AutoCAD Civil 3D: Tips, Tricks and Unnatural Acts

Jerry Bartels – Sr. Infrastructure Technical Specialist, Autodesk, Inc.
Jeff Bartels – Sr. Infrastructure Technical Specialist, Autodesk, Inc.
Alan Gilbert – Sr. Infrastructure Technical Specialist, Autodesk, Inc.

Learning Objectives

- Learn how to automate several tasks
- Learn how to make more use of underutilized features
- Learn how to use several standard functions in new ways
  Discover several useful undocumented commands

Description

This session is dedicated entirely to productivity techniques that will help improve your daily operations when working with AutoCAD Civil 3D software. These tips include automating regular tasks, using standard functions in new ways, exploring underutilized features, and even exploiting a handful of undocumented commands. We'll present the information using a real-world problem-solving context, rather than simply going feature by feature, so you can fully appreciate the "why" in addition to the "how." Come join us for this 90-minute session as we show you numerous ways to help you get the most from your AutoCAD Civil 3D investment.

About the speakers

Jerry.Bartels@autodesk.com
For more than 25 years, Jerry has worked in all areas of civil engineering, surveying, and mapping. At Autodesk, Jerry specializes in civil infrastructure solutions and currently provides presales, training, and support services throughout the country. He has received several awards from Autodesk for his presentations.

Jeff.Bartels@autodesk.com
For 20 years Jeff has worked in the civil engineering industry. He was one of the early adopters of Civil 3D, migrating his frim to a BIM workflow in 2008. As a member of Autodesk's Infrastructure Technical Specialist Team, Jeff provides training and support for many of Autodesk's civil infrastructure applications. Since 2008, he has published more than 25 titles on AutoCAD and Civil 3D.

Alan.Gilbert@autodesk.com
Alan is an Autodesk Technical Specialist supporting the efforts of the AEC sales team. This coverage includes everything from small engineering firms up to large government customers such as departments of transportation. He is registered as a Professional Engineer and Professional Land Surveyor in the state of Alabama.

Jerry, Jeff and Alan are also authors on an Autodesk Infrastructure Industry Blog where they post weekly Tips, Tricks and Workflows. http://civilimmersion.typepad.com/

Tool for Tuesday: GeographicLocation

You can get there from here!!

Have you ever wanted to find a location in your model using a property address? I know I have. For example, I'm going to start working on a project and I have its address. I also have access to tons of aerial imagery within Civil 3D that I would love to start reviewing for my project site and its surrounding area. The problem is that Civil 3D works off of coordinates and not addresses. I can set the correct coordinate projection but have found it hard to quickly locate my proposed project site.

So what do I do…. I go to Google Earth and find the site by address. From there, I review the imagery but I can't really start doing too much because that work needs to be done in Civil 3D. So I look for ways to jump from one environment to the other. (And I have seen some pretty creative workflows over the years. :))

If only an interface existed in Civil 3D where we could find a location based on a simple property address.

The exciting news is that the interface we need already exists in Civil 3D!!! We just need to exploit AutoCAD's "GeographicLocation" tool.

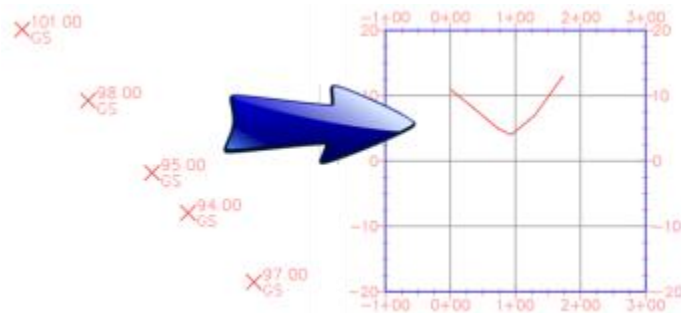🌐 ⁔ GEOGRAPHICLOCATION Set location from [Map File]<Map>:

 Check out the video below to see how it works.

https://www.youtube.com/watch?v=uzA9lOH2PmM

-Jerry

Tool for Tuesday: Draw3DEntityProfile

Ok, today's tool is really more of a "feature of a workflow" than it is an official tool. :)

Having said this, it helps us do a really cool thing. Create a section style view from Point Objects!!

