Complex Corridor - Targeting Conditional Solutions and Linking Your Design

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We will explore the under-utilized, not so well known and very powerful Subassemblies included with AutoCAD Civil 3D 2016.

First we must understand there is nothing generic about Generic Subassemblies

Next we will consider multiple scenarios; if the design is to be complete, then we provide some Conditions for success; using Horizontal and Vertical Conditional Subassemblies to create complex corridors while limiting the amount of overall assemblies and providing a better design.
At the end of this class, you will be able to:

- Use Generic Subassemblies to extract, apply, and modify design information to our corridor.

- Apply the correct Conditional Subassemblies to enhance and expedite the design process.

- Create Assembly using Links and Conditional Subassembly Components.

- Construct a Corridor and assign necessary targets, using the Assemblies created.
Introductions

Sean Hulbert, PE – Autodesk
- Sean Hulbert is a Registered Professional Engineer in the State of Oregon, and is a Technical Support Specialist at Autodesk (supporting AutoCAD Civil 3D and Autodesk InfraWorks 360). Prior to working at Autodesk, Sean worked in the civil engineering industry for almost 25 years. Sean was always a key advocate for technological advancement at the consulting firms where he was employed. Introducing concepts and work flows for laser scanning and multi-dimensional modeling. By leveraging software already owned, Sean spearheaded the corporation’s evolution into a multi-platform design environment. He was responsible for CADD and BIM education, as well as creating and modifying policies and procedures to keep up with ever changing technology. Using his knowledge and practical hands-on experience Sean was able to successfully introduce new technology and ideas to an existing environment creating a desire to use BIM concepts and workflows on transportation projects. Sean also presented at Autodesk University in 2011 and 2012.

Wendy Lim – Autodesk
- Wendy is an Autodesk Technical Support Senior Specialist in Kuala Lumpur, Singapore. Wendy has worked for Autodesk since January of 2012 and working as a Civil Engineer since 2002, specializing in Autodesk product, primarily Civil 3D and InfraWorks 360. She has worked on projects mostly entailing designs of infrastructure comprising drainage, water supply, flood mapping, residential grading and roadways in Malaysia, UAE and Qatar. Wendy is also a veteran presenter at Autodesk University; AU2015 Class – CI9963-L Compose Like Beethoven: Subassembly Composer, Simple to Complex.

Rick Ellis – CADapult Software Solutions, Inc.
- Rick Ellis is the President of CADapult Software Solutions, Inc., where he provides training and consulting services to clients around the country, helping them get the most out of their design software investment. Rick specializes in AutoCAD® Civil 3D®, AutoCAD® Map 3D, Autodesk® InfraWorks™, AutoCAD® Raster Design, and AutoCAD®. He is a member of the Autodesk Developer Network, and author of several critically acclaimed books on AutoCAD Civil 3D, and AutoCAD Map 3D; including the Practical Guide series. Rick continues to use AutoCAD Civil 3D on projects in a production environment, in addition to teaching classes to organizations both large and small around the country. This practical background and approach has made him a sought after instructor by organizations around the world. Rick is also a veteran presenter at Autodesk University; GEN10909-L - A Practical Guide to Parametric Drawing in AutoCAD, CI10904-L - A Practical Guide to GIS in AutoCAD Civil 3D, ITI10907 - Managing AutoCAD Civil 3D from the Ground Up and IT10908 - Drawing from Experience: Tell All of 4 CAD Managers with Over 100 Years of Experience – rick@cadapult.com

Ron Couillard – CADSoft Consulting
- Ron is an Infrastructure Solutions Engineer at CADsoft Consulting, in the Phoenix Arizona area and has over 15 years experience using Civil Engineering software.
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Expectations and Background

Dataset
- You will need to locate the Dataset for this class and extracted the necessary files to your machine.
- We are using a real topographic survey. Thank you!
  Washington County, Oregon
  Project Manager Tony Roos, PE
  Project Engineer Fred Wismer, PE.
- I have removed all customization from the file. We are also using the template shipped with AutoCAD Civil 3D 2016, _autocad civil 3d (imperial) ncs.dwt. All of the Subassemblies used are Out of the Box with AutoCAD Civil 3D 2016. The exception to this statement would be minor modifications that were made to the Corridor Code Set Styles and Label Styles.
- It is also important to remember, like many of the processes within AutoCAD and AutoCAD Civil 3D, there are multiple ways to achieve the same results. Due to time constraints, this lab is considering basic design concepts; however these approaches can be used in very complex environments.

Intermediate Level
- A basic understanding of AutoCAD Civil 3D, the Corridor Objects and the components used in their creation is required to get the most out of this lab.
Subassembly Properties and Help

- The Subassembly Properties dialog box will give you access to the design parameters for each Subassembly.
- The Subassembly Help Menus will direct you when the parameter is unclear.

LaneSuperelevationAOR

This subassembly creates a cross-sectional representation of a travel lane, applying the Outside or Inside Lane superelevation slope value for the corridor model’s baseline alignment.

It is used for most undivided roads, or divided roads with no lane slope break on either side. It may also be used for the outside or inside lanes of divided crowned or broken-back highways. The pavement structure follows the standards described in “Pavement Structure on Paved Sections” in the AutoCAD Civil 3D Help.

Crowned, undivided road (left and right insertions shown)

Uncrowned, divided road (only right insertion shown)
Getting to Know Your Subassemblies

Generic Subassemblies
There is nothing generic about information that can be extracted from your model by using Generic Subassemblies.

- Links to Surface, Offset, Elevation, etc.
  We will focus on these tools.

- Marked Point, LinkToMarkedPoint, etc.
  Not a focus of this lab.
Getting to Know Your Subassemblies

Conditional Subassemblies
Conditional subassemblies work in a similar to a basic If / Then flow control statement. *If* the following condition is found *then* follow this path, if not, then follow another path. It is import to know that the Conditional Subassemblies only ask the question, they have no other impact to your design.

- **Conditional Cut / Fill Subassembly**
  The Conditional Cut / Fill Subassembly will apply additional Subassemblies based on depth of the cut or fill condition.

- **Conditional Horizontal Subassembly**
  The Horizontal Subassembly will continue to follow Path ‘A’ if the condition if true, otherwise it will follow Path ‘B’. Both Conditional Subassemblies can be stacked to create a very complex design condition.
AutoCAD Civil 3D 2016
Exercise 1
AutoCAD Civil 3D 2016
Exercise 2
AutoCAD Civil 3D 2016
Exercise 3
AutoCAD Civil 3D 2016
Exercise 4
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