Autodesk
AutoCAD Architecture 2008
Fundamentals
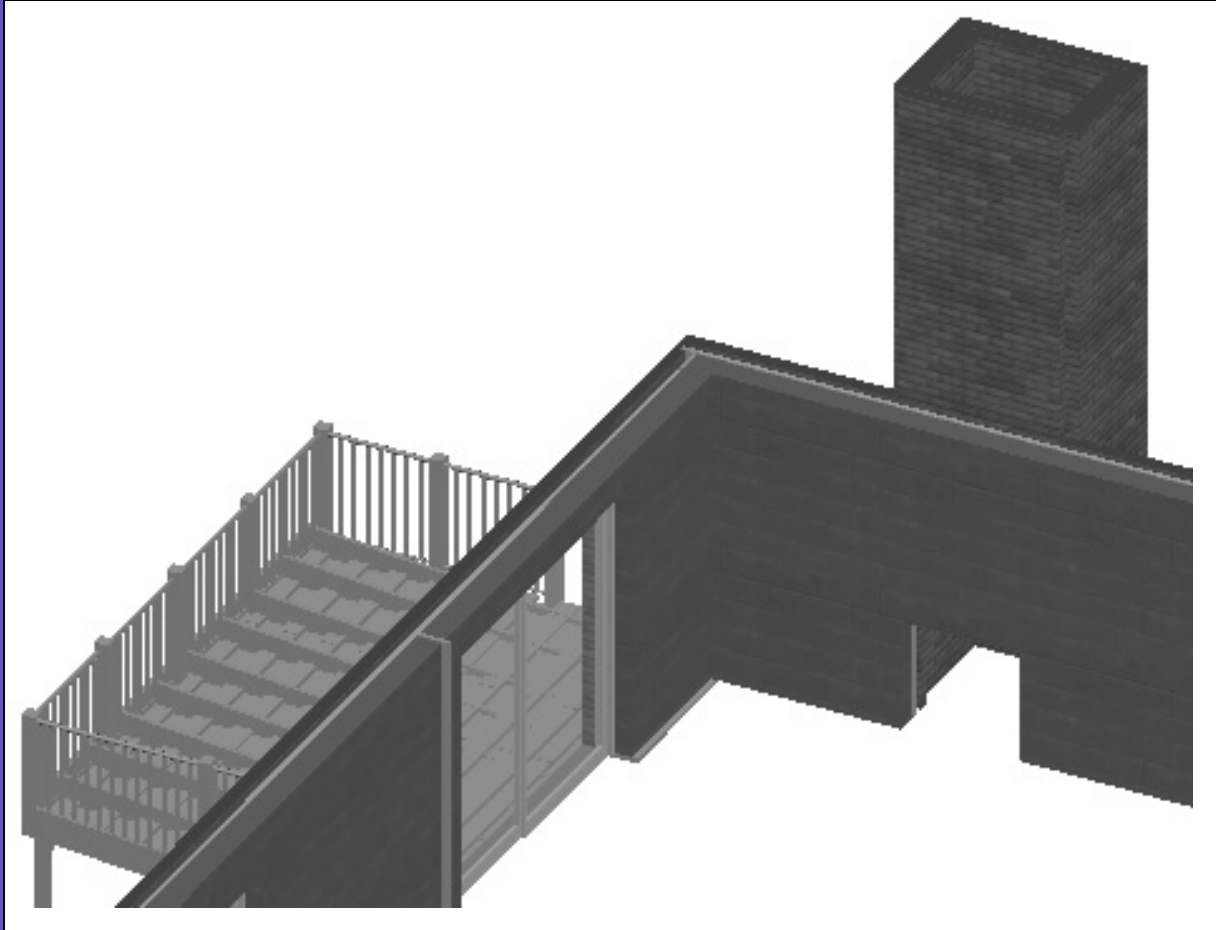
Elise Moss

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.

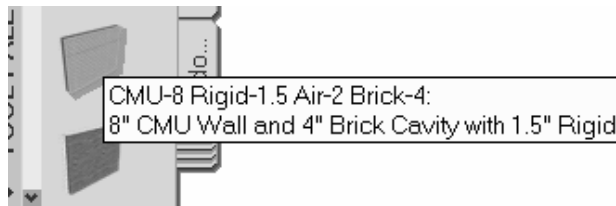| Tool Palette	Walls
Command Line	WallAdd
Menu	Design→Walls→Add Wall

Exercise 3-1:
Creating Exterior Walls

Drawing Name: New
Estimated Time: 10 minutes

This exercise reinforces the following skills:
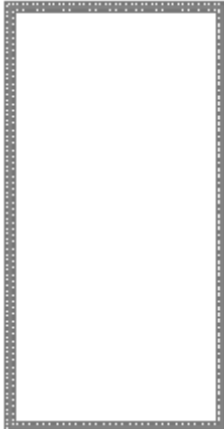
- ❏ Create Walls
- ❏ Project Navigator

1.   Start a new drawing using QNEW.

2.   Launch the Tool Palette.

   Select the **Walls** tab.

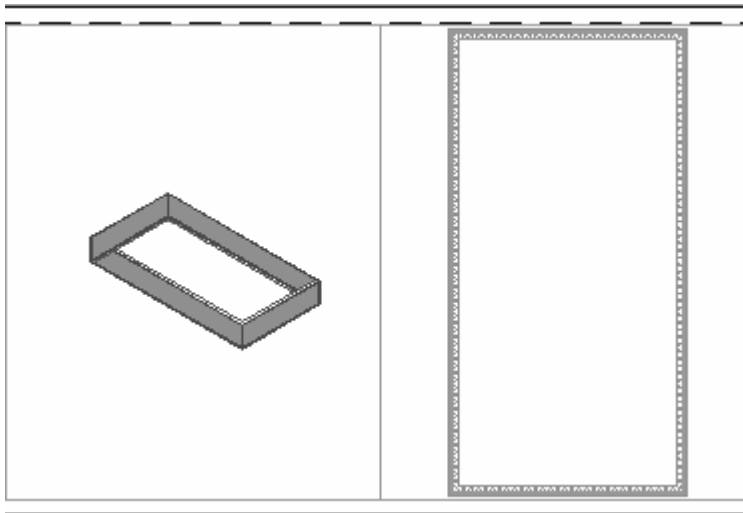   Select the **CMU-8 RIGID-1.5 Air-2 Brick-4:** wall style.

3.   Toggle **ORTHO** ON.

Start the wall at 0,0.
Create a rectangle 60′ tall and 30′ wide.

4.   Select the **Work** tab.

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

6.   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:

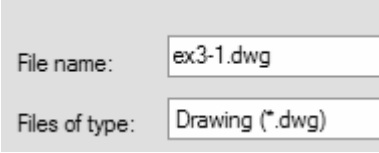## *Convert to Walls*

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→External Reference**.

Insert | Format | Express | 3D

- DesignCenter
- Multi-View Block...
- Block...
- External Reference...
- Image...
- Field...
- Table...

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

File name: ex3-1.dwg

Files of type: Drawing (*.dwg)

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.

4.
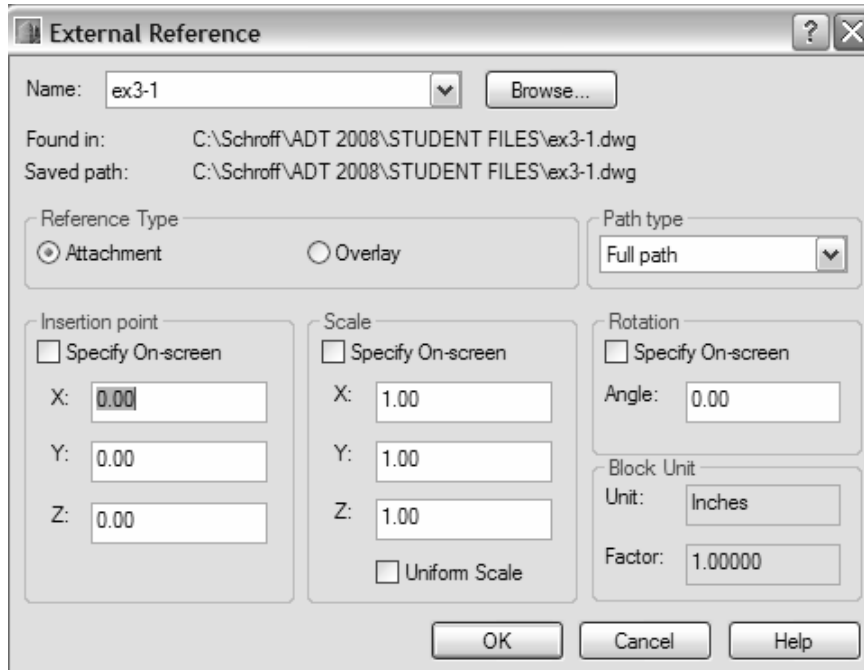
Uncheck **Specify On-Screen** under Insertion point, scale, and rotation.

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

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.

