

DIGITAL TOOLS

GROUP 1 – STUDENTS

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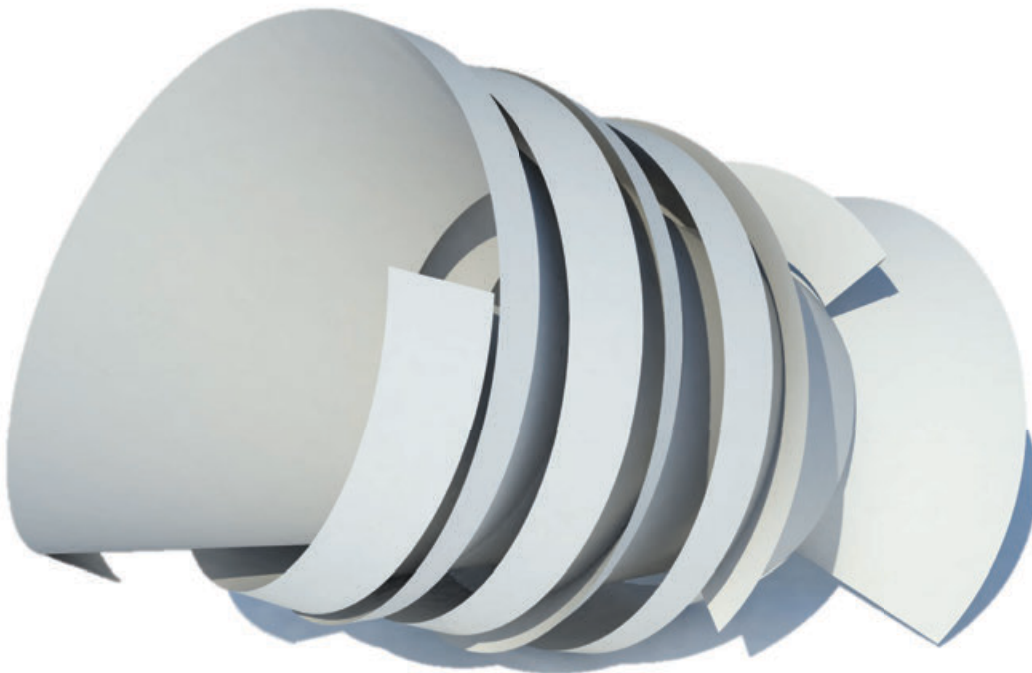
Alejandro Núñez López

ASSIGNMENT 1

DESCRIPTION

The lamp is a project developed as an exercise to use the laser cutter. By using cardboard opalina 61*54cm 250gr, as material and bending as technique we explored physic models.

At first by simple shape of bended paper, the main structure has been distinguished. By this clarified beginning, we started thinking about the connections and the exact size of shapes to make it stable.

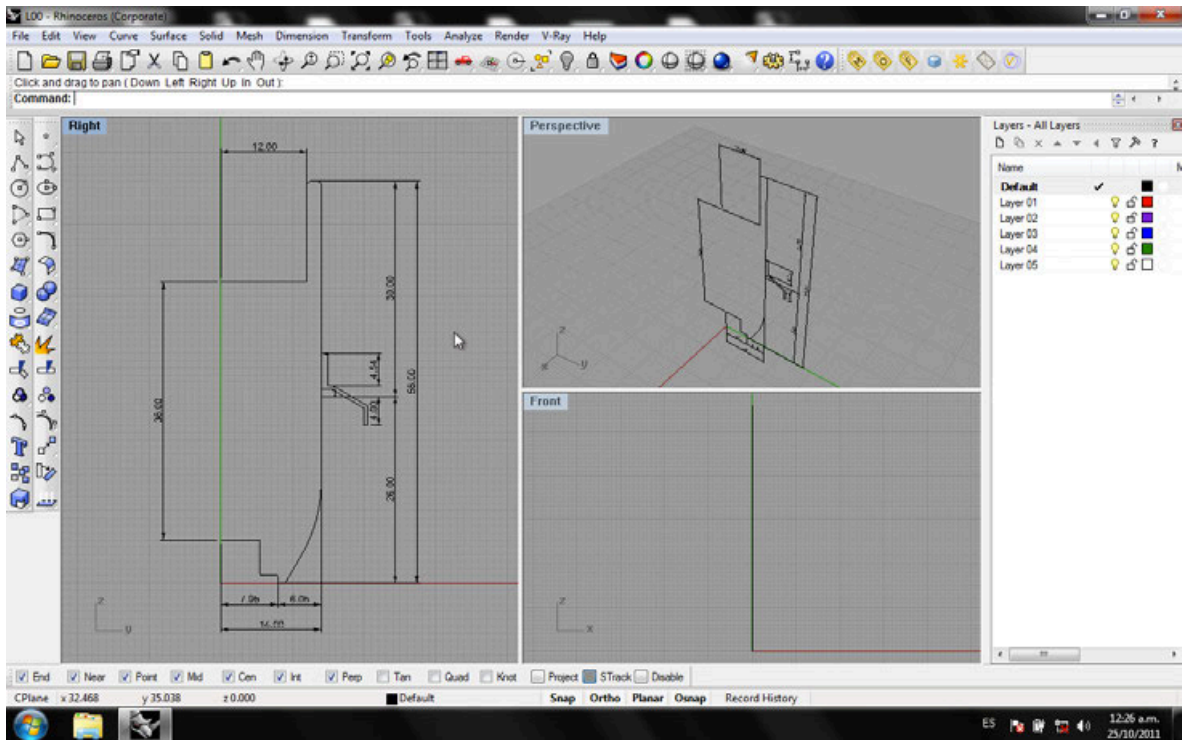


PROCESS

Digital processes documentation and modeling steps

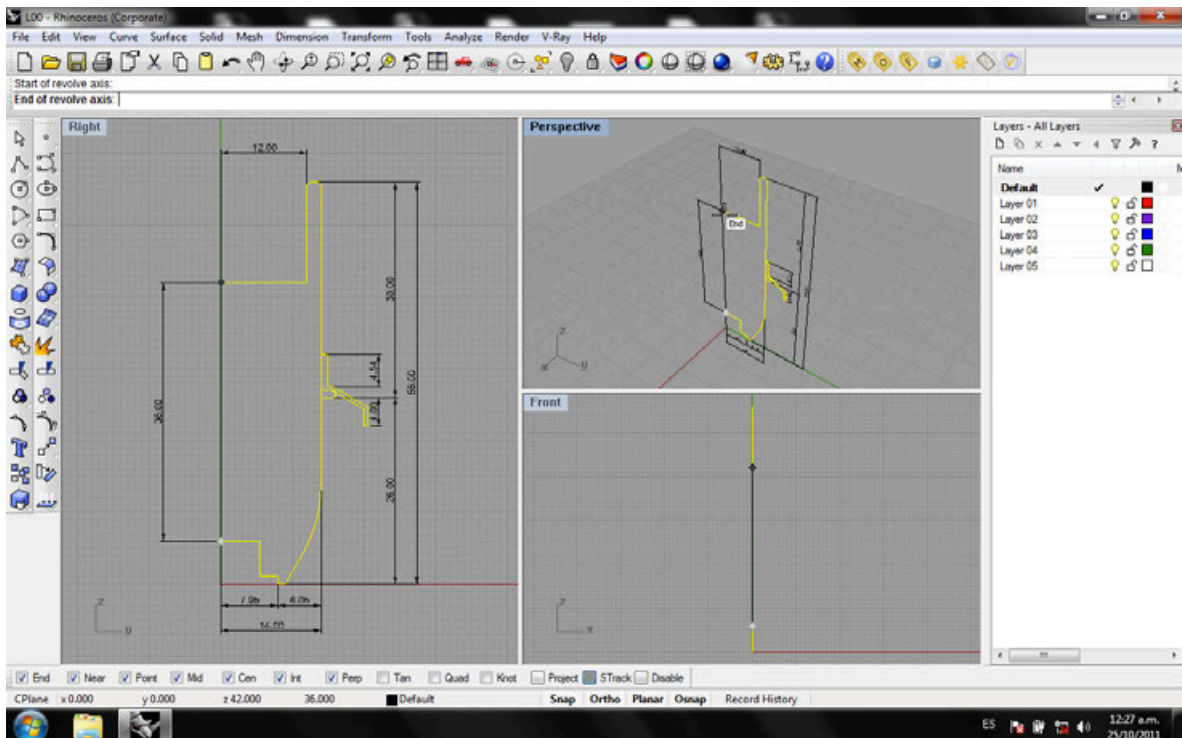
Step 1

Create lamp contour.



