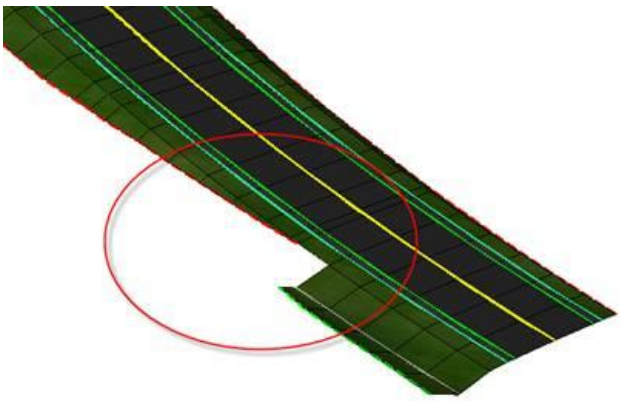
2_14 END CONDITION EXCEPTION – CUT TO FILL TRANSITIONS

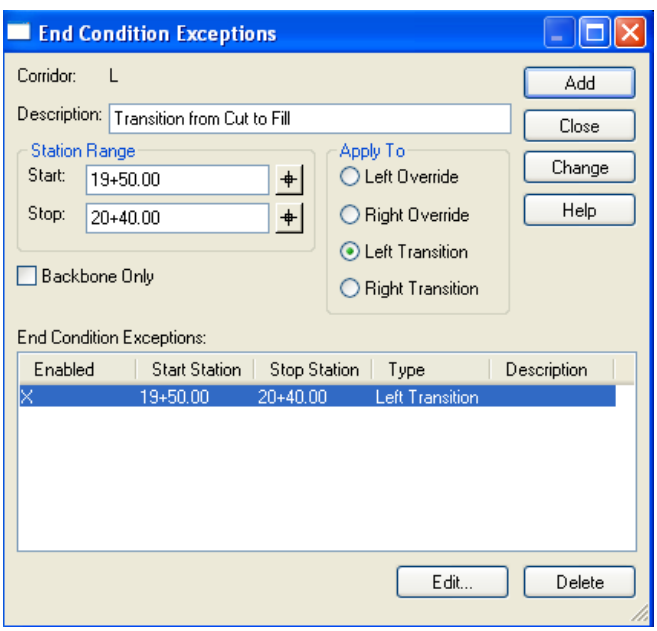
Question:

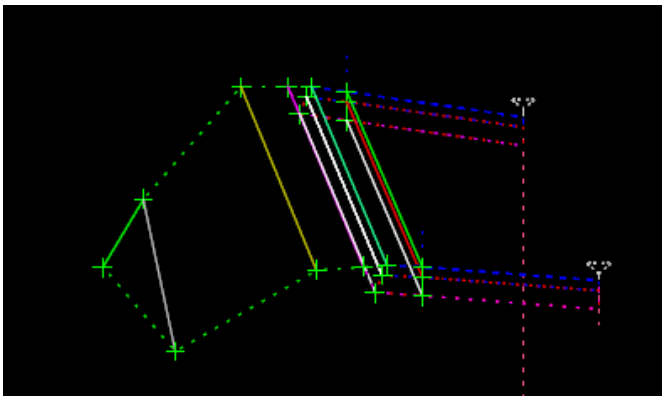
I'm trying to smooth out the transition from a cut to fill section using Roadway Designer End Condition Exception – Transitions. Why does my shoulders get deleted during the process and is there a better way?



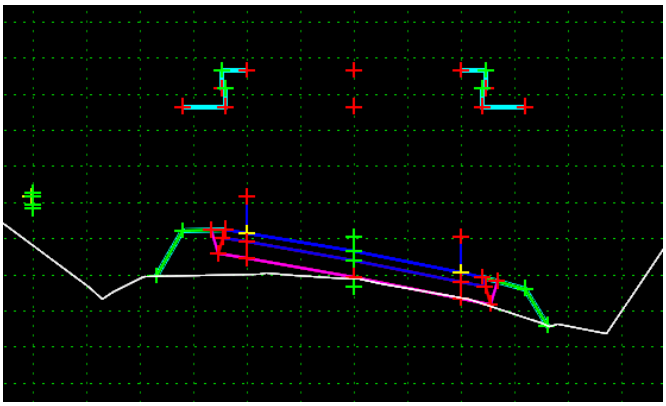
Answer:

End Condition Exceptions (Transition and Override) remove all constraints from all points outside the template backbone (shoulders and end conditions) and in the same process ignores and deletes all other end condition branches. Since one of these EC branches, as a parent component, was designed to seek the default paved shoulder section was deleted during the process, the shoulder components, as children components, were also deleted.

