1.1. REFERENCE STANDARDS

1.1.1. The plumbing fixtures and associated trim shall be selected to match or exceed the performance defined by industry standards, including but not limited to:

1.1.1.1. Ontario Building Code
1.1.1.2. CSA B45 Series
1.1.1.3. CSA B125 Series
1.1.1.4. ASHRAE 189.1
1.1.1.5. ASME A112.19.2.

1.2. PERFORMANCE BENCHMARKS

1.2.1. The plumbing fixtures shall be designed and constructed in a way that will allow them to operate satisfactory with the water flows supplied by the trim.

1.2.2. The current benchmarks to be met are:

- Toilets flush valves: 1.28 gallon/flush (OBC max. 1.32 gallon/flush)
- Urinals flush valves: 0.5 gallon/flush (OBC max. 0.84 gallon/flush)
- Public lavatories: max. flow rate of 0.5 gpm when tested in accordance with ASME A112.18.1/CSA B125.1. (OBC max. 1.84 gpm)
- Staff washrooms: max. flow rate of 1.5 gpm when tested in accordance with ASME A112.18.1/CSA B125.1. (OBC max. 1.84 gpm)

1.3. SELECTION OF PLUMBING FIXTURES

1.3.1. The plumbing fixtures shall be manufactured of vitreous china; in any one building, the fixtures shall be the product of a single manufacturer. Water closets and urinals shall be certified to CAN/CSA-B45.0, "General Requirements for Plumbing Fixtures".

1.3.2. Fixtures and trim shall be new and free of all defects or blemishes. Finished surfaces shall be clean, smooth, and bright guaranteed not to craze, change colour or scale. Imperfections of any kind shall be sufficient reason for rejection and the item shall be removed and an acceptable replacement installed at no additional cost.

1.3.3. In all public spaces, the plumbing fixtures shall be wall-hung, to facilitate floor cleaning. To this end, adequate allowances shall be made in terms of chases behind the supporting walls to allow for the installation of carriers, support arms and electronic components of the trim. Access to the chases shall be provided for periodic maintenance.

1.3.4. In staff washrooms, floor-mounted toilets are an acceptable alternate to wall-mounted units, upon specific consent from GO Transit/Metrolinx Project Management staff.

1.3.5. Where applicable, the plumbing fixtures shall be barrier-free; the architectural drawings will define the number and location of barrier-free equipment.

1.3.6. All plumbing fixtures shall be vented to the outdoors and sized/installed in accordance with the OBC (part 7) requirements.

1.4. SELECTION OF TRIM

1.4.1. In any one building, the trim shall be the product of a single manufacturer. Unless specified otherwise, all exposed valves, pipe, escutcheon, etc., shall be polished chrome finish.

1.4.2. For all plumbing fixtures in public spaces, the trim shall be of the touch-less electronic type, hard wired. Trim of plumbing fixtures in staff and service rooms (not accessible to the general public) shall be manually operated.

1.4.3. Adequate provisions shall be made for the power supply wiring, transformers, junction boxes and all other accessories necessary to make the equipment fully functional.

1.4.4. In addition to the electronic trim, all the accessories required for the installation and operation of the plumbing fixtures shall be provided (toilet covers, angle stops, flexible connectors, escutcheons, P-traps, grid strainers, etc.). Other accessories such as soap dispensers, mirrors, grab bars, etc. shall be defined by the Architectural discipline.

1.4.5. The water supply pipes serving the plumbing trim shall be of adequate size to ensure that the minimum available pressure at each location is sufficient to allow the trim to operate as intended. Unless supporting calculations are submitted, no water supply piping to a toilet or urinal trim shall be less than ¾" diam. The minimum residual pressure at any trim shall not be less than 25 psi.

1.4.6. Where hot and cold domestic water are supplied, local tempering valves shall be used to prevent accidental scalding. Alternately, one main tempering valve can be used to serve the entire facility.

1.5. TOILETS – STAFF WASHROOMS

1.5.1. Vitreous China, 1.28 gpf [4.8 lpf] or greater high efficiency, ADA, floor mounted bottom outlet toilet with siphon jet flushing action and elongated front rim with 1-1/2" top spud. This bowl is designed to perform to industry standards with as little as 1.28 gallons per flush, engineered to provide optimal performance and 20% water savings over conventional 1.6 gpf toilets.

1.5.2. Fixture dimensions meet ANSI/ASME standard A112.19.2 and CAN/CSA B45 requirements. Meets the American Disabilities Guidelines and ANSI A117.1 requirements when installed according to the respective requirements.

