Session 11

Traditional Family Editor vs. Conceptual Massing Environment—Discuss

Paul F. Aubin: www.paulaubin.com

Class Description

Creating custom family content in Revit has always been a bit challenging to master. In recent versions of Revit it is even more so thanks to Conceptual Massing Environment. When it first came out (back in 2010) I assumed it would be transitional and that eventually the tools and features of the traditional and massing environments would be merged together to make a single and more powerful family editor. But alas, this is not the case. So here we are several releases later with two similar, but very distinct family editing experiences. This wouldn't be such an issues except for the fact that you cannot easily move between the two. Take profile families (vs the need to use Generic Models in massing) as an example or the inability to copy and paste between the two environments and you can begin to understand the issue. In this session, we'll look at a side-by-side comparison of the two environments and then open it up to discussion from the group. Both your questions and your expertise are welcome in this session. Come join the conversation.

About the Speaker:

Paul F. Aubin is the author of many Revit book titles including the widely acclaimed: *The Aubin Academy Mastering Series*, his all new *Renaissance Revit* and Revit video training at www.lynda.com/paulaubin. Paul is an independent architectural consultant providing Revit® Architecture implementation, training, and support services. Paul's involvement in the architectural profession spans over 20 years, with experience in design, production, CAD management, mentoring, coaching and training. He is an active member of the Autodesk user community, an Expert Elite and is a high-rated repeat speaker at Autodesk University, Revit Technology Conference and the BIM Workshops. His diverse experience in architectural firms, as a CAD manager, and as an educator gives his writing and his classroom instruction a fresh and credible focus. Paul is an associate member of the American Institute of Architects. He lives right here in Chicago with his wife and three children.

Contact Paul directly from the contact form at his website: **www.paulaubin.com**

The Background

Last year I published a book called: *Renaissance Revit: Creating Classical Architecture with Modern Software*. I often describe the book as a "deep dive" into the Revit family editor. The book is in tutorial format and as its title suggests, the examples are drawn from classical architecture. (Admittedly I have a great interest in renaissance and classical architectural periods). But I was actually more interesting in delving deep into the family editor using examples that would be familiar (at least in a cursory sense) to nearly any reader (we've all seen classical columns) and yet much more interesting than the basic box that we often see in tutorials. Great. But you may be wondering what this all has to do with this class? Well, in the course of preparing the material for the book, I had the opportunity to explore both the traditional and massing family editor environments quite extensively. This combined with a conversation that I had with Tim Waldock; via his blog gave me the idea for this session.

Class Format

This class is a discussion forum. This means that unlike a lecture or lab class, there is not a "fixed" agenda. Instead, in this paper I have listed several topics that can serve as talking points for the discussion. The goal of the session is to share ideas with the group. So it is my hope that we will get lots of group participation in the discussion. This is meant to be a dialog. So please feel free to share your thoughts.

Traditional or Massing—Which do you prefer?

OK, so that's where the idea came from. Now a little more detail. Let me start by saying that in general I have tended to prefer the traditional family editor in my work. I don't have a really compelling reason why, I guess that it is just what I learned first and in some silly way I feel like its cheating when I go to the massing environment. However, that has certainly not stopped me from diving in with both feet. So, if given a family authoring task, and all things being equal, I will tend to create a traditional family first and only go to massing if there is something that the family requires that I cannot easily achieve in traditional.

Ah but Why?

I am not quite ready to answer that yet, but this is the part where I bring in the conversation I had with Tim Waldock. When my book came out, Tim posted a review of it on his blog that also contained a rather lengthy comparison chart of the two family environments. He mentions that the post was inspired by the partial comparison I had mad in my book. With Tim's permission, I have reproduced some of his comparisons here.

You can read the original post here:
http://revitcat.blogspot.com/2013/12/rival-revit-environments-traditional-vs.html
Be sure to also check out the other posts he has on Adaptive Components as well.

