

SCOPE OF WORK:

INSTALLATION OF A SOLAR WATER HEATING SYSTEM WITH A ROOF TOP COLLECTOR

DESIGNED PER:

ASCE 7-05

WIND LOAD:

DESIGNED FOR 160 MPH

WIND EXPOSURE:

EXPOSURE CATEGORY C

SOLAR SYSTEM COLLECTOR:

MODEL: AE-21/AE-24/AE-26/AE-28/AE-32/AE-40

APPLICABLE CODE:

FLORIDA 2007 CODE W/09 SUPP

THIS PLAN MAY NOT BE USED FOR MULTIPLE PERMITS,E.G. NO MASTER FILING

ENGINEERED:

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16502 HANNA RD.
LUTZ, FLORIDA 33549

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PE. # 59180

SOLAR HYDRONICS CORP DOMESTIC HOT WATER (DHW) INSTALLATION NOTES: THIS DRAWING AND THE ENGINEERING HEREON ESTABLISH THE INSTALLATION REQUIREMENTS FOR DHW EQUIPMENT ON BUILDINGS IN FLORIDA 60 FEET OR LESS IN HEIGHT AND AT ROOF ANGLES FROM FLAT UP TO 45 DEGREES. PER THIS PARTICULAR INSTALLATION DOCUMENT, THE SOLAR HYDRONICS CORP DHW SOLAR PANELS MAY BE INSTALLED PARALLEL TO THE ROOF PLANE WITH HOLD DOWNS FLUSH ON TOP OF THE UPPER SURFACE OF THE ROOF COVERING OR TILTED-UP TO ACHIEVE BETTER SOLAR COLLECTION. **FLUSH-MOUNT SHALL REQUIRE 4-ANCHORS PER COLLECTOR (3/8-INCH DIAMETER CRS) IN PZ-1 & PZ-2, EXPOSURES B & C, IN ALL WIND ZONES UP TO AND INCLUDING 160 MPH.**

THE SOLAR HYDRONICS CORP DHW COLLECTORS HAVE PASSED MIAMI TESTING LABS WIND LOAD TESTING OF -102 PSF PER ASTM E-330 (MTL FILE NUMBER 95-1249).THIS ENGINEER HAS EVALUATED THE INSTALLATION COMPONENTS AND HARDWARE CURRENTLY PROVIDED BY SOLAR HYDRONICS CORP AS OEM INSTALLATION KITS AND FOUND THEM TO MEET THE REQUIREMENTS OF THE FLORIDA BUILDING CODE CURRENT AS OF THE DATE OF THIS PLAN. THERE SHALL BE NO SUBSTITUTION OF OTHER VENDOR MATERIALS (OTHER THAN THE GENERIC # 14 BY 1 INCH, SS, SELF-DRILLING, SCREWS AS SHOWN IN **FIGURE 2**) WITHOUT PRIOR APPROVAL OF THIS ENGINEER THRU SOLAR HYDRONICS CORP.

PLUMBING SHALL BE PER FIGURE 1. FLORIDA PLUMBING CODE SHALL BE ADHERED TO. PARTICULAR ATTENTION SHALL BE GIVEN TO PROTECTION AGAINST OVER-PRESSURE AND FREEZING - PER FLORIDA MECHANICAL CODE, CHAPTER 14, AND PER SOLAR HYDRONICS CORP INSTALLATION INSTRUCTIONS. THIS DRAWING SHOWS THE "D" VERSION PLUMBING. HOWEVER, THERE ARE OTHER VARIANTS (PHOTO-VOLTAIC PUMP, INDIRECT, AND/OR DRAIN-BACK) WHICH, ALTHOUGH NOT SPECIFICALLY SHOWN HEREON , ARE COVERED BY THIS SEALED DRAWING - SO LONG AS INSTALLED PER SOLAR HYDRONICS CORP INSTALLATION INSTRUCTIONS.

