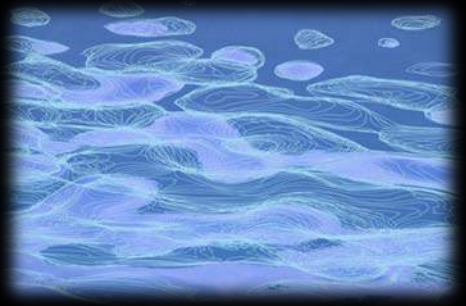


Strengthening the Self-Sufficiency of Poor Communities through Adopting the Construction and Utilization of Integrated Collector Storage Solar Water Heaters

RAEL BERKOWITZ

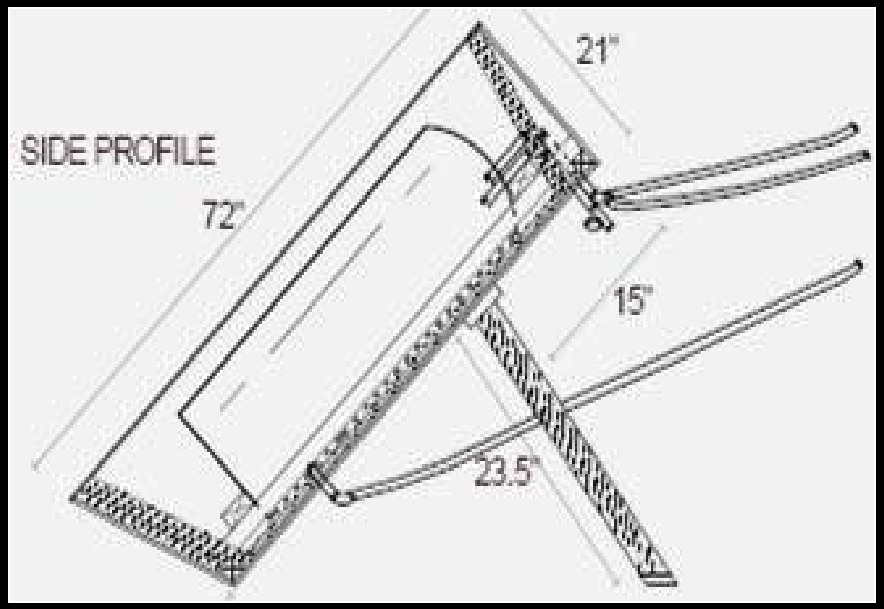
2010 - ASES CONFERENCE

ICS SOLAR WATER HEATER - COMMUNITY OF FOCUS

- Community of Valle de Las Palmas, Tecate MX
- Corazon Fostering Community Cohesion & Self-Sufficiency
- Renewable Systems Supporting Household Well-Being

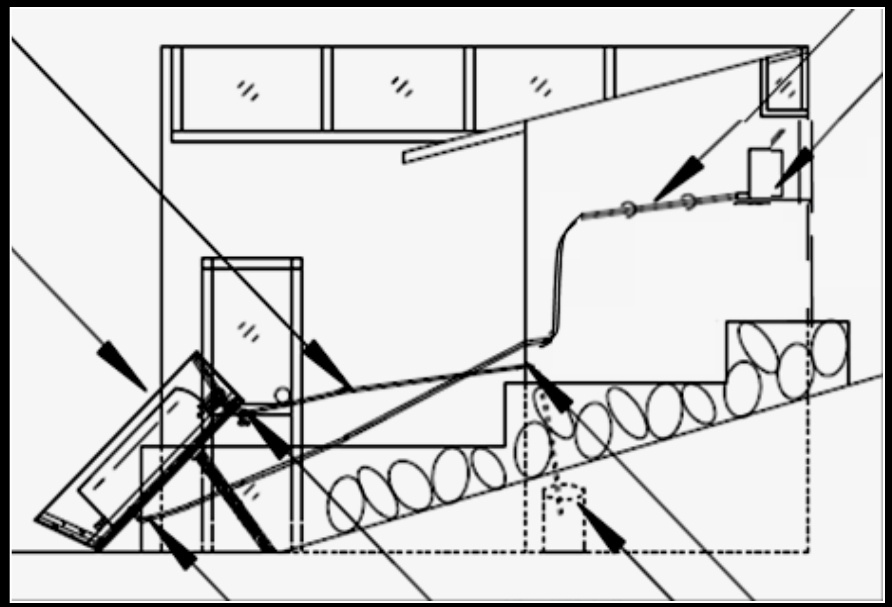
ICS SOLAR WATER HEATER - DEVICE OVERVIEW

