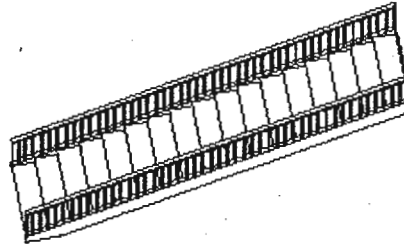
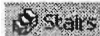


Creating Stairs



Like other Revit Building elements, stairs are “smart” parametric objects. With just a few clicks you can create stairs of varying heights and designs, complete with railings. They can be standard stairs created by their run in length or complex stairs sketched with riser lines and boundaries.



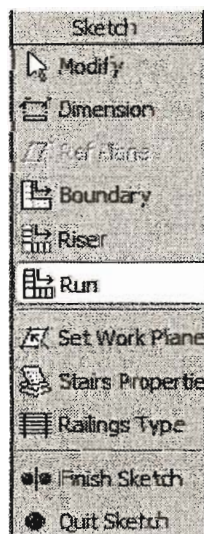
Stairs

Design Bar: Modelling

Menu Bar: Modelling>Stairs

To Create Standard Stairs

1. Open a plan or 3D view.
2. Start the **Stairs** command.
3. The stairs options in sketch mode will appear in the Design Bar.
4. Click on **Stairs Properties** and set the parameters, such as the stair *Width, Base Level, and Top Level*. Click **OK** to close the Element Properties dialog box.
5. Click on **Railings Types** and select a railing type from the list.
6. Click on the **Run** button in the Design Bar.
7. Click on the screen to pick a start point for the run. A box that shows the stair orientation and number of risers appears.
8. For straight stairs of a single run, pick a second point anywhere *beyond* the box to create the run.
9. For multi-landing or u-shaped stairs, pick a second point *inside* the box for the length of the first run. Then pick a start point and end point for the next run. Landings are automatically created between runs.
10. Continue, as needed, to complete the entire stairs.
11. Edit the footprint, if desired.
12. Click **Finish Sketch** to create the stairs complete with railings.



- Reference Planes can help you to pick the start and end locations of each run.
- Railings are automatically added with the stairs. They can be modified or deleted as required.
- To create a spiral staircase, click the **Arc from center and end points** button on the Options toolbar. The spiral must be less than 360 degrees.

Stairs Properties

Constraints

Base Level	The level for the beginning of the stairs.
Base Offset	The distance above or below the Base Level where you want the stairs to start. This can be. For example, you may be building the stairs off of an existing 2'-0" platform. You would set the Base Level Offset to 2'-0".
Top Level	The top level for one set of stairs where they will stop.
Top Offset	The distance above or below the Top Level where you want the stairs will stop.
Multistory Top Level	If you are working in a multistory building and want the same set of stairs to repeat on each level, specify the level to which the stairs should repeat. This will only work if the levels are equal distances apart.

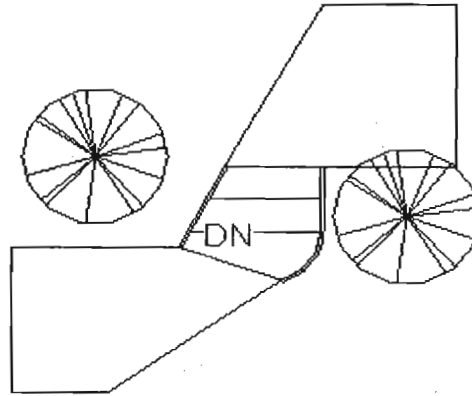
Graphics

Up Text/Down Text	The text for the Up/Down labels.
Up/Down Label, Up/Down Arrow, and Show Up Arrow in all Views	Check boxes to control whether the annotation shows for the labels.

Dimensions

Width	The width of one flight of stairs.
Desired Number of Risers	The default value is calculated by the distance between levels. Changing the number of risers will impact the actual rise and may not match building codes or be allowed by the stair type.
Actual Number of Risers	(Read only.) Displays the number of risers that have actually been used in the sketch. To fully complete the sketch it should match the <i>Desired Number of Risers</i> .
Actual Riser Rise	Sets the actual riser height. The value must be equal to or less than value specified in the type's Maximum Riser Height. The default type can be no more than 7".
Actual Tread Depth	The depth of the tread.

