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Release notes
USFOS 8-2, July 2005

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1 Introduction

The current version of USFOS is version 8-2 with release date 2005-07-01, and the release contains following:

- ❑ CD-ROM
- ❑ Release Notes (this MEMO)

Except for this MEMO, no “paper information” will be distributed in connection with this release. All information is stored on the CD.

2 News in USFOS version 8-2 - 2005.

2.1 Introduction

Some of the new features are described by examples located on the web site, and reference to the actual example(s) will be given for the different new options.

2.2 Enhanced Graphical User Interface

The graphical user interface (xact) has been enhanced since last year's release. The GUI version released together with USFOS 8-2 has version 2-2. Check under help/about to ensure that the latest version is installed.

2.2.1 Keep Settings on New Files

If a series of result files should be inspected, for example comparing the different analysis results, it is possible to "Keep Settings on New File". By default, the option is switched OFF. When the option is activated, the viewpoint, the actual scalar result and the step number will be kept and used on the new result file.

"What to keep", could be customised by the user.

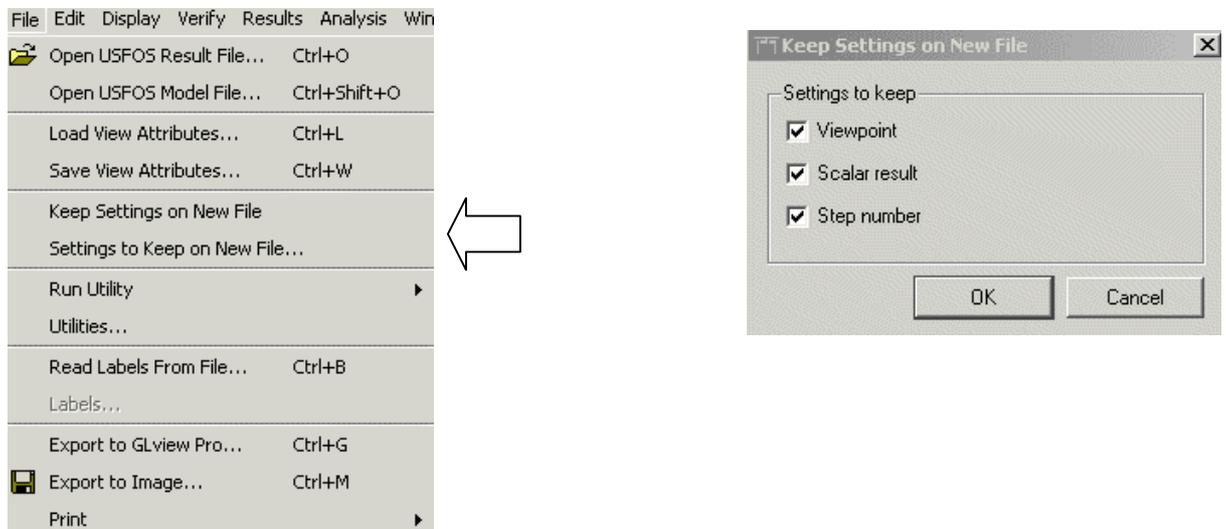


Figure 2-1 Keep Settings on new files and what to keep.

2.2.2 Limit Result steps (Set step range)

If a series of result files should be inspected, for example comparing the different analysis results, it is possible to specify the range of result steps to display. The “Step Range” option is found in the Results menu as seen in Figure 2-2. The dialogue box is opened with the first and last steps displayed. Figure 2-3 shows an example, where the first steps, (the “apply self weight steps”), are skipped during a boat impact. The “Full Range”/ Apply resets this option.

Step range has impact on following:

- ❑ Plots
- ❑ Animation

The fringe range however, is still based on the min/max result values for the entire analysis.

