



Representation

Studio Daniels Core II GSAPP Spring 2011

Tatsuya Sakairi

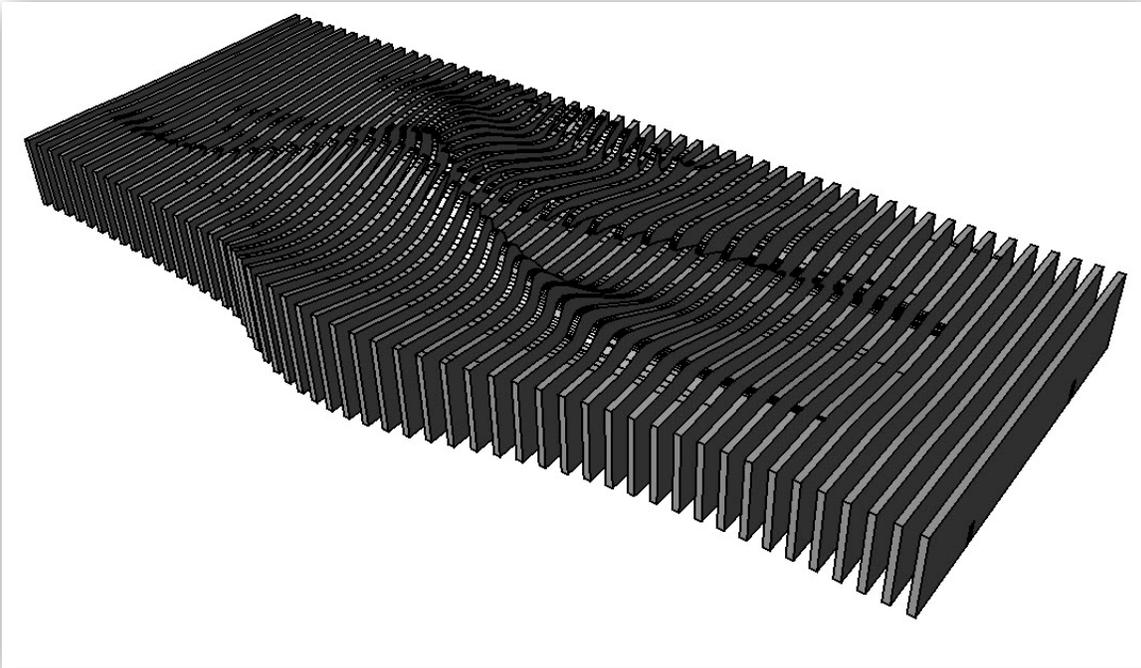
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坂入 達也
Tatsuya Sakairi
fblooparch.com
fbloop.wordpress.com

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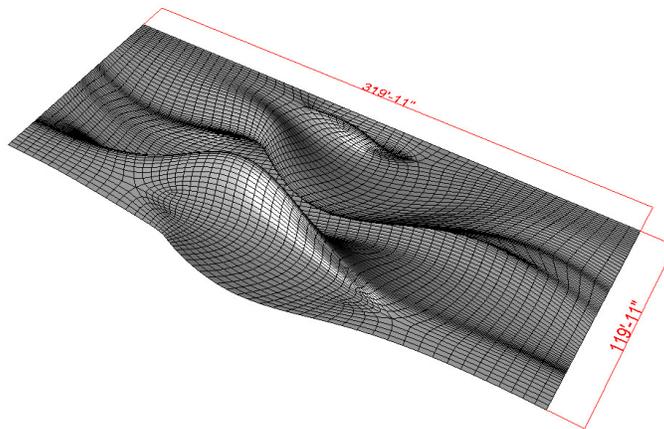
1 Laser cut rib model



The steps below is to create laser cut rib model.

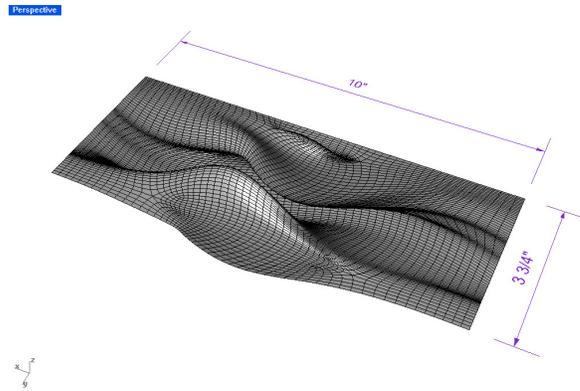
Step 1

Scale the digital model in Rhino. In this small project, we will use $1/32'' = 1' - 0''$. So scale the model.... to $1/32/12 = 0.00260417$.



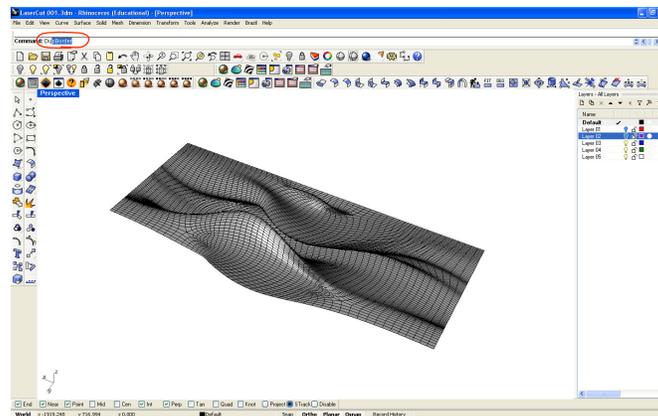
Step 2

Make sure the model is scaled properly.



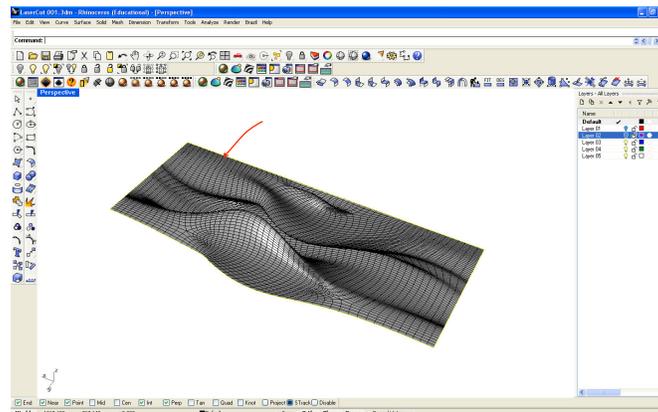
Step 3

DupBorder to Duplicate the border of the mesh object.



