

PART 1 – GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and Divisions 00 and 01, apply to this Section.
- B. Related Sections include the following:
 - 1. Division 23.
 - 2. Division 22.
 - 3. Division 26.

1.2 SUMMARY

- A. This Section includes drainage piping specialties for the following:
 - 1. Soil, waste, and vent systems.
 - 2. Storm drainage systems.

1.3 CODES AND STANDARDS

- A. Codes and Standards shall be the current version adopted by the Authority Having Jurisdiction.

1.4 SYSTEM PERFORMANCE REQUIREMENTS

- A. Provide components and installation capable of producing piping systems with following minimum working-pressure ratings, unless otherwise indicated:
 - 1. Soil, Waste, and Vent Piping: 10-foot head of water.
 - 2. Storm Drainage Piping: 10-foot head of water.
 - 3. Force-Main Piping: 50 psig.

1.5 SUBMITTALS

- A. Product Data: For each plumbing specialty indicated. Include rated capacities of selected equipment and shipping, installed, and operating weights. Indicate materials, finishes, dimensions, required clearances, and methods of assembly of components; and piping and wiring connections for the following plumbing specialty products:
 - 1. Dishwasher air gap fittings.
 - 2. Cleanouts.
 - 3. Drains.
 - 4. Indirect waste receptors.
 - 5. Oil Interceptors.
 - 6. Waste oil storage tanks.
 - 7. Grease interceptors.
 - 8. Miscellaneous drainage piping specialties.
- B. Reports: Specified in "Field Quality Control" Article.

- C. Maintenance Data: For specialties to include in the maintenance manuals specified in Division 01. Include the following:
1. Oil interceptors.
 2. Grease interceptors.
 3. Miscellaneous drainage piping specialties.

1.6 QUALITY ASSURANCE

- A. Provide listing/approval stamp, label, or other marking on plumbing specialties made to specified standards.
- B. Listing and Labeling: Provide electrically operated plumbing specialties specified in this Section that are listed and labeled.
1. Terms "Listed" and "Labeled": As defined in National Electrical Code, Article 100.
 2. Listing and Labeling Agency Qualifications: "Nationally Recognized Testing Laboratory" as defined in OSHA Regulation 1910.7.
- C. Comply with ASME B31.9, "Building Services Piping," for materials, products, and installation.
- D. Comply with NFPA 70, "National Electrical Code," for electrical components.

1.7 EXTRA MATERIALS

- A. Deliver extra materials to Owner. Furnish extra materials described below that match products installed, are packaged with protective covering for storage, and are identified with labels describing contents.
1. Water Filter Cartridges: Furnish quantity not less than 200 percent of amount of each type and size installed.
 2. Operating Key Handles: Furnish one extra key for each key-operated hose bibb and hydrant installed.

PART 2 – PRODUCTS

2.1 DISHWASHER AIR-GAP FITTINGS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Dishwasher Air-Gap Fittings:
 - a. Brass Craft.
 - b. Bristol Corp.; J & B Products Div.
 - c. Moen, Inc.; Dearborn Brass Co. Div.
 - d. Sioux Chief Manufacturing Co., Inc.
 - e. Or Approved Equal.
- B. Description: ASSE 1021, fitting suitable for use with domestic dishwashers and for deck mounting; with plastic body, chrome-plated brass cover; and capacity of at least 5 gpm; and inlet pressure of at least 5 psig at temperature of at least 140 deg F. Include 5/8-inch- ID inlet and 7/8-inch- ID outlet hose connections.

2.2 CLEANOUTS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Cleanouts:

- a. Josam Co.
- b. Jay R. Smith Mfg. Co.
- c. Tyler Pipe; Wade Div.
- d. Zurn Industries, Inc.; Hydromechanics Div.
- e. Or Approved Equal.

B. General: Size cleanouts as indicated on drawings, or where not indicated, same size as connected drainage piping.

1. Provide wall cleanouts on each end of water closet ends and one over main drops in addition, provide all cleanouts required per code.

C. Cleanouts: ASME A1122.36.2M, cast-iron body with straight threads and gasket seal or tapered threads for plug, flashing flange and clamping ring, and a brass closure plug. Cleanouts for installation in floors not having membrane waterproofing may be furnished without clamping ring.

