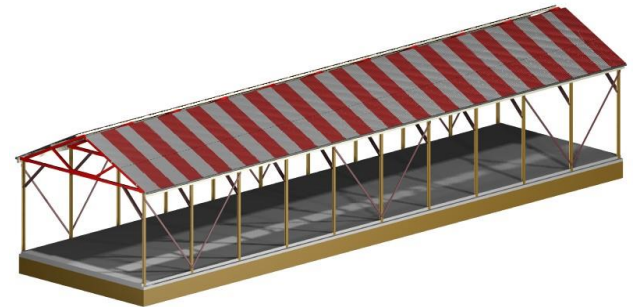
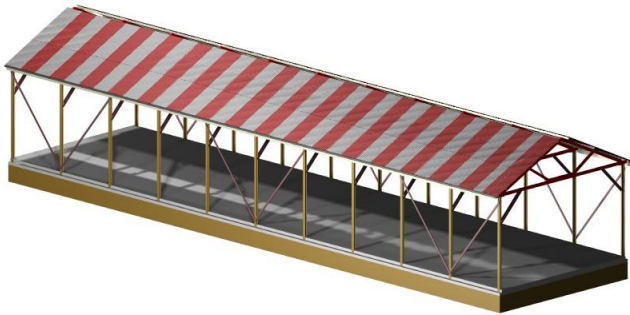


KRM GS001 HO Acrylic 100 Foot NSW Grain Shed

Instructions for Construction

By

Keiran Ryan



Introduction

Thank you for purchasing the KRM GS001 HO 100ft Grain Shed Kit. Grain Sheds in the NSW railway and grain systems come in various forms. One of the original styles, was a shed that had a concrete floor with vertical roof supports made from disused rail and hardwood timber trusses. They had a sectional spacing of 10 feet between supports. These sheds were built at the turn of the century (20th that is). There are still a few sheds existing today, but only a few as most of them have either fallen down or been demolished. This kit is based on this type of Grain Storage Shed

The sheds were originally designed to store bagged grain sacks and keep them from the weather and vermin. The shed roof was clad with corrugated iron. Early on, the sheds had to be modified by having sheets of corrugated iron on edge at the bottom inside of the rail supports to prevent vermin from gaining access to the grain stacks and infesting the grain. (all to no avail). The sheds had no ridge capping, but had a curved section of corrugated iron over the centre of the roof, minimising joints and the possibility of rain water ingress.

These sheds have gone through many modifications over the years which include, no side cladding, minimal cladding as previously mentioned, and later to full cladding to allow the storage of AFL Superphosphate. This full cladding differed from the norm, in that timber battens were attached to the inside of the rail supports and the cladding was then attached to the inside of the battens.

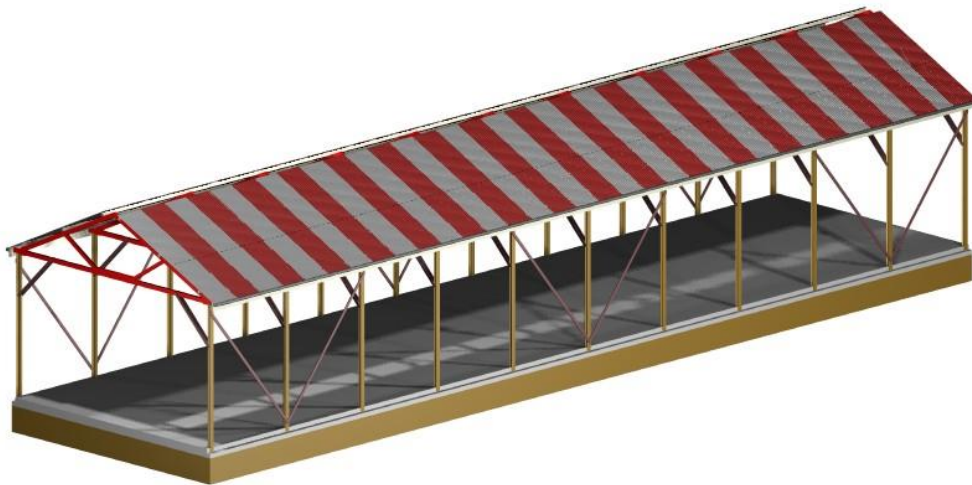
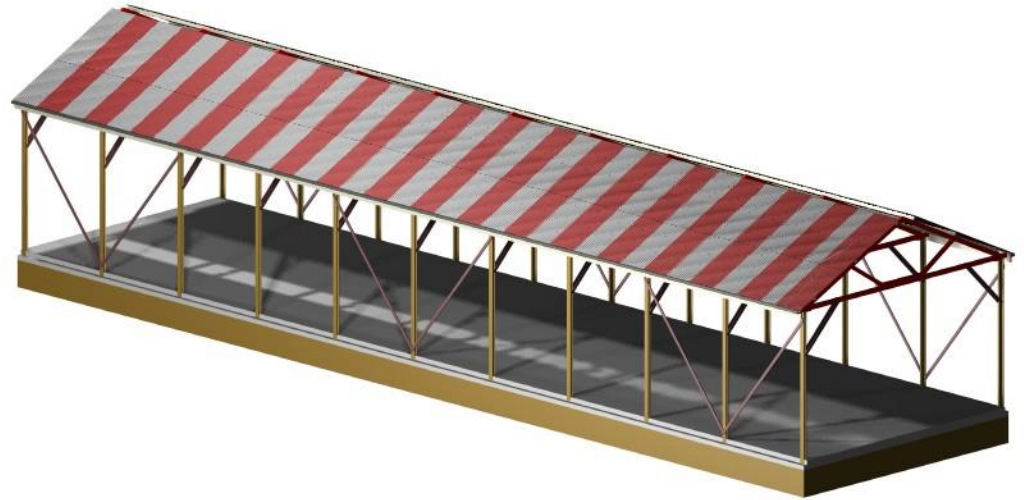
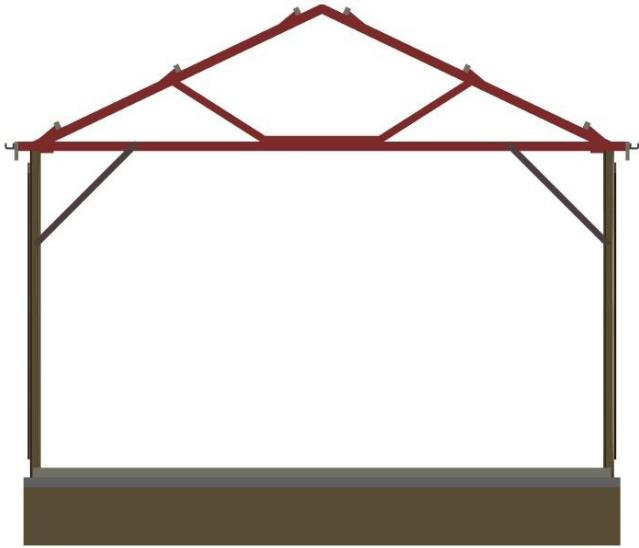
The Model

While it would be nice to be able to model the railway and associated buildings exactly as the prototype, it is not always practical to do so. This kit is no different. The compromise that we need to deal with, involves the shed length. Most of the sheds found around NSW are up to 320 ft long (In scale ----1120 mm). This is way too long to model, due to space and cost limitations.

This kit builds up into a shorter model that is 100 ft long (350 mm). There is potential to make a 300 ft long shed by joining 3 sheds together with a little modification.

There are a few prototype grain shed photos attached in the instruction Memory Stick to assist you in the construction of the grain shed.

Outcome



The diagrams shown here, represent the actual model, but could differ slightly in detail.

Modifications to Kit

Keiran Ryan Models, is always using feedback to improve kits that have been available in the past, so here are a few of the improvements to the 100' NSW Grain Shed Kit.

1. The trusses have been changed from 1 mm acrylic trusses to dual 0.45 mm Etched Nickle Silver trusses that require the modeller to laminate together to make up much more rigid 0.9 mm trusses. This improves the roof rigidity and allows the trusses to be soldered to the vertical rail support sections.
2. There are now 2 different types of truss jigs, the first one is the original jig that has been updated and is now 3 mm thick, which is again much more rigid, and less prone to breaking. The 2nd jig is a new jig that allows the trusses to be centred and the trusses soldered to the vertical rail supports.
3. The base of the building now only has the “Go – No Go” gauge as the trusses, which were laser cut from the base, are now made from etched Nickle Silver, and the base is much more stable because of this.

KRM GS001 HO Acrylic 100ft NSW Grain Shed Kit

- The major components in this kit are laser cut form 1mm, 1.5 mm and 3 mm acrylic.
- 22 Truss Halves – 0.45 mm Nickle Silver – Laminate to form 11 trusses.
- Base and concrete floor – 1mm clear acrylic.
- The Truss building jig – 3 mm acrylic.
- The Truss/Rail Soldering Jig – 1.5 mm acrylic.
- Truss bracing – 0.3 mm etched brass – 44 only.
- Rail bracing – 0.3 mm etched brass – 12 only.
- 0.4 mm Phosphor Bronze wire – 4 x 300 mm length only.
- 1.0 mm brass wire – 1 x 300 mm length only – Down pipes.
- Code 70 rail – 3 x 330 mm lengths. 1 x 240 mm length. Cut 22 lengths as per the go/no-go jig in the base.
- Evergreen styrene (HO scale) 6 only 6”x 4” (Truss battens) , 2 only 10” x 2” Fascia).
- 2 x 0.4 mm laser cut saw tooth timber ends.
- 2 x 0.4 mm laser cut timber bargeboards.
- 2 x Evergreen styrene 1.5mm “C” Channel. (Guttering)
- 240 Grit Sanding Block.
- What the modeller needs to supply.
 - Timber base (available from Keiran Ryan Models - \$22.50 – (\$20.50 with the kit).
 - Campbell's Corrugated Aluminium.- 2 - packets of (scale) 12ft.
 - Supa Glue, 2 Part Epoxy
 - Dichloromethane.(Please Read the Health Warning)

Health Warning

The following is a warning for using **Dichloromethane**:

Principal hazards

- *** Dichloromethane is harmful if you swallow or inhale it.
- *** It may act as a narcotic, so inhaling it will make you feel unwell.
- *** Like many small hydrocarbons that contain halogen atoms, dichloromethane is a suspected carcinogen. It is unlikely to be strongly carcinogenic, but it is important to reduce your exposure to the lowest level possible.

Safe handling

Wear safety glasses. Work in a well-ventilated area. Avoid repeated or long-lasting exposure.

Emergency

Eye contact: Immediately flush the eye with water. If irritation persists, call for medical help.

Skin contact: Wash off with soap and water.

If swallowed: Call for medical help.

Disposal

Store for later disposal as chlorinated waste solvent.

Protective equipment

Safety glasses.

Construction Hints & Tips

- Please read the instructions **3 TIMES** before commencing the construction of this kit. (Yeah I hate reading instructions as well – but somebody has to read them – why else would I write them?)
- Please work safely, as injuries can occur when using sharp instruments and tools.
- Thin section acrylic can be very brittle and easily damaged, so take care when working with this material, especially the trusses.
- The rail required for the vertical supports in this kit should be code 70, as the base holes are cut to suit this size rail. Rail is supplied with the kit. Sand the top, base and sides of the rail to prepare it for fitting in the Truss/Rail Soldering Jig.
- There is a slot at one end of the base, that is used as a GO – NOGO jig. Cut and file the rail pieces to fit this jig, using the sanding block to square up the rail ends. This allows consistency in the length of the truss supports. The rail must **JUST** fit in the slot, if it is tight it is a NO-GO and if it is sloppy it is also a NO-GO
- When using super glue, use a toothpick to apply glue to components, as excess glue (unintentional) can ruin a model.
- Dichloride methane is possibly the best glue to use with the acrylic material, but supa glue will also work.

Let's
Get
Ready
To
Model

Instructions

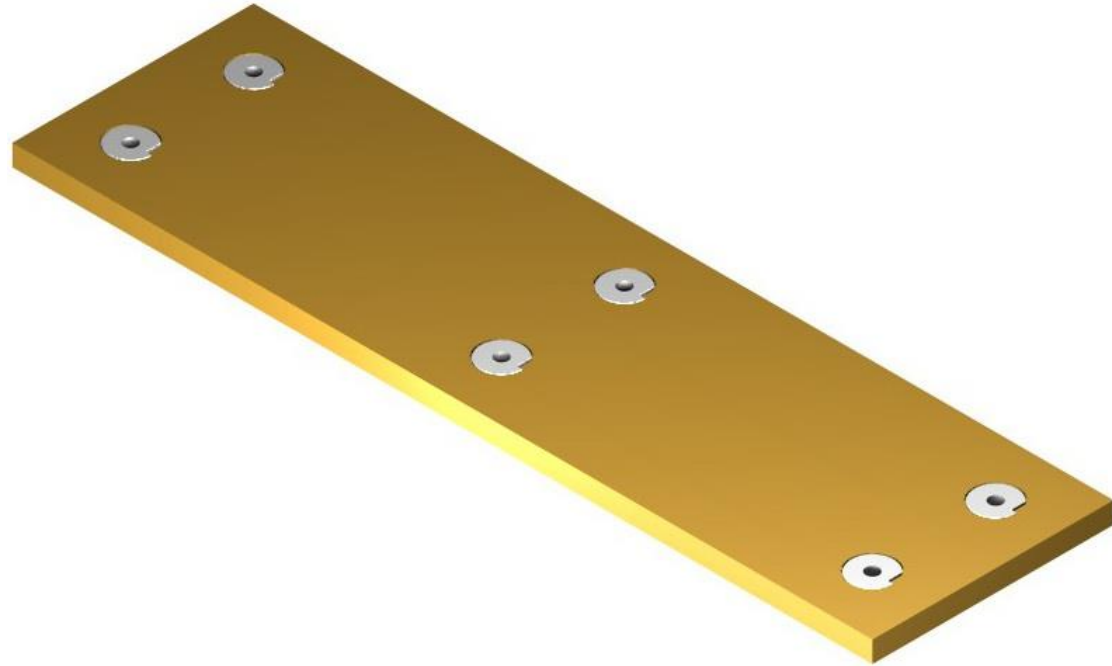
The following are an overview of the instructions, some can be done on their own in any order, while others will need to be done in a set order.

There are jigs provided to assist in the construction methods, so please take the time to examine the way that the jigs work, to enable you to get the best result from this kit. This is just a list and will be expanded on later in further slides.

1. Base and Acrylic Floor.
2. Cutting and preparing the Vertical Rail Supports.
3. Soldering the Trusses and Centre Wire.
4. Building the Truss Jig.
5. Building the Truss to Rail Soldering Jig.
6. Gluing the Purlins to the Trusses.
7. Fitting the Truss Bracing.
8. Fitting the Cross Bracing to the Shed.
9. Fitting the Roof Ends.
10. Fitting the Fascia and Guttering.
11. Fitting the Downpipes.
12. Paint Colours.

The Base Step 1

The 9 mm Craft wood Base Plate has 6 x ¼ inch “T” nuts located 25 mm in from the sides. The base can be treated with a clear coat of urethane to protect it when finished. The T nuts, will allow the silo to be bolted into your layout and removed when necessary, if any repairs are required. Do ensure that the screws, screwing into the base are not longer than the T Nuts, as damage will occur to the acrylic base if longer screws are used.

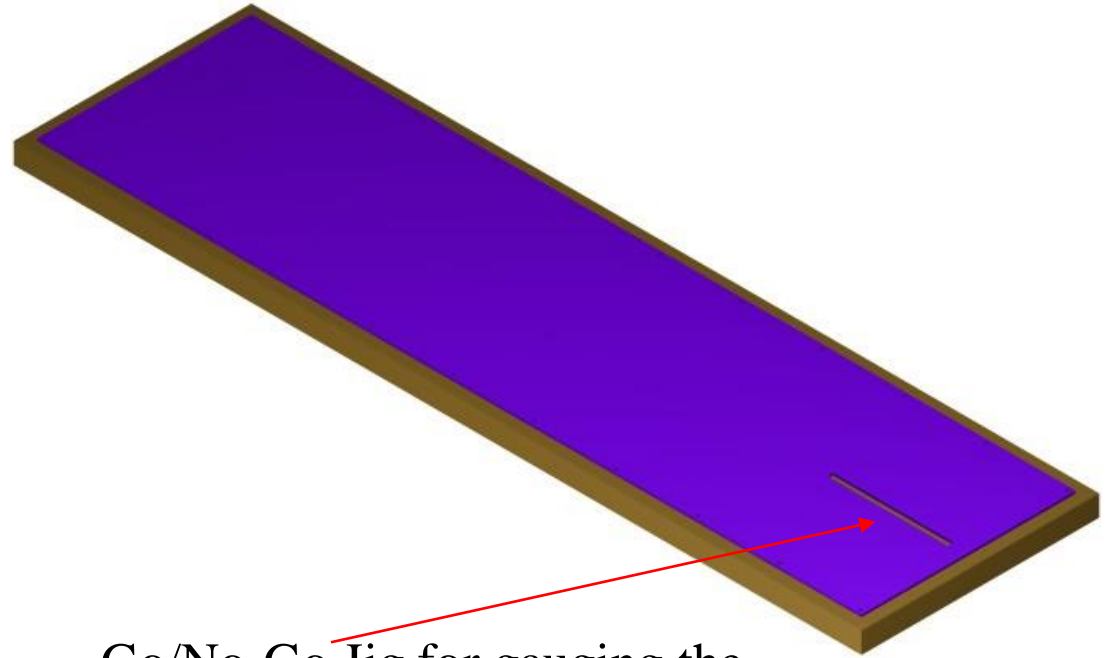


The 1 mm Acrylic sub-base can be glued to the timber base. It should be located equidistant from the sides and the ends.

Providing a short overhang of timber. The base can be glued to the timber using a contact cement available in spray cans from most hardware store. Do allow the contact cement to dry before pressing the acrylic down on it.

“Be very careful when gluing the acrylic into position as the acrylic is very thin and you only get one chance to make it adhere to the timber. Use a sheet of paper under the acrylic to prevent the glue from sticking to the timber and slide the paper along as the acrylic adheres to the base, slowly working you way along”

Base Step 2.

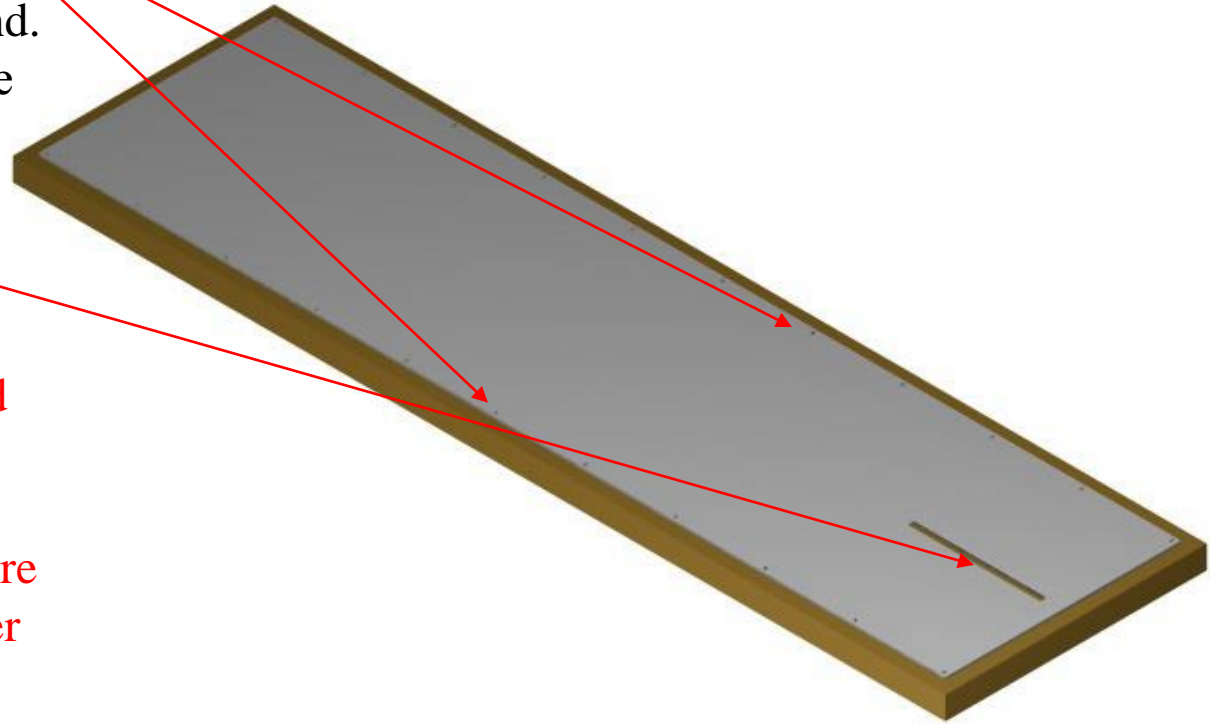


Go/No-Go Jig for gauging the rail roof supports - Cut the rail lengths over size and trim them to fit the gauge, there should be no movement in the gauge when the rail is test fitted.