5.
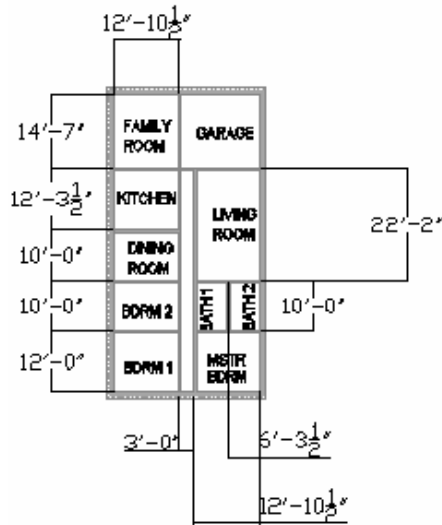
Create the layout shown using lines or polylines.   (It may be helpful to turn off the A-Walls layer while you are working and create your lines on layer 0).

Do not add the dimensions or the text to your drawing. They are there to help you place the lines only.

Don't draw using rectangles if you are going to use the CONVERT method or you will get duplication of lines over lines, which will affect the wall creation.

If you do not want to spend time creating the floor plan, you can download the drawing 'floor plan.dwg' from www.schroff1.com.
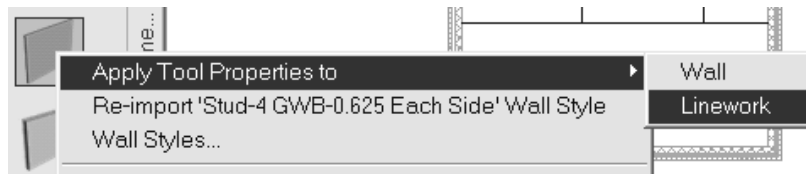
6.
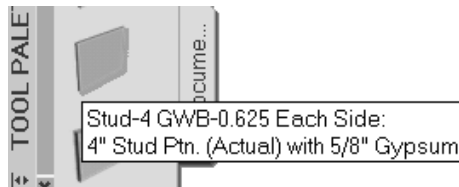
Locate the **Stud-4 GWB-0.625 Each Side:** wall style.

7. Highlight the Wall tool.
Right click and select **Apply Tool Properties to→Linework**.
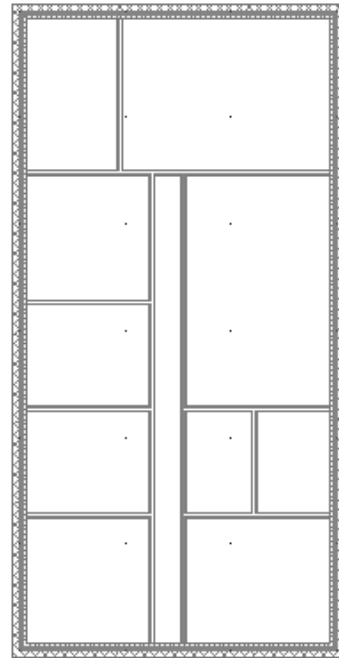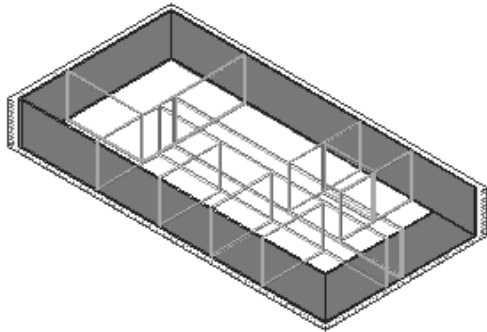

8. Select all the interior polylines you just created.

```
Erase layout geometry? [Yes/No] <N>: Y

15 new wall(s) created.
Command: Regenerating model.
```

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

9. Switch to the Work tab so you can see how your house looks in 3D.
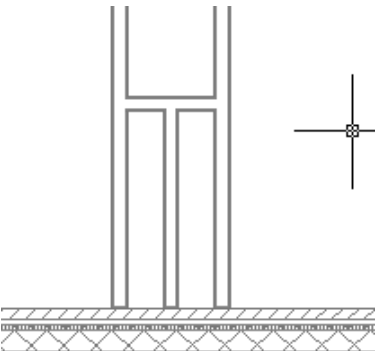
10. Save the file as *ex3-2.dwg*.

Exercise 3-3:
Wall Cleanup

Drawing Name: ex3-2.dwg
Estimated Time: 30 minutes

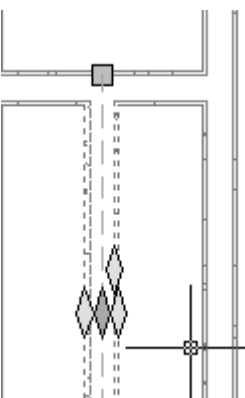This exercise reinforces the following skills:

- ❑ Modifying Walls
- ❑ Edit Justification
- ❑ Wall Tools
- ❑ Xref Manager
- ❑ Edit External References In-Place
- ❑ Unreconciled Layers

1. Open *ex3-2.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**.

   Body Modifiers
   Roof/Floor Line
   Interference Condition
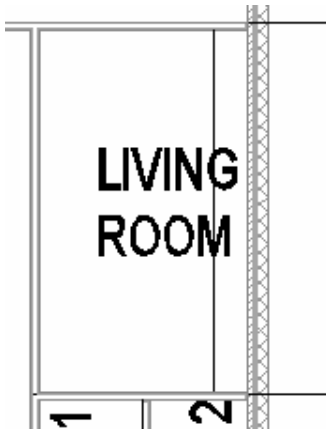   Edit Justification
   Cleanups

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

   Select the Center Diamond.

5.
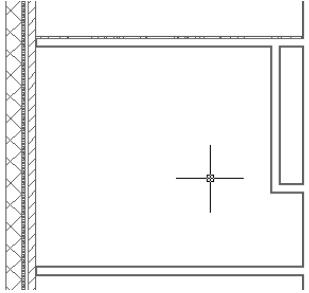
Draw a closet in Bedroom #2.
Use the same interior wall style.
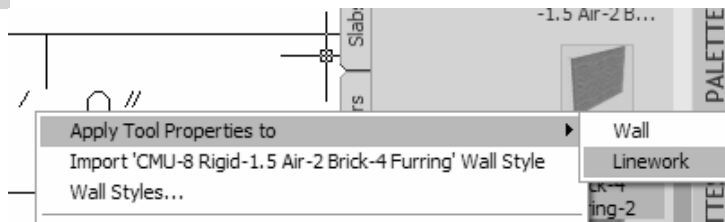Set the wall 1′ from the hallway wall and 6′ in length.

LIVING
ROOM

Draw a vertical line 2′ inside the living room area.
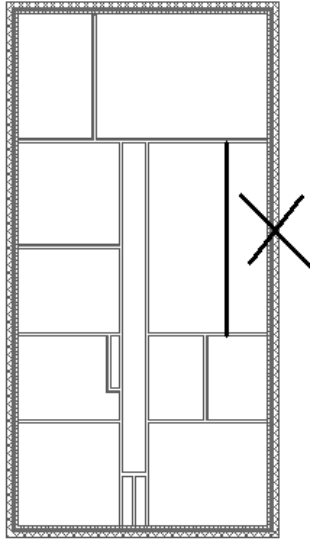
CMU-8 Rigid
-1.5 Air-2 B...

Locate the exterior wall style we used previously.

Convert the vertical line to the exterior wall styles using **Apply Tool Properties to Linework**.

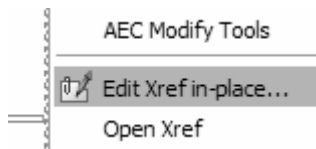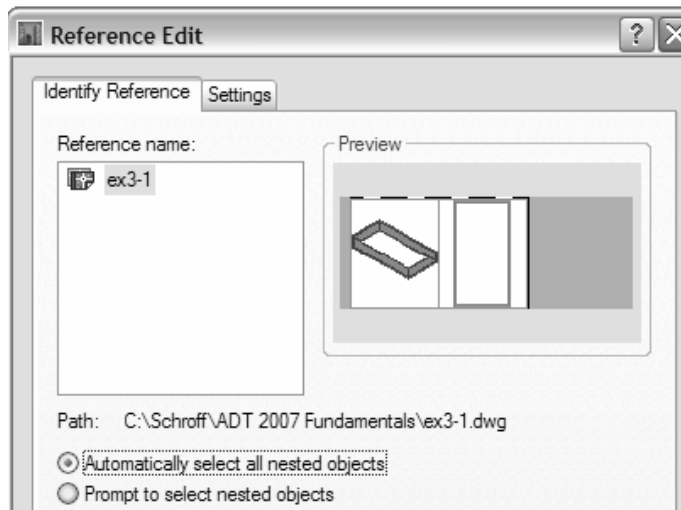| Apply Tool Properties to | ▶ | Wall |
| Import 'CMU-8 Rigid-1.5 Air-2 Brick-4 Furring' Wall Style | | Linework |
| Wall Styles... | | |

6.

Next, we delete the wall indicated and modify the exterior wall so it creates a porch entry way..

7.

Select the exterior walls.
Right click and select **Edit Xref in-place**.

8.

Enable Automatically select all nested objects.

Press **OK**.

By enabling the ability to select nested objects, you would be able to select blocks or other items inserted in the drawing. It is not really applicable here as there are no nested objects…just walls.

You'll notice that the interior walls now appear lighter to allow you to select the referenced file's objects.