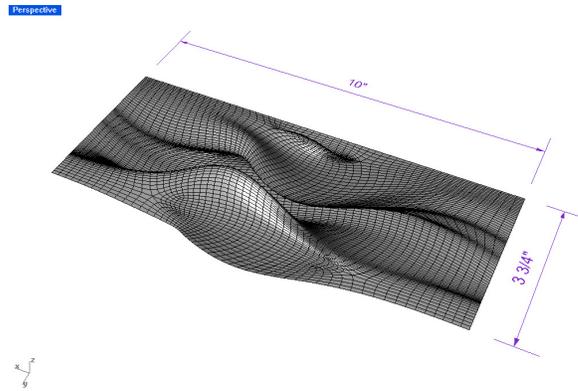
Step 4

Make sure the border curve is created.



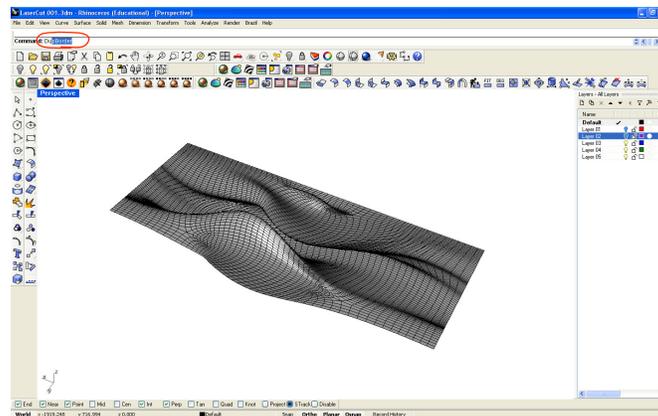
Step 2

Make sure the model is scaled properly.



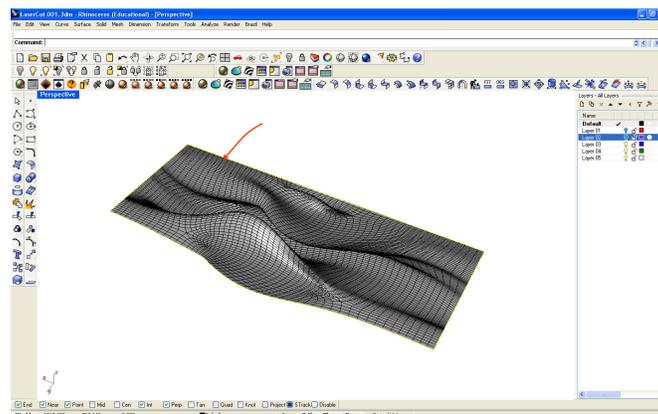
Step 3

DupBorder to Duplicate the border of the mesh object.



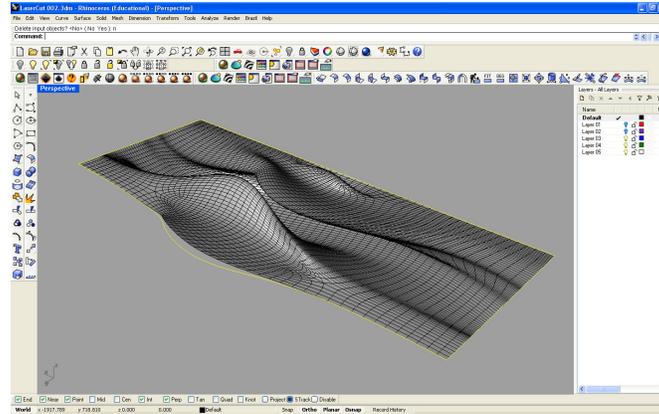
Step 4

Make sure the border curve is created.



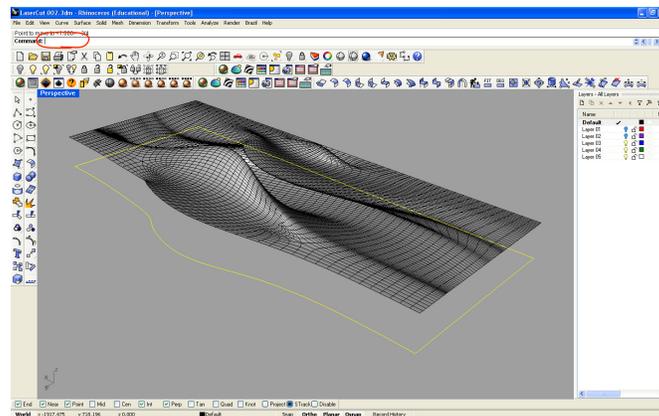
Step 5

Select the border curve that you just created. **ProjectToPlane > Delete Input NO** to duplicate and flatten the curve.



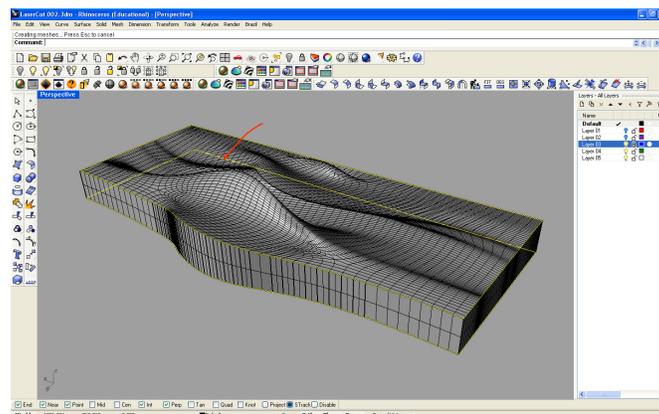
Step 6

Move the flatten curve $-3/4$ " in vertical axis.

