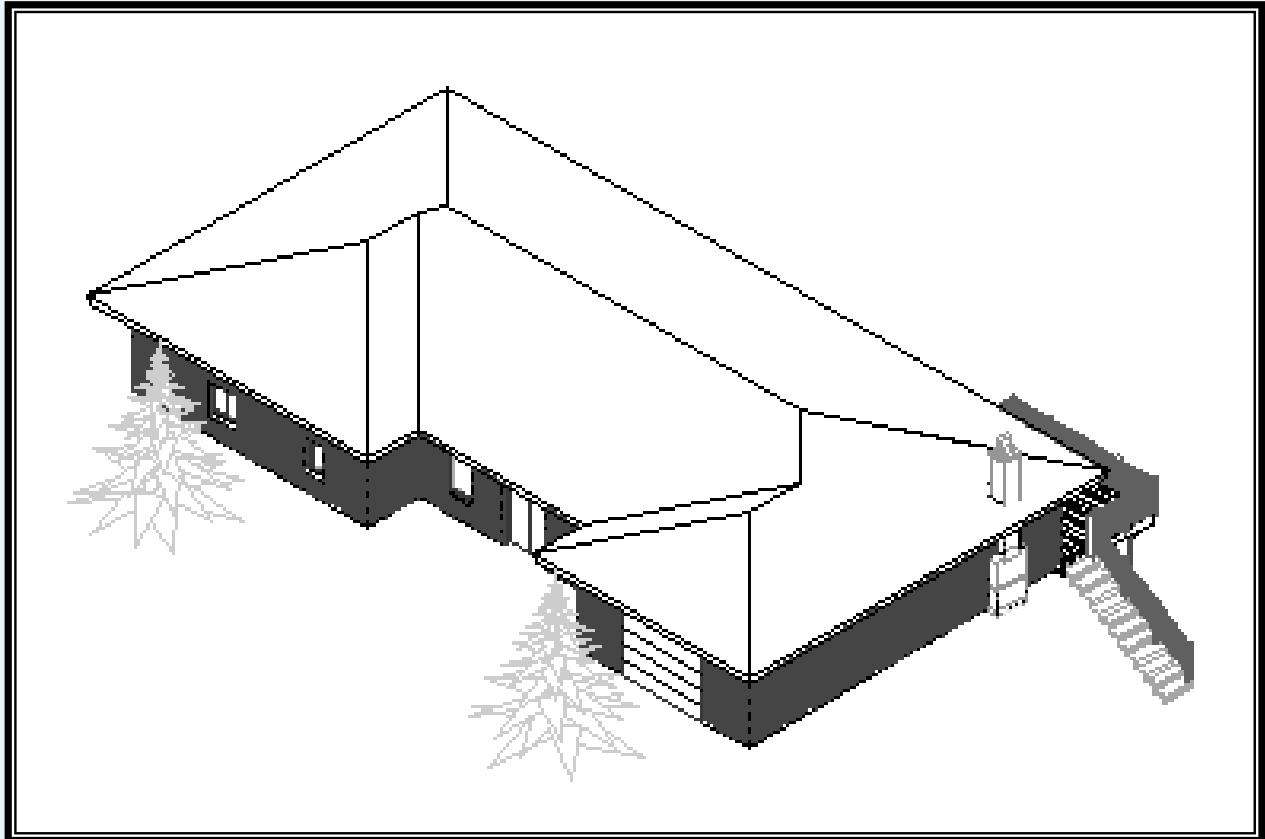


Autodesk
**AutoCAD Architecture 2009
Fundamentals**



Elise Moss

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Lesson 3

Floor Plans

The floor plan is central to any architectural drawing. We start by placing the exterior walls, then the interior walls, then doors, and finally windows.

Tool Palette	Walls
Command Line	WallAdd
Menu	Design→Walls→Add Wall


Exercise 3-1:


Creating Exterior Walls

Drawing Name: New
Estimated Time: 10 minutes

This exercise reinforces the following skills:

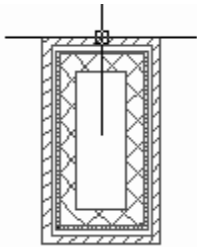
- Create Walls
- Project Navigator

1.  Start a new drawing using QNEW.

2.  Launch the Tool Palette.

Select the **Walls** tab.

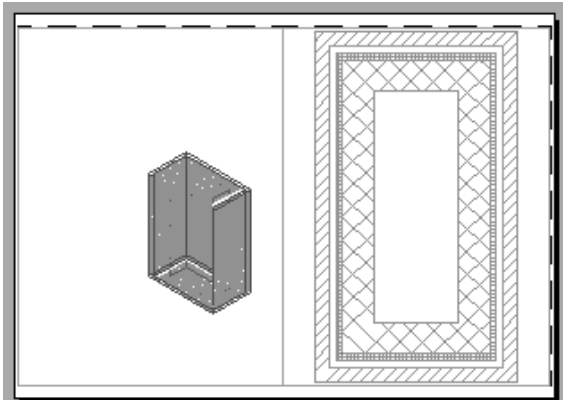
3.  CMU-190 Rigid-038 Air-050 Brick-090 Select the **CMU-190 RIGID-038 Air-50 Brick-090** wall style.

4.  Toggle **ORTHO** ON.
Start the wall at 0,0.
Create a rectangle 1830 mm tall and 914 mm wide.

5. Select the **Work** tab.



- 6.



You see that the walls you placed are really 3-dimensional.

7. Save your drawing as *Ex3-1.dwg*.



TIP: If you draw a wall and the materials composing the wall are on the wrong side, you can reverse the direction of the wall. Simply select the wall, right click and select the Reverse option from the menu.


Exercise 3-2:

Inserting a Drawing Reference

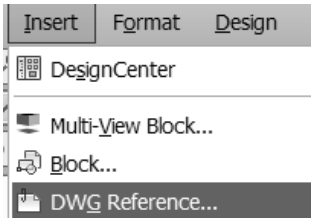
Drawing Name: new
Estimated Time: 60 minutes

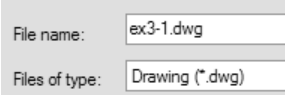
This exercise reinforces the following skills:

- Convert to Walls
- Drawing references (previously known as external references or Xrefs)
- Creating Interior Walls

1.  Start a new drawing using **QNEW**.

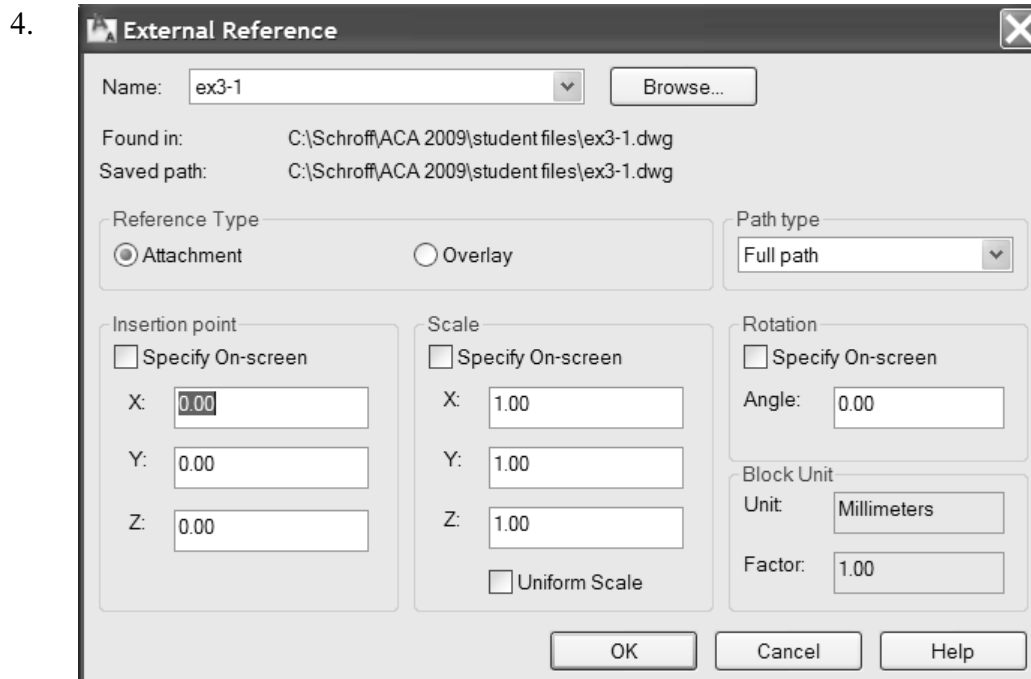
2.  Go to **Insert→DWG Reference**.



