



Solar Water Heater Program System Completion Form



CERTIFICATE OF INSTALLATION

Site Address _____ Customer Name _____

The solar water heater described below and installed at the above address is complete and meets all requirements of Emerald People's Utility District Solar Water Heater Program. I, the undersigned, certify the information on this form is true and correct.

Company Name _____ Signature _____

Name (Printed) _____ Date _____

SYSTEM DATA

System Name & Model # _____
Total Collector Area _____ ft² (net/gross) Tilt _____ degrees Orientation _____ degrees E or W of true south

PRESSURE INFORMATION

Initial Incoming Water Supply Pressure: _____ psi Corrected Incoming Water Supply Pressure: _____ psi
Existing or Installed Backflow Preventer, Check Valve, or Pressure Reducer? yes / no

TYPE OF SOLAR WATER HEATER INSTALLED

____ Single tank ____ Two Tank ____ Three Tank
____ Antifreeze ____ Drainback ____ Self Pumping ____ I.C.S ____ Thermosiphon ____ Other _____

SOLAR STORAGE TANK

Heat exchanger tank _____ Y/N If yes, then ____ wrap-around ____ internal ____ external
Manufacturer _____ Model # _____ Wattage _____ kW
Tank size _____ gallons Insulation R-value: Tank _____ Jacket _____ Total _____
Solar Storage Capacity _____ gallons Location _____

BACKUP ELECTRIC WATER HEATER (If two-tank system)

Tank size _____ gallons Insulation R-value: Tank _____ Jacket _____ Total _____
Thermostat settings: Upper _____ (degrees) Lower _____ (degrees) Location _____

COLLECTOR INFORMATION

Collector manufacturer _____ Model # _____ # Collectors _____

DIFFERENTIAL CONTROLLER (Active Systems Only)

Manufacturer _____ Model # _____

PIPE INSULATION

Brand/Type _____ Length of pipe runs (one way, storage tank to collectors) _____ feet

Company Inspecting:

Inspected by:

Date:

Emerald PUD Participating Contractor _____

Building Permit: _____ Eugene _____ Springfield _____ Lane County
New Construction __ Yes __ No Permit # _____ # of Bedrooms _____ # of People in Home _____

- ____ 18. High temperature rated closed cell foam pipe insulation with a minimum ¾-inch wall thickness is installed on all pipes in the system. R-12 minimum insulation is installed on potable water piping exposed to outdoor temperature or in unheated spaces.
- ____ 19. Pipe insulation is properly sized to fit pipe and continuously closed and sealed.
- ____ 20. Pipe insulation exposed to the outside is adequately protected.
- ____ 21. Underground piping is of the appropriate type and is fully enclosed with appropriately water proofed R-6 insulation designed for underground application, is protected from sharp objects, and is below frost line.
- ____ 22. Underground cross-linked polyethylene piping is continuous with no connections along the lengths to be buried.

Freeze Protection

- ____ 23. Approved freeze protection is provided.
- ____ 24. If an antifreeze system: a vented, double wall or approved heat exchanger has been installed.
- ____ 25. High temperature propylene glycol antifreeze solution has been used.

Valves

- ____ 26. Fully ported isolation valves are installed, enabling bypass of solar system.
- ____ 27. Anti-scald, pressure compensating tempering valve(s) are installed and are:
 - On the downstream side of the backup electric water heater(s).
 - Located after anti-convective plumbing.
 - Set no higher than 140° F.
- ____ 28. All valves, gauges and instruments are labeled per Bonneville specifications.
- ____ 29. Temperature & Pressure relief valve is installed on solar storage tank.
- ____ 30. Valves are supplied for filling, flushing, and draining collector loop and potable water piping.

Solar Storage Tank

- ____ 31. Minimum solar storage tank capacity of 1.25 gallons/square foot of collector net area is provided.
- ____ 32. Electric power is not connected to a roof-mounted tank or the solar tank (except for wiring to upper element on non-roof-mounted, single tank systems).
- ____ 33. Solar storage tank is insulated to Program standards. If in Oregon, and insulated to OSEIA standards, industry sticker is on the tank.
- ____ 34. If solar storage tank is located in space where water leakage could cause structural damage, drip pan with pipe routed to drain or outside is installed.
- ____ 35. Anti-convective piping with sweat fittings is installed on cold water supply inlet at top of solar storage tank.

