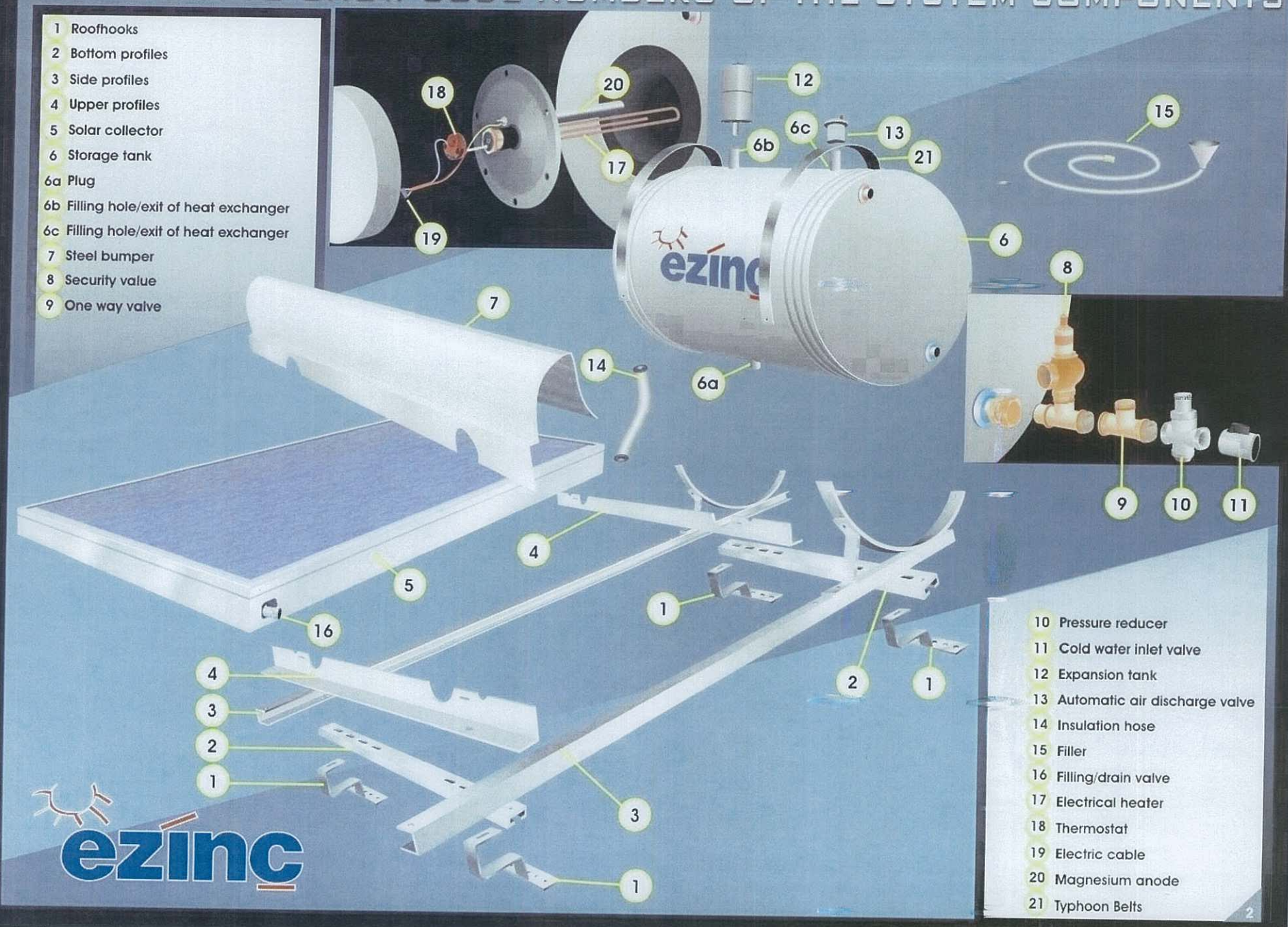
ezinc

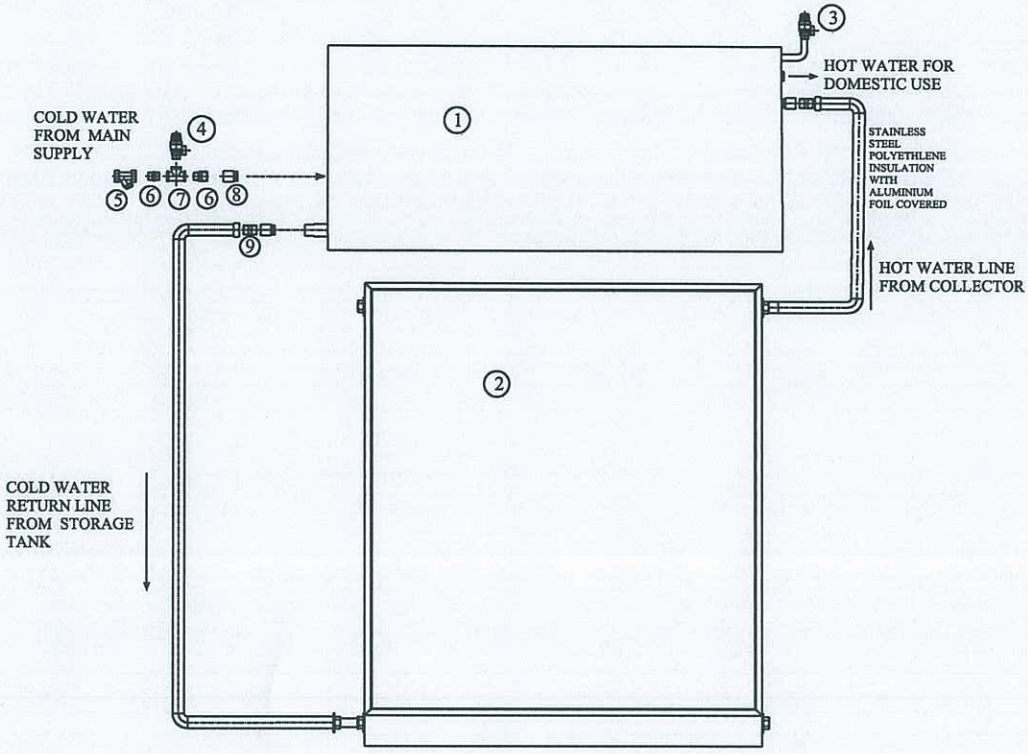
INSTRUCTION MANUAL
OF THERMOSIPHON SOLAR WATER HEATER

ezinc

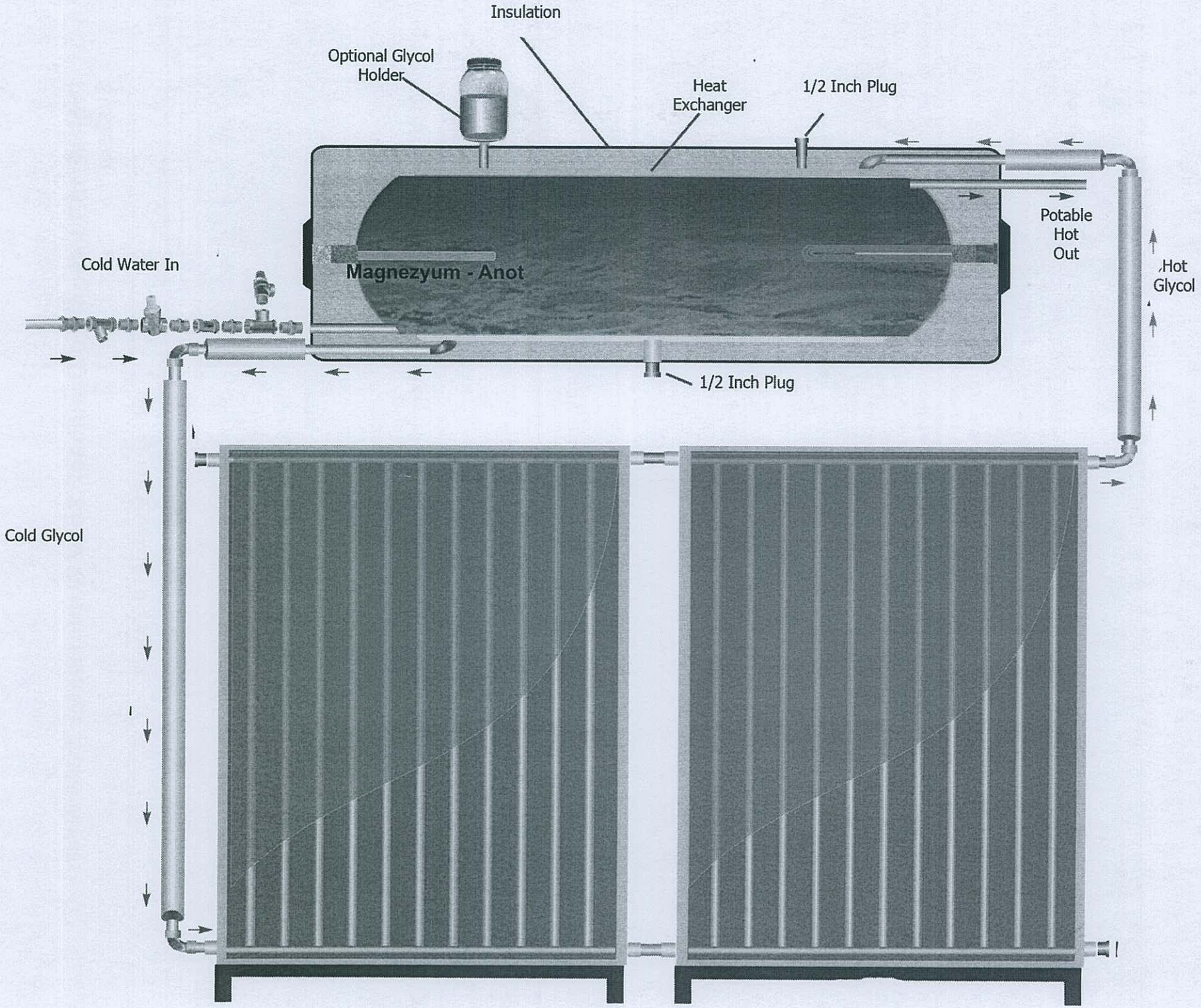
2-DIAGRAM TO SHOW CODE NUMBERS OF THE SYSTEM COMPONENTS

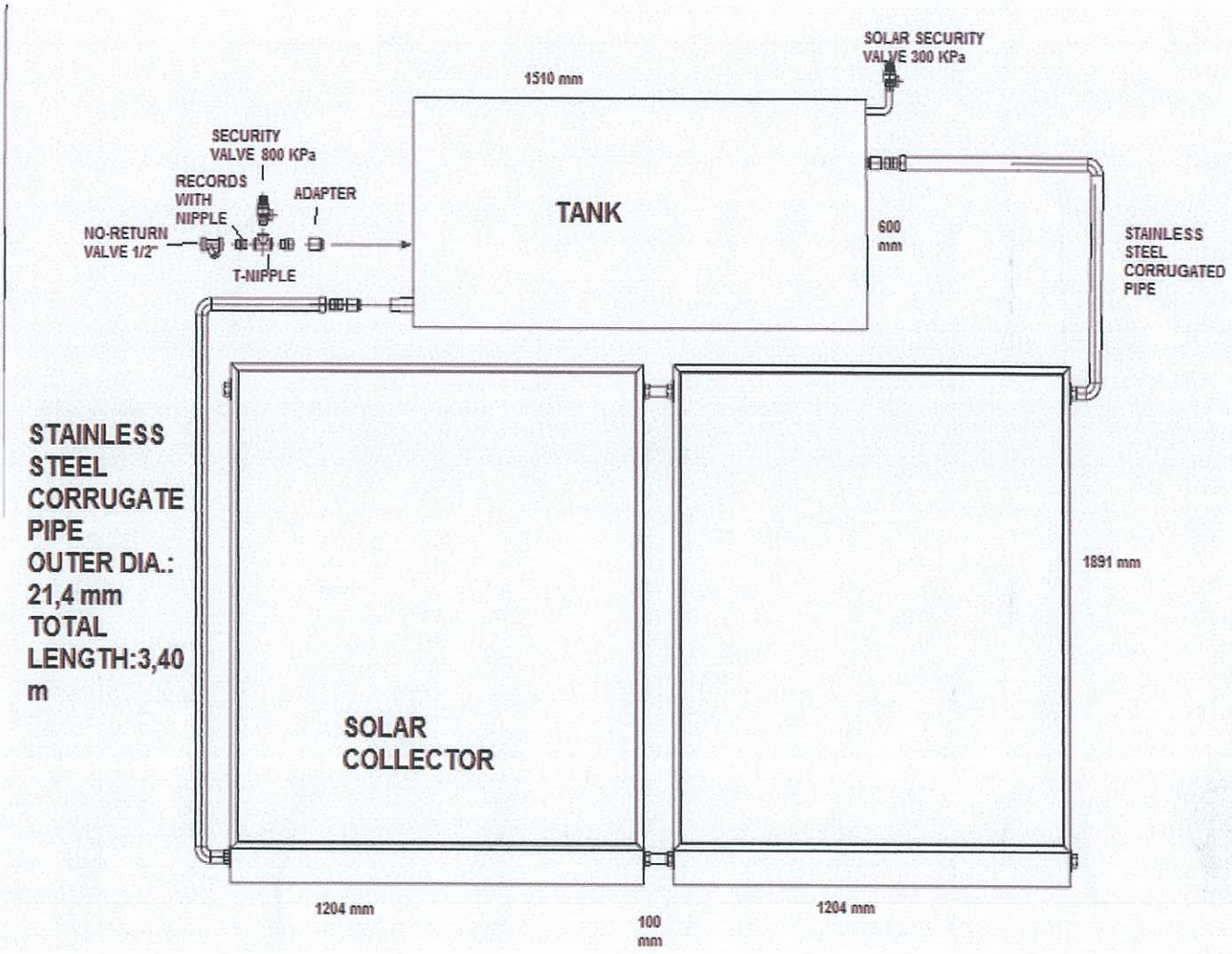


HYDRAULIC DIAGRAM OF CLOSED LOOP THERMOSIPHON SYSTEM



1. STORAGE TANK
2. SOLAR COLLECTOR
3. SOLAR SECURITY VALVE 300 KPa
4. SECURITY VALVE 800 KPa
5. NO-RETURN VALVE 1/2"
6. NIPPLE
7. T NIPPLE
8. ADAPTER
9. RECORDS WITH NIPPLE


Insulation
Optional Glycol Holder
Heat Exchanger
1/2 Inch Plug
Potable Hot Out
Hot Glycol
Cold Water In
Magnezyum - Anot
1/2 Inch Plug
Cold Glycol


SOLAR SECURITY
VALVE 300 KPa
1510 mm
SECURITY
VALVE 800 KPa
RECORDS
WITH
NIPPLE
ADAPTER
NO-RETURN
VALVE 1/2"
T-NIPPLE
TANK
600
mm
STAINLESS
STEEL
CORRUGATED
PIPE
STAINLESS
STEEL
CORRUGATE
PIPE
OUTER DIA.:
21,4 mm
TOTAL
LENGTH:3,40
m
SOLAR
COLLECTOR
1891 mm
1204 mm
100
mm
1204 mm

1) INTRODUCTION

Thank you very much to prefer high quality, long-term durable and efficient EZINC solar thermal systems.

Important notice: Please read this manual carefully before starting installation of solar water heater.
This solar water heating system is working according to the natural circulation (thermosiphon principle).

General
These instructions describe mounting and installation of thermosiphon solar water heaters. All installations must be done by authorized staff. Please read these instructions carefully before starting the installation. If you do not suit to the instructions, product will be out of any guarantee.

Position of the system
Thermosiphon solar water heaters are able to convert the maximum solar energy to the heat, when the cover of the collector faces to the south. Local climatic conditions, wrong installation, inclination of the collector according to the coordinates of the location may effect the performance of the system.

Transportation
During transportation and installation you should pay attention to the following points:
- Protect the glass and the backsheet of solar collectors from damages.
- Do not put heavy materials on the collectors which can cause any damage.

Protection recommendations
During the installation, please cover the glass side of the collector with a non-transparent blanket which will avoid transmittance of the direct sunlight into the collector.

Usage of anti-freeze liquid
All of our systems must be filled by a convenient proportion of solar heating liquid (glycol) before operation.

Maintenance requirements
To get the maximum efficiency from your thermosiphon solar water heater and to increase its' lifetime, please check the following points annually:

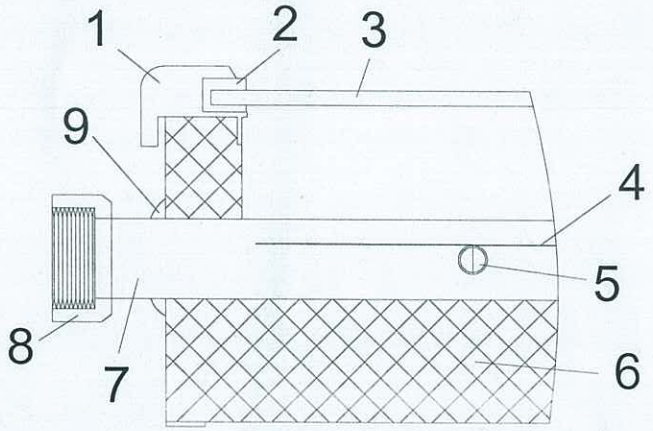
- Check the antifreeze level annually.
- Check the hydraulic connections.

Important notice: If necessary, please install a pressure reducer between cold water inlet of the tank and main supply to avoid any problems because of high pressure of main supply. Our kit package is not including pressure reducer.

2) GENERAL CHARACTERISTICS

Collector specifications:

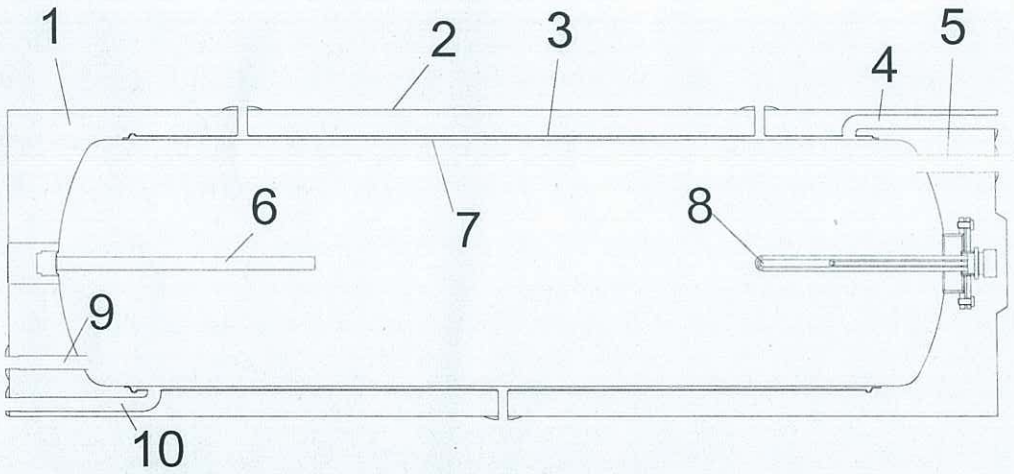
		L USB
DIMENSIONS (mm)	HEIGHT	1891
	WIDTH	1204
	DEPTH	99
WEIGHT		41 kg
GROSS COLLECTOR AREA (sqm.)		2,28
NET ABSORBER (APERTURE) AREA (sqm.)		2,12
MANIFOLD TUBES		COPPER Ø25 mm
RISER TUBES		COPPER Ø12 mm
ABSORBER SHEET		COPPER
SURFACE COATING		BLUE SELECTIVE
CASING MATERIAL		ELECTROSTATIC POWDER COATED EXTRUDED ALUMINIUM PROFILE
INSULATION		POLYURETHANE
GLASS		LOW-IRON TEMPERED SOLAR GLASS
GASKETS-SEALING		EPDM



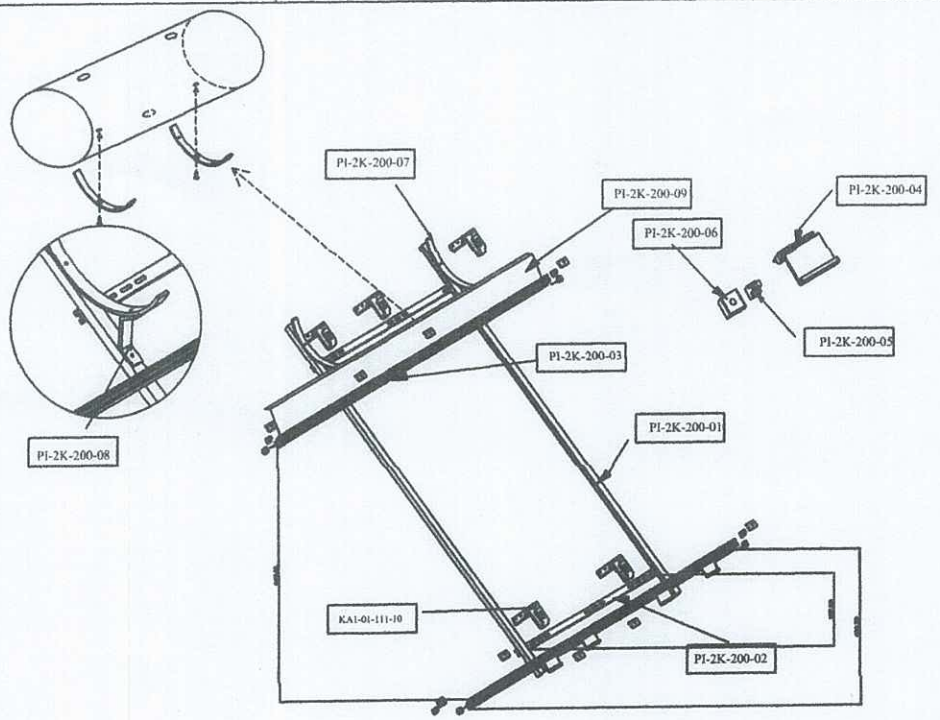
1- Glass profile
2- Glass sealing
3- Glass (frontal cover)
4- Absorber sheet
5- Absorber riser tube
6- Insulation
7- Absorber manifold (header) tube
8- Female connection fitting
9- Gasket

Tank specifications:

TANK TYPE		KG-170
NET CAPACITY		167 LT
HEAT EXCHANGER TYPE		JACKET
TANK DIMENSIONS (mm)	DIAMETER	1270
	LENGTH	Ø 600
NET WEIGHT		96 kg
INTERIOR TANK COATING		ENAMEL COATING
OUTSIDE COVER MATERIAL		ELECTROSTATIC POWDER COATED GALVANISED STEEL
INSULATION		DIRECT-INJECTED MONOBLOCK POLYURETHANE
OPERATION PRESSURE STORAGE TANK		8 BAR (800 kPa)
OPERATION PRESSURE JACKET		3 BAR (300 kPa)
HEATING SUPPORT		2 kW ELECTRICAL HEATING ELEMENT WITH THERMOSTAT (OPTIONAL)
PROTECTION AGAINST CORROSION		MAGNESIUM ANODE BAR



1- Direct-injected monoblock polyurethane insulation
2- Electrostatic powder coated steel outside cover
3- Jacket heat exchanger
4- Hot fluid inlet from collector to jacket heat exchanger
5- Hot water outlet to use
6- Magnesium anode bar
7- Thermo glass enamel coated interior tank
8- Electrical heating element with thermostat (OPTIONAL)
9- Cold water inlet
10- Cold fluid outlet from jacket heat exchanger to collector



	DIMENSIONS	QUANTITY	WEIGHT	RESİM NO
7500 PROFİL	2400 mm	2	5,308 GR	PI-2K-200-01
8122 PROFİL	1050 mm	2	2,419 GR	PI-2K-200-02
7510 PROFİL	2640 mm	2	5,890 GR	PI-2K-200-03
7504 PROFİL	30 mm	4	0,103 GR	PI-2K-200-04
7511 PROFİL	30 mm	12	0,206 GR	PI-2K-200-05
7506 PROFİL	40 mm	8	0,130GR	PI-2K-200-06
10*30 LAMA	700 mm	2	3,297 GR	PI-2K-200-07
10*30 LAMA	240 mm	2	1,130 GR	PI-2K-200-08
SHEET		1	2,536 GR	PI-2K-200-09
ROOF HOOK		5	6,250 GR	KA1-01-111-10

SEHBA RENGİ	KASA ADI	KASA RESMİ	KASA RENGİ	KASA ÖLÇÜSÜ
	SÜPERLINE L			1204*1891

AÇIKLAMA	PARÇA ADI	ÇİZİM NO
SÜPERLINE L YE GÖRE AYARLI	PIAC SEHPA MONTAJ	PI-2K-200-01

REVİZYON			
	.....		
	.....		
	.....		

