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| Version | Date | Description of Revisions |
| 1 | August 30, 2006 | Approved final document. |
| 2 | November 16, 2009 | Modified ‘Related Sections’ |
| 3 | September 28, 2010 | Minor revisions and additions of section 1.3 – Measurement and Payment |
| 4 | November 24, 2014 | First draft review, addition of Property Services wording. (AV) |
| 5 | June 8, 2015 | Second Draft for Review (AV) |
| **6** | **September 16, 2015** | **Updated, Finalized Specification – Reference eDOCS #5823605-v5 (AV)** |
| 7 | April 1, 2015 | Updated all old references and formatting changes |
| 8 | March 20, 2017 | Addition of plumbing related industry standards and deletion of cited products by adding designer notes to provide performance specifications. One cited product (Portable Eyewash Stations) remains due to operational requirements. (AV) |
| 9 | May 29, 2017 | Updated references to standards ANSI/ISEA Z87.1-2015, ANSI/ISEA Z358.1-2014, CSA B45.11-11 (R 2016), CSA B45.12-13/IAPMO Z402-2013, ASME A112.18.1-2012/CSA B125.1-12 **(AAM)** |

NOTE:

This is a CONTROLLED Document. Any documents appearing in paper form are not controlled and should be checked against the on-line file version prior to use.

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**The on-line copy is the current version of the document.**

# GEneral

## Related Sections

### *[Under "Related Sections", identify other Sections that are related to, and/or dependent on, the work results or information specified elsewhere. The list should be limited to Sections with specific information that the reader might expect to find in this Section, but is specified elsewhere. For example, if hardware for aluminum entrances is specified in the aluminum entrance Section, a cross-reference would be appropriate in the finish hardware Section. The purpose of this cross-referencing is for information only, to aid in finding those other requirements—not to define the scope of the Section.*

### *The objective of this section is to provide guidance to the User for the purpose of designing Plumbing Piping and Pumps systems.*

### *It is applicable to the design of new facilities, upgrades and expansions of existing, and retrofitting of existing facilities.*

### *Cross-referencing here may also be used to coordinate assemblies or systems whose components may span multiple Sections and which must meet certain performance requirements as an assembly or system.*

### *Contractor is responsible for coordination of the Work.*

### *This Section is to be completed/updated during the design development by the Consultant. If it is not applicable to the section for the specific project it may be deleted.]*

### *[List Sections specifying installation of products supplied but not installed under this Section and indicate specific items.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Execution requirements for ...[item]... specified under this Section.

### *[List Sections specifying products installed but not supplied under this Section and indicate specific items.]*

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: Product requirements for ...[item]... for installation under this Section.

### [List Sections specifying related requirements.]

### Section [\_\_\_\_\_\_ – \_\_\_\_\_\_\_\_\_\_\_\_]: [Optional short phrase indicating relationship].

## References

### Comply with the latest edition of the following statutes, codes, and standards and all amendments thereto.

### All Products covered by this Section shall be designed, manufactured, tested, installed and commissioned in accordance with Industry applicable Codes and Standards including but not limited to:

