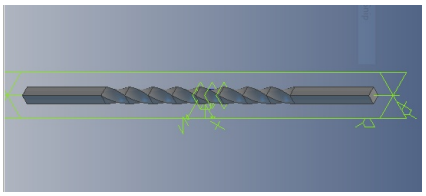
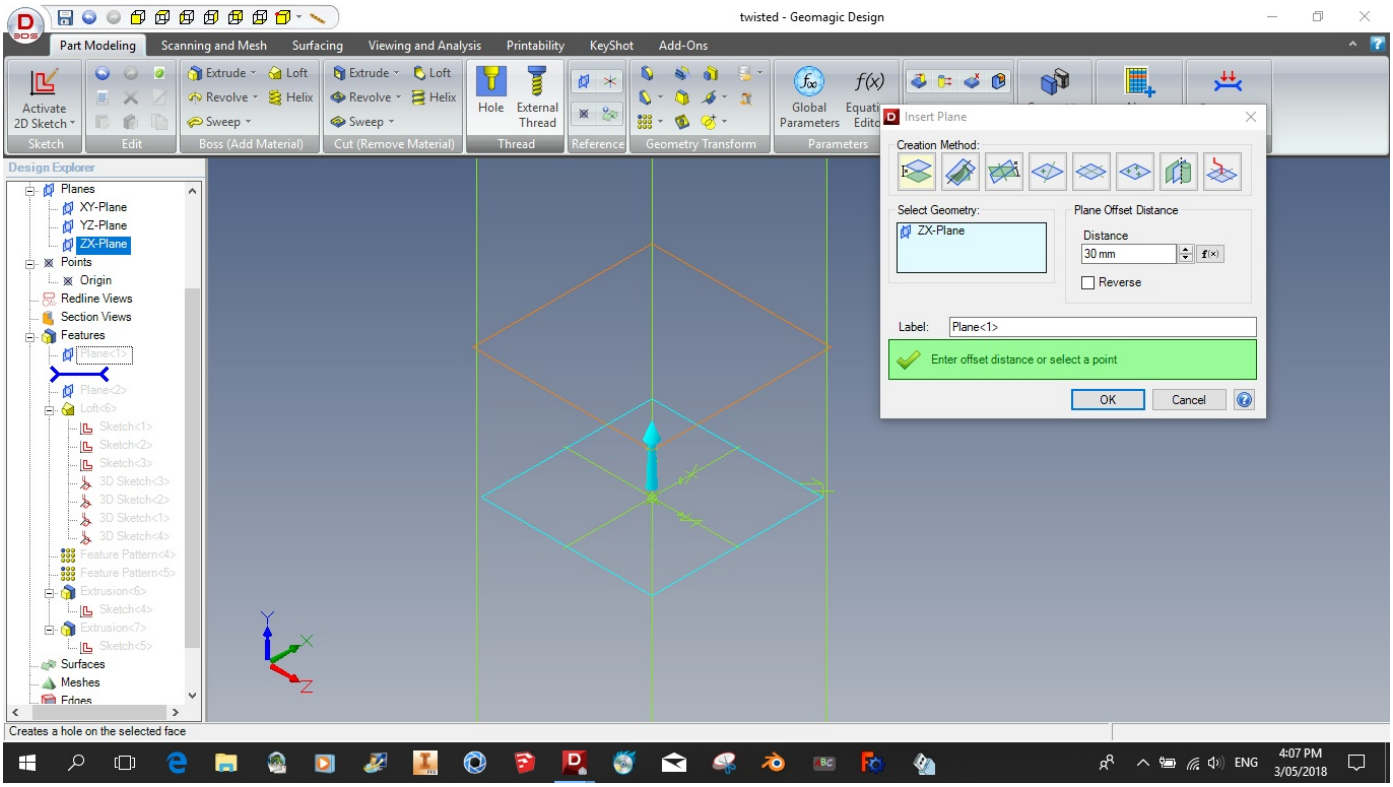
Modeling Twisted 25 X 25 Square Bar



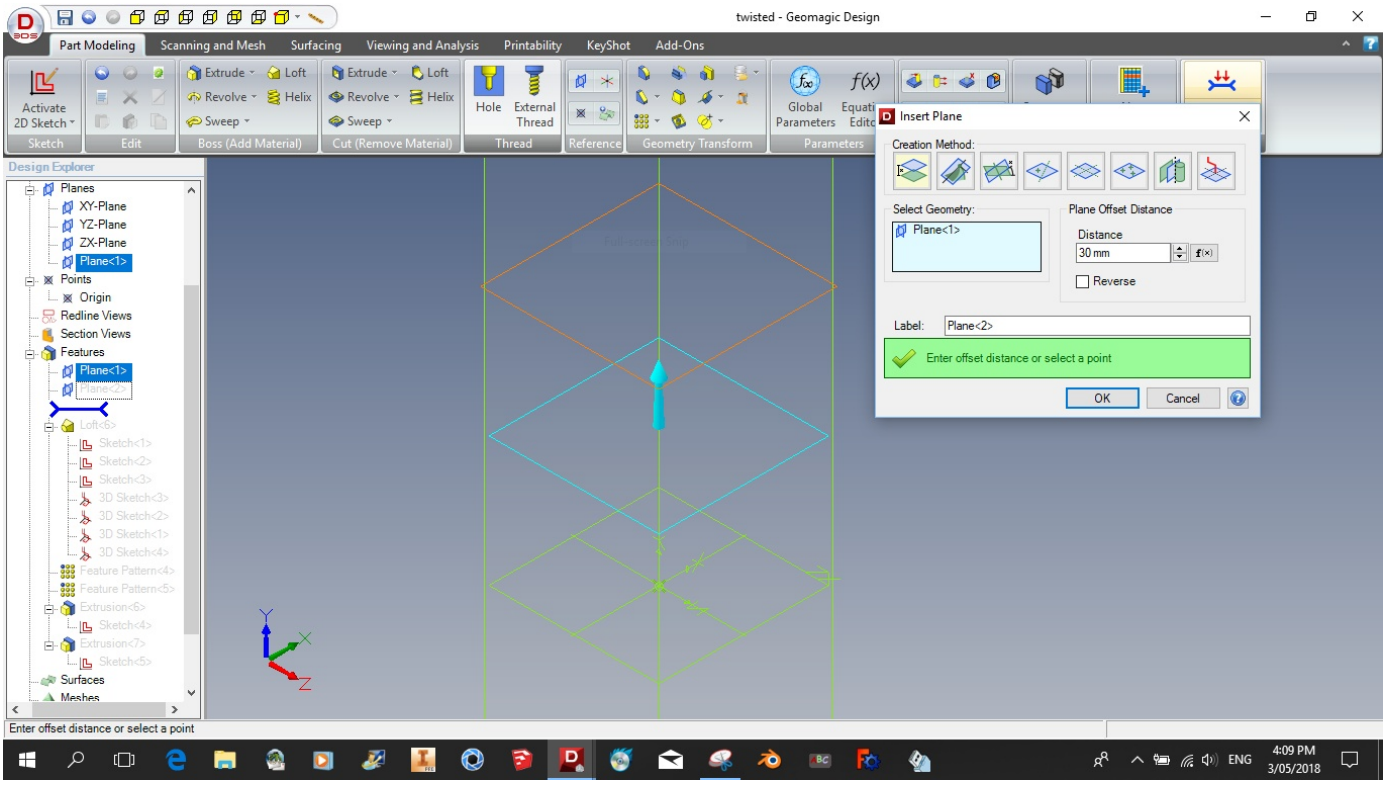
Modelling a twisted 25mm x 25mm square bar with Geomagic Design (Alibre) software. The model is made using lofted sketches, and as this feature tool is common to many software packages, the basic method should work with other software.