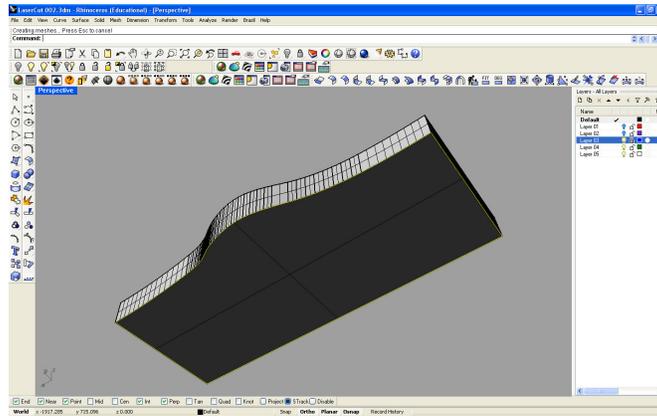


Step 7

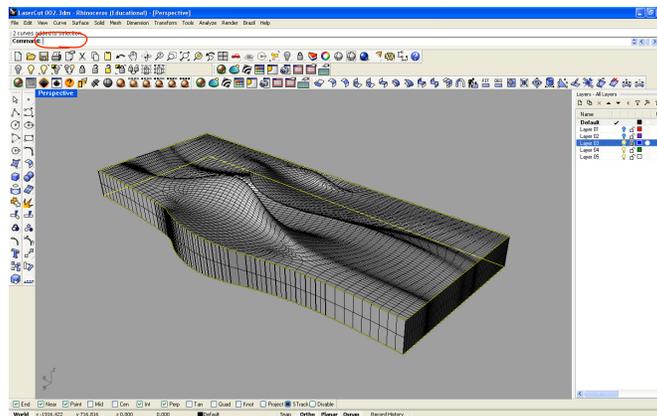
Loft between 2 curves



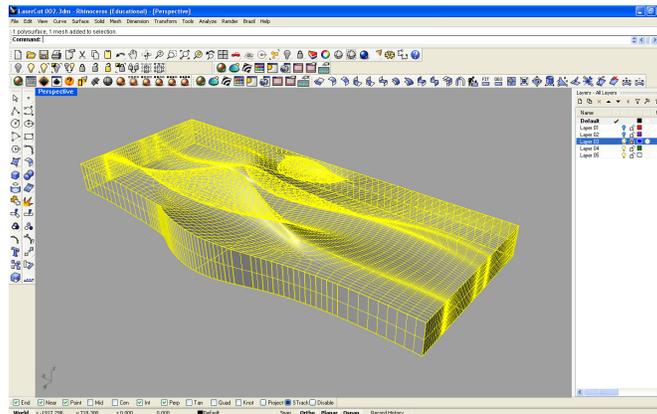
Step 8
Select the bottom curve. **Surface > Planar Curves**



Step 9
Select > Curves. **Delete** selected curves.

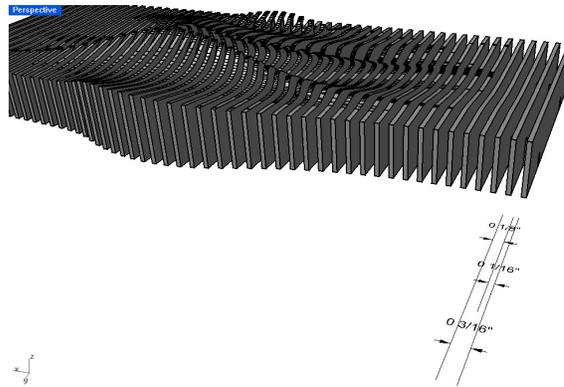


Step 10
Select **Mesh** object at the top and **polysurface** at the side and the **surface** at the bottom.



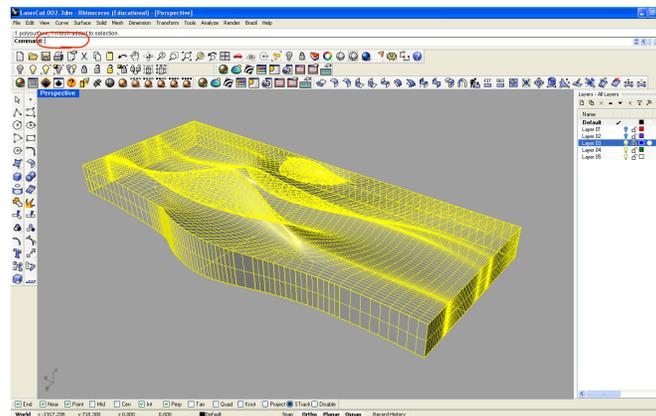
Step 11

You will create ribs across one direction. Let's assume the material thickness to be 1/16" (Chipboard) and the span between ribs is 3/16".



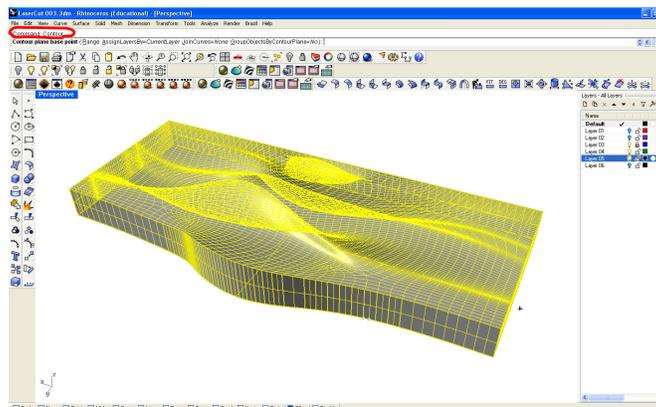
Step 12

Make sure three objects are still selected.



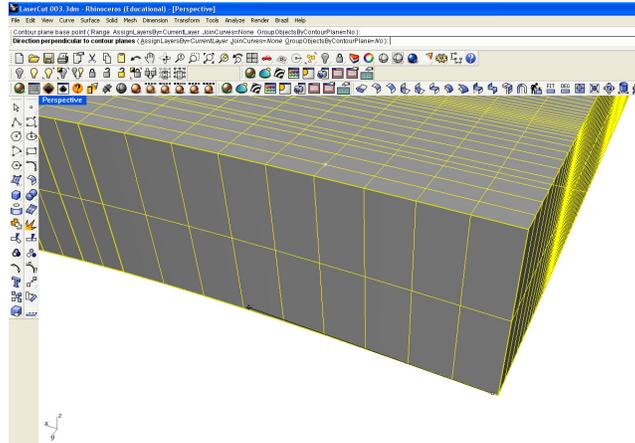
Step 13

Create contour across. **Contour**



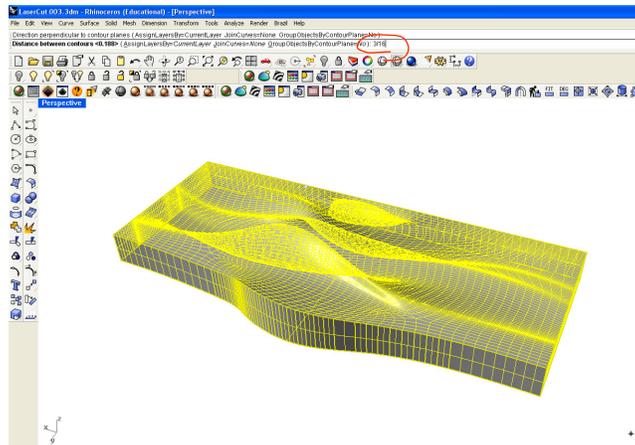
Step 14

Click the start point of contour. Start from near corner at the end (but not the exact corner).



