KRM S024 - S024 HO Acrylic Silo

Kit

Instructions for Construction. Produced By Keiran Ryan

Preface

Adding to the range of silo models from Keiran Ryan Models, this kit is the bigger brother of the S008, the S016 Acrylic Silo Kit. This silo kit has a slightly longer footprint than the S008 Kit and has the addition of a larger bin on the left hand end of the silo.

This kit is an acrylic laser cut kit and is consists of laser cut sections of 1.5mm clear acrylic that are tabbed and glued in place to form the basic structure which the modeller can then build upon.

There is no cutting or snapping required, and the modeller obtains a much more completed structure that is more consistent, squarer, and easier to work with. Thank you for you support in purchasing this kit, and I hope to be able to provide more kits of this type, not just for silos, but for other structures associated with model railways. (Any ideas would be appreciated).

These instructions, as you are now aware, are on a USB Stick. The information on this USB Stick is Copyright protected, as are the photos. The modeller can certainly use the information for his or her own purpose, but they are forbidden to use the material to on-sell or trade or sell without the permission of the author of the USB Stick. There are links in this document that will redirect you to the instructions in various formats, depending on your preference. There are also other plans and photos that can be accessed on the USB Stick, which make this USB Stick a one-stop shop, and great reference source. The basic instructions are also available on the <u>Keiran Ryan Models</u> web site if required.

Introduction to this Kit

Disclaimer

This silo is NOT a complete kit. It is an easy starter kit for modellers who prefer to have a model silo for their layout, with the detail work being assisted by using the original article in the Australian Model Railway Magazine Issue 165 in December 1990 through to 167 in April 1991.

The material used in the construction of this kit is 1.5mm clear acrylic and can be very brittle. You will need to be very careful with the material in the process of construction, and to also be careful with thin sections of the material, as they can easily be broken. If you do break a piece, it will glue back together using Dichloromethane.

MEK will **NO**T bond this material.

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.

KRM S024 - HO S024 Acrylic Silo Kit

The parts in this kit make up into sub-assemblies as per the bags that they were packed in. Parts have been checked when packed, but please check all parts in the bags with the check list provided, and if any parts are missing let me know and I will have them replaced.

- ➢ 8 Gig USB Stick
- ➢ 4 Rubber Bands and 4 x 50 mm Conduit and 2 x 110 mm conduit.
- The Silo Base
- The Base Filler Pieces
- The Silo Sub-Frame
- > The Cupola
- > The Annex
- Rear Road Support
- Rear Road
- > 1.2 mm Twist Drill.
- > 1 x 300 mm length of 1.2 mm Brass Wire.
- > 1 x 100 mm length of 16 mm Conduit.
- > 50 mm length of Special Shapes H4 H Pattern Brass.
- 3D Parts include ---- Drainage System, Out loading Platform, Spoil Bin, Wagon Shed Footings, Weighbridge Scale.
- Please Note that on each of the instruction slides, the parts required are displayed in purple on the top left or right to assist you in progress of this kit.

Instructions

➢Please ensure that you read the instructions 3 times before you make a start on this kit ------ (I Know----I hate reading them to, but it helps with the kit).

➢Keiran Ryan Models does have a breakages policy, which states, that if you break a part in this kit, it will be replaced once, but only once, so be very careful

This is a simple step by step process.

> The parts in purple are the new parts to be fitted.

➤The parts in grey are the parts already fitted.

➢Identify parts before committing them to the location. Remove the Plastic/Paper backing before fitting.

>DON'T force the parts, as they are brittle and WILL BREAK if forced.

>DON'T glue parts until all parts of the sub-assembly are in place, and ensure that they are the correct part.

➤There are parts that will need to be clad in corrugated iron (e.g. Campbell's aluminum) and other parts that will need to be painted. The acrylic takes paint very easily.

➤Have fun, as this kit is very easy to build. And I would appreciate your feedback!!!!!

The Outcome

This drawing represents what we expect to achieve when this kit is completed. Naturally the silo has to be finished with fillers, paint, cladding and other parts not included with the kit. And the modeller still requires the parts to build a wagon shed; plans to assist you in this task are included on this USB Stick. KRM S04 (Etched Brass Parts) and KRM S05 (Windows and Doors) are available from the KRM web site

Bin Roof Cupola Sub-Frame Annex Front Step **Out loading Platform**

Spoil Bin

Base









Model?????

A Good Foundation

A good foundation is always a healthy place to start. The silo base can be glued (Selleys Gel Grip or preferably, Selleys contact cement spray) to a 9mm Craftwood base which is screwed to a 12mm Craftwood base which is used as the floor to a storage box for carrying the silo. The foundation of the silo is screwed to the base with 6 x ¼" "T" Nuts and 6 x ¼" ¾ brass cheese head screws. The 9mm bases with ¼" "T" Nuts fitted, are available from K R M for \$30.00 + postage, or simply make your own to the template of the Silo Base .

If you are gluing the base to a craftwood foundation, be careful not to fill the slots in the acrylic with contact cement.

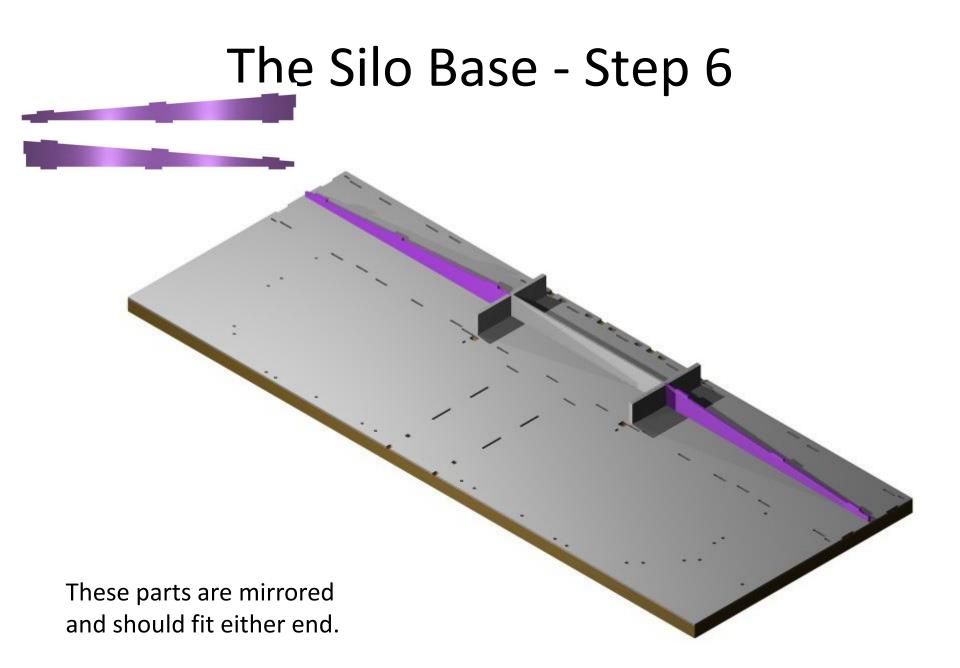
Again, make sure that the tabs fit neatly into the slots, as filing them after gluing the base to the craft wood, will be impossible.

When gluing, allow the contact cement to dry on both surfaces before they are allowed to touch. Rub the acrylic with a firm pressure to make sure that the acrylic adheres to the craft wood.

There are 4 slotted pieces that fit in the general area; you cannot confuse them because they have different bottom tab arrangements. One has 2 tabs and the other has 3. Narrower ones go to the outside, as in the next drawing.

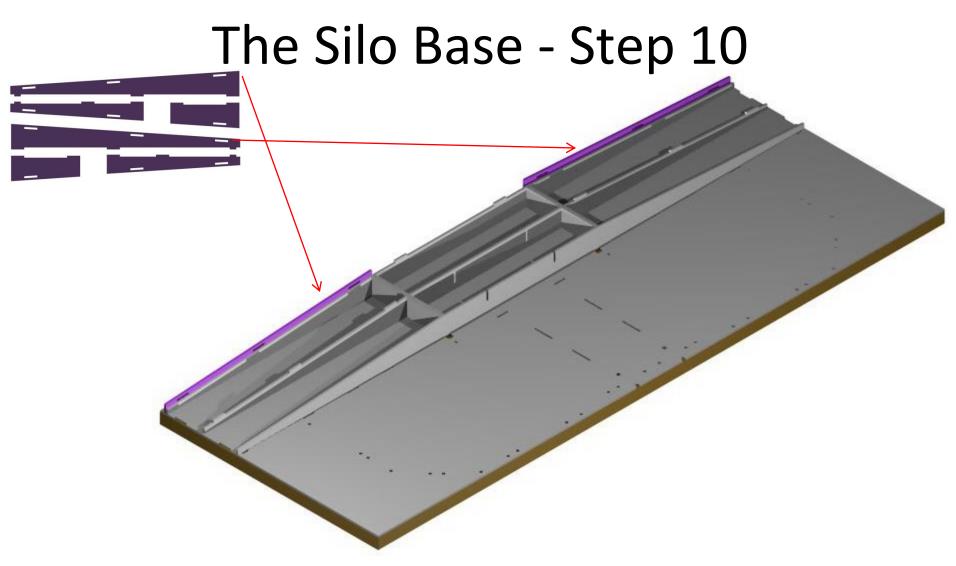
The 2 leg and the 3 leg parts are virtually laminated together.