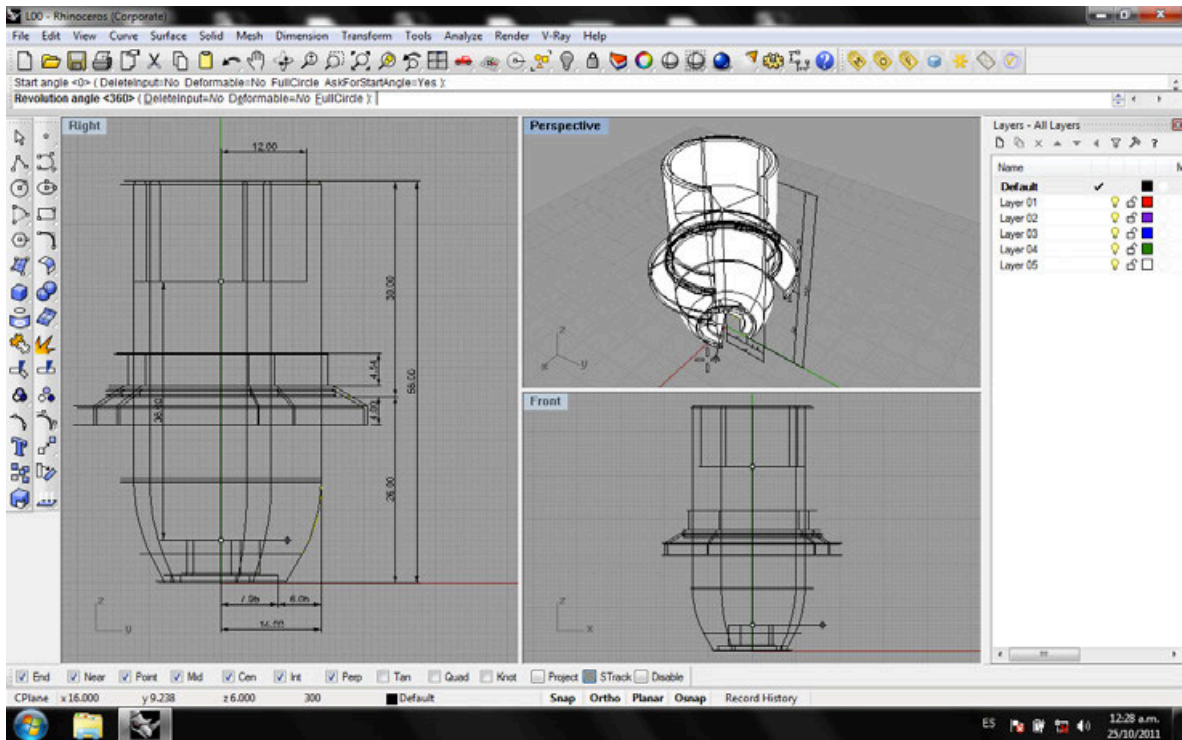
Step 2

Set revolving axis.



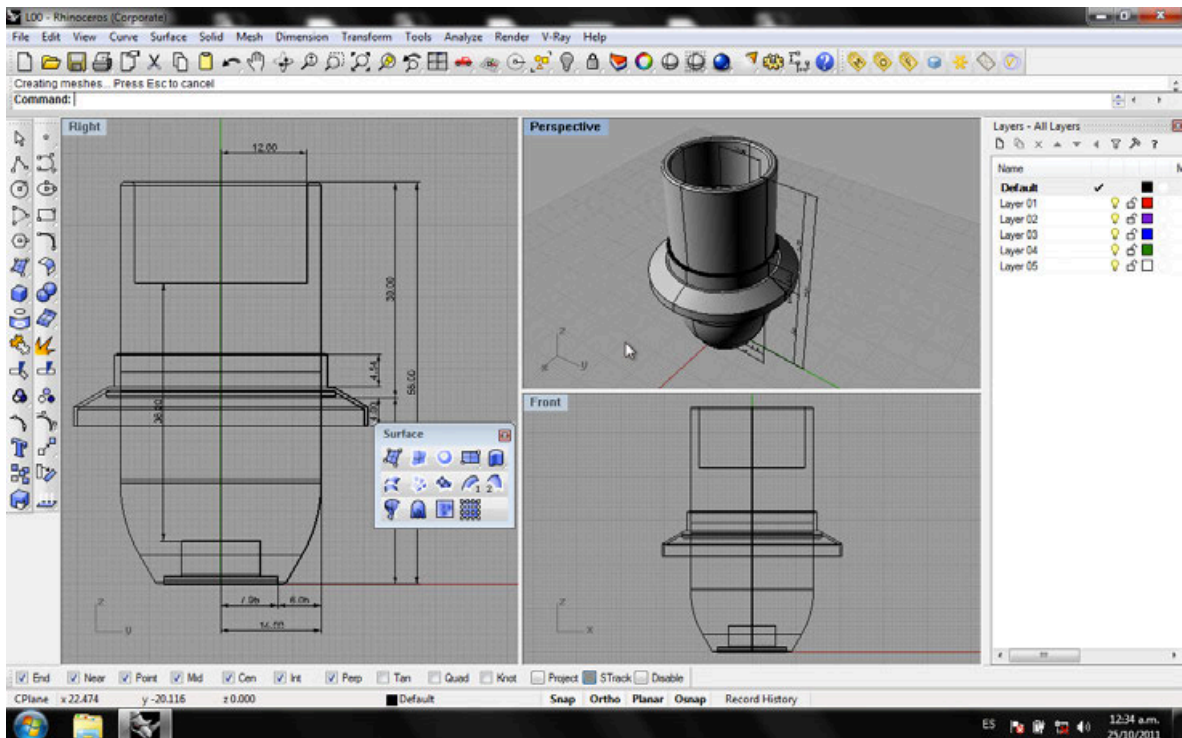
Step 3

Revolve lamp contour.



