ITEM 634.840000WY – SANITARY SEWER PUMPING STATION

DESCRIPTION

The work shall consist of providing a sanitary pumping station complete with submersible pumps; piping; fittings; valves and specials; customer power pole; precast structures; hatches; control enclosure; electrical equipment; pump controls; alarm system, manual transfer switch, owner’s standard generator connection, and all appurtenances in accordance with Plans and Specifications or as directed or as approved by the Engineer.

The Contractor shall provide all labor, materials and equipment for a complete installation and a ready for operation sanitary sewer pumping station.

MATERIALS

1. General

All materials and appurtenances required for the work shall be new and of quality matching that specified herein. Where no specific kind or quality of material is given, a first class standard article as accepted by the Engineer shall be furnished.

2. Sanitary Pump Wet Well and Valve Chamber –

   a. Bedding Material: Bedding material for the wet well shall be crushed stone meeting the requirements of NYSDOT Material Designation 703-0201 (No. 1 Stone) and/or as directed or as approved by the Engineer.

   b. Structures: The wet well and valve chamber shall be of pre-cast reinforced concrete construction meeting the requirements of Subsection 704-03, except as noted herein. Precast concrete shall attain minimum 28-day compression strength of 4000 psi. The Engineer reserves the right to reject any pre-cast units that show evidence of poor workmanship or subsequent damage. All tie wires, spreaders, conduit openings, etc., shall be cut back at openings, at least 1½ inches then repaired in accordance with Subsection 704-03. The manufacturer shall comply with all recommendations of the waterproofing company so as to produce a completely waterproof structure. The Precast Sanitary Pump Wet Well and Valve Chamber shall be:


   Or equal, as directed or as approved by the Engineer.

   Wall thickness, floor thickness, together with length, width and height of the pump station shall be as shown on the Drawings. The joint between each section of the structure shall be fitted with a 2 inch butyl rope.
c. Access Hatches:

1) Heavy Duty with Safety Grate: Where shown on the Contract Drawings, an access hatch shall be furnished and installed on the wet well and valve chamber structure top slabs. The access hatch shall be constructed of 1/4 inch aluminum channel frame with an anchor flange around the perimeter. The access door shall be 1/4 inch aluminum diamond shape pattern designed and constructed to withstand a live load of 300 pounds per square foot and shall be equipped with stainless steel hardware throughout and automatic hold open arm(s) with release handle. A snap lock with a removable handle with a recessed hasp covered by a hinged lid flush with surface shall be provided. A bituminous coating shall be applied to the exterior of the frame. A 1-1/2 inch drainage coupling shall be located in the front right corner of channel frame. The device shall be provided with an 8-inch minimum curb. An integral powder coated aluminum safety grate with hinged mechanism shall also be included. When closed, the grate shall conform with OSHA 1910.23 for fall protection. The access hatches shall be:

<table>
<thead>
<tr>
<th>Access Hatch w/ Safety Grate Manufactured By: SYRACUSE CASTINGS, Cicero, NY</th>
<th>Access Hatch w/ Safety Grate Manufactured By: NYSTROM BUILDING PRODUCTS, Brooklyn, MN</th>
<th>Access Hatch w/ Safety Grate Manufactured By: HALLIDAY PRODUCTS, Orlando, FL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model EC HD AOSG</td>
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Or equal, as directed or as approved by the Engineer.

d. Piping, Fittings, Valves and Specials, Etc.: The Contractor shall furnish and install all necessary piping, fittings, valves and specials, etc. at the pump station, as required and as shown on the Drawings.

1) Plug Valve, 4 Inches and Larger

   a) Valves shall be nonlubricated, tapered type.

   b) Type: Cast iron body.

   c) Plug: Drip-tight, steel with resilient facing bonded to sealing surface and suitable for sewage application.

   d) Packing: Nitrile-Butadiene.

   e) Bearings: Heavy duty stainless steel.

   f) Pressures: Working Pressure: 125 psi CWP.

   g) Valve Actuator: Lever-type with lift, turn, and reset action.
Locking device to hold plug in desired position. 
Adjustable memory stop with valve position indicator. 2-inch square actuating nut.