Test fit all parts and ensure that they are all the way into their appropriate slots, before gluing.



This section is made up from 2 pieces that fit neatly together. The back two have tabs in the top with no slots. The top tabs are used to locate the back road, the inner two have slots in them.

The parts to the right of screen are fitted next and tap into the parts previously fitted. Again test fit all parts prior to gluing, and file any slots and tabs to fit if required.



These parts are used to support the rear road.

The inner parts are in 2 sections to accommodate the large storage bin

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The above pattern indicates that the footings at locations "X" are at 90 degrees to the other footings These are the 3D wagon shed footings that are fitted into slots on the base and locked in place by the 6 acrylic supports fitted in Step 15, ensure that the footings are in the correct orientation.

The inner support, gives support for the rear road.

These parts are used to lock the support pieces and the road supports all together.



The end plates fill in the gaps at the end of the silo, and are not seen when located in place on the layout.

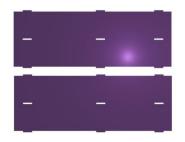


These support parts, assist in giving the wagon shed footings a secure location.





Test fit the rear road and weighbridge support, don not glue into place at this stage as you may need to adjust the fit of this part, be very careful with the fine edges of this part.



The rear road ramps are fitted into the supports on the sides, and slotted into the middle road supports.

The final base with all the previous parts fitted. The drainage system is next.

The 3D drainage system is made on a small fret, the pieces need to be removed from the fret (once identified) and the small extrusion should be removed so that the base of each piece is flush apart from the 2 mm tabs that fit in the base of the silo

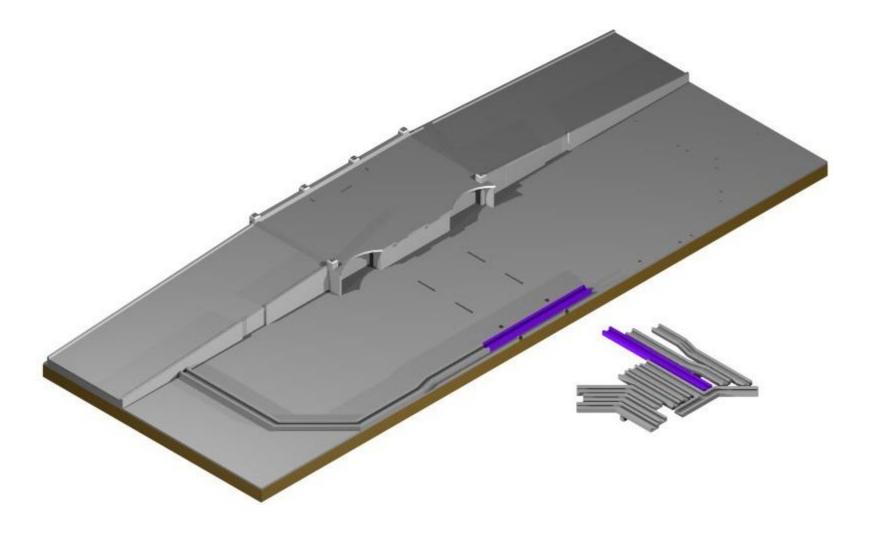
This is a step by step process. You need to identify each part and fit it into the silo base, in the appropriate locations. Clean the extrusions to the support fret off the base of each part but do not remove the 2 mm tabs.



Each part is designed only to fit in one place, and fill the joint with a filler such as Tamiya putty, and then sand the joint smooth.

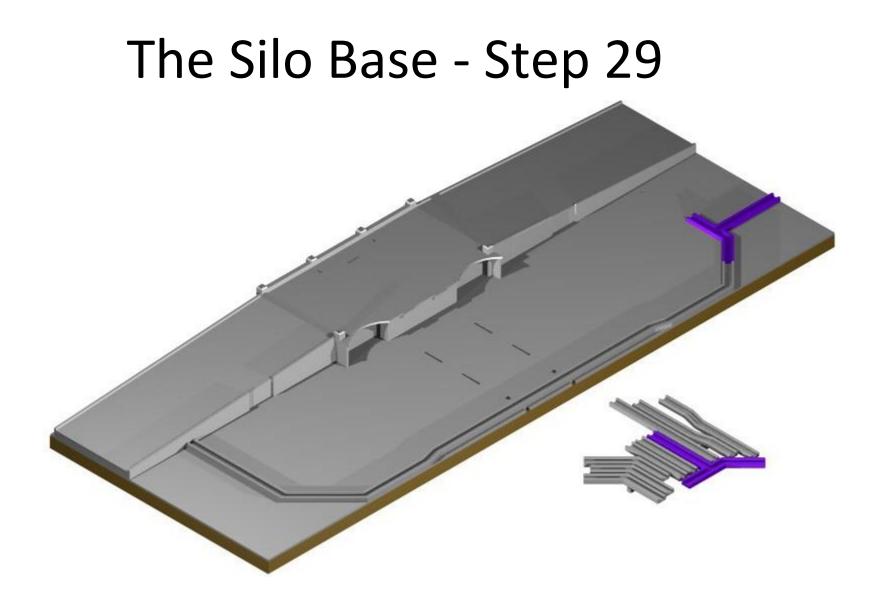


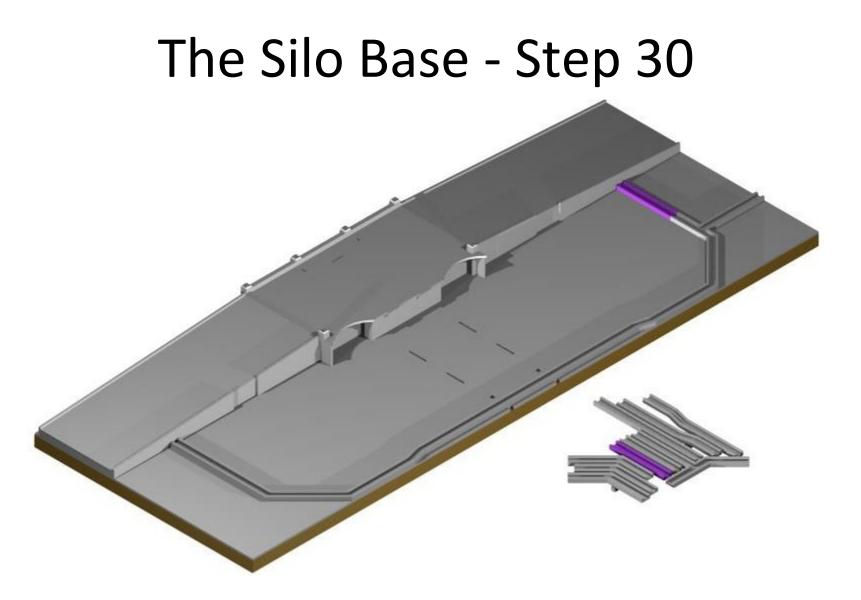




Just remember to only remove the tab joining the parts to the fret not the 2 mm tabs







The Silo Base - Step 31

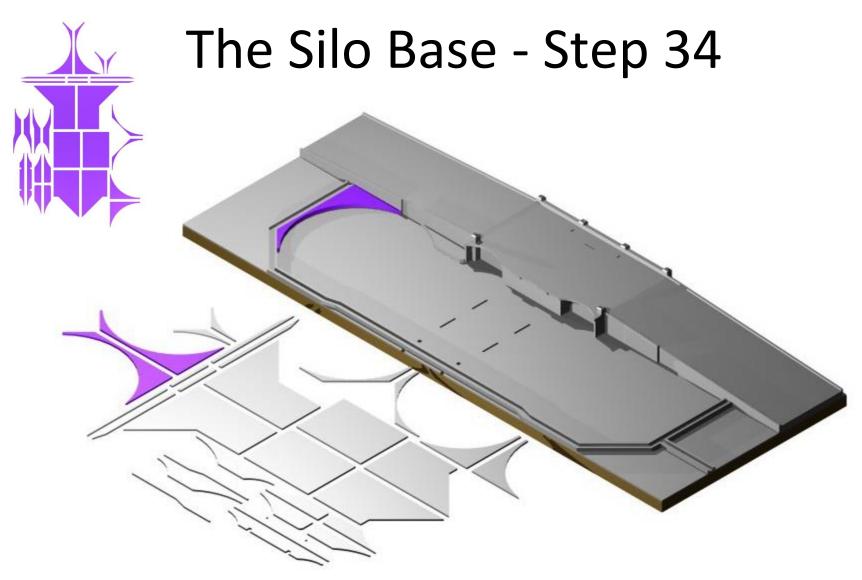
The finished drainage system in place, do not forget the fill the joints and sand smooth



