

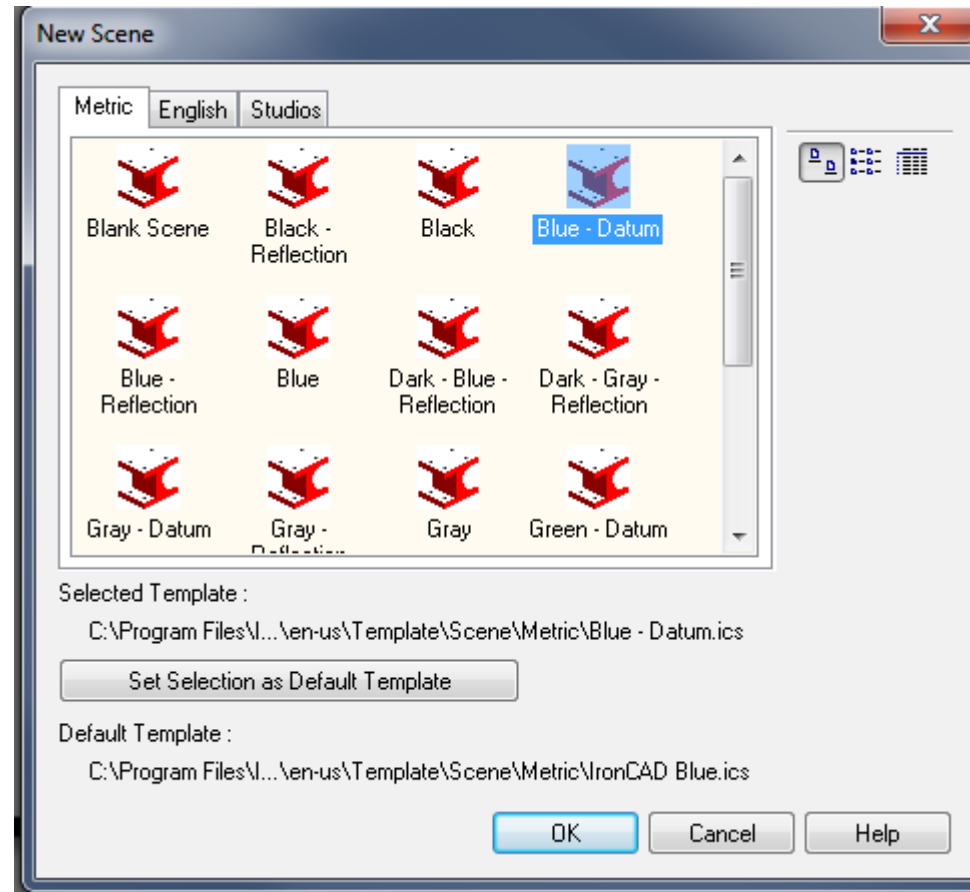
Quick Guide to Using Sketch, Sheet Metal Create Loft and Solid/Surface Flat Pattern from Faces

IRONCAD is feature laden with different ways of doing things. Creating a Innovative Part is easier using the Feature Wizards to create custom 3D parts and as you go on you can use other ways by using defined sketch paths as guides. If you are more familiar with a formula driven process, a Structure Part creation will give you this process driven model creation. As for Sheet Metal, the convention is a step similar but different when it treats round or circles as it transition from a square or rectangle. As Sheet Metal is formed by angles and bends with splits/gaps, no circular or round transition will be a perfect symmetry as machined or solid parts.

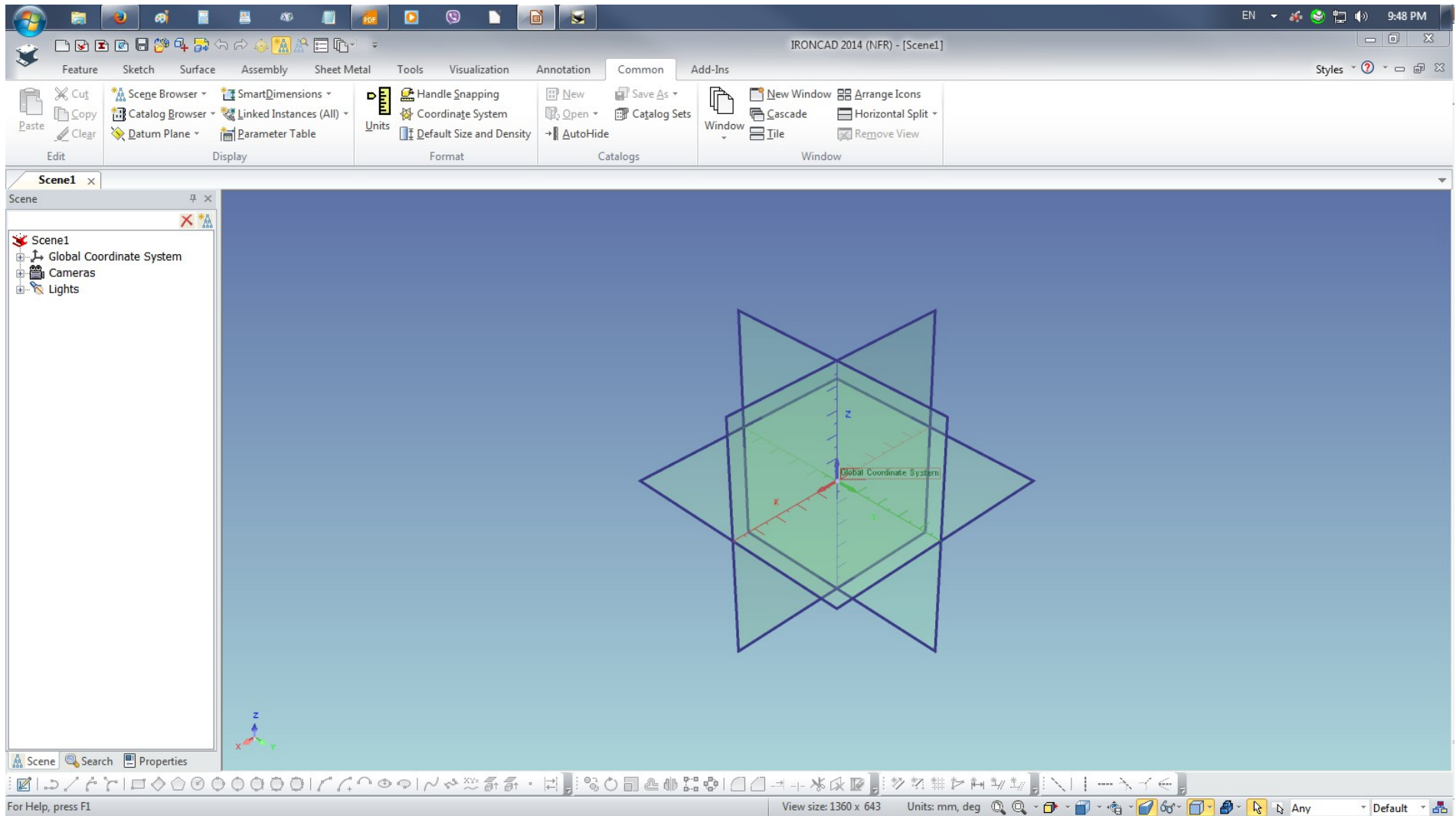
Special thanks to Dariusz Leczynski, Kevin DeVoll and Mike Walls for their assistance with kernel behavior switch on IRONCAD2014. IRONCAD uses ACIS both Parasolid kernels to perform operations, however on certain features requires which has the kernel advantage in performing the task. Ctrl+K switches the ACIS kernel to facilitate the Unfold command on the model



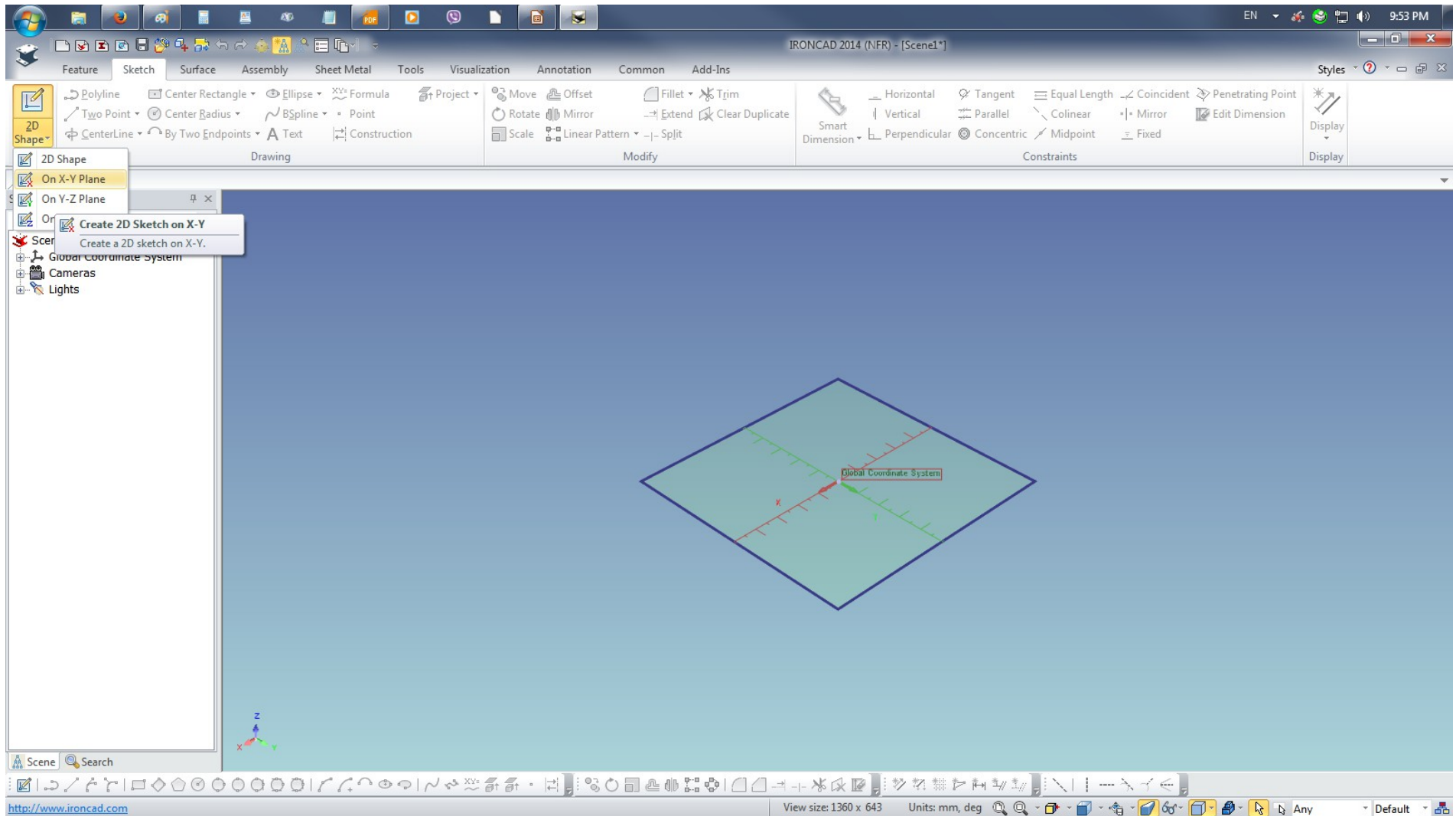
For this guide, a rectangular section 400 mm x 250 mm will transition to a circular section 200 mm diameter and a height/depth of 350 mm. Select a Metric New Scene Blue-Datum to begin with.



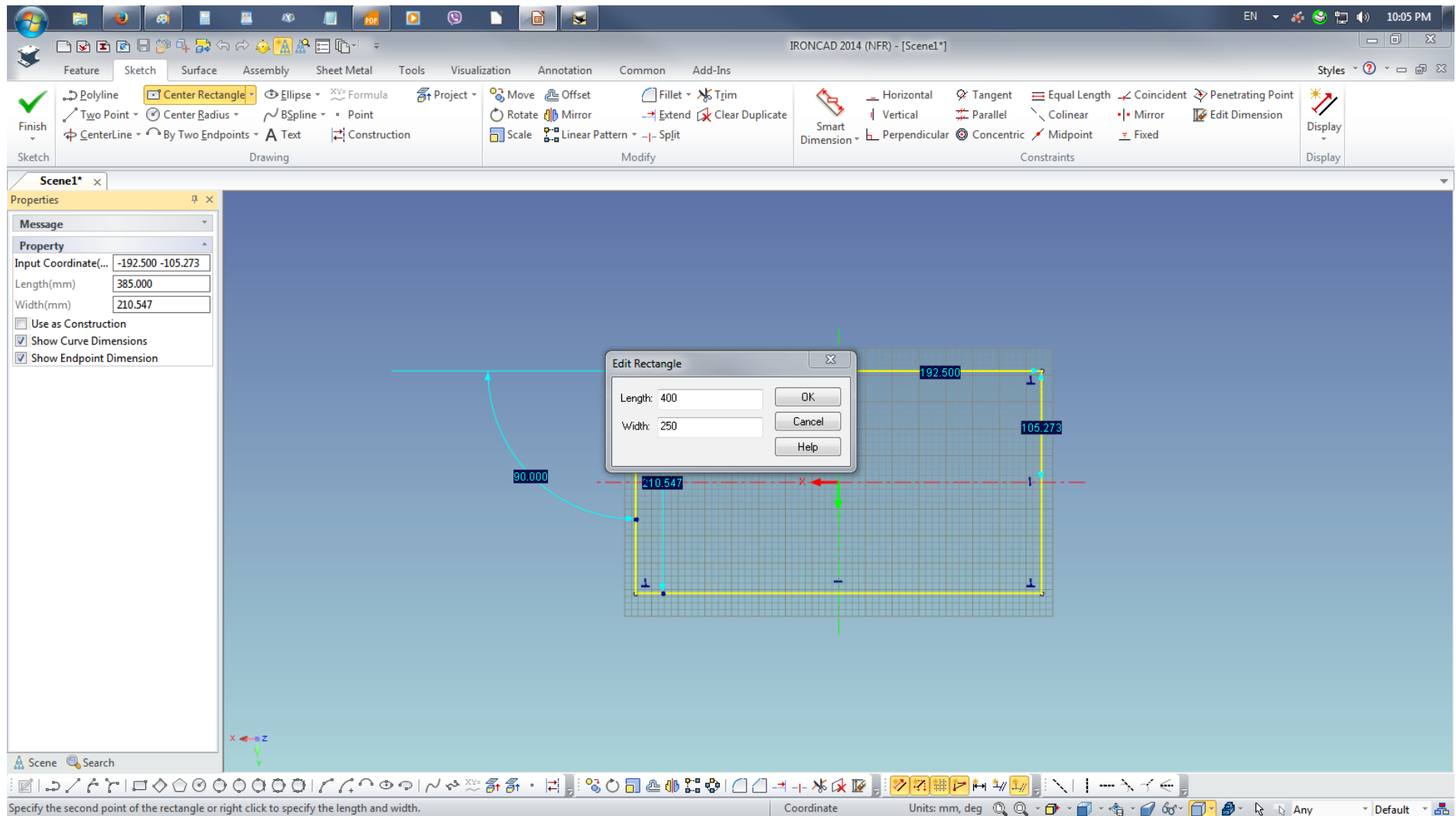
The Datum Screen is used so you will be aware of the 0,0,0 position that can be of value when creating items to used in a catalog or assembly. Press keys X, Y to hide YZ and XZ planes.



