Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal

.3 Section 01 78 00 - Closeout Submittals

.4 Section 07 84 00 - Fire Stopping

.5 Section 21 05 01 - Common Work Results for Mechanical

.6 Section 21 07 20 - Thermal Insulation for Piping

.7 Section 22 11 16 - Domestic Water Piping.

.8 Section 22 13 17 - Drainage Waste and Venting Piping – Cast Iron and Copper

.9 Section 22 13 18 – Drainage Waste and Venting Piping - Plastic

.10 Section 23 05 05 - Installation of Pipework

.11 Section 23 05 29 - Hangers and Supports for Piping and Equipment

.12 Section 33 11 16 - Incoming Site Water Utility Distribution Piping

1.2 REFERENCES

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Submit manufacturer's instructions, printed product literature and data sheets and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Shop Drawings:

.1 Submit drawings stamped and signed by professional engineer registered or licensed in Province of Manitoba, Canada.

.2 Indicate on drawings:

.1 Mounting arrangements.

.2 Operating and maintenance clearances.

.3 Shop drawings and product data accompanied by:

.1 Detailed drawings of bases, supports, and anchor bolts.

.2 Acoustical sound power data, where applicable.

.3 Points of operation on performance curves.

.4 Manufacturer to certify current model production.

.5 Certification of compliance to applicable codes.

.4 In addition to transmittal letter referred to in Section 01 33 00 - Submittal Procedures: use MCAC "Shop Drawing Submittal Title Sheet". Identify section and paragraph number.

1.4 CLOSEOUT SUBMITTALS

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

.2 Operation and Maintenance Data: submit operation and maintenance data for incorporation into manual.

.1 Operation and maintenance manual approved by, and final copies deposited with, Consultant before final inspection.

.2 Operation data to include:

.1 Control schematics for systems including environmental controls.

.2 Description of systems and their controls.

.3 Description of operation of systems at various loads together with reset schedules and seasonal variances.

.4 Operation instruction for systems and component.

.5 Description of actions to be taken in event of equipment failure.

.6 Valves schedule and flow diagram.

.7 Colour coding chart.

.3 Maintenance data to include:

.1 Servicing, maintenance, operation and trouble-shooting instructions for each item of equipment.

.2 Data to include schedules of tasks, frequency, tools required and task time.

.4 Performance data to include:

.1 Equipment manufacturer's performance datasheets with point of operation as left after commissioning is complete.

.2 Equipment performance verification test results.

.3 Special performance data as specified.

.4 Testing, adjusting and balancing reports as specified in Section 23 05 93 - Testing, Adjusting and Balancing for HVAC.

.5 Approvals:

.1 Submit 2 copies of draft Operation and Maintenance Manual to Consultant for approval. Submission of individual data will not be accepted unless directed by Consultant.

.2 Make changes as required and re-submit as directed by Consultant.

.6 Additional data:

.1 Prepare and insert into operation and maintenance manual additional data when need for it becomes apparent during specified demonstrations and instructions.

.7 Site records:

.1 Consultant] will provide 1 set of reproducible mechanical drawings. Provide sets of white prints as required for each phase of work. Mark

changes as work progresses and as changes occur. Include changes to existing mechanical systems, control systems and low voltage control wiring.

.2 Transfer information weekly to reproducibles, revising reproducibles to show work as actually installed.

.3 Use different colour waterproof ink for each service.

.4 Make available for reference purposes and inspection.

.8 As-built drawings:

.1 Prior to start of Testing, Adjusting and Balancing for HVAC, finalize production of as-built drawings.

.2 Identify each drawing in lower right hand corner in letters at least 12 mm high as follows: - "AS BUILT DRAWINGS: THIS DRAWING HAS BEEN REVISED TO SHOW MECHANICAL SYSTEMS AS INSTALLED" (Signature of Contractor) (Date).

.3 Submit to Consultant for approval and make corrections as directed.

.4 Perform testing, adjusting and balancing for HVAC using as-built drawings.

.5 Submit completed reproducible as-built drawings with Operating and Maintenance Manuals.

.9 Submit copies of as-built drawings for inclusion in final TAB report.

1.5 MAINTENANCE MATERIAL SUBMITTALS

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

.2 Furnish spare parts as follows:

.1 One set of packing for each pump.

.2 One casing joint gasket for each size pump.

.3 One glass for each gauge glass.

