



ACE Structural Engineering Applications LLC

ACE FrameWorks Utilities

Column BasePlate(s) Documentation

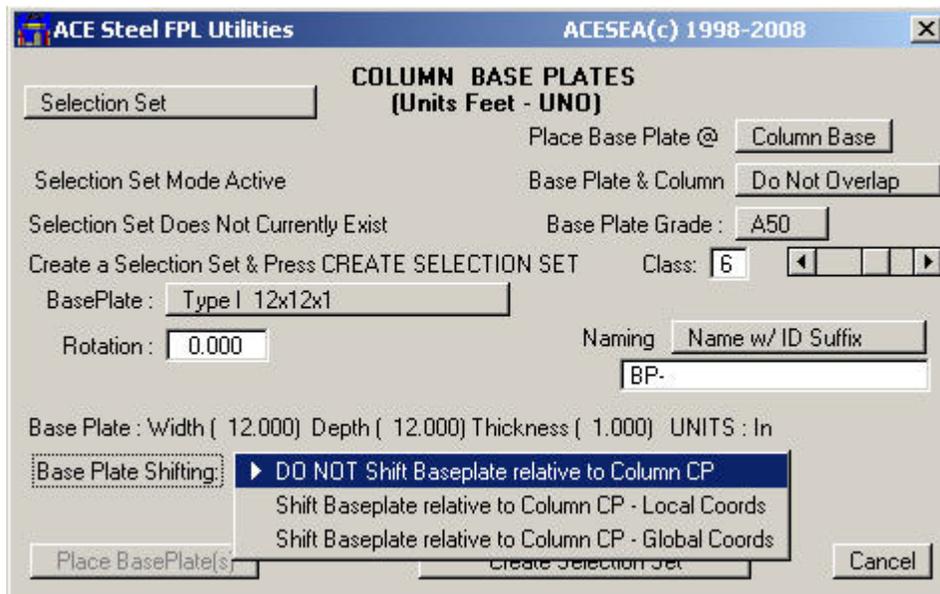
Mar 15, 2013

Column BasePlate(s) (ACE_BP.MA)

(Versions - FWP 3.1.x.x/3.2.x.x rel 2.0.5 & FWP 7.0.x.x rel 7.0.5 & FWP 7.1/7.2/7.3 rel 6.0.5 & FWP 8.0.x.x rel 8.0.5 & FWP 9.0.x.x rel 9.0.5 & FWP 10.0.x.x rel 10.0.5 & FWP 11.0.x.x rel 11.0.5 & FWP 12.0.x.x rel 12.0.5)

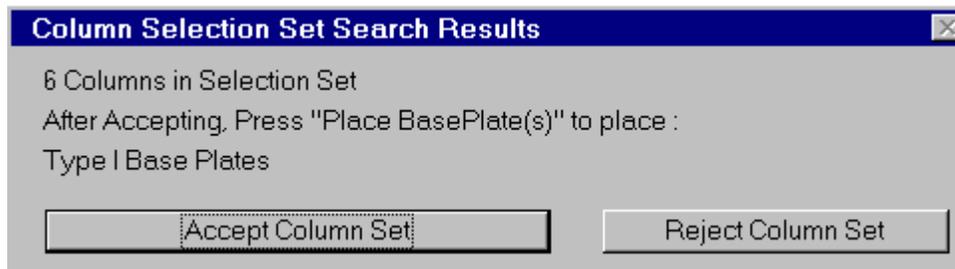
The *Column BasePlate(s)* application simplifies the placement of base plates on either bottom and/or top ends of vertical (parallel to z-axis) columns. The plate may be placed at the ends of the column or overlapping the ends. In addition to placing plates at top and/or bottom of column, the application optionally trims columns with the overlapping option (provided plate & column are in same model). The baseplate application can work in either an interactive individual placement mode or a selection set mode. The baseplate(s) being placed may be selected from a baseplate library (see ASCII Baseplate Definition file) and/or custom specified. While both modes are similar, the two modes are discussed separately.

Selection Set Mode



BasePlate(s) Selection Set Mode - Primary Dialog Box w/o Set Selected

The dialog box shown above is the one seen when the program is started in Selection Set Mode or when the Selection Set Mode is entered. Simply select a selection set and press the “Create Selection Set” button. The following dialog box appears when a selection set is selected.

