

SPECIALTY EQUIPMENT AND MATERIAL SPECIFICATIONS

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1. Sewage Air Release Valve (Long Valve Body)

Sewage Air Release Valves shall have an elongated body and be designed to operate (open) while pressurized allowing entrained air in a sewage force main line, sewage pump, or waste water system to escape thru the air release orifice without spillage or spurt. After entrained air escapes thru the air release orifice, the valve orifice shall be closed by a needle mounted on a compound lever mechanism, and prevent media from escaping. The air release orifice will then remain closed until more air accumulates and the opening cycle repeats automatically. The internal compound lever mechanism shall be stainless steel to prevent corrosion. Each air release valve shall be provided with an inlet and blow off valves with quick disconnect couplings and a five (5) foot section of with a quick disconnect coupling hose for flushing.

The internal linkage shall be fitted with a stem, having a stainless steel concave float threaded into the opposite end. The concave float shall hang inside the valve body, slightly above the inlet and approximately thirteen (13) inches from the lever mechanism, thereby maintaining an air gap between the mechanism and the waste media. The valve body and float shall withstand 500 psi shell test pressure. The valve inlet shall be 2" N.P.T. with a 1" N.P.T. outlet. Sewage air release valve shall be the Universal Sewage Air Release Valve Model SL20A as manufactured by Crispin Valve; Model 400 as manufactured by APCO Valve and Primer Company or equal.

Materials of construction shall be certified the following A.S.T.M. specifications:

Body & cover	Cast Iron	ASTM A 126 GR.B
Internal Linkage, Stem	Stainless Steel	Series T300
Float	Stainless Steel	ASTM A240 T304
Needle	Buna-N	Nitrile Rubber
Exterior Paint	Phenolic Primer Red Oxide	FDA Approved for Potable Water

2. Sewage Combination Air Valve Series - Air Release/Vacuum Relief – (Long Valve Body)

Sewage Combination Air Valves shall be single body, double orifice valves to allow large volumes of air to escape or enter thru the larger diameter air and vacuum orifice when filling or draining a pipeline.

When the pipeline is filled and pressurized, the large air & vacuum orifice shall stay closed, but the smaller diameter air release orifice shall remain operative and open to allow small pockets of air accumulation in the valve body to escape automatically and independently of the large orifice.

The large air & vacuum orifice shall shut-off when the free floating-center guided plug is raised into the orifice by the lifting force of the concave – bottom float. The large orifice shut-off shall be without spilling. The Buna-N Seat must be fastened to the valve cover, without distortion, for drop tight shut-off. The overall height and width shall not exceed the dimensions shown on the table below. Each combination air valve shall be fitted with an inlet valve and two (2) blow off valves with quick disconnect couplings. A minimum of five (5) feet of hose with a quick disconnect on one end shall be provided to facilitate flushing the valve. Materials of construction shall be certified the following A.S.T.M. specifications:

Body & cover	Cast Iron	ASTM A 126 GR.B
Float	Stainless Steel	ASTM A240 T304
Stem	Stainless Steel	Series T300
Needle & Seat	Buna-N	Nitrile Rubber
Plug (1"-2"-3"-4")	Brass	ASTM B124
(6" size)	Stainless Steel	ASTM A240 T304
Leverage Frame (1"-2")	Delrin or cast iron (3"-4"-6")	ASTMD1233 or ASTM A126 GR.B
Exterior Paint	Phenolic Primer Red Oxide	FDA Approved for Potable Water

SMALL ORIFICE		
OPERATING PRESSURE PSI	SMALL ORIFICE DIAMETER	VENTING CAPACITY CFFAM
0-150	7/32"	68

The combination sewage air valve shall be sized for standard working pressures of 0 – 150 psi and be equipped with a 7/32" diameter orifice for air release or venting during operation. The combination sewage air release/vacuum relief valve with a two (2) inch inlet and a one (1) inch outlet valve shall be a Model USL20B as manufactured by Crispin Valve; Model 443 as manufactured by APCO Valve and Primer Corporation or equal.

