

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Comply with the requirements of Section 21 05 01, Mechanical General Provisions.
- .2 Comply with the requirements of Section 21 05 05, Basic Materials and Methods.
- .3 Comply with the requirements of Sections 22 06 01 Approved Substitutes for Plumbing and 23 06 01 Approved Substitutes for HVAC.

1.2 WORK PERFORMED UNDER THIS SECTION

- .1 As indicated on the Drawings and in the Specifications, provide complete plumbing systems with all necessary appurtenances, trim and piping, including, but not limited to:
 - .1 Plumbing fixtures and trim;
 - .2 Domestic cold water piping;
 - .3 Domestic hot and recirculation water piping;
 - .4 Sanitary drainage and venting piping;
 - .5 Refrigeration piping;
 - .6 Storm drainage piping.
- .2 Provide Equipment, Personnel and Material necessary to assist with Pipe Cleaning and Chemical Treatment.

1.3 START-UP AND COMMISSIONING

- .1 Start-up and Commissioning shall be undertaken prior to the Occupancy stage of each Construction Phase.
- .2 Provide the Equipment, Personnel and Material necessary to put the Plumbing Systems into Operation.
- .3 Provide the Equipment, Personnel, Material and Information necessary to assist the Mechanical Contractor in completing the Commissioning Process.

1.4 QUALITY ASSURANCE

- .1 Qualifications: Execute work of this section by skilled tradesmen regularly employed in the installation of plumbing and drainage systems.

1.5 SUBMITTALS

- .1 Submit shop drawings on plumbing fixtures/trim, drains and associated accessories; and humidifiers and accessories.

PART 2 PRODUCTS AND MATERIALS

2.1 PLUMBING FIXTURES AND BRASS

- .1 Provide fixtures complete with all required trim. Fixtures shall be free from flaws or blemishes. Surfaces shall be clear, smooth and bright and have dimensional stability.

- .2 Exposed visible parts of the fixture supply trim shall be chrome-plated, fixtures to be white unless otherwise noted.
- .3 All fixtures shall bear C.S.A. approval.
- .4 Provide individual stops on each fixture water supply. Exposed stops to be screw-driver type. Concealed stops to be wheel handle type.
- .5 Provide C.S.A. traps in required sizes with c.o.
- .6 All supplies to be flexible type.
- .7 Fixture Schedule – Refer to Plumbing Fixture schedule in this specification.
- .8 All fixtures and equipment for handicapped use shall be in complete accordance with all applicable codes and regulations.

2.2 SHOCK ABSORBERS

- .1 Provide pre-manufactured shock absorbers equal to Zurn Z-1700. Fabricated pipe type shock absorbers will not be allowed.
- .2 Shock absorbers shall be installed in the following locations and where indicated on the drawings:
 - .1 Top of each riser in buildings over one story.
 - .2 End of horizontal runs except where such runs end with a riser over one story.
 - .3 Fixture groupings not serviced by the above.
 - .4 At fast closing valves (Flush valve water closets and sinks).

2.3 PRESSURE RELIEF AND REGULATING VALVES AND BACKFLOW PREVENTERS

- .1 Where indicated or performance specified on the drawings, and where required by Authorities, provide pressure relief and regulating valves and backflow preventers as required.
- .2 Backflow preventers shall be of a type and size as required by the Authority Having Jurisdiction.

2.4 CLEANOUTS AND ACCESS COVERS

- .1 All cleanouts and access covers shall be suitable for heavy duty traffic.
- .2 Provide cleanouts and access covers suitable for the specified floor finish.
- .3 All floor access covers shall be set flush with the finished floor.
- .4 Access covers shall be polished nickel bronze with V.P. screws.
- .5 Exposed cleanouts shall be standard M.J. or Bell and Spigot cleanout plugs with no access cover.
- .6 Cleanouts concealed behind walls or above non-removable ceilings shall be standard M.J. or Bell & Spigot cleanout plugs with suitable access doors.

- .7 Cleanouts in finished floors shall be standard M.J. or Bell & Spigot cleanout plugs with manufactured covers to suit the floor finish. Access covers equal to Ancon or Zurn will be acceptable. Access covers shall have recessed pans for accepting the floor finish (carpet or tile) in finished areas with flooring.