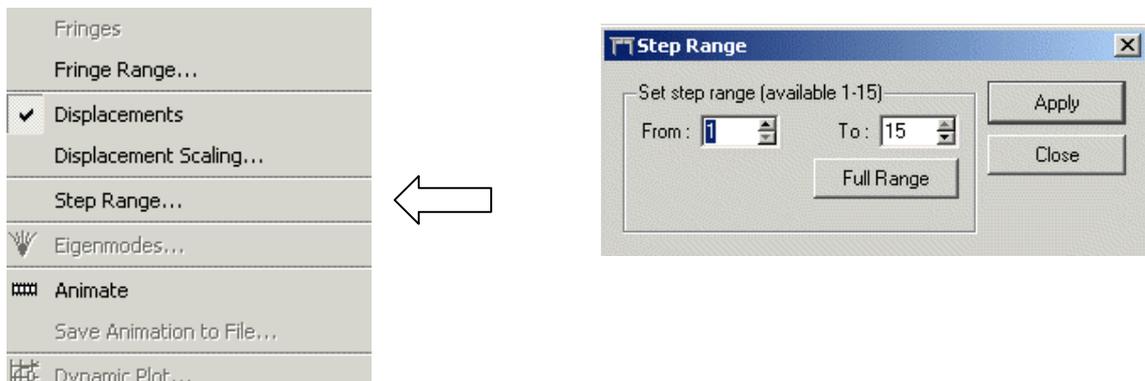


Figure 2-2 Limit Result steps. Step Range is found in the Results menu

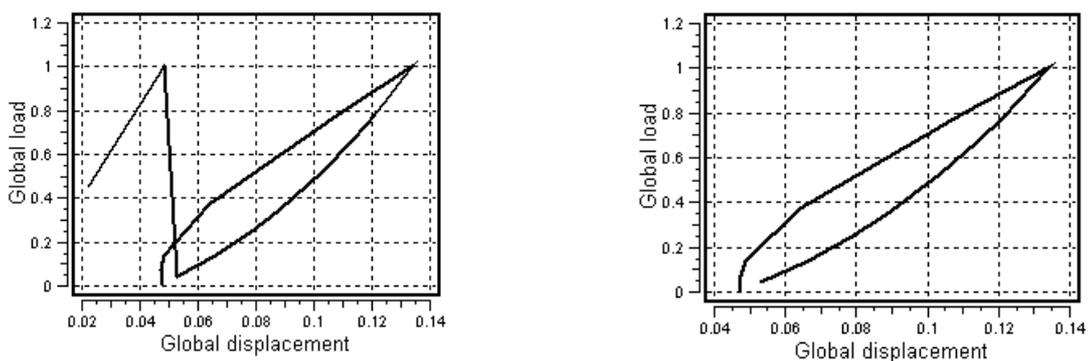


Figure 2-3 The first steps of the boat impact analysis is skipped.

2.2.3 Save Animation on file (MPG, AVI or GIF)

For several years, it has been possible to generate animations of any result (the animate option found in the results menu). If the user want to save the animation (for distribution to customers, for presentation of results etc), following alternatives exist:

- Export to Glview Pro
- Save the animation in MPEG format *NEW*
- Save the animation in AVI format *NEW*
- Save the animation in GIF format *NEW*

The animation will be set up with following data:

- Actual Result. (The Fringe range specified will be kept)
- Actual Displacement scaling
- Actual window size (could be specified manually)

Settings relevant for the various animation formats could be set, (AVI, MPEG and GIF have different settings). If AVI is selected, it is recommended to use uncompressed bit map, (no coding). Uncompressed BitMap (Raw data) is more computer-independent than using advanced compressing techniques, which require presence of various codec's on the computers. (The AVI file could instead be compressed using WinZip).