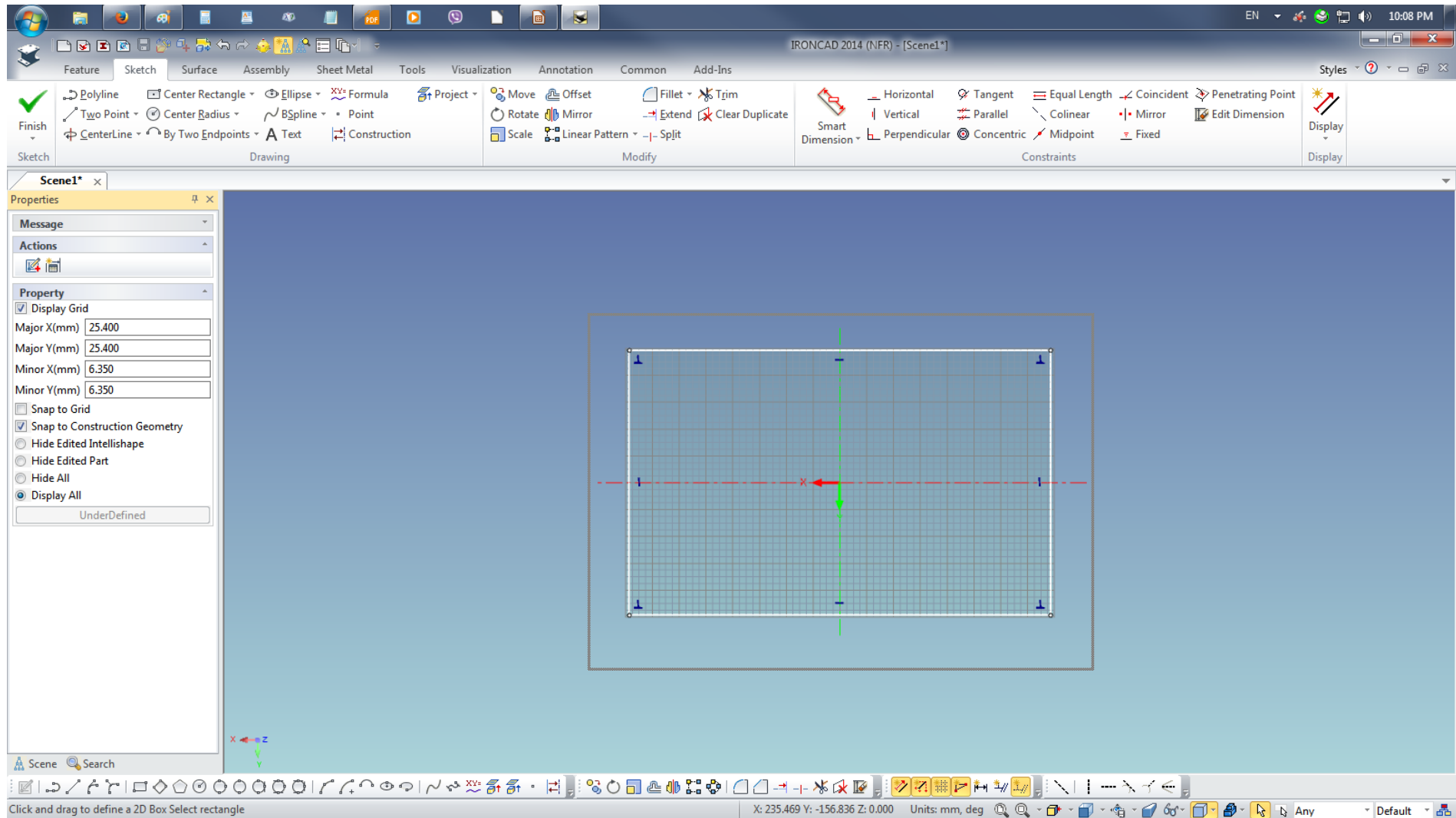
Go to Sketch and Click 2D Shape and select XY Plane



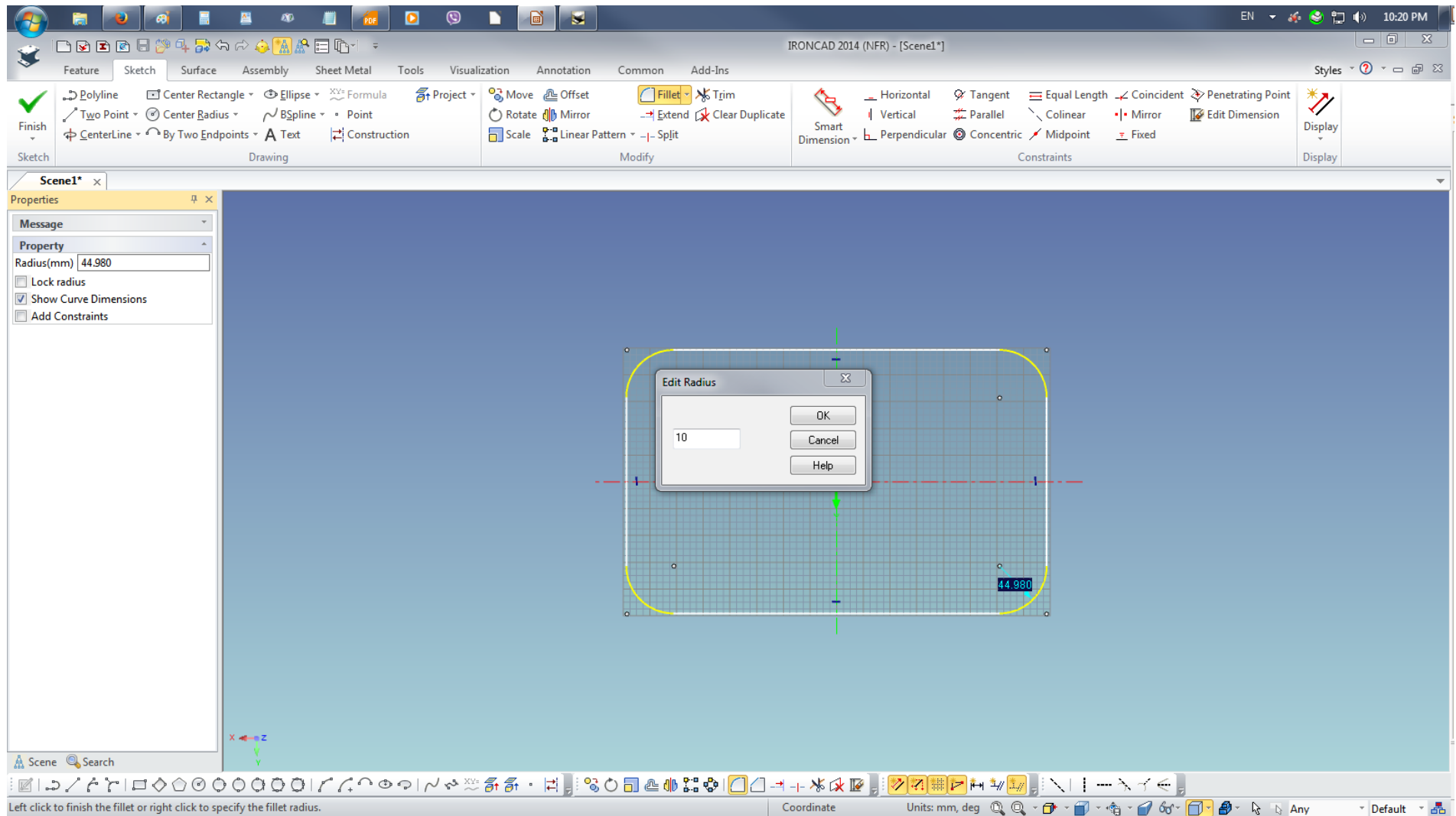
From the drawing tools, select Rectangle on the drop down list, select Center Rectangle. Point cursor at the center of the drawing grid. Depress the RMB and drag to draw the rectangle and tupe the values as shown on the Edit Rectangle dialogue box and click OK to confirm action.

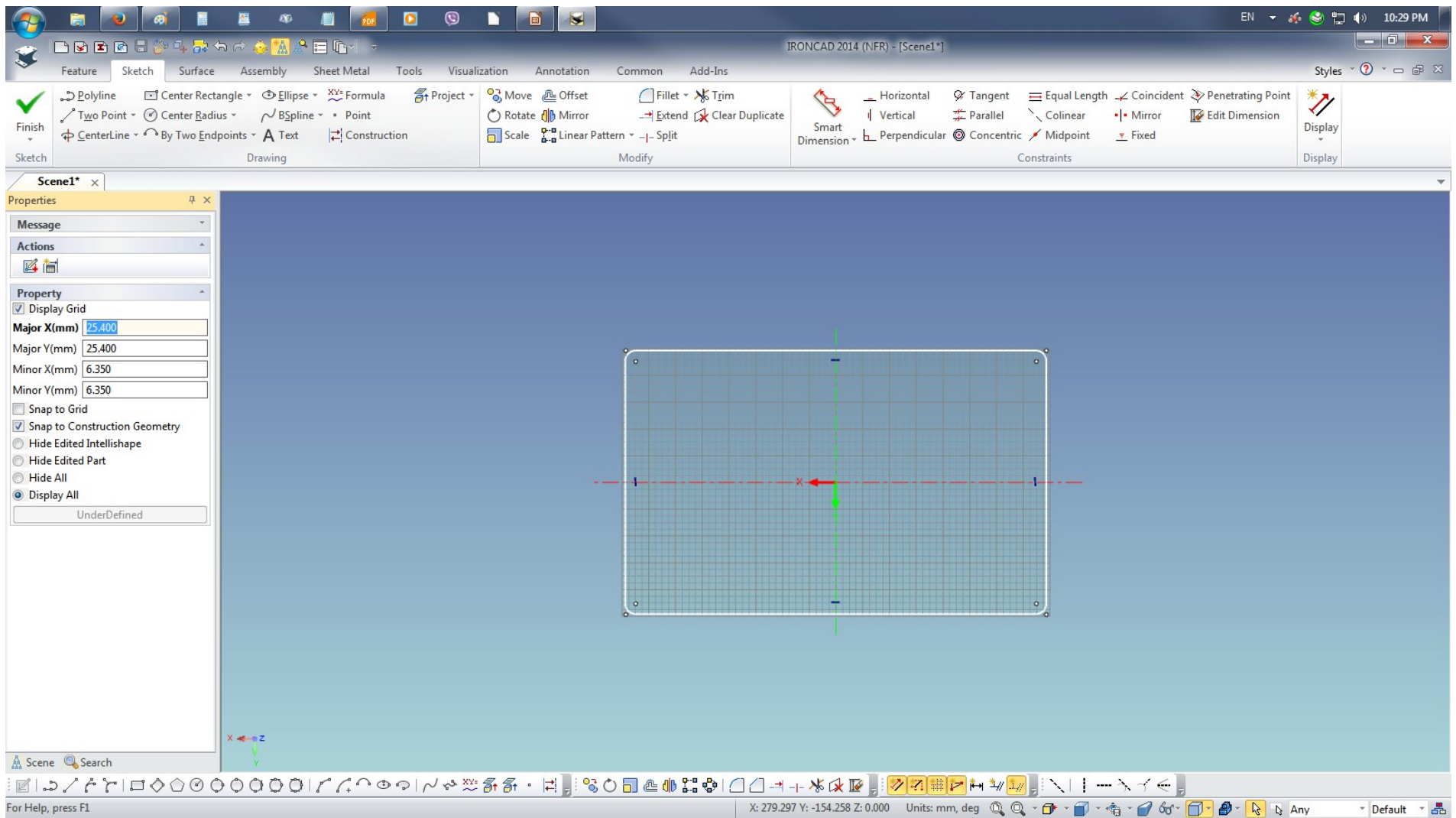


Depress the LMB to select with cursor the drawn rectangle to highlight the object. This will facilitate the Fillet to be done in all corners of the rectangle.

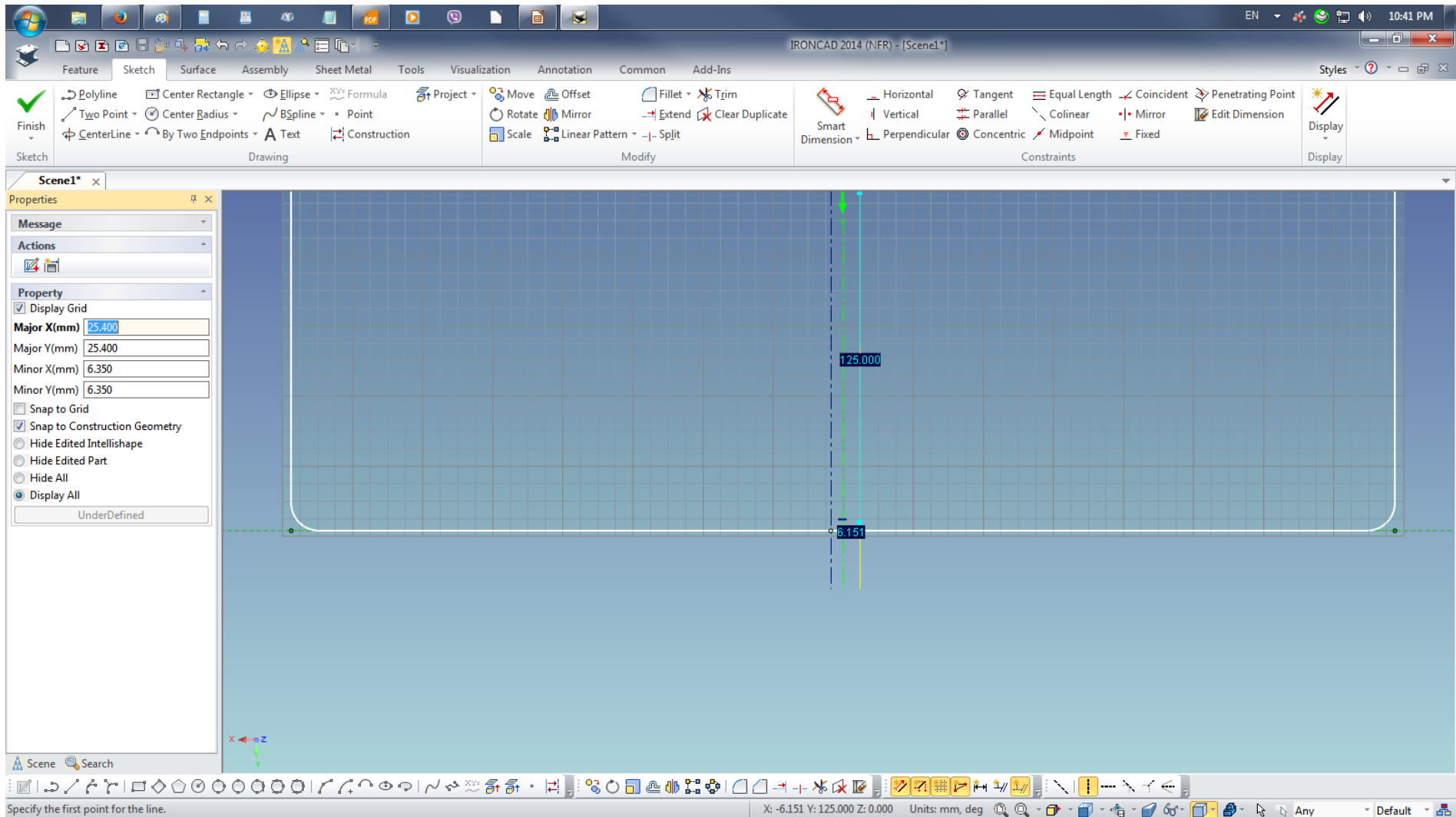


Click on Fillet tool from the Modify tool set. Pick corner and depress the RMB and drag. Upon release of the RMB fill the value of 10 on the Edit Radius dialogue box and click OK