PART 3 INSTALLATION AND EXECUTION

3.1 GENERAL

- .1 Install all fixtures, drains, cleanouts, equipment, etc., as per manufacturer's requirements.

3.2 FIXTURE INSTALLATION

- .1 Connect fixtures, complete with supplies and drains, separately trapped, supported level and square.
- .2 Provide supports required to set fixtures square and level.
- .3 Mount wall hung water closets with rim at 425mm (17") A.F.F.

3.3 SPECIALTIES INSTALLATION

- .1 Non-freeze wall hydrants:
 - .1 Install 600 mm (24") above finished grade unless otherwise noted
 - .2 Provide inside shut-off valve.
- .2 Cleanouts:
 - .1 Install accessible cleanouts at traps where required.
- .3 Backflow Preventers:
 - .1 Provide drain to nearest floor funnel drain.
- .4 Pressure/Temperature Relief Valves:
 - .1 Provide drain to +/- 100mm (4") above finished floor.

3.4 EQUIPMENT INSTALLATION

- .1 Provide all necessary indirect drains from all equipment, whether provided by this Contractor or not, including but not limited to:
 - .1 Fan-Coil/Furnace/AHU Drain Pans
- .2 Indirect drains shall be piped to the nearest floor drain or other suitable location.

3.5 TESTING

- .1 Test piping in accordance with the procedures outlined in Section 21 05 05.

- .2 Ensure that insulated piping and equipment installed in concealed places is tested and inspected prior to permanent concealment.

3.6 START-UP AND COMMISSIONING

- .1 Prior to the Occupancy Stage of each Construction Phase:
 - .1 Start up the Equipment and Systems as per Specification Section 23 08 05.
 - .2 Calibrate and adjust all items provided under this contract.
 - .3 Assist in the commissioning Process as required. Refer to Specification Section 23 08 05.
 - .4 Provide instructions to the City as required. Refer to Specification Section 21 05 01.

END OF SECTION 22 10 05

PART 1

1.1 GENERAL REQUIREMENTS

- .1 Comply with the requirements of Section 21 05 01, Mechanical General Provisions.
- .2 Comply with the requirements of Section 21 05 05, Basic Materials and Methods.

1.2 APPROVED 'SUBSTITUTES' AND 'ALTERNATES'

- .1 Where a Manufacturer's name, make, model, and/or size is specified, it is for the purpose of setting a standard of quality, performance, capacity, appearance and/or serviceability, and is acceptable without qualification. Manufacturers listed as acceptable 'Substitutes' have been deemed by the Contract Administrator as capable of producing equipment and/or material of comparable quality, performance and approximate dimensions, and can be used in the preparation of the Bid. Where no substitutes are indicated, provide the exact make specified or provide the necessary documents for review.
- .2 Substitute or Alternate requests are to be provided in accordance with B6.

1.3 APPROVED 'SUBSTITUTES'

- .1 The following is the list of pre-approved 'Substitutes':
 - .1 Access Doors: Lehage; Milcor; Acudor; Mifab;
 - .2 Air Vents: Hamlet and Garneau; Bell and Gossett; Dole;
Maid-O-Mist; Armstrong; Braukman;
 - .3 Back Flow Preventors: Conbraco; Beeco; Febco; Watts;
Kunkle; Taylor; Consolidated;
Fisher; Singer; Crosby-Ashton;
Boylston; Lonergan; Masoneilan;
Wilkins
 - .4 Chemical Treatment: Bird Archer; Calgon;
Dearborne; Mogul; Drew Chemical;
 - .5 Cleanouts: Ancon; Smith; Zurn; Mifab;
 - .6 Insulation (General): Fibreglas; Manson; Knauf;
 - .7 Insulation (Traps): TrapWrap (Brocar); LavGuard (TrueBro);
 - .8 Level and Flow Switches: Magnetrol;
 - .9 Plumbing Fixtures, Drains and Brass:
 - .1 Electronic Faucets: Cambridge; Kohler;
Zurn; Chicago; Sloan; Delta;
 - .2 Floor Drains, and Fixture Carriers: Ancon; Smith; Zurn;
Mifab;

