



ACE Structural Engineering Applications LLC

ACE FrameWorks Foundation Import Documentation

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Foundation Import Program (ACE_FDN.MA)

(Current Versions - FWP 3.1.x.x/3.2.x.x rel 2.0.8 & FWP 7.0.x.x rel 7.0.8 & FWP 7.1/7.2/7.3 rel 6.0.8 & FWP 8.0.x.x rel 8.0.8 & FWP 9.0.x.x rel 9.0.8 & FWP 10.0.x.x rel 10.0.8 & FWP 11.0.x.x rel 11.0.8 & FWP 12.0.x.x rel 12.0.8)

The foundation import program can be utilized to place the twelve foundation types supported by eleven ACE FWP FPL Foundation utilities which include: Single Pedestal Foundation, Vertical Vessel Foundation, Combined Footing Foundation, Eccentric Footing Foundation, Mat Foundation, Pedestals, Ringwall Foundation, Drilled Pier Foundation, Concrete Tank Foundation, Grout Pads on Peds/Fdns, AB Groups on Peds/Fdns & Pile Groups beneath Fdns. As with all ACE FWP FPL Utilities, the foundation utilities are MDL/FPL (MicroStation Development Language & FrameWorks Parametric Language) applications, which run under Intergraph's FrameWorks Plus product. The foundations are all created from solid FWP shape(s) or FWP members. This program reads a defined ASCII file format (extension FDN) and places all valid foundation definitions found in the file. A sample of the FDN ASCII file (named ACE.FDN) is distributed with this application. The sample illustrates the simple format for foundation definition. The format for the FDN file is outlined later in detail in this document. All necessary FrameWorks parameters can be specified for all components in the foundation import file. The ACE.FDN sample distributed with this program is partially listed later in this document. The application will by default look for *.FDN files in the c:\ directory. The starting search directory can be specified with the environment variable ACE_FDN_FILE. The foundation import file support a units command so that English specified FDN file can be imported into a Metric model and vice versa.



Primary Dialog Box – Foundation Import Program

Several options for foundation naming are available. First, the foundation name that is specified in the ASCII file may be utilized. The second option allows new names to be generated at placement time. Under this option, all components for a given foundation are given the same name by concatenating the foundation type (3 character name) and first component FrameWorks ID. The prefix names for the foundation types are as follows: SPF, VVF, CFF, EFF, MAT, PDF, RWF, DPF, TKF, GRT, ABG & PIG. The third option groups foundation names by foundation type and sequence number. Finally, FrameWorks normal naming (autoname) for individual components may be specified.

This application can be extremely useful for organizations that have internally developed foundation design utilities or use commercial applications that support the FDN file format. Internally developed applications can be easily modified to create an ASCII file that can be read by this utility to FWP foundation models. The models can be utilized for interference checking, material takeoff, design review or drawing generation.

The following pertinent topics for the Foundation Import application are discussed in ensuing sections: coordinate system for foundation programs, commercial applications currently supporting the FDN file format, Foundation (FDN) ASCII file format (including a sample and the commands for FDN ASCII files), Section Substitution File for Anchor Bolt Groups & Pile Groups and the record mode capability.

ACE FrameWorks Foundation Import Documentation

Coordinate System for Foundation Programs

Coordinate System Nomenclature

ACE FPL Utilities consider the coordinate system to map to plant coordinates (North/South, East/West, elevation). While a design file is typically considered to have x, y and z coordinates, the FPL's consider East to be positive x, North to be positive y and the elevation to be z. Thus when specifying a MicroStation keyin such as xy = 100, 50, 10 remember that MicroStation expects the first coordinate to be x, which is East for positive and West for negative. The second coordinate is y, which is North for positive and South for negative. And of course the third coordinate is z for elevation.

Foundation Orientation Notes (with emphasis on the combined footing)

The foundation programs all utilize the same nomenclature for items such as pedestal width, pedestal length or depth, footing width and footing length. In all cases the width is the East-West dimension (parallel to x-axis) and the depth (sometimes referred to as length) is the North-South dimension (parallel to the y-axis). All elevations and heights refer to elevations or elevation distances (parallel to the z-axis).

Most of the foundation programs footing & pedestal orientations are relatively easy to understand, however the combined footing program may be the exception to that statement. The combined footing program always starts with the two pedestals forming a South-North line. The first pedestal is always the southern most pedestal. In cases where the eccentric single pedestal option is utilized, the pedestal is placed on a South-North line and the pedestal centerline does not have to match the footing centerline in the South-North direction. All pedestal centerlines will always match the footing centerline in the East-West direction. Obviously many combined footing will have different orientation, which is controlled by the ability to rotate the foundation mat and pedestal. Unlike the interactive combined footing placement, mat rotation and pedestal rotation are always separate for the foundation import program. In cases where the two pedestals form an East -West line, a rotation of 270 or -90 degrees should be utilized. Even in such an orientation, the pedestal width and depth can generally be defined in such a manner that no rotation is required unless of course the two pedestals form a line which is neither parallel to South-North nor East-West. In this case a pedestal rotation is typically required.

