

GENERAL

The contractor shall furnish and install one complete wastewater pumping station. Principal items of equipment shall include a precast concrete wet well, full access steel cover, duplex submersible pumps, remote pump removal system, pump discharge piping, alternating electrical controls complete with Norweco Tilt-a-Trol™ mercury level control sensors and flashing high liquid level alarm light, and all necessary internal piping and mechanical equipment as described in the following specifications and as manufactured by Norweco, Inc., Norwalk, Ohio, U.S.A.

The pumping station wet well shall be reinforced to withstand normal pressures from external soil and internal hydrostatic loads. To eliminate any possibility of differential settling of the tankage, the contractor shall install a six inch thick leveling pad of sand or stone in the bottom of the excavation prior to tank setting.

OPERATING CONDITIONS

The wastewater pumping station shall be as shown on Drawing Number _____ and shall be a Model Number _____. Duplex submersible pumps shall be installed within a wet well having an internal diameter of _____ feet and a wall thickness of _____ inches. Each pump shall be capable of delivering _____ gallons per minute against a total dynamic head (TDH) of _____ feet. The pump shut-off head shall not be less than _____ feet. At a minimum TDH of _____ feet, the pumps shall not overload their motors beyond the nameplate service factor. The anticipated operating range shall be from _____ feet TDH minimum to _____ feet TDH maximum.

WET WELL

The wastewater pumping station wet well shall be constructed of properly reinforced five thousand PSI, twenty-eight day compression strength precast concrete. Each casting used to construct the chamber shall be a monolithic unit. Individual sections shall be joined with an approved joint. To insure the watertight integrity of the finished structure, each joint shall be sealed with a self-adhering compression gasket. The gasket shall be of a resilient, synthetic, self-sealing material. Non-compression joints with grouted sealing compounds shall not be used. To eliminate joint interference, inlet and outlet piping connections shall be located a minimum of eight inches from adjacent joints.

An access ladder shall be provided to permit emergency access. The ladder shall extend over the full height of the wet well and shall be constructed of drop front type steps permanently cast in place.

A steel access cover complete with bi-fold doors shall be installed to provide full access to pumping station equipment. The doors shall be equipped with drop type lifting handles and a pin tumbler type padlock that is a part of the master-keyed system used for tank openings, control cabinets and related equipment. The cover shall include a mercury level control sensor mounting bracket and vent assembly complete with a screened vent cap.

The capacity of the wet well below the inlet invert shall be _____ gallons. Mercury level control sensors shall be adjusted to provide an effective capacity of _____ gallons and to provide _____ minute retention of the average daily flow.

PUMPING STATION SPECIFICATIONS

PUMPS

Duplex alternating Norweco Model _____ submersible pumps wired for _____ volt, _____ phase, _____ cycle operation shall be installed in the wastewater pumping station. The pump motors shall be _____ horsepower operating at _____ RPM. All openings and passages shall be of sufficient size to permit the passage of a _____ inch diameter sphere.

The submersible pump motors shall contain moisture resistant windings and shall be NEMA Design B mounted in an oil filled watertight housing. Three phase motors shall be dual voltage having a voltage tolerance of +10% to -14% of nameplate rating. When operating at the rated horsepower, the motor shall reach a maximum speed that exceeds ninety-seven percent of the referenced synchronous speed. The submersible pumps shall be capable of operating continuously in a totally or partially submerged condition at the rated load. The pumps shall also be capable of operating continuously in a totally dry condition.

The stator casing and oil casing shall be of high grade cast iron construction. The impeller shall be two vane, non-clog, semi-open type of cast iron or all bronze construction and all external fasteners shall be of stainless steel.

Each pump shall be provided with a mechanical shaft seal, running in an oil reservoir. The seal shall consist of one stationary and one rotating tungsten-carbide ring with each held in contact by separate springs. The lower compression spring shall be protected against exposure to the pumped liquid. The seals shall require no maintenance or adjustment and shall be easily replaceable.

REMOTE PUMP REMOVAL SYSTEM

A remote pump removal system shall be installed to allow pump installation and removal from grade without personnel entry into the wet well. A movable sealing flange shall be mounted on the pump discharge. A stationary receiving flange shall be mounted at the bottom of the vertical pump discharge piping. The pump shall be raised and lowered into position by a telescopic hoist assembly. Galvanized schedule forty steel guide rails shall direct the pump and movable flange to the proper position for interconnection to the stationary receiving flange. The mating flanges shall be designed to effect a positive connection and seal when the pump is installed.

The telescopic hoist shall extend a minimum of five feet above the wet well access cover when in the upright position and shall be secured by a pinlock device. The hoist shall retract fully to allow the bi-fold doors to be closed and locked. The hoist shall be located in a manner that permits the removal of either pump and shall allow full three hundred-sixty degree rotation for direct loading to a service vehicle. The hoist shall have a rated capacity of not less than seven hundred-fifty pounds. A one thousand pound rated, five-eighths inch diameter polypropylene lifting cable shall be securely attached to each pump. The lifting cables shall be arranged to allow connection to the hoist for pump installation or removal.

Galvanized schedule forty steel guide rails shall be installed extending over the full depth of the wet well. Two guide rails shall be installed on opposing sides of each pump discharge and shall be set plumb to insure a proper sliding action free of side motion or swiveling. The guide rails shall interlock with the stationary receiving flange base and shall be secured by a structural steel bracket mounted to the wet well access cover.