9. Use the Break tool to create the opening for the living room entrance.
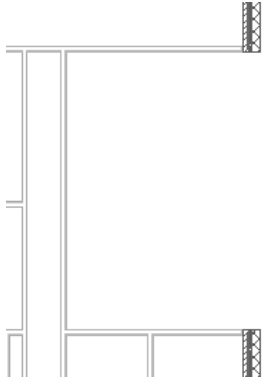
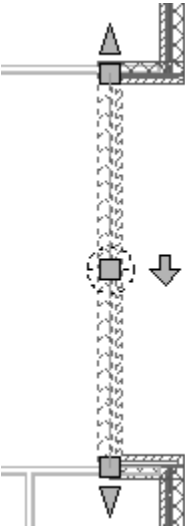10. Locate the **CMU-8 Rigid-1.5 Air-2 Brick-4** wall style.

CMU-8 Rigid-1.5 Air-2 Brick-4:
8" CMU Wall and 4" Brick Cavity with 1.5" Rigid
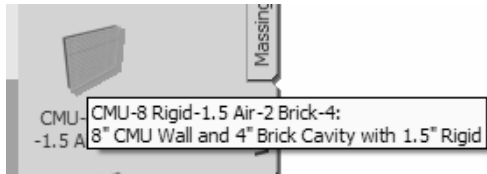
11. Draw a new wall section indenting 4′ in using the end points of the remaining exterior wall.
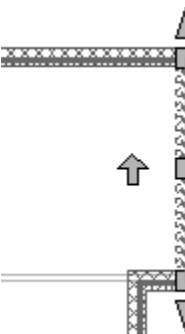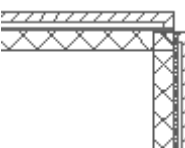
Endpoint
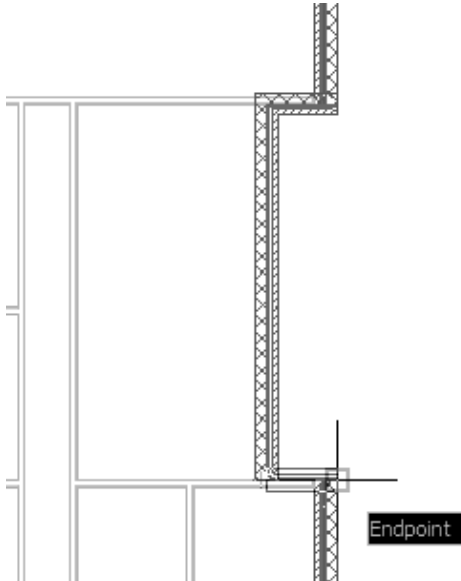
12. A circle with an 'x' will appear. This indicates a fault error. A fault error occurs when walls over-lap or you have a wall in the wrong direction.
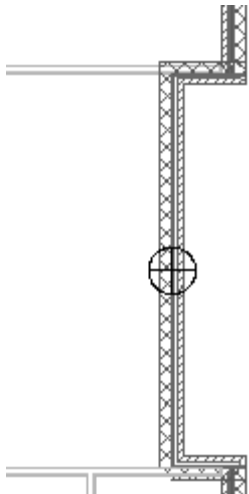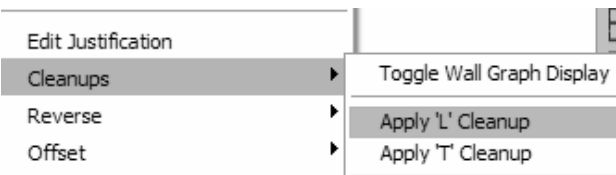
In this case, the wall was drawn in a different direction (note the hatch pattern.) from the other walls.
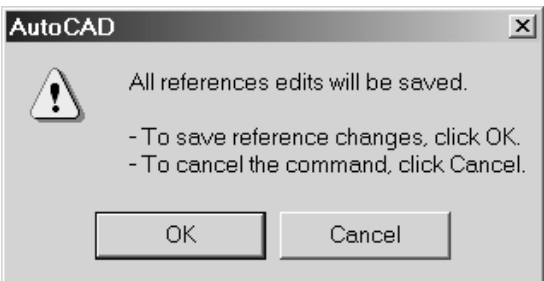
13. If you select the wall, blue grips appear. The blue arrow indicates the exterior side of the wall.

14. If you select a different wall, you see that the blue arrow is located on the opposite side.

All the walls should have the blue arrow located on the exterior side.

To flip the wall, simply left pick on the blue arrow.

15. The corners may require some clean-up work.

16.

Edit Justification	
Cleanups	▶
Reverse	▶
Offset	▶

| Toggle Wall Graph Display |
| Apply 'L' Cleanup |
| Apply 'T' Cleanup |

Select a wall.
Right click and select **Apply 'L' Cleanup**.
Then select the adjacent wall.

17. Select the Save and Close Xref tool.

18. **AutoCAD**

All references edits will be saved.

- To save reference changes, click OK.
- To cancel the command, click Cancel.

OK   Cancel

Press **OK**.

You can now edit the interior walls but not the exterior walls.

19. The walls appear cleaner.

L.R.

Edit Xref in-place…
Open Xref
Clip Xref
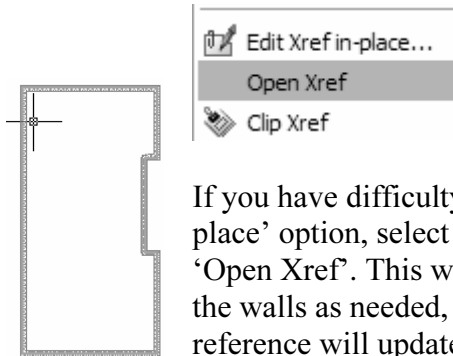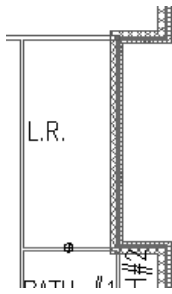
If you have difficulty cleaning up the walls using the 'Edit Xref in-place' option, select the external reference, right click and select 'Open Xref'. This will open up the file you are referencing. Clean up the walls as needed, then save. The drawing hosting the external reference will update.
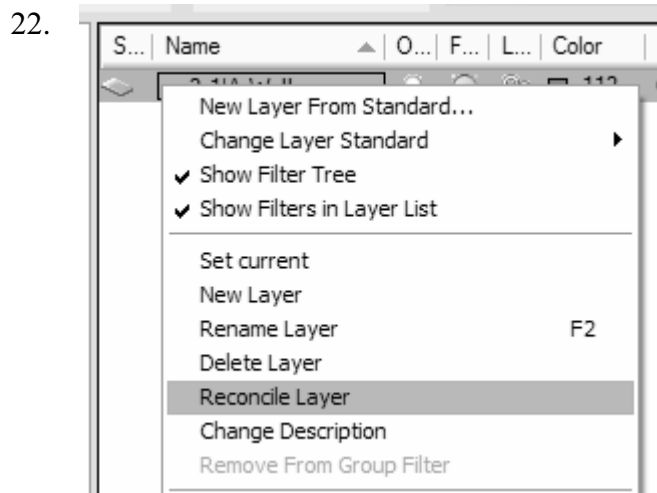
You may see a notification that you have unreconciled layers. Unreconciled layers are new layers that have been added to a drawing without user acknowledgement. When you inserted the external reference file, new layers were added to the drawing.
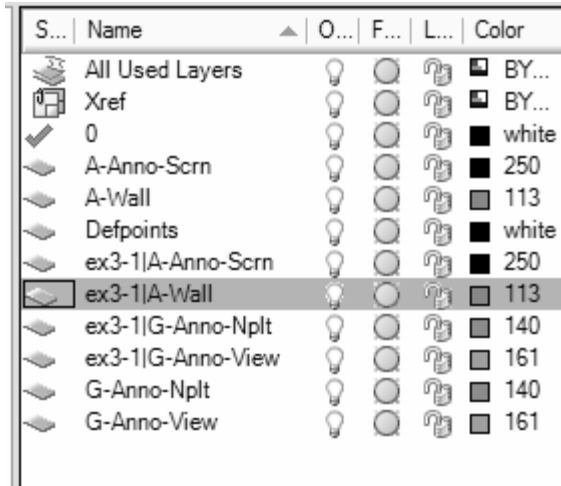
20. Select the layer alert icon in the task tray.
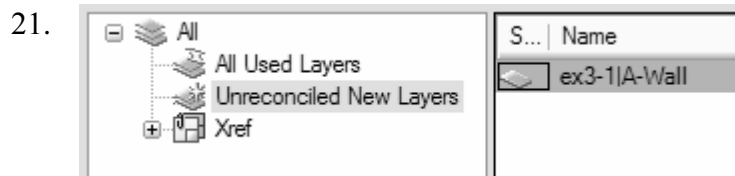
21. You will see a category for Unreconciled New Layers and the right pane will display a list of the new layers.

All
All Used Layers
Unreconciled New Layers
Xref

S… | Name
ex3-1|A-Wall

22. Highlight the layer in the right pane.

Right click and select 'Reconcile Layer'.

S… | Name ▲ | O… | F… | L… | Color
New Layer From Standard…
Change Layer Standard ▶
✔ Show Filter Tree
✔ Show Filters in Layer List
Set current
New Layer
Rename Layer   F2
Delete Layer
Reconcile Layer
Change Description
Remove From Group Filter

23.