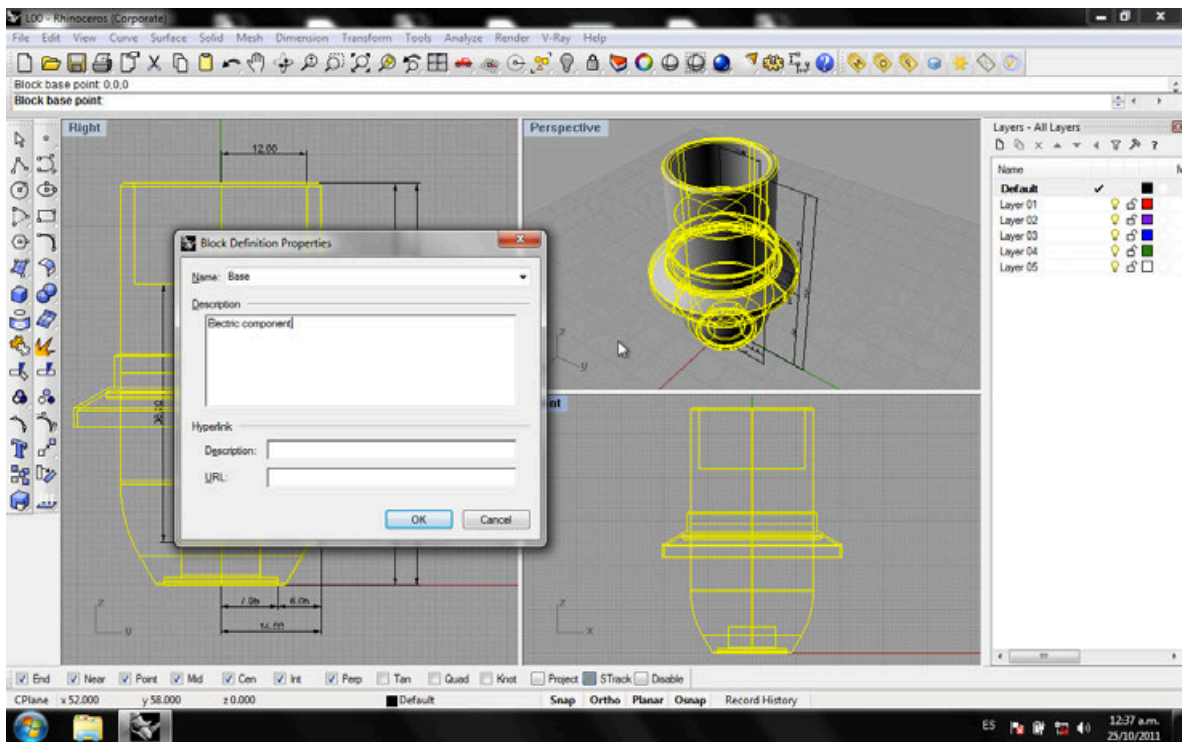
Step 4

Set revolve to 360°.



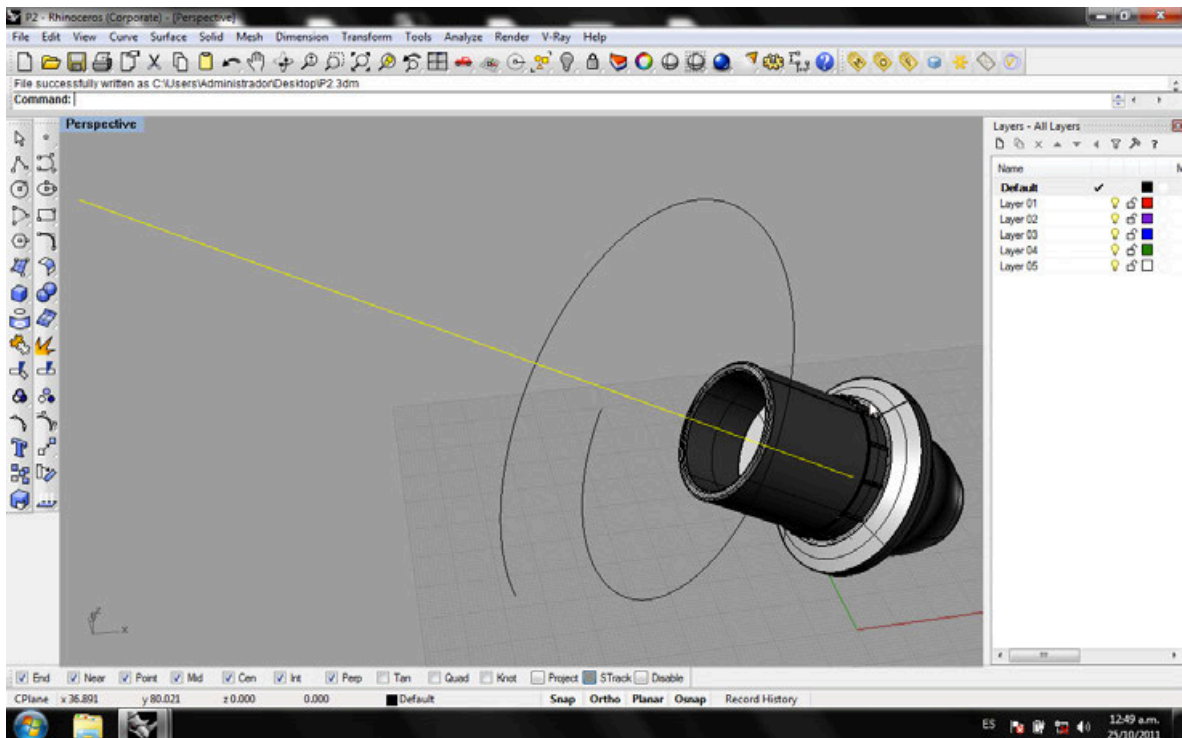
Step 5

Convert base to block.



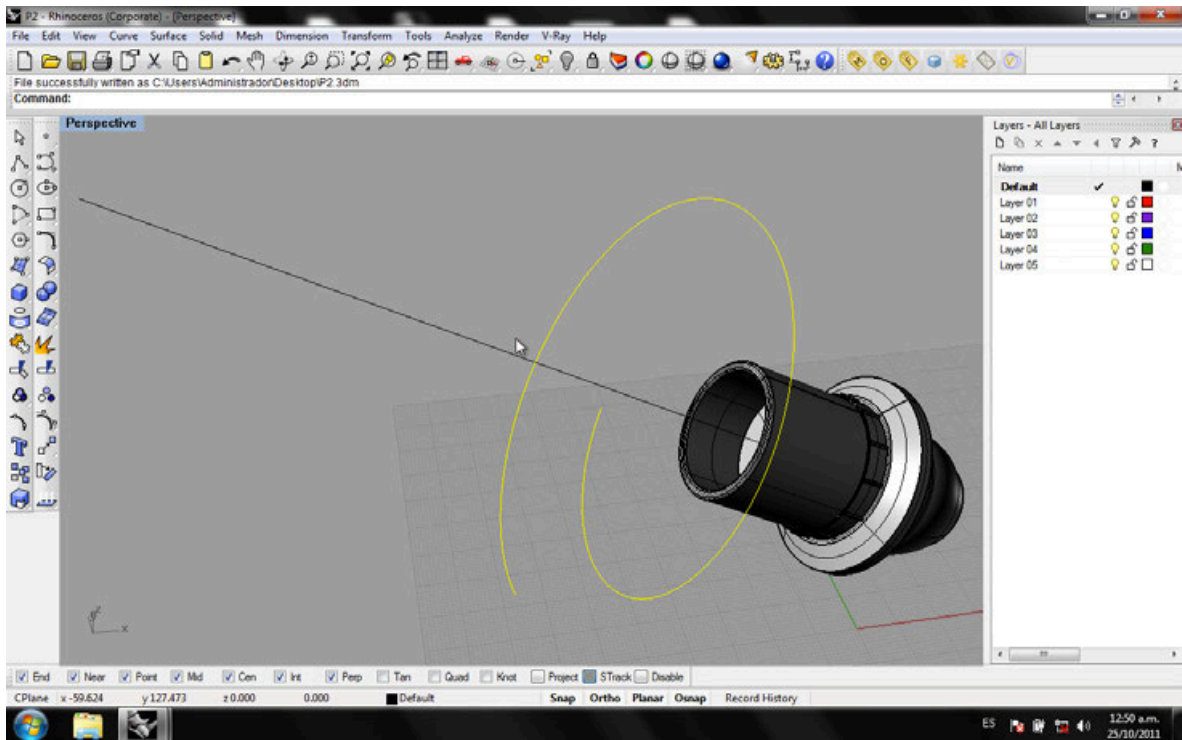
Step 6

Create line axis as modeling aid.



