

This Product MasterSpec Section is licensed by Deltek, Inc. to Whitehall Manufacturing; Morris Group International ("Licensee").

This Product MasterSpec Section modifies the original MasterSpec text and does not include the full content of the original MasterSpec Section.

Revisions made to the original MasterSpec text are made solely by the Licensee and are not endorsed by, or representative of the opinions of, Deltek or The American Institute of Architects (AIA). Neither AIA nor Deltek are liable in any way for such revisions or for the use of this Product MasterSpec Section by any end user. A qualified design professional should review and edit the document to suit project requirements.

For more information, contact Whitehall Manufacturing; Morris Group International, P.O. Box 3527, City of Industry, CA 91744-0527; Phone: (626) 968-6681; Fax: (626) 855-4862; Website: <https://www.whitehallmfg.com/home>; Email: <Insert email address>.

For information about MasterSpec, contact Deltek at (800) 424-5080 or visit masterspec.com.

SECTION 221319.13 - SANITARY DRAINS

TIPS:

To view non-printing **Editor's Notes** that provide guidance for editing, click on MasterWorks/Single-File Formatting/Toggle/Editor's Notes.

To read **detailed research, technical information about products and materials, and coordination checklists**, click on MasterWorks/Supporting Information.

Access Product MasterSpec Sections:

[<Double click here to view the list of manufacturer Sections available at ProductMasterSpec.com.>](#)

PART 1 - GENERAL

1.1 SUMMARY

A. Section Includes:

1. Ligature-resistant drain strainers.
2. Floor drains.
3. Floor sinks.
4. Trench drains.
5. 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. Provide sanitary drains bearing label, stamp, or other markings of specified testing agency.
- B. Comply with NSF 14 for plastic sanitary piping specialty components.

2.2 LIGATURE-RESISTANT DRAIN STRAINERS

- A. Ligature-Resistant Shower Drain Strainers <Insert drawing designation if any>:
 - 1. Basis-of-Design Product: Subject to compliance with requirements, provide Whitehall Manufacturing; Morris Group International, BestCare model [WHPG] [WHPD-2NH]; <Insert drawing designation> or comparable product by one of the following:
 - a. Josam Company.
 - b. Zurn Industries, LLC.
 - c. <Insert manufacturer's name>.
 - 2. Material: 16 gauge, Type 304 stainless steel.
 - 3. Top Shape: Round.
 - 4. Dimensions of Top or Strainer: 4.13 inch (105 mm).
 - 5. Body Material: Brass.
 - 6. Shower Drain Strainer Hardware: Manufacturer's standard ligature-resistant hardware required to secure strainer grate to drain body.
- B. Ligature-Resistant Floor Drain Strainers <Insert drawing designation if any>:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Whitehall Manufacturing; Morris Group International, model [WHDG-5RD] [WHDG-6RD] [WHDG-5SQ] [WHDG-6SQ] [WHDG-5RD-SS] [WHDG-6RD-SS] [WHDG-5SQ-SS] [WHDG-6SQ-SS]; <Insert drawing designation> or comparable product by one of the following:
 - a. Josam Company.
 - b. Zurn Industries, LLC.
 - c. <Insert manufacturer's name>.
2. Grate Material: [Nickel bronze] [Stainless steel].
3. Top Shape: [Round] [Square].
4. Grate Dimensions: [5 inch (127 mm)] [6 inch (152 mm)].
5. Floor Drain Strainer Hardware: Manufacturer's standard ligature-resistant hardware required to secure strainer grate to drain body.

2.3 FLOOR DRAINS

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

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Commercial Enameling Company.
 - b. Jay R. Smith Mfg Co; a division of Morris Group International.
 - c. Josam Company.
 - d. MIFAB, Inc.
 - e. Prier Products, Inc.
 - f. Sioux Chief Manufacturing Company, Inc.
 - g. Wade; a subsidiary of McWane Inc.
 - h. WATTS.
 - i. Zurn Industries, LLC.
 - j. <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. Seepage flange.
6. Anchor flange.
7. Clamping device.
8. Outlet: [Bottom] [Side] <Insert type>.
9. Backwater Valve: [Drain-outlet type] [Integral, ASME A112.14.1, swing-check type].
10. Coating on Interior and Exposed Exterior Surfaces: [Acid-resistant enamel] <Insert material>.
11. Sediment Bucket: <Insert description>.
12. Top or Strainer Material: [Bronze] [Gray iron] [Nickel bronze] [Stainless steel] <Insert material>.
13. Top of Body and Strainer Finish: [Nickel bronze] [Polished bronze] [Rough bronze] [Stainless steel] <Insert finish>.

