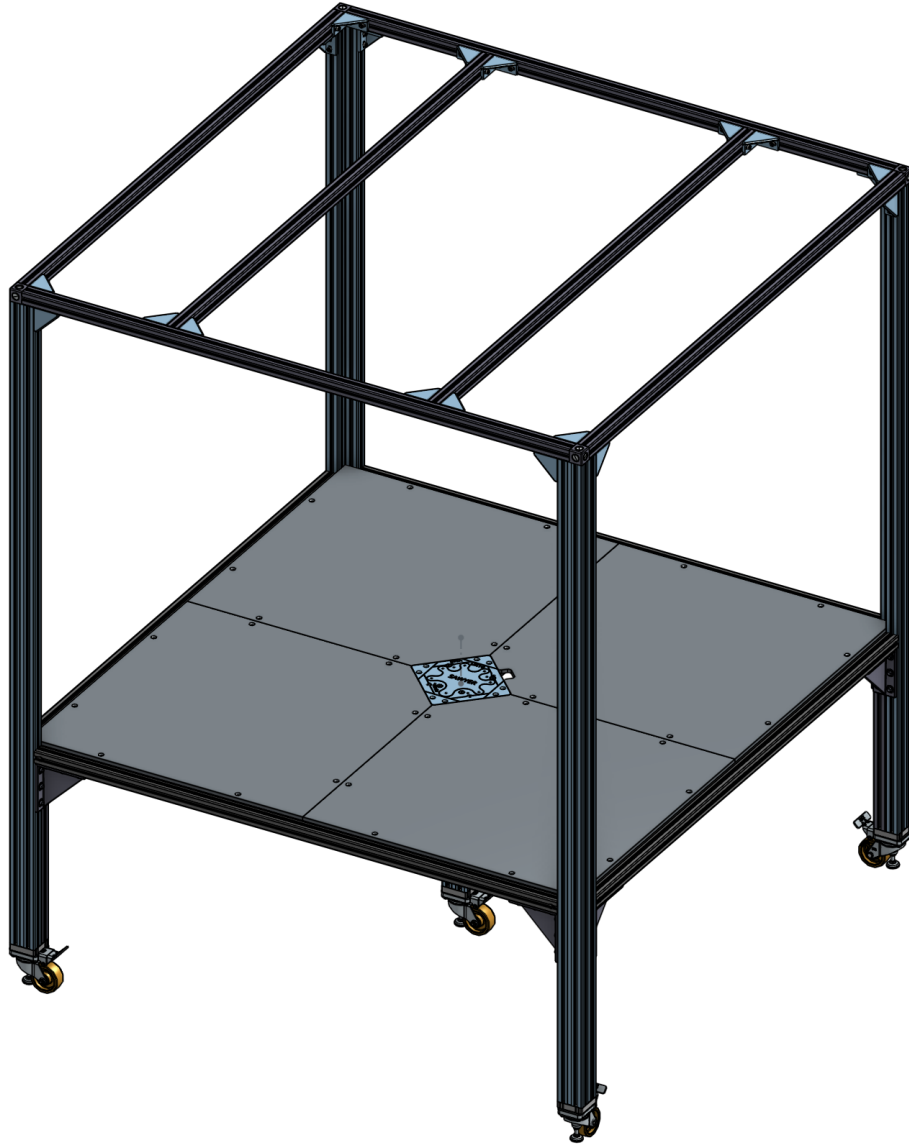


# Robot Cell Assembly



<b>Document Version:</b>	v2
<b>Date:</b>	11/02/2019

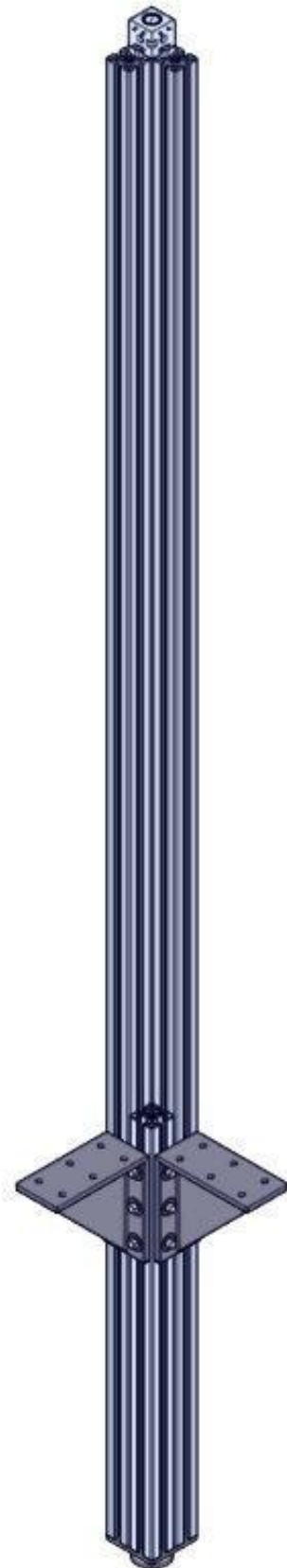
## 1 Assembling the Large Pillars (x4)

### Tools Required

- M12x1.75 Tapping tools
- T45 Torx Driver
- Hex Drivers

### Parts Required

Description	Quantity
AEX 45x90x90L M12/- 2350mm	4
AEX 45x45L M12/- 729mm	4
Cubic Connector 45x45 Kit	4
90x90mm Foot Plate	4
M12 Hex CSK Screw	12
Gussets 180x180mm	8
Gusset Mounting Kits	8
Blickle Caster foot with Stop	5



## 1.1 Assembling the Feet of the Large Pillars

“AEX 45x90x90L M12/- 2350mm” = Large AEX

“AEX 45x45L M12/- 729mm” = Small AEX

Align the tapped end of the Large Extruded profile with the pre-tapped end of the Small AEX using the Leg Adaptor Plate as shown in Figure 1.1

Then screw on the caster wheel on the Leg Adaptor Plate using 4x M8x40 hex socket head cap screws

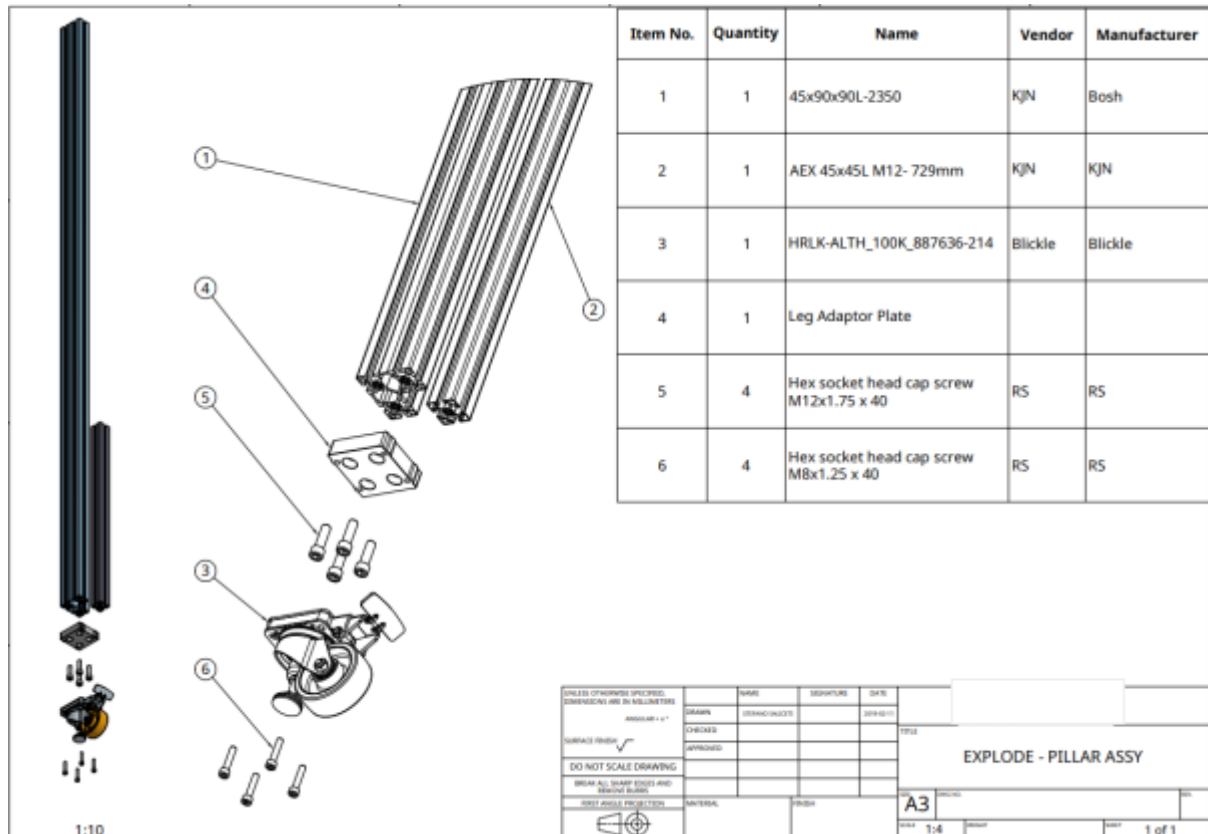
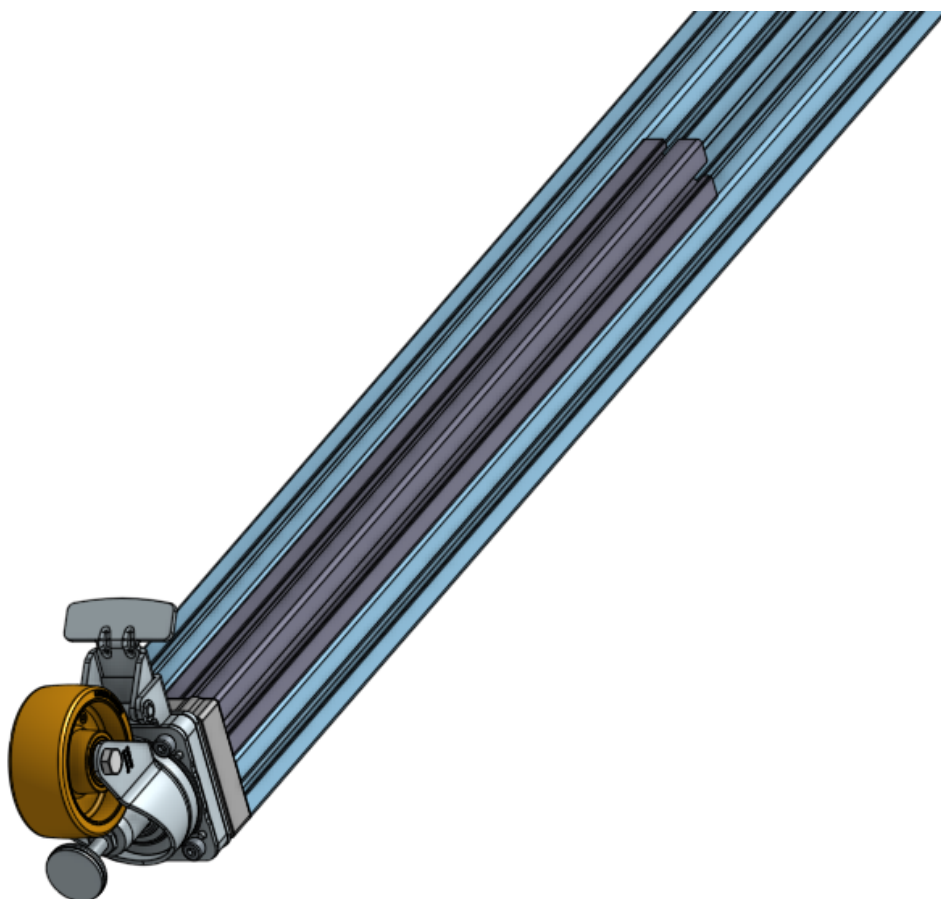


Figure 1.1

Figure 1.2 shows what the large pillar should look like at this stage.



