SECTION 22 33 33 – electric domestic water heaters (point-of-use)

1. GENERAL
	* + 1. RELATED DOCUMENTS
				1. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.
				2. Specifications throughout all Divisions of the Project Manual are directly applicable to this Section, and this Section is directly applicable to them.
			2. SUMMARY
				1. This section covers providing all labor and materials for the complete first class installation of point-of-use electric storage (6 - 50 gallon) tank type domestic water heaters indicated and scheduled on Contract Drawings complete with all controls, piping, valves, wiring, supports, accessories, testing, and other normal parts required for complete, code compliant, operable installation that is acceptable to the authorities having jurisdiction.
			3. REFERENCE STANDARDS
				1. The latest published edition of a reference shall be applicable to this Project unless identified by a specific edition date.
				2. All reference amendments adopted prior to the effective date of this Contract shall be applicable to this Project.
				3. All materials, installation and workmanship shall comply with the applicable requirements and standards addressed within the following references:

2009 Edition of the International Plumbing Code

Underwriters Laboratories Listings

2008 Edition of the National Electric Code

* + - 1. QUALITY ASSURANCE
				1. Heaters shall be designed to limit the maximum temperature to avoid scalding.
				2. Manufacturer Qualifications: Company shall have minimum three years documented experience specializing in manufacturing the products specified in this section.
				3. Provide equipment with manufacturer's name, model number, and rating/capacity permanently identified.
				4. Water heater shall meet or exceed the minimum energy factor requirements of ASHRAE Standard 90.1b -2001.
				5. Installer Qualifications: Company shall have minimum three years documented experience specializing in performing the Work of this section. Installation of plumbing systems shall be performed by individuals licensed by the AHJ as a Journeyman or Master Plumber. Installation may be performed by Apprentice Plumbers provided they are registered with the AHJ and under direct supervision of a licensed plumber. All installation shall be supervised by a licensed Master Plumber.
				6. Products and installation of specified products shall be in conformance with recommendations and requirements of the following:

National Sanitation Foundation (NSF).

National Electric Code (NFPA 70).

UL Standard 1453 or UL Standard 174 - Electric Booster and Commercial Storage Tank Water Heaters.

* + - 1. SUBMITTALS
				1. Product Data:

Include dimension Drawings of water heaters indicating piping, components and required connections.

Manufacturer's data sheets, wiring diagrams and Installation Instructions.

Provide complete description of equipment materials, electrical characteristics, options provided, warranty, maximum water pressure requirements and code compliance.

* + - * 1. Record Documents:

Provide full written description of manufacturer’s warranty.

* + - * 1. Operation and Maintenance Data:

Include operation, maintenance, and inspection data, replacement part numbers and availability, and service depot location and telephone number.

* + - 1. DELIVERY, STORAGE and HANDLING
				1. Accept products on Site in factory packaging. Inspect for damage. Maintain products in factory packaging until installation.
				2. Provide temporary inlet and outlet caps when not factory provided. Maintain caps in place until installation.
				3. Protect components from damage after installation.
				4. Do not allow use of heater for any reason, other than testing, during the construction phase of this project.
			2. warranty
				1. The manufacturer shall provide a three-year warranty in writing against tank leaks caused by corrosion and one-year parts warranty against operational failure due to faulty manufacturing or materials.
				2. The complete system shall be warranted in writing against defects in materials or workmanship under normal use and service for a period of one year after date of Substantial Completion.
1. PRODUCTS
	* + 1. GENERAL
				1. All materials shall meet or exceed all applicable referenced standards, federal, state and local requirements, and conform to codes and ordinances of authorities having jurisdiction.
			2. point of use domestic water heater
				1. Acceptable manufacturers

State

Rheem

A.O. Smith

Lochinvar

All electric point-of-use storage tank type water heaters provided within this project shall be the product of one manufacturer.