1. Tiled Areas: Round cleanout top with tile recess top.
2. Quarry Tiled Areas: Square nickel-bronze cleanout cover.
3. Walls: Round cleanout cover with stainless steel finish.
4. All Other Areas: Round cleanout top with nickel-bronze finish.

2.3 DRAINS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Drains:

- a. Josam Co.
- b. Jay R. Smith Mfg. Co.
- c. Tyler Pipe, Wade Div.
- d. Zurn Industries, Inc.
- e. Or Approved Equal.

B. General: Size outlets as indicated on drawings.

1. Floor Drains: ASME A112.21.1M, cast-iron body, with seepage flange and clamping device, and trap seal primer valve connection. Floor drains for installation in floors not having membrane waterproofing may have seepage flange with clamping device. Floor drains for use as area drains in exterior slab on grade may be furnished with anchor flange instead of seepage flange and clamping device. Floor drains for installation in showers shall be Zurn ZN415SS, 5x5 grid top, free area 9 sq.in. or Zurn ZN415SS, 5 in. diameter grid top, free area 8 sq. in. Provide the following options as indicated:
 2. Trap primer connection.
 3. Round strainer with integral funnel.

4. Polished nickel bronze top.
 5. Slotted top.
- C. Roof Drains: ASME A112.21.2M, cast-iron body, with combination flashing ring and gravel stop, cast-iron dome except where other dome material is specified, extension collars, underdeck clamp, and sump receiver. Roof drains for installation in cast-in-place concrete decks may be furnished without underdeck clamp and sump receiver.
- D. Trench Drains: Pre-sloped trench drainage system, polyethylene plastic drain channel with 0.75% bottom slope, modular sections with interlocking ends, standard cast grating, complete with the straps and mounting accessories.
- E. Floor Sinks: Cast iron body, 12-inch square by 8-inch deep sump, 3-inch bottom outlet, square slotted medium duty grate, with polished nickel bronze top, with interior dome strainer.

2.4 INDIRECT WASTE RECEPTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Indirect Waste Receptor:
 - a. Acorn 8200-1.
 - b. Or Approved Equal.
- B. Indirect Waste Receptors – Wall Box:
1. Wall box: 18 gage, type 304 stainless steel, with all seams continuous welded. Provide with waste receptor, wall anchoring clips, 2-inch stainless steel bottom drain connection, and the following options as indicated:
 2. Wall frame/flange: One piece construction fabricated from 16 gage, type 304 stainless steel with exposed exterior surfaces polished to a satin finish. Removable wall flange is secured to box with Phillips head screws at each corner and includes a removable door.
 3. Door: Construction and finish to match wall frame/flange. Provide door with cam and cylinder lock with 2 keys, concealed hinges that allow door to fully open 150 degrees, and means to easily remove door.
- C. Accessories:
1. Trap Primer Valve per Section 22 11 19.
 2. Rubber grommets at all piping penetrations in wall box.
 3. Phenolic labels for service, and as indicated.
 4. Basket strainer, if required by Authority Having Jurisdiction.

2.5 OIL INTERCEPTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Oil Interceptors:
 - a. Josam Co.

- b. Jay R. Smith Mfg. Co.
 - c. Tyler Pipe, Wade Div.
 - d. Zurn Industries, Inc.
 - e. Or Approved Equal.
- B. Oil Interceptors: Acid resistant coated steel, bronze cleanout plug and visible double wall trap seal, removable combination pressure equalizing/flow diffusing baffle and sediment bucket, horizontal baffle.
- 1. Accessories:
 - a. Extension section, inlet and outlet 18-inches below finished floor.
 - b. Heavy duty cover completely reinforced for heavy duty applications.
 - c. Anchor flange with clamp collar.
 - d. Angle type flow control device.