h) Flanged Joint: ANSI B16.1; Class 125, 250 psi working pressure minimum.

i) Coatings: All internal surfaces, except finished surfaces, gaskets, or bearing surfaces shall be epoxy coated in accordance with AWWA C550.

j) Eccentric plug valves shall conform to current AWWA standards and shall be opened and closed with wheel operators. The eccentric plug valves shall be:

<table>
<thead>
<tr>
<th>Eccentric Plug Valve</th>
<th>Eccentric Plug Valve</th>
<th>Eccentric Plug Valve</th>
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<tbody>
<tr>
<td>Manufactured By:</td>
<td>Manufactured By:</td>
<td>Manufactured By:</td>
</tr>
<tr>
<td>G A Industries</td>
<td>PRATT,</td>
<td>DEZURIK,</td>
</tr>
<tr>
<td>Mars, Pa.</td>
<td>Aurora, IL</td>
<td>Sartell, MN</td>
</tr>
</tbody>
</table>

Or equal, as directed or as approved by the Engineer.

2) Check Valves

a) Check valves shall be a non-clog, unobstructed, free flow rolling ball type. The ball shall be out of the flow in the open position and be directed to and from the body seat by guiderails integral with the valve body. The ball shall be actuated by the flowing medium, without the use of springs, levers, weights, etc. The body shall be flanged, cast iron and the ball shall be a hollow steel sphere with a smooth covering of nitrile rubber. The valve shall be suitable for 1030 kPa (150 psi) working pressure. Flanges shall be flat faced and drilled to ANSI B16.1, Class 125 cast iron. The check valve shall be:

<table>
<thead>
<tr>
<th>FLYGT HDL Check Valve</th>
<th>Check Valve</th>
<th>Check Valve</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manufactured By:</td>
<td>Manufactured By:</td>
<td>Manufactured By:</td>
</tr>
<tr>
<td>ITT FLYGT CORPORATION,</td>
<td>CLOW VALVE COMPANY,</td>
<td>G A Industries</td>
</tr>
<tr>
<td>Rochester, NY</td>
<td>Oskaloosa, IA 52577</td>
<td>Mars, Pa.</td>
</tr>
</tbody>
</table>

Or equal, as directed or as approved by the Engineer.

3) Pipe Joints

a) Flanges – Specials, Companion, and Adjustable:

Flange shall conform with ANSI B16.1, Class 125.
Material shall be ductile iron. Threading shall conform with National Standard Pipe Thread.

b) Adaptor Flanges:

Adaptor flanges for ductile iron or steel pipe shall be manufactured of high strength ductile iron, ASTM A536, Grade 65-45-12. Flange dimensions and drilling shall be in accordance with ANSI B16.1, 125 pound pattern for cast iron, and/or ANSI B16.5, 150 pound pattern for steel. Gaskets shall be BUNAS (SBR) in accordance with ANSI/AWWA C111/A21.11 and shall be included with the flange. Set screws shall be of AISI 4140, high strength, low alloy steel, 190,000 psi minimum tensile strength, heat treated and zinc plated for corrosion resistance. Set screws shall be of square-head design and coincide with the manufacturers torque installation requirements for all pipe thicknesses.

Adaptor flanges shall be UL listed and FM approved and shall be Uni-Flange TM Series 200/400, as manufactured by Uni-Flange Corporation, or as directed or as approved by the Engineer.

4) Pipe Supports:

a) All piping, fittings, valves and specials, etc. shall be adequately supported and/or restrained in the pumping station with the use of wall brackets, pipe stands, threaded rod, etc. All hardware shall be constructed of non-corrosive materials and be of a type capable to support and/or restrain the piping, etc. at twice the normal working pressure. Vertical supports shall be placed under each valve, tee, and bend and/or cross.

5) Pipe & Fittings:

a) Working Pressure:

All pipe, fittings, and joints shall be rated for a 150 psi minimum working pressure.

b) Ductile Iron:


c) Steel: Stainless Welded Steel, ASTM A778.

