



ACE Structural Engineering Applications LLC

ACE FrameWorks Utilities

Orthogonal Hole Punch Documentation

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Orthogonal Hole Punch (ACE_OHP.MA)

(Versions - FWP 3.1.x.x/3.2.x.x rel 2.0.2 & FWP 7.0.x.x rel 7.0.2 & FWP 7.1/7.2/7.3 rel 6.0.2 & FWP 8.0.x.x rel 8.0.2 & FWP 9.0.x.x rel 9.0.2 & FWP 10.0.x.x rel 10.0.2 & FWP 11.0.x.x rel 11.0.2 & FWP 12.0.x.x rel 12.0.2)

The *Orthogonal Hole Punch* application simplifies the punching of holes in conforming FWP solids (SLAB,

WALL & SOLID). A conforming solid is any solid FWP type SLAB or SOLID that is formed via a rectangular surface shape projected a constant distance or a FWP “brick shaped” solid type WALL formed with the FWP wall command. While such a solid will have six faces, only two of the faces may be punched (see pages 2 & 3). Round, square, rectangular & slotted holes may be punched. The hole may be punched completely or partially through the solid. The opening/hole dimensions may be defined or may be selected from an “openings library” (see ASCII Openings file). The term “opening” is being used to define the punch template. If the opening is within or borders the surface boundary, the resulting hole will match the opening. The opening may extend over the surface boundary. For such a case, the hole is a subset of the opening. The opening and the FWP solid surface are highlighted when a FWP solid is selected and an opening is active.

Orthogonal Hole Punch - Primary Dialog Box w/o Solid Selected

The dialog box shown above appears when the program is started. First, a FWP solid is selected using the FWP Solid pull-down menu. A surface face for the solid is selected using the surface option button. Next, the opening location, punch depth, opening rotation & WP are selected/confirmed. The opening location is relative to the width and depth of the face being punched. The opening may be located to preset locations with the Horizontal & Vertical option buttons and/or the horizontal & vertical distances may be specified directly. The incremental movement buttons may be utilized to shift the opening vertically and/or horizontally. The opening dimensions may be selected via opening option button or custom defined. When all is as desired, the hole can be punched with the PUNCH HOLE button. Any

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parameter (face, location, punch depth, rotation, WP, opening, opening library, FWP Solid) may be changed at any time. This process is illustrated in the Program Operation section. FWP solids are discussed in the next section.

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FWP Solids - Conforming Criteria & Determining Type

As previously stated only conforming FWP Solids may be punched. A conforming solid is any solid FWP type SLAB or SOLID that is formed via a rectangular surface shape projected a constant distance or a “brick shaped” WALL formed with the FWP WALL command. Thus any solid formed with arcs and/or polygons with less than or more than 4 vertices are NOT conforming. Another way to view a conforming solid is that it basically forms a brick template/shape. Since FWP Solids may be defined in many ways, FWP type terminology (WALL, SLAB & SOLID) is supplemented with the following categories termed ACESEA OHP solid titles: **FWP Solid, FWP Flat Slab, FWP Vertical Wall, FWP Edge Slab, FWP Top Wall, and FWP Edge Wall.** *Hole punching in solids type WALL is quite complex as the WALL is handled in a special manner by FWP – see next page.*

FWP Solids type SLAB or SOLID (FWP type WALL is very special see page 3)

A FWP solid type SLAB and SOLID is processed by reading the solids first rectangular shape – this is termed the primary surface.

Conforming ACESEA OHP “FWP Flat Slab”

To qualify as a conforming FWP flat slab, the solid must be a FWP type SLAB or SOLID & the primary surface must 1) form a horizontal plane and 2) have the most surface area.

Conforming ACESEA OHP “FWP Edge Slab”

To qualify as a conforming FWP edge slab, the solid must be a FWP type SLAB or SOLID & 1) the primary surface must form a vertical plane and 2) the surface with most surface area must be flat.

Conforming ACESEA OHP “FWP Vertical Wall”

To qualify as a conforming FWP vertical wall, the solid must be a FWP type SLAB or SOLID & the primary surface must 1) form a vertical plane and 2) have the most surface area.

Conforming ACESEA OHP “FWP Top Wall”

To qualify as a conforming FWP Top Wall, the solid must be a FWP type SLAB or SOLID & 1) the primary surface must form a horizontal plane and 2) the surface with most surface area must be vertical.

Conforming ACESEA OHP “FWP Edge Wall”

To qualify as a conforming FWP Edge Wall, the solid must be a FWP type SLAB or SOLID & 1) the primary surface must form a vertical plane and 2) the surface with most surface area must be vertical.

Conforming ACESEA OHP “FWP Solid”

Any FWP solid type SLAB or WALL that does not meet above criteria..

Punching Faces for FWP Solids type SLAB or SOLID

Only two faces of the six faces on a solid type SLAB or SOLID is punchable. A solid is processed by reading the solids first rectangular shape and the second rectangular shape (remember a conforming solid must be a rectangle projected a constant distance). Using these two shapes, the six surface outlines for the solid can be generated. However only the first two faces of the solid (a parallel pair) may be punched. Punching the other four faces would generate errors (FrameWorks limitation), thus the PUNCH HOLE command is disabled when they are selected. The creation of a solid is very important in determining the pair of valid punching faces. It is possible to create a flat slab by the narrow edge rectangle projected a distance. A flat slab generated this manner can only be punched horizontally. Thus if a flat slab is to be punched vertically, it must be created with a flat plane shape. Similarly a FWP solid type SOLID vertical wall may be created using the narrow edge projected vertically. This type of wall may only be punched vertically. Thus if a wall (FWP type SOLID) is to be punched horizontally, it must be created with a vertical plane shape.

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FWP Solids - Conforming Criteria & Determining Type (con'd)

As previously stated Hole punching in solids type WALL is quite complex as the WALL is handled in a special manner by FWP. If a WALL is placed using the FWP wall command (orthogonal or shape) it is created by defining a shape in a plan view – the shape for a wall may be non-rectangular. This application will only punch walls that are rectangular (i.e. walls that are “rectangular bricks”). Walls can only be punched correctly in the direction of thickness (this is very different from FWP type SLAB & SOLIDS – see page 2). Solids FWP type WALL can be created with FPL applications (Gusset Plate applications are an example) – this type of FWP WALL is generally not punchable. Gusset plates FWP type WALL are not punchable with this application [note: 1) horizontal gusset plates type WALL can be punched with the other hole punch utility creating a slab hole but this is type hole will not propagate properly; 2) vertical gusset plates can not be punched]. Use FWP type SOLID or SLAB for punchable gusset plates.

FWP Solids type WALL

A FWP solid type WALL is processed by reading the solids first rectangular shape – termed the primary surface. If the first shape forms a horizontal plane, it is titled an ACESEA OHP “FWP Top Wall”.

Conforming ACESEA OHP “FWP Top Wall”

To qualify as a conforming FWP Top Wall, the solid must be a FWP type WALL & the primary surface must form a horizontal plane (since the pairs of surfaces are parallel, both surfaces form a flat plane). Furthermore, the wall must be a “brick shape”. This is the only type of punchable FWP type WALL for this application.

Punching Faces for FWP Solids type WALL

Only two faces of the six faces on a solid type WALL is punchable. The FWP solid type WALL varies from the types SOLID in SLAB in that the first two faces (primary surface) is NOT punchable. A solid is processed by reading the solids first rectangular shape and the second rectangular shape (remember a conforming solid must be a rectangle projected a constant distance). Using these two shapes, the six surface outlines for the solid can be generated. For FWP solid type WALL, the first two faces will display the following message & the punch button will be disabled & labeled “INVALID”.



The other four faces will display a “Try Punch Wall” as shown below.



The correct punch direction is the direction of the wall thickness when the FWP solid type WALL was created. This cannot be determined from the geometry of the FWP solid, however more often than not it is the thin direction and usually known by the designer. Thus it is left to the user to select the two correct faces. Punching the two incorrect faces will generate FWP error (FrameWorks limitation).

The creation of a FWP solid type WALL is generally done with the FWP create WALL command. If a solid FWP type WALL is created with FPL, it is punchable by this application only if the solid is created from a flat horizontal rectangle projected vertically. Non-conforming FWP WALLs will display the following messages:

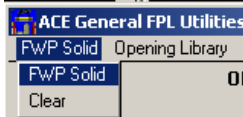


or



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Program Operation



Using the FWP Solid top-bar menu, activate FWP Solid command and select a conforming FWP Solid. For this illustration, a vertical solid “apparent wall” (FWP type SOLID) is selected and the dialog box shown below appears.

