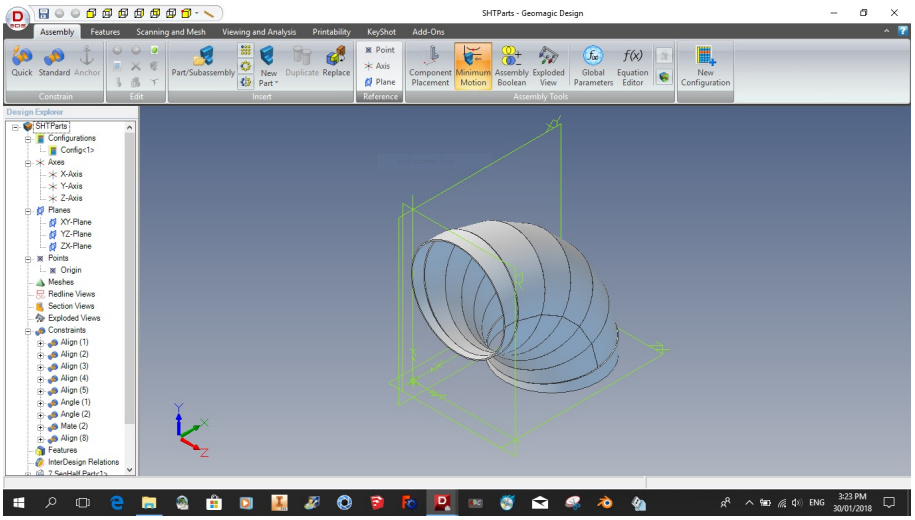
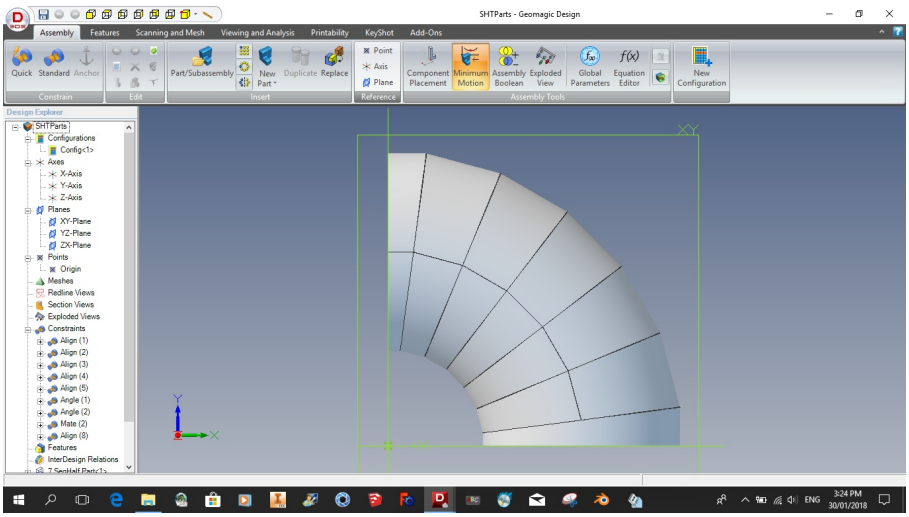
Lobsterback Duct Bends Sheetmetal Method

This is the method I use to construct lobsterback bends with sheetmetal tools that I can produce flat patterns from, These flat patterns can then be used to produce files for CNC profile cutting machines. I have come accross other ways of doing this using surfaces, thickend and turned into sheet metal parts. The software I am using is Alibre Design, the actual version though, is the Geomagic Design branded version. As the version I have is low on surfacing tools I have found this a good way to model lobsterback bends, which I have been involved with the design and manufacture for many years.

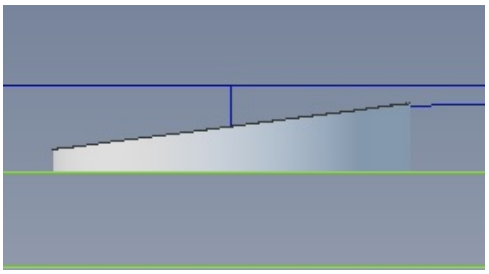


On the left is the completed 7 segment bend. I started detailing these types of bends before CAD, then with the first 2D CAD software and now with 3D modeling software. The method I use is made up from my knowledge of producing developed patterns using these three aproaches.

As the 3D model is parametric, once you have a basic model you can easily generate required sizes by editing the parameters. The Alibre Design package comes with a feature where you attach a parameter file to a design file and driving a template with this file can make short work of generating new sizes.

