



Working with Detail Components and Managing Details

With Revit® Structure, you can use 2D detail components from the software libraries or create and load custom detail components. You can also create, edit, and save detail groups for typical connection or reinforcement configurations used by an organization. In addition, you can manage a library of typical details to reuse details across projects.

Objectives

After completing this chapter, you will be able to:

- Create 2D detail components.
- Work with detail groups.
- Manage a library of typical details.

Lesson: Creating 2D Detail Components

Overview

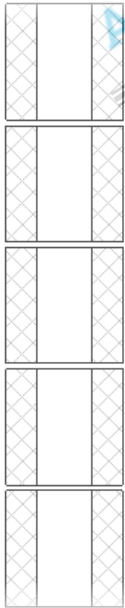
This lesson describes how to create 2D detail components. You begin the lesson by learning about 2D detail components and the process of creating them. Next, you learn some recommended practices for creating 2D detail components. The lesson concludes with an exercise on creating 2D detail components.

Construction details are an important part of a design project. Details are specific manufacturing, construction, or placement instructions that add the necessary information to designs to make them complete.

In Revit Structure, you can create details by leveraging 3D models and then adding 2D detail components and line work. You can also create details in drafting views by using detail components and line work. In addition, you can import the existing CAD details into drafting views.

You can use 2D detail components from the Revit Structure libraries or create and load custom detail components. 2D details can also be used as repeating detail components. The Repeating Detail tool on the Drafting tab provides a quick way to array detail components. This tool enables you to create a repeating detail that can be controlled parametrically.

The following illustration shows a 2D Concrete Masonry Unit (CMU) detail component repeated in a project.



Objectives

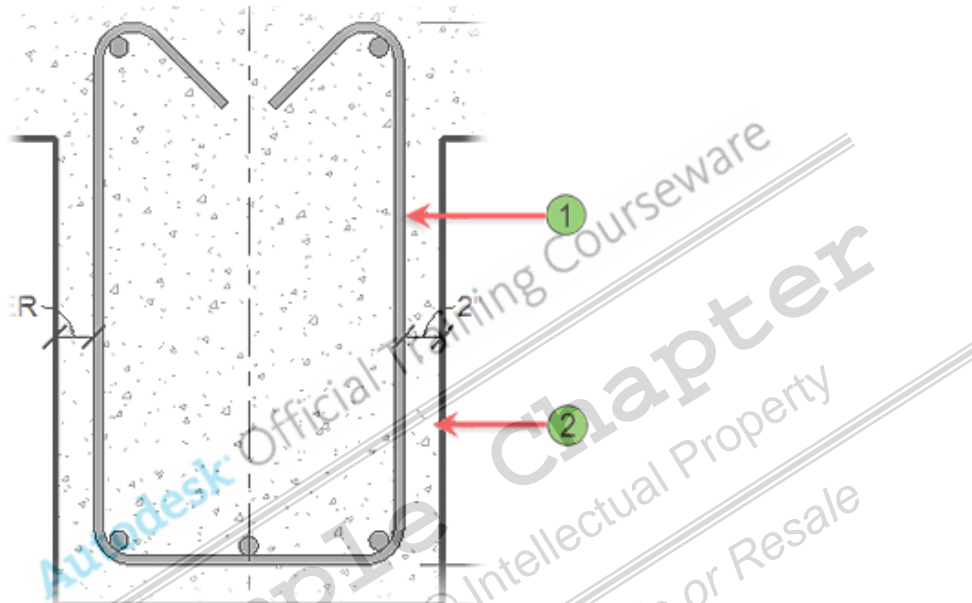
After completing this lesson, you will be able to:

- Describe 2D detail components.
- Describe the steps in the process of creating 2D detail components.
- State the recommended practices for creating 2D detail components.
- Create a 2D detail component.

About 2D Detail Components

2D detail components are 2D family objects that you add to drawings for displaying information that is not modeled. You do this to avoid excessive modeling of objects in drawings. 2D detail components also support tagging and keynoting for faster annotation of drawings.

The following illustration shows a stirrup longitudinal reinforcing bar 2D detail component added to the section view of a concrete beam.



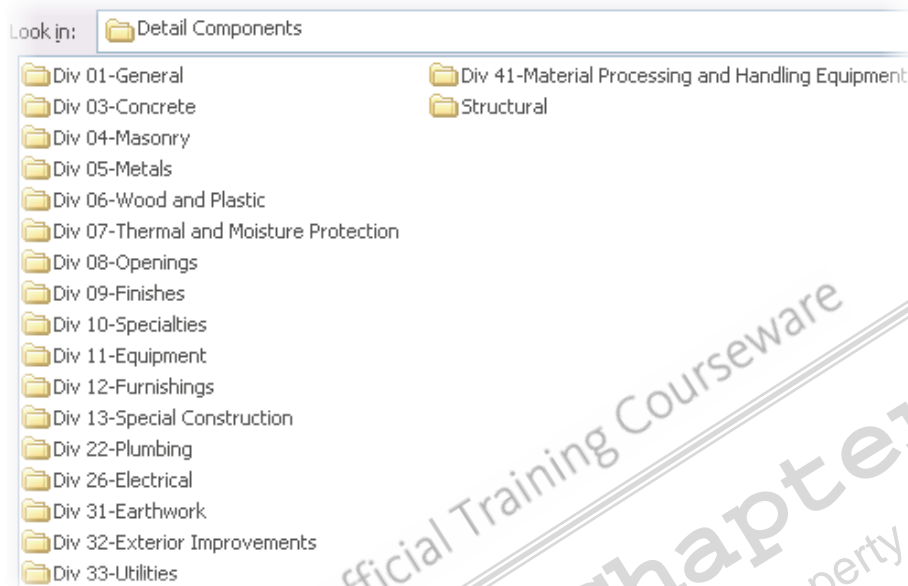
- 1 Stirrup longitudinal reinforcing bar
- 2 Concrete beam