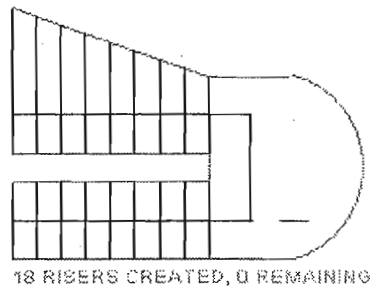
Drawing Boundaries and Riser Lines



To create stairs with irregular boundaries or risers, you can draw a boundary and individual riser lines. For example, you can use this method to create a landscape design with multiple levels and various widths of stairs.

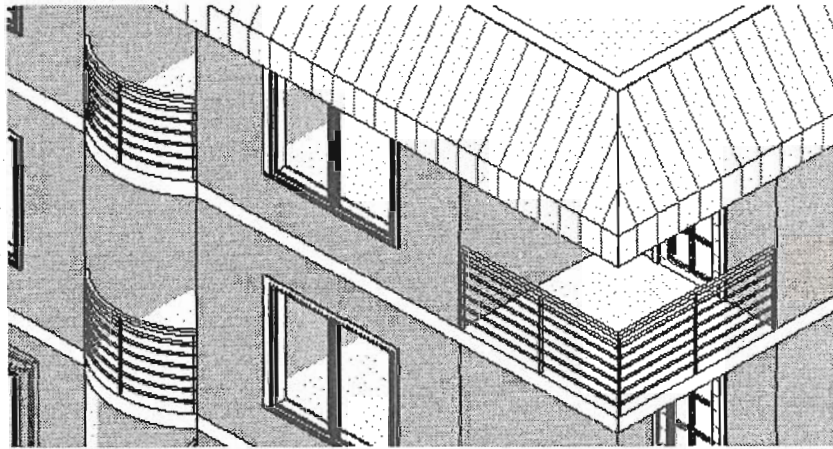
1. Open a plan or 3D view.
 2. Start the **Stairs** command.
 3. The stairs options in sketch mode appear in the Design Bar.
 4. Click on the **Boundary** button and draw the outline of the stairs. You do not need to add boundaries at the top and bottom of the stairs; the risers will show those.
 5. Click on the **Riser** button and draw the risers. The risers must touch the boundary at each end.
 6. Adjust the **Stairs Properties** as required.
 7. Click **Finish Sketch** to create the stairs.
- The sketch tools for drawing boundaries and risers are similar to those used for drawing walls.
 - In Sketch mode, riser lines are black and boundaries are green.
 - The number of risers must be appropriate for the properties of the stair type.

Editing the Stair Footprint



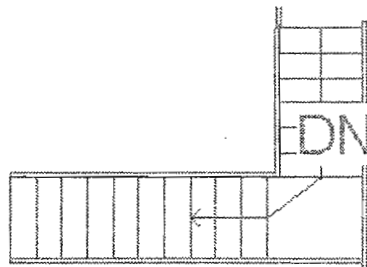
You can adjust any style of stair by editing the sketch. Select the stairs (not the railings) and click **Edit** on the Options toolbar. You can modify the boundary line and individual risers with the shape handles and dynamic dimensions, as well as with the standard editing commands such as **Move** and **Trim**.

Adding and Modifying Railings



Railings are automatically created with stairs, but you can modify or delete them independently from the stair object. You can also add railings separate to the stairs and in other locations, such as a balcony.

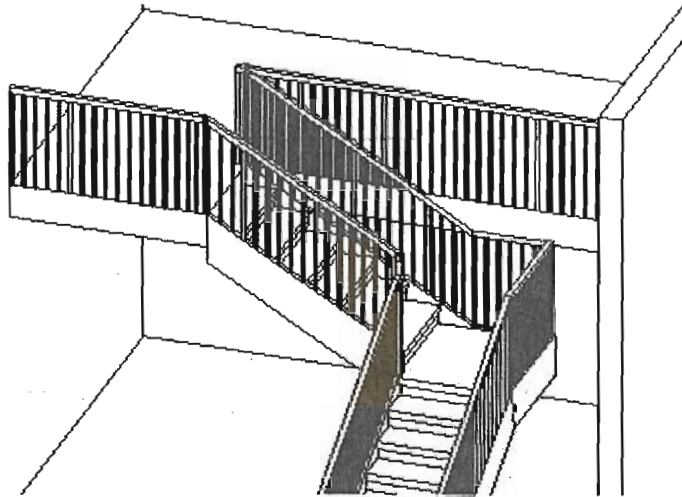
Modifying Railings



Using the **Modify** command you can select a railing and change the style in the Type Selector. You can also click **Edit**, which will take you to sketch mode. There you can modify the individual lines that describe the railing using shape handles and dynamic dimensions. You can add additional lines if needed, but they must be connected to the existing lines.