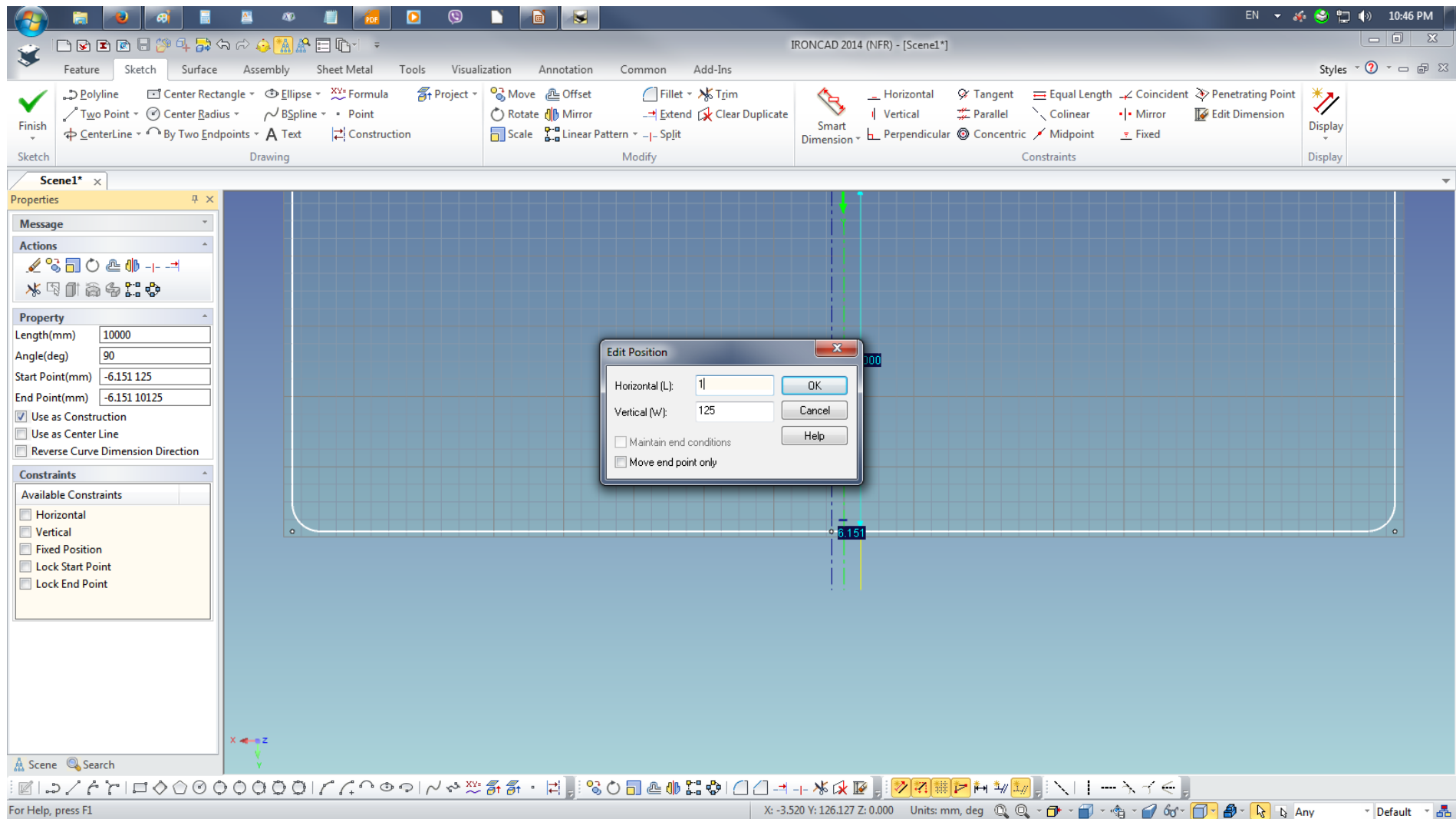




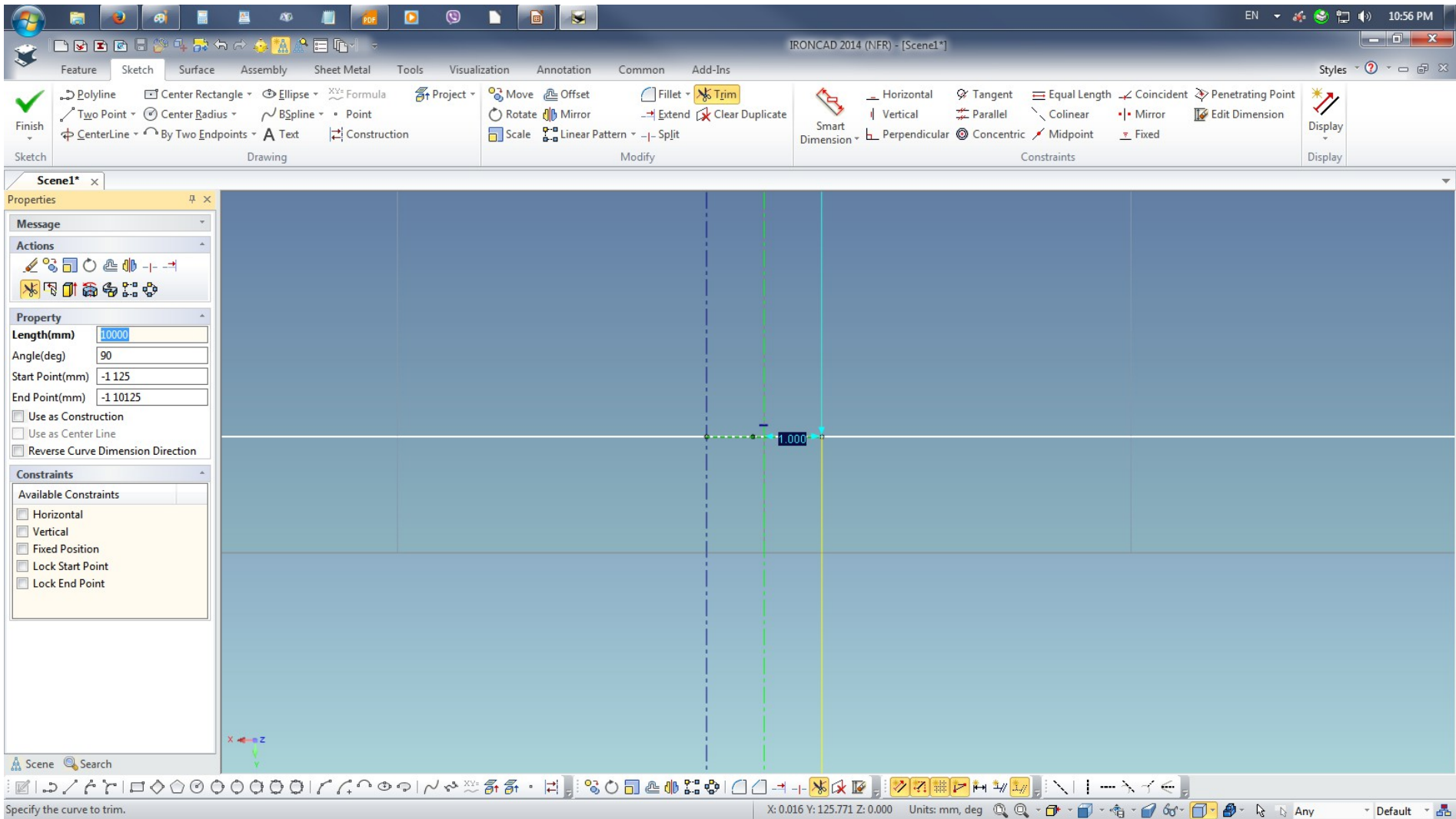
Next a split/gap must be created on the rectangular sketch so it work with the Create Loft on the Sheet Metal operation later. The split or gap can be created by drawing a small Center Rectangle or Center Radius Circle drawing on a center point on the location of the split or gap and using the Trim Curve to create the break on the rectangle. I tend to use the construction line as a force of habit as it records on the edit of the section.

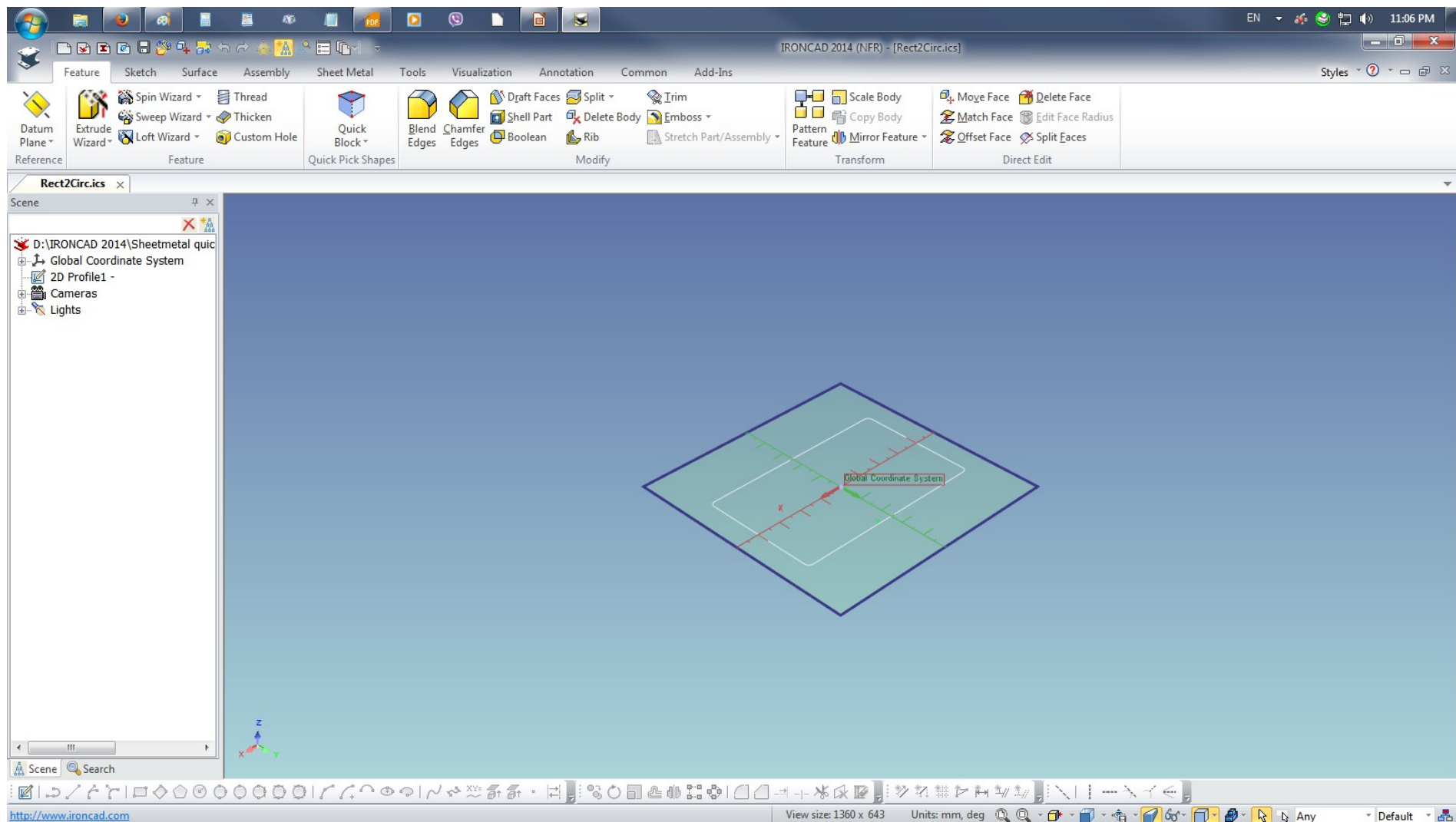


Point cursor on the horizontal value and perform RMB click to edit the value and enter 1. Perform on the same edit on the other vertical construction line. Please note the Show Curve Dimensions and Show Endpoint Dimensions show be activated from Display button to show.