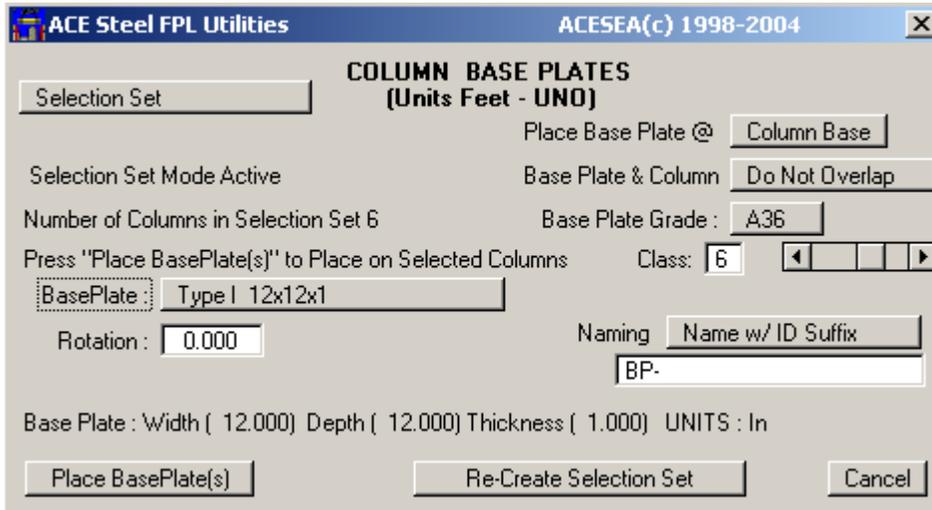


BasePlate(s) Selection Set Mode - Approve Selection Set

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Selection Set Mode (con'd)

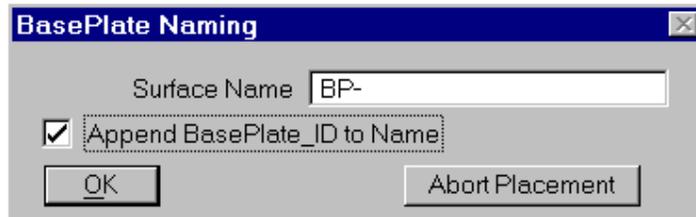
When OK is pressed the following dialog box appears:



BasePlate(s) Selection Set Mode - Primary Dialog Box w/ Set Active

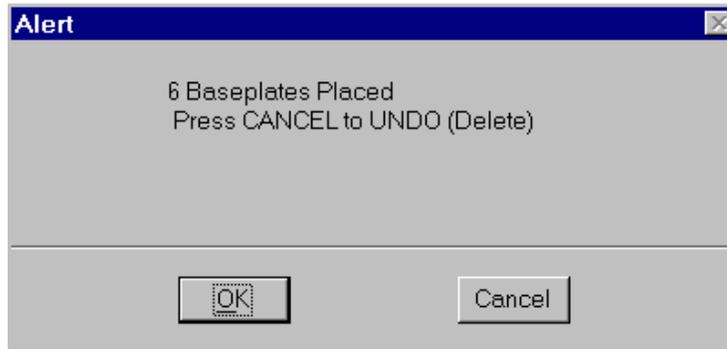
For the situation shown in the dialog box above, six 12”x12”x1” base plates may now be placed by pressing “Place BasePlate(s)”. Any of the baseplate parameters (baseplate selection, rotation, grade, class, or naming) may be changed before placement.

When the “Place BasePlate(s)” button is pressed the following dialog box appears (since Dynamic Naming is active):



Dynamic Naming Dialog Box

If abort is pressed, placement is aborted. When the placement is aborted, the selection set is also removed. If OK is pressed, placement of base plates is performed and the following dialog box with an “Immediate UNDO” option is presented.

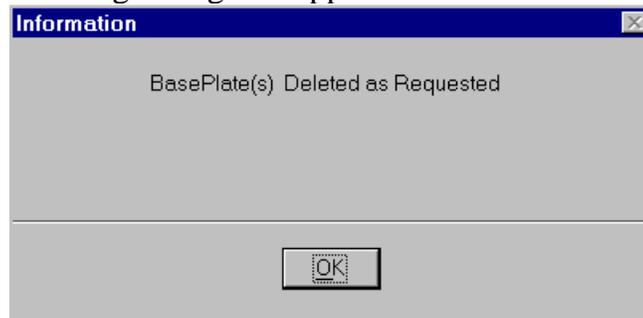


Selection Set Placement Undo Option

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Selection Set Mode (con'd)

