Part 1 General

1.1 SUMMARY

.1 Acronyms:

.1 Cx - Commissioning.

.2 CxA - Commissioning Agent

1.2 INTENT

.1 Provide commissioning of plumbing equipment and systems in accordance with this, Section 01 91 13 and related sections.

.2 All items noted in this document are the responsibility of the contractor supplying and installing the equipment, unless noted otherwise.

1.3 MANUFACTURER'S SERVICE ON SITE

.1 Arrange and pay for qualified Manufacturer's representatives to supervise starting and testing the following mechanical equipment and systems:

.1 Pumps

.2 Domestic hot water system

.2 Use manufacturers factory trained personnel where required to maintain manufacturer's warranty.

.3 Maintain documentation of all equipment start-up and commissioning and provide to Commissioning Agent.

1.4 AIR & HYDRONIC SYSTEM TESTING, ADJUSTING & BALANCING

.1 The Contractor will hire a Certified Balancing Agent for completion of the testing, adjusting and balancing of all air handling and hydronic systems.

Part 2 Products

2.1 TEST EQUIPMENT

.1 None

Part 3 Execution

3.1 GENERAL

.1 Commission all equipment and systems installed as part of this contract. Typical required information or actions are listed below for each equipment or system.

.2 Document the commissioning process by completing the PI forms, Performance Verification (PV) Tests and System PV Tests.

.3 The following procedures noted below outline generally accepted good practices for hydronic equipment and systems. If these systems do not apply to this building project, then they are not applicable to commissioning.

3.2 HYDRONIC EQUIPMENT AND SYSTEMS – PUMPS

.1 Check that installation is in accordance with drawings, specifications and Manufacturer's recommendations.

.2 Complete Manufacturer's installation and start-up check sheets and include the following items:

.1 Pump is level. Pump is properly aligned and millwright certificate is submitted to engineer.

.2 Isolation valves, strainers, check valve, pressure gauges, by-pass filter and flow meter are installed properly.

.3 Pump suction has sufficient length of straight run piping.

.4 Air has been completely bled off piping system.

.5 Expansion tank is charged and on-line.

.6 Strainers have clean screens in place.

.7 Where specified for large pumps, check pump base vibration isolation and flexible connections on water pipes are properly installed.

.8 Nameplate is readily visible.

.9 Check clearance space is adequate for pump servicing and removal.

.3 Start pumps as recommended by the Manufacturer.

.1 Check impeller is rotating in correct direction.

.2 Run-in pumps for minimum 12 continuous hours.

.3 Ensure flows through parallel pumps are equally balanced.

.4 Ensure mechanical seals do not leak; ensure packing gland type seals are wetted.

.5 Check pump NPSH - net positive suction head.

.6 Where vibration isolation is specified, check for correct static deflection of unit vibration isolators and that start-up and shut-down deflection is within resilience limits of isolators and flexible connections.

.7 Verify that motor has sufficient airflow through casing to provide cooling.

.4 Provide PV testing to ensure pumps perform as per specifications

.5 Provide maintenance services.

.1 Ensure that all equipment is serviced prior to owner takeover.

.2 Ensure that all equipment is installed so as to provide access for maintenance and removal.

.3 Clean strainers.

.4 Replace shaft seals if pump has been used to degrease system.

3.3 HYDRONIC EQUIPMENT AND SYSTEMS – DOMESTIC WATER

.1 Check that installation is in accordance with drawings, specifications and Manufacturer’s recommendations.

.2 Complete Manufacturer’s installation and start-up check sheets and include the following:

.1 Inspect domestic water systems including piping layout, pipe support, expansion provisions, and slope for draining and venting, before pressure testing any section of pipe.

.2 Pressure test sections of pipe prior to application of insulation or to concealment.

.3 Pressure test each completed system before any equipment is started.

.4 Start domestic hot water system’s circulator pumps.

.5 Balance Domestic Hot Water system return circulation circuits by temperature drop measurement.

.6 Sterilize Domestic water systems..

.7 Ensure all air chambers and expansion compensators are properly installed.

.8 Ensure entire system can be completely drained.

.9 Check operation of water hammer arrestors. Let one outlet run for ten seconds, then shut water off quickly. If water hammer occurs, replace water hammer arrestor. Repeat for each outlet and flush valve.

