rating as required by the associated circuit voltage.
  - 5) Visually indicate operational status.
  - 6) Be Dehn DEHNguard series or equal by MTL Technologies.
- b. Provide surge protection device at any connection of multi-pole AC power to panels containing programmable logic controllers, remote I/O equipment, UPS's, transmitters, radios, VFDs, Reduced Voltage Soft Starters or other electronic equipment. Device shall:
  - 1) Be mounted internal to the associated panel, with dedicated overcurrent protection.
  - 2) Provide protection for all phases.
  - 3) Have 40kA (per phase) peak surge current rating.
  - 4) Have maximum continuous operating voltage (MCOV) rating as required by the associated circuit voltage.
  - 5) Visually indicate operational status.
  - 6) Be Square D SDSA or HWA series or equal.
2. Analog I/O Panel Terminations:
  - a. Provide surge protection device at the PLC (or similar) panel connection of each analog I/O signal. Device shall:
    - 1) Be mounted internal to the associated panel.
    - 2) Be of two-part (base and SPD), DIN-rail mountable construction.
    - 3) Have 10kA total nominal discharge current per line (based on 8/20 $\mu$ s waveform).
    - 4) Have maximum continuous operating voltage (MCOV) rating as required by the associated signal.
    - 5) Be Dehn Blitzductor XT series or equal by MTL Technologies.
3. Discrete I/O Panel Terminations:
  - a. Provide isolation relay at the PLC (or similar) panel connection of each discrete output signal (within the associated panel). See above for isolation relay requirements.
4. Low Voltage Power Supply Load Side Protection:
  - a. Provide surge protection device at the PLC (or similar) panel on the load side of each low voltage power supply that has low voltage connections extending external to the panel. Device shall:
    - 1) Be mounted internal to the associated panel.
    - 2) Be of two-part (base and SPD), DIN-rail mountable construction.
    - 3) Have 10kA total nominal discharge current per line (based on 8/20 $\mu$ s waveform).
    - 4) Have maximum continuous operating voltage (MCOV) rating as required by the associated utilization voltage.
    - 5) Be as manufactured by Dehn, MTL Technologies, or Phoenix Contact.
5. Network Panel Terminations:

- a. Provide surge protection device at the PLC (or similar) panel connection of each network cable. Device shall:
  - 1) Be mounted internal to the associated panel.
  - 2) Be of DIN-rail mountable construction.
  - 3) Have 1kA total nominal discharge current per line (based on 8/20 $\mu$ s waveform).
  - 4) Be designed specifically for the associated network connection type (Ethernet, RS485, RS232, etc.).
  - 5) Be MTL Zonebarrier series or equal.
- 6. Antenna Cable Terminations:
  - a. Provide surge protection device at the connection of antenna cable to the radio panel. Device shall:
    - 1) Be mounted internal to the associated panel.
    - 2) Provide coarse protection via replaceable gas-filled surge voltage arrestor
    - 3) Be Phoenix Contact COAXTRAB series or equal.

C. Installation and grounding of suppressor: As directed by manufacturer. Provide coordination and inspection of grounding.

### PART 3 - EXECUTION

#### 3.1. INSTALLATION

- A. Provide enclosure mounting supports as required for floor, frame or wall mounting. All supports in exterior, wet or process areas shall be stainless steel unless noted otherwise. All floor-mounted panels or other similar distribution equipment shall be mounted on 6" concrete housekeeping pads unless specifically shown otherwise.
- B. All enclosures used outside shall be solid bottom unless otherwise specified. All cable and piping openings shall be sealed watertight. Cable and piping shall enter the enclosure as shown on drawings or specified herein.
- C. All equipment and components shall be solidly grounded to the control panel. One grounded terminal unit shall be provided in each control panel for connection to plant ground system. Grounding digital and analog components shall be performed in accordance with the instrument supplier's installation recommendations. Signal ground shall be solidly connected to the ground system so as to prevent ground loops

#### 3.2. PAINTING

- A. For enclosures other than NEMA 4X stainless steel or fiberglass:
  - 1. Completely clean all surfaces so that they are free of corrosive residue. Then, phosphatize all surfaces for corrosion protection.
  - 2. Prime with two (2) coats and finish with one coat of factory finish textured polyurethane. Paint shall be Sherwin-Williams Polane "T" or approved equal.
  - 3. Color to be selected during shop drawing review phase.

#### 3.3. IDENTIFICATION & DOCUMENTATION

- A. Refer to specification section 26 05 53 for additional requirements.

- B. Control panel power supply source, type, voltage, number or circuit ratings shall be identified inside control panels and on drawings.
- C. All interior devices and components shall be identified with thermal transfer labels with black letters on white background. Labels shall be placed on the subpanel and not the component. Marking system shall be a Brother "PTouch II" or equal. Lettering shall be 1/4" high.
- D. All front panel mounted devices such as push buttons shall be identified by the use of engraved bakelite nameplates or legend plates. Nameplates shall be 1/8" thick, white with black core.
- E. Where a panel includes a PLC or other network-connected device that is intended to be connected to another system (such as a plant SCADA system) via a network connection, the panel supplier shall provide an Interface Control Document (IDC) to the other system supplier (such as the SCADA Integrator). This document shall itemize the following for each networked parameter that is capable of being monitored or controlled by the other system:
  - 1. Parameter Name/Function (ex: Pump No. 1 On/Off Status)
  - 2. Parameter Type (discrete or analog, input or output)
  - 3. Parameter register ID/location
- F. Where a panel includes a touchscreen or other programmable HMI display and is to be monitored by another system (such as a plant SCADA system), the panel supplier shall provide copies of the HMI display code and screenshots of all proposed HMI screens to the other system supplier (such as the SCADA Integrator) for their use in duplicating the associated HMI.
- G. A job-specific, custom wiring diagram for each control panel (not including control stations without relays) shall be provided to the contractor prior to installation for making the appropriate electrical connections. The wiring diagram shall clearly show all control components connected to the panel (whether the components are mounted internal or external to the enclosure). All wires and terminal blocks shall be clearly labeled. A laminated copy of the final wiring diagram for each unit shall be installed inside the door of the associated panel, and submitted to the owner with the as-built documentation.

#### 3.4. OWNER TRAINING

- A. Fully train the owner in the proper operation of all control panels/equipment, describing and demonstrating full operation, including function of each door-mounted device.

#### 3.5. SPARE EQUIPMENT

- A. Provide the following spare equipment:
  - 1. Fuses: 10% (minimum of 3) of each size and type utilized, mounted within a pocket within the associated control panel.
  - 2. Where control panel contains programmable controller (or similar equipment): Flash drive containing copies of all final programs utilized within the control panel, with provisions/cable assemblies as required to connect the flash drive provided to the controller to download the programs. Flash drive shall be

attached to retractable cord (long enough to reach the associated port) attached to the inside of the panel door.

END OF SECTION 26 29 00

## **Appendix D – GEFA Supplemental General Conditions**

# GEORGIA ENVIRONMENTAL FINANCE AUTHORITY

## SUPPLEMENTAL GENERAL CONDITIONS

for

### FEDERALLY ASSISTED STATE REVOLVING FUND CONSTRUCTION CONTRACTS

May 9, 2014

The following standard language must be incorporated into construction contract documents and in all solicitations for offers and bids for all construction contracts or subcontracts in excess of \$10,000 to be funded in whole or in part by the federally-assisted State Revolving Fund in the State of Georgia.