#### ASHRAE – American Society of Heating, Refrigeration, and Air Conditioning Engineers

##### *[Consultant to list the applicable standards from ASHRAE in detail]*

#### International Safety Equipment Association (ISEA)

##### ANSI/ISEA Z87.1-2015, Eyewash and Eye Protection Package

##### ANSI/ISEA Z358.1-2014 , Emergency Eyewash and Shower Equipment

#### ASTM – American Society of Testing and Materials

##### *[Consultant to list the applicable standards from ASTM in detail]*

#### Accessibility for Ontarians with Disabilities Act (AODA)

#### [Americans with Disabilities Act (ADA)] [where AODA does not cover items]

#### NFPA – National Fire Protection Association

##### *[Consultant to list the applicable standards from NFPA in detail]*

#### UL – Underwriters Laboratory).

##### *[Consultant to list the applicable standards from UL in detail]*

#### ULC – Underwriters Laboratory Canada ).

##### *[Consultant to list the applicable standards from ULC in detail]*

#### Canadian Gas Association (CGA).

##### *[Consultant to list the applicable standards from CGA in detail]*

#### Building Code Act, 1992, S.O 1992, c. 23, O. Reg. 332/12

#### Technical Standards and Safety Act, 2000 (TSSA)

##### O. Reg. 220/01: Boilers and Pressure Vessels

#### International Association of Plumbing and Mechanical Officials (IAPMO)

##### *[Consultant to list the applicable standards from IAPMO in detail]*

#### American Gas Association (AGA) )

##### *[Consultant to list the applicable standards from AGA in detail]*

#### American Society of Mechanical Engineers (ASME).

##### *[Consultant to list the applicable standards from ASME in detail, note CSA equivalent standards].*

#### American Water Works Association (AWWA)

##### C550-13, Protective Interior Coatings for Valves and Hydrants

#### American Society of Mechanical Engineers (ASME)

#### American Society of Sanitary Engineering (ASSE):

##### ANSI/ASSE 1010-2004, Performance Requirements for Water Hammer Arresters.

##### ASSE 1011-2004, Performance Requirements for Hose Connection Vacuum Breakers

#### Canadian Standards Association (CSA)

##### CSA/CSA Label on Fixtures

##### CSA LLC (Low Lead Content) label or certification

##### CAN/CSA-B45 Series-02 (R2013), Plumbing Fixtures (Consists of B45.0, B45.1, B45.2, B45.3, B45.4, B45.5, B45.6, B45.7, B45.8, B45.9)

##### CSA B45.11-11 (R 2016) /IAPMO Z401-2011 Glass Plumbing Fixtures,

##### CSA B45.12-13/IAPMO Z402-2013 Aluminum And Copper Plumbing Fixtures

##### CSA B45S1-04 (2013), Supplement #1 to CAN/CSA-B45 Series-02, Plumbing Fixtures.

##### CSA B79-08 (R2013), Commercial and Residential Drains and Cleanouts

##### CSA B125.3-12, Plumbing Fittings

##### ASME A112.18.1-2012/CSA B125.1-12, Plumbing Supply Fittings

##### ASME A112.18.2-2015/CSA B125.2-15, Plumbing Waste Fittings

##### *[Consultant to list additional applicable standards and label requirements from CSA in detail].*

#### Energy Star®

##### Products certified under the Energy Star® program with respect to water efficiency (as applicable).

#### WaterSense®

##### Products certified under the WaterSense® program with respect to water efficiency (as applicable).

#### NSF International

##### NSF 372 – 11, Drinking Water System Components – Lead Content

##### NSF 61-2013, Drinking Water System Components – Health Effects

#### Plumbing and Drainage Institute (PDI):

##### Code Guide 302 and Glossary of Industry Terms.

##### PDI-WH 201, revised 2010, Water Hammer Arresters Standard.

## Design Requirements

### Washrooms and other water consuming fixtures shall be located such that total length of piping is minimized. [In multi-floor buildings, washrooms shall be located in such a way that common risers can be employed.]

### Where technically and economically feasible, captured rainwater should be used for the flushing of water closets and urinals and for other non-potable water uses such as cooling tower makeup.

### Domestic water piping shall be sized for the design loads and expected future expansion. Reduction of water flow due to the use of low consumption fixtures shall be implemented where possible in order to reduce capital costs associated with plumbing piping.

### Type M copper piping shall not be specified or allowed. Type L shall be used instead.

### For drinking water plumbing system components, compliance with NSF 372-11 is required with the contractor required to provide proof of such certification.

### Plumbing fixture shall meet or exceed WaterSense® program requirements with respect to water efficient use by the component or device.

### Plumbing related products shall be Energy Star® certified in Canada (as applicable).

### [Consultant to obtain latest Regional water efficiency guidelines for plumbing fixtures and ensure all performance specifications in this technical design specification template meet or exceed such performance values.]