Base Step 3.

The Acrylic Base has 11 “T” shaped holes on each side and one long slot in the middle at one end. The “T” shaped holes are for the Vertical Rail Supports location points.

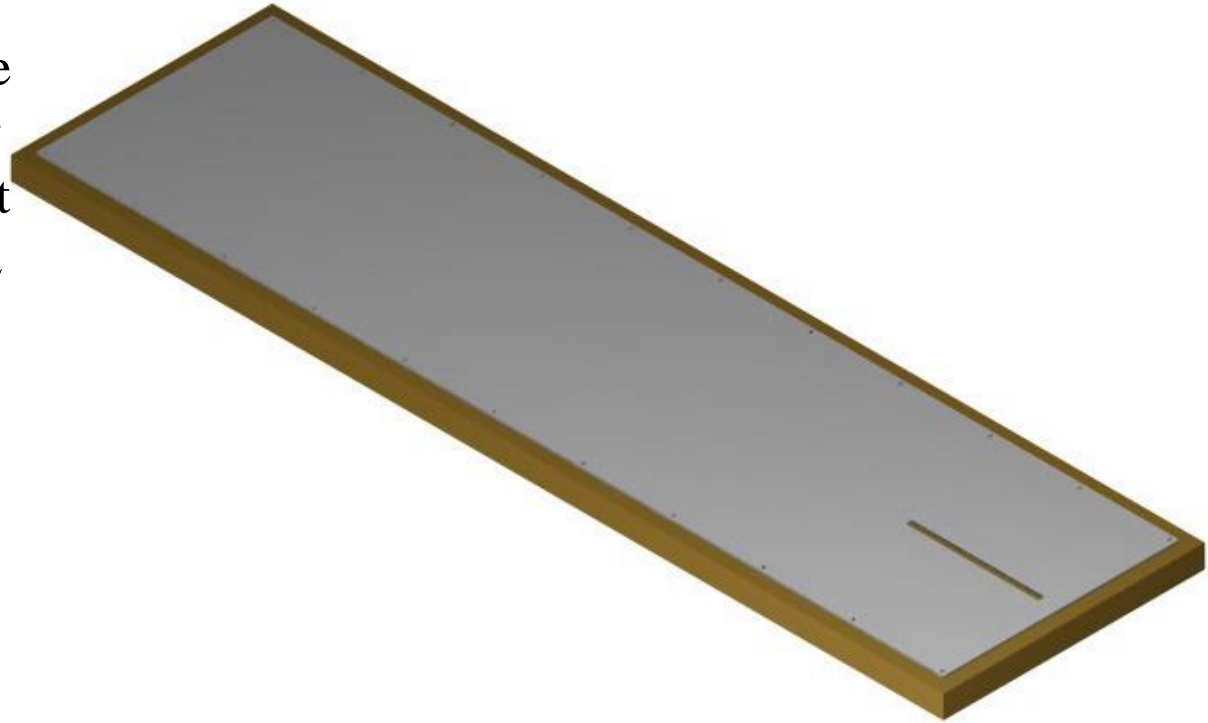
The long slot is a GO/NO GO gauge for the Vertical Rail Supports to be cut and test fitted for the correct length, there should be no movement in the gauge when the lengths of rail are correct. Cut the rail 1-2 mm over length and sand them back with the sanding block provided.



Rail Supports– Step 1

4 lengths of code 70 rail are provided in the kit. 3 x 330 mm and 1 x 240 mm. There will be enough rail to cut the 22 rail sections to just under 52 mm. Use the gauge to cut the rail approximately 1 to 2 mm longer than the gauge.

Using a file and the sanding block supplied, square up the ends and test fit the rail lengths into the jig. The rail should be tight without any movement (end to end) Take small amounts of at a time.



Rail Supports – Step 2

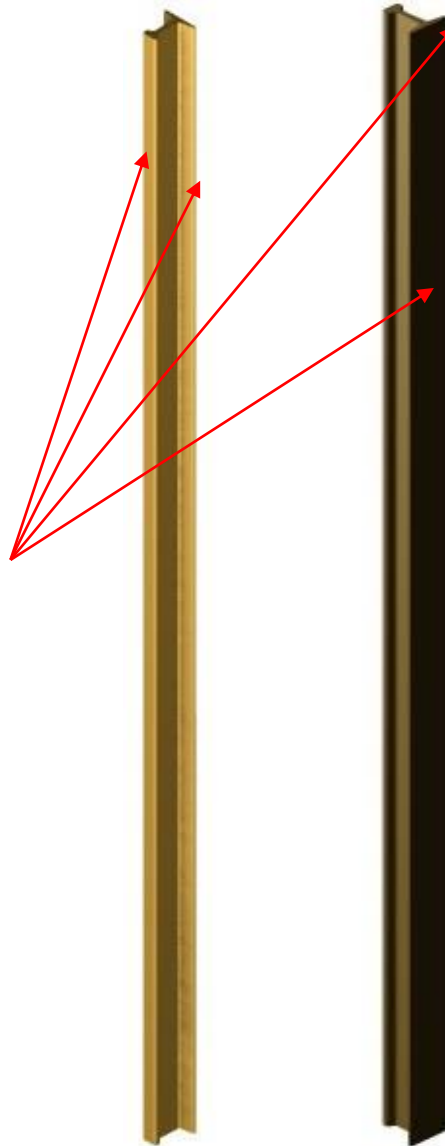
Rail Size – Code 70

Rail Length _51.87 mm

The rail needs to be prepared so that it fits neatly into the Truss to Rail Jig.

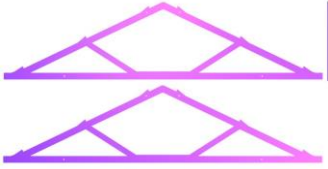
Using the sanding block provided, lightly sand the top and base of the rail as well as a light sanding of the both sides of the rail.

Test fit the rail in the jig so that it fits nice and easily with very little drag.

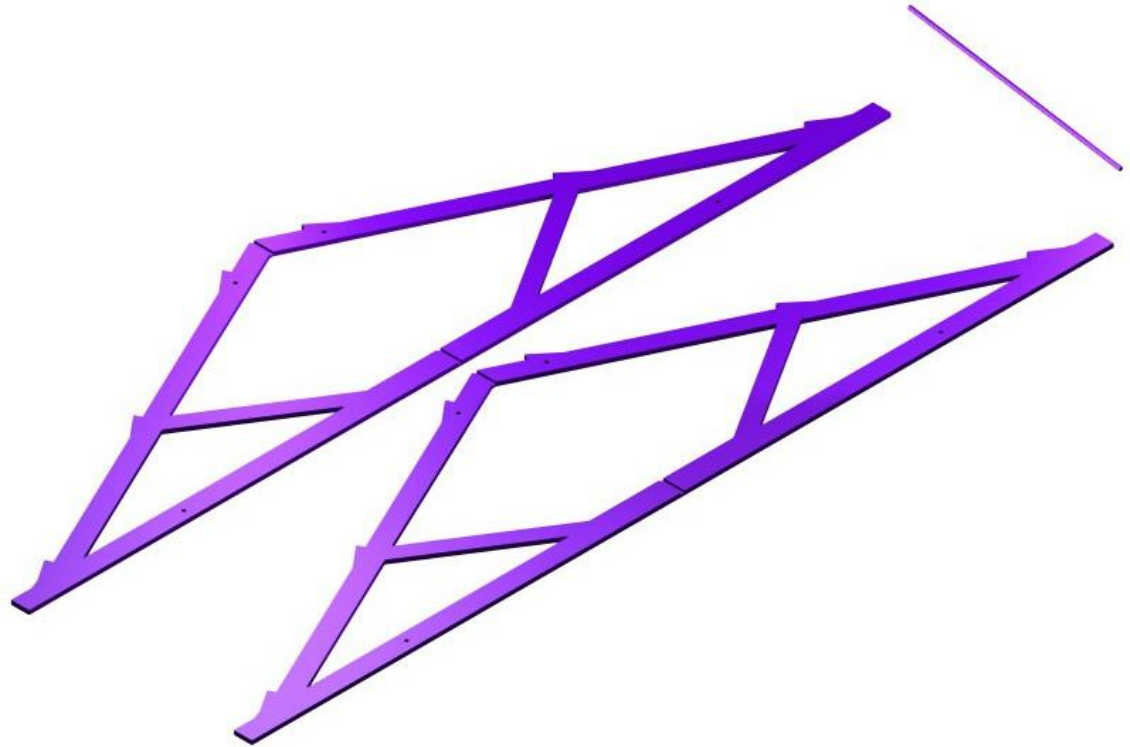


The top of the rail can also be cleaned and tinned, to be ready for soldering to the base of the trusses. It would be a good idea to clean the rail between 2-3 mm from the base on the base of the rail, and 5 mm from the top of the rail so that the frame bracing can be soldered to the rail when the time comes.

Trusses– Step 1

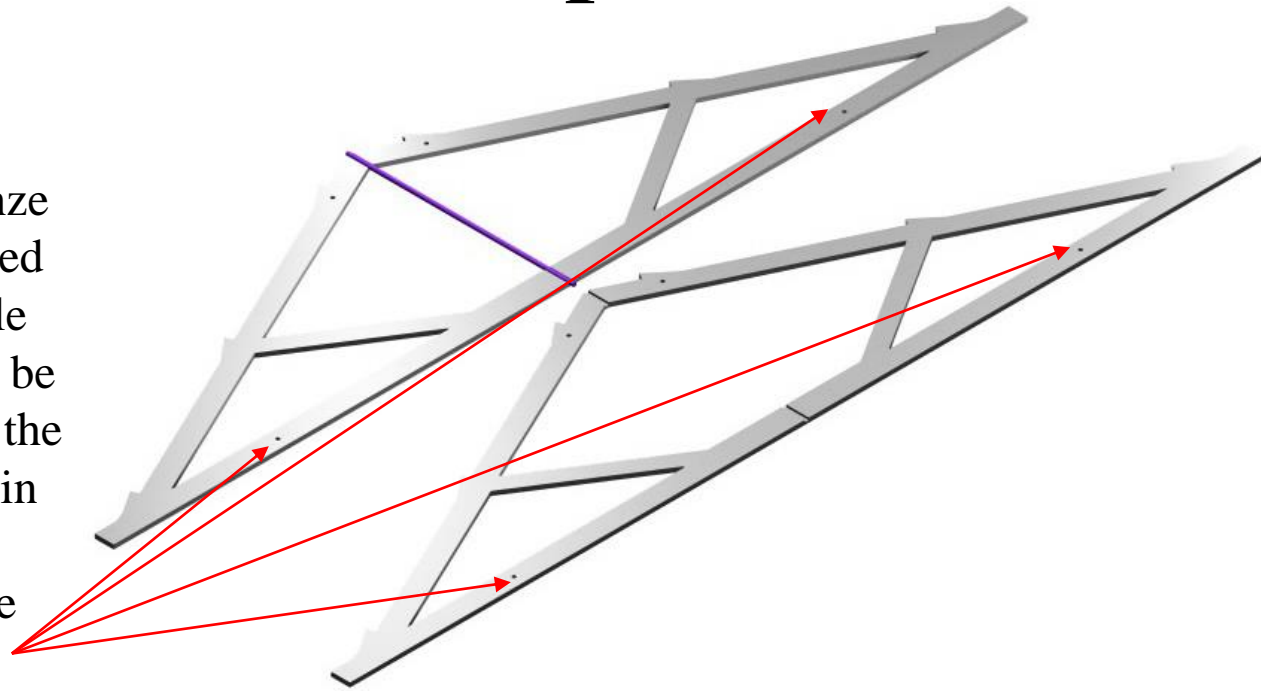


There are 22 truss halves that form up 11 trusses. The Trusses are etched from 0.45 mm Nickle Silver, and need to be laminated together. There is also a 0.4 mm Phosphor Bronze wire that needs to be soldered into the groove in the middle of the trusses.



Trusses – Step 2

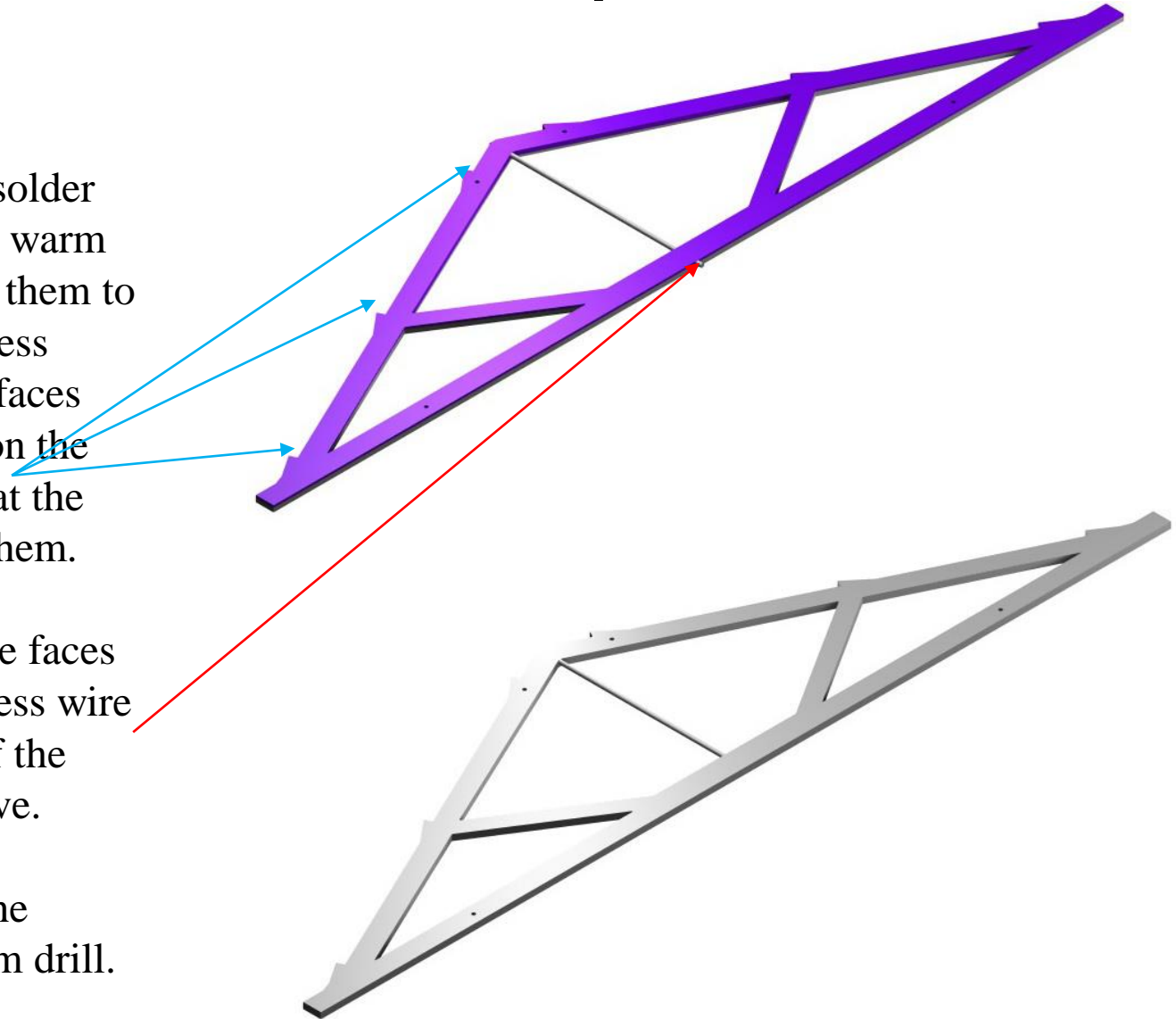
The 0.4 mm Phosphor Bronze wire that needs to be soldered into the groove in the middle of the trusses. The wire can be fitted into the groove when the soldering is done. To assist in aligning the truss halves, a piece of 0.4 mm wire can be placed into the holes in the truss base. Use small clamps or small pegs to hold the truss halves together whilst soldering.



Trusses – Step 3

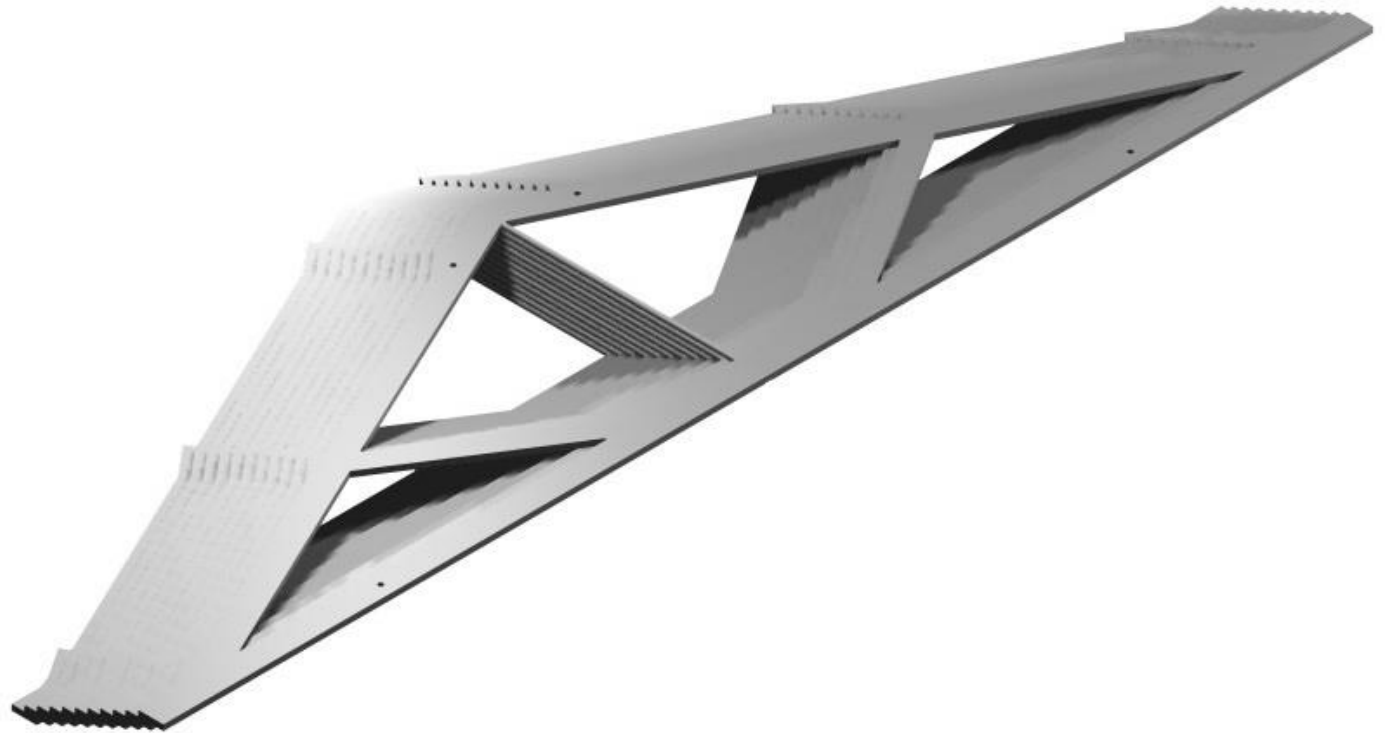
When The trusses are solder together, wash them in warm soapy water and allow them to dry. File away any excess solder and sand all surfaces and clean up the area on the inside of the ribs so that the purlins fit neatly into them. Use the sanding block supplied to clean up the faces of the trusses. The excess wire both top and bottom of the truss can also be remove.