Fittings: Type 304.

d) All piping, fittings, valves and specials, etc. shall be of equal or greater quality than those specified herein. All piping fittings, valves and specials, etc. shall be compatible with the submersible pumps, pump controls, and liquid level sensor system associated with the pump station.

e) Asphalitic Touch-Up Paint for Pipe Fittings and Bolts

Material shall be a self-priming, heavy-duty, cold-applied, water resistant coating made from pitch derived from suitable tars, selected solvents, and mineral fillers.

e. Slide Rail System: A corrosion resistant slide rail base complete with lower guide bar, holder, discharge elbow, and hydraulic sealing flange shall be bolted to the floor of the pump chamber with stainless steel bolts. Each stainless steel slide rail shall be sized per pump manufacturer’s recommendations and shall be anchored to the wet wall with stainless steel anchors at 3-meter (10 feet) (maximum) intervals to prevent deflection. All mounting brackets and hardware shall be stainless steel.

3. Submersible Pumps –

Submersible pumps shall be as identified as on the Drawings. The Contractor shall furnish all labor, materials, equipment, and incidentals required to provide two submersible sewage pumps for each NEC Class I, Division 1, Group D, Hazardous location, as specified herein. Each pump shall be a heavy duty non-clog sewage pump with characteristics specified herein. Equipment furnished under this section shall be warranted against defective parts or workmanship and normal wear and tear for a period of 5 years, and shall include full parts and labor. Prior to installation into the new pumping station, the Contractor shall inspect the submersible pumps for any damage. Should the Contractor find any damage, the Contractor shall make any necessary repairs or replacements. Installation shall be in accordance with the recommendations of the Manufacturer. The Contractor shall make preliminary field tests of the new pump station to ensure that the installation of the submersible pumps are correct. Pumps shall be Meyers, 3RHX, 3.5 inch impeller, 3HP, 230 volts, single phase, capable of 115 GPM @ 15 feet TDH. Once the Contractor correctly installs the submersible pumps and has performed field tests to ensure the station is in operable condition, the Contractor shall connect the new 6 inch force main to the pump station discharge piping at the location noted on the Drawings.

a. General Requirements:

1) Each pump station shall be equipped with the following:

a) Compatible stainless steel guide bar mounting system.

b) Contractor shall furnish two (2) identical pumps for the pump station
c) The pump shall be automatically and firmly connected to the discharge connection, guided by no less than two stainless steel guide bars extending from the top of the station to the discharge connection. Each pump shall be fitted with stainless steel lifting chain. The working load of the lifting system shall be 50 percent greater than the pump unit weight.

d) Sealing of the pumping unit to the discharge connection shall be accomplished by a machined metal-to-metal watertight contact. Sealing of the discharge interface with a diaphragm, O-ring, or profile gasket will not be acceptable.

e) No portion of the pump shall bear directly on the basin floor.

2) Construction:

a) Major pump components shall be of grey cast iron, ASTM A-48, Class 35B, with smooth surfaces devoid of blow holes or other irregularities. All exposed nuts or bolts shall be AISI Type 304 stainless steel or brass construction. All metal surfaces coming into contact with the pumpage other than stainless steel or brass, shall be protected by a factory applied spray coating of acrylic dispersion zinc phosphate primer with a polyester resin paint finish on the exterior of the pump.

b) Sealing design shall incorporate metal-to-metal contact between machined surfaces. Critical mating surfaces where watertight sealing is required shall be machined and fitted with Nitrile or Viton rubber O-rings. Fittings will be the result of controlled compression of rubber O-rings in two planes and O-ring contact of four sides without the requirement of a specific torque limit.

c) Rectangular cross-sectioned gaskets requiring specific torque limits to achieve compression shall not be considered as adequate or equal. No secondary sealing compounds, elliptical O-rings, grease or other devices shall be used.

3) Cable Entry Seal:

a) The cable entry seal design shall preclude specific torque requirements to insure a watertight and submersible seal. The cable entry shall consist of a single cylindrical elastomer grommet, flanked by washers, all having a close tolerance fit against the cable outside diameter and the entry inside diameter and compressed by the body containing a strain relief function, separate from the function of sealing the cable. The assembly shall provide ease of changing the cable when necessary using the same entry seal. The cable entry
junction chamber and motor shall be separated by a stator lead sealing gland or terminal board, which shall isolate the interior from foreign material gaining access through the pump top. Epoxies, silicones, or other secondary sealing systems shall not be considered acceptable.