Information for the selected solid is displayed in an accept/reject dialog box as shown below.

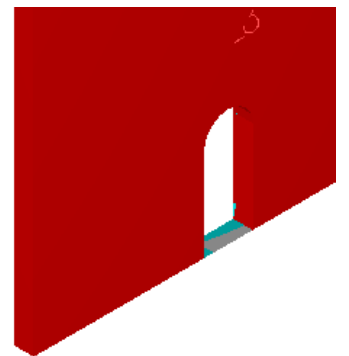
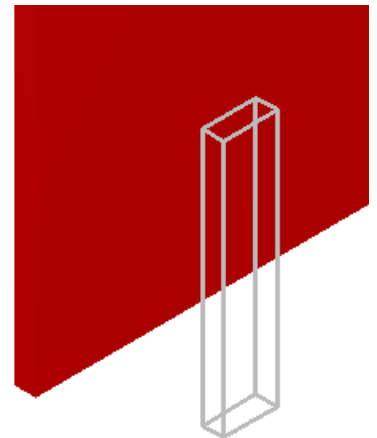
A dialog box titled 'FWP Vertical Wall SO_2 (2) Mbr ID 2 W= 20.000 D= 18.000 T= ...'. It contains a table with four points (Pt1 to Pt4) and their coordinates in East (x), North (y), and Elev (z).

| Pt | East (x) | North (y) | Elev (z) |
|------|----------|-----------|----------|
| Pt1: | 0.000 | 0.000 | 0.000 |
| Pt2: | 20.000 | 0.000 | 0.000 |
| Pt3: | 20.000 | 0.000 | 18.000 |
| Pt4: | 0.000 | 0.000 | 18.000 |

At the bottom, there are two buttons: 'Accept Solid SO_2' and 'Reject Solid'.

Vertical Solid Accept/Reject Dialog Box

If the FWP type SOLID is accepted, the primary dialog box becomes populated as shown below.

A screenshot of the 'ORTHOGONAL HOLE PUNCH' dialog box. The title bar says 'ACESEA(c) 1998-2004'. The main title is 'ORTHOGONAL HOLE PUNCH (Units Feet - UNO)'. The 'FWP Vertical Wall' section shows 'Vertical Solid Surface Width 20.000 by Depth 18.000' and a table of points. The 'Opening Location, Depth, Rotation & WP' section has buttons for 'Horizontal', 'Vertical', 'Punch Depth', and 'Opening WP', along with input fields for 'Specified', 'Bottom', 'Punch Fully', 'WP 5', and 'Rotation: 0.000'. The 'Incremental Button Movement' section has buttons for '- Horiz', '+ Horiz', '- Vert', and '+ Vert', and input fields for 'Horizontal Increment' and 'Vertical Increment'. The 'Opening Dimensions' section has a dropdown for 'Opening: Arch Door' and input fields for 'Slotted Width: 2.500' and 'Depth: 12.000'. The 'Solid Properties' section shows 'SOLID PROPERTIES', 'Thickness: 1.000', 'ID: 2', 'Material: 1', 'Class: 1', 'Name: SO_2', and 'Grade: Fc_4'. The 'Hole Coordinates' section shows 'Opening Attach Location: 9.000x 0.000y 0.000z' and a table of points. At the bottom, there are buttons for 'PUNCH HOLE', 'HILITE Hole', 'Display Surface', and 'Cancel'.

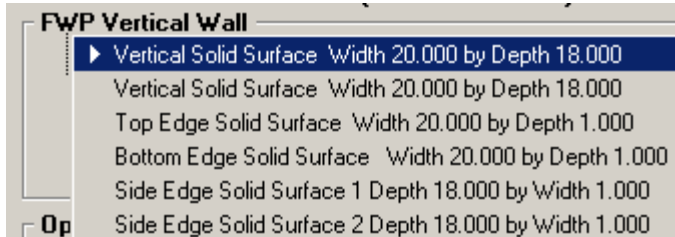
Once a FWP solid is selected, a hole can be punched if a valid opening is currently active (as shown above). The image top right shows the dynamic display for the opening limits for an arch doorway (note the opening extends the boundary – ½ slotted hole). The image bottom right shows the resultant arch doorway hole in the wall. The dialog box is divided into four sections. Each section is discussed in the following pages.

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Program Operation con'd

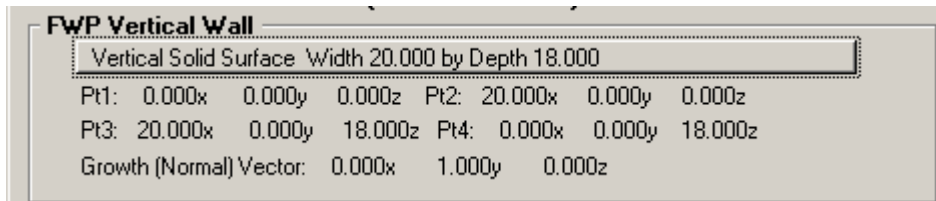
Section 1: Selection of FWP solid surface

Each FWP solid has 6 faces. This section has an option button to select any of the six surfaces. Only the first two faces can be punched for FWP types SOLID or SLAB. For FWP solid type SOLID or SLAB, this application shows and allows selection of all 6 faces, however whenever faces 3 thru 6 are selected, the PUNCH HOLE button is disabled.



Option Button for FWP Solid Surface Selection

The selected surface (only 1st or 2nd can be punched) is the one that the opening/hole will be “punched” into. For the case shown, a vertical solid type FWP SOLID was selected where the first two faces form a large rectangular vertical surface, thus the section has been titled FWP Vertical Wall. For FWP type SOLID or SLAB, there are four possible ACESEA OHP solid titles: FWP Flat Slab, FWP Edge Slab, FWP Vertical Wall and FWP Solid. For FWP type WALL, there are two possible ACESEA OHP solid titles: FWP Top Wall, and FWP Edge Wall (the ACESEA OHP solid titles are discussed in detail on pages 3 & 4). At any time the face may be changed. If a valid opening is active, the new surface & opening will be re-highlighted and ready to adjust or punch. For the selected surface, the four coordinates (Pt1, Pt2, Pt3 & Pt4) and the growth vector is shown below the option button. The growth vector is the direction normal to the face (opposite to the other parallel face).



Section 1 Face Selection, Surface Edge Points & Growth Vector

At any time a new FWP solid may be selected using the FWP Solid top-bar menu.

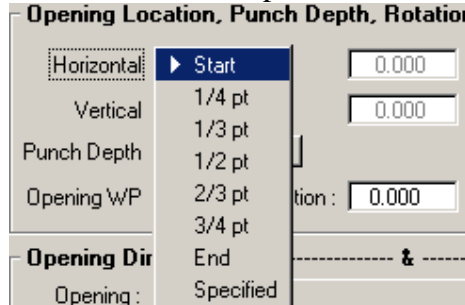
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Section 2: Opening Location, Punch Depth, Rotation & WP

Each of the six surfaces is simply a rectangular box with a width & a depth. In this section the box is treated as a two dimensional element (horizontal & vertical) no matter how the solid is oriented in the model. The location of the opening relative to the surface is defined in this section. The width (horizontal) and the depth (vertical) are selected with horizontal & vertical option buttons

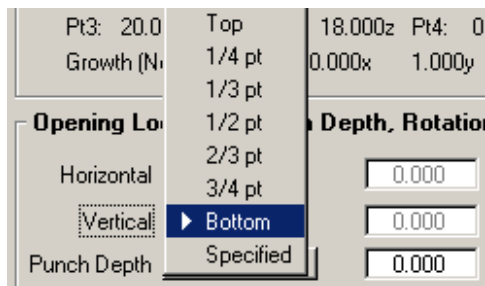
For the horizontal option button the options are: (Start, 1/4 pt, 1/3 pt, 1/2 pt, 2/3, 3/4, End, Specify). Typically



the horizontal movement is indeed a horizontal movement across the face of the solid. The start and end points are somewhat random however the distance between them is the width of that face in that direction. Whenever a selection other than specify is active, the horizontal value is shown in a disabled text box. Whenever specify is active, the horizontal value text box is enabled. When the horizontal value text box is enabled, the horizontal location may be keyed in.