*Figure 1.2*

## 1.2 Attaching the Cubic Connectors to the Large Pillars.

It is recommended to attach the cubic connectors to the Large AEX now given that the tops of the pillars are easily accessible.

Within each Cubic Connector kit there should be:

- 1 x Cubic Connector
- 3 x Self-tapping M12 screws
- 3 x Cubic Connector covers

For this step the Cubic Connectors will be attached to each of the large AEX using one of the self-tapping screws as shown in Figure 1.3. Position the Cubic Connector such that the other two screw holes align with the 90mm sides of the large AEX.

**NOTE:** These self-tapping screws have a different pitch to the M12 CSK screws used previously. Therefore, do not use the M12 tapping tools for this step.

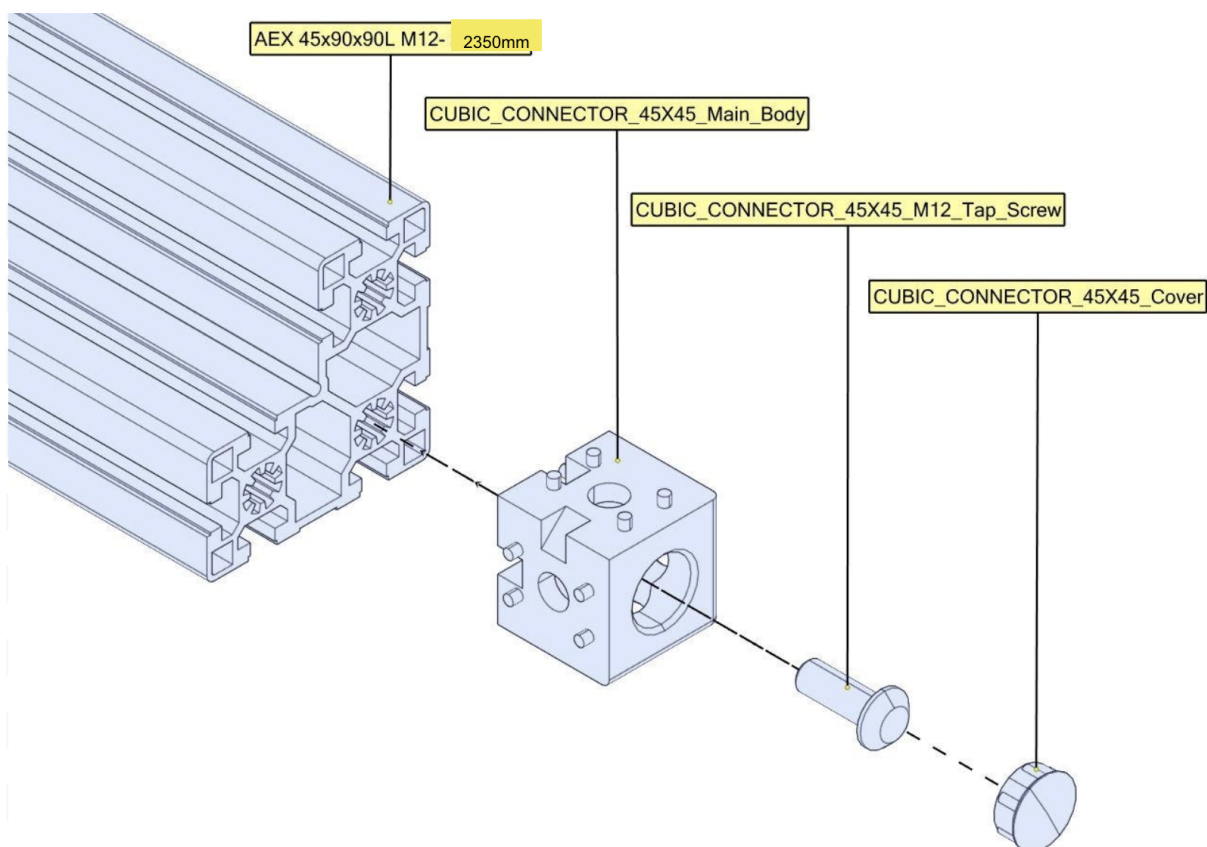


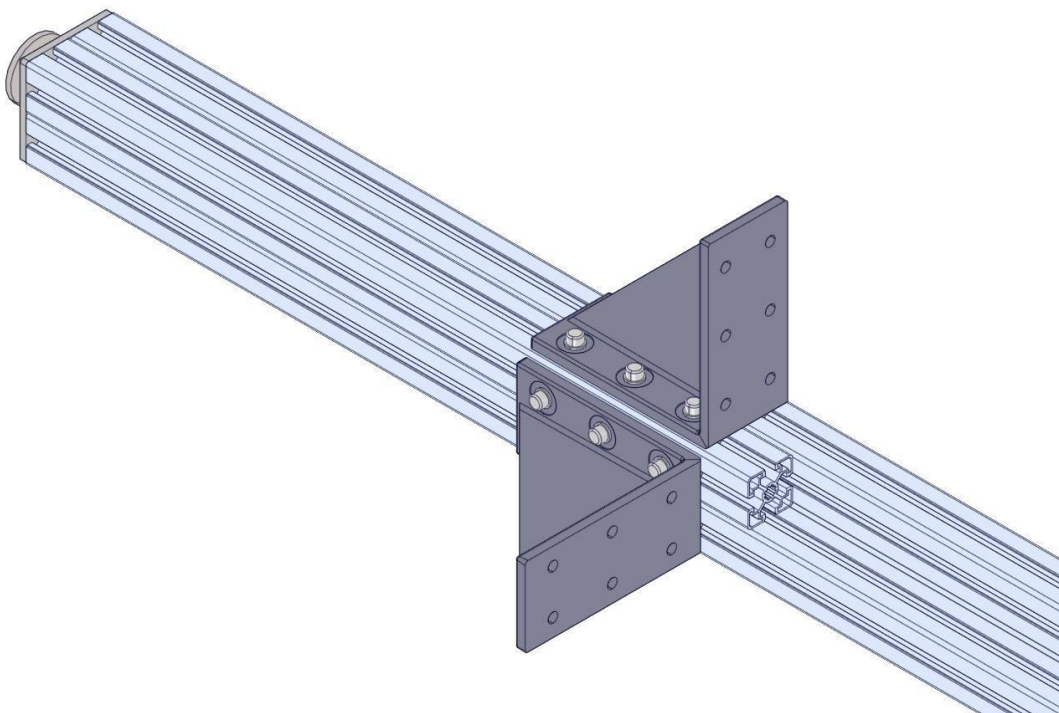
Figure 1.3

### 1.3 Attaching the Gussets 180x180mm to the Large Pillars

Each Mounting Kit should contain:

- 4 x Mounting Bars
- 12 x M8 Washers
- 12 x M8 Torx Cap Head Screws

Figure 1.4 shows what you should see after completing this section.



*Figure 1.4*

First, slide the mounting bars into the slots of the AEX as shown in Figure 1.5.

Then loosely screw on the gussets using the screws and washers included in the mounting kits. See Figure 1.6.

The gussets should sit **45mm** from the face of the small AEX, see Figure 1.7. Using a piece of 45x45mm AEX is a good way to ensure correct position. It is more important to be closer to the face of the small AEX than further away.

Once in position, evenly tighten each screw using a T45 torx driver.