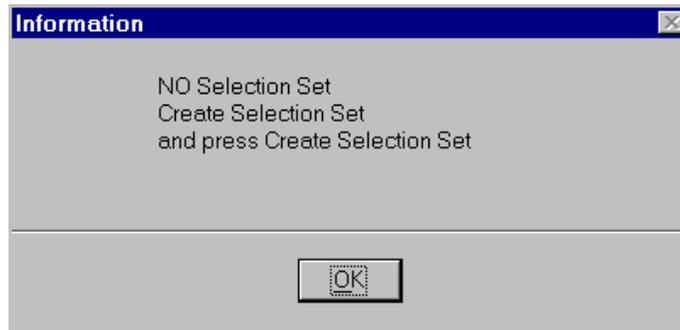
If “Cancel” is pressed, the following dialog box appears:



UNDO Deletion Message

If “OK” is pressed, the Top and/or Base BasePlates are placed. The selection set is removed and the selection set mode primary dialog box reappears.

If a selection set is not present when the “Create Selection Set” button is pressed, the following dialog box appears.



NO Selection Set Message

Dismiss the message and create selection set and press the “Create Selection Set” button. Assuming valid columns were in the selection set, proceed as previously shown.

The utility has internal defaults for all the items shown on the primary selection set dialog box. The defaults may be overridden with user defined defaults by using a definition file which is discussed in detail later in this document.

Optional Base Plate Shifting

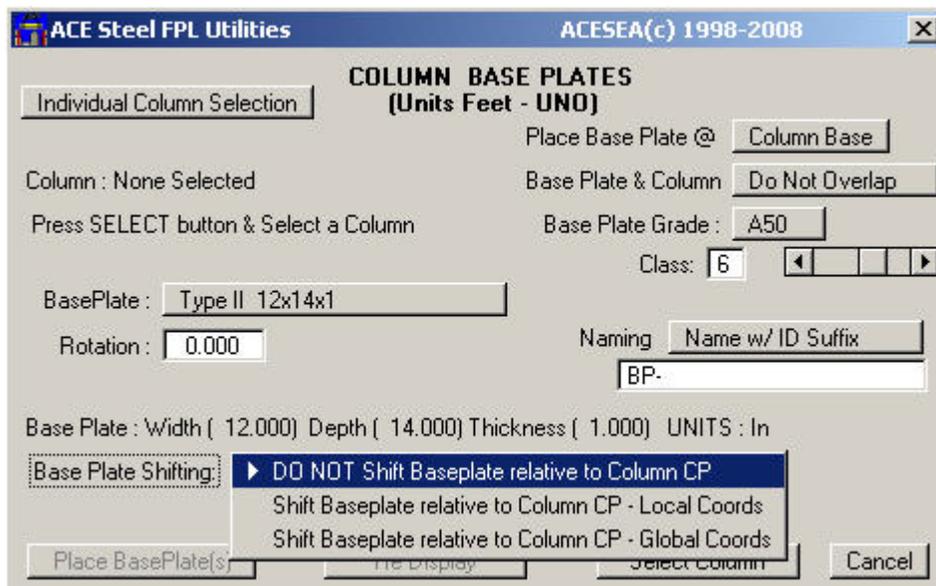
The base plate may be optionally be shifted relative to the CP of the column. The shift may be relative to member local axes or relative to global axes. The three shifting options are as follows:

1. DO NOT Shift Baseplate relative to Column CP
2. Shift Baseplate relative to Column CP - Local Coords
3. Shift Baseplate relative to Column CP - Global Coords

Option 1 is the default setting for base plate shifting

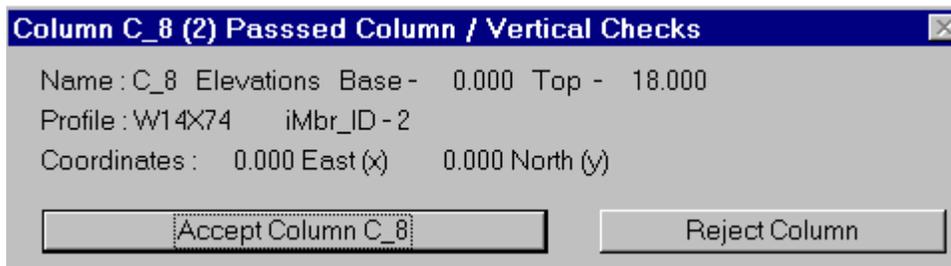
Column BasePlate(s) Documentation

Interactive Mode



BasePlate(s) Interactive Mode - Primary Dialog Box w/o Column Selected

The dialog box shown above is the one seen when the program is started in Interactive Mode or when the Interactive Mode is entered. Simply press the “Select Column” button and then datapoint a column. The following dialog box appears when a column is selected.