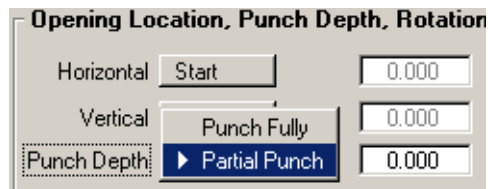
Option Button for Horizontal Location

For the vertical option button the options are: (Top, 3/4 pt, 2/3 pt, 1/2 pt, 1/3, 1/4, Bottom, Specify). Typically the vertical movement is indeed a vertical movement across the face of the solid. The top is where possible



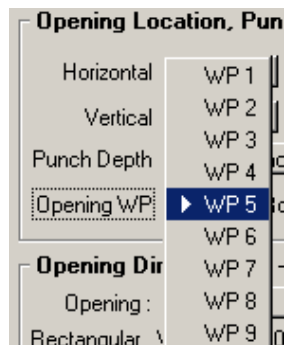
the higher elevation and the bottom is the lower. The distance between the top & bottom points is the width of that face in that direction. Of course for flat slabs, the vertical direction is actually the other horizontal direction. Whenever a selection other than specify is active, the vertical value is shown in a disabled text box. Whenever specify is active, the vertical value text box is enabled. When the vertical value text box is enabled, the vertical location may be keyed in.

Option Button for Vertical Location



The punch depth is controlled by the punch depth option button. The options for the punch depth are: (Punch Fully, Partial Punch).

Option Button for Punch Depth



The WP for the opening is the attachment point of the opening. The attachment point is synonymous with the CP of a rectangular member. Thus the WP is an integer value from 1 to 9 (bottom-left, bottom-center, bottom-right, center-left, center-center, center-right, top-left, top-center, top-right). A WP of 5 will place the opening by the center. Note that the opening rotation will take place about the WP of the opening.

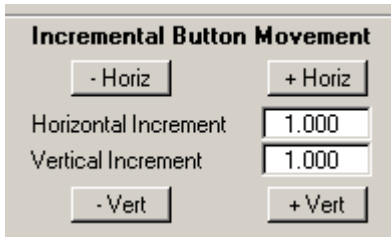
Option Button for Opening WP

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Program Operation con'd

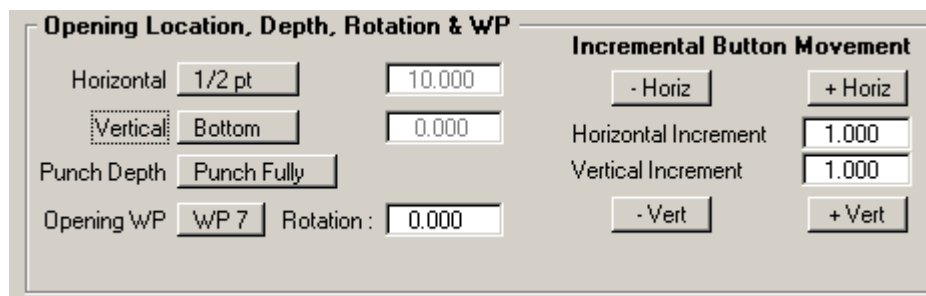
Section 2: Opening Location, Punch Depth, Rotation & WP con'd

To the right of this section is the Incremental Button Movement. In this area, the increment of movement for a button push can be defined. The opening can be moved both horizontally and/or vertically with the four buttons (+HORIZ, -HORIZ, +VERT & -VERT). Whenever a button is pushed, the option for that direction becomes “specify” and the increment is added to the current value. When the Horizontal or Vertical option button is “specify”, the keyin field may be used keyin specific values. For all other options the keyin field is displayed but disabled (see below). The opening may be moved with the buttons and/or by keying in desired coordinates.



The dialog box titled "Incremental Button Movement" contains four buttons: "- Horiz", "+ Horiz", "- Vert", and "+ Vert". Below the buttons are two input fields: "Horizontal Increment" with a value of "1.000" and "Vertical Increment" with a value of "1.000".

Incremental Button Movement



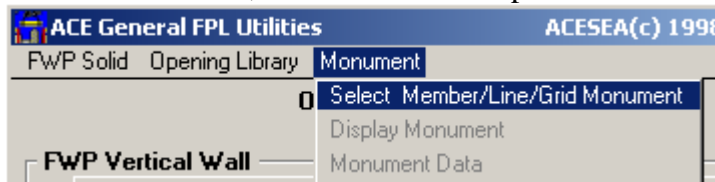
The dialog box titled "Opening Location, Depth, Rotation & WP" contains several input fields and buttons. On the left, there are fields for "Horizontal" (1/2 pt), "Vertical" (Bottom), "Punch Depth" (Punch Fully), and "Opening WP" (WP 7). On the right, there are fields for "Rotation" (0.000) and "Incremental Button Movement" (10.000). Below the "Vertical" field is a button labeled "Vertical".

Section 2 Horizontal & Vertical location, Punch Depth, WP & Rotation

Any of the above items can be changed at any time. When an item changes, the location of the opening will change. If a opening is active, the surface & opening will be highlighted and the opening can be punched with the “Punch Hole” button. At this point the opening can be placed, further locations changes may be made, opening dimension may be changed, surface may be changed or new FWP Solid may be selected.

MONUMENT Member/Line/Grid - Pulldown Menu & Section 2

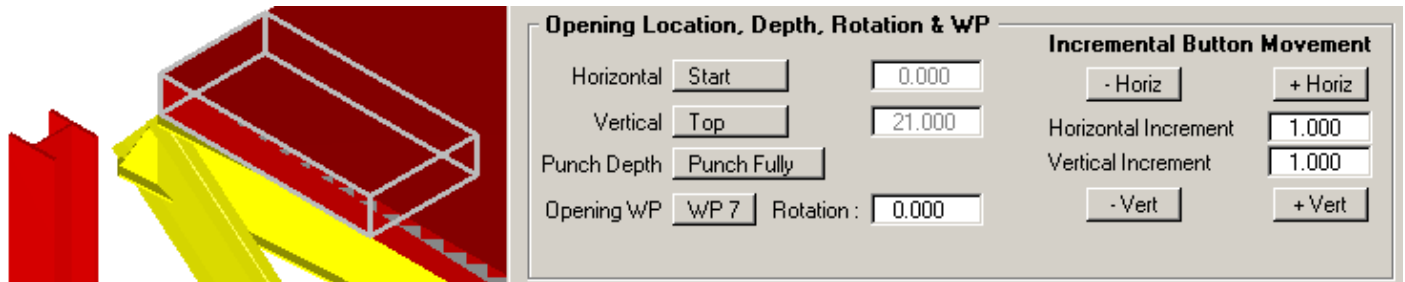
The coordinate system for locating the opening is defined by the rectangular sides of the FWP solid surface. The two dimensions are referred to as HORIZ & VERT and are somewhat arbitrary. A Monument Member/Line/Grid may optionally be defined for the active surface. A Monument Member/Line/Grid can be quite valuable in precisely locating openings relative to known plant locations (monuments). The Monument line must intersect the active surface with an orthogonal intersection. The HORIZ & VERT distances are then relative to the monument line (intersection point) if the monument toggle is turned on. To select a Monument Member/Line/Grid, use the Monument pull-down menu option “Select Member/Line/Grid Monument.”



The options “Display Monument” & Monument Data” are disabled until a Monument is selected. For this example a monument member (column) is selected to illustrate the monument concept.

