



Part 5 – Adding openings

Introduction

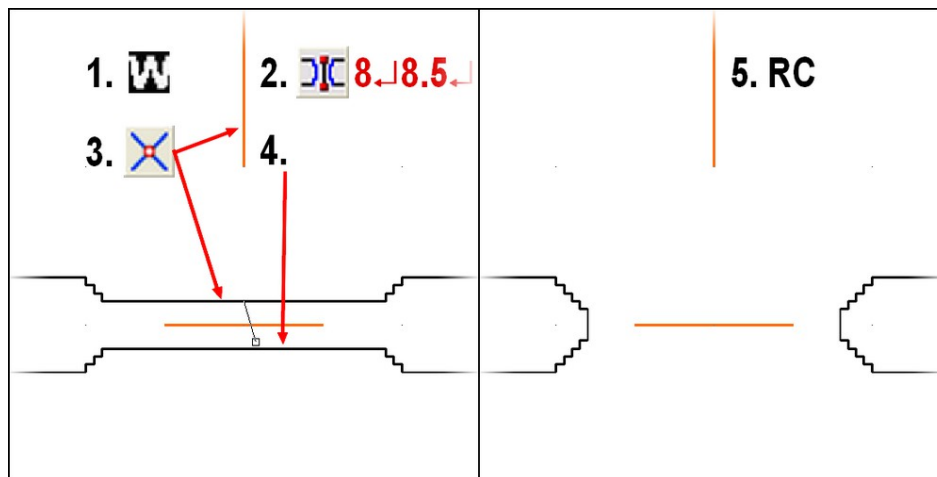
To finish the walls, openings will be added. Then these walls will then be turned into solid filled polygons.

Inserting any CA46 opening (door, window, arrow slit) is very similar to placing alcoves.

Main door

The construction line for the main door was drawn previously (part 4 – page 24):

1. Click (and if the grid is visible).
2. Click on the **Door** icon (**DOR1**) and type **8** for the inner width then **8.5** for the outer width.
3. Use the **Intersection** modifier (**F6**) and select the orange axis then one of the two lines defining the wall to break, the opening's axis will automatically be perpendicular to this first line (in some cases, wall sides are not parallel so it's important to choose carefully the first point).
4. Click anywhere on the facing line,
5. Right-click to end



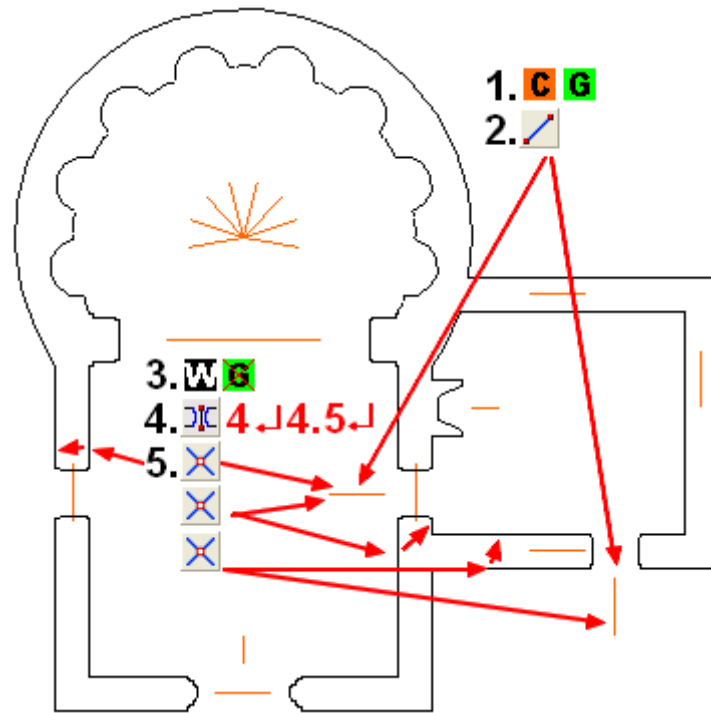
Note: the tool just creates the doorway, it doesn't add the door symbol.

Smaller doors

Three more doors are needed, with a 4' inner width and a 4.5' frame.