A skew angle does not exist for the foundation import program as each foundation is placed in the individual placement mode. Rotated orientation is handled by the footing and/or pedestal(s) rotation angle. All rotation angles follow the right hand rule about the positive z-axis. Again any confusion can be easily cleared up with a little experimentation.

Commercial Applications which Support the FDN File Format

At the time of this writing the following commercial applications write the ACE FrameWorks Utilities FDN format file:

- **Advanced Software for Foundation Design**
Dimensional Solutions, Inc.
www.Dimsoln.com

ACE FrameWorks Foundation Import Documentation

Sample Foundation ASCII Input File

Sample Input File for Foundation Import Utility (4/25/2005)

(All records that start with a blank are comments)

(Partial file listing of sample)

(f.0.5 Units can be defined in the import file - upward compatible)

(f.0.6 Support for Grout Pads)

(f.0.6 Revised PAR command adding GRT type and adding NG & itype for PED, FTG & GRT - Upward compatible)

(f.0.6 Support for Anchor Bolt Groups)

(f.0.6 Support for File Groups)

UNIT ENG FEET

PAR PED 2 Fc_4 FDN 7 Fc_5

SPF 50.000 75.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760001
SPF 70.000 75.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760002
SPF 90.000 75.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760003
SPF 110.000 75.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760004
SPF 50.000 90.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760005
SPF 70.000 90.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760006
SPF 90.000 90.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760007
SPF 110.000 90.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760008
SPF 50.000 105.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760009
SPF 70.000 105.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760010
SPF 90.000 105.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760011
SPF 110.000 105.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760012
SPF 50.000 120.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760013
SPF 70.000 120.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760014
SPF 90.000 120.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760015
SPF 110.000 120.000 99.000 CIR 4.50 2.000 2.50 90.000 REC 1.50 12.000 8.000 90.000 NAME SPF8974957760016

PAR PED 2 Fc_3 FDN 7 Fc_3

CFF 180.0 25.0 99.0 OCT 5.50 3.0 3.0 0.0 -2.50 CIR 6.50 2.0 2.0 0.0 5.0 REC 1.50 9.0 15.0 0.0 NAME CFF8974959920001

CFF 180.0 40.0 99.0 OCT 5.50 3.0 3.0 0.0 -2.50 CIR 6.50 2.0 2.0 0.0 5.0 REC 1.50 9.0 15.0 0.0 NAME CFF8974959920002

PAR FDN 5 Fc_4

RWF 225.000 75.000 97.000 4.000 75.000 72.000 NAME RWF8974960380001

PAR PED 2 Fc_3 FDN 7 Fc_6

DPF -25.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380001
DPF -5.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380002
DPF 15.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380003
DPF 35.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380004
DPF 55.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380005
DPF 75.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380006
DPF 95.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380007
DPF 115.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380008
DPF 135.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380009
DPF 155.000 25.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380010
DPF -25.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380011
DPF -5.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380012
DPF 15.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380013
DPF 35.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380014
DPF 55.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380015
DPF 75.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380016
DPF 95.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380017
DPF 115.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380018
DPF 135.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380019
DPF 155.000 40.000 87.000 CIR 6.000 2.000 1.50 0.000 3.000 9.401924 6.000 2.598076 NAME DPF8974963380020

