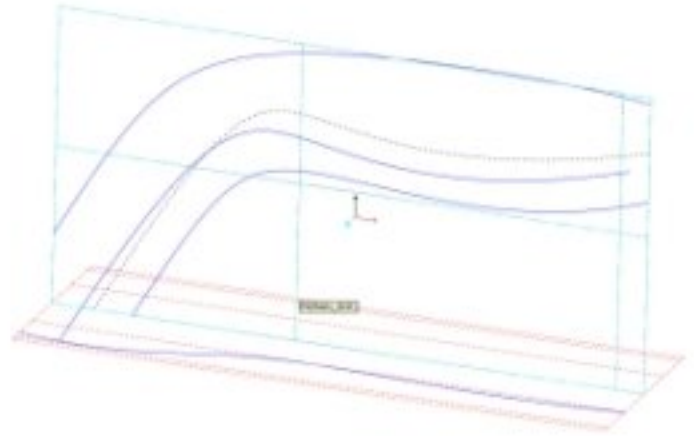
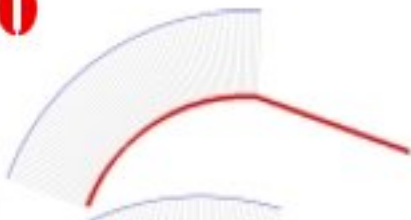


Welcome in the next chapter surfacing related. Contrary to picture on left, such part is not considered to be recreated this time.

In fact, we are going to focus on curves which are the basis not only for model visible above.



G0



G1



G2



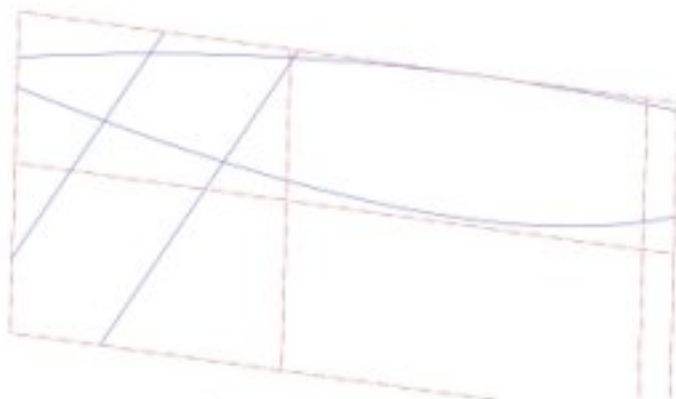
Before we start laying any curve down I want to take a time for a little introduction into "Curves World".

In fact most curves consist of smaller single pieces joined together, what finally creates one chain. The type of "joint"/connection dictates the type and quality of final curve. Because of this one should consider three basic transition types:

*G0 - single pieces (curve entities) are joined. Share common point

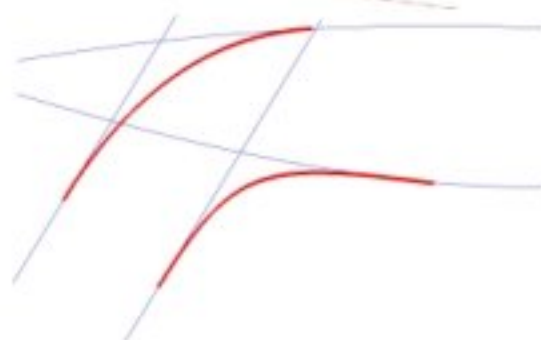
*G1 - curve entities are joined and tangent to each other.

*G2 - entities are tangent and maintain same curvature radius at transition point

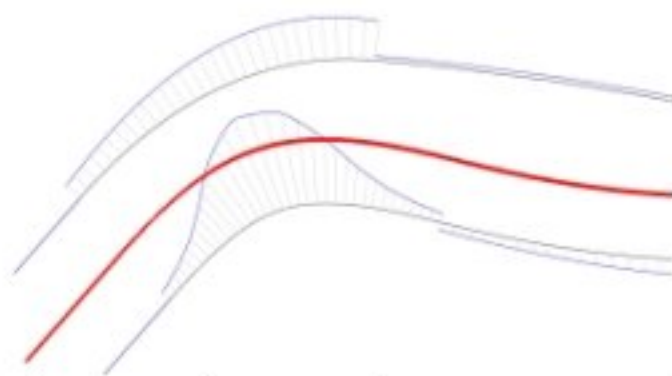


With all above let's investigate possible ways of creating curves for the part introduced at top.

