SECTION 22 10 01

PLUMBING PIPING AND ACCESSORIES

PART 1 GENERAL

1.1 REFERENCES

A. The following is a list of standards which may be referenced in this section:
   1. American National Standards Institute (ANSI).
   2. American Society of Sanitary Engineering (ASSE):
      a. 1010, Performance Requirements for Water Hammer Arresters.
      b. 1050, Performance Requirements for Stack Air Admittance Valves for Sanitary Drainage Systems.
   3. American Society for Testing and Materials (ASTM):
      a. A47/A47M, Standard Specification for Ferritic Malleable Iron Castings.
      b. A53/A53M, Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
      c. A74, Standard Specification for Cast Iron Soil Pipe and Fittings.
      d. A105/A105M, Standard Specification for Forgings, Carbon Steel, for Piping Components.
      e. A126, Standard Specification for Gray Iron Castings for Valves, Flanges, and Pipe Fittings.
      f. A179/A179M, Standard Specification for Seamless Cold-Drawn Low-Carbon Steel Heat-Exchanger and Condenser Tubes.
      g. A181/A181M, Standard Specification for Forgings, Carbon Steel, for General-Purpose Piping.
      h. A197/A197M, Standard Specification for Cupola Malleable Iron.
      i. A234/A234M, Standard Specification for Piping Fittings of Wrought Carbon Steel and Alloy Steel for Moderate and Elevated Temperatures.
      j. A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 psi Tensile Strength.
      k. A518/A518M, Standard Specification for Corrosion-Resistant High-Silicon Iron Castings.
      l. A563, Standard Specification for Carbon and Alloy Steel Nuts.
      m. A861, Standard Specification for High-Silicon Iron Pipe and Fittings.
      n. A888, Standard Specification for Hubless Cast Iron Soil Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Application.
      o. B32, Standard Specification for Solder Metal.
      p. B61, Standard Specification for Steam or Valve Bronze Castings.
      q. B62, Standard Specification for Composition Bronze or Ounce Metal Castings.
      r. B75, Standard Specification for Seamless Copper Tube.
      s. B88, Standard Specification for Seamless Copper Water Tube.
      t. B98/B98M, Standard Specification for Copper-Silicon Alloy Rod, Bar, and Shapes.

u. B127, Standard Specification for Nickel-Copper Alloy (UNS N04400) Plate, Sheet, and Strip.
v. B139/B139M, Standard Specification for Phosphor Bronze Rod, Bar, and Shapes.
w. B164, Standard Specification for Nickel-Copper Alloy Rod, Bar, and Wire.
x. B194, Standard Specification for Copper-Beryllium Alloy Plate, Sheet, Strip, and Rolled Bar.
y. B306, Standard Specification for Copper Drainage Tube.
z. C564, Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.
aa. C1277 Standard Specification for Shielded Couplings joining Hubless Cast Iron Soil Pipe and Fittings
bb. D1784, Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds.
cc. D1785, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80, and 120.
dd. D2000, Standard Classification System for Rubber Products in Automotive Applications.
ee. D2466, Standard Specification for Poly(Vinyl Chloride) (PVC) Plastic Pipe Fittings.
ff. D2564, Standard Specification for Solvent Cements for Poly(Vinyl Chloride) (PVC) Plastic Piping Systems.
gg. D2855, Standard Practice for Making Solvent-Cemented Joints with Poly(Vinyl Chloride) (PVC) Pipe and Fittings.
hh. E438, Standard Specification for Glasses in Laboratory Apparatus.
ii. F656, Standard Specification for Primers for Use in Solvent Cement Joints of Poly(Vinyl Chloride) (PVC) Plastic Pipe and Fittings.
jj. F1412, Standard Specification for Polyolefin Pipe and Fittings for Corrosive Waste Drainage Systems.

4. American Water Works Association (AWWA):
   a. C104/A21.4, Cement-Mortar Lining for Ductile Iron Pipe and Fittings for Water.
   b. C110/A21.10, Ductile-Iron and Gray-Iron Fittings, 75 mm. Through 1200 mm for Water and Other Liquids.
   c. C111/A21.11, Rubber Gasket Joints for Ductile Iron Pressure Pipe and Fittings.
   d. C115/A21.15, Flanged Ductile-Iron Pipe with Ductile-Iron or Gray-Iron Threaded Flanges.
   e. C151/A21.51, Ductile-Iron Pipe, Centrifugally Cast, for Water.
   f. C203, Coal-Tar Protective Coatings and Linings for Steel Water Pipelines - Enamel and Tape - Hot Applied.
   g. C207, Standard for Steel Pipe Flanges for Waterworks Service-Sizes 100 mm Through 3600 mm
   h. C606, Grooved and Shouldered Joints.
   i. C651, Disinfecting Water Mains.

