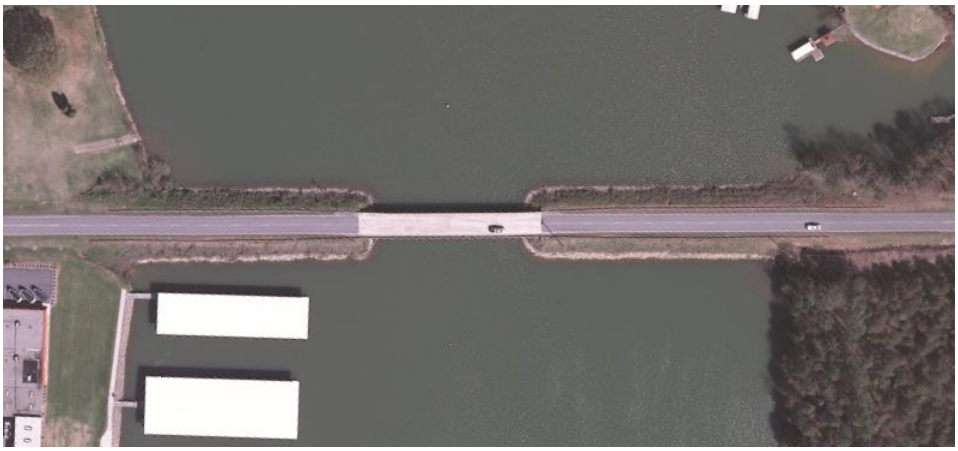
3_1 CAUSEWAY CORRIDOR – TIN HULL EXTENSION

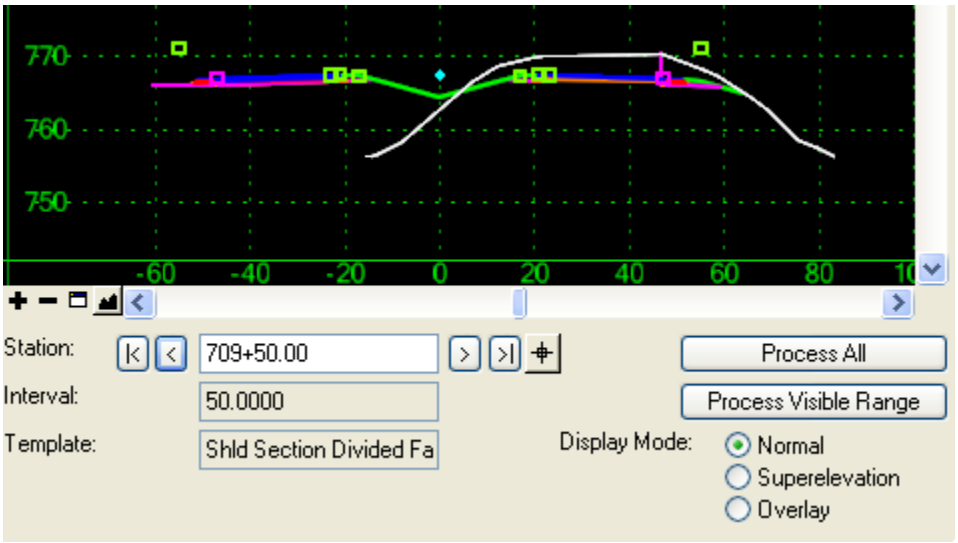
Question:

The roadway on this project crosses portions of Lake Norman several times. There are long causeways that lead to long bridges. The model will have large portions where it will 'fail' because surveys will not pick up the bottom of the lake where the causeways are (and we are widening a 2 lane to a 4 lane divided hwy). How will this be handled with CM?