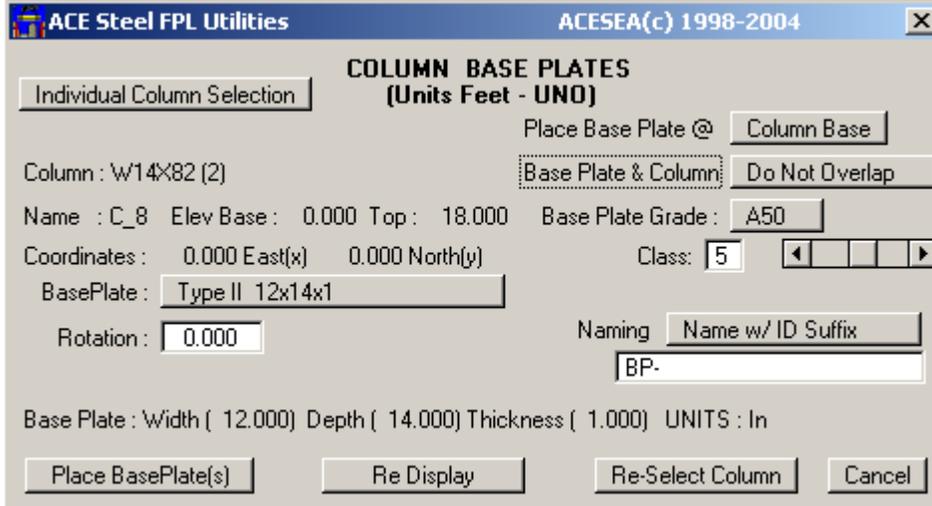
BasePlate(s) Interactive Mode - Approve Column Selection

The dialog box displays the message “Passed Column/Vertical Checks”. The selected column must be a FWP COLUMN which is parallel to the z-axis. If the “Reject Column” button is pressed, the Interactive Mode Primary Dialog Box reappears.

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Interactive Mode (con'd)

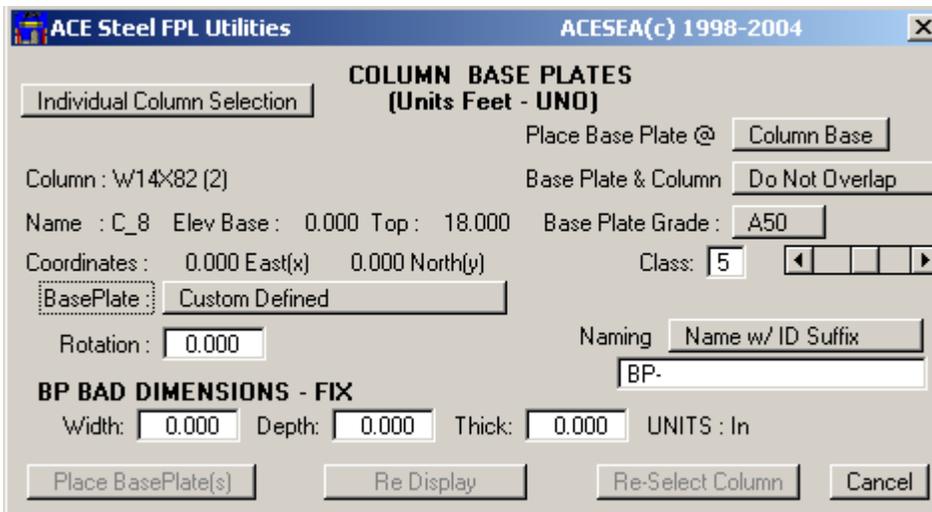
If “Accept Column” is pressed the following dialog box appears:



BasePlate(s) Interactive Mode - Primary Dialog Box w/ Column Selected

Upon initial selection the column is highlighted and a baseplate is displayed at the proper end(s) of the column.

For the situation shown in the dialog box above, a 12” x 14” x 1” base plate may now be placed on highlighted column C_8 by pressing “Place BasePlate(s)”. Any of the baseplate parameters (baseplate selection, rotation, grade, class, or naming) may be changed before placement. If baseplate selection or rotation are changed before placement, the display element will be removed. The display element must then be placed by pressing the “Re Display” button before placement is allowed. Since the tentative baseplate is displayed, the Undo feature is not available in the interactive mode. If a Custom BasePlate is selected and any of the dimensions are zero or less, the dialog box will appear as follows (note similar behavior occurs in the selection set mode).

