

SECTION 22 13 00 - FACILITY SANITARY SEWERAGE

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Soil and waste systems including connections to sanitary mains as indicated on the Drawings. Work includes, but is not limited to:
 - a. Excavation and backfilling as specified in Division 31 Section "Earth Moving."
 - b. Sanitary waste, drain and vent piping.
 - c. Floor sinks.
 - d. Floor drains.
 - e. Hub drains.
 - f. Trench drains.
 - g. Area drain.
 - h. Trap seal.
 - i. Cleanouts.
 - j. Grease interceptors.
 - k. Plumbing fixture connections.
 - l. Mechanical equipment connections.
 - m. Food preparation sinks and disposer connections.
 - n. Testing.

1.2 SUBMITTALS

- A. Shop Drawings for Grease Interceptor. Submit to local officials having jurisdiction for approval prior to purchase.
- B. Field quality-control inspection and test reports.

1.3 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14, "Plastics Piping Systems Components and Related Materials," for plastic piping components. Include marking with "NSF-dwv" for plastic drain, waste, and vent piping; and "NSF-drain" for plastic drain piping.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding 10-foot head of water (30 kPa) minimum working pressure, unless otherwise indicated:

2.2 SANITARY, DRAIN AND VENT PIPING:

- A. Copper Piping 2-1/2 inches (63.5 mm) and Under: ASTM B 88.62, Type "M" copper.
- B. Plastic Piping:
 - 1. Polyvinyl chloride (PVC) Pipe: ASTM D 2665, Schedule 40 DWV.
 - a. PVC Socket Fittings: ASTM D 2665, socket type, made to ASTM D 3311, drain, waste, and vent patterns.
 - 2. ABS Pipe: ASTM D 2661, Schedule 40, solid wall.
 - a. ABS Socket Fittings: ASTM D 2661, made to ASTM D 3311, drain, waste, and vent patterns.
 - 3. Protect plastic piping above slab in stock rooms from damage with guards or concrete curbs.
- C. Exposed vent piping will not be permitted in sales area or customer vision areas below bottom elevation of decor.
- D. Collect vent piping where practical so roof will be pierced a minimum number of times. Vent sizes and heights above roof per governing codes. Vents piercing roofs flashed per roofing manufacturer's requirements. Provide wire basket strainer in top of all vents.

2.3 DRAINS:

- A. Manufacturers:
 - 1. Canplas Industrial Products
 - 2. Josam Company
 - 3. Jay R Smith Mfg. Co., Div. of Smith Industries
 - 4. Oatey Company
 - 5. Sioux Chief Manufacturing Company, Inc.
 - 6. Tyler Pipe; Wade Division
 - 7. Watts Regulator Company; A Division of Watts Water Technologies, Inc.
 - 8. Zurn Industries, Inc.
- B. FD1 - Light Duty Floor Drain: PVC body, with 5.5-inch (140-mm) round nickel bronze adjustable grate.
 - 1. Basis of Design: Sioux Chief Manufacturing Company, Inc.; Finish Line, adjustable drainage system, 832-35PNR.
- C. FD2 - Heavy Duty Stainless Steel Floor Drain: Smooth antimicrobial PVC gray colored body, with 8-1/2-inch (216-mm) round stainless steel ring and pinned grate, 4,500 lbs. (2,041 kg) load rating, and stainless steel sediment basket.

1. Product: Sioux Chief Manufacturing Company, Inc.; 0860-4PKW. Specify store number and address when ordering.
 - a. No substitutions allowed.
- D. FD4 - Floor Sink, Round: Heavy duty PVC body with Schedule 40 hub connection, with 8-1/2-inch (216-mm) round PVC half grate strainer and stainless-steel mesh debris basket.
 1. Use: For case drains, when floor sinks versus hub drains are required by code. Square FD5 floor sinks to be used for case drains only when required by authority having jurisdiction.
 2. Product: Sioux Chief Manufacturing Company, Inc.; Model 860-4P2W, Gray. Specify store number and address when ordering.
 - a. Provide Sioux Chief Manufacturing Company, Inc.; Model 860-W4P2W, White, only when required by authority having jurisdiction.
 - b. No substitutions allowed.
- E. FD5 - Floor Sink, Square: Heavy Duty PVC body with Schedule 40 hub connection, nominal 10-1/4 inch (260 mm) square, with PVC half grate and stainless steel mesh debris basket.
 1. Use: Required for Starbucks Kiosk.
 2. Product: Sioux Chief Manufacturing Company, Inc.; Model 0861-G4PW2, Gray. Specify store number and address when ordering.
 - a. Provide Sioux Chief Manufacturing Company, Inc.; Model 861-4PW2, White, only when required by authority having jurisdiction.
 - b. No substitutions allowed.
- F. FD6 - Heavy Duty Cast Iron Floor Drain: smooth PVC body, with 8-1/2-inch (216-mm) round cast iron ring and grate, 5,000 lbs. (2,268 kg) load rating, and PVC sediment basket.
 1. Basis of Design: Sioux Chief Manufacturing Company, Inc.; 860-4PiU.

