DATACAD LLC

TECHNICAL BULLETIN

Adding New Windows or Doors to the ZAC Database

What if you cannot find the right window or door in the ZAC database? You can create your own and add these windows or doors to the ZAC database. Then, you can use them repeatedly in your ZAC drawings.

To add windows or doors to your ZAC database, you must:

1. Create the 3D window and/or door components. This involves using a DataCAD Plus macro or drawing 3D slabs and polygons for the window or door by yourself.

2. Create the 2D versions of the window and/or door using DataCAD Plus.

3. Dimension the window or door in meters. The ZAC database only accepts input in meters. If you created the window or door using inches and feet, you must change the ScaleTyp (in the Settings menu) to Meters.

4. Save the drawing of these components as symbols. The drawing must be placed as a symbol into a template file so the ZAC database will know where to find it.

5. Add the new window or door to the ZAC database. This allows you to use it in future ZAC drawing projects.

Creating the 3D Window or Door Components

There are several methods for creating a window or door with DataCAD Plus:

- Use the AEC_Modl macro, Window, to define and produce a window

- Use the AEC_Modl macro, Door, to define and produce a door

- Use the SWINDOW macro to define and produce a window

- Use an existing 3D window from the WIN_3D template file that you can explode, modify, and save as a new window

- Use an existing 3D door from the DOR_3D template file that you can explode, modify, and save as a new door

- Draw your own window or door

Each of these methods is described in the *DataCAD Plus Reference Manual.* Using a macro to create a window or door is much simpler than drawing one from scratch.
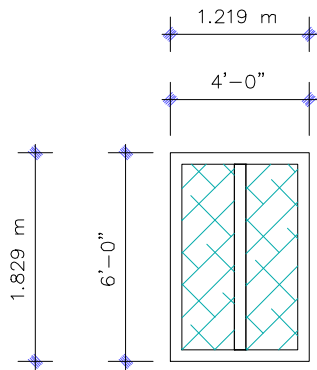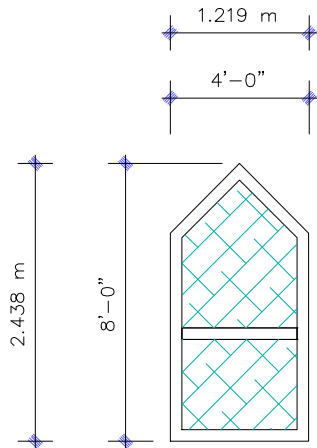
Regular-shaped rectangular window

This was drawn with DataCAD Plus 3DEntity and Slab.

You can draw it using imperial measurements. Dimensions must be changed to meters for inclusion in the ZAC database.

To draw your own regular-shaped 3D window or door (such as a square or rectangle):

1. Use DataCAD Plus 3DEntity.

2. Select Slab.

3. Choose RectAngl.

4. Select Thicknss, supply the value in the input field, and press [Enter].

5. Use Base+Thk to draw the slab by stretching the rubberband.

6. Draw rectangular slabs where you want to insert glass. Right-click to return to the Slab menu.

7. Select Voids and click on the master slab.

8. Choose Entity and AddVoids; click on each rectangular slab where you want to leave an opening for the glass.

9. Use 3DEntity Polygon or Slab to produce the glass within the openings.

See the *DataCAD Plus Reference Manual* for information about working with 3D polygons, slabs, and voids.

Irregular-shaped window with an angular top

This was drawn with DataCAD Plus 3DEntity and Slab.

You can draw the window using imperial measurements. Dimensions must be changed to meters for inclusion in the ZAC database.
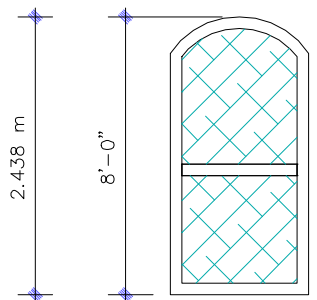
Irregular-shaped window with a circular top

This was drawn with DataCAD Plus 3DEntity and Slab. The curved portion was drawn with 3DEntity, Vert_Cyl, and 3Pt_Arc (Closed and Hgt+Thk).

