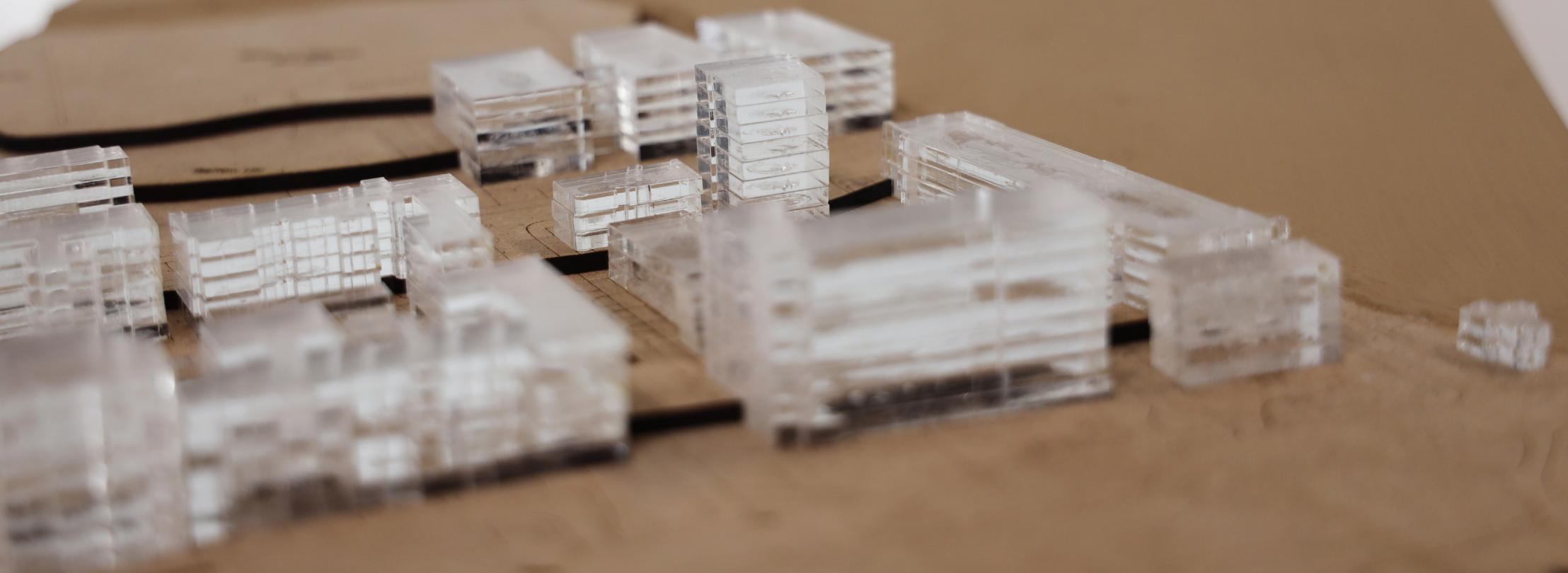


Site models

A guide for physical modelling



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This guide will focus on the steps to generate 3D models.

Please refer to the Modelling Techniques guide for preparing 2D CAD files.

Q: What are ways to make site models?

A:

There are many ways to make site models. However, it is important to consider the condition of the site to pick the best methods. These are the factors to consider:

- Landscape and topography, ie: flat site, hill site etc.
- Urban surrounding, ie: streets, neighbouring buildings, public spaces/concourse etc.
- Natural environment, parks and greenspaces
- Body of water, ie: rivers, lakes, reservoirs and coasts etc.

After carefully considering these factors, you need to think about what factors you would like to emphasise in your site model. It usually falls into three categories:

