

AutoCAD Architecture 2010

Imperial Tutorials

Autodesk®

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Introduction

The AutoCAD Architecture tutorials show you how to use the features of AutoCAD® Architecture 2010 to complete your architectural projects.

Using the Tutorials

1

This lesson provides the basic information you need to get started with the AutoCAD® Architecture 2010 tutorials.

What is in the Tutorials

In the AutoCAD Architecture tutorials, you work with an AutoCAD Architecture project that contains the model for a research building. The building has laboratory space on the third level and general office space on levels one and two.

How the tutorials are organized

The tutorials are designed to follow the typical architectural workflows. The tutorials cover the following:

- Modeling, which includes space planning and the creation of the building shell, foundation slab, interior partition walls, and roof.
- Creating a AutoCAD Architecture project, which includes the creation of constructs, elements, views, and sheets.
- Documenting, which includes dimensioning, scheduling, tagging, and creating callouts.

The exercises in each lessons are designed to be basic and brief. You do not design an entire building, but you design enough to gain an understanding of how to use the tools and options in the product.

Accessing the Training Files

Training files are AutoCAD Architecture projects and drawings that you use with each lesson. In this exercise, you learn where the training files are located, and how to open and save them.

Locate the training files

The Tutorials option on the AutoCAD Architecture 2010 Help menu provides a link to the installation website for the tutorial content and training files. When you install the training files as instructed, they are copied to My Documents\Autodesk\My Projects.

In some lessons, you work with an AutoCAD Architecture project located in My Documents\Autodesk\My Projects. In other lessons you open an individual drawing that is not part of a project. These drawings are located in My Documents\Autodesk\My Projects\Training_Files_I.

NOTE The tutorials reference Windows XP file paths. If you are running Windows Vista, the paths may be different.


Use the training files

Depending on the lesson, a training file can be either a stand-alone drawing file or an AutoCAD Architecture project that contains the building model and views of the model that are used to complete the steps in a lesson. Each exercise includes a Training Files section that describes the project and drawing file used in the exercise.

The tutorials are grouped and presented in a recommended order for optimal learning. It is recommended that you complete the exercises within a lesson in the specified order. However, you can complete the tutorials in any order. For example, you can complete the Creating a Project tutorial before you begin the Modeling tutorial.

Open a training project

1 Click  ► Open ► Project.

2 In the left pane of the Project Browser, click , and, if necessary, scroll to select the file path and folder My Documents\Autodesk\My Projects.

If the project ACA_Create_Project - Imperial is not displayed, it may not have been extracted to this location. The Windows default location for My Documents is C:\Documents and Settings\<user name>\My Documents.

3 In the left pane, double-click ACA_Create_Project - Imperial.


4 In the Project Browser - Project Location Changed dialog, click Repath the project now.

The project name displays in bold type to indicate it is current.

5 In the Project Browser, click Close.

Save a training file



6 To save a training file with a new name, click  ► Save As.

7 In the Save Drawing As dialog:

- For Save in, select the folder in which to save the new file. You can save the file in the appropriate My Projects folder or in another location.
- For File name, enter the new file name. Unless you are directed to save the file, it is good practice is to save the training file with a unique name after you have made changes.
- For Files of type, verify that drawing files (*.dwg) is selected, and click Save.

Close a training file



8 Click  ► Close.

9 If you have made changes, you are prompted to save the changes. In most cases, you may close the file with or without saving changes.

AutoCAD Architecture Basics

2

In this lesson, you are introduced to basic concepts that will help you work effectively in AutoCAD Architecture. You also learn how to use the basic tools that make up the AutoCAD Architecture interface.

For optimal learning, you should understand the concepts and master the techniques introduced in this lesson before you begin the other AutoCAD Architecture tutorials.

Understanding the Concepts

What is AutoCAD Architecture 2010?

AutoCAD Architecture is a design and documentation system that supports the design, drawings, and schedules required for a building project.

In the AutoCAD Architecture model, every drawing sheet, 2D and 3D view, and schedule is a presentation of information from the same underlying building model. As you work in drawing and schedule views, AutoCAD Architecture collects information about the building project and coordinates this information across all other representations of the project.

Designing with Objects

AutoCAD Architecture is an object-based CAD application. When you design in the application, you draw from a large collections of objects that represent real-world architectural components, such as wall, doors, windows, stairs and roofs.

AutoCAD Architecture objects contain information that allows them to function like the real-world components that they represent, to relate intelligently to

one another, and to display in a 2-dimensional (2D) or 3-dimensional (3D) context.

Understanding AutoCAD Architecture 2010 terms

Many of the terms used to identify objects in AutoCAD Architecture are common, industry-standard terms. However, some terms are unique to AutoCAD Architecture. Understanding the following terms will help you to work effectively in the software.

Project: In AutoCAD Architecture, the project is the single database of information for your design. The project folder contains all information for the building design, from geometry to construction data. This information includes components used to design the model, views of the project, and drawings of the design. By using a single project folder, AutoCAD Architecture makes it easy for you to alter the design and have changes reflected in all associated areas (such as plan views, elevation views, section views, and schedules). Having one folder to track also makes it easier to manage the project.

Level: Levels are infinite horizontal planes that act as a reference for level-hosted elements, such as roofs, floors, and ceilings. Most often, you use levels to define a vertical height or story within a building. You create a level for each known story or other needed reference of the building; for example, first floor, top of wall, or bottom of foundation. To place levels, you must be in a section or elevation view.

Divisions: Divisions segment the building in the horizontal plane. A division might be a wing of a building. By default, each new project in AutoCAD Architecture has one division.

Constructs: Constructs are the main building blocks (or base drawing files) of the building model. A construct represents one unique portion of a building, such as a building core, an apartment, or an entire floor.

You assign a construct to a level and a division within the project.

Elements: An element is a generic building block for multiple use. For example, you can create an element for a typical bathroom layout and reference it multiple times into one or more constructs.

Views: After the structure of the building project is defined and constructs are assigned to levels and divisions, you can start to create view drawings. A view drawing references a number of constructs to present a specific view of the building project.

To create a view drawing, you first decide which portion of the building you wish to look at and which type of view to generate. View drawings

automatically reference the appropriate constructs according to their level/division assignments within the building.

Sheets: Sheets are the final output of a building design. Sheets are used to plot view drawings of your building project. After you create the necessary model views, detail views, and section/elevation views, you then drag the views onto the sheets to create sheet views. Sheets are collected together to create a sheet set.

Working in the Product

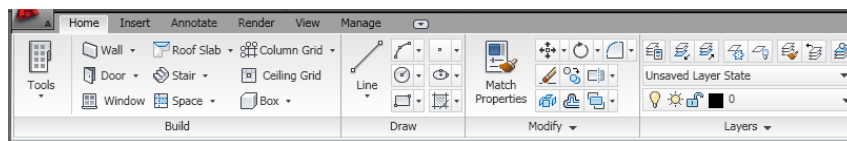
AutoCAD Architecture is a powerful CAD product for the Microsoft® Windows operating system. Its interface resembles those of other products for Windows, featuring a ribbon that contains the tools you use to complete tasks.

The AutoCAD Architecture interface is designed to simplify your workflow. With a few clicks, you can change the interface to support the way that you work. For example, you can set the ribbon to one of the three display settings for optimum use of the interface. You can also display several project views at one time, or layer the views so you see only the one on top.

Read the following topics to familiarize yourself with the basic parts of the AutoCAD Architecture product. Then experiment with hiding, showing, and rearranging interface components to support the way you work.

Ribbon Overview


The ribbon displays automatically at the top of the work area when you create or open a file. It provides a palette of all available tools. The ribbon is made up of tabs, and each tab is divided into panels.




You can customize the ribbon by changing the order of the panels, or moving a panel off the ribbon to the drawing area or your desktop. You can minimize the ribbon for maximum use of the drawing area.

To move panels

- 1 Click a panel label and drag the panel to a new location on the ribbon.

- 2 Click a panel label and drag the panel off the ribbon.
- 3 To return the panel to the ribbon, on the border of the floating panel, click  (Return Panels to Ribbon).

To minimize the ribbon

- 1 Click  (Minimize) to the right of the ribbon tabs.
- 2 The minimize behavior cycles through the following minimize options:
 - **Show Full Ribbon:** Shows entire ribbon.
 - **Minimize to Panel Titles:** Shows tab and panel labels only.
 - **Minimize to Tabs:** Shows tab labels only.

Ribbon Tabs and Panels

TIP When you see a button that shows a line dividing it into two sides, you can click the top (or left) side to access the tool you probably use most often. Click the other side to display a list of related tools.





Example of button that can be clicked on two sides


The following table describes the ribbon tabs and the types of commands they contain.

Ribbon Tab	Includes commands for...
Home	many of the tools you need to create the building model.
Insert	tools to add and manage secondary items such as raster images, and CAD files.

Ribbon Tab	Includes commands for...
Annotate	tools used for adding 2D information to a design.
View	tools used for managing and modifying the current view, and for switching views.
Manage	project and system parameters, and settings.

Expanded Panels

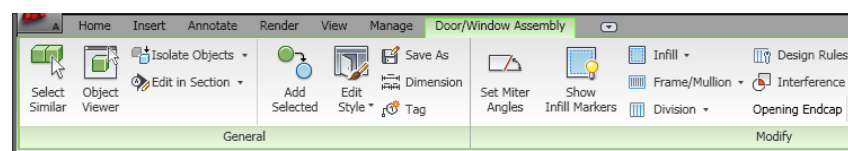
A drop-down arrow next to a panel name () indicates that you can expand the panel to display additional tools and controls. By default, an expanded panel closes automatically when you click another panel. To keep a panel expanded, click the push pin () in the lower left corner of the expanded panel.

A dialog-launcher arrow on the bottom right of a panel () opens a dialog.

Contextual Ribbon Tabs

When you execute certain commands or select an object, a special contextual ribbon tab displays that contains a set of tools that relate only to the context in which you are working.

For example, when you select a door/window assembly, the Door/Window Assembly contextual tab displays commands that are commonly used when working with door/window assemblies.













The Application Menu

Click the application button () to display the application menu.

The application menu provides access to many common file-related commands and also allows you to manage your files using advanced commands such as Export and Publish.








You can perform the following actions on the application menu:


On the application menu, click...	to...
 (New)	select a template and create a new drawing.
 (Open)	select a file to open.
 (Save)	save the current file.
 (Save As)	save the current drawing with a new name.
 (Export)	export the current drawing.
 (Print)	print the current drawing.
 (Publish)	publish the current project.
 (Send)	transmit the current drawing.
 (Utilities)	access tools to maintain the current drawing.

On the application menu, click...	to...
 (Close)	close the current drawing.
Options	set various AutoCAD Architecture options

Using the Quick Access Toolbar

The Quick Access toolbar is located on the AutoCAD Architecture title bar and contains the following items by default:

Quick Access Toolbar Item	Description
 (New)	creates a new drawing.
 (Open)	opens a file.
 (Save)	saves the current drawing.
 (Undo)	cancels the last action. Displays list of all actions taken during the session.
 (Redo)	reverses the effects of the previous Undo command.
 (Plot)	prints a drawing.
 (Project Browser)	opens the Project Browser.

Quick Access Toolbar Item	Description
 (Project Navigator)	opens the Project Navigator.


To undo or redo a series of operations, click the drop-down to the right of the Undo and Redo buttons. This displays the command history in a list. Starting with the most recent command, you can select any number of previous commands to include in the Undo or Redo operation.

The Quick Access toolbar can display below the ribbon. Click  at the right side of the Quick Access toolbar, then click Show Below the Ribbon to change the display setting.

You can add an item to the Quick Access toolbar from the drop-down by clicking More Commands and dragging the command from the Command List pane to the Quick Access toolbar.

Project Browser

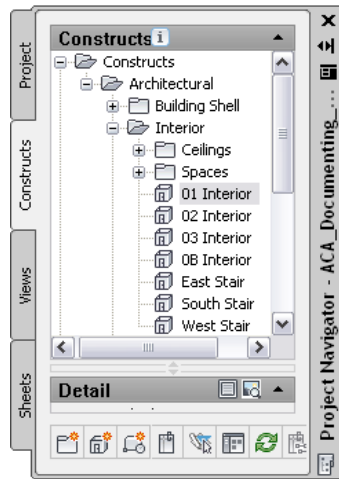
Use the Project Browser to create, copy, and switch between projects. On the left side of the Project Browser, you can create new projects, browse existing projects, and select the current project. On the right side of the Project Browser, an embedded Internet Explorer allows you to browse your project home page.

To open the Project Browser, on the Quick Access toolbar, click  (Project Browser).

To change the current project, double-click the name of a project in the left pane.


Project Navigator

After you select a project in the Project Browser, you use the Project Navigator to create, edit, and manage the drawing and construction documentation files within the project. Use the Project Navigator to create and open elements, constructs, views, and sheets for the current project.



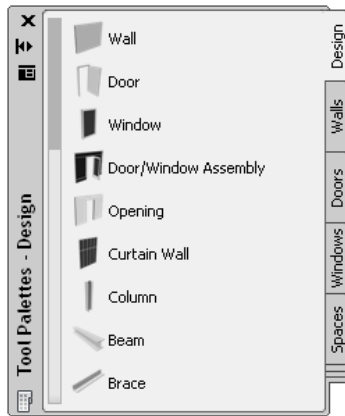
The Project Navigator has 4 tabs that correspond to the main phases of project creation:

- The Project tab contains the project information, including the levels and divisions in the building model.
- The Constructs tab manages the construct and element drawings that make up the building model.
- The Views tab manages the drawings that contain views of the building model.
- The Sheets tab organizes all the plotting sheets (created from referenced views) into a single project sheet set.

To open the Project Navigator, on the Quick Access toolbar, click  (Project Navigator).

Tools and Tool Palettes

AutoCAD Architecture includes a large inventory of tools organized into tool palettes. Tools represent the individual objects you can add to a drawing. For example, there are numerous tool palettes containing tools for design, such as tools for working with walls, windows, and doors. There are also tool palettes containing documentation tools, such as those for annotation and callouts.




To open the current tool palette, click Home tab ► Build panel ► Tools drop-down ► Design Tools.

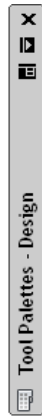
To switch the active tool palette group, right-click the title bar of the currently active tool palette group. On the context menu, select the tool palette group that you want to display.

Controlling the Appearance of Palettes

Palettes, such as a tool palette or the Properties palettes, remain open as you work in AutoCAD Architecture. You can control the behavior of a palette by using techniques to hide, dock, or pin it.

You can hide a palette so that it becomes hidden when you move the cursor away from it, leaving only the title bar visible. To automatically hide a palette,

in the title bar of the palette, click  (Auto-hide). To temporarily redisplay a hidden palette, move the cursor over the title bar.



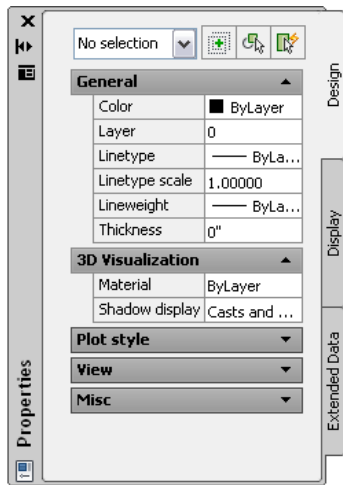
To disable auto-hide, click (Auto-hide) again.

You can position palettes in the application window to make the best use of your work area. A palette can be docked on the left or right side of your workspace, or it can float (undocked).

To dock a palette, right-click the title bar of the palette, and click Allow docking. Position the cursor over the title bar, and drag the palette to the left or right side of the workspace. To undock a palette, drag the palette from the edge of the workspace.

Properties Palette

The Properties palette provides a central location to view the properties of a selected object. Use the Properties palette to view and change settings for the style, dimensions, location, property set data, and other characteristics of an object.



If the Properties palette is not displayed when you select an object, you can display it by clicking Home tab ► Build panel ► Tools drop-down ► Properties.

Drawing Window Status Bar

The drawing window status bar is located at the bottom of the drawing window. It contains the following information about the current project and drawing:

- Name of the current project
- Type (construct, element, view, or sheet) and name of the current drawing
- Active scale for the current drawing or viewport
- Display configuration of the current viewport or model space view
- Cut plane height

Options at the far right of the drawing window status bar provide access to the following functions: Surface Hatch Toggle, Layer Key Overrides, Isolate Objects, AEC Project Standards, Autodesk TrustedDWG, and Manage Xrefs.



Command Line Window

The command line window is located under the drawing window status bar. You can use it to enter a command by typing the command name. Some commands have abbreviated names. For example, instead of entering line to start the LINE command, you can enter l. To find a command, you can type a letter in the command window, and press *TAB* to cycle through all the commands that begin with that letter. To repeat a command, press the Up arrow to scroll through recent commands.



Application Status Bar

The application status bar is located under the command line window. It contains the following information and tools when you drawing is open:

- Coordinate values
- Drawing tools
- Quick properties
- View tools
- Navigation tools
- Annotation tools
- Workspace
- Lock
- Elevation
- Clear screen



Style Manager

The Style Manager provides a central location where you can view and work with styles.

A style is a set of parameters that determines the appearance or function of an object in AutoCAD Architecture. For example, a door style determines the type of door represented in a drawing, such as single, double, bi-fold, or hinged. The door style also determines the shape of the door, such as rectangular or arched, as well as default frame dimensions, standard sizes, and display properties. You assign the same style to all instances of an object that have the same characteristics. For example, you could assign one door style to all the office doors in a building and another door style to all fire doors in the building.

To access the Style Manager, click **Manage** tab ► **Style & Display** panel ► **Style Manager**.

Content Browser

The Content Browser is a library of tool catalogs that contain tools, tool palettes, and tool packages. You can locate tools in the content browser either by searching or by navigating through the tool catalogs.

You will use the Content Browser in several lessons in the tutorials to obtain tools that you use to perform specific tasks.

To access the Content Browser, click **Insert** tab ► **Content Panel** ► **Content Browser**.

Performing Common Tasks

In this exercise, you perform some common AutoCAD Architecture tasks. It is recommended that you master these tasks before you begin the other tutorials, so that you are comfortable working in AutoCAD Architecture and can focus on the information presented in each lesson.

To practice these tasks, you open a training file that you will work with later in the tutorial.

Working with Objects

Open a training file


1 Click  ► **Open**.

- 2** In the Select File dialog, browse to My Documents\Autodesk\My Projects\ACA_Create_Project - Imperial\Constructs\Architectural\Interior\01 Interior.dwg, and click Open.


Enable object snaps

Throughout the tutorials, you enable and disable the use of object snaps and control which snaps are available as you create your design.

When object snaps are enabled, the cursor snaps to specified points on objects. For example, you can snap to the endpoint of a line or snap to the intersection of 2 lines.

- 3** On the application status bar, verify that Object Snap  is enabled. If the icon is darkened, click it to enable object snaps.

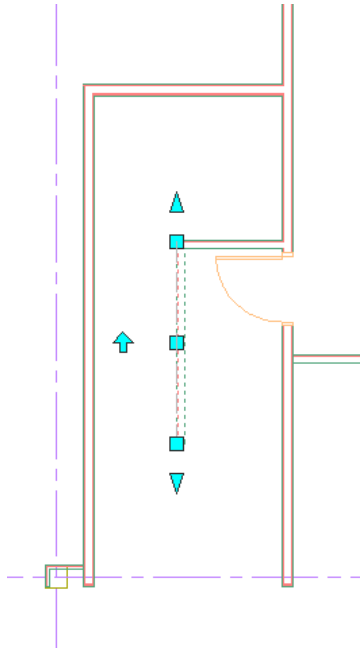
Configure object snaps

- 4** Right-click Object Snap , and click Settings.
- 5** In the Drafting Settings dialog, on the Object Snap tab, select the snaps you want to enable, clear all other snaps, and click OK.

Select objects

In order to modify a object, you must first select it. There are several ways you can select one or more objects in a drawing:

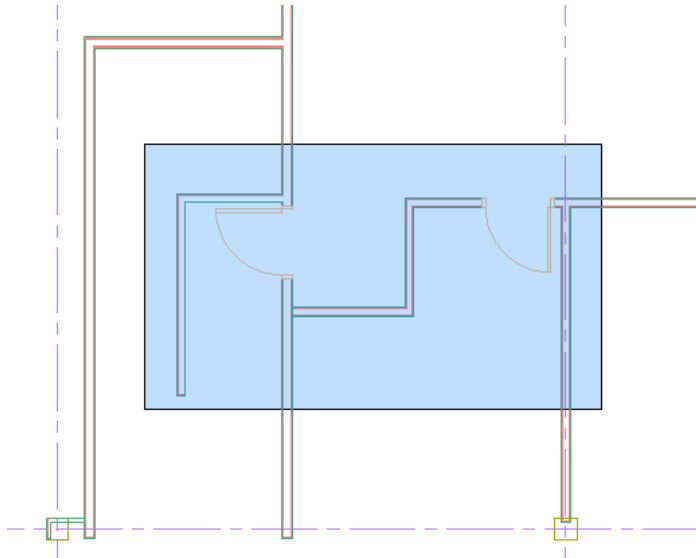
- 6** Move the cursor over an object (such as a wall), and click to select it.



7 Press *ESC* to deselect the object.

8 Click outside an object or group of objects, drag the cursor to draw a bounding box around the objects, and click a second time to select all objects that are completely within the bounding box.

NOTE Dragging the cursor from left to right selects only the objects that are entirely enclosed by the rectangular window. Dragging from right to left selects objects that the window encloses or crosses.



9 Press *ESC* to deselect the objects.

Select similar objects

10 Select an object, right-click, and click Select Similar. This selects all objects in the drawing of that type.


NOTE Alternatively, with an object selected, on the ribbon click <object> tab ► General panel ► Select Similar.

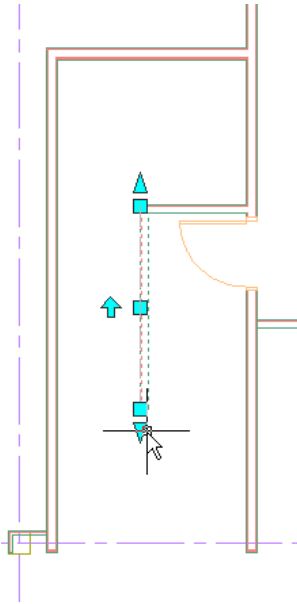
11 Press *ESC* to deselect the objects.

Use editing grips

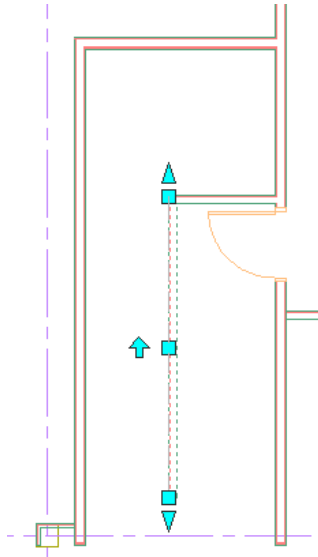
Grips are small, solid-filled shapes displayed at strategic points on a selected object. Grips make it easy to modify and work with objects.

12 In the drawing area, select a wall.

13 Click the lengthen grip () at the end of the wall as shown.




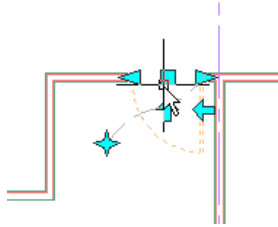
14 Click to specify a new endpoint for the wall.



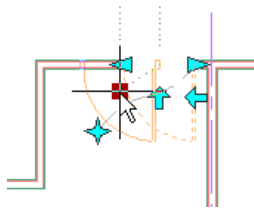
15 Press *ESC*.

16 Select a door.

17 Click the location grip ().




18 Click to specify a new location for the door.



When you use the location grip to move an object, associative movement enables you to move a component quickly and accurately without breaking the connection with other objects.

19 Press *ESC*.

Undo a command

20 On the Quick Access toolbar, click  (Undo).

NOTE Undo has no effect on commands that open, close, or save a window or a drawing, or on commands that display information, change the graphics display, regenerate the drawing, or export the drawing to a different format.

Repeat the last command

21 Press the Up arrow to display the last command in the command line window.

22 Press *ENTER*.

Cancel a command

23 Press *ESC*.

Modifying the View

In this exercise, you learn how to modify your view of the drawing as you work with your AutoCAD Architecture project.

In the tutorials, you will frequently need to change what you see in the drawing window. For example, you may need to pan to a specific region of a drawing or zoom to fit an entire structure or floor plan into the view. You may also be told to use different 2D and 3D views to display your design.

Practice these techniques until you can easily adjust your view of the drawing in the drawing area.

Open the training file

Continue to work with the drawing you opened in the previous exercise.


Pan (move) the view

- 1 Click and hold the mouse wheel, and drag the drawing area to reposition it.


Zoom to adjust the view

- 2 Roll the mouse wheel up to zoom in. Roll the mouse wheel down to zoom out.

- 3 To zoom to a specific area in the drawing, click View

tab ► Navigate panel ► Zoom drop-down ► Window (), and specify 2 points.

- 4 To zoom to display the extents of the drawing, click View

tab ► Navigate panel ► Zoom drop-down ► Extents ().

Use visual styles

A visual style is a collection of settings that control the display of edges and shading in the viewport. As soon as you apply a visual style or change its settings, you can see the effect in the viewport. Five default visual styles are supplied with the product.

- 5 Click View tab ► Appearance panel ► Visual Styles drop-down

() ► 2D Wireframe.


Objects are displayed using lines and curves to represent the boundaries. Raster and OLE objects, linetypes, and lineweights are visible.

6 Click View tab ► Appearance panel ► Visual Styles drop-down

() ► 3D Wireframe.


Objects are displayed using lines and curves to represent the boundaries.

7 Click View tab ► Appearance panel ► Visual Styles drop-down

() ► 3D Hidden.

Objects are displayed using 3D wireframe representation. Lines representing back faces are hidden.

8 Click View tab ► Appearance panel ► Visual Styles drop-down

() ► Realistic.

Objects are shaded and edges are smoothed between polygon faces. Materials that you have attached to the objects are displayed.

9 Click View tab ► Appearance panel ► Visual Styles drop-down

() ► Conceptual.

Objects are shaded and edges are smoothed between polygon faces. The shading uses a transition between cool and warm colors rather than dark to light. The effect is less realistic, but it can make the details of the model easier to see.

Use preset 3D views

You can select predefined standard orthographic and isometric views.

10 Click View tab ► Appearance panel ► View drop-down ► SW Isometric.

11 Click View tab ► Appearance panel ► View drop-down ► Top.

Use the View panel

To quickly access view zoom options, visual styles, and preset views, you can use the View panel that floats in the drawing area when you open AutoCAD Architecture for the first time.

12 Expand a drop-down menu on the View panel and select a predefined view, a visual style, or a zoom option.



- 13** Click Return Panels to Ribbon in the upper right corner of the panel to return the View panel to the Home tab on the ribbon.



- 14** Click the Home tab, and drag the View panel back into the drawing area.

Use the ViewCube

The ViewCube is a 3D navigation tool that displays when the 3D graphics system is enabled and allows you to easily change views. Once the ViewCube is displayed, it appears in a corner of the drawing window in an inactive state. When you position the cursor over the ViewCube, it becomes active. By clicking the ViewCube, you can switch to a preset view, roll the current view, or change to the Home view of the model.

- 15** Click View tab ► Appearance panel ► Visual Styles drop-down

() ► 3D Wireframe.

The ViewCube displays.

- 16** Click a side, edge, or corner of the ViewCube to change the view.

- 17** When you are done practicing with the ViewCube, close the file without saving it.

Modeling

In this tutorial, you model the main features of the Research Building. You:

- Perform preliminary space planning.
- Create the building shell.
- Create the foundation slab for the building.
- Lay out interior partitions on one floor of the building.
- Create a hip roof over the tower portion of the building.

Space Planning

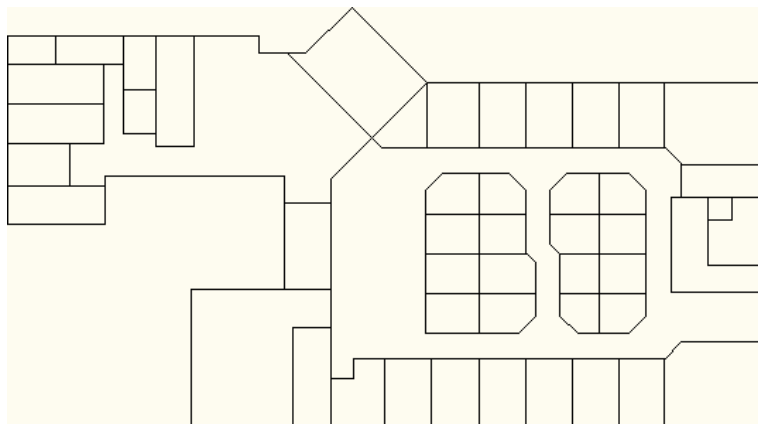
3

In this lesson, you use the automated space planning and scheduling tools in AutoCAD Architecture to calculate and report area on a space plan.

You learn to:

- Create a space plan with 2D tagged spaces from a linework drawing.
- Create a color-filled presentation plan that identifies space usage.
- Create a space inventory schedule that reports space usage and area on the space plan.
- Use a display theme to display a graphic report of the spaces by size.

Preliminary 2D floor plan sketch

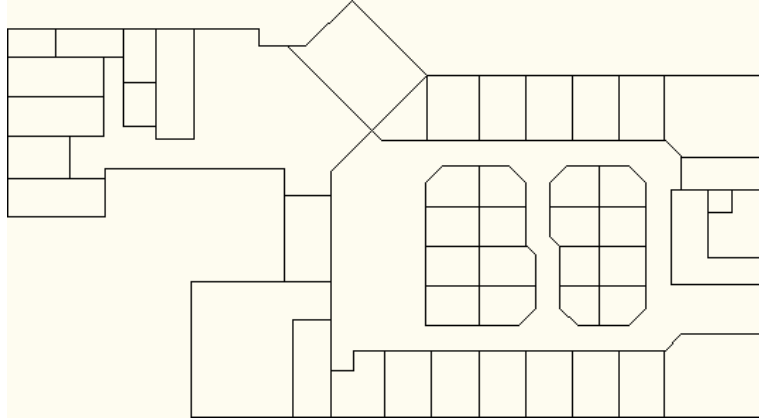


SPACE INVENTORY

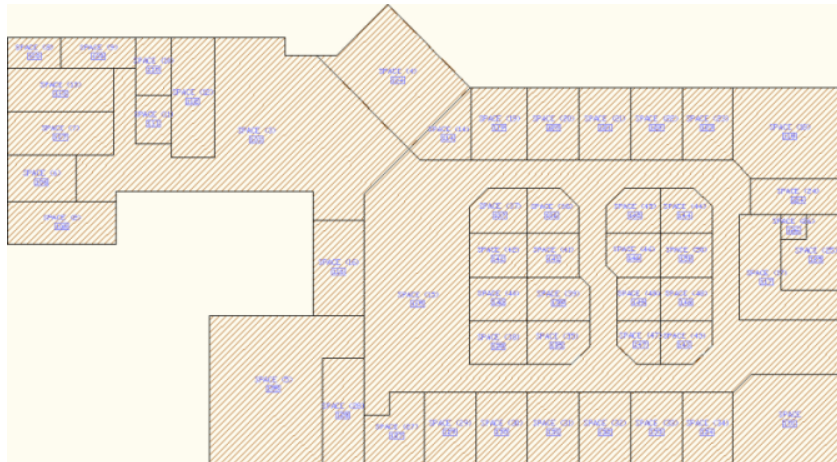
Room	Size
100-101	100-101
100-102	100-102
100-103	100-103
100-104	100-104
100-105	100-105
100-106	100-106
100-107	100-107
100-108	100-108
100-109	100-109
100-110	100-110
100-111	100-111
100-112	100-112
100-113	100-113
100-114	100-114
100-115	100-115
100-116	100-116
100-117	100-117
100-118	100-118
100-119	100-119
100-120	100-120
100-121	100-121
100-122	100-122
100-123	100-123
100-124	100-124
100-125	100-125
100-126	100-126
100-127	100-127
100-128	100-128
100-129	100-129
100-130	100-130
100-131	100-131
100-132	100-132
100-133	100-133
100-134	100-134
100-135	100-135
100-136	100-136
100-137	100-137
100-138	100-138
100-139	100-139
100-140	100-140
100-141	100-141
100-142	100-142
100-143	100-143
100-144	100-144
100-145	100-145
100-146	100-146
100-147	100-147
100-148	100-148
100-149	100-149
100-150	100-150
100-151	100-151
100-152	100-152
100-153	100-153
100-154	100-154
100-155	100-155
100-156	100-156
100-157	100-157
100-158	100-158
100-159	100-159
100-160	100-160
100-161	100-161
100-162	100-162
100-163	100-163
100-164	100-164
100-165	100-165
100-166	100-166
100-167	100-167
100-168	100-168
100-169	100-169
100-170	100-170
100-171	100-171
100-172	100-172
100-173	100-173
100-174	100-174
100-175	100-175
100-176	100-176
100-177	100-177
100-178	100-178
100-179	100-179
100-180	100-180
100-181	100-181
100-182	100-182
100-183	100-183
100-184	100-184
100-185	100-185
100-186	100-186
100-187	100-187
100-188	100-188
100-189	100-189
100-190	100-190
100-191	100-191
100-192	100-192
100-193	100-193
100-194	100-194
100-195	100-195
100-196	100-196
100-197	100-197
100-198	100-198
100-199	100-199
100-200	100-200
100-201	100-201
100-202	100-202
100-203	100-203
100-204	100-204
100-205	100-205
100-206	100-206
100-207	100-207
100-208	100-208
100-209	100-209
100-210	100-210
100-211	100-211
100-212	100-212
100-213	100-213
100-214	100-214
100-215	100-215
100-216	100-216
100-217	100-217
100-218	100-218
100-219	100-219
100-220	100-220
100-221	100-221
100-222	100-222
100-223	100-223
100-224	100-224
100-225	100-225
100-226	100-226
100-227	100-227
100-228	100-228
100-229	100-229
100-230	100-230
100-231	100-231
100-232	100-232
100-233	100-233
100-234	100-234
100-235	100-235
100-236	100-236
100-2	

In this exercise, you use automated space planning tools to create spaces on a preliminary floor plan. You use the linework on a 2D floor plan sketch to quickly generate 2D tagged spaces. You explore 2 different space creation methods: manual (one-at-a-time generation of spaces) and automatic (generation of several spaces at once).


2D floor plan sketch



Spaces generated from floor plan linework



Training File

- Click  > Open > Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_SP_01_Create_Spaces_i.dwg, and click Open.

Set the space properties

1 On the Design tab of the Design tool palette, click the Space tool



2 On the Properties palette:

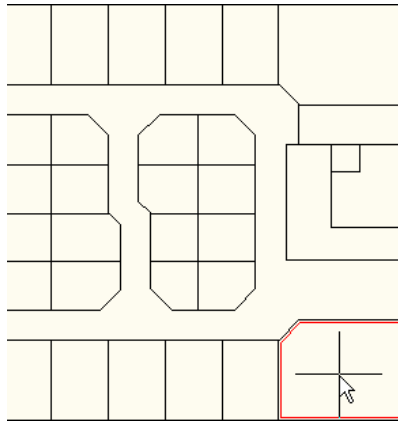
- Under General, for Style, select Standard.
- For Tag, select AEC7_Room_Tag.
- For Associative, select No.
- For Create type, select Generate.
- Under Component Dimensions, for Geometry type, select 2D.

Manually generate a space

3 Without clicking in any of the rooms, move the cursor into the room in the lower right corner of the floor plan.

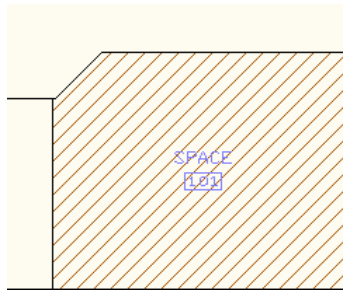
The space object automatically detects the room boundary and displays it as red.

TIP Before you add spaces, use boundary detection to determine if there are any gaps in the boundaries.



4 Click in the room.

A tagged space displays.

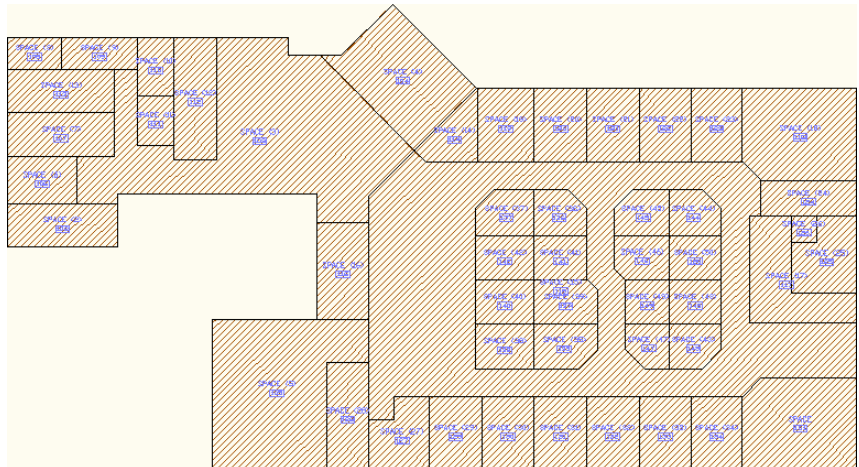


Automatically generate the remaining spaces on the floor plan

5 Right-click in the drawing, and click Generate all.

6 Press *ESC*.

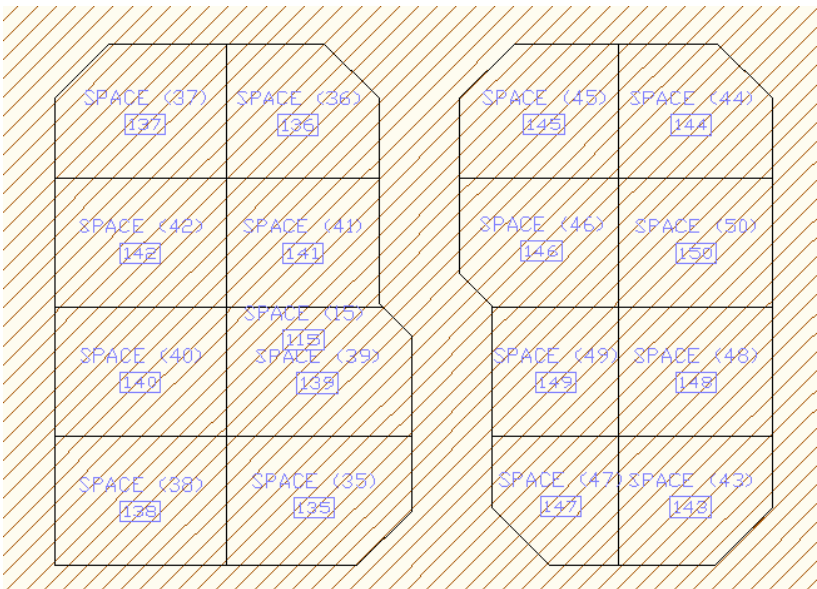
Spaces and tags display in each room on the floor plan. Because the tags are located in the geometric center of each space, depending on the size of each space and its proximity to other spaces, some space tags may overlap.



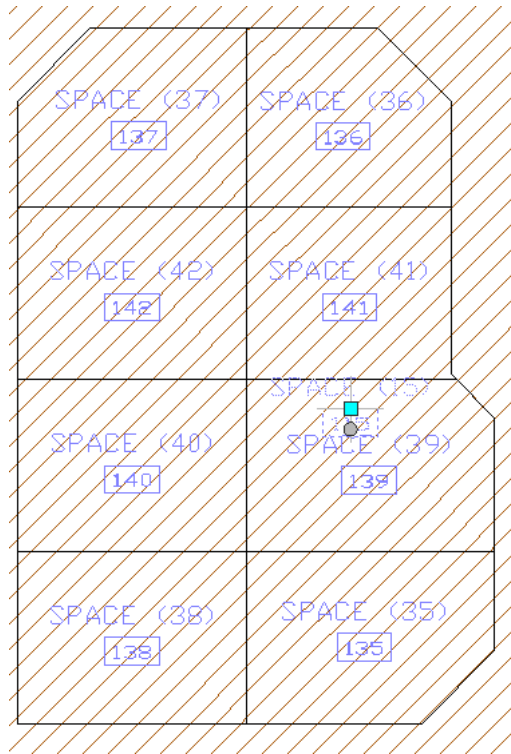
Reposition overlapping tags

7 Reposition one of the tags in the center office area:

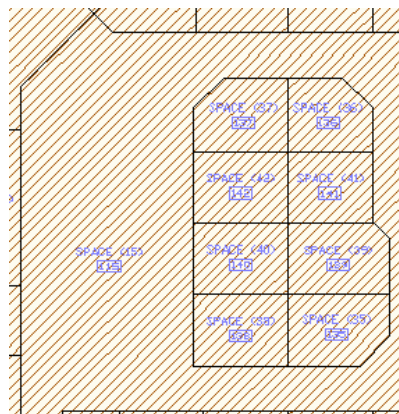
- Zoom to the center of the space plan.



- If necessary, on the application bar, click Object Snap to turn it off.
- Select the space tag as shown.



- Drag the cyan location grip to the center of the rectangular space on the left.



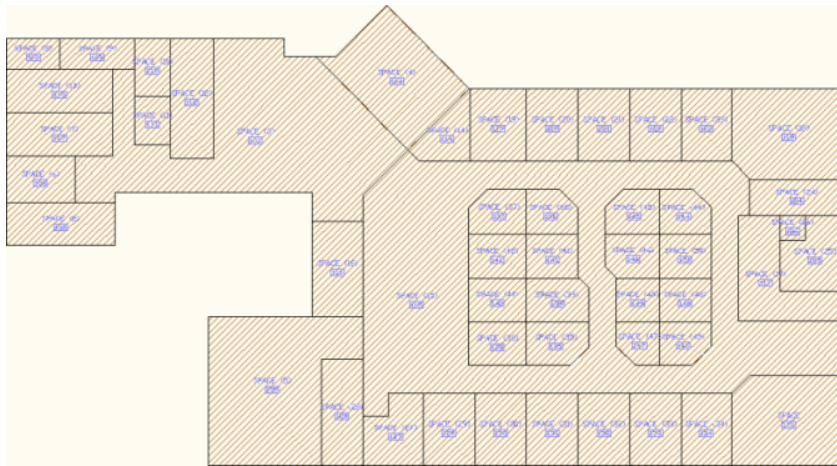
- Press *ESC*.

- 8 If necessary, reposition other tags on the plan.
- 9 Close the drawing with or without saving it.

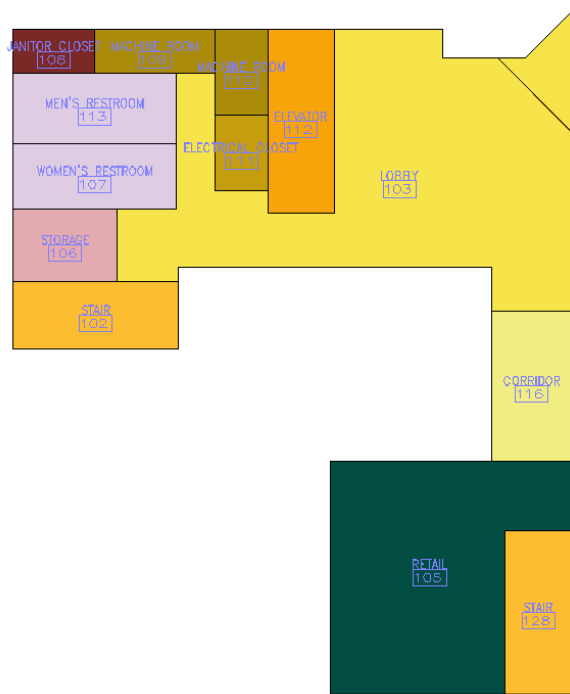
Creating a Color-Filled Presentation Plan

In this exercise, you redefine generic spaces on a space plan to identify specific room types on the plan. The redefined spaces feature specific room names and corresponding color fills.


Generic spaces



Redefined spaces identified by room type




Training File

- Click  ► Open ► Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_SP_02_Space_Styles_i.dwg, and click Open.

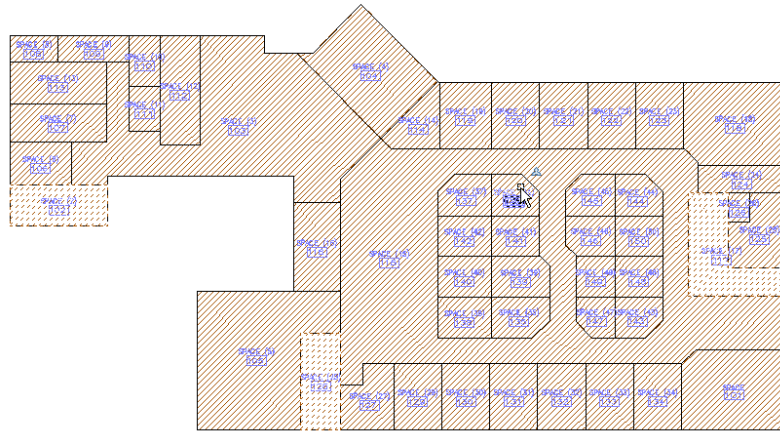
Redefine 3 spaces as stairways

1 On the Design tool palette, click the Spaces tab.

2 Right-click the Stairway tool (), and click Apply Tool Properties to ► Space.

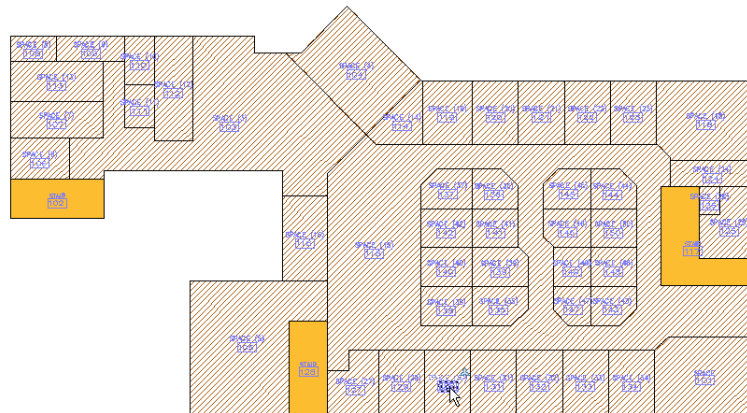
3 Select the 3 spaces shown below.

TIP Make sure you select the spaces and not the space tags.



4 Press *ENTER*, and press *ESC*.

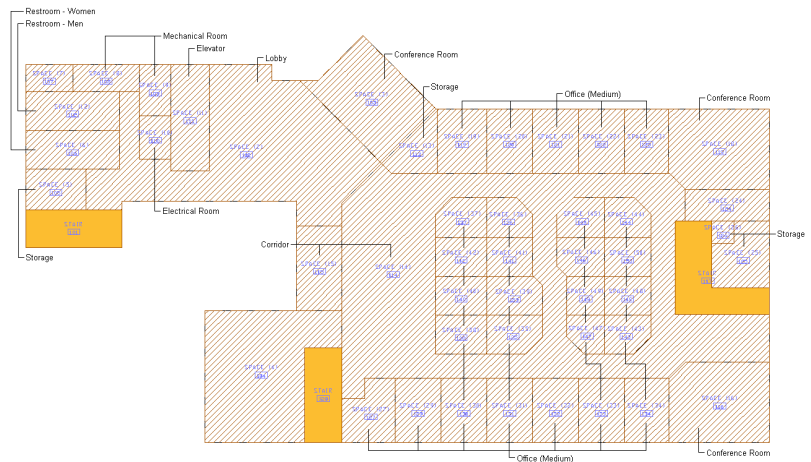
The tags on the 3 spaces identify them as stairs, and the spaces display a color fill.



Redefine most of the remaining spaces on the plan

5 Leaving the top left and lower left spaces empty, use other space tools on the tool palette (that correspond to the names in the plan below) to redefine most of the remaining spaces on the plan.

IMPORTANT After redefining each space type, press *ESC* to end the command.




Next, create new styles to define the 2 remaining spaces on the plan. You want to define the large lower space as a retail area and the small upper space as a janitor closet.

Create a Retail space style

- 6 Click Manage tab ► Style & Display panel ► Style Manager.
- 7 In the left pane of the Style Manager, under ACA_SP_02_Space_Styles.i.dwg, expand Architectural Objects.
- 8 Expand Space Styles, right-click Conference_Room, and click Copy.
- 9 Select Space Styles, right-click, and click Paste.
- 10 Right-click Conference_Room (2), and click Rename.
- 11 Enter **Retail**, and press *ENTER*.

The new Retail space style has the same properties as the Conference_Room style. If you apply the Retail space style as is, you will create a space with the same color fill as the Conference_Room style.

Change the color fill for the Retail space style

- 12 In the right pane of the Style Manager, click the Display Properties tab, and click  (Edit Display Properties).

13 On the Layer/Color/Linetype tab of the Display Properties dialog:

- For Base Hatch, under Color, click the current color, PANTONE 319 C.
- On the Color Books tab of the Select Color dialog, for Color, enter **3305 c**.
- Click OK twice.

14 Using the same technique, change the color of the fill for the following display representations that feature a style override:

- Plan High Detail
- Plan Low Detail
- Plan Presentation

Create a Janitor_Closet space style

15 Using the same technique that you used in the previous steps, create a Janitor_Closet space style using 181 c as the Base Hatch color.

16 When the space style is complete, click OK to exit the Style Manager.

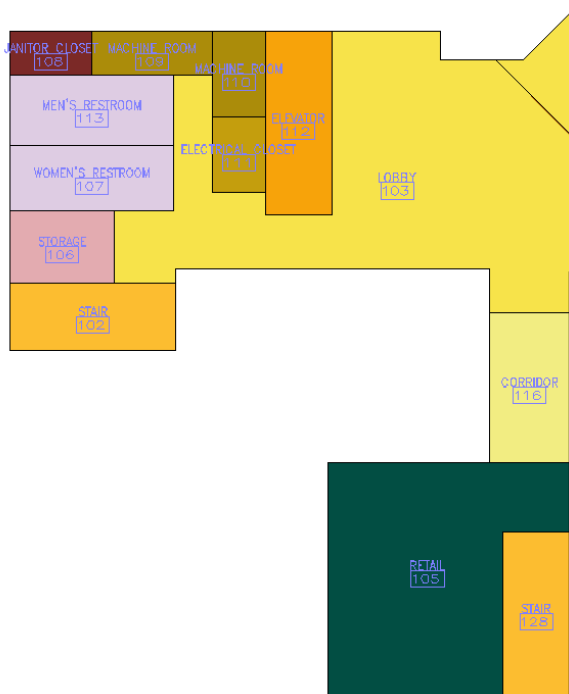
Apply the 2 new styles to spaces on the floor plan

17 Select the space in the top left corner of the space plan.

18 On the Properties palette, under General, for Style, select Janitor_Closet.

19 Press *ESC*.

20 Using the same method, apply the Retail style to the remaining space.

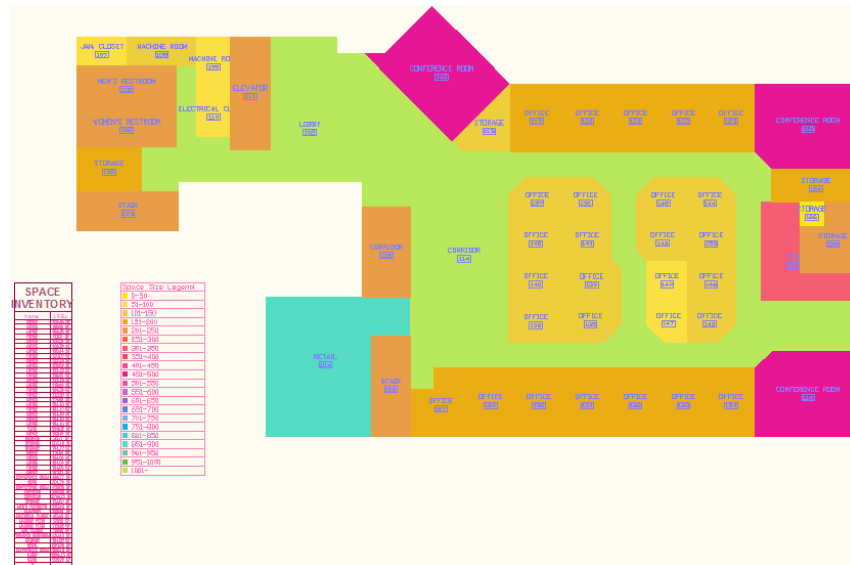


21 Close the drawing with or without saving it.


Creating a Space Inventory Schedule

In this exercise, you create a space inventory schedule that reports the name and area of the spaces on the space plan. After you create the schedule, you add a display theme to create a graphic report (legend) of the spaces by size.

Space inventory schedule and display theme legend on the space plan



Training File

- Click  > Open > Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_SP_03_Schedule_Theme_i.dwg, and click Open.

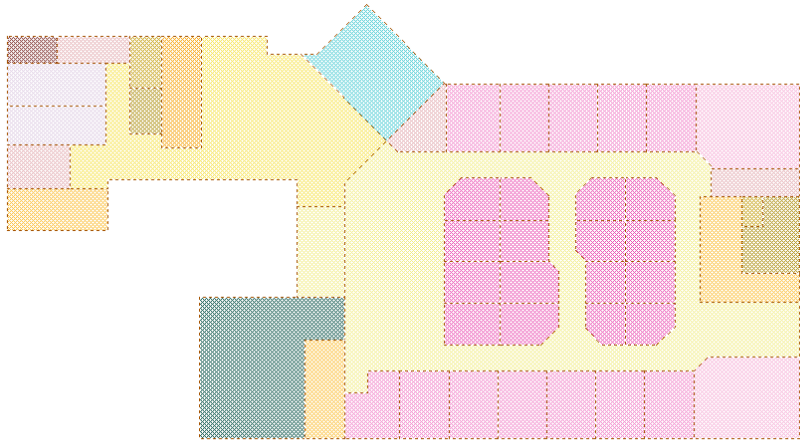
Create a space inventory schedule

- 1 Right-click the Tool palette title bar, and click Document.
- 2 Click the Scheduling tab, and click the Space Inventory Schedule



tool ().

- 3 Using a selection window, select all of the spaces on the plan, and press *ENTER*.



4 Specify the point shown below to place the upper left corner of the schedule, and press *ENTER* to accept the default size.

The schedule sizes to the current drawing scale and the annotation plot size that is set in the drawing options.