Definition of 2D Detail Components

A detail component is a standard and view-specific 2D family made from line work and filled regions. For example, if you create a 2D detail component of welded wire fabric and use it in the section view of a beam, the wire fabric is not displayed in any other views, such as elevations.

You can create 2D detail components by using various detail component templates available in the imperial and metric template libraries. Detail components can be created as standard or line-based detail components. Line-based detail components automate the creation of linear components, such as structural framing members. You create standard detail components by using the *Detail Components.rft* file and line-based detail components by using the *Detail Component line based.rft* file.

You can save detail components in predefined content libraries. The content libraries are organized into various divisions, which are defined by the Construction Standards Institute (CSI). These divisions store classification categories and standards used by architects and structural engineers.

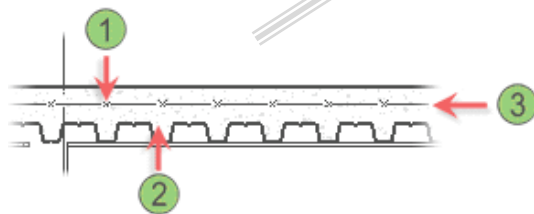


Predefined content libraries

After creating a 2D detail component, you can create repeating patterns of the detail component along a path in the detail or drafting views in a project. You can create repeating patterns by using the Repeating Detail command.

Example of 2D Detail Components

The following illustration shows a 2D welding wire fabric detail component repeated in a beam.



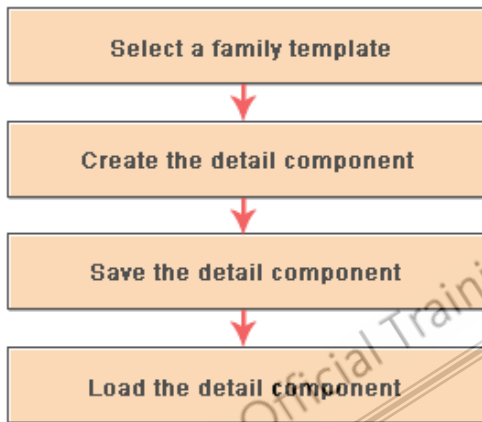
- ① 2D welded wire fabric detail component
- ② Section view of concrete and metal deck floor
- ③ Repeating detail of the 2D welded wire fabric detail component

Process of Creating 2D Detail Components

To create a 2D detail component, you specify a family template and create the 2D detail component as a family file. You then save the detail component in a separate folder and load it into the project.

Process: Creating 2D Detail Components

The following illustration shows the process of creating a 2D detail component.



The following steps describe the process of creating a 2D detail component.

- 1. Select a family template.**
Select a family template from within the project to create a detail component.
- 2. Create the detail component.**
Create a standard or line-based detail component.
- 3. Save the detail component.**
Save the detail component in a separate folder so that you can reuse or modify the detail component later, if required.
- 4. Load the detail component.**
Load the detail component into the project. If required, use the detail component to create a repeating detail.

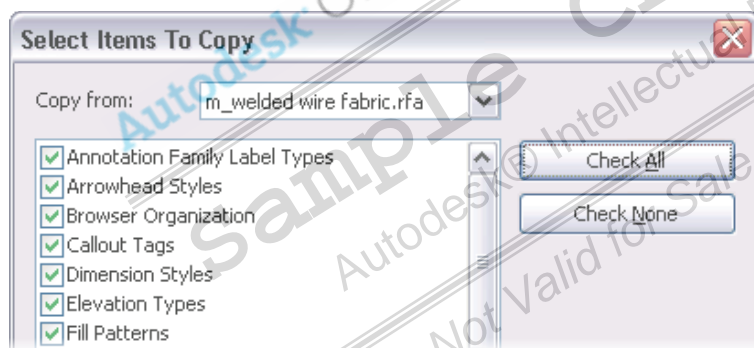
Guidelines for Creating 2D Detail Components

The following recommended practices help you work efficiently while creating 2D detail components.

- Create separate content folders to save the customized detail component files. This simplifies content management as you can segregate predefined content from custom content. This practice also enables you to retain the custom content folders when upgrading the software.
- Create parameters for detail components to create intelligent and versatile components.
- Use the Masked Region tool within a detail component to hide the model geometry that you do not want to show in detail.
- Group and save detail components to create complex standard details.
- Use the Transfer Project Standards command to transfer the repeating detail standard families from one project or template file to another. By using this command, you can quickly copy families that are not present in a project template.