	İSİM	İMZA	TARİH
ÇİZEN	M. KAYGISIZ		25.12.2007
KONTROL	M. KAYGISIZ		25.12.2007
ONAY	A.FERUDUN DALLI		25.12.2007

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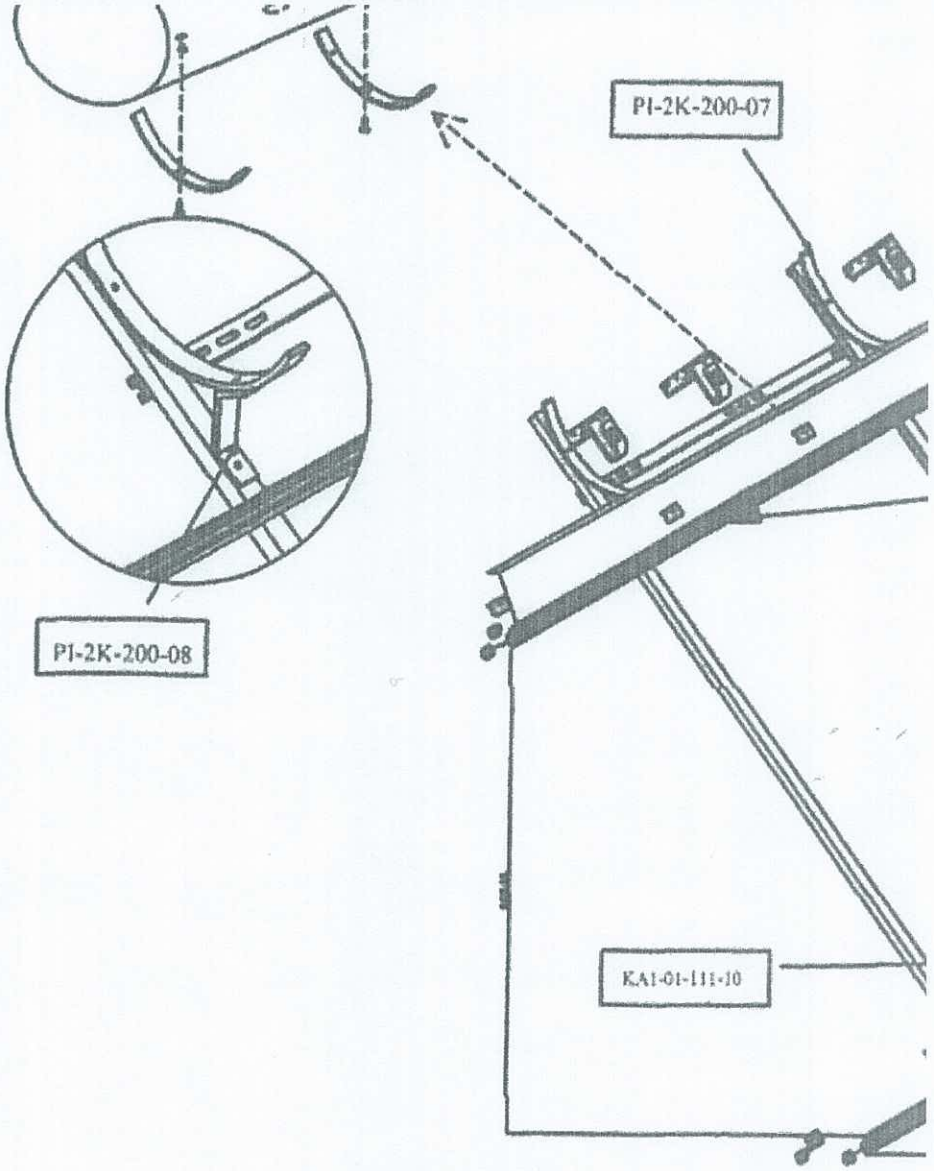
EZİNÇ METAL SAN. ve TİC. A.Ş

MALZEME	ALÜMİNYUM
ADET	1
TOLERANS	± 0.5
KATIA NO	1/1
ÖLÇEK	



	DIMENSIONS	QUANTITY	WEIGHT	RESİM NO
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10*30 LAMA	700 mm	2	3,297 GR	PI-2K-200-07
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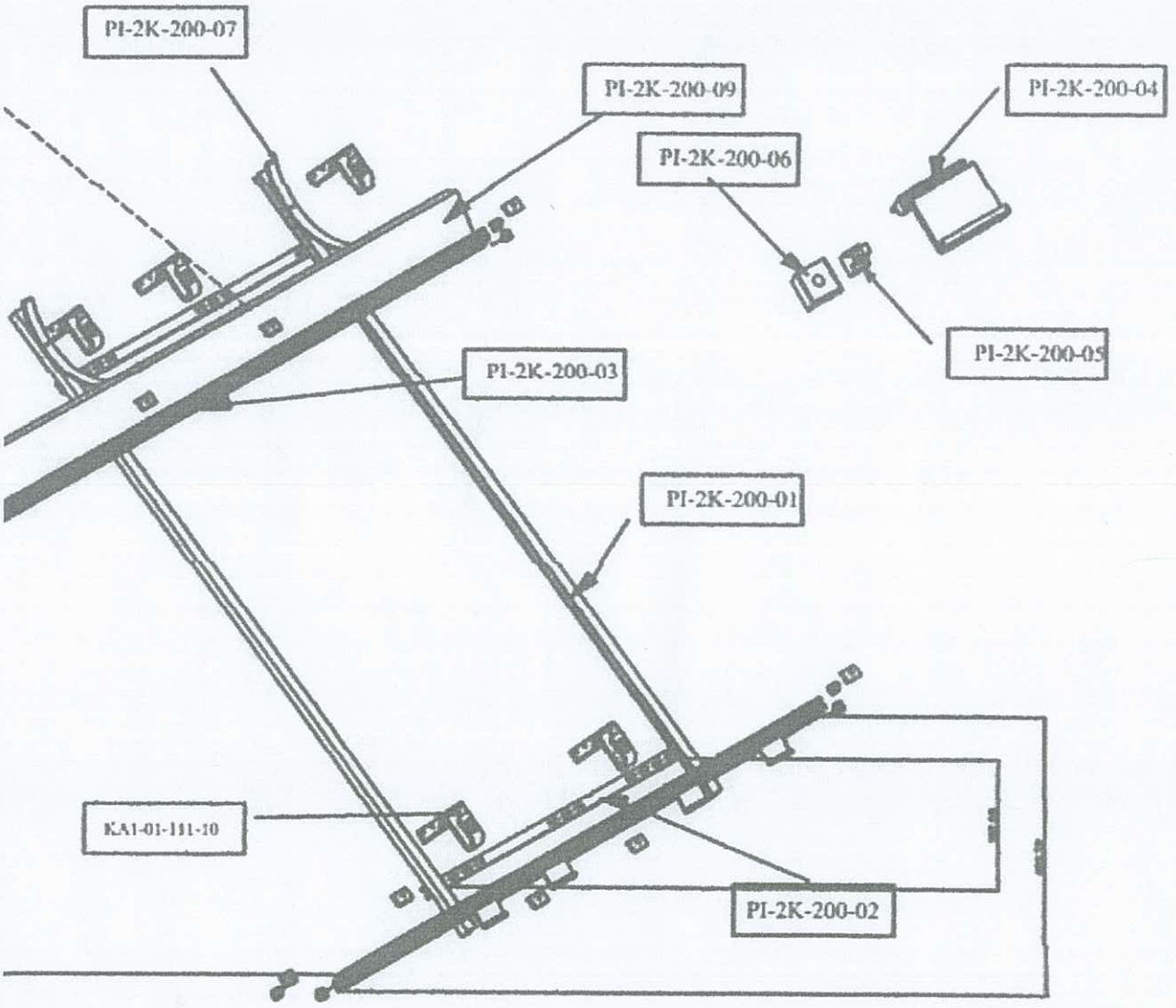
ŞEHBA RENGİ	KASA ADI	KASA RESMİ	KASA RENGİ	KASA ÖLÇÜSÜ
	SÜPERLINE L			1204*1891

AÇIKLAMA

SÜPERLINE L YE GÖRE AYARLI

	İSİM	TARİH	TASDİK
ÇİZEN	M. KAYGISIZ		25.12.
KONTROL	M. KAYGISIZ		25.12.



AÇIKLAMA	SÜPERLINE L YE GÖRE AYARLI	PARÇALAR	PIAC SEHPA MONTAJ
ÇİZİM NO	PI-2K-200-01		
REVİZYON	....		
MALZEME	AlMgSi0,5 F22		
ADET	1		
TOLERANS	± 0.5		
KAĞIT NO	1/1		
ÖLÇEK			

	İSİM	İMZA	TARİH
ÇİZEN	M. KAYGISIZ		25.12.2007
KONTROL	M. KAYGISIZ		25.12.2007
ONAY	A.FERUDUN DALLI		25.12.2007

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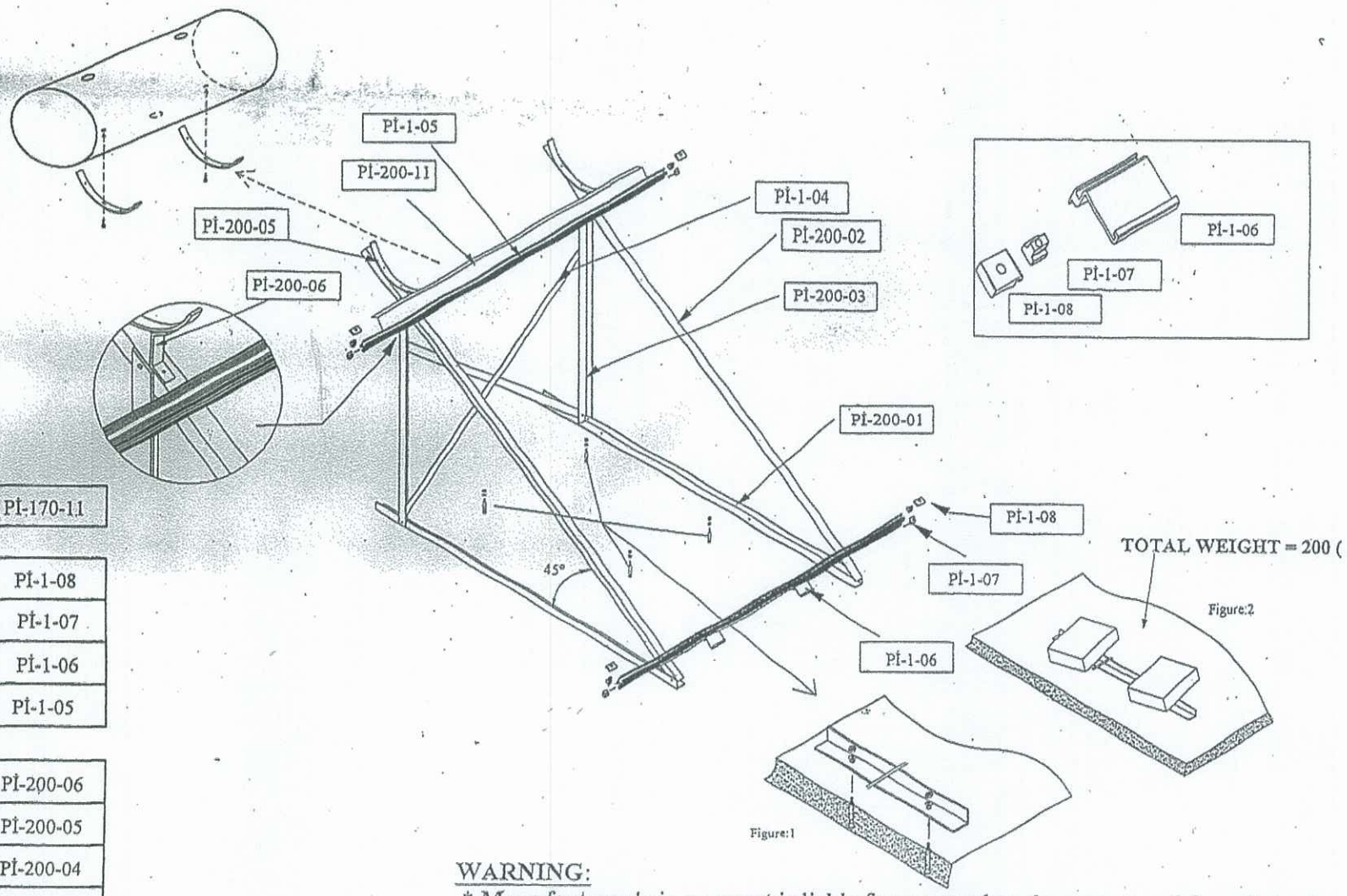
EZİNÇ METAL SAN. ve TİC. A.Ş.



1200 mm	1	Pİ-170-11

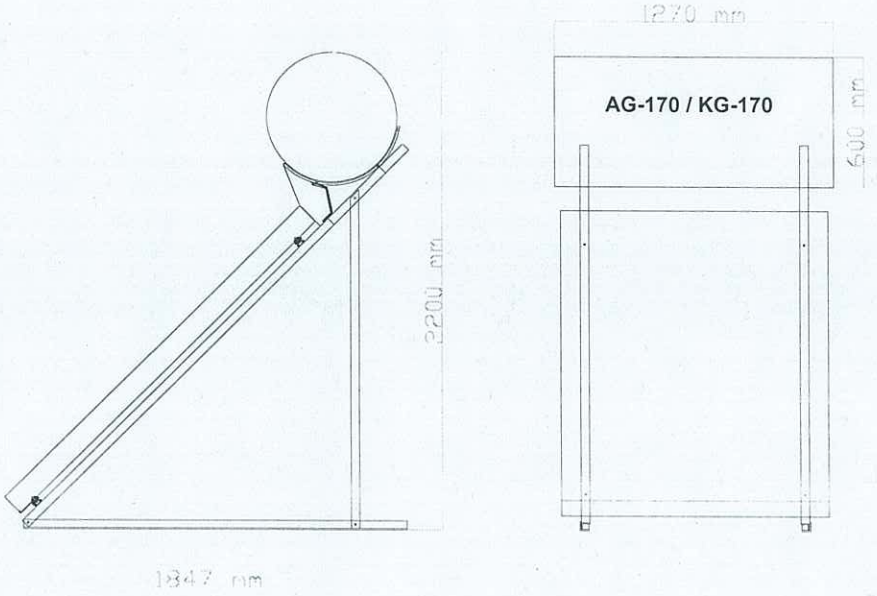
40 mm	4	Pİ-1-08
30 mm	8	Pİ-1-07
30 mm	2	Pİ-1-06
1300 mm	2	Pİ-1-05

240 mm	2	Pİ-200-06
700 mm	2	Pİ-200-05
1085 mm	2	Pİ-200-04
1545 mm	2	Pİ-200-03
2400 mm	2	Pİ-200-02
1750 mm	2	Pİ-200-01

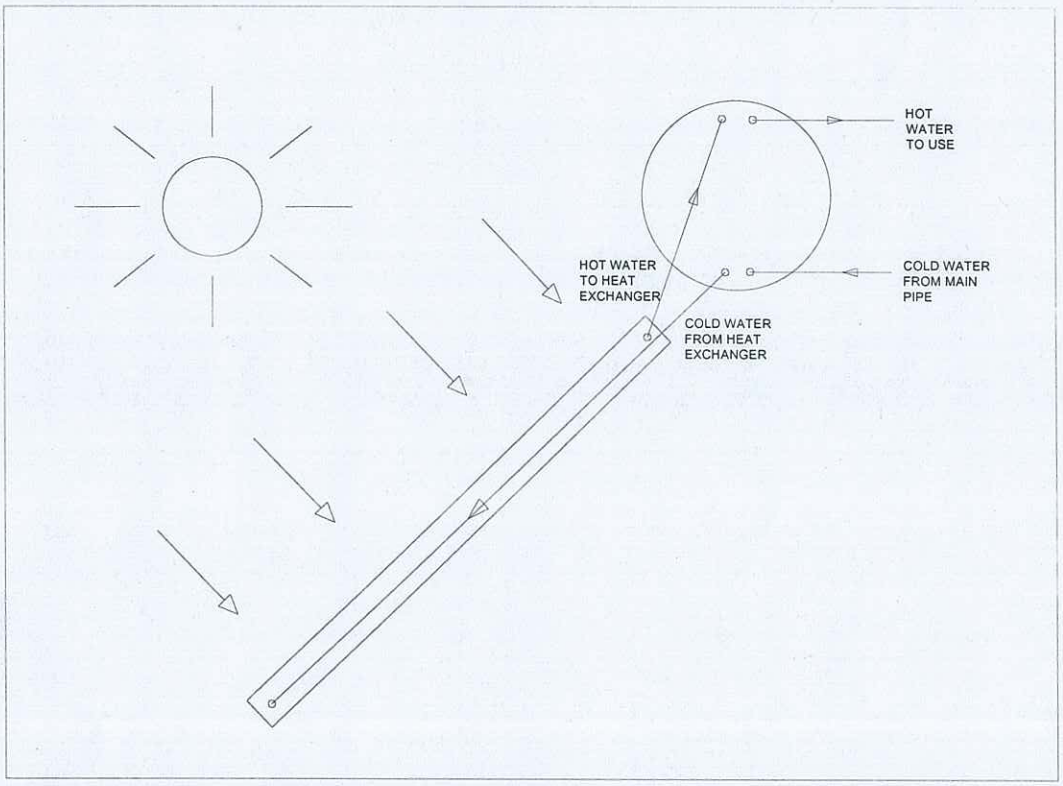
WARNING:

* Manufacturer's in no event is liable for any product damage caused from faulty ins
* Mounting set is produced for normal circumstances.
  If there is any extreme climate circums in your country like typhoon , strong wind et
  Please support mounting set with additional precautions as shown on figure 1 and 2.

Dimensions After Installation:



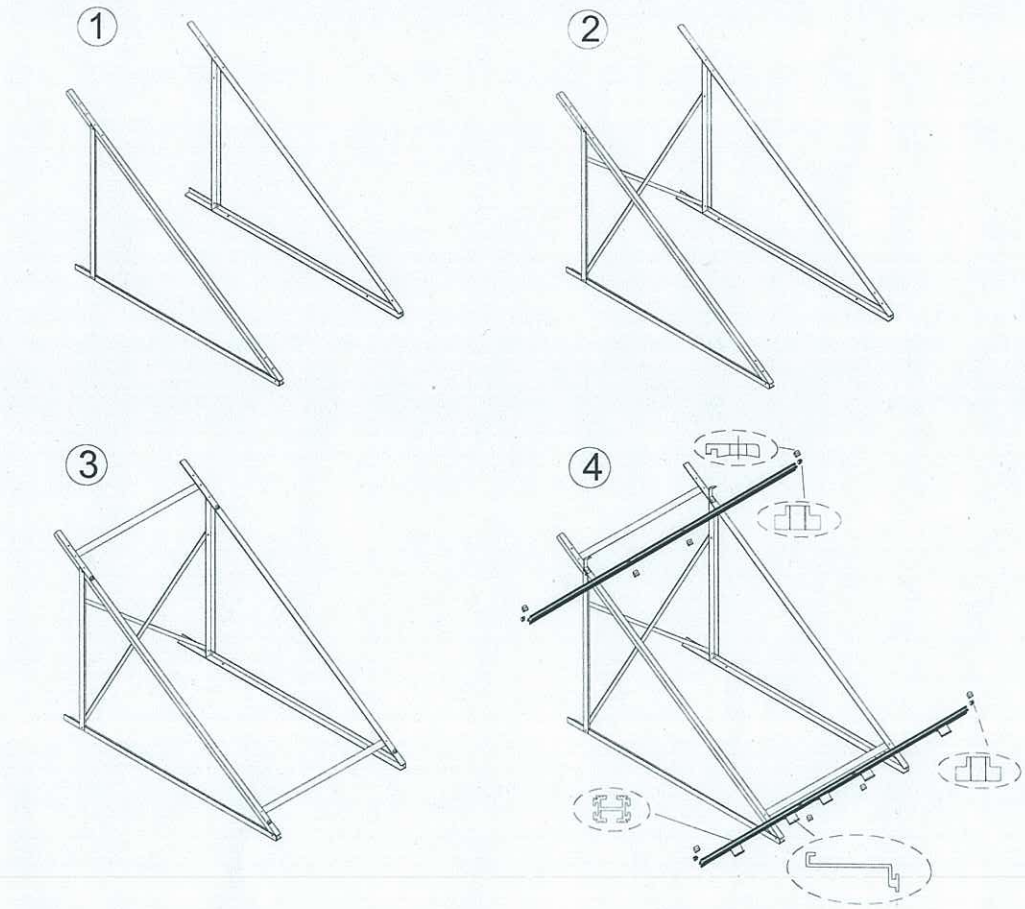
3) OPERATION INSTRUCTIONS

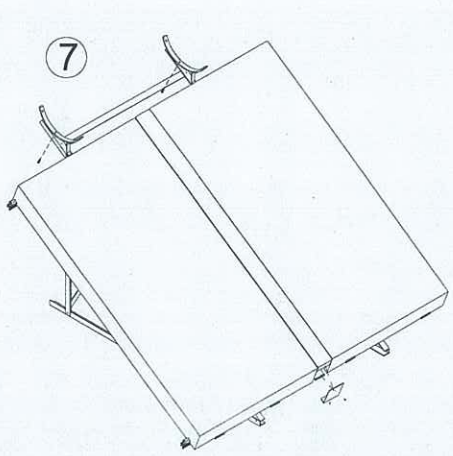


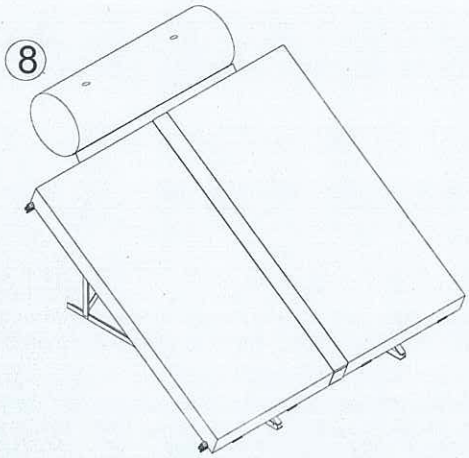
EZINC Thermosiphon type solar water heaters are working according to the thermosiphon principle (natural circulation). Storage tank which is located on a higher level than collector's top level; has an heat exchanger jacket.

TYPE		KG-170 13 LT (FLUID CAPACITY)
TEMPERATURE	LIQUID TYPE	
-5°C	GLYKOL WATER	1,4 lt 11,6 lt
11°C	GLYKOL WATER	2,6 lt 10,4 lt
-18°C	GLYKOL WATER	3,9 lt 9,1 lt
-20°C	GLYKOL WATER	4,4 lt 8,6 lt
-27°C	GLYKOL WATER	5,3 lt 7,7 lt
-36°C	GLYKOL WATER	6,5 lt 6,5 lt

4) MOUNTING SET AND MOUNTING STEPS







5) FITTINGS & CONNECTIONS

- Pressure relief (safety) valve for heat exchanger circuit
- Pressure relief (safety) valve for storage tank
- Insulated connection pipes between tank and collector(s)
- Other fittings

EZINC Metal San. Tic. A.S.
Address: OSB 23. Cad. No: 31 TR-38070 Kayseri TURKEY
Tel: +90-352-3211321 Fax: +90-352-3211325
e-mail: sales@ezinc.com.tr
www.ezinc.com.tr

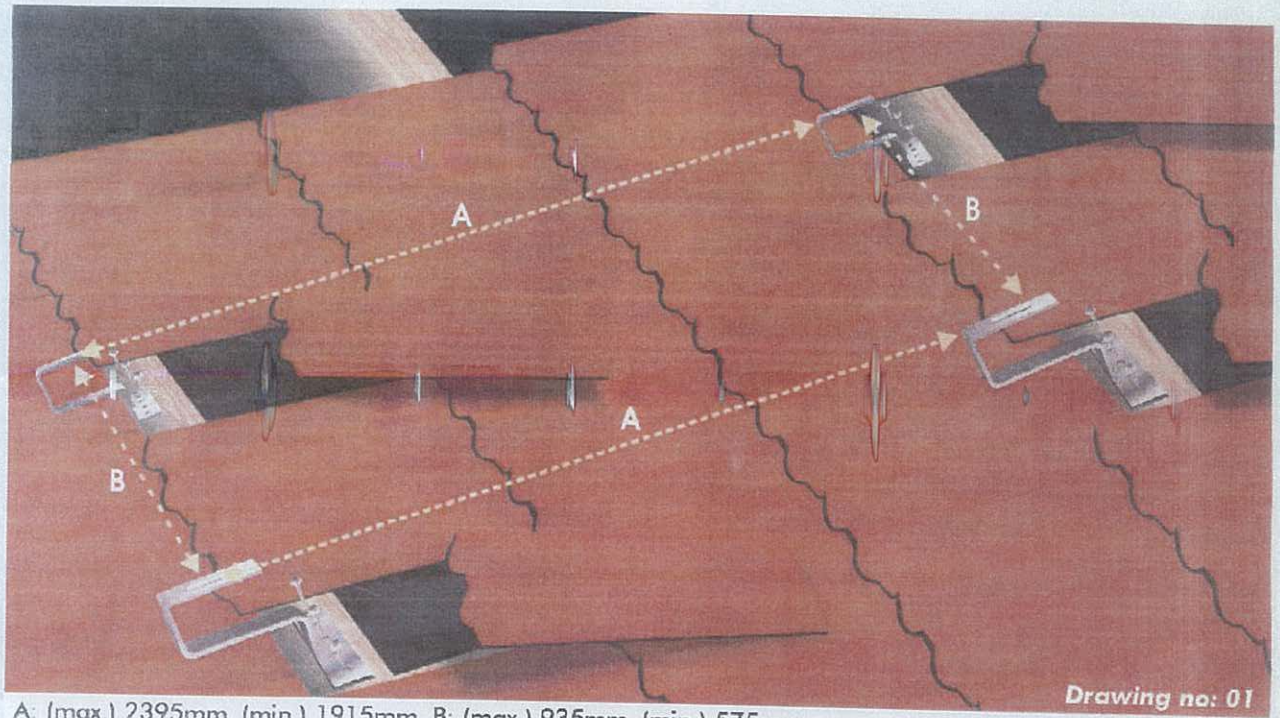
3. INSTALLATION MANUAL :

3.a. Instructions : (All descriptions stated and drawings in the manual has to be checked before starting the installation.)