Answer:

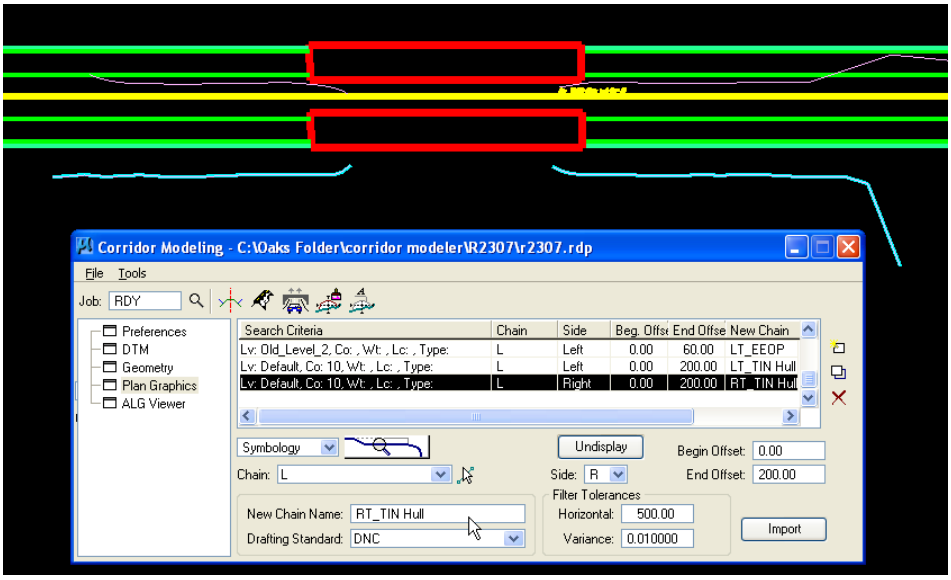
The problem with most causeway surveys is not enough existing ground TIN/DTM coverage (stops at water edge), resulting in end condition failures.



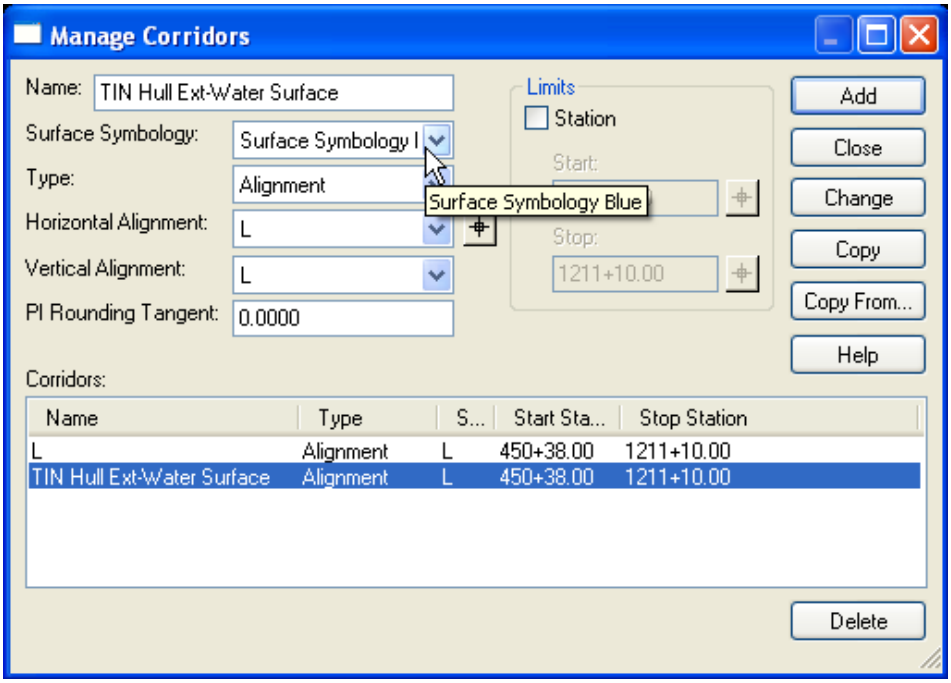


To solve this issue with Corridor Modeling, the extension of the TIN hull (boundary) has to be made. An assumption is made where the water surface elevation is extended out for a predefinable distance so the side slope/end condition can mark the “slope stake” point.