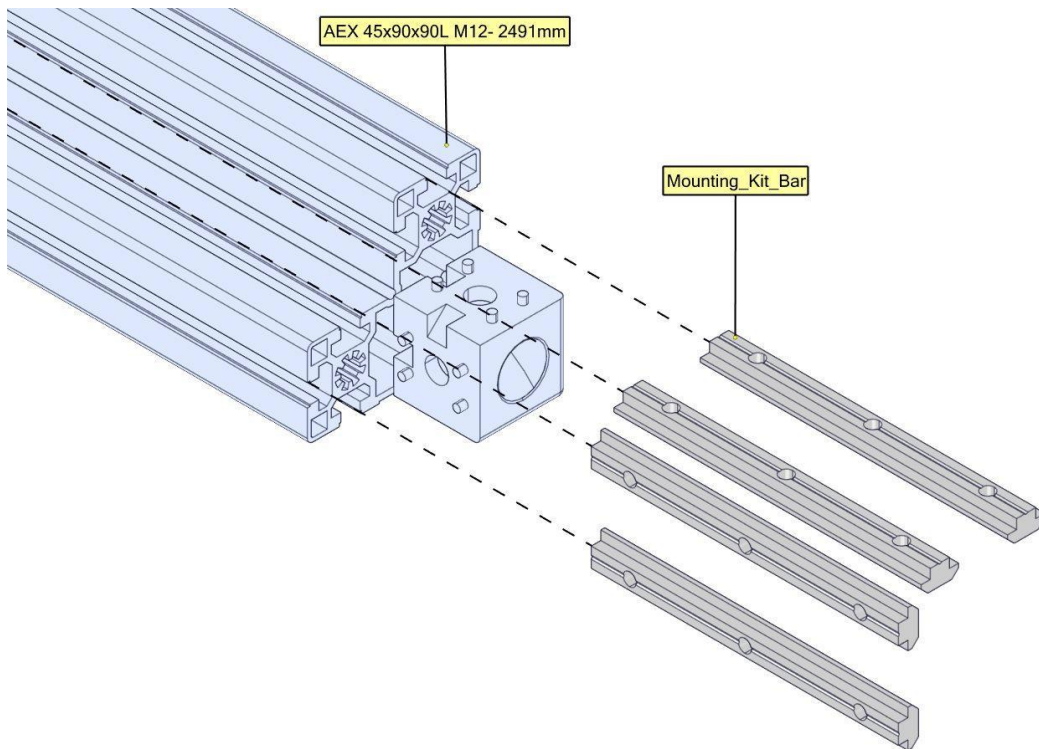


Figure 1.5

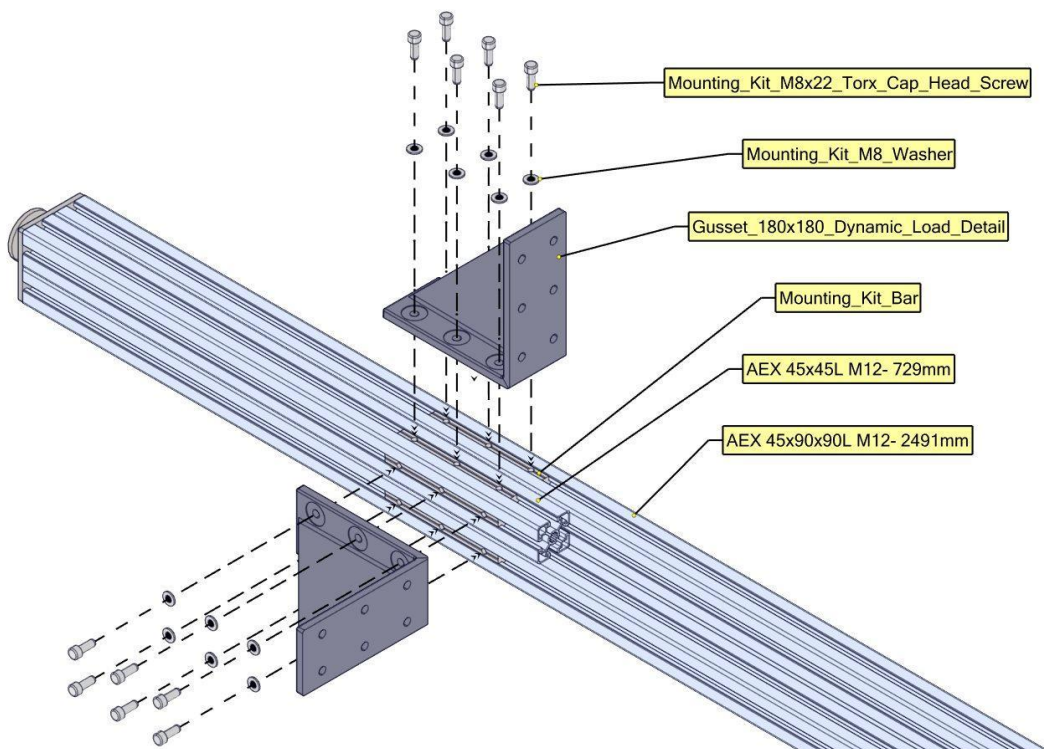


Figure 1.6



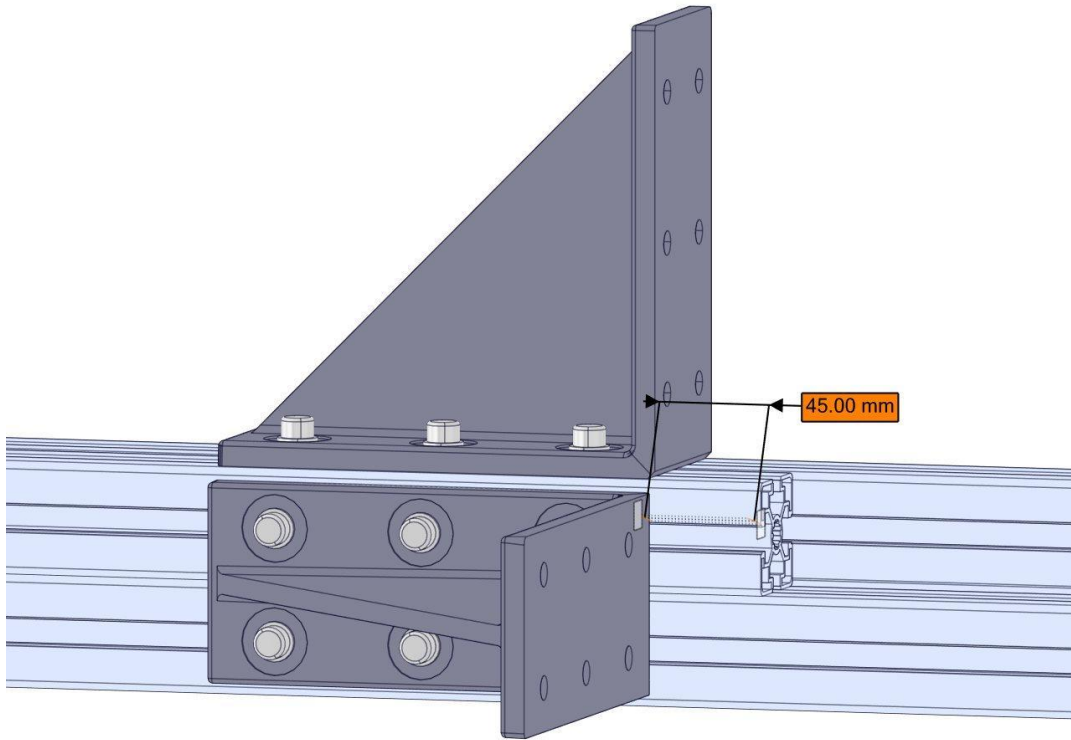


Figure 1.7



## 2 Assembling the Central Pillar

### Tools Required

- Adjustable wrench
- T45 Torx Driver

### Parts Required

Description	Quantity
AEX 90x90 M16/- 693mm	1
Gussets 180x180mm	4
Gusset Mounting Kits	4
Levelling Foot, D90	1
Damping Ring 90mm	1

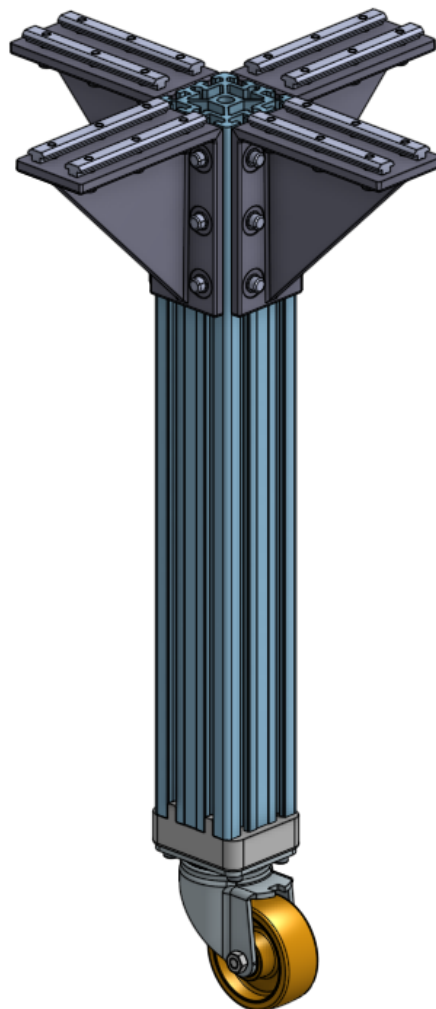


Figure 2.1

## 2.1 Attaching the Center Wheel

Attach the wheel and the support as per image below.

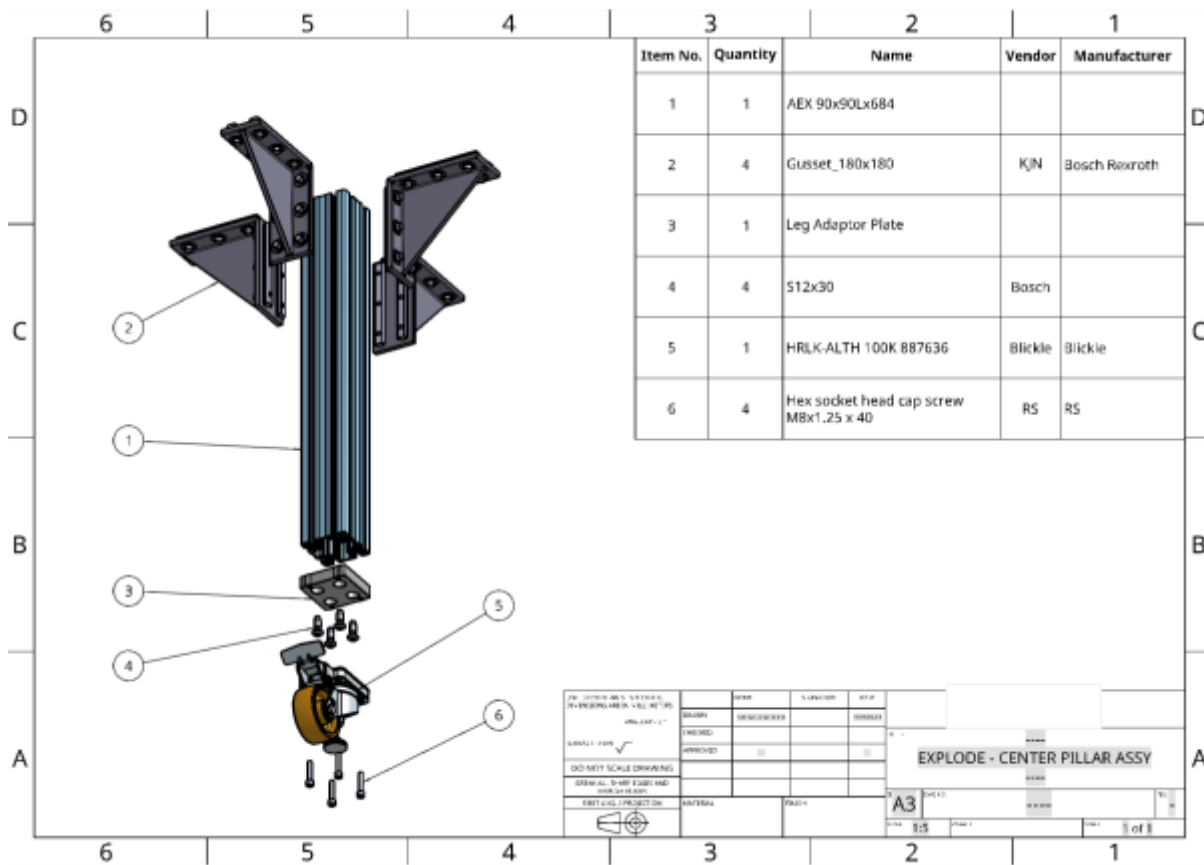


Figure 2.2

## 2.2 Attaching and Positioning the Gussets

First insert the mounting bars into the slots of the 90x90 AEX, see Figure 2.3.

Loosely screw on the gussets using the M8 Torx cap head screws and M8 washers, see Figure 2.4. Align the top of the gussets with the top face of the 90x90 AEX. If a flat surface is available, placing the assembly upside down will help to ensure even attachment.