S...	Name	▲	O...	F...	L...	Color
🗁	All Used Layers		💡	◯	🖶	🔲 BY...
🗐	Xref		💡	◯	🖶	🔲 BY...
✔	0		💡	◯	🖶	■ white
◈	A-Anno-Scrn		💡	◯	🖶	■ 250
◈	A-Wall		💡	◯	🖶	◻ 113
◈	Defpoints		💡	◯	🖶	■ white
◈	ex3-1|A-Anno-Scrn		💡	◯	🖶	■ 250
◇	ex3-1|A-Wall		💡	◯	🖶	◻ 113
◈	ex3-1|G-Anno-Nplt		💡	◯	🖶	◻ 140
◈	ex3-1|G-Anno-View		💡	◯	🖶	◻ 161
◈	G-Anno-Nplt		💡	◯	🖶	◻ 140
◈	G-Anno-View		💡	◯	🖶	◻ 161

The layer will be added to the Used Layer list.

Press **Apply** and **OK** to exit the Layer Manager dialog.

24.
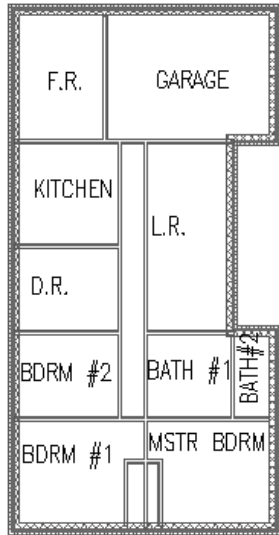
The drawing is now updated.

Save as *ex3-3.dwg*.
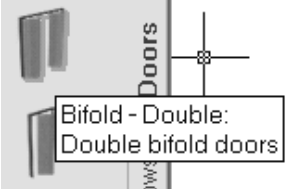
Exercise 3-4:
Adding Closet Doors
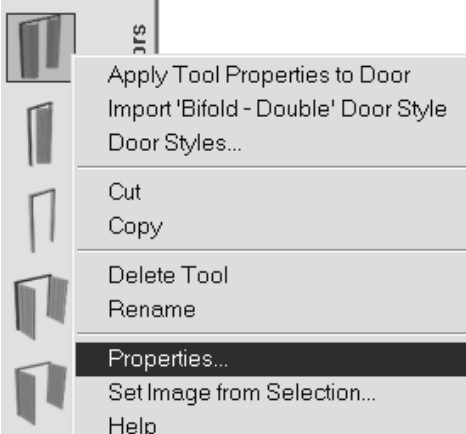
Drawing Name: Ex3-3.dwg
Estimated Time: 10 minutes

This exercise reinforces the following skills:

    ❑   Adding Doors
    ❑   Door Properties

1.   Open *ex3-3.dwg.*

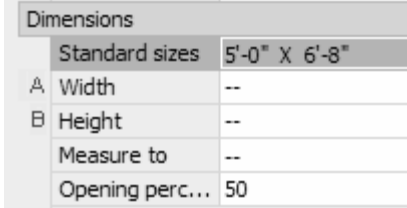2.   Locate the **Bifold-Double** door on the Doors tab of the Tool Palette.

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	5'-0" X 6'-8"
A Width	--
B Height	--
Measure to	--
Opening perc...	50

Expand the **Dimensions** section.
Set the Standard sizes to
5′-0″ x 6′-8″.
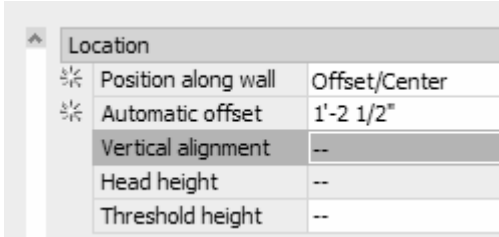
TIP: If you left click in the field, a down arrow will appear…select the down arrow and you will get a list of standard sizes. Then, select the size you want.

Set the Opening percentage to **50**.

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	1'-2 1/2"
Vertical alignment	--
Head height	--
Threshold height	--

Expand the **Location** section.

Set Position along wall to **Offset/Center**.

Automatic offset	1'-2 1/2"

Set the Automatic offset to **1′-2 1/2″**.

(This will center the closet doors along the wall.)

Press **OK** to close the Properties dialog.

TIP: Note the vertical alignment field. It defaults to a threshold height of 0″ for doors and a head height of 6′8″ for windows. You will need to adjust these defaults in multi-story buildings.

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6. Place the Bifold Double doors at the two closets.

    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.
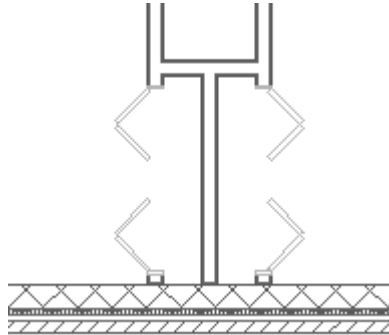
7. Place a Bi-fold Double door in the wall shown.
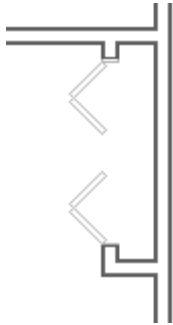
8. Save as *ex3-4.dwg*.

Exercise 3-5:
Adding Interior Doors

Drawing Name: ex3-4.dwg
Estimated Time: 10 minutes

This exercise reinforces the following skills:
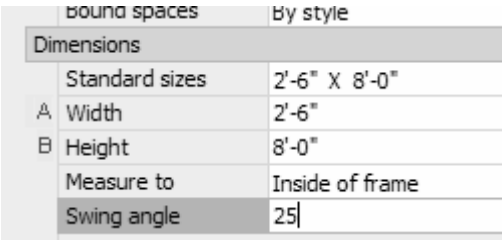
- ❑ Adding Doors
- ❑ Door Properties
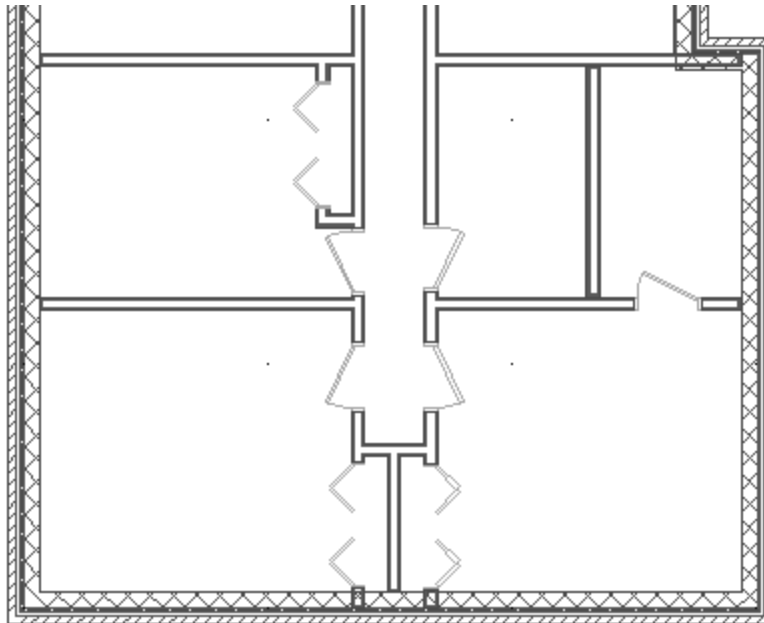
We will add single hinge doors in the areas shown.
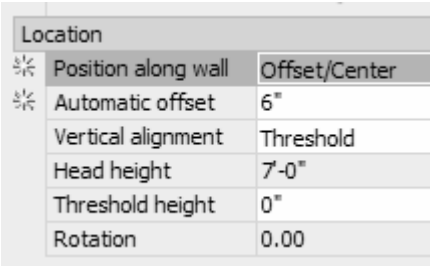
You may need to do some wall cleanup to get the rooms to look proper.

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 *ex3-4.dwg.*

2.   Locate the **Single Hinged** door on the Doors tab of the Tool Palette. Right click and select **Properties**.

3.

Bound spaces	By style
Dimensions	
Standard sizes	2'-6" X 8'-0"
A Width	2'-6"
B Height	8'-0"
Measure to	Inside of frame
Swing angle	25|

Expand the Dimensions section.
Set the Standard sizes to
2′-6″ x 8′-0″.
Set the Swing angle to **25**.

4.

Location	
Position along wall	Offset/Center
Automatic offset	6"
Vertical alignment	Threshold
Head height	7'-0"
Threshold height	0"
Rotation	0.00

Set the Position along wall to **Offset/ Center**.
Set the Automatic offset to **6″**.

Press **OK**.