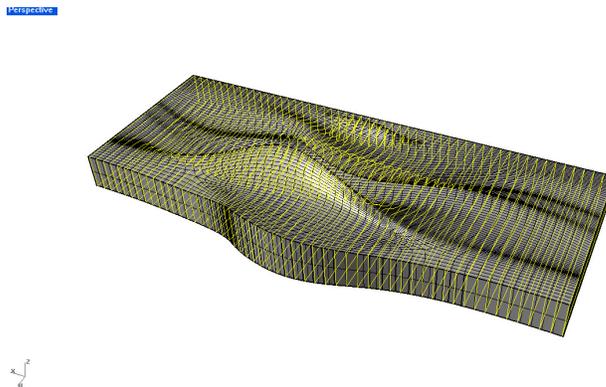
Step 15

Type in 1/16 for the contour span.

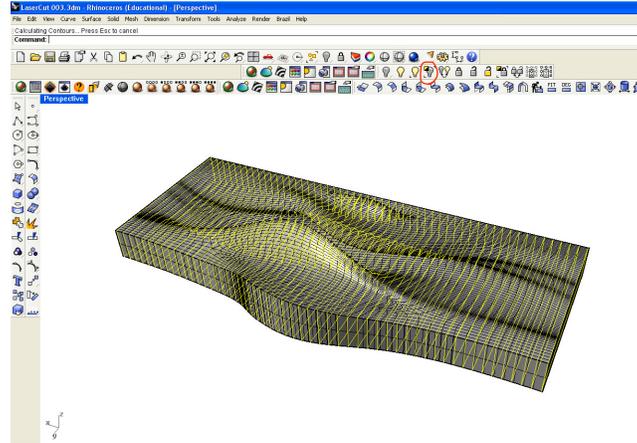


Step 16

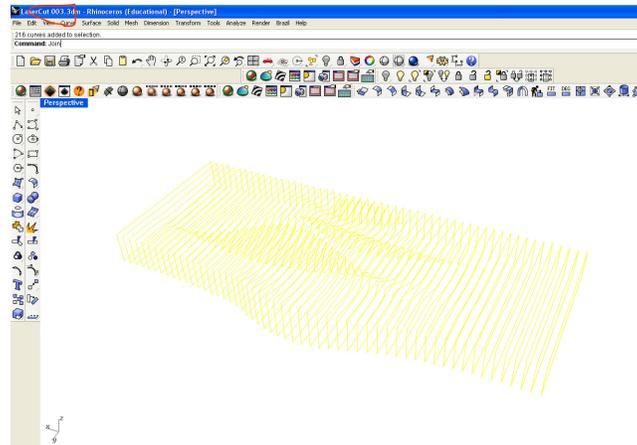
Contour is created



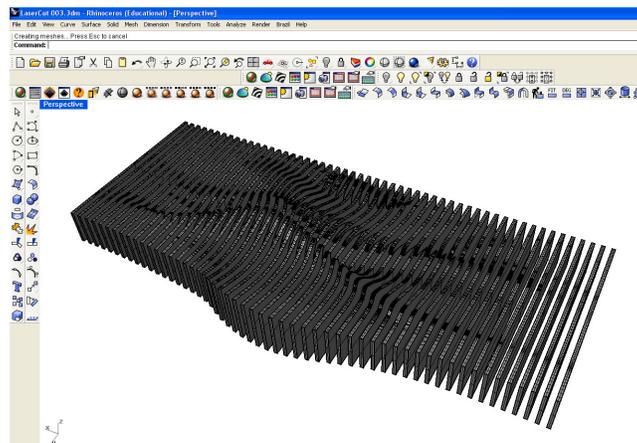
Step 17 Invert selection and hide objects



Step 18 Join all the curves.

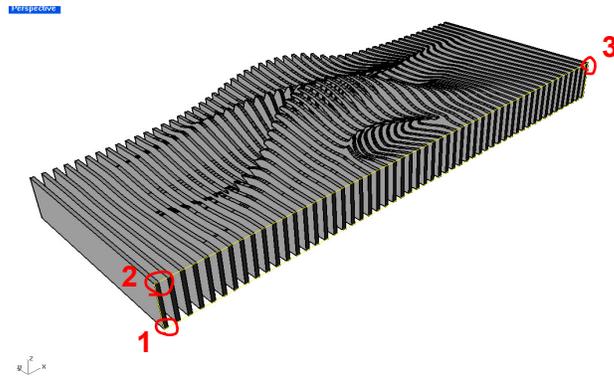


Step 19 ExtrudeCrv to extrude curves along X direction. Make sure Cap option is enabled



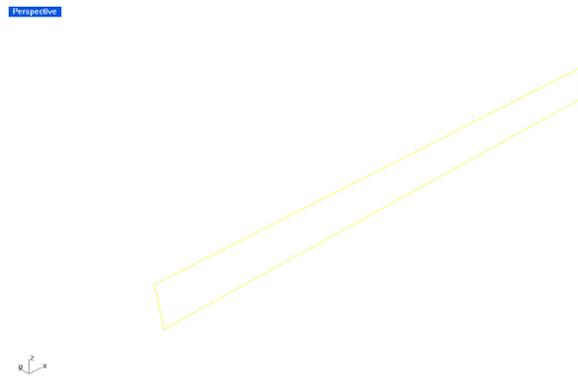
Step 20

Create a rectangle at the back of the contour object by using **3Point** option.



