SECTION 22 10 06
PLUMBING PIPING SPECIALTIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drains.
B. Cleanouts.
C. Hose bibbs.
D. Hydrants.
E. Washing machine boxes and valves.
F. Refrigerator valve and recessed box.
G. Back water valves.
H. Backflow preventers.
I. Double check valve assemblies.
J. Water hammer arrestors.
K. Sumps and interceptors.
L. Mixing valves.
M. Catch basins and manholes.

1.02 RELATED REQUIREMENTS

A. Section 01 10 00 - Summary: Product requirements for Owner furnished kitchen equipment.
B. Section 01 60 00 - Product Requirements: Procedures for Owner-supplied products.
C. Section 03 30 00 - Cast-in-Place Concrete: Manhole bottoms.
D. Section 03 30 00 - Cast-in-Place Concrete: Execution requirements for concrete catch basin bases.
E. Section _____: Roofing.
F. Section 22 10 05 - Plumbing Piping.
G. Section 26 27 17 - Equipment Wiring: Electrical characteristics and wiring connections.
H. Section 33 05 13 - Manholes and Structures.

1.03 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design; 2010.
B. ASME A112.6.3 - Floor and Trench Drains; 2001 (R2007).
C. ASME A112.6.4 - Roof, Deck, and Balcony Drains; 2008 (Reaffirmed 2012).
D. ASSE 1011 - Hose Connection Vacuum Breakers; 2004.
E. ASSE 1012 - Backflow Preventer with Intermediate Atmospheric Vent; 2009.
F. ASSE 1013 - Reduced Pressure Principle Backflow Preventers and Reduced Pressure Principle Fire Protection Backflow Preventers; 2011.
G. ASSE 1019 - Performance Requirements for Wall Hydrant with Backflow Protection and Freeze Resistance; 2011.
H. ASTM C478 - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections; 2015.
I. ASTM C478M - Standard Specification for Circular Precast Reinforced Concrete Manhole Sections (Metric); 2015.
J. DIN 19580 - Drainage Channels for Vehicular and Pedestrian Areas - Durability, Mass per Unit Area and Evaluation of Conformity; 2010.

K. NSF 61 - Drinking Water System Components - Health Effects; 2014 (Errata 2015).

L. NSF 372 - Drinking Water System Components - Lead Content; 2011.

M. PDI-WH 201 - Water Hammer Arresters; 2010.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component sizes, rough-in requirements, service sizes, and finishes.

C. Shop Drawings: Indicate dimensions, weights, and placement of openings and holes.

D. Certificates: Certify that grease interceptors meet or exceed specified requirements.

E. Manufacturer's Instructions: Indicate Manufacturer's Installation Instructions: Indicate assembly and support requirements.

F. Sustainable Design Documentation: Submit appropriate evidence that materials used in potable water systems comply with the specified requirements.

G. Operation Data: Indicate frequency of treatment required for interceptors.

H. Maintenance Data: Include installation instructions, spare parts lists, exploded assembly views.

I. Project Record Documents: Record actual locations of equipment, cleanouts, backflow preventers, water hammer arrestors, _____.

J. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 60 00 - Product Requirements, for additional provisions.
   2. Extra Loose Keys for Outside Hose Bibbs: One.
   3. Extra Hose End Vacuum Breakers for Hose Bibbs: One.
   4. Service Kits for _____: One.
   5. Containers of _____: One.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with not less than three years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Accept specialties on site in original factory packaging. Inspect for damage.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Specialties in Potable Water Supply Systems: Provide products that comply with NSF 61 and NSF 372 for maximum lead content.

2.02 DRAINS

A. Manufacturers:
   1. Jay R. Smith Manufacturing Company; _____: www.jayrsmith.com.
   2. Josam Company; _____: www.josam.com.
   3. LATICRETE International, Inc.; LATICRETE® HYDRO BAN® Linear Drain: www.laticrete.com.
   4. LATICRETE International, Inc.; LATICRETE® HYDRO BAN® Bonding Flange Drain: www.laticrete.com.
   5. Noble Company; FreeStyle Linear Drain: www.noblecompany.com.
   6. Zurn Industries, LLC; _____: www.zurn.com.
   7. _____.
   8. Substitutions: See Section 01 60 00 - Product Requirements.