These Supplemental General Conditions shall not relieve the participants in this project of responsibility to meet any requirements of other portions of this construction contract or of other agencies, whether these other requirements are more or less stringent. The requirements in these Supplemental General Conditions must be satisfied in order for work to be funded with the State Revolving Fund.

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## INSTRUCTIONS & GENERAL REQUIREMENTS

It is the policy of the State Revolving Loan Fund (SRF) to promote a fair share of subcontract, materials, equipment and service awards to small, minority, and women-owned businesses for equipment, supplies, construction, and services. Compliance with these contract provisions is required in order for project costs to be eligible for SRF funding. The fair share objective is a goal, not a quota. Failure on the part of the apparent successful bidder to submit required information to the loan recipient (Owner) may be considered by the Owner in evaluating whether the bidder is responsive to bid requirements.

### THE PRIME CONTRACTOR MUST SUBMIT THE FOLLOWING ITEMS TO THE OWNER:

#### A. Before beginning the work of any contract:

- 1) **DBE Compliance Form and related documentation.** The Owner must submit this information to the Georgia Environmental Finance Authority (GEFA) to demonstrate compliance with Disadvantaged Business Enterprise (DBE) requirements. GEFA concurrence is recommended prior to award of the construction contract and is required prior to commencement of any SRF-funded construction. (Pages GEFA-4&5)
- 2) **Certification Regarding Equal Employment Opportunity.** This form is required for the Prime Contractor and for all subcontractors. The Prime Contractor form should be submitted with the DBE Compliance Form, and the subcontractor forms should be submitted as the subcontracts are executed. (Page GEFA-9)
- 3) **Certification Regarding Debarment, Suspension, & Other Responsible Matters.** This form is required for the Prime Contractor and for all subcontractors. The Prime Contractor form should be submitted with the DBE Compliance Form and the subcontractor forms should be submitted as the subcontracts are executed. (Page GEFA-10)
- 4) **\*EPA Form 6100-2 DBE Subcontractor Participation Form.** This form gives a DBE subcontractor the opportunity to describe the work the DBE subcontractor received from the Prime Contractor, how much the DBE subcontractor was paid, and any concerns the DBE subcontractor might have. The Prime Contractor must provide this form to each DBE subcontractor. The DBE subcontractor can, as an option, complete and submit this form to the GEFA DBE Coordinator, who will also forward the form to the EPA DBE Coordinator. (Page GEFA-11)
- 5) **\*EPA Form 6100-3 DBE Subcontractor Performance Form.** This form captures the description of work to be performed by an intended DBE subcontractor and the price of the work. This form is to be provided by the Prime Contractor to each DBE subcontractor and submitted with the DBE Compliance Form. (Page GEFA-12)
- 6) **\*EPA Form 6100-4 DBE Subcontractor Utilization Form.** This form captures intended or anticipated use of an identified DBE subcontractor by the Prime Contractor and the estimated dollar amount of the work. This form is to be completed by the Prime Contractor and submitted with the DBE Compliance Form. (Page GEFA-13)

**\* 6100 FORMS ARE NOT REQUIRED WHEN ALL OF THE WORK IS SELF-PERFORMED BY THE PRIME CONTRACTOR.**

#### B. During the performance of the contract:

- 7) **Changes to Subcontractors Form.** If any changes, substitutions, or additions are proposed to the subcontractors included in previous GEFA concurrences, the Owner must submit this information to GEFA for prior concurrence in order for the affected subcontract work to be eligible for SRF funding. (Page GEFA-14)
- 8) **DBE Annual Report.** The Owner must submit this information to GEFA no later than October 20<sup>th</sup> of any year that the construction contract is active. (Page GEFA-15)
- 9) **Certified Payrolls.** These should be submitted to the Owner weekly for the Prime Contractor and all subcontractors. The Owner must maintain payroll records and make these available for inspection. Use Department of Labor form WH-347 or a similar form that contains all of the information on the Department of Labor.

### THE OWNER MUST SUBMIT INFORMATION FOR GEFA REVIEW AND CONCURRENCE TO:

Georgia Environmental Finance Authority  
Attention: DBE Compliance Coordinator  
233 Peachtree Street, N.E.  
Harris Tower, Suite 900  
Atlanta, Georgia 30303  
(404)584-1000; (404)584-1069 (fax)  
[dbecompliance@gefa.ga.gov](mailto:dbecompliance@gefa.ga.gov)



# DBE COMPLIANCE FORM

ALL INFORMATION OUTLINED ON THIS FORM IS REQUIRED FOR DBE COMPLIANCE REVIEW. THE PROPOSED PRIME CONTRACTOR AND OWNER SHOULD ENSURE THAT THIS INFORMATION IS COMPLETE PRIOR TO SUBMITTAL.

Loan Recipient \_\_\_\_\_

SRF Loan Number \_\_\_\_\_

## PRIME CONTRACTOR'S AND OWNER'S CERTIFICATIONS:

*I certify that the information submitted on and with this form is true and accurate and that this firm has met and will continue to meet the conditions of this construction contract regarding DBE solicitation and utilization. I further certify that criteria used in selecting subcontractors and suppliers were applied equally to all potential participants and that EPA Forms 6100-2 and 6100-3 were distributed to all DBE subcontractors.*

\_\_\_\_\_  
(Prime Contractor signature)

Date \_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

*I certify that I have reviewed the information submitted on and with this form and that it meets the requirements of the Owner's State Revolving Fund loan contract.*

\_\_\_\_\_  
(Signature of Owner or Owner's representative)

Date \_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

## CONTACT INFORMATION

Owner contact \_\_\_\_\_

Owner phone number & email \_\_\_\_\_

Consulting Engineer contact \_\_\_\_\_

Consulting Engineer phone number & email \_\_\_\_\_

Proposed Prime Contractor \_\_\_\_\_

Prime Contractor contact \_\_\_\_\_

Prime Contractor phone number & email \_\_\_\_\_

Proposed total contract amount \$ \_\_\_\_\_

Proposed total MBE participation \$ \_\_\_\_\_ Percentage \_\_\_\_\_ Goal: 4.0 percent

Proposed total WBE participation \$ \_\_\_\_\_ Percentage \_\_\_\_\_ Goal: 4.0 percent

