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Autodesk®
AutoCAD® Architecture
2024 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 2024, 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 2024\enu\Tool Catalogs.

The floor plan is central to any architectural drawing.

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.

If you are using Projects to organize your model, it is recommended that exterior walls are placed on Shell Constructs and interior walls are placed on Interior Constructs.

Exercise 3-1:
Creating a Floor Plan

Drawing Name: 01 Core.dwg
Estimated Time: 45 minutes

This exercise reinforces the following skills:

- ❑ Create Walls
- ❑ Wall Properties
- ❑ Wall Styles
- ❑ Style Manager
- ❑ Insert a PDF
- ❑ Insert Doors
- ❑ Insert Windows
- ❑ Materials
- ❑ Content Browser
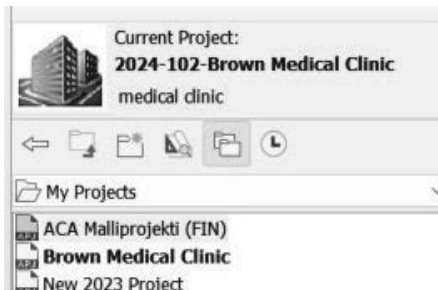
1. Launch the US Metric version of ACA.

   This ensures that all the content will be metric.

2. Open the Project Browser.

3. Set the **Brown Medical Clinic** Current.

   The Brown Medical Clinic project was created using a metric project template. Placeholders were automatically generated.

4.		Launch the Project Navigator.
		Switch to the Constructs tab.
		Highlight **01 Core**.
		Right click and select **Open**.
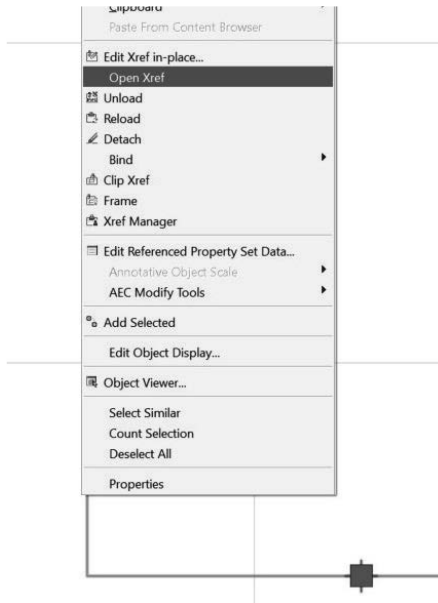
5.		*There is a rectangle in the drawing acting as a placeholder.*
		Select the rectangle.
		Right click and select **Open Xref**.

6.	Typical Toilet Room*	The external reference is an element called Typical Toilet Room.
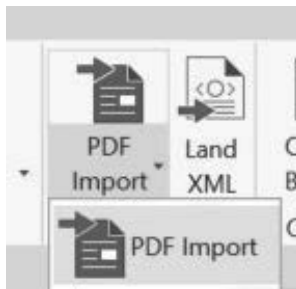
		Close the drawing.
7.		Switch to the Insert ribbon.
		Select **PDF Import**.

8.	File name: medical clinic-first floor	Locate the *medical clinic – first floor.pdf.*
	Files of type: PDF (*.pdf)	Click **Open**.
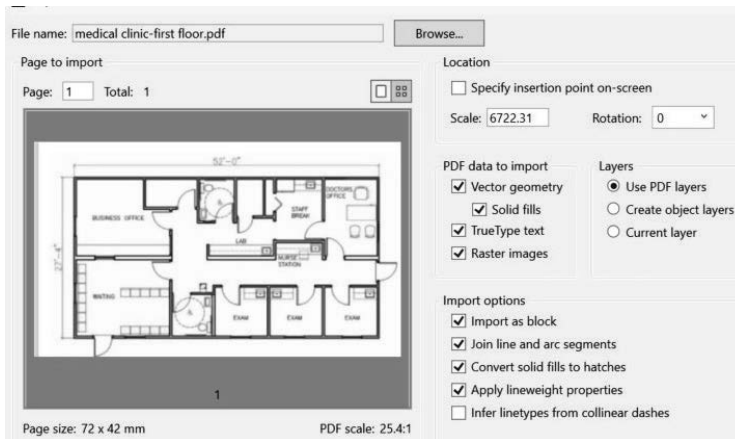
9. Disable **Specify insertion point**.
This will insert the PDF at 0,0,0
Set the Scale to **6722.31**.
This scales the PDF to the correct metric measurements.
Enable **Raster Images**.
Enable **Import as block**.
Click **OK**.

10.

Set the View Scale to **1:1**.

11.
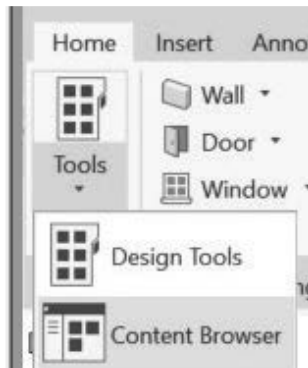
Launch the **Content Browser** from the Home ribbon.

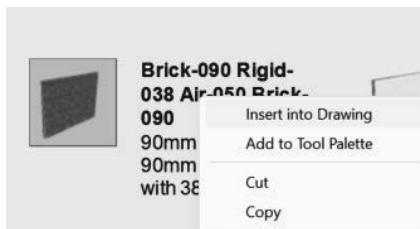12. Locate the **Design Tool Catalog -Metric**.
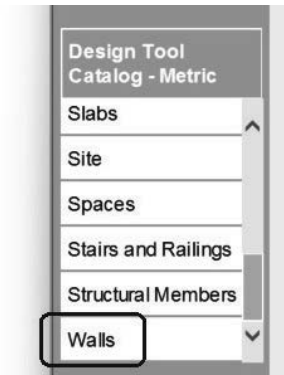
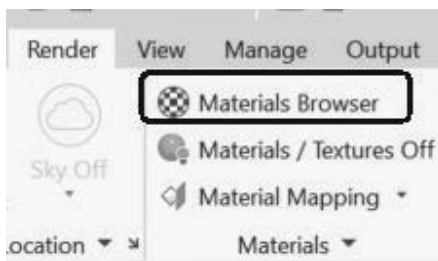13. Scroll down and select **Walls**.

14. Select **Brick**.

15. Locate the Brick-090 Rigid-038 Air-050 Brick-090.

Right click and select **Insert into Drawing**.

16. Go to the Render ribbon.

Select **Materials Browser**.

17.
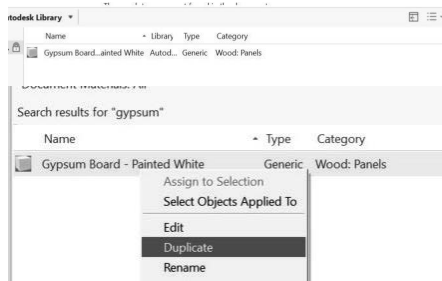
Locate the **Gypsum Board**.
Import into the current drawing.