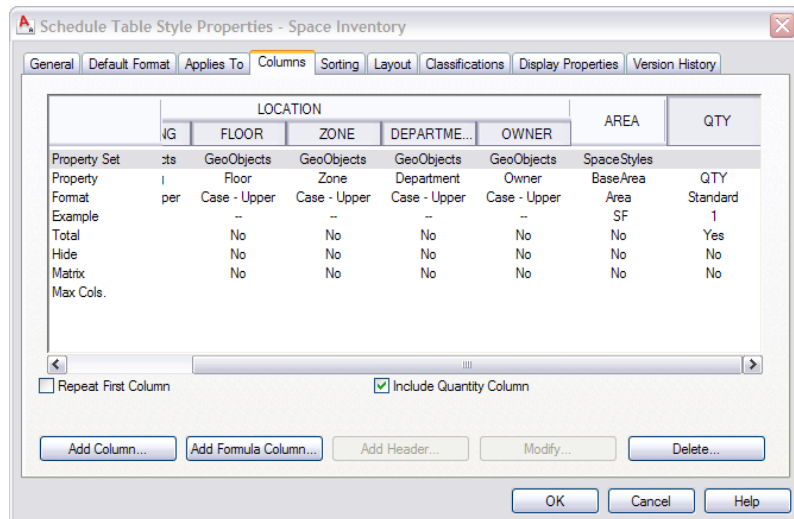
5 Zoom in to the schedule.

Notice that the schedule is missing information in most of its cells. Also, for this space plan, you need to display only the space names, area, and total area for the building scheme.

SPACE INVENTORY							
LOCATION						AREA	QTY
SITE	BUILDING	FLOOR	ZONE	DEPARTMENT	OWNER		
?	?	?	?	?	?	108.15 SF	2
?	?	?	?	?	?	89.59 SF	1
?	?	?	?	?	?	80.91 SF	1
?	?	?	?	?	?	108.79 SF	1
?	?	?	?	?	?	108.39 SF	1
?	?	?	?	?	?	106.44 SF	1
?	?	?	?	?	?	100.07 SF	1
?	?	?	?	?	?	122.13 SF	3
?	?	?	?	?	?	108.59 SF	1
?	?	?	?	?	?	128.21 SF	1
?	?	?	?	?	?	118.84 SF	1
?	?	?	?	?	?	104.78 SF	1
?	?	?	?	?	?	123.23 SF	1
?	?	?	?	?	?	174.61 SF	1
?	?	?	?	?	?	161.10 SF	5
?	?	?	?	?	?	216.02 SF	1
?	?	?	?	?	?	162.49 SF	1
?	?	?	?	?	?	30.71 SF	1
?	?	?	?	?	?	205.16 SF	1
?	?	?	?	?	?	161.17 SF	1
?	?	?	?	?	?	174.51 SF	1
?	?	?	?	?	?	181.04 SF	3
?	?	?	?	?	?	197.21 SF	1
?	?	?	?	?	?	468.77 SF	1
?	?	?	?	?	?	301.79 SF	1
?	?	?	?	?	?	468.65 SF	1
?	?	?	?	?	?	235.25 SF	1
?	?	?	?	?	?	2718.73 SF	1
?	?	?	?	?	?	124.50 SF	1
?	?	?	?	?	?	220.40 SF	2
?	?	?	?	?	?	248.61 SF	1
?	?	?	?	?	?	83.48 SF	1
?	?	?	?	?	?	98.86 SF	1
?	?	?	?	?	?	112.42 SF	1
?	?	?	?	?	?	79.89 SF	1
?	?	?	?	?	?	151.83 SF	1
?	?	?	?	?	?	890.73 SF	1
?	?	?	?	?	?	492.16 SF	1
?	?	?	?	?	?	1524.13 SF	1
?	?	?	?	?	?	223.29 SF	1
							50

Remove the unused columns in the schedule

- 6 Select the schedule table, right-click, and click Edit Schedule Table Style.
- 7 In the Schedule Table Style Properties dialog, click the Columns tab.
- 8 While pressing *CTRL*, select all of the schedule columns except Area.



9 Release *CTRL*, and in the lower right corner of the dialog, click Delete.

10 In the Remove Columns/Headers dialog, click OK.

Add a Name column to the schedule

11 Click Add Column.

12 In the Add Column dialog, click the Categorized tab.

13 In the left pane of the dialog, under SpaceObjects, select the Name property, and click OK.

14 In the Schedule Table Style Properties dialog, select the Name column, and drag it in front of the Area column.

Modify the Area column to include total area

15 Select the Area column, and click Modify.

16 In the Modify Column dialog, select Total, and click OK twice.

The new space inventory schedule displays in the drawing.

SPACE INVENTORY	
Name	AREA
OFFICE	109.15 SF
OFFICE	89.99 SF
OFFICE	109.15 SF
OFFICE	80.91 SF
OFFICE	109.79 SF
OFFICE	109.39 SF
OFFICE	105.44 SF
OFFICE	100.07 SF
OFFICE	122.13 SF
OFFICE	108.59 SF
OFFICE	122.13 SF
OFFICE	129.21 SF
OFFICE	122.13 SF

Add a display theme to the floor plan

17 On the Document Tool palette, click the Themes tab.

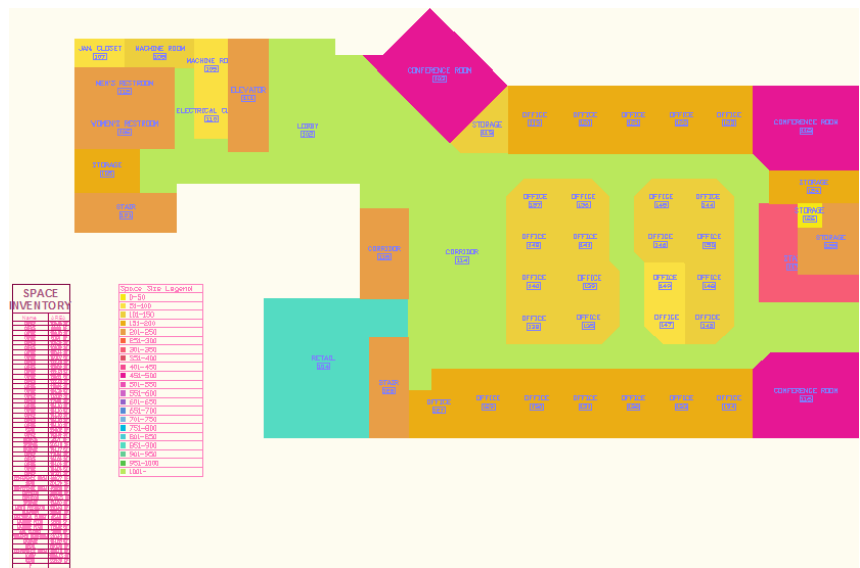


18 Click the Theme by Space Size tool ().

19 Specify a point to place the top left corner of the theme next to the schedule, and press *ENTER*.



20 Zoom in to view the schedule and theme.



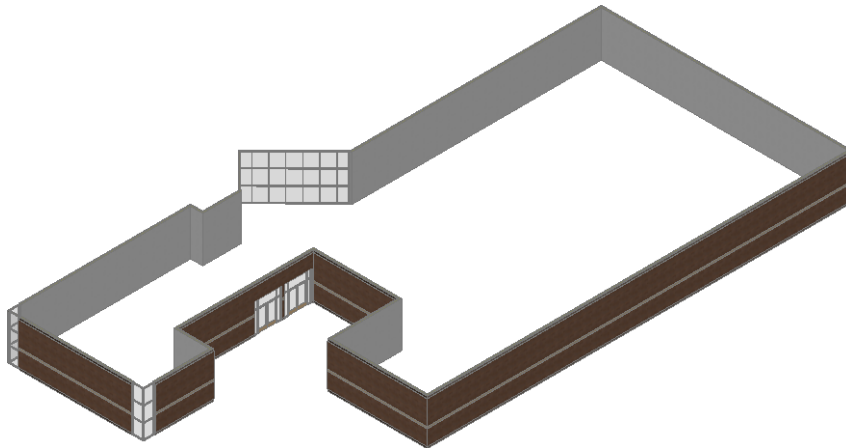
21 Close the drawing with or without saving it.

Creating the Shell

4

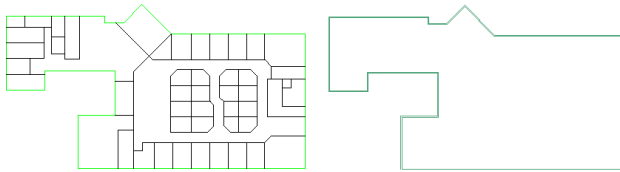
In this lesson, you create the building shell and lay out a structural grid for the building.
You learn to:

- Create the shell walls from linework in a drawing.
- Use two different techniques to create the structural grid.
- Add curtain walls and an entrance to the shell.

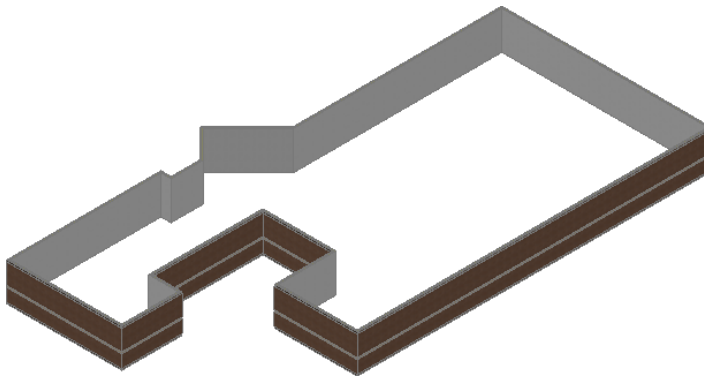


Converting Linework to Shell Walls


In this exercise, you create the exterior building shell by converting 2D linework in an AutoCAD drawing (DWG) to walls.




After you create the walls, you adjust their position, materials, and height to match the building design requirements.

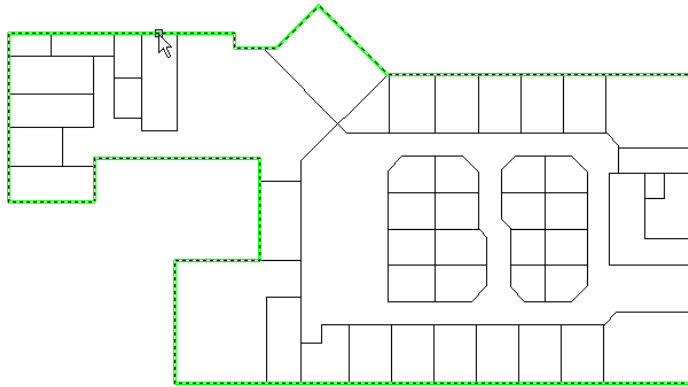


Training File

- Click  ► Open ► Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_CS_01_Linework_Walls_i.dwg, and click Open.

Convert the exterior linework to walls

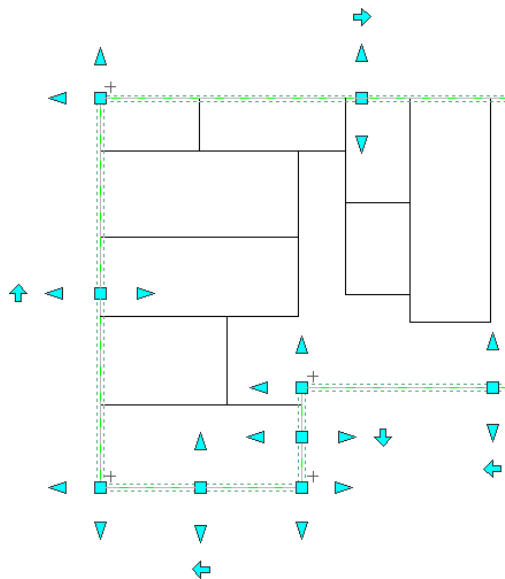
- 1 On the Design tab of the Design tool palette, right-click the Wall tool (), and click Apply Tool Properties to ► Linework.
- 2 Select the green polyline, which represents the exterior face of the shell wall that you want to create.



3 Press *ENTER* twice to retain linework in the drawing so that you can check the position of the walls that you create.

4 With the walls selected, zoom in to the top left corner of the floor plan.

The linework displays in the center of the walls. Because the linework represents the exterior face of the walls, you need to reposition the walls so their exterior faces align with the linework. Walls have a Justification property that lets you control their positioning.

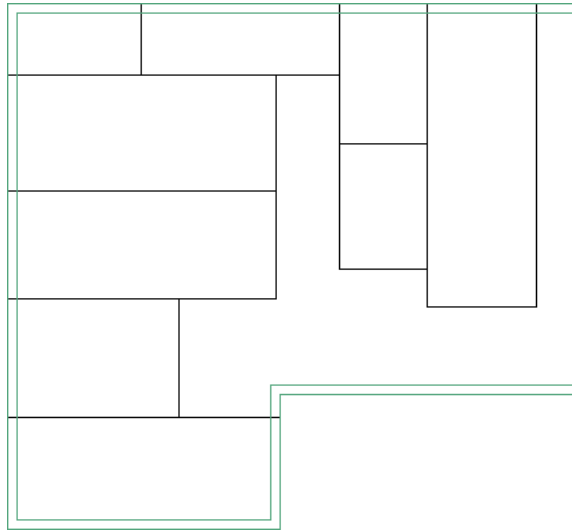


Change the wall justification


5 On the Properties palette, under Dimensions, for Justify, select Left, and press *ESC*.

6 Zoom to the drawing extents.

The walls are now left justified and the linework, although still in the drawing, is no longer visible because the exterior wall faces align with it.



Erase the linework

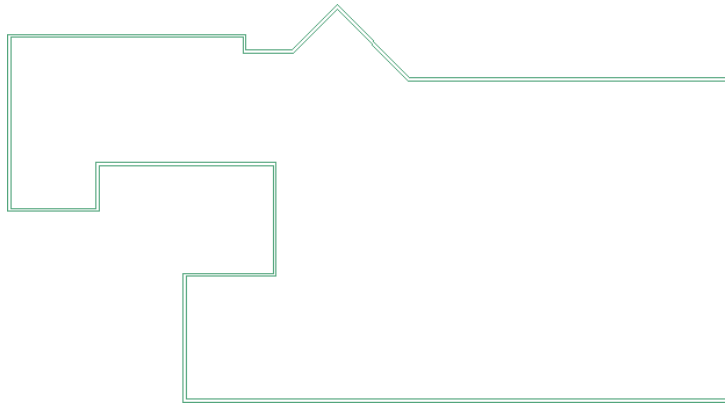
7 On the Properties palette, click  (Quick Select).

8 In the Quick Select dialog:

- For Object Type, select Wall.
- Under How to apply, select Exclude from new selection set.
- Click OK.
All the linework in the drawing, including the green exterior polyline and the black interior polylines, is selected.

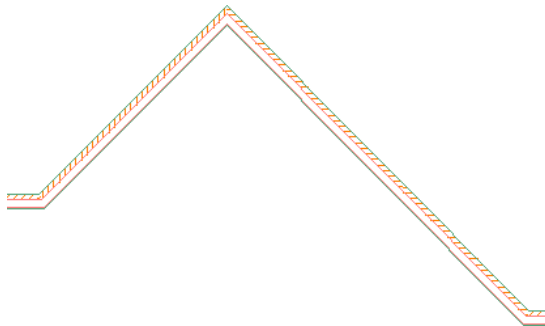
9 Press *DELETE*.

Only the shell walls remain in the drawing.



Change the wall style to match the design requirements

- 10** Using the Quick Select command or a window selection, select the shell walls.
- 11** On the Properties palette, under General, for Style, select Stud-5.5 Brick-LOWER FLOOR.
- 12** Press *ESC*.
- 13** Zoom to the triangulated walls at the top of the drawing.
The wall displays the multiple layers of material specified in the new style. However, to ensure that the shell walls reach the roof, you need to change the wall height.



Adjust the wall height

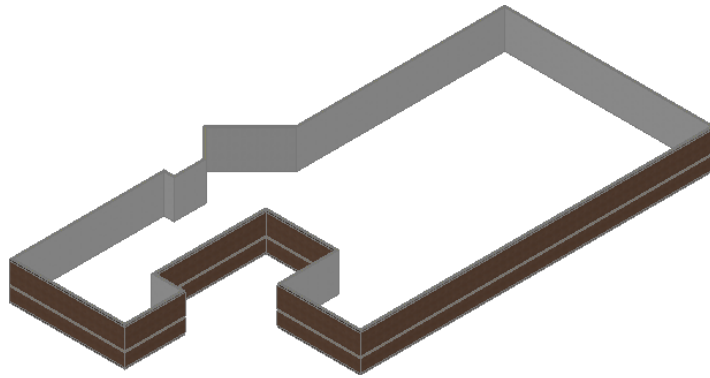
- 14** Select all the walls in the drawing.
- 15** On the Properties palette, under Dimensions, for Base height, enter **15'**.

16 Press *ESC*.

View the walls in 3D

17 Click View panel ► View drop-down ► View, SW Isometric.

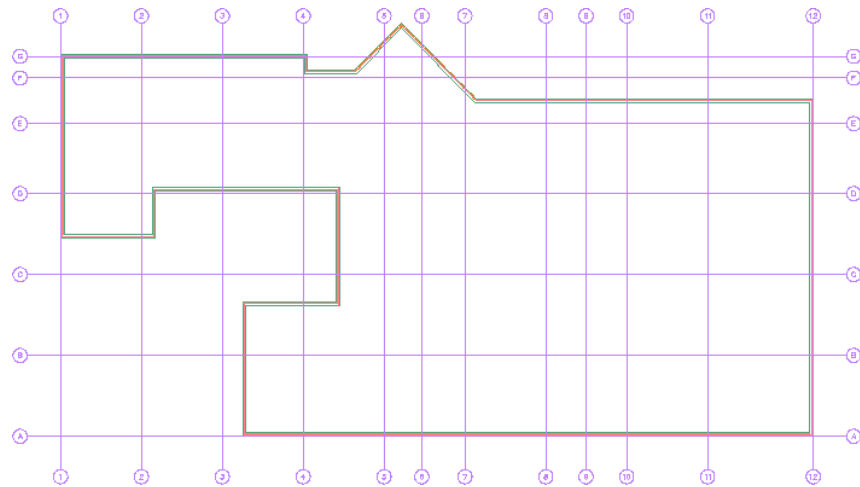
18 Click Visual Styles drop-down ► Visual Styles, Realistic.




19 Close the drawing with or without saving it.

Creating a Layout Grid


In this exercise, you create a structural grid for the Research Building. You create the grid as a regularly-spaced rectangular grid, and then grip-edit it to create the irregular shape that the building requires. When you complete the grid, you use automatic labeling to place bubbles on the ends of the grid lines.



Training File

- Click  ► Open ► Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_CS_02_Create_Grid_i.dwg, and click Open.

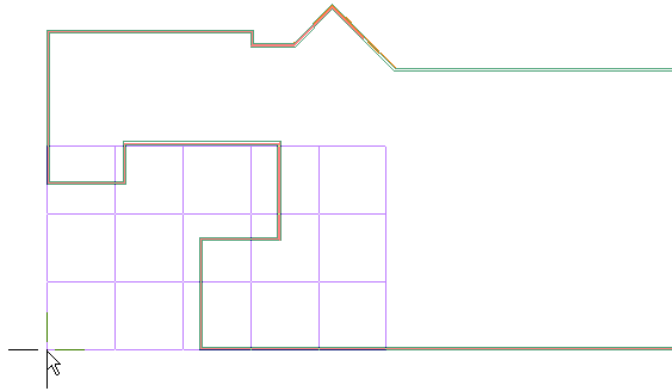
Create a structural grid

1 On the Design tab of the tool palette, click the Column Grid tool ().

2 Place the grid:

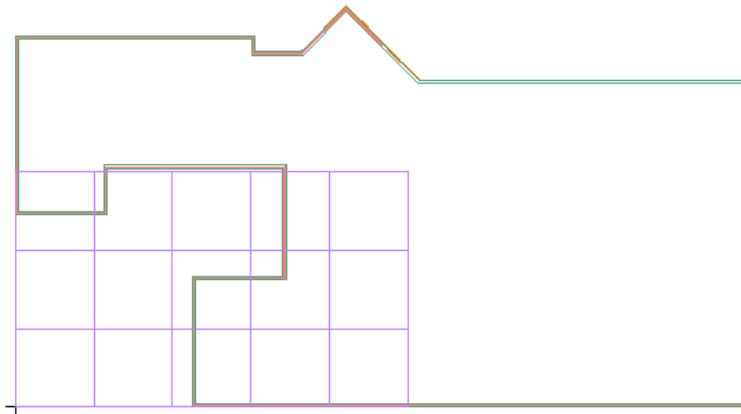
- If necessary, on the application status bar, click Ortho Mode to turn it off.
- Click Object Snap to turn it on.
- Right-click Object Snap, and click Intersection.
- Move the cursor to the middle of the tick mark in the lower left corner of the drawing, and when the intersection snap displays, select it.

The tick mark is located at the endpoint extension of the lower wall and the leftmost wall, and exists to aid you in placement of the grid.



3 Press *ENTER* twice.

A grid displays, but it is too small. You can adjust the overall size of the grid, as well as the individual bays by changing the grid properties.



Resize the grid

4 Select the grid.

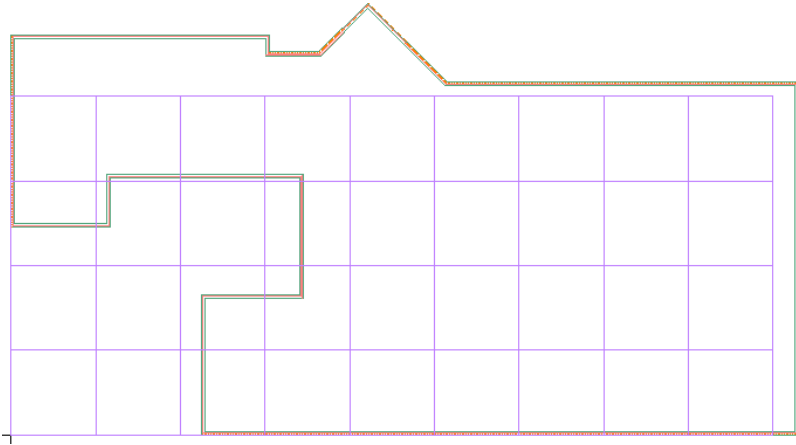
5 On the Properties palette, under Dimensions:

■ For X-Width, enter **185'**.

■ For Y-Depth, enter **95'**.

■ Press *ESC*.

6 The grid is still not the correct size for the building. Because the bays/grids are set to regular spacing, the exact dimensions of 185' x 95' cannot be created.



Convert both X and Y directions of the grid to manual placement in order to edit the grid

7 Select the grid, right-click, and click X Axis ► Layout Mode.

8 Press *ENTER*.

After the layout mode is selected, you can make selections on the command line. By default, manual is the selection made on the command line. After you convert to manual, grips display on each grid line endpoint.

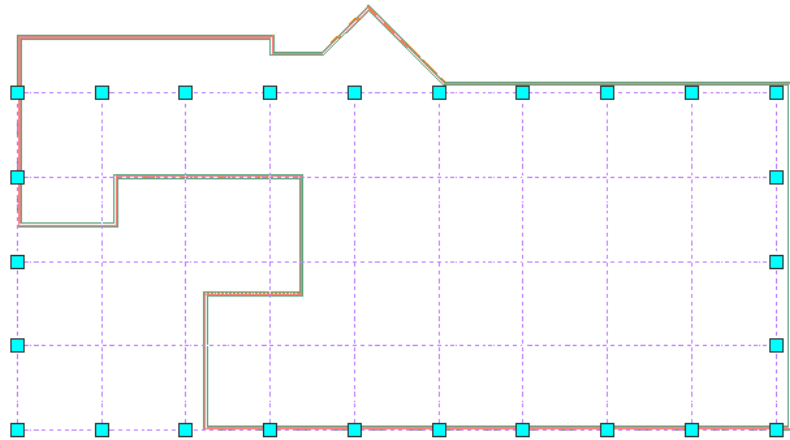
9 Select the grid, right-click, and click Y Axis ► Layout Mode.

10 Press *ENTER*.

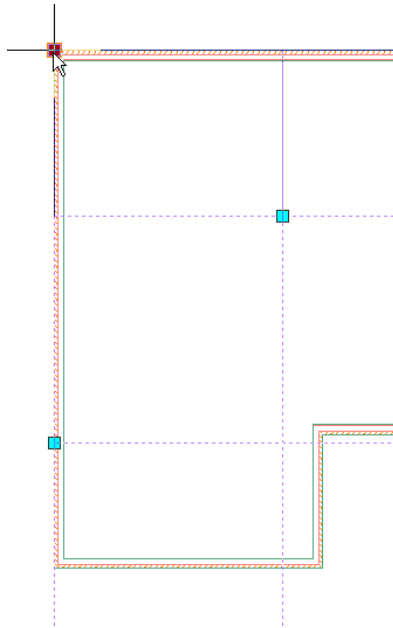
Now you can edit the grid lines like linework.

Grip edit the grid

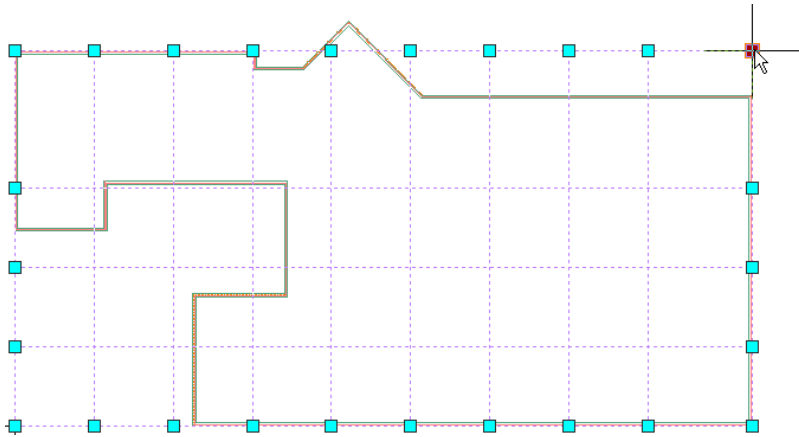
11 Select the grid to display grips.



- 12** Select the top left grid grip, and drag it to the top endpoint of the left vertical wall.



- 13** Select the top right grid grip, drag it over to align with the right vertical shell wall, and press *ESC*.



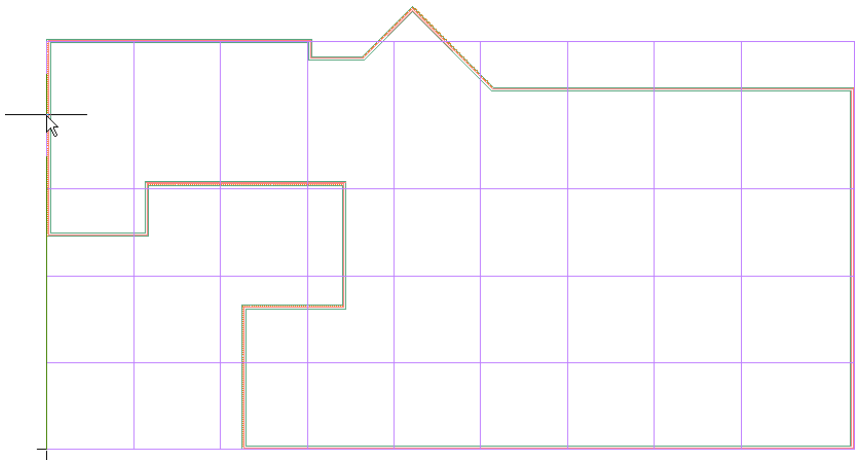
Manually add a horizontal grid line to the top of the grid

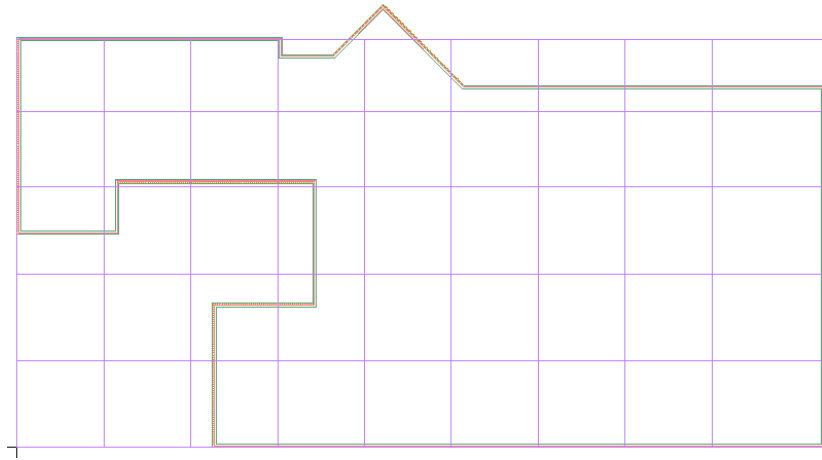
14 On the application status bar, click Object Snap to turn it off.

15 Select the grid, right-click, and click Y axis ► Add Grid Line.

16 Specify a point on the grid as shown.

Exact placement of the grid line is not necessary, as you adjust the line in subsequent steps.





Automatically label grid lines with a preloaded grid bubble block

17 Select the grid, right-click, and click Label.

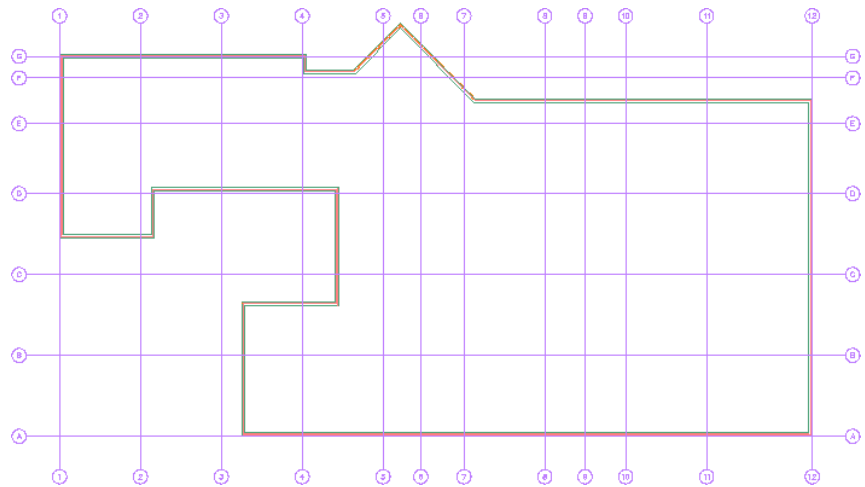
The X and Y axis both have tabs to control how you can label both the horizontal and vertical grids.

18 In the Column Grid Labeling dialog:

- On the Y – Labeling tab, under Labels, click in the Number field in the first line, enter **A**, and press *ENTER*.
The rest of the grid lines in the dialog are assigned letters.
- Under Bubble Parameters, select Left, and clear Right.
- Under Extension, enter **10'**.
- Click the X – Labeling tab.
- On the X – Labeling tab, under Labels in the X - Direction, click in the Number field in the first line, enter **1**, and press *ENTER*.
- Under Bubble Parameters, select Top, and clear Bottom.
- Under Extension, enter **10'**.
- Click OK.
Grid bubbles display on the grid lines.

21 In the Column Grid Labeling dialog:

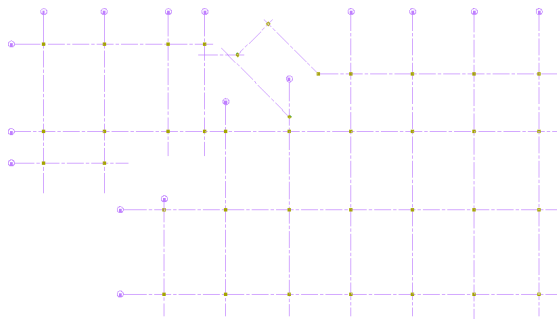
- Click the X – Labeling tab.
- Under Labels in the X - Direction, in the first line under Number, enter **1**, and press *ENTER*.
The grid line numbers resequence in the dialog, and the new grid line is numbered.
- Under Bubble Parameters, select Bottom.
- Click the Y – Labeling tab.
- Under Labels, in the first line under Number, enter **A**, and press *ENTER*.
- Under Bubble Parameters, select Right.
- Click OK.
The new bubbles display on the grid.




22 Close the drawing with or without saving it.

Creating a Layout Grid from Linework

In this exercise, you use linework in a sketch to create a more complex building grid than the grid that you created in the previous exercise. After you create the grid, you attach columns to the grid nodes. When the grid is complete, you manually label the grid lines.

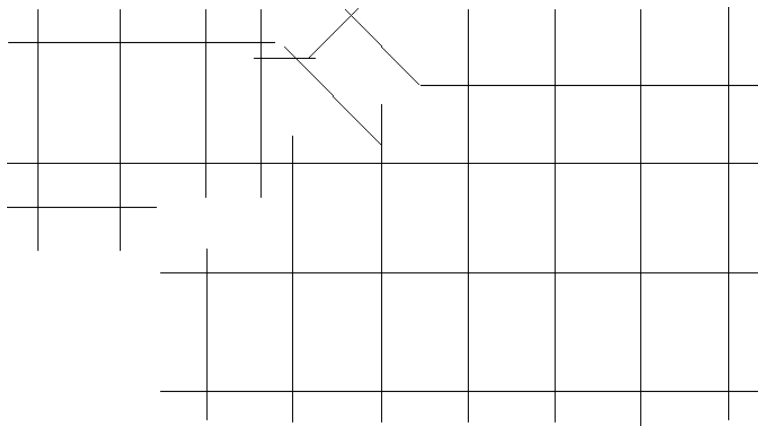



Training File

- Click  ► Open ► Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_CS_03_Linework_Grid_i.dwg, and click Open.

Convert linework to a grid

1 Zoom to the extents of the drawing.

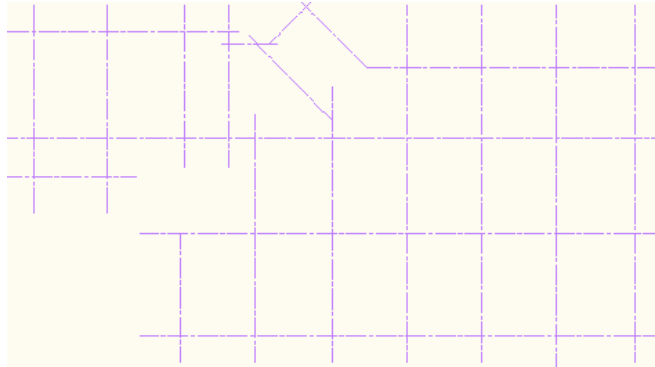


2 On the Design tab of the Design tool palette, right-click the Column Grid tool (), and click Apply Tool Properties to ► Linework.

3 Using a selection window, select the drawing linework, and press *ENTER*.


4 On the command line, enter *y*, and press *ENTER*.

5 Press *ESC*.



Create a column on each node of the grid

6 On the Design tab of the Design tool palette, click the Column

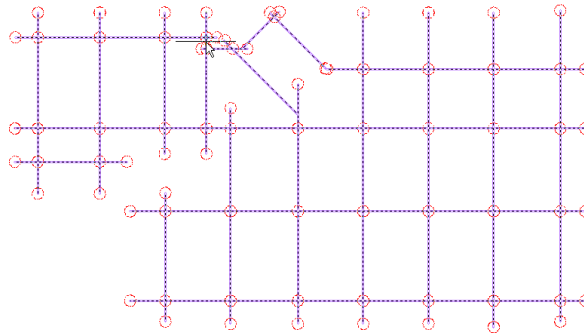
tool ().

Next, specify a placement option for the columns.

7 Move the cursor over any one of the grid intersections until a column and a tooltip display.

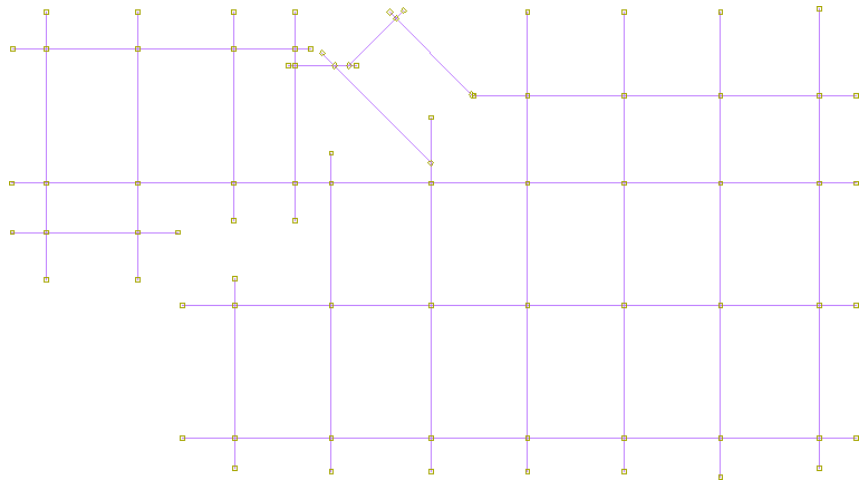
8 Press *CTRL* once to access the Add columns to all nodes option.

A red circle displays wherever a column will be placed.



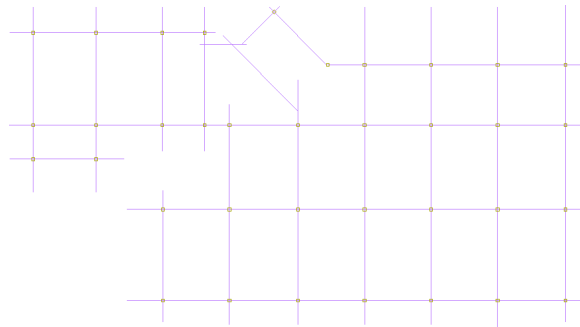
9 Click to place the columns, and press *ENTER*.

Columns display at each node, however, some grid nodes do not require columns. For example, all the grid endpoints do not need columns.



10 Select the extra columns at all the grid line endpoints, and press *DELETE*.

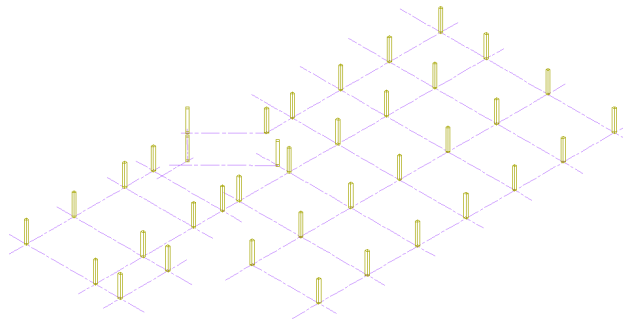
When you are done deleting the extra columns, the grid should appear as shown.



View the columns in 3D


11 Click View panel ► View drop-down ► View, SW Isometric.


Because the columns use the Standard style, a generic column displays at each grid intersection.



Change the style of the columns

12 Add a column tool from the Content Browser to the tool palette:

- Click Home tab ► Build panel ► Tools drop-down ► Content Browser.
- In the right pane of the Content Browser, click the Design Tool Catalog - Imperial.
- In the left pane, click Structural ► Members.
- In the right pane, click Next until you locate the Column Cover 12 x 12 tool.
- On the lower-right corner of the Column Cover 12 x 12 icon, click  (i-drop).
- Drag the tool onto the tool palette, and when the dropper fills, release the mouse button.
- Close the Content Browser.

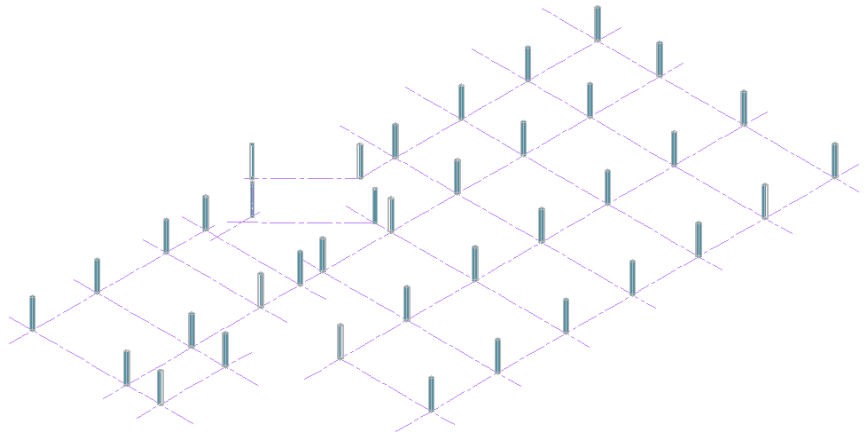
13 On the Properties palette, click  (Quick Select).

14 In the Quick Select dialog:

- For Object Type, select Structural Member.
- For How to apply, select Include in new selection set.
- Click OK.
All the columns are selected.

15 On the Design tab of the Tool palette, right-click Column Cover 12 x 12, and click Apply Tool Properties to ► Column.

16 Press *ESC*.



Next, label each grid line with a bubble.

Use the grid bubble tool to label each line individually

17 Click View panel ► View drop-down ► View, Top.

18 Right-click the Tool palette title bar, and click Document.

19 On the Annotation tab of the Document tool palette, click the

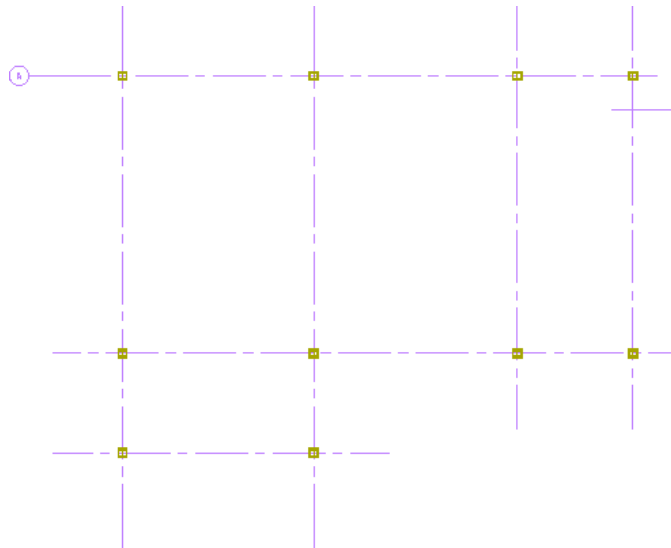


Column Bubble tool ().

20 Select the left endpoint of the top horizontal grid line.

21 In the Create Grid Bubble dialog:

- For Label, enter **A**.
- Clear Apply at both ends of gridline.
- Click OK.



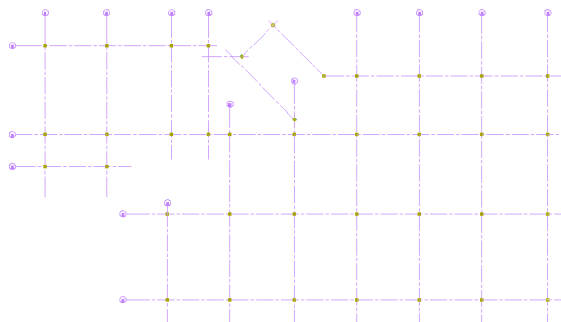
22 Select the left endpoint of the grid line below the one that you just labeled.

23 In the Create Grid Bubble dialog:

- For Label, verify that B displays.
- Clear Apply at both ends of grid line.
- Click OK.

24 Continue to select grid line endpoints to label the remaining lines as shown.

Use a letter sequence on the horizontal lines and a numeric sequence on the vertical lines.



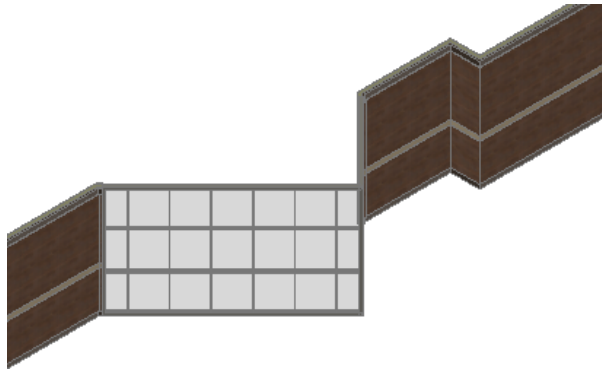
25 When you are done, press *ENTER*.

26 Close the drawing with or without saving it.


Creating a Curtain Wall

In this exercise, you convert some of the walls that you created in a previous exercise to curtain walls. After you create the curtain walls, you modify them to match the building design requirements. You modify the curtain wall:

- grid size
- mullion and frame definitions
- panel thickness




Training File

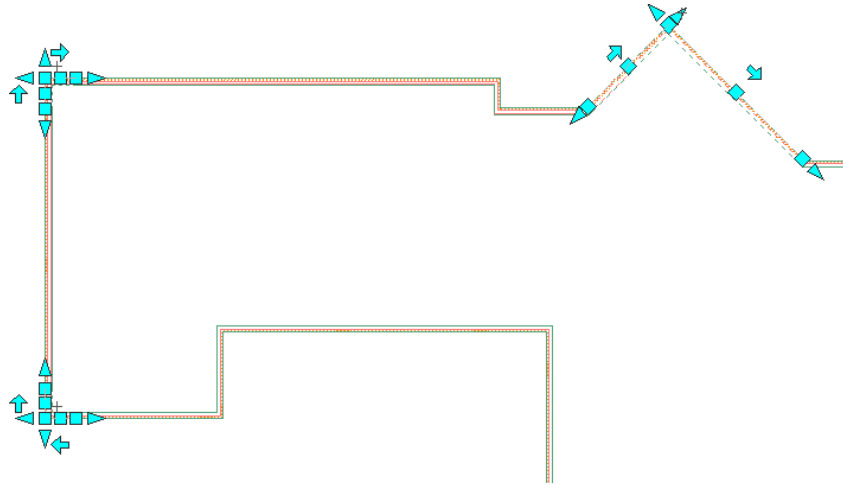
- Click  ► Open ► Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_CS_04_Create_Curtain_Wall_i.dwg, and click Open.

Convert walls to curtain walls

- 1** On the Design tab of the Design tool palette, right-click the

Curtain Wall tool (), and click Apply Tool Properties to ► Walls.

- 2 Select the walls in the bumpout on the north side of the building and in the corners of the left wing of the building as shown.



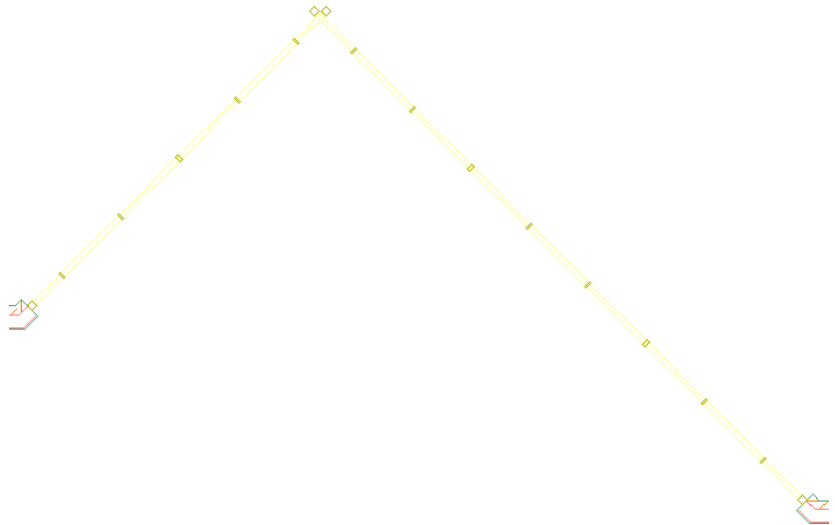
- 3 Press *ENTER*.

- 4 On the command line:

- Enter *c* and press *ENTER*.
This option allows you to use the center of the wall to justify the curtain walls.
- Enter *y*, and press *ENTER*.
Use this option to erase the layout geometry (the walls used in the conversion).

- 5 Press *ESC*, and zoom to the bumpout to view the curtain walls.

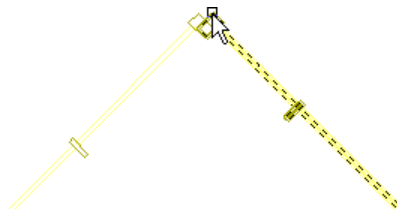
The curtain walls overlap at the corner and require trimming. Trimming is often necessary when you convert linework or walls to curtain walls or other objects.



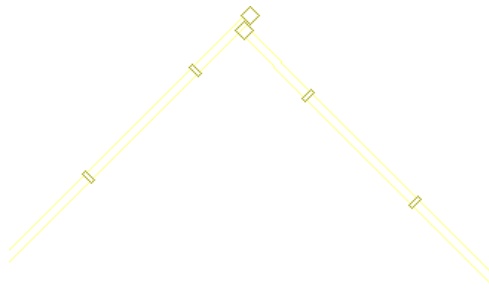
Trim the curtain walls

6 Trim the right curtain wall segment:

- Click Home tab ► Modify panel ► AEC Trim drop-down ► Trim.
- Select the left curtain wall segment, and press *ENTER*.
- Select the top portion of the right curtain wall segment.

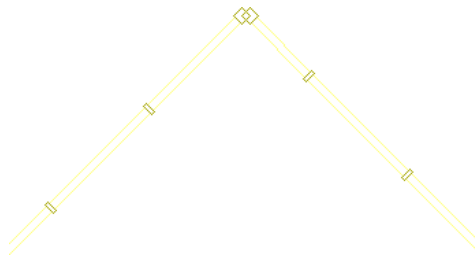


- Press *ENTER*.
The right segment is trimmed to the left segment.



7 Trim the left curtain wall segment:

- Click Home tab ► Modify panel ► Trim.
- Select the right curtain wall segment, and press *ENTER*.
- Select the top portion of the left curtain wall segment, and press *ENTER*.



Modify the curtain wall style to match design requirements

8 Select the left curtain wall segment, right-click, and click Edit Curtain Wall Style.

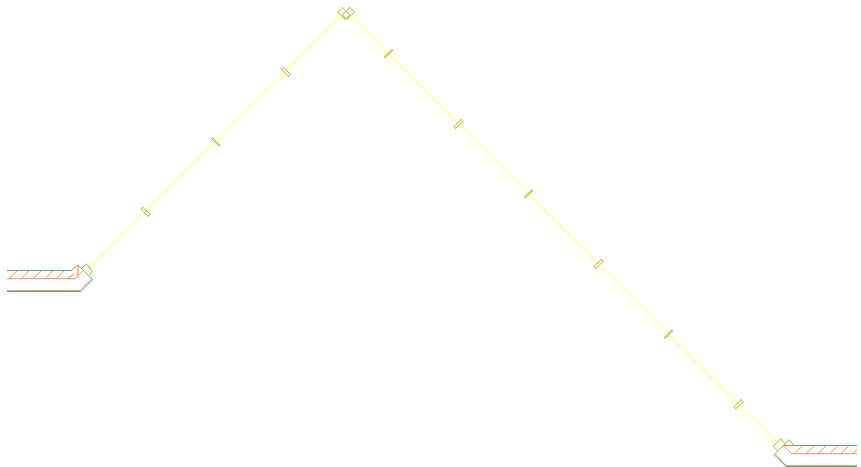
9 Modify the frame to be 5" deep:

- In the Curtain Wall Style Properties dialog, on the Design Rules tab, in the left pane, under Element Definitions, select Frames.
- In the lower right pane, for Depth, enter 5".

10 Modify the mullions so they are also 5" deep:

- In the left pane, under Element Definitions, select Mullions.
- In the lower right pane, for Depth, enter 5".


- 11** Modify the curtain wall panel so it is 1" thick:
- In the left pane, under Element Definitions, select Infills.
 - In the lower right pane, for Panel Thickness, enter **1"**.
Now divide the curtain wall horizontally into 5' increments.
- 12** Alter the cell dimensions of the horizontal division:
- In the left pane, under Element Definitions, select Divisions.
 - In the upper right pane, verify Horizontal Division is selected.
 - In the lower right pane, for Cell Dimension, enter **5'**.
- 13** Modify the vertical grids so the center of each mullion element is 4' from the center of the adjacent mullion:
- In the upper right pane, select Vertical Division.
 - In the lower right pane, for Cell Dimension, enter **4'**.
 - Click OK.
- 14** View the modifications that you just made.
- The curtain wall now matches the design requirements more closely, but it still needs modifications. You need to position the glass closer to the exterior face of the wall and adjust the display of the corner condition (where the two walls meet).



15 Modify the curtain wall style again:

- Select the left curtain wall, right-click, and click Edit Curtain Wall Style.
- In the Curtain Wall Style Properties dialog, on the Design Rules tab, under Element Definitions, select Infills.
- In the lower left pane, for Offset, enter **1"**.
Adding this offset moves the panel closer to the exterior face of the wall.

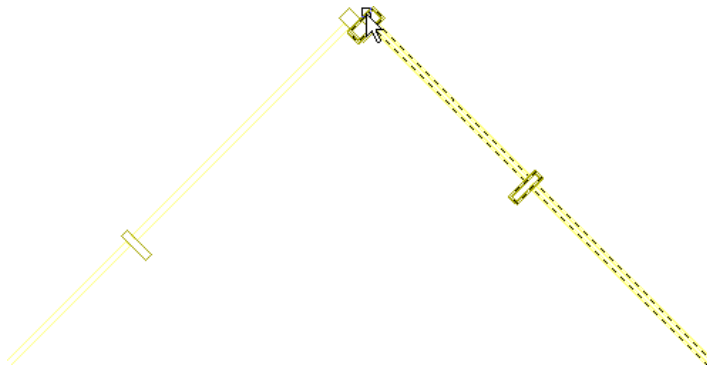
Next, you create a new frame for the corner condition and assign it the correct position in the curtain wall. You create a corner mullion based on a profile (a closed loop polyline) that was previously created.

- In the left pane, select Frames.
- In the upper right pane, click  (New).
- Enter **Corner**, and press *ENTER*.
- In the lower right pane, select Use Profile.
- For Profile, select Corner Mullion.
- Click OK.

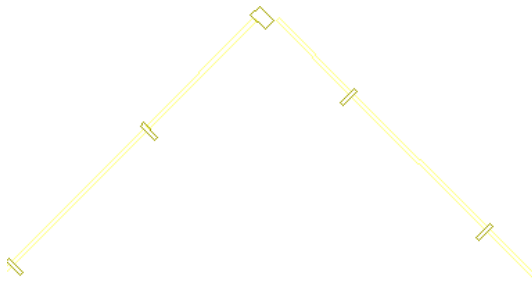
Next, you override the frames at the corner of each curtain wall. You remove the frame on one curtain wall and replace the default frame with a corner frame (previously created) on the other.

16 Select the right curtain wall segment, right-click, and click Frame/Mullion ► Override Assignment.

17 Select the top right curtain wall edge.

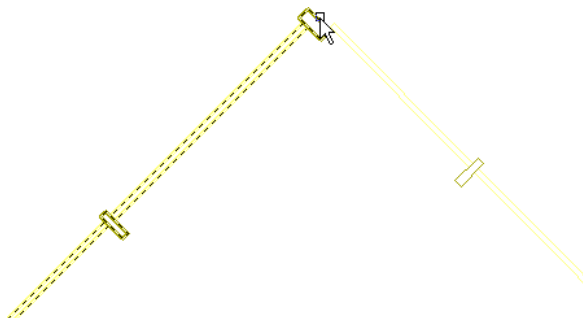


18 In the Frame Assignment Override dialog, select Remove Frame, and click OK.



19 Select the left curtain wall segment, right-click, and click Frame/Mullion ► Override Assignment.

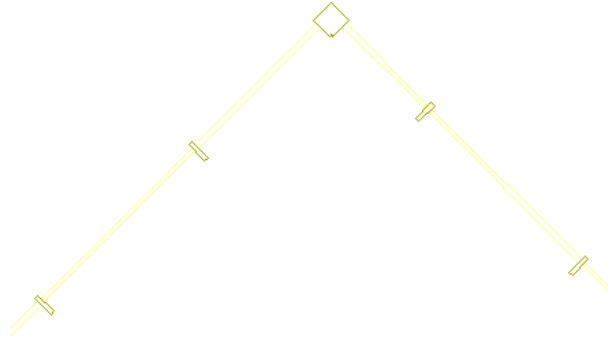
20 Select the top left curtain wall edge.



