

Commercial Circulating Systems

Circulating Hot Water System:

A specifically designed water distribution system where one or more pumps are operated in the service hot water piping to circulate heated water from the water-heating equipment to the fixture supply and back to the water-heating equipment.

Demand Recirculation Water System:

A water distribution system where one or more pumps prime the service hot water piping with heated water upon a demand for hot water

Heat Trace: (Not defined in the Energy Code but here for reference)

A heat trace system is an electrical system used to maintain or raise the temperature of pipes and vessels. The electric heating is achieved by utilizing a resistant element that is run alongside the piping or vessel

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C404.6.1 Circulation systems (2018 & 2021)

- Heated-water circulation systems shall be provided with a circulation pump.
- The system return pipe shall be a dedicated return pipe or a cold water supply pipe.
- Gravity and thermo-syphon circulation systems shall be prohibited.
- Controls for circulating hot water system pumps shall automatically turn off the pump when the water in the circulation loop is at the desired temperature and when there is not a demand for hot water.
- The controls shall limit the temperature of the water entering the cold water piping to not greater than 104°F

C404.6.1.1 Demand recirculation controls (2018 & 2021)

- Demand recirculation water systems shall have controls that start the pump upon receiving a signal from the action of a user of a fixture or appliance, sensing the presence of a user of a fixture, or sensing the flow of hot or tempered water to a fixture fitting or appliance.

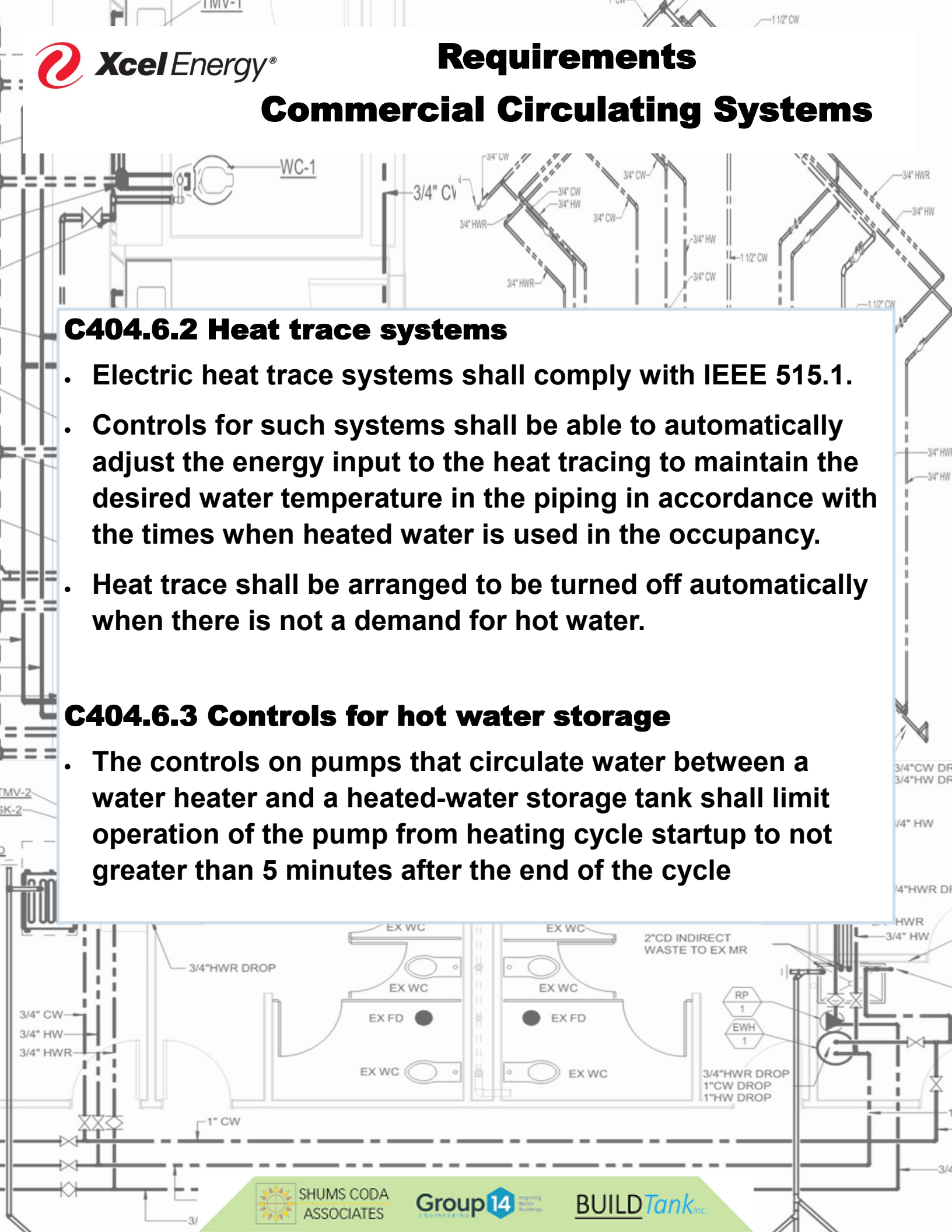
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C404.6.2 Heat trace systems