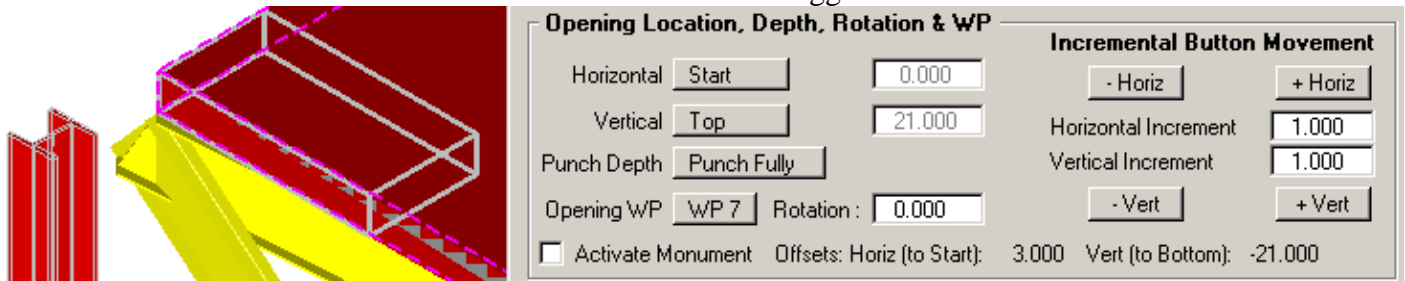
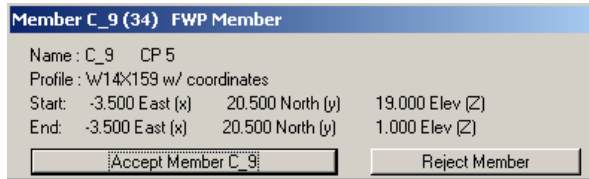
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MONUMENT Member/Line/Grid - Pulldown Menu & Section 2 con'd



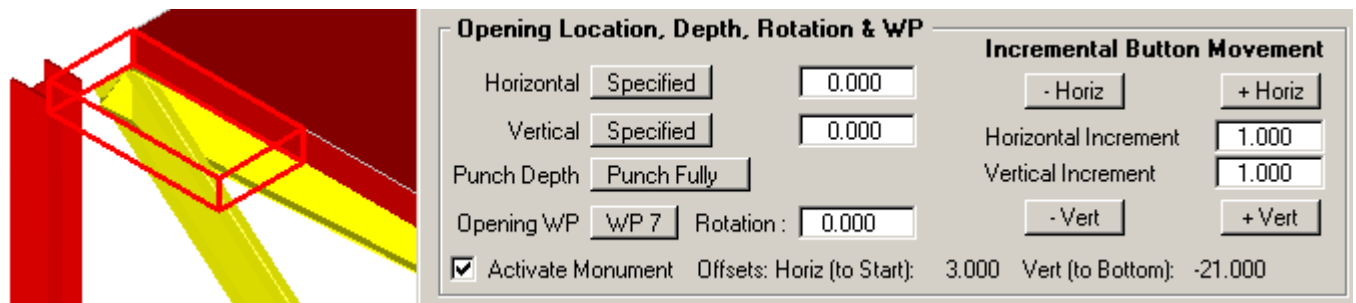
Section 2 Before a Monument is Selected

The select monument command is issued and the column is selected which is 3 feet East of the HORIZ start & VERT Top, then the accept/reject dialog box shown left appears. If the monument member is accepted, the monument is highlighted and section 2 appears as follows. The monument will remain inactive until the Activate Monument is toggled on.



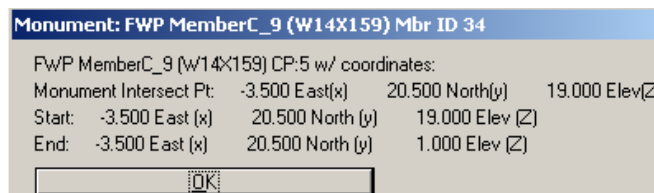
Activate Monument is Inactive & Toggle Option & Information Appears

If the Activate Monument toggle is toggled on, the plate will jump to the monument. The plate can then be located relative to the monument with horiz/vert locations or keyins or using the incremental button movement. When the toggle is turned on section 2 appears as follows. Note that the opening is now on the monument.



Activate Monument is Toggled on & Plate Jumps to Monument

When a monument has been defined it can be highlighted with the pull-down command "Display Monument".



The monument data can also be displayed with the "Monument Data" pull-down command. The monument may be toggled on or off at any time. The monument may be deselected by using the select monument command & not selecting a monument. If a surface is selected where the monument is not valid, the monument

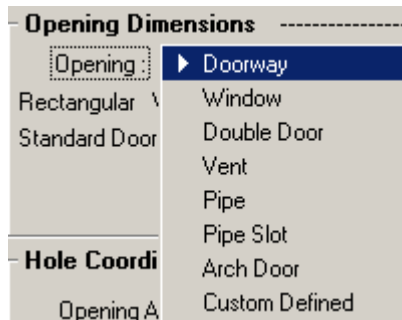
is deactivated and disabled until either a new valid monument is selected or a valid face is selected. A monument will always have two valid faces.

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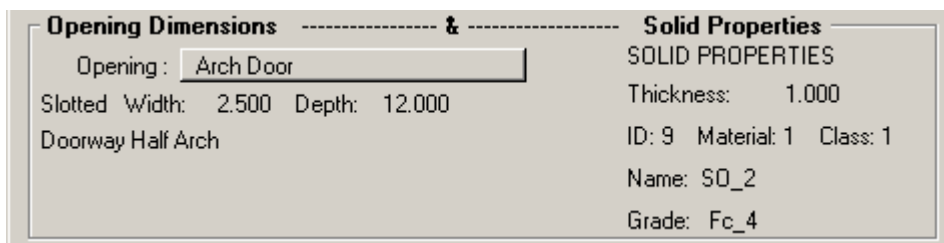
Program Operation con'd

Section 3: Opening Dimensions & Solid Properties

This section allows the selection and/or definition of opening dimensions. This section also displays the FWP SOLID information (ID, name, class, material & grade). The opening dimensions (width & depth) may be defined by selecting an opening from an opening library (see page x) or the dimensions may be specified. Opening selection is controlled by an opening option button and may be changed at any time.

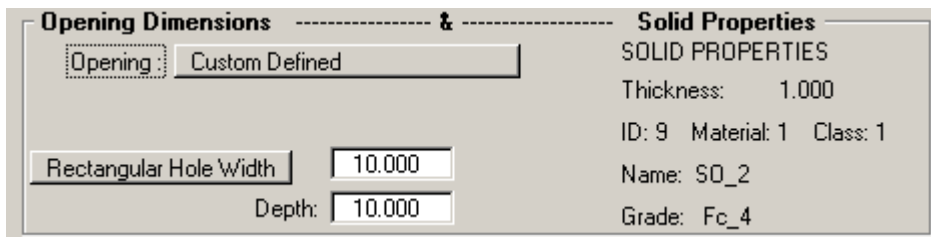


Option Button for Opening Selection



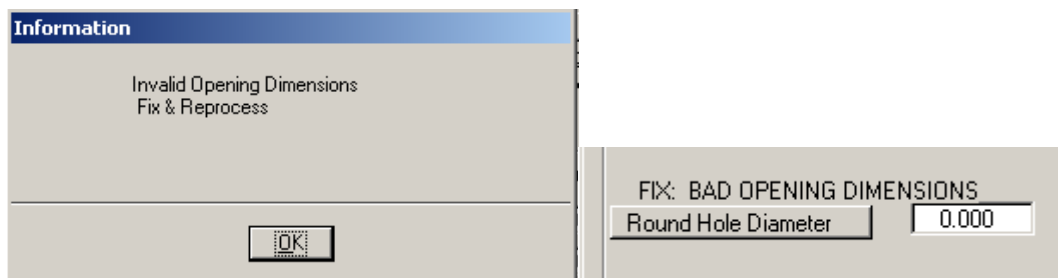
Section 3 Opening Dimensions from Openings Library & Solid Properties

For the case shown above, an Arch doorway (from openings library) is the opening to be punched for the selected solid. The properties for the selected solid are: Name-SO_2; ID-9; Material-1 (steel), class-1; Grade-Fc_4 with a 1 foot thickness.



Section 3 Opening Dimensions Custom Defined & Solid Properties

For the case shown above, a custom opening is being defined to be punched for the selected solid. The properties for the selected solid are: Name-SO_2; ID-9; Material-1 (steel), class-1; Grade-Fc_4 with a 1 foot thickness. If the opening dimensions are invalid (negative or zero values), the following dialog boxes will appear.



Dialog Boxes Indicating Bad Opening Dimensions

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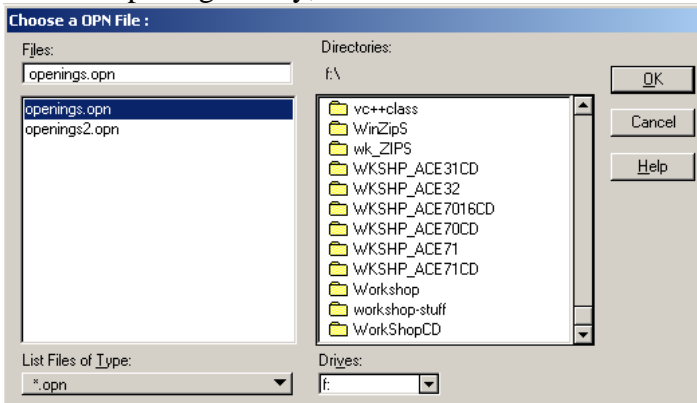
Program Operation con'd

Section 3: Opening Dimensions & Solid Properties (con'd)

A new opening library may be read at any time from the top bar menu Opening Library category by activating the menu command Select Opening Library.