2.6 WASTE OIL STORAGE TANKS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 1. Waste Oil Storage Tanks:
 - a. Ace Tank.
 - b. Or Approved Equal.
- B. Waste Oil Storage Tanks: Labeled under ground storage tank, horizontal light wrap double wall inner tank constructed of 10-gauge steel, exterior coated with fiberglass reinforced polyester laminate, interior lined with two coats of epoxy.
- C. Accessories:
- 1. Eye bolt style hold down straps.
 - 2. Interior coating.
 - 3. Tank leak/level monitoring console for two alarm functions.
 - 4. Liquid level switch.
 - 5. Leak detection switch including cable connector and adapter.
 - 6. 18-inch grade level manhole with bolted watertight lid.
 - 7. Tank cleanout spool.
 - 8. 3-inch grade level manhole with bolted watertight lid.
 - 9. Tank pumpout.
 - 10. 12-inch grade level manhole with bolted watertight lid.

2.7 GREASE INTERCEPTORS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- 1. Grease Interceptors:
 - a. Utility Vault Company.
 - b. Or Approved Equal.

- B. Grease Interceptors: Single vault system with pre-cast divider:
 - 1. Vault: Concrete 28-day compressive strength $f'c = 4500$ psig rebar ASTM A-615 Grade 60, mesh ASTM A-185 Grade 65.
 - 2. Covers: Three 24-inch diameter covers with locking frame, air and gas tight, H-20 truck wheel with 30% impact per AASHTO.

2.8 MISCELLANEOUS DRAINAGE PIPING SPECIALTIES

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Miscellaneous Drainage Piping Specialties:
 - a. Jay R. Smith Mfg. Co.
 - b. Josam Co.
 - c. Tyler Pipe, Wade Div.
 - d. Zurn Industries, Inc.
 - e. Or Approved Equal.
- B. Roof Flashing Assemblies: Manufactured assembly made of 4-lb/sq. ft., 0.0625-inch- thick, lead flashing collar and skirt extending at least 8 inches from pipe with galvanized steel boot reinforcement, and counterflashing fitting.
 - 1. Vent Cap: [Open-top, without cap][Low silhouette model with vandal-proof vent cap][Extended model with field-installed, vandal-proof vent cap].
- C. Open Drains: Shop or field fabricate from ASTM A 74, Service class, hub-and-spigot, cast-iron, soil-pipe fittings. Include P-trap, hub-and-spigot riser section of length to provide depth indicated; and where indicated, increaser fitting of size indicated, joined with ASTM C 564 rubber gaskets. Size P-trap as indicated.
- D. Deep-Seal Traps: Cast iron or bronze, with inlet and outlet matching connected piping, cleanout where indicated, and trap seal primer valve connection where indicated.
 - 1. 2-Inch NPS: 4-inch- minimum water seal.
 - 2. 2-1/2 Inch NPS and Larger: 5-inch- minimum water seal.
- E. Floor-Drain Inlet Fittings: Cast iron, with threaded inlet and threaded or spigot outlet, and trap seal primer valve connection.
- F. Air-Gap Fittings: ASME A112.1.2, cast iron or cast bronze, with fixed air gap, inlet for drain pipe or tube, and threaded or spigot outlet.
- G. Stack Flashing Fittings: Counterflashing-type, cast-iron fitting, with bottom recess for terminating roof membrane, and with threaded or hub top for extending vent pipe.
- H. Vent Caps: Cast-iron body with threaded or hub inlet and vandal-proof design. Include vented hood and set-screws to secure to vent pipe.
- I. Expansion Joints: ASME A112.21.2M, assembly with cast-iron body with bronze sleeve, packing gland, and packing, of size and end types corresponding to connected piping.

- J. Downspout Nozzle: Nickel bronze body, threaded inlet, wall flange and outlet nozzle.
- K. Stop-and-Waste Drain Valves: MSS SP-110, ball valve, rated for 200-psig minimum CWP or MSS SP-80, Class 125, gate valve, ASTM B 62 bronze body, with 1/8-inch NPS side drain outlet and cap.
- L. Horizontal Backwater Valves: ASME A112.14.1, cast-iron body, with removable bronze swing-check valve and threaded or bolted cover.
 - 1. Closed-Position Check Valve: Factory assembled or field modified to hang closed unless subject to backflow condition.
 - 2. Open-Position Check Valve: Factory assembled or field modified to hang open unless subject to backflow condition.
 - 3. Extension: ASTM A 74, Service class; full-size, cast-iron, soil-pipe extension to field-installed cleanout at floor, instead of cover.
- M. Drain Outlet Backwater Valves: Cast-iron or bronze body, with removable ball float, threaded inlet, and threaded or spigot outlet.

