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Autodesk®
AutoCAD® Architecture
2018 Fundamentals

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Lesson 3:
Floor Plans

AutoCAD Architecture comes with 3D content that you use to create your building model and to annotate your views. In ACA 2018, you may have difficulty locating and loading the various content, so this exercise is to help you set up ACA so you can move forward with your design.

The Content Browser lets you store, share, and exchange AutoCAD Architecture content, tools, and tool palettes. The Content Browser runs independently of the software, allowing you to exchange tools and tool palettes with other Autodesk applications.

The Content Browser is a library of tool catalogs containing tools, tool palettes, and tool packages. You can publish catalogs so that multiple users have access to standard tools for projects.

ACA comes with several tool catalogs. When you install ACA, you enable which catalogs you want installed with the software. By default, Imperial, Metric, and Global are enabled. The content is located in the path: C:\ProgramData\Autodesk\ACA 2018\enu\Tool Catalogs.

Exercise 3-1:
Adding ACA Catalogs to the Catalog Browser

Drawing Name: New
Estimated Time: 10 minutes

This exercise reinforces the following skills:

- ❑ ACA Catalog Browser
- ❑ Adding Catalogs to the Content Browser

1.
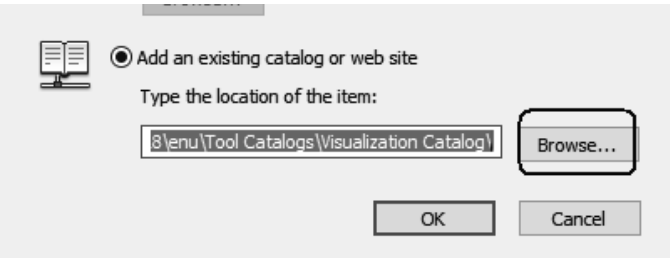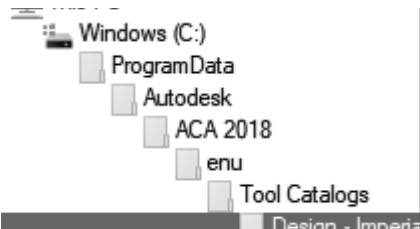   Start a new drawing using QNEW or select the + tab.

2. Launch the **Content Browser** – located on the Home ribbon under the Tools drop-down.

3. Select the Add or Create Catalog tool located on the lower left corner of the Browser dialog.

4. Select the **Browse** button.

☑ Add an existing catalog or web site

Type the location of the item:

8\enu\Tool Catalogs\Visualization Catalog\ [Browse...]

[OK] [Cancel]

5. Browse to the Design – Imperial folder located under:

Windows (C:)
ProgramData
Autodesk
ACA 2018
enu
Tool Catalogs
Design - Imperia

C:\ProgramData\Autodesk\ACA 2018\enu\Tool Catalogs

6. Select the *Design – Imperial.atc* file.

File name: Design - Imperial [Open ▼]

Files of type: Catalog and Stock Tool Files (*.atc) [Cancel]

Press **Open**.

7. ☑ Add an existing catalog or web site

Type the location of the item:

C:\ProgramData\Autodesk\ACA 2018\enu\ [Browse...]

[OK] [Cancel]

Press **OK**.

8. The catalog is now listed in the Content Browser.

AUTODESK
AUTOCAD
ARCHITECTURE

Design Tool
Catalog -
Imperial

9. Repeat to add the Design Tool – Catalog – Metric, the Global Catalog, and the Visualization Catalog.

Design Tool   Design Tool   Global   Visualization
Catalog -   Catalog -   Catalog   Catalog
Imperial   Metric

Exercise 3-2:

Adding Tools from the Content Browser to the Tool Palette

Drawing Name: New
Estimated Time: 10 minutes

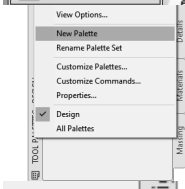This exercise reinforces the following skills:

- ❑ ACA Catalog Browser
- ❑ Adding Tools to the Tool Palette

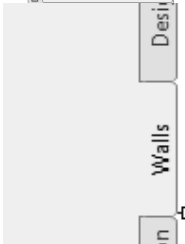1. Start a new drawing using QNEW or select the + tab.

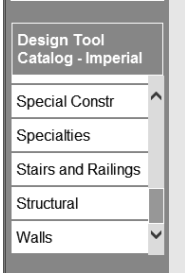2. Launch the **Content Browser** – located on the Home ribbon under the Tools drop-down.

3. Launch the **Design Tools** palette– located on the Home ribbon under the Tools drop-down.

4. Right click on the Tool Palettes title bar.

    Select **New Palette**.

5. Rename the palette **Walls**.

6. Left click on the **Design Tool Catalog – Imperial** on the Content Browser to open.

7.

Design Tool Catalog - Imperial

Special Constr
Specialties
Stairs and Railings
Structural
Walls

Scroll down the list of categories until you see Walls.

Select **Walls**.

8.
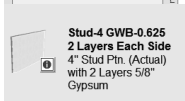
Search
Stud-4   GO
☐ in Walls

In the Search field, type in **Stud-4**.
Press **Go**.

9.

Stud-4 Rigid-1.5 Air-1 Brick-4
4" Stud Cavity Wall (Actual) with 4" Brick and 1.5" Rigid

Locate the **Stud-4 Rigid-1.5 Air-1 Brick-4** Wall Style.

Place your cursor over the wall style.
Hold down the left mouse to fill up the eyedropper.
Then place the cursor over the Walls palette and release the left mouse button.

10.

Stud-4 Rigid-1.5 Air-1 Brick-4

The wall style is added to the Walls tool palette.

11.

Stud-4 GWB-0.625 2 Layers Each Side
4" Stud Ptn. (Actual) with 2 Layers 5/8" Gypsum

Locate the **Stud-4 GWB-0.625-2 Layers Each Side** Wall Style.
Place your cursor over the wall style.
Hold down the left mouse to fill up the eyedropper.
Then place the cursor over the Walls palette and release the left mouse button.

12.

Stud-4 Rigid-1.5 Air-1 Brick-4
Stud-4 GWB-0.625 2 Layers Each Side

The wall style is added to the Walls tool palette.

13.

Search
CMU-8   GO
☐ in CMU

Type **CMU-8** in the Search field.

14.

CMU-8 Rigid-1.5 Air-2 Brick-4
8" CMU Wall and 4" Brick Cavity with 1.5" Rigid

Locate the **CMU-8 Rigid 1.5 Air 2 Brick-4** Wall Style.
Place your cursor over the wall style.
Hold down the left mouse to fill up the eyedropper.
Then place the cursor over the Walls palette and release the left mouse button.

15.

Stud-4 Rigid-1.5 Air-1 Brick-4
Stud-4 GWB-0.625 2 Layers Each Side
CMU-8 Rigid-1.5 Air-2 Brick-4

The Walls tool palette should have three wall styles available.

The floor plan is central to any architectural drawing. In the first exercise, we convert an AutoCAD 2D floor plan to 3D. In the remaining exercises, we work in 3D.

A floor plan is a scaled diagram of a room or building viewed from above. The floor plan may depict an entire building, one floor of a building, or a single room. It may also include measurements, furniture, appliances, or anything else necessary to the purpose of the plan.

Floor plans are useful to help design furniture layout, wiring systems, and much more. They're also a valuable tool for real estate agents and leasing companies in helping sell or rent out a space.

Exercise 3-3:
Going from a 2D to 3D Floor plan

Drawing Name: New
Estimated Time: 45 minutes

This exercise reinforces the following skills:

- ❑ Create Walls
- ❑ Wall Properties
- ❑ Wall Styles
- ❑ Style Manager
- ❑ Insert an AutoCAD drawing
- ❑ Trim, Fillet, Extend Walls

1.   Start a new drawing using QNEW or select the + tab.

2.   Type **UNITS**.
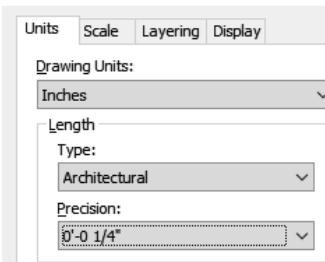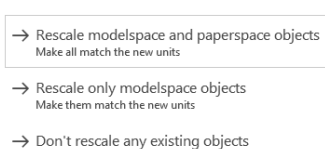
   Set the Units to **Inches**.

   Set the Type to **Architectural.**

   Set the Precision to **¼"**.

   Press **OK**.

3.   Since we haven't placed anything in the drawing yet, you can select Option 3 – **Don't rescale any existing objects.**

4.

Activate the **Insert** ribbon.

Select **Attach**.
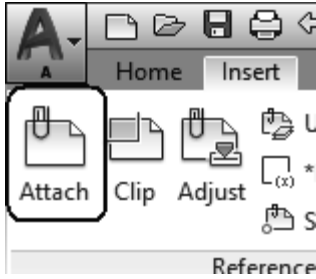
5.

Locate the *autocad_floor_plan.dwg* file in the exercises.
Set your Files of type to Drawing (.dwg) to locate the file.*
Press **Open**.
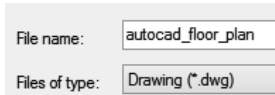
6.

Uncheck Insertion Point.
Uncheck Scale.
Uncheck Rotation.
This sets everything to the default values.

Press **OK**.
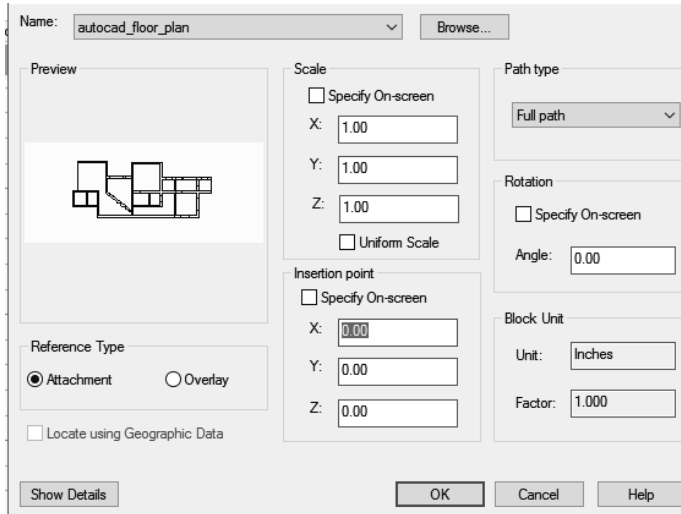
7.

Use the ViewCube to switch to a 3D view.

Note that the AutoCAD file is 2D only.

Return to a top view.
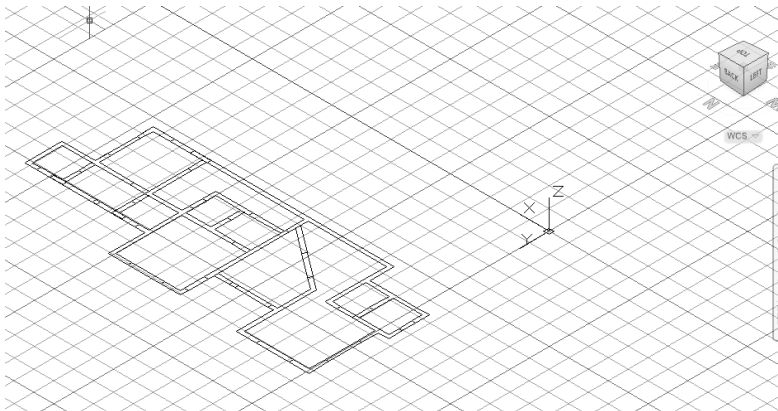
8.

Select the attached xref.
Right click and select
Bind→Insert.
This converts the xref to an inserted block.

9. Select the block reference and type **EXPLODE** to convert to lines.

10. Activate the **Home** ribbon.

    Select the **Measure** tool on the Inquiry panel.

11. Measure a wall thickness.
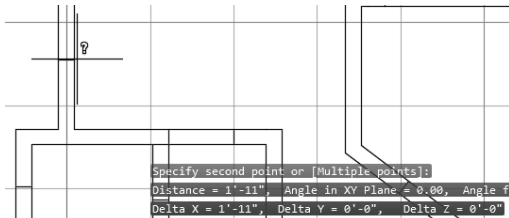
    Note that the walls are 1′-11″ thick.

    Specify second point or [Multiple points]:
    Distance = 1'-11", Angle in XY Plane = 0.00, Angle f
    Delta X = 1'-11", Delta Y = 0'-0", Delta Z = 0'-0"

12. Launch the **Design Tools** palette from the Home ribbon.
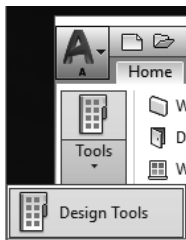
13. Activate the **Walls** palette.

    This palette was created in the Exercise 3-2.

14. Apply Tool Properties to
    Import 'Stud-4 Rigid-1.5 Air-1 Brick-4' Wall Style
    Wall Styles...
    Cut

    Locate the Stud-4 Rigid-1.5 Air-1 Brick-4 wall style on the tool palette.
    Right click and select **Import Stud-4 Rigid-1.5 Air-1 Brick-4 Wall Style**.
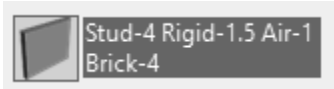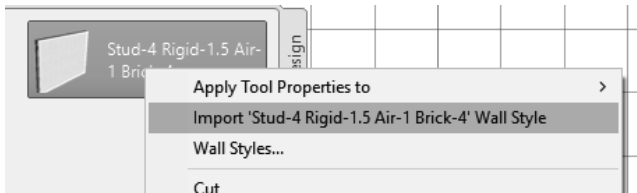
    This adds the wall style to the active drawing.

15. Stud-4 Rigid-1.5 Air-1 Brick-4

    Locate the Stud-4 Rigid-1.5 Air-1 Brick-4 wall style.

    Right click and select **Import Wall Style.**

    Apply Tool Properties to
    Import 'Stud-4 Rigid-1.5 Air-1 Brick-4' Wall Style

    This loads the wall style into the file.
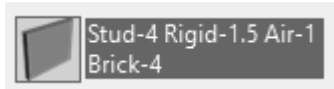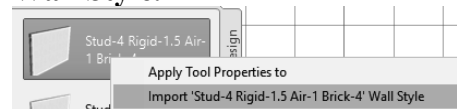
16.	Stud-4 Rigid-1.5 Air-1 Brick-4 Apply Tool Properties to → Import 'Stud-4 Rigid-1.5 Air-1 Brick-4' Wall Style Wall Styles...	Right click on the **Stud-4 Rigid-1.5 Air-1 Brick-4** wall style and select **Wall Styles**. *This launches the Style Manager.*
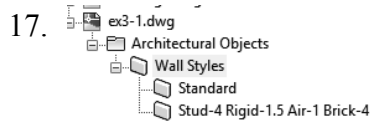
17.	ex3-1.dwg
	  Architectural Objects
	    Wall Styles
	      Standard
	      Stud-4 Rigid-1.5 Air-1 Brick-4
		Note that the only wall styles available are Standard and the style that was just imported.
		
		Highlight the **Stud-4 Rigid-1.5 Air-1 Brick-4** wall style.

18.

