

PROJECT 619-23-105

Correct FCA Assessment Findings on Failing Plumbing Conditions for Building 1

Construction Scope of Work – 3-Year Timeline (CFM/OHE-Aligned Format)

1.0 GENERAL

1.1 Project Overview

This construction project will correct Facility Condition Assessment (FCA) findings related to failing domestic hot and cold water plumbing conditions in Building 1 and address waterborne pathogen (e.g., Legionella) risk. The work includes removal of dead-leg piping, upgrades to domestic hot water (DHW) and domestic cold water (DCW) systems, installation of a chilled domestic water system, implementation of continuous water quality monitoring, and distribution system modifications. The primary functional areas of focus include the 2nd Floor and patient care areas on the 3rd Floor, with building-wide domestic water improvements as required.

1.2 Objectives

- Eliminate dead-leg piping to reduce stagnation and pathogen growth.
- Maintain DHW temperatures and DCW temperatures in ranges consistent with VA and applicable guidelines for Legionella risk mitigation.
- Provide reliable system-wide recirculation, mixing, and monitoring to improve safety and performance.
- Support continuous compliance with VA, VHA, and applicable codes/standards for healthcare facilities.

1.3 Applicable Standards and References

- VA Office of Construction & Facilities Management (CFM) and Office of Healthcare Engineering (OHE) guidelines for scopes of work and plumbing/water systems in healthcare facilities.
- VHA directives and handbooks related to Legionella and water management (e.g., VHA Legionella/Water Safety guidance).
- VA Technical Information Library (TIL) plumbing and mechanical design manuals and master specifications as applicable.
- International Plumbing Code (IPC) or locally adopted plumbing code.
- ASHRAE, ASPE, and relevant NSF/ANSI standards for potable water systems.
- NFPA, OSHA, and other applicable federal, state, and local codes and regulations.

1.4 Coordination and Phasing

The Contractor shall coordinate all activities with Facility Engineering, Infection Prevention,

Safety, and affected clinical services. Work shall be phased to maintain continuous operation of patient care functions, with outages and tie-ins scheduled during off-hours or weekends as directed by the facility.

2.0 DETAILED SCOPE OF WORK

2.1 Demolition and Piping Modifications

2.1.1 Removal of Dead-Leg Piping

Identify and remove all sections of domestic water “dead-leg” piping (both hot and cold) throughout Building 1, from fixtures back to the main distribution trunks as required to eliminate stagnant branches. Cap, reconfigure, or reroute piping to maintain proper flow-through conditions in accordance with VA and CFM/OHE guidance. Restore all disturbed architectural finishes (walls, ceilings, floors) to match existing construction after piping modifications are complete.

2.1.2 Re-Insulation of Domestic Hot Water Piping

Survey all DHW and DHW return (DHWR) piping for missing or damaged insulation. Remove deteriorated insulation and install new code-compliant thermal insulation with appropriate vapor barrier where required. Ensure continuity of insulation at fittings, valves, and appurtenances, per VA master specifications.

2.2 Domestic Hot Water (DHW) System Upgrades

2.2.1 Water Heater Temperature and Master Mixing Valves

Adjust water heater setpoints so that DHW storage temperatures are maintained at 140°F. Where existing master mixing (tempering) valves are not present on the outlet of DHW heaters, furnish and install new master mixing valves sized for the full heater capacity. Commission and balance mixing valves to deliver safe, code-compliant fixture outlet temperatures while maintaining elevated storage temperatures for pathogen control.

2.2.2 DHW Recirculation and Distribution Improvements

Extend DHW return (DHWR) piping to within 6 feet of all DHW fixtures (sinks, lavatories, and other applicable outlets), minimizing dead-leg volumes. At each sink/lavatory, furnish and install point-of-use thermostatic mixing valves (TMVs) or mixing devices to allow the distribution piping to operate at elevated DHW temperatures while delivering safe outlet temperatures to patients and staff. Replace existing DHW recirculation pumps with new pumps appropriately sized to accommodate increased flow requirements due to extended DHWR loops and added mixing hardware. Balance all DHWR circuits to maintain required minimum return temperatures throughout the building.

2.3 Domestic Cold Water (DCW) and Chilled Domestic Water System

2.3.1 Chilled Domestic Water Plant

Furnish and install a new system to chill incoming domestic cold water to below 68°F, consisting of a chiller system (air-cooled or water-cooled with cooling tower and condenser water system), a plate-and-frame or shell-and-tube heat exchanger specifically designed for domestic water applications, and chilled water pumps with associated hydronic piping,

valves, strainers, and specialties. Locate and install equipment in designated mechanical spaces as approved by the facility and in accordance with structural, noise, and service clearance requirements.

2.3.2 Domestic Cold Water Recirculation (DCWR) Loop

Install a new insulated domestic cold water recirculation (DCWR) piping loop in parallel with the existing DCW distribution system throughout the entire building. Provide DCWR mains, risers, and branches as needed to maintain circulation and temperature control in all critical areas, with particular focus on the 2nd Floor and patient areas on the 3rd Floor. Furnish and install DCWR pumps, balancing valves, and check valves to maintain stable flow and minimize stagnation.

2.3.3 Insulation of Cold Water Piping

Insulate all new and existing DCW and DCWR piping that now operate at chilled water conditions, including fittings and valves, with appropriate thermal insulation and continuous vapor barrier to prevent condensation and protect finishes.