## Measurement and Payment

*[Choose one of the following payment language provisions that best suits the individual project.*

*If this Section is not specifically referenced by an item in the Bid Form, please use the following language:*

.1 The work of this Section will not be measured separately for payment. All costs associated with the work of this Section shall be included in the Contract Price.

*OR If this Section is specifically referenced in the Bid Form, use the following language and identify the relevant item in the Bid Form:*

.1 All costs associated with the work of this Section shall be included in the price(s) for Item No(s). \_\_\_ in the Bid Form.

*If the work of this Section is to be measured and paid for by several different methods, please amend the standard wording given above to reflect the different methods of measurement and payment.*]

## Submittals

### Action Submittals:

#### Shop Drawings: Catalogue information and rough in dimensions for plumbing fixtures, products, and specialties.

#### Refer to Division 1, Section 01300 – Submittals

#### Refer to Division 2, Section 02511 - Watermains

## Regulatory Requirements

### Comply with the Building Code Act, 1992, S.O. 1992, C. 23, O. Reg. 332/12, the most recent building code and the requirements of local area municipalities having jurisdiction. *[Consultant to review and amend as required for the project]*

# PRODUCTS

## Manufacturers

### Fixture Trim:

#### Supply Stops and Traps:

##### *[Consultant to provide performance requirements]*

#### Flush Valves:

##### *[Consultant to provide performance requirement details, CSA compliant]*

#### Water Closet Seats:

##### *[Consultant to provide performance requirement details, CSA compliant]*

#### Lavatory Supply, Tailpiece, and Trap Insulation:

##### *[Consultant to provide performance requirement details, CSA compliant]*

### Plumbing Fixtures:

#### Water Closets, Lavatories, and Service Sinks:

##### *[Consultant to provide performance requirement details, CSA compliant]*

#### Faucet Fittings:

##### Sinks:

###### *[Consultant to provide performance requirement details, CSA compliant]*

##### Lavatories:

###### *[Consultant to provide performance requirement details, CSA compliant]*

#### Shower Trim:

##### *[Consultant to provide performance requirement details]*

#### Shower Stalls:

##### *[Consultant to provide performance requirement details, CSA compliant]*

#### Stainless Steel Sinks:

##### *[Consultant to provide performance requirement details, ASME A112.19.3-2008/CSA B45.4-08 (R2013) compliant]*

#### Mop Sinks:

##### *[Consultant to provide performance requirement details, CSA compliant]*

#### Drinking Fountains and Electric Water Coolers:

##### *[Consultant to provide performance requirement details and confirm with the Region, CSA compliant]*

### Emergency Showers and Eyewashes:

#### *[Consultant to provide performance requirement details, conformance to ANSI Z358.1-2014 and cite other applicable regulations if any]*

### Drainage Products:

#### General:

##### *[Consultant to provide performance requirement details, CSA B79-08 (R2013) compliant]*

#### Acid Resistant:

##### *[Consultant to provide performance requirement details, CSA compliant]*

### Plumbing Specialties:

##### *[Consultant to provide performance requirement details, CSA compliant as applicable]*

#### Wall Hydrants:

##### *[Consultant to provide performance requirement details, compliance with AWWA standards]*

#### Yard Hydrants:

##### *[Consultant to provide performance requirement details, compliance with AWWA standards]*

#### Shock Arresters:

##### *[Consultant to provide performance requirement details based on hydraulic surge analysis, compliant with* PDI-WH 201, revised 2010, Water Hammer Arresters Standard*]*

#### Trap Primers:

##### *[Consultant to provide performance requirement details, CSA compliant]*

#### Pressure/Temperature Relief Valves:

##### *[Consultant to provide performance requirement details, compliant with O. Reg. 220/01: Boilers and Pressure Vessels (as applicable)]*

#### Pressure Gauges:

##### *[Consultant to provide performance requirement details, units of measurement, accuracy requirements, accessibility to read and maintain]*

