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SECTION 221319.13 - SANITARY DRAINS

TIPS:

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PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Floor drains.
2. Floor sinks.
3. Trench drains.
4. Channel drainage systems.

1.2 DEFINITIONS

- #### A. ABS: Acrylonitrile-butadiene styrene.

- B. FRP: Fiberglass-reinforced plastic.
- C. HDPE: High-density polyethylene.
- D. PE: Polyethylene.
- E. PP: Polypropylene.
- F. PVC: Polyvinyl chloride.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.

PART 2 - PRODUCTS

2.1 DRAIN ASSEMBLIES

- A. Sanitary drains shall bear label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14 for plastic sanitary piping specialty components.

2.2 FLOOR DRAINS

- A. Cast-Iron Floor Drains **<Insert drawing designation if any>**:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing model [2005-A] [2005-B] [2005-69] [2005-TT] [2015] [2120] [2141] [2320] [2500] [2505] [2624]; **<Insert product name or designation>** or comparable product by one of the following:
 - a. Commercial Enameling Company.
 - b. Josam Company.
 - c. MIFAB, Inc.
 - d. Prier Products, Inc.
 - e. Sioux Chief Manufacturing Company, Inc.
 - f. Wade; a subsidiary of McWane Inc.
 - g. WATTS.
 - h. Zurn Industries, LLC.
 - i. **<Insert manufacturer's name>**.
2. Standard: ASME A112.6.3[**with backwater valve**].
3. Pattern: [Area] [Floor] [Funnel floor] [Sanitary] **<Insert pattern>** drain.
4. Body Material: [Gray iron] **<Insert material>**.
5. Accessories:
 - a. Seepage Flange.
 - b. Anchor Flange.
 - c. Clamping Device.

- d. Outlet: **[Bottom]** **[Side]** **<Insert Outlet type>**.
- e. Backwater Valve: Drain-outlet, **[ASME A112.14.1, integral]**, **[swing-check]** type.
- f. Coating on Interior and Exposed Exterior Surfaces: **[Acid-resistant enamel]** **<Insert material>**.
- g. Sediment Bucket.
- h. Top or Strainer Material: **[Bronze]** **[Gray iron]** **[Nickel bronze]** **[Stainless steel]** **<Insert material>**.
- i. Top of Body and Strainer Finish: **[Nickel bronze]** **[Polished bronze]** **[Rough bronze]** **[Stainless steel]** **<Insert finish>**.
- j. Top Shape: **[Round]** **[Square]** **<Insert shape>**.
- k. Dimensions of Top or Strainer: **<Insert dimensions and describe body, sump, and grate>**.
- l. Top Loading Classification: **[Extra Heavy]** **[Heavy]** **[Light]** **[Medium]** duty.
- m. Funnel: **<Insert description and dimensions>**.
- n. Inlet Fitting: Gray iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection.
- o. Trap Material: **[Bronze]** **[Cast iron]** **[Copper]** **<Insert material>**.
- p. Trap Pattern: **[Deep-seal P-trap]** **[Standard P-trap]** **<Insert pattern>**.
- q. Trap Features: **[Cleanout]** **[Trap-seal primer valve drain connection]** **[Cleanout and trap-seal primer valve drain connection]** **<Insert type>**.

B. Stainless Steel Floor Drains, ASME A112.3.1 **<Insert drawing designation if any>**:

1. Manufacturers: Subject to compliance with requirements, provide products by the following:
 - a. Zurn Industries, LLC.
 - b. **<Insert manufacturer's name>**.
2. Outlet: **[Bottom]** **[Side]** **<Insert type>**.
3. Top or Strainer Material: **[Stainless steel]** **<Insert material>**.
4. Top Shape: **[Round]** **[Square]** **<Insert shape>**.
5. Dimensions of Top or Strainer: **<Insert dimensions and describe body, sump, and grate>**.
6. Seepage Flange: **[Not required]** **[Required]**.
7. Anchor Flange: **[Not required]** **[Required]**.
8. Clamping Device: **[Not required]** **[Required]**.
9. Trap-Primer Connection: **[Not required]** **[Required]**.
10. Trap Material: **[Cast iron]** **[Stainless steel]** **[Not required]** **<Insert material>**.
11. Trap Pattern: **[Deep-seal P-trap]** **[Standard P-trap]** **[Not required]** **<Insert pattern>**.