THIS ENGINEER HAS DETERMINED THAT THE HOLD-DOWN HARDWARE AND FASTENERS SUPPLIED BY SOLAR HYDRONICS CORP WILL WITHSTAND HURRICANE FORCE WINDS UP TO AND INCLUDING 160 MPH 3-SECOND GUSTS. THE ONLY REMAINING VARIABLE OF SIGNIFICANCE IS THE ATTACHMENT OF THE HOLD DOWNS TO THE UNDERLYING ROOF SYSTEM USING OEM HARDWARE. LAGGING OF SHC DHW COLLECTORS FOR FLUSH MOUNT INSTALLATION (PARALLEL WITH THE ROOF SURFACE AND AS CLOSE THERETO AS PERMITTED BY OEM HARDWARE) SHALL BE ALLOWED IN EXPOSURE CATEGORY B AND C AND IN BOTH PZ1 AND PZ2 AT MEAN ROOF HEIGHTS OF 60-FT OR LESS AND IN ALL WIND ZONES THRU 160 MPH SO LONG AS THE FOLLOWING CAUTIONARY RULES ARE OBSERVED. LAGS SHALL BE CORROSION RESISTANT STEEL, 3/8 INCH DIAMETER MINIMUM OR BETTER. LAGS SHALL ACHIEVE AT LEAST 3-INCHES OF SOLID EMBEDMENT IN RAFTER OR BLOCKING. MEASUREMENTS MUST BE CAREFULLY MADE AND PILOT HOLES SHALL BE DRILLED TO ENSURE HITTING UNDERLYING RAFTERS OR TRUSSES AND TO AVOID WOOD SPLITTING. FOUR LAGS PER COLLECTOR ARE THE STANDARD WHEN INSTALLING PARALLEL WITH THE PLANE OF THE ROOF IN 160 MPH, EXPOSURE CATEGORY C, 60-FT ROOF HEIGHT OR OTHER LESS DEMANDING CONDITIONS.

TLT-UP IS PERMITTED ONLY WITH SITE-SPECIFIC ENGINEERING. INSTALLER SHOULD SUPPLY ENGINEER THE FOLLOWING:

- SITE PHYSICAL ADDRESS
- EQUIPMENT LIST
- HAND-DRAWN PLAN VIEW SHOWING BUILDING FOOTPRINT, TANK & COLLECTOR LOCATIONS
- SITE PHOTOS OPTIONAL, BUT DESIRABLE.

PROCEDURES TO USE WHEN, IN THE INSTALLER'S OPINION, HITTING THE CENTER OF TRUSS OR RAFTER WITH A LAG CANNOT BE ASSURED. EITHER USE A 3/8 INCH (MIN) "J" BOLT GRABBING THE TRUSS/RAFTER OR 3/8 INCH DIAMETER (MIN) ALL THREAD ROD PLUS STANDARD FENDERS & LOCK WASHERS AND NUT THRU MINIMUM 4" BY 4" BY 9" BLOCKING ON THE UNDERSIDE OF THE ROOF SHEETING. WHERE BLOCKING METHOD IS USED, INSTALLER SHALL APPLY A GENEROUS BEAD OF LIQUID NAILS 1N-901 (OR EQUIVALENT OR BETTER) FOR MINIMUM OF 1 FT ALONG THE NEAR JOINTS OF THE ROOF TRUSS AND SHEETING ON EACH TRUSS ON BOTH SIDES OF THE BLOCKING - SEE FIGURE 2 ON THIS SHEET.