CONTINUED ON NEXT PAGE

**Please submit the following with the DBE Compliance Form:**

- 1) List of all committed and uncommitted subcontractors by trade, including company name, address, telephone number, contact person, dollar amount of subcontract, and DBE/MBE/WBE status.
- 2) Indicate in writing if no solicitations were made because the Prime Contractor intends to use only its own forces to accomplish the work.
- 3) Proof of certification by EPA, SBA, DOT (or by state, local, Tribal, or private entities whose certification criteria match EPA criteria) for each subcontractor listed as a DBE, MBE, or WBE.
- 4) Documentation of solicitation efforts for prospective DBE firms, such as fax confirmation sheets, copies of solicitation letters and e-mails, printout of online solicitations, printouts of online search results and copies and affidavits of publication in newspapers or other publications. (see also, **"Six Good Faith Efforts"**, page GEFA-7).
  - a. The Prime Contractor shall use the necessary resources to identify and directly solicit no less than 3 certified MBE firms and 3 certified WBE firms to bid in each expected subcontract trade or area. If a diligent and documented search of the recommended directories does not identify 3 potential certified MBE firms and 3 potential certified WBE firms, then the Prime Contractor shall post an advertisement in the Owner's local legal organ, the Owner's official website, a regional newspaper in a larger community in the proximity, the Prime Contractor's website, or some other appropriate resource.
  - b. The Prime Contractor is encouraged to follow-up each written, fax, or e-mail solicitation with at least 1 logged phone call.
  - c. Whenever possible, post solicitations for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
- 5) Written justification for not selecting a certified DBE subcontractor that submitted a low bid for any subcontract area.
- 6) Certification By Proposed Prime Contractor or Subcontractor Regarding Equal Employment Opportunity (GEFA-9)
- 7) Certification By Proposed Prime or Subcontractor Regarding Debarment, Suspension, and Other Responsible Matters. (GEFA-10)
- 8) \*EPA Form 6100-3 DBE Subcontractor Performance Form for all DBE subcontracts. (GEFA-12)
- 9) \*EPA Form 6100-4 DBE Subcontractor Utilization Form for all DBE subcontracts. (GEFA-13)

\*6100 forms are not required when all of the work is self-performed by the prime contractor.

**END OF DBE COMPLIANCE FORM**



## DBE COMPLIANCE CHECKLIST

THE PRIME CONTRACTOR MUST SUBMIT THE FOLLOWING ITEMS TO THE OWNER BEFORE THE WORK BEGINS:

Loan Recipient \_\_\_\_\_

SRF Loan Number \_\_\_\_\_

### Include in Package Submittal

PRIME CONTRACTOR ONLY	TOTAL CONTRACT AMOUNT	
ALL SUBCONTRACTORS, INCLUDING DBE FIRMS	TRADE	AMOUNT
ALL SUBCONTRACTORS, INCLUDING DBE FIRMS	TRADE	AMOUNT
DBE SUBCONTRACTORS ONLY	TRADE	AMOUNT
DBE SUBCONTRACTORS ONLY	TRADE	AMOUNT
PRIME CONTRACTOR ONLY <i>(Not applicable if self-performing all work, with no subcontracting)</i>		

1. **DBE Compliance Form.** The Owner must sign and submit this information to the Georgia Environmental Finance Authority (GEFA) to demonstrate compliance with DBE requirements. GEFA concurrence is recommended prior to award of the construction contract and is required prior to commencement of any SRF-funded construction. (Pages GEFA-4&5)

2. **Certification Regarding Equal Employment Opportunity.** This form is required for the Prime Contractor and for all subcontractors. The Prime Contractor's form should be submitted with the DBE Compliance Form and the subcontractors' forms should be submitted as the subcontracts are executed. (Page GEFA-9)

3. **Certification Regarding Debarment, Suspension, & Other Responsible Matters.** This form is required for the Prime Contractor and for all subcontractors. The Prime Contractor's form should be submitted with the DBE Compliance Form and the subcontractors' forms should be submitted as the subcontracts are executed. (Page GEFA-10)

4. **EPA Form 6100-2 DBE Subcontractor Participation Form.** This form gives a DBE subcontractor the opportunity to describe the work the DBE subcontractor received from Prime Contractor, how much the DBE subcontractor was paid, and any other concerns the DBE subcontractor might have. The Prime Contractor must provide this form to each DBE subcontractor. The DBE subcontractor can, as an option, submit this form to the GEFA DBE Coordinator, who will forward the form to the EPA DBE Coordinator. (Page GEFA-11)

5. **EPA Form 6100-3 DBE Subcontractor Performance Form.** This form captures an intended DBE subcontractor's description of work to be performed for the Prime Contractor and the price of the work. This form is to be provided by the Prime Contractor to each DBE subcontractor and submitted with the DBE Compliance Form. (Page GEFA-12)

6. **EPA Form 6100-4 DBE Subcontractor Utilization Form.** This form captures the Prime Contractor's intended use of an identified DBE subcontractor and the estimated dollar amount of the work. This form is to be completed by the Prime Contractor and submitted with the DBE Compliance Form (Page GEFA-13)

### Uncommitted Trades

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### Documentation of Good Faith Efforts

Newspaper ads	Internet Websites	Fax Confirmation	Copies of Solicitation Emails/letters	Copies of phone logs
PROOF OF CERTIFICATION FOR EACH SUBCONTRACTOR LISTED AS A DBE, MBE, OR WBE				

## SIX GOOD FAITH EFFORTS

These good faith efforts are required methods to ensure that DBEs have the opportunity to compete for procurements funded by EPA financial assistance dollars. Such good faith efforts are described as follows:

1. Ensure DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities. This will include placing DBEs on solicitation lists and soliciting them whenever there are potential sources.
2. Make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process. This includes, whenever possible, posting solicitation for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
3. Consider in the contracting process whether firms competing for large contracts could subcontract with DBEs. This will include dividing total requirements when economically feasible into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.
4. Encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually.
5. Use the resources, services, and assistance of the Department of Transportation (DOT), Small Business Administration (SBA), and the Minority Business Development Agency of the Department of Commerce (MBDA).
6. If the Prime Contractor awards subcontracts, it must take the steps described in items (1) through (5) listed above.

Please note that DBEs, MBEs, and WBEs must be certified by EPA, SBA, or DOT (or by state, local, Tribal, or private entities whose certification criteria match EPA's). DBEs must be certified in order to be counted toward the Prime Contractor's MBE/WBE goals. "Self-certified" DBE subcontractors will not be counted toward the Prime Contractor's MBE/WBE goals. Depending upon the certifying agency, a DBE may be classified as a DBE, a Minority Business Enterprise (MBE), or a Women's Business Enterprise (WBE).

The Prime Contractor must employ and document the **Six Good Faith Efforts** for all subcontracts, even if the Prime Contractor has achieved the fair share objectives.

The documentation of solicitations for the **Six Good Faith Efforts** must be detailed in order to allow for satisfactory review. Such documentation might include fax confirmation sheets, copies of solicitation letters/emails, printouts of the online solicitations, printouts of online search results and affidavits of publication in newspapers or other publications. The Prime Contractor is encouraged to follow up each written, fax, or e-mail solicitation with at least 1 logged phone call.

The Prime Contractor should attempt to identify and solicit DBEs in the geographic proximity of the project before soliciting those located farther away.

If a DBE subcontractor fails to complete work under the subcontract for any reason, the Prime Contractor must notify the Owner in writing prior to any termination and must employ the Six Good Faith Efforts described above if using a replacement subcontractor. Any proposed changes from the approved DBE subcontractor list must be reported to the Owner and to GEFA on the *Changes to Approved Subcontractors Form* (GEFA-14) prior to initiation of the action. EPA Forms Nos. 6100-3 and 6100-4 must also be submitted to GEFA for new DBE subcontracts.

