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DETAILED EQUIPMENT SPECIFICATION

MFG SERIES FILTERS

1.0 SCOPE

- 1.1 Provide as indicated a factory assembled vertical pressure type filter system. The system shall be of an approved design as fabricated by a manufacturer regularly engaged in the production of water treatment equipment. All equipment and material shall be supplied per the specifications as intended for a complete and operational system.
- 1.2 The filter system is intended for _____. Choose one of the following: (Iron / Manganese Removal) (Acid Neutralization) (Sediment Removal) (Taste / Odor, Organic Reduction, Chlorine Removal) (Other).
- 1.3 Qualified manufacturers of water conditioning equipment shall be engaged in the manufacture of this type of equipment for a period of not less than (10) years. Acceptable manufacturers are Marlo Inc, or engineer's approval equal.

2.0 GENERAL DESCRIPTION

- 2.1 The system, in compliance with equipment specifications, is described as an _____. Choose one of the following: (Single) (Twin) (Triple) (Quad) (Other) water filter system meeting the design data requirements as hereinafter specified.
- 2.2 The system specifications are based on Marlo Model_____.

3.0 DESIGN DATA

3.1 DESIGN PARAMETERS

Normal System Flow & Pressure Drop_____ GPM@ ___ PSI per vessel
Maximum System Flow & Pressure Drop_____ GPM@ ___ PSI per vessel
Daily Water Usage_____Gallons/Day
Daily Hours of Water Demand_____Hours/Day
Backwash Flow _____ GPM
Filter Tank Freeboard _____% minimum.
Operating Temperature Range_____°F
Operating Pressure Range (System)_____PSIG
Electrical Requirement _____
System Dimensions (LxWxH) _____

(Note – pressure drop with unit(s) on line and backwashed clean).

3.2 EQUIPMENT SCHEDULE

Filter Tanks Qty. _____ Dia. _____ in. SideShell _____ in.
Service Valves Size _____ in. Type _____
Filter Media Qty. _____ cu. ft./tank _____ cu.ft.total

Backwash / Regeneration Controller Type _____.

Choose one of the following: (Time Clock) (Signal Actuated) (Other)

4.0 EQUIPMENT

4.1 Filter Tank (s)

The filter tank(s) shall be of wound fiberglass with polyethylene lining. The inner shell is constructed of high density polyethylene (HDPE) which is wound with continuous fiberglass roving for strength. The tank shall be rated at 150 psig operating pressure and 120⁰ F temperature. Each tank is factory tested prior to shipment. The tanks shall meet the requirements of NSF and WQA.

4.1.1 Tank Option

ASME code stamped and certified working pressure to be 150 psi., available on 24" x 72" and larger tanks only.

4.2 Distributor Assembly

Filters with 21 inch diameter and larger tanks will be equipped with a hub and lateral distributor system constructed of ABS and PVC. The laterals will be slotted to prevent media loss. Tanks 18 inch diameter and smaller will include a single non-clogging segmented distributor constructed of ABS. The distributor shall be covered with a gravel support bed.

4.3 Main Operating Valves

A fully automatic multiport control valve shall be provided to cycle the filter through the down flow service, up flow backwash and down flow rinse operating modes. The valve shall be constructed with cast brass valve body and Teflon coated brass piston. The valve will be controlled by a single piston that is motor driven for positive operation. The control system shall consist of piston motor timer / positioner which controls the regeneration program and is fully adjustable.

4.3.1 Separate Source Backwash Option

The filter system shall be furnished with additional diaphragm valves which allows use of a separate source of water for backwashing.

4.4 Flow Control

An automatic backwash control shall be provided to maintain a proper backwash and fast flush flows over wide variations of operating pressure. Controller to contain no moving part, and requires no field adjustment.

5.0 REGENERATION INITIATION OPTIONS (Choose One)

5.1 Control

A time clock, 7 or 12 day, is provided to allow the system to be regenerated at any time of the day or night, on any day(s) of the week.

5.1.1 Control Option

An auxiliary switch shall be provided to allow the filter to be interlocked with other equipment during the regeneration cycle.

5.1.2 Control Option.

Differential pressure switch initiation controller. Backwash shall be initiated based on a measurement of increased pressure loss across the system.