Some background…

For years, field crews have collected points in a linear fashion to represent cross sections of swales, ditches, roads… Having said this, once the points were brought into Civil 3D, we see only points. If we wanted to see a cross sectional representation of even a single row of points, we needed to create a surface, alignment, profile view…. In short, I for one was always looking for an easier way to quickly visualize my point information.

Today is that day!!

There is a little known option of the Feature Line Elevation Editor that will do exactly what we want. (Create a section type view without having to build a Surface)

You simply connect the points together that represent your section using a 3D polyline, convert that polyline into a Feature line and display a Quick Profile of the Feature Line using the Draw3DEntityProfile option of the Feature Line Elevation Editor dialog box. (Takes longer to read than do!! :))
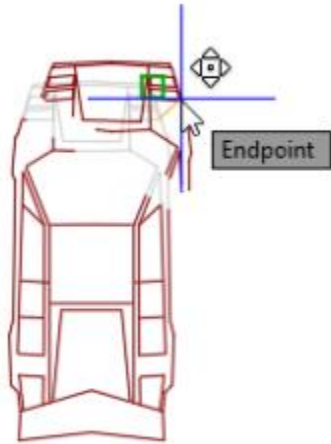
Check out the video below to see how it works.

https://www.youtube.com/watch?v=U9jmJtfDLSE
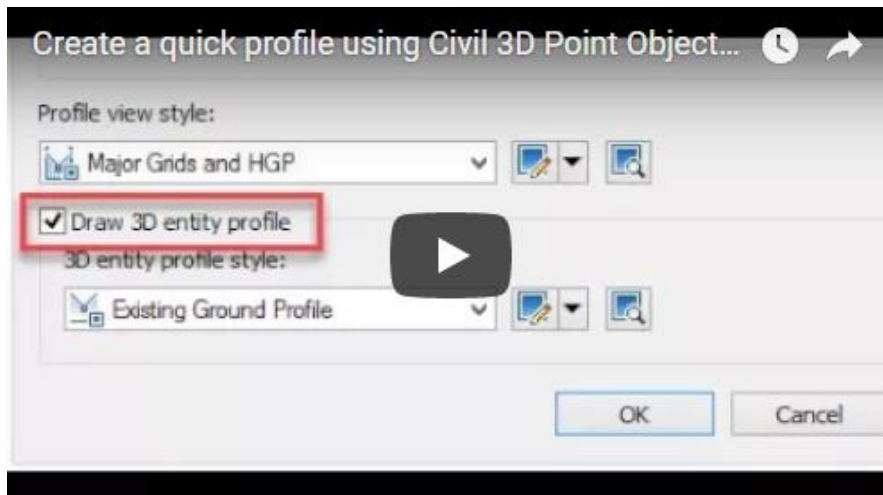
-Jerry

Tool for Tuesday: LineworkTrim & LineworkDivide

Today is a special day! Not only do we have two tools for Tuesday but they are undocumented commands. (At least as it relates to Civil 3D :))

Being equipped with these tools extends your abilities when it comes to working with AutoCAD Blocks.

Let me set the stage…

From the beginning of time, there are just some things you cannot do with AutoCAD Blocks. For example Trim. If you try and Trim a Block, it is simply ignored.

Additionally, you cannot break a Block into two pieces. (Sure you can explode them but then the entire Block returns to numerous native AutoCAD entities)

You might be thinking, where would this be helpful? I thought the same thing too because I had never really considered the possibilities. Working with Blocks in this way was never really something I had ever thought about because it violated my understanding of all that is good in the AutoCAD universe. :)

In short, these tools can be helpful in a number of situations from creating exhibits, creating details or even creating a Model Space representation of a Paperspace viewport. As my mind slowly expands to accept this new reality, I'm finding more uses for them every day.