You can draw the window using imperial measurements. Dimensions must be changed to meters for inclusion in the ZAC database.

To draw an irregular-shaped 3D window or door with an angular top:

1. Use DataCAD Plus 3DEntity.
2. Draw the angular window using Slab, Horizntl, Thicknss, and Base+Thk.
3. Create a void where the glass should appear.
4. Produce the glass.

To draw an irregular-shaped 3D window or door with a curved top:

1. Use DataCAD Plus 3DEntity and Slab to create the rectangular portion of the window or door.
2. Choose Vert_Cyl from the 3DEntity menu to begin drawing the curved portion.
3. Select 3Pt_Arc, Closed, and Hgt+Thk.
4. Click on one corner of the rectangular slab where you want the curved portion to begin.
5. Click on another corner where you want the curved portion to end.
6. Click on the curved portion when the shape of the window or door is correct.
7. Create a void where the glass should appear.
8. Produce the glass.

For irregular-shaped windows with either an angular or curved top, you also need to create a 3D horizontal polygon of the outer perimeter of the window for the void that ZAC must generate.

Outer perimeter shape

Create a 3D horizontal polygon of the perimeter of the irregular-shaped window or door for the void that ZAC must generate.
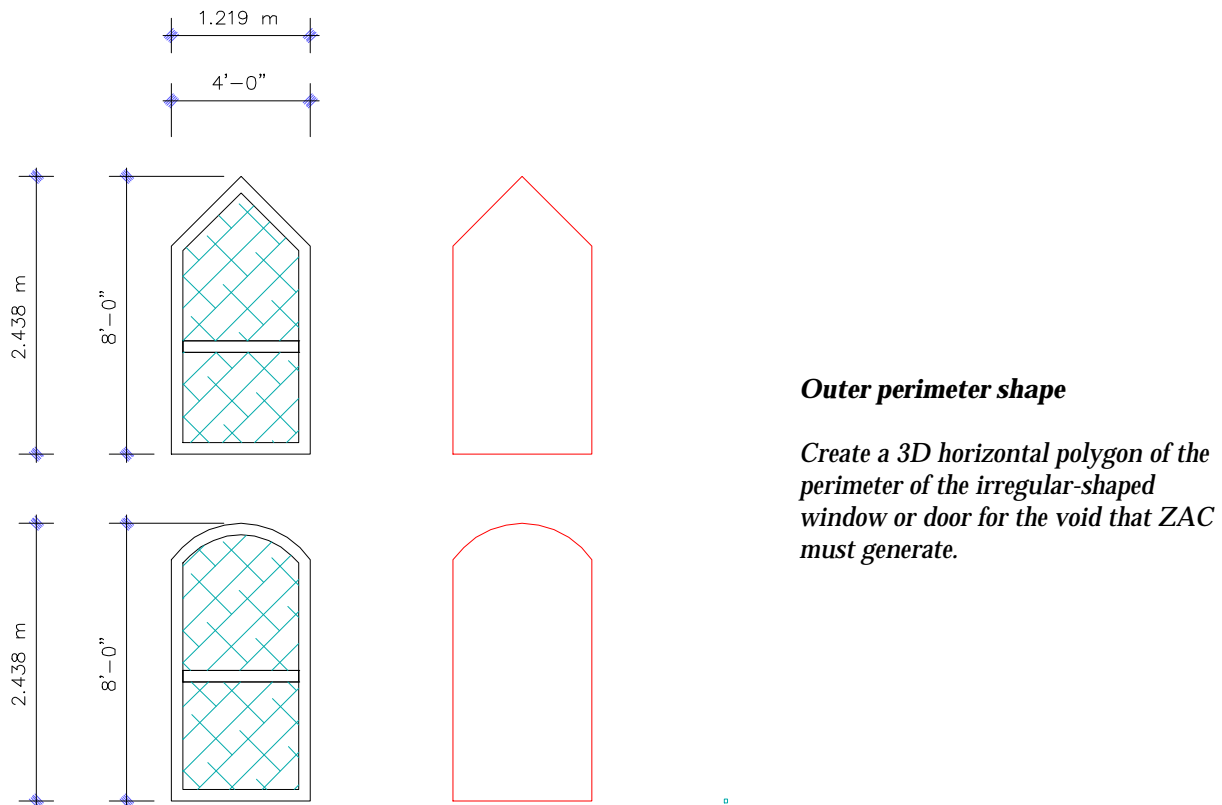
To create the outer perimeter shape of the window with the angular top:

