

**SECTION 13 17 23
THERAPEUTIC POOLS**

SPEC WRITER NOTE: Delete between // // if not applicable to project. Also delete any other item or paragraph not applicable in the section and renumber the paragraphs.

PART 1 - GENERAL

1.1 DESCRIPTION:

- A. This section includes therapeutic pool equipment, filtering, heating, circulating, and sterilizing components.

1.2 RELATED WORK:

- A. Section 01 00 00, GENERAL REQUIREMENTS: Requirements for pre-test of equipment.
- B. Section 13 05 41, SEISMIC RESTRAINT REQUIREMENTS FOR NON-STRUCTURAL COMPONENTS: Seismic requirements for non-structural equipment.
- C. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING: General mechanical requirements and items, which are common to more than one section of Division 22.
- D. Section 22 11 23, DOMESTIC WATER PUMPS and Section 22 14 29, SUMP PUMPS: Requirements for circulating pumps, sump pumps.
- E. Section 23 07 11, HVAC, PLUMBING, AND BOILER PLANT INSULATION: Requirements for pipe insulation.
- F. Section 22 05 11, COMMON WORK RESULTS FOR PLUMBING, which includes welding qualifications.
- G. Section 22 05 19, METERS AND GAGES FOR PLUMBING PIPING and Section 22 05 23, GENERAL-DUTY VALVES FOR PLUMBING PIPING: For copper tubing valves and gages.
- H. Section 22 33 00, ELECTRIC DOMESTIC WATER HEATERS: For semi instantaneous water heaters.

1.3 QUALITY ASSURANCE:

- A. Manufacturer's Qualifications: Manufacturer with five (5) years continuous documented experience in // design // and // fabrication // and // installation // of therapeutic pools of type and size required for that project. Submit qualifications.
- B. Manufacturer's product submitted has been in satisfactory and efficient use on minimum of three (3) installations similar and equivalent to this project for past three (3) years.

- C. Installer Qualifications: An experienced installer with five (5) years continuous documented experience who has specialized in installing therapeutic pools similar to those indicated for this Project and who is acceptable in writing to manufacturer. Submit qualifications.

1.4 WARRANTY:

- A. Construction Warranty: Comply with FAR clause 52.246-21, "Warranty of Construction".
- B. Manufacturer Warranty: Manufacturer shall warranty their therapeutic pools for a minimum of two (2) // // years from date of installation and final acceptance by the Government. Submit manufacturer warranty.

1.5 SUBMITTALS:

- A. Submit in accordance with specification Section 01 33 23, SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES.
- B. Manufacturer's Literature and Data:
 - 1. Pool Inlets
 - 2. Pool Drain
 - 3. Filter System
 - 4. Sight Glasses
 - 5. Float Tank
 - 6. Float Control and Valve
 - 7. Rate of Flow Indicator
 - 8. Hypochlorinator
 - 9. Ozone Generator
 - 10. Hair and Lint Interceptor
 - 11. Vacuum Cleaning Tool
 - 12. Vacuum Cleaning Fittings
- C. Manufacturer qualifications.
- D. Installer qualifications.
- E. Manufacturer's warranty.

1.6 APPLICABLE PUBLICATIONS:

- A. The publications listed below form a part of this specification to the extent referenced. The publications are listed in the text by the basic designation only.
- B. ASTM International (ASTM):
 - F441/F441M-13.....Chlorinated Poly (Vinyl Chloride) (CPVC)
Plastic Pipe, Schedules 40 and 80
- C. Manufacturers Standardization Society (MSS) of the Valve and Fitting Industry, Inc.:

SP-80-08.....Bronze Gate, Globe, Angle and Check Valves

PART 2 - PRODUCTS

2.1 POOL INLETS:

Nozzle-type with adjustable plastic jet head and regulating shutter in strainer plate to control flow. Inlets to have cast brass body, with anchor flange and all exposed parts nickel bronze.

2.2 POOL DRAINS:

- A. Gutter Drains: Cast brass body with chromium plated polished brass strainer or polyvinyl chloride (PVC) approximately 64 by 95 mm (2-1/2 by 3-3/4 inches).
- B. Outlet Drains: Cast Iron body or PVC with adjustable anti-vortex cover of chromium plated brass or stainless steel or PVC not less than 305 mm (12 inches) in diameter.

SPEC WRITER NOTE: Sand filters should only be used unless local Department of Health Codes requires the use of cartridge filters.

