

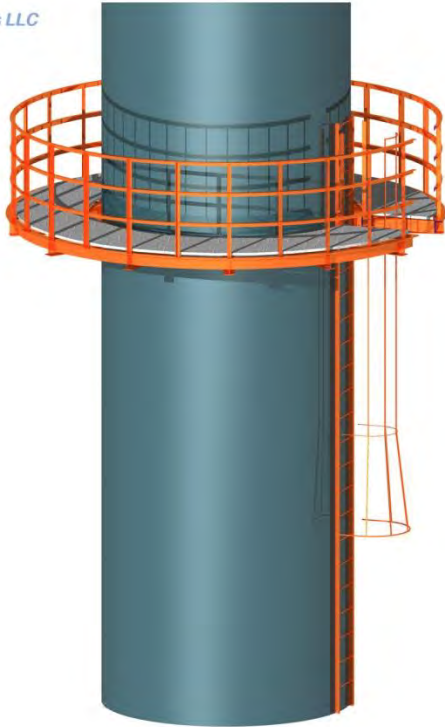


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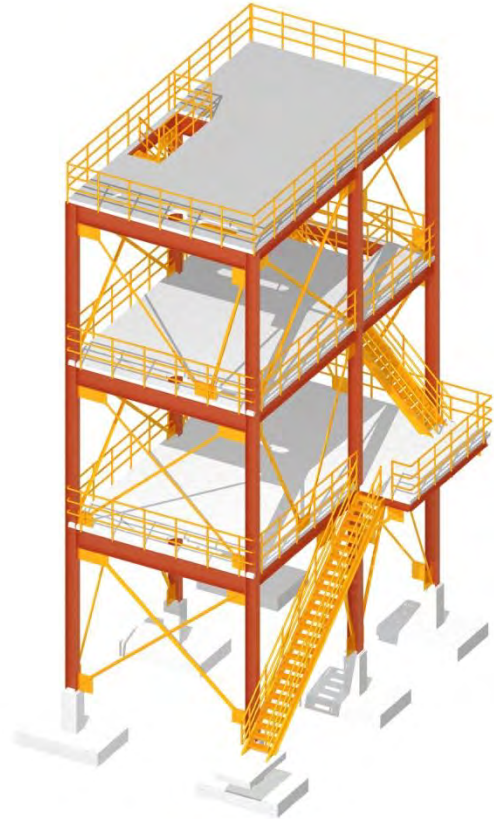
ACE Structural
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ACE Frame Works Utilities