VVF 15.000 115.000 98.000 OCT 6.50 8.000 45.000 OCT 1.50 16.000 45.000 NAME VVF8974965870001

VVF 15.000 85.000 98.000 OCT 6.50 8.000 45.000 OCT 1.50 16.000 45.000 NAME VVF8974965870002

VVF -25.000 100.000 98.000 OCT 6.50 12.000 0.000 OCT 2.50 25.000 0.000 NAME VVF8974965870003

PAR PED 1 Fc_3

PDF 142.50 67.50 103.000 CIR 6.000 1.50 2.000 0.000 NAME PDF8974967230001

PDF 157.50 67.50 103.000 CIR 6.000 1.50 2.000 0.000 NAME PDF8974967230002

PDF 142.50 82.50 103.000 CIR 6.000 1.50 2.000 0.000 NAME PDF8974967230003

PDF 157.50 82.50 103.000 CIR 6.000 1.50 2.000 0.000 NAME PDF8974967230004

PAR FDN 7 Fc_3

MAT 150.000 75.000 99.000 CIR 4.000 30.000 20.000 0.000 NAME MAT8974969200001

PAR PED 1 Fc_3

PDF 142.50 107.50 103.000 CIR 6.000 1.50 2.000 0.000 NAME PDF8974967230005

PDF 157.50 107.50 103.000 CIR 6.000 1.50 2.000 0.000 NAME PDF8974967230006

PDF 142.50 122.50 103.000 CIR 6.000 1.50 2.000 0.000 NAME PDF8974967230007

PDF 157.50 122.50 103.000 CIR 6.000 1.50 2.000 0.000 NAME PDF8974967230008

MAT 150.000 115.000 99.000 OCT 4.000 30.000 20.000 0.000 NAME MAT8974969200002

PAR PED 6 Fc_4 FDN 5 Fc_3

TKF 60.0 175.0 84.0 CIR 15.50 15.50 13.250 1.25 0.0 1.50 REC 2.25 18.0 16.0 NAME TKF9214683950001

TKF 90.0 175.0 84.0 REC 17.0 15.0 14.750 1.25 0.0 0.0 REC 2.25 18.0 16.0 NAME TKF9214683950002

ACE FrameWorks Foundation Import Documentation

Sample Foundation ASCII Input File (continued)

```
UNITS ENGLISH FEET
PAR GRT 3 Fc_4 2 1
GRT 50.000000 75.000000 105.062500 REC 0.062500 1.000000 1.166667 1.333333 0.000000 NAME GRT11144492450001
PAR GRT 3 Fc_4 2 1
GRT 70.000000 75.000000 105.062500 REC 0.062500 1.000000 1.166667 1.333333 0.000000 NAME GRT11144492450002
PAR GRT 3 Fc_4 2 1
GRT 90.000000 75.000000 105.062500 REC 0.062500 1.000000 1.166667 1.333333 0.000000 NAME GRT11144492450003
PAR GRT 3 Fc_4 2 1
GRT 110.000000 75.000000 105.062500 REC 0.062500 1.000000 1.166667 1.333333 0.000000 NAME GRT11144492450004
PAR GRT 3 Fc_4 2 1
GRT 50.000000 90.000000 105.062500 REC 0.062500 1.000000 1.166667 1.333333 0.000000 NAME GRT11144492450005
PAR GRT 3 Fc_4 2 1
GRT 70.000000 90.000000 105.062500 REC 0.062500 1.000000 1.166667 1.333333 0.000000 NAME GRT11144492450006
PAR GRT 3 Fc_4 2 1
GRT 90.000000 90.000000 105.062500 REC 0.062500 1.000000 1.166667 1.333333 0.000000 NAME GRT11144492450007
PAR GRT 3 Fc_4 2 1
GRT 110.000000 90.000000 105.062500 REC 0.062500 1.000000 1.166667 1.333333 0.000000 NAME GRT11144492450008
UNITS ENGLISH FEET
ABP HB CL 3 GR A36 NG 2 ST 2002
ABG "SR1 1/2" 4 105.000000 0.416667 NAME AB11144489920001
ABL 50.375000 75.333333
ABL 49.625000 74.666667
ABL 50.375000 74.666667
ABL 49.625000 75.333333
ABG "SR1 1/2" 4 105.000000 0.416667 NAME AB11144489920002
ABL 70.375000 75.333333
ABL 69.625000 74.666667
ABL 70.375000 74.666667
ABL 69.625000 75.333333
ABG "SR1 1/2" 4 105.000000 0.416667 NAME AB11144489920003
ABL 90.375000 75.333333
ABL 89.625000 74.666667
ABL 90.375000 74.666667
ABL 89.625000 75.333333
ABG "SR1 1/2" 4 105.000000 0.416667 NAME AB11144489920004
ABL 110.375000 75.333333
ABL 109.625000 74.666667
ABL 110.375000 74.666667
ABL 109.625000 75.333333
ABG "SR1 1/2" 4 105.000000 0.416667 NAME AB11144489920005
ABL 50.375000 90.333333
ABL 49.625000 89.666667
ABL 50.375000 89.666667
ABL 49.625000 90.333333
ABG "SR1 1/2" 4 105.000000 0.416667 NAME AB11144489920006
ABL 70.375000 90.333333
ABL 69.625000 89.666667
ABL 70.375000 89.666667
ABL 69.625000 90.333333
ABG "SR1 1/2" 4 105.000000 0.416667 NAME AB11144489920007
ABL 90.375000 90.333333
ABL 89.625000 89.666667
ABL 90.375000 89.666667
ABL 89.625000 90.333333
ABG "SR1 1/2" 4 105.000000 0.416667 NAME AB11144489920008
ABL 110.375000 90.333333
ABL 109.625000 89.666667
ABL 110.375000 89.666667
ABL 109.625000 90.333333
UNITS ENGLISH FEET
PIP CO CL 3 GR A36 NG 2 MA 0 ST 2001 TA 0
PIG "HP12X53" 8 NAME PILE11144507550001
PIL -17.250000 100.000000 98.250000 -17.250000 100.000000 78.000000 1.000000 0.000000 0.0
PIL -17.250000 107.750000 98.250000 -17.250000 107.750000 78.000000 1.000000 0.000000 0.0
PIL -17.250000 92.250000 98.250000 -17.250000 92.250000 78.000000 1.000000 0.000000 0.0
PIL -32.750000 100.000000 98.250000 -32.750000 100.000000 78.000000 1.000000 0.000000 0.0
PIL -32.750000 107.750000 98.250000 -32.750000 107.750000 78.000000 1.000000 0.000000 0.0
PIL -32.750000 92.250000 98.250000 -32.750000 92.250000 78.000000 1.000000 0.000000 0.0
PIL -25.000000 107.750000 98.250000 -25.000000 107.750000 78.000000 1.000000 0.000000 0.0
PIL -25.000000 92.250000 98.250000 -25.000000 92.250000 78.000000 1.000000 0.000000 0.0
PIP CO CL 3 GR A42 NG 2 MA 0 ST 2001 TA 0
PIG "P12STD" 4 NAME PILE11144507550002
PIL 19.250000 89.250000 98.250000 19.250000 89.250000 84.000000 1.000000 0.000000 0.0
PIL 10.750000 80.750000 98.250000 10.750000 80.750000 84.000000 1.000000 0.000000 0.0
PIL 19.250000 80.750000 98.250000 19.250000 80.750000 84.000000 1.000000 0.000000 0.0
PIL 10.750000 89.250000 98.250000 10.750000 89.250000 84.000000 1.000000 0.000000 0.0
PIP CO CL 3 GR A42 NG 2 MA 0 ST 2001 TA 0
PIG "P12STD" 4 NAME PILE11144507550003
PIL 19.250000 119.250000 98.250000 19.250000 119.250000 84.000000 1.000000 0.000000 0.0
PIL 10.750000 110.750000 98.250000 10.750000 110.750000 84.000000 1.000000 0.000000 0.0
PIL 19.250000 110.750000 98.250000 19.250000 110.750000 84.000000 1.000000 0.000000 0.0
PIL 10.750000 119.250000 98.250000 10.750000 119.250000 84.000000 1.000000 0.000000 0.0
```