- Passive Integrated Collector (ICS) Storage Solar Water Heater
- Greenhouse Effect, Tilt of Geographical Latitude
- Gravitational Water Circulation, Thermal Stratification



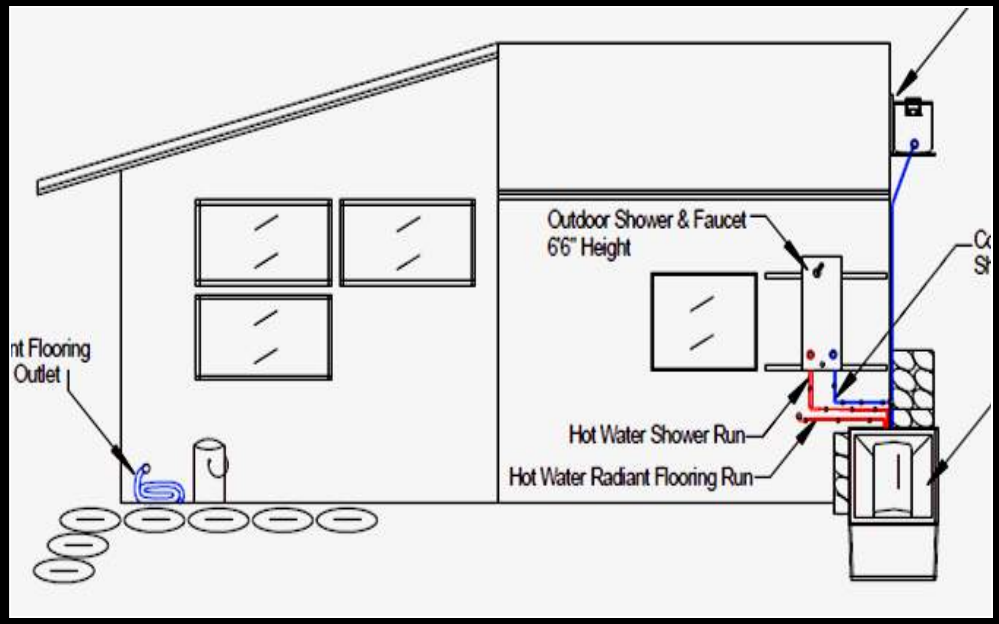
ICS SOLAR WATER HEATER - PROTOTYPE DEVICE

- Lyle Center for Regenerative Studies - “The Tijuana House”
- Simulated Off-Grid Domestic Hot Water Application
- ICS Solar Water Heating System Accessibility