Step 1.



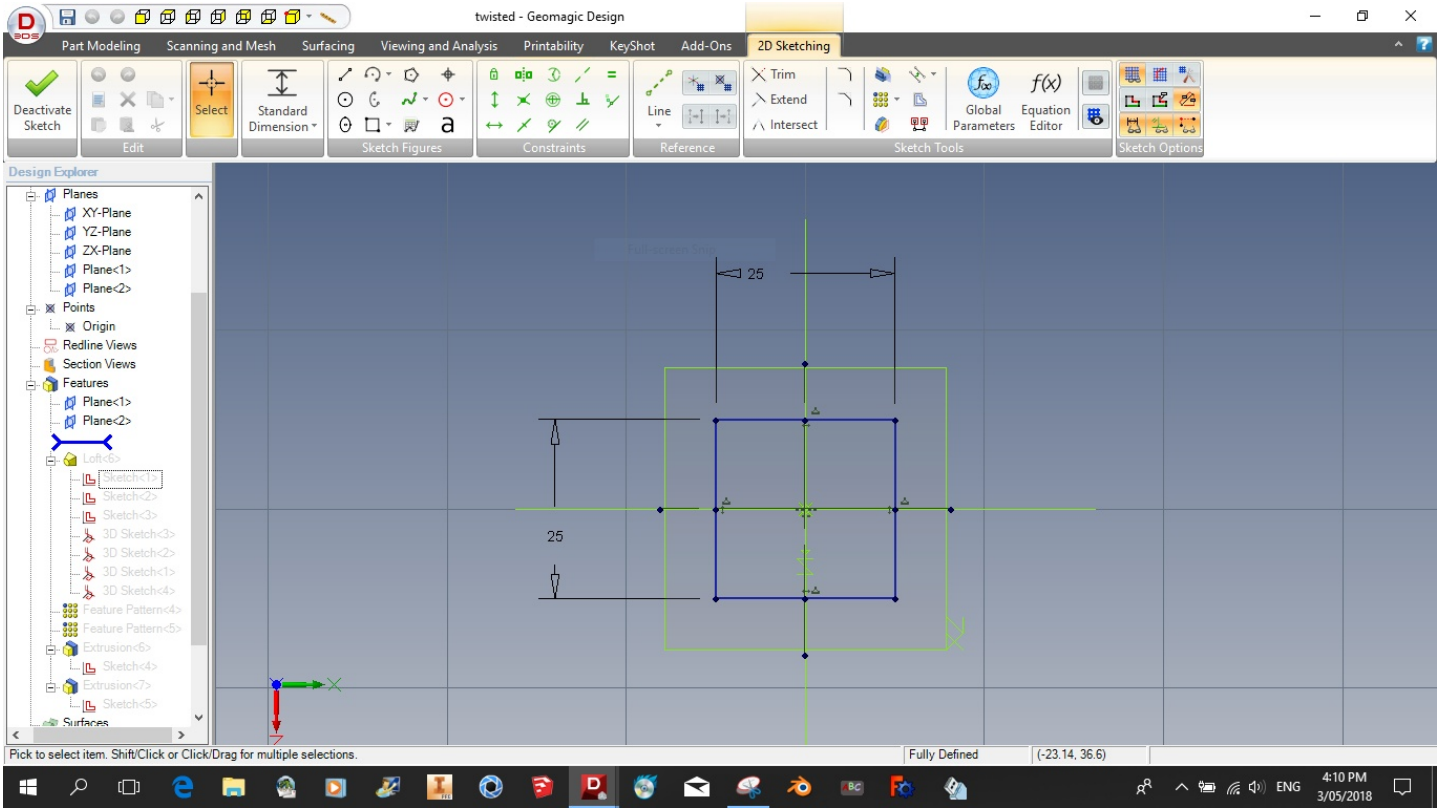
A new plane is constructed, in this case 30mm from the base plane. As the length of one twist is to be 60mm this plane needs to be 1/2 the twist pitch

Step 2.



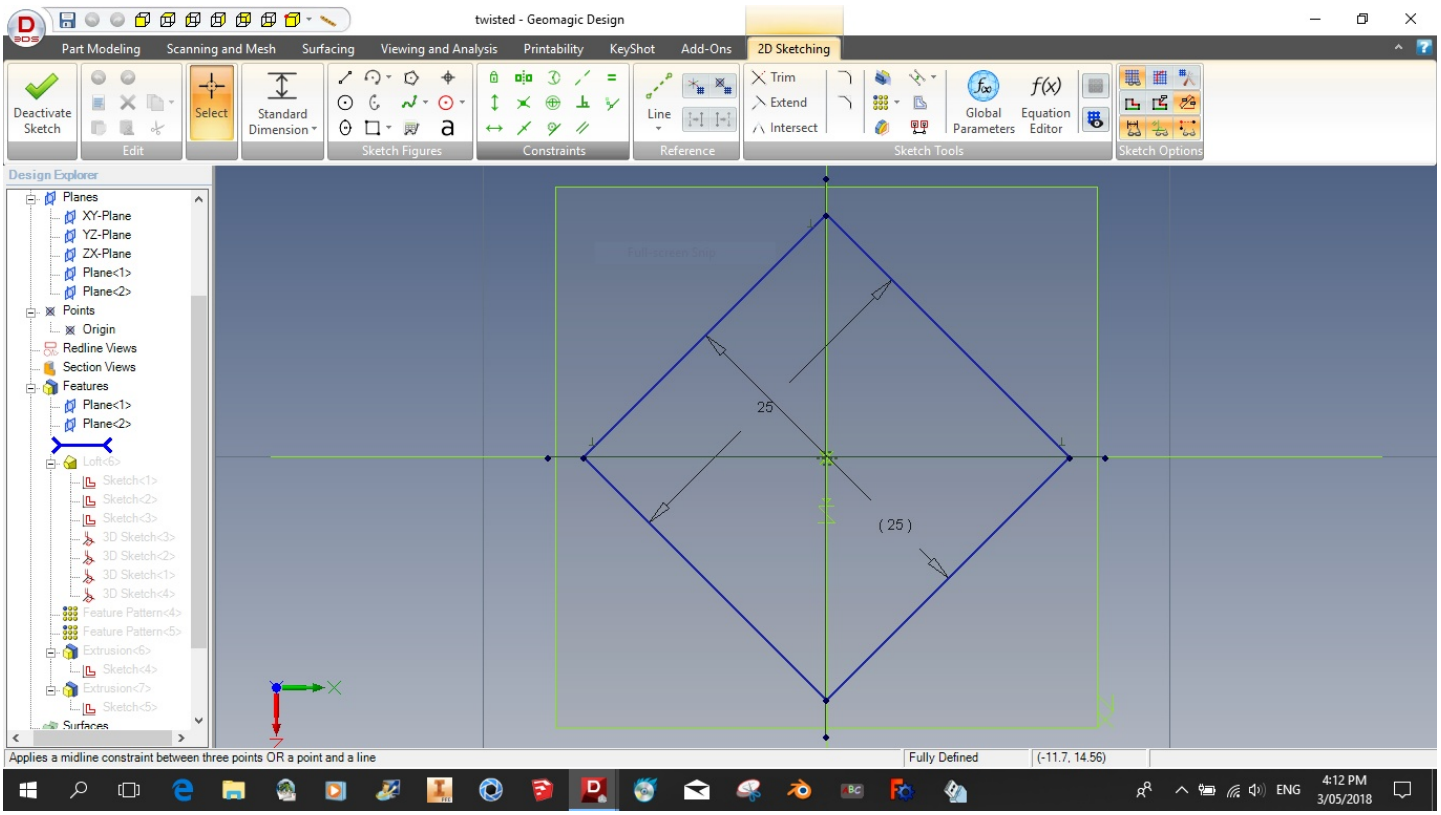
A second plane is constructed 30mm from the first constructed plane. This plane is positioned from the first plate 30mm as this is half the first pitch.