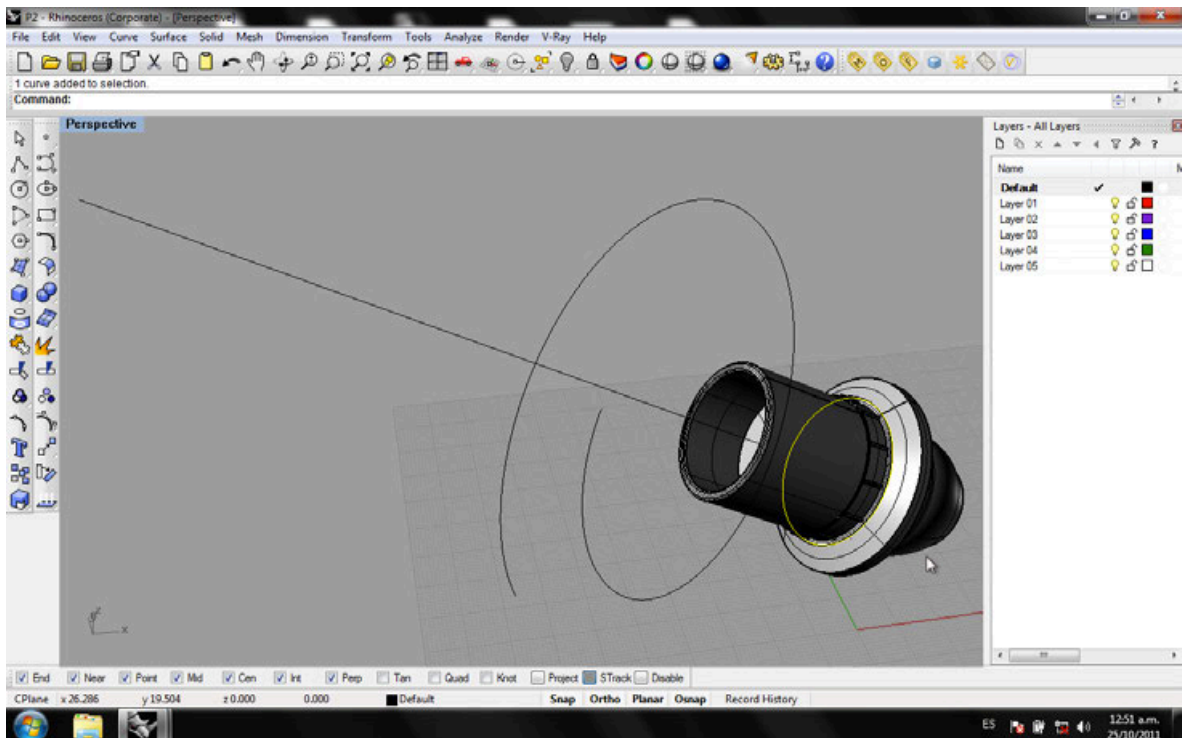
Step 7

Create SPIRAL around the line axis (1.4 turns).



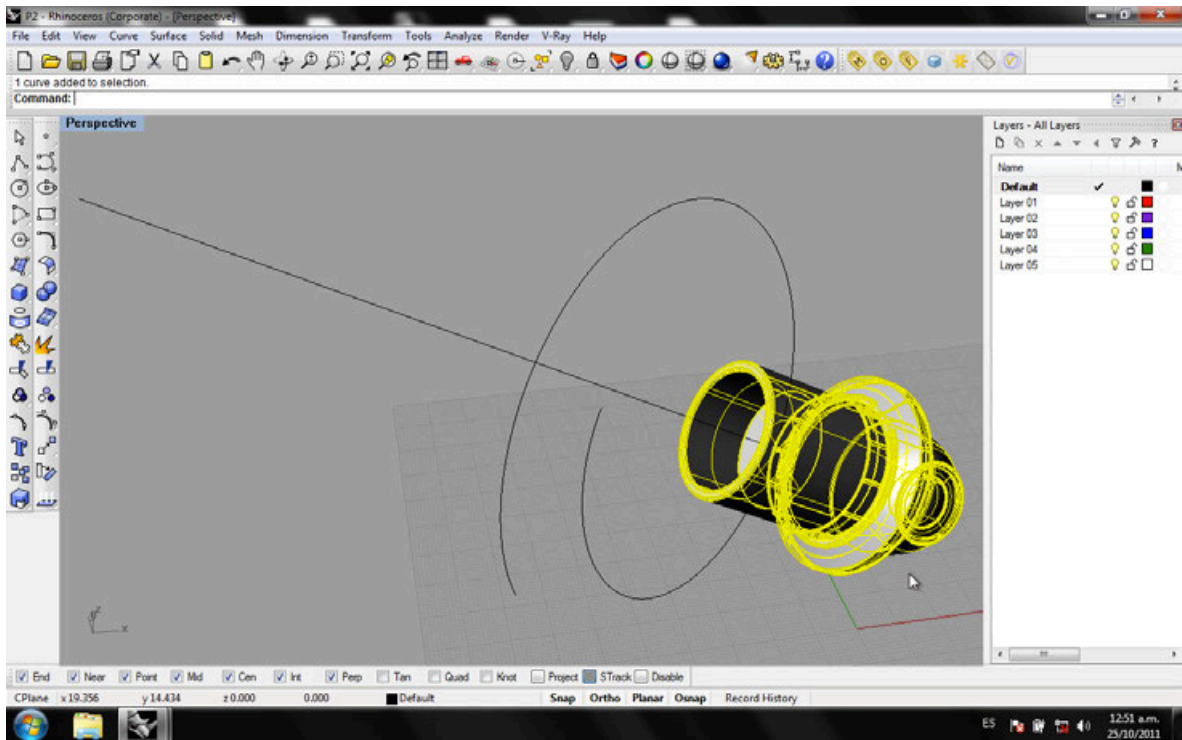
Step 8

Create 2 HELIX around the base block.



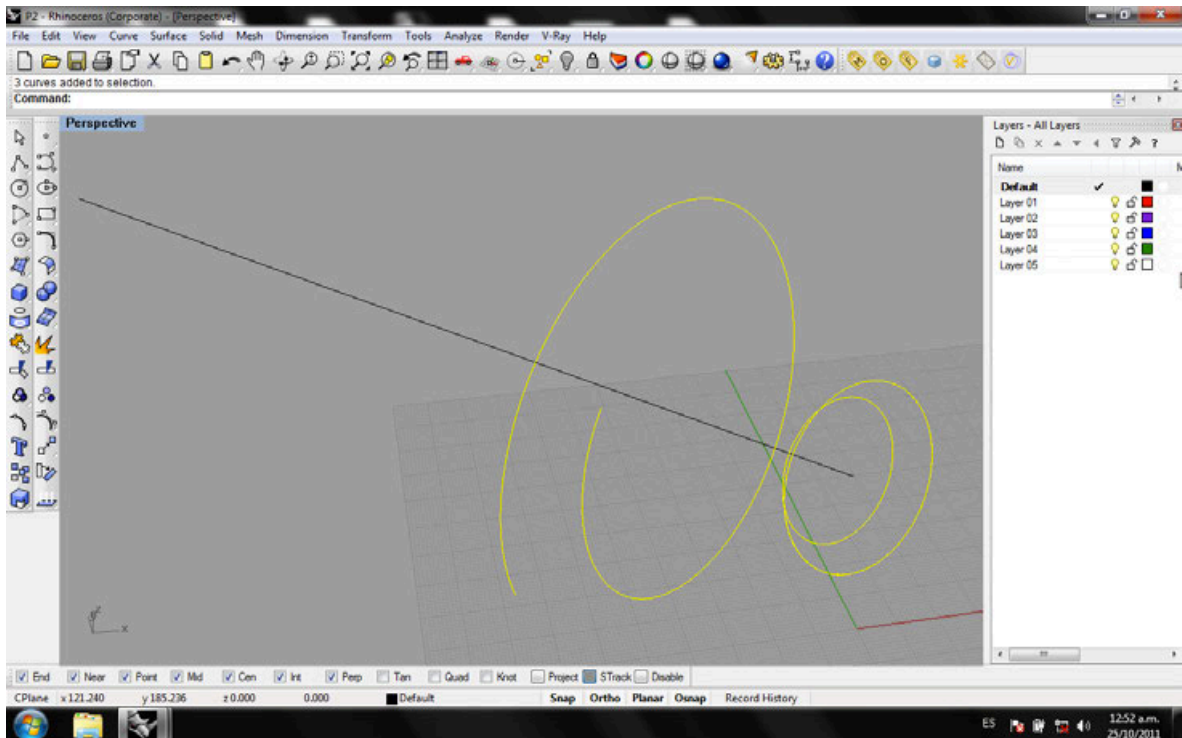
Step 9

Hide the Base block to make the next part easier.