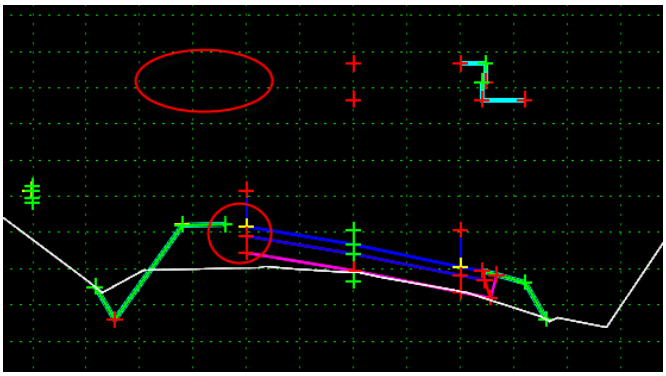


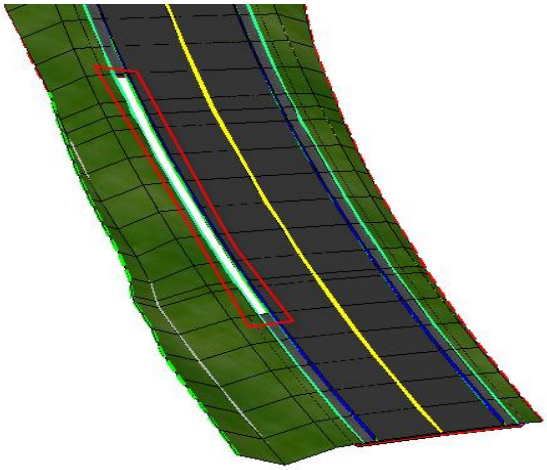


Without ECE-T

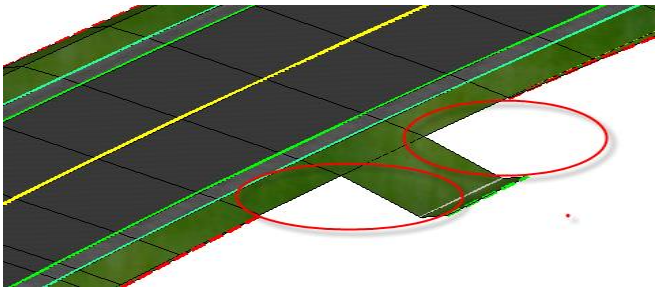


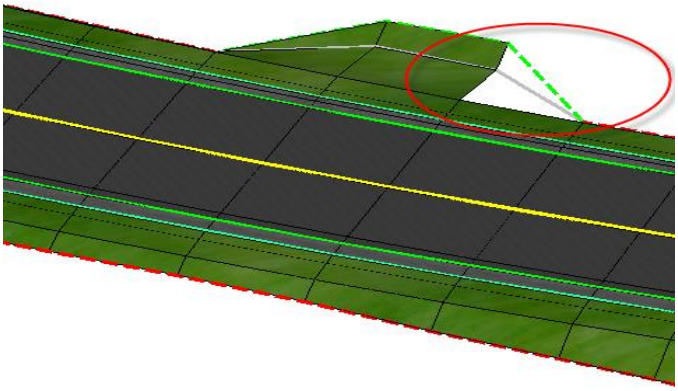
With ECE-T



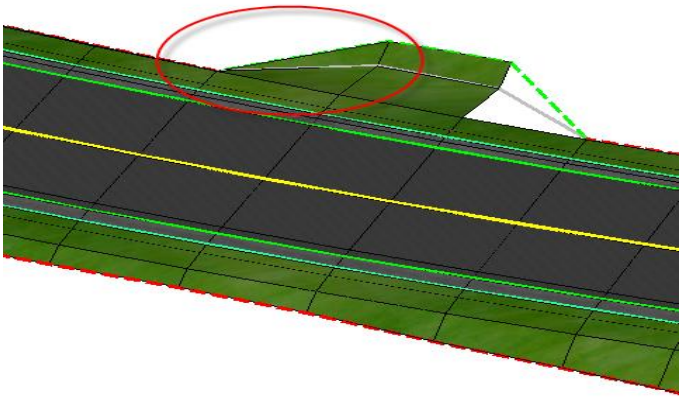


Because the way our standard templates are built, we cannot use ECE in its current state. However, ECE-T can be used between two consecutive template drops, instead of a range of template drops, with limited results. The problem is with creating the surface going from a fill to a cut section. One surface plane on the side slope of a fill section cannot create two surface planes for the front and back ditch slopes on a cut section.



