SECTION 11123

CONTAINMENT PIPE SYSTEM
(REVISED JUNE 9, 2022)

PART 1 - GENERAL

1.01 SECTION INCLUDES

Requirements for materials and installation of Polyvinyl chloride (PVC) and Chlorinated polyvinyl chloride (CPVC) pipes and fittings, detection system and pre-manufactured channels as shown on the Contract Drawings.

1.02 REFERENCES

A. ANSI Standards

1. ANSI B16.1 Cast Iron Pipe Flanges and Flanged Fittings, Class 125
2. ANSI B16.3 Malleable Iron Threaded Fittings, Class 150 and 300

B. ANSI/NSF

ANSI/NSF 61 Drinking Water System Components-Health Effects

C. ANSI/AWWA Standards

1. ANSI/AWWA C900 Polyvinyl Chloride (PVC) Pressure Pipe 4 In. Through 12 In. for Water Distribution
2. ANSI/AWWA C905 Polyvinyl Chloride (PVC) Water Transmission Pipe, Nominal Diameters 14 In. Through 36 In.

D. ASTM Standards

1. ASTM A193 Specification for Alloy-Steel and Stainless Steel Bolting Materials for High-Temperature Service
2. ASTM A194 Specification for Carbon and Alloy Steel Nuts for Bolts for High-Pressure and
3. ASTM D1784 Specification for Rigid Poly (Vinyl Chloride) (PVC) Compounds and Chlorinated Poly (Vinyl Chloride) (CPVC) Compounds
4. ASTM D1785 Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120
5. ASTM D2464 Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
6. ASTM D2467 Specification for Socket-Type Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80
7. ASTM D2564 Specification for Solvent Cements for Poly (Vinyl Chloride) (PVC) Plastic Pipe and Fittings
8. ASTM D3139 Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals
9. ASTM D4024 Specification for Reinforced Thermosetting Resin (RTR) Flanges

10. ASTM F437 Specification for Threaded Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80.
11. ASTM F439 Specification for Socket-Type Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe Fittings, Schedule 80
12. ASTM F441 Specification for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe, Schedules 40 and 80
13. ASTM F477 Specification for Elastomeric Seals (Gaskets) for Joining Plastic Pipe
14. ASTM F493 Specification for Solvent Cements for Chlorinated Poly (Vinyl Chloride) (CPVC) Plastic Pipe and Fittings.

E. AWWA Standards

AWWA Manual PVC Pipe - Design and Installation

1.03 SUBMITTALS

General: As specified in Section 01600 - Materials and Equipment and Section 01330 – Submittals.

PART 2 - PRODUCTS

2.01 GENERAL

Pipe materials furnished shall follow the requirements of Section 01600 – Materials and Equipment.

2.02 CONTAINMENT PIPE SYSTEMS

A. Contractor shall provide all contained piping, tubing, fittings and valving for the bleach piping as shown on the Drawings.

1. All bleach containment piping shall be CPVC.

a. All chemical piping, fitting and valving shall be schedule 80 CPVC and all O-rings, seats, seals and gaskets shall be Viton.

b. All cleaner and glue shall be industrial grade, pressure rated, silica free and approved for use with NaOCl.

c. Pressure test per manufacturer testing procedures at 150% working pressures.

2. All double contained piping system shall be FEP carrier tubing and schedule 80 CPVC containment pipe.

a. Contractor shall provide contained piping system that must be compatible with leak detection system and must coordinate and supply all piping and tubing for the leak detection system.

b. ASTM: D1784 and F-441.

c. Provide sufficient termination fitting with tap and termination fittings for pressure testing system.

d. All gaskets, seals, o-rings, & seats shall be Viton.

e. The leak detector panels and sensors are specified in Paragraph 2.04. The Contractor shall:

(1) Provide tees and saddles for the leak detector sensors
(2) Provides tee and fittings and valves for the drains.

f. All cleaner and glue shall be industrial grade, pressure rated, silica free and approved for use with NaOCl.

g. Pressure test per manufacturer testing procedures at 150% working pressures.

2.03 PRE-MANUFACTURED CHANNEL SYSTEM FOR DOUBLE CONTAINED PIPE SYSTEMS

A. The Contractor is responsible determining the length of the channel system, core drill the tops for piping entrances, installing pipe supports, installing pipes, excavating, providing & installing gravel bedding, support blocks, backfilling and grading as shown on the Drawings.

B. The manufacturer shall be: Plastibeton, Oldcastle Precast, Inc. (239.574.8896) or approved equal.

C. Model: 3016 For new channel and covers at South Bleach Facility.

D. Standard Length: 118”

E. Material: High Density Polymer Concrete with excellent resistance rating for 15% NaOCl solution.

F. Covers:

1. Rated for H20 loading
2. Weight/Model/Dimensions: 158 lb/TC 20 HD/ 39-5/16”x22”x2” & 111 lb/TC 12 HD/39-5/16”x14”x2-1/4”
3. Model No. / Number of spare covers: TC 20 HD / 6 & TC 12 HD / 4
4. Protection Rods:

a. Material/Number: Stainless steel or approved non-corrosive material / 6 bars per std. length of channel
b. Size: As determined by the manufacturer

5. Two hand holes per cover with removable plugs

G. End Plates: High Density Polymer Concrete

H. Pipe Supports:

1. Shall be as shown on the contract drawings and shall be stainless steel uni-strut with stainless steel bolts and anchors bolts. Spacing of supports shall not exceed 5 foot intervals.