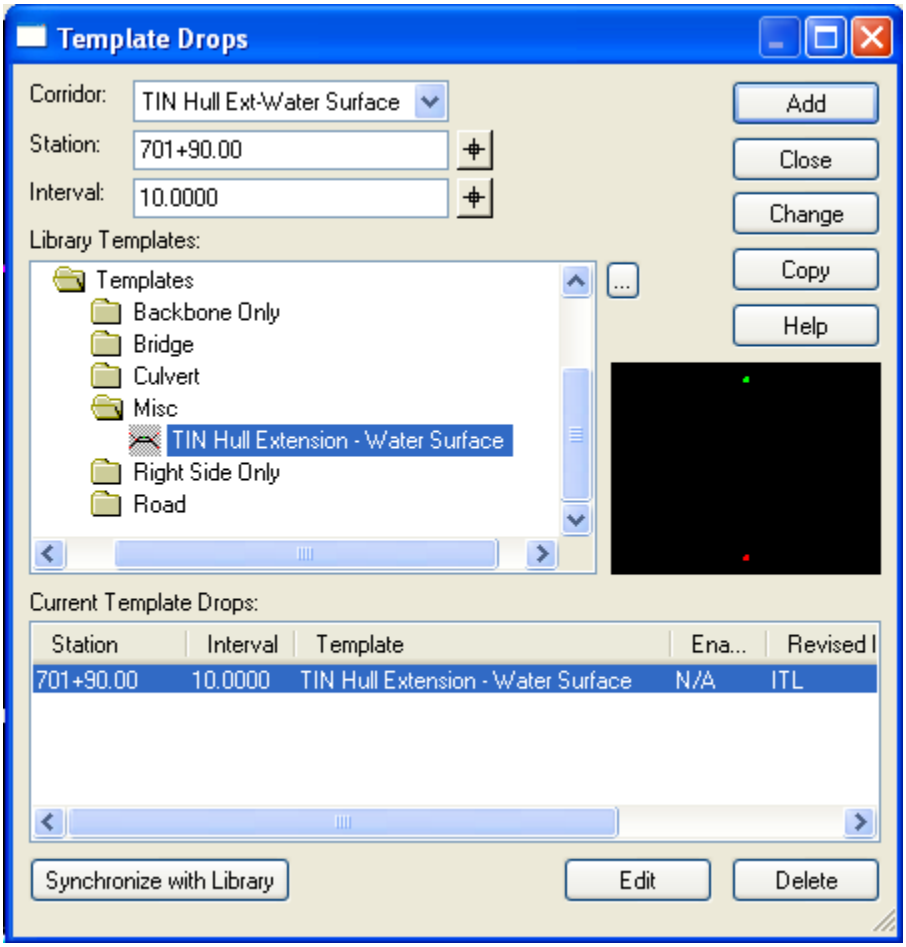
First lay out the TIN hull using the DTM tools and store just the causeway areas as 2D graphics.



