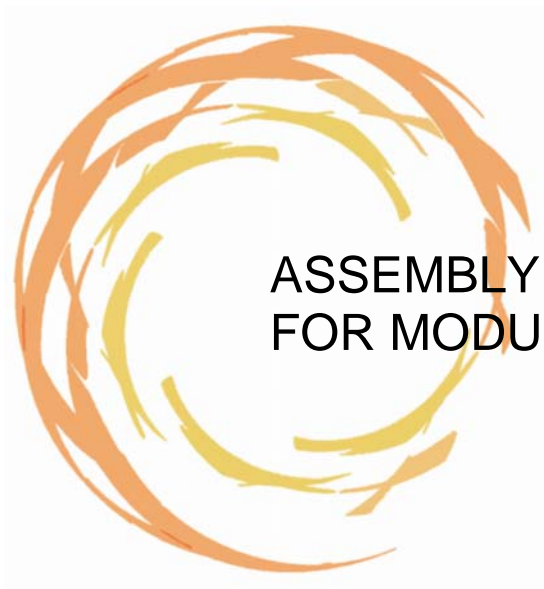


“CLOSEST TO THE SUN”
ouraset
SOLAR THERMAL SYSTEMS



**ASSEMBLY MANUAL
FOR MODULAR STRUCTURES**



1. Introduction

The Modular System Structure is designed to be compatible among different models. By changing only 1-2 parts you can build up all the different models of structures that you may require, whether for thermosyphonic or force-circulated systems.

Your system structure is made of two materials:

- Perforated profiles electro galvanized
- Aluminium extruded headers with static paint

2. List of Components used in the structures.

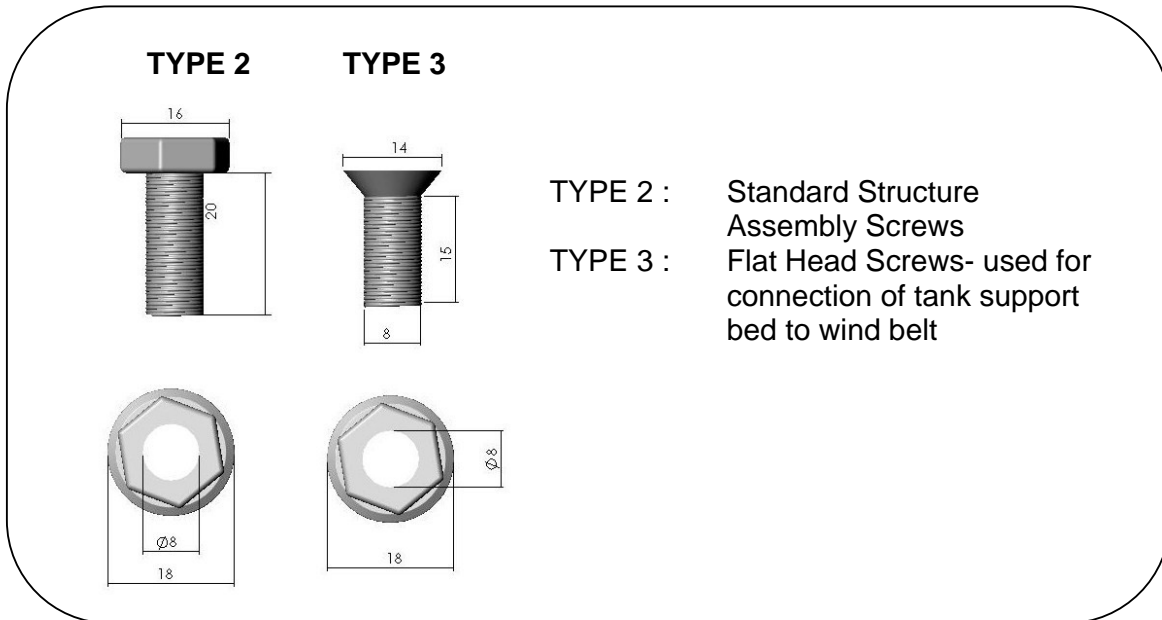
PARTS LIST FOR STRUCTURES		Size	FORCE CIRCULATED SYSTEMS				THERMOSYPHONIC SYSTEMS					
			VIR-2	VIR-3	VFR45-2	VFR45-3	TFR 45-1	TFR 45-2	TFR 35-1 ^{*1}	TFR 35-2	TIR-1	TIR-2
A	BASE FRAME	2000 mm	2	3	2	3	2	2	2	2	2	2
B35	VERTICAL FRAME	1220 mm	-	-	2	3	2	2			-	-
B45	VERTICAL FRAME	1415 mm							2	2		
C35	SIDE FRAME	780 mm	-	-	2	3	2	2			2	2
C45	SIDE FRAME	585 mm							2	2		
D1	ALUM.PANEL.FRAME	1000 mm	-	-	-	-	2	-	2	-	2	-
D2	ALUM.PANEL.FRAME	2000 mm	2	-	2	-	-	2	-	2	-	2
D3	ALUM.PANEL.FRAME	3000 mm	-	2	-	2	-	-	-	-	-	-
E	BACK & SIDE DIAGONALS	1500 mm	2	4	4	7	4	4	4	4	2	4
F5	TANK SUPPORT BED*	Ø500	-	-	-	-	-	-	-	-	-	-
F6	TANK SUPPORT BED	Ø600	-	-	-	-	2	2	2	2	2	2
G	TANK WIND BELT	-	-	-	-	-	2	2	2	2	2	2
H	PANEL WIND GRIP	-	4	6	4	6	2	4	2	4	2	4
I	GROUND SUPPORTS	100 mm	-	-	4	6	4	4	4	4	-	-
J	ROOF ANCHORS		4	6	-	-	-	-	-	-	6	6
K2	SCREW TYPE 2 ^{*2}	M8x20mm	30	30	30	30	30	30	30	30	30	30
K3	SCREW TYPE 3	M8x15mm	-	-	-	-	4	4	4	4	4	4
Compact System Models that use the corresponding structure			201, 202, 301/2, 302/2	301/3, 302/3, 501, 502	201, 202, 301/2, 302/2	301/3, 302/3, 501, 502	151 191	192 302	151 191	192 302	151 191	192 302

^{*1} By changing only two parts B & C to B35 & C35 you can easily convert your thermosyphonic flat roof structure from 45° inclination to 35°. (See Section 5)

^{*2} 30 units of K2 screws are supplied with all packages regardless of the exact amount of screws used.