Example

The following illustration shows the Select Items To Copy dialog box displayed on using the Transfer Project Standards command. You use this dialog box to transfer repeating detail standard families from one project or template file to another project or template file.



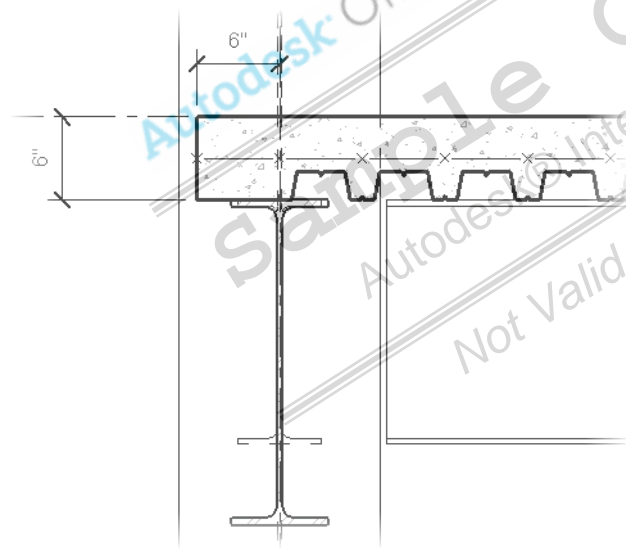
Exercise: Create a 2D Detail Component

In this exercise, you create a 2D detail component of a section of a welded wire fabric. You then create a repeating detail using the component to add the welded wire fabric to detail views.

You need to add a welded wire fabric to a concrete slab section. To do this, you create a 2D welded wire detail component. You save the detail component as a separate file so that it is available as a standard family for use in other projects. Next, you load the detail component family into a project. Finally, you create a repeating detail using the new detail component to add the repeating patterns of the welded wire to the sections and detail views.

You do the following:

- Create a 2D detail component of welded wire fabric.
- Create the repeating detail.



The completed exercise



Completing the Exercise

To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 1: Working with Detail Components and Managing Details*. Click *Exercise: Create a 2D Detail Component*.

Create a 2D Detail Component of Welded Wire Fabric

1. Launch Revit Structure.

NOTE: The illustrations for the metric dataset will be slightly different from those shown here.

2. Click File menu > New > Family.

3. In the New Family dialog box:

- Navigate to *C:\Documents and Settings\All Users\Application Data\Autodesk\RST 2009\Imperial Templates (C:\Documents and Settings\All Users\Application Data\Autodesk\RST 2009\Metric Templates)*.
- Select *Detail Component.rft (Metric Detail Component.rft)* from the list of templates to open the 2D detail component template.
- Click Open.

4. Click File menu > Save As.

5. In the Save As dialog box:

- Navigate to the desktop to save the file.
- For File Name, enter **i_welded wire fabric.rfa (m_welded wire fabric.rfa)**.
- Click Save.

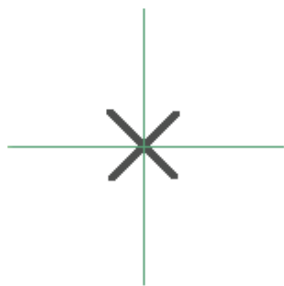
6. On the Design Bar, Family tab, click Lines to sketch the lines of the welded wire detail component.

7. On the Options Bar, ensure that the Chain check box is clear.

8. In the view window:

- Zoom in to the intersection of the vertical and horizontal reference planes.
- Sketch two diagonal lines of 0' 1" (25 mm) in the form of an X.

TIP: You can draw one of the diagonal lines and then mirror it along the vertical reference plane to create the other identical line. Use the arrow keys or the Move tool to accurately place the lines at the intersection of the reference planes.

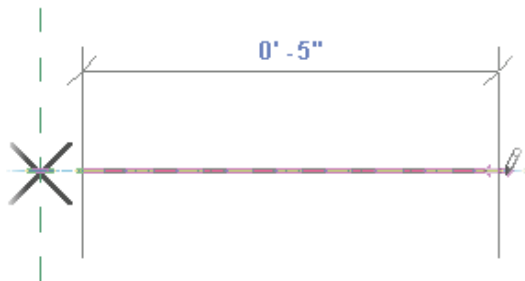


9. On the Design Bar, Family tab, click Modify to end the currently active command, if required.

10. On the Design Bar, Family tab, click Lines.

11. In the view window, sketch a horizontal line of 0' 5" (125 mm) along the horizontal reference plane. The horizontal line should be created at a distance of 0' 0 1/2" (12.5 mm) from the vertical reference plane.

TIP: You can use temporary dimensions to create the line with the specified length and spacing from the origin.



12. On the Design Bar, Family tab, click Modify to end the currently active command.

13. Click File menu > Save to save the new detail component.

Create the Repeating Detail

1. Open *i_creating_a_repeating_detail.rvt* or *m_creating_a_repeating_detail.rvt*. The file opens in the Section 2 view.
2. Press CTRL+TAB to switch to the *i_welded wire fabric.rfa* or *m_welded wire fabric.rfa* file.
3. On the Design Bar, Family tab, click Load into Projects to load the 2D welded wire fabric detail component. Notice that the *i_creating_a_repeating_detail.rvt* (*m_creating_a_repeating_detail.rvt*) file is activated. You will create the repeating detail in this file.