#### Thermometers:

##### *[Consultant to provide performance requirement details, thermometers to be of mercury free type]*

#### Automatic Washer Supplies:

##### *[Consultant to provide performance requirement details]*

## General

### Fixture Trim:

#### Provide plumbing fixture trim where applicable on fixtures.

### Plumbing Fixtures:

#### Indicated by fixture number as shown on the Contract Drawings.

### Drainage Products:

#### Indicated by fixture number as shown on the Contract Drawings.

### Plumbing Specialties:

#### Indicated by fixture number as shown on the Contract Drawings.

### Exposed fixture connections and piping shall be polished chrome-plated.

## Materials

### *[Consultant to review cited products for each subsection and amend with the most water efficient similarly functioning device that meets or exceeds York Region standards for plumbing fixtures as they change over time]*

### Fixture Trim:

#### Supply Stop:

##### Flexible supply with heavy cast brass, loose key, 12 mm IPS by 10 mm OD tubing angle stop to wall with canopy flange; chrome plated finish. Provide stop with stuffing box.

##### *[Consultant to provide additional performance requirement details]*

#### Trap:

##### Chrome-plated, 17-gauge, semi-cast P trap with compression ring cast brass waste and vent connection and cleanout.

##### 40 mm for lavatories and drinking fountains.

##### 40 mm for sinks.

##### *[Consultant to provide additional performance requirement details]*

### Water Closet and Urinal Flush Valves:

#### Low flush, quiet action with screwdriver stop and vacuum breaker:

#### *[Consultant to provide performance requirement details including water efficiency requirements]*

### Plumbing Fixtures:

#### Drinking Fountain (Barrier Free Design, AODA compliant, Dual Height, Back Plate):

##### *[Consultant to provide performance requirement details in consultation with the Region]*

#### Sink Fixture (Wall Hung Type, barrier free design):

##### 537 mm by 559 mm, vitreous china, for floor mounted concealed arm carrier, three-hole punched on 100 mm centers for faucet

##### *[Consultant to provide additional performance requirement details]*

#### Faucet:

##### *[Consultant to provide additional performance details including water efficiency requirements (WaterSense®)]*

#### Trim:

##### *[Consultant to provide additional performance and material requirement details]*

#### Insulation:

##### *[Consultant to provide additional performance requirement details]*

#### Strainer:

##### *[Consultant to provide additional performance requirement details]*

#### Carrier:

##### *[Consultant to provide additional performance requirement details]*

#### Mop Sink: (Molded stone, corner set, 600 mm or 900 mm by 600 mm by 300 mm deep with stainless steel bumper guard, back panels and chrome-plated brass drain.)

##### *[Consultant to provide additional performance requirement details including features to allow draining of power-driven floor maintenance equipment]*

#### Mop Sink Faucet:

##### *[Consultant to provide additional performance requirement details]*

###### Fixture to come with hose threads, vacuum breaker, and rod support. Faucet shall be mounted 900 mm above finish floor.

#### Accessories for Mop Sink:

##### *[Consultant to provide additional performance requirement details]*

###### Complete with stainless steel mop hanger.

#### Sink Fixture (Counter, Stainless Steel, Single Compartment): 550 mm by 550 mm by 262 mm deep, 18 gauge, Type 304 stainless steel, 3 hole punch, self-rimming, undercoated, ledge type, CSA compliant.

##### *[Consultant to provide additional performance requirement details]*

#### Faucet:

##### *[Consultant to provide additional performance requirement details]*

###### [single handle with 200 mm cover plate.]

###### [double handle.]

#### Trim: (40 mm OD, 17 gauge chrome plated cast tailpiece and cast brass P trap with cleanout, and 12 mm wall supply stop with loose key.)

