

**RFP 160485
REQUEST FOR PROPOSALS
UV DISINFECTION SYSTEM
WASTEWATER TREATMENT PLANT
CITY OF OAK RIDGE, TENNESSEE**

The City of Oak Ridge (Oak Ridge) is requesting proposals (RFP) from qualified Suppliers for a complete UV Disinfection system for the Wastewater Treatment Plant (WWTP) in Oak Ridge, Tennessee. The address of the WWTP is 200 Monterrey Road, Oak Ridge, Tennessee, 37830.

Included with this request are applicable system specifications (Appendix A) and a copy of relevant drawings (Appendix B) of the existing UV disinfection building.

It is Oak Ridge's intent to preselect the UV Disinfection system and to name the selected Supplier's system along with a scope, guaranteed price, and delivery schedule in the contract documents for the general construction contract. The current schedule for the general construction contract to be awarded is the second quarter 2019. Contract time for the general construction contract is estimated to be 9 months.

This is not a direct procurement by Oak Ridge. Rather, the selected Supplier will furnish and deliver the UV Disinfection system under the general construction contract for the project.

Proposal Content

The proposal shall contain the following items:

1. Lump sum price(s) for furnishing and delivery of the UV Disinfection system, accessories, and services as specified herein. If alternate equipment and/or processes (other than the named) are proposed, include sufficient information on the alternate equipment or processes so as to allow evaluation.
2. Equipment information and system design parameters, including but not limited to anticipated water quality parameters. Include documentation to justify the design dose.
3. Third party bioassay dose calculations.
4. Operational, including energy usage, and maintenance costs anticipated over the 20-year life of the equipment. Energy usage shall be provided for both the current annual average and peak design flow rates.
5. Preliminary system layout drawings.
6. Itemized list of equipment, materials, and services to be furnished, together with a list of items and services to be furnished by others. Alternate methods or equipment may be proposed, however such alternate methods must be clearly described in the proposal to receive consideration.
7. Expected submittal schedule and equipment delivery schedule following award of the construction contract.
8. Warranties for the system, lamps, and ballasts.
9. List of exceptions to or deviations from the specifications (if any). If none, state "No Exceptions."
10. Brief summary of experience with UV Disinfection systems and a list of at least twenty (20) installations in the U.S. of similar type and similar or larger size to

- that required for the Wastewater Treatment Plant. Include system capacity and date completed. Provide name and telephone number of contact person.
11. Brief summary and anticipated cost of recommended periodic maintenance and replacements, including interval(s).
 12. Description of UV System Supplier's service capabilities including local support offered for technical service and spare part availability.
 13. Brief, concise summary of any advantages, which are unique to the suppliers' system or equipment, compared to other UV Disinfection systems.

Additional information is neither desired nor requested. Proposals which contain numerous or significant exceptions to the specifications may be considered nonresponsive.

Proposal Submittal

Proposals shall be submitted in a plain sealed envelope marked on the front of the envelope "Proposal for UV Disinfection System" with the bid date and the name and address of the Supplier. Proposals shall be delivered to the address below no later than 2:00 p.m. local time on Tuesday, December 4, 2018:

By Regular Mail
Attn: Lyn Majeski
Finance Department
City of Oak Ridge
P.O. Box 1
Oak Ridge, TN 37831-0001

In Person or Overnight Delivery
Attn: Lyn Majeski
Finance Department
City of Oak Ridge
100 Woodbury Lane
Oak Ridge, TN 37830

Questions regarding this RFP should be directed in writing to Lyn Majeski via e-mail at lmajeski@oakridgetn.gov by noon at least five days prior to the submittal deadline. Requests for a site visit should be directed to Patrick Berge via email at pberge@oakridgetn.gov at least five days prior to the submittal deadline.

Basis of Selection

This proposal is part of an evaluated selection process. The capital cost of the system will be part of the evaluated price. In addition, Oak Ridge will consider factors other than evaluated price in making the final selection. These factors may include, but are not limited to operating cost, capacity, process flexibility, mechanical simplicity and reliability, ease and frequency of maintenance, experience, and technical support and service capabilities. Oak Ridge may waive any informality and make a selection at its sole and absolute discretion, which it deems to be in its best interest.

A responsive supplier is one who provides the information requested above and who proposes to furnish a UV Disinfection system as specified herein. A qualified supplier is one who has been regularly engaged in the manufacture and furnishing of UV Disinfection systems for a minimum of ten (10) years and who has a minimum of one hundred (100) UV Disinfection systems in satisfactory operation in the U.S. of similar type and similar or larger size to that required for the Oak Ridge wastewater treatment plant.

Interviews with suppliers are not planned at this time. However, Oak Ridge may decide to conduct interviews with one or more suppliers if it deems that such meetings would be beneficial to the selection process.

Suppliers who respond to the Request for Proposals will be notified in writing of the final selection.

Conditions

1. The pricing provided in the Supplier's proposal shall be valid for twelve (12) months from the Proposal Date listed above. The price may be subject to adjustment from that date to the date that a purchase order is executed with the construction Contractor. Price adjustment shall be subject to the approval of Oak Ridge. The price adjustment shall be based on the U.S. Department of Labor, Bureau of Labor Statistics, PPI commodity data, series WPU10.
2. The General Conditions and Supplemental General Conditions of the construction contract are provided as Appendix C to this RFP. Jurisdiction shall be Anderson County, Tennessee for all matters related to this RFP and the construction contract.
3. Oak Ridge reserves the right to abandon this request for proposals in its entirety and to make no selection.
4. Sales tax is not applicable to this RFP. If the Contractor ultimately determines that sales tax is applicable, then he will be responsible for such in accordance with the General and Supplemental General Conditions of the construction contract.

APPENDIX A – SPECIFICATIONS

SECTION 46 6656

OPEN CHANNEL LOW PRESSURE HIGH OUTPUT ULTRAVIOLET TREATMENT EQUIPMENT

PART 1 - GENERAL

1.1 SCOPE

- A. Under this Section furnish and deliver a complete and operational open channel, gravity flow ultraviolet (UV) disinfection system capable of performing as specified herein. Equipment components shall conform to the specific requirements of this section. The system described herein shall be capable of disinfecting effluent to meet the water quality standards listed in this section.
- B. It is the intent that the Supplier furnish and deliver to the job site all equipment and accessories and all necessary services for a complete UV Disinfection system as specified herein. The scope of supply shall include, but is not limited to, the following major items: UV modules, integral module lifting mechanism(s), electrical cabinets housing the electronic ballasts, power distribution, system control, UV detection system, automatic wiping system and water level control device(s) as shown on the drawings and specified herein.
- C. The following items or services will be provided by others or the Contractor:
 - 1. Equipment unloading, temporary storage, and installation.
 - 2. Channel modifications as required to install the UV Disinfection equipment
 - 3. Electrical and control wiring not specified herein.
 - 4. SCADA
- D. Relationship with Contractor. The UV Disinfection system furnished under this Section will be purchased, unloaded, and installed by a Contractor selected by the Owner in accordance with detailed drawings and installation instructions furnished by the Supplier.

1.2 DEFINITIONS

- A. Supplier: The UV Disinfection System provider.
- B. Owner: The City of Oak Ridge, Tennessee.
- C. Contractor: Firm retained by the Owner to install the UV Disinfection system. The Contractor is to be procured by the Owner via the open and competitive bidding process.
- D. Engineer: FOXPE, LLC

1.3 QUALITY ASSURANCE

A. Qualifications

1. A single Supplier regularly engaged in the design, manufacture, and supply of UV Disinfection equipment shall furnish the system and all of its components.
2. The Supplier shall have at least 10 years of experience in the application, design, and furnishing of processing equipment of the size and type specified herein.
3. The Supplier shall have at least 100 installations in the U.S. of similar or larger size and of similar type.

B. Performance Guarantee. The Supplier shall provide a disinfection performance guarantee. The Supplier shall provide a lifetime performance guarantee that the supplied system will disinfect to the limits provided herein based on the specified water quality described in 1.4.C. There shall be no limit on the concentration of influent coliform to the UV system. The performance guarantee shall be subject to the operation and maintenance of the system in accordance with the Supplier's written Operation and Maintenance manual and the use of Supplier approved parts.

1.4 PERFORMANCE AND DESIGN REQUIREMENTS

A. General. The UV Disinfection system shall be capable of achieving the performance and disinfection requirements of this section.

B. Treatment Prior to Disinfection. The following treatment units and processes are utilized at the WWTP.

1. Prior to the UV Disinfection system, the wastewater has undergone a combination of secondary biological treatment and, in the event of flows in excess of 10 MGD, physical and chemical treatment.
2. Flows from 0-10 MGD are treated in the secondary biological treatment process. The secondary treatment process includes fine screening, activated sludge biological treatment, secondary clarification, and mixed media filtration.
3. Flows from 10-30 MGD are treated in a physical and chemical treatment process. The physical and chemical treatment process includes fine screening, ferric chloride coagulant addition (up to 100 mg/l), powdered activated carbon (PAC) addition, flocculation, and clarification.
4. Effluents from the biological and physical/chemical treatment processes are blended prior to the UV Disinfection system.

C. Design Conditions

1. Peak Flow 30 MGD
2. Annual Average Flow 4.2 MGD
3. Minimum Flow 1.0 MGD
4. Total Suspended Solids 30 mg/l
5. Effluent Temperature 5-30 degrees C
6. Ultraviolet Transmittance @ 253.7 nm 65% minimum
7. Effluent standards to be achieved: 126 e.coli/100 ml based on a 30 day Geometric Mean of daily samples and 487 e.coli/100ml daily maximum. Effluent standards shall be guaranteed regardless of influent count to UV system.

D. System Configuration

1. Number of Channels 2
2. Channel Length 35'-1 ¼"
3. Channel Width 4'-8"
4. Channel Depth 10'-10"
5. UV system design shall not require enlargement of the existing channel dimensions.
6. Each channel shall be capable of individual, independent operation. There are two existing electric motor operated isolation slide gates available for use in channel isolation. The Supplier shall provide the necessary I/O and programming to provide for automatic operation of these influent isolation gates.
7. The Supplier shall provide the necessary instrumentation, controls, and equipment to equalize the flow between channels when both channels are in operation.

E. Performance Requirements

1. The ultraviolet disinfection system will produce an effluent conforming to the microbiological discharge limit as specified above. Grab samples will be taken in accordance with the Microbiology Sampling Techniques found in *Standard Methods for the Examination of Water and Wastewater, 19th Edition*.
2. The UV system will be designed to deliver a minimum T1 reduction equivalent dose (RED) of 15 mJ/cm² and MS2 RED of 30 mJ/cm² at the design peak flow, in effluent with a UV Transmission of 65% at end of lamp life (EOLL) after reductions for quartz sleeve fouling and to achieve the design conditions provided herein. The basis for evaluating the dose will be the independent third party bioassay. Bioassay validation methodology to follow applicable protocols described in NWRI *Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse* (May 2003, 2012) and 2006 USEPA UVDGM. At a minimum the following parameters shall have been considered during validation testing: UVT, measured UV intensity, flow rate per lamp, power consumption, UV sensitivity of challenge organism, head loss across UV banks.
3. The dose will be adjusted using an end of lamp life factor of 0.5 to compensate for lamp output reduction over the time period corresponding to the manufacturer's lamp warranty. The use of a higher lamp aging factor will be considered only upon review and approval of independent third party verified data that has been collected and analysed in accordance with protocols described in the NWRI *Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse* (May 2003, 2012).
4. The RED will be adjusted using a quartz sleeve fouling factor of 0.8 to compensate for quartz sleeve transmission reduction due to wastewater effluent fouling. The use of a higher quartz sleeve fouling factor will be considered only upon review and approval of independently verified data that has been collected and analysed in accordance with protocols described in the NWRI *Ultraviolet Disinfection Guidelines for Drinking Water and Water Reuse* (May 2003, 2012). The data recorded for the determination of the validated fouling factor must be obtained by testing in secondary wastewater effluent utilizing the same lamp, quartz sleeve and cleaning system proposed by the Supplier.
5. The UV system shall be capable of dose pacing to reduce electrical energy consumption in response to the disinfection demand based on a minimum of

channel flow signal (provided by others through either SCADA communications or 4-20mA signal), the UV sensor signal(s), and the online measured UV transmittance.

1.5 SHOP DRAWINGS AND ENGINEERING DATA

- A. Submit complete shop drawings and engineering data to the Engineer prior to fabricating equipment. Shop drawings shall include the following information:
 - 1. Manufacturer's product data sheets giving detailed functional description.
 - 2. Construction and material specifications.
 - 3. Performance specifications.
 - 4. Electrical requirements and wiring diagrams. Include maximum allowable lengths for power cables between the lamps and ballast enclosures
 - 5. Exploded assembly diagrams and component lists.
 - 6. Plan and elevation drawings with dimensions in English units.
 - 7. Process and instrumentation diagrams.
 - 8. List of spare parts to be furnished.
 - 9. Hydraulic calculations demonstrating compliance with the required hydraulic characteristics. Include system head loss, including that of the effluent level control device.
 - 10. Independent bioassay validation and dosage calculations demonstrating compliance with the specified RED requirements.
 - 11. Disinfection performance guarantee.
- B. Submit complete installation, assembly, and erection drawings and detailed installation and adjustment instructions to the Engineer and Contractor. Information shall include weights of equipment and anchor bolt location and arrangement. Equipment lifting points shall be provided, along with recommendations for short-term and long-term storage.

1.6 TRANSPORTATION

- A. Provide transportation of all equipment, materials, and products furnished under this section to the job site. Coordinate transportation with Contractor's installation schedule.
- B. Suitably box, crate, or otherwise protect all equipment during transportation.
- C. Ship and deliver all equipment in the largest assembled sections practical or permitted by carrier regulations to minimize the number of field connections.
- D. Ensure that the equipment is assembled and transported in such a manner so as to clear buildings, power lines, bridges, and similar structures encountered during shipment or delivery to the site of the work.
- E. Small items and appurtenances such as gauges, valves, switches, instruments, and probes which could be damaged during shipment shall be removed from the equipment prior to shipment and packaged and shipped separately. All openings shall be plugged or sealed to prevent the entrance of water or dirt.

1.7 OPERATION AND MAINTENANCE DATA

- A. Submit one preliminary copy (PDF format) and four (4) final printed copies of a complete operation and maintenance manual covering all equipment and products furnished under this section. Manuals shall be assembled in tabbed and indexed 3-ring binders with typed table of contents. Organize manuals into separate sections for each piece of related equipment. Final operation and maintenance manuals shall also be furnished in electronic (PDF) format.

- B. Equipment and Systems. Provide the following information for each piece of equipment, each operating system, and each electric or electronic system.
 - 1. Description: Provide a complete description of each unit and related component parts, including the following:
 - a. Equipment or system function.
 - b. Operating characteristics.
 - c. Limiting conditions.
 - d. Engineering data and tests.
 - e. Complete nomenclature and number of replacement parts.

 - 2. Manufacturer's Information: For each manufacturer of a component part or piece of equipment, provide the following:
 - a. Printed operating and maintenance instructions.
 - b. Assembly drawings and diagrams required for maintenance.
 - c. Wiring diagrams.
 - d. List of items recommended to be stocked as spare parts.

 - 3. Maintenance Procedures: Provide information detailing essential maintenance procedures, including the following:
 - a. Routine operations.
 - b. Trouble-shooting guide.
 - c. Disassembly, repair, and reassembly.
 - d. Alignment, adjusting, and checking.

 - 4. Operating Procedures: Provide information on equipment and system operating procedures, including the following:
 - a. Start-up procedures.
 - b. Equipment or system break-in.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Instructions on stopping.
 - f. Shut-down and emergency instructions.
 - g. Summer and winter operating instructions.
 - h. Required sequences for electric or electronic systems.
 - i. Special operating instructions.

5. Servicing Schedule: Provide a schedule of routine servicing and lubrication requirements, including a list of required lubricants for equipment with moving parts.
6. Controls: Provide a description of the sequence of operation and as-installed control diagrams by the control manufacturer for systems requiring controls.

1.8 WARRANTY

- A. Provide a written warranty against defective workmanship and materials on the UV Disinfection system and components for a period of 12 months following substantial completion of the construction contract. This warranty shall be in addition to any implied warranties and shall cover both parts and labor.
- B. The UV lamps shall be warranted for a minimum of 15,000 hours when operated in automatic mode, prorated after 9,000 hours. On/off cycles are limited to an average of four (4) per day accumulated over the guaranteed life of the lamp.
- C. Lamp drivers (ballasts) shall be warranted for 10 years, prorated after 1 year.
- D. UV Intensity Sensors shall be warranted for 5 years.
- E. When work covered by a warranty has failed and been corrected by replacement or rebuilding, reinstate the original warranty on the failed item of equipment by written endorsement.
- F. Complete warranty work as soon as possible following receipt of notice from the Owner or Contractor for a warranty claim.
- G. In the event of multiple equipment failures of major consequence during the warranty period, disassemble, inspect, and modify or replace the affected equipment as necessary to prevent further occurrences and reinstate the original warranty.

1.9 PATENTS

- A. Pay all patent fees and royalties and bear all costs incident to the use of any design, process, or product, which is the subject of patent or copyright by others.
- B. Indemnify, defend, and hold harmless the Owner and Engineer and their employees and agents from and against all claims, damages, losses, and expenses (including attorney's fees and court costs) arising out of the infringement of any patent rights or copyrights incident to the performance of the work.

PART 2 - MATERIALS AND EQUIPMENT

2.1 GENERAL DESCRIPTION AND REQUIREMENTS

- A. The system will be designed for complete submersion of the UV lamps under all flow conditions including both electrodes and the full length of the lamp arc.

- B. The lamp array configuration will be in a staggered inclined arrangement.
- C. All materials exposed to UV light shall be 316 stainless steel, quartz glass, PTFE, FKM, or other suitable long-term UV resistant materials.
- D. All equipment shall be new and unused.
- E. All parts shall be manufactured to handle the forces that may be expected during shipping, installation, and operation.
- F. Equipment shall be shipped and delivered fully assembled, except where partial disassembly is required in order to conform to transportation regulations or for protection of components.

2.2 UV LAMPS

- A. Lamps will be high intensity low-pressure amalgam design.
- B. The lamp shall withstand an average of four (4) on/off cycles per day without reducing lamp life, warranty or causing any damage to the lamp.
- C. Lamps will be operated by electronic lamp drivers with variable output capabilities ranging from a maximum of 50% to 100% of nominal power. The lamp assembly shall incorporate active filament heating to maintain a minimum lamp efficiency of 30% across varying water temperatures and between the minimum and maximum stated lamp power levels.
- D. The filament shall be significantly rugged to withstand shock and vibration.
- E. Each lamp plug will be accessible from the top of the UV bank to facilitate lamp removal.
- F. An integral safety interlock in the lamp plug will prevent removal of energized lamps.
- G. The lamp plug and shall be rated NEMA Type 6P.

2.3 UV BANK

- A. Each UV bank will consist of UV lamps, quartz sleeves and an automatic chemical and/or mechanical cleaning system mounted in a stainless steel frame.
- B. The UV modules shall be designed for submergence without causing failures or damage to the system or components.
- C. Each UV bank shall be designed to prevent possible short-circuiting at the side walls and top of bank in the reactor.
- D. Equipment must be provided by the UV manufacturer to enable lifting a complete bank of lamps from the channel at once for inspection and/or servicing. Each module shall be designed to allow lifting from the operating position in the channel to a maintenance

or storage position above the channel using an integral lifting mechanism. All components for a complete and functional automatic module lifting system shall be provided.