NOTE: If multiple projects are open on your computer, the Load into Projects dialog box is displayed. In the dialog box, select the check box for the *i_creating_a_repeating_detail.rvt* (*m_creating_a_repeating_detail.rvt*) file and click OK.

4. On the Design Bar, Drafting tab, click Repeating Detail to create the repeating detail.

TIP: If the Repeating Detail command is not displayed on the Drafting tab, click More Tools > Repeating Detail.

5. On the Options Bar, click Element Properties.

6. In the Element Properties dialog box, click Edit/New to modify the properties of the repeating detail.

7. In the Type Properties dialog box, click Duplicate to create a copy of the detail component. You do this so that the existing repeating detail is not overwritten.

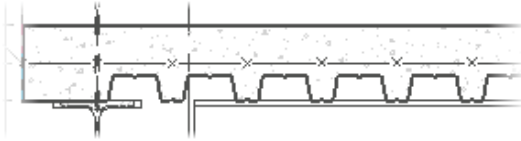
8. In the Name dialog box:

- For Name, enter **Welded Wire Fabric**.
- Click OK.

9. In the Type Properties dialog box, under Type Parameters:

- Select *i_welded wire fabric* (*m_welded wire fabric*) from the Detail list.
- For Spacing, enter **0' 6" (150 mm)**.
- Select 90° Counterclockwise from the Detail Rotation list.

10. Click OK to close each dialog box.
11. In the view window, pan and zoom to display the slab.
12. To sketch the welded wire fabric:
 - Click the left edge of the slab.
 - Move the cursor to the right edge of the slab.
 - Click to end sketching the welded wire fabric.



13. On the Design Bar, Drafting tab, click Modify to end the currently active command.
14. Close the file without saving.

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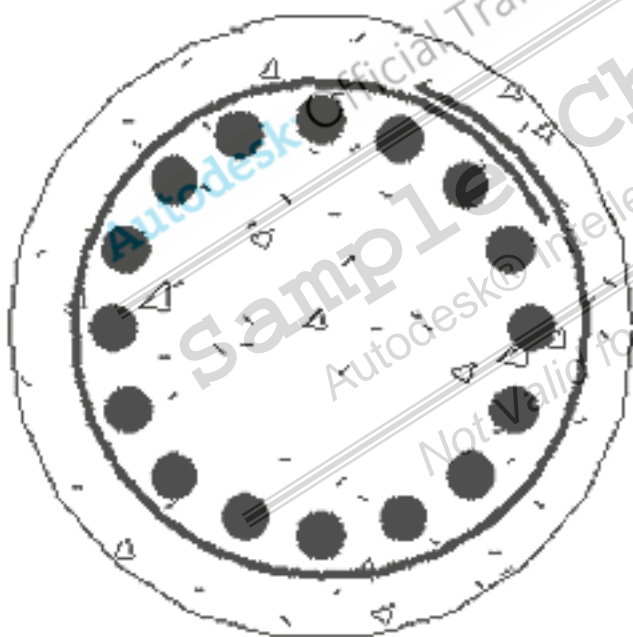
Lesson: Working with Detail Groups

Overview

This lesson describes how to work with detail groups. You begin the lesson by learning the steps to create and edit detail groups. Then, you learn about some recommended practices for creating and editing detail groups. The lesson concludes with an exercise on working with a detail group.

With Revit Structure, you can create detail groups for typical connection or reinforcement configurations used by your organization. Detail groups save time and improve detail accuracy because you can insert approved configurations into a given project from a central group library.

Although Revit Structure has detailing and reinforcing tools available, using typical details for standard situations is usually more efficient. A standard situation would be a roof detail where an I-beam that supports the roof slab is supported by a bolted angle channel, and is exactly the same for all the roofs in the project.



Detail group of longitudinal reinforcing and circular ties for a concrete column

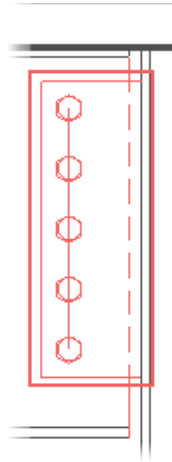
Objectives

After completing this lesson, you will be able to:

- Create detail groups.
- Edit detail groups.
- State the recommended practices for creating and editing detail groups.
- Work with a detail group.

Creating Detail Groups

An assembly or collection of two or more detail components is called a detail group.



Detail group of bolts and a steel angle for a standard framed beam connection

You create a detail group by using the Group command from the Edit menu. After you create a detail group, you can save it to a detail group library so that it is available for use in other projects.

You can create detail groups in two situations, when you already have detail components drawn in your project and when you do not have them in your project.

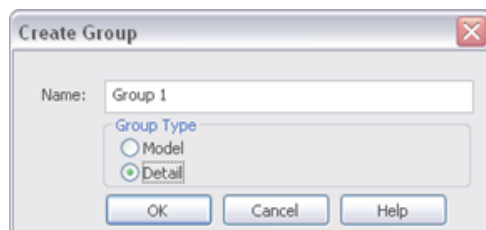


After the new detail group is created, you can view it under Groups > Detail in the Project Browser.