B. Roof Drains:
   1. Assembly: ASME A112.6.4.
   2. Body: Lacquered cast iron with sump.

3. Strainer: Removable polyethylene dome with vandal proof screws.
4. Accessories: Coordinate with roofing type, refer to Section _____:
    a. Membrane flange and membrane clamp with integral gravel stop.
    b. Adjustable under deck clamp.
    c. Roof sump receiver.
    d. Waterproofing flange.
    e. Controlled flow weir.
    f. Leveling frame.
    g. Adjustable extension sleeve for roof insulation.
    h. Perforated or slotted ballast guard extension for inverted roof.
    i. Perforated stainless steel ballast guard extension.

C. Parapet Drains:
1. Lacquered cast iron body with aluminum flashing clamp collar and epoxy coated sloping grate.

D. Canopy and Cornice Drains:
1. Lacquered cast iron body with aluminum flashing clamp collar and epoxy coated flat strainer.

E. Roof Overflow Drains:
1. Lacquered cast iron body and clamp collar and bottom clamp ring; pipe extended to _____ inches above flood elevation.

F. Downspout Nozzles:
1. Bronze round with straight bottom section.

G. Area Drains:
1. Assembly: ASME A112.6.4.
2. Body: Lacquered cast iron with sump.
3. Strainer: Round nickel-bronze.
4. Accessories: Membrane flange and membrane clamp with integral gravel stop, with adjustable under deck clamp.

H. Linear Drains:
1. Body: Provide PVC, ABS, or stainless-steel with sloped channel to vertical waste pipe.
2. Clamping Ring: Stainless steel mechanism to clamp waterproof membrane to linear drain body.
3. Strainer: Removable brushed stainless steel or tile top strainer furnished by manufacturer or others.
4. Grate: Cross-hatch.
5. Additional Components: Manufacturer's standard membrane, sealant, fasteners, and anchors.

I. Floor Drains (General)
1. Floor drains shall be coated cast iron with integral double drainage flange, weep holes, sediment bucket, inside caulked bottom outlet, grates of bronze, federal specification WW-P-541b paragraph 19.7, type 220, and equal to J.R. Smith #2110.
2. Funnel/Floor Drain : Funnel shall be round and high attached to the grate with concealed screws. The drain shall of coated cast iron with an inside caulked bottom outlet. It shall comply with ANSI 112.21.1. and be equal to J.R. Smith Model Fig.3510-F11.

J. Floor Drain (FD-1):
1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer.

K. Floor Drain (FD-2):

1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable round nickel bronze strainer with removable perforated sediment bucket.

L. Floor Drain (FD-3):
   1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze strainer with polished bronze funnel or anti-splash rim.

M. Floor Drain (FD-4):
   1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze extra heavy duty strainer.

N. Floor Drain (FD-5):
   1. ASME A112.6.3; lacquered cast iron or stainless steel, two piece body with double drainage flange, weep holes, reversible clamping collar, and round, adjustable nickel-bronze extra heavy duty strainer with hinged grate and sediment bucket.

O. Floor Drain (FD-6):
   1. Lacquered cast iron or stainless steel, two piece body with drainage flange, heavy duty grate 6 inches wide, 12 inches long, dome strainer, end plates with gaskets.

P. Shower Channel Drain (SCD-1): Factory fabricated channel and grate with built in outlet pipe.
   1. Basis of Design: ACO Polymer Products, Inc., QuARTz: www.quartzbyaco.com.
   2. Channel Edge: Plain edge.
   3. Plumbing Connector Type: Stainless steel.
   4. Channel Length: 55 inches.
   5. Grate Style: Solid tray to accept tile to match floor; with drainage slot at edges.
   6. Grate Style: Manufacturer's standard "Hawaii".
   7. Grate Style: To be selected by Architect from manufacturer's full range.
   8. LED Lighting Feature: Red.
   9. Substrate Construction: Wooden subfloor over joists.
   10. Material: Electropolished stainless steel.
   11. Outlet Pipe: 2 inch diameter.
   12. Manufacturers:
      a. _____.
      b. _____.
      c. _____.
      d. Substitutions: See Section 01 60 00 - Product Requirements.