2.3 FILTER AND JET SYSTEM:

- A. Vertical pressure type or vacuum type utilizing diatomaceous earth as filtering medium, equipped with pre-coat tank, continuous body feed tank, and all necessary valves, gages, piping and accessories. Filters plant, when handling water from the pool at the rate of // // m/L (// // gpm) to deliver filtrate, free from color, turbidity, or matter in suspension.
- B. Filter Elements: A battery of elements having a total free unobstructed filter area of not less than // // square meters (// // square feet). Filtering medium to be deposited on elements constructed of stainless steel or stone. Elements to be easily removable for cleaning when necessary. Head and tail-pieces to be bronze.
- C. Pressure Type Filter: Filter elements to be contained in filter shells fabricated of high grade tank steel with corrosion-resisting interior finish, riveted or welded, designed for a working pressure of 410 kPa (60 psig). Shells to be tested before shipment under a hydrostatic pressure of 690 kPa (100 psig) and to show no sign of leakage. Top heads to be easily removable to give access to elements. Shells to be securely supported by legs and to have all necessary openings for pipes properly reinforced.
- D. Vacuum Type Filter: Tank to be open type made completely of glass fiber reinforced plastic and externally braced with galvanized steel.

Elements to have suitable porosity and permeability so that after pre-coating initial pressure loss will be less than 3400 Pa (1 inch) mercury. Filter elements to be glass fiber reinforced plastic with mono-filament plastic sleeves, or corrosion-resisting metal, mounted vertically, and connected to a closed underdrain manifold leading to pump suction. Elements to be easily and individually removable and not require tie rods for assembly. Provide filter battery with a vacuum limit switch to stop circulating pump at a predetermined point before reaching maximum possible suction lift.

- E. Vacuum Type Filter Level Control Valve: Modulating type float valve installed in filter inlet line with float operator installed in filter tank to insure no overflowing of filter tank. Valve to be a butterfly type with diaphragm operator and be controlled by a pilot float valve in filter tank. Level control to be fail-safe type.
- F. Pre-coat Tank: Steel, having a capacity of not less than 4.5 kg (10 pounds) of filtering medium. Assemble into inlet piping.
- G. Continuous Feed Tank (Slurry Tank): Continuous motor agitated feed tank of sufficient size for filter battery.
- H. Jets to be adjustable/directional and multi-functional jets formed of thermoplastic co-extrusion of PVC so as not to cause corrosive action with pool shell. Jets to be pumped and plumbed through manufacturer's standard dual pump system. Jets for the therapy pool to include two (2) front resistance/therapy jets. Provide one (1) 1.5 m (5 feet) attachable therapy hose for deep tissue massage. Jets controlled with a variable frequency drive pneumatic controls may not be used. Laminar flow or paddle wheel systems are not to be accepted as adequate replacements for the adjustable multi-directional jet system.

2.4 SIGHT GLASSES:

Manufacturer's standard. Vane to extend into pipe to deflect a continuous stream of water into and through the glass. Sight glass to have blow-off cock.

2.5 FLOAT TANK OR POOL VESSEL:

- A. Constructed of steel or thermoplastic with reinforced fiberglass backing. Steel is welded construction, open top, galvanized after fabrication.
- B. Openings: Sizes shown on construction documents and properly reinforced with flanges welded to tank and threaded for screwed pipe connections,

or may have extra heavy couplings welded to tank both inside and outside.

- C. Support: Iron or steel stand or chair or other type suitable for tank furnished.
- D. Tank Size (Minimum): 2.3 x 4.3 x 1.5 m (7'-6" x 14' x 5') deep containing a volume of 9,911 liters (2,250 gallons) total capacity.

2.6 FLOW METER:

Provide meter capable of operating at 52 degrees C (125 degrees F) and 410 kPa (60 psig). Scale to be calibrated in L/min (gpm) and to be suitable for the flow delivery.

2.7 HYPOCHLORINATOR OR BROMINATOR:

- A. Automatically controlled of sufficient capacity to produce residual chlorine or bromine content in pool water, at any point in pool, of between 0.40 and 0.60 mg/L (0.4 and 0.6 ppm). Hypochlorinator to be installed complete with suction hose, strainer assembly at end of suction hose, sight feed indicator, two hypochlorite solution tanks of sufficient size, and all other necessary accessories.
- B. Furnish one (1) orthotolidin comparator having a standard color disc with a range from 0.05 to 1.00 mg/L (.05 to 1.0 ppm), arranged in nine (9) steps and equipped with a dust-proof eyepiece, fitted with a glass prism which will bring image of treated sample and color standard side by side to facilitate quick and accurate reading.