- To remove railings, start the **Modify** command and select the railing(s) in the completed stair. Press the key or the **Delete** button on the Standard toolbar to delete the railing.

Creating Additional Railings



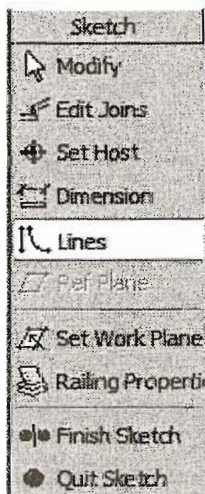
If you want a railing around a balcony or in the middle of wide stairs you can create a new railing separate from the stairs.



Railing

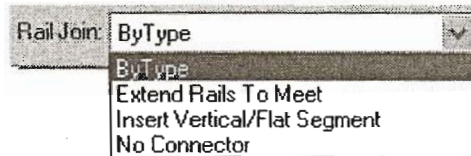
Design Bar: Modelling

Menu Bar: Modelling>Railing

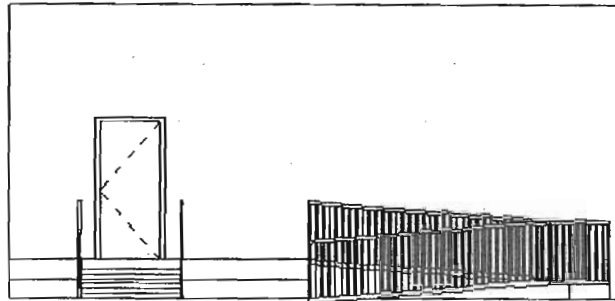


1. Open a plan view.
 2. Start the **Railing** command.
 3. Click the **Set Host** button in the Design Bar and select the element that the railing will be associated with, such as a stair or floor. (This makes the railing take on the slope of the host, and is not required if the host is flat.)
 4. The **Lines** button becomes active. Draw the lines that define the railing.
 5. Click on the **Railing Properties** button and specify the railing type.
 6. Click **Finish Sketch** to create the railing.
- The **Lines** tool has two modes in the Options toolbar, *Draw* and *Pick*. *Draw* gives you the standard sketching tools (Lines, Rectangles, etc.). *Pick* allows you to set an offset and pick objects to generate the sketch lines.
 - The railing must be a single continuous sketch. You can use **Trim** or **Split** to clean up the railing sketch as needed.

- If two railing segments meet in a plan but are at two different heights you can specify how they interact. While you are still in sketch mode you can modify each intersection with the **Edit Joins** tool. Click on the button and then click on the intersection. Select the method from the Options toolbar, as shown below. The default is *ByType*, which is specified in the Railing Properties under Angled Joins or Tangent Joins.



Creating Ramps



The process of creating ramps is very similar to that of stairs. You draw runs that are automatically connected by landings, if needed.

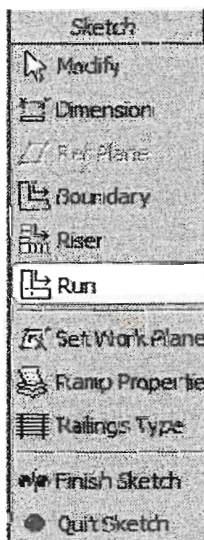
Ramps are rarely used for great vertical distances, as they require a lot of space for their runs. You will need to check the local building codes to see how long a run can be before a landing is required.