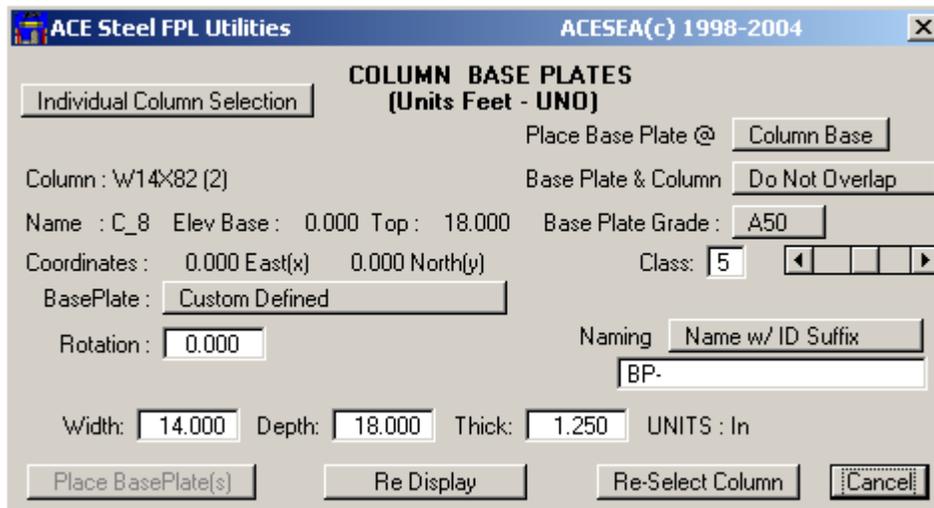


Dialog Box Indicating Bad BasePlate Dimensions

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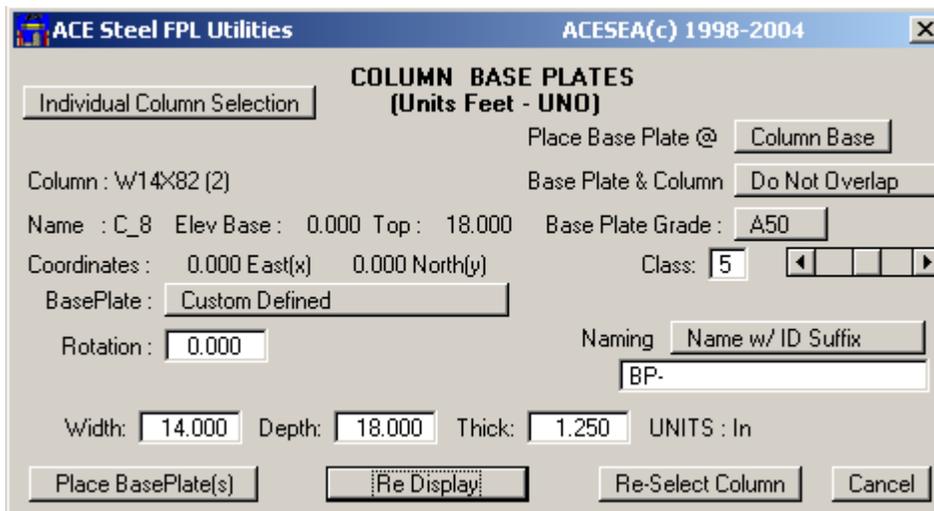
Interactive Mode (con'd)

This will always occur the first time Custom Defined baseplate is selected. Simply input the desired dimensions in the keyin fields and the following change will occur to the dialog box.



Dialog Box w/ Appropriate BasePlate Dimensions

The "Place BasePlate(s)" button is deactivated when the baseplate is changed in the interactive mode. Simply press "ReDisplay" and the baseplate will be placed in temporary graphics and the dialog box will appear as:

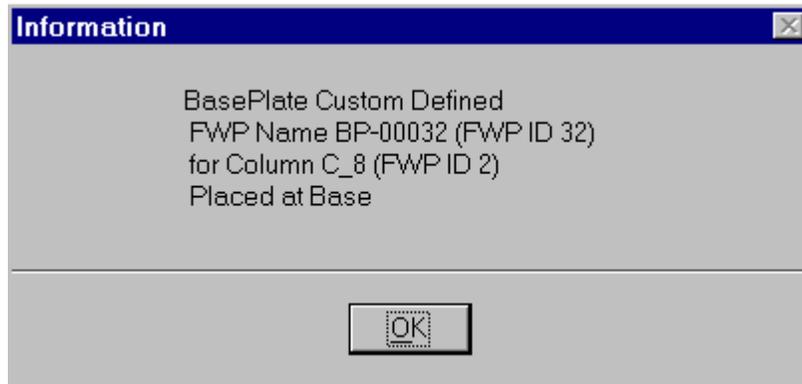


Interactive Dialog – Ready for BasePlate Placement

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Interactive Mode (con'd)

Press the “Place BasePlate(s)” button to place the baseplate. When the button is pressed the following dialog box appears:



When the dialog box is dismissed (“OK” button is pressed), the interactive primary dialog box reappears. The application is now ready for selection of a new column.

