A Template for Success: Maximize your Autodesk® Revit® Structure Template

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SE3189 A well planned and efficiently organized template is an essential and critical starting point to a successful Autodesk® Revit® Structure project. A great template can not only save time and money throughout the design process, but illustrate company standards, improve consistency and quality of the model and documentation, and assist with collaboration across disciplines. Time savings equal cost savings and developing your company template to its full potential will help reap these savings. In this class, we will discuss template basics, the power of view templates, customized schedules, graphical company standards, and browser organization with a focus on the structural discipline. Finally, we will explore what is new with Autodesk® Revit® 2013 and how the changes will be reflected in our template environment.

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

• Increase productivity via a customized Autodesk® Revit® template.
• Develop strategies for implementing company standards.
• Create structurally specific schedules to increase workflow.
• Create or update a template using Autodesk® Revit® 2013.

About the Speaker

Tina is a Senior Structural Technologist and BIM Specialist for Herold Engineering. Tina has played a key role in the advancement of Autodesk® Revit® Structure over the past 6 years. She has extensive experience developing courses for in-house training, teaching, and providing support of Autodesk® Revit® Structure for a multi-discipline firm with offices across North America. She is responsible for the developing long term goals and strategies for the structural discipline and participates in the overall BIM planning for the company. Over the years, she has cultivated Autodesk® Revit® Structure templates to include structural specific standards and content with a focus on improving the consistent implementation of company standards. She also creates, vets, and standardizes all content for distribution. She is a Structural project team leader and some of her previous Autodesk Revit Structure work includes leading the structural team for two large-scale international airport expansion projects.
Getting started

Start with a meeting. The focus of the meeting: setting BIM standards. So gather your BIM team or create a small focus group of your skilled Reviteers, whichever best suits your company. Begin by reviewing your current standards and how they can be translated or improved in Autodesk® Revit®. Then discuss and set standard naming conventions for company content like text and dimensions, line styles, families and shared parameters. Standards provide all users the comfort and confidence that they are using the correct content for the correct purpose. Most likely, you will have some of these company standards already set and documented and re-working them to suit Autodesk® Revit® will be simple.

Customize your Autodesk® Revit® Template

Template Basics

Text Styles

Setup all the text styles to suit your standards and the various type properties you would use in any typical project. Part of the naming convention should include the height of the text, opaque or transparent, and any other type properties assigned for example, leader differentiations, and borders. Additional consideration should be given to units, metric or imperial; do you need both? If so, create a naming convention that can be used in both templates.
Dimension Styles

Create dimension styles that complement your text style types. Use similar naming conventions where possible to keep the types consistent and easy for everyone to use. In addition to the type property considerations listed in the text styles section on the previous page, project units should also be considered as part of the dimensions type if you would like to incorporate a variation of rounded unit dimension styles.

Line Weights, Line Patterns, and Object Styles

Revise line weights and line patterns to be consistent with your current standards. Consider beginning with just 2 sets of line weights, one to cover typical plan scale one for typical section scale. Then review the line patterns and create and/or import new patterns to suit your needs.
Once the basic line weights and line patterns are set to your standards, proceed to the object styles settings. The object styles dialog box sets the global properties of all elements in the model. Adjust line weights, colors, and patterns (as well as materials where desired) for all objects. Fully test the settings repeatedly by plotting and reviewing all objects (in plan and section) and adjusting the desired output is achieved.

**Line Styles**

Naming preferences and quantity of line styles contained within the template vary greatly amongst companies. Across the companies line styles are most commonly named by pen type and pen weight. The variations to this basic naming concept include prefixing and suffixing with company initials, and prefixing with numbers to organise the list. Modifications to line weight settings and line patterns should also be completed in conjunction with line styles setup.
Content

Load it up!

Load structural columns, footings, and beams. Load a handful of types for each family. The benefit of having the company specific content already loaded is that additional types can be directly loaded from within the project template (should the file location remain unchanged) via the project browser.

Using the reload option from the family list in the browser will open the associated file folder from which that family was originally loaded. Using this method will help ensure the company standard content is consistently loaded into projects and implemented.

Load company annotations and symbols. Load all company specific tags, and be sure to keep the list up to date. Once loaded use the tag dialog box to set the default tags, and then assign leader types to each one.

