

SECTION 2

# Pipe Schedule

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**DIGESTER GAS CLEANING PROJECT  
PIPE SCHEDULE**

Fluid	Pipe Size	Pipe Material	Lining / Coating
Digester Gas	≤ 2"	304 Stainless Steel	System 2 / System 5 System 2 / System 5
	3"	Carbon Steel	
	≥ 4"	Ductile Iron	
Digested Sludge	All	Ductile Iron	Cement lined / System 5
Reclaimed Water	All	PVC Schedule 80	System 25
Drain/Overflow	All	PVC Schedule 80	System 25

**System No. 2 Submerged Metal—Domestic Sewage:**

Surface Preparation: SP5, White Metal Blast Cleaning

Primer: In accordance with manufacturer's recommendations

Final Coat: Coal tar epoxy -- 2 coats, 16 MDFT, min. OR High Build epoxy -- 2 coats, 16 MDFT, min.

**System No. 5 Exposed Metal—Mildly Corrosive:**

Surface Preparation: SP10, Near-White Blast Cleaning

Primer: Epoxy primer - ferrous metal -- 1 coat, 2.5 MDFT, min.

Final Coat: Polyurethane enamel -- 1 coat, 3 MDFT, min

**System No. 25, Exposed FRP, Plastic**

Surface Preparation:

1. Hand sand plastic surfaces to be coated with medium grit sandpaper to provide tooth for coating system
2. Large areas may be power sanded or brush-off blasted, provided sufficient controls are employed so without removing excess

Coating: Acrylic Latex, semigloss -- 2 coats, 320 SFPGPC, min.

SECTION 3

# Valve Specification

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CEC - DIGESTER GAS CLEANING  
 AT INLAND EMPIRE UTILITIES AGENCY, RP-1  
 VALVE SPECIFICATION

Valve Type	Valve Description
V307	<p>Stainless Steel Ball Valve 2 Inches and Smaller:</p> <ul style="list-style-type: none"> <li>a. Three-piece, ASTM A276 GR 316 or ASTM A351/ A351M GR CF8M stainless steel body and end pieces, full port Type 316 stainless steel ball, threaded ends, reinforced PTFE seats, body seal and stem packing, blowout-proof stainless steel stem, stainless steel lever operator with vinyl grip, rated 1,000-pound WOG, 150 psi SWP.</li> <li>b. Manufacturers and Products:           <ul style="list-style-type: none"> <li>1) Milwaukee; 30 Series.</li> <li>2) Nibco; T-595-S6-R-66-LL.</li> <li>3) Conbraco Apollo; 86-500 Series.</li> </ul> </li> </ul>
V320	<p>Vee-Ball Valve 1 Inch to 16 Inches:</p> <ul style="list-style-type: none"> <li>a. ANSI Class 150-pound valve with flanged ends, Type 317 stainless steel body, heat treated nickel- or hard chromium-plated 317 stainless steel ball, splined-type 17-4 PH stainless steel shafts, reinforced PTFE flow-ring seal, reinforced PTFE with stainless steel or Hastalloy sleeve bearings, and PTFE V-ring packing. Valve to have 300:1 rangeability and equal percentage characteristic.</li> <li>b. Provide electric operator for modulating service (see below).</li> <li>c. Manufacturers and Products:           <ul style="list-style-type: none"> <li>1) Fisher Controls: Design V150.</li> <li>2) DeZurik: VPB V-Port Ball Valve.</li> </ul> </li> </ul>
V330	<p>PVC Ball Valve 2 Inches and Smaller:</p> <ul style="list-style-type: none"> <li>a. Rated 150 psi at 73 degrees F, with ASTM D1784, Type I, Grade 1 polyvinyl chloride body, ball, and stem, end entry, double union design, solvent-weld socket ends, elastomer seat, Viton or Teflon O-ring stem seals, to block flow in both directions.</li> </ul>

