Drainage and Vent Piping and Specialties Specification

Specification 22 13 00

Revision 03

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Metrolinx,

an Agency of the Government of Ontario

Amendment Record Sheet

Amendment in Clause No.	Date of Amendment	Description of Changes
Various	September 2018	Revised to coordinate with corresponding specifications.
Various	May 2020	Revise product specification model # typo.
1.3.3	September 2025	Added section 20 05 25 "Mechanical Insulation" to list of Related Works.
1.4.11	September 2025	Added new paragraph for Ontario Building Code to list of Reference Standards.
1.4.12	September 2025	Added new paragraph for Transport Canada Standard for piping under railways to list of Reference Standards.
3.3.1 f)	September 2025	Added requirement for underground piping under railways.
3.3.5	September 2025	Added new paragraph to provide piping insulation as per the requirements of Section 20 05 25.

Contents:

1. GENERAL

1.1. SCOPE OF WORK

1.1.1. Provide drainage and vent piping and specialties as required, scheduled, and specified herein.

1.2. DESIGN REQUIREMENTS

1.2.1. Design requirements are based on Part 2 specified requirements of products.

1.3. RELATED WORKS

1.3.1. Section 20 05 05 - Mechanical Work General Instructions.

1.3.2. Section 20 05 10 - Basic Mechanical Materials and Methods.

1.3.3. Section 20 05 25 – Mechanical Insulation.

1.3.4. Section 20 05 40 – Mechanical Work Commissioning.

1.4. REFERENCE STANDARDS

1.4.1. Standards and codes shall be latest editions adopted by and enforced by local governing authorities.

1.4.2. ASTM A53 Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.

1.4.3. ASTM B306 Standard Specification for Copper Drainage Tube (DWV).

1.4.4. ASTM C32 Standard Specification for Sewer and Manhole Brick (Made From Clay or Shale).

1.4.5. ASTM C478 Standard Specification for Precast Reinforced Concrete Manhole Sections.

1.4.6. CAN/CSA B70 Cast Iron Soil Pipe, Fittings, and Means of Joining. CAN/CSA B181.2 PVC Drain, Waste, and Vent Pipe and Pipe Fittings.

1.4.7. CAN/CSA B182.2 PVC Sewer Pipe and Fittings (PSM Type).

1.4.8. CAN/ULC S102.2, Standard Method of Test for Surface Burning Characteristics of Flooring, Floor Coverings, and Miscellaneous Materials and Assemblies.

1.4.9. CAN/ULC S115 Standard Method of Fire Tests of Firestop Systems.

1.4.10. Ontario Building Code

1.4.11. TC E-10, Standards Respecting Pipeline Crossings Under Railways

1.5. TRAINING

1.5.1. Training shall be a full review of all components, including but not limited to a full operation and maintenance demonstration, with abnormal events.

1.5.2. Include for 2 training sessions of maximum 7 hours duration per session for 10 Metrolinx people per session.

1.5.3. Refer to Section 20 05 05 for additional general requirements.

1.6. WARRANTY

1.6.1. Products shall be guaranteed by manufacturer, for a minimum of 5 years after acceptance by Metrolinx.

1.7. DELIVERY, STORAGE AND HANDLING

1.7.1. Handle and store products in accordance with manufacturer's instructions, in locations approved by Metrolinx. Include one copy of these instructions with product at time of shipment.

1.8. SUBMITTALS

1.8.1. Refer to submittal requirements in Section 20 05 05.

1.8.2. Submit a copy of plumbing inspection certificate prior to application for Substantial Performance of the Work.

1.8.3. Submit letters from product manufacturers/suppliers to certify correct installation of products as specified in Part 3 of this Section.

1.8.4. Submit shop drawings/product data sheets as follows:

a) To regulatory authority for review and approval prior to submitting to Consultant;

b) Submit shop drawings/product data sheets for all products specified in Part 2 of this Section except for pipe and fittings; and

c) Copies of all calculations, stamped and signed by same engineer who signs layout drawings, and a listing of all design data used in preparing the calculations, system layout and sizing requirements.

1.8.5. Product Data

a) Submit product data sheets indicating:

1) Technical data, supplemented by bulletins, component illustrations, detailed views, technical descriptions of items, and parts lists;

2) Performance criteria, compliance with reference standards, characteristics, limitations, and troubleshooting protocol;

3) Product transportation, storage, handling, and installation requirements; and

4) Product identification in accordance with Metrolinx requirements.