.3 Provide maintenance services:

.1 Ensure that all equipment is serviced prior to Owner takeover.

.2 Ensure that all equipment is installed so as to provide easy access for maintenance and removal.

3.4 HYDRONIC EQUIPMENT AND SYSTEMS – HOT WATER SYSTEM

.1 Check that installation is in accordance with drawings, specifications and Manufacturer's recommendations.

.2 Complete Manufacturer's installation and start-up check sheets and include the following:

.1 Inspect the Hot Water System including piping layout, pipe support, expansion provisions, and slope for draining and venting, before pressure testing any section of pipe.

.2 Pressure test sections of pipe prior to application of insulation or to concealment.

.3 Pressure test the system before any equipment is started.

.4 Ensure that when primary pumps fail, the control valves close, and that the secondary pumps control valve opens and secondary pump starts. Perform this test again with opposite configuration.

.5 Ensure all air chambers and expansion compensators are properly installed.

.6 Ensure entire system can be completely drained.

.7 Ensure Air Separators, are properly installed. Check to make sure the Air Separator drains properly and that the Automatic Air Vent functions as per Manufacturer's specifications.

.8 Ensure Side Stream Filters are properly installed and Sight Glass is working properly. Ensure the Chemical Pot Feeder is installed properly.

.9 Ensure all Heat Exchangers, are installed as per Manufacturer's specifications.

.10 Confirm all gauges and thermometers can be read from the floor level and are installed and calibrated as recommended by manufacturer.

.11 Verify following equipment is installed as recommended by manufacturer.

.1 PRVs.

.2 Air eliminators.

.3 Strainers.

.4 Check valves.

.5 Balancing valves.

.6 Plumbing fixtures.

.7 Backflow preventers.

.8 Vacuum breakers.

.3 Provide maintenance services.

.1 Ensure that all equipment is serviced prior to Owner takeover.

.2 Ensure that all equipment is installed so as to provide easy access for maintenance and removal.

3.5 HYDRONIC EQUIPMENT AND SYSTEMS - PLUMBING DRAINAGE

.1 Check that installation is in accordance with drawings, specifications and Manufacturer's recommendations.

.2 Complete Manufacturer's installation and start-up check sheets and include the following:

.1 Inspect plumbing drainage systems including above ground drainage piping layout, pipe support, slope, venting, before pressure testing or concealing any section of the work.

.2 Hydraulically test above ground installations within buildings.

.3 Ensure all traps are fully primed.

.4 Ensure all fixtures are properly anchored and connected to system.

.5 Flush each valve, drain each sink and operate each fixture to ensure drainage and trap anti-siphon venting is effective.

.6 Open each cleanout, cover with linseed oil and reseal each cleanout. Ensure each cleanout is fully accessible and access doors are properly installed. Check cleanouts after building finishes (flooring, wall covering) have been installed.

.7 Ensure roof drain metal domes are installed. Ensure storm piping is free of debris or roof insulation ballast. Remove caps as required. Verify insulation on piping is as specified.

.3 Provide maintenance services.

.1 Ensure that all equipment is serviced prior to Owner takeover.

.2 Ensure that all equipment is installed so as to provide easy access for maintenance and removal.

3.6 HYDRONIC EQUIPMENT AND SYSTEMS – DISTRIBUTION

.1 Check that installation is in accordance with drawings, specifications and Manufacturer's recommendations.

.2 Complete Manufacturer's installation and start-up check sheets and include the following:

.1 Inspect piping layout, pipe support, expansion provisions, slope for draining and venting, vibration isolation before pressure testing any section of pipe.

.2 Pressure test sections of pipe prior to application of insulation or to concealment.

.3 Pressure test each completed system, in accordance with Division 22, before any equipment is started.

.4 Chemically clean water filled system and glycol filled systems.

.5 Chemically treat water filled.

.6 Check system for fluid or pump noise in pipes. Rectify as necessary.

.7 Check that insulation is installed as per specifications and is neat and tidy.

.8 Check that insulation has not been damaged during construction and note any sections that require repair.

.9 Check that all distribution piping is labelled.

.3 Provide Testing, Adjusting and Balancing for all Hydronic Equipment and Systems by a Certified Independent Agent as per Section 23 05 93.