- Contractor and customer must be agree on all details for a safe and successful installation before the job (location of the system, controlling the static resistance of the roof, piping, additional parts and material necessary)
- Position of the Solar Water Heater should not be shaded by any object (chimneys, buildings, etc.) all around the year. Solar Water Heater must face the south.
- Solar Water Heater must be installed on a roof not less than 15°, not more than 35°. If the angle is out of above tolerances, correct material should be used to adjust the angle considering heavy winds, hurricanes etc. damages.
- For correct installation on sloping roofs, it is necessary to install the support base in such a position so that the storage tank should be placed nearly over a roof timber and in no case way between two timbers.
- If the surface on which the Solar Water Heater will be installed is not compatible with the standart equipment with each appliance, then a different equipment must be used. The contractor has to choose, propose and install such different equipment, with the acceptance of the customer.
- Roofhooks must be screwed with appropriate screws on the roof timber to have enough strength at the beginning of the installation.
- In regions has heavy snowfalls, very important to ensure, that too much snow doesn't accumulate behind storage tank. In regions has heavy winds and storms, the storage tank must be placed in a stable way on the roof and must be tightened with additional materials.
- All tubes and valves must be well insulated to avoid heat loss and freezing risk.
- Special attention must be taken for installation, filling and connecting of the closed circuit.
- Only experienced technicians can make the installation, filling and connection.

3.b. Mounting of the support base on the roof :

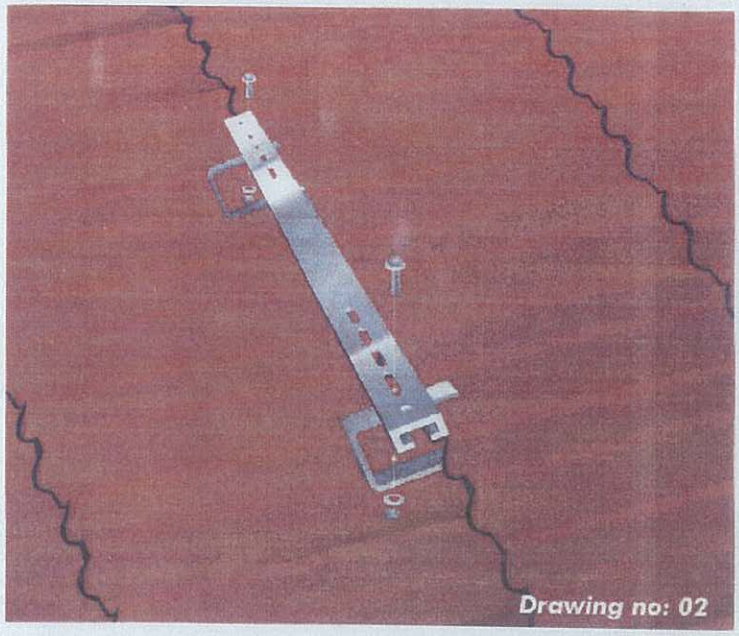
Remove the roof tiles, screw 4 roofhooks (code no:1) on the wooden timbers or on the concrete of the roof tightly as shown on drawing no 01 considering minimum and maximum distance between roofhooks. For each roofhook use at least 3 screws.Cover the roof tiles again.



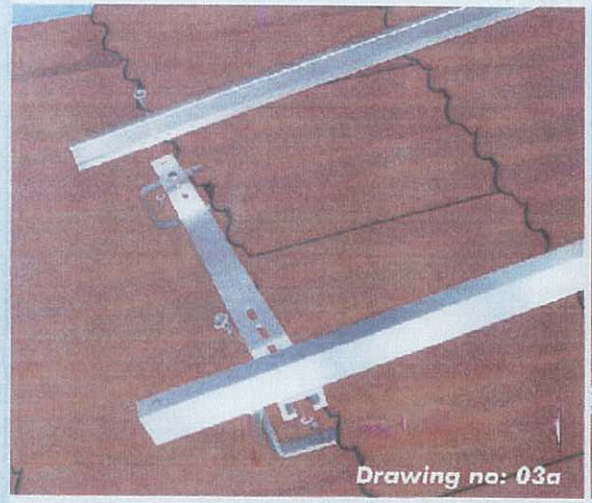
A: (max.) 2395mm, (min.) 1915mm B: (max.) 935mm, (min.) 575mm

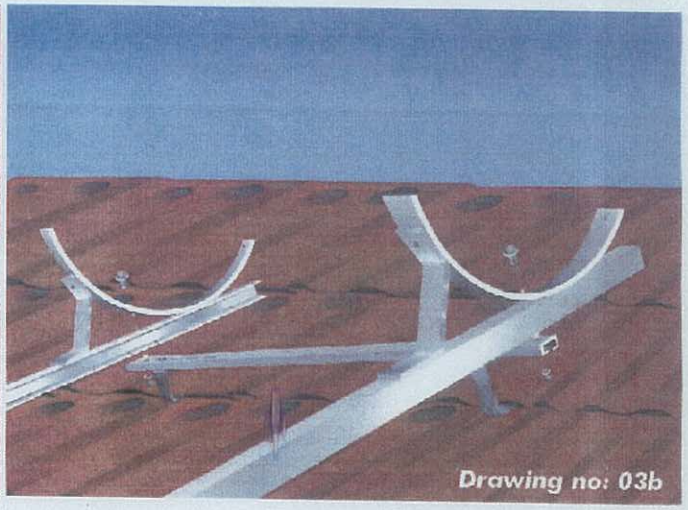
3. INSTALLATION MANUAL :

Screw 2 pieces of bottom profiles (code no:2) tightly on roofhooks with screws and bolts horizontally from long holes as shown on drawing no 02.

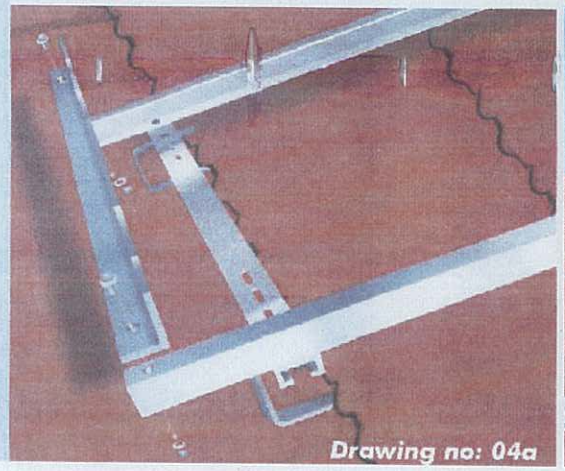


Screw 2 pieces of side profiles (code no:3) tightly on bottom profiles with screws and bolts vertically from holes at the ends of bottom profiles as shown on drawing no 03a and 03b.



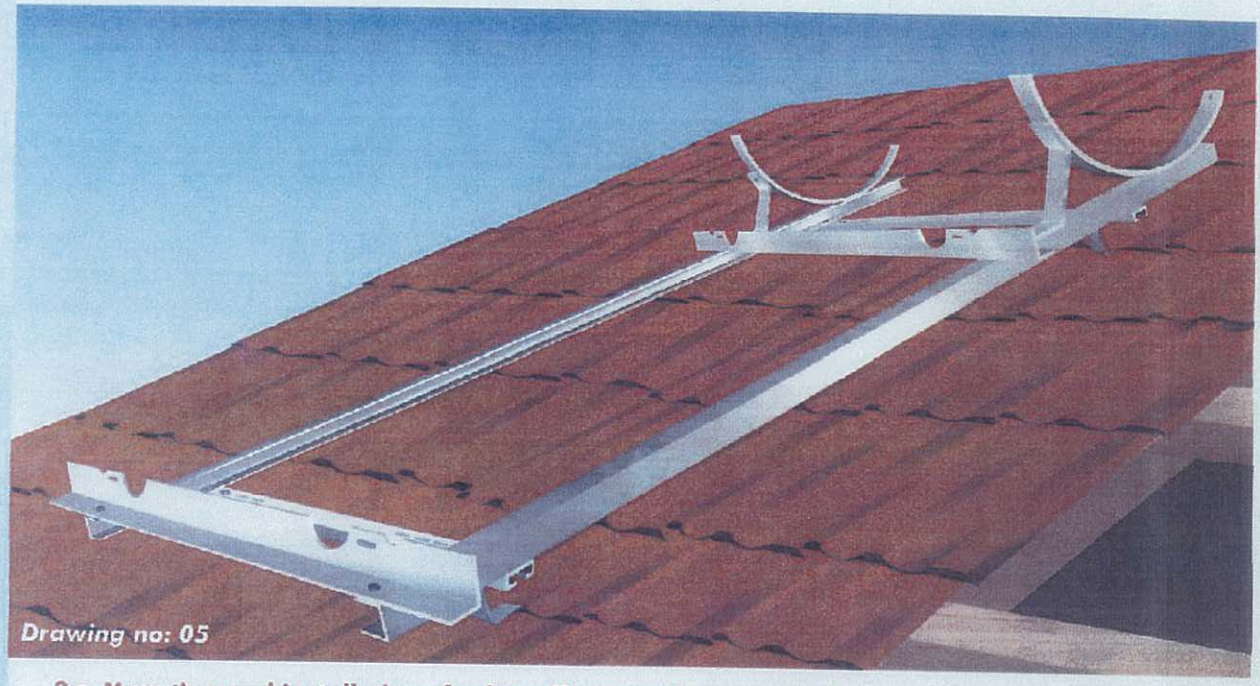


Screw 2 pieces of upper profiles (code no:4) tightly on side profiles with screws and bolts horizontally as shown on drawing no:04a and 04b.



3. INSTALLATION MANUAL :

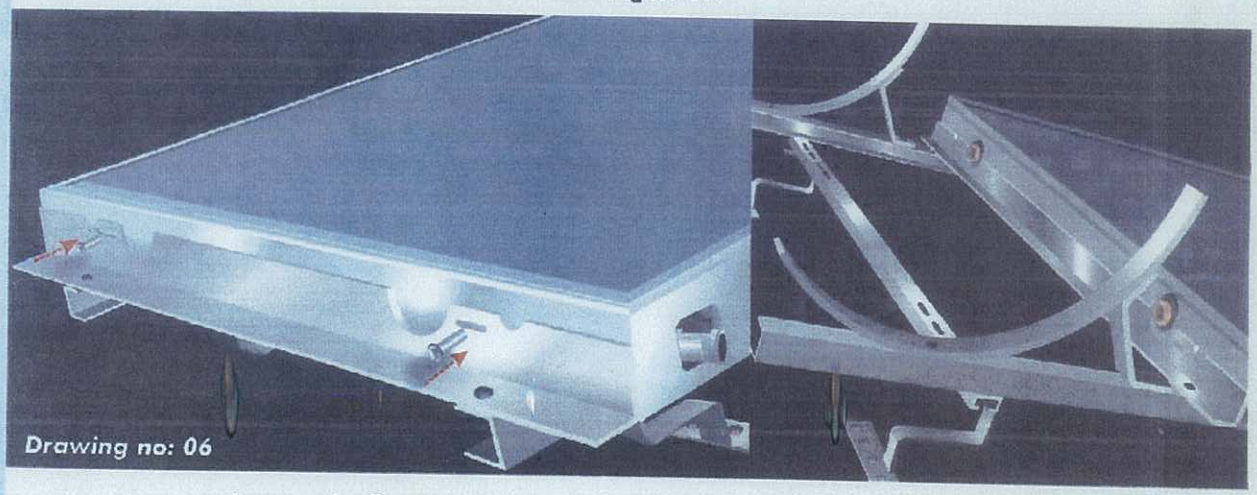
·Mounting of support base is completed (see drawing no:05).



Drawing no: 05

3.c. Mounting and installation of solar collector and storage tank :

Place the collector between two upper profiles and fix it from bottom side to upper profile with two screws as shown on drawing no 06.



Drawing no: 06

Connect the flexible tubes (code no:7) tightly to thermal fluid inlet and outlet (code no:6a and 6b) of storage tank as shown on drawing no 07. Be sure that the connections are leakproof. You should use leakproofing material resisted to hot water.

Drawing no: 07

3. INSTALLATION MANUAL :

Place the storage tank on it's housing on side profile as "EZINC" logo faces south. Connect the open edges of flexible tubes to collector inlet and outlet as shown on drawing no.8. Be sure that the connections are leakproof. You should use leakproofing material resisted to hot water. Locate and fix insulation hoses (code no:15) on flexible tubes.

Drawing no: 08

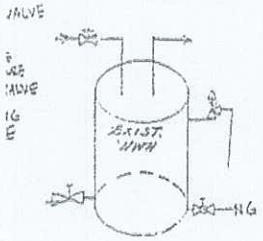
Screw the steel bumper (code no:8) to upper profile together with the collector as shown on drawing no 9a and 9b.

Drawing no: 09a

Drawing no: 09b

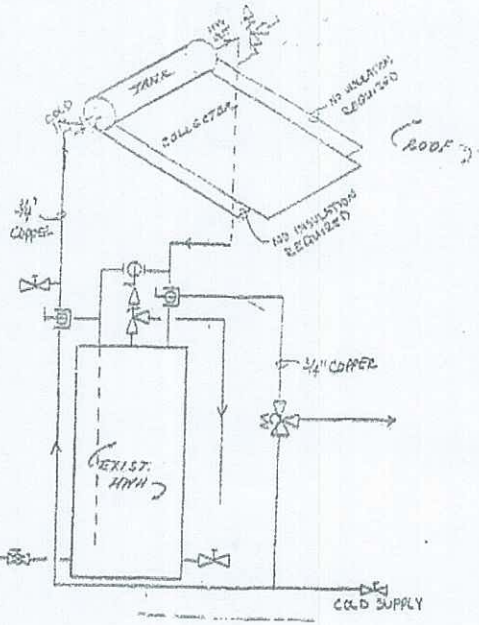
Fix the storage tank to side profile from behind and fix typhoon belts as shown on drawing no 010.

Drawing no: 010



NOTES

1. ISOLATE COLD SUPPLY AND CUT PIPING AFTER VALVE
2. INSTALLER TO FIELD LOCATE ALL VALVES & FITTINGS
3. ALL NEW PIPING SHALL BE 3/4" COPPER
4. PRESSURE/TEMPERATURE RELIEF DRAIN COPPER or CPVC
5. INSULATE ALL PIPING ABOVE ROOF. COLLECTOR TO STORAGE TANK INSULATION NOT REQUIRED



PLUMBING SCHEMATIC

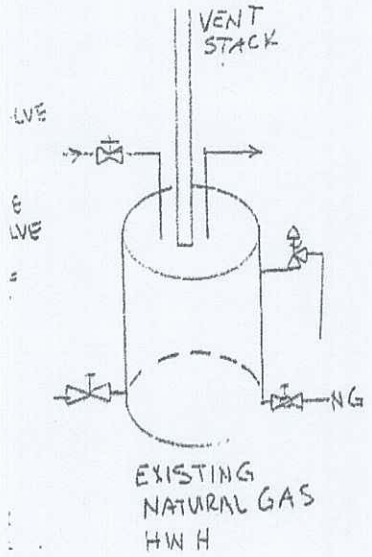
NTS

GENERAL NOTES:

1. THE INSTALLATION PLAN IS FOR THE 48 GALLON THERMOSIPHON EZINC SOLAR WATER HEATER.
2. THE INSTALLATION OF EQUIPMENT WILL BE DONE IN ACCORDANCE WITH THE MANUFACTURERS SPEC'S.
3. THE STRUCTURAL FRAMEWORK REQUIRED FOR SUPPORTING THE EQUIPMENT TO BE ALUMINUM WITH STAINLESS FASTENERS.
4. THE EQUIPMENT AS INSTALLED ON THE ROOF TOP IS DESIGNED TO WITHSTAND WINDS UP TO 130 MPH.
5. ALL ROOF PENETRATIONS TO BE PROTECTED WITH APPROVED PITCH PANS
6. ALL WORK TO BE IN COMPLIANCE WITH THE 2007 FBC WITH 2009 SUPPLEMENTS & ASCE 7-05.
7. GENERAL CONTRACTOR / OWNER TO VERIFY ALL DIMENSIONS AND STUCTURAL CONDITIONS AS SHOWN ON THE PLANS. ANY DISCREPENCY BETWEEN THE PLANS AND THE ACTUAL EXISTING CONDITIONS SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY.

FBC 2007 WITH 2009 SUPPLEMENTS & ASCE 7-05:

DESIGN CRITERIA:	
BASIC WIND SPEED	140MPH
IMPORTANCE FACTOR	1.0
BUILDING CATEGORY	II
BUILDING DESIGN	ENCLOSED
WIND EXPOSURE	D
INTERNAL PRESSURE COEF.	+/-0.18
DESIGN PRESSURES:	
ROOF UPLIFT	-33.9 PSF



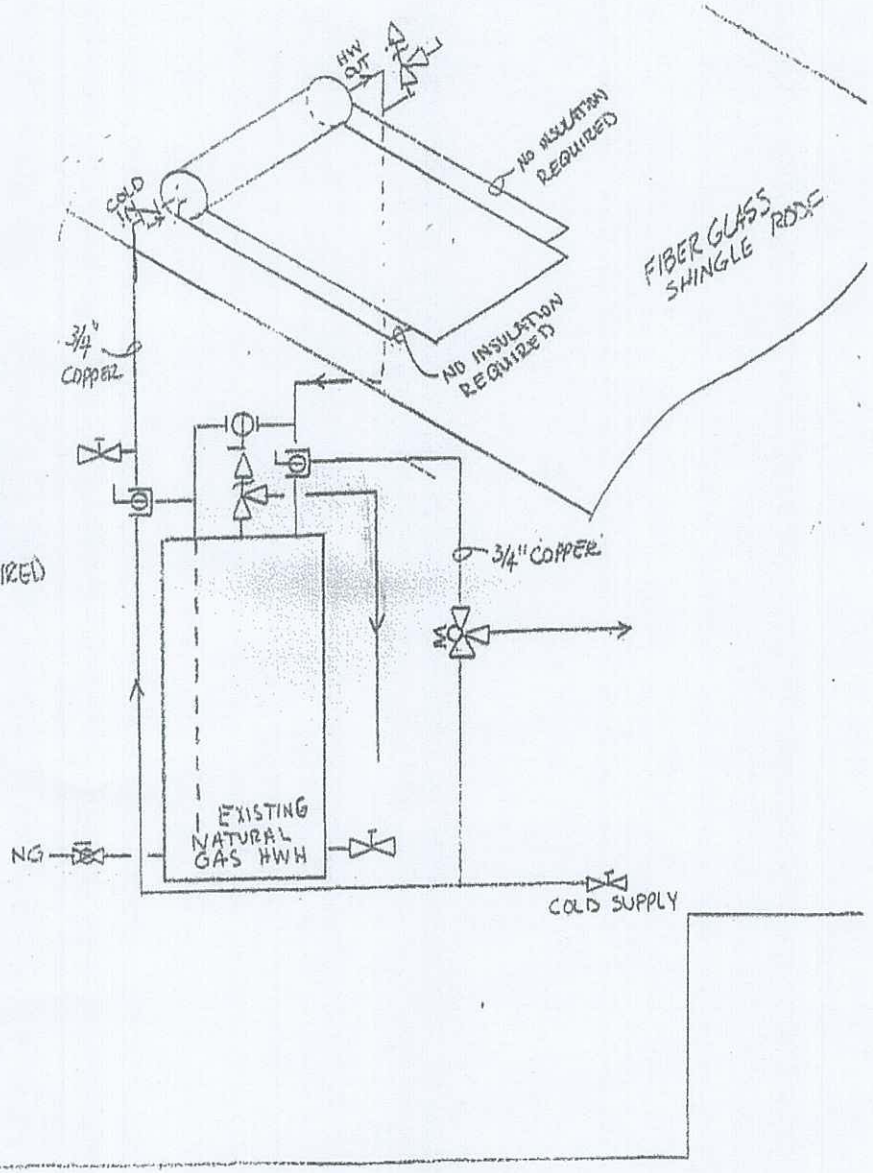
① ISOLATE COLD SUPPLY AND CUT PIPING AFTER VALVE

② INSTALLER TO FIELD LOCATE ALL VALVES & FITTINGS

③ ALL NEW PIPING SHALL BE 3/4" COPPER

④ PRESSURE / TEMPERATURE RELIEF DRIAN COPPER or CPVC

⑤ INSULATE ALL PIPING ABOVE ROOF. COLLECTOR TO STORAGE TANK INSULATION NOT REQUIRED



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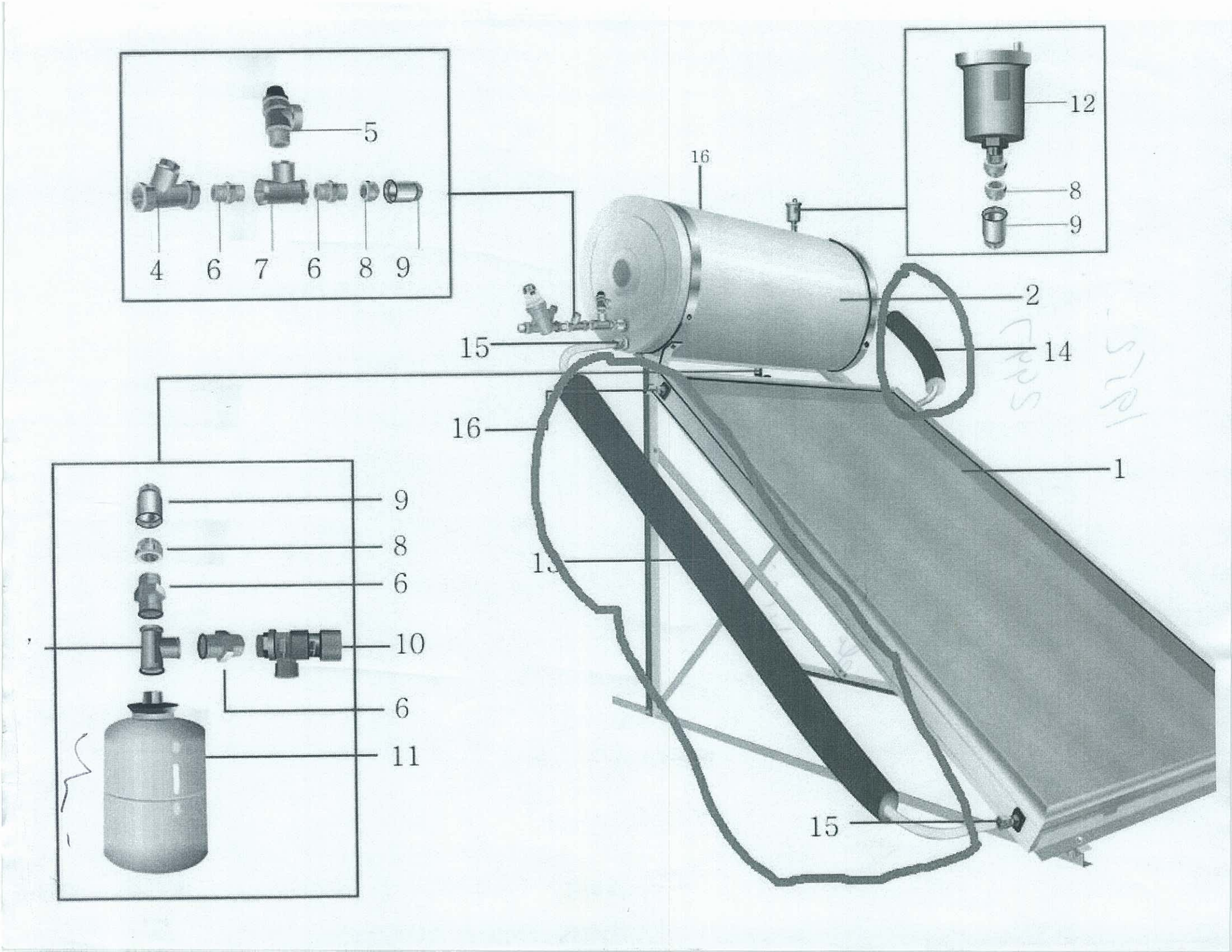
5
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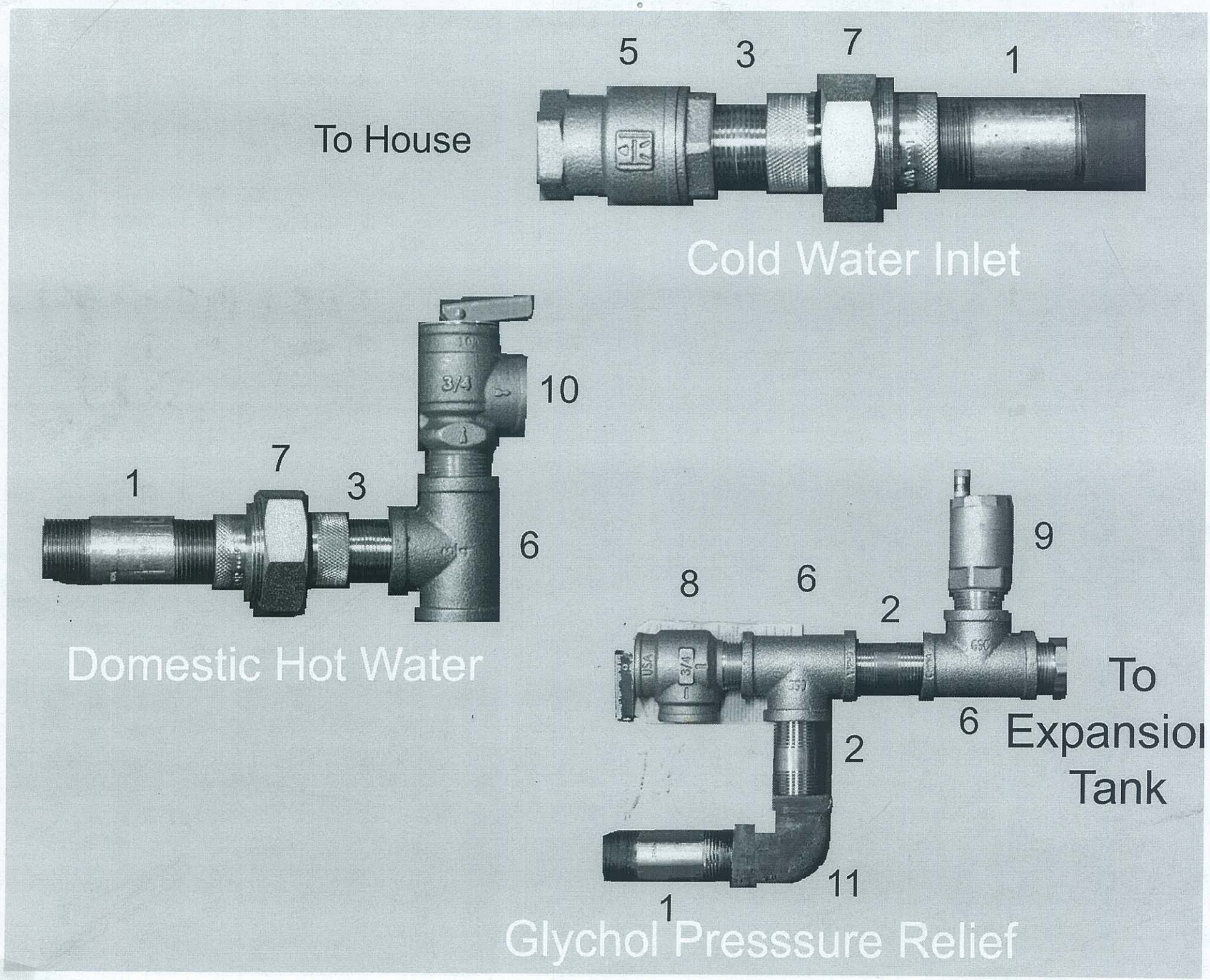
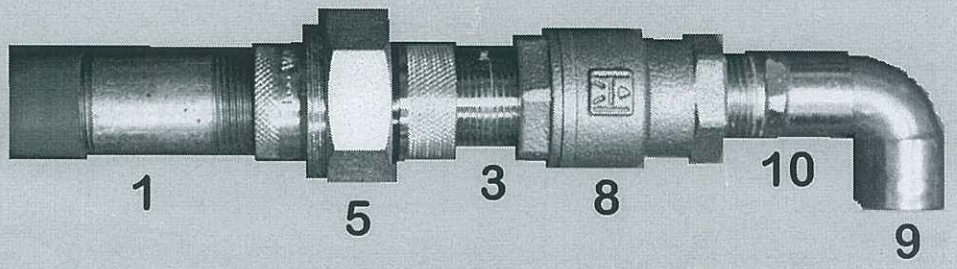
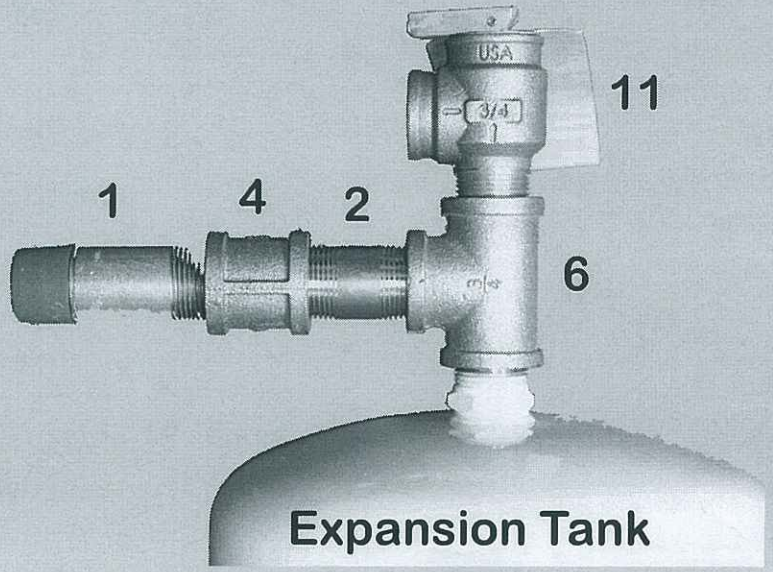