Total Width: 11 1/8"

General | **Components** | Materials | En
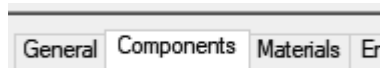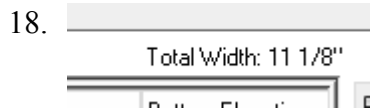
Activate the **Components** tab.

The components tab lists the materials used in the wall construction.

Note the components listed in the Style Manager for the wall style. The total wall thickness is 11-1/8″.

We need a wall style that is 1′–11″. We need to add 11- 7/8" of material to the wall style.

19.	Total Width: 11 1/8 	Index	Name	Priority	Width	Edge Offset	Function	Dimension ⊞ ▥
---	---	---	---	---	---	---
1	Brick Veneer	810	4"	2 1/2"	Non-Structural	☑ ☐
2	Air Gap	700	1"	1 1/2"	--	☐ ☐
3	Rigid Insulation	600	1 1/2"	0"	Non-Structural	☐ ☐
4	Stud	500	4"	-4"	Structural	☑ ☐
5	GWB	1200	5/8"	-4 5/8"	Non-Structural	☐ ☐		Highlight the row that lists the GWB material. *GWB stands for Gypsum Wallboard.*
20.	▦	Select the **Add Component** tool.

21.		Index	Name	Priority	Width	Edge Offset	Function	Dimens ⊞
---	---	---	---	---	---	---
1	Brick Ven...	810	4"	2 1/2"	Non-Struct...	☑
2	Air Gap	700	1"	1 1/2"	--	☐
3	Rigid Insul...	600	1 1/2"	0"	Non-Struct...	☐
4	Stud	500	3 1/2"	-3 1/2"	Structural	☑
5	GWB	1200	5/8"	-4 1/8"	Non-Struct...	☐
6	GWB	1200	5/8"	-4 3/4"	Non-Struct...	☐		Another 5/8″ piece of GWB (gypsum board) is added.

22.   Total Width: 11 1/8"   Note that the thickness of the wall updated to: **11 1/8"**.

23.

Index	Name	Priority	Width	Edge Offset	F
1	Brick Veneer	810	4"	2 1/2"	N
2	Air Gap	700	1"	1 1/2"	–
3	Rigid Insulation	600	1 1/2"	0"	N
4	Stud	500	4"	-4"	S
5	GWB	1200	5/8"	-4 5/8"	N
6	GWB	1200	5/8"	-4 5/8"	N

Highlight the Brick Veneer material in the top row.
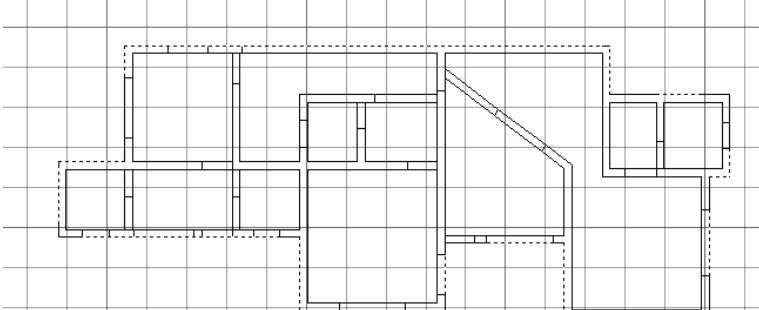
24. 🔲 Select the **Add Component** tool.

25.

Total Width: 1'-11"

Index	Name	Priority	Width	Edge Offset	Function	Dime ⊞
1	Brick Veneer	810	4"	2 1/2"	Non-Structural	☑
2	CMU	810	1' 3.875"	2 1/2"	Non-Structural	☑
3	Air Gap	700	1"	1 1/2"	–	☐
4	Rigid Insulation	600	1 1/2"	0"	Non-Structural	☐
5	Stud	500	4"	-4"	Structural	☑
6	GWB	1200	5/8"	-4 5/8"	Non-Structural	☐
7	GWB	1200	5/8"	-4 5/8"	Non-Structural	☐

Change the name of the second row material to **CMU**.
Set the width to 1' 3.875" thick.

To change the values, just place the cursor in that cell and start typing.

26. Verify that your layers are set as shown.
Verify that the total width is 1' 11".
27. Press **OK** to close the Styles Manager dialog.

28.

Apply Tool Properties to ▸	▸ Wall
Re-import 'Stud-4 Rigid-1.5 Air-1 Brick-4' Wall Style	Linework
Wall Styles...	
Cut	

Right click on the **Stud-4 Rigid-1.5 Air-1 Brick-4** wall style and select **Apply Tool Properties to → Linework**.

29.

Select the outside segments of the walls.

Do not select any of the interior walls.

Press ENTER when you are done selecting lines.

30. You will be prompted if you want to erase any of the linework. Enter **NO**.

31.
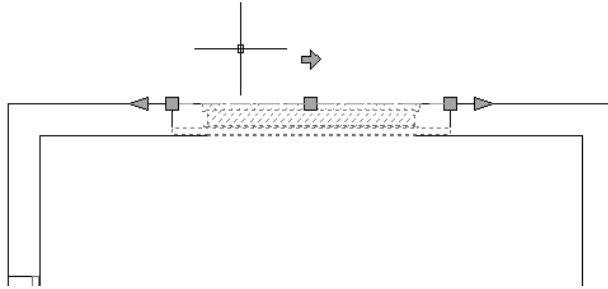
Zoom into one of the walls that was placed.

Note that it is the correct width. The blue arrow indicates the exterior side of the wall. If the blue arrow is inside the building, click on the blue arrow and it will flip the orientation of the wall.

If necessary, move walls so they are aligned with the floor plan's walls.

32.
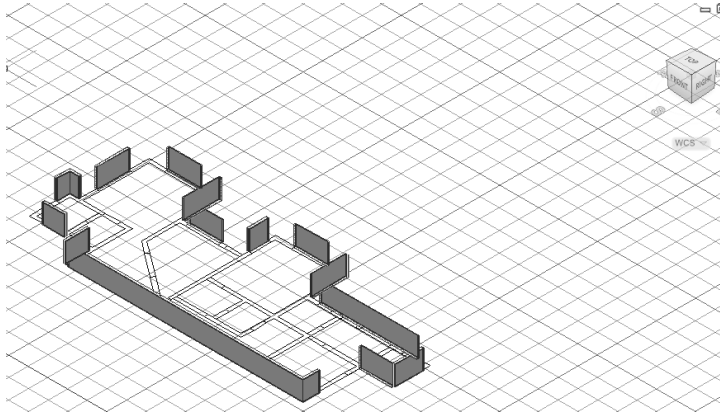
Switch to a 3D view.

You should see 3D walls where you selected lines.

33.
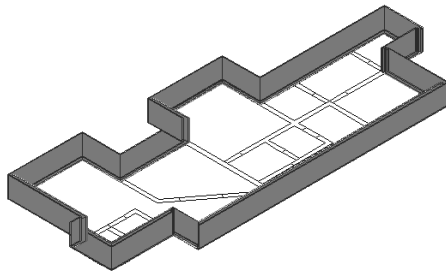
To join the walls together, use FILLET with an R value of 0.
Type FILLET, then select the two walls to be joined to form a corner.

34.
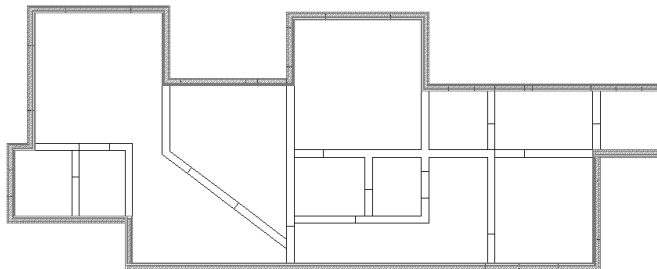
In the plan view, the exterior walls should form a closed figure.

35.
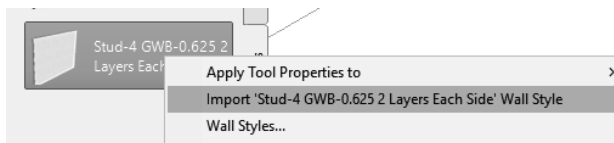
Locate the **Stud-4 GWB-0.625-2 Layers Each Side** Wall Style.

Right click and select Import Wall Style.

This loads the wall style into the file.
Right click and select Wall Styles.
This will launch the Styles Manager.
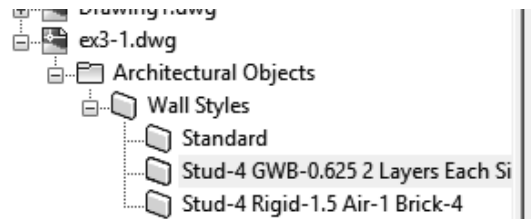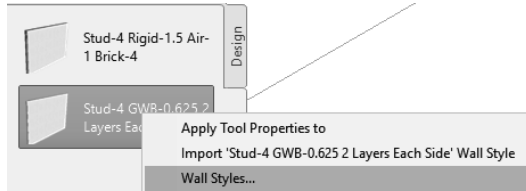
36. Highlight the **Stud-4 GWB-0.625-2 Layers Each Side** Wall Style in the Style Manager list.

Total Width: 6 1/2"

Select the **Components** tab.

Index	Name	Priority	Width	Edge Offset	Function	Dime ⊞
1	GWB	1210	5/8"	5/8"	Non-Structural	☐
2	GWB	1200	5/8"	0"	Non-Structural	☐
3	Stud	500	4"	-4"	Structural	☑
4	GWB	1200	5/8"	-4 5/8"	Non-Structural	☐
5	GWB	1210	5/8"	-5 1/4"	Non-Structural	☐

The total width for this wall style is 6 1/2".

37.

Total Width: 1'-11"

Index	Name	Priority	Width	Edge Offset	Function	Dime ⊞
1	GWB	1210	5/8"	5/8"	Non-Structural	☐
2	GWB	1200	5/8"	0"	Non-Structural	☐
3	Stud	500	1' 9.75"	-4"	Structural	☑
4	GWB	1200	5/8"	-4 5/8"	Non-Structural	☐
5	GWB	1210	5/8"	-5 1/4"	Non-Structural	☐

Change the Stud width to **1′ 9 3/4″**.

Adjust the positions of the components so that the wall looks proper.

Press **OK** to close the Style Manager.

38. Select the **Stud-4 GWB-0.625-2 Layers Each Side** wall style.
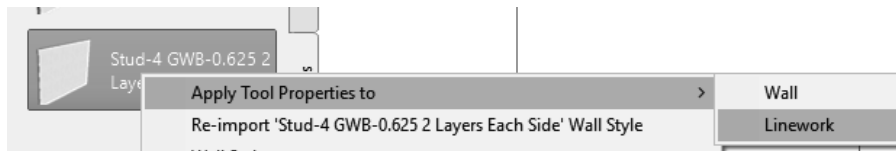
Right click and select **Apply Tool Properties to → Linework**.
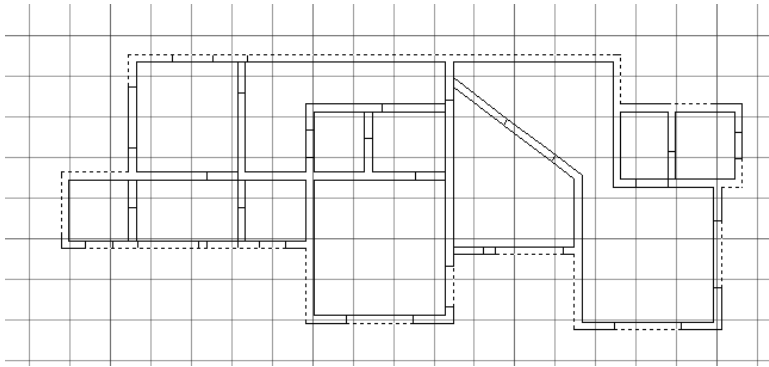
39. Select the inside segments of the walls.

Do not select any of the exterior walls.

Press ENTER when you are done selecting lines.

40. You will be prompted if you want to erase any of the line work. Enter **NO**.

41. Zoom into one of the walls that was placed. Note that it is the correct width.
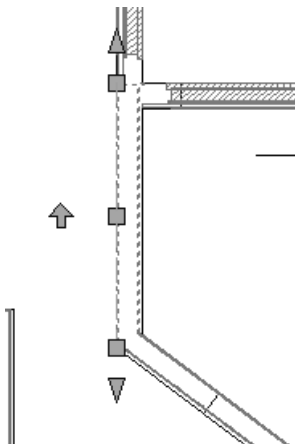
The blue arrow indicates the exterior side of the wall. If the blue arrow is inside the building, click on the blue arrow and it will flip the orientation of the wall. Because these are interior walls with gypsum board on both sides, the orientation doesn't matter.

If necessary, move walls so they are aligned with the floor plan's walls.
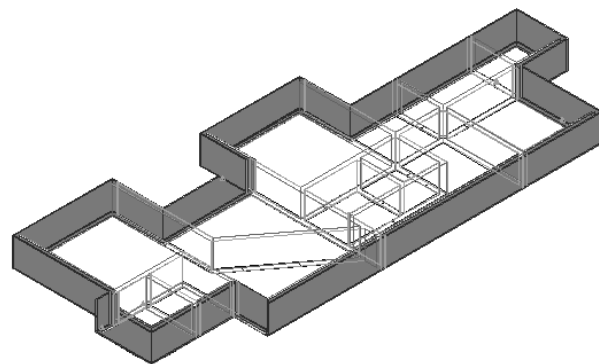
42. Use the TRIM, EXTEND, and FILLET tools to edit the interior walls.
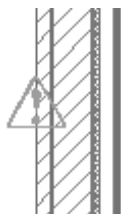
43. Some of your walls may display a warning symbol.

This means that you have walls overlapping each other.

Check to see if you have more than one wall or if you need to trim the walls.

44. Save as *ex3-3.dwg*.

The ex3-3 file can be downloaded from the publisher's website, so you can check your file against mine and see how you did.

Exercise 3-4:

Importing a PDF into ACA

Drawing Name: New
Estimated Time: 10 minutes

This exercise reinforces the following skills:

- ❑   Import PDF
- ❑   Create Walls
- ❑   Wall Properties
- ❑   Wall Styles
- ❑   Model and Work space

1.   Go to the Application
      Menu (the Capitol Letter
   A).

      Select **New→Drawing**.
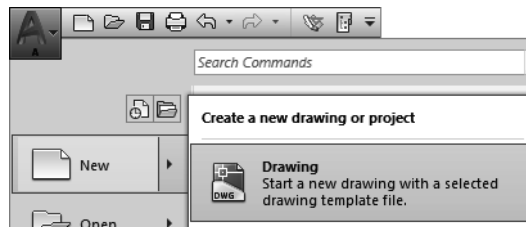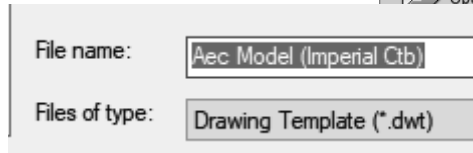
2.   Select the *Aec Model (Imperial Ctb)* template.

      Press **Open**.

      Note this template uses Architectural units.
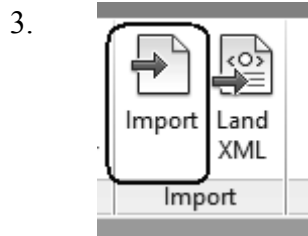
3.   Activate the **Insert** ribbon.