3.  Locate *ex3-1.dwg*.
Press **Open**.



TIP: Many architects use external drawing references to organize their projects. That way teams of architects can concentrate just on their portions of a building. External references also use less system resources.



Uncheck **Specify On-Screen** under Insertion point, Scale, and Rotation.

Press **OK**.

This will insert the file as an external reference at 0,0,0.

5. Save the file as *ex3-2*.



TIP: You can convert lines, arcs, circles, or polylines to walls. If you have created a floor plan in AutoCAD and want to convert it to 3D, open the floor plan drawing inside of AutoCAD Architecture. Use the Convert to Walls tool to transform your floor plan into walls.

Exercise 3-3

Convert to Walls

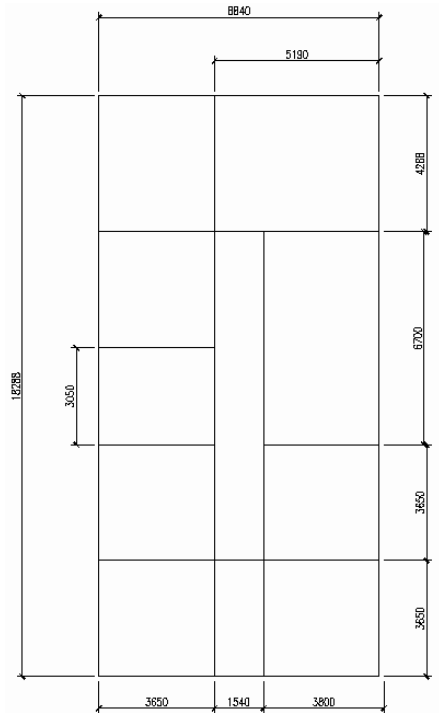
Drawing Name: floor plan.dwg

Estimated Time: 10 minutes

This exercise reinforces the following skills:

- Convert to Walls

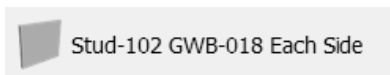
1.



Open *floor plan.dwg*.

This file can be downloaded from www.schroff.com/resources.

2.

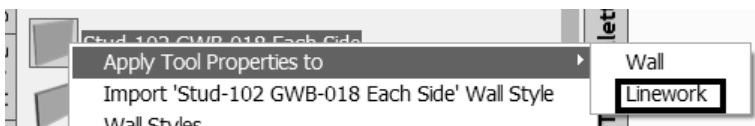


Locate the **Stud-102 GWB-018 Each Side** wall style.

3.

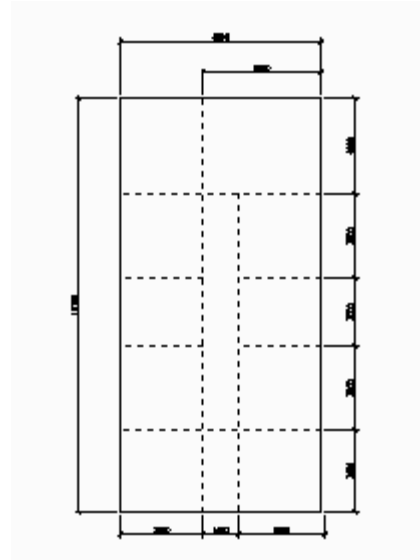
Highlight the wall tool.

Right click and select **Apply Tool Properties to → Linework**.

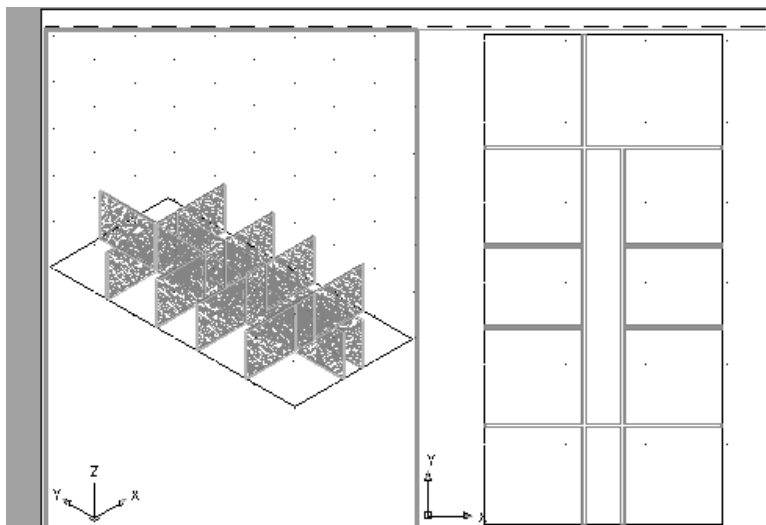


4. Select all the interior lines.

You are prompted if you want to erase the layout geometry. Type **Y** for Yes.



5. Switch to the Work tab so you can see how your house looks in 3D.



6. Save the file as *ex3-3.dwg*.

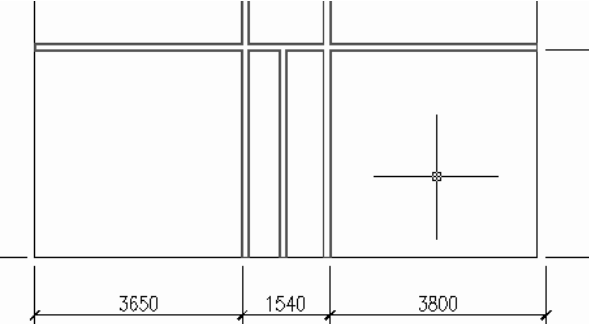
Exercise 3-4: Wall Cleanup

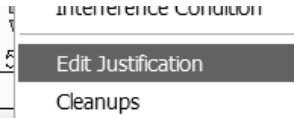
Drawing Name: ex3-3.dwg
Estimated Time: 30 minutes

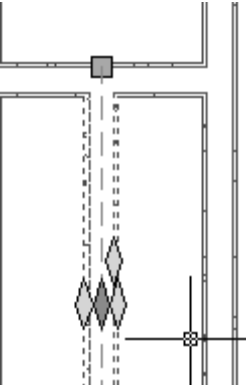
This exercise reinforces the following skills:

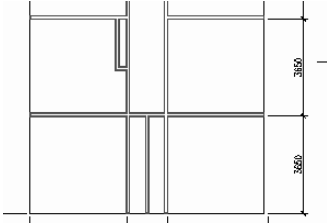
- Modifying Walls
- Edit Justification
- Wall Tools
- Break at Point
- Apply Tool Properties to Wall
- Cleanup Tools

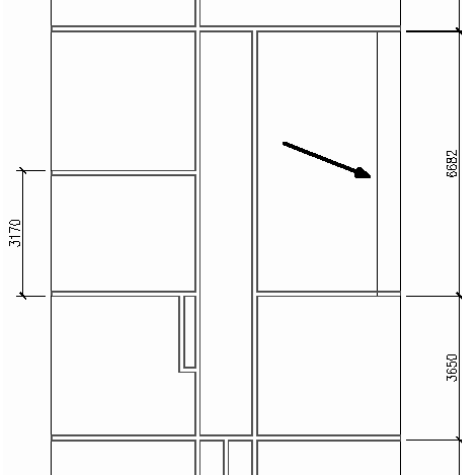
1.  Open *ex3-3.dwg*.

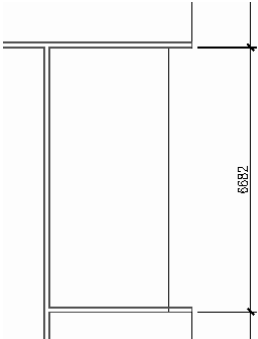
2.  Add a closet area between the master bedroom and Bedroom #1.
To do this, draw a wall from the mid-point of the wall in the horizontal direction and then draw a vertical wall from the mid-point of the new horizontal wall.