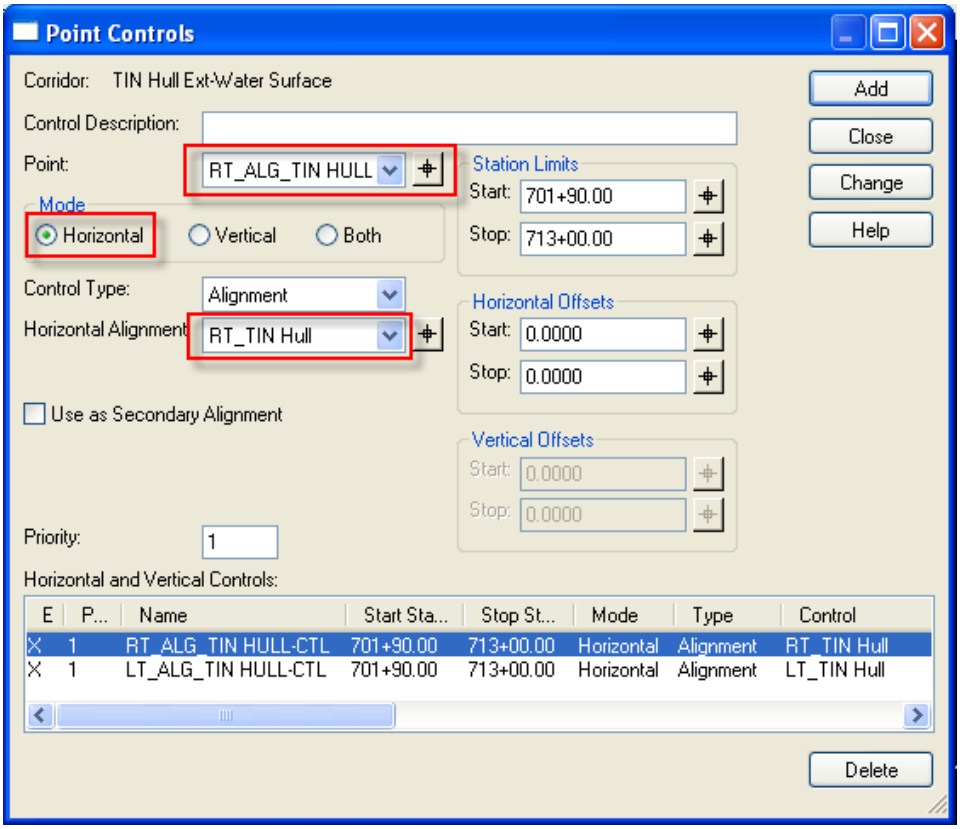
Using the same IRD as the mainline in Roadway Designer, create a second corridor to extend the existing ground as the water surface elevation.



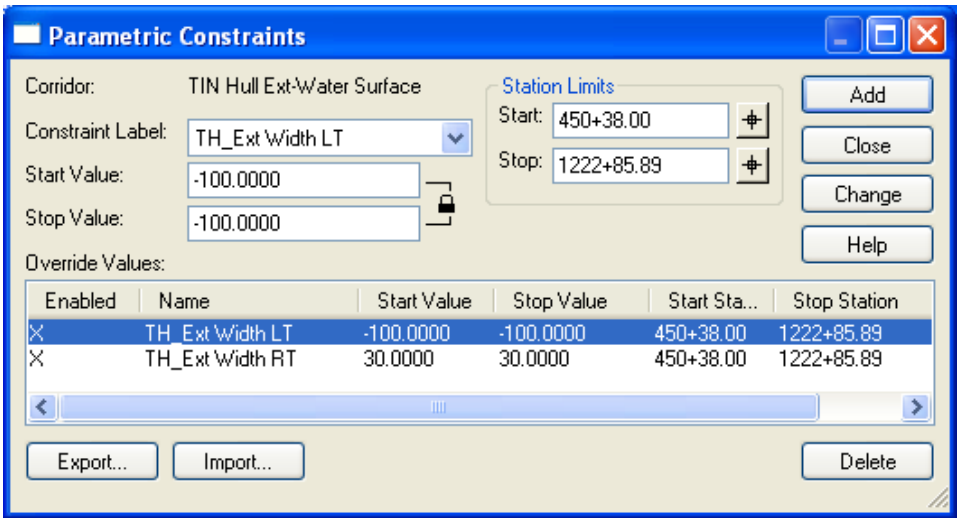
Drop the template “TIN Hull Ext-Water Surface” in the Misc template folder.