1.8.6. Shop Drawings

a) Submit shop drawings indicating:

1) Capacity and ratings;

i) Mounting details to suit locations shown, indicating methods and hardware shall be used; and

2) Applicable control components and control wiring schematic.

1.8.7. Commissioning Package

a) Submit the following in accordance with Sections 20 05 05 and 20 05 40:

1) Commissioning Plan;

2) Commissioning Procedures;

3) Certificate of Readiness;

4) Complete test sheets specified in Section 20 05 40 and attach them to the Certificate of Readiness; and

5) Source Quality Control inspection and test results and attach to the Certificate of Readiness.

1.8.8. Commissioning Closeout Package

a) Submit the following in accordance with Section 20 05 05:

1) Deficiency Report;

2) Commissioning Closeout Report;

3) Submit the following for each Product for incorporation into the Operation and Maintenance Manuals in accordance with Section 20 05 05:

4) Identification: manufacturer's name, type, year, serial number, number of units, capacity, and identification to related systems;

5) Functional description detailing operation and control of components;

i) Performance criteria and maintenance data;

ii) Safety precautions;

iii) Operating instructions and precautions;

iv) Component parts availability, including names and addresses of spare part suppliers;

v) Maintenance and troubleshooting guidelines/protocol;

vi) Product storage, preparation, handling, and installation requirements; and

vii) Commissioning Report.

1.9. QUALITY ASSURANCE

1.9.1. Drainage piping and fittings shall comply with codes, regulations and standards listed above and applicable local codes and regulations.

1.9.2. Site personnel shall be licensed in jurisdiction of the work and under continuous supervision of a foreman who is an experienced system installer.

1.9.3. Manufacturers Qualifications

a) Manufacturer shall be ISO 9000, 9001 or 9002 certified. Manufacturer of product shall have produced similar product for a minimum period of five years. When requested by Consultant, an acceptable list of installations with similar product shall be provided demonstrating compliance with this requirement.

b) Where manufacturers provide after installation onsite inspection of product installations, include for manufacturer's authorized representative to perform onsite inspection and certificate of approvals.

1.9.4. Installers Qualifications

a) Installers for work shall be performed by or work under licensed Mechanical Contractor

b) Installers of equipment, systems, and associated work shall be qualified and experienced installers of respective products and work in which they are installing.

c) Where, manufacturers provide training sessions to installers and certificates upon successful completion, installers to have obtained such certificates and submit copies with shop drawings.

1.9.5. Regulatory Requirements

a) Products and work to comply with applicable local governing authority regulations, bylaws, and directives. Include for required inspections and certificate of approvals of installation work from local governing authorities.

2. PRODUCTS

2.1. PIPE, FITTINGS AND JOINTS

2.1.1. PVC Sewer

a) DR35 rigid, green PVC hub and spigot pattern sewer pipe and fittings to CAN/CSA B182.2, with gasket joints assembled with pipe lubricant.

b) DR35 rigid, PVC sewer pipe and fittings, with solvent weld joints, all certified to CSA B182.1 and colour-coded as per local governing codes, regulations, and standards.

2.1.2. PVC – DWV

2.1.3. IPEX System 15 or approved equivalent, rigid PVC drain, waste and vent pipe and fittings to CAN/CSA B181.2, complete with a Flame Spread Rating of 25 or less when tested to CAN/ULC S102.2, with solvent weld joints or MJ Grey mechanical joint couplings, and, for fire barrier penetration, approved firestop conforming to CAN/ULC S115.

2.1.4. PVC DWV piping installed inside plenums and buildings classified as “High Buildings” shall be IPEX System XFR or approved equivalent, rigid PVC drain, waste and vent pipe and fittings to CAN/CSA B181.2, complete with a Flame Spread Rating of 25 or less and a Smoke Developed Classification of 50 or less when tested to CAN/ULC S102.2, with solvent weld joints or MJ Grey mechanical joint couplings, and, for fire barrier penetration, approved firestop conforming to CAN/ULC S115.

2.1.5. Copper - Solder Joint

2.1.6. Type DWV hard temper to ASTM B306, with forged copper solder type drainage fittings and 50% lead - 50% tin solder joints.