2.4 Disinfection, Chemical Injection, and Monitoring

2.4.1 Chlorination Injection Stations

Furnish and install one chlorination injection station per floor for Building 1, complete with metering pumps, solution tanks, controls, and safety provisions. Tie injection points into the domestic water distribution in locations approved by the facility to ensure uniform distribution. Provide all required plumbing, chemical-resistant tubing, backflow prevention, and containment measures.

2.4.2 Continuous Water Quality Monitoring System

Furnish and install a continuous monitoring system on the incoming domestic water service. System shall monitor, at a minimum, pH, chlorine (free or total, as specified), and water temperature. Integrate monitoring and alarm points into the existing Building Automation System (BAS) or other VA-approved monitoring platform. Provide user interface, trending capability, and data logging consistent with CFM/OHE and facility requirements.

2.5 Controls, Electrical, Structural, and Architectural Work

2.5.1 Controls Integration

Provide DDC controls, sensors, and programming required for proper operation of the chilled domestic water system, recirculation pumps, chemical injection stations, and monitoring equipment. Coordinate with existing BAS vendor to ensure compatibility and standardized graphics.

2.5.2 Electrical

Provide new electrical feeders, disconnects, starters/VFDs, and panels as required for new pumps, chiller plant equipment, controls, and monitoring systems, in compliance with VA electrical standards. Coordinate shutdowns and tie-ins with facility to avoid disruption of critical operations.

2.5.3 Structural and Architectural

Provide structural supports, housekeeping pads, seismic restraints, and pipe supports as required. Patch and repair all disturbed architectural and finishes surfaces to match existing construction.

2.6 Testing, Commissioning, and Training

Perform hydrostatic testing, flushing, and disinfection of all new and modified piping systems in accordance with VA and code requirements. Functionally test all pumps, valves, mixing valves, chiller plant components, injection stations, and monitoring devices. Provide test and balance for domestic water flows as required for proper recirculation and temperature maintenance. Support commissioning activities as directed by the VA Commissioning Agent, including pre-functional checklists, functional performance testing, and trend reviews. Provide training for facility operations staff on system operation, monitoring, maintenance, and emergency procedures, with O&M manuals and as-built drawings.

3.0 THREE-YEAR CONSTRUCTION TIMELINE (PERIOD OF PERFORMANCE)

Total Construction Duration: 36 months from Notice to Proceed (NTP), inclusive of phasing and coordination with clinical operations. The Contractor shall develop a detailed Critical Path Method (CPM) schedule consistent with the following framework.

3.1 Year 1 (Months 1–12): Mobilization, Central Systems, and Initial Floors

- Mobilization, submittals, and procurement of long-lead equipment (chiller, heat exchanger, pumps, monitoring system, injection equipment).
- Detailed field verification of existing domestic water systems in Building 1.
- Installation of central chilled domestic water plant (chiller, cooling tower if used, heat exchanger, chilled water pumps).
- Installation of main portions of the DCWR loop and associated insulation in non-patient or low-acuity areas.
- Installation of central continuous monitoring system at incoming domestic service.
- Begin removal of dead-leg piping and DHW/DCW corrections in mechanical spaces, basement, and selected non-patient areas.
- Initial installation and testing of one or more chlorination injection stations to validate approach and controls.

3.2 Year 2 (Months 13–24): 2nd Floor and 3rd Floor Patient Care Areas

- Execute phased work on 2nd Floor and patient areas on the 3rd Floor in close coordination with clinical leadership.
- Extend DHWR piping to within 6 feet of fixtures and install point-of-use mixing valves at sinks/lavatories in these areas.
- Complete removal of remaining dead-leg piping serving these floors.
- Complete DCWR loop distribution to serve all patient care zones on 2nd and 3rd floors.
- Replace DHW recirculation pumps and balance DHW/DHWR circuits for these areas.

- Install and commission chlorination injection stations on each floor; integrate injection controls with monitoring system.
- Conduct interim testing, flushing, disinfection, and functional performance testing for upgraded areas.

3.3 Year 3 (Months 25–36): Building-Wide Completion, Optimization, and Closeout

- Complete any remaining DHW/DCW/recirculation work in residual areas of Building 1.
- Perform global rebalancing of DHW/DHWR and DCW/DCWR systems building-wide.
- Fine-tune setpoints and control sequences for chiller plant, pumps, injection systems, and monitors based on trend data and Water Management Program feedback.
- Complete final testing, sterilization/disinfection (as required), and integrated commissioning of the entire domestic water system.
- Deliver final as-built drawings, O&M manuals, training records, and commissioning reports.
- Address all punch list items and provide warranty documentation.

4.0 DELIVERABLES (MINIMUM)

- Detailed construction CPM schedule reflecting the 36-month period of performance, with clearly defined phases by floor/area and system.
- Submittals for all major equipment, valves, piping, insulation, controls, and monitoring hardware in accordance with VA/CFM/OHE requirements.
- Interim and final test reports (pressure tests, disinfection certificates, water quality and temperature trend summaries).
- Commissioning documentation and training materials.
- Record (as-built) drawings and updated riser diagrams for DHW, DHWR, DCW, and DCWR systems, and associated equipment.