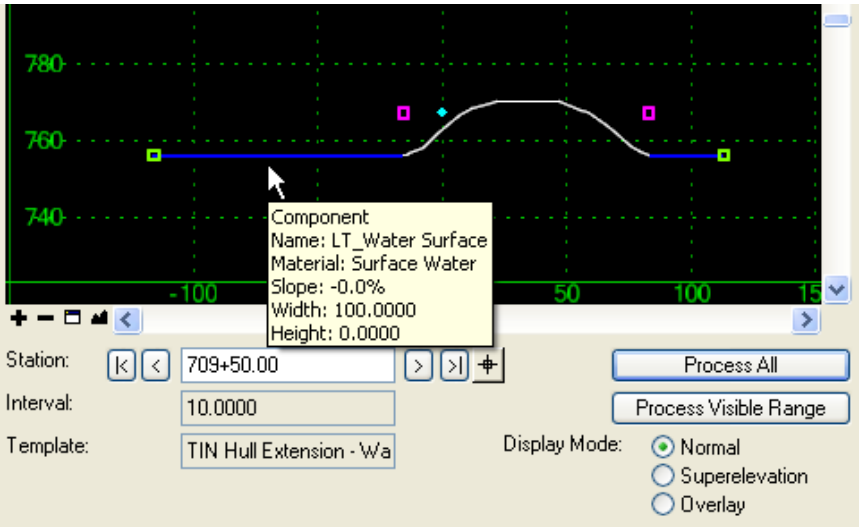
Use point controls to move points **LT_ALG_TIN HULL-CTL** and **RT_ALG_TIN HULL-CTL** horizontally to the location where the TIN hull graphics were stored in the earlier steps.



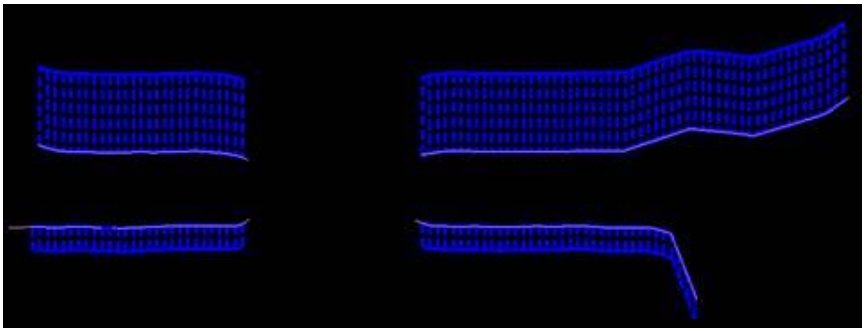
Use the parametric constraint label **TH_Ext Width LT** and **TH_Ext Width RT** to predefine the TIN hull extension width left and right side.



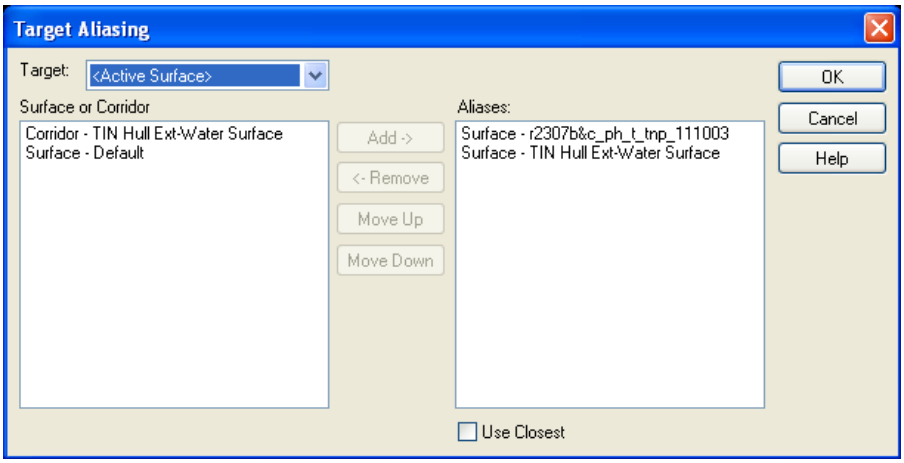
Now note the water surface extension in Roadway Designer.

