**6. ENGINEERING SYSTEMS REQUIREMENTS**

**D20 PLUMBING**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
SYSTEMS REQUIREMENTS  
PLUMBING TEMPLATE 09/22  
  
Instructions for using this template: There are template files for each UNIFORMAT Level 2 Group Element. This template is for Group Element D20-PLUMBING. Text such as this is hidden text that will not print when the hidden text box in "Print/Options" is un-checked.  
  
The Mechanical Team Member must edit this template for the requirements of the project. The SYSTEMS REQUIREMENTS are intended to define items that are required throughout the facility or on a system wide basis that is common to several rooms. Room-specific requirements are defined in the ROOM REQUIREMENTS section. Coordinate with the lead programmer for ROOM REQUIREMENTS. Editing is required where brackets [ ] appear. Delete all building elements that are not required for the project. If additional elements or sub-elements are required for the project that do not appear in the template, refer to the NIST UNIFORMAT II publication for additional building element numbers and descriptions. The Uniformat II Work Breakdown Structure can be found at** [**www.wbdg.org/ndbm/**](http://www.wbdg.org/ndbm/) **. Coordinate with the PERFORMANCE SPECIFICATION SECTION D20 to ensure that performance requirements are provided for all of the Building Elements listed here and that paragraph numbering matches.  
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NOTE: Consider each plumbing component relative to Part 2 UFGS Section 01 33 29, *Sustainability Requirements and Reporting* and UFC 1-200-02, *High Performance and Sustainable Building Requirements*.  
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Refer to Part 4 Section D20 for performance requirements of the building elements included in the plumbing system.

**SYSTEM DESCRIPTION**  
**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*   
NOTE: Edit the following for the specific project requirements. Remember to let the design build A/E design the project. Keep the requirements general wherever possible. If it is covered by the building code or by PTS D20, it does not need to be restated in this section.  
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The plumbing system for [ ] consists of all fixtures, potable cold and hot water piping and equipment, piping insulation, water heating equipment, sanitary waste and vent piping systems, and other specialty piping and equipment within 5 foot (1.5 meter) of the building. [Refer to Building Requirements, Space Tabulations Section of the Project Program for building occupancy levels.]

**GENERAL SYSTEM REQUIREMENTS**  
Provide working space around all equipment. Provide concrete pads under all equipment. Provide all required fittings, connections and accessories required for a complete and usable system. Install all equipment in accordance with the criteria of PTS section D20 and the manufacturer's recommendations. Design and install in accordance with International Plumbing Code (IPC) and UFC 3-420-01, *Plumbing Systems*. Where the word "should" is used in the manufacturer's recommendations, substitute the word "must".

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NOTE: Commissioning of Domestic Hot Water (DHW) and other energy systems is required for Guiding Principle Validation and Third Party Certification in accordance with Part 2 UFGS Section 01 33 29, *Sustainability Requirements and Reporting*.  
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[Include the \_\_\_\_\_\_\_\_\_ system to list of systems to be commissioned in accordance with Part 2 UFGS Section 01 33 29, *Sustainability Requirements and Reporting*]

**D2010 PLUMBING FIXTURES**

Provide quantity and type of plumbing fixtures required for the occupancy, use, and functions described for this facility. Refer to Room Requirements Section for additional specific requirements for spaces with plumbing fixtures. Provide handicapped fixtures in accordance with the referenced criteria in the Project Program.

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NOTE: Coordinate with the Architect for the types of plumbing fixtures to be required in each area. Expand description to include areas served by different fixture types where required.  
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 NOTE: Automatic controls for water closets, urinals, and faucets provide enhanced hygiene and improved water conservation but cost more and may require more maintenance than lever- or knob-operated valves. This should be discussed with the user and automatic controls specified if requested by the user.  
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**D201001 WATER CLOSETS**

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NOTE: Flush valve toilets are normally provided in public restrooms. Tank toilets are normally provided in Bachelor Enlisted Quarters (BEQs), Bachelor Officers Quarters (BOQs), and other private restrooms. Wall-mounted toilets are preferred for ease of cleaning the restroom floor; floor-mounted toilets are more abuse-resistant.  
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NOTE: Where 1.6 GPF tank type toilets are considered to be a problem, consider specifying power-flush type toilets.  
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Refer to Room Requirement Section for the number and type of water closets required.

Provide floor mounted dual-flush valve, manual type water closets in all Room Plan bathroom spaces.

