

220010-H: SUPPLEMENTAL PLUMBING SPECIALTIES

Related Sections

Basis Guideline: [220010](#) – “Plumbing Specialties”
[064040-H](#) – “Architectural Woodwork”

For an explanation of the use of these guidelines, see [“Design Guidelines for UMHC Facilities”](#)

Included as part of this UMHC guideline section are the details described within the following UM Master Specification sections:

[224200](#) – “Plumbing Fixtures”

The UM Master Specifications may be used as a reference and/or basis, but the A/E is completely responsible for contract specifications (meeting the intent of the UMHC Guidelines and Preferred Manufacturers List) that are used in UMHC projects.

UMH Standard Details:

[D220010H-1](#) – “Typical Mixing Valve Detail”

[D220010H-2](#) - “Typical Ice Machine Piping Detail”

Definitions

Handwashing sinks: Sinks used in patient rooms, including the patient bathroom lavatory, and clinical care settings to perform routine handwashing. Applies to inpatient and outpatient facilities. Does not include public or staff rest rooms.

Plumbing Fixtures

Master specification 224200 “Plumbing Fixtures” specifies healthcare specific plumbing fixtures that reflect the requirements of Michigan Medicine (MM). AE shall use this specification on all projects, edited to be project specific.

Michigan Medicine prefers the use of batteries for all automatic faucets & flush valves. If hardwired, AE shall provide power from an emergency power source.

Each patient toilet room shall have individual isolation valves on H&CW lines above accessible ceilings. Provide check valves immediately downstream of these isolation valves in lieu of providing local supplemental check valves at all mixing valves within the patient toilet.

All local mixing valves (i.e. shower mixing valves, lavatory ADA mixing valves, etc.) shall be provided with additional, external check valves on the hot and cold water feeds to the valve to supplement the check valves inherent in the mixing valve. See standard detail D220010H-1 “Typical Mixing Valve Detail”.

The AE shall pay special attention to the use of plumbing fixtures in behavioral health patient areas. All fixtures shall utilize an anti-ligature design specifically intended for psychiatric patients. When electric faucets are used on hand washing sinks, the faucet shall be hard wired on a critical power circuit. If a critical circuit is not available then the faucet shall be battery powered. Plumbing fixtures in behavioral health applications shall conform to the latest “Design Guide for the Built Environment of Behavioral Health Facilities” published by FGI as well as MM DG 5.19 “MM Behavioral Health Design Guideline”.

Water Closets

Water closets shall be dual-flush, flush valve, elongated bowl, and floor-mounted. Fixture shall be rated for 1,000 lbs. Provide with white plastic, open front seat and self-sustaining hinges.

Floor-mounted, floor-outlet water closets shall be the basis of design for all new work. Floor-mounted, wall-outlet water closets can be used in renovation work as a direct replacement for an existing wall-outlet water closet.

In off-site outpatient facilities with limited incoming water services, pressure-assisted flush tank water closets are allowed.

Flush valves used in patient toilet rooms shall utilize an integral swing-down bed pan washer.

Handwashing Sinks

The following requirements shall apply to all handwashing sink applications:

- Conform to State of Michigan Healthcare code, FGI 2018 requirements.
- The minimum size for MM handwashing sinks shall be 16"Wx14"x6-1/2" deep.
 - Exception: smaller bowl dimensions are allowed in patient lavatory applications
- Provide a wall-hung, integral, solid-surface or vitreous china backsplash/ counter/ bowl assembly with an offset grid strainer and non-splash configuration (i.e. sloped bowl bottom) for all handwashing applications. See architectural design guideline 064040-H "Architectural Woodwork".
 - Exception: Patient lavatory applications using a vitreous china unit with standard centralized grid strainer location are allowed.
- All handwashing sinks/ lavatories shall be provided without an overflow drain.
- Faucet shall utilize an integral 1.0 GPM flow control device in the base of a gooseneck faucet with a laminar, non-aerated, discharge with smooth end (no means to attach an aerator). Aerators are not allowed on handwashing sinks.
- Utilize manual wrist blade or foot pedal control. Patient lavatory applications should only use manual wrist blade faucets. Automatic electric eye faucets should not be used in handwashing applications.
- Faucets shall not discharge directly over the sink drain. The A/E shall be responsible for coordinating the faucet spout dimensions with the bowl outlet to prevent this.

Non-Handwashing Sinks

Aerators and automatic electric eye faucets are allowed for use in non-handwashing sink applications. Provide with 0.5 GPM flow control aerators, battery power and override to allow continuous flushing of water thru the faucet (for disinfection, if needed).