##### *[Consultant to provide additional performance requirement details]*

#### Strainer:

##### *[Consultant to provide additional performance requirement details and amend as required]*

#### *[Disposer]:*

##### *[Consultant to provide performance requirement details and amend as required, CSA compliant]*

#### *[Hot Water Dispenser]:*

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant]*

###### Operational to 87.8 degrees Celsius.

#### Sink Fixture (Counter, Stainless Steel, Double Compartment): (550 mm by 1,075 mm by 262 mm deep, 18 gauge, Type 304 stainless steel, 3 hole punch, self-rimming, undercoated, ledge type.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant]*

#### Faucet: (Short spout with vacuum breaker, 20 mm hose thread outlet, pail hook, H supply arms, 100 mm to 215 mm adjustable centers, lever handles. Faucet mounted on backsplash.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant]*

###### [single handle with 200 mm cover plate.]

###### [double handle.]

###### [side valve with gooseneck spout. Faucet mounted on counter.]

###### [dual lever handles with gooseneck spout. Faucet mounted on counter.]

#### Sink Fixture (Small Coffee, Bar Sink): (392 mm by 334 mm by 152 mm deep, 18 gauge, Type 304 stainless steel, self-rimming, undercoated, ledge type.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant]*

#### Free Standing Sink Fixture (Single Compartment, Free Standing): (686 mm by 686 mm by 350 mm deep, 14-gauge, Type 304 stainless steel, 200 mm backsplash, adjustable stainless steel tubular legs.)

##### *[Consultant to provide additional performance requirement details and amend as required]*

#### Trim: (40 mm OD, 17-gauge chrome plated flat strainer, tailpiece, and cast brass P trap with cleanout, and 12 mm wall supply stop with loose key.)

##### *[Consultant to provide performance requirement details and amend as required, compliant with ASME A112.18.2/CSA B125.1-12*]

#### Shower Enclosure (Stall, Barrier Free Design, AODA compliant): (fiberglass enclosure complete with integral seat, grab bars, and chrome plated drain.)

##### *[Consultant to provide performance requirement details and amend as required, CSA compliant]*

#### Showerhead:

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant]*

###### Complete with [0.16] L/s flow restrictor.

#### Mixing Valve: (thermostatic and pressure balancing type)

##### *[Consultant to provide performance requirement details and amend as required, CSA compliant]*

#### Trim:

##### *[Consultant to provide additional performance and material requirement details and amend as required, CSA compliant]*

###### Inlet strainer, check, integral stop, temperature limit stop, 2 wall hooks, and diverter valve.

#### Urinal (Flush Valve, Wall Hung Type): (Vitreous china, siphon jet action with flushing rim, top spud, Urinals shall be ultra-low flow with maximum water consumption of [0.5 LPF].)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant]*

#### Urinal Support:

##### *[Consultant to provide performance requirement details and amend as required, CSA compliant]*

#### Toilet (Flush Valve, Wall Hung Type, Barrier Free Design, AODA compliant): (Vitreous china, siphon jet action, top spud, elongated bowl.)(Mounted for handicap access with flush valve handle pointed to wide side of stall enclosure, Toilets shall be [3.6L] maximum flush with a 3L minimum recommended.)

##### *[Consultant to provide performance requirement details and amend as required, CSA compliant]*

### Safety Equipment:

#### Emergency Shower (Freestanding): (ABS plastic or stainless steel deluge, Stay open, chrome plated brass or stainless steel ball valve, 32 mm galvanized pipe standard with 225 mm diameter floor flange support, Magnetically operated proximity switch alarm.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant, ANSI Z358.1-2014 compliant]*

#### Emergency Eyewash: (Anti-surge spray-heads, swing away design and automatic stream control, Stay open ball valve, Magnetically operated proximity switch. Shall be self-contained or heated as required)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant, ANSI Z358.1-2014 compliant]*

#### Safety Shower/Eyewash Combination: (deluge shower, aerated eye/face wash, stay open valve, freestanding, 32 mm pipe standard, stanchion, and floor flange. Modesty Curtain, Magnetically operated proximity switches Alarms. Bury Depth:[600 mm.] [1050 mm.] [1650 mm.]. Shall use all stainless steel, all PVC, freeze proof, frost proof or enclosed as required)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant, ANSI Z358.1-2014 compliant]*

#### Portable Eyewash Station:

##### CSA compliant, ANSI Z358.1-2014 compliant.

##### Approved Product: Honeywell Porta Stream II® Eyewash Station including one-year’s supply of S-9876 saline refill packs for each station.