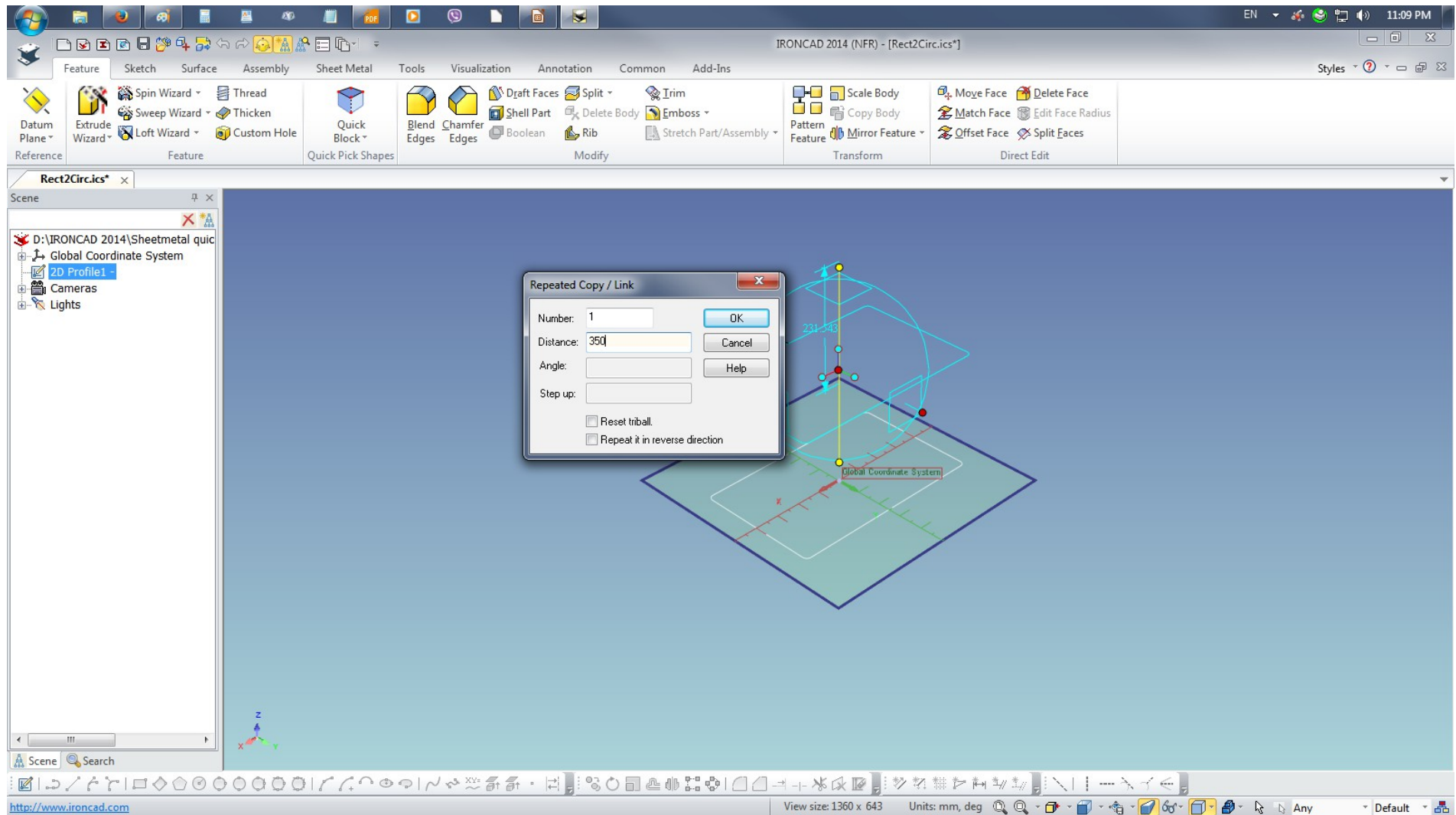


Point the cursor on the point of the construction line intersection on drawing grid and use the scroll wheel to zoom in or out. Select Trim Curve and point the cursor between the construction line. Notice the green broken line that will create the split or gap between construction lines. Once the gap is created click Finish

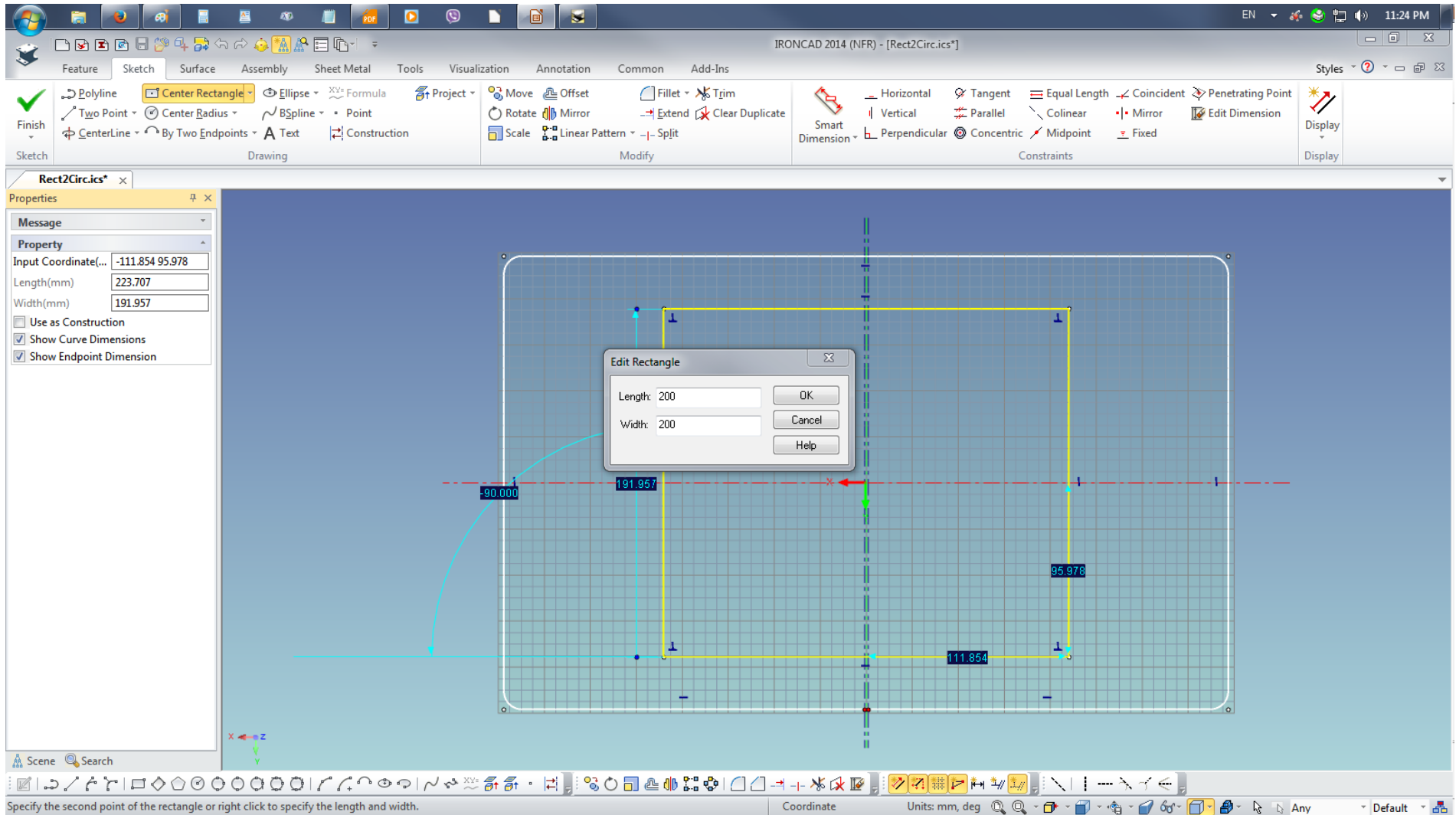




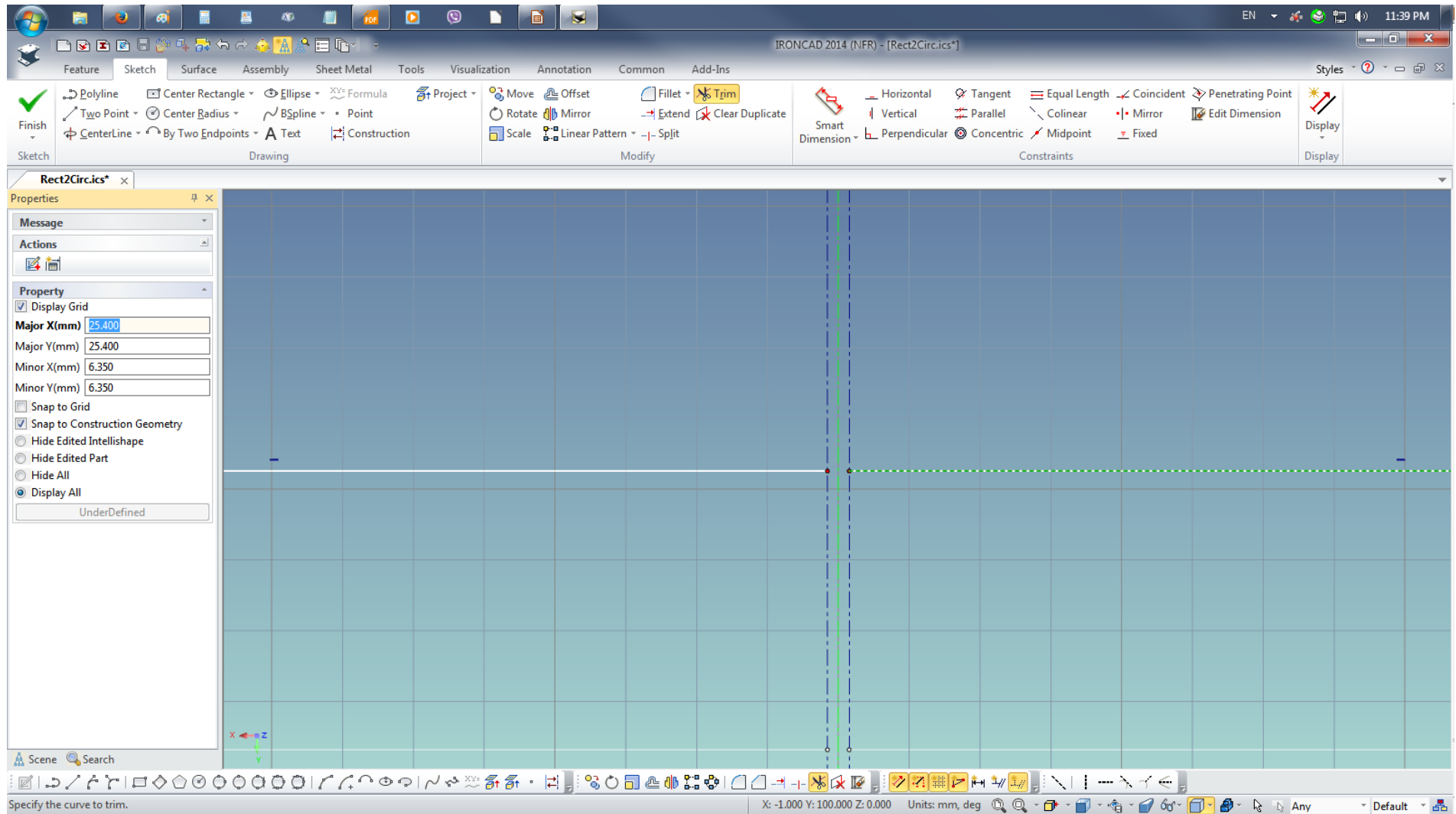
Select 2D Profile1 > key F10 to activate TriBall and point cursor on the top vertical handle and depress RMB and drag upwards. On release select Copy and enter 350 on the Distance field of the Repeated Copy / Link dialogue box.



RMB click to select and Edit the copied 2D Profile1. Draw a Center Rectangle from the center of the drawing with RMB drag and on the Edit Rectangle dialogue box. Enter 200 for both fields and click OK. Press Esc to release previous selected tool. Click on the previous drawn rectangular box to delete.