- .3 Plumbing Brass: Delta; Waltec; Symmons; Crane;
Zurn; Emco; Sloan; PricePfister;
Leonard; Mifab; Smith; Moen;
Cambridge; Powers;
- .4 Plumbing Fixtures (General): Crane; Kohler; American Standard;
- .5 Plumbing Fixtures (Specialty): Fiat; Bradley; Metcraft;
- .6 Stainless Steel Sinks: Steel Queen; KIL/Aristaline;
Architectural Metals;
- .7 Toilet Seats; Olsonite; Centoco; Bemis;
- .10 Pressure Gauges: Taylor; Weiss; Marshalltown;
Ashcroft; Duro; Lunkenheimer;
Trerice; Ametek; Marsh; Winters;
- .11 Pressure Relief Valves,
Pressure Regulating Valves: Conbraco; Beeco; Febco; Watts;
Kunkle; Taylor; Consolidated;
Fisher; Singer; Crosby-Ashton;
Boylston; Lonergan; Masoneilan; Wilkins
- .12 Pumps (Circulating): Armstrong; Grundfos; Bell and Gossett;
Darling; Taco;
- .13 Shock Absorbers: Smith; Zurn;
- .14 Sound and Vibration
Isolation: Vibron; Airmaster; Amber-Booth;
Kinetics; Vibro-Acoustics; SVC Ind.;
- .15 Strainers: Armstrong; Crane; Mueller; Sarco;
Streamflo; Kitz; Toyo
- .16 Thermometers: Taylor; Weiss; Marshalltown;
Ashcroft; Duro; Lunkenheimer;
Trerice; Ametek; Marsh; Winters;
- .17 Vacuum Breakers: Febco; Watts; Wilkins;
- .18 Valves (General): Crane; Kitz; Apollo; Newman-Hattersley;
Nibco; Toyo; Jenkins; American Valve;
- .19 Valves (Butterfly): Kitz; Nibco; Jenkins; Newman-
Hattersley; Apollo; Dezurik; Crane
- .20 Valves (Check): Centerline; Hagen; Mueller;
Singer; Dezurik; Crane

END OF SECTION 22 06 01

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

- .1 Provide fixtures complete with all required trim.
- .2 All exposed trim to be chrome plated, fixtures to be white.
- .3 Provide individual stops on each fixture water supply. Exposed stops to be screw-driver type. Concealed stops to be wheel handle type.
- .4 Provide C.S.A. traps in required sizes with cleanouts.
- .5 All supplies to be flexible type.

PART 2 PRODUCTS AND MATERIALS

2.1 PLUMBING FIXTURES AND EQUIPMENT LIST

- .1 WC-1- TOILET - FLOOR MOUNTED - VITREOUS CHINA – FLUSH VALVE – BARRIER FREE
 - .1 **American Standard Madera Flowise Elongated Right Height, 419 mm high #3461.001.020 HET Toilet**, vitreous china with EverClean antimicrobial surface which inhibits the growth of stain and odor causing bacteria mold and mildew, floor mounted, siphon jet flush action, operates in the range of 4.2 L to 6 L (1.1 US Gal to 1.6 US Gal) per flush, condensate channel, 305 mm x 254 mm (12" x 10"), 54 mm (2-1/8") fully glazed internal trapway, floor outlet, bolt caps, 38 mm (1-1/2") dia. Top spud. **Centoco #HL820STS heavy duty toilet seat**, for elongated bowl open front, white solid plastic, with cover, reinforced stainless steel check hinges, metal flat washers stainless steel posts and nuts. **Sloan Solis model 8111-1.6**, exposed Electronic, Solar Powered, Hands-Free Flush valve, chrome plated, 6 L (1.6 US Gal) factory set flow, quiet action, vacuum breaker. **Floor Flange**, (same material as the connecting pipe drain), with all brass bolts and with rubber gasket.
- .2 LAV-1 - BASIN - VITREOUS CHINA – HANDS FREE FAUCET - BARRIER-FREE DESIGN & GENERAL USE
 - .1 **FRANKE model #WT500C-8 S.S.** Sink, single hole, 500mm x 446mm x 141mm) deep, wall-hung, one-piece wall hanger, back ledge, 20 gauge type 316 stainless steel, exposed surfaces are polished satin finish, overflow. **Sloan Solis model EAF-275, Solar Powered, Hands-Free Faucet less temperature adjustment**, C.P. 4" (102mm) C.C., ceramic disc cartridge, all metal construction, vandal-resistant 1.9 LPM (0.5 GPM) flow. ADA compliant, vandal resistant spray head. C/w braided flexible supplies. Less drain, less pop-up hole. **McGuire #155WC Basin Drain**, C.P., cast brass 1 pc. top, offset open grid with 17ga. (1.5mm), 1-1/4" (32mm) tailpiece. **McGuire #H170BVRB-LR Supplies**, C.P., polished brass, rigid short horizontal integral copper sweat tube nipples, 1/2" (12mm) I.D. x 5" (127mm) long all brass 1/4 turn ball valve angle stops with combination V.P. loose key handles, escutcheons, less S.S. braided flexible risers. **McGuire #8872C-17T 'p' Trap**, C.P., 17 gauge (1.5mm), brass adjustable body, 1-1/4" (32mm) and escutcheon. **McGuire #PW2000WC 'PROWRAP' Sanitary Covering**, of PVC, vandal-resistant flexible seamless construction, anti-