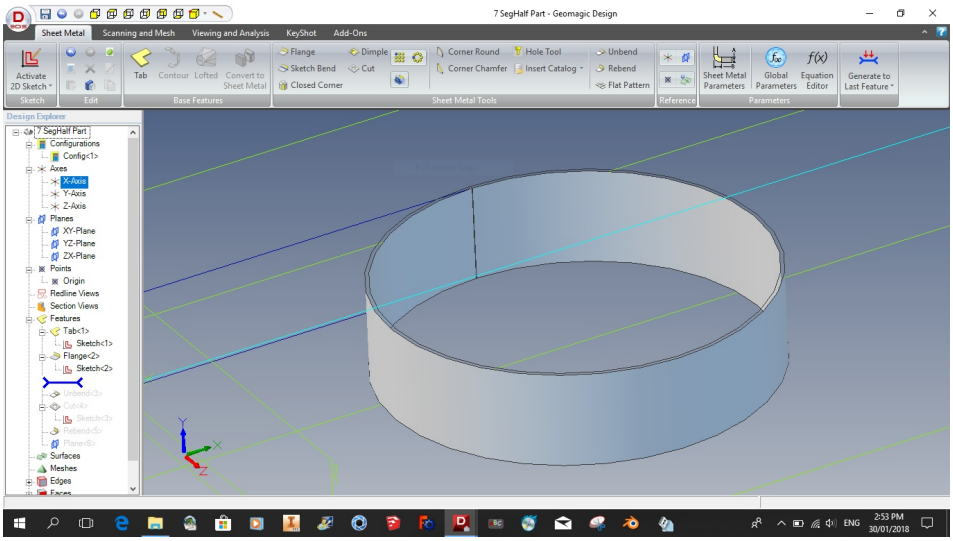


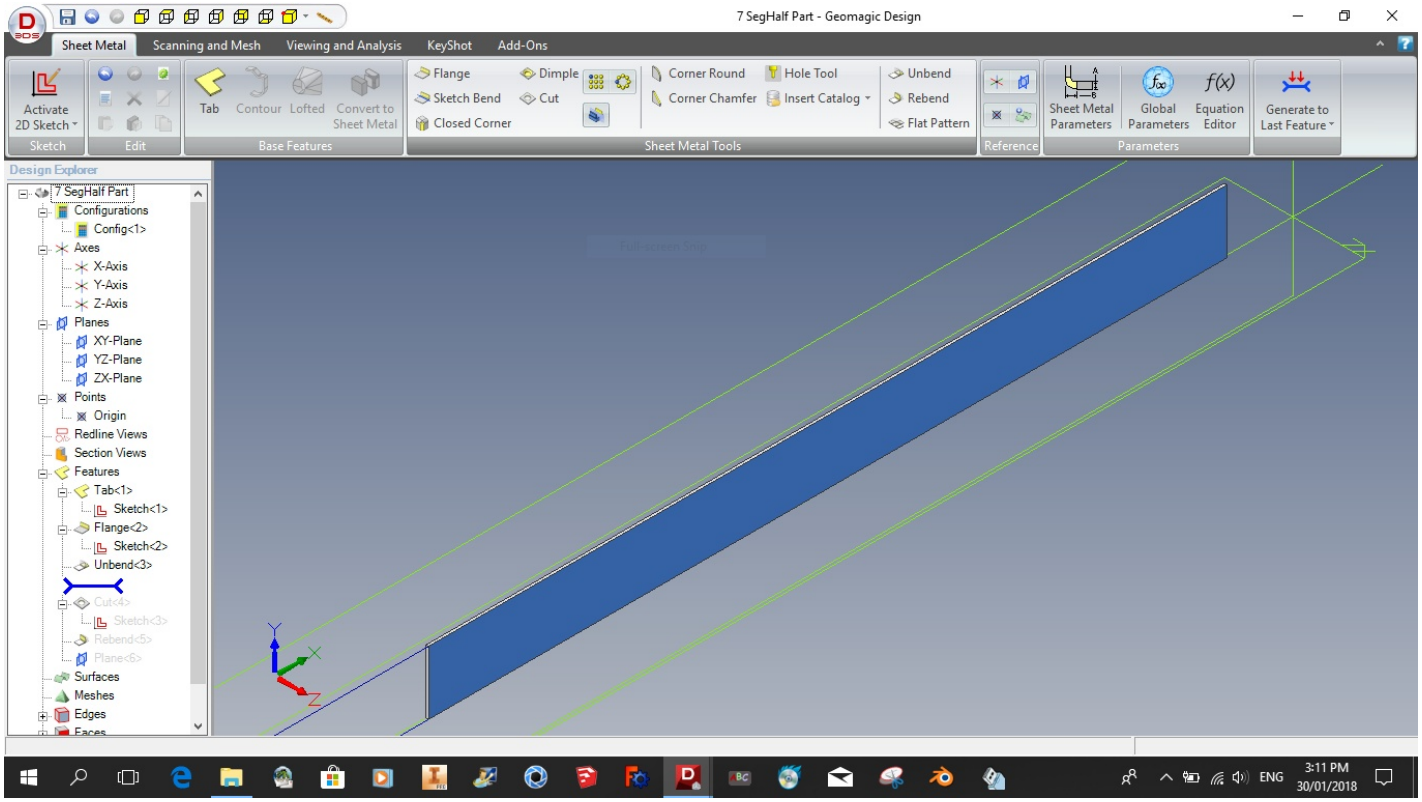
I have not used this method with othe software such as Solid Works, Solid Edge or Inventor but for anyone familar wth these packages, should not be too difficult to adapt this aproach.



