Building Division	SOLAR WATER HEATING Submittals and Guidelines City of Palo Alto (CPA) Building Inspection Division 285 Hamilton Ave. Inspection Request: 650 329-2496 **IVR# 704, 705, 706**	Revision Date:03/25/11 General Requirements/Checklist for: **Residential and Commercial** Codes Enforced: 2010 CPC,CRC,CBC,CMC, CEC Palo Alto Municipal Code (PAMC)
The information provided in this document is general and intended as a guide only. Each project is unique and additional requirements may be enforced as deemed appropriate.		

Palo Alto rebate program- Solar hot water link

SUBMITTALS AND INSPECTION GUIDELINES

- **ALL OF THE FOLLOWING REQUIREMENTS MUST BE INCLUDED ON THE COVER SHEET OF EACH SUBMITTAL**

☐ **A reduced pressure principle backflow preventer assembly** (RP) is required when a solar water heating system is installed *CPC 602.3*. Specify and identify the location of the RP on plans. Once the loop is closed with the installation of the RP the code (CPC 608.3) requires the installation of expansion tank(s) on all water heaters/ boilers. See "Backflow Prevention" guidelines for all general requirements.

☐ Specify what type of heat transfer medium is being used (propylene glycol, Ethylene glycol, water etc) Glycol Systems shall be limited to 200 degree F.

☐ Specify type of solar system.
(Example: Active or passive, open or closed loop)

☐ Provide complete installation and operation manuals for:
- Water heater
- Solar collector
- Water heater storage tank

☐ Drawings shall show floor/site plan with:
- Location of solar collector
- Rafter size and span
- Location of panels
- Weight of panels
- Attachment of panels to the structure
- Existing equipment (I.E. Photovoltaic panels)

☐ Provide type of listed attachments dry/wet weight of roof mounted solar collectors and storage tank if used on the roof. (Load of roof mounted equipment may require plan check engineer approval. Structural calculations and additional drawings may be required.)

- ☐ Submit roof calculations for collectors if over 5 pounds per square foot or:
  - Submit plans showing rafter size, length, species and grade of wood, spacing of rafters, and type of roof sheathing, size of roof sheathing, size of roof sheathing, and sizes of roof areas to receive the collectors (roof dimensions) to determine compliance with CBC 2308.10.3.
- ☐ Show roof pitch and type of roof covering. Provide rating (weight) of composition shingles and indicate number of roof overlays. Indicate if the roof framing is an engineered truss system.
- ☐ Provide flashing detail showing method of weather proofing and water proofing. *(Flashing and counter flashing)*
- ☐ Provide location of storage tank, water heater and heat exchanger. Include all required clearances and access.
- ☐ IAPMO/UL listing required for water heater/storage tank/controller/heat exchanger.
- ☐ An expansion tank is required on all systems with the exception of drain back systems.
- ☐ Double walled heat exchangers/Storage tank are required if a Glycol System is used (closed loop). Single wall heat exchangers are acceptable if the transfer medium contains substances as safe by the FDA with a Gosslin toxicity rating of 1. Equipment shall be permanently labeled “Non-toxic Propylene Glycol”.
- ☐ Anti-scald valves (Pressure/balance- thermostatic mixing type) are required on system at each plumbing fixture or on water heater outlet to home. Anti-scald valve protection is required to meet ASSE 1017, 1016 or 1070.
- ☐ Provide installation instructions of existing water heater if it is to be used with solar storage tank.(It must be suitable to be installed with solar storage tank)
- ☐ If a tankless water heater is used, it must be suitable to be installed with solar storage tank and must be able to control output temperatures over a range of input temperatures between 50 degrees F and 150 degrees F. Provide installation and maintenance instructions.
- ☐ Provide seismic braces for the water heater and storage tank. If the seismic braces are not going to be a listed product (I.E. Holdrite straps) then provide a detail for the anchorage.
- ☐ Brass, copper or stainless fittings shall be used only. Galvanized and steel are not allowed.
- ☐ Backflow control at the water meter requires an expansion tank.
- ☐ Electric water heaters require a separate dedicated circuit. Provide the size and amperage.
- ☐ Condensate shall be piped to the sanitary sewer.
- ☐ An isometric drawing is required showing the size, length of pipe and demand of all gas burning appliances
- ☐ Bond hot, cold and gas with number six copper.
- ☐ Venting- what type of material is being used to convey the products of combustion? Does it require a condensate drain?
- ☐ Anti-Scald valve protection is required meeting ASSE 1017,1016, & 1070
- ☐ Shut off valves should be placed on all equipment to allow installation and repair.

- ☐ Provide by-pass valve to allow the water heater to operate if the solar system must be shut down or if it leaks.
- ☐ Provide Pressure/ temperature relief valve at every isolatable heat generating device.
- ☐ Wood shall NOT be exposed to the elements (including Pressure Treated wood).
- ☐ Solar panels attachments shall be designed for a minimum wind speed of 85MPH
- ☐ Provide documentation that all components are listed and tested.
- ☐ Provide a pan under on all interior water heaters and drain them to an approved location.
- ☐ Prove 1" phenolic plaque on each panel and storage tank identifying the type of heat transfer liquid. (I.E. ethylene glycol, propylene glycol, water) and warning to avoid substituting any other fluid
- ☐ Provide a phenolic plaque indicating all valves and their intended use (i.e. how to shut off and isolate the system.)
- ☐ Pressure/temperature valve shall be run to an approved location.
- ☐ Hot water shall be piped directly to the storage tank.
  - Automatic freeze protection is required. Re-circulation (direct forced circulation) freeze protection not allowed. Drain back to a small reservoir is the safest form of freeze protection with, at least ¼ inch per foot gradient between the solar collector(s) and the drain back reservoir.
- ☐ Solar systems with **closed fluid loop** that contain heat transfer fluid requires an expansion tank.
- ☐ All solar hot water heating piping shall be insulated with minimum ¾" insulation and insulation exposed to sunlight shall be UV protected (i.e. approved exterior jacket.)

REQUIRED INSPECTIONS

1) IVR# 704 Roof attachments prior to installing panels
2) IVR# 702 Piping inspection when concealed.
3) IVR# 703 Final inspection