- Flat urban landscape
- Hill landscape
- Mix of above

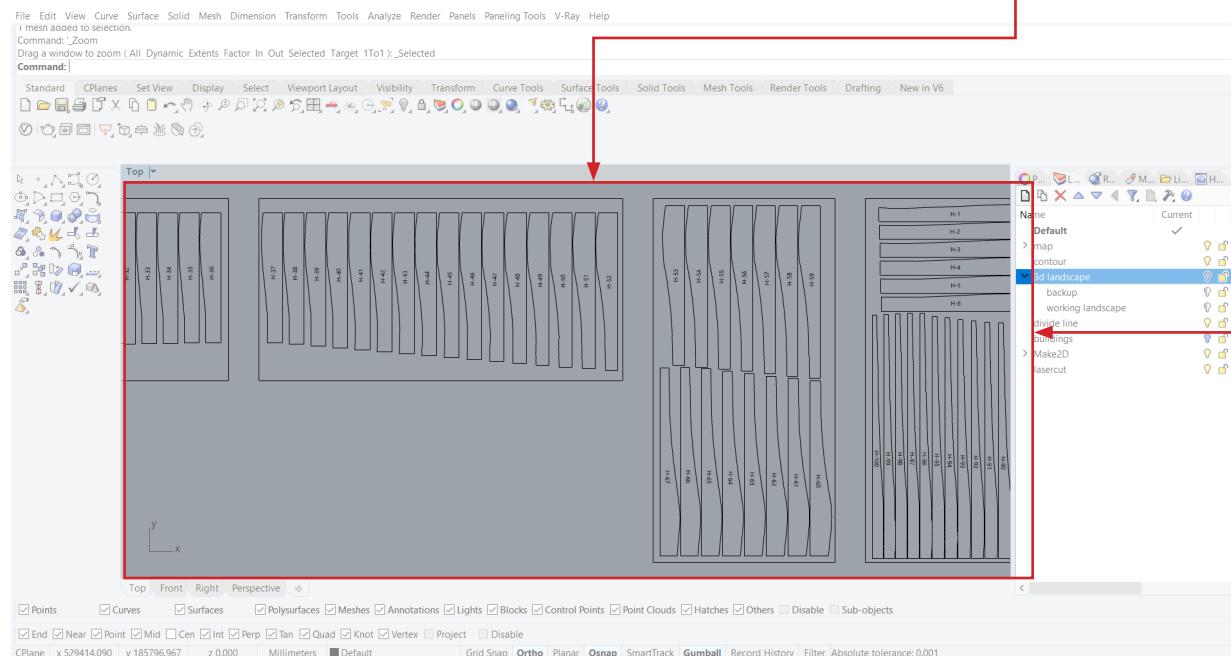
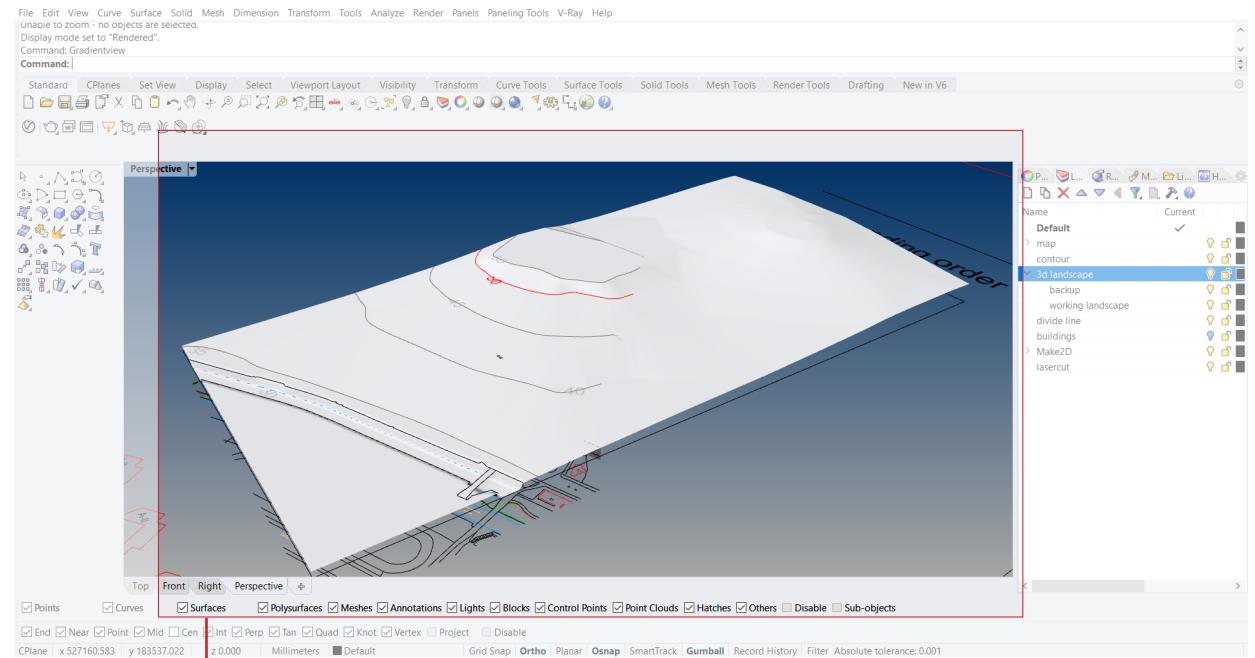
Then you will need to prepare for the GIS data of the site for your model. You shall be able to obtain the data from Digi-map for free with university credentials. However, we will not dive into that in this guide.

This guide will focus on the design strategy to prepare a model that can be produced with laser cut available in the university facility. The sample model used in this guide contains a relatively flat urban surrounding well as a hilly landscape, which provide demonstrate Vertical and horizontal slicing techniques that produces different results.

Disclaimer: the model used in this guide is specifically design to show different methods in one go and under normal circumstances it is not advised to do so. We recommend you to choose one method only.

Smooth Terrain / File prep

Terrain is an important factor to consider when it comes to design. Contour lines are vertically spaced planes that slice the terrain at a given height. Sometimes it is important to emphasise the topography of the site but the typical contour line model just doesn't carry the same impact as a full-fledged terrain model. This can be achieved by slicing the digital model horizontally and laser cut the profiles for assembly. This method can achieve a smoother results than the conventional contour line model.

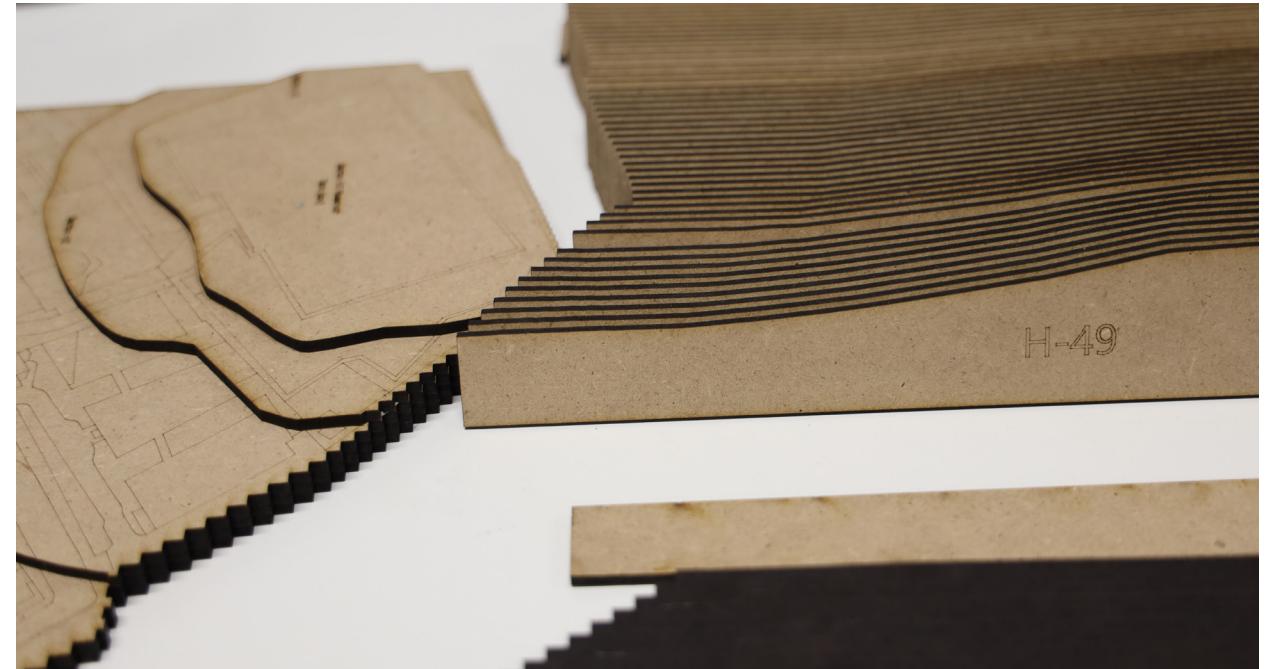


1. In this example, we will slice part of the site horizontally to produce a full-fledged terrain model. And in addition, we will use it in conjunction contour-line model to incorporate engraved details such as streets, buildings and public spaces in the site model.