For the format of this section, I have adopted Tim's method of using a two column table to compare the two environments. Seems to work pretty well.

Comparing the two environments

A common abbreviation for the Conceptual Massing Environment is: CME. To be consistent with this, I will also use TFE to refer to the Traditional Family Environment.

Interface

Here is an overview of the major difference between the interfaces in the two environments:

	TFE	**CME**
Environment	**2D** w/ some 3D views	**3D** w/ some 2D views
Levels and Ref Planes	Do **not** appear in 3D	**Do** appear in 3D
Selection	Chain **second** in TAB order	Chain **first** in TAB order
Set Work Plane	Use the **Set** tool	**Select** any plane or surface
Create 3D forms	Use **five predefined tools**	Use the **Create Form** button

Pros and Cons of each. Who wins?

	Pros and Cons	**Winner**
Environment	This is largely personal preference. For those that prefer a 3D environment, CME has the edge, but there are advantages to 2D environments as well. The TFE is consistent with the project environment which can be a big plus.	Draw
Levels and Ref Planes	Not seeing Datum elements in 3D is a limitation of the traditional environment that should be fixed to match the CME	CME
Selection	TAB is an important part of Revit selection. It is necessary in both environments. I therefore see little advantage to the reversal of TAB order in CME. In my opinion, all environments should be consistent.	TFE
Set Work Plane	I am on the fence on this one. We trade consistency in the CME for some convenience. But sometimes still require the Set button, so I am not convinced this is better.	TFE
Create 3D forms	This one is very tough to evaluate. The addition of lofted forms is huge. But sometimes I just want to create an extrusion or	CME

	revolve. I would prefer something in between the approaches taken by the two environments.	

Workflow

Here is an overview of the major difference between workflow in the two environments:

	TFE	**CME**
Create a 3D form	Choose a tool, then **sketch**	Sketch, then **create form**
Setting Work Plane	Switch views, or use **Set** tool	**Click** on a **plane** or surface, optionally use Set tool
Adding Levels	**N/A**	**Depends** on template
Adding Ref Planes	**2D views** only	**Any view***
Using Reference Lines	**Limited** to controlling rotation	**Used extensively** for work planes and relationships
Using Reference Points	**N/A**	**Very powerful**!
Modes of editing	Edit **sketch**	**Many**: In canvas, X-ray, Dissolve, etc.

Pros and Cons of each. Who wins?

	Pros and Cons	**Winner**
Create a 3D form	I think there are advantages to both approaches. Create form is a little more flexible giving a slight edge to CME	CME
Setting Work Plane	Noted this above already	TFE
Adding Levels	Not available in CFE	CME
Adding Ref Planes	I like that reference planes show in 3D, but I do not like the way they appear in CME. Their representation in 3D is on the last level	TFE

	created and is very difficult to change this. 2D vs 3D extents is confusing at best. It is also very difficult to control with precision.	
Using Reference Lines	Used more extensively in CME	CME
Using Reference Points	Not available in CFE	CME
Modes of editing	There are more ways to edit in the CME giving it a slight edge. But sometimes modal editing (edit sketch) gives nice separation that is tough to achieve in modeless environments	CME

*When adding Reference Planes in the CME, the first two clicks sets the extents. From then on, you can only change the 3D extents in a 3D view. Stretching in 2D views, changes the 2D extents only.

Copy and Paste

There has long been a barrier between the various work environments in Revit. This is no more obvious than when you attempt to copy and paste. No comparison is really necessary here as the behavior is the same, but I felt compelled to include it as an entry anyway since it can be quite frustrating when you run into this limitation. Limitations like this I have taken to referring to as: "Artificial Barriers". I refer to them this way as the limitation seems completely arbitrary. This is particularly true when copying simple lines from one environment to another. There are work arounds of course. But it would be so much easier if you could simply copy and paste. So when modelling, be careful of the following:

- Copy and Paste is not allowed between environments. You cannot copy and paste:
  - From project to family.
  - From 2D family to 3D family.
  - From CME to TFE.

o Or here's a real kicker, from view to view.