 Check out the video below to see how they work.

https://www.youtube.com/watch?v=b2L7CHYl51k
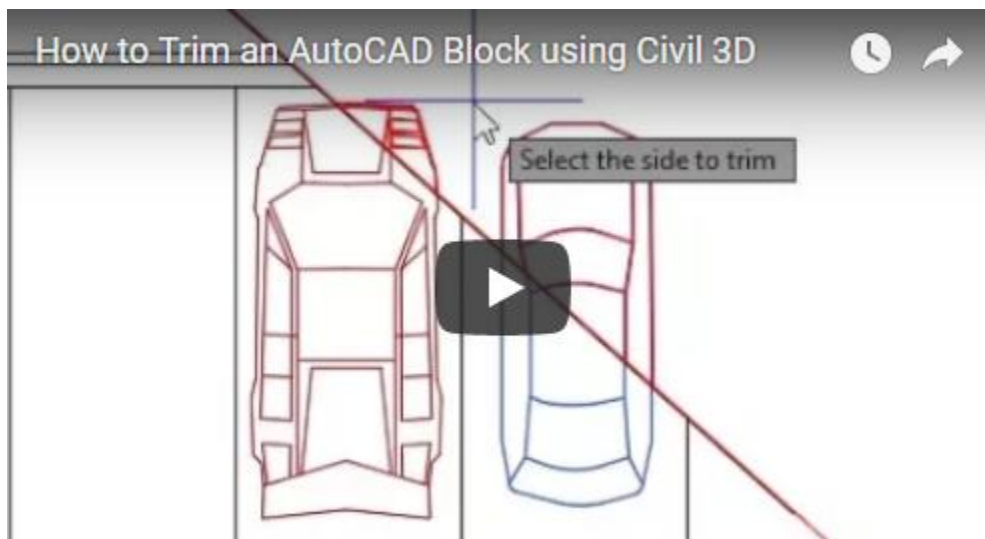
-Jerry

Tool for Tuesday: AECCREPORTPOINTPROX

Today's tool is all about QA/QC as it relates to our Civil 3D Point Objects.

In short, having duplicate Points or Points in very close proximity to each other can indicate a problem especially when the Points represent existing conditions.

Maybe the same object was collected from different setups and their elevations vary more than an acceptable amount. Maybe Points were inadvertently inserted multiple times into the same model. Maybe the redundant information is causing issues with Surface triangulation...

There are many reasons why duplicate (or nearly duplicate) Points should be identified and evaluated.

Unfortunately, until recently, there was not an easy way for us to identify these Points.

In Civil 3D 2016 there was a Transportation Extension module that was released mid-year. This module contained an AECCREPORTPOINTPROX tool designed specifically to evaluate our Points and generate a report of any Points that fell within our user defined proximity tolerance. This report could then be used to go back and evaluate the affected Points and determine if any resolution was required.

Very cool!!

I know what you are thinking... Where do I get my hands on this Transportation Extension so I can try it out. In short, if you have Civil 3D 2018, you already have it!! The Transportation Extension tools have been rolled into the "out of the box" Civil 3D installation.

Check out the video below to see where to find it and how it works.

https://www.youtube.com/watch?v=S8CCcuiP5rQ

-Jerry

Tool for Tuesday: Delete Duplicate Points

It's like Ketchup, more isn't better. :)

Today's installment definitely falls into the "strategy" container.

I created this one because I am often asked for ways to deal with duplicate Points. In last week's Blog Post we looked at a tool that can identify and list duplicate Point objects in a report. (AECCREPORTPOINTPROX)

The challenge remains that the user is left with a report which still requires them to address each duplicate Point situation manually. (At the end of the day, this is truly the best and safest way!!)

Having said this, what if we already know what caused the problem? For example, someone inadvertently inserted the same Points into our model multiple times. In this instance, manually deleting all of the duplicates can be tedious and time consuming.

Because this is a common issue that folks are faced with, numerous strategies exist on how best to resolve it.

So today, I created a video that walks through what I do.

Note: It requires both Civil 3D and some simple Excel.

As I go through the workflow, I try and do it in a logical order from a complete removal and replacements of the Points, to a more surgical approach to the point removal, to a non-destructive approach where the duplicate Points are simply hidden.