14. Top Shape: [**Round**] [**Square**] <Insert shape>.
15. Dimensions of Top or Strainer: <Insert dimensions and describe body, sump, and grate>.
16. Top Loading Classification: [**Extra Heavy Duty**] [**Heavy Duty**] [**Light Duty**] [**Medium Duty**] <Delete if not applicable>.
17. Funnel: <Insert description and dimensions>.
18. Inlet Fitting: [**Gray iron, with threaded inlet and threaded or spigot outlet, and trap-seal primer valve connection**].
19. Trap Material: [**Bronze**] [**Cast iron**] [**Copper**] <Insert material>.
20. Trap Pattern: [**Deep-seal P-trap**] [**Standard P-trap**] <Insert pattern>.
21. Trap Features: [**Cleanout**] [**Trap-seal primer valve drain connection**] [**Cleanout and trap-seal primer valve drain connection**] <Insert type>.

B. Ligature-Resistant Cast-Iron Floor Drains <Insert drawing designation>:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Whitehall Manufacturing; Morris Group International model [**WHFD-5RD-2NH**] [**WHFD-6RD-2NH**] [**WHFD-5SQ-2NH**] [**WHFD-6SQ-2NH**] [**WHFD-5RD-2NH-SS**] [**WHFD-6RD-2NH-SS**] [**WHFD-5SQ-2NH-SS**] [**WHFD-6SQ-2NH-SS**] [**WHFDV-6RD-2NH**] Series; <Insert drawing designation> or comparable product by one of the following:
 - a. Josam Company.
 - b. Zurn Industries, LLC.
 - c. <Insert manufacturer's name>.
2. Standard: ASME A112.6.3[**with backwater valve**].
3. Body Material: Cast iron.
4. Seepage flange.
5. Anchor flange.
6. Clamping device.
7. Grate Material and Finish: [**Nickel bronze**] [**Stainless steel**].
8. Grate Shape: [**Round**] [**Square**].
9. Grate Dimension: [**5 inch (127 mm)**] [**6 inch (152 mm)**].
10. Ligature-Resistant Cast Iron Floor Drain Hardware: Manufacturer's standard ligature-resistant hardware required to secure strainer grate to drain body.

C. Stainless Steel Floor Drains, ASME A112.3.1 <Insert drawing designation>:

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.

7. Anchor flange.
8. Clamping device.
9. Trap-primer connection.
10. Trap Material: [**Cast iron**] [**Stainless steel**] <Insert material>.
11. Trap Pattern: [**Deep-seal P-trap**] [**Standard P-trap**] <Insert pattern>.

D. Stainless Steel Floor Drains, ASME A112.6.3 <Insert drawing designation>:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. BLÜCHER; A Watts brand.
 - b. Jay R. Smith Mfg Co; a division of Morris Group International.
 - c. Josam Company.
 - d. Kusel Equipment Co.
 - e. Scherping Systems, Inc.
 - f. Sioux Chief Manufacturing Company, Inc.
 - g. Wade; a subsidiary of McWane Inc.
 - h. WATTS.
 - i. Zurn Industries, LLC.
 - j. <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.
7. Anchor flange.
8. Clamping device.
9. Trap-primer connection.
10. Trap Material: [**Cast iron**] [**Stainless steel**] <Insert material>.
11. Trap Pattern: [**Deep-seal P-trap**] [**Standard P-trap**] <Insert pattern>.