2.04 SODIUM HYPOCHLORITE LEAK DETECTION SYSTEM

A. Each sodium hypochlorite containment pipe system, shall be equipped with Leak Detection Sensor(s) reporting the alarm status to a Leak Detection Panel. When a leak is detected, the audible and visual signals in the Control Panel shall be activated. Also, a general alarm relay contact shall interact with a plant PLC to report a General Alarm Condition and the location.

B. Each local Leak Detection Panel shall be equipped with an alarm strobe light, a HMI capable of testing each zone and indicating alarms locally and a keyed alarm silence switch. The panels shall be NEMA 4X rated and Type 316 stainless steel construction. Provide panel with fuse. Provide panel with surge suppression of type ASCO Model 252. Provide ground bus in panel attached for ground connection to counterpoise grounding system

C. The Chlorine Leak Detection System shall include the following:

1. South Facility:
    a. Two (2) Leak Detection Panels: configured for two (2) alarm zones
    b. Seven (7) Non-Intrusive Leak Sensors with cables rated for submergence.
2. North Facility:
    a. One (1) Leak Detection Panel: configured for three (3) alarm zones
    b. Five (5) Non-Intrusive Leak Sensors with cables rated for submergence.
3. Pre-Filter
    a. One (1) Leak Detection Panel: Configured for (1) alarm zone
    b. One (1) Non-Intrusive Leak Sensor with cables rated for submergence.

D. The Leak Detection System shall be manufactured by ~~Guardian Products, distributed in Florida by Custom Guard (IPEX)~~ PermAlert or approved equal.

1. Leak Detection Panel shall be PermAlert Model LW2000 (Liquid Watch II) and shall be in a NEMA 4X Stainless Steel panel.

2. System shall be compatible with the County SCADA System.

3. Leak detection probes shall be Liquid Watch PWS-LW. Where existing probe leads do not allow direct connection to the panel; approved watertight splices shall be used in an approved enclosure.

E. Refer to the electrical Contract Drawings and Specifications for additional information and requirements.

PART 3 - EXECUTION

3.01 INSTALLATION OF EXPOSED PVC PIPING

A. Alignment

1. Install pipe to accurate lines and grades with fittings, valves and appurtenances at locations shown on Drawings and as specified.
2. Wherever possible, install piping parallel to walls and floors.

B. Installation

1. Clean debris, dirt, and other deleterious substances out of piping before installing piping. Keep piping clean until accepted at completion of work. Do not place debris, tools, clothing, lumber, or other materials in pipe during installation.
2. Inspect pipe, fittings, valves, and appurtenances for defects prior to installation.
3. Use proper implements, tools, and facilities. Do not damage piping or its linings and coating.
4. Install piping so no undue strain is placed upon piping joints, equipment, or structures.

C. Supports

1. Provide supports necessary to hold pipe and appurtenances at lines and grades shown on Drawings
2. Support piping so that there is no undue strain on piping joints, equipment, or structures.
3. Provide hangers and supports where required to support pipe and fittings in accordance with manufacturer's recommendations.

3.02 SETTING APPURTENANCES

A. Install fittings, valves, hydrants, couplings, adapters, sleeves, saddles, and other piping appurtenances, in piping as indicated on the Drawings.

3.03 JOINT DEFLECTION

A. General

1. Deflect pipe and fittings as required to provide horizontal and vertical alignment as shown and specified.
2. Deflection of pipe and fitting joints shall not exceed limits specified in this Section. If alignment requires joint deflections in excess of allowable deflection joint, furnish and install fittings or a sufficient number of shorter lengths of pipe.

B. Maximum Allowable Joint Deflection - maximum joint deflection shall be as specified maximum by the pipe manufacturer or the restrained joint manufacturer.

3.04 FLUSHING AND CLEANING

A. Flush and clean PVC and CPVC piping used for potable water or reclaimed water.

B. Purge PVC, CPVC and FEP tubing used for chemical piping with dry compressed air (DCA) or nitrogen (N) as indicated in the following table:

Service	Purge Gas	Dew Point
Alum	DCA	-40° F
Chlorine Gas	N	-40° F
Sodium Hypochlorite	DCA	-40° F
Polymer	DCA	-40° F
Polymer Solution	DCA	-40° F
Sample	DCA	-40° F
Sodium Hydroxide	DCA	-40° F
Sulfur Dioxide Gas	N	-40° F
Sulfur Dioxide Solution	DCA	-40° F

3.05 HYDROSTATIC TEST

Test PVC and CPVC piping at 150 psi.

3.06 MANUFACTURERS' REPRESENTATIVE

A. Provide services of pipe and fitting manufacturers' representatives as required to obtain correct piping installation, jointing, connections to structures, connections to existing piping systems, and piping supports.

B. Provide assistance of pipe and fitting manufacturers' representatives at no additional cost to the Owner.

C. Provide assistance of pre-manufacture channel system manufacturer's representative at no additional cost to the Owner.

D. Provide assistance of leak detection system manufacturer's representative at no additional cost to the Owner.

END OF SECTION