Once in position, evenly tighten the screws of the gussets using the T45 driver.

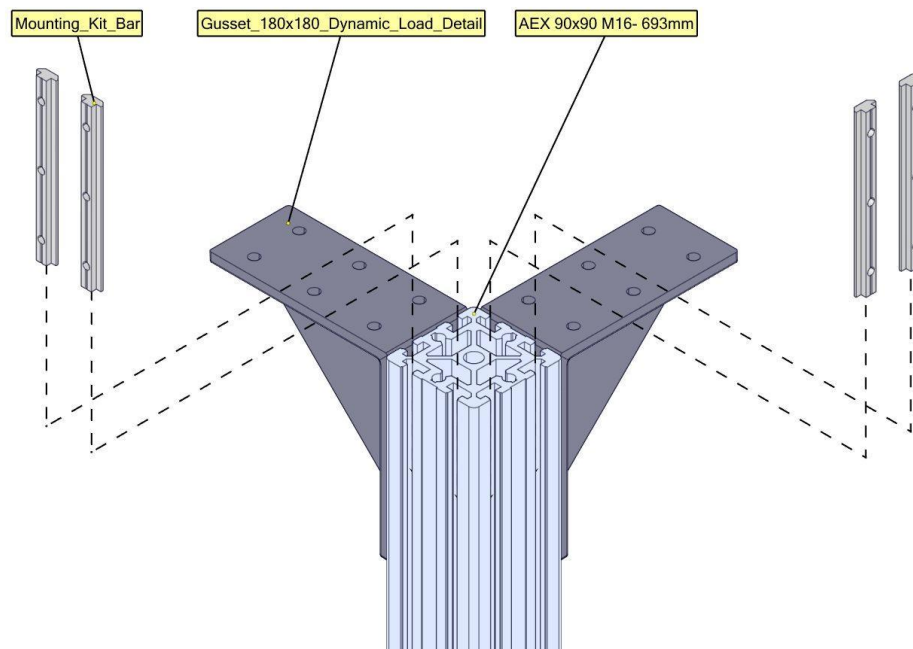


Figure 2.3

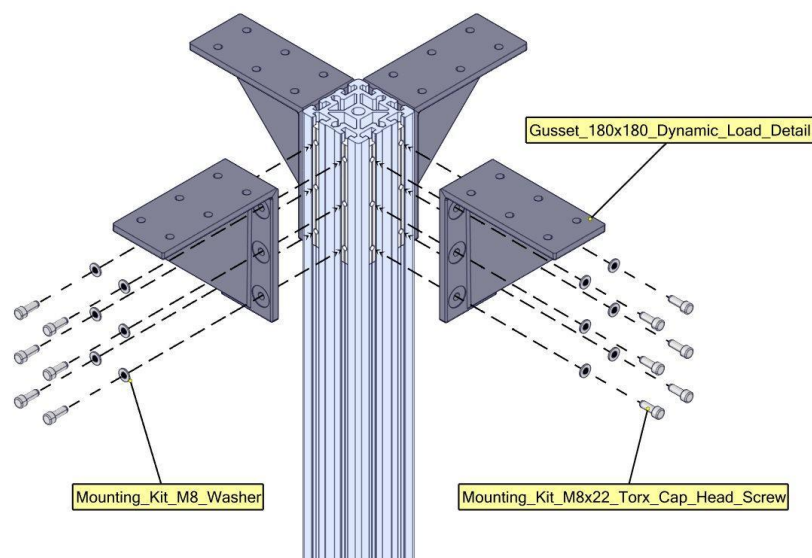


Figure 2.4

### 3 Assembling the Frame

#### Tools required

- T45 Torx Driver
- Hex Drivers
- Mallet

#### Parts Required

Description	Quantity
Large Pillar	4
Small Pillar	1
AEX 45x90L 2XD17VS 1910mm	5
AEX 45x90L 2XD17VS 910mm	6
AEX 45x90L 2XD17VS 410mm	8
Gusset Mounting Kit (used to make the pillars)	8
D17x90 Bolt Connectors	30

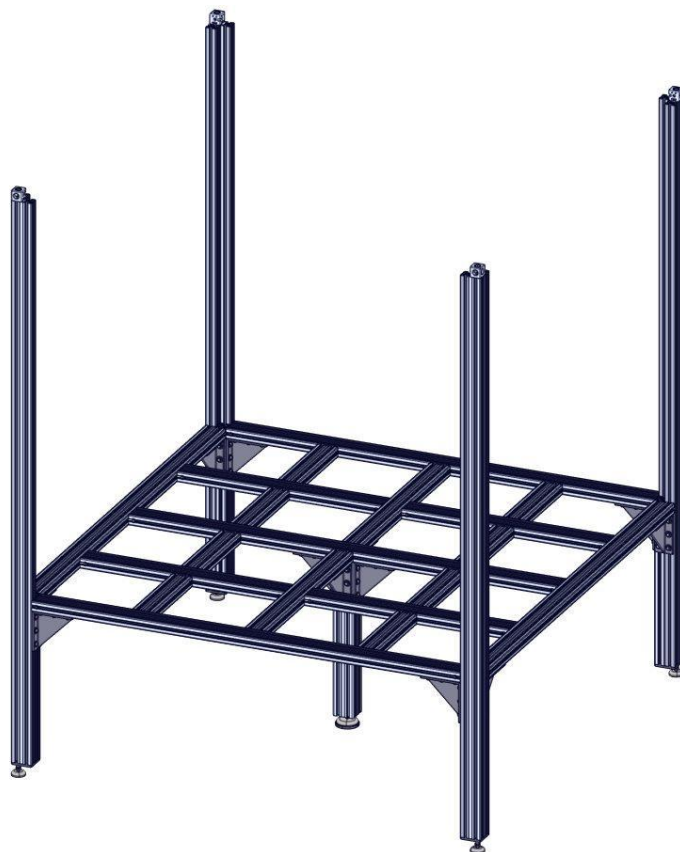


Figure 3.1

### 3.1 Assembling the Sides

First slide the mounting bars into the slots of the AEX as shown in Figure 3.2.

Position the 1910mm AEX onto the gusset of the large pillar as shown in Figure 3.3. The end of the 1910mm AEX should butt up to the pillar.

Once in position, fasten the AEX to the large pillar using the M8 Torx cap head screws and the M8 washers from the mounting kit used for the large pillars, see Figure 3.4 and Figure 3.5.

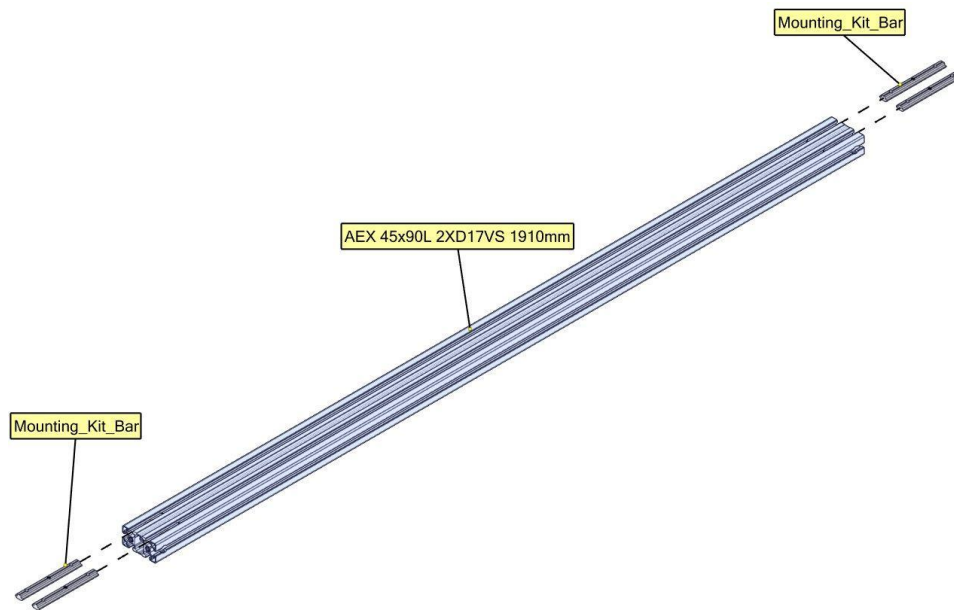


Figure 3.2



Figure 3.3

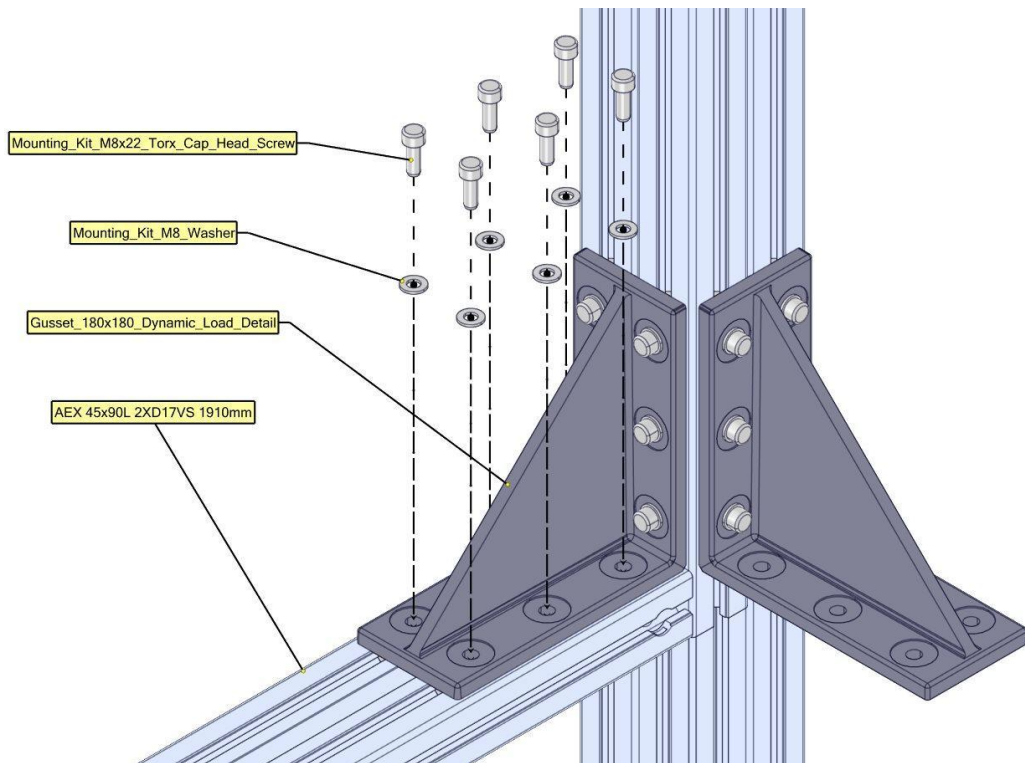
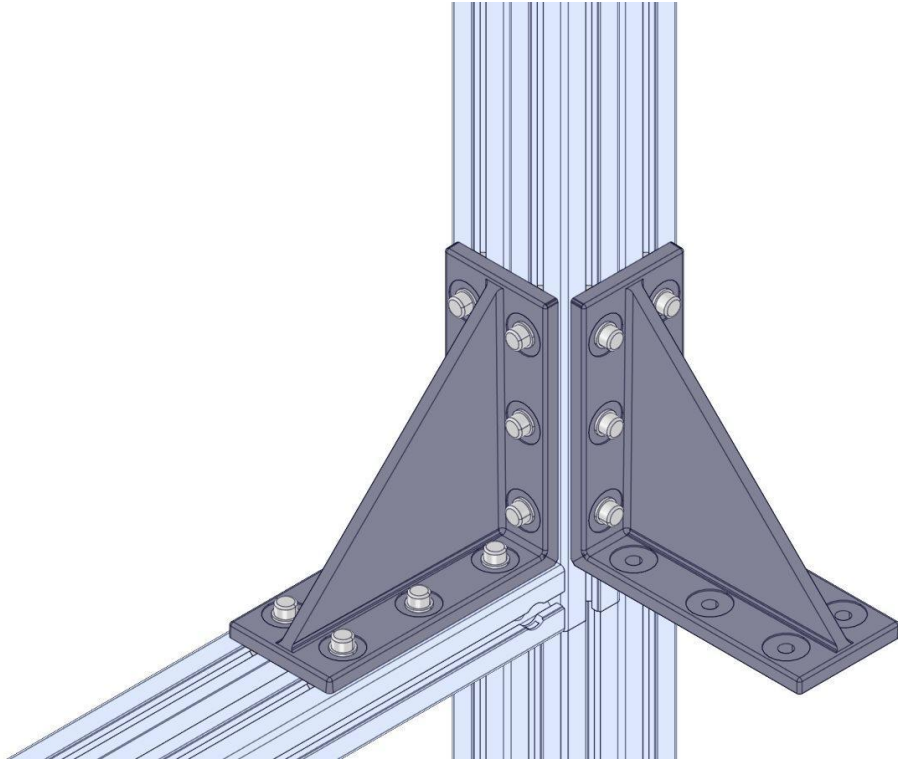