Step 3.



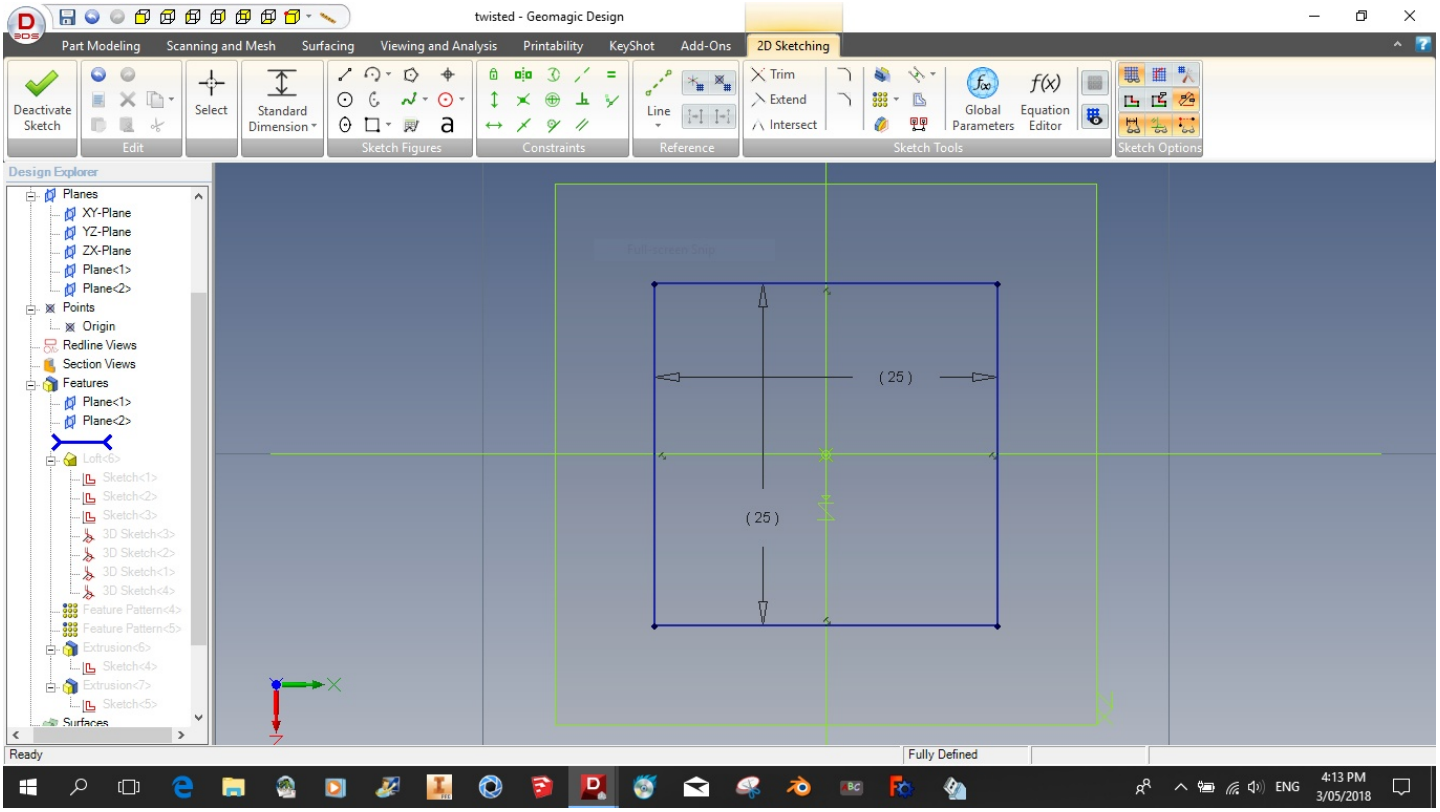
A sketch is now made on the base plane. As, in this case the twisted section is to be 25 x 25 square the sketch is dimension as above. I is important that this sketch is symmetrical to model origin.

Step 4.



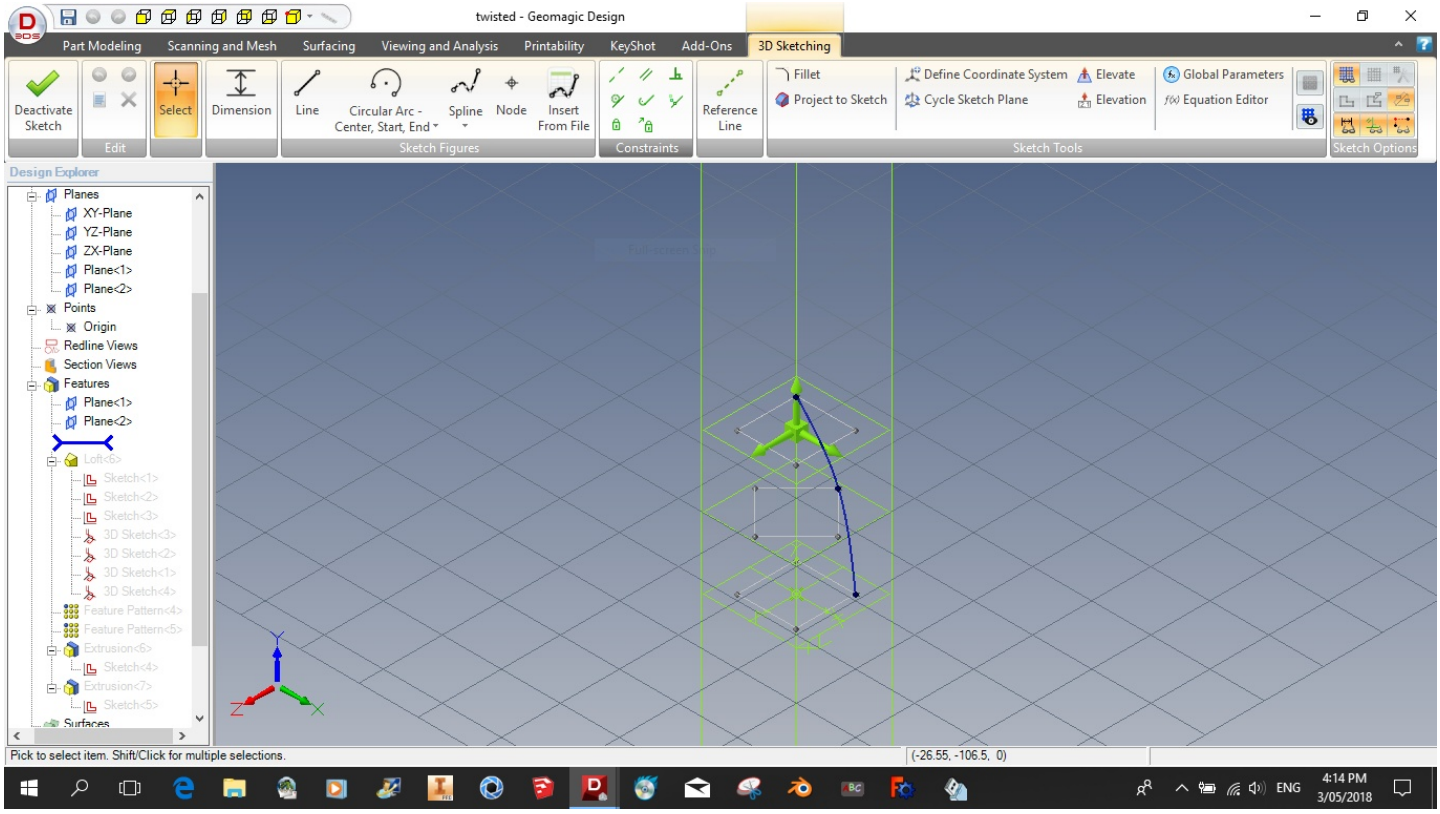
A sketch is now made on the middle plane. again this is for a 25 x 25 square, but as this is on the mid point of the twist, the sketch is rotated 45 deg.

