

Volume 1, No. 2
April, 2009

Civil CAD CONSULTANT

Express-TIP

On the Slide

Q: Creating the liner in the end condition looks great, but what about volumes?

A: The liner is treated like other closed components in the design. Show it on your sections, then in **End Area Volumes** make certain it's set to **Exclude** on the **Classifications** page. The volume of the liner will be included in your overall cut, and will also be included in the volume of the liner material.

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Minimum depth / Variable liner

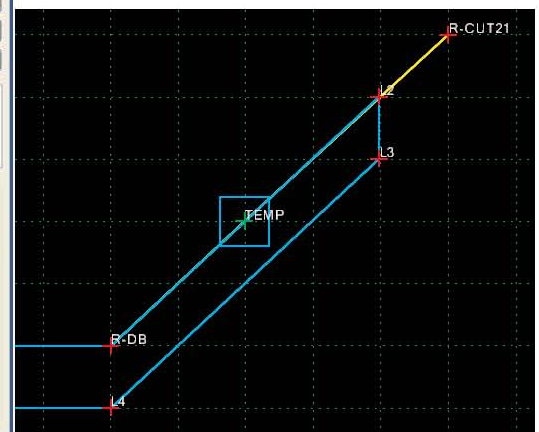
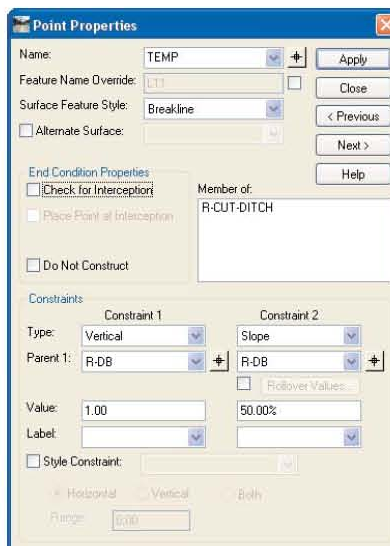
When the Ditch is too Shallow

We left off last time with a ditch liner that only shows up when the ditch is present, using the Parent/Child relationship. What about when the ditch is too shallow to build the entire liner, or when you don't want to construct a ditch unless it meets a minimum depth? Let's look at both scenarios.

Minimum depth

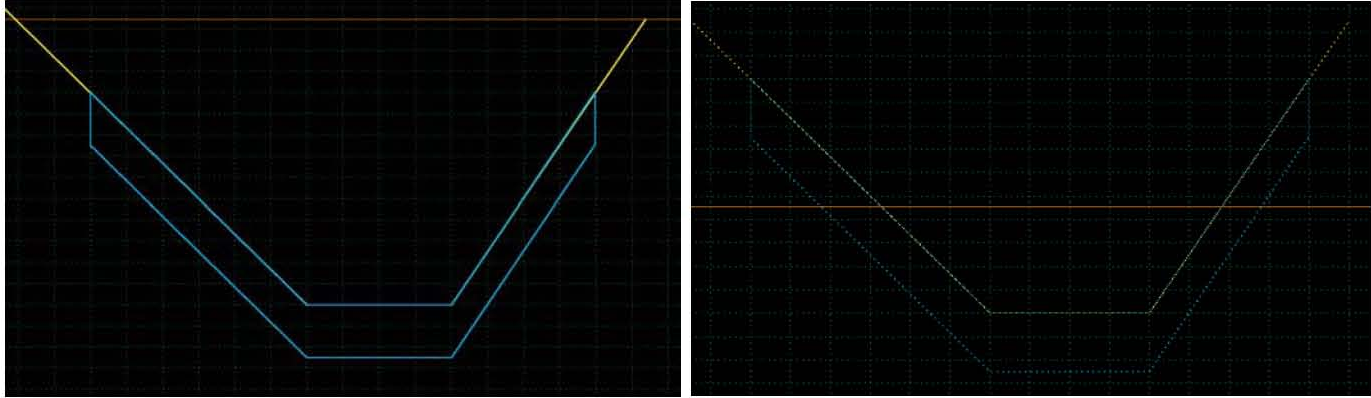
- 1 Right-click on the ditch backslope and choose **Insert Point**.
- 2 Place the point at the approximate location of the minimum depth you wish to maintain (here 1 ft.), then set the constraints to the exact depth. Constrain the point by a **Vertical** and **Slope** from the ditch bottom. The real key to having

the ditch only occur when it is deeper than 1ft is to toggle off **Check for Interception**.



Then, if the existing ground is encountered before minimum depth is met, the segment will pass right through. The following segment is set to **Check for Interception**, but since the existing ground has already been passed through, it will fail in this instance and the ditch will not be constructed.