Procedure: Creating Detail Groups Without Detail Components

The following steps describe how to create detail groups when detail components do not exist in a project.

1. Click Edit menu > Group > Create Group.
2. In the Create Group dialog box:
 - Provide an appropriate group name.
 - Click Detail.



3. Draw detail components and detail lines to create your detail group in the project.
4. On the Detail Group toolbar, click Finish to complete the creation of the detail group.

Editing Detail Groups

At times, you might want to add or remove components from a detail group. For example, you have added two detail components in the form of high-strength bolts to a structural steel connection. If you place the two detail components in a group, you can remove either or both of the two bolts using the Edit Group option.

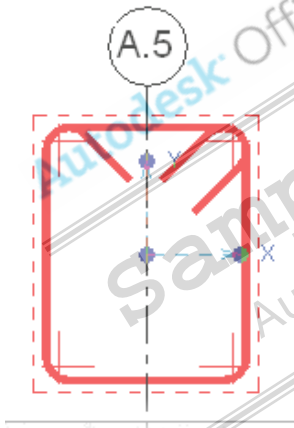
After a detail group is created, it behaves as one unit and changes made to any instance of the group propagate to all instances of that group in the current project. If a change to a particular group is meant to be a change for future projects as well, remember to save to library.

You can draw additional detail components while in group editing mode. These components are automatically added to the group, unless you choose to remove them from the group before you finish editing it.

Procedure: Editing Detail Groups

The following steps describe how to edit detail groups:

1. Select a detail group in a project to edit.



The Edit Detail Group mode is activated, the selected detail group is highlighted, and the rest of the content in the active view is unavailable for editing.

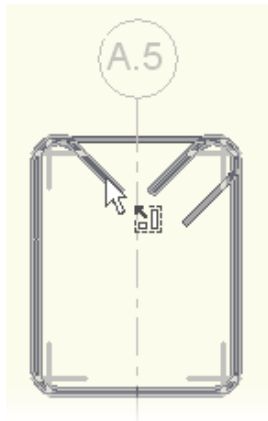
2. On the Options Bar, click Edit Group.



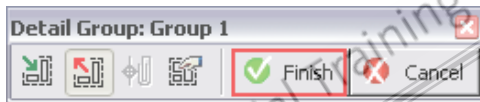
3. On the Detail Group toolbar, click Add To Group to add components or Remove From Group to remove them.



4. Select the component to add or remove.



5. On the Detail Group toolbar, click Finish.



Guidelines for Creating and Editing Detail Groups

The following recommended practices help you create and edit detail groups effectively.

- Specify a central library with a name indicative of the detail components and groups in it so that these can be easily found and accessed by all the designers and detailers.
- Create detail groups for typical detail components that are repeating and save to the central library for reuse in other projects.
- Ensure that you create the new group from a copy of existing detail components, when creating a new detail group. This saves time.
- Shift an existing detail group in a project by selecting the instance of the group and dragging the green x-y axis to a new position to facilitate the placement of groups. This alters the origin of existing and subsequent instances of the group.

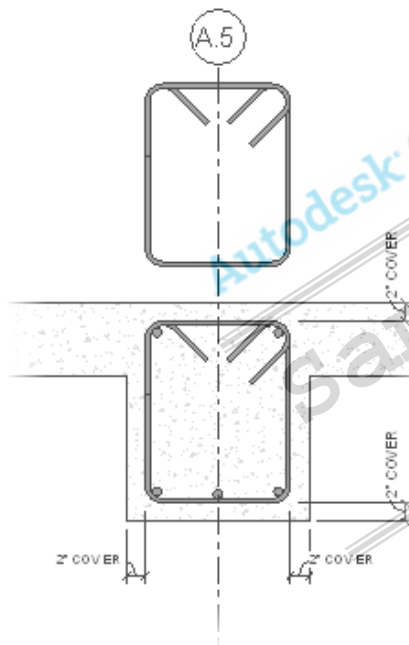
Exercise: Work with a Detail Group

In this exercise, you create a detail component and create and save a detail group for use in other projects.

You create a typical 2D reinforcing detail component for a beam component family to build a library of possible reinforcement configurations. The beam component family already contains one reinforcing detail component. You want to group these typical concrete reinforcing detail components into one group so that they can be used in future projects.

You do the following:

- Create a new detail component.
- Create and save a detail group.



The completed exercise

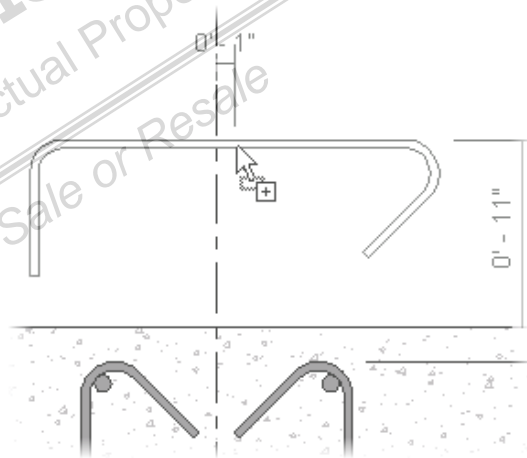


Completing the Exercise

To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 1: Working with Detail Components and Managing Details*. Click *Exercise: Work with a Detail Group*.