Please refer to the Lasercut technique guide for more details in terms of file preparation and other modelling skills. After producing the pieces, use PVA/wood adhesive for gluing the pieces. And use clamps to make sure the model pieces are glued properly.



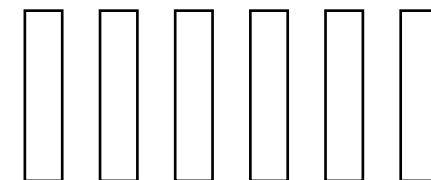
Make sure you layout the pieces in order and assemble them by following the number sequence. Pay attention to whether to use ascending or descending order for assembly. Please double check with your digital model to prevent mistakes.



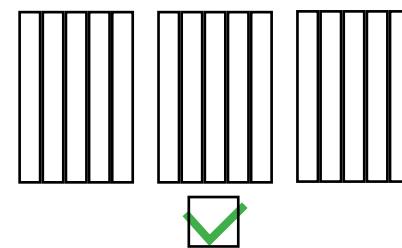
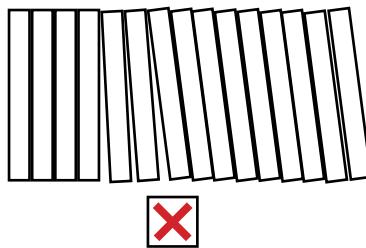
1,2,3,4..... ascending order



.....4,3,2,1 descending order

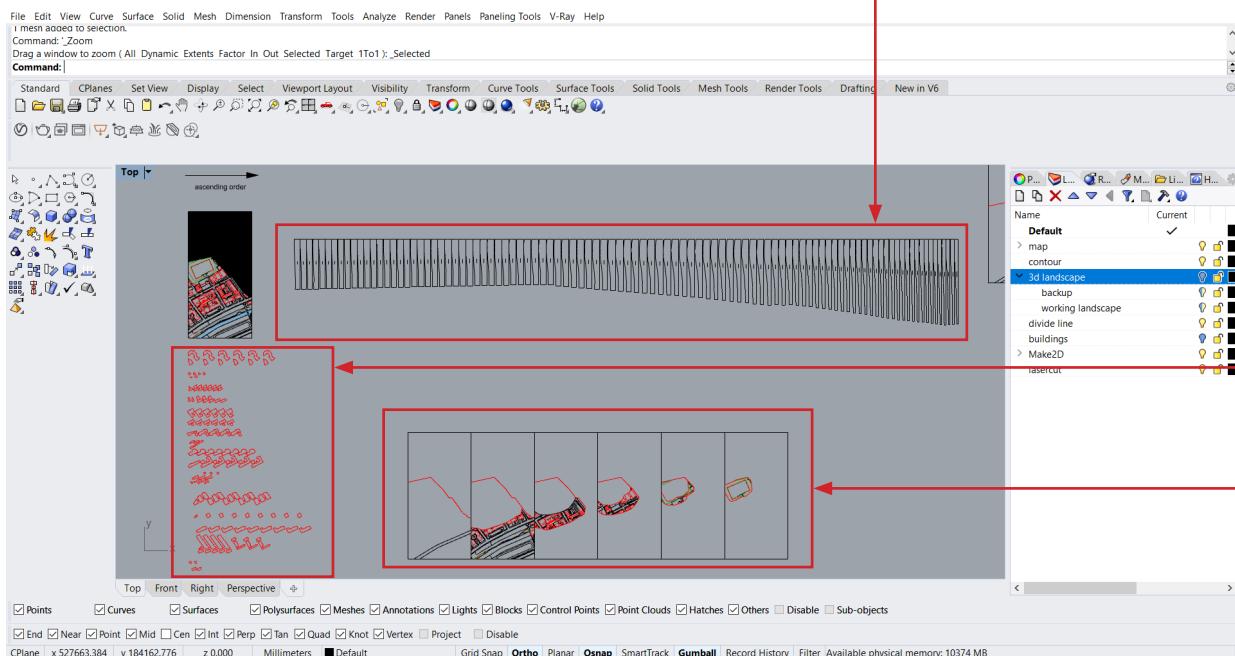
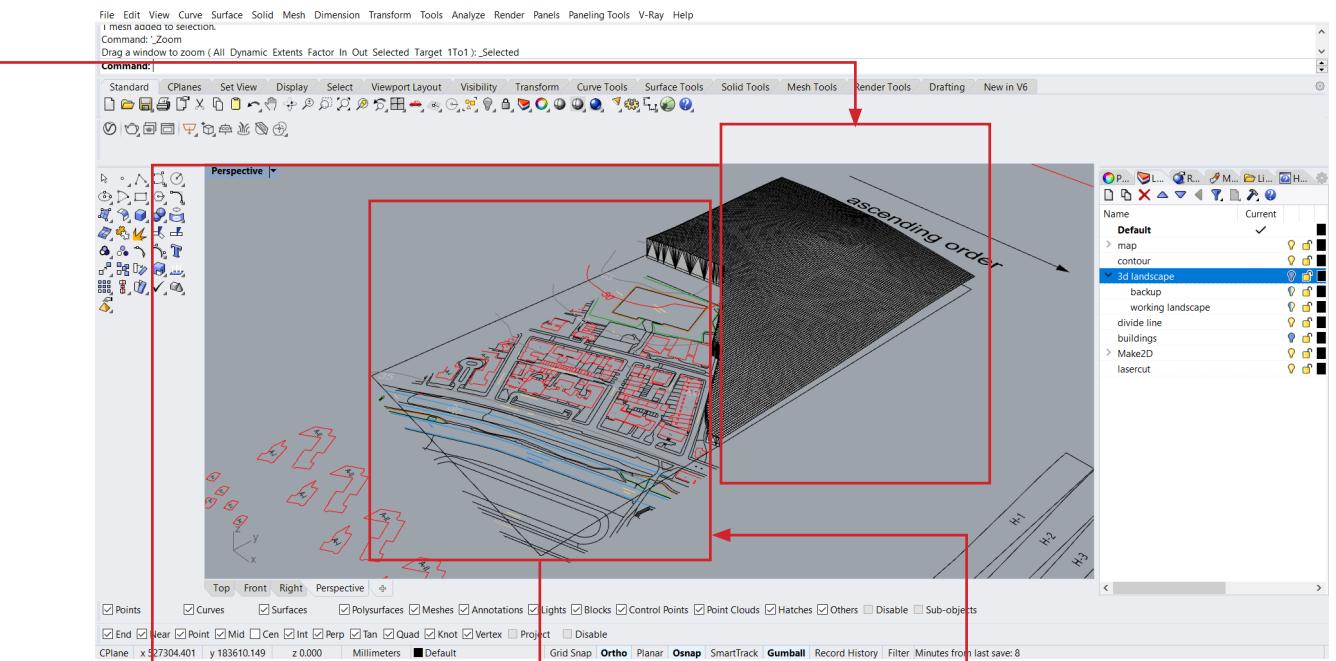