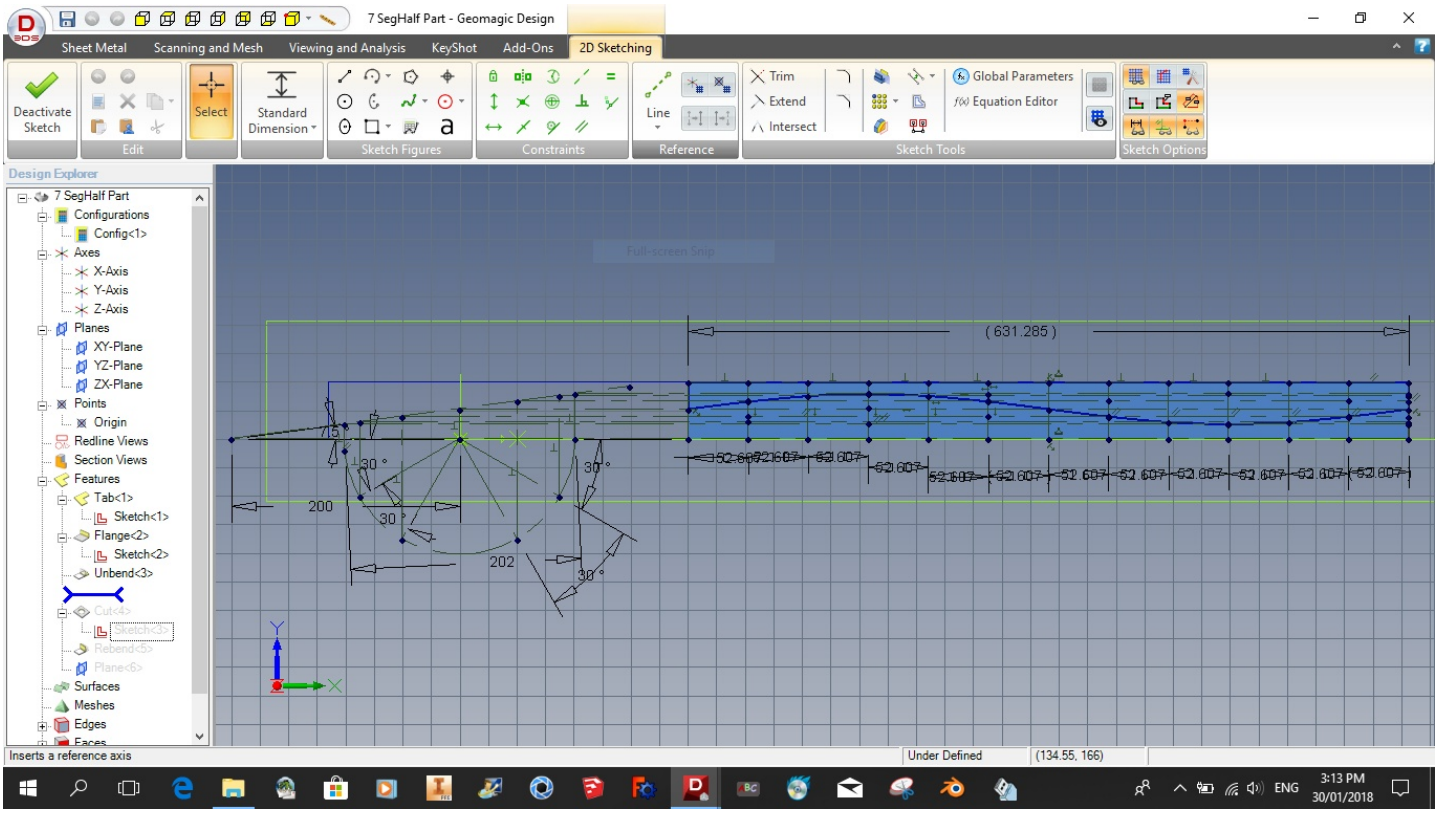
As with all standard lobsterback bends, the start and finish segments are basically a normal segment cut in half. The location of the segment seam, see image of finished bend, assists the fabricator in lining up the parts to assemble the bend.