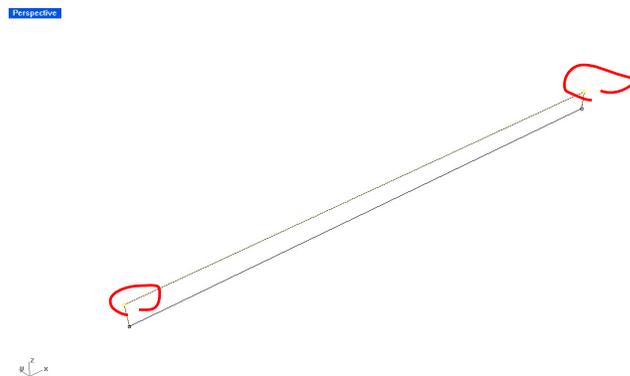
Step 21

Hide everything else except the **rectangle** you just created.



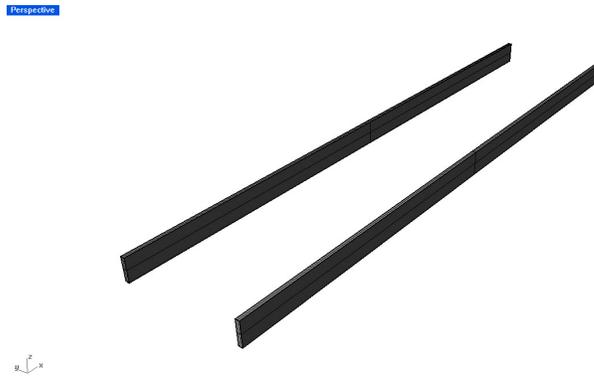
Step 22

Move 2 control points **-0.375** in **Z axis** (half of 3/4")



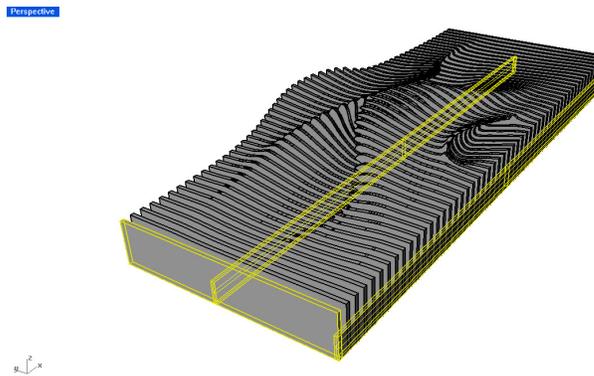
Step 23

Create a **extruded solid** based on the rectangle. **Copy** the solid **2"** away from the original. **Group** two solids together.



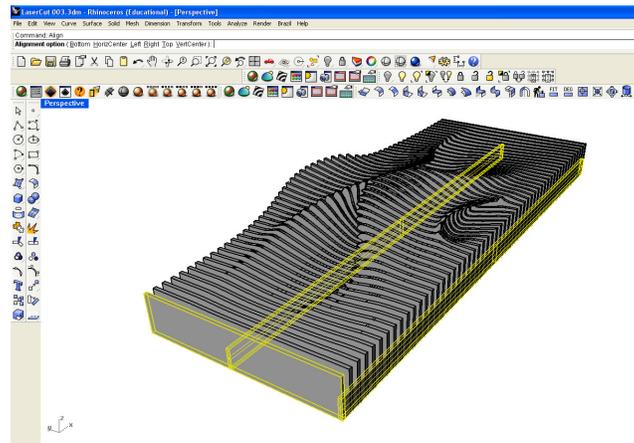
Step 24

Select the **Group** and the rib at the edge (selecting order is important).



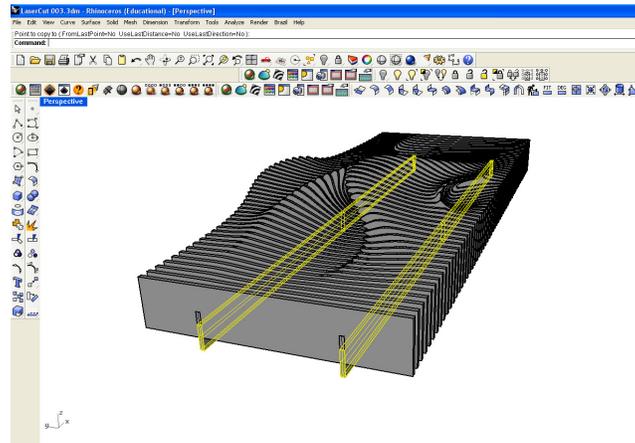
Step 25

Align two object. **Align > HorizontalCenter**



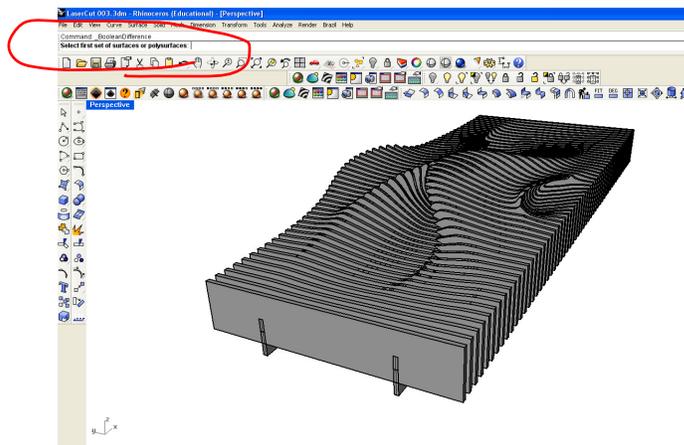
Step 26

Copy the group object -0,1875" in Z Axis.



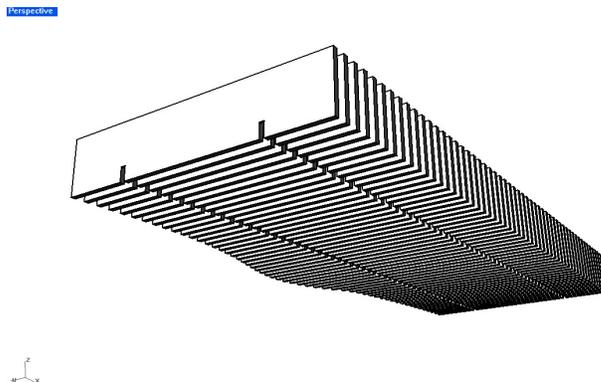
Step 27

BooleanDifference! Select the ribs as a first set and the copied **Group** object as a second set. **DeleteInput** option > **YES**



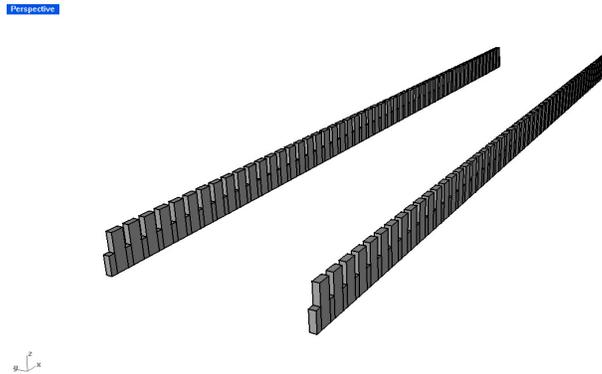
Step 28

Notches are created.