#### Tempering Valve: (Bronze, brass, copper, and stainless steel. Maximum flow rate 40 GPM. Inlet and Outlet: 32 mm IPS. Max Inlet Pressure: 862 KPG. Max Inlet Temperature: 82 degrees C.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA compliant]*

### Drainage Products:

#### Area Drain: (Cast iron body and grate. (polished bronze strainer). Hinged grate, sediment bucket, and vandal-proof screws. Sump receiver, underdeck clamp, vandal-proof screws, and seepage openings.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Cleanout: (Taper thread, bronze plug, heavy duty, scoriated cast iron or nickel bronze top.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Downspout Boot: (Cast iron body and strap.)

##### *[Consultant to provide performance requirement details and amend as required, CSA compliant]*

#### Floor Cleanout (Finished Areas): (Floor drainage system – tiled floor. Tapered thread, bronze plug with round adjustable scoriated secured nickel bronze top.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Floor Cleanout (Unfinished Areas): (Floor drainage system – exposed concrete. Tapered thread, bronze plug with round adjustable scoriated secured cast iron top.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Floor Drain (Finished Areas): (Cast iron body, adjustable nickel bronze strainer. Trap primer connection, vandal-proof screws or equivalent.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Floor Drain (Unfinished Areas, General Drainage): (Cast iron body and grate. Sediment bucket option, trap primer connection, vandal-proof screws or equivalent.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Floor Drain (Unfinished Areas, Heavy Drainage): (Cast iron body and grate. Sediment bucket Option. Trap primer connection, vandal-proof screws.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Floor Drain (Gutter Drain): (Rectangular cast iron body and grate.)

##### *[Consultant to provide performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Floor Drain (Indirect Receptor): (Cast iron body and strainer. Round top, anti-flood rim strainer, trap primer connection, vandal-proof screws.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Floor Drain (Acid Resistant, Lab area.): (Acid resistant polypropylene with flame retardant body, integral flange with clamping collar, basket strainer, and top grate.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Floor Drain (Acid Resistant, Process Area.):

##### *[Consultant to provide performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Gutter Drain: (Rough bronze flashing clamp and bronze top secured high dome.)

##### *[Consultant to provide performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Roof Drain: (Cast iron body with combined flashing clamp and gravel stop, and cast iron dome. Options: Extension collar, sump receiver, underdeck clamp.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Overflow Drain: (Cast iron body with combined flashing clamp and gravel stop, and cast iron dome. Extension collar, sump receiver, underdeck clamp, and 50 mm high cast iron standpipe Options.)

##### *[Consultant to provide additional performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Overflow Nozzle: (Cast bronze body and flange.)

##### *[Consultant to provide performance requirements and amend as required]*

#### Wall Cleanout: (Stainless steel cover and screw.)

##### *[Consultant to provide performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

#### Hub Drain: (Coated cast iron reducing hub adapter with standard cast iron hub.)

##### *[Consultant to provide performance requirement details and amend as required, CSA B79-08 (R2013) compliant]*

### Plumbing Specialties:

#### Hose Bibb:

##### Angle Type Hose Valve 20 mm: (20 mm NPT female inlet, 20 mm male hose thread outlet, heavy rough brass body rated 827 kPa, lock-shield bonnet, removable handle, atmospheric vacuum breaker conforming to ASSE Standard 1011 and IAPMO code.)

###### *[Consultant to provide additional performance requirement details and amend as required, applicable ASTM and CSA compliance]*

##### Angle Pattern Hose Valve 25 mm to 75 mm: (All bronze, screwed ends, inside screw, rising stem, TFE disc, outlet of cast brass NHT by NPT, male by male, nipple adapter with hexagonal wrench feature, brass cap with chain, rated 300 WOG.)

