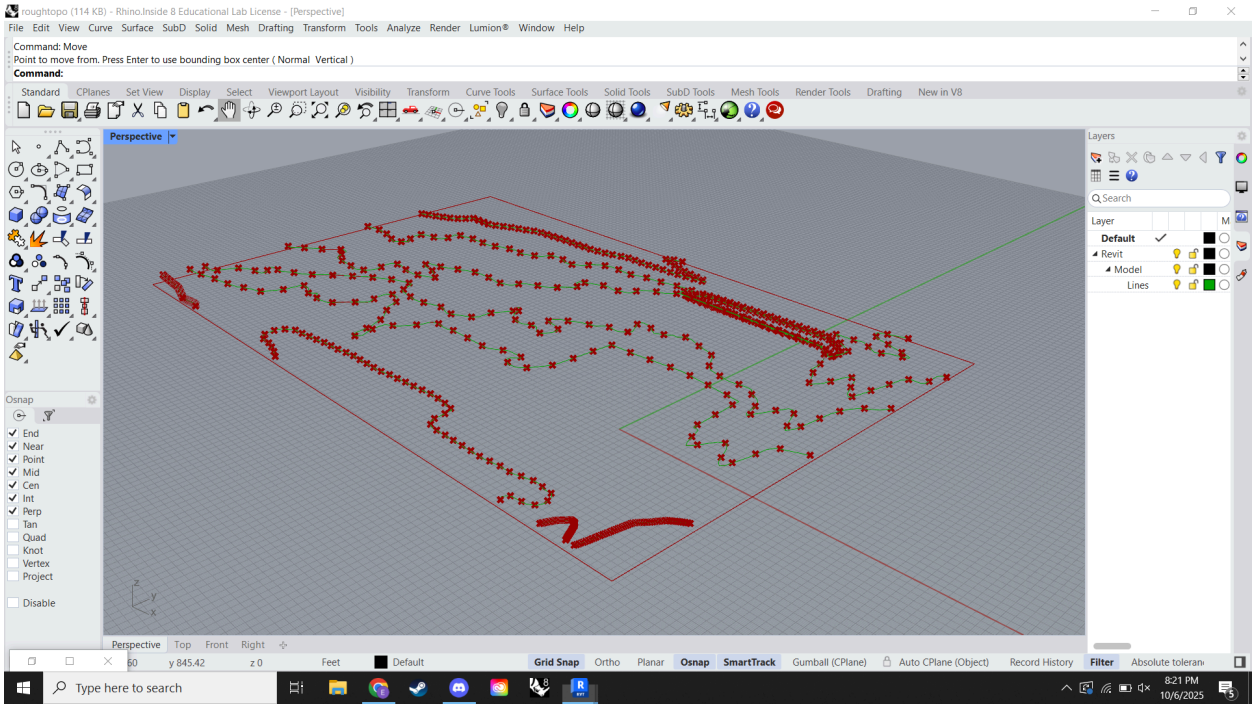
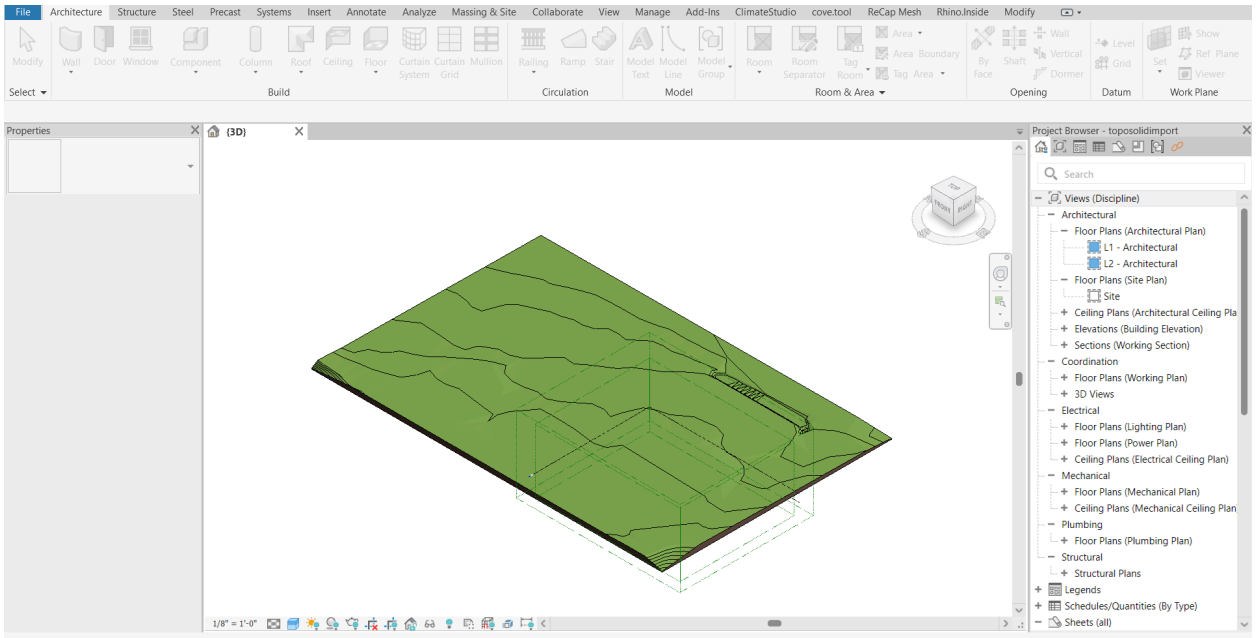
When working on adjusting a topo solid for my studio project, I quickly grew frustrated with the editing tools for it. This was largely because the only way to change the solid was through manipulating the points of the triangles that made up the topo solid, attempting to adjust contours lead to results that felt arbitrary if not random. Therefore, after my introduction to the rhino inside workflow, I immediately felt as though this could mitigate my frustrations with the topo solid system. In my first attempt, I used the mesh made from a point cloud using cloud compare, which yielded what would likely be the most accurate results. However, this workflow did not lend itself to easily editing the topography, depending on rhino's mesh editing tools. I wanted to be able to directly draw contours and have the toposolid reflect this. Additionally, importing the mesh into revit was very time consuming as it took a very long time to load, a wait that could potentially repeat with every change I made to the topography. Despite this, the initial topo solid brought in through this work flow was far far better than what forma provided me, being far less chaotic and likely accurate.