Check out the video below to see how it works.

https://www.youtube.com/watch?v=E9MbWs6eoVI
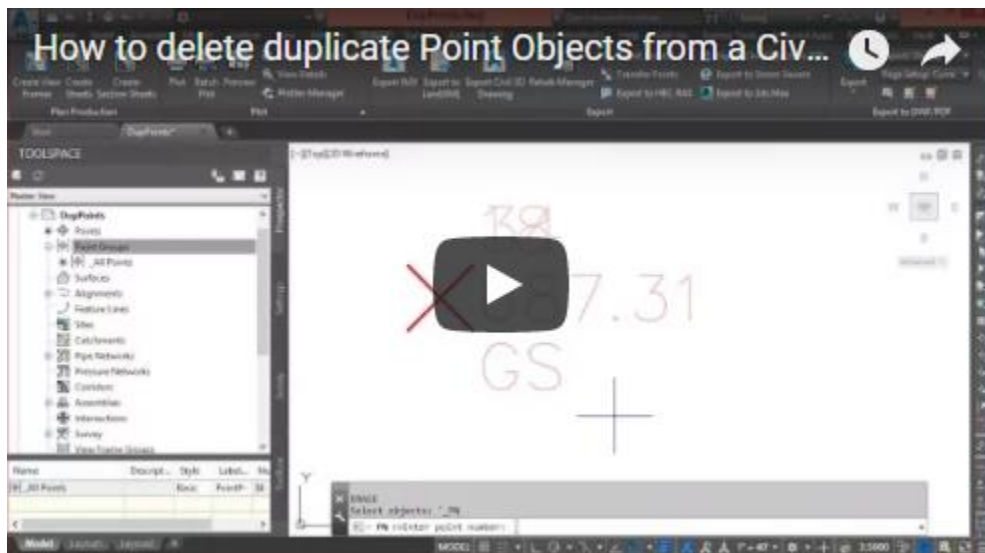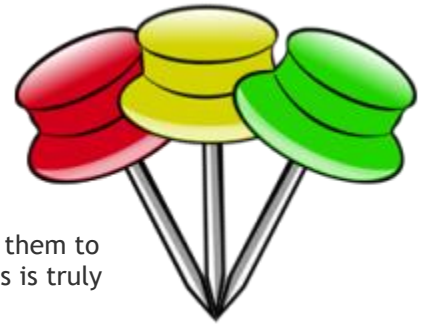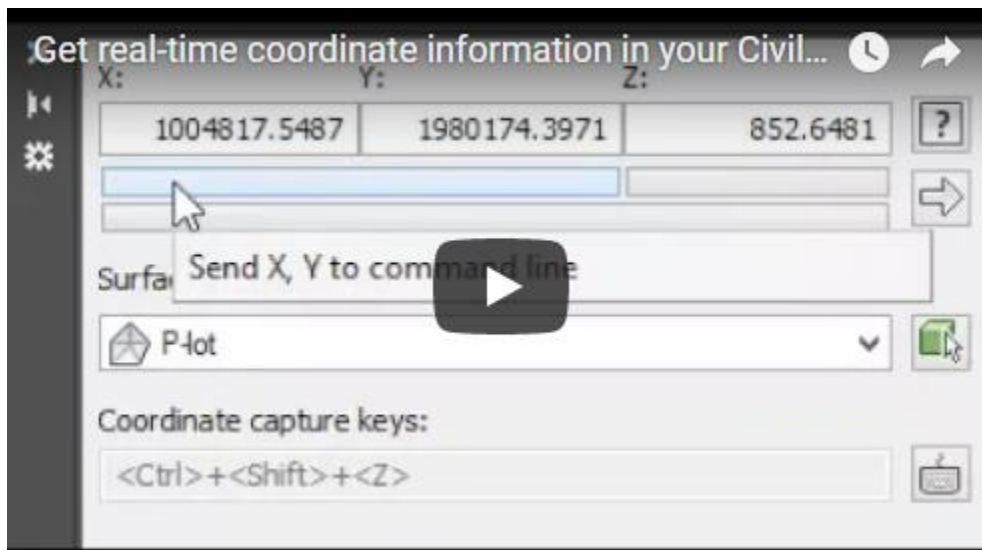
-Jerry

Tool for Tuesday: ShowCT

Today's tool is all about tracking your coordinate position in real-time.

For those folks that have used Autodesk software for a number of years, you may remember a coordinate tracking utility in Land Desktop. Essentially, it was a tool that would display the X,Y,Z position of your crosshairs in real-time as you moved around the screen. The Z elevation came from the current surface. (Remember when we used to have to assign which surface was current? :))

Whether you remember the old tool or not, this functionality is also available in Civil 3D including some improvements!

Not only can we track coordinates in real-time, but we can also capture them, edit them and pass them on to be used in future commands.