1. Select Polygon from the 3DEntity menu.
2. Choose Horizntl.
3. Activate Z-Base.

4. Click at each corner of the polygon and right-click to end it.

To create the outer perimeter shape of the window with the curved top:

1. Create a horizontal polygon for the rectangular part of the window following steps 1 through 4 of the preceding instructions.

2. Select Vert_Cyl from the 3DEntity menu.

3. Activate 3Pt_Arc, Closed, and Base+Thk.

4. Set Thicknss to 0.

5. Click once on each outer corner of the curve and once on the curve's perimeter.

You can add more 3D elements (such as handles) to the window or door.

Creating 2D Components for the 2D Plan

In addition to the 3D components, you also need to create three separate 2D components. These will represent the 2D plan display of the window or door at various levels of detail.
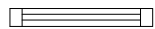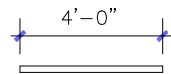
To create 2D components:

1. Deactivate W on the switch bar. This allows you to draw 2D lines instead of walls.

2. Use 2D lines to draw three different versions of the window or door 2D components. Each version should show slightly more details than the preceding one.

3. Use [H] for the Hatch menu and apply patterns where needed in the detailed drawing.

If various windows or doors are the same width (as in this example) and have the same plan representation, they can all refer to the same 2D components in the database.

Dimensioning the Window or Door

Whether you use a macro to fashion the window or door or draw your own from scratch, you must dimension it. The ZAC database works with meters only, not inches. If your window or door was created with imperial (inches and feet) measurements, you must change them to metric before you can dimension it.

To dimension the window or door:

1. Select Settings from the UTILITY menu.

2. Choose ScaleTyp.

3. Select Meters.

4. Right-click to return to the UTILITY menu and select Dimension.

5. Dimension the width and height of the 3D window or door.

6. Dimension the 2D window or door.

Once the dimensions are in meters, ZAC can use this information in the database.

Saving the Window or Door Components as Symbols

Once you have created all the components necessary for both the 2D and 3D representation, you must save all of them as symbols to the correct folders so the database will be able to find them.

To access the correct template files where these components will be stored:

1. Press [T] to go to the Template menu.

2. Select NewPath. Using ScrlFwrd where necessary, navigate through these folders and files: <ROOT>, DCAD_LLC, DCADPLUS, TPL, and ZAC.

In some places, you may need to use ScrlFwrd until you find the particular folder.

3. Right-click the mouse and select WIN_3D for windows. (If you are working with doors, select DOR_3D instead.) The template for windows appears.
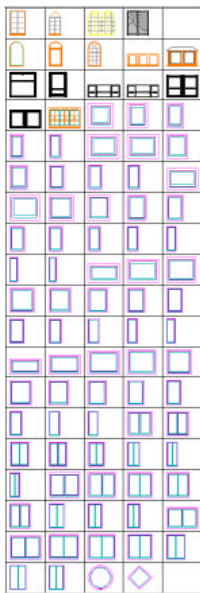
TPL\ZAC\WIN_3D

To add more space in the template window to hold your new symbols:

1. Select Divisons from the Template menu. The prompt requests "Number of X-divisions in template."

2. Press [Enter] to accept what is already there. The prompt requests "Number of Y-divisions in template."

3. Type the number 20 in the input box and press [Enter]. This will add an extra row of template windows where you can place your new symbols.
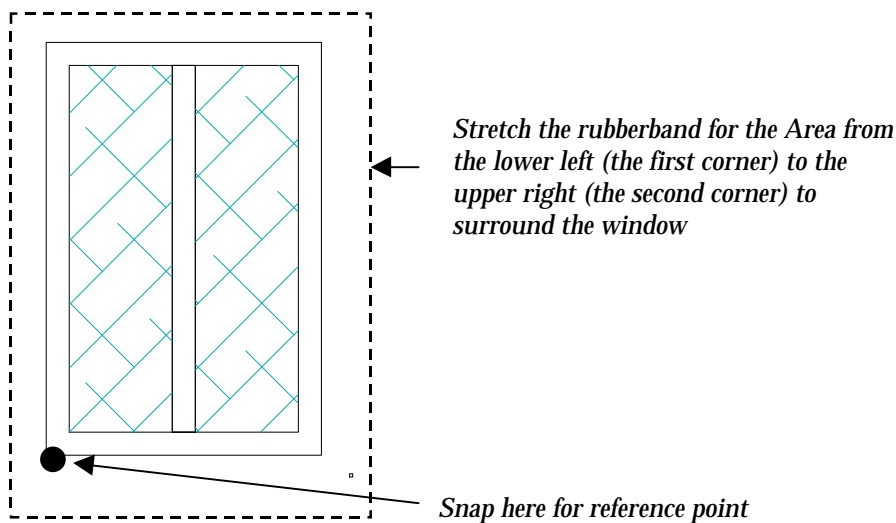
To save the first 3D symbol:

1. Select SaveSymb from the Template menu.

2. Activate AutoPath in the SaveSymb menu so the symbols will be saved to the correct folder. The prompt requests "Enter name of the symbol file to be saved."

3. Type a name with no more than eight characters (for this example, type the name WIN-T1) and press [Enter].

4. Activate Area. The prompt requests "Select first corner of area to <CREATE SYMBOL>."

5. Stretch the rubberband around the window (by clicking just beneath the lower left corner and moving above the upper right corner) and click when you have enclosed it. This selects the window you created. The prompt requests "Select a reference point for symbol."

6. Snap to the lower left corner of the window by clicking your middle mouse button or pressing [N]. (See the following illustration.) This immediately pops your window into the WIN_3D template. The prompt requests "Item name."

7. Type the window symbol's name (in this example, WIN-T1) and press [Enter].

Make a note of the folder and the symbol name (in this example, it is SYM\ZAC\WIN_3D\WIN-TI) for future reference.

8. Right-click twice to close the operation.

Follow steps 1 through 8 to save the other two windows as WIN-T2 and WIN-T3.

Stretch the rubberband for the Area from the lower left (the first corner) to the upper right (the second corner) to surround the window

Snap here for reference point

Saving Irregular-shaped 3D Polygon Voids as Symbols

Before ZAC can place the irregular-shaped window or door you created into your drawing, there must be a matching void for it. The 3D polygon you created represents that void. You must save the 3D polygon to the correct template file so that ZAC can use it to create a void where the irregular-shaped window or door will be placed.