3. Description of screws that are used in the mounting of the stands.

You will use three kinds of screws that will be sent with your structure.



4. ASSEMBLY OF THE STANDS

4.1 Assembly of Thermosyphonic Flat Roof Stand (TFR45)

- 4.1.1** Connect the **base frame** (A) with the tank support beds (F6), then the support beds (F6) to the vertical frame (B) and side frame (C). Use side diagonal (E) to complete one leg of the structure. Measure the dimensions illustrated at Figure A.
- 4.1.2** Put together the second leg of the structure in the same way described at step 4.1.1.
- 4.1.3** Use back diagonals (E) to connect the two legs of the structure together. Measure **880 mm** between the center of tank beds for structure type TFR45-1 for systems 121-151-191 when connecting the back diagonals. (See Figure A). Use the holes on the vertical frames (B) that correspond to this distance between the two legs.
- 4.1.4** The distance between the center of tank beds is **1260 mm** for structure type TFR45-2 for systems 192-302. (See Figure B)
- 4.1.5** Install the aluminum panel frames on the base frames (A) , first the bottom aluminum frame(D) to the first hole of the base frame from the bottom. Then

put the top aluminium panel frame (D) on the corresponding hole on the base frame that measures 1950 mm. Remember that solar panel will be located between these two aluminium frames.

- 4.1.6** Screw the tank wind belt (G) on the tank beds (F) from the front. Screw the belts from the back of the stand only after you have placed the tank on the tank beds, after when you have finished all steps of the installation of the structure.
- 4.1.7** Put your structure on the desired location on the roof to mark the points on which you want to anchor the ground support (I).
- 4.1.8** Put the structure aside and drill the holes on the roof and insert plugs and nuts. Anchor the ground supports (I) on the roof.
- 4.1.9** Move the structure on top of the ground supports (D) Install the ground supports on each four points of the structure that touch the ground.
- 4.1.10** After you have placed the panels on the stand, install the **panel grips. (H)**
- 4.1.11** Put the tank on the support beds and screw the tank wind belt from the back of the structure.