5. Cast Iron Soil Pipe Institute (CISPI): 301, Standard Specification for Hubless Cast Iron Pipe and Fittings for Sanitary and Storm Drain, Waste, and Vent Piping Application.

1.2 DESIGN REQUIREMENTS

A. Where pipe diameter, thickness, pressure class, pressure rating, or thrust restraint is not shown or specified, design piping system in accordance with the following:
   1. Building Services Piping Systems: National Plumbing Code of Canada with Manitoba Plumbing Code Amendments.

1.3 SUBMITTALS

A. Action Submittals:
   1. Product data sheets.
   2. Shop Drawings
      a. Drawings showing changes in location of fixtures or equipment that are advisable in the opinion of Contractor.
   3. Isometric riser diagrams.

B. Informational Submittals:
   1. Changes in location of equipment or piping that affect connecting or adjacent work, before proceeding with the work.
   2. Complete list of products proposed for installation.
   3. Test records produced during testing.

PART 2 PRODUCTS

2.1 PIPING

A. Piping Schedule: Refer to Section 40 27 00, Process Piping—General.

B. Piping Material: Refer to Piping Data Sheet(s), Article—Supplements and Section 40 27 00, Process Piping—General.

2.2 HOSE VALVES AND HYDRANTS

A. HV-1, Hose Valve:
   1. Cast bronze globe valve, 20 mm size, with NPT screwed ends, union bonnet, rising stem, teflon disc, hand wheel, and NPT x NST hose thread adapter outlet connection.
   2. Rated 1034 kPa service water pressure, 2069 kPa WOG.
   3. Manufacturers and Products:
      a. Stockham; Figure B-22T.
      b. Crane Co.; Catalog No. 7TF.

B. HV-2, Hose Valve:
1. Cast bronze globe valve, 40 mm size, with NPT screwed ends, union bonnet, rising stem, teflon disc, hand wheel, and NPT x NST hose thread adapter outlet connection.
2. Rated 1034 kPa SWP, 2069 kPa-WOG.
3. Manufacturers and Products:
a. Stockham; Figure B-22T.
b. Crane Co.; Catalog No. 7TF.

C. HV-3, Hose Valve:
1. Cast bronze globe valve, 50 mm size, with NPT screwed ends, union bonnet, rising stem, teflon disc, hand wheel, and NPT x NST hose thread adapter outlet connection.
2. Rated 1034 kPa SWP, 2069 kPa-WOG.
3. Manufacturers and Products:
a. Stockham; Figure B-22T.
b. Crane Co.; Catalog No. 7TF.

D. HV-4, Hose Valve:
1. Cast bronze globe valve, 65 mm size, with NPT screwed ends, union bonnet, rising stem, teflon disc, hand wheel, and NPT x NST hose thread adapter outlet connection.
2. Rated Class 150 SWP, Class 300 WOG.
3. Manufacturers and Products:
a. Stockham; Figure B-22T.
b. Crane Co.; Catalog No. 7TF.

2.3 MISCELLANEOUS PIPING SPECIALTIES

A. Strainers for Water Service:
1. Iron body, Y-pattern, Class 125 rated, with screwed bronze or bolted iron cap.
2. Screen: Heavy-gauge stainless steel or monel, 30-mesh.
3. Manufacturers and Products:
a. Crane; No. 988-1/2.
b. Asco Red Hat.

B. Vacuum Breakers 50 mm and Smaller:
1. Angle type, as required.
2. Manufacturers:
a. Febco.
b. Watts.

C. Water Hammer Arrestors:
1. Materials: ASSE 1010 certified, Type L copper tube, HHPP piston with two lubricated EPDM O-rings, approved lubricant, rolled piston stop, wrought copper male thread adapter.
2. Manufacturers and Products:
a. J. R. Smith; Series 5000.

b. Zurn Z-1700.
c. P.P.P. Inc., SS Series

D. Water Hose:
1. Furnish 15 m length(s) of 20 mm, EPDM black cover and EPDM tube, reinforced with two textile braids. Furnish each length with brass male and female NST hose thread couplings to fit hose nozzle(s) and hose valve(s) specified.
2. Rated minimum working pressure of 1369 kPa.
3. Manufacturers:
a. Goodyear.
b. Boston.