Load detail components. Load everything that has been customized or created by your company as well as any out of the box content you generally use.

Develop the system families. Create wall types and floor assemblies for wood, steel, and concrete project materials. Review the levels, plans, grids, sections, callouts (heads and tails) and viewport types. Revise the embedded family content to meet your company standards and load and update relevant system family content. Create a variety of types to suit typical circumstances, for example, section types for building sections 1:50 scale, sections at 1:20 scale, detail sections at 1:10. Later view templates can be assigned to each type of section.

Now, most obviously loading up a template with everything makes for a very big template file. Mine is about 35meg. My primary argument for this rather large starting template is that it’s much easier and less time restrictive to purge things out and delete views via the working view list (also setup in the template) than it is to load in all the necessary content. Additionally, if every user has the standard content at their fingertips from the start it is much easier for them to follow the company standards and use the content at hand.
**Filled Regions**

Create as many standard filled region types within the template as necessary, this will eliminate the need for users to create additional types, and also keep the naming and styles consistent for every project. Once again they should be labelled with their background type for proper identification and use in the model.

![Filled Regions](image)

**Browser Organisation**

Set view types and naming conventions for project views to ensure a fluid transition for users on every project. There are a variety of ways to set these up. We have chosen to setup plotting, working, coordination, template and analytical views into their own buckets on the list. We prefix working views with a w_ and use lower case lettering for the view name. Plotting views (or views to be placed on sheets) are upper case, and all views are organised into buckets by a shared parameter within the template. The typical details project is built from the same template however the project browser has additional material buckets for all the typical detail views.
**Project Data / Save to Central View**

A project data view (or save to central view) is a great way to communicate information about your project. In addition, setting this view as the Starting View makes it the first view everyone sees when they open the project. Providing this view in the template allows us to immediately communicate vital information about every project. Information such as project name, project number, description, location, client names, and whether links, design option or phasing are being used are, and level of detail. Pertinent pieces of information can be easily exchanged via this administrative view.

<table>
<thead>
<tr>
<th>Project Name</th>
<th>BC Ambulance Services</th>
</tr>
</thead>
<tbody>
<tr>
<td>Project Description</td>
<td>Interior retrofit and Seismic Upgrade of Existing Building</td>
</tr>
<tr>
<td>Location</td>
<td>Victoria, BC</td>
</tr>
<tr>
<td>Client Name</td>
<td>Jawl Properties</td>
</tr>
<tr>
<td>Links</td>
<td>Yes: Architectural CAD in working views</td>
</tr>
<tr>
<td>Design Options</td>
<td>No</td>
</tr>
<tr>
<td>Phasing</td>
<td>Yes: Existing and New</td>
</tr>
<tr>
<td>LOD</td>
<td>300</td>
</tr>
</tbody>
</table>

**Project Location View**

Another pertinent project administrative view is the project location view. In this view you can see below that the project location and site survey have been turned on in the visibility graphics for this view. The purpose of this view in the project template is to coordinate location and elevation between discipline models.
“How to” Views

What workset do strip footings go on? How do I cope a beam? How do I model a brace? How do I create a sketch? Is there a list of the short cut keys? Consider putting the answers to your users’ most common questions and more at their fingertips.

Internal documents to address these questions are great, but they are not always actually used as reference material. Providing a “how to” bucket with a variety of categories and views into your Typical Details project (see also Page 11) is an excellent way to provide additional redundancy to the most common questions and other procedural information you’d like to communicate in a consistent format for everyone. Note that views with more than 6-8 letter size images can be slow to load, so keeping the view names and buckets specific will increase the effectiveness of the information at hand as well as making the information easily searchable via the new browser search tool.
Template Content View

Your template now contains standard dimensions, text styles, line styles, and you’ve loaded a large amount of content; so how can you make it even easier for the standard company content be used for the correct purposes? Document it! Create an administrative template content view and load it up. Illustrate your standards. Show your dimension styles and text styles; add comments associated with their proper use. Create thumbnails of your standard filled regions and drop in an organised picture directory of your detail components. Not only will these important company standards now never be purged accidentally from your project, but it will demonstrate the variety of content within the template. Also if you’ve ever found yourself scrolling up and down the drop down list of detail components searching for a certain component because you couldn’t quite remember the correct name, you’ll find this view exceptionally handy. Activate this template view and find the component you need quickly.

