

Stairs & Rails in Autodesk Revit: A Practical Primer

Robert Manna - Stantec

AB4881-V

This class will introduce Autodesk Revit software users to the new "stair by component" tool included in Revit 2013. We will review the basic components, how the stairs are assembled, how to edit and modify the stairs, and how to create a new stair. We will also examine some stair conditions that can be more easily addressed with the new tool. We will also take a close look at some of the key railing enhancements in 2013 and how to use and apply them.

Learning Objectives

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

- Understand the components of the stair.
- Model a stair that overlaps itself.
- Modify a stair and create more complex conditions.
- Apply the new railing enhancements to greatly improve your railings.

About the Speaker

Robert works for Stantec in the Boston office, he has been a key team member on multiple projects, most recently the Project Architect for a clinic. He now serves as the BIM R&D leader for the firm as well as providing consulting services for clients implementing BIM. Internally he has taught and helped develop the curriculum for training users, he provides high level support as well as planning and implementation of new tools. He has spoken at RTC North America, has been a guest lecturer at the BAC, and has presented at BIM events hosted by the AIA, ACEC, Autodesk and resellers. He has written two articles about Revit for the AUGI AEC Edge magazine, and has written assessment questions for KnowledgeSmart. He maintains a personal blog dedicated to Revit & BIM. When he has time he hangs out with his wife and two year old daughter, and enjoys hitting the ski slopes, swimming pool and bike trails. When he doesn't have time he is busy working on their new house, 100% designed in Revit!

robert.manna@stantec.com

Introduction

The primary purpose of this course is to give you an introduction to the changes brought by Revit 2013 to the Stair and Railing tools. With Revit 2013 there is now more control and flexibility in regards to the geometry of both types of elements as well as more options for documenting and the ability to customize a number of parts and pieces to your specific needs. This class focuses on the new features and functionality, for information on previously existing features and functionality, please see other AU courses or Autodesk's documentation. Most critically throughout the videos we will highlight several bugs that have been identified in the current build of Revit 2013 and that are important to be aware of.

The speaker would also like to acknowledge the collaborative work previously done with Krista Manna (Nelson) and David Light (Case) that helped with the development of this course content.

Component Based Stairs

The biggest change with stairs is the addition of the "Stairs by Component" tool. The previous stair tool is not renamed to be "Stair by Sketch", so the "old" tool is still present. Both tools can be used, based on what makes the most sense. The component based stair allows you to "model" the stair by generating components such as runs and landings. Runs are defined using a "location line" similar to the way walls are created. Landings are automatically generated as runs are created, however both runs and landings include geometry shape handles that can be used to manipulate the 3D objects in real-time. It should also be noted that the stair geometry can all be previewed live as edits are made, without having to exit editing mode. Runs and landings can also be "dissolved" into sketch based elements which allows for significantly more freedom in shape and size.

Railing Enhancements

Unlike stairs, there is not a "new" railing tool, nor are there any significant changes to the underlying rail tool structure. However the rail tool does feature several key enhancements that make it far easier to model a more accurate handrail and guardrail, which is typically of greatest concern from a documentation and design perspective. The new rails features adopt a similar paradigm to the Curtain Wall tool, where a number of properties can be "type drive" however many of them can be overridden at the instance level to allow customization of the handrail or guardrail to meet specific context sensitive conditions.

Video Modules

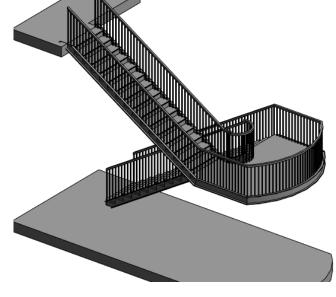
The majority of the Revit content used in the videos is default out of the box content that comes with Revit 2013. For the railing demonstration a custom support family was also created. A dataset that matches the videos can be downloaded from the AU website.

Video One: Introduction to Component Stairs

This module introduces the new Stair by Component tool. The first portion covers the basics of all the components that make up a stair object and how they fit into Revit's hierarchy. In the second portion of the video a pre-created stair is edited to introduce the basic concepts of how the components interact and some of the critical properties.

