UNIVERSITY OF MICHIGAN
ARCHITECTURE, ENGINEERING AND CONSTRUCTION

ARCHITECTURE & ENGINEERING
326 East Hoover, Mail Stop B
Ann Arbor, MI 48109-1002
Phone: 734-764-3414
Fax: 734-936-3334

BuildingName
The Description of the Project
P00000000 0000

SPECIFICATION DIVISION 22

NUMBER SECTION DESCRIPTION

DIVISION 22 PLUMBING
SECTION 221319 - DRAINAGE SPECIALTIES

END OF CONTENTS TABLE

DIVISION 22 PLUMBING
SECTION 221319 - DRAINAGE SPECIALTIES

REVISIONS:
8-1-99: CONTENT APPROVED AS NEW MASTER
8-11-99: REVISED TO VBS.DOT TEMPLATE

EDITOR: FUTURE SECTION WILL ADDRESS PVC CLEANOUTS, ROOF DRAINS AND FLOOR DRAINS.

SPEC TEAM: I SUGGEST WE DELETE THE FOLLOWING FOR SHORT SPEC VERSION:
2.3 TRENCH DRAINS
2.4 ROOF DRAINS
2.5 DRAINAGE SPECIALTIES
3.5 INSTALLATION OF ROOF DRAINS
APPLICABLE PORTIONS OF 1.1 SCOPE OF WORK

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

INCLUDE PARAGRAPH 1.1.A AND B IN EVERY SPECIFICATION SECTION. EDIT RELATED SECTIONS 1.1.B TO MAKE IT PROJECT SPECIFIC.

A. Drawings and general provisions of the Contract, Standard General and Supplementary General Conditions, Division 1 Specification Sections, and other applicable Specification Sections including the Related Sections listed below, apply to this Section.

1.2 SCOPE OF WORK

SPEC EDITOR: REVISE EDIT TO SUIT PROJECT

A. Provide piping, fittings, and specialties up to point 5 feet beyond the building for the following systems:

1. Sanitary Waste and Vent System
2. Storm Waste System

B. This section specifies materials and installation for the following specialties:

1. Clean-outs
2. Floor Drains
3. Trench Drains
4. Roof Drains
5. Drainage Specialties (backwater valves, trap primers, neutralization tanks)

PART 2 - PRODUCTS

2.1 CLEAN-OUTS

SPEC EDITOR: STANDARD APPLICATION IS SPECIFIED BELOW. OTHER OPTIONS INCLUDE SQUARE COVER, RECESSED COVER, TRACTOR COVER, WATER TIGHT COVER, FLANGE AND CLAMP WITH MEMBRANE (FOR WET, ABOVE GRADE LOCATIONS). CONSULT CATALOG FOR SPECIAL APPLICATIONS.

A. Floor Clean-Out: Cast iron body, round, adjustable, scoriated, secured, nickel-bronze top, threaded and slotted bronze closure plug, outlet connection to suit application. For carpeted floors, provide nickel bronze carpet clamping frame and cover. Manufacturer: Smith 4020 to 4031, Wade, Zurn, Watts.

B. Wall Clean-Out: Treaded bronze plug in cast iron tee or ferrule, with stainless steel cover.

C. Exposed Clean-Out: Threaded plug, of material compatible with system piping.

2.2 FLOOR DRAINS

SPEC EDITOR: THE FLOOR DRAINS LISTED BELOW ARE STANDARD APPLICATION FLOOR DRAINS. ADD ADDITIONAL FLOOR DRAINS FOR SPECIALTY APPLICATIONS (HOSPITALS ETC.). OPTIONS INCLUDE: GRATE MATERIAL, SQUARE OR HINGED GRATES, SIDE OUTLETS, INTEGRAL BACKWATER VALVES, TRAPS, TRAP PRIMERS, 12" DIAMETER GRATES, ANIMAL ROOMS (WITH AUTO FLUSH), COATED BODY.

A. General floor drain requirements: Unless otherwise noted, provide round strainer/ grate, cast iron body, seepage flange and clamping collar, bottom outlet same size as pipe served, with caulked, no-hub or neoprene gasket connection. Load classifications per ASME A112.21.1M. Waterproofing: 40 mils sheet membrane, chlorinated polyethylene, Chloraloy 240.

B. Provide funnel type floor drain cover for floor drains used for cooling coil condensate drains, equipment drains and wherever shown on drawings. See details.

SPEC EDITOR: USE FD-A IN TOILET ROOMS, SHOWERS, SMALL KITCHENS, FINISHED AREAS, SMALL MECHANICAL ROOMS.