Select a opening library, OPN file.



The opening data in the new file will replace any that previously existed.

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Program Operation con'd

Section 4: Hole Coordinates

This section shows the hole coordinates when a FWP Solid is selected and a valid opening is active. This section displays whether opening is inside, outside, straddling or bordering the surface outline. The

Hole Coordinates
Hole Extends Boundary

Opening Attach Location: 10.000x -1.000y 0.000z
For WP=5 & Rotation = 0.000 Hole CL: 10.000x -1.000y 0.000z
Slotted Hole Width 2.500 & Depth 12.000 1.000 deep Bounded by:
Pt1: 8.750x -1.000y -6.000z Pt2: 11.250x -1.000y -6.000z
Pt3: 11.250x -1.000y 6.000z Pt4: 8.750x -1.000y 6.000z

PUNCH HOLE HILITE Hole Display Surface Cancel

coordinates of the opening attach location are displayed. In addition the opening corner coordinates and the opening center point is displayed. At any time the FWP Solid, surface, hole location data or hole dimensions/properties may be

changed. The hole can be punched by pressing the “Punch Hole” button when the hole size, location & orientation are correct.

When the punch hole button is pressed, the hole is punched and the following dialog box appears.

Information

Hole for SL_1 (FWP ID 1)
Has Been Punched

OK

Once OK is pressed, the populated dialog box reappears. At of the parameters (FWP Solid, surface, opening location data or opening dimensions) may be changed and additional holes may be punched.

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FWP Solid -Type Flat Slab Solid

To qualify as a conforming flat slab solid: 1) must be FWP solid type SLAB or SOLID, 2) The solid must be created by a rectangular shape projected a constant thickness and 2) the FWP Solid face, primary face, must form a flat plane and be surface with the largest area. The following dialog boxes appear when a conforming Flat Slab Solid is selected

FWP Flat Slab SQ_1 (1) Mbr ID 1 W= 15.000 D= 20.000 T= 1.000

Flat Solid SQ_1 (1) Mbr ID 1 Elev 1.000
 Pt1: 0.000x 0.000y Pt2: 15.000x 0.000y
 Pt3: 15.000x 20.000y Pt4: 0.000x 20.000y

ACE General FPL Utilities ACESEA(c) 1998-2004

FWP Solid Opening Library Monument

ORTHOGONAL HOLE PUNCH
 (Units Feet - UNO)

FWP Flat Slab
 Flat Solid Surface Elev: 1.000 Width: 15.000 by Depth: 20.000
 Pt1: 0.000x 0.000y 1.000z Pt2: 15.000x 0.000y 1.000z
 Pt3: 15.000x 20.000y 1.000z Pt4: 0.000x 20.000y 1.000z
 Growth (Normal) Vector: 0.000x 0.000y 1.000z

Opening Location, Depth, Rotation & WP

Horizontal
 Vertical Horizontal Increment
 Punch Depth Vertical Increment
 Opening WP Rotation:

Incremental Button Movement

Opening Dimensions & Solid Properties

Opening: **SOLID PROPERTIES**
 Thickness: 1.000
 ID: 1 Material: 1 Class: 1
 Rectangular Hole Width Name: SQ_1
 Depth: Grade: Fc_4

Hole Coordinates

Hole Inside Boundary
 Opening Attach Location: 7.500x 10.000y 0.000z
 For WP=5 & Rotation = 0.000 Hole CL: 7.500x 10.000y 0.000z
 Rectangular Hole Width 1.000 & Depth 0.500 1.000 deep Defined by:
 Pt1: 7.000x 9.750y 0.000z Pt2: 8.000x 9.750y 0.000z
 Pt3: 8.000x 10.250y 0.000z Pt4: 7.000x 10.250y 0.000z

For a flat slab solid, the surfaces (1 through 6) are determined as follows: 1) highest elevation flat surface (surface with most area); 2) lowest elevation flat surface (parallel to 1); 3) edge solid surface 1; 4) edge solid surface 2 (parallel to 3); 5) edge solid surface 3 (normal to 1-4); 6) edge solid surface 4 (parallel to 5).

FWP Flat Slab

► Flat Solid Surface Elev: 1.000 Width: 15.000 by Depth: 20.000
 FlatSolid Surface Elev: 0.000 Width: 15.000 by Depth: 20.000
 Edge Solid Surface 1 Width: 15.000 by Depth: 1.000
 Edge Solid Surface 2 Width: 15.000 by Depth: 1.000
 Edge Solid Surface 3 Width: 20.000 by Depth: 1.000
 Edge Solid Surface 4 Width: 20.000 by Depth: 1.000

Op

Orthogonal Hole Punch Documentation

FWP Solid -Type Edge Slab Solid

To qualify as a conforming edge slab solid: 1) must be FWP solid type SLAB or SOLID, 2) solid must be created by a rectangular shape projected a constant thickness and 2) the FWP Solid face, primary face, must form a vertical plane and 3) a different surface must have the largest area and form a flat plane. This solid may only be punched horizontally (not vertically). The following dialog boxes appear when a conforming Edge Slab Solid is selected

FWP Edge Slab SO_4 (6) Mbr ID 6 W= 25.000 D= 1.500 T= 18.0...

| | | | |
|------|-----------------|-----------------|-----------------|
| Pt1: | 15.000 East (x) | 0.000 North (y) | 1.000 Elev (Z) |
| Pt2: | 40.000 East (x) | 0.000 North (y) | 1.000 Elev (Z) |
| Pt3: | 40.000 East (x) | 0.000 North (y) | -0.500 Elev (Z) |
| Pt4: | 15.000 East (x) | 0.000 North (y) | -0.500 Elev (Z) |

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FWP Solid Opening Library Monument

ORTHOGONAL HOLE PUNCH

(Units Feet - UNO)

FWP Edge Slab

Vertical Solid Surface Width 25.000 by Depth 1.500

Pt1: 15.000x 0.000y 1.000z Pt2: 40.000x 0.000y 1.000z
 Pt3: 40.000x 0.000y -0.500z Pt4: 15.000x 0.000y -0.500z
 Growth (Normal) Vector: 0.000x -1.000y 0.000z

Opening Location, Depth, Rotation & WP

Horizontal
 Vertical Horizontal Increment
 Punch Depth Vertical Increment
 Opening WP Rotation:

Opening Dimensions & **Solid Properties**

Opening: **SOLID PROPERTIES**
 Thickness: 18.000
 ID: 6 Material: 1 Class: 1
 Rectangular Hole Width Name: SO_4
 Depth: Grade: Fc_4

Hole Coordinates

Hole Inside Boundary
 Opening Attach Location: 27.500x 18.000y 0.250z
 For WP=5 & Rotation = 0.000 Hole CL: 27.500x 18.000y 0.250z
 Rectangular Hole Width 1.000 & Depth 0.500 18.000 deep Defined by:
 Pt1: 27.000x 18.000y 0.500z Pt2: 28.000x 18.000y 0.500z
 Pt3: 28.000x 18.000y 0.000z Pt4: 27.000x 18.000y 0.000z

For a edge slab solid, the surfaces (1 through 6) are determined as follows: 1) primary face - edge surface 1; 2) opposite primary face edge surface 2 (parallel to 1) 3) top edge flat solid surface 1; 4) bottom edge flat solid surface 4 (parallel to 3); 5) side edge solid surface 3; 6) edge solid surface 4 (parallel to 5).