FIGURE A: TFR45-1: T. Syphonic flat Roof Structure for 1 Panel

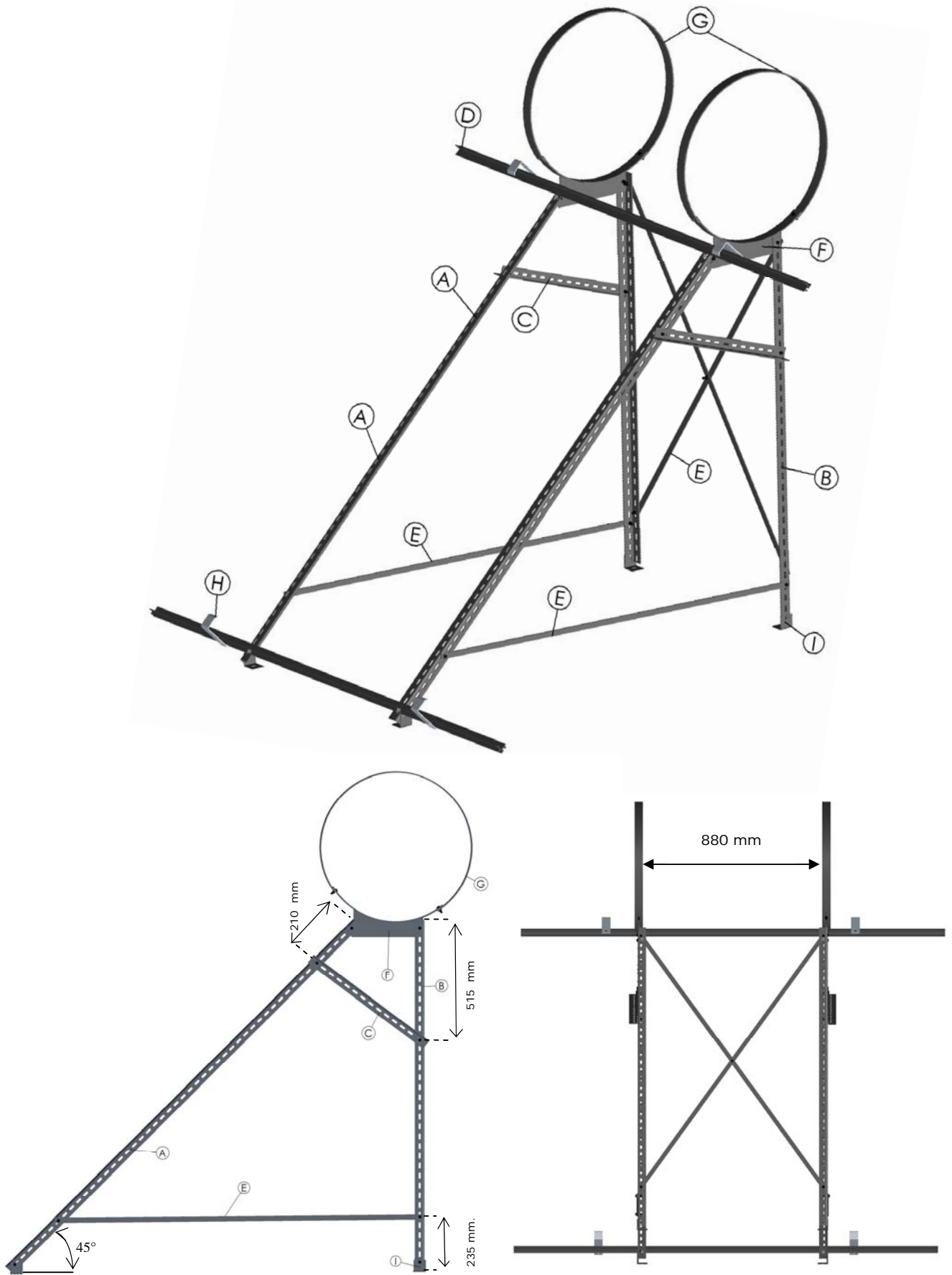
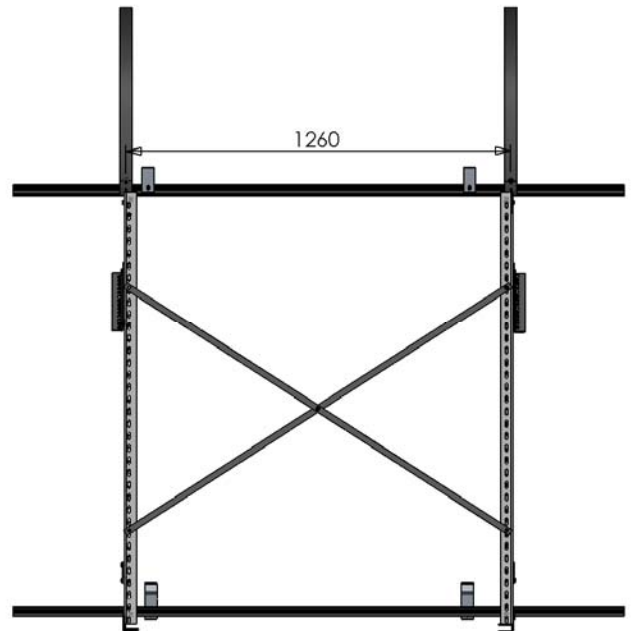
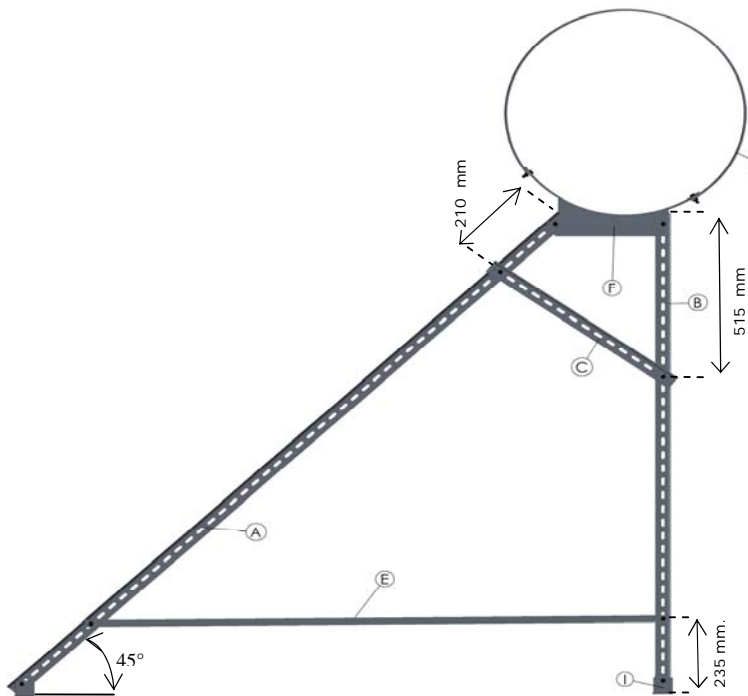
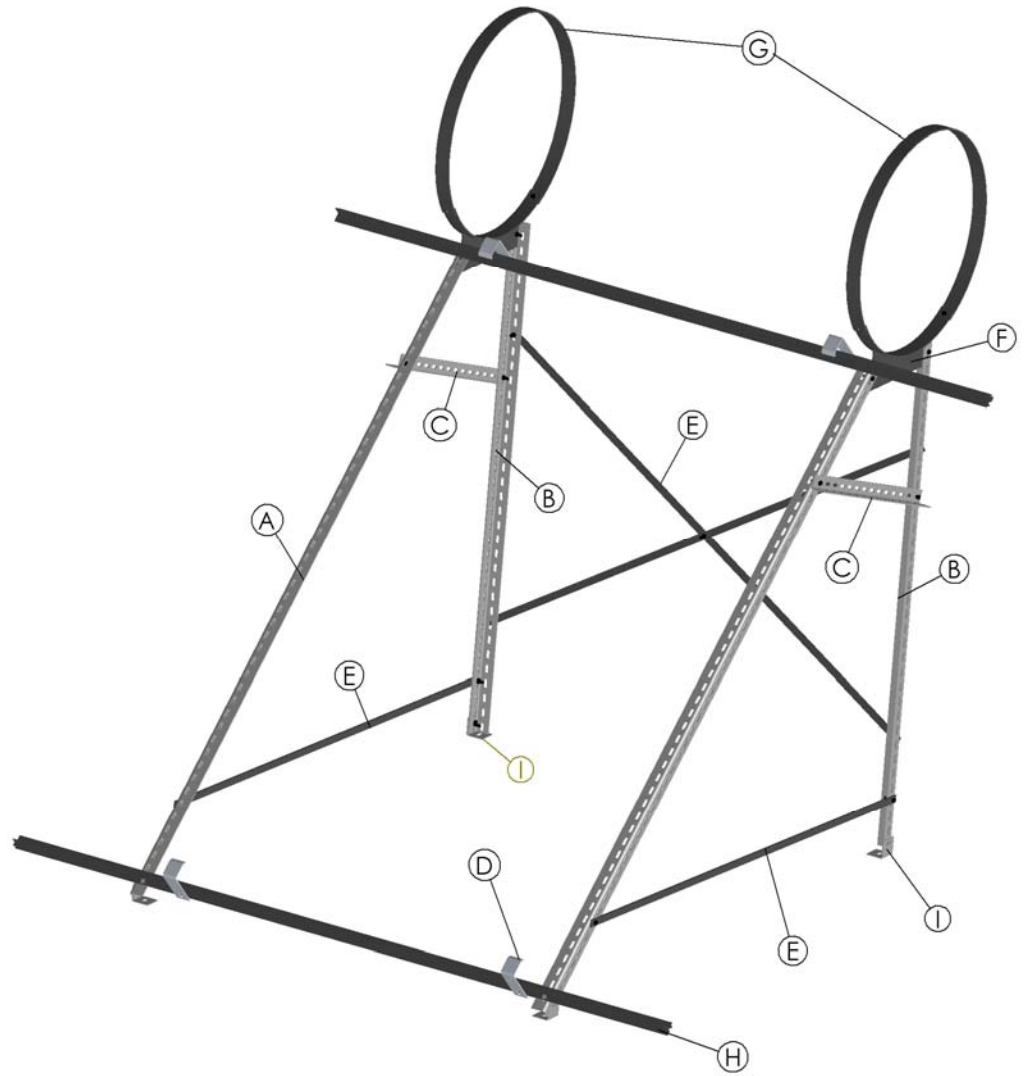