18.
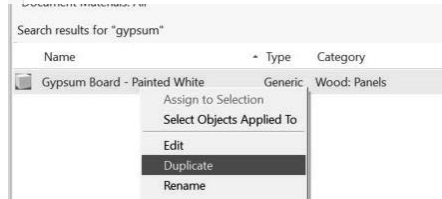
Highlight the Gypsum Board
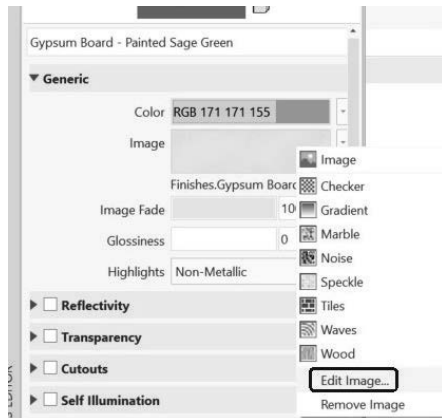material that is in the document.
Right click and select **Duplicate**.

19.

Rename the copied Gypsum Board
material:
**Gypsum Board - Painted Sage
Green.**

Double click on the material to edit.

20.

Change the Color to **RGB
171,171,155**.

*I use the ColorPicker website to
help you determine the RGB values
of paint colors.*

Right click on the image and select
Edit Image.

21.

Click on the Source file name.
Select the image file located in the
Lesson 3 download files named *SW
6178 Clary Sage*.
Close the dialog.

22.

The appearance has been edited.

Close the Materials Editor.

Close the Materials Browser.

23.

Go to the Manage ribbon.

Launch the **Style Manager**.

24.

Browse to **Wall Styles** under Architectural Objects.
You will see the wall style you just imported.

25.

Create a copy of the Brick-090 wall style.
Paste under Wall Styles.

26.

Rename the copied style:
Brick-090 Rigid-038 Air-050 Gypsum Wall Board.

27.

| General | Components | Materials | Endcaps / Opening Endcaps | Classifica |

Name:

Brick-090 Rigid-038 Air-050 Gypsum Wall Board

Change the Description.

Description:
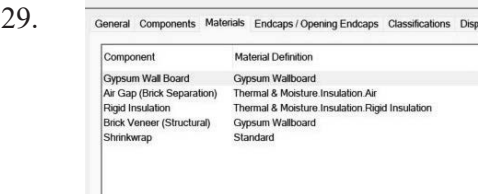
Gypsum Wall Board and 90mm Brick Wall with 38mm Rigid

28. Select the Components tab.

Set up the layers as shown.

The Brick Veneer should be on the exterior.

Index	Name	Priority	Width	Edge Offset
1	Gypsum Wall Board	810	3.00	-5.00
2	Air Gap (Brick Separati...	805	50.00	38.00
3	Rigid Insulation	804	38.00	0.00
4	Brick Veneer (Structural)	800	90.00	38.00

29.

Select the Materials tab.
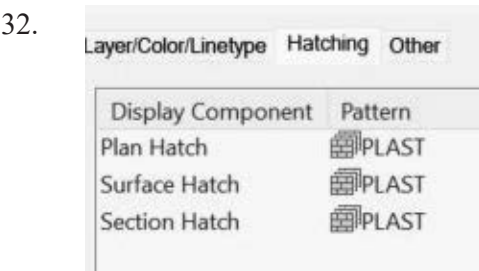
Edit the Gypsum Wall Board.

30.

Select the Style Overrides.

31.

Set the Plan Linework color to **Green** on the Line/Color/Linetype tab**.**
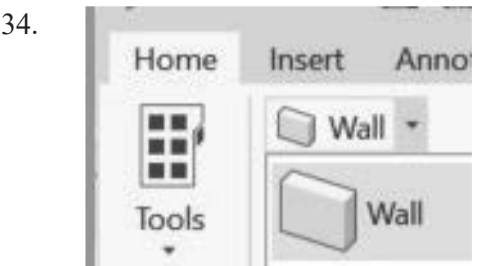
32.

Set the Hatching to **PLAST** on the Hatching tab.

33.

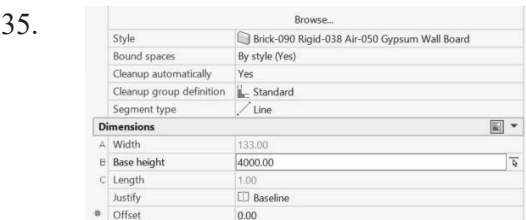Set the Render Material to the **Gypsum Wall Board Sage Green** on the Other tab.

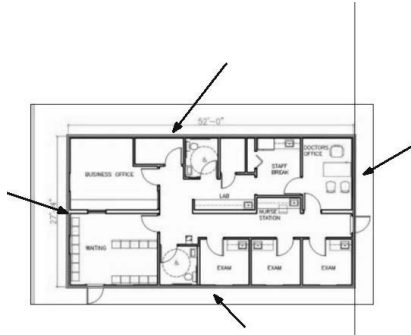Close the Display Properties dialog.
Close the Styles Manager.

34.

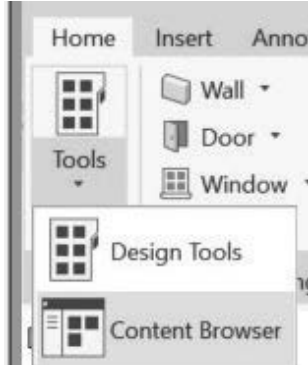Select the **Wall** tool from the Home ribbon.

35.

Set the Style to **Brick-090 Gypsum Wall Board**.
Set the Base Height to **4000**.

36.

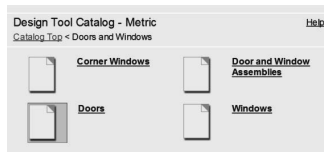Draw the four walls that are the outline of the building.

37.

Launch the **Content Browser** from the Home ribbon.

38.

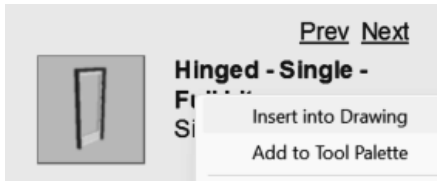Locate the **Design Tool Catalog -Metric**.
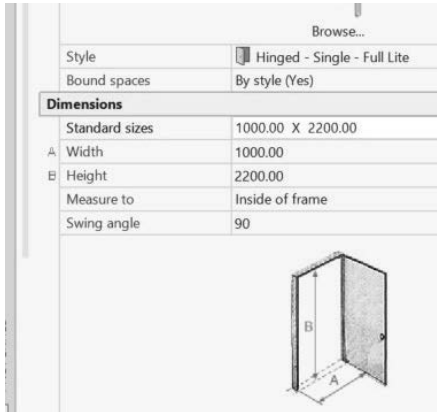
39.