6.0 FILTER MEDIA – Choose one of the following:

- 6.1 Manganese Greensand
The filter bed shall be provided for iron, manganese and suspended solids removal. The media has an effective size of 0.3 to 0.35 mm and filter requires a minimum bed depth of 30 inches. Regeneration with potassium permanganate is needed for efficient iron and manganese removal.
- 6.2 Manganese Greensand / Anthracite
A dual-media filter bed shall be provided for efficient iron, manganese and suspended solids removal. The filter bed consists of two layers of media to reduce filter pressure drop, provide deep bed filtration and long filter runs. The first layer will consist of hard coal anthracite with an effective size of 0.6 to 0.8 mm. The second layer consists of manganese greensand with an effective size of 0.3 to 0.35 mm. Total bed depth shall be a minimum of 30 inches. The manganese greensand can be regenerated with potassium permanganate and chlorine for efficient iron and manganese removal.
- 6.3 Activated Carbon
An activated carbon filter bed will be provided for chlorine, organic, color, taste and odor removal. The carbon shall be manufactured from bituminous coal with a 12 x 40 mesh particle size and has approximately 900 square meters or surface area per gram. The carbon will have a minimum iodine number of 800 and a minimum abrasion number of 75. The carbon bed depth shall be a minimum of 30 inches.
- 6.4 Multi – media
A multi-media filter bed will be provided for superior quality effluent and long filter runs. The filter bed shall be constructed of graded layers of media to provide deep bed filtration, low pressure drop and the ability to remove particles down to 10 microns. The top layer will consist of hard coal anthracite with an effective size of 0.6 to 0.8 mm. The second layer consist of sand with an effective size of 0.45 to 0.55 mm. The third layer consists of 30 to 40 mesh garnet with and effective size of 0.25 to 0.42 mm. The fourth layer consists of 8 – 12 mesh garnet with and effective size of 1.4 mm. Total bed depth shall be a minimum of 30 inches.
- 6.5 Filter AG
The filter media shall be a non-hydrous aluminum silicate with irregular surface characteristics affording maximum removal of suspended matter throughout the filter bed. The media shall not be affected by chlorine nor require any type of chemical regeneration. Particle retention shall be forty (40) micron or larger.
- 6.6 Calcite / Corosex
The filter media shall be crushed and screened white marble material. The media shall slowly dissolve in contact with acidic water to elevate the pH and increase alkalinity. pH elevation to the range 6.8 to 8.5 shall be accomplished without the use of chemical additives.

7.0 CHEMICAL REGENERATION SYSTEM OPTION

Manganese greensand requires regeneration with potassium permanganate in order to provide efficient oxidation / filtration of iron and manganese. Choose one of the following:

7.1 Continuous Feed Regeneration

An inline flow meter with magnetically operated read switch to provide a contact closure proportional to system flow rate. Meters shall be a cast brass body with direct multijet high-speed impeller. An electronically controlled diaphragm type chemical feed pump properly sized for the system flow rate. The pump shall automatically adjust the frequency of stroke based on contacts supplied by the inline flow meter. The wet end of the pump shall be compatible to the type of chemical required. A suitably sized polyethylene storage tank assembly shall be provided with a minimum capacity of 30 gallons. The tank shall allow for mounting of the pump and contain a straightening tube to be run over the pump suction tubing. A suitably sized agitator shall be provided for mixing and dissolving the chemicals. The meter shall be totally enclosed fan cooled with an internal on-off switch. The shaft and impeller on the agitator shall be stainless steel with an epoxy coating suitable for the service. The agitator shall be mounted directly to the tank assembly.

7.2 Batch Regeneration

A chemical regenerant tank shall be supplied to hold potassium permanganate for regeneration of the manganese greensand bed. Tank size diameter _____ in. Height _____ in. with draw assembly and eductor for periodic batch regeneration.

8.0 ACCESSORIES OPTION

8.1 Pressure Gauges for raw water inlet and filtered water outlet.

8.2 Sampling Cocks for raw water inlet and filtered water outlet.

9.0 INSTRUCTIONS

A complete set of installation, operating and maintenance manuals shall be provided.

10.0 FIELD SERVICE

The services of a factory authorized service representative shall be made available to supervise, inspect, and provide operator training as required for initial start-up and system operation.

11.0 GUARANTEE

Under normal operating conditions, the media shall not be washed out of the system during backwash or service. Any mechanical equipment proving defective in workmanship or material within one year after installation or 18 months after shipment, whichever comes first, shall be replaced FOB factory. Fiberglass filter tanks are guaranteed for five years after installation.