C. Stainless Steel Floor Drains, ASME A112.6.3 **<Insert drawing designation if any>**:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; model **[9620]** **[9630]** **[9700]** **[9705]** **[9710]** **[9725]** **[9730]** **[9733]** **[9750]**; **<Insert product name or designation>** or comparable product by one of the following:
 - a. Josam Company.
 - b. Kusel Equipment Co.
 - c. Scherping Systems, Inc.
 - d. Sioux Chief Manufacturing Company, Inc.

- e. Wade; a subsidiary of McWane Inc.
 - f. WATTS.
 - g. Zurn Industries, LLC.
 - h. **<Insert manufacturer's name>**.
2. Outlet: **[Bottom]** **[Side]** **<Insert type>**.
 3. Top or Strainer Material: **[Stainless steel]** **<Insert material>**.
 4. Top Shape: **[Round]** **[Square]** **<Insert shape>**.
 5. Dimensions of Top or Strainer: **<Insert dimensions and describe body, sump, and grate>**.
 6. Accessories:
 - a. Seepage Flange.
 - b. Anchor Flange.
 - c. Clamping Device.
 - d. Trap-Primer Connection.
 - e. Trap Material: **[Cast iron]** **[Stainless steel]** **<Insert material>**.
 - f. Trap Pattern: **[Deep-seal P-trap]** **[Standard P-trap]** **<Insert pattern>**.
 - g. **<Insert additional accessories>**.
- D. Plastic Floor Drains **<Insert drawing designation if any>**:
1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; model **[202]** **[215]** **[216]** **[225]**; **<Insert product name or designation>** or comparable product by one of the following:
 - a. Canplas LLC.
 - b. IPS Corporation.
 - c. Josam Company.
 - d. Oatey.
 - e. Plastic Oddities.
 - f. Sioux Chief Manufacturing Company, Inc.
 - g. Zurn Industries, LLC.
 - h. **<Insert manufacturer's name>**.
 2. Standard: ASME A112.6.3.
 3. Material: **[ABS]** **[or]** **[PVC]** **<Insert material>**.
 4. Accessories:
 - a. Seepage Flange.
 - b. Clamping Device.
 - c. Outlet: **[Bottom]** **[Side]** **<Insert type>**.
 - d. Sediment Bucket.
 - e. Top or Strainer Material: Plastic.
 - f. Top of Body and Strainer Finish: Plastic.
 - g. Top Shape: Round.
 - h. Dimensions of Top or Strainer: **<Insert dimensions and describe body, sump, and grate if required>**.
 - i. Trap Material: Plastic drainage piping.
 - j. Trap Pattern: **[Standard P-trap]** **<Insert pattern>**.
 - k. **<Insert additional accessories>**.

2.3 FLOOR SINKS

A. Cast-Iron Floor Sinks <Insert drawing designation if any>:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; model [3020] [3030] [3040] [3060] [3100] [3140] [3200] [3400] [3410] [3420] [3450]; <Insert product name or designation> or comparable product by one of the following:
 - a. Commercial Enameling Company.
 - b. Josam Company.
 - c. Wade; a subsidiary of McWane Inc.
 - d. Watts; a Watts Water Technologies company.
 - e. Zurn Industries, LLC.
 - f. <Insert manufacturer's name>.
2. Standard: ASME A112.6.7.
3. Pattern: [Floor] [Funnel floor] <Insert pattern> drain.
4. Body Material: Cast iron.
5. Accessories:
 - a. Anchor Flange: [With] [Without] seepage holes.
 - b. Clamping Device.
 - c. Outlet: Bottom, [no-hub] <Insert type> connection.
 - d. Coating on Interior Surfaces: [Acid-resistant enamel] <Insert coating>.
 - e. Sediment Bucket.
 - f. Internal Strainer: [Dome] [Flat].
 - g. Internal Strainer Material: [Aluminum] <Insert material>.
 - h. Top Grate Material: [Cast iron] <Insert material> [, loose] [, hinged].
 - i. Top of Body and Grate Finish: [Nickel bronze] [Acid-resistant enamel] <Insert finish>.
 - j. Top Shape: [Round] [Square] <Insert shape>.
 - k. Dimensions of Top Grate: <Insert dimensions and describe grate pattern>.
 - l. Top Loading Classification: [No traffic] <Insert traffic loading>.
 - m. Funnel: <Insert material, shape, and dimensions>.
 - n. <Insert additional accessories>.