- Electric heat trace systems shall comply with IEEE 515.1.
- Controls for such systems shall be able to automatically adjust the energy input to the heat tracing to maintain the desired water temperature in the piping in accordance with the times when heated water is used in the occupancy.
- Heat trace shall be arranged to be turned off automatically when there is not a demand for hot water.

C404.6.3 Controls for hot water storage

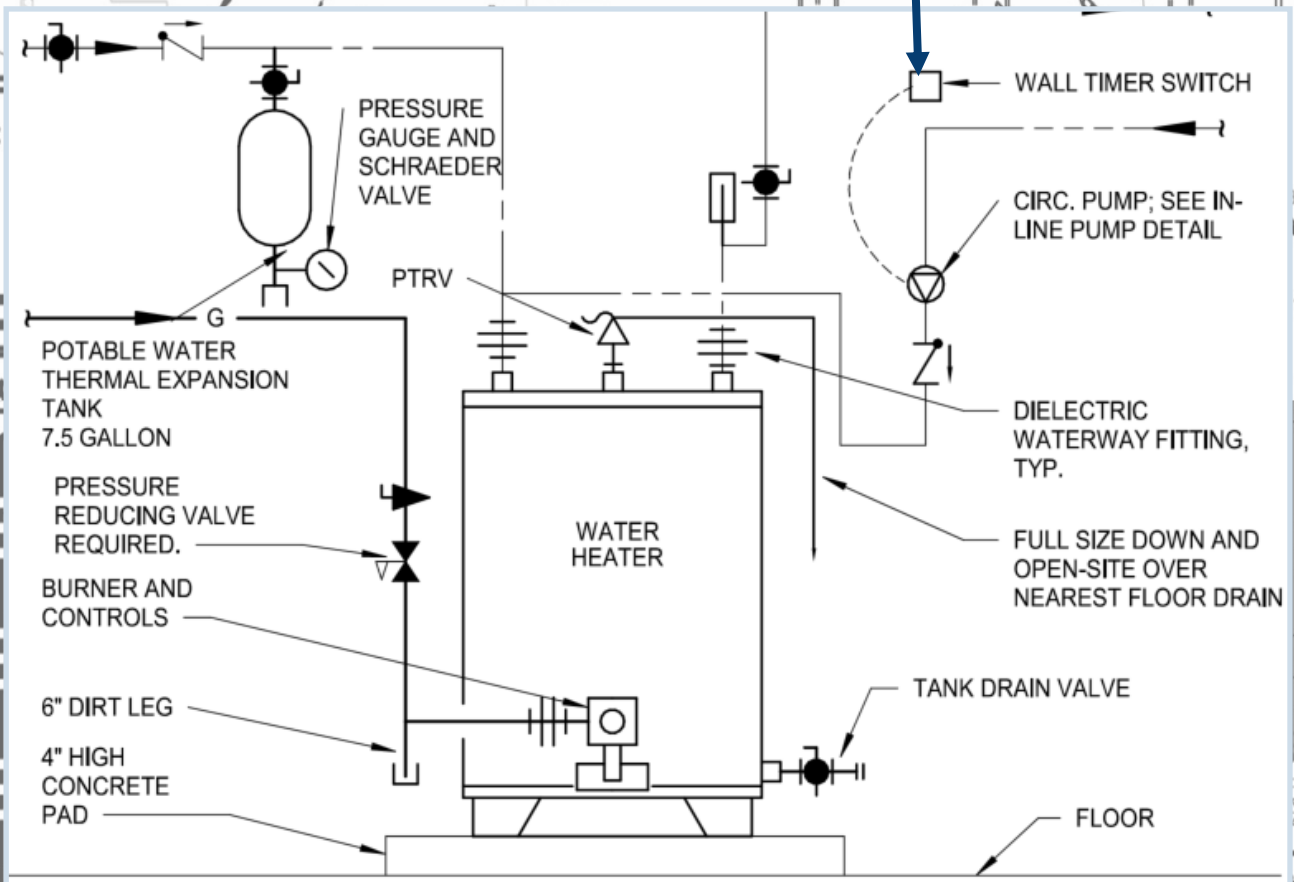
- The controls on pumps that circulate water between a water heater and a heated-water storage tank shall limit operation of the pump from heating cycle startup to not greater than 5 minutes after the end of the cycle



Plan Review/Inspection Circulation systems

Plans may contain very detailed sections others may be generic in nature with the details in the specifications document.