- E. All electrical connectors and motors located on the module and above nominal channel water level shall either rated at IP67 or located within IP67 enclosures suitable for temporary submersion.
- F. Each UV module, bank, or lamp as applicable to the Supplier's standard design shall be equipped with an interlock switch.
- G. Each lamp will be enclosed in an individual quartz sleeve.

2.4 AUTOMATIC CLEANING SYSTEM

- A. An automatic in-situ cleaning system will be provided to clean the quartz sleeves using both chemical and/or mechanical methods. Wiping sequence will be automatically initiated with capability for manual override.
- B. The cleaning system will be fully operational while UV lamps and modules are submerged in the effluent channel and energized.
- C. Cleaning sequence frequency will be field adjustable to enable optimization with effluent characteristics.
- D. The wipers shall travel the full length of the UV lamp arc.
- E. The UV intensity sensor shall be cleaned utilizing the same automatic cleaning method as that of the lamp quartz sleeves.
- F. The wiping system shall be controlled by the UV system controller and provide a fully automatic, unattended operation.

2.5 EFFLUENT LEVEL CONTROL

- A. An effluent level control device shall be provided to maintain the minimum channel effluent level required to keep lamps submerged at all times and to prevent over submergence. Each channel shall have one individual level control device.
- B. Effluent level control devices that utilize moveable weirs shall be fully automatic and controlled by the UV system controller. An ultrasonic level sensor mounted onto a fixed structure above the channel(s) shall measure the channel level continuously. The channel level shall be used by the UV System Controller to provide modulating control of the downward opening gate. The parameters and actuator run / dwell time setting shall be adjusted at commissioning of the system to suit the hydraulic characteristics of the facility and to minimize system hunting. Additional service visits shall be included to provide for acceptable operation over the entire range of hydraulic capacity at no additional expense to the Owner.

2.6 ELECTRICAL

A. General

1. All applicable electrical components will be UL-listed to ensure safety standards are met.
2. Supplier to provide all cabling between lamps and drivers.
3. The electrical enclosures for the UV system shall be NEMA Type 12 / IP54 painted steel. Stainless steel enclosures are acceptable.
4. All heat sensitive components shall be adequately cooled with outside air utilizing forced ventilation. The electrical components and enclosures are to be installed inside the existing building equipped with HVAC to maintain ambient temperature within the range of 60 to 90 degrees F.
5. Electrical supply to each Power Distribution Center will be 480V, 3 phase, 4 wire + GND, 60 Hz.
6. Electrical supply to all control and instrumentation devices will be 120V, 1 Phase, 2 Wire + GND, 60 Hz.

B. Power Distribution Centers

1. An independent and fully operational power distribution center (PDC) shall be provided for each channel. Each PDC shall be capable of isolation and independent operation.
2. All internal components will be sealed from the environment.
3. Each PDC shall be able to electrically isolate each bank of lamp drivers and safely replace a lamp driver without de-energizing any other operating banks.
4. Each PDC shall be equipped with a temperature control device, which will shut off this part of the UV system in case of exceeding 50°C or 122°F.
5. Each PDC shall be equipped with a cabinet heater to prevent the formation of condensation due to humidity.

C. Electronic Ballasts

1. The electronic ballasts shall comply with the CE & UL requirements, specifically the IEEE519 and the IEC 6100-3-2.
2. The ballasts shall be electronic microprocessor controlled, designed as slot cards fitting into a rack system with a plug connector for ease of maintenance.
3. Each ballast shall drive a pair of lamps with independent control and monitoring circuits, and provide individual lamp status information to the system control.
4. The ballast shall detect lamp failures and initiate a re-strike sequence, independently from any external influence.
5. The ballast shall incorporate a galvanic separation of the input and output circuits. In case of the output circuit operating in abnormal conditions regarding voltage and/or amperage, the ballast shall shut off the affected lamp. Ballasts without this feature shall be equipped with one GFC per ballast.
6. The operating power factor for the ballasts shall be minimum 0.99 over the entire power range of the ballast.
7. One power factor correction circuit shall power a maximum of two UV lamps in order to increase system reliability.
8. The ballast efficiency shall be a minimum of 95% at maximum power and less than 94% across the entire range.

9. The ballast total harmonic distortion (THD) shall be less than 5%. Ballast enclosures exceeding this THD value shall be equipped with an active harmonic filter.
10. The ballasts shall be tested on line disturbances up to 4000 V.
11. Ballasts requiring liquid closed loop re-circulating heat exchanger systems, e.g., propylene glycol, for cooling shall not be permitted.

D. Control and Instrumentation

1. A PLC based automatic control system shall be provided.
 - a. An Allen Bradley / Rockwell Compact Logix PLC shall be provided. Include necessary communications cards for the Modbus TCP/IP protocol for connection to the Owner's SCADA system.
 - b. A HMI shall be provided, 15-inch minimum with color capabilities.
 - c. Develop all PLC programming.
 - d. Develop and fully document all applications software.
 - e. Incoming power shall be adequately protected from surge.
 - f. All wiring shall be numbered and referenced to as-built schematics for ease of future maintenance.
 - g. All wiring shall be neatly routed within the enclosure using Panduit or similar.
 - h. All power supplies, circuit breakers, and transient surge protection devices shall be provided.
 - i. Panel layout drawings shall include, but shall not be limited to, for each panel, a front view, side view(s), rear view, base plan (where applicable and subpanel layout). The layout of devices on and within the panel shall be clearly shown with all devices identified. Panel mounting details shall be shown and overall dimensions shall be shown, plus all dimensions relative to mounting bolt locations, etc. Door swing arcs shall be shown on the panel base plans. Locations and sizing of cable and/or conduit entry areas shall be clearly shown.
 - j. Panel wiring diagrams may be schematic in nature provided they follow J.I.C., IEC, or other acceptable engineering standard schematic diagram format and clearly show all wire numbers, terminal point numbers, and contain sufficient notes and information to facilitate checking of drawings, testing and maintenance of the system and its equipment, etc. The function of each relay shall be identified near that relay's coil on the schematic diagram.
 - k. System interconnection diagrams shall include complete identification of all system interconnecting wires, cables, etc. This includes terminal numbers from the power distribution centers, field control panels, and field devices. System interconnection diagrams and panel wiring diagrams may be combined into one set of drawings, provided all details of both types of drawings are clearly and understandably incorporated and provided that field wiring may be easily distinguished from panel wiring.
 - l. All drawings shall be prepared in such detail as to enable plant technical personnel to maintain, troubleshoot, and repair the system without assistance of the system supplier's field service personnel.
 - m. After all field changes or corrections made during installation and field check-out have been completed, then all system supplier documentation shall be revised to reflect the "as installed, corrected, and accepted"

condition of the system and final record copies of all Supplier's documentation including instrument specification sheets and/or bills of material for the system shall be provided to the Owner and Engineer.

- n. These specifications cover the intended functionality of the equipment, but do not necessarily cover all details necessary for a complete, operable and functional system. The Supplier shall provide all devices and appurtenances necessary to provide a complete, operable and satisfactory system as indicated or specified.
 - o. The Supplier shall be responsible for detailed design and proper functioning of the control systems to be furnished under these Specifications. The Supplier shall be responsible for preparation of the required submittal data to be provided under these Specifications, including operation and maintenance manuals, complete documentation including "as built" drawings, and other documentation required under this and other related specification sections. In addition, the Supplier shall be responsible for conducting all tests including calibration and operational demonstrations either in the factory and/or the field, to demonstrate final compliance with these Specifications as required. The appropriate technical supervision for installation and connections to the existing and new equipment shall be provided during construction as well as during final termination verifications, testing, quality control, and field acceptance tests.
2. Dose-Pacing
- a. A dose-pacing system will be supplied to modulate the lamp UV output in relationship to a 4-20 mA DC signal from an effluent flow meter (supplied and installed by others) and UV intensity sensor(s).
 - b. The system shall be dose-paced such that as the flow and effluent quality change, the design UV dose is delivered while conserving power.
 - c. A shielded twisted pair cable shall be provided by the Contractor for connecting the UVT monitor (4-20 mA signal) to the System Control Center. The control system will modulate the lamp intensity in response to the effluent UV Transmission and UV intensity.
3. UV Intensity Sensors
- a. A UV sensor will continuously monitor the UV intensity produced within each UV Bank.
 - b. The UV sensor shall be factory-calibrated to US National Institute for Standards and Technology (NIST).
 - c. Sensors will be designed such that reference sensor readings can be taken without interrupting disinfection and without removing UV lamps, banks/modules or sleeves.
4. UV Transmission Monitors
- a. An on-line UVT monitor will be provided to automatically and continuously track the UV transmission of the effluent at the 254 nm wavelength.
 - b. One UVT monitor shall be provided, to be installed in the common influent distribution box or as shown on the drawings.
 - c. UVT monitors requiring pumping and straining of the effluent out of the channel to the monitor shall not be permitted.

PART 3 - EXECUTION

3.1 SELLER REQUIREMENTS DURING DESIGN AND CONSTRUCTION

A. Design Assistance

1. Seller shall provide assistance to the Engineer during the design of the project. Design assistance shall include, but not be limited to the following:
 - a. Providing detailed drawings, specific to the project, described in these Specifications in AutoCAD format. Seller to coordinate with Engineer on release version.
 - b. Attending one (1) design meeting at the Engineer's office, including all associated costs for travel, lodging, meals, etc.
 - c. Providing reviews for both preliminary and final construction drawings and specifications related to the equipment specified herein.
 - d. Providing written comments to the Engineer.
 - e. Providing telephone and e-mail support during the design and construction process.
 - f. Providing detailed installation drawings, including anchor rod placement, for supports required for Seller provided equipment.

3.2 INSTALLATION AND START-UP SERVICES

A. Installation and Check-Out

1. Provide the services of a factory-trained engineer who has at least three (3) years' experience in systems described above to supervise and check out the installation by the Contractor. Provide a minimum of one trip and three (3) 8-hour days at the job site.
2. The Supplier shall submit a report certifying that the equipment has been installed properly, checked out, and is ready for safe operation in the manner intended.

B. Start-Up and Training

1. Provide the services of a factory-trained engineer who has at least three (3) years' experience in systems described above to start up the system and provide training to the Owner's operators. Provide a minimum of one trip at the job site each for startup and training.
2. These visits are separate and in addition to any follow-up visits for warranty work.

3.3 SPARE PARTS

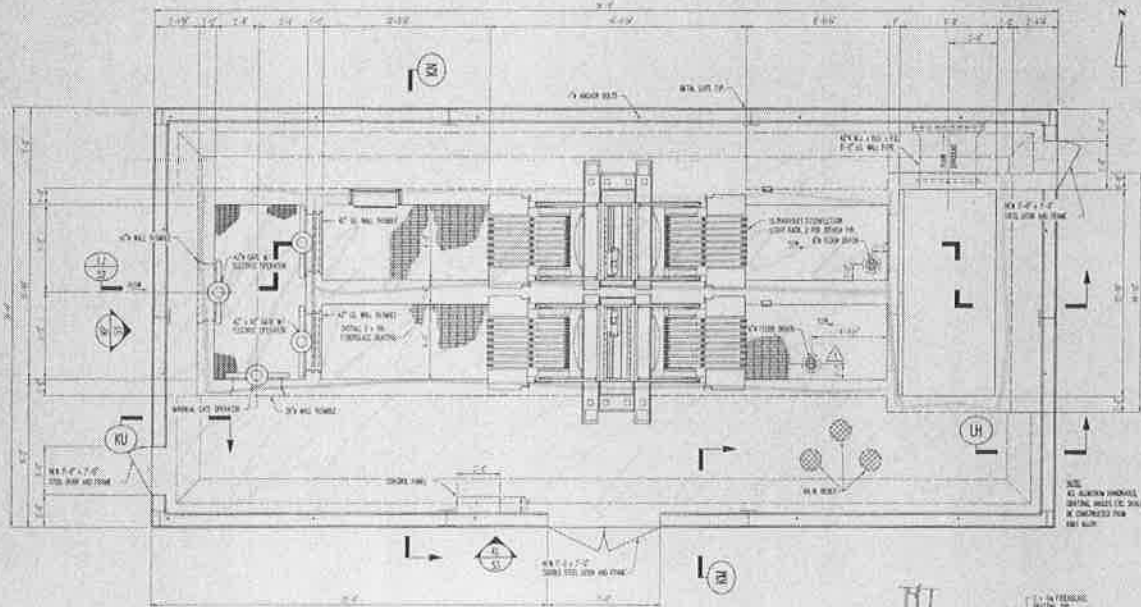
A. The following spare parts and safety equipment will be supplied

1. 10% UV Lamps

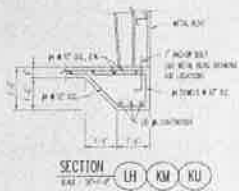
2. 5% Ballasts
3. 10% Quartz Sleeves
4. 10% Wiper Seals
5. 1 operator kit that includes UV-resistant face shield, gloves and cleaning solution

END OF SECTION

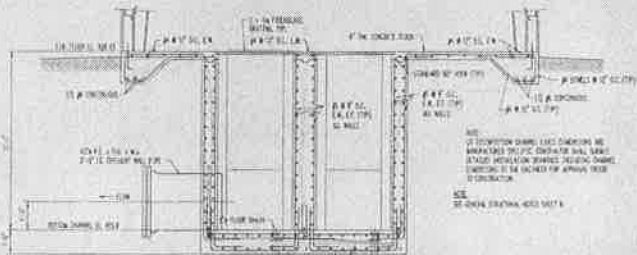
APPENDIX B – EXISTING DRAWINGS



PLAN
SCALE: 1/8" = 1'-0"



SECTION
SCALE: 1/8" = 1'-0"



SECTION
SCALE: 1/8" = 1'-0"

NOTE:
1. ALL DIMENSIONS UNLESS OTHERWISE SPECIFIED ARE IN FEET AND INCHES.
2. ALL DIMENSIONS SHALL BE TO FACE UNLESS OTHERWISE SPECIFIED.
3. ALL DIMENSIONS SHALL BE TO CENTER UNLESS OTHERWISE SPECIFIED.
4. ALL DIMENSIONS SHALL BE TO CENTER UNLESS OTHERWISE SPECIFIED.
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9. ALL DIMENSIONS SHALL BE TO CENTER UNLESS OTHERWISE SPECIFIED.
10. ALL DIMENSIONS SHALL BE TO CENTER UNLESS OTHERWISE SPECIFIED.



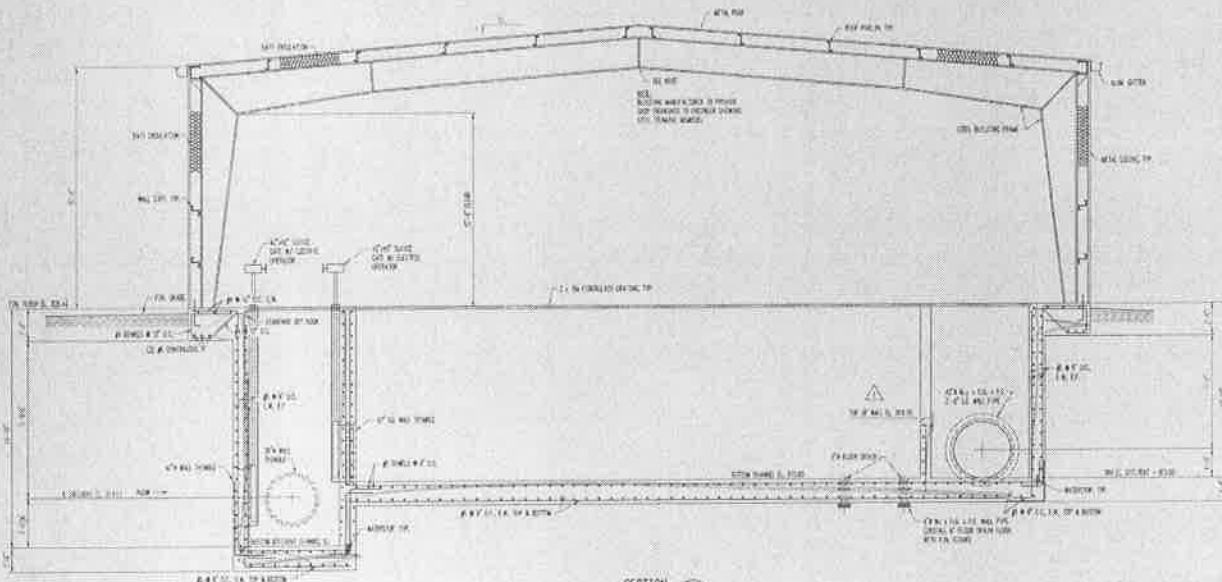
| | | |
|-----|---------|--------------------|
| NO. | DATE | DESCRIPTION |
| 1 | 10/1/11 | ISSUED FOR BIDDING |
| 2 | 10/1/11 | ISSUED FOR BIDDING |
| 3 | 10/1/11 | ISSUED FOR BIDDING |

LD&A
LINDSEY D. ANDERSON
ARCHITECTS

CITY OF OAK RIDGE
ANDERSON COUNTY, TENNESSEE

ULTRAVIOLET DISINFECTANT
TREATMENT BUILDING
STRUCTURAL PLAN AND DETAILS

| | | | | |
|-------------|---------|----------|-----|---------|
| PROJECT NO. | DATE | SCALE | BY | CHECKED |
| 11-11-11 | 10/1/11 | AS SHOWN | JWH | JWH |



SECTION
 1/2" = 1'-0"

NOTE:
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS ARE IN FEET AND INCHES.
 DIMENSIONS IN PARENTHESES ARE FOR INFORMATION ONLY.

NOTE:
 ALL DIMENSIONS SHALL BE TO FACE UNLESS OTHERWISE SPECIFIED.