Let me explain that last one. Let's say that you have a 2D shape that you drew in a plan view and you decide that you want to use that same shape in elevation instead. You cannot simply copy and paste it from plan to elevation. This is because it will try to maintain its 3D orientation. This is true even with symbolic lines in the TFE. In the massing environment, you cannot use 2D elements at all. So there are only model lines, no symbolic lines. But regardless, copy and paste behaves the same way. Once a work plane is established, paste will only paste parallel to the original work plane.

There are a few ways around these limitations.

- **To copy and paste between from a project to a family**—Create an in-place family in the project. In the in-place edit mode, create your geometry. Then copy it before finishing the family. You will now be able to paste into a family in the family editor. You can use Pick Lines to trace existing elements and reuse their shapes.
- **To copy from a family to a project**—place an instance of the family and then use Pick Lines to "trace" the geometry.
- **To copy from TFE to CME**—Nest the traditional family into the massing family and then use Pick Lines or simply trace it.
- **To copy from view to view**—You're going to hate this, but you can export a view to DWG, then insert it into another view. Once there, use Pick Lines to trace it, and then delete the DWG.
- **Alternative**—Don't draw 2D shapes in families. Use nested profile families instead. This makes it easier to choose any work plane and/or change the work plane without redrawing or tracing. There are some caveats... *See the topic on Profiles below.* When importing 3D geometry, using face-based nested families eliminates issues with work planes and orientation.

To copy from CME to TFE

This is perhaps the **biggest artificial barrier** of them all. There is a complete barrier between CME and TFE. While you can insert a traditional family into a conceptual family. You **cannot** do the reverse. So, if you need to trace some portion of a massing family in a traditional family, consider this the ultimate work around. Here are the steps:

- Open or create a project.
- Insert the massing family into the project.
- Create an in-place family.
- Use Pick Lines to trace the shape from the massing family. (Pay attention to the view you are doing this in, or you end up hitting the "can't copy from plan to elevation" artificial limitation above).
- Do not finish the family yet. Select the picked lines and copy them to clipboard.
- Switch to your traditional family open in the family editor.
- Paste.

That should work *most* of the time.

Profiles

Profiles are 2D shapes used to create 3D form. Both environments are capable of using this methodology, but the specifics vary. Here are some of the differences with respect to profiles in the two environments:

	TFE	**CME**
Profiles	Nested 2D families created from a Profile template and containing 2D lines forming a closed shape	Nested Generic Model families containing only model lines forming a closed shape
3D forms that can use profiles	**Sweeps** and **Swept Blends**	**Any**

Pros and Cons of each. Who wins?

	Pros and Cons	**Winner**
Profiles	Using profiles offers many benefits, but the biggest advantage is the ability to define the profile once and then reuse it in many locations and/or families. This is true in either environment. The biggest	TFE

	limitation here is that you cannot use traditional profiles in the CME. This means that if you need the same profile in both environments, you have to define it twice. (This is not as easy as it should be either, see the above information on copy and paste). Nested GM families are larger than profile families, so the edge goes to TFE	
3D forms that can use profiles	It is unfortunate that you cannot use profiles to define extrusions, blends and revolves. But Sweeps and Swept blends can emulate most of the same forms, so the limitation is more a nuisance than true limitation. Edge to CME	CME

Errors

Ah errors. What would the family editor (and Revit in general) be without errors? This is another of those topics that is not so much a comparison as just one that needs to be part of our discussion.
Some of my favourite errors:

- Can't create form
- This would result in a self-intersecting form
- Use the "rearrange profiles" button (never found this button)…
- Other