5. Place the doors as indicated on the previous page.

6. Save the file *ex3-5.dwg*.

Exercise 3-6:
Add Opening

Drawing Name: ex3-5.dwg
Estimated Time: 15 minutes
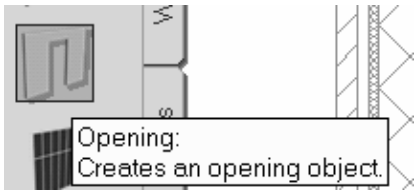
This exercise reinforces the following skills:

❑ Adding Openings
❑ Opening Properties
❑ Copying Tools
❑ Set Image from Selection
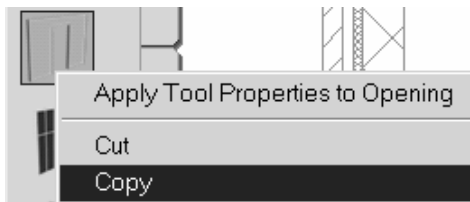
Openings can be any size and elevation. They can be applied to a wall or be freestanding. Openings are placed on Layer A-Wall-Open. The Add Opening Properties allow the user to either select a Pre-defined shape for the opening or use a custom shape.

Add opening to the midpoint of this wall.

DINING ROOM
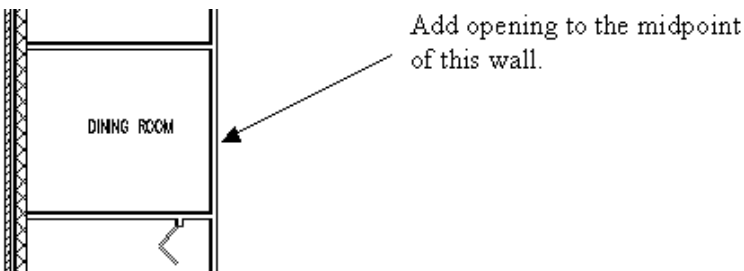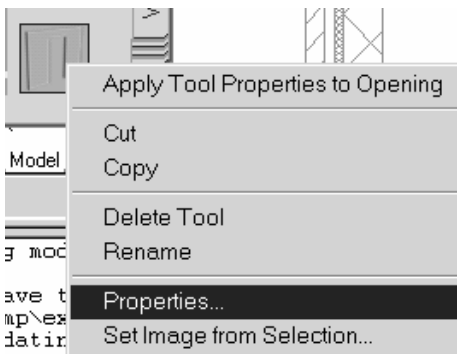
1.   Open *ex3-5.dwg*.
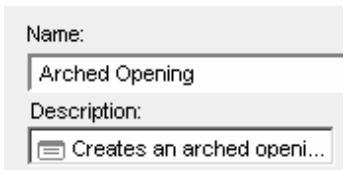
2.   Locate the **Opening** on the Design tab of the Tool Palette.

Opening:
Creates an opening object.
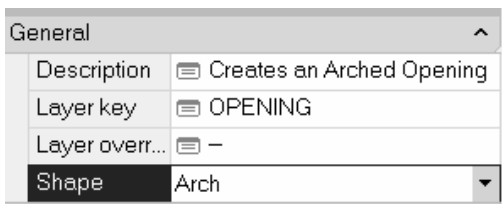
Copy a Tool

3.   Right click and select **Copy**.

Apply Tool Properties to Opening
Cut
Copy

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

Doors

View Options...
Paste

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

Apply Tool Properties to Opening
Cut
Copy
Delete Tool
Rename
Properties...
Set Image from Selection...

Model
g mod
ave t
mp\ex
datir

6.   Name:
Arched Opening
Description:
Creates an arched openi...

Change the Name to **Arched Opening**.
Change the Description to **Creates an arched opening object**.

General		^
Description	Creates an Arched Opening	
Layer key	OPENING	
Layer overr...	–	
Shape	Arch	▼

Expand the General section.
Set the Description to **Creates an Arched Opening**.
Set the Layer key to **OPENING**.
Set the Shape to **Arch**.

Dimensions		
A Width	3'-0"	
B Height	6'-8"	
C Rise	1'-0"	

Expand the Dimensions section.
Set the Width to **3′-0″**.
Set the Height to **6′-8″**.
Set the Rise to **1′-0″**.

Location		
Position along wall	Offset/Center	
Automatic offset	3'-4"	
Vertical alignment	—	

Expand the Location section.
Set the Position along wall to **Offset/Center**.
Set the Automatic offset to **3′-4″**.

Press **OK**.

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

8. Use **View→3D orbit** to view the arched opening.
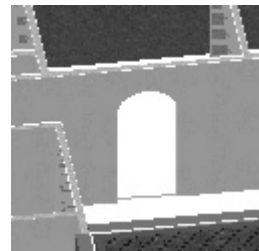
Create an Image for a Tool

9.
Properties...
Set Image from Selection...
Help

Select the Arched Opening icon.
Right click and select **Set Image from Selection…**
Pick the arched opening you created.

The icon updates to show an arched opening.
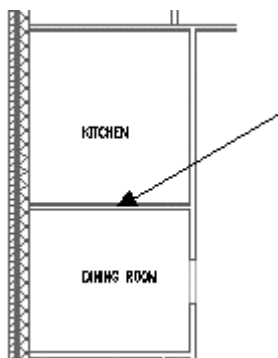
Next we place a rectangular opening in the location indicated.

10.   Select the **Cased Opening** tool from the Doors Tool Palette.
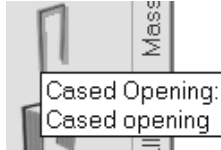
11.   Expand the Dimensions section.
Set the Width to **6′-0″**.
Set the Height to **6′-8″**.
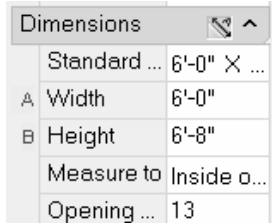
Expand the Location section.
Set the Position along wall to **Offset/Center**.
Set the Automatic offset to **6″**.
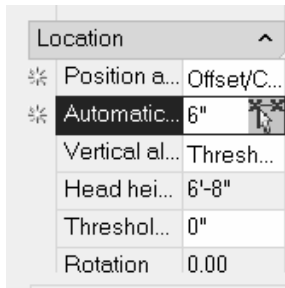
12.   Place the opening in the wall between the kitchen and the dining room.
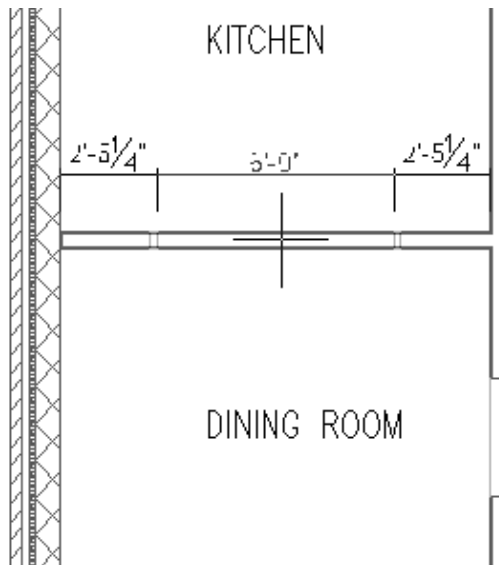
13.   Select the **Work** tab to view the openings.

Select the **Model** tab.

3-21
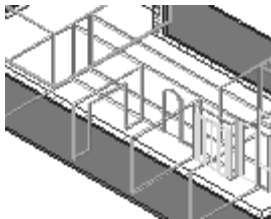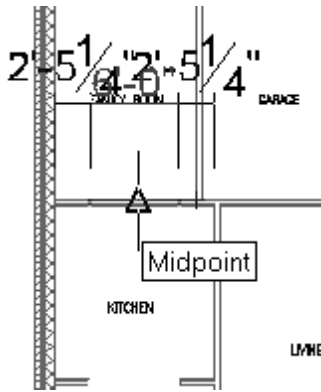
14. Place a rectangular opening between the kitchen and the family room.
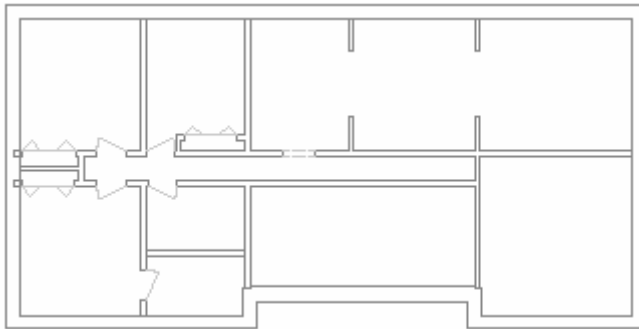
This is our floor plan so far.
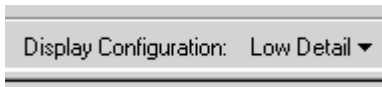
The view is set to Low Detail and rotated 90 degrees.

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

Exercise 3-7:
Adding Doors

Drawing Name: ex3-6.dwg
Estimated Time: 20 minutes

This exercise reinforces the following skills:

❑   Adding Doors

1.   Open *ex3-6.dwg.*
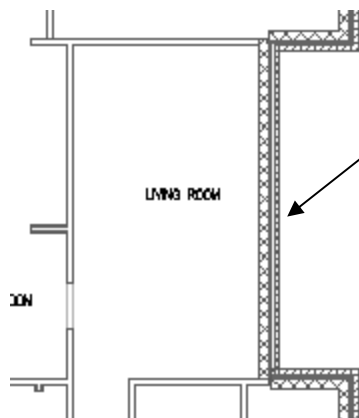
We will add an entry door on the wall indicated.

Remember the exterior walls reside on an external reference.
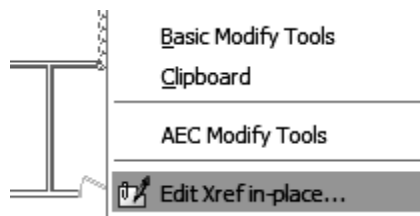
Select the Exterior Walls.
Right click and select **Edit Xref in-place**.
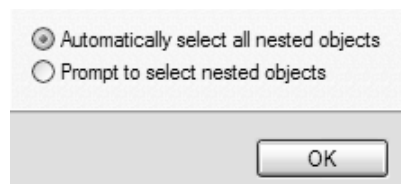
Press **OK**.