The utility has internal defaults for all the items shown on the dialog box above. The defaults may be overridden with user defined defaults by using a definition file which is discussed in detail later in this document.

Top & Base Plate Options

For both the selection set mode or the individual mode, plates may be placed at the column base, the column top or both. This option is controlled by the “Place Base Plate” option button shown below.

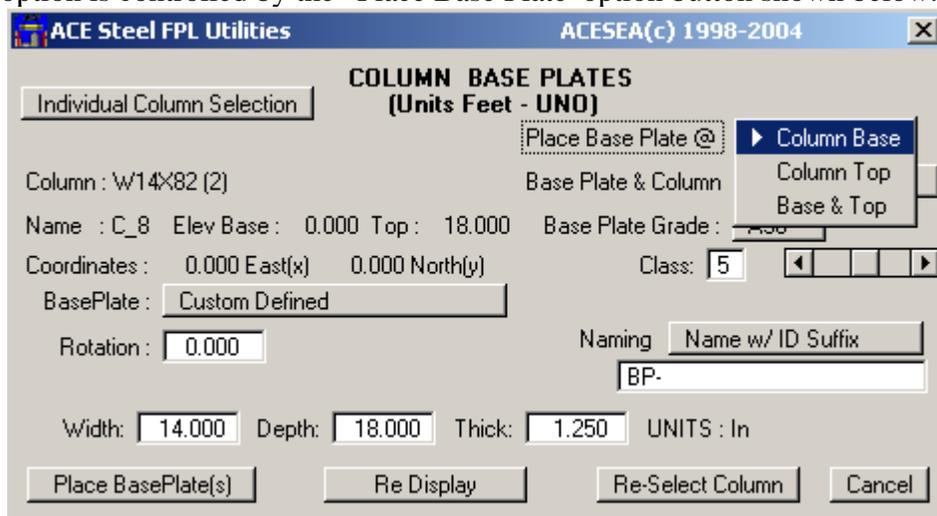


Plate Placement Locations: Column Base and/or Top

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Overlap & Trim Options

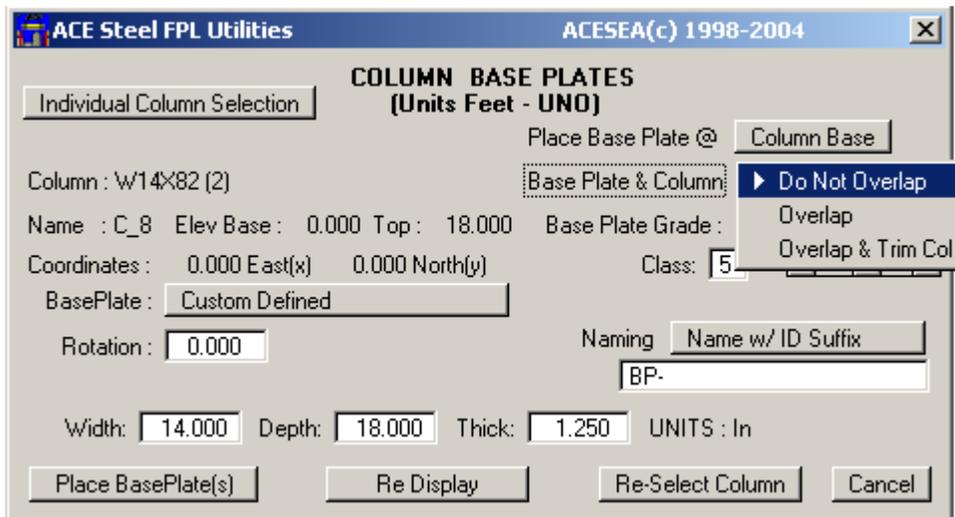
For both the selection set mode or the individual mode, plates may be placed as “Do Not Overlap”, “Overlap” or “Overlap & Trim Column”.

For the “Do Not Overlap” option, the TOS of a base plate is placed against the BOS of the Column. The BOS of a top plate is placed against the TOS of the Column.

For the “Overlap” option, the BOS of a base plate is placed against the BOS of the Column. The TOS of a top plate is placed against the TOS of the Column.