	<ul style="list-style-type: none"> <li>b. Manufacturers and Products:           <ul style="list-style-type: none"> <li>1) Nibco; Chemtrol Tru-Bloc.</li> <li>2) ASahi/America; Duo-Bloc.</li> <li>3) Spears; True Union.</li> </ul> </li> </ul>
<p>V405</p>	<p>Eccentric Plug Valve 3 Inches to 12 Inches:</p> <ul style="list-style-type: none"> <li>a. Nonlubricated type rated 175 psig CWP, drip-tight shutoff with pressure from either direction, cast iron body, exposed service flanged ends per ASME B16.1 or grooved ends in accordance with AWWA C606 for rigid joints, buried service mechanical joint ends, unless otherwise shown.</li> <li>b. Plug cast iron with round or rectangular port of no less than 80 percent of connecting pipe area and coated with Buna-N, seats welded nickel, stem bearing lubricated stainless steel or bronze, stem seal multiple V-rings, or U-cups with O-rings of nitrile rubber, grit seals on stem.</li> <li>c. Operators:           <ul style="list-style-type: none"> <li>1) 3-Inch to 4-Inch Valves: Wrench lever manual.</li> <li>2) 6-Inch to 12-Inch Valves: Totally enclosed, geared, manual operator with handwheel, 2-inch nut, or chain wheel. Size operator for 1.5 times the maximum operating shutoff pressure differential for direct and reverse pressure, whichever is higher. For buried service, provide completely sealed operator filled with heavy lubricant and 2-inch nut.</li> </ul> </li> <li>d. Manufacturers and Products:           <ul style="list-style-type: none"> <li>1) Pratt; Ballcentric.</li> <li>2) 2) DeZurik; Style PEC.</li> <li>3) 3) Milliken; Millcentric Series 600</li> </ul> </li> </ul>
<p>V408</p>	<p>Eccentric Plug Valve 3 Inches to 12 Inches for Digester Gas Service:</p> <ul style="list-style-type: none"> <li>a. Nonlubricated type rated 175 psig working pressure, bubble-tight shutoff with gas pressure from one direction, body cast iron with flanged ends, plug cast iron with round or rectangular port of no less than 80 percent of connecting pipe area and coated with Buna-N, seats welded nickel, stem bearing lubricated stainless steel, stem seal multiple V-rings or U-cups with O-rings of nitrile rubber.</li> <li>b. Internal surfaces of valve body epoxy lined (except seat).</li> <li>c. Operators:</li> </ul>

	<ol style="list-style-type: none"> <li>1) 3-Inch and 4-Inch Valves: Wrench lever manual.</li> <li>2) 6-Inch Through 12-Inch Valves: Totally enclosed, geared, manual operator, with handwheel, 2-inch nut, or chain wheel.</li> </ol> <p>d. Manufacturers and Products:</p> <ol style="list-style-type: none"> <li>1) Pratt; Ballcentric.</li> <li>2) DeZurik; Style PEC.</li> <li>3) Milliken; Millcentric Series 600.</li> </ol>
V602	<p>Check Valve 2 Inches and Smaller:</p> <ol style="list-style-type: none"> <li>a. All bronze, threaded cap, threaded ends, swing type replaceable Teflon disc and bronze disc holder, rated 150-pound SWP, 300-pound WOG.</li> <li>b. Manufacturers and Products: <ol style="list-style-type: none"> <li>1) Walworth; Figure 3412.</li> <li>2) Milwaukee; Figure 510.</li> </ol> </li> </ol>
V634	<p>Rubber Flapper Check Valve 2 Inches to 24 Inches:</p> <ol style="list-style-type: none"> <li>a. Iron body, ASME B16.1, Class 125 flanges, steel-reinforced Neoprene flapper raised seating ring, rated 150-pound CWP.</li> <li>b. The body and cover shall be lined with Neoprene. The lining shall be auto-claved to the body and cover and cured to 55 durometer. The lining shall be tested in conformance with ASTM D573.</li> <li>c. b. Manufacturers and Products: <ol style="list-style-type: none"> <li>1) APCO; Series 100R.</li> <li>2) Val-Matic</li> </ol> </li> </ol>
V940	<p>Solenoid Valve 1/4 Inch to 2 Inches:</p> <ol style="list-style-type: none"> <li>a. Two-way internal pilot operated diaphragm type, 316 stainless steel body, resilient seat suitable for gas, solenoid coil molded epoxy, NEMA insulation Class F, 24 volts dc, 60-Hz, unless otherwise indicated. Solenoid enclosure NEMA 250, explosion proof. Size and normal position (OPEN or CLOSED when de-energized) as indicated.</li> <li>b. Minimum operating pressure differential of 0 psig, maximum operating pressure differential of 15 psig.</li> <li>c. c. Manufacturers and Products:</li> </ol>