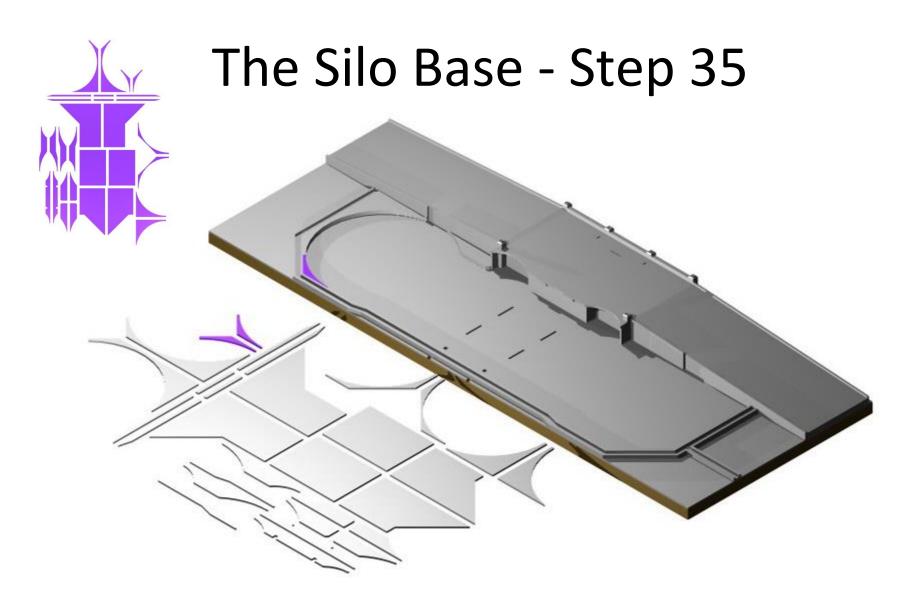
The following slides, show the parts used to fill the silo base that would normally be filled with concrete in the prototype.



The fill process shows 2 of each piece, this should allow it to reach the height of the drain.



Some of the parts are small, sharp, and fragile, and should be test fitted before gluing into place.









The scale fits centrally against the back of the road.

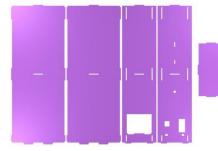


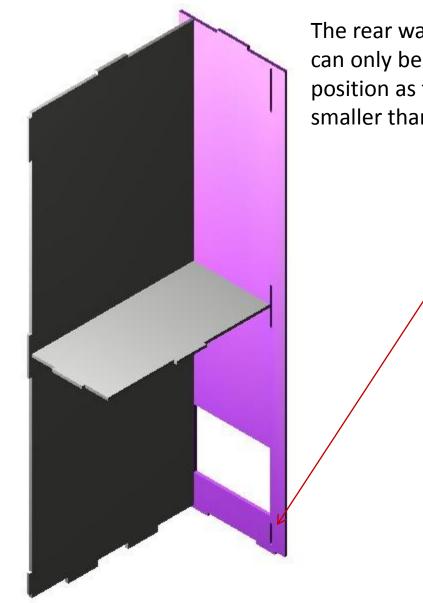
So Far, So Good!!!!!!

- Now if you have got this far without any problems, the hard bit is done only kidding there are plenty of hard bits to go (joking).
- The base is now all glued together (there is more work to be done on it but more about that later) and can be set aside to dry, while you proceed with the next sub assembly ---- the Silo Sub-Frame.
- The Silo sub structure, consists of the centre elevator of the silo and the top and bottom of the silo.

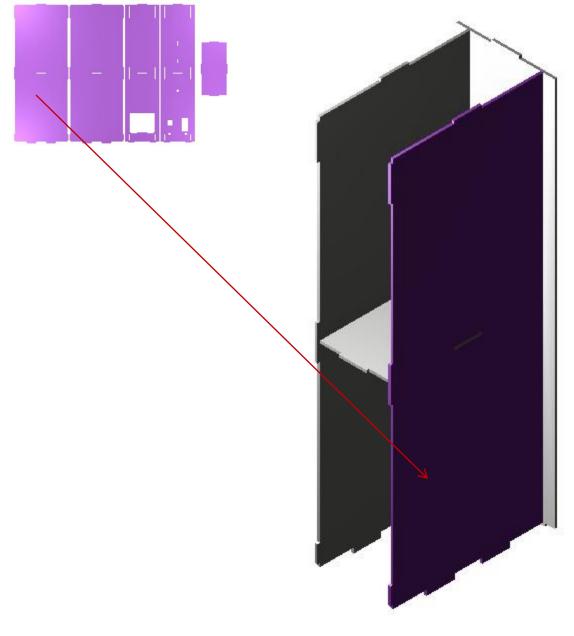
The sub frame is the centre of the silo, and is the main stay for the build of the silo, so time should be taken to get the construction correct.

Start with one of the spreaders (identical) and the centre support. Ensure that you test fit all parts before gluing.



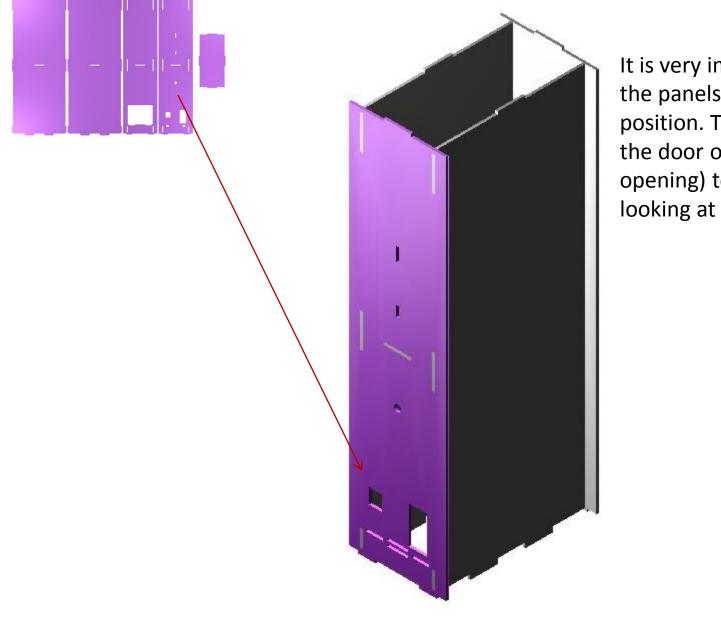


The rear wall is fitted next and can only be located in one position as the lower tab is smaller than the others/



I have found that after test fitting the parts, the best thing to do is to dry fit the parts and secure them with 3 elastic bands (supplied) and then run the glue into the joints and place the parts aside to dry.

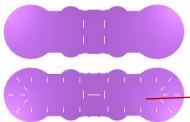
Ensure that you do not glue the elastic bands to the sub-frame.



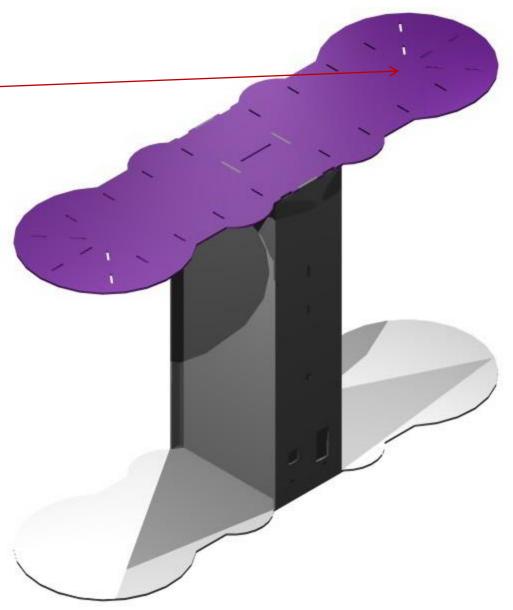
It is very important to place the panels into the correct position. The front panel has the door opening (larger opening) to the right when looking at the front of the silo.

The next step is to identify the top and base parts of the silo. The base only has tabs for the base of the subframe to fit into.

The parts (when located) can be easily broken, so it is very important that the parts be handled with extreme care.



The top of the silo is located in place and secured with glue.



The small bin sections (supplied 50 mm conduit) are test fitted next. These parts have been faced and should be squared and to the correct height. If you find any vast differences (too tall, or too low) they can be sanded or filled.