21 In the Frame Assignment Override dialog:

- For Frame Element Definition, select Corner.

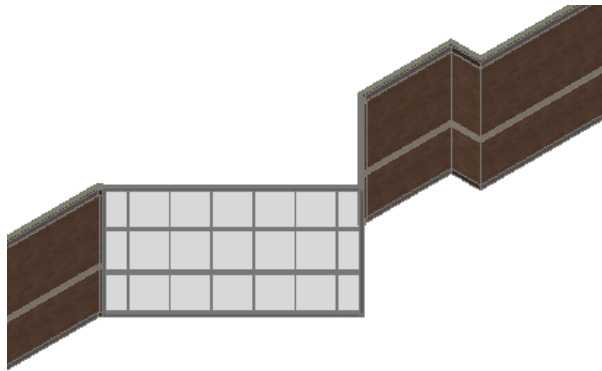
- Click OK.



View the changes to the curtain wall in 3D

22 Click View panel ► View drop-down ► View, NE Isometric.

23 Click Visual Styles drop-down ► Visual Styles, Realistic.



24 Optional: Use same techniques to change the two corner conditions on the curtain walls in the left wing of the building:
The style changes you made earlier in the exercise (deeper frames and grid spacing) are already applied to these curtain walls.

25 Close the drawing with or without saving it.

Creating an Entrance


In this exercise, you create an entrance by adding two door and window assemblies to the building shell. A door/window assembly is a single object composed of multiple doors and windows.

TIP Use door/window assemblies when you need to add multiple doors and windows as a single unit.

You begin the exercise by placing a generic door/window assembly in the building shell. After you place it, you create a new style to match the design requirements for the entrance.



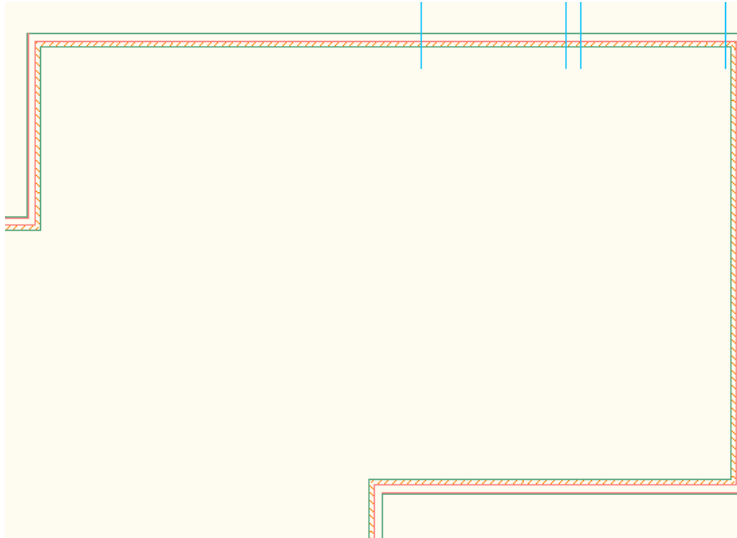
Training File

- Click  ➤ Open ➤ Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_CS_05_Create_Entrance_i.dwg, and click Open.


Place two door/window assemblies

- 1 Zoom in to the blue vertical lines in the drawing.

These are temporary marks to aid you with the placement of the assemblies.



2 On the Design tab of the tool palette, click the Door/Window

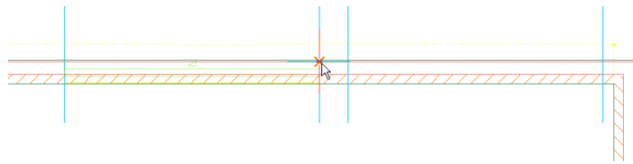
Assembly tool ().

3 On the Properties palette:

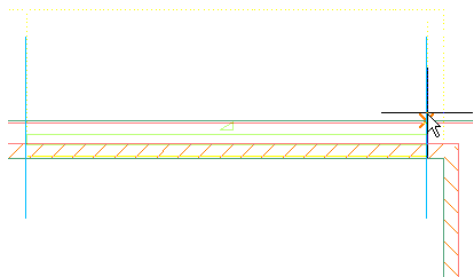
- Under Dimensions, for Width, enter **9'**.
- Under Height, enter **10'**.
- Under Location, for Vertical alignment, select Sill.
- For Sill height, enter **0**.

4 Place the door/window assemblies:

- If necessary, on the application status bar, click Object Snap to turn it on.
- Right-click Object Snap, and click Intersection.
- Select the wall that the blue lines intersect.
- Move the cursor to the intersection of the wall and one of the blue lines as shown, and when the intersection snap displays, select it.



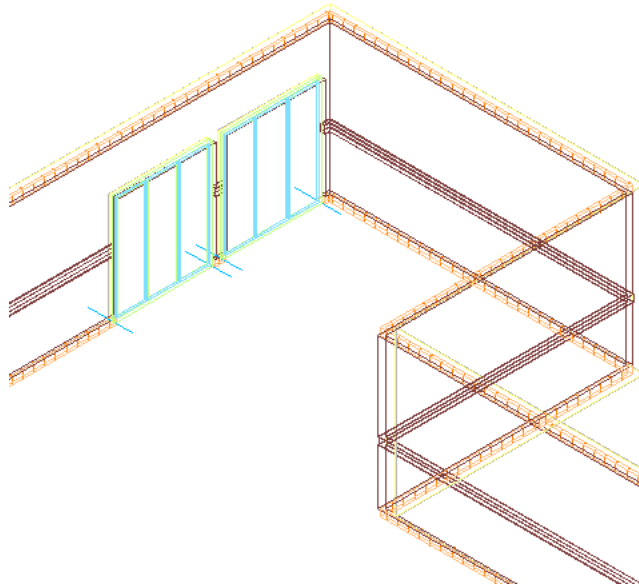
- Move the cursor to the right, and select the intersection of the wall and line as shown.



- Press *ENTER*.

View the door/window assemblies in 3D

- 5 Click View panel ► View drop-down ► View, SW Isometric.
- 6 Zoom in to the door/window assemblies.



Create a new Door/Window Assembly style

- 7 Select the door/window assembly on the left, right-click, and click Copy Door/Window Assembly Style and Assign.

This option copies the existing style of the assembly, and then assigns the copy to the same assembly.

- 8 In the Door/Window Assembly Style Properties dialog, name the style:

- Click the General tab.
- Under Name, enter **Entrance**.


TIP Choose style names that help you and others know what the style contains and where it might be used in the project.

- 9 Define the vertical divisions in the door/window assembly:

- Click the Design Rules tab.
- In the left pane, under Element Definitions, select Divisions.
- In the upper right pane, select Default Division, right-click, and click Rename.


Rename the Default Division to a name that shows that it is the vertical division of the door/window assembly.

- Enter **Vertical Division**, and press *ENTER*.
- Next, you alter the placement of the vertical member so that the middle section is a constant 6'-0" opening for the double door.
- In the left pane, select Primary Grid.
- In the lower right pane, for Division Type, select Manual. Manual grid lines are assigned to be placed 3'-1" from the midpoint of the door/window assembly. 3'-1" is used because mullions will be placed centered on the grid line. In this case, the mullions will be 2" wide. The 3'-1" dimension allows the mullion to be placed and still leave a 6'-0" opening.

- In the lower right pane, click  (Add Grid Line) twice.
- For Gridline 1, under Offset, enter 3'-1", and press *ENTER*.
- For Gridline 2, under Offset, enter -3'-1", and press *ENTER*. The second grid line specified is given a negative value from the midpoint to make the total opening 6'-0" (the size of the double door).

Next, you create a new division that establishes the horizontal portion of the door/window assembly. In this case, there is a transom above the 7'-0" doors so you create a horizontal grid/mullion at this position.

10 Add a transom (horizontal division) to the door/window assembly:


- In the left pane, under Element Definitions, select Divisions.
- At the bottom of the upper right pane, click  (New).
- Enter **Transom**, and press *ENTER*.

11 In the lower right pane, under Gridline, select the second gridline,

and click  (Remove Gridline).

12 Select Gridline 1, and under From, select Grid Start.

13 Select the Offset value, and enter 7'-1".

14 For Orientation, select  (Horizontal).

Next, you assign the primary grids (vertical divisions) to the horizontal gridline by nesting the horizontal divisions into each infill cell of the vertical divisions.

15 In the left pane, select Primary Grid.

16 In the upper right pane, under Cell Assignments, select Default Cell Assignment.

17 Under Element, select *Nested Grid*.

Next, you use the new nested grid in the transom division.

18 In the left pane, under Primary Grid, select New Nested Grid.

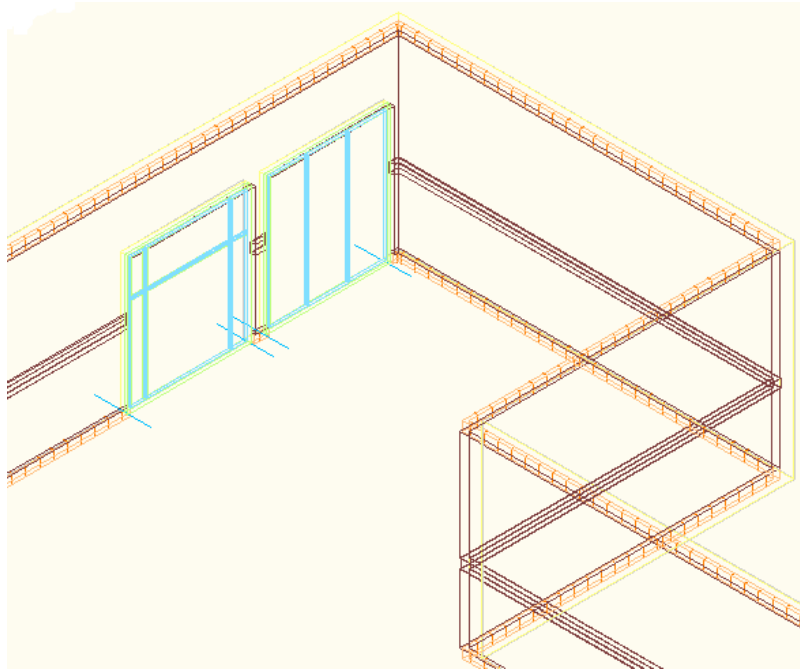
19 In the upper right pane, under Division Assignments, select New Nested Grid.

20 Under Element, select Transom.

21 Click OK.

22 View the results.

Both the vertical and horizontal grids display in the assembly. The second Door/Window assembly does not yet reflect these changes because you have not assigned the Entrance style to it.




Next, you modify the infills to include a double door. You create an infill to use as an override for a cell in the door/window assembly. You use an infill thickness of 1", matching the glass thickness from the curtain wall in the previous exercise.

Modify the Door/Window Assembly style

23 Select the same door/window assembly, right-click, and click Edit Door/Window Assembly Style.

24 In the Door/Window Assembly Style Properties dialog:

- In the left pane, under Element Definitions, select Infills.
- In the lower right pane, for Panel Thickness, enter 1". Create a new infill type that uses a door style rather than a simple panel.
- In the upper right pane, click  (New).
- Enter **Entrance Doors**, and press *ENTER*.
- In the lower right pane, for Infill Type, select Style.

- Under Style, expand Door Styles, and select Hinged – Double - Full - Lite - Frameless.

Any loaded style can be used for the infill panel. In this case, the door style that you want has been previously loaded into the drawing.

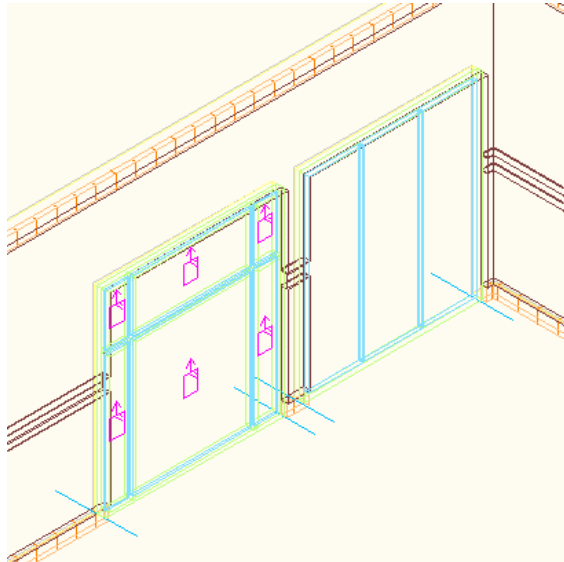
25 Modify both frames and mullions to use 2" x 5" members:

- In the left pane, under Element Definitions, select Frames.
- In the lower right pane, for Width, enter 2".
- For Depth, enter 5".
- In the left pane, under Element Definitions, select Mullions.
- In the lower right pane, for Width, enter 2".
- For Depth, enter 5".
- Click OK.

Now the infill you created must be assigned to the center section of the Door/Window assembly. To help select and change the infills, turn on the infill markers.

26 Select the first door/window assembly, right-click, and click Infill

- Show Markers.

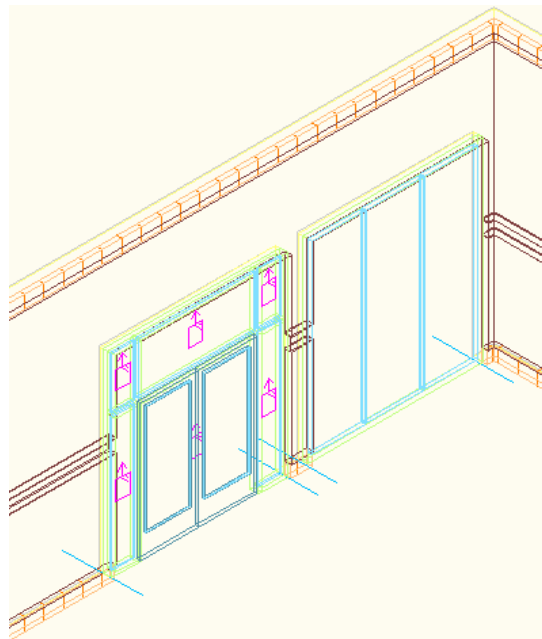


27 Select the door/window assembly, right-click, and click Infill ► Override Assignment.

28 Select the middle infill on the bottom row, and press *ENTER*.

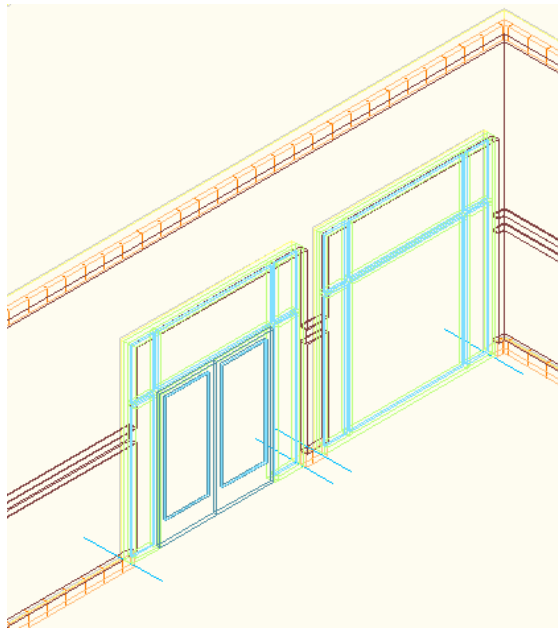
29 In the Infill Assignment Override dialog:

- Under Infill Element Definition, select Entrance Doors.
- Under Frame Removal, select Bottom.
- Click OK.



Turn off the infill markers

30 Select the first door/window assembly, right-click, and click Infill ► Hide Markers.

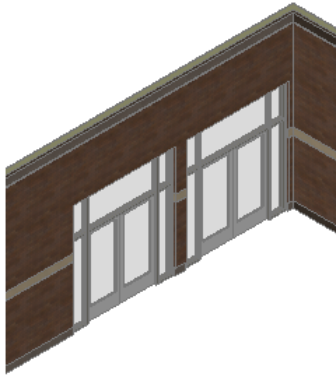


Assign the new style to the adjacent door/window assembly

- 31** Select the other door/window assembly.
- 32** On the Properties palette, under General, for Style, select Entrance.
- 33** Using the same method from the previous steps, replace the middle infill panel with the door.

View the changes in a realistic view


- 34** Click View Panel ► Visual Styles drop-down ► Visual Styles, Realistic.

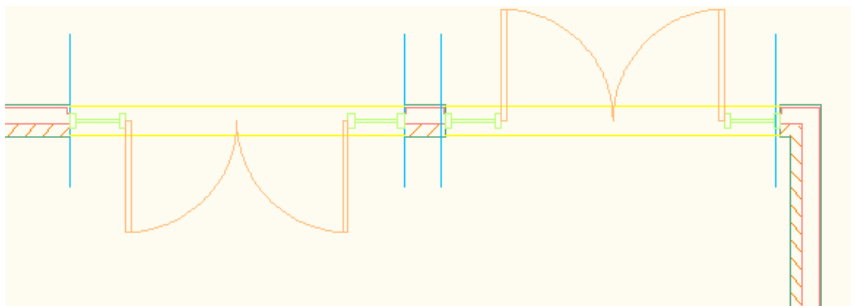
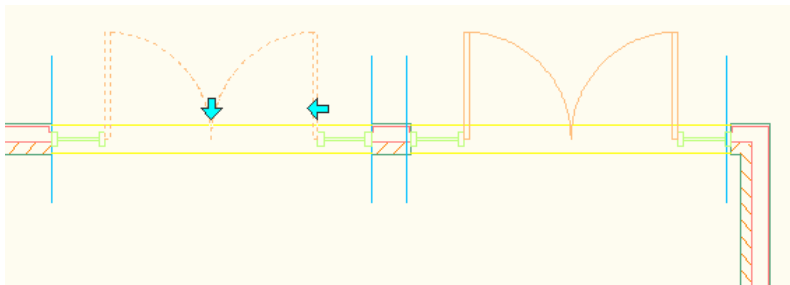


Switch to a plan view

35 On the ViewCube, click TOP.

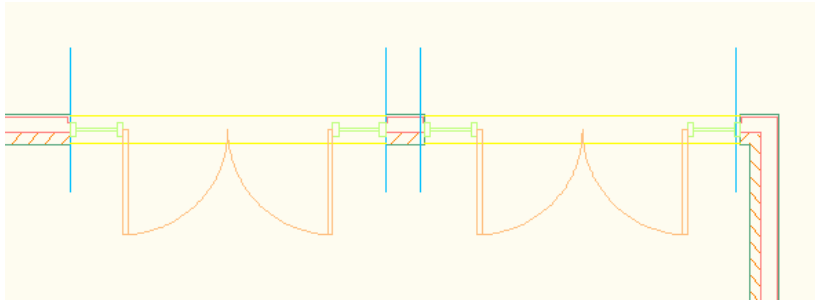
Modify the door to swing outward

36 Select one of the doors, and click the flip grip ().



37 Press *ESC*.

38 Repeat the previous steps to flip the swing of the other door.



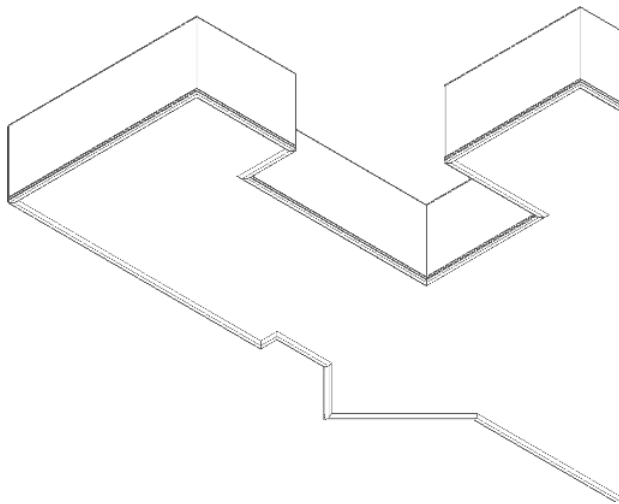
39 Close the drawing with or without saving it.

Creating Slabs

5

In this lesson, you create a haunched foundation slab for the Research Building.

The foundation slab as viewed from underneath the building

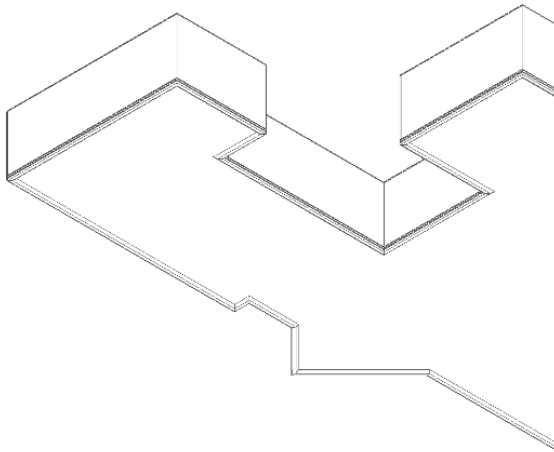


In AutoCAD Architecture, a slab is a three-dimensional object with multiple edges. A slab style controls the appearance of the slab, while a slab edge style controls the appearance of the slab edges.

To create the haunched edges of the foundation slab, a profile is applied to the slab edges in the slab edge style. When you create the slab, this profile is extruded along the slab edges, creating the haunched appearance.


Creating a Foundation Slab

In this exercise, you create a haunched foundation slab for the building.



Because the Design tool palette does not contain a tool to create the haunched slab, before you can create the slab, you must import a haunched slab tool from the Content Browser.


Training File

- Click  ► Open ► Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_AS_01_Foundation_Slab_i.dwg, and click Open.

Search for haunched slab tool in the Content Browser

- 1 Click Insert tab ► Content panel ► Content Browser.
- 2 In the left pane, under Search, enter **haunch slab**, and click GO.
The search results, which include a 6 inch haunch slab tool, display in the right pane.

Add the Haunch (6 inch slab) tool to the Design tool palette

- 3 In the lower right corner of the Haunch (6 inch slab) tool icon, click  (i-drop).
- 4 Drag the tool onto the Design tool palette, and when the dropper icon fills, release the mouse button.
- 5 Close the Content Browser.

Use the new slab tool to create the foundation slab

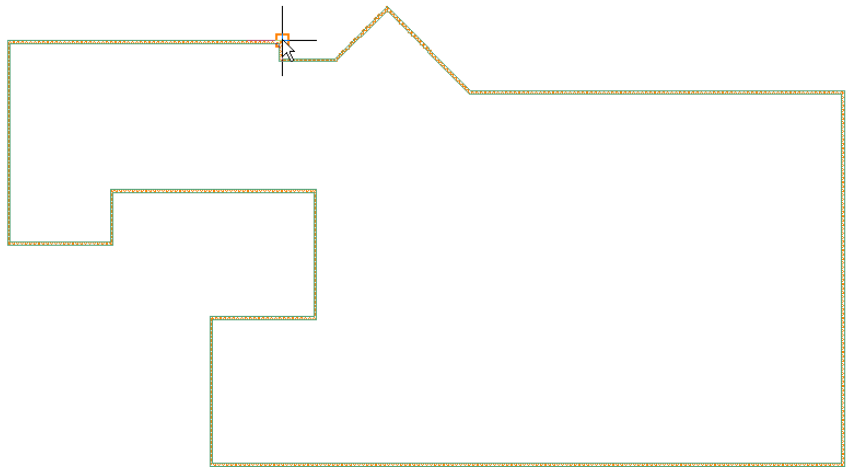
6 If necessary, on the application status bar:

- Click Ortho Mode and Object Snap to turn them on.
- Right-click Object Snap, and click Endpoint.

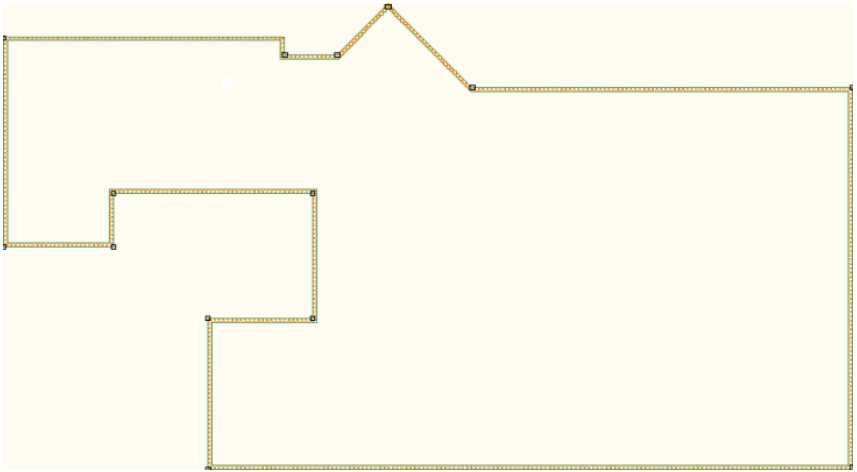
7 On the Design tab of the Design tool palette, click Haunch (6 inch slab) ().

8 Trace the outer perimeter of the building:

- Move the cursor over the outer wall endpoint as shown, and when the endpoint displays, select it.



- Moving in a clockwise direction, continue to select the outer endpoints of each wall segment.



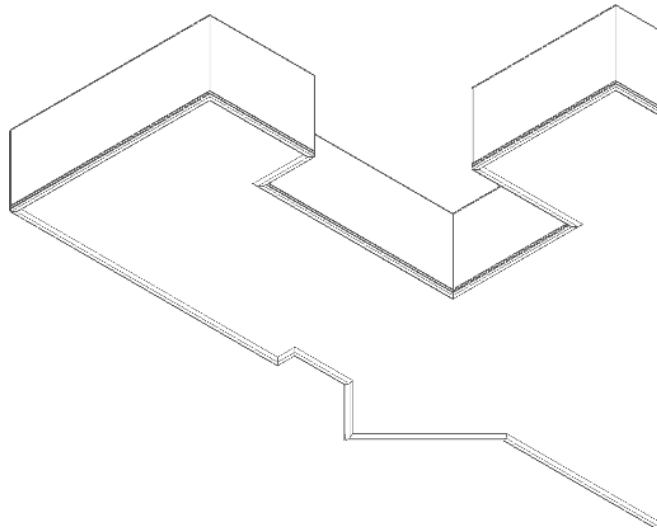
- When you select the final endpoint, on the command line, enter **c**, and press *ENTER*.

View the slab in 3D

9 Switch to a 3D hidden view to view the slab in detail:

- Click View panel ► View drop-down ► View, SW Isometric.
- Click Visual Styles drop-down ► Visual Styles, Hidden.
- To view the slab edges, on the ViewCube, click





10 Close the drawing with or without saving it.

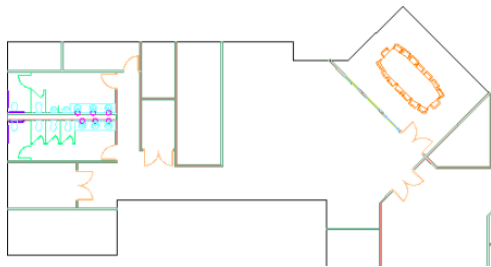
Creating Interior Partitions

6

In this lesson, you create interior partitions on a building floor plan.

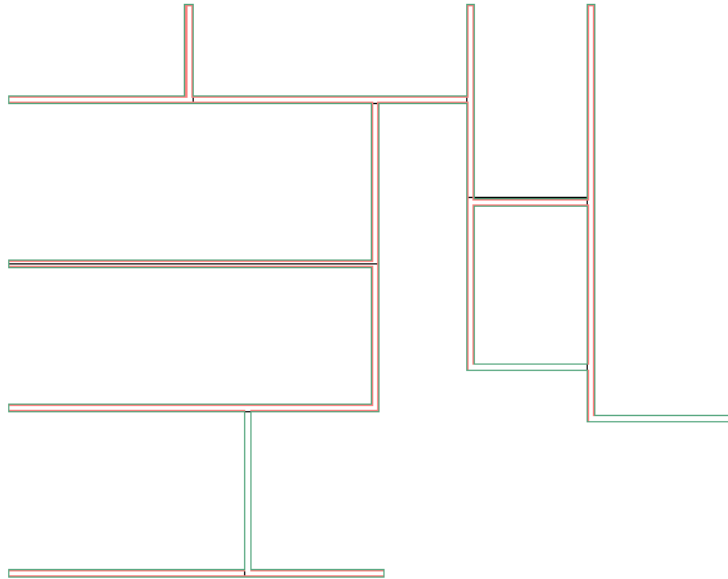
You learn to:

- Create and modify partition walls.
- Place and reposition doors and windows in the partition walls.
- Lay out a restroom created by the partition walls.
- Place a conference table and chairs (furniture) in a room on the floor plan.




Creating Partition Walls

In this exercise, you create interior partition walls on a building floor plan.



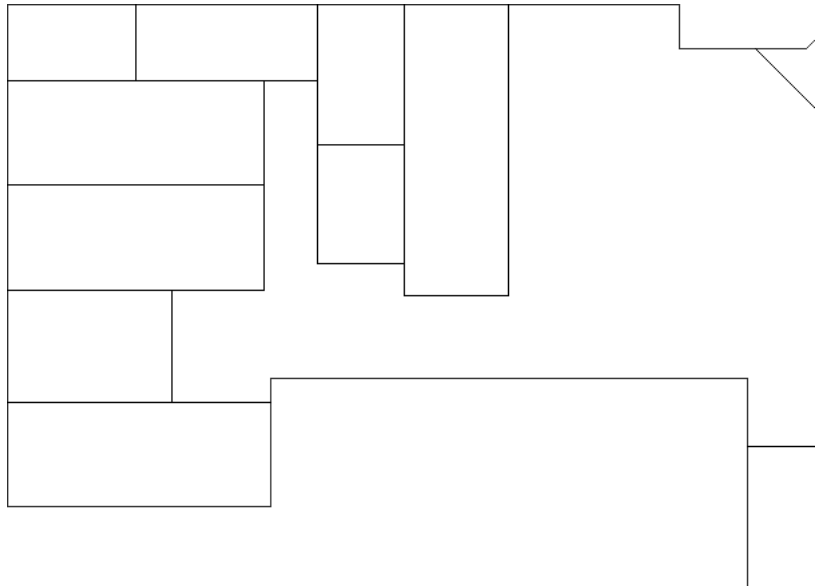
To layout the partition walls, you open a drawing (DWG) that contains a floor plan sketch, and you use the linework as guide to create the walls. You learn how to create walls with wall tools and how to copy and modify walls.

Training Files

- Click  ➤ Open ➤ Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_IP_01_Wall_Layout_i.dwg, and click Open.

Trace linework in the drawing to create a partition wall

- 1 Zoom in to the upper left corner of the floor plan.



2 If necessary, on the application status bar:

- Click Ortho Mode and Object Snap to turn them on.
- Right-click Object Snap, and click Endpoint.

3 On the Design tab of the Design tool palette, click the Wall tool

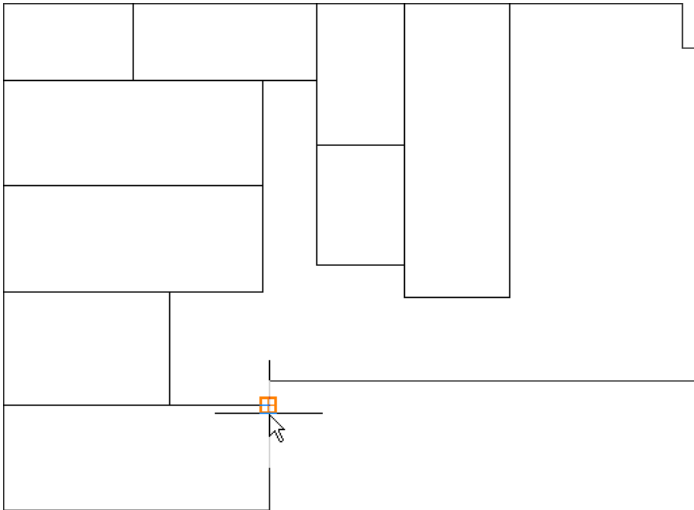


4 On the Properties palette:

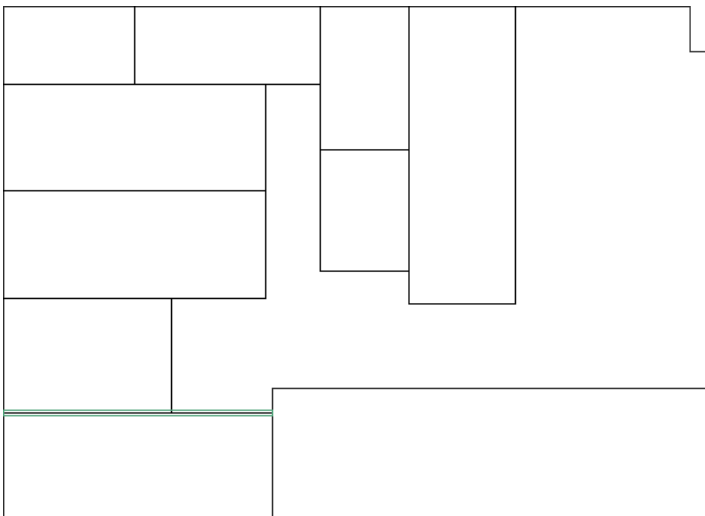
- Under Dimensions, for Width, enter **6"**.
- For Justify, select Center.

5 Create the wall:

- Move the cursor to the lowest horizontal interior wall in the zoomed area, and select the right endpoint of the linework as shown.

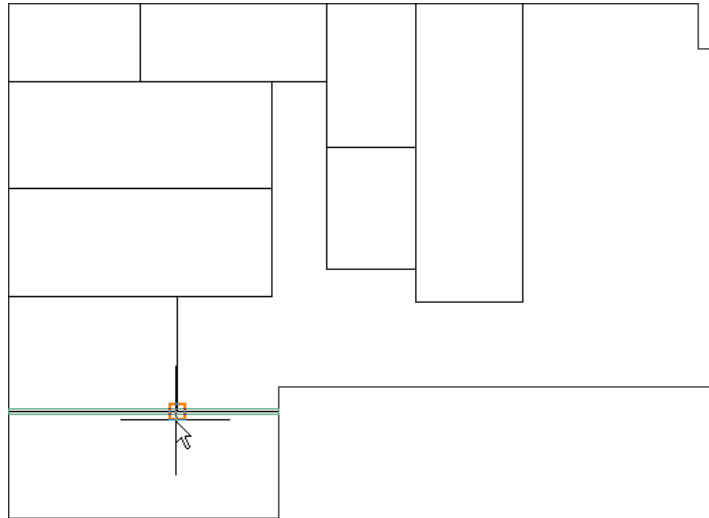


- Move the cursor to the left, select the left endpoint of the linework, and press *ENTER*.

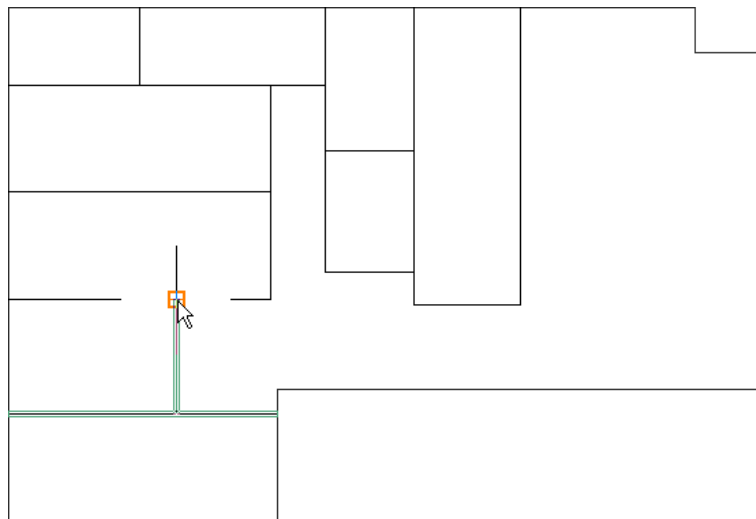


Add another partition wall

- 6 Right-click in the drawing, and click Repeat WallADD.
- 7 Create the wall:
 - Select the endpoint of the vertical line as shown.



- Move the cursor up, and select the endpoint of the line as shown.



- Press *ENTER*.

Another quick way to add an object to the drawing is to use the Add Selected function from the right-click menu. This not only

repeats the command, but also uses the same style and properties of the object that you select.

Add a third partition wall

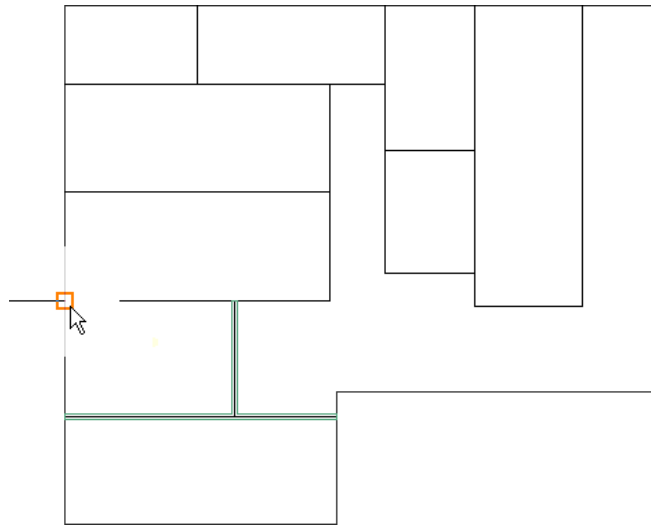
8 Select the wall you just added, right-click, and click Add Selected.

In this case, change the justification to right because you are going to create the walls that form the hallway. Right and left are relative to the direction in which you are drawing the wall. In this case, right is correct as you are placing the walls from left to right.

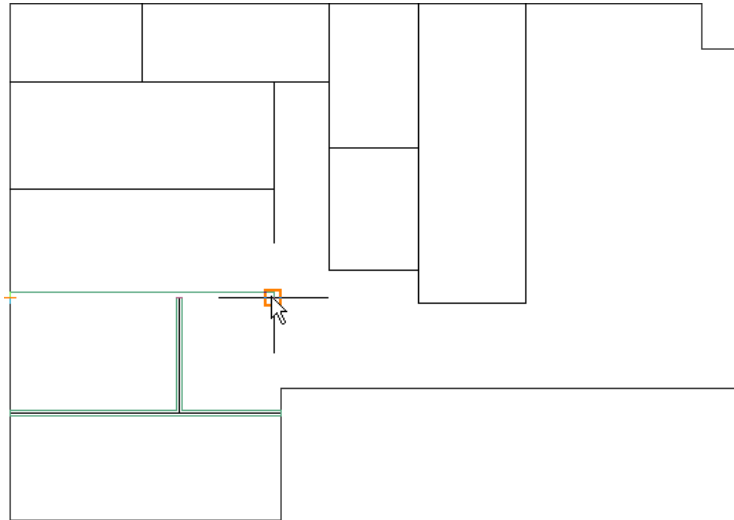
9 On the Properties palette, under Dimensions, for Justify, select Right.

10 Create the wall:

■ Select the left endpoint of the line as shown.



■ Select the right endpoint of the line as shown.

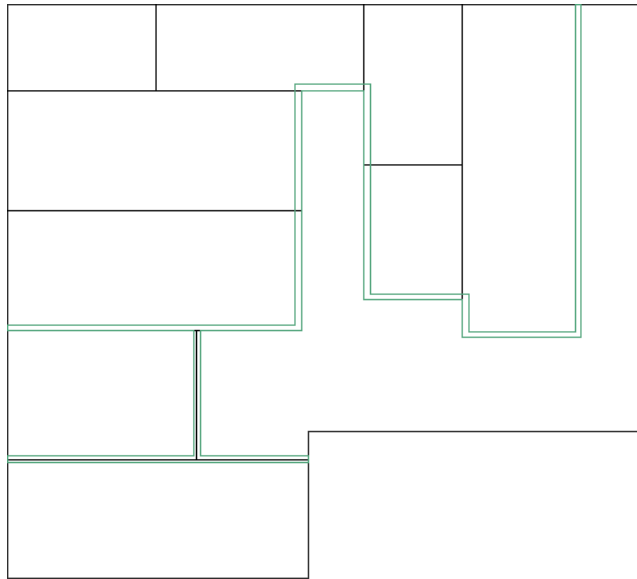


■ Press *ENTER*.

Add additional partition walls

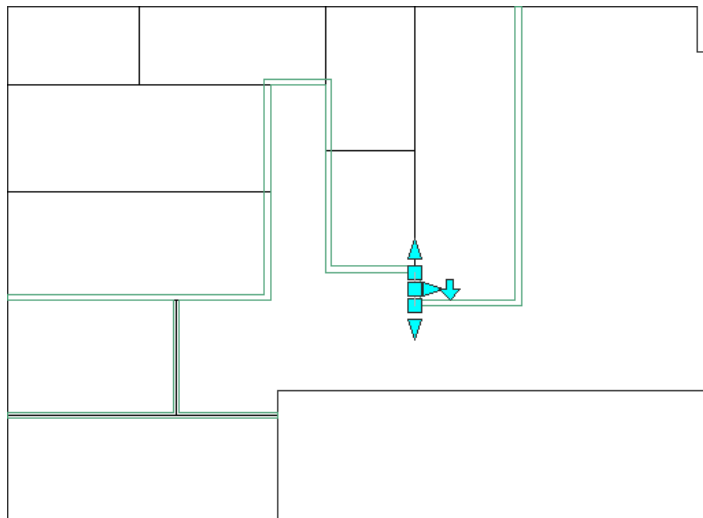
11 Using the techniques you used in previous steps, create right-justified partition walls on the floor plan as shown.

BEST PRACTICE Draw continuous walls rather than smaller segments placed end to end.

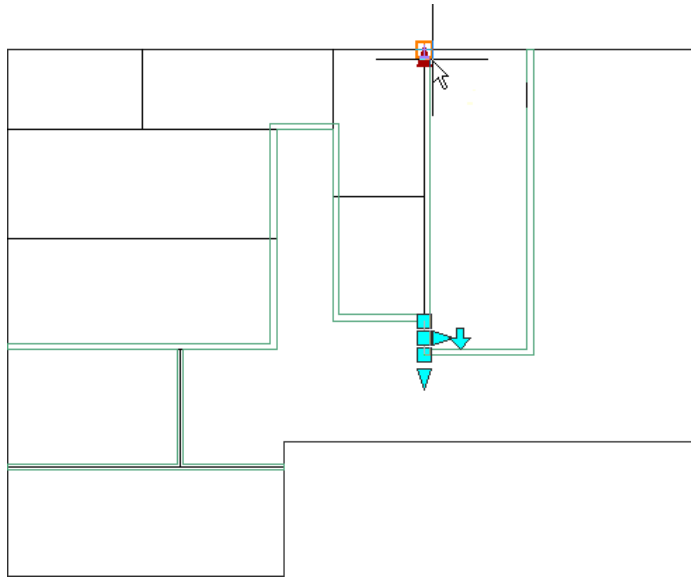


Grip edit partition walls

12 Select a wall segment to display its grips as shown.

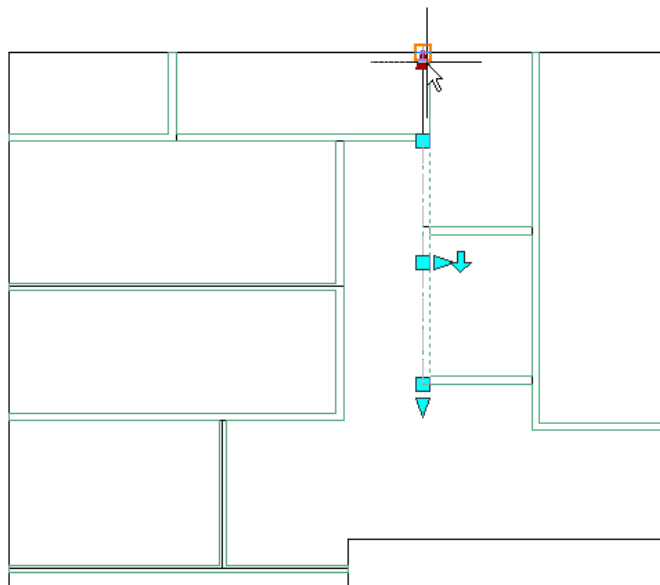


13 Select the top triangular lengthen grip, and drag it to the endpoint of the linework.



14 Press *ESC*.

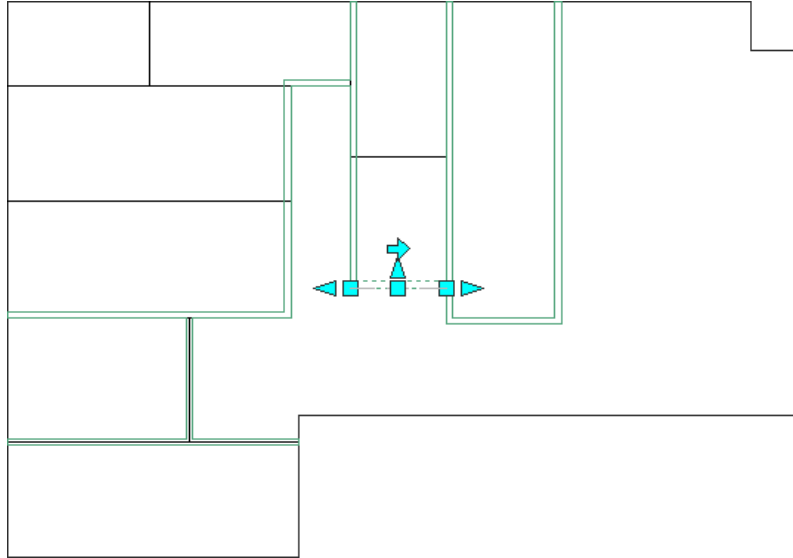
15 Using the same technique, grip edit another wall as shown.



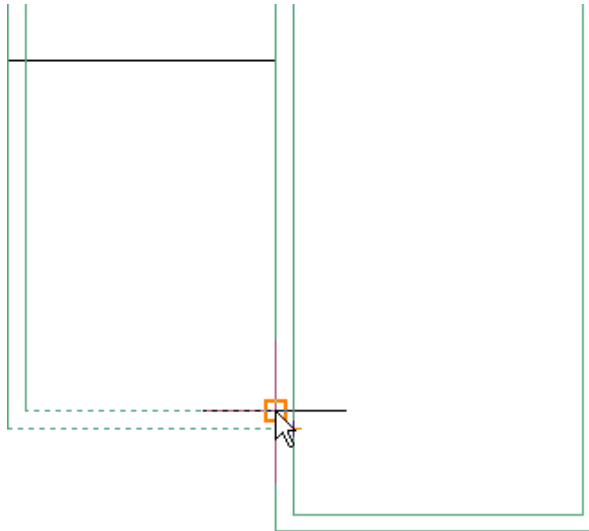
- 16** You can also use basic AutoCAD editing commands like Copy and Move to modify walls.

Copy a wall to create a new wall

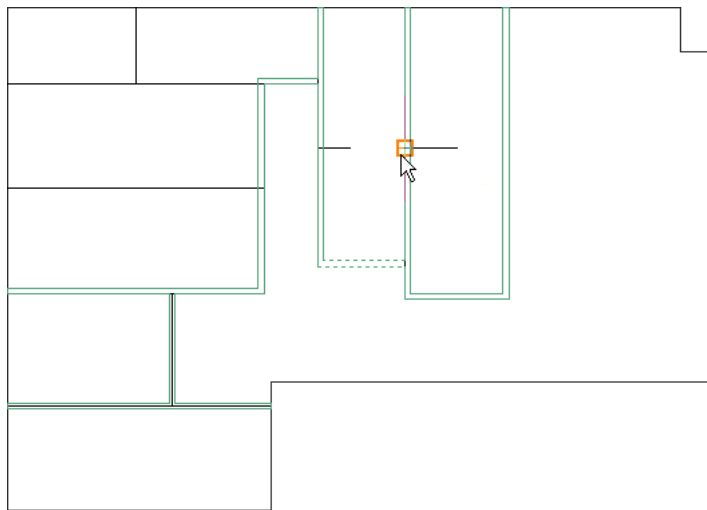
- 17** Select the short wall segment as shown, right-click, and click Basic Modify Tools ► Copy.



- 18** Select the endpoint of the wall as shown.



19 Move the cursor up, and select the line endpoint as shown.



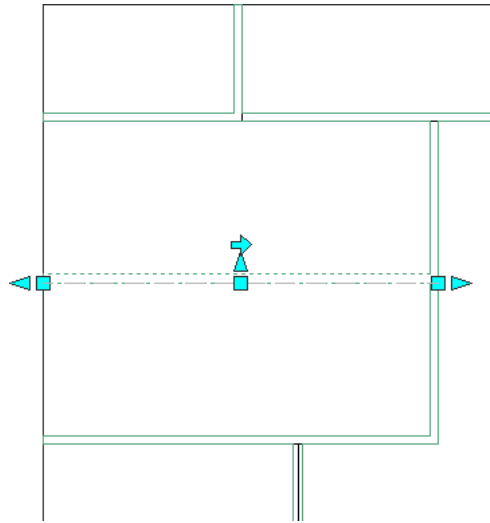
20 Press *ESC*.

21 Using the techniques you used in previous steps, lay out the remaining partition walls on this portion of the floor plan.

Modify partition walls

22 Select the wall as shown.

In the next exercise, you use this wall as a plumbing chase wall, so you want to ensure that the wall justification is set to Center, and press *ESC*.




- 23** On the Properties palette, under Dimensions, for Justify, select Center, and press *ESC*.

Because you created the walls using the Wall tool on the Design palette, the walls use the Standard style, and they display a basic or "generic" representation of a wall. You can change the style of an object to change its appearance and match design requirements.

Next, you import a wall tool with a new wall style from the Content Browser and use the wall tool to change the style of the partition walls.


Add a wall tool to the Design tool palette from the Content Browser

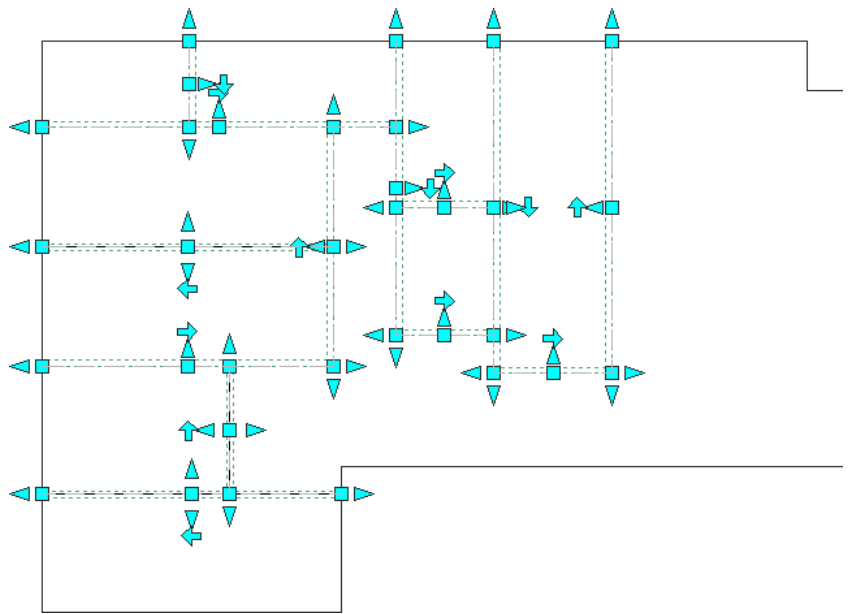
- 24** On the Design tool palette, click the Walls tab.
- 25** Add a wall tool from Content Browser to the palette:
- Click Insert tab ► Content panel ► Content Browser.
 - In the left pane, under Search, enter **Stud-3.5 GWB-0.625 Each Side**, and click GO.
If more than one tool is displayed in the right pane after the search, be sure to use the tool with the name that exactly matches the name you entered above.

- In the lower right corner of the wall tool icon, click  (i-drop).
- Drag the tool onto the tool palette, and when the dropper fills, release the mouse button.
- Close the Content Browser.

Apply the new wall tool style to the partition walls

26 Use Quick Select to select all the walls:

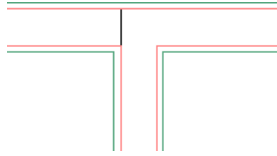
- On the Properties palette, click  (Quick Select).
- In the Quick Select dialog, for Object Type, select Wall.
- Click OK.



27 On the Design tab of the Design tool palette, right-click the Stud-3.5 GWB- 0.625 Each Side tool, and click Apply Tool Properties to ► Wall.


28 Press *ESC*.


The walls display the new style.



Erase the layout linework

29 Use Quick Select to select all the walls:

- On the Properties palette, click  (Quick Select).
- In the Quick Select dialog, for Object Type, select Wall.
- Click OK.

30 On the drawing status bar, click  (Isolate Objects) ► Hide Objects.

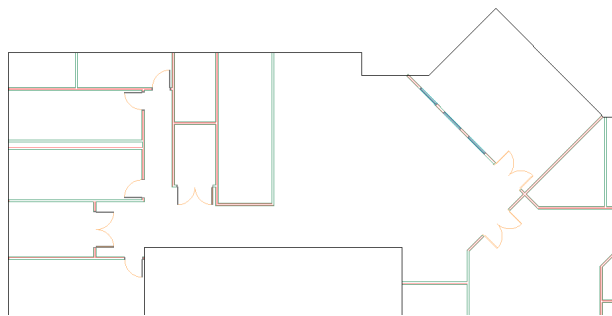
31 Using a window selection, select all of the linework in the drawing, and press *DELETE*.

32 On the drawing status bar, click  (Isolate Objects)/End Object Isolation) ► End Object Isolation.


33 Close the drawing with or without saving it.

Placing Doors and Windows

In this exercise, you place doors and windows in the interior partition walls on the floor plan.

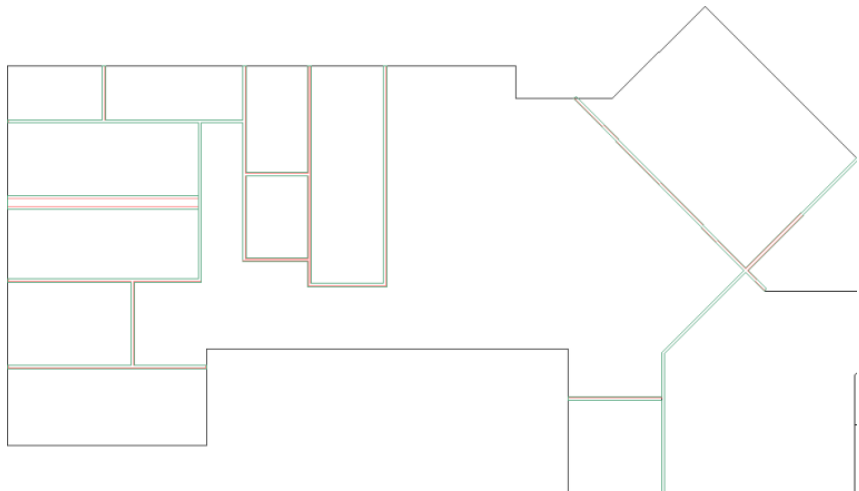


Training Files

- Click  > Open > Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_IP_02_Doors_Windows_i.dwg, and click Open.