All carriers for wall hung lavatories/ sinks shall be rated for a minimum 250-pound load on the plumbing fixture.

Scrub Sinks

Scrub sinks shall be specified by the AE, contractor provided and installed. See specification 224200 "Plumbing Fixtures" for various requirements. AE shall note the following:

- Each sink station shall be equipped with an anti-splash gooseneck faucet with a laminar flow head (rose bud style spray heads are not allowed per Infection Prevention department).
- Provide sink with adjustable thermostatic controlled pressure regulating mixing valve, one per station. Mixing valve shall be equipped with internal check stops for serving to prevent cross-flow. In addition, AE shall detail the need to install fully redundant check valves on the HW & CW feeds to the mixing valve.
- In-wall concealed carrier or wall bracket shall be utilized to hang surgical scrub sink. No pedestal style base supports shall be allowed. A minimum of 16" free area clearance shall be provided from the bottom of sink to finished floor level.
- Do NOT provide sinks with optional soap dispensers. Michigan Medicine will install external soap dispensers via direction from the Infection Prevention department.
- Coordinate with surgical staff on preference for utilizing splash screen basin dividers for dual basin sink station applications. Typically, dividers are not desired.

- Water flow shall be activated/deactivated by electronic infrared sensor technology. Do NOT provide foot pedals or knee operated panels. Water shall remain on as long as the infrared sensor is activated and shall not be governed by a pre-set time period.
- Each sink station shall be equipped with a visual digital water flow timer.
- No eyewash should be provided unless required by Infection Prevention or Safety Management Services. In rare cases where required, provide a separate, dedicated eye wash fixture compliant with ANSI standards. Do not integrate handwashing and eyewash.

Patient Care Units

Do not install factory packaged Patient Care Units. Instead, AE shall detail and specify standard plumbing fixtures (water closet, sink, faucet, bed pan washer, etc.), as outlined in this section, installed in cabinetry. Plumbing fixtures and cabinetry shall conform to UMH design guidelines and UMH preferred manufacturer's list. See DG 064040-H: ARCHITECTURAL WOODWORK for cabinetry requirements.

Bed pan washers shall be wall-mounted swing down type as opposed to hand-held type. Coordinate type with UMH staff.

Emergency Safety Equipment

Emergency eye washers and safety showers shall conform to ANSI/ ISEA Z358.1, set to utilize a tepid source (i.e. 60°F-90°F) via an approved emergency mixing valve manufactured for the dedicated purpose of serving safety equipment. Mixing valve shall fail in full cold flow in the event of valve failure.

Where an emergency eye wash is required, AE shall specify a dedicated eye wash unit with integral bowl piped to drain. Where space/ use does not allow the use of a dedicated eye wash unit, AE shall specify an ANSI Z358.1 compliant combination faucet/ eye wash at the sink in the room (i.e. Speakman SEF-1801) or a drench hose eye wash unit mounted in the backsplash of the sink, to allow the means to perform eye washing over the sink bowl. Sink shall be for clean use only (i.e. handwashing) and not for dirty functions. The AE shall coordinate the sink bowl dimensions needed to prevent splashing during regular testing of the eyewash with the vendor published data on eyewash plume. Typically, the sink dimensions used with combination faucet/ eye wash units shall utilize a minimum 13" front to back bowl to capture the eyewash plume and prevent splashing and puddling on the floor.

Miscellaneous

Janitor closets require a floor mounted mop sink, with rim guard, rough chrome plated brass faucet, wall mounted 36" above the floor with wall bracket, pail hook, vacuum breaker, wall mounted mop holding bracket and 3'-0" rubber hose connected to hose end of faucet. In addition, provide a separate, dedicated non-potable CW connection for chemical mixing/ dilution, consisting of a ½" CW with hose bib connection, fed from a RPZ backflow preventer racked on the wall, for ease of servicing. Mount hose bibb over mop sink. Provide sign over non-potable hose bibb indicating "Chemical Connection Faucet Only".

Drinking fountains shall be located in alcoves or recesses in corridors. They shall be refrigerated and designed for barrier-free use. Drinking fountains in high public traffic areas shall be provided with integral water bottle refill stations. All drinking fountains, with or without bottle filling stations, shall be provided without carbon filters, as these have shown to be problematic with the control of water-borne pathogens.