      Select the **Import** tool (located in the middle of the ribbon).
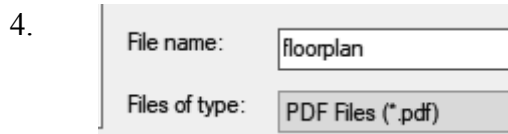
4.   Select the *floorplan.pdf* file.
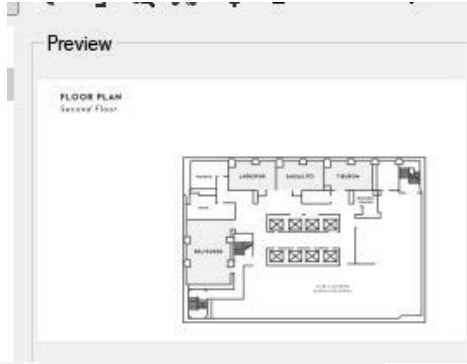
5. *You will see a preview of the pdf file.*

    Press **Open**.
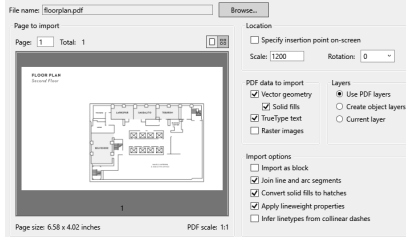
6. Uncheck specify insertion point on-screen.

    This will insert the pdf to the 0,0 coordinate.

    Set the Scale to **1200**.

    This will scale the pdf.

    Set the rotation to 0.

    Enable Vector Geometry.
    Enable Solid Fills.
    Enable TrueType Text.
    This will convert any text to AutoCAD text.
    Enable Join line and arc segments.
    Enable Convert solid fills to hatches.
    Enable Apply lineweight properties.
    Enable Use PDF layers.

    Press OK.
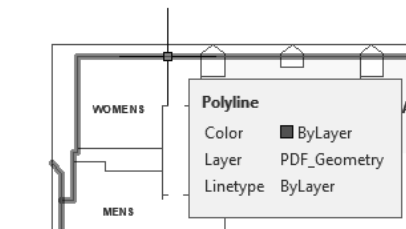
7. Notice if you hover your mouse over any of the elements imported, they have been converted to ACA elements.

8. Highlight the **Stud-4 Rigid** wall style on the tool palette.
    Right click and select **Apply Tool Properties to Linework.**

9.
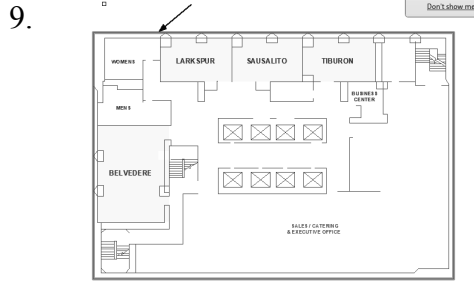
Select the outside polyline on the floorplan.

When prompted to erase existing lines, select **No**.

10.
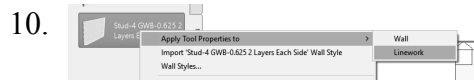
Highlight the **Stud 4- GWB** wall style.
Right click and select **Apply Tool Properties to Linework.**

When prompted to erase existing lines, select **No**.

11.
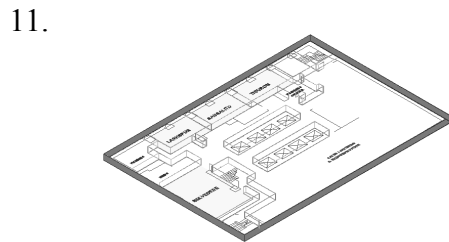
Use the FILLET, TRIM, and EXTEND tools to place the interior walls.

12. Save as *ex3-4.dwg*.

You can compare your drawing with mine and see how you did.

Exercise 3-5:
Creating Walls

Drawing Name: New
Estimated Time: 10 minutes

This exercise reinforces the following skills:

- Create Walls
- Wall Properties
- Wall Styles
- Model and Work space

1. Go to the Application Menu (the Capitol Letter A).

   Select **New→Drawing**.
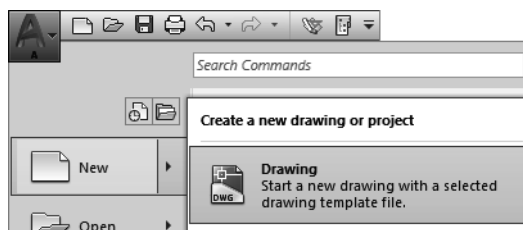
2. Select the *Aec Model (Imperial Ctb)* template.
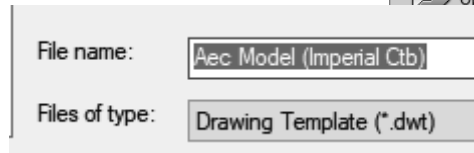
   Press **Open**.

   Note this template uses Architectural units.

3. Select the **Wall** tool from the Home ribbon.
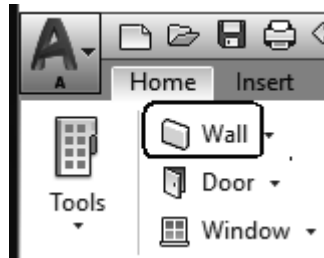
4. In the Properties dialog, check under the Style drop-down list.
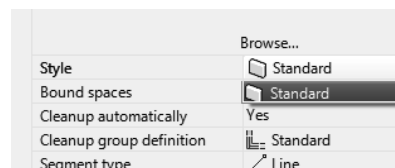
   Only the Standard style is available.

   This is the wall style that is loaded in the template.

5. Exit out of the command by pressing ESC.

6.   Launch the Design Tools palette from the Home ribbon.
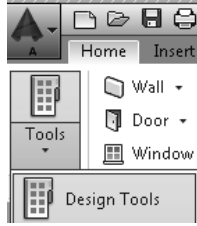
7.   Select the Walls palette.
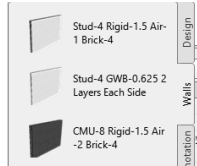
8.   Select the **CMU-8 Rigid-1.5 Air 2 Brick-4** wall style.
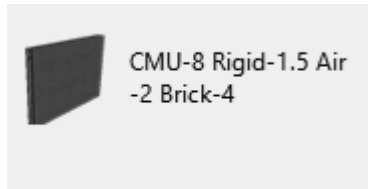
9.   Toggle **ORTHO** ON.
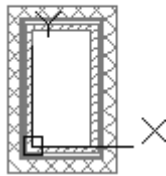
   Start the wall at 0,0.
   Create a rectangle 72 inches [1830 mm] tall and 36 inches [914 mm] wide.

   You can use Close to close the rectangle.

   Place the walls as if you are drawing lines.

10.   Go to the **View** ribbon.

11.   Toggle on the Layout tabs.
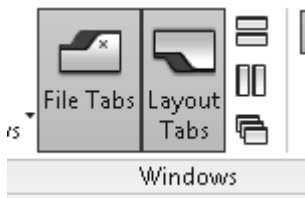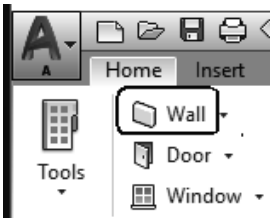
12.   Select the **Work** tab now visible in the lower left corner of the screen.
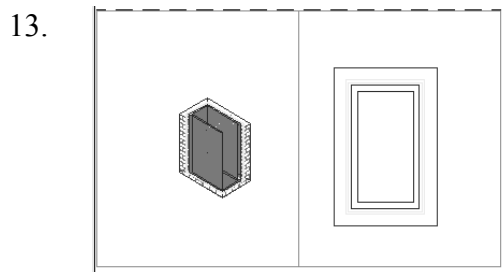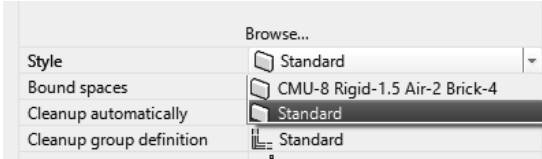
13.   The work tab opens up a layout with two viewports. One viewport is 3D and the other viewport is a top view.

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

14.   **Model**   Work   ✦   Switch back to the Model space tab.

15.   Select the **Wall** tool from the Home ribbon.

16.   In the Properties dialog, check under the Style drop-down list.

Note that the CMU wall style is now available under the drop-down list.

17.   Exit out of the command by pressing ESC.

18.   Save your drawing as e*x3-5.dwg*.

Tips**T**ricks

➢ 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.

➢ To add a wall style to a drawing, you can import it or simply create the wall using the Design Tools.

➢ 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 fewer system resources.

➢ 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.

➢ 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.

Exercise 3-6:

Creating a Floor Plan Using an Image

Drawing Name: new.dwg
Estimated Time: 60 minutes

This exercise reinforces the following skills:

- ❑ Insert Image
- ❑ Add Wall

1. Go to the Application Menu (the Capitol Letter A).
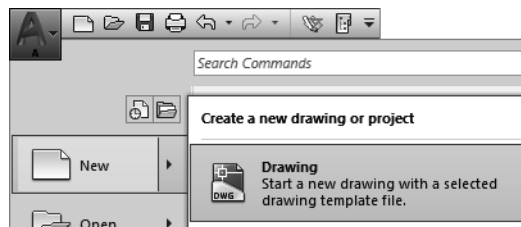
   Select **New→Drawing**.

2. Select the *Aec Model (Imperial Ctb)* template.

   Press **Open**.

   Note this template uses Architectural units.

3. Select the **Insert** ribbon.

   Select the **Attach** tool.

4. Browse to the folder where the exercises are stored.

   Change the Files of type to **All image files**.

5. Select the *floorplan1* file.

   Press **Open**.

6.

| Name: | floorplan1 | ∨ | Browse... |

Preview | **Path type** | **Scale**

Relative path ∨

☐ Specify on-screen

113.00000

Insertion point

☐ Specify on-screen

Rotation

☐ Specify on-screen

X: 0"
Y: 0"
Z: 0"

Angle: 0.00

Show Details | OK | Cancel | Help
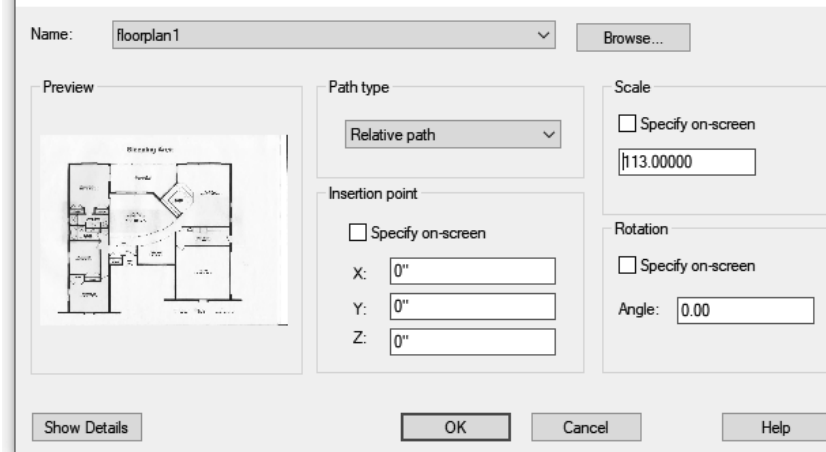
Uncheck the insertion point to insert the image at **0, 0, 0**.

Set the Scale to **113.00**.
Set the Angle to **0.0**.

Press **OK**.

7. Unsaved Layer State
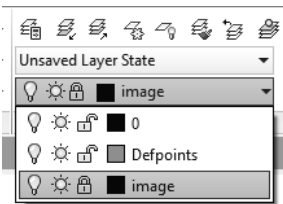
To prevent your image from moving around:

Create a new layer called image.
Select the image.
Right click and select Properties.
Assign the image to the image layer.
Lock the image layer.

8. Home   Insert

Wall ▾
Door ▾
Tools
Window
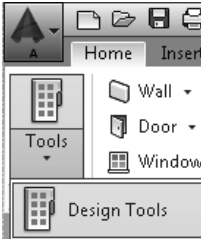
Design Tools

Open the Design Tools palette.
Select the Walls palette.

9. Stud-4 Rigid-.5 Air-1 Bric...

Locate the **Stud-4 Rigid 1.5 Air-1 Brick-4** wall style.

10.
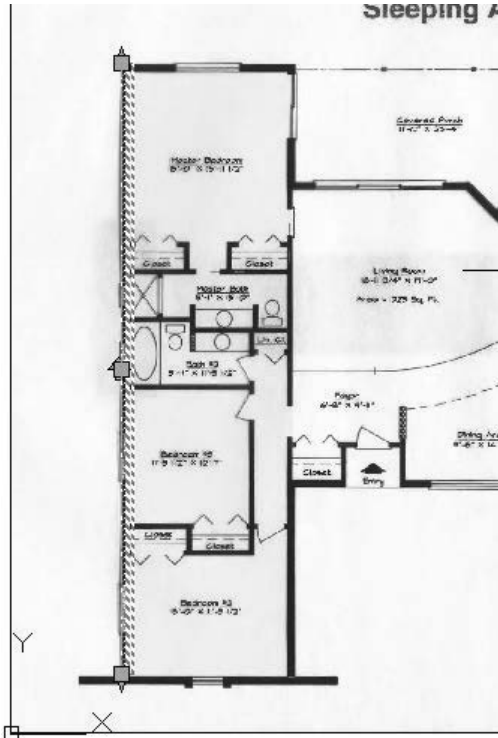
Draw a wall on the far left side of the floor plan, tracing over the wall shown in the image file.

Orient the wall so the exterior side of the wall is on the outside of the building.

11.
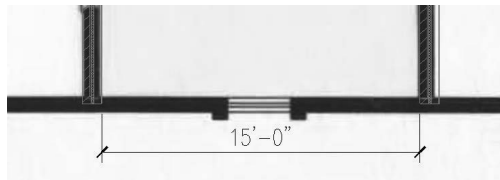
Offset the wall 15′ 11-1/8″ to the right.

The additional offset takes into account the wall thickness of 11-1/8".

Flip the wall orientation so the wall exterior is on the outside of the building.
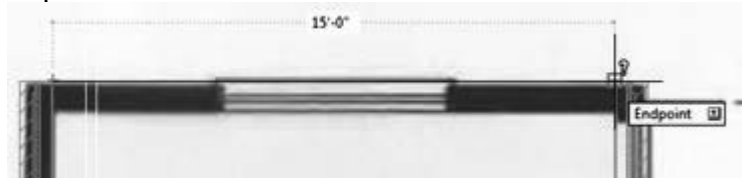
Check the offset distance to ensure the two walls are 15′ apart from inside finish face to inside finish face.

12. Trace a horizontal wall using the **Stud-4 Rigid 1.5 Air-1 Brick-4** wall style.
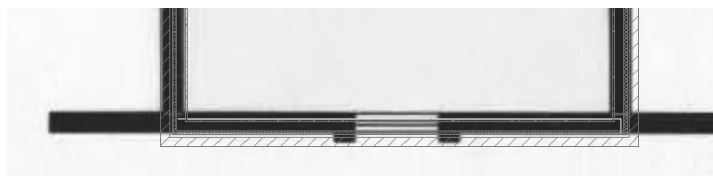
13.

Offset the horizontal wall 12′ 4.625″. *This is 11' 5 1/2" plus 11 1/8".*

Verify that the distance from finish face to finish face is 11' 5 ½″.