Place doors

1 Zoom to the upper left portion of the floor plan.



2 If necessary, on the application status bar, click Dynamic Input to display temporary dimensions as you place doors and windows.

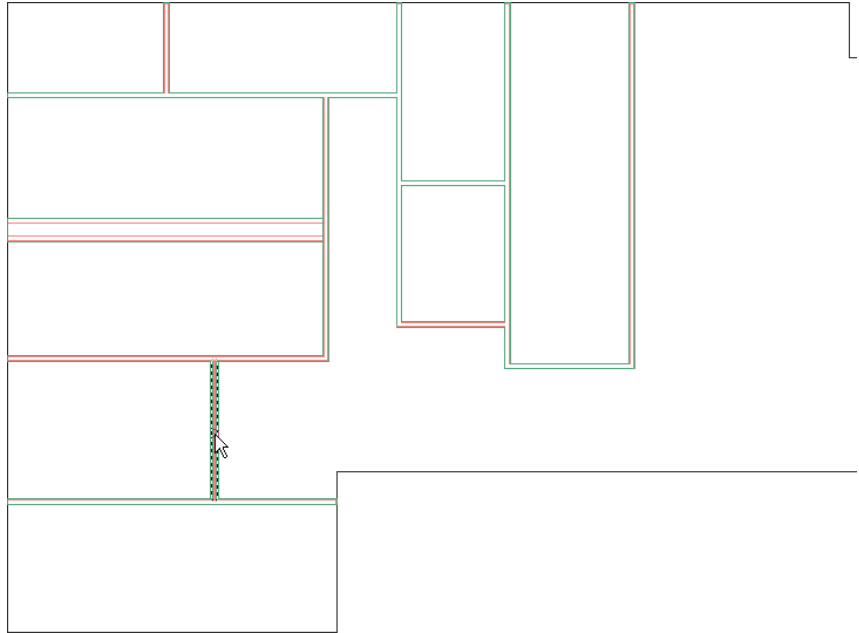
3 On the Design tab of the Design tool palette, click the Door tool



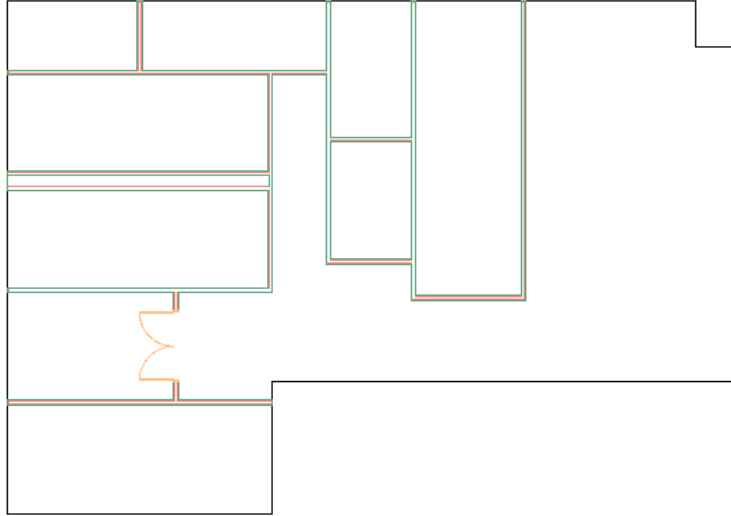
4 On the Properties palette:

- Under General, for Style, select Hinged – Double – Metal Frame in Plan.
- Under Dimension, for Width, enter 6'.
- Under Location, for Position along wall, select Offset/Center.
- For Automatic Offset, enter 4".

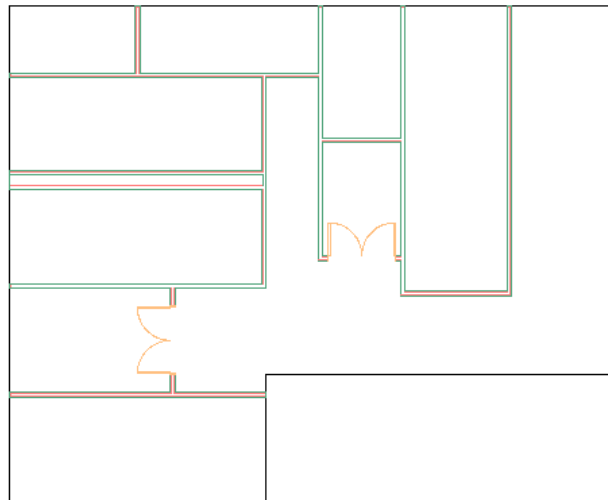
- 5 If necessary, on the application status bar, click Osnap to turn it off.
- 6 Select the center of the wall as shown, and when a centered door displays, click to place it.



- 7 Press *ENTER*.



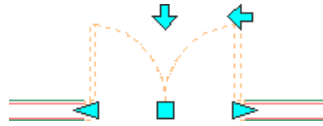
8 Using the same technique, place another door as shown.



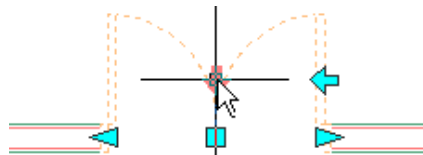
Change the swing direction of the doors

9 Use a flip grip to change the swing direction:

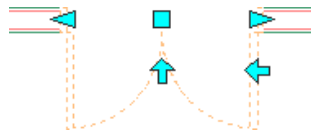
- Select the door that you just placed.



- Click .



The door swing is flipped.



10 Press *ESC*.

11 Using the same technique, flip the swing of the other door.

Place additional doors

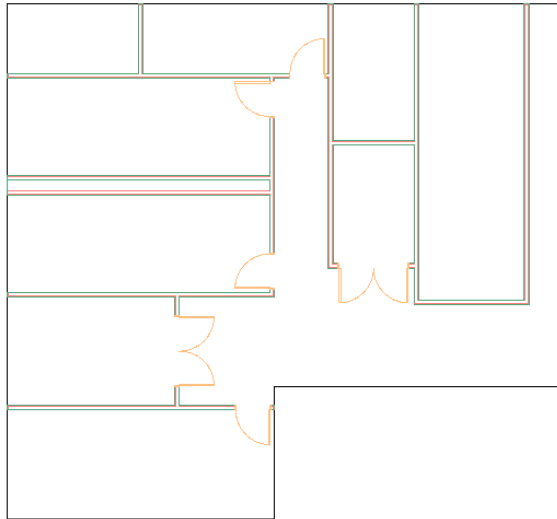
12 On the Design tab of the Design tool palette, click the Door tool



13 On the Properties palette:

- Under General, for Style, select Hinged – Single – Metal Frame in Plan.
- Under Dimensions, for Width, enter 3'.

14 Place doors as shown, and press *ESC*.



Place two double doors

15 On the Design tab of the Design tool palette, click the Door tool

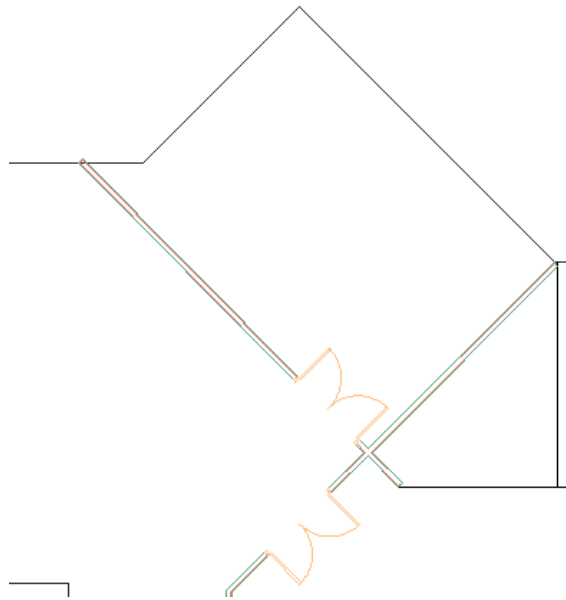


().


16 On the Properties palette:

- Under General, for Style, select Hinged – Double – Full Lite.
- Under Dimensions, for Width, enter **6'**.
- Under Location, for Position along wall, select Offset/Center.
- For Automatic Offset, enter **1'**.

17 Place doors as shown, and press *ESC*.



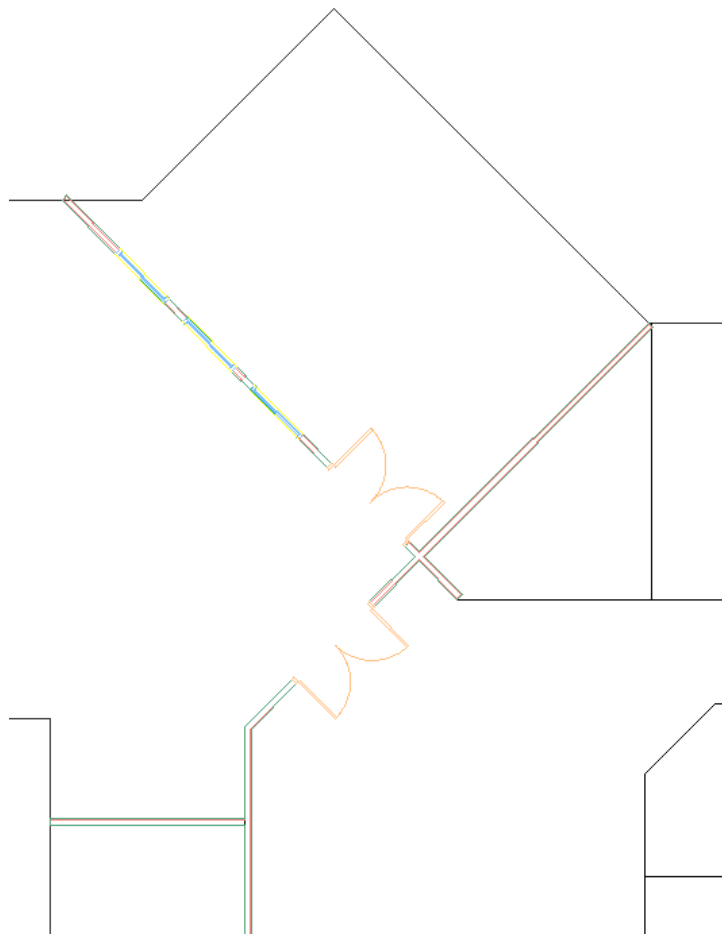
Place windows

18 On the Design tab of the Design tool palette, click the Window tool ().

19 On the Properties palette:

- Under Dimensions, for Width, enter **4'**.
- For Height, enter **6'**.
- Under Location, for Position along wall, select Unconstrained.
- For Vertical alignment, select Head.
- For Head height, enter **7'**.

20 Place three windows in the wall as shown, and press *ESC*.
Exact placement is not necessary.

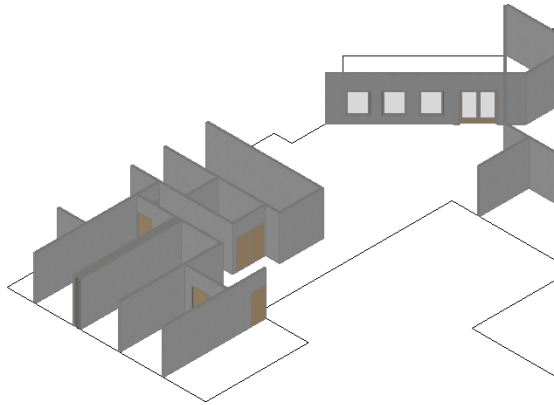


View the floor plan in 3D

21 Click View panel ► View drop-down ► View, SW Isometric.

22 Click Visual Styles drop-down, ► Visual Styles, Realistic.

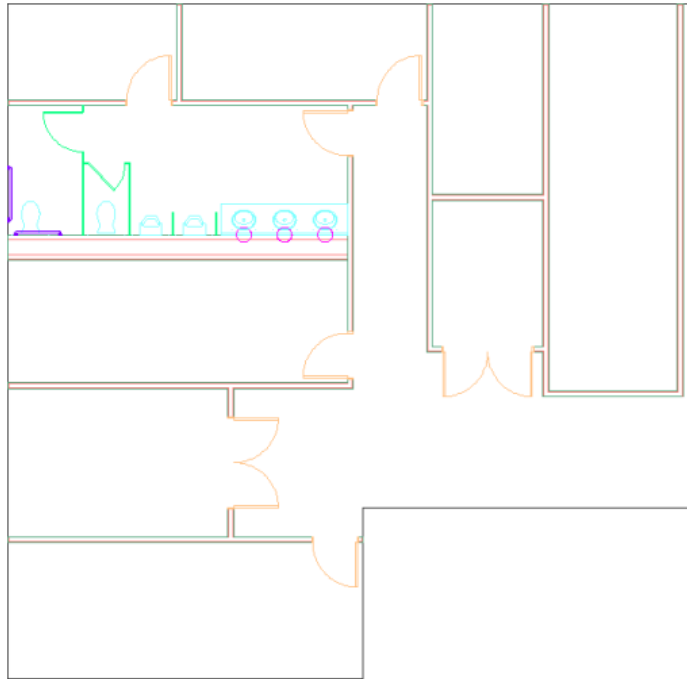
The doors and windows display in the partition walls.



23 Close the drawing with or without saving it.

Laying Out a Restroom


In this exercise, you lay out a restroom. You create a chase wall on the floor plan, and then place fixtures, accessories, and stall partitions on the floor plan.



The fixtures that you place on the floor plan are contained in a single block. The block contains the fixtures in a preconstructed restroom layout, including accessories and stall partitions.

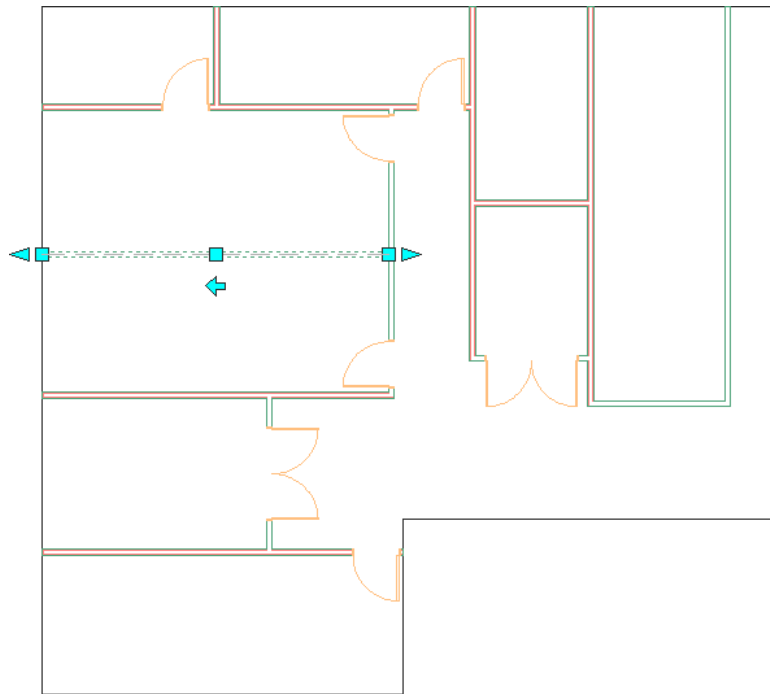
After you place the restroom layout, you modify it to better fit the floor plan. Because the restroom layout is a block, you can explode it to edit its individual components.

Training Files

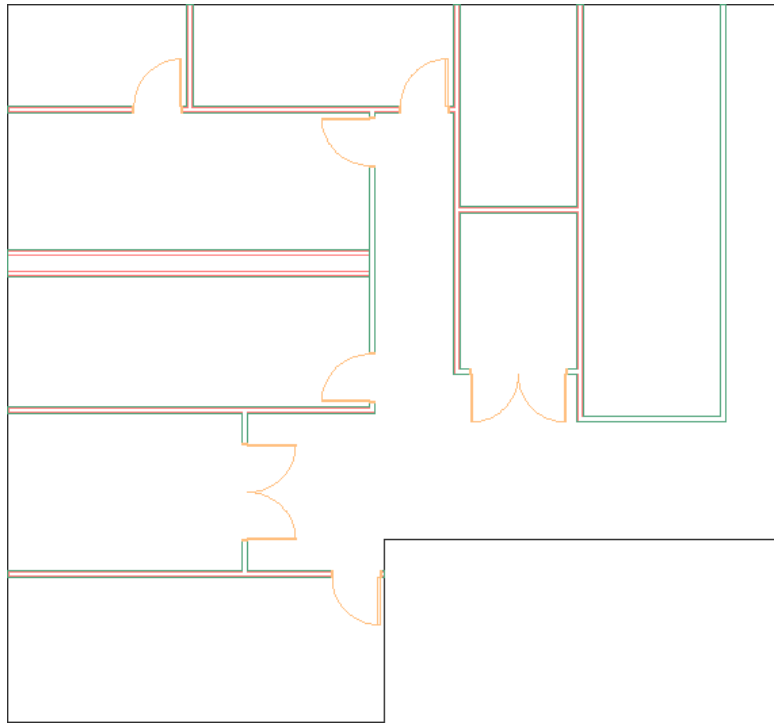
- Click  ► Open ► Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_IP_03_Place_Fixtures_i.dwg, and click Open.

Change a wall style to create a chase wall


- 1 Select the wall as shown below.



- 2 On the Properties palette, under General, for Style, select 12in Chase Wall – Stud-3.5 GWB-0.625 Each Side (2), and press *ESC*. The chase wall divides the 2 rooms that are intended for use as restrooms. You want to lay out the lower restroom, which is the women’s restroom.



Add a restroom layout tool to the tool palette

- 3 On the Design tool palette, click the FF + E tab, and scroll to the Fixtures division on the palette.
- 4 Add the layout tool from the Content Browser to the palette:
 - Click Home tab ► Build panel ► Tools drop-down ► Content Browser.
 - In the left pane, under Search, enter **rest room**, and click GO.
 - In the right pane, locate the Rest Room (Women) tool. You may have to click Next in the bottom right corner to view more of your search results.
 - In the lower-right corner of the Rest Room (Women) tool icon, click  (i-drop).
 - Drag the tool onto the FF + E tab of the Design tool palette, and when the dropper fills, release the mouse button.

- Close the Content Browser.

Place the restroom layout

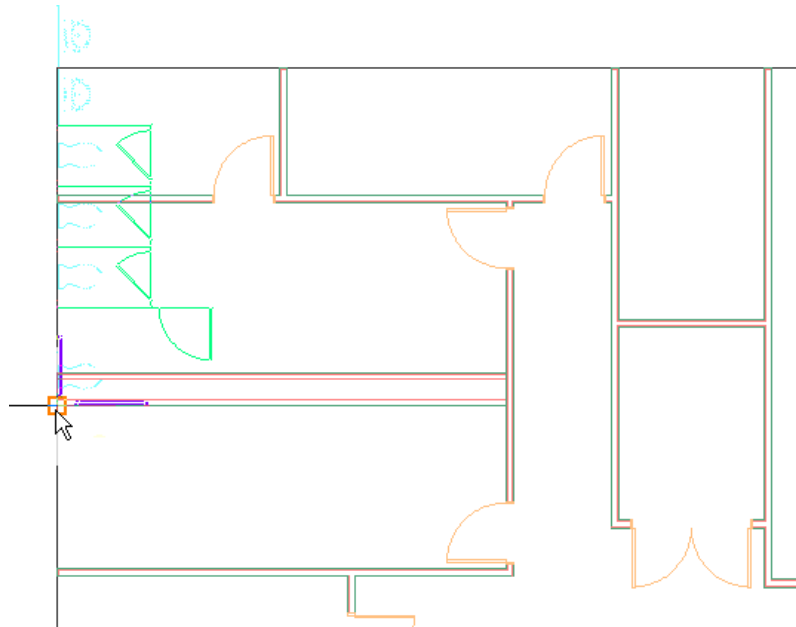
5 On the FF + E tab of the Design tool palette, click the Rest Room (Women) tool, and in the Insert dialog, click OK.

6 If necessary, on the application status bar:

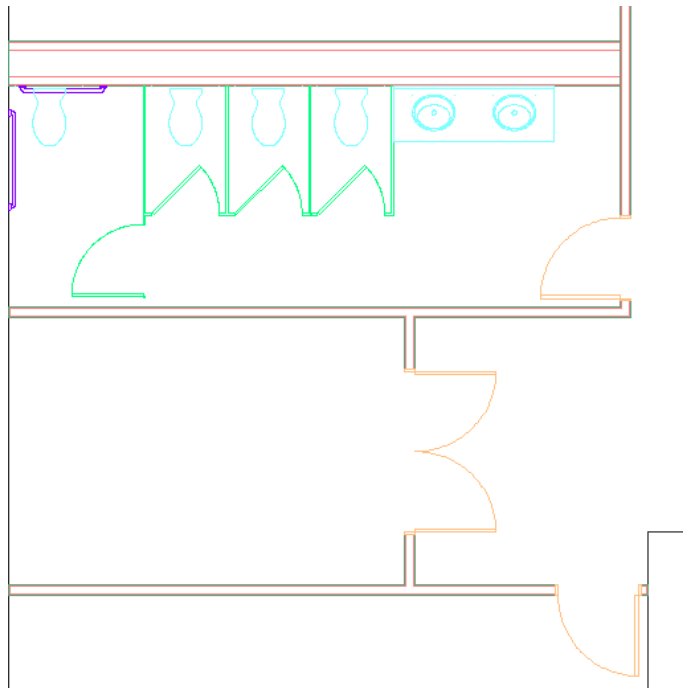
- Click Object Snap to turn it on.
- Right-click Object Snap, and click Endpoint.

7 Place the restroom:

- Move the cursor over the endpoint of the wall as shown.



- On the command line, enter **r**, and press **ENTER**.
- Enter **270°**, and press **ENTER**.
- Select the endpoint snap.
The layout matches most of the restroom design requirements, but the end stall wall is not long enough and the counter with the lavatories requires 3 evenly spaced lavatories.



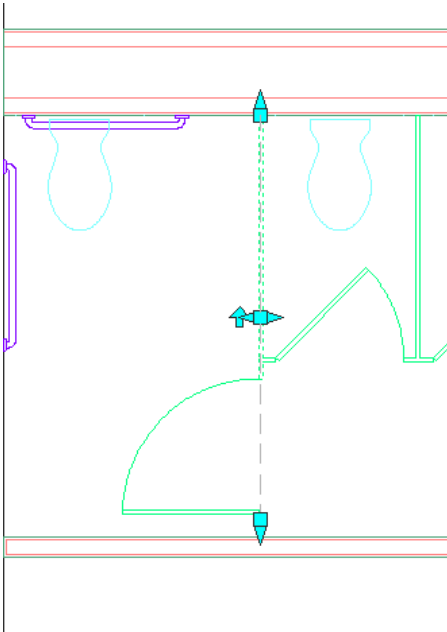
Modify the restroom layout

8 Explode the restroom layout block:

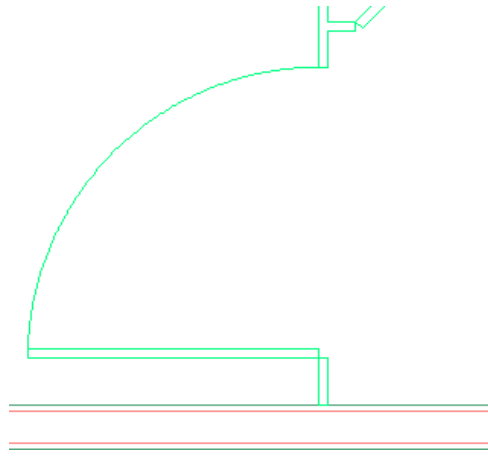
- Select the restroom layout.
- Click Home tab ► Modify panel ► Explode.

9 Lengthen the stall wall:

- Select the wall to display its grips.

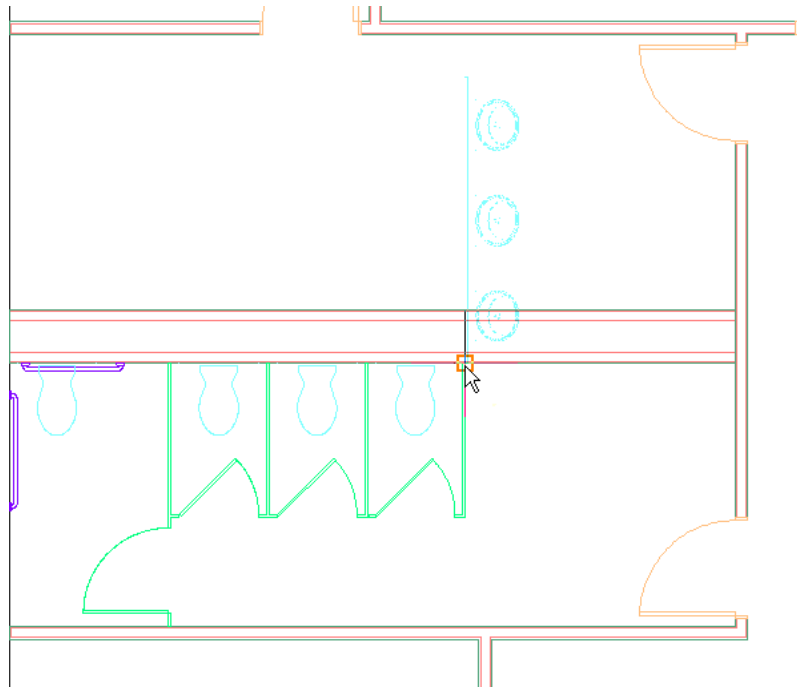


- On the application status bar, right-click Object Snap.
- Click Wall Justification Line to turn it off, and click Perpendicular to turn it on.
This allows you to snap to the face of the interior wall while lengthening the stall wall.
- Select the bottom triangular cyan lengthen grip.
- Click the face of the wall, and press *ESC*.

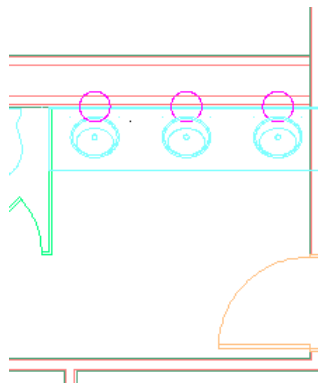


10 Replace the lavatories:

- Select the lavatories and counter top, and press *DELETE*.
- Open the Content Browser, search for the Lavs (3) tool, and use i-drop to add it to the FF + E palette.
- On the FF + E tab of the Design tool palette, click the Lavs (3) tool, and in the Insert dialog, click OK.
- Move the cursor over the endpoint of the stall wall as shown.



- On the command line, enter **r**, and press *ENTER*.
- Enter **270°**, and press *ENTER*.
- Select the endpoint snap.



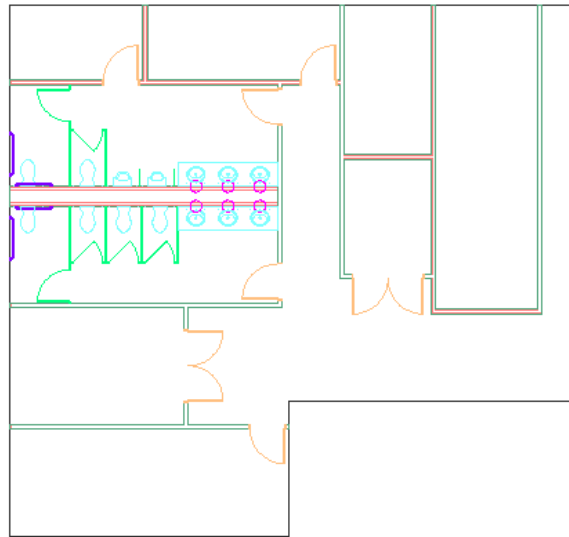
Now the restroom includes 3 lavatories, but the counter is too long and overlaps the restroom wall.

11 Using the techniques you learned in previous steps, shorten the lavatory counter:

- Explode the lavatories block.
- Using grips, shorten the lavatory counter so that it snaps to the interior wall face of the restroom.
The lavatory counter block contains a curve anchor bolt (the magenta circles at rear of lavatories). This allows the attached lavatories to maintain equal spacing as you shorten the counter.

12 Optional: Using the techniques learned in this exercise, lay out the men's restroom:

- Use the Content Browser to locate a men's restroom layout block.
- Before you explode the block, use the Mirror command to place it.

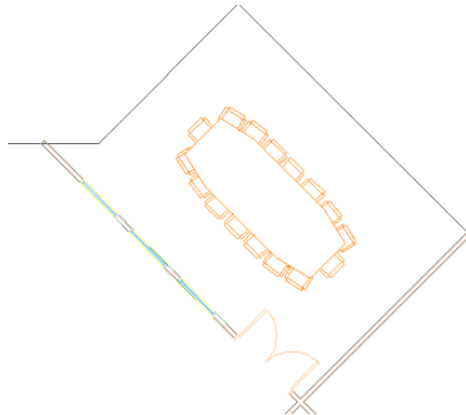


13 Close the drawing with or without saving it.

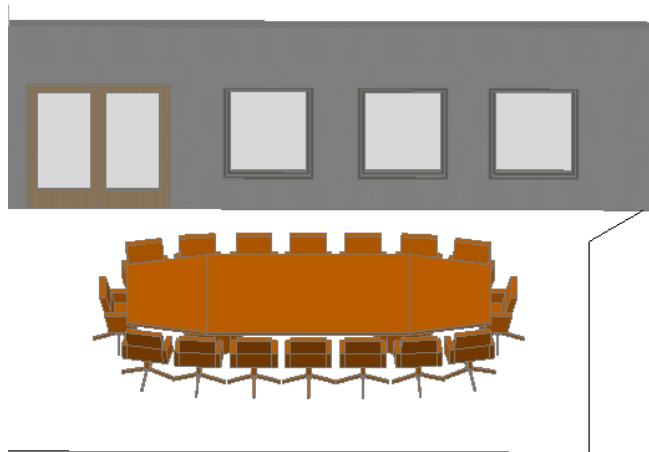
Placing Furniture

In this exercise, you place a conference table and chairs on the floor plan as a single multi-view block. Like an AutoCAD block, a multi-view block is an object that can combine 2 or more objects to create a single object. Unlike an AutoCAD block, a multi-view block can have different representations in different view directions.


The conference table in plan view



The conference table in a 3D view



Training Files


■ Click  > Open > Drawing.

- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_IP_04_Place_Furniture_i.dwg, and click Open.

Add a new conference table and chairs tool to the tool palette

1 On the Design tool palette, click the FF + E tab, and scroll to the Furnishings division.

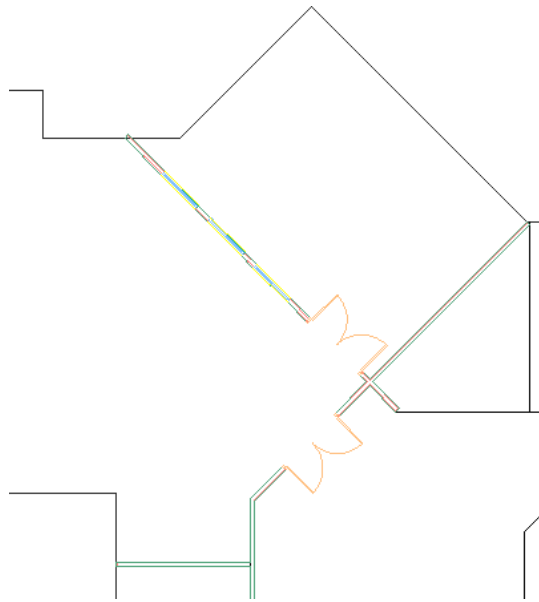
2 Add the conference table tool from the Content Browser to the palette:


- Click Home tab ► Build panel ► Tools drop-down ► Content Browser.
- In the right pane of the Content Browser, click Design Tool Catalog - Imperial.
- In the left pane, under Search, enter **conference table**, and click GO.
- In the right pane, locate the Conf 16ft - 16 Seat tool.
- In the lower right corner of the Conf 16ft - 16 Seat tool, click  (i-drop).
- Drag the tool to the FF + E palette under the Furnishings division, and when the dropper icon fills, release the mouse button.

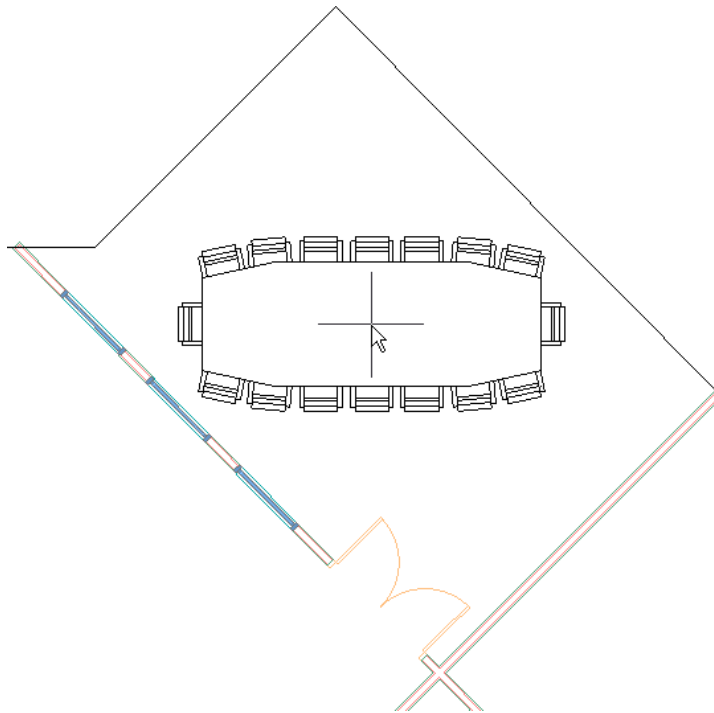
3 Close the Content Browser.

Place the conference table and chairs on the floor plan

4 Zoom to the large conference room on the floor plan.

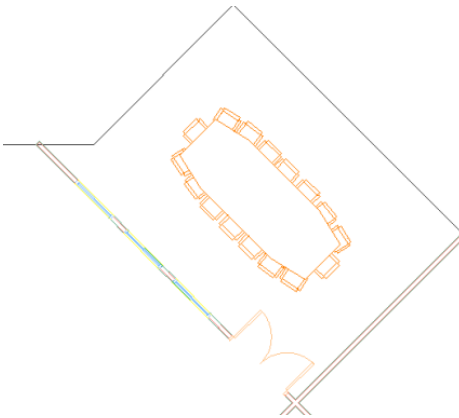


- 5** On the FF + E tab of the Design tool palette, click the Conf 16ft - 16 Seat tool ().
- 6** Move the cursor over the center of the conference room.
The conference table displays.



7 Rotate the conference table into position:

- On the command line, enter **r**, and press **ENTER**.
- Enter **135**, and press **ENTER**.
- Click in the drawing to place the table.
- Press **ESC**.



View the conference table layer assignment

8 Select the conference table.

9 On the Properties palette, under General, for Layer, notice that the conference table is on a predefined layer in the drawing.

Tools that you import from the Content Browser contain layer assignments. When you use a tool to create an object, the object is placed on its assigned layer. The layer is created if it does not exist in the drawing.

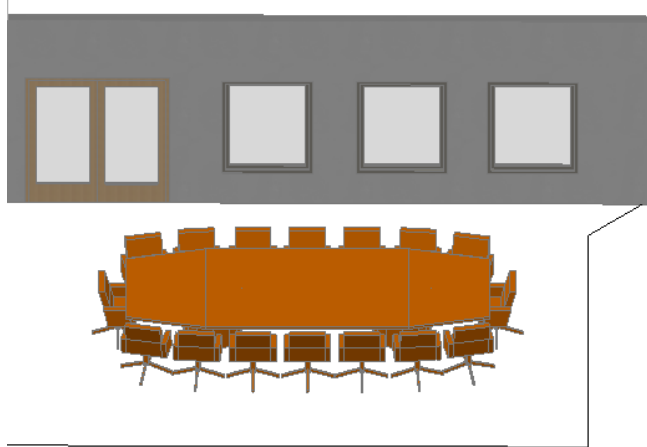
10 Press *ESC*.

View the conference table in 3D

11 Click View panel ► View drop-down ► View, NE Isometric.

12 Click Visual Styles drop-down, ► Visual Styles, Realistic.

The multi-view block displays a 3D view of the conference table.



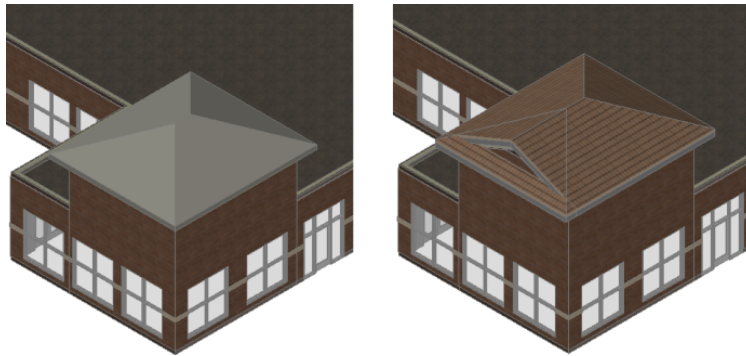
- 13 Optional:** Search the Content Browser for additional office furnishings and place them on the floor plan.
- 14** Close the drawing with or without saving it.

Creating a Roof

7

In this lesson, you create a roof over the tower portion of the Research Building.

You begin by creating a basic hip roof, and then modifying it to meet the building design requirements by adding materials and a gable end.

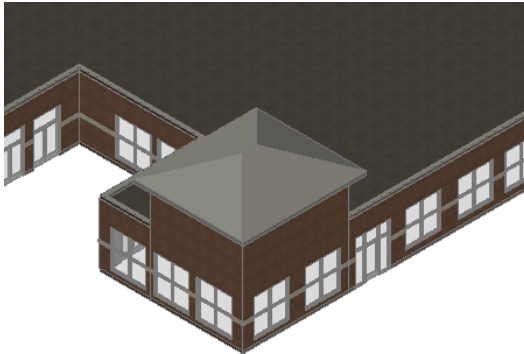


You learn to:


- Use the Roof tool on the Design tool palette to create a basic hip roof.
- Convert a roof to its constituent roof slabs to facilitate modification of the roof geometry.
- Modify the roof slab geometry to create a gable end.
- Change the roof style to display materials on the roof.

Creating a Hip Roof

In this exercise, you use the Roof tool on the Design tool palette to create a simple hip roof over the building tower.



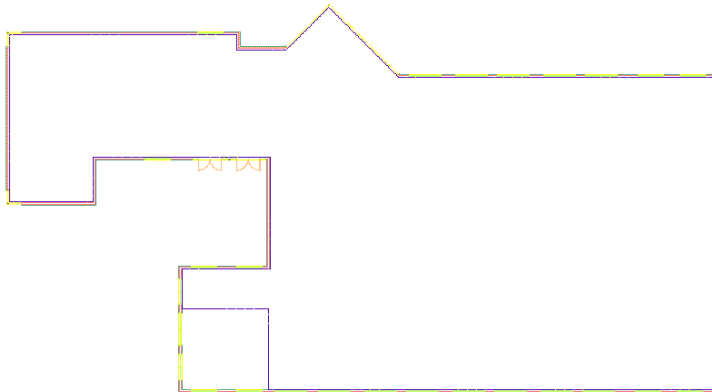
Training File

- Click  ➤ Open ➤ Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_CR_01_Create_Roof.i.dwg

View the flat roof in a 2D view

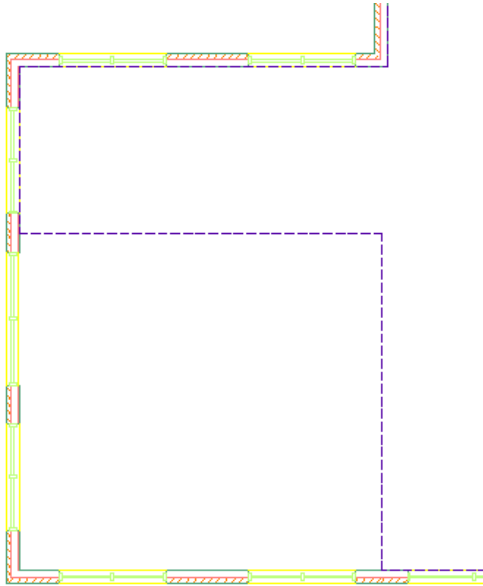
- 1 Click View Panel ➤ View drop-down ➤ View, Top.
- 2 Click View panel ➤ Visual Styles drop-down ➤ Visual Styles, 2D Wireframe.

A flat roof, consisting of a single slab with a canted edge, covers most of the building. An offset value positions the roof vertically in the building shell.



3 Zoom in to view the tower area.

The flat roof slab displays as a dashed line and is cut out around the area where you want to add the tower roof.



Create the tower roof

4 If necessary, on the application status bar:

- Click Ortho Mode and Object Snap to turn them on.
- Right-click Object Snap, and click Endpoint.

5 On the Design tab of the Design tool palette, click the Roof tool



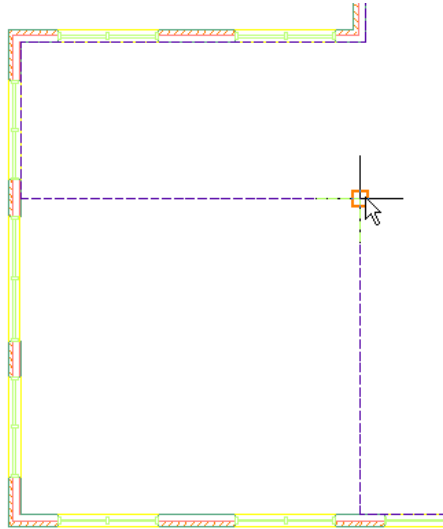
().

6 On the Properties palette:

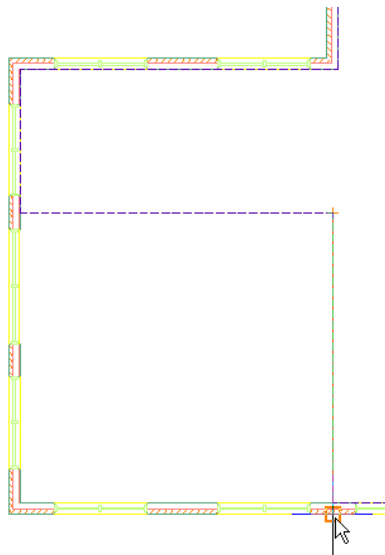
- On the Design tab, under Dimensions, for Edge cut, select Plumb.
- Under Next Edge, for Overhang, enter **2'**.
- Under Lower Slope, for Rise, enter **5"**.
- Under Lower Slope, for Plate height, enter **24'**

7 Sketch the roof footprint:

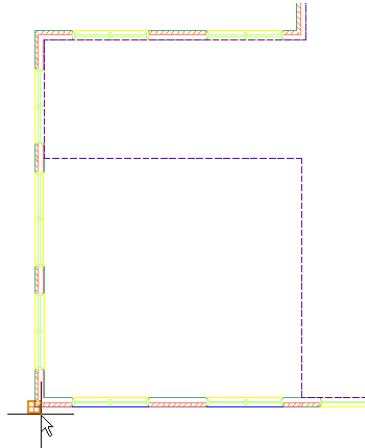
- Select the roof slab endpoint as shown.



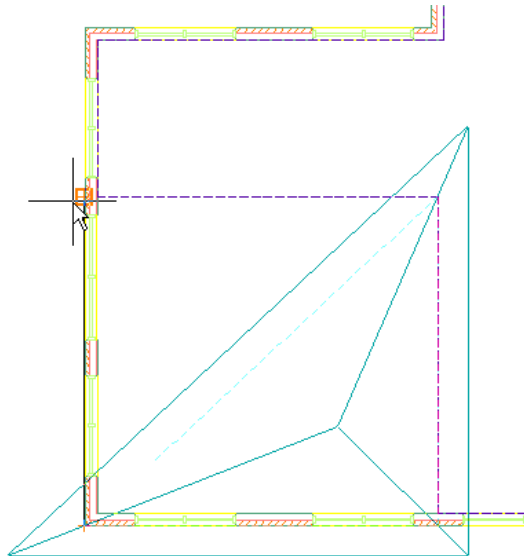
- Move the cursor down, and select the wall endpoint as shown.



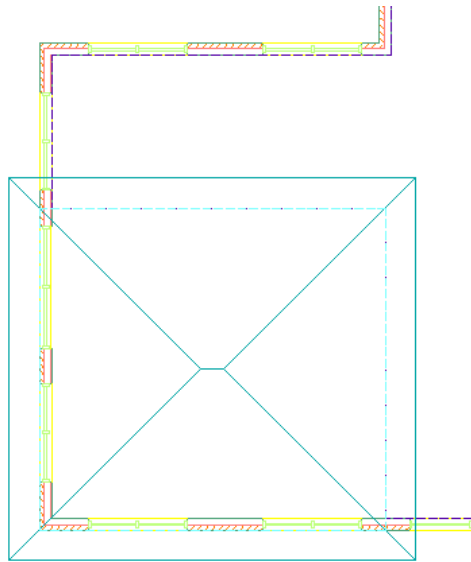
- Move the cursor to the left, and select the horizontal wall endpoint.



- Move the cursor up, and select the vertical wall endpoint. The roof valleys and ridges are calculated automatically as you complete the footprint.



- Press *ENTER*. The complete tower roof displays.

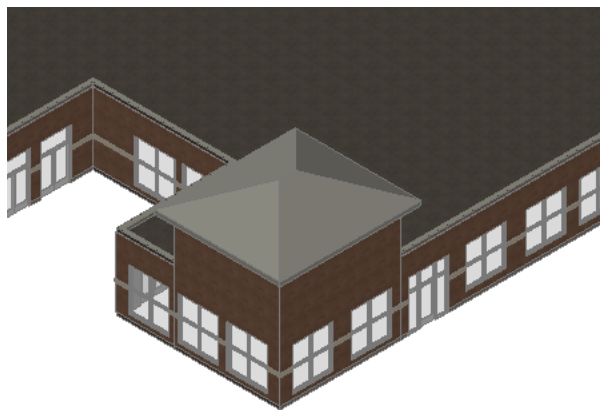


View the roof in 3D

8 Click View Panel ► View drop-down ► View, SW Isometric.

9 Click Visual Styles drop-down ► Visual Styles, Realistic.

Because the roof was created with the Roof tool on the Design tool palette, it uses the Standard roof style to create a basic or “generic” representation of a hip roof that does not include materials.



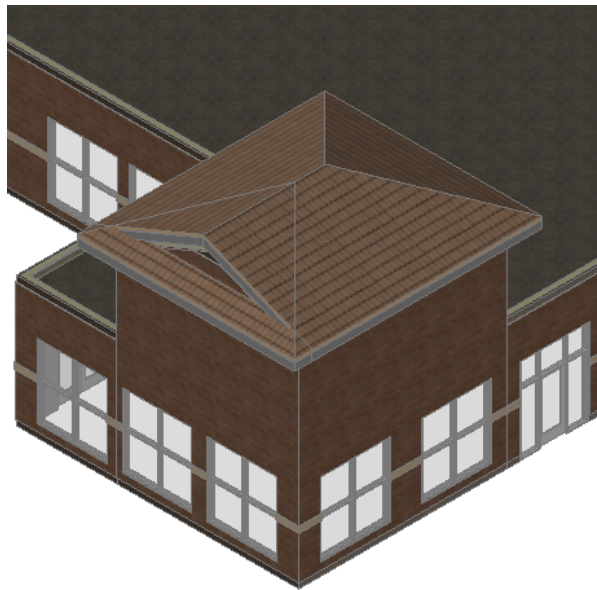
In the next exercise, you modify the tower roof to better match the building design requirements by editing its geometry and changing the roof style to display the roof with materials.

10 Close the drawing with or without saving it.

Modifying the Hip Roof


In this exercise, you modify the basic tower roof you created in the previous exercise to satisfy the building design requirements.

The modified roof features a gable, retains a hipped portion on the east (right) side, and displays materials.



Before you modify the roof geometry, you convert the roof to the individual slabs that compose it. After the conversion, you use modification tools, such as the Trim command, to modify the slab geometry.

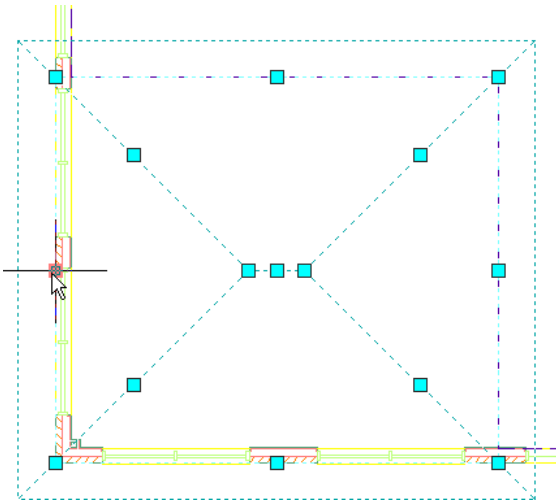
Training File

- Click  ➤ Open ➤ Drawing.
- In the Select File dialog, browse to C:\My Documents\Autodesk\My Projects\Training_Files_I.

- Select ACA_CR_02_Roof_Slabs.i.dwg

Convert the tower roof to roof slabs

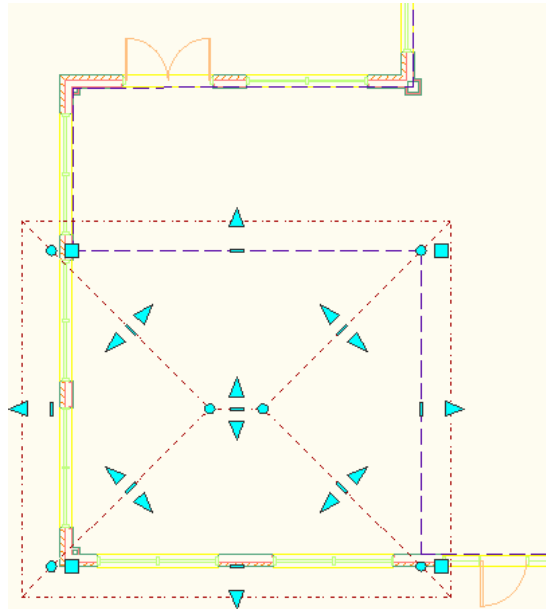
- 1 Click View Panel ► View drop-down ► View, Top.
- 2 Move the left tower roof edge away from the left tower wall:
 - If necessary, on the application status bar, click Ortho Mode to turn it on.
 - Select the roof to display its grips, and select the middle cyan location grip on the left edge.



- Move the grip slightly to the left, enter 6", and press *ENTER*.
- 3 Convert the tower roof into roof slabs:
 - With the roof selected, right-click, and click Convert to Roof Slabs.
 - In the Convert to Roof Slabs dialog, select Erase Layout Geometry, and click OK.

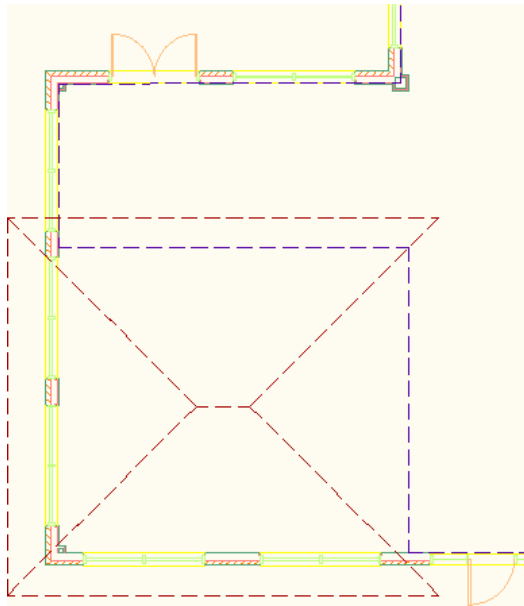
Erasing the layout geometry removes the roof after you create the slabs. In some cases, you might want to retain the roof geometry, but in this case, you no longer need the roof object after you convert it to slabs.

Grips display on each roof slab, showing you the individual slabs that you can modify independently.



■ Press *ESC*.

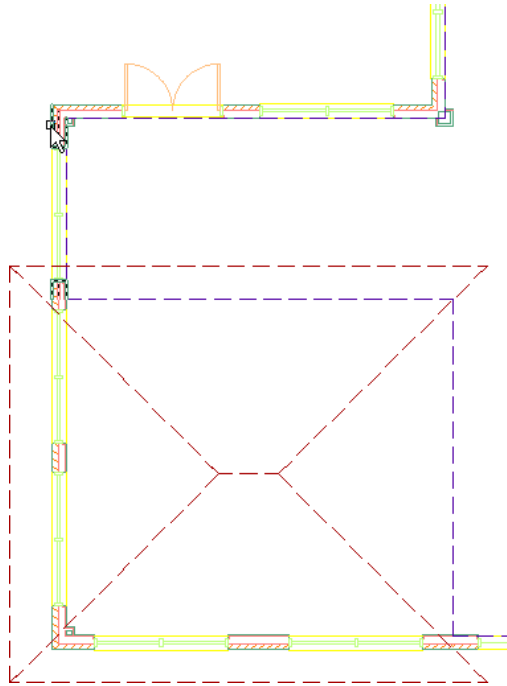
4 Select the right roof slab, and press *DELETE*.



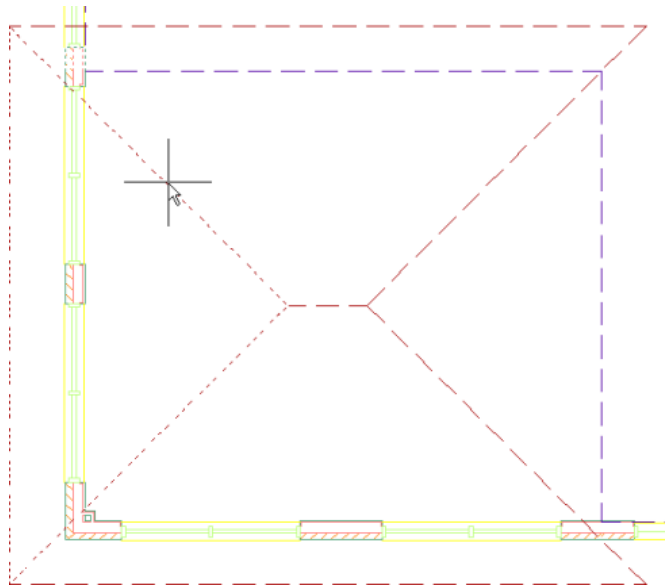
The upper portion of the left roof slab needs to be trimmed to the wall line, keeping only the overhang geometry.