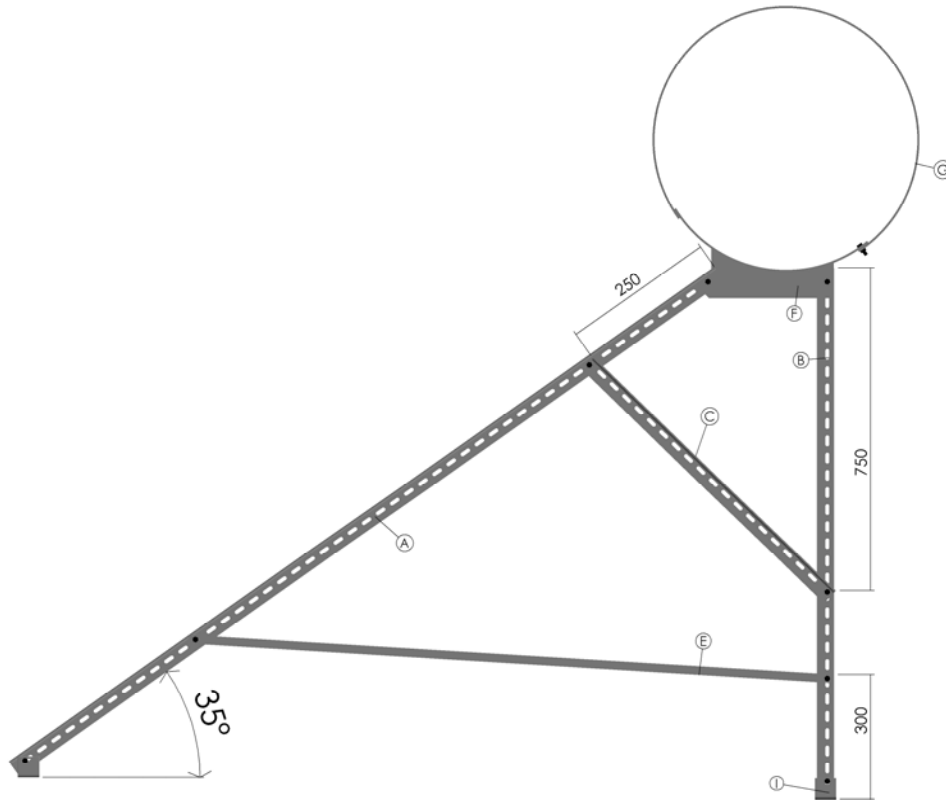
FIGURE B: TFR45-2: T. Syphonic Flat Roof Structure for 2 Panels



4.2 Assembly of Thermosyphonic Flat Roof Stand (TFR35)

By changing only two parts (B,C) that are listed at Section 2, you can easily convert your flat roof structure from 45° inclination to 35°. During your installation you just need to take into account the dimensions illustrated in Figure C, below:

FIGURE C: TFR35-1 /2: T. Syphonic flat Roof Structure for 1-2 Panel 35°



4.3 Assembly of Thermosyphonic Inclined Roof Stand (TIR)

The way the inclined roof stand is assembled depends on whether you use the components for 35° or 45° (C35 or C45) in your flat roof installations. The assembly is very similar with a small difference which is illustrated at Figure E & F.

- 4.3.1 Put the base frame (A) and the side frame (C) together to form one straight frame as seen on Figures E & F. The frames will be connected by the use of two screws
- 4.3.2 Put together the second leg of the structure in the same way described at step 4.3.1.
- 4.3.3 Connect the tank beds (F) from the outer surface of the straight frame you have obtained by putting together parts A and C together. You can count the

- holes to identify the exact location of connection. Use back diagonals (E) to connect the two frames together. The distance between the center of tank beds must be **880 mm.** for structure type TIR45-1 for systems 121-151-191 when connecting the back diagonals. Use the holes on the vertical frames (B) that correspond to this distance between the two legs. (See Figure A)
- 4.3.4 The distance between the two legs must be **1260 mm.** for structure type TIR45-2 for systems 192-302.
- 4.3.5 Install the aluminum panel frames on the base frames (A). First the top aluminum frame (D) as illustrated at Figure E. Then put the bottom aluminium panel frame (D) on the corresponding hole as shown in the Figure. It is crucial that you measure exactly 1950 mm. between the top and bottom aluminium frames. This is the distance required for accurate placement of the solar panels.
- 4.3.6 Screw the tank wind belt (G) on the tank beds (F) from the front. Screw the belts from the back of the stand only after you have placed the tank on the tank beds, after when you have finished all steps of the installation of the structure.
- 4.3.7 Remove the tiles on the roof and identify the location on the wooden, steel or concrete beams on which it is possible to screw the **roof anchors (J)**. Install the roof anchors on the suitable locations alongside the beams. Try to locate the anchors in a way that one pair is at the bottom and the other two pairs are closer to the top.
- 4.3.8 Put the structure aside and drill the holes on the roof and insert plugs and nuts. Anchor the roof supports (I) on the roof.
- 4.3.9 Move the structure on top of the ground supports (D) Install the ground supports on each four points of the structure that touch the ground.
- 4.3.10 After you have placed the panels on the stand, install the **panel grips. (H)**
- 4.3.11 Put the tank on the support beds and screw the tank wind belt from the back of the structure.