Q. Prefabricated Trench Drain (TD-1): Trench drain system assembled from factory fabricated, polymer concrete castings in standard lengths and variable depths, with integral joint flanges and integral grating support rails; includes joint gaskets and grating.
   1. Basis of Design: ACO Polymer Products, Inc., KlassikDrain; _____: www.acousa.com.
   2. Load Class: DIN 19580, Class A.
   3. ADA Standards compliant.
   4. ADA Standards compliant.
   5. ADA Standards compliant.
   6. ADA Standards compliant.
   7. Chemical Resistant.
   8. Chemical Resistant.
   9. Chemical Resistant.
   10. Chemical Resistant.
   11. Grating Material and Style: Perforated stainless steel.
   12. Grating Material and Style: Perforated galvanized steel.
   13. Grating Material and Style: Slotted stainless steel.
   14. Grating Material and Style: Slotted galvanized steel.

15. Grating Material and Style: Slotted ductile iron.
16. Grating Material and Style: Slotted plastic.
17. Grating Material and Style: Fiberglass bars.
18. Grating Material and Style: Longitudinally slotted stainless steel.
19. Grating Material and Style: Longitudinally slotted galvanized steel.
20. Grating Material and Style: Longitudinally slotted ductile iron.
21. Grating Material and Style: Mosaic iron.
22. Grating Material and Style: Galvanized steel mesh.
23. Grating Material and Style: Stainless steel mesh.
24. Grating Material and Style: Slotted composite.
25. Grating Material and Style: Perforated brass.
26. Grating Material and Style: Ductile iron grid.
27. Grating Material and Style: ADA Standards compliant ductile iron.
28. Grating Material and Style: Galvanized steel bar.
29. Grating Material and Style: Stainless steel bar.
30. Basis of Design: ACO Polymer Products, Inc., SlabDrain; _____: www.acousa.com.
31. Load Class: DIN 19580, Class A.
32. ADA Standards compliant.
33. ADA Standards compliant.
34. ADA Standards compliant.
35. ADA Standards compliant.
36. Chemical Resistant.
37. Chemical Resistant.
38. Chemical Resistant.
39. Chemical Resistant.
40. Chemical Resistant.
41. Shallow Invert.
42. Shallow Invert.
43. Shallow Invert.
44. Shallow Invert.
45. Grating Material and Style: Perforated stainless steel.
46. Grating Material and Style: Perforated galvanized steel.
47. Grating Material and Style: Slotted stainless steel.
48. Grating Material and Style: Slotted galvanized steel.
49. Grating Material and Style: Slotted plastic.
50. Grating Material and Style: Fiberglass bars.
51. Grating Material and Style: Longitudinally slotted stainless steel.
52. Grating Material and Style: Longitudinally slotted galvanized steel.
53. Grating Material and Style: Longitudinally slotted ductile iron.
54. Grating Material and Style: Mosaic iron.
55. Grating Material and Style: Galvanized steel mesh.
56. Grating Material and Style: Stainless steel mesh.
57. Grating Material and Style: Slotted composite.
58. Grating Material and Style: Perforated brass.
59. Grating Material and Style: Ductile iron grid.
60. Grating Material and Style: ADA Standards compliant ductile iron.
61. Grating Material and Style: Slotted ductile iron.
62. Basis of Design: ACO Polymer Products, Inc., FlowDrain; _____: www.acousa.com.
63. Load Class: DIN 19580, Class A.
64. ADA Standards compliant.
65. Chemical Resistant.
66. Grating Material and Style: Stainless steel bars.
67. Grating Material and Style: Galvanized steel bars.