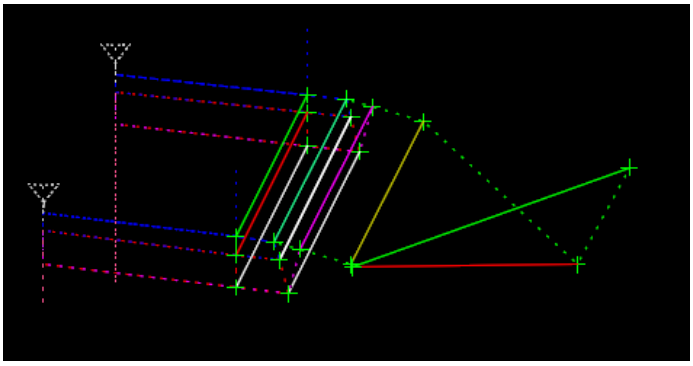


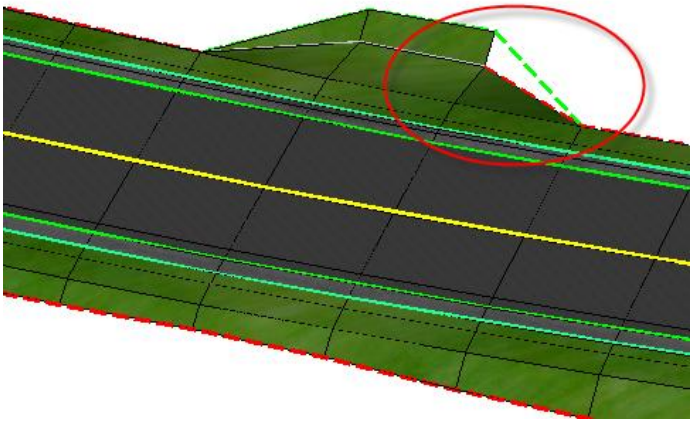
Conversely, there is no issues combining the two front and back ditch slopes into one fill slope.br>



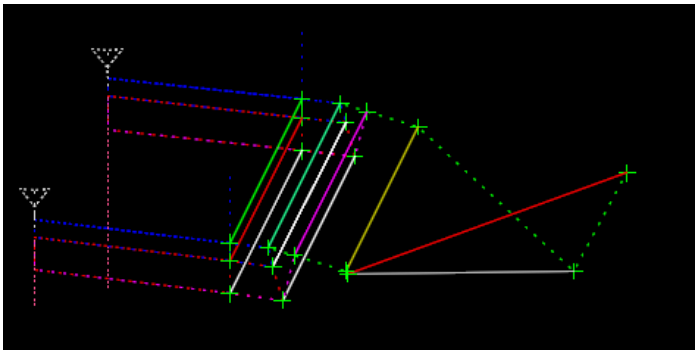
When using ECE-T, it is very important to note which point from the beginning template is to connect to on the ending template. In the below example, we are going from a fill to a cut section, therefore the red fill slope stake point must be used first to connect to one of the ditch point in a cut section. Two possible solutions:

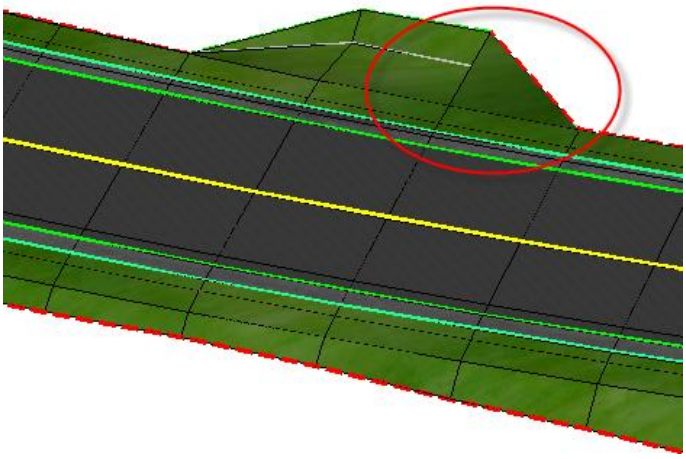
1. Fill Slope Tie to Ditch Base





2. Fill Slope Tie to Ditch Outer Boundary





The only way to circumvent this issue is to create another point on the fill side slope end conditions (breaking the fill slope into two pieces instead of just one) to match the same number of surface plane on a ditch cut section. There are more cons than pros for going this route and it will required a major overhaul of the template library that this is not a viable option for us currently. Hopefully SS3 will make surface transitioning easier in the near future.

The best-practice solution to transition from a cut to fill section and vice versa may come from Hydro. By designing a ditch grade, the transition from cut to fill or fill to cut can consistently be completed successfully without using ECE Transition or Override.