Locate the **Doors** category.

40.

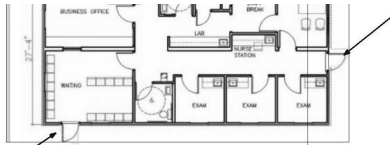Locate the **Hinged – Single – Full Lite** door.

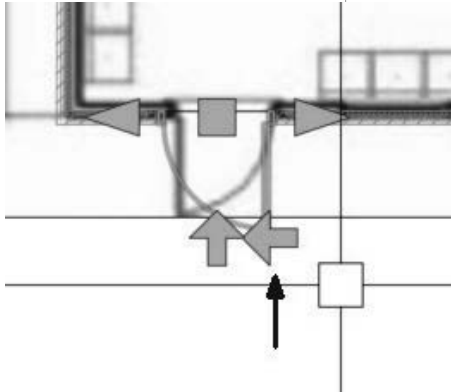41. Right click and select **Insert into Drawing**.

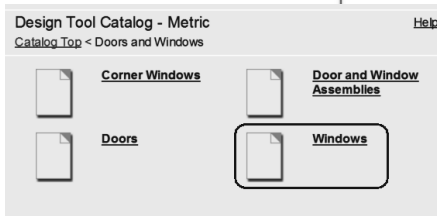42. Set the Standard size to 1000 x 2200.

43. Place in the locations shown.

44. If required, select the placed door. Use the arrows to flip the door so it is oriented correctly.
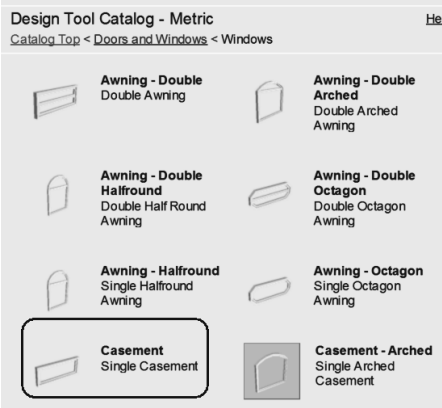
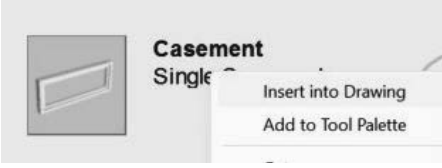45. Return to the Design Tool Catalog – Metric.
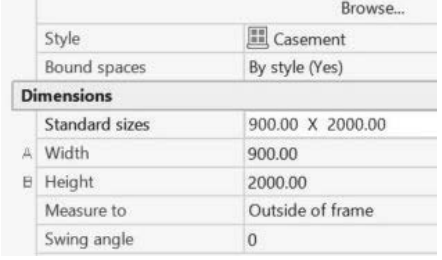
Select the **Windows** category.

46.

Design Tool Catalog - Metric

Catalog Top < Doors and Windows < Windows

Awning - Double
Double Awning

Awning - Double
Arched
Double Arched
Awning

Awning - Double
Halfround
Double Half Round
Awning

Awning - Double
Octagon
Double Octagon
Awning

Awning - Halfround
Single Halfround
Awning

Awning - Octagon
Single Octagon
Awning

Casement
Single Casement

Casement - Arched
Single Arched
Casement

Locate **the Casement – Single Casement window**.

47.

Casement
Single

Insert into Drawing

Add to Tool Palette

Right click and select **Insert into Drawing**.

48.

Browse...

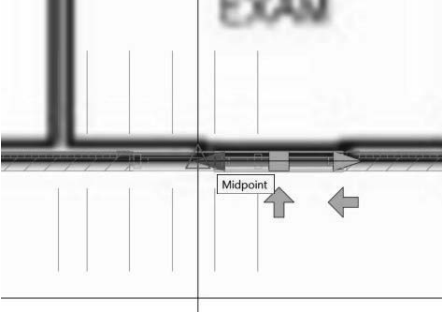|		
Style	Casement	
Bound spaces	By style (Yes)	
Dimensions		
Standard sizes	900.00 X 2000.00	
A Width	900.00	
B Height	2000.00	
Measure to	Outside of frame	
Swing angle	0	

Set the size to **900.00 x 2000.00**.

49.
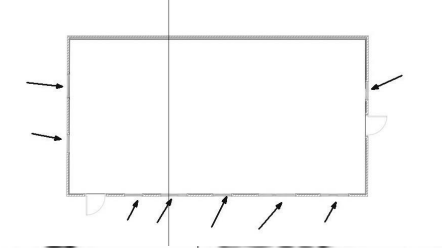
Place a window.
Right click and select Multiple.
Set the number of windows to 6.
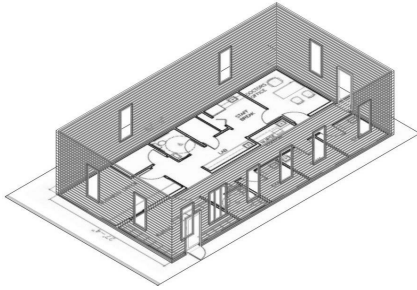Place the additional windows.

50.

Midpoint

You can use the arrows to orient the windows correctly.
The arrows should be located on the exterior side of the windows.
You can use the middle grip to position the window.
You can use the end grips to resize the window.

51.

Place windows around the building.

52.

Switch to a 3D view.

Save the *01 Core.dwg* and close.

Exercise 3-2:

Adding Interior Walls

Drawing Name: 01 Core.dwg
Estimated Time: 20 minutes

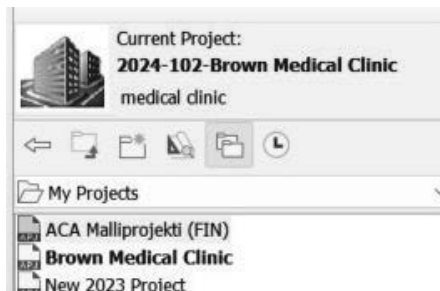This exercise reinforces the following skills:

- ❑ Create Walls
- ❑ Insert Doors
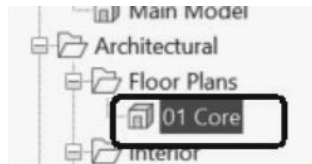- ❑ Content Browser

1.

Open the Project Browser.

2.

Set the **Brown Medical Clinic** Current.