5
3
7
1
To House
Cold Water Inlet
10
1
7
3
6
Domestic Hot Water
9
8
6
2
To
6
2
Expansio
Tank
11
1
Glychol Presssure Relief

Cold Water Inlet

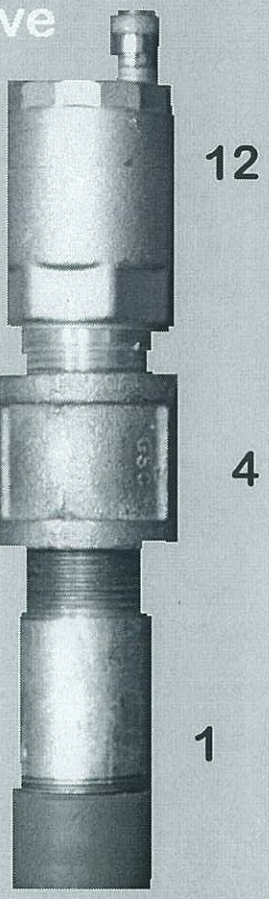


Alternate Cold Water Inlet

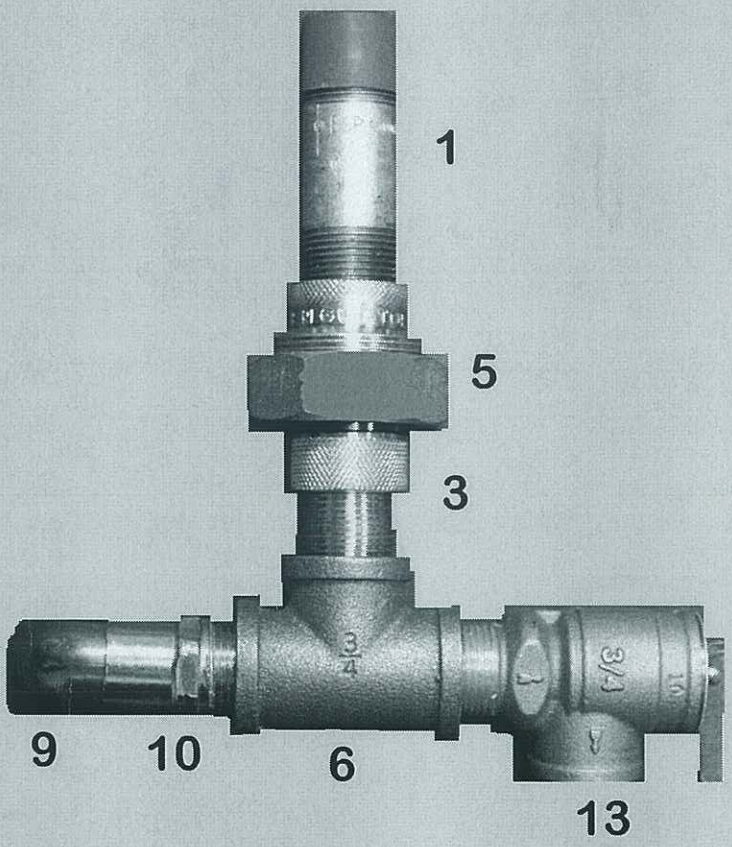
Glychol Pressure Relief



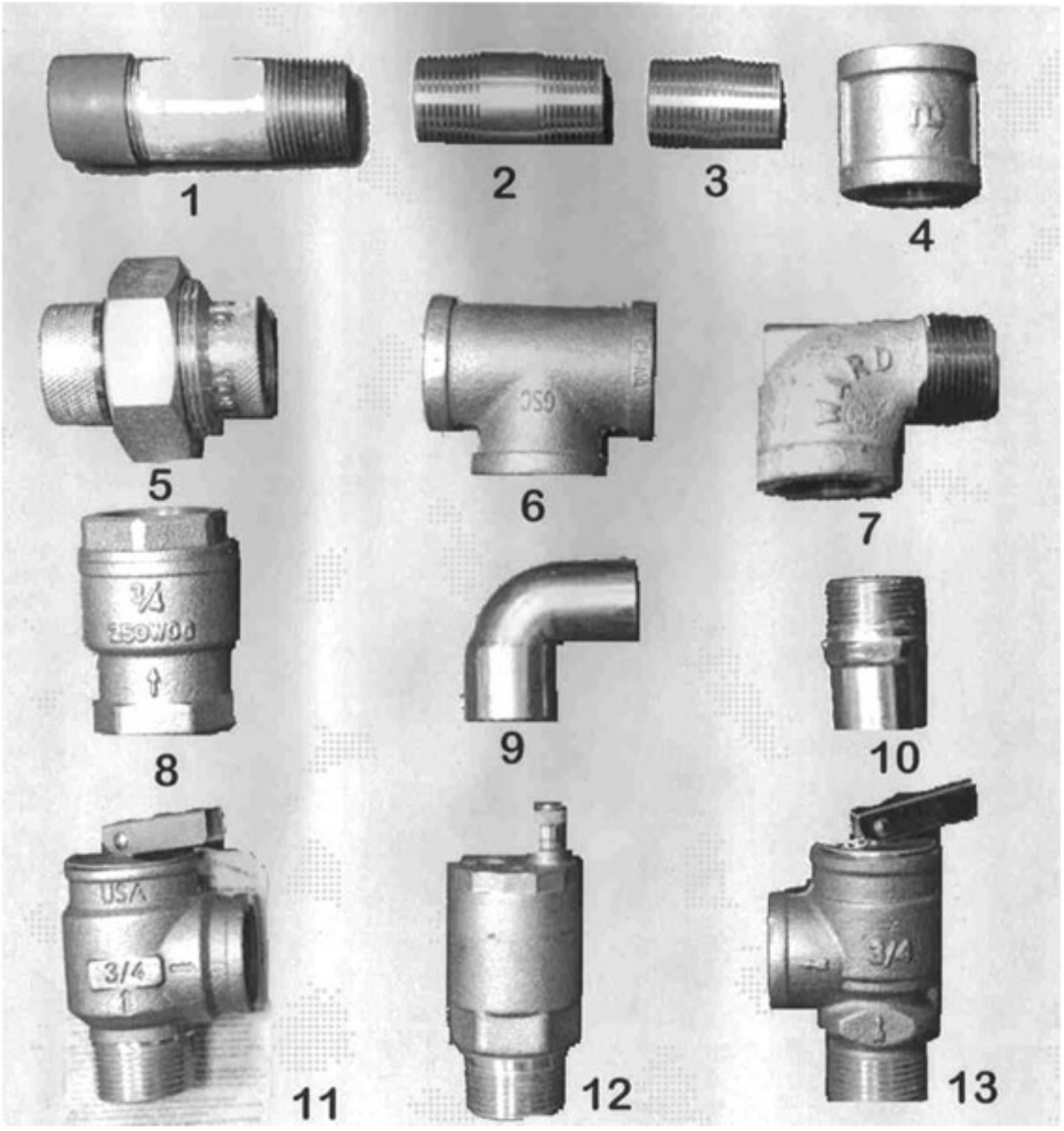
Air Release Valve



Domestic Hot Water Out



Fitting BOX CONTENTS		
Item	Quantity	Description
1	5	3/4 x 3 BSPT X NPTM Galv Nipple*
		*The tank end of this nipple is marked "BSPT"
2	2	3/4 X 2 Brass Nipple
3	2	3/4 X Close Brass Nipple
4	1	3/4 x 1/2 Brass Bushing
5	1	3/4 125# Spring Loaded Check Valve
6	3	3/4 Brass Threaded Tee
7	2	3/4 FIPXFIP Dielectric Union
8	1	10417-09 Conbraco Relief Valve @ 45
9	1	FV4M1 3/4 Air Vent Valve and Vacuum Relief
10	1	17402-03 Conbraco Relief Valve @ 125
11	1	3/4 Galv 90 Elbow
Items Not on Picture:		
17	1	1/4 pt can Hercules Blue Block Pipe Dope
18	1	1/2 Roll Teflon Tape


1
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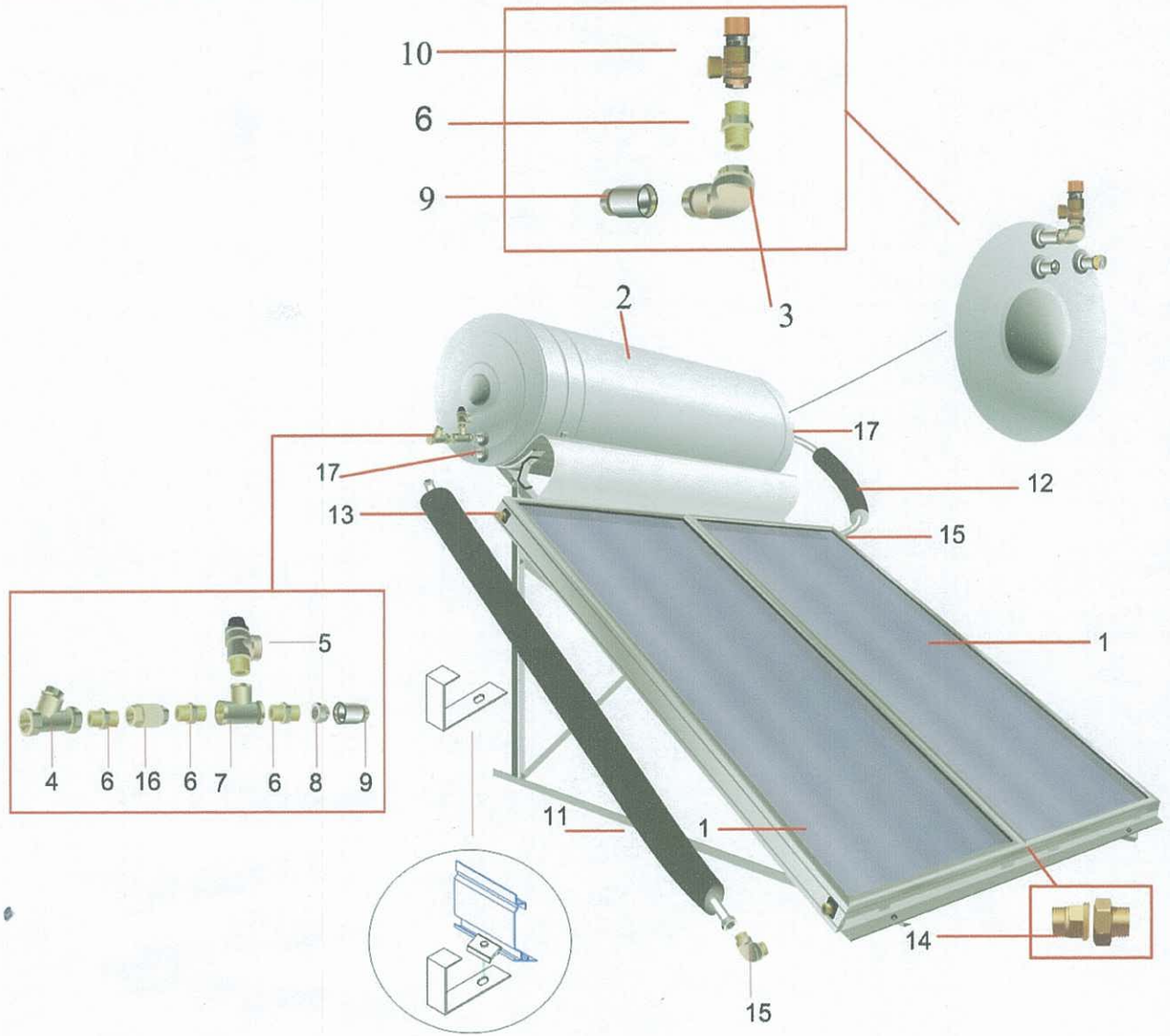
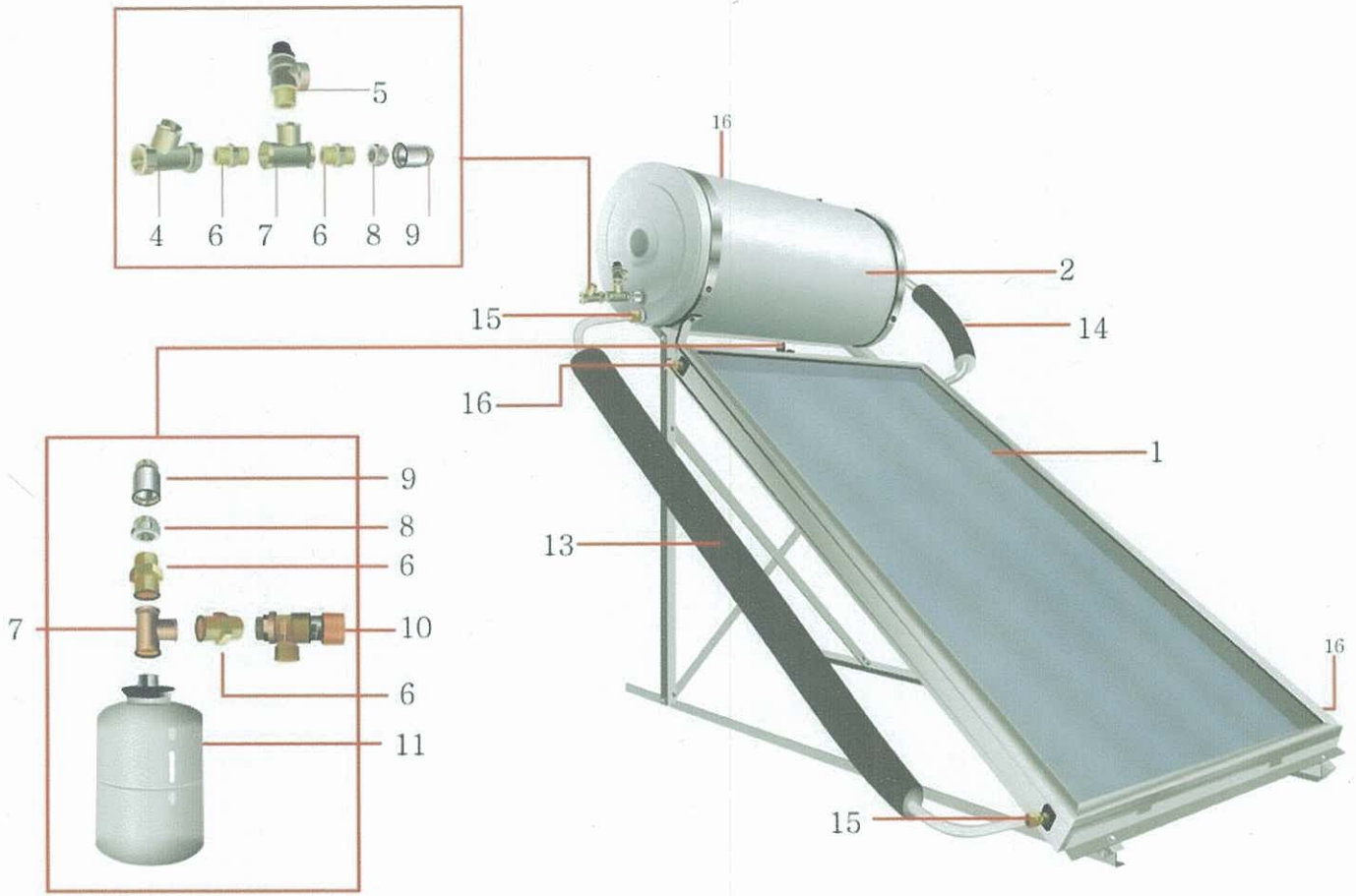
12
13

old

No	Description	Picture	Quanty
1	Collector		2
2	Boiler		1
3	Elbow 1/2"- 3/4"		1
4	No-return valve ½" FF		1
5	Security Valve 8 Bar (or 6 Bar) M		1
6	Nippel 1/2" MM		4
7	T Nippel 1/2" FFF		1
8	Adapter 1/2"- 3/4" FM		1
9	Adapter 3/4" FM		5
10	Security Valve		1
11	Long pipe connection 3/4" FF		1
12	Short pipe connection 3/4" FF		1
13	Plug 3/4"		2
14	Racord with nippel 3/4" MM		2
15	Elbow ½"- 3/4"		2
16	Filter		1
17	Nippel 3/4" MM		2



New



4. OPERATION MANUAL:

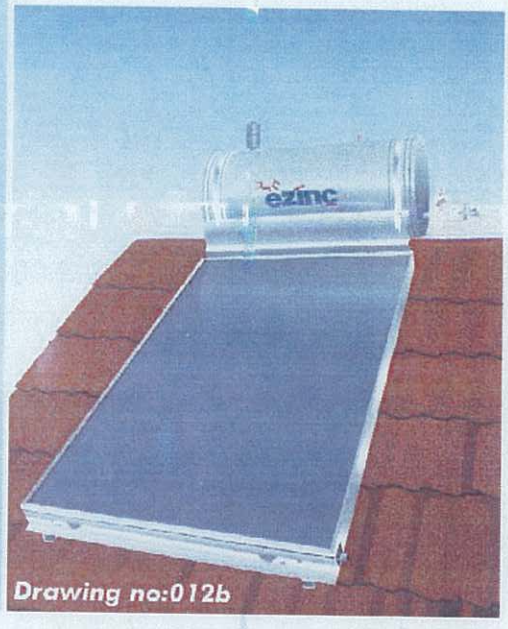
4.a. Filling of the closed circuit with thermal fluid:

20 lt of thermal fluid is supplied with each appliance. It's the mixture of Propylence Glycol and water for the antifreeze protection of the solar water heater against -20 °C. Manufacturer of propylene glycol is Dow Detschland Inc.

- Fix the edge of filler (code no:16) to the filling/drain valve located at the bottom corner of the collector and open the valve. Start to fill the thermal fluid through filler keeping the filler minimum 10 cm upper than top of storage tank (drawing 12a and 12b). Never keep the filler level lower or equal to storage tank during filling process. Go on filling until thermal fluid overflows out from exist (code no 6c and 6d) on the storage tank. Wait several minutes to be sure that no air inside, if necessary fill some more. When you finish filling, close drain valve on the bottom corner of the collector tightly, then remove the edge of filler. Shake the storage tank little bit to let the air inside goes out, fill some more thermal fluid through filling holes on the storage tank (code no 6c and 6d) if thermal fluid level is reduced. Fix the expansion tank to filling hole (code no:6c) and fix the plug to the other filling hole (code no:6d) tightly. Be sure that no leakage on these two points.
- Open one of hot water tap in the house then, open the valve (code no:12) on cold water inlet of the storage tank. Wait untill water comes from the tap. When water comes out without air bubbles it means storage tank is full of water. Close the tap and pull out the cover on the collector.
- Heating power and period of solar water heaters changes from region to another. Just for reference, under condition of having 1000 W/m² solar radiation, Ezinc solar water heaters heats the cold water in the storage tank 10 °C/hour (average).
- Check all connections , valves, fittings and insulations last time 2-3 hours after the installation.
- Solar Water Heaters reaches to the optimum performance within two days after the installation. Nevertheless, you may receive heated water starting from second day after installation.

Drawing no: 012a

A: (min.) 10 cm



Drawing no:012b

ARTICLE 9
WARRANTY CONDITIONS

Warranty Conditions of Thermosiphon Solar Water Heater Kits

9.01. Tank and collector in under The Company's limited warranty against serial faults which are caused by raw material and production faults, within 5 (five) years. The Company will replace 100% of faulty tanks and/or collectors during the first 3 (three) years after installation date and The Company will replace 50% of faulty tanks and/or collectors during the last 2 (two) years of 5 (five) years total limited warranty period. Those faults can be leaks on tank body or leaks on collector pipes. Warranty period starts from the installation date of the thermosiphon kit to the end user's facility, but installation date must be within 12 (twelve) months after production date of the product. Otherwise, (installations later than 12 (twelve) months after production date), warranty period will start from the date, 12 (twelve) months after production date of the thermosiphon kit.

9.02. As the mgnesium anode bar inside of the tanks, is a consumable part, it is out of The Company's 5 (five) years limited warranty.

9.03. All electrical parts and components on the tank are out of 5 (five) years limited warranty.

9.04. Collector glasses are out of any warranty against breakages, because of damages, during transportation, handling, storage, installation, operation, hail, maintenance, etc.

9.05. Security valves are under 2 (two) years warranty of the supplier. Therefore The Company is able to give the same warranty conditions and period to The Distributor, for the security valves. Security valves must be checked and changed every two years, if necessary. Damages, problems, etc. on the thermosiphon kit, which are caused by a disordered security valve, will take tank, collector and the system out of any warranty. The Company strictly recommend to change security valves when their warranty period finishes.

9.06. All warranty conditions are valid if the product is mounted and installed according to the instructions mentioned in the installation manual of The Product. Also all warranty conditions are valid if installation made by authorized and certified staff. During the warranty period, all maintenance and repairs on The Product, must be done annually, by authorized and certified staff and disordered parts and accessories must be changed; otherwise The Product will be out of any warranty.

Authorization For Maintenance, Service and Repairs

9.07. The Distributor is the authorized agent of The Company, in The Territory for services, repairs and maintenance of The Products during the validity period of this agreement.