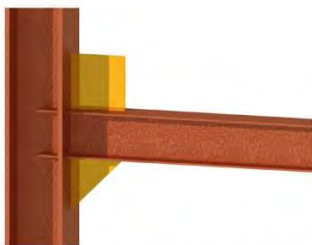
11 Steel Utilities



13 General Utilities



Automated Horizontal Bracing Gusset Plates

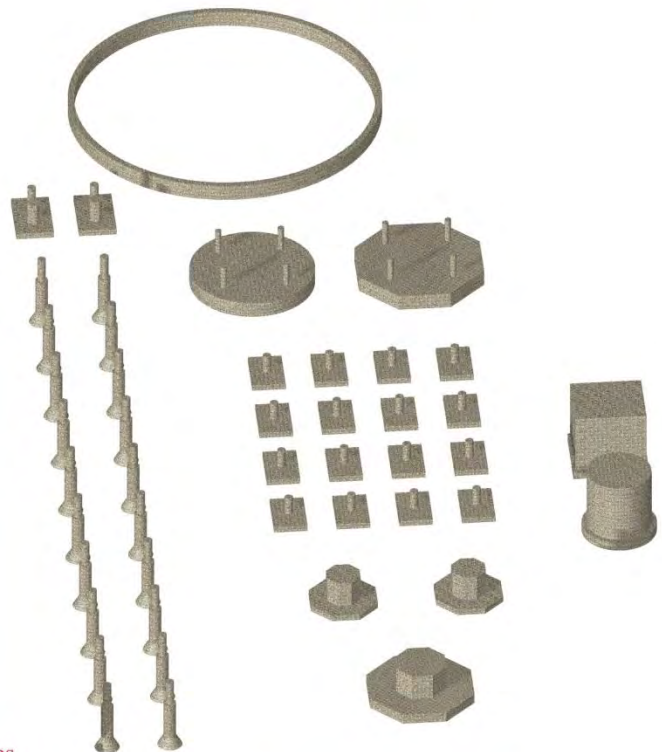


Automated Fixed End Beam Stiffeners



Automated Vertical Bracing Gusset Plates

6 Gusset Plate Utilities



11 Foundation Utilities

ACE Structural Engineering Applications LLC

ACE FrameWorks Plus FPL Utilities

ACE FrameWorks Plus FPL Utilities were originally released with 17 FPL utilities January 1, 1999. Today, the ACE FrameWorks utilities contain 41 FPL utilities covering four categories, namely: steel, gusset plates, foundation and general. Current software documentation & information about the ACE FrameWorks Utilities is available for download at the ACESEA Web Site (www.ACESEA.com). A training website containing both sample files and PPS w/ embedded AVI's is available. The utilities are leased on a yearly basis and are under constant support and maintenance. When bugs are found or reported, the application is investigated & revised as necessary. When new versions of FrameWorks Plus are released, necessary changes, if any, are made to the utilities. Client suggestions are welcomed and encouraged. Many new features & enhancements are constantly being added to the existing utilities. In addition to the constant support & maintenance for the existing utilities, new utilities are frequently added. Powerful new features such as the Immediate UNDO Capability, Dynamic Naming, Named Groups, Global Origin and stronger English/Metric units handling have been incorporated into the original utilities and carried into the new utilities. This document briefly outlines the current status of the ACE FrameWorks Plus FPL Utilities.

ACE FrameWorks Plus FPL Utilities

The ACE FrameWorks suite of FPL's includes 41 utilities in the categories: Steel utilities, Gusset Plate (GP) utilities, Foundation utilities and



General utilities. All utilities support both English and Metric units. The utilities are FPL/MDL applications, which run on top of Intergraph's FrameWorks Plus, which runs on top of Bentley's MicroStation. Currently nine (9) sets of Utilities are available: one for FWP versions 3.1.x.x & 3.2.x.x; one for FWP 7.00.00.16 & earlier; one for FWP 7.00.00.19 & later; one for FWP versions 7.1.x.x/7.2.x.x/7.3.x.x; one for FWP versions 8.0.x.x; one for FWP versions 9.0.x.x; one for FWP versions 10.0.x.x and one for FWP versions 11.0.x.x and one for FWP versions 12.0.x.x (nine separate versions are necessary due to underlying database or FPL function differences between versions). ACE Utilities for FWP 3.x.x.x & FWP 7.0.x.x are compatible with MicroStation versions 95, SE and J. ACE Utilities for FWP 7.1.x.x/7.2.x.x/7.3.x.x & FWP 8.0.x.x & FWP 9.0.x.x & FWP 10.0.x.x & FWP 11.0.x.x & FWP 12.0.x.x are compatible with MicroStation J. The seven sets of utilities are available to clients at the ACESEA Software Delivery Web Page. The FWP version is checked to ensure that mismatch between FPL and FWP version does not occur. The suite of utilities is under constant revision with the addition of new utilities and the enhancement of existing ones.

Current release information as well as the documentation to the utilities is available on the Web Site (www.ACESEA.com). Each of the four categories: steel, gusset plates, foundation and general have a section in the following pages of this brochure.