FWP Edge Slab

- ▶ Vertical Solid Surface Width 25.000 by Depth 1.500
- Vertical Solid Surface Width 25.000 by Depth 1.500
- Top Edge Solid Surface Width 25.000 by Depth 18.000
- Bottom Edge Solid Surface Width 25.000 by Depth 18.000
- Side Edge Solid Surface 1 Depth 1.500 by Width 18.000
- Side Edge Solid Surface 2 Depth 1.500 by Width 18.000

Orthogonal Hole Punch Documentation

FWP Solid - Type Vertical Wall Solid (*non FWP type WALL*)

To qualify as a conforming vertical wall solid: 1) must be FWP solid type SLAB or SOLID, 2) The solid must be created by a rectangular shape projected a constant thickness and 2) the FWP Solid face, primary face, must form a vertical plane and be surface with the largest area. The following dialog boxes appear when a conforming Vertical Wall Solid is selected

FWP Vertical Wall SO_5 (7) Mbr ID 7 W= 15.000 D= 12.000 T= ...

| | | | |
|------|-----------------|-----------------|------------------|
| Pt1: | 15.000 East (x) | 0.000 North (y) | -12.000 Elev (Z) |
| Pt2: | 0.000 East (x) | 0.000 North (y) | -12.000 Elev (Z) |
| Pt3: | 0.000 East (x) | 0.000 North (y) | 0.000 Elev (Z) |
| Pt4: | 15.000 East (x) | 0.000 North (y) | 0.000 Elev (Z) |

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FwP Solid Opening Library Monument

ORTHOGONAL HOLE PUNCH
(Units Feet - UNO)

FWP Vertical Wall

Vertical Solid Surface Width 15.000 by Depth 12.000

Pt1: 15.000x 0.000y -12.000z Pt2: 0.000x 0.000y -12.000z
 Pt3: 0.000x 0.000y 0.000z Pt4: 15.000x 0.000y 0.000z
 Growth (Normal) Vector: 0.000x -1.000y 0.000z

Opening Location, Depth, Rotation & WP

Horizontal
 Vertical
 Punch Depth
 Opening WP Rotation:

Incremental Button Movement

Horizontal Increment
 Vertical Increment

Opening Dimensions & Solid Properties

Opening:
 Rectangular Width: 5.000 Depth: 4.000
 Special Item 2100 Window

SOLID PROPERTIES
 Thickness: 2.000
 ID: 7 Material: 1 Class: 1
 Name: SO_5
 Grade: Fc_4

Hole Coordinates

Hole Inside Boundary

Opening Attach Location: 10.000x 2.000y -6.000z
 For WP=5 & Rotation = 0.000 Hole CL: 10.000x 2.000y -6.000z
 Rectangular Hole Width 5.000 & Depth 4.000 2.000 deep Defined by:
 Pt1: 12.500x 2.000y -8.000z Pt2: 7.500x 2.000y -8.000z
 Pt3: 7.500x 2.000y -4.000z Pt4: 12.500x 2.000y -4.000z

For a vertical wall solid, the surfaces (1 through 6) are determined as follows: 1) primary face - edge surface

FWP Vertical Wall

▶ Vertical Solid Surface Width 15.000 by Depth 12.000

Vertical Solid Surface Width 15.000 by Depth 12.000
 Top Edge Solid Surface Width 15.000 by Depth 2.000
 Bottom Edge Solid Surface Width 15.000 by Depth 2.000
 Side Edge Solid Surface 1 Depth 12.000 by Width 2.000
 Side Edge Solid Surface 2 Depth 12.000 by Width 2.000

1; 2) opposite primary face edge surface 2 (parallel to 1) 3) top edge flat solid surface 1; 4) bottom edge flat solid surface 4 (parallel to 3); 5) side edge solid surface 3; 6) edge solid surface 4 (parallel to 5).

Orthogonal Hole Punch Documentation

FWP Solid - Type Top Wall Solid (*non FWP type WALL*)

To qualify as a conforming edge wall solid: 1) must be FWP solid type SLAB or SOLID, 2) solid must be created by a rectangular shape projected a constant thickness and 2) the FWP Solid face, primary face, must form a horizontal plane and 3) a different surface must have the largest area and form a vertical plane. This solid may only be punched vertically (not horizontally). The following dialog boxes appear when a conforming Top Wall Solid is selected

FWP Top Wall SO_2 (2) Mbr ID 2 W= 1.000 D= 20.000 T= 15.000

Flat Solid SO_2 (2) Mbr ID 2 Elev 0.000
 Pt1: 0.000x 0.000y Pt2: -1.000x 0.000y
 Pt3: -1.000x 20.000y Pt4: 0.000x 20.000y

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FWP Solid Opening Library Monument

ORTHOGONAL HOLE PUNCH (Units Feet - UNO)

FWP Top Wall
 Flat Solid Surface Elev: 0.000 Width: 1.000 by Depth: 20.000
 Pt1: 0.000x 0.000y 0.000z Pt2: -1.000x 0.000y 0.000z
 Pt3: -1.000x 20.000y 0.000z Pt4: 0.000x 20.000y 0.000z
 Growth (Normal) Vector: 0.000x 0.000y 1.000z

Opening Location, Depth, Rotation & WP **Incremental Button Movement**

Horizontal Increment
Punch Depth Vertical Increment
Opening WP Rotation:

Opening Dimensions **Solid Properties**

Opening: **SOLID PROPERTIES**
Thickness: 15.000
ID: 2 Material: 1 Class: 1
Rectangular Hole Width Name: SO_2
Depth: Grade: Fc_4

Hole Coordinates **Hole Inside Boundary**

Opening Attach Location: -0.500x 10.000y -15.000z
For WP=5 & Rotation = 0.000 Hole CL: -0.500x 10.000y -15.000z
Rectangular Hole Width 0.750 & Depth 0.500 15.000 deep Defined by:
Pt1: -0.125x 9.750y -15.000z Pt2: -0.875x 9.750y -15.000z
Pt3: -0.875x 10.250y -15.000z Pt4: -0.125x 10.250y -15.000z

For a top wall solid, the surfaces (1 through 6) are determined as follows: 1) primary face – top edge surface 1; 2) opposite primary face edge surface 2 (parallel to 1); 3) side edge surface 1; 4) opposite edge surface 2 (parallel to 3); 5) side edge solid surface 3; 6) edge solid surface 4 (parallel to 5).

FWP Top Wall

► Flat Solid Surface Elev: 0.000 Width: 1.000 by Depth: 20.000
 FlatSolid Surface Elev: -15.000 Width: 1.000 by Depth: 20.000
 Edge Solid Surface 1 Width: 1.000 by Depth: 15.000
 Edge Solid Surface 2 Width: 1.000 by Depth: 15.000
 Edge Solid Surface 3 Width: 20.000 by Depth: 15.000
 Edge Solid Surface 4 Width: 20.000 by Depth: 15.000

Orthogonal Hole Punch Documentation

FWP Solid - Type Edge Wall Solid (*non FWP type WALL*)

To qualify as a conforming edge wall solid: 1) must be FWP solid type SLAB or SOLID, 2) solid must be created by a rectangular shape projected a constant thickness and 2) the FWP Solid face, primary face, must form a vertical plane and 3) a different surface must have the largest area and form a vertical plane. This solid may only be punched horizontally in long direction (not vertically). The following dialog boxes appear when a conforming Edge Wall Solid is selected

FWP Edge Wall SO_3 (4) Mbr ID 4 W= 1.000 D= 12.000 T= 15.0...

| | | | |
|------|-----------------|-----------------|------------------|
| Pt1: | 15.000 East (x) | 0.000 North (y) | 0.000 Elev (Z) |
| Pt2: | 16.000 East (x) | 0.000 North (y) | 0.000 Elev (Z) |
| Pt3: | 16.000 East (x) | 0.000 North (y) | -12.000 Elev (Z) |
| Pt4: | 15.000 East (x) | 0.000 North (y) | -12.000 Elev (Z) |

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FWP Solid Opening Library Monument

ORTHOGONAL HOLE PUNCH
(Units Feet - UNO)

FWP Edge Wall

Vertical Solid Surface Width 1.000 by Depth 12.000

Pt1: 15.000x 0.000y 0.000z Pt2: 16.000x 0.000y 0.000z
 Pt3: 16.000x 0.000y -12.000z Pt4: 15.000x 0.000y -12.000z
 Growth (Normal) Vector: 0.000x -1.000y 0.000z

Opening Location, Depth, Rotation & WP

Horizontal
 Vertical Horizontal Increment
 Punch Depth Vertical Increment
 Opening WP Rotation:

Incremental Button Movement

Opening Dimensions & Solid Properties

Opening: **SOLID PROPERTIES**
 Thickness: 15.000
 ID: 4 Material: 1 Class: 1
 Rectangular Hole Width Name: SO_3
 Depth: Grade: Fc_4

Hole Coordinates

Hole Extends Boundary

Opening Attach Location: 15.333x 15.000y -6.000z
 For WP=5 & Rotation = 0.000 Hole CL: 15.333x 15.000y -6.000z
 Rectangular Hole Width 0.750 & Depth 0.500 15.000 deep Defined by:
 Pt1: 14.958x 15.000y -5.750z Pt2: 15.708x 15.000y -5.750z
 Pt3: 15.708x 15.000y -6.250z Pt4: 14.958x 15.000y -6.250z

For a edge wall solid, the surfaces (1 through 6) are determined as follows: 1) primary face - edge surface 1; 2) opposite primary face edge surface 2 (parallel to 1) 3) top edge flat solid surface 1; 4) bottom edge flat solid surface 4 (parallel to 3); 5) side edge solid surface 3; 6) edge solid surface 4 (parallel to 5).