Check out the video below to see how the ShowCT tool works.

https://www.youtube.com/watch?v=HFZ5JHWbB2c

-Jerry

Finish Strong Friday: "The Disappearing Curb" - Using Offset Assemblies for Perpendicularity

For this week's post, I decided to pull out a crowd favorite from my previous blog and share on Civil Immersion.

The problem is simple: how can I model a curb and gutter shape around a curb return that maintains perpendicular to the return instead of the baseline horizontal alignment. The answers are many: intersection wizard, manually building your own "intersection wizard-like" regions, multiple corridors, or grading objects. I'm sure there are more, but you get the point. Offset Assemblies give us an additional option and allow us to model a simple intersection in a single corridor region. You need an alignment to control the horizontal of the Offset Assembly object-which isn't a problem since you will generally have the curb return geometry. The trick is controlling the vertical position of the Offset Assembly...

Check out the video below to see this workflow in action.
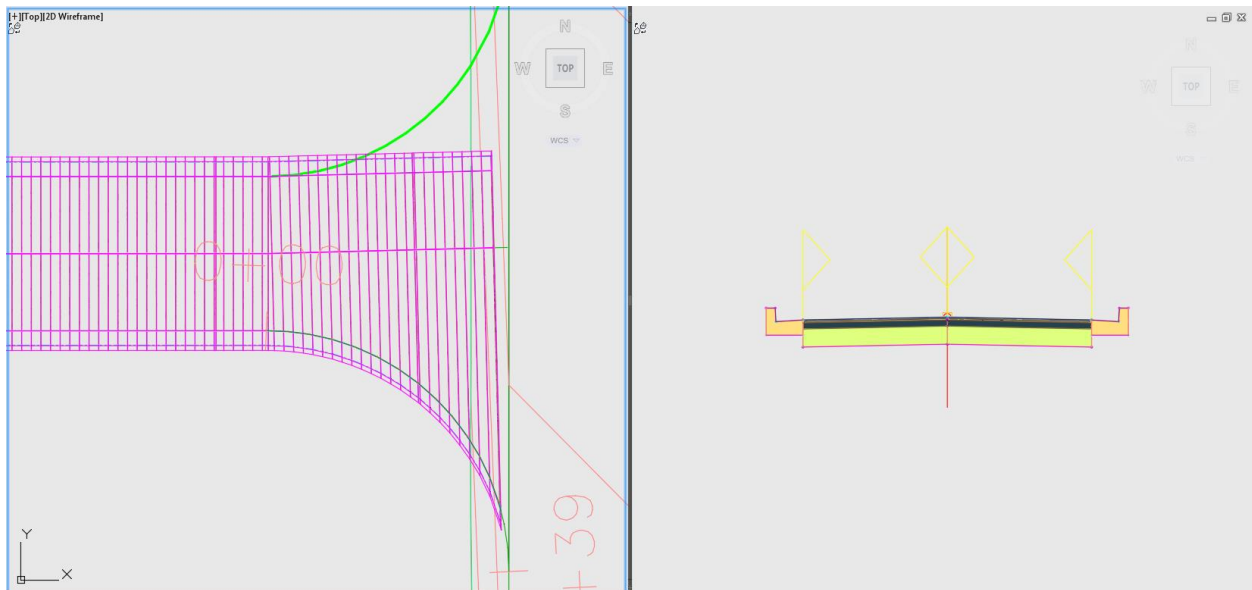
-Alan

Finish Strong Friday: Finding Last Surface Intersection with Subassembly Composer

I was recently asked how one could create a subassembly that would automatically find the last possible intersecting point on a particular surface target along a given slope. The use case was shoring slopes and computing resulting quantities on things like earthen channels and mines. Thanks to Auxiliary Points in Subassembly Composer (which I call ghost points), we can accomplish this without too much trouble.