.4 Complete PV testing to ensure that hydronic systems meet or exceed the performance requirements outlined in the drawings and specifications.

.5 Provide maintenance services.

.1 Ensure all equipment is serviced prior to take-over.

.2 Ensure all equipment is installed so as to provide easy access for maintenance and removal.

3.7 MISCELLANEOUS EQUIPMENT AND SYSTEMS – TANKS

.1 Check that installation is in accordance with drawings, specifications and Manufacturer's recommendations.

.2 Complete Manufacturer's installation and start-up check sheets and include the following:

.1 Tank is level on housekeeping base.

.2 No visible damage to vessel.

.3 Check PRVs for correct operation and specified relief pressure. Adjust as required.

.4 Clearances have been provided and piping is flanged for easy removal and servicing.

.5 Labels are clearly visible.

.6 Controls, gauges, alarm devices, etc. are operational.

.7 Access ports/manholes provided.

.8 Piping sizes - inlets/outlets are correct.

.9 Lining is intact and not damaged.

.10 Tank has dielectric unions on piping connections.

.11 Verify drain line.

.3 Provide maintenance services.

.1 Adjust thermostat to final setting

.2 Clean unit

.3 Confirm that all equipment is accessible for maintenance and operations

3.8 MECHANICAL EQUIPMENT AND SYSTEMS DEMONSTRATION AND INSTRUCTION

.1 Provide demonstrations and instruction in accordance with Section 01 91 13.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American National Standards Institute (ANSI)/American Society of Mechanical Engineers International (ASME).

.1 ANSI/ASME B16.15, Cast Bronze Threaded Fittings, Classes 125 and 250.

.2 ANSI/ASME B16.18, Cast Copper Alloy Solder Joint Pressure Fittings.

.3 ANSI/ASME B16.22, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

.4 ANSI/ASME B16.24, Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500.

.2 American Society for Testing and Materials International, (ASTM).

.1 ASTM A307, Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 ASTM B88M, Standard Specification for Seamless Copper Water Tube (Metric).

.3 ASTM F492, Standard Specification for Propylene and Polypropylene (PP) Plastic-Lined Ferrous Metal Pipe and Fittings.

.3 American Water Works Association (AWWA).

.1 AWWA C111, Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.4 Canadian Standards Association (CSA International).

.1 CSA B242, Groove and Shoulder Type Mechanical Pipe Couplings.

.5 Department of Justice Canada (Jus).

.1 Canadian Environmental Protection Act, 1999, c. 33 (CEPA).

.6 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.7 Manufacturer's Standardization Society of the Valve and Fittings Industry (MSS).

.1 MSS-SP-67, Butterfly Valves.

.2 MSS-SP-70, Cast Iron Gate Valves, Flanged and Threaded Ends.

.3 MSS-SP-71, Cast Iron Swing Check Valves, Flanged and Threaded Ends.

.4 MSS-SP-80, Bronze Gate, Globe, Angle and Check Valves.

.8 National Research Council (NRC)/Institute for Research in Construction.

.1 NRCC 38728, National Plumbing Code of Canada (NPC).

.9 Transport Canada (TC).

.1 Transportation of Dangerous Goods Act, 1992, c. 34 (TDGA).

1.2 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Submit product data for following: valves.

.3 Submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.

.4 Provide maintenance data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

1.3 HEALTH AND SAFETY

.1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

1.4 STORAGE AND HANDLING

.1 Store and manage hazardous materials in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

1.5 WASTE MANAGEMENT AND DISPOSAL

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

Part 2 Products

2.1 PIPING

.1 Domestic hot, cold and recirculation systems, within building.

.1 Above ground: copper tube, hard drawn, type L: to ASTM B88M.

.2 Buried or embedded: copper tube, soft annealed, type K: to ASTM B88M, in long lengths and with no buried joints.

2.2 FITTINGS

.1 Bronze pipe flanges and flanged fittings, Class 150 and 300: to ANSI/ASME B16.24.

.2 Cast bronze threaded fittings, Class 125 and 250: to ANSI/ASME B16.15.

.3 Cast copper, solder type: to ANSI/ASME B16.18.

.4 Wrought copper and copper alloy, solder type: to ANSI/ASME B16.22.

.5 NPS 2 and larger: roll grooved to CSA B242.