FWP Edge Wall

- Vertical Solid Surface Width 1.000 by Depth 12.000
- Vertical Solid Surface Width 1.000 by Depth 12.000
- Top Edge Solid Surface Width 1.000 by Depth 15.000
- Bottom Edge Solid Surface Width 1.000 by Depth 15.000
- Side Edge Solid Surface 1 Depth 12.000 by Width 15.000
- Side Edge Solid Surface 2 Depth 12.000 by Width 15.000

Orthogonal Hole Punch Documentation

FWP Solid - Type Top Wall Solid (*FWP type WALL*)

To qualify as a conforming wall, the FWP Solid face with the largest area must be a vertical plane. The FWP create wall command must be used to create a rectangular wall (brick shape – i.e. the plan element (shape or orthogonal) must form a rectangle). The following dialog boxes appear when a conforming FWP wall is selected

FWP Top Wall bottom_to_top (4) Mbr ID 4 W= 10.000 D= 2.000 ...

Flat Solid bottom_to_top (4) Mbr ID 4 Elev 30.000
 Pt1: 0.000x 2.000y Pt2: 10.000x 2.000y
 Pt3: 10.000x 0.000y Pt4: 0.000x 0.000y

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FWP Solid Opening Library Monument

ORTHOGONAL HOLE PUNCH
 (Units Feet - UNO)

FWP Top Wall

Edge Solid Surface 1 Width: 10.000 by Depth: 15.000
 Pt1: 0.000x 2.000y 15.000z Pt2: 0.000x 2.000y 30.000z
 Pt3: 10.000x 2.000y 30.000z Pt4: 10.000x 2.000y 15.000z
 Growth (Normal) Vector: 0.000x 1.000y 0.000z

Opening Location, Depth, Rotation & WP

Horizontal
 Vertical Horizontal Increment
 Punch Depth Vertical Increment
 Opening WP Rotation:

Opening Dimensions & Solid Properties

Slotted Width: 2.500 Depth: 12.000
 Doorway Half Arch

SOLID PROPERTIES
 Thickness: 15.000
 ID: 4 Material: 1 Class: 1
 Name: bottom_to_top
 Grade: Fc_4

Hole Coordinates

Hole Extends Boundary
 Opening Attach Location: 5.000x 0.000y 15.000z
 For WP=5 & Rotation = 0.000 Hole CL: 5.000x 0.000y 15.000z
 Slotted Hole Width 2.500 & Depth 12.000 15.000 deep Bounded by:
 Pt1: 3.750x 0.000y 9.000z Pt2: 6.250x 0.000y 9.000z
 Pt3: 6.250x 0.000y 21.000z Pt4: 3.750x 0.000y 21.000z

For a top wall solid (FWP type WALL), the surfaces (1 through 6) are determined as follows: 1) flat solid surface 1 (non-punchable); 2) opposite flat solid surface 2 (parallel to 1); 3) side edge solid surface 1; 4) opposite side edge solid surface 2 (parallel to 3); 5) side edge solid surface 3 (normal to 1-4); 6) opposite side edge solid surface 4 (parallel to 5). The thickness direction of the wall is punchable. An option to punch surfaces 3 thru 6 is given.

FWP Top Wall bottom_to_top (4) Mbr ID 4 W= 10.000 D= 2.000 ...

Flat Solid Surface Elev: 30.000 Width: 10.000 by Depth: 2.000
 FlatSolid Surface Elev: 15.000 Width: 10.000 by Depth: 2.000
 ▶ Edge Solid Surface 1 Width: 10.000 by Depth: 15.000
 Edge Solid Surface 2 Width: 10.000 by Depth: 15.000
 Edge Solid Surface 3 Width: 2.000 by Depth: 15.000
 Edge Solid Surface 4 Width: 2.000 by Depth: 15.000

FWP Solid – Type General Solid


If a solid does not qualify as one of the previous types and is a brick shape, it is a General Solid.

Solid SO_1 (1) Mbr ID 1 W= 15.000 D= 20.224 T= 1.978

| | | | |
|------|------------------|------------------|----------------|
| Pt1: | -15.000 East (x) | 20.000 North (y) | 3.000 Elev (Z) |
| Pt2: | 0.000 East (x) | 20.000 North (y) | 3.000 Elev (Z) |
| Pt3: | 0.000 East (x) | 40.000 North (y) | 6.000 Elev (Z) |
| Pt4: | -15.000 East (x) | 40.000 North (y) | 6.000 Elev (Z) |

Accept Solid SO_1

Reject Solid


ACE General FPL Utilities

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FWP Solid Opening Library Monument

ORTHOGONAL HOLE PUNCH
(Units Feet - UNO)

FWP Solid

Sloped Solid Surface Width 15.000 by Depth 20.224

Pt1: -15.000x 40.000y 6.000z Pt2: 0.000x 40.000y 6.000z
Pt3: 0.000x 20.000y 3.000z Pt4: -15.000x 20.000y 3.000z
Growth (Normal) Vector: 0.000x -0.148y 0.989z

Opening Location, Depth, Rotation & WP

Horizontal
Vertical
Punch Depth
Opening WP Rotation :

Incremental Button Movement

Horizontal Increment
Vertical Increment

Opening Dimensions & **Solid Properties**

Square Width: 6.000
Standard Double Doorway

SOLID PROPERTIES
Thickness: 1.978
ID: 1 Material: 1 Class: 1
Name: SO_1
Grade: Fc_4

Hole Coordinates

Opening Attach Location: -7.500x 30.293y 2.544z
For WP=5 & Rotation = 0.000 Hole CL: -7.500x 30.293y 2.544z
Square Hole Width & Depth 6.000 1.978 deep Defined by:
Pt1: -10.500x 33.260y 2.989z Pt2: -4.500x 33.260y 2.989z
Pt3: -4.500x 27.327y 2.099z Pt4: -10.500x 27.327y 2.099z

Hole Inside Boundary

For a general solid, the surfaces (1 through 6) are determined as follows: 1) sloped solid surface 1 (the first rectangle

FWP Solid

- ▶ Sloped Solid Surface Width 15.000 by Depth 20.224
 - Sloped Solid Surface Width 15.000 by Depth 20.224
 - Sloped Edge Solid Surface 1 Width 15.000 by Depth 1.978
 - Sloped Edge Solid Surface 2 Width 15.000 by Depth 1.978
 - Sloped Edge Solid Surface Depth 20.224 by Depth 1.978
 - Sloped Edge Solid Surface Depth 20.224 by Depth 1.978

read); 2) sloped edge solid surface 2 (the second rectangle read - parallel to 1); 3) sloped edge solid surface 1; 4) sloped edge solid surface 2 (parallel to 3); 5) sloped edge solid surface 3 (normal to 1-4); 6) sloped edge solid surface 4 (parallel to 5).

Orthogonal Hole Punch Documentation

Orthogonal Hole Punch Variables and Options

The Orthogonal Hole Punch application, ACE_OHP.MA, has been designed to allow greatly facilitate punching holes in on FWP solids. Virtually all items shown on the primary dialog boxes can be controlled through the definition files. The following items are controlled through the both the dialog box & definition file (unless noted otherwise).

- Top-bar menu with FWP Solid & Opening Library
- Option Button to select 1 of 6 surface faces
- Option Buttons to select placement location
 - Horizontal Location
 - Vertical Location
 - Embedment
 - WP for opening
- Buttons to control horizontal & vertical incremental movement
- Keyin field increment
- Keyin field opening rotation
- Keyin fields for Custom Opening Dimensions
- Toggle for Monument Activation (when monument defined)

Orthogonal Hole Punch Documentation

Opening File

The Opening configuration file defines “standard openings”. The file is an ASCII file which has a defined suffix of OPN. Each opening configuration is defined on a single line (record). A opening configuration consists of: a Name (32 char max); a Description 64 char max; a width; a depth and a type. The Opening configuration file is limited to 99 entries. The Opening configuration file must be pointed to in the definition file and upon loadup of the application an option button with the name/desc label is populated with entries. If a file is not specified, only custom openings may be punched.