3. Sewage Combination Air Valve Air Release / Vacuum Relief (Short Body Valve)

Sewage combination air valves for both air release and vacuum relief function may be a universal sewage – short body valve. The valves may be used where either air release or air release/vacuum relief valves are indicated in the plans.

The valve shall be designed to discharge air from an empty line when filling, and relieve the vacuum when draining the system. The valve(s) shall also release an accumulation of air while in service. All three (3) functions shall be accomplished in a single valve body.

The valve shall operate through a compound lever system that will seal both the pressure orifice and the Air & Vacuum orifice simultaneously.

This lever system shall permit a 3/16" orifice to release an accumulation of air from the valve body at a capacity of 54.6 SCFM of air at a pressure of 150 PSIG. The valve body shall be cast iron. The internal linkage and float shall be a stainless steel. The valve(s) shall be Crispin Model US10B Universal Sewer Air Valve or equal. The valve(s) shall be two (2) inch NPT screwed as ANSI Class 125 flanged inlet connection.

A device to protect the top air release vent to prevent dirt and debris from entering the outlet of the valve shall be supplied on the valve.

The valves shall be supplied with backflushing attachments so that the interior body can be flushed periodically for proper operation.

Standard operating pressure for the valves shall 20 to 150 PSIG.

4. Eccentric Plug Valves

Plug valves shall be of the non-lubricated eccentric type with an elastomer covering all seating surfaces. The elastomer shall be suitable for the service intended (sewage – nitrile). Flanged valves shall be manufactured in accordance with ANSI B16.1 Class 125, including facing, drilling and flange thickness. Ports shall be round with a minimum of 81% port area to facilitate "pigging" when required.

Valve bodies shall be of ASTM A-126 Class B cast iron in accordance with AWWA C-504-87 Section 5.2.1. Three (3) inch diameter valves shall be furnished with a welded-in overlay seat of not less than 90% nickel in accordance with AWWA C-507085 Section 3.2.3.5. Sprayed, plated or screwed-in seats are not acceptable.

Plugs shall be of ASTM A-536 Grade 65-45-12 in compliance with AWWA C-504-87 Section 2.2.2. The plugs shall be of one piece solid construction with PTFE thrust bearings on the upper and lower bearing journals to reduce torque and prevent dirt and grit from entering the bearing and seal area.

Valves shall be furnished with replaceable sleeve type bearings conforming to AWWA C-504-87, Section 3.6.1 and AWWA C-507-85, Section 3.2.4. Bearings shall be of sintered, oil impregnated type 316 stainless steel ASTM A-743 Grade CF-8M. Valve shaft seals shall be of the "U" cup type in accordance with AWWA C-504-87, Section 3.7.2. Seals shall be self adjusting and repackable without removing the bonnet from the valve.

Wrench operated valves shall be capable of being converted to worm gear or automated operation without removing the bonnet or plug from the valve. All wrench operated valves shall be equipped with a 2" square nut for use with extended "T" handles.

Valves shall be designed and manufactured to shut off bubble tight at 175 psi. Plug valves shall be Millcentric Series 601/600 as manufactured by Milliken Valve Company or equal.

5. Globe Surge Relief Valve

The Globe Surge Relief Valve shall be heavily constructed cast iron valve body with integral end flanges and full unobstructed flow thru area. The disc shall be cast iron having a replaceable resilient Buna-N seat for tight shut-off. The pivot shaft shall be Type 303 stainless steel and be a single unit, extending thru the valve body with a weight and lever mounted on one or both ends.

The Globe Surge Relief Valve shall be adjusted at the factory to hold closed against the normal operating system pressure. When the system pressure exceeds this setting, the Globe Surge Relief Valve shall open immediately to relieve the pressure rise, but close slowly at an adjustable rate as the system pressure returns to normal.