For the first step, a sheet metal cylinder, diameter same as required duct diameter. This needs to have a height bigger than required for segment.

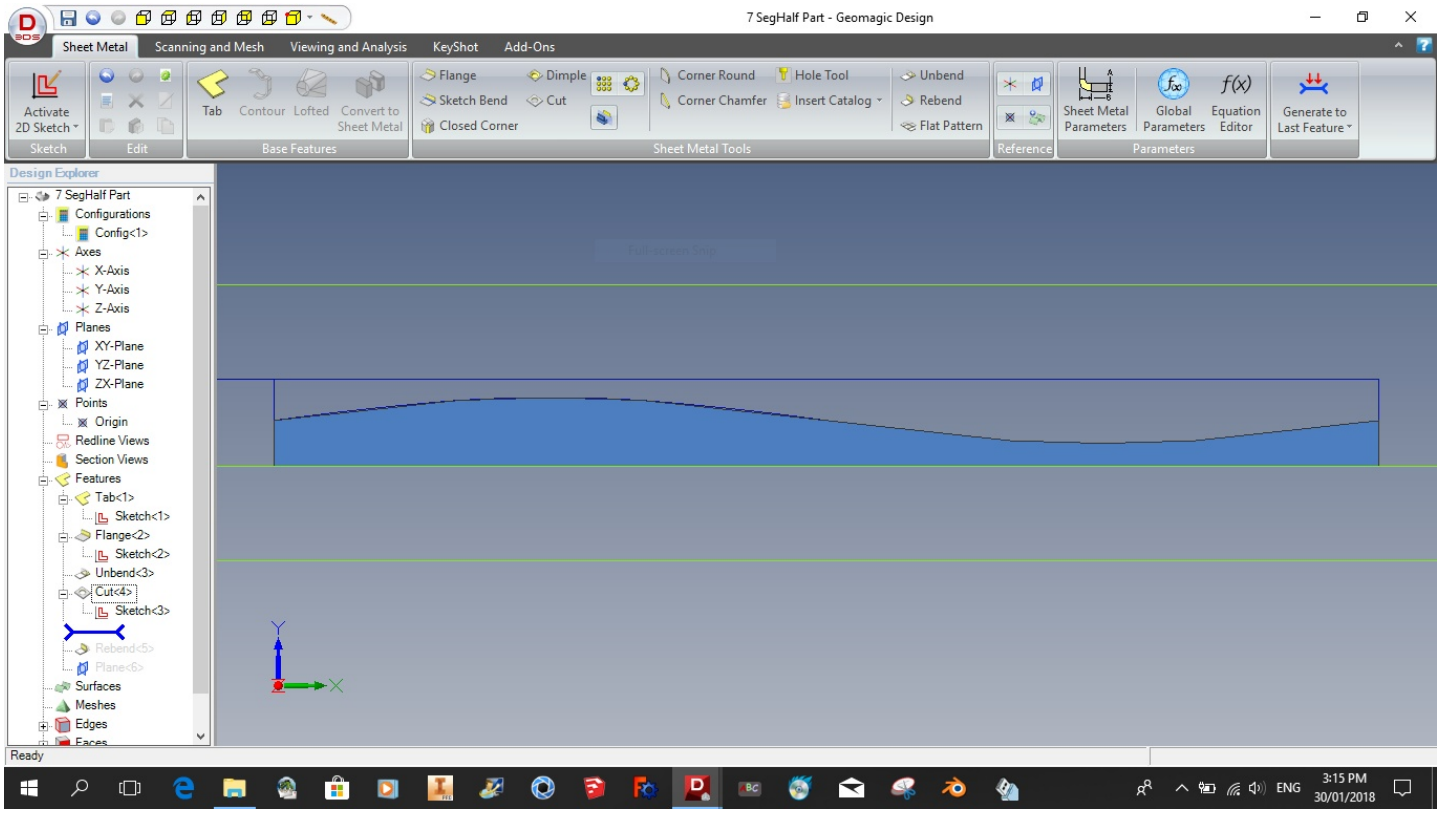




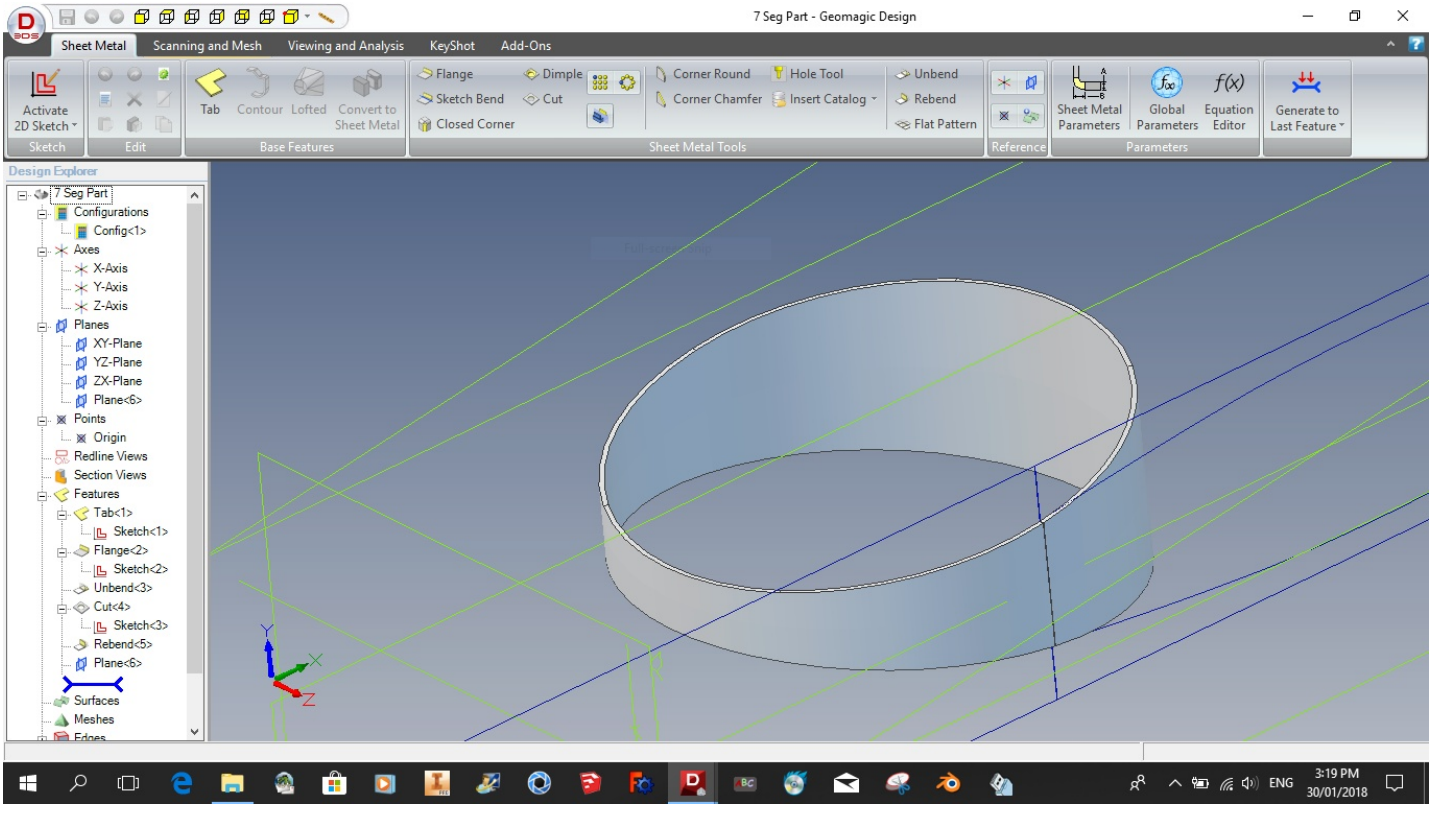
Next we flatten this cylinder, and a sketch is places onto the plane of the flattend cylinder.