For large amount of pieces, organise them in groups and glue them separately in bundles before assembling large pieces. This is to prevent pieces from slipping to one side and affect the final results.



Contouring / File prep

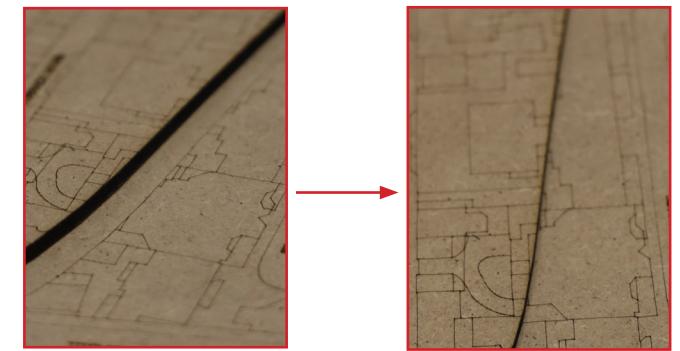
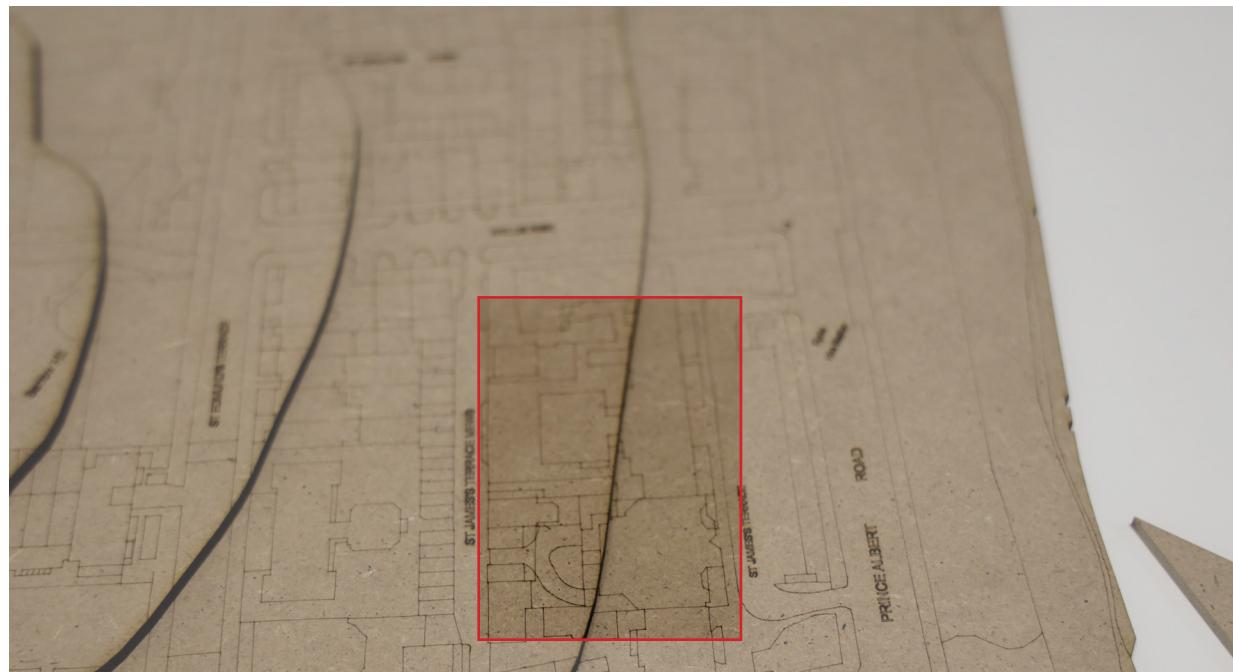
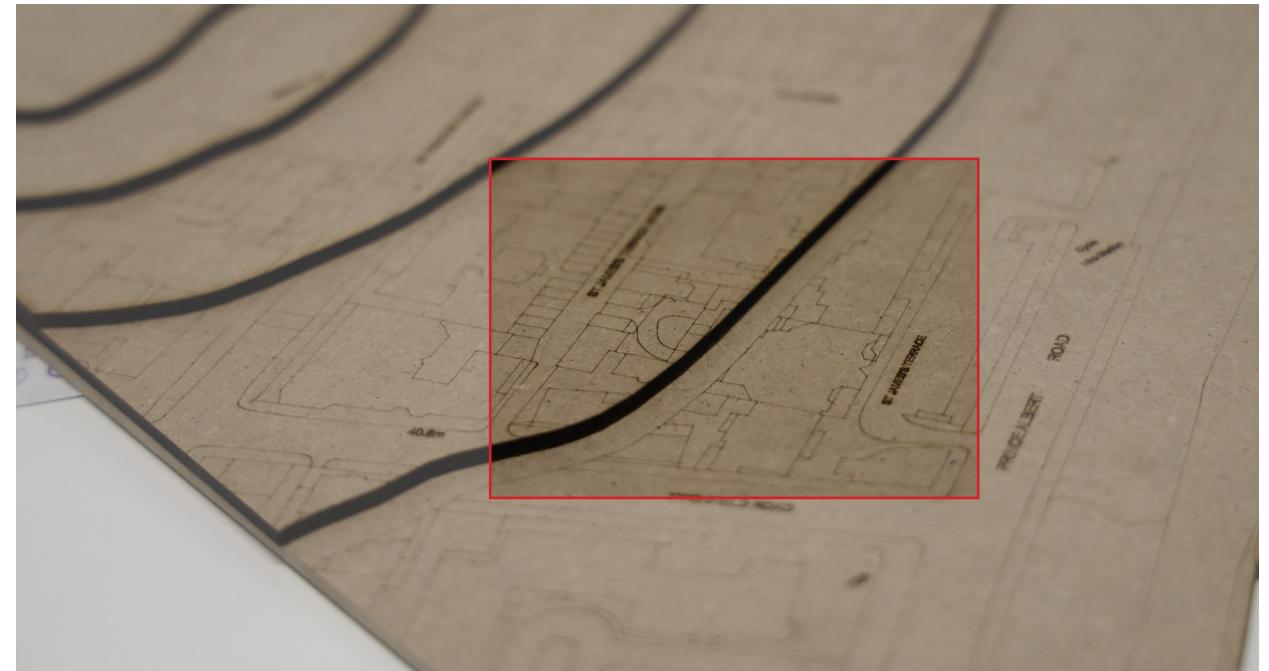
2. In this part of the screen shots shown here, we have already highlighted the horizontal slicing method to represent the terrain. If you want to use vertical and horizontal slicing methods, Keep in mind that you need to draw a border line between the two.