Drill out the holes in the trusses using an 0.4 mm drill.



Trusses – Step 4

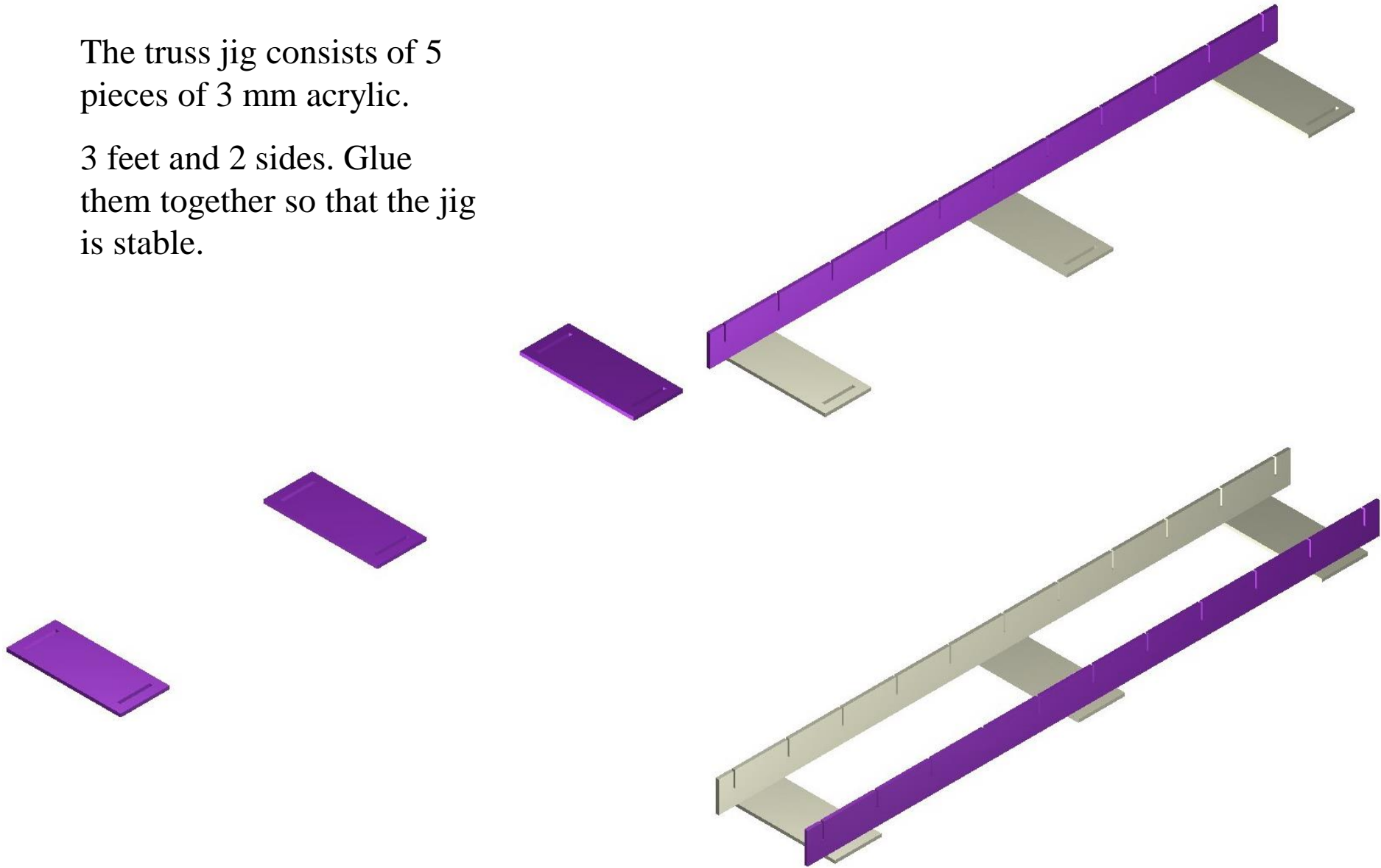
The finished trusses can now be placed aside while the truss jig is assembled.



The Truss Jig – Step 1

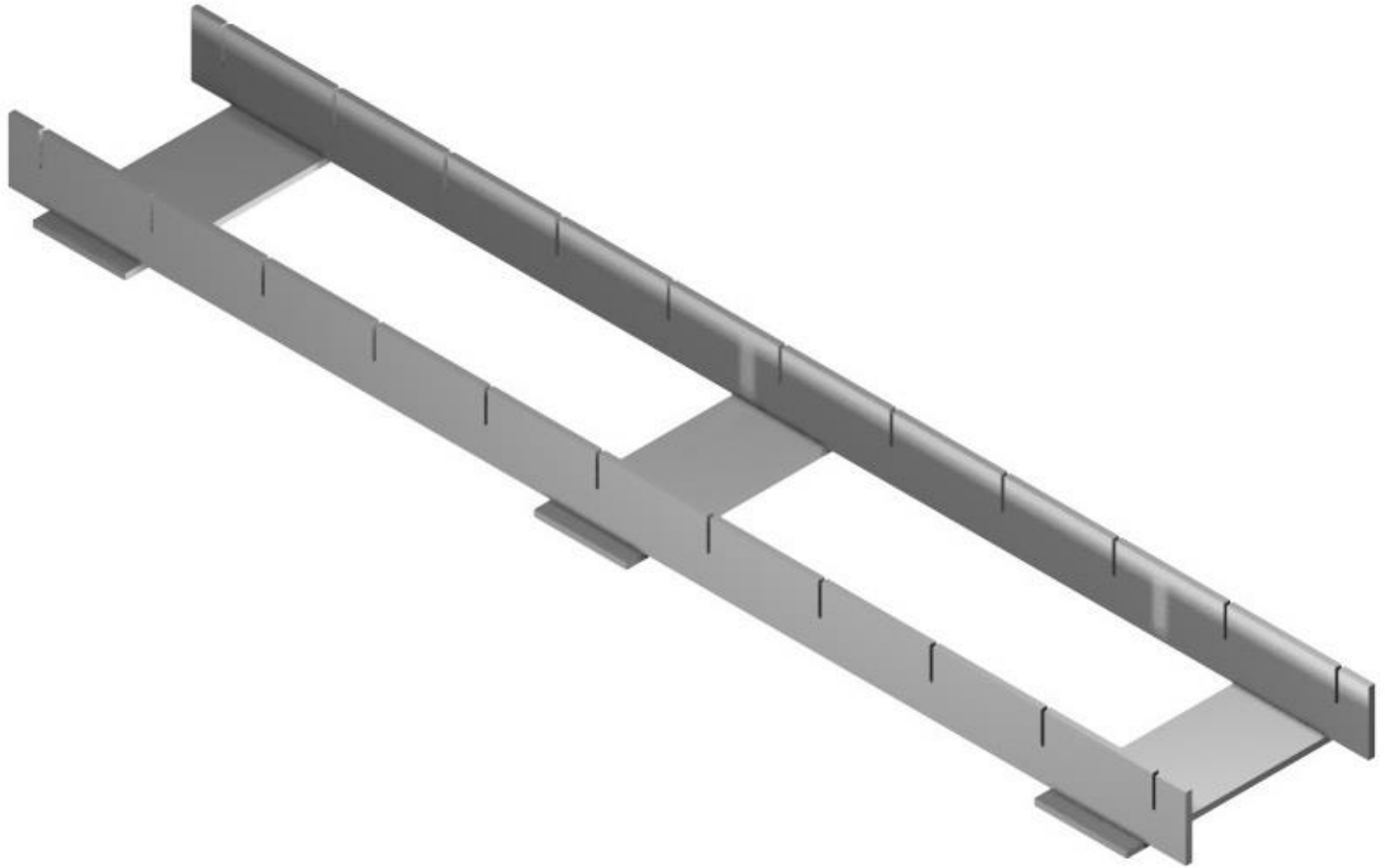
The truss jig consists of 5 pieces of 3 mm acrylic.

3 feet and 2 sides. Glue them together so that the jig is stable.



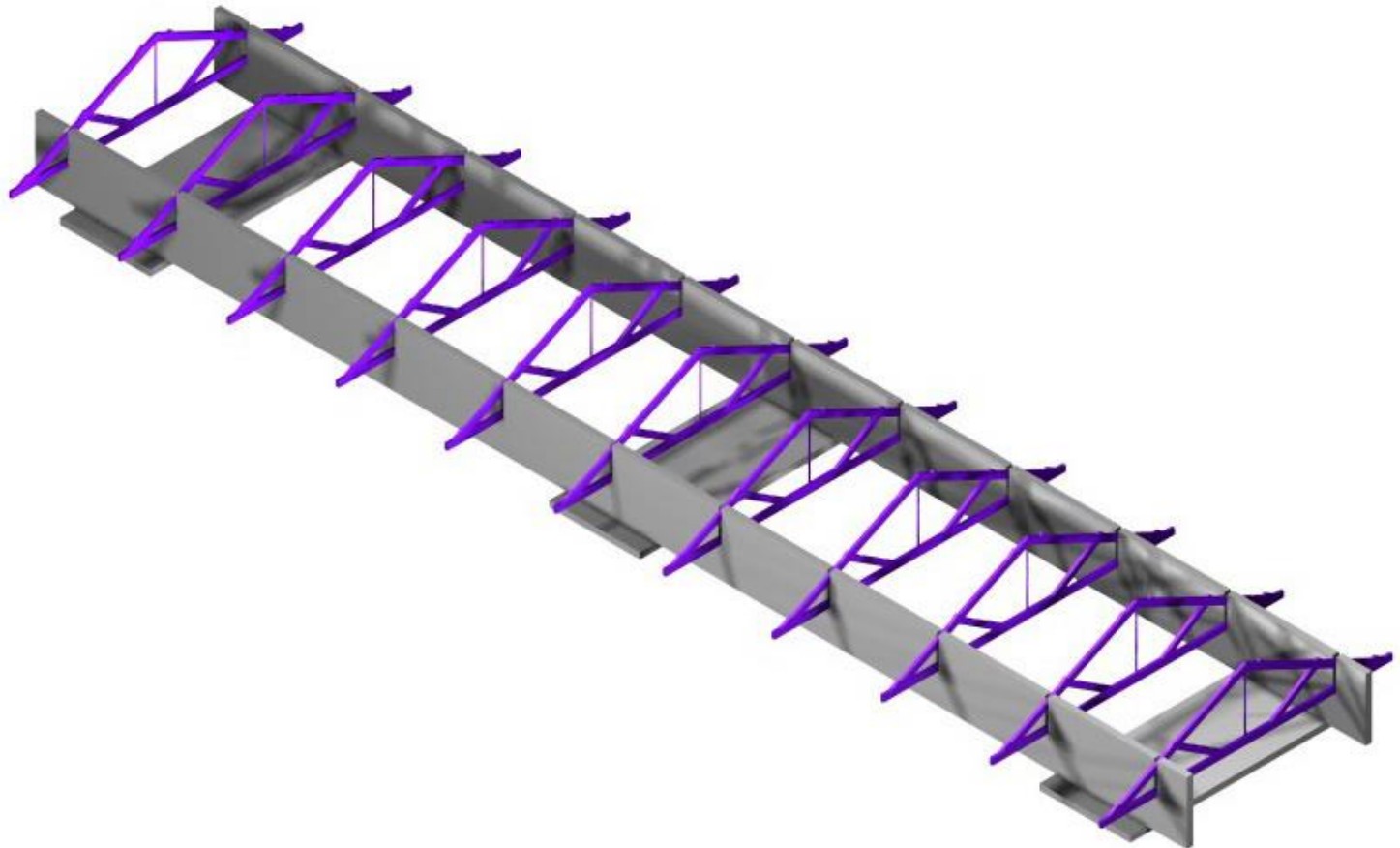
The Truss Jig – Step 2

The finished Truss Jig , ready to accept the trusses for assembly.

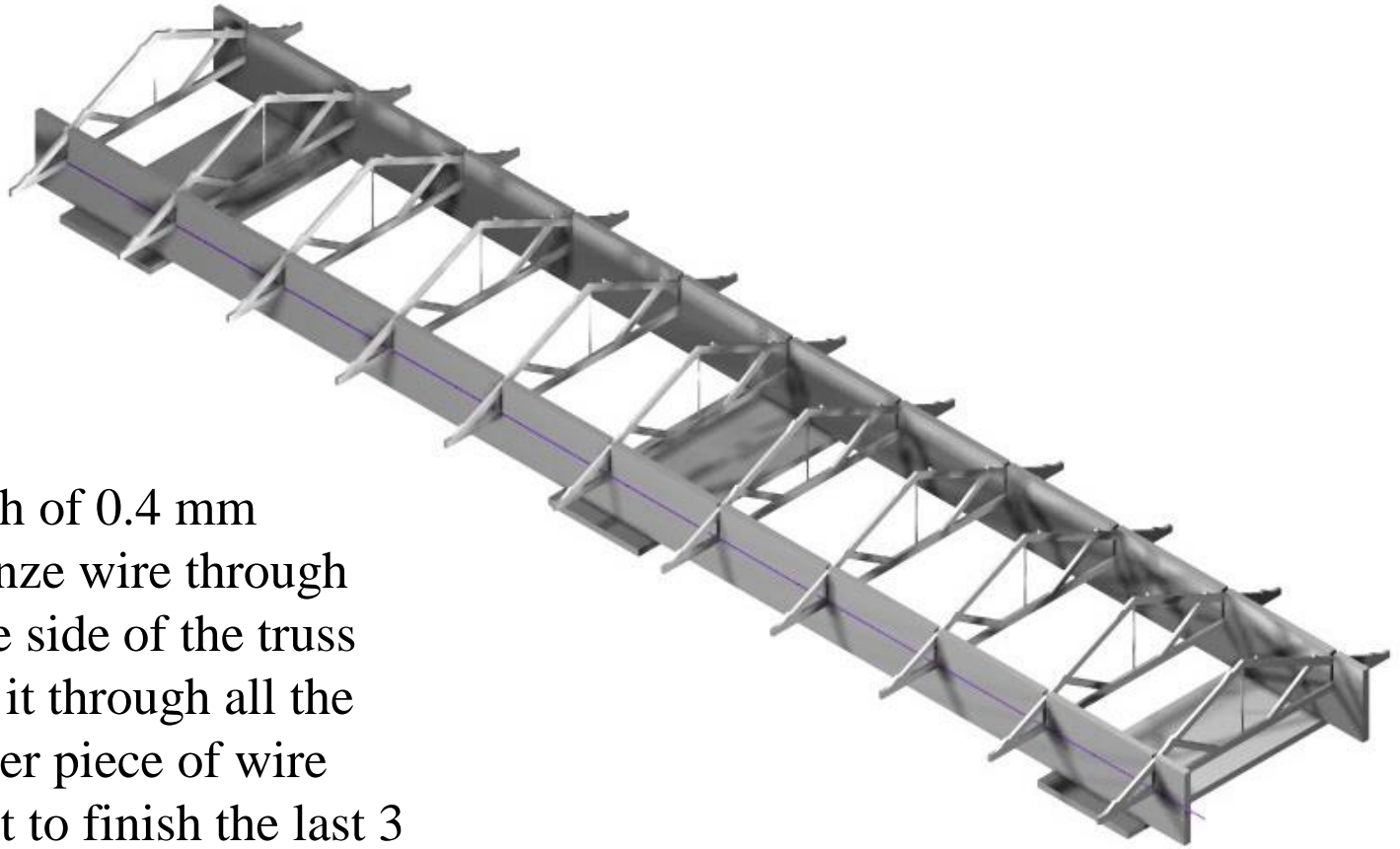


The Truss Jig – Step 3

Place the trusses into each groove.
The trusses are aligned in the next step.

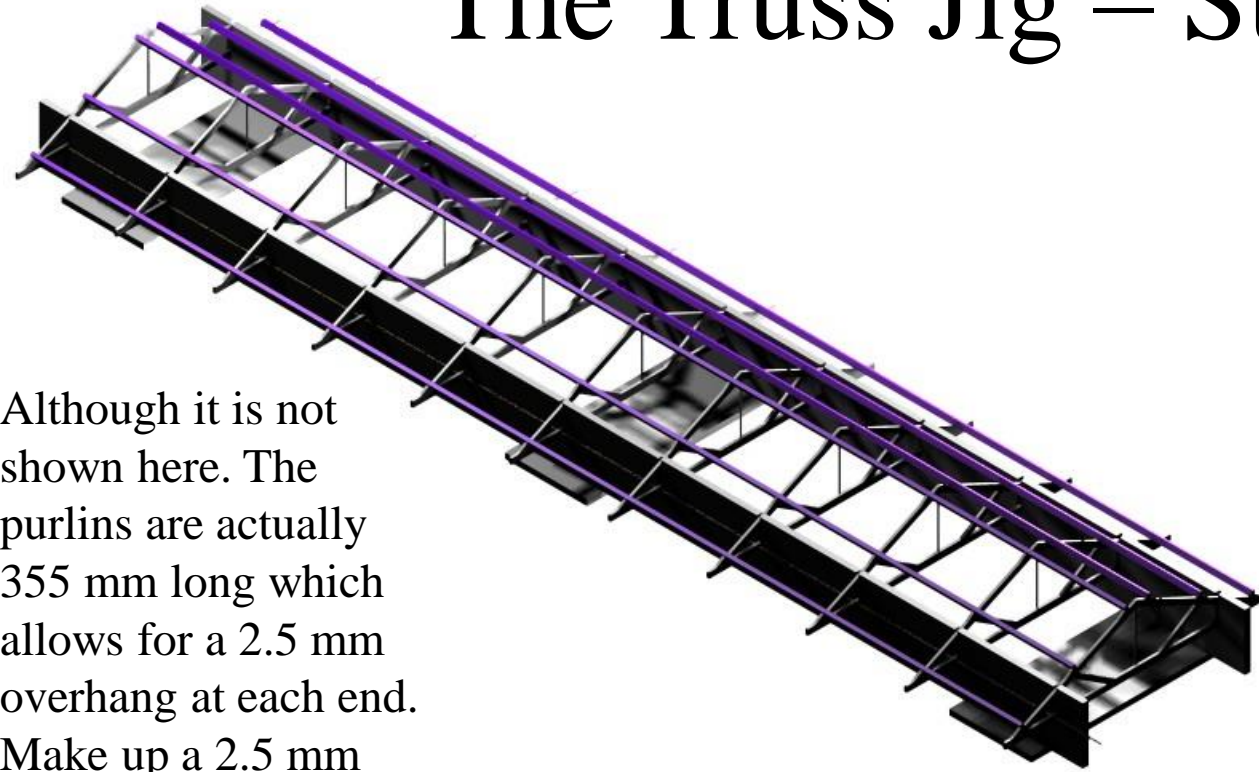


The Truss Jig – Step 4

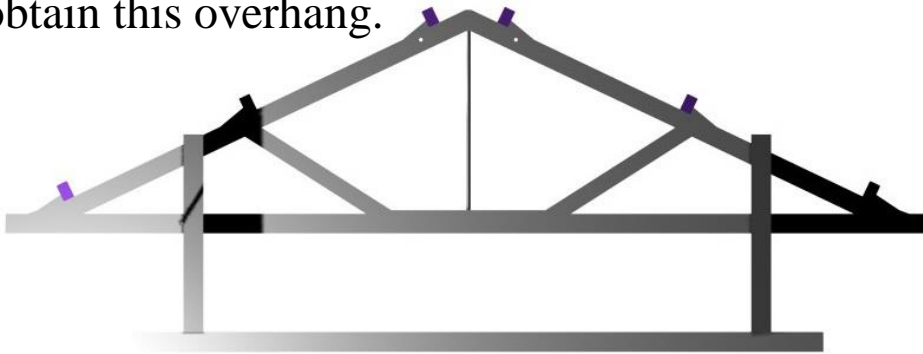


Locate a length of 0.4 mm Phosphor Bronze wire through the hole in one side of the truss base. And run it through all the trusses. Another piece of wire needs to be cut to finish the last 3 trusses. Cut small pieces of masking tape and tape the wire to the side of the Truss Jig. This will secure the trusses in place.