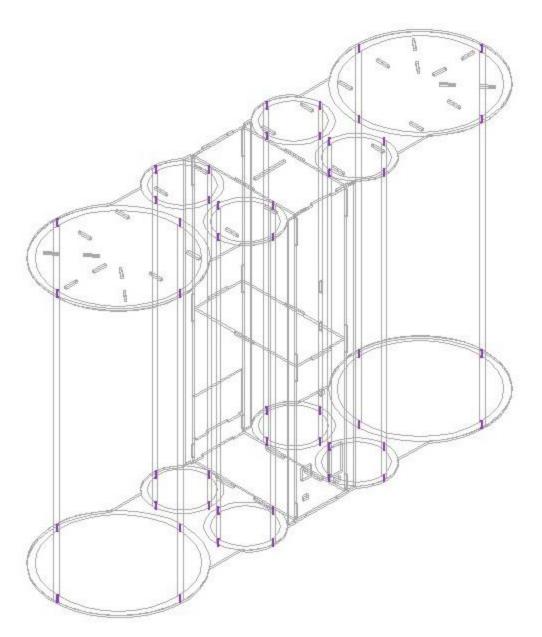
The bins are secured with brass pins from 1.2 mm brass wire (supplied) view in step 9.

The large bins (110 mm conduit) cab be test fitted now and the same rules apply as per the previous smaller bins.



The purple lines in this drawing, indicate the 1.2 mm wires (supplied as is a 1.2 mm drill).

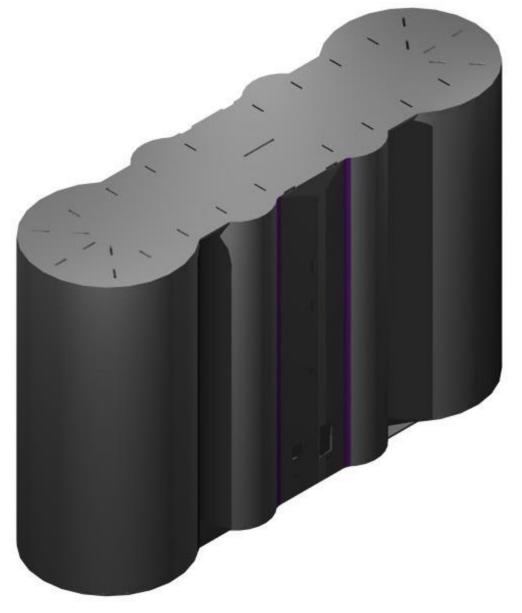
The holes for the wires should be drilled centrally into the conduit. 10 mm lengths of wire are trimmed and fitted into the holes with supa glue and filled flush with silo (top and base)



The joints where the bins and fitted to the front and rear walls of the sub-structure, need to be filled and sanded smooth.

To assist with this process a 100 mm length of 16 mm conduit is supplied to get the correct profile for the joint (you will require to supply the body filler).

As the filler is going off, remove some of the larger excesses of filler, and sand the rest smooth with wet and dry sandpaper.



The sub-frame ready to be worked on.

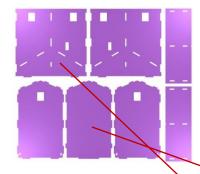
This is now the time to locate the holes for the doors and vent. Working with the silo at this stage, prevents any damage to any protrusions that will occur with the inclusions of the roof.

The structure is much easier to handle at this stage



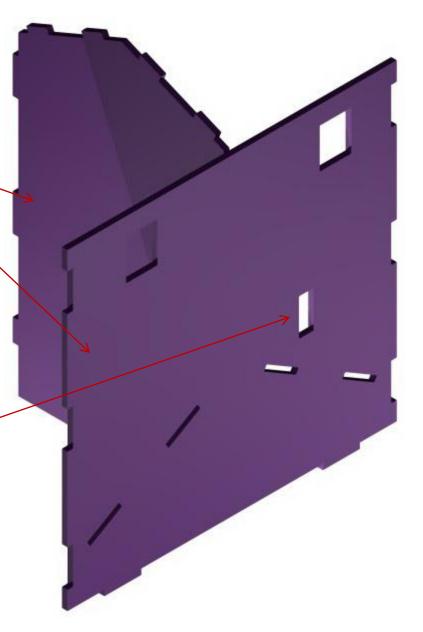
Onward, and upward

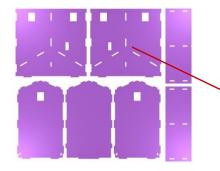
- The Cupola and Bin Roof need to be fitted next but some work is required on putting the holes in the bin walls to accommodate the vents and doors.
- It is handy to have some photos of the silo that you would like to model, so that you can get an idea of the location of these doors and vents. Use the castings as a guide to the size of the holes required to fit these parts.
- The reason for this is simple, when the roof and the cupola are attached to the silo it becomes more difficult to handle and work with and damage to these parts can easily occur.
- Lets proceed with the cupola.



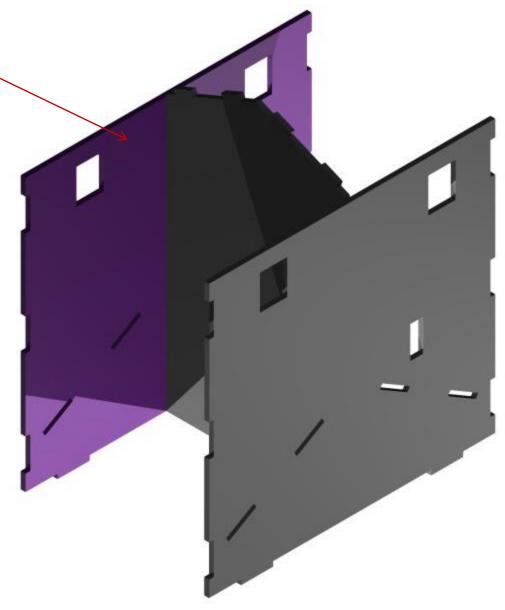
The cupola is a very simple structure. It is located on the top of the substructure, and is used to allow the roof of the large bins to line up.

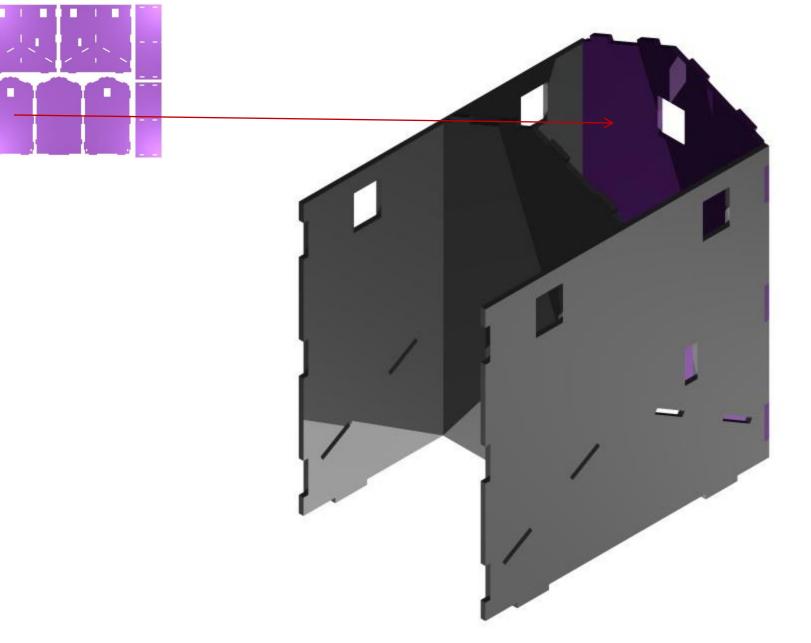
It is important to note that the hole in the cupola wall, (used to fit a delivery chute) should be to the front of the silo.

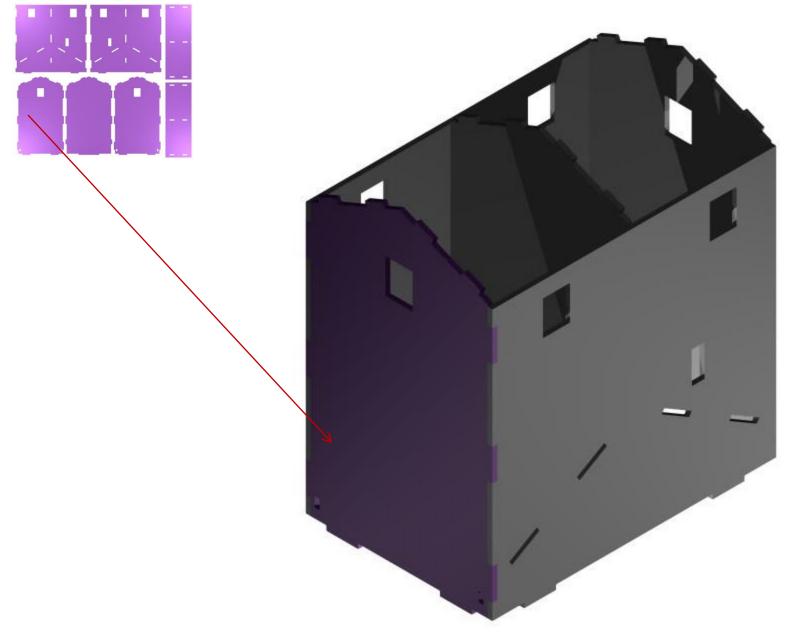


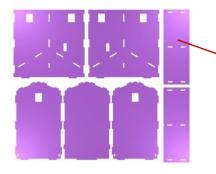


The elastic bands use to secure the parts in the sub-frame, can be used to secure the parts of the cupola, so that glue can be run along the joints.