3. Contour line model is pretty straight forward to make. We are using it in this case because it will allow us to engrave street maps and building outlines on our model. However, this will come at an expense of having jagged edges of contour lines.

Contouring / Modelling

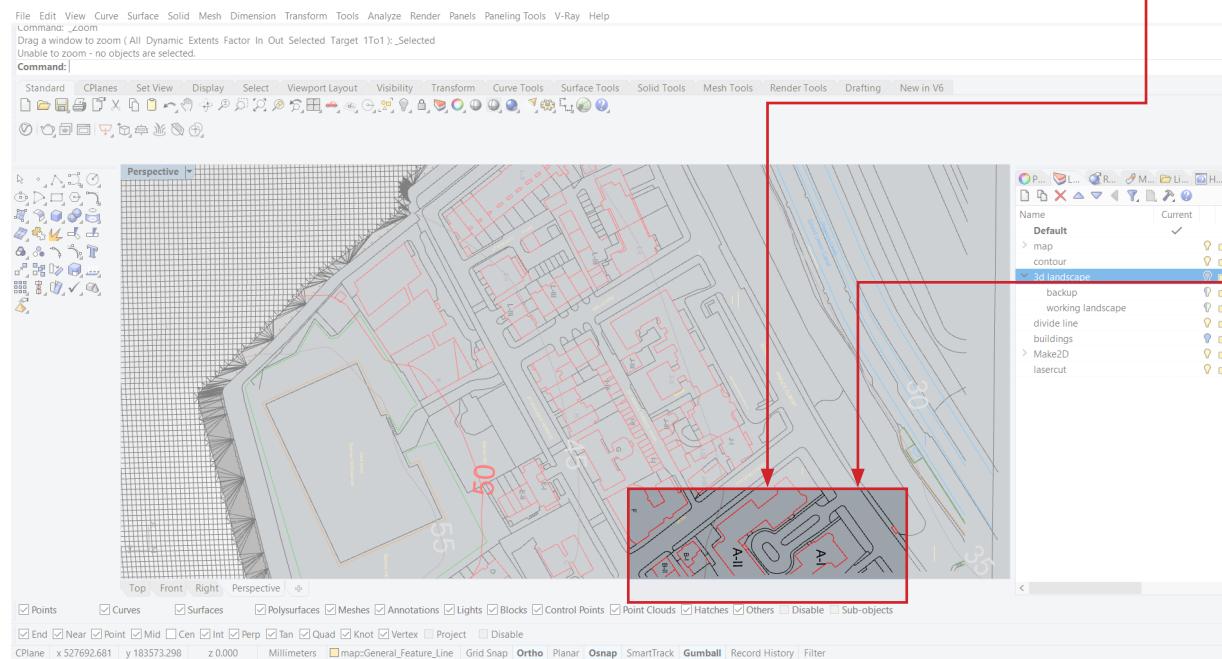
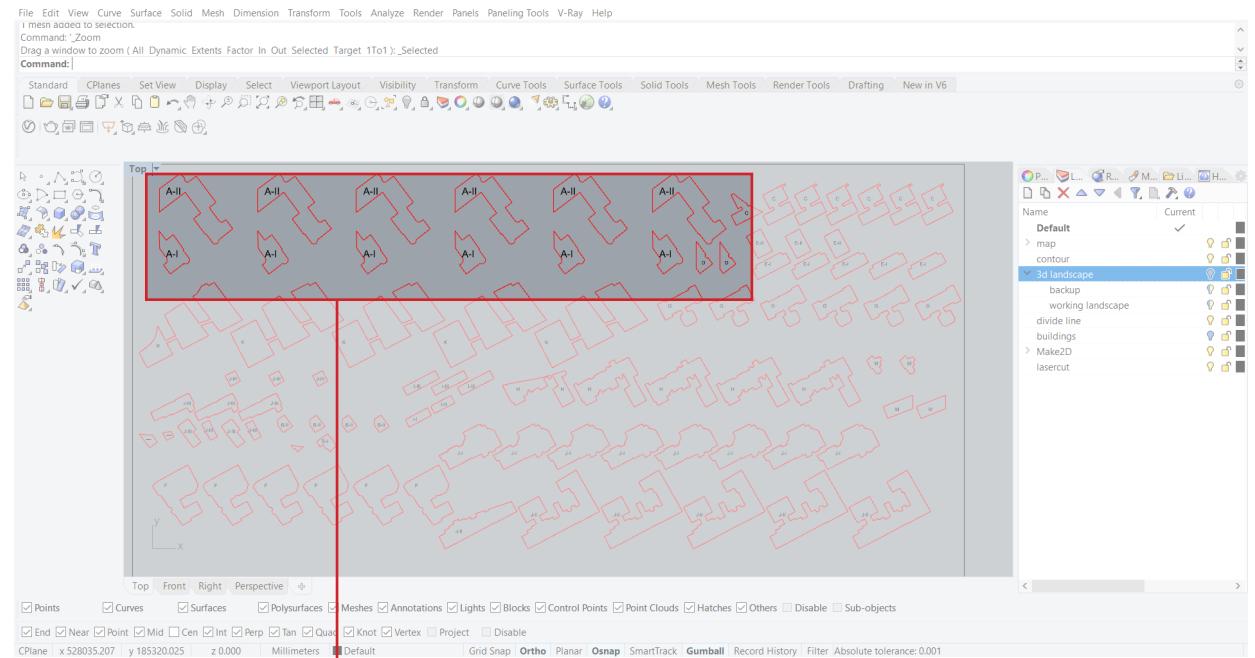
During assembly, match the border lines engraved on the lower piece and match it with the outline with the top piece.