E. Hose Nozzles:
1. Furnish 20 mm cast brass satin finish nozzle(s) with adjustable fog, straight-stream, and shut-off features and rubber bumper. Provide nozzle(s) with female NST hose thread.
2. Manufacturers:
a. Croker.
b. Elkhart.

F. Sleeves:
1. Manufacturers and Products:
a. J. R. Smith; Figure 1720.
b. Zurn Z198.

G. Insulating Dielectric Unions and Flanges:
1. Galvanically compatible with piping to which attached and pressure ratings suitable for system working pressures.
2. Unions 50 mm and Smaller: Screwed or solder-joint type.
3. Unions 65 mm and Larger: Flanged type, complete with bolt insulators, dielectric gasket, bolts, and nuts.
4. Manufacturers:
a. Epco Sales, Inc., Cleveland, OH.
b. Capitol Insulation Unions.

H. Air Admittance Valve (AAV):
1. PVC construction with internal air check valve and insect screen.
2. Unit shall meet ASSE 1051 for fixture and branch air admittance valves.
3. Unit shall bear seal of ASSE approval.
4. Manufacturer and Product: Studor, Inc., Dunedin, Florida; Maxi-Vent (50 mm to 100 mm).

I. Joint Solder: 95-5 wire solder, ASTM B32, Grade 95 TA. Do not use cored solder.

J. Pipe Joint Sealer: Compound insoluble in water or Teflon tape; approved by NFS for use in potable water.

K. Rubber Gaskets: ASTM C564.

2.4 METERING AND MEASURING DEVICES

A. Thermometers:
1. Adjustable angle, red reading mercury type with 225 mm case and scale range in degrees C, as shown.
2. Furnish with 90 mm stem length and separable NPT brass thermowell.
3. Manufacturers:
   a. Weksler.
   b. Trerice.

B. Pressure Gauges:
1. Construction: 90 mm gauge size, 0 to 690 kPa, 0 to 1103 kPa range, steel case, glass crystal, brass movement, and 6 mm NPT lower connection.
2. Furnish with 6 mm brass gauge cock.
3. Manufacturers and Products:
   a. Ashcroft; Type 1008.
   b. Marsh; J80.

PART 3 EXECUTION

3.1 GENERAL

A. Install plumbing systems to meet the applicable Plumbing Code.

B. Field Obstructions:
1. Drawings do not attempt to show exact details of piping. Provide offsets around obstructions.
2. Do not modify structural components, unless approved by Contract Administrator.

C. Sleeves:
1. Pipe sizes shown are nominal sizes, unless shown or specified otherwise.
2. Provide piping passing through walls, floors, or ceilings with standard-weight pipe sleeves.
3. Provide pipes passing through finished walls with chrome-plated canopy flanges.
4. Dry pack sleeves in existing work in-place and provide finished appearance.
5. Pack holes left by removal of existing piping with grout and finish to match adjacent surface.

D. Provide unions in piping systems at connections to equipment.

E. Provide insulating dielectric unions and flanges between ferrous and nonferrous piping and where otherwise required for electrically insulated connection.

F. Pipe air release valves, water-lubricated bearings, and other appurtenances having water effluent to nearest drain with copper tubing.

3.2 INSTALLATION

A. Steel Pipe:
1. Ream, clean, and remove burrs and mill scale from piping before making up.
2. Seal joint with pipe joint sealer of Teflon tape.

B. Copper Tubing:
1. Cut tubing square and remove burrs.
2. Clean both inside of fittings and outside of tubing with steel wool and hydrochloric acid before soldering.
3. Prevent annealing of fittings and hard-drawn tubing when making connections.
4. Do not use mitered joints for elbows or notching of straight runs of pipe for tees.

C. Rigid PVC or CPVC:
1. Cut, make up, and install in accordance with pipe manufacturer's recommendations.
2. Ream, clean, and remove burrs from cut ends before joining pipe.
3. Lay in trench by snaking pipe from one side to other.
4. Offset: As recommended by manufacturer for maximum temperature variation between time of solvent welding and final use.
5. Do not lay pipe when temperature is below 4.5 degrees C or above 32 degrees C when exposed to direct sunlight.
6. Shield ends to be joined from direct sunlight prior to and during laying operation.
7. Use strap wrenches only for tightening threaded plastic joints. Do not over tighten fittings.