Figure 3.4



*Figure 3.5*



Fasten the other side of the 1910mm AEX to another large pillar, making sure that the other gussets on the large pillars face in the same direction. Continue this procedure until you have all four sides connected, see Figure 3.7.



*Figure 3.6*



*Figure 3.7*

### 3.2 Centre Support Structure

The surface frame utilises the bolt connectors to provide clean perpendicular fastening. To assemble the bolt connectors, first insert the bolt connector shaft (1) into the cut hole making sure that the flat side of the shaft faces away from the profile face. Then insert the pegs (2) into the profile holes as shown in Figure 3.8 to keep the shaft in place.

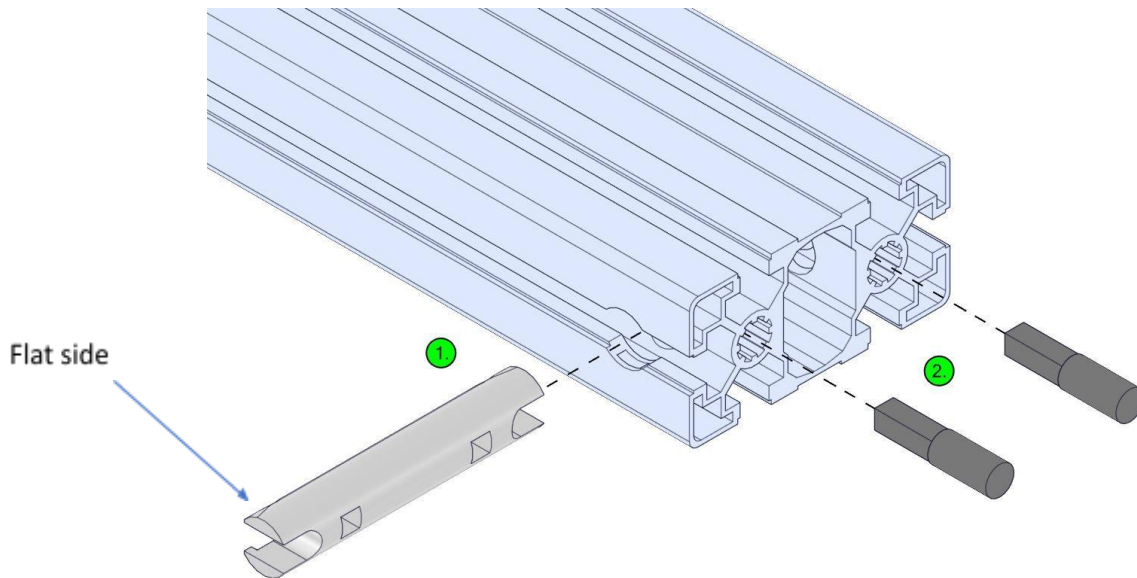


Figure 3.8

Slide the mounting bars into the slots of the 1910mm AEX and 910mm AEX as shown in Figure 3.2.

Then attach the 1910mm AEX to the small pillar as shown in Figure 3.9 allowing for adjustment. Attach the 910mm AEX to the small pillar and fasten the gusset screws to ensure a secure connection, see Figure 3.9.

Position the 1910mm AEX 910mm from one of its end faces to the side faces of the 910mm AEX then tighten the gusset screws evenly on the 1910mm AEX. One of the 910mm AEX struts may be used to correctly space the pillar.

Finally insert and tighten the bolt connector screws to ensure sufficient stiffness in the structure, see Figure 3.10. Finally tighten the gusset screws.

The resultant assembly should look as shown in Figure 3.9.

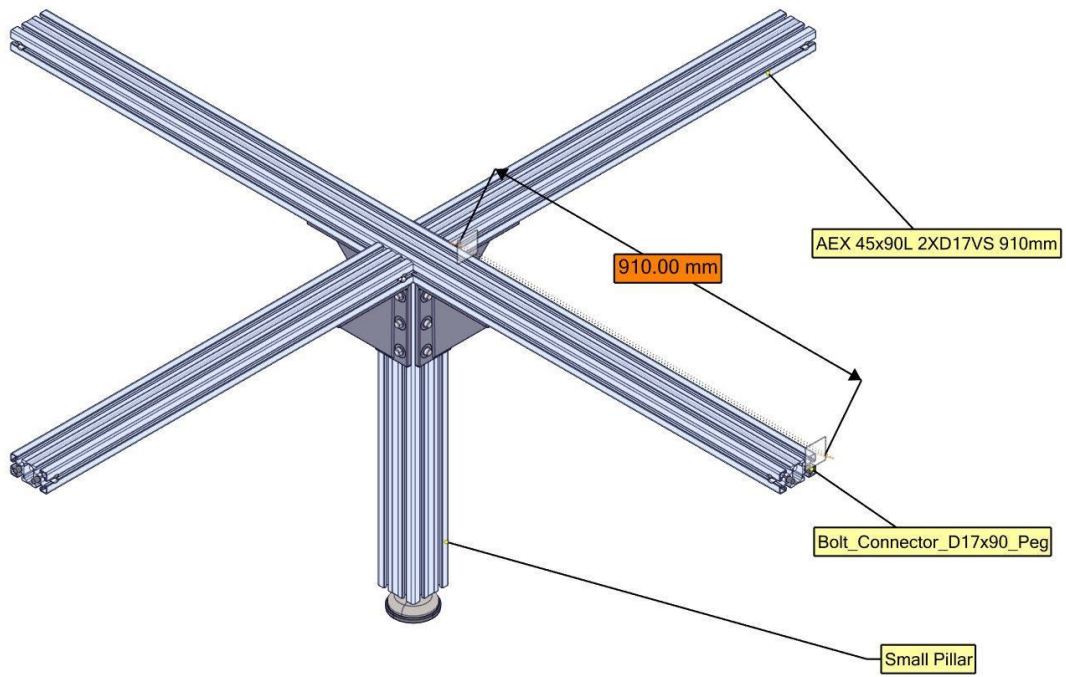


Figure 3.9

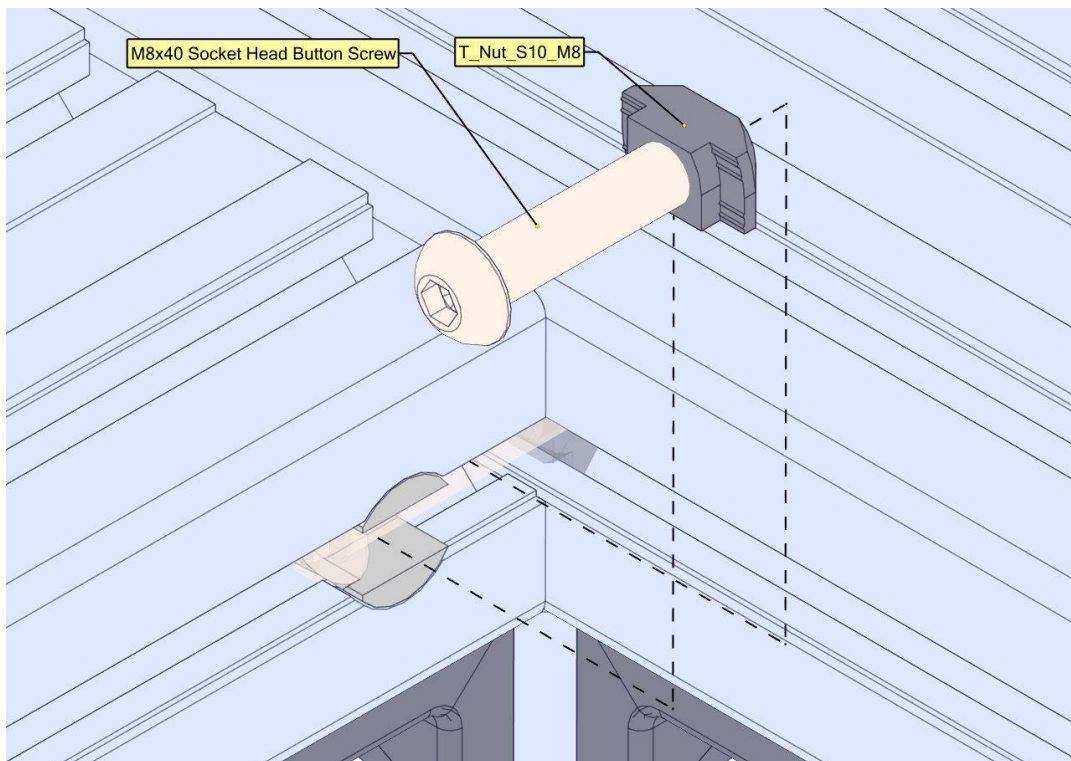


Figure 3.10

### 3.3 Corner Cross Structure (x4)

The steps to assemble this structure are similar to the steps taken in Section 3.2.