Enable **Automatically select all nested objects**.

Press **OK**.

2.   Select the **Hinged-Double-Exterior** door.
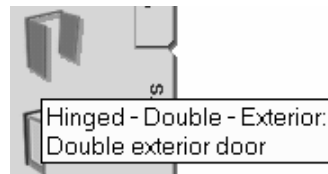
3.

Expand the Dimensions section.
Set the Standard size to **4′-0″ x 6′-8″**.
Set the Swing angle to **0**.

Expand the Location section.
Set the Position along wall to **Offset/Center**.
Set the Automatic offset to **6″**.

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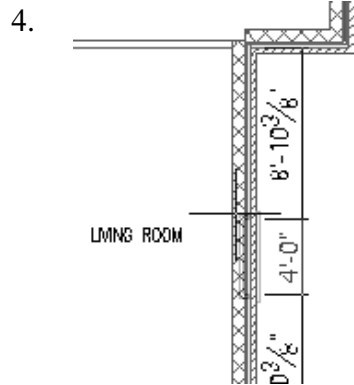
Place the door so it is centered in the wall.

5.

Select the **Overhead-Sectional** door.

6.

Expand the Dimensions section.
Set the Standard size to **8′-0″ x 7′-0″**.
Set the Swing angle to **0**.
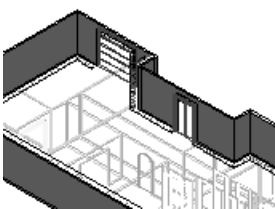
7.

Set the Position along wall to
Offset/Center.
Set the Automatic offset to **6″**.
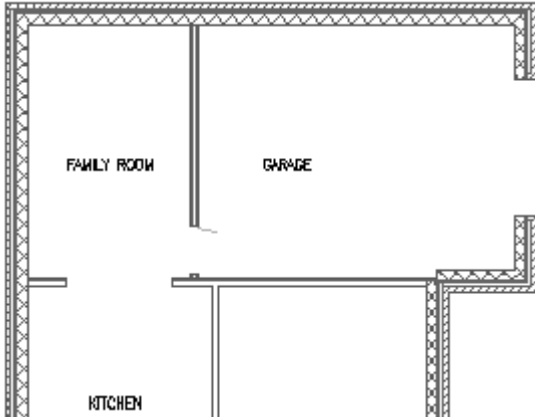
8.   Place the door in the garage wall.
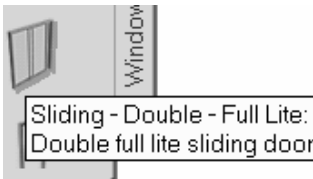
GARAGE

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

Switch back to the Model tab.
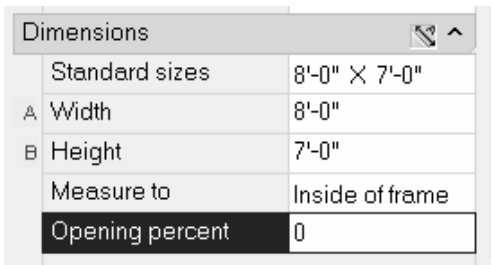
10. Next we add a sliding door to the family room wall indicated.

FAMILY ROOM   GARAGE

KITCHEN

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

Sliding - Double - Full Lite:
Double full lite sliding door

12.

Dimensions	
Standard sizes	8'-0" × 7'-0"
A Width	8'-0"
B Height	7'-0"
Measure to	Inside of frame
Opening percent	0
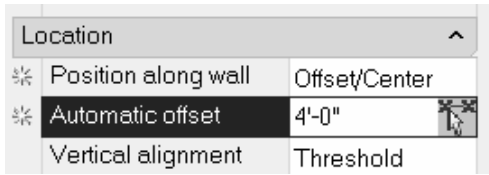
Set the Standard Size to **8′-0″ x 7′-0″**.
Set the Opening percent to **0**.

Expand the Location section.
Set the Position along wall to **Offset/
Center**.
Set the Automatic offset to **4′-0″**.

13.   Place the sliding door.
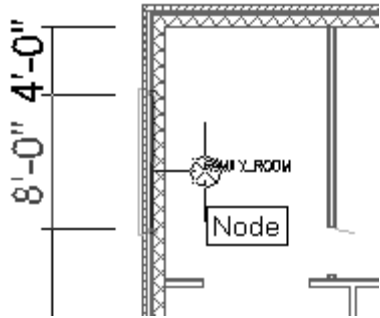
14.   Save the changes back to the external
reference.

15.   Press **OK**.
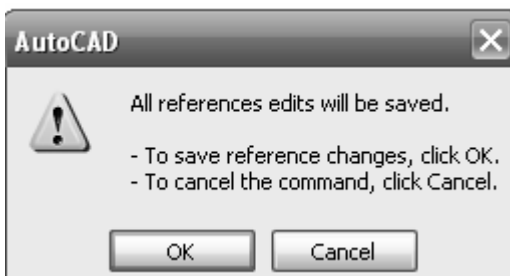
16.   If your doors don't look proper, use the
Display Manager to modify the appearance.
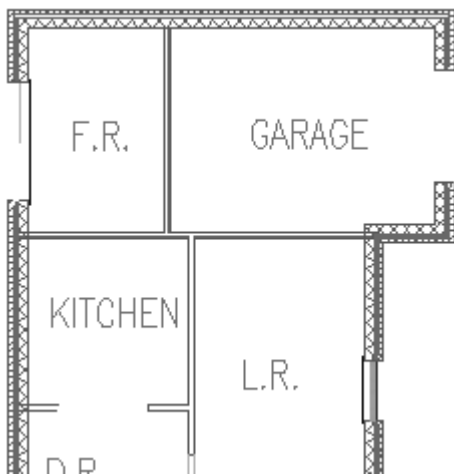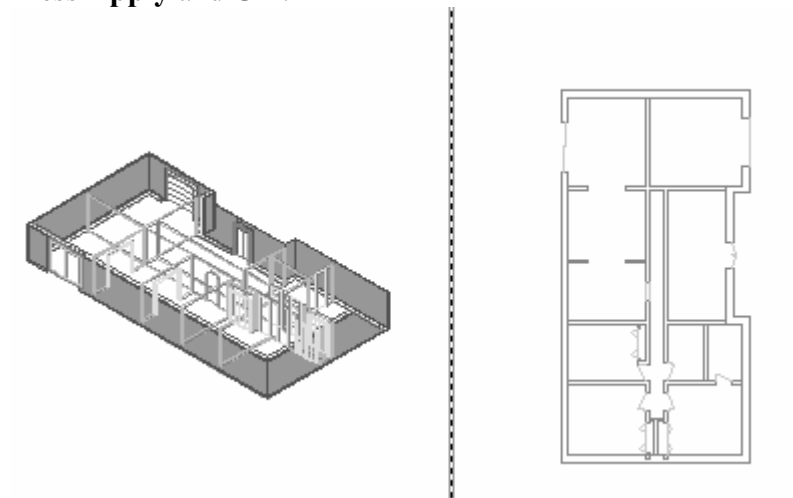
17.   Go to **Format→Display Manager**.

18.
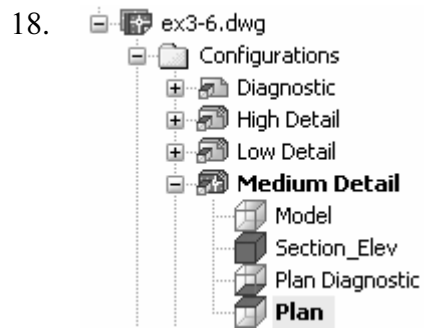
Expand the Configurations folder.

Locate the Plan configuration under Medium Detail.

Note that this configuration is in bold because it is the current active configuration.

19.

Place a check mark for Doors and Door/Window Assembly to set them visible in all views.

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

20. Select the Work tab to view your model.

21. Save the file as *ex3-7.dwg*.

Exercise 3-8:
Add Window Assemblies

Drawing Name: Lesson 3-7.dwg
Estimated Time: 30 minutes
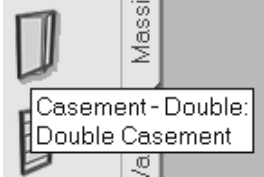
This exercise reinforces the following skills:

❑   Add Windows

1.   Open *ex3-7.dwg.*

      Select the Model tab.

2.   Select an exterior wall.
Right click and select **Edit Xref In-place**.

Press **OK**.

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

4.   Expand the Dimensions section.
Set the size to **2′-10″ x 3′-0″**.

5.   Expand the Location section.
Set the Position along wall to
Offset/Center.
Set the Offset to **4′-0″**.
Set the Head height to **4′-8″**.