Trim the upper portion of the left roof slab to the wall line

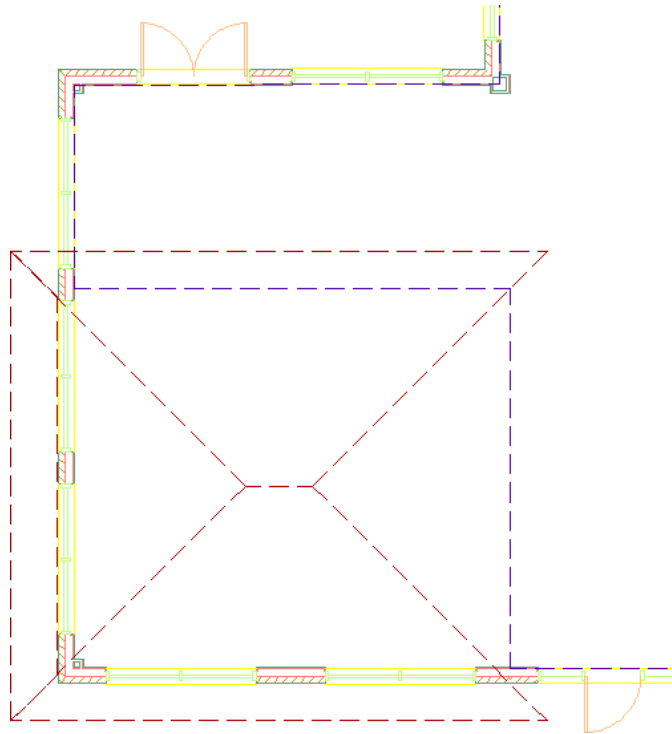
- 5 Select the left roof slab, right-click, and click Trim.
- 6 Select the left vertical tower wall to use it as the trimming edge.



7 Select the right side of the roof (the side that you want to remove).



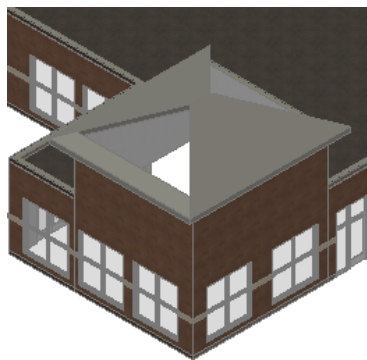
The roof slab trims to the wall line.



View the results in 3D


8 Click View panel ► View drop-down ► View, SW Isometric.

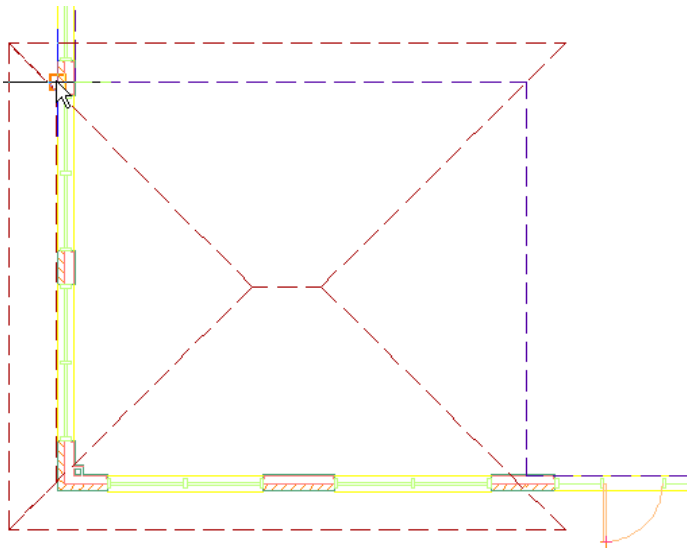
9 Click Visual Styles drop-down ► Visual Styles, Realistic.



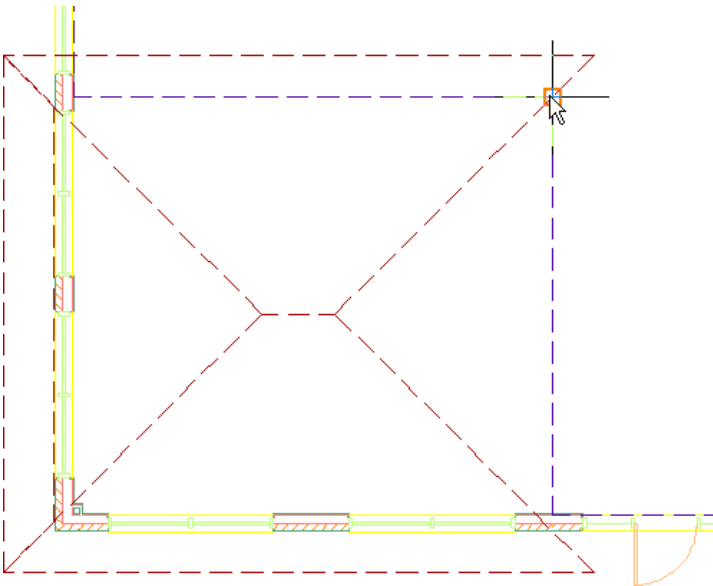
Next, you create another roof object to generate the gable end geometry on the left side of the tower roof.

Create the gable end of the roof

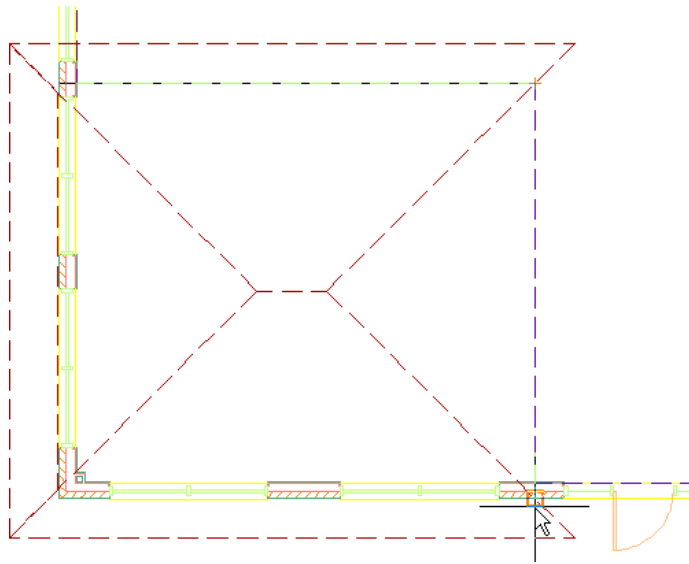
- 10 Click ViewCube ► Top.
- 11 Click View panel ► Visual Styles drop-down ► Visual Styles, 2D Wireframe.
- 12 If necessary, on the application status bar:
 - Click Ortho Mode and Object Snap to turn them on.
 - Right-click Object Snap, and click Endpoint.
- 13 On the Design tab of the Design tool palette, click the Roof tool () .
- 14 On the Properties palette:
 - On the Design tab, under Dimensions, for Edge cut, select Plumb.
 - Under Next Edge, for Overhang, enter 2'.
 - Under Lower Slope, for Plate height, enter 24'.
 - For Rise, enter 5" .
- 15 Sketch the roof footprint:
 - Select the wall endpoint as shown.



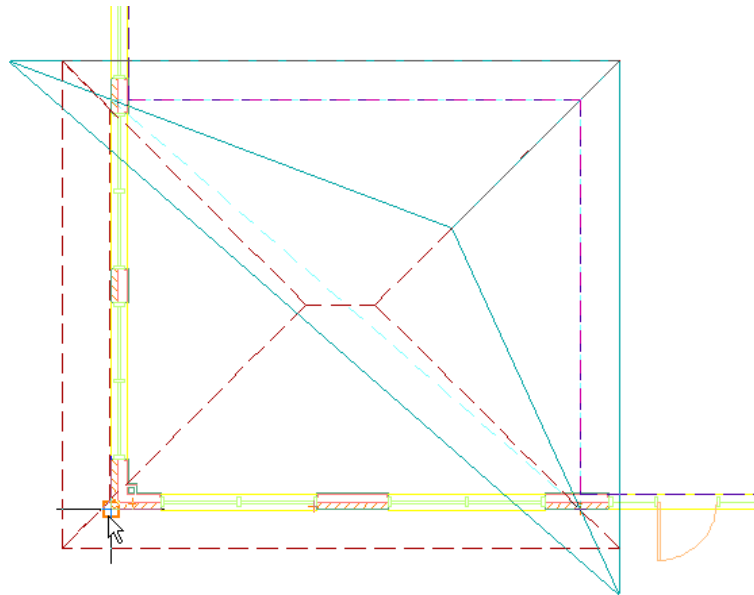
- Move the cursor to the right, and select the endpoint as shown.



- Move the cursor down, and select the wall endpoint as shown.

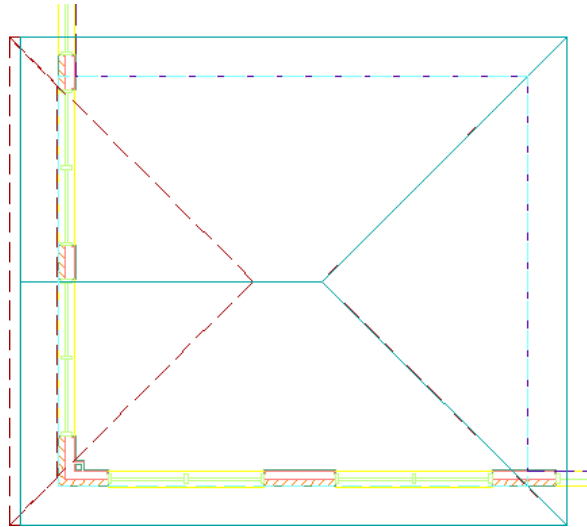


- Move the cursor to the left, and select the wall endpoint as shown.



16 Before you add the final edge, on the command line, set it to define the gable:

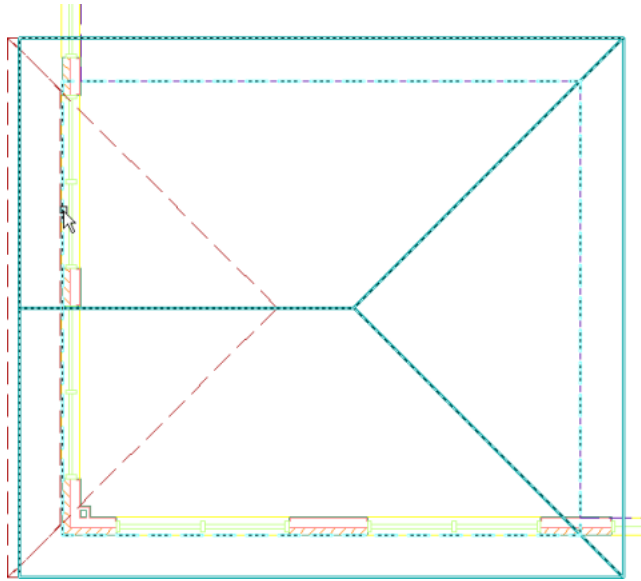
- Enter **g**, and press *ENTER*.
- Enter **y**, and press *ENTER* twice.



Modify the roof edge overhang

17 Select the roof, right-click, and click Edit Edges/Faces.

18 Select the left roof edge, and press *ENTER*.



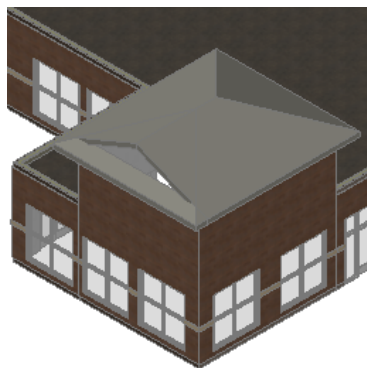
19 In the Roof Edges and Faces dialog:

- Under Roof Edges, under (B) Overhang, enter **6"**.
- Click OK.

View the results in 3D

20 Click View panel ► View drop-down ► View, SW Isometric.

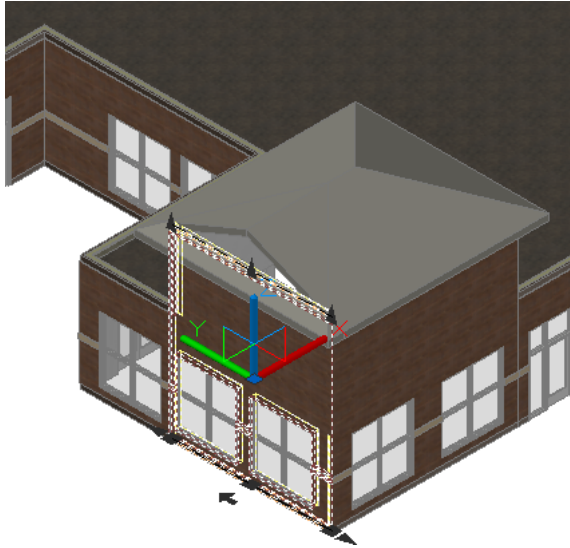
21 Click Visual Styles drop-down ► Visual Styles, Realistic.



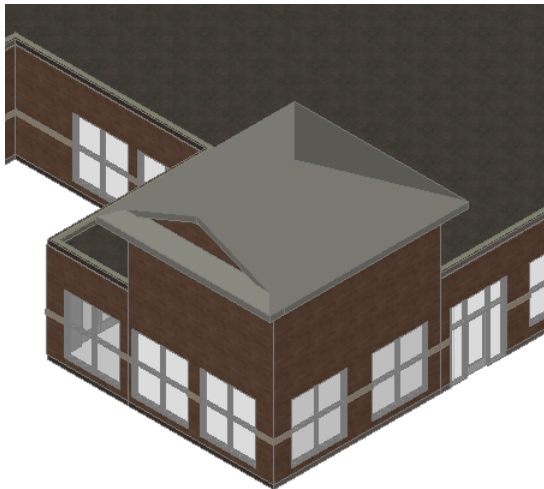
With the gable in place, you can adjust the wall roof line to follow the other gable end.

Edit the roof line to match the wall

- 22** Select the wall, right-click, and click Roof/Floor Line ► Modify Roof Line.



- 23** On the command line, enter **a**, and press *ENTER*.
24 Select the roof, press *ENTER*, and press *ESC*.
25 Press *ESC*.





Convert the roof used to establish the gable end to roof slabs

- 26 Select the roof, right-click, and click Convert to Roof Slabs.
- 27 In the Convert to Roof Slabs dialog, select Erase Layout Geometry, and click OK.
- 28 Press *ESC*.

Change the roof style to display the roof with materials

- 29 Add a tool from the Content Browser to the Design tool palette:

- Click Home tab ► Build panel ► Tools drop-down ► Content Browser.
- In the left pane of the Content Browser, under Search, enter **roof slabs**, and click GO.
In the search results in the right pane, locate the Square Cut roof tool.
- In the lower right corner of the Square Cut tool icon, click  (i-drop).
- Drag the tool onto the Design tool palette, and when the dropper icon fills, release the mouse button.
- Close the Content Browser.

- 30 On the Properties palette, select  (Quick Select).

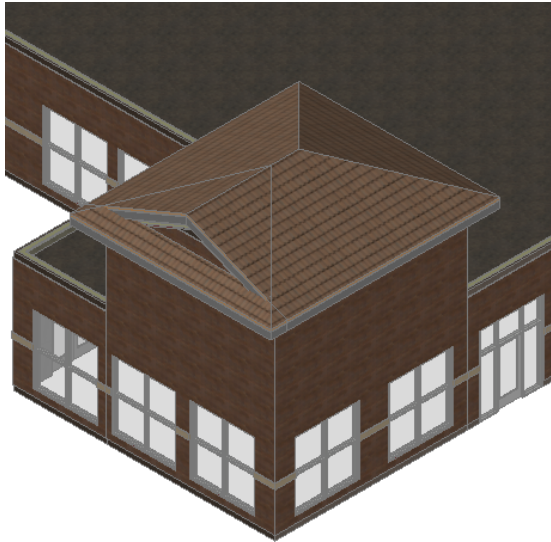
- 31 In the Quick Select dialog, for Object Type, select Roof Slab, and click OK.

The roof slabs are selected.

- 32 On the Design tab of the Design tool palette, right-click the Square Cut roof tool, and click Apply Tool Properties to ► Roof Slab.

- 33 Press *ESC*.

The roof displays the materials that are assigned in the style.



34 Close the drawing with or without saving it.

Working in a Project

In this tutorial, you create and work with the files that make up the Research Building project. You:

- Create a project and add levels to the Research Building project.
- Create and work with construct drawings, which are the main building blocks of the Research Building model.
- Create and work with element drawings using externally referenced drawings (xrefs).
- Create different views of the Research Building model.
- Create and work with sheet drawings.

Creating a Project

8

In this lesson, you learn about the types of drawings that make up the Research Building project.

You learn to:

- Create a project.
- Add levels to a project.

Overview: Managing Drawings in a Project

AutoCAD Architecture lets you create, coordinate, and distribute your project drawings within the AutoCAD Architecture project environment.

In AutoCAD Architecture your building model geometry is distributed among drawing files (DWGs). To store and manage the drawings, you create a project. In the project, you create the basic levels (floors) and divisions (wings) of the building, to which you assign the drawings that contain the geometry of your model.

Using enhanced AutoCAD® Xref technology, the drawings that contain the building model geometry can be referenced together, and views of the building model can be created and referenced onto plotting sheets.

All the files in your project are organized in a main project folder. Project drawings are classified as constructs, elements, views, or sheets and are stored in corresponding project sub-folders.

Constructs and Elements

Two types of drawings, constructs and elements, contain the geometry that makes up the building model.

Constructs are the main building blocks of the model. They define distinct portions of the building, such as the exterior shell or the interior partition walls, and are assigned to a location (level and division) within the building.

Elements are collections of geometry that can be referenced by multiple constructs, such as a service core that would be referenced on multiple floors of a commercial building.

Views and Sheets

A view drawing references one or more constructs according to their location in the building to present a specific view of the building model. You decide what part of the building model you wish to view and create a model space view.

Sheet drawings are DWG files that you plot or electronically publish to produce construction documents. Sheet drawings contain paper space layouts that comprise the layout of the sheet. You reference model space views from view drawings to create sheet views. Any changes that you make to the model can be updated in the sheets.

Creating the Research Building Project


In this exercise, you create a new project similar to the Research Building project that you use in this tutorial.



- 1 Click  ► New ► Project.


The Project Browser displays. You use the Project Browser to create, copy, and switch between projects.



- 2 In the left pane, click , and if necessary, scroll to view the current file path and folder.


If necessary, browse to My Documents\Autodesk\My Projects. This is where your project folder will be created.



- 3 On the Project Browser, click  (New Project).

- 4 In the Add Project dialog:

- For Project Number, enter **101**.
- For Project Name, enter **Research Building**.

- For Project Description, enter **Commercial Building**.
- Verify that Create from template project is selected.
- Click , browse to C:\ProgramData\Autodesk\ACA 2010\enu\Template\Template Project (Imperial), select Template Project (Imperial).apj, and click Open.
- Click OK.
The Research Building project displays in bold type in the Project Browser to indicate it is current.

5 In the Project Browser, click Close.



The Project Navigator displays. You use the Project Navigator to create, access, and organize the drawings in the current project.

Adding Levels to the Project

In this exercise, you add levels to the Research Building project that you use in this tutorial.

Training File

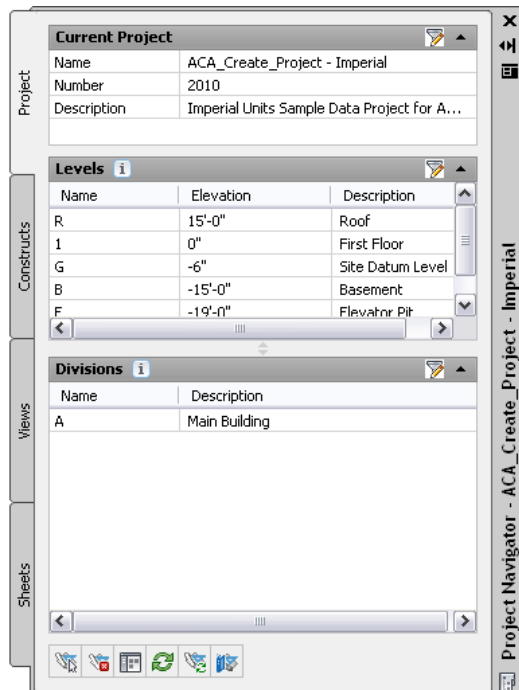


- Click  ➤ Open ➤ Project.
- In the left pane of the Project Browser, click , and if necessary, select the file path and folder My Documents\Autodesk\My Projects.
- In the left pane, double-click ACA_Create_Project - Imperial.
- In the Project Browser - Project Location Changed dialog, click Repath the project now.
The project name displays in bold type to indicate it is current.
- In the Project Browser, click Close.

View the project levels

1 Locate the Project Navigator.


The Project Navigator features 4 tabs that you use to create, access, and organize the drawings in the project.



2 On the Project Navigator, on the Project tab, view the project information:

- Under Current Project, view the project name, number, and description.
- Under Levels, notice that the project has 5 levels.
- Under Divisions, notice that the project has a single division. Because the project does not contain any wings or other horizontal divisions, additional divisions are not necessary.

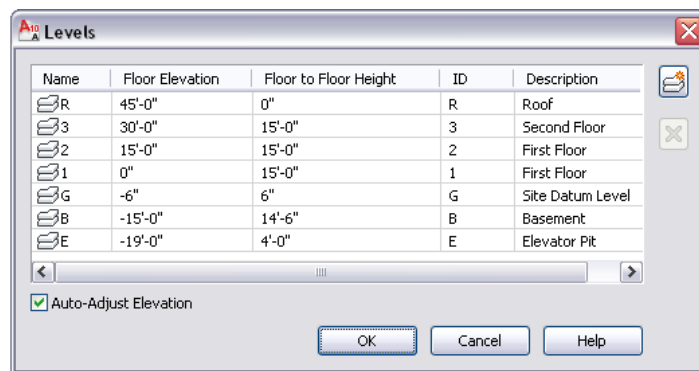
Add two levels (floors) to the project

3 In the Levels title bar, click  (Edit Levels).

4 In the Levels dialog:

- Verify that Auto-Adjust Elevation is selected. This ensures that the floor elevation of existing levels is automatically adjusted based on the assigned floor-to-floor heights of each level.

- Under Name, right-click R, and click Add Level Below.
A new level is added below the roof level (R). You change the numbering, ID, and description of the level to match its use in the building. Using a logical naming convention will make it easier for you and others to work with the project, especially if the project is large and complex.
- For the new level, under Name, double-click the existing value and enter **3**.
- Under ID, double-click the existing value and enter **3**.
- Under Description, enter **Third Floor**.
- Under Name, right-click 3, and click Add Level Below
- For Name, replace the existing value with **2**.
- For ID, replace the existing value with **2**.
- For Description, enter **Second Floor**.



5 Click OK.

6 In the AutoCAD Architecture 2010 dialog, click Yes.

View the new levels

7 On the Project Navigator, on the Project tab, under Levels, the new levels display.

The new levels are automatically saved with the project when they are created. They are used in later lessons in this tutorial.

Creating Constructs

9

In this lesson, you create and work with construct drawings.

You learn to:


- Create a construct from an existing drawing outside of the project.
- Create a stair in a spanning construct.
- Create a stair tower in a spanning construct.

Creating a Construct from a Drawing

In this exercise, you create a new project construct from an external drawing. The construct contains the interior floor plan for the second floor of the Research Building.


Training File



- Click  ► Open ► Project.
- If necessary, in the Project Browser, browse to My Documents\Autodesk\My Projects.
- Double-click ACA_Create_Project - Imperial.
- Close the Project Browser.

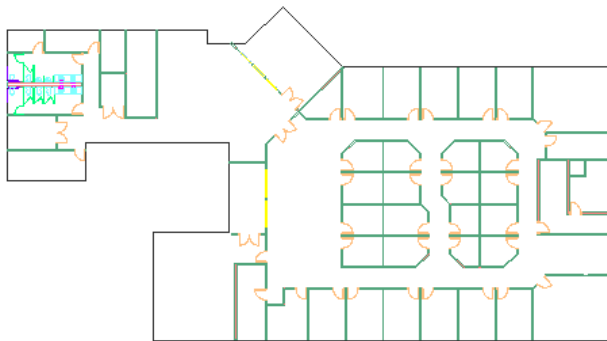
Open an external drawing



1 Click  ► Open ► Drawing.

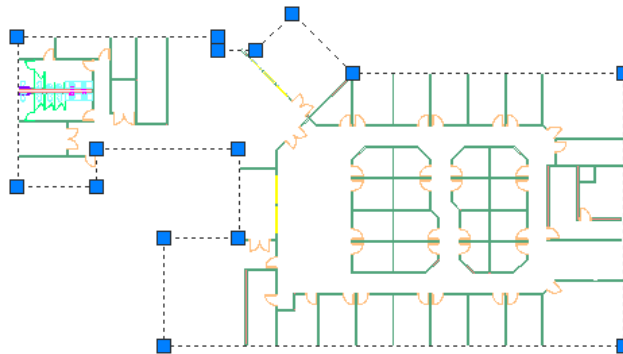
2 In the Select File dialog:

- Browse to My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_CC_01_Construct_from_Existing.i.dwg, and click Open.



Modify the drawing

3 Select the polyline perimeter, and press *DELETE*.



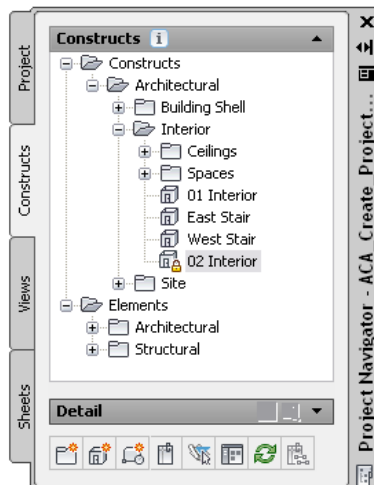
Save the drawing as a project construct

- 4 On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural.
- 5 Right-click Interior, and click Save Current Dwg as Construct.
- 6 In the Add Construct dialog:
 - Click in the Name field, enter **02 Interior**, and press *ENTER*. Using a logical file naming convention and a detailed file description can help you later when you need to access drawings using the Project Navigator.
 - Click in the Description field, and in the Description dialog, enter **Second Floor Interior Partition Layout**.
 - Click OK to close the Description dialog.

Assign the construct to a level

- 7 In the Add Construct dialog, under Assignments, under Division A, select 2, and click OK.
- 8 View the construct on the Project Navigator.

The lock indicates that the construct is currently open.

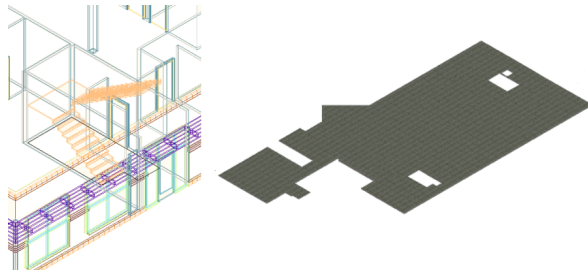


- 9 Save the construct drawing 02 Interior and close it.

Creating a Stair Construct

In this exercise, you create a stair with a landing in a spanning construct, which is a construct that spans multiple floors. After you create the stair, you cut a hole in the floor slab on the second level of the building to accommodate the top of the stair.

Stair with modified slab



Training File

- Continue to use the project you used in the previous exercise, ACA_Create_Project - Imperial.

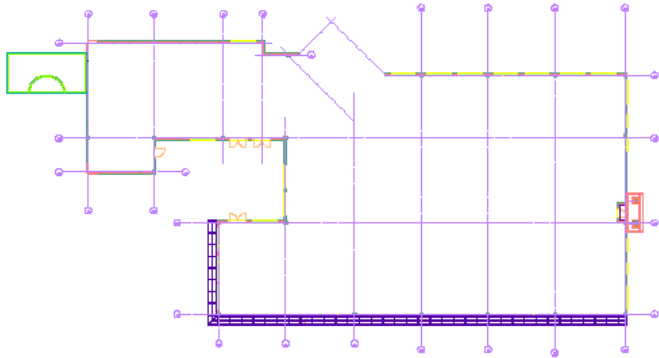
Create a spanning construct

- 1 On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural, right-click Interior, and click New ► Construct.
- 2 In the Add Construct dialog:
 - Click in the Name field, enter **Center Stair**, and press *ENTER*.
 - Click in the Description field, and in the Description dialog, enter **Central Stair Tower**.
 - Click OK.
 - Under Assignments and Division A, select levels 1, 2, and 3.
 - Select Open in drawing editor, and click OK.

The new Center Stair construct, which is an empty DWG file, opens.

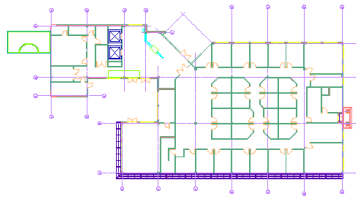
Attach other constructs as externally referenced drawings (xrefs)

- 3 On the Project Navigator, on the Constructs tab, expand Architectural ► Building Shell, select 01 Shell, and drag it to the drawing area.



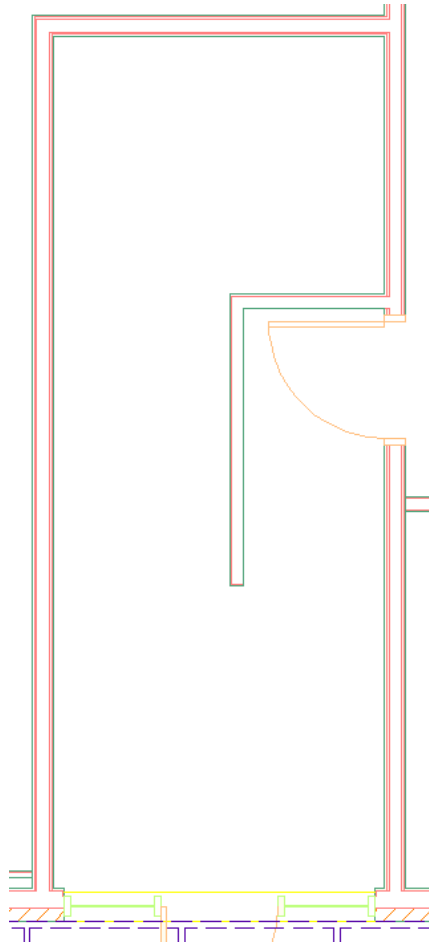
- 4 On the Project Navigator, on the Constructs tab, under Interior, select 01 Interior, and drag it to the drawing.

Now you can reference the geometry from the constructs when you create the stair.



Create a stair between the first and second floors

- 5 Zoom to the area near the bottom left of the floor plan as shown.



6 On the Design tab of the Design tool palette, click the Stair tool







7 On the Properties palette:

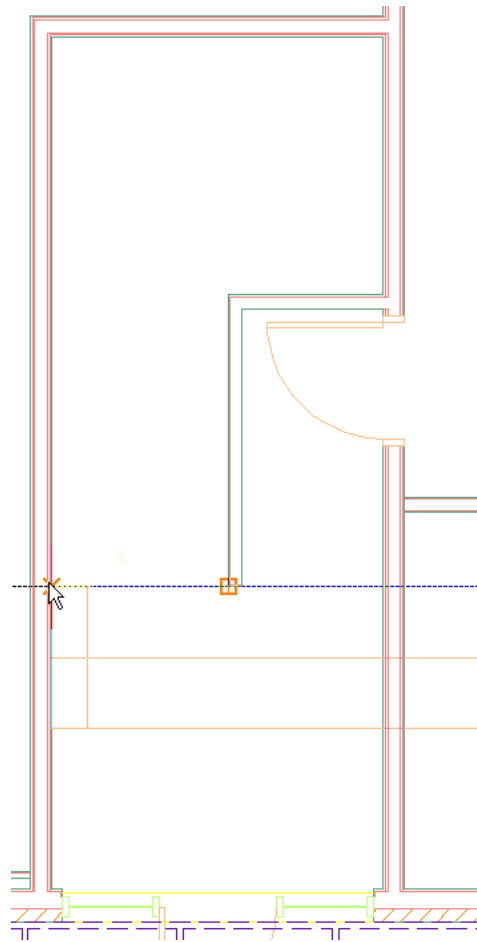
- Under Dimensions, for Height, enter **15'**.
The stair height matches the floor-to-floor height of the building levels.
- For Justify, select Left.
Using left justification when creating the stair lets you create the stair on the outside wall of the stair area and generate the

correct stair geometry based on the calculation rules of the stair style.

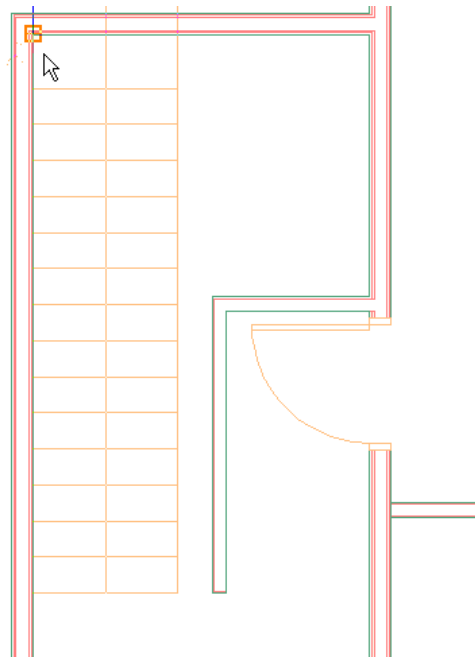
8 Create the stair:

- If necessary, on the application status bar, click  (Ortho Mode),  (Object Snap), and  (Object Snap Tracking) to turn them on.
- Right-click  (Object Snap), and click Settings.
- On the Object Snap tab, select Endpoint and Apparent intersection, clear all other snaps, and click OK.
- Move the cursor over the exterior endpoint of the stair enclosure, then move the cursor to the left vertical wall until the intersection displays, and select it.

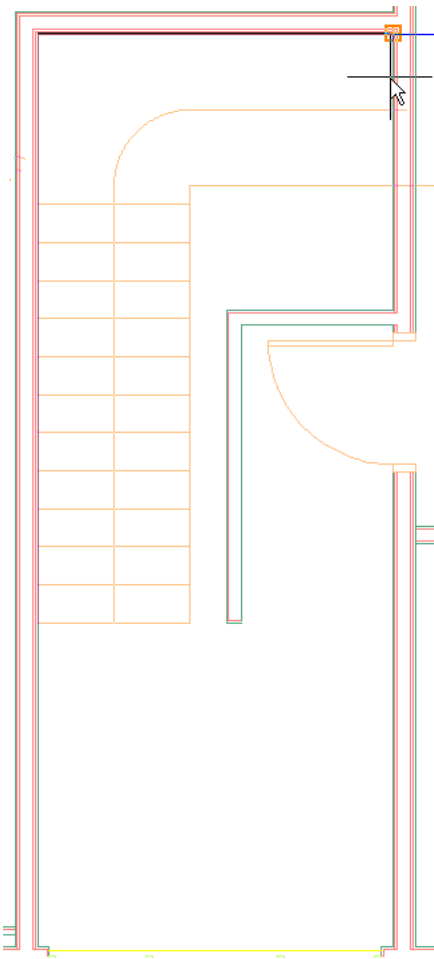
TIP You may need to zoom in to view the endpoint snaps.



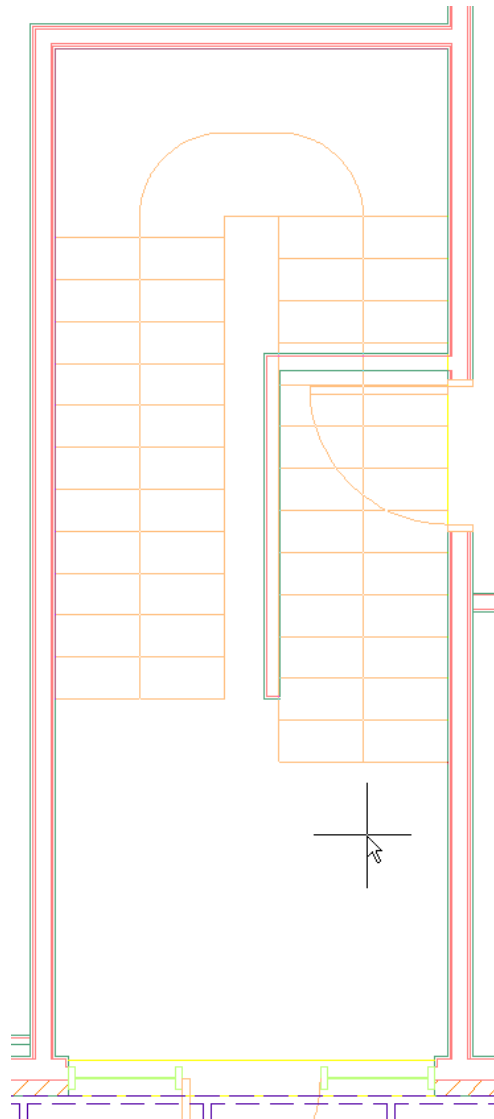
- Move the cursor up, and select the wall endpoint as shown.



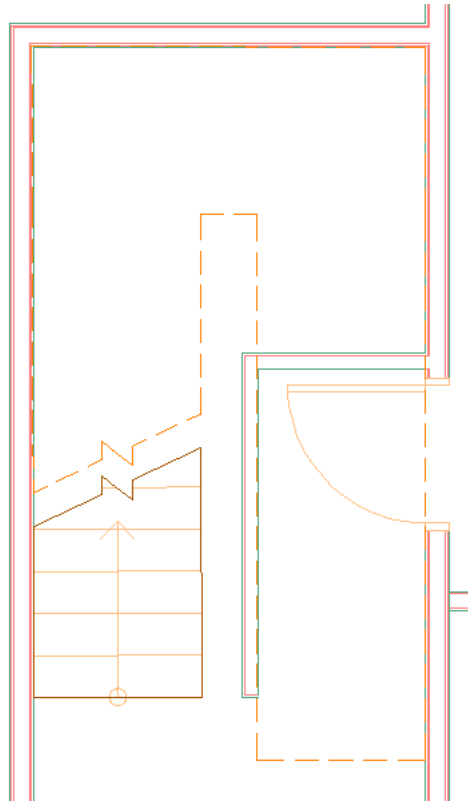
- Move the cursor to the right, and select the endpoint as shown.



- Move the cursor down past the stair enclosure until the calculated end of the stair displays, and click a point as shown.



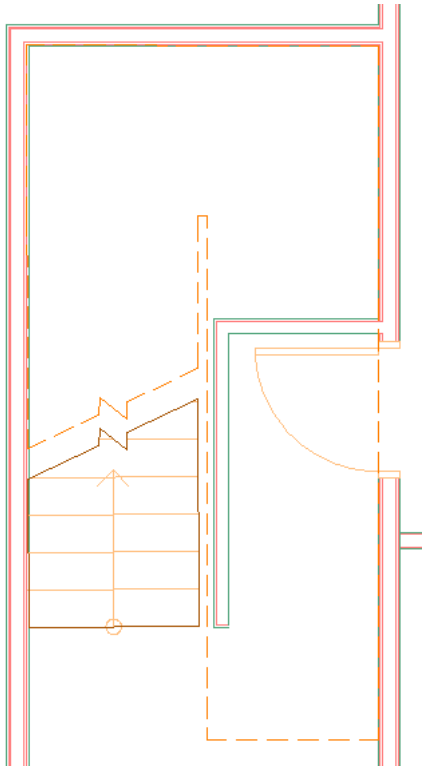
- Press *ESC*.
The stair displays. The dashed outline represents the portion of the stair that is located above the drawing cut plane.



Modify the stair width so it covers the center wall in the stair enclosure

9 Select the stair, and on the Properties palette, under Dimensions, for Width, enter **4' 2"**.

10 Press *ENTER*, and press *ESC*.



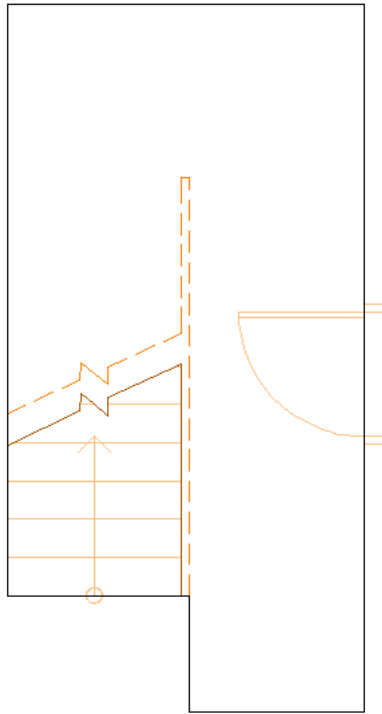
Create an outline of the stair

11 Freeze the interior wall layer to better view the stair:


- Click Home tab ► Layers panel ► Freeze.
- Select the walls surrounding the stair, and press *ENTER*.
The interior partition wall layer is frozen, and the walls no longer display.

12 Trace the main stair perimeter:

- Click Home tab ► Draw panel ► Line drop-down ► Polyline.
- Using endpoint snaps, trace the outer perimeter of the stair.
- Press *ENTER*.

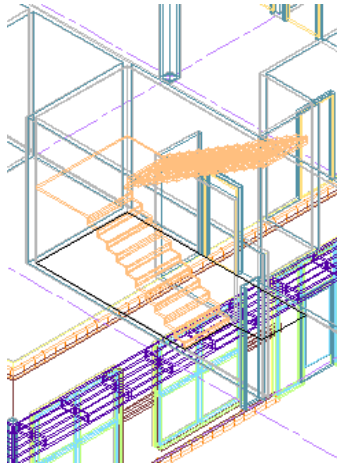


13 Thaw the interior wall layer:


- Click Home tab ► Layers panel ► Layer drop-down.
- Locate the layer 01 Interior | A-Wall.
- Click  next to 01 Interior | A-Wall.
The walls are displayed.

View the stair in 3D

14 Click View panel ► View drop-down ► View, SW Isometric.

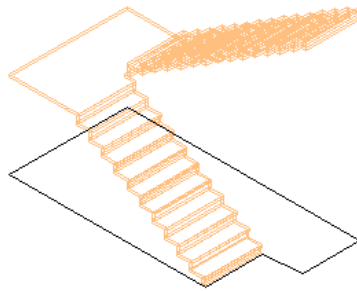


Detach the externally referenced (xref) constructs

15 On the drawing window status bar, click  (Manage Xrefs).

16 On the External References palette:

- While pressing *SHIFT*, select 01 Shell and 01 Interior.
- Right-click, and click Detach.

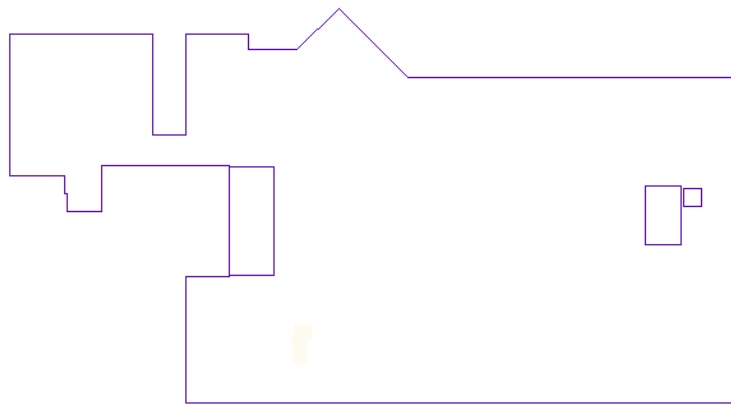


17 Close the External References palette.

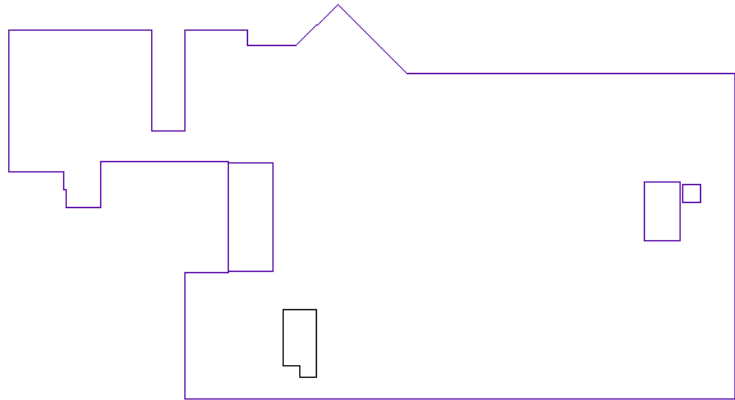
Cut a hole in the second floor slab to accommodate the stair

18 Copy the polyline:

- Select the polyline, right-click, and click Clipboard ► Cut.
- On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Building Shell ► Slabs, and double-click 02 Slab.
The second floor slab displays.



- In the drawing area, right-click, and click Clipboard ► Paste to Original Coordinates.
The polyline displays in the correct location on the slab.



Cut a hole in the slab

19 Cut a hole in the slab with the polyline:

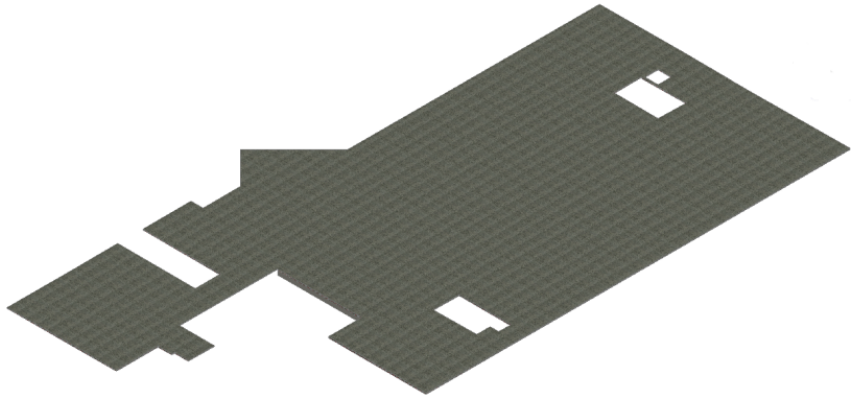
- Select the slab, right-click, and click Hole ► Add.
- Select the polyline, and press *ENTER*.
- On the command line, enter *y* and press *ENTER* to delete the polyline used to define the geometry of the hole.

View the slab in 3D

20 Click View panel ► View drop-down ► View, SW Isometric.

21 Click Visual Styles drop-down, and click Visual Styles, Realistic.

The slab displays a hole that will accommodate the stair. When creating a stair between each level of the building, you must cut a hole on each floor slab in the building.



22 Close the drawing with or without saving it.

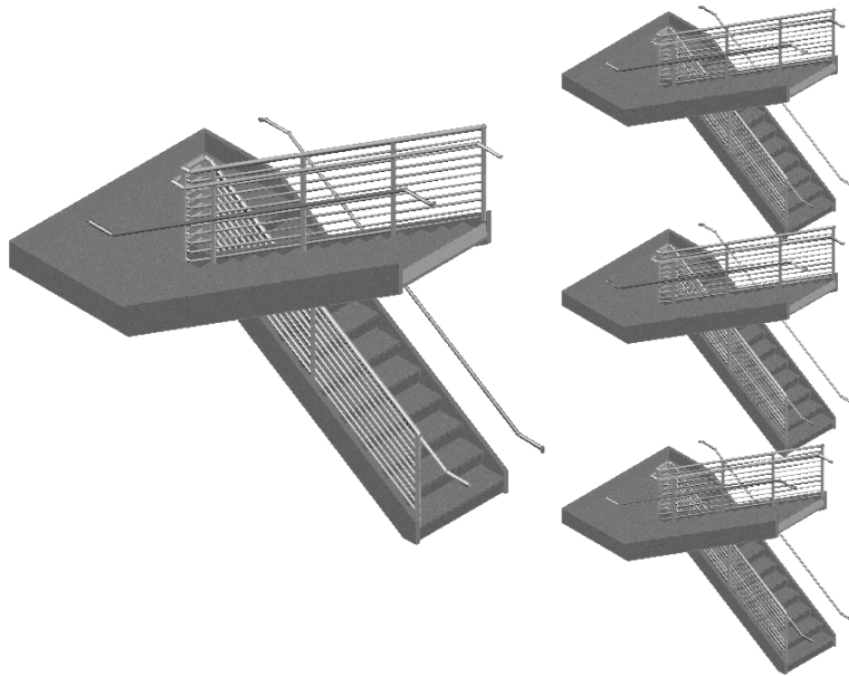
Creating a Stair Tower

In this exercise, you create a stair tower that provides a flight of stairs on each level of the Research Building.

To create the tower, you:

- Open a construct that contains a stair that spans the basement and first floor.
- Modify the construct to span the basement, first, second, and third floors.
- Use the Create Stair Tower command to copy the stair geometry (including the railings) between the first, second, and third floors.

Stair and the resulting stair tower

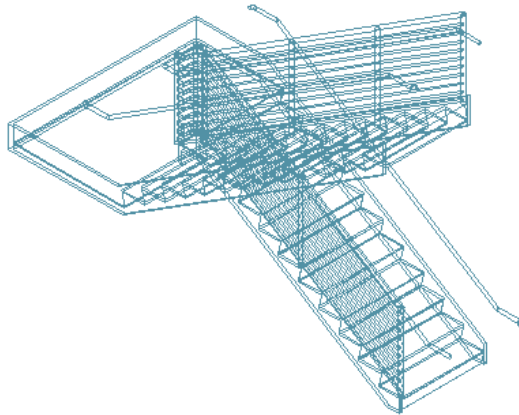


Training File

- Continue to use the project you used in the previous exercise, ACA_Create_Project - Imperial.
- On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Interior, and double-click West Stair.

Change the view

- 1 Click View panel ► View drop-down ► View, SE Isometric.
The stair construct is similar to the one that you created in the previous exercise.

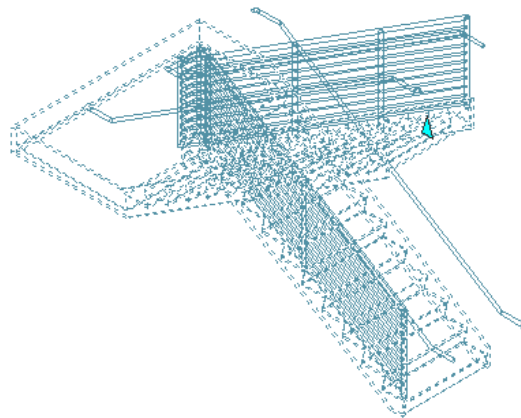


Modify the construct so it spans 4 building levels

- 2 On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Interior, right-click West Stair, and click Properties.
- 3 In the Constructs dialog, under Assignments and Division A, verify that Level 1 is selected.
- 4 Select levels B, 2, and 3, and click OK.

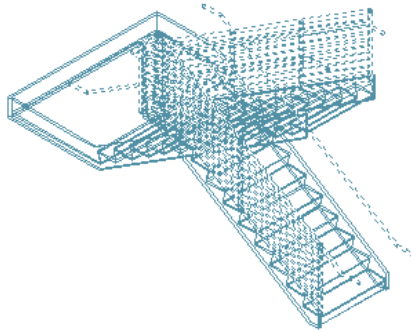
Create the stair tower

- 5 Select the stair.



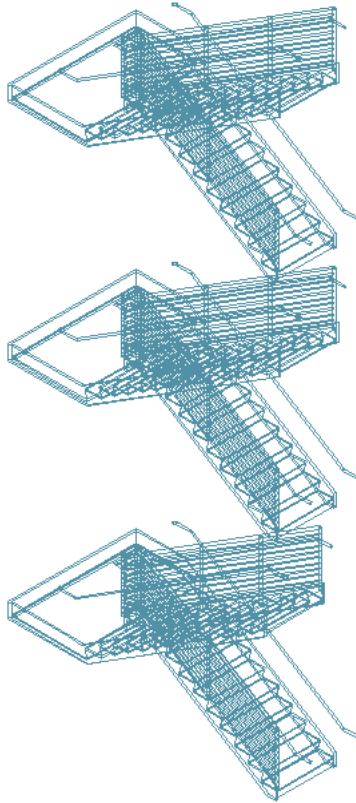
6 Click Stair tab ► Modify panel ► Create Stair Tower.

7 Select the railings to include them in the tower, and press *ENTER*.



8 In the Select Levels dialog:

- Under Selected, verify that level 1 is selected.
- If needed, select B and 2.
- Select Include Anchored Railings.
- Click OK.
The complete stair tower displays.



9 Press *ESC*.

10 Close the drawing with or without saving it.

Creating Elements

10

In this lesson, you create and work with element drawings.

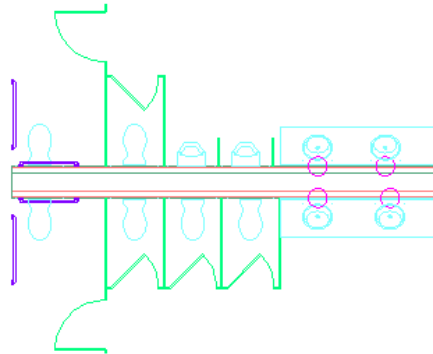
You learn to:

- Create an element using existing geometry.
- Place the element into 2 construct drawings as an xref (externally referenced) drawing.
- Modify the geometry of the element and update the xref in both constructs.

Creating an Element

In this exercise, you create a new element, a typical toilet room layout, that is used in multiple levels of the Research Building project.

Primary Toilets element created from 2nd level floor plan geometry



Training File

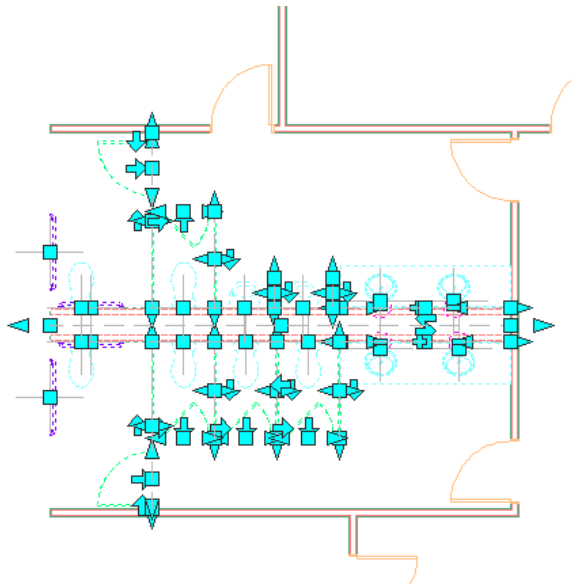
- If necessary, in the Project Browser, open ACA_Create_Project - Imperial.

Create a new element drawing

- 1 On the Project Navigator, on the Constructs tab, expand Elements ► Architectural.
- 2 Right-click Toilet Layouts, and click New ► Element.
- 3 In the Add Element dialog:
 - Click in the Name field, enter **Primary Toilets**, and press *ENTER*. It is a good practice to use a name that describes how the element is used in the project.
 - Click in the Description field, and in the Description dialog, enter **Primary toilet rooms layout**.
 - Click OK.
 - Select Open in drawing editor.
 - Click OK.

Copy geometry from a construct drawing into the element drawing

- 4 On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Interior, and double-click 02 Interior.
- 5 Zoom to the toilet area, and select all of the toilet room objects.