First loosely attach one of the 410mm AEX to the 910mm AEX using the bolt connectors.

Then slide it into position 410mm away from one of the ends of the 910mm AEX, see Figure 3.11. When in position, tighten the bolt connectors. Repeat for the other 410mm AEX.

**NOTE:** Make sure that all AEX pieces are level and that the top faces are flush with each other.

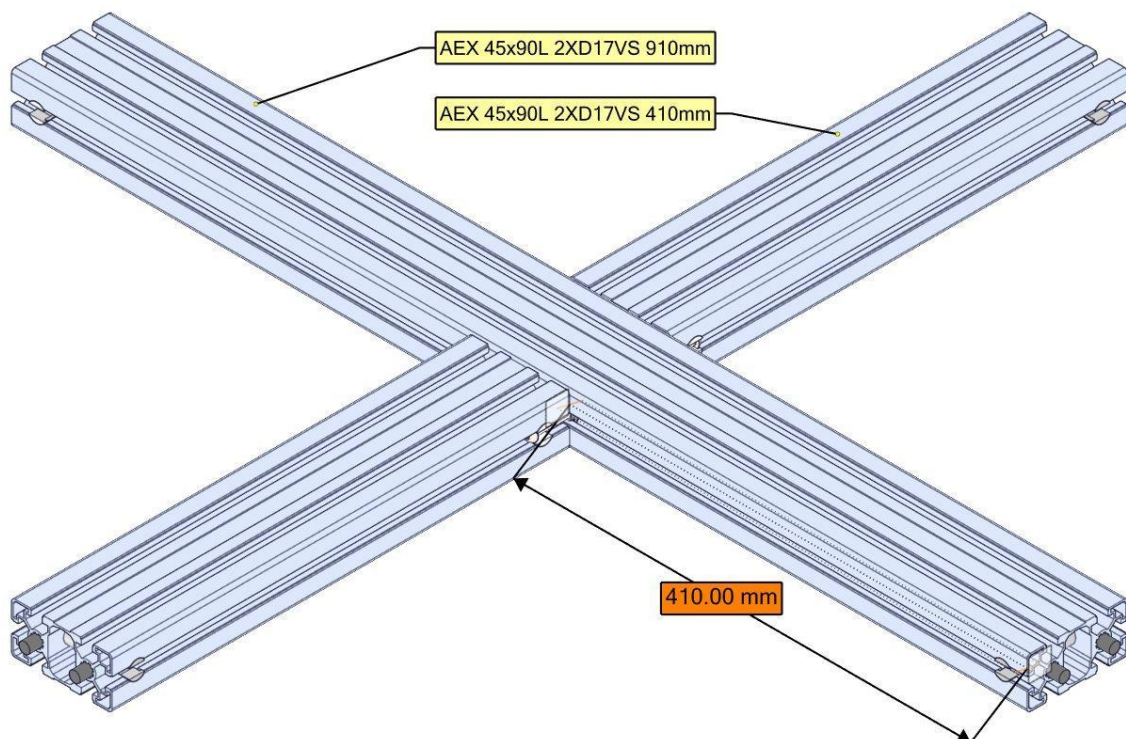


Figure 3.11

### 3.4 Assembling the Surface Frame

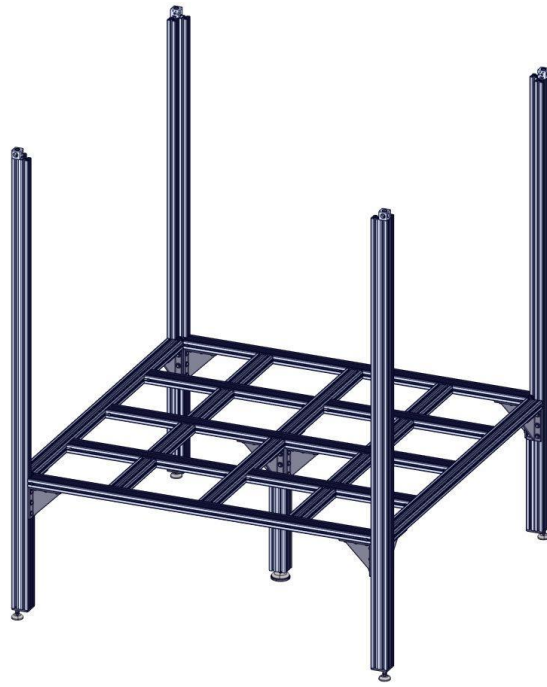
Insert the centre support structure into the outer frame. Level using the centre levelling foot, if needed, and fix the structure in place when the top faces of the AEX are flush with the outer frame crossbeams.

Insert the corner cross structures into the frame. Mallets may be needed for tight fitting elements. And again, ensure that the top faces are flush.

Once in position secure using the bolt connectors.



*Figure 3.12*



*Figure 3.13*



## 4 Assembling the Ceiling frame

### Tools Required

- Size 13 spanner

### Parts Required

Description	Quantity
AEX 45x45L 2000mm	6
Bracket 45x90mm with Fittings	20

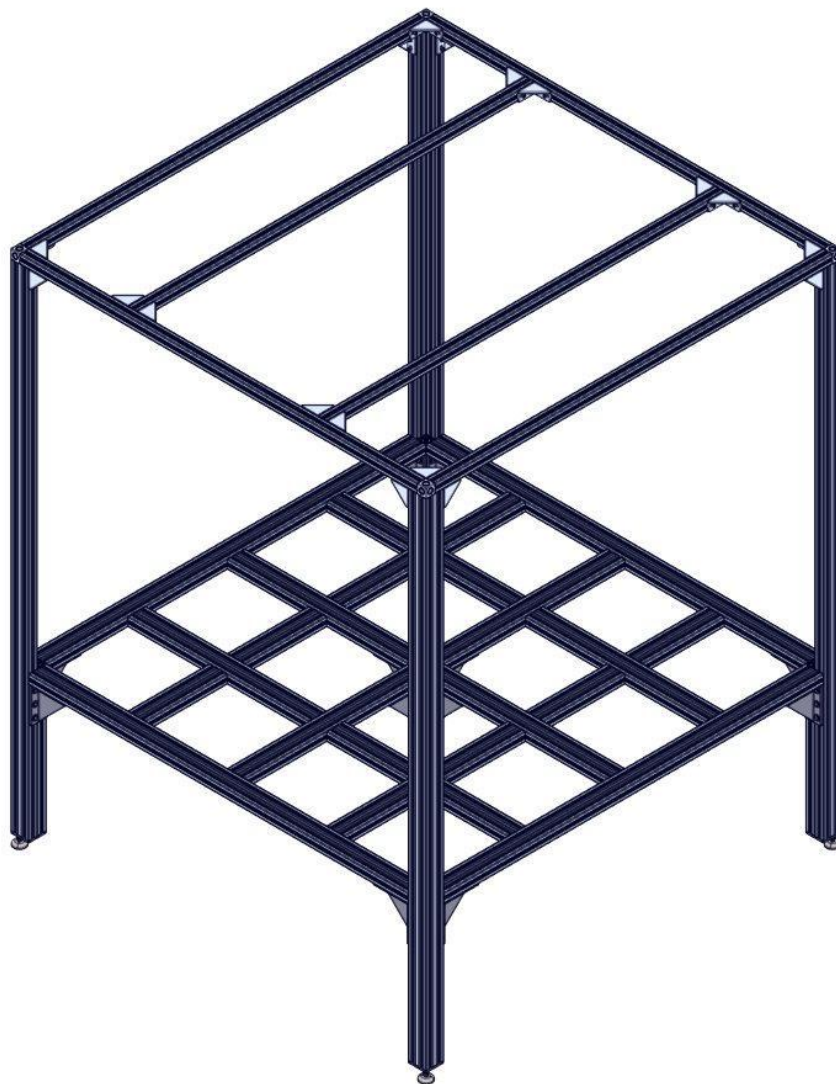


Figure 4.1



#### 4.1 Attaching the Corner Parts

**NOTE:** First thread the ends of the 2000mm 45x45L AEX by using the self-tapping screws which come with the cubic connectors. This will make it easy to assemble once in position.

Place the AEX into position and fix to the cubic connector.

Attach the Brackets between the Large Pillars and the AEX for support.

