**Storage System with Tankless for Recovery and Redundancy**

Tankless water heaters shall be installed indoors or outside with a remote control per the manufacturer instructions. The tankless shall be plumbed in conjunction with a commercial rated storage tank(s). The tankless will act to recover the storage tank through a high capacity pump (P-1) controlled by an immersion aquastat (S-1) installed in the tank(s). Cold water will enter the bottom inlet of the storage tanks, hot water will exit the tanks feeding a thermostatically control tempering valve and untempered line that feeds the domestic use hot water. The end of the hot water building loop will return to the bottom inlet of the storage tank through a recirculation pump sized for the building head (P-2) and controlled by an immersion aquastat (S-2) that is installed in the return line. A timer (T-1) will be used to shut down the pump during off-peak periods.

S-1 should be set 5°F below the tankless temperature setting; S-2 should be set 5°F below the mixing valve temperature. T-1 should be set to shut off the loop during periods when hot water is not needed, and on an hour before typical use periods to help reduce energy usage.

Normally Closed Bypass valves may be installed in the system to prevent down time in the event of a tank failure, allowing the system to operate at a reduced capacity. All plumbing, pipe size, valves, should be specified by a mechanical engineer or the installing contractor.

Written System Description

**System Components**

P-1 Circulation Pump
- Sized to meet 9.5 GPM times the number of tankless units
- @ 50ft of Head Pressure (Example: 6 Tankless units would need to be rated at 57 GPM @ 50ft of Head)
- Storage Tank sized to meet the dump load requirements of the application

V-1 Storage Aquastat
- Set 5 to 10°F below the tankless temperature setting

S-1 Immersion Aquastat
- 5°F below tankless temperature setting

T-1 24-Hour Programmable timer
- Set to turn off the pump in off peak periods

P-2 Circulation Pump
- Sized to meet the flow and head required for the building.
- 24-Hour Programmable timer
- Set point at 10°F below tank set temperature.

Q-1 Immersion Aquastat
- Set point at 10°F below tank set temperature

*See the Tankless Piping Diagram Book for details on various manifold systems*