**6. ENGINEERING SYSTEMS REQUIREMENTS**

**D20 PLUMBING**

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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 pressure assisted toilets.
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[Refer to Room Requirement Section for the number and type of water closets required.]

[Provide [wall] [floor] mounted [flush valve] [dual function flush valve] water closets [with automatic flush control] in all public restroom spaces.]

[Provide [wall] [floor] mounted [flush tank] [dual function flush tank] water closets in private restroom spaces.]

 **D201002 URINALS**

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

[Provide flush valve urinals [with automatic flush control] in all public restroom spaces.]

[Provide waterless type urinals in all public restroom spaces.]

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NOTE: Care should be exercised in selecting waterlesss urinals. In order to maintain sanitary conditions, the waterless urinal trap inserts should be replaced two to four times a year. The urinal's immiscible barrier liquid needs to be replenished according to the urinal's use, or approximately once a month, so the urinal maintains its' seal. If cleaned with excessive water, the trap seal liquid will be washed down the drain allowing sewer gasses to enter the space. The RFP Editor must ensure that responsible installation representatives are aware of these maintenance requirements and approve the use of waterless urinals.
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[Provide waterless type urinals[ in the \_\_\_\_\_\_\_\_]. ]

 **D201003 LAVATORIES**

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

[Provide countertop lavatories [with metering faucet] [with automatic control] in each restroom space.] [Provide pop-up drain.]

[Provide wall mounted lavatories made of [cast iron] [vitreous china], with [straight] back [with metering faucet] [with automatic control] in [\_\_\_\_\_] space.] [Provide pop-up drain.]

 **D201004 SINKS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
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 countertop [kitchen] sink with [one] [two] compartments in the [kitchen] [\_\_\_\_] space. [Provide waste disposer unit.]

[Provide service sink in the [\_\_\_\_] space.]

[Provide mop sink in the [\_\_\_\_] space.]

[Provide laundry sink in the [\_\_\_\_] space.]

 **D201005 SHOWERS/TUBS**

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

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NOTE: Research with the client to determine what type of bathtub material is acceptable. All applications may not require cast iron bathtubs. Consider facility type, abuse, initial cost, and maintenance.
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[Provide an [enameled cast iron] [porcelain steel] bathtub and shower supply fittings in the [\_\_\_\_] space.]

[Provide a [one piece [fiberglass reinforced plastic (FRP)] [acrylic] bath and shower module][shower stall][ with [terrazzo] [acrylic] shower floor] and shower supply fittings] in the [\_\_\_\_] space.]

[Provide push button flow control for handheld showerheads.]

 **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 in the [\_\_\_\_\_\_] spaces.]

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

 **D201090 EMERGENCY FIXTURES**

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NOTE: Where required by local or other authorities, provide a pressure-compensated tempered water supply with the temperature held between 60 and 95 degrees F for all emergency shower (ES)/eyewash shower (EWS) connected to the potable water system, including those installed outdoors. Ensure the hot water system is sized to include the full flow of at least one ES/EWS for not less than 15 minutes. Water too cold may cause the victim to leave the shower too soon, thereby increasing the risk of injury. Water too warm may scald the victim, who needs to stay in the shower, and any chemical reactions present will increase in rate with increasing temperature.
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Provide emergency [shower] [eyewash] [shower and eyewash] in the [\_\_\_\_] space [with [privacy curtain and rail] [privacy enclosure].

[Provide tepid water (\_\_F to \_\_F) with water tempering valve assembly.]

Provide alarms and appurtenances for service within NEMA type [3 or 4] [7 or 9] enclosures.]

 **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] [PVC piping] [CPVC piping] and fittings for [above ground] [and] [buried] piping.

 **D202002 VALVES & HYDRANTS**

[Provide isolation valves at supply to each floor.] Provide hose bibbs in mechanical rooms [and] [\_\_\_\_]. Provide [wall hydrants] [hose bibbs] along the building exterior such that all points along the perimeter can be reached with a 100 foot (30 meter) long hose. [Provide hose bibbs to service [rooftop HVAC equipment][and solar panels].]