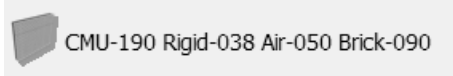
3.  To center the vertical wall, select it.
Right click and select **Edit Justification**.

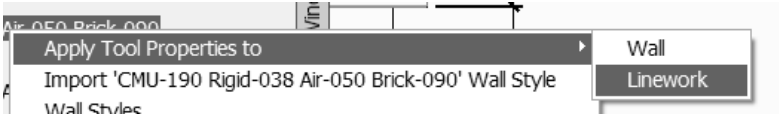
4.  Diamond grips will appear to indicate different wall justification methods (Left/Right/Center).
Select the Center Diamond.

5.  Draw a closet in Bedroom #2.
Use the same interior wall style.
Set the wall 304 mm from the hallway wall and 1820 mm in length.

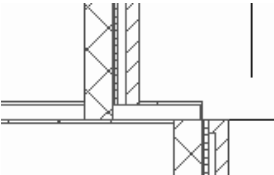
6.  Draw a vertical line 610 mm inside the living room area.

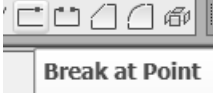
7.  Delete the vertical line to the right of the line just placed.

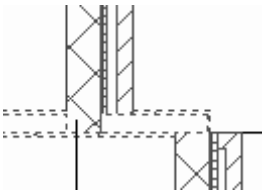
8.  Locate the exterior wall style: **CMU-190 Rigid-038 Air-050 Brick-090**.

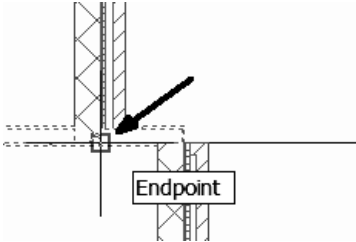
9.  Convert the outside lines to the exterior wall style using **Apply Tool Properties to Linework**.

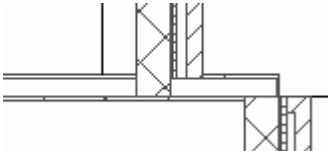
10. When prompted to erase layout geometry, enter **Yes**.

11.  We have a small section of wall that should be split so that it can be assigned the exterior wall style.


12.  Select the **Break at Point** tool on the Modify toolbar to split the wall into two sections.

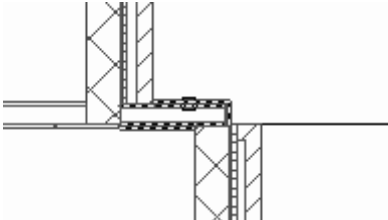
13.  Select the wall.
It will highlight.

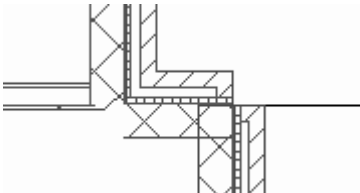
14.  Select the point indicated as the break point.

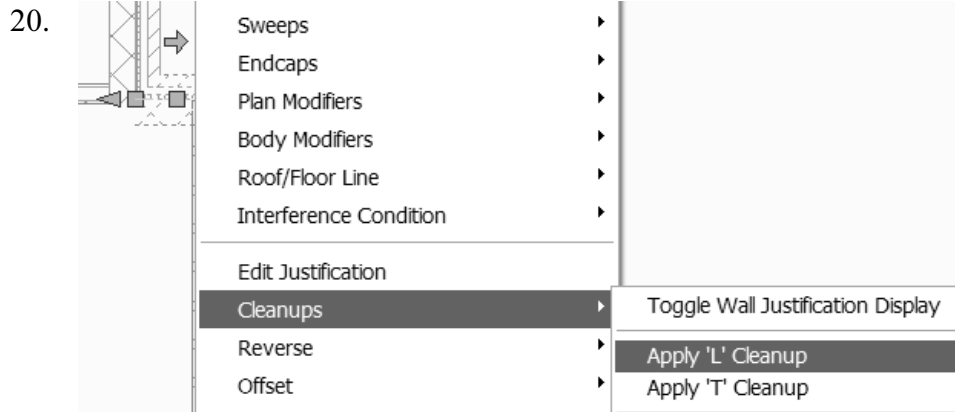
15.  The wall is now two separate sections.

16.  Locate the **CMU-190 Rigid-038 Air-050 Brick-090** wall style.

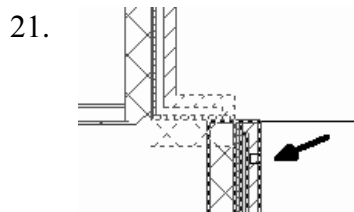
17.  Right click and select **Apply Tool Properties to**→**Wall**.

18.  Select the small wall section to be converted.

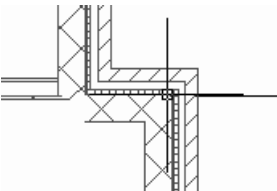
19.  The wall will be converted to the correct wall style.



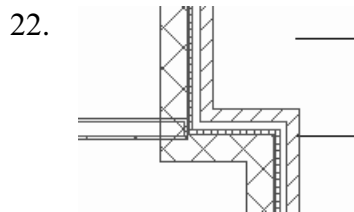
Select the small section of wall.
Right click and select **Cleanups**→**Apply 'L' Cleanup**.



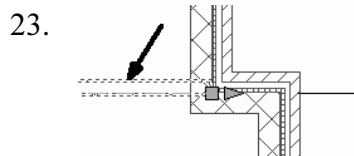
You'll be prompted to select the wall to cleanup with.
Select the wall indicated.



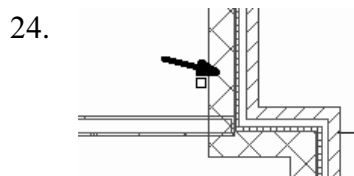
The corner is cleaned up.



Repeat on the other corner.

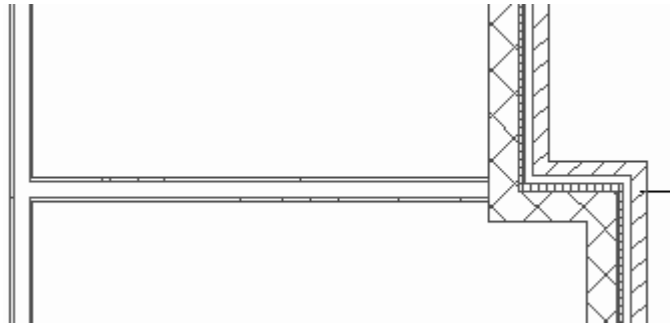


Select the interior wall.
Right click and select **Cleanups**→**Apply 'T' Cleanup**.



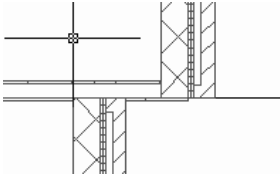
When prompted to select the boundary wall, select the wall indicated.

25.



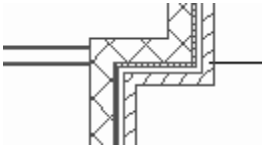
If the wall does not clean up properly, use grips to get the end points of the wall to appear correctly.

26.



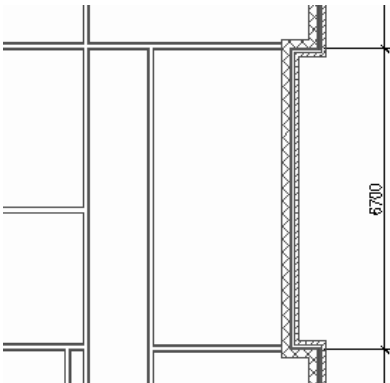
Repeat the process for the other corner.

27.