In my second attempt, I took a much more simplified approach, opting instead to simply trace the contour lines provided by Bozeman Gis into rhino at scale. Then, I took these on foot contours and moved them to their appropriate elevation in the z axis. From there, I just needed to put the curves into a curve component and divide them into a series of points. I could've instead used the control points component, the divide curve component allowed for easy parametric control of the desired detail for each contour line. No matter what component is used though, it is still necessary to flatten the data as each contour line will initially be in its own list, leading to the creation of multiple topo solids, each only considering one contour line, rather than a single one that considers all. The only other input needed was the boundary of the topo solid, I just used a rectangle that was sized around the scope box of my site plan drawing in revit. I am much happier with this result, as effectively I am able to just manipulate the contour lines and have the topo solid reflect my changes as they are made. This made editing the topo solid far easier and allowed for better fine grain control of the contours as I was essentially able to just edit them in 2d, with those changes being reflected live in section. There are still issues with this workflow which will result in me likely only using it in sections and elevations, opting instead to use detail lines as my contour lines in my 2d sit plan drawings.

The main issue is the seemingly casual relationship between the points that make up the topo solid and the contour lines revit draws on it. While I believe that the topo solid in 3d is representative of the contour lines drawn in rhino, the contours revit produces are not directly related to these points. This is essentially the same issue I was trying to circumvent by using rhino inside, as I was struggling to draw contours just by dragging around the points from the forma topo solid. If there is a logic to how the contours respond to these points, I do not understand it. But, the toposolid produced from rhino inside is still far more flexible and editable than it would be from just the revit editing tools. Secondly, the topo solid wants all of it's corners to be flat leading to steep slopes from high contour lines to the "base" corner of the topo solid. I think this issue can be solved with further script refinement though, as I have seen examples online without this issue.



Rhino file containing contour lines at appropriate elevations and the boundary curve (this could be used to create a variety of interesting shapes)



Topo solid created from the points generated by those contour lines. This solid will live update with changes made to the contour lines.