D. Water System Balancing: Provide a qualified registered engineer or firm specializing in testing and balancing to adjust domestic water system. Balance system for required water flows at each plumbing fixture, terminal device, and recirculating hot water loop.

E. Water Hammer Arrestors:
1. Install in piping systems where shown on Drawings and adjacent to pieces of equipment where quick closing valves are installed.
2. Install at all emergency safety showers and eyewashes.
3. Size and install in accordance with Plumbing and Drainage Institute Standard PDI-WH201.
4. Shock arresters to have access panels or to be otherwise accessible.

F. Valves: Install in accordance with manufacturer's recommendations.

G. Miscellaneous Piping Specialties: Install in accordance with manufacturer's recommendations.

H. Metering and Measuring Devices: Install in accordance with manufacturer's recommendations.

3.3 SANITARY AND WASTE DRAINS AND VENTS PIPING

A. Installation:
1. Set piping occurring above floor slab true and plumb.
2. Set exposed risers as close to walls as possible.
3. Where vent stacks pass through roof slab, fit with flashing sleeve secured to roof.
4. Extend vents minimum 305 mm above roof.
5. Provide cleanouts where shown and where required by code.

3.4 HVAC CONDENSATE PIPING

A. Set piping true and plumb.

B. Slope piping 1:100 minimum.

3.5 WATER SUPPLY PIPING

A. Water supply piping includes domestic cold water (PW), domestic hot water (DHW), domestic hot water return (DHR), tempered domestic water (TDW) and nonpotable water (NPW) systems.

B. Flush water piping systems clean of internal debris, clean faucet aerators, and adjust plumbing fixture valves for manufacturer’s recommended flow.

C. Do not run water piping through electrical rooms, stairwells, or immediately over or within a 1 m horizontal clearance of electrical panels, motor starters, or environmental control panels.

D. Hose Valves and Hydrants: Attach handle with setscrew and provide manufacturer’s recommended gravel fill around drain hole of post hydrants.

E. Provide valve operators with position indicators, where indicated, to show position of valve disc or plug.

F. Provide bypass with globe valve for emergency throttling around each reducing valve.

G. Protect buried copper and steel pipe and fittings with a single wrap of coal-tar saturated felt in accordance with AWWA C203.

H. Vacuum Breakers 50 mm and Smaller: Install minimum 150 mm above flood line of equipment they serve.

I. Provide manual air vents at high points in domestic hot water system.

3.6 HANGERS AND SUPPORTS

A. Install pre-engineered support equipment in accordance with the manufacturer's recommendations.

B. Hanger Rod Sizing and Spacing for:

1. Steel Pipe:

Pipe Size	Max. Hanger Spacing	Min. Rod Size
25 mm & smaller	2 m	6 mm
32 through 65 mm	25 m	6 mm
80-100 mm	3.0 m	10 m
150 mm	3.7 m	10 m
200 mm	3.7 m	12 m

2. Copper Pipe:
   a. Rod Size: Same as for steel pipe.
   b. Spacing: 0.6 m less per size than for steel pipe, except pipe 32 mm and smaller shall be supported every 2 m.
3. Cast Iron Pipe:
   a. Rod Size: Same as for steel pipe.
   b. Spacing: Locate hanger rods at each pipe joint and change of direction.
4. Plastic Pipe:
   a. Rod Size: Same as for steel pipe.
   b. Spacing: As recommended by manufacturer and as required by applicable Plumbing Code for flow and temperature in pipe.
5. No metal portion of hanger shall contact pipe directly.

C. Attach Support Rods For Horizontal Piping:

1. To steel beams with I-clamps.
2. To concrete with inserts, or with flanges fastened with flush shells.
3. To wood with thickness of 65 mm or more thick, with bolts or angle clips.

D. Trapeze Hangers:

1. Trapeze hangers may be used in lieu of individual hangers where horizontal piping is arranged with two or more parallel lines.
2. Attach lines to horizontal with U-bolts or one-hole clamps.

E. Vertical Piping:

1. Support by channel type support system and pipe clamps on 3 m maximum centers.
2. Copper, and Plastic Piping: Isolate from channels and pipe clamps with pipe isolators.