E. Ligature-Resistant Linear Drains <Insert drawing designation>:

1. Basis-of-Design Product: Subject to compliance with requirements, provide Whitehall Manufacturing; Morris Group International; BestCare model [**WHL-12-F**] [**WHL-24-F**] [**WHL-36-F**] [**WHL-48-F**] [**WHL-60-F**] or comparable product by one of the following:
 - a. Josam Company.
 - b. Zurn Industries, LLC.
 - c. <Insert manufacturer's name>.
2. Outlet: Bottom.
3. Top or Strainer Material: Type 304 stainless steel polished to a No. 4 satin finish.
4. Top Shape: Rectangular.
5. Dimensions of Top or Strainer: 2.25 inch (57 mm) width x [**12 inch (305 mm)**] [**24 inch (610 mm)**] [**36 inch (915 mm)**] [**48 inch (1220 mm)**] [**60 inch (1525 mm)**] length.

6. Flashing flange.
7. Clamping device.
8. Drain Body Material: Type 304 stainless steel.

F. Plastic Floor Drains <Insert drawing designation>:

1. Manufacturers: Subject to compliance with requirements, provide products 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. Seepage flange.
5. Clamping device.
6. Outlet: [Bottom] [Side] <Insert type>.
7. Sediment Bucket: <Insert description>.
8. Top or Strainer Material: [Bronze] [Plastic] [Stainless steel] <Insert other>.
9. Top of Body and Strainer Finish: [Nickel bronze] [Polished bronze] [Rough bronze] [Stainless steel] <Insert other>.
10. Top Shape: [Round] [Square] <Insert shape>.
11. Dimensions of Top or Strainer: <Insert dimensions and describe body, sump, and grate if required>.
12. Trap Material: [Cast iron] [Plastic drainage piping] <Insert material>.
13. Trap Pattern: [Standard P-trap] <Insert pattern>.

2.4 FLOOR SINKS

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

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Commercial Enameling Company.
 - b. Jay R. Smith Mfg Co; a division of Morris Group International.
 - c. Josam Company.
 - d. Wade; a subsidiary of McWane Inc.
 - e. WATTS.
 - f. Zurn Industries, LLC.
 - g. <Insert manufacturer's name>.
2. Standard: ASME A112.6.7.

3. Pattern: **[Floor]** **[Funnel floor]** <Insert pattern> drain.
4. Body Material: Cast iron.
5. Anchor Flange: **[Not required]** **[Required]** [, with seepage holes].
6. Clamping Device: **[Not required]** **[Required]**.
7. Outlet: Bottom, **[no-hub]** <Insert type> connection.
8. Coating on Interior Surfaces: **[Not required]** **[Acid-resistant enamel]** <Insert coating>.
9. Sediment Bucket: **[Not required]** <Insert description>.
10. Internal Strainer: **[Not required]** **[Dome]** **[Flat]**.
11. Internal Strainer Material: **[Aluminum]** <Insert material>.
12. Top Grate Material: **[Cast iron]** <Insert material>[, loose] [, hinged].
13. Top of Body and Grate Finish: **[Nickel bronze]** **[Acid-resistant enamel]** <Insert finish>.
14. Top Shape: **[Round]** **[Square]** <Insert shape>.
15. Dimensions of Top Grate: <Insert dimensions and describe grate pattern>.
16. Top Loading Classification: **[No traffic]** <Insert traffic loading>.
17. Funnel: **[Not required]** **[Required]**. <Insert material, shape, and dimensions>.
18. <Insert additional options here>.

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

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jay R. Smith Mfg Co; a division of Morris Group International.
 - b. Josam Company.
 - c. Wade; a subsidiary of McWane Inc.
 - d. WATTS.
 - 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: Stainless steel.
5. Anchor flange[**with seepage holes**].
6. Clamping device.
7. Outlet: Bottom, **[no-hub]** <Insert type> connection.
8. Sediment Bucket: <Insert description>.
9. Internal Strainer: **[Dome]** **[Flat]**.
10. Internal Strainer Material: **[Stainless steel]** <Insert material>.
11. Top Grate Material: **[Stainless steel]** <Insert material>[, loose][, hinged].
12. Top of Body and Grate Finish: **[Satin nickel]** **[Stainless steel]** <Insert finish>.
13. Top Shape: **[Round]** **[Square]** <Insert shape>.
14. Dimensions of Top Grate: <Insert dimensions and describe grate pattern>.
15. Top Loading Classification: **[No traffic]** <Insert traffic loading>.
16. Funnel: <Insert material, shape and dimensions>.
17. <Insert additional options here>.