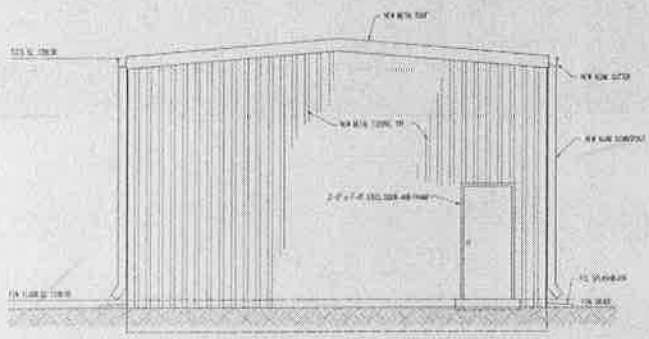
| | | |
|-----|---------|-------------------------|
| NO. | DATE | DESCRIPTION |
| 1 | 10/1/11 | ISSUED FOR PERMITS |
| 2 | 10/1/11 | ISSUED FOR CONSTRUCTION |

LD&A
 LEONARD D. ANDERSON & ASSOCIATES, INC.
 1000 N. W. 10th St., Suite 100
 Ft. Lauderdale, FL 33304
 Phone: (954) 571-1111
 Fax: (954) 571-1112
 www.ldand.com

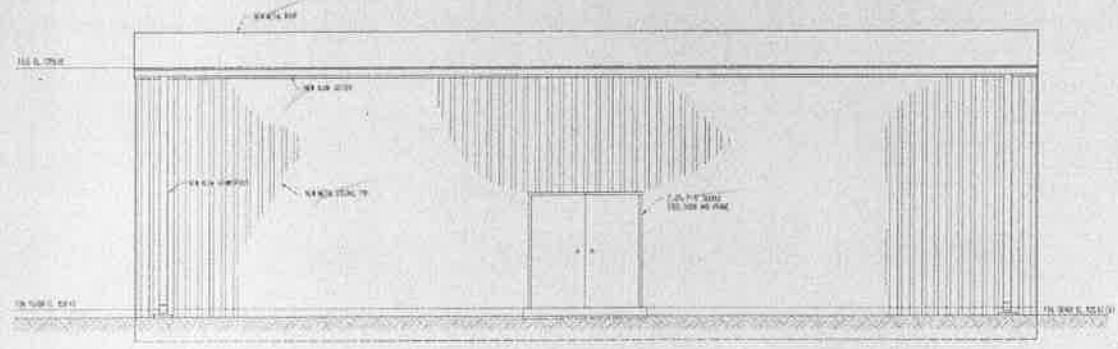
CITY OF OAK RIDGE
 ANDERSON COUNTY, TENNESSEE

ULTRAVIOLET DISINFECTION
 TREATMENT BUILDING
 STRUCTURAL SECTIONS

| | | | | |
|--------------|---------|--------------|-----------|--------------|
| PROJECT NO. | DATE | SCALE | SHEET NO. | TOTAL SHEETS |
| 11-11-11-001 | 10/1/11 | 1/2" = 1'-0" | 1 | 1 |



ELEVATION
FRONT



ELEVATION
SIDE



| | | |
|-----|-------------------|----------|
| NO. | DESCRIPTION | DATE |
| 1 | ISSUED FOR PERMIT | 11/15/11 |
| 2 | REVISED | 11/15/11 |

LD&A
Landscape Design & Architecture

CITY OF OAK RIDGE
ANDERSON COUNTY, TENNESSEE

ULTRAVIOLET DISINFECTION
TREATMENT BUILDING
EXTERIOR ELEVATIONS

| | | | |
|----------|--------------|----|------|
| DATE | SCALE | BY | CHKD |
| 11/15/11 | 1/8" = 1'-0" | LD | LD |
| NO. | DATE | BY | CHKD |
| 1 | 11/15/11 | LD | LD |



| | |
|------|-------------|
| DATE | DESCRIPTION |
| | |
| | |
| | |

L.D. A

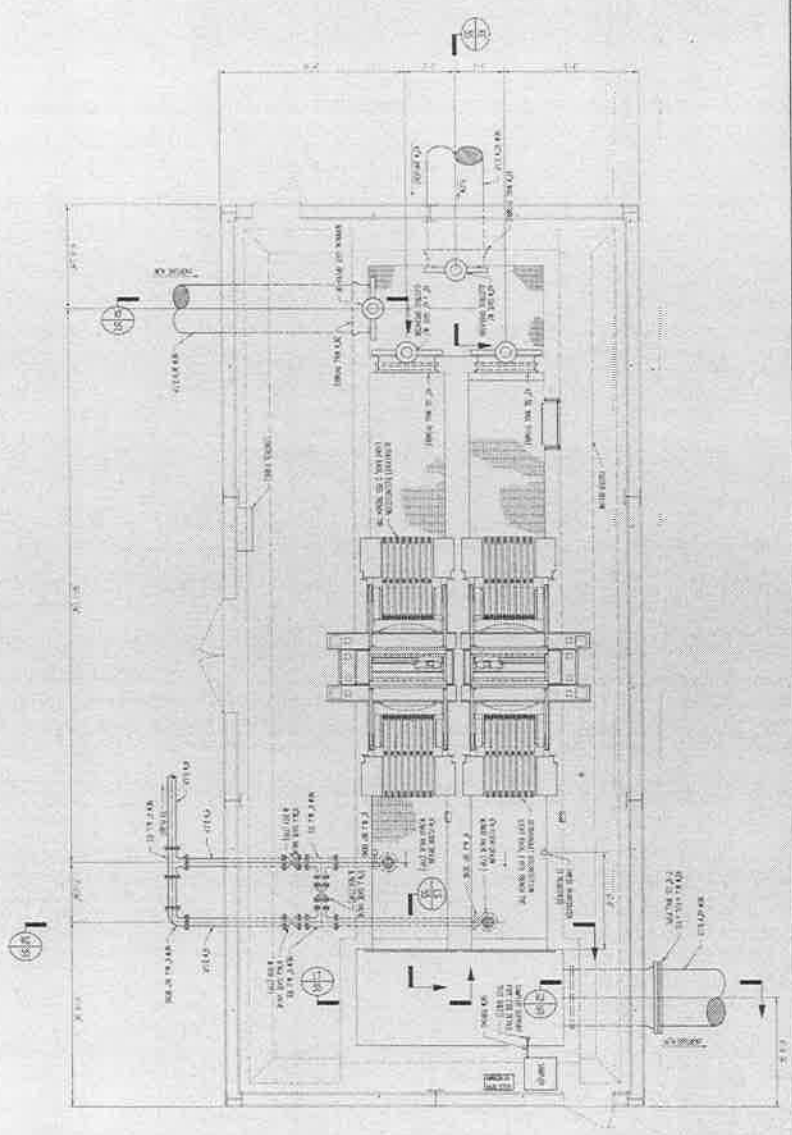
CITY OF OAK RIDGE
ANDERSON COUNTY, TENNESSEE

QUINCY ROBERTSON
MECHANICAL PLAN

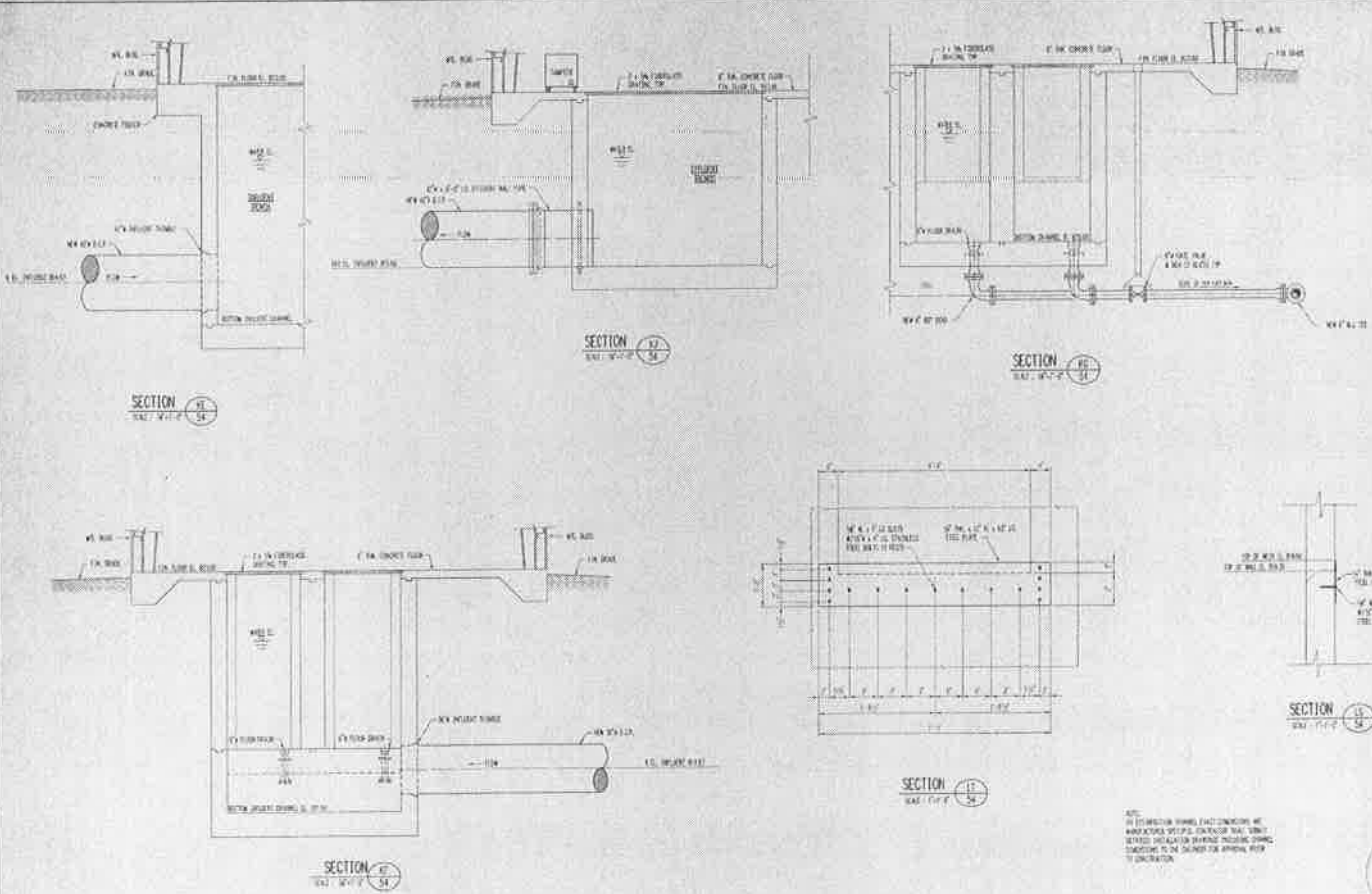
| | |
|------|-------------|
| DATE | DESCRIPTION |
| | |
| | |
| | |

53

ALL DIMENSIONS UNLESS SHOWN OTHERWISE ARE TO FACE UNLESS NOTED OTHERWISE. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE. ALL DIMENSIONS ARE TO FACE UNLESS NOTED OTHERWISE.



Quincy Robertson
MECHANICAL ENGINEER



NOTE:
 ALL DIMENSIONS SHALL BE IN ACCORDANCE WITH THE CITY OF OAK RIDGE SPECIFICATIONS FOR MECHANICAL CONTRACTS.
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHALL BE IN INCHES.
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHALL BE IN FEET AND INCHES.
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHALL BE IN METERS.
 UNLESS OTHERWISE SPECIFIED, ALL DIMENSIONS SHALL BE IN MILLIMETERS.



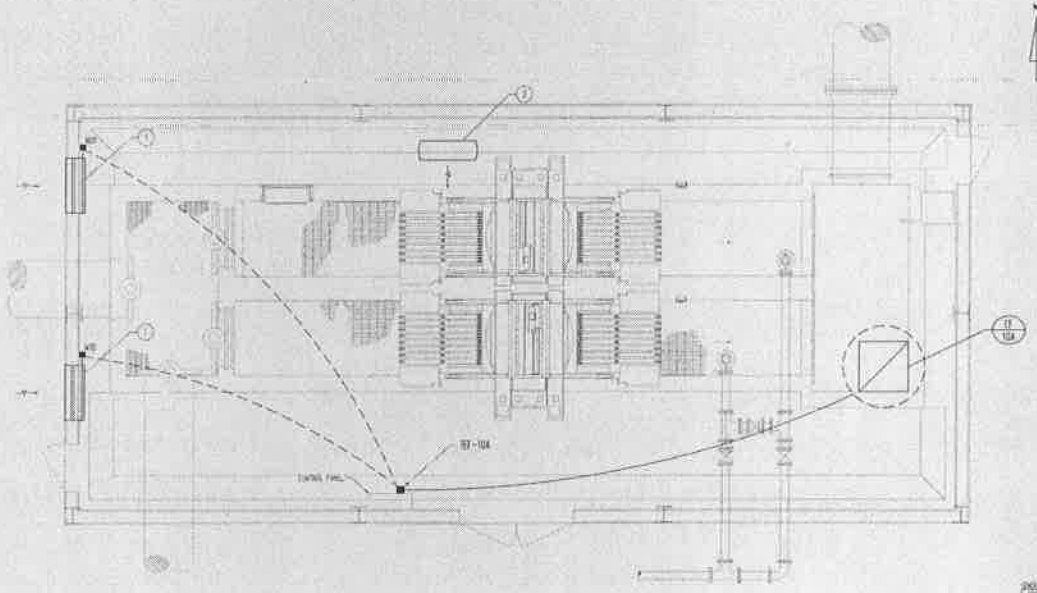
| | | |
|-----|------|-------------|
| NO. | DATE | DESCRIPTION |
| | | |
| | | |

LD&A
 CONSULTING ENGINEERS
 1000 N. W. 10th St.
 Fort Lauderdale, Florida 33304

CITY OF OAK RIDGE
 ANDERSON COUNTY, TENNESSEE

ULTRAVIOLET DISINFECTION
 TREATMENT BUILDING
 MECHANICAL SECTION AND DETAILS

| | | | |
|------|----|---------|----------|
| DATE | BY | CHKD BY | APP'D BY |
| | | | |
| | | | |



GENERAL NOTES:
 1. CHECK FOR LOCATION OF ALL CHAS. & W. & L. DUCT TRAYS AND WELLS ON THIS PLAN.
NOTES:
 1. 17-104: 1/2" x 1/2" WOODRUFF DUCTILE LAMPS, 15000 HRS. MIN. TENSILE STRENGTH 60,000 PSI.
 2. METAL SCREWS: USE #6 OR #8, W/REIN. W/ST. STEEL OR 304 SS. USE 1/2" DIA. 2000 PSI. W/ST. STEEL W/ST. 304 SS. USE 1/2" DIA. W/ST. W/ST. 304 SS.



| | | |
|-----|------|-------------|
| NO. | DATE | DESCRIPTION |
| | | |
| | | |

LD&A
 LEONARD D. ANDERSON & ASSOCIATES
 1000 N. W. 10th St.
 Anderson, TN 37010

CITY OF OAK RIDGE
 ANDERSON COUNTY, TENNESSEE

ULTRAVIOLET DISINFECTION
 TREATMENT BUILDING
 H.V.A.C. PLAN

| | | | |
|------|-------|----|-------|
| DATE | SCALE | BY | CHKD. |
| | | | |
| | | | |

APPENDIX C – GENERAL and SUPPLEMENTAL
GENERAL CONDITIONS

SECTION 00 7200

GENERAL CONDITIONS

- | | |
|--|---|
| 1. Definitions | 17. Subsurface Conditions |
| 2. Additional Instructions and Detail Drawings | 18. Suspension of Work, Termination and Delay |
| 3. Schedules, Reports and Records | 19. Payments to Contractor |
| 4. Drawings and Specifications | 20. Acceptance of Final Payment as Release |
| 5. Shop Drawings | 21. Insurance |
| 6. Materials, Services and Facilities | 22. Contract Security |
| 7. Inspection and Testing | 23. Assignments |
| 8. Substitutions | 24. Indemnification |
| 9. Patents | 25. Separate Contracts |
| 10. Surveys, Permits, Regulations | 26. Subcontracting |
| 11. Protection of Work, Property and Persons | 27. Engineer's Authority |
| 12. Supervision by Contractor | 28. Land and Rights-of-Way |
| 13. Changes in the Work | 29. Guaranty |
| 14. Changes in Contract Price | 30. Arbitration |
| 15. Time for Completion and Liquidated Damages | 31. Taxes |
| 16. Correction of Work | |

1. DEFINITIONS

- 1.1. Wherever used in the **CONTRACT DOCUMENTS**, the following terms shall have the meanings indicated which shall be applicable to both the singular and plural thereof:
- 1.2. **ADDENDA** - Written or graphic instruments issued prior to the execution of the Agreement which modify or interpret the **CONTRACT DOCUMENTS**, **DRAWINGS**, **AND SPECIFICATIONS** by additions, deletions, clarifications or corrections.
- 1.3. **BID** - The offer or proposal of the **BIDDER** submitted on the prescribed form setting forth the prices for the Work to be performed.
- 1.4. **BIDDER** - Any person, firm or corporation submitting a **BID** for the **WORK**.
- 1.5. **BONDS** - Bid, Performance, and Payment Bonds and other instruments of security, furnished by the **CONTRACTOR** and his surety in accordance with the **CONTRACT DOCUMENTS**.
- 1.6. **CHANGE ORDER** - A written order to the **CONTRACTOR** authorizing an addition, deletion or revision in the **WORK** within the general scope of the **CONTRACT DOCUMENTS**, or authorizing an adjustment in the **CONTRACT PRICE OR CONTRACT TIME**.
- 1.7. **CONTRACT DOCUMENTS** - The contract, including Advertisement For Bids, Information For Bidders, **BID**, Bid Bond, Agreement, Payment Bond, Performance Bond, **NOTICE OF AWARD**, **NOTICE TO PROCEED**, **CHANGE ORDER**, **DRAWINGS**, **SPECIFICATIONS**, and **ADDENDA**.

- 1.8. **CONTRACT PRICE** - The total monies payable to the CONTRACTOR under the terms and conditions of the CONTRACT DOCUMENTS.
- 1.9. **CONTRACT TIME** - The number of calendar days stated in the CONTRACT DOCUMENTS for the completion of the WORK.
- 1.10. **CONTRACTOR** - The person, firm, or corporation with whom the OWNER has executed the Agreement.
- 1.11. **DRAWINGS** - The part of the CONTRACT DOCUMENTS that show the characteristics and scope of the WORK to be performed and which have been prepared or approved by the ENGINEER.
- 1.12. **ENGINEER** - The person, firm, or corporation named as such in the CONTRACT DOCUMENTS.
- 1.13. **FIELD ORDER** - A written order effecting a change in the WORK not involving an adjustment in the CONTRACT PRICE or an extension of the CONTRACTOR during construction.
- 1.14. **NOTICE OF AWARD** - The written notice of the acceptance of the BID from the OWNER to the successful BIDDER.
- 1.15. **NOTICE TO PROCEED** - Written communication issued by the OWNER to the CONTRACTOR authorizing him to proceed with the WORK and establishing the date of commencement of the WORK.
- 1.16. **OWNER** - A public or quasi-public body or authority, corporation, association, partnership, or individual for whom the WORK is to be performed.
- 1.17. **PROJECT** - The undertaking to be performed as provided in the CONTRACT DOCUMENTS.
- 1.18. **RESIDENT PROJECT REPRESENTATIVE** - The authorized representative of the OWNER who is assigned to the PROJECT site or any part thereof.
- 1.19. **SHOP DRAWINGS** - All drawings, diagrams, illustrations, brochures, schedules, and other data that are prepared by the CONTRACTOR, a SUBCONTRACTOR, manufacturer, SUPPLIER, or distributor, which illustrate how specific portions of the WORK shall be fabricated or installed.
- 1.20. **SPECIFICATIONS** - A part of the CONTRACT DOCUMENTS consisting of written descriptions of a technical nature of materials, equipment, construction systems, standards, and workmanship.
- 1.21. **SUBCONTRACTOR** - An individual, firm or corporation having a direct contract with the CONTRACTOR or with any other SUBCONTRACTOR for the performance of a part of the WORK at the site.
- 1.22. **SUBSTANTIAL COMPLETION** - That date as certified by the ENGINEER when the construction of the PROJECT or a specified part thereof is sufficiently completed, in

accordance with the CONTRACT DOCUMENTS, so that the PROJECT or specified part can be utilized for the purposes for which it is intended.