After applying the PVA glue, place the model on the corner or edge of the table and clamp it down preferably overnight for optimal strength. This is necessary because PVA takes a long time to dry and the pieces could move out of place without any fixture.



It is important to show other buildings on the site. One quick way to do this is to produce a stack model to produce volumetric models of the urban surrounding. If you need to show the facades of the surrounding, simply make 2D depiction/engraving of the facade and glue it to the side of the model that you want to show the facade.

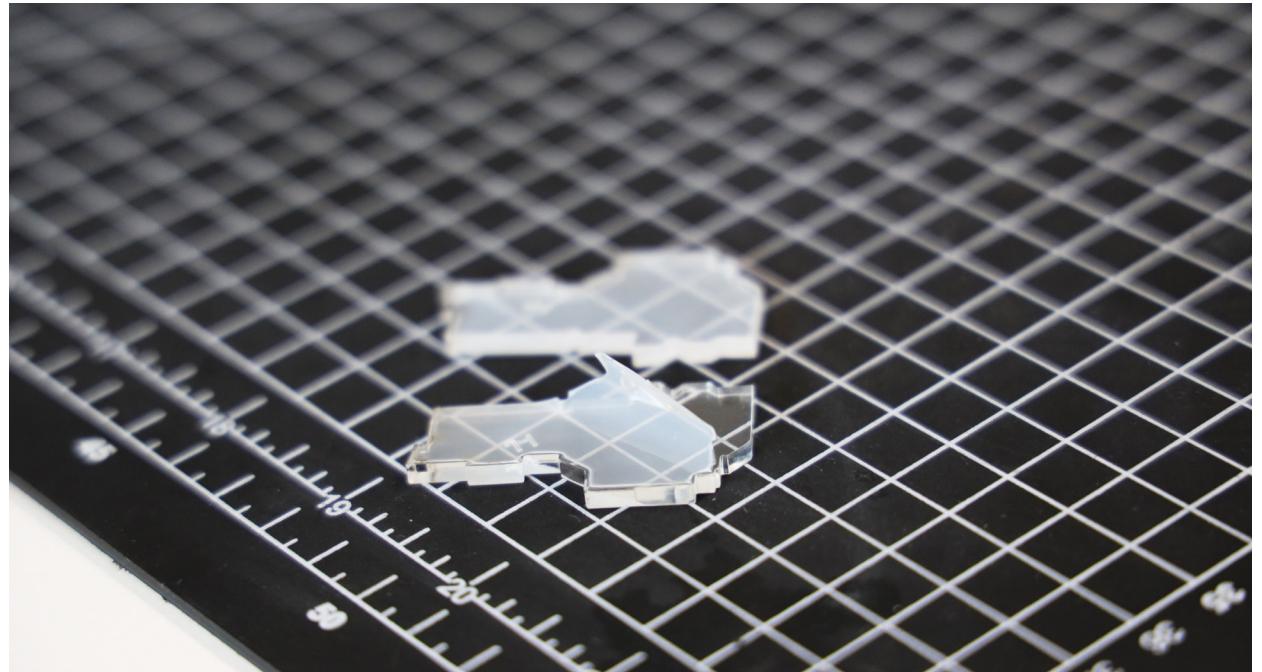


4. This method is pretty straight forward, simply slice the digital models in vertical direction and add some marking on the profiles. This will make assembly process a lot easier. Personally I think this is better than building a box to represent the buildings due to its simplicity and easy of assembly.

Use appropriate PPE personal protection for applying acrylic glue. Make sure you apply glues in an area with good ventilation and fresh air as it is toxic. Apply the glue with a syringe for safety and control.