ACE FrameWorks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File

The ASCII import file supports eighteen (18) commands, which allows the definition of the twelve foundation types supported by the eight foundation applications in the ACE FrameWorks Utilities. The eighteen commands are: **UNI, PAR, SPF, VVF, CFF, EFF, DPF, RWF, MAT, PED, TKF, GRT, ABP, ABG, ABL, PIP, PIG, PIL**. There are twelve (12) FDN commands and each FDN command fully describes a FDN configuration with two exceptions. The two exceptions are AB groups which requires a ABG command followed by ABL commands and Pile groups which requires PIG command followed by PIL commands. The twelve FDN commands are: **SPF, VVF, CFF, EFF, DPF, RWF, MAT, PED, TKF, GRT, ABG & PIG**.

Command Definition

- **Valid Primary Keyword Commands:** (UNI, PAR, SPF, VVF, CFF, EFF, DPF, RWF, MAT, PED, TKF, GRT, ABP, ABG, ABL, PIP, PIG, PIL)
- Each record must begin with a valid primary keyword or it is ignored (capitalization is **REQUIRED**)
- 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
- Providing a UNI command at the start will ensure proper units irrespective of model units
- 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.
- Providing a PAR command before any FDN commands which places FWP solids
 1. Will ensure proper definition of class, grade, namedgroup & FWP solid type
 2. If a PAR command is not supplied class will be 2
 3. If a PAR command is not supplied grade will be FC_3
 4. If a PAR command is not supplied named group will be inactive
 5. If a PAR command is not supplied FWPsolid type will be SOLID
- Providing a PIP command before PIG & ABP before ABG commands will
 1. Ensure ensure proper definition of class, grade, namedgroup, subtype for ABG
 2. Ensure ensure proper definition of class, grade, namedgroup, subtype, tag & material for PIG
 3. If a PIP/ABP command is not supplied class will be 2
 4. If a PIP/ABP command is not supplied grade will be A36
 5. If a PIP/ABP command is not supplied named group will be inactive
 6. If a PIP/ABP command is not supplied subtypewill be inactive
 7. If a PIP/ABP command is not supplied material will be steel
- All values for a given command must be defined in order shown above (UNO).
- The components of a given command (record) must all be present and in the order shown (UNO)
- By default application looks for FDN file (extension .fdn) in c:\
- The starting search directory can be specified with the environment variable ACE_FDN_FILE

UNIT Command - Units Command (Highly recommended optional command)

UNIT {UNITTYPE} {UNIT}

where :

{UNITTYPE} May be ENGLISH or METric

{UNIT} May be FEET or INCh for ENGLISH (feet is default) or METer or MM for METric (meter is default)

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.

