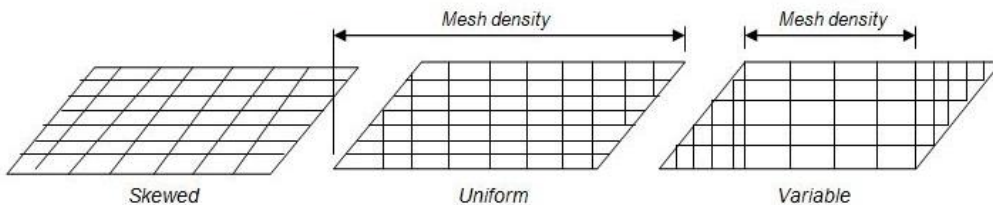# ACES V7.1 and V7.2
MAJOR NEW FEATURES

1. GENERAL SYSTEM CHANGES

❑ **WINDOWS 7:** The program has been compiled to run under the WINDOWS 7 Professional (64 Bit) operating system. However, the same version will also run under Win7 (32 Bit), VISATA and XP. It is significantly faster on all platforms. Changes were also made to the licence file (*Aces.vsn*) to provide clearer licensing information. (Implemented in V 7.1).

❑ **WINDOWS 8:** WIN8 may object to writing data to files with the extension "*.scr*" (assuming them to be screensavers) and also to files without extensions (in particular the 'PARAMS' file). All scratch files names were therefore changed from *.scr* to *.txt* and 'PARAMS' to '*PARAMS.TXT*' in Version 7.200.
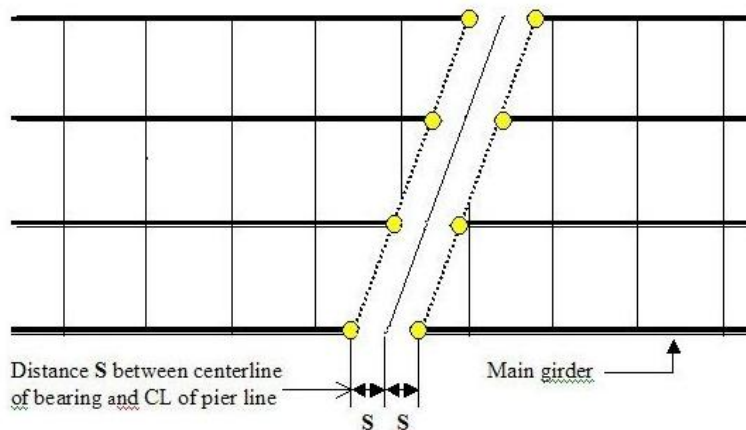
2. GRILLAGE TEMPLATES - Skewed Grillages Type 2, 3

❑ *'Variable'* **Mesh Type:** This additional grillage layout type was added to the existing two types (*Skewed* and *Uniform*). When the mesh is created the transverse member densities in the skew regions are different to those in the main body of the span (defined as that area lying between the internal span apexes).   The mesh densities in the skew regions of each span are based on the number of longitudinal girders in the model. The density in the body of the span is specified by the *Mesh Density* parameter.

Variable Mesh Type: For each span in the structure the program calculates the length between the internal apex points then divides this distance into a uniform grillage mesh, where the mesh spacing is given by: *Length / Mesh density*

❑ *'Offset for Internal Supports'*: This option enable supports to be generated at a defined offset '*S*' from the internal span end nodes. If a value is entered into this field ACES will create a series of new spans offset from the internal lines of support by that amount. The "old" supports and former connecting members between them are deleted.

Distance S between centerline of bearing and CL of pier line

Main girder

S S

3. STAGE CONSTRUCTION

Options were provided that enable stage construction analysis to be more easily performed.
They included changes to the following menus and dialog boxes:

❑ "*Analyse / Analysis Type*" **dialog box:** Radio buttons were added to the bottom of this
dialog box to allow the exclusion of de-activated members/elements from the analysis. The
exclusion is performed by multiplying the *E* value of de-activated members by a suitably
small factor nominated by the user (the default value is .001) and by setting the correspond-
ing density to zero. Member and element loads on de-activated members are also excluded
from the analysis.