Shower mixing valves shall be non-scalding type, combination pressure balanced/ thermostatic and shall be provided with additional, external check valves on the hot and cold water feeds to the valve to supplement the check valves inherent in the mixing valve. Supplemental check valves shall be accessible, ideally located in an accessible ceiling adjacent to the branch shutoff valves serving the bathroom fixtures. Showers in patient rooms shall be equipped with both a fixed and a handheld shower head with diverter valve. Either shower head shall be operable, but not simultaneously.

Floor Drains

Each toilet room shall have a floor drain. All floor drains in toilet rooms shall utilize a gravity fed trap primer consisting of a 1/2" tube interconnecting the lavatory's p-trap to the toilet room floor drain (i.e. JR

Smith “Prime-Eze Water Saver Trap Primer”) or an inline floor drain trap sealer (i.e. RectorSeal SureSeal). Valve-based trap primers shall not be acceptable.

All floor drains used for indirect waste shall utilize a funnel mounted in a grated drain top. All indirect waste shall terminate, with an air gap, over the funnel.

Floor drains in ADA showers, labor & delivery tub rooms and other bathrooms that are prone to having water on the floor shall utilize a low profile trench drain to separate wet areas from dry, extending from wall to wall. In addition, bathroom design shall utilize a secondary trench drain at the door threshold, to prevent water from flowing out into the patient room. Trench drain body & grate shall be manufactured from 304 or 316 stainless steel and shall be made to be mounted in a 2” deep concrete topping pour. Grate shall be heel-proof, coordinate type with architect. Trench drains shall utilize an external p-trap; models with an integral trap are not acceptable.

All emergency eyewash locations shall terminate over a sink or bowl that is piped to the building sanitary waste system. All emergency shower locations shall be provided with a floor drain (drain does not require a trap primer) directly below the shower discharge. OSHA requires that emergency showers & eyewashes be periodically tested and should not puddle on the floor, posing a slipping hazard.

Water Filtration Devices

A/E to specify water filtration for all equipment supplied with domestic water, typically a 5-micron in-line cartridge type filter (coordinate filter requirements with equipment supplier and UMH maintenance):

- Ice Maker
- Vending Machines
- Sterilizers/ Washers
- Kitchen Equipment
- Refrigerators with integral water/ ice dispensers

Do not provide carbon filters without approval from Infection Prevention, as these have shown to be problematic with the control of water-borne pathogens.

AE to provide water filtration to water-cooled medical equipment (ie MRI's, etc), consistent with manufacturer recommendations. Provide full-size, valved bypass for all filters, to allow filter service while maintaining proper flow to medical equipment.

Backflow Preventers

The A/E shall clearly indicate the size and discharge location of indirect drains off of backflow preventers, sized to handle a full discharge of flow.

Water Quality

Many of UMHC's facilities receive domestic water from the City of Ann Arbor Water Treatment facility. The City of Ann Arbor water supply is a blend of surface water (Huron River) and well water. The City utilizes a cold lime softening process in combination with the use of chloramine disinfectant, which results in a water service exhibiting the following characteristics:

- High pH of 8-9
- High conductivity of 500-700 uS
- Medium hardness of ~140 mg/L

These conditions have been shown to cause premature failure of numerous materials utilized in traditional plumbing systems, predominantly in the domestic hot water and high temperature hot water distribution systems, as raising the temperature of the water increases the corrosive potential of the water. See [“Domestic Water Analysis – Premature Failures in UMH Domestic Hot Water Systems”](#) report published under the Policy Papers section of UMHC's design guidelines for more details.

To address this issue, the A/E shall incorporate the following into their design for all domestic water work in facilities served by the City of Ann Arbor Water Treatment plant (i.e. the main healthcare campus, Wall St campus, Briarwood facilities, EPW, East Ann Arbor campus, etc.):

- Materials (piping, valve bodies & trim, fixture bodies & trim, DHW heaters, etc.) used in the domestic hot water system shall predominantly be based on Type L copper and 316 stainless steel. Limit the use of brass, mild steel and lower quality stainless steels (i.e. 304).
- Limit/ eliminate the use of open cell elastomerics like EPDM, which are traditionally used in gaskets for grooved fittings, in the domestic hot water system. Where necessary to utilize EPDM, specify the use of peroxide-cured EPDM which has been found to be more resistant to our water quality.
- Limit/ eliminate the use of mixing valves in domestic water systems. These valves have exhibited a high failure rate and are a source of numerous bleed thru problems throughout campus. Where mixing valves are required (i.e. showers, emergency fixtures, ADA fixtures), provide redundant check valves in the HW & CW connections upstream of the mixing valve.