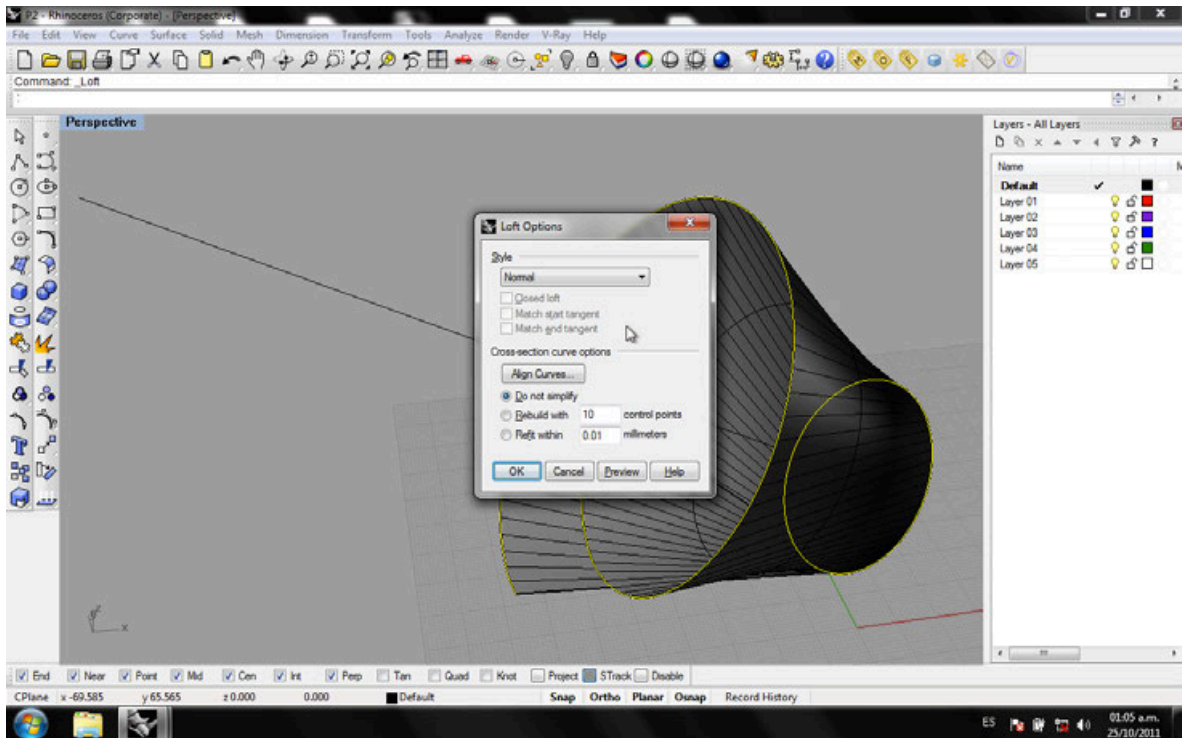
Step 10

Select the outside curves.



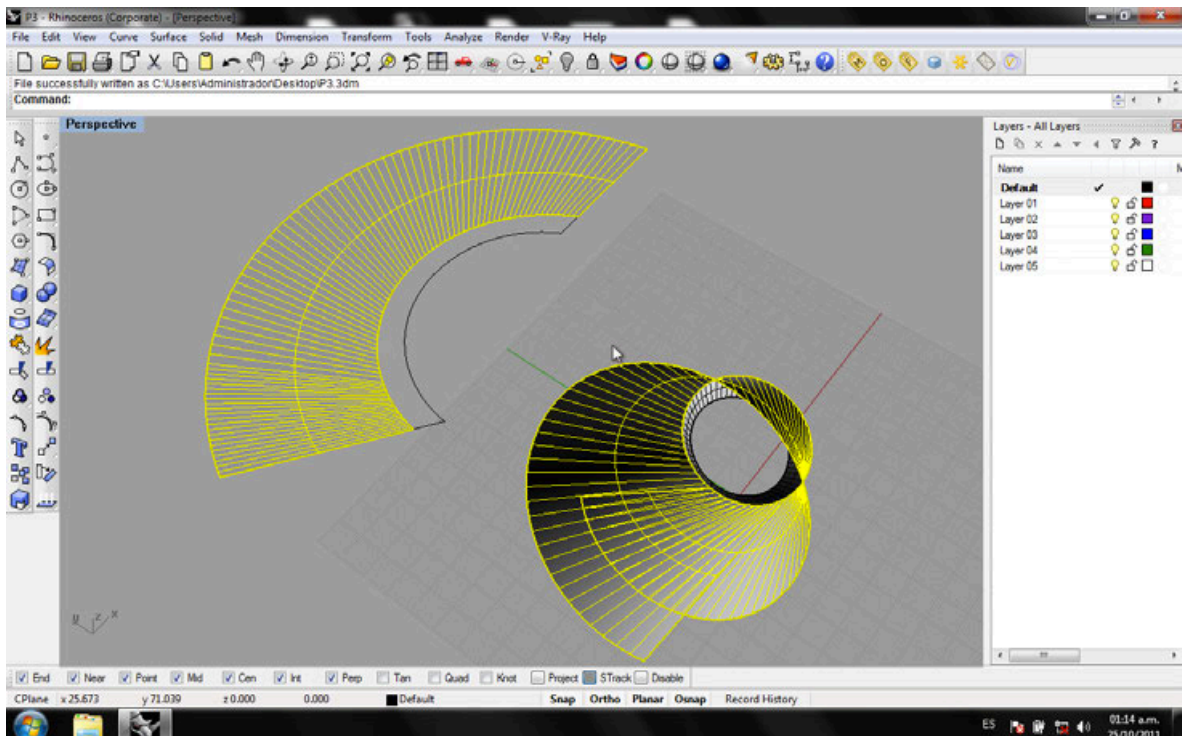
Step 11

Create loft surface with the curves. Do the same with the inside curves.