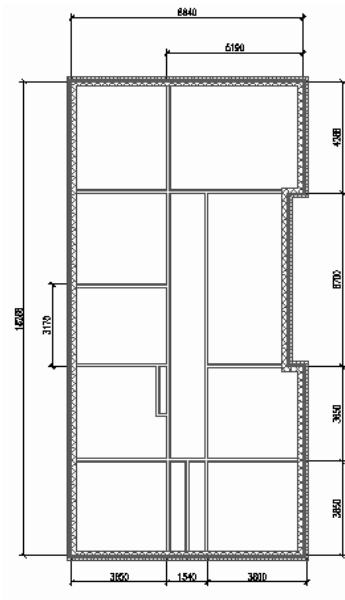
Use the Break at Point Tool.
Apply the correct Wall Style.
Apply L Cleanup.

28.



The walls appear cleaner.

29.



The drawing is now updated.

Save as *ex3-4.dwg*.

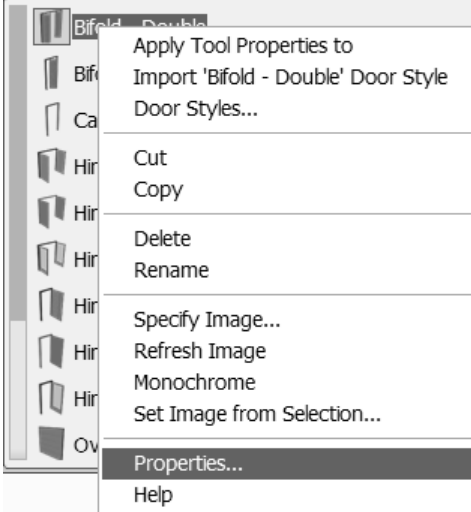
Exercise 3-5:
Adding Closet Doors

Drawing Name: Ex3-4.dwg
 Estimated Time: 10 minutes

This exercise reinforces the following skills:

- ❑ Adding Doors
- ❑ Door Properties

1.  Open *ex3-4.dwg*.
2.  **Bifold - Double** Locate the **Bifold-Double** door on the Doors tab of the Tool Palette.

3.  Highlight the **Bifold-Double** door. Right click and select **Properties**.



TIP: To create a freestanding door, press the ENTER key when prompted to pick a wall. You can then use the grips on the door entity to move and place the door wherever you like.

To move a door along a wall, use Door→Reposition→Along Wall. Use the OSNAP From option to locate a door a specific distance from an adjoining wall.

4.

Dimensions	
Standard sizes	1500.00 X 2100.00
A Width	--
B Height	--
Measure to	--
Opening percent	50

 Expand the **Dimensions** section.
Set the Standard sizes to **1500.00 x 2100.00**.
Set the Opening percent to **50**.

TIP: If you left click in the field, a down arrow will appear...select the down arrow and you will get a list of standard sizes. Then, select the size you want.

A 25% opening will show a door swing at a 45-degree angle.
The value of the Opening percentage determines the angle of the arc swing.
A 50% value indicates the door will appear half-open at a 90-degree angle.

5.

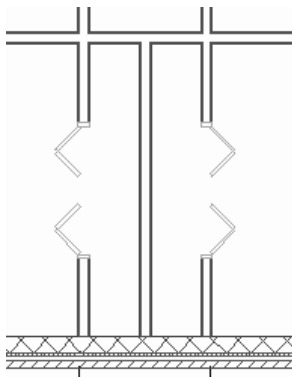
Location	
* Position along wall	Offset/Center
* Automatic offset	300
Vertical alignment	--
Head height	--
Threshold height	--

 Expand the **Location** section.
Set Position along wall to **Offset/Center**.

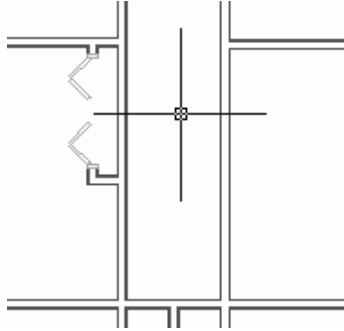
6. Set the Automatic offset to **300.00**.
(This will center the closet doors along the wall.)
Press **OK** to close the Properties dialog.
7. Place the Bifold Double doors at the two closets.

Note: *Enable a Midpoint OSNAP to locate the doors.*

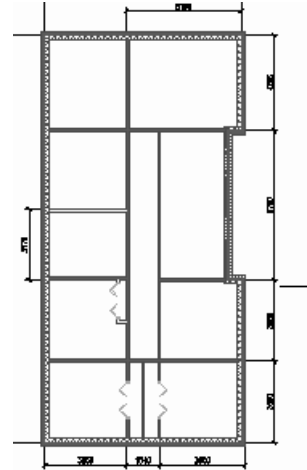
The orientation of the door swing is determined by the wall side selected.
In both cases, you want to select the outside face of the wall.



8.



Place a Bi-fold Double door in the wall shown.

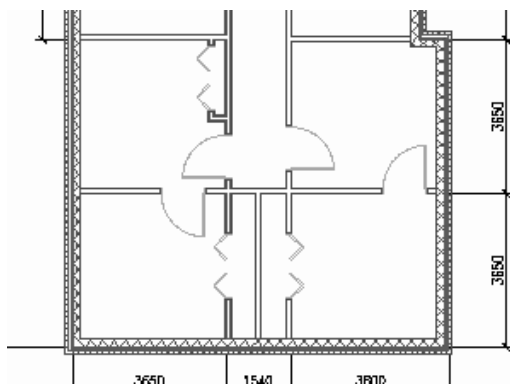
9. Save as *ex3-5.dwg*.**Exercise 3-6:****Adding Interior Doors**

Drawing Name: ex3-5.dwg

Estimated Time: 10 minutes

This exercise reinforces the following skills:

- Adding Doors
- Door Properties



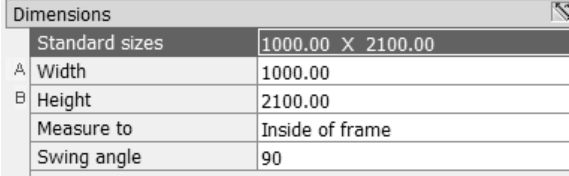
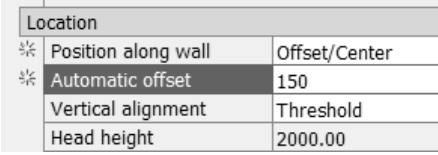


We will add single hinge doors in the areas shown.

You may need to do some wall cleanup to get the rooms to look proper.

Use AddWall, Extend, and Trim as needed.

Try to keep the walls so they line up to keep the floor plan looking clean.



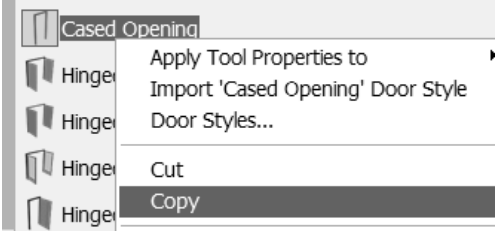
1.  Open *ex3-5.dwg*.
2.  **Hinged - Single** Locate the **Single Hinged** door on the Doors tab of the Tool Palette.
Right click and select **Properties**.
3.  Expand the **Dimensions** section.
Set the Standard sizes to **1000.00 x 2100.00**.
Set the Swing angle to **90**.
4.  Set the Position along wall to **Offset/ Center**.
Set the Automatic offset to **150**.
Press **OK**.
5. Place the doors as indicated.
6. Save the file *ex3-6.dwg*.