B. Stainless Steel Floor Sinks, ASME A112.6.7 <Insert drawing designation if any>:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; model [3001] [DX3001] [9691]; <Insert product name or designation> or comparable product by one of the following:
 - a. Josam Company.
 - b. Wade; a subsidiary of McWane Inc.
 - c. Watts; a Watts Water Technologies company.
 - d. Zurn Industries, LLC.
 - e. <Insert manufacturer's name>.
2. Standard: ASME A112.6.7.

3. Pattern: **[Floor]** **[Funnel floor]** **<Insert pattern>** drain.
4. Body Material: Stainless steel.
5. Accessories:
 - a. Anchor Flange: **[With]** **[Without]** seepage holes.
 - b. Clamping Device.
 - c. Outlet: Bottom, **[no-hub]** **<Insert type>** connection.
 - d. Sediment Bucket.
 - e. Internal Strainer: **[Dome]** **[Flat]**.
 - f. Internal Strainer Material: **[Stainless steel]** **<Insert material>**.
 - g. Top Grate Material: **[Stainless steel]** **<Insert material>** **[, loose]** **[, hinged]**.
 - h. Top of Body and Grate Finish: **[Satin nickel]** **[Stainless steel]** **<Insert finish>**.
 - i. Top Shape: **[Round]** **[Square]** **<Insert shape>**.
 - j. Dimensions of Top Grate: **<Insert dimensions and describe grate pattern>**.
 - k. Top Loading Classification: **[No traffic]** **<Insert traffic loading>**.
 - l. Funnel: **<Insert material, shape, and dimensions>**.
 - m. **<Insert additional accessories>**.

C. Plastic Floor Sinks **<Insert drawing designation if any>**:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; model **[3142]** **[3143]**; **<Insert product name or designation>**
 - a. Canplas LLC.
 - b. IPS Corporation.
 - c. Oatey.
 - d. Plastic Oddities.
 - e. Sioux Chief Manufacturing Company, Inc.
 - f. **<Insert manufacturer's name>**.
2. Standard: ASME A112.6.7.
3. Pattern: **[Floor]** **[Funnel floor]** **<Insert pattern>** drain.
4. Body Material: PVC.
5. Outlet: Bottom, PVC primer and solvent cement connection.
6. Sediment Bucket: **<Insert description>**.
7. Internal Strainer: **[Dome]** **[Flat]**.
8. Internal Strainer Material: **[PVC]** **<Insert material>**.
9. Top Grate Material: **[PVC]** **<Insert material>**.
10. Top Shape: **[Round]** **[Square]** **<Insert shape>**.
11. Dimensions of Top Grate: **<Insert dimensions and describe grate pattern>**.
12. Top Loading Classification: **[No traffic]** **<Insert traffic loading>**.
13. Funnel: **<Insert material, shape and dimensions>**.
14. **<Insert additional accessories>**.

2.4 TRENCH DRAINS

A. Trench Drains **<Insert drawing designation if any>**:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; **[2710]** **[2810]**; **<Insert product name or designation>** or comparable product by one of the following:

- a. Josam Company.
 - b. MIFAB, Inc.
 - c. Sioux Chief Manufacturing Company, Inc.
 - d. Wade; a subsidiary of McWane Inc.
 - e. WATTS.
 - f. Zurn Industries, LLC.
 - g. **<Insert manufacturer's name>**.
2. Standard: ASME A112.6.3 for trench drains.
 3. Material: Ductile or gray iron.
 4. Accessories:
 5. Flange: [**Anchor**] [**Seepage**].
 6. Clamping Device.
 7. Outlet: [**Bottom**] [**End**] [**Side**] **<Insert location>**.
 8. Grate Material: [**Ductile iron**] [**Ductile iron or gray iron**] [**Gray iron**] [**Stainless steel**] **<Insert material>**.
 9. Grate Finish: [**Painted**] **<Insert finish>**.
 10. Dimensions of Frame and Grate: **<Insert dimensions and describe body, sump, and grate if required>**.
 11. Top Loading Classification: [**Extra Heavy Duty**] [**Heavy Duty**] [**Light Duty**] [**Medium Duty**] **<Delete if not applicable>**.
 12. Trap Material: [**Cast iron**] [**Stainless steel**] **<Insert material>**.
 13. Trap Pattern: [**Standard P-trap**] **<Insert pattern>**.
 14. **<Insert additional accessories>**.