❑ "*Analyse*" - **Main menu option:** Two items were added to this menu - "*Include all
members/elements in the analysis*" and "*Exclude de-activated members/elements from the
analysis*". Note that the modification of '*E* and density is only performed just prior to the
analysis and is temporary – the original (actual) properties assigned to suppressed
members/elements are always retained and will be used in the analysis once the
members/elements have been re-activated.

❑ "*Activate / De-Activate*" **menu options:** A new top menu option was created to allow
nodes, members and elements to be selectively de-activated. The supression (de-
activation) features were removed from the "*Activate*" menu option**.**

❑ **Analysis Message:** If the analysis option is clicked and members/elements have been
deactivated (suppressed) ACES will display a warning message to this effect. Member and
element loads on de-activated members are not included in the analysis.

❑ **Loading model files with de-activated members/elements:** When loading model files
with de-activated members/elements the program will display a warning message that parts
of the model have been de-activated.

4. ENVELOPES (V7.2)

❑ **Floating Envelope List:** A new "*ENV*" option and icon have been provided that allows all
currently defined envelopes to be listed in a "floating" window when interrogating results. The
diagram for any envelope can then be quickly displayed just by clicking on its entry in the list.
The envelope list can also be activated via a tick-box on the envelope selection dialog box.

❑ **Enveloping & Summing Cumulative Envelopes:** Cumulative envelopes can now be
summed and enveloped with each other or with non-cumulative envelopes.

❑ **Retaining Summed & Enveloped Envelopes:** Envelopes that have been summed or
enveloped are retained in the envelope list. They are now identified with the prefixes:
[C] Cumulative envelope;   [E] Envelope of envelopes;   [S] Sum of envelopes

4. OTHER CHANGES

❑ **Right-Click on a member - Member Release:** Options have been provided in the pop-up
right-click menu to add or delete moment releases at either end of the selected member.

❑ **Adding Nodes:** If a new node is created using the "*Add node*" option and it falls on an
existing member an option is now given for that member to be divided at that point. If the
member is not divided the node will be left in an unconnected state.

❑ **Member Force Options** dialog box**:** A feature has been included on this dialog box that
allows both the vehicle and vector diagrams to be displayed concurrently - but only if an
individual loading (using the '*LCase*' button) is selected. The option cannot be used for
combinations or envelopes. The feature is activated via a tick box called: "*Display both
vehicle & vector diagrams*".

❑ **Reports / Moments & shears / Sort by loadings:** When selected this option now brings up a dialog box that gives the user three member/node range options to report on:

- All members in the current range
- At specified nodes
- At specified members

Note that for the second option the results are given at the start or end of all members ending at the designated node(s).

5. MME MODULE

❑ **Envelope of envelopes function:** Both normal and cumulative (polarised) envelope types can be mixed when creating an envelope of envelopes. Envelopes of envelopes will be saved with the job and can be recalled later. They can also be transferred into the PSC module. (V7.2)

❑ **Loading existing envelopes from model files:** When adding ACES model files into the MME file list the module now searches each file for any envelopes that may have already been created and optionally loads them into the MME envelope list. A dialog box allows the required envelopes to be selected. Each envelope in the file being added is associated with its corresponding file number.

6. PSC MODULE

❑ **Enhancements:**

- Multiple sections (i.e., the entire girder) can now be designed
- Variable section properties along the girder (i.e., every section can be different)
- Design forces can be imported from ACES models and other sources (e.g., EXCEL)
- Ultimate Moment check can optionally be performed using strain-compatibility analysis
- Comprehensive shear and shear plus torsion checks
- Serviceability crack check to AS5100 using strain-compatibility analysis
- Graphical display of a range of results along the girder
- Ability to save and retrieve strand segment and passive reinforcement profiles
- Fully annotated reports that include the design methodology
- Customisable output reports, design methodologies and default parameters settings