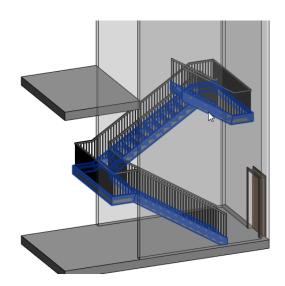
Key points for module one:

- The family components that make up a stair.
- Instance based properties allow for contextual customization.
- There are two types of shape handles for controlling runs, and it is important to know the difference.
- Converting a component object to a sketch-based object is a "one-way" operation.



Video Two: Creating a Stair from Scratch

This module starts by creating a new stair from scratch in a given context. The context of the stair creation is originally based on an actual project (but greatly simplified). The stair includes three runs which illustrates one of the new capabilities with the stair tool; overlapping runs and landings. An important point to note, the default width of a run is driven by the minimum width property. If you need to "go back" in size when creating a new run, you must start the run tool then use the Properties Palette's combo box to access the run properties. You can of course always create a run, and then resize it too.



Key points for module two:

- How a stair is created from scratch.
- How the location line works (and its current drawback)
- The ability to set a rule for minimum stair width.
- How easily components can be selected and manipulated.

Video Three: Fine Tuning a Stair

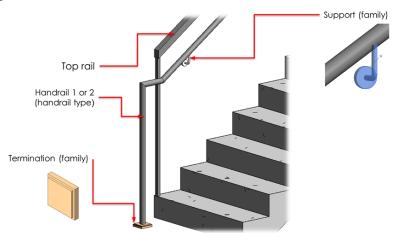
This module takes the stair created in module and two and refines it. In particular some adjustments are needed to the runs and the number of treads. In the Stair by Sketch tool this would have been a relatively simple exercise of just adjusting the sketch lines. With the new stair by component tool making adjustments must be considered from a "modeling" point of view, where the "physical" nature of the model must be considered, rather than simply thinking in plan. Lastly some "flare" is added is added at the end, re-enforcing the relationship between stair by component and sketch based objects.

Key points for module three:

- How to adjust a stair with more than two runs.
- When to convert objects to sketch based.
- The need to pay attention to the instance properties of each unique component.
- Multiple editing modes.

Video Four: Introduction to Railing Improvements

This module introduces the enhancements made in Revit 2013 to the Railing tool. The first portion of the module reviews what is new, then the impact to the railing topology and how the new families fit in with what already existed in Revit. The second portion of the module demonstrates how to set-up a basic wall mounted handrail, similar to what is often encountered when designing buildings.



Key points for module four:

- New railing related families introduced.
- The basic system topology.
- How to quickly add a continuous rail object (specifically a handrail).
- Two bugs that are currently present in the railing enhancements.
- The need to pay attention to the instance properties of each unique component.

Video Five: Fine Tuning the Handrail

This module specifically focuses on demonstrating some of the key properties of the handrail family and how they can be used to quickly develop a model that represents real-world conditions. This includes locating the handrail relative to its host and controlling the supports, as well as the properties that control the rail transitions. All of the properties examined in this module are type based.

Key points for module five:

- Type level control of handrails.
- Railing location control.
- Railing support control
- A regeneration bug related to support families.

Video Six: Editing Transitions

This module examines the flexibility the new continuous rail features allow in editing the transitions of the rail. There are numerous instance based options that allow the handrail to be customized to meet various design goals. The approach to instance versus type control is very similar to Type driven Curtain Wall.



Key points for module six:

- Quick ways to manipulate transitions.
- Multiple editing modes.
- More complex transition modifications.
- Being aware of Work Planes.

Video Seven: Working with Handrail Supports

The last module takes a quick look at how the handrail support families can also be customized at an instance level, similar to editing transitions. Much like curtain wall grid lines/mullion types, handrail supports can be quickly and easily moved, copied and have their types changed to support different geometrical conditions.

Key points for module seven:

- How to adjust support locations.
- How to replace or remove supports.