2.3 JOINTS

.1 Rubber gaskets, latex-free 1.6 mm thick: to AWWA C111.

.2 Bolts, nuts, hex head and washers: to ASTM A307, heavy series.

.3 Solder: 95/5 tin copper alloy.

.4 Teflon tape: for threaded joints.

.5 Grooved couplings: designed with angle bolt pads to provide rigid joint, complete with EPDM flush seal gasket.

.6 Dielectric connections between dissimilar metals: dielectric fitting to ASTM F492, complete with thermoplastic liner.

2.4 GATE VALVES

.1 NPS 2 and under, soldered:

.1 Rising stem: to MSS-SP-80, Class 125, 860 kPa, bronze body, screw-in bonnet, solid wedge disc as specified Section 23 05 22 - Valves - Bronze.

.2 NPS 2 and under, screwed:

.1 Rising stem: to MSS-SP-80, Class 125, 860 kPa, bronze body, screw-in bonnet, solid wedge disc as specified Section 23 05 22 - Valves - Bronze.

2.5 GLOBE VALVES

.1 NPS2 and under, soldered:

.1 To MSS-SP-80, Class 125, 860 kPa, bronze body, renewable composition disc, screwed over bonnet as specified Section 23 05 22 - Valves - Bronze.

.2 NPS 2 and under, screwed:

.1 To MSS-SP-80, Class 150, 1 MPa, bronze body, screwed over bonnet, renewable composition disc as specified Section 23 05 22 - Valves - Bronze.

2.6 SWING CHECK VALVES

.1 NPS 2 and under, soldered:

.1 To MSS-SP-80, Class 125, 860 kPa, bronze body, bronze swing disc, screw in cap, regrindable seat as specified Section 23 05 22 - Valves - Bronze.

.2 NPS 2 and under, screwed:

.1 To MSS-SP-80, Class 125, 860 kPa, bronze body, bronze swing disc, screw in cap, regrindable seat as specified Section 23 05 22 - Valves - Bronze.

2.7 BALL VALVES

.1 NPS 2 and under, screwed:

.1 Class 150.

.2 Bronze body, stainless steel ball, PTFE adjustable packing, brass gland and BunaN seat, steel lever handle as specified Section 23 05 22 - Valves - Bronze.

.2 NPS 2 and under, soldered:

.1 To ANSI/ASME B16.18, Class 150.

.2 Bronze body, stainless steel ball, PTFE adjustable packing, brass gland and BunaN seat, steel lever handle, with NPT to copper adaptors as specified Section 23 05 22 - Valves - Bronze.

Part 3 Execution

3.1 INSTALLATION

.1 Install in accordance Plumbing Code and local authority having jurisdiction.

.2 Install pipe work in accordance with Section 23 05 01 - Installation of Pipework, supplemented as specified herein.

.3 Assemble piping using fittings manufactured to ANSI standards.

.4 Install CWS piping below and away from HWS and HWC and other hot piping so as to maintain temperature of cold water as low as possible.

.5 Connect to fixtures and equipment in accordance with manufacturer's written instructions unless otherwise indicated.

.6 Buried tubing:

.1 Lay in well compacted washed sand in accordance with AWWA Class B bedding.

.2 Bend tubing without crimping or constriction. Minimize use of fittings.

3.2 VALVES

.1 Isolate equipment, fixtures and branches with ball valves.

.2 Balance recirculation system using lock shield globe valves. Mark settings and record on as-built drawings on completion.

3.3 PRESSURE TESTS

.1 Conform to requirements of Section 23 05 00 - Common Work Results – Mechanical.

.2 Test pressure: greater of 1 times maximum system operating pressure or 860 kPa.

3.4 FLUSHING AND CLEANING

.1 Flush entire system for 8 h. Ensure outlets flushed for 2 h. Let stand for 24 h, then draw samples off longest run. Submit to testing laboratory to verify that system is clean copper to Provincial potable water guidelines. Let system flush for additional 2 h, then draw off another sample for testing.

3.5 PRE-START-UP INSPECTIONS

.1 Systems to be complete, prior to flushing, testing and start-up.

.2 Verify that system can be completely drained.

.3 Ensure that pressure booster systems are operating properly.

.4 Ensure that air chambers, expansion compensators are installed properly.

3.6 DISINFECTION

.1 Flush out, disinfect and rinse system to requirements of authority having jurisdiction.