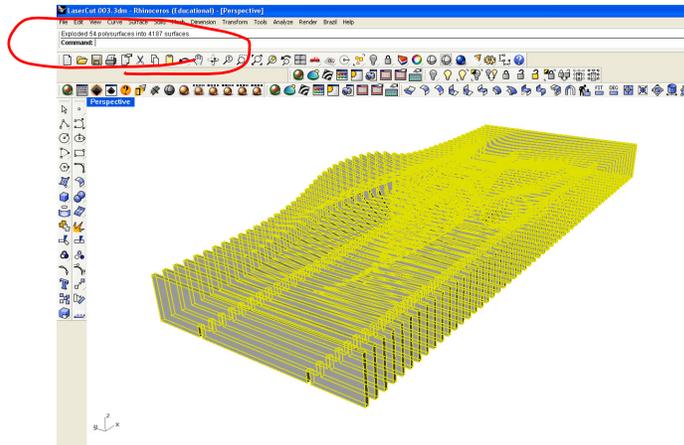
Step 29

Repeat **Boolean Difference**, the Original Group object as a first set and Ribs as Second set



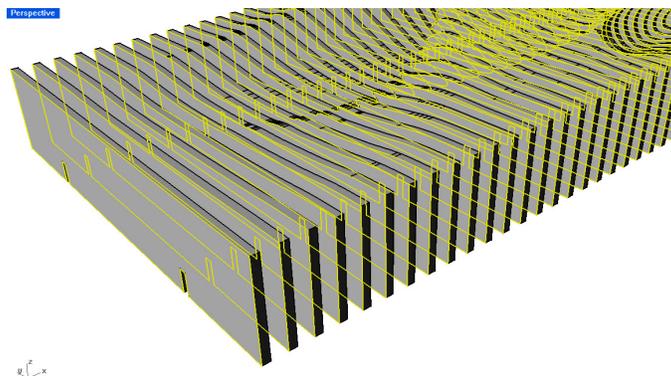
Step 30

Now Explode all the objects.



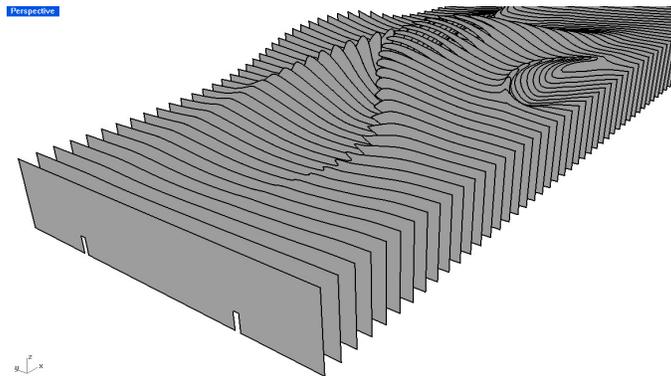
Step 31

Select the surface at one side for each rib.



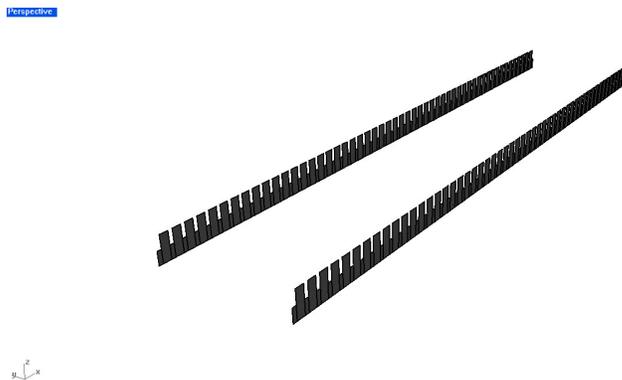
Step 32

Invert selection and **delete** everything else except the group object.



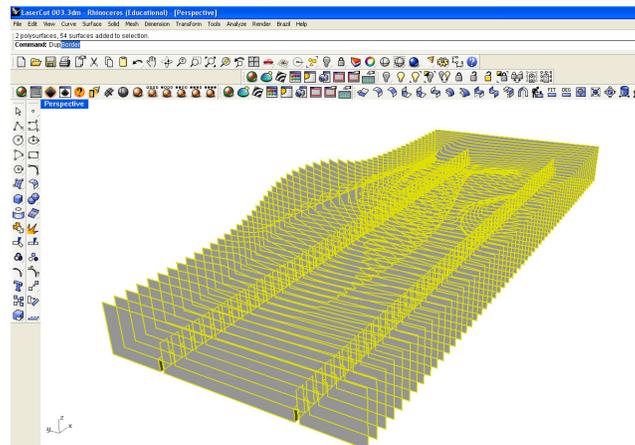
Step 33

Repeat same step for the group object.



Step 34

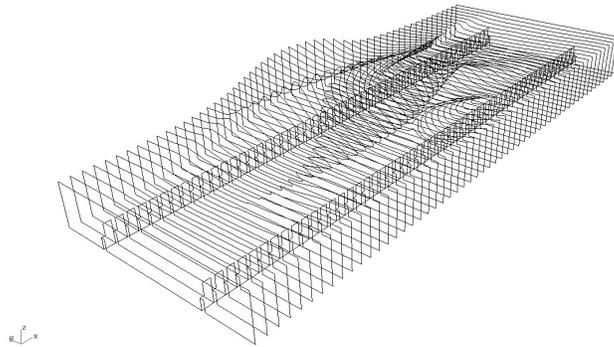
Select all the objects and **DupBorder** to create border curves.