14.
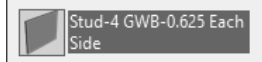
Locate the **Stud-4 GWB-0.625 Each Side** wall style on the Walls palette.

15. Right click and select **Apply Tool Properties to → Wall**.
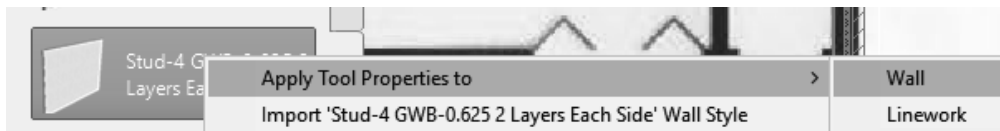
16.
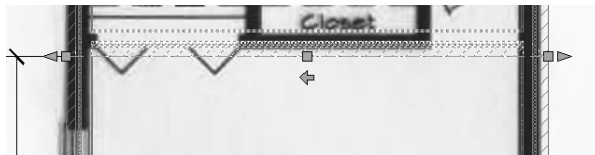
Select the upper horizontal wall.

Press **ENTER**.

17.
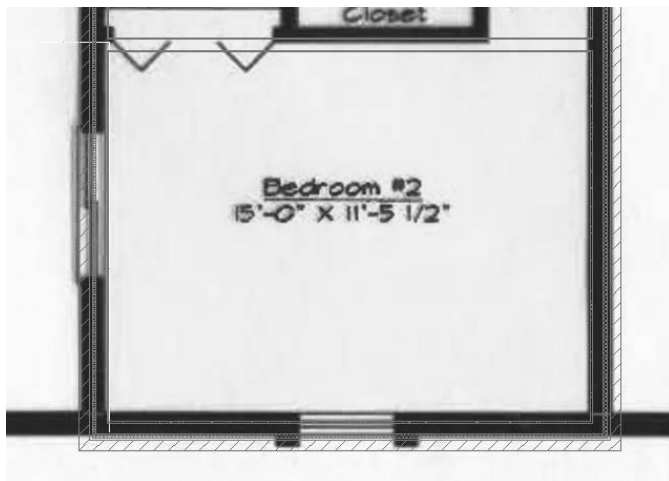
The wall style will update.

18.

Place a **Stud-4 Rigid 1.5 Air-1 Brick-4** wall at the top horizontal location of the Master Bedroom.

Verify that the orientation is for the exterior side of the wall outside the building.

19.

Use the FILLET command to create corners between the vertical and horizontal walls.

Type FILLET and select the horizontal wall, then select a vertical wall. Repeat for the other side.

20.
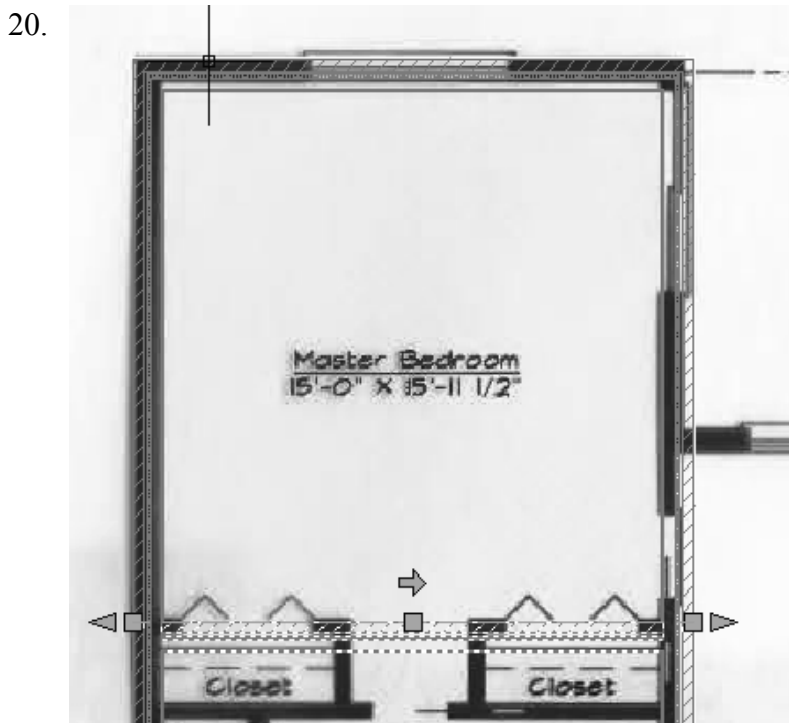
Offset the top horizontal wall 16′ 10.625″.

21.
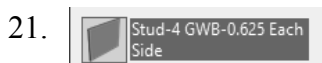
Locate the **Stud-4 GWB-0.625 Each Side** wall style on the palette.

22. Right click and select **Apply Tool Properties to → Wall**.
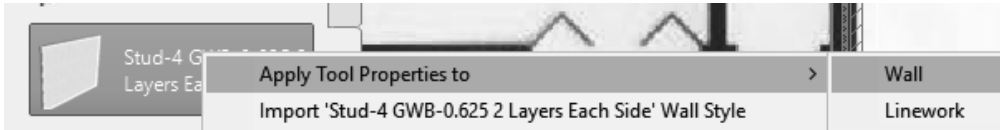
23.
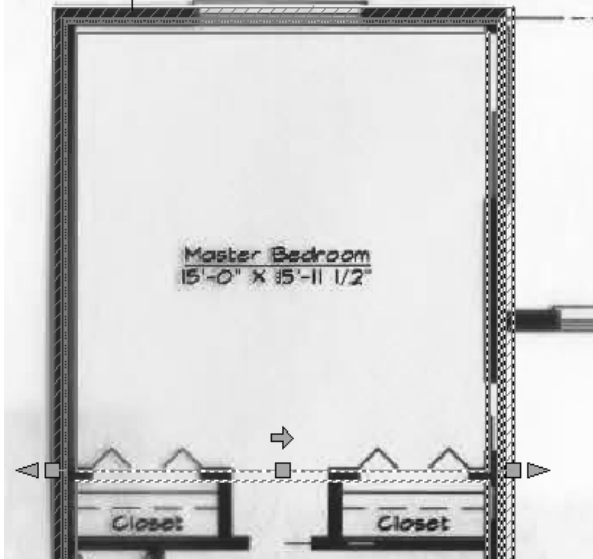
Select the lower horizontal wall.

Press **ENTER**.

24.

Offset the left vertical exterior wall **12′ 4.625″**.

Change the offset wall to the interior **Stud-4 GWB-0.625 Each Side** wall style using the **Apply Tool Properties to → Wall**.

25.
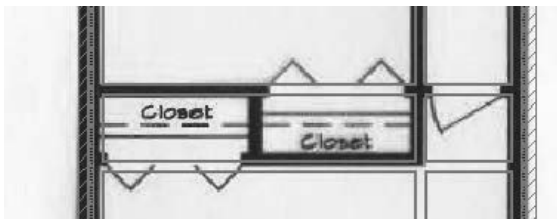
Use an offset of 2′ 0″ to create the closet space.

26.
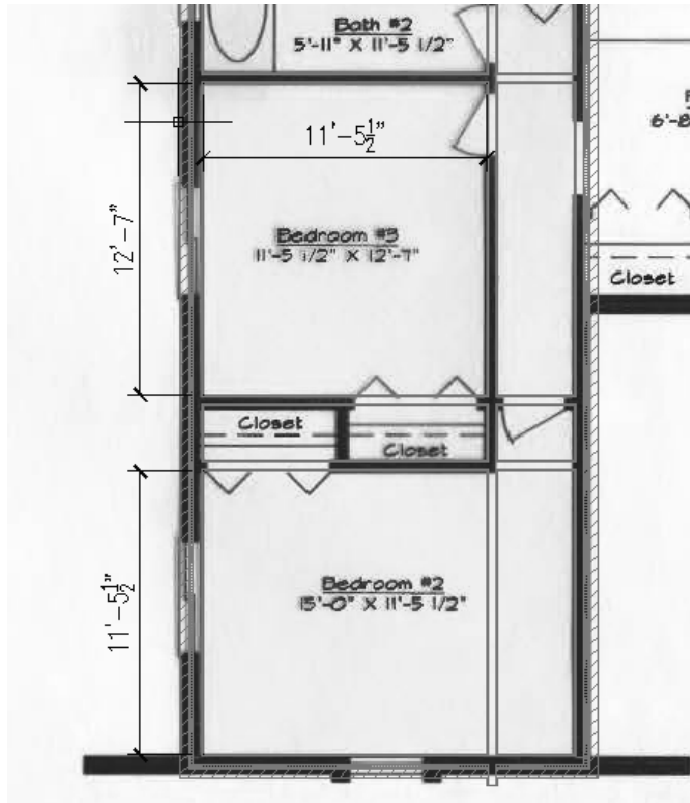
Adjust the position of the walls as needed to ensure they match the floor plan image.

27. Stud-4 Rigid-1.5 Air-1 Brick-4
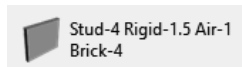
Select the **Stud-4 Rigid 1.5 Air-1 Brick-4** wall tool from the Design Tools palette.

28.
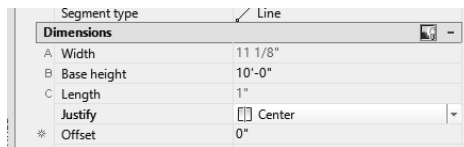
On the Properties palette, set the Justify option to **Center**.

29. Trace the remaining south walls of the floor plan.

30.
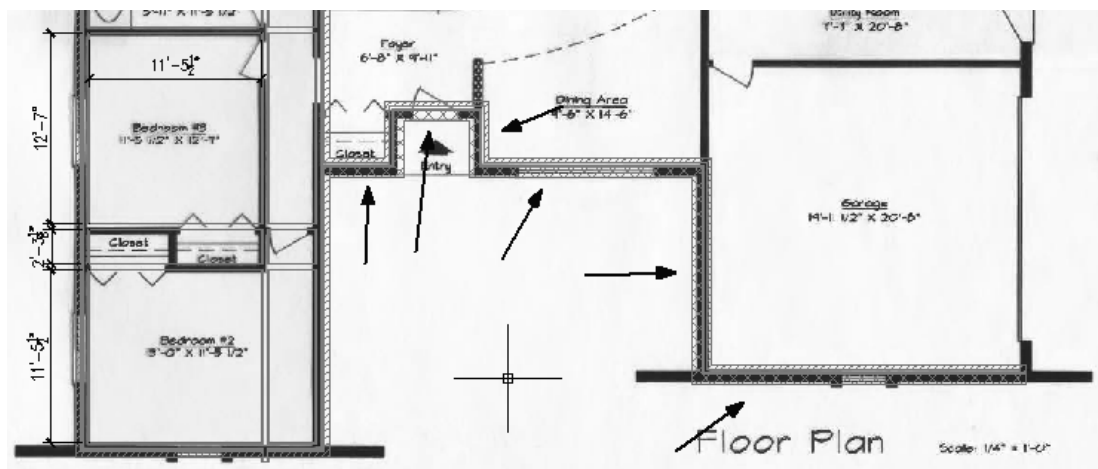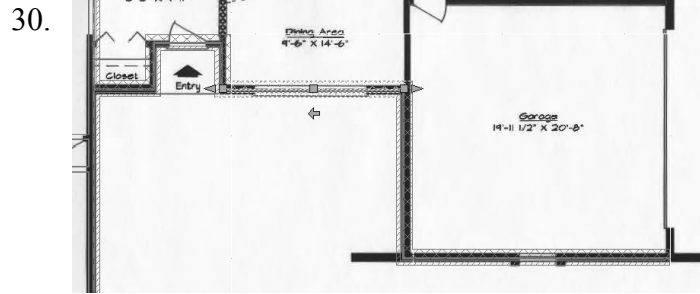
Use the flip arrows to orient the exterior side of the walls to the outside of the building.

31.
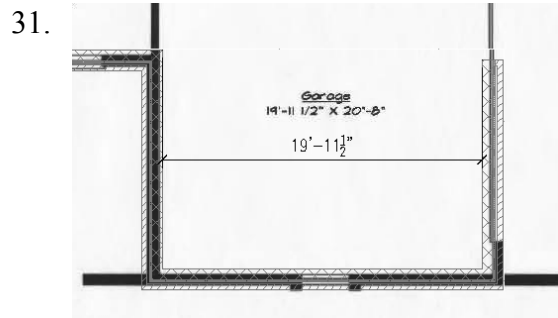
Offset the left garage wall 21′ 3″.

Verify that the dimension from face to face of the interior side of the walls is 19′ 11 ½″.

32.
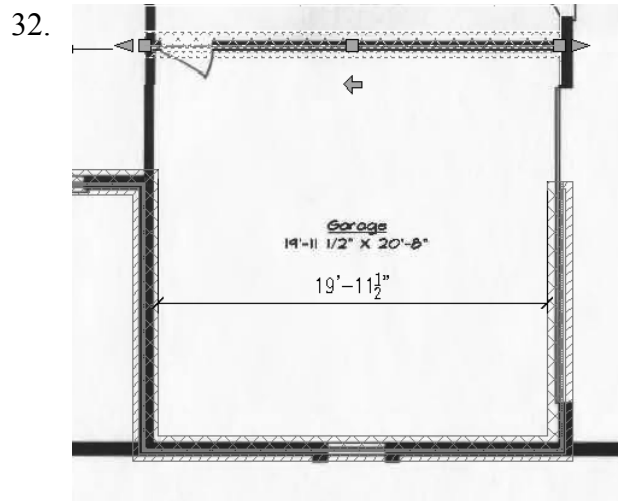
Offset the south garage wall 20′ 8″.

33.

	Browse...
Style	Stud-4 GWB-0.625 2 Layers Ea... ▾
Bound spaces	Standard
Cleanup automatically	Stud-4 GWB-0.625 2 Layers Each Side
Cleanup group definition	Stud-4 Rigid-1.5 Air-1 Brick-4
Segment type	Line
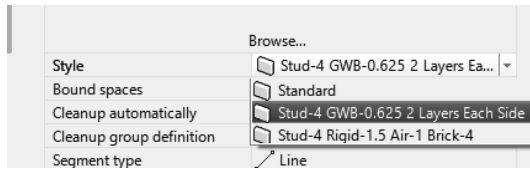
Select the north garage wall.

In the Properties palette:
Change the wall style to **Stud-2.5 GWB-0.625 Each Side**.

34.
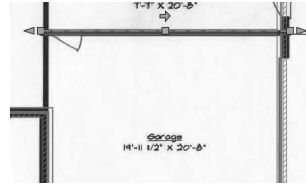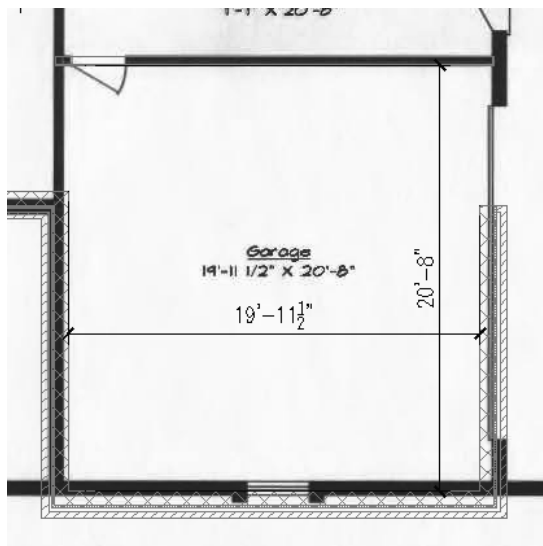
Adjust the position of the garage walls so the distance from interior face to interior face north-south is 20′ 8″ and the distance from interior face to interior face west-east is 19′ 11½″.

