



# Enhancing Field Execution in Bridge Construction Using Revit, Civil 3D and Inventor

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**CI1435-R** This class uses a case study of the Saline Creek Bridge in Fort McMurray, Alberta, to demonstrate methods of using Autodesk Revit, Civil 3D, and Inventor software to create digital prototypes of bridge infrastructure projects to enable efficient and accurate construction of complex elements. We explore the workflow used for passing model information between Revit, Civil 3D, and Inventor, as well as methods of integrating survey and layout.

## Learning Objectives

At the end of this class, you will be able to:

- Pass model elements back and forth between Revit, Civil 3D, and Inventor
- Use complex model geometry to create layout points for a robotic total station
- Use Revit component tools to create complex geometry
- Use Revit and Inventor building elements in Civil 3D for excavation planning and quantities

## About the Speaker

*Drew Teal is a Professional Engineer working in Edmonton, Alberta with PCL Construction Management. For the past 6 years Drew has worked with field crews to implement Building Information Modeling tools and workflows to address specific constructability challenges and enhance field execution and efficiency. Drew earned his bachelor's degree in Civil Engineering at the University of Alberta and is a Revit Certified Professional and a LEED Accredited Professional. As Construction Modeling Manager for the Edmonton District. Drew works to develop and implement BIM enabled workflows through the process of Virtual Construction. PCL Edmonton's modeling team develops virtual prototypes of our projects using Autodesk Revit, Civil 3D and Inventor to aid project teams in scope review, surveying, quantity take off, constructability analysis, value engineering, 4D scheduling, progress tracking and quality assurance.*

## **Learning Objectives**

### **Pass Information Back and Forth Between Revit, Civil 3D and Inventor**

#### **Benefit to Field Execution**

Revit, Civil 3D and Inventor all have different strengths in determining accurate geometry for various aspects of the project. By passing information back and forth between them you can capitalize on the strengths of each program to provide the field with accurate reference geometry.

#### ***Project Chronicle Videos***

AU 2013 - CI1435-R - Transferring Model Elements

### **Use Complex model geometry to create layout points for a Robotic Total Station**

#### **Benefit to Field Execution**

Complex model geometry can clearly define the final product of construction execution. By creating the digital model of the final product and using the Robotic Total Station to reference that digital geometry in the field you can improve efficiency and accuracy of layout and installation.

#### ***Project Chronicle Videos***

AU 2013 - CI1435-R – Creating 3D Layout Points

### **Use Revit Component tools to create complex geometry**

#### **Benefit to Field Execution**

Revit components were used to create most of the complex geometric elements in the models for the Saline Creek Bridge project. The advantage of this approach is that all complex elements worked very well in the Revit environment. The disadvantage was that in some cases Inventor would have been a better tool to create the geometry and then import it into Revit. The videos below will illustrate this lesson learned and why it is sometimes advantageous to work with the Revit component tools and sometimes better to work in Inventor and pass the model geometry to Revit.

#### ***Project Chronicle Videos***

AU 2013 - CI1435-R - Creating Complex Geometry Using Revit Component Tools

## Use Revit and Inventor building elements in Civil 3D for excavation planning and quantities

### Benefit to Field Execution

When structural geometry is complex it can create significant challenges for excavation planning. This is particularly true when different segments of the same excavation must be separated for budgeting or tracking purposes. By bringing complex reference geometry from Inventor or Revit into Civil 3D, feature lines can be created using 3D snaps that can form the basis for grading surfaces, allowing complex excavations to be precisely planned and quantified.

### *Project Chronicle Videos*

AU 2013 - CI1435-R – Excavation with Revit, Inventor and Civil 3D

## Apps for Viewing Example Files

### Autodesk Apps

#### *Autodesk Inventor Publisher Viewer*



#### *Autodesk BIM 360 Glue*



**Saline Creek AU Presentation Files**

<http://sdrv.ms/1b7jYdX>