System Requirements

Software

Windows XP (all versions), Windows 7 & 10 (FWP 11 & 12 only)*
MicroStation (uStn) version J, SE or 95 as noted
Intergraph FrameWorks 3.1.x.x/3.2.x.x or
Intergraph FrameWorks 7.0.x.x or
Intergraph FrameWorks 7.1.x.x/7.2.x.x/7.3.x.x (uStn J only) or
Intergraph FrameWorks 8.0.x.x (uStn J only) or
Intergraph FrameWorks 9.0.x.x (uStn J only) or
Intergraph FrameWorks 10.0.x.x (uStn J only) or
Intergraph FrameWorks 11.0.x.x (uStn J only) or
Intergraph FrameWorks 12.0.x.x (uStn J only)

Hardware

Pentium II Processor or better
64mg Ram or better
SVGA 17 inch Monitor or bigger

*(Note: when using Windows 7 and 10 and initiating FWP with a batch file, must run batch file "Run as Administrator" – if not environment will not be properly passed to FWP & MicroStation resulting in FAILURE)

ACE FrameWorks Utilities Information

The information presented in this brochure is brief due to space limitations, however an ACE FrameWorks Utilities overview document is available for download on the ACESEA web site WWW.ACESEA.COM. In fact, the documentation for all of the utilities can be downloaded from the ACESEA web site.

ACESEA Contact Information

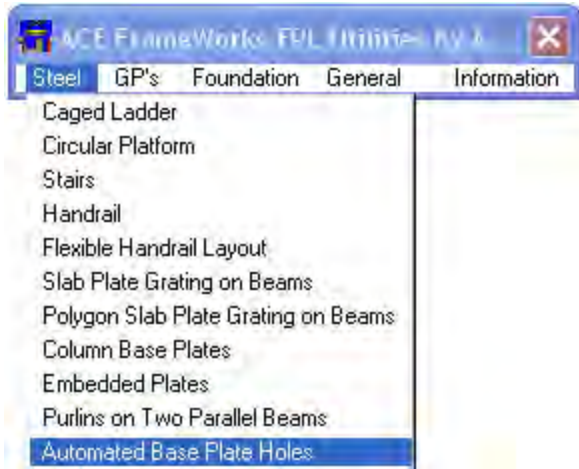
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Steel Utilities

There are currently eleven (11) steel utilities. The steel utilities include the following applications: Caged Ladder, Circular Platform, Stairs, Handrail, Flexible Handrail Layout, Column Base Plates, Slab Plate & Grating on Beams, Polygon Slab Plate & Grating on Beams, Embedded Plates on FWP Members/Solids, Purlins on Two Parallel Beams and Automated Base Plate Holes. Two noteworthy features, which have been incorporated into all the steel utilities, are: Immediate Undo Capability and Dynamic Name Definition. The Immediate Undo Capability has been warmly received as it allows the option of removing FrameWorks members, arcs & solids immediately after placement. Dynamic naming allows creation at placement time with the option to append the FWP ID of the first item placed. All steel utilities support all FrameWorks models units. Each utility is very briefly discussed below.



Caged Ladder: This application facilitates the placement of ladders with or without cages. Both step through and side step ladders can be placed at any orientation normal to the XY plane. The resultant ladder can be at any angle rotated about the Z-axis.

Circular Platform: This application facilitates the placement of circular platforms (includes HR) for vertical vessels. The platform may form a complete circle around the vessel or a partial circle with defined start and end angles and/or ladder ends. Ladder ends provide caged ladder access.

Stairs: The stairs application facilitates the placement of stairs. Which may consist of two stringers with treads and may optionally be placed with or without handrails and/or top and base landings. Handrail can be on the top or side of the stringer. Numerous stair definition techniques are available.

Handrail: This application facilitates the placement of straight runs of handrail. A handrail run consists of handrail posts, top rail, optional mid rail, optional third rail, and optional toe plate (optionally offset). Numerous layout definition techniques are provided to aide in constructing handrail.

Flexible Handrail Layout: This application facilitates the placement of continuous line and/or arc segments of handrail. The application utilizes a two-step process. First, a layout template is generated and manipulated. Subsequently template is processed via "Rules" to generate handrail layout

Column BasePlates: This application simplifies the placement of base plates on either bottom and/or top ends of vertical columns. The baseplate application can work in either an interactive individual placement mode or a selection set mode. A custom base plate file can be utilized.