.2 Upon completion, provide laboratory test reports on water quality for [epartmental Representative.

3.7 START-UP

.1 Timing: Start up after:

.1 Pressure tests have been completed.

.2 Disinfection procedures have been completed.

.3 Certificate of static completion has been issued.

.4 Water treatment systems operational.

.2 Provide continuous supervision during start-up.

.3 Start-up procedures:

.1 Establish circulation and ensure that air is eliminated.

.2 Check pressurization to ensure proper operation and to prevent water hammer, flashing and/or cavitation.

.4 Rectify start-up deficiencies.

END OF SECTION

Part 1 General

1.1 QUALITY ASSURANCE

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

1.2 DELIVERY STORAGE AND DISPOSAL

.1 Waste Management and Disposal:

.1 Separate and recycle waste materials in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

Part 2 Products

2.1 MATERIAL

2.2 COPPER TUBE AND FITTINGS

.1 Above ground sanitary, storm and vent Type DWV to: ASTM B306.

.1 Fittings.

.1 Cast brass: to CAN/CSA-B125.

.2 Wrought copper: to CAN/CSA-B125.

.2 Solder: lead free, tin-95:5, type TA, to ASTM B32.

2.3 CAST IRON PIPING AND FITTINGS

.1 Buried sanitary, storm and vent minimum NPS 3, to: CAN/CSA-B70, with one layer of protective coating.

.1 Joints.

.1 Mechanical joints.

.1 Neoprene or butyl rubber compression gaskets: to ASTM C564 or CAN/CSA-B70.

.2 Stainless steel clamps.

.2 Hub and spigot.

.1 Caulking lead: to CSA B67.

.2 Cold caulking compounds.

.2 Above ground sanitary, storm and vent]: to CAN/CSA-B70.

.1 Joints.

.1 Hub and spigot.

.1 Caulking lead: to CSA B67.

.2 Mechanical joints.

.1 Neoprene or butyl rubber compression gaskets with stainless steel clamps.

Part 3 Execution

3.1 INSTALLATION

.1 In accordance with Section 23 05 01 - Installation of Pipework.

.2 Install in accordance with Provincial Plumbing Code and local authority having jurisdiction.

3.2 TESTING

.1 Pressure test buried systems before backfilling.

.2 Hydraulically test to verify grades and freedom from obstructions.

3.3 PERFORMANCE VERIFICATION

.1 Cleanouts:

.1 Ensure accessible and that access doors are correctly located.

.2 Open, cover with linseed oil and re-seal.

.3 Verify that cleanout rods can probe as far as the next cleanout, at least.

.2 Test to ensure traps are fully and permanently primed.

.3 Storm water drainage:

.1 Verify domes are secure.

.2 Ensure weirs are correctly sized and installed correctly.

.3 Verify provisions for movement of roof system.

.4 Ensure that fixtures are properly anchored, connected to system and effectively vented.

.5 Affix applicable label (storm, sanitary, vent, pump discharge etc.) c/w directional arrows every floor or 4.5 m (whichever is less).

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 American Society for Testing and Materials International (ASTM).

.1 ASTM A126, Specification for Gray Iron Castings for Valves, Flanges and Pipe Fittings.

.2 ASTM B62, Specification for Composition Bronze or Ounce Metal Castings.

.2 American Water Works Association (AWWA).

.1 AWWA C700, Cold Water Meters-Displacement Type, Bronze Main Case.

.2 AWWA C701, Cold Water Meters-Turbine Type for Customer Service.

.3 AWWA C702-1, Cold Water Meters-Compound Type.

.3 Canadian Standards Association (CSA International).

.1 CSA-B64 Series, Backflow Preventers and Vacuum Breakers.

.2 CSA-B79, Floor, Area and Shower Drains, and Cleanouts for Residential Construction.

.3 CSA-B356, Water Pressure Reducing Valves for Domestic Water Supply Systems.

.4 Health Canada/Workplace Hazardous Materials Information System (WHMIS).

.1 Material Safety Data Sheets (MSDS).

.5 Plumbing and Drainage Institute (PDI).

.1 PDI-G101, Testing and Rating Procedure for Grease Interceptors with Appendix of Sizing and Installation Data.

.2 PDI-WH201, Water Hammer Arresters Standard.