# RESOURCES FOR IDENTIFYING DBE SUBCONTRACTORS

## RESOURCES FOR IDENTIFYING DBE SUBCONTRACTOR'S FOR DIRECT SOLICITATION:

Georgia Department of Transportation (GDOT)  
Disadvantaged Business Enterprise Program  
(404) 631-1972

[https://gdotbiext.dot.ga.gov/analytics/saw.dll?Dashboard&PortalPath=%2Fshared%2FExternal%2F\\_portal%2FUCP%20Directory&Page=UCP%20Directory&Action=Navigate&Syndicate=true&anon=1](https://gdotbiext.dot.ga.gov/analytics/saw.dll?Dashboard&PortalPath=%2Fshared%2FExternal%2F_portal%2FUCP%20Directory&Page=UCP%20Directory&Action=Navigate&Syndicate=true&anon=1)

City of Atlanta, Georgia Office of Contract Compliance (404) 330-6010  
<https://www.atlantaga.gov/government/mayor-s-office/executive-offices/office-of-contract-compliance>

DeKalb County, Georgia  
Office of Purchasing and Contracting  
(404) 371-4730  
<http://dekalbbsbe.info/wordpress1/wp-content/uploads/2016/05/DeKalbCountyCertifiedVendorsListMay10-2016-Final2.pdf>

Fulton County, Georgia  
Purchasing and Contract Compliance  
(404) 612-5800  
<http://www.fultoncountyga.gov/fcpccd-local-business-directory>

Metropolitan Atlanta Rapid Transit Authority (MARTA)  
Disadvantaged Business Enterprise Program  
(404) 848-4656  
<https://marta.diversitysoftware.com/FrontEnd/VendorSearchPublic.asp?XID=8663&TN=marta>

United States Environmental Protection Agency  
[http://www.epa.gov/osbp/dbe\\_team.htm](http://www.epa.gov/osbp/dbe_team.htm)  
Teree Henderson  
National DBE Program Coordinator  
(202) 566-2222  
[henderson.teree@epa.gov](mailto:henderson.teree@epa.gov)

For more information about DBE compliance,  
contact:  
[db\\_compliance@gefa.ga.gov](mailto:db_compliance@gefa.ga.gov)

## NOTES:

- (1) The Prime Contractor shall use the necessary resources to identify and directly solicit no less than 3 certified MBE firms and 3 WBE firms to bid in each expected subcontract area or trade.
- (2) If a diligent and documented search of the recommended directories does not identify 3 potential certified MBE firms and 3 potential certified WBE firms, then the Prime Contractor shall post an advertisement in the Owner's local legal organ, the Owner's official website, a regional newspaper in a larger community in the proximity, the Prime Contractor's website, or some other appropriate resource. Whenever possible, post solicitation for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.
- (3) Expenditures to a DBE that acts merely as a broker or passive conduit of funds, without performing, managing, or supervising the work of its subcontract in a manner consistent with normal business practices may not be counted.
- (4) The Prime Contractor should attempt to identify and first solicit DBEs in the geographic proximity of the project before soliciting those located farther away.
- (5) Contact GEFA Program Managers at (404) 584-1000 or [db\\_compliance@gefa.ga.gov](mailto:db_compliance@gefa.ga.gov) for further assistance or resources.

**CERTIFICATION BY PROPOSED PRIME CONTRACTOR OR SUBCONTRACTOR  
REGARDING  
EQUAL EMPLOYMENT OPPORTUNITY**

Proposed Prime Contractor
Proposed Subcontractor

This certification is required pursuant to Executive Order 11246, Part II, Section 203 (b), (30 F.R. 12319-25). Any bidder or prospective prime contractor, or any of the proposed subcontractors, shall state as an initial part of the bid or negotiations of the contract whether it has participated in any previous contract or subcontract subject to the equal opportunity clause; and, if so, whether it has filed all compliance reports due under applicable instructions.

Where the certification indicated that the prime or subcontractor has not filed a compliance report due under applicable instruction, such contractor shall be required to submit a compliance report.

(1) Bidder has participated in a previous contract or subcontract subject to the Equal Opportunity Clause.  
YES \_\_\_\_\_ NO \_\_\_\_\_

(2) Compliance Reports were required to be filed in connection with such contract or subcontract.  
YES \_\_\_\_\_ NO \_\_\_\_\_ (If YES, state what reports were filed and with what agency.)

(3) Bidder has filed all compliance reports due under applicable instructions, including SF-100 (EEO-1 Report).  
YES \_\_\_\_\_ NO \_\_\_\_\_ (If NO, please explain in detail.)

The information above is true and complete to the best of my knowledge and belief. (A willfully false statement is punishable by law – U.S. Code, Title 18, Section 1001.)

\_\_\_\_\_  
PRINTED NAME & TITLE OF AUTHORIZED REPRESENTATIVE OF CONTRACTOR OR SUBCONTRACTOR

\_\_\_\_\_  
SIGNATURE OF AUTHORIZED REPRESENTATIVE

\_\_\_\_\_  
DATE

**CERTIFICATION BY PROPOSED PRIME CONTRACTOR OR SUBCONTRACTOR  
REGARDING  
DEBARMENT, SUSPENSION, AND OTHER RESPONSIBLE MATTERS**

Proposed Prime Contractor
Proposed Subcontractor

Under Executive Order 12549 individuals or organizations debarred from participation in Federal Assistance Programs may not receive an assistance award under federal program or sub-agreement there under for \$25,000 or more. Accordingly each recipient of a State loan or a contract (engineering or construction) awarded under a loan must complete the following certification (see 40 CFR 32.510).

The prospective participant certifies to the best of its knowledge and belief that it and its principals;

- (a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency.
- (b) Have not within a three year period preceding this proposal been convicted of or had a civil judgement rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;
- (c) Are not presently indicted for or otherwise criminally or civilly charged by a government entity (Federal, State or local) with commission of any of the offenses enumerated in paragraph (1) (b) of this certification; and
- (d) Have not within a three year period preceding this application/proposal had one or more public transactions (Federal, State or local) terminated for cause of default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. (A willfully false statement is punishable by law – U.S. Code, Title 18, Section 1001.)

\_\_\_\_\_  
PRINTED NAME & TITLE OF AUTHORIZED REPRESENTATIVE OF CONTRACTOR OR SUBCONTRACTOR

\_\_\_\_\_  
SIGNATURE OF AUTHORIZED REPRESENTATIVE

\_\_\_\_\_  
DATE

\_\_\_\_\_ I am unable to certify to the above statements. My explanation is as follows:

**Disadvantaged Business Enterprise (DBE) Program  
DBE Subcontractor Participation Form**

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. This form gives a DBE<sup>1</sup> subcontractor<sup>2</sup> the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g., in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Received from the Prime Contractor Involving Construction, Services , Equipment or Supplies	Amount Received by Prime Contractor

<sup>1</sup> A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

<sup>2</sup> Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.



## Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Performance Form

This form is intended to capture the DBE<sup>1</sup> subcontractor's<sup>2</sup> description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement Recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractors bid or proposal package.

Subcontractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Prime Contractor Name		Issuing/Funding Entity:	

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services , Equipment or Supplies	Price of Work Submitted to the Prime Contractor
DBE Certified By: ___ DOT ___ SBA ___ Other: _____		Meets/ exceeds EPA certification standards? ___YES ___NO ___Unknown

<sup>1</sup> A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

<sup>2</sup> Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

## Disadvantaged Business Enterprise (DBE) Program DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or anticipated use of identified certified DBE<sup>1</sup> subcontractors<sup>2</sup> and the estimated dollar amount of each subcontract.