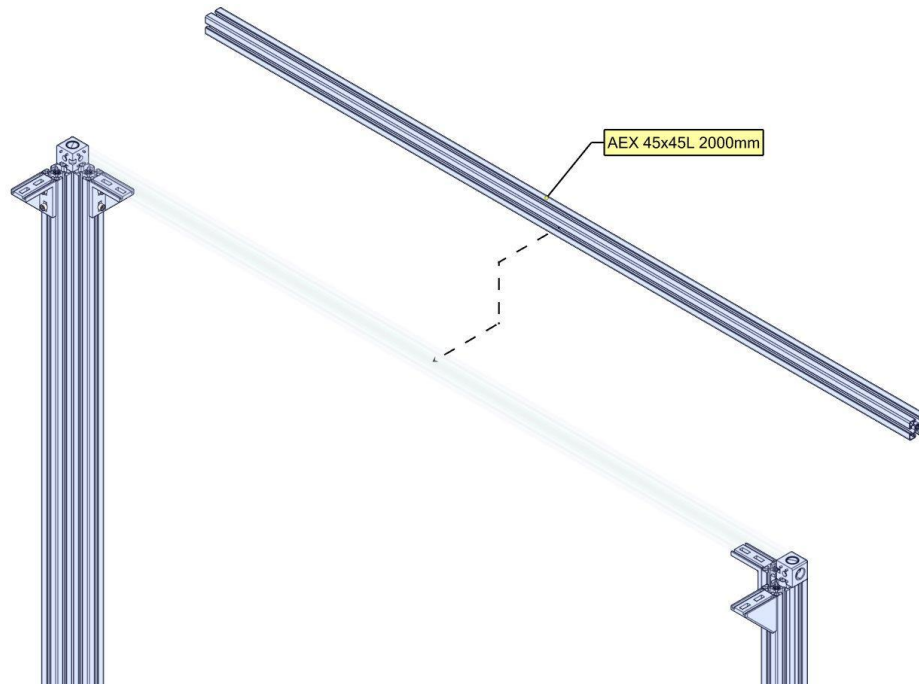


Figure 4.2

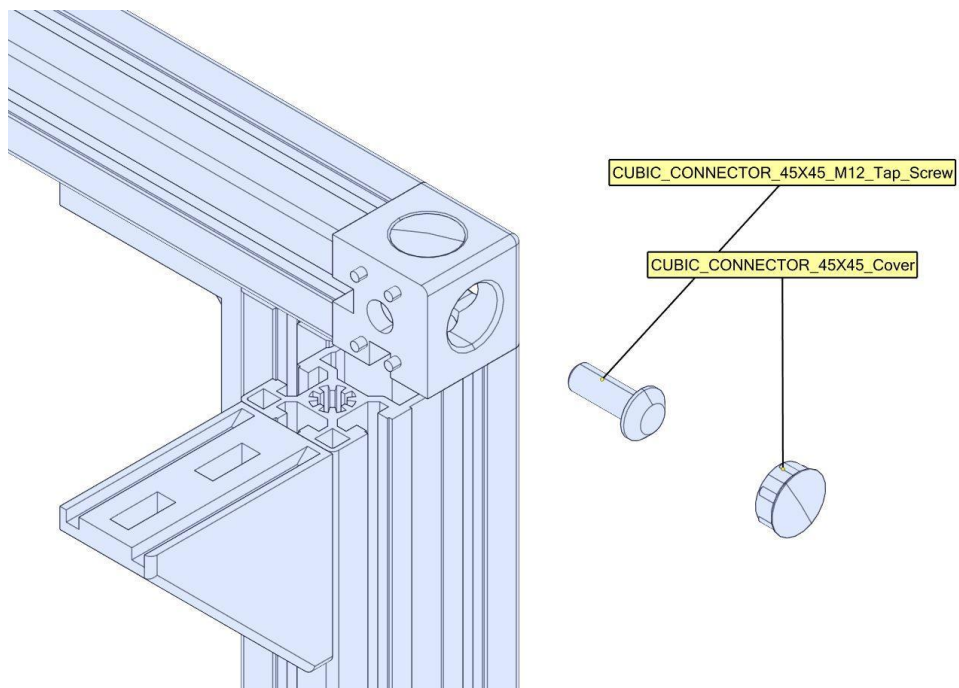


Figure 4.3

With all four edges in place, attach another bracket assembly in each corner, see Figure 4.4.

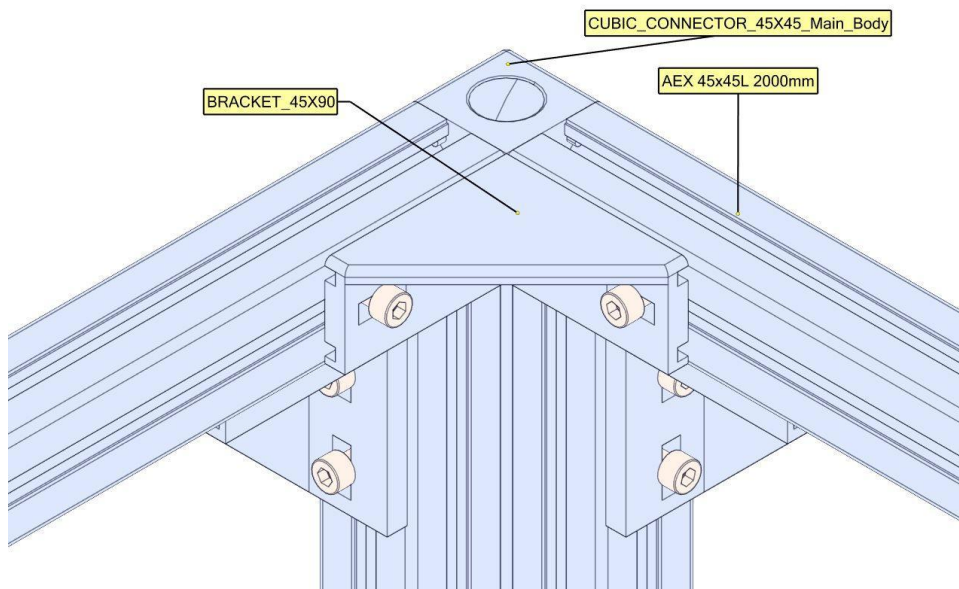


Figure 4.4

## 4.2 Attaching the Lighting Support Beams

Secure the brackets to the 2000mm AEX when it is in position.

Space the beams 910mm apart and 500mm away from the edge for centred lighting over the cell, see Figure 4.6.

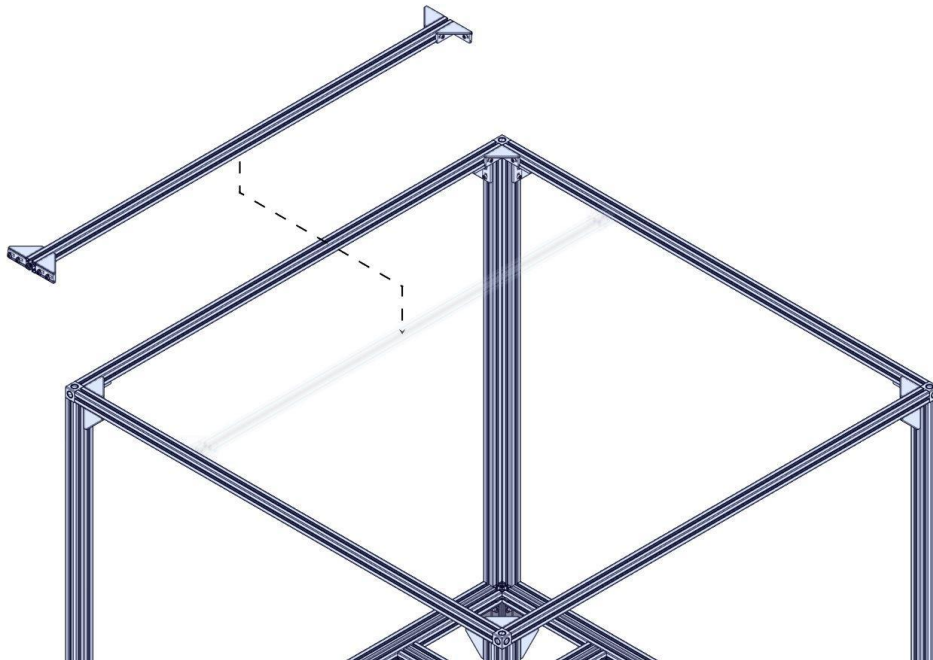


Figure 4.5

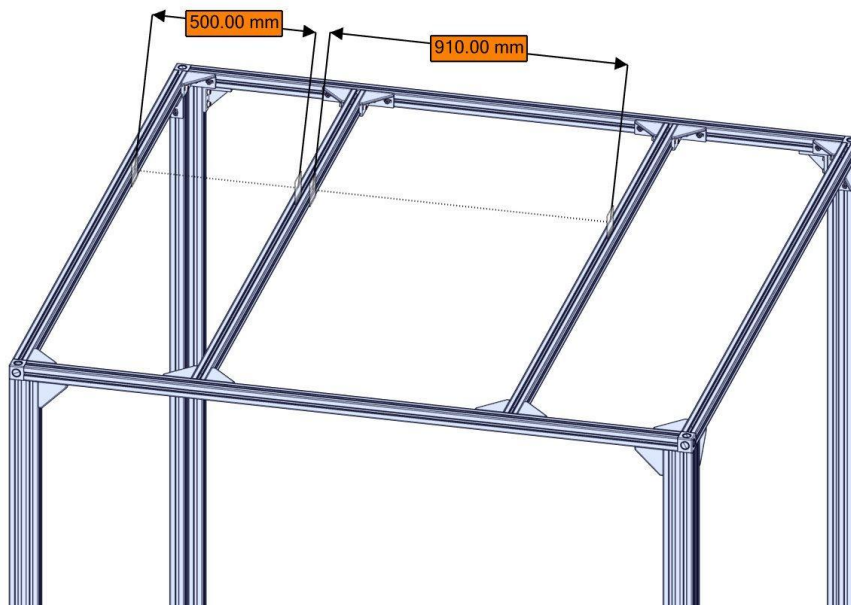


Figure 4.6

## 5 Assembling the Surface

### Tools Required

- Torque wrench
- Hex Drivers

### Parts Required

Description	Quantity
Base Tile	2
Base Tile Corner	1
Base Tile Corner and Notch Drawing	1
Universal Mounting Plate	1

The surface tiles can be used either way around due to having countersunk holes on both sides of the tile. The tiles use M8x25mm socket CSK head screws and M8 nuts to fix to the surface frame.

**NOTE:** A hard but smooth plastic strip, of known thickness, between the tiles and the frame would give the tiles more protection against scratches. A 3mm thick strip would raise the tiles to be level with the mounting plate.

Once the configuration of the cell has been chosen, line up the mounting points of the tiles with the slots in the surface frame. Leave the tiles loose to allow for adjustment as the tiles are placed. Position the tiles to minimise gaps and to line up edges for optimal aesthetics.

Secure the tiles with the screws torqued to 2Nm.

Secure the mounting plate with the screws torqued to 16Nm.