2.4 TRENCH DRAINS

A. Manufacturers

1. ABT Polydrain, Inc.
2. ACCO Drain, Inc.
3. Hubbell Polycast
4. Quartzite Polycast
5. Sioux Chief Manufacturing Company, Inc.
6. Zurn Industries, Inc.

B. TD1 - Trench Drains: Black Painted Ductile Iron Grate for cooler door and backroom door way application, 56,000 lb. (25,400 kg) grate load rating. See Drawings for sizes.

1. Basis of Design: Zurn Industries, Inc.; Z-806, polymer drain with ductile iron grates.

- C. TD2-Trench Drains: Reinforced Slotted Galvanized Steel Grate, **28,000 lb (12,700 kg)** grate load rating load, for service department walkway application: See Drawings for sizes.

1. Manufacturers

- a. ABT Polydrain, Inc., Product #2420
- b. Zurn Industries, Inc., Product # Z886 RFG

2.5 TRAP SEALS

- A. General: May be used in place of trap primers to prevent emission of sewer gases where permitted by authorities having jurisdiction.
- B. Material: Provide one of the following:
- 1. Commercial grade UV and Ozone resistant ABS plastic housing with proprietary EPDM rubber diaphragm and soft rubber sealing gasket.
 - a. Product: Rectorseal; SureSeal
 - 2. Smooth, soft, flexible, elastomeric PVC material molded into shape of duck's bill, open on top with curl closure at bottom.
 - a. Product: ProSet Systems, Inc; Trap Guard.
- C. Size: As required to fit drain opening as recommended by manufacturer.

2.6 CLEANOUTS (CO)

- A. Interior and Exterior Traffic Area Floor Cleanouts:
- 1. Product: Sioux Chief Manufacturing Company, Inc.; Model 834-4DNRH heavy duty nickel bronze cleanout cover. Specify store number and address when ordering.
 - a. No substitutions allowed.
 - 2. Size: **4-inch (102-mm)** top adjustable to finish floor, regardless of piping size in which floor cleanouts are installed.
 - 3. Load Rating: Provide cleanout covers with a minimum load rating of **15,000 lbs. (6803 kg)**.
- B. Wall Cleanouts: **4-inch (102-mm)** cleanout cover kit, with brass plug and stainless steel polished top.
- 1. Basis-of-Design: Sioux Chief Manufacturing Company, Inc.; 873 series.
- C. Exterior Non-Traffic Area Cleanouts: **4-inch (102-mm)** adjustable heavy-duty cleanout in concrete pad at grade with **6-1/2 inch (165 mm)** heavy-duty all ductile-iron ring and cover with polypro cleanout plug and **4-inch (102-mm)** PVC pipe connection.