C. Type FD-A: Light duty, adjustable, nickel bronze strainer, minimum strainer diameter equal to twice pipe diameter. Manufacturer: Smith 2005-A, Wade, Zurn, MiFAB.

SPEC EDITOR: USE FD-B IN LARGE KITCHENS, AND AREAS WITH HEAVIER LOADS, WHERE FINAL ADJUSTMENT IS IMPORTANT, AND SEDIMENT BUCKET IS NOT REQUIRED.

D. Type FD-B: Medium duty, adjustable 8 1/2" diameter cast iron grate. Manufacturer: Smith 2310, Wade, Zurn, MiFAB.

SPEC EDITOR: USE FD-C OR FD-D IN LARGE MECHANICAL ROOMS, LOADING DOCKS AND AREAS WITH HEAVIER LOADS, WHERE FINAL ADJUSTMENT IS LESS IMPORTANT, AND SEDIMENT BUCKET IS REQUIRED.

E. Type FD-C: Medium duty, 8 1/2" diameter cast iron grate, free standing sediment bucket. Manufacturer: Smith 2110, Wade, Zurn, MiFAB.

F. Type FD-D: Heavy duty, 10" x 12" cast iron grate, free standing sediment bucket. Manufacturer: Smith 2450, Wade, Zurn.

2.3 TRENCH DRAINS

SPEC EDITOR: SEE JAY R. SMITH POLYMER CONCRETE AND FIBERGLASS DRAINAGE SYSTEMS FOR A VIABLE ALTERNATIVE TO CAST IRON. ADDITIONAL RESEARCH AND EDITTING IS REQUIRED TO MAKE TRENCH DRAINS PROJECT SPECIFIC.

A. Trench drain type designations and sizes are indicated on Drawings.

B. Cast Iron Trench Drains: Cast-iron shallow hub body and grate with end plates and gaskets, assembled in standard lengths for total length and width as indicated, with the following features:

1. Sediment bucket.
2. Flashing device.
3. Heel-proof, ADA compliant grate.
4. Vandal-proof grate.
5. Backwater valve.
6. Convex grate.
7. Dome bottom strainer.
8. Bottom outlet, inside caulk.

C. Manufacturers: Smith, Wade, Zurn, Erik-sons

2.4 ROOF DRAINS

SPEC EDITOR: THESE ROOF DRAINS ARE STANDARD FOR MOST INSULATED ROOFS. USE RD-C WHERE PRACTICAL. OTHER CONSIDERATIONS: CAST IN PLACE DRAINS, PROMENADE DRAINS, EXPANSION JOINTS, OVERFLOW DRAINS, IRMA ROOFS. SECONDARY ROOF DRAINAGE IS REQUIRED BY CODE - COORDINATE WITH ARCHITECT.

A. General roof drain requirements: Unless otherwise noted, provide secured round cast iron dome, cast iron body and flashing clamp/ gravel stop, sump receiver, underdeck clamp, bottom outlet same size as pipe served, with caulked, no-hub or neoprene gasket connection.

SPEC EDITOR: RD-A IS FOR SMALL AREAS, 2" - 4" OUTLET

B. Type RD-A: 8" diameter, 40 sq. in. free area, cast iron extension and collar. Manufacturer: Smith 1330, Wade, Zurn.

SPEC EDITOR: RD-B IS FOR MEDIUM AREAS, 2" - 4" OUTLET

C. Type RD-B: 12" diameter, 70 sq. in. free area, cast iron extension and collar. Manufacturer: Smith 1310, Wade, Zurn.

SPEC EDITOR: RD-C IS FOR LARGE AREAS, 2" - 6" OUTLET

D. Type RD-C: 15" diameter, 100 sq. in. free area, cast iron adjustable extension and collar. Manufacturer: Smith 1015, Wade, Zurn.

SPEC EDITOR: RD-D IS FOR VERY LARGE AREAS, 8" TO 10" OUTLET

E. Type RD-D: 20" diameter, 150 sq. in. free area, cast iron extension and collar. Manufacturer: Smith 1010, Wade, Zurn.

2.5 DRAINAGE SPECIALTIES

SPEC EDITOR: EDIT ITEMS BELOW CAREFULLY. OTHER ITEMS TO CONSIDER ADDING: GREASE INTERCEPTORS

A. Backwater Valve (in-line): Bronze fitted cast-iron, bolted cover. Flapper shall provide a maximum 1/4 inch clearance between flapper and seat for air circulation. Manufacturer: Smith 7022, Wade, Zurn.