Step 5.



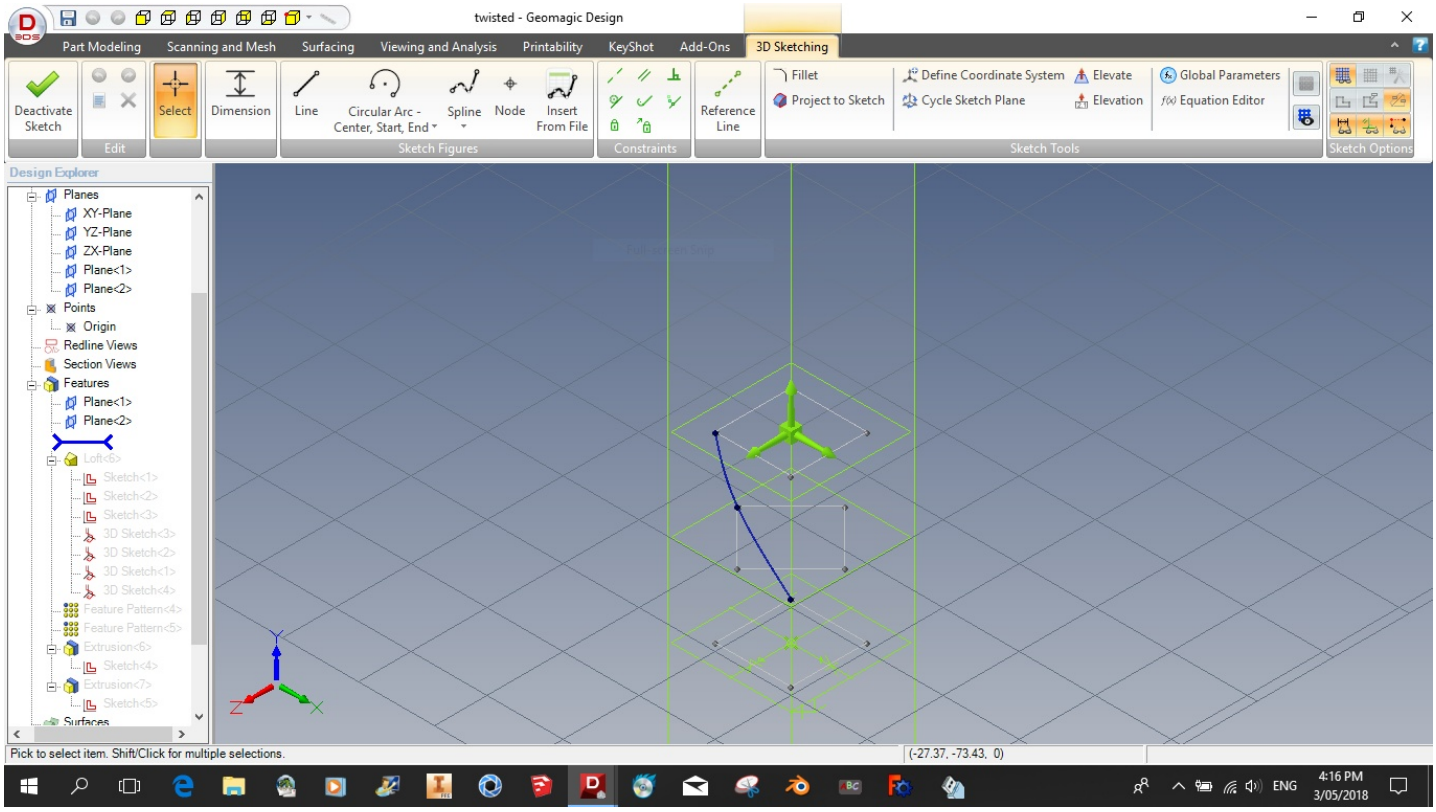
The final sketch is now made on the 3rd plane. again this is for a 25 x 25 square, This sketch is made symmetrical with the sketch on the base plane.

Step 6.



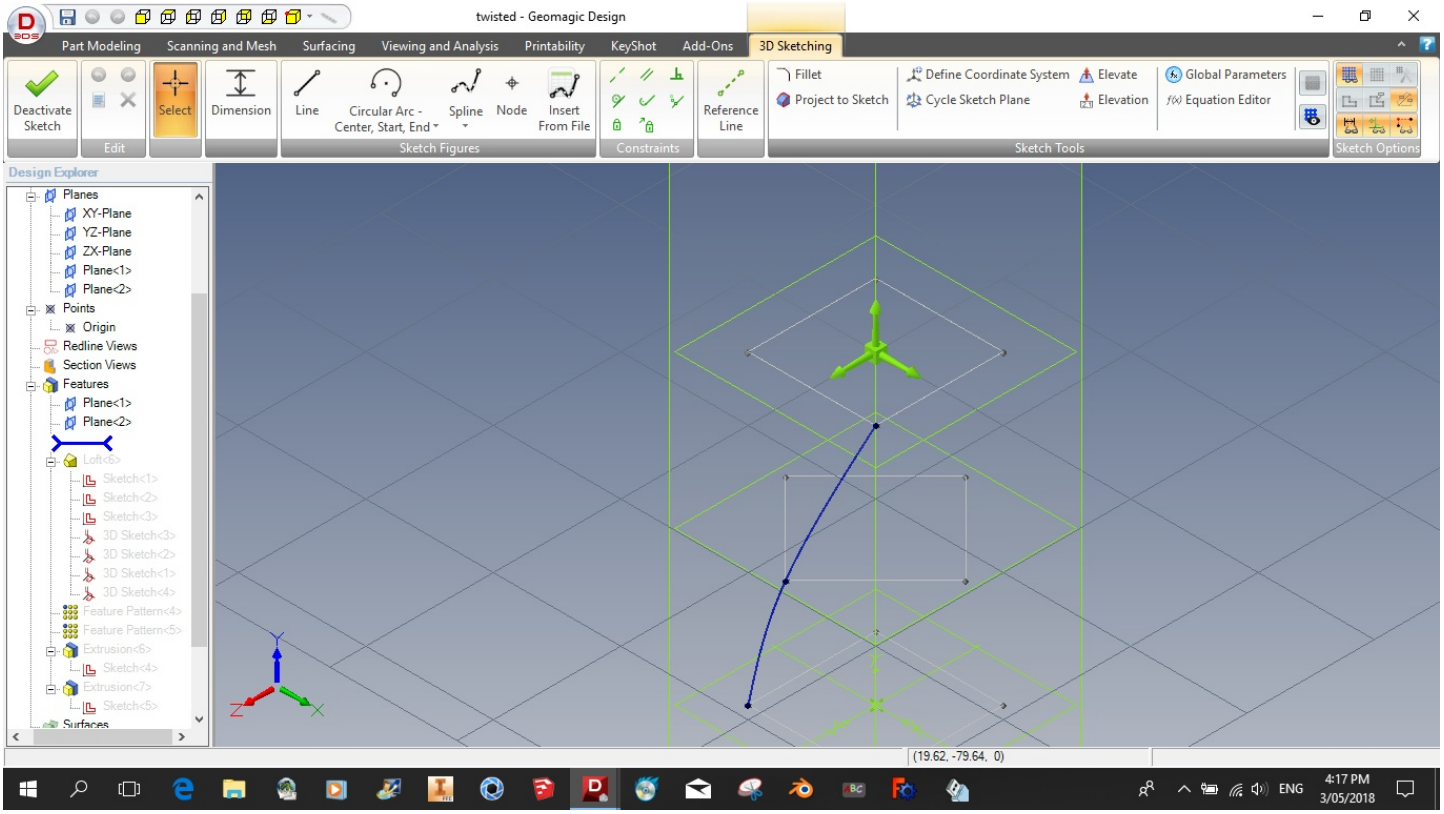
A 3D sketch is now made.This sketch connects the corners of the three profile corners as shown above.