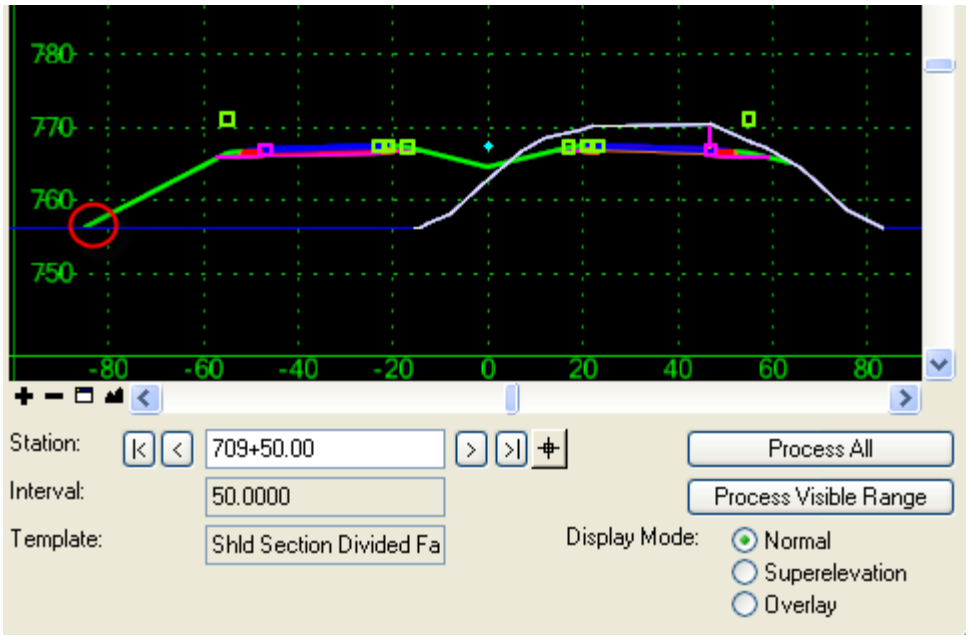


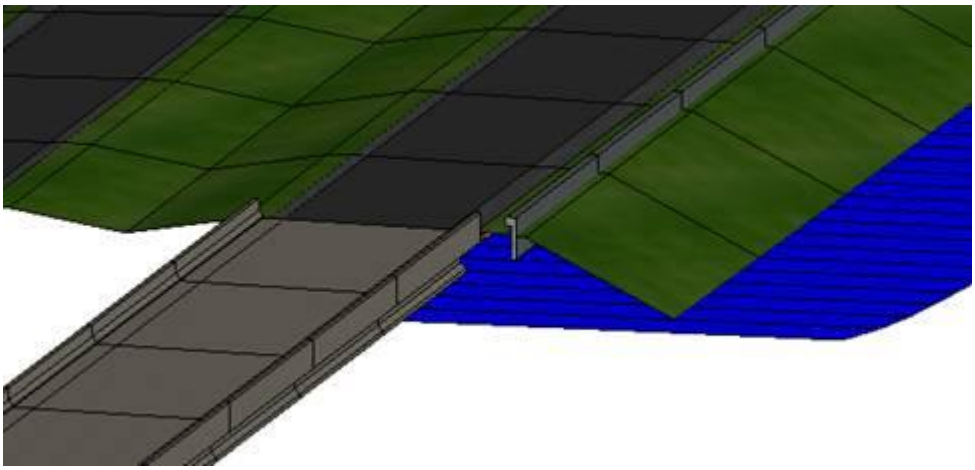
Plan view of TIN hull (pink) and water surface extension (blue).



After creating the surface of the **TIN Hull Ext-Water Surface** corridor, Target Aliasing can now be used on the mainline -L- corridor to define the water surface in addition to the the existing ground surface for the end conditions to tie to.







Please note that earthwork will not be as accurate as if the bottom of the lake terrain is known and some additional adjustments have to made. But this procedure will at least allow for Geopak earthwork to process and should get you in the "ballpark". As with all causeways, other NCDOT Units such as Hydro, Geotech, Location and Surveys, and Photogrammetry will help determine the type and quantity of material, the nominal depth of fill, and if rock plating is needed.