

SECTION 22 46 00

WATER CONDITIONING EQUIPMENT

Revision History

0		Issue for Tender	Af	Af	
Rev.	Date	Description of Revision	Prepared By	Checked By	Approved By

SECTION 22 46 00

WATER CONDITIONING EQUIPMENT

INDEX

PART 1 - GENERAL

- 1.1 RELATED DOCUMENTS
- 1.2 WORK INCLUDED
- 1.3 DESCRIPTION OF WORK
- 1.4 QUALITY ASSURANCE
- 1.5 SUBMITTALS
- 1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

PART 2 PRODUCTS

- 2.1 PACKAGED FILTRATION SYSTEM
- 2.2 COPPER SILVER IONIZATION UNIT
- 2.3 ULTRA VIOLET STERILIZATION UNIT
- 2.4 TERMINAL FILTERS (FOR DRINKING WATER)

PART 3 - EXECUTION

- 3.1 INSTALLATION



PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- 1.1.1 Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 WORK INCLUDED

- 1.2.1 Compliance with relevant General Requirements of Mechanical Services.

1.3 DESCRIPTION OF WORK

- 1.3.1 Furnish and install Plumbing Equipment as indicated on drawings.

1.4 QUALITY ASSURANCE

- 1.4.1 Manufacturer's Qualifications: Firms regularly engaged in manufacture of specified items with characteristics, sizes and capacities required, whose products have been in satisfactory use in similar service for not less than 5 years.
- 1.4.2 Certification, test certificates under specified operating conditions shall be provided by manufacturer.

1.5 SUBMITTALS

- 1.5.1 Product Data: Submit manufacturer's specifications and installation instructions.
- 1.5.2 Shop Drawings: Submit manufacturer's assembly-type shop drawings indicating dimensions, weight loadings, required clearances and methods of assembly of components.
- 1.5.3 Wiring Diagrams: Submit manufacturer's electrical requirements for power supply wiring to equipment. Submit manufacturer's ladder-type wiring diagrams for interlock and control wiring. Clearly differentiate between portions of wiring that are factory – installed and portions to be field- installed.
- 1.5.4 Maintenance Data: Submit maintenance data and parts lists for each type of equipment, control and accessory, including "trouble – shooting" maintenance guide. Include this data, product data, shop drawings and wiring diagrams in maintenance manual.

1.6 PRODUCT DELIVERY, STORAGE AND HANDLING

- 1.6.1 Handle equipment and components carefully to prevent damage, breaking, denting and scoring. Do not install damaged equipment or components, replace with new.
- 1.6.2 Store equipment and components in clean dry place. Protect from weather, dirt, fumes, water, construction debris, and physical damage.

PART 2 - PRODUCTS

2.1 PACKAGED FILTRATION SYSTEM

- 2.1.1 A packaged multimedia filtration system complete shall be supplied for turbidity odour and smell removal. Capacity shall be as indicated on the drawings.
- 2.1.2 Filter tank shall be suitable for a working pressure of 689 KPa (100psi) and tested at 50% in excess of the working pressure. Shell height to allow a minimum free board space of 100% of the mineral bed depth for adequate expansion during backwashing. Tank to be equipped with one manhole located in the top head of the tank. Filter tank to be supported by legs and be painted with a rust inhibiting primer. Filter tank shall be of glass reinforced polyester construction.
- 2.1.3 The collector system shall consist of a plate welded to the complete diameter of the tank and centrally supported by a pier. Plate to accommodate collectors spaced to collect and dispense water laterally. Multiple layers of filter media to be furnished to properly distribute the backwash water and support the mineral bed.
- 2.1.4 Following media shall consist of four layers as follows:
- 2.1.4.1 Top layer to consist of light weight chips to retain large flat pieces of debris.
- 2.1.4.2 Second layer to collect the bulk of coarse turbidity.
- 2.1.4.3 Third layer to remove finer particles not collected in the upper layers.
- 2.1.4.4 Bottom layer of high density material to polish the water removing particulates down to 10 micron size.