1.5.3. Seat: Institutional/Industrial, extra heavy duty, chemical resistant, solid plastic, open front less cover for elongated bowls, integrally molded bumpers, concealed check hinge with stainless steel post. Seat shall be posture contoured body design. Color shall be white. When installed, top of seat shall be at min. 432 (17") from the finished floor.

1.5.4. Fittings and Accessories: Floor flange fittings-cast iron; Gasket-wax; bolts with chromium plated cap nuts and washers.

1.5.5. Manual Flush Valve: Exposed, quiet diaphragm-type, chrome plated, flushometer valve with a polished exterior. Complete with , dual seal diaphragm with a clog resistant, filtered by-pass. The valve shall be ADA compliant with a non-hold open and no leak handle feature, high back pressure vacuum breaker, one piece hex coupling nut, adjustable tailpiece, spud coupling and flange for top spud connection. Control stop has internal siphon-guard protection, vandal resistant stop cap, sweat solder kit, and a cast wall flange with set screw. Internal seals are made of chloramine resistant materials.

1.6. TOILETS – PUBLIC WASHROOMS

1.6.1. Wall-hung vitreous china toilet shall be 1-½” top spud with 2-1/8” fully glazed trapway with siphon jet action. Valve and toilet are an engineered system designed to provide optimal performance and 20% water savings over 1.6 gpf conventional toilets.254 x 305mm (10" x 12") water surface area 100% factory flush tested.

1.6.2. Where applicable, install at the height suitable for barrier-free use. Fixture dimensions meet ANSI/ASME standard A112.19.2 and CAN/CSA B45 requirements. Meets the American Disabilities Guidelines and ANSI A117.1 requirements when installed according to the respective requirements.

1.6.3. Seat: Institutional/Industrial, extra heavy duty, chemical resistant, solid plastic, open front less cover for elongated bowls, integrally molded bumpers, concealed check hinge with stainless steel post. Seat shall be posture contoured body design. Color shall be white. When installed, top of seat shall be at min. 432 (17") from the finished floor.

1.6.4. Support Carrier – single toilet: Adjustable, with 4 or 5 Hub & Spigot connections. Complete with Dura-Coated cast iron right hand or left hand main fitting, with 2" vent, adjustable gasketed face plate, universal floor mounted foot supports, corrosion resistant adjustable ABS coupling with integral test cap, fixture bolts, trim, and stud protectors. Rear anchor tie down and bonded "Neo-Seal" gasket.

1.6.5. Support Carrier – back to back toilets: Adjustable, with 4 no-hub connections. Complete with Dura-Coated cast iron fitting, with 2” (50 mm) vent, adjustable gasketed face plates, universal floor mounted foot supports, corrosion resistant adjustable ABS couplings with integral test cap, fixture bolts, trim, stud protectors and bonded "Neo-Seal" gaskets.

1.6.6. Touch-less hard-wired flush valve: exposed, quiet diaphragm-type, chrome plated, flushometer valve with a polished exterior, complete with 1.28 gallon/flush chloramines resistant, dual seal diaphragm with clog-resistant, filtered by-pass. The valve incorporates a motorized actuator, an integral infrared convergence type proximity sensor, and a manual push-button override into an all metal, polished chrome plated housing. Sensor range automatically adjusts to its environment at power up and is powered by a 7.6 VDC power converter. Each power converter can accommodate up to eight flush valves. The valve is complete with high back pressure vacuum breaker, one piece hex coupling nut, adjustable tailpiece, spud coupling and flange for top spud connection. Control stop has internal siphon-guard protection, vandal resistant stop cap, sweat solder kit, and a cast wall flange with set screw. Internal seals are made of chloramines resistant materials.

1.6.7. Hardwired Power Converter – Hardwired power converter to power up to eight (8) sensor urinal/closet flush valves or up to 8 hardwired sensor faucets. The converter is integrated within a 4-11/16" x 4-11/16" x 2-1/8" electrical and the low voltage connections are performed at the terminal block mounted externally on the box cover.

1.7. URINALS – ALL WASHROOMS

1.7.1. Urinal: Vitreous china, wall hung, 1/8 gallons per flush (0.5 Liters per flush), high efficiency washout flushing action, pressure compensating internal flow regulator, 3/4 ” top spud, 2” outlet flange and rubber gasket, with integral trap, 14” extended rim for barrier-free compliance when installed at proper height. Assembled with vandal resistant outlet stainless steel strainer.

1.7.2. Fixture dimensions meet ANSI/ASME standards A112.19.2 and CAN/CSA B45 requirements. Meets the American Disabilities Guidelines and ANSI A117.1 requirements when urinal is installed 17" (432 mm) from finished floor.