###### *[Consultant to provide additional performance requirement details and amend as required, applicable ASTM and CSA compliance]*

#### Hose Bibb: (20 mm polished chrome plated brass hose bibb, vacuum breaker, and removable T handle.)

##### *[Consultant to provide additional performance requirement details and amend as required, applicable ASTM and CSA compliance]*

#### Wall Hydrant (Freeze proof): (20 mm with removable T handle, integral vacuum breaker, and hose connection)

###### *[Consultant to provide additional performance requirement details and amend as required, applicable ASTM, AWWA and CSA compliance]*

#### Yard Hydrants (Freeze proof): (Removable bronze nozzle with standard pipe thread, variable flow plunger, galvanized steel pipe operating rod and casing, and automatic drain.)

##### *[Consultant to provide additional performance requirement details and amend as required, applicable ASTM, AWWA, CAN/ULC and CSA compliance]*

#### Shock Arresters: (ASSE 1010 certified, Type L copper tube, HHPP piston with 2 lubricated EPDM O rings, FDA approved lubricant, rolled piston stop, wrought copper male thread adapter.)

##### *[Consultant to provide additional performance requirement details and amend as required, applicable ASTM and CSA compliance]*

#### Trap Priming Valve: (Cast bronze, line pressure drop activated, anti-siphon port, 12 mm connection.)

##### *[Consultant to provide additional performance requirement details and amend as required, applicable ASTM and CSA compliance]*

#### Automatic Trap Priming System (12 mm connection): (Electronic controller, manual override switch, solenoid valve, 12 mm connection, calibrated water distribution manifold, and air gap.)

##### *[Consultant to provide additional performance requirement details and amend as required, applicable ASTM and CSA compliance]*

#### Automatic Trap Priming System: (Pre-set 24 hour clock, manual override switch, solenoid valve, 20 mm connection, calibrated water distribution manifold, water hammer arrestor, and steel cabinet.)

##### [*Consultant to provide additional performance requirement details and amend as required, applicable ASTM and CSA compliance]*

#### Pressure/Temperature Relief Valve: (ASME/AGA rated, bronze body construction, vacuum relief valve vent in drain, backup emergency safety fuse plug, tamper resistant bonnet screws, test lever, short thermostat, and automatic reseating.)

##### *[Consultant to provide additional performance requirement details and amend as required, applicable ASME, ASTM and CSA compliance]*

#### Pressure Gauge: (90 mm gauge size, 0 to 1,100 kPa range, steel case, glass crystal, brass movement, and 8.5 mm NPT lower connection.)

##### *[Consultant to provide additional performance and accuracy requirement details and amend as required, applicable ASME and ASTM and compliance]*

#### Thermometer: (Adjustable angle, red reading non-mercury type with 225 mm case and -1 to 85 degrees C range, 90 mm aluminum stem, and separate NPT brass thermowell.)

##### *[Consultant to provide additional performance and accuracy requirement details and amend as required, applicable ASME and ASTM and compliance]*

#### Automatic Washer Supply: (Recessed box with 50 mm drain connection, 12 mm hot and cold water valves with shock arresters on both hot and cold water supplies.)

##### *[Consultant to provide performance and accuracy requirement details and amend as required, applicable ASME compliance]*

### Laboratory Fixtures:

#### Laboratory Double/Single/Cup/Scullery Sink: Furnished under Section 12345 - Laboratory Casework and Equipment, rough-in 50 mm drain and 40 mm vent, P-trap, trap arm, supplies and stops. Make final connection to sink under this section.

#### Laboratory Eye/Body Wash and handheld eyewash: Furnished under Section 12345 - Laboratory Casework and Equipment, rough-in 12 mm water to eyewash and 40 mm water to shower, 50 mm drain, 65 mm vent, P-trap and trap arm, and make final connections to unit under this Section.

### Sealant: In accordance with Section 07900 - Joint Sealers.

# EXECUTION

## Preparation

### Drawings do not attempt to show exact details of fixtures. Where diagrams show fixture locations, the Contractor is cautioned that these diagrams must not be used for obtaining material quantities. Changes in the locations of fixtures, advisable in the opinion of the Contractor, shall be submitted to the Consultant for review before proceeding with the Work.