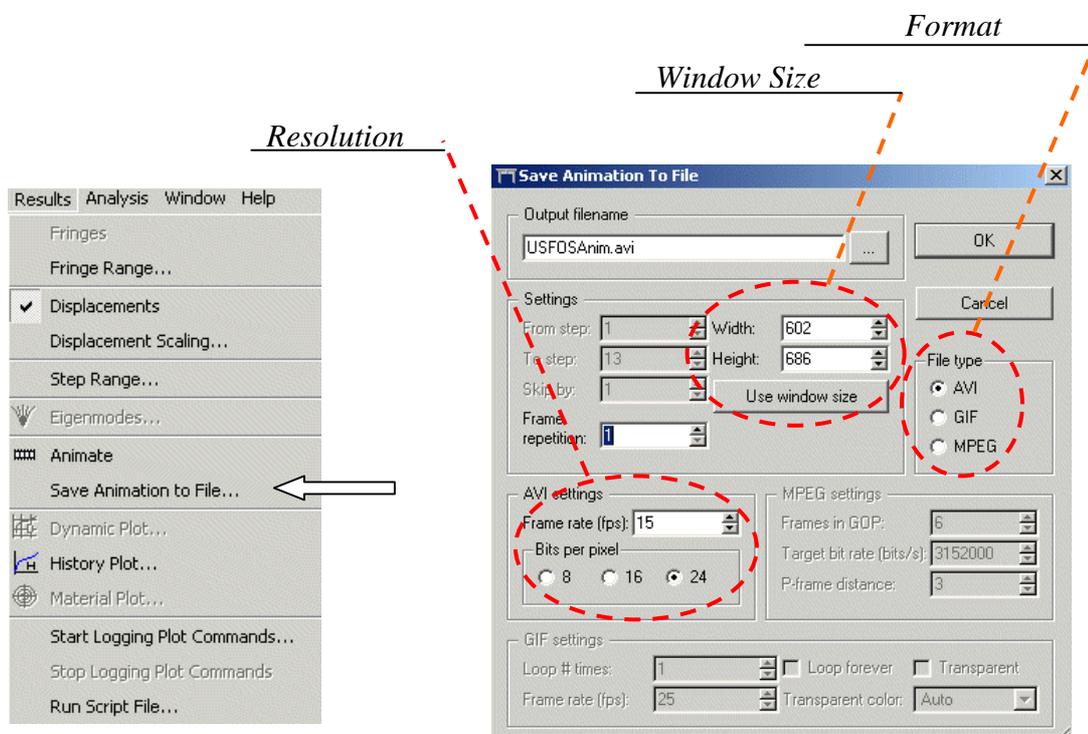


Figure 2-4 The Save Animation Menu

2.2.4 Highlight Elements or Nodes

In order to “find” elements and nodes in a big model, the “Highlight Element” and “Highlight Node” are useful options found under the menu Verify. Elem/Node Ids could be type in manually, or selected from the table. The “Auto highlight” means that the element/nodes are highlighted as you point in the table. Highlight is removed using the “Remove Highlight”.

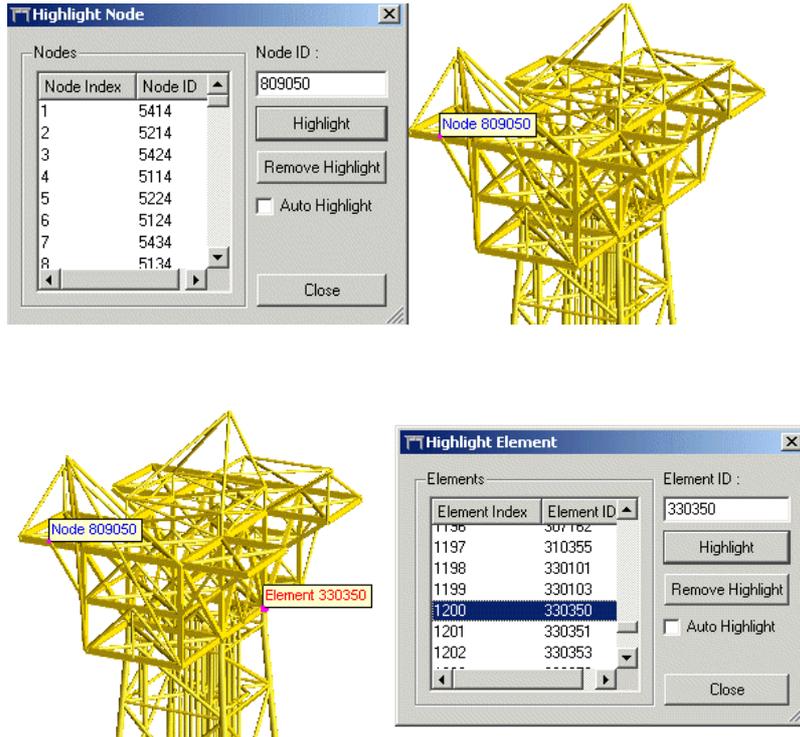


Figure 2-5 Highlight Elements and Nodes

2.2.5 Verify Nodal Forces

Verification of concentrated forces (not moments) is found in the image result window (lower left corner of the xact window, see Figure 2-6). The load cases with concentrated forces are listed. By default the force values are printed at arrow tip, and the length of the longest arrow is 0.3 x model outstretch. Figure 2-7 gives an example of the different options. Following could be customised:

- Label On/Off
- Length of arrow
- Line width and colour

The Vector setting is found under the Verify Menu.