The Truss Jig – Step 5



Although it is not shown here. The purlins are actually 355 mm long which allows for a 2.5 mm overhang at each end. Make up a 2.5 mm gauge from a scrap piece of styrene to obtain this overhang.



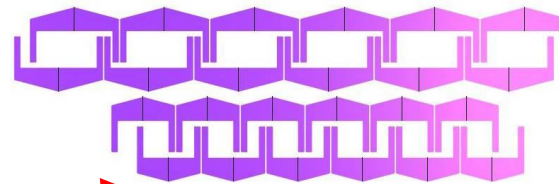
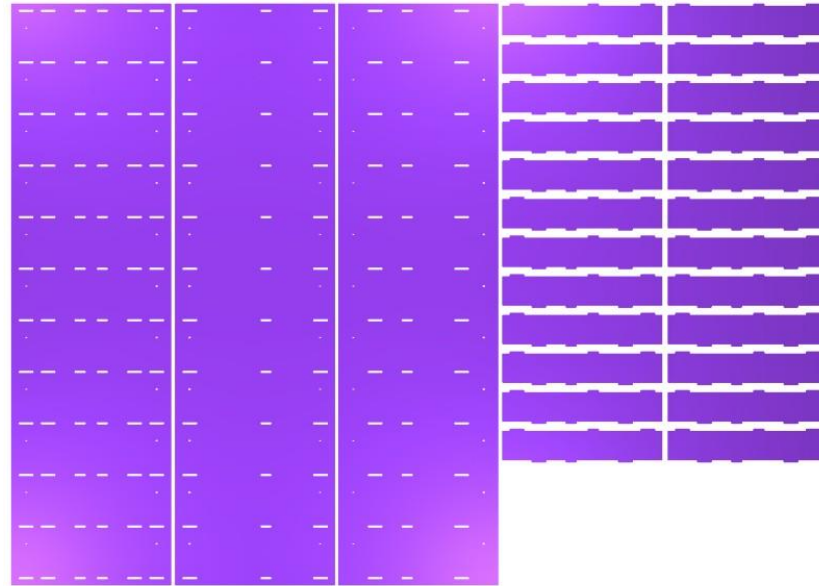
Clean the styrene purlins before use. (supplied in the kit) The 6" x 4" purlins are now placed inside the ribs with the 6" facing up as per the image to the bottom left. Glue the purlins in place. The preferred adhesive would be 2-part epoxy such as 2-minute Araldite, or similar. Allow the glue to dry for 12-24 hours. Gently remove the masking tape holding the wire and remove the wire. The truss assembly can now be removed from the jig and placed onto the Truss/Rail Jig, ready for soldering. (keep the trusses in this jig until the soldering is to be done.)

The Truss to Rail Soldering Jig –

Step -1

This jig may appear to be a little bit of overkill, but it is important to be able to solder the trusses to the rail supports so that the supports are vertical, and the trusses are centred. And to ensure that the soldered joint is not able to melt the purlins or the jig.

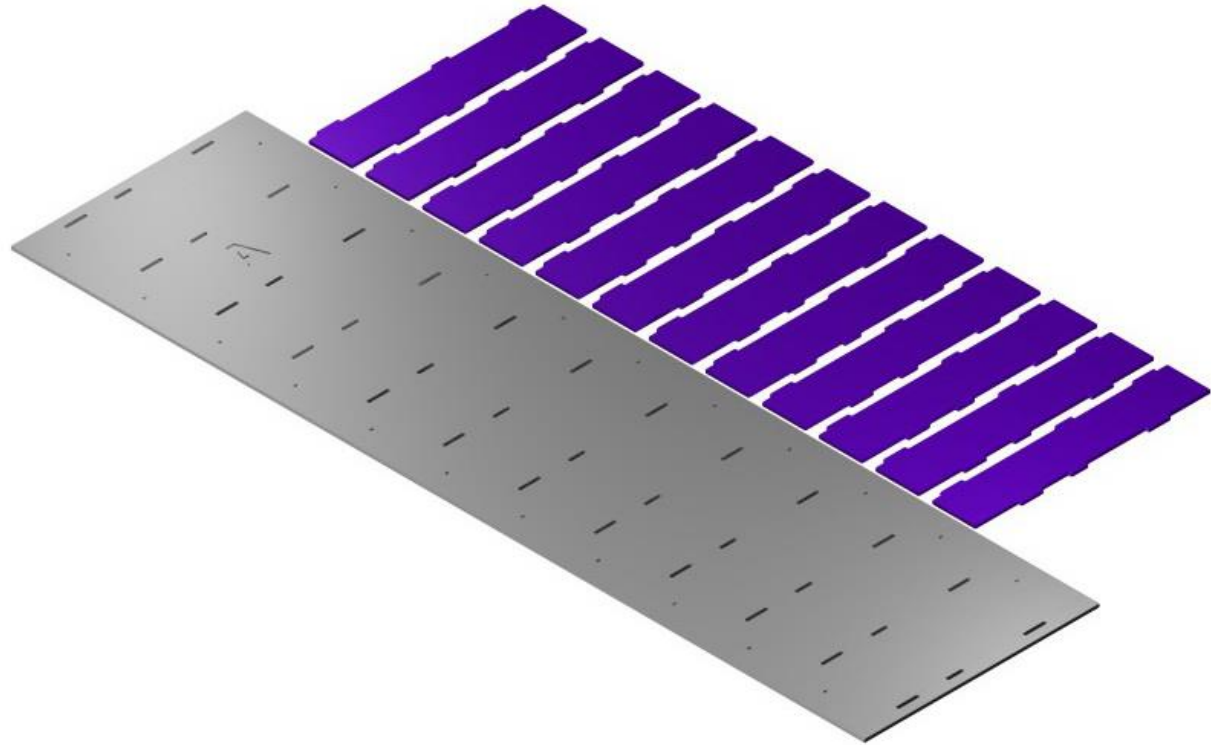
The jig can be glued together using either CCA (Supa Glue) or Dichloride Methane (Acrylic Glue) the pieces to the right should not be glued into the jig as they will need to be removed. If for any reason one leg breaks of these pieces, they will still do their job of assisting to align the truss assembly



The Truss to Rail Soldering Jig – Step - 2

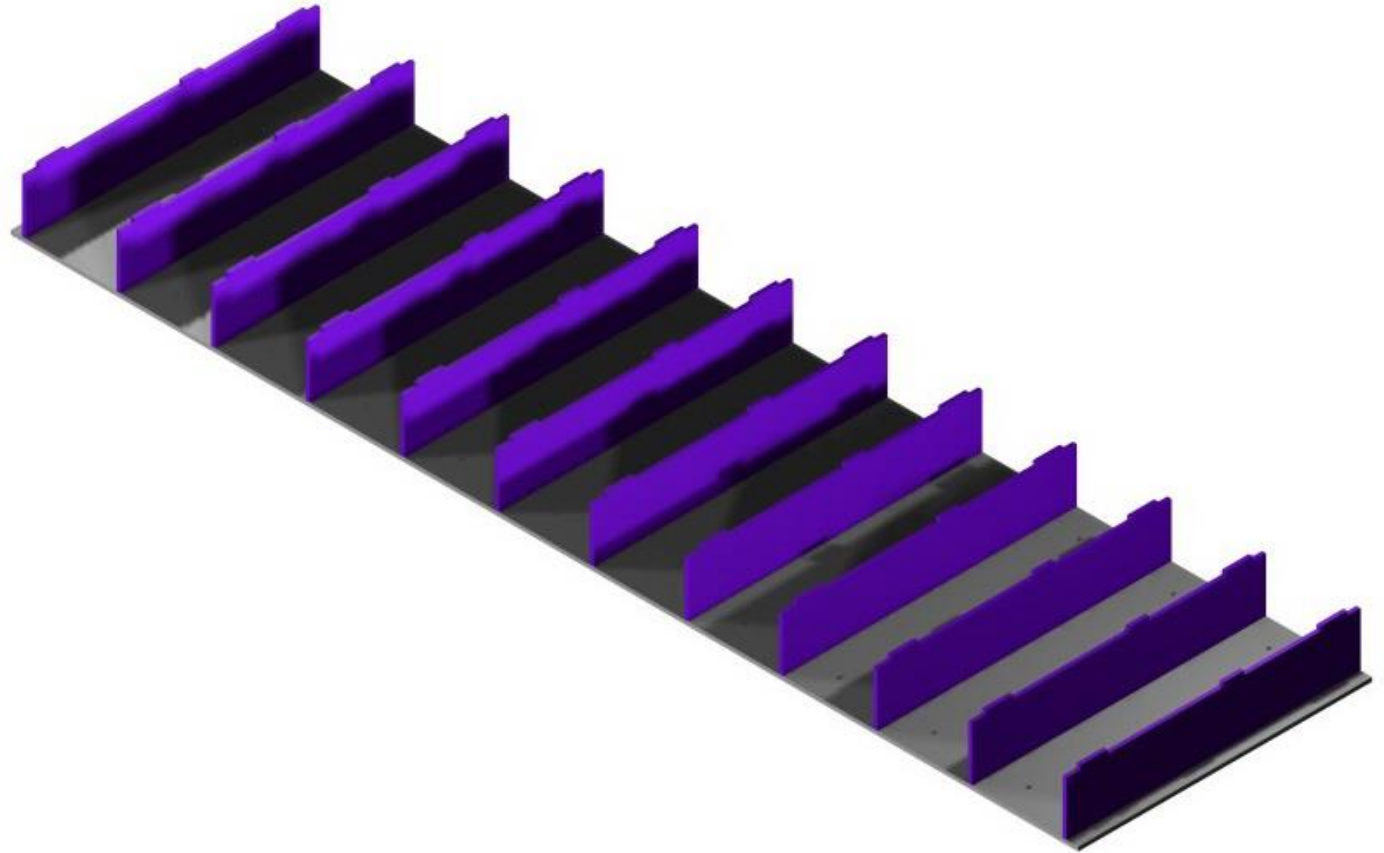
You will need the acrylic piece marked “A” and 12 Supports. The supports are identical.

Remove the paper on all parts. Place the supports into “A” making sure that “A” is face up, in other words the “A” can be read correctly.



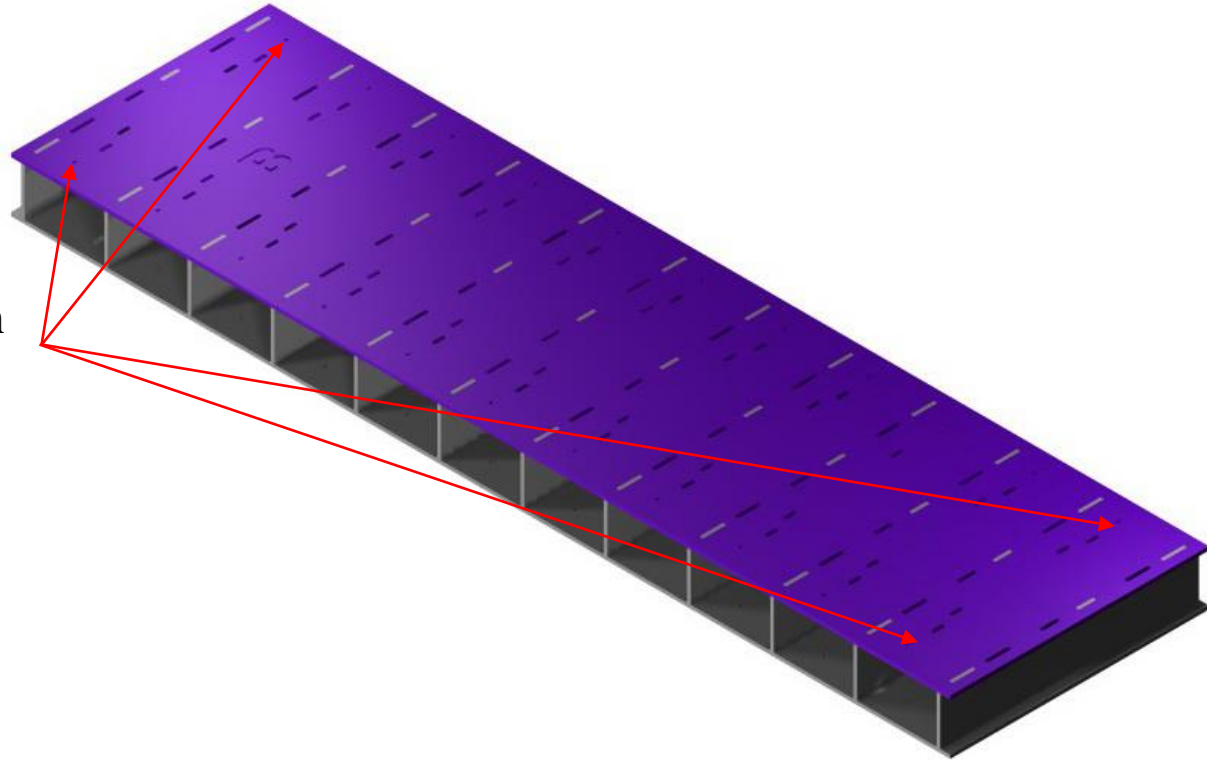
The Truss to Rail Soldering Jig – Step - 3

It is easier to glue the jig together when acrylic piece “B” is fitted as it holds the supports closer to vertical.



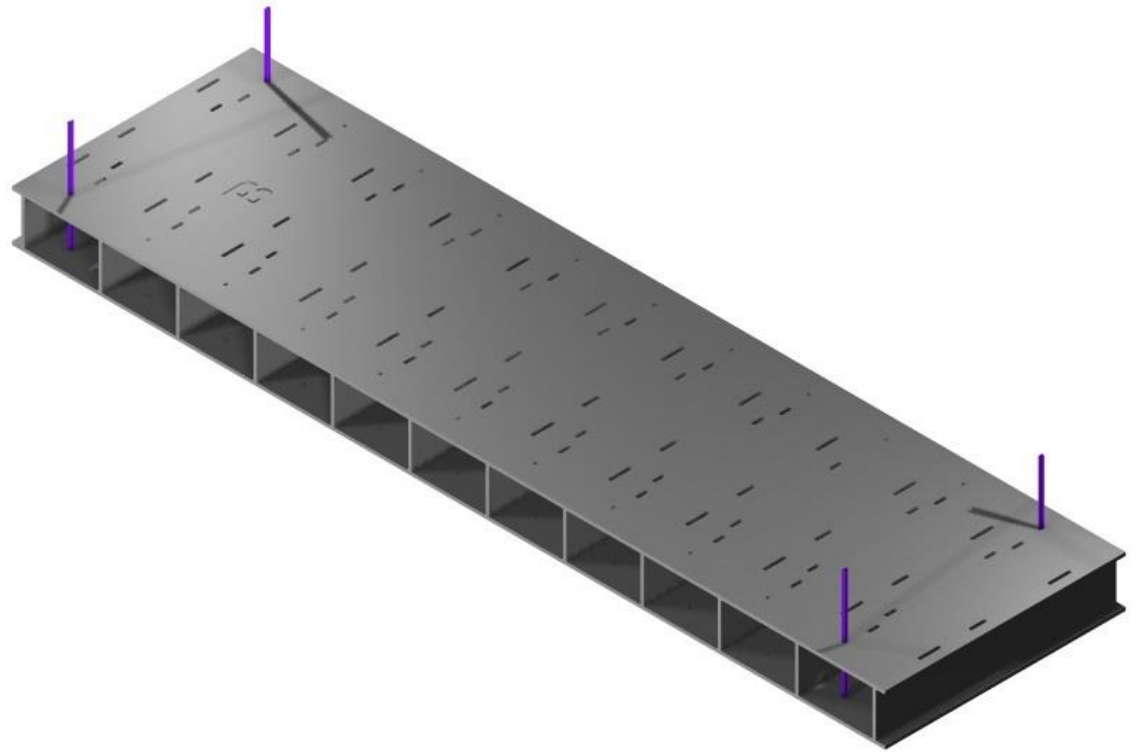
The Truss to Rail Soldering Jig – Step - 4

You will need the acrylic piece marked “B”. Place this part onto the top of the supports on “A”. To assist in aligning the jig and keeping the supports vertical, you can place 4 pieces of rail in the 4 corners.