2.8 OZONE GENERATOR:

Provide automatically controlled non-arc, conforming to OSHA Standards and be suitable for wall mounting. Provide Underwriters Laboratories labeled components. Provide replacement ozone cartridge cells with a minimum life of 6,000 hours.

2.9 HAIR AND LINT INTERCEPTOR:

Install in suction line of circulating pump:

- A. Duplex strainer with heavy cast iron body or PVC body.
- B. Flanged inlet and outlet with iron pipe size (IPS) standard interceptors.
- C. Removable brass or stainless steel or PVC perforated basket strainers.
- D. Gasketed water-tight covers secured with bolted yoke arrangement.
- E. Install MSS SP-80 valves to allow off-stream basket to be removed for cleaning with continuous flow through the other strainer.
- F. Strainer size to be based on a flow rate of 125 percent of circulating pump L/min (gpm), with maximum pressure drop of 45 kPa (15 feet).

Floating weir systems made of PVC material and telescoping skimmer body are also acceptable alternatives.

2.10 VACUUM CLEANING TOOL:

- A. Provide the following: "Tow Type" vacuum cleaning tool complete with 381 mm (15 inch) sweep, renewable bristle brush, with handle and swivel tee connection and // solid rubber // // rubber-tired wheels //, extension handles.
- B. 15.2 m (50 feet) of vacuum hose with couplings at each end.
- C. Six copper floats, with clamps, for hose.
- D. Provide cast iron body, with polished brass, chromium plated, adjustable vacuum connection with cover.

SPEC WRITER NOTE: A handheld vacuum is an alternative to "Tow Type" vacuum. Edit accordingly per size of pool to be cleaned.

//E. Handheld vacuum model with manual suction stimulation. //

2.11 POOL HEATERS:

- A. Refer to specification Section 22 33 00, ELECTRIC DOMESTIC WATER HEATERS, for semi instantaneous water heaters.

2.12 COMPUTER DOCUMENTATION SYSTEM AND REMOTE CONTROL OPERATIONS:

- A. Provide a custom designed control system that utilizes a fully integrated control system based around an industry standard PLC (Programmable Logic Controller) which monitors pool conditions through various sensors. Provide PLC that communicates with the Operator/Trainer via the infrared remote control, the maintenance pendant, and Windows-based software running on a personal computer. Provide software capable of monitoring the pool functions, treadmill speed, and jet power via RS-232 communications with the PLC, and then use this information to display current session information, and store the information in a patient database for future reference, and progress reports.
- B. Provide control system that includes:
 - 1. Water-resistant remote control unit, which can control jet action, treadmill floor action.
 - 2. Manual controls for the previously listed items, thermostatic control of water temperature, filtration system controls, and all other pertinent controls for a complete working system.
- C. Provide pool electronic patient monitoring systems with PC i5 processor (minimum) complete with 610 mm (24 inch) monitor, mouse, desktop unit,

surge protector, and keyboard, two fixed underwater cameras, camera switching device, 635 mm (28 inch) viewing monitor, // DVR (Digital Video Recorder) // // NVR (Network Video Recorder) //, and appropriate software and licensing agreements.

2.13 PIPING AND DRAINS:

- A. Provide PVC schedule 40 piping (ASTM F441/F441M) from each drain with shutoff valve as required and down turn to existing adjacent sump pit drain. Do not provide water supply piping of ferrous metals to prevent corrosion and water chemistry issues.
- B. Pool drain: Install and connect pool drain from the pool to the designated location in the sump pit. Refer to Section 22 14 29, SUMP PUMPS.

PART 3 - EXECUTION

3.1 INSTALLATION:

- A. Install therapeutic pool equipment as per manufacturer's instruction and under the supervision of manufacturer's qualified representative and as shown on construction documents.
- B. Seal watertight pool inlets.
- C. Install flow meter on filtered water supply pipe to pool.
- D. Install sight glass as required per manufacturer's instructions.
- E. Installation and activation of chlorinator to be under direct supervision of a qualified representative of manufacturer of apparatus.

3.2 INSTRUCTION AND PERSONNEL TRAINING:

- A. Provide one (1) 8-hour day of pool and water chemistry training to the Government facility maintenance personnel to educate on how to maintain the pool and properly care for the pool water. Provide additional training when directed by the Contracting Officer Representative (COR) for the physical therapists, doctors and athletic trainers on water therapy and conditioning techniques.

3.3 TEST:

- A. Conduct performance test, in the presence of the COR and a manufacturer's field representative, to show that all therapeutic pool equipment and control devices operate properly and in accordance with design and specification requirements.

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