Step 7.



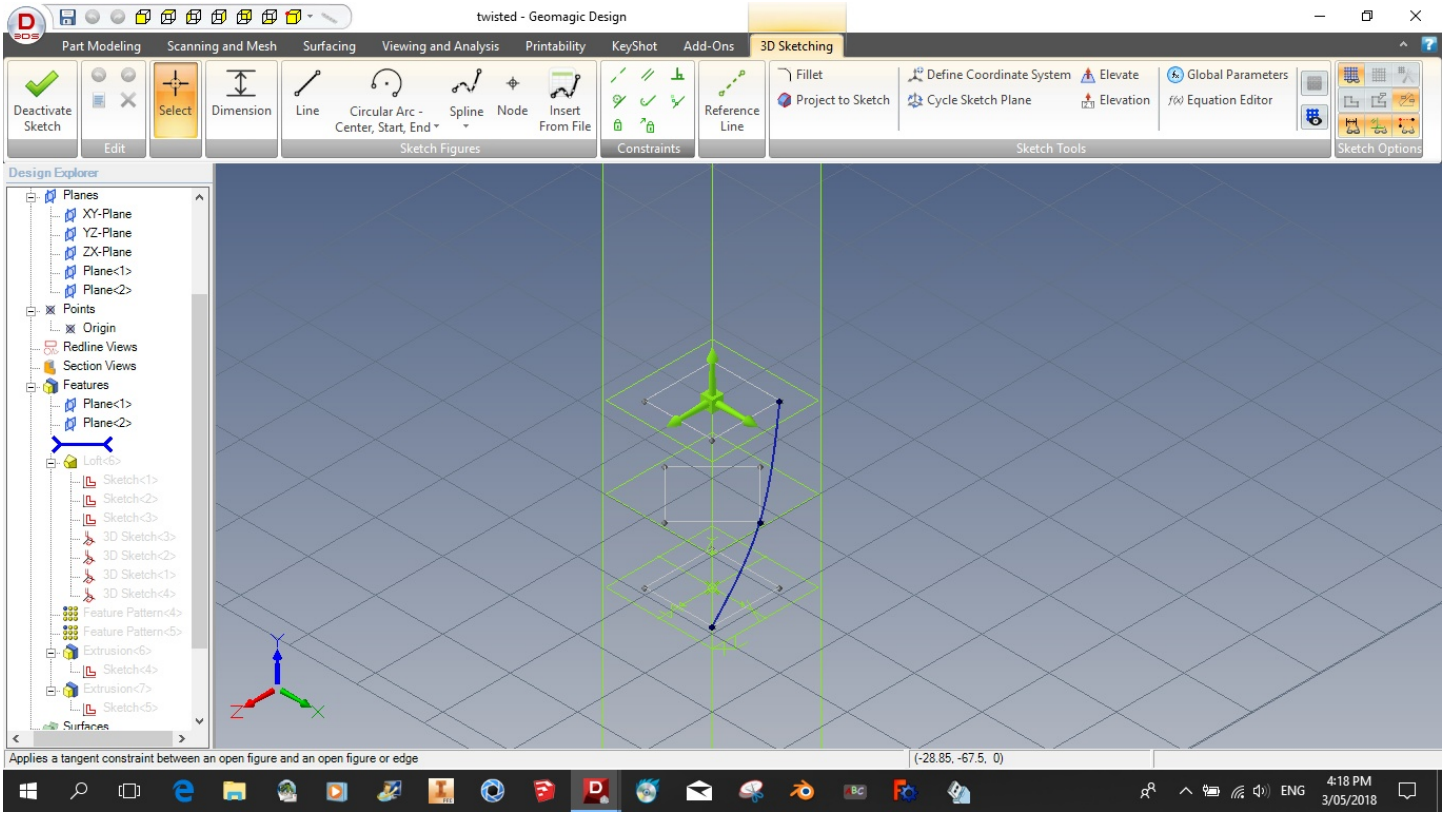
Step 7 is similar to step six. We move on to the next corner of the profile sketch and link them together as above.

Step 8.