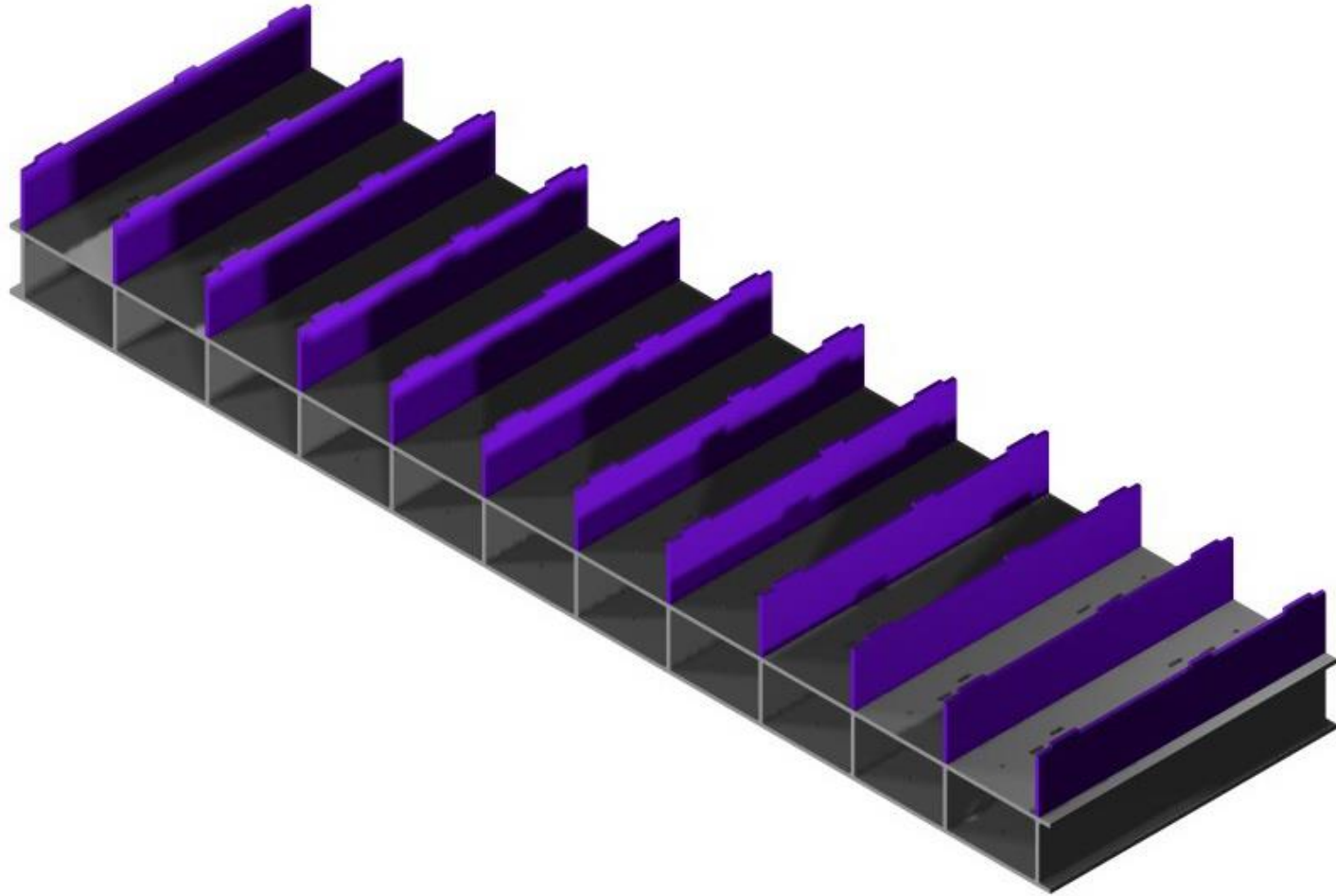
The Truss to Rail Soldering Jig – Step - 5

You will need the acrylic piece marked “B”. Place this part onto the top of the supports on “A”. To assist in aligning the jig and keeping the supports vertical, you can place 4 pieces of rail in the 4 corners. Please ensure that the rail sections fit easily and can be removed without excessive force. Glue the supports to both “A” and “B”. **Do not get glue onto the rail sections, as they need to be removed, both now and later.**



The Truss to Rail Soldering Jig – Step - 6

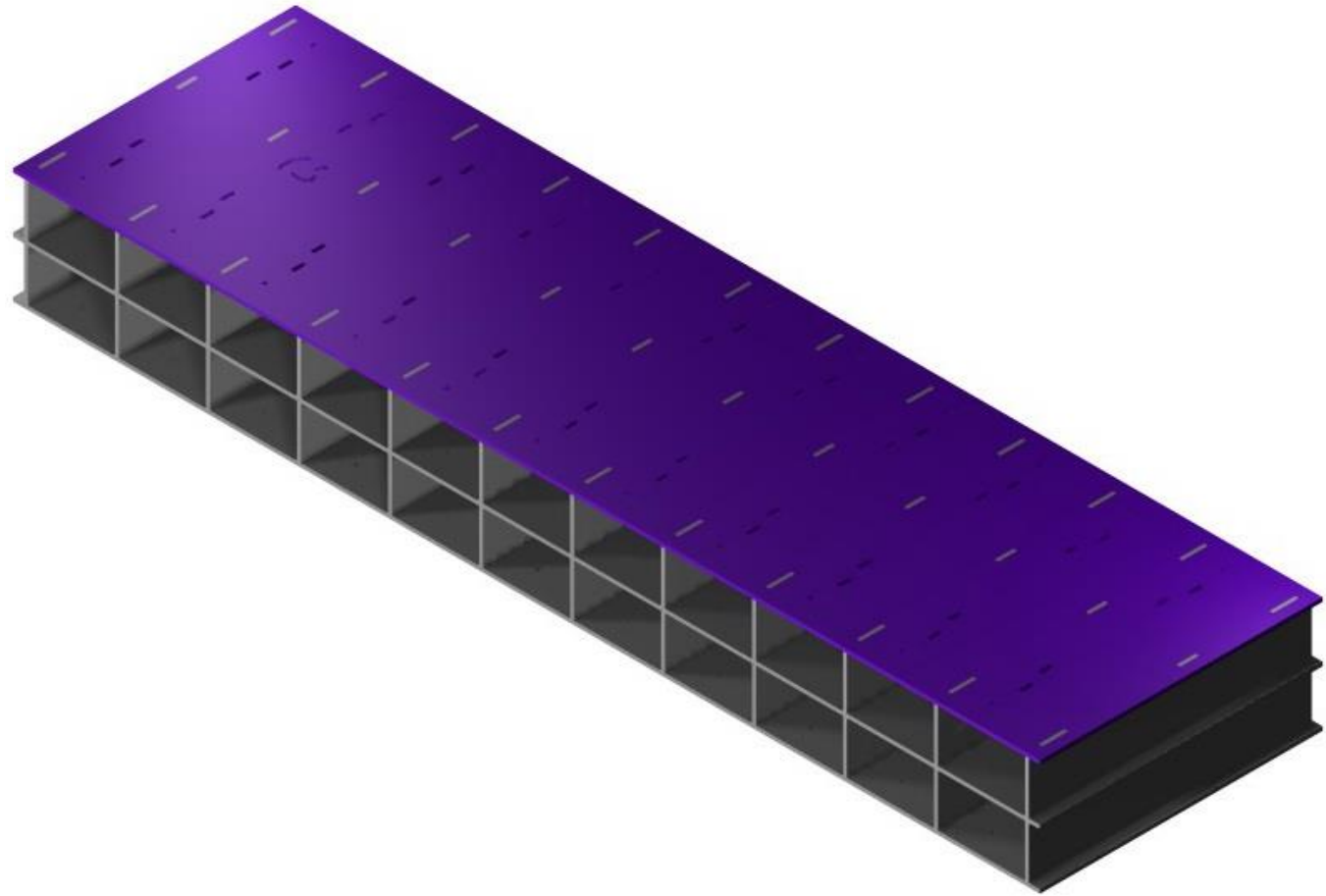
Locate the other 12 supports into place in the tab holes. Again do not glue in place until acrylic piece “C” is place on top of the supports.



The Truss to Rail Soldering Jig – Step - 7

The same procedure needs to be done with “C”.

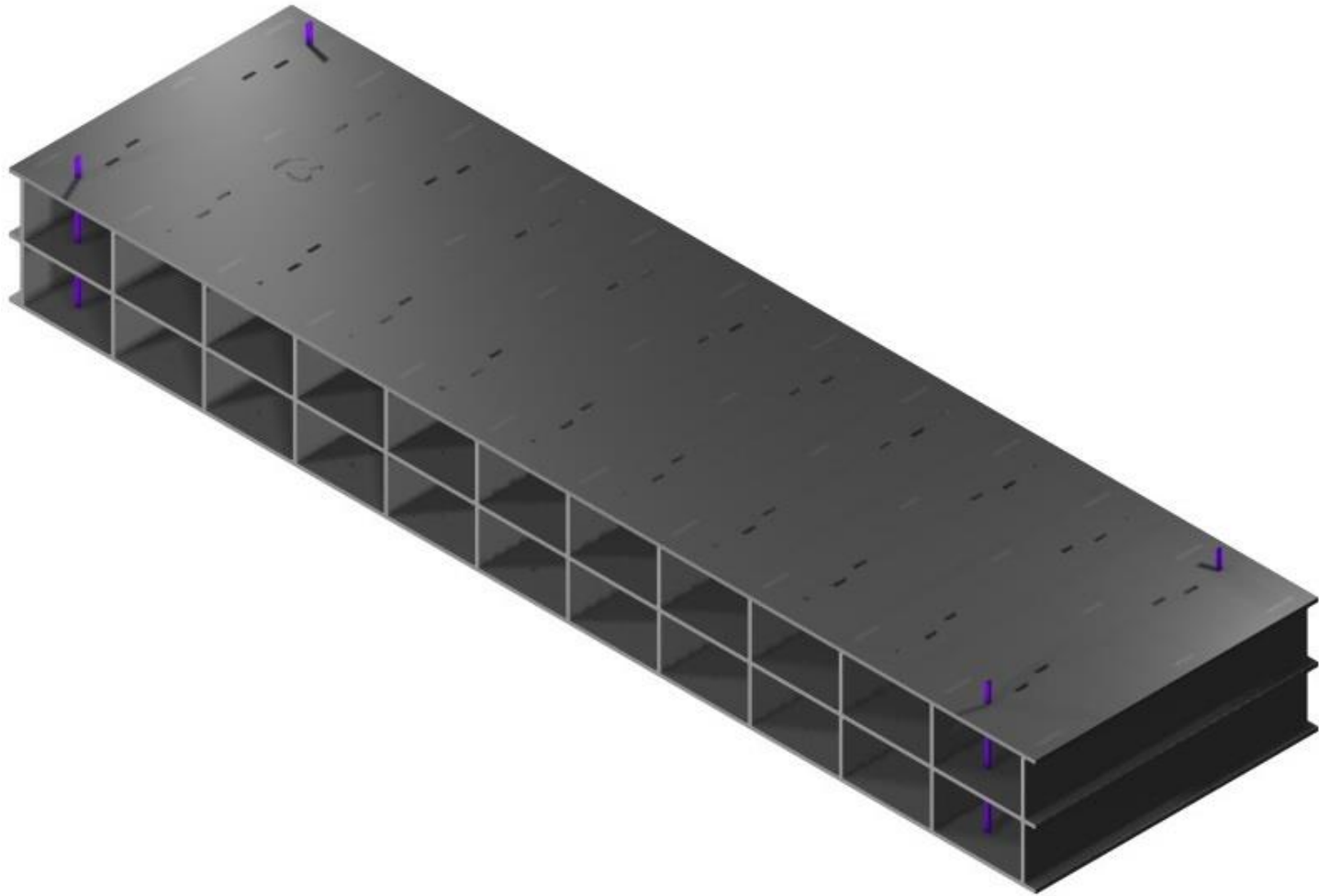
Rails can be placed on all 4 corners the same as when the other pieces were glued in place.



The Truss to Rail Soldering Jig – Step - 8

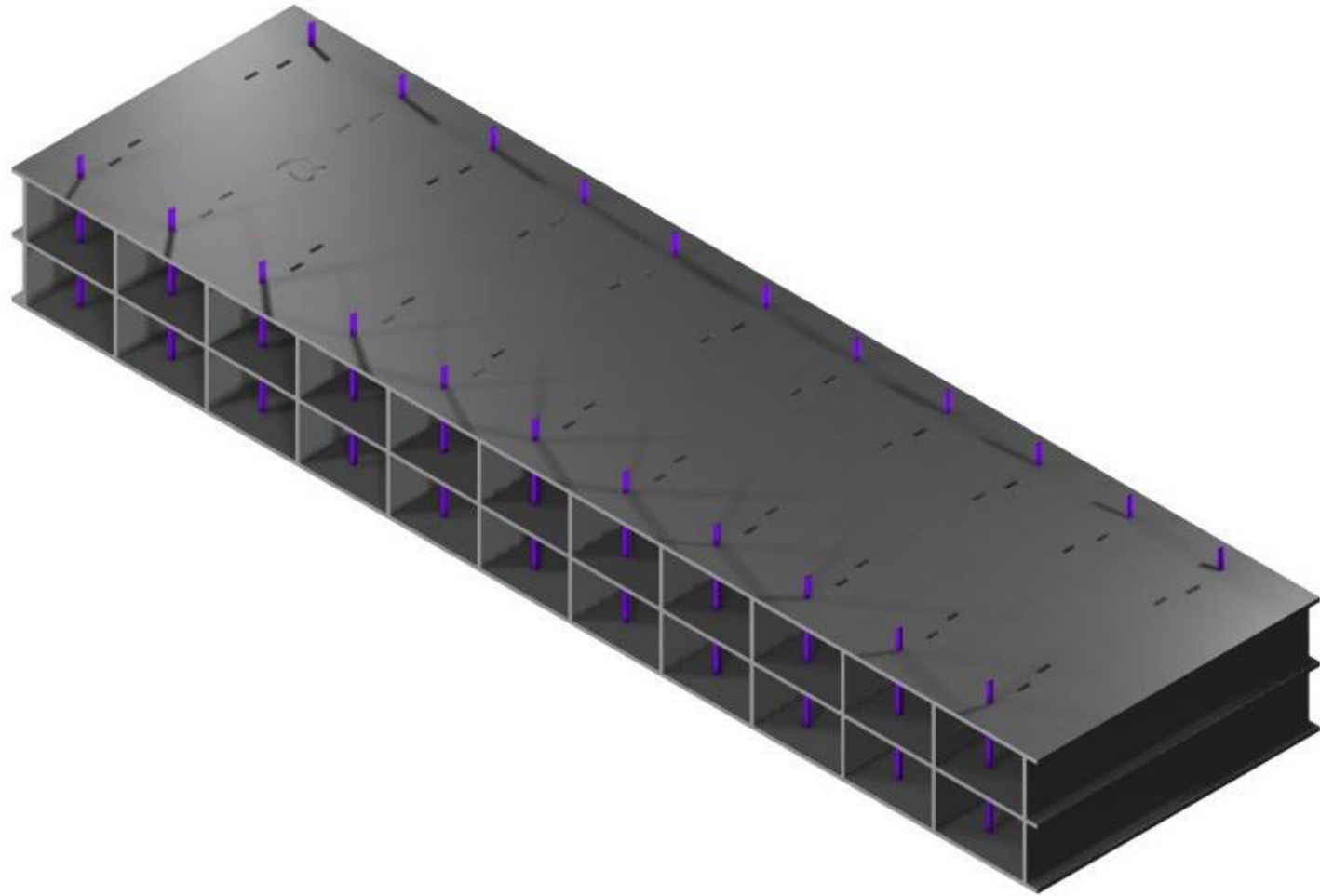
The same procedure needs to be done with “C”. Rail sections can be placed on all 4 corners the same as when the other pieces were glued in place.

Again do not glue the rail when gluing the acrylic, and ensure that the rail goes in and out smoothly and easily

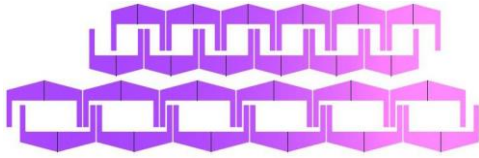


The Truss to Rail Soldering Jig – Step - 9

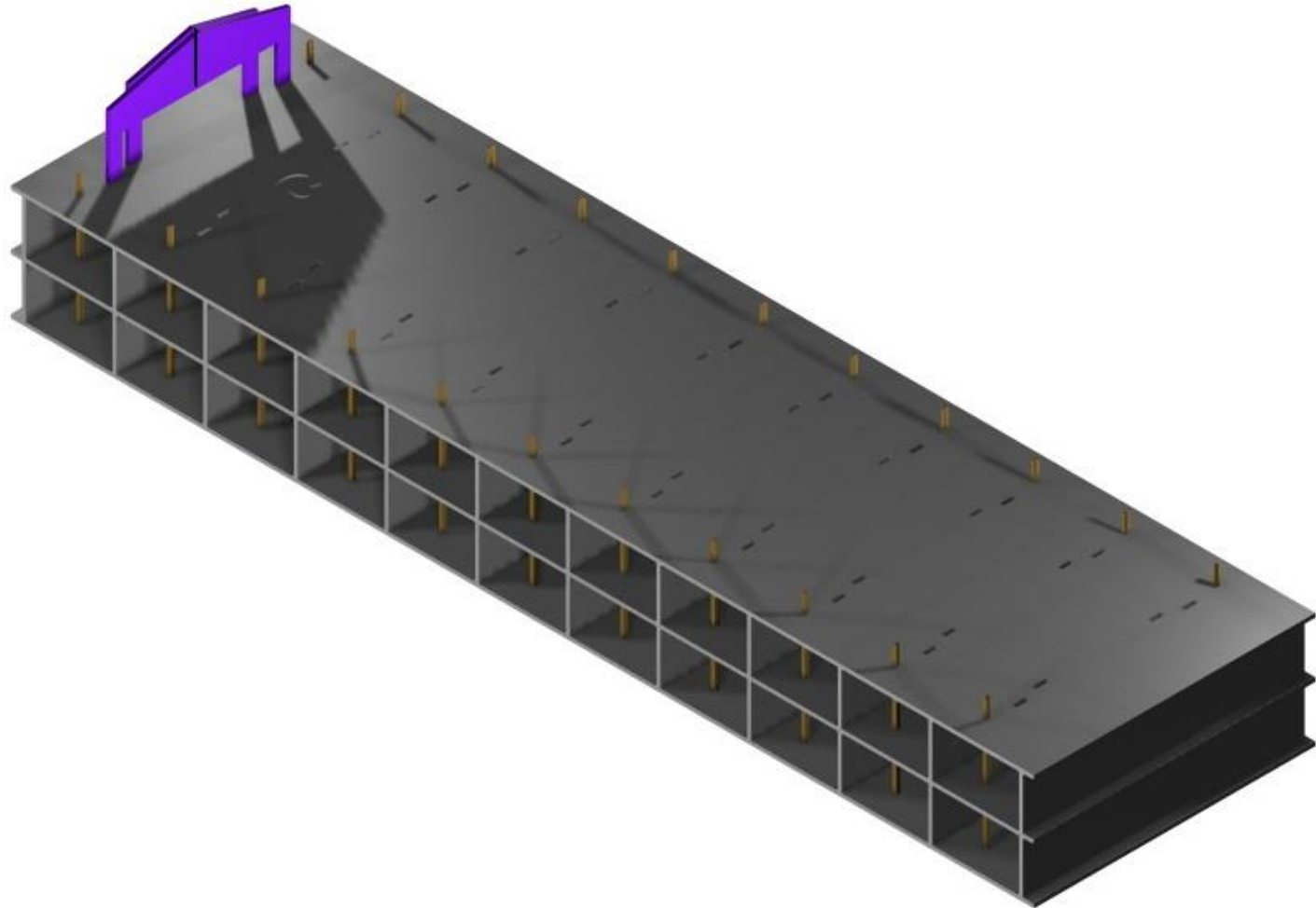
Locate all 22 sections of rail into the jig, making sure that they fit smoothly and easily, they cannot afford to be too tight, or the alignment of rail supports, and trusses may move when the structure is removed.