4) Motor:

a) The pump motor shall be induction type with a squirrel cage rotor, shell type design, housed in an oil filled, watertight chamber, NEMA B type. The stator windings and stator leads shall be insulated with moisture resistant Class F insulation rated for 155 degrees C (311 degrees F). The motor shall be designed for continuous duty handling pumped media of 40 degrees C (104 degrees F) and capable of up to 15 evenly spaced starts per hour. Heat sensor thermostats shall be embedded in the windings to protect the motor. The junction chamber containing the terminal board, shall be hermetically sealed form the motor by an elastomer compression seal. Connection between the cable conductors and stator leads shall be made with threaded compression type binding posts permanently affixed to a terminal board. Wire nuts or crimping type connection devices are not acceptable. The motor and pump shall be designed and manufactured by the same source.

b) The power cable shall be sized according to the NEC and ICEA standards and shall be of sufficient length to reach the junction box without the need of any splices. The outer jacket of the cable shall be oil resistant chloroprene rubber. The motor and cable shall be capable of continuous submersion underwater without loss of watertight integrity to a depth of 65 feet.

c) The motor horsepower (minimum 3HP) shall be adequate so that the pump is non-overloading throughout the entire pump performance curve from shut-off through run-out.

5) Bearings:

a) The pump shaft shall rotate on two bearings. Motor bearings shall be permanently grease lubricated. The upper bearing shall be a single deep groove ball bearing. The lower bearing shall be a two row angular contact bearing to compensate for axial thrust and radial forces.

6) Pump Shaft:

a) Pump and motor shaft shall be the same unit. The pump shaft is an extension of the motor shaft. Couplings shall not be acceptable. The
ITEM 634.840000WY – SANITARY SEWER PUMPING STATION

shaft shall be AISI Type 416 stainless steel.

7) Impeller:
   a) The impeller(s) shall be of ductile iron, class 65, ASTM 536, recessed type.

8) Volute:
   a) Pump volute(s) shall be single-piece grey cast iron. Class 35B, nonconcentric design with smooth passages large enough to pass any media that may enter the impeller. Minimum inlet and discharge size shall be as specified.

9) Motor Protection:
   a) Motor shall have over temperature protection
   b) A leakage sensor shall be provided to detect water in the stator chamber.

4. Pump Control Panel –

   a. The motor control panel shall be assembled and tested by a shop meeting U.L. Standard 508 for industrial controls. All motor control panels shall be assembled and tested by the same manufacturer so as to insure suitability and assurance of experience in matching controls to motors and to insure single source responsibility for the equipment. All control panels shall be furnished by the pump supplier.

   b. All circuit breakers shall be heavy duty thermal magnetic or motor circuit protector similar and equal to square "D" type "FAL". Each breaker shall be sized to adequately meet the operating conditions of the load and have a minimum interrupting capacity of 22,000 amps at 240 vac.

   c. A NEMA 4X fiberglass control panel shall be furnished with each pumping unit to be installed, as shown on the plans.

   d. The control panel enclosure shall be molded of glass reinforced polyester resins which are chemically resistant to corrosion atmospheres. The resin system shall be pigmented to impart a gray color to the enclosure and be resistant to ultraviolet light.

   e. The resin system also shall include a flame retardant to obtain a flammability rating which meets U.L. 94V-O. Heat distortion temperature shall be 350 degrees Fahrenheit.

   f. The enclosure shall be of one piece, weatherproof construction with smooth, rounded corners and shall be constructed to have a smooth exterior and interior. The enclosure
shall be fitted with a closed cell neoprene gasketed cover. The enclosure shall be provided with back panel mounting provisions.

g. The cover shall be hinged with a heavy duty corrosion resistant stainless steel piano hinge. The cover shall be lockable by means of two (2) high quality combination stainless steel latches and padlock hasps.

h. The enclosure shall be provided with external mounting feet on the top and bottom of the enclosure. These mounting feet shall be fiberglass and molded as an integral part of the enclosure.

i. The enclosure shall have a separate dead front inner door. The inner door shall be a minimum of 0.080” aluminum and shall be hinged. All lights, switches, and overload resets shall be mounted through the inner door. Circuit breakers shall also be mounted through the inner door.