68. Grating Material and Style: Slotted ductile iron.
69. Grating Material and Style: ADA Standards compliant slotted ductile iron.
70. Basis of Design: ACO Polymer Products, Inc., PowerDrain; _____: www.acousa.com.
71. Load Class: DIN 19580, Class D.
72. ADA Standards compliant.
73. Chemical Resistant.
74. Grating Material and Style: ADA Standards compliant slotted ductile iron.
75. Trench Width: 8 inches.
76. Trench Section Length: 39 inches, and 19-1/2 inches.
77. Grating Support Rail: Stainless steel.
78. Accessories:
    a. Foul air trap.
    b. Oval to round pipe connection.
    c. Vertical outlet strainer.

R. Floor Sink (FS-1):
1. Lacquered cast iron body with dome strainer and seepage flange.

S. Floor Sink (FS-2):
1. Round lacquered cast iron body with integral seepage pan, epoxy coated interior, aluminum dome strainer, nickel bronze frame, full grate.

T. Planter Drains:
1. ASME A112.6.4; lacquered cast iron body with sump.
2. Strainer: Removable polyethylene dome with stainless steel screen.
3. Accessories: Membrane flange and membrane clamp with integral gravel stop.

2.03 CLEANOUTS

A. Manufacturers:
1. Jay R. Smith Manufacturing Company; _____: www.jayrsmith.com.
2. Josam Company; _____: www.josam.com.
3. Zurn Industries, LLC; _____: www.zurn.com.
4. _____.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. General
1. Standard: ASME A112.36.2M for cast iron for cleanout.
2. Size: Same as connected drainage piping
3. Body Material: Hubless, cast-iron soil pipe test tee as required to match connected piping.
4. Closure: Raised-head, brass plug.
5. Closure Plug Size: Same as cleanout size.

C. Cleanouts at Exterior Surfaced Areas (CO-1):

D. Cleanouts at Exterior Unsurfaced Areas (CO-2):
1. Line type with lacquered cast iron body and round epoxy coated gasketed cover.

E. Cleanouts at Interior Finished Floor Areas (CO-3):
1. Lacquered cast iron body with anchor flange, reversible clamping collar, threaded top assembly, and round gasketed scored cover in service areas and round gasketed depressed cover to accept floor finish in finished floor areas.

F. Cleanouts at Interior Finished Wall Areas (CO-4):
1. Line type with lacquered cast iron body and round epoxy coated gasketed cover, and round stainless steel access cover secured with machine screw.

G. Cleanouts at Interior Unfinished Accessible Areas (CO-5): Calked or threaded type. Provide bolted stack cleanouts on vertical rainwater leaders.

2.04 HOSE BIBBS

A. Manufacturers:
   1. Jay R. Smith Manufacturing Company; _____: www.jayrsmith.com.
   2. Watts Regulator Company; _____: www.wattsregulator.com.
   3. Zurn Industries, LLC; _____: www.zurn.com.
   4. _____.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Interior Hose Bibbs:
   1. Bronze or brass with integral mounting flange, replaceable hexagonal disc, hose thread spout, chrome plated where exposed with handwheel, integral vacuum breaker in conformance with ASSE 1011.

C. Interior Mixing Type Hose Bibbs:
   1. Bronze or brass, wall mounted, double service faucet with hose thread spout, integral stops, chrome plated where exposed with handwheels, and vacuum breaker in conformance with ASSE 1011.

D. Exterior Hose Bibbs:
   1. Where called for on drawings, a Hose Bibb with Torx bolt and accompanying tool, Model MDF-36DB (New York Special) with 2 (two) hose hooks, shall be installed according to manufacturer's specifications. Item shall be direct buried. Color shall be MDF-Green. Item shall be manufactured by Most Dependable Fountains, 4697 Winchester, Memphis, TN 38118, tel. (800) 552-6331 attn: Angela Horne or equal.
      a. Concrete for footing shall conform to the Concrete Specifications in this contract.
      b. All new piping shall be rigid copper of sizes shown on the Drawings. Substitutions of smaller sizes will not be permitted. If sizes shown on the Drawings are not available in specified material, the Contractor shall furnish the next larger size at no increase in the contract price.