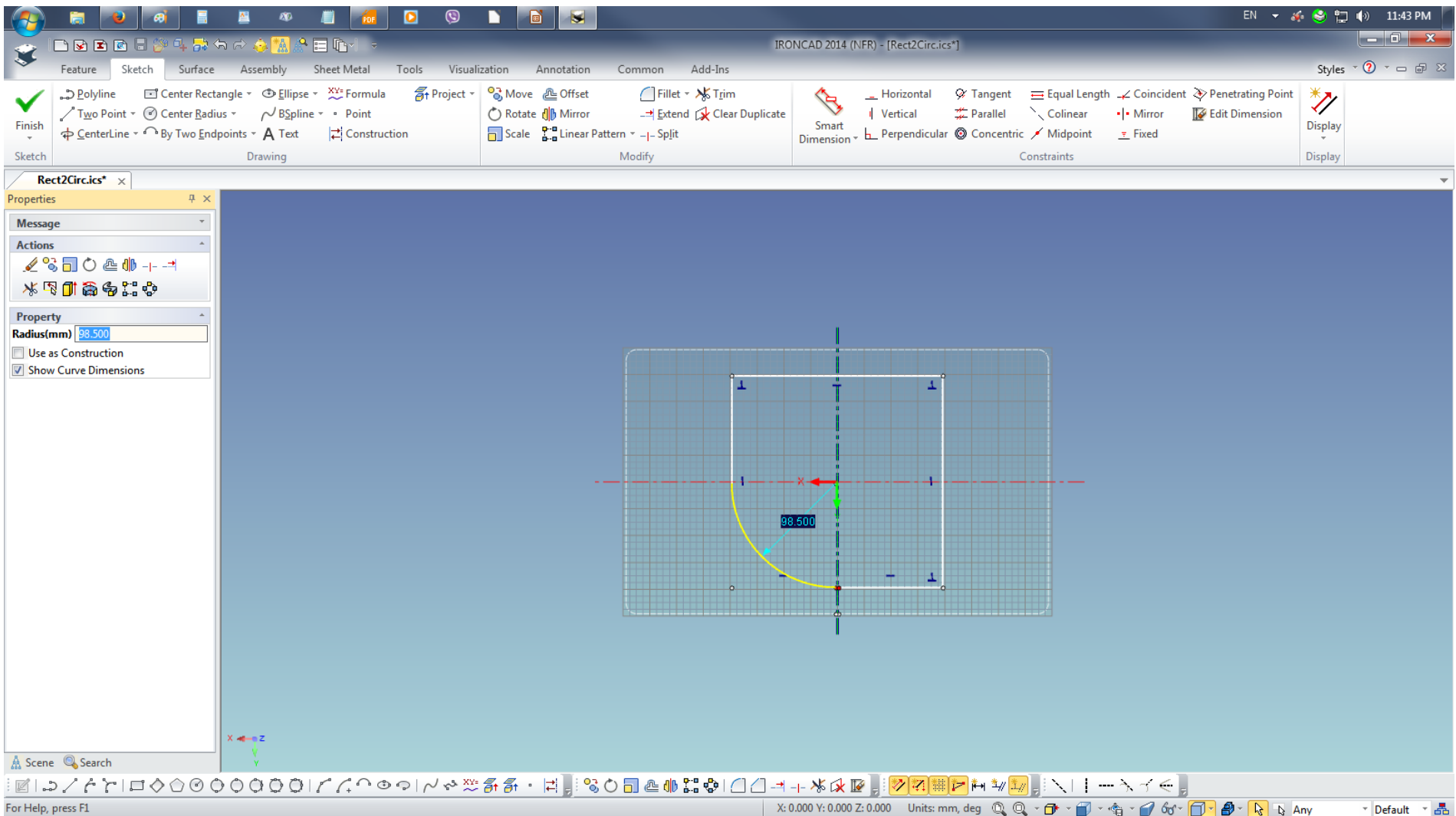


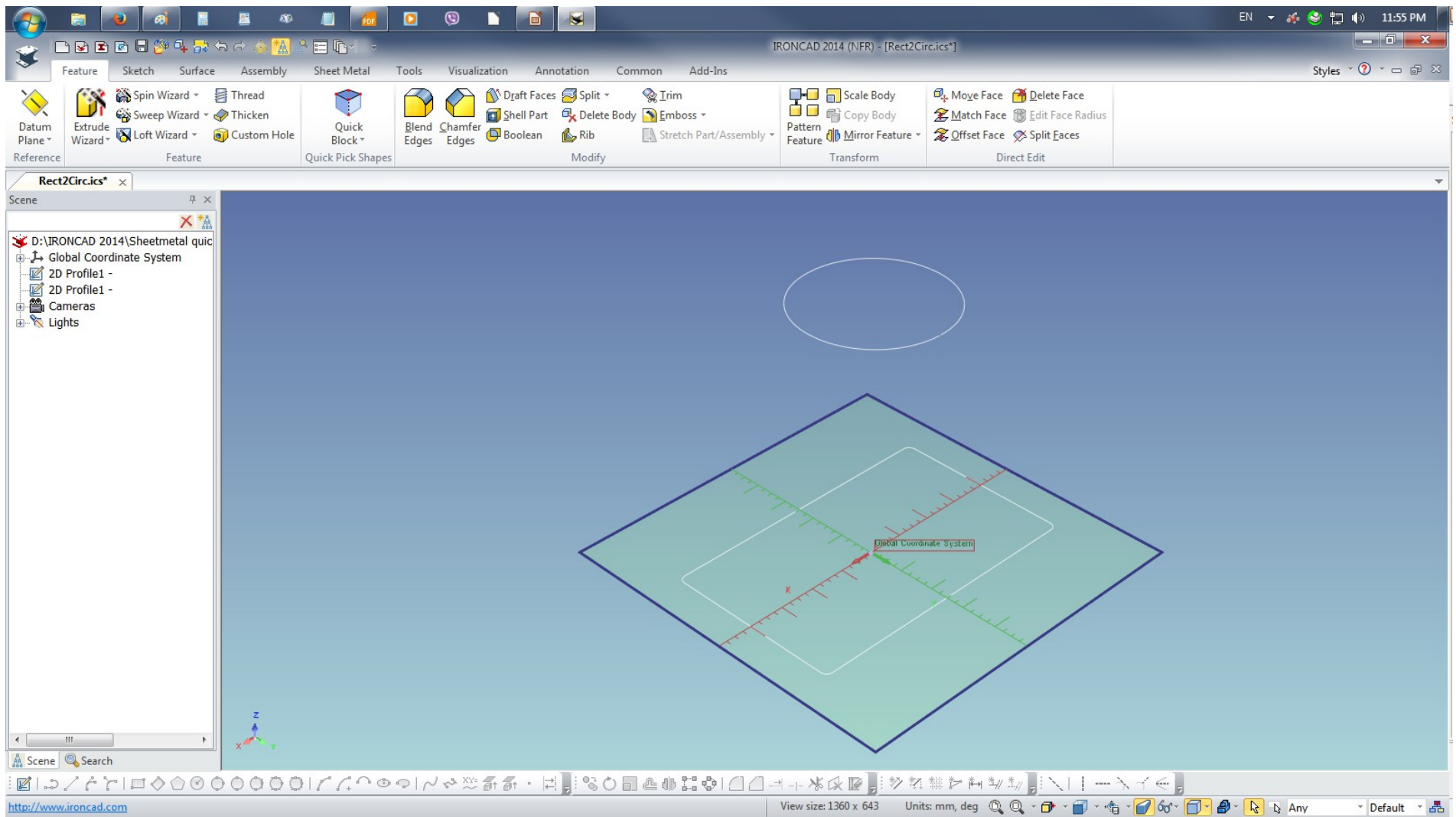
Zoom in to split/gap point. As the Vertical Construction Line is still in place, perform the Trim Curve command to create the split/gap between the construction lines



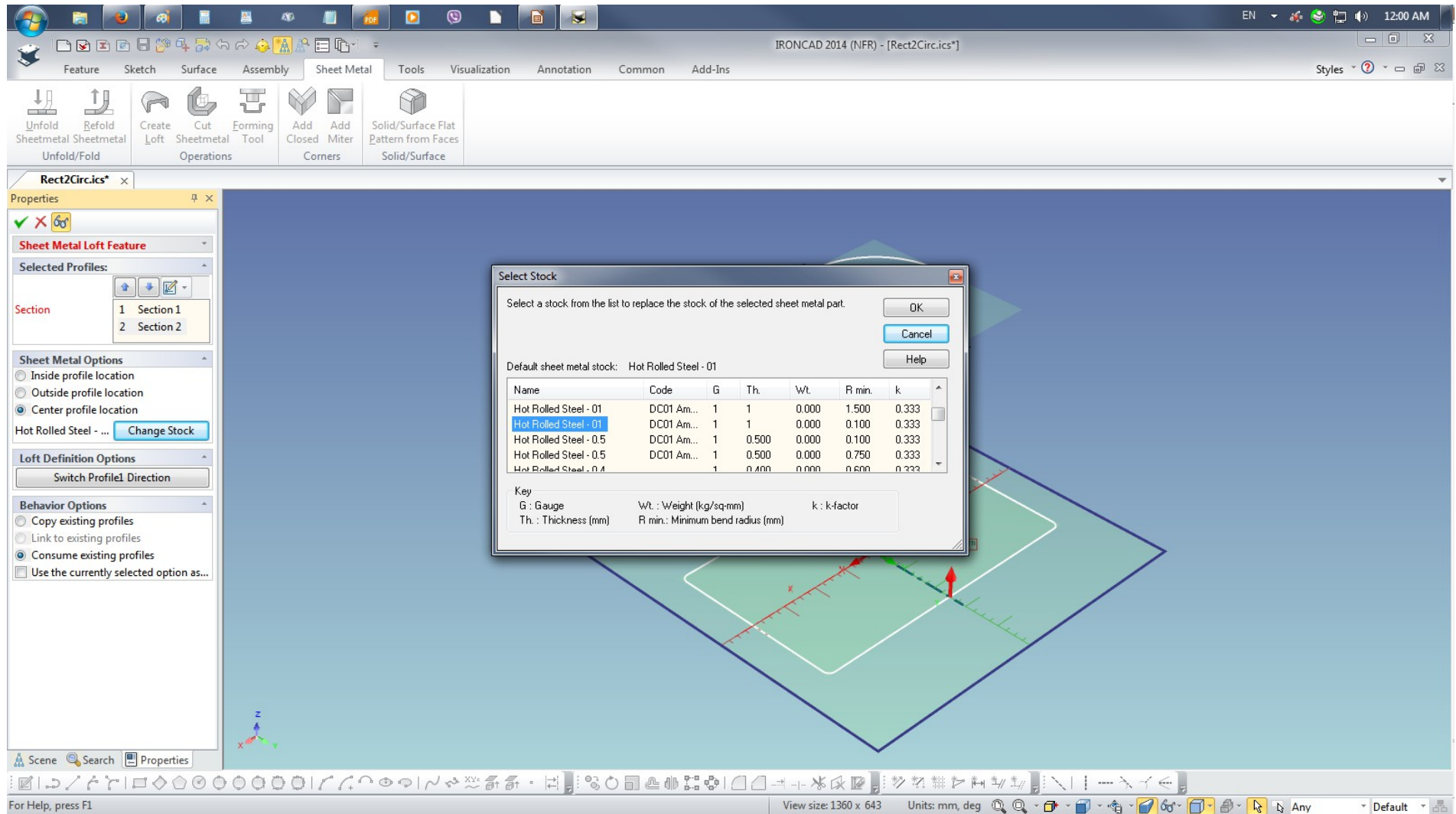
Press F8 (Fit Scene) to view. Select Fillet and point the cursor on bottom left side corner with a split horizontal line. Depress RMB and drag the corner Fillet towards the center of the drawing grid to get the maximum value and edit to 98.4. Perform all the Fillet with same action and enter the same value on three other corners to create a consistent symmetrical corner blends and Click Finish to end the edit on the section.

Alternatively, start the selecting frame from corner line with the adjacent cut to the rest of the corners so you drag the fillet corner evenly through out the all corners consistently.

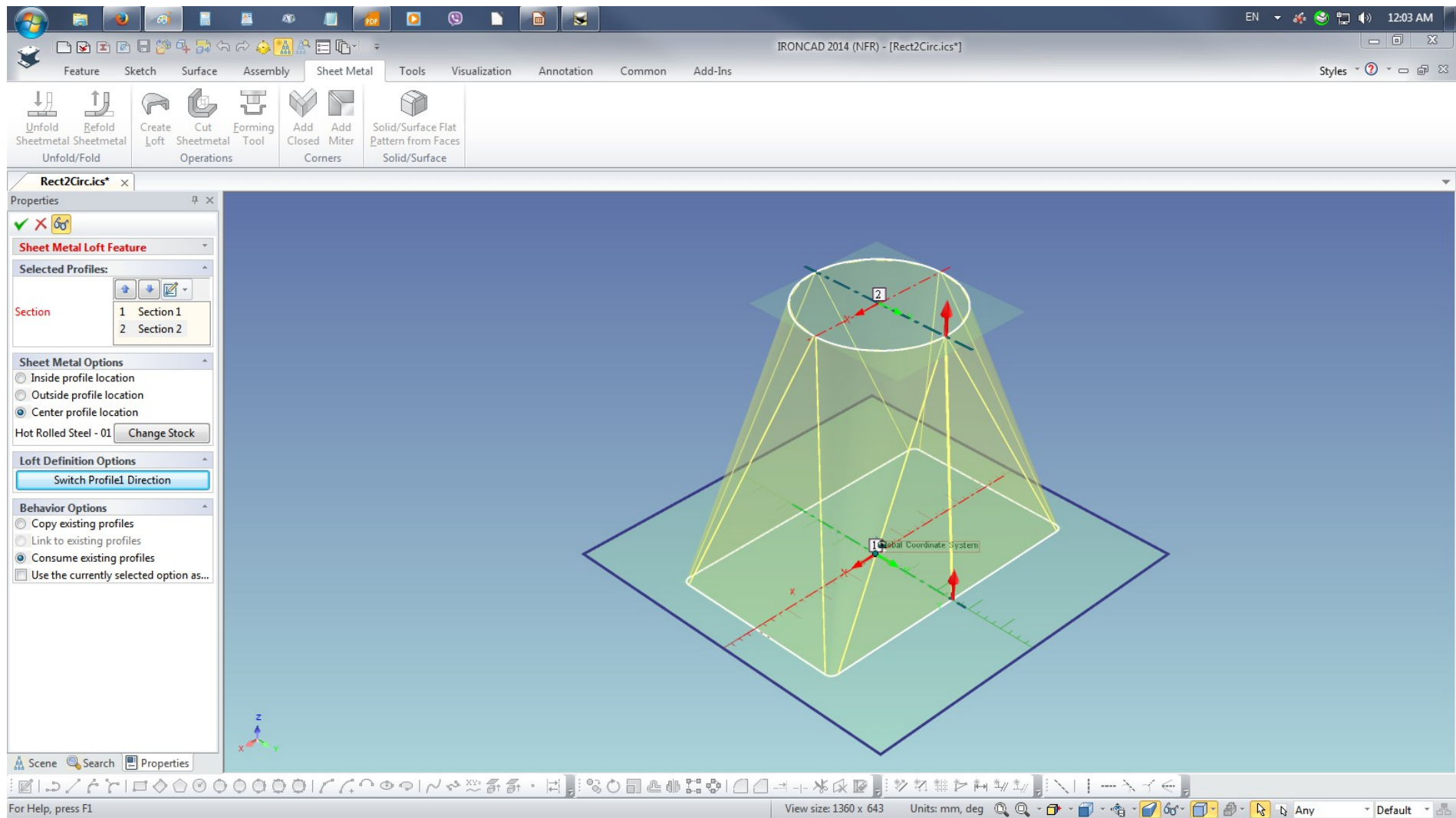




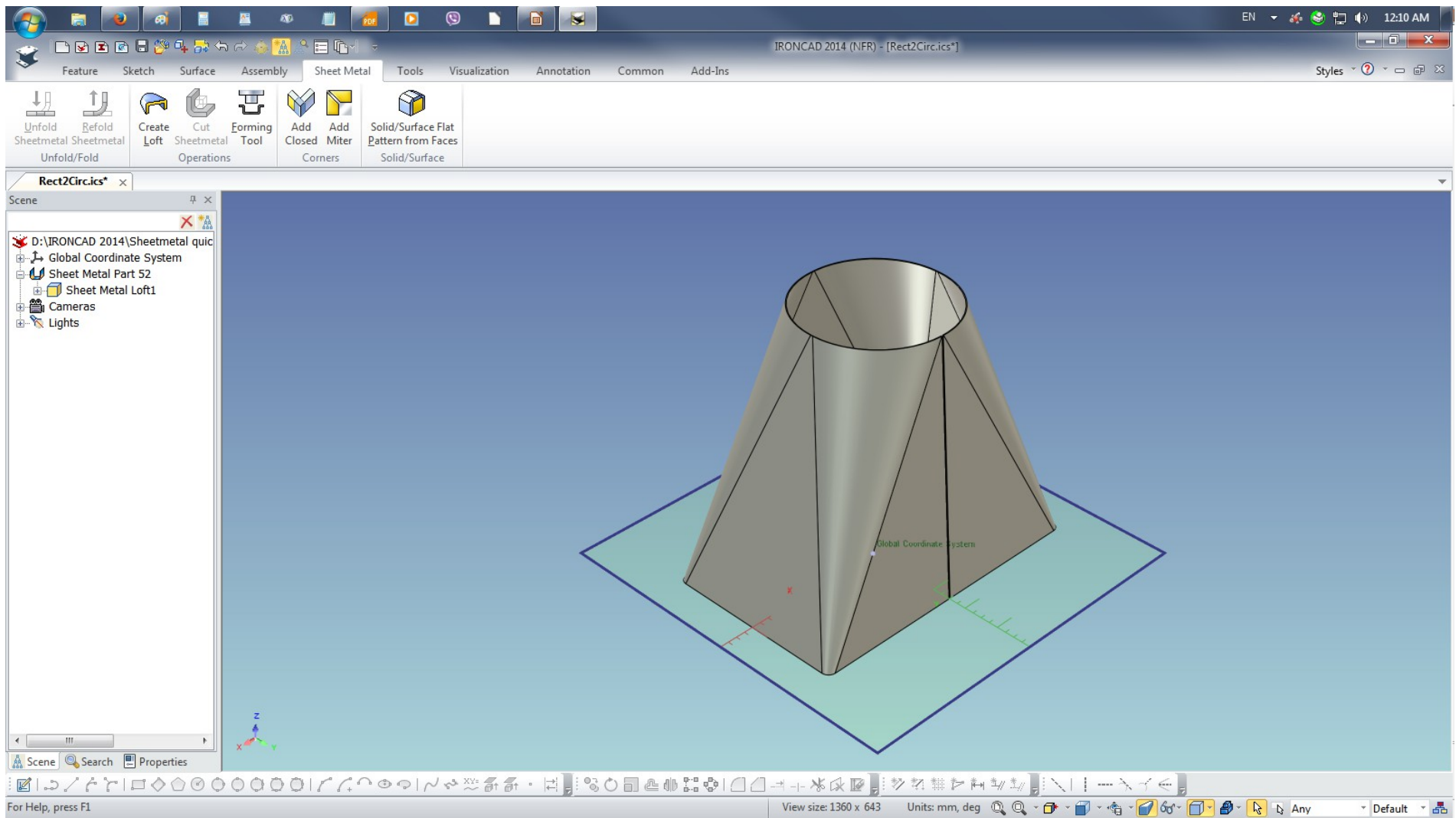
Go to the Sheet Metal tab and select Create Loft operation. Select the profiles for the section and Change Stock to the desired material.