Placed in this template view (example below) is all company standard text styles, dimension styles, filled regions, line styles, as well as commonly used detail components by type (masonry, steel, wood, rebar, anchors etc.) custom symbols, and repeating details.
Implementing Company Standards

General Notes

There are many different ways to tackle the addition of General Notes to your template. Options include creating groups of text notes, using note blocks, and using key schedules. Try them all and determine which method you prefer and proceed to add them into the company template. Then take it further. Add the notes to a typical general notes sheet within the template. Additionally, toss on the standard abbreviations, structural drawing list, symbols and other company standard legends to complete the first couple sheets for every project.
Typical Details Project

Load it up! Mentioned previously, but it’s truly not feasible to put everything in the template. So where should you draw the line? Not included in the template are the company standard typical details and the “how to” views (see Page 7). Typically, companies have anywhere from a hundred to several hundred typical details. Many of these details are not required on every project so all of this standard company content is kept and maintained within a Typical Details project. Start a new project with your company template and load in all your details. In the example below, details were loaded into drafting views from AutoCAD® (the files were modified prior to import) and organised by material in the project browser.

BIM Best Practices

Do you have a BIM Best Practices document for your company? This is a living evolving document that contains BIM related company procedures from project start up instructions through to completion and archiving, consider adding it in image format to your Typical Details project along with the “how to” views.
**Drawing List, Sketch Schedule, and Working View List**

Additional schedules in the template should include a drawing list, sketch schedule, and a working view list. Drawing list is a typical and standard piece of the project, added to the first sheet within our template. The sketch schedule and working view list are examples of administrative views within a template. The sketch schedule tracks all sketches created along with sketch name and issue date.

<table>
<thead>
<tr>
<th>Sketch Number</th>
<th>Sketch Name</th>
<th>Issue Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>SK-S01</td>
<td>TYP MAT DEPTH CHANGE DETAIL</td>
<td>MARCH 1, 2011</td>
</tr>
<tr>
<td>SK-S02</td>
<td>TYP DETAIL FOR PIPES THRU GRADE BEAMS</td>
<td>MARCH 1, 2011</td>
</tr>
<tr>
<td>SK-S03</td>
<td>REVISED PARTIAL FOUNDATION / MAIN FLOOR</td>
<td>MARCH 3, 2011</td>
</tr>
<tr>
<td>SK-S04</td>
<td>REVISED DETAIL 13/S301</td>
<td>MARCH 3, 2011</td>
</tr>
</tbody>
</table>

The working view list core purpose is the management of all content within a project. Use this administrative view for tracking consistency of views, view template applications, tracking company standards and for purging unused views and content from the project at project completion, archiving, or model exchange.

**Placeholder Links**

As we continue down the path of tending to all the needs of any project via the template, adding placeholder links into the template will allow you to further customise views with filters, and view templates to immediately standardise architectural, mechanical and electrical revit model links.

**File Structure**

Implementing a standard file folder format for your Autodesk Revit Structure projects is another method to increase consistency from project to project. This will enable every user to easily link, locate, and save all necessary project related content.
Structural Specific Schedules

**Footing Schedules**

Set up in the template example below are two types of footing schedules. One for simpler smaller projects and one for larger, more complex projects. Both are placed onto the typical sheet in the template and detailed with all relevant parameter information to populate each schedule. Additionally, should you prefer, any of the parameters governing the next few examples of schedules could be added to structural specific tags and used in plan or section.