2.1.7. Cast Iron

a) Class 4000 cast iron pipe, fittings, and mechanical coupling joints to CAN/CSA B70.

2.1.8. Copper - Victaulic Coupling Joint (or approved equivalent)

a) Type DWV hard temper to ASTM B306, with factory or site rolled grooved ends (with grooving rolls designed for copper) and Victaulic "Copper Connection" wrought copper or cast bronze fittings and Style 606 gasket type couplings.

2.1.9. Galvanized Steel - Victaulic Coupling Joint (or approved equivalent)

a) Schedule 40 mild steel, galvanized, ASTM A53, factory or site rolled grooved, complete with Victaulic or approved equivalent galvanized ductile iron grooved end fittings and, unless otherwise specified, Victaulic Style 77 or approved equivalent hot dip galvanized mechanical joint couplings with Grade M gaskets.

2.1.10. PVC Weeper Piping

a) 150 mm (6") dia. corrugated perforated PVC pipe with an integral geodesic sock, supplied in coils.

2.2. SHUT-OFF AND CHECK VALVES

2.2.1. Shut-off Valves – Gate Type

a) NPS 2 and under, soldered:

1) Rising stem: to MSS-SP-80, Class 125, 860 kPa, bronze body, screw-in bonnet, solid wedge disc.

b) NPS 2 and under, screwed:

1) Rising stem: to MSS-SP-80, Class 125, 860 kPa, bronze body, screw-in bonnet, solid wedge disc.

c) NPS 2 1/2 and over, flanged:

1) Rising stem: to MSS-SP-70, Class 125, 860 kPa, flat flange faces, cast-iron body, bronze trim.

d) NPS 2 1/2 and over, flanged:

1) Non-rising stem: to MSS-SP-70, Class 125, 860 kPa, flat flange faces, cast-iron body, bronze trim, bolted bonnet.

e) Standard accepted products:

1) Toyo Valve Co.;

2) Milwaukee Valve;

3) Kitz Corporation;

4) Victaulic Co. of Canada Ltd.;

5) Apollo Valves;

6) Watts Industries (Canada) Inc.; or

7) Approved equivalent.

2.2.2. Shut-off Valves – Ball-Type

a) Class 600, 4140 kPa (600 psi) WOG-rated full-port ball valves, each complete with a forged brass body, blowout-proof stem, chrome-plated solid brass ball, solder or screwed ends as required, and removable lever handle;

b) Standard accepted products:

1) Toyo Valve Co.;

2) Milwaukee Valve;

3) Kitz Corporation;

4) Victaulic Co. of Canada Ltd.;

5) Apollo Valves;

6) Watts Industries (Canada) Inc.; or

7) Or approved equivalent.

2.2.3. Check Valves

a) Class 125, bronze, 1725 kPa (250 psi) WOG-rated vertical lift check valve with solder or screwed ends as required, and, for horizontal piping, Class 125, bronze 1380 kPa (200 psi) WOG-rated swing check valves with solder or screwed ends;

b) Standard accepted products:

1) Toyo Valve Co.;

2) Milwaukee Valve Co.;

3) Kitz Corporation; or

4) Approved equivalent.

2.3. VENT STACK COVERS

2.3.1. Lexcor Model "Flash-Tite" or approved equivalent, seamless, spun aluminum, insulated vent stack covers with caps and a factory-applied asphalt primer coating on top and bottom of flange.

2.4. CLEANOUTS

2.4.1. Horizontal Piping

a) TY pipe fitting with an extra-heavy brass plug screwed into the fitting.

2.4.2. Vertical Piping

a) Bronze or copper cleanout tees in copper piping, each complete with a bronze ferrule, and, for cast iron piping, "BARRETT" or approved equivalent, type cast iron cleanout tees, each gas and water-tight and complete with a bolted cover.

2.4.3. Urinals

a) Wall access cleanout assemblies, each complete with a tapered plug, threaded brass insert, urethane rubber seal, and polished stainless steel access cover with vandal-proof stainless steel securing screw;

b) Standard accepted products:

1) Watts Industries (Canada) Ltd. #CO-590-RD;

2) Jay R. Smith #SQ4-1819;

3) Zurn #ZSS-1666-1;

4) Mifab #C1440-RD; or

5) Aproved equivalent.