6.

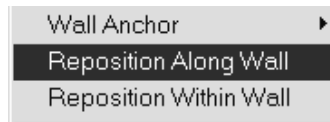Select the wall shown and the endpoint indicated.

The endpoint is where the offset is calculated from.

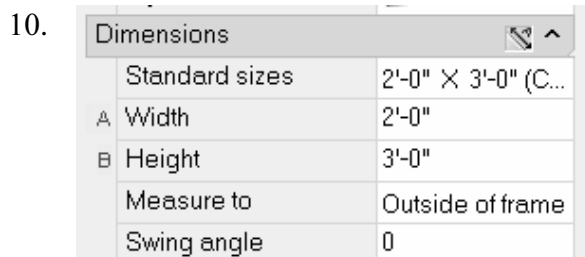7. Select the **Casement-Double** window again.

8.

Place the window on the vertical master bedroom wall.
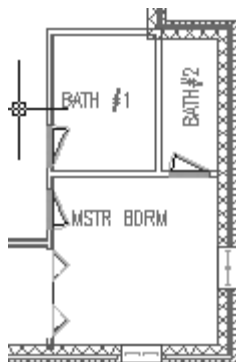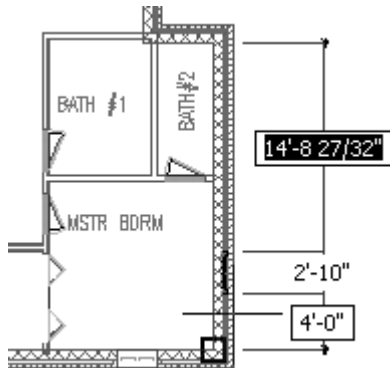
Remember – if you don't like the position of any of the Windows, you can reposition them. Just select the window, right click, and select 'Reposition Along Wall.'

Wall Anchor	▶
Reposition Along Wall	
Reposition Within Wall	

9.
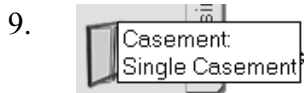
Select the **Casement: Single Casement** window.

10.

Dimensions	⬙ ^
Standard sizes	2'-0" × 3'-0" (C...
A Width	2'-0"
B Height	3'-0"
Measure to	Outside of frame
Swing angle	0

Expand the Dimensions section.
Set the size to **2′-0″ x 3′-0″**.

Location	^
⁑ Position along wall	Offset/Center
⁑ Automatic offset	3'-1"
Vertical alignment	Head
Head height	4'-8"

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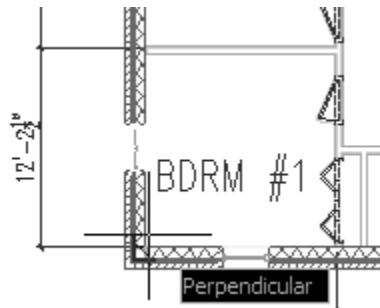Set the Position along wall to **Offset/ Center**.
Set the Offset to **3′-1″**.

11.
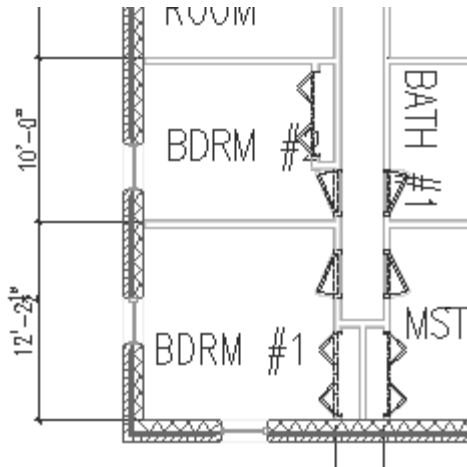Place the window in the master bath wall.
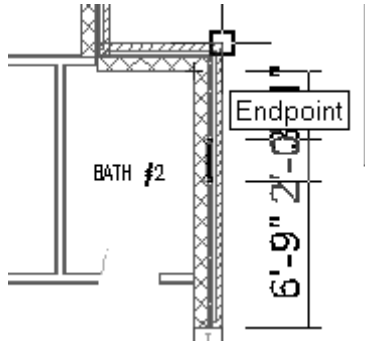
12. Place a 2′-10″ x 3′-0″ Double Casement window in Bedroom #1 using a 4′-8″ offset.
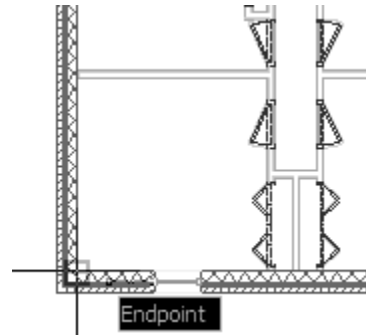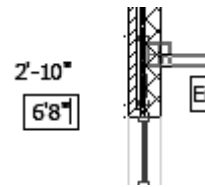
13.
Place a 2′-10″ x 3′-0″ Double Casement window in Bedroom #1 using a 4′-8″ offset on the left vertical wall.

14.

Place a 2′-10″ x 3′-0″ Double Casement window in Bedroom #2 using a 6′-8″ offset on the left vertical wall.
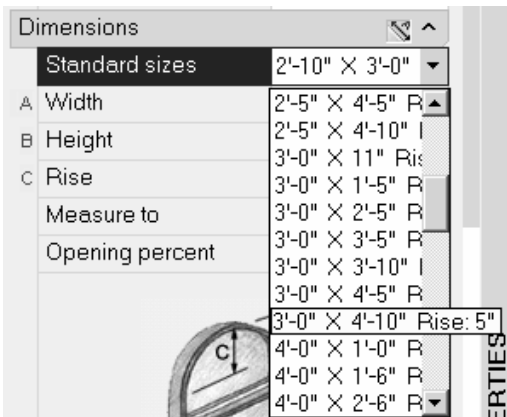

A small edit field will appear when you select the wall to place a window that allows you to change the size of offset on the fly.
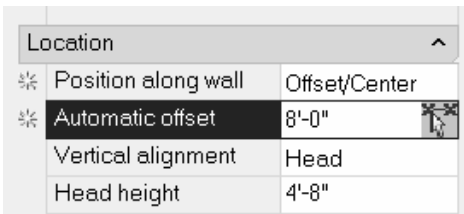
15.
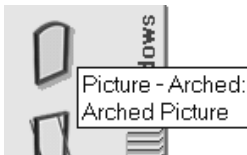
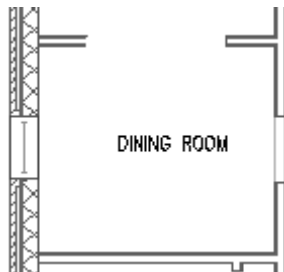Locate the **Picture- Arched** to place in the left dining room wall.

16.

Expand the Dimensions section.
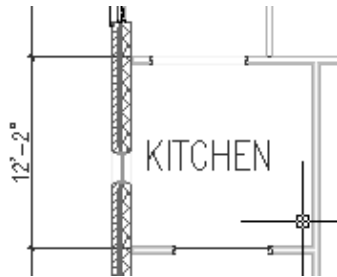Set the size to **2′-10″ x 4′-10″ Rise 5″**.

17.

Expand the Location section.
Set the Position along wall to **Offset/Center**.
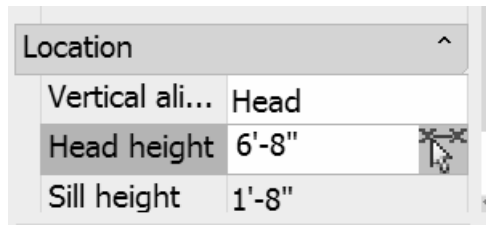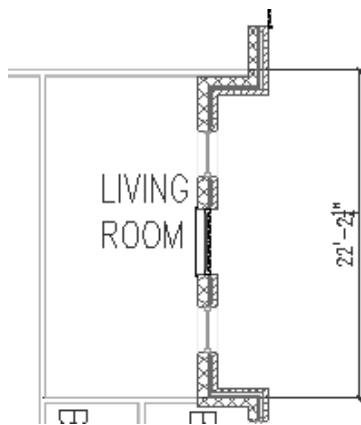Set the Offset to **8′-0″**.

18.

Place the window.

19.

Add a 2′-0″ x 3′-0″ **Casement: Single** window using a 9′-2″ offset to the kitchen.

Set the Head height to **6′8″**.

This will ensure that any cabinetry in the kitchen does not interfere with the window.

20.

Place an **3′-0″ x 4′ 6″ Rise 5″ Arched Picture** window with an offset of 0″ on each side of the entry door in the right living room wall.
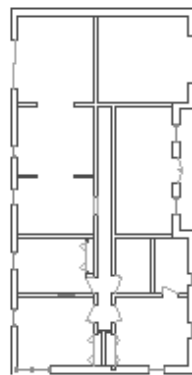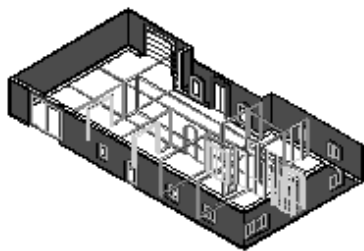
21.