- 1.23. **SUPPLEMENTAL GENERAL CONDITIONS** - Modifications to General Conditions required by a Federal agency for participation in the PROJECT and approved by the agency in writing prior to inclusion in the CONTRACT DOCUMENTS, or such requirements that may be imposed by applicable state laws.
- 1.24. **SUPPLIER** - Any person or organization who supplies materials or equipment for the WORK, including that fabricated to a specific design, but who does not perform labor at the site.
- 1.25. **WORK** - All labor necessary to produce the construction required by the CONTRACT DOCUMENTS, and all materials and equipment incorporated or to be incorporated in the PROJECT.
- 1.26. **WRITTEN NOTICE** - Any notice to any party of the Agreement relative to any part of this Agreement in writing and considered delivered and the service thereof completed, when posted by certified or registered mail to the said party at his last given address or delivered in person to said party or his authorized representative on the WORK.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

- 2.1. The CONTRACTOR may be furnished additional instructions and detail drawings, by the ENGINEER, as necessary to carry out the WORK required by the CONTRACT DOCUMENTS.
- 2.2. The additional drawings and instruction thus supplied will become a part of the CONTRACT DOCUMENTS. The CONTRACTOR shall carry out the WORK in accordance with the additional detail drawings and instructions.

3. SCHEDULES, REPORTS, AND RECORDS

- 3.1. The CONTRACTOR shall submit to the OWNER such schedule of quantities and costs, progress schedules, payrolls, reports, estimates, records and other data where applicable as are required by the CONTRACT DOCUMENTS for the WORK to be performed.
- 3.2. Prior to the first partial payment estimate the CONTRACTOR shall submit construction progress schedules showing the order in which he proposes to carry on the WORK, including dates at which he will start the various parts of the WORK, estimated date of completion of each part and, as applicable:
 - 3.2.1. The dates at which special detail drawings will be required; and
- 3.3. Respective dates for submission of SHOP DRAWINGS, the beginning of manufacture, the testing and the installation of materials, supplies and equipment.

4. DRAWINGS AND SPECIFICATIONS

- 4.1. The intent of the DRAWINGS and SPECIFICATIONS is that the CONTRACTOR shall furnish all labor, materials, tools, equipment, and transportation necessary for the proper execution of the WORK in accordance with the CONTRACT DOCUMENTS and all incidental work necessary to complete the PROJECT in an acceptable manner, ready for use, occupancy or operation by the OWNER.
- 4.2. In case of conflict between the DRAWINGS and SPECIFICATIONS, the SPECIFICATIONS shall govern. Figure dimensions on DRAWINGS shall govern over scale dimensions, and detailed DRAWINGS shall govern over general DRAWINGS.
- 4.3. Any discrepancies found between the DRAWINGS and SPECIFICATIONS and site conditions or any inconsistencies or ambiguities in the DRAWINGS or SPECIFICATIONS shall be immediately reported to the ENGINEER, in writing, who shall promptly correct such inconsistencies or ambiguities in writing. WORK done by the CONTRACTOR after his discovery of such discrepancies, inconsistencies or ambiguities shall be done at the CONTRACTOR'S risk.

5. SHOP DRAWINGS

- 5.1. The CONTRACTOR shall provide SHOP DRAWINGS as may be necessary for the prosecution of the WORK as required by the CONTRACT DOCUMENTS. The ENGINEER shall promptly review all SHOP DRAWINGS. The ENGINEER'S approval of any SHOP DRAWING shall not release the CONTRACTOR from responsibility for deviations from the CONTRACT DOCUMENTS. The approval of any SHOP DRAWING that substantially deviates from the requirement of the CONTRACT DOCUMENTS shall be evidenced by a CHANGE ORDER.
- 5.2. When submitted for the ENGINEER'S review, SHOP DRAWINGS shall bear the CONTRACTOR'S certification that he has reviewed, checked, and approved the SHOP DRAWINGS and that they are in conformance with the requirements of the CONTRACT DOCUMENTS.
- 5.3. Portions of the WORK requiring a SHOP DRAWING or sample submission shall not begin until the SHOP DRAWING or submission has been approved by the ENGINEER. A copy of each approved SHOP DRAWING and each approved sample shall be kept in good order by the CONTRACTOR at the site and shall be available to the ENGINEER.

6. MATERIALS, SERVICES AND FACILITIES

- 6.1. It is understood that, except as otherwise specifically stated in the CONTRACT DOCUMENTS, the CONTRACTOR shall provide and pay for all materials, labor, tools, equipment, water, light, power, transportation, supervision, temporary construction of any nature, and all other services and facilities of any nature whatsoever necessary to execute, complete, and deliver the WORK within the specified time.

- 6.2. Materials and equipment shall be so stored as to insure the preservation of their quality and fitness for the WORK. Stored materials and equipment to be incorporated in the WORK shall be located so as to facilitate prompt inspection.
- 6.3. Manufactured supplies, materials, and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned as directed by the manufacturer.
- 6.4. Material, supplies, and equipment shall be in accordance with samples submitted by the CONTRACTOR and approved by the ENGINEER.
- 6.5. Materials, supplies, or equipment to be incorporated into the WORK shall not be purchased by the CONTRACTOR or the SUBCONTRACTOR subject to a chattel mortgage or under a conditional sale contract or other agreement by which an interest is retained by the seller.

7. INSPECTION AND TESTING

- 7.1. All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.
- 7.2. All materials and equipment used in the construction of the PROJECT shall be subject to adequate inspection and testing in accordance with generally accepted standards, as required and defined in the CONTRACT DOCUMENTS.
- 7.3. The CONTRACTOR shall provide at his expense the testing and inspection services required by the CONTRACT DOCUMENTS.
- 7.4. If the CONTRACT DOCUMENTS, laws, ordinances, rules, regulations, or orders of any public authority having jurisdiction require any WORK to specifically be inspected, tested, or approved by someone other than the CONTRACTOR, the CONTRACTOR will give the ENGINEER timely notice of readiness. The CONTRACTOR will then furnish the ENGINEER the required certificates of inspection, testing, or approval.
- 7.5. Inspections, tests, or approvals by the ENGINEER or others shall not relieve the CONTRACTOR from his obligations to perform the WORK in accordance with the requirements of the CONTRACT DOCUMENTS.
- 7.6. The ENGINEER and his representatives will at all times have access to the WORK. In addition, authorized representatives and agents of any participating Federal or State agency shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. The CONTRACTOR will provide proper facilities for such access and observation of the WORK and also for any inspection or testing thereof.
- 7.7. If any WORK is covered contrary to the written instructions of the ENGINEER it must, if requested by the ENGINEER, be uncovered for his observation and replaced at the CONTRACTOR'S expense.

- 7.8. If the ENGINEER considers it necessary or advisable that covered WORK be inspected or tested by others, the CONTRACTOR, at the ENGINEER'S request will uncover, expose, or otherwise make available for observation, inspection or testing as the ENGINEER may require, that portion of the WORK in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such WORK is defective, the CONTRACTOR will bear all the expenses of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction. If, however, such WORK is not found to be defective, the CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction, and an appropriate CHANGE ORDER shall be issued.

8. SUBSTITUTIONS AND "OR-EQUALS"

- 8.1. Whenever a material, article, or piece of equipment is identified on the DRAWINGS or SPECIFICATIONS by reference to brand name or catalogue number, it shall be understood that this is referenced for the purpose of defining the performance or other salient requirements and that other products of equal capacities, quality, and function may be considered. The CONTRACTOR may recommend the use of an "or-equal" manufacturer or supplier or substitution of a material, article, or piece of equipment of equal substance and function for those referred to in the CONTRACT DOCUMENTS by reference to brand name or catalogue number, and if, in the sole opinion of the ENGINEER, such material, article, or piece of equipment is of equal substance and function to that specified, the ENGINEER may approve its substitution and use by the CONTRACTOR. Factors to be considered, but not limited to, include: materials of construction, quality, durability, appearance, strength, design characteristics, reliability, performance, experience, economy of operation, and availability of responsive service.
- 8.2. Any cost differential shall be deductible from the CONTRACT PRICE and the CONTRACT DOCUMENTS for substitute and "or-equal" items and shall be appropriately modified by a CHANGE ORDER. The CONTRACTOR warrants that if substitutes or "or-equals" are approved, no major changes in the function or general design of the PROJECT will result. Incidental changes or extra component parts required to accommodate the substitute or "or-equal" item will be made by the CONTRACTOR without a change in the CONTRACT PRICE or CONTRACT TIME. The CONTRACTOR shall be solely responsible for any changes to the design required to accommodate the use of substitute items, including reimbursement of the OWNER for ENGINEERS documented costs. Reimbursement of ENGINEERS cost to evaluate substitute items shall not depend on the final acceptability of substitute items. OWNER may require CONTRACTOR to furnish at CONTRACTORS expense a special performance guarantee or other surety with respect to any substitute. The CONTRACTOR shall provide all data in support of any proposed substitute or "or-equal" item at CONTRACTORS expense.
- 8.3. The ENGINEER will be allowed a reasonable time within which to evaluate each proposal or submittal made pursuant to this paragraph. ENGINEER may require CONTRACTOR to furnish additional data about the proposed substitute or "or-equal" item. ENGINEER will be the sole judge of acceptability. No "or-equal" or substitute shall be ordered, installed, or utilized until ENGINEERS review is complete, which

will be evidenced by a CHANGE ORDER in the case of a substitute or an approved Shop Drawing for an "or-equal". ENGINEER will advise CONTRACTOR in writing of any negative determination.

9. PATENTS

- 9.1. The CONTRACTOR shall pay all applicable royalties and license fees. He shall defend all suits or claims for infringement of any patent rights and save the OWNER harmless from loss on account thereof. Except that the OWNER shall be responsible for any such loss when a particular process, design, or the product of a particular manufacturer or manufacturers is specified, however, if the CONTRACTOR has reason to believe that the design process or product specified is an infringement of a patent, he shall be responsible for such loss unless he promptly gives such information to the ENGINEER.

10. SURVEYS, PERMITS, REGULATIONS

- 10.1. The OWNER shall furnish all boundary surveys and establish all base lines for locating the principal component parts of the WORK together with a suitable number of bench marks adjacent to the WORK as shown in the CONTRACT DOCUMENTS. From the information provided by the OWNER, unless otherwise specified in the CONTRACT DOCUMENTS, the CONTRACTOR shall develop and make all detail surveys needed for construction such as slope stakes, batter boards, stakes for pile locations and other working points, lines, elevations, and cut sheets.
- 10.2. The CONTRACTOR shall carefully preserve bench marks, reference points and stakes and, in case of willful or careless destruction, he shall be charged with the resulting expense and shall be responsible for any mistakes that may be caused by their unnecessary loss or disturbance.
- 10.3. Permits and licenses of a temporary nature necessary for the prosecution of the WORK shall be secured and paid for by the CONTRACTOR unless otherwise stated in the SUPPLEMENTAL GENERAL CONDITIONS. Permits, licenses, and easements for permanent structures or permanent changes in existing facilities shall be secured and paid for by the OWNER, unless otherwise specified. The CONTRACTOR shall give all notices and comply with all laws, ordinances, rules, and regulations bearing on the conduct of the WORK as drawn and specified. If the CONTRACTOR observes that the CONTRACT DOCUMENTS are at variance therewith, he shall promptly notify the ENGINEER in writing and any necessary changes shall be adjusted as provided in Section 13. CHANGES IN THE WORK.

11. PROTECTION OF WORK, PROPERTY

- 11.1. The CONTRACTOR will be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the WORK. He will take all necessary precautions for the safety of, and will provide the necessary protection to prevent damage, injury or loss to all employees on the WORK and other persons who may be affected thereby, all the WORK and all materials or equipment to be incorporated therein, whether in storage on or off the site, and other property at the site or adjacent thereto, including trees, shrubs, lawns, walks, pavements, roadways,

structures, and utilities not designated for removal, relocation or replacement in the course of construction.

- 11.2. The CONTRACTOR will comply with all applicable laws, ordinances, rules, regulations and orders of any public body having jurisdiction. He will erect and maintain, as required by the conditions and progress of the WORK, all necessary safeguards for safety and protection. He will notify owners of adjacent utilities when prosecution of the WORK may affect them. The CONTRACTOR will remedy all damage, injury, or loss to any property caused, directly or indirectly, in whole or in part, by the CONTRACTOR, any SUBCONTRACTOR or anyone directly or indirectly employed by any of them or anyone for whose acts any of them be liable, except damage or loss attributable to the fault of the CONTRACT DOCUMENTS or to the acts or omissions of the OWNER or the ENGINEER or anyone employed by either of them or anyone for whose acts either of them may be liable, and not attributable, directly or indirectly, in whole or in part, to the fault or negligence of the CONTRACTOR.
- 11.3. In emergencies affecting the safety of persons or the WORK or property at the site or adjacent thereto, the CONTRACTOR, without special instruction or authorization from the ENGINEER or OWNER, shall act to prevent threatened damage, injury, or loss. He will give the ENGINEER prompt WRITTEN NOTICE of any significant changes in the WORK or deviations from the CONTRACT DOCUMENTS caused thereby, and a CHANGE ORDER shall be issued covering the changes and deviations involved.

12. SUPERVISION BY CONTRACTOR

- 12.1. The CONTRACTOR will supervise and direct the WORK. He will be solely responsible for the means, methods, techniques, sequences and procedures of construction. The CONTRACTOR will employ and maintain on the WORK a qualified supervisor or superintendent who shall have been designated in writing by the CONTRACTOR as the CONTRACTOR'S representative at the site. The supervisor shall have full authority to act on behalf of the CONTRACTOR and all communications given to the supervisor shall be as binding as if given to the CONTRACTOR. The supervisor shall be present on the site at all times as required to perform adequate supervision and coordination of the WORK.

13. CHANGES IN THE WORK

- 13.1. The OWNER may at any time, as the need arises, order changes within the scope of the WORK without invalidating the Agreement. If such changes increase or decrease the amount due under the CONTRACT DOCUMENTS, or in the time required for performance of the WORK, an equitable adjustment shall be authorized by CHANGE ORDER.
- 13.2. The ENGINEER, also, may at any time, by issuing a FIELD ORDER, make changes in the details of the WORK. The CONTRACTOR shall proceed with the performance of any changes in the WORK so ordered by the ENGINEER unless the CONTRACTOR believes that such FIELD ORDER entitles him to a change in CONTRACT PRICE or TIME, or both, in which event he shall give the ENGINEER WRITTEN NOTICE thereof within seven (7) days after the receipt of the ordered

change. Thereafter the CONTRACTOR shall document the basis for the change in CONTRACT PRICE or TIME within thirty (30) days. The CONTRACTOR shall not execute such changes pending the receipt of an executed CHANGE ORDER or further instruction from the OWNER.

14. CHANGES IN CONTRACT PRICE

- 14.1. The CONTRACT PRICE may be changed only by a CHANGE ORDER. The value of any WORK covered by a CHANGE ORDER or of any claim for increase or decrease in the CONTRACT PRICE shall be determined by one or more of the following methods in the order of precedence listed below:
- (a) Unit prices previously approved.
 - (b) An agreed lump sum.
 - (c) The actual cost for labor, direct over-head, materials, supplies, equipment, and other services necessary to complete the work. In addition there shall be added an amount to be agreed upon but not to exceed fifteen (15) percent of the actual cost of the WORK to cover the cost of general overhead and profit. In no case shall the value of materials, supplies, equipment, and other services exceed actual cost or as identified in RS Means or equivalent, latest edition.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- 15.1. The date of beginning and the time for completion of the WORK are essential conditions of the CONTRACT DOCUMENTS and the WORK embraced shall be commenced on a date specified in the NOTICE TO PROCEED.
- 15.2. The CONTRACTOR will proceed with the WORK at such rate of progress to insure full completion within the CONTRACT TIME. It is expressly understood and agreed, by and between the CONTRACTOR and the OWNER, that the CONTRACT TIME for the completion of the WORK described herein is a reasonable time, taking into consideration the average climatic and economic conditions and other factors prevailing in the locality of the WORK.
- 15.3. If the CONTRACTOR shall fail to complete the WORK within the CONTRACT TIME, or extension of time granted by the OWNER, then the CONTRACTOR will pay to the OWNER the amount for liquidated damages as specified in the BID for each calendar day that the CONTRACTOR shall be in default after the time stipulated in the CONTRACT DOCUMENTS.
- 15.4. The CONTRACTOR shall not be charged with liquidated damages or any excess cost when the delay in completion of the WORK is due to the following, and the CONTRACTOR has promptly given WRITTEN NOTICE of such delay to the OWNER or ENGINEER.
- 15.4.1. To any preference, priority, or allocation order duly issued by the OWNER.

- 15.4.2. To unforeseeable causes beyond the control and without the fault or negligence of the CONTRACTOR, including but not restricted to, acts of God or of the public enemy, acts of the OWNER, acts of another CONTRACTOR in the performance of a CONTRACT with the OWNER, fires, floods, epidemics, quarantine, restrictions, strikes, freight embargoes, and abnormal and unforeseeable weather; and
- 15.4.3. To any delays of SUBCONTRACTORS occasioned by any of the causes specified in paragraphs 15.4.1 and 15.4.2 of this article.

16. CORRECTION OF WORK

- 16.1. The CONTRACTOR shall promptly remove from the premises all WORK rejected by the ENGINEER for failure to comply with the CONTRACT DOCUMENTS, whether incorporated in the construction or not and the CONTRACTOR shall promptly replace and re-execute the WORK in accordance with the CONTRACT DOCUMENTS and without expense to the OWNER and shall bear the expense of making good all WORK of other CONTRACTORS destroyed or damaged by such removal or replacement.
- 16.2. All removal and replacement WORK shall be done at the CONTRACTOR'S expense. If the CONTRACTOR does not take action to remove such rejected WORK within ten (10) days after receipt of WRITTEN NOTICE, the OWNER may remove such WORK and store the materials at the expense of the CONTRACTOR.

17. SUBSURFACE CONDITIONS

- 17.1. The CONTRACTOR shall promptly, and before such conditions are disturbed, except in the event of an emergency, notify the OWNER by WRITTEN NOTICE of:
 - 17.1.1. Subsurface or latent physical conditions at the site differing materially from those indicated in the CONTRACT DOCUMENTS; or
 - 17.1.2. Unknown physical conditions at the site, of an unusual nature, differing materially from those ordinarily encountered and generally recognized as inherent in WORK of the character provided for in the CONTRACT DOCUMENTS.
- 17.2. The OWNER shall promptly investigate the conditions, and if he finds that such conditions do so materially differ and cause an increase or decrease in the cost of, or in the time required for, performance of the WORK, an equitable adjustment shall be made and the CONTRACT DOCUMENTS shall be modified by a CHANGE ORDER. Any claim of the CONTRACTOR for adjustment hereunder shall not be allowed unless he has given the required WRITTEN NOTICE, provided that the OWNER may, if he determines the facts so justify, consider and adjust any such claims asserted before the date of final payment.

18. SUSPENSION OF WORK, TERMINATION AND DELAY

- 18.1. The OWNER may suspend the WORK or any portion thereof for a period of not more than ninety days or such further time as agreed upon by the CONTRACTOR,

by WRITTEN NOTICE to the CONTRACTOR and the ENGINEER which notice shall fix the date on which WORK shall be resumed. The CONTRACTOR will resume that WORK on the date so fixed. The CONTRACTOR will be allowed an increase in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, directly attributable to any suspension.