2.5. FLOOR CLEANOUT TERMINATIONS

2.5.1. Factory-finished cast iron terminations, each adjustable and complete with a cast iron body with neoprene sleeve, solid, gasketed, polished nickel-bronze scoriated top access cover to suit floor finish, a seal plug, and captive, vandal-proof, stainless steel securing hardware.

2.5.2. Standard accepted products:

a) Watts Industries (Canada) Ltd. # CO-200-R-1;

b) Jay R. Smith #4020-F-C Series;

c) Zurn # ZN-1602-SP Series;

d) Mifab # C1100-XR-1 or #C1000-R-3; or

e) Approved equivalent.

2.5.3. Cleanout terminations in areas with a tile or sheet vinyl floor finish shall be as above, but with a square top in lieu of a round top.

2.6. FLOOR DRAINS, FUNNEL FLOOR DRAINS AND HUB DRAINS

2.6.1. Unless otherwise specified or indicated, floor drains, funnel floor drains, and hub drains shall be vandal-proof drains in accordance with drawing symbol list, each complete with a cast iron body and a trap seal primer connection. Cast iron components shall be factory finished with latex-based paint coating.

2.6.2. Drains in areas with a tile or sheet vinyl floor finish shall be as above, but with a square grate in lieu of a round grate.

2.6.3. Provide heavy-duty epoxy-coated cast-iron cast-in-place parking deck drain, square anti-ponding top with membrane clamping flange, heavy-duty self-closing hinged grate, and sediment buckets for multi-level parking garages.

2.6.4. Standard accepted products:

a) Watts Industries (Canada) Ltd.;

b) Jay R. Smith Manufacturing Co.;

c) Zurn Industries Ltd.;

d) Mifab Inc; or

e) Approved equivalent.

2.7. ROOF DRAINS

2.7.1. Unless otherwise specified or indicated, roof drains shall be cast iron body drains with aluminum domes, in accordance with the drawing symbol list. Cast iron components shall be factory finished with latex-based paint coating.

2.7.2. Standard accepted products:

a) Watts Industries (Canada) Ltd.;

b) Jay R. Smith Manufacturing Co.;

c) Zurn Industries Ltd.;

d) Mifab Inc; or

e) Approved equivalent.

2.8. DRAINAGE TRENCH FRAMES AND GRATING

2.8.1. Welded, hot-dipped galvanized, 45 mm x 45 mm x 6.4 mm (1-¾" x 1-¾" x ¼") carbon steel angle frame, 300 mm (12") wide, with anchor straps and lengths as required, and baked epoxy-coated cast iron slotted grating in 600 mm (24") long sections.

2.8.2. Standard accepted products:

a) Watts Industries (Canada) Ltd. #TD-910-B1-4;

b) Jay R. Smith #2971VP;

c) Zurn # Z796VP; or

d) Approved equivalent.

2.9. TRENCH DRAINS

2.9.1. Modular, pre-sloped, polyester fibreglass construction interlocking sections of drainage channel with overlapping joints, drainpipe connection outlets as required, end caps and covers to suit the application, integral anchor tabs for grate anchoring and trench levelling, heavy-duty coated steel angle top frames, and heavy-duty coated cast iron slotted grate supplied in 600 mm (24") long sections.

2.9.2. Standard accepted products:

a) Watts Industries (Canada) Inc. “Dead Level” Series;

b) Jay. R. Smith #9810 Series;

c) Zurn "Flow-Thru" System;

d) ACO Systems Ltd. "ACO Drain;" or

e) Approved equivalent.

2.10. INTERIOR CATCH BASIN FRAMES AND COVERS

2.10.1. Heavy-duty, minimum 508 mm (20") square but sized to design requirements, baked epoxy-coated cast iron, non-removable, hinged slotted grate with coated steel frame with concrete anchors.

2.10.2. Standard accepted products:

a) Watts Industries (Canada) Ltd.;

b) Jay R. Smith;

c) Zurn;

d) Mifab; or

e) Approved equivalent.

2.11. BACKWATER VALVES

2.11.1. Heat-bonded powder epoxy-coated cast iron in-line type, each complete with a bolted and gasketed cover, bronze flapper, stainless steel extension, and stainless steel hardware.

2.11.2. Standard accepted products:

a) Watts Industries (Canada) Inc. BV-230-R Series;

b) Jay R. Smith #7022-CAN;

c) Zurn #Z-1095-15-MJ; or

d) Approved equivalent.

