GRAITEC MODELING THE FUTURE

What's New

in Advance Design 2024.1.2

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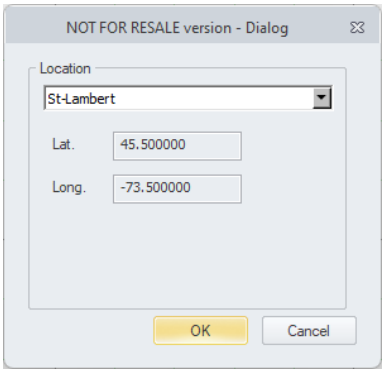
1. Improvements and corrections

We are pleased to announce the release of **Hotfix 2** for Advance Design 2024.1. This latest hotfix not only addresses a set of bug fixes (including those rectified in the non-public Hotfix 1) but also introduces a new option related to load distribution.

We have categorized the corrections and improvements into four distinct groups. Below, you will find a detailed list outlining each of these updates, ensuring you are fully informed about the enhancements made to Advance Design.

1.1 Modelling

- [**Seismic spectral values – NBC 2020**] Updated database with seismic spectral values for the design of buildings in Canada acc. the National Building Code of Canada 2020 (NBC 2020). The data is now consistent with the latest update used by the official government website (https://www.seismescanada.rncan.gc.ca/hazard-alea/interpolat/nbc2020-cnb2020-en.php). In addition, to make it easier to verify the data, a display of the geographic coordinates used has been added to the location selection window. (#172000)



- [**Crash**] Corrected the problem of unexpected program termination during model rotation operations on a specific model with steel connections. (#168115)
- [**Crash**] Corrected the problem of unexpected program termination during copying the model by symmetry by plane command on a specific user model. (#168450)
- [**Crash**] Corrected the problem of unexpected program termination during the opening of a specific user model, resulting from incorrect model conversion. (#168363)
- [**Crash**] Corrected the problem of unexpected program termination when selecting the Imperial system option in the window with the list of reinforcement diameters in RC Calculation settings. (#170111)
- [**Combinations - EN 13031-1**] Corrected the problem of not considering the K-factor for Occasional variable loads during combination generation according to EN 13031-1 (#162062)
- [**Snow - EN 13031-1**] Corrected the problem related to the generation of exceptional load cases according to EN 13031-1 also for drifted snow. (#170881)
- [**Parametric Z Section**] Corrected the problem of determining incorrect (underestimated) cross-sectional parameters for parametric Zed sections. (#171100]

1.2 Steel design

- [**Crash – Eurocode 3**] Corrected the problem of unexpected program termination during the verification process of a steel element in the user's model, resulting from incorrect model conversion. (#167475)

- [**Cold-formed sections – Eurocode 3**] Corrected the problem of missing verification results of cold-formed elements with Ignore Fy & Mz option enabled if verification was not performed on the selection of elements. (#169952)

- [**Problems when working with 2 monitors**] Corrected the problem of incorrect display of windows with buckling or lateral-torsional buckling settings, when working with multiple monitors. The problem was causing parts of the window to be invisible and was related to the handling of scaling window contents with certain configurations of the screen and system settings. (#168648)

- [**Buckling for bar and strut elements**] Corrected a problem with the inability to change settings for buckling if the linear element was modeled as Bar or Strut. (#171060)

- [**Suggested shapes table**] Corrected the problem with the deflection work ratio not being considered when selecting the weakest element in the Suggested Shapes window if "per system" was selected as the sorting method. (#169810)

- [**Suggested shapes table**] Corrected the problem of ignoring the option to select the deflection verification location from the superelement deflection settings, which resulted in using the deflection envelope results for superelements when optimizing profiles in the Suggested Shapes table. (#171235)

- [**Torsional properties for tubular sections**] Corrected the problem of incorrect determination of torsion parameters for tubular cross sections during the Advanced Stability verification. Now additional torsional moment from warping (Mw) and warping bi-moment (Mxs) are ignored for square, rectangular and circular hollow sections. (#170787)

1.3 Postprocessing

- [**Deformation display**] To unify the display of displacements for linear and surface elements, the default displacement display mode for both element categories has been modified to be the same "Deformed". (#167896)

- [**Crash – Result table**] Corrected the problem of unexpected program termination if a comma character was used as a decimal separator during the definition of the value filter in the table with stress results for planar supports. (#170074)

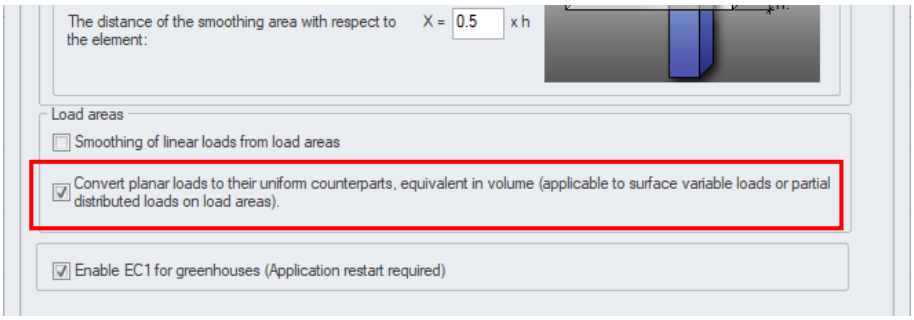
- [**Crash – Result table**] Corrected the problem of unexpected program termination when attempting to display a table of force data for load type objects in the Result tables window. (#170101)