2.05 HYDRANTS

A. Manufacturers:
   1. Arrowhead Brass & Plumbing, LLC; _____: www.arrowheadbrass.com.
   2. Jay R. Smith Manufacturing Company; _____: www.jayrsmith.com.
   3. Zurn Industries, LLC; _____: www.zurn.com.
   4. _____.

B. Wall Hydrants:
   1. ASSE 1019; freeze resistant, self-draining type with chrome plated wall plate hose thread spout, handwheel, and integral vacuum breaker.

C. Floor Hydrants:
   1. ASSE 1019; chrome plated lockable recessed box, hose thread spout, lockshield and removable key, and vacuum breaker.

2.06 WASHING MACHINE BOXES AND VALVES

A. Box Manufacturers:
   1. IPS Corporation/Water-Tite; _____: www.ipscorp.com.
   2. Oatey Supply Chain Services, Inc; _____: www.oatey.com.
   3. _____.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Valve Manufacturers:
   1. IPS Corporation/Water-Tite; _____: www.ipscorp.com.
   2. Zurn Industries, LLC; _____: www.zurn.com.
   3. _____.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Description: Plastic preformed rough-in box with brass long shank valves with wheel handles, socket for 2 inch waste, slip in finishing cover.

2.07 REFRIGERATOR VALVE AND RECESSED BOX

A. Box Manufacturers:
   1. IPS Corporation/Water-Tite; _____: www.ipscorp.com.
   2. Oatey Supply Chain Services, Inc; _____: www.oatey.com.
   3. _____.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Valve Manufacturers:
   1. IPS Corporation/Water-Tite; _____: www.ipscorp.com.
   2. Zurn Industries, LLC; _____: www.zurn.com.
   3. _____.
   4. Substitutions: See Section 01 60 00 - Product Requirements.

C. Description: Plastic preformed rough-in box with brass valves with wheel handle, slip in finishing cover.

2.08 BACK WATER VALVES

A. Manufacturers:
   1. Jay R. Smith Manufacturing Company; _____: www.jayrsmith.com.
   2. Savko Plastic Pipe & Fittings, Inc; _____: www.savko.com.
   3. Zurn Industries, LLC; _____: www.zurn.com.
   4. _____.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Cast Iron Back Water Valves: ASME A112.6.4; lacquered cast iron body and cover, brass valve, extension sleeve, and access cover.

C. Plastic Back Water Valves: ABS body and valve, extension sleeve, and access cover.

2.09 BACKFLOW PREVENTERS

A. Manufacturers:
   1. Conbraco Industries, Inc; _____: www.apollovalves.com.
   2. Watts Regulator Company, a part of Watts Water Technologies; _____: www.wattsregulator.com.
   3. Zurn Industries, LLC; _____: www.zurn.com.
   4. _____.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. General:
   1. Shall be approved by the New York City Department of Environmental Protection.
      a. Reduced-Pressure-Principle Backflow Preventers-Lead Free
         1) See Editing Instruction No. 1 in the Evaluations for cautions about naming manufacturers and products. Retain one of first three subparagraphs and list of manufacturers below. See Division 01 Section "Product Requirements."
         2) Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
            (a) Ames Co.
            (b) Conbraco Industries, Inc.
            (c) FEBCO; SPX Valves & Controls.
            (d) Flomatic Corporation.
            (e) Watts Industries, Inc.; Water Products Div.
            (f) Zurn Plumbing Products Group; Wilkins Div.
         3) Standard: ASSE 1013.
         4) Operation: Continuous-pressure applications.