B. Trap Primers: ASSE 1018, bronze body valve with automatic vacuum breaker, with 1/2 inch connections. Manufacturers: Precision Plumbing Products Model P-1

C. Dilution and Neutralization Tank: Plastic construction, for use with acid laboratory waste, see details. Manufacturers: Orion, Wessels, Town and Country Plastics.

D. Acid Waste Clean-out: For lab waste piping, specified to be polypropylene, provide corrosion resistant fire retardant polypropylene cleanouts, ASTM-D 401, with nickel bronze cover. Manufacturer: Orion, Sioux Chief

E. Acid Waste Floor Drain: For lab waste piping specified to be polypropylene, provide corrosion resistant floor drains manufactured with fire retardant polypropylene, ASTM-D-4101. Grate funnel and covers shall be fiber filled polypropylene. Manufacturer: Orion: Model FD-3, Sioux Chief

F. Trap seal: HPDE (High density poly ethylene)housing with heavy duty silicone diaphragm and soft EPDM sealing gasket. Floor rating ASSE 1072 AF GW. Manufactures: RectorSeal, Josam, JRSmith.

G. Air admittance valves: A one-way valve allowing air to enter plumbing drainage systems when negative pressures develop in the system. Gravity closing, sealing the vent terminal at zero differential pressure (no flow conditions) and under positive internal pressures.

1. Standards Compliance: ASSE 1050 & 1051,ICC ESR-1664, NSF Standard 14, IAPMO – Classified Mark, ASTM F-409, IPC 2003, IRC 2003.
2. Materials:
   a. Valve: White PVC with 1-1/2 in NPT threads.
   b. Tension membrane: Neoprene or silicone.
   c. Tubular Adapter: [White 1-1/2 in (38 mm) polypropylene] [Black 1-1/2 in (38 mm) polypropylene] [PVC].
   d. DFU Rating: 6. For venting 2 in (51 mm) DWV or smaller.
   e. Opening Pressure: Minus 0.01 psi.
   f. Closing Sealing Pressure: 0.00 psi and higher.
   g. Air inlet screen.
   h. Protective rubber sleeve.
   i. Functionality Test: 100 percent functional at 1/4 in (6 mm) H2O and 30 in (762 mm) H2O.
   j. Operating Temperature Range: Minus 40 to 150 degrees F (minus 4.4 to 65.6 degrees C).
3. Manufacturers: Studor, Oatey.

PART 3 - EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Verify existing grades, inverts, utilities, obstacles, and topographical conditions prior to installations.

B. Examine rough-in requirements for plumbing fixtures and other equipment having drain connections to verify actual locations of piping connections prior to installation.

C. Examine walls, floors, roof, and plumbing chases for suitable conditions where piping and specialties are to be installed.

3.2 INSTALLATION OF PIPING

A. Refer to Related Section 221113 for additional requirements.

B. Install underground cast iron piping per Cast Iron Soil Pipe Institute Engineering Manual.

3.3 INSTALLATION OF CLEANOUTS

SPEC EDITOR: CLEANOUT LOCATIONS SHOULD BE INDICATED ON DRAWINGS. CLEANOUTS IN ULAM AREA SHALL BE LOCATED IN WALLS. CLEANOUTS LOCATED IN THE FLOOR WILL NOT BE PERMITTED.

A. Provide cleanouts at each change in direction of piping greater than 45 degrees, where indicated on drawings and where required by code. Clean-outs shall be same size as pipe served through 4". Above Ground Cleanouts: Install cleanouts at minimum intervals of 50' for piping 4 inch and smaller and 100' for larger piping, at base of each vertical soil or waste stack.

B. Encase exterior cleanouts in concrete flush with grade.

C. Cleanouts shall be aesthetically located with respect to tile patterns, masonry bond and alignment. Coordinate installation with masonry and concrete work.

D. Prior to acceptance of the system, demonstrate that cleanout plugs are easily removable and can be easily rodded.

E. When cleanouts are required in above grade floors, flash and clamp cleanouts in floors provided with membrane waterproofing as specified for floor drains.

3.4 INSTALLATION OF FLOOR DRAINS

A. Install floor drains as indicated on drawings, at low points of surface areas to be drained.

B. Provide trap for all floor drains, minimum 3" trap and waste.

C. Check drainage of surfaces by flooding with the hose.

D. Provide vent for floor drain piping per code, minimum 1 1/2".

3.5 INSTALLATION OF ROOF DRAINS

SPEC EDITOR: USE DETAIL SHOWING INSTALLATION OF WATERPROOF MEMBRANE

A. Install drain flashing collar or flange so that no leakage occurs between roof drain and adjoining roofing. Maintain integrity of waterproof membranes, where penetrated.

B. Check drainage of surfaces by flooding with hose.

END OF SECTION 221319