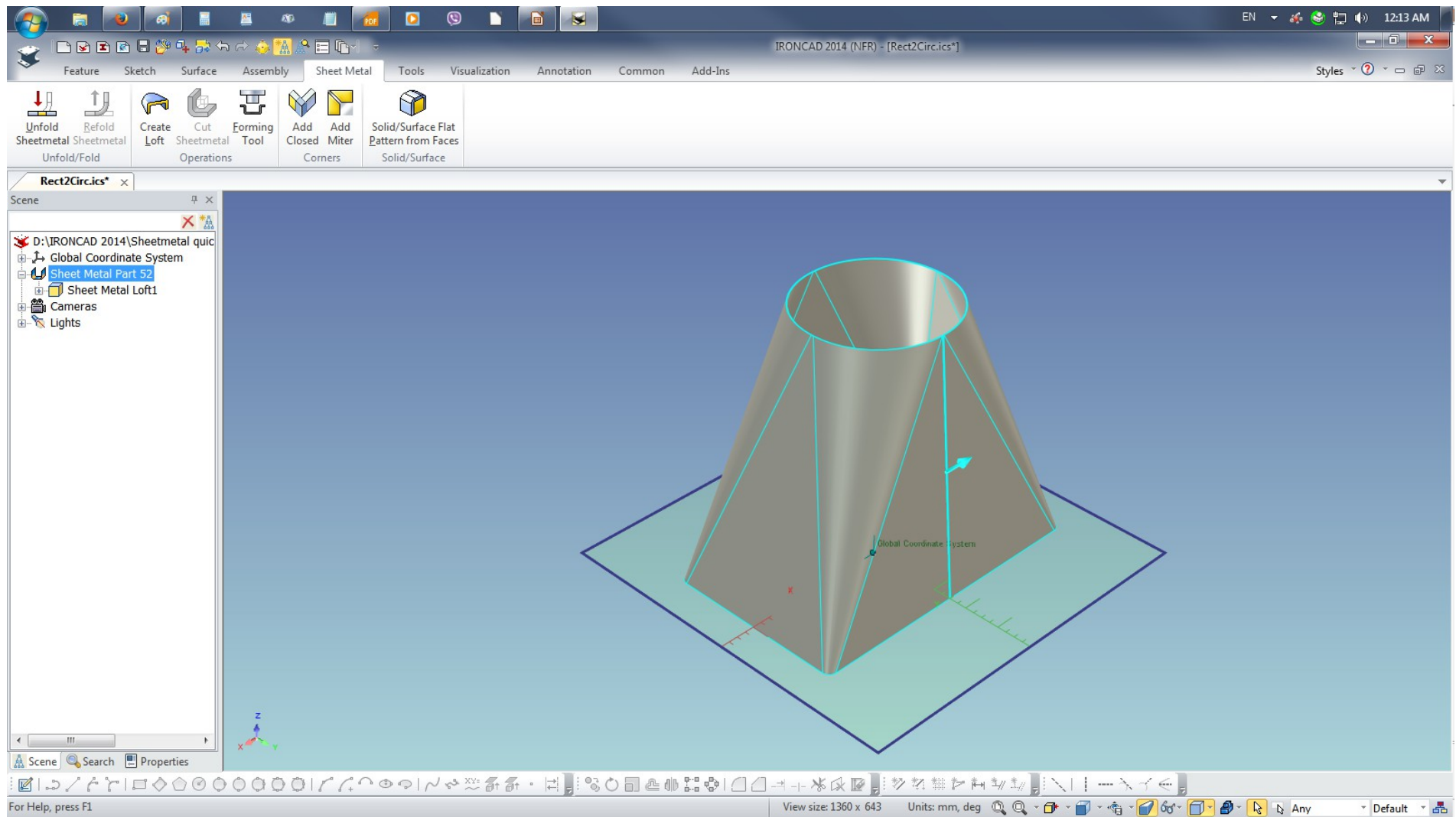
If it fails to generate a preview, Switch Profile1 Direction from the Loft Definition Options to generate.



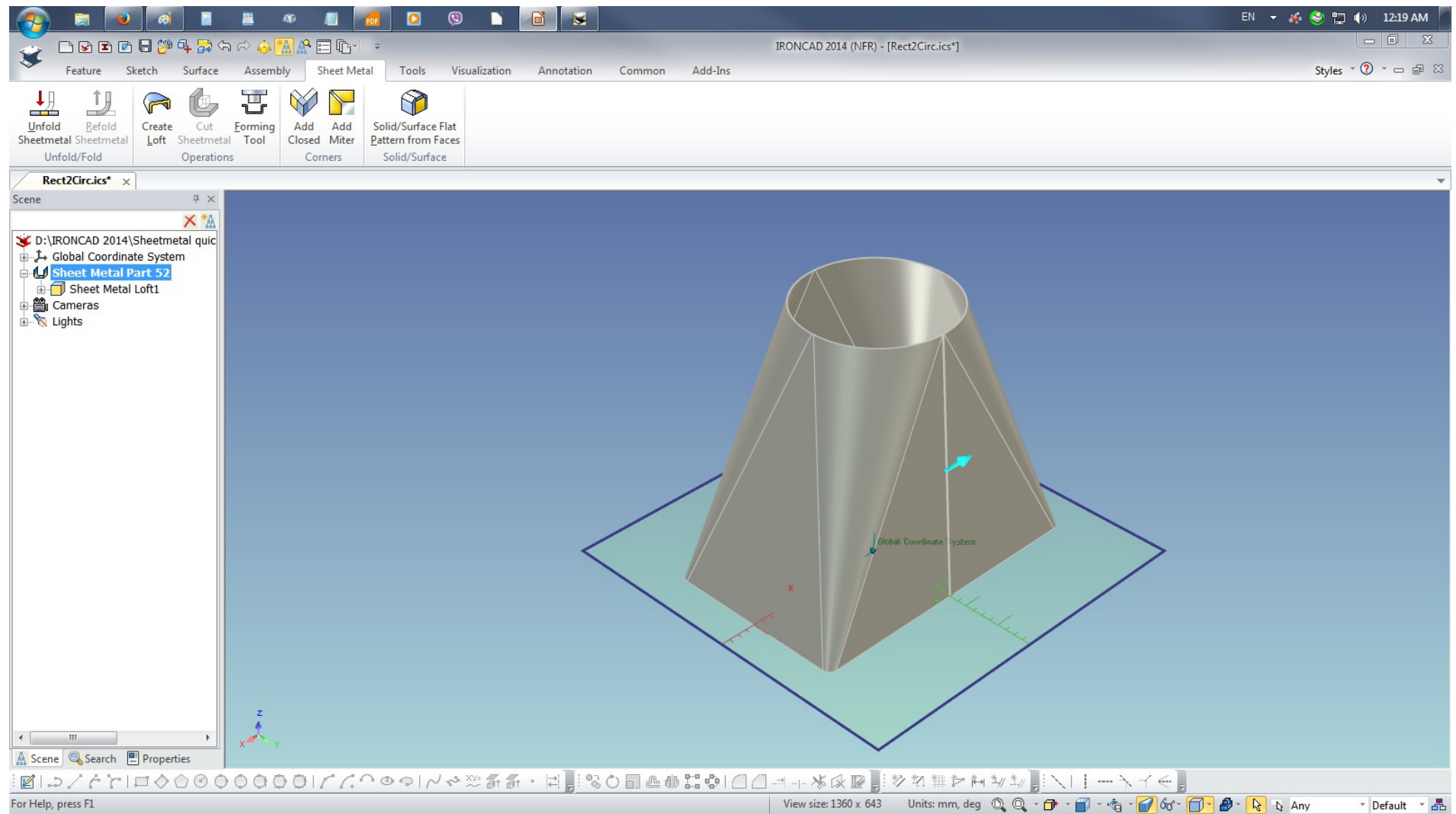
Created Loft



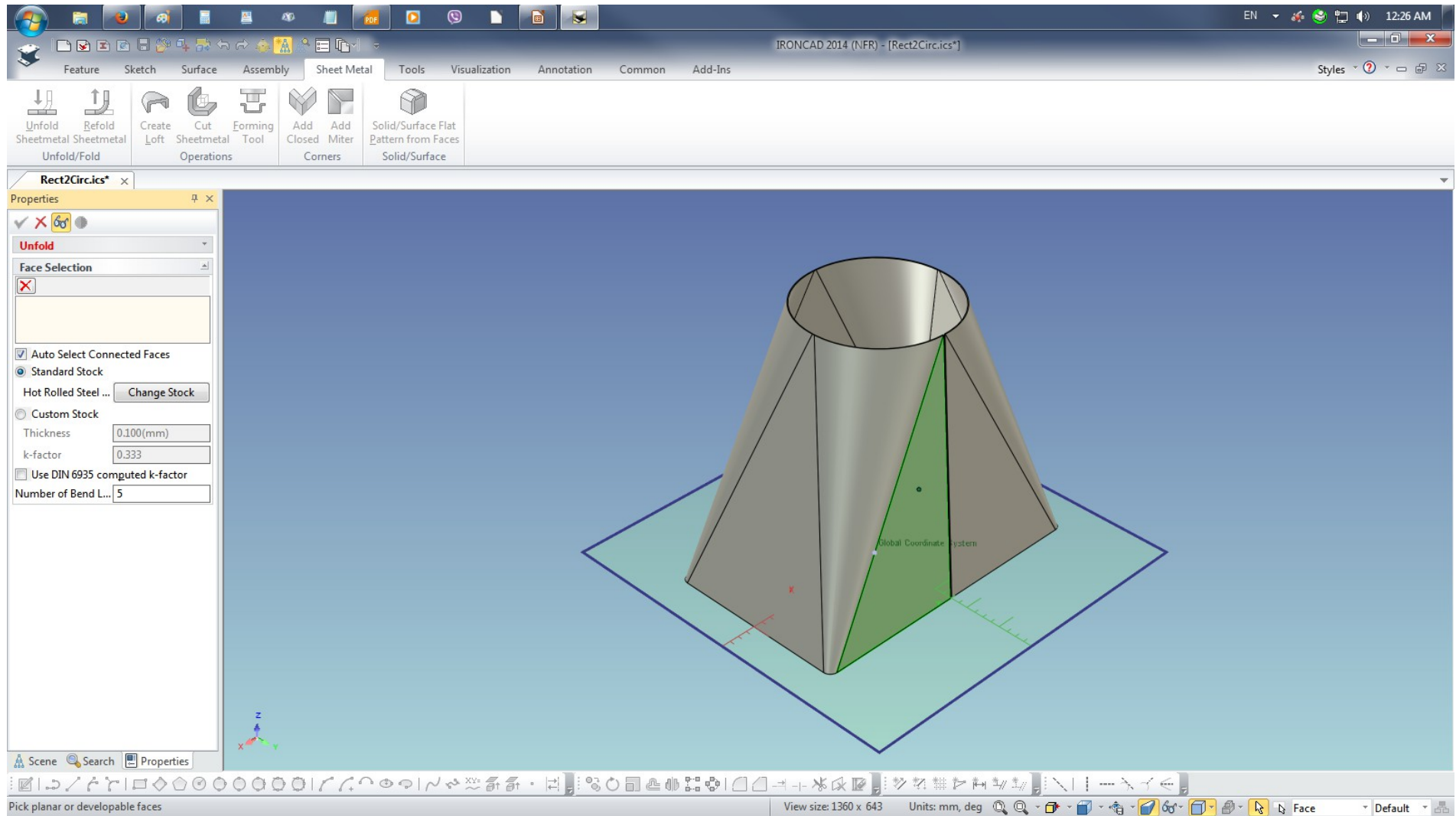
Select and invoke Ctrl+K to switch to ACIS