The Brown Medical Clinic project was created using a metric project template. Placeholders were automatically generated.
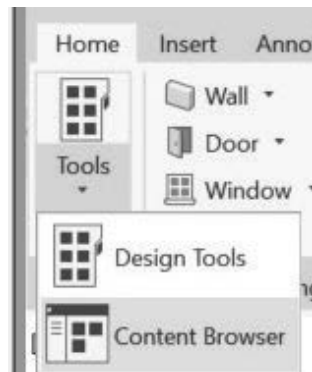
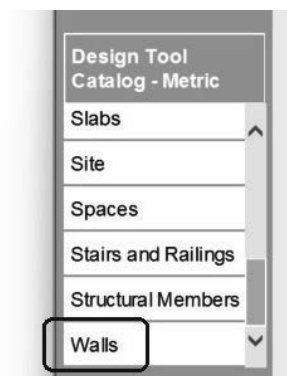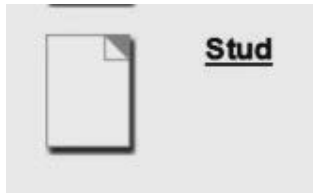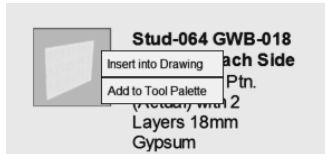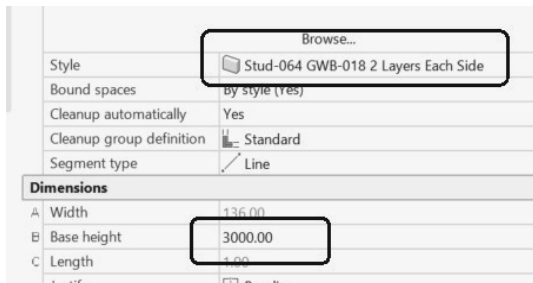| 3.		Switch to the Constructs tab. Highlight **01 Core**. Right click and select **Open**.
4.		Launch the **Content Browser** from the Home ribbon.
5.		Locate the **Design Tool Catalog -Metric**.
6.		Scroll down and select **Walls**.

7. Select the **Stud** category.

8. Locate the **Stud-064 GWB-018 2 Layers Each Side**.
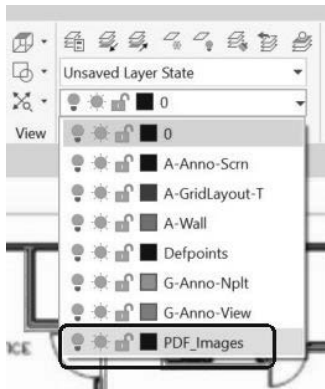Right click and select **Insert into Drawing**.

9. Verify that the Style is set correctly.
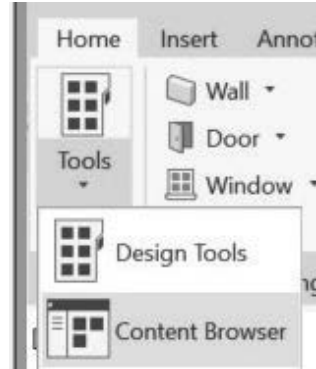Set the Base Height to **3000**.
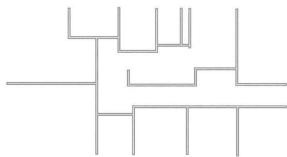
10. Trace over the PDF to place just the interior walls.
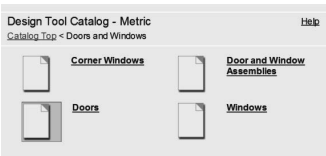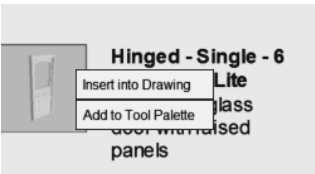
11. You can freeze and thaw the PDF_Images to review your work.

Lock the PDF_Images layer to ensure that the PDF is not moved or accidentally deleted.

12. Launch the **Content Browser** from the Home ribbon.

13. Locate the **Design Tool Catalog -Metric**.

14. Locate the **Doors** category.

15. Locate the **Hinged – Single – - 6 Panel - Half Lite** door.
Right click and select **Insert into Drawing**.

16. Set the Standard size to **1000 x 2200**.

17.
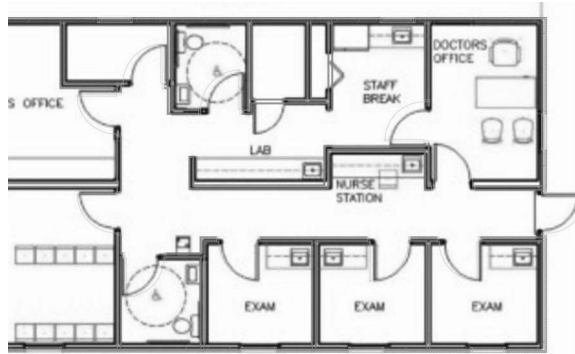
Use the grips and flip arrows to adjust the orientation, position, and size of the doors to match the PDF layout.

18.

Locate the **Design Tool Catalog -Metric**.

19.
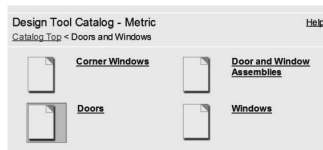
Locate the **Doors** category.

20.

Locate the **Bifold – Single Louver** door.
Right click and select **Insert into Drawing**.

21.
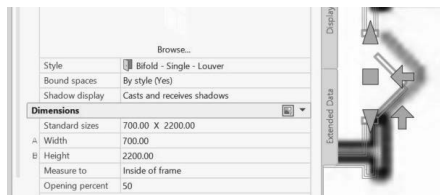
Set the Standard size to **700 x 2200**.

Place in the Staff Break room.

22.

Locate the **Design Tool Catalog -Metric**.

23.
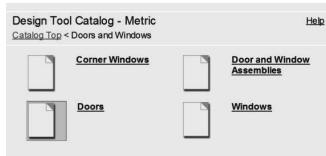
Locate the **Doors** category.

24.

Locate the **Hinged - Single** door. Right click and select **Insert into Drawing**.

25.

Set the Standard size to **950 x 2200**.

Place in the two bathrooms.

26.
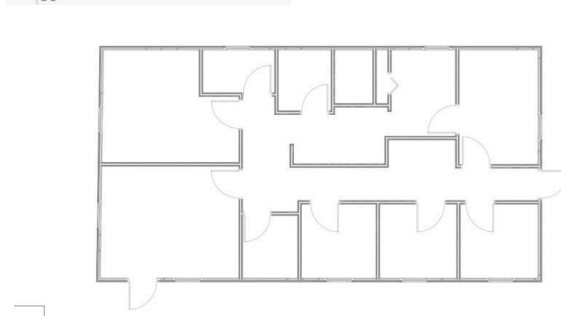
Save the file.