1.4 Distribution of loads

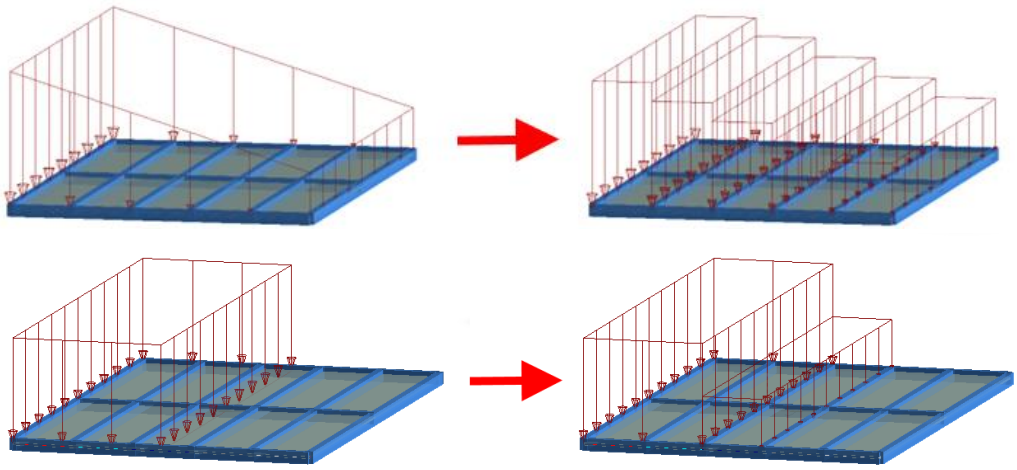
- [**Construction stages**] Resolved the problem of not correctly assigning to the construction stages all loads defined on the load area, if during the generation of the calculation model the load area is automatically divided into smaller parts. (#167950)

- [**Variable linear load distribution**] Corrected the problem of using the wrong direction of inclination of the load area when determining the load generated during the automatic load distribution defined on the load area, when the applied load was linear with a variable value. The bug caused the automatically generated load in the analytical model to be slanted in the wrong plane. (#170278)

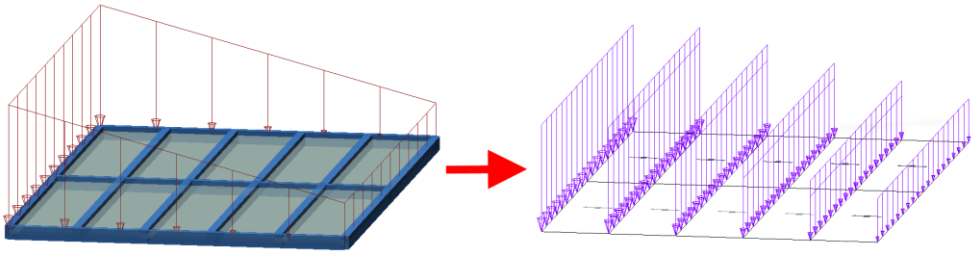
- [**Distribution of surface loads on Load areas**] This update adds a new option related to the distribution of surface load applied on the load area. The new option (enabled by default) is available in the Application settings window, on the Results tab.



The purpose of the new option is to improve and simplify the layout of loads applied to linear elements located under the load area, when the surface load applied on the load area has a variable value or only partially covers the load area. In both cases, during the process of load decomposition to linear elements at the time of analytical model generation, the surface load is converted to equivalent loads of constant value over smaller areas. It should be noted that the input load is not modified, and the conversion is carried out only during the computational model generation process.
The image below shows the idea for two discussed cases:



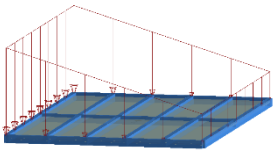
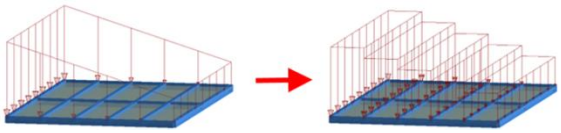
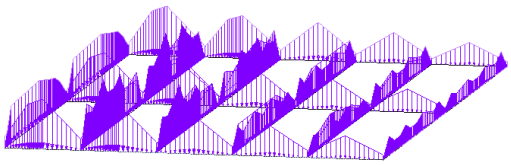
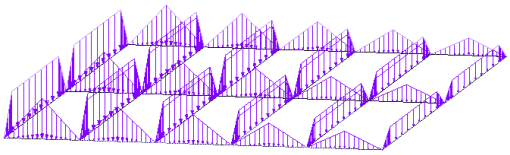
The above simplification makes it possible to use an analytical distribution for a load that is uniform over all areas between linear elements. The following example shows the generated linear loads for a one-way force distribution.



For most typical examples (such as roofs with purlins) this simplification is giving a regular and symmetrical load distribution. And in addition, the number of loads generated automatically is much lower than when using the influence line algorithm, which affects the shorter model generation.

When the new option is disabled, for cases in which the analytical load distribution method cannot be used (such as mentioned earlier cases when the surface load has a variable value or only partially covers the load area), the previous algorithm based on the influence lines concept is used. Unfortunately, this algorithm often generates a complex system with triangular and trapezoidal linear loads.

The image below shows an example of a two-way decomposition for a variable surface load, for both states of the new option.

Off	On
	
	

It should also be noted that in cases where the analytical load distribution method can be successfully used, it is automatically selected regardless of the status of the new option. For example, as in the images below, where the surface load is uniform and covers the load area in its entirety, or when it fully covers the areas between linear elements.