.3 Provide one set of special tools required to service equipment as recommended by manufacturers.

.4 Furnish one commercial quality grease gun, grease and adapters to suit different types of grease and grease fittings.

1.6 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle materials in accordance with Section 01 61 00 - Common Product Requirements and with manufacturer's written instructions.

.2 Delivery and Acceptance Requirements: deliver materials to site in original factory packaging, labelled with manufacturer's name and address.

.3 Storage and Handling Requirements:

.1 Store materials indoors in dry location] and in accordance with manufacturer's recommendations in clean, dry, well-ventilated area.

.2 Store and protect from nicks, scratches, and blemishes.

.3 Replace defective or damaged materials with new.

.4 Packaging Waste Management: in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products And Materials

NOT USED

Part 3 Execution

3.1 EXAMINATION

.1 Verification of Conditions: verify that conditions of substrate previously installed under other Sections or Contracts are acceptable for installation in accordance with manufacturer's written instructions.

.1 Inform Consultant of unacceptable conditions immediately upon discovery.

.2 Proceed with installation only after unacceptable conditions have been remedied [and after receipt of written approval to proceed from Consultant.

3.2 PAINTING REPAIRS AND RESTORATION

.1 Do painting in accordance with Section 09 90 00 - Painting.

.2 Prime and touch up marred finished paintwork to match original.

.3 Restore to new condition, finishes which have been damaged.

3.3 SYSTEM CLEANING

.1 Clean interior and exterior of all systems including strainers.

3.4 FIELD QUALITY CONTROL

.1 Site Tests: conduct following tests in accordance with Section 01 45 00 - Quality Control and submit report as described in PART 1 -ACTION AND INFORMATIONAL SUBMITTALS.

.2 Manufacturer's Field Services:

.1 Obtain written report from manufacturer verifying compliance of Work, in handling, installing, applying, protecting and cleaning of product and submit Manufacturer's Field Reports as described in PART 1 - ACTION AND INFORMATIONAL SUBMITTALS.

.2 Provide manufacturer's field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with manufacturer's instructions.

3.5 DEMONSTRATION

.1 Supply tools, equipment and personnel to demonstrate and instruct operating and maintenance personnel in operating, controlling, adjusting, trouble-shooting and servicing of all systems and equipment during regular work hours, prior to acceptance.

.2 Use operation and maintenance manual, as-built drawings, and audio visual aids as part of instruction materials.

3.6 CLEANING

.1 Progress Cleaning: clean in accordance with Section 01 74 11 - Cleaning.

.1 Leave Work area clean at end of each day.

.2 Final Cleaning: upon completion remove surplus materials, rubbish, tools and equipment in accordance with Section 01 74 11 - Cleaning

.3 Waste Management: separate waste materials for reuse recycling] in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

3.7 PROTECTION

.1 Protect equipment and systems openings from dirt, dust, and other foreign materials with materials appropriate to system.

END OF SECTION

Part 1

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal

.3 Section 01 78 00 - Closeout Submittals

.4 Section 07 84 00 - Fire Stopping

.5 Section 21 05 01 - Common Work Results for Mechanical

.6 Section 21 07 20 - Thermal Insulation for Piping

.7 Section 22 42 01 - Plumbing Specialties and Accessories

.8 Section 23 05 05 - Installation of Pipework

.9 Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment

.10 Section 33 11 16 - Incoming Site Water Utility Distribution Piping

1.2 REFERENCES

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

.1 ANSI/ASME B16.15-06, Cast Bronze Threaded Fittings, Classes 125 and 250.

.2 ANSI/ASME B16.18-01, Cast Copper Alloy Solder Joint Pressure Fittings.

.3 ANSI/ASME B16.22-01, Wrought Copper and Copper Alloy Solder Joint Pressure Fittings.

.4 ANSI/ASME B16.24-01, Cast Copper Alloy Pipe Flanges and Flanged Fittings, Class 150, 300, 400, 600, 900, 1500 and 2500.

.2 ASTM International Inc.

.1 ASTM A307-07b Standard Specification for Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

.2 ASTM A536-84(2004), Standard Specification for Ductile Iron Castings.

.3 ASTM B88M-05, Standard Specification for Seamless Copper Water Tube (Metric).

.3 American National Standards Institute/American Water Works Association (ANSI)/(AWWA)

.1 ANSI/AWWA C111/A21.11-0], Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings.