j. The back panel shall be a minimum of 0.080” aluminum and held in place by four (4) #10 screws, which will mate to four (4) threaded standoffs, which are molded into the enclosure.

k. The panel shall include pump circuit breakers, control circuit breaker (breakers rated at 10,000 A.I.C.), alarm circuit fuse, control circuit fuse, I.E.C. rated motor starters with 1-pole ambient compensated bimetal overload relays, pump hand-off-auto switches (momentary in the hand position), alarm test switch, pump run lights, seal leak lights, start and run capacitors, start relays, alternator relay (solid state), override relay, terminal blocks, two (2) ground lugs, heat strip, duplex receptacle, elapsed time meters, one set dry contacts for remote monitoring, lockable manual transfer switch, owner’s standard generator connection and all necessary wiring and brackets.

l. The control panel shall be fitted with a red lexan (polycarbonate) alarm light. The light shall be approximately 3" high by 3½" diameter. The globe shall be mounted on top of the enclosure with a neoprene gasket. The lens cannot be removed from the exterior of the enclosure. The lens maybe removed by entering the interior of the enclosure and removing four (4) #8 screws. The bulb shall be 40 watt minimum high intensity-medium base type. The bulb shall be easily replaced by removing a thumb screw from the support bracket on the interior of the panel.

m. The alarm shall have a bright glow and flash during power failure, pump failure and high water conditions. The alarm light will go out when the water level drops.

n. All internal wiring shall be neat and color coded. Each internal wire shall be a different color or stripe (except for ground) and all incoming wires shall terminate into a box clamp type terminal block. All wires shall be 14GA. type TEW rated for 105 degrees.

o. A schematic diagram (showing wire color) shall be permanently fastened to the inside of the enclosure. An Installation and Service Manual shall also be included with the control panel.
p. The control panel shall be U.L. listed as an assembly.

5. Level Sensors –

   a. Pump operation shall be controlled by floats. The control system shall meet the requirements of the National Electrical Code as being intrinsically safe.

      1) The system shall provide for the automatic and manual control and alternation of the pumps to maintain a pumped down condition of the wet well.

      2) Mercury tube type switch level controls, sealed in a leak-proof and shock-proof polyurethane float, shall be provided for backup pump “off” controls. High wet well level warning alarm shall also be provided.

      3) Floats shall be Type S-M, manufactured by F.E. Myers, or equal, as directed or as approved by the Engineer. Four (4) mercury switch level controls shall be supplied.

      4) Provide a manual override switch in the control panel for each float level sensor.

6. Miscellaneous:

   a. Pipe Supports:

      1) Black steel welded construction (outside wet well) with stainless steel expansion bolts and hardware. Coat all ferrous surfaces with two coats of coal tar epoxy.

7. General Requirements –

   Electrical: Secure necessary permits and pay all required fees applicable to the work. Obtain NYBFU, or equivalent, Inspection Certificate.

8. Electrical Distribution Equipment –

   All equipment shall be in dead front NEMA 3R enclosures. Manufactured by Square D, Cutler Hammer, General Electric, or equal, as directed or as approved by the Engineer.

   a. Service Disconnect: Disconnect shall be fused, heavy duty and labeled for use as service equipment.

   b. Distribution Panel: Panel shall be circuit breaker type with thermal magnetic, molded cast breakers, 22 KAIC.

   c. Manual Transfer Switch: Switch shall be double throw, heavy duty, non-fused, padlockable.
CONSTRUCTION DETAILS

1. General Product Delivery, Storage, and Handling –

   a. Fittings, valves, pipe, controls, equipment, and other accessories shall be handled in such a manner as to ensure delivery to the site in sound, undamaged condition. Take special care not to injure factory finishes. Replace or make satisfactory repairs to pipe or fittings with damaged coatings or linings. Store pipe, valves, and other accessories in conformance with manufacturer's recommendations.

2. Shop Drawings –

   A complete set of shop drawings covering all aspects of the pumping station, valve chamber and miscellaneous shall be submitted to the Engineer as a package. Separate submittals of various components will not be accepted.

