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SCOPE OF WORK:
 INSTALLATION OF TWO SOLAR WATER PRE-HEATERS:
 COLLECTORS ARE ALL 40-SF; TANKS ARE ALL 120-GAL
 SYSTEM # 1 10-COLLECTORS W/6 TANKS, SYSTEM # 2 4 COLLECTORS W/2 TANKS

COMPATIBLE WITH BOTH:
 ASCE 7-02 & ASCE 7-05

WIND LOAD:
 DESIGNED FOR 130 MPH

WIND EXPOSURE:
 EXPOSURE CATEGORY C

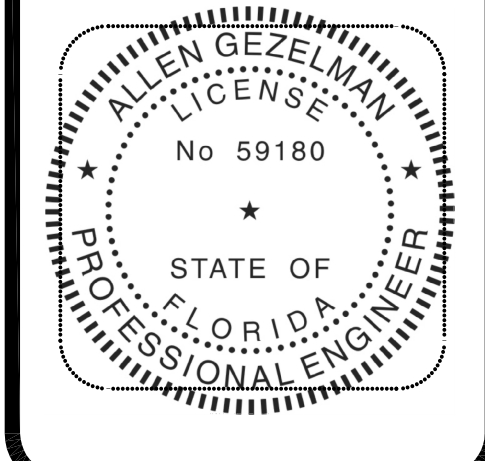
SOLAR SYSTEM COLLECTOR:
 MODEL: (14) AE-40 DHW

APPLICABLE CODE:
 2004 W/06 SUPPLEMENT FBC, FMC, FPC & FBC, FPC, FMC 2007

LEGAL DESCRIPTION: LOTS 3 TO 9 INC. BLK 2 BOSTROMS LOWER ORMOND BCH PER OR 2436 PG 1659 EXC. PT OF MAVERICK MOTEL PER OR 2621 PG 0601 & OR 2688 PG 667 & EXC OR 2937 PG 429 ASSESSED AS CONDOMINIUM OR TIMESHARE UNITS PER OR 3437 PG 1135

ENGINEERED:
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 SIGGI BROCKS
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 TAMPA, FL 33629

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Contractor shall incorporate industry standard automatic freeze protection means & methods of his choice. Contractor shall install valves of his choice to permit the "isolation & draindown" of the solar collectors. Contractor shall provide written instructions to the owner which clearly explain how to "isolate & drain solar loop" and how to restart the system. At system commissioning, Contractor shall physically show owner or owner's representative how to "isolate-drain-restart". Contractor shall obtain and maintain a statement signed and dated by owner acknowledging that freeze damage is an owner - not a warranty or designer responsibility. Contractor shall place in clearly visible, appropriate location(s), signage. In letters NLT (not less than) 1/2-inch with appropriate wording to convey a warning substantially as follows:

NOTICE TO OWNER/OPERATOR
 REFER TO PUBLISHED SOLAR ENERGY SYSTEM OWNERS MANUAL FOR PROCEDURES.
 FREEZE DAMAGE TO SOLAR ENERGY EQUIPMENT CAN OCCUR AT TEMPERATURES ABOVE 32 DEGREES FAHRENHEIT AMBIENT DUE TO RE-RADIATION TO THE SKY ON CLEAR NIGHTS.

IT IS RECOMMENDED THAT SOLAR COLLECTORS BE DRAINED IN ADVANCE OF CLEAR NIGHTS WHEN AMBIENT AIR TEMPERATURES MAY FALL NEAR FREEZING.

- FREEZE DAMAGE RESULTS FROM OWNER/OPERATOR FAILURE
- FREEZE DAMAGE WILL NOT BE COVERED UNDER WARRANTY
- FREEZE DAMAGE IS NOT DUE TO A DESIGNER OMISSION/ERROR.