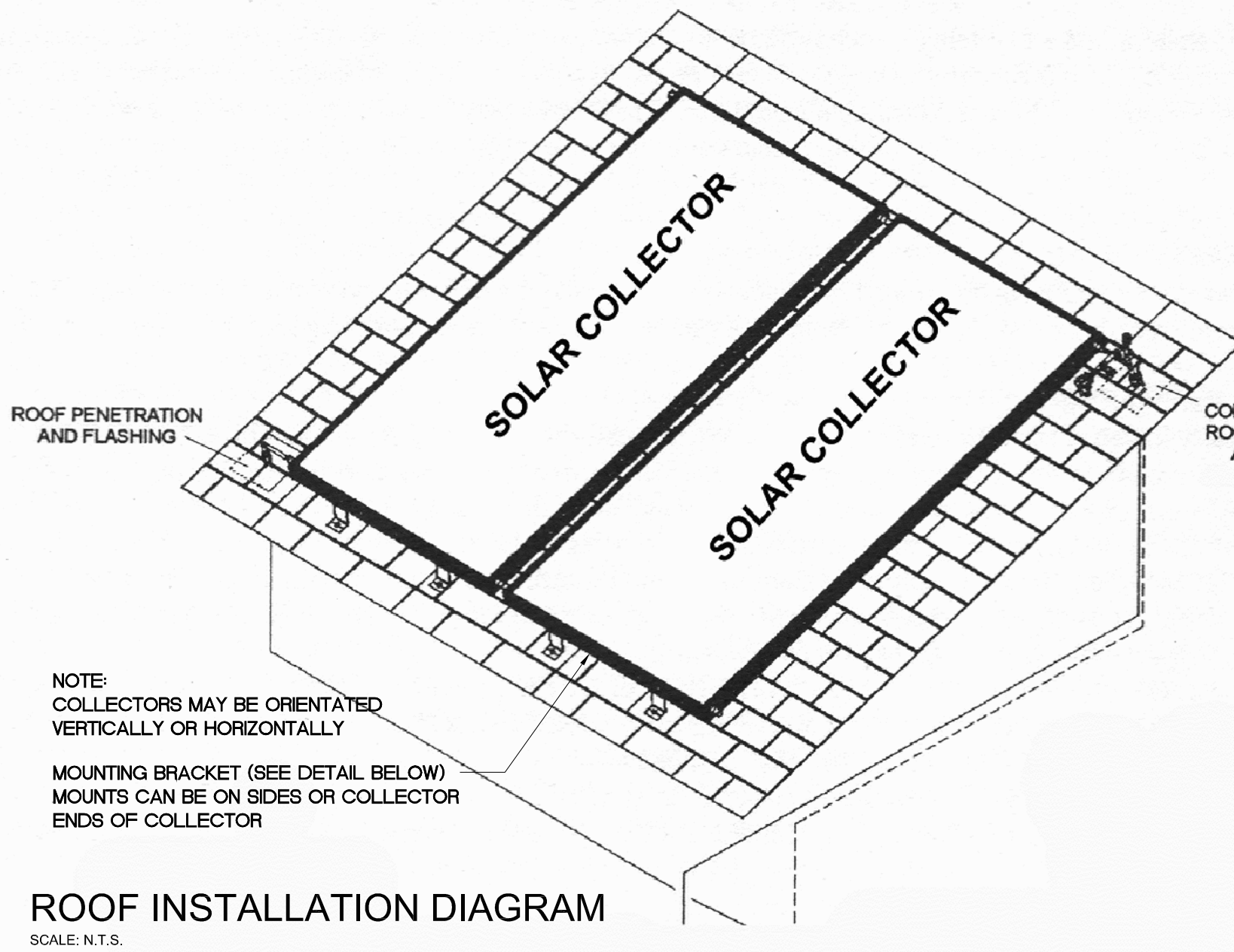
INSTALLER SHALL ADHERE TO REQUIREMENTS OF FBC CHAPTER 15 (ROOFING) AND BEST PRACTICES OF THE NRCA ROOFING & WATERPROOFING MANUAL TO ENSURE THAT THE SOLAR INSTALLATION DOES NOT CAUSE ROOF LEAKS AT INITIAL INSTALLATION OR AS THE SYSTEM "AGES".