Ezing L Bracket for Collectors installed on shingle roof. for Active Systems usage (non thermosiphons)

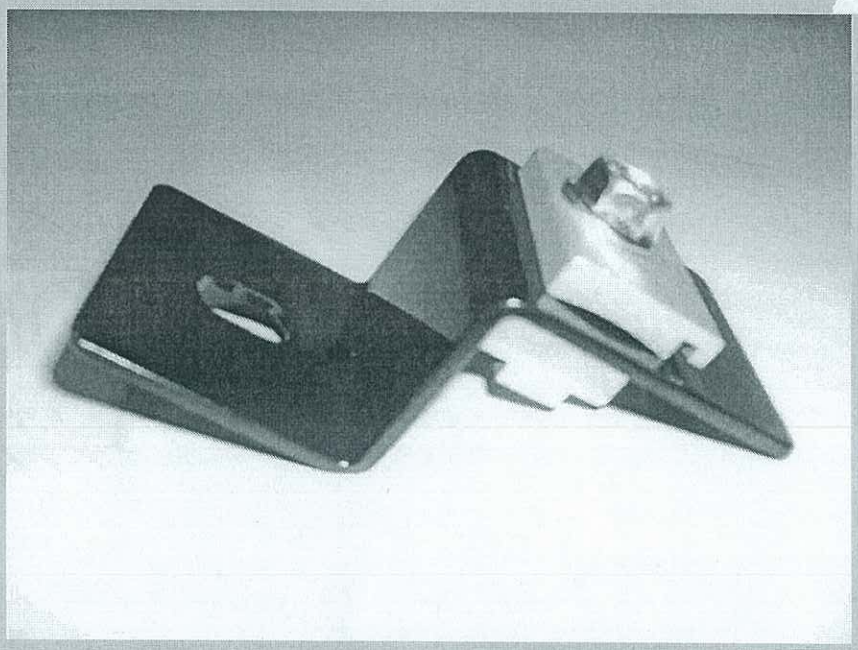
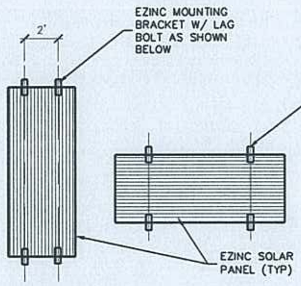
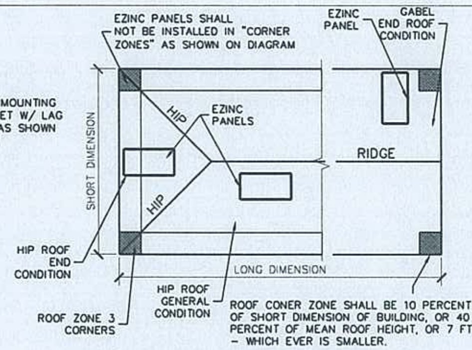


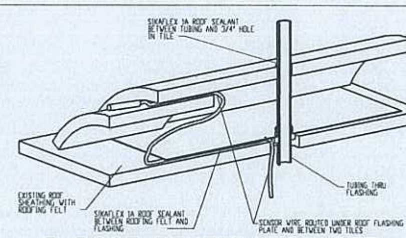
Image 4 of 4



1 / SE-2 PLAN OF PANELS
SCALE: 3/16"=1'-0"


EZINC PANELS SHALL NOT BE INSTALLED IN "CORNER ZONES" AS SHOWN ON DIAGRAM
EZINC PANEL
GABEL END ROOF CONDITION
HIP
EZINC PANELS
HIP
SHORT DIMENSION
RIDGE
HIP ROOF END CONDITION
LONG DIMENSION
HIP ROOF GENERAL CONDITION
ROOF ZONE 3 CORNERS
ROOF CONER ZONE SHALL BE 10 PERCENT OF SHORT DIMENSION OF BUILDING, OR 40 PERCENT OF MEAN ROOF HEIGHT, OR 7 FT - WHICH EVER IS SMALLER.

2 / SE-2 ROOF LAYOUT PLAN
SCALE: NONE



6 / SB-4 ROOF PENETRATION DETAIL
SCALE: N.T.S.

GENERAL NOTES:

1. THESE PLANS ARE IN COMPLIANCE WITH THE 2007 FLORIDA BUILDING CODE, WITH 2009 SUPPLEMENTS, SECTION R301 FOR WIND EXPOSURE CATEGORY "C". CHAPTER 16 FOR 146 MPH EXPOSURE "C" WIND VELOCITY AND PER ASCE 7-05, CHAPTER 6.0 FOR 146 MPH EXPOSURE "C" WIND VELOCITY TYPICALLY.

2. THESE PLANS REMAIN IN EFFECT UNTIL FUTURE CODE REVISIONS DICTATE THAT AN UPDATE IS NECESSARY.

3. LAG BOLT CAPACITIES AND EMBEDMENT ARE BASED UPON "NATIONAL DESIGN SPECIFICATION FOR STRESS GRADE LUMBER AND FASTENINGS" AS PUBLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION.

4. ALL CONNECTIONS ARE FOR ROOFS 0° TO 45° MAX SLOPE CONDITIONS, AND ALL CONNECTORS ARE FOR MEAN ROOF HEIGHTS NOT TO EXCEED 30'-0". ACTUAL ROOF FINISH NOT SHOWN FOR SIMPLICITY.

5. APPLIED PRESSURES PER ASCE 7-05:
   ZONE 1: QZ = -50.4 PSF
   ZONE 2: QZ = -77 PSF

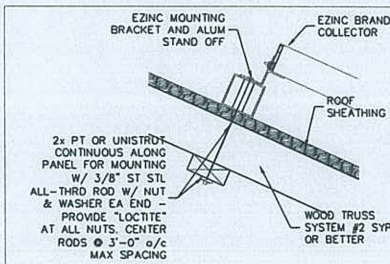
6. COLLECTOR TRIBUTARY AREA AND APPLIED LOADS.
   AT = 4x8 = 32 FT2
   ZONE 1: F1 = 32 X -50.4 = 1613 LBS

7. THE PANEL WILL BE 4' MAX (PER FBC 2007 CHAPTER 3) IN ZONE 2 AND THE REST IN ZONE 1. THIS YIELDS THE FOLLOWING LOADS:
   ZONE 1: F1 = 913 LBS (ZONE 1 HEADER LOADING)
   ZONE 2: F2 = 1,125 LBS (ZONE 2 HEADER LOADING)
   FORCE ON INDIVIDUAL LAG BOLT = LIFTING FORCE - COLLECTOR WEIGHT (NEGLECTED - CONSERVATIVE APPROACH) / # FASTENERS
   - R1 = 913 LBS/ 2 = 457 LBS
   - R2 = 1,125 LBS/ 2 = 563 LBS

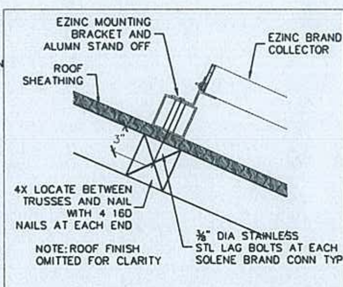
8. APPLY SIKAFLEX ROOF SEALANT OR EQ. TO ALL ROOF PENETRATIONS

WITHDRAWAL LOADS (LB) FOR 3" EMBEDMENT LAGS IN WOOD

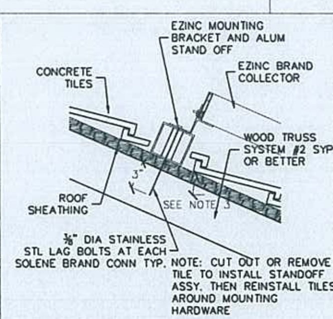
LUMBER LAG DIA	WHITE OAK	SOUTHERN YELLOW PINE	RED WOOD	DOUGLAS FIR
1/4"	1,143	843	576	501
3/8"	1,411	923	660	614


EZINC MOUNTING BRACKET AND ALUM STAND OFF
EZINC BRAND COLLECTOR
ROOF SHEATHING
2x PT OR UNISTRUT CONTINUOUS ALONG PANEL FOR MOUNTING W/ 3/8" ST STL ALL-THRD ROD W/ NUT & WASHER EA END - PROVIDE "LOCTITE" AT ALL NUTS. CENTER RODS @ 3'-0" o/c MAX SPACING
WOOD TRUSS SYSTEM #2 SYP OR BETTER

5 / SE-2 (TYP) MISSED TRUSS SPANNER INSTALL
SCALE: 1-1/2"=1'-0"


EZINC MOUNTING BRACKET AND ALUMN STAND OFF
EZINC BRAND COLLECTOR
ROOF SHEATHING
3"
4X LOCATE BETWEEN TRUSSES AND NAIL WITH 4 16D NAILS AT EACH END
NOTE: ROOF FINISH OMITTED FOR CLARITY
3/8" DIA STAINLESS STL LAG BOLTS AT EACH SOLENE BRAND CONN TYP

3 / SE-2 (TYP) MISSED TRUSS NAILER INSTALLATION
SCALE: 1-1/2"=1'-0"


EZINC MOUNTING BRACKET AND ALUM STAND OFF
CONCRETE TILES
EZINC BRAND COLLECTOR
WOOD TRUSS SYSTEM #2 SYP OR BETTER
3"
SEE NOTE
ROOF SHEATHING
3/8" DIA STAINLESS STL LAG BOLTS AT EACH SOLENE BRAND CONN TYP.
NOTE: CUT OUT OR REMOVE TILE TO INSTALL STANDOFF ASSY. THEN REINSTALL TILES AROUND MOUNTING HARDWARE

4 / SE-2 CONC TILE
SCALE: 1-1/2"=1'-0"

ANCHORING "EZINC SOLAR HOT WATER HEATER" PANELS ON COC. TILE

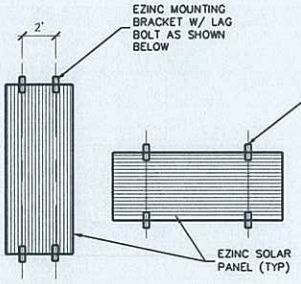
NAME:

ADDRESS:

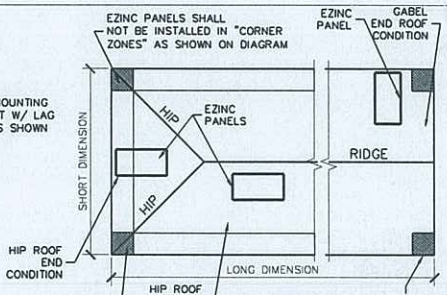
RC ENGINEERING, LLC.
COA 28345
2381 CREST RIDGE COURT
SANFORD, FL 32771
EDMOCRATES E. CASTILLO - FLA P.E.

PROJECT #:
DESIGNED: REC080110
SCALE: NOTED

DRAWING NO. SE-2
SHEET 1 OF 1

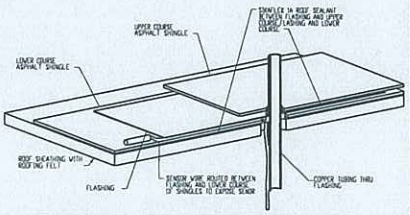


1 SE-1 PLAN OF PANELS
SCALE: 3/16"=1'-0"

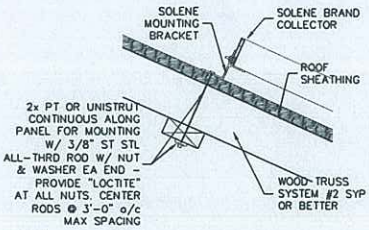


ROOF CONER ZONE SHALL BE 10 PERCENT OF SHORT DIMENSION OF BUILDING, OR 40 PERCENT OF MEAN ROOF HEIGHT, OR 7 FT - WHICH EVER IS SMALLER.

2 SE-1 ROOF LAYOUT PLAN
SCALE: NONE



6 SE-1 ROOF PENETRATION DETAIL
SCALE: N.T.S.



5 SE-1 MISSED TRUSS SPANNER INSTALL
SCALE: 1-1/2"=1'-0"

GENERAL NOTES:

1. THESE PLANS ARE IN COMPLIANCE WITH THE 2007 FLORIDA BUILDING CODE, WITH 2009 SUPPLEMENTS, SECTION R301 FOR WIND EXPOSURE CATEGORY "C". CHAPTER 16 FOR 146 MPH EXPOSURE "C" WIND VELOCITY AND PER ASCE 7-05, CHAPTER 6.0 FOR 146 MPH EXPOSURE "C" WIND VELOCITY TYPICALLY.

2. THESE PLANS REMAIN IN EFFECT UNTIL FUTURE CODE REVISIONS DICTATE THAT AN UPDATE IS NECESSARY.

3. LAG BOLT CAPACITIES AND EMBEDMENT ARE BASED UPON "NATIONAL DESIGN SPECIFICATION FOR STRESS GRADE LUMBER AND FASTENINGS" AS PUBLISHED BY THE NATIONAL FOREST PRODUCTS ASSOCIATION.

4. ALL CONNECTIONS ARE FOR ROOFS 0° TO 45° MAX SLOPE CONDITIONS, AND ALL CONNECTORS ARE FOR MEAN ROOF HEIGHTS NOT TO EXCEED 30'-0". ACTUAL ROOF FINISH NOT SHOWN FOR SIMPLICITY.

5. APPLIED PRESSURES PER ASCE 7-05:
ZONE 1:OZ = -50.4 PSF
ZONE 2:OZ = -77 PSF

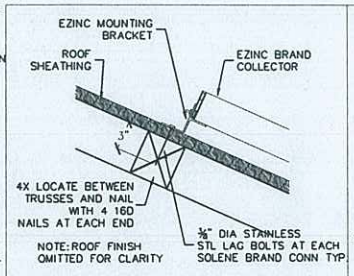
6. COLLECTOR TRIBUTARY AREA AND APPLIED LOADS.
AT = 4x8 = 32 FT2
ZONE 1:F1 = 32 X -50.4 = 1613 LBS

7. THE PANEL WILL BE 4' MAX (PER FBC 2007 CHAPTER 3) IN ZONE 2 AND THE REST IN ZONE 1. THIS YIELDS THE FOLLOWING LOADS:
ZONE 1:F1 = 913 LBS (ZONE 1 HEADER LOADING)
ZONE 2:F2 = 1,125 LBS (ZONE 2 HEADER LOADING)
FORCE ON INDIVIDUAL LAG BOLT = LIFTING FORCE - COLLECTOR WEIGHT (NEGLECTED - CONSERVATIVE APPROACH) / # FASTENERS
- R1 = 913 LBS/ 2 = 457 LBS
- R2 = 1,125 LBS/ 2 = 563 LBS

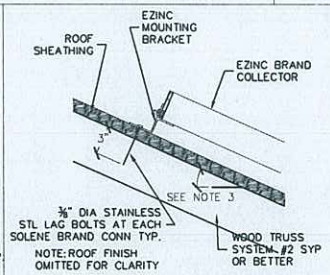
8. APPLY SIKAFLEX ROOF SEALANT OR EQ. TO ALL ROOF PENETRATIONS

WITHDRAWAL LOADS (LB) FOR 3" EMBEDMENT LAGS IN WOOD

LUMBER LAG DIA	WHITE OAK	SOUTHERN YELLOW PINE	RED WOOD	DOUGLAS FIR
1/4"	1,143	843	576	501
3/8"	1,411	923	660	614



3 SE-1 MISSED TRUSS NAILER INSTALLATION
SCALE: 1-1/2"=1'-0"



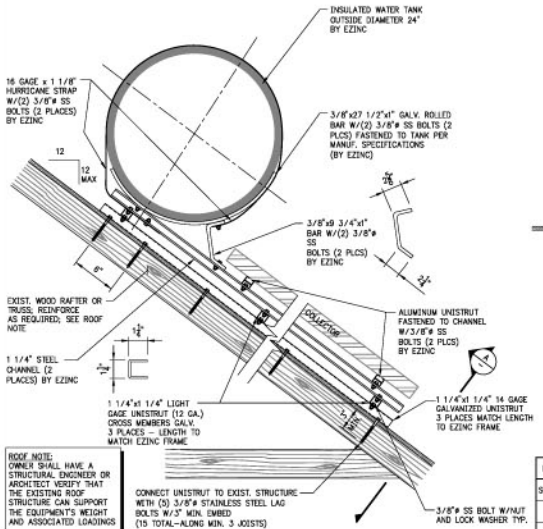
4 SE-1 SHINGLE/METAL/ BUILT UP ROOF
SCALE: 1-1/2"=1'-0"

ANCHORING OF THE "EZINC SOLAR HOT WATER HEATER" COLLECTORS
NAME:
ADDRESS

RC ENGINEERING, LLC.
COA 28345
238 CREST RIDGE COURT
SANFORD, FL 32771
TEL/ 407-434-8818 FAX/ 407-688-8818
ERMOCRATES E. CASTILLO - FLA. P.E. 52990

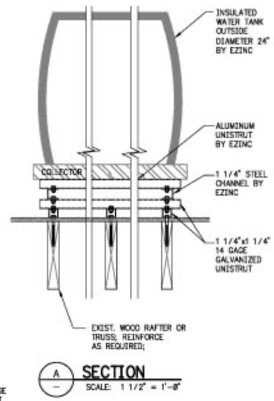
PROJECT #: 60136
DESIGNED: RECO80110
SCALE: NOTED

DRAWING NO.
SE-1
SHEET 1 OF 1



INSULATED WATER TANK OUTSIDE DIAMETER 24" BY EZINC
16 GAGE x 1 1/8" HURRICANE STRAP W/(2) 3/8"ø SS BOLTS (2 PLACES) BY EZINC
3/8"x27 1/2"x1" GALV. ROLLED BAR W/(2) 3/8"ø SS BOLTS (2 PLCS) FASTENED TO TANK PER MANUF. SPECIFICATIONS (BY EZINC)
12
12 MAX
3/8"ø9 3/4"x1" BAR W/(2) 3/8"ø SS BOLTS (2 PLCS) BY EZINC
EXIST. WOOD RAFTER OR TRUSS; REINFORCE AS REQUIRED; SEE ROOF NOTE
ALUMINUM UNISTRUT FASTENED TO CHANNEL W/3/8"ø SS BOLTS (2 PLCS) BY EZINC
1 1/4" STEEL CHANNEL (2 PLACES) BY EZINC
1 1/4"x1 1/4" LIGHT GAGE UNISTRUT (12 GA.) CROSS MEMBERS GALV. 3 PLACES – LENGTH TO MATCH EZINC FRAME
1 1/4"x1 1/4" 14 GAGE GALVANIZED UNISTRUT 3 PLACES MATCH LENGTH TO EZINC FRAME
ROOF NOTE: OWNER SHALL HAVE A STRUCTURAL ENGINEER OR ARCHITECT VERIFY THAT THE EXISTING ROOF STRUCTURE CAN SUPPORT THE EQUIPMENT'S WEIGHT AND ASSOCIATED LOADINGS
CONNECT UNISTRUT TO EXIST. STRUCTURE WITH (5) 3/8"ø STAINLESS STEEL LAG BOLTS W/3" MIN. EMBED (15 TOTAL–ALONG MIN. 3 JOISTS)
3/8"ø SS BOLT W/NUT AND LOCK WASHER TYP.
COLLECTOR

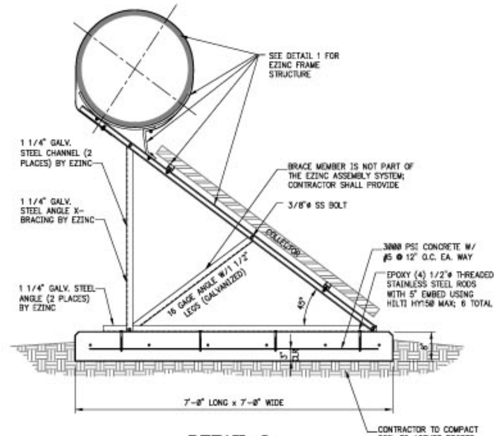
DETAIL 1
SUPPORT ON WOOD TRUSS/RAFTER
SCALE: 1 1/2" = 1'-0"



SECTION (A)
SCALE: 1 1/2" = 1'-0"

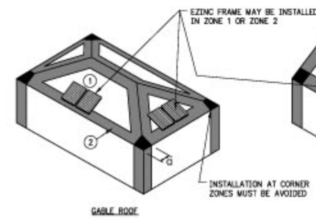
DESIGN AND ACTUAL LOADS (lb) FOR 3/8" LAG BOLTS WITH 3" EMBED

LUMBER TYPE	WITHDRAWAL LOAD	ACTUAL LOAD (MAX)
SOUTHERN PINE	923 LB	336 LB
REDWOOD	660 LB	336 LB
DOUGLAS FIR	614 LB	336 LB



SEE DETAIL 1 FOR EZINC FRAME STRUCTURE
1 1/4" GALV. STEEL CHANNEL (2 PLACES) BY EZINC
BRACE MEMBER IS NOT PART OF THE EZINC ASSEMBLY SYSTEM; CONTRACTOR SHALL PROVIDE
1 1/4" GALV. STEEL ANGLE X-BRACING BY EZINC
3/8"ø SS BOLT
3000 PSI CONCRETE W/ #5 @ 12" O.C. EA. WAY
EPOXY (4) 1/2"ø THREADED STAINLESS STEEL RODS WITH 5" EMBED USING HILTI HY150 MAX; 6 TOTAL
1 1/4" GALV. STEEL ANGLE (2 PLACES) BY EZINC
16 GAGE ANGLE W/1 1/2" LEGS (GALVANIZED)
45°
7'-0" LONG x 7'-0" WIDE
CONTRACTOR TO COMPACT SOIL TO ASSURE PROPER BEARING SURFACE
COLLECTOR

DETAIL 3
SUPPORT ON GROUND
SCALE: 1" = 1'-0"



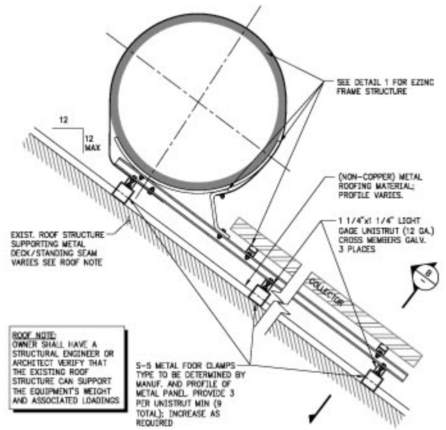
130 mph WIND PRESSURE COMPONENTS AND CLADDING (EXP. C)

ZONE	DESCRIPTION	PRESSURE
1	ZONE (1) INTERIOR ROOF ZONE	+41.5, –37.2
2	ZONE (2) ROOF END ZONE	+41.5, –44.3

DESIGN NOTES:
1. ROOF ANGLE SHALL NOT EXCEED 12:12 (45°)
2. MEAN ROOF HEIGHT NOT TO EXCEED 30'-0"
3. ROOF CORNER ZONE DIMENSION 'a' SHALL EQUAL THE SMALLEST VALUE CALCULATED FROM THE FOLLOWING:
   A. 10% OF THE SHORTEST BUILDING DIMENSION (NOT LESS THAN 4%)
   B. 40% OF THE EAVE HEIGHT

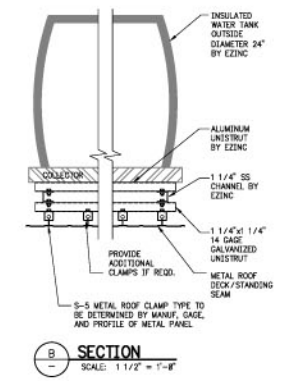
GENERAL NOTES:

1. THIS IS A GENERIC ATTACHMENT PLAN FOR ALL TYPES OF ROOFS AND GROUND INSTALLATION.
2. THE CONTRACTOR IS TO FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, AND CONDITIONS PRIOR TO CONSTRUCTION OR FABRICATION.
3. THE STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE DRAWINGS OF ALL OTHER DISCIPLINES AND ANY APPLICABLE SPECIFICATIONS. THE CONTRACTOR SHALL VERIFY THE REQUIREMENTS OF OTHER TRADES AS TO SLEEVES, HANGERS, INSERTS, ANCHORS, HOLES, AND OTHER ITEMS TO BE INCORPORATED INTO THE STRUCTURE.
4. WHERE A DETAIL IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY CALLED FOR ON THE DRAWINGS.
5. THE SPECIFIC EQUIPMENT IS FOR A 80 GALLON THERMOSIPHON EZINC SOLAR WATER HEATER TANK & PANEL.
6. THE STRUCTURAL FRAMEWORK SUPPORTING THE EQUIPMENT TO BE PROVIDED BY EZINC.
7. ALL THRU-BOLT FASTENERS TO BE STAINLESS STEEL 3/8" DIAMETER AND WITH STAINLESS STEEL LOCK WASHERS
8. THE ROOF ATTACHMENT PENETRATIONS TO BE PROTECTED BY USING AN APPROVED PITCH PLAN SYSTEM.
9. THE EQUIPMENT ATTACHMENTS AS SHOWN ARE DESIGNED TO WITHSTAND WIND FORCES ASSOCIATED WITH 130 MPH, EXP. C, IMPORTANCE FACTOR EQUALS 1.0.
10. FOUNDATION DESIGN BASED ON SOIL BEARING OF 1500 PSF. THE EQUIPMENT TO BE INSTALLED AS PER EQUIPMENT MANUFACTURERS SPECIFICATIONS.
11. THIS PLAN DOES NOT COVER ANY ELECTRICAL OR PLUMBING REQUIREMTNS ASSOCIATED WITH THE INSTALLATION.
12. GSE TAKES NO LIABILITY FOR PROPERTY DAMAGE OR PERSONAL INJURY RESULTING FROM INCORRECT INSTALLATION OF STRUCTURE OR ROOF FAILURE THAT MAY RESULT FROM PLACEMENT ON AN INADEQUATE STRUCTURE. THE OWNER SHALL PROVIDE AN ENGINEER'S OR ARCHITECT'S VERIFICATION THAT THE EXISTING ROOF STRUCTURE CAN SUPPORT THE ADDITIONAL DEAD AND WIND LOAD OF THE EQUIPMENT. CALCULATIONS PROVIDED ARE FOR REFERENCE ONLY AND SHALL BE VERIFIED.