➢ 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, click 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 3-3:
Place a Grid
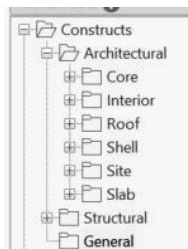
Drawing Name: grid.dwg
Estimated Time: 10 minutes
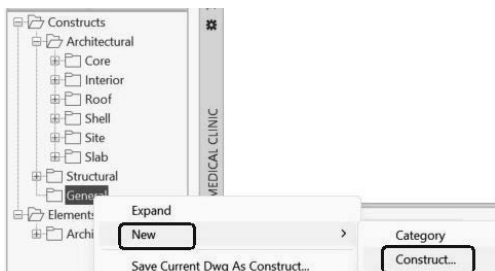
This exercise reinforces the following skills:

- ❑ Place a grid
- ❑ Create a new Construct

1.   Launch the US Metric version of ACA.

This ensures that all the content will be metric.

2.   Launch the Project Navigator.
On the Constructs tab:
Highlight **Constructs**.
Right click and select
New→Category.

3.   Name the new category **General**.

4.   Highlight **General**.
Right click and select
New→Construct.

5.

Name	Grid and Bubbles
Description	Grid and Bubbles
Category	Constructs\General
Drawing Template	C:\Users\elise...\Project Model (Metric Stb).dwt
File Name	Grid and Bubbles

Assignments

Level	Description	Division <
R	Roof	☑
2	Second Floor	☑
1	First Floor	☑
S	Site Datum Level	☑
B	Basement	☑

☑ Open in drawing editor

The Construct has been set to spanning by selecting more than one checkbox. The Construct will be inserted at the lowest checked level and objects in the Construct will be shared.

Change the Name to **Grid and Bubbles**.
In Description, type **Grid and Bubbles**.
Enable all the **Levels**.
Enable Open in drawing editor.

Click **OK**.

6.

Set the Scale to **1:1**.

7.

| Home | Insert | Annotate | Render | View | Manage | Collaborate |

Wall ▾   Roof Slab ▾   ⊞ Enhanced Custom Grid ▾
Door ▾   Stair ▾   ⊞ Enhanced Custom Grid
Tools
Window ▾ Space ▾
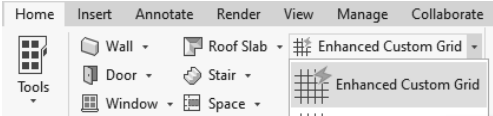
Click on **Enhanced Custom Grid** on the Home ribbon.

8.

Bottom Left Right

Bay Size	Number	Type	Label
0.00	1	Primary	1
3635.00	1	Primary	2
1357.00	1	Primary	3
1410.00	1	Primary	4
785.00	1	Primary	5
1143.00	1	Primary	6
1518.00	1	Primary	7
536.00	1	Primary	8
2571.00	1	Primary	9
2895.00	1	Primary	10

Select the **Bottom** tab.
Type in the following values:

3635
1357
1410
786
1143
1518
536
2571
2895

9.

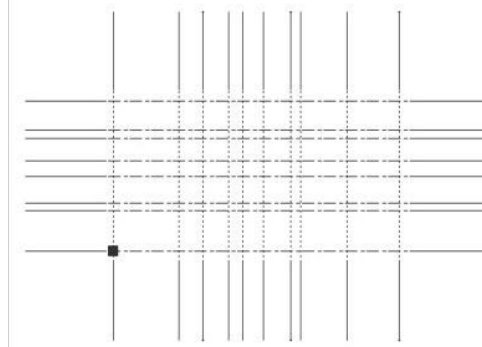| Bay Size	Number	Type	Label
0.00	1	Primary	A
2270.00	1	Primary	B
393.00	1	Primary	C
1464.00	1	Primary	D
874.00	1	Primary	E
1231.00	1	Primary	F
483.00	1	Primary	G
1617	1	Primary	H
--	--	--	--

Switch to the Left tab.
Type in the following values:
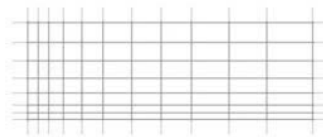
2270
393
1463
874
1231
483
1617

10.

There is a preview window which shows the grids.
Click **OK** to place the grid.

11.

Type **0,0** as the insertion point.
Click **ENTER** to accept the rotation angle of 0.
The grid is placed.

12.

Object Viewer...
Select Similar
Count Selection
Deselect All
Properties
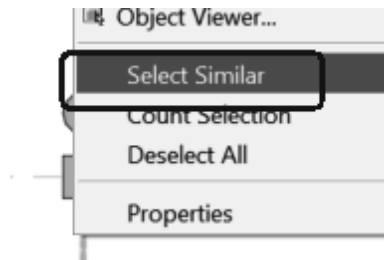
Select one of the column bubbles.
Right click and **Select Similar**.

13.

Bound spaces	By style (No)
Scale	
X	125.00
Y	125.00
Z	125.00
Location on column grid	

Change the Scale to **125** in the Properties palette.

Click ESC to release the selection.

14.
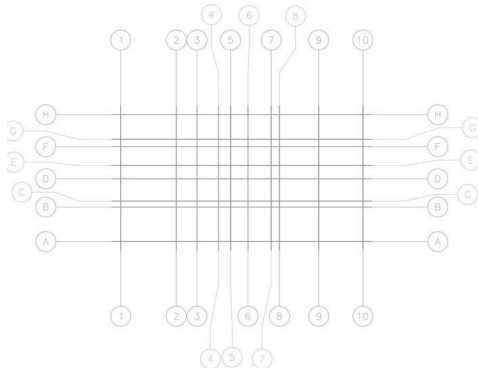
The grid updates.

You can select the overlapping column bubbles and move them to a new position.
This will create a copy, so you need to delete the original column bubble.

Save the file.

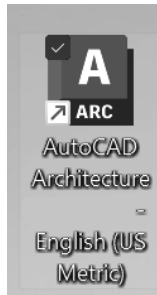*Exercise 3-4:*
Combining Constructs

Drawing Name: Main Model,dwg
Estimated Time: 15 minutes

This exercise reinforces the following skills:

- ❑ Add Constructs to a 3D model
- ❑ Create a new Construct
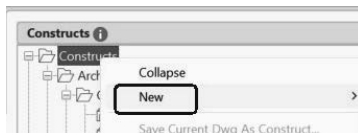- ❑ Visual Styles

1.

Launch the US Metric version of ACA.

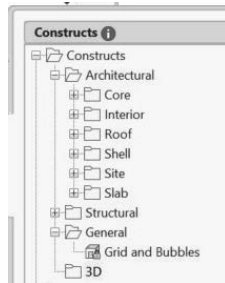*This ensures that all the content will be metric.*

2.

Launch the Project Navigator.
On the Constructs tab:
Highlight **Constructs**.
Right click and select **New→Category**.