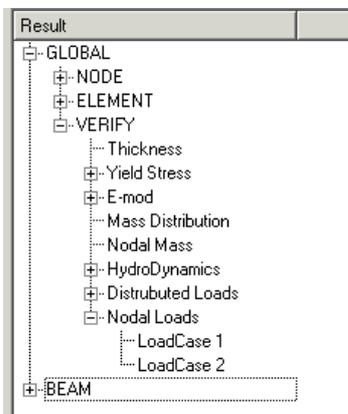


Figure 2-6 Verify Nodal Forces menu.

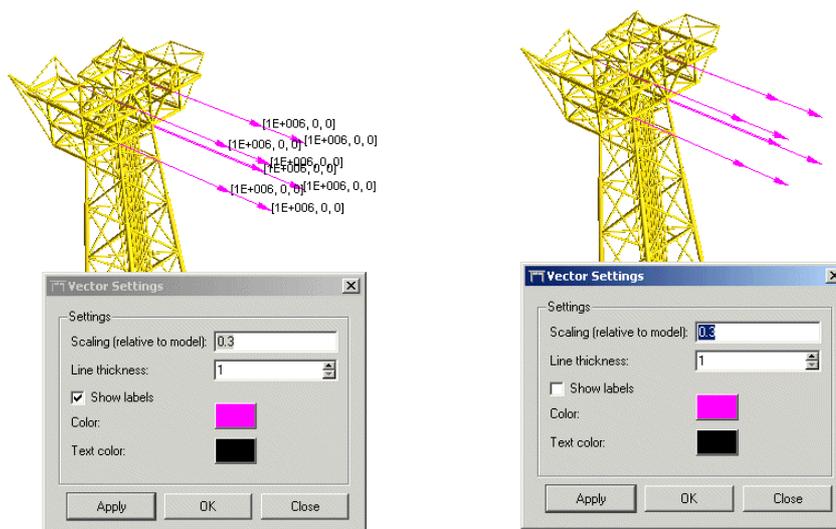


Figure 2-7 Verify Concentrated Forces (not moments)

2.2.6 Verify Concentrated (nodal) Masses

Verification of concentrated Masses is found in the image result window (lower left corner of the exact window, see Figure 2-8). By default the mass value is printed at the bar tip, and the height of the longest bar is 0.3 x model outstretch. Following could be customised:

- Label On/Off
- Height of the bar
- Bar width and colour

The Bar setting is found under the Verify Menu.

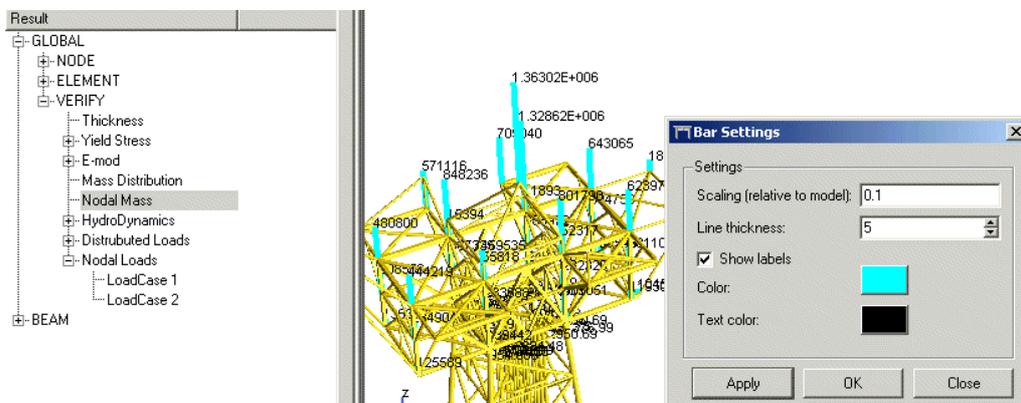


Figure 2-8 Verify Nodal Masses

The Bars could be presented together with normal result fringes (as well as force arrows).

The option is switched off (and on again) under the Verify Menu.

2.2.7 Script Files for logging/running Save Plot commands

If a series of XY-plots are to be generated for a number of result files (of same model), saving the define/save XY-plots could save time.

Under the Results menu, the Start/Stop logging of commands are found. The commands are stored on a ASCII files with extension *.usf* (USFOS Script File, see Figure 2-10).