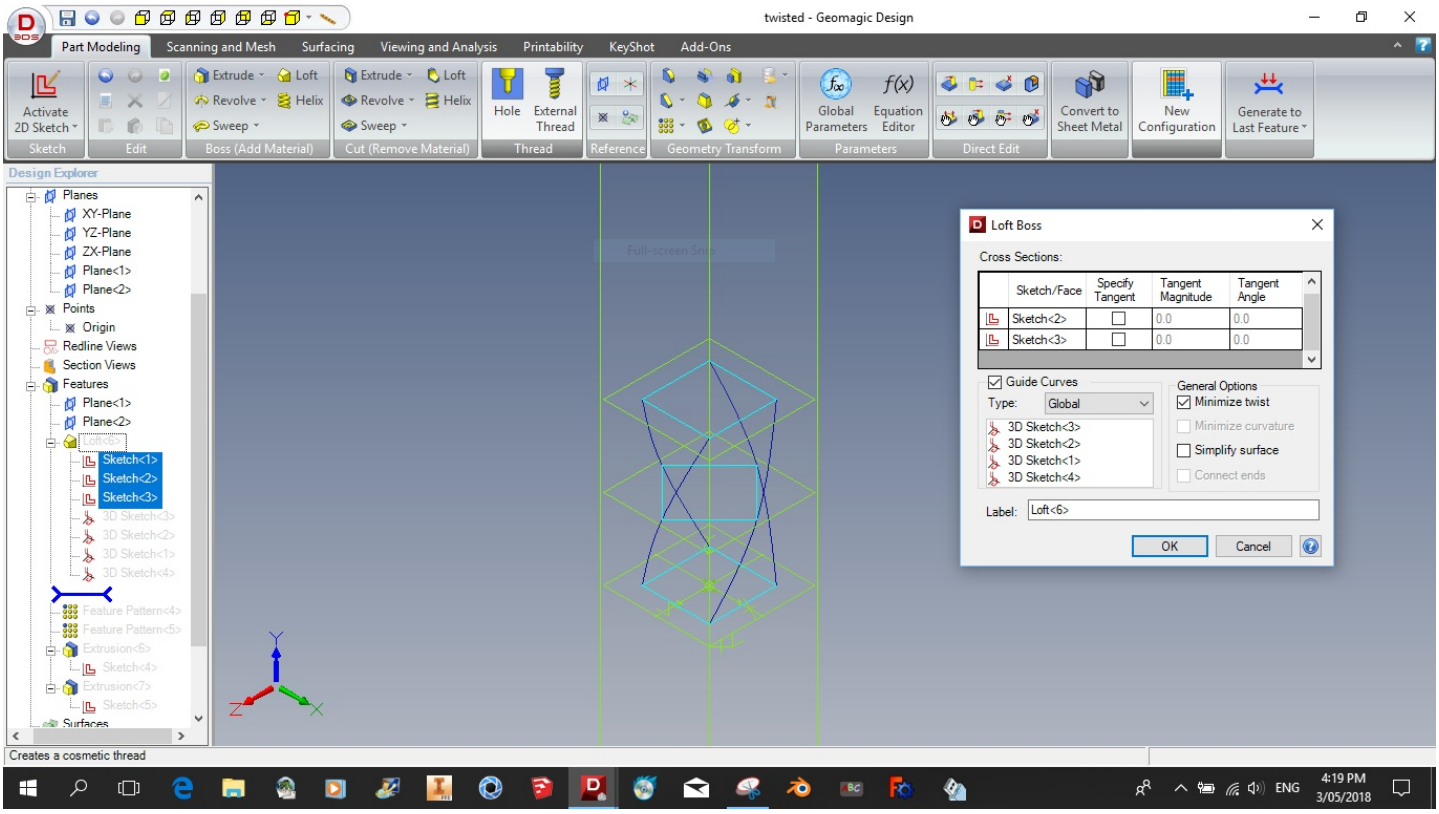
Step 8 continues the process of linking the corners of the profiles with a 3D sketch.

Step 9.



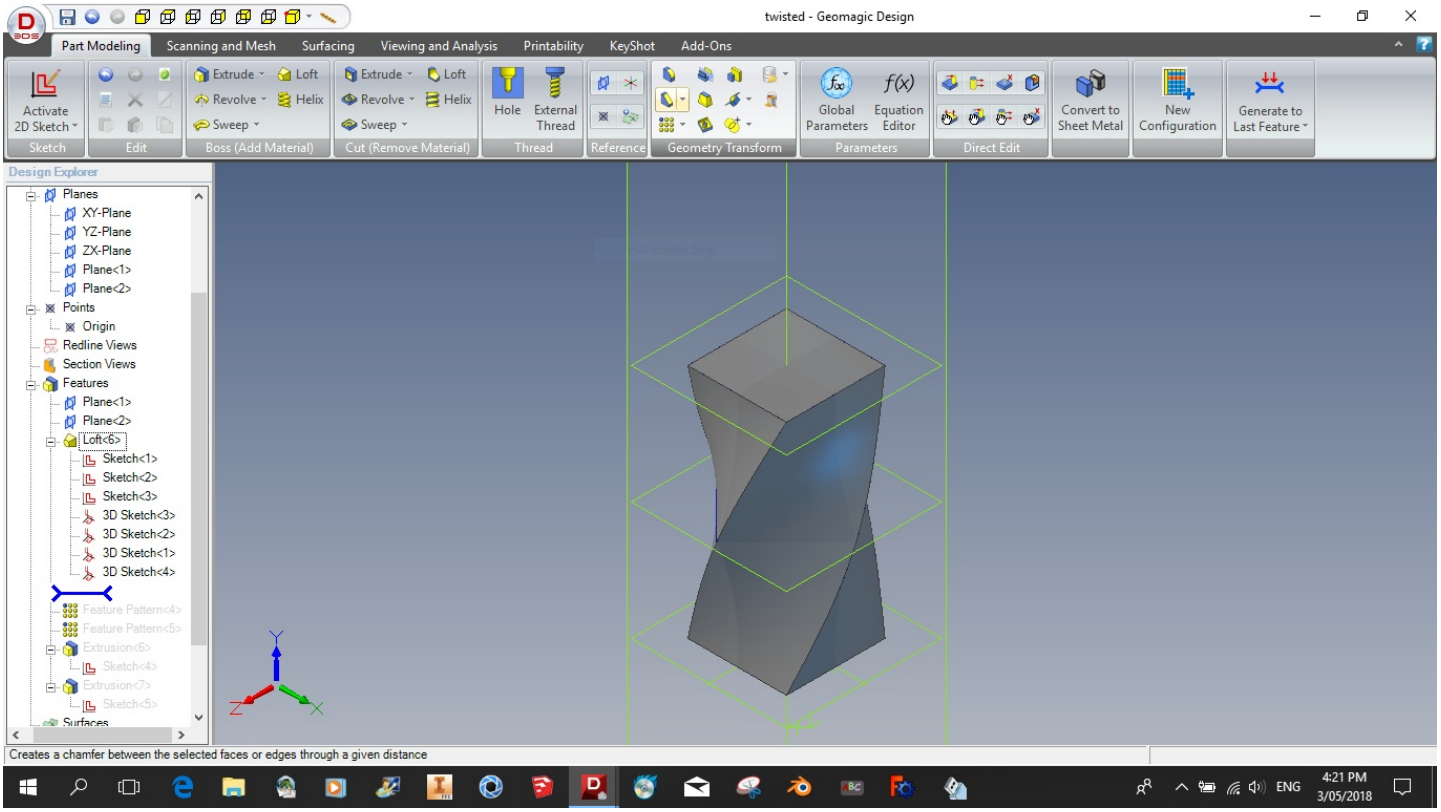
And now the final corners of the profiles are linked..

Step 10.