Figure 5.1

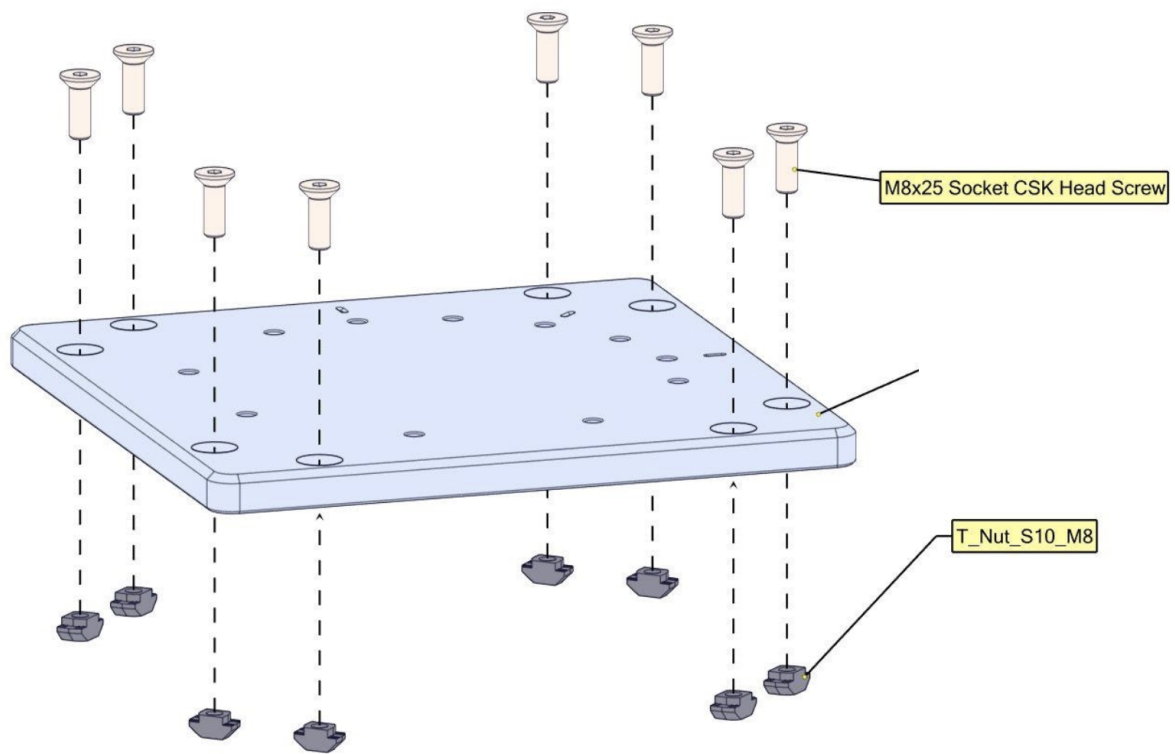


Figure 5.2

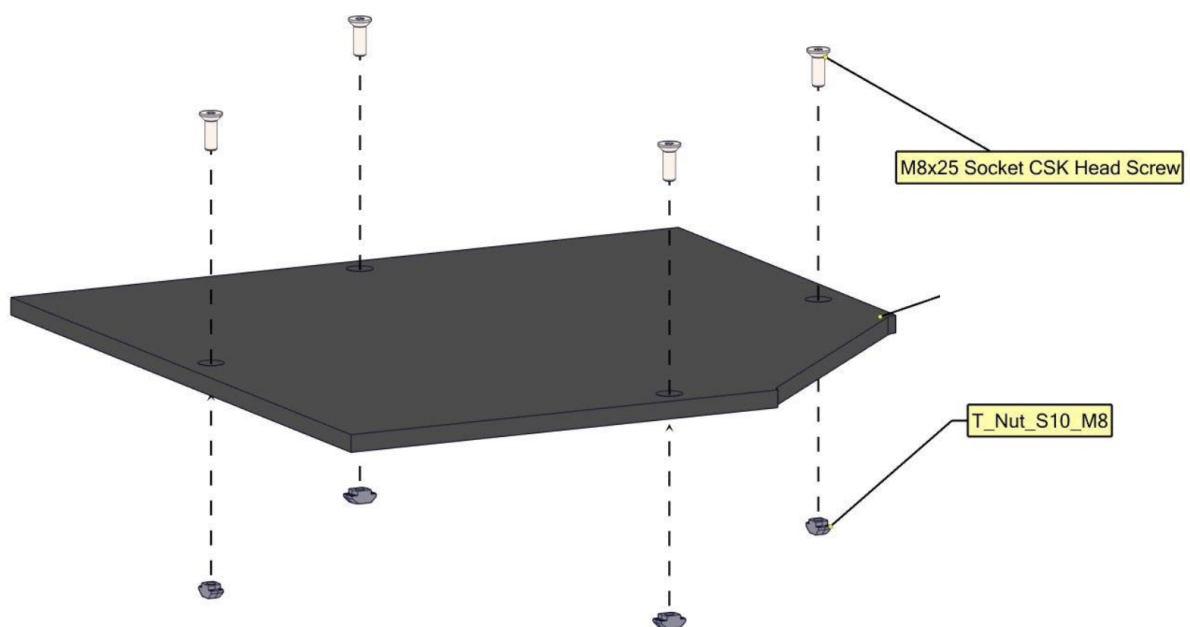


Figure 5.3

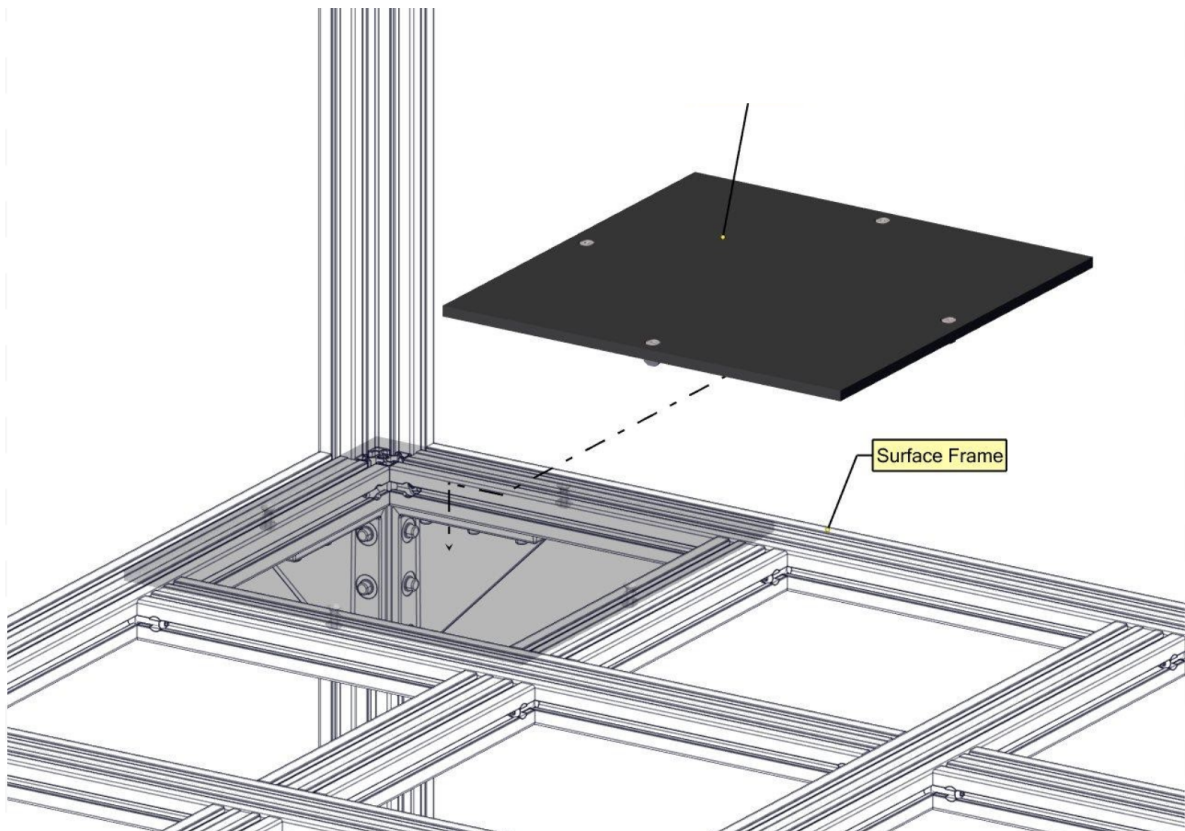


Figure 5.4

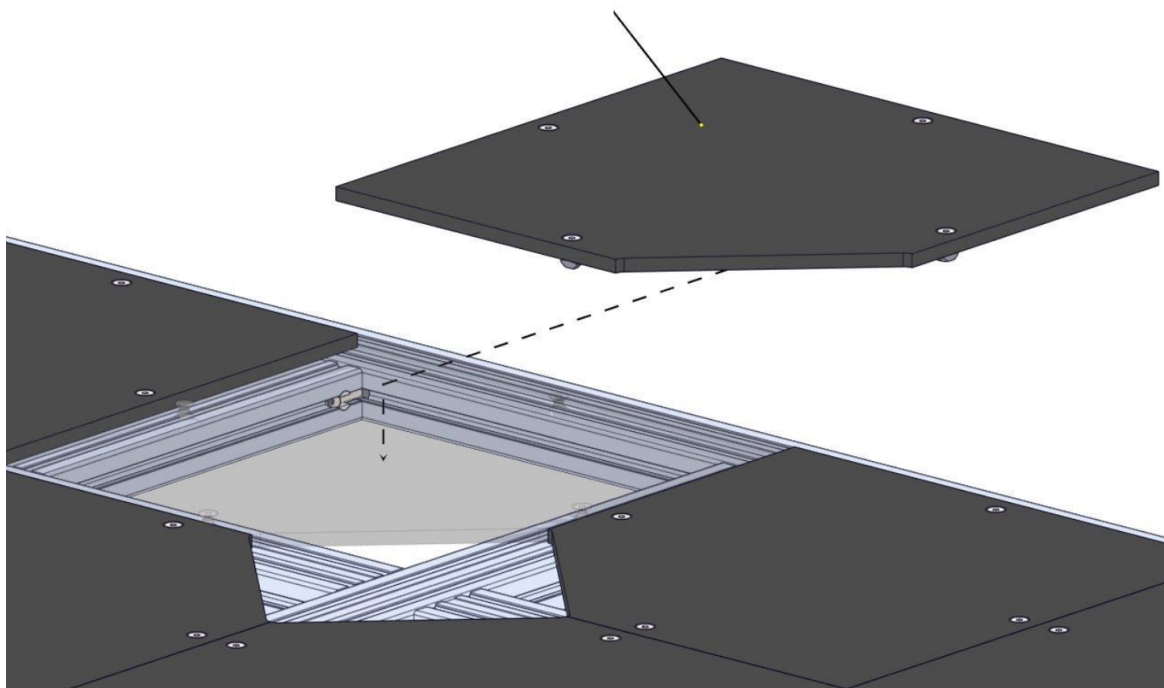


Figure 5.5

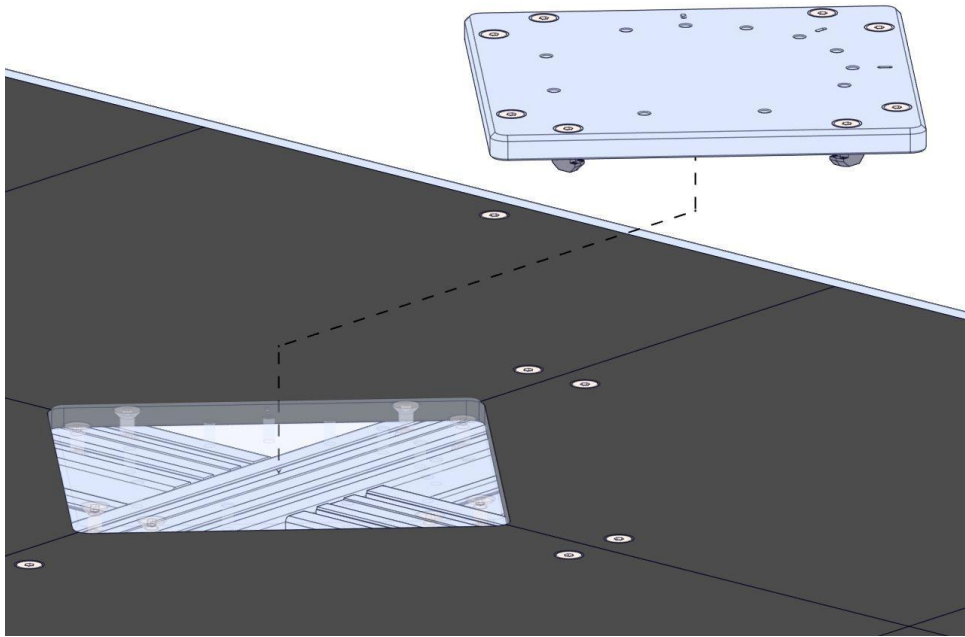


Figure 5.6