## Installation

### Fixture Trim: Install fixture trim where applicable on fixtures.

### Plumbing Fixtures, Mounting Heights:

#### Standard rough in catalogued heights, unless shown otherwise on the Drawings.

#### Caulk fixtures in contact with finished walls with waterproof, white, non-hardening sealant which will not crack, shrink, or change colour with age. See Section 07900 - Joint Sealers.

### Exact fixture location and mounting arrangement shall be as indicated on toilet room elevations and details as shown on the Drawings.

### Unless noted otherwise in the Contract Documents and as a minimum, fixtures shall be supported as indicated in PDI Code Guide 302.

### Safety Equipment:

#### System Shutoff Valves:

##### Shutoff valves shall give visual indication of position (open or closed).

##### Shutoff valves shall be lockable valves and locked in open position.

#### Each safety shower, eyewash, combination safety shower/eyewash shall have a red safety signoff tag. After completing requirements listed below, the Contractor and Region shall sign the red safety signoff tag. Requirements are as follows:

##### Visually check safety shower/eyewash piping for leaks.

##### Verify that upon operation, stay-open valves remain open.

##### Showerheads shall be between 2.1 m and 2.5 m above standing surface.

##### Shower spray pattern, when valve is full open, shall be a minimum 500 mm in diameter at 1,500 mm above standing surface.

##### Water arcs from eyewash spray heads must cross. Test with appropriate eyewash gauge as approved by Consultant. Minimum flow rates for safety showers shall be [2] L/s.

##### Minimum flow rates for eyewashes shall be [0.2] L/s.

##### Tempered water shall be temperature indicated on Contract Drawings.

##### Fully compliant with ANSI/ISEA Z358.1/ANSI/ISEA Z87.1, Eyewash and Eye Protection Package

### Drainage Products:

#### Floor Drains: Set top flush with floor. Provide membrane clamps where required.

#### Cleanouts: Install where shown on the Drawings or required for purposes intended. Set the cover flush with the finished floor.

### Plumbing Specialties:

#### Hose Bibbs and Wall Hydrants: Mount 600 mm above finished floor or grade, unless indicated otherwise on the Contract Drawings.

#### Shock Arresters: Install Plumbing and Drainage Institute certified and rated shock arresters, sized and located in accordance with PDI WH 201 and as shown on the Drawings. Shock arresters shall have access panels or shall be otherwise accessible.

#### Trap Priming Valves:

##### Floor drain traps primed with priming valves, 12 mm copper to floor drain.

##### Two traps maximum primed from one priming valve or as recommended by the manufacturer. Locate in mechanical spaces or janitor’s rooms and as indicated on the Drawings.

##### Provide shutoff valve ahead of priming valves.

#### Thermometers and Pressure Gauges:

##### Arrange devices to facilitate use and observation.

##### Install in orientation that will allow clear observation from ground level.

##### Provide pressure gauges with block valves.

##### Install thermometers in thermowells.

### Caulk penetrations of exterior walls with weather-proof sealant in accordance with Section 07900 - Joint Sealers.

### Adjust water flows in domestic water systems for reasonable water flows at each plumbing fixture, terminal device, and recirculation loop. Flush valve fixtures shall be adjusted for proper flush cycle time and water quantity.

## Field Quality Control

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

### Cover concealed or insulated work only after testing has been successfully completed.

### Notify the Consultant and Region a minimum of 48 hours prior to shower testing. The Consultant and Region reserve the right to witness all tempered water and safety shower testing.

### Test safety shower and eyewash units. Water flow must be tested at both showerhead and eyewash/face ring.

#### Shower Flow:

#### Test with tube type water gauge with an appropriate test kit and [20] litres container.

##### Container shall fill in 10 seconds or less, with a minimum [2 ] L/s flow.

#### Eyewash Flow:

##### Test with an approved tube type water gauge and a 4 litre container.

##### Container shall fill in [20] seconds or less.

#### Contractor shall log, date, and initial inspection upon passing flow tests.

### Verify alarm operation both locally and system-wide. Notify security prior to testing if the alarm is connected system-wide.

**END OF SECTION**