	<ul style="list-style-type: none"> <li>1) ASCO; 8215</li> <li>2) Skinner.</li> </ul>
Manual Operators	<p>1. General:</p> <ul style="list-style-type: none"> <li>a. Operator force not to exceed 40 pounds under any operating condition, including initial breakaway. Gear reduction operator when force exceeds 40 pounds.</li> <li>b. Operator self-locking type or equipped with self-locking device.</li> <li>c. Position indicator on quarter-turn valves.</li> <li>d. Worm and gear operators one-piece design worm-gears of gear bronze material. Worm hardened alloy steel with thread ground and polished. Traveling nut type operators threader steel reach rods with internally threaded bronze or ductile iron nut.</li> </ul> <p>2. Exposed Operator:</p> <ul style="list-style-type: none"> <li>a. Galvanized and painted handwheels.</li> <li>b. Lever operators allowed on quarter-turn valves 8 inches and smaller.</li> <li>c. Cranks on gear type operators.</li> <li>d. Chain wheel operator with tiebacks, extension stem, floor stands, and other accessories to permit operation from normal operation level.</li> <li>e. Valve handles to take a padlock, and wheels a chain and padlock.</li> </ul>
Electric Operators:	<p>1. General:</p> <ul style="list-style-type: none"> <li>a. Comply with AWWA C540.</li> <li>b. Size to 1-1/2 times required operating torque. Motor stall torque not to exceed torque capacity of valve.</li> <li>c. Controls integral with the actuator and fully equipped as specified in AWWA 540.</li> <li>d. Stem protection for rising stem valves.</li> </ul>

2. Actuator Operation – General:

- a. Suitable for full 90-degree rotation of quarter-turn valves or for use on multiturn valves.
- b. Manually override handwheel.
- c. Valve position indication.
- d. Operate from FULL CLOSED to FULL OPEN positions or the reverse in 10 seconds.

3. Modulating Service:

- a. Size motors for continuous duty.
- b. Feedback potentiometer and integral electronic positioner/comparator circuit to maintain valve position.
- c. HAND-OFF-AUTO (Local-Off-Remote) Selector Switch:
  - 1) OPEN-STOP-CLOSE pushbutton to control valve in HAND position.
  - 2) 4 to 20 mA dc input signal to control valve in AUTO position.
  - 3) Auxiliary contact that closes in REMOTE position.
- d. Valves shall close upon loss of signal unless otherwise indicated.
- e. OPEN and CLOSED indicating lights.
- f. Ac motor with reversing starter or dc motor with solid state reversing controller, and built-in overload protection. Controller capable of 1200 starts per hour.
- g. Duty cycle limit timer and adjustable band width to prevent actuator hunting.
- h. Valve position output converter that generates a 4 to 20 mA dc signal in proportion to valve position, and is capable of driving into loads up to 500 ohm at 24 volts dc.

4. Actuator Power Supply:

- a. 120-volt, single-phase unless otherwise indicated.
- b. Externally operable power disconnect switch.

5. Enclosure:

- a. As defined in NEMA 250, Type 4.

b. b. Contain 120□volt space heaters.

7. Limit Switch:

- a. Single-pole, double-throw (SPDT) type, field adjustable cam-operated, with contacts rated for 5 amps at 120 volts ac.
- b. Each valve actuator to have a minimum of two transfer contacts at end position, one for valve FULL OPEN and one for valve FULL CLOSED.
- c. Housed in actuator control enclosure.

8. Manufacturers and Products:

- a. Rotork.
- b. EIM Co.
- c. AUMA.
- d. Limitorque.