Slab Plate & Grating on Beams: This application simplifies the placement of surfaces (concrete slab, steel plate or steel grating). Four beams and/or grids to be selected as a boundary definition for the surface. The surface inset or outset from the centerline to the surface may be specified.

Polygon Slab Plate & Grating on Beams: This application simplifies the placement of a polygon surface with from 3 to 30 sides. The polygon surface may be a concrete slab, steel plate or grating. The polygon is formed by selecting intersecting elements successively forming a closed polygon.

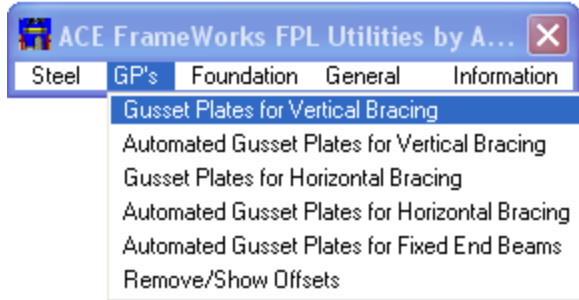
Embedded Plates on FWP Members/Solids: This application simplifies the placement of embedded plates on FWP members or solids. Plates may be placed relative to any of the six member/solid faces. The plate may be fully embedded, embedded a specific amount or on the surface.

Purlins on Two Parallel Beams: This application simplifies the placement roof purlins on two parallel FWP beam members. This application is especially useful for the case where the beams are sloped. Purlins may be C, MC, I, WF or HP shapes. Six methods are provided for purlin layout.

Automated Base Plate Holes: Anchor bolt holes may be placed in an automated fashion at the intersection of base plates & anchor bolts.

Gusset Plate Utilities

Currently there are six (6) gusset plate utilities: Gusset Plates for Vertical Bracing, Automated Gusset



Plates for Vertical Bracing, Gusset plates for Horizontal Bracing, Automated Gusset plates for Horizontal Bracing, Automated Gusset Plates for Fixed End Beams & Remove/Show Offsets. The interactive applications allow connection members to be selected and then an appropriate gusset plate is sized. The sized GP may be manipulated and/or placed as a FWP solid. The automated applications study each brace and select a connection type, from which a GP is sized

and placed into the FWP model. Sizing is based on a configurable set of connection variables (reference: "Modeling Vertical Bracing Gusset Plates for Interference Detection" & "Modeling Horizontal Bracing Gusset Plates for Interference Detection"). The automated GP applications support a feature called connection specification files. A connection specification file allows specific connection variable sets to be used under filtered conditions (i.e. profile, class ...). This feature allows many sets of connection variables to be utilized for the different bracing situations likely to be encountered. The connection specification capability allows for more realistic gusset plate sizing. The automated GP applications can produce hundreds of gusset plate FWP solids in seconds. The automated utilities make early gusset plate interference detection both painless and affordable. If gusset plate modeling is important to your operations, check out the three automated gusset plate applications. Each utility is very briefly discussed below.

Gusset Plates for Vertical Bracing: This application both sizes and greatly simplifies the placement of gusset plates for vertical bracing framing. This application interactively allows connecting members to be selected and gusset plates to be sized, manipulated and placed.

Automated Gusset Plates for Vertical Bracing: This application both sizes and places gusset plates at each vertical brace (VBRACE) end for the entire model (includes FWP attached models). This automated application studies each vertical brace and places appropriate gusset plate if possible.

Gusset plates for Horizontal Bracing: This application both sizes and greatly simplifies the placement of gusset plates for horizontal bracing framing. This application interactively allows connecting members to be selected and gusset plates to be sized, manipulated and placed.