6 Right-click, and click Clipboard ► Cut.

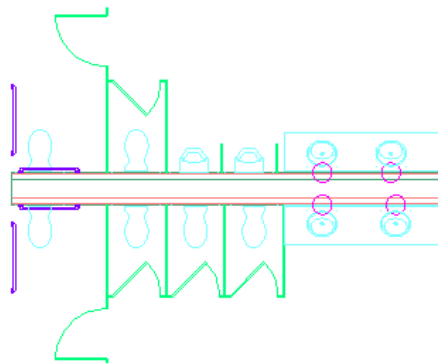


7 Click ► Primary Toilets.dwg.

This is the drawing you created. Clicking its name brings it to the front of the drawing area and makes it the active drawing.

8 Right-click, and click Clipboard ► Paste to Original Coordinates.

9 Zoom to the drawing extents.

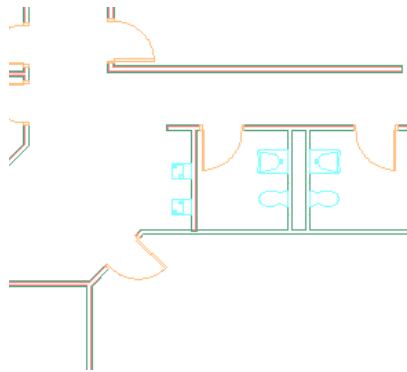


- 10 Save and close both drawings (Primary Toilets.dwg and 02 Interior.dwg).

Placing and Modifying an Element

In this exercise, you place a toilet room layout element into 2 different floor plans as an xref (externally referenced) drawing. You then modify the element and update it on both floor plans.

Modified secondary toilet room layout element placed in floor plans

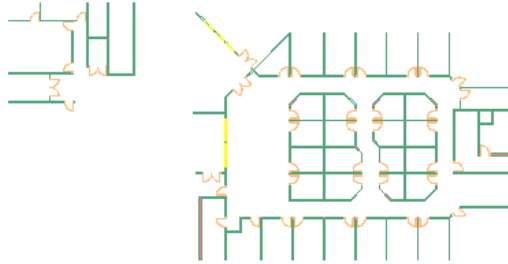


Training File

- Continue to use the project you used in the previous exercise, ACA_Create_Project - Imperial.
- On Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Interior, and double-click 02 Interior.

View the entire drawing

- 1 Zoom to the drawing extents.

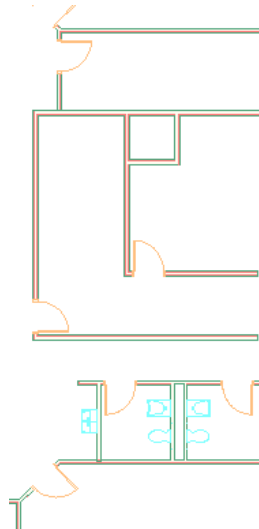


Attach the element to the second floor plan as an xref

- 2 On the Project Navigator, on the Constructs tab, expand Elements ► Architectural ► Toilet Layouts, and drag Secondary Toilets onto the floor plan.

This automatically creates an external reference (xref) to the Secondary Toilets element. In this case, the element drawing was positioned correctly, but if needed, you could move or reposition it.

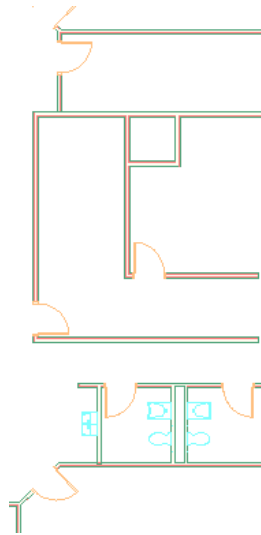
- 3 Zoom to the secondary toilet area at the right of the drawing.



Before you modify the element, place it on another floor plan.

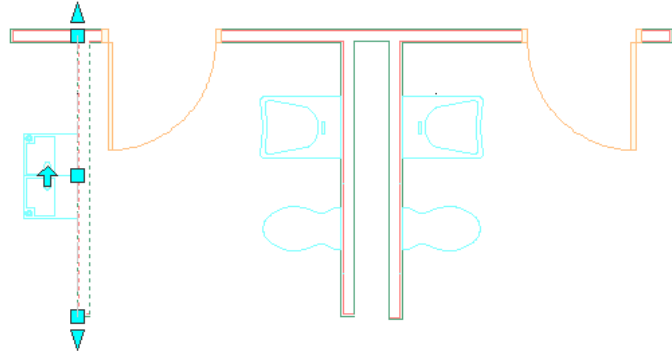
Attach the element to the first floor plan as an xref





- 4 On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Interior, and open 01 Interior.
- 5 On the Project Navigator, on the Constructs tab, expand Elements ► Architectural ► Toilet Layouts, and drag Secondary Toilets onto the floor plan.
- 6 Zoom to the secondary toilets area.
The layout is the same for both floors.

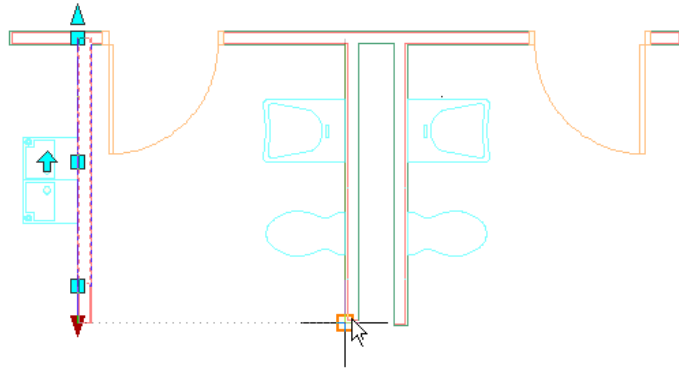


Modify the element

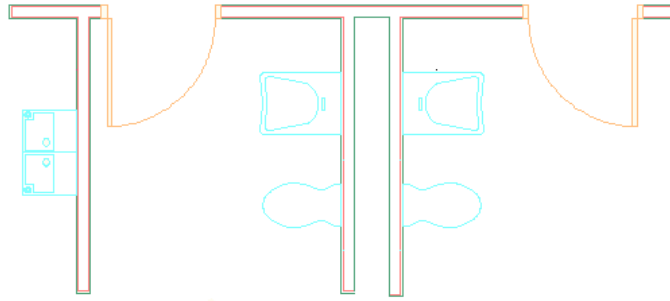
- 7 On the Project Navigator, on the Constructs tab, expand Elements ► Architectural ► Toilet Elements, and open Secondary Toilets.
- 8 Change the style and the length of the wall that hosts the drinking fountains:
 - Select the wall as shown.



- On the Properties palette, under General, for Style, select Stud-3.5 GWB-0.625 Each Side.
- If necessary, on the application status bar, click  (Object Snap) and  (Object Snap Tracking) to turn them on.
- Right-click  (Object Snap), click Settings, and on the Object Snap tab click Endpoint and Apparent Intersection.
- Click OK.
- Select the wall again to display its grips.
- Click the Lengthen grip () and move the cursor over the exterior endpoint of the wall on the right.




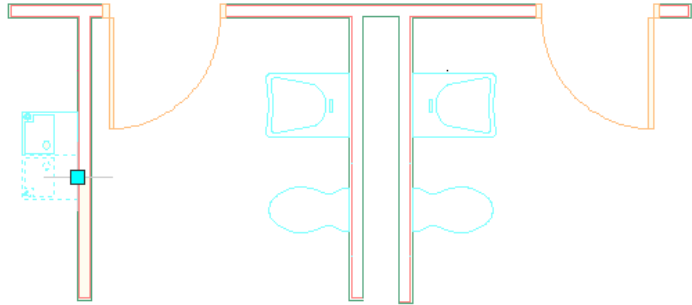
- When the endpoint extension displays, click to specify a point.



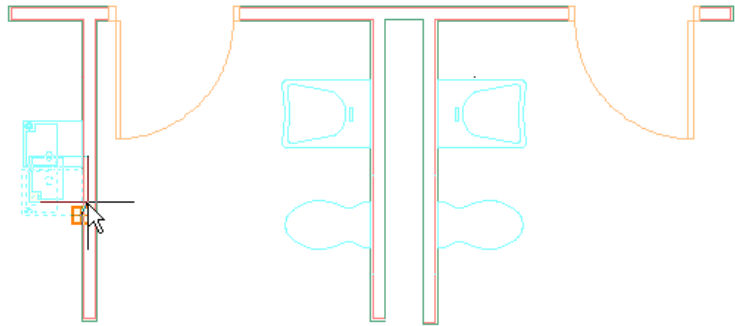
9 Press *ESC*.

10 Separate the drinking fountains by moving the lower fountain 18" below the upper fountain:

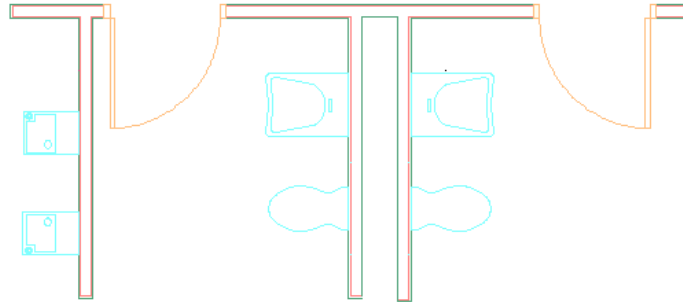
- If necessary, click  (Ortho Mode) to turn it on.
- Select the lower fountain.



- Right-click, and click Basic Modify Tools ► Move.
- Select the endpoint of the fountain as shown.



- Move the cursor down, on the command line, enter **18"**, and press *ENTER*.
The fountain is moved.



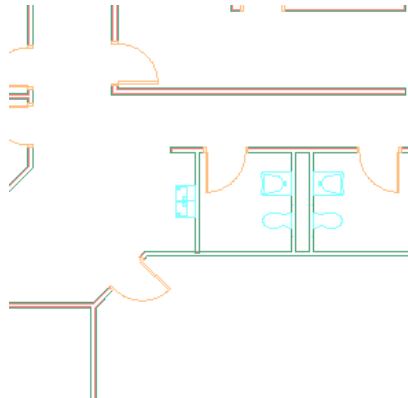
11 Save the drawing.

View the changes to the floor plans



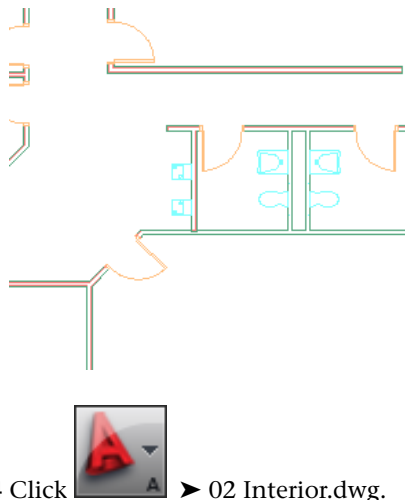
12 Click  01 Interior.dwg.

The Secondary Toilet element is not yet updated in the drawing.



13 In the update balloon that displays in the right corner of the drawing window, click the Reload Secondary Toilets link.

The updated Secondary Toilets element displays in the 01 Interior construct.



14 Click  02 Interior.dwg.

15 In the update balloon that displays in the right corner of the drawing window, click the Reload Secondary Toilets link.

The updated element displays in the 02 Interior construct.

16 Save and close the drawings.

Creating Views

11

Views bring together model elements and annotation in preparation for placement on a sheet.

After you create a view, you define a model space view within the view drawing. You can annotate the model space view, and then place the view on a sheet. The model space view establishes the name of the view on the sheet and the scale used when placing the drawing.

You learn to:

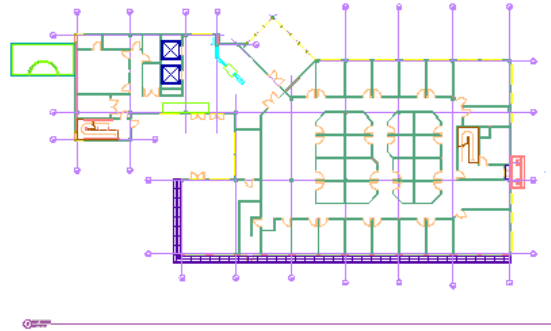
- Create different types of views: plan, elevation, and live section.
- Create categories within the project to organize your views.
- Define model space views that you can place on sheets.
- Make changes to building geometry and update the corresponding views.

Creating a Floor Plan View

In this exercise, you create a floor plan view of the first floor of the Research Building. To create the view, you create a new view drawing and then externally reference (xref) the constructs that contain the first floor building geometry.

Although you do not place views on sheets in this exercise, you define a model space view to which you add a title mark in preparation for sheet placement. If you were to place the model space view on a sheet, it would automatically report the title mark number, view name, and viewport scale.

Floor plan view with title mark



Training File

- If necessary, in the Project Browser, open ACA_Create_Project - Imperial.

Create a new category for project floor plan views

1 On the Project Navigator:

- Click the Views tab.
- Right-click Views, and click New Category.
- Enter **Floor Plans**, and press *ENTER*.
The new Floor Plans category, a folder within the project structure, displays in the Views folder.

Create a new floor plan view

2 Right-click Floor Plans, and click New View Dwg ► General.

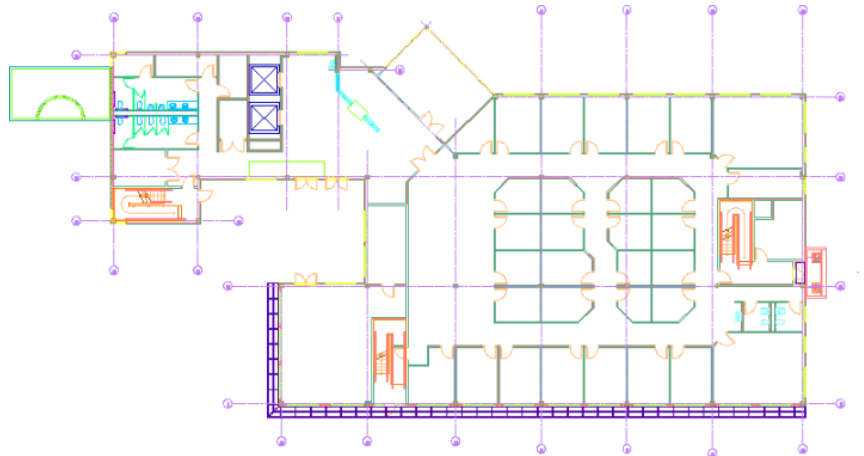
Selecting General determines the template that is used to create the view drawing (as set in the Project Standards). It also determines the icon that identifies the view on the Project Navigator.

3 In the Add General View dialog:

- Click in the Name field, enter **1st Floor Plan**, and press *ENTER*.
- Click in the Description field, and in the Description dialog, enter **1st Floor Dimensioned Construction Plan**, and click OK.
- Click Next.

Next, define the context of the view drawing. Because the view that you want to create is a first floor plan, you select Level 1 of the building.

- In the right pane, under Division A, select Level 1.
- Click Next.
A tree view displays a list of all the constructs that are assigned to Level 1 of the building. All the constructs are selected for inclusion in the new view. Clear some of the constructs to use only the ones that the view requires.
- Clear Slabs, Ceilings, Spaces, and Site.
- At the bottom left corner of the dialog, select Open in drawing editor.
- Click Finish.
All the specified constructs are included in the view drawing as external references (xrefs).



Before you place a view on a sheet, you must create a model space view. The model space view establishes the view name on the sheet and the scale that is used when you place the view on a sheet.

Create a model space view in the floor plan view


- 4 On the Project Navigator, on the Views tab, expand Views ► Floor Plans, right-click 1st Floor Plan, and click New Model Space View.

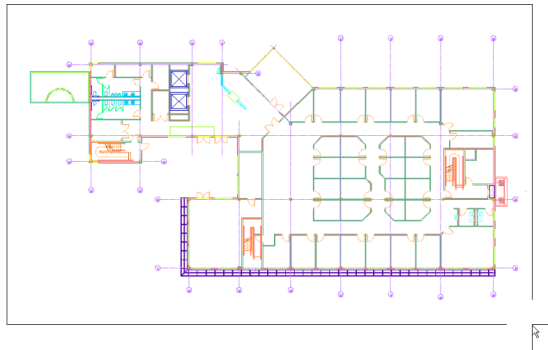
5 In the Add Model Space View dialog, click in the Name field, and enter **1st Floor**.

Next, define the model space view extents that determine the size of the viewport that you will create when you place the view on a sheet.

TIP The model space view extents should be large enough to accommodate any annotation that you might need to add to the view. If the view extents are not wide enough, you will have to repeat the next steps to redefine the view extents.

6 Define the model space view extents:

- Click  (Define View Window).
- In the drawing area, click a point slightly above the top left corner of the geometry.
- Move the cursor to the lower right as shown, and specify a point.




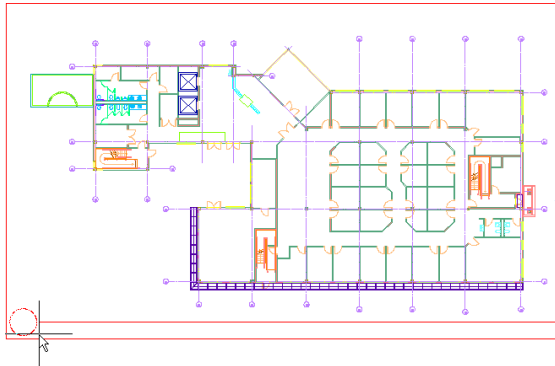
- Click OK.

Next, place a title mark in the model space view that automatically reports the view name and viewport scale. The title mark also includes a bubble which, when you place the model space view on a sheet, will report the title mark number.

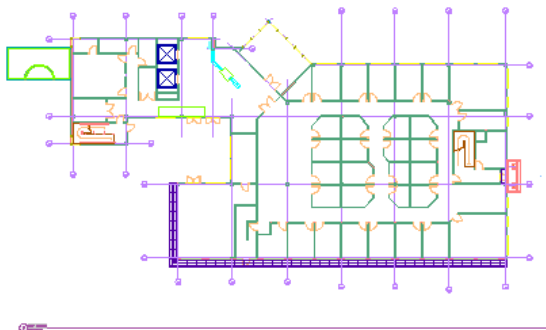
Place a title mark in the model space view

7 Right-click the Tool palette title bar, and click Document.

- 8** On the Callouts tab of the Document tool palette, click the Title Mark tool ().
- 9** Move the cursor over the model space view until its boundaries highlight.
- 10** Click to select the view and specify an insertion point for the title mark symbol as shown.



- 11** Click to the right to specify the endpoint of the title mark line.
The title mark is created.



- 12** Zoom in to the title mark to view the results.
The title mark reports the view name and viewport scale, but the bubble displays a question mark instead of a view number. When you place the model space view onto a sheet, the bubble automatically updates to display the current title mark number.



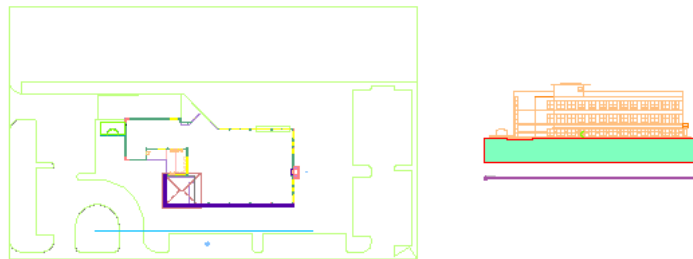
13 Close the drawing with or without saving it.

Creating an Elevation

In this exercise, you create an elevation view of the Research Building in a view drawing. To create the elevation, you create a new view drawing, place an elevation line, determine the extents of the elevation view, and generate the elevation, which you place in the view drawing.

After you create the elevation, you open the Roof construct and remove the two roof tower windows that display in the elevation. You save these design changes, reopen the view that contains the elevation, and refresh the elevation to view the roof tower design change.

Elevation drawing with elevation view



Training File

- Continue to use the project you used in the previous exercise, ACA_Create_Project - Imperial.

Assign project drawings to levels

- 1 Assign the second level shell to project level 2:
 - On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Building Shell.
 - Right-click 02 Shell, and click Properties.
 - In the Modify Construct dialog, under Division A, select 2 and click OK.

2 Assign the third level shell to project level 3:

- On the Project Navigator, right-click 03 Shell, and click Properties.
- In the Modify Construct dialog, under Division A, select 3 and click OK.

Create a new category for elevation views

3 On the Project Navigator:

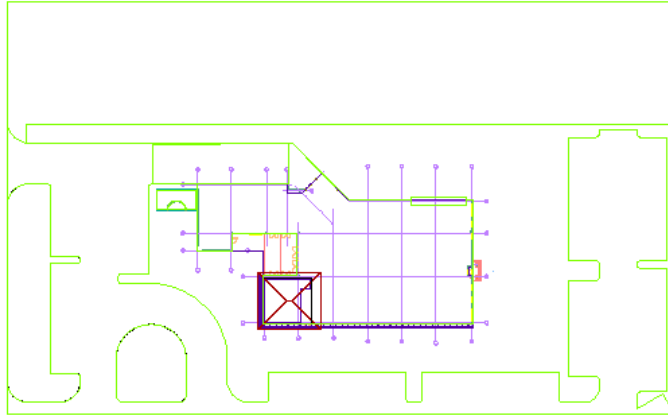
- Click the Views tab.
- Right-click Views, and click New Category.
- Enter **Elevations**, and press *ENTER*.
A new Elevations category, a folder within the project structure, displays in the Views folder.

Create a view in which to create the elevation

4 Right-click Elevations, and click New View
Dwg ► Section/Elevation.

5 In the Add Section/Elevation View dialog:

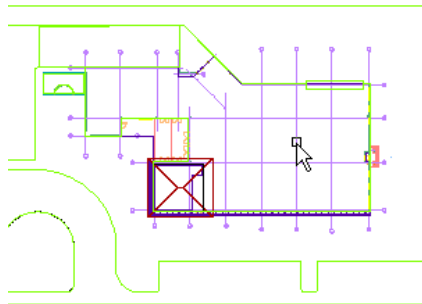
- In the right pane, click in the Name field, enter **Exterior Elevations**, and press *ENTER*.
- Click Next.
- In the right pane, under Division A, select levels R, 3, 2, 1, and G.
These are the levels used to generate the elevation.
- Click Next.
- In the tree view in the right pane, under Building Shell, clear Slabs.
- Clear Interior.
- Under Site, clear Landscaping and Site.
- Select Open in drawing editor.
- Click Finish.
The new Exterior Elevations view drawing opens.



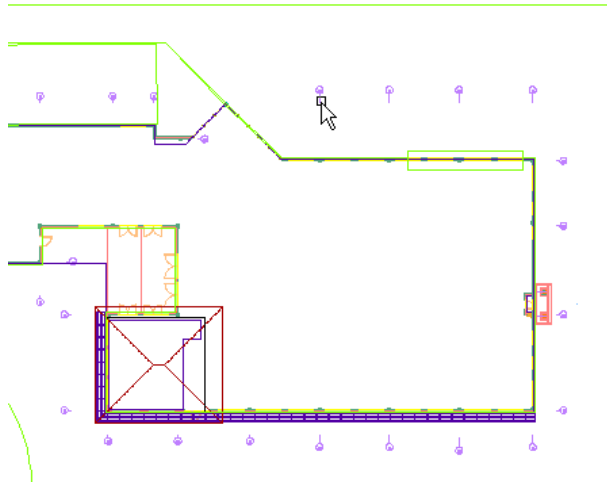
Turn off the grid

6 Turn off the display of the layers containing the grid:

- Click Home tab ► Layers panel ► Freeze.
- Click the column grid.

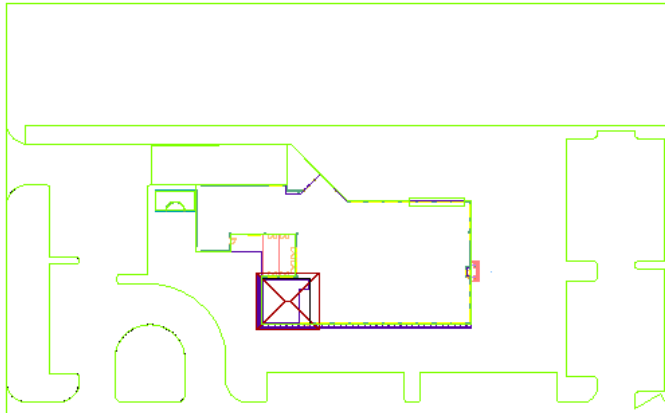


- Click a grid label.



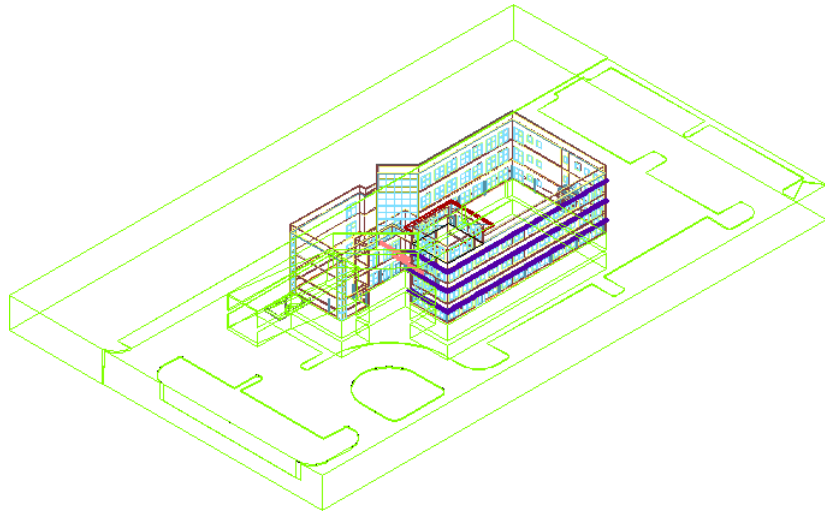
■ Press *ENTER*.

The grid and grid labels no longer display.



View the drawing in 3D

7 Click View panel ► View drop-down ► View, SW Isometric.



8 Click View drop-down ► View, Top.

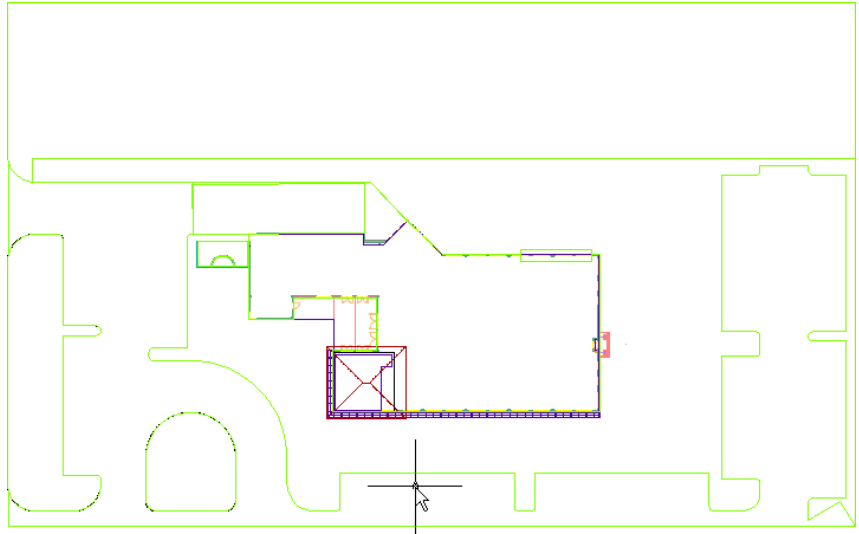
Create an elevation view

9 If necessary, click  (Object Snap) to turn it off.

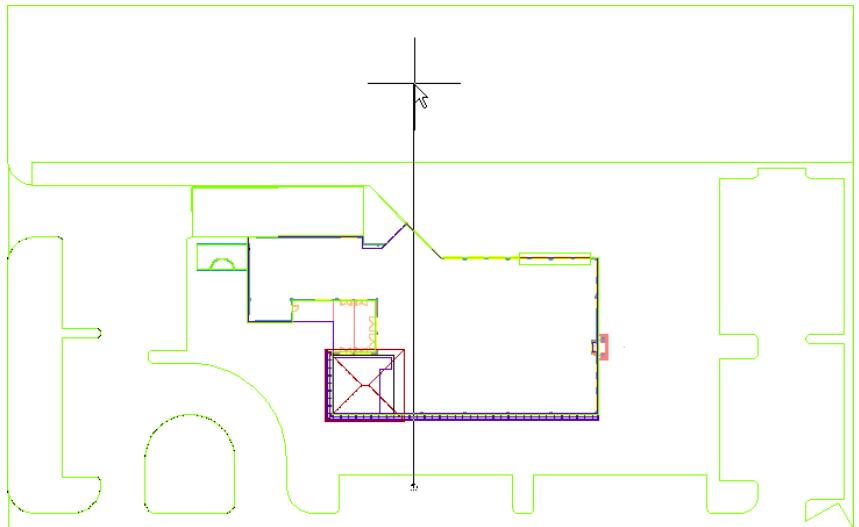
10 On the Callouts tab of the Document tool palette, click the

Elevation Mark A1 tool ().

11 Specify an insertion point for the elevation marker as shown.



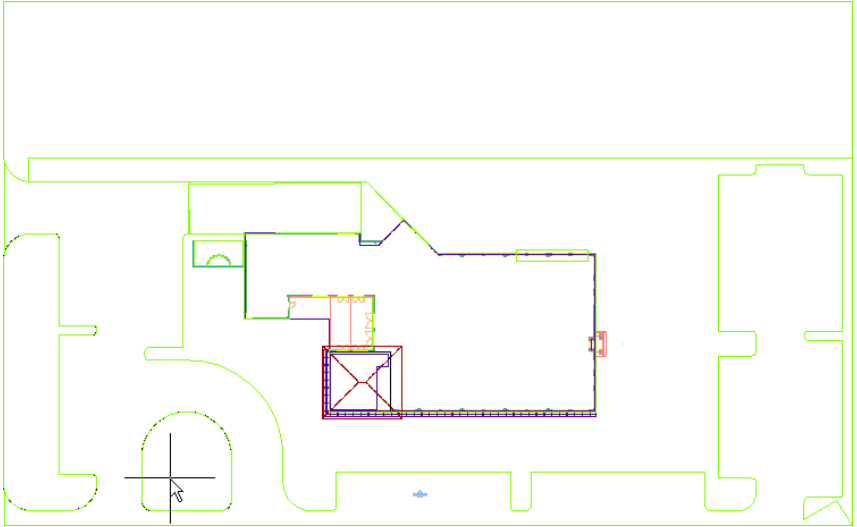
12 Specify a direction for the elevation line as shown.



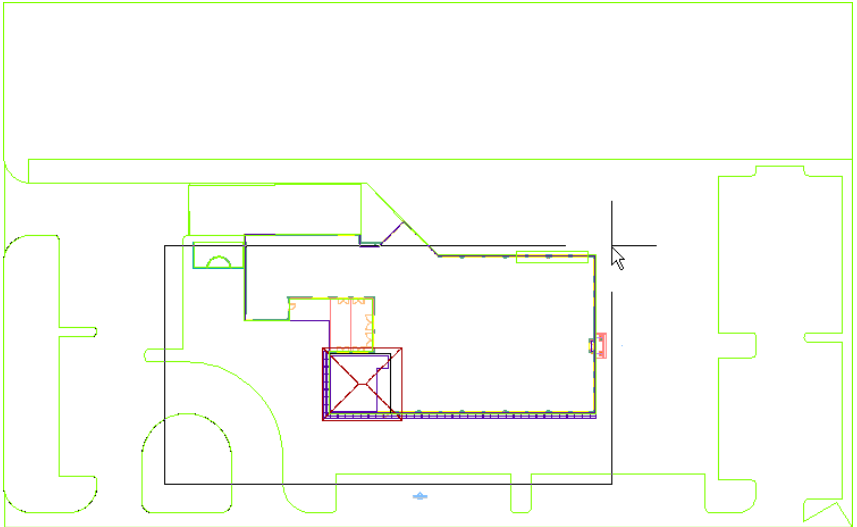
13 In the Place Callout dialog, under Create in, click Current Drawing.

14 Create a region in the view that includes the building geometry that you want to use to create the elevation:


- Specify a point below the left side of the building as shown.



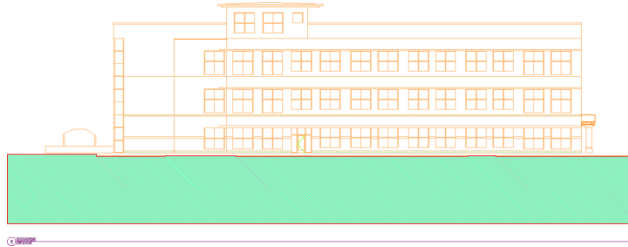
- Move the cursor to the top right corner of the building, and specify a point to create the region.



- 15 On the right side of the drawing, specify an insertion point for the elevation.

TIP Place the elevation away from the drawing geometry so you can annotate it. If you place the elevation too close to the geometry, select the elevation, and use its Location grip () to move it.

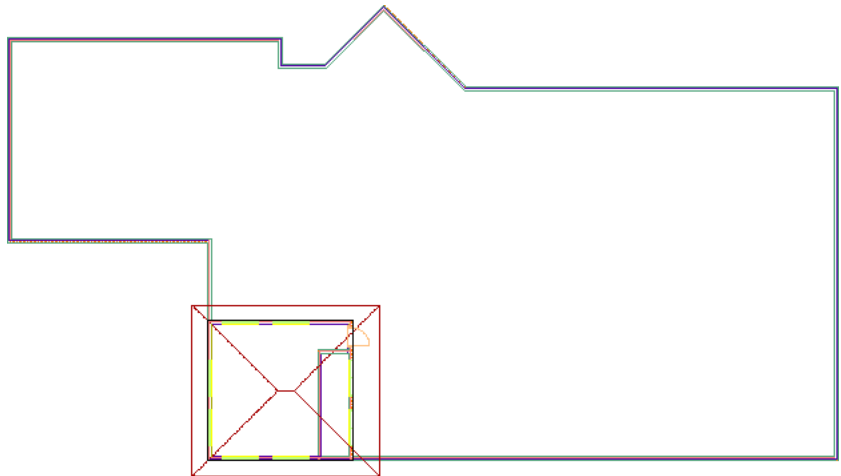
16 Zoom to the elevation.



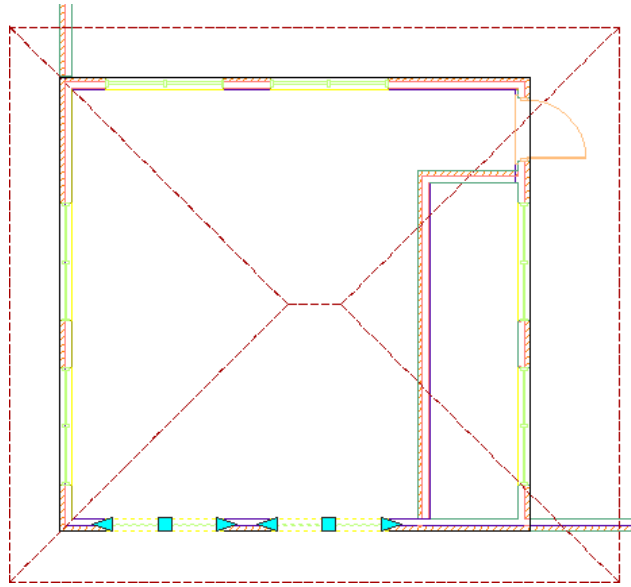
Remove 2 tower windows from the roof construct

17 On the Project Navigator:

- Click the Constructs tab.
- Expand Constructs ► Architectural ► Building Shell, and double-click Roof.



18 Zoom to the south wall of the stair tower, select the 2 windows as shown, and press *DELETE*.

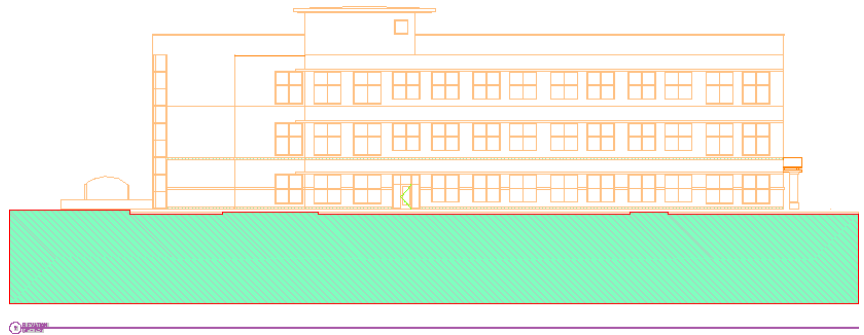


19 Save the drawing.

Refresh the elevation to view the changes to the Roof construct

20 Update both drawings:

- Click View tab ► Windows panel ► Switch Windows drop-down ► Exterior Elevations.dwg.
- In the update balloon that displays in the right corner of the drawing window, click the Reload Roof link.
Notice that the 2 windows still display in the elevation.
- Select the elevation, and click 2D Section/Elevation tab ► Modify panel ► Refresh.
- Press *ESC*.
The windows no longer display in the elevation.

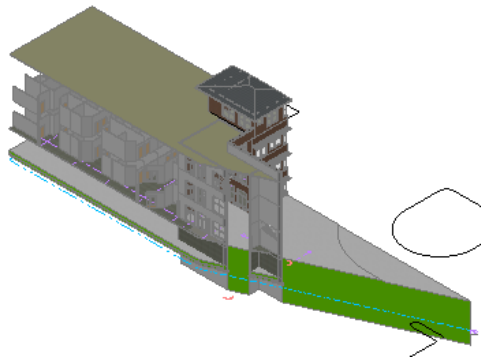


21 Close the drawing with or without saving it.

Creating a 3D Section

In this exercise, you create a section for the Research Building that is enabled in a 3D view you use to “live cut” the building geometry.

Live 3D section of Research Building



Training File

- Continue to use the project you used in the previous exercise, ACA_Create_Project - Imperial.

Create a new category for project section views

1 On the Project Navigator:

- Click the Views tab.
- Right-click Views, and click New Category.

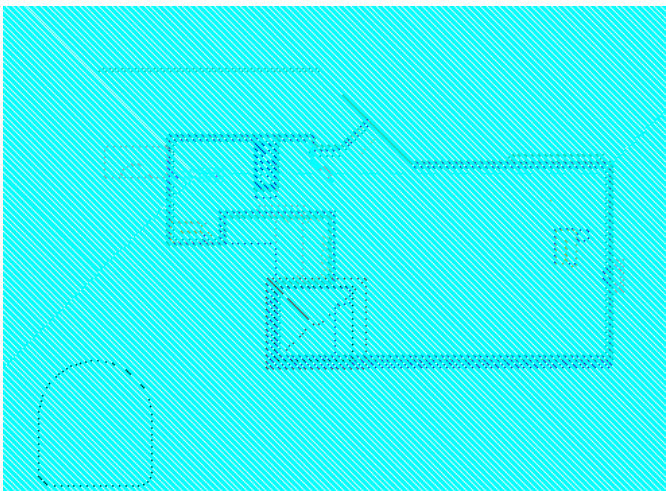
- Enter **Sections**, and press *ENTER*.
A new Sections category, a folder within the project structure, displays in the Views folder.

Create a new section view drawing

2 Right-click Sections, and click New View Dwg ► Section/Elevation.

3 In the Add Section/Elevation View dialog:

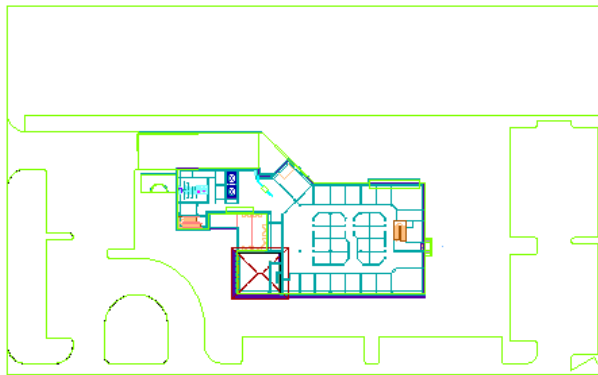
- For Name, enter **3D Building Section**, and press *ENTER*.
- Click in the Description field, enter **Live section through building** in the Description dialog, and click OK.
- Click Next.
- Under Division A, select all the building levels: R, 3, 2, 1, G, B, and E.
- Click Next.
- In the tree view, under Interior, clear Ceilings and Spaces.
- Under Site, clear Landscaping and Site.
- Click Finish.
The 3D Building Section view drawing is created and opened.
The cut plane requires adjusting.





Change the cut plane height

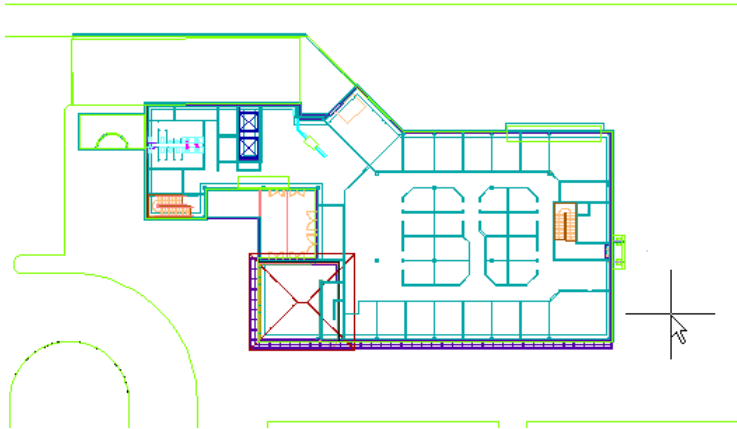
The cut plane of the drawing is determined from the lowest level of the construct that you selected to include in the view, which is the basement level. The view is currently cutting through the mass object used for topography. You need to raise the cut plane of the drawing so this does not happen.

- 4 On the drawing window status bar, click Cut Plane.
- 5 In the Global Cut Plane dialog, for Cut height, enter **75'**, and click OK.

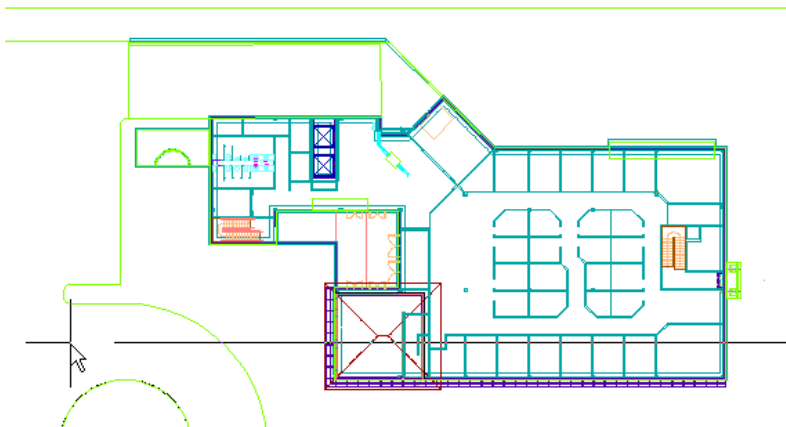


Draw a section line through the building

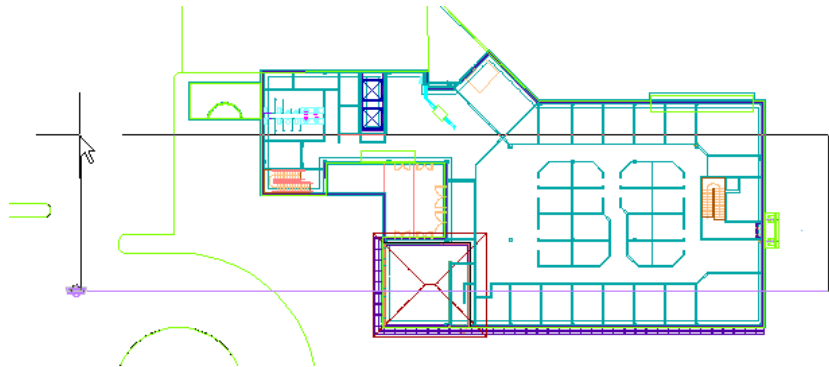
- 6 If necessary, on the application status bar, click  (Ortho Mode) to turn it on.
- 7 On the Callouts tab of the Document tool palette, click the Section Mark A2T tool ().
- 8 Specify a point for the start point of the section line as shown.



- 9** Move the cursor left, specify a point past the left end of the building for the endpoint of the section line, and press *ENTER*.



- 10** Move the cursor up, and specify a point to define the section view extents.



11 In the Place Callout dialog:

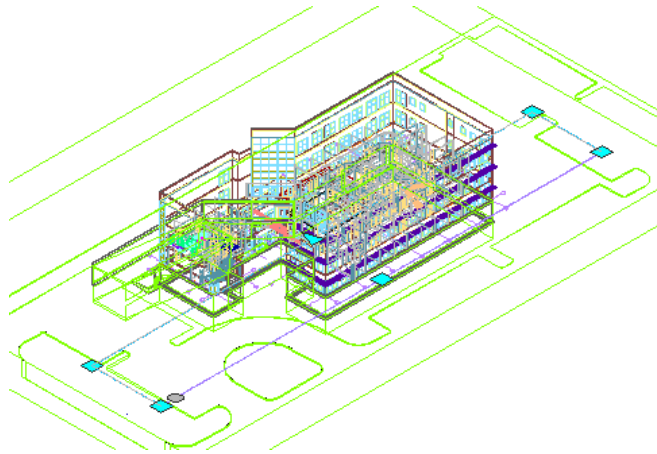
- For New Model Space View Name, enter **Building Section**.
- Under Create in, click Current Drawing.

12 Specify a point to the right of the drawing to place the section.
The section is created and displays in the drawing.



View the drawing in 3D

- 13 Click View panel ► View drop-down ► View, SW Isometric, and zoom into the building model.
- 14 Select the section line.

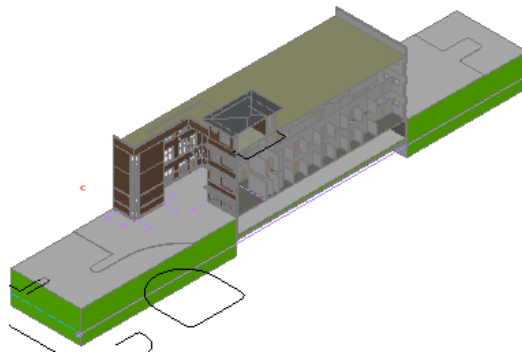


15 Click Building Section Line tab ► Live Section panel ► Enable Live Section.

Model objects outside of the bounding box of the section are removed.

Shade the view to better view the live section

16 Click View panel ► Visual Styles drop-down ► Visual Styles, Realistic.

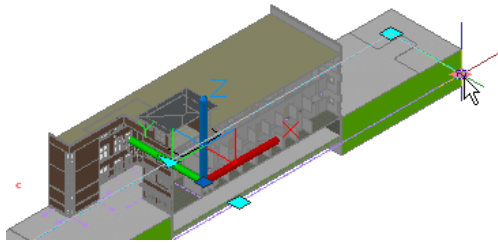


Grip edit the live section

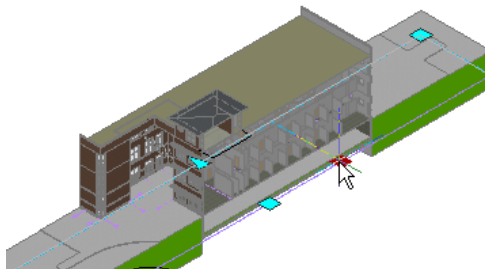
17 Select the section line.

18 Edit the end of the section:

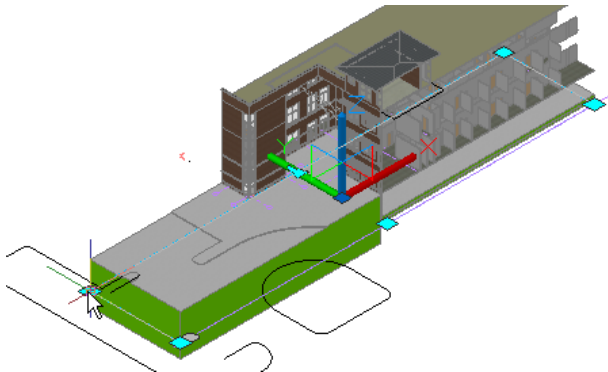
- Click the End grip () as shown.



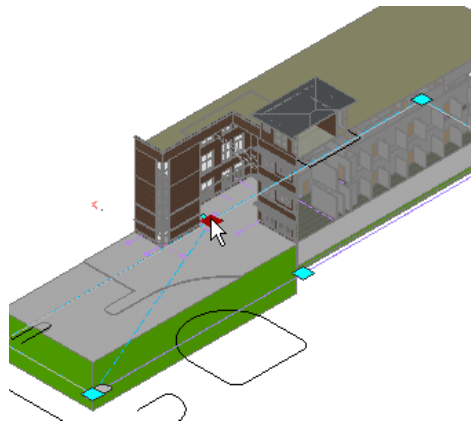
- Click to specify a new location as shown.



- Select the Side A Endpoint grip () as shown.



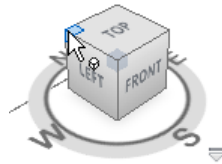
- Click to specify a new location as shown.



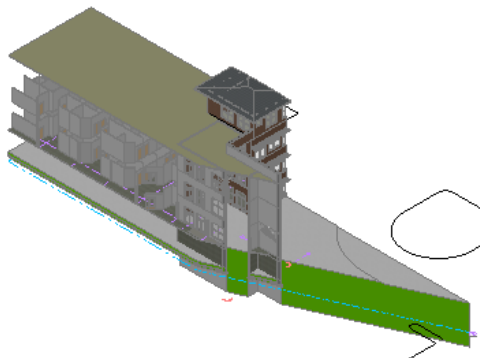
■ Press *ESC*.

Change the view direction

19 Click the corner of the ViewCube as shown.



The view direction changes.



20 Close the drawing with or without saving.

Creating Sheets

12

In this lesson, you create and work with sheet drawings.

You learn to:

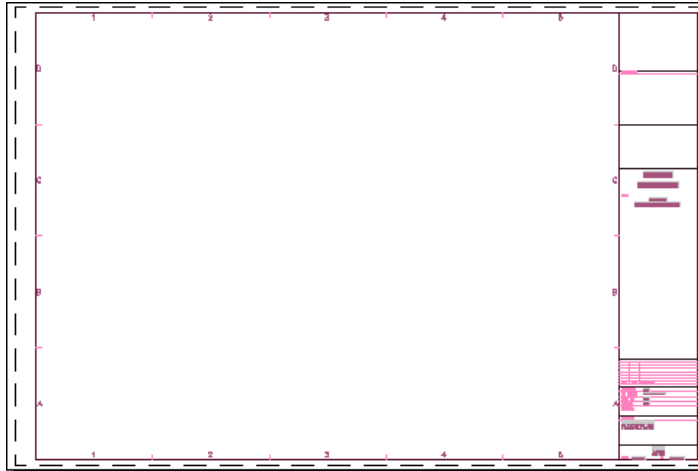
- Create a sheet from an existing template.
- Place a model view on the template.
- Publish a sheet to a DWF file for distribution.

Creating a Sheet

In this exercise, you create a sheet for the Research Building project.

Typically sheets are used for printing and presentation, and annotation is placed directly into a view drawing. The Project Navigator Sheets tab acts as an interface to the AutoCAD Sheet Set Manager.

Research Building Project sheet





Training File

- If necessary, in the Project Browser, open ACA_Create_Project - Imperial.

View the sheet set properties

- 1 On the Project Navigator:
 - Click the Sheets tab.
 - Right-click ACA_Create_Project, and click Properties.
- 2 In the Sheet Set Properties dialog, review the sheet set properties.
- 3 When you finish reviewing the properties, click Cancel.

Create a sheet subset

- 4 On the Project Navigator, on the Sheets tab, right-click ACA_Create_Project, and click New ► Subset.
- 5 In the Subset Properties dialog:
 - For Subset name, enter **Architectural**.
 - Under Sheet Creation Template, click  (Browse).
 - In the Select Layout as Sheet Template dialog, under Drawing template file name, click  (Browse).

- In the Select Drawing dialog, navigate to C:\ProgramData\Autodesk\ACA 2010\enu\Template.
- Select AEC Sheet (Imperial Stb).dwt, and click Open.
- In the Select Layout as Sheet Template dialog, under Select a layout to create new sheets, select Arch D (24 x 36).
- Click OK twice.

Create a new sheet in the subset

- 6 On the Project Navigator, right-click Architectural, and click New ► Sheet.
- 7 In the New Sheet dialog, assign a number and name to the sheet:
 - Under Number, enter **A101**.
 - Under Sheet title, enter **Floor Plan**.
 - Select Open in drawing editor, and click OK.



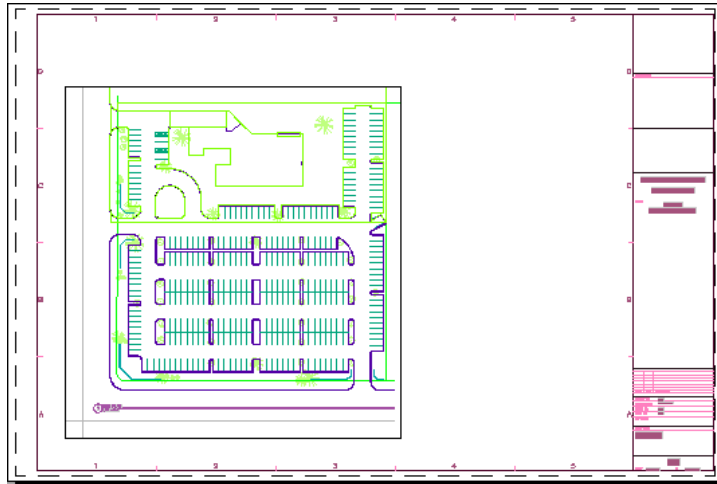
- 8 Zoom to the title block.

The sheet is created from the specified template, which has been updated with the sheet number and name you specified.

- On the Project Navigator, on the Sheets tab, expand ACA_Create_Project ► Civil, and double-click C101 Site Plan.

Place a view on the sheet

- 1 On the Project Navigator, on the Views tab, expand Views ► Site Plan.
- 2 Under the Site Plan view, select the Site Plan model space view, and drag it to the drawing.
- 3 Specify an insertion point for the view at the bottom left corner of the sheet.




- 4 **IMPORTANT** Make sure you are selecting the model space view from the Project Navigator, not the view drawing itself. This is important for labeling and viewport sizing. If you do not have model space views created in your files, you need to create them before you can drag a view to a sheet.

Publish the sheet to a DWF file



- 5 Click ► Print ► Plot.
- 6 In the Plot dialog:

- 7 ■ Under Printer/plotter, for Name, select DWF55 eView (optimized for viewing).PC3.
 - Under Plot offset (origin set to printable area), for X, enter 0.
 - Under Plot offset (origin set to printable area), for Y, enter 0.
If you save a plot setup, you can quickly assign default values to the options in the Plot dialog, which will save time during future plot jobs.
 - Under Page setup, click Add.
 - In the Add Page Setup dialog, enter **DWF Plot for Review**, and click OK.
 - Click Preview.
 - In the Preview window, click Plot ().
- 8 Browse to the location where you want to save the DWF and specify a file name.
- 9 Click Save.