FIGURE D: TIR-1 OR TIR-2: T. Syphonic Inclined Roof Structure for 1 or 2 Panel(s)

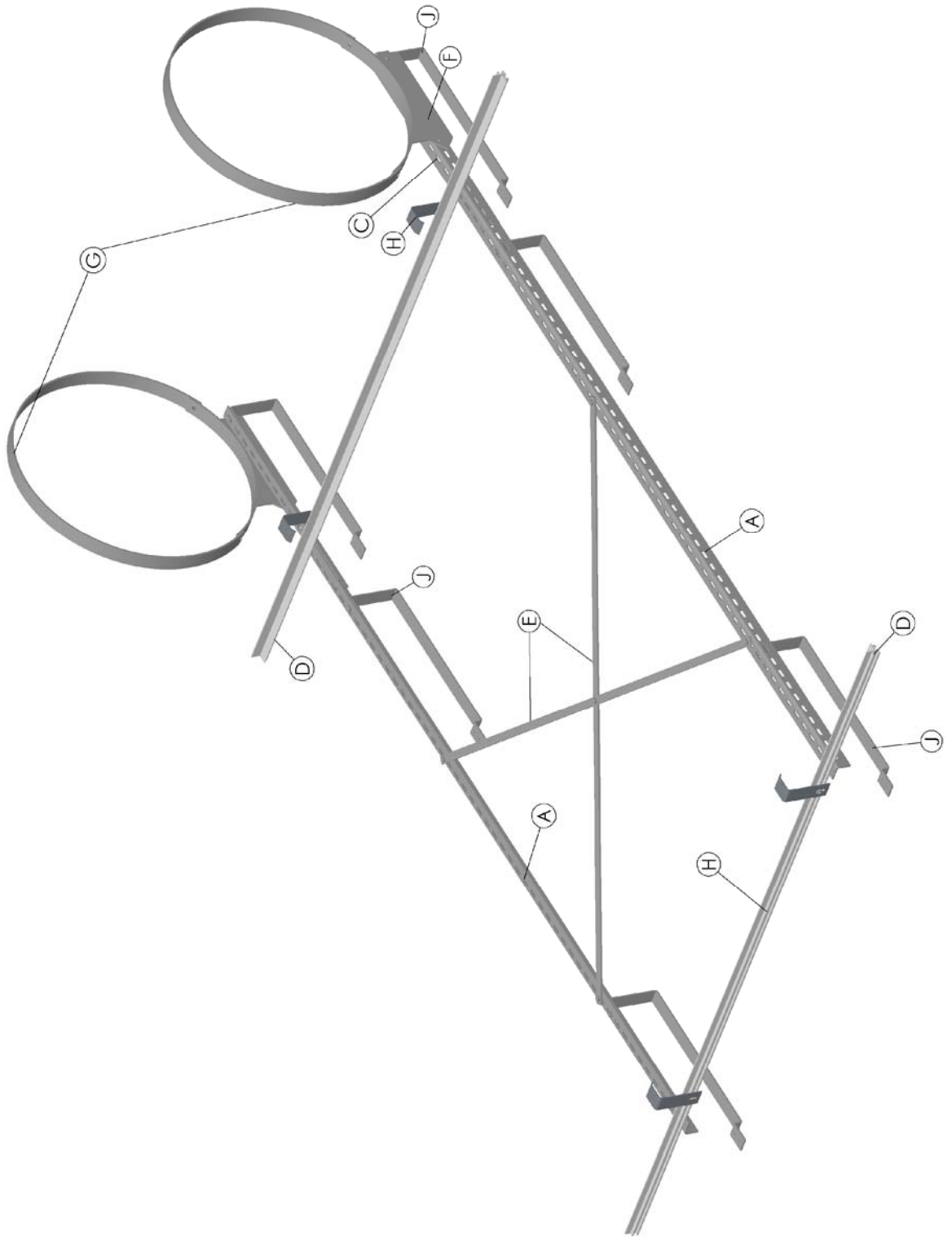


FIGURE E: Connection Details for Inclined Roof Assembly – Using C45

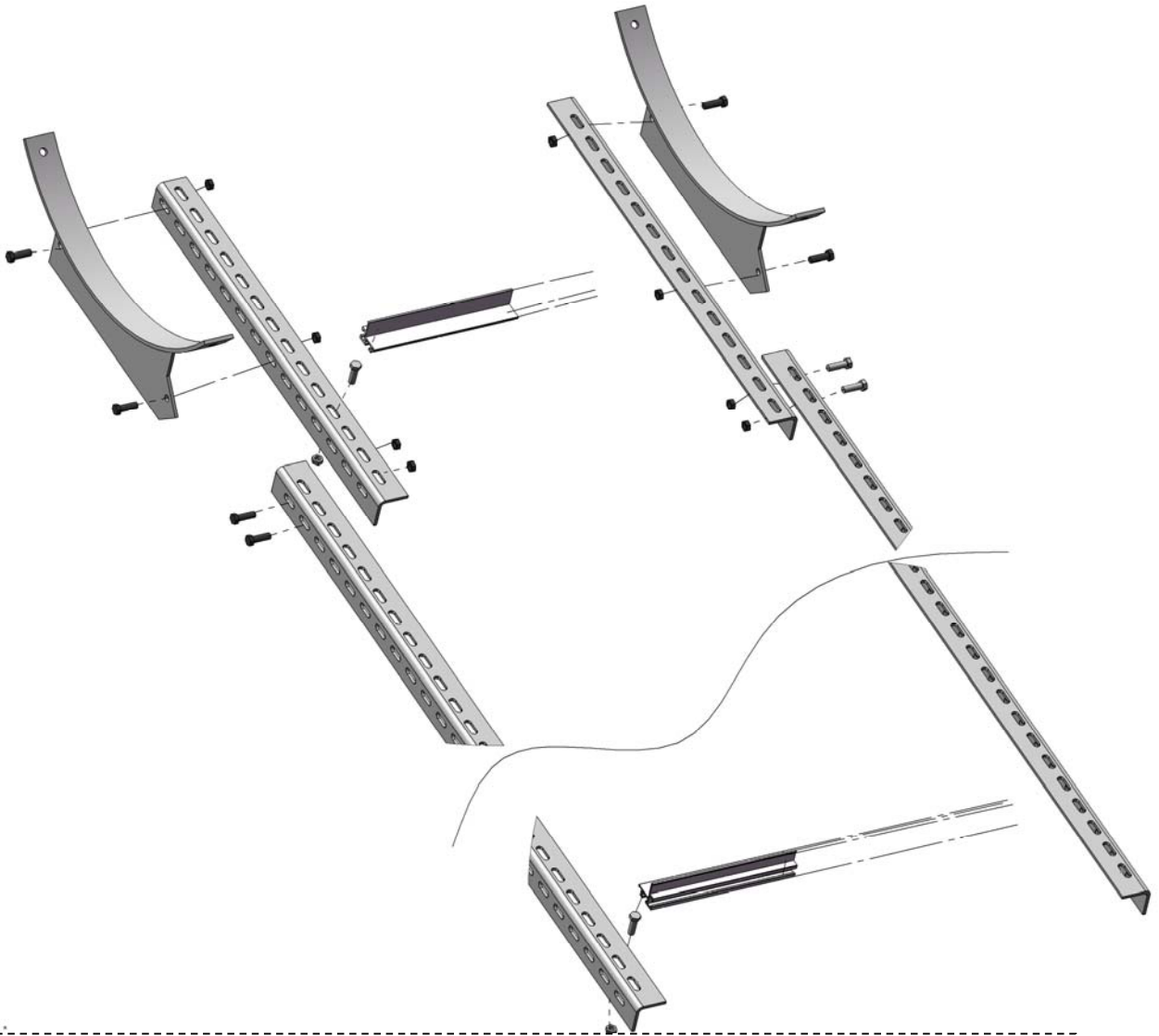
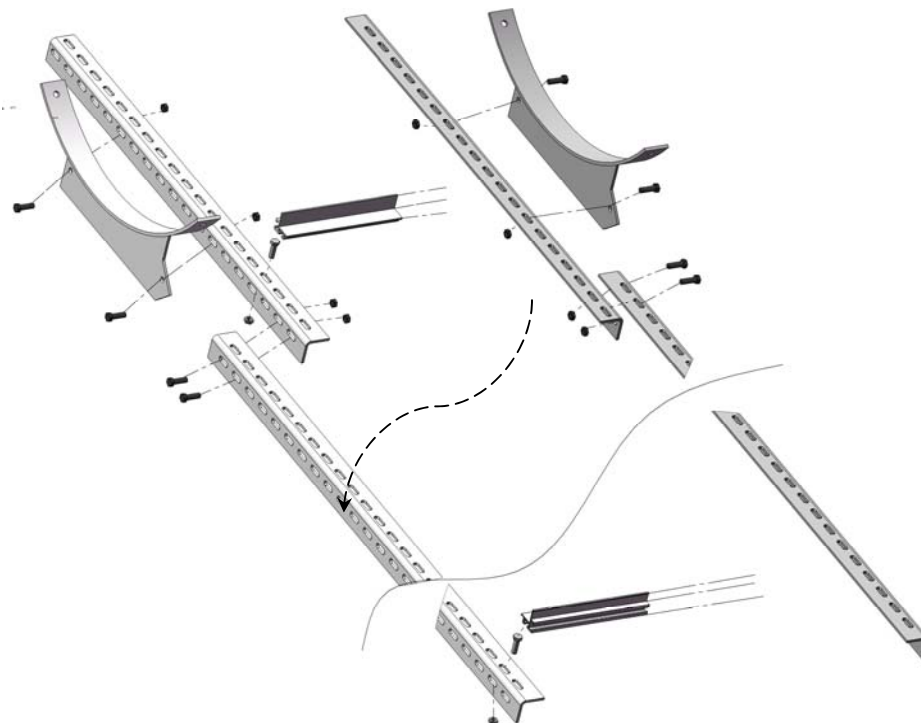


FIGURE F: Connection Details for Inclined Roof Assembly – Using C35



4.4 Assembly of the Villaset Inclined Roof Stand (VIR-2 and VIR-3)

- 4.4.1 Refer to Figure G or Figure H and the relevant component list at section 2 in relation to the structure that you will be installing.
- 4.4.2 Connect the **aluminum panel frames (D)** to connect the 2 **base frames (A)** to form a rectangular structure. First the bottom aluminum frame (D) to the first hole of the base frame from the bottom.. Then put the top aluminum panel frame (D) on the corresponding hole on the base frame that measures 1950 mm. Remember that solar panel will be located between these two aluminium frames.
- 4.4.3 For VLS 201-202 301/2 and 302/2. The distance between the center of two base frames must be 1260 mm. Measure this distance before screwing the **aluminium frames (D)** tightly to the base frames.
- 4.4.4 For VLS 301/3 -302/3 501 and 502: The distance between the two base frames must be exactly 1260 mm Measure this distance before screwing the **aluminium frames (D)** tightly to the base frames.
- 4.4.5 Use the **back diagonals (E)** to stabilize the base frames, using the holes that correspond to the above mentioned distance between the base frames.
- 4.4.6 Remove the tiles on the roof and identify the location on the wooden, steel or concrete beams on which it is possible to screw the **roof anchors (J)**. Install the roof anchors on the suitable locations alongside the beams. Try to use that the anchors are located in a way that one pair while the other is at the top.
- 4.4.7 After you have placed the panels on the stand, install the **panel grips. (H)**

FIGURE G: VIR-2:

Villaset Inclined Roof Structure for 2 Panels

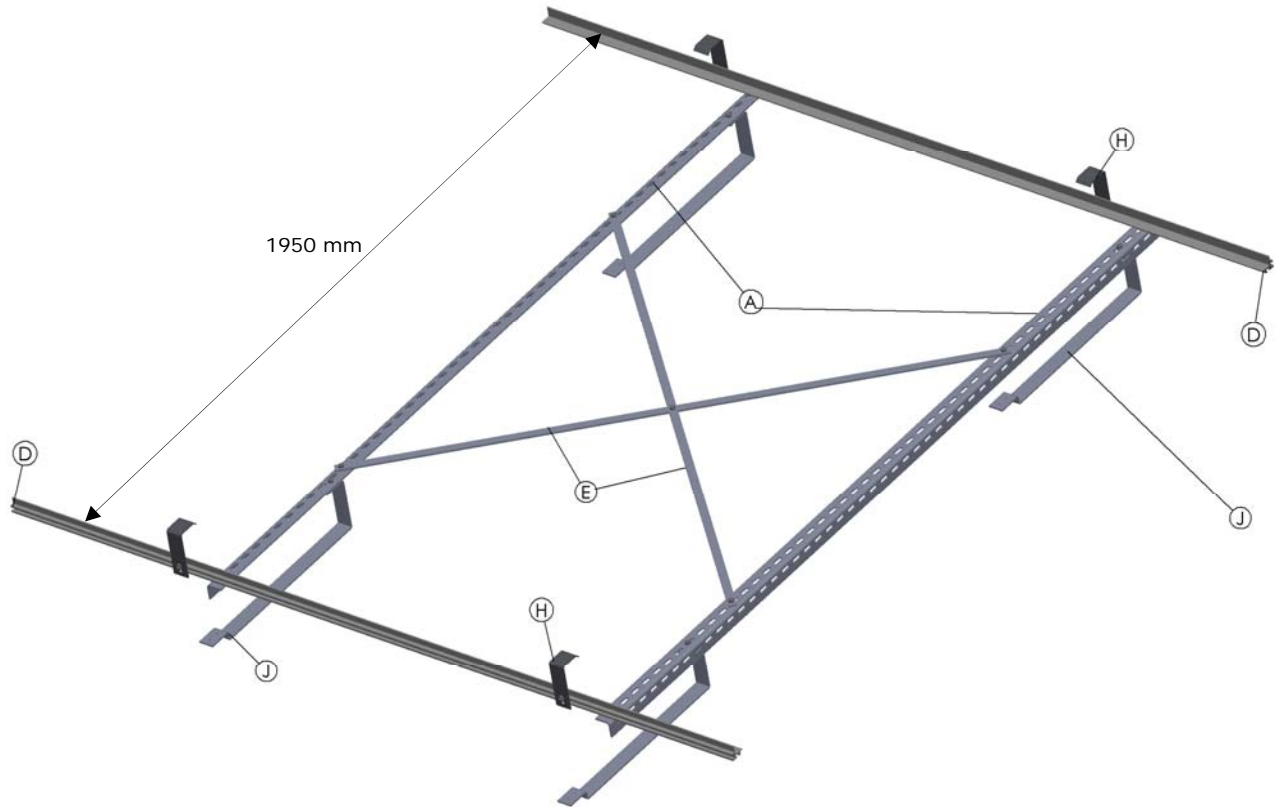
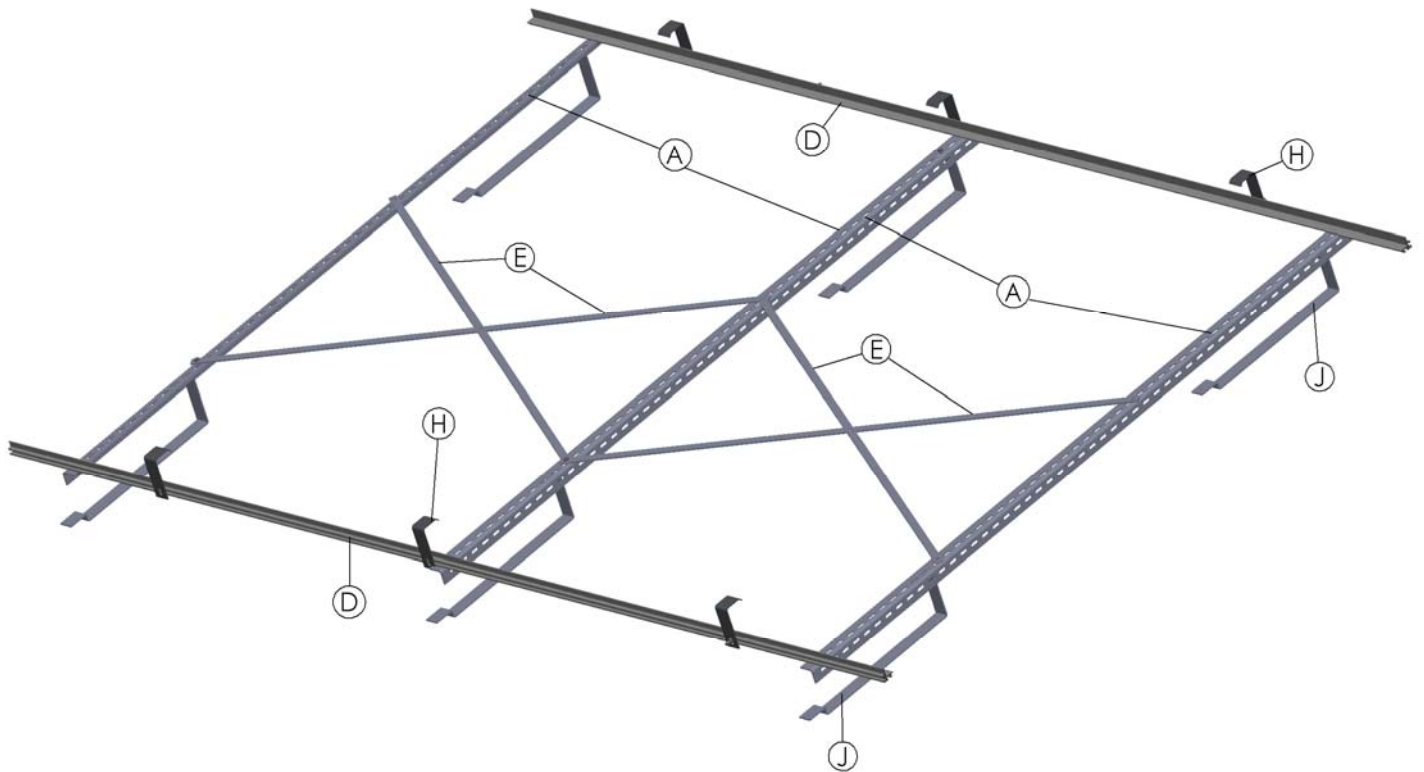


FIGURE H: VIR-3:

Villaset Inclined Roof Structure for 3 Panels



4.5. Assembly of the Villaset Flat Roof Stand (VFR45-2, VFR45-3)

Refer to the table at section 2 to check the full list of parts used in the assembly of the structure and Figures H, I illustrated below.