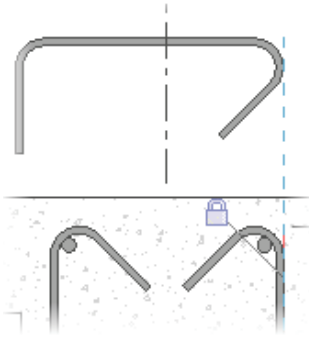
Create a New Detail Component

1. Open *i_grouping_detail_component_groups.rvt* or *m_grouping_detail_component_groups.rvt*. The file opens in the Section 4 view.
2. On the Design Bar, Drafting tab, click Detail Component to start placing a detail component.
3. Ensure that *i_stirrup_tie* (*m_stirrup_tie*) is selected in the Type Selector list.
4. To place a detail component, in the view window:
 - Move the cursor over the drawing area.
 - Click to place the stirrup tie just above the concrete beam, as shown.
5. On the Design Bar, Drafting tab, click Modify to end the Detail Component command.
6. In the view window, select the stirrup tie you placed in step 4.
7. On the Tools toolbar, click Align.

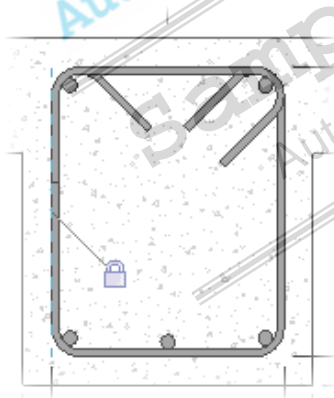


8. To align the right edge of the stirrup tie with the right edge of the existing beam stirrup, in the view window:

- Click the right edge of the existing beam stirrup.
- Click the right curved corner of the stirrup tie.
- Click the lock icon to lock the alignment.



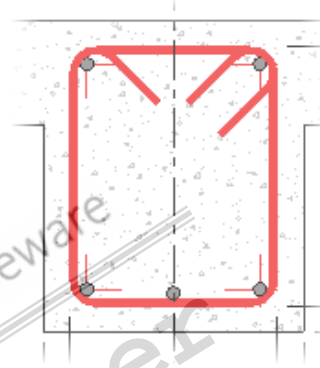
9. Repeat step 8 to align the edges of the stirrup tie with the top and left edges of the existing beam stirrup and to lock each alignment, as shown.



10. On the Design Bar, Drafting tab, click Modify to end the Align command.

11. To select all the detail components, in the view window:

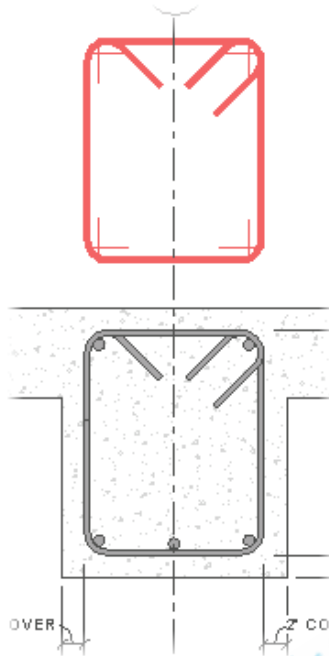
- Click the top edge of the beam stirrup.
- CTRL+select the left edge of the beam stirrup.



12. On the Edit toolbar, click Copy to start copying the detail component.

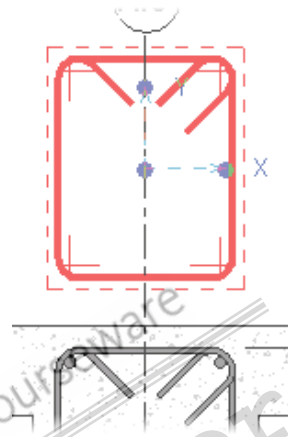
13. In the view window, click the top edge of the beam stirrup to establish a starting point for placing a copy of the detail component.

14. Click above the beam to place a copy of the detail component, as shown.



NOTE: A copy of the components has been created because the original components have been constrained to the concrete beam. Trying to create a grouping of the constrained components can create undesirable results.

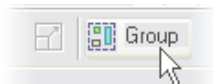
In the view window, notice that a dashed line is displayed around the grouped components.



3. On the Options Bar, click Element Properties.
4. In the Element Properties dialog box, click Edit/New.
5. In the Type Properties dialog box, click Rename.
6. In the Rename dialog box:
 - For New, enter **Concrete Beam 20 X 24 Reinforcing (Concrete Beam 508 X 610 Reinforcing)**.
 - Click OK to close all the dialog boxes.
7. Click File menu > Save to Library > Save Group.

Create and Save a Detail Group

1. On the Edit toolbar, click Group.



2. In the Create Detail Group dialog box:
 - Accept the default name of Group 1.
 - Ensure that the Open in Group Editor check box is clear.
 - Click OK.