3. Manufacturer’s Representative –

   The Contractor shall arrange for a qualified service representative(s) from the company(ies) manufacturing or supplying the pumps, controls, and related equipment to perform the duties herein described. Service representative shall be responsible for all start-up and programming functions.

   The manufacturer’s representative shall supervise the installation of all submersible pump equipment. After installation of the equipment has been completed and the equipment is presumably ready for operation, but before it is operated by others, the manufacturer’s representative shall inspect, operate, pretest and adjust the equipment. The Contractor shall assist in the pretest. The Engineer shall be notified one (1) week in advance so he may attend and make notification to the municipality’s operator or representative to be present for all testing. Engineer will notify three (3) work days prior to pre-test. The inspection shall include, but not be limited to, the following points as applicable:

   a. Soundness (without cracked or otherwise damaged parts).

   b. Completeness in all details as specified.

   c. Correctness of setting, alignment and relative arrangement of various parts.

   d. Adequacy and correctness of overall installation and performance.

   The operation, testing and adjustment shall be as required to provide that the equipment is left in proper condition for satisfactory operation under the conditions specified.

   On completion of his work, the manufacturer’s or supplier’s representative shall submit in triplicate to the Engineer a complete signed report of the results of his inspection, operation, adjustment and tests. The report shall include detailed descriptions of the points inspected, tests and adjustments made, quantitative results obtained if such are specified and a certificate that the equipment conforms to the
requirements of the Contract and is ready for permanent operation and that nothing in the installation will render the manufacturer’s warranty null and void.

e. Provide on-site startup and training for system operator. Eight (8) hours minimum required, unless otherwise directed or approved by the Engineer after consultation with the system operator.

4. Electrical Installation –

The Contractor shall make preliminary field tests to ensure that the reconnection of the electrical pump control panel is correct. Contractor shall coordinate with owner and pay all costs for connection of electrical power to the pump station.

5. Pipe And Fitting, Installation –

a. Inspect the pipe, fittings, and other materials for damage and other defects. Reject all unsound or damaged material.

   1) Cleanliness:

      a) Foreign material shall be prevented from entering the pipe and fittings while they are being placed.

   2) Cutting of Pipe:

      a) Cut pipe in a neat workmanlike manner.

      b) Ductile iron pipe may be cut with an abrasive pipe saw, rotary wheel cutter, guillotine pipe saw, or milling wheel saw. Avoid damage to cement mortar lining.

      c) Smooth all cut ends and edges by grinding.

   3) Joints:

      a) Assemble joints in strict accordance with manufacturer's instructions using recommended lubricants, gaskets, and sealing tape.

   4) Painting:

      a) Paint all piping and accessories as specified or noted on plans.

      b) Touch Up: Paint any previously uncoated bolts, fittings, tie rods, clamps, or other accessories and touch up any scraped areas of the pipe.

6. Valves –
ITEM 634.840000WY – SANITARY SEWER PUMPING STATION

a. Valves:

1) Set plumb unless otherwise noted on drawings.

2) Valves and other fittings shall have flanged joints unless otherwise specified.

3) Valve components shall be carefully inspected prior to installation. Valve discs shall be opened and closed to make sure the valve operates properly, that stops and limiting devices are properly set, and that the valve seats properly.

4) Strictly adhere to manufacturer's installation requirements.

7. Painting –

a. Paint all piping, valves, and applicable accessories.

b. Touch Up: Paint any previously uncoated bolts, fittings, tie rods, clamps, and accessories.

c. Painting includes field painting of exposed bare and covered pipes, hangers, exposed steel and iron work, and primed metal surfaces of mechanical and electrical equipment.

d. Do not paint prefinished items, concealed surfaces, finished metal surfaces, operating parts, and labels.

e. Follow paint manufacturer’s instructions for storage and application of paint products.

f. Primer: Metal surfaces not factory primed shall receive a field application of a quick-drying, rush-inhibitive, alkyd-based or epoxy-metal primer, as recommended by the paint manufacturer. One coat required.

g. Finish Coat: Apply two coats of semi-gloss acrylic-latex enamel (interior or exterior, depending on location). Follow manufacturer’s recommendations for application. Color to be selected by system operator.