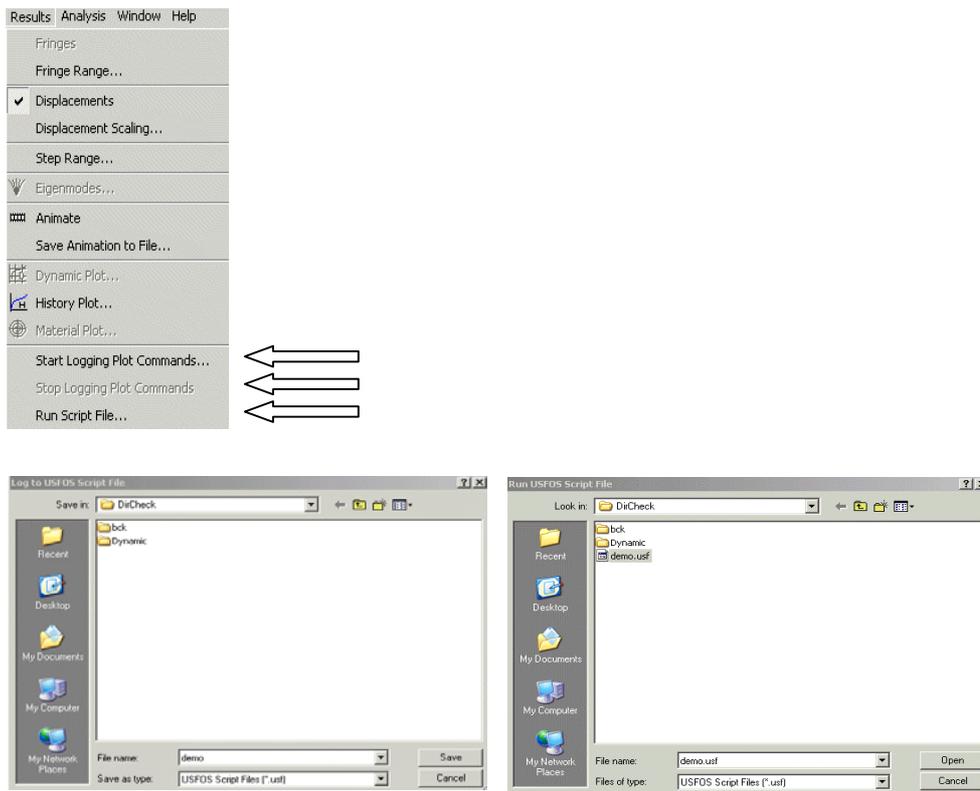


Figure 2-9 Saving / Running Script files for generation of XY-plot files.

```

plot history Step number,-1,-1,-1,Z-Reaction,-1,-1,-1
plot save Plot1.bmp,BMP
plot history Step number,-1,-1,-1,Base Shear,-1,-1,-1
plot save Plot2.bmp,BMP
    
```

Figure 2-10 Example of content on a script file.

The Script File “Language” is relatively easy to interpret, (and the advanced users will typically prefer to create/edit the file manually... ☺).

2.2.8 Editor Command: *Find*

The context sensitive editor available under “Analysis Control” and “Window/Editor” is extended with a Find Option. (Ctrl F).

The editor is, by default, searching for files with extension *.fem* (input files for USFOS), but could also be used for reading USFOS text-output files (.out and .text).