Check out the video below to see this technique in action.

https://www.youtube.com/watch?v=hUqrQhkHD5g&t=2s
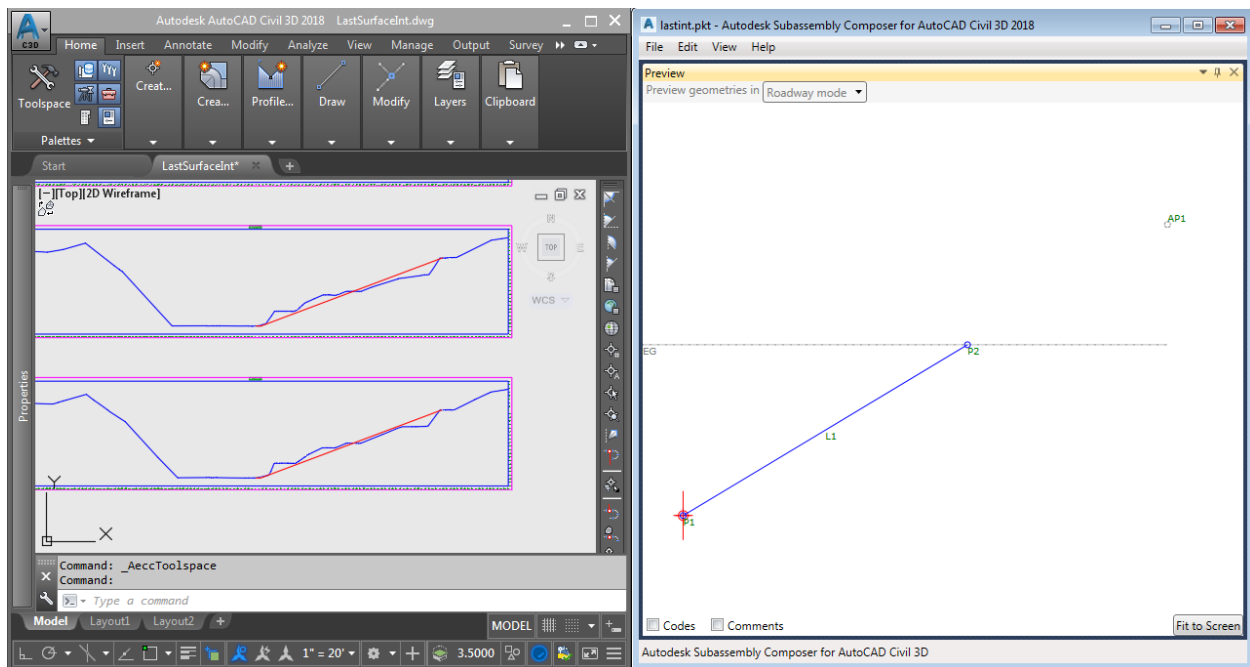
-Alan

Finish Strong Friday: Using Traverse Editor/Adjustment Tools on Connecting Traverse

We've seen several iterations of a traverse editor over the last several years starting back with the Cogo Editor. I'm confident that the product team will continue to expand the Traverse Editor and Traverse Adjustment tools over time, but I doubt you'll see any more major interface overhauls any time soon as the current platform has been solid.

Today, I wanted to show a workflow using these tools to analyze a closed-connecting traverse. Thanks to the updated Traverse Adjustment functionality, we can run closure checks and angular balancing on these types of traverses (in addition to classical loop traverses).

Check out the video below to see this workflow in action.

https://www.youtube.com/watch?v=XrF29Zqeryo

-Alan

Finish Strong Friday: Using "Mapcheck" for Record Survey and Plat Analysis

Civil 3D gives us several methods for analyzing and adjusting survey, parcel, and plat data. There are times however, when our record/plat data isn't as clean as we would like or we would like to analyze several possible property boundary scenarios without creating lots of parcels and polygons. In these cases, the Mapcheck tool in Civil 3D may be just what you need.
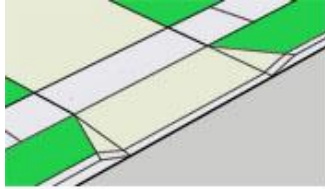
Check out the video below to see some workflows where the Mapcheck command could come in handy.