- 18.2. If the CONTRACTOR is adjudged a bankrupt or insolvent, or if he makes a general assignment for the benefit of his creditors, or if a trustee or receiver is appointed for the CONTRACTOR or for any of his property, or if he files a petition to take advantage of any debtor's act, or to reorganized under the bankruptcy or applicable laws, or if he repeatedly fails to supply sufficient skilled workmen or suitable materials or equipment, or if he repeatedly fails to make prompt payments to SUBCONTRACTORS or for labor, materials, or equipment or if he disregards laws, ordinances, rules, regulations, or orders of any public body having jurisdiction of the WORK or if he disregards the authority of the ENGINEER, or if he otherwise violates any provision of the CONTRACT DOCUMENTS, then the OWNER may, without prejudice to any other right or remedy and after giving the CONTRACTOR and his surety a minimum of ten (10) days from delivery of a WRITTEN NOTICE, terminate the services of the CONTRACTOR and take possession of the PROJECT and of all materials, equipment, tools, construction equipment, and machinery thereon owned by the CONTRACTOR, and finish the WORK by whatever method he may deem expedient. In such case the CONTRACTOR shall not be entitled to receive any further payment until the WORK is finished. If the unpaid balance of the CONTRACT PRICE exceeds the direct and indirect costs of completing the PROJECT, including compensation for additional professional services, such excess SHALL BE PAID TO THE CONTRACTOR. If such costs exceed such unpaid balance, the CONTRACTOR will pay the difference to the OWNER. Such costs incurred by the OWNER will be determined by the ENGINEER and incorporated in a CHANGE ORDER.
- 18.3. Where the CONTRACTOR'S services have been so terminated by the OWNER, said termination shall not affect any right of the OWNER against the CONTRACTOR then existing or which may thereafter accrue. Any retention or payment of monies by the OWNER due the CONTRACTOR will not release the CONTRACTOR from compliance with the CONTRACT DOCUMENTS.
- 18.4. After ten (10) days from delivery of a WRITTEN NOTICE to the CONTRACTOR and the ENGINEER, the OWNER may without cause and without prejudice to any other right or remedy, elect to abandon the PROJECT and terminate the Contract. In such case, the CONTRACTOR shall be paid for all WORK executed and any expense sustained plus reasonable profit.
- 18.5. If, through no act or fault of the CONTRACTOR, the WORK is suspended for a period of more than ninety (90) days by the OWNER or under an order of court or other public authority, or the ENGINEER fails to act on any request for payment within thirty (30) days after it is submitted, or the OWNER fails to pay the CONTRACTOR substantially the sum approved by the ENGINEER within thirty (30) days of its approval and presentation, then the CONTRACTOR may, after ten (10) days from delivery of a WRITTEN NOTICE to the OWNER and the ENGINEER, terminate the CONTRACT and recover from the OWNER payment for all WORK executed and all expenses sustained. In addition, and in lieu of terminating the

CONTRACT, if the ENGINEER has failed to act on a request for payment or if the OWNER has failed to make any payment as aforesaid, the CONTRACTOR may upon then (10) days WRITTEN NOTICE to the OWNER and the ENGINEER stop the WORK until he has been paid all amounts then due, in which event and upon resumption of the WORK, CHANGE ORDERS shall be issued for adjusting the CONTRACT PRICE or extending the CONTRACT TIME or both to compensate for the costs and delays attributable to the stoppage of the WORK.

- 18.6. If the performance of all or any portion of the WORK is suspended, delayed, or interrupted as a result of a failure of the OWNER or ENGINEER to act within the time specified in the CONTRACT DOCUMENTS, or if no time is specified, within a reasonable time, an adjustment in the CONTRACT PRICE or an extension of the CONTRACT TIME, or both, shall be made by CHANGE ORDER to compensate the CONTRACTOR for the costs and delays necessarily caused by the failure of the OWNER or ENGINEER.

19. PAYMENTS TO CONTRACTOR

- 19.1. At least ten (10) days before each progress payment falls due (but not more often than once a month), the CONTRACTOR will submit to the ENGINEER a partial payment estimate filled out and signed by the CONTRACTOR covering the WORK performed during the period covered by the partial payment estimate and supported by such data as the ENGINEER may reasonably require. If payment is requested on the basis of materials and equipment not incorporated in the WORK but delivered and suitably stored at or near the site, the partial payment estimate shall also be accompanied by such supporting data, satisfactory to the OWNER, as will establish the OWNER'S title to the material and equipment and protect his interest therein, including applicable insurance. The ENGINEER will, within ten (10) days after receipt of each partial payment estimate, either indicate in writing his approval of payment and present the partial payment estimate to the OWNER, or return the partial payment estimate to the CONTRACTOR indicating in writing his reasons for refusing to approve payment. In the latter case, the CONTRACTOR may make the necessary corrections and resubmit the partial payment estimate. The OWNER will, within ten (10) days of presentation to him of an approved partial payment estimate, pay the CONTRACTOR a progress payment on the basis of the approved partial payment estimate. The OWNER shall retain an amount not exceeding ten (10) percent of each payment limited to five (5) percent of the total contract amount until final completion and acceptance of all work covered by the CONTRACT DOCUMENTS. On completion and acceptance of a part of the WORK on which the price is stated separately in the CONTRACT DOCUMENTS, payment may be made in full, including retained percentages, less authorized deductions.
- 19.2. The request for payment may also include an allowance for the cost of such major materials and equipment that are suitably stored either at or near the site.
- 19.3. Prior to SUBSTANTIAL COMPLETION, the OWNER, with the approval of the ENGINEER and with the concurrence of the CONTRACTOR, may use any completed or substantially completed portions of the WORK. Such use shall not constitute an acceptance of such portions of the WORK.

- 19.4. The OWNER shall have the right to enter the premises for the purpose of doing work not covered by the CONTRACT DOCUMENTS. This provision shall not be construed as relieving the CONTRACTOR of the sole responsibility for the care and protection of the WORK, or the restoration of any damaged WORK except such as may be caused by agents or employees of the OWNER.
- 19.5. Upon completion and acceptance of the WORK, the ENGINEER shall issue a certificate attached to the final payment request that the WORK has been accepted by him under the conditions of the CONTRACT DOCUMENTS. The entire balance found to be due the CONTRACTOR, including the retained percentages, but except such sums as may be lawfully retained by the OWNER, shall be paid to the CONTRACTOR within thirty (30) days of completion and acceptance of the WORK.
- 19.6. The CONTRACTOR will indemnify and save the OWNER or the OWNER'S agents harmless from all claims growing out of the lawful demands of SUBCONTRACTORS, laborers, workmen, mechanics, materialmen, and furnishers of machinery and parts thereof, equipment, tools, and all supplies, incurred in the furtherance of the performance of the WORK. The CONTRACTOR shall, at the OWNER'S request, furnish satisfactory evidence that all obligations of the nature designated above have been paid, discharged, or waived. If the CONTRACTOR fails to do so the OWNER may, after having notified the CONTRACTOR, either pay unpaid bills or withhold from the CONTRACTOR'S unpaid compensation a sum of money deemed reasonably sufficient to pay any and all such lawful claims until satisfactory evidence is furnished that all liabilities have been fully discharged where upon payment to the CONTRACTOR shall be resumed, in accordance with the terms of the CONTRACT DOCUMENTS, but in no event shall the provisions of this sentence be construed to impose any obligations upon the OWNER to either the CONTRACTOR, his Surety, or any third party. In paying any unpaid bills of the CONTRACTOR, any payment so made by the OWNER shall be considered as a payment made under the CONTRACT DOCUMENTS by the OWNER to the CONTRACTOR and the OWNER shall not be liable to the CONTRACTOR for any such payments made in good faith.
- 19.7. If the OWNER fails to make payment thirty (30) days after approval by the ENGINEER, in addition to other remedies available to the CONTRACTOR, there shall be added to each such payment interest at the maximum legal rate commencing on the first day after said payment is due and continuing until the payment is received by the CONTRACTOR.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

- 20.1. The acceptance by the CONTRACTOR of final payment shall be and shall operate as a release to the OWNER of all claims and all liability to the CONTRACTOR other than claims in stated amounts as may be specifically excepted by the CONTRACTOR for all things done or furnished in connection with this WORK and for every act and neglect of the OWNER and others relating to or arising out of this WORK. Any payment, however, final or otherwise, shall not release the CONTRACTOR or his sureties from any obligations under the CONTRACT DOCUMENTS or the Performance BOND and Payment BONDS.

21. INSURANCE

- 21.1. The CONTRACTOR shall purchase and maintain such insurance as will protect him from claims set forth below which may arise out of or result from the CONTRACTOR'S execution of the WORK, whether such execution be by himself or by any SUBCONTRACTOR or by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable:
 - 21.1.1. Claims under workmen's compensation, disability benefit, and other similar employee benefit acts:
 - 21.1.2. Claims for damages because of bodily injury, occupational sickness or disease, or death of his employees:
 - 21.1.3. Claims for damages because of bodily injury, sickness or disease, or death of any person other than his employees:
 - 21.1.4. Claims for damages insured by usual personal injury liability coverage which are sustained (1) by any person as a result of an offense directly or indirectly related to the employment of such person by the CONTRACTOR, or (2) by any other person; and
 - 21.1.5. Claims for damages because of injury to or destruction of tangible property, including loss of use resulting therefrom.
- 21.2. Certificates of Insurance acceptable to the OWNER shall be filed with the OWNER prior to commencement of the WORK. These Certificates shall contain a provision that coverages afforded under the policies will not be canceled unless at least fifteen (15) days prior WRITTEN NOTICE has been given to the OWNER.
- 21.3. The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, liability insurance as hereinafter specified:
 - 21.3.1. CONTRACTOR'S General Public Liability and Property Damage Insurance including vehicle coverage issued to the CONTRACTOR and protecting him from all claims for personal injury, including death, and all claims for destruction of or damage to property, arising out of or in connection with any operations under the CONTRACT DOCUMENTS, whether such operations be by himself or by any SUBCONTRACTOR under him, or anyone directly or indirectly employed by the CONTRACTOR or by a SUBCONTRACTOR under him. Insurance shall be written with a limit of liability of not less than \$1,000,000 for all damages arising out of bodily injury, including death, at any time resulting therefrom, sustained by any one person in any one accident: and a limit of liability of not less than \$1,000,000 aggregate for any such damages sustained by two or more persons in any one accident. Insurance shall be written with a limit of liability of not less than \$500,000 for all property damage sustained by any one person in any one accident; and a limit of liability of not less than \$500,000 aggregate for any such damage sustained by two or more persons in any one accident.

- 21.3.2. The CONTRACTOR shall acquire and maintain, if applicable, Fire and Extended Coverage insurance upon the PROJECT to the full insurable value thereof for the benefit of the OWNER, the CONTRACTOR, and SUBCONTRACTORS as their interest may appear. This provision shall in no way release the CONTRACTOR or CONTRACTOR'S surety from obligations under the CONTRACT DOCUMENTS to fully complete the PROJECT.
- 21.4. The CONTRACTOR shall procure and maintain, at his own expense, during the CONTRACT TIME, in accordance with the provisions of the laws of the state in which the work is performed. Workmen's Compensation Insurance, including occupational disease provisions, for all of his employees at the site of the PROJECT and in case any work is sublet, the CONTRACTOR shall require such SUBCONTRACTOR similarly to provide Workmen's Compensation Insurance, including occupational disease provisions for all of the latter's employees unless such employees are covered by the protection afforded by the CONTRACTOR. In case any class of employees engaged in hazardous work under this contract at the site of the PROJECT is not protected under Workmen's Compensation statute, the CONTRACTOR shall provide, and shall cause each SUBCONTRACTOR to provide, adequate and suitable insurance for the protection of his employees not otherwise protected.
- 21.5. The CONTRACTOR shall secure, if applicable, "All Risk" type Builder's Risk Insurance for WORK to be performed. Unless specifically authorized by the OWNER, the amount of such insurance shall not be less than the CONTRACT PRICE totaled in the BID. The policy shall cover not less than the losses due to fire, explosion, hail, lightning, vandalism, malicious mischief, wind, collapse, riot, aircraft, and smoke during the CONTRACT TIME, and until the WORK is accepted by the OWNER. The policy shall name as the insured the CONTRACTOR, the ENGINEER, and the OWNER.

22. CONTRACT SECURITY

- 22.1. The CONTRACTOR shall within ten (10) days after the receipt of the NOTICE OF AWARD furnish the OWNER with a Performance Bond and a Payment Bond in penal sums equal to the amount of the CONTRACT PRICE, conditioned upon the performance by the CONTRACTOR of all undertakings, covenants, terms, conditions, and agreements of the CONTRACT DOCUMENTS, and upon the prompt payment by the CONTRACTOR to all persons supplying labor and materials in the prosecution of the WORK provided by the CONTRACT DOCUMENTS. Such BONDS shall be executed by the CONTRACTOR and a corporate bonding company licensed to transact such business in the state in which the WORK is to be performed and named on the current "Department of the Treasury's Listing of Approved Sureties (Department Circular 570)." The expense of these BONDS shall be borne by the CONTRACTOR. If at any time a surety on any such BOND is declared a bankrupt or loses its right to do business in the state in which the WORK is to be performed or is removed from the listing of approved sureties, CONTRACTOR shall within ten (10) days after notice from the OWNER to do so, substitute an acceptable BOND (or BONDS) in such form and sum and signed by such other surety or sureties as may be satisfactory to the OWNER. The premiums on such BOND shall be paid by the CONTRACTOR. No further

payments shall be deemed due nor shall be made until the new surety or sureties shall have furnished an acceptable BOND to the OWNER.

23. ASSIGNMENTS

- 23.1. Neither the CONTRACTOR nor the OWNER shall sell, transfer, assign, or otherwise dispose of the Contract or any portion thereof, or of his right, title, or interest therein, or his obligations thereunder, without written consent of the other party.

24. INDEMNIFICATION

- 24.1. The CONTRACTOR will indemnify and hold harmless the OWNER and the ENGINEER and their agents and employees from and against all claims, damages, losses, and expenses including attorney's fees arising out of or resulting from the performance of the WORK, provided that any such claims, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property including the loss of use resulting therefrom: and is caused in whole or in part by any negligent or willful act or omission of the CONTRACTOR, and SUBCONTRACTOR, anyone directly or indirectly employed by any of them or anyone for whose acts any of them may be liable.
- 24.2. In any and all claims against the OWNER or the ENGINEER, or any of their agents or employees, by any employee of the CONTRACTOR, any SUBCONTRACTOR, anyone directly or indirectly employed by any of them, or anyone for whose acts any of them may be liable, the indemnification obligation shall not be limited in any way by any limitation on the amount or type of damages, compensation, or benefits payable by or for the CONTRACTOR or any SUBCONTRACTOR under workmen's compensation acts, disability benefit acts or other employee benefits acts.
- 24.3. The obligation of the CONTRACTOR under this paragraph shall not extend to the liability of the ENGINEER, his agents or employees arising out of the preparation or approval of maps, DRAWINGS, opinions, reports, surveys, CHANGE ORDERS, designs, or SPECIFICATIONS.

25. SEPARATE CONTRACTS

- 25.1. The OWNER reserves the right to let other contracts in connection with this PROJECT. The CONTRACTOR shall afford other CONTRACTORS reasonable opportunity for the introduction and storage of their materials and the execution of their WORK, and shall properly connect and coordinate his WORK with theirs. If the proper execution or results of any part of the CONTRACTOR'S WORK depends upon the WORK of any other CONTRACTOR, the CONTRACTOR shall inspect and promptly report to the ENGINEER any defects in such WORK that render it unsuitable for such proper execution and results.
- 25.2. The OWNER may perform additional WORK related to the PROJECT by himself, or he may let other contracts containing provisions similar to these. The CONTRACTOR will afford the other CONTRACTORS who are parties to such Contracts (or the OWNER, if he is performing the additional WORK himself), reasonable opportunity for the introduction and storage of materials and equipment

and the execution of WORK, and shall properly connect and coordinate his WORK with theirs.

- 25.3. If the performance of additional WORK by other CONTRACTORS or the OWNER is not noted in the CONTRACT DOCUMENTS prior to the execution of the CONTRACT, written notice thereof shall be given to the CONTRACTOR prior to starting any such additional WORK. If the CONTRACTOR believes that the performance of such additional WORK by the OWNER or others involves him in additional expense or entitles him to an extension of the CONTRACT TIME, he may make a claim therefor as provided in Sections 14 and 15.

26. SUBCONTRACTING

- 26.1. The CONTRACTOR may utilize the services of specialty SUBCONTRACTORS on those parts of the WORK which, under normal contracting practices, are performed by specialty SUBCONTRACTORS.
- 26.2. The CONTRACTOR shall not award WORK to SUBCONTRACTOR(S), in excess of fifty (50%) percent of the CONTRACT PRICE, without prior written approval of the OWNER.
- 26.3. The CONTRACTOR shall be fully responsible to the OWNER for the acts and omissions of his SUBCONTRACTORS, and of persons either directly or indirectly employed by them, as he is for the acts and omissions of persons directly employed by him.
- 26.4. The CONTRACTOR shall cause appropriate provisions to be inserted in all subcontracts relative to the WORK to bind SUBCONTRACTORS to the CONTRACTOR by the terms of the CONTRACT DOCUMENTS in so far as applicable to the WORK of SUBCONTRACTORS and to give the CONTRACTOR the same power as regards terminating any subcontract that the OWNER may exercise over the CONTRACTOR under any provision of the CONTRACT DOCUMENTS.
- 26.5. Nothing contained in this CONTRACT shall create any contractual relation between any SUBCONTRACTOR and the OWNER.

27. ENGINEER'S AUTHORITY

- 27.1. The ENGINEER shall act as the OWNER'S representative during the construction period. He shall decide questions that may arise as to quality and acceptability of materials furnished and WORK performed. He shall interpret the intent of the CONTRACT DOCUMENTS in a fair and unbiased manner. The ENGINEER will make visits to the site and determine if the WORK is proceeding in accordance with the CONTRACT DOCUMENTS.
- 27.2. The CONTRACTOR will be held strictly to the intent of the CONTRACT DOCUMENTS in regard to the quality of materials, workmanship, and execution of the WORK. Inspections may be made at the factory or fabrication plant of the source of material supply.

- 27.3. The ENGINEER will not be responsible for the construction means, controls, techniques, sequences, procedures, or construction safety.
- 27.4. The ENGINEER shall promptly make decisions relative to interpretation of the CONTRACT DOCUMENTS.

28. LAND AND RIGHTS-OF-WAY

- 28.1. Prior to issuance of NOTICE TO PROCEED, the OWNER shall obtain all land and rights-of-way necessary for carrying out and for the completion of the WORK to be performed pursuant to the CONTRACT DOCUMENTS, unless otherwise mutually agreed.
- 28.2. The OWNER shall provide to the CONTRACTOR information that delineates and describes the lands owned and rights-of-way acquired.
- 28.3. The CONTRACTOR shall provide at his own expense and without liability to the OWNER any additional land and access thereto that the CONTRACTOR may desire for temporary construction facilities, or for storage of materials.