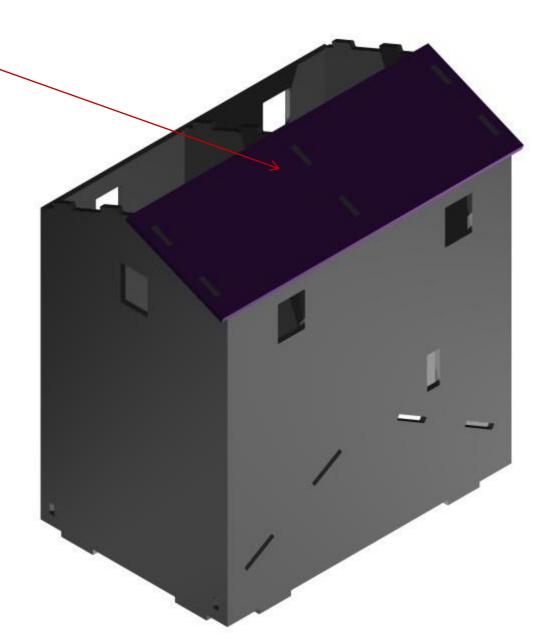


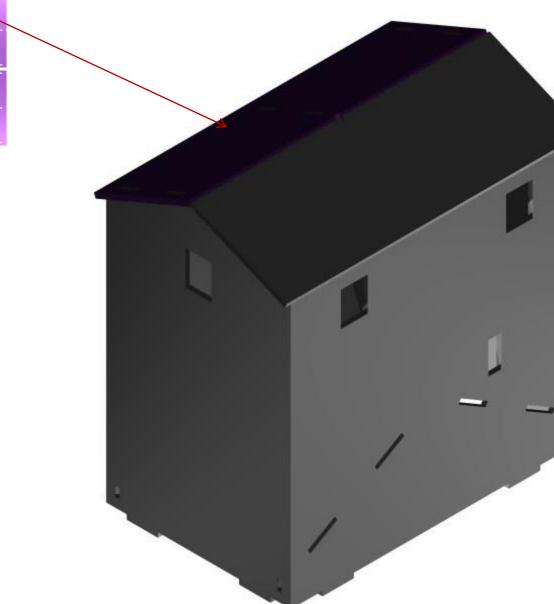


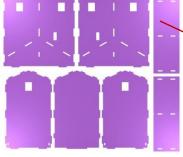




The roof parts have a very small slot in the centre of each piece, this slot is located to the centre of the cupola, on both roof panels.



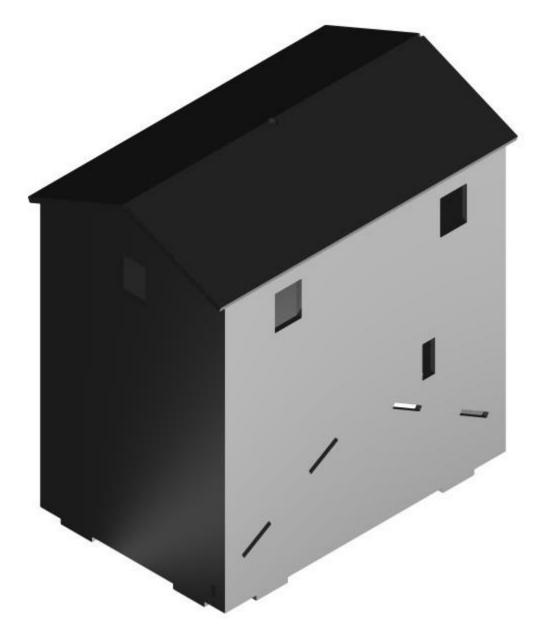






All done.

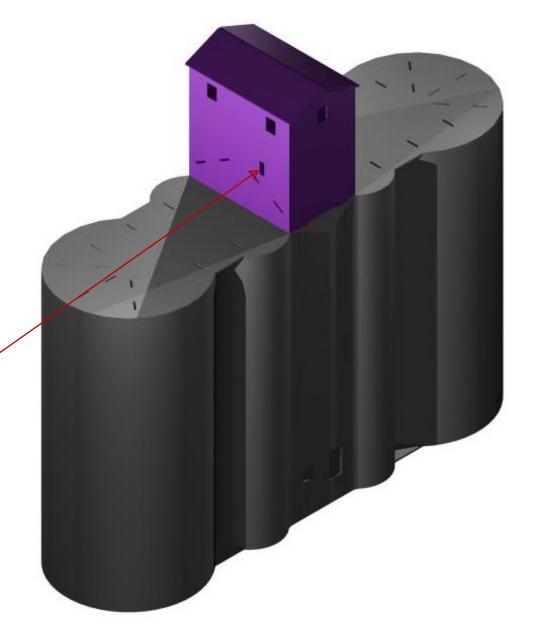
The finished cupola, ready to be located on top of the subframe and ready for the large roof to be fitted.



Another Step Down – Nearly Done

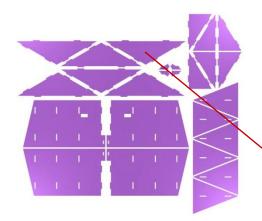
- The cupola can now be left to dry.
- Once dry, the next step is to place the cupola onto the sub-frame and start to build the roof in situ.
- So let us proceed to that next process.
- Remember to dry fit the parts, so that they can be checked for fit before gluing into place.

Silo Roof - Step 1



Place the cupola on top of the prebuilt sub-frame so the side with the rectangular holes goes to the front of the silo

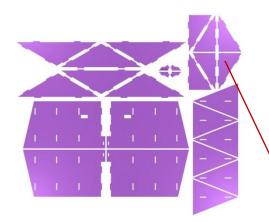
Silo Roof - Step 2



The 6 roof profiles are located next, dry fit before gluing.

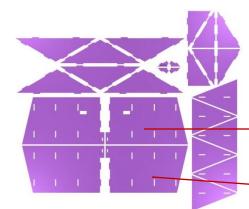


Silo Roof - Step 3

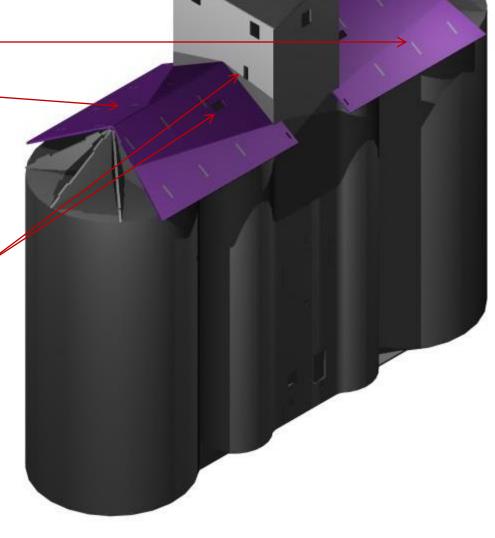


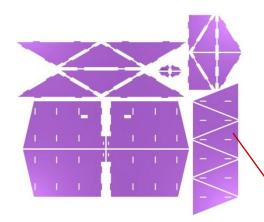
At the end of the silo, the roof has 3 angled profiles, and the supports for these profiles are located in place.



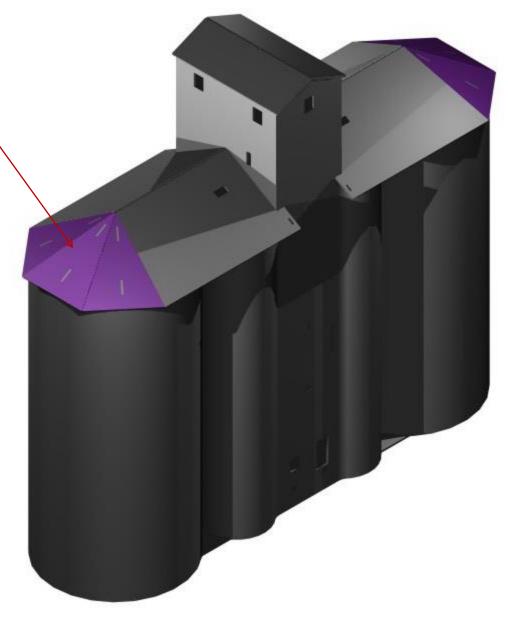


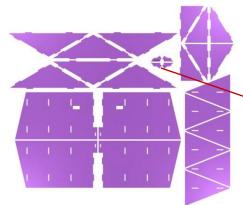
The long roof parts are located next, and please ensure that the they are aligned with the slot in the roof aligned with the slots in the cupola.