An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package.

Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name		Project Name	
Bid/ Proposal No.	Assistance Agreement ID No. (if known)	Point of Contact	
Address			
Telephone No.		Email Address	
Issuing/Funding Entity:			

I have identified potential DBE certified subcontractors	___ YES	___ NO	
If yes, please complete the table below. If no, please explain:			
Subcontractor Name/ Company Name	Company Address/ Phone/ Email	Est. Dollar Amt	Currently DBE Certified?

Continue  
on back  
if needed

<sup>1</sup> A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certifications as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.

# CHANGES TO APPROVED SUBCONTRACTORS FORM

Loan Recipient \_\_\_\_\_ SRF Loan Number \_\_\_\_\_

## CERTIFICATIONS:

*I certify that the information submitted on and with this form is true and accurate and that this firm has met and will continue to meet the conditions of this construction contract regarding DBE solicitation and utilization. I further certify that criteria used in selecting subcontractors and suppliers were applied equally to all potential participants.*

\_\_\_\_\_  
(Prime Contractor signature) Date \_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

*I certify that I have reviewed the information submitted on and with this form and that it meets the requirements of the Owner's State Revolving Fund loan contract.*

\_\_\_\_\_  
(Signature of Owner or Owner's representative) Date \_\_\_\_\_

\_\_\_\_\_  
(Printed name and title)

## GENERAL INFORMATION:

- 1) If an approved subcontractor is terminated or replaced, please identify this company and briefly state reason.

Subcontractor Name::	Trade
Reason Terminated or Replaced	

- 2) For new or additional subcontractors, list name, trade, address, telephone number, contact person, dollar amount of subcontract, and DBE status.

New Subcontractor Name and Contact Person	Trade
Address	Telephone Number
Dollar Amount	DBE Status

- 1) Attach proof of certification by EPA, SBA, DOT (or by state, local, Tribal, or private entities whose certification criteria match EPA's) for each subcontractor listed as a DBE, MBE, or WBE.
- 2) Attach documentation of Six Good Faith Efforts solicitation effort for all new subcontracts.
- 3) Provide justification for not selecting any certified DBE subcontractor that submitted a low bid for any subcontract area.
- 4) For each subcontractor, attach certifications regarding Equal Employment Opportunity (GEFA-9) and certifications regarding Debarment, Suspension, and Other responsible Matters (GEFA-10)

**DBE ANNUAL REPORT**  
**FORM (5700-52A)**

This form must be completed by recipients of federal financial assistance for procurement of supplies, equipment, construction or services. SRF loan recipients are required to submit this report to GEFA by the 20th of October for the previous period of October 1 through September 30. Please submit a "negative" report even if \$0 is the amount paid to MBE/WBE subcontractors during the reporting period.

ANNUAL REPORT FORM (5700-52A)			
<b>1. PRIME CONTRACTOR</b>		<b>2. REPORTING PERIOD (Complete date using current year.)</b>  Period Ending    (September 30, _____)	
<b>3. SUBMIT TO:</b> Georgia Environmental Finance Authority Attention: DBE Compliance Coordinator 233 Peachtree Street, N.E. Harris Tower, Suite 900 Atlanta, Georgia 30303 dbe_compliance@gefa.ga.gov		<b>4. LOAN RECIPIENT (Name, Address and Telephone)</b>	
<b>5. LOAN RECIPIENT (OWNER) REPORTING CONTACT</b>	<b>PHONE:</b>	<b>6. TYPE OF FEDERAL FINANCIAL ASSISTANCE PROGRAM (Check one)</b> CWSRF _____ DWSRF _____	<b>7. SRF LOAN NUMBER</b>
<b>8. CONTRACTOR NAME &amp; TOTAL CONSTRUCTION CONTRACT AMOUNT</b>		<b>9. ACTUAL DOLLAR AMOUNT PAID TO MBE/WBE SUBCONTRACTORS THIS PERIOD</b>  \$ MBE _____ \$ WBE _____ <b>NEGATIVE REPORT (\$0) _____</b>	
<b>10. RECIPIENT'S MBE/WBE GOALS</b>  MBE    4.0 %        WBE    4.0 %		<b>11. TOTAL DOLLARS SPENT THIS PERIOD</b> MBE                \$ _____ WBE                \$ _____ NON MBE/WBE    \$ _____ TOTAL              \$ _____	
<b>12. NAME &amp; TITLE OF AUTHORIZED REPRESENTATIVE OF LOAN RECIPIENT (OWNER).</b>		<b>13. SIGNATURE OF AUTHORIZED REPRESENTATIVE OF LOAN RECIPIENT.</b>	<b>14. DATE</b>
<b>MBE/WBE PAYMENTS MADE DURING PERIOD</b>			
NAME & ADDRESS of DBE (SUB)CONTRACTOR (indicate if MBE or WBE firm)		TOTAL DOLLAR AMOUNT PAID & DATE PAID \$ _____ DATE _____	

## **SPECIAL PROVISIONS**

- (a) The Prime Contractor is required to pay its subcontractors in accordance with the Georgia Prompt Payment Act (OCGA 13-11).
- (b) The Prime Contractor is required to insert the entirety of the Davis Bacon contract requirements into all subcontracts
- (c) Sewer line and water line crossing of all roads and streets shall be done in accordance with the Georgia Department of Transportation (D.O.T.) Policies and Procedures and must comply with the Ga. D.O.T. Standard Specifications, Construction of Roads and Bridges, 1993 Edition.
- (c) Construction shall be carried out so as to prevent bypassing of wastewater flow and to prevent interruption of drinking water treatment during construction. EPD must receive written notification prior to any reduction in the level of treatment and must approve all temporary modifications to the treatment process prior to the activity.
- (d) Erosion and Sedimentation Control shall be accomplished in accordance with the Georgia Erosion and Sedimentation Control Act of 1975 as currently amended and NPDES General Permits (Storm Water from Construction Sites). See also [www.gaepd.org](http://www.gaepd.org) and [www.gaswcc.georgia.gov](http://www.gaswcc.georgia.gov) for information regarding permits.
- (e) Use of Chemicals: All chemicals used during project construction or furnished for project operation, whether herbicide, pesticide, disinfectant, polymer reactant or of other classification, must show approval of either EPA or USDA. Use of all such chemicals and disposal of residues shall be in conformance with State and local regulations as appropriate.
- (f) It is the duty of the Prime Contractor, the Owner and the Engineer to ensure the construction of the project, including the letting of contracts in connection therewith, shall comply with all applicable laws and regulations and requirements of the United States of America or any agency thereof, the state of Georgia or any agency thereof, territorial, or any local government laws or political subdivision and ordinances to the extent that such requirements do not conflict with Federal laws and this subchapter.
- (g) EPD, EPA, and GEFA shall have access to the site and the project work at all times.

### **BONDS**

Bonding requirements for Contracts of \$100,000 or less are contained in the General Conditions. Bond requirements of contracts in excess of \$100,000 are:

1. Bid guarantee equivalent to five percent of the bid price. The bid guarantee shall consist of a firm commitment such as a certified check or bid bond submitted with the bid.
2. Performance bond equal to 100 percent of the contract price and;
3. Payment bond equal to 100 percent of the contract price. Bonds must be obtained from companies holding Certificates of Authority as acceptable sureties, issued by the U.S. Treasury.