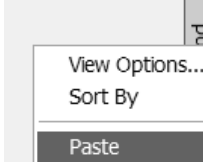
Exercise 3-7:**Create an Arched Opening Tool**

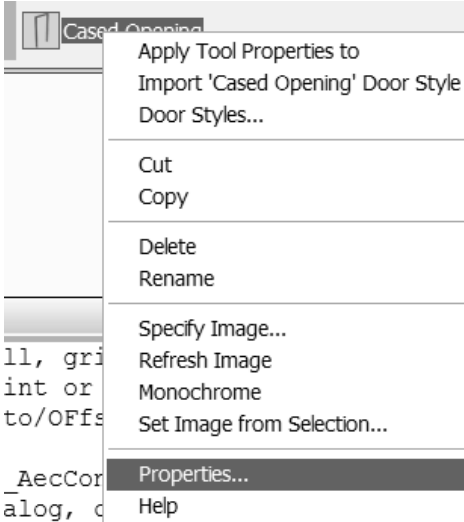
Drawing Name: *ex3-6.dwg*
 Estimated Time: 10 minutes

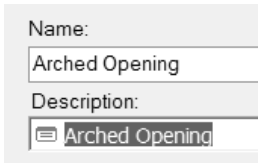
This exercise reinforces the following skills:

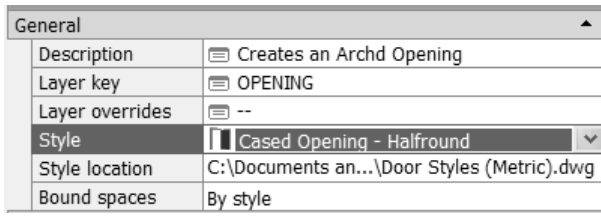
- Copying Tools
- Tool Properties

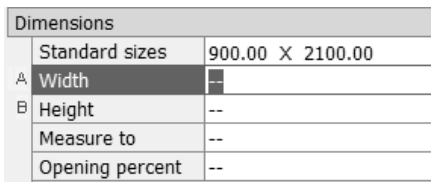
1.  Open *ex3-6.dwg*.
2.  **Cased Opening** Locate the **Cased Opening** on the Design tab of the Tool Palette.
3.  Right click and select **Copy**.

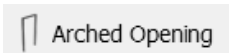
4.  Select the **Doors** tab.
Right click and select **Paste**.

5.  Highlight the copied tool.
Right click and select **Properties**.

6.  Change the Name to **Arched Opening**.
Change the Description to **Arched Opening**.

7.  Expand the General section.
Set the Description to **Creates an Archd Opening**.
Set the Layer key to **OPENING**.
Set the Layer to **Cased Opening - Halfround**.
Set the Style to **Cased Opening-Halfround**.

8.  Expand the Dimensions section.
Set the Standard Size to **900.00 x 2100.00**.
Press **OK**.

 The tool is defined in the palette.

9. Save as *ex3-7.dwg*.

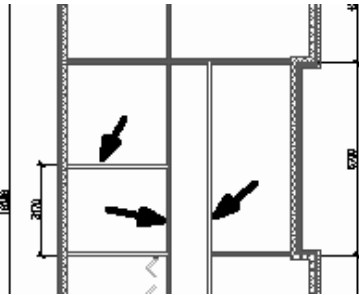
Exercise 3-7:**Adding an Opening**

Drawing Name: ex3-7.dwg
 Estimated Time: 10 minutes

This exercise reinforces the following skills:

- ❑ Adding Openings
- ❑ Opening Properties
- ❑ Copying Tools
- ❑ Set Image from Selection

Openings can be any size and elevation. They can be applied to a wall or be freestanding. The Add Opening Properties allow the user to either select a Pre-defined shape for the opening or use a custom shape.



Openings will be added to the walls indicated.

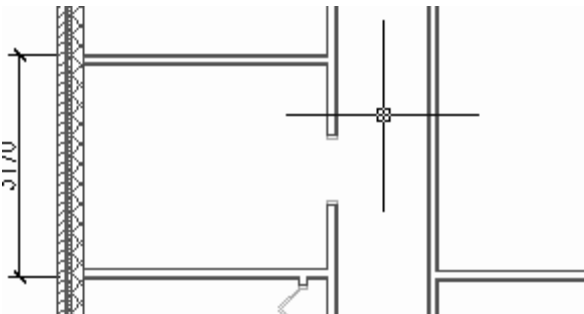
1.  Open *ex3-7.dwg*.

2.  **Arched Opening** Select the **Arched Opening** tool.

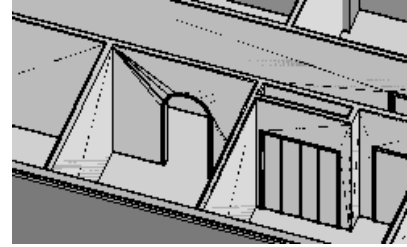
3.


Location	
* Position along wall	Offset/Center
* Automatic offset	300.00
Vertical alignment	Threshold
Head height	2000.00

 Expand the Location section.
 Set the Position along wall to **Offset/Center**.
 Set the Automatic offset to **300.00**.

4.  Place the arched opening in the dining room wall.

5. Use **View→3D orbit** to view the arched opening.



6.  Arched Opening

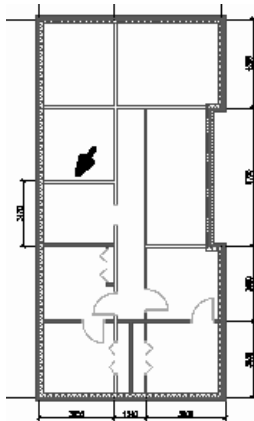
- Apply Tool Properties to
- Re-import 'Cased Opening - Halfround Door Styles...
- Cut
- Copy
- Delete
- Rename
- Specify Image...
- Refresh Image
- Monochrome
- Set Image from Selection...**

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Select the **Arched Opening** icon on the tool palette.
Right click and select **Set Image from Selection...**
Pick the arched opening you created.
The icon updates to show an arched opening.



7.  Arched Opening The tool icon updates with the new image.



Next we place a rectangular opening in the location indicated.

8.  Cased Opening Select the **Cased Opening** tool from the Doors tool palette.

9.

Dimensions	
Standard sizes 1000.00 X 2200.00	
A	Width 1000.00
B	Height 2200.00
Measure to Inside of frame	
Opening percent 50	

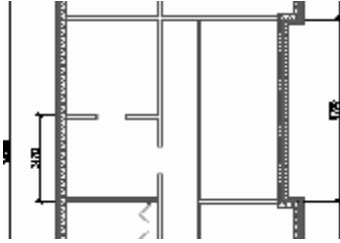
 Expand the Dimensions section. Select the Standard sizes of **1000.00 x 2200.00**.

10.

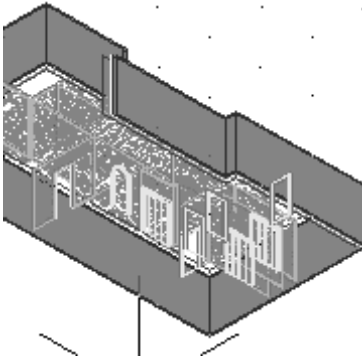
Location	
※	Position along wall Offset/Center
※	Automatic offset 300.00
Vertical alignment Threshold	
Head height 2000.00	

 Expand the Location section. Set the Position along wall to **Offset/Center**. Set the Automatic offset to **300.00**.

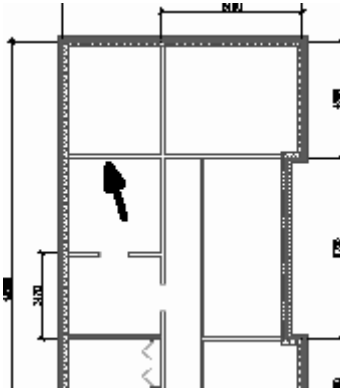
11. Place the opening in the wall between the kitchen and the dining room.



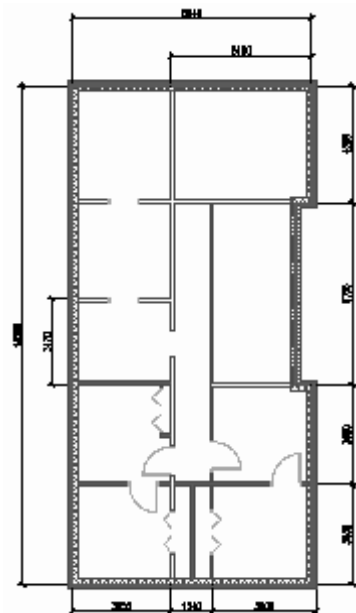
12. Select the **Work** tab to view the openings.
Select the **Model** tab.