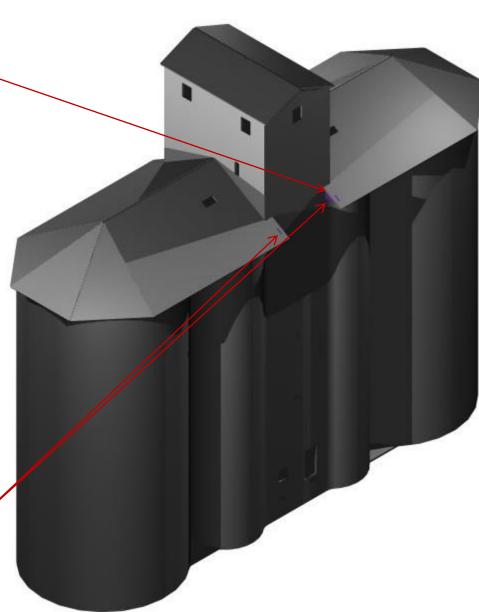


The end roof panels are next and this process may involve a little bit of adjusting , to get the segments absolutely square with each others





The final pieces are to be placed along the inside edge of the roof against the cupola, these pieces are very small and can be easily lost, so be careful, if they fall to the ground.



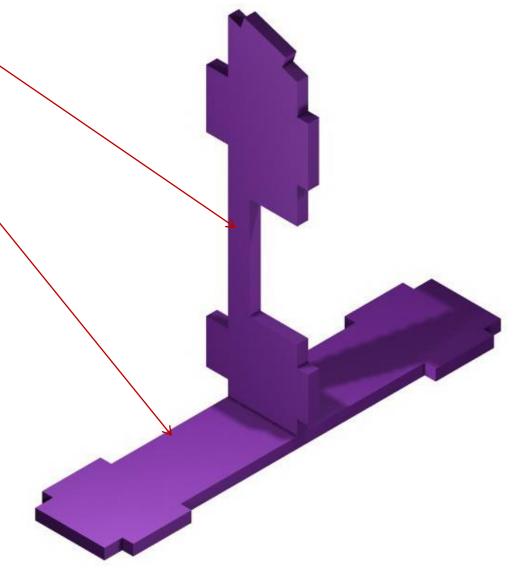
The finished substructure, cupola and roof.

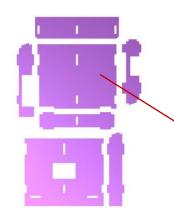


Another Step Down – Nearly Done

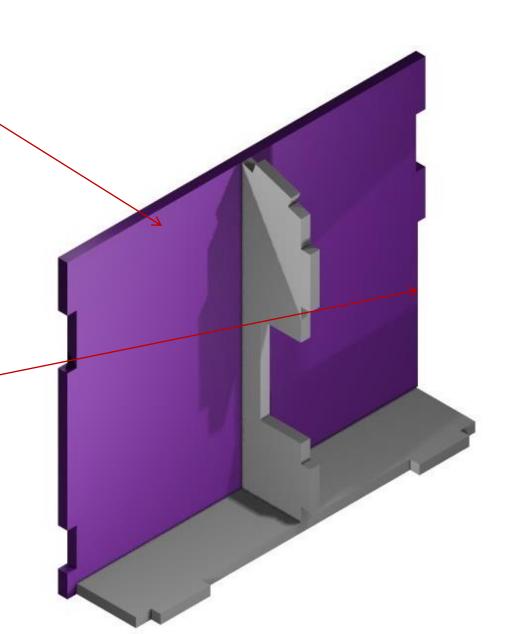
- The main sub-assemblies are now built. Now we can concentrate on the smaller sub-assemblies.
- These smaller assemblies are very easily fitted to the main assemblies at a later time.
- Firstly the Annex, then the Spoil Bin, The Out loading Platform, the rear Step and the Front Step
- The Annex is located on the front of the silo and slots are provided where it will fit.

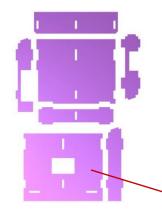
The annex is fitted to the centre of the front panel of the silo, and starts with the centre piece secure to the annex base.



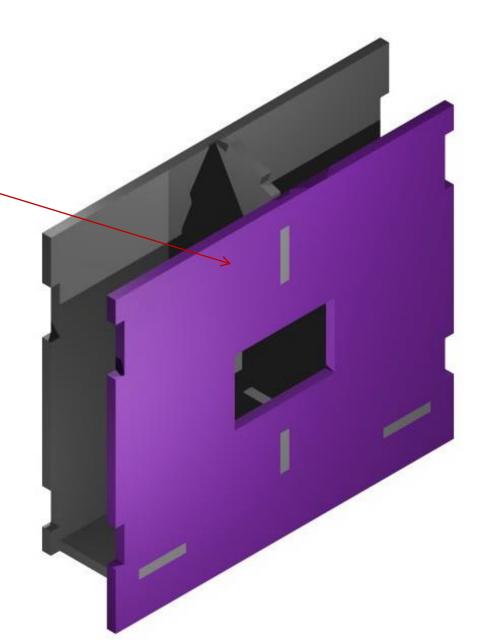


The rear panel has two small slots on one side and the other side has one small slot and one large slot, and this side goes to the right.



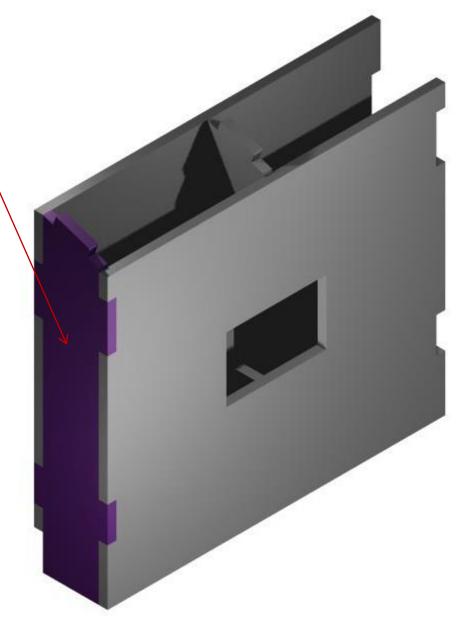


The front panel is symmetrical and there fore fits either way



The left side panel is fitted with the roof slopping to the front (sounds strange I know, but it has been fitted backwards in the past.)

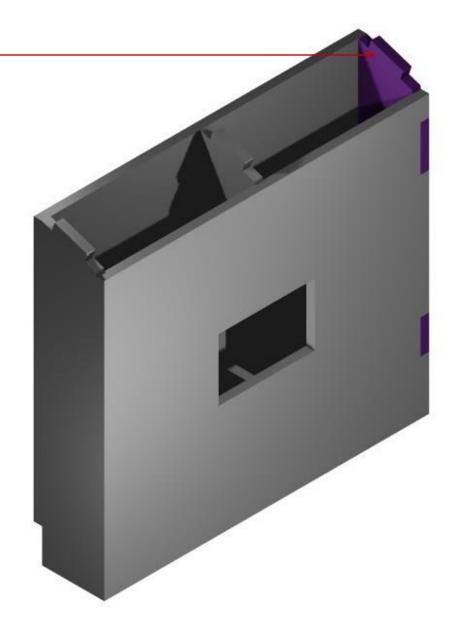
Silo Annex - Step 4

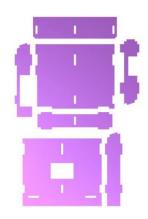




The right panel is very fragile and can be easily broken.

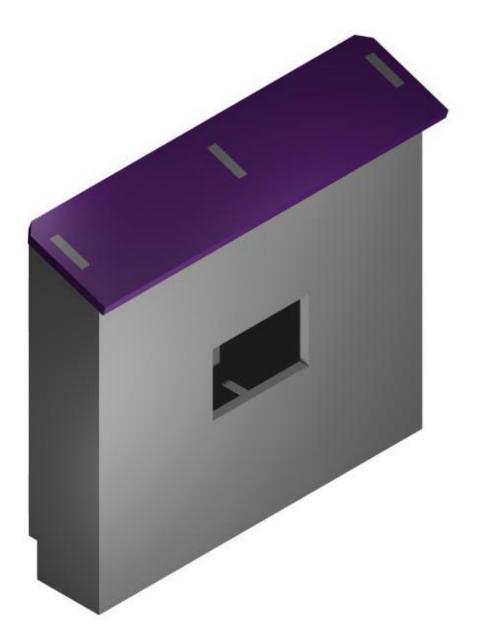
The narrow door is fitted to this side of the annex.