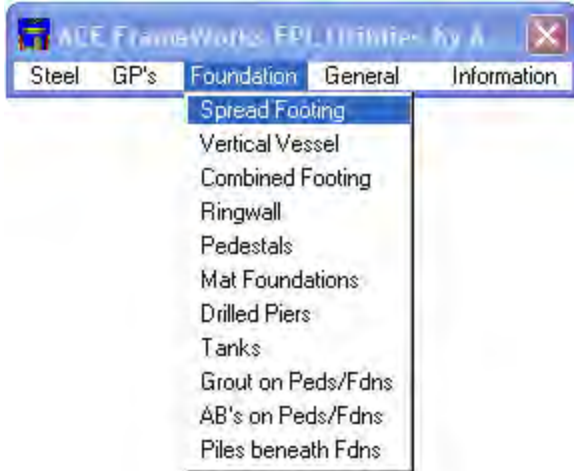
Automated Gusset plates for Horizontal Bracing: This application both sizes and places gusset plates at each horizontal brace (HBRACE) end for the entire model (includes FWP attached models). This automated application studies each horizontal brace and places appropriate gusset plate.

Automated Gusset Plates for Fixed End Beams: This application places top and/or bottom plates at each beam fixed end for the entire model (includes FWP attached models). This automated application studies each beam and places appropriate gusset plate if beam has a fixed end.

Remove/Show Offsets: This application is a useful tool for removing and/or showing/understanding member end workpoint offsets of FrameWorks vertical braces, horizontal braces, columns and/or beams. This utility is provided as a companion utility for the ACE family of gusset plate utilities.

Foundation Utilities

There are eleven (11) foundation utilities. The foundation utilities include: Spread Footing, Vertical Vessel, Combined Footing, Ringwall, Pedestals, Mats, Drilled Piers, Grout Pads on Peds/Fdns, AB Groups on Peds/Fdns, Pile Groups beneath Fdns and Tanks. All foundation utilities have the immediate UNDO capability, which allows foundation components to be immediately removed after placement. Foundation utilities support all FrameWorks models units. Each foundation application allows a single foundation or multiple foundations placement. In the multiple placement mode either a rectangular grid is specified or a selection set is utilized. Each application features the “last data point” command. Each utility is very briefly discussed below.



Spread Footing: This application allows for the rapid placement of rectangular or square spread footings with a single rectangular, square or round concentric pedestal. The pedestal and/or footing may be rotated together or independently.

Vertical Vessel: This application allows for the rapid placement of vertical vessel foundations. The pedestal (optional) may be square or octagonal and the footing may be square or octagonal. The pedestal and/or footing may be rotated together or independently.

Combined Footing: This application allows for the rapid placement of rectangular or square spread footings with two (or one) rectangular, square, octagonal or round one-way non-concentric pedestals. The pedestals and/or footing may be rotated together or independently.

Ringwall Foundation: This application allows for the rapid placement of ringwall foundations. Ringwall diameters may be specified by: Wall OD & ringwall thickness, Wall ID & ringwall thickness or Wall OD & Wall ID. Wall by: BOC & ringwall height, TOC & ringwall height or TOC & BOC.

Pedestals: This application allows for the rapid placement of rectangular, square, octagonal or round pedestals. Pedestals may be rotated. Pedestals may be specified by: BOC & height, TOC & height or TOC & BOC. The pedestal utility combined with the mat utility can create custom foundations

Mat Foundations: This application allows for the rapid placement of square, rectangular, octagonal or circular mat foundations. The mat foundation may be rotated. The mat foundation utility in conjunction with the pedestal utility can create virtually any desired foundation.

Drilled Piers: This application allows for the rapid placement of drilled shaft pier foundations, which may optionally include pedestals (rectangular, square or round) and/or bell bottoms. The pedestal may be rotated. Several input options are available for both pedestal & bell bottom definition.

Grout Pads on Peds/Fdns: A grout pad may be placed on peds/fdns or a selection set of fdns. Pad may match fdn shape or be defined.