### **SPECIAL NOTICE TO BIDDERS**

By the submission of this bid, each bidder acknowledges that he understands and agrees to be bound by the equal opportunity requirements of EPA regulations (40 CFR Part 8, particularly Section 8.4 (b)), which shall be applicable throughout the performance of work under any contract awarded pursuant to this solicitation. Each bidder agrees that if awarded a contract, it will similarly bind contractually each subcontractor. In implementation of the foregoing policies, each bidder further understands and agrees that if awarded a contract, it must engage in affirmative action directed at promoting and ensuring equal employment opportunity in the workforce used under the contract (and that it must require contractually the same effort of all subcontractors whose subcontracts exceed \$10,000.00). The bidder understands and agrees that "affirmative action" as used herein shall constitute a good faith effort to achieve and maintain minority employment in each trade in the on-site workforce used on the project.

# **EQUAL EMPLOYMENT OPPORTUNITY NOTICE**

## **NOTICE OF REQUIREMENT FOR AFFIRMATIVE ACTION TO ENSURE EQUAL OPPORTUNITY (EXECUTIVE ORDER 11246)**

1. The Offeror's or Bidder's attention is called to the Equal Opportunity Clause which is included in the nondiscrimination Provision and Labor Standards, EPA Form 5720-4 and the Standard Federal Equal Employment Opportunity (EEO) Construction Contract Specifications set forth herein.
2. The goals for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

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Goals for minority participation for each trade	<b>4.0 percent</b>
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Goals for female participation for each trade	<b>4.0 percent</b>
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These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area.

The Contractor's compliance with the Executive Order and the regulations in 41 CFR Part 60-4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set forth in 41 CFR 60-4.3(a), and its efforts to meet the goals established for the geographical area where the contract resulting from this solicitation is to be performed. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minority and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation to the contract, the Executive Order and the regulations in 41 CFR Part 60-4. Compliance with the goals will be measured against the total work hours performed.

3. The contractor shall not discriminate on the basis of race, color, national origin or sex in the performance of this contract. The contractor shall carry out applicable requirements of 40CFR Part 33 in the award and administration of contracts awarded under EPA financial assistance agreements. Failure by the contractor to carry out these requirements is a material breach of this contract, which may result in the termination of this contract.
4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (insert description of the geographical area where the contract is to be performed giving the state, county and city, if any).

## **EEO Construction Contract Specifications (Executive Order 11246)**

### **EEO Specifications:**

1. As used in these specifications:
  - a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
  - b. "Director" means Director, Office of Federal Contract Compliance Program, United States Department of Labor, or any person to whom the Director delegates authority;
  - c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form, 941.
  - d. "Minority" includes:
    - (i) Black (all persons having origins in any of the Black African racial groups not of Hispanic origin);
    - (ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
    - (iii) Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Subcontinent, or the Pacific Islands); and
    - (iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).
2. Whenever the contractor, or any subcontractor at any tier, subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of \$10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.
3. If the Contractor is participating (pursuant to 41 CFR 60-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.
4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7(a) through (p) of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employees in the covered area. The Contractor is expected to make substantially uniform progress toward its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.
6. In order for the non-working training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.
7. The Contractor shall take specific affirmative actions to ensure equal employment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
  - a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor's employees are assigned to work. The Contractor, where possible, will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
  - b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available, and maintain a record of the organizations ☐ responses.
  - c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever actions the Contractor may have taken.
  - d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's efforts to meet its obligations.
  - e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trained programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the sources compiled under 7(b) above.
  - f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.



- g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with on-site supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
  - h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.
  - i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and tests to be used in the selection process.
  - j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
  - k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
  - l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
  - m. Ensure that seniority practices, job classifications, work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
  - n. Ensure that all facilities and company activities are non-segregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
  - o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
  - p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.
8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations 7(a) through (p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant may be asserted as fulfilling any one or more of its obligations under 7(a) through (p) of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes

a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).
10. The Contractor shall not use the goals and timetables or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.
11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.
12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.
13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps, at least as extensive as those standards prescribed in paragraph 7 of these specifications, so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.
14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation, if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.
15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

# **Davis-Bacon and Related Acts**

## **Labor Standards Provisions for Federally Assisted Contracts**

### **Contract Provision for Contracts in Excess of \$2,000.**

#### **(1) Minimum wages.**

(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics.

Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in § 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.

Subrecipients may obtain wage determinations from the U.S. Department of Labor's web site, <http://www.dol.gov/whd/govcontracts/dbra.htm> (E-tools)

(ii)(A) The subrecipient(s), on behalf of EPA, shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The State award official shall approve a request for an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the subrecipient(s) agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), documentation of the action taken and the request, including the local wage determination shall be sent by the subrecipient (s) to the State award official. The State award official will transmit the request, to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210 and to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification request within 30 days of receipt and so advise the State award official or will notify the State award official within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the subrecipient(s) do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the award official shall refer the request and the local wage determination, including the views of all interested parties and the recommendation of the State award official, to the Administrator for determination. The request shall be sent to the EPA DB Regional Coordinator concurrently. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt of the request and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii)(B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The subrecipient(s), shall upon written request of the EPA Award Official or an authorized representative of the Department of Labor, withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the (Agency) may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

### (3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii)(A) The contractor shall submit weekly, for each week in which any contract work is performed, a copy of all payrolls to the subrecipient, that is, the entity that receives the sub-grant or loan from the State capitalization grant recipient. Such documentation shall be available on request of the State recipient or EPA. As to each payroll copy received, the subrecipient shall provide written confirmation in a form satisfactory to the State indicating whether or not the project is in compliance with the requirements of 29 CFR 5.5(a)(1) based on the most recent payroll copies for the specified week. The payrolls shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on the weekly

payrolls. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at <http://www.dol.gov/whd/forms> or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the subrecipient(s) for transmission to the State or EPA if requested by EPA, the State, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the subrecipient(s).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under § 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under § 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the State, EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency or State may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees--

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed.

In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the EPA determines may be appropriate, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the

meaning of this clause include disputes between the contractor (or any of its subcontractors) and Subrecipient(s), State, EPA, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

**Contract Provision for Contracts in Excess of \$100,000.**

(a) Contract Work Hours and Safety Standards Act. The subrecipient shall insert the following clauses set forth in paragraphs (a)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of \$100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Item 3, above or 29 CFR 4.6. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (a)(1) of this section the contractor and any subcontractor responsible therefore shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (a)(1) of this section, in the sum of \$10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (a)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The subrecipient, upon written request of the EPA Award Official or an authorized representative of the Department of Labor, shall withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (a)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (a)(1) through (4) of this section.

(b) In addition to the clauses contained in Item 3, above, in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in 29 CFR 5.1, the Subrecipient shall insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Subrecipient shall insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the (write the name of agency) and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job

(5) Compliance Verification:

(a) The subrecipient shall periodically interview a sufficient number of employees entitled to DB prevailing wages (covered employees) to verify that contractors or subcontractors are paying the appropriate wage rates. As provided in 29 CFR 5.6(a)(6), all interviews must be conducted in confidence. The subrecipient must use Standard Form 1445 (SF 1445) or equivalent documentation to memorialize the interviews. Copies of the SF 1445 are available from EPA on request.