2.5 CHANNEL DRAINAGE SYSTEMS

- A. Stainless Steel Channel Drainage Systems, ASME A112.3.1 **<Insert drawing designation if any>**:
 1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; [**9660**] [**9666**] [**9667**] [**9670**] [**9671**]; **<Insert product name or designation>** or comparable product by one of the following:
 - a. Josam Company.
 - b. **<Insert manufacturer's name>**.
 2. Description: Modular system of stainless steel channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling.
 3. Standard: ASME A112.3.1 for trench drains.
 4. Channel Sections: Interlocking joint, stainless steel with level invert.
 - a. Dimensions: [**2.0 inches (51 mm)**] [**6.0 inches (152 mm)**] [**14 inches (356 mm)**] wide. Include number of units required to form total lengths indicated.
 5. Grates: Manufacturer's designation "[**heavy**] [**medium**] duty," with slots or perforations, and of width and thickness that fit recesses in channels.
 - a. Material: [**Stainless steel**] **<Insert material>**.

- a. ABT, Inc.
 - b. ACO USA.
 - c. Forté Composites, Inc.
 - d. Josam Company.
 - e. Polycast: Hubbell Power Systems, Inc.
 - f. **<Insert manufacturer's name>**.
2. Description: Modular system of channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling.
 3. Channel Sections: Narrow, interlocking-joint, sloped-invert, polymer-concrete modular units with end caps.
 - a. Include rounded bottom, with built-in invert slope of 0.6 percent and with outlets in number, sizes, and locations indicated.
 - b. Include extension sections necessary for required depth.
 - c. Dimensions: **4-inch (102-mm)** inside width. Include number of units required to form total lengths indicated.
 - d. Frame: **[Gray-iron or galvanized steel for grates] [Not required]**.
 4. Grates: Manufacturer's designation "**[heavy] [medium]** duty," with slots or perforations, and of width and thickness that fit recesses in channel sections.
 - a. Material: **[Ductile iron] [Fiberglass] [Galvanized steel] [Gray iron] [Stainless steel] <Insert material>**.
 - 1) Locking Mechanism: **[Manufacturer's standard device for securing grates to channel sections] [Not required]**.
 5. Covers: Solid **[ductile or gray iron] <Insert material>**, of width and thickness that fit recesses in channel sections, and of lengths indicated.
 6. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
 7. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.
- D. Narrow, Level-Invert, Polymer-Concrete Channel Drainage Systems **<Insert drawing designation if any>**:
1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; **[9878] [9895]**; **<Insert product name or designation>** or comparable product by one of the following:
 - a. ABT, Inc.
 - b. ACO USA.
 - c. Forté Composites, Inc.
 - d. Josam Company.
 - e. **<Insert manufacturer's name>**.
 2. Description: Modular system of channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling.

3. Channel Sections: Narrow, interlocking-joint, precast, polymer-concrete modular units with end caps.
 - a. Include rounded bottom, with level invert and with **NPS 4 (DN 100)** outlets in number and locations indicated.
 - b. Dimensions: [**5-inch (127-mm)**] <Insert dimension> inside width and [**9-3/4 inches (248 mm)**] <Insert dimension> deep. Include number of units required to form total lengths indicated.
 - 1) Frame: [**Gray-iron or galvanized steel for grates**] [**Not required**].
 4. Grates: Manufacturer's designation "[**heavy**] [**medium**] duty," with slots or perforations, and of width and thickness that fit recesses in channel sections.
 - a. Material: [**Ductile iron**] [**Fiberglass**] [**Galvanized steel**] [**Gray iron**] [**Stainless steel**] <Insert material>.
 - b. Locking Mechanism: [**Manufacturer's standard device for securing grates to channel sections**] [**Not required**].
 5. Covers: Solid [**ductile or gray iron**] <Insert material>, of width and thickness that fit recesses in channel sections, and of lengths indicated.
 6. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
 7. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.
- E. Wide, Level-Invert, Polymer-Concrete Channel Drainage Systems <Insert drawing designation if any>
1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; model [**9879**]; <Insert product name or designation> or comparable product by one of the following:
 - a. ABT, Inc.
 - b. ACO USA.
 - c. Josam Company.
 - d. Polycast: Hubbell Power Systems, Inc.
 - e. <Insert manufacturer's name>.
 2. Description: Modular system of channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling.
 3. Channel Sections: Wide, interlocking-joint, precast, polymer-concrete modular units with end caps.
 - a. Include flat or rounded bottom, with level invert and with outlets in number, sizes, and locations indicated.
 - b. Dimensions: [**8-inch (203-mm)**] <Insert dimension> inside width and [**13-3/4 inches (350 mm)**] <Insert dimension> deep. Include number of units required to form total lengths indicated.