29. GUARANTY

- 29.1. The CONTRACTOR shall guarantee all materials and equipment furnished and WORK performed for a period of one (1) year from the date of SUBSTANTIAL COMPLETION. The CONTRACTOR warrants and guarantees for a period of one (1) year from the date of SUBSTANTIAL COMPLETION of the system that the completed system is free from all defects due to faulty materials or workmanship and the CONTRACTOR shall promptly make such corrections as may be necessary by reason of such defects including the repairs of any damage to other parts of the system resulting from such defects. The OWNER will give notice of observed defects with reasonable promptness. In the event that the CONTRACTOR should fail to make such repairs, adjustments, or other WORK that may be made necessary by such defects, the OWNER may do so and charge the CONTRACTOR the cost thereby incurred. The Performance BOND shall remain in full force and effect through the guarantee period. The guarantee period is separate from and does not replace specified equipment warranties in excess of one year.

30. DISPUTES

- 30.1. If the parties are unable to resolve a dispute, claim, or controversy relating to this Contract by direct discussions or by voluntary nonbinding mediation, the OWNER and the CONTRACTOR may pursue their respective remedies at law or equity.

31. TAXES

- 31.1. The CONTRACTOR will pay all sales, consumer, use and other similar taxes required by the law of the place where the WORK is performed.

END OF SECTION

SECTION 00 7300

SUPPLEMENTAL GENERAL CONDITIONS

1. DEFINITIONS

- 1.1. The following shall be added to the definitions listed in the General Conditions:
- (a) APPROVED - shall mean as approved, directed, required or permitted by the Engineer, unless specified otherwise.
 - (b) CITY, COUNTY, OR AUTHORITY - (City of Oak Ridge, Tennessee; Anderson County, Tennessee)
 - (c) CONTRACT DOCUMENTS – Adding the following new provisions to those listed in the General Conditions, the Contract Documents shall also include Certificate of Owner's Attorney, General Conditions, Supplemental General Conditions, funding agency requirements, EEO and MBE/WBE requirements, wage rate decisions, and all other certificates, regulations and documents herein bound.
 - (d) ENGINEER – Replacing the definition listed in the General Conditions, FOXPE, LLC, or its lawfully designated successor.
 - (e) OWNER – Replacing the definition listed in the General Conditions, City of Oak Ridge, Tennessee
 - (f) OWNER'S ATTORNEY – The City Attorney for the City of Oak Ridge, Tennessee
 - (g) SUBSTANTIAL COMPLETION – In addition to the definition listed in the General Conditions, the determination as to whether the project is sufficiently complete so it can be utilized for its intended purposes will be based upon a consideration of completion items and submittals specified in the Specifications.
 - (h) SUPPLEMENTAL GENERAL CONDITIONS - In addition to the definition listed in the General Conditions, also such modifications to the General Conditions as the Owner or Engineer may deem necessary.
 - (i) THE SITE is the location of the proposed WORK as shown on the Drawings.

2. ADDITIONAL INSTRUCTIONS AND DETAIL DRAWINGS

- 2.1. (RESERVED)

3. SCHEDULES, REPORTS, AND RECORDS

- 3.1. Each such schedule is to be subject to change from time to time in accordance with the progress of the work.

- 3.2. The Contractor shall also furnish on forms to be supplied by the Owner and/or his Engineer:
- (a) a detailed estimate giving a complete breakdown of a lump sum contract price and
 - (b) periodic itemized estimates of work done for the purpose of making partial payments thereon.

The costs employed in making up any of these schedules will be used only for determining the basis of partial payments and will not be considered as fixing a basis for additions to or deductions from the Contract Price.

4. DRAWINGS AND SPECIFICATIONS

- 4.1. The Drawings, Specifications and Addenda shall form part of this Contract and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, headings, running headlines and marginal notes contained in the Contract Documents are solely to facilitate reference to various provisions of the Contract Documents and in no way affect, limit, or cast light on the interpretation of the provisions to which they refer.
- 4.2. Upon award of the Contract, the Contractor upon request will be supplied free of charge up to six complete sets of the Drawings and Specifications. If the Contractor requests additional prints or specifications, they will be furnished to him at cost at the Contractor's expense.
- 4.3. The Contractor shall keep on the job a copy of the Drawings and Specifications and shall at all times give the Owner and Engineer access thereto. Anything mentioned in the Specifications and not shown on the Drawings or shown on the Drawings and not mentioned in the Specifications shall be of like effect as if shown or mentioned in both.
- 4.4. The Contractor shall not take advantage of any errors or omission that may exist in the Drawings and Specifications, but shall immediately call them to the attention of the Engineer whose prompt interpretation or correction thereof shall be conclusive.

5. SHOP DRAWINGS

- 5.1. After checking and verifying all field measurements, the Contractor shall submit to the Engineer for review one electronic PDF set of all Shop Drawings, which shall have been checked by and stamped with the approval of Contractor and identified as the Engineer may require. The data shown on the Shop Drawings will be complete with respect to dimensions, design criteria, materials of construction and the like to enable the Engineer to review the information as required.
- 5.2. The Contractor shall also submit for the Engineer's review with such promptness as to cause no delay in work, all samples required by the Contract Documents. All samples will have been checked by and stamped with the approval of the

Contractor, identified clearly as to material, manufacturer, any pertinent catalog numbers and the use for which intended.

- 5.3. At the time of each submission, the Contractor shall in writing call the Engineer's attention to any deviations that the Shop Drawing or sample may have from the requirements of the Contract Documents.
- 5.4. The Engineer will review with reasonable promptness those Shop Drawings and samples submitted in accordance with the Contractor's approved Submittal Schedule, but his review shall be only for general conformance with the information given in the Contract Documents. The Contractor shall make any corrections required by the Engineer and shall return the required number of corrected copies of Shop Drawings and resubmit new samples. The Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections called for by the Engineer on previous submissions. Contractor's stamp of approval on any Shop Drawing or sample shall constitute a representation to the Owner and the Engineer that the Contractor has either determined and verified all quantities, dimensions, field construction criteria, materials, catalog numbers, and similar data, or he assumes full responsibility for doing so, and that he has reviewed or coordinated each Shop Drawing or sample with the requirements of the work and the Contract Documents.
- 5.5. Engineer's review of Shop Drawings or samples shall not relieve the Contractor from his responsibility for any deviations from the requirements of the Contract Documents unless the Contractor has in writing called the Engineer's attention to such deviation at the time of submission and the Engineer has concurred in writing with the specific deviation, nor shall any review by the Engineer relieve the Contractor from responsibility for errors or omissions in the Shop Drawings.
- 5.6. Once approved, the Contractor shall submit four paper sets of all Shop Drawings.

6. MATERIALS, SERVICES AND FACILITIES

- 6.1. Any work necessary to be performed after regular working hours, on Sundays or on legal holidays, shall be performed without additional expense to the Owner.
- 6.2. The Contractor warrants that he has good title to all materials, supplies, and equipment used by him in the work.
- 6.3. All materials required in the work may be stored on the site upon which the project is to be constructed, subject to approval by the Engineer, but all such materials, tools, and machinery shall be neatly and compactly stored in such a manner as to not interfere with traffic and to cause the least inconvenience to the property owners. All fire hydrants must at all times be kept free and unobstructed, and water and gas shut-off boxes, underground power and telephone line manholes must not be covered by such materials.
- 6.4. Materials, tools, and machinery shall not be piled or placed against trees unless the trees shall be amply protected against injury therefrom. All materials, tools,

machinery, etc., stored upon public thoroughfares must be provided with warning lights at night to warn the traffic of such obstruction.

- 6.5. The Contractor shall make his own arrangements for delivery and handling of equipment and materials as he may require for the prosecution of the work. The location of all temporary lines, roadways and similar facilities shall be subject to the approval of the Engineer, and these shall be located and operated so as not to interfere with other work carried on by the Owner or by other contractors.
- 6.6. It is agreed that any temporary power lines, roadways or other facilities which the Contractor furnishes, installs, maintains, and removes at the completion of the work, may be used by the Owner or any of its contractors at such reasonable time or times as may be directed by the Engineer. Likewise it is provided that similar facilities of other contracts will become available to the Contractor under similar conditions.
- 6.7. Adequate sanitary facilities shall be provided by the Contractor. All such sanitary facilities shall conform to the requirements of the respective State and County Departments of Public Health.
- 6.8. Office space and furnishings for the Resident Project Representative, if required, will be as specified in the Specifications. If required, office space must be provided before the Contractor's first partial payment estimate will be approved. No separate payment shall be made for office space.
- 6.9. Contractor shall furnish six hard hats which shall be made available to authorized representatives and agents of the Owner and any interested governmental agency while visiting the job site.

7. INSPECTION AND TESTING

- 7.1. Where testing and inspection of materials or equipment are required by the Contractor supplying the applicable materials and equipment, no separate payment will be made for these services. The laboratory or inspection agency shall be approved by the Owner.
- 7.2. Where mill tests of materials are required by the Engineer under the Contract Documents, Contractor shall furnish certified copies of such mill tests.
- 7.3. Where shop equipment performance tests are specified, the Engineer shall be permitted to witness such tests. In the absence of a witnessed test, certified copies of shop tests shall be submitted at the discretion of the Engineer. Cost of Engineer's services and any travel and associated room and board to witness this test will be borne by the Contractor.
- 7.4. No payment will be made to the Contractor for samples taken for tests such as concrete cylinders, etc., where testing is required by the Contract Documents.
- 7.5. Replacing Section 7.8 in the General Conditions, If the Engineer considers it necessary or advisable that covered work be inspected or tested by others, the Contractor, at the Engineer's request will uncover, expose, or otherwise make

available for observation, inspection or testing as the Engineer may require, that portion of the work in question, furnishing all necessary labor, materials, tools, and equipment. If it is found that such work is defective, or the work was covered by the Contractor contrary to written instructions of the Engineer, the Contractor will bear all the expenses of such uncovering, exposure, observation, inspection, and testing and of satisfactory reconstruction. If, however, such work is not found to be defective, and the work was covered in accordance with written instructions of the Engineer, the Contractor will be allowed an increase in the Contract Price or an extension of the Contract Time, or both, directly attributable to such uncovering, exposure, observation, inspection, testing and reconstruction, and an appropriate Change Order shall be issued.

8. SUBSTITUTIONS AND “OR-EQUALS”:

- 8.1. The Owner, through the Engineer, will consider proposals for substitution of materials, equipment, and methods or “or-equal” items only when such proposals are accompanied by full and complete technical data and all other information required to evaluate the proposed substitution.
- 8.2. The Contractor shall not substitute materials, equipment, or methods unless such substitution or “or-equal” item has been specifically approved for this project by the Engineer.
- 8.3. The Contract, if awarded, will be on the basis of materials, equipment, and methods defined and specified in the Contract Documents, Specifications, and Drawings, or substitute or “or-equal” materials and equipment as defined in paragraph 8 of the General Conditions approved by the Engineer and identified by Addendum. Request for Engineer’s clarification of materials and equipment considered “or-equal” prior to the Effective Date of the Agreement must be received by the Engineer at least 10 days prior to the date for receipt of bids. Request for Engineer’s clarification of materials and equipment considered as substitutes prior to the Effective Date of the Agreement must be received by the Engineer at least 15 days prior to the date for receipt of bids. Each request must conform to the requirements of the General Conditions and shall be made only by the bidding Contractor. The burden of proof of the merit of the proposed item is upon the Contractor and the Engineer’s decision of approval or disapproval will be final. If Engineer approves any proposed “or-equal” or substitute item, such approval will be set forth in an Addendum issued to all prospective Bidders. Bidding Contractors shall not rely upon approvals in any other manner.
- 8.4. The Contractor shall verify prior to bidding that all specified items will be available in time for installation during orderly and timely progress of the project.
- 8.5. In the event specified items will not be so available, the Contractor shall notify the Engineer prior to receipt of bids.
- 8.6. Costs of delays because of non-availability of specified items, when such delays could have been avoided by the Contractor, will be back charged as necessary and shall not be borne by the Owner.

- 8.7. In cases where experience clauses are used, an alternate bond or cash deposit may be accepted from manufacturers that do not meet the specified experience period. The bond or cash deposit provided by the manufacturer or supplier will guarantee replacement of the equipment or process in the event of failure or unsatisfactory service. The period of time for which the bond or cash deposit is required shall be the same as the experience period of the time specified.

9. PATENTS

- 9.1. License and/or royalty fees for the use of a process which is authorized by the Owner of the project must be reasonable and paid to the holder of the patent, or his authorized licensee, directly by the Owner and not by or through the Contractor.

10. SURVEYS, PERMITS, REGULATIONS

- 10.1. The baseline and benchmark, if applicable, are indicated on the Drawings. The Contractor shall be responsible for all surveying required for laying out and constructing the Work.
- 10.2. The Contractor shall procure all permits and licenses, pay all charges or fees, and give all notices necessary for the completion of the work.

11. SURVEYS, PERMITS, REGULATIONS

- 11.1. In order to protect the lives and health of his employees under the Contract, the Contractor shall comply with all pertinent provisions of the "Manual of Accident Prevention in Construction" issued by the Associated General Contractors of America, Inc., and shall maintain an accurate record of all cases of death, occupational disease and injury requiring medical attention or causing loss of time from work, arising out of and in the course of employment on work under the Contract.
- 11.2. The Contractor alone shall be responsible for the safety, efficiency, and adequacy of his plant, appliances and methods, and for any damage that may result from their failure or their improper construction, maintenance, or operation.
- 11.3. The Contractor shall, at his own expense, shore up and protect any buildings, bridges, or other public or private structures which may be encountered or endangered in the prosecution of the work, and that may not be otherwise provided for, and he shall repair and make good any damages to such property by reason of his operations. All existing fences which were removed by the Contractor due to prosecution of the work shall be replaced by the Contractor. No extra payment will be made for said work or materials.
- 11.4. Contractor shall repair or replace at his own expense any existing water pipes, power and communication lines, or other public utilities, roads, drain pipes, sewers, drainage ditches and all plantings (including grass) that are damaged during construction. The site shall be left in its present condition after all cleanup work has been done. Any damage to drainage or water pipes, local sewers, or plantings (including grass, utilities, roads, parking space, or other structures)

shall be repaired and replaced immediately in the condition found. Such repairs and replacement shall be at the expense of the Contractor.

- 11.5. Contractor shall preserve all governmental markers (e.g. U.S.G.S., T.V.A., etc.), and none such will be removed or disturbed without prior approval of the Engineer. Any removal and replacement of such markers shall be at the expense of the Contractor.
- 11.6. The Contractor shall employ watchmen on the work as necessary to protect the work from damage, vandalism, etc., and shall, when necessary, erect and maintain such strong and suitable barriers and such lights as will effectually prevent the happening of any accident to health, limb or property. Lights shall be maintained between the hours of one-half hour before sunset and one-half hour after sunrise.
- 11.7. Contractor will be required, at his own expense, to do every thing necessary to support, protect and sustain all sewer, water or gas pipe; service pipes; electric lights; power, telephone, or telegraph poles; conduits; and other fixtures laid across or along the site of the work. The Engineer, as well as the company or the corporation owning said poles, pipes or conduits, must be notified by the Contractor before any such fixtures are removed or molested. In case any of the said sewer, gas, or water pipes; service pipes; electric lights; power, telephone or telegraph poles; conduits; or other fixtures are damaged, they shall be repaired by the authorities having control of the same, and the expense of said repairs shall be deducted from the monies due or to become due the Contractor under this Contract.
- 11.8. Should it become necessary to temporarily change the position or remove any poles, electric conduits, water pipes, gas pipes, or other pipes or wires, the Contractor shall notify the Engineer and company or the corporation owning said poles, pipes or conduits of the location and circumstances, and shall cease work if necessary until satisfactory arrangements have been made by the owners of the said poles, pipes, conduits, or wires to properly care for the same. No claims for damages will be allowed on account of any delay occasioned thereby. The entire cost of such temporary changes or removal must be included in the unit or lump sum prices bid for the various items of work under this Contract.
- 11.9. In the event of temporary suspension of work, or during inclement weather, or whenever the Engineer shall direct, the Contractor will, and will cause his subcontractors to protect carefully his and their work and materials against damage or injury from the weather. If, in the opinion of the Engineer, any work or materials shall have been damaged or injured by reason of failure on the part of the Contractor or any of his subcontractors to so protect the work, such materials shall be removed and replaced at the expense of the Contractor.
- 11.10. Before, during, and after installation, the Contractor shall furnish and maintain satisfactory protection to all equipment against injury by weather, flood or breakage, thereby permitting the work to be left in a perfect condition at the completion of the contract. No extra payment will be made for this work but the entire cost of the same shall be included in the price bid for the construction of the work done under this contract.

- 11.11. 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 strictly conform with the manufacturer's instructions.
- 11.12. Reasonable care shall be taken during construction to avoid damage to vegetation. Ornamental shrubbery and tree branches shall be temporarily tied back, where appropriate, to minimize damage. Trees which receive damage to branches shall be trimmed of those branches to improve the appearance of the tree. Tree trunks receiving damage from equipment shall be treated with a tree dressing.

12. SUPERVISION BY CONTRACTOR

- 12.1. It is understood that the Contractor's representative shall be one who can be continued in that capacity for the particular job involved unless he ceases to be on the Contractor's payroll. Changes in supervision must be approved by the Engineer.

13. CHANGES IN THE WORK

- 13.1. All Change Orders, including a change in technical design or an increase in cost, must be approved by the Owner, the Engineer and those governmental agencies whose approval is required.
- 13.2. Before executing any Change Order involving adjustment of the contract price, where necessary and desirable, the Contractor shall first obtain the consent of his surety.
- 13.3. No claim for extra work or cost shall be allowed unless the same was done in pursuance of a written order of the Engineer approved by the Owner. When the work is performed under the terms of the General Conditions, the Contractor shall furnish satisfactory bills, payrolls, and vouchers covering all items of cost and when requested by the Owner, give the Owner access to accounts relating thereto.
- 13.4. The location of utility lines, pavements, and other appurtenant construction shown on the Drawings may be raised or lowered, may be moved from one location to another, or may be lengthened or shortened by the Owner because of clearances needed, easement changes, design changes, or any other reason. In such case, the Contractor shall be entitled to payment for the work based on the unit prices shown in the Bid Schedule. No additional payment will be allowed because of such changes unless the Contractor notifies the Owner in writing prior to commencing that portion of the work and an appropriate change order is prepared.
- 13.5. If additional time is requested on account of a change in the work, the documentation of the basis for the requested time shall include a detailed justification and calculation relating the time extension to the project schedule and critical path. Any time extensions claimed for abnormal weather must be

supported by historical weather records for the period in question. Generally, for changes that do not directly affect work elements on the critical path of the project, additional time will be granted only in proportion to the cost of the change over the original contract price.

- 13.6. Failure to submit the written notice or failure to document the basis for the increase in contract price or time within the times specified shall bar the Contractor from all future claims for a change in contract price or an extension of time on account of the change.
- 13.7. Changes in contract price will not be granted in connection with so-called "Acts of God" or nature (i.e., floods, storms, earthquakes, etc.).