2.12. EXTERIOR CATCH BASINS

2.12.1. Pre-cast reinforced concrete catch basins manufactured to ASTM C478 and Municipal standards, each sized and arranged to meet drainage pipe size and arrangement, and complete with:

a) Cast iron frame and cover to Municipal standards;

b) Required masonry work to raise top of catch basins flush with finished grade or pavement surfaces.

2.12.2. Masonry work shall consist of cement mortar and clay or shale bricks to ASTM C32 Grade M5, or Oaks Precast Industries "MODULOC" or approved equivalent, pre-cast interlocking concrete members and accessories.

2.13. EXTERIOR MANHOLES

2.13.1. Pre-cast reinforced concrete manholes manufactured to ASTM C478 and Municipal standards, each sized and arranged to meet drainage pipe size and arrangement, and complete with:

a) Poured-in-place or pre-cast concrete base;

b) Cast-in-place "Safety" type aluminum steps on 300 mm (12") centres, each step coated with 2 coats of static asphalt paint;

c) Unperforated cast iron cover with lifting holes and a matching frame;

d) As required by manhole depth and safety regulations, cast-in-place hinged aluminum safety grating with SG 1 1 R-T6 aluminum alloy bearing bars, aluminum grate to CAN/CSA S157, and self-locking type stainless steel hinges and fasteners with galvanized steel safety chain and snap hook;

e) Required masonry work to raise top of manholes flush with finished grade, or as otherwise indicated on drawings; and

f) Masonry work shall consist of cement mortar and clay or shale bricks to ASTM C32 Grade M5, or Oaks Precast Industries "MODULOC" or approved equivalent, pre-cast

2.14. GREASE INTERCEPTOR

2.14.1. Grease intercepting and recovery unit of #11 gauge Type 304 stainless steel construction with sensor controlled grease draw-off solenoid valve, automatic shut-down with audible/visual alarm if maximum grease capacity is exceeded, integral heating element with thermostat, gasketed stainless steel cover, stainless steel solids interceptor, and remote surface wall mounting indicator panel with status indicating lights, audible alarm, 115/24 volt control transformer and NEMA 2 enclosure.

2.14.2. Standard accepted products:

a) Watts Industries (Canada) Inc. WD-E Series;

b) Jay R. Smith #8000-ELECT series or #8400-ELECT series;

c) Zurn #Z1172-UN series; or

d) Approved equivalent.

2.15. OIL INTERCEPTOR

2.15.1. Epoxy-coated steel construction automatic oil interceptor with removable baffles, deep-seal trap with cleanout, sediment bucket, aluminum frame and cover, and remote wall mounting indicating panel with status indicating lights, audible alarm, 115/24 volt control transformer, and NEMA 2 surface wall mounting enclosure.

2.15.2. Standard accepted products:

a) Watts Industries (Canada) Inc. OI-SS / HI 7873 Series;

b) Jay R. Smith 8500-SC-ELECT-CAN Series;

c) Zurn #Z1198 series; or

d) Approved equivalent.

3. EXECUTION

3.1. DEMOLITION

3.1.1. Refer to demolition requirements identified on drawings and specifications.

3.2. UNDERGROUND MUNICIPAL SERVICE CONNECTION

3.2.1. Make required arrangements with Municipality for installation of drain service piping mains from Municipal main to property line.

3.2.2. Pay charges levied by Municipality for service connection work.

3.2.3. Municipal charges for underground street service connection work shall be paid out of a prime cost allowance. Submit original copies of invoices issued by Municipality for street service connection work.

3.3. DRAIN AND VENT PIPING INSTALLATION REQUIREMENTS

3.3.1. Provide required drainage and vent piping. Pipe, unless otherwise specified, as follows:

a) For underground pipe inside building and to points 1.5 m (5') outside building lines – rigid PVC sewer pipe, minimum 75 mm (3") diameter;

b) For pipe inside building and aboveground in sizes less than or equal to 65 mm (2-½") diameter – Type DWV copper;

c) For pipe inside building and aboveground in sizes greater than or equal to 75 mm (3") diameter – Class 4000 cast iron;

d) For pipe inside building and aboveground in lieu of Type DWV copper and cast iron, at your option and where permitted by governing Codes and Regulations – rigid PVC DWV;

e) For drainage pump discharge pipe connections from pump to and including shut-off and check valve connections – Type "DWV" copper with Victaulic "Copper Connection" fittings and couplings, or Schedule 40 galvanized steel with Victaulic fittings and couplings; and

f) For underground piping outside the building crossing under railways, piping shall be encased in a larger pipe called casing piping. Both the carrier or inner pipe and the casing or outer pipe shall conform to the applicable requirements of AREMA Chapter 1, Section 5.3 “Guidelines for Pipelines Conveying Non-Flammable Substances”, with respective materials in conformance with CSA standards. Carrier pipe shall be PVC sewer pipe and fittings with solvent weld joints.