1. Basis-of-Design: Sioux Chief Manufacturing Company, Inc.: 834-4PiR

2.7 GREASE INTERCEPTOR

- A. As indicated (interior and exterior) on plumbing drawings.
 1. Include indented top design with lettering cast into cover, using wording equivalent to "GREASE INTERCEPTOR."
- B. Structural Design Loads: Heavy-Traffic Load per ASTM C 890, A-16.
- C. Precast Concrete Grease Interceptors: Comply with ASTM C 1613 and requirements of authorities having jurisdiction.
 1. Material: Precast steel reinforced concrete, 5000 psi (34.5 MPa) minimum, for exterior underground installation.
 2. Capacity: As indicated on drawings or minimum capacity of 1000 gallons (3790-liters).
 3. Interior Coating: Provide fabricator's standard epoxy coating if required by authorities having jurisdiction.
 4. Include rubber-gasketed joints, manholes, compartments or baffles, and piping or openings to retain grease and to permit wastewater flow.
 5. Grade Rings (If Required): Reinforced-concrete rings, 6- to 9-inch (150- to 225-mm) total thickness, to match diameter of manhole frame and cover.
 6. Manhole Frames and Covers: Ferrous; 24-inch (610-mm) ID by 7- to 9-inch (175- to 225-mm) riser with 4-inch- (100-mm-) minimum width flange and 26-inch- (660-mm-) diameter cover meeting specified structural design loads.
 - a. Quantity: Two minimum
 - b. Materials:
 - 1) Ductile Iron: ASTM A 536, Grade 60-40-18, unless otherwise indicated.
 - 2) Gray Iron: ASTM A 48/A 48M, Class 35, unless otherwise indicated.
 - c. Include indented top design with lettering cast into cover, using wording equivalent to "GREASE INTERCEPTOR."

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

- A. General:
 1. Do not run sanitary piping under freezers and avoid running sanitary piping under coolers if at all possible. Run indirect system vents separately through roof independent from sanitary system vents.
 2. Do not install exposed vent piping in sales area below 14-feet (4.3-m) or customer vision areas. Coordinate location to be grouped with other piping and conduit extending to roof.
 3. Collect vent piping where practical so roof will be pierced a minimum number of times without increasing depth of wall. Vent sizes and heights above roof per governing codes.

- Vents piercing roofs flashed per roof manufacturer's recommended details. Provide wire basket strainer in top of all vents.
4. Do not run sanitary vent piping in return air shaft wall. If no other option is available, cast iron, steel, or copper vent piping may be run in return air shaft wall upon approval of the Owner.
- B. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.
- C. Install cast-iron sleeve with water stop and mechanical sleeve seal at each service pipe penetration through foundation wall. Select number of interlocking rubber links required to make installation watertight. Sleeves and mechanical sleeve seals are specified in Division 22 Section "Common Work Results for Plumbing."
- D. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Wall penetration systems are specified in Division 22 Section "Common Work Results for Plumbing."
- E. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep 1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.
- F. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- G. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 and smaller; 1 percent downward in direction of flow for piping NPS 4 and larger.
 2. Horizontal Sanitary Drainage Piping: 1 percent downward in direction of flow.
 3. Horizontal Grease Waste Piping: 1 percent downward in direction of flow where permitted by code. When required by 2018 and later International Plumbing Code only, 2 percent downward in direction of flow.
 4. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.
- H. Install ABS soil and waste drainage and vent piping according to ASTM D 2661.
- I. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.
- J. Install underground PVC soil and waste drainage piping according to ASTM D 2321.

- K. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.
- L. Install grease interceptor outside, underground as indicated on the on the Drawings. Backfill interceptor with pea gravel or equivalent backfill approved by manufacturer.
 - 1. Ensure that all federal, state, and local codes are followed.
 - 2. For installations where the subsurface water level may rise above the bottom of the tank at any time, install anti-buoyancy concrete slab as indicated on the Drawings and per manufacturer's recommended installation instructions.
 - 3. Coordinate any required pavement or concrete slabs over grease interceptors per manufacturer requirements in traffic bearing locations.
- M. Underground piping servicing fixtures discharging **140 Degree F. (60 Degree C.)** or hotter provide trap and first 20 lineal feet of pipe cast iron prior to connecting to underground PVC piping.

3.2 JOINT CONSTRUCTION

- A. Basic piping joint construction requirements are specified in Division 22 Section "Common Work Results for Plumbing."
- B. PVC Nonpressure Piping Joints: Join piping according to ASTM D 2665.

