

# BCWS OWNED GRINDER PUMP STATION DESIGN GUIDELINES

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## PART 1 GENERAL

### 1.1 GENERAL GUIDELINES

- A. The following sewer system design guidelines are based on Federal, State and Local health requirements, and the Berkeley County Water & Sanitation engineering design criteria.
- B. Design criteria not indicated herein shall comply with "Ten States Standards" where applicable.
- C. All installations are to meet the standards of the South Carolina Department of Health and Environmental Control (SCDHEC) Standards for Wastewater Facility Construction: R. 61-67, and in particular: Section 67.300 Construction Permits.

1.2 It is not the policy of the department to allow grinder pump stations. However, under unusual conditions that arise, where normal installation of gravity sewer cannot be implemented, the department will consider such installations after all other possibilities have been exhausted. When it has been approved, the following minimum criteria will be used. Additional standard pump station design specifications can be found in Appendix G 11312 Pump Station Design Criteria and 16449 Pump Control System for reference.

### 1.3 GENERAL DESIGN CRITERIA

- A. Duplex station only - with guide rails.
- B. No motors larger than 3 horsepower. Pumping system requirements for horsepower, pumping rate and tank volume shall be determined by certified engineer or manufacturer representative for each specific installation.
- C. Only ABS Piranha S-Series will be allowed.
- D. All discharge piping shall be arranged to same specification laid out in BCWS standard pump station specification. All piping shall be 304 stainless steel. No valve vaults will be accepted.
- E. Furnish standard pump control panel enclosure. At a minimum, enclosures should include the following:

1. Product Description: Cabinet conforming to NEMA ICS 6, Type 4X, 304 or 316 stainless steel powder coated white – no exceptions. The NEMA rating may be reduced to 3R based upon installation of the 3-point, 90 degree turn lockable latch kits that are required on this panel. Panel shall have a hinged, interior door to provide mounting surface for controller displays, labels, and other required components.
  2. Box Size: as required to meet project requirements. Ensure adequate wiring space is provided, and thermal/air flow needs of various components are considered in sizing of enclosure.
  3. Fronts: 304 or 316 stainless steel, fully gasketed, dead-front, surface mounted type with 3-point, quarter-turn latching, lockable door handle with concealed hinge. Hinges shall be completely rust-free under all circumstances. Enclosures, hinges or hardware that rusts, including “surface” rust where pitting is evident, shall cause the entire panel be replaced and any and all associated repair work and materials shall be at the Contractors’ expense and at no additional costs to BCWS. Finish: manufacturer’s standard.
- F. A visual alarm must be installed.
- G. A 4’ diameter precast concrete (approved Epoxy Coated at 125 mils for Sherwin Williams Duraplate 6100 or 120 mils nominal thickness for Raven Epoxy 405.) or fiberglass wet well may be used. Tank volume shall be determined by certified engineer.
- H. The pump access covers for the wet wells shall consist of access covers installed and positioned over the pumps as per the pump manufacturer’s recommendations. All covers shall have a load capacity of 300 lb. psf (1464kg psm) load rating. Material shall be aluminum alloy 6063-T5 and T6, or equivalent, 1/4" plate, with stainless steel or aluminum hasp, handle, and hinges. The frame shall be complete with hinged and hasp-equipped exposed padlock clip recessed locks are not acceptable. No “slam lock” with T handle key is required. The frame for the wet well hatch shall include upper guide in the top slab of the wet well. The doors shall have safety locking handles to lock the access door in the open position. Note: A Flygt Safe-Hatch or BCWS approved equal safety grate is required.
- I. Each discharge line shall be equipped with a tapped fitting, petcock, gauge diaphragm and a 4" glycerin filled dual range pressure gauge reading in feet and PSI with increments of 1 PSI, with the range and scale appropriate for the application. The gauge shall read in the center of the range during normal operations. A stainless steel diaphragm will be installed to separate the gauge from

sewer. Gauge diaphragm to be Ashcroft diaphragm isolator/Seal flushing type model No. 50-101SS-04T-CG or equivalent.

- J. For pump stations with duplex pumps each pump shall be designed to operate in a lead lag sequence and be on an alternating cycle.
- K. Station must operate on floats.
- L. Force main discharge shall connect to existing BCWS manhole. See standard detail Sewer Panel 2C. Discharge manhole to be Epoxy Coated at 125 mils with Sherwin Williams Duraplate 6100 or 120 mils nominal thickness with Raven Epoxy 405 from below the frame to the flow line of the manhole. All coated manholes shall have a composite frame and cover installed. Next manhole downstream shall also be epoxy coated. Manifolds to existing force main are only approved on a case by case basis and are when all other tie-in methods have been exhausted.
- M. Station must be in a location easily accessible by BCWS maintenance staff. Reasonable all-weather access is required to maintain these stations.
- N. Freeze protection is required on all above grade piping.

#### 1.4 MATERIALS

- A. Materials and installation for all gravity sewer lines and force mains shall comply with commonly accepted design standards such as ASTM (American Society for Testing and Materials), ANSI (American National Standard), AWWA (American Water Works Association) or other design standards and as shown in the BCWS Standard Specifications

#### 1.5 ELECTRICAL

- A. All work, equipment and materials furnished shall conform with the existing rules, requirements and specifications of the Insurance Rating Organization having jurisdiction, the serving electrical utility company, and the latest edition of the National Electrical Code (NEC)

#### 1.6 FENCING

- A. Each pump station shall be fenced to prevent access by unauthorized persons. The type of fencing or other means of controlling access shall be approved by BCWS.

#### 1.7 FLOOD PROTECTION

- A. Pump stations shall be designed to be fully operational during flooding to the twenty five (25) year flood elevation unless the influent flow into the pump station

can be stopped. Pump station structures and equipment shall be protected from physical damage by flooding to the one hundred (100) year flood elevation.

**END OF SECTION**