5) Pressure Loss: 12 psig (83 kPa) maximum, through middle 1/3 of flow range.
6) Body and shutoffs shall construct using Lead Free cast copper silicon alloy materials. Lead Free reduced pressure zone assembly shall comply with state codes and standards, where applicable, requiring reduce lead content.
7) There shall be no threads or screws in the waterway exposed to line fluids
8) Configuration: Designed for horizontal, straight through flow.
9) Accessories: The assembly shall also include two resilient isolation valves, four resistant seated test cocks. Air -Gap Fitting: ASME A112.1.2, matching backflow-preventer connection.
   (a) Solenoid valve shall be the Rain Bird PEB- Inline Industrial Irrigation Valve or equal. Size of solenoid valve shall be determined by size of "K" copper piping called for on Contract Drawings, 1" minimum.
   (b) Shut-off Valve (gate valve): Gate Valves 2" and under, shall be lead-free bronze gate valve, Model number- T-113-LF Threaded by Nibco, Inc, phone 800.234.0227 or equal. Size of gate valve shall be determined by size of "K" copper piping called for on Contract Drawings, 1" minimum.
   (c) Drain Valve (ball valve): Drain Valve (hose bibb) shall be a ½" bronze ball valve, two piece body, full port, with ¾ inch hose connection. Valve shall be either the Apollo Model 78-103-01, the Nibco Model T-585-70-HC or equal. Size of ball valve shall be determined by size of "K" copper piping called for on Contract Drawings, 1" minimum.
   (d) Timer (electromechanical time switch with 24 hour dial) shall be Catalog No. 1101 (1100 Series) as manufactured by: Tork Electromechanical Controls, a division of NSI Industries, Telephone 877.268.3700 or equal. The timer shall be located in the building in an area indicated on the Drawings.
   (e) Y-Strainer: The Y-Strainer shall be Stay Flow strainer model YBT Bronze Y Strainer as manufactured by Flexi Craft Industries, 2323 West Hubbard Street, Chicago, IL 60612 phone 312.4284750 or equal. Y Strainer shall be for water with stainless steel screen. Strainer shall be sized for piping.
   (f) Pipe Fittings and Joints: The main line pipe and fittings shall be "K" copper. Contractor shall insure that proper slope is consistently applied to all piping to ensure positive gravity assisted drainage of the entire system. All piping and fittings shall be brazed and meet all applicable codes. The Contractor shall install all necessary piping in general accordance with the plan, however the Authority reserves the right to change the routing, or depth of pipe. Foreign materials shall be prevented from entering the system during installation. Immediately prior to assembling, all pipes, valves and fittings shall be cleaned. All unattached ends of pipe, fittings, and valves shall be plugged and capped pending attachment of additional pipe or fittings. All lines shall be thoroughly flushed prior to attachment of terminal fittings. All piping shall be laid with a sufficient slope, minimum one half percent (.5%) to drain for winterization. Special care shall be taken to ensure that all backfill material is free of damaging debris and piping is well supported while back filling occurs. All piping shall be installed min. four (4) feet below grade surrounded by a six-inch (6") envelope of sand to ensure protection.
   (g) Copper Pipe: Copper pipe shall be rigid hard temper type "K" copper tubing in straight lengths meetings ASTM specification B88-09. Copper tubing and fittings are to be supplied from gate valves on the water supply lines to the hose bibb.
   (h) Fittings: Fittings shall be approved red brass class "A" thread less type, containing no less than 85% copper adaptable for copper tubing. Brazing joint fillings shall be wrought copper or bronze in accordance with ANSI B16.22.

(i) Joints: Joints between copper tubing and threaded pipe shall be made of brass adapter fittings properly brazed to tubing. Joints shall be made by brazing.
(j) All valves, unless otherwise specified, shall be of 125 psi working steam pressure.

C. Reduced Pressure Backflow Preventers:
1. ASSE 1013; bronze body with bronze internal parts and stainless steel springs; two independently operating, spring loaded check valves; diaphragm type differential pressure relief valve located between check valves; third check valve that opens under back pressure in case of diaphragm failure; non-threaded vent outlet; assembled with two gate valves, strainer, and four test cocks.