Provide floor mounted dual-flush valve, manual type water closets in the Public Head spaces. The Public Head must be handicapped accessible.

Provide a floor mounted dual-flush valve, manual type water closet in the Duty Office Head. The Duty Office Head must be handicapped accessible.

**D201002 FLUSH VALVE TYPE HANDICAPPED URINALS**

Refer to Room Requirement Section for the number and type of urinals required.

Provide flush valve type handicapped urinals in the Public Head.

**D201003 LAVATORIES**

Refer to Room Requirement Section for the number and type of lavatories required.

Provide a countertop lavatory made of solid surfacing material in each Room Plan bathroom space. The countertop lavatory in the Room Plan bathrooms must be the under mounted type.

Provide a wall mounted lavatory made of vitreous china with a straight back in the Public Head. The wall mounted lavatory in the Public Head must be handicapped accessible.

Provide a wall mounted lavatory made of vitreous china with a straight back in the Duty Office Head. The wall mounted lavatory in the Duty Office Head must be handicapped accessible.

Provide washerless faucets at lavatories.

**D201004 SINKS**

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NOTE: Single compartment sink is suitable for kitchens in bachelor's quarters. Double compartment sink with garbage disposal is for use in housing or other applications.  
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Refer to Room Requirement Section for the number and type of sinks required.

Provide a countertop kitchen sink with one compartment in the Room Plan service area. Kitchen sink must be provided with hot and cold water connections.

Provide a countertop kitchen sink with one compartment in the Multi-purpose room. Kitchen sink must be provided with hot and cold water connections.

Provide two compartment laundry sinks in the Laundry room. Laundry sinks must be provided with hot and cold water connections. Provide a mop sink with hot and cold water connections in the Janitor's room.

Provide a mop sink with hot and cold water connections in the Janitor's room.

**D201005 SHOWERS**

Refer to Room Requirement Section for the number of showers required.

Provide pre-cast terrazzo shower floor receptors in each Room Plan bathroom, and provide solid surface surround shower enclosures with hot and cold water connections and fittings. The shower heads must be stationary to keep from spraying toward the shower entrance opening and causing water damage.

Provide a gear wash area at the ends of the BEQ wings and near the entrances for the purpose of washing boots and other gear. The gear wash area must be located outside prior to entering the BEQ, and located on an 2.4 meter (8 foot) diameter depressed slab for drainage. Do not locate the gear wash area at the front entrance to the BEQ. The gear wash area must provide a shower post in the middle of the 2.4 meter (8 foot) depressed drainage slab. The shower post must be a manufactured item and have 6 shower heads, each equipped with shutoff valves that are easily accessed by personnel for washing gear. The gear wash area shower post must be approximately 1.8 meter (6 feet) high, and be provided with hot and cold water connections and fittings. Provide a drainage pipe in the center of the depressed drainage slab. All external water piping must be freeze proof in areas prone to freezing.

Provide single lever faucets at tub/showers or shower stalls and flow restrictive type showerheads at showers.

**D201006 DRINKING FOUNTAINS AND COOLERS**

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NOTE: Coordinate with the Public Works Department regarding water quality at the project locale. If water quality is known to be substandard such that filters are required at fountains/coolers, add those feature requirements here. If the Base/PWD is providing the filters for the project also indicate that in this Section.  
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[Refer to Room Requirement Section for the number and type of [drinking fountains] [and] [water coolers] required.]

[Provide drinking fountains with coolers for interior public areas, and appropriate exterior areas.]

[Provide water coolers in the [\_\_\_\_\_\_] spaces.]

**D2020 DOMESTIC WATER DISTRIBUTION**

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NOTE: Coordinate with the fire protection section for existing data or flow test requirement.  
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Perform a flow test to determine system requirements.

A flow test was performed with the following results:  
Date:  
Time:  
Location:  
Static pressure:  
Residual pressure:  
Flow:

**D202001 PIPES AND FITTINGS**

Provide copper tubing and fittings for above ground and buried piping. No pressure tubing except water service entrance and trap primers is permitted under the floor slab.

**D202002 VALVES & HYDRANTS**

Provide shutoff valves at domestic water supply to each floor. Provide shutoff valves at water supplies to fixtures and to provide ease of maintenance as required in the IPC. Provide hose bibbs in mechanical room(s) and along the building exterior such that all points along the perimeter can be reached with a 30 meter (100 foot) long hose. [Provide hose bibbs to service [rooftop HVAC equipment][and solar panels].] Provide freeze proof wall hydrants along the exterior in areas subject to freezing.