35.
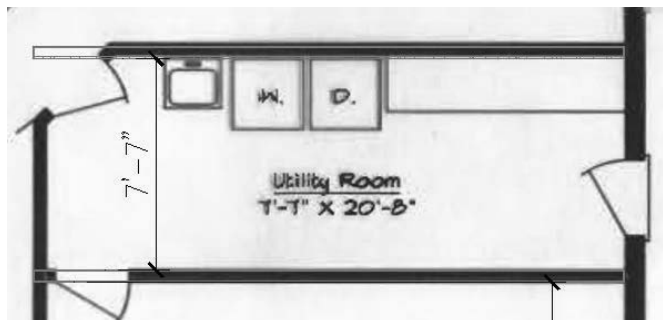
Offset the south utility room wall up 8′ ¼″.

Verify that the distance from interior face to interior face is 7′ 7″.

36.
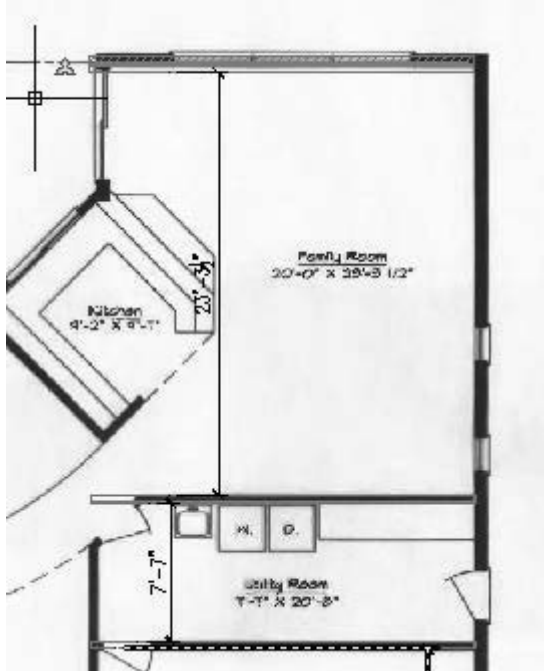
Offset the north utility wall 23′ 9.1325″.

Assign the top wall to the **Stud-4 Rigid 1.5 Air-1 Brick-4** wall style.

Verify that the distance from interior face to interior face is 23′ 3½″.

37.
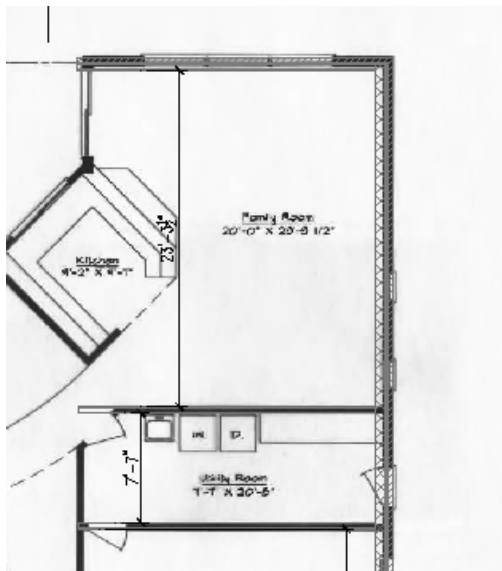
Use the FILLET command to create the northeast corner of the building.

38.
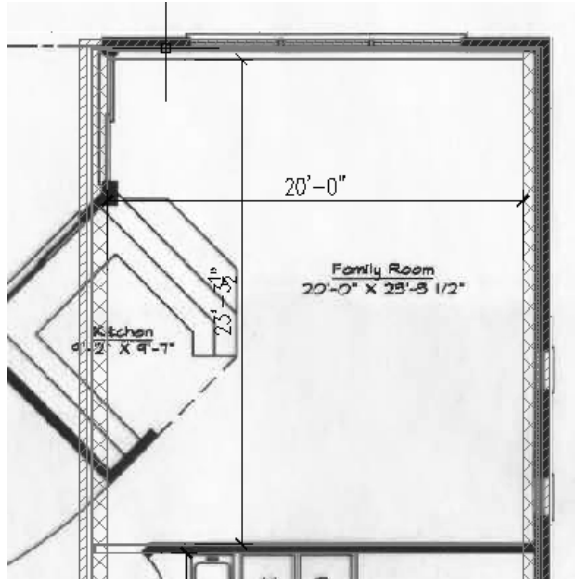
Place the west family room wall.

Verify that the distance from interior face to interior face is 20′ 0″.

39.
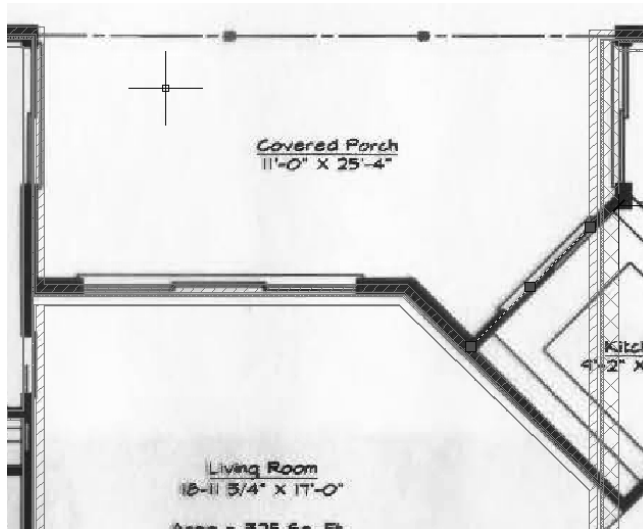
Trace over the floor plan to place the walls for the covered porch.

40.
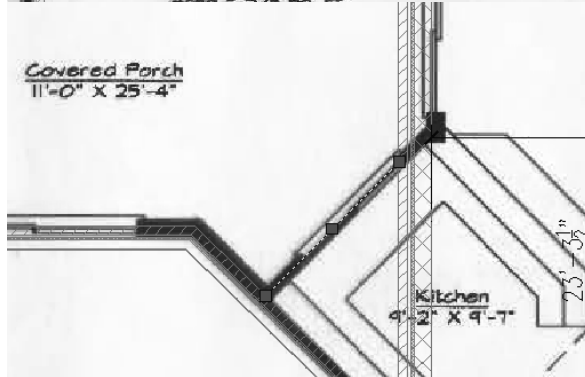
Draw a line at a 45° angle to designate the wall for the kitchen.

41. Locate the **Stud-3.5 Rigid 1.5 Air-1 Brick-4 Wall** style.
Right click and **Apply Tool Properties to → Linework** and select the angled line.

Stud-4 Rigid-1.5 Air-1
Bric

Apply Tool Properties to   ▶   Wall
Re-import 'Stud-4 Rigid-1.5 Air-1 Brick-4' Wall Style   Linework
Wall Styles...
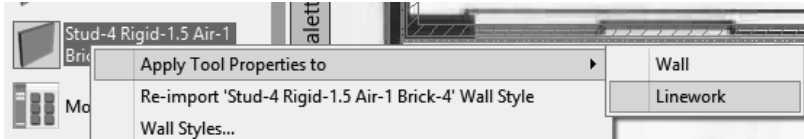
42.   Use the BREAK tool to divide the walls that need to be split into the two different styles.

43.   The walls indicated should be broken using the BREAK tool so one segment can remain exterior and one segment can be changed to the interior wall style.
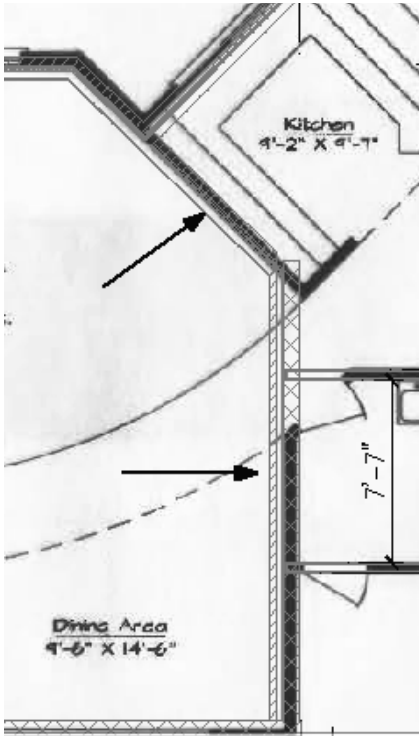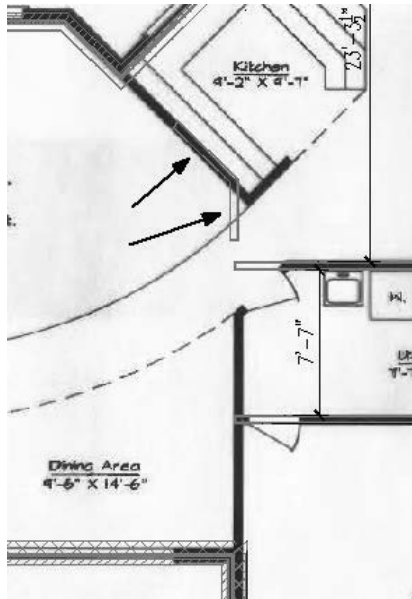
44. Change the interior wall segments to the interior wall style.
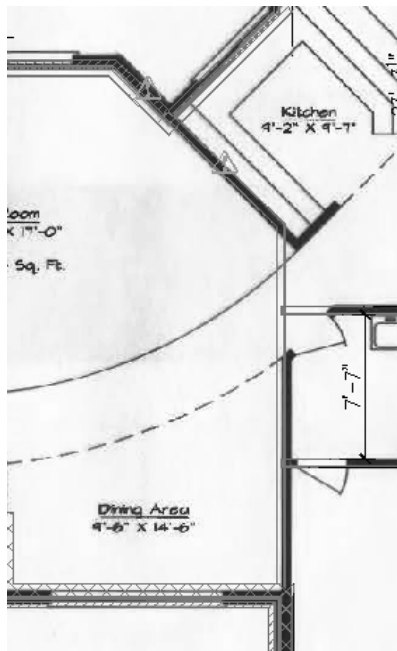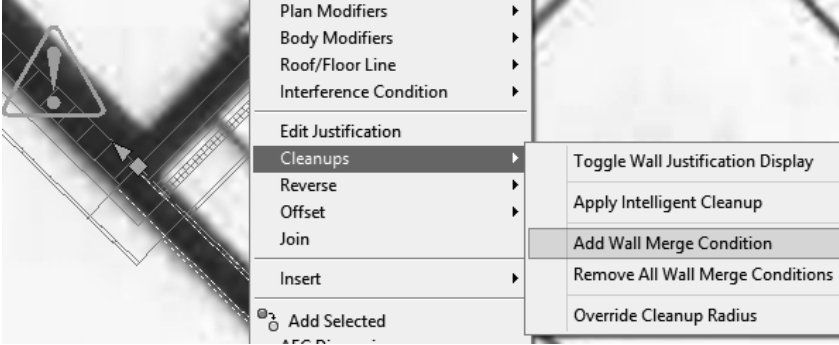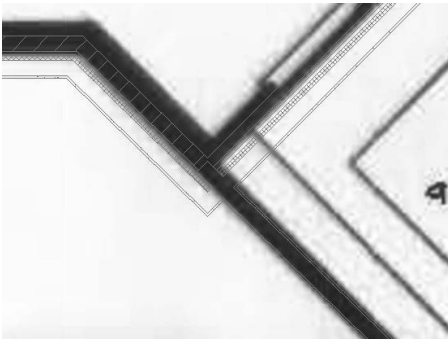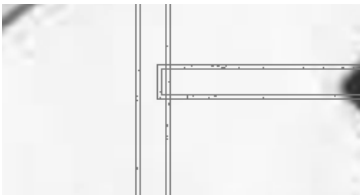
45. Use the EXTEND tool to extend the interior walls.
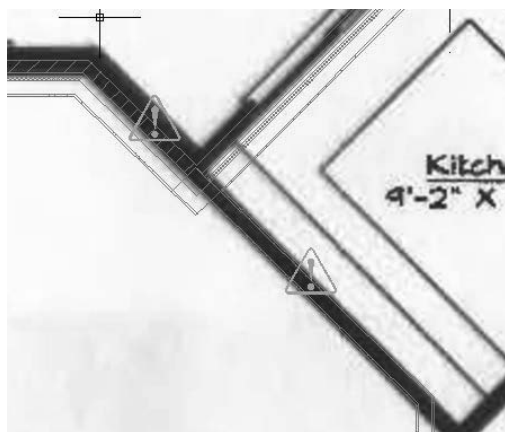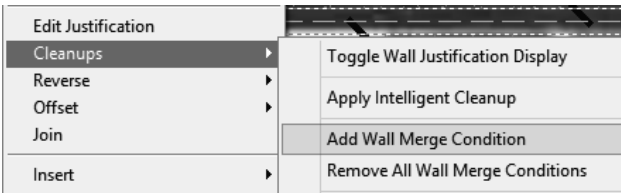
A triangle symbol with an exclamation point indicates that you have a wall interference condition – usually a wall on top of a wall.
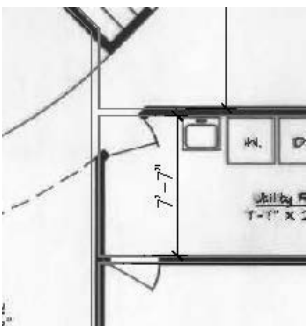
46.

Select the interior wall with the interference condition.
Right click and select **Cleanups → Add Wall Merge Condition**.

47.

Select the two exterior walls where it is interfering.

The walls will merge and clean up the intersection area.

48.

Zoom into the area near the utility room and notice some of the walls may need to be cleaned up as well.

49.

Select one of the interior walls.
Right click and select **Cleanups → Add Wall Merge Condition**.

50.

Select both walls.

The wall intersection cleans up.

51.

Repeat for the south utility wall.

52.
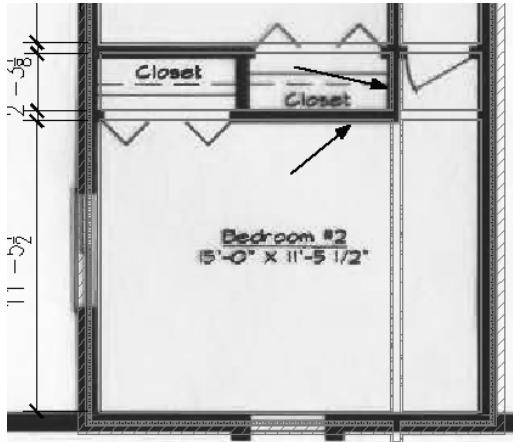
Zoom into the Bedroom #2 area.

Use FILLET to eliminate the extra interior walls. Select the walls at the locations indicated to clean up the room.