(b) The subrecipient shall establish and follow an interview schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, the subrecipient should conduct interviews with a representative group of covered employees within two weeks of each contractor or subcontractor's submission of its initial weekly payroll data and two weeks prior to the estimated completion date for the contract or subcontract. Subrecipients must conduct more frequent interviews if the initial interviews or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. Subrecipients shall immediately conduct necessary interviews in response to an alleged violation of the prevailing wage requirements. All interviews shall be conducted in confidence.

(c) The subrecipient shall periodically conduct spot checks of a representative sample of weekly payroll data to verify that contractors or subcontractors are paying the appropriate wage rates. The subrecipient shall establish and follow a spot check schedule based on its assessment of the risks of noncompliance with DB posed by contractors or subcontractors and the duration of the contract or subcontract. At a minimum, if practicable, the subrecipient should spot check payroll data within two weeks of each contractor or subcontractor's submission of its initial payroll data and two weeks prior to the completion date the contract or subcontract. Subrecipients must conduct more frequent spot checks if the initial spot check or other information indicates that there is a risk that the contractor or subcontractor is not complying with DB. In addition, during the examinations the subrecipient shall verify evidence of fringe benefit plans and payments thereunder by contractors and subcontractors who claim credit for fringe benefit contributions.

(d) The subrecipient shall periodically review contractors and subcontractors' use of apprentices and trainees to verify registration and certification with respect to apprenticeship and training programs approved by either the U.S Department of Labor or a state, as appropriate, and that contractors and subcontractors are not using disproportionate numbers of, laborers, trainees and apprentices. These reviews shall be conducted in accordance with the schedules for spot checks and interviews described in Item 5(b) and (c) above.

(e) Subrecipients must provide a report of compliance to the Georgia Environmental Finance Authority detailing compliance efforts and results. This report will be submitted with or prior to the loan recipient's first request for funding of construction costs, prior to final disbursement of funds from the loan, and as requested by the GEFA during the project.

(f) Subrecipients must immediately report potential violations of the DB prevailing wage requirements to the EPA DB coordinator and to the appropriate DOL Wage and Hour District Office listed at <http://www.dol.gov/whd/america2.htm>.



# **INSERT WAGE RATE DETERMINATION HERE**

Wage Rates (for *Heavy Construction*) are state/county specific can be found at:

<http://www.dol.gov/whd/govcontracts/dbra.htm>

Sample Payroll Form (WH-347) is found at:

<http://www.dol.gov/whd/forms/wh347.pdf>

Labor Standards Interview Form (SF-1445) is found at:

<http://www.gsa.gov/portal/forms/download/115910>

Davis-Bacon (WH-1321) poster is found at:

<http://www.dol.gov/whd/regs/compliance/posters/fedprojc.pdf>  
(English)

<http://www.dol.gov/whd/regs/compliance/posters/davispan.pdf>  
(Spanish)

Fair Labor Standards Act Minimum Wage poster is found at:

<http://www.dol.gov/whd/regs/compliance/posters/minwagebwp.pdf>  
(English)

<http://www.dol.gov/whd/regs/compliance/posters/minwagespbwP.pdf>  
(Spanish)

“EEO Is the Law” poster is found at:

[http://www.eeoc.gov/employers/upload/eeoc\\_self\\_print\\_poster.pdf](http://www.eeoc.gov/employers/upload/eeoc_self_print_poster.pdf)  
(English)

[http://www.eeoc.gov/employers/upload/eeoc\\_self\\_print\\_poster\\_spanish.pdf](http://www.eeoc.gov/employers/upload/eeoc_self_print_poster_spanish.pdf)  
(Spanish)

“EEO Is the Law” poster supplement is found at:

[http://www.eeoc.gov/employers/upload/eeoc\\_gina\\_supplement.pdf](http://www.eeoc.gov/employers/upload/eeoc_gina_supplement.pdf)  
(English)

[http://www.eeoc.gov/employers/upload/eeoc\\_gina\\_supplement\\_spanish.pdf](http://www.eeoc.gov/employers/upload/eeoc_gina_supplement_spanish.pdf)  
(Spanish)

OSHA poster is found at:

<http://www.osha.gov/Publications/osh3165low-res.pdf>  
(English)

<http://www.osha.gov/Publications/osh3167.pdf>  
(Spanish)

# CERTIFIED PAYROLL REVIEW CHECKLIST

(This is a *recommended Certified Payroll Review Checklist for the Owner's use.*)

CONTRACT ID  City of CW/DWSRF#00 - 000	PRIME CONTRACTOR/SUBCONTRACTOR  X Construction
GENERAL WAGE DECISION AND DATE  (Insert number & date)	PAYROLL PERIOD ENDING

**INSTRUCTIONS:** This checklist is to be used in conjunction with projects requiring Davis-Bacon Wage Rates and compliance reviews. All certified payrolls are to be date stamped upon receipt from the prime contractor.

## Payroll Information Checklist:

- \_\_\_\_\_ Prime Contractor's or subcontractor's name and address
- \_\_\_\_\_ Contract ID numbers (GEFA SRF No.)
- \_\_\_\_\_ Week ending.
- \_\_\_\_\_ Project location.
  
- \_\_\_\_\_ Employee ID or Last 4 digits of Social Security Number
  - \_\_\_\_\_ Social Security Number removed
  - \_\_\_\_\_ Employee's work classification
  - \_\_\_\_\_ Identification of OJTs, apprentices and program levels (%) on payrolls.
  - \_\_\_\_\_ Verify that OJT and Apprentice Program documentation is in project files.
  
- \_\_\_\_\_ Daily and weekly employee hours worked in each job classification.
  - \_\_\_\_\_ Daily and weekly employee overtime (or premium) hours worked
  - \_\_\_\_\_ Total weekly hours worked on all jobs (prevailing and non-prevailing wage).
  - \_\_\_\_\_ Base rate shown for each employee, overtime (or premium) rate shown when worked.
  - \_\_\_\_\_ Verify correct wage rates are being paid.
  - \_\_\_\_\_ Verify overtime is being paid correctly (over 40 hrs/wk, and Time and a half)
  - \_\_\_\_\_ Week's gross wages
  - \_\_\_\_\_ Week's itemized deductions.
  - \_\_\_\_\_ Week's net wages paid
  
- \_\_\_\_\_ Compliance statement attached.
  - \_\_\_\_\_ Method of fringe benefit payment described by checking either box (4)(a) or (4)(b).
  - \_\_\_\_\_ Fringe benefit package information in file and updated as needed (if 4(a) is checked)
  - \_\_\_\_\_ Exceptions explanation for fringe benefit (4)(c).
  - \_\_\_\_\_ Signature.

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## Compliance Review Checklist (for field reviews):

- \_\_\_\_\_ Verify work classifications reported are consistent with the work performed.
- \_\_\_\_\_ Compare payrolls with wage rate interviews when conducted.
- \_\_\_\_\_ Compare number of employees and hours worked with project documentation.