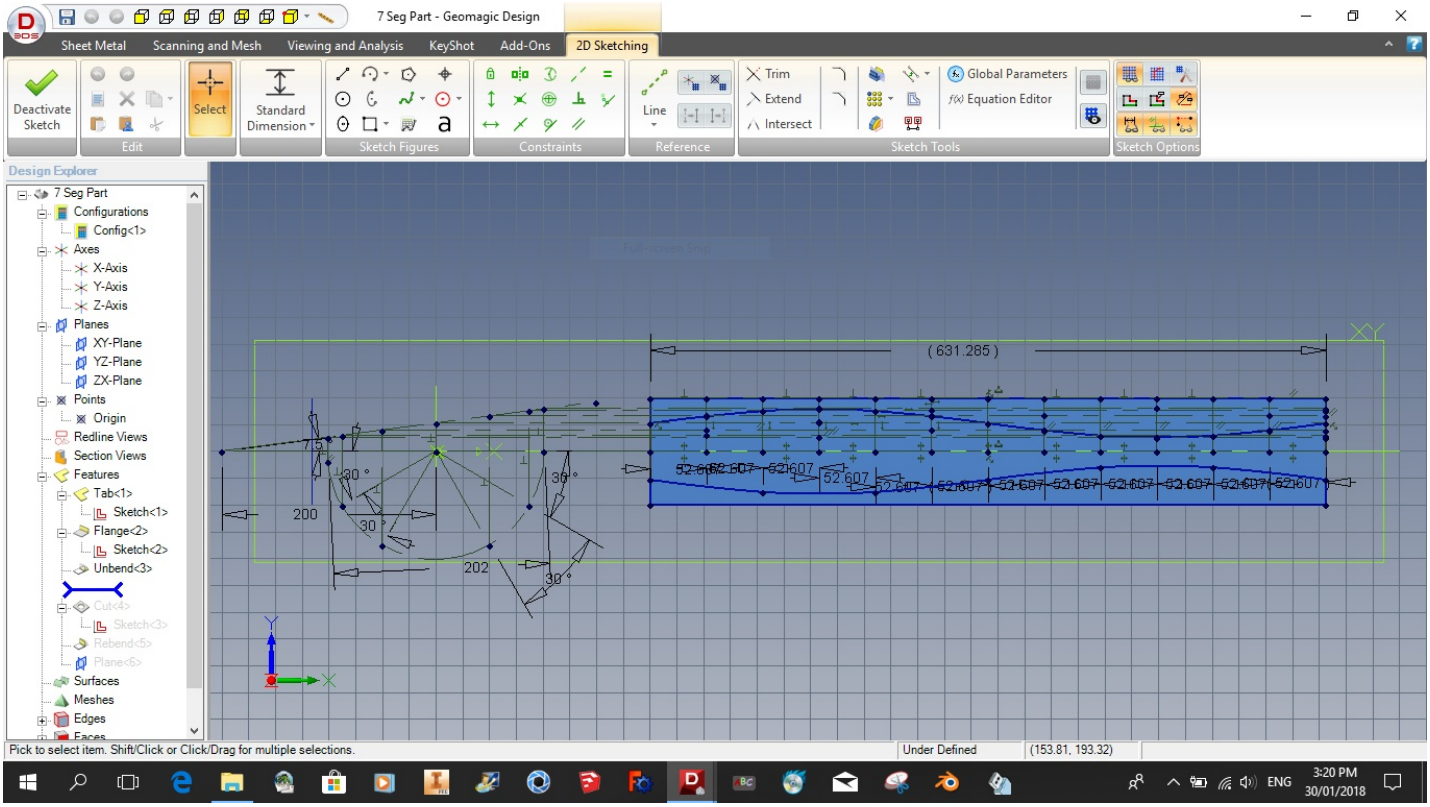


This sketch is the image above. This is a generated sine curve. The method used to generate this curve. In amoungst my collection of vintage engineering text books, some from the Victorian and Edwardian era, there are many examples. I was first taught this basic method of developing lobsterback patterns when at school in the 1970's. Combining this old manual pattern deveplopment method with a modern 3D CAD package makes producing a useful, flatenable part simple. I have not gone into detail laying out this curve as there are many books on sheetmetal patern developements. When I was a student we were taught sheetmetal patern development.



And now we have completed flat pattern. We can then roll back into modeled sheetmetal part with the flat pattern for generating CNC files to cut on profile cutting machines.





The full patern segments are produced the same way. The sketch used to cut the sine curve can be mirrored to produce both sides. Though I have not tried it, the required sine curve could be generated in a spreadsheet, then used to drive the cut sketch.