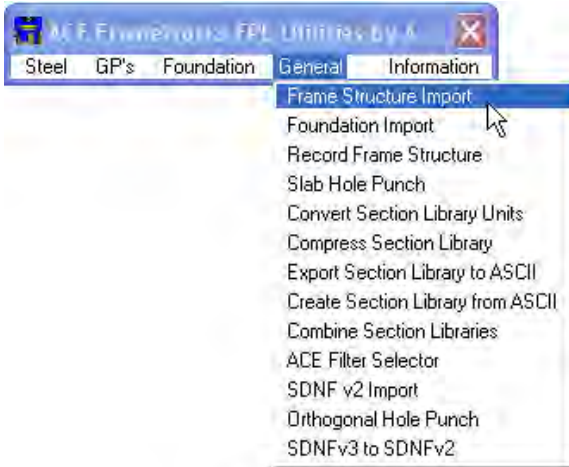
AB Groups on Peds/Fdns: A AB group may be placed on peds/fdns or a selection set of fdns. Std AB groups or custom groups may be placed.

Pile Groups beneath Fdns: A pile group may be placed beneath a fdn or a selection set of fdns. Std pile groups or custom groups may be placed.

Tank Foundations: Rectangular, square, or round concrete tanks with or without a top and with or without a (oversized option) base may be placed.

General Utilities

There are thirteen (13) general utilities. General utilities include: Frame Structure Import, Foundation Import, Record Frame Structure, SDFN Import, ACE Convert SDFN v3 to v2, Slab Hole Punch, Orthogonal Hole Punch, ACE Filter Selector, Compress Section Library, Convert Section Library Units, Export Section Library to ASCII, Create Section Library from ASCII & Combine Libraries. All general utilities support all FrameWorks models units. There are 5 utilities to import or export FrameWorks components; 5 utilities to maintain section library, a filter selector utility and two hole punch utilities. The SDFN import will read any valid SDFN v2 file, allowing import from other systems/sources (PDMS etc). The convert SDFN v3 to v2 file complements the SDFN Import utility. Foundation import can be utilized to read internally generated data from in-house foundation design or commercial programs. Together the Slab Hole Punch & Orthogonal Hole Punch utilities provide a very effective solid hole punching capability. Each utility is briefly discussed below.



Frame Structure Import: This application can be utilized to place ordinary FrameWorks tapered/non-tapered members & arcs (beams, columns, vertical & horizontal braces). This program reads an ACESEA defined ASCII file format and places all valid frame members found in the file.

Foundation Import: This application can be utilized to place the nine foundation types supported by eight Foundation utilities. This application reads an ACESEA ASCII file format and places all valid foundation definitions found in the file. In-house design programs can easily write the ASCII file.

SDFN Import: This application can be utilized to read SDFN files created by FrameWorks or any other application that writes the SDFN version 2 format. The SDFN version 2 format supports linear & arc members (tapered or non-tapered), and plate elements, which are placed as solids.

Convert SDFN v3 to v2: This application can be utilized to convert SDFN version 2 files to SDFN version 2 Files.

Frame Structure Record: This application can be utilized to record a selection set of ordinary FrameWorks framing arc/member. This application writes an ACESEA defined ASCII file format of frame members. This utility produces a file that is compatible with the Frame Structure Import utility.

Slab Hole Punch: This application facilitates easy slab hole punching. The hole punch has both an interactive and batch mode. The puncher can punch rectangular, square, slotted or circular holes at any angle. Holes may be complete or partial hole - punched from either the top or bottom.

Ace Filter Selector: This application facilitates the manipulation of collections of FrameWorks members. While FrameWorks currently contains both a filter capability and a locate command, the ACE filter selector is essentially another filter which provides additional grouping capabilities.

Orthogonal Hole Punch: This application facilitates hole punching for any rectangular shaped FWP Solid with any orientation. The puncher can punch rectangular, square, slotted or circular holes at any angle. Punched holes may be complete or may be a partial. Ideal for WALL hole punching.

Library Utilities: There are a total of five section library utilities. The compress utility allows a section library to be compressed. The conversion utility allows a library to be converted from mm to inch (or vice versa). The export utility allows the contents of a section library to be written to an ACESEA ASCII file format. The import utility allows a section library to be generated from an ACESEA ASCII file. The combine libraries utility allows a section library to be generated from a combination (5 max) of library files and/or ACESEA ASCII files.