13. Place a rectangular opening between the kitchen and the family room.



14. This is our floor plan so far.
Save the file as *ex3-8.dwg*.



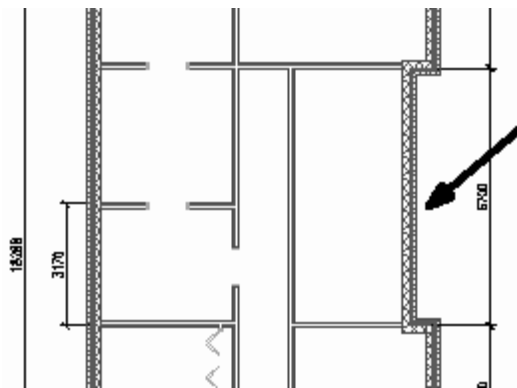
Exercise 3-9: Adding Doors

Drawing Name: ex3-8.dwg
Estimated Time: 20 minutes

This exercise reinforces the following skills:

- Adding Doors

1.  Open *ex3-8.dwg*.



We will add an entry door on the wall indicated.

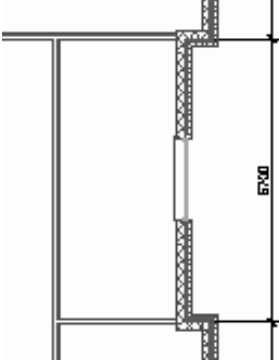
2.  Select the **Hinged-Double-Exterior** door.


3.

Dimensions	
Standard sizes	1800.00 X 2200.00
A Width	1800.00
B Height	2200.00
Measure to	Inside of frame
Swing angle	0

Expand the Dimensions section.
Set the Standard size to **1800.00 x 2200.00**.
Set the Swing angle to **0**.

Expand the Location section.
Set the Position along wall to **Offset/Center**.
Set the Automatic offset to **300**.

4.  Place the door so it is centered in the wall.

5.  Select the **Overhead-Sectional** door.

6.

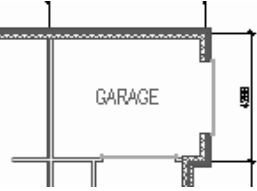
Dimensions	
Standard sizes	2440.00 X 2134.00 (Custom Size)
A Width	2440.00
B Height	2134.00
Measure to	Inside of frame
Opening percent	0

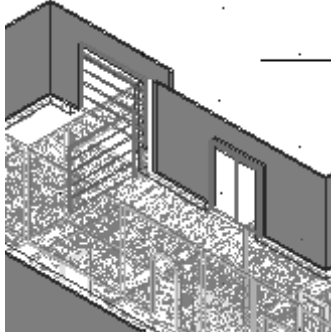

Expand the Dimensions section.
Set the Standard size to **2440.00 x 2134.00**.
Set the Swing angle to **0**.

7.

Location	
Position along wall	Offset/Center
Automatic offset	300.00
Vertical alignment	Threshold
Head height	2134.00

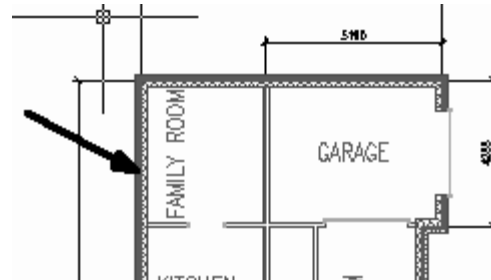
Set the Position along wall to **Offset/Center**.
Set the Automatic offset to **300.00**.

8.  Place the door in the garage wall.

9.  

Switch to the Work tab to view the garage door and front entry door.
Switch back to the Model tab.

10. Next we add a sliding door to the family room wall indicated.



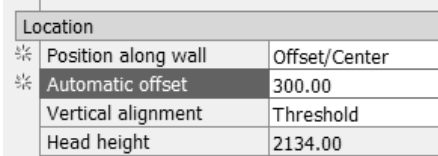
11. Select a **Sliding Door - Double Full Lite** to add to the family room.




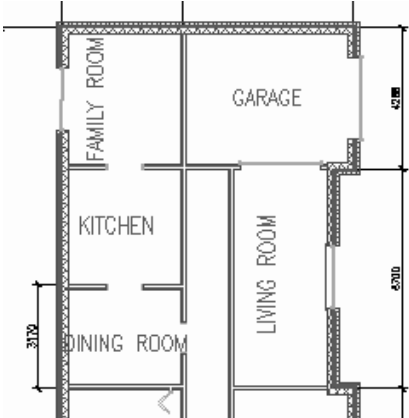
12.

Dimensions	
Standard sizes	1800.00 X 2200.00
A Width	1800.00
B Height	2200.00
Measure to	Inside of frame
Opening percent	0

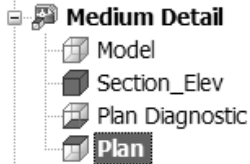
Expand the Dimensions section.
Set the Standard size to **1800.00 x 2200.00**.
Set the Swing angle to **0**.

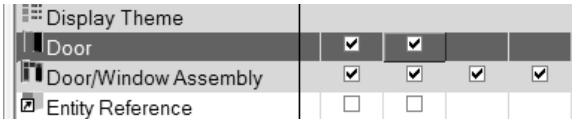
13.  Expand the **Location** section.
Set the Position along wall to **Offset/Center**.
Set the Automatic offset to **300**.
- | Location | |
|-----------------------|---------------|
| ※ Position along wall | Offset/Center |
| ※ Automatic offset | 300.00 |
| Vertical alignment | Threshold |
| Head height | 2134.00 |

14.  Place the sliding door.

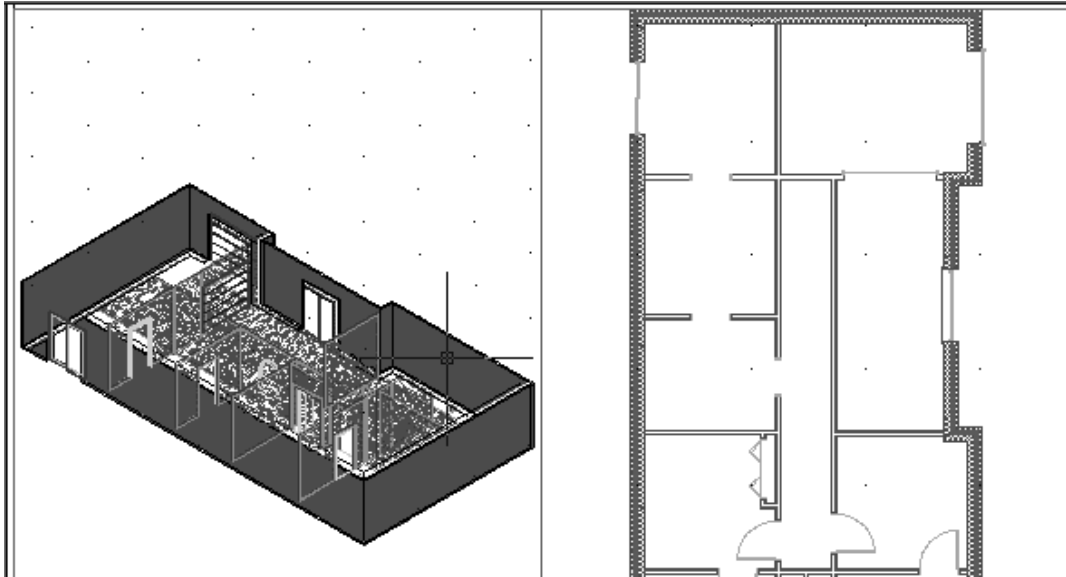
15.  If your doors don't look proper, use the Display Manager to modify the appearance.

16.  Go to **Format→Display Manager**.

17.  Expand the Configurations folder.
Locate the **Plan** configuration under Medium Detail.
Note that this configuration is in bold because it is the current active configuration.