For the “Overlap & Trim Column” option, the BOS of a base plate is placed against the BOS of the Column. After placement, the column is trimmed to the TOS of the Base Plate. The TOS of a top plate is placed against the TOS of the Column. After placement, the column is trimmed to the BOS of the Top Plate. This option will only function if the plates are being placed in the same model file as the column file (this application allows columns to be in separate model partitions – for this situation, this feature will fail). If an UNDO is requested, the column trim will also be undone.

This option is controlled by the “Base Plate & Column” option button shown below.



BasePlate(s) Naming

The BasePlate(s) placed consists of one FrameWorks solid (type SLAB) element and may be named depending upon the naming option selected. The name may be a constant name or it may be a prefix with the FrameWorks solid member ID (FWP ID) appended as a suffix. The default prefix is BP, however a different prefix may be specified in the definition file or supplied at runtime. Other naming options include : dynamic naming at placement time; a constant specified name; or FrameWorks normal naming for individual components (autoname). Dynamic naming allows the name to be selected (or remain the last name selected) at placement time with or without appending the FWP ID to the name. Dynamic naming was illustrated for the selection set mode. Dynamic naming works the same way for the interactive mode.

Column BasePlate(s) Documentation

Column BasePlate(s) Variables and Options

The Column BasePlate(s) application, ACE_BP.MA, has been designed to allow greatly facilitate the placement of baseplates on the column base and/or top. This FrameWorks Plus FPL application is limited to vertical (parallel to z-axis) columns. 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).

- Mode of Operation
 1. Selection Set Mode
 2. Interactive Mode
- Option Button to select baseplate type (not in definition file)
- Keyin fields for Custom BasePlate Dimensions (not in definition file)
- Option Button to select placement location (not in definition file)
 - Base plate only
 - Top Plate only
 - Both top & base plates
- Option Button to select placement overlap condition w/ trim option if overlap
 - Base Plate & Column DO NOT OVERLAP
(Column BOS against Base Plate TOS & vice versa)
 - Base Plate & Column Overlap
(Column BOS against Base Plate BOS & vice versa)
 - Base Plate & Column Overlap – Trim Column after placement
(Base Plate & Column MUST be in same model file or this option FAILS)
(Column BOS against Base Plate BOS & vice versa)
(Column base trimmed to Base Plate TOS)
(Column top trimmed to Top Plate BOS)
- Option Button to select Grade
 - up to 10 choices
 - may be user defined
- Slider/Keyin to select class (0 to 9)
- BasePlate(s) rotation (not in definition file)
- Naming Option Parameters
 - Toggle for Mbr_ID suffix
 - Name Input

The lone item that is only controllable through the definition file is:

LOCK option for the baseplate type. If the LOCK is specified, only baseplates from the BasePlate Configuration file may be placed.

Orientation Notes

The orientation of the plate is dependent upon the column orientation and specified plate rotation. If a plate rotation is not specified (typically the case), the edges of the plate will be parallel to the flange and the web of the column. The depth of the plate follows the orientation vector line of the column (in other words, the width is parallel to the flange and the depth is parallel to the web). If a plate rotation is specified, the plate is rotated from the column OV line by the specified rotation. Positive rotation is determined by the right hand rule.

Column BasePlate(s) Documentation

BasePlate Configuration File

The BasePlate configuration file defines “standard base plates”. The file is an ASCII file which has a defined suffix of CFG. Each base plate configuration is defined on a single line(record). A base plate configuration consists of: a Name (32 char max); a Description 64 char max ; a width; a depth and a thickness. The BasePlate configuration file is limited to 99 entries. The BasePlate 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 base plates may be placed. If LOCK is specified on the GEN command in the definition file, custom base plates may not be placed.

The philosophy behind the application is that a company and/or project will create a BasePlate configuration file. Such a file will encourage standardization and hopefully help eliminate excessive base plate configurations. The application may be configured to require placement of standard base plates only, to allow only custom base plates or to allow the combination of both of the above.

The BasePlate configuration file has two types of records. The format for the BasePlate configuration file is as follows:

UNIT Command - Units Command (optional command)

UNIT {UNITTYPE}

where :

{UNITTYPE} May be ENGLISH or METRIC

All input for the application is in inches for English units and mm for metric units.

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

Units may be changed at any time but be aware that the properties (in attached primary or user section library) for the member specified must match the current model units.