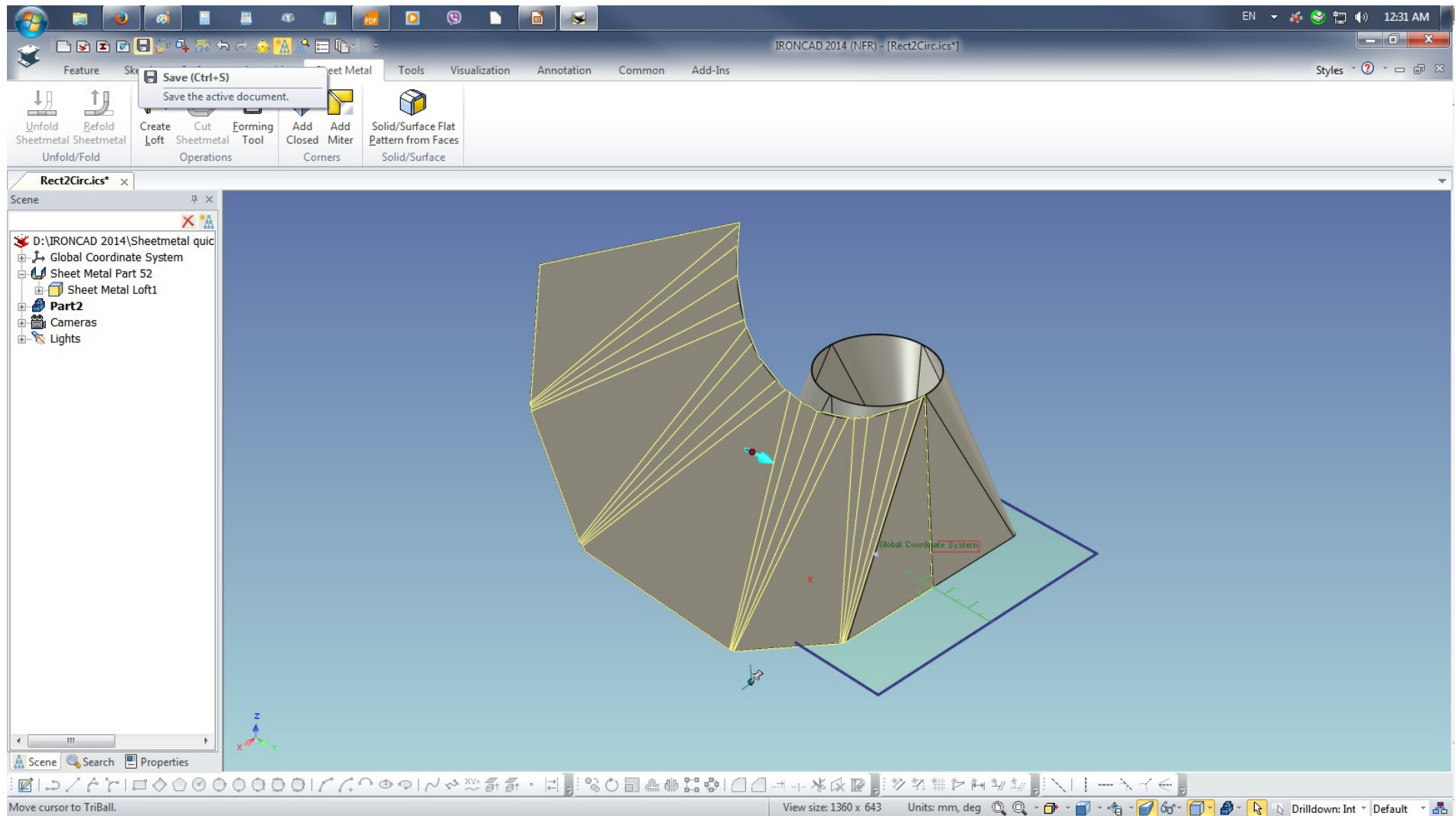
Color change on ACIS kernel change



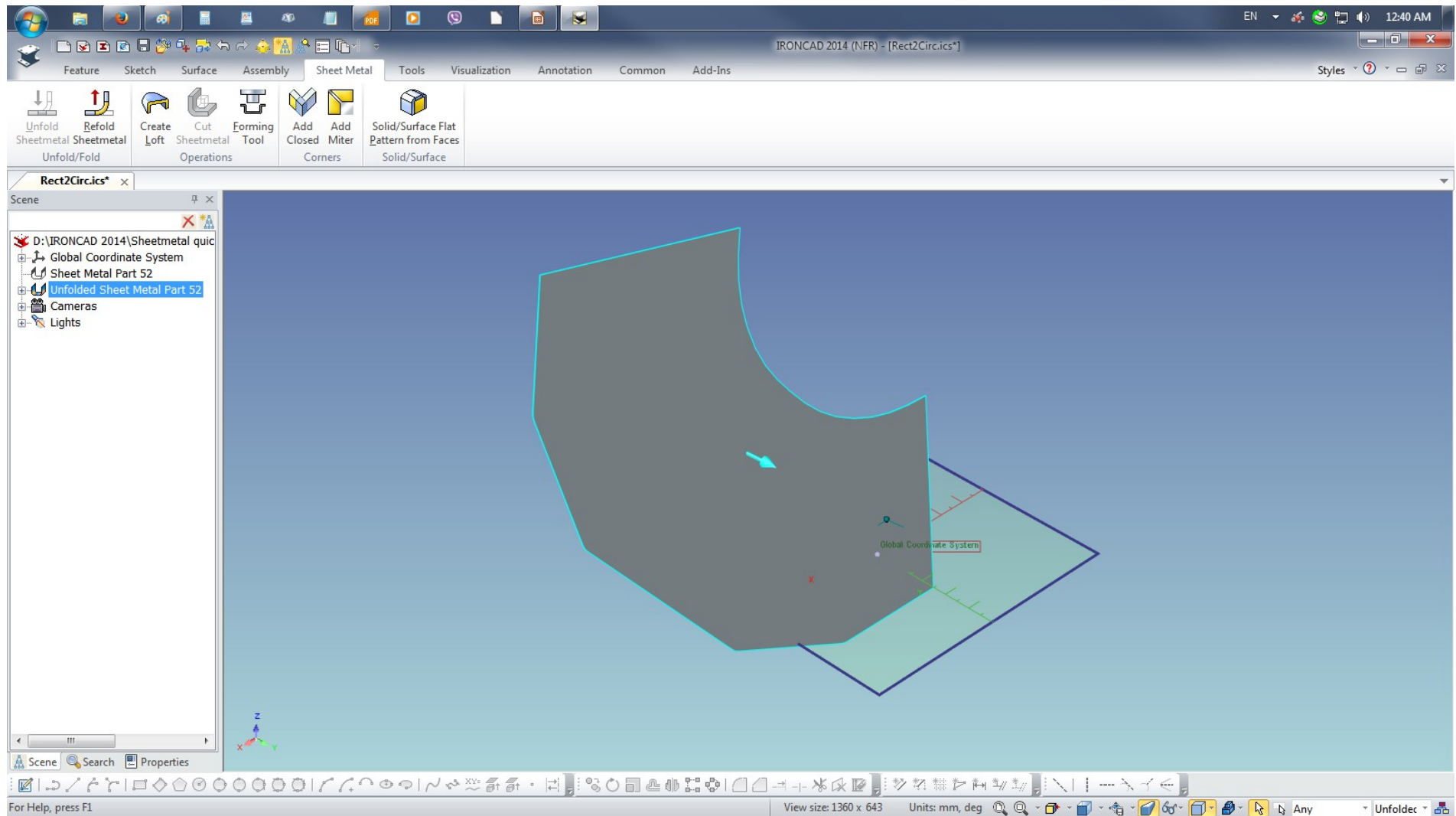
To perform a bend line check or if the created Sheet Metal Loft was done with the values set, select Solid/Surface Flat Pattern from Faces. Select this face as it registers to Face Selection box and click the Check mark.



Point the cursor on the generated Part2 and perform a double LMB click to generate the bend lines. Save the file.



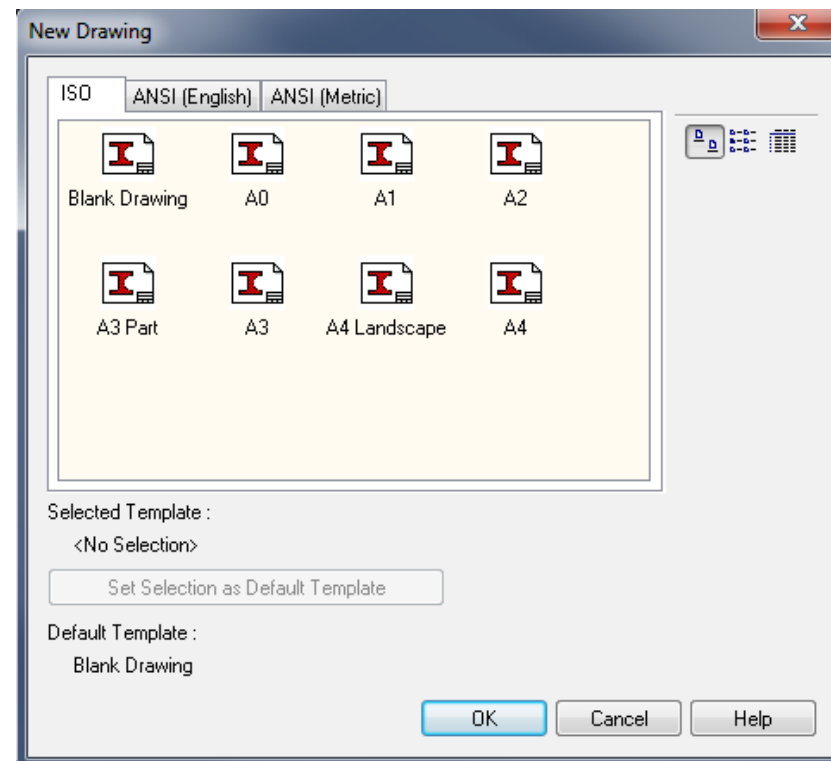
Delete the created Part 2 and select the Sheet Metal part and select Unfold button or on the RMB click select Unfold



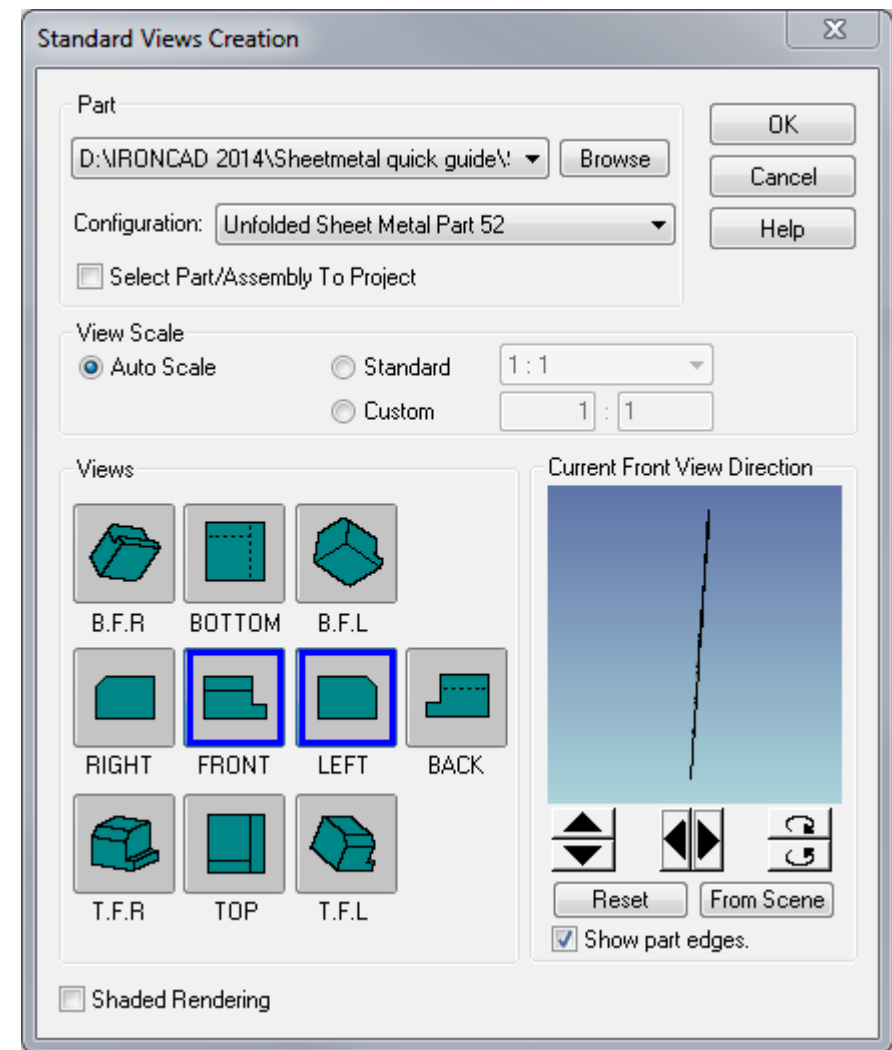
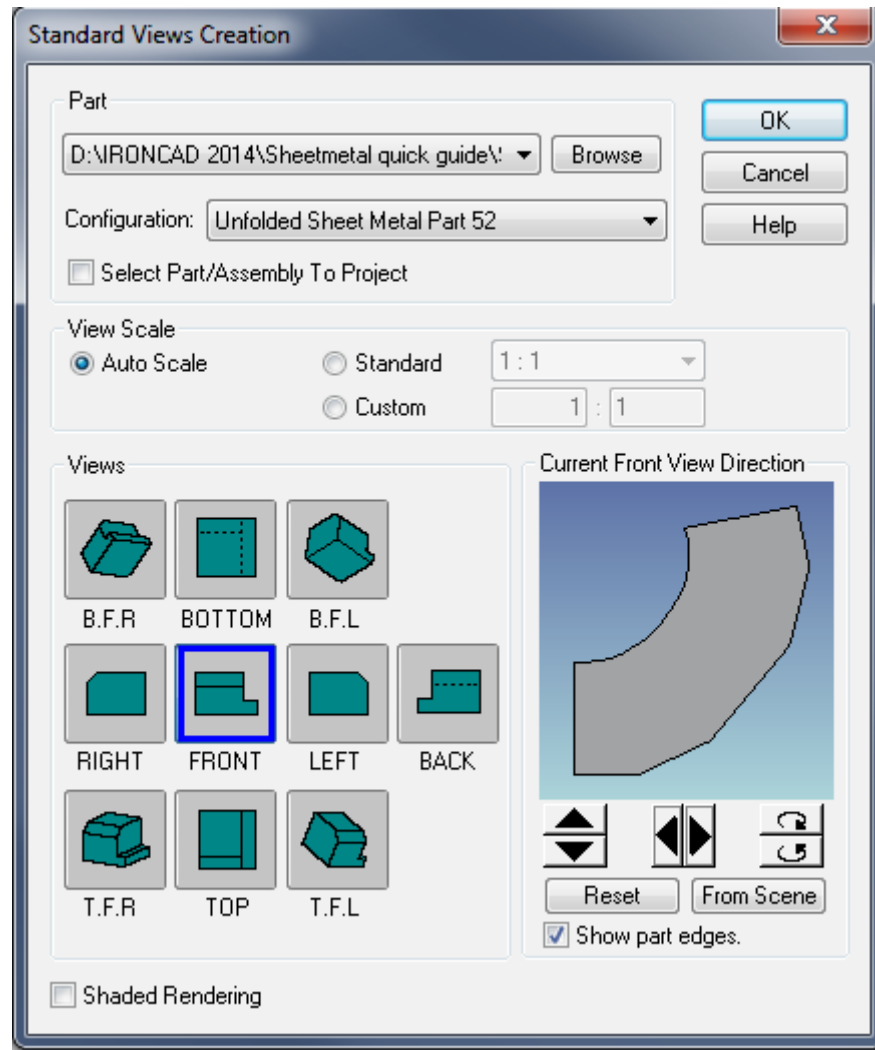
To create the IRONCAD Drawing (ICD) on File > New > Drawing and select the appropriate Template sheet.

Please note with Blank Drawing, most of the sheet features are not selected. For the metric users the current default Blank Drawing sheet is set to imperial unit. The software recognizes the current scene source and follows the unit set. Set a Metric Template sheet and Set Selection as Default Template and similar to the Scene selection so you don't have to deal with the unit system of your choice.