18.  Place a check mark for Doors and Door/Window Assembly to set them visible in all views.
- | Display Theme | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
|----------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Door | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |
| Door/Window Assembly | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> |
| Entity Reference | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> | <input type="checkbox"/> |

19. Press **Apply** and **OK**.



20. Select the Work tab to view your model.



21. Save the file as *ex3-9.dwg*.

Exercise 3-10 **Add Window Assemblies**

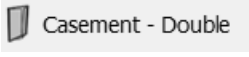
Drawing Name: Lesson 3-9dwg
Estimated Time: 30 minutes

This exercise reinforces the following skills:

- Add Windows

1.  Open *ex3-10wg*.

2.  Select the Model tab.

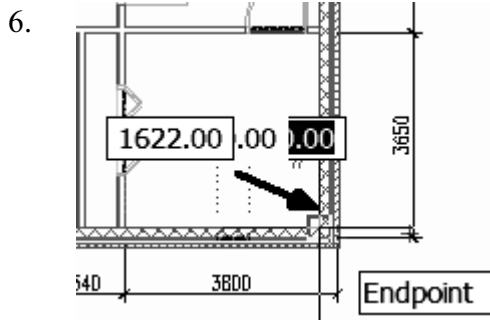
3.  Select the Windows tab of the Tool Palette.
Select the **Casement-Double** window.

4. Expand the Dimensions section.
Set the size to **600 x 900**.

Bound spaces		By style (Yes)
Dimensions		
Standard sizes		600.00 X 900.00
A	Width	600.00
B	Height	900.00
Measure to		Outside of frame
Swing angle		0

5. Expand the Location section.
Set the Position along wall to **Offset/Center**.
Set the Offset to **2510.00**.

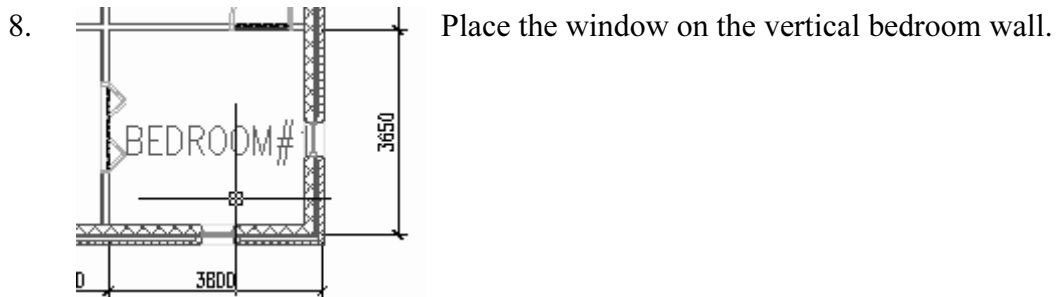
Location		
☼	Position along wall	Offset/Center
☼	Automatic offset	1220.00
Vertical alignment		Sill
Head height		2510.00
Sill height		1000.00



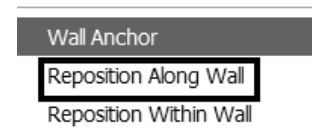
Select the wall shown and the endpoint indicated.


The endpoint is where the offset is calculated from.

7. Select the **Casement-Double** window again.



Remember – if you don't like the position of any of the Windows, you can reposition them. Just select the window, right click, and select **Reposition Along Wall**.



9.  **Casement** Select the **Casement** window.

10. Expand the Dimensions section.
Set the size to **600.00 x 1200.00**.

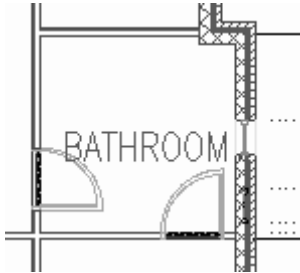
Bound spaces		By style (Yes)
Dimensions		
Standard sizes		600.00 X 1200.00
A	Width	600.00
B	Height	1200.00
Measure to		Outside of frame
Swing angle		0

11.

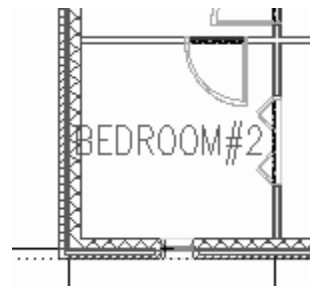
Location	
Position along wall	Offset/Center
Automatic offset	1215.00
Vertical alignment	Sill
Head height	1900.00

Expand the Location section.
Set the Position along wall to **Offset/Center**.
Set the Offset to **3'-1"**.

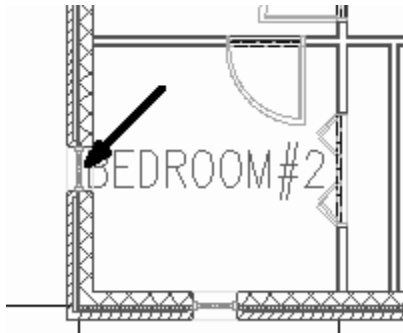
12. Place the window in the bath wall.



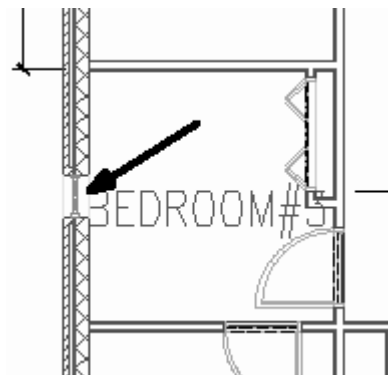
13. Place a Double Casement window in Bedroom #2.




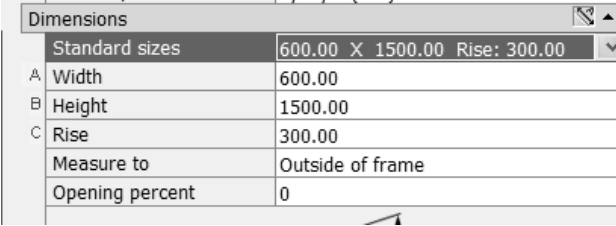
14. Place a Double Casement window in Bedroom #2 on the left vertical wall.

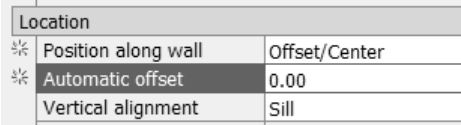


15. Place a Double Casement window in Bedroom #3 on the left vertical wall.

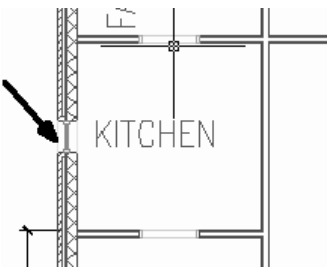


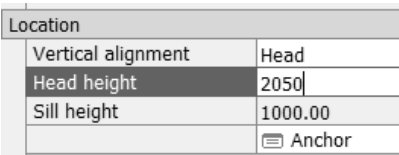
16.  Picture - Arched Locate the **Picture - Arched** to place in the left dining room wall.

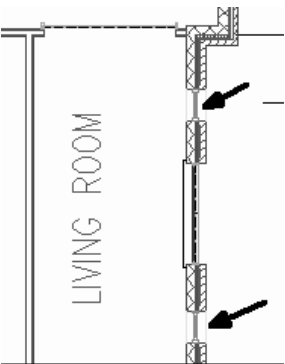
17.  Expand the Dimensions section. Set the size to **600.00 x 1500.00 Rise 300.00**.

18.  Expand the Location section. Set the Position along wall to **Offset/Center**. Set the Offset to **0.00**.

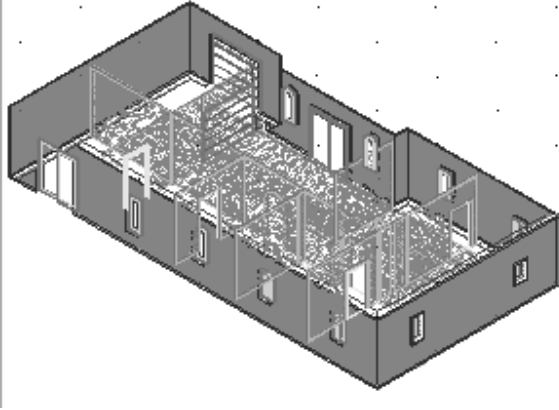
19.  Place the window.

20.  Add a **Casement: Single** window to the kitchen.

21.  Set the Head height to **2050**. This will ensure that any cabinetry in the kitchen does not interfere with the window.

22.  Place an **Arched Picture** window with an offset of 0" on each side of the entry door in the right living room wall.

23.



Your floor plan should look similar to the one shown here.