3.3 HANGER AND SUPPORT INSTALLATION

- A. Pipe hangers and supports are specified in Division 23 Section "Hangers and Supports for Facility Services." Install the following:
 - 1. Vertical Piping: MSS Type 8 or Type 42, clamps.
 - 2. Individual, Straight, Horizontal Piping Runs: According to the following:
 - a. **100-feet (30.5-m)** and Less: MSS Type 1, adjustable, steel clevis hangers.
 - b. Longer Than **100-feet (30.5-m)**: MSS Type 43, adjustable roller hangers.
 - c. Longer Than **100-feet (30.5-m)**, if Indicated: MSS Type 49, spring cushion rolls.
 - 3. Multiple, Straight, Horizontal Piping Runs **100-feet (30.5-m)** or Longer: MSS Type 44, pipe rolls. Support pipe rolls on trapeze.
 - 4. Base of Vertical Piping: MSS Type 52, spring hangers.
- B. Install supports according to Division 23 Section "Hangers and Supports for Facility Services."
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced 1 size for double-rod hangers, with **3/8-inch (9.5-mm)** minimum rods.
- E. Install hangers for copper tubing with the following maximum horizontal spacing and minimum rod diameters:

1. NPS 1-1/4: 72 inches (1.8-m) with 3/8-inch (9.5-mm) rod.
 2. NPS 1-1/2 and NPS 2: 96 inches (2.4-m) with 3/8-inch (9.5-mm) rod.
 3. NPS 2-1/2: 108 inches (2.7-m) with 1/2-inch (13-mm) rod.
 4. NPS 3 to NPS 5: 10-foot (3-m) with 1/2-inch (13-mm) rod.
 5. NPS 6: 10-foot (3-m) with 5/8-inch (16-mm) rod.
- F. Install supports for vertical copper tubing every 10-foot (3-m).
- G. Install hangers for PVC piping with the following maximum horizontal spacing and minimum rod diameters:
1. NPS 1-1/2 and NPS 2: 48 inches (1.2-m) with 3/8-inch (9.5-mm) rod.
 2. NPS 3: 48 inches (1.2-m) with 1/2-inch (13-mm) rod.
 3. NPS 4 and NPS 5: 48 inches (1.2-m) with 5/8-inch (16-mm) rod.
 4. NPS 6: 48 inches (1.2-m) with 3/4-inch (19-mm) rod.
- H. Install supports for vertical PVC piping every 48 inches (1.2-m).
- I. Support piping and tubing not listed above according to MSS SP-69 and manufacturer's written instructions.

3.4 CONNECTIONS

- A. Connect soil and waste piping to exterior sanitary sewerage piping. Use transition fitting to join dissimilar piping materials.
- B. Connect drainage and vent piping to the following:
1. Plumbing Fixtures: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code.
 2. Plumbing Fixtures and Equipment: Connect atmospheric vent piping in sizes indicated, but not smaller than required by authorities having jurisdiction.
 3. Plumbing Specialties: Connect drainage and vent piping in sizes indicated, but not smaller than required by plumbing code.
 4. Mechanical Equipment: Connect drainage piping as indicated. Provide shutoff valve, if indicated, and union for each connection. Use flanges instead of unions for connections NPS 2-1/2 and larger.
 5. Food Prep Equipment: Connect drainage piping in sizes indicated, but not smaller than required by plumbing code, to equipment supplied by Owner and equipment supplied and installed by Owner.
 6. Non-Refrigerated Fixtures and Equipment: Drain lines from non-refrigerated fixtures and equipment to building system shall be as specified in Section 11 41 33 "Fixtures and Equipment Plumbing Connections."
 7. Refrigerated Equipment: Drain lines from refrigerated equipment to building system shall be supplied and installed as specified in Section 11 41 34 "Fixtures and Equipment condensate drain Connections."

3.5 FIELD QUALITY CONTROL

- A. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction.
 - 1. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.
 - 2. Final Inspection: Arrange for final inspection by authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.
- B. Reinspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for reinspection.
- C. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.
- D. Test sanitary drainage and vent piping according to procedures of authorities having jurisdiction.
 - 1. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
 - 2. Prepare reports for tests and required corrective action.

3.6 TESTING:

- A. The entire soil, waste and vent system shall be tested per code and to the satisfaction of the Plumbing Inspector and the Owner. Cover no work until it has been approved. The minimum requirements shall be as follows:
- B. Water pressure: 10-foot head of water (30 kPa) of water for 15 minutes without loss of water.
- C. Air pressure: 5 psi. for 15 minutes without loss of air.
- D. Entire soil and waste systems to be inspected for debris and flushed prior to pouring of concrete floor slab.
- E. Perform all systems tests in the presence of an authorized representative of the Owner. Notify the Owner of all systems tests at least 48 hours in advance.

3.7 CLEANUP:

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

END OF SECTION 22 13 00

BLANK SHEET