14. CHANGES IN CONTRACT PRICE

- 14.1. For any change in contract price, the Contractor shall submit a detailed price breakdown sufficient to permit analysis of all material, labor, equipment, subcontract, and overhead costs, as well as profit, regardless of whether the change is an increase or a decrease in price. Any amounts claimed by subcontractors must be supported by a similar price breakdown.
- 14.2. The change in contract price shall be deemed to cover all costs, overhead, and profit attributable to the change, including any delays or impacts related thereto. There will be no reservation of rights for future or further increases in contract price in connection with a particular change.

15. TIME FOR COMPLETION AND LIQUIDATED DAMAGES

- 15.1. The said amount is fixed and agreed upon by and between the Contractor and the Owner because of the impracticability and extreme difficulty of fixing and ascertaining the actual damages the Owner would in such event sustain, and said amount is agreed to be the amount of damages which the Owner would sustain, and said amount shall be retained from time to time by the Owner from current periodic estimates.
- 15.2. The Owner will suffer financial loss if the project is not "substantially completed" on the date set forth in the Contract Documents. The Contractor and his Surety shall be liable for and shall pay to the Owner the sums stipulated in the Bid or Contract as fixed, agreed, and liquidated damages for each calendar day of delay until the project is "substantially completed."

16. CORRECTION OF WORK

- 16.1. If, in the opinion of the Engineer, it is undesirable to replace any defective or damaged materials or to reconstruct or correct any portion of the work injured or not performed in accordance with the Contract Documents, the compensation to be paid to the Contractor hereunder shall be reduced by such amount as, in the judgment of the Engineer, shall be equitable.

17. SUBSURFACE CONDITIONS

- 17.1. Owner and Engineer make no representations or guarantee, either expressed or implied, about any subsurface conditions that may be encountered within the scope of the project. The Contractor should satisfy himself/herself by on-site inspections, core-drillings or other methods of the subsurface conditions that may be encountered. The risk of encountering and correcting such subsurface conditions shall be borne solely by the Contractor, and the Contract price shall include the cost of performing the work complete-in-place.
- 17.2. The Engineer may have made certain subsurface explorations in the vicinity of the work to be constructed under this Contract. These borings were made only for the Engineer's information in designing the project. Copies of these logs of borings and their locations will be provided to prospective Bidders upon request. These logs of borings are furnished only as information to Bidders for whatever interpretation and use they desire to make of conditions found when the borings were made. The Owner and Engineer do not warrant that the same conditions exist between borings and the Bidder shall satisfy himself as to the nature of the subsurface conditions throughout the project. If the Bidder wishes to make borings at any location, he shall be afforded the opportunity to do so. Cost of such borings shall be at the Bidder's expense.

18. SUSPENSION OF WORK, TERMINATION, AND DELAY

- 18.1. In the event a portion of the work is delayed or interrupted, the Contractor shall continue to prosecute those portions of the work unaffected by the delay or interruption.
- 18.2. In the event of a delay or interruption in the work, the Contractor shall make reasonable and appropriate adjustments in his job site resources (manpower and equipment) to minimize the overall cost impact of the delay or interruption.
- 18.3. In the event of a delay or interruption in the work due to the failure of the Owner or Engineer to act within the time specified in the Contract Documents, or if no time is specified, within a reasonable time, the Contractor shall so notify the Engineer in writing immediately upon becoming aware of the delay. The Contractor shall submit a detailed justification for any claim for adjustment in contract price or extension in contract time on account of the delay or interruption as soon as the price or time impact can be quantified, but in no case later than 30 days following the end of the delay or interruption. Failure to submit the written notification or the justification within the time specified shall bar the Contractor from all future claims for adjustment in contract price or time on account of the delay.

19. PAYMENTS TO CONTRACTOR

- 19.1. No separate payment will be made for any items specified in the General Conditions or Supplemental General Conditions. Payments for such items shall be included in the unit price and lump sum prices bid by the Contractor for items listed in the Bid Schedule.

20. ACCEPTANCE OF FINAL PAYMENT AS RELEASE

20.1. (RESERVED)

21. INSURANCE

21.1. Each insurance policy shall be renewed at least 30 days before the expiration date thereof.

21.2. Insurance must be carried by a recognized insurance company licensed to do business in the state in which the project is constructed.

21.3. The Contractor's and his Subcontractor's Public Liability and Property Damage Insurance shall provide protection in the amounts specified in Paragraph 21.3.1 of the General Conditions and as further specified in the Special Conditions (if included) against the following special hazards:

- (a) Blasting damage
- (b) Damage to existing structures
- (c) Damage to private driveways, walks, shrubbery, plantings, etc.
- (d) Damage to public utilities, electric, water, telephone, gas, sewerage, etc.
- (e) Damage to U.S. Government markers.

21.4. The Contractor shall not commence work under this Contract until he has obtained all the insurance required and such insurance has been approved by the Owner, nor shall the Contractor allow any subcontractor to commence work on his subcontract until the insurance required of the subcontractor has been so obtained and approved.

21.5. In the event any insurance coverage should be canceled or allowed to lapse, Contractor will not be permitted to work until adequate and satisfactory insurance is in effect. Failure to keep insurance policies in effect WILL NOT be cause for any claims for extension of time under this Contract.

21.6. Limits of liability for general public liability and property damage insurance shall not be less than:

- (a) Bodily Injury \$1,000,000 each person
\$1,000,000 each occurrence
- (b) Property Damage \$500,000 each occurrence
\$500,000 aggregate

21.7. Limits of liability for comprehensive motor vehicle liability and property damage insurance.

- (a) Bodily Injury \$1,000,000 each person
\$1,000,000 each occurrence
- (b) Property Damage \$250,000 each occurrence

- 21.8. The Contractor shall provide builder's risk insurance to protect the Contractor and the Owner against risks of damage to buildings, structures, materials, and equipment not otherwise covered under installation floater insurance, from the perils of fire and lightning, the perils included in the standard extended coverage endorsement, and the perils of vandalism and malicious mischief. The amount of such insurance shall be not less than the insurable value of the work at completion less the value of the materials and equipment insured under installation floater insurance. If the work does not include the construction of building structures, builder's risk insurance may be omitted providing the installation floater insurance fully covers the work.
- 21.9. The Contractor shall provide installation floater insurance to protect the Contractor and the Owner from all insurable risks of physical loss or damage to materials, products and equipment not otherwise covered under builder's risk insurance while in warehouses or storage areas, during installation, during testing, and after the work is completed. Equipment such as pumps, motors, engine-generators, compressors, process equipment, switchgear, transformers, panel boards, control equipment, and other similar equipment shall be insured under installation floater insurance when the aggregate value of the equipment exceeds \$10,000.
- 21.10. If the work does not include the construction of building structures or installation of equipment, the builder's risk insurance and installation floater insurance may be omitted.

22. CONTRACT SECURITY

- 22.1. A Payment Bond in the amount of 100 percent of the contract price and a Performance Bond in the amount of 100 percent of the contract price shall be required in the form set forth in the Contract Documents.

23. ASSIGNMENTS

- 23.1. In case the Contractor assigns all or any part of any monies due or to become due under this Contract, the instrument of assignment shall contain a clause substantially to the effect that it is agreed that the right of the assignee in and to any monies due or to become due to the Contractor shall be subject to prior claims of all persons, firms and corporations for services rendered or materials supplied for the performance of the work called for in this contract.

24. INDEMNIFICATION

- 24.1. (RESERVED)

25. SEPARATE CONTRACTS

- 25.1. (RESERVED)

26. SUBCONTRACTING

- 26.1. The Contractor shall not award any work to any Subcontractor without prior written approval of the Owner, which approval will not be given until the Contractor submits to the Owner a written statement concerning the proposed award to the Subcontractor, which statement shall contain such information as the Owner may require.

27. ENGINEER'S AUTHORITY

- 27.1. The Engineer may appoint such resident project representatives as he may desire. Scope of the resident project representative's authority will extend to all parts of the work and to the preparation and manufacture of the materials to be used. A resident project representative is placed on the work to keep the Engineer and Owner informed as to the progress of construction and the manner in which it is being done and also to call to the attention of the Contractor any deviation from the Drawings and Specifications.
- 27.2. The resident project representatives have the authority to reject defective material or work that is being improperly done subject to the final decision of the Engineer. The resident project representatives are not authorized to revoke, alter, enlarge, or relax the provisions of these conditions, nor are they authorized to approve or accept any portion of the completed work, or to issue instructions contrary to the Drawings and Specifications.
- 27.3. The Contractor may request written instructions from the Engineer upon any important items that lie within the resident project representative's jurisdiction.

28. LAND AND RIGHTS-OF-WAY

- 28.1. In the event all land and rights-of-way have not been obtained as herein contemplated before construction begins, the Contractor shall begin the work upon such land and rights-of-way as the Owner may have previously acquired, and no claim for damages whatsoever will be allowed by reason of the delay in obtaining the remaining land and rights-of-way. Should the Owner be prevented or enjoined from proceeding with the work, or from authorizing its prosecution, either before or after the commencement, by reason of any litigation, or by reason of its inability to procure any lands or rights-of-way for the work, the Contractor shall not be entitled to make or assert claim for damage by reason of said delay, or to withdraw from the Contract except by consent of the Owner; but time for completion of the work will be extended to such time as the Owner determines will compensate for the time lost by such delay such determination to be set forth in writing.

29. GUARANTY

- 29.1. (RESERVED)

30. DISPUTES

- 30.1. (RESERVED)

31. TAXES

31.1. (RESERVED)

32. CONFLICTING CONDITIONS

32.1. Any provision in any of the Contract Documents which may be in conflict or inconsistent with any of the paragraphs in the General Conditions or the Federal Regulations shall be void to the extent of such conflict or inconsistency except if when and as clarified by the Supplemental General Conditions. Interpretations of any conflicts not clarified may be requested by the Contractor in writing to the Engineer. In the event of conflicts between funding agency documents, the more restrictive will apply.

32.2. In case of unresolved conflict between items of the Contract Documents, the following order of precedence shall govern, with the higher item taking precedence over a lower item:

- (a) Contract (including Supplemental Agreements and Change Orders thereto)
- (b) Addenda
- (c) Bid Proposal
- (d) Supplemental General Conditions
- (e) General Conditions
- (f) Specifications
- (g) Governing Standard Specifications
- (h) Schedules on Drawings
- (i) Notes on Drawings
- (j) Details on Drawings
- (k) Large Scale Drawings
- (l) Small Scale Drawings
- (m) Dimensions Given in Figures
- (n) Scaled Dimensions

32.3. In the event of any discrepancy between any drawing and the figure written thereon, the figures, unless obviously incorrect, shall be taken as correct.

33. REQUIRED PROVISIONS DEEMED INSERTED

33.1. Each and every provision of law and clause required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted, or is not correctly inserted, then upon the application of either party the Contract shall forthwith be physically amended to make such insertion or correction.

34. PROHIBITED INTEREST

- 34.1. No member of or delegate to Congress, or resident commissioner, shall be admitted to any share or part of this Contract or to any benefit that may arise therefrom, but this provision shall not be construed to extend to this Contract if made with a corporation for its general benefit.
- 34.2. No official of the Owner who is authorized in such capacity and on behalf of the Owner to negotiate, make, accept or approve, or to take part in negotiating, making, accepting or approving any architectural, engineering, inspection, construction or material supply contract or any subcontract in connection with the construction of the Project, shall become directly or indirectly interested personally in this Contract or in any part hereof. No officer, employee, architect, attorney, engineer or inspector of or for the Owner who is authorized in such capacity and on behalf of the Owner to exercise any legislative, executive, supervisory or other similar functions in connection with the construction of the Project, shall become directly or indirectly interested personally in this contract or in any part thereof, any material, supply contract, subcontract, insurance contract, or any other contract pertaining to the Project.

35. USE OF PREMISES AND REMOVAL OF DEBRIS

- 35.1. The Contractor expressly undertakes at his own expense:
- (a) To take every precaution against injuries to persons or damage to property;
 - (b) To store his apparatus, materials, supplies and equipment in such orderly fashion at the site of the work as will not unduly interfere with the progress of his work or the work of any other contractors;
 - (c) To place upon the Work or any part thereof only such loads as are consistent with the safety of that portion of the Work;
 - (d) To clean up frequently all refuse, rubbish, scrap materials and debris caused by these operations, to the end that at all times the site of the Work shall present a neat, orderly and workmanlike appearance;
 - (e) Before final payment to remove all surplus material, false work, temporary structures, including foundations thereof, plant of any description and debris of every nature resulting from his operations, and to put the site in a neat, orderly condition;
 - (f) To effect all cutting, fitting or patching of his work required to make the same to conform to the Drawings and Specifications and, except with the consent of the Engineer, not to cut or otherwise alter the work of any other contractor.

36. ESTIMATE OF QUANTITIES

- 36.1. Wherever the estimated quantities of work to be done and materials to be furnished under this Contract are shown in any of the Contract Documents including the proposal, they are given for use in comparing Bids, and the right is especially reserved except as herein otherwise specifically limited, to increase or diminish them as may be deemed reasonably necessary or desirable by the Owner to complete the Work contemplated by this Contract, and such increase or decrease shall in no way nullify this Contract, nor shall any such increase or decrease give cause for claims or liability for damages.

37. CONTRACTOR'S OBLIGATIONS

- 37.1. The Contractor shall in good workmanlike manner perform all work and furnish all supplies and materials, machinery, equipment, facilities and means, except as herein otherwise expressly specified, necessary or proper to perform and complete the Work required by this Contract, within the time herein specified, in accordance with the provisions of this Contract and said Specifications and in accordance with the Drawings covered by this Contract and all supplemental drawings, and in accordance with the directions of the Engineer as given from time to time during the progress of the Work. He shall furnish, erect, maintain and remove such construction plant and such temporary works as may be required. The Contractor shall observe, comply with and be subject to all terms, conditions, requirements, and limitations of the Contract and Specifications and shall do, carry on, and complete the entire work to the satisfaction of the Engineer and the Owner.
- 37.2. The Contractor shall restore disturbed areas to original or better condition.
- 37.3. When work performed under this Contract is in areas where easements and working agreements have been obtained by the Owner on private properties, it shall be the responsibility of the Contractor to protect trees, shrubs, gardens, etc., insomuch as is possible and to restore said properties to the satisfaction of the property owners, said protection and restoration shall include but not be limited to the fencing off of trees and shrubs, transplanting of trees and shrubs, etc., replacing topsoil removed with topsoil of equal or better quality, regrassing, and replacing fences. All expenses for said protection and restoration shall be borne by the Contractor, and no separate payment shall be made for this work.
- 37.4. When work is done on private property in easements and working agreements obtained by the Owner, the Contractor shall furnish affidavits from the property owners attesting to the fact that their property has been satisfactorily restored before that portion of the work will be considered for final payment.

38. PAYMENTS BY CONTRACTOR

- 38.1. The Contractor shall pay (a) for all transportation and utility services not later than the 20th day of the calendar month following that in which services are rendered, (b) for all materials, tools, and other expendable equipment to the extent of 90 percent of the cost thereof, not later than the 20th day of the calendar month following that in which such materials, tools, and equipment are

delivered at the site of the Project, and the balance of the cost thereof not later than the 30th day following the completion of that part of the Work in or on which such materials, tools, and equipment are incorporated or used, and (c) to each of his subcontractors, not later than the 5th day following each payment to the Contractor, the respective amounts allowed the Contractor on account of the work performed by his subcontractors to the extent of each subcontractor's interest therein.

39. INFORMATION TO BE FURNISHED

- 39.1. Contractor shall fill out all questionnaire forms completely in preparing his Bid and after award shall supply to the Engineer all pertinent information required.

40. WAIVER

- 40.1. It is expressly understood and agreed that any waiver granted by the Engineer or the Owner of any term, provision or covenant of this Contract shall not constitute a precedent nor breach of the same or any other terms, provisions or covenants of this Contract.
- 40.2. Neither the acceptance of the Work by the Owner nor the payment of all or any part of the sum due the Contractor hereunder shall constitute a waiver by the Owner of any claim which the Owner may have against the Contractor or surety under this Contract or otherwise.

41. CONNECTING OF EXISTING WORK

- 41.1. Contractor shall remove such existing masonry and piping as is necessary in order to make the proper connections to these structures at the locations shown. Also, he shall make the necessary pipeline, roadway, and other connections at the several points in order that on completion of the Contract, all required flows may flow through the several pipelines and structures. No extra payment shall be made for this work, but the entire cost of the same shall be included in the price bid for the various items of the Work to be done under this Contract.

42. PROGRAM AND METHOD OF CONSTRUCTION

- 42.1. The order or sequence of execution of the Work and the general arrangements of the construction plant to be installed shall at all times be subject to the review of the Engineer. If at any time before the commencement or during the progress of the Work, or any part of it, such features, and appliances used or to be used appear to the Engineer as insufficient, or improper, he may order the Contractor to improve their character, and the Contractor shall conform to such orders, but the failure of the Engineer to demand any increase of safety, efficiency, adequacy, or any improvement shall not release the Contractor from his obligation to secure the safe conduct and quality of the Work specified.

43. BUILDINGS AND SHANTIES

- 43.1. No shanties, camps, or buildings for the housing of men employed on the Work shall be erected on land owned or leased by the Owner unless a permit, in

writing, is secured from the Owner allowing their construction. Should permission be asked and granted, the Contractor must comply with all regulations regarding the construction and maintenance of such buildings.

44. CONSTRUCTION METHODS AND PROTECTION OF PROPERTIES

- 44.1. Cooperation with Utilities - The Contractor shall be cooperative at all times with all utilities, or their duly authorized agent or contractor, installing or connecting new services and shall coordinate all phases of the work with said utilities to avoid unnecessary delays or complications.
- 44.2. Damage to Property
- (a) The Contractor is warned to prevent excessive dust or air pollution that may disfigure or soil any public or private facilities. The use of water sprinklers or other approved devices to reduce dust will be necessary if such is the case. Additionally, in cases of heavy rains or storms, every effort shall be made to prevent mud or water which may result due to the construction from accumulating on or damaging any property or any private owner.
 - (b) Contractor shall use special care in working in areas where the right-of-way crosses private property. Contractor shall also replace, at his/her own expense, any existing water pipes, power lines, communication lines, or other public utilities, roads, drain pipes, sewers, drainage ditches, and all plantings including grass and/or sod on private property. The site shall be left in its present condition after all cleanup work has been done. Any damage to drainage pipes, water pipes, local sewers, plantings (including grass and/or sod), utilities, roads, parking space, or other structures shall be repaired and replaced immediately in the condition found. Such repairs and replacement shall be at the expense of the Contractor.
- 44.3. Existing Sanitary, Combined and/or Storm Sewers
- (a) Whenever existing sewers are broken or damaged as a result of traffic or excavation by the Contractor, the maintenance, replacement, and/or repairs to the damaged existing sanitary, combined, and/or storm sewer shall be the Contractor's responsibility, except as otherwise provided for on the Drawings and in the Contract Documents, or as authorized by the Engineer, and the expense of maintaining, repairing, replacing, or connecting to existing sewers shall be borne by the Contractor.
 - (b) No separate payment will be made for handling sewage from existing sewers or interrupted connections, since it shall be the responsibility of the Contractor to maintain services until such time as the proposed or relocated sewers can be constructed. If the Contractor should damage any existing sewer, such that it affects the public interest, health, or general welfare, the Contractor shall replace or repair that sewer at his/her own expense as directed by the Engineer.