ACE Frameworks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

PAR Command - Parameter Command (Highly recommended optional command)

- Command may contain PED and/or FTG and/or GRT specification in any order
- All parameters class, grade, ng & itype must be specified in proper order
- Command may be issued as often as necessary
- PED, FTG & GRT parameter definitions remain in effect until changed

PAR PED class grade ng iType FTG class grade ng iType GRT class grade ng iType

Where :

| | |
|-------|--|
| PED | keyword for pedestal - optional (capitalization is important) |
| class | can be from 0 to 9 (required if PED speified) |
| grade | must be a valid grade definition 24 chars max (grade required if PED speified) |
| ng | positive integer specifying named group (-1 no named group is default) |
| itype | integer specifying FWP solid type SOLID-0 or SLAB-1 (0-SOLID is default) |
| FTG | keyword for footing - optional (capitalization is important) |
| class | can be from 0 to 9 (required if FTG specified) |
| grade | must be a valid grade definition 24 chars max (grade required if FTG specified) |
| ng | positive integer specifying named group (-1 no named group is default) |
| itype | integer specifying FWP solid type SOLID-0 or SLAB-1 (0-SOLID is default) |
| GRT | keyword for grout pad - optional (capitalization is important) |
| class | can be from 0 to 9 (required if GRT specified) |
| grade | must be a valid grade definition 24 chars max (grade required if GRT specified) |
| ng | positive integer specifying named group (-1 no named group is default) |
| itype | integer specifying FWP solid type SOLID-0 or SLAB-1 (0-SOLID is default) |

*NOTE: If never specified, the default value for class of the pedestal & footing & grout pad is 2
and the default grade of the pedestal & footing & grout pad is FC_3. If never specified,
namedgroup (ng) is inactive & the solid type is SOLID*

ACE FrameWorks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

All twelve foundation type (FDN) commands for this application are described in the following pages. The twelve commands are: SPF, VVF, CFF, EFF, DPF, RWF, MAT, PED, TKF, GRT, ABG & FIG. One similarity between the data following the command is the coordinate location data. This part of the command looks like:

SPF north_cord east_cord boc_elev ... rest of command

Where :

north_cord – The North (South negative) coordinate location for the centroid of the foundation. (Y valye)
east_cord – The East (West negative) coordinate location for the centroid of the foundation. (X valye)
boc_cord – The bottom of concrete (BOC) elevation for the foundation. (Z valye)

Spread Footing

- **Keyword - SPF (must be first 3 characters)**
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**
- **Double concentric single pedestal footing i.e. CL's of PED & FTG match**

SPF north_cord east_cord boc_elev
{PEDSHAPE} height width depth angle
{FTGSHAPE} thickness width depth angle NAME name

Where :

{PEDSHAPE} Keyword - must be CIR, SQU or REC
if CIR or SQU - depth is ignored but must be supplied
if CIR - angle is ignored but must be supplied
width is always a East-West dimension
depth is always a North-South dimension
{FTGSHAPE} Keyword - must be SQU or REC
if SQU - depth is ignored but must be supplied
width is always a East-West dimension
depth is always a North-South dimension
NAME keyword for name - required (capitalization is important)
name can be up to 24 characters (may contain blanks - any case)

Vertical Vessel Foundation

- **Keyword - VVF (must be first 3 characters)**
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**

VVF north_cord east_cord boc_elev
{PEDSHAPE} height width angle
{FTGSHAPE} thickness width angle NAME name

Where :

{PEDSHAPE} Keyword - must be SQU or OCT
note that angle must always be supplied even if 0
{FTGSHAPE} Keyword - must be SQU or OCT
note that angle must always be supplied even if 0
NAME keyword for name - required (capitalization is important)
name can be up to 24 characters (may contain blanks - any case)

ACE Frameworks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

Mat Foundation

- **Keyword - MAT** (must be first 3 characters)
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**

MAT north_cord east_cord boc_elev {FTGSHAPE} thickness width depth angle NAME name

Where :

{FTGSHAPE} Keyword - must be SQU, OCT, CIR or REC
if SQU, OCT or CIR - depth is ignored but must be supplied
if CIR - angle is ignored but must be supplied
width is always a East-West dimension
depth is always a North-South dimension
note that angle must always be supplied even if 0
NAME keyword for name - required (capitalization is important)
name can be up to 24 characters (may contain blanks - any case)

Pedestal Foundation

- **Keyword - PDF** (must be first 3 characters)
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**

PDF north_cord east_cord boc_elev {PEDSHAPE} height width depth angle NAME name

Where :

{PEDSHAPE} Keyword - must be SQU, OCT, CIR or REC
if SQU, OCT or CIR - depth is ignored but must be supplied
if CIR - angle is ignored but must be supplied
width is always a East-West dimension
depth is always a North-South dimension
note that angle must always be supplied even if 0
NAME keyword for name - required (capitalization is important)
name can be up to 24 characters (may contain blanks - any case)

ACE Frameworks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

Combined Footing Foundation

- **Keyword - CFF** (must be first 3 characters)
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**
- **Normal two pedestal combined footing**

CFF north_cord east_cord boc_elev
{PEDSHAPE1} height1 width1 depth1 angle1 dist_cl1
{PEDSHAPE2} height2 width2 depth2 angle2 dist_cl2
{FTGSHAPE} thickness width depth angle NAME name

Where :