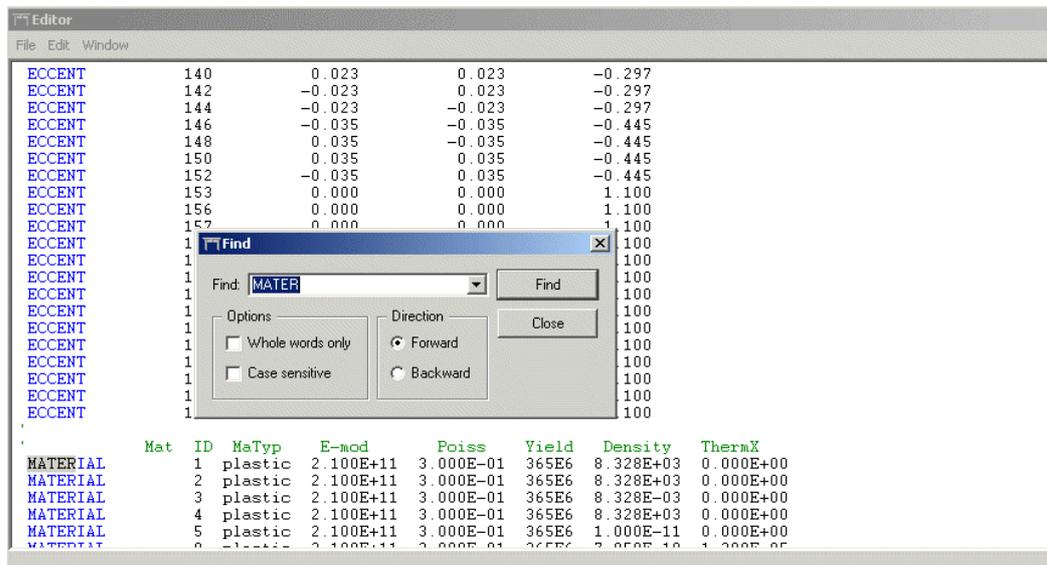


Figure 2-11 New Editor function: The Find Option

2.3 Grouted Joints

A model for grouted joints based on ISO is implemented. The Grouted Joint options is controlled by the user through the new command **JntOption**.

A joint becomes *grouted* based on following rule:

- If Chord 1 specified under CHJOINT is grouted and *default* CHJOINT parameters are used, (only joint ID and the two Chord Ids are specified). If more parameters are specified under the CHJOINT, the user has to specify grouted joint separately.
- If the command **JntOption** *Grouted* <JointID> is specified.

See the example available on the web, [www.USFOS.com](http://www.usfos.com) under Examples/USFOS/misc or use the link below:

http://www.usfos.no/examples/usfos/misc/Grout_Joint01/index.html

2.4 Grouted Members

An improved version of the Grouted Member option (first time released in the 8-1 version) is available. Both examples, theory and verification are available on the web site. A “package” of information is found from following link:

http://www.usfos.no/examples/usfos/misc/Grouted_Member01/index.html

2.5 Joint Checking. Non-Tubular Braces

At present, the CHJOINT option has failed if at least one of the “braces” was non tubular. Version 8-2 accepts non tubular braces, but such “braces” are not checked (no capacity formulas are implemented at present).

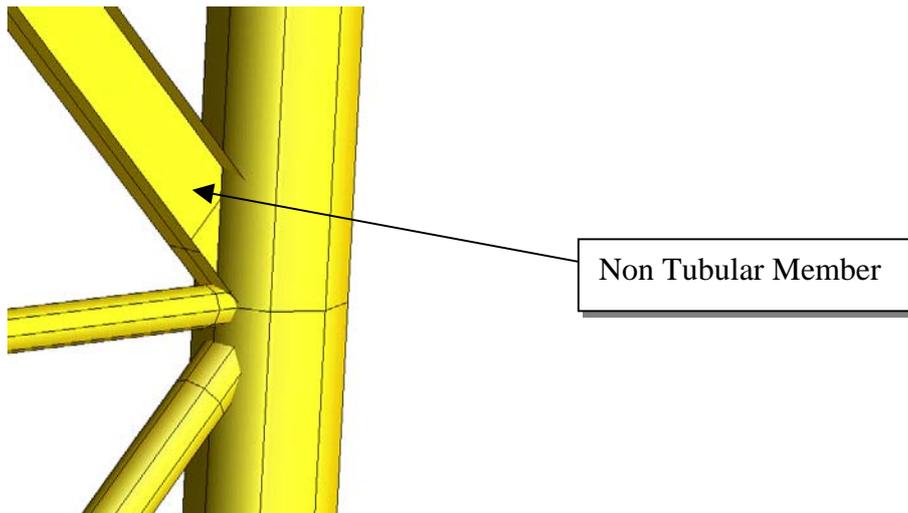


Figure 2-12 Non Tubular Brace among tubular to check.

<i>NODE</i>	<i>Chord</i>		<i>Chord</i>	<i>Capacity</i>		<i>Element</i>
<i>ID</i>	<i>elem 1</i>	<i>elem 2</i>	<i>geo</i>	<i>rule</i>	<i>Formulation</i>	
80	210	190	1	API	Spring	

<i>Data for the 3 braces :</i>						

<i>Brace</i>	<i>Conn</i>	<i>Angle</i>	<i>Gap</i>	<i>Axial</i>	<i>MipB</i>	<i>MopB</i>
<i>ID</i>	<i>Type</i>	<i>(deg)</i>		<i>Cap.</i>	<i>Cap.</i>	<i>Cap.</i>
40	NoChk			2.333E+06	1.581E+05	3.758E+04
50	KT	45	0.033	1.256E+05	7.553E+03	5.835E+03
120	KT	90	0.033	7.500E+04	3.468E+03	2.856E+03

Figure 2-13 The non tubular braces are just disregarded during the checking

2.6 Skin Friction on Piles

The example highlights the parameter **FMax** specified for Sand under the command **API_SOIL**. By default, the skin friction increases for increasing overburden pressure, but the user may override this by specifying a maximum, limiting skin friction.