To save an irregular-shaped 3D polygon void as a symbol:

1. Press [T] for the Template menu.

2. Select NewFile and use ScrlFwrd until you find the WIN_VOID file.

3. Choose WIN_VOID. This file contains the 3D polygons ZAC uses to create voids.

If necessary, you can add more template windows by selecting Divisons and changing the number of X or Y divisions. (See the instructions in the previous section.)
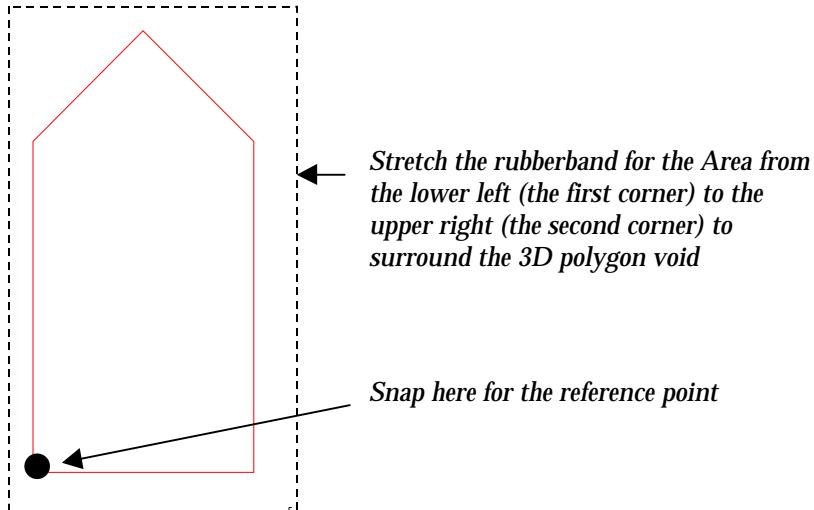
4. Select SaveSymb, type the symbol name (in this example, WIN-T2) in the input box, and press [Enter].

5. Activate Area, stretch the rubberband around the void (by clicking just beneath the lower left corner and moving above the upper right corner), and click when you have enclosed it. This selects the void you created. The prompt requests "Select a reference point for symbol."

6. Snap to the lower left corner of the void by clicking your middle mouse button or pressing [N]. (See the following illustration.) This immediately pops your 3D polygon void into the WIN_VOID template. The prompt requests "Item name."

7. Type the void symbol's name (in this example, WIN-T2) and press [Enter].

Make a note of the folder and the symbol name (in this example, it is SYM\ZAC\WIN_VOID\WIN-T2) for future reference.

8. Right-click twice to close the operation.

Follow steps 1 through 8 to save the 3D polygon void for another window. In this example, you would save the third window's 3D polygon void as WIN-T3 in the WIN_VOID template.

Stretch the rubberband for the Area from the lower left (the first corner) to the upper right (the second corner) to surround the 3D polygon void

Snap here for the reference point

Saving the 2D Window or Door Components as Symbols

You must also save the 2D window or door components (which you created earlier in this example for three levels of detail) as symbols. Each one must be placed in the appropriate template much like the 3D windows or doors.

To save the simplest of the 2D window components as a symbol:

1. Press [T] to reach the Template menu.

2. Select NewFile and use ScrlFwrd until you find the WIN_2D_1 file.

3. Choose WIN_2D_1. This file contains the most basic 2D representations.

If necessary, you can add more template windows by selecting Divisons and changing the number of X or Y divisions. (See the instructions in a previous section.)

4. Select SaveSymb, type the symbol name (in this example, PLAN-4) in the input box, and press [Enter].

5. Activate Area, stretch the rubberband around the first 2D plan (by clicking just beneath the lower left corner and moving above the upper right corner), and click when you have enclosed it. This selects the simplest 2D plan you created. The prompt requests "Select a reference point for symbol."

6. Snap to the middle left edge of the 2D plan by clicking your middle mouse button or pressing [N]. (See the following illustration.) This immediately pops your 2D plan into the WIN_2D_1 template. The prompt requests "Item name."

Stretch the rubberband for the Area from the lower left (the first corner) to the upper right (the second corner) to surround the 2D plan
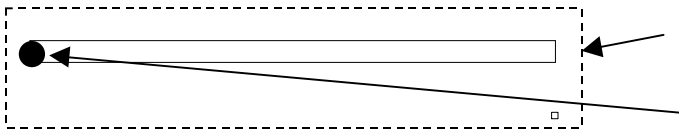
Snap to the middle left edge for reference point

Type the void symbol's name (in this example, PLAN-4) and press [Enter].