- {PEDSHAPE1} Keyword - must be SQU, OCT, CIR or REC
 - if SQU, OCT or CIR - depth is ignored but must be supplied
 - if CIR - angle is ignored but must be supplied
 - width1 is always a East-West dimension
 - depth1 is always a North-South dimension
 - dist_cl1 is the distance from footing CL to ped CL
 - if South of CL a negative number
 - note that angle must always be supplied even if 0
- {PEDSHAPE2} Keyword - must be SQU, OCT, CIR or REC
 - if SQU, OCT or CIR - depth is ignored but must be supplied
 - if CIR - angle is ignored but must be supplied
 - width2 is always a East-West dimension
 - depth2 is always a North-South dimension
 - ped1_ped2 is the distance between CL of ped1 and ped2
 - always a positive number (ped2 always North of ped1)
 - note that angle must always be supplied even if 0
- {FTGSHAPE} must be SQU or REC
 - if SQU - depth is ignored but must be supplied
 - width is always a East-West dimension
 - depth is always a North-South dimension
 - note that angle must always be supplied even if 0
- NAME keyword for name - required (capitalization is important)
 - name can be up to 24 characters (may contain blanks - any case)

ACE Frameworks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

Eccentric Footing Foundation

- **Keyword - ECC** (must be first 3 characters)
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**
- **Special variation of the combined footing foundation (only one pedestal)**

EFF north_cord east_cord boc_elev
{PEDSHAPE} height width depth angle dist_cl
{FTGSHAPE} thickness width depth angle NAME name

Where :

- {PEDSHAPE} Keyword - must be SQU, OCT, CIR or REC
 - if SQU, OCT or CIR - depth is ignored but must be supplied
 - if CIR - angle is ignored but must be supplied
 - width is always a East-West dimension
 - depth is always a North-South dimension
 - dist_cl1 is the distance from footing CL to ped CL
 - if South of CL a negative number
 - note that angle must always be supplied even if 0
- {FTGSHAPE} must be SQU or REC
 - if SQU - depth is ignored but must be supplied
 - width is always a East-West dimension
 - depth is always a North-South dimension
 - note that angle must always be supplied even if 0
- NAME keyword for name - required (capitalization is important)
 - name can be up to 24 characters (may contain blanks - any case)

ACE FrameWorks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

Drilled Pier Foundation

- **Keyword - DPF** (must be first 3 characters)
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**
- **As a minimum a shaft always exists with or without pedestal and/or bell**

DPF *north_cord* *east_cord* *boc_elev* {PEDSHAPE} *height* *width* *depth* *angle*
 shaft_diam *shaft_length* *bell_diam* *bell_length* *NAME* *name*

Where :

boc_elev is the base BOC of shaft or bell if present
{PEDSHAPE} Keyword - must be SQU, OCT, CIR, REC, or NON (NON indicates no pedestal)
if NON - height, width, depth & angle are ignored but all must be supplied
if SQU, OCT or CIR - depth is ignored but must be supplied
if CIR angle is ignored but must be supplied
width is always a East-West dimension
depth is always a North-South dimension
angle must always be supplied even if 0
shaft_diam is always positive non-zero drilled shaft diameter
shaft_length is always positive non-zero drilled shaft length
bell_diam is bell diameter - zero if no bell - must be supplied
bell_length is bell length - zero if no bell - must be supplied
Note : class & grade of shaft & bell is controlled by PAR FTG specification
NAME keyword for name - required (capitalization is important)
 name can be up to 24 characters (may contain blanks - any case)

ACE FrameWorks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

Ringwall Foundation

- **Keyword - RWF** (must be first 3 characters)
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**

RWF *north_cord* *east_cord* *boc_elev* *wall_height* *wall_od* *wall_id* *NAME* *name*

Where :

NAME keyword for name - required (capitalization is important)

name can be up to 24 characters (may contain blanks - any case)

Note : class & grade of ringwall foundation is controlled by PAR FTG specification

Concrete Tank Foundations

- **Keyword - TKF** (must be first 3 characters)
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**
- **Tank required (walls), optional top & optional base are concentric**

TKF *north_cord* *east_cord* *boc_elev*
 {TANKSHAPE} *width* *depth* *wall_height* *wall_thick* *angle* *top_thick*
 {BASESHAPE} *base_thick* *base_width* *base_depth* *NAME* *name*

Where :

boc_elev is the base elevation of the foundation

(wall BOC will be boc_elev + base_thick)

{TANKSHAPE} Keyword - must be CIR, SQU or REC

if CIR or SQU - depth is ignored but must be supplied

if CIR - angle is ignored but must be supplied

angle pertains to top, walls & base

width is always a East-West dimension

depth is always a North-South dimension

wall_height is the actual wall height (does not include base or top)

if top_thick is 0.0 a top is not placed

Note : class & grade for wall & top is controlled by PED specification

{BASESHAPE} Keyword - must be CIR, SQU or REC

if base_thick is 0.0 a base is not placed

if CIR or SQU - depth is ignored but must be supplied

base_width is always a East-West dimension

base_depth is always a North-South dimension

Note : class & grade for base is controlled by FTG specification

NAME keyword for name - required (capitalization is important)

name can be up to 24 characters (may contain blanks - any case)