2.10 DOUBLE CHECK VALVE ASSEMBLIES

A. Manufacturers:
1. Conbraco Industries, Inc; _____: www.apollovalves.com.
2. Watts Regulator Company, a part of Watts Water Technologies; _____: www.wattsregulator.com.
3. Zurn Industries, LLC; _____: www.zurn.com.
4. _____.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Double Check Valve Assemblies:
1. ASSE 1012; Bronze body with corrosion resistant internal parts and stainless steel springs; two independently operating check valves with intermediate atmospheric vent.

2.11 WATER HAMMER ARRESTORS

A. Manufacturers:
1. Jay R. Smith Manufacturing Company; _____: www.jayrsmith.com.
2. Watts Regulator Company, a part of Watts Water Technologies; _____: www.wattsregulator.com.
3. Zurn Industries, LLC; _____: www.zurn.com.
4. _____.
5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Water Hammer Arrestors:
1. Stainless steel construction, bellows type sized in accordance with PDI-WH 201, precharged suitable for operation in temperature range minus 100 to 300 degrees F and maximum 250 psi working pressure.
a. Standard: ASSE 1010 or PDI-WH 201
b. Type: Metal bellows or Copper tube with piston.
c. Size: ASSE 1010, Sizes AA and A through F or PDI-WH 201, Sizes A through F.

2.12 SUMP AND INTERCEPTORS

A. Manufacturers:
1. Jay R. Smith Manufacturing Company; _____: www.jayrsmith.com.
2. Zurn Industries, LLC; _____: www.zurn.com.
3. _____.
4. Substitutions: See Section 01 60 00 - Product Requirements.

B. Sumps:
1. Precast concrete with required openings and drainage fittings.
2. Cover: 3/8 inch thick checkered steel plate with gasket seal frames and anchor bolts.

C. Grease Interceptors:
1. Construction:
a. Material: Epoxy coated fabricated steel.
b. Rough-in: On floor.

c. Accessories: Multi-weir baffle assembly, integral deep seal trap, removable integral flow control, sediment bucket.
d. Cover: Steel, epoxy coated, non-skid with gasket, securing handle, and enzyme injection port, recessed for floor finish.

2. Unit Rating: _____ gpm flow and _____ lbs grease capacity.
3. Interceptor shall have steel body, Duco coating inside and outside, baffles, gasketed cover, means of evacuating solids, internal air relief, non-submerged inlet, double wall outlet seal, proper size external flow control fitting with air inlet; guaranteed to give 90% grease interception with complete evacuation of solids and no moving parts.
4. Interceptor shall conform to PDI G101

D. Oil Interceptors:
1. Construction:
a. Material: Epoxy coated fabricated steel.
b. Rough-in: On floor.
c. Accessories: Integral deep seal trap, removable integral flow control, adjustable draw-off assembly, sediment bucket.
d. Cover: Steel, epoxy coated, non-skid with gasket, securing handle, and enzyme injection port, recessed for floor finish.
e. Unit Rating: _____ gpm flow and _____ lbs oil capacity.

E. Solid Interceptor:
1. Type: Factory-fabricated interceptor made for removing and retaining sediment from wastewater.
2. Body Material: Cast iron or steel.
3. Interior Separation Device: Screens.
4. Interior Lining: Corrosion-resistant enamel.
5. Exterior Coating: Corrosion-resistant enamel.
6. End Connections: Threaded.
7. Mounting: Above floor.

F. Sediment Interceptors:
1. Epoxy coated cast iron body and secured cover with removable stainless steel sediment bucket.

2.13 MIXING VALVES

A. Thermostatic Mixing Valves:
1. Manufacturers:
a. ESBE; _____: www.esbe.se/en.
b. Honeywell International Inc; _____: yourhome.honeywell.com.
c. Leonard Valve Company; _____: www.leonardvalve.com.
d. _____.
e. Substitutions: See Section 01 60 00 - Product Requirements.
2. Valve: Chrome plated cast brass body, stainless steel or copper alloy bellows, integral temperature adjustment.
3. Capacity: _____ gpm at _____ psi differential.
4. Accessories:
a. Check valve on inlets.
b. Volume control shut-off valve on outlet.
c. Stem thermometer on outlet.
d. Strainer stop checks on inlets.
5. Cabinet: 16 gage, 0.0598 inch prime coated steel, for recessed mounting with keyed lock.