3 Apply and then test to ensure the desired results



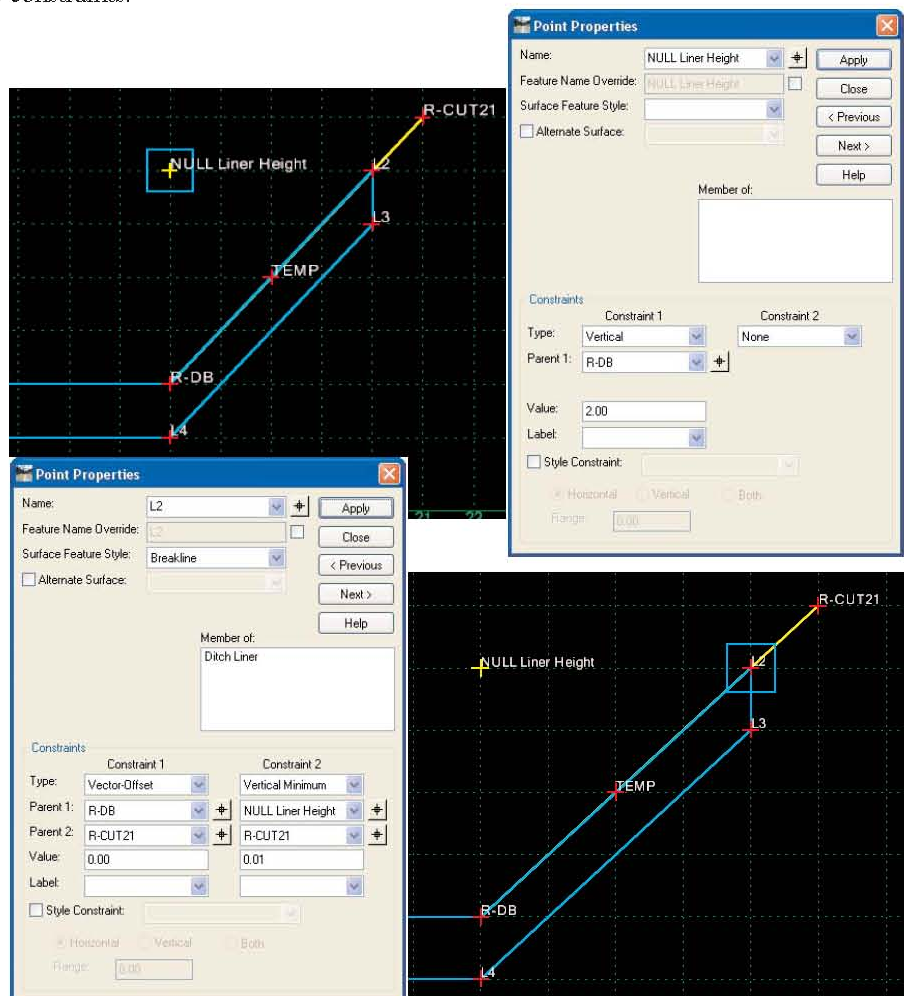
Variable size liner

In the situation when the ditch exceeds the minimum depth, but is still shallower than the liner, you can make the liner variable by using a Null point and changing the constraints.

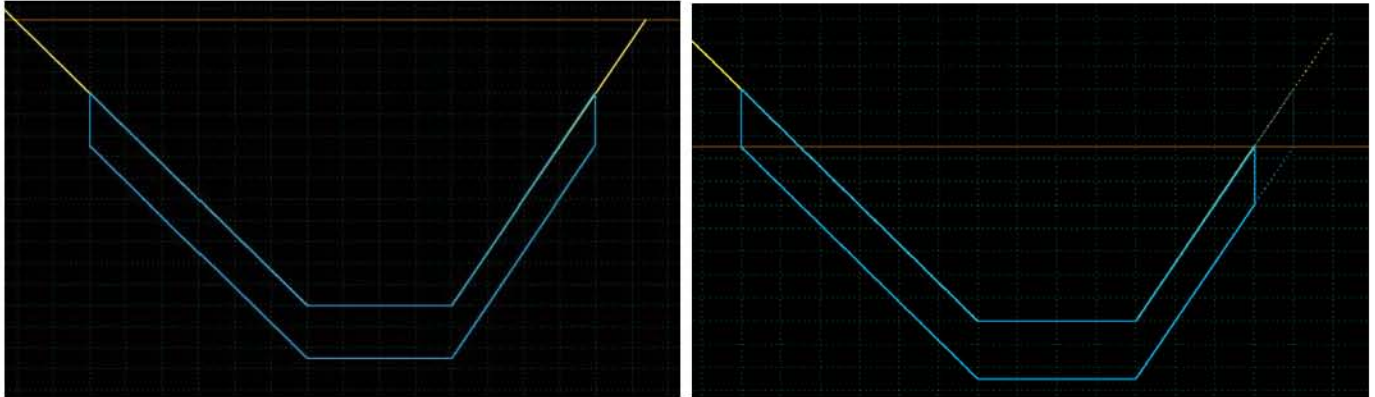
1 Right-click in a clear area and choose **Add New Component > Null Point**.


Place the Null point at the full height of the liner and vertically constrain it there. This point will control the liner when the ditch is deeper than the full liner height.

2 Next, **Edit** the point at the top of the liner. Here, constrain the point to stay at the same elevation as either the Null point you just created or the Cut point at the interception with the ground, *whichever is lower*. This is accomplished using the **Vertical Minimum** constraint. When the Null point is lower, the constraint holds the liner at a constant elevation matching the Null point. When the Cut point is lower, the constraint holds the liner at the Cut point elevation, making it variable.



- 4** Test the template again and note that the liner is only present when its **Parent**, the ditch, is present, the liner 'shrinks' when the ditch is shallower, and there is no ditch when it doesn't meet the minimum depth.



The use of a Null point takes this task, which at first seems difficult, and makes it very simple to accomplish. There are many other good uses for Null points we'll be exploring in the future. 

Upcoming Issues:

Some of the topics in store include: Checking alignment integrity, Non-triangulating components, Finding unused Cogo point numbers, Styles: From End Condition targets to Point Control options to Constraints.

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End Conditions
Display Rules
Parametric
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Null Points
Clipping Options

The list goes
on and on!