C. Plastic Floor Sinks <Insert drawing designation>:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Canplas LLC.
 - b. IPS Corporation.
 - c. Oatey.
 - d. Plastic Oddities.
 - e. **<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 options here>**.

2.5 TRENCH DRAINS

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

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jay R. Smith Mfg Co; a division of Morris Group International.
 - b. Josam Company.
 - c. MIFAB, 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. Standard: ASME A112.6.3 for trench drains.
3. Material: Ductile or gray iron.
4. Flange: **[Anchor] [Seepage] [Not required]**.
5. Clamping Device: **[Not required] [Required]**.
6. Outlet: **[Bottom] [End] [Side] <Insert location>**.
7. Grate Material: **[Ductile iron] [Ductile iron or gray iron] [Gray iron] [Stainless steel] <Insert material>**.
8. Grate Finish: **[Painted] [Not required] <Insert finish>**.
9. Dimensions of Frame and Grate: **<Insert dimensions and describe body, sump, and grate if required>**.

10. Top Loading Classification: [**Extra Heavy Duty**] [**Heavy Duty**] [**Light Duty**] [**Medium Duty**] <Delete if not applicable>.
11. Trap Material: [**Cast iron**] [**Stainless steel**] [**Not required**] <Insert material>.
12. Trap Pattern: [**Standard P-trap**] [**Not required**] <Insert pattern>.

2.6 CHANNEL DRAINAGE SYSTEMS

A. Stainless Steel Channel Drainage Systems, ASME A112.3.1 <Insert drawing designation>:

1. Manufacturers: Subject to compliance with requirements, provide products by 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: [**5.8 inches (147 mm)**] [**11.7 inches (297mm)**] 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: [**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**].
6. Covers: Solid [**ductile or gray iron**] [**stainless steel**] <Insert material>, of width and thickness that fit recesses in channels, and of lengths indicated.
7. Supports, Anchors, and Setting Devices: Manufacturer's standard, unless otherwise indicated.
8. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.

B. Stainless Steel Channel Drainage Systems, Non-ASME A112.3.1 <Insert drawing designation>:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. MultiDrain Systems, Inc.
 - b. Zurn Industries, LLC.
 - c. <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. Channel Sections: Interlocking joint, stainless steel with level invert.
 - a. Dimensions: [6 inches (152 mm)] [12 inches (305 mm)] wide. Include number of units required to form total lengths indicated.
 4. Grates: Manufacturer's designation "[heavy] [medium] duty," with slots or perforations, and of width and thickness that fit recesses in channels.
 - 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] [stainless steel] <Insert material>, of width and thickness that fit recesses in channels, 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.
- C. Narrow, Sloped-Invert, Polymer-Concrete Channel Drainage Systems <Insert drawing designation>:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ABT, Inc.
 - b. ACO USA.
 - c. Forté Composites, Inc.
 - d. Hubbell Incorporated (Hubbell Power Systems).
 - e. Jay R. Smith Mfg Co; a division of Morris Group International.
 - f. Josam Company.
 - g. <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>**:
1. Manufacturers: Subject to compliance with requirements, provide products 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>**:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ABT, Inc.
 - b. ACO USA.
 - c. Hubbell Incorporated (Hubbell Power Systems).
 - 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: 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>**:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. ACO USA.
 - b. Aquaduct, Inc.

- c. Jay R. Smith Mfg Co; a division of Morris Group International.
 - d. Zurn Industries, LLC.
 - 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: 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>**:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Jay R. Smith Mfg Co; a division of Morris Group International.
 - b. Sioux Chief Manufacturing Company, Inc.
 - c. Tuf-Tite Corporation.
 - d. Zurn Industries, LLC.
 - 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: 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>:
1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - a. Infinity Plastics, Inc.
 - b. Jay R. Smith Mfg Co; a division of Morris Group International.
 - 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, 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>:
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