.4 Canadian Standards Association (CSA International)

.1 CSA B242-05, 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-67-02a, Butterfly Valves.

.2 MSS-SP-70-06, Gray Iron Gate Valves, Flanged and Threaded Ends.

.3 MSS-SP-7105, Gray Iron Swing Check Valves, Flanged and Threaded Ends.

.4 MSS-SP-80-03, 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) -2010.

.9 Transport Canada (TC)

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

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Provide manufacturer's printed product literature and datasheets for insulation and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

.3 Closeout Submittals:

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

1.4 DELIVERY, STORAGE AND HANDLING

.1 Packaging Waste Management in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

.2 Place materials defined as hazardous or toxic in designated containers.

.3 Handle and dispose of hazardous materials in accordance with CEPA, TDGA, Regional and Municipal regulations.

Part 2 Products

2.1 SUSTAINABLE REQUIREMENTS

.1 Materials and products in accordance with Section 01 47 15 - Sustainable Requirements: Construction.

2.2 PIPING

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

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

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

2.3 FITTINGS

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

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

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

.4 NPS 3 (75mm) and larger: roll grooved to CSA B242.

2.4 JOINTS

.1 Solder: 95/5 or silver bearing lead free.

.2 Teflon tape: for threaded joints.

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

.4 Dielectric connections between dissimilar metals: dielectric fitting, complete with thermoplastic liner.

2.5 GATE VALVES

.1 DN 50 and under, soldered:

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

.2 Jenkins #813, Crane #1324, Toyo 299, Lunkenheimer #2131, Kitz 43, Nibco 5134, Milwaukee #149, Newman Hattersley T609M.

.2 DN 50 and under, screwed:

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

.2 Jenkins #810, Crane #428, Toyo 293, Lunkenheimer #2125, Kitz 24, Nibco T111, Milwaukee #148, Newman Hattersley T607M.

.3 DN 65 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 specified Section [23 05 23.02 - Valves - Cast Iron: Gate, Globe, Check].

.2 Jenkins #452, Crane #461, Toyo #415A Lunkenheimer #1428, Kitz 75, Nibco F619, Milwaukee F2882-M, Newman Hattersley T501.

2.6 SWING CHECK VALVES

.1 DN 50 and under:

.1 To MSS-SP-80, Class 125, 860 kPa, bronze body, bronze swing disc, screw in cap, regrindable seat.

.2 Jenkins #4092, Crane #37, Toyo #236, Lunkenheimer #2144, Kitz 22, Nibco T433B, Milwaukee 509, Newman Hattersley 47.

.2 DN 65 and over, flanged:

.1 To MSS-SP-71, Class 125, 860 kPa, cast iron body, flat flange faces, renewable seat, bronze disc, bolted cap.

.2 Iron body flanged, Jenkins #587, Crane #373, Toyo #435A, Kitz 78, Lunkenheimer #1390; Victaulic 2-½" to 3" style 716, 4" to 8" style 715 and 8" to 12" style 711, Nibco F918B, Milwaukee F2474-M, Newman Hattersley 651.

2.7 BALL VALVES

.1 DN 50 and under, screwed:

.1 Class 150.

.2 Bronze construction with TEF packing and seat, raised lever handle.

.3 Jenkins 33, Crane 9302, Toyo 5044A Lunkenheimer 747 F, Kitz 56, Nibco T580, Milwaukee BA100, Newman Hattersley 1969.

.2 DN 50 and under, soldered:

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

.2 Bronze body, ball, PTFE adjustable packing, brass gland and PTFE seat, steel lever handle, with NPT to copper adaptors.

.3 Crane 9322, Toyo 5049, Kitz 57, Nibco S580, Milwaukee BA150, Newman Hattersley 1979.

2.8 BUTTERFLY VALVES

.1 DN 65 and over, lug:

.1 To MSS-SP-67, Class 200.

.2 Cast iron body, ductile iron chrome plated disc, stainless steel stem, EPT liner.

.3 Lever operated,

.4 DN 200 and over, gear operated.

.2 DN 65 and over, grooved ends:

.1 Class 300 psig CWP, bubble tight shut-off, bronze body EPDM coated ductile iron disc with integrally cast stem.

.2 Operator:

.1 DN 100 and under: lever handle with multi-position adjustment.

