Allies at Last: Getting Architects and Engineers on the Same Coordinate Page

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About the speakers

Nick Sipes

Nick Sipes has over a decade working in the design and construction industry. For seven years, he worked for a major global architecture firm in their interior design group where he specialized in corporate offices and government facilities. Following his efforts there, he transitioned to a small Maryland architecture firm where he became their BIM champion by working to migrate them from AutoCAD to Revit.

For the last 3 1/2 years Nick has been an Applications Specialist at CADD Microsystems focusing on BIM related workflows using Revit, Dynamo and BIM 360. He has presented at several Revit User Groups on the East Coast and the Director of the BIMxt Network, a live online grouping discussing all things BIM in the industry.
About the speakers

Marissa Gagné

Marissa is the Practice Manager for Civil and Infrastructure at CADD Microsystems. Marissa graduated from Virginia Tech with Bachelor’s and Master’s degrees in Civil Engineering. She has been working with Autodesk products for over 25 years, specializing in the Civil and GIS solutions. She has worked for a number of reputable civil firms in Virginia providing CAD support to transportation, utility, land development, mapping, and GIS projects. At CADD Microsystems, Marissa’s responsibilities include managing the Civil Team, performing product demonstrations, teaching classes, giving seminars and workshops, and performing consulting for many Autodesk products such as Civil 3D, Land Desktop, Map 3D and Raster Design.
Learning Objectives

• Learn how to establish shared coordinates between Revit and Civil 3D

• Learn how to incorporate Revit building model data in Civil 3D

• Learn how to share a Surface model from Civil 3D with Revit using BIM360

• Learn how to assemble design-model data into an immersive InfraWorks model
Prerequisites
Software Overview

Navisworks NWC Export Utility

Need Access to BIM 360 Document Management module and Desktop Connector
Process Overview

STEP 1: ACCEPTANCE
Everyone meets and agrees on the 2 coordinates systems (real world and project world).

STEP 2: INITIAL HANDOFF
Locate Points in Revit and provide building shell to Civil.

STEP 3: ESTABLISHING COORDINATES
Sets the real-world coordinate system that everyone will follow and locate the building in the coordinate system.

STEP 4: REVIT LEARNS COORDINATES
Revit gathers real-world coordinate system.

STEP 5: SYNCHRONIZING THE DESIGN MODELS
Share the Building model to Civil, Share the topo with the Architect

STEP 6: VISUALIZE IN INFRAWORKS
Seeing the Big Picture
Acceptance
Acceptance

THE WORLD REVOLVES AROUND THE BUILDING
Civil Engineers, building drawings are rotated so that they fit nicely on a sheet of paper. Normally with the entrance at the top or bottom of the page.

THE WORLD IS ROUND
Architects, the world is round and does not revolve around your building. You need to learn how to play with others outside of your building.

WE USE FLAT GRIDS TO LOCATE OBJECTS
Buildings are located on defined grids that
State Planes

- The country is broken up into flat grids. In the US they are called State Planes.

- Each plane has a defined origin that can be used to locate any object in the real world.

Source: noaa.gov
Revit Lives in 2 Worlds

• Revit models live in 3 coordinate systems.
  o Internal Coordinates
    ▪ Internal Mathematical coordinate system Revit uses to locate all objects in the computer model. It is best practice to leave the Project Coordinates aligned to this coordinate system.
  o Project Coordinates
    ▪ Locates the elements relative to the building model. Allows for Project North to be different from True North
  o Shared Coordinates
    ▪ Locates the building within the real-world.
    ▪ This system is sometimes referred to as Survey Coordinates, GIS Coordinates, Grid Coordinates, State planes.

• Revit has 3 “Origins”
  o Internal Origin – Origin of Internal Coordinates (actual 0,0,0)
  o Project Base Point – Origin of Project Coordinates
  o Survey Point – not an origin.
Demonstration
Summary
Process Summary

STEP 1: ACCEPTANCE
Let’s agree to disagree.

STEP 2: INITIAL HANDOFF
Can you please tell me where my building lives?

STEP 3: ESTABLISHING COORDINATES
There’s no place like home. There’s no place like home. There’s no place like home.

STEP 4: REVIT LEARNS COORDINATES
Revit can play in the sandbox (Real-world) with everyone else

STEP 5: SYNCHRONIZING THE DESIGN MODELS
Let’s all share the love

STEP 6: VISUALIZE IN INFRAWORKS
Seeing the Big Picture
Please recommend our class.