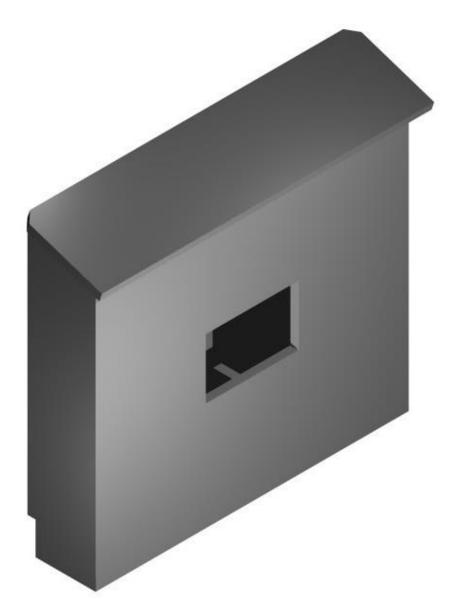
The roof line slopes down from back to front. The small angle sections accommodate the joint between the bins and the front wall. You may need to adjust the roof to fit the silo by filing or sanding.

Silo Annex - Step 6



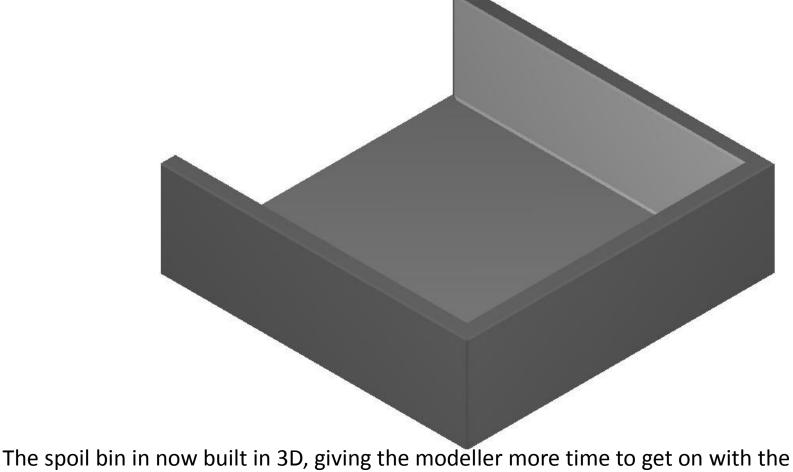


All Done



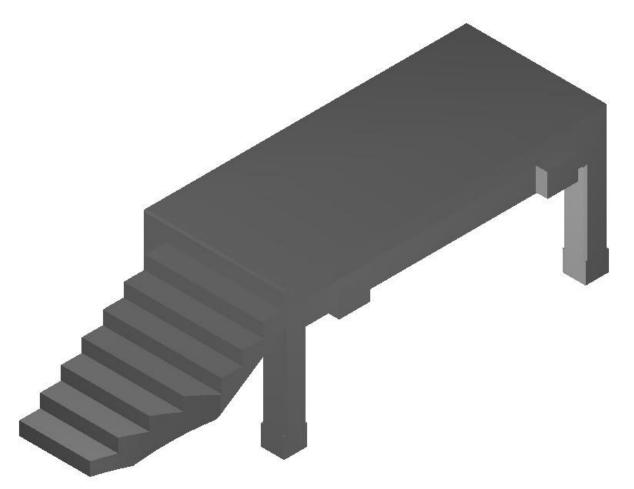
The finished (not yet clad) annex. You may notice that there are 2 tabs protruding out the back of the annex. These are to assist in locating the annex to the sub-structure.

Silo Spoil Bin

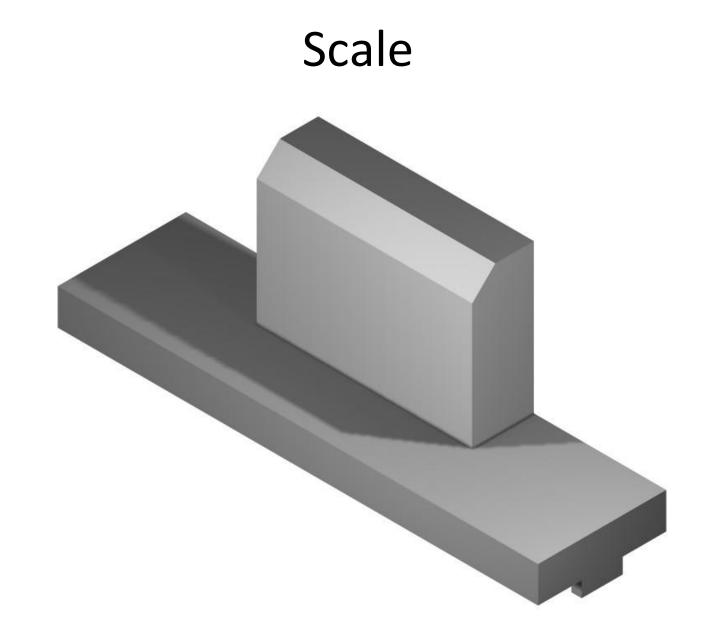


The spoil bin in now built in 3D, giving the modeller more time to get on with the build process, it was previously built up from 8 acrylic parts.

Out loading Platform

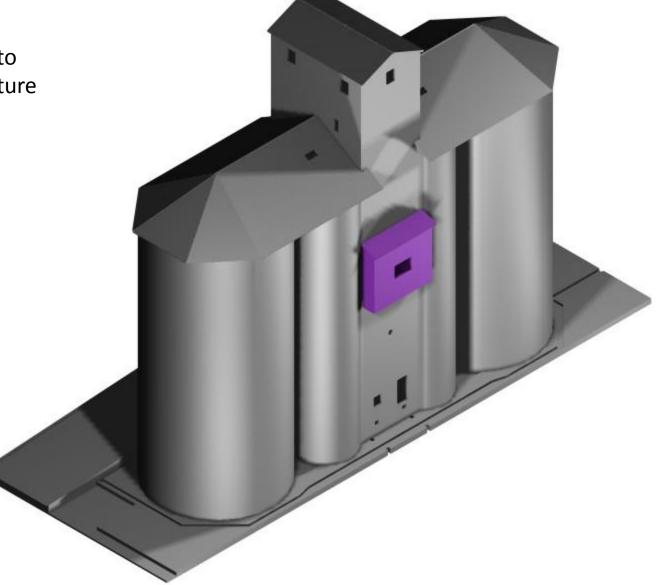


The 3D out-loading platform id also now in 3D and was previously made from 18 individual parts.

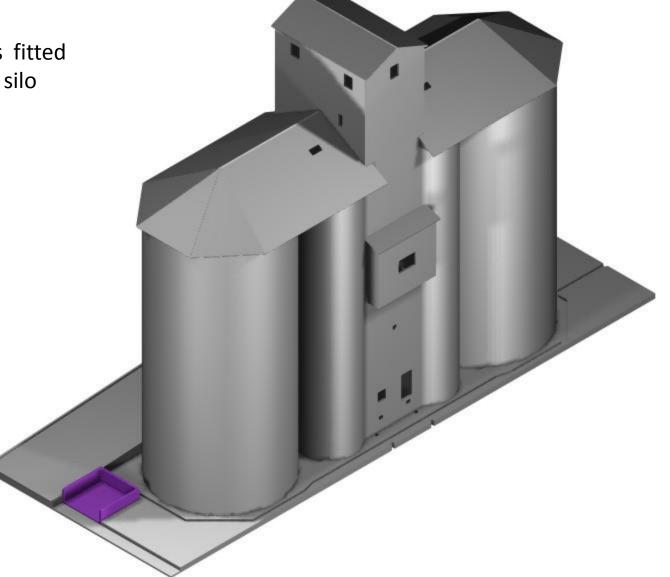


The scale is also now in 3D and makes the fitting so much more easily.