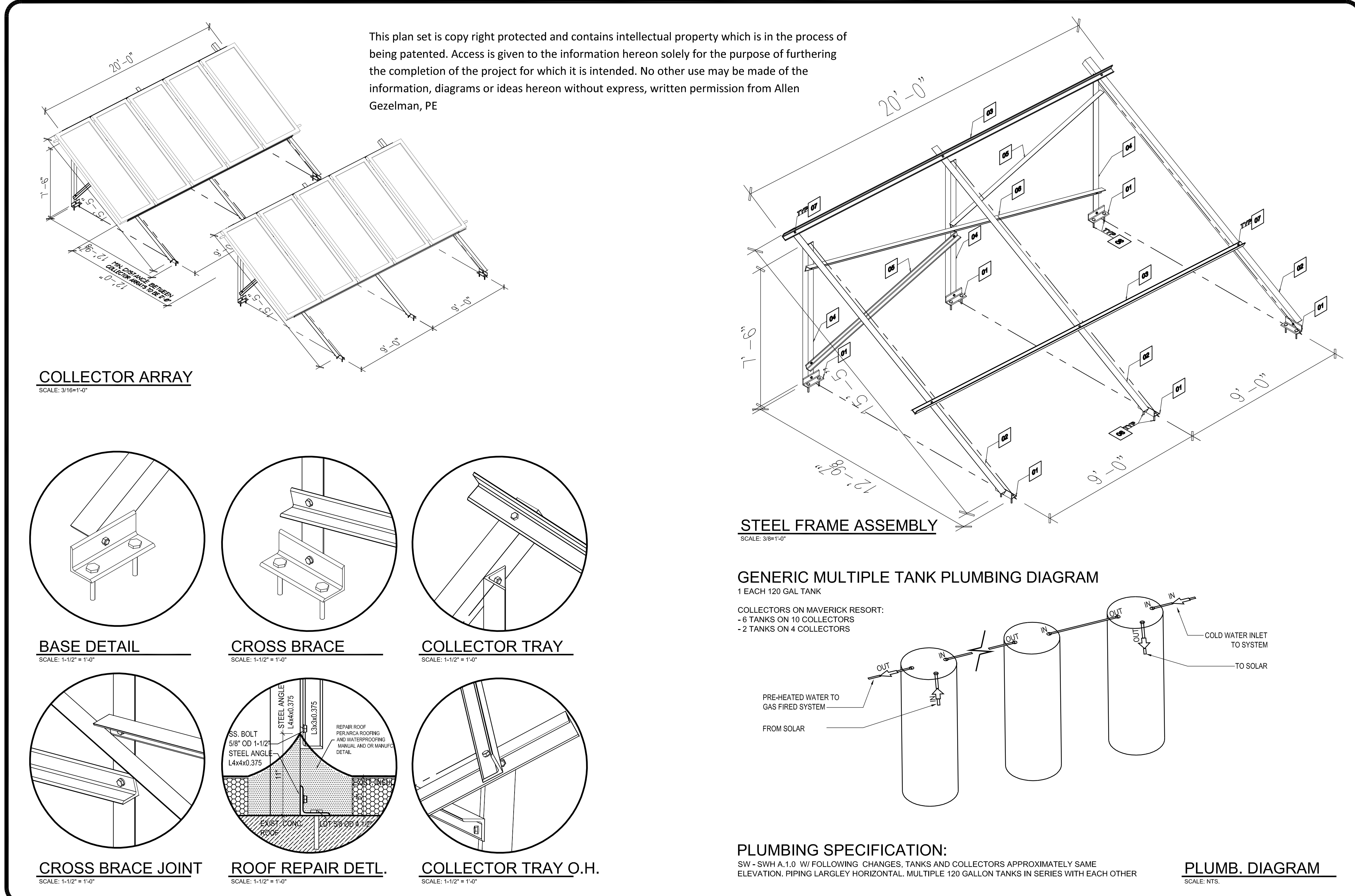
01 NOTICE TO OWNER
 SCALE: N.T.S.