.2 DN 150 and over: gear operated.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

.1 Install in accordance with NPC, local authority having jurisdiction, Province Plumbing Code.

.2 Assemble piping using fittings manufactured to ANSI standards.

.3 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.

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

.5 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.

3.3 VALVES

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

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

3.4 PRESSURE TESTS

.1 Conform to requirements of Section 21 05 01 - Common Work Results for Mechanical.

.2 Test pressure: greater of 1.5 times maximum system operating pressure or 860 kPa.

3.5 FLUSHING AND CLEANING

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

3.6 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.

3.7 DISINFECTION

.1 Flush out, disinfect and rinse system to requirements of authority having jurisdiction. Before being placed into service piping shall be chlorinated throughout their entire lengths. Method to be used to introduce disinfectant into lines must be approved by the Consultant and Provincial local Department of Health. Chlorine must be added to attain concentration of fifty ppm (50 ppm) throughout system and this solution will then be retained for twenty-four" hours (24 hr), after which time chlorine concentration must not have dropped below five ppm (5 ppm). After chlorination is complete piping shall be

flushed throughout until replacement water is equal chemically and bacteriologically to supply. On completing chlorination of piping, set system in operation as directed by Consultant.

.2 Coordinate with Section 33 11 16- Site Water Utility Distribution Piping - Incoming Site Water Utility Distribution Piping.

.3 Upon completion, provide laboratory test reports on water quality for Consultant approval.

3.8 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.

.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.

.3 Bring HWS storage tank up to design temperature slowly.

.4 Monitor piping HWS and HWC piping systems for freedom of movement, pipe expansion as designed.

.5 Check control, limit, safety devices for normal and safe operation.

.4 Rectify start-up deficiencies.

3.9 PERFORMANCE VERIFICATION

.1 Scheduling:

.1 Verify system performance after pressure and leakage tests and disinfection are completed, and Certificate of Completion has been issued by authority having jurisdiction.

.2 Procedures:

.1 Verify that flow rate and pressure meet Design Criteria.

.2 Adjust pressure regulating valves while withdrawal is maximum and inlet pressure is minimum.

.3 Verify performance of temperature controls.

.4 Verify compliance with safety and health requirements.

.5 Check for proper operation of water hammer arrestors. Run one outlet for 10 seconds, then shut of water immediately. If water hammer occurs, replace water hammer arrestor or re-charge air chambers. Repeat for outlets and flush valves.

.6 Confirm water quality consistent with supply standards, and ensure no residuals remain as result of flushing or cleaning.

.3 Reports:

.1 In accordance with Section 01 91 13 - General Commissioning (Cx) Requirements: Reports, using report forms as specified in Section 01 91 13 - General Commissioning (Cx) Requirements: Report Forms and Schematics.

.2 Include certificate of water flow and pressure tests conducted on incoming water service, demonstrating adequacy of flow and pressure.

3.10 OPERATION REQUIREMENTS

.1 Co-ordinate operation and maintenance requirements including, cleaning and maintenance of specified materials and products with Section 23 05 05 - Installation of Pipework.

3.11 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning

.2 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal

.3 Section 01 78 00 - Closeout Submittals

.4 Section 07 84 00 - Fire Stopping

.5 Section 21 05 01 - Common Work Results for Mechanical

.6 Section 22 05 00 - Common Work Results for Plumbing

.7 Section 23 05 05 - Installation of Pipework

.8 Section 23 07 15 - Thermal Insulation for Piping

.9 Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment

.10 Section 33 11 16 - Incoming Site Water Utility Distribution Piping

1.2 REFERENCES

.1 ASTM International Inc.

.1 ASTM B32-08, Standard Specification for Solder Metal.

.2 ASTM B306-02, Standard Specification for Copper Drainage Tube (DWV).

.3 ASTM C564-03a, Standard Specification for Rubber Gaskets for Cast Iron Soil Pipe and Fittings.

.2 Canadian Standards Association (CSA International).

.1 CSA B67-1972(R1996), Lead Service Pipe, Waste Pipe, Traps, Bends and Accessories.

.2 CAN/CSA-B70-06, Cast Iron Soil Pipe, Fittings and Means of Joining.

.3 CAN/CSA-B125.3-05, Plumbing Fittings.

.3 Green Seal Environmental Standards (GSES)

.1 Standard GS-36-00, Commercial Adhesives.