2.9 FLASHING MATERIALS

- A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:
 - 1. General Use: 4 lb/sq. ft. or 0.0625-inch thickness.
 - 2. Vent Pipe Flashing: 3 lb/sq. ft. or 0.0469-inch thickness.
 - 3. Burning: 6 lb/sq. ft. or 0.0937-inch thickness.
- B. Copper Sheet: ASTM B 152, of the following minimum weights and thicknesses, unless otherwise indicated:
 - 1. General Applications: 12 oz./sq. ft.
 - 2. Vent Pipe Flashing: 8 oz./sq. ft.
- C. Zinc-Coated Steel Sheet: ASTM A 653, with 0.20 percent copper content and 0.04-inch minimum thickness, unless otherwise indicated. Include G90 hot-dip galvanized, mill-phosphatized finish for painting if indicated.
- D. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil minimum thickness.
- E. Fasteners: Metal compatible with material and substrate being fastened.
- F. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.
- G. Solder: ASTM B 32, lead-free alloy.
- H. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 – EXECUTION

3.1 DRAINAGE PIPING SPECIALTY INSTALLATION

- A. General: Install drainage piping specialty components, connections, and devices according to manufacturer's written instructions.
- B. Install backwater valves in building drain piping as indicated. For interior installation, provide cleanout deck plate flush with floor and centered over backwater valve cover, and of adequate size to remove valve cover for servicing.
- C. Install expansion joints on vertical risers, stacks, and conductors as indicated.
- D. Install cleanouts in aboveground piping and building drain piping as indicated, and where not indicated, according to the following:
 - 1. Size same as drainage piping up to 4-inch NPS. Use 4-inch NPS for larger drainage piping unless larger cleanout is indicated.
 - 2. Locate at each change in direction of piping greater than 45 degrees.
 - 3. Locate at minimum intervals of 50 feet for piping 4-inch NPS and smaller and 100 feet for larger piping.
 - 4. Locate at base of each vertical soil and waste stack.
- E. Install cleanout deck plates, of types indicated, with top flush with finished floor, for floor cleanouts for piping below floors.
- F. Install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall, for cleanouts located in concealed piping.
- G. Install flashing flange and clamping device with each stack and cleanout passing through floors with waterproof membrane.
- H. Install vent flashing sleeves on stacks passing through roof. Secure over stack flashing according to manufacturer's written instructions.
- I. Install floor drains according to manufacturer's written instructions, in locations indicated.
- J. Install floor drains at low points of surface areas to be drained as indicated. Set grates of drains flush with finished floor or as indicated. Size outlets as indicated.
- K. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- L. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
- M. Position floor drains for easy access and maintenance.
- N. Install roof drains at low points of roof areas according to roof membrane manufacturer's written installation instructions and size outlets as indicated.
- O. Install roof-drain flashing collar or flange so no leakage occurs between drain and adjoining roofing. Maintain integrity of waterproof membranes where penetrated.
- P. Position roof drains for easy access and maintenance.

- Q. Install interceptors, including trapping, venting, and flow-control fitting, according to authorities having jurisdiction and with clear space for servicing.
 - 1. Above-Floor Installation: Set unit with bottom resting on floor, unless otherwise indicated.
 - 2. Flush with Floor Installation: Set unit and extension if required, with cover flush with finished floor.
 - 3. Recessed Floor Installation: Set unit in receiver housing having bottom or cradle supports, with receiver housing cover flush with finished floor.
 - 4. Pit Installation: Set unit in pit as indicated.
 - 5. Install cleanout immediately downstream from interceptors not having integral cleanout on outlet.
 - 6. Coordinate oil-interceptor storage tank and gravity drain with Division 23 for oil distribution systems.
- R. Fasten wall-hanging drainage piping specialties securely to supports attached to building substrate if supports are specified and to building wall construction if no support is indicated.
- S. Fasten recessed, wall-mounting drainage piping specialties to reinforcement built into walls.
- T. Install traps on drainage piping specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
- U. Locate drainage piping as close as possible to bottom of floor slab supporting fixtures and drains.
- V. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.
- W. Include wood-blocking reinforcement for recessed and wall-mounting drainage piping specialties.