B. Pressure Balanced Mixing Valves:
1. Manufacturers:
a. Delta Faucet Company; _____: www.deltafaucet.com.
b. Tacotherm Ltd; _____: www.tacotherm.co.uk.

c. _____.
d. Substitutions: See Section 01 60 00 - Product Requirements.

2. Valve: Chrome plated cast brass body, stainless steel cylinder, integral temperature adjustment.
   a. Capacity: _____ gpm at _____ psi differential.
3. Accessories:
   a. Volume control shut-off valve on outlet.
   b. Stem thermometer on outlet.
   c. Strainer stop checks on inlets.
   d. Cabinet: 16 gage, 0.0598 inch prime coated steel, for recessed mounting with keyed lock.

2.14 CATCH BASINS AND MANHOLES

A. Manufacturers:
   1. Forterra; _____: www.forterrapressurepipe.com.
   2. Kistner Concrete Products, Inc; _____: www.kistner.com.
   3. Sherman Dixie Concrete Industries; _____: www.shermandixie.com.
   4. _____.
   5. Substitutions: See Section 01 60 00 - Product Requirements.

B. Catch Basins:
   1. Barrel: ASTM C478 (ASTM C478M); precast concrete sections laid on cast-in-place reinforced concrete foundation pad, 36 inches or 48 inches diameter with precast concrete top.
   2. Inlet Assembly: Two piece heavy duty cast steel or cast iron frame and grate with ground or machined grate and frame bearing surfaces.
   3. Curb and gutter style: Rectangular grate and storm back:
      a. Capacity 247 cu ft/s.
      b. Capacity ____ cu ft/s.
   4. Standard: Round frame and grate:
      a. Capacity 194 cu ft/s.
      b. Capacity ____ cu ft/s.
   5. Manhole frame: Grated top:
      a. Capacity 141 cu ft/s.
      b. Capacity ____ cu ft/s.
   6. Minimum Cover Over Outlet: 6 feet.
   7. Minimum Cover Over Outlet: _____ feet.
   8. Slope bottom slab 10 percent to outlet invert.
   9. Provide minimum 2 feet sump below outlet.

C. Manholes: Formed-bottom type, laid on cast-in-place reinforced concrete foundation pad; concrete as specified in Section 03 30 00.
   1. Construction: Concrete masonry units.
   2. Size: 48 inch diameter.
   3. Size: _____ inch diameter.
   4. Cover: Standard cast iron with minimum sized pick hole, and frame. Use heavy duty cover and frame in vehicular traffic areas.
   5. Manufacturers:
      a. Campbell Group; _____: www.campbellfoundry.com.
      b. Neenah Enterprises, Inc; _____: www.nfco.com.
      c. _____.
      d. Substitutions: See Section 01 60 00 - Product Requirements.
   6. Steps: 3/4 inch diameter galvanized steel on 16 inch centers.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Extend cleanouts to finished floor or wall surface. Lubricate threaded cleanout plugs with mixture of graphite and linseed oil. Ensure clearance at cleanout for rodding of drainage system.

C. Encase exterior cleanouts in concrete flush with grade.

D. Install floor cleanouts at elevation to accommodate finished floor.

E. Install approved portable water protection devices on plumbing lines where contamination of domestic water may occur; on boiler feed water lines, janitor rooms, fire sprinkler systems, premise isolation, irrigation systems, flush valves, interior and exterior hose bibbs.

F. Pipe relief from backflow preventer to nearest drain.

G. Install water hammer arrestors complete with accessible isolation valve on hot and cold water supply piping to lavatory sinks, washing machine outlets, or _____.

H. Install air chambers on hot and cold water supply piping to each fixture or group of fixtures (each washroom). Fabricate same size as supply pipe or 3/4 inch minimum, and minimum 18 inches long.

END OF SECTION