.4 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-A2005, Adhesive and Sealant Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Provide manufacturer's printed product literature and datasheets for adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.3 Packaging Waste Management in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products

2.1 COPPER TUBE AND FITTINGS

.1 Above ground sanitary drainage, condensate drains and vents Type DWV to: ASTM B306.

.1 Fittings.

.1 Cast brass: to CAN/CSA-B125.3.

.2 Wrought copper: to CAN/CSA-B125.3.

.2 Solder: lead free.

2.2 CAST IRON PIPING AND FITTINGS

.1 Buried sanitary, storm and minimum DN 75, to: CAN/CSA-B70, with one layer of protective coating.

.1 Joints:

.1 Mechanical joints:

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

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

.1 Joints:

.1 Mechanical joints:

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

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

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

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

3.3 TESTING

.1 Pressure test buried systems before backfilling.

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

3.4 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).

3.5 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.2 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION

Part 1 General

1.1 RELATED REQUIREMENTS

.1 Section 01 33 00 - Submittal Procedures

.2 Section 01 74 21 - Construction/Demolition Waste Management and Disposal

.3 Section 01 78 00 - Closeout Submittals

.4 Section 07 84 00 - Fire Stopping

.5 Section 21 05 01 - Common Work Results for Mechanical

.6 Section 22 05 00 - Common Work Results for Plumbing

.7 Section 23 05 05 - Installation of Pipework

.8 Section 23 05 29 - Hangers and Supports for HVAC Piping and Equipment

.9 Section 23 07 15 - Thermal Insulation for Piping

.10 Section 33 11 16 - Incoming Site Water Utility Distribution Piping

1.2 REFERENCES

.1 ASTM International Inc.

.1 ASTM D2235-04, Standard Specification for Solvent Cement for Acrylonitrile-Butadiene-Styrene (ABS) Plastic Pipe and Fittings.

.2 ASTM D2564-04e1, Standard Specification for Solvent Cements for Poly Vinyl-Chloride (PVC) Plastic Piping Systems.

.2 Canadian Standards Association (CSA International)

.1 CAN/CSA-Series B1800-06, Thermoplastic Non-pressure Pipe Compendium - B1800 Series.

.3 Green Seal Environmental Standards (GSES)

.1 Standard GS-36-00, Commercial Adhesives.

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

.1 Material Safety Data Sheets (MSDS).

.5 South Coast Air Quality Management District (SCAQMD), California State

.1 SCAQMD Rule 1168-A2005, Adhesive and Sealant Applications.

1.3 ACTION AND INFORMATIONAL SUBMITTALS

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

.2 Product Data:

.1 Provide manufacturer's printed product literature and datasheets for piping and adhesives, and include product characteristics, performance criteria, physical size, finish and limitations.

.2 Provide two copies WHMIS MSDS - Material Safety Data Sheets in accordance with Section 01 35 30 - Health and Safety Requirements.

1.4 DELIVERY, STORAGE AND HANDLING

.1 Deliver, store and handle in accordance with Section 01 61 00 - Common Product Requirements.

.2 Deliver materials to site in original factory packaging, labelled with manufacturer's name, address.

.3 Store at temperatures and conditions recommended by manufacturer.

.4 Packaging Waste Management: in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

Part 2 Products And Materials

2.1 PIPING AND FITTINGS

.1 For buried, above ground DWV piping to:

.1 PVC or ABS with fusion welded fittings

.2 To CAN/CSA B1800.

2.2 JOINTS

.1 Solvent weld for PVC: to ASTM D2564.

.2 Solvent weld for ABS: to ASTM D2235.

Part 3 Execution

3.1 APPLICATION

.1 Manufacturer's Instructions: comply with manufacturer's written recommendations, including product technical bulletins, handling, storage and installation instructions, and datasheets.

3.2 INSTALLATION

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

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

3.3 TESTING

.1 Pressure test buried systems before backfilling.

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

3.4 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 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 fixtures are properly anchored, connected to system and effectively vented.

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

3.5 CLEANING

.1 Clean in accordance with Section 01 74 11 - Cleaning.

.1 Remove surplus materials, excess materials, rubbish, tools and equipment.

.2 Waste Management: separate waste materials for reuse recycling in accordance with Section 01 74 21 - Construction/Demolition Waste Management and Disposal.

END OF SECTION