Make a note of the folder and the symbol name (in this example, it is SYM\ZAC\WIN_2D_1\PLAN-4) for future reference.

7. Right-click twice to close the operation.

You must now save the next two levels of the 2D plan of the window components. In each case, you will follow steps 1 through 8, but change the name of the template file. The Item name is PLAN-4 for all levels of the 2D plan of the window components.

Middle level of the 2D window components:

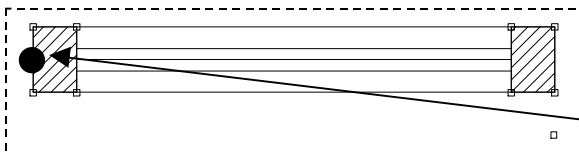|	
Template file	WIN_2D_2
Item name	PLAN-4
Folder and symbol name	SYM\ZAC\WIN_2D_2\PLAN-4
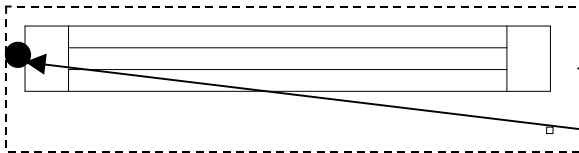
Stretch the rubberband for the Area from the lower left (the first corner) to the upper right (the second corner) to surround the 2D plan

Snap to the middle left edge for reference point

Most complex level of the 2D window components:

Template file	SYM\ZAC\WIN_2D_3
Item name	PLAN-4
Folder and symbol name	SYM\ZAC\WIN_2D_3\PLAN-4

Stretch the rubberband for the Area from the lower left (the first corner) to the upper right (the second corner) to surround the 2D plan

Snap to the middle left edge for reference point

Adding the New Window or Door Components to the ZAC Database

After adding the window or door components you created to the template files as symbols, you must add them to either an existing or new database.

To create a new database:

1. Click on the Windows Start button in the lower left corner of your screen.

2. Select Programs and click on Windows Explorer.

3. Open the folders for DCAD_LLC, DCADplus, and DBF.

4. Highlight either the Z_WIN_AN.DBF (windows database) or Z_DOR_AN.DBF (doors database) file.

5. Click on the Copy icon (or select Copy from the Edit pull-down menu.

6. Scroll to the bottom of the list of files in the DBF folder. There you will find a file labelled Copy of Z_WIN_AN.DBF (for windows) or Copy of Z_DOR_AN. DBF (for doors).

7. Select Rename from the File pull-down menu. Copy of Z_WIN_AN.DBF (or Copy of Z_DOR_AN.DBF) is highlighted in a rectangular box.

8. Type an eight-character file name and the file extension ".DBF" (remember that a period or dot precedes DBF) and press [Enter]. For example, you could use ZMYWINS.DBF or ZMYDOORS.DBF as the file name.

To add the new windows or doors to a database file:

1. Activate the ZAC and W buttons on the DataCAD Plus switch bar.

2. Select ARCHTECT from the EDIT menu.

3. Choose Openings.

4. Click on Window to work with the new windows or Door to work with new doors.

5. Press [Backspace] to load the Z_WIN_AN.DBF (for windows) or Z_DORS_AN.DBF (for doors) database. The database appears.

If you created your own database or want to save the new windows or doors to a different database, press [Alt]+[Backspace], choose dBase, and select the database you want to load.