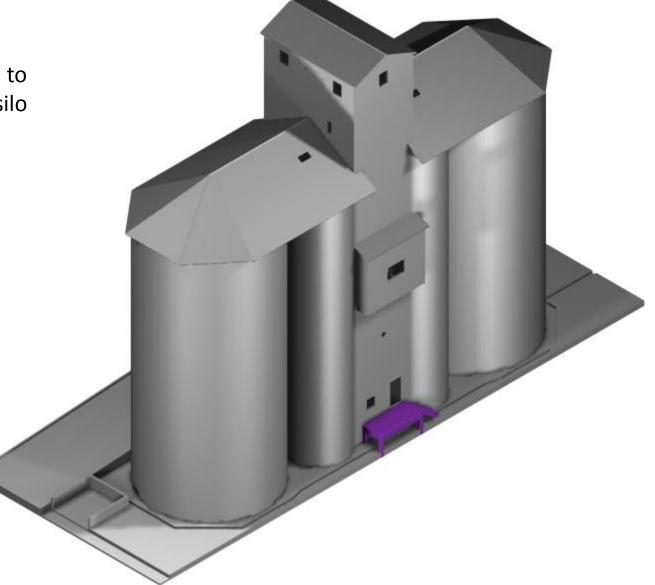
The Annex fitted to the silo sub-structure



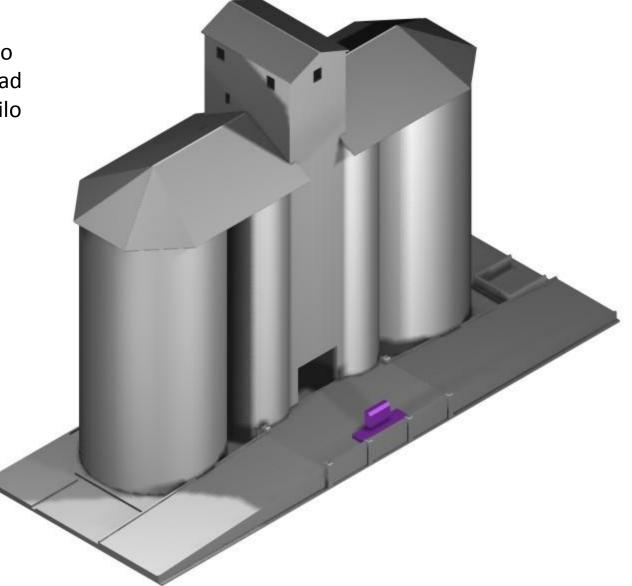
The Spoil Bin is fitted to the finished silo structure



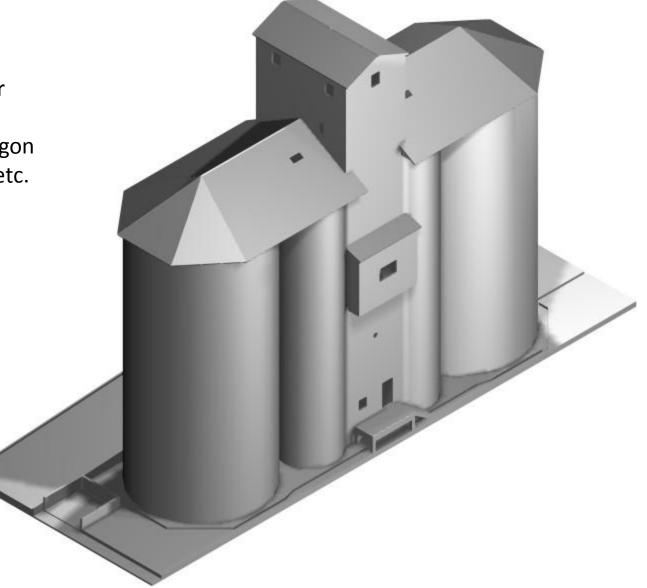
The Out-Loading Platform is fitted to the front of the silo sub-structure.



The Scale is fitted to silo wagon shed road at the rear of the silo



The finish silo structure ready for cladding and the building of the wagon shed, downpipes etc.



Putting it all together

- Although the sub-assemblies can now go together, there is work to be done on each sub-assembly before they are joined permanently.
- By all means test fit the parts, but be aware that there is much work to be done before they can be permanent.
- Some of the work will require other kits such as the KRM S04 Etched Brass Parts Kit, and the KRM S05 Accessory Parts Kit.
- These kits are in available.
- Hints on cladding are also available in this presentation.
- The Information in the next few slides is not comprehensive and more detail can be found in the original article in the AMRM.
- Let's start with the Silo Base.

Putting it all together - The Base

- The weighbridge and partitions need to be fitted (KRM S04 Etched Brass Parts Kit)
- The base will need to be given an undercoat, joints and tab slots filled and sanded to represent concrete (new or old – your choice).
- If the silo you are modelling has electrical conduits and electrical control box, go ahead and fit them.

Putting it all together - The Sub Frame

- > The Sub-Frame will need to have door holes cut in the bins.
- Down pipes will need to be fitted to all 6 Bins, made up from 1mm brass wire and the Astragals supplied in the KRM S04 Etched Brass Kit.
- The rear door will need to be fitted to the Sub-Frame (KRM S004 Etched Brass Kit).
- The front door and window and the bin doors will need to be fitted to the Sub-Frame (Bins) (KRM S04 Parts Kit).
- There is also a down pipe from the annex to the base of the silo that will need to be fitted.
- And a Ladder/ Ladder Guard will need to be fitted to the front of the silo on the right side of the Annex.
- The joints, bins and front and rear panels will need to be filled with a twopart auto body filler, using a 16 mm conduit (supplied) to achieve a neat blended contour.
- The large joint on the sides, between the bins, needs to be filled by body filler, and can be done in a similar way to the other joints, using the 16 mm conduit to obtain a nice even contour.
- And finally the Sub assembly will require sanding and painting then fitted in place.

Putting it all together – The Cupola, Bin Roof

- Glue the Cupola to the Sub-Frame.
- Fascia and guttering need to be secured to the cupola and bin roof. Fascia from 10"x 2" Evergreen Styrene, and guttering from small Evergreen "C" channel(1.5 mm).
- The Cupola and Bin Roof needs to be completely clad with Campbell's Corrugated Aluminium. The cladding overhangs the silo bins by a scale 4" -6".
- The cladding comes in various sheet lengths, but my preferred option is to obtain the 12ft length, as other sizes can be cut from the longer sheets. And always start the cladding at the lowest point and clad up to the highest point.
- Ridge capping made from 8"x 1" styrene with 0.025" styrene rod for the ridge.
- Downs pipes are fitted on both sides of the Cupola, and are distributed onto the bin roof by a "T" piece. Two astragals each side secure the down pipes.
- Lead flashing can be made from masking tape, cut into thin slithers, and placed in the appropriate locations, with the cladding on the outside of the flashing fitted after the flashing is located.
- Finally windows need to be fitted to the cupola.

Putting it all together - The Annex

- Fit the barge board and fascia (same as main silo)
- Fit the guttering
- Fit main beam and cross beams under the Annex, as well as a locating loop for the winch rope to go through
- Clad the Annex roof
- Clad the rest of the Annex from bottom to top
- Fit the down pipe (using photos for reference)
- Fit window and door after painting the Annex
- Only glue the Annex in place with a couple of dots of white glue so that it holds in place but can be removed if required..

Putting it all together - The Out loading Platform

- The Out loading platform can be modified with a pipe safety barrier if required
- The front steps can be glued to the Out-loading platform, but be very careful when fitting the platform and steps to the base and Sub-Frame
- Use photos as references for various out loading platforms.

Putting it all together – The Out loading Chute, Winch and Pulley

- > The Out loading chute needs to be scratch built, as per the original article.
- At this stage the pulley and winch also need to be scratch built, but this is being looked at.

Putting it all together – The Wagon Shed

- The Wagon Shed is built from plans in the original article, as well as the plans supplied on this Flash Card.
- The vertical beams for the wagon shed can be made from commercially available H beam (Special Shapes H4).
- The battens and purlins can be made from Special Shapes' 3/64" square brass, which gives more surface area to solder to the beams than brass angle would allow.

Corrugated Aluminium

➤Campbell's Corrugated Aluminium is my preferred cladding material to use when cladding Australian buildings in HO scale. It comes in 4, 6, 8, 10 and 12 scale ft lengths, and the best value is the 12 ft packs.

➤I make up a template with one full sheet, marked with a thin black Pental pen. This is used to make the other sheets. I then cut the sheets with a ruler and sharp snap off blade. If small sized sheets are required, they can be cut from the 12 ft sheets.

➤The material is them overlapped by 1 corrugation, and is glued to the building, using Selleys Gel Grip.

➤The layering of the cladding is important. It must be layered from the bottom up, with the overlapping dimension not being all that important.

>The use of prototype photos is essential to achieve the correct look

➤The material can be obtained from the retailers mentioned on the resources page.

Resources

- Brass Section
 - Special Shapes Brass
 - ► <u>IR Models</u>
- Styrene Section
 - Evergreen Styrene
- > Paint
 - Floquil Paints
- Corrugated Aluminium
 - Model Railroad Craftsman
 - > <u>The Railcar</u>

- Local Suppliers
 - Casula Hobbies
 - Berg's Hobbies