- 2.1.5 All filter media shall be of good quality possessing characteristics of durability, long life, resistance to attrition and shall not impart taste, odour or colour to the water being treated. Filter media shall be selected for removing particulates down to 10 micron size.
- 2.1.6 The filter unit shall be equipped with a fully automatic, self contained control valve using a cartridge design permitting instant service. Timer to automatically control the filter clean-up cycle on a pre set schedule. Duration of backwash and rinse cycles to be factory set to accommodate site conditions.
- 2.1.7 The filtration unit shall be suitable for removal of suspended matters, de-chlorination, organic removal, and odour removal.

2.2 COPPER SILVER IONIZATION UNIT

- 2.2.1 Copper silver ionization unit (Ion Chamber Cell) is constructed of cut grooved, schedule 40 Stainless Steel pipe, industry Victaulic unions or flanges.
- 2.2.2 Industrial grade electrical connectors, individually link each of the ion chamber cells to computer control system for instant action/reaction and precise copper and silver ion generation. All external/internal electrical interfaces with the electrodes should be isolated in a safety enclosure.
- 2.2.3 Internal components and configurations offer a high surface "Cross section" contact area, between the water and the electrodes to maximize ionic performance. Internal laminar flow hydrodynamic features, eliminate water turbulence to minimize sedimentation and electrode scaling due to obstructions and water eddies.
- 2.2.4 The internal electrodes are composed of certified high quality copper and silver alloys.
- 2.2.5 Installation for the copper silver unit including control panel and connection with circulating pump, etc... should be as per manufacturer requirement. Also, this system shall be connected with BMS.

2.3 ULTRA VIOLET STERILIZATION UNIT

- 2.3.1 The ultra violet sterilization unit shall provide protection against water borne organisms. The unit shall include stainless steel sterilizing chambers with removable head. UV lamps shall slide into high purity quartz sleeves. Sleeves shall be attached to chamber head so that these may be easily removed as a bundle for inspection and cleaning.
- 2.3.2 A flow regulator on the discharge line shall maintain flow to ensure an exposure dosage of at least 30,000 micro watt-sec/cm.
- 2.3.3 The sterilizer unit shall include high powered ballast, fuse, power safety switch all inside a white enamel housing with stainless steel cover.
- 2.3.4 The sterilizer unit shall be proceeded with an inline filter on the water line to remove sediment down to 10 microns.
- 2.3.5 Accessories shall include an intensity monitor and pilot light, alarm horn.

2.4 TERMINAL FILTERS (For Drinking Water)

- 2.4.1 Type: Ceramic cartridge with activated carbon fill.
- 2.4.2 Function: Taste and odour removal and sub-micron filtration of dirt and bacteria.
- 2.4.3 Construction: Stainless steel housing with threaded connection and threaded inlet and outlet ports.
- 2.4.4 Accessories: Mounting bracket, chrome plated brass wall unions at inlet and outlet; outlet piping concealed in the wall; ball type isolating valve at the inlet and a bib tap above the deck for outlet.

PART 3 - EXECUTION

3.1 INSTALLATION

- 3.1.1 All material shall be installed strictly in compliance with the manufacturer's instructions.
- 3.1.2 Run all piping as direct as possible, avoiding unnecessary offsets.
- 3.1.3 The interconnecting piping for plants shall be UPVC Class E and the valves shall be non-corrosive material.
- 3.1.4 The installation shall be carried out and validated by the water treatment plant supplier.
- 3.1.5 Ream all pipes to full inside diameter after cutting and thoroughly clean before erection. All material shall have proper identification marks that can be verified prior installation.
- 3.1.6 After the plants are installed, thoroughly flush all piping before running pumps sterilizing the potable water system.
- 3.1.7 The sterilization works shall be included in the operation and maintenance manual.

END OF SECTION