4.5.1 Connect the the base frame (A) with the vertical frame (B) and side frame (C).

Measure the distance indicated at Figure C to identify the connection point of side frame (C) to the base frame (A). Use side diagonal (E) to complete one leg of the structure.

4.5.2 Put together the second leg of the structure in the same way described at step 4.5.1

4.5.3 Use back diagonals (E) to connect the two legs of the structure together.

Measure 1260 mm between the two legs when connecting the back diagonals.

4.5.4 Install the aluminum panel frames on the base frames (A) , first the bottom aluminum frame(D) to the first hole of the base frame from the bottom.. Then put the top aluminum panel frame (D) on the corresponding hole on the base frame that measures 1950 mm. Remember that solar panel will be located between these two aluminium frames.

4.5.5 Put your structure on the desired location on the roof to mark the points on which you want to anchor the ground support (I).

4.5.6 Put the structure aside and drill the holes on the roof and insert plugs and nuts. Anchor the ground supports (I) on the roof.

4.5.7 Move the structure on top of the ground supports (D) Install the ground supports on each four points of the structure that touch the ground.

4.5.8 After you have placed the panels on the stand, install the **panel grips. (H)**

4.5.9 For the assembly of Villaset 301/3 and 501 VLS 301/3-302/3 and 501-502 follow the same steps described above. The distance between each leg must be **1260 mm** in this case.

FIGURE I: VFR45-2 Villaset Flat Roof Structure for 2 Panels

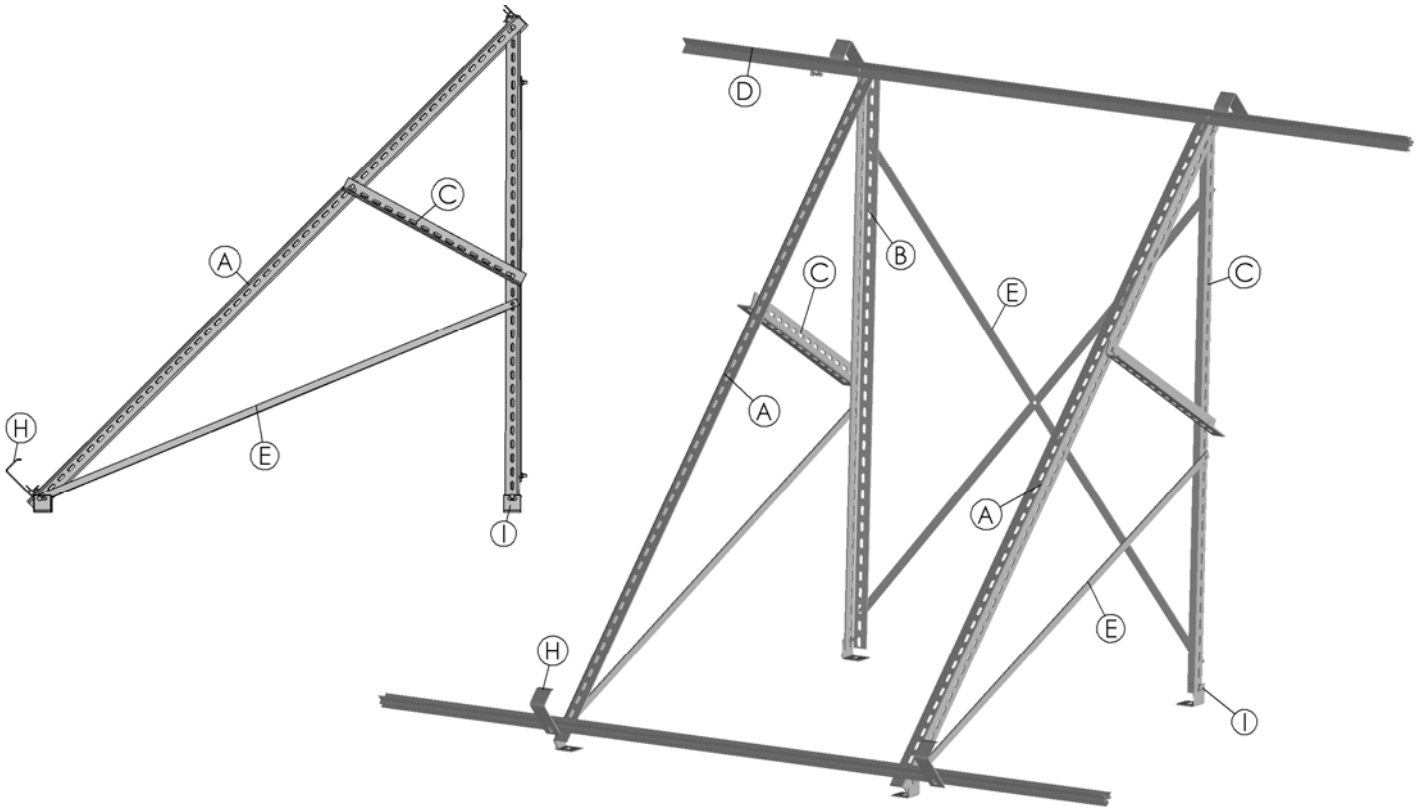


FIGURE J: VFR45-3 Villaset Flat Roof Structure for 3 Panels