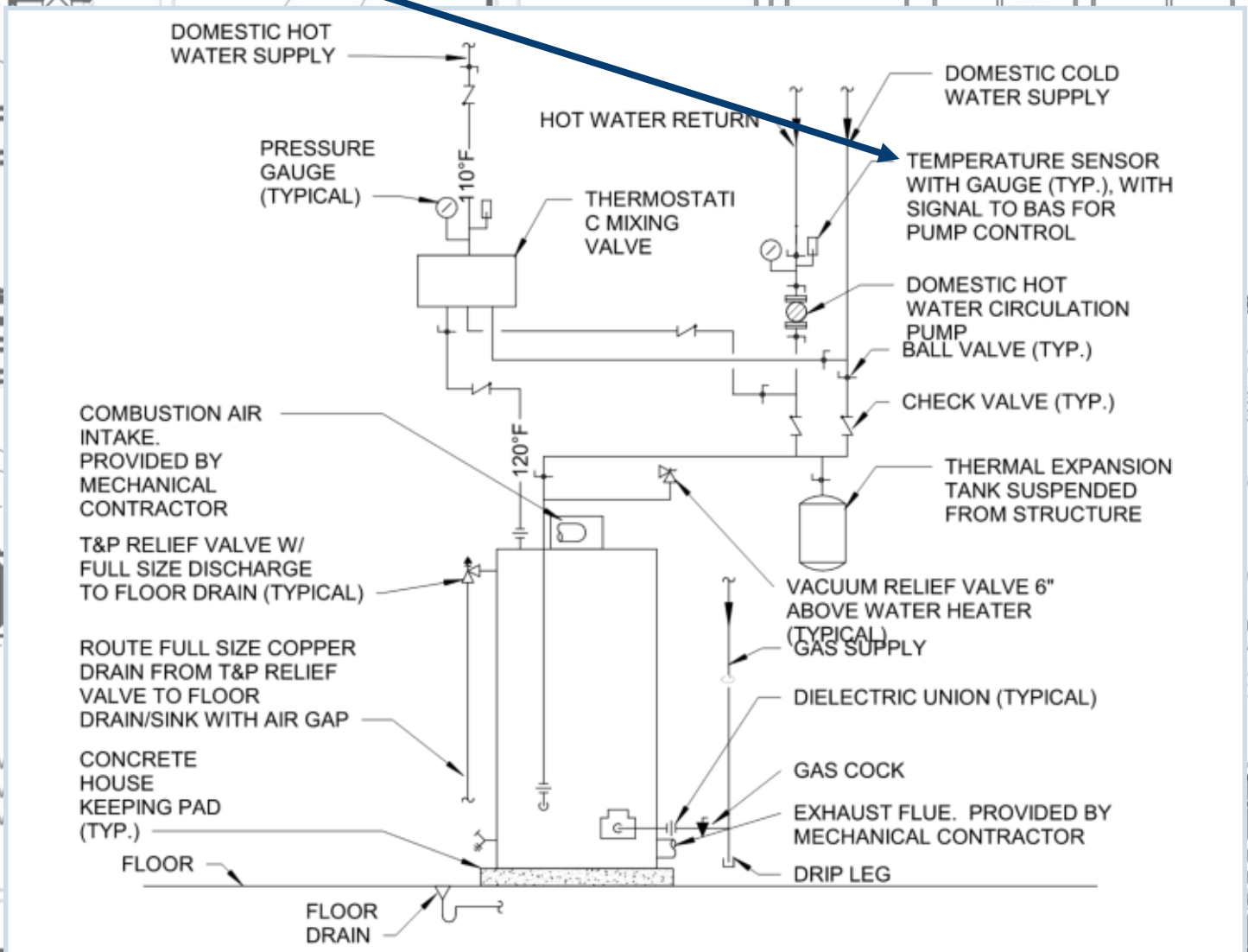
Adding a simple timer is not code compliant



Plan Review

Circulation systems

- Plans may contain very detailed sections others may be generic in nature with the details in the specifications document.
- **BAS = Building Automation System**
Code compliant circulation system. Has a circulation pump with a temperature sensor for pump control.



Inspection

Circulation systems

The key for inspections is to rely on what the accepted plans indicate.

Verify:

- Was any type of recirculation system installed? Yes.
- Was the system shown in the plans.
- If not request plans for review.
- Verify that the pump and temperature sensor were installed and that the needed controls were installed.
- With Building Automations System (BAS) you may need to speak with the technicians that are programming the BAS