INSTALLERS, AUTHORITIES HAVING JURISDICTION AND OTHERS HAVING QUESTIONS OR DIFFERING CONDITIONS, MAY CONTACT THIS ENGINEER DIRECTLY - CELL: 813 650 7246, FAX: 866 397 9050, E-MAIL: ALLEN@GEZELMANPE.COM

NOTE: SUITABLE FOR HVHZ

REGARDING WIND LOAD - MY DESIGNS CLEARLY SHOW COMPLIANCE PER ASCE 7 WITH THE FLORIDA BUILDING CODE.

REGARDING GRAVITY LOAD - OUR HEAVIEST COLLECTOR WEIGHS 147 POUNDS WHICH IS DISTRIBUTED OVER A 40 S.F AREA. WATER IN THE COLLECTOR IS NEGLIGIBLE. EACH COLLECTOR HOLDS ABOUT A GALLON OF WATER. POOL COLLECTORS A BIT MORE. HOT WATER COLLECTORS A LITTLE LESS. REGARDLESS, SOLAR PANELS ARE AN INSIGNIFICANT LOAD ON THE ROOF UNDERNEATH!

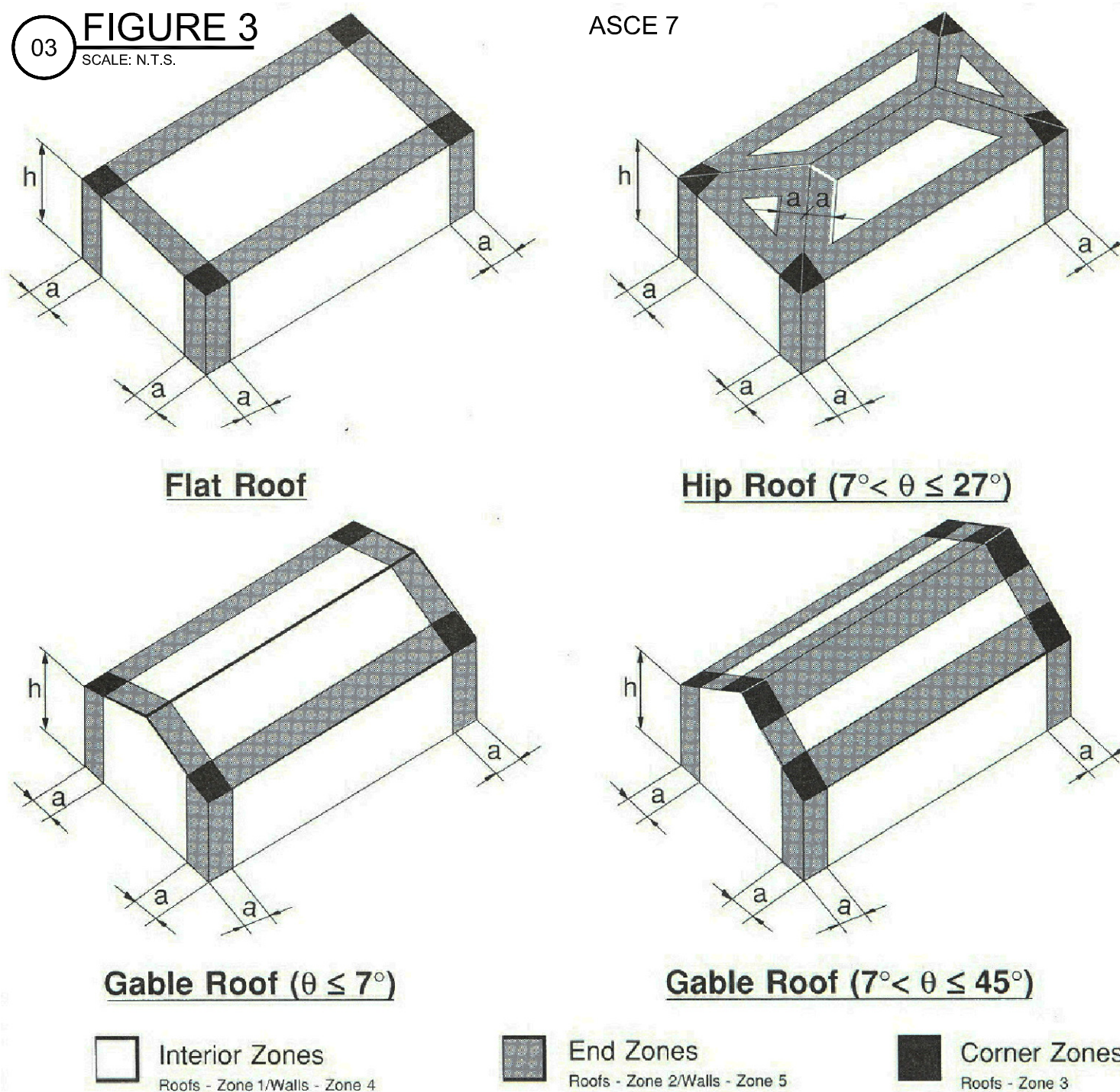


02 FIGURE 2
SCALE: 1/2" = 1'-0"

ENLARGED VIEWING:

THOSE WISHING TO VIEW THIS PLAN IN LARGER FORMAT MAY DO SO BY CONTACTING ENGINEER. BY E-MAIL (Allen@GezelmanPE.com) AND ENGINEER WILL REPLY WITH AN E-MAIL CONTAINING A PDF ATTACHMENT OF THIS PLAN WHICH MAY BE ENLARGED TO YOUR TASTE. ALTERNATELY, YOU MAY JUST GO TO THE FOLLOWING ONLINE LOCATION DIRECTLY: www.GezelmanPE.com