8. In the Save Group dialog box:
 - Navigate to the folder where you saved the courseware datasets.
 - Click Save.

NOTE: You now have a group of reinforcing steel components that you can load into other projects by selecting Load from Library. You can also copy this group to other sections and details within the current project.

9. Close the file without saving.

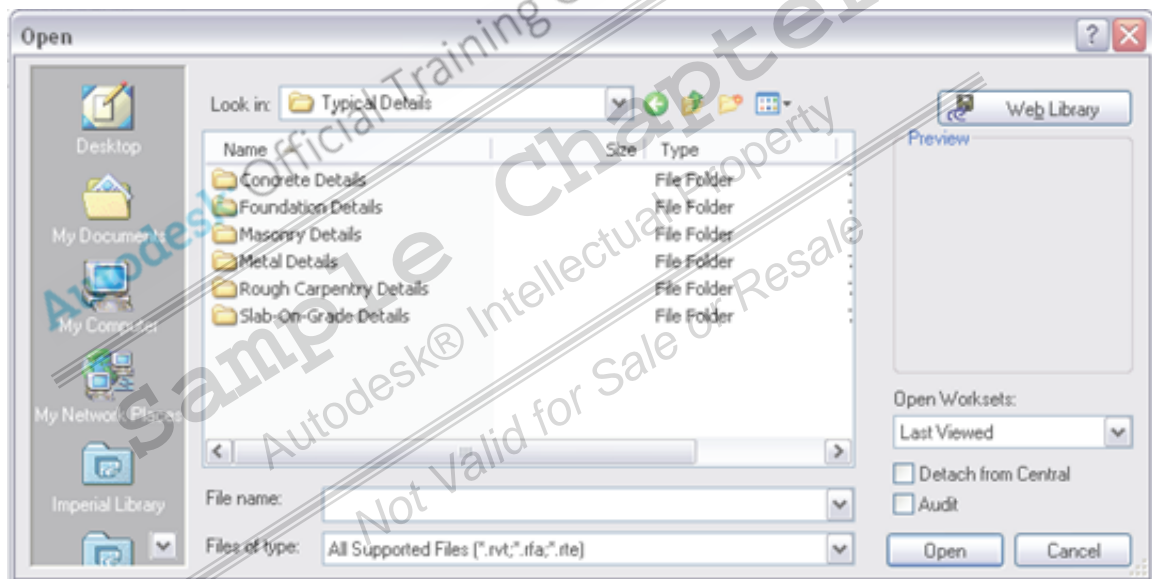
Lesson: Managing a Library of Typical Details

Overview

This lesson describes how to manage a library of typical details. You begin the lesson by learning about the libraries of typical details. Next, you learn the process and some recommended practices for managing these libraries. The lesson concludes with an exercise on managing a library of typical details.

You save typical details to libraries so that the details can be reused across projects. You can insert these details in projects wherever they are needed.

Most structural engineering firms develop and maintain libraries of typical details in various formats. By effectively managing these libraries, you can use the details efficiently.



Directory of typical details organized on the basis of materials and structural systems

Objectives

After completing this lesson, you will be able to:

- Describe libraries of typical details.
- Identify the steps in the process of managing a library of typical details.
- State the recommended practices for managing a library of typical details.
- Manage a library of typical details.

About Libraries of Typical Details

A library of typical details enables you to retrieve details that are commonly used across projects. An organization may develop and maintain a large number of typical details. Therefore, it is important to organize these details in a logical order so that they can be easily retrieved and used in projects. To organize typical details, you create a folder structure on the server of your organization to function as a library.

Definition of a Library of Typical Details

Libraries of typical details are generally 2D detail views that are not directly associated with the structural model. You can save these detail views to folders on a server and use them in other projects. The folders that contain the typical details are collectively referred to as the library of typical details.

Saving to a Library of Details

Using Revit Structure, you can detail and annotate 3D model views or create 2D detail views. These views can be exported directly from a project to a new file and saved to the library of typical details. You can export 2D and 3D detail views to a new project, but only the 2D detail views can be exported to a new project as a complete detail or as part of another detail.

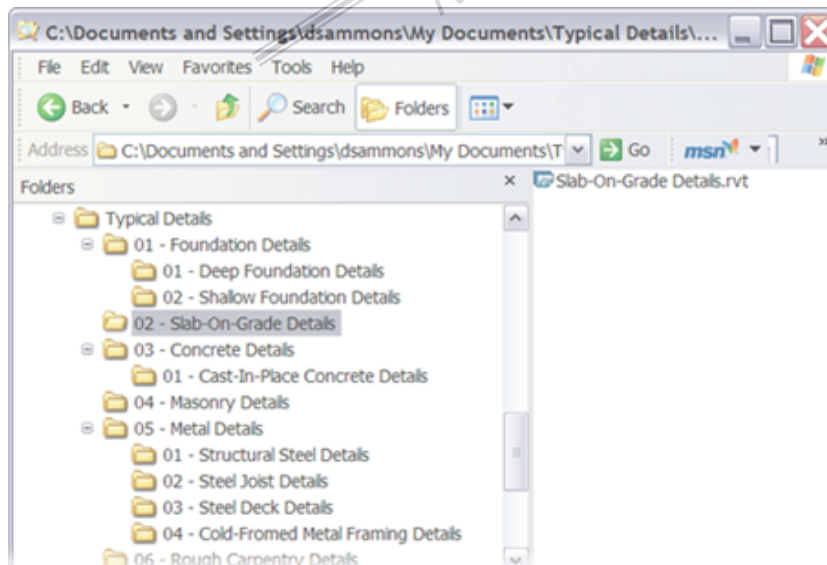
To save a view to an external file, you use the Save to Library option on the File menu.