3.
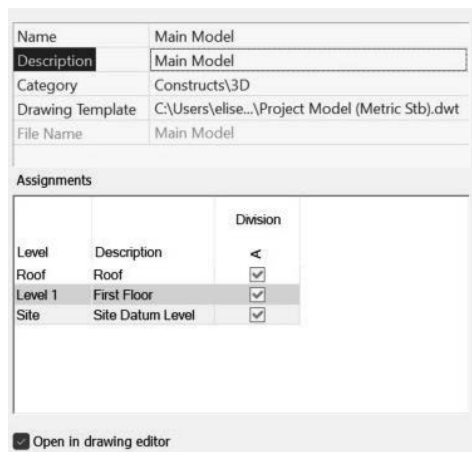
Name the new category **3D**.

4.

Highlight **3D**.
Right click and select
New→Construct.

5.

Change the Name to **Main
Model**.
In Description, type **Main
Model**.
Enable all the **Levels**.
Enable Open in drawing editor.

Click **OK**.

6.
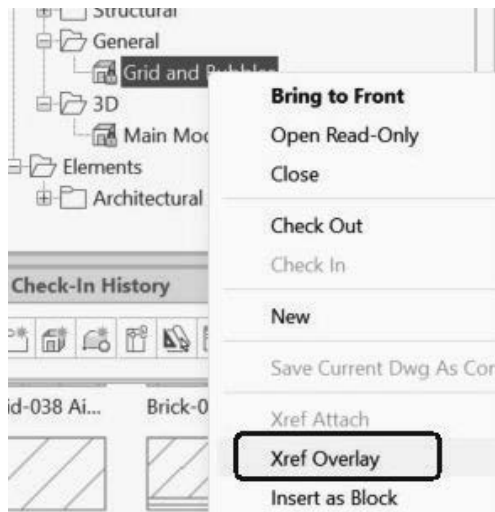
Highlight the **Grid and Bubbles**
construct.
Right click and select **Xref
Overlay**.

The Grid and Bubbles drawing is placed in the Main Model drawing.
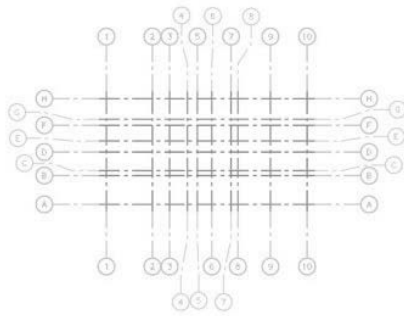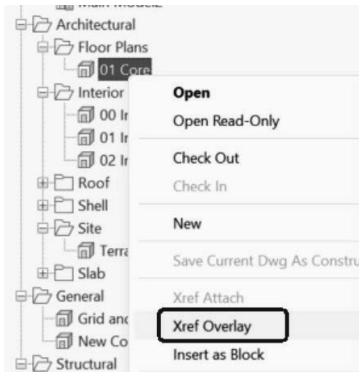
7. Highlight the **01 Core** construct.

Right click and select **Xref Overlay**.

8. If necessary, reposition the 01 Core construct so it is aligned with the grid layout.

9. [−][SW Isometric][2D Wireframe]

Switch to an isometric view.

10.

Set the Visual Style to Realistic.

Orbit around the model.

Check for any other errors and correct as needed.

11.

Save the drawing.

Curtain Walls

Curtain walls provide a grid or framework for inserting objects such as windows and doors. Curtain walls have many similarities to stand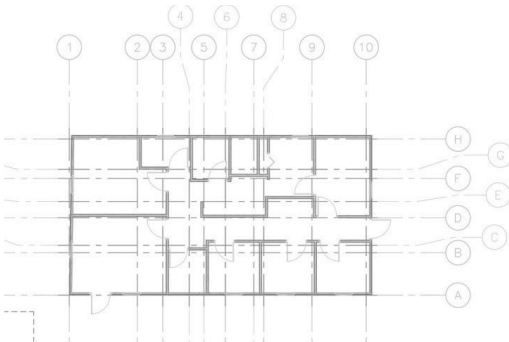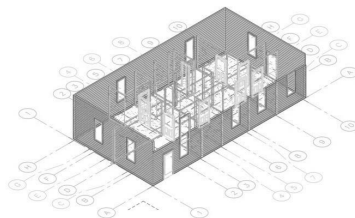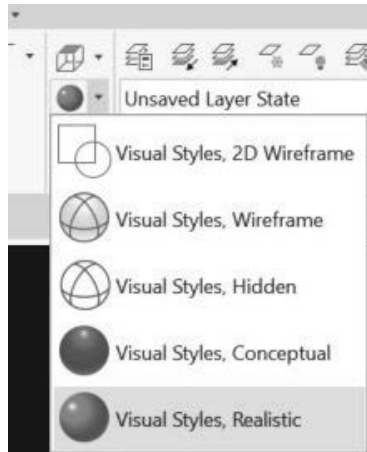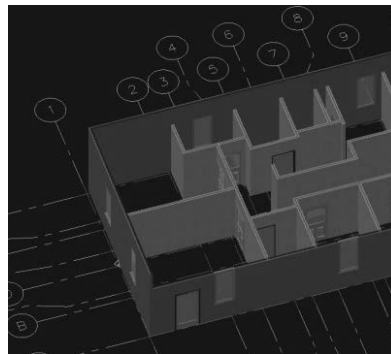ard walls, such as baseline, roof line, and floor line, and they allow for interferences. You can insert doors, windows, and door/window assemblies into a curtain wall, just like standard walls, but the insertion process is different.

Curtain Wall Grids

Curtain walls are made up of one or more grids. Each grid in a curtain wall has either a horizontal division or a vertical division, but you can nest the grids to create a variety of patterns from simple to complex.

Elements of Grids

Grids are the foundation of curtain walls, curtain wall units, and door/window assemblies. Every grid has four element types:

- **Divisions:** Define the direction of the grid (horizontal or vertical) and the number of cells

- **Cell Infills:** Contain another grid, a panel infill, or an object such as a window or a door

- **Frames:** Define the edge around the outside of the primary grid and nested grids

- **Mullions:** Define the edges between the cells

Note: Division is an abstract element, in contrast to the other three element types that represent physical elements of the curtain wall.
Each element type is assigned a default definition that describes what elements of that type look like.