53.
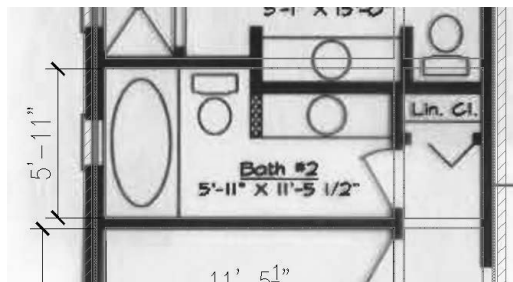
Offset the south bathroom wall 6′ 4.25″.

Verify that the distance from interior face to interior face is 5′ 11″.

54.
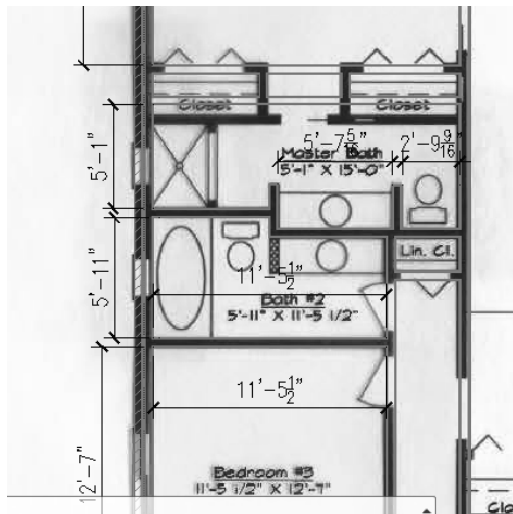
Add the interior walls for the lavatory areas.
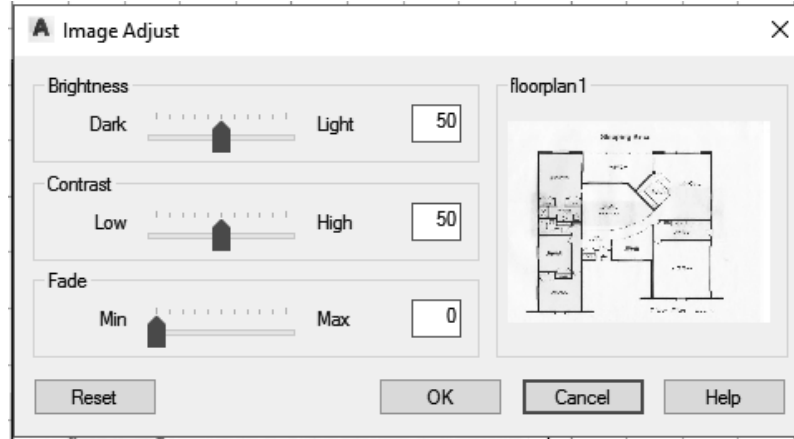
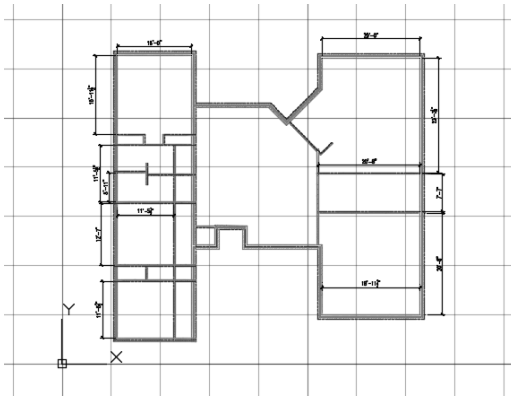Use the wall style **Stud-4 GWB-0.625 Each Side**.

55.

Unlock the image layer.
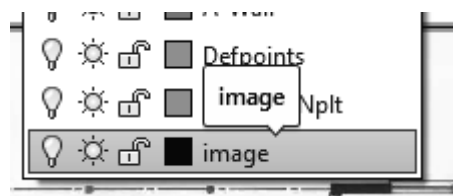
Select the image.
Right click and select Image→Adjust.

56. You can adjust how much of the image you see so it doesn't interfere with your work.

Alternatively, you can freeze the image layer or change the transparency of the layer.

57.

You should have a completed floor plan.

Save as *ex3-6.dwg*.

Exercise 3-7:
Adding Doors

Drawing Name: Ex3-6.dwg
Estimated Time: 45 minutes
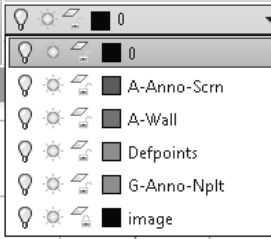
This exercise reinforces the following skills:

❑ Adding Doors
❑ Door Properties

1. Open *ex3-6.dwg*.

2. Right click on the Command prompt and select **Options.**

3. Activate the **Profiles** tab.
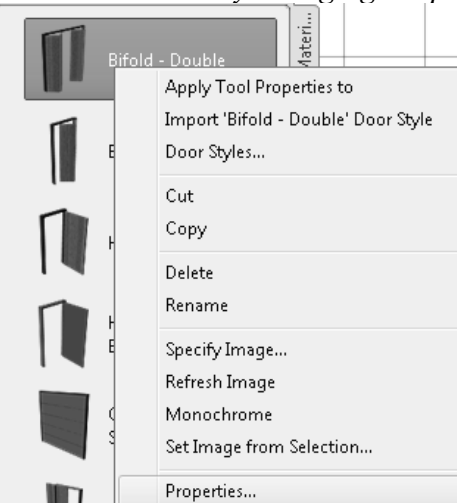
Set the AutoCAD Architecture (US Imperial) profile as current.
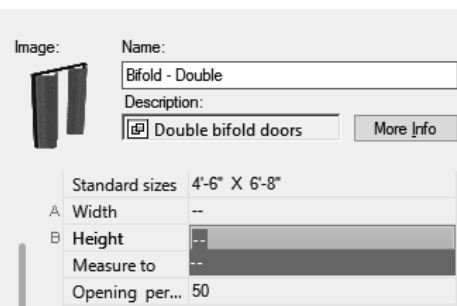
4. Thaw the image layer so you can see where doors are located if you froze that layer or adjust the image so you can see the door locations.

5. Open the Design Tools palette.

6. Locate the **Bifold-Double** door on the Doors tab on the Tools palette.

By changing the profile, more palettes are now available for you.

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

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

Set the Opening percent to **50**.

If you left click in the Standard sizes 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.

9.

| Location		▲
✳	Relative to grid	--
✳	Position along wall	Offset/Center ˅
✳	Automatic offset	6"
✳	Justification	--
	Vertical alignment	--
	Head height	--
	Threshold height	--

Expand the **Location** section.

Set Position along wall to **Offset/Center**.
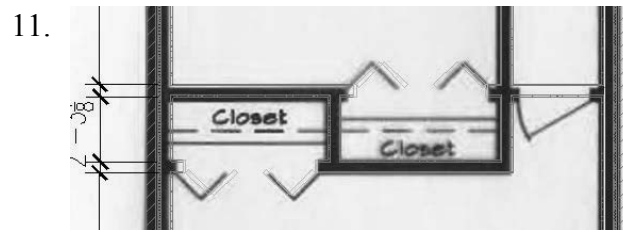This will allow the user to snap to the center
position along the wall.

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

10. Place the Bifold - Double doors at the
two closets.

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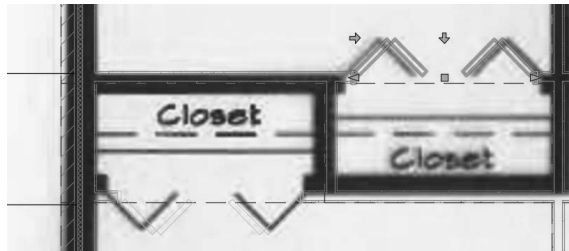
In both cases, you want to select the outside face of the wall.
Center the closet door on each wall.

11. Place the **Bifold - Double** door at each
of the closets located in Bedroom #2
and Bedroom #3.
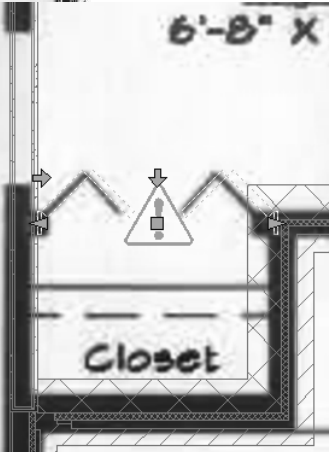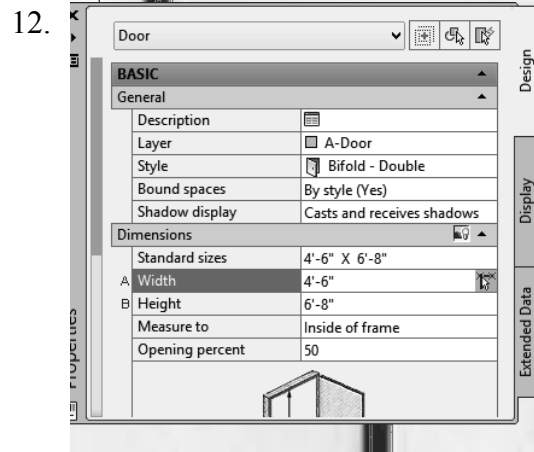
12. Place the **Bifold -
Double** door at the
closet next to the
entry way.

*The exclamation
mark indicates that
the door is too wide
for the wall.*

13.

Dimensions		▲
	Standard sizes	4'-0" X 6'-8" (Custom Size)
A	Width	4'-0"
B	Height	6'-8"
	Measure to	Inside of frame
	Opening percent	50

Select the door.

In the Properties palette,
change the width of the Bifold - Double door
to **4′ 0″**.
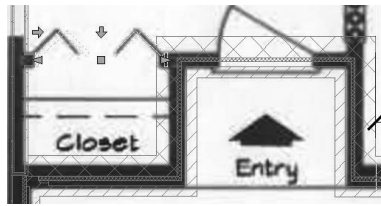
The door updates and the warning symbol disappears.

The door now fits.

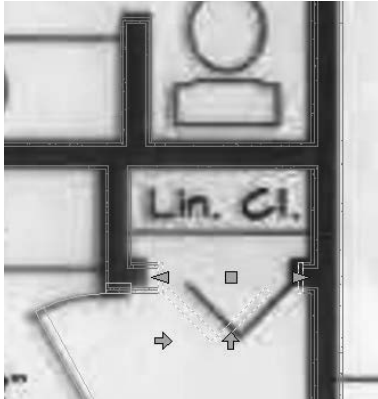14. Bifold - Single   Locate the **Bifold - Single** door on the Doors tab of the Design Tools palette.

15.

In the Properties palette:

Set the door to use the Standard Size
2′ 4″ x 6′ 8″.
Set the Opening percent to **50**.
Press **OK** to close the Properties palette.

16.

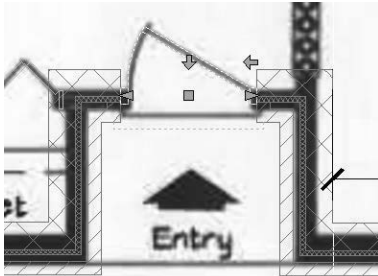Place the door in the Linen Closet near the lavatories.

17. Hinged - Single - Exterior   Locate the **Hinged - Single - Exterior** door on the Doors tab of the Design Tools palette.

18.

A	Width	3'-0"
B	Height	6'-8"
	Measure to	--
	Swing angle	30

In the Properties palette,
set the door to use the size
3′ 0″ x 6′ 8″.

Set the Swing angle to **30**.

19.

Select the side of the wall that will be used for the door swing and place the entry door.

20. Hinged - Single   Locate the **Hinged - Single** door on the Doors tab of the Design Tools palette.

21.

A	Width	2'-6"
B	Height	6'-8"
	Measure to	--
	Swing angle	30

In the Properties palette,
set the door to use the size
2′ 6″ x 6′ 8″.

Set the Swing angle to **30**.

22.

✳	Relative to grid	--
✳	Position along wall	Offset/Center
✳	Automatic offset	4 7/8"
✳	Justification	--
	Vertical alignment	--

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

23.
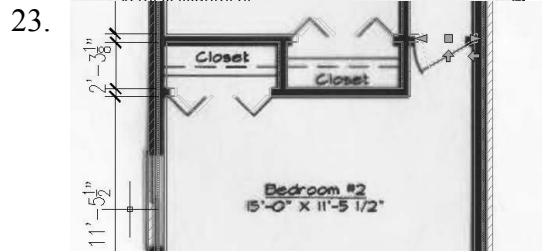
Place the door in Bedroom #2.

24.
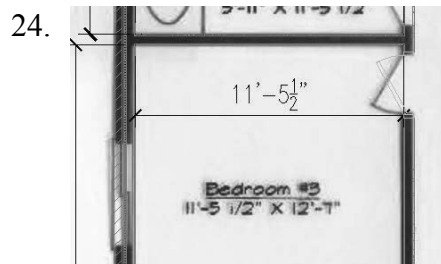
Place the door in Bedroom #3.

The swing is on the correct side but not the correct direction.

25.
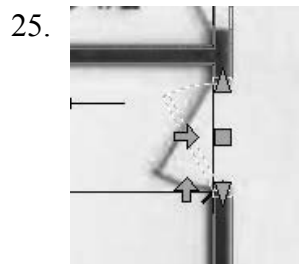
Select the door so it highlights.

The horizontal arrow flips the orientation of the door to the other side of the wall.

The vertical arrow flips the orientation of the door swing.

Left click on the vertical arrow.
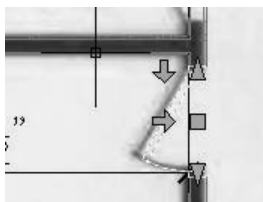
The door updates to match the floor plan image.

26.

Place a **Hinged - Single** door in Bath #2.
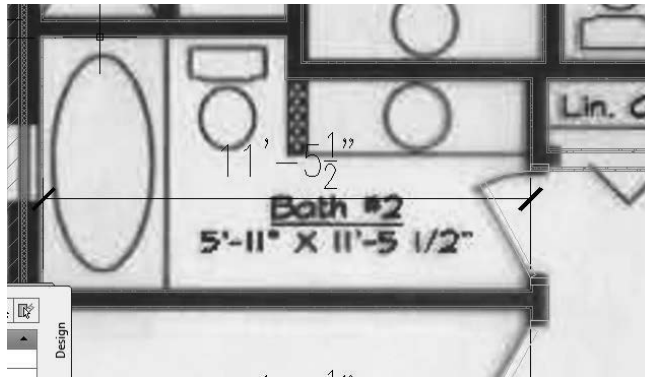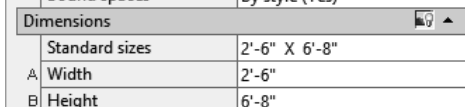
27.

Place a **Hinged - Single** door in the Utility Room.
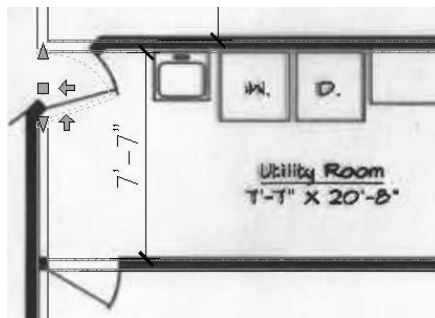
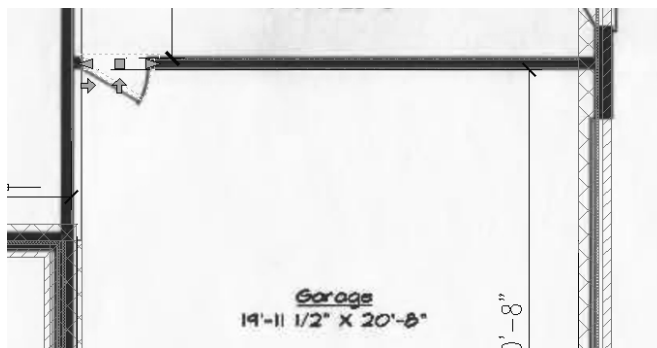Set the swing angle to **70**.