Step 35

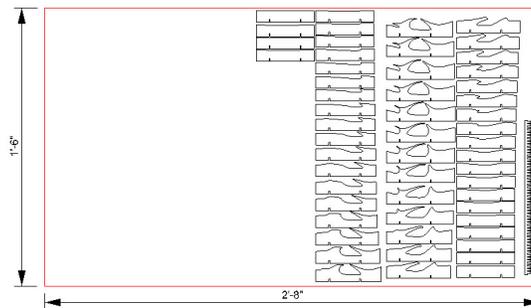
Delete all the surface and you will get all the curves with notches.
Now you can layout in Autocad and ready to go for laser cut.

Perspective

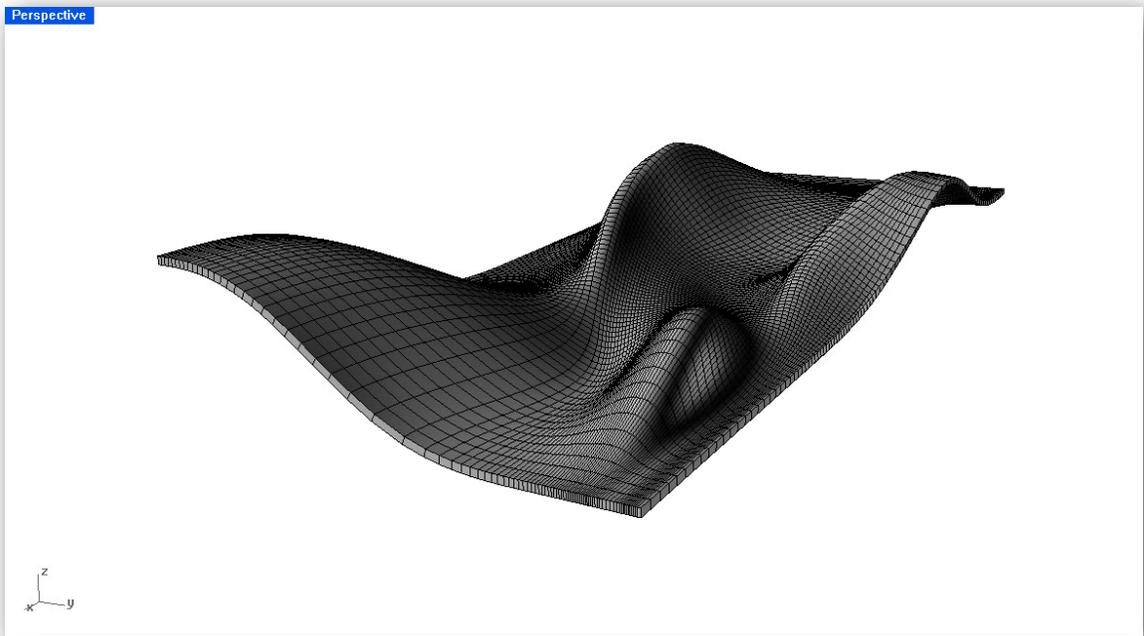


Step 36

For layout, you need to find out the work surface size of the machine.
The below is the case of **Universal VLS6.60**.



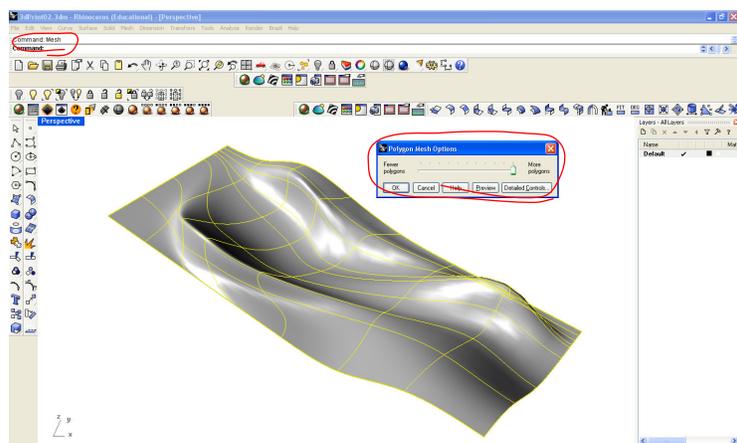
2 3d Print Setup



The steps below is to setup 3d Print

Step 1

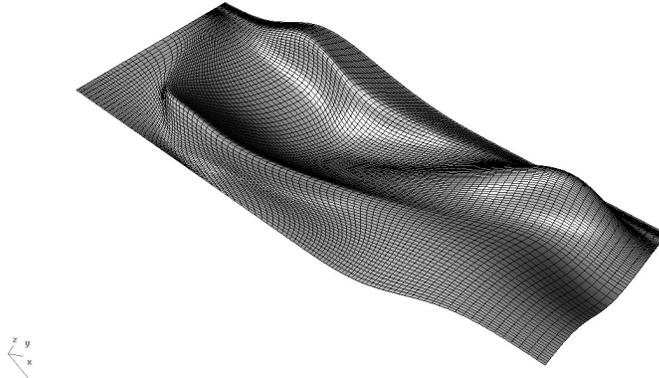
Convert the object to **Mesh**. **Mesh > Set the resolution appropriate to your object.**



Step 2

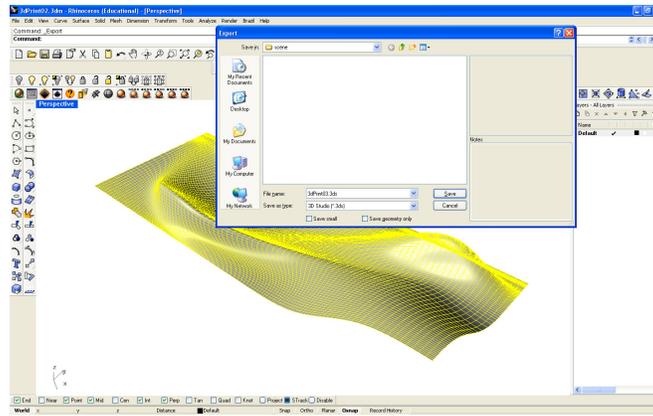
Make sure you have **Mesh** object.