Select the Save Edits tool.
Press OK to save the modifications to your drawing.

If Wall Defect symbols appear, try reversing the direction of the wall or using the Wall Cleanup tools. That should eliminate any errors.

22.

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

Save as *ex3-8.dwg*.

Exercise 3-9:
Adding a Fireplace

Drawing Name: ex3-8.dwg
Estimated Time: 30 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 *ex3-8.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*.
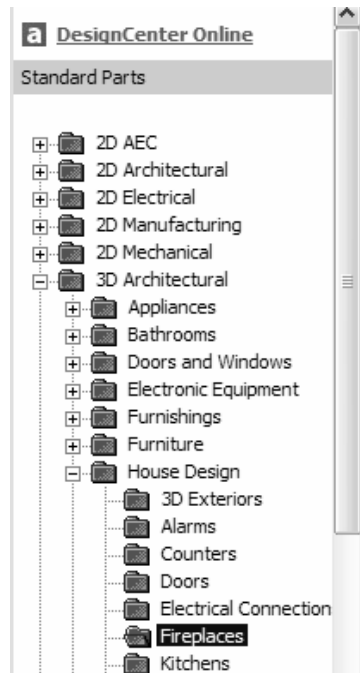
5. There is a 3D model with a Hearth.

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.
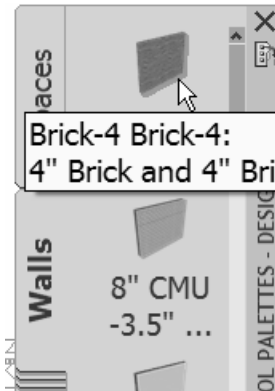
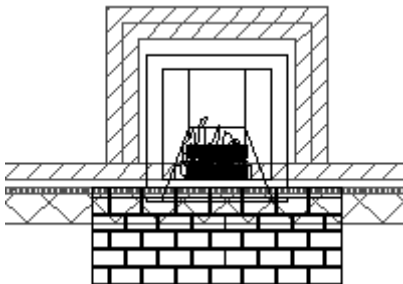7. Place the fireplace into the family room wall.

8. Use the 3D Orbit tool to inspect how the fireplace appears.
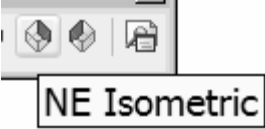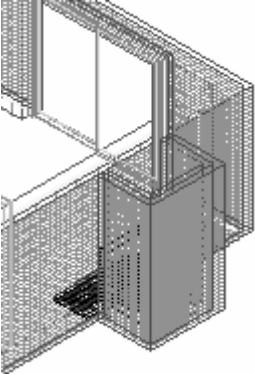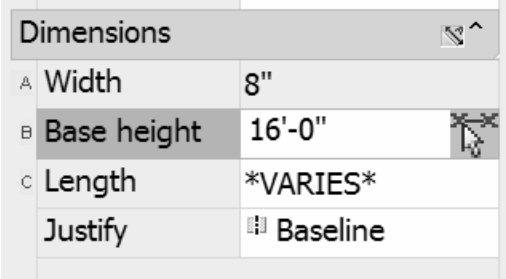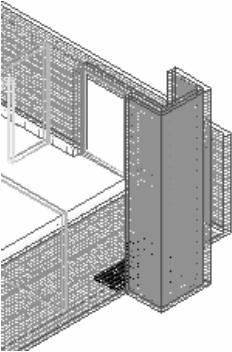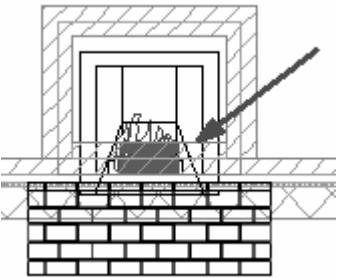
    Go back to a plan view.
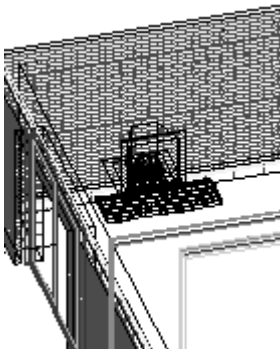
9. Go to the Walls Tool Palette.

    Select the Brick-4 Brick-4 wall style.

10. Draw a wall 3′ 4″ in the vertical direction and 4′ 8″ in the horizontal direction to enclose the hearth.

11. Switch to a NE Isometric view to inspect the chimney.

12. We need to make the chimney taller.

Select the walls for the chimney that were just placed.

Right click and select **Properties**.

13. Under Dimensions:

Set the Base Height to **16′**.

14. The chimney now looks better.

Switch back to a plan view.

15. Place a small section of wall to enclose the chimney.

16. Select the wall for the chimney that was just placed.

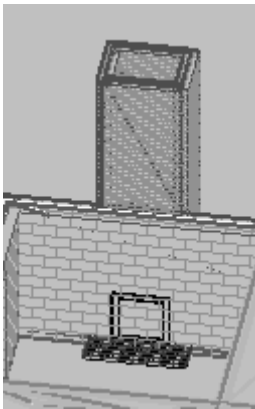Right click and select **Properties**.

17.

Under Location:

Set the Elevation to **8′**.

18.

Use 3D Orbit to inspect your work so far.
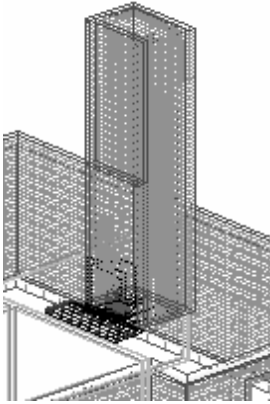
19.

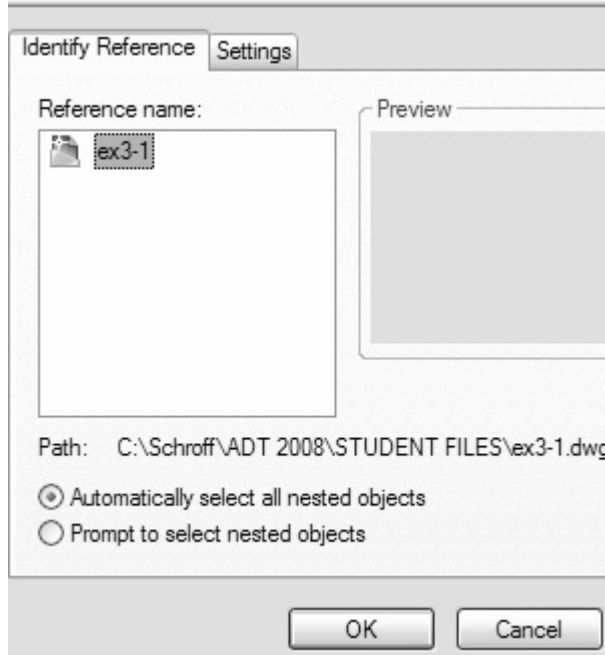If you switch to a 3D hidden visual style, you see that we need an opening in our fireplace.

Switch back to a plan view.

20.

Select the wall where the fireplace is placed.

Right click and select **Edit Xref in-place**.

21. Press **OK**.

Identify Reference | Settings

Reference name:

ex3-1

Preview

Path: C:\Schroff\ADT 2008\STUDENT FILES\ex3-1.dwg

◉ Automatically select all nested objects
○ Prompt to select nested objects

OK   Cancel

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

23. Change the Height to **2′ 10″**.
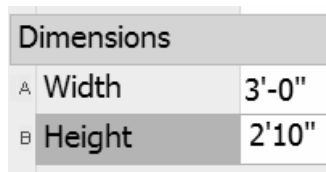
Dimensions
A Width   3'-0"
B Height   2'10"
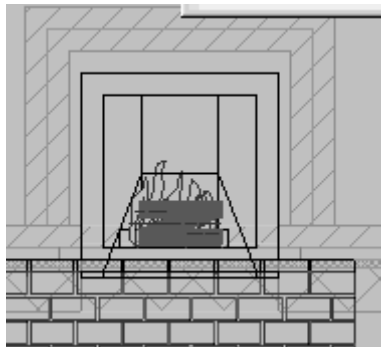
24. Place the opening in the wall.

25.

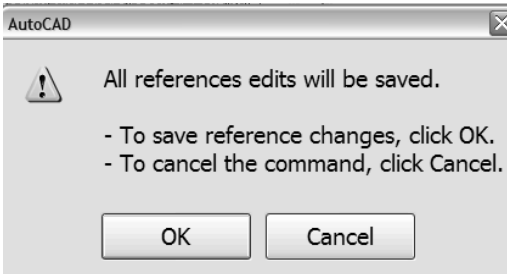Use 3D Orbit and Zoom to inspect the opening in the fireplace.

26.

Use the Add tool to add the chimney and fireplace to the external reference.

Refedit

ex3-1

27.

Select the Save icon to save the change to the external reference.

Save back changes to reference

28.

Press **OK**.

AutoCAD

⚠ All references edits will be saved.

- To save reference changes, click OK.
- To cancel the command, click Cancel.

OK   Cancel

29.

Your finished fireplace and chimney should look similar to this.

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

Close all open drawings.
You can do this by typing **CLOSEALL** on the command line.