3.2 CONNECTIONS

- A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties. The following are specific connection requirements:
 - 1. Install piping connections between drainage piping specialties and piping specified in other Division 22 Sections.
 - 2. Install piping connections indicated as indirect wastes from appliances and equipment specified in other Sections, to spill over receptors connected to plumbing piping systems.
- B. Install hoses between drainage piping specialties and appliances as required for connections.
- C. Arrange for electric-power connections to plumbing specialties and devices that require power. Electric power is specified in Division 26 Sections.
- D. Drainage Runouts to Drainage Piping Specialties: Install drainage and vent piping, with approved trap, of sizes indicated, but not smaller than required by authorities having jurisdiction.

- E. Interceptor Connections: Connect piping, flow-control fittings, and accessories as indicated.
 - 1. Grease Interceptors: Connect inlet and outlet to unit, and flow-control fitting and vent to unit inlet piping.
 - 2. Oil Interceptors: Connect inlet, outlet, vent, and gravity drawoff piping to unit; flow-control fitting and vent to unit inlet piping; and gravity drawoff and suction piping to oil storage tank.
- F. Ground electric-powered drainage piping specialties.
 - 1. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. Where manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.
- G. Arrange for electric-power connections to plumbing specialties and devices that require power. Electric power, wiring, and disconnect switches are specified in Division 26 Sections.

3.3 FLASHING INSTALLATION

- A. Fabricate flashing manufactured from single piece unless large pans, sumps, or other drainage shapes are required.
- B. Burn joints of lead sheets where required.
- C. Solder joints of copper sheets where required.
- D. Install sheet flashing on pipes, sleeves, and specialties passing through or embedded in floors and roofs with waterproof membrane.
 - 1. Pipe Flashing: Sleeve type, matching pipe size, with minimum length of 10 inches, and skirt or flange extending at least 8 inches around pipe.
 - 2. Sleeve Flashing: Flat sheet, with skirt or flange extending at least 8 inches around sleeve.
 - 3. Embedded Specialty Flashing: Flat sheet, with skirt or flange extending at least 8 inches around specialty.
- E. Set flashing on floors and roofs in solid coating of bituminous cement.
- F. Secure flashing into sleeve and specialty clamping ring or device.
- G. Install flashing for piping passing through roofs with counterflashing or commercially made flashing fittings, according to Division 07.
- H. Extend flashing up vent pipe passing through roofs and turn down into pipe, or secure flashing into cast-iron sleeve having calking recess.
- I. Fabricate and install flashing and pans, sumps, and other drainage shapes as indicated. Install drain connection if indicated.

3.4 FIELD QUALITY CONTROL

- A. Manufacturer's Field Service: Provide services of factory-authorized service representative to supervise the field assembly of components and installation of grease recovery units, including piping and electrical connections, and to report results in writing.
 - 1. Test and adjust drainage piping specialty controls and safeties. Replace damaged and malfunctioning controls and components.

3.5 START-UP PROCEDURES

- A. Before startup, perform the following checks:
 - 1. System tests are complete.
 - 2. Damaged and defective specialties and accessories have been replaced or repaired.
 - 3. Clear space is provided for servicing specialties.
- B. Before operating systems, perform the following steps:
 - 1. Close drain valves, hydrants, and hose bibbs.
 - 2. Open general-duty valves to fully open position.
 - 3. Remove and clean strainers.
 - 4. Verify that drainage and vent piping are clear of obstructions. Flush with water until clear.
 - 5. Fill grease interceptors with clean water.
- C. Startup Procedures: Follow manufacturer's written instructions. If no procedures are prescribed by manufacturer, proceed as follows:
 - 1. Energize circuits for electrically operated units. Start and run units through complete sequence of operations.

3.6 DEMONSTRATION

- A. Startup Services: Engage a factory-authorized service representative to perform startup services and train Owner's maintenance personnel as specified below:
 - 1. Train Owner's maintenance personnel on procedures and schedules related to startup of and servicing interceptors.
 - 2. Train Owner's maintenance personnel on procedures and schedules related to startup of and servicing grease recovery units.
 - 3. Review data in the maintenance manuals. Refer to Division 01.
 - 4. Schedule training with Owner with at least 7 days' advance notice.

3.7 PROTECTION

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

END OF SECTION