- (c) Contractor shall make all connections to existing sewerage facilities as shown on the Drawings.

45. SEWAGE, SURFACE, AND FLOOD FLOWS

- 45.1. The Contractor shall furnish all the necessary equipment, shall take all necessary precautions and shall assume the entire cost of handling any sewage, seepage, storm, surface, and flood flows which may be encountered at any time during the construction of the Work. The manner of providing for these flows shall meet the approval of the Engineer, and the entire cost of said work shall be included in prices bid for the various items of the Work to be done under this Contract.
- 45.2. The Contractor will minimize siltation and bank erosion during construction.
- 45.3. During the period of construction the Contractor shall cooperate with the Owner's employees in maintaining all existing collection, pumping, and treatment facilities in operation. The cost of any temporary conveyances or bypass pumping shall be included in the price bid for other items of work under this Contract, as no separate payment will be made.
- 45.4. The Contractor shall not discharge or allow discharge of pollutants, as defined in the Clean Water Act, including fill and sediment, into waters of the State or United States, including wetlands, unless authorized by an appropriate State or Federal permit. This prohibition specifically applies to silt and sediment in storm water runoff and in water pumped from trenches and excavations.
- 45.5. In the event that pollutants are discharged or otherwise released to the environment as the result of the Contractor's negligence or unlawful conduct, it is understood and agreed that the Contractor shall bear all risks associated with such release(s), shall indemnify the Owner and the Engineer from any liabilities resulting from the release(s), and shall not make any claim for additional compensation for delays or damage resulting from such release(s).

46. OBSTRUCTIONS ENCOUNTERED

- 46.1. In addition to showing the structures to be built under this Contract, the Drawings show certain information obtained by the Owner regarding the pipelines and other structures which exist along the site of the Work, both at and below the surface of the ground. The Owner expressly disclaims any responsibility for the accuracy or completeness of the information given on the Drawings with regard to existing structures and pipelines, and the Contractor will not be entitled to any extra compensation on account of inaccuracy or incompleteness of such information, said structures and pipelines being shown only for the convenience of the Contractor who must verify the information to his own satisfaction. The giving of this information upon the Drawings will not relieve the Contractor of his obligations to support and protect all pipelines and other structures that may be encountered during the construction of the work and to make good all damages done to such pipelines and structures as provided in these Supplemental General Conditions.

47. USE OF STREETS

- 47.1. During the progress of the Work, the Contractor shall make ample provision for both vehicular and foot traffic on any public road, and shall indemnify and save harmless the Owner from any expense whatsoever due to his operations over said roadways. The Contractor shall also provide free access to all fire hydrants, water and gas valves located along the line of his work. Gutters and waterways must be kept open or other provisions made for the removal of storm water. Street intersections may be blocked only one-half at a time, and the Contractor shall lay and maintain temporary driveways, bridges and crossings such as in the opinion of the Engineer are necessary to reasonably accommodate the public and to provide access to needed private driveways. In the event of the Contractor's failure to comply with these provisions, the Owner may cause the same to be done and will deduct the cost of such work from any monies due or to become due the Contractor under this Contract, but the performance of such work by the Owner or at its insistence shall serve in no way to release the Contractor from his general or particular liability for the safety of the public or the Work.
- 47.2. Required line crossings of all streets and roads shall be done in accordance with the applicable state Department of Transportation procedures.
- 47.3. Contractor will be permitted to close a street when necessary for the proper prosecution of the work. The Contractor shall keep the Police and Fire Department continuously informed as to his intentions to close streets and give the Police Department sufficient notice in order that "No Parking" signs may be placed at the proper time to clear the street for construction.
- 47.4. The Contractor shall maintain property barricades and flagmen to detour traffic.
- 47.5. At all times the Contractor is responsible for damage to city and county streets as a result of their use in this project. The streets must be kept clear of all dirt, stone, or other debris. All debris, dirt, etc., whether caused by rains, storms, spillage from trucks or otherwise, shall be kept out of sewers. The Contractor is responsible for and may not plead ignorance of city and county ordinances and amendments thereto that may affect this use of streets or sewers.

48. CONSULTING AND RESIDENT OBSERVATION SERVICES DURING CONSTRUCTION

- 48.1. In providing the Owner with consulting services and resident project representation during construction, the Engineers and their employees do not assume any duty to supervise construction means or methods and safety procedures followed by any contractor, subcontractor and/or their respective employees or to any other person; nor for any public liability or for property damage caused through acts of the Contractor, subcontractor and/or their respective employees or any other person.

49. SAFETY AND HEALTH REGULATIONS

- 49.1. The Contractor shall comply with the Department of Labor Safety and Health Regulations for construction promulgated under the Occupational Safety and

Health Act of 1970 (PL 91-596) and under Section 107 of the Contract Work Hours and Safety Standards Act (PL 91-54).

- 49.2. Contractor shall allow free access to any Department of Labor Representative for inspection purposes.

50. ACCESS BY REPRESENTATIVES OF GOVERNMENTAL AGENCIES

- 50.1. The authorized representatives and agents of all governmental agencies involved in this project shall have access to the work at all times and shall be permitted to inspect all work, materials, payrolls, records of personnel, invoices of materials, and other relevant data and records. Contractor shall provide proper facilities for the access and inspection of the work by such persons.

51. LOCAL AND STATE LAWS

- 51.1. The Contractor shall abide by all local and State laws or ordinances to the extent that such requirements do not conflict with Federal laws or regulations.
- 51.2. Anti- Discrimination – The Contractor, in performing the work or furnishing the services covered by the Contract Documents, shall not discriminate against any person because of race, creed, color, national origin, age, sex, sexual orientation, disability, religion, or other legally protected status. The City of Oak Ridge encourages the utilization of minority and women-owned businesses in its contracting and subcontracting projects and the Contractor is encouraged to actively solicit the participation of these businesses. The Contractor shall inform all of its subcontractors and vendors providing work or services under the Contract Documents of this requirement and shall ensure compliance therewith.
- 51.3. Governing Law – The Contract Documents are governed by the laws of the State of Tennessee.
- 51.4. City Officer and Employees Not to Have Financial Interest – No contract shall be made with any officer or employee of the City or any firm or corporation in which any officer or employee of the City has financial interest.
- 51.5. Compliance with All Laws, Ordinances, Statutes, and Regulations – The Contractor shall comply with all Federal, state, county, and local laws, ordinances, statutes, and regulations. Pursuant to City Code § 5-143, the City may not accept bids from Bidders in default of any payment of any nature due to the City, including but not limited to taxes, licenses, and fees.
- 51.6. Tobacco Products – The selected Bidder and its employees/subcontractors shall comply with all building policies, regulations, schedules, and rules as set out and required by the City. Please note smoking (including e-cigarettes) and the use of tobacco products (chewing) is prohibited in City-owned facilities. For any work done at City facilities, any smoking occurring outside of the buildings must occur at least twenty (20) feet away from any entrance, open window, or other opening into which smoke could infiltrate into the building. Spent smoking materials are to be properly discarded and not littered onto the grounds.

52. NEW JOB OPPORTUNITIES (WHERE REQUIRED BY FUNDING AGENCY ONLY)

52.1. The Contractor shall:

- (a) To the maximum extent practicable, follow hiring and employment practices which will assure that performance of the Work results in new job opportunities for the unemployed and the underemployed; and
- (b) Insert or cause to be inserted the same or similar provisions in each construction subcontract.

53. CONSTRUCTION RESTRICTIONS

53.1. Heavy construction machinery shall not be used within 500 feet of residential areas between the hours of 06:30 p.m. and 6:30 a.m except as otherwise provided herein.

53.2. No blasting or drilling shall be performed within 500 feet of residential areas between the hours of 06:30 p.m. and 6:30 a.m.

54. LEAD BASE PAINT AND JOINT SEALERS

54.1. No lead-based paints, protective coatings or joint sealers may be used on this project.

55. ASPHALT

55.1. Pursuant to the conditions as set out in the Specifications for hot asphaltic concrete binder and surface courses with particular reference to the limitations or temperature and weather conditions, the Owner may at its option and upon written notice, suspend the Contract over the winter and bad weather months. The Contract may then be resumed when weather conditions will permit the application of the above pavement, at the discretion of the Engineer. The notice to resume said contract shall be in writing. The suspended period will in no way be counted against the Contractor's allotted time to do the entire work.

55.2. This provision does not relieve the Contractor of the responsibility to maintain existing work already completed or any other responsibilities of the Contract; nor shall the Contractor, upon the basis of this fair notice herein; be eligible to make claim for or receive any damages for loss of overhead, plant expense, or anticipated profits, nor any other expenses incurred due to delay.

56. ABANDONMENT OR TERMINATION OF CONTRACT

56.1. For contracts over \$10,000, the Owner reserves the right to abandon the Contract if it will be in the Owner's best interest. The Contractor will be paid a fair payment, as negotiated with the Owner, for the work completed to date.

57. EVIDENCE OF PAYMENT

- 57.1. Contractor may be asked to present acceptable evidence from time to time that all bills have been paid for labor, materials, and equipment for which payment on account has been made in monthly estimates. Before final payment is made, Contractor shall, if required by the Owner, present sworn affidavit that all labor, materials, equipment, and service engaged for the work have been paid in full and that there are no outstanding debts or liens on any portions of the work.

58. ACCESSIBILITY OF RECORDS (PROJECTS WITH FEDERAL FUNDS ONLY)

- 58.1. The Owner, representatives of applicable federal agencies, the Comptroller General of the United States, or any of their duly authorized representatives, for a period of three years beyond completion of the Contract, shall have access to any books, documents, papers, and records of the Contractor which are directly pertinent to this Project for the purpose of making audit, examination, excerpts, and transcriptions of contracts in excess of \$10,000.

59. WORK WEEK, OVERTIME PAY, SHOW-UP PAY, AND ON-CALL PAY

- 59.1. All work performed under this Contract shall be performed on a 40-hour work week basis and shall include not only the prime Contractor but any and all subcontractors. The 40-hour work week shall be established by the Contractor at the Pre-construction Conference. Any deviation from the established work week will be approved in advance in writing by the Owner. Any additional cost incurred by the Owner due to deviations from the established work week will be borne by the Contractor. The Contractor shall provide written acknowledgment that he will pay any overtime cost incurred by the Owner at the time of requesting an increase in the 40-hour work week.
- 59.2. The Contractor will be assessed for each hour of overtime incurred by the Engineer's field representative(s) as a result of extended work hours (i.e., a total of more than 40 hours per calendar week) by the Contractor or his subcontractors.
- 59.3. If the Contractor advises the Engineer's field representative(s) that he will work on a particular day and subsequently decides not to work and does not so advise the representative(s) before he departs for the job site, the Contractor will be assessed an amount equal to 2 hours of the representative's time for "show-up" pay plus round-trip travel time and mileage. Show-up pay will not be assessed in the event of inability to work due to unanticipated inclement weather.
- 59.4. If the Contractor requests that the Engineer's field representative(s) be available to work on a weekend or a holiday but does not actually commit to work, the Contractor will be assessed an amount equal to 8 hours of the representative's time for "on-call" pay for each day that the Contractor so requests.
- 59.5. The above assessments for field representative's overtime pay, show-up pay, and on-call pay will be deducted as a separate line item on the Contractor's next progress payment request. Unless otherwise stated, the Engineer's field

representative's time will be assessed at \$60.00 per hour for regular time and \$90.00 per hour for overtime.

- 59.6. Available working times are Monday through Friday, 6:30 a.m. to 6:30 p.m except as otherwise provided herein. Work outside these times shall only be performed with the Owners permission.

END OF SECTION

SECTION 00 7373

SUPPLEMENTAL GENERAL CONDITIONS FOR TENNESSEE

A. LOCAL AND STATE LAWS

Senate Bill No. 1726 (Public Acts 1978 [Chapter 692]), known as the Underground Utility Damage Prevention Act (and all amendments thereto), enacted by the General Assembly of the State of Tennessee, is in its entirety to be considered a part of these documents.

B. TENNESSEE WATER QUALITY CONTROL ACT OF 1977

Tennessee Code Annotated (TCA) 69-3-108, Rule 1200-4-10-.05 (General NPDES Permit for Storm Water Discharges Associated with Construction Activity) requirements, in their entirety, shall be considered a part of these documents.

C. CONTRACTORS LICENSING ACT OF 1994

The Contractors Licensing Act of 1994 (TCA 62-6-101) (and all amendments thereto), enacted by the General Assembly of the State of Tennessee, is in its entirety to be considered a part of these Specifications.

D. BLASTING - T.C.A. §68-105-103

Persons who conduct blasting operations must notify Department of Commerce and Insurance at least 72 hours prior to the commencement of the operation. Civil penalties may be imposed for failure to comply.

E. ESCROW ACCOUNT OF CONTRACTOR RETAINAGE (Contracts over \$500,000)

1. Tennessee Code Annotated (TCA) 66-34-104 as amended. If applicable, the Owner will set up separate escrow account for deposit of retainage due Contractor in accordance with TCA 66-34-104 and amendments. These requirements shall be a part of these Specifications in their entirety.
2. TCA 66-34-104. Retention of Portion of Contract Price in Escrow — Applicability — Mandatory Compliance
 - (a) Whenever, in any contract for the improvement of real property, a certain amount or percentage of the contract price is retained, that retained amount shall be deposited in a separate, interest bearing, escrow account with a third party which must be established upon the withholding of any retainage.
 - (b) As of the time of the deposit of the retained funds, the funds shall become the sole and separate property of the prime contractor or remote contractor to whom they are owed, subject to the rights of the person withholding the retainage in the event the prime contractor or remote contractor otherwise entitled to the funds defaults on or does not complete its contract.

- (c) In the event that the party withholding the retained funds fails to deposit the funds into an escrow account as provided herein, such party shall be responsible for paying the owner of the retained funds an additional three hundred dollar (\$300) penalty per day for each and every day that such retained funds are not deposited into such escrow account.
- (d) The party with the responsibility for depositing the retained amount in a separate, interest-bearing, escrow account with a third party shall have the affirmative duty to provide written notice that it has complied with the requirements of this section to any prime contractor upon withholding the amount of retained funds from each and every application for payment, including:
 - 1. Identification of the name of the financial institution with whom the escrow account has been established;
 - 2. Account number; and
 - 3. Amount of retained funds that are deposited in the escrow account with the third party.
- (e) Upon satisfactory completion of the contract, to be evidenced by a written release by the owner or prime contractor owing the retainage, all funds accumulated in the escrow account together with all interest on the account shall be paid immediately to the prime contractor or remote contractor to whom the funds and interest are owed.
- (f) In the event the owner or prime contractor, as applicable, fails or refuses to execute the release provided for in subsection (c), then the prime contractor or remote contractor, as applicable, may seek any remedy in a court of proper jurisdiction and the person holding the fund as escrow agent shall bear no liability for the nonpayment of the fund to the prime contractor or remote contractor; provided, however, that all claims, demands, disputes, controversies, and differences that may arise between the owner, prime contractor or prime contractors, and remote contractor or remote contractors regarding the funds may be, upon written agreement of all parties concerned, settled by arbitration conducted pursuant to the Tennessee Uniform Arbitration Act, compiled in title 4, chapter 5, part 3, or the Federal Arbitration Act, 9 U.S.C. § 1, et seq., as may be applicable.
- (g) In contracts to which the state or any department, board or agency of the state, including the University of Tennessee, is a party, interest shall be paid on the retained amounts at the same rate interest is paid on the funds of local governments participating in the local government investment pool established pursuant to § 9-4-704, for the contract period.

- (h) The provisions of this section shall be applicable to the state, any department, board or agency of the state, including the University of Tennessee, and all counties and municipalities and all departments, boards or agencies of the counties and municipalities, including all school and education boards, and any other subdivision of the state.
- (i) This section shall be applicable to all prime contracts and all subcontracts thereunder for the improvement of real property when the contract amount of such prime contract is five hundred thousand dollars (\$500,000) or greater, notwithstanding the amount of such subcontracts.
- (j) Compliance with this section shall be mandatory, and may not be waived by contract.
- (k) Failure to deposit the retained funds into an escrow account as provided herein, within seven (7) days' receipt of written notice regarding such failure, is a class A misdemeanor.

[Acts 1975, ch. 345, §§ 1-4; TCA, §§ 64-1148—64-1151; Acts 1985, ch. 340, §§ 1, 2; 1986, ch. 551, § 9; 2007, ch. 189, § 43; 2007, ch. 201, §§ 1, 2; TCA § 66-11-144; Acts 2008, ch. 804, §§ 1, 2; 2010, ch. 875, § § 1, 2; 2012, ch. 609, § § 2-5.]

3. TCA 66-34-203. Withholding of Payment or Retainage by Owner

Nothing in this chapter shall prevent the owner from reasonably withholding payment or a portion of a payment to the contractor; provided, that such withholding is in accordance with the provisions of the written contract between the owner and the contractor. The owner may also withhold a reasonable amount of retainage as specified in the written contract between the owner and the contractor; provided, however, that the retainage amount may not exceed five percent (5%) of the amount of the contract.

[Acts 1991, ch. 45, § 1; 2007, ch. 201, § 4.]

4. TCA 66-34-103. Withholding of Retainage — Violations — Penalties

- (a) All construction contracts on any project in this state, both public and private, may provide for the withholding of retainage; provided, however, that the retainage amount may not exceed five percent (5%) of the amount of the contract.
- (b) The owner, whether public or private, shall release and pay all retainages for work completed pursuant to the terms of any contract to the prime contractor within ninety (90) days after completion of the work or within ninety (90) days after substantial completion of the project for work completed, whichever occurs first. As used in this subsection (b), work completed shall be construed to mean the completion of the scope of the work and all terms and conditions covered by the contract under which the retainage is being held. The prime contractor shall pay all retainages due any subcontractor within ten (10) days after receipt of the retainages from the owner. Any subcontractor receiving the retainage from the prime contractor shall pay to any subsubcontractor or material supplier all

retainages due the subsubcontractor or material supplier within ten (10) days after receipt of the retainages.

- (c) Any default in the making of the payments shall be subject to those remedies provided in this part.
- (d) In the event that an owner or prime contractor withholds retainage that is for the use and benefit of the prime contractor or its subcontractors pursuant to § 66-34-104(a) and (b), neither the prime contractor nor any of its subcontractors shall be required to deposit additional retained funds into an escrow account in accordance with § 66-34-104(a) and (b).
- (e) (1) It is an offense for a person, firm, or corporation to fail to comply with subsection (a) or (b) or § 66-34-104(a).
 - (2) (A) A violation of this subsection (e) is a Class A misdemeanor, subject to a fine only of three thousand dollars (\$3,000).
 - (B) Each day a person, firm or corporation fails to comply with subsection (a) or (b) or § 66-34-104(a) is a separate violation of this subsection (e).
 - (C) Until the violation of this subsection (e) is remediated by compliance, the punishment for each violation shall be consecutive to all other such violations.
 - (3) In addition to the fine imposed pursuant to subdivisions (e)(2)(A) and (B), the court shall order restitution be made to the owner of the retained funds. In determining the appropriate amount of restitution, the formula stated in § 40-35-304 shall be used.

[Acts 2007, ch. 201, § 3; 2008, ch. 804, § 3; 2012, ch. 609, § 1.]

END OF SECTION