Review the DWF in Autodesk Design Review

- 10 If you have Autodesk Design Review installed, open Autodesk Design Review.
- 11 Click the application menu button, and click Open ► Open File.
- 12 In the Open File dialog, browse to the location where you saved the DWF, select the file, and click Open.

You can use Autodesk Design Review to review and mark up DWF files. DWF files can also be directly referenced into DWG files for review.

Documenting a Project

In this tutorial, you document the Research Building project. You:

- Add dimensions and modify their behavior and appearance using styles and grips.
- Create project-based tags for rooms and doors.
- Create and modify schedule tables.
- Add a callout to a drawing and link the callout to an associated detail view and sheet.
- Detail a view.

Working with AEC Dimensions

13

In this lesson, you use the tools in AutoCAD Architecture to add and modify AEC dimensions.

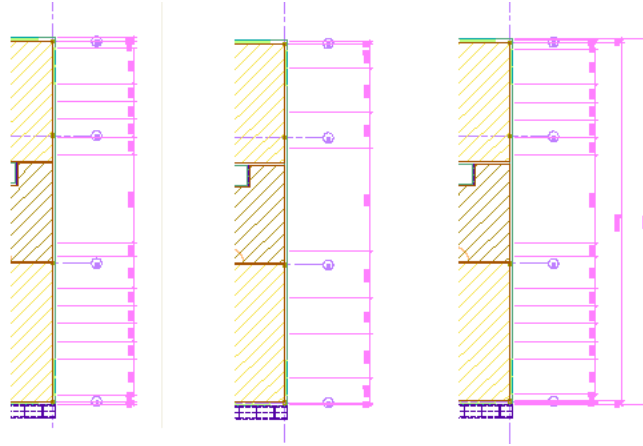
You learn to:

- Add an AEC dimension and modify its style.
- Update an AEC dimension in a drawing when the geometry in an externally referenced drawing (an xref) changes.
- Use grips to modify AEC dimension points, chains, and text.
- Use display representations to control the amount of detail displayed for an AEC dimension.

Adding and Modifying AEC Dimensions

In this exercise, you add an AEC dimension to a wall in a project view of the third floor of the Research Building. You modify the AEC dimension style and the wall style to control which points on the wall and other objects are dimensioned. You then change the style used to display the AEC dimension so that the dimension consists of multiple chains.


Changes to a dimension resulting from style changes



Training File

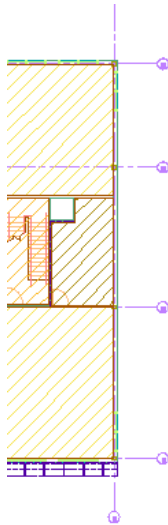


- Click  ➤ Open ➤ Project.

- In the left pane of the Project Browser, click , and select the file path and folder My Documents\Autodesk\My Projects.
- In the left pane, double-click ACA_Documenting_Projects - Imperial. The project name displays in bold type to indicate it is current.
- Close the Project Browser.
- On the Project Navigator, on the Views tab, expand Views ➤ Floor Plans, and double-click 03 - 3rd Level Plan to open the drawing.

Place an AEC dimension

- 1 Zoom to the right side of the drawing as shown.



2 Right-click the Tool palette title bar and click Document.

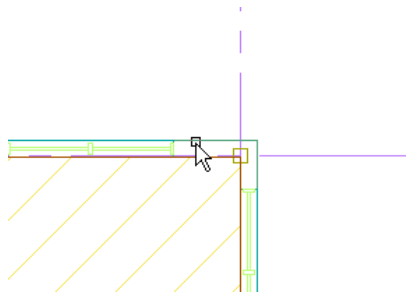
3 Add the dimension:

- On the Dimensions tab of the Document tool palette, click

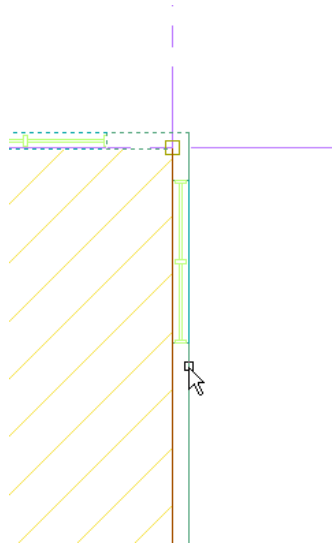


the AEC Dimension - Exterior tool ().

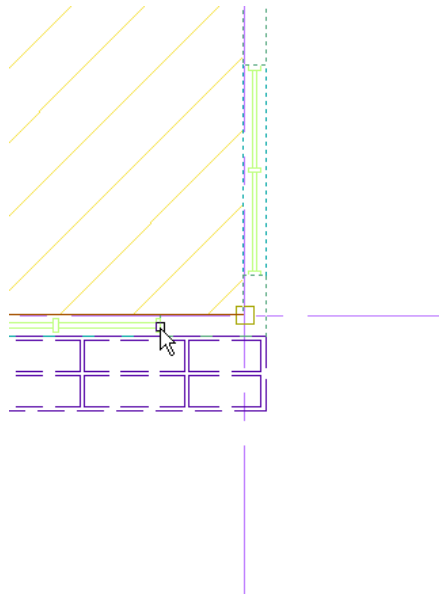
- On the Properties palette, under General, for Style, select Standard.
- Select the wall at the top of the drawing by clicking as shown.



- Select the right wall by clicking as shown.

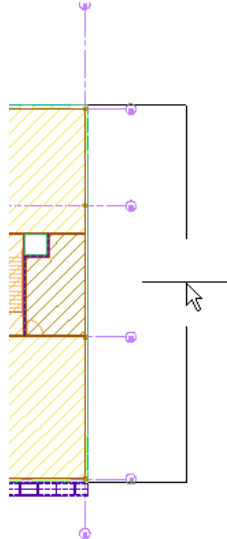


- Select the wall at the bottom of the drawing by clicking as shown.



- Press *ENTER*.

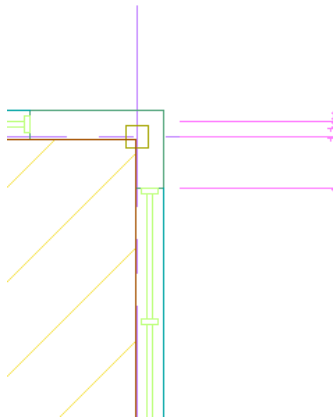
- Click as shown to place the dimension.



View the endpoint of the dimension

- 4 Zoom to the upper-right corner of the drawing, as shown.

The dimension does not measure the full distance to the exterior of the wall.




To correct this, you can edit the AEC dimension style, which determines how windows, doors, openings, and intersecting walls are dimensioned.

Modify the AEC dimension style

5 Select the AEC dimension.

6 Click AEC Dimension tab ► General panel ► Edit Style drop-down ► Edit Style.

7 In the AEC Dimension Style Properties dialog:

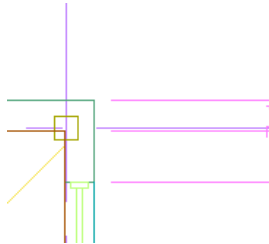
- On the Display Properties tab, click  (Edit Display Properties).
- In the Display Properties dialog, click the Contents tab.
- On the right side of the dialog, under Wall, for Wall Width, select Center.
The preview to the right of the drop-down displays a sample of how the Center condition is dimensioned.



- Select another option for Wall Width, and observe the preview.
- When you are done viewing previews, select Overall so that the total width of the wall is dimensioned.
- Click OK twice.

8 Press *ESC*.

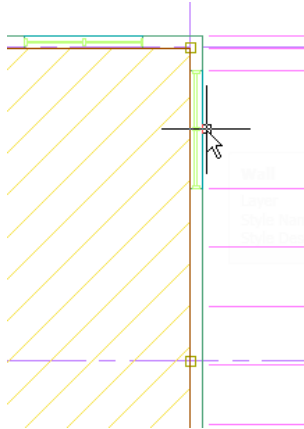
The dimension now displays the full width of the wall. The interior and exterior wall faces are dimensioned.



You can also use wall styles to determine what points in a wall are dimensioned. Next, you modify the wall style for a drawing that is externally referenced (as an xref) by the view drawing.

Modify the wall style of the 3rd Floor Shell drawing xref

9 Click the exterior wall to select the xref.

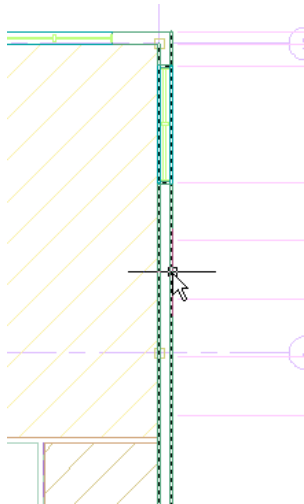


10 Click External Reference tab ► Edit panel ► Edit Reference In-Place.

11 In the Reference Edit dialog, click OK.



12 Press *ESC*.

13 Select the wall as shown.



14 Right-click, and click Edit Wall Style.

15 In the Wall Style Properties dialog:

- Click the Components tab.
- Resize the dialog if necessary to display the Function and Dimension columns.
- For Brick Veneer, under Function, select Non-Structural.
- For Stud, under Dimension, clear  .
- For Stud, under Dimension, verify that  is selected.
- Click OK.

These settings define the wall stud as the only structural component of the wall and specify that the AEC dimension should measure from the outside face of that component.

16 Save the changes to the xref file:

- Right-click in the drawing, and click Close REFEDIT Session ► Save Reference Edits.
- In the AutoCAD dialog, click OK.

There is no change in the appearance of the dimension yet. Next, you modify the AEC dimension style to use the structural settings you specified for the wall style.

Modify the AEC dimension style to use the wall structure when dimensioning a wall

17 Select the AEC dimension.

18 Click AEC Dimension tab ► General panel ► Edit Style.

19 In the AEC Dimension Style Properties dialog, on the Display

Properties tab, click  (Edit Display Properties).

20 In the Display Properties dialog, on the Contents tab:

- On the left side of the dialog, under Apply to, verify that Wall is selected.
- On the right side of the dialog, under Wall, on the Wall Width drop-down, select Structural By Style.

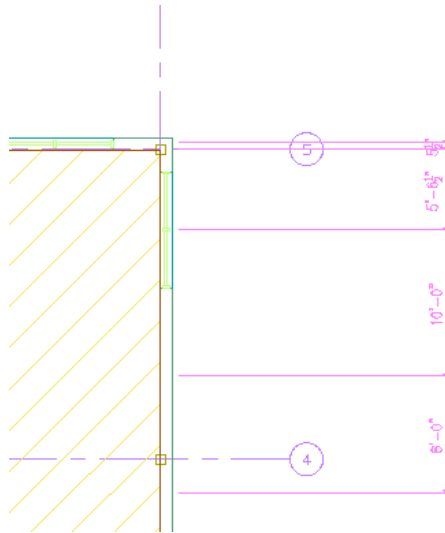
The structural components in the wall will be dimensioned according to the settings specified in the wall style instead of the AEC dimension style.

Modify the AEC dimension style to dimension the center of objects in a wall

- Under Apply to, select Opening in Wall, and in the right pane under Opening in Wall, clear Opening Max. Width and select Center of Opening.
- Under Apply to, select Curtain Wall, and in the right pane, clear Bounding Box and select Center.
- Under Apply to, select Door/Window Assembly, and in the right pane, clear Bounding Box and select Center.
- Under Apply to, select Opening/Door/Window, and in the right pane, clear Bounding Box and select Center.
- Click OK twice.

21 Press *ESC*.

The wall is dimensioned to the stud as specified by the wall style, and objects in the wall, such as windows, are dimensioned to the center as specified in the AEC dimension style.



An AEC dimension style can specify that the dimension consists of multiple chains, with each chain defined to dimension different objects. Next, you change the style used to display the AEC dimension from a single-chain style to a three-chain style.

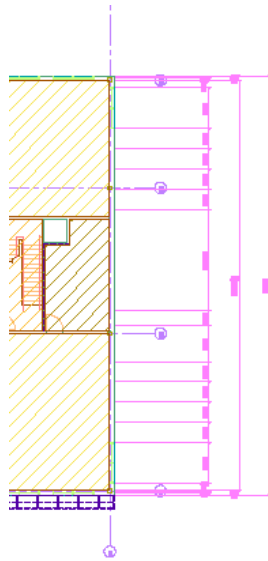
Change the style used by the AEC dimension

22 Select the AEC dimension.

23 On the Properties palette, under General, for Style, select Exterior - Center of Opening.

24 Press *ESC*.

The dimension now has 3 chains. You can use the techniques you learned in this exercise to edit the dimension style and review what objects are dimensioned by each chain.



25 Close the file with or without saving.

Updating AEC Dimensions

In this exercise, you add a dimensioned view of the first floor of the Research Building to a sheet. You then update the dimensioned geometry by moving a door/window assembly in an xref drawing file that is referenced by the view.

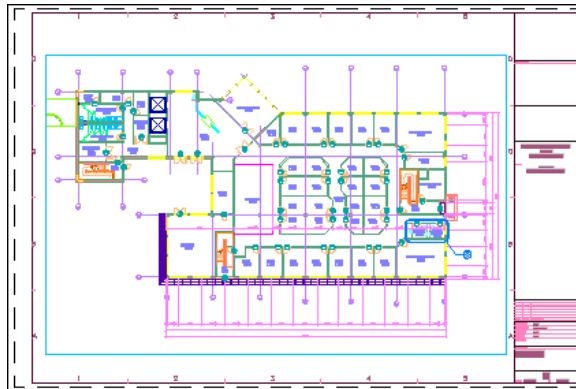
After you reload the xref, the AEC dimension values in the view drawing are updated to reflect the change to the door/window assembly.

Training File

- Continue to use the project you used in the previous exercise, ACA_Documenting_Projects - Imperial.
- On the Project Navigator, on the Sheets tab, expand ACA_Documenting_Projects, and open A-2 Entry Level.

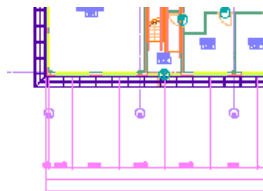
Add a view drawing to the sheet

- 1 On the Project Navigator, on the Views tab, expand Views ► Floor Plans, and drag 01 - Entry Level Plan into the drawing area.
- 2 Click to place the view in the drawing area.
Exact placement is not important.



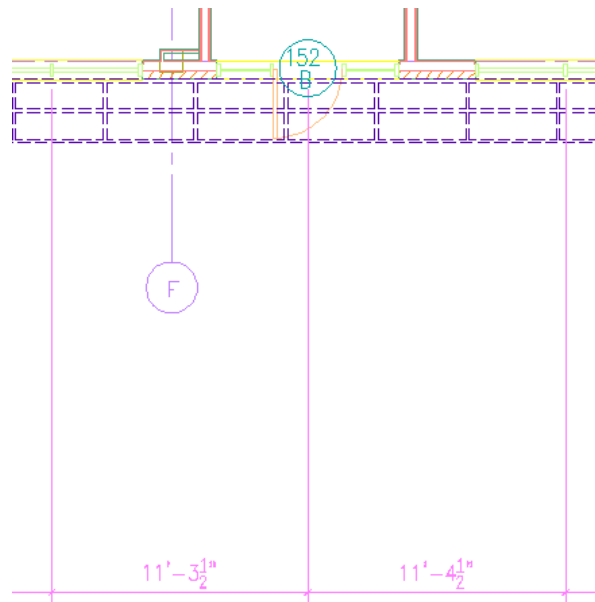
Zoom to the dimensioned geometry

- 3 Zoom to the lower left area of the drawing as shown.



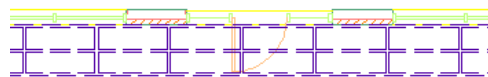
- 4 Zoom to the door/window assembly near the stair as shown.

The AEC dimension values reflect the current location of the door/window assembly within the wall.



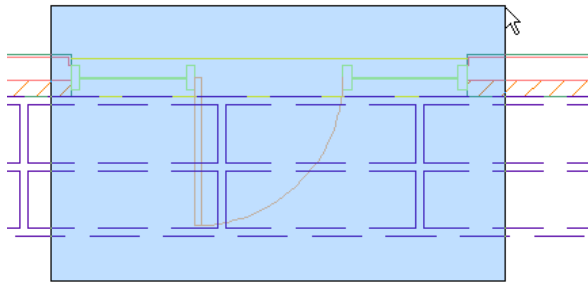
Open the drawing containing the building shell geometry


- 5 On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Building Shell, and open 01 Shell.
- 6 Zoom to the same door/window assembly as shown.



Move the door/window assembly

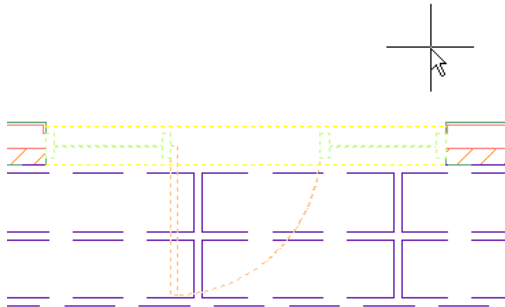
- 7 Click two points from left to right to specify a window and select the door/window assembly.



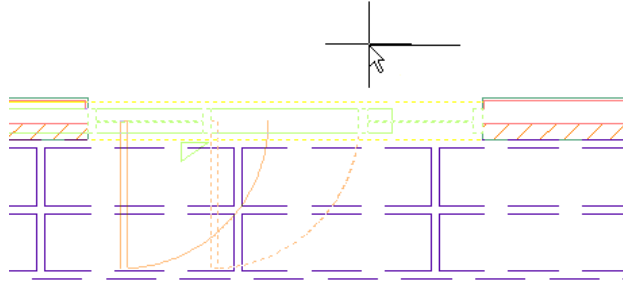
8 On the application status bar, click  (Ortho Mode) to turn it on.

9 Right-click, and click Basic Modify Tools ► Move.

10 Select a base point as shown.




11 Move the cursor to the left to specify the direction to move the door/window assembly.



- 12** On the command line, enter **.5"** and press **ENTER**.

The door/window assembly is moved **.5"** in the specified direction.

- 13** On the application status bar, click  (Ortho Mode) to turn it off.


- 14** Save and close the drawing.

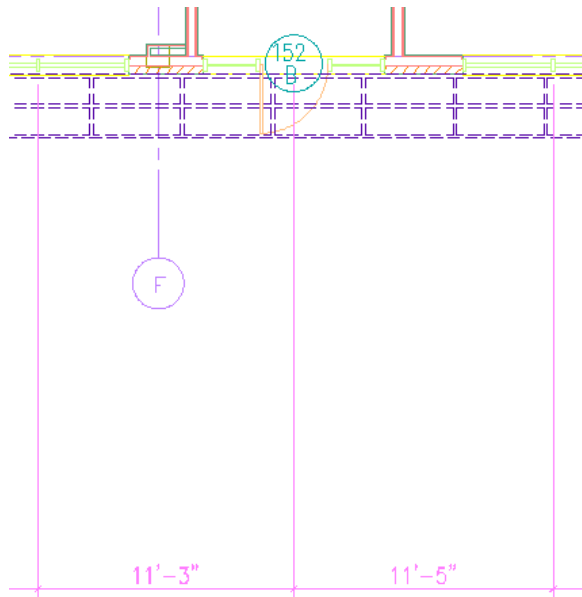
In the original drawing, the dimension values for the door/window assembly have not changed

Update the dimension

- 15** In the update balloon at the lower right corner of the drawing area, click **Reload 01 Shell**.

The dimension values are updated.

NOTE Alternatively, you can update the drawing using the External References Manager, which you access by clicking  on the drawing window status bar.



16 Close the drawing with or without saving.

Modifying AEC Dimensions

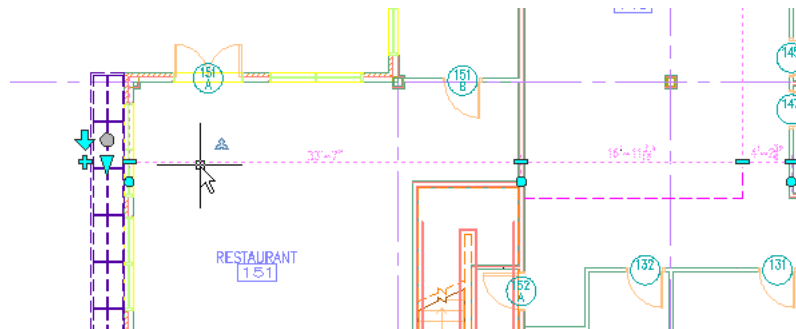
In this exercise, you use grips to modify an AEC dimension on the first floor of the Research Building. You move the chain, and you add, delete, and move dimension points. You also move dimension text and trim an extension line.

Training File

- Continue to use the project you used in the previous exercise, ACA_Documenting_Projects - Imperial.
- On the Project Navigator, on the Views tab, expand Views ► Floor Plans, and open 01 - Entry Level Plan.

Move the dimension chain

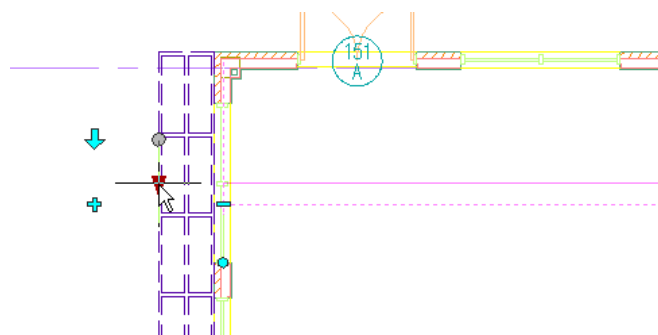
- 1** Select the AEC dimension that spans the building interior as shown.



2 Zoom to the left end of the dimension.

3 Click the Move All Chains grip ().

4 Move the grip and click a new location for the dimension chain as shown.

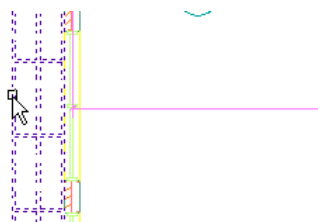


All parts of the AEC dimension are automatically updated. If a dimension has multiple chains, all chains are moved.

Add a point to the AEC dimension

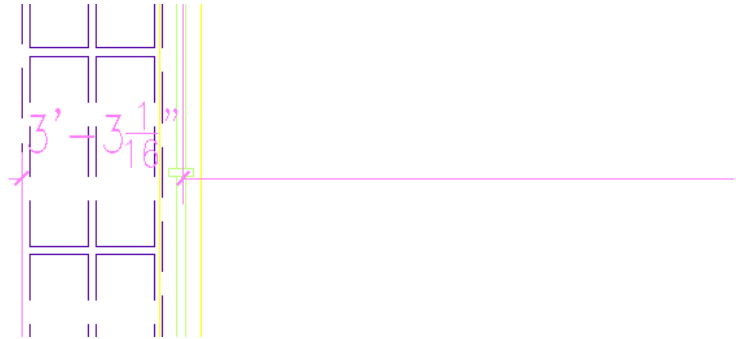
5 Click the Add grip ().

6 Select the sunscreen overhang as shown and press *ENTER*.



7 Press *ESC*.

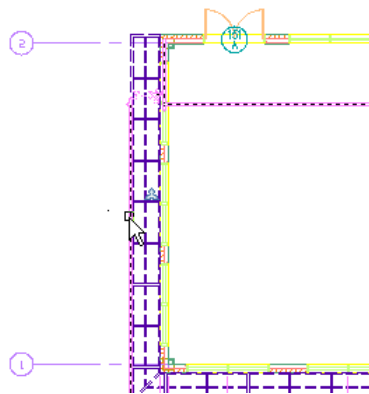
The dimension value is calculated, and an extension line is added.



Trim the extension line

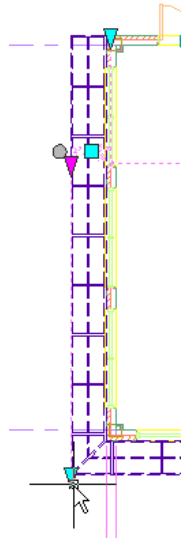
8 Move the cursor over the new extension line so it is highlighted.

The new extension line runs the length of the exterior wall.

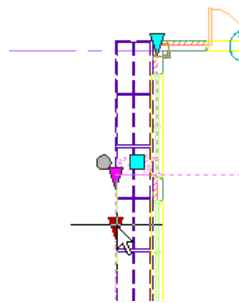


9 Select the extension line, and click the Edit In Place grip ().

10 Click the Extension Line Offset grip ().




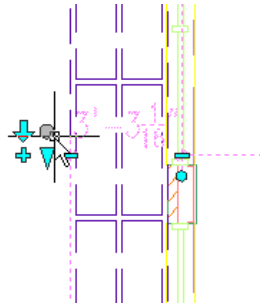
- 11** Move the grip closer to the dimension chain as shown.
Exact placement is not important.



- 12** Click to specify the new extension line endpoint.
The dimension line is trimmed.

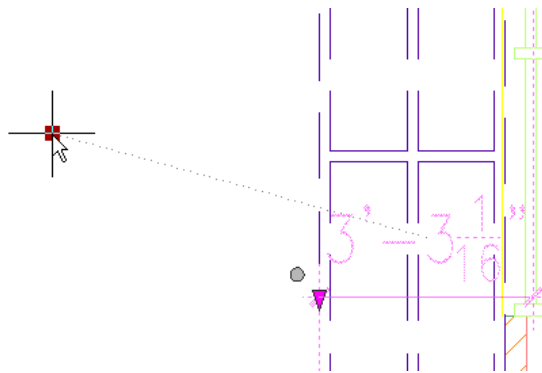
Move the location of dimension text

- 13** With the dimension still highlighted, click the Edit In Place grip
().



14 Click the Text Position grip (■).

15 Click to specify a new location for the text as shown.

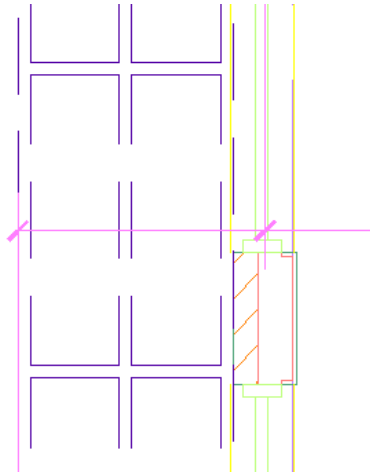


16 Press *ESC*.


The dimension text is moved to the new position.

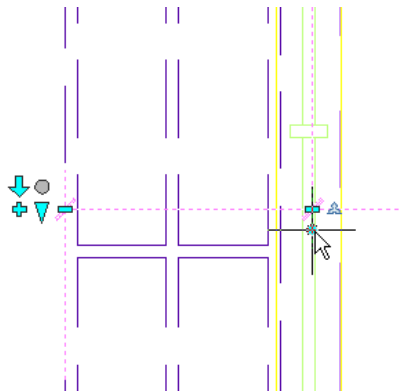
Move a dimension point from the middle of a wall to the exterior face of the wall

17 Zoom to the left end of the AEC dimension as shown.



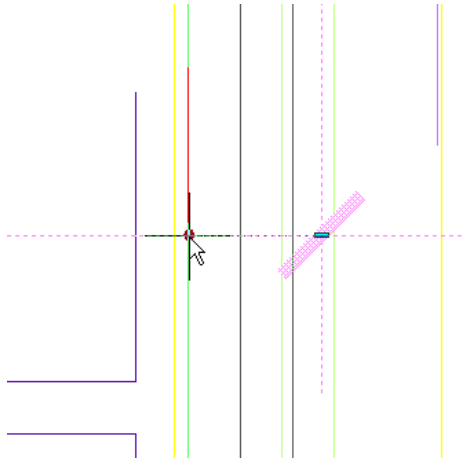
18 Select the AEC dimension.

19 Click the Apply Component Override grip () as shown.



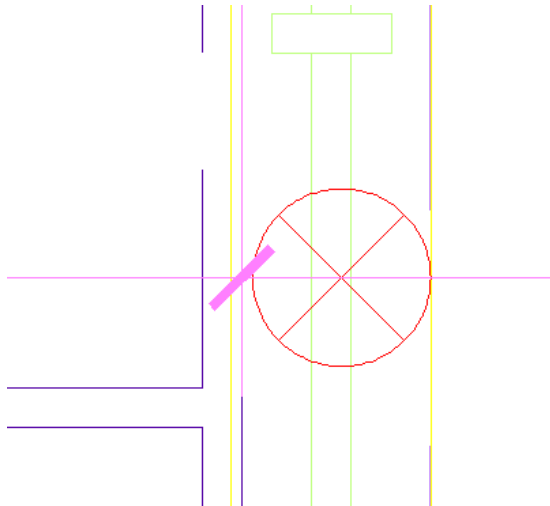
20 Click the new location on the exterior face on the wall.

Zoom in to be sure the override line highlights the component of the wall that you are overriding.



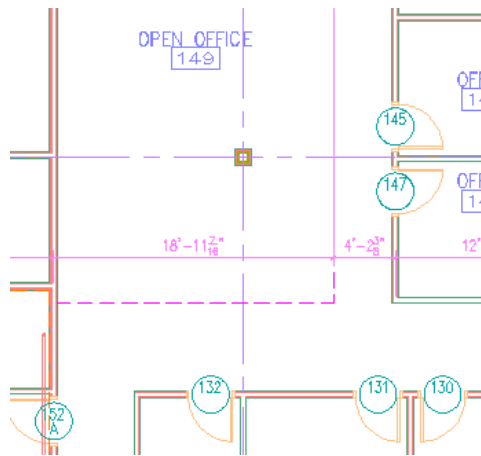
21 Press *ESC*.

An override is applied for the selected dimension point, and the dimension values are updated. The displayed symbol indicates the condition has an override. The symbol will not appear when the drawing is printed.



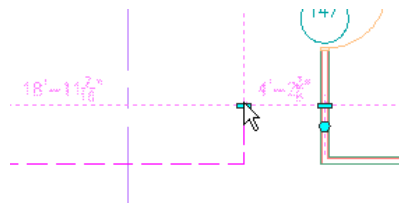
Remove an extension line

22 Pan the drawing to the right, following the dimension, to an extension line as shown.

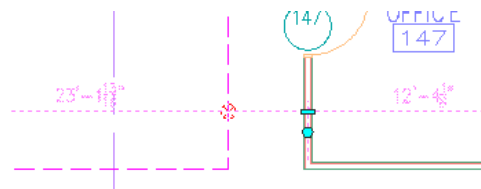


23 Select the dimension.

24 Click the Remove Extension Line grip () as shown.



The extension line is deleted and the dimension is updated.



25 Press *ESC*.

26 Close the drawing with or without saving it.

Customizing the Display of AEC Dimensions

In this exercise, you modify an AEC dimension style so that only overall dimensions appear when the AEC dimension is displayed using the Presentation display representation. A display representation specifies the

amount of detail to be displayed for an object. You use display representations to control, for example, how an object displays in different drawings with different scales.

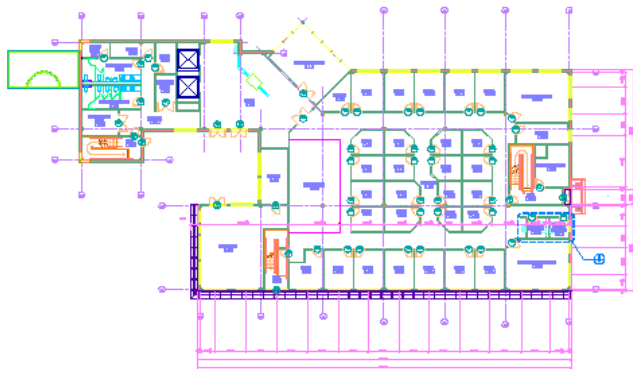
Training File

- Continue to use the project you used in the previous exercise, ACA_Documenting_Projects - Imperial.
- On the Project Navigator, on the Views tab, expand Views ► Floor Plans, and open 01 - Entry Level Plan.

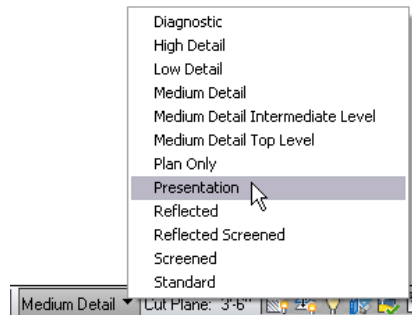
Change the display representation

- 1 View the AEC dimensions in the drawing.

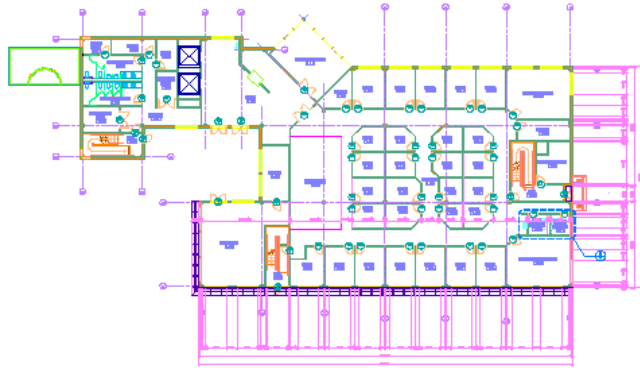
Exterior dimensions display with 3 chains, as specified by the Medium Detail display representation.



- 2 On the drawing window status bar at the lower right of the drawing area, open Display Configuration and click Presentation.

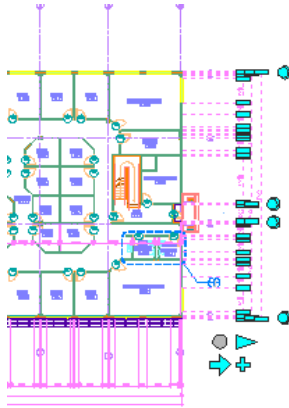


The AEC dimensions in the drawing are displayed using the Presentation display configuration.



Change the number of chains shown in the Presentation display configuration

3 Select an AEC dimension as shown.



4 Right-click, and click Edit AEC Dimension Style.

5 In the AEC Dimension Style Properties dialog, on the Display

Properties tab, click  (Edit Display Properties).

6 In the Display Properties dialog, click the Contents tab.

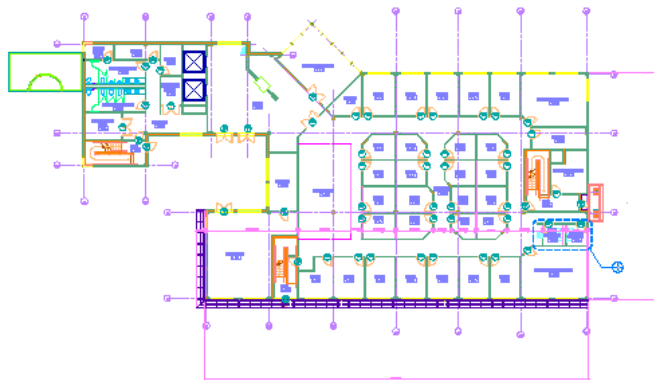
7 On the left side of the dialog, clear Chain1, Chain2, and Chain3.

8 On the right side of the dialog, select Overall.

9 On the left side of the dialog, verify that Chain3 is selected.

10 Click OK twice.

The AEC dimensions that use the modified style now display with one chain.



Change the display representation

- 11** On the drawing window status bar, select the Medium Detail display representation.

The AEC dimensions are displayed with 3 chains as they were previously. The changes you made to the AEC dimension style apply only to Presentation display representation.

- 12** Close the drawing with or without saving.

Scheduling the Building Model

14

In this lesson, you create and modify tags and schedule tables.

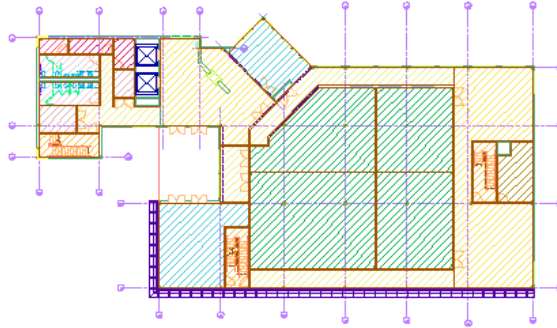
You learn to:

- Create tags for rooms and doors in a drawing.
- Create a schedule table and populate it with data.
- Update a schedule table to reflect changes to objects in the table.
- Add and remove columns from a schedule table, change the text of the heading, and change the weight of lines for plotting.
- Automatically tag the rooms and doors in a drawing.

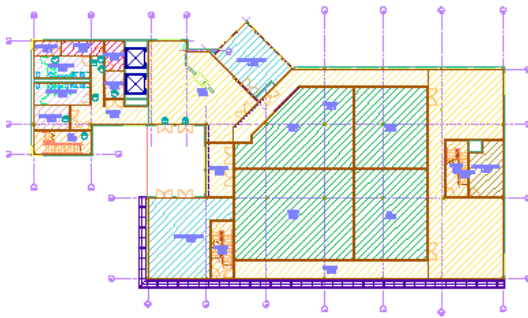
Creating Tags

In this exercise, you add project-based room tags to all the rooms on the third floor of the Research Building and then adjust the numbering used in some tags. You then create project-based tags for some doors in the drawing.

Level 3 view before room and door tags are added



Level 3 view after room and door tags are added



Training File

- If necessary, open the project ACA_Documenting_Projects - Imperial.
- On the Project Navigator, on the Views tab, expand Views ► Floor Plans, and double-click 03 - 3rd Level Plan to open the drawing.

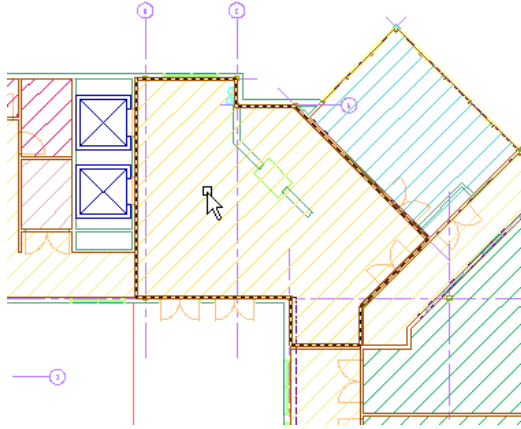
Place a single room tag

- 1 On the Document tool palette, click the Tags tab, and click the

Room Tag - Project Based tool ().

A project-based room tag uses the level and a room number to create a unique tag for each room. Each tagged space will have the appropriate property sets attached to it if needed. The spaces referenced by this view drawing will be updated in the 03 Spaces constructs drawing.

- 2 Click inside the lobby area as shown.

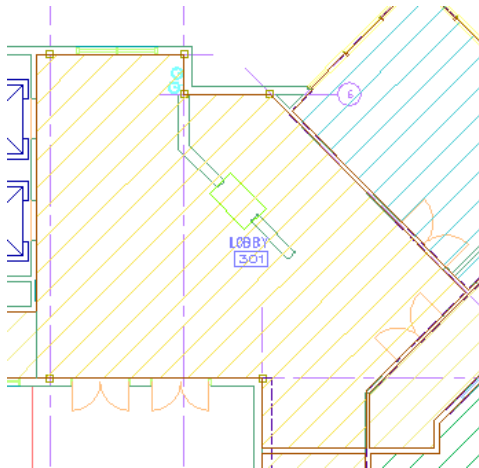


3 Press *ENTER*.

The Edit Property Set Data dialog specifies the property set that will be attached to the space. The room number, which is automatically generated, will be attached to the space.

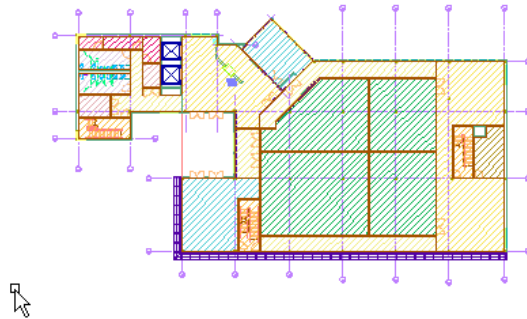
4 In the Edit Property Set Data dialog, click OK.

A project-based room tag consisting of the level (3) and a room number is placed in the geometric center of the lobby, and the appropriate property set is attached to the selected space in the construct drawing Spaces 03.

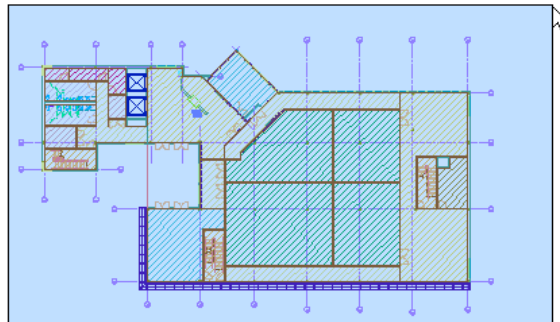


Tag the other rooms in the drawing

- 5 With the command still active, on the command line, enter **m** and press *ENTER*.
- 6 Specify the first point of a selection window as shown.

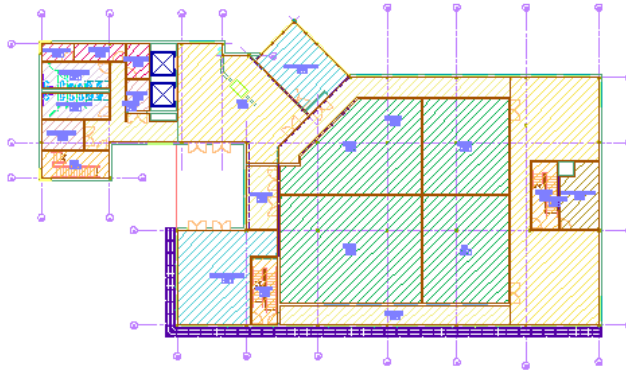


- 7 Specify the second point of the selection window as shown.



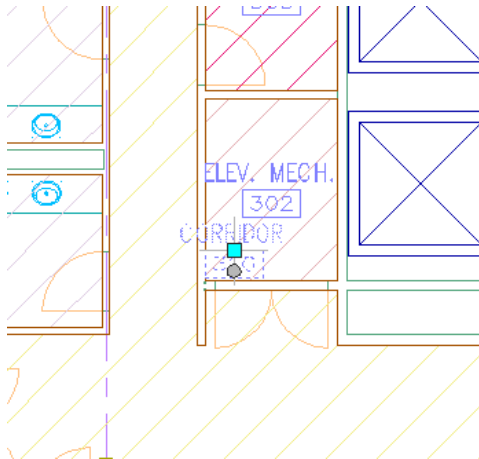
- 8 Press *ENTER*.
Objects not eligible for tagging are filtered out of the selection window.
- 9 In the AutoCAD Architecture 2010 dialog, click No to prevent the lobby space from being tagged twice.
- 10 In the Edit Property Set Data dialog, click OK.
- 11 Press *ESC*.

All the rooms in the drawing are tagged with a tag consisting of the level and the room number, and the property set is attached to each space in the construct drawing 03 Spaces.




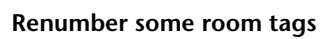
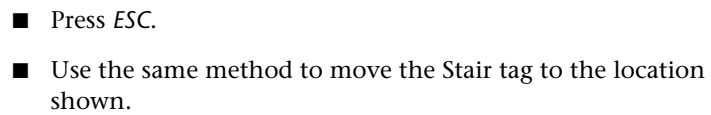
Use grips to adjust the location of some room tags

12 Zoom to the area shown and select the Corridor tag.

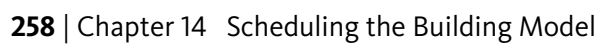


13 Move the tags:


- Click the Location grip ().
- Click in the new location for the tag as shown.



14 Zoom to the upper left corner of the drawing as shown.

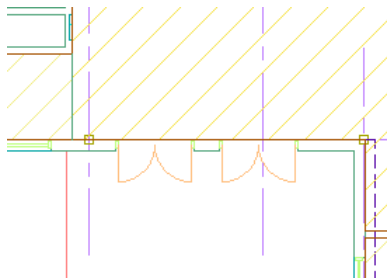


15 Renumber room tags:


- On the Tags tool palette, click the Renumber Data tool ().
- In the Data Renumber dialog, for Start Number, enter **02**.
The first tag number will be 302. The prefix of 3 is taken from the level.
- Click OK.
- Select the space containing the Corridor tag that you just moved.
- Select the space containing the Stair tag that you just moved.
- Select the remaining spaces in the area in a clockwise direction, starting with space tagged Fire Sprinkler and ending with the space tagged Elev. Mech.
- Press *ENTER*.
The tags are renumbered sequentially (beginning with 302) in the order you selected them.

Create project-based door tags

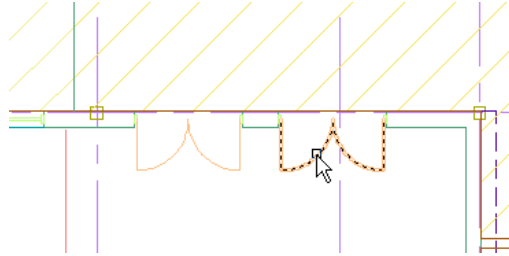
16 Zoom to the lobby area doors as shown.



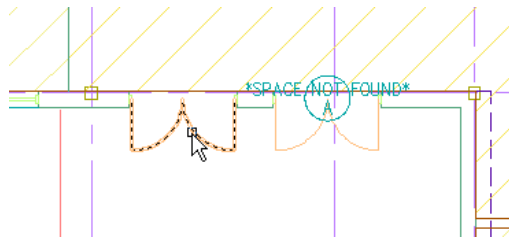
17 Create door tags:

- On the Tags tool palette, click the Door Tag - Project Based tool ().
A project-based door tag uses the space number of the room it is associated with. It is a good practice to tag rooms (to create the space numbers) before you tag doors.

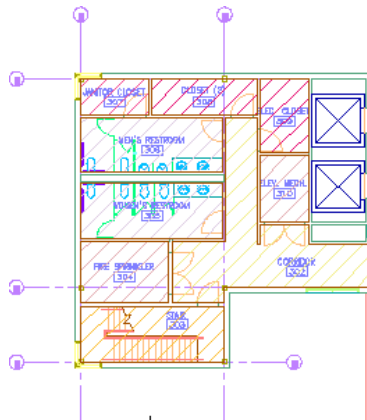
- Select the door to tag as shown.




- Press *ENTER*.
- In the Edit Property Set Data dialog, click OK. This dialog allows you to establish or modify property set values when the tag is placed.
- Select another door as shown.



- Press *ENTER*.
- In the Edit Property Set Data dialog, for Number Suffix, enter **B**, and click OK. For both doors, the area in the tag where a space number should be inserted shows "space not found" instead of a space number. You will address this condition later in the exercise.
- On the command line, enter **m**, and press *ENTER*.
- In the area shown, select each door individually, selecting a total of 8 doors.

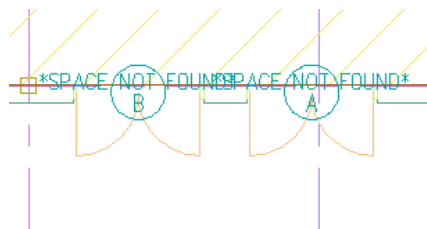


- Press **ENTER**.
- In the Edit Property Set Data dialog, clear Number Suffix. Since each room has a single door, a unique identifier is not required for the door tag.
- Click OK.
Door tags are added to all the selected doors. Each tag contains the number of the space the door swings into.
- Press **ENTER**.

18 If desired, select each door tag individually and use the Location grip () to reposition it.

Update tags for doors that do not have space information

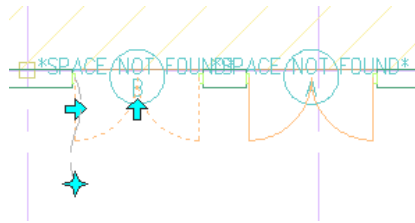
19 Zoom to the 2 doors that do not have space information.




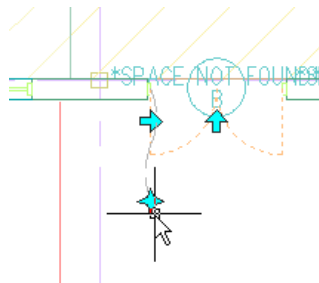
A door tag takes its information from the space that the door swings into. In this case, the doors do not swing into a valid space, as indicated by the text in the drawing.

20 Change the space for the doors:

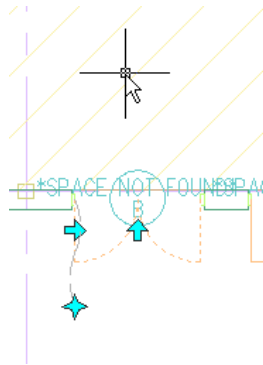
- Click one of the doors to select the xref that contains the doors.
- Click External Reference tab ► Edit panel ► Edit Reference In-Place.
- In the Reference Edit dialog, click OK.
- Press *ESC*.
- Select the left door.



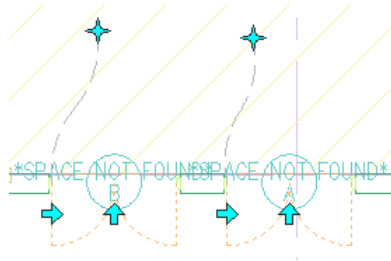
- Click the Property Data Location grip ().



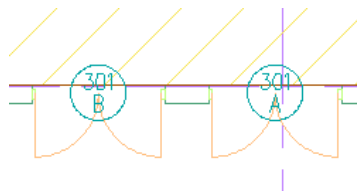
- Click to place the grip in space 301 as shown.




- Using the same method, move the Property Data Location grip for the door on the right as shown. The tags now take their information from space 301.

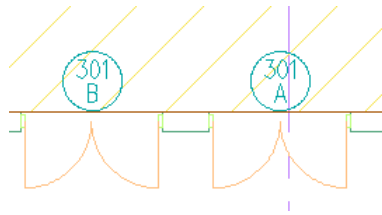


- Click Door tab ► Edit Reference panel ► Save Changes.
- In the AutoCAD dialog, click OK. In the main drawing, the tags are updated with the correct space number.



Reposition the door tags

- 21 Select each tag individually and use the Location grip () to reposition it as shown.



22 Close the drawing with or without saving.

Adding and Updating a Schedule Table


In this exercise, you place a schedule table on a sheet. You populate the schedule with data from an externally referenced (xref) drawing that contains the model objects for the second floor of the Research Building. You change the properties of a scheduled object and update the schedule table to reflect the change. You then modify the property set that is attached to a door style, and update the schedule table to reflect the change.

Training File

- Continue to use the project you used in the previous exercise, ACA_Documenting_Projects - Imperial.
- On the Project Navigator, on the Sheets tab, expand ACA_Documenting_Projects, and open A-9 Schedules.

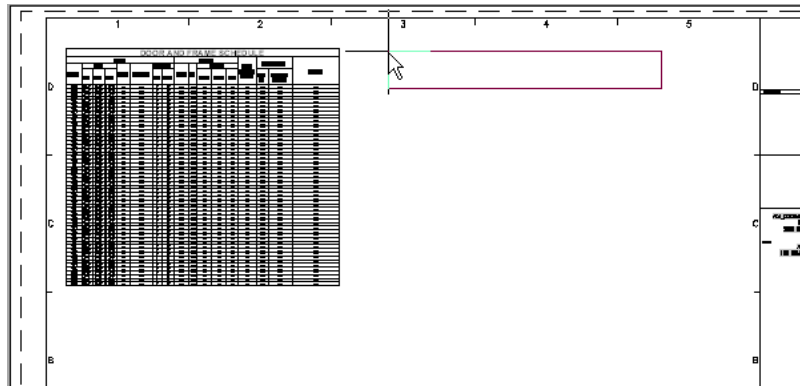
Place a schedule table onto a sheet

1 On the Document tool palette, click the Scheduling tab, and click

Door Schedule Project Based ().

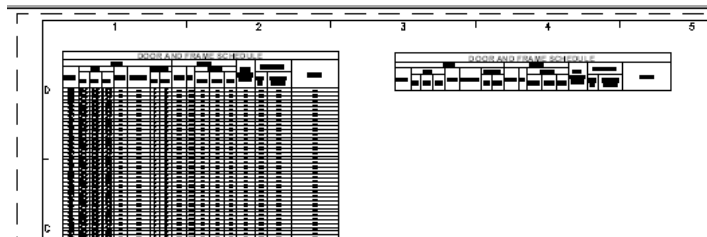
2 Press *ENTER*.

3 Click as shown to place the upper left corner of the schedule.



4 Press *ENTER*.

The size of the schedule is automatically determined using the annotation plot scale of the drawing and the text size setting in the schedule table style.



Alternatively, you can click the lower right corner of the schedule to specify the schedule size.

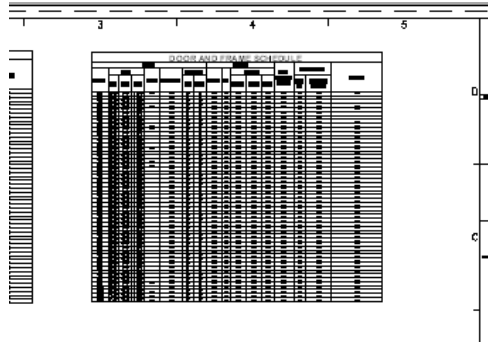
Add data to the schedule table from a source drawing

5 Select the schedule you just placed.

6 Update the source drawing:

- On the Properties palette, on the Design tab, expand Advanced, and under External Source, for Schedule External Drawing, select Yes.
- Under External Source, for External Drawing, click Browse.
- In the Select a drawing file dialog, navigate to My Documents\Autodesk\My Projects\ACA_Documenting_Projects - Imperial\Views\Floor Plans.

- Select 02 - 2nd Level Plan.dwg and click Open.
- Under Basic, under Selection, for Layer Wildcard, enter ***door*** and press *ENTER*.
The schedule is updated with the objects from any layer that includes “door” in its name.



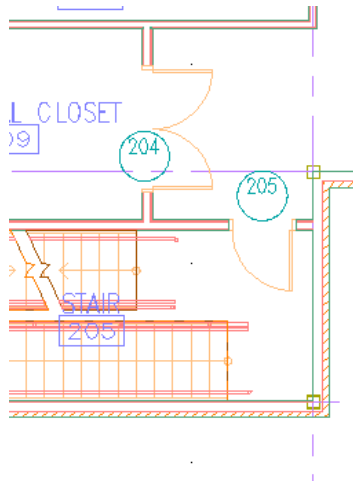
You can use layer names in drawings to distinguish between objects you want to schedule and objects that you do not want to schedule. For example, you can separate toilet partition doors and elevator doors from the doors that you want to show in a schedule.

7 Press *ESC*.

Next, you change the properties of some scheduled objects.

Access the properties of a door through the source drawing

- 8** On the Project Navigator, on the Views tab, expand Views ► Floor Plans, and open 02 - 2nd Level Plan.
- 9** Zoom to the doors on the left side of the drawing as shown.



- 10** Click one of the doors to select the xref drawing that contains the doors.