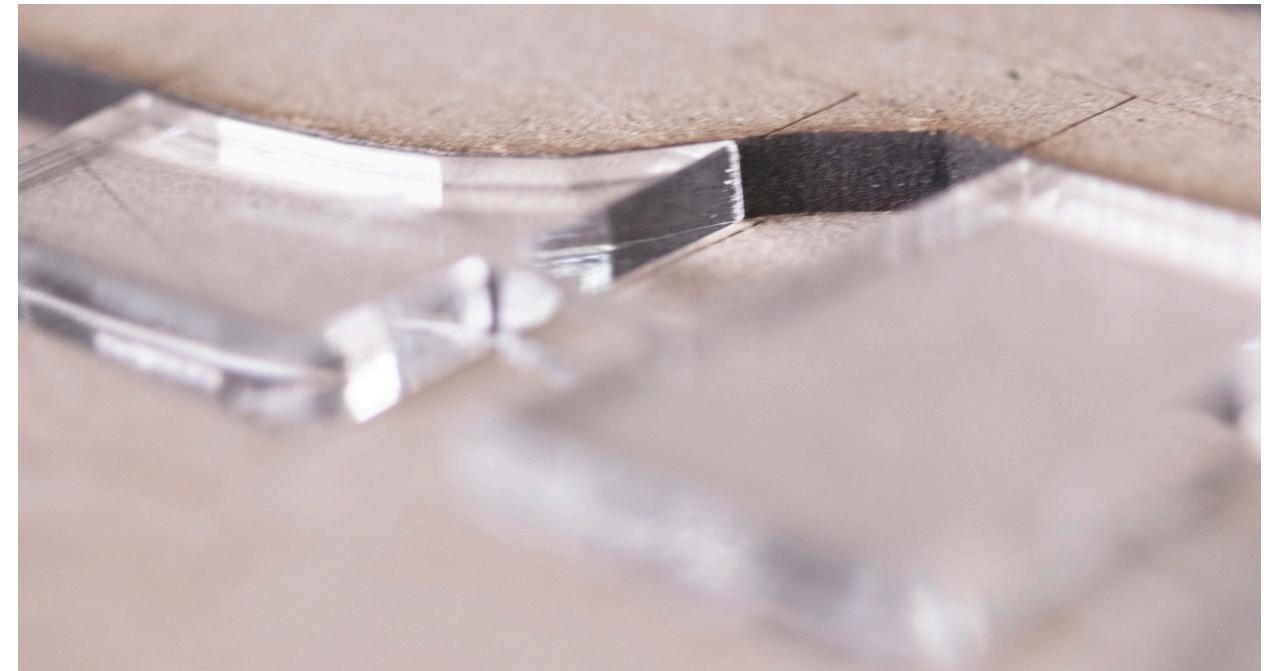
Peel off the remaining plastic film before applying the glue. While lasercut, we usually peel off the top layer only which will enhance engraving but the bottom film is left on to prevent melting. You should try stack the models before gluing them down. Pay attention to special pieces that lies on the sloped side.



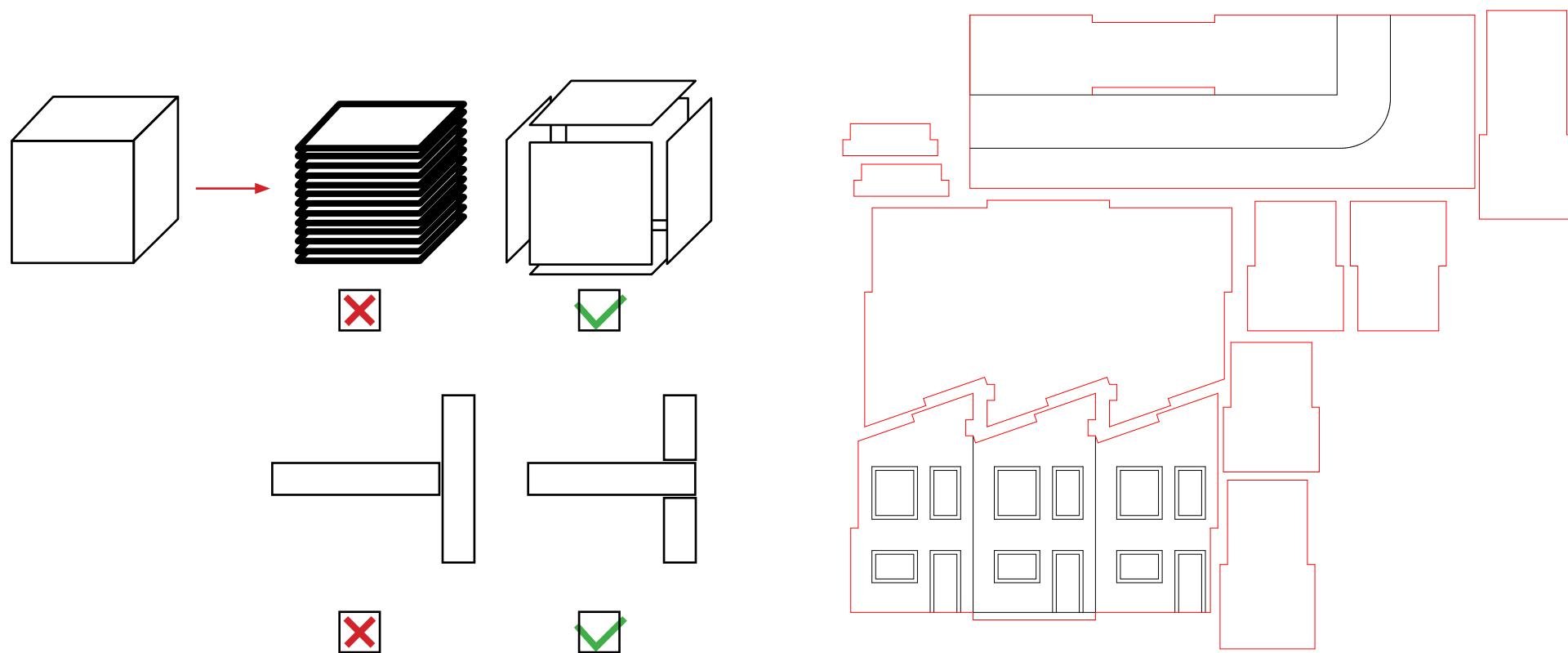
It is recommended to do a mock assembly before applying any glue. This way ,you can identify missing pieces and familiarise yourself with all your pieces and where do they suppose to go.