- 0 KEY NOTES** REVISION 1: ALL METAL THICKNESS REDUCED TO 0.25 INCHES
- 01 BASE, STEEL ANGLE L 4X4X0.25 12" LONG PRIMED & PAINTED W/ ROSTOLEUM INDUSTRIAL MET. PAINT
 - 02 RAFTER, STEEL ANGLE L 4X4X0.25 15'-5" LONG PRIMED & PAINTED W/ ROSTOLEUM INDUSTRIAL MET. PAINT
 - 03 TRACK, ANGLE L 3X3X0.375 20'-0" LONG PRIMED & PAINTED W/ ROSTOLEUM INDUSTRIAL MET. PAINT
 - 04 VERT. POST, ANGLE L 4X4X0.25 7'-6" TALL PRIMED & PAINTED W/ ROSTOLEUM INDUSTRIAL MET. PAINT
 - 05 CROSS BRACE, ANGLE L 3X3X0.25 9'-10" LONG PRIMED & PAINTED W/ ROSTOLEUM INDUSTRIAL MET. PAINT
 - 06 CROSS BRACE, ANGLE L 3X3X0.25 19'-4" LONG PRIMED & PAINTED W/ ROSTOLEUM INDUSTRIAL MET. PAINT
 - 07 STAINLESS STEEL HEX BOLT 5/8" OD 1-1/2" OR LONGER, TORQUE TO 50 FTLB
 - 08 RACK ANCHOR, READ HEAD LDT 5/8-IN OD, 4-1/2 INCHES LONG OR SUBSTITUTE APPROVED BY THIS ENGINEER, TORQUE TO BE 50 FTLB.
- 04 LEGEND**
 SCALE: N.T.S.