- 1) Frame: [**Gray-iron or galvanized steel for grates**] [**Not required**].
 4. Grates: Manufacturer's designation "[**heavy**] [**medium**] duty," with slots or perforations, and of width and thickness that fit recesses in channel sections.
 - a. Material: [**Ductile iron**] [**Fiberglass**] [**Galvanized steel**] [**Gray iron**] [**Stainless steel**] <**Insert material**>.
 - b. Locking Mechanism: [**Manufacturer's standard device for securing grates to channel sections**] [**Not required**].
 5. Covers: Solid [**ductile or gray iron**] <**Insert material**>, of width and thickness that fit recesses in channel sections, and of lengths indicated.
 6. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
 7. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.
- F. FRP Channel Drainage Systems <**Insert drawing designation if any**>:
1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; model [**9812**] [**9872**]; <**Insert product name or designation**> or comparable product by one of the following:
 - a. ACO USA.
 - b. Aquaduct, Inc.
 - c. Zurn Industries, LLC.
 - d. <**Insert manufacturer's name**>.
 2. Description: Modular system of channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling.
 3. Channel Sections: Interlocking-joint, sloped-invert, FRP modular units, with end caps. Include flat, rounded, or inclined inside bottom, with outlets in number, sizes, and locations indicated.
 - a. Dimensions: [**4 inches (102 mm)**] [**4 or 6 inches (102 or 152 mm)**] [**6 inches (152 mm)**] [**6 or 8 inches (152 or 203 mm)**] [**8 inches (203 mm)**] wide. Include number of units required to form total lengths indicated.
 - b. Frame: [**Galvanized steel**] [**Stainless steel**] [**Manufacturer's standard metal**] <**Insert material**> for grates.
 4. Grates: With slots or perforations and widths and thickness that fit recesses in channel sections.
 - a. Material: [**Fiberglass**] [**Galvanized steel**] [**Gray iron**] [**Stainless steel**] <**Insert material**>.
 - b. Locking Mechanism: [**Manufacturer's standard device for securing grates to channel sections**] [**Not required**].
 5. Covers: Solid [**ductile or gray iron**] <**Insert material**>, of width and thickness that fit recesses in channel sections, and of lengths indicated.

6. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
7. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.

G. HDPE or PE Channel Drainage Systems **<Insert drawing designation if any>**:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Sioux Chief Manufacturing Company, Inc.
 - b. Tuf-Tite Corporation.
 - c. Zurn Industries, LLC.
 - d. **<Insert manufacturer's name>**.
2. Description: Modular system of channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling.
3. Channel Sections: Interlocking-joint, HDPE or PE modular units, with end caps. Include flat, rounded, or inclined bottom, with level invert and with outlets in number, sizes, and locations indicated.
 - a. Dimensions: **4 inches (102 mm)** wide. Include number of units required to form total lengths indicated.
4. Grates: With slots or perforations and widths and thickness that fit recesses in channel sections.
 - a. Material: **[Fiberglass] [Galvanized steel] [Gray iron] [Stainless steel] <Insert material>**.
 - b. Color: **<Insert color or delete subparagraph>**.
5. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
6. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.