PUMPING STATION SPECIFICATIONS

PUMP DISCHARGE PIPING

The pump discharge piping shall be constructed of galvanized schedule forty steel pipe and galvanized schedule forty malleable iron threaded pipe fittings. A removable cleanout plug shall be installed at the top of the vertical discharge pipe. Individual galvanized pipe unions, dresser couplings and flexible couplings with stainless steel clamps shall be provided as necessary in the pump discharge piping.

VALVES (OPTIONAL)

Discharge check valves shall be provided for each pump to prevent recirculation where common force mains are utilized. The check valve shall be of the brass swing or weighted arm type. A non-rising stem type gate valve shall also be installed immediately downstream of the check valve. The check and gate valves shall be installed in each discharge line at the top near the access door and shall be complete with all necessary pipe fittings and flanges.

VALVE CHAMBER (OPTIONAL)

An external valve chamber shall be provided. Equipment installed within the valve chamber shall include spring or weighted arm type check valves, non-rising stem type gate valves, optional recirculating bypass line, chamber drain line to the wet well, all necessary pipe fittings and flanges.

The valve chamber shall be constructed of properly reinforced five thousand PSI, twenty-eight day compression strength precast concrete. Each casting used to construct the chamber shall be a monolithic unit. Individual tank sections shall be joined with an approved joint. To insure the watertight integrity of the finished structure, each joint shall be sealed with a self-adhering compression gasket. The gasket shall be of a resilient, synthetic self-sealing material. Non-compression joints with grouted sealing compounds shall not be used.

FLANGED DISCHARGE PIPING (OPTIONAL)

The pump discharge piping shall be constructed of Class 125 cast iron flanged pipe and fittings and shall conform to ANSI B16.1 and ASTM A197 standards. Weighted arm, swing type flanged check valves and non-rising stem, resilient seat type flanged gate valves shall also be provided. The check valves and gate valves shall be installed in a precast concrete valve chamber. Individual pipe unions, dresser couplings and flexible couplings with stainless steel clamps shall be provided as necessary in the pump discharge piping.

ELECTRICAL CONTROLS

The wastewater pumping station electrical controls shall be mounted within a weatherproof NEMA 4X enclosure. The enclosure shall have two coats of weather-resistant paint and be equipped with a pin tumbler type padlock as part of the master-keyed system used for all pump station closures. The electrical enclosure shall be mounted on the pump station cover.

The electrical controls shall include a duplex alternating pump motor control center complete with across-the-line switch type combination starters, three phase overload protection, control circuit transformer, electrical alternator, reset pushbutton and terminals for connection of overload or high water level alarm and "Hand-Off-Auto" toggle selector switches. The motor control center shall be a Model _____ as manufactured by Norweco, Inc., Norwalk, Ohio, U.S.A. or equal.

PUMPING STATION SPECIFICATIONS

The electrical controls shall be designed for automatic operation utilizing Norweco Tilt-a-Trol™ mercury level control sensors. The controls shall provide automatic alternation at each successive pump cycle to equalize pump usage.

Rising liquid level in the wet well shall activate the “lead pump” level sensor initiating a pump cycle. The pump cycle shall be terminated by the “pumps off” level sensor which shall be adjusted to maintain a minimum liquid level in the wet well to facilitate pump cooling. An additional level sensor shall initiate operation of the lag pump if the liquid level rises six inches above the lead pump activation point. A flashing high liquid level alarm light shall be activated if the liquid level rises to within six inches of the wet well inlet invert elevation.

CORROSION PROTECTION

After completion of welding, all steel surfaces of the dosing station equipment shall be blasted to white metal. All surfaces shall be primed with one coat of strontium chromate primer thinned ten percent with epoxy thinner, for a dry thickness of one and one-half mils. After a minimum of eight hours drying time, two coats of catalyzed PPG Aquapon shall be applied, one coat in a horizontal spray pattern and one coat in a vertical spray pattern. This shall produce a four to six mil total dry thickness on the interior surfaces and six to nine mil total dry thickness on the exterior surfaces.

The finished interior and exterior color shall be Norweco green. The plant manufacturer shall provide sufficient finish coating packaged for field touch-up.

MANUFACTURER

The equipment specified herein shall be the product of a manufacturer having a minimum of five years experience in the construction of prefabricated equipment of this particular type and design. The contractor shall prepare his bid on the basis of the specific equipment and materials specified for purposes of determining the low bid. This is not done, however, to eliminate other products or equipment of equal quality and efficiency. Substitution of equipment may be made if the proposed substitution is superior or equal in construction and performance. If equipment is to be substituted, the contractor shall obtain engineering drawings and specifications for the project. It is assumed that the substitution will result in a reduction of cost to the contractor and, if revised drawings submitted by the contractor are approved, the savings will be passed along in a reduction of the contractor's bid price. After execution of the contract, substitution of equipment of makes other than that specified will not be considered.

WARRANTY

The manufacturer shall warrant the equipment being supplied to the owner against defects in workmanship and materials for a period of one year under normal use and service.

The warranty shall not cover any item which has been subjected to external damage, disassembled and/or repaired by unauthorized persons, flooded or otherwise mistreated. The manufacturer shall not be held liable for any consequential damages or contingent liabilities which are directly or indirectly a result of any failures in materials or equipment, or from delivery or installation delays. Items normally consumed in service such as grease, oil, v-belts, fuses, filters, seals, etc., shall not be warranted.