1. Click and
2. Draw short **Lines** to define the doors axes
3. Click and
4. Click on the **Door** icon (**DOR1**) and type **4** for the inner width then **4.5** for the outer width
5. Place the openings with the **Intersection** modifier (**F6**) on each inner or outer wall line, then click on the facing line
6. Right-click after the last door has been inserted
7. Save the file as Chapel09.fcw






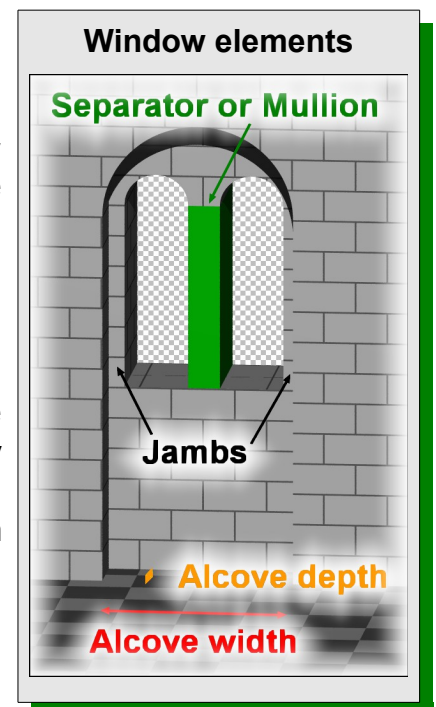


Note: the nave's right and left door share the same construction line (left to the right doorway)

Chapel's windows

These windows have a vertical element separating the opening in two panels. It is called a mullion but was named separator in the tool for simplicity's sake (see sidebar). Inserting windows follows the same pattern as the doors:

1. Click **C** and **G**
2. Draw short **Lines**  to define the windows axes
3. Click **W** and **G**
4. Click on the **Window**  icon (**WIN1**) and type **3** for the alcove width, **1** for its depth, **1** for the #Separator and lastly **0.5** (or right-click) for the Separator width
5. Place the openings with the **Intersection**  modifier (**F6**) on each inner wall line, then click on the outside line
6. Right-click after the last window has been inserted
7. Save the file as Chapel10.fcw



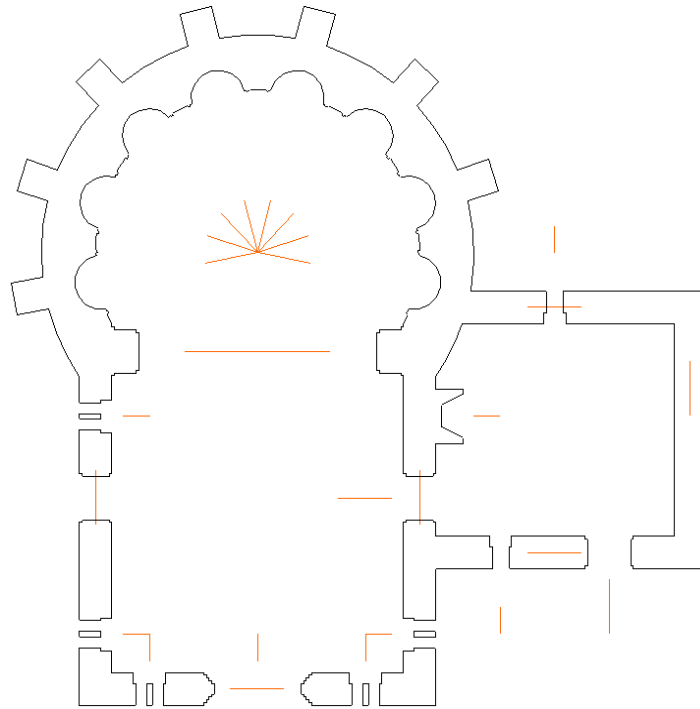
Lodging windows

Follow the steps from the chapel's windows, changing the parameters as following:





- Alcove width: **2**
- Alcove depth: **1**
- #Separator: **0**
- Separator width: **0.5** (default)