microbial, to exposed piping (to protect against heat/contusions) as per local codes.

- .3 KS-1 – DOUBLE BOWL SINK - COUNTERTOP WITH LEDGEBACK - STANDARD USE
- STAINLESS STEEL - SINGLE LEVER/HANDLE FAUCET
- .1 **Kindred QDL2031/7 S.S. Sink**, 3 hole, 8" (203mm) centers, 20-1/2" x 31-1/4" x 7" (521mm x 790mm x 152mm) deep, counter mounted, back ledge, grade 18-8 type 302 stainless steel, double compartment, satin finished rim and bowl, with spillway, self-rimming, with crumb cup strainers, sound deadening and mounting kit, 3-1/2" (89mm) crumb cup strainer with 1-1/2" (38mm) tail piece. **Delta #400-WFELHHDF**, chrome plated metal, deck mounted, 8" centreset, single lever faucet with standard 8" swing spout and spray attachment with anti-siphon device. Provide aerator. 8.3 LPM (2.2 GPM) flow, removable brass escutcheon plate, flexible copper supplies and less hand spray (cap provided for non-spray application). **McGuire #H170BV Supplies**, C.P., polished brass, rigid horizontal integral copper sweat tube nipples, 1/2" (12mm) I.D. x 5" (127mm) long, all brass 1/4 turn ball valve angle stops with combination V.P. loose key handles, escutcheons and flexible copper risers. **Provide 'p' Trap**, cast brass 1-1/2" (38mm) with cleanout, union and escutcheon.
- .4 KS-2 - KITCHEN WASH-UP SINK, COUNTER-TOP, SINGLE COMPARTMENT
- .2 **FRANKE model #LBS6808-1 S.S. Sink**, 3 hole, 8" (203mm) centres, 20-1/2" x 20" x 8" (521mm x 508mm x 203mm) deep, self-rimming, back ledge, grade 18-8 type 302 stainless steel, single compartment, mirror finished rim, satin finished bowl, with crumb cup strainer, sound deadening and mounting kit. **Delta model #100-WFELHHDF**, chrome plated metal, deck mounted, 8" centreset, single lever faucet with 8" swing spout. Provide aerator. Supplies with metal angle stops, adaptors, escutcheons and flexible metal risers. Provide 'p' Trap, 1-1/2" (38mm) with cleanout, union and escutcheon.
- .5 MS-1 - MOP SINK - FLOOR MOUNTED - MOLDED STONE - TWO HANDLE FAUCET
- .1 **FIAT MSB2424- Mop Sink**, 24" x 24" x 10" (914mm x 610mm x 254mm) deep, floor mounted, molded-stone 'SMC' one piece homogeneous product, and **Integral Drain** with S.S. domed strainer and lint basket 3" (75mm) outlet. **FIAT #830-AA Faucet**, R.C.P. 8" (203mm) C.C., wall mounted, solid cast brass body, with cast metal cross handles, wall brace, integral vacuum breaker, integral stops, pail hook, hose end and top brace. **FIAT #832-AA Bracket**, S.S., 36" (915mm) hose with chrome coupling. **FIAT #1239-BB Bumper Guards**, Aluminum. **FIAT #889-CC S.S. Mop Hanger**, triple. **FIAT #QDC3XH Mop Sink Drain Gasket**, connection 3" (75mm) pipe. **FIAT #MSG24 Wall Guards**.S.S. for one, two, or three sides with corner bracket. **Provide 'p' Trap**.
- .6 FD-1 - FLOOR DRAINS - ADJUSTABLE STRAINER
- .1 **Watts Drainage Products FD-100-C-A** epoxy coated cast iron floor drain with anchor flange, reversible membrane clamp with primary and secondary weepholes, 1/4" (6mm) thick (specify diameter) adjustable nickel bronze (standard) strainer, and no hub (MJ) (standard) outlet.
- .2 Coordinate/confirm with flooring type.
- .7 FD-2 - FLOOR DRAINS - MECHANICAL ROOM & UNFINISHED AREA DRAINS - STRAINER WITH FUNNEL
- .1 **Similar to FD-1 but c/w funnel.**