There is a good habit to create "Size" sketches at beginning. For example as rectangles!

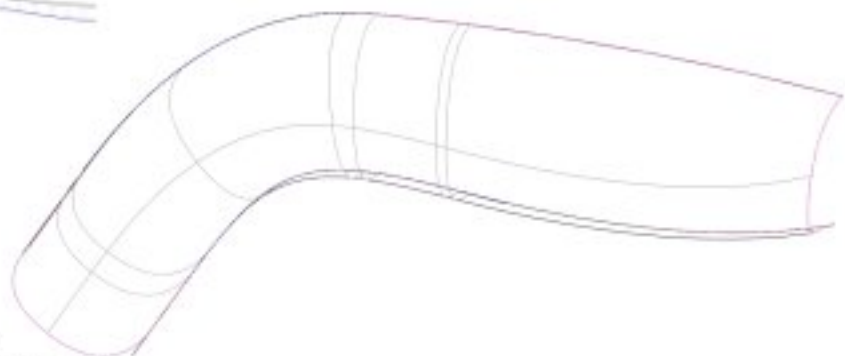


Use the "Size" sketch to create major contours - for example as simple arcs. Then as next sketch create conic arcs between them - take a look on left.

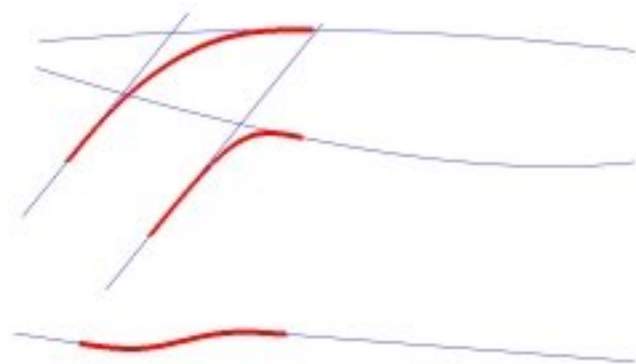


Combine created curves into one by creating new sketch and collecting existing curve with Use Edge tool. So far everything looks quite good.

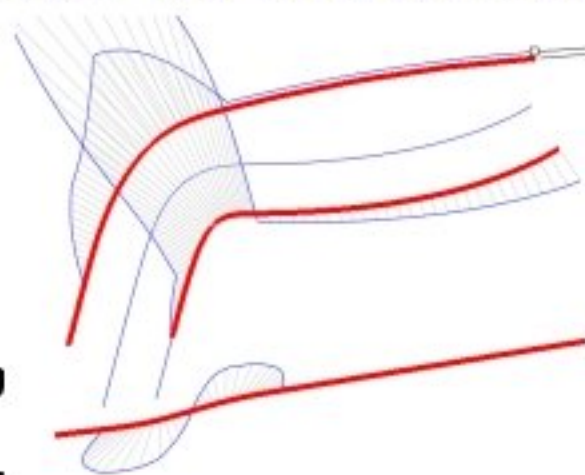
It is enough to perform Curvature  check to find out the plot is not optimum.



Same for surface created on these curves. It is up to consists of many small patches and edges!