F. Insulated Piping: Furnish galvanized protection shield and oversized hangers under insulated piping.

3.7 INTERIM CLEANING

A. As specified in Section 40 27 00, Process Piping—General.

B. Prevent accumulation of weld rod, weld spatter, pipe cuttings and filings, gravel, cleaning rags, and other foreign material within piping during fabrication and assembly.

C. Examine piping to assure removal of foreign objects prior to assembly.

D. Shop cleaning may employ conventional commercial cleaning method if it does not corrode, deform, swell, or otherwise alter physical properties of material being cleaned.

3.8 TESTING

A. As specified in Section 40 80 01, Piping Leakage Testing.

3.9 CLEANING AND DISINFECTION

A. Prior to final acceptance, following assembly and testing, flush pipelines with water, except for plant process air lines and instrument air lines, and remove accumulated construction debris and other foreign matter.

B. Minimum Flushing Velocity: 1.52 meter per second.

C. Insert cone strainers in the connections to attached equipment and leave until cleaning has been accomplished.

D. Remove accumulated debris through drains 50 mm and larger or by dropping spools and valves.

E. Immediately following drainage of flushed lines, dry piping with compressed air.

F. Plant process air and instrument air piping shall be blown clean of loose debris with compressed air.

G. Disinfect pipelines intended to carry potable water before placing in service:
   1. Meet the requirements of AWWA C651, unless otherwise specified.
   2. Disinfecting Mixture:
      a. A chlorine-water solution having a free chlorine residual of 40 ppm to 50 ppm.
      b. Prepare by injecting one of the following:
         1) Liquid chlorine gas-water mixture.
         2) Dry chlorine gas.
         3) Calcium or sodium hypochlorite and water mixture.
      c. Inject mixture into pipeline at a measured rate while freshwater is allowed to flow through the pipeline at a measured rate so the combined mixture of freshwater and chlorine solution or gas is of the specified strength.
      d. Apply liquid chlorine gas-water mixture by means of a chlorinating device.
      e. Feed dry chlorine gas through proper devices for regulating the rate of flow and providing effective diffusion of gas into water within pipe being treated.

f. Chlorinating devices for feeding solutions of chlorine gas or gas itself must prevent backflow of water into chlorine cylinder.

g. Calcium Hypochlorite: If this procedure is used, first mix dry powder with water to make a thick paste, then thin to approximately a 1 percent solution (10,000 ppm chlorine).

h. Sodium Hypochlorite: If this procedure is used, dilute liquid with water to obtain a 1 percent solution.

i. The following proportions of hypochlorite to water will be required:

Product	Quantity	Water
Calcium Hypochlorite [1] (65 - 70 percent C1)	0.5 kg	28.5 Litres
Sodium Hypochlorite [2] (5.25 percent C1)	3.8 Litres	16 Litres
1. Comparable to commercial products known as HTH, Perchloron, and Pittchlor. 2. Known as liquid laundry bleach, Clorox, and Purex.		

H. Point of Application:

1. Inject chlorine mixture into pipeline to be treated at the beginning of the line through a corporation stop or suitable tap in the top of pipeline.
2. Control clean water from the existing system or another source so it flows slowly into newly installed piping during chlorine application.
3. Manipulate valves so the strong chlorine solution in the line being treated will not flow back into the line supplying the water. Use check valves if necessary.

I. Retention Period:

1. Retain treated water in pipeline for a minimum of 24 hours or long enough to destroy nonspore-forming bacteria.
2. At the end of the retention period, the disinfecting mixture shall have a strength of at least 10 ppm of chlorine.
3. Operate valves, hydrants, and other appurtenances during disinfection to assure disinfecting mixture is dispersed into all parts of the pipeline including dead ends, new services, and similar areas that otherwise may not receive the disinfecting solution.
4. Do not place concentrated quantities of commercial disinfectants in pipeline before filling with water.
5. After chlorination, flush the water from the permanent source of supply until water through pipeline is equal chemically and bacteriologically to the permanent source of supply.

J. Disposal of Disinfecting Water:

1. Dispose of disinfecting water in an acceptable manner that will protect the public and receiving waters from harmful or toxic concentrations of chlorine.
2. Do not allow disinfecting water to flow into a waterway without adequate dilution or other satisfactory method of reducing chlorine concentrations to a safe level.