28.

Hinged - Single - Exterior

Locate the **Hinged - Single - Exterior** door on the Doors tab of the Design Tools palette.

29.

In the Properties palette,
set the door to use the Standard Size
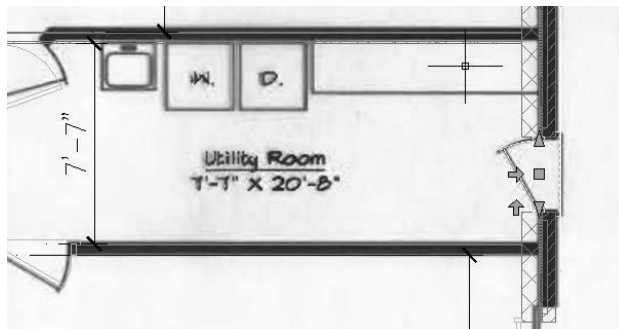**2′ 6″ x 6′ 8″**.

Set the Swing angle to **30**.

30.

Place the door between the Utility Room and the Garage.

31.

Place the door on the east wall of the Utility Room.

32. | Overhead - Sectional | Locate the **Overhead - Sectional** door on the Doors tab of the Design Tools palette.
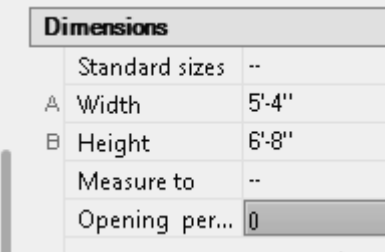
33.

Bound spaces	By style (Yes)
Dimensions	🔲 −
Standard sizes	16'-0" X 6'-8" (Custo...
A Width	16'-0"
B Height	6'-8"
Measure to	Inside of frame
Opening percent	0

In the Properties palette, set the door to use the Size **16′ 0″ x 6′ 8″**.

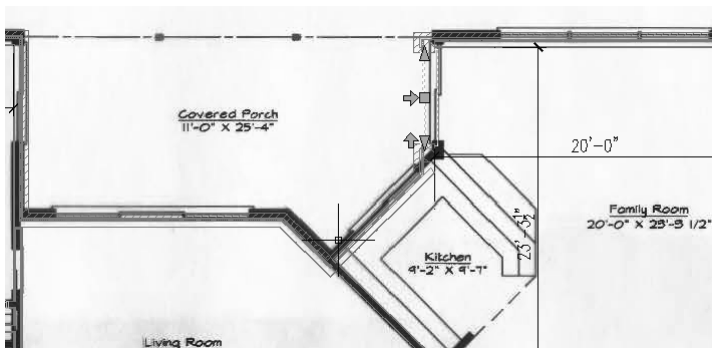Set the Opening percent to **0**.

34.

Place the garage door.
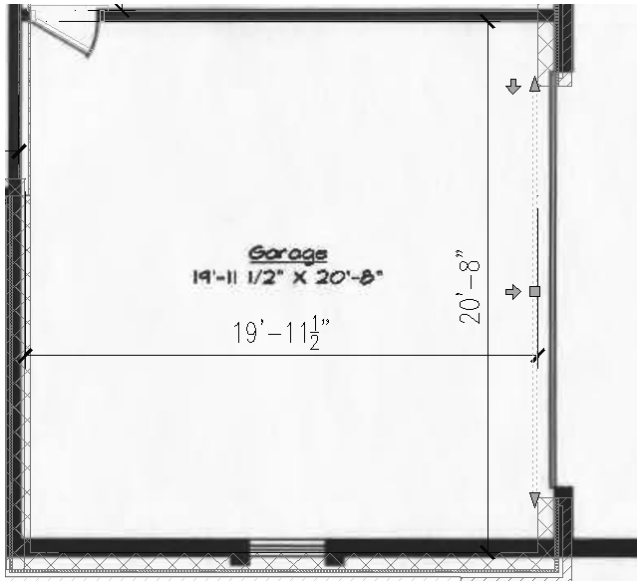
35. | Sliding - Double - Full Lite | Locate the **Sliding - Double - Full Lite** door on the Doors tab of the Design Tools palette.

36.

Dimensions	
Standard sizes	--
A Width	5'-4"
B Height	6'-8"
Measure to	--
Opening per...	0

In the Properties palette, set the door to use the Standard Size **5′ 4″ x 6′ 8″**.

Set the Opening percent to **0**.

37.

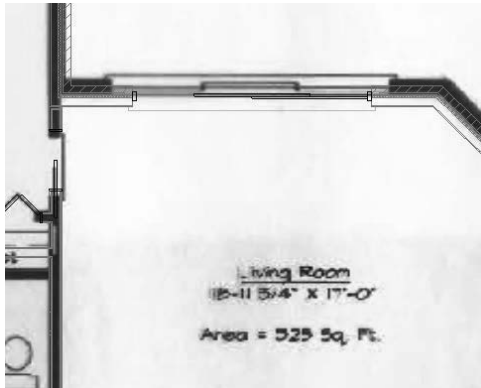Place the door in the family room.

38.
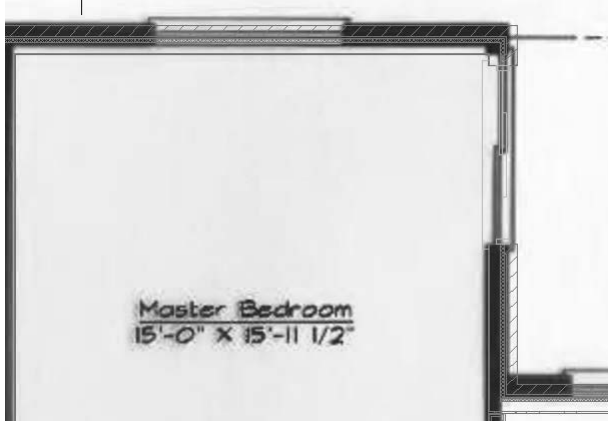
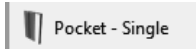Place a second **Sliding - Double - Full Lite** door on the east wall of the Master Bedroom.

39.

Set the door to use the size
10′ 0″ x 6′ 8″.
Set the Opening Percent to **50**.

40.

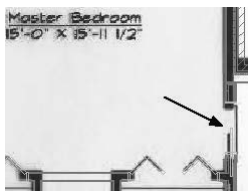
Center the door on the north wall of the Living Room.

41. | Pocket - Single

Locate the **Pocket - Single** door on the Doors tab of the Design Tools palette.

42.

In the Properties palette,
set the door to use the size:
2′ 6″ x 6′ 8″.

Set the Opening percent to **50**.

43.

Place the door in the lower right corner of the Master Bedroom.

44.

Dimensions	
Standard sizes	2'-4" X 6'-8"
A Width	2'-4"
B Height	6'-8"
Measure to	Inside of frame
Opening percent	50

In the Properties palette,
set the door to use the Standard Size **2′ 4″ x 6′ 8″**.

Set the Opening percent to **50**.
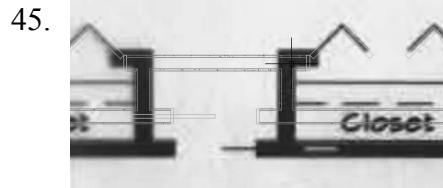
45. Center the pocket door on the lower horizontal wall between the Master Bedroom closets.
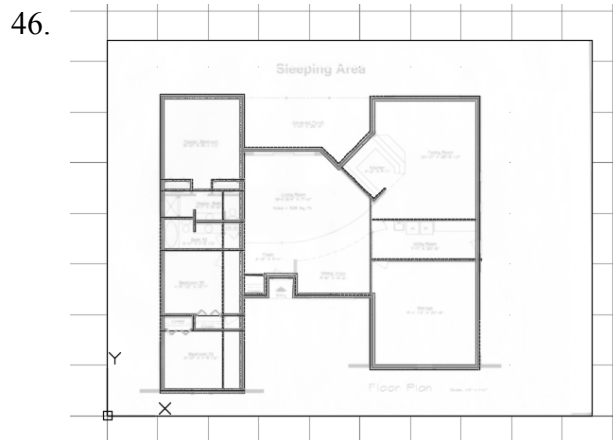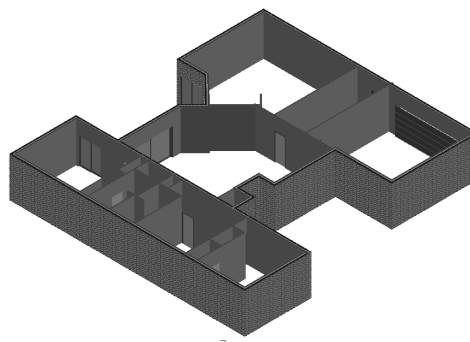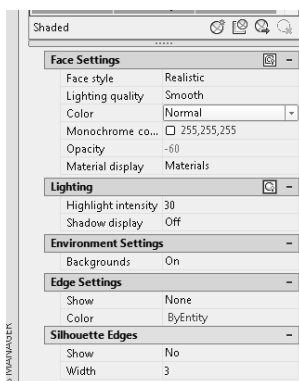
46. Image layer is adjusted to be faded. Dimensions were moved to a layer named A-Anno-Dim and then frozen.

This is the floor plan so far.

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

Switch to an isometric view and you will see that your model is 3D.

Look at the model using different visual styles. Which style do you like best?
The model shown uses a Shaded visual style as defined by the dialog shown.

Exercise 3-8:
Create an Arched Opening Tool

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

This exercise reinforces the following skills:
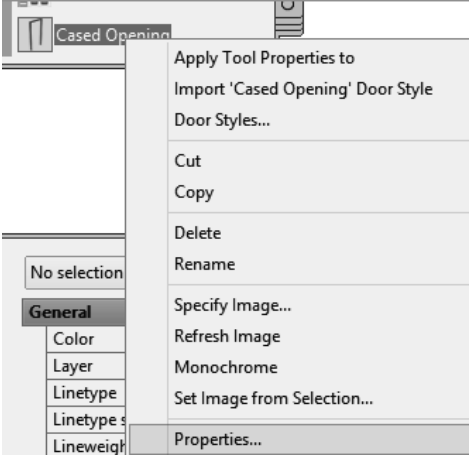
❑ Copying Tools
❑ Tool Properties

1. ⬚   Open *ex3-7.dwg*.

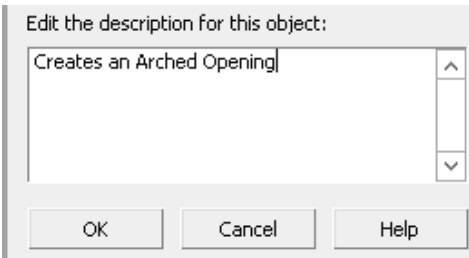2. ⬚ Cased Opening   Locate the **Cased Opening** tool on the Doors palette.
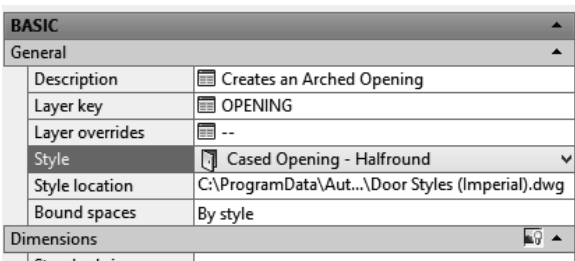
3.   Right click and select **Copy**.

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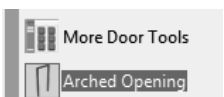Right click and select **Paste**.

5.

The copied tool is located at the bottom of the palette.

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

6.

Change the Name to **Arched Opening**.
Change the Description to **Arched Opening**.
Press **OK**.

7.

Expand the General section.
Set the Description to **Creates an Arched Opening**.
Press **OK**.

8.

Set the Layer key to **OPENING**.
Set the Style to **Cased Opening-Half round**.

Press **OK**.

 The tool is defined in the palette.

9. Save as *ex3-8.dwg*.

Adding an Opening

Drawing Name: ex3-8.dwg
Estimated Time: 15 minutes

This exercise reinforces the following skills:

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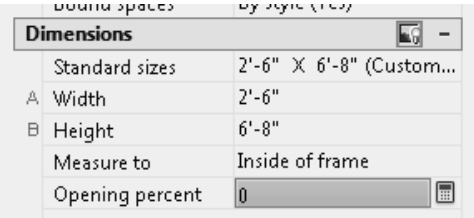- ❑ Copying Tools
- ❑ Set Image from Selection

Openings can be any size and elevation. They can be applied to a wall or be freestanding. The Add Opening Properties allow the user to either select a Pre-defined shape for the opening or use a custom shape.
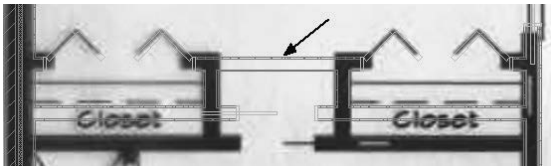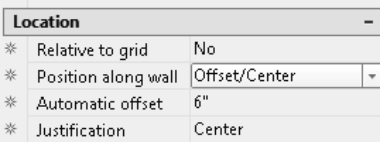
 An opening will be added to the upper wall between the Master Bedroom closets.
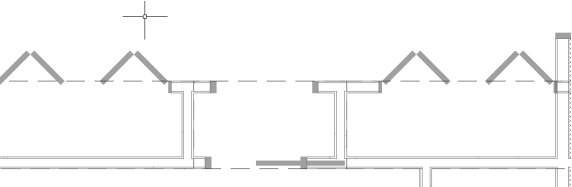
1.   Open *ex3-8.dwg*.
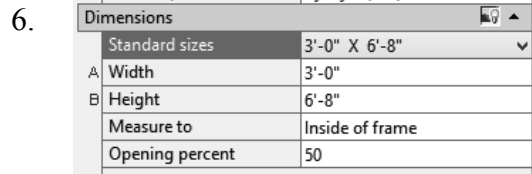
2.   Select the **Arched Opening** tool.

3.   In the Properties palette, set the door to use the size **2′ 6″ x 6′ 8″**.

4.   Expand the Location section in the Properties palette.
Set the Position along wall to **Offset/Center**.
Set the Automatic offset to **6″ [300.00]**.

5.   Place the arched opening in the wall between the closets in the Master Bedroom. Center it on the wall.

6.

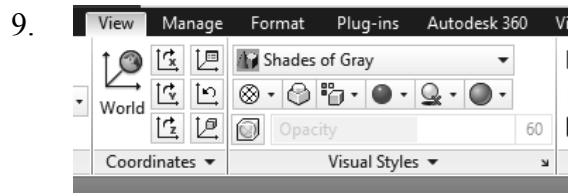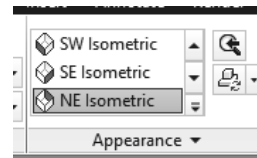| Dimensions		
Standard sizes	3'-0" X 6'-8"	
A Width	3'-0"	
B Height	6'-8"	
Measure to	Inside of frame	
Opening percent	50	

In the Properties palette, set the door to use the size **3′ 0″ x 6′ 8″**.