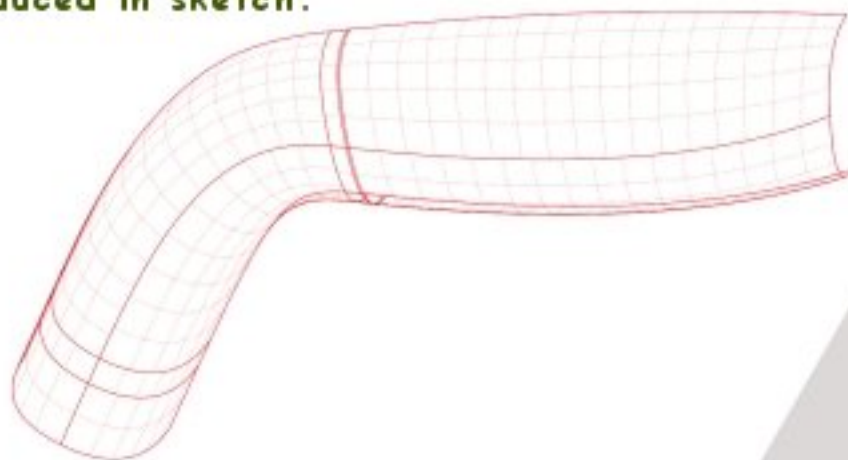


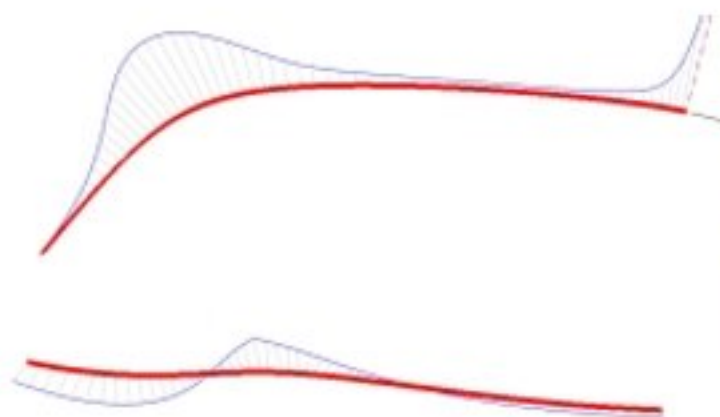
The question arise - what can be done to improve this situation. Well, at first the curvature plot could be smoother, without visible steps. This is because of lack of G2 transition.



It is hard to maintain G2 transition in sketcher. Such thing is possible - just take a look into Sketcher Article. Still this can be worked around by creating Curves through points with curvature transition and then combine with existing contours in final sketch same as in previous example.

The very first apparent difference is the curvature plot which seems to be much more consistent now. However the surface still suffers from many patches and edges. This is due to the many curve entities introduced in sketch.





The best way to address this case is to use spline instead of ordinary entities.

Spline can be created in the sketcher and modified by Edit > Modify. It is a good habit to create a spline with a minimum no. of control points if possible.

The advantage of spline is its consistent curvature plot. Spline also do not create any extra element in control points, like an edge or vertex in the final geometry.

To create spline in sketcher use this icon

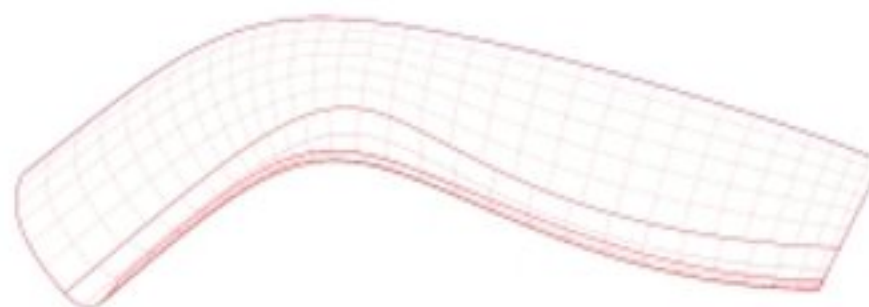
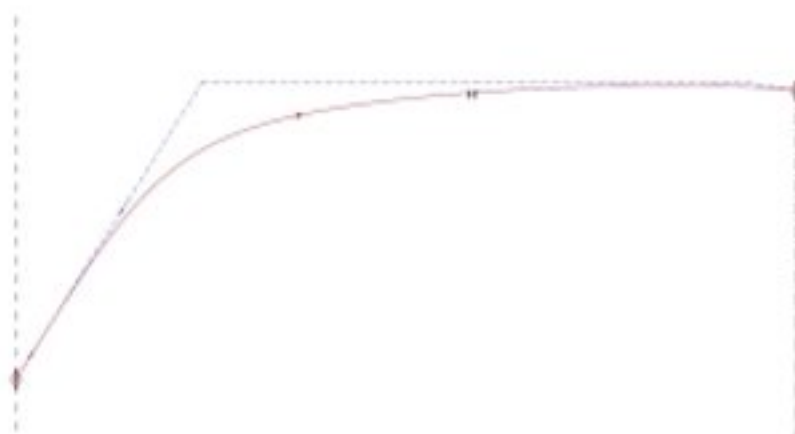


Sketch > Spline

To modify Spline, select it, and Edit > Modify. As a result special dashboard menu will appear with additional options.

Personally I recommend to take advantage of control polygon. This allows user to control spline in some parametric way.

While modifying spline, turn on Curvature display, which will be generated dynamically.



The influence of curves consisted of spline can not be unnoticed. Final surface lacks patches and extra edges like before. Surface and curvature is smooth.

General difference between arc and spline is the simplicity of parametrization. Arcs have constant radius and curvature that is why are easier to predict how they are going to be after changes. Spline is harder to control with relations, but fits best for "curvature" shapes!