8. Pump Station Installation –

a. Install the duplex pumps, piping, valves, control panel and alarm devices as shown on the Contract Drawings and in strict accordance with the manufacturer's recommendations. Operationally test the system for plumbing leaks, operation of valves and controls. Check the pumping rate by timing the cycle time between on-off levels.

b. Electrical work shall conform to all applicable State and Local Codes and the National Electrical Code (N.E.C.).
c. Items of specific manufacturers shall be installed in strict accordance with manufacturer's printed instructions and/or manufacturer's representative's directions.

d. Provide grounding system as per the N.E.C.

e. All power and control cables from control panel to the pump station shall be continuous. No splices or junction boxes shall be used in wet well. The wet well shall be considered a Class I, Division 1, Group D, location.

f. All access hatches shall be installed per manufacturer's instructions.

g. Provide fall protection grating as specified.

h. Immediately after the placing of one section on another, the exterior portion of the joint shall be filled with Axpandcrete RM, or equivalent. After completing the joint, the entire exterior surface of the station shall be coated with two heavy, troweled bitumastic coatings. The interior of the joint shall be filled with “Anti-Hydro” mortar and give a smooth finish.

9. Field Test –

After installation of the unit together with all accessories, it shall be put in first class operating condition; and after inspection, testing, operation and adjustments have been completed by the manufacturer’s representative and after the manufacturer’s representative has submitted his report to the Engineer, the pumping equipment shall be field tested by the Contractor in the presence of the Engineer to demonstrate the ability of the unit to operate properly without vibration or overheating.

All defects or defective equipment shall be corrected or replaced at the expense of the Contractor and, if necessary, the tests shall be repeated until satisfactory results are obtained. The Contractor shall furnish all labor, piping, equipment, water, power and materials necessary for testing.

10. Operating Instructions and Training –

The Contractor shall furnish five (5) bound copies of instruction manuals covering operation and maintenance of all equipment furnished. The manuals shall be complete with wiring diagrams, lubrication schedules, drawings, functional descriptions, cuts, trouble shooting recommendations, parts lists and other information required for the proper operation, maintenance, repair and adjustment of the equipment. All parts shall be numbered or otherwise clearly identified to facilitate ordering of replacements.

Upon completion of all work and all tests, the Contractor shall furnish the necessary skilled labor and helpers for operating the system and equipment for a period of one (1) day. During this period, he shall instruct the Owner or his representative fully in the operations, adjustment and maintenance of all equipment furnished.

11. General
ITEM 634.840000WY – SANITARY SEWER PUMPING STATION

a. Provide conduit seals in all conduits between control panel and wet well.

b. Provide separate conduit for 4-20ma wiring to the pressure transducer. Do not run with any other wiring (including the control wiring for the redundant level control system).

c. Provide one spare control conduit from the wet well equal in size to those used. Terminate this spare conduit below the control panel with sufficient space to add a seal and connection to the control panel in the future.

d. The Contractor shall furnish and install new submersible pump electric supply cables with sufficient length to reach the electric control panel. Under no circumstance will splices in this cable be permitted. Each electric supply cable will be housed individually in their own conduit running from the sanitary pump station wet well to the electric control panel. The electric cable installation shall be done by the qualified service representative and shall be included in their duties as described under the Construction Details, Section 2.

12. Warranty –

Contractor shall provide a warranty for the work covered by this special specification, transferrable to the municipality/system operator, upon completion of the work. This warranty shall insure that defects not due to improper use that develop within two (2) years from the date the completed project is turned over to the municipality/system operator are corrected. Warranty includes full parts, labor, materials, and other necessary expenses.

METHOD OF MEASUREMENT

There will be no measurement under this item, the work described herein to be paid for on a lump sum basis.

BASIS OF PAYMENT

Payment for Sanitary Sewer Pumping Station will be made on a lump sum basis. The Lump Sum price bid for this item shall include the cost of all equipment, materials and labor required for a complete installation of a Sanitary Sewer Pumping Station, (including all fees for inspection, service connections, licenses, electrical energy, excavation, backfill, sheeting and any other cost that may incur in constructing/installation of the Sanitary Sewer Pumping Station) ready for its intended use.