- .8 RD-1 - ROOF DRAINS
- .1 **Watts** lacquered cast iron roof drain with integral gravel stop, under-deck clamps, metal dome, 1 control flow notches, for insulation below membrane to suit. Refer also to building roof plan for further details.
 - .2 Coordinate/confirm with roof type.
- .9 DF-1 – DRINKING FOUNTAIN DUAL HEIGHT.
- .1 **HAWS Model 1119** "Hi-Lo" design, 18 gauge, type 304 stainless steel construction, one-piece stamped bowls, rounded corners, push-button activated valve assembly.
 - .2 Wall mounted, with vandal resistant components.
 - .3 100% lead-free waterways.
- .10 DWH-1 - DOMESTIC HOT WATER HEATER
- .1 The water heater shall be a **Bradford White model TW4-75S-76B-3N-** Commercial Light Duty, Power Vent, Gas water heater, with a rated storage capacity of not less than 75 US gallons (284 liters), 76 MBH gas input, a minimum 100 deg recovery of 74 GPH (280 LPH). The tank shall be Vitraglas® lined and have magnesium anode rods, 2" (50mm) Non-CFC foam insulation, and come equipped with an ASME rated T&P relief valve, a cold water inlet Hydrojet® Sediment Reduction System.
 - .2 It shall be design certified by UL for 180°F (82°C) application, either with or without a separate storage tank, and comply with state and local codes and ordinances.
 - .3 Provide Roof vent and termination kit.
- .11 WH-1 - HYDRANTS - EXTERIOR NON-FREEZE
- .1 **Jay R. Smith #5560QT-NB Box Type, Non-freeze, Wall Hydrant**, 1/4 turn non-drip, ceramic cartridge, 3/4" (13mm) non-freeze wall type, bronze nickel plated body, adjustable wall flange, operating key, self-draining integral vacuum breaker. Length to suit wall thickness.
 - .2 Bronze Box with Chrome Plated Face.
- .12 DW-1 – DISHWASHER – ROUGH IN AND CONNECT
- .1 1/2" water supply valved and capped until final connection dishwasher.
 - .2 Capped sanitary until connection.
 - .3 Confirm requirements with final Dishwasher selection.
- .13 HR-1 – HOSE REEL
- .1 **REELCRAFT** Nordic Series Model 3900-31-16 electric hose reel with a 3-way hose guide and 250' (76m) hose @ 1" (25mm) I.D., wall bracket.
 - .2 Provide four-way hose guide HR1059 at exterior wall penetration. Layout of mechanical room may require additional guides.
 - .3 Provide shut-off valve and back-flow prevention.
 - .4 Provide Backflow Preventer to be of a type and size as required by the Authority Having Jurisdiction. To be installed at the highest point in the piping system.
- .14 RP-1 - RECIRCULATING PUMP (DOMESTIC HOT WATER)
- .1 **Armstrong model H-51**, 1" (25mm), 1/4 H.P., in-line circulator, based on 15 GPM at 20ft. head. Bronze body construction.

- .15 SP-1 & SP-2 SUMP PUMPS (WEeping TILE)
- .1 **Myers model S33 series**, 1/3 hp submersible sump pump, based on 15 gpm (0.93 l/s) at 20 ft. (6.1m) head.
 - .2 Myers model CE panel series for duplex pump operation c/w magnetic starter, alternator, running lights, high water alarm, etc.
 - .3 Control panel to be installed in crawlspace.
 - .4 Lifting chains.

END OF SECTION 22 06 40.13