ACE FrameWorks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

Grout Pads

- **Keyword - GRT** (must be first 3 characters)
- **Capitalization is required**
- **All command components contained on one line of input**
- **All components must be specified and must be in order shown**

GRT north_cord east_cord tog_elev {GRTSHAPE} thickness edgebevel width depth angle
NAME name

Where :

tog_elev is top of grout
{GRTSHAPE} Keyword - must be SQU, OCT, CIR or REC
if SQU, OCT or CIR - depth is ignored but must be supplied
if CIR - angle is ignored but must be supplied

thickness is the grout pad thickness
edgebevel is the slope of grout edge (Run/Rise)
(i.e. 45 deg is 1.0 60 deg is .5774 90 deg is 0.0)
width is always a East-West dimension
depth is always a North-South dimension
note that angle must always be supplied even if 0

NAME keyword for name - required (capitalization is important)
name can be up to 24 characters (may contain blanks - any case)

ACE FrameWorks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

AB Group (3 commands: optional ABP, ABG followed by ABL commands)

- Keyword - ABG (must be first 3 characters) to start a AB Group Definition
- **CRITICAL:** num_bolts ABL commands **MUST IMMEDIATELY FOLLOW** the ABG command
- Note that a ABP (AB property) command should be issued at least once before ABG
- If ABP not supplied – defaults are utilized
- AB group properties (ABP) remain in effect until changed
- Capitalization is required
- All command components contained on one line of input
- All components must be specified and must be in order shown

ABP {MEMTYPE} (CL class) (GR grade) (NG namedgroup) (ST subtype)

where :

{MEMTYPE} Keyword - must be CO, BM, VB or HB
(CO-Column, BM-Beam, VB-Vertical Brace, HB-Horizontal Brace)

CL class is AB class - valid range 0 - 9 (optional command)

GR grade is AB grade - any valid grade (24 chars) (optional command)

NG NG is named group - integer corresponding to a named group
(optional command - default is (-1) - no named group)

ST ST is member subtype - integer corresponding to a “new attribute” member subtype
(optional command - default is (0) - no member subtype)
(ST can be a value specified in FWP attributes.dat file or
it may be a unique value > 10 & less than 31,000
if ST is in attributes.dat file FWP will allow it to be searched etc
if it is not it can be found with a FPL application)

CL and/or GR and/or NG and/or ST may be specified in any order - all optional

Once command is used properties for AB's remain in effect until a new property command for AB's.

Command may be specified multiple times as required. (This command must be specified at least once)

ABG section num_bolts toc_elev projection NAME name

where :

section is valid library name of solid round bar
surrounded by " " (i.e. "3 1/2AB")

num_bolts (that many ABL commands must immediately follow a ABG command)

toc_elev is top of concrete (base of AB)

projection is the AB height from toc

NAME keyword for name - required (capitalization is important)

name can be up to 24 characters (may contain blanks - any case)

ABL north_cord east_cord

where :

north_cord is North coordinate for anchor bolt center (CP-5)

east_cord is Eorth coordinate for anchor bolt center (CP-5)

ACE Frameworks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

File Group (3 commands: optional PIP, PIG followed by PIL commands)

- Keyword - PIG (must be first 3 characters) to start a File Group Definition
- **CRITICAL:** num_piles PIL commands MUST IMMEDIATELY FOLLOW the PIG command
- Note that a PIP (Pile property) command should be issued at least once before PIG
- If PIP not supplied – defaults are utilized
- Pile group properties (PIP) remain in effect until changed
- Capitalization is required
- All command components contained on one line of input
- All components must be specified and must be in order shown

**PIP {MEMTYPE} (CL class) (GR grade) (MA material) (NG namedgroup)
(ST subtype) (TA tagmethod)**

where :

{MEMTYPE} Keyword - must be CO, BM, VB or HB
(CO-Column, BM-Beam, VB-Vertical Brace, HB-Horizontal Brace)

CL is class - valid range 0 - 9 (optional command)

GR is grade - any valid grade (24 chars) (optional command)

MA is material integer value (0-steel (def), 1-concrete 2-other) (optional command)

NG is named group - integer corresponding to a named group
(optional command - default is (-1) - no named group)

ST is member subtype - integer corresponding to a “new attribute” member subtype
(optional command - default is (0) - no member subtype)
(ST can be a value specified in FWP attributes.dat file or
it may be a unique value > 10 & less than 31,000
if ST is in attributes.dat file FWP will allow it to be searched etc
if it is not it can be found with a FPL application)

TA defines tagging method – (ST must be defined or tagging is inactive – optional command)
0 - check for existing tags in current file & all attached files – then start with maxvalue
plus 1 and increment each subsequent pile in group by 1 – default method
-1 - tag is defined on PIL record (if not supplied DO NOT TAG)
- If # is greater than 0 – Starting tag number – each pile is incremented by 1