SEE DETAIL 1 FOR EZINC FRAME STRUCTURE
12
12 MAX
(NON-COPPER) METAL ROOFING MATERIAL; PROFILE VARIES.
1 1/4"x1 1/4" LIGHT GAGE UNISTRUT (12 GA.) CROSS MEMBERS GALV. 3 PLACES
EXIST. ROOF STRUCTURE SUPPORTING METAL DECK/STANDING SEAM VARIES SEE ROOF NOTE
ROOF NOTE: OWNER SHALL HAVE A STRUCTURAL ENGINEER OR ARCHITECT VERIFY THAT THE EXISTING ROOF STRUCTURE CAN SUPPORT THE EQUIPMENT'S WEIGHT AND ASSOCIATED LOADINGS
S-5 METAL FOOR CLAMPS TYPE TO BE DETERMINED BY MANUF. AND PROFILE OF METAL PANEL. PROVIDE 3 PER UNISTRUT MIN (9 TOTAL); INCREASE AS REQUIRED
COLLECTOR

DETAIL 2
SUPPORT ON METAL ROOF
SCALE: 1 1/2" = 1'-0"



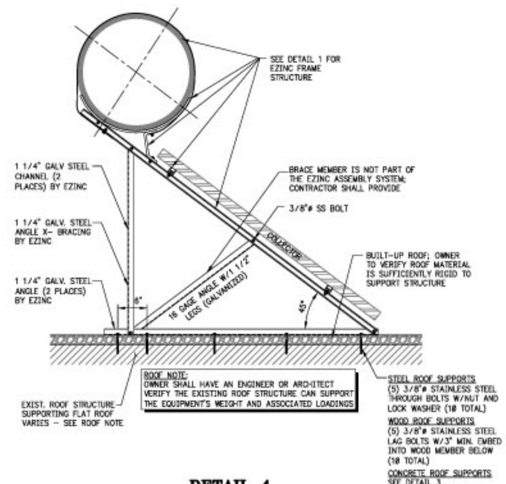
INSULATED WATER TANK OUTSIDE DIAMETER 24" BY EZINC
ALUMINUM UNISTRUT BY EZINC
1 1/4" SS CHANNEL BY EZINC
1 1/4"x1 1/4" 14 GAGE GALVANIZED UNISTRUT
PROVIDE ADDITIONAL CLAMPS IF REQD.
METAL ROOF DECK/STANDING SEAM
S-5 METAL ROOF CLAMP TYPE TO BE DETERMINED BY MANUF, GAGE, AND PROFILE OF METAL PANEL
COLLECTOR

SECTION (B)
SCALE: 1 1/2" = 1'-0"

DESIGN AND ACTUAL LOADS (lb) FOR S-5 METAL CLAMPS

LUMBER TYPE	LOAD CAPACITY	ACTUAL LOAD
S-5 CLAMP	VARIES*	469 LB

*THE CAPACITY OF S-5 CLAMPS VARY BY ROOF GAGE, PROFILE; AND MUNUF; OWNER SHALL PROVIDE VERIFICATION THAT S-5 CLAMP IS SUFFICIENT AND ADD ADDITIONAL CLAMPS IF REQUIRED



SEE DETAIL 1 FOR EZINC FRAME STRUCTURE
1 1/4" GALV STEEL CHANNEL (2 PLACES) BY EZINC
BRACE MEMBER IS NOT PART OF THE EZINC ASSEMBLY SYSTEM; CONTRACTOR SHALL PROVIDE
1 1/4" GALV. STEEL ANGLE X- BRACING BY EZINC
3/8"ø SS BOLT
BUILT-UP ROOF; OWNER TO VERIFY ROOF MATERIAL IS SUFFICIENTLY RIGID TO SUPPORT STRUCTURE
1 1/4" GALV. STEEL ANGLE (2 PLACES) BY EZINC
16 GAGE ANGLE W/1 1/2" LEGS (GALVANIZED)
45°
EXIST. ROOF STRUCTURE SUPPORTING FLAT ROOF VARIES – SEE ROOF NOTE
ROOF NOTE: OWNER SHALL HAVE AN ENGINEER OR ARCHITECT VERIFY THE EXISTING ROOF STRUCTURE CAN SUPPORT THE EQUIPMENT'S WEIGHT AND ASSOCIATED LOADINGS
STEEL ROOF SUPPORTS (5) 3/8"ø STAINLESS STEEL THROUGH BOLTS W/NUT AND LOCK WASHER (10 TOTAL)
WOOD ROOF SUPPORTS (5) 3/8"ø STAINLESS STEEL LAG BOLTS W/3" MIN. EMBED INTO WOOD MEMBER BELOW (10 TOTAL)
CONCRETE ROOF SUPPORTS SEE DETAIL 3
COLLECTOR

DETAIL 4
SUPPORT ON FLAT ROOF
SCALE: 1" = 1'-0"

80 GALLON WATER STORAGE TANK

OVERALL LENGTH	75.2"
OVERALL DIAMETER	23.6"ø
NOMINAL WORKING PRESSURE	15–115 psi
WEIGHT – EMPTY	305 LB
WEIGHT – FULL	1276 LB

SOLAR COLLECTOR

OVERALL SIZE OF EACH PANEL (2-TOTAL)	74.4"x47.4"
WEIGHT EMPTY	91 LB EACH
WEIGHT INSTALLED	106 LB EACH

GSE
GULF STATES ENGINEERING
Creating Solutions
PHONE: 251 408-7199

PREMIUM SOLAR LLC
3357/3 GARBER DR.
TALLAHASSEE, FL 32303
PREMIUM SOLAR

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	APPROVED BY
0	–	–	SLS	SLS	SLS

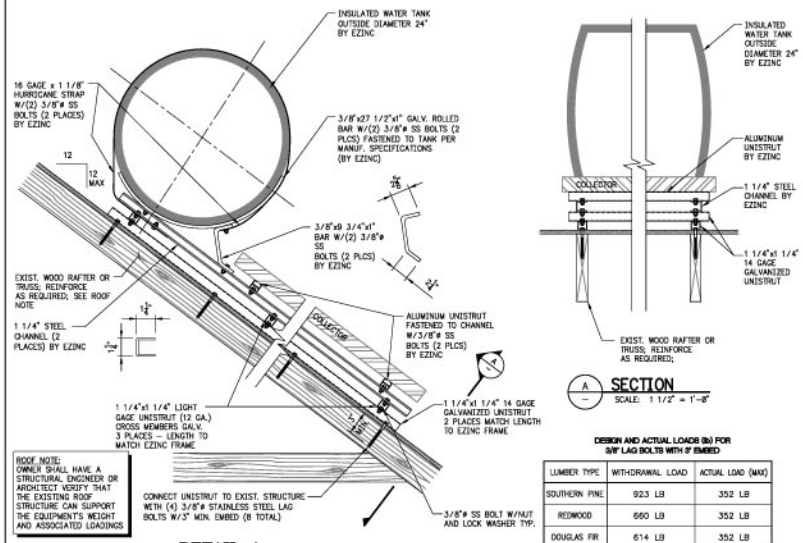
GSE GULF STATES ENGINEERING Creating Solutions

CUSTOMER: John Doe Residence
111 Any Street,
Any Where, US

GSE ENGINEERING SEAL

TITLE: 80 GALLON EZINC KG 300 THERMO SIPHON SOLAR WATER HEATING SYSTEM
GENERAL INSTALLATION DWG

DRAWN	CHECKED	APPROVED
SLS	SLS	–
DATE: 07/15/11	SCALE: AS NOTED	
ST01	(1 OF 1)	REVISION: 0



DETAIL 1
SUPPORT ON WOOD TRUSS/RAFTER

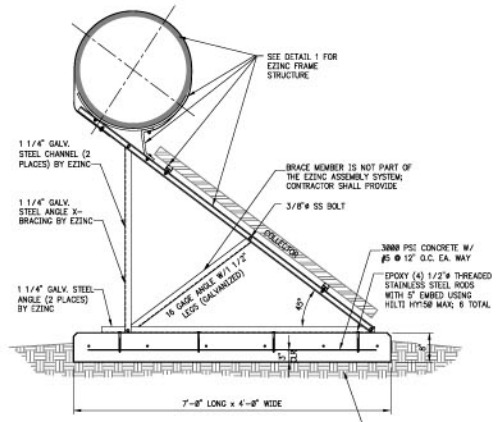
SCALE: 1 1/2" = 1'-0"

A — SECTION

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

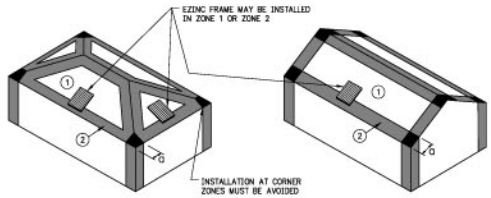
DESIGN AND ACTUAL LOADS (lb) FOR 5/8" LAG BOLTS WITH 3" EMBED

LUMBER TYPE	WITHDRAWAL LOAD	ACTUAL LOAD (MAX)
SOUTHERN PINE	923 LB	352 LB
REDWOOD	660 LB	352 LB
DOUGLAS FIR	614 LB	352 LB



DETAIL 3
SUPPORT ON GROUND

SCALE: 1" = 1'-0"



130 mph WIND PRESSURE COMPONENTS AND CLADDING (EXP. C)

ZONE	DESCRIPTION	PRESSURE
1	ZONE ① INTERIOR ROOF ZONE	+41.5, −37.2
2	ZONE ② ROOF END ZONE	+41.5, −44.3

DESIGN NOTES:
1. ROOF ANGLE SHALL NOT EXCEED 12:12 (45°)
2. MEAN ROOF HEIGHT NOT TO EXCEED 30'-0"
3. ROOF CORNER ZONE DIMENSION 'a' SHALL EQUAL THE SMALLEST VALUE CALCULATED FROM THE FOLLOWING:
   A. 10% OF THE SHORTEST BUILDING DIMENSION (NOT LESS THAN 4ft)
   B. 40% OF THE EAVE HEIGHT

GENERAL NOTES:

1. THIS IS A GENERIC ATTACHMENT PLAN FOR ALL TYPES OF ROOFS AND GROUND INSTALLATION.
2. THE CONTRACTOR IS TO FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, AND CONDITIONS PRIOR TO CONSTRUCTION OR FABRICATION.
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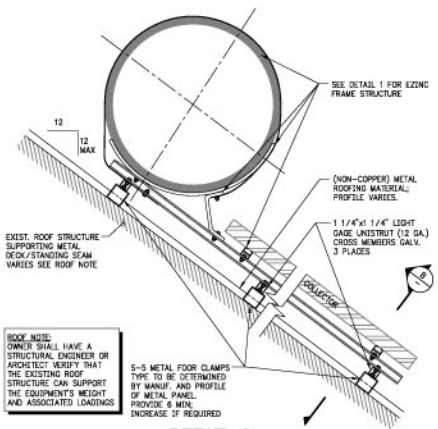
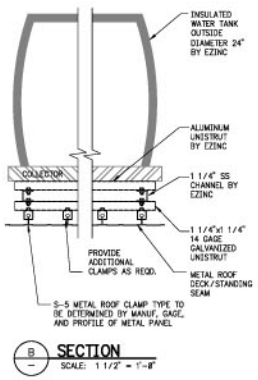
4. WHERE A DETAIL IS SHOWN FOR ONE CONDITION, IT SHALL APPLY FOR ALL LIKE OR SIMILAR CONDITIONS EVEN THOUGH NOT SPECIFICALLY CALLED FOR ON THE DRAWINGS.
5. THE SPECIFIC EQUIPMENT IS FOR A 46 GALLON THERMOSIPHON EZINC SOLAR WATER HEATER TANK & PANEL.
6. THE STRUCTURAL FRAMEWORK SUPPORTING THE EQUIPMENT TO BE PROVIDED BY EZINC.
7. ALL THRU-BOLT FASTENERS TO BE STAINLESS STEEL 3/8" DIAMETER AND WITH STAINLESS STEEL LOCK WASHERS
8. THE ROOF ATTACHMENT PENETRATIONS TO BE PROTECTED BY USING AN APPROVED PITCH PLAN SYSTEM.
9. THE EQUIPMENT ATTACHMENTS AS SHOWN ARE DESIGNED TO WITHSTAND WIND FORCES ASSOCIATED WITH 130 MPH, EXP. C, IMPORTANCE FACTOR EQUALS 1.0.
10. FOUNDATION DESIGN BASED ON SOIL BEARING OF 1500 PSF. THE EQUIPMENT TO BE INSTALLED AS PER EQUIPMENT MANUFACTURERS SPECIFICATIONS.
11. THIS PLAN DOES NOT COVER ANY ELECTRICAL OR PLUMBING REQUIREMENTS ASSOCIATED WITH THE INSTALLATION.
12. GSE TAKES NO LIABILITY FOR PROPERTY DAMAGE OR PERSONAL INJURY RESULTING FROM INCORRECT INSTALLATION OF STRUCTURE OR ROOF FAILURE THAT MAY RESULT FROM PLACEMENT ON AN INADEQUATE STRUCTURE. THE OWNER SHALL PROVIDE AN ENGINEER'S OR ARCHITECT'S VERIFICATION THAT THE EXISTING ROOF STRUCTURE CAN SUPPORT THE ADDITIONAL DEAD AND WIND LOAD OF THE EQUIPMENT. CALCULATIONS PROVIDED ARE FOR REFERENCE ONLY AND SHALL BE VERIFIED.



DETAIL 2
SUPPORT ON METAL ROOF

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



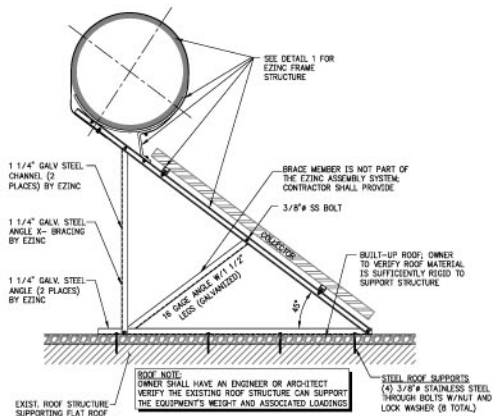
B — SECTION

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

DESIGN AND ACTUAL LOADS (lb) FOR S-5 METAL CLAMPS

LUMBER TYPE	LOAD CAPACITY	ACTUAL LOAD
S-5 CLAMP	VARIES*	352 LB

*THE CAPACITY OF S-5 CLAMPS VARY BY ROOF GAGE, PROFILE; AND MUNUF; OWNER SHALL PROVIDE VERIFICATION THAT S-5 CLAMP IS SUFFICIENT AND ADD ADDITIONAL CLAMPS IF REQUIRED



DETAIL 4
SUPPORT ON FLAT ROOF

SCALE: 1" = 1'-0"

46 GALLON WATER STORAGE TANK

OVERALL LENGTH	47.3"
OVERALL DIAMETER	23.6"ø
NOMINAL WORKING PRESSURE	15–115 psi
WEIGHT – EMPTY	205 LB
WEIGHT – FULL	748 LB

SOLAR COLLECTOR

OVERALL SIZE	74.4"x47.4"
WEIGHT EMPTY	91 LB
WEIGHT INSTALLED	106 LB

GSE
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PREMIUM SOLAR LLC
3357/3 GARBER DR.
TALLAHASSEE, FL 32303

PREMIUM SOLAR

REV	DATE	DESCRIPTION	DRAWN BY	CHECKED BY	APPROVED BY
			SLS	SLS	–

GSE
GULF STATES ENGINEERING
Creating Solutions

OWNER:
John Doe Residence
111 Any Street,
Any Where, US

GSE ENGINEERING SEAL

46 GALLON EZINC KG 170 THERMO SIPHON SOLAR WATER HEATING SYSTEM
GENERAL INSTALLATION DWG

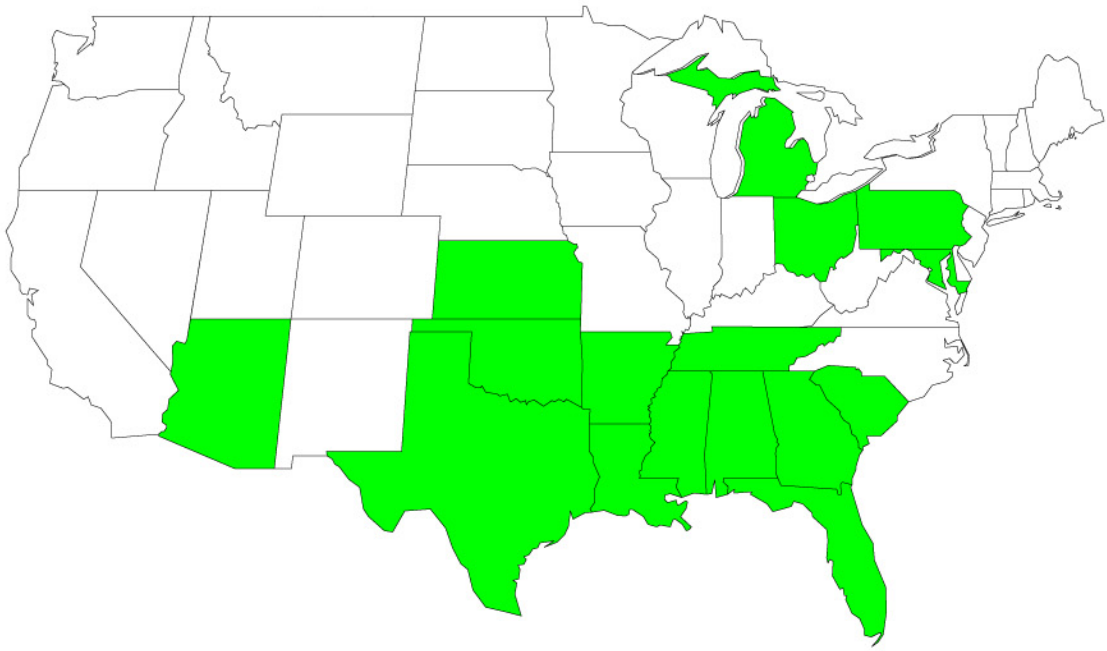
DRAWN	CHECKED	APPROVED
SLS	SLS	–

DATE: 07/13/11 SCALE: AS NOTED

DRAWING NUMBER: S100 (1 OF 1) REVISION: Ø

If needed, Premium Solar can provide sealed copies of permitting drawings for Thermosiphon Solar Water Heating Systems. Price is $150.00 to be paid in advance to Premium Solar in order to get ONE sealed document. Premium Solar is paying $150.00 directly to the engineering company. GSE engineering is licensed in the states seen in the map below. If drawings for other sates are needed please notify us and GSE will expedite licensure.

GSE Licensed States



GSE staff are currently licensed in 16 states and have their credentials on file with NCEES for expedient licensure in additional states.

Alabama	Michigan
Arizona	Mississippi
Arkansas	Ohio
Florida	Oklahoma
Georgia	Pennsylvania
Kansas	South Carolina
Louisiana	Tennessee
Maryland	Texas

GATE VALVE

PRESSURE TEMPERATURE RELIEF VALVE

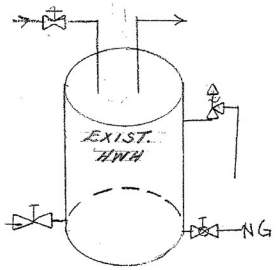
MIXING VALVE

BALL VALVE

3 WAY BALL VALVE

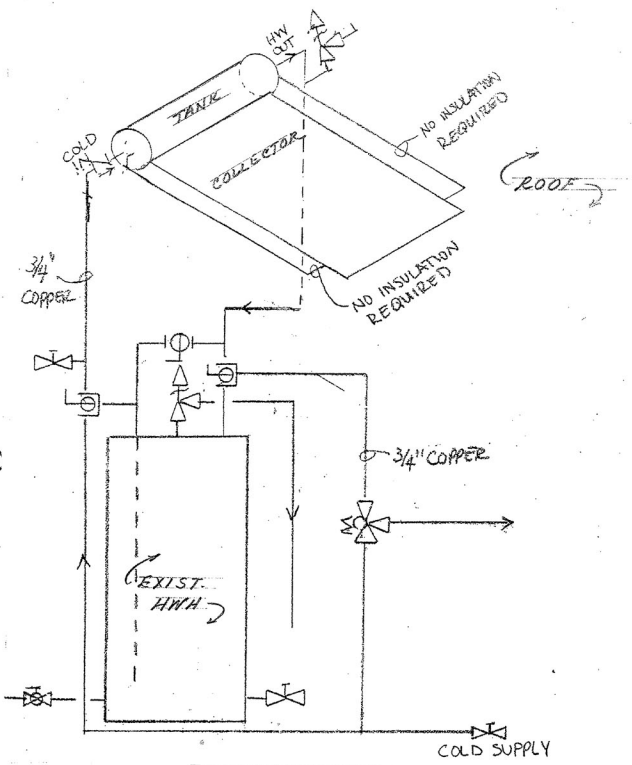
CHECK VALVE

PLUG VALVE



NOTES:

1. ISOLATE COLD SUPPLY AND CUT PIPING AFTER VALVE
2. INSTALLER TO FIELD LOCATE ALL VALVES & FITTINGS
3. ALL NEW PIPING SHALL BE 3/4" COPPER
4. PRESSURE/TEMPERATURE RELIEF DRIAN COPPER or CPVC
5. INSULATE ALL PIPING ABOVE ROOF. COLLECTOR TO STORAGE TANK INSULATION NOT REQUIRED



PLUMBING SCHEMATIC

NTS

GENERAL NOTES:

1. THE INSTALLATION PLAN IS FOR THE 48 GALLON THERMOSIPHON EZINC SOLAR WATER HEATER.
2. THE INSTALLATION OF EQUIPMENT WILL BE DONE IN ACCORDANCE WITH THE MANUFACTURERS SPEC'S.
3. THE STRUCTURAL FRAMEWORK REQUIRED FOR SUPPORTING THE EQUIPMENT TO BE ORIGINAL EZINC FRAMES
4. THE EQUIPMENT AS INSTALLED ON THE ROOF TOP IS DESIGNED TO WITHSTAND WINDS UP TO 130 MPH.
5. ALL ROOF PENETRATIONS TO BE PROTECTED WITH APPROVED PITCH PANS.
6. ALL WORK TO BE IN COMPLIANCE WITH THE 2007 FBC WITH 2009 SUPPLEMENTS & ASCE 7- 05.
7. GENERAL CONTRACTOR / OWNER TO VERIFY ALL DIMENSIONS AND STUCTURAL CONDITIONS.AS SHOWN ON THE PLANS. ANY DISCREPENCY BETWEEN THE PLANS AND THE ACTUAL EXISTING CONDITIONS SHOULD BE REPORTED TO THE ENGINEER IMMEDIATELY.

FBC 2007 WITH 2009 SUPPLEMENTS & ASCE 7-05:

DESIGN CRITERIA:	
BASIC WIND SPEED	130 MPH
IMPORTANCE FACTOR	1.0
BUILDING CATEGORY	II
BUILDING DESIGN	ENCLOSED
WIND EXPOSURE	B
INTERNAL PRESSURE COEF.	+/-0.18

DESIGN PRESSURES:	
ROOF UPLIFT	-33.0 PSF

NOTE: Plumbing Schematic of the 80 gallon EZINC Thermosiphon Solar Water Heating System requires the same characteristics except the KG-300 80 gallon systems come with 80- gallon tank and 2 collectors.

SEMINOLE TRUSSES, INC.

SERVICE. TECHNOLOGY. INTEGRITY.

Since 1978, builders have relied on Seminol
as their partner of ch

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Local ownership you c
Quality on e

Contact Us

Seminole Trusses is committed to being your partner of choice. Our facilities produce high quality products for residential, apartments and multiplexes, condos, townhomes and commercial properties.

Seminole Trusses, Inc.
Corporate Headquarters
30726 Blue Star Highway
P.O. Box 69
Midway, Florida 32343
850.575.0102
850.575.4413 fax
E-Mail: trusses@seminoletrusses.com

FOR TRUSS REINFORCING

Service. Technology. Integrity.

ITW Building Components Group, Inc.

1950 Marley Drive Haines City, FL 33844
Florida Engineering Certificate of Authorization Number: 0 278
Florida Certificate of Product Approval # FL1999
 Document ID:1UC6857-Z0123110535

Truss Fabricator:	**Seminole Trusses, Inc.**
Job Identification:	**Z20276--Teems Premium Solar -- C.P.U. , ****
Truss Count:	**2**
Model Code:	**Florida Building Code 2007 and 2009 Supplement**
Truss Criteria:	**FBC2007Res/TPI-2002(STD)**
Engineering Software:	**Alpine Software,Version 10.02.**
Structural Engineer of Record:	**The identity of the structural EOR did not exist as of**
Address:	**the seal date per section 61G15-31.003(5a) of the FAC**
Minimum Design Loads:	**Roof - 29.0 PSF @ 1.25 Duration**
	Floor - N/A
	Wind - 120 MPH ASCE 7-05 -Closed

Notes:

1. **Determination as to the suitability of these truss components for the structure is the responsibility of the building designer/engineer of record, as defined in ANSI/TPI 1**
2. **The drawing date shown on this index sheet must match the date shown on the individual truss component drawing.**
3. **As shown on attached drawings; the drawing number is preceded by: HCUSR857**

Details: PB120-

#	Ref	Description	Drawing#	Date
1	64796--a1		11143001	05/23/11
2	64797--p1		11143002	05/23/11

05/23/2011

-Truss Design Engineer-
William H. Krick
Florida License Number: 70861
1950 Marley Drive
Haines City, FL 33844

Top chord 2x4 SP #2
Bot chord 2x4 SP #2
Webs 2x4 SP #3

Special loads
------(Lumber Dur.Fac.=1.25 / Plate Dur.Fac.=1.25)
TC- From 47 plf at -1.50 to 47 plf at 14.00
TC- From 47 plf at 14.00 to 47 plf at 20.00
TC- From 47 plf at 20.00 to 47 plf at 35.50
BC- From 20 plf at 0.00 to 20 plf at 14.42
BC- From 50 plf at 14.42 to 50 plf at 17.50
BC- From 20 plf at 17.50 to 20 plf at 34.00
TC- 128.00 lb Conc. Load at 14.00
TC- 311.00 lb Conc. Load at 20.00
TC- 88.00 lb Conc. Load at 24.49

Wind reactions based on MWFRS pressures.