The doors are contained in an externally referenced (xref) drawing. To modify the doors, you edit the xref in place.

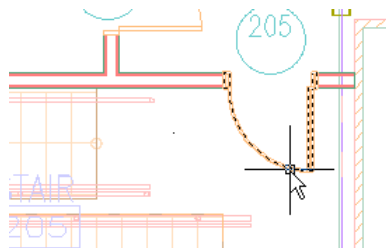
- 11** Click External Reference tab ► Edit panel ► Edit Reference In-Place.

- 12** In the Reference Edit dialog, click OK.

- 13** Press *ESC*.

Add a fire rating to a door in the xref drawing

- 14** Select the lower door as shown.



- 15** On the Properties palette, on the Extended Data tab, under Property Sets, for FireRating, enter **20 min.** and press *ENTER*.

- 16** Click Door tab ► Edit Reference panel ► Save Changes.

- 17** In the AutoCAD dialog, click OK.

View the updated schedule table

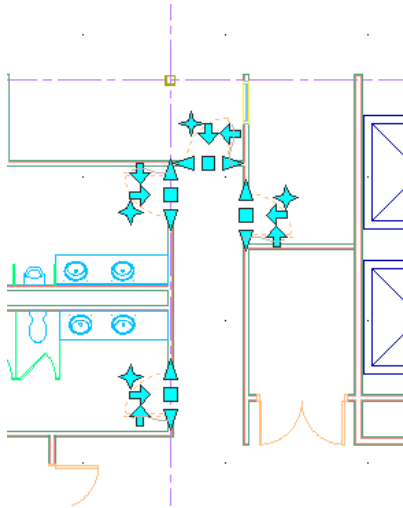
- 18 Click View tab ► Windows panel ► Switch Windows drop-down ► A-9 Schedules.dwg
- 19 Select the Door and Frame schedule table you added earlier.
- 20 Click Schedule Table tab ► Modify panel ► Update.
- 21 Press *ESC*.
- 22 Zoom to the Fire Rating Label column.

The modified fire rating for the door is included in the schedule table.

.L	FIRE RATING LABEL	HA SET NO
-	--	--
-	--	--
-	--	--
-	--	--
-	20 MIN.	--
-	--	--

Edit the properties of a set of doors by editing the construct that contains them

- 23 On the Project Navigator, on the Constructs tab, expand Constructs ► Architectural ► Interior, and open 02 Interior.
- 24 Select four doors as shown.

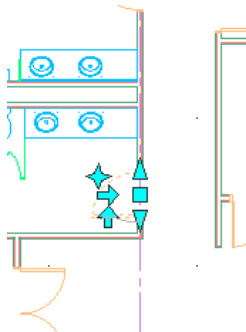


25 On the Properties palette, on the Extended Data tab, for Remarks, enter **By Owner** and press *ENTER*.

26 Press *ESC*.

Modify a property attached to the door style

27 Select a door as shown.



28 Click Door tab ► General panel ► Edit Style.

29 In the Door Style Properties dialog:

- On the General tab, click Property Sets.
- In the Edit Property Sets Data dialog, under DoorStyles, for Material, enter **wood**.
The material property is modified for all doors of this style.

- Click OK twice.

30 Press *ESC*.

31 Close and save the drawing.

View the changes

32 Select the schedule table you have been working with.

33 Click Schedule Table tab ► Modify panel ► Update.

34 Press *ESC*.

35 Zoom to view the updates in the Notes column.

“By owner” is added to all the modified doors.

NOTES	
--	
By owner	
By owner	
--	
--	
By owner	
By owner	
--	
--	

36 Zoom to view the updates in the Materials column.

The material wood has been added to all doors that use the style you modified.

MATL
--
WOOD
WOOD
--
WOOD
WOOD
WOOD
WOOD
--

37 Close the drawing with or without saving.

Changing the Appearance of a Schedule

In this exercise, you modify the appearance of an existing schedule. You delete columns and add new columns, you modify the text of the table heading, and you change the lines of the table to make them easier to read and to comply with project standards.

Training File

- Continue to use the project you used in the previous exercise, ACA_Documenting_Projects - Imperial.
- On the Project Navigator, on the Sheets tab, expand ACA_Documenting_Projects, and open A-9 Schedules.

If you saved the drawing after the last exercise, there will be two schedules in the drawing, and you should work with the schedule on the left.

Remove columns from the schedule table

- 1 Zoom to the area of the Frame heading on the schedule.

FRAME					FIRE RATING LABEL
MATL	EL	DETAIL			
		HEAD	JAMB	SILL	

2 Select the schedule.

3 Right-click and click Edit Schedule Table Style.

4 In the Schedule Table Style Properties dialog:

- Click the Columns tab.
The layout of the headings in the dialog reflects the layout of the schedule table column headings in the drawing.
- Scroll in the dialog to the Frame headings.
- While pressing CTRL, select the column headings HEAD, JAMB, and SILL.
- Click Delete.
- In the Remove Columns/Headers dialog, click OK.
- Click OK.

The schedule table is updated, and the columns you removed from the dialog are removed.

FRAME		FIRE RATING LABEL
MATL	EL	

Add a column to the schedule table

5 Select the schedule, right-click, and click Edit Schedule Table Style.

6 In the Schedule Table Style Properties dialog:

- On the Columns tab, click Add Column.
In the Add Columns dialog, a list of the available properties for the scheduled objects is displayed.
- On the Categorized tab, under DoorObjects, click HeadDetail.
The right side of the dialog describes the column that will be added to the schedule table for the DoorObjects HeadDetail property.

- On the right side of the dialog, under Column Properties, for Heading, enter **Head Det.**
This is the text that will appear in the column heading in the schedule table.
- Under Column Position, select Insert Before.
- Under Column, select the last column in the list, DoorObjects:Remarks.
- Click OK.
- Scroll the dialog to verify that the new column heading is inserted before the rightmost column.

Add another column to the schedule table

7 In the Schedule Table Style Properties dialog:

- Click Add Column.
- On the Categorized tab, under DoorObjects, click JambDetail.
- On the right side of the dialog, for Heading, enter **Jamb Det.**
- Under Column Position, select Insert After.
- Under Column, select DoorObjects:HeadDetail.
- Click OK.
- Scroll the dialog to verify that the new column is inserted before the rightmost column on the schedule.
- Click OK.
The schedule table is updated with 2 new columns as specified.

Head Det.	Jamb Det.	NOTES
--	--	--
--	--	--


Edit schedule table text

- 8 Using the method you used earlier, select the table and edit the table style.
- 9 In the Schedule Table Style Properties dialog:
 - Click the Default Format tab.
 - Under Text Appearance, for Style, select RomanS.
 - Click the Layout tab.
 - For Table Title, enter **Door Schedule - First Floor**.
 - Under Format, to the right of Title, click Override Cell Format.
 - In the Cell Format Override dialog, for Alignment, select Middle Left.
 - Click OK twice.
 - Press *ESC*.

The schedule table title text is changed and shifted to the left.

Door Schedule - First Floor	
DOOR	FRAME

Change the appearance of the lines in the table

- 10 Using the method you used earlier, select the table and edit the table style.
- 11 In the Schedule Table Style Properties dialog, click the Display Properties tab.
- 12 Click  (Edit Display Properties).
- 13 In the Display Properties dialog, under the Plot Style heading, click in the top cell to edit the plot style for the Outer Frame.
If needed, expand the dialog so that you can see the entire row.
- 14 In the Select Plot Style dialog, under Plot Styles, select 50 Percent, and click OK.

This changes the saturation level of the line to make the schedule more readable. Use this technique to modify schedule table lines when plotting schedules to obtain the desired results.

- 15** For Data Minor Row Lines, click under Plot Style to edit the value.
- 16** In the Select Plot Style dialog, under Plot Styles, select 25 Percent and click OK three times.
- 17** Press *ESC*.
- 18** Close the drawing with or without saving.

Working with Callouts

15

In this lesson, you work with callouts and their associated views and drawings.

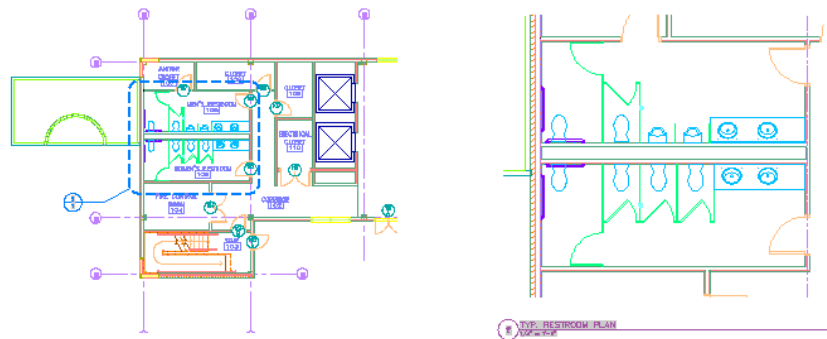
You learn to:

- Place a callout in a drawing and create a detail view from the callout geometry.
- Place a detail view on a sheet and change the sheet number so that callout text that references the detail view is updated automatically.
- Place a callout in a section drawing and update the callout text to reflect an existing detail view in an existing sheet.

Creating a Callout and a Detail View

In this exercise, you place a callout in a drawing of the first floor of the Research Building, and at the same time you create a detail view that contains the geometry for the callout. You then open the detail view and adjust the position of the label.

Callout in drawing and detail view

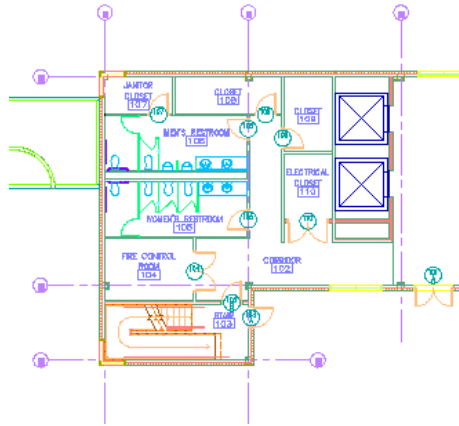


Training File


- If necessary, open the project ACA_Documenting_Projects - Imperial.
- On the Project Navigator, on the Views tab, expand Views ► Floor Plans, and double-click 01 - Entry Level Plan to open the drawing.

Place the callout

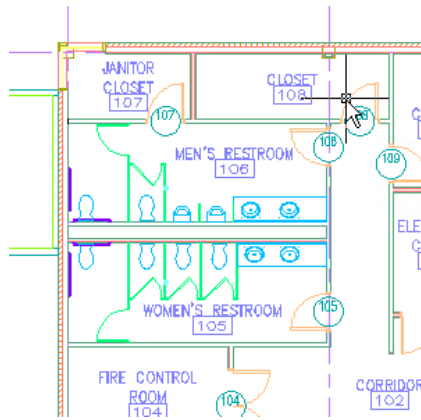
- 1 Zoom to the restroom area on the left side of the drawing as shown.



- 2 On the Document tool palette, click the Callouts tab, and click

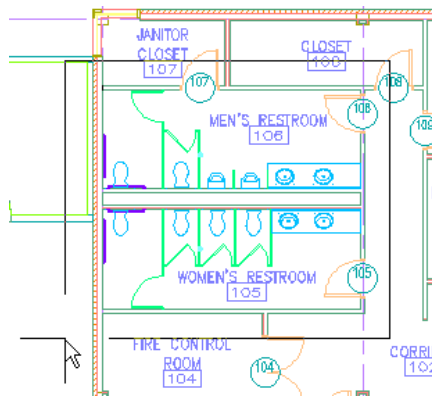
the Detail Boundary B (Rectangle) tool ().

- 3 Click to place the upper right corner of the callout as shown.

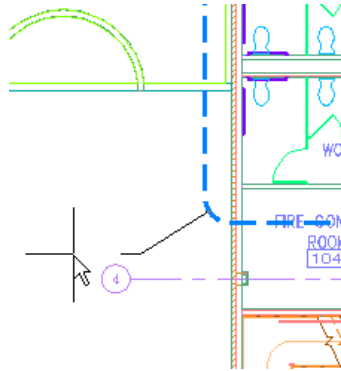


Exact placement is not important.

4 Click to place the lower left corner as shown.



5 Click two points as shown to place the extension line.



6 Press *ENTER*.

Specify information about the new view drawing

7 In the Place Callouts dialog:

- Clear Generate Section/Elevation.
- Under Scale, select 1/4"=1'0".
- Under New Model Space View Name, enter **Typ. Restroom Plan**.
- Under Create in, click New View Drawing.

8 In the Add Detail View dialog, for Name, enter **Enlarged Toilet Room Plan**.

This is the name of the new view drawing.

9 Click Next.

Specify the elements that will be included in the new view

10 Verify that First Floor is selected and all other options are cleared.

11 Click Next.

12 Verify that check boxes next to Constructs and Architectural are selected.

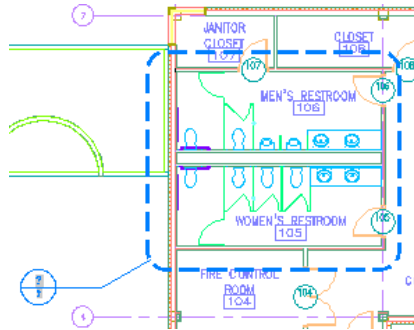
13 Under Building Shell, select 01 Slab and 01 Shell, and clear all other options.

14 Under Interior, select 01 Space and 01 Interior, and clear all other options.

15 Click Finish.

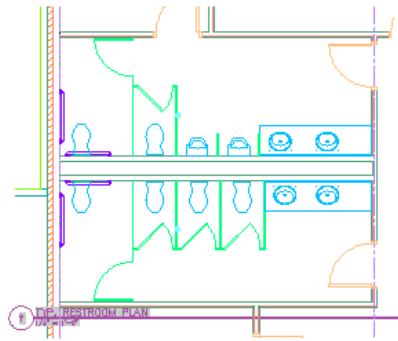
Specify the extents of the view

- 16** Click 2 points that closely match the callout boundaries.
Exact placement is not required.
The callout is created in the drawing.



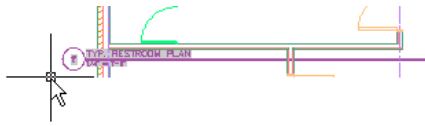
Open the newly created view drawing

- 17** On the Project Navigator, on the Views tab, under Views, double-click the Enlarged Toilet Room Plan drawing that you just created.
- 18** Zoom to the plan view.

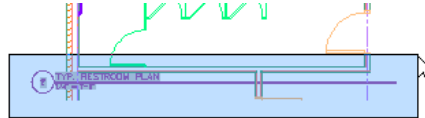


Move the label

- 19** Select all parts of the label:
- Specify the first point as shown.



- Specify the second point as shown.

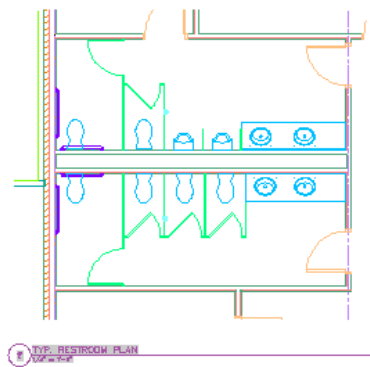


- Right-click, and click Basic Modify Tools ► Move.
- Specify a base point immediately to the left of the label, and an offset point below the base point as shown.



- Press *ESC*.

The label is moved.



- 20 Close the drawing with or without saving.

Placing a Detail View on a Sheet

In this exercise, you place an existing detail view onto a sheet, and verify that the text for a callout that references the detail view is updated. You then change the name of the sheet containing the detail view, and verify that the callout text is updated automatically to reflect the new sheet name.

Training File

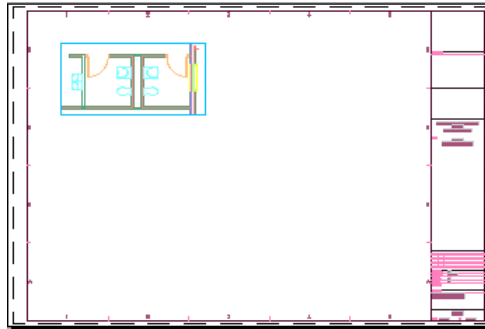
- Continue to use the project you used in the previous exercise, ACA_Documenting_Projects - Imperial.
- On the Project Navigator, on the Sheets tab, open A - 9_1 Enlarged Plans.

Place a view onto a sheet

- 1 Zoom the drawing so that you can see the entire sheet.



- 2 On the Project Navigator, on the Views tab, expand Views ► Floor Plans ► Enlarged Plans ► Secondary Toilets - Enlarged.
- 3 Drag the model view Secondary Toilets - Enlarged to the sheet.
- 4 Click to place the view in the drawing.
Exact placement is not important.

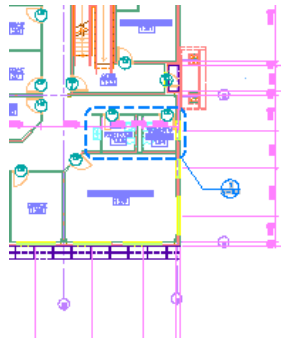


5 Save and close the drawing.

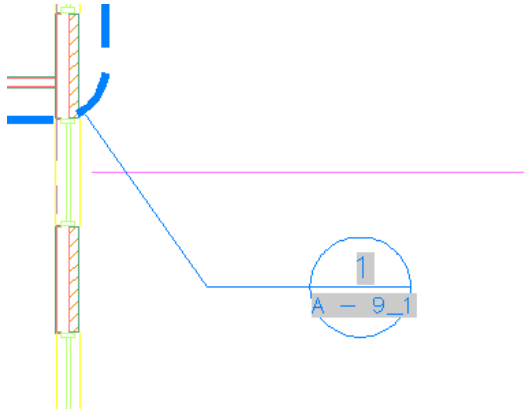
Open a drawing that contains the callout

6 On the Project Navigator, on the Views tab, expand Views ► Floor Plans, and open 01 - Entry Level Plan.

7 Zoom to the callout on the right as shown.



The callout text is updated to reflect the view number (1) and sheet number (A - 9_1) where the callout view is located.



8 Save and close the file.

Change the sheet number

9 On the Project Navigator, on the Sheets tab, right-click A - 9_1 Enlarged Plans, and click Rename and Renumber.

10 In the Rename & Renumber Sheet dialog, under Number, enter **A - 4_1**.

11 Under Rename options, for Rename layout to match, select Sheet title.

12 For Rename drawing file to match, select Sheet title and Prefix with sheet number.

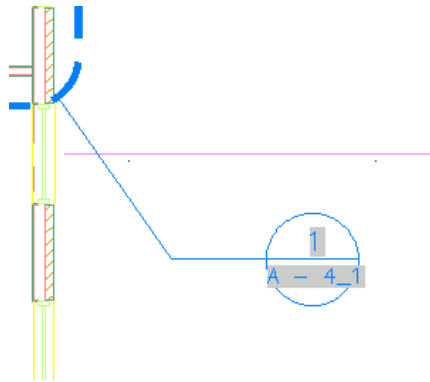
13 Click OK.

The Sheet name is changed on the Project Navigator.

View the updated sheet number in the drawing that contains the callout

14 On the Project Navigator, on the Views tab, expand Views ► Floor Plans, and open 01 - Entry Level Plan.

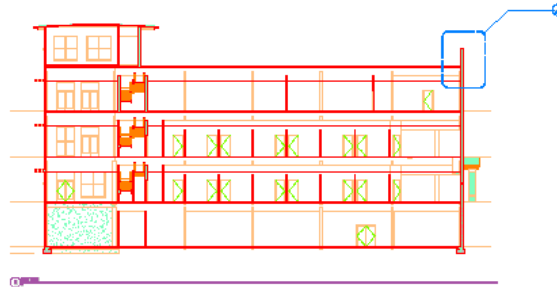
The sheet reference is updated in the callout.



Placing a Callout in a Drawing

In this exercise, you place a callout in an existing section drawing. The callout refers to a parapet detail view that has already been created in the project and placed on a sheet. After you place the callout, you link it to the existing detail view and sheet, and the callout text is automatically updated in the drawing.

Section drawing with callout

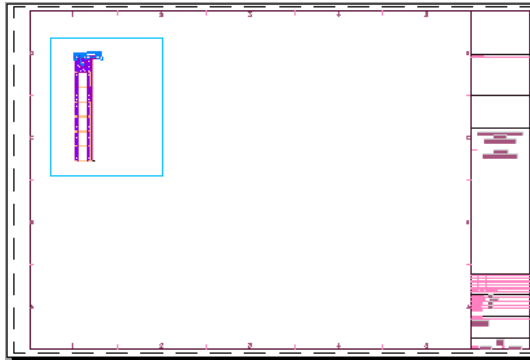


Training File

- Continue to use the project you used in the previous exercise, ACA_Documenting_Projects - Imperial.

View the existing parapet callout sheet and view

- 1 On the Project Navigator, on the Sheets tab, expand ACA_Documenting_Projects, and open A-8 Details. The parapet view is view 1 on sheet A-8.

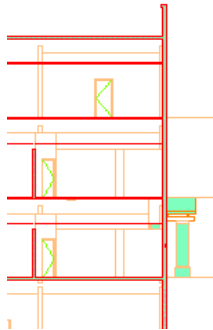


2 Close the drawing without saving it.

Create the callout

3 On the Project Navigator, on the Views tab, expand Views ► Sections, and open Building Sections.

4 Zoom to the parapet as shown.

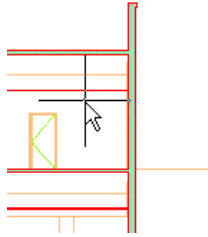


5 On the Document tool palette, on the Callouts tab, click the Detail

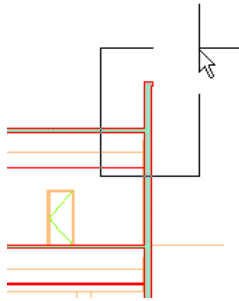


Boundary B (Rectangle) tool ().

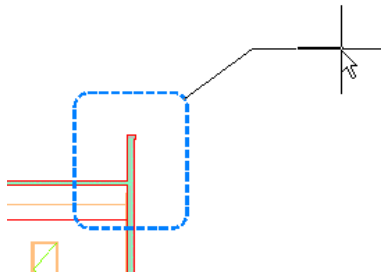
6 Click as shown to specify the first corner of the callout.
Exact placement is not important.



7 Click as shown to specify the second point.



8 Click 2 points to place a leader/extension line as shown.

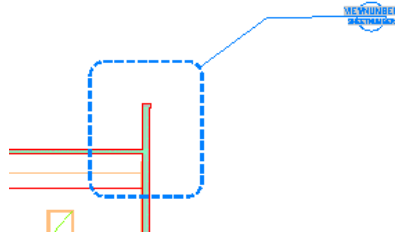


9 Press *ENTER*.

10 In the Place Callout dialog, click Callout Only.

You select this option because the detail view drawing already exists.

The callout is created with placeholder text for the view number and the sheet number.



Link the callout with an existing detail view

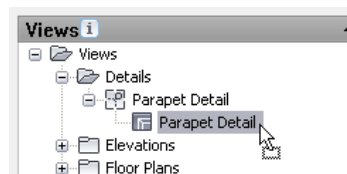
- 11 On the Project Navigator, on the Views tab, expand Views ► Details ► Parapet Detail.

The Parapet Detail model view is shown under the Parapet Detail category.

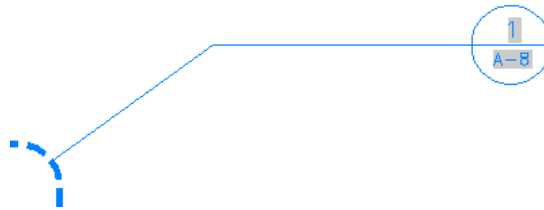
- 12 Click the callout text to select it.



- 13 Click the callout text again, and drag it to the Project Navigator and into the Parapet Detail model view.



The callout text is updated with the view number (1) and the sheet (A-8) that contains the parapet detail view.



14 Close the drawing with or without saving it.

Creating Details

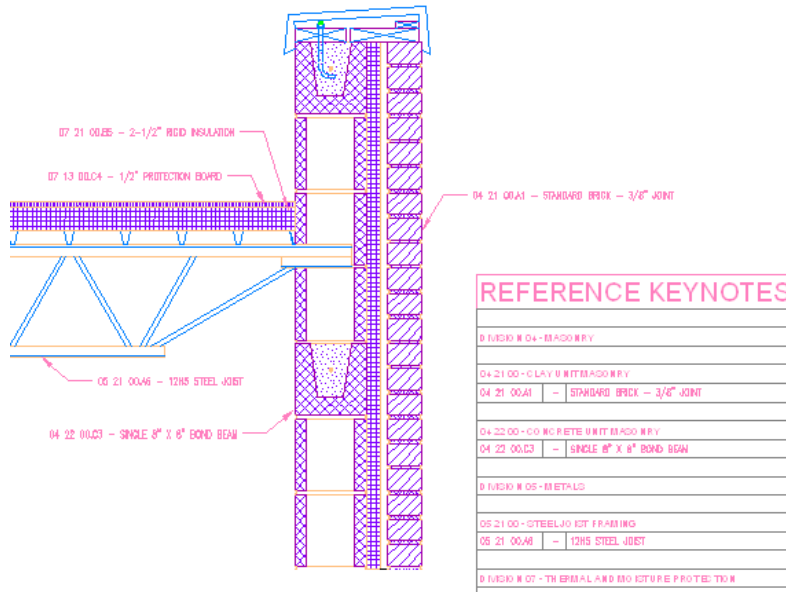
16

In this lesson, you create building assembly details.

You learn to:

- Place detail blocks in a drawing using the Detailing tool palette and the Detail Component Manager.
- Use keyword filters to search the Detail Component Manager for a detail block with a known name.
- Replace a detail block with another detail block.
- Use an AEC Modify tool to customize detail blocks.
- Annotate details with keynotes and create a sheet keynote legend.

Completed detail drawing with keynotes and legend



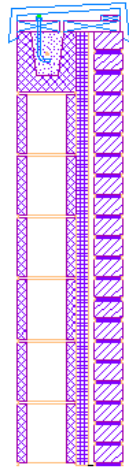
Adding Detail Components Using the Detailing Tool Palette

AutoCAD Architecture comes with an extensive library of detail blocks that you can use to automate the creation of construction details.

The most commonly used detail blocks are located on the Detailing tool palette. The blocks are organized by CSI Masterformat divisions for easy access to the different categories of building components.


In this exercise, you add a brick course to a detail drawing that is already underway.

**Wall with brick
course detail
component**



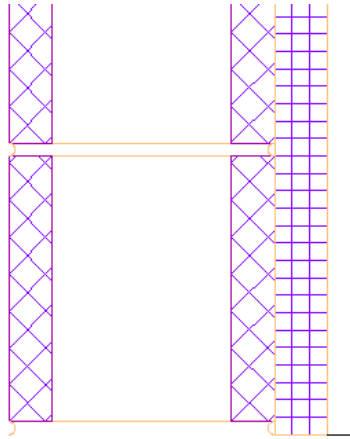
Training File







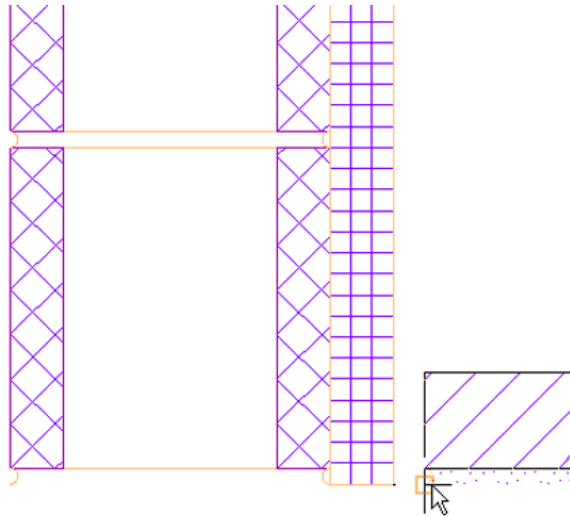
- Click  ➤ Open ➤ Drawing.
- In the Select File dialog, browse to My Documents\Autodesk\My Projects\Training_Files_I.
- Select ACA_DET_01_Detail_Wall_i.dwg, and click Open.

Add a detail component

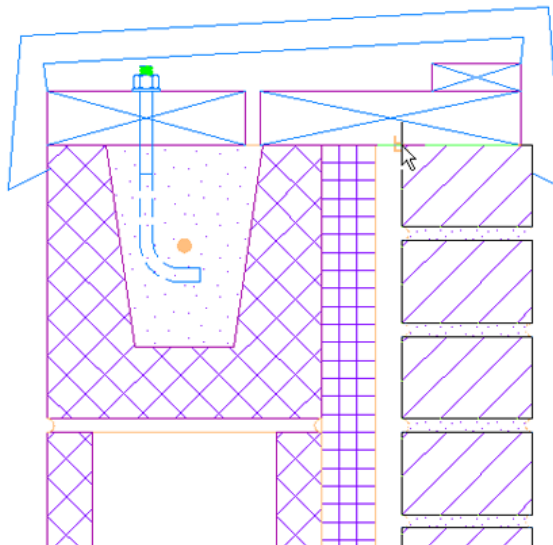
- 1 Zoom to the lower right of the drawing.



- 2 If necessary, on the application status bar, click  (Object Snap) to turn it on.
- 3 Right-click  (Object Snap), click Settings, and on the Object Snap tab, select Endpoint and Perpendicular and clear all other object snaps.
- 4 Click OK.
- 5 Right-click the Tool palette title bar, and click Detailing to display the Detailing tool palette.
- 6 On the Basic tab of the Detailing tool palette, click 04 - Masonry  ().
- 7 To specify the start point of the brick course, click the Endpoint object snap of the reference line as shown.



8 To specify the endpoint of the brick course, click the Perpendicular object snap that displays at the bottom of the Nominal Cut Lumber detail component as shown.



The brick course is added to the detail drawing.

9 Press *ENTER*.

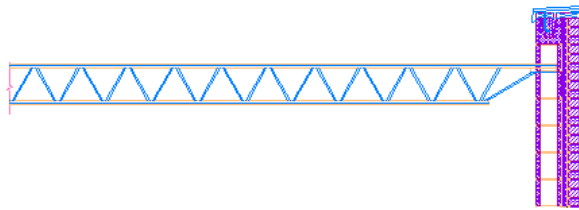
10 Save the drawing with or without closing it.

Using the Detail Component Manager

Detail blocks that are not located on the Detailing tool palette are available in the Detail Component Manager.

In this exercise, you use the Detail Component Manager to add a steel joist to the detail drawing. You use the Xflip layout tool to specify the orientation of the joist.

Wall with joist detail component



Training File

- Continue to use the drawing you used in the previous exercise, ACA_DET_01_Detail_Wall.i.dwg.

Add a detail component using the Detail Component Manager

1 On the Basic tab of the Detailing tool palette, right-click 05 -


Metals (), and click Detail Component Manager.

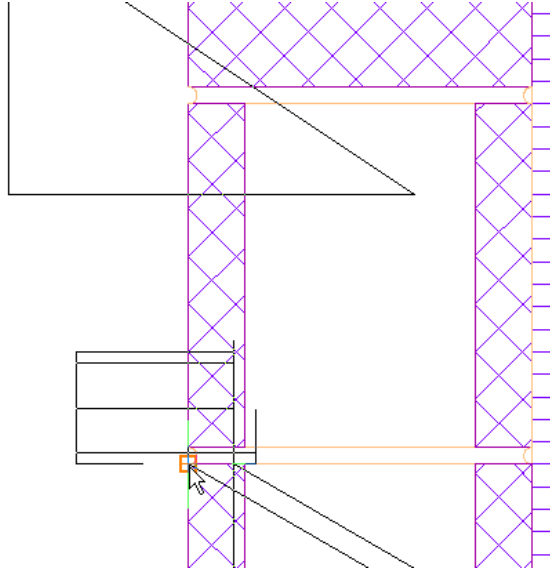
2 In the Detail Component Manager tree view, expand AEC Detail Component Database (US) ► Division 05 - Metals ► 05 21 00 - Steel Joist Framing, and click H-Series Open Web Joists.

3 In the bottom panel, select the row containing 12H5 Steel Joist. To select the entire row, click the gray area to the left of the Description column.

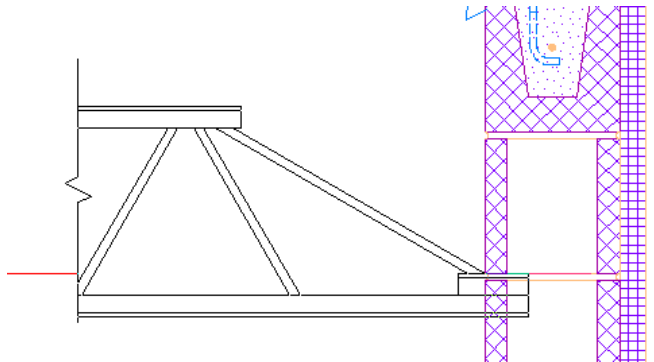
4 Click Insert Component.

5 On the Properties palette, under Component, for View, select Elevation.

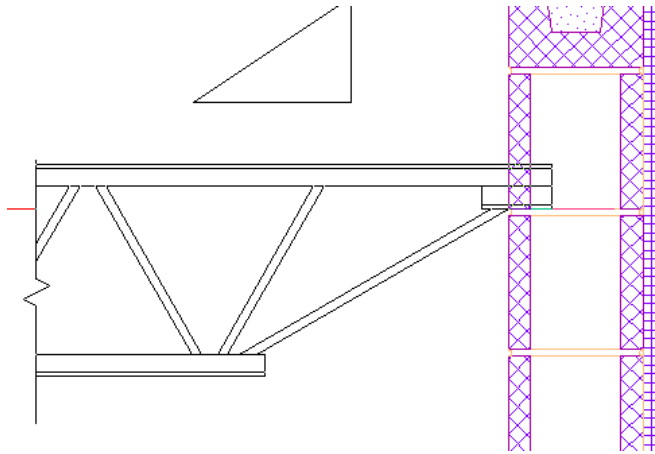
- 6 If necessary, on the application status bar, click  (Ortho Mode) to turn it on.
- 7 To place the right end of the joist, use the Endpoint object snap to click the upper left corner of the second Bond Beam from the top as shown.



- 8 Move the cursor to the left to view the orientation of the joist.



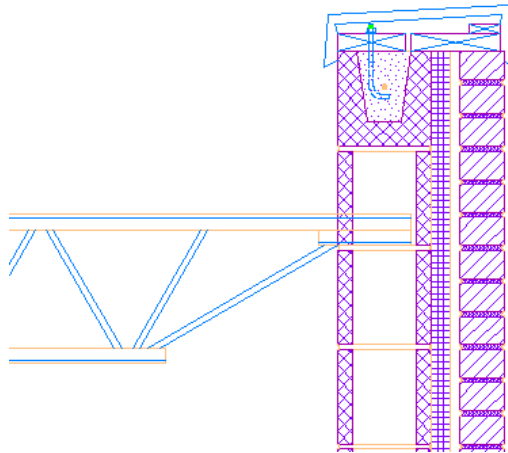
- 9 Right-click and click Xflip to flip the joist detail component about the X axis.



10 To place the left end of the joist, on the command line, enter **13'** and press *ENTER*.

11 To specify the bearing length, on the command line, enter **6** and press *ENTER*.

12 Press *ENTER*.

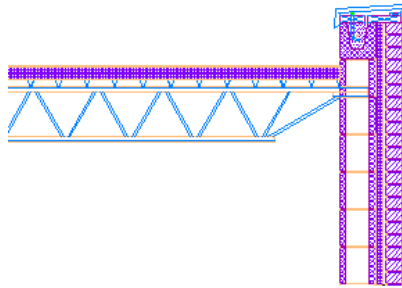


13 Save the drawing with or without closing it.

Using Catalog Search Filters

In this exercise, you use the Detail Component Manager filter to search for metal deck, rigid insulation, and protection board detail components, which you add to the drawing.




Joist with detail components added



Training File

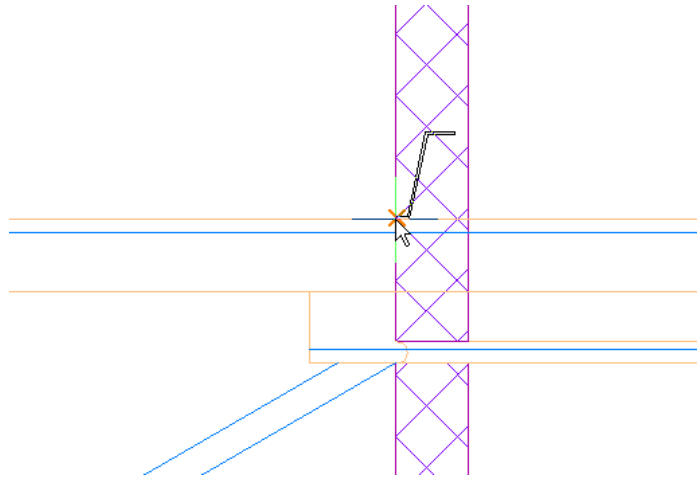
- Continue to use the drawing you used in the previous exercise, ACA_DET_01_Detail_Wall_i.dwg.

Use search to locate a detail component

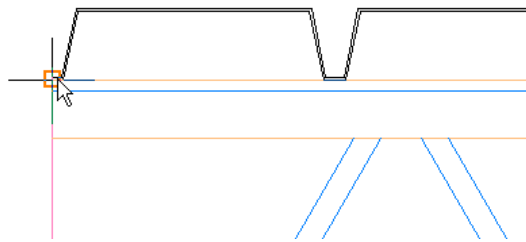
- 1 Right click  (Object Snap), click Settings, select Endpoint and Apparent Intersection, clear all other snaps, and click OK.
- 2 Click  (Ortho Mode) to turn it off.
- 3 Click Home tab ► Details panel ► Detail Components.
- 4 In the Detail Component Manager dialog, under Filter, next to , enter **roof decking**, and press *ENTER*.
- 5 In the detail component tree view:
 - Select Roof Decking.
 - In the bottom panel, select the row containing 1.5 NR 18 Roof Deck.
 - Click Insert Component.

Place the detail component


- 6 On the Properties palette, under Component, for View, select End.
- 7 To place the right end of the decking, click the Intersection object snap near the right end of the joist as shown.

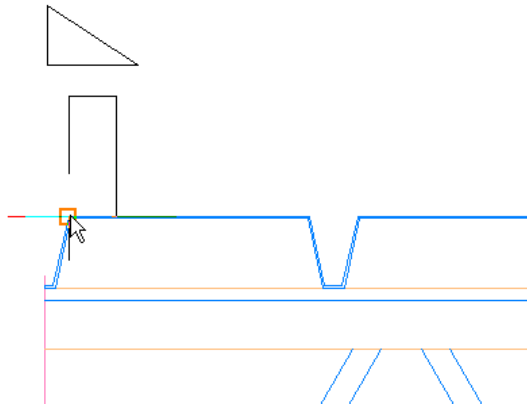



- 8 Right-click, and click Xflip to flip the component about the X axis.
- 9 To place the left end of the decking, click the Endpoint snap at the left end of the joist.
Be sure to keep the command active after you click the point.

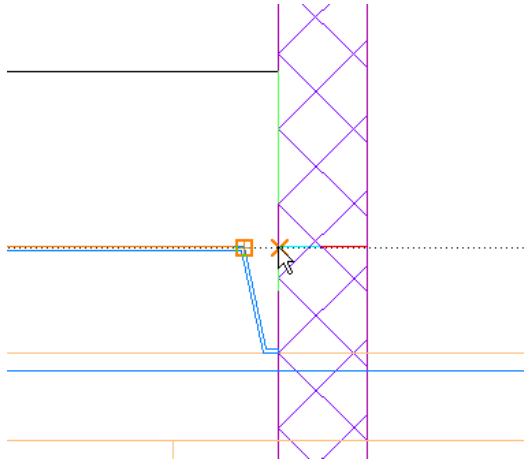


Locate and place another detail component

- 10 On the Properties palette, next to Component, click  (Select a Component).
- 11 In the Select Component dialog, in the Filter box, type **rigid insulation**, and press *ENTER*.
- 12 In the detail component tree view:
 - Select Rigid Insulation.
 - In the bottom panel, select 2-1/2" Rigid Insulation.
 - Click Select Component.
- 13 To place the left end of the rigid insulation, click the left Endpoint object snap of the roof decking as shown.



- 14 If necessary, click  (Object Snap Tracking) to turn it on.
- 15 To place the right end of the rigid insulation, use Object Snap Tracking to specify a point near the top-right end of the roof decking as shown.
Keep the command active after you click the point.

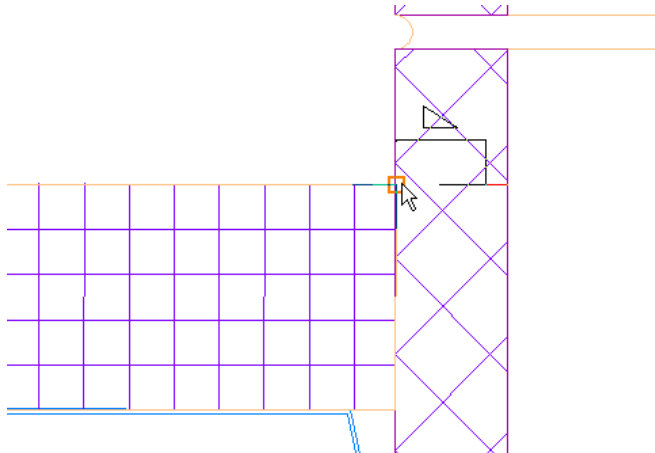


Locate and place another detail component

16 Using the same method, select Protection Board, 1/2" Protection Board in the Detail Component Manager.

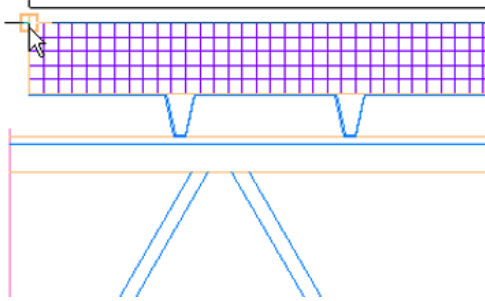
17 Click  (Object Snap Tracking) to turn it off.

18 To place the right endpoint of the protection board, specify the Endpoint object snap as shown.

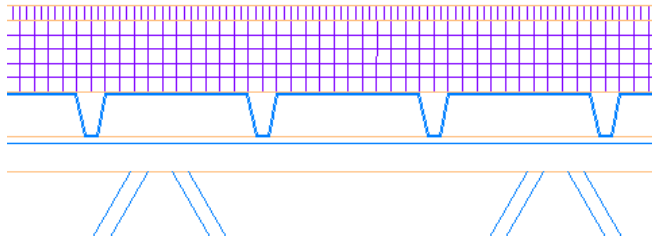


19 Right-click, and click Xflip to flip the component about the X axis.

- 20** To place the left endpoint, click the top-left Endpoint object snap of the rigid insulation as shown.



- 21** Press *ENTER*.



- 22** Save the drawing with or without closing it.

Replacing a Detail Component

You can easily replace an existing detail component with another detail component using the Replace Selected tool.

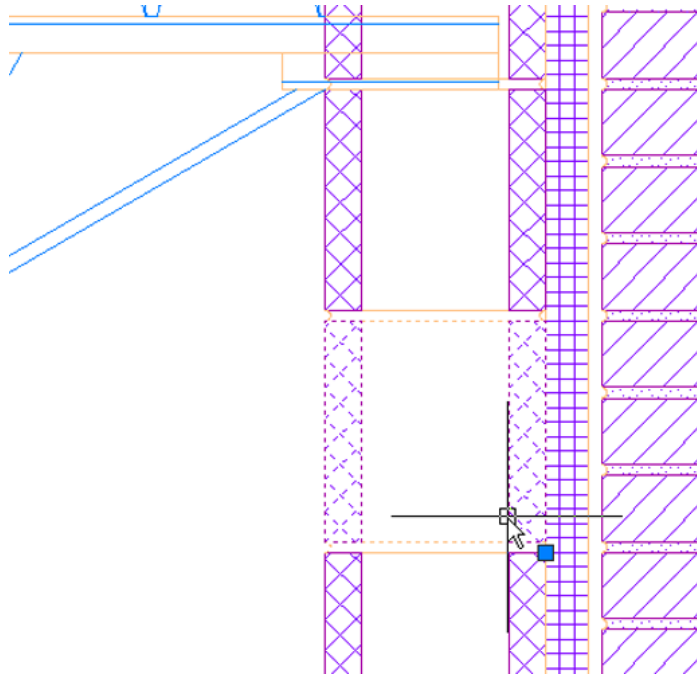
In this exercise, you change an existing CMU detail block to a Bond Beam detail block.

Training File

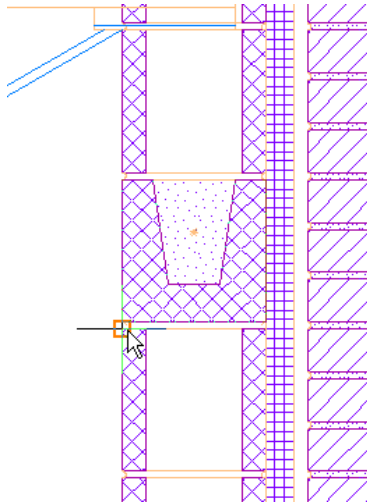
- Continue to use the drawing you used in the previous exercise, ACA_DET_01_Detail_Wall.i.dwg.

Replace a detail component

- 1** Select a CMU block detail component as shown.



- 2 Right-click, and click Replace Selected.
- 3 On the Properties palette:
 - Under Component, for Type, select Bond Beams.
 - For Description, select Single 8" x 8".
- 4 For the base point, specify the Endpoint object snap of a CMU block as shown.



5 Press *ENTER*.

6 Save the drawing with or without closing it.

Using the AEC Modify Tools

When the detail blocks provided with AutoCAD Architecture need to be modified to reflect specific design criteria, AEC Modify tools can be used to merge, obscure, or subtract linework.

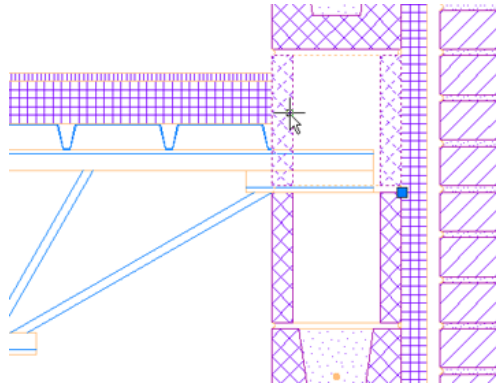
In this exercise, you use the Subtract AEC Modify tool to hide bond beam linework that should not be visible behind the joist.

Training File

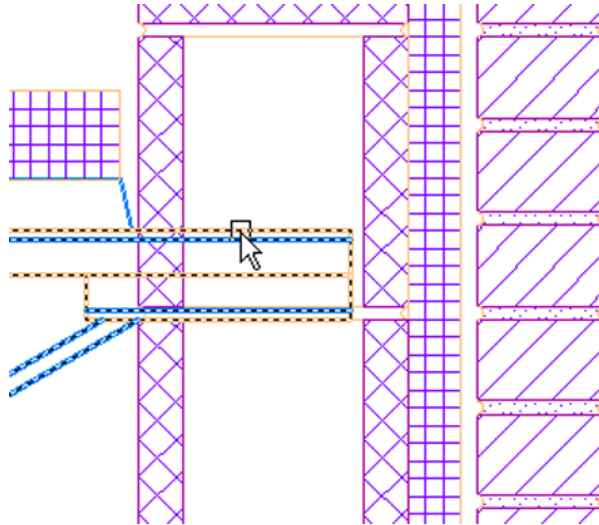
- Continue to use the drawing you used in the previous exercise, ACA_DET_01_Detail_Wall.i.dwg.

Subtract linework using the AEC Modify tool

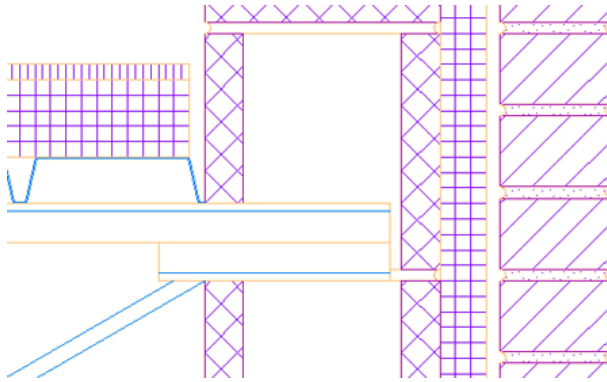
- 1 Select the CMU block detail component as shown.



- 2 Right-click, and click AEC Modify Tools ► Subtract.
- 3 Select the Joist detail component, and press *ENTER*.



- 4 On the command line, enter **n**, and press *ENTER*.
The bond beam detail behind the joist is removed.



5 Save the drawing with or without closing it.

Adding Keynotes and a Legend



Detail Component Manager blocks reference names and material descriptions that can be used to automatically annotate them.

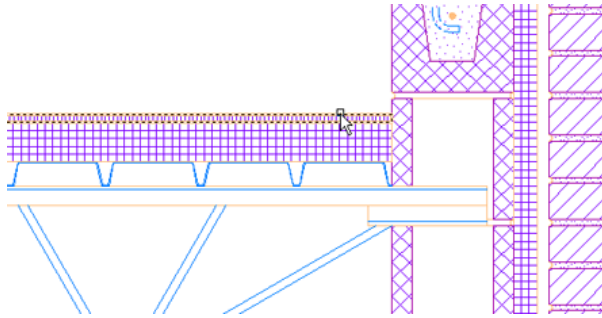
In this exercise, you add keynotes to the drawing and create a sheet keynote legend.

Training File

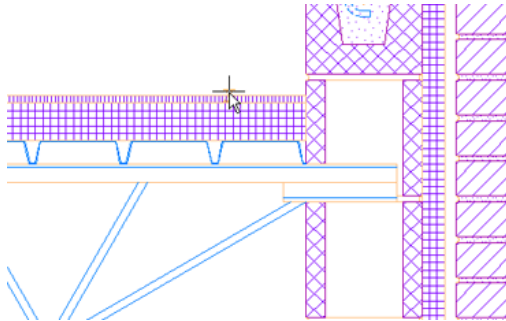
- Continue to use the drawing you used in the previous exercise, ACA_DET_01_Detail_Wall_i.dwg.

Add keynotes

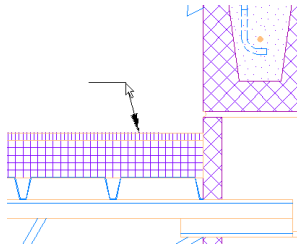
- 1 Click  (Object Snap) to turn it off.
- 2 Right-click the Detailing tool palette title bar, and click Document.
- 3 On the Document tool palette, click the Annotation tab, and click the Reference Keynote (Straight Leader) tool ().
- 4 In the drawing area, select the 1/2" Protection Board detail component.



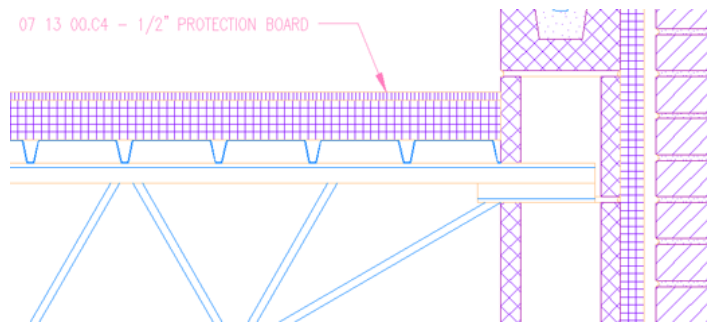
5 Click to specify the first leader point as shown.



6 Move the cursor up and to the left, and click to specify the next point of the leader line.

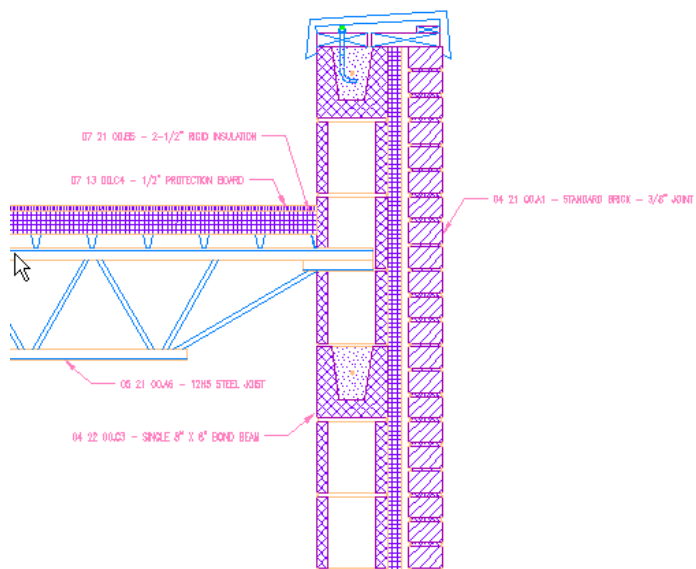


7 Press *ENTER* to place the keynote text.
The keynote for the Protection Board displays.




8 Using the same method, add the following keynotes:

- 07 21 00.B5 - 2-1/2" Rigid Insulation
- 04 21 00.A1 - Standard Brick - 3/8" Joint
- 05 21 00.A6 - 12H5 Steel Joist
- 04 22 00.C3 - Single 8" X 8" Bond Beam



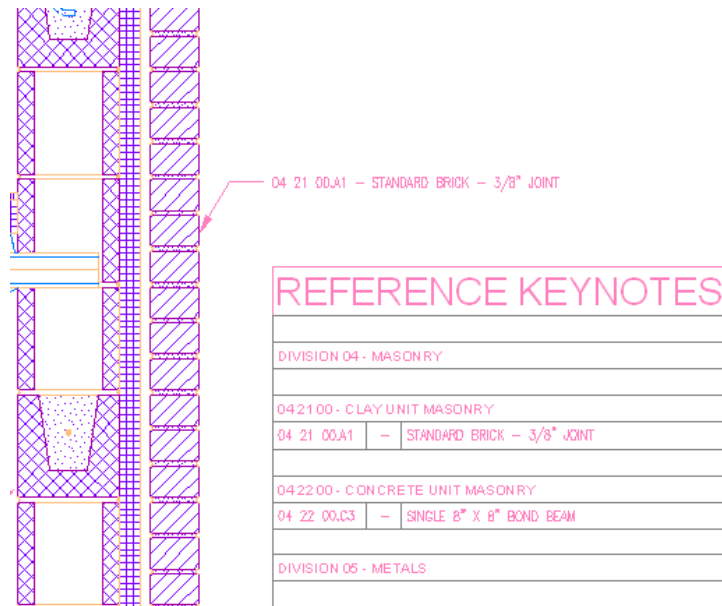
Add a keynote legend

9 On the Annotation tab of the Document tool palette, click the Reference Keynote Legend tool ().

10 In the drawing area, select the keynotes you placed.

11 Press *ENTER*.

12 To the right of the detail view, specify a location for the upper-left corner of the legend.



13 Close the drawing with or without saving.