https://www.youtube.com/watch?v=Zq3UY7eN2YI&t=6s
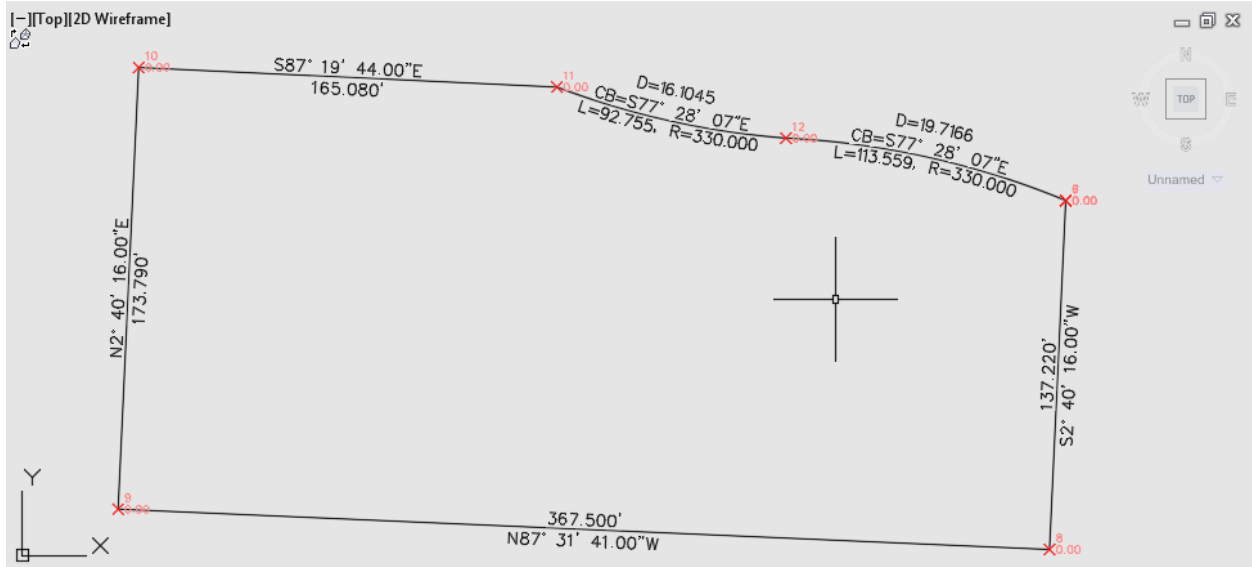
-Alan

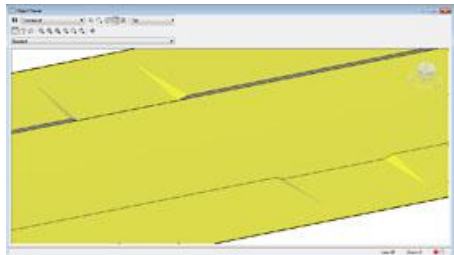# Adding Driveways to a Civil 3D Corridor using Minimal Targeting

If you've modeled driveways in the past, you may have found them to be one of the more challenging things to add to a Civil 3D corridor model. In today's installment, I'm going to show you a way to add driveways using a simple pair of targets.

The workflow revolves around a custom part that I created using Subassembly Composer. If you'd like to experiment with *(or reverse engineer)* this part, it can be downloaded here - **http://autode.sk/2zoVhkR**
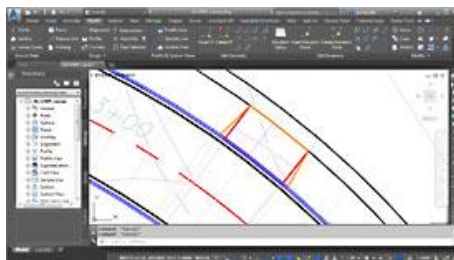
To present the workflow, I've recorded a "triple feature" that walks through everything. If you are interested, I've provided hyperlinks below to all three sessions.
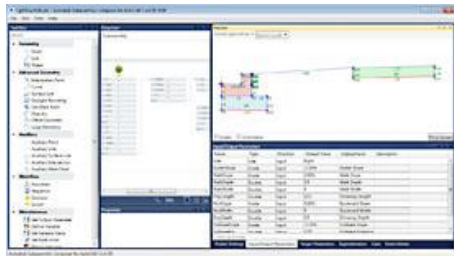
Part 1 – "Exploring the Custom Driveway Subassembly"
https://youtu.be/fDjeI69UX94

Part 2 – "Adding Driveways to a Civil 3D Corridor Model"
https://youtu.be/Op3N6X7-rC8

Part 3 – "Modeling Driveways Along Corridor Curves"
https://youtu.be/RbBE5ba0a6U

Let me say up front that this workflow isn't intended to be the "end all" way to create driveways, that being said, I do think it can be used to model many of them. In addition, I'm hoping what I show here may give you some new ideas, allowing you to take this concept even further on your own.

-Jeff