LOADING HAS BEEN CALCULATED BY THE TRUSS MANUFACTURER.IT IS THE RESPONSIBILITY OF THE BUILDING DESIGNER TO VERIFY AND APPROVE THE LOADING.

MODEL ONLY

120 mph wind, 15.00 ft mean hg
within 4.50 ft from roof edge,
BC DL=5.2 psf. Iw=1.00 GCpi(+/

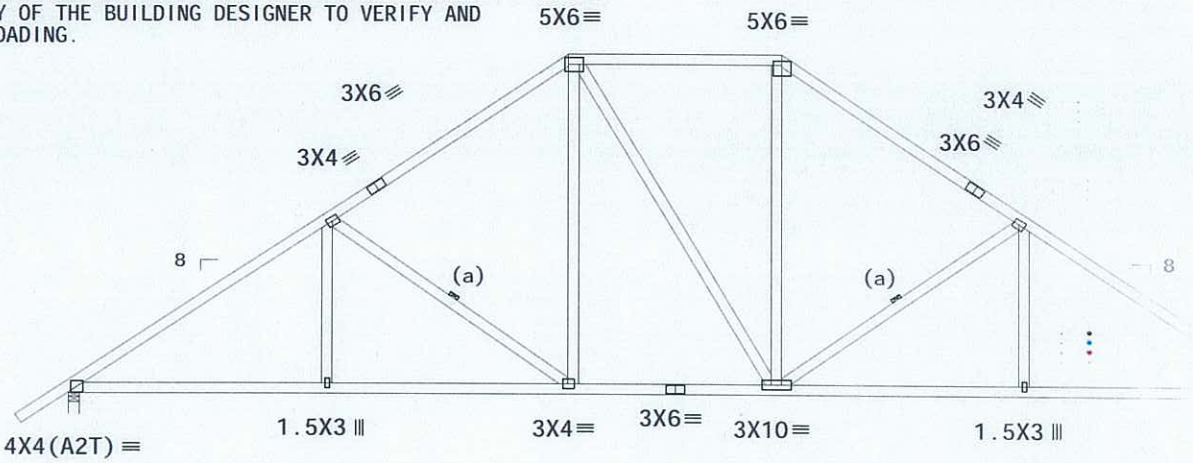
(a) Continuous lateral bracing
brace. 80% length of web membe
attached with 8d Box or Gun (0

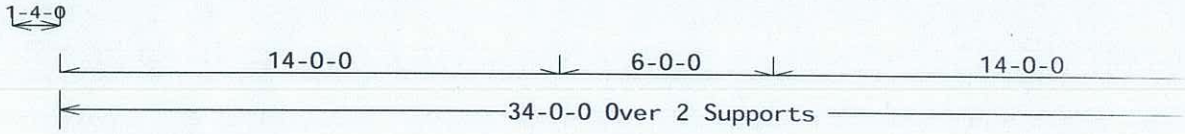
*** WARNING: 20 psf additional
modified ** *

Bottom chord checked for 10.00

Deflection meets L/360 live an

Top Chord overhang(s) may be f





R=1481 U=305 W=3.5"
RL=307/-307

R

Design Crit: FBC2007Res/TPI-2002(STD)

PLT TYP. Wave FT/RT=20%(0%)/10(0) 10.02.06.1210.14 QTY

ALPINE
ITW Building Components Group Inc.
Haines City, FL 33844
FL COA #0 278

WARNING READ AND FOLLOW ALL NOTES ON THIS SHEET!
IMPORTANT FURNISH THIS DESIGN TO ALL CONTRACTORS INCLUDING INSTALLERS.

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WILLIAM H. KRICK LICENSE No. 70861 STATE OF FLORIDA PROFESSIONAL ENGINEER

May 23 11

Top chord 2x4 SP M-30
Bot chord 2x4 SP M-30
Webs 2x4 SP #3

Special loads
------(Lumber Dur.Fac.=1.25 / Plate Dur.Fac.=1.25)
TC- From 57 plf at 0.00 to 57 plf at 3.00
TC- From 57 plf at 3.00 to 57 plf at 6.00
BC- From 4 plf at 0.00 to 4 plf at 6.00
TC- 550.00 lb Conc. Load at 3.83

Wind reactions based on MWFRS pressures.

LOADING HAS BEEN CALCULATED BY THE TRUSS MANUFACTURER.IT IS THE RESPONSIBILITY OF THE BUILDING DESIGNER TO VERIFY AND APPROVE THE LOADING.

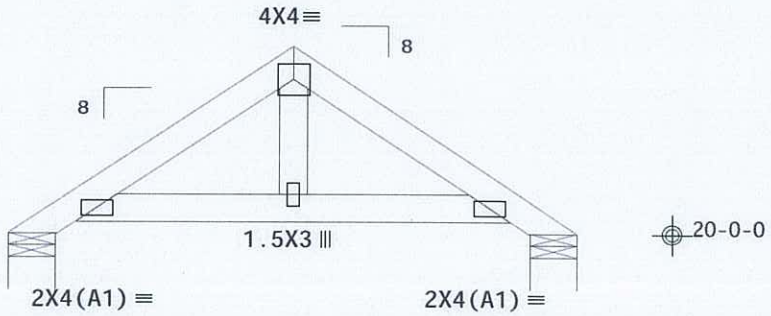
Refer to drawing PB1200310 for piggyback detail. Top chord of supporting truss under piggyback to be braced @ 24" O.C., unless otherwise specified.

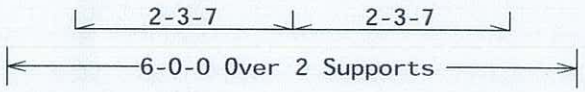
120 mph wind, 21.00 ft mean hg
within 4.50 ft from roof edge,
BC DL=1.2 psf. Iw=1.00 GCpi(+/

Bottom chord checked for 10.00

Deflection meets L/360 live an

MODEL ONLY





R=350 U=193 W=6"
RL=52/-52

R=533 U=295 W=6"

Design Crit: FBC2007Res/TPI-2002(STD)

PLT TYP. Wave

FT/RT=20%(0%)/10(0)

10.02.06.1210.14

QTY

ALPINE
ITW Building Components Group Inc.
Haines City, FL 33844
FL COA #0 278

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WILLIAM H KRICK
LICENSE
No. 70861
STATE OF
FLORIDA
PROFESSIONAL ENGINEER

May 2

120 PIGGYBACK DETAIL

UP TO 120 MPH WIND, 30.00 FT MEAN HGT, ASCE 7-02 OR ASCE 7-05, ENCLOSED BLDG. LOCATED ANYWHERE IN ROOF, CAT II, EXP C, WIND DL= 5.0 PSF (MIN), Kzt=1.0.

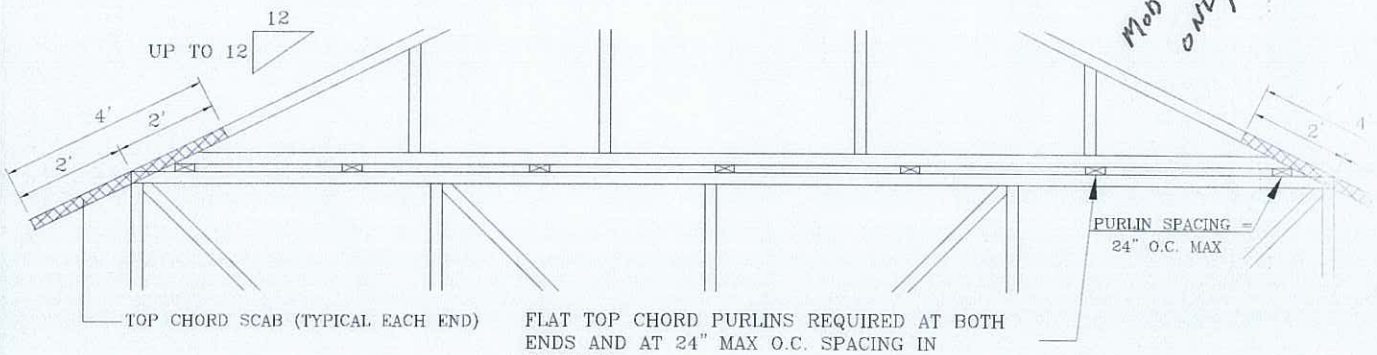
MAXIMUM TRUSS SPACING
DETAIL IS NOT APPLICABL
CUPOLA, STEEPLE, CHIMN

NOTE: TOP CHORDS OF TRUSSES SUPPORTING PIGGYBACK CAP TRUSSES MUST BE ADEQUATELY BRACED BY SHEATHING OR PURLINS. THE BUILDI
PROVIDE DIAGONAL BRACING OR ANY OTHER SUITABLE ANCHORAGE TO PERMANENTLY RESTRAIN PURLINS, AND LATERAL BRACING FOR OUT OF PL

** REFER TO ENGINEER'S SEALED TRUSS DESIGN DRAWING FOR PIGGYBACK AND BASE TRUSS SPECIFICATIONS.

DETAIL A : PURLIN SPACING = 24" O.C. OR LESS

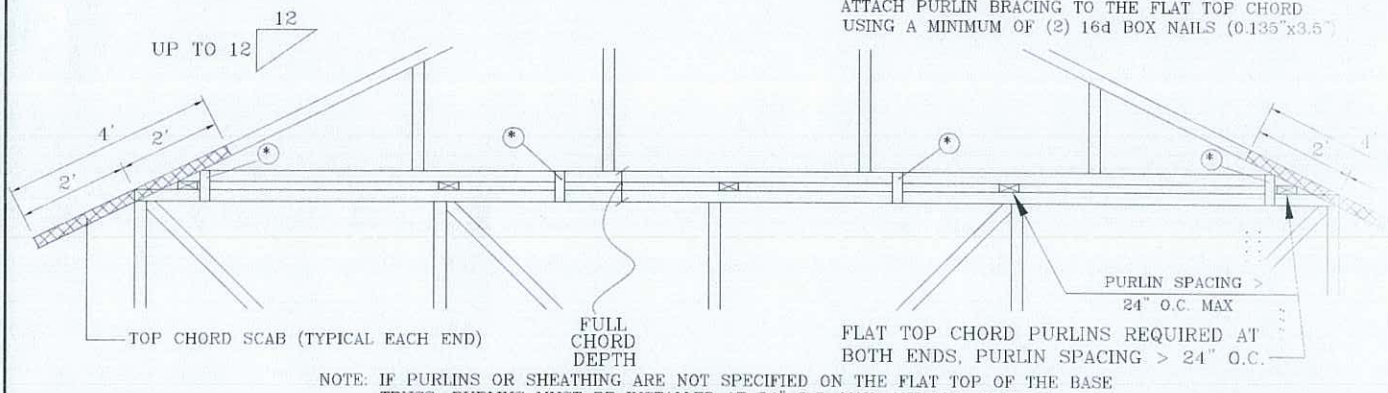
MODEL ONLY



DETAIL B : PURLIN SPACING > 24" O.C.

PIGGYBACK CAP TRUSS SLANT NAILED TO ALL TOP CHORD P
BRACING WITH (2) 16d BOX NAILS (0.135"x3.5") AND SECUR
CHORD WITH 2x4 #3 GRADE SCAB (1 SIDE ONLY AT EACH P
ATTACHED WITH 2 ROWS OF 10d BOX NAILS (0.128"x3") AT

ATTACH PURLIN BRACING TO THE FLAT TOP CHORD USING A MINIMUM OF (2) 16d BOX NAILS (0.135"x3.5")



NOTE: IF PURLINS OR SHEATHING ARE NOT SPECIFIED ON THE FLAT TOP OF THE BASE TRUSS, PURLINS MUST BE INSTALLED AT 24" O.C. MAX. AND USE DETAIL A.

TW
Building Components Group Inc.

Earth City, MO 63045

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IMPORTANT FURNISH COPY OF THIS DESIGN TO INSTALLATION CONTRACTOR.
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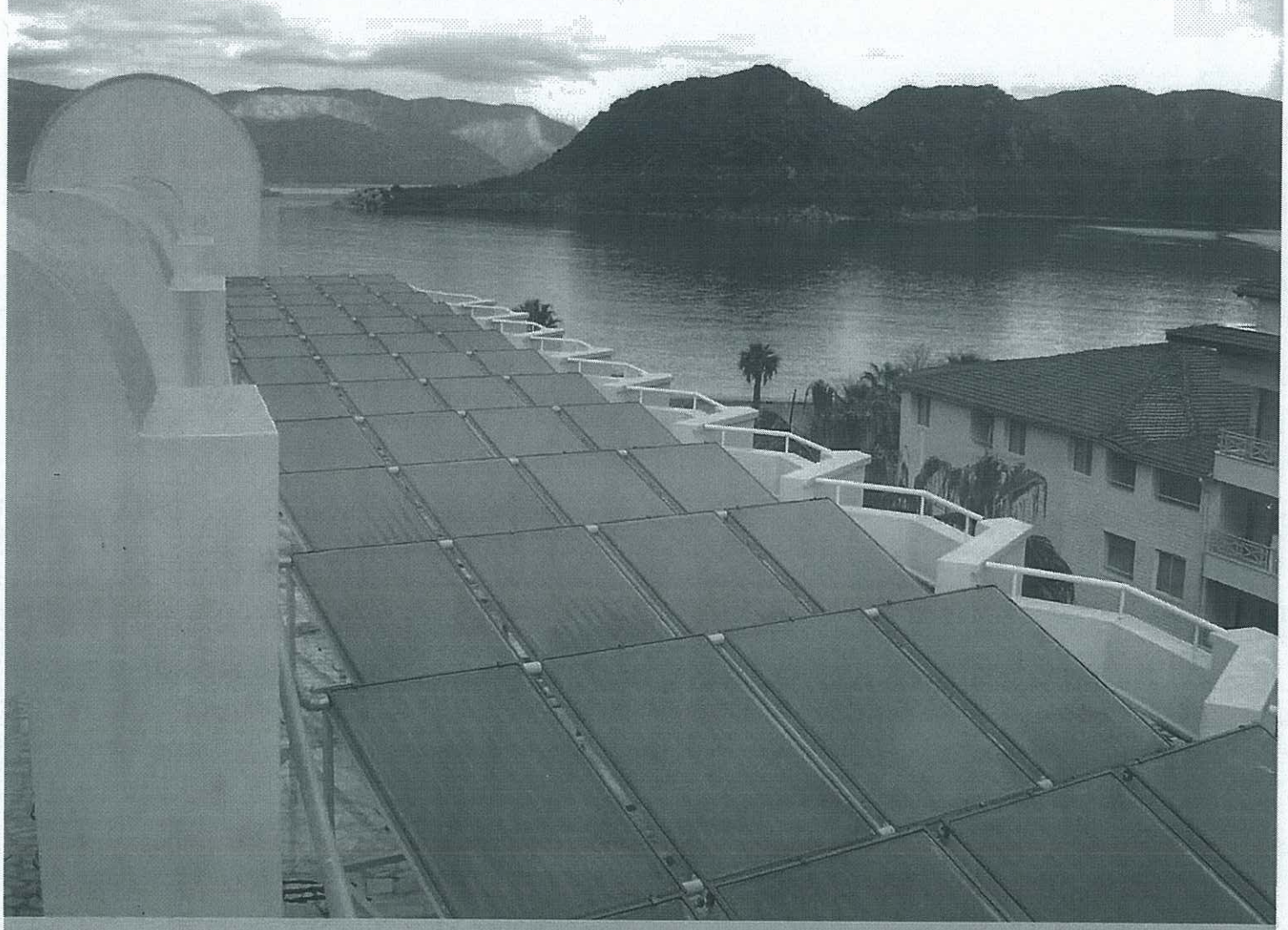
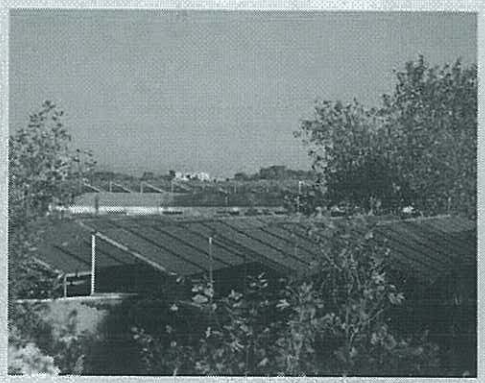
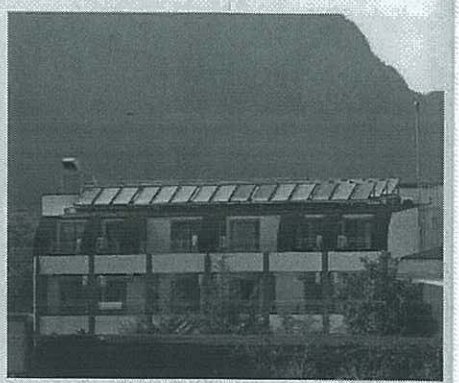






1.0 INTRODUCTION

This report documents the testing performed at Bodycote Materials Testing Canada Inc. on a solar domestic hot water system supplied by **Ezinc Metal**. Exposure tests were conducted at the Florida Solar Energy Center (FSEC), then thermal performance testing of the system was done at the National Solar Test Facility. Tests were performed in accordance with the SRCC test specifications included in Appendix 1.

The National Solar Test Facility (NSTF) is operated by Bodycote Materials Testing Canada Inc. for Natural Resources Canada.

2.0 DESCRIPTION OF SYSTEM TESTED

One tank, one flat plate solar collector and the necessary connecting and mounting hardware were received from **Ezinc** for testing at the NSTF. The system components are described below.

Bodycote sample number:	04-08-0503
Manufacturer name:	Ezinc Metal
Collector model:	Superline L
FSEC identification:	00092
Collector type:	flat plate, liquid
General construction:	aluminum extrusion side frame, aluminum back plate
Connections:	
Tank to collector:	insulated flexible metal pipe, ¾" NPT fittings
Tank inlet / outlet:	½" NPT fittings
Cover plate:	tempered low-iron glass, 4mm thick
Absorber material:	copper absorber plate bonded (all around) to copper tubes
Absorber coating:	selective
Gross dimensions:	1.890 m x 1.201 m; area: 2.270 m²
Aperture dimensions:	1.855 m x 1.167 m; area: 2.165 m²
Heat transfer fluid:	35 % (by vol.) propylene glycol / deionized water
Expansion tank:	pre-charged to 2 bar (29 psi)

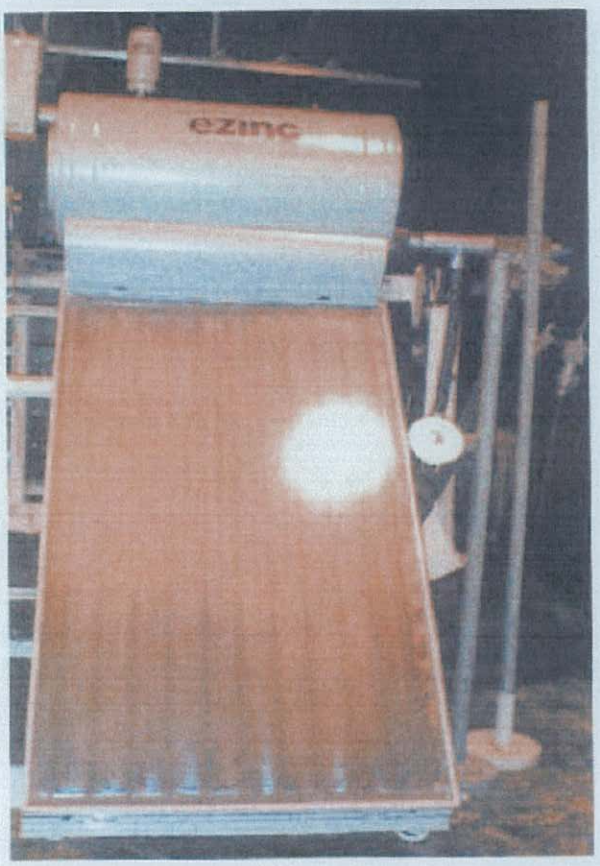


Figure 1. Digital photo of the Ezinc system set up in test chamber.

3.0 THERMAL PERFORMANCE TEST PROCEDURES

The list of tests performed at BMTC were specified by SRCC, and are detailed in the document attached to this report as Appendix A. The details of the test procedures are described in SRCC document TM-1, titled "Simplified SDHW System and Component Test Protocols, Version 1.8, December 6, 2002".

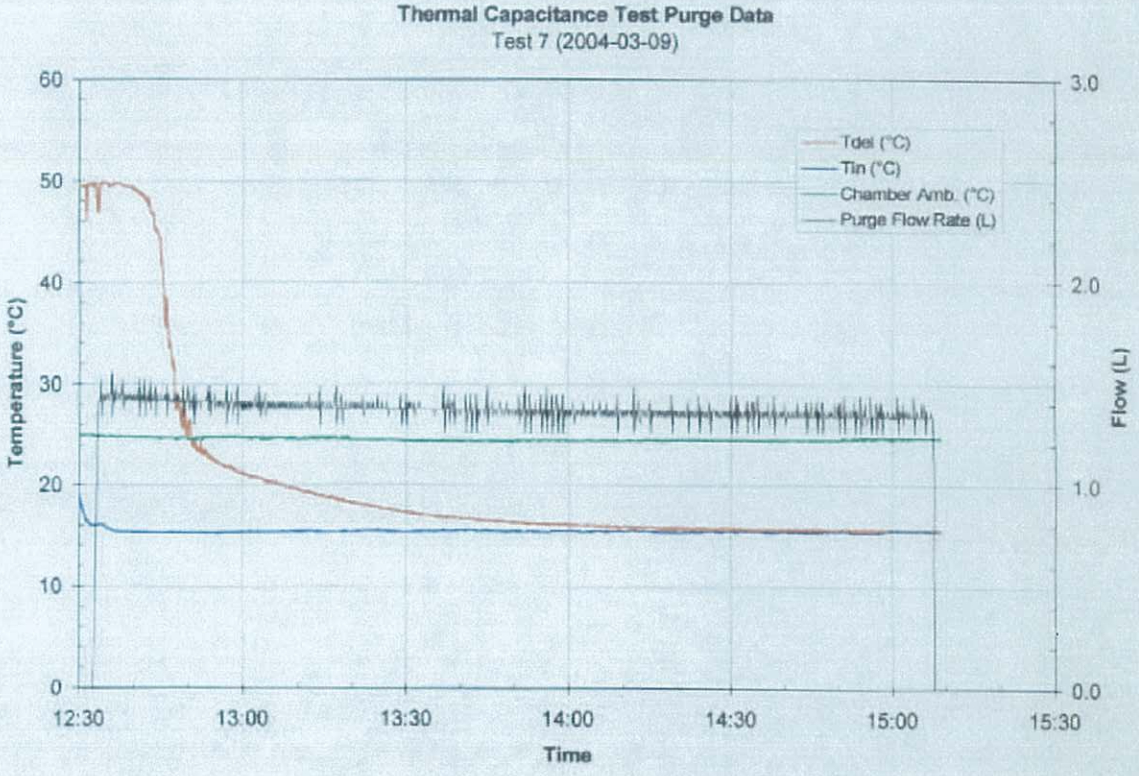
Before the thermal performance tests were done at the NSTF, the system components were assembled and placed on outdoor exposure at the Florida Solar Energy Center.