Ramp

Design Bar: Modelling

Menu Bar: Modelling>Ramp



1. Start the **Ramp** command.
2. The Sketch options will show on the Design Bar.
3. Click on the **Ramp Properties** button.
4. Click on **Railings Types** and select a railing type from the list.
5. In the Element Properties dialog box, the *Top Level* option is set by default to the next level up from the *Base Level*. Unless the ramp goes from floor to floor, change the *Top Level* to the same level as the *Base Level* and type in the required distance as the *Top Offset*. For example, for a ramp based on Level 1, set the *Top Level* to Level 1 and the *Top Offset* to 2'-0" or whatever the overall height of the ramp needs to be.
6. Click **OK** to close the Element Properties dialog box.
7. Click on the screen to pick a start point for the run. A preview box shows the ramp orientation and length. You can switch between linear and curved runs.
8. For a straight ramp of a single run, pick a second point anywhere *beyond* the box to create the run.
9. For a ramp with more than one run, pick a second point *inside* the box for the length of the first run. Pick a start and end point for the next run. Landings are automatically created between runs.
10. Click **Finish Sketch** and the ramp (including railings) will be created.



Practice: Stairs, Railings, and Ramps

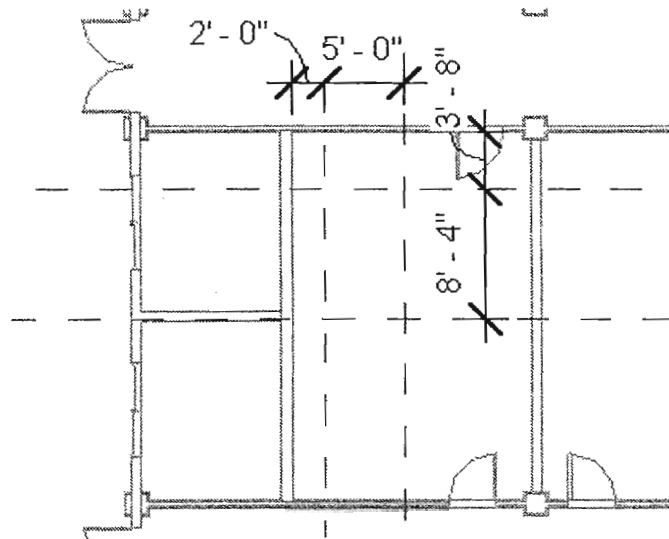
In this practice you will create u-shaped interior stairs, add railings to a balcony, and (optional) create exterior stairs and a ramp. Estimated time for completion: 30 minutes.

Continue working on the project **Clark Hall**. If you have not completed earlier practices open **Clark Hall-8**.

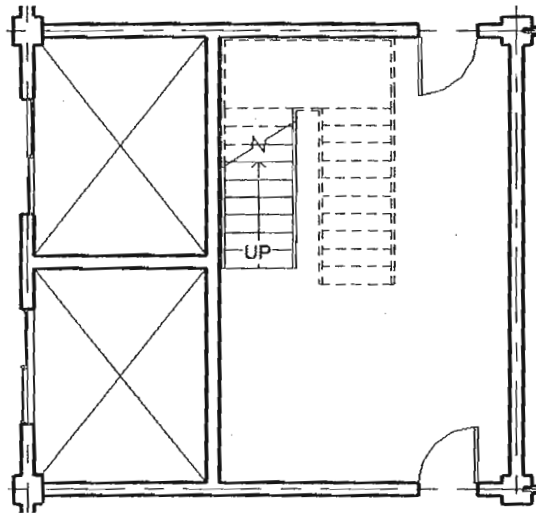
Task 1: Creating U-shaped Stairs

1. Open the Level 1 floor plan view.
2. Zoom in on the area next to the elevators in the Classroom Wing.
3. Start the **Stairs** command. In the Sketch menu, click on **Stairs Properties** and set the parameters as follows:

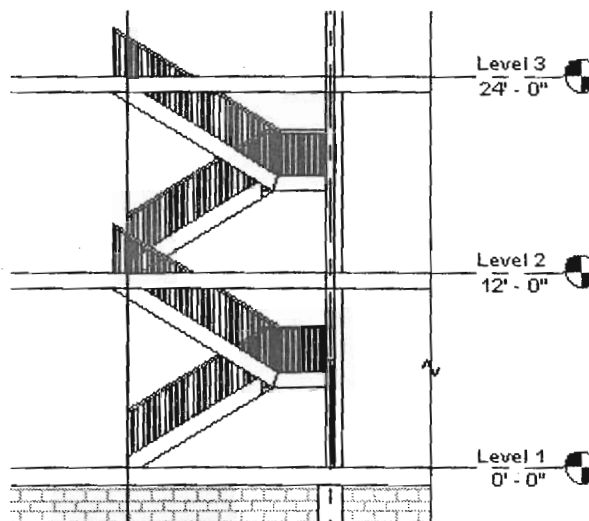
<i>Width</i>	3'-6"
<i>Base Level</i>	Level 1
<i>Top Level</i>	Level 2
<i>Base Offset</i>	0
<i>Top Offset</i>	0
4. Click **OK** to close the Stairs Properties dialog box.
5. Use the **Ref Plane** tool to draw four reference planes, as shown below. An easy way to do this is to use the *Pick* option with the appropriate offsets.



6. Click on **Run**. Draw the first run from the bottom left to the top left intersection of the reference planes. Draw a second run from the top right PAST the bottom reference plane to create the total number of risers.



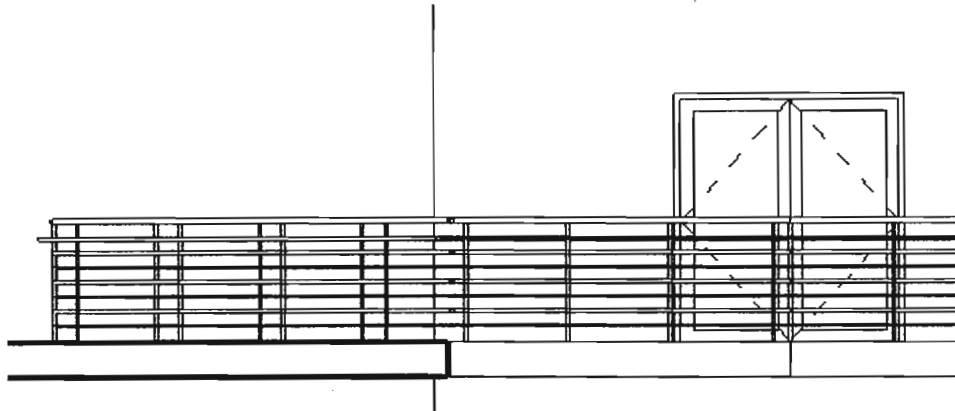
7. Click **Finish Sketch**. The stairs should look like the illustration above.
8. Select the stairs and edit its Properties. Set the *Multistory Top Level* to **Level 3** and click **OK**. This extends the same run of the stairs up to Level 3.



9. Add doors on either end of the stairwell for access if you haven't already done so.

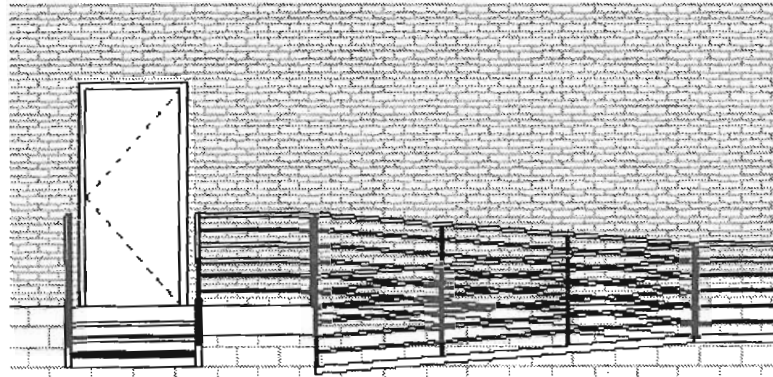
10. If time permits, create the appropriate cutouts in the floors for the stairs and add doors on the other levels.
11. If time permits, create similar stairs in the stairwell at the other end of the Classroom Wing. You can also add stairs from the Basement to Level 1 at each location. (The distance from the Basement to Level 1 is a different from the other levels. Therefore, these stairs cannot be created using the Multistory Top Level option.)
12. Save the project.