 **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 backflow preventers of types and at points within domestic water systems as specified by IPC. Locate building backflow preventer inside the mechanical room on service entrance lines where not provided exterior to the building. Provide reduced pressure principle type backflow preventer at all 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 [electric] [[natural gas] [propane] [oil] fired] water heater for heating of domestic water.]

[Provide instantaneous electric water heater for the [\_\_\_\_] space.]

[Provide steam heat exchanger for heating of domestic water. Provide storage tank.]

[Provide master thermostatic mixing valve.]

[Provide domestic hot water recirculation system with high efficiency recirculation pump and recirculation loop with all associated fixtures, equipment, and appurtenances, Provide [in-line] [base mounted] circulator for 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 domestic water booster system for domestic water distribution system.]

 **D202004 INSULATION & IDENTIFICATION**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
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]. [Provide ice maker connector box for refrigerators.]

 **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**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
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 [hub and spigot] [hub less] pipe and fittings, [rubber compression gasket joints] for [above] [below] ground installation.]

[Provide plastic [PVC] [ABS] piping, fittings, and solvent cement for [above] [below] ground installation.]

 **D203002 VENT PIPE & FITTINGS**

[Provide cast iron [hub and spigot] [hub less] pipe and fittings, [rubber compression gasket joints].]

[Provide plastic [PVC] [ABS] piping, fittings, and solvent cement.]

 **D203003 FLOOR DRAINS**

Provide floor drains in mechanical rooms, restrooms, and plumbing chase areas.

[Provide floor sinks in kitchens.]

[Provide floor sinks to receive condensate from air handling units.]

 **D203004 SANITARY & VENT EQUIPMENT**

Provide sump pump in the [\_\_\_\_\_].

Provide sewage pump in the [\_\_\_\_\_].

 **D2040 RAIN WATER DRAINAGE**

 **D204001 PIPE & FITTINGS**

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NOTE: Typically, concealed interior roof drain systems are prohibited. Coordinate with the Architectural group.
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NOTE: Consider potential for plenum application. If using plenum for distribution, provide plenum-compatible piping materials.
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NOTE: Coordinate with the Civil engineer for type of piping utilized beyond the 5’ building line. It would be wise to match the pipe to tie into.
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Provide Cast iron [hub and spigot] [hub less] pipe and fittings [above][below] ground. [Provide PVC piping, fittings, and solvent cement [above][below] ground.] [Provide ABS piping, fittings, and solvent cement [above][below] ground.]

 **D204002 ROOF DRAINS**

Provide roof drains that are compatible with the roofing system.

 **D204004 INSULATION & IDENTIFICATION**

Provide the same as domestic water piping.

 **D204090 OTHER RAIN WATER DRAINAGE SYSTEM**

[Provide rainwater harvesting system.]

[Provide storm water filtration.]

 **D2090 OTHER PLUMBING SYSTEMS**

 **D209001 SPECIAL PIPING SYSTEMS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
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 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].]]

 **D209002 ACID WASTE SYSTEMS**

Provide acid waste system in the [\_\_\_\_\_\_].

 **D209003 INTERCEPTORS**

**\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*
NOTE: Include the following paragraph where an oil/water interceptor is required in or adjacent to the facility. Edit to suit the application. Oil/water interceptors located away from the facility should be covered in section G30, Site Mechanical Utilities. Coordinate with the civil engineer on the project
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Provide an oil/water interceptor for the [\_\_\_\_\_].

Provide a grease interceptor for the [\_\_\_\_\_].

 **D209005 COMPRESSED AIR SYSTEM (NON-BREATHING)**

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NOTE: Edit requirements for Compressed Air systems as required for the project.
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Provide air compressor, [refrigerated air dryer,] [aftercooler], and receiver. Provide piping and compressed air drops with quick disconnects throughout the work areas to allow connection of equipment such as pneumatic tools and air guns.

 **D209090 OTHER SPECIAL PLUMBING SYSTEMS**

[Provide grey water (waste water) recovery system.]

--End of Section--