Element type	Default definitions
Divisions	Primary horizontal grid with a fixed cell dimension of 13' and secondary vertical grid with a fixed cell dimension of 3'
Cell Infills	Cells containing simple panels 2" thick
Frames	Left, right, top, and bottom outer edges of grid 3" wide and 3" deep
Mullions	Edges between cells 1" wide and 3" deep

Exercise 3-5:
Place a Curtain Wall

Drawing Name: 3D Model-Master_2
Estimated Time: 15 minutes

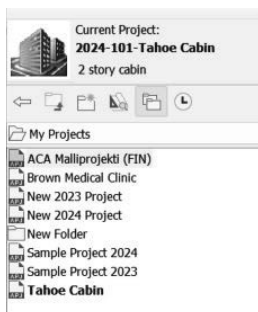This exercise reinforces the following skills:

- ❑ Place a curtain wall
- ❑ External References
- ❑ Steering Wheel
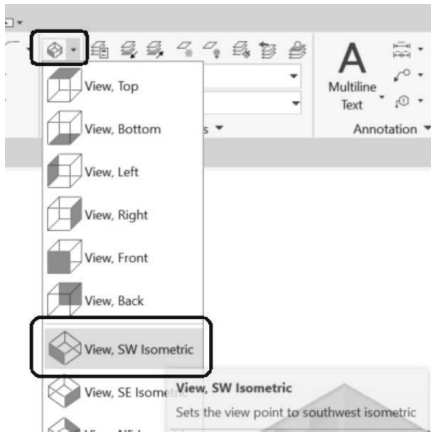- ❑ Views
- ❑ UCS

1.

Launch the ACA English (US Imperial) software.

2.

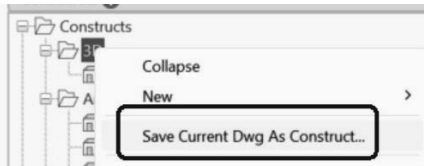Set the **Tahoe Cabin** project current.

3.

Open 3D Model-Master_2.dwg.

On the Home ribbon:
Switch to a **SW Isometric view**.

4.

On the Project Navigator:
Open the **Constructs** tab.
Highlight **3D**.
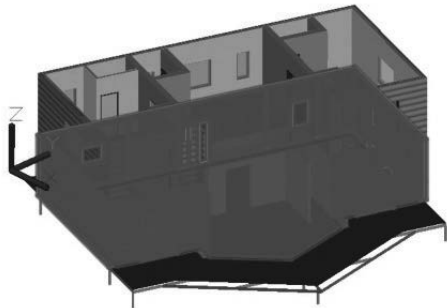Right click and select **Save Current Dwg As Construct**.

5.

Name	3D Model-Master_2
Description	3D Model-Master_2
Category	Constructs\3D
File Name	3D Model-Master_2

Assignments

Level	Description	Division
Roof	Roof	✓
Second Floor	Second Floor	✓
First Floor	First Floor	✓
Ground Level	Ground Level	✓
Foundation	foundation	✓

Enable all the levels.

Click **OK**.

6.

Select the lower exterior walls.

Edit Reference In-Place
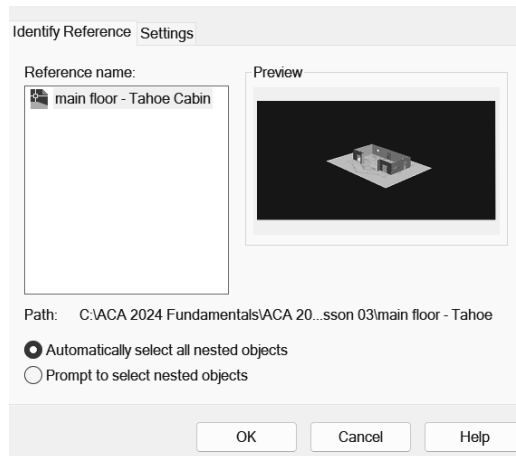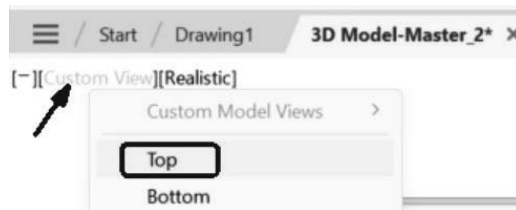
On the ribbon, select **Edit Reference In-Place**.

7.

Click **OK**.

8.

Switch to a **Top** view.

9.

Under the Viewcube, select **WCS** to use the World UCS.
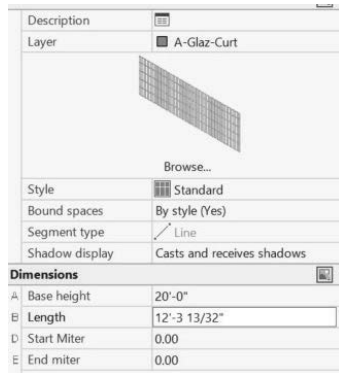
You will see the UCSICON adjust.
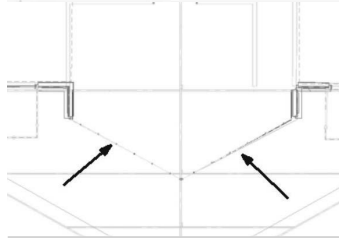
10.
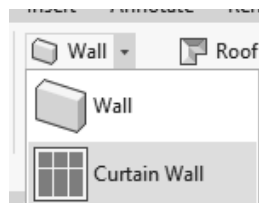
Select the **Curtain Wall** tool on the Home ribbon.
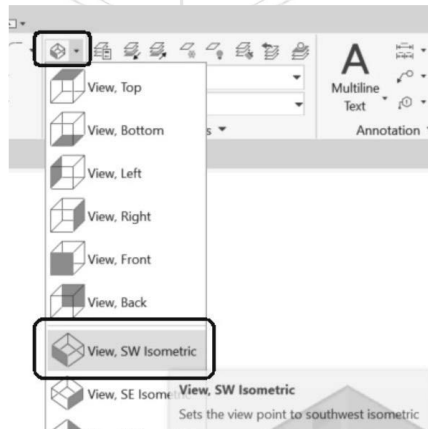
11.   Set the Base Height to **20'-0".**

12.   Draw two angled lines to place the curtain wall.

13.   On the Home ribbon:
Switch to a **SW Isometric view**.
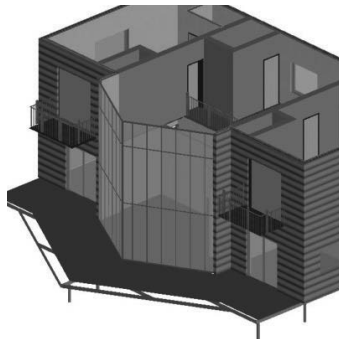
14.   Press the SHIFT key and the middle mouse button to orbit around the model and inspect the curtain wall.
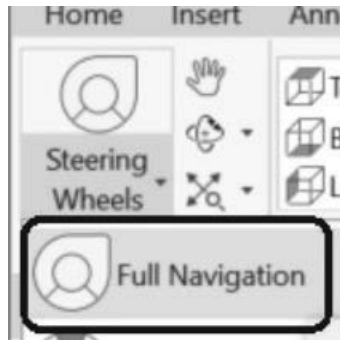
15. Switch the View ribbon.

Launch the **Full Navigation** Steering Wheel.

16. Use the different tools on the steering wheel to view the model.

   When you are done, click the X located in the upper right corner of the steering wheel to close.

17. Select **Save Changes** on the ribbon.

18. Click **OK**.

All references edits will be saved.