Task 2: Adding Railings



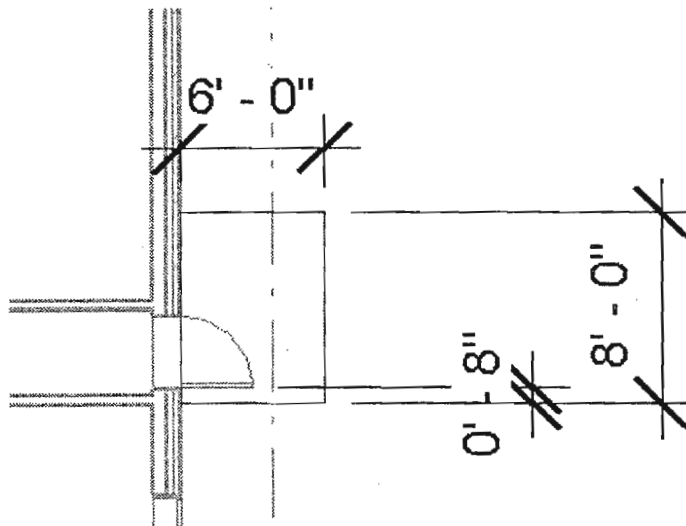
1. Open the Level 2 floor plan view.
2. Zoom in on the Entry area. There should be a hole cut in the floor here.
3. Start the **Railing** command.
4. Draw sketch lines around the opening in the floor.
5. Click on **Railing Properties** in the Menu Bar and set the *Type* to **Guardrail-Pipe**. Click **OK**.
6. Click **Finish Sketch**.
7. Create a section to view the new railings.
8. If your project does not have a door at the end of the Corridor as shown above, copy the door from the first level to the second and third levels.
9. Save the project.

Task 3: Creating a Back Entrance with Stoop, Stairs, and Ramp (Optional)



Note: this set of stairs and ramp will not have “ground” beneath them when you view them in 3.

1. Open the Level 1 floor plan view and zoom in on the right side of the Office area near the exterior door.

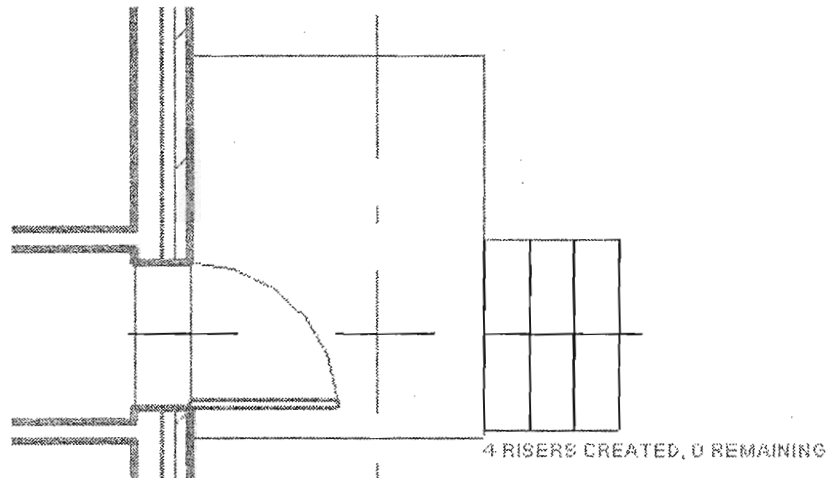


2. Start the **Floor** command and draw an 8' x 6' floor for a landing outside the door, as shown above. In the Floor Properties dialog box, make sure the *Height Offset from Level* is set to 0'-0". Finish the sketch.

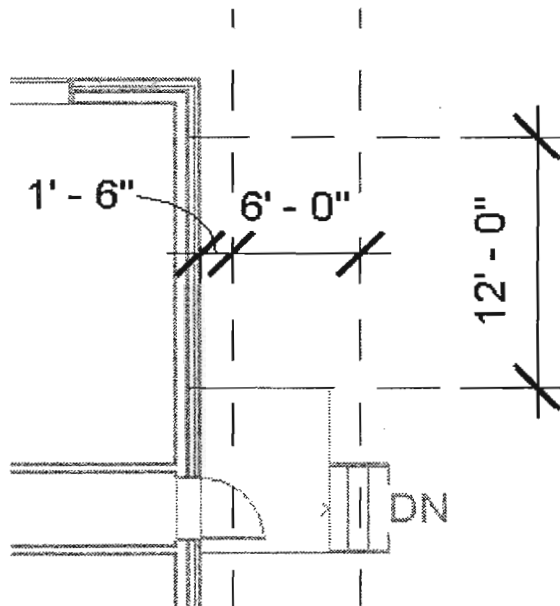
3. Start the **Stairs** command.
4. Use the **Ref Plane** tool to draw a horizontal reference plane through the center of the door and passing through the landing.
5. Click on **Stairs Properties** and set the parameters as follows:

Width	4'-0"
Base Level	Level 1
Base Offset	-2'-0"
Top Level	Level 1
Top Offset	0'-0"

6. Click **Run** and add the stairs, centered on the reference plane and the end of the landing, as shown below.



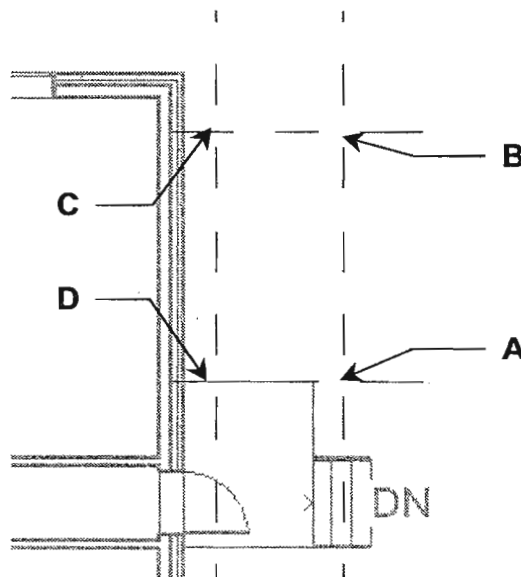
7. Click **Finish Sketch** to finish the stairs.
8. The stairs will be the wrong direction when drawn from the intersection. This is because the first point defines the bottom of the stair and the second the top. In this situation the stairs must be rotated 180 degrees from the default center to get the correct direction. To rotate, select the stair, and start the **Rotate** command. Type in *Angle*: **180** in the Options toolbar.
9. Start the **Ramp** command.
10. Use **Ref Plane** to draw the four reference planes shown below.



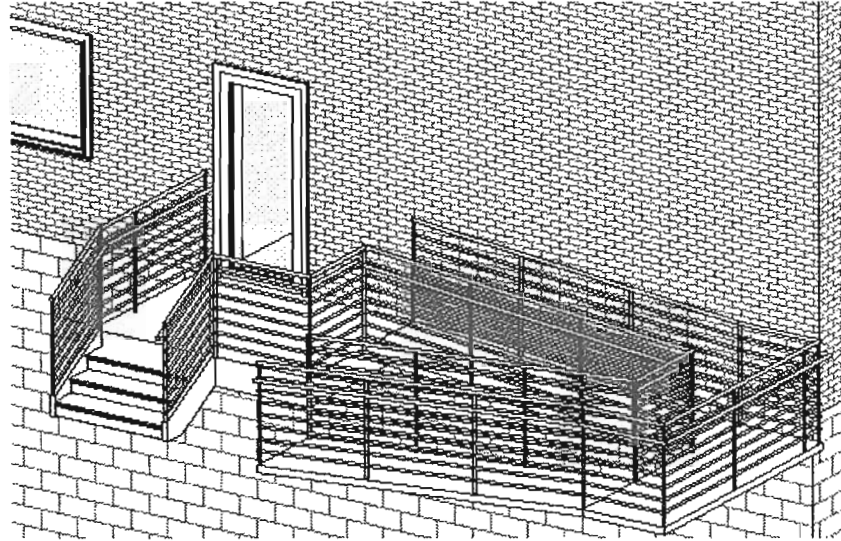
11. Click on **Ramp Properties** and set the parameters as follows:

Width	3'-0"
Base Level	Level 1
Base Offset	-2'-0"
Top Level	Level 1
Top Offset	0'-0"

12. Click Run. Draw the first run from points A to B and a second run from points C to D as shown below.



13. Click **Finish Sketch**. The ramp and railings appear.
14. Draw railings around the open areas on the landing. Since you need two unconnected railings, you will need to do two separate railing sketches.
15. Inspect the area in the 3D view and East elevation view.



16. Save the project.