In the actual example, the P-Y, T-Z and Q-Z properties of each layer are computed according to API-93 based on the user defined soil data (like friction angle, weight, shear strength etc.). For the upper layers, a weak sand is specified with the skin friction limited to 20.000 N/m² (20 kPa). The lower layers are specified with a stronger sand, and in this case, the skin friction resistance is limited to 50.000 N/m² (50 kPa).

Same property could be referred to several time, and reference to 0 gives no soil stiffness at actual layer.

The actual parameter **FMax** is specified as the last parameter as seen below.

```

,
,
      ID typ      load Gam  Plug Phi  Delta  rNq  QPlim  FMax
API_SOIL 11 Sand  Static 17000 0 25 25 20 1.0E+07 20E3
API_SOIL 13 Sand  Static 18000 0 35 25 20 1.0E+07 50E3
,

```

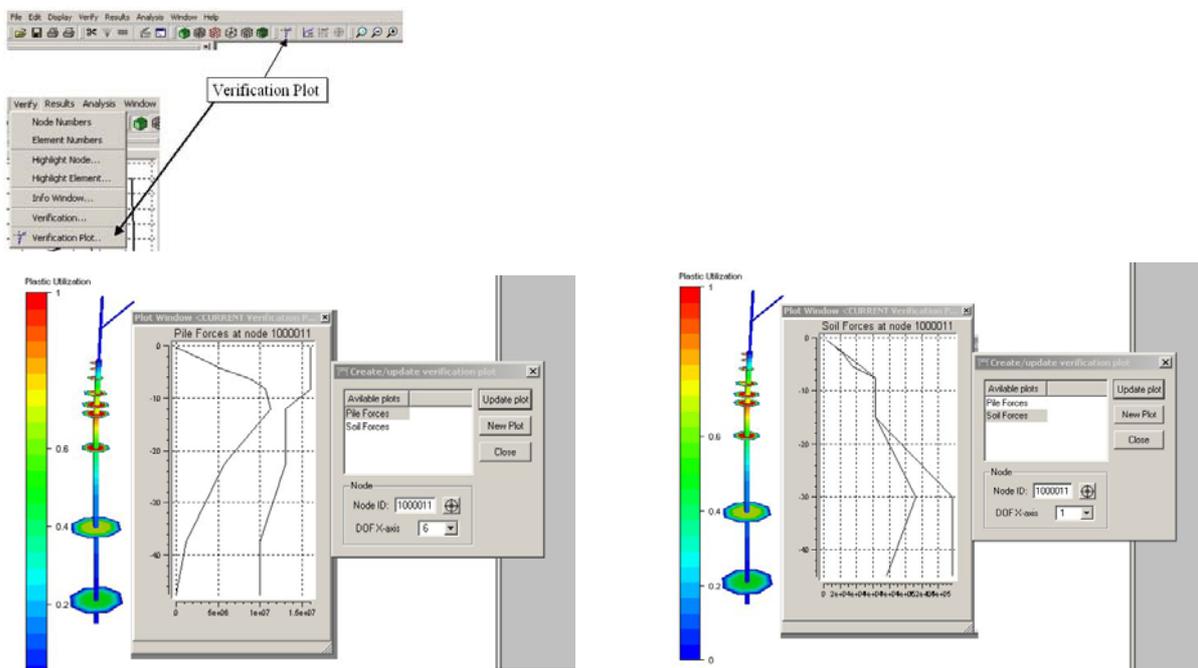


Figure 2-14 Extended Plot Option for Pile/Soil

An example is found on the following link:

<http://www.usfos.no/examples/usfos/foundation/Pile03/index.html>

3 New/modified input commands

Since last main release (8-1), following input identifiers are added/extended:

<i>API_SOIL</i>	:	Extended Command	;	<i>Skin Friction Limitation</i>
<i>JNTOPTION</i>	:	New Command	;	<i>Grouted /No-Grouted Joints</i>