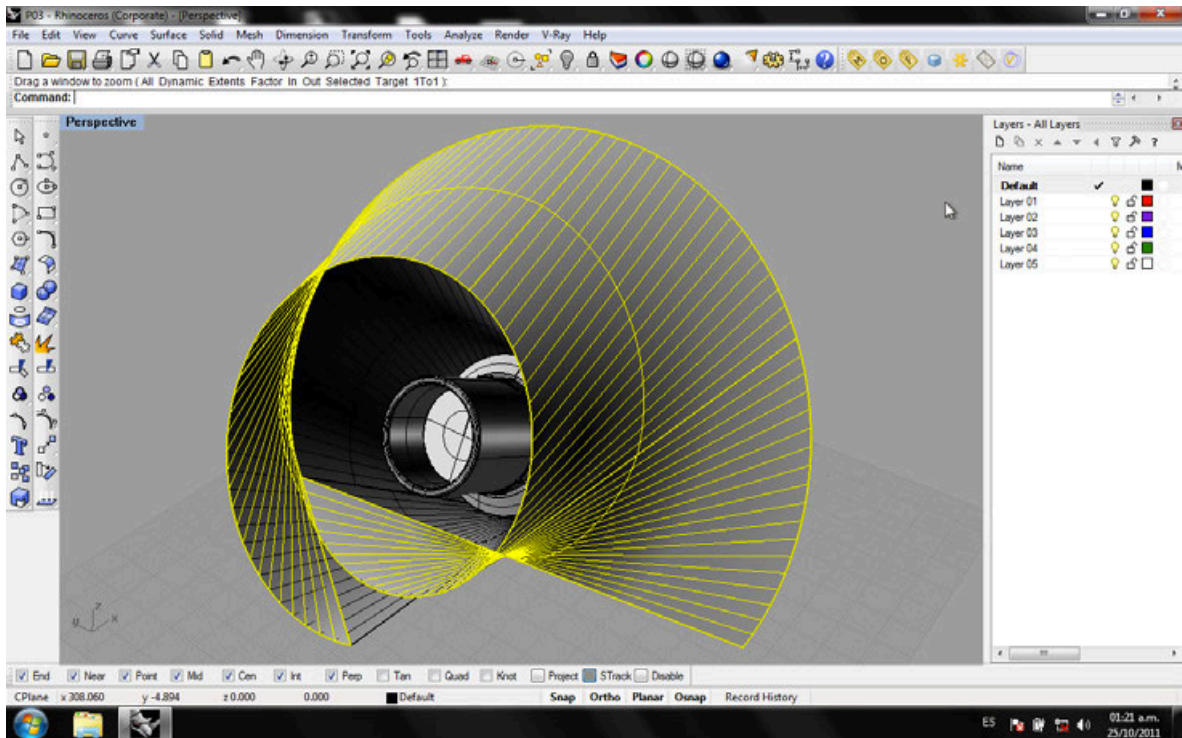
Step 12

Unroll the pieces to get a fabrication profile.



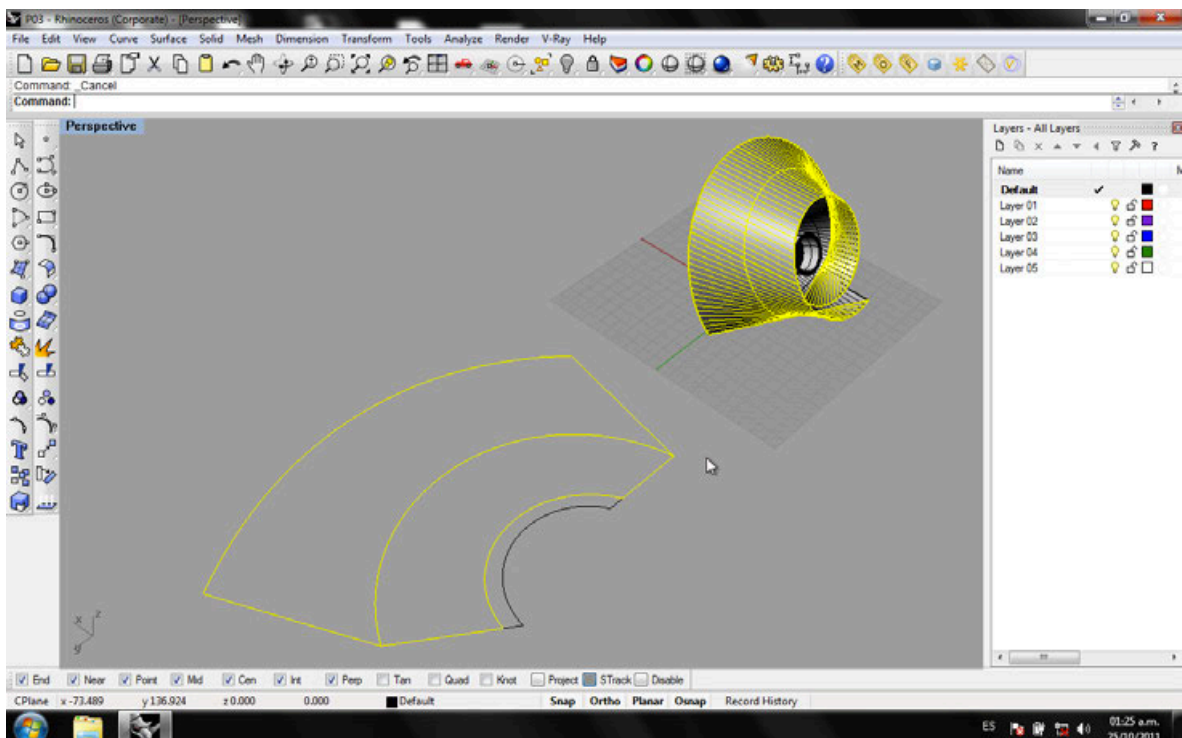
Step 13

Create a bigger SPIRAL in the backside of the lamp, and loft the outer curves.



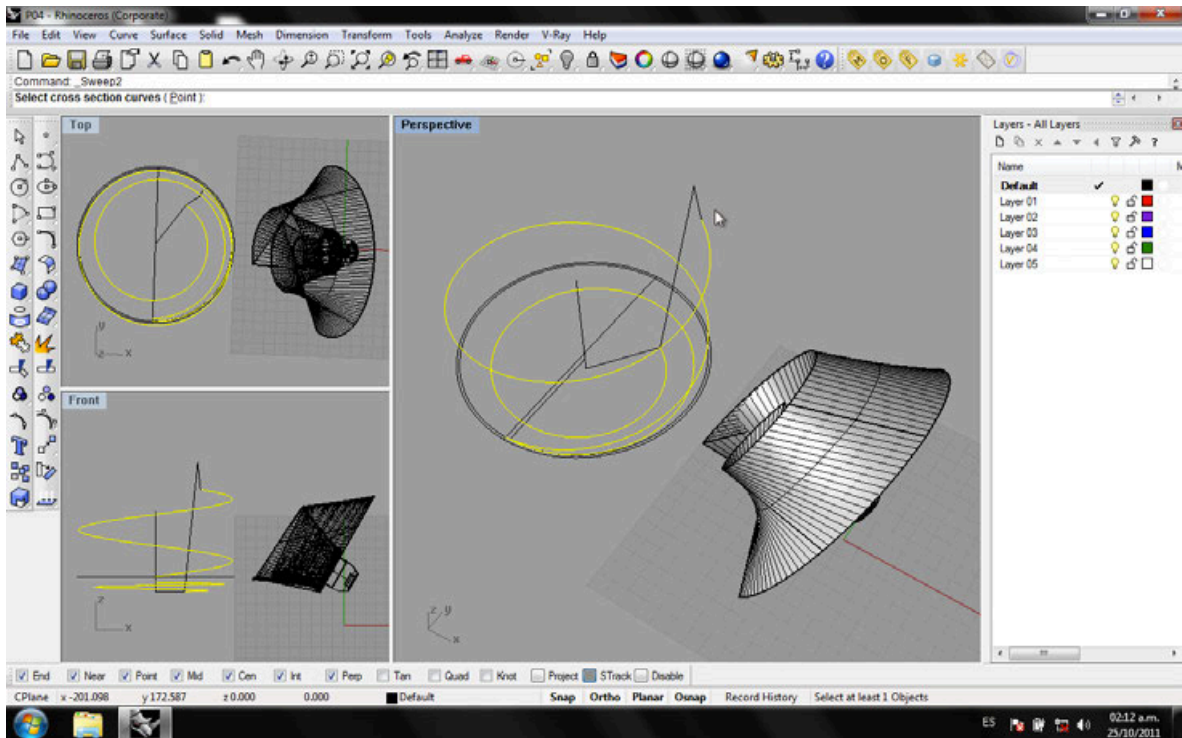
Step 14

Unroll the new piece and duplicate its border to complete the fabrication profile.