* + - * 1. Furnish and domestic hot water heaters with dimensions, capacities and electrical characteristics as scheduled on the Contract Drawings and as outlined herein. This Specification describes minimum quality and performance requirements. Variations of system components by the individual referenced manufacturers are acceptable for installation in this project provided they meet or exceed all of the requirements indicated herein, are compatible with the electrical service provided and fit properly in the allocated space.
				2. Heater shall have 150 psi working pressure and be equipped with extruded high density anode rod. All internal surfaces of the heater exposed to water shall be glass-lined with an alkaline borosilicate composition that has been fused to steel by firing at a temperature range of 1600°F.
				3. Direct-Immersion threaded electric heating elements heating elements shall be medium watt density with zinc plated copper sheath. Each element shall be controlled by an individually mounted thermostat and high temperature cutoff switch. Heaters having double-elements shall be provided with simultaneous wiring to permit both elements to operate at the same time.
				4. The heater outer jacket shall be of baked enamel finish and shall be provided with full size control compartment for performance of service and maintenance through hinged front panels and shall enclose the tank with foam insulation.
				5. Water heater shall have a properly sized, factory provided temperature and pressure relief valve.
				6. The tank drain valve shall be located in the front for ease of servicing.
			1. Vacuum Relief Valves
				1. Construction shall be bronze body with silicone disc having a dry guide which is located out of the water. Unit shall open at less than 1/2" vacuum and be suitable for use within a system having a maximum water pressure of 200 psi and a maximum temperature of 250°F. Vacuum relief valves shall be in compliance with the appropriate requirements of ANSI Z21.22.
				2. Vacuum relief valves shall be manufactured by Watts Regulator, Wilkins or Conbraco.
1. EXECUTION
	* + 1. PREPARATION
				1. Provide 4” high reinforced concrete housekeeping pad beneath floor mounted water heaters or provide heater with legs/base manufactured by heater manufacturer.
			2. INSTALLATION
				1. Installation shall meet or exceed all applicable federal, state and local requirements, referenced standards and conform to codes and ordinances of authorities having jurisdiction.
				2. All installation shall be in accordance with manufacturer’s published recommendations.
				3. Install water heaters, piping, wiring and accessories in accordance with the manufacturer’s installation instructions.
				4. Furnish all supports required by the equipment included in this Contract in accordance with the manufacturer’s published instructions.
				5. Each water heater located above ceiling or at any location where leakage would result in damage to the building or its contents shall be provided with and set within a safety pan equipped with a minimum ¾ inch drain connection. Safety pans shall be minimum 24 gauge galvanized sheet metal and be three inches larger on all sides than the water heater, with a minimum depth of two inches.
				6. Connect and extend copper piping from pan drain connection and temperature and pressure relief valve and discharge separately to the exterior of the building and terminate between 6 and 24 inches above grade at a visible location that cannot cause damage to property or personnel. Relief valve shall not discharge into safety pan.
				7. Safety pan and relief valve drain lines shall be copper and installed so that all water will drain completely out of the piping. Where it is impractical or physically impossible to extend a drain line to the building exterior, drain lines shall discharge separately into a floor drain, housekeeping mop sink or other location approved by the BJC HEALTHCARE.
				8. Each water heater shall be provided with clear access and unobstructed passageway that is adequate to allow removal and replacement.
				9. Install heater in a vertical position with a clearance on all sides for servicing. Coordinate location of unit to avoid conflicts with other system or building components.
				10. Furnish and install all necessary valves, strainers, unions, etc. to facilitate proper functioning and servicing of equipment.
				11. Provide dielectric isolation device where copper lines connect to ferrous lines or equipment.
				12. Install an accessible line size shutoff valve in cold water inlet within two feet of heater.
				13. Provide heat trap inlet piping for storage type heaters to prevention migration of heated water into cold water system.
				14. Provide heat trap in outlet piping for storage type heaters serving non-circulated distribution systems.
				15. Provide a vacuum relief valve in cold water supply to heaters having bottom feed inlet. Install valve in accordance with manufacturer's recommendations.
				16. Provide a temperature gauge in the outlet piping adjacent to storage type heaters. Locate gauge in an easily readable position.
				17. Flush water supply line to remove all air, scale and dirt prior to connecting heater.
				18. Take precautions to prevent heat generated by soldering procedures from being transmitted to heater components.
				19. Coordinate with Electrical Contractor for power and wiring required. Verify that electrical power is connected to a properly grounded dedicated branch circuit of proper voltage rating and equipped with ground fault interrupter. Each heater shall be provided with an independent circuit. Insure that the correct wire and circuit breaker sizes are provided.
				20. When all plumbing installation is completed, check for leaks and take corrective action before proceeding. Flow hot water until temperature has stabilized. Verify and insure that the water meets scheduled temperature at all outlets. Clean heater water prior to final inspection of installation.
			3. Training
				1. Contractor shall instruct and acquaint the Owner with the proper functioning, operation and maintenance of the water heater and all associated installed components.

END OF SECTION 22 33 33