1.2 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data:

.1 Submit manufacturer's printed product literature, specifications and datasheet for fixtures and equipment.

.2 Indicate dimensions, construction details and materials for specified items.

.3 Submit WHMIS MSDS in accordance with Section 02 61 33 - Hazardous Materials. Indicate VOC's for adhesive and solvents during application and curing.

.3 Certificates: submit certificates signed by manufacturer certifying that materials comply with specified performance characteristics and physical properties.

.4 Instructions: submit manufacturer's installation instructions.

.5 Manufacturers' Field Reports: manufacturers' field reports specified.

.6 Closeout submittals: submit maintenance and engineering data for incorporation into manual specified in Section 01 78 00 - Closeout Submittals.

Part 2 Products

2.1 CLEANOUTS

.1 Cleanout Plugs: heavy cast iron male ferrule with brass screws and threaded brass or bronze plug. Sealing-caulked lead seat or neoprene gasket.

.2 Access Covers:

.1 Wall Access: face or wall type, polished nickel bronze square cover with flush head securing screws, bevelled edge frame complete with anchoring lugs.

.2 Floor Access: round cast iron body and frame with adjustable secured nickel bronze top

2.2 WATER HAMMER ARRESTORS

.1 Stainless steel or Copper construction, bellows type: to PDI-WH201.

2.3 VACUUM BREAKERS

.1 Breakers: to CSA-B64 Series, vacuum breaker atmospheric.

Part 3 Execution

3.1 MANUFACTURER'S INSTRUCTIONS

.1 Compliance: comply with manufacturer's written recommendations or specifications, including product technical bulletins, handling, storage and installation instructions, and data sheet.

3.2 INSTALLATION

.1 Install in accordance with provincial codes, and local authority having jurisdiction.

.2 Install in accordance with manufacturer's instructions and as specified.

3.3 CLEANOUTS

.1 Install cleanouts at base of soil and waste stacks, and rainwater leaders, at locations required code, and as indicated.

.2 Bring cleanouts to wall or finished floor unless serviceable from below floor.

.3 Building drain cleanout and stack base cleanouts: line size to maximum NPS4.

3.4 WATER HAMMER ARRESTORS

.1 Install on branch supplies to fixtures or group of fixtures.

END OF SECTION

Approved: 2004-12-31

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International).

.1 CAN/CSA-B45, Plumbing Fixtures.

.2 CAN/CSA-B125, Plumbing Fittings.

.3 CAN/CSA-B651, Barrier-Free Design.

1.2 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.

.1 Submit shop drawings and product data in accordance with Section 01 33 00 - Submital Procedures.

.1 Indicate, for all fixtures and trim:

.1 Dimensions, construction details, roughing-in dimensions.

.3 Closeout Submittals:

.1 Submit maintenance data in accordance with Section 01 78 00 - Closeout Submittals.

.2 Include:

.1 Description of fixtures and trim, giving manufacturer's name, type, model, year, capacity.

.2 Details of operation, servicing, maintenance.

.3 List of recommended spare parts.

1.3 QUALITY ASSURANCE

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

1.4 DELIVERY STORAGE AND DISPOSAL

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

Part 2 Products

2.1 MANUFACTURED UNITS

.1 Fixtures: manufacture in accordance with CAN/CSA-B45 series.

.2 Trim, fittings: manufacture in accordance with CAN/CSA-B125.

.3 Exposed plumbing brass to be chrome plated.

.4 Number, locations: architectural drawings to govern.

.5 Fixtures in any one location to be product of one manufacturer and of same type.

.6 Trim in any one location to be product of one manufacturer and of same type.

.7 Refer to Plumbing Fixture Schedule for fixture specifications.

.8 Fixture piping:

.1 Hot and cold water supplies to each fixture:

.1 Chrome plated flexible supply pipes each with screwdriver stop, reducers, and escutcheon.

.2 Waste:

.1 Brass P trap with clean out on each fixture not having integral trap.

.2 Chrome plated in all exposed places.

.9 Chair carriers:

.1 Factory manufactured floor-mounted carrier systems for all wall-mounted fixtures.

Part 3 Execution

3.1 INSTALLATION

.1 Mounting heights:

.1 Standard: to comply with manufacturer's recommendations unless otherwise indicated or specified.