You can also save a view to an external file by right-clicking the view in the Project Browser and selecting Save to New File.

Example of a Library of Typical Details

The following illustration shows a library of typical details organized by materials and structural systems.

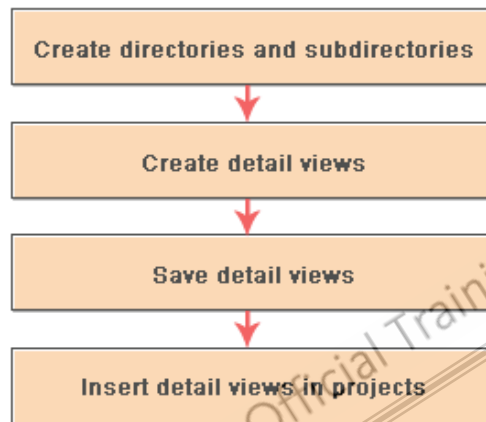


Process of Managing a Library of Typical Details

You can organize a library of typical details by categories, such as materials and structural systems, according to the project requirements.

Process: Managing a Library of Typical Details

The following illustration shows the process of managing a library of typical details.



The following steps describe the process of managing a library of typical details.

1. Create directories and subdirectories.

Create directories and subdirectories as required in Microsoft Windows Explorer to group details by materials, structural systems, or any other category.

2. Create detail views.

Create the detail views that contain 2D typical details or a combination of model geometry and 2D detail components.

3. Save detail views.

Save the detail views to external detail library files.

4. Insert detail views in projects.

Insert the detail views in a project from the library of typical details. You can insert typical detail drafting views using the Insert from File option on the File menu.

Guidelines for Managing a Library of Typical Details

The following recommended practices help you efficiently manage a library of typical details.

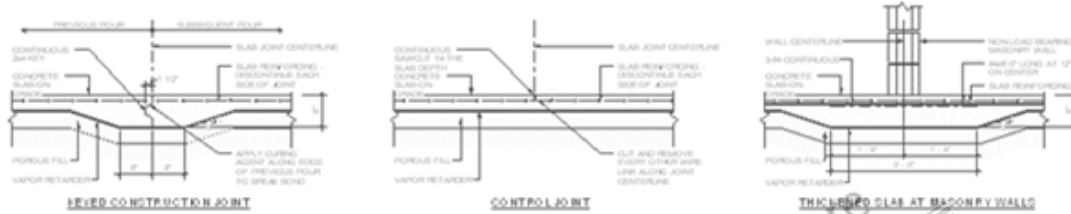
- Create a library of typical details on the server of your organization so that the details are readily available to all users. You can write-protect the Revit files containing the typical detail views to prevent the files from any intentional or accidental changes.
- Export detail views as sheets to ensure correct placement of the view when you import the detail view into another project.
- Save detail views to the library of typical details. This eliminates the need to include these views in a project template file and reduces the size of the project template file. You can load these views into a project, whenever required.

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Exercise: Manage a Library of Typical Details

In this exercise, you create a directory structure that you can use to manage your library of typical details.

You have an extensive library of typical details. You need to organize the library so that you can access the details and use them in Revit projects.



The completed exercise



Completing the Exercise

To complete the exercise, follow the steps in this book or in the onscreen exercise. In the onscreen list of chapters and exercises, click *Chapter 1: Working with Detail Components and Managing Details*. Click *Exercise: Manage a Library of Typical Details*.

1. On the desktop, create a new folder named **Typical Details**. This folder will be used as the library of typical details.
2. In the Typical Details folder, create the following subfolders:
 - Foundation Details
 - Slab-On-Grade Details
 - Concrete Details
 - Masonry Details
 - Metal Details
 - Rough Carpentry Details

These subfolders are named to organize the typical details by materials and structural systems and are just an example of names you can use.

3. Open *c_managing_a_library_of_typical_details.rvt* to save it in the library of typical details. The file opens in the Slab-On-Grade Details drafting view.

4. In the Project Browser, under Drafting Views (Detail), right-click Slab-On-Grade Details. Click Save to New File.
5. In the Save As dialog box:
 - Navigate to the *Typical Details > Foundation Details* folder you created on the desktop.
 - Click Save to save the drafting view to the library of typical details.
6. Close the file without saving.

Chapter Summary

Now that you have learned to work with 2D detail components and detail groups, you can efficiently create 2D detail components, and create and save detail groups for use in your current project and in other projects. You also learned to manage a library of typical details to retrieve typical details that are commonly used across projects.

In this chapter, you learned to:

- Create 2D detail components.
- Work with detail groups.
- Manage a library of typical details.

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