1.7.3. Touch-Less Flush Valve – public washrooms: sensor operated, hardwired exposed high efficiency flushometer valve. The valve is designed to perform to industry standards with as little as 1/8th gallon per flush. Valve is operated by an infrared convergence-type proximity sensor with smart technology, powered by a hardwired power converter. Furnished with vandal resistant chrome plated metal housing, chloramine resistant internal seals, and reversible cover. Valve features an internal flow regulator to maintain constant flow rates independent of line pressures and an in-line filter to protect the valve from debris within the water. Complete with high pressure vacuum breaker, one piece hex coupling nut, adjustable tailpiece, spud coupling and flange for top spud connection. Control stop has internal siphon-guard protection, vandal resistant stop cap, sweat solder kit, and a cast wall flange with set screw.

1.7.4. Manual Flush Valve – staff washrooms: Exposed, quiet diaphragm-type, chrome plated flushometer valve with a polished exterior. Complete with dual seal diaphragm with a clog resistant, triple filtered by-pass. The valve is ADA compliant with a non hold open and no leak handle feature, high back pressure vacuum breaker, one piece hex coupling nut, adjustable tailpiece, spud coupling and flange for top spud connection. Control stop has

internal siphon-guard protection, vandal resistant stop cap, sweat solder kit, and a cast wall flange with set screw. Internal seals are made of chloramine resistant materials.

1.7.5. Support Carrier: adjustable height, dura-coated steel stanchions with welded feet, adjustable support plates and mounting bolts and trim.

1.8. LAVATORY – STAFF WASHROOMS

1.8.1. 20" [508 mm] x 17" [432 mm] vitreous china counter-top lavatory, faucet holes for or 8" centers. Self-rimming front overflow design. Waste: 1-1/4" O.D. Depth: 6-5/8". Fixture dimensions meet ANSI/ASME standard A112.19.2-2003 and CAN/CSA B45 requirements. Meets the American Disabilities Guidelines and ANSI A117.1 requirements when lavatory is installed 34" (864 mm) from finished floor.

1.8.2. Complete with the following accessories: Grid Strainer, P-Trap with clean-out, basin supplies with offset flex, risers, stops and escutcheons, offset open grid strainer, cast brass, 1¼" (32 mm). Where applicable provide ADA trap, stop, and supply protectors, ADA grid strainer.

1.8.3. Manual Faucet: Polished chrome-plated widespread with adjustable centers from 6" [152mm] to 20" [508mm], with a 3-1/2" [89mm] centerline rigid or swing gooseneck spout and quarter turn ceramic disc cartridges. Unit is furnished with a 2.2 GPM [8.3 L] pressure compensating aerator (complying with ANSI A112.18.1 Standard for flow), 4" [102mm] vandal-resistant color coded metal wrist blade handles, mounting hardware and 1/2" NPSM coupling nuts for standard lavatory risers. Widespread accommodates installations up to 1-1/8" [29mm] thick.

1.9. LAVATORY – BARRIER-FREE, PUBLIC WASHROOMS

1.9.1. 20" x 23" vitreous china wall hung ADA lavatory with single faucet hole and half pedestal, front overflow. Provided with holes for concealed arm carrier systems. Fixture dimensions meet ANSI/ASME standard A112.19.2-2003 and CAN/CSA B45 requirements. Meets the American Disabilities Guidelines and ANSI A117.1 requirements when lavatory is installed 34" (864 mm) from finished floor

1.9.2. Accessories: 'P' trap 17 gauge (1.5 mm) clean-out and escutcheon, basin supplies with offset flex, risers, stops and escutcheons, offset open grid strainer, cast brass, 1¼" (32 mm).

1.9.3. Touch-Less Faucet: Meets the American Disabilities Guidelines and ANSI A117.1. The sensor faucet is a hardwired 12VDC electronic sensor faucet for retrofit and new construction. The faucet incorporates an infrared convergence type proximity sensor into the cast brass chrome plated base of the gooseneck faucet. The faucet is furnished complete with sensor module, spout module, inline filter, a 1.5 gpm vandal resistant aerator, connecting wire to power converter, an inlet for a ½" (13 mm) ball riser and single supply hose. Also included are 4 'AA' batteries that provide battery backup power to the faucet during power outages. Sensor range is factory set for optimum performance. Thermostatic Mixing Valve for single faucets included.

1.9.4. Support carrier and concealed arms: A.R.C coated steel stanchions with welded feet, steel sleeves, cast iron headers and arms, alignment truss and mounting bolts and trim.