E. Passive Systems (Thermosiphon, ICS, and Hybrid ICS)

- ____ 1. Roof-mounted solar storage tanks and ICS systems have adequate structural support per manufacturer's specifications.
- ____ 2. The potable water inlet and outlet piping on roof-mounted tanks and ICS systems is type L copper or brass and is piped to directly above the roof jack, where the connection to non-metal piping is made.
- ____ 3. Incoming supply line pressure to the system does not exceed 70 psi, and pressure reducing valve (if required) is properly located.
- ____ 4. A 90psi (150psi for ICS) cold-water expansion valve is installed in the collector/solar storage tank supply piping downstream of any pressure reducing valve, check valve or backflow preventer, and in an area not subject to freezing and routed to a positive drain.
- ____ 5. A check valve is installed in the cold water supply line before the cold water expansion valve for thermosiphon and ICS systems.
- ____ 6. A thermometer is installed between solar storage and auxiliary water heater tank in the inlet piping to and near the top of the auxiliary tank.
- ____ 7. Pressure relief valve at ICS collector outlet or temperature /pressure relief valve on solar tank are piped to drain per manufacturer's guidelines.
- ____ 8. Vacuum Tube Integrated Collector Storage systems include:
 - Circulation loop for high limit heat transfer with a differential controller, a check valve and pump in the piping from the collector(s).
 - Meets Specifications F. 3-7, 11-13, 20, & 31.
 - Expansion tank is installed when number of tubes is greater than four.

F. Active Systems (All)

- ____ 1. Incoming supply line pressure to the system does not exceed 90psi, and pressure-reducing valve (if required) is properly located.
- ____ 2. If a pressure-reducing valve, check valve, and/or back flow preventer is/are on potable supply line to the system, a properly sized and located expansion tank is installed.
- ____ 3. Collector loop plumbing has been thoroughly flushed and pressure tested prior to charging with collector fluid and system startup.
- ____ 4. Fluid has an adequate flow rate and circulates in proper direction.

Date of Inspection

EMERALD PUD SOLAR WATER HEATER PROGRAM INSPECTION CHECKLIST

- ___ ___ ___ 5. Circulation pump is installed with shaft oriented horizontally.
- ___ ___ ___ 6. System has been designed to allow for isolation of the circulation pump.
- ___ ___ ___ 7. Controller has correct settings and is mounted within 6 ft. of solar storage tank, hard-wired or plugged into nearest outlet, and wiring is securely attached.
- ___ ___ ___ 8. If PV powered system, the PV module is connected to the DC pump with wiring of appropriate gauge and type, and is installed through a dedicated roof jack with exterior conduit.
- ___ ___ ___ 9. If PV powered system, a DC rated on/off switch is installed between the PV module and the circulating pump.
- ___ ___ ___ 10. If PV powered system, a high temperature limit shutoff function is installed and wired through the circulation pump.
- ___ ___ ___ 11. Sensors are placed correctly, attached securely, and adequately insulated. Plug sensor is installed on solar tank when a fitting is provided.
- ___ ___ ___ 12. Sensor wiring has UV-rated exterior jacketing, is continuously attached, and is protected from abrasion, contact with 110V/220V lines/conduit, weather and high temperature, and has solid connections.
- ___ ___ ___ 13. Flow meter is provided.
- ___ ___ ___ 14. Thermometer is provided at hot water outlet port on solar storage tank.

Active Antifreeze Systems

- ___ ___ ___ 15. Fill valve has a label indicating non-toxic heat transfer fluid to be used.
- ___ ___ ___ 16. Fill and drain valves have leak-proof caps.
- ___ ___ ___ 17. Pressure gauge is installed in the collector loop and the operating pressure is within 10-45 psi.
- ___ ___ ___ 18. A 150 psi pressure relief valve piped to drain is installed on the return line from the collectors.
- ___ ___ ___ 19. A check valve is installed on return line from collectors near inlet to heat exchanger.
- ___ ___ ___ 20. A correctly sized and rated expansion tank is installed on supply line to collectors.
- ___ ___ ___ 21. A threaded plug fitting is installed at the high point in the collector loop and is insulated.

Active Drainback Systems

- ___ ___ ___ 22. Collectors are pitched a minimum of 1/8 inch per foot to inlet and piping is continuously pitched between collector and drainback reservoir with a minimum 1/8 inch per foot.
- ___ ___ ___ 23. There are no inverted U-loop piping configurations between the storage tank and the pump.
- ___ ___ ___ 24. A 150psi pressure relief valve is installed on drainback tank
- ___ ___ ___ 25. Drainback tank is insulated to Program standards for solar storage tanks.
- ___ ___ ___ 26. Distilled or deionized water and a suitable corrosion inhibitor have been used in the collector loop piping.
- ___ ___ ___ 27. Fill and drain valves have leak-proof caps.

Active Draindown Systems

- ___ ___ ___ 28. Collectors are pitched a minimum of 1/8 inch per foot to inlet and piping is continuously pitched between collector and draindown valve(s) with a minimum 1/8 inch per foot.
- ___ ___ ___ 29. The system tanks, vents, valves, pumps, and discharge piping are located in an enclosed, insulated space.
- ___ ___ ___ 30. Automatic air vent and vacuum relief valve are installed at the high point in the collector loop and are insulated.
- ___ ___ ___ 31. A Y-type strainer is installed in collector loop on supply side of the circulation pump.
- ___ ___ ___ 32. Drain line from the draindown valve is minimum 1/2" rigid copper pipe with a 1/4" per foot pitch to a positive drain and plumbed to within 12" of the valve. Transition poly tubing from the valve is inserted 3" into the copper pipe.

Notes: _____