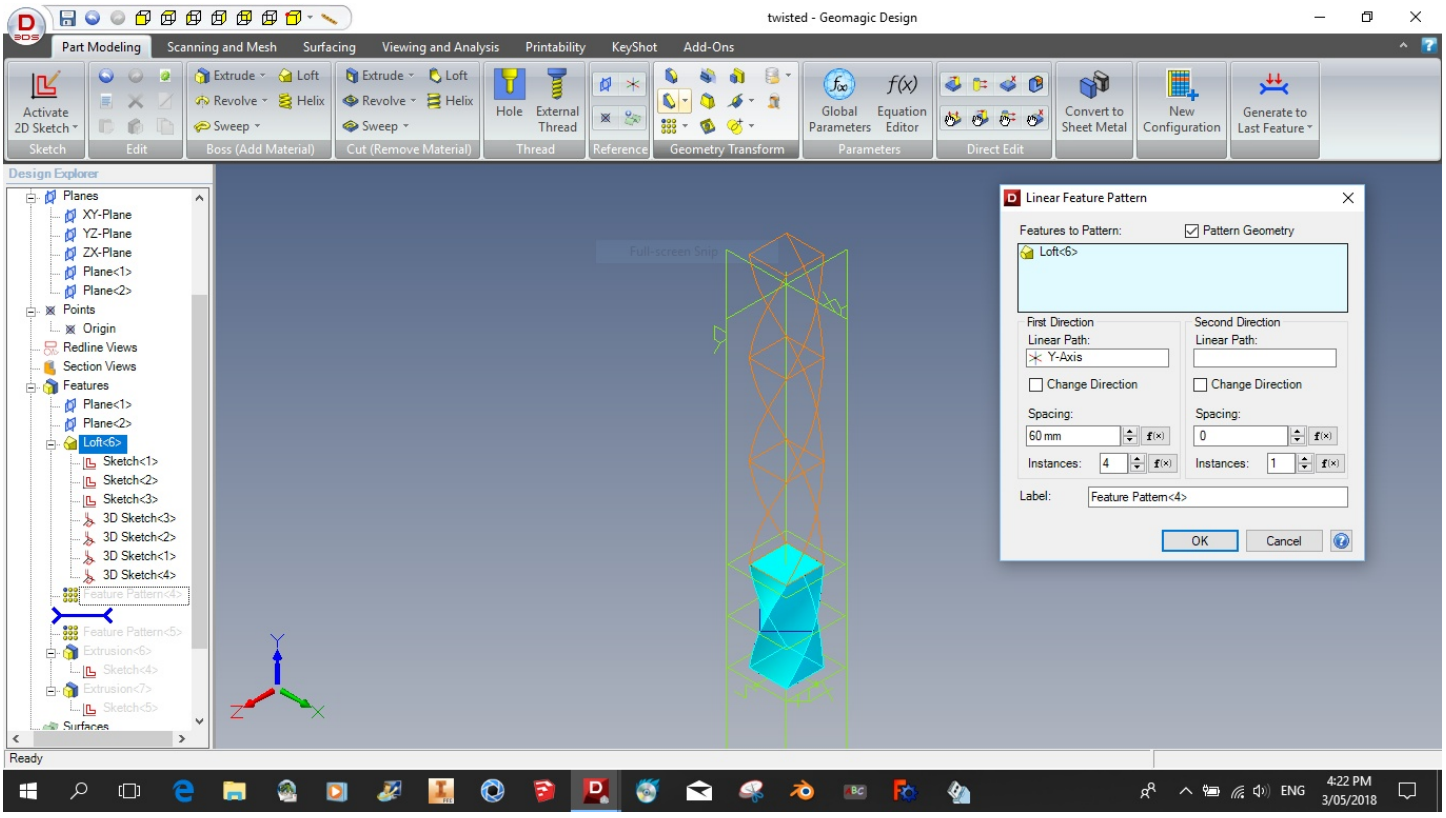
We now loft the 3 profiles to produce a section of twist. The 3D sketched are used as guide curves to control the loft

Step 11.



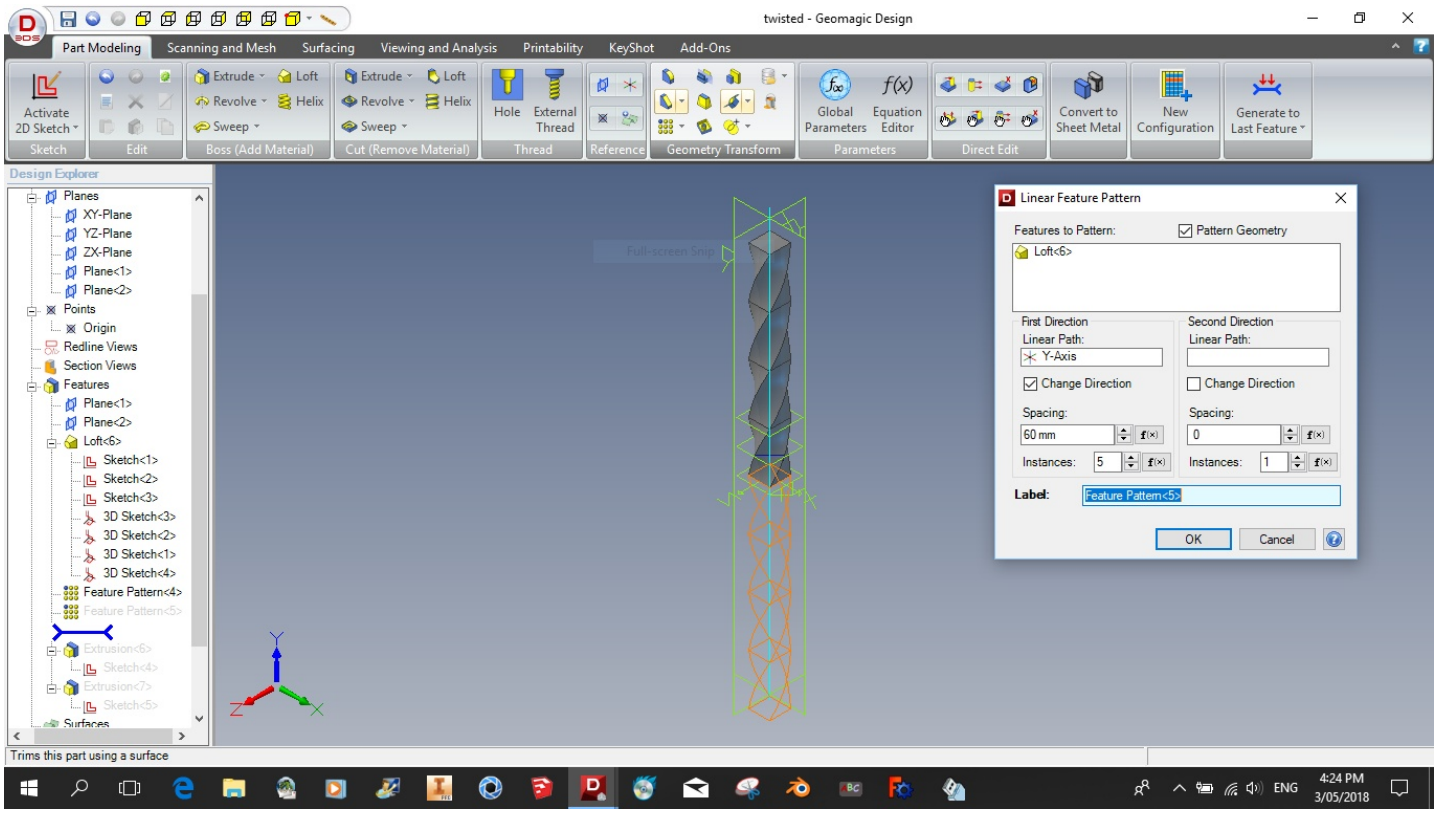
The completed loft forms 1 pitch of twisted section.

Step 12.