Add icon →
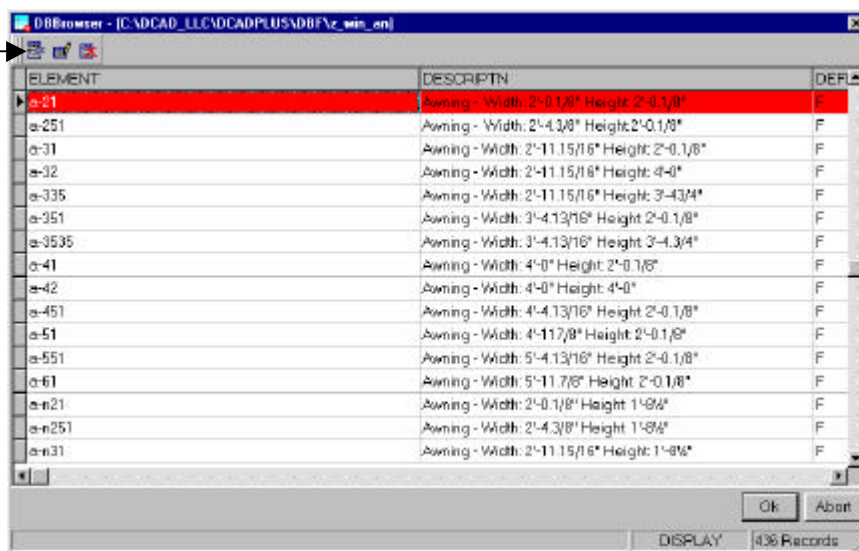
6. Select any existing database item and choose the Add icon. The database entry screen for that item (known as an Element) appears.
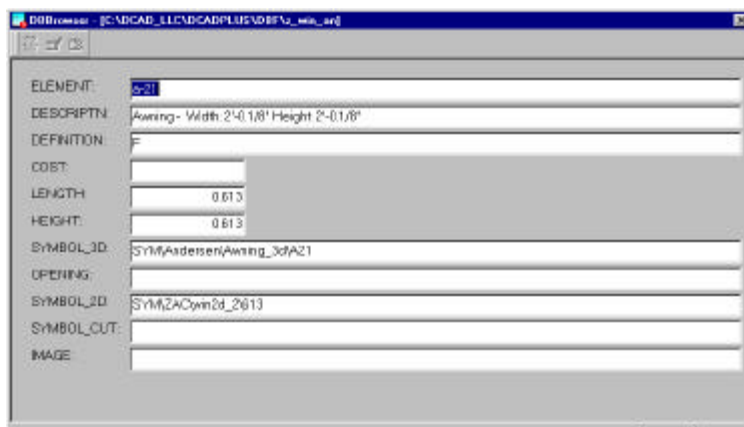
It doesn't matter which database item you select. The item you select serves as a pattern for a new database window or door element. This new element will not replace the one currently on your screen. The new element (window or door) will be added to the database so that you can use it in drawings.

7. Type the information about your new window or door into the database entry fields. Press [Tab] to move from one entry field to the next. When you are finished, click on the OK button.

> Based on the example where you created the new windows, the information in the database fields for the rectangular one would be:

ELEMENT	WIN-T1
DESCRIPTN	Rect Window 4'-0 x 6'-0
DEFINITION	F
COST	0
LENGTH	1.219
HEIGHT	1.829
SYMBOL_3D	SYM\ZAC\WIN_3D\WIN-T1
OPENING	
SYMBOL_2D	SYM\ZAC\WIN_2D_1\PLAN-4
SYM_CUT	

In the DEFINITION field for a window, F indicates a fixed window and no entry (blank) signifies a freely defined window. In the DEFINITION field for a door, F indicates a fixed single door, FD is used for a fixed double door, and no entry (blank) signifies a freely defined door.

For the rectangular window, no entry is needed in the OPENING field since this symbol has rectangular proportions.

If we had created a symbol for a cut section, that would be entered in the SYM_CUT (section detail) field. The SYM_CUT information is used when ZAC generates a section.

8. Repeat steps 6 and 7 for each additional window or door you want to add to the database. When you are finished entering new items to the database, click on Ok to return to the ZAC drawing window.