3.10 CORROSION PROTECTION

A. As specified in Section 40 27 00, Process Piping—General.

3.11 PROTECTION OF INSTALLED WORK

A. Protective Covers:
   1. Provide over floor and shower drains during construction, to prevent damage to drain strainers and keep foreign material from entering drainage system.
   2. Cover roof drains and emergency overflow drains during roofing process so roofing material and gravel do not enter drain piping.
   3. Remove at time of Substantial Completion.

3.12 FIELD FINISHING

A. In accordance with Section 40 27 00, Process Piping—General.

3.13 PIPING IDENTIFICATION

A. Refer to Section 40 27 00, Process Piping—General and Pipe Schedule.

3.14 SUPPLEMENTS

A. The supplements listed below, following "End of Section," are part of this Specification.
   1. 22 10 01.01, Plumbing Piping Schedule.
   2. Plumbing Piping Data Sheets.

Section Number		Title
22 10 01.03		Cast Iron Soil Pipe (CI01) and Fittings

END OF SECTION

SECTION 22 10 01.01

PLUMBING PIPING SCHEDULE

Legend	Service	Size(s) (mm)	Exposure	Piping Material	Specification Section	Operating Pressure (kPa)	Test Type	Test Pressure (kPa)	Pipe Colors and Labels	Notes
CON	Condensate Drain, HVAC	All	EXP/BUR	CU01	40 27 00.13	NA	H	34.5		
D	Sanitary Drain	All	EXP/BUR	CI01	22 10 01.03	NA	H	34.5		
DHW, DHR	Hot Water, Potable	12-65	EXP/BUR	CU01	40 27 00.13		H			
DHW, DHR	Hot Water, Potable	>65	EXP/BUR	SS01	40 27 00.08		H			
R	Refrigerant	All	EXP/BUR	CU02	23 23 00	Note 1	Note 1	Note 1		Note 1
RW	Roof Drainage Water	All	EXP/BUR	CI01	22 10 01.02	NA	H	34.5		
SPD	Sump Pump Discharge	25-80	EXP/BUR	SS01	40 27 00.08		H			
TP	Trap Primer	12-20	EXP/BUR	CU01	40 27 00.13	NA	H			
TDW	Tempered Water, Potable	All	EXP/BUR	CU01	40 27 00.13		H			
V, VTA	Sanitary Vent	All	EXP	CI01	22 10 01.03	NA	H	34.5		
PW, NPW	Potable, Non-potable Water	12-65	EXP/BUR	CU01	40 27 00.13		H			
PW, NPW	Potable, Non-potable Water	>65	EXP/BUR	SS01	40 27 00.08		H			

Notes:

1. Refer Section 23 23 00, Refrigerant Piping, for testing requirements.

Legend		
Exposure	Pressure Test	Material
BUR Buried	H Hydrostatic	CI01 Cast Iron Soil Pipe
EXP Exposed		CU0X Copper
		SS0X Stainless Steel

END OF SECTION

SECTION 22 10 01.03 CAST IRON SOIL PIPE AND FITTINGS (CI01)		
Item	Size	Description
Pipe	150 mm and smaller	Hubless, CISPI 301, service weight, no-hub ends.
	200 mm and larger	Hub and spigot, ASTM A74, service weight, single hub and spigot.
Joints	150 mm and smaller	Compression: Neoprene sealing sleeve with 24-gauge Type 304 stainless steel shield and clamp assembly.
	200 mm and larger	Rubber gaskets, ASTM C564.
Fittings	All	ASME B16.4; ASME 16.12, CISPI 301.
Coating	All	Bituminous-coated inside and out; marked with manufacturer’s name or trademark and CISPI symbol.

END OF SECTION

SECTION 22 40 00

PLUMBING FIXTURES

PART 1 GENERAL

1.1 REFERENCES

A. The following is a list of standards which may be referenced in this section:
   1. Canadian Gas Association (CGA).
   2. American Society of Mechanical Engineers (ASME).
   3. American Society of Sanitary Engineering (ASSE): 1010, Performance Requirements for Water Hammer Arresters.
   4. CSA/CSA Label on Fixtures.
   5. Plumbing and Drainage Institute (PDI):
      a. Code Guide 302 and Glossary of Industry Terms.
      b. WH-201, Water Hammer Arrester Standard.
   6. Underwriters Laboratories of Canada (ULC).

1.2 SUBMITTALS

A. Action Submittals:
   1. Shop Drawings: Catalog information and rough-in dimensions for plumbing fixtures, products, and specialties.