CL and/or GR and/or NG and/or MA and/or ST and/or TA may be specified in any order
(CL, GR, NG, MA, AT, ST & TA are all optional)

*Once command is used properties for Piles remain in effect until a new property command for Piles.
Command may be specified multiple times as required. (**command must be specified at least once**)*

ACE FrameWorks Foundation Import Documentation

Input Definitions & Rules for Foundation ASCII Import File (con'd)

Pile Group (con'd)

PIG *section num_piles NAME name*

where :

section is valid library name of pile section

surrounded by " " (i.e. "14 SQ Pile")

num_piles (that many PIL commands must immediately follow a PIG command)

NAME keyword for name - required (capitalization is important)

name can be up to 24 characters (may contain blanks - any case)

PIL *top_north_cord top_east_cord top_elev_cord base_north_cord base_east_cord
base_elev_cord OVnorth OVeast OVelev TAG tag NAME name*

Where :

top_north_cord is North coordinate for top of pile center (CP-5)

top_east_cord is East coordinate for top of pile center (CP-5)

top_elev_cord is elev coordinate for top of pile center (CP-5)

base_north_cord is North coordinate for bottom of pile center (CP-5)

base_east_cord is East coordinate for bottom of pile center (CP-5)

base_elev_cord is elev coordinate for bottom of pile center (CP-5)

OVnorth is the North vector value (y-value)

OVeast is the East vector value (x-value)

OVelev is the elev vector value (z-value)

TAG keyword for TAG - required (capitalization is important)

tag a long integer from 1 to 2,000,000

TAG command is optional – will put a Pile mark on element

The mark is “new attribute” Fabricator_PrebuyMark

NAME keyword for name - required (capitalization is important)

name can be up to 24 characters (may contain blanks - any case)

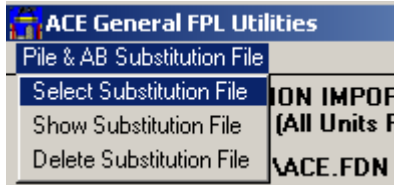
Note that a NAME supplied on PIL command overrides PIG command

Obviously NAME is an optional command

ACE FrameWorks Foundation Import Documentation

Section Substitution File for Anchor Bolt Groups & Pile Groups

Unlike other “foundation types which are FWP solids”, anchor bolt groups & pile groups are comprised of FWP members, which must be found in either the project section library or a user supplied section library. Since the source producing a FDN file may use profile names that are different from FrameWorks nomenclature, a section substitution file may be specified. The initial location and/or search directory for a substitution file (.SEC file) can be specified with the following uStn environment variable: ACE_ABPILESEC_FILE (such as: ACE_ABPILESEC_FILE=f:/subst_files/AB-PILE.sec). At any time a substitution file may be defined or redefined using the “Pile & AB Substitution File” pulldown menu.



The “Select Substitution File” will activate a lookup dialog box to locate section substitution files. Section substitution files have a .SEC extension. “Show Substitution File” will give the name of the current substitution file & the number of profiles in the file (also number found in libraries). The “Delete Substitution File” will remove substitution file.

The section substitution file specifies old shape and new shape to be substituted on a record. There is no limit to the number of substitutions (records) that may be contained in a file. Capitalization is not important as strings for member profile shapes are compared without regard to capitalization. Thus a single record in a section substitution file would look as follows:

“old profile name” “new profile name”
where

- Each profile name must be contained in quotes
- A profile name may have embedded spaces
- Capitalization is not important
- A minimum of at least one space must separate the old and new profiles
- Each record in the file is a single substitution
- No limit to the number of records in the file

Sample .SEC File

```
"1inchAB"    "SR1"  
"1.5inchAB"  "SR1 1/2"  
"2inchAB"    "SR2"  
"Timber Pile" "SR12"  
"Precast Pile" "SB12SQ"
```

Foundation Record Mode

The default mode for the 8 foundation utilities is the place foundation mode. However a special record mode can be controlled with a special MicroStation environment variable. The available modes are: place only; record and place; and record only. The MicroStation environment variable, which controls the mode is ACE_REC. When ACE_REC is 0 or undefined, the default place only mode is active. When ACE_REC is 1, foundations are both placed and recorded. Finally when ACE_REC is 2, the record only mode is entered. When the record only mode is active, the 8 foundation programs can be run from MicroStation without FrameWorks active. All other modes will activate FrameWorks and will fail if FrameWorks is not on system.

In the record mode, a foundation input file is appended to the file c:\ace.fdn (default file name). If the MicroStation environment variable ACE_REC_FILE points to a valid path and file name, that will be the record file. The file written is compatible with the ACE FWP general utility Foundation Import. Thus engineers/designers utilizing MicroStation can write record files which, can be subsequently batch loaded into FrameWorks.

ACE FrameWorks Foundation Import 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.

This particular application will ALWAYS WRITE to a log file. This application WILL FAIL with a locked C drive. The environment variable ACE_LOG_PATH must be utilized for this application if the C drive is locked.

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).