The philosophy behind the application is that a company and/or project will create a Openings configuration file. The Opening configuration file has two types of records. The format for the Openings configuration file is as follows:

UNIT Command - Units Command (optional command)

UNIT {UNITTYPE} {UNIT}

where :

{UNITTYPE} May be ENGLISH (feet) or METric (meters).

If units is not specified it is assumed that the units match the current model units.

{UNIT} Must be FEET or INCh for ENGLISH (default feet) or must be METer or MM for METric (default meters).

If unit is not specified, it is assumed that the units are feet for English & meters for metric.

OPENing Command - Opening Specification

OPEN “name” sType width depth “desc”

where :

name : Opening name - enclosed in “” marks - 24 characters maximum

sType : sType is the Opening type which can be:

ROU Round Opening

SQU Square Opening

REC Rectangular Opening

SLO Slotted Opening

width : Opening width

depth : Opening depth (provide a 0 for SQU or ROU openings)

desc : Opening description - enclosed in “” marks - 64 characters maximum

Sample Opening Specification File

```
UNIT  ENG  FT
Opening  "Doorway"  REC  3.0  6.0      "Standard Doorway"
Opening  "Window"   REC  5.0  4.0      "Special Item 2100 Window"
Opening  "Double Door"  SQU  6      "Standard Double Doorway"
UNIT  MET  M
Opening  "Vent"     REC  .5   1.0      "Special Item 2200 Vent"
UNIT  ENG  IN
Opening  "Pipe"     ROU  24   "Circular 2 ft Pipe Opening"
Opening  "Pipe"     ROU  24   "Circular 2 ft Pipe Opening"
```

Orthogonal Hole Punch Documentation

Definitions File

Due to the dissimilar nature of the variables in the general utilities, where applicable each general utility has a separate definition (DEF) file. While each file is distinctly different, each file is similar in the basic method of definition. Each definition file may optionally be controlled with either of two environment variables. Thus a project specific definition file for each project may be easily specified. The environment variables may be specified in numerous ways (similar to any MicroStation variable), however the utilization of a project.pcf is highly recommended. Environment variable definition is discussed in detail in the installation notes provided with the ACE FrameWorks utilities. The default name and location for the definition file for this utility are: C:\ACE_OHP.DEF. A directory for the definition file may be specified with the environment variable ACE_DEF_PATH (will look in specified path for file ACE_OHP.DEF). A complete name and location of a definition file may be also specified with the environment variable ACE_OHP_DEF. The first valid definition file found is utilized. The search for a definition file happens in the following order or priority:

1. If the variable ACE_OHP_DEF is specified, the named file at this location will be used if found.
2. If the variable ACE_DEF_PATH is specified and ACE_OHP.DEF is found in this directory, it is used.
3. If there is a c:\ace_ohp.def file it is utilized.
4. If none of the above, internal program defaults are utilized – a warning message will be displayed. (if environment variables in 1 and/or 2 above are specified and corresponding DEF file is not found, a warning is displayed)

A sample default file is provided below. In the following section, the commands for the definition file are outlined in detail.

The steel definition files allow the specification of units (Metric (meters or mm) or English (ft or in)). Thus a given default file may be utilized in either a Metric or English project. The units may be changed throughout the definition file. If units are not specified, it is assumed that the definition file units match the units of the model (feet/in-English & meters/mm-Metric). If units are defined and they do not match the model, the variables after the units command are converted to match the model units.

Sample Definitions File

```
UNI  ENG
OPE  REC 1.0  1.0 0.0
LOC   0   0   0   0   5   0.0  0.0  0.0  .5
FIL  c:\Opening.opn
```


Orthogonal Hole Punch Documentation

Definitions File - Command Definition

- **Valid Primary Keyword Commands: (UNI, LOC, OPE, FIL)**
- Each record must begin with a valid primary keyword or it is ignored
- All records that start with a blank are considered comments
- The commands/keywords (records) may be placed in any order however the order is significant
- All values for a given command must be defined in order shown above. If default values are acceptable, only the changed values must be given. However all values up to that point must be defined whether changed or not.
- The components of a given command (record) must all be present and in the order shown
- The units command is special and may be repeated and located as required. While commands may be in any order, it should be obvious that the location of the units command is extremely important.
- By default application looks for C:\ACE_OHP.DEF definition file
- Definition file path may be defined with environment variable ACE_DEF_PATH
- ACE_DEF_PATH=d:\mydir\
(the DEF file ACE_OHP.DEF will be looked for in the directory d:\mydir)
- Definition file may be defined with environment variable ACE_OHP_DEF
- ACE_OHP_DEF = d:\mydir\mydef_file *(highest priority definition)*
(the DEF file mydef_file will be looked for in the directory d:\mydir)
- **NOTE : Components shown in bold may only be specified in the definitions file**

UNIT Command - Units Command (optional command)

UNIT {UNITTYPE} {UNIT}

where :

{UNITTYPE} May be ENGLISH (feet) or METRIC (meters).

If units is not specified it is assumed that the units match the current model units.

{UNIT} Must be FEET or INCH for ENGLISH (default feet) or must be METER or MM for METRIC (default meters).

If unit is not specified, it is assumed that the units are feet for English & meters for metric.

OPE Command - Opening Command defines default parameters for custom opening

OPE sType fWidth fDepth fRotation

where :

sType : sType is the Opening type (initial value only) which can be:

ROU Round Opening

SQU Square Opening

REC Rectangular Opening

SLO Slotted Opening

fWidth : opening width - used for starting specify value

fDepth : opening depth - used for starting specify value

fRotation : opening Rotation (0 to 360) Pos counterclockwise

FIL Command - File Command defines location of opening configuration file

FIL sOpeningFile

where

sOpeningfile : Path & name of opening file (may use environment variables)

Orthogonal Hole Punch Documentation

Definitions File - Command Definition (con'd)

LOC Command - Opening Location Startup Values Command

LOC *iSurface iHoriz iVert iEmbed fHoriz fVert fEmbed fIncrement*

iSurface : 7 >= *iSurface* >= 0

0-Surface 1
1-Surface 2
2-Surface 3
3-Surface 4
4-Surface 5
5-Surface 6

iHoriz : 7 >= *iHoriz* >= 0

0-Top
1-1/4 pt
2-1/3 pt
3-1/2 pt
4-2/3 pt
5-3/4 pt
6-End pt
7-Specified

iVert : 7 >= *iVert* >= 0

0-Top
1-3/4 pt
2-2/3 pt
3-1/2 pt
4-1/3 pt
5-1/4 pt
6-Bottom
7-Specified

iEmbed : 2 >= *iEmbed* >= 0

0-Fully Embedded
1-On Surface
2-Specified

iWP : Starting WP opening setting 9 >= *iWP* >= 1

1-WP1
2-WP2
3-WP3
4-WP4
5-WP5
6-WP6
7-WP7
8-WP8
9-WP9

fHoriz : Horizontal Offset value - used for starting specify value

fVert : Vertical Offset value - used for starting specify value

fEmbed : Embed Offset value - used for starting specify value

fIncrementHor : Starting value of horizontal increment for opening button movement

fIncrementVer : Starting value of vertical increment for opening button movement

Orthogonal Hole Punch Documentation

LOG FILES

All applications can write log files if the environment variable `ACE_DUMP` is set to 1. There have been reports that some sites lock the C root drive and under certain conditions a locked C drive can cause a system fault 5.

All applications have been modified to warn of a locked drive/file and then gracefully exit. All applications now look for the environment variable `ACE_LOG_PATH`. If it is found, that is the directory where the log files will be placed. If the directory is locked or non-existent or if file is locked a warning will be given and the C drive will be tried. If it is locked or the file is locked a warning will be given and application will gracefully exit.

Usage of the variable `ACE_LOG_PATH` to control log file locations is similar to `ACE_DEF_PATH` to control DEF files. However there is one very important difference: `ACE_LOG_PATH` should NEVER point to a network drive (this is highly recommended for `ACE_DEF_PATH`). Everyone writes to the same named log file and if they are on a network drive there will be bad consequences. ALWAYS point `ACE_LOG_PATH` to a local drive (perhaps a temp off C root).