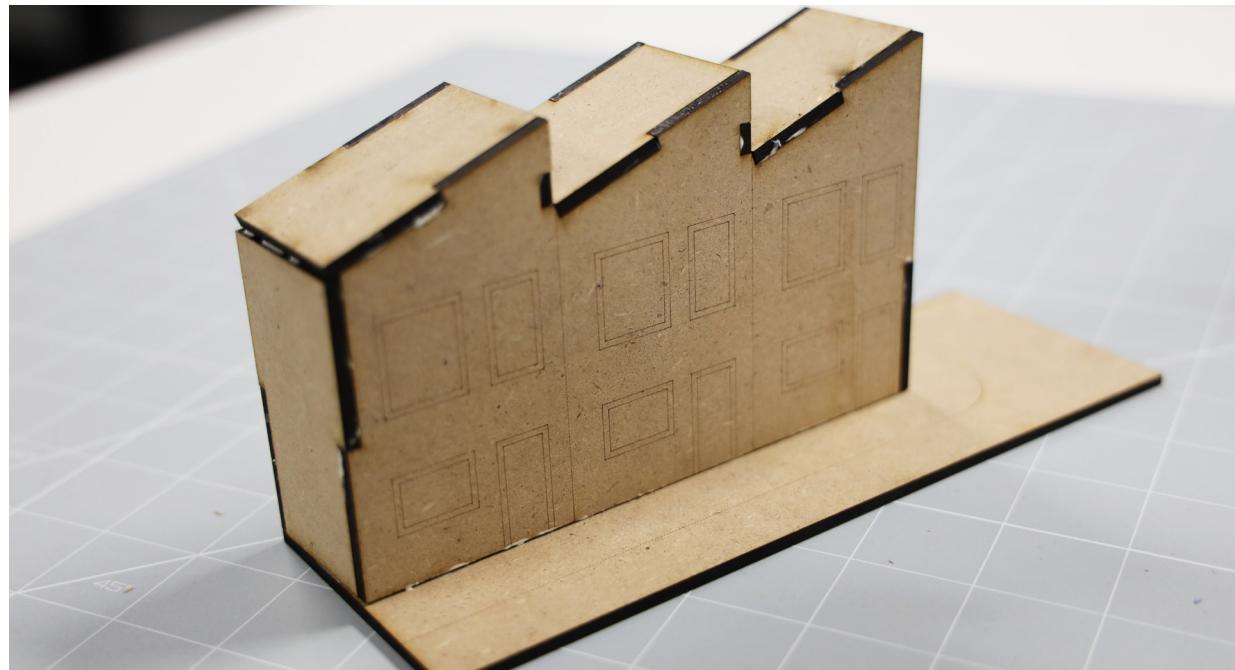
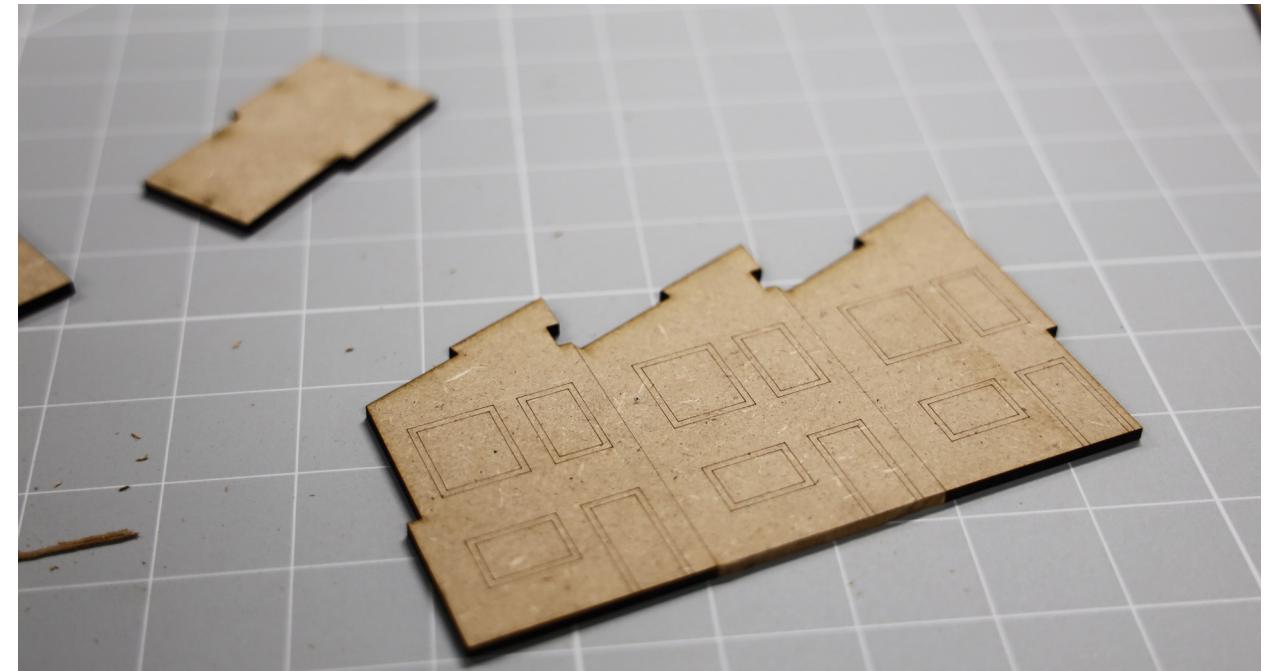
You should try stack the models before gluing them down. Pay attention to special pieces that lies on the bottom of the sloped side. Sometimes the bottom piece can be small and look different so be careful not to loose them and try to assign on the serial number on the bottom piece.



The above mentioned techniques is suitable for small scale model ie 1:1000 because you just have to show volume without much details. However, if your site models have a bigger scale ie 1:200, then you will need to use a different method because a volume model shown previously won't show much details and will disperse a lot of materials. It is useful to build a box model which you can engrave facade elevations. However, we strongly recommend to design box corner joints that will make assembly easier.



You can apply facade by engraving them on the front facing panel. Use the PVA glue for assembly as it turns clear when it dries. And PVA provide a strong bound for wood and paper based martial such as PVA.



Q: I finished this guide, so what now?

A:

Now it is time to get to work. If you have questions, You can contact us.

Here are also some online resources:

- [Rhino user manual](#)
- [McNeel forum](#)
- [Pinterest](#)
- [Adobe forum](#)

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