3.3.2. Install and slope underground drainage piping to inverts or slopes indicated on drawings to facilitate straight and true gradients between points shown. Verify available slopes before installing pipes.

3.3.3. Unless otherwise specified, slope horizontal branches of vent piping down to fixture or pipe to which they connect with a minimum pitch of 25 mm (1") in 1.2 m (4').

3.3.4. Extend vent stacks up through roof where shown, but with exact locations which shall be coordinated with site conditions and in all cases, maintaining a minimum of 3 m (10'-0") from fresh air intakes, or greater as required by applicable codes and regulations. Terminate vent stacks a minimum of 330 mm (13") above roof (including roof parapets) in vent stack covers. Where not shown on drawings, route vent piping from source to building exterior as required in order to satisfy local governing codes and authority. Coordinate vent routing with other building services and ensure there is no architectural impact.

3.3.5. Where required, insulate drainage piping in accordance with requirements specified in Section 20 05 25.

3.3.6. Provide cast brass dielectric unions at connections between copper pipe and ferrous pipe or equipment.

3.4. INSTALLATION OF SHUT-OFF AND CHECK VALVES

3.4.1. Provide a shut-off valve and a check valve in discharge piping of each drainage pump. Provide gate valves for operations of complete open or closed.

3.4.2. Locate valves so they are easily accessible without the use of ladders or other such devices.

3.4.3. Refer to drainage detail drawings.

3.5. SUPPLY OF VENT STACK COVERS

3.5.1. Supply a properly sized vent stack cover for each vent stack penetrating roof.

3.5.2. Hand vent stack covers to roofing trade at site for installation and flashing into roof construction as part of roofing work. Coordinate installation to ensure proper locations. Provide waterproofing caps over vent stacks.

3.6. INSTALLATION OF CLEANOUTS

3.6.1. Provide cleanouts in drainage piping in locations as follows:

a) In building drain or drains as close as possible to inner face of outside wall, and, if a building trap is installed, locate cleanout on downstream side of building trap;

b) At or as close as practicable to the foot of each drainage stack;

c) At maximum 15 m intervals in horizontal pipe 100 mm (4") dia. and smaller;

d) At maximum 30 m intervals in horizontal pipe larger than 100 mm (4") dia.;

e) In the wall at each new urinal or bank of urinals in a washroom;

f) Wherever else shown on drawings; and

g) Provide and install cleanout on the upstream side and directly over every running trap.

3.6.2. Cleanouts shall be same diameter as pipe in piping to 100 mm (4") diaameter, and not less than 100 mm (4") diameter in piping larger than 100 mm (4") diameter.

3.6.3. Where cleanouts in vertical piping are concealed behind walls or partitions, install cleanouts near floor, and so cover is within 25 mm (1") of the finished face of the wall or partition.

3.7. INSTALLATION OF FLOOR CLEANOUT TERMINATIONS

3.7.1. Where cleanouts occur in horizontal inaccessible underground piping, extend cleanout TY fitting up to floor, and provide a cleanout termination set flush with finished floor.

3.7.2. In waterproof floors, ensure each cleanout termination is equipped with a flashing clamp device. Cleanout terminations shall suit floor finish.

3.7.3. Where, cleanout terminations occur in finished areas, confirm locations prior to rough-in and arrange piping to suit.

3.7.4. Ensure cleanout termination covers in tiled floor are square in lieu of round.

3.8. INSTALLATION OF FLOOR DRAINS, FUNNEL FLOOR DRAINS AND HUB DRAINS

3.8.1. Provide floor drains, funnel floor drains, and hub drains as required. Refer to drawing details.

3.8.2. Coordinate location of floor drains, funnel floor drains, and hub drains with equipment provided by Mechanical Division and Metrolinx's supplied equipment. Install in accordance with manufacturer's instructions.