The Truss to Rail Soldering Jig – Step – 10

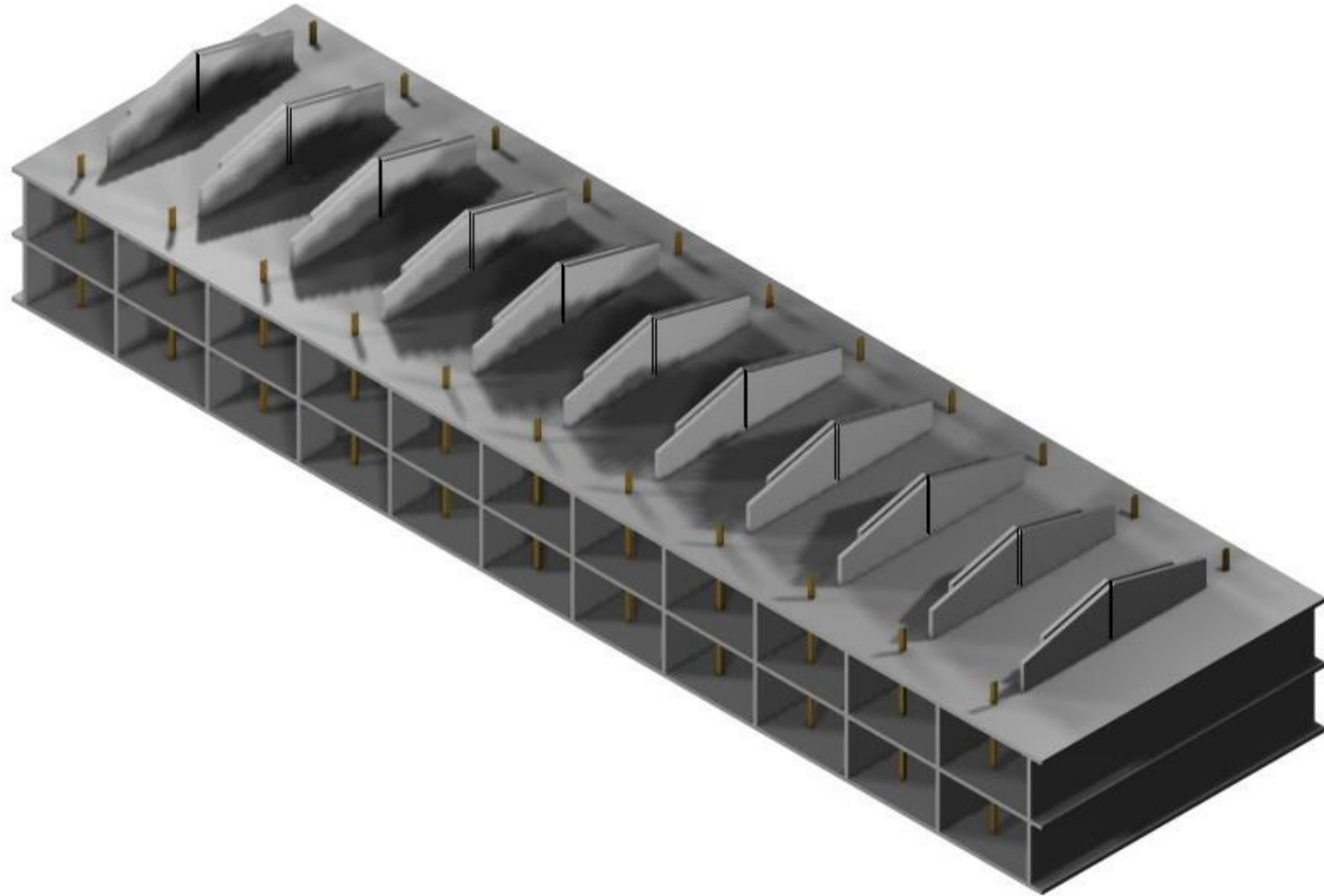


The truss spacers are located into the jig. The purpose of these pieces is to keep the truss in location whilst it is soldered to the vertical rail supports. The pieces can only fit on either side of the truss. They do not need to be glued in place as they locate through both “C” and “B” and should be firmly in place.



The Truss to Rail Soldering Jig – Step – 11

The truss spacers have a scribe line located in their centre. And as they are clear acrylic, this will allow the truss to be centred by eye, by the modeller. If the line is not obvious, a rub of black ink or black paint can be smeared onto the line to give it a highlight

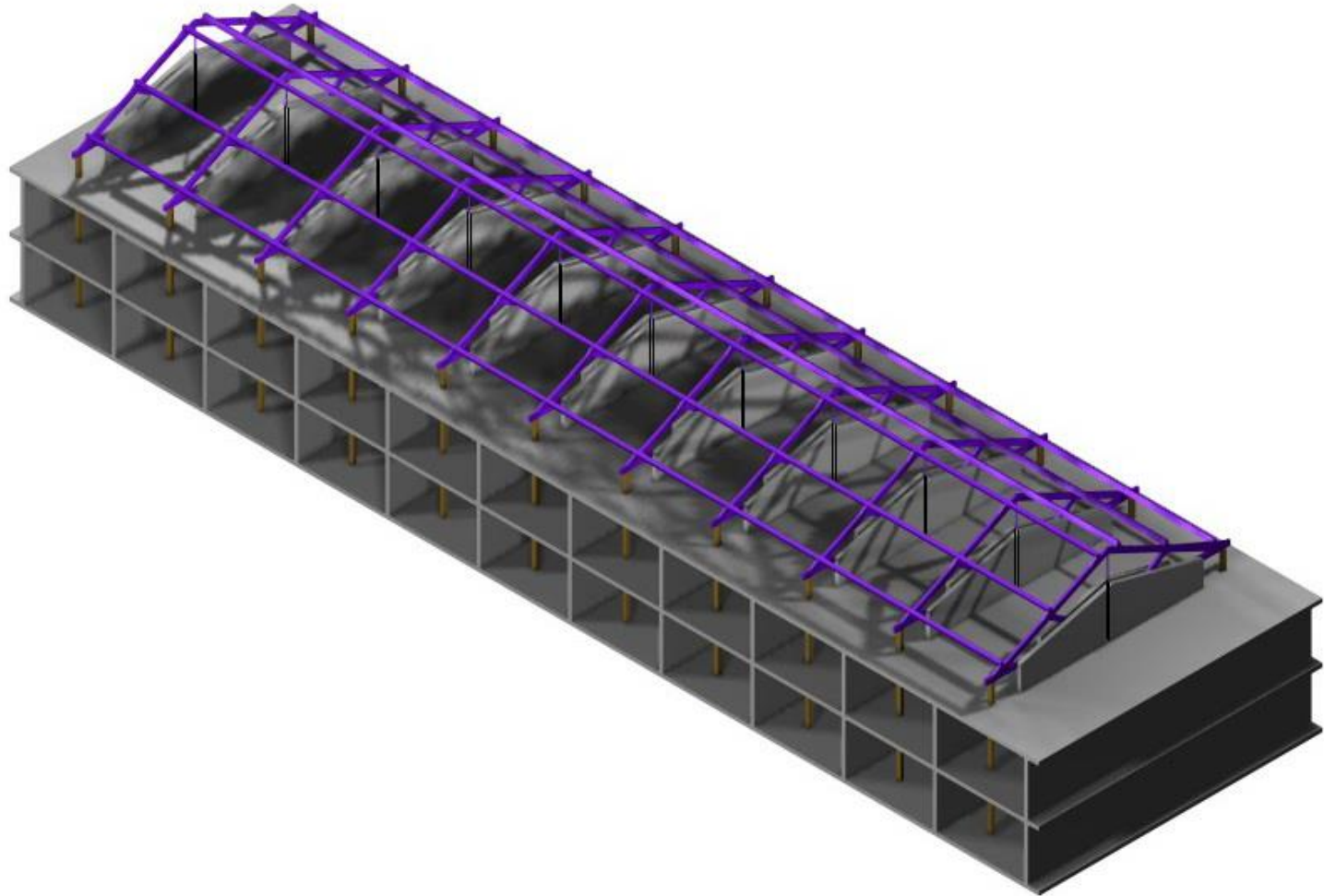


The Truss to Rail Soldering Jig – Step – 12

The trusses can now be removed from the Truss Jig and placed into the Truss to Rail Soldering Jig.

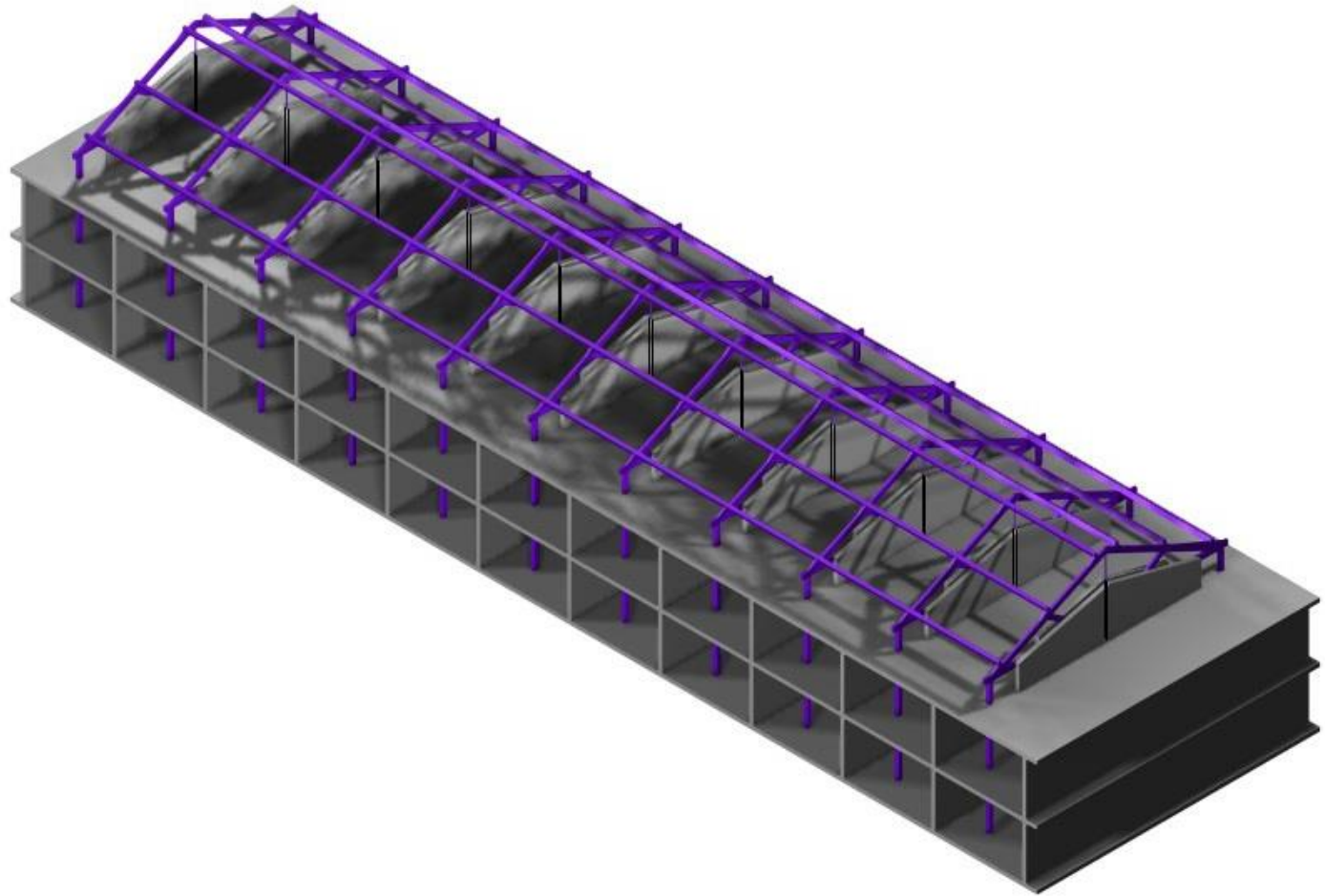
The trusses “should” line up with the Vertical Rail Supports. The scribe lines can be used to adjust the trusses so that they are centred to the rail supports.

Slowly solder each side of each truss to its corresponding rail support, ensuring a good clean joint.



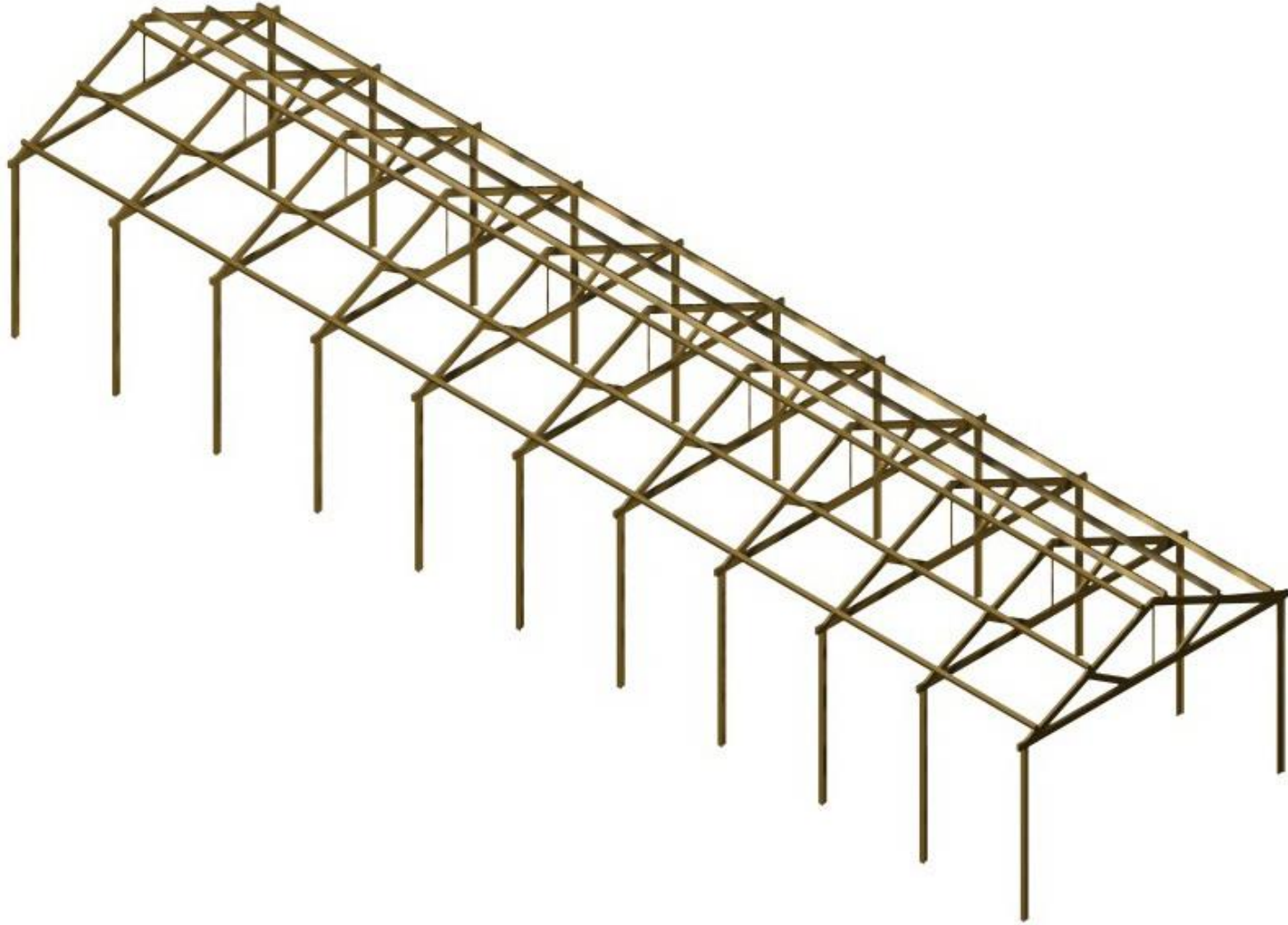
The Truss to Rail Soldering Jig – Step – 13

Once all the trusses are soldered to the Rail Supports, the combined truss /rail structure can be slowly eased out of the jig. Please take your time with this process, so that you do not damage any of the joints that have just been soldered together.



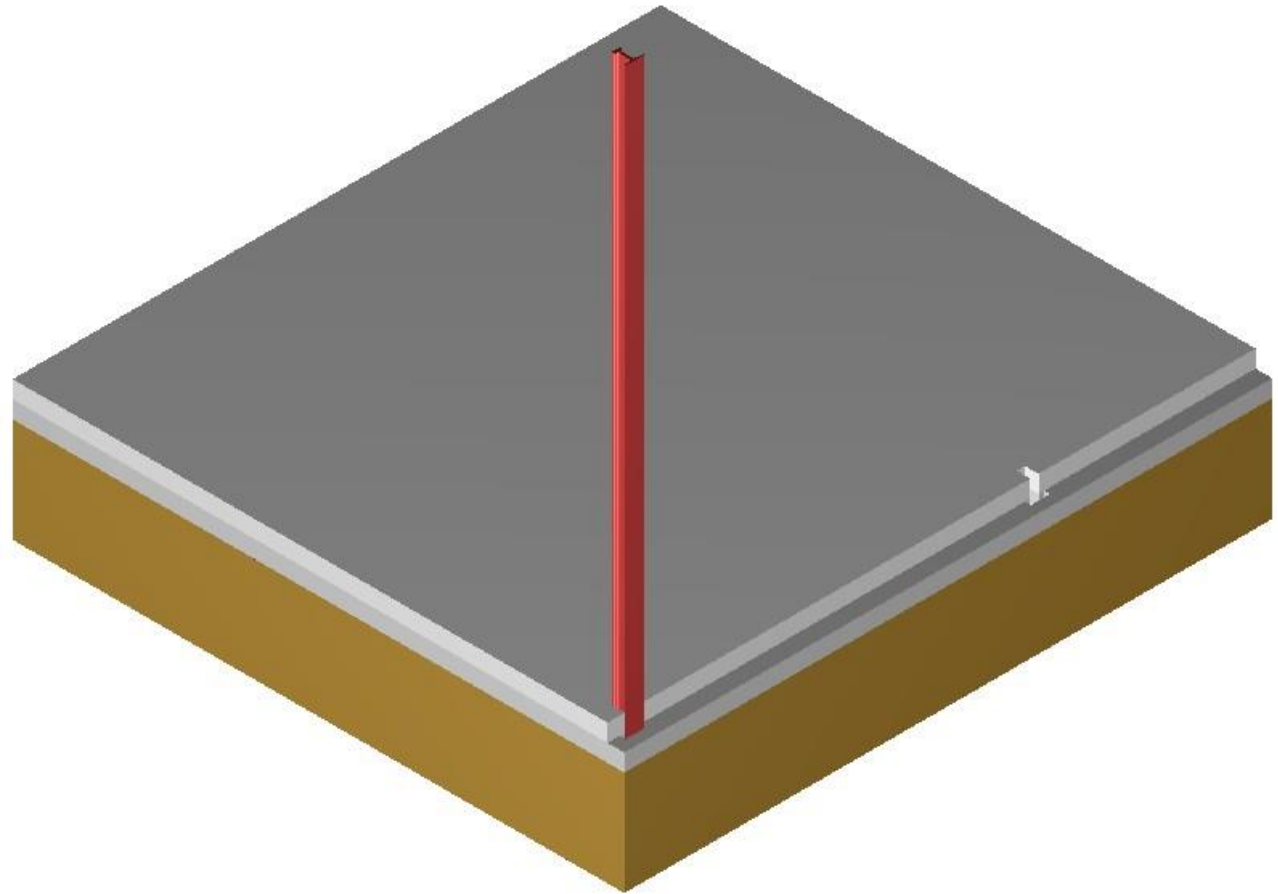
The Truss to Rail Soldering Jig – Step – 14

The truss/rail structure can be placed safely to the side and we can concentrate on the next part of this build.