1.3 REGULATORY REQUIREMENTS

A. Comply with the Plumbing Code and the requirements of provincial and local authorities having jurisdiction.

B. Comply with the Canadian with Disabilities Act, and local and provincial requirement.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Drainage Products:
   1. General:
      a. Smith.
      b. Watts.
      c. Zurn.
   2. Acid Resistant:
      a. Enfield.
      b. Pegas.

2.2 MATERIALS

A. Drainage Products:

1. CO-1, Cleanout:
   a. Material: Taper thread, bronze plug, scoriated nickel bronze top.
   b. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 4023.
2. FCO-1, Floor Cleanout (Unfinished Areas):
   a. Service: Floor drainage system – exposed concrete.
   b. Material: Tapered thread, bronze plug with round adjustable scoriated secured cast iron top.
   c. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 4243S.
3. FD-1, Floor Drain (Unfinished Areas, General Drainage):
   a. Materials: Cast iron body and grate.
   b. Options: Sediment bucket, Jay R. Smith Mfg. Co.; Model 2696, trap primer connection, vandalproof screws.
   c. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 2210T-U.
4. FD-2, Floor Drain (Finished Areas):
   a. Materials: Cast iron body, adjustable nickel bronze strainer.
   b. Options: Jay R. Smith Mfg. Co.; Model 2696, trap primer connection, vandalproof screws.
   c. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 2005T-U-round.
5. GD-1, Floor Drain (Gutter Drain):
   a. Materials: Rectangular cast iron body and grate.
   b. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 2585T-U.
6. HD-1, Floor Drain (Indirect Receptor):
   a. Materials: Cast iron body and strainer.
   b. Options: Round top, anti-flood rim strainer, Jay R. Smith Mfg. Co.; Model 2696, trap primer connection, vandalproof screws.
   c. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 2010T-U-F37.
7. FFD-1, Floor Drain with Funnel:
   a. Materials: Cast iron body and grate.
   b. Option: Oval funnel.
   c. Manufacturers: Jay r. Smith Mfg. Co., Model 2005Y/3591NB-P.
8. RD-1, Roof Drain:
   a. Materials: Cast iron body with combined flashing clamp and gravel stop, and cast iron dome.
   b. Options: Extension collar, sump receiver, underdeck clamp.
   c. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 1010Y-E-R-C-CID.
9. OD-1, Overflow Drain:
   a. Materials: Cast iron body with combined flashing clamp and gravel stop, and cast iron dome.
   b. Options: Extension collar, sump receiver, underdeck clamp, and 50 mm high cast iron standpipe.
   c. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 1070Y-E-R-C-CID-CIS.

10. ON-1, Overflow (Discharge) Nozzle:
    a. Material: Cast bronze body and flange.
    b. Manufacturer and Product: Jay R. Smith Mfg. Co.; Model 1770.
11. HD-2, Hub Drain:
    a. Coated cast iron reducing hub adapter with standard cast iron hub.
    b. Hub: Two pipe sizes larger than outlet.

PART 3 EXECUTION

3.1 PREPARATION

A. Drawings do not attempt to show exact details of fixtures. Changes in locations of fixtures, advisable in opinion of Contractor, shall be submitted to Contract Administrator for review before proceeding with the Work.

3.2 INSTALLATION

A. Drainage Products:
1. Floor Drains: Set top flush with floor. Provide membrane clamps where required.
2. Unless protected by a running trap, provide a P-trap for all floor drains, gutter drains, funnel floor drains, and hub drains.
3. Cleanouts: Install where shown or required for purposes intended. Set cover flush with finished floor.
4. Hub Drains: Set top of hub 50 mm above finished floor.
5. Drain P-Trap Priming:
    a. Pipe: Type K, soft copper.
    b. Provide trap primer for all running traps, and P-traps of floor drains, gutter drains, funnel floor drains, and hub drains.
    c. No attempt has been made to show trap primer pipe routing on the drawings.
    d. Field route trap primer piping during installation of floor drains and hub drains. Terminate trap primer lines 300 mm above finished floor, neatly along the wall where the serving trap primer valve is located as shown on the drawing.

B. Caulk penetrations of exterior walls with weaterproof sealant.

3.3 FIELD QUALITY CONTROL

A. Perform visual inspection for physical damage, blocked access, cleanliness, and missing items.

B. Perform CCTV inspection of all concrete encased drains to confirm all drain piping has remained intact after concrete placement. Repair all drain piping showing blockage or damage.

END OF SECTION