The **Ezinc** system is a thermosiphon system, in which the thermal storage tank is placed horizontally at the top of the solar collector. For all tests the collector was tilted at 50 degrees from horizontal, and the thermal storage tank connected to the collector was positioned with the

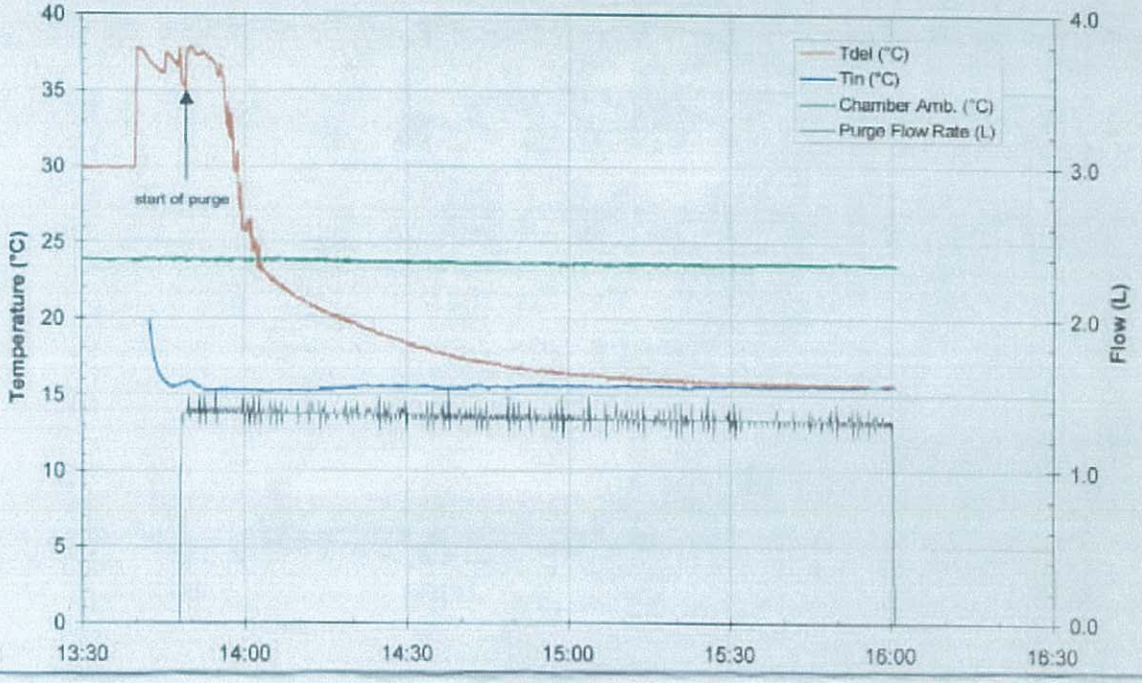
hot water outlet at the top, directly above the cold water inlet at the bottom. The expansion tank was pressurized and the system was charged with 35 % (by vol.) propylene glycol / deionized water mix.

3.0 SYSTEM AND COMPONENT THERMAL PERFORMANCE TEST RESULTS

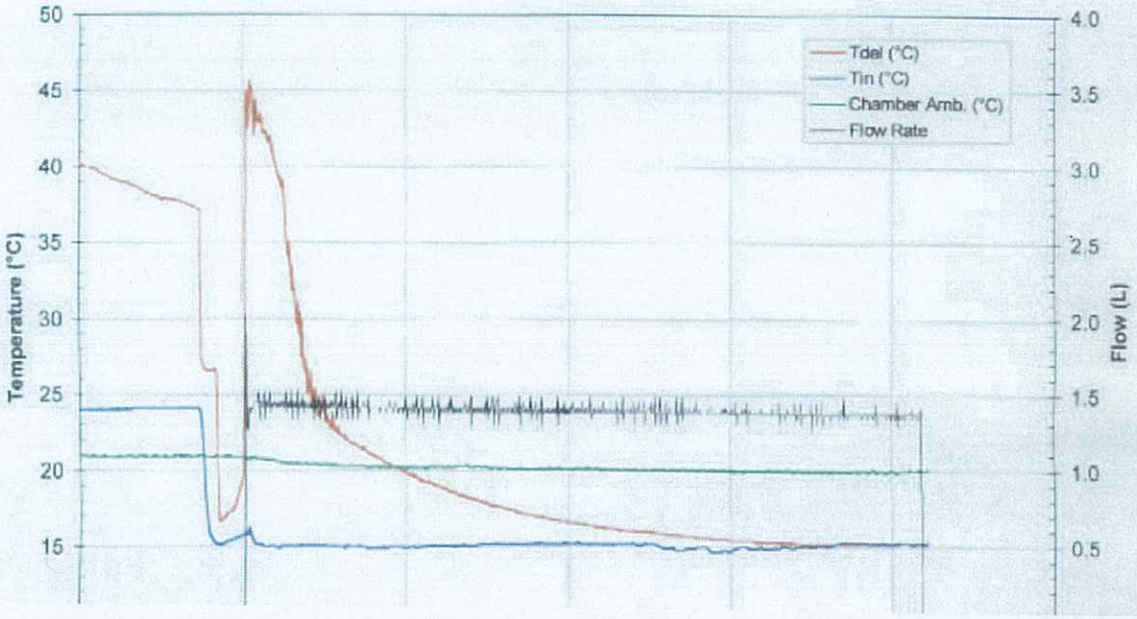
Results of all tests were transmitted to Jim Huggins at SRCC for computer modeling of Ezinc systems as the tests were completed. All test data are contained on the CD-ROM accompanying this report. The following plots of the individual test data are printed to provide the reader with a general impression of the test results. The analysis performed by Bodycote Materials Testing Canada Inc. on the test data was limited to confirmation of the accuracy of the test data.



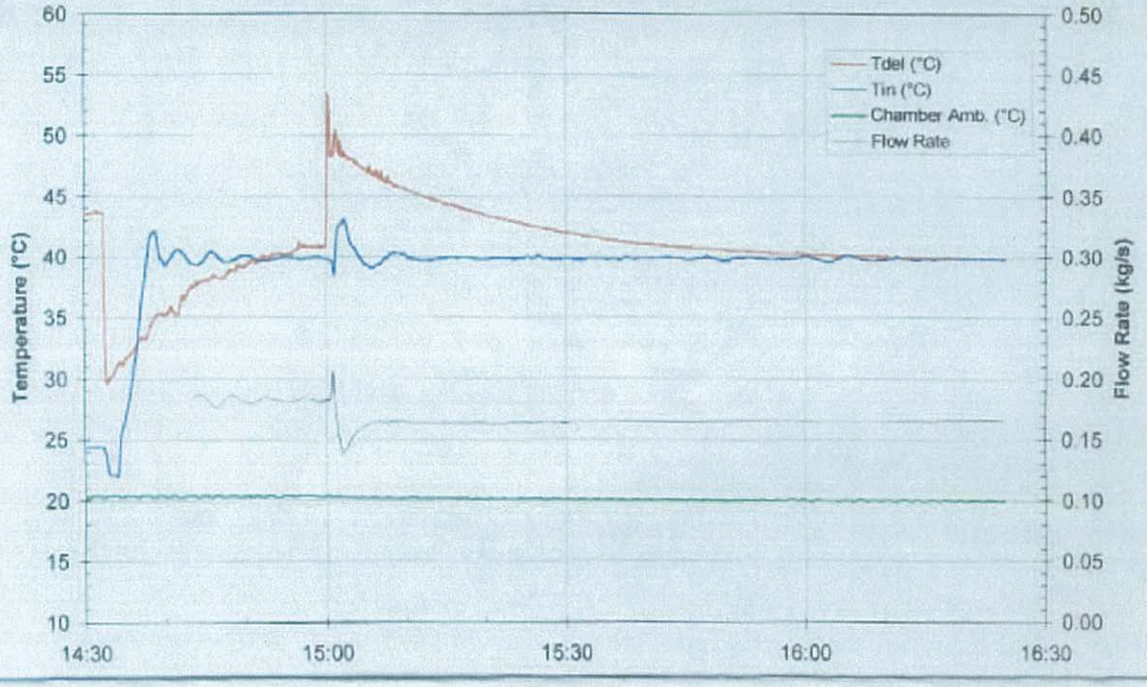
Heat Loss Test Purge Data
Test 8 (2004-03-08)



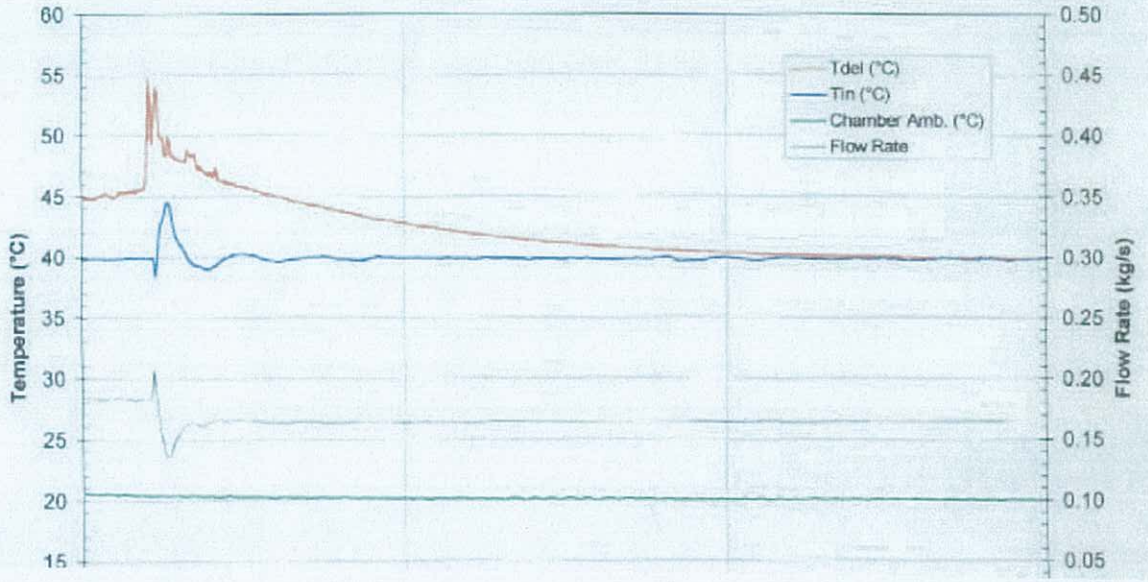
Test 9.1 Purge Data
(2004-03-10)



Test 9.2 Purge Data
(2004-03-12)



Test 9.3 Purge Data
(2004-03-11)



Measurements of Ezinc system test set-up.

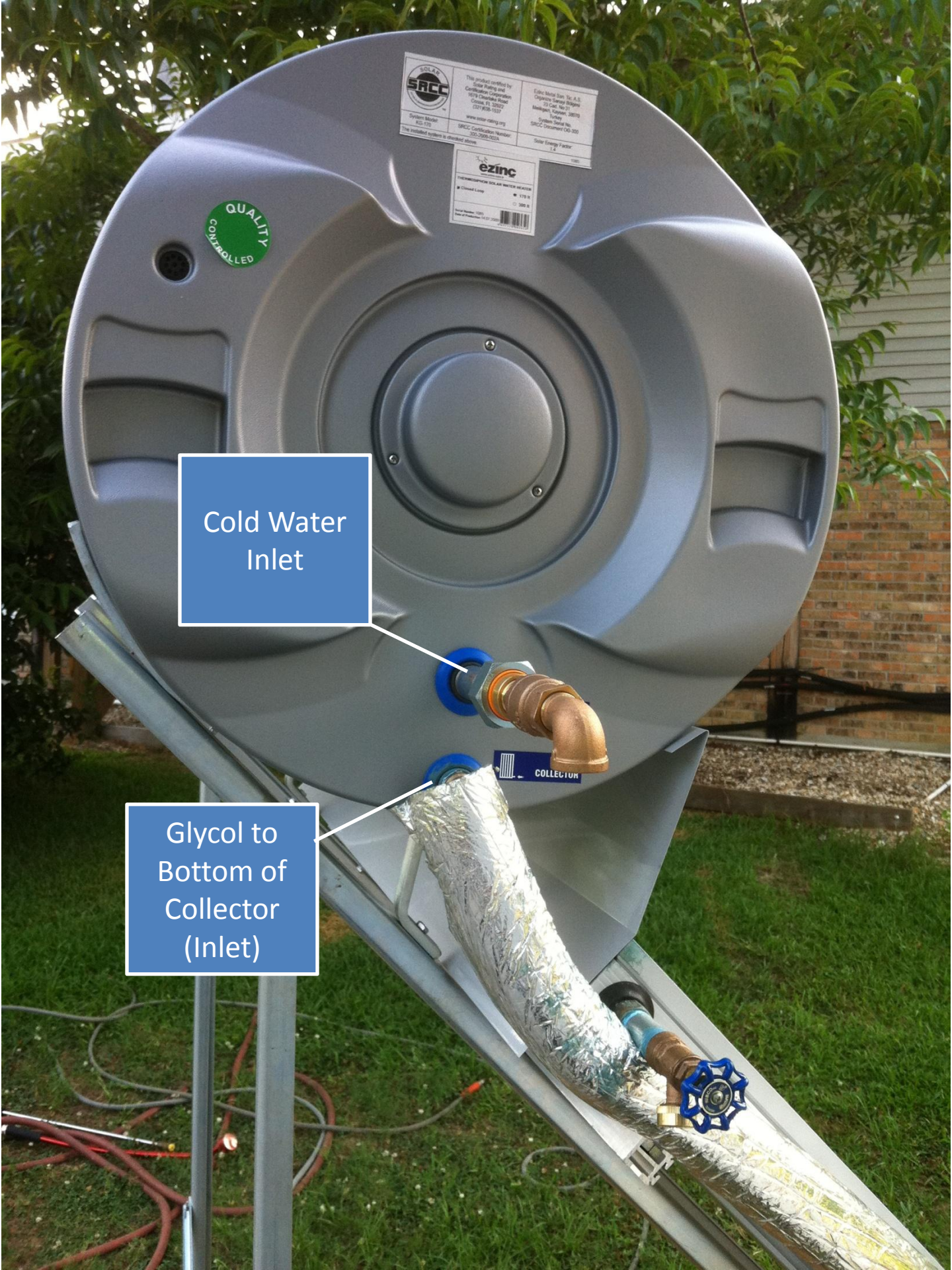
1. Collector angle:	**49° from horizontal**
2. bottom of collector to top of collector:	**1.437 m** (1.722 - 0.285)
3. bottom of collector to where (coll-tank) pipe goes into tank:	**1.635 m** (1.920 - 0.285)
4. (coll-tank) pipe entry to top of tank:	**0.55 m**
5. (coll-tank) pipe entry to (coll-tank) pipe exit:	**0.715 m** (horizontal distance)
*|Num. of Parallel Risers/Panel:	**11**
*|Riser Diameter:	**17 mm**
*|Total Riser Length:	**19.69 m** (1.790 x 11)
*|Header Diameter:	**25 mm**
*|Header Length/Panel:	**2.320 m** (1.155 + 1.165)
*|Collector to Tank Spacing:	**190 mm**
*|Coll-Tank Pipe Inner Diameter:	**15 mm**
*|Coll-Tank Pipe Outer Diameter:	**21 mm**
*|Coll-Tank Pipe Conductivity (pipe material):	**Stainless steel**
*|Thickness of Coll-Tank Pipe Insulation:	**½"**
*|Conduc. of Coll-Tank. Pipe Insulation (material):	**polyethylene foam**
*|Length of Coll-Tank Inlet Pipe:	**0.26 m** (straightened to measure it)
*|Length of Coll-Tank Outlet Pipe:	**0.26 m** (same as inlet pipe)
*|# of Rt Angle in Coll In Pipe:	**S-shaped**
*|# of Rt Angle in Coll Out Pipe:	**S-shaped**
*$|Solar Tank Volume:	**160 L**
*|Height of Thermostat:	**Centred in outlet end of water tank (set at 40°C)**
*|Height of Aux. Heater from bottom of tank:	**Centred in outlet end of water tank**
*$|Maximum Auxiliary Heating (wattage of element):	**1500 W (mfr. data)**
*|Height of Cold Inlet Above Tank Bottom:	**90 mm (to centre of pipe)**
*|Solar Tank Diameter (we need both the tank itself and shell):	**Shell O.D. is 550 mm, tank I.D. is ~450 mm**

*|Solar Tank Wall Thickness: **Lip of opening is 4 mm. There is a blue (ceramic type) coating inside tank.**

*|Inner Jacket Diameter: **There is 75 mm of polyurethane foam insulation on the flanged outlet end of the water tank. End cover is bonded to insulation, can't remove it to see the mantle tank.**

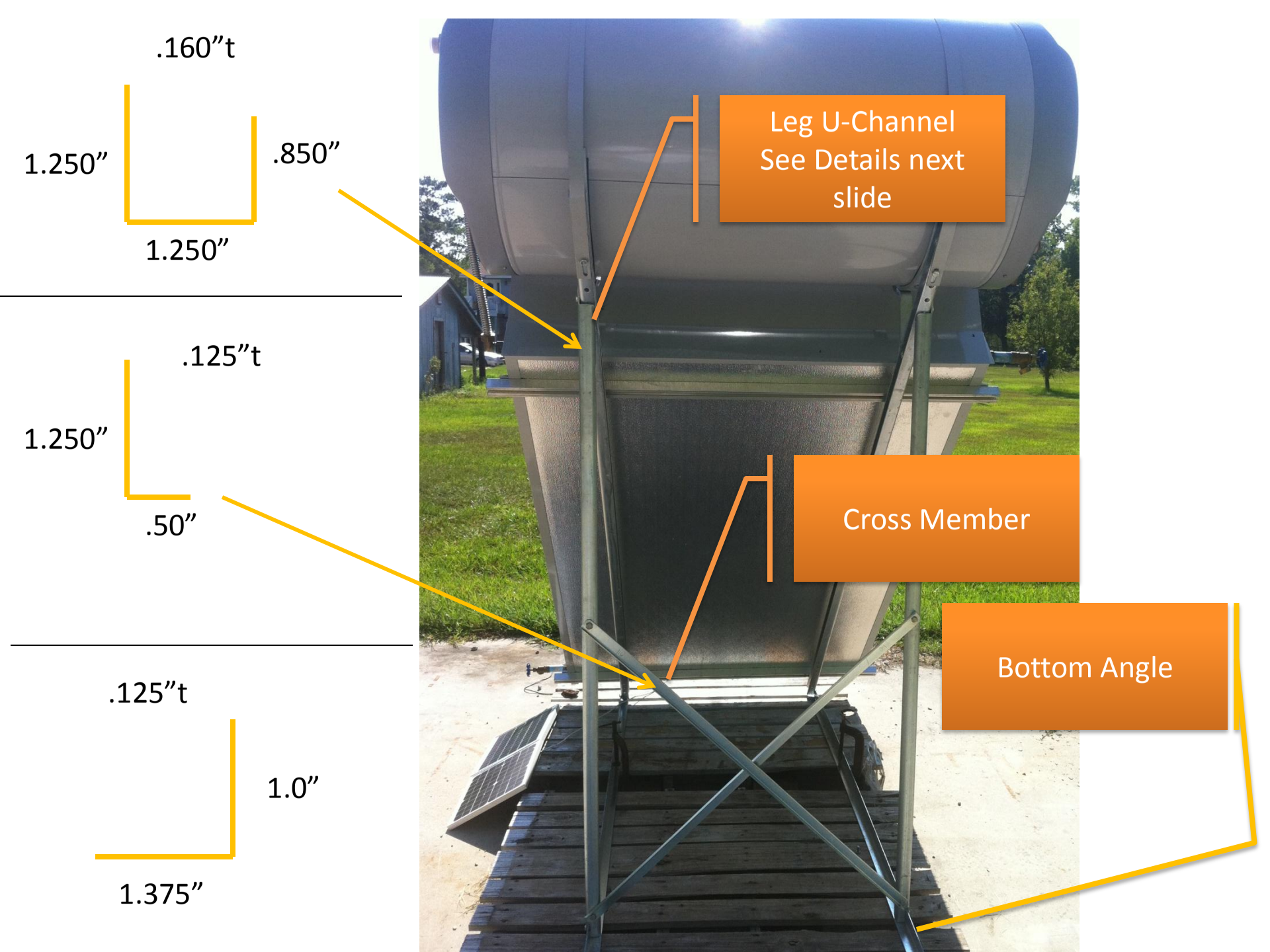
*|Outer Tank Length:	**1.230 m**
Inner Tank Length:	**1.130 m**

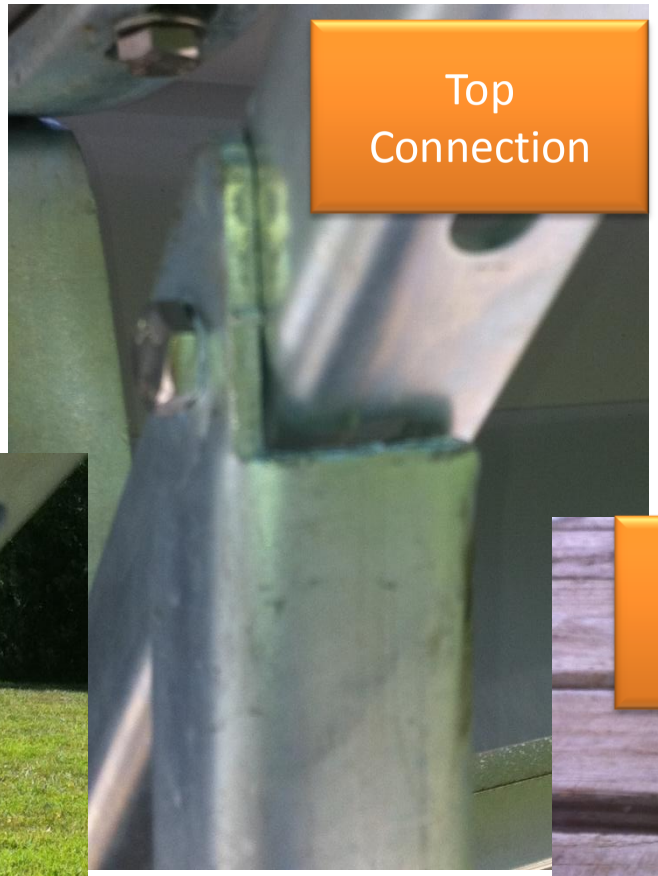
*|Collector Test Fluid Density: **We used 35% propylene glycol in deionized water (per your email on 23-Jan-2004). Density of that mix is 64.5 lb/ft³ at 70 °F. Recovered 36.5 lbs. (16.0 L) of mix when I drained mantle tank and collector. Collector holds 5.5 L, therefore the mantle tank volume should be 10.5 L.**


Cold Water Inlet
Glycol to Bottom of Collector (Inlet)
QUALITY CONTROLLED
SRCC
ezinc
COLLECTOR


Glycol Air Vent
Glycol Pressure Relief
Hot Water Pressure Relief
Glycol Return from Collector
Hot Water Out

Front View of Hot Water and Glycol Piping


.160”t
1.250”
.850”
1.250”
.125”t
1.250”
.50”
.125”t
1.0”
1.375”
Leg U-Channel
See Details next
slide
Cross Member
Bottom Angle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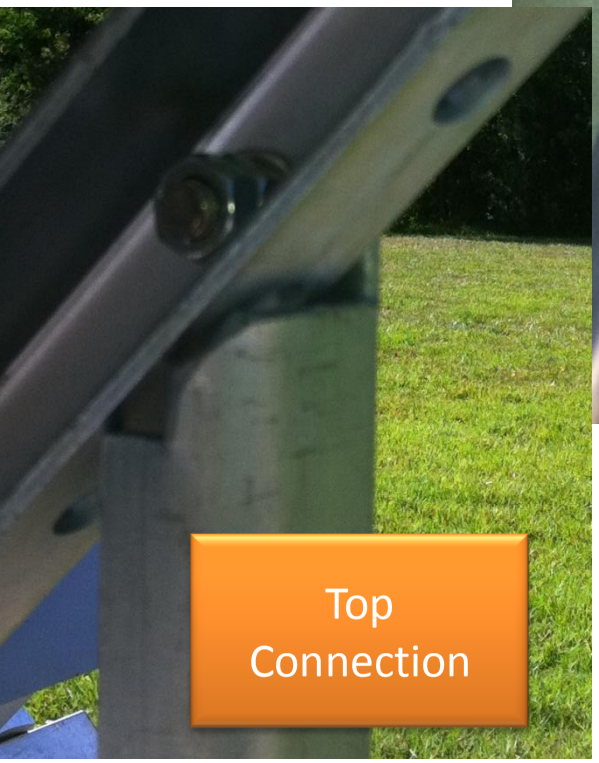
Connection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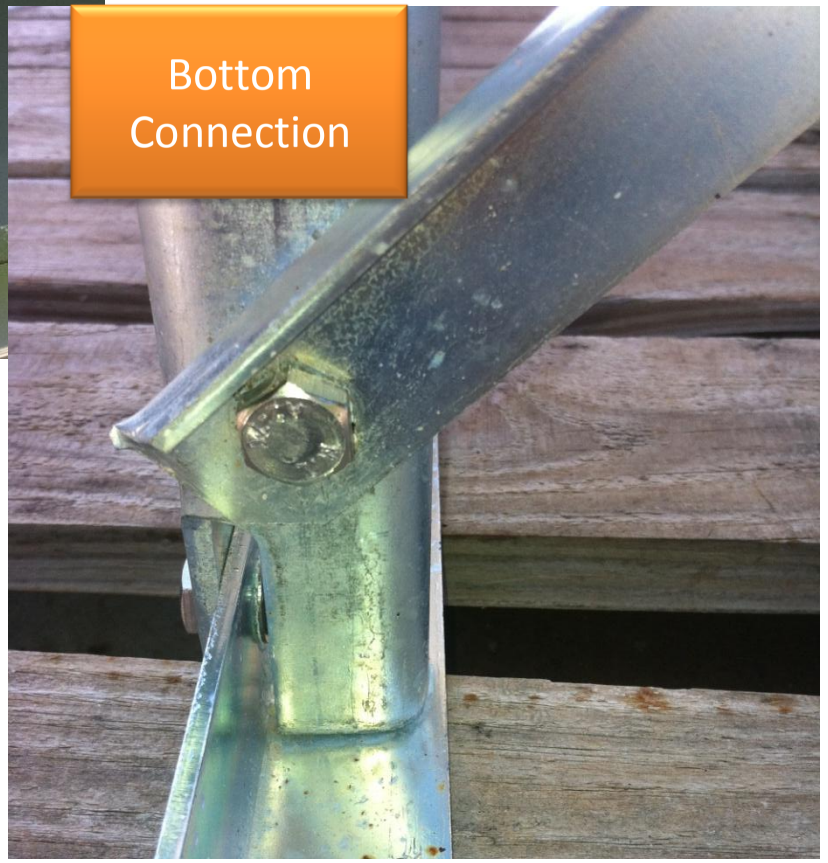
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