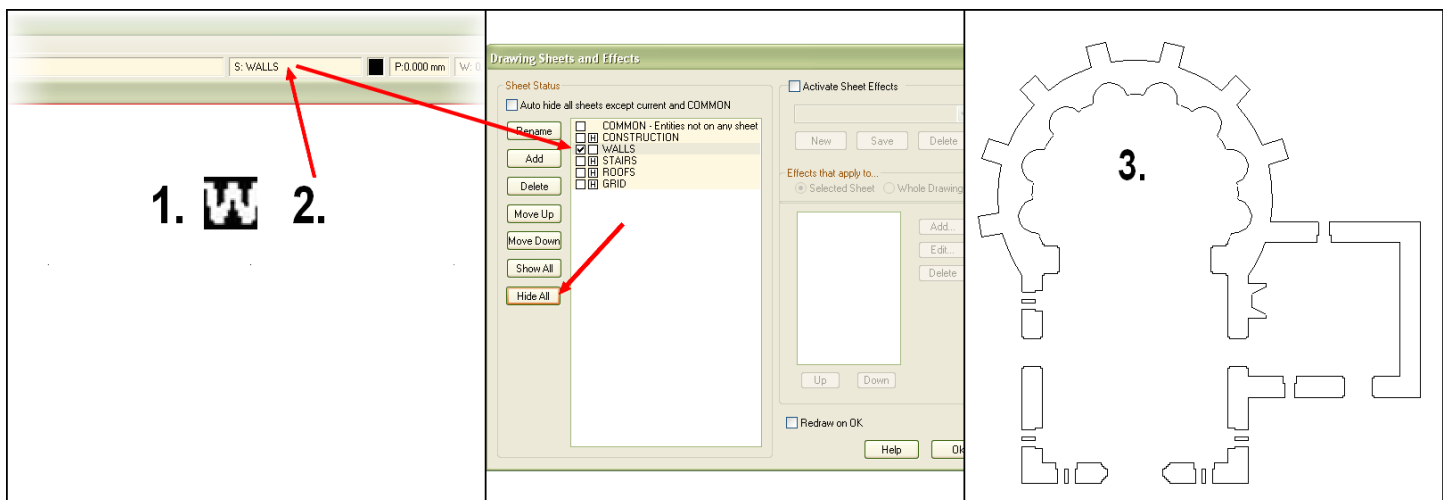
Note: half the separator width will be applied on both jambs of the window even if you specify 0 as the separator number.