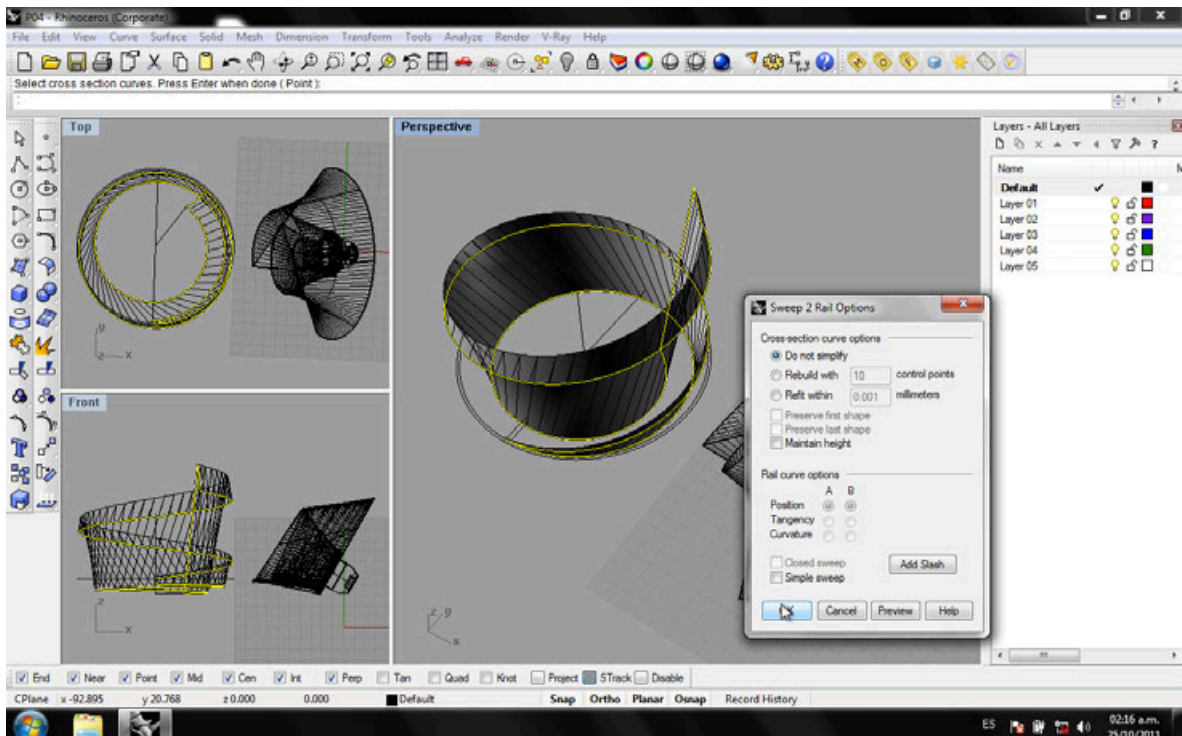
Step 15

Draw 2 SPIRAL around a central axis, in the way shown on the picture.



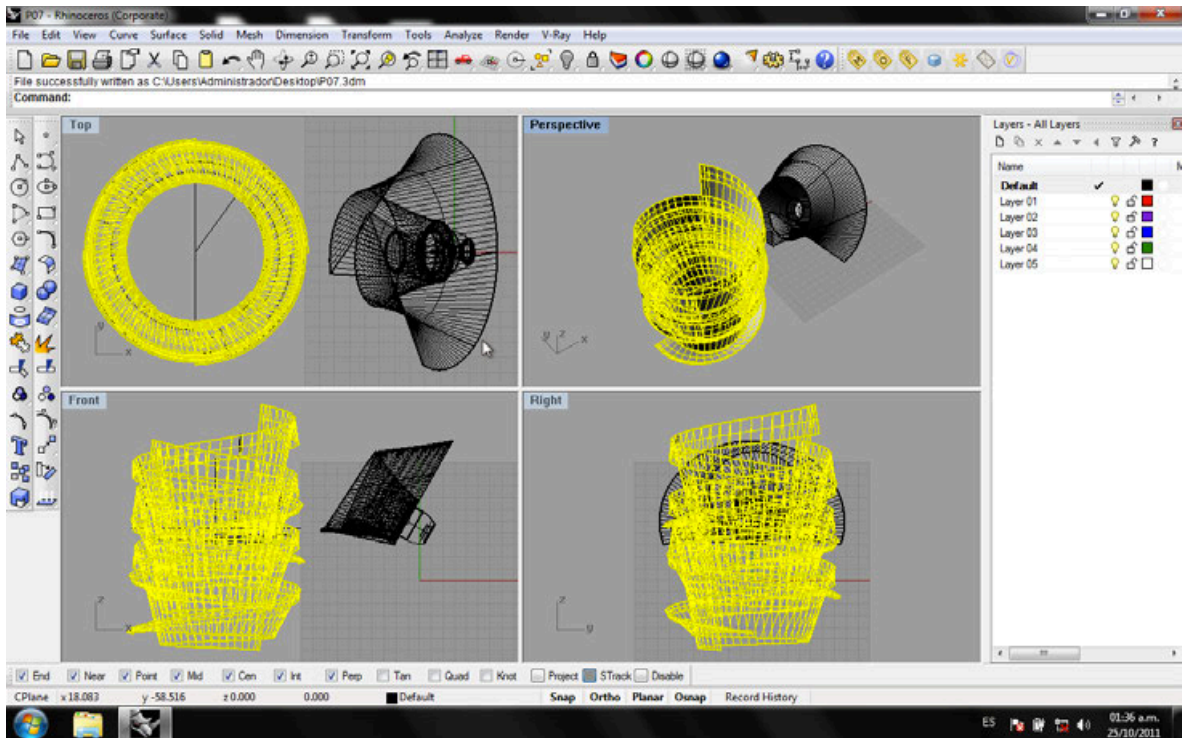
Step 16

Use the SWEEP 2 RAILS to create the lamp cover components.



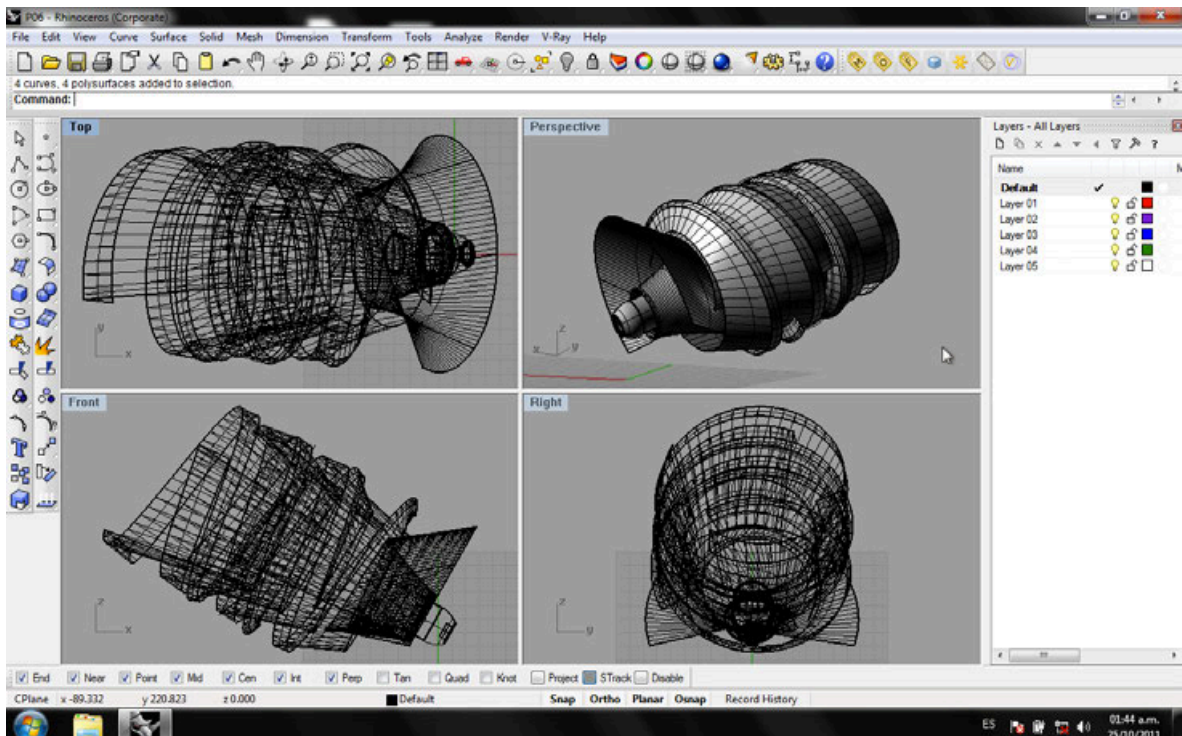
Step 17

Duplicate and rotate the polysurface to compose the lamp cover.