H. PP Channel Drainage Systems **<Insert drawing designation if any>**:

1. Basis-of-Design Product: Subject to compliance with requirements, provide J.R. Smith Manufacturing; model **[9930] [9931]**; **<Insert product name or designation>** or comparable product by one of the following:
 - a. Infinity Plastics, Inc.
 - b. **<Insert manufacturer's name>**.
2. Description: Modular system of channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling.

3. Channel Sections: Interlocking-joint, PP modular units, with end caps. Include flat, rounded, or inclined bottom, with level invert and with outlets in number, sizes, and locations indicated.
 - a. Dimensions: **4 inches (102 mm)** wide. Include number of units required to form total lengths indicated.
 4. Grates: With slots or perforations and widths and thickness that fit recesses in channel sections.
 - a. Material: **[Fiberglass] [Galvanized steel] [Gray iron] [Stainless steel] <Insert material>**.
 - b. Color: **<Insert color or delete subparagraph>**.
 5. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
 6. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.
- I. PVC Channel Drainage Systems **<Insert drawing designation if any>**:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. MultiDrain Systems, Inc.
 - b. NDS Inc.
 - c. **<Insert manufacturer's name>**.
 2. Description: Modular system of channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling.
 3. Channel Sections: Interlocking-joint, PVC modular units, with end caps. Include flat, rounded, or inclined bottom, with level invert and with outlets in number, sizes, and locations indicated.
 - a. Dimensions: **4 inches (102 mm)** wide. Include number of units required to form total lengths indicated.
 4. Grates: With slots or perforations and widths and thickness that fit recesses in channel sections.
 - a. Material: **[Fiberglass] [Galvanized steel] [Gray iron] [Stainless steel] <Insert material>**.
 - b. Color: **<Insert color or delete subparagraph>**.
 5. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
 6. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.

PART 3 - EXECUTION

3.1 INSTALLATION

- A. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.
1. Position floor drains for easy access and maintenance.
 2. Set floor drains below elevation of surrounding finished floor to allow floor drainage.
 3. Set with grates depressed in accordance with the following drainage area radii:
 - a. Radius, **30 Inches (750 mm)** or Less: Equivalent to 1 percent slope, but not less than **1/4-inch (6.35-mm)** total depression.
 - b. Radius, **30 to 60 Inches (750 to 1500 mm)**: Equivalent to 1 percent slope.
 - c. Radius, **60 Inches (1500 mm)** or Larger: Equivalent to 1 percent slope, but not greater than **1-inch (25-mm)** total depression.
 4. Install floor-drain flashing collar or flange, so no leakage occurs between drain and adjoining flooring.
 - a. Maintain integrity of waterproof membranes where penetrated.
 5. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
- B. Install trench drains at low points of surface areas to be drained.
1. Set grates of drains flush with finished surface, unless otherwise indicated.
- C. Comply with ASME A112.3.1 for installation of stainless steel channel drainage systems.
1. Install on support devices, so that top will be flush with adjacent surface.
- D. Install FRP channel drainage system components on support devices, so that top will be flush with adjacent surface.
- E. Install plastic channel drainage system components on support devices, so that top will be flush with adjacent surface.
- F. Install open drain fittings with top of hub [**1 inch (25 mm)**] [**2 inches (51 mm)**] **<Insert dimension>** above floor.

3.2 CONNECTIONS

- A. Comply with requirements in Section 221316 "Sanitary Waste and Vent Piping" for piping installation requirements. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Comply with requirements in Section 221319 "Sanitary Waste Piping Specialties" for backwater valves, air admittance devices and miscellaneous sanitary drainage piping specialties.

- C. Comply with requirements in Section 221323 "Sanitary Waste Interceptors" for grease interceptors, grease-removal devices, oil interceptors, sand interceptors, and solid interceptors.
- D. Install piping adjacent to equipment to allow service and maintenance.
- E. Ground equipment in accordance with Section 260526 "Grounding and Bonding for Electrical Systems."
- F. Connect wiring in accordance with Section 260519 "Low-Voltage Electrical Power Conductors and Cables."

3.3 LABELING AND IDENTIFYING

- A. Distinguish among multiple units, inform operator of operational requirements, indicate safety and emergency precautions, and warn of hazards and improper operations, in addition to identifying unit. Nameplates and signs are specified in Section 220553 "Identification for Plumbing Piping and Equipment."

3.4 PROTECTION

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

END OF SECTION 221319.13