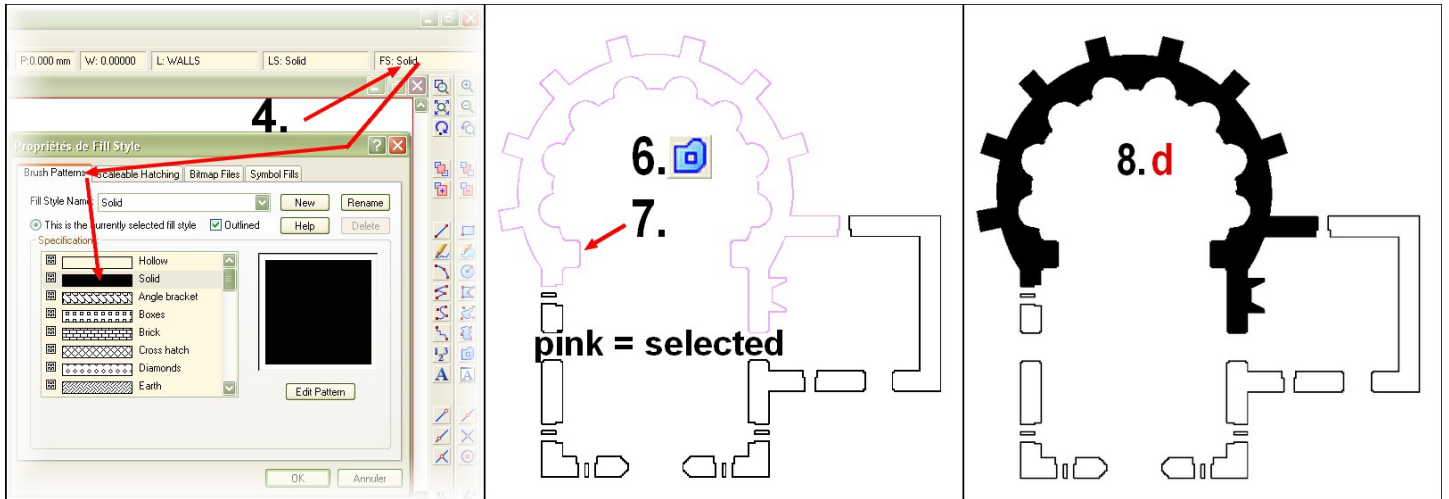






Filling the sanctuary wall

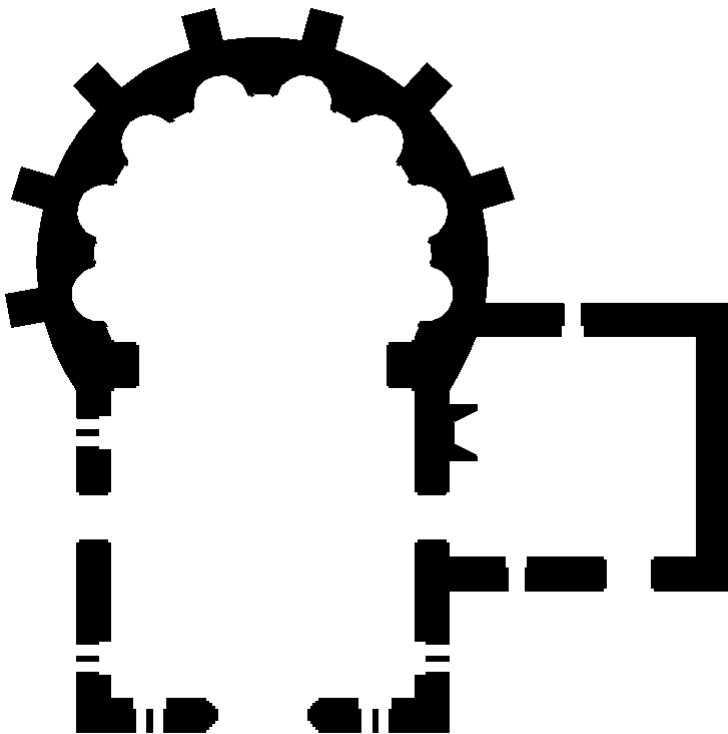
1. Click 
2. Click on the Sheet Indicator and click on **Hide All** then on **OK** to hide all sheets except the wall sheet. You should only have the black lines and arcs visible. If it isn't the case, use the **Move to Sheet** command (right-click  or **MOVESHT**↵) to place any entity on the sheet where it belongs.
3. Check that no dangling lines or arcs appear. If some are present, you probably have wall elements on another sheet. Show all sheets again and use the **Move to Sheet** command (right-click  or **MOVESHT**↵) to place any black line or arc on the **WALLS** sheet then start from step 1. again.
4. Click on the Fill Style Indicator and select **Solid** in the **Brush Patterns** tab.
5. Save the file as Chapel11.fcw. Multipolys are not the more stable entities...
6. Click on the **Multipoly**  (**MPOLY2**↵) tool.
7. Carefully select all the entities making the sanctuary wall including the arcs (see picture).
8. Hit **d** (or right-click **do it**).





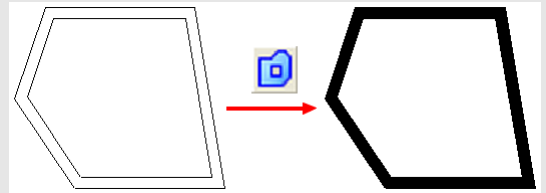
Filling the other walls


Repeat the previous steps but as the remaining parts don't feature arcs, use **Line To Path** (right-click  or **LTP2**) instead of the **Multipoly**  (**MPOLY2**) tool (see sidebar). Theoretically you can selected all the remaining entities in one go but sometimes you will see lines going from a supposed polygon to another a small distance apart, so tread carefully...



Multipolys versus Polygons

- in some cases, you will find yourself with walls without opening, like in the basement of a tower for example. It means that the inner contour has no connection to the outer contour. A Multipoly is the only solution to fill the area between the contours:



- when you use the Line to Path method with arcs, these arcs are converted in a succession of lines, making the shape looking less round. Depending on the resolution of the output, this can be a good solution anyway.
- when all your walls are defined by lines, you can use the Line to Path method to convert the connecting lines into polygons because you can edit polygons with the **Node edit**  tool, but you can't do it with multipolys without first exploding them into their individual parts.

Conclusion :

Unbroken shapes: use **Multipoly**
 Round parts: use **Multipoly**
 All other cases: use **Line to Path**





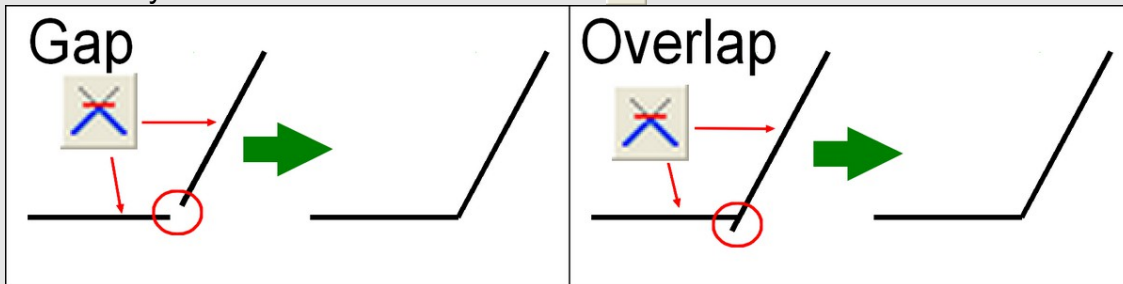
Troubleshooting

Both the **Multipoly** (MPOLY2) and the **Line To Path** (LTP2) tools are very demanding and you might find yourself with odd results (e.g. edges crossing the intended polygon) or even CC3 or computer crash. This is mainly due to two possibilities:

1. the lines or arcs do not connect precisely enough
2. you have duplicates (i.e. exactly the same entity in two or more instances) or overlapping entities

Check the connections

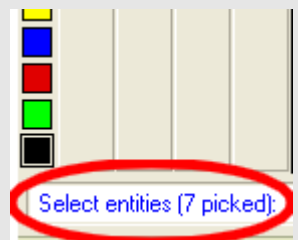
With the **Zoom Window** icon focus on the parts where oddities occur to see if gaps or overlaps are present. Remedy with the **Trim To Intersection** tool:



Check and remove duplicates

Use the **Info**→**LIST** (LIST) command and select the lines/arcs one after another, keeping an eye on the command bar where you'll see the number of entities selected (see picture to the right).

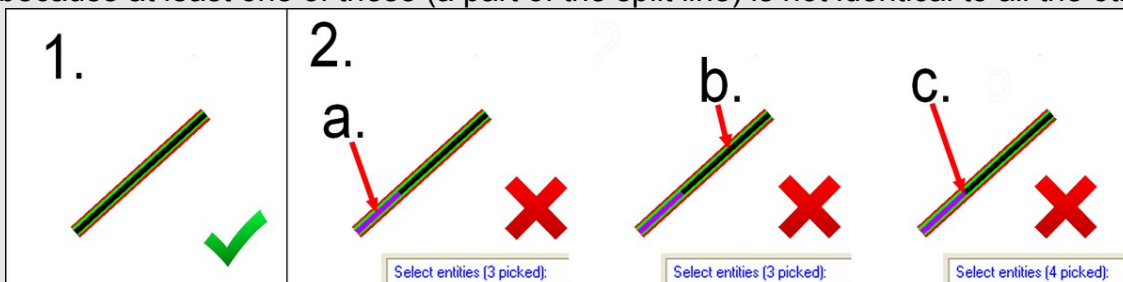
When you encounter duplicates, the number of entities picked will increase by more than one. For example if the number goes from 7 to 10 and it looks like you selected only one more line, you may have three instances of the same line, i.e. two duplicates.



To remove the duplicates, you use the **DELDUPS** command that stands for **DE**LEte **DU**Plicates. This is a text only command, meaning there is no icon to click nor any menu displaying this command.

Now, if **DELDUPS** would work by selecting all the entities and letting the computer find the duplicates that would be a dream come true, alas, this commands removes duplicates **only if you select a single entity and it's duplicates**.

Imagine for example that you have a line and three duplicates of this line. You used the **Split** command on this line. One, and only one, of the four instances was split. When you select the entities after invoking the **DELDUPS** command and clicking on what you think is a line, you will see four or five (if you click almost on the split point) entities picked at once, but none will be removed because at least one of these (a part of the split line) is not identical to all the other.




1. The black, green and red lines (widths difference intentional) have the same endpoints, DELDUPS will remove two and leave one. 2. The black line has been split. Either you click on a., selecting the identical red and green lines and the shorter violet, on b. selecting the identical red and green lines and the shorter black line, or on c. selecting all four entities: DELDUPS will fail.







Check and remove overlapping entities

The worst case is probably when you have a short line (or arc) portion hidden over or beneath a longer line (or arc). Only the **Info**→**LIST** (**LIST**↵) command will help you get this information (you may even find sometimes lines with a length of zero). You can try to combine the selection (right-click, select **both** or **not** depending on the way you proceed) but most often the quicker way is to note the tag number of the offending entity. Use the **Erase**  (**ERA**↵) command and type **#**. The prompt changes to "Tag #" and you enter the carefully noted number, followed by ↵. Each entity has a unique tag number so you won't erase anything else.

1. 	2. LIST ↵  "tag # 20040"	3.  #  Tag #:	4. "20040" ↵  Tag #: 20040	5. d 
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1. The short green line (intentionally wider) is hidden beneath the black one. DELDUPS won't be any good here because the green and black line don't share the same endpoints (the color has no importance though).
2. Perform an **Info**→**List** command (**LIST**↵) to get the tag number.
3. Click on **Erase**  (**ERA**↵) and type **#**.
4. Type the number noted at step 2. In this example, 20040↵.
5. Hit **d** or right-click and select **Do it**. The gap seen here indicates that the line has been deleted. The black line is still whole.
6. Click **Redraw**  to see the black line whole.

Conclusion

The walls are now finished. Many castle or religious building layouts you can find in guides, books or websites look just like this map, with just some labels and a scale bar (and sometimes not even that).

In the following parts, we will convert this map in a full color and high resolution battlemat by slowly adding bitmap fill styles and new sheets to benefit from the effect variety offered by CC3.