Perspective



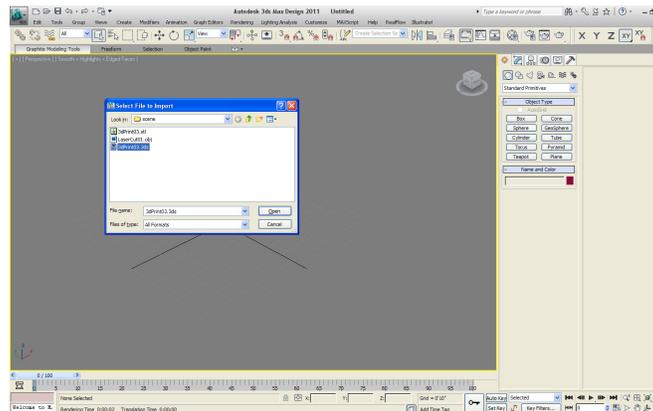
Step 3

Export the object as 3ds format.



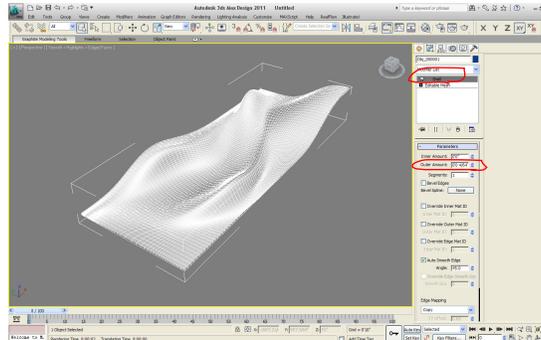
Step 4

Import the object to 3dsMax.



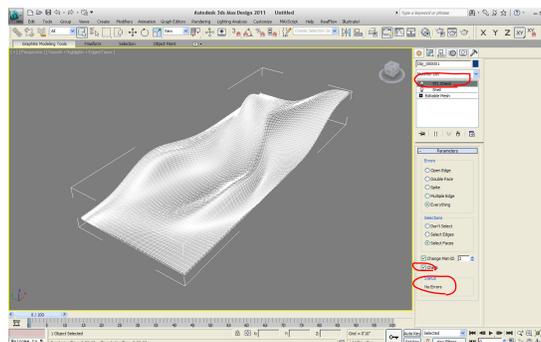
Step 5

To make “Watertight” object, the object has to have a thickness.
Allowable thickness varies depends on a 3d Print machine.
Apply Shell modifier > outer amount to be 1/16”

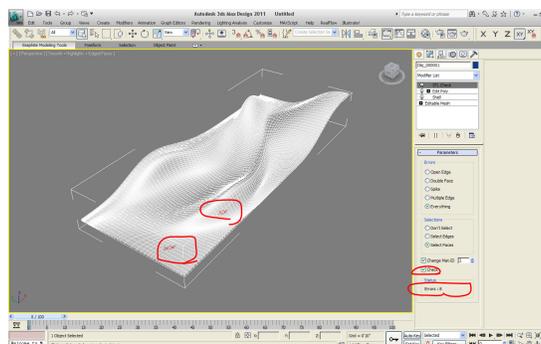


Step 6

Apply **STL Check** to make sure that the object does not have a problem.

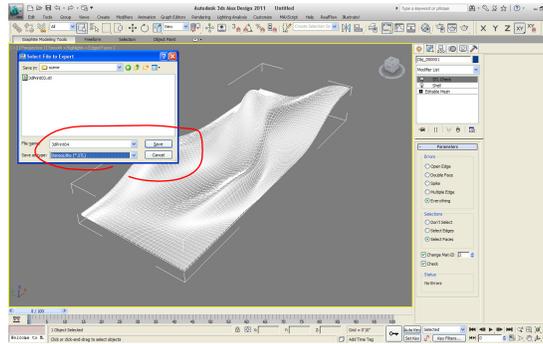


If the object has a problem **STL Check** tell you the type of problem the object has.

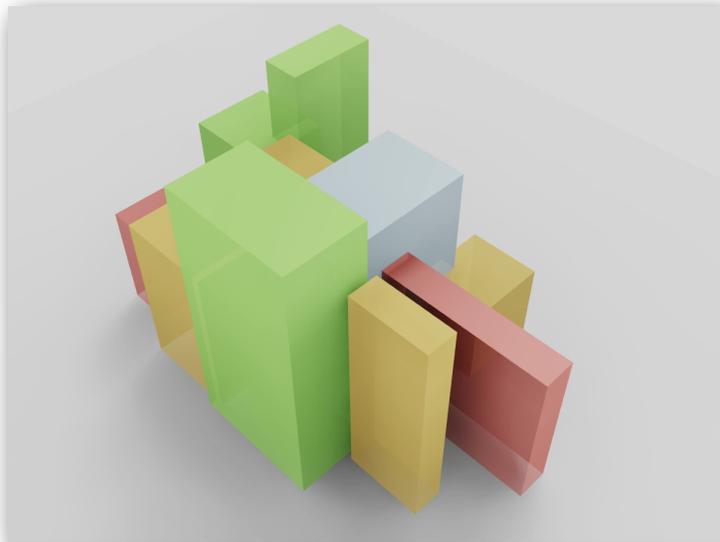
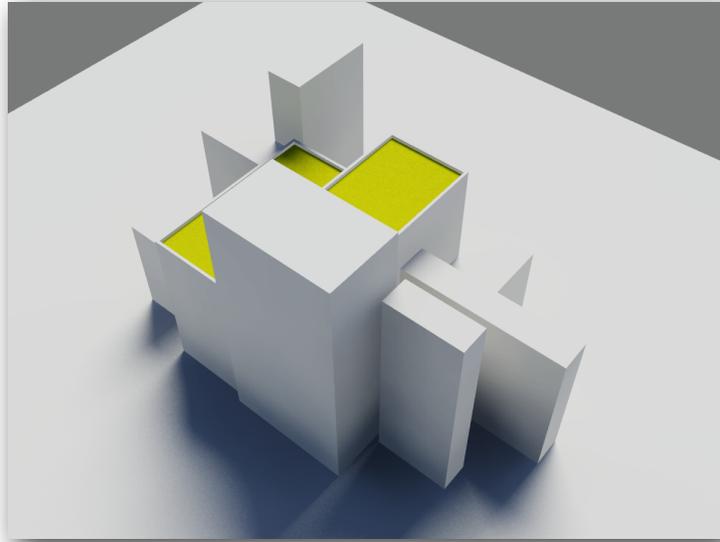


Step 7

Export the file as **STL** format for 3d print setup.



3 Rendering Setup



Instructions will be given in the class