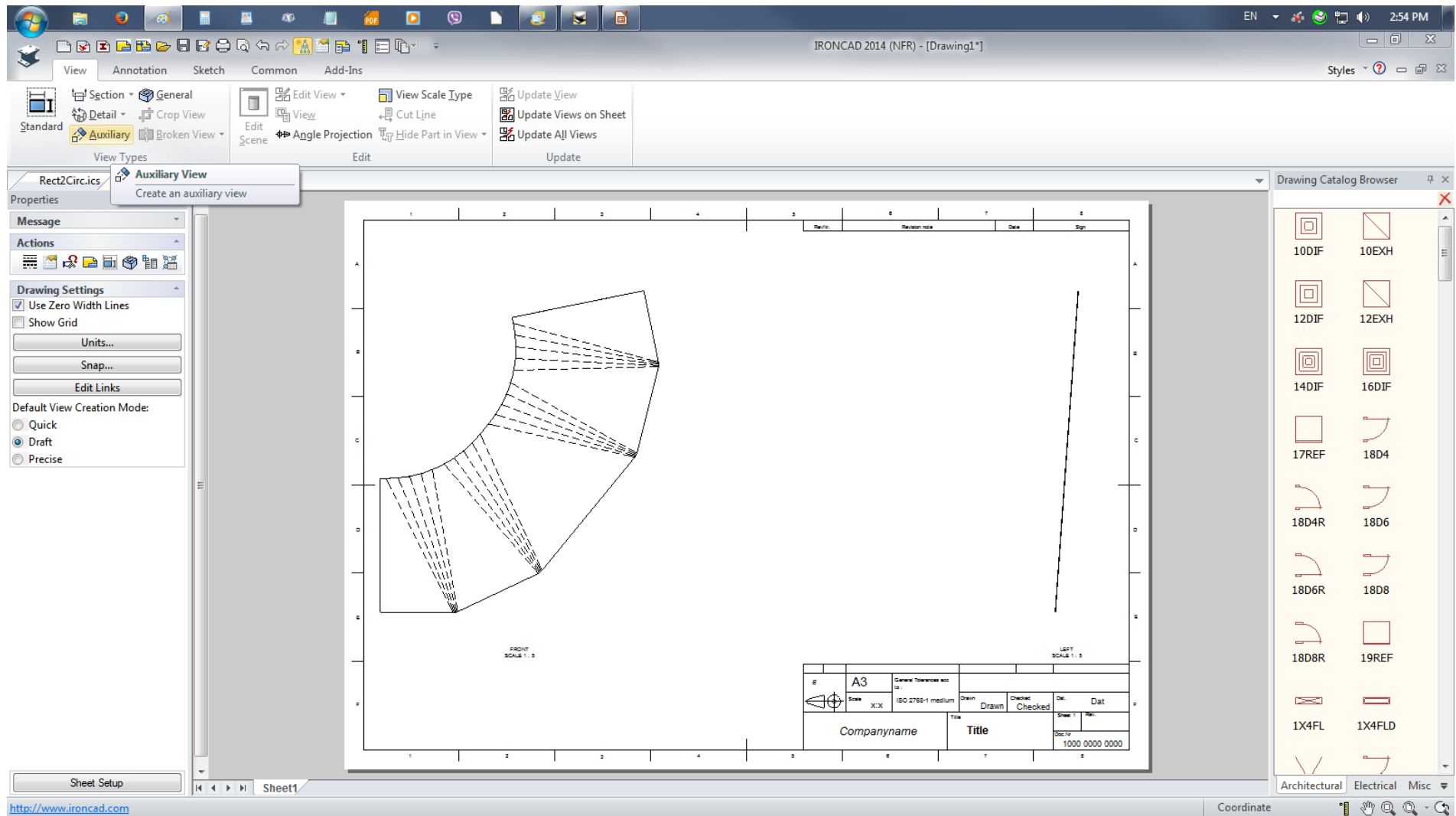
Also note that some sheet metal project you create may have transitions adjacent to 2 parallel sides and unfolded pattern will flat on the plane. This will show the bend lines and associated data to visible to Front Sectional view. On unfolded pattern created from angled faces, you have to add a view selection showing the the tilt of the unfolded pattern to view. Creating an Auxiliary View parallel to tilt of the unfolded pattern will display the true flat projection and display the bend lines and associated data.



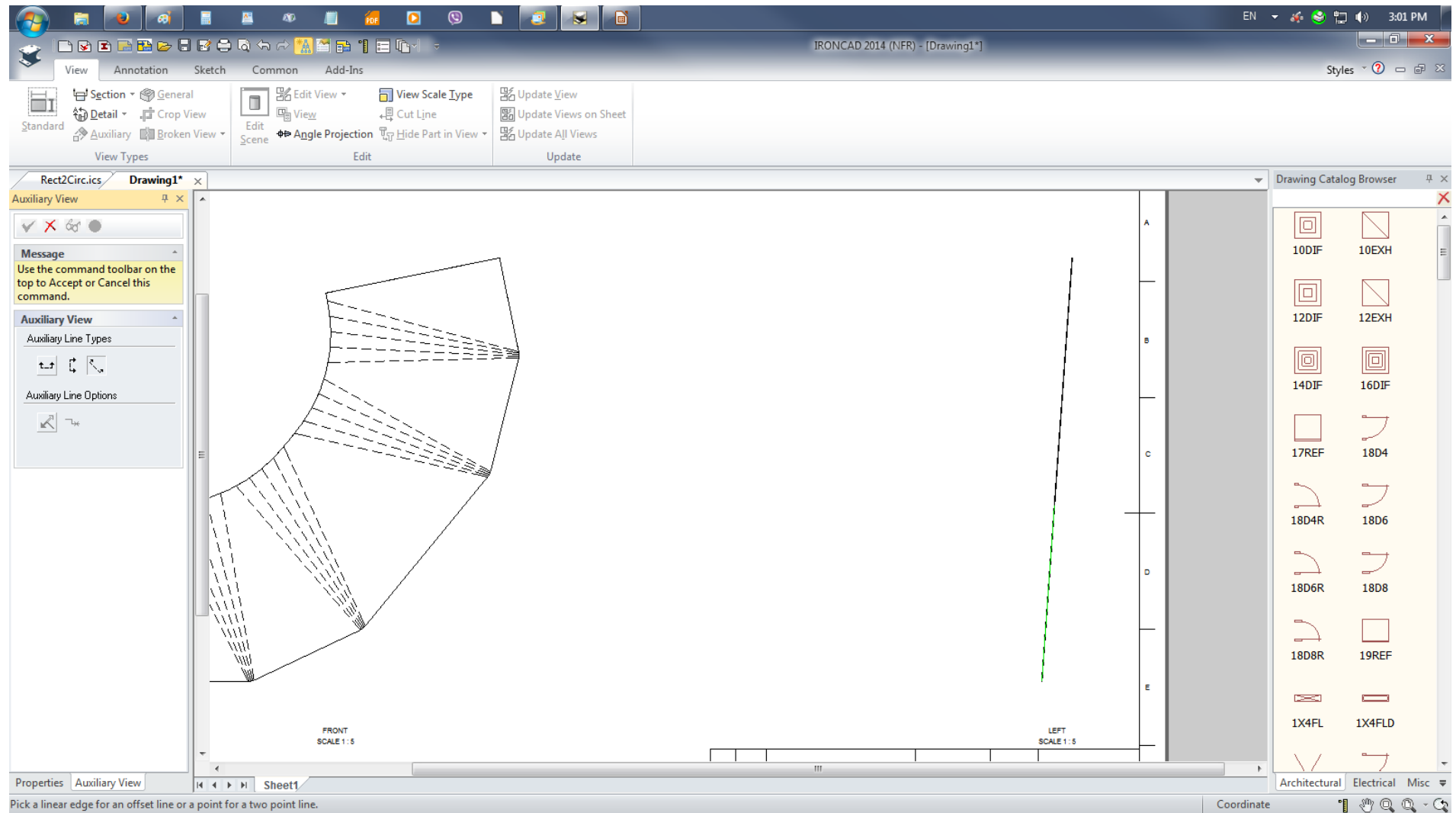
To check the Unfolded Sheet Metal position on the plane, at the Current Front View Direction display click the left or right horizontal directional buttons. As it display the tilted unfolded sheet metal, add a secondary view from the Views selection. Remember to set the view direction back at the Current Front View Direction showing the front. Click OK



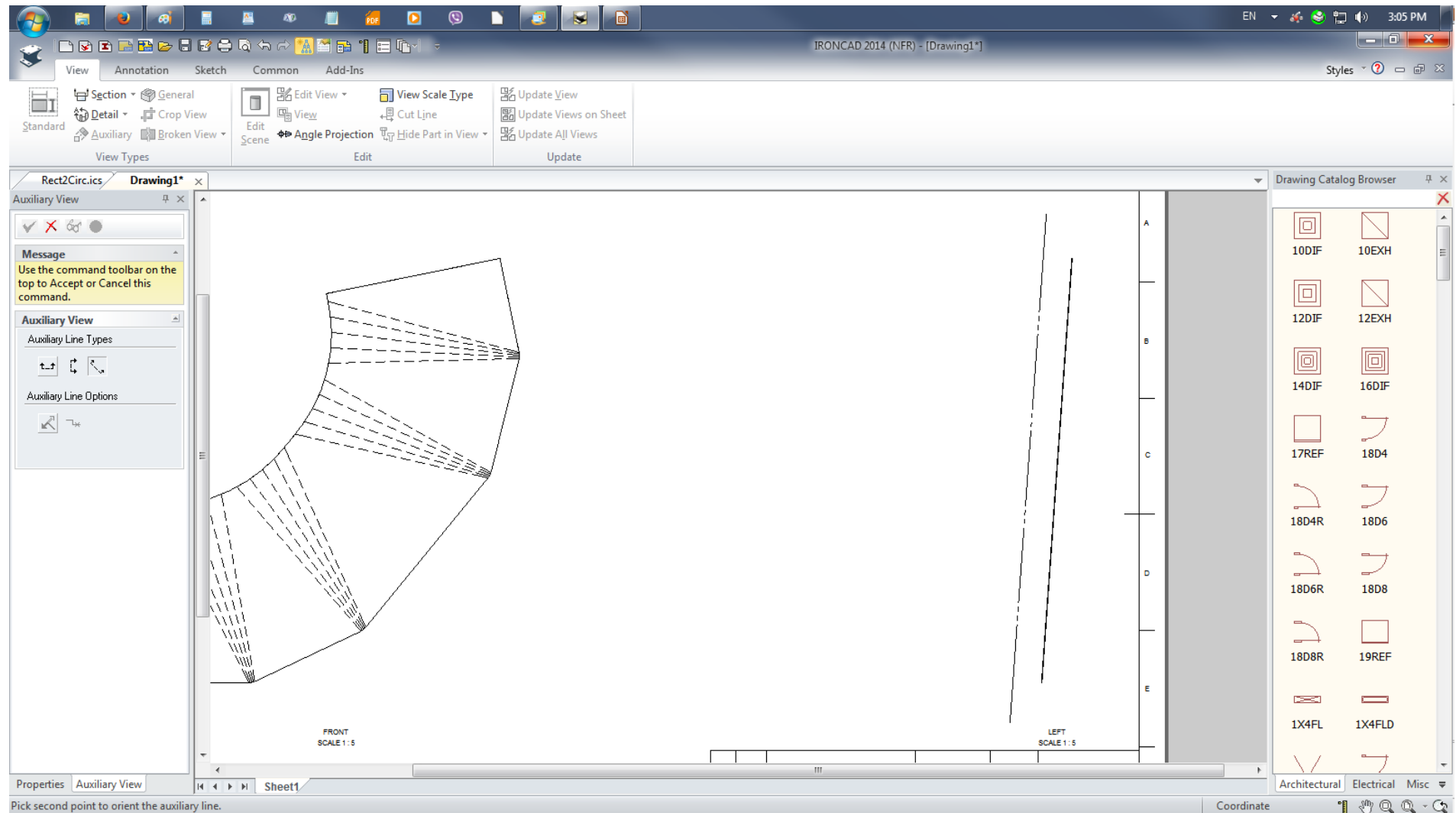
The views created with a standard 1:5 scale. Select the Auxiliary View Types to open the dialogue screen. Zoom to the the left view with the mouse scroll wheel with cursor almost near the center of the drawing.



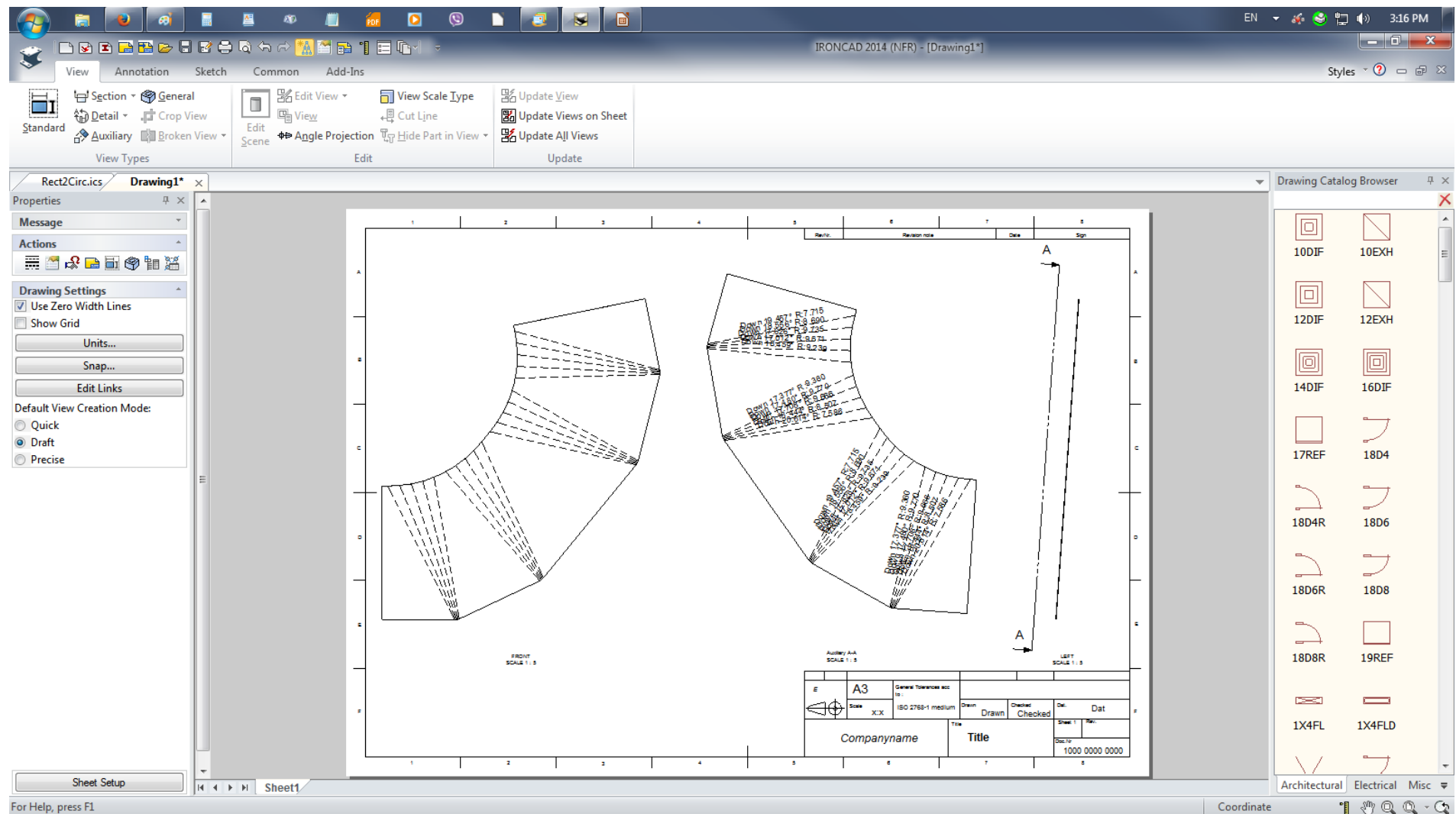
Hover the cursor over or near drawing till it picks a green segment indicator and LMB click



Drag and position the displayed sectional line in place with LMB click. Please note the direction of the line end arrows. It can be switch by the Auxiliary Line Options.



Drag and position the displayed sectional line in place with LMB click. Please note the direction of the line end arrows. It can be switch by the Auxiliary Line Options. Click the Check button to create. Place and LMB click the view outline in place and hit the Esc button to release. The Auxiliary A-A view project the true flat pattern showing the bend lines and manufacturing string.



To show the view details, hover the cursor over the selected view area till it displays the red drawing box. RMB click and select Properties to display the View Properties dialogue screen options.