.2 Wall-hung fixtures: as indicated by architectural drawings, measured from finished floor.

.3 Physically handicapped: to comply with most stringent of either NBCC or CAN/CSA B651.

3.2 ADJUSTING

.1 Conform to water conservation requirements specified this section.

.2 Adjustments:

.1 Adjust water flow rate to design flow rates.

.2 Adjust pressure to fixtures to ensure no splashing at maximum pressures.

.3 Checks:

.1 Aerators: operation, cleanliness.

.2 Vacuum breakers, backflow preventers: operation under all conditions.

.3 Wash fountains: operation of flow-actuating devices.

.4 Thermostatic controls:

.1 Verify temperature settings, operation of control, limit and safety controls.

END OF SECTION

Part 1 General

1.1 REFERENCES

.1 Canadian Standards Association (CSA International).

.1 CAN/CSA-B45, Plumbing Fixtures.

.2 CAN/CSA-B125, Plumbing Fittings.

.3 CAN/CSA-B651, Barrier-Free Design.

1.2 SUBMITTALS

.1 Submittals in accordance with Section 01 33 00 - Submittal Procedures.

.2 Product Data: submit WHMIS MSDS - Material Safety Data Sheets in accordance with Section 02 61 33 - Hazardous Materials.

.3 Submit shop drawings and product data in accordance with Section 01 33 00 - Submittal Procedures.

.4 Indicate fixtures and trim:

.1 Dimensions, construction details, roughing-in dimensions.

.5 Closeout Submittals:

.1 Provide maintenance data including monitoring requirements for incorporation into manuals specified in Section 01 78 00 - Closeout Submittals.

.2 Include:

.1 Description of fixtures and trim, giving manufacturer's name, type, model, year, capacity.

.2 Details of operation, servicing, maintenance.

.3 List of recommended spare parts.

1.3 QUALITY ASSURANCE

.1 Health and Safety:

.1 Do construction occupational health and safety in accordance with Section 01 35 30 - Health and Safety Requirements.

1.4 DELIVERY STORAGE AND DISPOSAL

.1 Waste Management and Disposal:

.1 Separate waste materials for reuse and recycling in accordance with Section 01 74 19 - Construction/Demolition Waste Management And Disposal.

Part 2 Products

2.1 MANUFACTURED UNITS

.1 Fixtures: manufacture in accordance with CAN/CSA-B45 series.

.2 Trim, fittings: manufacture in accordance with CAN/CSA-B125.

.3 Exposed plumbing brass to be chrome plated.

.4 Number, locations: architectural drawings to govern.

.5 Fixtures in any one location to be product of one manufacturer and of same type.

.6 Trim in any one location to be product of one manufacturer and of same type.

.7 Refer to Plumbing Fixture Schedules for fixture specification.

.8 Fixture piping:

.1 Hot and cold water supplies to fixtures:

.1 Chrome plated flexible supply pipes with screwdriver stop, reducers, escutcheon.

.2 Waste:

.1 Brass P trap with clean out on fixtures not having integral trap.

.2 Chrome plated in exposed places.

.9 Chair carriers:

.1 Factory manufactured floor-mounted carrier systems for wall-mounted fixtures.

Part 3 Execution

3.1 INSTALLATION

.1 Mounting heights:

.1 Standard: to comply with manufacturer's recommendations unless otherwise indicated or specified.

.2 Wall-hung fixtures: as indicated by architectural drawings, measured from finished floor.

.3 Physically handicapped: to comply with most stringent of either NBCC or CAN/CSA B651.

3.2 ADJUSTING

.1 Conform to water conservation requirements specified this section.

.2 Adjustments:

.1 Adjust water flow rate to design flow rates.

.2 Adjust pressure to fixtures to ensure no splashing at maximum pressures.

.3 Adjust flush valves to suit actual site conditions.

.4 Adjust urinal flush timing mechanisms.

.5 Automatic flush valves for WC's and urinals: set controls to prevent unnecessary flush cycles during silent hours.

.3 Checks:

.1 Water closets, urinals: flushing action.

.2 Aerators: operation, cleanliness.

.3 Vacuum breakers, backflow preventers: operation under all conditions.

.4 Thermostatic controls:

.1 Verify temperature settings, operation of control, limit and safety controls.

END OF SECTION