BASE Command - BasePlate Configuration Definition

BASE “name” width depth thickness “desc”

where : NOTE : (English - inches - Metric - mm)

name	:	BasePlate name - enclosed in “” marks - 24 characters maximum
width	:	BasePlate width
depth	:	BasePlate depth (parallel to column orientation vector – see orientation notes)
thick	:	BasePlate thickness
desc	:	BasePlate description - enclosed in “” marks - 64 characters maximum

Sample BasePlate Configuration File

```
UNIT    English
BASE    "Type I"   12.0  12.0  1.0  " 12x12x1"
BASE    "Type II"  12.0  14.0  1.0  " 12x14x1"
BASE    "Type III" 12.0  16.0  1.0  " 12x16x1"
```

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Definitions File

Due to the dissimilar nature of the variables in the steel utilities, each steel 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_BP.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_BP.DEF). A complete name and location of a definition file may be also specified with the environment variable ACE_BP_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_BP_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_BP.DEF is found in this directory, it is used.
3. If there is a c:\ace_bp.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 in later sections of this document. Toward the end of this document, the commands for the definition file are outlined in detail.

Due to the complex nature of the variables, the steel definition files allow the specification of units (either Metric (mm) or English (inch) for this application). 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/inch-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
GEN  IND  A50   4     NOLOCK  0       0
GRA  4    A36   A42   A50     A272
BAS  c:\basePL.cfg
NAM  DYN  BP-
```

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Definitions File - Command Definition

- **Valid Primary Keyword Commands** : (UNI, GEN, GRA, BAS, NAME)
- 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_BP.DEF definition file
- Definition file path may be defined with environment variable ACE_DEF_PATH
- ACE_DEF_PATH=d:\mydir\
(the DEF file ACE_BP.DEF will be looked for in the directory d:\mydir)
- Definition file may be defined with environment variable ACE_BP_DEF
- ACE_BP_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}

where :

{UNITTYPE} May be ENGLISH or METRIC

All input for the application is in inches for English units and mm for metric units.

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

Units may be changed at any time but be aware that the properties (in attached library) for the member specified must match the current model units.

GEN Command - General Command defines general parameters

GEN {sMode} sGrade iClass {sLOCK_STATUS} iOverlap iLocation

where :

{sMode}	:	IND (individual) or SEL (selection set) (SEL default)
sGrade	:	Baseplate grade (startup value) (1 st value default)
iClass	:	Baseplate class (valid options 0 - 9)
{sLOCK_STATUS}	:	LOCK or NOLOCK (Lock option for baseplate file)
iOverlap	:	Base Plate Column Overlap Startup Definition (Default 0) 0 - Column & Base Plate DO NOT OVERLAP 1 - Base Plate Overlaps Column Ends 2 - Base Plate Overlaps Column Ends & Trim Column Back
iLocation	:	Place Plate Location (Default 0) 0 - Place plate at Base only 1 - Place plate at Top only 2 - Place plate at both Base & Top

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Definitions File - Command Definition (con'd)

GRA Command - Grade Command defines grades options

GRA *iGrades sGrade1 ... sGraden*

where

iGrades : The number of grades (default value - 3)
sGrades1 : Grade definition (24 character max - should also be defined in FrameWorks)
sGraden : Last grade definition (10 maximum).

BAS Command - Baseplate Command defines location of baseplate file

BAS *sBaseplateFile*

where

sBaseplatefile : Path & name of baseplate file (can include environment variable)

NGP Command - Named Group Command defines namedgroups

(Optional command to define named groups)

NGP *iNGP_baseplate*

where

iNGP_baseplate : Named group for Base Plates (default -1 which is none)

NOTE: Namedgroups are defined globally for a project. The iNGP_xxx value is an integer value that corresponds to the index of the global namedgroups. The first namedgroup is 0, the next is 1 and so on up to a maximum integer value of the number of namedgroups minus one. If a name group does not exist for the integer value specified, the member type in question will simply not be placed in a named group. A value of -1 specifies that the member type in question is not to be put in a namedgroup. In FWP namedgroups are specified by an alpha name so be careful when selecting integers. **SOLID NAMEDGROUPS ARE FUNCTIONAL with FWP version 7.00.00.17 and later.**

NAME Command - Name Command defines method of naming components

NAME *{NAME_OPTION} name_prefix*

where

{NAME_OPTION} : Keyword - must be AUT or SPE or DYN or CON
SPEcified : Use the supplied name and append the member ID for baseplate solid
Thus each baseplate will have a different name
(This is the default option with the name "BP")
DYNamic : At placement time will display last name used with following options
1) option to supply a new name
2) option to request that member ID for baseplate placed be appended
Thus each baseplate will have a different name
3) option to abort placement
AUTo : FrameWorks assigns names by type and sequence number
(name_prefix not required or utilized)
CONstant : Use this name for all baseplates

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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).