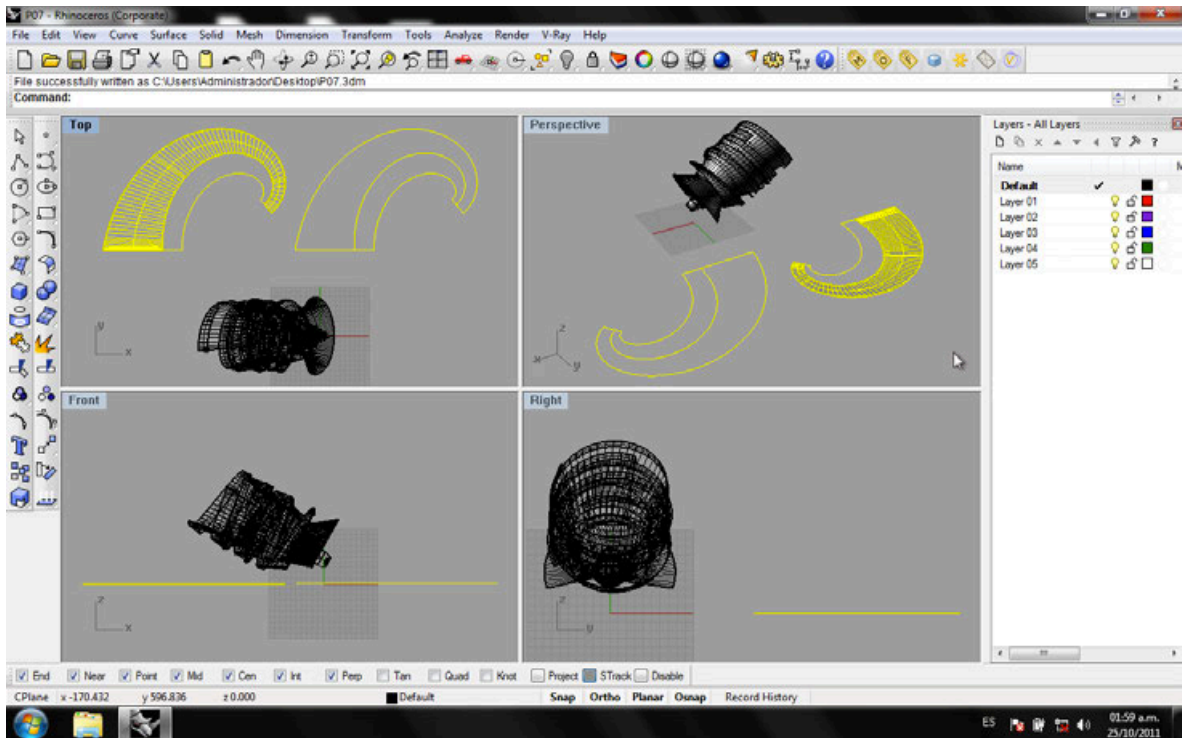
Step 18

Rotate the lamp cover and align it with the main line axis (See step 6).



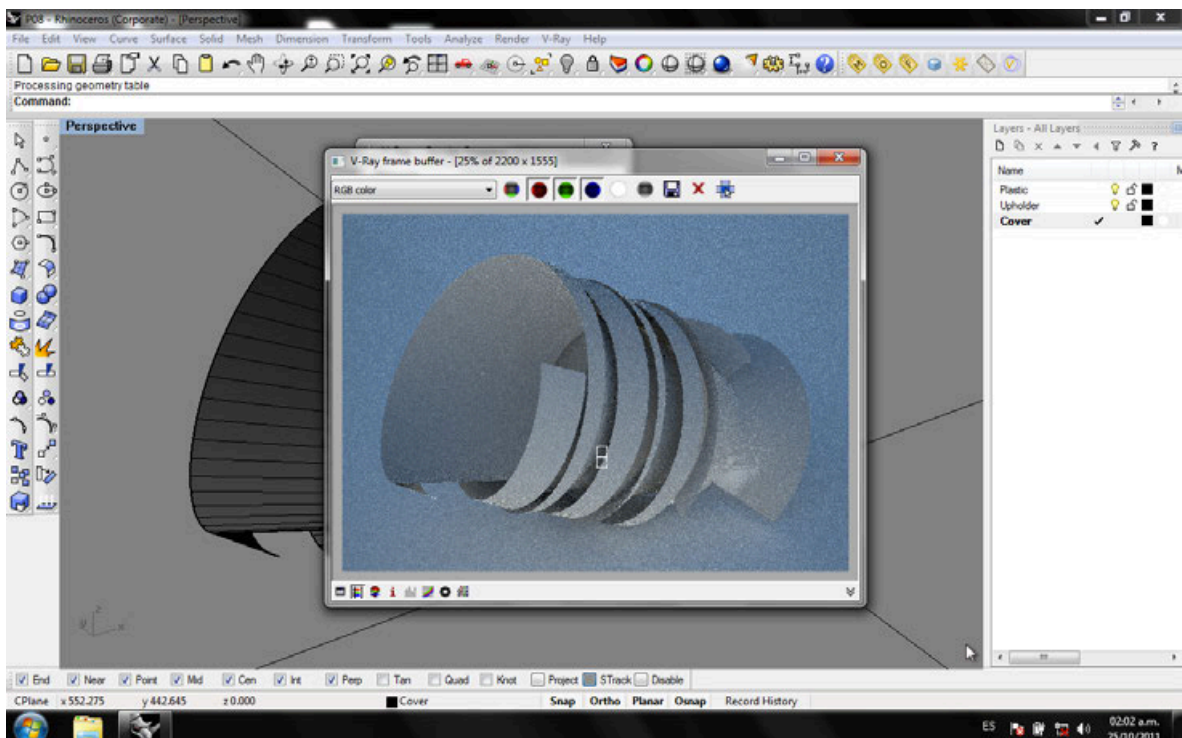
Step 19

Extract the lamp cover fabrication profiles (Follow the instructions shown on the steps 12 and 14).



Step 20

Render using V-Ray.



PERFORMANCE

The lamp fabrication was developed with a combination of two and three-dimensional modeling. Initially, each piece was developed in a two dimensional stage in order to understand the cutting process by using the laser cutter. With this exercise, we had the opportunity to experiment with different styles of cutting and engraving. Once we got the first idea with the two-dimensional projection, the modeling part by Rhino was a necessary tool to understand how the entire structure of the lamp works.

However, as our material was cardboard in combination with bending technique, we found more useful to cut pieces from the two dimensional model. This process gave us the opportunity to bend the cardboard as the design needed.

In order to develop a more efficient work we put the engraved design as the first task for the laser cutter, and the cutting process as a second task. In general, the cutting process took a few minutes, and the final product was well done.