3.8.3. Equip each drain with a trap.

3.8.4. In equipment rooms and similar areas, exactly locate floor drains to suit location of mechanical equipment and equipment indirect drainage piping. In washrooms, exactly locate floor drains to avoid interference with toilet partitions.

3.8.5. Confirm exact location of drains prior to roughing in. Where floor drains occur in washrooms, coordinate locations with toilet partition installations.

3.8.6. Temporarily plug and cover floor drains during construction procedures. Remove plugs and covers during final clean-up work and when requested, demonstrate free and clear operation of each drain. Replace any damaged grates and refinish any areas of the drain where cast iron finish has been damaged or removed, including rusted areas.

3.9. INSTALLATION OF ROOF DRAINS

3.9.1. Supply roof drains and place roof drain bodies in position for flashing into roof construction as part of roofing work. Connect with piping and provide accessories.

3.9.2. Protect roof drains from damage and entrance of debris until roofing work is complete, and refinish any areas where cast iron factory finish has been damaged or removed, including rusted areas.

3.10. INSTALLATION OF DRAINAGE TRENCH FRAMES AND GRATING

3.10.1. Supply frame and grating sections for drainage trench. Provide piping connections, traps, etc., as required.

3.10.2. Hand frames to concrete trade forming and pouring trenches. Ensure frames are properly and accurately installed.

3.10.3. Be present during concrete pour to ensure frames are not dislodged or damaged and remain straight and true. Immediately report any problems.

3.10.4. Install grates and secure in place. Temporarily cover grates during construction procedures. Clean trenches when work is complete.

3.11. INSTALLATION OF TRENCH DRAINS

3.11.1. Provide pre-sloped sections of drainage channel and install so top frames are level and plumb in relation to floor finishes. Provide accessories, traps, etc., as required.

3.11.2. Be present during concrete pour to ensure trench drainage is not dislodged or damaged and remains straight and true. Immediately report any problems.

3.11.3. Install grating and secure in place.

3.11.4. Temporarily cover trench drainage openings during construction procedures. Clean trenches when work is complete.

3.12. INSTALLATION OF INTERIOR CATCH BASIN FRAMES AND COVERS

3.12.1. Supply frames and hinged grates for interior catch basins, and provide sump inlet and outlet piping and accessories.

3.12.2. Hand frames to concrete trade pouring concrete sump, and coordinate installation of sump piping with the formwork installation.

3.12.3. Install grates and secure in place. Clean sumps when work is complete.

3.13. INSTALLATION OF BACKWATER VALVES

3.13.1. Provide backwater valves in drainage piping and connect with piping.

3.13.2. Set backwater valve assembly such that cover is flush with finished floor. Provide an extension piece if required due to depth of piping.

3.14. INSTALLATION OF EXTERIOR MANHOLES

3.14.1. Provide pre-cast concrete manholes. Properly bed each unit and set to required invert.

3.14.2. Provide a reinforced pre-cast concrete base slab and bottom section for each manhole or provide a poured-in-place concrete base. Ensure each manhole is sized to match pipe size and arrangement. Conform to Municipal installation standards.

3.14.3. Provide masonry work required to raise top of each assembly flush with finished grade level.

3.14.4. When work is substantially complete, clean out each manhole.

3.15. INSTALLATION OF EXTERIOR CATCH BASINS

3.15.1. Provide pre-cast concrete catch basins. Properly bed each unit and set to required invert.

3.15.2. Ensure each catch basin is sized to meet pipe size and arrangement. Conform to Municipal installation standards. Provide masonry work required to raise top of each assembly flush with finished grade level, or as otherwise indicated on drawings.

3.15.3. When work is substantially complete, clean out each catch basin.

3.16. INSTALLATION OF DRAINAGE INTERCEPTOR

3.16.1. Provide an interceptor in drainage piping. Refer to drawings for additional requirements.

3.16.2. Ensure unit is easily accessible for maintenance. Confirm exact location prior to roughing-in.

3.16.3. Wall mount control panel and provide required 24-volt control wiring in conduit from control panel to interceptor.

3.16.4. Refer to Section 20 05 10 for equipment/system start-up requirements.

3.16.5. Refer to Section 20 05 10 for equipment/system manufacturer certification requirements. Submit a copy of the letter prior to Substantial Performance of the Work.

END OF SECTION