**D202003 DOMESTIC WATER EQUIPMENT**

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NOTE: For backflow preventers, coordinate with ESR G30 to ensure multiple preventers are not provided.  
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Provide a reduced pressure principle type backflow preventer for the building at the domestic water service entrance inside the mechanical room.

Provide a reduced pressure principle type backflow preventer at all domestic make-up water lines inside the mechanical room and at all make-up water lines to systems containing chemical treatment.

Refer to ESR G30 for water meter requirements.

[Provide [high efficiency [natural gas] [propane] fired] water heater(s) for heating of domestic water.]

[Provide a steam heat exchanger for heating of domestic water. Steam inlet pressure must be no greater than 103 kPa (15 psig) at the control valve to the heat exchanger.]

[Provide a water-to-water heat exchanger for heating of domestic hot water with the central low temperature hot water system]

Provide a domestic hot water storage tank.

Provide domestic hot water temperature actuated thermostatic mixing valve(s). Domestic hot water must be stored in the domestic hot water storage tank at 60 degrees Celsius (140 degrees Fahrenheit) and mixed with domestic cold water to deliver 43.3 degrees Celsius (110 degrees Fahrenheit) throughout the BEQ.

[Provide domestic hot water recirculation system with high efficiency recirculation pump and recirculation loop with all associated fixtures, equipment, and appurtenance. Provide an in-line circulator pump for the domestic hot water distribution system.]

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NOTE: Pressure booster system may be required where water pressure is known to be inadequate.  
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[Provide a domestic water booster system for domestic water distribution within the BEQ if the exterior water flow test determines the need.]

**D202004 INSULATION & IDENTIFICATION**

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NOTE: Verify insulation material type with Base PWD.  
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Provide mineral fiber insulation with vapor barrier on domestic hot water supply and recirculation piping. [Provide cellular glass insulation with vapor barrier on domestic cold water supply [and grey water] piping.] Provide identification for piping and equipment.

**D202005 SPECIALTIES**

Provide washing machine connector box for clothes washers in the Laundry room. Provide ice maker connector boxes for refrigerators in the Room Plan service area.

**D202090 OTHER DOMESTIC WATER SUPPLY**

Provide piping supports in accordance with the IPC. Provide inspections, disinfection, and testing in accordance with the IPC.

**D2030 SANITARY WASTE**

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NOTE: Verify waste pipe and fitting material type with Base PWD.  
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NOTE: Consider potential for plenum application. If using plenum for distribution, provide plenum-compatible piping materials.  
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**D203001 WASTE PIPE & FITTINGS**

[Provide cast iron hubless pipe and fittings with rubber compression gasket joints for [above] [and] [belowground installations.] [Provide PVC piping, fittings, and solvent cement for [above] [and] [below] ground installations.]

**D203002 VENT PIPE & FITTINGS**

Provide cast iron hubless pipe and fittings, with rubber compression gasket joints, or provide PVC piping, fittings, and solvent cement.

**D203003 FLOOR DRAINS**

Provide floor drains in Mechanical room(s), Fire Pump room, Laundry room, plumbing chase areas, and any other areas required to receive condensate from air handling equipment that is not located in the mechanical room. Provide [trap primers][deep seal traps] on "P" traps that do not regularly receive water.

**D203004 SANITARY & VENT EQUIPMENT**

Provide a sump pump in the elevator shaft pit.

**D2040 RAIN WATER DRAINAGE**

See section B30 "Roofing" for rain water drainage systems.

**D2090 OTHER PLUMBING SYSTEMS**

**D209001 SPECIAL PIPING SYSTEMS**

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NOTE: Natural gas piping is included in Section D30 also. If both sections D20 and D30 are in the project, delete the following paragraph and use Section D30. Coordinate with and insert the name of the gas company.  
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[Obtain natural gas pressures from the local gas utility provider, [\_\_\_\_\_]. Provide any applications and permits, and provide the complete [natural gas][propane] system from the load side of the utility meter to the heating equipment. Contract with the local gas utility provider for installation of piping and appurtenances up to the load side of the meter. [Tie the gas meter into the Building Automation System (BAS)[ and the existing Advanced Metering Infrastructure (AMI) metering system].]]

--End of Section--