What are some of your favourite errors? Bottom line: errors are an unfortunate part of working in Revit. Unfortunately the errors in the CME are not always that helpful. So I would give the **edge to TFE** here.
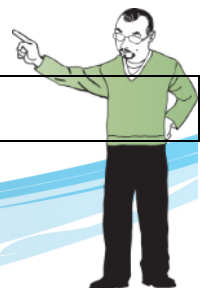
Editing Workplanes / Element Placement

Here is an overview of the major difference between using workplanes in the two environments:

	TFE	**CME**
Level	Templates contain one or two levels. "Two-level based" templates are only available in TFE. To set level as work plane, use the Set tool	You can add levels in the Mass template. Not in Adaptive or pattern based to set level as work plane, use the Set tool or just select it.
Reference Plane	Use the Set tool to select it. Name reference planes to make them easier to set.	Simply click a reference plane to use it as a work plane.
Surface of 3D Form	Use the Set tool to pick a surface	Simply select the surface or use the Set tool
Reference Line	Use the Set tool	Simply select it or use the Set tool
Reference Point	N/A	Simply select it or use the Set tool
Changing Work Planes	Use Pick New Host	Use Pick New Host or drop-down on Options Bar

Pros and Cons of each. Who wins?

In general, setting work planes is fairly simple in both environments. The CME is slightly easier in that you can simply select a work plane to make it active. However, this can actually work against you if you select an element or datum without intending to make it the work plane. Therefore, it is always important to pay close attention to the active work plane. But this is true in both environments. Remember that while you can re-host an element after it is created, it is not always easy to choose a new work plane; particularly if it is at a different angle than the one on which it was created. So careful planning and paying close attention is critical.

	Pros and Cons	**Winner**

General use of Work Planes	Ease of selecting in CME is balanced by likelihood of accidentally selecting the wrong plane.	Tie
Using Points as work planes	To me this is one of the best super powers of the CME. Being able to create a point element anywhere you need a work plane is huge! Couple this the ability to host points on other geometry like reference lines and even other points and this is by far one of the most powerful features of CME by a long shot	CME

Categories

Categories is one of the most important considerations. This has been perhaps one of the biggest sticking points for me in my own personal adoption of the CME. The CME supports only certain categories. When using the CME to create building massing studies using the *Mass.rft* template, you cannot change the category. So it is very important to choose your category carefully. With Adaptive components (using the *Generic Model Adative.rft* template), you can change the category to certain common component categories. The advantage of doing this is that you can use the modelling tools of the CME to create elements in your model. The disadvantage is that these items must be inserted directly into projects; they *cannot* be nested into TFE families. Adaptive families also tend to be larger in file size (see below).

Despite the possible limitations, adaptive components open up the possibility to using all of the functionality of the CME to create reusable content items in your library. It is a compelling possibility. However, please keep in mind that only certain categories are supported.

Pros and Cons of each. Who wins?

If the item you are modelling contains features that require functionality from the CME, then the choice is plain. The CME has the edge here. These include things like:

- Freeform geometry
- Complex relationships between hosts like reference points hosted on reference lines
- 3D Spline-based forms
- Need for multiple insertion points (Adaptive points)

File Size / Performance

When it comes to file size, traditional families tend to be smaller than massing families. In fact, massing families; particularly adaptive components, can be quite large. File size by itself is not always a cause of concern, but when it begins to impact file performance it is. So in general, keeping families small is always desirable. But if smaller families is your only criterion, then you would rarely choose to use the CME. So you have to balance this against other issues and benefits gained from using the CME.

Pros and Cons of each. Who wins?

While perhaps a cop-out answer, I will say that it really depends on the family and situation. If purely looking at file size, the CFE is usually the winner, but since it should really be performance and functionality that is important to a project team, I have to call this one a tie.

Summary

This paper has highlighted only a few key areas of comparison between the two family editing environments. If you visit the above-referenced post over at RevitCat you will see that there are MANY more points for future discussion and consideration. I encourage you to visit the post and join in the conversation.