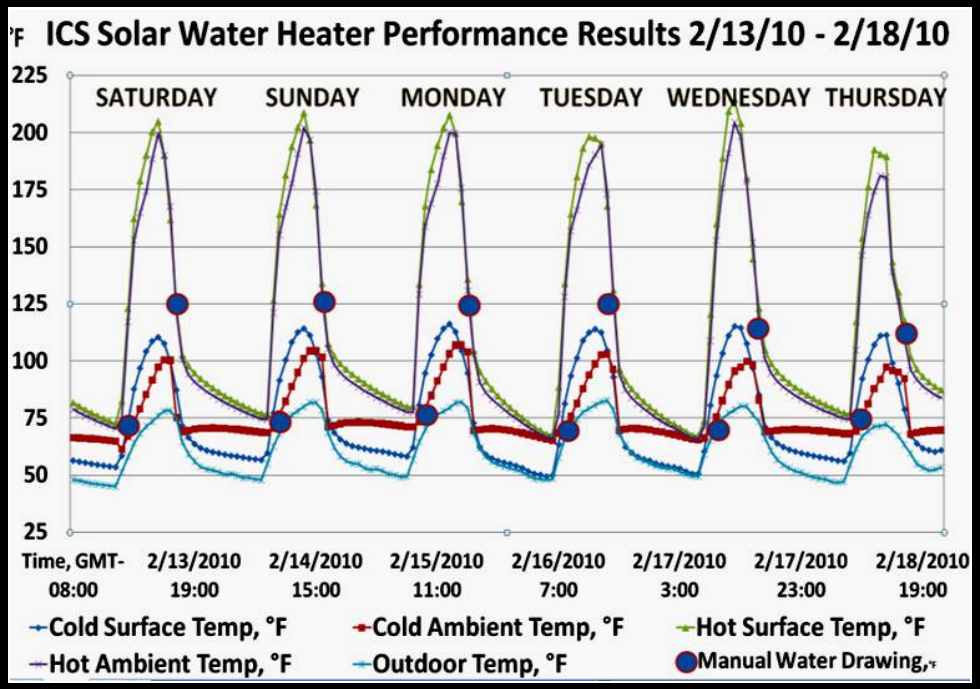
ICS SOLAR WATER HEATER - DEVICE APPLICATION

- Hot Water Application – Multi-Purpose Shower System
- Favorable Performance Results

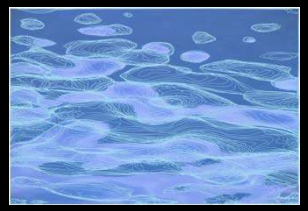


ICS SOLAR WATER HEATER - SYSTEM PERFORMANCE

- Simulated Hot Water Usage Schedule
- Seasonal/Weather Based Performance
- System Specific Usage Behavior



ICS SOLAR WATER HEATER - CONSTRUCTION



MATERIALS:

- Lumber: five 8’ long 2x2’s, two 8’ long 2x4’s, two 8’x4’ plywood sheets & two 8’x4’ sheets of polystyrene insulation.
- Plumbing: 30/40gallon used water heater, galvanized ¾” plugs, elbows, nipples & couplings. Pressure release safety valve.
- Hardware: Teflon tape, metal strapping, lag & hex head screws, reflective tape, weather-stripping, L-brackets, joist-hangers.
- Paint: High-heat black spray paint, caulking, quarts of primer /paint.
- Glass: ¼” thick 34”x76” preferably sized tempered glass.

SOLAR WATER HEATER - CONSTRUCTION SEQUENCE

I. Strip Used Conventional Water Heater:

II. Pressure Teat Metal Tank:

SOLAR WATER HEATER - CONSTRUCTION SEQUENCE

III. Construct Tank's Support Cradle & Foundation for Enclosure:

IV. Construct the Tank's Boxed Enclosure & Prepare Piping Inlets & Outlets:

SOLAR WATER HEATER - CONSTRUCTION SEQUENCE

V. Fit & Place Insulation Sheets Inward, Seal with Reflective Tape & Pipe:

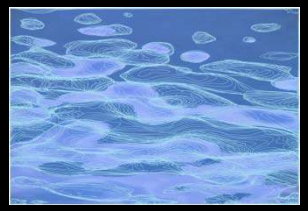
VI. Caulk, Prime & Paint, Construct Leg Support & Lay a Foundation:

SOLAR WATER HEATER - CONSTRUCTION SEQUENCE

VII. Weather-strip Perimeter, Position Sheet of Glass & Bracket On:

VIII. Connect Exterior Pipe Fittings to Inlet & Outlet Valves & Fill with Water

ICS SOLAR WATER HEATER



Thank you!

Comments & Questions?