1. **GENERAL**
	1. **Summary**
		1. Consultants must propose fixture types very early in the design process to enable them to be tested on campus.
		2. BCIT requires all projects to comply with and achieve LEED Gold level of certification. All plumbing fixtures and trim shall be selected for highest performance with lowest practical water flow.
	2. **References and Related BCIT Standards**
		1. ANSI Z358.1-2014 Emergency Eye Wash and Shower Equipment.
		2. ASME A112.18.1-2012/CSA B125.1-12 Plumbing Supply Fittings.
		3. ASME A112.19.3-2008/CSA B45.4.08 (R2013) Stainless steel plumbing fixtures, Includes Updates No. 1 and No. 2.
		4. ASME A112.19.5-2011/CSA B45.15-11 Flush Valves and Spuds for Water Closets, Urinals, and Tanks, Includes Update No. 1.
		5. BC Building Code, Latest Edition.
	3. **Design Requirements**
		1. Specify water conserving type of fixtures and trim.
		2. Depending on water supply pipe size, design and hot water temperature, consider low flow faucets with anti-scald devices.
		3. Water Closets:
			1. All water closets in public areas shall be floor-mounted and have open front seats.
			2. Confirm water closet selection with Consultant and BCIT at Schematic Design Stage to establish wall or floor mounted and access.
		4. Urinals:
			1. All urinals shall be wall-hung.
		5. Sensors:
			1. Hard-wired, ‘No-touch’ motion detector-activated plumbing fixtures and accessories are preferred for faucets, urinals, water closets and are to be considered for paper towel, hand dryer and soap dispensers.
		6. Drinking Water Fountains:
			1. All buildings over 600 gross square meters shall have at least one (1) accessible drinking water fountain, located in a public area. Drinking fountain must include an appropriate fixture for touchless filling water bottles.
			2. New buildings: Locate drinking water fountains inside buildings at Level 1 entrance lobbies visible from the exterior. On multi-floor buildings, locate a drinking fountain/water bottle filling station at the same location on each floor, generally just outside a main public washroom group.
		7. Plumbing Fixtures:
			1. All plumbing fixtures and trim used in accessible locations shall comply with BC Building Code latest edition (Including Accessibility Handbook).
			2. Selection of Flush toilets: Flushing efficiency to a Maximum Performance (MaP) rating of ≥ 1000 g/flush is recommended. Refer to MaP searchable database for further instruction: <http://www.map-testing.com/>.
			3. Installation of low-flush/high efficiency toilets with extremely long drainage distances may require evaluation on a site-by site basis, especially if no supplemental flows (e.g., from showers or baths) are available.
			4. Specify make of fixtures with manufacturers’ local representation.
		8. Controls:
			1. Use building power for hands free controls, where provided use standby power for the building.
			2. Where automatic recharging is included in the fixture, battery-powered units are acceptable. Acceptable product: Toto Ecoflush or approved alternative.
	4. **Submittals**
		1. Submit in accordance with Section 01 33 00 Submittal Procedures.
		2. Product Data: Provide catalogue illustrations of fixtures, sizes, rough-in dimensions, utility sizes, trim, and finishes.
		3. Shop Drawings: Provide clear water consumption data and LEED Water Efficiency Credit compliance on Shop Drawings.
		4. Maintenance Data: Include fixture trim exploded view and replacement parts lists.
	5. **Quality Assurance**
		1. Manufacturer Qualifications: Company specializing in manufacturing products specified in this Section with minimum Five (5) years documented experience.
		2. All fixtures and trim shall be CSA approved.
		3. Products Requiring Electrical Connection require ULC and CSA classification.
		4. Emergency showers and eye wash stations should meet ANSI Z358.1 Standards, latest Edition.
2. **PRODUCT AND DESIGN REQUIREMENTS**
	1. **Prohibited Materials and Practices**
		1. Waterless Urinals and Dual Flush Toilets:
			1. Do not use waterless urinals.
			2. Dual flush toilets may be used for private Staff washroom installations only, where there is no student or public access. Do not use for public washrooms.
		2. Do not provide filters for drinking water fountains (no backflow preventers required).
	2. **Plumbing Fixtures**
		1. Emergency Showers and Eye Wash Stations:
			1. Provide eyewash and emergency showers in accordance with WorkSafe BC requirements.
			2. Water: Tempered, not to exceed 25°C, or be lower than 20°C.
			3. Hand controlled valves: Type: ‘stay open’.
			4. Provide a plumbed in floor drain complete with trap primers for each shower and station.
			5. Where an eye-wash station is adjacent to a sink, the sink drain may be used for the eye-wash drain.
			6. Specify eye wash stations as eye wash only, not face and eye wash combination.
	3. **Laboratory Plumbing Fixtures**
		1. Trim for Sinks:
			1. Typically hot and cold gooseneck type with type handles.
			2. Where ADA trim: Complete with blade handles, vacuum breaker and tapered, barbed nozzles, or aerator type outlets for wash-up sinks.
		2. Laboratory Sinks:
			1. Typically 316 stainless steel with counter-top flange.
			2. No ledge-back or cross strainer outlet.
	4. **Fixture Water Efficiency Requirements**

|  |  |  |
| --- | --- | --- |
|  | **Requirement** (Maximum Volume orFlow Rate) | **Comparative Notes** |
| **Toilets - Residential** | 4.8 litres/flush average | * Equivalent to existing BC Building Code
 |
| **Toilets – Industrial, Commercial, Institutional** | 6 litres/flush average |  |
| **Urinals** | 1.9 litres/flush | * Equivalent to BC Building Code
 |
| **Shower head** | 5.7 litres/minute | * BC Building Code is 9.5 litres/min
* Equivalent to LEED 2009 prerequisite
 |
| **Kitchen Faucet** | 6.8 litres/minute | * BC Building Code is 8.3 litres/min
* Kitchen faucets usually need higher flow than lavatories for good user experience
 |
| **Lavatory Faucet – non sensor/metering** | 5.6 litres/minute | * BC Building Code is 8.3 litres/min
* Lavatory faucets do not require flows as high as kitchen faucets for good user experience
 |
| **Lavatory Faucet – sensor/ metering** | 0.76 litres/cycle | * Equivalent to LEED 2009 prerequisite
 |

1. **EXECUTION**
	1. **Examination**
		1. Verify that electric power is available and of the correct characteristics.
		2. Prior to rough-in and installation, confirm location and size of fixtures and openings.
	2. **Preparation**
		1. Confirm millwork is constructed with adequate provision for installation of counter top lavatories and sinks.
		2. Rough-in fixture piping connections to minimum sizes indicated in fixture rough-in schedule.
	3. **Installation**
		1. Install each fixture with trap, easily removable for servicing and cleaning.
		2. Install and secure wall mounted fixtures in place with wall supports, wall carriers and bolts.
		3. Seal fixtures to wall and floor surfaces with silicone sealant, colour to match fixture.
		4. Solidly attach water closets to floor with lag screws or brass anchor bolts. Lead flashing is not intended to hold fixture in place.
		5. Floor mounted plumbing fixtures: Provide cast brass or cast iron floor flanges.
		6. Adjust stops or valves for intended water flow rate to fixtures without splashing, noise, or overflow.

\*\*\* END OF **PLUMBING FIXTURES** SECTION \*\*\*