1.10. LAVATORY – PUBLIC WASHROOMS

1.10.1. Wall hung lavatory, 20" (508 mm) x 18" (457 mm) vitreous china wall, with rear overflow and single faucet hole. Provided with holes for concealed arm carrier systems. Waste: 1-1/4" [32 mm] O.D. Depth: 6-3/4" [171 mm] Shipping Weight: 35 lbs [16 kg]. Fixture dimensions meet ANSI/ASME standard A112.19.2-2003 and CAN/CSA B45 requirements.

1.10.2. Accessories: 'P' trap 17 gauge (1.5 mm) clean-out and escutcheon, basin supplies with offset flex, risers, stops and escutcheons, offset open grid strainer, cast brass, 1¼" (32 mm).

1.10.3. Touch-Less Faucet: Hardwired sensor brass faucet with a polished chrome exterior. The faucet incorporates a 12 VDC solenoid valve, an adjustable range 6" to 36" on-approach wall mounted sensor, and a deck mounted cast faucet with a 1.5gpm vandal resistant aerator. The faucet is furnished complete with a 120 VAC/12 VDC plug-in power converter, solenoid valve, in-line filter, and electrical box cover plate with attachment screws. Thermostatic tempering valve included.

1.10.4. Support Carrier: adjustable height, dura-coated steel stanchions with welded feet, steel sleeves, chrome plated escutcheons, cast iron headers and arms, alignment truss and mounting bolts and trim.

1.11. SERVICE SINK – MAINTENANCE FACILITIES

1.11.1. Stainless steel construction, in 54" or 36" Diameter Semi-Circular or Circular Bowls, 9" Deep Bowl, Designed for Heavy Duty Hand Washing

1.11.2. Bowl: One-piece pressing of 14-gauge stainless steel with a #4 polished finish.

1.11.3. Pedestal: Constructed of die-formed legs, upper braces, scuff bases and panels: legs are zinc chromate plated 14 gauge steel; upper braces are 16 gauge galvanized steel; and scuff bases and pedestal panels are 300 series stainless steel with a #4 finish.

1.11.4. Valves and Fittings: spray head with stainless steel support tube and bowl gasket; spud with domed strainer; spray head supply line; manual mixing valve; volume control valve; and (2)stop,strainer and check valves.

1.11.5. Activation Controls: Foot Control - Each press of the foot rail mechanically actuates a hold-open valve, with slow closing upon release of foot pressure.

1.12. MOP SINK

1.12.1. One piece, precast terrazzo made of black and white marble chips in gray Portland cement to produce a compressive strength not less than 3000 P.S.I. seven days after casting.

1.12.2. Terrazzo surface shall be ground and polished with all air holes or pits grouted and excess removed.

1.12.3. Shoulders shall be not less than 12" high outside and 10" inside at lowest wall. Shoulder width not less than 2” on all sides with a 1/4" pitch towards the inside. Complete with stainless steel caps on all curbs Standard drain body is stainless steel cast and Wall Guards manufactured of heavy gauge stainless steel and help protect walls adjacent to thr sink.

1.12.4. Standard drain body is stainless steel cast integrally and provides for a caulked lead connection not less than 1" deep to a 3" pipe. Includes stainless steel strainer

1.12.5. Terrazzo Mop Basins must be installed on a 1/2" layer of mortar in order that the mop basin be level and to prevent cracking

1.12.6. Certifications: Meets ANSI Z124.6, CSA listed,and IAPMO listed under file # 3561.

1.12.7. Faucet: Polished chrome-plated cast brass 8" (203mm) faucet with quarter turn ceramic disc cartridges, 3/8" (10mm) short swivel inlets providing adjustable centers from 7-1/4" (184mm) to 8-3/4" (222mm), integral service stops and a 6" (152mm) centerline cast brass spout with chemical resistant atmospheric vacuum breaker, ¾" hose threaded outlet, pail hook and adjustable wall brace. Unit is furnished with 2½" (64mm) vandal-resistant color-coded brass lever handles. Vacuum breaker is certified to the Uniform Plumbing Code®, ASSE 1001-2002 and CSA B64-01.

1.13. EYE-WASH STATIONS

1.13.1. 18 Gauge Type 304 Stainless Steel recessed cabinet, heavy duty structure with smudge resistant bead blast finish to provide a durable, long lasting product.

1.13.2. Barrier-free eye/face wash shall include an eye/face wash head shall feature inverted directional laminar flow which achieves zero vertical velocity supplied by an integral flow control, a fully recessed wall mounted 18 Gauge, Type 304 stainless steel deep-drawn cabinet, wheelchair accessibility, and polished chrome-plated brass pull-down valve with easy access in-line strainer. Unit shall also include brass pipe and fittings, a front-access maintenance panel, universal sign, 1/2" NPT(M) inlet. Operating pressure is 30 - 90 psi (2.1 - 6.2 bar).