A heavy duty oil dashpot system shall be externally mounted on the valve to control the rate of closure, in such a manner, to positively prevent any slam. The oil shall be stored in a stainless steel oil reservoir maintaining a constant head on the dashpot to immediately fill the dashpot when the valve opens to insure non-slam closure. The closing rate shall be externally and infinitely adjustable thru a color coded flow control valve having a locking device to prevent tampering, once the close rate is set. Pressure Class 150 valve body with a relief pressure setting 100 psi shall be provided for this project. Valve exterior to be painted with Red Oxide Phenolic Primer Paint as accepted by the FDA for use in contact with Potable Water. All materials of construction shall be in writing to conform to A.S.T.M. specifications as follows:

Body	Cast Iron	ASTM A 126, Gr. B
Cover	Cast Iron	ASTM A 126, Gr. B
Disc Seat	Buna-N	
Disc	Cast Iron	ASTM A 126, Gr. B
Pivot Shaft	Stainless Steel	ASTM A582 T303

Valve shall be the APCO Series 6500 Globe Surge Relief Valve, as manufactured by Valve & Primer Corporation or equal.

6. Single Leaf Access Door And Frame (Rectangular)

The single leaf access frame and cover where shown shall have a ¼" thick one-piece, mill finish, extruded aluminum frame, incorporating a continuous concrete anchor. A bituminous coating shall be applied to the frame exterior where it will come in contact with concrete. Door panel shall be ½" aluminum diamond plate, reinforced to withstand a live load of 300 lbs. psf. Door shall open to 90° and automatically lock with a stainless steel hold open arm and aluminum release handle. For ease of operation, the hold open arm shall incorporate an enclosed stainless steel compression spring assist. Door shall close flush with the frame and rest on a built in neoprene cushion/gasket. Hinges and all fastening hardware shall be stainless steel. Unit shall lock with a stainless steel slam lock with removable key and have a non-corrosive handle. Unit shall be guaranteed against defects in material and/or workmanship for a period of ten (10) years. Rectangular access doors shall be similar to Model No. SIS 2424 as manufactured by Halliday Products, Inc. or equal.

7. Single Leaf Access Door And Frames (Round)

Access hatch for the surge relief valve vault shall be a round access door with the single leaf access frame and cover. A ¼" thick, mill finish, extruded aluminum frames, incorporating embed anchor plates. The door panel shall be ½" aluminum diamond plate, reinforced to withstand a live load of 300 lbs. psf. Door shall open to 90° and automatically lock with a stainless steel hold open arm with aluminum release handle. Door shall close flush with the frame. Hinges and all fastening hardware shall be stainless steel. Unit shall lock with a non-corrosive locking bar and have a non-corrosive handle. Unit shall be guaranteed against defects in material and/or workmanship for a period of ten (10) years. The unit shall be the Series R1R, Model R1R48 as manufactured by Halliday Products, Inc. or equal.

8. Hoist

A chain hoist shall be provided for lifting the pumps for service from the above ground sewage pump station. A hand chain hoist with a lift capacity of at least 1,000 pounds similar to Model 5613 as manufactured by CM Hurricane or equal shall be provided for this station.

9. Wall Penetration Seals

Wall penetrations in manholes or concrete vaults for sewage piping shall be sealed with modular, mechanical type interlocking synthetic rubber links appropriately shaped to continuously fill the annular space between pipe and wall. The elastomeric elements and hole size shall be sized for the specified pipe. The seal devise shall be similar to the Link-Seal Assembly as manufactured by Thunderline/Link Seal or equal.

Pipe Size	Pipe Type	Core Hole Size	Link Seal Model No.
2"	PVC	4"	LS-300
4"	Sch. 80 PVC	8"	LS-400
4"	DIP	8"	LS-400
8"	SDR-35 PVC	12"	LS-475
8"	DIP	12"	LS-475

10. Foundation Drain

The foundation or wet well drains around the wet well shall be installed as drainage envelopes to maintain the water table at the elevation noted around the wet well. The envelope shall be constructed and dimensioned as shown in the detail.