Back to the Base – Step - 1

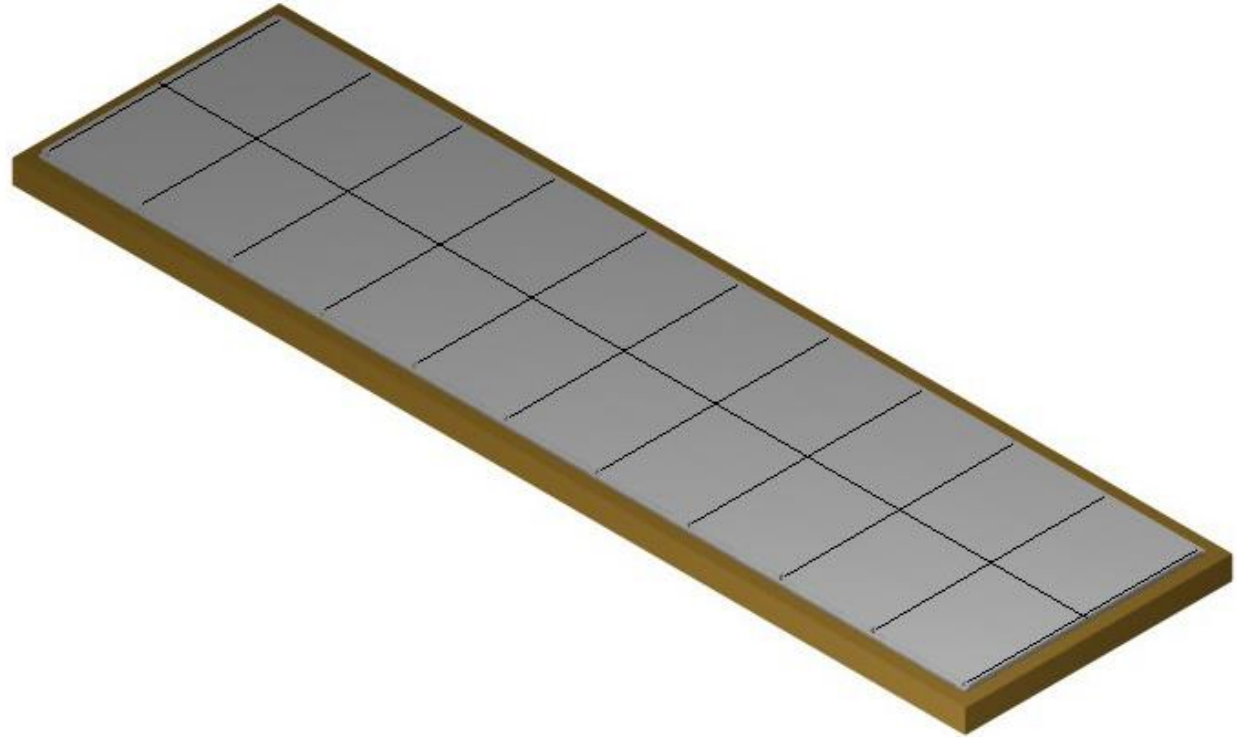
The base is as we left it earlier. Now we need to understand how the base actually works. The small “T Shaped holes locate the base of the Vertical Rail Supports. On top of the base acrylic piece, another 1 mm thick acrylic piece which is scribed, to resemble concrete slabs, is glued to the base acrylic piece. However it really needs to be glued in exactly the correct position. The slots on each side of this piece has to line up with the head of each Vertical Support Rail, and only glued in position, when this is achieved.



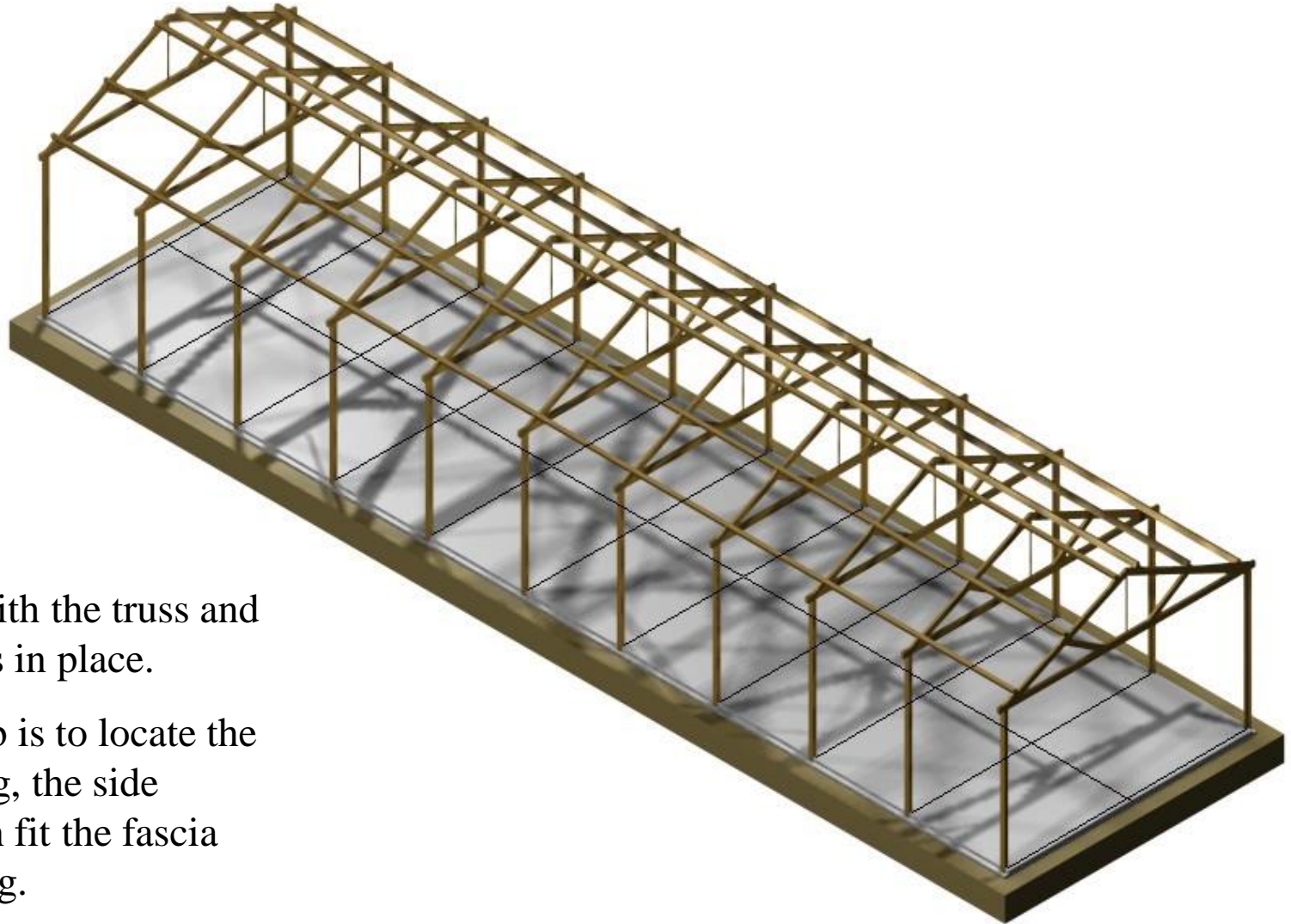
Back to the Base – Step - 2

The base is now ready for the addition of the Truss/Rail Structure.

Care needs to be taken with this step to make sure that no movement occurs with the rail to Truss joints, and also to ensure that the bottom of each rail is located fully into the base acrylic.



Back to the Base – Step - 3



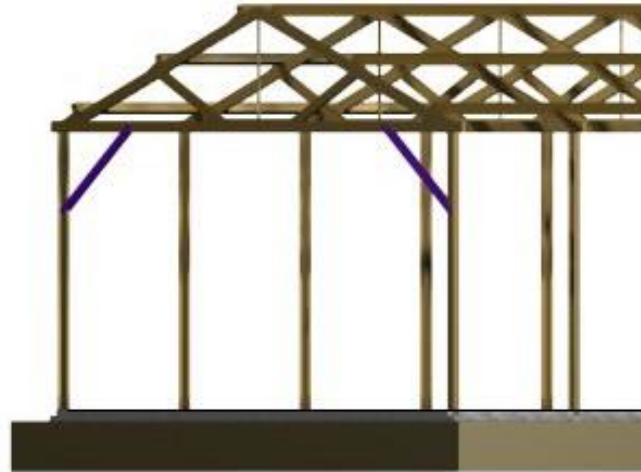
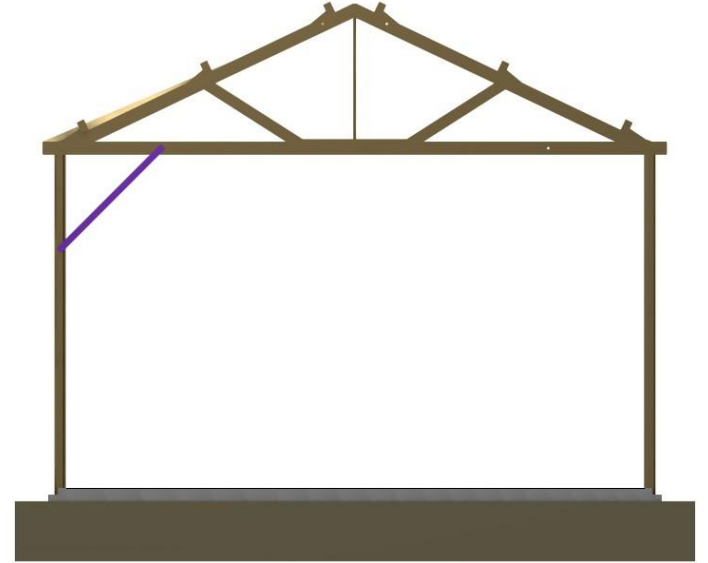
The base with the truss and rail supports in place.

The next job is to locate the truss bracing, the side bracing then fit the fascia and guttering.

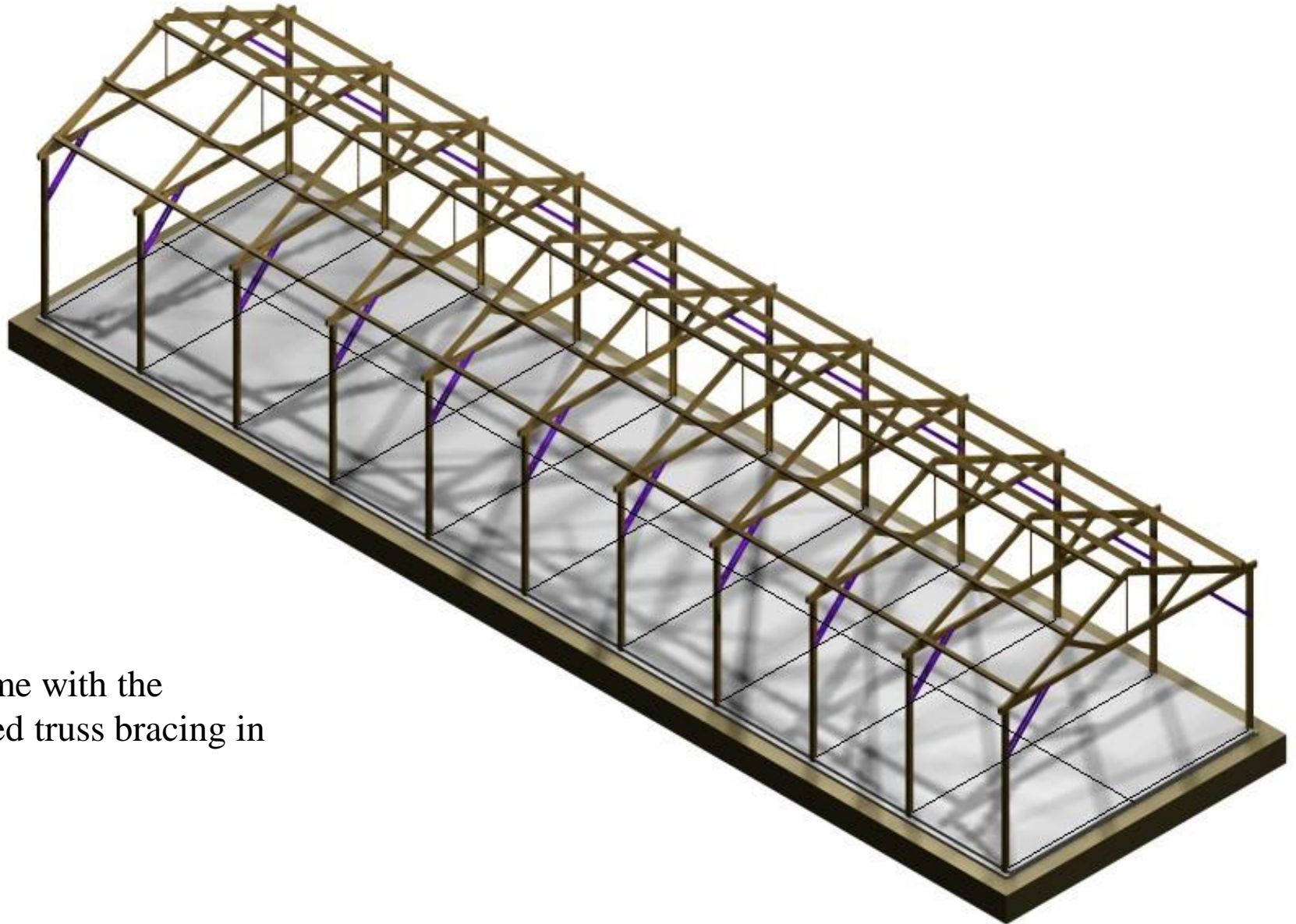
Truss Bracing – Step 1



The trusses are braced to the Vertical Rail Supports on both sides of the truss. They are located on the truss, by using a 0.4 mm wire after drilling the hole in the truss brace using a 0.4 mm drill. The braces are then soldered to the rail and at the truss at 45 degrees. Use a fiber brush to clean the rail at the point of intersection, before soldering in place

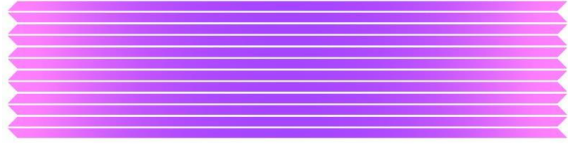


Truss Bracing – Step 2

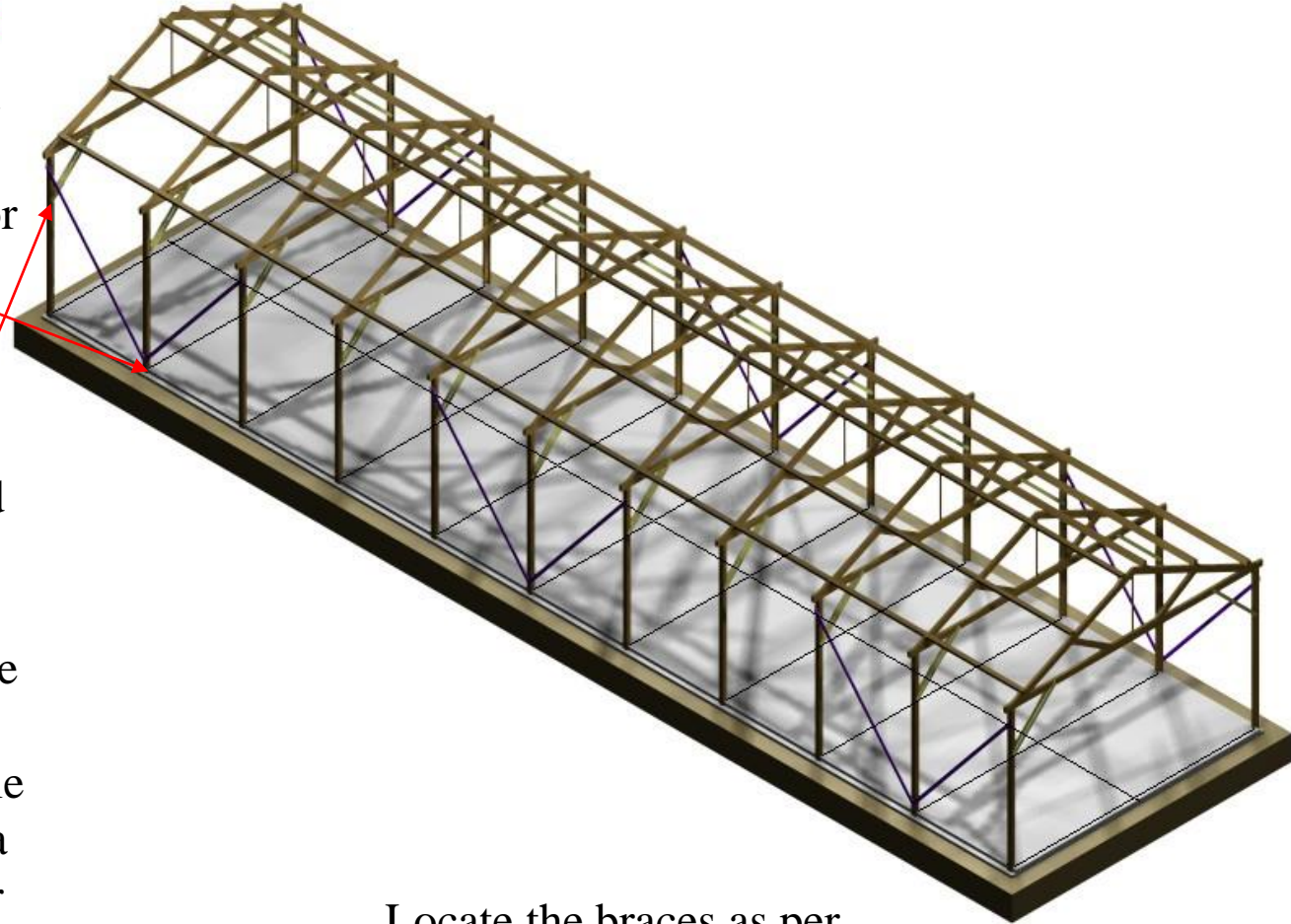


The Frame with the completed truss bracing in place.

Frame Bracing – Step 1

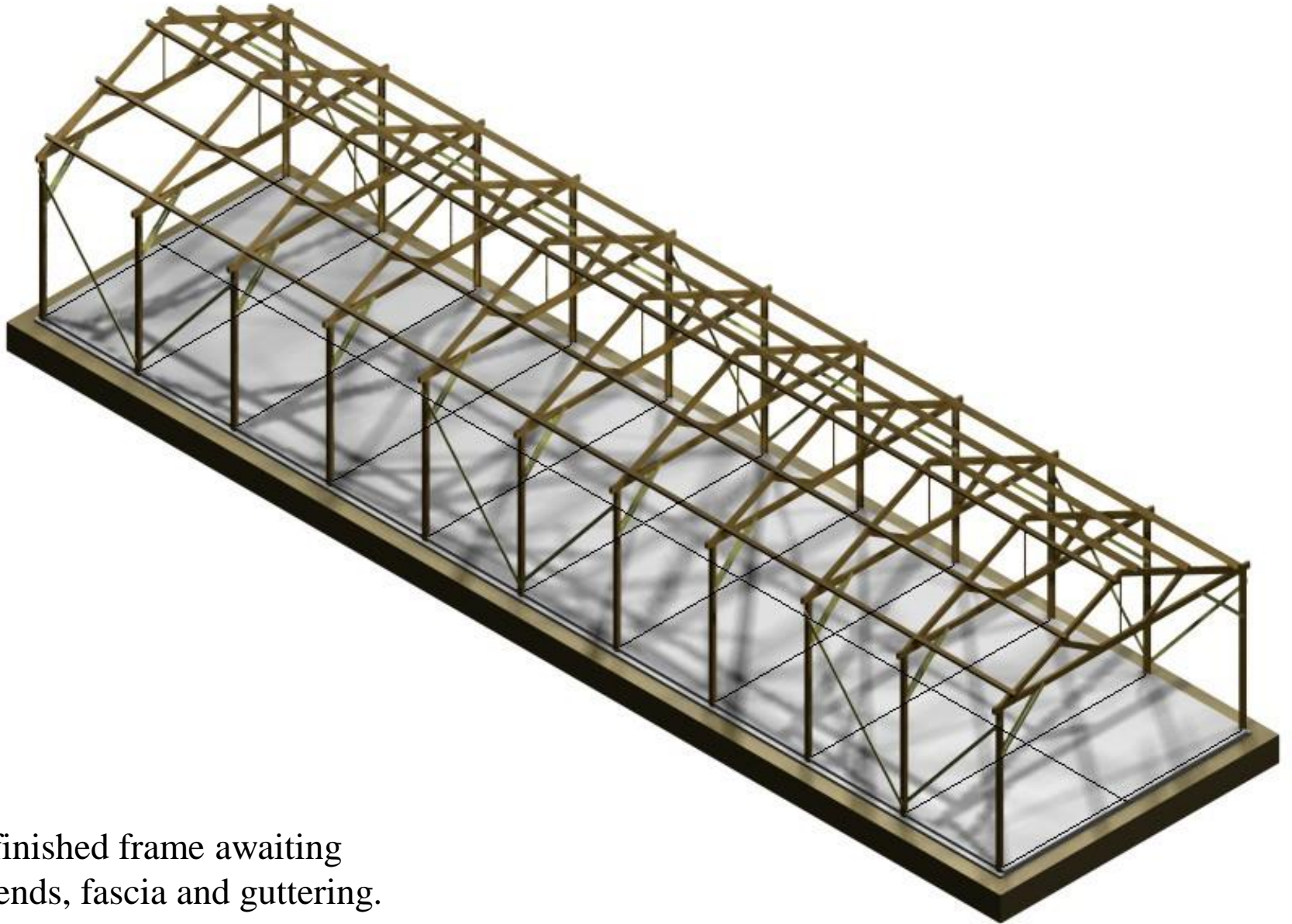


The frame braces, will require minor trimming. Locate the first brace 2 mm from the floor on the 2nd Vertical Support Rail. Clean the surface of the rail for soldering. Place the brace in the middle of the rail, so that the other end is located on the first Vertical Rail Support, with a slight overhang. File both ends of the brace so that they are flush with the outside and the middle of the rails. Use this brace as a template for the others. Solder into place and clean up excess solder and clean up with warm soapy water and a sponge.