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

OK   Cancel
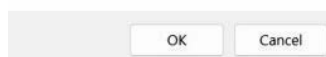
Exercise 3-6:
Add an Opening to a Wall

Drawing Name: 01 Core.dwg
Estimated Time: 10 minutes

This exercise reinforces the following skills:

❑   Add an opening to a wall

1.   Launch the US Metric version of ACA.

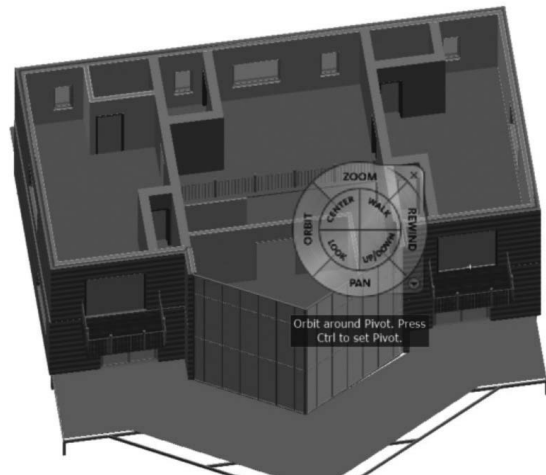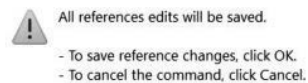*This ensures that all the content will be metric.*

2.   Open the Project Browser.
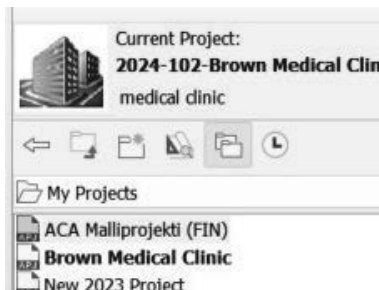
3.   Set the **Brown Medical Clinic** Current.

The Brown Medical Clinic project was created using a metric project template. Placeholders were automatically generated.
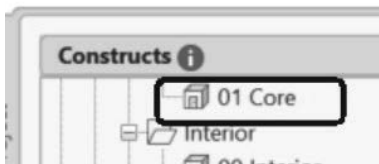
4.   Launch the Project Navigator.

Switch to the Constructs tab.

Highlight **01 Core**.

Right click and select **Open**.
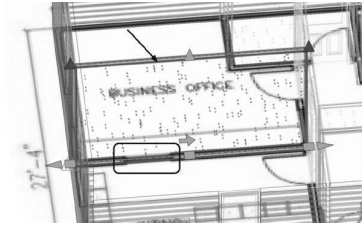
5. Switch to an Isometric view.

Select the wall located between the business office and the waiting area.

6. Select **Opening** on the ribbon.

7. Place the opening so it aligns with the opening shown in the PDF.

8. Click on the bottom arrow grip to raise the height of the opening.

9. The opening should be adjusted to look like a window between the rooms.

10. Save and close the drawing.

Notes:

QUIZ 3

True or False

1. When you insert a PDF into a drawing, it cannot be converted to AutoCAD elements, like lines or text.

2. When you insert an image, it cannot be converted to AutoCAD elements, like lines or text.

3. The direction you place walls – clockwise or counter-clockwise – determines which side of the wall is oriented as exterior.
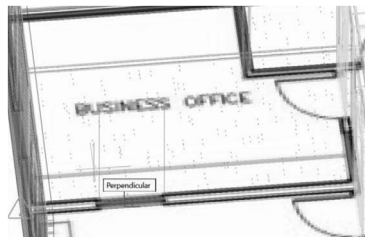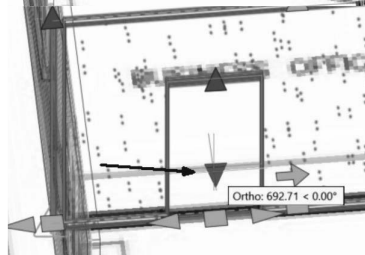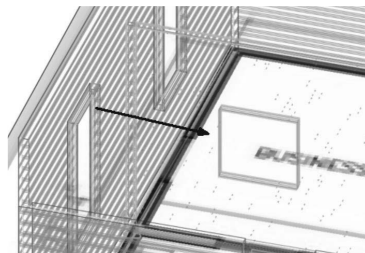
4. Curtain walls can only be linear, not arcs, in AutoCAD Architecture.

5. Grids can only be lines, not arcs, in AutoCAD Architecture.

6. To re-orient a door, use the Rotate command.

7. You can set cut planes for individual objects (such as windows), an object style (such as walls) or as the system default.

Multiple Choice

8. To change the hatch display of wall components in a wall style:

   A.   Modify the wall style
   B.   Change the visual style
   C.   Change the display style
   D.   Switch to a plan\top view

9. This tool on the status bar:

   A.   Sets the elevation of the active level
   B.   Controls the default cut plane of the view and the display range
   C.   Sets the distance between levels
   D.   Sets the elevation of the active plane

10. To assign a material to a door:

   A.   Modify the door component by editing the door style
   B.   Drag and drop the material from the Material Browser onto a door
   C.   Use the Display Manager
   D.   Define a new Visual Style

11. You want to create a wall that shows a specific paint color. Put the steps in the correct order.

    A. Place a wall.
    B. Open the Styles Manager.
    C. Import the desired material into the current drawing.
    D. Use the Materials Browser to locate a similar material.
    E. Duplicate the Material and redefine it with the correct color specification.
    F. Create a new wall style.
    G. Assign the desired material to a wall component.
    H. Set the Render material for the wall component to the desired material definition.

12. You want to place a door style that is not available on the Design Tools palette. You open the Design Tool Catalog and search for the desired door style. You locate the desired door style. Now what?

    A. Select the Door tool on the Home ribbon and use the Properties palette to select the desired door style.
    B. Add the Door Style from the Design Tool Catalog to the Design Tools palette.
    C. Right click on the desired door style in the catalog and select Insert into Drawing.
    D. Right click on the desired door style in the catalog and select Add to Styles Manager.
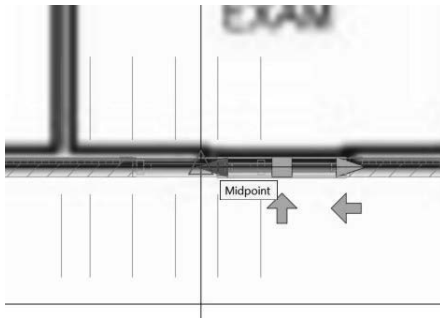
13. You select on a window that was placed in the model. The arrows can be used to:

    A. Change the window location/position.
    B. Change the window orientation.
    C. Change the window size.
    D. Change the window opening.

ANSWERS:

1) F; 2) T; 3) T; 4) F; 5) F; 6) F; 7) T; 8) A; 9) B; 10) A; 11) D, E, C, B, F, G, H, A; 12) C; 13) B