03 FIGURE 3
SCALE: N.T.S.

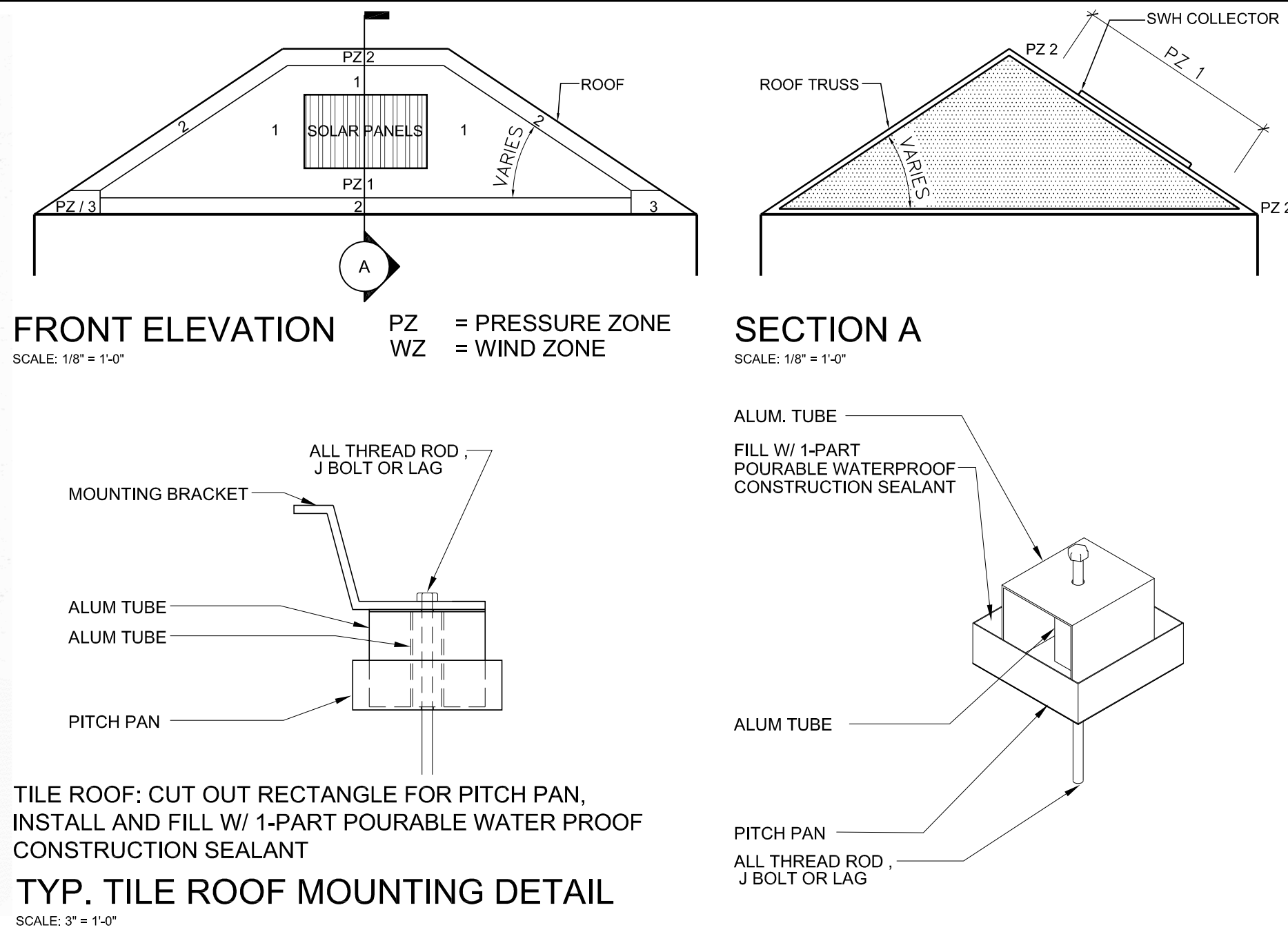


Notes:

1. Pressures shown are applied normal to the surface, for exposure B, at h = 30 ft (9.1m), I = 1.0, and K_{zt} = 1.0. Adjust to other conditions using Equation 6-2.
2. Plus and minus signs signify pressures acting toward and away from the surfaces, respectively.
3. For hip roofs with θ ≤ 25°, Zone 3 shall be treated as Zone 2.
4. For effective wind areas between those given, value may be interpolated, otherwise use the value associated with the lower effective wind area.
5. Notation:
a: 10 percent of least horizontal dimension or 0.4h, whichever is smaller, but not less than either 4% of least horizontal dimension or 3 ft (0.9 m).
h: Mean roof height, in feet (meters), except that eave height shall be used for roof angles <10°.
θ: Angle of plane of roof from horizontal, in degrees.

GENRAL NOTE:

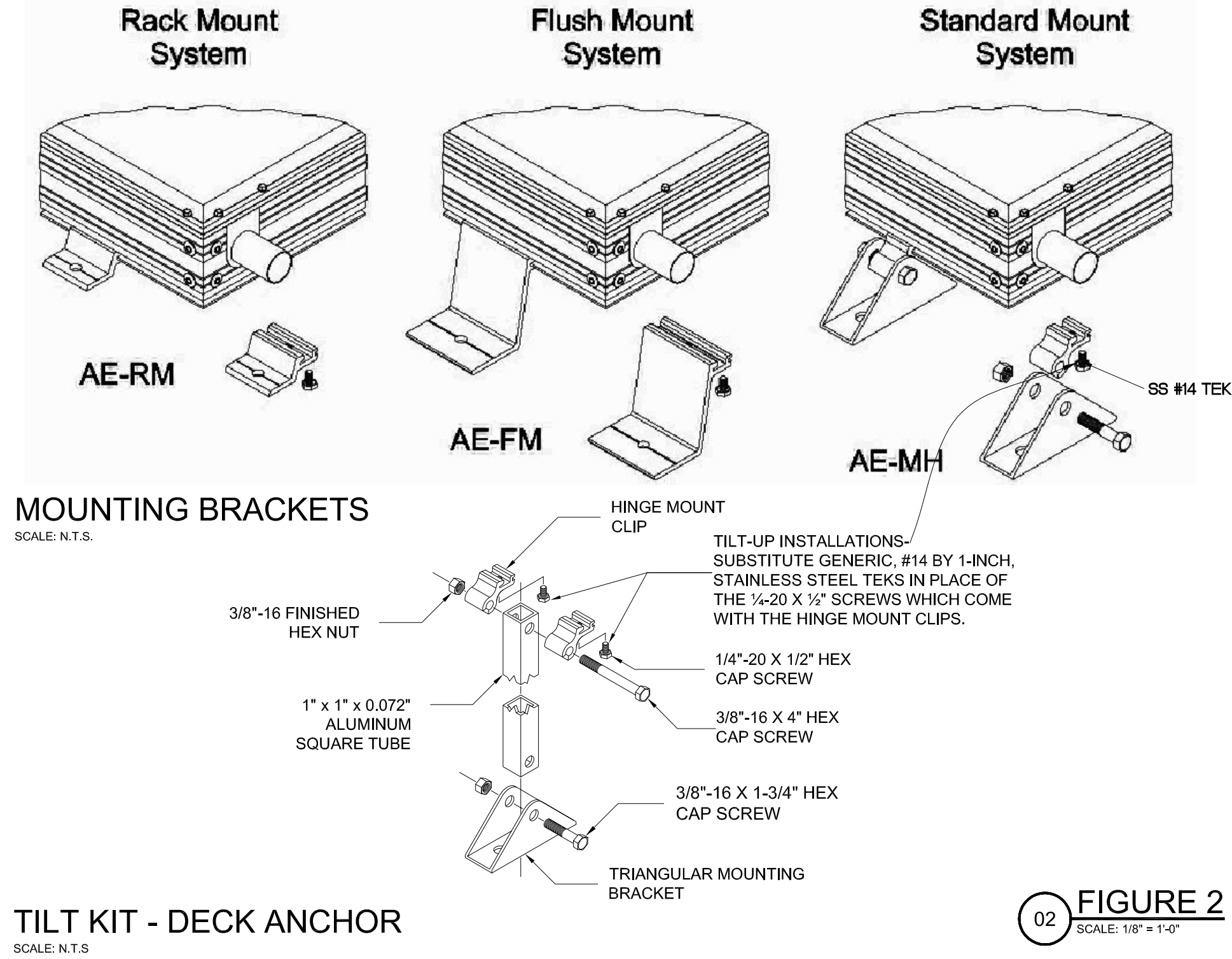
ALL HOT WATER SOLAR COLLECTORS SOLD IN THIS STATE ARE REQUIRED TO HAVE BEEN TESTED BY THE FLORIDA SOLAR ENERGY CENTER AND BEAR ITS CERTIFICATION LABEL. THE COLLECTORS LISTED ON THIS PLAN COMPLY WITH THOSE REQUIREMENTS. FURTHER INFORMATION MAY BE ACCESSED ON LINE AT:
[HTTP://WWW.FSEC.UCF.EDU/EN/INDUSTRY/TESTING/STCOLLECTORS/HOT_WATER_RATINGS/INDEX.HTM](http://www.FSEC.UCF.EDU/EN/INDUSTRY/TESTING/STCOLLECTORS/HOT_WATER_RATINGS/INDEX.HTM)



NOTE -THERE SHALL BE AT LEAST 4 HOLD-DOWN ATTACHMENTS FOR EACH SOLAR COLLECTOR ON A ROOF.

TYP. MOUNTING DETAIL

SCALE: 1-1/2" = 1'-0"



02 FIGURE 2
SCALE: 1/8" = 1'-0"

INSTALLATION OF A ROOF TOP SOLAR WATER HEATER

SYSTEM:

Solar Hydronics Corp
1423 Gunn Highway
Odessa, FL 33556

DATE: 07/02/09
REVISION NO./DATE:

THIS IS A SINGLE SHEET PLAN

SHEET NAME:

PERMIT SET

DRAWN:SB CHECKED:AG

SHEET NO:
A.1.3

AS:1.3.WH 07.02.09.dwg