REVIEWED BY:	DATE
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## **Appendix E – Life Cycle Cost Spreadsheet**

Shenandoah WWTF UV Disinfection Equipment Lifecycle Cost Evaluation Form

Item	Units	Value	Notes
<b>A. System Design Criteria and Configuration</b>			
A.1 Design UV Dose	mJ.cm2	50.00	
A.2 Total Number of Channels	#	2.00	
A.3 Organism		MS2	
A.4 UV Transmittance		65% @ 254 nm	
A.5 Number of Banks per Channel	#		Vendor Entry
A.6 Total Number of Banks	#		Vendor Entry
A.7 Number of Modules per Bank	#		Vendor Entry
A.8 Total Number of Modules	#		Vendor Entry
<b>B. Equipment</b>			
B.1 Number of Lamps per Module	#		Vendor Entry
B.2 Total Number of Lamps	#		Vendor Entry
B.3 Power Consumption per lamp	Watts		Vendor Entry
B.4 No. of Ballasts	#		Vendor Entry
B.5 No. of Quartz Sleeves	#		Vendor Entry
B.6 No. of UV Intensity Sensors	#		Vendor Entry
B.7 No. Replaceable Cleaning Components	#		Vendor Entry
<b>C. Equipment Operating at Average Daily Flow Condition 0.9 MGD</b>			
C.1 No. of Lamps	#		Vendor Entry
C.2 No. of Ballasts	#		Vendor Entry
C.3 No. of Quartz Sleeves	#		Vendor Entry
C.4 No. of UV Intensity Sensors (UVIS)	#		Vendor Entry
C.5 No. of Replaceable Cleaning Components (RCC)	#		Vendor Entry
<b>D. Parts Warranty</b>			
D.1 Lamp Warranty	hours		Vendor Entry
D.2 Lamp Warranty	years		Divide Value in D.1 by 8,760 hrs/yr. Entry to be to the nearest Hundreth
D.3 Ballast Warranty	years		Vendor Entry
D.4 Quartz Sleeve Warranty	years		Vendor Entry
D.5 UVIS Warranty	years		Vendor Entry
D.6 RCC Warranty	years		Vendor Entry
<b>E. Replacement Parts Pricing</b>			
E.1 Lamp Cost	\$/unit		Vendor Entry
E.2 Ballast Cost	\$/unit		Vendor Entry
E.3 Quartz Sleeve Cost	\$/unit		Vendor Entry
E.4 UVIS Cost	\$/unit		Vendor Entry
E.5 RCC Cost per lamp	\$/unit		Vendor Entry
<b>F. Estimated No. of Parts Replaced Annually</b>			
F.1 Estimated Annual Lamp Replacement	#		Divide value in C.1 by value in D.2. Round up to the nearest whole number
F.2 Estimated Annual Ballast Replacement	#		Divide value in C.2 by value in D.3. Round up to the nearest whole number
F.3 Estimated Annual Sleeve Replacement	#		Divide value in C.3 by value in D.4. Round up to the nearest whole number
F.4 Estimated Annual UVIS Replacement	#		Divide value in C.4 by value in D.5. Round up to the nearest whole number
F.5 Estimated Annual RCC Replacement	#		Divide value in C.5 by value in D.6. Round up to the nearest whole number

Shenandoah WWTF UV Disinfection Equipment Lifecycle Cost Evaluation Form

Item	Units	Value	Notes
<b>G. Estimated Annual Part Replacement Cost</b>			
G.1 Est. Annual Lamp Replacement Costs	\$		Multiply value in E.1 by value in F.1. Round up to the nearest dollar
G.2 Est. Annual Ballast Replacement Costs	\$		Multiply value in E.2 by value in F.2. Round up to the nearest dollar
G.3 Est. Annual Sleeve Replacement Costs	\$		Multiply value in E.3 by value in F.3. Round up to the nearest dollar
G.4 Est. Annual UVIS Replacement Costs	\$		Multiply value in E.4 by value in F.4. Round up to the nearest dollar
G.5 Est. Annual RCC Replacement Costs	\$		Multiply value in E.5 by value in F.5. Round up to the nearest dollar
G.6 Total Est. Annual Replacement Costs	\$		Add values G.1 through G.5
<b>H. Estimated Labor Requirements</b>			
H.1 Time to Replace Lamp	hours	0.167	
H.2 Time to Replace Ballast	hours	0.250	
H.3 Time to Replace Sleeve	hours	0.167	
H.4 Time to Replace UVIS	hours	0.167	
H.5 Time to Replace RCC	hours	0.250	
<b>I. Estimated Annual Labor Costs</b>			
I.1 Est. Labor Rate	\$/hour		
I.2 Est. Annual Labor Cost for Lamp Replacement	\$	\$0.00	Multiply value in F.1 by value in H.1 by Value in I.1
I.3 Est. Annual Labor Cost for Ballast Replacement	\$	\$0.00	Multiply value in F.2 by value in H.2 by Value in I.1
I.4 Est. Annual Labor Cost for Sleeve Replacement	\$	\$0.00	Multiply value in F.3 by value in H.3 by Value in I.1
I.5 Est. Annual Labor Cost for UVIS Replacement	\$	\$0.00	Multiply value in F.4 by value in H.4 by Value in I.1
I.6 Est. Annual Labor Cost for RCC Replacement	\$	\$0.00	Multiply value in F.5 by value in H.5 by Value in I.1
I.7 Total Est. Annual Labor Cost	\$	\$0.00	Add values I.2 through I.6
<b>J. Estimated Annual Power Cost</b>			
J.1 Power Draw at Peak Flow - 3.3 MGD	kW		Vendor Entry
J.2 Power Draw at Average Flow - 0.9 MGD	kW		Vendor Entry
J.3 Power Draw at Minimum Flow - 0.12 MGD)	kW		Vendor Entry
J.4 Operating time at Peak Condition	%	5%	
J.5 Operating time at Average Condition	%	50%	
J.6 Operating time at Minimum Condition	%	45%	
J.7 Power Cost	\$/kWh	\$0.15	
J.8 Power Usage for Operating time at Peak Condition	kW		Multiple value in J.1 by value in J.4 by 8,760 hrs/yr
J.9 Power Usage for Operating time at Average Condition	kW		Multiple value in J.2 by value in J.5 by 8,760 hrs/yr
J.10 Power Usage for Operating time at Minimum Condition	kW		Multiply value in J.3 by value in J.6 by 8,760 hrs/yr
J.11 Total Annual Power Usage	kW		Add Values in J.8, J.9, and J.10
J.12 Est. Annual Power Costs at AF	\$		Multiply value in J.11 by J.7
<b>K. Estimated Present Worth</b>			
K.1 TOTAL EQUIPMENT COST	\$		Vendor Entry
K.2 Est. Total Annual Replacement Parts Cost	\$		Enter value in G.6
K.3 Est. Total Annual Labor Cost	\$		Enter value in I.7
K.4 Est. Total Annual Power Cost at ADF	\$		Enter value in J.12
K.5 Est. Total Annual Operating Costs	\$		Add values in K.2 through K.4
K.6 Present Value of Est. Annual Operating Costs	\$		Multiply value in K.5 by 12.46. Assumes (P/A, 5%, 10)
K.7 ESTIMATED PRESENT WORTH (10 years)	\$		Add values in K.1 and K.6