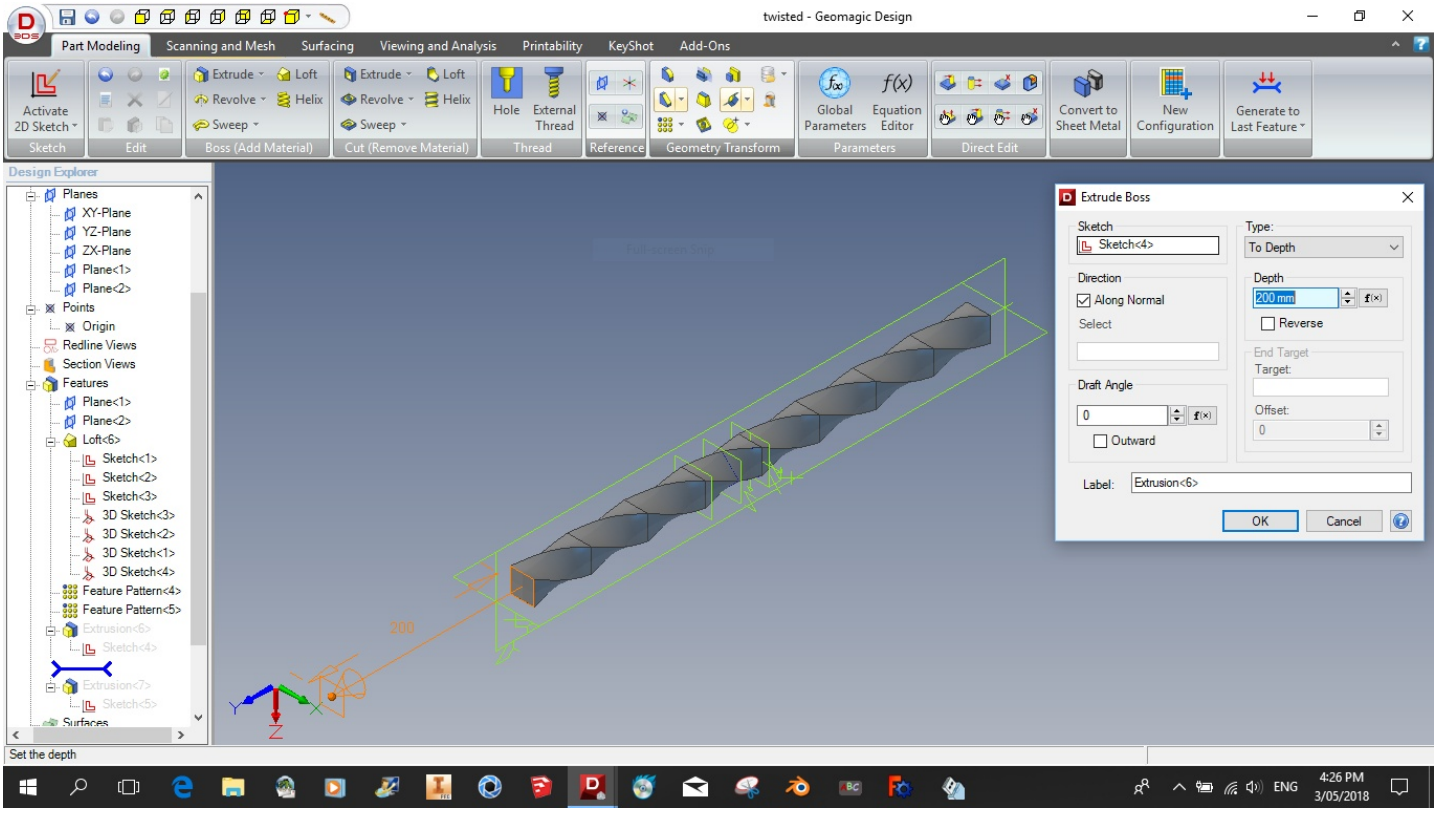
The feature pattern tool is now used to make the number of twists required.

Step 13.



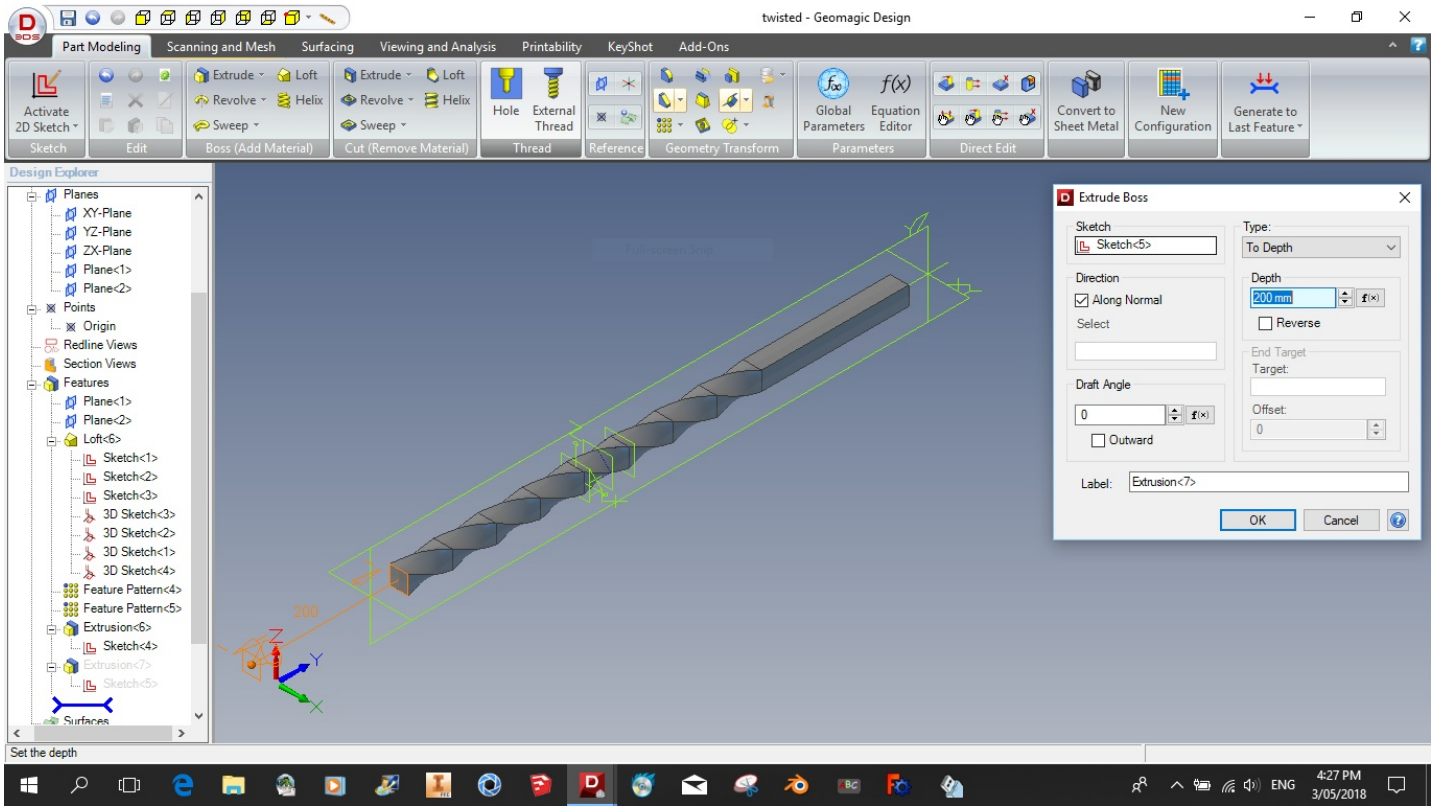
As , in this case I wished to have features symmetrical to base plane, I patterned twists each side of this plane.

Step 14.



To complete the part I require, I am adding straight section to each end. this is a simple extruded profile.

Step 15.



Next extrude the other end.

The completed part.