> Based on the example where you created the new windows, the information in the database fields for the irregular-shaped ones would be:

ELEMENT	WIN-T2	WIN-T3
DESCRIPTN	Rect Window 4'-0 x 8'-0	Rect Window 4'-0 x 8'-0
	with Angular top	with Curved top
DEFINITION	F	F
COST	0	0
LENGTH	1.219	1.219
HEIGHT	2.438	2.438
SYMBOL_3D	SYM\ZAC\WIN_3D\WIN-T2	SYM\ZAC\WIN_3D\WIN-T3
OPENING	SYM\ZAC\WIN_VOID\WIN-T2	SYM\ZAC\WIN_VOID\WIN-T3
SYMBOL_2D	SYM\ZAC\WIN_2D_1\PLAN-4	SYM\ZAC\WIN_2D_1\PLAN-4
SYM_CUT		

Using the New 3D Windows or Doors in ZAC Drawings

Now that the windows or doors you created (either from scratch or with a macro) are in the database, you can use them in your ZAC drawings.

To use the new windows or doors that you added to the database:

1. Activate ZAC and W in the Switch bar and select ARCHTECT from the UTILITY menu. The ZAC icon bar appears.

2. Use the Wall icon to draw walls.

3. Click on the Create Windows or the Create Doors icon.

4. Press [Backspace] to open the windows or doors database. The database appears.

5. Highlight one of the windows or doors you created and click on Ok. You return to the drawing screen.

6. Insert the new window or door into the wall.

Generating the 2D Plan with the New Windows or Doors

When you created the 3D windows in the exercise, you also designed their 2D representations in three levels of detail. In addition, you saved these 2D representations as symbols and included them in the database for each window. These will be used to generate the 2D plan.

To make sure you use the new window or door in the 2D plan:

1. Activate ZAC and W in the Switch bar and select ARCHTECT from the Utility menu. The ZAC icon bar appears.

2. Choose Gen_2D from the ARCHTECT menu.

3. Select Detail from the Gen_2D menu. The Z_DETAIL.DBF database appears.
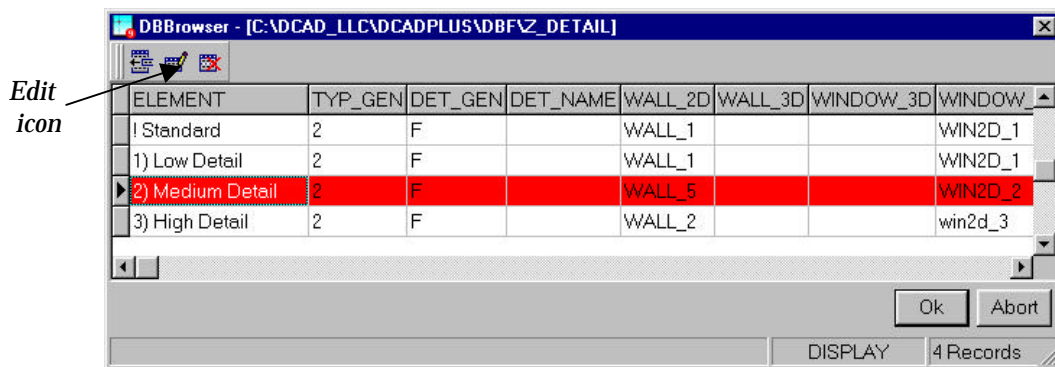
Edit icon

4. Click on the Edit icon.

5. Make sure that the correct folders are associated for each level of detail in the fields for Window_2D and Door_2D. These are:

	Window_2D	*Door_2D*
Standard	WIN_2D_1	DOR_2D_1
Low Detail	WIN_2D_1	DOR_2D_1

Medium Detail	WIN_*2D_2*	DOR_2D_2
High Detail	WIN_2D_3	DOR_2D_3

If necessary, make changes.

6. Select Ok to return to the database.

7. Choose the level of detail you want to use in your 2D plan and click on Ok to generate it.