Save as *ex3-10.dwg*.

Exercise 3-11:

Adding a Fireplace

Drawing Name: ex3-10.dwg

Estimated Time: 20 minutes


This exercise reinforces the following skills:

- Using the Design Center
- Adding Openings

In this exercise, we add a fireplace to the family room. You can download the fireplace from the publisher's website or use the fireplace available from the Design Center.

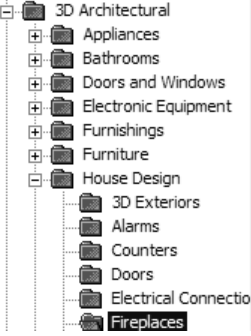


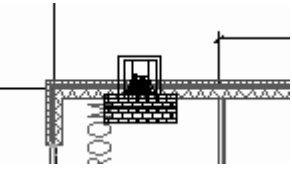
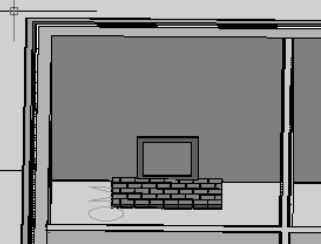
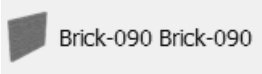
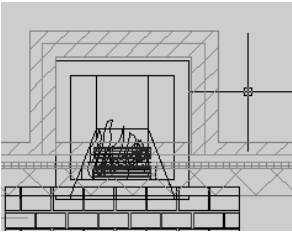
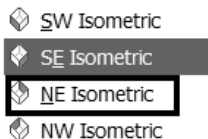
1.  Open *ex3-10.dwg*.

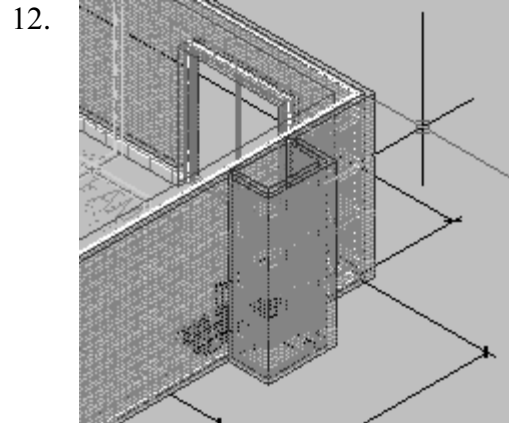
Select the Model tab.

2.  Select the **Design Center** tool or type **ADC** on the command line.

3.  Select the **DC Online** tab.

Note: *In order to access DC Online, you must have an active internet connection. If you do not have an active connection, you can download the file from the publisher's website and come back to this exercise.*

4.  In the *Standard Parts* section, browse to **Fireplaces** under *3D Architectural/House Design*.
5.  There is a 3D model with a **Hearth**.
- Hearth**
6.  Hover the mouse over the file icon. An eyedropper will appear. This means the content is idrop-enabled. Simply hold down your left mouse button to fill the eyedropper, then keep the left mouse button down, move the mouse into the graphics window and release the left mouse button to drag and drop the symbol into the drawing file.
7.  Place the fireplace into the family room wall.
8.  Use the 3D Orbit tool to inspect how the fireplace appears.
Go back to a plan view.
9.  Go to the **Walls** tool palette.
- Select the **Brick-090 Brick-090** wall style.
10.  Add walls in the vertical direction and in the horizontal direction to enclose the hearth.
Switch **Justification** using the Properties dialog as you place the walls.
11.  Switch to a NE Isometric view to inspect the chimney.



We need to make the chimney taller.

Select the walls for the chimney that were just placed.

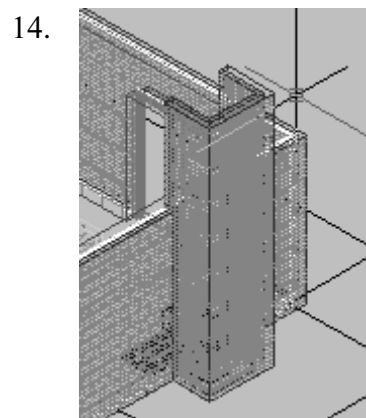
Right click and select **Properties**.

13.

Shadow display		Casts and receives
Dimensions		
A	Width	180.00
B	Base height	4875.00
C	Length	*VARIES*
	Justify	*VARIES*

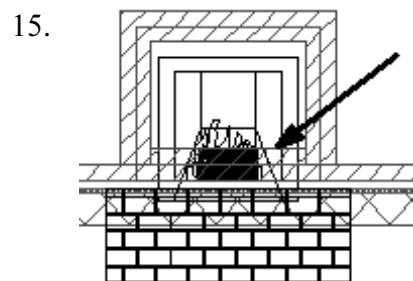
Under Dimensions:

Set the Base Height to **4875.00**.



The chimney now looks better.

Switch back to a plan view.



Place a small section of wall to enclose the chimney.

Shadow display		Casts and receives
Dimensions		
A	Width	180.00
B	Base height	1875.00
C	Length	1024.77
	Justify	Left

Set the height to **1875.00**.

16. Select the wall for the chimney that was just placed.
Right click and select **Properties**.

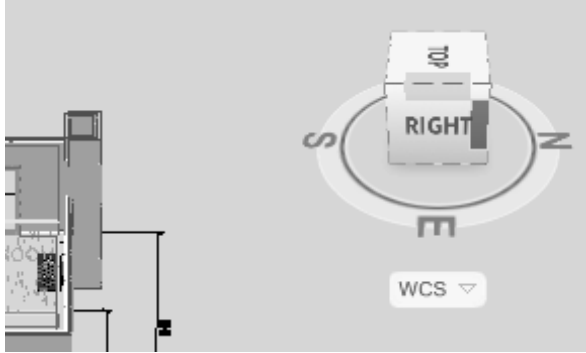
17.

Location	
Rotation	0.00
Elevation	3000

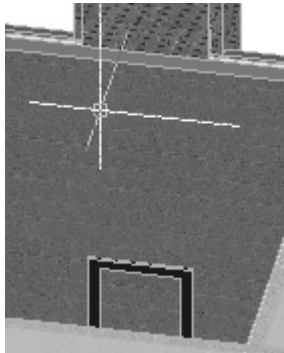
Scroll down to Location:

Set the Elevation to **3000**.

18. Use new ViewCube tool to inspect your work so far.



19. If you switch to a Realistic visual style, you see that we need an opening in our fireplace.
Switch back to a plan view.



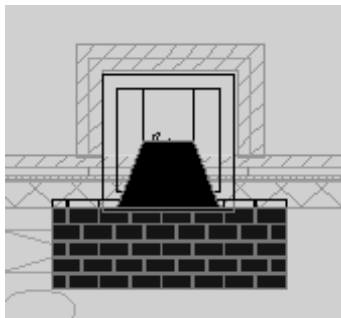
20.  Opening Select the **Opening** tool from the Design Palette.


21.

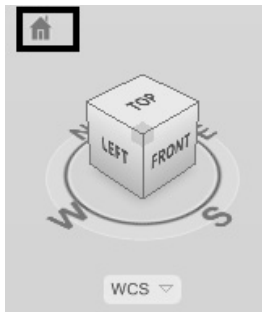
Dimensions		
A	Width	914.40
B	Height	862.60

 Change the Width to **914.4**.
Change the Height to **862.6**.

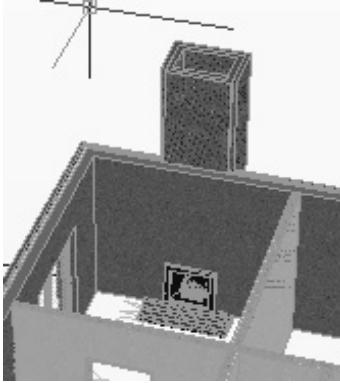
22. Place the opening in the wall.



23.  Select the Home icon to switch to a 3D view.
Then use the ViewCube to inspect the opening in the fireplace.



24.



Your finished fireplace and chimney should look similar to this.

Save the file as *ex3-11.dwg*.

Close all open drawings.

You can do this by typing **CLOSEALL** on the command line.