Locate the braces as per the image above.

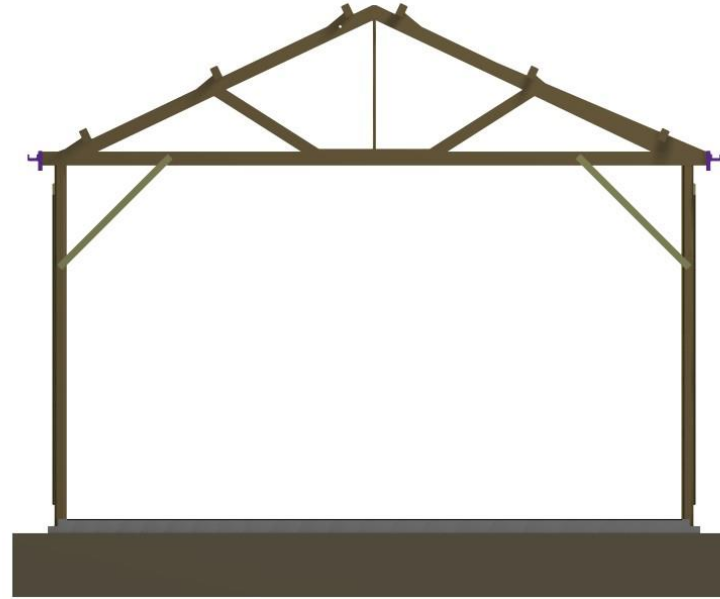
Frame Bracing – Step 1



The finished frame awaiting roof ends, fascia and guttering.

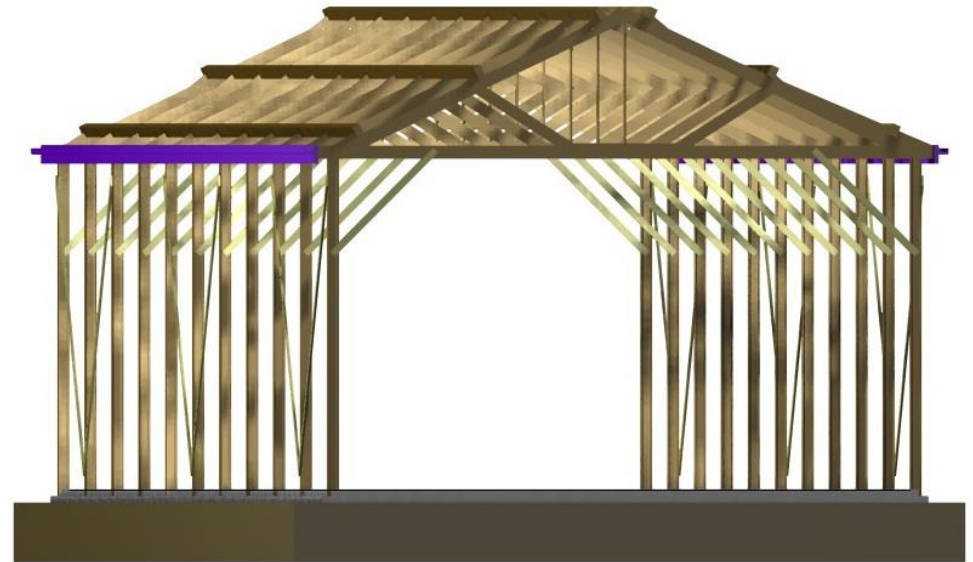
Fascia and Gutters – Step 1

The gutter and fascia

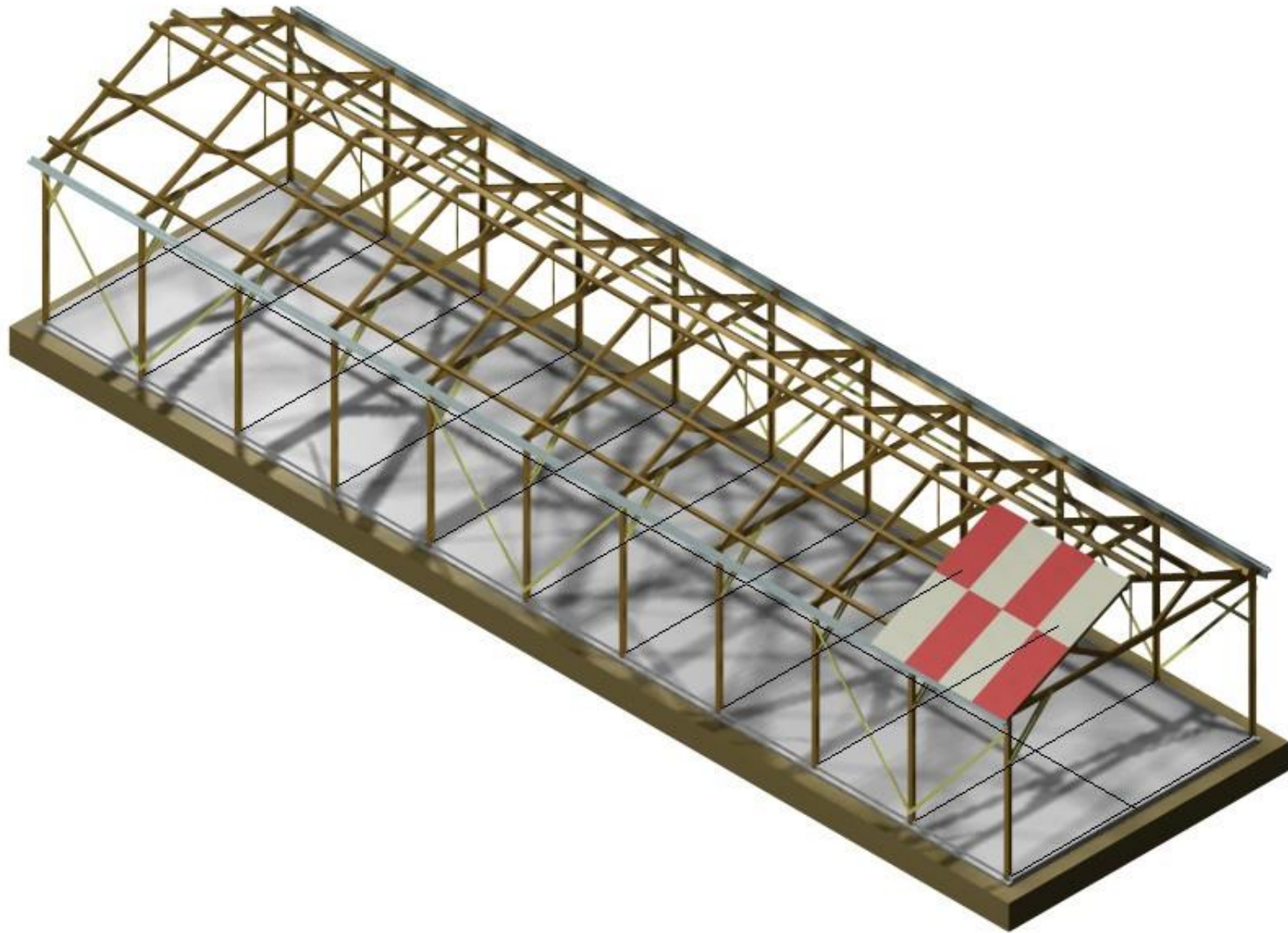


The fascia and gutter are next. The fascia is 10" x 2" Evergreen HO Strip. The gutter is Evergreen HO 1.5 mm Channel. The Strip and Gutter need to be glued together before attaching to the end of the trusses. The gutter is 0.5 mm below the top line of the fascia, allow to dry before attempting to glue onto the truss ends. CCA or 2-part epoxy would be best to use in gluing the parts to the trusses.

The cladding for the roof,(not supplied) needs to sit on the top of the fascia, and then sit INTO the gutter and about 1/4 of the way into the gutter. Once glued, allow to dry overnight.

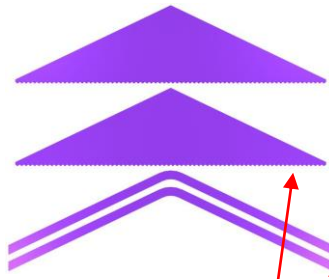


The Truss Jig – Step 2

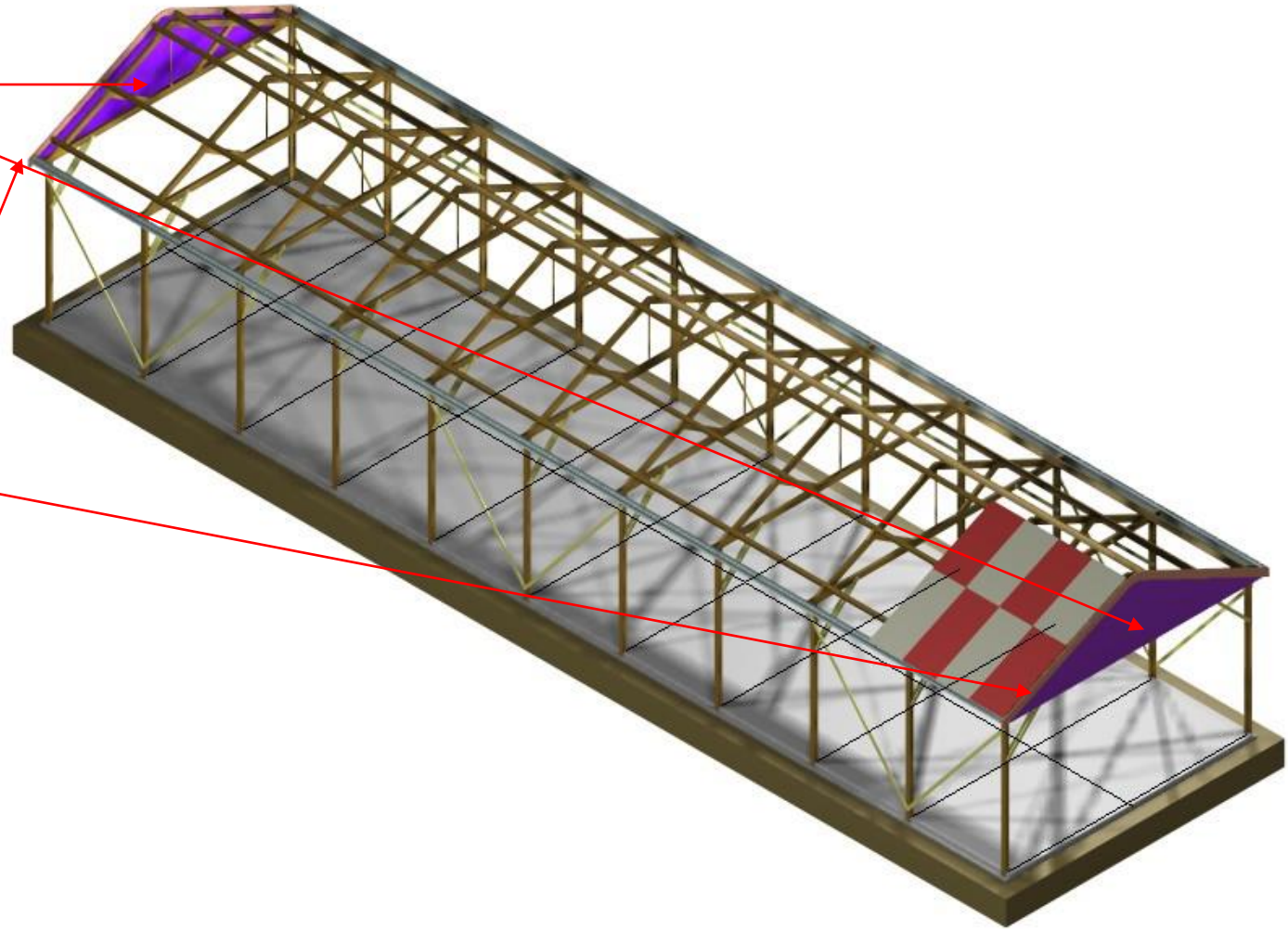


With the gutter and fascia fitted, we can move on to the Timber Sawtooth Ends and Barge Boards.

The Truss Jig – Step 8



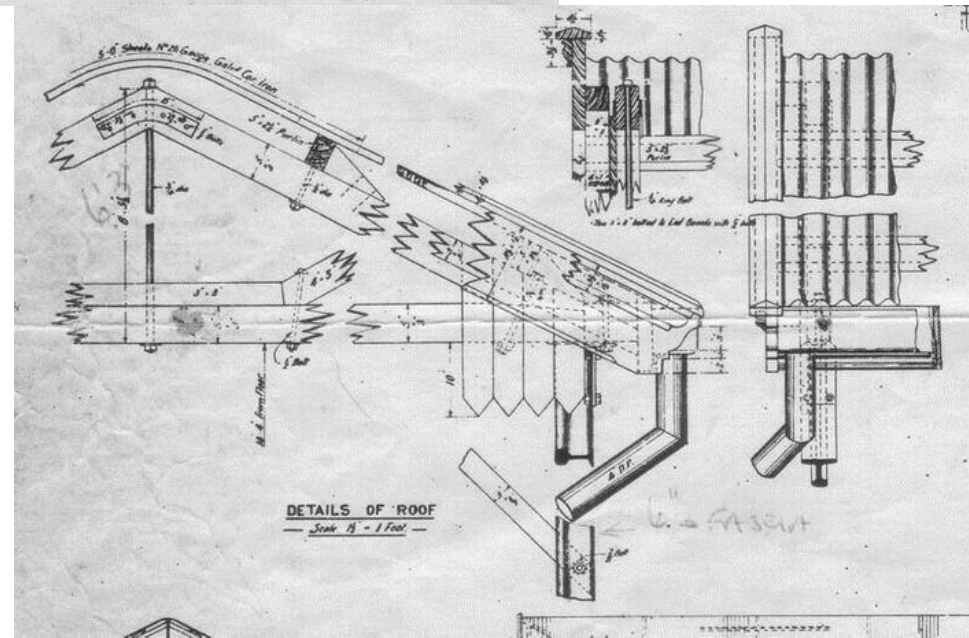
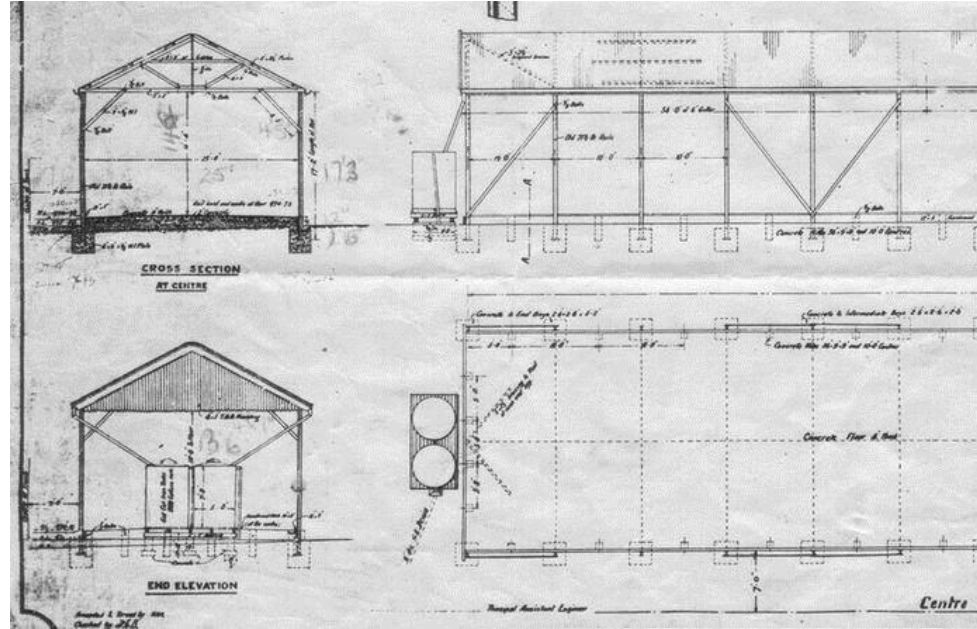
The Timber Sawtooth Ends are fitted first, sitting on the inside of the purlins, and the fascia, flush with both. The Barge Board then sits onto of the Timber Sawtooth Ends and against the purlins.



Downpipes – Step 1

The Downpipes are formed from 1 mm Brass Rod (supplied in the kit)

Downpipes can be run at the ends of the structure in water tanks or just onto the ground. The addition of a couple of water tanks gives the structure much more character, and the drawings on the left will assist in achieving this.



The Grain Shed – Painting

➤ Timber Base	Flat Black
➤ Base & Sub-base	Concrete
➤ Rail Supports	Rust
➤ Trusses	Brown
➤ Truss Bracing	Rust
➤ Battens	Brown
➤ Fascia	Colour of Choice
➤ Guttering	Colour of Choice
➤ End Saw Tooth Timber	Brown
➤ Barge Boards	Same as Fascia
➤ Side Bracing	Rust
➤ Corrugated Iron	SP Lettering Gray
➤ Down pipes	Same as Guttering

It would be wise to paint the components as you go to avoid the problem of access later on. You can do touchups at the end when all the components are glued together.

Because of the age of this type of shed, the shed would normally be severely weathered, unless it was brand new.

The base of the shed has etched lines indicating 10ft slabs of concrete, and grass would normally grow between the slabs (expansion joints).

There would also be spills of grain sacks leaving deposits of grain all over the place, some germinating some not.

In later years white remnants of Superphosphate would also be on the concrete base.

The Grain Shed – Painting Tips & Weathering

It would be wise to paint the components as you go to avoid the problem of access later on. You can do touch-ups at the end when all the components are glued together.

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In later years white remnants of Superphosphate would also be on the concrete base.

The corrugated iron roof would also be extremely weathered (Rusted) or brand new (replaced)

Dry brushing and the use of water colours and powders for weathered, would suit this kit really well.

In Conclusion

I hope that you have enjoyed working with this kit and are happy with the result. If for whatever reason you have found a problem with this kit, or there is something that doesn't make sense, or just doesn't work, you can contact me on any of the methods listed below. Or if you have a suggestion that may improve the kit or the methods suggested to build the kit, please let me know.

It is very important that modellers have their say in regard to Keiran Ryan Model kits, and feedback is not just encouraged but is very much preferred.

Positive or negative, feedback has it's place in improving this kit, and for improving other kits in the future.

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