- Maverick Resort Solar Water Pre-Heating Systems Installation Notes:**
- This is a site-specific design which adapts the residential design sheet (Solar World Solar Water Heater A.1.0, SW-SWH A.1.0, which accompanies and is part and parcel of this site-specific plan) to the conditions on top of the Maverick Resort in Ormond Beach, FL.
 - Commodity items, e.g., steel structural components, fasteners, piping/fittings, etc. are specified as generic and may be obtained from whatever source contractor desires - so long as they meet the requirements of the Florida Building Code, site conditions and this engineer's intent. All of the solar components used per this plan shall be provided by Solar World/LeverEdge and shall be installed per SW-SWH A.1.0 - except as herein specified differently by this site specific adaptation of SW-SWH A.1.0.
 - There are two independent solar water pre-heating systems covered by this plan - the tanks will be used for storage only and will not have their back-up electric heating elements supplied with electricity.
 - This plan covers the installation of 14-each, 4-ft by 10-ft, flat-plate, medium-temperature, solar collectors mounted as multiple-collector arrays on three, spatially separated, herein specified, steel racks.
 - The three solar collector arrays shall be arranged into two, water pre-heating systems; two-each, five-collector-arrays shall plumbed as a system with a set of six-each 120 gallon tanks plumbed in series with each other and in parallel with collector arrays. A third solar collector array shall have four solar collectors and shall be plumbed with two-each, 120-gallon, solar tanks-in-series with each other, collectors-in-parallel with each other and with tanks - refer to drawing for visual clarification.
 - The solar collectors making up each of the three arrays shall be plumbed in parallel within each array. The collector arrays in the two-rack, solar water heating system shall be plumbed with the arrays in series, tanks-in-series, solar "loop" in parallel with the tanks - refer to drawing for visual clarification.
 - The three steel racks which support the solar collectors in these arrays are identical. The metal shall be primed and painted completely with generous coats of RustOleum Industrial Metal Paint after all cutting and drilling has been completed. Paint shall be cured before transporting rack components to the Maverick roof. Paint shall be touched up after racks are installed on the roof. All fasteners shall be stainless steel.
 - The two five-collector-arrays will have their outboard collectors overhanging the rack by approximately 3-ft at diagonally opposite corners and also overhanging the collector mounting angles, which support the collectors and which attach the collectors to their mounting racks, by approximately 1-ft - as shown on the drawing. These overhangs have been deliberately designed into the installation and are compensated for in and by the specified steel dimensions. All of the steel structural elements can be cut from stock, 20-ft lengths. This design complies with the Florida Building Code. Particular attention is given to resisting wind forces, to resisting the salt-air environment, to achieving required roof clearance (FBC Table 1509.7) and to providing good solar performance - including collector lateral slope for manual draindown.
 - Collector arrays shall be separated to prevent shading of one array by another.
 - Collector arrays shall be installed in Wind Pressure Zone 1 only. Pressure zone 2 width is 5 feet. Refer to Figure 3 on the accompanying SW-SWH A.1.0 - Flat Roof.
 - All solar "loop" piping shall be 3/4-inch, nominal ID. Pipes shall be encased in tube insulation which shall be supported above the finished roof surface by contractor chosen, generic pipe supports. Supports shall be spaced at intervals allowed by FPC Table 308.5. Engineer suggests, but does not specify, OMC Oily-flow PipeGuards (www.oilfast.com) which are available thru SunCoast Roofers Supply. If contractor uses the 5-inch diameter supports - PipeGuard (PGL-BK), he may run two, insulated pipes in a single support. Further, if pipes are metal and contractor straps the two insulated pipes together at least at the midpoint between supports, the supports may be placed on up to 12-ft centers. This size/model PGL is large enough to allow the solar pipes to thermally elongate and contract without dragging the pipe support. Therefore, it is recommended that the bases of the supports be adhered to the SPF roof surface coating with a compatible adhesive such as GE Silicone Caulk or other as recommended by the roofing sub-contractor. This has arrangement offers added benefit of resistance against wind. Otherwise, use of a slip-sheet is recommended to protect the roof surface coating from movement of the pipe supports. Contractor is free to use other pipe supports which contractor may find at other roof supply outlets, Common alternate pipe supports include:
 Miro http://www.miroind.com/product_name.php?type=Pipe%20Supports
 Rubber Triangle <http://www.rubbertriangle.com/>.
 - A single Taco, model 006B, pump shall used on each of the two solar pre-heating systems.
 - All bolts shall be 5/8-inch OD - 1-1/2 inch or longer. Except, bolts into concrete roof deck which shall be Red Head LDT 5/8-in OD, 4-1/2 inches long or substitute approved by this engineer.
 - Suggested rack- erection procedure is to have roofing contractor open the roof to the deck at the rack attachment points and prepare the concrete surface to receive the rack and the roof repair application. Rack should initially be assembled with the bolts only finger tight. After the rack is assembled completely (no solar collectors). Torque all 5/8 bolts (including Red Heads) to 50-ft-pounds (note exception explained below) beginning from the upper-most bolts and working down to the roof deck. Next install the Red Heads "RH" (contractor should wait until now to drill the anchor holes in the concrete roof deck. There shall be two RH-LDT anchor bolts in each anchor point hold down angle) per RH manufacturer instructions. Exception noted earlier - leave bolts holding the upper diagonal collector mounting angle slightly loose until the collectors are secured in place using the SS #14 TEK screws. This done because the upper bolt hole in the racks which secures the collector mounting diagonal angle is slotted in order for the TEK screws to pull that collector mounting angle tight against the collector frames. This compensates for variability in collector length and ensures that everything is "snug". Once the TEKs have been run in tight, then, tighten those last remaining 5/8-inch bolts to 50-ft pounds. Torque is not specified on TEK screws - just make them snug.

05 INSTALLATION NOTES
 SCALE: N.T.S.



**INSTALLATION OF A ROOF TOP
 SOLAR WATER HEATER**
 485 SOUTH ATLANTIC AVE ORMOND BEACH FL. 32174

SYSTEM:

 8998 130th Avenue
 Largo FL 33773-1401
 727.559.0307

DATE: 09/10/08
 REVISION NO./DATE:
 THIS PLAN SUBMITTAL CONSISTS OF THIS SHEET PLUS SW-SWH A.1.0

SHEET NAME:
PERMIT SET
 DRAWN: SB CHECKED: AG
 SHEET NO:
MAV SWH A.1.0
 MAV SWH A.1.0.dwg