The drainage pipe within the envelope shall be four (4) inch diameter, perforated ADS or equal corrugated plastic pipe. The outlet section of the drain beginning approximately ten (10) feet from the wet well shall be a non-perforated, corrugated ADS plastic pipe or equal.

The stone within the envelope shall consist of VDOT #68 aggregate placed around the drain line. The stone shall be completely encompassed by filter cloth separator as specified herein. The filter cloth fabric shall meet the specifications shown in the Table below.

REQUIREMENTS FOR FILTER FABRIC USED WITH FOUNDATION DRAINS		
Physical Property	Test Method	Requirements
Equivalent Opening Size	Corps of Engineers CWO 2215-77	Equal or greater than U.S. No. 50 sieve
Tensile Strength @ 20% (maximum)	VTM-52	30 lbs./linear in. (minimum)
Puncture Strength	ASTM D751	80 lbs. (minimum)

11. Angle Surge Relief Valve

The Angle Surge Relief Valve shall be heavily constructed, cast iron body with a ductile iron cover/spacer to withstand severe shock conditions. The body shape shall be 90° angle pattern to permit side or downward discharge.

The cover/spacer shall provide an air gap between the surge valve and the hydraulic cylinder. The valve stem shall be connected to the hydraulic cylinder by means of a self-aligning universal connector to insure smooth positive opening without binding during shock opening of the valve.

The hydraulic cylinder shall be removable from the valve, without dismantling or removing the valve from the line.

Closing speed shall be externally adjustable by means of a micrometer control valve.

The valve disc shall be normally closed against the system operating pressure by means of a spring or springs. When the system pressure exceeds the normal operating pressure by 10%, the Angle Surge Relief Valve shall open immediately to relieve the pressure surge and close slowly as the system pressure returns to normal, by means of the hydraulic cylinder. The hydraulic cylinder shall be capped on both ends (totally enclosed) to prevent dirt or dust from fouling up the cylinder operation. It shall be fitted with an atmospheric oil reservoir.

The shut-off pressure shall be set at the factory, but additional adjustments can be made in the field by increasing or decreasing the tension on the externally adjustable springs.

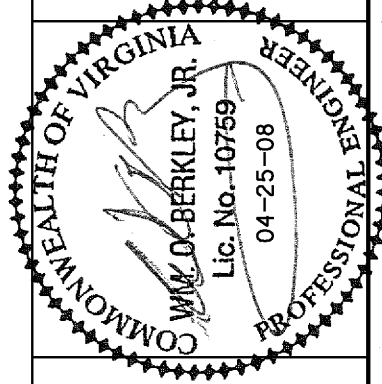
Valve exterior to be painted with Universal Primer as accepted by the FDA for use in contact with Potable Water.

All materials of construction shall be certified in writing to conform with A.S.T.M. specifications as follows:

Body	Cast Iron	ASTM A126.Gr.B
Cover/Spacer	Ductile Iron	ASTM A536 GR.65-45-12
Body seat ring	Aluminum bronze	ASTM B148-9C
Disc seat	Buna-N	
Disc seat (16")	Aluminum bronze with molded Buna-N	
Disc	Steel	ASTM A36
Heavy duty hydraulic cylinder	Steel	

The angle surge relief valve shall be the two (2) inch, Series 3000 Angle Surge Relief Valve as manufactured by Valve & Primer Corporation, or equal.

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GILLS CREEK DISTRICT
FRANKLIN CO., VA.

SPECIALTY EQUIPMENT AND MATERIALS SPECIFICATIONS

DATE: 01-10-08

DRAWN:

CHECKED:

REVISIONS

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2	03-31-08
3	04-14-08
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