7.
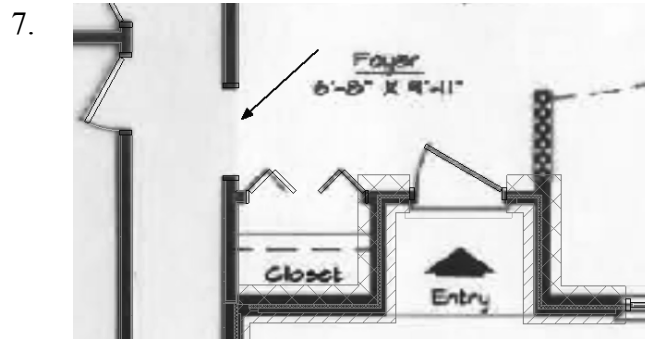
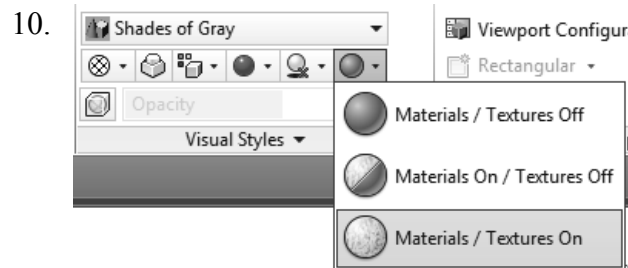Place the Arched Opening on the left side of the Foyer above the Entry.

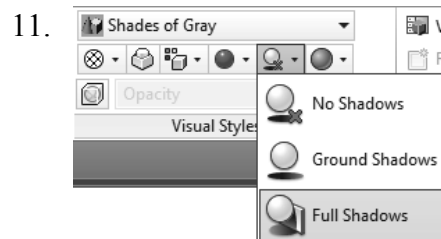8. Use the View tools on the View ribbon **View → NE Isometric** and **3D orbit** to view the arched opening.

9. On the View ribbon,

Switch to a **Shades of Gray** display.

If your walls are reversed, you can change the orientation in the plan/top view.
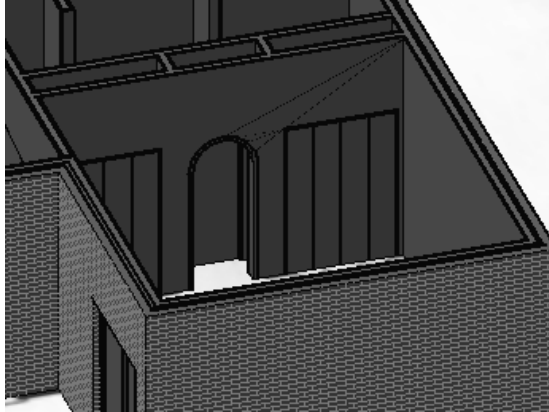
10. Set the **Materials/Textures On**.

11. Set to **Full Shadows**.

Note how the display changes.

When materials, textures, and shadows are enabled, more memory resources are used.
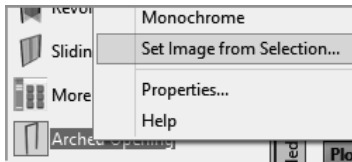
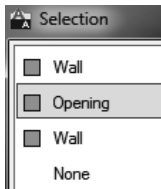12.   Locate the Arched Opening placed in the Master Bedroom.

13.   Select the **Arched Opening** icon on the tool palette.
     Right click and select **Set Image from Selection…**
     Pick the arched opening you created.
     Press **Enter**.

A dialog box allows you to choose which object to use for the image selection.

 If you have Selection Cycling enabled, you will see a selection dialog box.

 Select **Opening**.

Press **Enter**.

You can select more than one object for your image selection.

 The tool icon updates with the new image.

14. Select the Work tab to view your model.

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

Exercise 3-10:
Add Window Assemblies
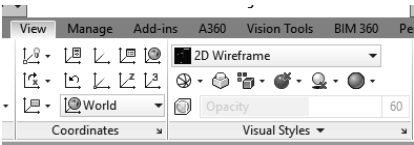
Drawing Name: ex3-9.dwg
Estimated Time: 30 minutes

This exercise reinforces the following skills:

❑   Add Windows

1.   Open ex3-10.*dwg*.

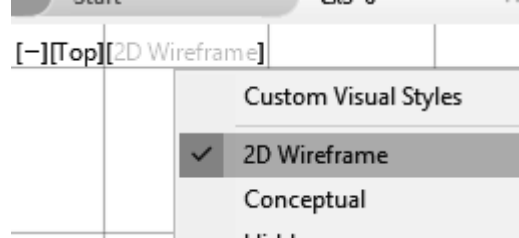   Switch to a Top View.
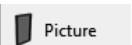
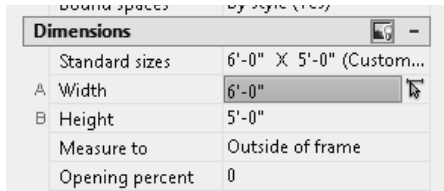2.   Set the View style to **2D Wireframe**.

Remember you can change the view settings in the upper left corner of the display window.

3.   Activate the **Design Tools** from the Home ribbon, if they are not launched.

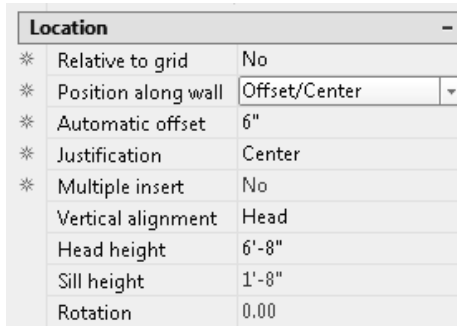4.   Select the Windows tab of the Tool palette.

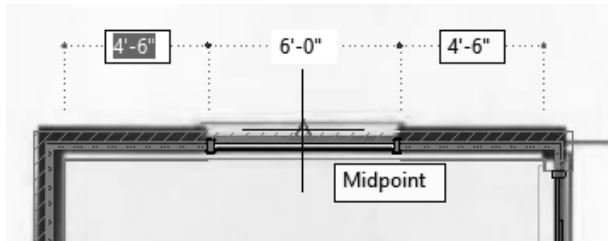5.   Select the **Picture** window.

6.

Dimensions		🖼 –
Standard sizes	6'-0" X 5'-0" (Custom...	
A Width	6'-0"	⍂
B Height	5'-0"	
Measure to	Outside of frame	
Opening percent	0	

Expand the Dimensions section.
Set the size to **6′-0″ x 5′-0″**.

7.

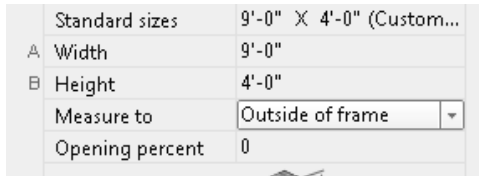| Location		–
✳ Relative to grid	No	
✳ Position along wall	Offset/Center	▾
✳ Automatic offset	6"	
✳ Justification	Center	
✳ Multiple insert	No	
Vertical alignment	Head	
Head height	6'-8"	
Sill height	1'-8"	
Rotation	0.00	

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

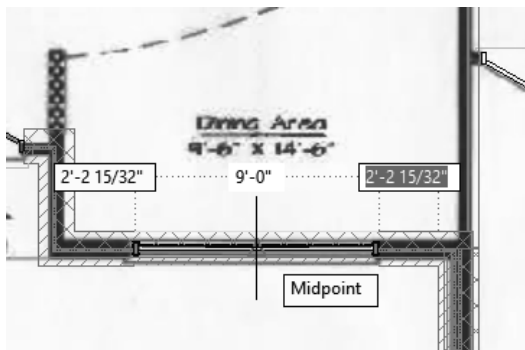8.

Select the midpoint of the north Master Bedroom wall.

9.

Standard sizes	9'-0" X 4'-0" (Custom...	
A Width	9'-0"	
B Height	4'-0"	
Measure to	Outside of frame	▾
Opening percent	0	

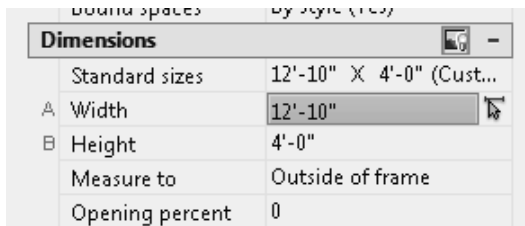On the Properties palette,
expand the Dimensions section.

Change the Width to **9′-0″**.
Change the Height to **4′-0″**.

10.

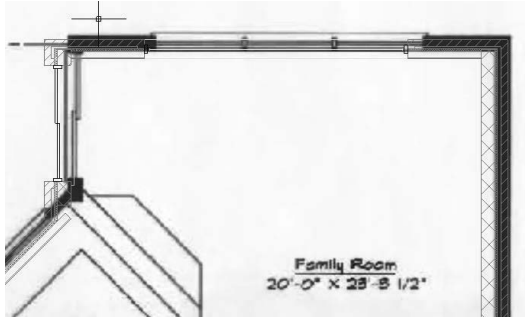Place the window at the midpoint of the south wall in the Dining Area.

11.

Dimensions		🖼 –
Standard sizes	12'-10" X 4'-0" (Cust...	
A Width	12'-10"	⍂
B Height	4'-0"	
Measure to	Outside of frame	
Opening percent	0	

On the Properties palette,
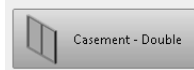expand the Dimensions section.

Change the Width to **12′-10″**.
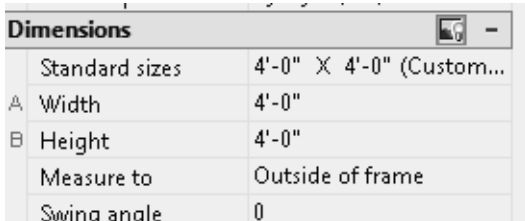Change the Height to **4′-0″**.

12.

Place the window at the midpoint of the north wall for the Family Room.

13.

Select the **Casement - Double** window on the Windows palette.

14.

Dimensions		
Standard sizes	4'-0" X 4'-0" (Custom...	
A Width	4'-0"	
B Height	4'-0"	
Measure to	Outside of frame	
Swing angle	0	

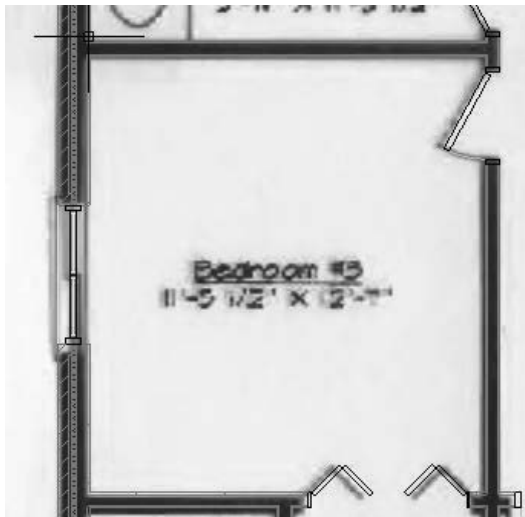On the Properties palette, expand the Dimensions section.

Change the Width to **4′-0″**.
Change the Height to **4′-0″**.

15.

Place the window in the west wall of Bedroom #2.

16.

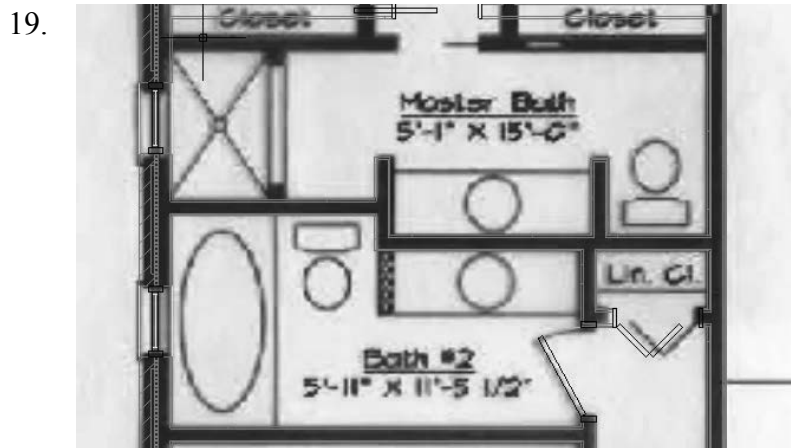Place the window in the west wall of Bedroom #3.

17. Select the **Casement** window.

18.
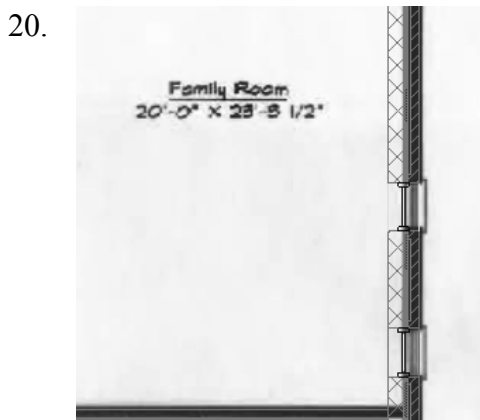
Bound spaces	By style (Yes)	
Dimensions		🔲 –
Standard sizes	2'-0" X 4'-0" (Custom...	
A Width	2'-0"	
B Height	4'-0"	▷
Measure to	Outside of frame	
Swing angle	0	

On the Properties palette,
expand the Dimensions section.

Change the Width to **2′-0″** .
Change the Height to **4′-0″**.

19. Place two windows on the west wall of the bathrooms.

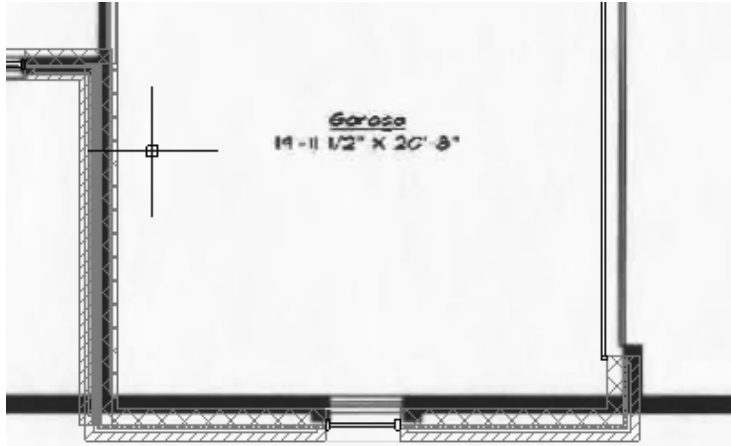20. Place two windows on the east wall of the Family Room.

21.

Dimensions		🔲 –
Standard sizes	3'-0" X 4'-0" (Custom...	
A Width	3'-0"	
B Height	4'-0"	▷
Measure to	Outside of frame	

On the Properties palette,
expand the Dimensions section.

Change the Width to **3′-0″** .
Change the Height to **4′-0″**.

22.

Place the window in the south wall of the Garage.

23.   Save as *ex3-10.dwg*.