<table>
<thead>
<tr>
<th>MARK</th>
<th>SIZE</th>
<th>REINFORING</th>
<th>MIN FTG DEPTH</th>
</tr>
</thead>
<tbody>
<tr>
<td>PF1</td>
<td>6&quot; x 6&quot; x 1'-4&quot;</td>
<td>6-20M E/W TOP &amp; BOTTOM</td>
<td>4'-0&quot;</td>
</tr>
<tr>
<td>PF2</td>
<td>6&quot; x 6&quot; x 1'-4&quot;</td>
<td>6-20M E/W TOP &amp; BOTTOM</td>
<td>BEAR ON (E) MUD SLAB</td>
</tr>
</tbody>
</table>

**Column Schedules**

As per the footing schedules, custom build a variety of column schedules within your template to suit your specific company standards. Provide simple schedules by material (and combined) as well as full graphical column schedules. Once again each schedule is placed upon a sheet (per AIA standards) and for ease of use documented with all relevant tag and parameter information.
**Beam Schedules**

Add a variety of beam schedules to cover the typical situations you encounter. In the example below there are two concrete beam schedules. One simple and one duplicate concrete beam schedule. Each schedule has an accompanied reference, the typical beam detail. The duplicate schedule was created from the necessity to provide beams of the identical size with different reinforcing. The revision to create the second schedule ideally has made the first schedule redundant; however this is merely shown as an example of the ongoing template process and this was revised in the latest template.

You can also tell from the example shown below that typical project standards do not include modelling the reinforcing of concrete beams. The schedule for that is still a work in progress. However, for more complex beams which do not meet our typical detail like stepped beams or a continuous beam with varying depth, the reinforcing is fully modelled and a full beam elevation is detailed in the project.

In addition to the concrete beams schedules, there is a simple schedule for each steel, wood, and a combined schedule in the template for basic projects. Each schedule is placed on the beam schedules sheet in the template with all relevant parameters and tags labelled.
**Base Plate Schedules**

Simple and complex, it’s a standard theme in a flexible template. The same theory is applied to base plate schedules. Try a simple and complex version times 2. One for modelled connections and one that can be populated via user input alone. The examples below depict first the simple schedule, followed by the complex schedule, a partial example of the typical detail referenced to theses schedules and a clip of a base plate tag used in section.

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**Shear Walls**

Company standards for shear walls should also be included the template. Per our company standards, wood shear walls are scheduled and with the exception of wall type are populated with direct user input via shared parameters associated with the wood shear wall types residing in the template.

In contrast, concrete shear walls are drawn in full elevation and added to sheets along with their specific shear wall zone reinforcing detailing and typical shear wall notes. For ease of detailing in both elevation and plan, as well providing consistent shear wall zone tagging in plan and elevation, current company practice is to model concrete shear wall zones with reinforced concrete columns. The columns are filtered from the graphical column schedule in the template.
setup and graphically overridden in the view template associated to the structural plans and shear wall elevations.

**Autodesk® Revit® 2013**

**View Templates**

New to the release of Autodesk® Revit® 2013 directly related to how we work with company templates is the ability to assign a view template to view types and have it applied to new views of that type. This allows for standardization of views prior to creation. In addition, new views remain dynamically linked to that view template. Any changes made to the view template will be reflected in each view. Essentially we no longer need to police the model by re-applying view templates later into the process when graphical changes are made. In relation to this change, we created a pleather of additional more specific view templates in our template now that they have a longer lasting more resilient standard control over the entire lifespan of the project.
**Structural Levels / Building Story**

This is not necessarily something that will be reflective in your template setup however it is worth mentioning in your “how to” views. Should you have been previously inclined to add levels denoting “top of steel”, “top of joist”, “top of footing”, etc. Structural levels are now available for this purpose; levels designated as structural levels can be filtered and therefore setup in view templates to be unseen by other disciplines. Building story can also be designated.

![Image of Properties window showing level settings]

**Reinforcement Enhancements**

Area and path reinforcement are now separate items on the view visibility list, depending upon your company standards this may add these to your view template settings.

![Image of view visibility list with reinforcement options highlighted]
One More Thing

Consider making your template a work-shared project file. The benefits of this method include:

- the ability to lock the standards down, for example, user can create duplicate text or dimension styles but the cannot edit the standard types.
- the ability to add standard worksets.
- the ability to add placeholder links on preset worksets.

Summary

A well planned and efficiently organized template is an essential and critical starting point to a successful Autodesk® Revit® project. A great template can be a large leap forward into every structural project. In addition to the suggestions and examples contained within this handout, be mindful of your users and what works best for your company. Also, remember to document all the ins and outs of your company template so anyone can use your standards, custom content, and settings within the template to its fullest potential.

Thank you for your time.

Tina Bos